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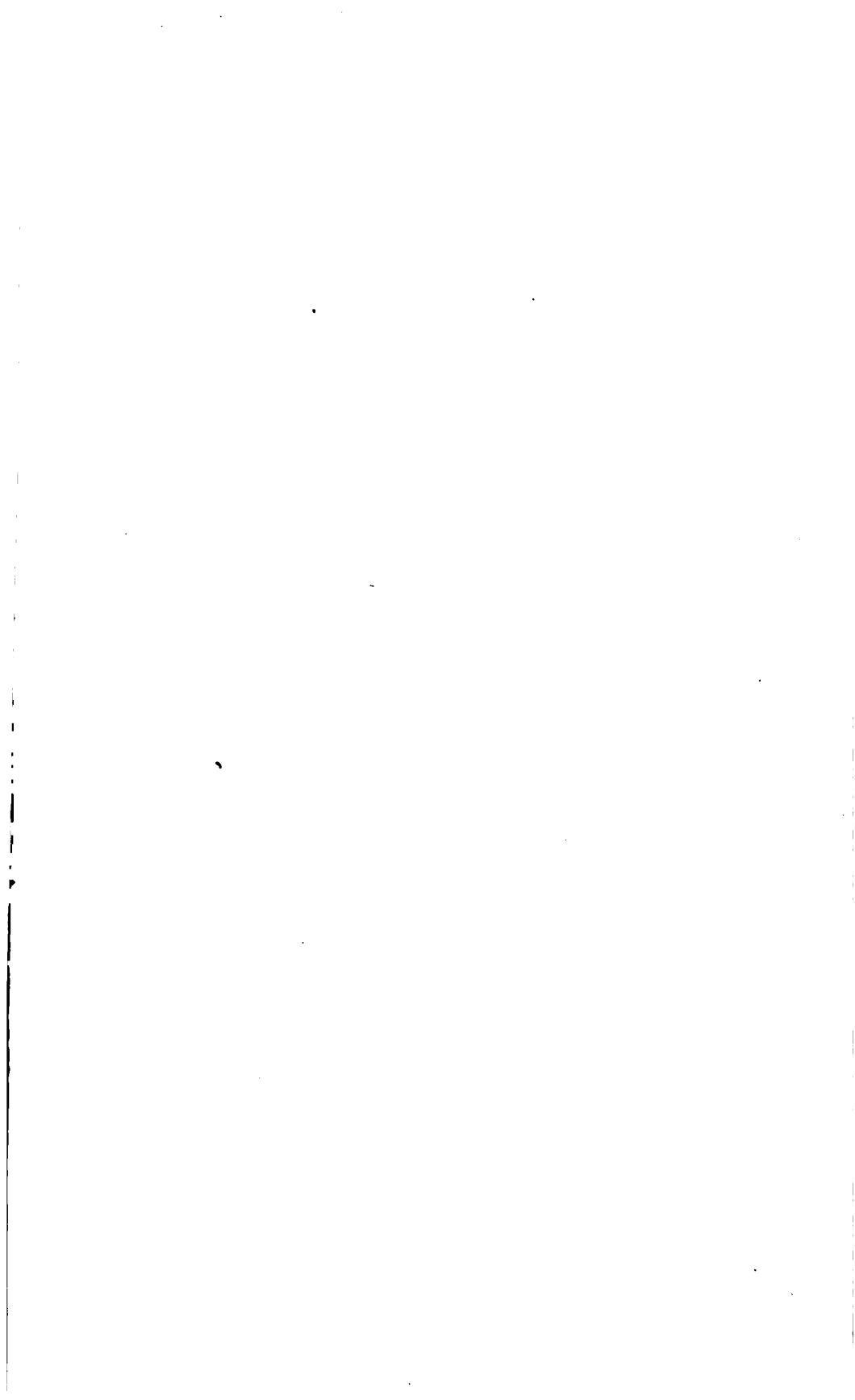
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THE
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NAUTICAL ALMANAC

FOR THE YEAR

1916

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NOTE.—Those whose names are printed in italics devote only a small portion of their time to work of the Nautical Almanac Office.

January, 1914.

PREFACE.

This volume of the *American Ephemeris and Nautical Almanac* was prepared under the immediate supervision of Professor W. S. EICHELBERGER, U. S. N., the Director. The character of the matter herein contained is the same as in the immediately preceding volumes, but the arrangement has been changed in a number of instances. The changes in the Ephemeris have been made with the approval of the Astronomical Council of the Observatory upon the recommendation of the Director, after consultation with the Assistants of the Nautical Almanac Office.

This is the first volume to be issued under the international agreement resulting from the *Congrès International des Éphémérides Astronomiques* held at Paris in October, 1911.

The naval appropriation bill approved August 22, 1912, contained the following:

The Secretary of the Navy is hereby authorized to arrange for the exchange of data with such foreign almanac offices as he may from time to time deem desirable, with a view to reducing the amount of duplication of work in preparing the different national nautical and astronomical almanacs and increasing the total data which may be of use to navigators and astronomers available for publication in the *American Ephemeris and Nautical Almanac*: *Provided*, That any such arrangement shall be terminable on one year's notice: *Provided further*, That the work of the Nautical Almanac Office during the continuance of any such arrangement shall be conducted so that in case of emergency the entire portion of the work intended for the use of navigators may be computed by the force employed by that office, and without any foreign cooperation whatsoever: *Provided further*, That any employee of the Nautical Almanac Office who may be authorized in any annual appropriation bill and whose services in whole or in part can be spared from the duty of preparing for publication the annual volumes of the *American Ephemeris and Nautical Almanac* may be employed by said office in the duty of improving the tables of the planets, moon, and stars, to be used in preparing for publication the annual volumes of the office: *Provided further*, That section four hundred and thirty-five, Revised Statutes, is hereby repealed.

In accordance with the authority granted by Congress, the Navy Department has expressed its willingness to adopt the program of exchanges of data recommended by the International Congress at

have been made with the understanding that the proposed agreement shall be binding on the next edition and with the following conditions:

"That in preparing the RESOLUTION, 'the primary ephemerides of the stars will hereafter be calculated to 1900 mean time in R. A. to 15th decimal and 1900 mean time in DECLINATION and for every year after 1900 the same shall continue for the MERIDIAN OF GREENWICH * * *' the DEPARTMENT is not committed to the printing of the next EPHIMERIS in that RESOLUTION and DECLINATION due to the fact that the MERIDIAN OF GREENWICH MERIDIAN in the *American Ephemeris and Nautical Almanac*

"With reference to the RESOLUTION, 'the predictions of the eclipses and occultations will be made with every possible precision,' the DEPARTMENT has the same with regard to eclipses and occultations will be printed with the same degree of precision as now published in the *American Ephemeris and Nautical Almanac*.

"With regard to the MERIDIAN OF GREENWICH and the RESOLUTION, 'The DEPARTMENT expresses the wish that the adoption of the MERIDIAN OF GREENWICH for all the EPHIMERIDES be realized as soon as possible,' the DEPARTMENT accepts this RESOLUTION in spirit but with certain reservations. The *American Ephemeris and Nautical Almanac* has from the beginning used that MERIDIAN for NAUTICAL purposes, but on account of the remoteness of the AMERICAN CONTINENT from it, and the fact that the NAVAL OBSERVATORY and other OBSERVATORIES near the MERIDIAN are extensive users of the star places published by the *American Ephemeris and Nautical Almanac*, the DEPARTMENT deems it expedient to reserve the right to publish certain EPHIMERIDES for the MERIDIAN OF WASHINGTON.

The volume, as in previous years, is divided into three parts, as follows:

Part I. *Ephemeris for the Meridian of Greenwich*, which gives the positions of the Sun and Moon, the geocentric and heliocentric positions of the major planets, and other fundamental astronomical data for equal intervals of Greenwich mean time.

The material of this part has been rearranged. All information needed in connection with observations of the positions of the Sun has been brought together, and the resulting solar ephemeris is given first in order and for the entire year. Then follows the lunar ephemeris for the entire year, embodying all the information for use in connection with observations of the position of the Moon. Finally, there

appear the planetary ephemerides arranged in accordance with the planet's distance from the Sun, beginning with Mercury.

Part II, *Ephemeris for the Meridian of Washington*, which gives ephemerides of 825 stars, Sun, Moon, and major planets, for transit over the meridian of the Naval Observatory, Washington, which passes midway between the West and East Transit Circles of the Observatory. The mean places of the fixed stars and the data for their reduction are also included in Part II.

In this part the principal changes are that the number of circumpolar stars for which daily ephemerides are given has been increased to 35, and these ephemerides are given together; that the apparent right ascensions of stars whose declination is less than 60° are given to $0''.001$; and that the apparent declinations of all stars are given to $0''.01$.

Part III, *Phenomena*, which contains predictions of phenomena to be observed, with data for their computation. Greenwich mean time is used throughout this part except with the occultations visible at Washington where Washington time is used. Tables for the determination of latitude and azimuth from Polaris, tables for the conversion of time, and an alphabetical list of observatories, with their latitudes, longitudes, and other data, are contained in this part.

The hourly ephemeris of the Moon, and the Greenwich ephemeris of Mars, Jupiter, Saturn, Uranus, and Neptune, were furnished by the office of the *British Nautical Almanac*.

The Greenwich ephemeris of Mercury, the elements of Saturn's rings, the elongations of Saturn's satellites, and the apparent places for Greenwich transit of 518 ten-day stars were furnished by the office of the *Berliner Jahrbuch*.

The conjunctions, phenomena, and configurations of Jupiter's satellites I-IV and the apparent places for Greenwich transit of 38 circumpolar stars were furnished by the office of the *Connaissance des Temps*.

The apparent places for Greenwich transit of 121 ten-day stars were furnished by the office of the *Almanaque Nautico*.

The apparent places for Greenwich transit of 47 ten-day stars were furnished by the office of the *Annuario Astronomico di Torino*.

In accordance with the recommendations of the *Congrès International des Éphémérides Astronomiques*, most of the material furnished from abroad is based upon tables prepared in the American Nautical Almanac Office. In the Introduction are mentioned the various tables upon which the different ephemerides are based.

The following computations were made by the American Nautical Almanac Office:

In Part I, the entire ephemeris of the Sun and Venus; the longitude, latitude, and horizontal parallax of the Moon; and all the hourly and daily variations for the quantities furnished from abroad except in the case of the right ascension and declination of the Moon.

In Part II, the quantities used in computing the apparent places of the stars from their mean places; the mean place list; the interpolation of the apparent places of 724 stars from transit at Greenwich to transit at Washington; the apparent places of 101 stars; the interpolation of the ephemerides of the Sun, Moon, and planets from Greenwich noon to transit at Washington; the stellar magnitudes of the planets.

In Part III, the data relating to the eclipses of the Sun and Moon; the data relating to the occultations of stars by the Moon; the ephemerides for physical observations of the Sun, Moon, Mars, and Jupiter; the elements of the illuminated disks of Mercury and Venus; the stellar magnitudes of the planets; the data concerning the satellites of Mars, Uranus, Neptune, the fifth, sixth, and seventh satellites of Jupiter, and the ninth satellite of Saturn; the diagrams of all the satellite orbits; the position angle and distance tables of the satellites of Saturn; the list of phenomena; the list of observatories with their geographical coordinates; and the tables for the determination of latitude and azimuth from observations of Polaris.

In addition, all computations made in the American Nautical Almanac Office and those received from the other offices were subjected to checks to insure absence of errors.

The personnel of the Office at the date of issue of this volume is given on page ii, and those who worked on this Ephemeris and are not now members of the force are William Auhagen and Walter C. Grebe.

J. L. JAYNE,
Captain, U. S. Navy,
Superintendent Naval Observatory.

U. S. NAVAL OBSERVATORY, *January, 1914.*

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ERRATA.

The American Ephemeris, 1913.

Page.

677, No. 143, Description for 3°.6 E. read 3°.6 W.

The American Ephemeris, 1914.

677, No. 143, Description for 3°.6 E. read 3°.6 W.

The American Ephemeris, 1915.

558, Dec. 32, Apparent Right Ascension for 5°.67 read 5°.65
 677, No. 144, Description for 3°.6 E. read 3°.6 W.
 698, Table V, Lat. 58° 10', Decl. 88° 51' 50'' for 15''.8 read 15''.6

INTRODUCTION.

The Ephemeris for the Meridian of Greenwich, comprising Part I of this volume, has been constructed from various tables of the Sun, Moon, and planets, as stated below, and the ephemerides of these bodies for the meridian of Washington contained in Part II have been computed from the same tables.

The Ephemeris of the Sun is constructed from NEWCOMB'S *Tables of the Sun, Astronomical Papers of the American Ephemeris*, Vol. VI, part 1.

The adopted value of the mean equatorial horizontal parallax of the Sun is 8''.80, *Paris Conference, May, 1896*.

The Sun's rectangular equatorial coordinates are computed from the longitudes and latitudes by the following formulæ:

$$\begin{aligned} X &= R \cos \lambda \\ Y &= R \sin \lambda \cos \omega - 19.3 R \beta \\ Z &= R \sin \lambda \sin \omega + 44.5 R \beta \end{aligned}$$

The reductions to mean equinox are computed by the formulæ—

$$\begin{aligned} \Delta X &= + Y \sec \omega \Delta \lambda \sin 1'' \\ \Delta Y &= -X \cos \omega \Delta \lambda \sin 1'' + Z \Delta \omega \sin 1'' + 9.1 \tau R \sin (\lambda + 6^\circ) \\ \Delta Z &= -X \sin \omega \Delta \lambda \sin 1'' - Y \Delta \omega \sin 1'' - 21.0 \tau R \sin (\lambda + 6^\circ) \end{aligned}$$

where the numerical coefficients are in units of the seventh place of decimals and

- R = the Sun's distance from the Earth,
- λ = the Sun's true longitude,
- β = the Sun's true latitude, expressed in seconds of arc,
- ω = the obliquity of the ecliptic,
- $\Delta \lambda$ = the reduction of longitude for precession and nutation from the beginning of the Besselian fictitious year,
- $\Delta \omega$ = the reduction of the mean to the apparent obliquity,
- τ = the fraction of the year since the beginning of the Besselian fictitious year.

The longitude, latitude, and parallax of the Moon are derived from HANSEN'S *Tables de la Lune* (London, 1857), the mean longitude being corrected as in previous years, beginning with the volume for the year 1883. The statement concerning these corrections which is contained in the volumes from 1883 to 1911, inclusive, is erroneous, in that they have not been computed strictly in accordance with the formula in NEWCOMB'S *Researches on the Motion of the Moon*, part 1, page 268, *Washington Observations*, 1875, Appendix II. That formula is,

$$-1''.14 - 29''.17 T - 3''.86 T^2 - V_2 - 0''.09 \sin A - 15''.49 \cos A,$$

while the expression actually used is,

$$-1''.14 - 29''.17 T - 3''.76 T^2 - V_2 - 15''.49 \cos A.$$

In these formulæ T is the time in units of 100 years reckoned from 1800.

The ephemerides of Mercury, Venus, and Mars are derived from NEWCOMB'S tables of these planets, *Astronomical Papers of the American Ephemeris*, Vol. VI, parts 2, 3, and 4.

The ephemerides of Jupiter and Saturn are derived from the tables constructed in this office by GEORGE W. HILL, *Astronomical Papers of the American Ephemeris*, Vol. VII, parts 1 and 2.

The ephemerides of Uranus and Neptune are derived from NEWCOMB'S tables of these planets, *Astronomical Papers of the American Ephemeris*, Vol. VII, parts 3 and 4.

The nutation used in computing the ephemerides of the Sun, Moon, and planets has been taken from Tables XXXII and XXXIII of NEWCOMB'S *Tables of the Sun, Astronomical Papers of the American Ephemeris*, Vol. VI, part 1. The formulæ from which this nutation is computed are as follows, the time interval T being expressed in units of 100 years, reckoned from 1900. See *Tables of the Sun*, page 26.

$$\begin{array}{ll}
 \delta\psi = -(17''.234 + 0''.017 T) \sin \Omega & \delta\epsilon = +9''.214 \cos \Omega \\
 + 0''.209 \sin 2 \Omega & -0''.090 \cos 2 \Omega \\
 - 1''.257 \sin 2 L & +0''.546 \cos 2 L \\
 - 0''.049 \sin (3 L + 78^\circ.7) & +0''.021 \cos (3 L + 78^\circ.7) \\
 + 0''.110 \sin (L + 75^\circ.3) & -0''.009 \cos (L - 78^\circ.7)
 \end{array}$$

The formulæ for the nutation used in computing the Besselian and Independent Star Numbers are as follows:

Terms of Long Period.	Terms of Short Period.
$\delta\psi = -(17''.234 + 0''.017 T) \sin \Omega$	$-0''.204 \sin 2 \mathcal{C}$
$+ 0''.209 \sin 2 \Omega$	$+0''.011 \sin (\mathcal{C} + I')$
$- 1''.272 \sin 2 L$	$+0''.068 \sin (\mathcal{C} - I')$
$+ 0''.126 \sin (L - I')$	$-0''.034 \sin (2 \mathcal{C} - \Omega)$
$- 0''.050 \sin (3 L - I')$	$-0''.026 \sin (3 \mathcal{C} - I')$
$+ 0''.021 \sin (L + I')$	$+0''.015 \sin (\mathcal{C} - 2 L + I')$
$+ 0''.012 \sin (2 L - \Omega)$	$+0''.006 \sin 2 (\mathcal{C} - L)$
$\delta\epsilon = + (9''.210 + 0''.0009 T) \cos \Omega$	$+0''.088 \cos 2 \mathcal{C}$
$- 0''.090 \cos 2 \Omega$	$+0''.018 \cos (2 \mathcal{C} - \Omega)$
$+ 0''.552 \cos 2 L$	$+0''.011 \cos (3 \mathcal{C} - I')$
$+ 0''.022 \cos (3 L - I')$	$-0''.005 \cos (\mathcal{C} + I')$
$- 0''.009 \cos (L + I')$	
$- 0''.007 \cos (2 L - \Omega)$	

The meaning of the symbols used and the manner in which these latter formulæ have been employed in computing the ephemerides of the stars are explained on pages 200 and 201. The slight discrepancy between the terms in 2 L in these two sets of formulæ is due to the correction of an error in the first set. See *Bulletin Astronomique*, 1898, Vol. XV, page 244.

The list of 825 stars contained in Part II has been selected from NEWCOMB'S *Catalogue of Fundamental Stars, Astronomical Papers of the American Ephemeris*, Vol. VIII, part 2.

In general, the names of the stars are the same as in NEWCOMB'S Suggested List of Fundamental Stars, except that the FLAMSTEED number has been omitted in all cases where Greek or italic letters are available. In some cases the constellation and number of the uranometries of HEIS or GOULD have been used. In all such cases, H¹ or the letter G precedes the constellation name, as, for example, 5 H¹. Cassiopeiæ and 38 G. Horologii.

The magnitudes of the stars have, with a few exceptions, been taken from *Annals of the Harvard College Observatory*, Vol. L, 1908.

The spectral classification has been furnished by the Harvard College Observatory. The notation is that of *Annals of Harvard College Observatory*, Vol. LVI.

The mean places, annual variations, and annual proper motions of the stars have been taken from NEWCOMB'S Catalogue, except that those of ϵ Hydri, 38 G. Horologii, and π Centauri have been taken from *Veroeffentlichungen des Koeniglichen Astronomischen Rechen-Instituts zu Berlin*, 1907, No. 33.

The values of $\Delta\alpha$ and $\Delta\delta$ which are given for the companions to the stars γ Andromedæ, α^1 Crucis, ζ^1 Ursæ Majoris and 61 Cygni, have been taken from BOSS'S *Preliminary General Catalogue*, and those for α^2 Geminorum from DOBERCK'S elements given in the *Astronomische Nachrichten*, 1904, vol. 166, page 145.

The formulæ for the computation of the Besselian and Independent Star Numbers are given on page 200, the coefficients being those given by NEWCOMB in *Bulletin Astronomique*, 1898, Vol. XV, page 241.

The terms of short period of the nutation, depending on the Moon's mean longitude, have been computed from the formulæ for these terms given above.

The method by which the right ascensions and declinations of the stars interpolated from the 10-day ephemerides are corrected for the effect of these short-period terms is given on page 201.

According to the formulæ on pages 200 and 201 the star constants $a, b, c, d, a', b', c', d'$ are computed for each star from its mean place at the beginning of the year, but if strict accuracy is required they should be computed from the star's mean place at date, and the following second-order terms should be added to the usual expressions for the reduction from mean to apparent place, namely—

To $\alpha - \alpha_0$	To $\delta - \delta_0$
$+0.000\ 003\ r^2 \sin \alpha \left. \vphantom{\begin{matrix} +0.000\ 003 \\ -0.000\ 149 \\ -0.000\ 0650 \end{matrix}} \right\} \tan \delta$	$+0.000\ 975\ r^2 \sin^2 \alpha$
$-0.000\ 149\ r^2 \cos \alpha \left. \vphantom{\begin{matrix} -0.000\ 149 \\ -0.000\ 0650 \end{matrix}} \right\} \tan \delta$	$-0.000\ 023 \cos 2\ \Omega$
$-0.000\ 0650\ r^2 \sin 2\alpha \left. \vphantom{\begin{matrix} -0.000\ 0650 \\ +0.000\ 0103 \end{matrix}} \right\} \tan^2 \delta$	$-0.000\ 080 \cos 2\ \Omega \cos 2\alpha$
$+0.000\ 0103 \sin 2\ \Omega \cos 2\alpha \left. \vphantom{\begin{matrix} +0.000\ 0103 \\ -0.000\ 0107 \end{matrix}} \right\} \tan^2 \delta$	$-0.000\ 077 \sin 2\ \Omega \sin 2\alpha$
$-0.000\ 0107 \cos 2\ \Omega \sin 2\alpha \left. \vphantom{\begin{matrix} -0.000\ 0107 \\ +0.000\ 0620 \end{matrix}} \right\} \tan^2 \delta$	$+0.000\ 040 \cos 2\ \odot$
$+0.000\ 0620 \sin 2\ \odot \cos 2\alpha \left. \vphantom{\begin{matrix} +0.000\ 0620 \\ -0.000\ 0622 \end{matrix}} \right\} \sec^2 \delta$	$-0.000\ 467 \cos 2\ \odot \cos 2\alpha$
$-0.000\ 0622 \cos 2\ \odot \sin 2\alpha \left. \vphantom{\begin{matrix} -0.000\ 0622 \\ +0.000\ 0513 \end{matrix}} \right\} \sec^2 \delta$	$-0.000\ 465 \sin 2\ \odot \sin 2\alpha$
$+0.000\ 0513 \sin (\odot + \Omega) \cos 2\alpha \left. \vphantom{\begin{matrix} +0.000\ 0513 \\ -0.000\ 0507 \end{matrix}} \right\} \tan \delta \sec \delta$	$-0.000\ 039 \cos (\odot + \Omega)$
$-0.000\ 0507 \cos (\odot + \Omega) \sin 2\alpha \left. \vphantom{\begin{matrix} -0.000\ 0507 \\ +0.000\ 0097 \end{matrix}} \right\} \tan \delta \sec \delta$	$-0.000\ 380 \cos (\odot + \Omega) \cos 2\alpha$
$+0.000\ 0097 \sin (\odot - \Omega) \cos 2\alpha \left. \vphantom{\begin{matrix} +0.000\ 0097 \\ -0.000\ 0053 \end{matrix}} \right\} \tan \delta \sec \delta$	$-0.000\ 385 \sin (\odot + \Omega) \sin 2\alpha$
$-0.000\ 0053 \cos (\odot - \Omega) \sin 2\alpha$	$-0.000\ 380 \cos (\odot - \Omega)$
	$-0.000\ 040 \cos (\odot - \Omega) \cos 2\alpha$
	$-0.000\ 072 \sin (\odot - \Omega) \sin 2\alpha$

These terms are negligible for stars whose declination is numerically less than 80° , but in computing the apparent places given in the American Ephemeris they have been applied whenever sensible.

The *apparent* places of seven stars have been corrected for the effect of annual parallax. These stars, with the adopted values of the annual parallax, are—

τ Ceti	0.31	α Centauri	0.75
ϵ Eridani	0.32	α Aquilæ (Altair)	0.23
α Canis Majoris (Sirius)	0.38	61 Cygni	0.30
α Canis Minoris (Procyon)	0.33		

The *apparent* places of α Canis Majoris (Sirius), α Canis Minoris (Procyon), and α^2 Centauri have been corrected for the effect of orbital motion. AUWERS's elements were used for Sirius and Procyon, and SEE's elements for α^2 Centauri. The values of these corrections are given on pages 98 and 99 of *Veroeffentlichungen des Koeniglichen Astronomischen Rechen-Instituts zu Berlin*, 1907, No. 33, but those for Sirius and Procyon need an additional correction to refer them to the center of the orbit before they are applicable to the mean places taken from NEWCOMB's Fundamental Catalogue. These additional corrections for Sirius and Procyon were omitted in the *Star List of the American Ephemeris* [*Supplement to the American Ephemeris and Nautical Almanac*] for 1910 and 1911, and in the *American Ephemeris and Nautical Almanac* for 1912 and 1913. The values of the corrections for the three stars are—

	Sirius.		Procyon.		α^2 Centauri.	
	1916.0	1917.0	1916.0	1917.0	1916.0	1917.0
$\Delta\alpha$	-0 ^s .142	-0 ^s .143	-0 ^s .062	-0 ^s .062	+0 ^s .658	+0 ^s .647
$\Delta\delta$	-0 ^m '.46	-0 ^m '.59	-0 ^m '.08	+0 ^m '.05	+6 ^m '''.25	+5 ^m '''.98

These corrections have not been applied to the mean places as published in this volume.

The stars occulted by the Moon have been selected from the *Catalogue of Zodiacal Stars* contained in Vol. VIII, part 3, *Astronomical Papers of the American Ephemeris*, and the mean places for 1916.0 have been derived from the same catalogue.

In Part III the elements of eclipses of the Sun and occultations of stars by the Moon are given in accordance with BESSEL's method, the special forms employed being a modification of those developed in CHAUVENET's *Spherical and Practical Astronomy*.

In the computation of the elements of Eclipses, the following corrections to the longitude, latitude, and parallax of the Moon, deduced by NEWCOMB from recent observations of occultations of stars by the Moon, *Astronomical Papers of the American Ephemeris*, Vol. IX, part 1, have been applied. These corrections have been assumed in each case to be constant during the eclipse.

G. M. T.			δv	δb	$\delta \pi$
1916			"	"	"
Jan.	19 ^d	21 ^h	+6.4	+1.0	+0.34
Feb.	3	4	+7.5	-0.3	+0.42
July	14	17	+6.2	-0.1	+0.43
July	29	14	+8.3	+1.0	+0.34
Dec.	24	8	+7.0	0.0	+0.42

The elongations of the satellites of Mars are derived from elements given by H. STRUVE in *Sitzungsberichte der Königlich Preussischen Akademie der Wissenschaften*, 1911, page 1073.

The conjunctions and phenomena of Jupiter's four brighter satellites are derived from SAMPSON's tables. The configurations are derived from a continuation of DAMOISEAU's tables by M. POTTIER.

The elongations of the Vth satellite of Jupiter are derived from unpublished elements deduced from the observations of BARNARD.

The differential coordinates of Jupiter's VIth and VIIth satellites are derived from elements and tables given in *Lick Observatory Bulletin*, 1906, Vol. IV, No. 112, and in *Astronomische Nachrichten*, 1907, Vol. 174, page 359, respectively.

The elongations and conjunctions of the satellites and the positions of the rings of Saturn are derived from elements given by H. STRUVE in *Observations de Poulkova*, Supplement 1, St. Petersburg, 1888; *Publications de Poulkovo*, Second Series, Vol. XI, St. Petersburg, 1898; with corrections communicated by H. STRUVE to the *Berliner Jahrbuch*. The differential coordinates of Phœbe are derived from elements and tables given in the *Annals of Harvard College Observatory*, 1905, Vol. LIII, No. VI.

The apparent outer dimensions (a and b) of the rings of Saturn are also according to STRUVE; the relative dimensions of the rings are computed from BESSEL's data, except those for the dusky ring, which are based on the observations of various astronomers.

The elongations of Ariel and Umbriel, the inner satellites of Uranus, are derived from the data of NEWCOMB's *Uranian and Neptunian Systems*, *Washington Observations*, 1873, Appendix I. The elongations of Titania and Oberon, the outer satellites of Uranus, are derived from elements given by H. STRUVE in *Abhandlungen der K. Preussischen Akademie der Wissenschaften*, 1912.

The elongations of the satellite of Neptune are derived from elements given by A. HALL in the *Astronomical Journal*, 1898, Vol. XIX, page 65.

The adopted apparent semidiameter of the Sun at the Earth's mean distance is $16' 1''.50$, while in the computation of eclipses the value given by AUWERS in the *Astronomische Nachrichten*, 1891, Vol. 128, page 367, is employed, viz., $15' 59''.63$.

In the computation of the ephemeris for physical observations of the Sun, the following elements by CARRINGTON have been used:

Inclination of the Sun's equator to the ecliptic	$7^{\circ} 15'$
Longitude of the ascending node of the Sun's equator on the ecliptic	$73^{\circ} 40' + 50''.25 (t-1850)$
Sidereal period of rotation (mean solar days)	$25^d 4.38$

The apparent semidiameter of the Moon is computed from the Moon's equatorial horizontal parallax, π , by the formula,

$$S = 0.272\,506\,\pi + 1''.50$$

where the constant 0.272 506 is based on data from occultations given by J. PETERS in the *Astronomische Nachrichten*, 1895, Vol. 138, page 147; and the constant $1''.50$ is added to cover the average effect of irradiation.

The value of the Moon's semidiameter employed in the computation of eclipses is computed from the formula,

$$\sin S = 0.272\,274 \sin \pi$$

In the computation of the ephemeris for physical observations of the Moon, the following notation and formulæ have been used, the value of I and the formulæ for physical libration being those given by F. HAYN in *Abhandlungen der K. Sächsischen Gesell. der Wissenschaften*, Vols. 29 and 30, 1904, 1907:

I = the inclination of the Moon's mean equator to the ecliptic ($= 1^{\circ} 32'.1$),

Ω = the longitude of the ascending node of the Moon's orbit, or the longitude of the descending node of the Moon's mean equator,

C = the angle at the center of the Moon's disk made by a lunar meridian with the circle of declination, counted from north to east,

$\lambda, \beta, \alpha, \delta$ = the geocentric longitude, latitude, right ascension, and declination of the Moon,

i = the inclination of the Moon's mean equator to the Earth's true equator,

Δ = the distance on the Moon's mean equator from its ascending node on the Earth's true equator to its ascending node on the ecliptic,

Ω' = the distance along the Earth's true equator from the true equinox to the ascending node of the Moon's mean equator,

ζ = the Moon's mean longitude, referred to the mean equinox,

g' = the Earth's mean anomaly,

g = the Moon's mean anomaly,

ω = the angular distance of the perigee of the Moon's orbit from its ascending node on the ecliptic,

b, l = the optical librations in latitude and longitude, respectively,

$\delta b, \delta l$ = the physical librations in latitude and longitude, respectively,

$b + \delta b$ = the Moon's geocentric libration in latitude = the Earth's selenographic latitude,

$l + \delta l$ = the Moon's geocentric libration in longitude = the Earth's selenographic longitude,

δC = the physical libration of C ,

$\mu = -0'.617 \sin 2(\Omega - \lambda)$,

$A = \sin I \cos(\Omega - \lambda)$,

$\tan B = \tan I \sin(\Omega - \lambda)$,

$\lambda' = \lambda + \mu + \Delta b$,

$b = B - \beta$,

$l = \lambda' - \zeta$,

$\sin C' = \sin i \frac{\cos(\lambda' + \Delta - \Omega)}{\cos \delta} = -\sin i \frac{\cos(\alpha - \Omega)}{\cos \delta}$,

$\delta b = +108'' \sin(\omega + l) + 37'' \sin(\omega - l) - 11'' \sin(g + \omega - l)$,

$\delta l = +12'' \sin g - 59'' \sin g' - 18'' \sin 2\omega$,

$-[108'' \cos(\omega + l) - 37'' \cos(\omega - l) + 11'' \cos(g + \omega - l)] \tan b$,

$\delta C = -[108'' \cos(\omega + l) - 37'' \cos(\omega - l) + 11'' \cos(g + \omega - l)] \sec b$,

$C = C' + \delta C$.

The Sun's selenographic latitude and longitude have been computed from formulæ the same as those given above except that the heliocentric coordinates of the Moon have been substituted for the geocentric coordinates.

The following elements have been used in computing the ephemerides for physical observations of the planets Mars and Jupiter:

Position of north pole of Mars	$\alpha = 21^h 10^m 0^s + 1^s.565(t-1905)$ $\delta = 54^\circ 30' 0'' + 12''.60(t-1905)$
Position of north pole of Jupiter	$\alpha = 17^h 52^m 0^s.84 + 0^s.247(t-1910)$ $\delta = 64^\circ 33' 34''.6 - 0''.60(t-1910)$
Rotation period of Mars	$24^h 37^m 22^s.65$
Rotation period of Jupiter {System I.	$9^h 50^m 30^s.004$
{System II.	$9^h 55^m 40^s.632$
Longitude of Central Meridian of Mars, May 15, 1897, Greenwich Mean Noon	$52^\circ.01$
Longitude of Central Meridian of Jupiter (System I.), July 14, 1897, Greenwich Mean Noon	$47^\circ.31$
Longitude of Central Meridian of Jupiter (System II.), July 14, 1897, Greenwich Mean Noon	$96^\circ.58$

The position of the north pole of Mars is as given by LOWELL and CROMMELIN (see *Monthly Notices R. A. S.*, 1905, Vol. 66, page 56), while that of the north pole of Jupiter has been deduced from the position given by DAMOISEAU for 1750 (see *Tables Écliptiques des Satellites de Jupiter*, page (1)). The rotation periods of Mars and of Jupiter and the longitudes of the central meridians are according to MARTH (see *Monthly Notices R. A. S.*, 1896, Vol. 56, pages 395-403 and 517-524). The longitude of the Great Red Spot and the time of its transit across the Central Meridian given in the volumes for 1913 and 1914

have been replaced by those of System II. of MARTH. This change has been made in view of the following facts: The Paris Conference of October, 1911, assigned to the office of the American Ephemeris and Nautical Almanac the preparation of the ephemerides for the physical observations of the planets; a general desire exists that the use of System II. of MARTH should not be discontinued; and the position of the Great Red Spot during the opposition of 1912 was about 70° from the place predicted from the elements adopted in the *American Ephemeris and Nautical Almanac* for 1913.

The adopted semidiameters of the planets, with the authority for each, are given on page xix. Their stellar magnitudes have been computed from formulæ given by G. MUELLER in *Publicationen des Astrophysikalischen Observatoriums zu Potsdam*, 1893, Vol. 8, page 366.

In the list of observatories the positions given in this volume have been thoroughly revised, and in each case the authority from which they are derived is given. The latitudes given are in most cases astronomical. In some instances they have been determined by geodetic triangulation from other points. The reductions from geographic to geocentric latitude, $\varphi' - \varphi$, and the distance from the center of the earth, ρ , are computed from the formulæ on page xviii, using the flattening $\frac{1}{297}$ obtained by JOHN F. HAYFORD in *Supplementary Investigation in 1909 of the Figure of the Earth and Isostasy*, U. S. Coast and Geodetic Survey, 1910, and adopted by the *Paris Conference*, October, 1911.

ANNIVERSARIES AND FESTIVALS, 1916.

New Year's Day	Saturday, Jan. 1.
Epiphany	Thursday, Jan. 6.
Lincoln's Birthday	Saturday, Feb. 12.
Septuagesima Sunday	Sunday, Feb. 20.
Washington's Birthday	Tuesday, Feb. 22.
Quinquagesima (Shrove Sunday)	Sunday, Mar. 5.
Ash Wednesday	Wednesday, Mar. 8.
Palm Sunday	Sunday, Apr. 16.
First Day of Passover	Tuesday, Apr. 18.
Good Friday	Friday, Apr. 21.
Easter Sunday	Sunday, Apr. 23.
Rogation Sunday	Sunday, May 28.
Memorial Day	Tuesday, May 30.
Ascension Day (Holy Thursday)	Thursday, June 1.
Hebrew Pentecost (Shebuoth)	Wednesday, June 7.
Pentecost (Whit Sunday)	Sunday, June 11.
Trinity Sunday	Sunday, June 18.
Corpus Christi	Thursday, June 22.
Independence Day	Tuesday, July 4.
Labor Day (except in certain States)	Monday, Sept. 4.
Hebrew New Year (Rosh Hashanah)	Thursday, Sept. 28.
Day of Atonement (Yom Kippur)	Saturday, Oct. 7.
First Day of Tabernacle (Sucoth)	Thursday, Oct. 12.
Election Day	Tuesday, Nov. 7.
Thanksgiving Day	Thursday, Nov. 30.
First Sunday in Advent	Sunday, Dec. 3.
Christmas Day	Monday, Dec. 25.

CHRONOLOGICAL ERAS AND CYCLES.

CHRONOLOGICAL ERAS.

THE YEAR 1916, WHICH COMPRISES THE LATTER PART OF THE 140TH AND THE BEGINNING OF THE 141ST YEAR OF THE INDEPENDENCE OF THE UNITED STATES OF AMERICA, CORRESPONDS TO—

The year 6629 of the Julian period;

- “ 7424–7425 of the Byzantine era, the year 7425 commencing on September 1;
- “ 5676–5677 of the Jewish era, the year 5677 commencing on September 28, or, more exactly, at sunset on September 27;
- “ 2669 since the foundation of Rome, according to VARRO;
- “ 2663 since the beginning of the era of NABONASSAR, which has been assigned to Wednesday, the 26th of February of the 3967th year of the Julian Period; corresponding in the notation of chronologists, to the 747th, and, in the notation of astronomers, to the 746th year before the birth of CHRIST;
- “ 2692 of the Olympiads, or the fourth year of the 673d Olympiad, commencing in July, 1916, if we fix the era of the Olympiads at $775\frac{1}{2}$ years before CHRIST, or near the beginning of July of the year 3938 of the Julian period;
- “ 2228 of the Grecian era, or the era of the SELEUCIDÆ, which began near the vernal equinox of the year, $-311 = \text{B. C. } 312, = 4402$ of the Julian Period;
- “ 1632 of the era of DIOCLETIAN;
- “ 2576 of the Japanese era and to the 5th year of the period entitled Taisho.

The year 1335 of the Mohammedan era, or the era of the Hegira, begins on the 28th day of October, 1916.

The first day of January of the year 1916 is the 2,420,864th day since the commencement of the Julian Period.

CHRONOLOGICAL CYCLES.

Dominical Letter	BA	Solar Cycle	21
Epact	26	Roman Indiction	14
Lunar Cycle or Golden Number	17	Julian Period	6629

ASTRONOMICAL CONSTANTS.

Solar Parallax	8.80"
Constant of Variation	9.11. Paris Conference.
Constant of Aberration	20.47"
General Precession	50' 25.44"—0".000 222 t—1900
Obliquity of the Ecliptic	23° 27' 8".28—0".4684 t—1900 } Newcomb.
Equatorial Horizontal Parallax of the Moon	57' 2".63" } Newcomb.)
Mean distance Earth to Moon 384 400 kilometers=238 855 miles, or 60.378 radii.	
Mean distance Earth to Sun 149 594 391 kilometers=92 495 416 statute miles.	
Velocity of Light 299 790 kilometers=196 324 statute miles per second Newcomb and Michelson.	
Light travels unit distance in 499.580.	

Gaussian Gravitation Constant $\gamma k=0.017 372 099=1.543 177 61$.

Acceleration in one second due to gravity, $g=9.8066-0.000 \cos 2\phi-\frac{21}{R^2}$.

Length of seconds pendulum, $l=0.993 549-0.002 631 \cos 2\phi-\frac{21}{R^2}$ Heilmert.

Length of the year:

Tropical ordinary	365 242 198.79—0.000 000 0614 t—1900
Sidereal	365 256 369.42—0.000 000 0011 t—1900 } Newcomb.
Anomalistic	365 259 641.34—0.000 000 0304 t—1900
Eclipse	346 620 000 —0.000 000 36 t—1900

Length of the month:

Synodical ordinary	$\frac{d}{29.530 588}=\frac{d}{29} \frac{h}{12} \frac{m}{44} \frac{s}{2.8}$	} Hansen.
Tropical	$\frac{d}{27.321 582}=\frac{d}{27} \frac{h}{7} \frac{m}{43} \frac{s}{4.7}$	
Sidereal	$\frac{d}{27.321 661}=\frac{d}{27} \frac{h}{7} \frac{m}{43} \frac{s}{11.5}$	
Anomalistic	$\frac{d}{27.554 550}=\frac{d}{27} \frac{h}{13} \frac{m}{18} \frac{s}{33.1}$	
Nodical	$\frac{d}{27.212 219}=\frac{d}{27} \frac{h}{5} \frac{m}{5} \frac{s}{35.7}$	

Length of the day:

Sidereal	$\frac{h}{23} \frac{m}{56} \frac{s}{4.991}$ of mean solar time.
Mean Solar	$\frac{h}{24} \frac{m}{3} \frac{s}{56.555}$ of sidereal time.

Dimensions of the Earth Hayford's Spheroid of 1909:

Equatorial Radius, $a=6378.268$ kilometers or 3963.34 statute miles.

Polar Radius, $b=6356.909$ " or 3949.99 " "

Flattening, $\frac{a-b}{a}=\frac{1}{297.0}$

Logarithm of the eccentricity $\frac{a^2-b^2}{a^2}=\log e=8.913 804$

Logarithm radius= $\log \rho=9.999 2695-0.000 7324 \cos 2\phi-0.000 0019 \cos 4\phi$.

Reduction from geographic latitude ϕ to geocentric latitude ϕ' ,

$$\phi'-\phi=-11' 35''.66 \sin 2\phi+1''.17 \sin 4\phi.$$

1 meter=3.280 8333 feet. 1 foot=0.304 8006 meters.

1 statute mile=0.868 962 nautical or geographical miles.

1 nautical mile=1.151 594 statute miles.

* Used in the computation of eclipses. The parallax used in the computation of the ephemeris of the Moon contained in this volume is 57' 2".23 Hansen.

† k^2 is the acceleration due to the Sun's attraction at the mean distance of the Earth from the Sun, which is also the astronomical unit of distance, the unit of time being one mean solar day.

‡ ϕ =latitude, h =elevation above sea level in meters, and $\log R=6.9424$.

NOTE.—The above values of $\log \rho$ and $\phi'-\phi$ were computed with the eccentricity that results from assuming that the flattening of the earth is exactly $\frac{1}{297}$.

ASTRONOMICAL CONSTANTS.

SEMI-DIAMETERS OF THE SUN, MOON, AND PLANETS.

Name.	At Unit Distance.	At Mean Least Distance.	In Kilometers.	In Statute Miles.	Authority.
Sun	15 59.63	"	695 553.46	432 196.01	Auwers.
Moon	15 32.58*	"	1 738.02	1 079.96	Newcomb.
Mercury	3.34	5.45	2 420.89	1 504.27	Le Verrier.
Venus	8.55	30.90	6 197.18	3 850.74	Peirce.
Mars	5.05	9.64	3 660.32	2 274.42	Peirce.
Jupiter (Equatorial)	1 40.20	23.84	72 626.64	45 128.01	Am. Eph.
Jupiter (Polar)	1 34.12	22.40	68 219.76	42 389.71	Peirce.
Saturn (Equatorial)	1 24.88	9.94	61 522.45	38 228.20	Barnard.
Saturn (Polar)	1 17.47	9.07	56 151.56	34 890.89	Barnard.
Uranus	33.52	1.84	24 295.86	15 096.72	Am. Eph.
Neptune	38.66	1.33	28 021.42	17 411.67	Am. Eph.

ELEMENTS OF THE PLANETARY ORBITS FOR THE EPOCH 1916—January 1^d G. M. T.

Name.	Mean Distance.	Sidereal Period in Tropical Years.	Sidereal Mean Daily Motion.	Synodic Period in Tropical Years.	Eccentricity.
☿ Mercury	0.387 039	0.240 85	14 732.420	0.317 26	0.205 6175
♀ Venus	0.723 331	0.615 21	5 767.670	1.598 72	0.006 8131
⊕ Earth	1.000 000	1.000 04	3 548.193	"	0.016 7443
♂ Mars	1.523 698	1.880 89	1 886.519	2.135 39	0.093 3234
♃ Jupiter	5.202 803	11.862 23	299.128	1.092 11	0.048 3636
♄ Saturn	9.538 843	29.457 72	120.455	1.035 18	0.055 8344
♅ Uranus	19.190 978	84.015 29	42.23	1.012 09	0.047 0894
♆ Neptune	30.070 672	164.788 29	21.53	1.006 14	0.008 5434

Name.	Inclination to the Ecliptic.	Mean Longitude of the Node.	Mean Longitude of the Perihelion.	Mean Longitude at the Epoch.	Logarithm of Mass in Unit of Sun's Mass.
☿ Mercury	7 0 11.4	47 20 8.1	76 8 54.9	334 1 49.48	3.221 8487—10
♀ Venus	3 23 37.6	75 55 25.1	130 23 20.7	345 50 27.48	4.389 3398—10
⊕ Earth	"	"	101 29 45.3	99 49 10.97	4.482 2896—10
♂ Mars	1 51 1.0	48 54 33.7	334 30 46.8	116 25 10.21	3.509 5499—10
♃ Jupiter	1 18 28.3	99 35 58.8	12 58 9.8	3 51 29.51	6.979 9082—10
♄ Saturn	2 29 30.0	112 55 23.2	91 24 7.9	102 19 36.17	6.455 7335—10
♅ Uranus	0 46 21.9	73 34 14.6	169 18 16.4	312 8 48.45	5.640 7528—10
♆ Neptune	1 46 39.8	130 51 17.2	43 53 43.7	120 12 12.53	5.705 5338—10

The elements of the four inner planets are derived from those given by NEWCOMB in Vol. VI of the *Astronomical Papers of the American Ephemeris*, and are the same as those used in computing the ephemerides of these planets. Those of Jupiter, Saturn, Uranus, and Neptune are taken from Vol. VII of the *Astronomical Papers* for the epoch of the tables. They are reduced to 1916 by applying LE VERRIER'S variations, and can not be regarded as being strictly identical with the elements used in computing the ephemerides of those planets in this volume.

* At mean distance. See *Ast. Papers Am. Eph.*, Vol. IX, p. 39. For the values of the semidiameter used in this volume see page xiii.

SYMBOLS AND ABBREVIATIONS.

SIGNS OF THE PLANETS, ETC.

☉	The Sun.	♂	Mars.
☾	The Moon.	♃	Jupiter.
☿	Mercury.	♄	Saturn.
♀	Venus.	♅	Uranus.
♁	The Earth.	♆	Neptune.

SIGNS OF THE ZODIAC.

Spring Signs.	{	1.	♈	Aries.	Autumn Signs.	{	7.	♎	Libra.
		2.	♉	Taurus.			8.	♏	Scorpius.
		3.	♊	Gemini.			9.	♐	Sagittarius.
Summer Signs.	{	4.	♋	Cancer.	Winter Signs.	{	10.	♑	Capricornus.
		5.	♌	Leo.			11.	♒	Aquarius.
		6.	♍	Virgo.			12.	♓	Pisces.

ASPECTS.

- ♌ Conjunction, or having the same Longitude or Right Ascension.
- ☐ Quadrature, or differing $\pm 90^\circ$ in Longitude or Right Ascension.
- ♌ Opposition, or differing 180° in Longitude or Right Ascension.

ABBREVIATIONS.

♊	Ascending Node.	°	Degrees.
♋	Descending Node.	'	Minutes of Arc.
N.	North.	"	Seconds of Arc.
S.	South.	h	Hours.
E.	East.	m	Minutes of Time.
W.	West.	s	Seconds of Time.

PART I.

ASTRONOMICAL EPHEMERIS FOR THE MERIDIAN OF GREENWICH.

FOR GREENWICH MEAN NOON.

Date.	Day of the Week.	Apparent Right Ascension.	Var. per Hour.	Apparent Declination.	Var. per Hour.	Semi-diameter.	Hor. Par.	Equation of Time. App.—Mean.	Var. per Hour.	Sidereal Time, or Right Ascension of Mean Sun.
		h m s	s	° ' "	"	' "	"	m s	s	h m s
Jan. 1	Sa	18 42 27.14	11.064	-23 5 35.0	+11.21	16 17.84	8.95	- 3 10.95	-1.198	18 39 16.19
2	Su	18 46 52.30	11.042	23 0 52.1	12.36	16 17.84	8.95	3 39.55	1.186	18 43 12.75
3	Mo	18 51 17.16	11.028	22 55 41.5	13.51	16 17.84	8.95	4 7.85	1.172	18 47 9.31
4	Tu	18 55 41.67	11.013	22 50 3.5	14.65	16 17.84	8.95	4 35.81	1.157	18 51 5.86
5	We	19 0 5.81	10.997	22 43 58.2	15.78	16 17.83	8.95	5 3.39	1.140	18 55 2.42
6	Th	19 4 29.53	10.979	-22 37 25.8	+16.91	16 17.82	8.95	- 5 30.55	-1.122	18 58 58.98
7	Fr	19 8 52.80	10.960	22 30 26.6	18.02	16 17.80	8.95	5 57.27	1.103	19 2 55.54
8	Sa	19 13 15.60	10.939	22 23 0.7	19.12	16 17.78	8.95	6 23.50	1.083	19 6 52.10
9	Su	19 17 37.88	10.917	22 15 8.4	20.22	16 17.76	8.95	6 49.23	1.061	19 10 48.66
10	Mo	19 21 59.62	10.894	22 6 49.9	21.31	16 17.73	8.95	7 14.41	1.033	19 14 45.21
11	Tu	19 26 20.80	10.870	-21 58 5.6	+22.38	16 17.70	8.95	- 7 39.03	-1.014	19 18 41.77
12	We	19 30 41.39	10.845	21 48 55.6	23.45	16 17.66	8.95	8 3.06	0.988	19 22 38.33
13	Th	19 35 1.36	10.819	21 39 20.2	24.50	16 17.62	8.95	8 26.47	0.962	19 26 34.89
14	Fr	19 39 20.70	10.792	21 29 19.7	25.54	16 17.57	8.95	8 49.25	0.935	19 30 31.45
15	Sa	19 43 39.39	10.765	21 18 54.5	26.57	16 17.52	8.95	9 11.38	0.908	19 34 28.01
16	Su	19 47 57.40	10.737	-21 8 4.7	+27.58	16 17.46	8.95	- 9 32.84	-0.880	19 38 24.56
17	Mo	19 52 14.73	10.708	20 56 50.7	28.58	16 17.39	8.95	9 53.61	0.851	19 42 21.12
18	Tu	19 56 31.36	10.678	20 45 12.8	29.57	16 17.32	8.94	10 13.69	0.821	19 46 17.68
19	We	20 0 47.28	10.648	20 33 11.3	30.55	16 17.24	8.94	10 33.05	0.791	19 50 14.24
20	Th	20 5 2.47	10.617	20 20 46.5	31.51	16 17.16	8.94	10 51.68	0.761	19 54 10.79
21	Fr	20 9 16.92	10.586	-20 7 58.8	+32.46	16 17.07	8.94	-11 9.57	-0.730	19 58 7.35
22	Sa	20 13 30.62	10.555	19 54 48.5	33.40	16 16.97	8.94	11 26.72	0.699	20 2 3.91
23	Su	20 17 43.57	10.524	19 41 15.8	34.32	16 16.87	8.94	11 43.11	0.667	20 6 0.47
24	Mo	20 21 55.76	10.492	19 27 21.2	35.23	16 16.76	8.94	11 58.74	0.635	20 9 57.02
25	Tu	20 26 7.18	10.460	19 13 5.0	36.12	16 16.65	8.94	12 13.60	0.603	20 13 53.58
26	We	20 30 17.82	10.427	-18 58 27.5	+37.00	16 16.53	8.94	-12 27.68	-0.571	20 17 50.14
27	Th	20 34 27.68	10.395	18 43 29.2	37.86	16 16.41	8.94	12 40.99	0.538	20 21 46.69
28	Fr	20 38 36.76	10.362	18 28 10.3	38.71	16 16.28	8.94	12 53.51	0.505	20 25 43.25
29	Sa	20 42 45.05	10.329	18 12 31.2	39.54	16 16.15	8.93	13 5.24	0.472	20 29 39.81
30	Su	20 46 52.54	10.296	17 56 32.4	40.35	16 16.02	8.93	13 16.18	0.439	20 33 36.36
31	Mo	20 50 59.23	10.262	-17 40 14.3	+41.15	16 15.88	8.93	-13 26.31	-0.406	20 37 32.92
Feb. 1	Tu	20 55 5.11	10.228	17 23 37.2	41.93	16 15.74	8.93	13 35.64	0.372	20 41 29.48
2	We	20 59 10.19	10.194	17 6 41.6	42.69	16 15.59	8.93	13 44.16	0.338	20 45 26.03
3	Th	21 3 14.45	10.160	16 49 27.9	43.44	16 15.44	8.93	13 51.86	0.304	20 49 22.59
4	Fr	21 7 17.89	10.126	16 31 56.5	44.17	16 15.28	8.93	13 58.74	0.270	20 53 19.15
5	Sa	21 11 20.51	10.092	-16 14 8.0	+44.88	16 15.13	8.92	-14 4.80	-0.235	20 57 15.70
6	Su	21 15 22.30	10.058	15 56 2.7	45.56	16 14.97	8.92	14 10.04	0.201	21 1 12.26
7	Mo	21 19 23.27	10.023	15 37 41.0	46.23	16 14.81	8.92	14 14.46	0.167	21 5 8.82
8	Tu	21 23 23.42	9.989	15 19 3.4	46.89	16 14.65	8.92	14 18.05	0.133	21 9 5.37
9	We	21 27 22.75	9.955	15 0 10.3	47.52	16 14.48	8.92	14 20.83	0.099	21 13 1.93
10	Th	21 31 21.28	9.922	-14 41 2.2	+48.14	16 14.31	8.92	-14 22.80	-0.065	21 16 58.48
11	Fr	21 35 19.00	9.889	14 21 39.5	48.74	16 14.14	8.92	14 23.96	-0.032	21 20 55.04
12	Sa	21 39 15.92	9.856	14 2 2.6	49.33	16 13.96	8.91	14 24.33	+0.001	21 24 51.59
13	Su	21 43 12.06	9.823	13 42 11.8	49.89	16 13.78	8.91	14 23.92	0.033	21 28 48.15
14	Mo	21 47 7.43	9.791	13 22 7.7	50.44	16 13.59	8.91	14 22.73	0.065	21 32 44.70
15	Tu	21 51 2.04	9.760	-13 1 50.6	+50.98	16 13.40	8.91	-14 20.78	+0.097	21 36 41.26
16	We	21 54 55.89	9.729	-12 41 20.9	+51.49	16 13.21	8.91	-14 18.08	+0.128	21 40 37.81

FOR GREENWICH MEAN NOON.

Date.	Day of the Year.	True Longitude.	Var. per Hour.	Latitude.	Logarithm of the Radius Vector of the Earth.	Var. per Hour.	Prec. in Long.	Nut. in Long.	Aberation.	True Obliquity.	Mean Time of Sidereal Noon.
		" ' "	"	"			"	"	"	23° 27'	h m s
Jan.	1	1 279 45 35.0	152.94	-0.58	9.992 6812	-0.8	-0.03	+13.49	20.81	6.14	5 19 51.27
	2	2 280 46 45.8	152.95	0.53	9.992 6802	-0.1	+0.11	13.54	20.81	6.14	5 15 55.36
	3	3 281 47 56.7	152.96	0.44	9.992 6810	+0.6	0.25	13.60	20.81	6.14	5 11 59.44
	4	4 282 49 7.8	152.96	0.33	9.992 6834	1.3	0.39	13.65	20.81	6.14	5 8 3.53
	5	5 283 50 18.9	152.96	0.21	9.992 6873	2.0	0.52	13.70	20.81	6.14	5 4 7.62
	6	6 284 51 29.9	152.95	-0.07	9.992 6928	+2.6	0.66	+13.75	20.81	6.14	5 0 11.71
	7	7 285 52 40.7	152.94	+0.08	9.992 6999	3.3	0.80	13.80	20.81	6.14	4 56 15.79
	8	8 286 53 51.2	152.93	0.22	9.992 7087	4.0	0.94	13.85	20.81	6.15	4 52 19.88
	9	9 287 55 1.2	152.91	0.34	9.992 7193	4.8	1.07	13.90	20.81	6.15	4 48 23.97
	10	10 288 56 10.7	152.89	0.45	9.992 7318	5.6	1.21	13.95	20.81	6.16	4 44 28.06
	11	11 289 57 19.7	152.86	+0.53	9.992 7463	+6.5	1.35	+14.00	20.81	6.16	4 40 32.14
	12	12 290 58 28.1	152.83	0.59	9.992 7630	7.4	1.49	14.05	20.81	6.17	4 36 36.23
	13	13 291 59 35.8	152.81	0.61	9.992 7820	8.4	1.63	14.09	20.81	6.17	4 32 40.32
	14	14 293 0 42.9	152.78	0.61	9.992 8033	9.4	1.76	14.14	20.81	6.18	4 28 44.40
	15	15 294 1 49.4	152.75	0.58	9.992 8271	10.4	1.90	14.18	20.81	6.19	4 24 48.49
	16	16 295 2 55.1	152.73	+0.52	9.992 8535	+11.5	2.04	+14.22	20.80	6.19	4 20 52.58
	17	17 296 4 0.2	152.70	0.44	9.992 8824	12.6	2.18	14.26	20.80	6.20	4 16 56.67
	18	18 297 5 4.6	152.67	0.34	9.992 9140	13.7	2.31	14.30	20.80	6.21	4 13 0.76
	19	19 298 6 8.4	152.64	0.22	9.992 9482	14.8	2.45	14.34	20.80	6.22	4 9 4.85
	20	20 299 7 11.5	152.62	+0.09	9.992 9852	16.0	2.59	14.37	20.80	6.23	4 5 8.93
	21	21 300 8 14.0	152.59	-0.04	9.993 0249	+17.1	2.72	+14.41	20.79	6.24	4 1 13.02
	22	22 301 9 15.8	152.56	0.17	9.993 0672	18.2	2.86	14.44	20.79	6.25	3 57 17.11
	23	23 302 10 17.0	152.54	0.29	9.993 1122	19.3	3.00	14.48	20.79	6.26	3 53 21.20
	24	24 303 11 17.7	152.52	0.40	9.993 1598	20.3	3.14	14.51	20.79	6.27	3 49 25.29
	25	25 304 12 17.7	152.49	0.48	9.993 2099	21.3	3.28	14.54	20.79	6.28	3 45 29.38
	26	26 305 13 17.2	152.47	-0.54	9.993 2624	+22.3	3.41	+14.57	20.78	6.29	3 41 33.47
	27	27 306 14 16.2	152.44	0.57	9.993 3171	23.2	3.55	14.60	20.78	6.30	3 37 37.56
	28	28 307 15 14.5	152.42	0.56	9.993 3739	24.1	3.69	14.62	20.78	6.31	3 33 41.64
	29	29 308 16 12.2	152.39	0.52	9.993 4327	24.9	3.83	14.65	20.78	6.32	3 29 45.73
	30	30 309 17 9.3	152.36	0.45	9.993 4933	25.6	3.96	14.67	20.77	6.33	3 25 49.82
	31	31 310 18 5.6	152.33	-0.35	9.993 5555	+26.2	4.10	+14.69	20.77	6.34	3 21 53.91
Feb.	1	32 311 19 1.2	152.30	0.23	9.993 6191	26.8	4.24	14.71	20.77	6.35	3 17 58.00
	2	33 312 19 55.8	152.26	-0.10	9.993 6841	27.4	4.38	14.72	20.76	6.36	3 14 2.09
	3	34 313 20 49.5	152.21	+0.04	9.993 7504	27.9	4.51	14.74	20.76	6.37	3 10 6.18
	4	35 314 21 42.0	152.16	0.19	9.993 8179	28.4	4.65	14.75	20.76	6.39	3 6 10.27
	5	36 315 22 33.4	152.11	+0.32	9.993 8866	+28.9	4.79	+14.76	20.75	6.40	3 2 14.36
	6	37 316 23 23.4	152.05	0.43	9.993 9566	29.4	4.93	14.77	20.75	6.41	2 58 18.45
	7	38 317 24 12.0	151.99	0.52	9.994 0279	30.0	5.07	14.78	20.75	6.43	2 54 22.54
	8	39 318 24 59.1	151.93	0.58	9.994 1006	30.6	5.20	14.79	20.74	6.44	2 50 26.63
	9	40 319 25 44.8	151.87	0.62	9.994 1748	31.3	5.34	14.80	20.74	6.45	2 46 30.72
	10	41 320 26 28.8	151.80	+0.63	9.994 2506	+32.0	5.48	+14.80	20.74	6.46	2 42 34.81
	11	42 321 27 11.2	151.73	0.61	9.994 3282	32.7	5.62	14.80	20.73	6.47	2 38 38.90
	12	43 322 27 52.0	151.67	0.56	9.994 4075	33.4	5.75	14.80	20.73	6.48	2 34 42.99
	13	44 323 28 31.1	151.60	0.48	9.994 4886	34.2	5.89	14.80	20.73	6.49	2 30 47.08
	14	45 324 29 8.6	151.53	0.39	9.994 5717	35.0	6.03	14.80	20.72	6.50	2 26 51.17
	15	46 325 29 44.5	151.46	+0.28	9.994 6567	+35.8	6.16	+14.79	20.72	6.51	2 22 55.26
	16	47 326 30 18.7	151.39	+0.15	9.994 7436	+36.7	6.30	+14.78	20.71	6.52	2 18 59.35

FOR GREENWICH MEAN NOON.

Date.	Day of the Week.	Apparent Right Ascension.	Var. per Hour.	Apparent Declination.	Var. per Hour.	Semi-diameter.	Hor. Par.	Equation of Time. App.—Mean.	Var. per Hour.	Sidereal Time, or Right Ascension of Mean Sun.
		h m s	s	° ' "	"	' "	"	m s	s	h m s
Feb. 16	We	21 54 55.89	9.729	-12 41 20.9	+51.49	16 13.21	8.91	-14 18.08	+0.128	21 40 37.81
17	Th	21 58 49.01	9.698	12 20 39.0	51.90	16 13.01	8.91	14 14.65	0.158	21 44 34.37
18	Fr	22 2 41.42	9.669	11 59 45.3	52.47	16 12.80	8.90	14 10.49	0.188	21 48 30.92
19	Sa	22 6 33.12	9.640	11 38 40.2	52.94	16 12.59	8.90	14 5.64	0.217	21 52 27.48
20	Su	22 10 24.13	9.612	11 17 24.1	53.39	16 12.38	8.90	14 0.10	0.245	21 56 24.03
21	Mo	22 14 14.47	9.584	-10 55 57.4	+53.83	16 12.16	8.90	-13 53.88	+0.272	22 0 20.59
22	Tu	22 18 4.16	9.557	10 34 20.4	54.25	16 11.93	8.89	13 47.02	0.299	22 4 17.14
23	We	22 21 53.22	9.531	10 12 33.6	54.65	16 11.71	8.89	13 39.53	0.325	22 8 13.70
24	Th	22 25 41.67	9.506	9 50 37.3	55.04	16 11.48	8.89	13 31.42	0.350	22 12 10.25
25	Fr	22 29 29.52	9.482	9 28 32.6	55.41	16 11.25	8.89	13 22.72	0.374	22 16 6.81
26	Sa	22 33 16.79	9.458	-9 6 17.9	+55.76	16 11.01	8.89	-13 13.43	+0.398	22 20 3.36
27	Su	22 37 3.50	9.435	8 43 55.5	56.10	16 10.78	8.88	13 3.59	0.421	22 23 59.91
28	Mo	22 40 49.67	9.413	8 21 25.3	56.42	16 10.54	8.88	12 53.20	0.444	22 27 53.47
29	Tu	22 44 35.31	9.391	7 58 47.6	56.72	16 10.30	8.88	12 42.29	0.466	22 31 53.02
Mar. 1	We	22 48 20.43	9.370	7 36 2.8	57.00	16 10.05	8.88	12 30.86	0.487	22 35 49.57
2	Th	22 52 5.06	9.349	-7 13 11.4	+57.27	16 9.81	8.88	-12 18.93	+0.507	22 39 46.13
3	Fr	22 55 49.20	9.329	6 50 13.8	57.52	16 9.56	8.87	12 6.52	0.527	22 43 42.68
4	Sa	22 59 32.87	9.310	6 27 10.5	57.75	16 9.31	8.87	11 53.64	0.546	22 47 39.24
5	Su	23 3 16.09	9.292	6 4 1.8	57.98	16 9.06	8.87	11 40.30	0.565	22 51 35.79
6	Mo	23 6 58.97	9.274	5 40 48.2	58.16	16 8.81	8.87	11 26.52	0.583	22 55 32.34
7	Tu	23 10 41.22	9.256	-5 17 30.1	+58.34	16 8.56	8.86	-11 12.32	+0.600	22 59 28.90
8	We	23 14 23.16	9.240	4 54 7.9	58.50	16 8.31	8.86	10 57.72	0.616	23 3 25.45
9	Th	23 18 4.72	9.224	4 30 42.0	58.64	16 8.06	8.86	10 42.72	0.632	23 7 22.00
10	Fr	23 21 45.91	9.209	4 7 12.7	58.77	16 7.81	8.85	10 27.35	0.647	23 11 18.56
11	Sa	23 25 26.74	9.195	3 43 40.5	58.89	16 7.55	8.85	10 11.63	0.662	23 15 15.11
12	Su	23 29 7.24	9.181	-3 20 5.8	+58.99	16 7.29	8.85	-9 55.58	+0.675	23 19 11.67
13	Mo	23 32 47.43	9.168	2 56 28.9	59.08	16 7.03	8.85	9 39.21	0.688	23 23 8.22
14	Tu	23 36 27.33	9.157	2 32 50.1	59.15	16 6.77	8.85	9 22.56	0.700	23 27 4.77
15	We	23 40 6.96	9.146	2 9 9.9	59.20	16 6.51	8.85	9 5.63	0.710	23 31 1.33
16	Th	23 43 46.34	9.136	1 45 28.6	59.24	16 6.25	8.84	8 48.46	0.720	23 34 57.88
17	Fr	23 47 25.49	9.127	-1 21 46.5	+59.26	16 5.98	8.84	-8 31.06	+0.729	23 38 54.43
18	Sa	23 51 4.44	9.119	0 58 4.0	59.27	16 5.71	8.84	8 13.46	0.737	23 42 50.99
19	Su	23 54 43.21	9.112	0 34 21.5	59.27	16 5.44	8.84	7 55.68	0.744	23 46 47.54
20	Mo	23 58 21.83	9.106	-0 10 39.3	59.25	16 5.17	8.83	7 37.74	0.750	23 50 44.09
21	Tu	0 2 0.32	9.101	+0 13 2.4	59.22	16 4.89	8.83	7 19.68	0.755	23 54 40.65
22	We	0 5 38.70	9.097	+0 36 43.2	+59.17	16 4.61	8.83	-7 1.50	+0.759	23 58 37.20
23	Th	0 9 17.00	9.095	1 0 22.7	59.11	16 4.33	8.83	6 43.25	0.762	0 2 33.75
24	Fr	0 12 55.24	9.093	1 24 0.6	59.04	16 4.05	8.83	6 24.94	0.764	0 6 30.30
25	Sa	0 16 33.45	9.092	1 47 36.5	58.98	16 3.77	8.82	6 6.59	0.765	0 10 26.86
26	Su	0 20 11.64	9.092	2 11 10.1	58.85	16 3.49	8.82	5 48.23	0.765	0 14 23.41
27	Mo	0 23 49.84	9.093	+2 34 41.1	+58.73	16 3.20	8.82	-5 29.88	+0.764	0 18 19.96
28	Tu	0 27 28.07	9.094	2 58 9.1	58.60	16 2.91	8.82	5 11.55	0.763	0 22 16.52
29	We	0 31 6.34	9.096	3 21 33.7	58.45	16 2.63	8.81	4 53.27	0.760	0 26 13.07
30	Th	0 34 44.68	9.099	3 44 54.6	58.28	16 2.35	8.81	4 35.06	0.757	0 30 9.63
31	Fr	0 38 23.10	9.103	4 8 11.3	58.10	16 2.07	8.81	4 16.92	0.753	0 34 6.18
Apr. 1	Sa	0 42 1.62	9.107	+4 31 23.5	+57.91	16 1.79	8.80	-3 58.88	+0.749	0 38 2.73
2	Su	0 45 40.25	9.112	+4 54 30.8	+57.69	16 1.52	8.80	-3 40.96	+0.744	0 41 59.29

FOR GREENWICH MEAN NOON.

Date.	Day of the Year.	True Longitude.	Var. per Hour.	Latitude.	Logarithm of the Radius Vector of the Earth.	Var. per Hour.	Prec. in Long.	Nut. in Long.	Aber-ration.	True Obliquity.	Mean Time of Sidereal Noon.
		" " "	"	"			"	"	"	23° 27'	h m s
Feb. 16	47	326 30 18.7	151.39	+0.15	9.994 7436	+36.7	6.30	+14.78	20.71	6.52	2 18 59.35
17	48	327 30 51.3	151.32	+0.02	9.994 8327	37.5	6.44	14.78	20.71	6.53	2 15 3.44
18	49	328 31 22.3	151.26	-0.11	9.994 9238	38.4	6.58	14.77	20.70	6.54	2 11 7.54
19	50	329 31 51.7	151.19	0.23	9.995 0169	39.3	6.72	14.76	20.70	6.55	2 7 11.63
20	51	330 32 19.5	151.13	0.34	9.995 1122	40.1	6.85	14.75	20.69	6.56	2 3 15.72
21	52	331 32 45.8	151.07	-0.44	9.995 2094	+40.9	6.99	+14.74	20.69	6.57	1 59 19.81
22	53	332 33 10.7	151.01	0.51	9.995 3086	41.7	7.13	14.73	20.68	6.58	1 55 23.90
23	54	333 33 34.1	150.95	0.55	9.995 4097	42.4	7.27	14.71	20.68	6.59	1 51 27.99
24	55	334 33 56.1	150.89	0.55	9.995 5124	43.1	7.40	14.70	20.67	6.60	1 47 32.08
25	56	335 34 16.7	150.83	0.52	9.995 6168	43.7	7.54	14.68	20.67	6.60	1 43 36.18
26	57	336 34 35.9	150.77	-0.46	9.995 7226	+44.3	7.68	+14.66	20.66	6.61	1 39 40.27
27	58	337 34 53.7	150.71	0.37	9.995 8295	44.8	7.82	14.64	20.66	6.62	1 35 44.36
28	59	338 35 10.1	150.65	0.25	9.995 9376	45.2	7.95	14.62	20.66	6.62	1 31 48.45
29	60	339 35 24.9	150.59	-0.12	9.996 0464	45.5	8.09	14.60	20.65	6.63	1 27 52.54
Mar. 1	61	340 35 38.3	150.52	+0.02	9.996 1561	45.8	8.23	14.57	20.65	6.63	1 23 56.64
2	62	341 35 50.0	150.45	+0.16	9.996 2662	+46.0	8.37	+14.55	20.64	6.63	1 20 0.73
3	63	342 36 0.0	150.38	0.29	9.996 3769	46.2	8.51	14.52	20.64	6.63	1 16 4.82
4	64	343 36 8.3	150.30	0.41	9.996 4880	46.4	8.64	14.50	20.63	6.63	1 12 8.91
5	65	344 36 14.6	150.22	0.51	9.996 5994	46.5	8.78	14.47	20.63	6.63	1 8 13.00
6	66	345 36 19.1	150.14	0.58	9.996 7112	46.6	8.92	14.44	20.62	6.64	1 4 17.10
7	67	346 36 21.4	150.05	+0.62	9.996 8234	+46.8	9.06	+14.41	20.62	6.64	1 0 21.19
8	68	347 36 21.7	149.97	0.63	9.996 9360	47.0	9.19	14.38	20.61	6.64	0 56 25.28
9	69	348 36 19.9	149.88	0.62	9.997 0492	47.3	9.33	14.35	20.60	6.64	0 52 29.37
10	70	349 36 15.9	149.79	0.58	9.997 1630	47.6	9.47	14.32	20.60	6.64	0 48 33.46
11	71	350 36 9.7	149.69	0.52	9.997 2775	47.9	9.60	14.29	20.59	6.64	0 44 37.56
12	72	351 36 1.3	149.60	+0.44	9.997 3927	+48.2	9.74	+14.26	20.58	6.63	0 40 41.65
13	73	352 35 50.6	149.51	0.33	9.997 5087	48.5	9.88	14.23	20.58	6.63	0 36 45.74
14	74	353 35 37.8	149.42	0.21	9.997 6255	48.9	10.02	14.20	20.57	6.62	0 32 48.84
15	75	354 35 22.8	149.33	+0.08	9.997 7433	49.3	10.16	14.16	20.57	6.62	0 28 53.93
16	76	355 35 5.5	149.24	-0.05	9.997 8620	49.7	10.29	14.13	20.56	6.62	0 24 58.02
17	77	356 34 46.1	149.15	-0.17	9.997 9818	+50.1	10.43	+14.10	20.55	6.61	0 21 2.11
18	78	357 34 24.6	149.06	0.28	9.998 1026	50.6	10.57	14.06	20.55	6.61	0 17 6.20
19	79	358 34 1.0	148.97	0.37	9.998 2244	51.0	10.71	14.03	20.54	6.60	0 13 10.30
20	80	359 33 35.3	148.89	0.44	9.998 3474	51.4	10.84	14.00	20.54	6.60	0 9 14.39
21	81	0 33 7.7	148.81	0.48	9.998 4714	51.8	10.98	13.96	20.53	6.59	0 5 18.48
22	82	1 32 38.2	148.73	-0.49	9.998 5963	+52.2	11.12	+13.93	20.52	6.58	0 1 22.57
23	83	2 32 6.8	148.65	0.47	9.998 7222	52.6	11.26	13.89	20.52	6.57	23 53 30.76
24	84	3 31 33.6	148.58	0.42	9.998 8488	52.9	11.39	13.86	20.51	6.56	23 49 34.85
25	85	4 30 58.6	148.51	0.35	9.998 9759	53.1	11.53	13.83	20.51	6.55	23 45 38.94
26	86	5 30 22.0	148.44	0.24	9.999 1034	53.2	11.67	13.79	20.50	6.53	23 41 43.04
27	87	6 29 43.5	148.36	-0.11	9.999 2312	+53.2	11.81	+13.76	20.50	6.52	23 37 47.13
28	88	7 29 3.3	148.29	+0.03	9.999 3590	53.2	11.95	13.73	20.49	6.51	23 33 51.22
29	89	8 28 21.4	148.22	0.16	9.999 4867	53.1	12.08	13.69	20.49	6.50	23 29 55.31
30	90	9 27 37.7	148.14	0.29	9.999 6140	53.0	12.22	13.66	20.48	6.49	23 25 59.41
31	91	10 26 52.2	148.06	0.41	9.999 7410	52.8	12.35	13.63	20.48	6.47	23 22 3.50
Apr. 1	92	11 26 4.7	147.98	+0.51	9.999 8674	+52.5	12.49	+13.60	20.47	6.46	23 18 7.59
2	93	12 25 15.2	147.90	+0.58	9.999 9931	+52.3	12.63	+13.57	20.47	6.44	23 14 11.68

FOR GREENWICH MEAN NOON.

Date.	Day of the Week.	Apparent Right Ascension.			Var. per Hour.	Apparent Declination.			Var. per Hour.	Semi-diameter.	Hor. Par.	Equation of Time. App.—Mean.	Var. per Hour.	Sidereal Time, or Right Ascension of Mean Sun.					
		h	m	s	s	°	'	"	"	'	"	m	s	h	m	s			
Apr.	1 Sa	0	42	1.62	9.107	+	4	31	23.5	+57.91	16	1.79	8.80	-3	58.88	+0.749	0	38	2.73
	2 Su	0	45	40.25	9.112		4	54	30.8	57.69	16	1.52	8.80	3	40.96	0.744	0	41	59.29
	3 Mo	0	49	19.00	9.118		5	17	32.8	57.46	16	1.24	8.80	3	23.16	0.738	0	45	55.84
	4 Tu	0	52	57.90	9.124		5	40	29.2	57.22	16	0.97	8.79	3	5.50	0.732	0	49	52.39
	5 We	0	56	36.96	9.131		6	3	19.6	56.97	16	0.69	8.79	2	48.01	0.725	0	53	48.95
	6 Th	1	0	16.19	9.138	+	6	26	3.7	+56.70	16	0.42	8.79	-2	30.68	+0.718	0	57	45.50
	7 Fr	1	3	55.60	9.147		6	48	41.0	56.41	16	0.15	8.79	2	13.55	0.710	1	1	42.05
	8 Sa	1	7	35.22	9.156		7	11	11.2	56.11	15	59.88	8.78	1	56.62	0.701	1	5	38.61
	9 Su	1	11	15.07	9.165		7	33	34.0	55.79	15	59.61	8.78	1	39.91	0.691	1	9	35.16
	10 Mo	1	14	55.16	9.175		7	55	49.1	55.46	15	59.34	8.78	1	23.44	0.681	1	13	31.72
	11 Tu	1	18	35.49	9.186	+	8	17	56.1	+55.12	15	59.07	8.78	-1	7.22	+0.670	1	17	28.27
	12 We	1	22	16.10	9.198		8	39	54.6	54.76	15	58.81	8.77	0	51.28	0.658	1	21	24.82
	13 Th	1	25	57.00	9.211		9	1	44.4	54.39	15	58.54	8.77	0	35.62	0.646	1	25	21.38
	14 Fr	1	29	38.20	9.224		9	23	25.2	54.00	15	58.27	8.77	0	20.27	0.633	1	29	17.93
	15 Sa	1	33	19.72	9.238		9	44	56.5	53.60	15	58.01	8.77	-0	5.24	0.619	1	33	14.49
	16 Su	1	37	1.59	9.252	+10	6	18.1	+53.19	15	57.75	8.76	+0	9.45	+0.604	1	37	11.04	
	17 Mo	1	40	43.81	9.267		10	27	29.7	52.77	15	57.48	8.76	0	23.78	0.589	1	41	7.59
	18 Tu	1	44	26.41	9.283		10	48	31.0	52.33	15	57.22	8.76	0	37.74	0.573	1	45	4.15
	19 We	1	48	9.41	9.300		11	9	21.7	51.88	15	56.95	8.75	0	51.29	0.556	1	49	0.70
	20 Th	1	51	52.82	9.318		11	30	1.4	51.42	15	56.69	8.75	1	4.44	0.538	1	52	57.26
	21 Fr	1	55	36.66	9.337	+11	50	29.9	+50.95	15	56.42	8.75	+1	17.15	+0.520	1	56	53.81	
	22 Sa	1	59	20.96	9.356		12	10	46.8	50.46	15	56.16	8.75	1	29.41	0.501	2	0	50.37
	23 Su	2	3	5.72	9.375		12	30	51.8	49.96	15	55.90	8.75	1	41.20	0.481	2	4	46.92
	24 Mo	2	6	50.95	9.395		12	50	44.7	49.44	15	55.64	8.75	1	52.52	0.461	2	8	43.48
	25 Tu	2	10	36.68	9.416		13	10	25.0	48.91	15	55.38	8.74	2	3.35	0.440	2	12	40.03
	26 We	2	14	22.91	9.437	+13	29	52.4	+48.37	15	55.12	8.74	+2	13.67	+0.419	2	16	36.59	
	27 Th	2	18	9.66	9.458		13	49	6.6	47.81	15	54.87	8.74	2	23.48	0.398	2	20	33.14
	28 Fr	2	21	56.93	9.480		14	8	7.2	47.24	15	54.62	8.74	2	32.77	0.376	2	24	29.70
	29 Sa	2	25	44.72	9.502		14	26	53.9	46.65	15	54.37	8.74	2	41.53	0.354	2	28	26.25
	30 Su	2	29	33.05	9.525		14	45	26.3	46.05	15	54.12	8.73	2	49.76	0.332	2	32	22.81
May	1 Mo	2	33	21.91	9.547	+15	3	44.2	+45.43	15	53.88	8.73	+2	57.45	+0.309	2	36	19.36	
	2 Tu	2	37	11.31	9.570		15	21	47.1	44.80	15	53.65	8.73	3	4.61	0.287	2	40	15.92
	3 We	2	41	1.26	9.592		15	39	34.7	44.16	15	53.41	8.73	3	11.22	0.264	2	44	12.47
	4 Th	2	44	51.75	9.615		15	57	6.7	43.50	15	53.18	8.72	3	17.28	0.241	2	48	9.03
	5 Fr	2	48	42.79	9.638		16	14	22.9	42.83	15	52.95	8.72	3	22.79	0.218	2	52	5.58
	6 Sa	2	52	34.38	9.661	+16	31	22.9	+42.15	15	52.73	8.72	+3	27.76	+0.195	2	56	2.14	
	7 Su	2	56	26.53	9.684		16	48	6.3	41.46	15	52.51	8.72	3	32.17	0.172	2	59	58.70
	8 Mo	3	0	19.23	9.707		17	4	32.8	40.75	15	52.30	8.72	3	36.03	0.149	3	3	55.25
	9 Tu	3	4	12.48	9.730		17	20	42.2	40.03	15	52.09	8.71	3	39.33	0.126	3	7	51.81
	10 We	3	8	6.29	9.754		17	36	34.2	39.30	15	51.88	8.71	3	42.08	0.103	3	11	48.37
	11 Th	3	12	0.65	9.777	+17	52	8.4	+38.55	15	51.67	8.71	+3	44.27	+0.080	3	15	44.92	
	12 Fr	3	15	55.57	9.800		18	7	24.6	37.80	15	51.47	8.71	3	45.91	0.057	3	19	41.48
	13 Sa	3	19	51.05	9.823		18	22	22.6	37.03	15	51.26	8.71	3	46.99	0.033	3	23	38.03
	14 Su	3	23	47.08	9.846		18	37	2.0	36.25	15	51.06	8.70	3	47.51	+0.010	3	27	34.59
	15 Mo	3	27	43.67	9.869		18	51	22.6	35.46	15	50.86	8.70	3	47.48	-0.013	3	31	31.15
	16 Tu	3	31	40.81	9.893	+19	5	24.1	+34.66	15	50.66	8.70	+3	46.89	-0.036	3	35	27.70	
	17 We	3	35	38.51	9.916	+19	19	6.2	+33.85	15	50.47	8.70	+3	45.74	-0.059	3	39	24.26	

FOR GREENWICH MEAN NOON.

Date.	Day of the Year.	True Longitude.	Var. per Hour.	Latitude.	Logarithm of the Radius Vector of the Earth.	Var. per Hour.	Proc. in Long.	Nut. in Long.	Aber-ration.	True Obliquity.	Mean Time of Sidereal Noon.
		" ' "	"	"			"	"	"	23° 27' "	h m s
Apr. 1	92	11 26 4.7	147.98	+0.51	9.999 8674	+52.5	12.49	+13.60	20.47	6.46	23 18 7.59
2	93	12 25 15.2	147.90	0.58	9.999 9931	52.3	12.63	13.57	20.47	6.44	23 14 11.68
3	94	13 24 23.8	147.81	0.62	0.000 1182	52.0	12.77	13.54	20.46	6.42	23 10 15.78
4	95	14 23 30.2	147.72	0.64	0.000 2426	51.7	12.91	13.51	20.46	6.40	23 6 19.87
5	96	15 22 34.4	147.63	0.63	0.000 3663	51.4	13.04	13.49	20.45	6.38	23 2 23.96
6	97	16 21 36.5	147.54	+0.59	0.000 4894	+51.1	13.18	+13.46	20.45	6.37	22 58 28.05
7	98	17 20 36.4	147.45	0.53	0.000 6119	50.9	13.32	13.43	20.44	6.35	22 54 32.14
8	99	18 19 34.0	147.35	0.45	0.000 7338	50.7	13.46	13.40	20.43	6.33	22 50 36.24
9	100	19 18 29.4	147.26	0.35	0.000 8553	50.5	13.60	13.38	20.43	6.31	22 46 40.33
10	101	20 17 22.4	147.16	0.24	0.000 9763	50.3	13.73	13.36	20.42	6.29	22 42 44.42
11	102	21 16 13.3	147.07	+0.12	0.001 0970	+50.2	13.87	+13.33	20.41	6.27	22 38 48.51
12	103	22 15 1.8	146.98	-0.01	0.001 2173	50.1	14.01	13.31	20.41	6.25	22 34 52.60
13	104	23 13 48.1	146.88	0.13	0.001 3374	50.0	14.15	13.29	20.40	6.22	22 30 56.70
14	105	24 12 32.2	146.79	0.24	0.001 4574	50.0	14.28	13.27	20.40	6.20	22 27 0.79
15	106	25 11 14.1	146.70	0.33	0.001 5772	49.9	14.42	13.25	20.39	6.18	22 23 4.88
16	107	26 9 53.8	146.61	-0.40	0.001 6970	+49.9	14.56	+13.23	20.38	6.16	22 19 8.97
17	108	27 8 31.5	146.53	0.44	0.001 8169	49.9	14.70	13.21	20.38	6.14	22 15 13.06
18	109	28 7 7.2	146.45	0.45	0.001 9368	49.9	14.83	13.20	20.37	6.12	22 11 17.16
19	110	29 5 41.0	146.37	0.43	0.002 0566	49.9	14.97	13.18	20.37	6.10	22 7 21.25
20	111	30 4 13.0	146.30	0.39	0.002 1765	49.9	15.11	13.17	20.36	6.07	22 3 25.34
21	112	31 2 43.2	146.23	-0.32	0.002 2962	+49.8	15.25	+13.16	20.35	6.05	21 59 29.43
22	113	32 1 11.7	146.16	0.22	0.002 4157	49.7	15.39	13.15	20.35	6.03	21 55 33.52
23	114	32 59 38.6	146.09	-0.09	0.002 5347	49.5	15.52	13.14	20.34	6.00	21 51 37.61
24	115	33 58 4.0	146.02	+0.05	0.002 6531	49.2	15.66	13.13	20.34	5.98	21 47 41.70
25	116	34 56 27.8	145.96	0.18	0.002 7708	48.8	15.79	13.12	20.33	5.95	21 43 45.79
26	117	35 54 50.0	145.89	+0.30	0.002 8875	+48.4	15.93	+13.11	20.33	5.92	21 39 49.88
27	118	36 53 10.7	145.83	0.42	0.003 0031	47.9	16.07	13.11	20.32	5.90	21 35 53.98
28	119	37 51 29.9	145.77	0.53	0.003 1175	47.4	16.21	13.10	20.32	5.87	21 31 58.07
29	120	38 49 47.5	145.70	0.61	0.003 2304	46.8	16.35	13.10	20.31	5.85	21 28 2.16
30	121	39 48 3.4	145.63	0.66	0.003 3419	46.1	16.48	13.10	20.31	5.82	21 24 6.25
May 1	122	40 46 17.7	145.56	+0.68	0.003 4518	+45.4	16.62	+13.10	20.30	5.79	21 20 10.34
2	123	41 44 30.3	145.49	0.67	0.003 5600	44.7	16.76	13.10	20.30	5.77	21 16 14.43
3	124	42 42 41.2	145.41	0.63	0.003 6667	44.0	16.90	13.11	20.30	5.74	21 12 18.52
4	125	43 40 50.2	145.34	0.56	0.003 7716	43.3	17.04	13.11	20.29	5.71	21 8 22.61
5	126	44 38 57.5	145.26	0.48	0.003 8750	42.6	17.17	13.12	20.28	5.68	21 4 26.70
6	127	45 37 2.9	145.19	+0.38	0.003 9768	+42.0	17.31	+13.13	20.28	5.66	21 0 30.79
7	128	46 35 6.5	145.11	0.27	0.004 0770	41.4	17.45	13.14	20.28	5.63	20 56 34.88
8	129	47 33 8.2	145.03	0.15	0.004 1757	40.8	17.59	13.15	20.27	5.61	20 52 38.97
9	130	48 31 8.1	144.96	+0.02	0.004 2730	40.2	17.72	13.16	20.26	5.58	20 48 43.06
10	131	49 29 6.1	144.88	-0.10	0.004 3689	39.7	17.86	13.17	20.26	5.55	20 44 47.15
11	132	50 27 2.3	144.80	-0.21	0.004 4635	+39.2	18.00	+13.18	20.26	5.53	20 40 51.24
12	133	51 24 56.6	144.73	0.31	0.004 5569	38.7	18.14	13.20	20.25	5.50	20 36 55.33
13	134	52 22 49.2	144.66	0.38	0.004 6491	38.2	18.27	13.22	20.25	5.48	20 32 59.42
14	135	53 20 40.1	144.59	0.42	0.004 7404	37.8	18.41	13.24	20.24	5.45	20 29 3.51
15	136	54 18 29.3	144.52	0.43	0.004 8307	37.5	18.55	13.26	20.24	5.42	20 25 7.60
16	137	55 16 16.8	144.45	-0.41	0.004 9201	+37.2	18.69	+13.28	20.23	5.40	20 21 11.68
17	138	56 14 2.9	144.39	-0.37	0.005 0088	+36.9	18.83	+13.30	20.23	5.38	20 17 15.77

FOR GREENWICH MEAN NOON.

Date.	Day of the Week.	Apparent Right Ascension.			Var. per Hour.	Apparent Declination.			Var. per Hour.	Semi-diameter.	Hor. Par.	Equation of Time. App.—Mean.	Var. per Hour.	Sidereal Time, or Right Ascension of Mean Sun.			
		h	m	s	s	°	'	"	"	'	"	m	s	h	m	s	
May	17 We	3	35	38.51	9.916	+19	19	6.2	+33.85	15	50.47	8.70	+3 45.74	-0.059	3	39	24.26
	18 Th	3	39	36.78	9.939	19	32	28.8	33.03	15	50.28	8.70	3 44.04	0.083	3	43	20.82
	19 Fr	3	43	35.61	9.963	19	45	31.5	32.19	15	50.09	8.69	3 41.77	0.106	3	47	17.38
	20 Sa	3	47	34.99	9.986	19	58	14.1	31.35	15	49.91	8.69	3 38.94	0.129	3	51	13.93
	21 Su	3	51	34.93	10.009	20	10	36.4	30.50	15	49.72	8.69	3 35.56	0.153	3	55	10.49
	22 Mo	3	55	35.43	10.032	+20	22	38.1	+29.64	15	49.54	8.69	+3 31.62	-0.176	3	59	7.05
	23 Tu	3	59	36.47	10.055	20	34	19.0	28.76	15	49.36	8.69	3 27.13	0.198	4	3	3.60
	24 We	4	3	38.05	10.077	20	45	38.7	27.88	15	49.18	8.69	3 22.11	0.220	4	7	0.16
	25 Th	4	7	40.17	10.099	20	56	37.1	26.98	15	49.00	8.69	3 16.55	0.242	4	10	56.72
	26 Fr	4	11	42.80	10.121	21	7	13.9	26.08	15	48.83	8.68	3 10.48	0.263	4	14	53.28
	27 Sa	4	15	45.93	10.141	+21	17	28.9	+25.16	15	48.67	8.68	+3 3.90	-0.284	4	18	49.83
	28 Su	4	19	49.56	10.161	21	27	21.8	24.24	15	48.51	8.68	2 56.83	0.304	4	22	46.39
	29 Mo	4	23	53.66	10.180	21	36	52.5	23.31	15	48.35	8.68	2 49.29	0.323	4	26	42.95
	30 Tu	4	27	58.21	10.199	21	46	0.7	22.37	15	48.20	8.68	2 41.29	0.342	4	30	39.50
	31 We	4	32	3.21	10.217	21	54	46.2	21.42	15	48.06	8.68	2 32.85	0.360	4	34	36.06
June	1 Th	4	36	8.62	10.234	+22	3	8.8	+20.46	15	47.92	8.68	+2 24.00	-0.377	4	38	32.62
	2 Fr	4	40	14.43	10.250	22	11	8.3	19.50	15	47.78	8.67	2 14.74	0.393	4	42	29.18
	3 Sa	4	44	20.62	10.265	22	18	44.6	18.53	15	47.65	8.67	2 5.11	0.408	4	46	25.74
	4 Su	4	48	27.17	10.280	22	25	57.5	17.55	15	47.53	8.67	1 55.12	0.423	4	50	22.29
	5 Mo	4	52	34.06	10.294	22	32	46.9	16.56	15	47.41	8.67	1 44.79	0.437	4	54	18.85
	6 Tu	4	56	41.27	10.306	+22	39	12.5	+15.57	15	47.29	8.67	+1 34.14	-0.450	4	58	15.41
	7 We	5	0	48.77	10.318	22	45	14.3	14.58	15	47.18	8.67	1 23.20	0.462	5	2	11.97
	8 Th	5	4	56.54	10.329	22	50	52.2	13.58	15	47.07	8.67	1 11.98	0.473	5	6	8.53
	9 Fr	5	9	4.57	10.339	22	56	6.0	12.57	15	46.97	8.67	1 0.51	0.483	5	10	5.08
	10 Sa	5	13	12.83	10.348	23	0	55.6	11.56	15	46.87	8.66	0 48.81	0.492	5	14	1.64
	11 Su	5	17	21.30	10.356	+23	5	20.9	+10.55	15	46.77	8.66	+0 36.90	-0.500	5	17	58.20
	12 Mo	5	21	29.95	10.364	23	9	21.9	9.53	15	46.68	8.66	0 24.81	0.507	5	21	54.76
	13 Tu	5	25	38.78	10.371	23	12	58.5	8.51	15	46.59	8.66	0 12.54	0.514	5	25	51.32
	14 We	5	29	47.76	10.377	23	16	10.5	7.49	15	46.50	8.66	+0 0.12	0.520	5	29	47.87
	15 Th	5	33	56.87	10.382	23	18	58.0	6.47	15	46.42	8.66	-0 12.43	0.525	5	33	44.43
	16 Fr	5	38	6.09	10.386	+23	21	20.9	+5.44	15	46.34	8.66	-0 25.10	-0.530	5	37	40.99
	17 Sa	5	42	15.41	10.390	23	23	19.1	4.41	15	46.27	8.66	0 37.87	0.534	5	41	37.55
	18 Su	5	46	24.82	10.393	23	24	52.6	3.38	15	46.20	8.66	0 50.72	0.537	5	45	34.11
	19 Mo	5	50	34.30	10.395	23	26	1.3	2.35	15	46.13	8.66	1 3.64	0.539	5	49	30.66
	20 Tu	5	54	43.82	10.396	23	26	45.2	1.31	15	46.06	8.66	1 16.59	0.540	5	53	27.22
	21 We	5	58	53.35	10.397	+23	27	4.4	+0.28	15	46.00	8.66	-1 29.57	-0.541	5	57	23.78
	22 Th	6	3	2.88	10.397	23	26	58.7	-0.75	15	45.94	8.66	1 42.54	0.540	6	1	20.34
	23 Fr	6	7	12.39	10.396	23	26	28.2	1.79	15	45.88	8.66	1 55.50	0.538	6	5	16.90
	24 Sa	6	11	21.86	10.393	23	25	32.8	2.82	15	45.83	8.66	2 8.40	0.536	6	9	13.46
	25 Su	6	15	31.25	10.389	23	24	12.7	3.85	15	45.78	8.66	2 21.23	0.532	6	13	10.02
	26 Mo	6	19	40.53	10.384	+23	22	27.8	-4.88	15	45.74	8.66	-2 33.96	-0.527	6	17	6.57
	27 Tu	6	23	49.69	10.378	23	20	18.3	5.91	15	45.71	8.66	2 46.56	0.522	6	21	3.13
	28 We	6	27	58.70	10.372	23	17	44.1	6.94	15	45.68	8.66	2 59.01	0.515	6	24	59.69
	29 Th	6	32	7.53	10.364	23	14	45.3	7.96	15	45.66	8.66	3 11.28	0.507	6	28	56.25
	30 Fr	6	36	16.15	10.354	23	11	22.1	8.98	15	45.64	8.66	3 23.35	0.498	6	32	52.81
July	1 Sa	6	40	24.54	10.344	+23	7	34.5	-9.99	15	45.63	8.66	-3 35.18	-0.488	6	36	49.36
	2 Su	6	44	32.68	10.333	+23	3	22.6	-11.00	15	45.62	8.66	-3 46.76	-0.477	6	40	45.92

FOR GREENWICH MEAN NOON.

Date.	Day of the Year.	True Longitude.			Var. per Hour.	Latitude.	Logarithm of the Radius Vector of the Earth.	Var. per Hour.	Prec. in Long.	Nut. in Long.	Aber-ration.	True Oblig-uity.	Mean Time of Sidereal Noon.
		"	"	"	"	"			"	"	"	23° 27'	h m s
May 17	138	56 14	2.9	144.39	-0.37	0.005 0088	+36.9	18.83	+13.30	20.23	5.38	20 17	15.77
18	139	57 11	47.5	144.33	0.30	0.005 0966	36.5	18.96	13.32	20.23	5.35	20 13	19.86
19	140	58 9	30.9	144.28	0.21	0.005 1836	36.1	19.10	13.35	20.22	5.32	20 9	23.95
20	141	59 7	13.0	144.23	-0.09	0.005 2697	35.7	19.23	13.38	20.22	5.30	20 5	28.04
21	142	60 4	54.0	144.18	+0.05	0.005 3547	35.2	19.37	13.41	20.22	5.28	20 1	32.13
22	143	61 2	34.0	144.14	+0.18	0.005 4386	+34.6	19.51	+13.44	20.21	5.25	19 57	36.22
23	144	62 0	13.0	144.10	0.31	0.005 5211	34.0	19.65	13.47	20.21	5.23	19 53	40.31
24	145	62 57	51.0	144.06	0.44	0.005 6021	33.4	19.79	13.50	20.20	5.20	19 49	44.40
25	146	63 55	28.1	144.03	0.55	0.005 6814	32.7	19.92	13.53	20.20	5.18	19 45	48.48
26	147	64 53	4.2	143.99	0.63	0.005 7589	31.9	20.06	13.56	20.20	5.16	19 41	52.57
27	148	65 50	39.5	143.95	+0.68	0.005 8344	+31.1	20.20	+13.59	20.19	5.14	19 37	56.66
28	149	66 48	13.8	143.91	0.70	0.005 9079	30.2	20.34	13.63	20.19	5.12	19 34	0.75
29	150	67 45	47.1	143.87	0.69	0.005 9792	29.3	20.48	13.66	20.18	5.09	19 30	4.84
30	151	68 43	19.5	143.83	0.65	0.006 0483	28.4	20.61	13.70	20.18	5.07	19 26	8.93
31	152	69 40	50.9	143.79	0.59	0.006 1151	27.4	20.75	13.74	20.18	5.05	19 22	13.01
June 1	153	70 38	21.3	143.74	+0.51	0.006 1796	+26.4	20.89	+13.78	20.17	5.03	19 18	17.10
2	154	71 35	50.6	143.70	0.42	0.006 2418	25.4	21.03	13.82	20.17	5.01	19 14	21.19
3	155	72 33	18.8	143.65	0.31	0.006 3016	24.5	21.16	13.86	20.17	4.99	19 10	25.28
4	156	73 30	46.0	143.61	0.18	0.006 3592	23.5	21.30	13.90	20.16	4.97	19 6	29.37
5	157	74 28	12.0	143.56	+0.05	0.006 4146	22.6	21.44	13.94	20.16	4.96	19 2	33.46
6	158	75 25	37.0	143.52	-0.07	0.006 4678	+21.7	21.58	+13.98	20.16	4.94	18 58	37.54
7	159	76 23	0.9	143.47	0.18	0.006 5188	20.8	21.71	14.02	20.16	4.92	18 54	41.63
8	160	77 20	23.7	143.43	0.28	0.006 5678	20.0	21.85	14.06	20.15	4.90	18 50	45.72
9	161	78 17	45.4	143.38	0.36	0.006 6149	19.2	21.98	14.11	20.15	4.88	18 46	49.81
10	162	79 15	6.1	143.34	0.42	0.006 6602	18.5	22.12	14.15	20.15	4.87	18 42	53.90
11	163	80 12	25.7	143.30	-0.44	0.006 7037	+17.8	22.26	+14.20	20.15	4.86	18 38	57.98
12	164	81 9	44.4	143.26	0.43	0.006 7456	17.2	22.40	14.24	20.14	4.84	18 35	2.07
13	165	82 7	2.1	143.22	0.40	0.006 7860	16.6	22.54	14.29	20.14	4.83	18 31	6.16
14	166	83 4	19.1	143.19	0.34	0.006 8250	16.0	22.67	14.34	20.14	4.81	18 27	10.25
15	167	84 1	35.2	143.16	0.25	0.006 8627	15.4	22.81	14.38	20.14	4.80	18 23	14.33
16	168	84 58	50.8	143.14	-0.13	0.006 8991	+14.9	22.95	+14.43	20.14	4.79	18 19	18.42
17	169	85 56	5.8	143.12	+0.01	0.006 9342	14.4	23.09	14.47	20.14	4.78	18 15	22.51
18	170	86 53	20.5	143.10	0.15	0.006 9680	13.8	23.23	14.52	20.14	4.77	18 11	26.60
19	171	87 50	34.8	143.09	0.28	0.007 0003	13.1	23.36	14.57	20.14	4.76	18 7	30.68
20	172	88 47	49.0	143.09	0.41	0.007 0311	12.4	23.50	14.62	20.14	4.75	18 3	34.77
21	173	89 45	3.0	143.08	+0.52	0.007 0601	+11.7	23.64	+14.66	20.14	4.74	17 59	38.86
22	174	90 42	16.8	143.08	0.60	0.007 0872	10.9	23.78	14.71	20.14	4.73	17 55	42.95
23	175	91 39	30.6	143.07	0.66	0.007 1123	10.0	23.92	14.76	20.14	4.73	17 51	47.04
24	176	92 36	44.4	143.07	0.69	0.007 1353	9.1	24.05	14.81	20.14	4.72	17 47	51.12
25	177	93 33	58.1	143.07	0.69	0.007 1560	8.1	24.19	14.85	20.13	4.71	17 43	55.21
26	178	94 31	11.7	143.07	+0.66	0.007 1744	+ 7.1	24.33	+14.90	20.13	4.71	17 39	59.30
27	179	95 28	25.3	143.06	0.61	0.007 1902	6.1	24.47	14.95	20.13	4.70	17 36	3.39
28	180	96 25	38.8	143.06	0.51	0.007 2036	5.1	24.60	14.99	20.13	4.70	17 32	7.47
29	181	97 22	52.3	143.06	0.40	0.007 2145	4.0	24.74	15.04	20.13	4.69	17 28	11.56
30	182	98 20	5.6	143.06	0.29	0.007 2228	2.9	24.88	15.08	20.13	4.69	17 24	15.65
July 1	183	99 17	18.8	143.05	+0.17	0.007 2285	+ 1.9	25.02	+15.12	20.13	4.68	17 20	19.74
2	184	100 14	31.9	143.04	+0.04	0.007 2316	+ 0.8	25.16	+15.17	20.13	4.68	17 16	23.82

FOR GREENWICH MEAN NOON.

Date.	Day of the Week.	Apparent Right Ascension.	Var. per Hour.	Apparent Declination.	Var. per Hour.	Semi-diameter.	Hor. Par.	Equation of Time. App.—Mean.	Var. per Hour.	Sidereal Time, or Right Ascension of Mean Sun.
		h m s	s	° ' "	"	' "	"	m s	s	h m s
July 1	Sa	6 40 24.54	10.344	+23 7 34.5	-9.99	15 45.63	8.66	-3 35.18	-0.488	6 36 49.36
2	Su	6 44 32.68	10.333	23 3 22.6	11.00	15 45.62	8.66	3 46.76	0.477	6 40 45.92
3	Mo	6 48 40.54	10.321	22 58 46.5	12.00	15 45.62	8.65	3 58.06	0.464	6 44 42.48
4	Tu	6 52 48.09	10.308	22 53 46.4	13.00	15 45.62	8.65	4 9.05	0.451	6 48 39.04
5	We	6 56 55.32	10.294	22 48 22.4	13.99	15 45.63	8.65	4 19.72	0.437	6 52 35.60
6	Th	7 1 2.19	10.279	+22 42 34.6	-14.98	15 45.65	8.65	-4 30.04	-0.422	6 56 32.15
7	Fr	7 5 8.69	10.263	22 36 23.2	15.96	15 45.67	8.65	4 39.98	0.406	7 0 28.71
8	Sa	7 9 14.80	10.246	22 29 48.4	16.93	15 45.69	8.65	4 49.53	0.389	7 4 25.27
9	Su	7 13 20.50	10.229	22 22 50.4	17.90	15 45.72	8.66	4 58.68	0.372	7 8 21.83
10	Mo	7 17 25.77	10.211	22 15 29.2	18.86	15 45.75	8.66	5 7.39	0.354	7 12 18.38
11	Tu	7 21 30.60	10.192	+22 7 45.1	-19.81	15 45.79	8.66	-5 15.66	-0.335	7 16 14.94
12	We	7 25 34.97	10.172	21 59 38.3	20.75	15 45.83	8.66	5 23.47	0.316	7 20 11.50
13	Th	7 29 38.86	10.152	21 51 8.9	21.69	15 45.83	8.66	5 30.80	0.296	7 24 8.06
14	Fr	7 33 42.28	10.132	21 42 17.2	22.62	15 45.93	8.66	5 37.66	0.276	7 28 4.62
15	Sa	7 37 45.21	10.112	21 33 3.2	23.54	15 45.98	8.66	5 44.03	0.255	7 32 1.17
16	Su	7 41 47.64	10.091	+21 23 27.2	-24.45	15 46.03	8.66	-5 49.90	-0.234	7 35 57.73
17	Mo	7 45 49.56	10.070	21 13 29.4	25.36	15 46.09	8.66	5 55.27	0.213	7 39 54.29
18	Tu	7 49 50.97	10.048	21 3 10.0	26.26	15 46.14	8.66	6 0.13	0.192	7 43 50.85
19	We	7 53 51.87	10.026	20 52 29.1	27.14	15 46.20	8.66	6 4.47	0.170	7 47 47.40
20	Th	7 57 52.24	10.004	20 41 27.1	28.02	15 46.26	8.66	6 8.23	0.148	7 51 43.96
21	Fr	8 1 52.08	9.982	+20 30 4.1	-28.89	15 46.33	8.66	-6 11.56	-0.125	7 55 40.52
22	Sa	8 5 51.37	9.959	20 18 20.3	29.75	15 46.40	8.66	6 14.30	0.102	7 59 37.08
23	Su	8 9 50.11	9.936	20 6 16.1	30.60	15 46.48	8.66	6 16.48	0.079	8 3 33.63
24	Mo	8 13 48.29	9.912	19 53 51.6	31.44	15 46.57	8.66	6 18.10	0.056	8 7 30.19
25	Tu	8 17 45.90	9.888	19 41 7.1	32.26	15 46.66	8.66	6 19.16	0.032	8 11 26.75
26	We	8 21 42.94	9.864	+19 28 2.9	-33.07	15 46.76	8.67	-6 19.64	-0.008	8 15 23.30
27	Th	8 25 39.39	9.840	19 14 39.3	33.88	15 46.96	8.67	6 19.53	+0.017	8 19 19.86
28	Fr	8 29 35.25	9.815	19 0 56.6	34.67	15 46.96	8.67	6 18.84	0.042	8 23 16.41
29	Sa	8 33 30.52	9.790	18 46 55.0	35.45	15 47.07	8.67	6 17.54	0.067	8 27 12.97
30	Su	8 37 25.18	9.765	18 32 34.8	36.22	15 47.18	8.67	6 15.65	0.092	8 31 9.53
31	Mo	8 41 19.24	9.740	+18 17 56.4	-36.98	15 47.30	8.67	-6 13.15	+0.117	8 35 6.08
Aug. 1	Tu	8 45 12.68	9.714	18 3 0.0	37.72	15 47.42	8.67	6 10.04	0.142	8 39 2.64
2	We	8 49 5.51	9.688	17 47 45.9	38.45	15 47.55	8.67	6 6.31	0.168	8 42 59.20
3	Th	8 52 57.73	9.663	17 32 14.5	39.16	15 47.68	8.67	6 1.97	0.194	8 46 55.75
4	Fr	8 56 49.33	9.637	17 16 26.1	39.87	15 47.82	8.68	5 57.02	0.219	8 50 52.31
5	Sa	9 0 40.31	9.611	+17 0 21.0	-40.56	15 47.96	8.68	-5 51.45	+0.245	8 54 48.86
6	Su	9 4 30.68	9.586	16 43 59.4	41.23	15 48.11	8.68	5 45.26	0.271	8 58 45.42
7	Mo	9 8 20.43	9.560	16 27 21.7	41.90	15 48.26	8.68	5 38.45	0.296	9 2 41.98
8	Tu	9 12 9.57	9.535	16 10 28.2	42.55	15 48.42	8.68	5 31.04	0.321	9 6 38.53
9	We	9 15 58.11	9.510	15 53 19.3	43.19	15 48.58	8.68	5 23.03	0.346	9 10 35.09
10	Th	9 19 46.06	9.486	+15 35 55.1	-43.82	15 48.74	8.68	-5 14.42	+0.371	9 14 31.64
11	Fr	9 23 33.42	9.462	15 18 16.0	44.43	15 48.90	8.68	5 5.22	0.395	9 18 28.20
12	Sa	9 27 20.21	9.438	15 0 22.3	45.04	15 49.07	8.69	4 55.45	0.419	9 22 24.76
13	Su	9 31 6.43	9.415	14 42 14.2	45.63	15 49.24	8.69	4 45.12	0.442	9 26 21.31
14	Mo	9 34 52.10	9.392	14 23 52.0	46.21	15 49.41	8.69	4 34.24	0.465	9 30 17.86
15	Tu	9 38 37.24	9.370	+14 5 16.1	-46.78	15 49.58	8.69	-4 22.82	+0.487	9 34 14.42
16	We	9 42 21.86	9.348	+13 46 26.7	-47.34	15 49.76	8.69	-4 10.88	+0.508	9 38 10.98

FOR GREENWICH MEAN NOON.

Date.	Day of the Year.	True Longitude.	Var. per Hour.	Latitude.	Logarithm of the Radius Vector of the Earth.	Var. per Hour.	Prec. in Long.	Nut. in Long.	Aber-ration.	True Obliquity.	Mean Time of Sidereal Noon.
		" " "	"	"			"	"	"	23° 27'	h m s
July	1	183 99 17 18.8	143.06	+0.17	0.007 2285	+ 1.9	25.02	+15.12	20.13	4.68	17 20 19.74
	2	184 100 14 31.9	143.04	+0.04	0.007 2316	+ 0.8	25.15	15.17	20.13	4.68	17 16 23.82
	3	185 101 11 44.9	143.04	-0.09	0.007 2322	- 0.3	25.29	15.21	20.13	4.68	17 12 27.91
	4	186 102 8 57.7	143.03	0.22	0.007 2303	1.3	25.42	15.26	20.13	4.68	17 8 32.00
	5	187 103 6 10.3	143.02	0.33	0.007 2259	2.3	25.56	15.30	20.13	4.68	17 4 36.09
	6	188 104 3 22.8	143.02	-0.42	0.007 2192	- 3.3	25.70	+15.34	20.13	4.68	17 0 40.18
	7	189 105 0 35.1	143.01	0.48	0.007 2101	4.2	25.84	15.38	20.13	4.68	16 56 44.26
	8	190 105 57 47.2	143.00	0.51	0.007 1989	5.1	25.98	15.43	20.13	4.68	16 52 48.35
	9	191 106 54 59.2	143.00	0.52	0.007 1857	5.9	26.11	15.47	20.13	4.68	16 48 52.44
	10	192 107 52 11.1	142.99	0.50	0.007 1705	6.7	26.25	15.51	20.13	4.68	16 44 56.53
	11	193 108 49 23.0	142.99	-0.44	0.007 1536	- 7.4	26.39	+15.55	20.13	4.68	16 41 0.62
	12	194 109 46 34.8	143.00	0.35	0.007 1350	8.1	26.53	15.58	20.13	4.68	16 37 4.70
	13	195 110 43 46.7	143.00	0.23	0.007 1149	8.7	26.67	15.62	20.13	4.69	16 33 8.79
	14	196 111 40 58.8	143.01	-0.10	0.007 0934	9.3	26.80	15.66	20.13	4.69	16 29 12.88
	15	197 112 38 11.1	143.02	+0.04	0.007 0705	9.8	26.94	15.70	20.13	4.70	16 25 16.97
	16	198 113 35 23.9	143.04	+0.18	0.007 0463	-10.4	27.08	+15.73	20.14	4.70	16 21 21.06
	17	199 114 32 37.1	143.06	0.31	0.007 0208	11.0	27.22	15.76	20.14	4.71	16 17 25.15
	18	200 115 29 51.0	143.09	0.43	0.006 9938	11.6	27.36	15.80	20.14	4.71	16 13 29.24
	19	201 116 27 5.5	143.12	0.53	0.006 9653	12.2	27.49	15.83	20.14	4.72	16 9 33.32
	20	202 117 24 20.9	143.16	0.61	0.006 9351	12.9	27.63	15.86	20.14	4.72	16 5 37.41
	21	203 118 21 37.1	143.19	+0.65	0.006 9031	-13.7	27.77	+15.89	20.14	4.73	16 1 41.50
	22	204 119 18 54.1	143.23	0.66	0.006 8692	14.5	27.91	15.92	20.15	4.73	15 57 45.59
	23	205 120 16 12.0	143.26	0.64	0.006 8333	15.4	28.04	15.94	20.15	4.74	15 53 49.68
	24	206 121 13 30.8	143.30	0.59	0.006 7952	16.3	28.18	15.97	20.15	4.75	15 49 53.77
	25	207 122 10 50.4	143.34	0.51	0.006 7549	17.3	28.32	16.00	20.15	4.75	15 45 57.86
	26	208 123 8 11.0	143.37	+0.42	0.006 7124	-18.2	28.46	+16.02	20.15	4.76	15 42 1.95
	27	209 124 5 32.4	143.41	0.31	0.006 6674	19.2	28.59	16.04	20.16	4.77	15 38 6.04
	28	210 125 2 54.7	143.45	0.18	0.006 6202	20.2	28.73	16.06	20.16	4.78	15 34 10.12
	29	211 126 0 17.8	143.48	+0.05	0.006 5705	21.2	28.86	16.08	20.16	4.79	15 30 14.21
	30	212 126 57 41.9	143.52	-0.08	0.006 5184	22.2	29.00	16.10	20.16	4.79	15 26 18.30
	31	213 127 55 6.7	143.55	-0.20	0.006 4639	-23.3	29.14	+16.12	20.17	4.80	15 22 22.39
Aug.	1	214 128 52 32.3	143.58	0.31	0.006 4070	24.3	29.28	16.13	20.17	4.81	15 18 26.48
	2	215 129 49 58.7	143.62	0.40	0.006 3478	25.2	29.42	16.15	20.17	4.82	15 14 30.57
	3	216 130 47 25.9	143.65	0.47	0.006 2863	26.1	29.55	16.16	20.17	4.83	15 10 34.66
	4	217 131 44 53.8	143.68	0.51	0.006 2227	27.0	29.69	16.17	20.18	4.84	15 6 38.75
	5	218 132 42 22.5	143.71	-0.52	0.006 1569	-27.8	29.83	+16.18	20.18	4.85	15 2 42.84
	6	219 133 39 51.9	143.74	0.50	0.006 0892	28.6	29.97	16.19	20.18	4.86	14 58 46.93
	7	220 134 37 22.0	143.77	0.45	0.006 0197	29.3	30.11	16.20	20.19	4.87	14 54 51.02
	8	221 135 34 53.0	143.81	0.37	0.005 9485	30.0	30.24	16.20	20.19	4.88	14 50 55.11
	9	222 136 32 24.7	143.84	0.27	0.005 8759	30.6	30.38	16.20	20.19	4.89	14 46 59.20
	10	223 137 29 57.3	143.88	-0.14	0.005 8018	-31.1	30.52	+16.21	20.20	4.90	14 43 3.29
	11	224 138 27 30.8	143.92	0.00	0.005 7266	31.6	30.66	16.21	20.20	4.91	14 39 7.38
	12	225 139 25 5.4	143.96	+0.14	0.005 6504	32.0	30.80	16.21	20.20	4.92	14 35 11.47
	13	226 140 22 41.0	144.01	0.27	0.005 5731	32.4	30.93	16.21	20.20	4.93	14 31 15.56
	14	227 141 20 18.0	144.06	0.40	0.005 4949	32.8	31.07	16.20	20.21	4.93	14 27 19.66
	15	228 142 17 56.2	144.12	+0.51	0.005 4158	-33.2	31.21	+16.20	20.21	4.94	14 23 23.75
	16	229 143 15 35.9	144.18	+0.59	0.005 3356	-33.6	31.35	+16.20	20.21	4.95	14 19 27.84

FOR GREENWICH MEAN NOON.

Date.	Day of the Week.	Apparent Right Ascension.	Var. per Hour.	Apparent Declination.	Var. per Hour.	Semi-diameter.	Hor. Par.	Equation of Time. App.—Mean.	Var. per Hour.	Sidereal Time, or Right Ascension of Mean Sun.
		h m s	s	° ' "	"	' "	"	m s	s	h m s
Aug. 16	We	9 42 21.86	9.348	+13 46 26.7	-47.34	15 49.76	8.69	- 4 10.88	+0.508	9 38 10.98
17	Th	9 46 5.96	9.327	13 27 24.0	47.88	15 49.94	8.69	3 58.43	0.529	9 42 7.53
18	Fr	9 49 49.57	9.307	13 9 8.4	48.41	15 50.12	8.70	3 45.49	0.549	9 46 4.08
19	Sa	9 53 32.70	9.287	12 48 40.2	48.93	15 50.30	8.70	3 32.06	0.569	9 50 0.64
20	Su	9 57 15.36	9.268	12 28 59.6	49.44	15 50.49	8.70	3 18.17	0.588	9 53 57.19
21	Mo	10 0 57.56	9.249	+12 9 7.1	-49.93	15 50.68	8.70	- 3 3.81	+0.607	9 57 53.75
22	Tu	10 4 39.32	9.231	11 49 2.9	50.41	15 50.87	8.70	2 49.01	0.626	10 1 50.30
23	We	10 8 20.64	9.213	11 28 47.4	50.88	15 51.07	8.70	2 33.78	0.644	10 5 46.86
24	Th	10 12 1.53	9.195	11 8 20.8	51.33	15 51.27	8.71	2 18.12	0.661	10 9 43.41
25	Fr	10 15 42.01	9.178	10 47 43.6	51.77	15 51.47	8.71	2 2.05	0.678	10 13 39.97
26	Sa	10 19 22.10	9.162	+10 26 56.0	-52.19	15 51.68	8.71	- 1 45.58	+0.694	10 17 36.52
27	Su	10 23 1.79	9.146	10 5 58.4	52.60	15 51.89	8.71	1 28.72	0.710	10 21 33.08
28	Mo	10 26 41.11	9.131	9 44 51.2	53.00	15 52.11	8.71	1 11.48	0.725	10 25 29.63
29	Tu	10 30 20.07	9.116	9 23 34.6	53.38	15 52.33	8.72	0 53.89	0.740	10 29 26.18
30	We	10 33 58.68	9.102	9 2 9.1	53.74	15 52.55	8.72	0 35.94	0.754	10 33 22.74
31	Th	10 37 36.95	9.088	+ 8 40 35.0	-54.09	15 52.78	8.72	- 0 17.66	+0.768	10 37 19.29
Sept. 1	Fr	10 41 14.90	9.075	8 18 52.6	54.43	15 53.01	8.72	+ 0 0.94	0.781	10 41 15.85
2	Sa	10 44 52.54	9.062	7 57 2.2	54.73	15 53.24	8.72	0 19.86	0.794	10 45 12.40
3	Su	10 48 29.82	9.050	7 35 4.3	55.06	15 53.48	8.73	0 39.07	0.806	10 49 8.95
4	Mo	10 52 6.94	9.039	7 12 59.2	55.36	15 53.72	8.73	0 58.57	0.817	10 53 5.51
5	Tu	10 55 43.74	9.028	+ 6 50 47.1	-55.64	15 53.97	8.73	+ 1 18.32	+0.828	10 57 2.06
6	We	10 59 20.29	9.018	6 28 28.4	55.91	15 54.22	8.73	1 38.33	0.838	11 0 58.62
7	Th	11 2 56.61	9.009	6 6 3.4	56.16	15 54.47	8.74	1 58.56	0.847	11 4 55.17
8	Fr	11 6 32.72	9.001	5 43 32.5	56.41	15 54.72	8.74	2 19.00	0.855	11 8 51.72
9	Sa	11 10 8.65	8.994	5 20 55.9	56.64	15 54.97	8.74	2 39.63	0.863	11 12 48.28
10	Su	11 13 44.41	8.987	+ 4 58 13.9	-56.85	15 55.22	8.74	+ 3 0.42	+0.869	11 16 44.83
11	Mo	11 17 20.03	8.982	4 35 26.9	57.06	15 55.47	8.74	3 21.35	0.874	11 20 41.38
12	Tu	11 20 55.53	8.977	4 12 35.1	57.25	15 55.72	8.75	3 42.41	0.879	11 24 37.94
13	We	11 24 30.93	8.973	3 49 38.8	57.43	15 55.98	8.75	4 3.56	0.883	11 28 34.49
14	Th	11 28 6.27	8.971	3 26 38.4	57.60	15 56.23	8.75	4 24.77	0.885	11 32 31.04
15	Fr	11 31 41.56	8.970	+ 3 3 34.1	-57.75	15 56.49	8.75	+ 4 46.04	+0.886	11 36 27.60
16	Sa	11 35 16.82	8.969	2 40 26.2	57.89	15 56.74	8.76	5 7.33	0.887	11 40 24.15
17	Su	11 38 52.07	8.970	2 17 15.0	58.02	15 57.00	8.76	5 28.63	0.887	11 44 20.70
18	Mo	11 42 27.34	8.971	1 54 1.0	58.14	15 57.25	8.76	5 49.91	0.886	11 48 17.26
19	Tu	11 46 2.66	8.973	1 30 44.4	58.24	15 57.51	8.76	6 11.15	0.884	11 52 13.81
20	We	11 49 38.04	8.976	+ 1 7 25.6	-58.32	15 57.77	8.77	+ 6 32.33	+0.881	11 56 10.36
21	Th	11 53 13.49	8.979	0 44 4.9	58.39	15 58.04	8.77	6 53.43	0.877	12 0 6.92
22	Fr	11 56 49.03	8.984	+ 0 20 42.6	58.45	15 58.30	8.78	7 14.44	0.873	12 4 3.47
23	Sa	12 0 24.69	8.989	- 0 2 40.8	58.49	15 58.57	8.78	7 35.33	0.868	12 8 0.02
24	Su	12 4 0.49	8.995	0 26 5.0	58.52	15 58.84	8.78	7 56.08	0.862	12 11 56.57
25	Mo	12 7 36.45	9.002	- 0 49 29.7	-58.53	15 59.11	8.78	+ 8 16.68	+0.855	12 15 53.13
26	Tu	12 11 12.57	9.009	1 12 54.5	58.53	15 59.38	8.78	8 37.11	0.847	12 19 49.68
27	We	12 14 48.88	9.017	1 36 19.0	58.51	15 59.65	8.78	8 57.35	0.839	12 23 46.23
28	Th	12 18 25.40	9.026	1 59 42.8	58.47	15 59.92	8.79	9 17.38	0.830	12 27 42.79
29	Fr	12 22 2.15	9.036	2 23 5.6	58.42	16 0.20	8.79	9 37.19	0.820	12 31 39.34
30	Sa	12 25 39.13	9.046	- 2 46 27.0	-58.35	16 0.48	8.79	+ 9 56.76	+0.810	12 35 35.89
Oct. 1	Su	12 29 16.37	9.057	- 3 9 46.6	-58.27	16 0.76	8.79	+10 16.08	+0.799	12 39 32.45

FOR GREENWICH MEAN NOON.

Date.	Day of the Year.	True Longitude.	Var. per Hour.	Latitude.	Logarithm of the Radius Vector of the Earth.	Var. per Hour.	Prec. in Long.	Nut. in Long.	Aber-ration.	True Obliq-uity.	Mean Time of Sidereal Noon.
		" ' "	"	"			"	"	"	23° 27'	h m s
Aug. 16	229	143 15 35.9	144.18	+0.59	0.005 3356	-33.6	31.35	+16.20	20.21	4.95	14 19 27.84
17	230	144 13 17.1	144.25	0.64	0.005 2543	34.1	31.48	16.19	20.22	4.96	14 15 31.93
18	231	145 10 59.9	144.32	0.66	0.005 1719	34.6	31.62	16.18	20.22	4.97	14 11 36.02
19	232	146 8 44.3	144.39	0.65	0.005 0882	35.2	31.76	16.17	20.22	4.97	14 7 40.11
20	233	147 6 30.4	144.46	0.61	0.005 0031	35.8	31.90	16.16	20.23	4.98	14 3 44.20
21	234	148 4 18.2	144.53	+0.55	0.004 9166	-36.4	32.03	+16.15	20.23	4.99	13 59 48.29
22	235	149 2 7.7	144.60	0.46	0.004 8284	37.1	32.17	16.14	20.23	5.00	13 55 52.38
23	236	149 59 58.9	144.67	0.35	0.004 7387	37.8	32.30	16.13	20.24	5.01	13 51 56.48
24	237	150 57 51.8	144.74	0.24	0.004 6472	38.5	32.44	16.11	20.24	5.01	13 48 0.57
25	238	151 55 46.3	144.81	+0.12	0.004 5540	39.2	32.58	16.09	20.25	5.02	13 44 4.66
26	239	152 53 42.6	144.88	-0.01	0.004 4590	-40.0	32.72	+16.08	20.25	5.02	13 40 8.75
27	240	153 51 40.5	144.95	0.13	0.004 3622	40.7	32.86	16.06	20.26	5.03	13 36 12.84
28	241	154 49 40.1	145.02	0.24	0.004 2636	41.5	32.99	16.04	20.26	5.04	13 32 16.93
29	242	155 47 41.2	145.08	0.34	0.004 1632	42.2	33.13	16.02	20.26	5.04	13 28 21.02
30	243	156 45 44.0	145.15	0.41	0.004 0610	43.0	33.27	16.00	20.27	5.05	13 24 25.12
31	244	157 43 48.3	145.21	-0.46	0.003 9570	-43.7	33.41	+15.98	20.27	5.05	13 20 29.21
Sept. 1	245	158 41 54.1	145.27	0.48	0.003 8513	44.4	33.55	15.95	20.28	5.06	13 16 33.30
2	246	159 40 1.4	145.33	0.47	0.003 7440	45.0	33.68	15.93	20.28	5.06	13 12 37.39
3	247	160 38 10.1	145.39	0.43	0.003 6352	45.6	33.82	15.91	20.29	5.06	13 8 41.48
4	248	161 36 20.2	145.45	0.36	0.003 5252	46.1	33.96	15.88	20.29	5.06	13 4 45.58
5	249	162 34 31.8	145.51	-0.26	0.003 4139	-46.5	34.10	+15.85	20.30	5.07	13 0 49.67
6	250	163 32 44.8	145.57	0.14	0.003 3017	46.9	34.24	15.82	20.30	5.07	12 56 53.76
7	251	164 30 59.3	145.64	-0.01	0.003 1886	47.2	34.37	15.79	20.31	5.07	12 52 57.85
8	252	165 29 15.4	145.70	+0.13	0.003 0749	47.5	34.51	15.76	20.32	5.07	12 49 1.94
9	253	166 27 33.0	145.77	0.26	0.002 9607	47.7	34.65	15.73	20.32	5.07	12 45 6.04
10	254	167 25 52.2	145.84	+0.38	0.002 8461	-47.8	34.79	+15.70	20.33	5.07	12 41 10.13
11	255	168 24 13.1	145.91	0.49	0.002 7313	47.9	34.92	15.67	20.33	5.07	12 37 14.22
12	256	169 22 35.9	145.99	0.57	0.002 6163	48.0	35.05	15.63	20.34	5.06	12 33 18.32
13	257	170 21 0.6	146.07	0.63	0.002 5011	48.1	35.19	15.60	20.34	5.06	12 29 22.41
14	258	171 19 27.2	146.15	0.65	0.002 3857	48.2	35.33	15.57	20.35	5.06	12 25 26.50
15	259	172 17 55.9	146.24	+0.64	0.002 2701	-48.3	35.47	+15.53	20.36	5.05	12 21 30.59
16	260	173 16 26.8	146.33	0.61	0.002 1542	48.4	35.61	15.50	20.36	5.05	12 17 34.69
17	261	174 14 59.8	146.42	0.56	0.002 0378	48.6	35.74	15.46	20.37	5.04	12 13 38.78
18	262	175 13 35.0	146.51	0.48	0.001 9210	48.8	35.88	15.43	20.38	5.04	12 9 42.87
19	263	176 12 12.4	146.61	0.38	0.001 8036	49.0	36.02	15.39	20.38	5.03	12 5 46.96
20	264	177 10 52.1	146.70	+0.27	0.001 6856	-49.3	36.16	+15.36	20.39	5.02	12 1 51.06
21	265	178 9 33.9	146.79	0.15	0.001 5669	49.6	36.30	15.32	20.39	5.02	11 57 55.15
22	266	179 8 18.0	146.88	+0.03	0.001 4475	49.9	36.43	15.28	20.40	5.01	11 53 59.24
23	267	180 7 4.2	146.97	-0.09	0.001 3272	50.3	36.57	15.25	20.40	5.00	11 50 3.34
24	268	181 5 52.6	147.06	0.21	0.001 2062	50.6	36.71	15.21	20.41	4.99	11 46 7.43
25	269	182 4 43.2	147.15	-0.31	0.001 0842	-51.0	36.85	+15.17	20.41	4.98	11 42 11.52
26	270	183 3 35.9	147.24	0.38	0.000 9613	51.4	36.99	15.14	20.42	4.97	11 38 15.61
27	271	184 2 30.6	147.32	0.43	0.000 8375	51.8	37.12	15.10	20.42	4.96	11 34 19.71
28	272	185 1 27.3	147.40	0.46	0.000 7129	52.1	37.26	15.06	20.43	4.95	11 30 23.80
29	273	186 0 26.0	147.48	0.46	0.000 5873	52.5	37.40	15.03	20.43	4.93	11 26 27.89
30	274	186 59 26.6	147.56	-0.43	0.000 4610	-52.8	37.54	+14.99	20.44	4.92	11 22 31.98
Oct. 1	275	187 58 29.0	147.64	-0.37	0.000 3340	-53.0	37.68	+14.96	20.44	4.90	11 18 36.08

FOR GREENWICH MEAN NOON.

Date.	Day of the Week.	Apparent Right Ascension.	Var. per Hour.	Apparent Declination.	Var. per Hour.	Semi-diameter.	Hor. Par.	Equation of Time. App.—Mean.	Var. per Hour.	Sidereal Time, or Right Ascension of Mean Sun.
		h m s	s	° ' "	"	' "	"	m s	s	h m s
Oct. 1	Su	12 29 16.37	9.057	— 3 9 46.6	—58.27	16 0.76	8.79	+10 16.08	+0.799	12 39 32.45
2	Mo	12 32 53.89	9.069	3 33 4.0	58.17	16 1.04	8.80	10 35.11	0.787	12 43 29.00
3	Tu	12 36 31.69	9.082	3 56 18.9	58.06	16 1.32	8.80	10 53.86	0.774	12 47 25.55
4	We	12 40 9.80	9.095	4 19 31.0	57.93	16 1.60	8.80	11 12.30	0.761	12 51 22.11
5	Th	12 43 48.25	9.109	4 42 39.8	57.79	16 1.89	8.80	11 30.41	0.747	12 55 18.66
6	Fr	12 47 27.05	9.124	— 5 5 45.0	—57.63	16 2.18	8.81	+11 48.17	+0.732	12 59 15.21
7	Sa	12 51 6.22	9.140	5 28 46.3	57.46	16 2.46	8.81	12 5.55	0.716	13 3 11.77
8	Su	12 54 45.77	9.157	5 51 43.3	57.28	16 2.74	8.81	12 22.55	0.700	13 7 8.32
9	Mo	12 58 25.74	9.175	6 14 35.7	57.08	16 3.02	8.81	12 39.13	0.682	13 11 4.87
10	Tu	13 2 6.15	9.194	6 37 23.2	56.87	16 3.30	8.82	12 55.27	0.663	13 15 1.43
11	We	13 5 47.03	9.214	— 7 0 5.3	—56.64	16 3.58	8.82	+13 10.95	+0.643	13 18 57.98
12	Th	13 9 28.39	9.235	7 22 41.8	56.40	16 3.86	8.82	13 26.15	0.622	13 22 54.54
13	Fr	13 13 10.25	9.256	7 45 12.4	56.14	16 4.13	8.82	13 40.83	0.600	13 26 51.09
14	Sa	13 16 52.65	9.278	8 7 36.6	55.87	16 4.40	8.83	13 54.99	0.578	13 30 47.64
15	Su	13 20 35.60	9.301	8 29 54.0	55.58	16 4.67	8.83	14 8.60	0.555	13 34 44.20
16	Mo	13 24 19.12	9.326	— 8 52 4.4	—55.28	16 4.94	8.83	+14 21.63	+0.531	13 38 40.75
17	Tu	13 28 3.23	9.351	9 14 7.3	54.96	16 5.21	8.83	14 34.07	0.506	13 42 37.30
18	We	13 31 47.95	9.376	9 36 2.4	54.62	16 5.48	8.84	14 45.99	0.480	13 46 33.86
19	Th	13 35 33.30	9.403	9 57 49.2	54.27	16 5.74	8.84	14 57.11	0.453	13 50 30.41
20	Fr	13 39 19.29	9.430	10 19 27.4	53.90	16 6.01	8.84	15 7.67	0.426	13 54 26.97
21	Sa	13 43 5.94	9.458	—10 40 56.5	—53.51	16 6.27	8.84	+15 17.58	+0.398	13 58 23.52
22	Su	13 46 53.27	9.486	11 2 16.1	53.11	16 6.54	8.85	15 26.80	0.370	14 2 20.07
23	Mo	13 50 41.29	9.515	11 23 25.9	52.69	16 6.80	8.85	15 35.34	0.341	14 6 16.63
24	Tu	13 54 30.00	9.545	11 44 25.4	52.26	16 7.07	8.85	15 43.18	0.312	14 10 13.18
25	We	13 58 19.43	9.575	12 5 14.3	51.80	16 7.33	8.85	15 50.31	0.282	14 14 9.74
26	Th	14 2 9.59	9.605	—12 25 52.0	—51.33	16 7.59	8.85	+15 56.70	+0.252	14 18 6.29
27	Fr	14 6 0.48	9.636	12 46 18.2	50.84	16 7.85	8.86	16 2.37	0.221	14 22 2.85
28	Sa	14 9 52.11	9.667	13 6 32.4	50.33	16 8.11	8.86	16 7.29	0.190	14 25 59.40
29	Su	14 13 44.49	9.698	13 26 34.2	49.81	16 8.37	8.86	16 11.46	0.158	14 29 55.96
30	Mo	14 17 37.63	9.730	13 46 23.2	49.27	16 8.63	8.87	16 14.88	0.126	14 33 52.51
31	Tu	14 21 31.54	9.762	—14 5 59.0	—48.71	16 8.88	8.87	+16 17.53	+0.094	14 37 49.07
Nov. 1	We	14 25 26.22	9.794	14 25 21.2	48.13	16 9.14	8.87	16 19.40	0.062	14 41 45.62
2	Th	14 29 21.67	9.827	14 44 29.3	47.54	16 9.39	8.87	16 20.51	+0.030	14 45 42.18
3	Fr	14 33 17.91	9.860	15 3 23.0	46.93	16 9.65	8.87	16 20.82	—0.003	14 49 38.73
4	Sa	14 37 14.95	9.893	15 22 1.9	46.30	16 9.90	8.88	16 20.34	0.036	14 53 35.29
5	Su	14 41 12.79	9.927	—15 40 25.5	—45.66	16 10.15	8.88	+16 19.06	—0.070	14 57 31.84
6	Mo	14 45 11.44	9.961	15 58 33.5	45.00	16 10.40	8.88	16 16.96	0.104	15 1 28.40
7	Tu	14 49 10.91	9.995	16 16 25.4	44.32	16 10.64	8.88	16 14.05	0.139	15 5 24.96
8	We	14 53 11.20	10.030	16 34 1.0	43.63	16 10.87	8.89	16 10.31	0.174	15 9 21.51
9	Th	14 57 12.34	10.065	16 51 19.9	42.93	16 11.10	8.89	16 5.73	0.209	15 13 18.07
10	Fr	15 1 14.32	10.100	—17 8 21.6	—42.21	16 11.33	8.89	+16 0.31	—0.244	15 17 14.62
11	Sa	15 5 17.15	10.136	17 25 5.8	41.47	16 11.56	8.89	15 54.03	0.279	15 21 11.18
12	Su	15 9 20.83	10.171	17 41 32.0	40.71	16 11.78	8.89	15 46.91	0.315	15 25 7.74
13	Mo	15 13 25.37	10.207	17 57 39.9	39.94	16 12.00	8.90	15 38.92	0.351	15 29 4.29
14	Tu	15 17 30.78	10.243	18 13 29.1	39.15	16 12.21	8.90	15 30.07	0.387	15 33 0.85
15	We	15 21 37.04	10.279	—18 28 59.2	—38.35	16 12.42	8.90	+15 20.37	—0.423	15 36 57.41
16	Th	15 25 44.17	10.315	—18 44 9.8	—37.53	16 12.62	8.90	+15 9.80	—0.459	15 40 53.96

FOR GREENWICH MEAN NOON.

Date.	Day of the Year.	True Longitude.	Var. per Hour.	Latitude.	Logarithm of the Radius Vector of the Earth.	Var. per Hour.	Prec. in Long.	Nut. in Long.	Aber-ration.	True Obliquity.	Mean Time of Sidereal Noon.
		" ' "	"	"			"	"	"	23° 27'	h m s
Oct.	1	275 187 58 29.0	147.64	-0.37	0.000 3340	-53.0	37.68	+14.96	20.44	4.90	11 18 36.08
	2	276 188 57 33.3	147.71	0.28	0.000 2065	53.2	37.81	14.92	20.45	4.89	11 14 40.17
	3	277 189 56 39.3	147.79	0.17	0.000 0785	53.3	37.95	14.89	20.45	4.88	11 10 44.26
	4	278 190 55 47.0	147.86	-0.05	9.999 9503	53.4	38.09	14.85	20.46	4.86	11 6 48.36
	5	279 191 54 56.5	147.93	+0.09	9.999 8221	53.4	38.23	14.82	20.47	4.85	11 2 52.45
	6	280 192 54 7.8	148.00	+0.23	9.999 6940	-53.3	38.36	+14.79	20.47	4.83	10 58 56.54
	7	281 193 53 20.8	148.06	0.35	9.999 5662	53.1	38.49	14.76	20.48	4.82	10 55 0.63
	8	282 194 52 35.5	148.16	0.46	9.999 4389	52.9	38.63	14.73	20.49	4.80	10 51 4.72
	9	283 195 51 52.2	148.24	0.54	9.999 3123	52.6	38.77	14.70	20.49	4.78	10 47 8.82
	10	284 196 51 10.8	148.32	0.60	9.999 1863	52.3	38.91	14.67	20.50	4.76	10 43 12.91
	11	285 197 50 31.4	148.40	+0.63	9.999 0612	-52.0	39.05	+14.64	20.50	4.74	10 39 17.00
	12	286 198 49 54.0	148.49	0.63	9.998 9369	51.6	39.18	14.61	20.51	4.72	10 35 21.09
	13	287 199 49 18.7	148.58	0.60	9.998 8134	51.2	39.32	14.58	20.52	4.70	10 31 25.18
	14	288 200 48 45.7	148.67	0.54	9.998 6908	50.9	39.46	14.56	20.52	4.68	10 27 29.28
	15	289 201 48 14.8	148.76	0.46	9.998 5689	50.6	39.60	14.53	20.53	4.66	10 23 33.37
	16	290 202 47 46.3	148.86	+0.36	9.998 4477	-50.3	39.74	+14.51	20.53	4.64	10 19 37.46
	17	291 203 47 20.0	148.95	0.25	9.998 3272	50.1	39.87	14.49	20.54	4.61	10 15 41.55
	18	292 204 46 55.9	149.05	0.13	9.998 2072	49.9	40.01	14.47	20.55	4.59	10 11 45.65
	19	293 205 46 34.2	149.14	+0.01	9.998 0878	49.7	40.15	14.45	20.55	4.56	10 7 49.74
	20	294 206 46 14.6	149.23	-0.11	9.997 9689	49.5	40.29	14.43	20.56	4.54	10 3 53.83
	21	295 207 45 57.4	149.33	-0.23	9.997 8504	-49.3	40.43	+14.41	20.56	4.51	9 59 57.92
	22	296 208 45 42.4	149.42	0.33	9.997 7322	49.2	40.56	14.39	20.57	4.49	9 56 2.01
	23	297 209 45 29.6	149.51	0.41	9.997 6142	49.1	40.70	14.37	20.58	4.47	9 52 6.10
	24	298 210 45 18.9	149.60	0.46	9.997 4966	49.0	40.84	14.36	20.58	4.44	9 48 10.20
	25	299 211 45 10.4	149.69	0.49	9.997 3791	48.9	40.98	14.35	20.59	4.42	9 44 14.29
	26	300 212 45 3.9	149.77	-0.49	9.997 2617	-48.9	41.12	+14.33	20.59	4.40	9 40 18.38
	27	301 213 44 59.4	149.85	0.46	9.997 1445	48.8	41.25	14.32	20.60	4.37	9 36 22.47
	28	302 214 44 56.7	149.93	0.40	9.997 0275	48.7	41.39	14.31	20.60	4.35	9 32 26.56
	29	303 215 44 55.9	150.00	0.31	9.996 9108	48.6	41.53	14.30	20.61	4.32	9 28 30.65
	30	304 216 44 56.8	150.07	0.20	9.996 7943	48.4	41.67	14.30	20.62	4.29	9 24 34.74
31	305 217 44 59.4	150.14	-0.08	9.996 6784	-48.2	41.80	+14.29	20.62	4.26	9 20 38.83	
Nov.	1	306 218 45 3.5	150.21	+0.05	9.996 5630	47.9	41.93	14.29	20.63	4.23	9 16 42.92
	2	307 219 45 9.2	150.27	0.18	9.996 4485	47.5	42.07	14.29	20.63	4.21	9 12 47.02
	3	308 220 45 16.5	150.33	0.31	9.996 3349	47.1	42.21	14.29	20.64	4.18	9 8 51.11
	4	309 221 45 25.2	150.40	0.42	9.996 2225	46.6	42.35	14.29	20.64	4.15	9 4 55.20
	5	310 222 45 35.5	150.46	+0.51	9.996 1114	-46.0	42.49	+14.30	20.65	4.12	9 0 59.29
	6	311 223 45 47.4	150.53	0.57	9.996 0019	45.3	42.62	14.30	20.65	4.09	8 57 3.38
	7	312 224 46 0.8	150.59	0.61	9.995 8939	44.6	42.76	14.31	20.66	4.06	8 53 7.47
	8	313 225 46 15.8	150.66	0.62	9.995 7878	43.9	42.90	14.32	20.66	4.03	8 49 11.56
	9	314 226 46 32.5	150.73	0.59	9.995 6834	43.1	43.04	14.33	20.66	4.00	8 45 15.65
	10	315 227 46 50.8	150.80	+0.53	9.995 5809	-42.3	43.18	+14.34	20.67	3.97	8 41 19.74
	11	316 228 47 11.0	150.87	0.45	9.995 4803	41.5	43.31	14.36	20.67	3.94	8 37 23.83
	12	317 229 47 32.8	150.95	0.35	9.995 3815	40.7	43.45	14.37	20.68	3.91	8 33 27.92
	13	318 230 47 56.5	151.02	0.23	9.995 2846	40.0	43.59	14.39	20.68	3.88	8 29 32.00
	14	319 231 48 22.0	151.10	+0.11	9.995 1895	39.3	43.73	14.41	20.68	3.85	8 25 36.09
	15	320 232 48 49.3	151.18	-0.01	9.995 0961	-38.6	43.87	+14.43	20.69	3.82	8 21 40.18
	16	321 233 49 18.5	151.26	-0.13	9.995 0044	-37.9	44.00	+14.45	20.70	3.80	8 17 44.27

FOR GREENWICH MEAN NOON.

Date.	Day of the Week.	Apparent Right Ascension.			Var. per Hour.	Apparent Declination.			Var. per Hour.	Semi-diameter.	Hor. Par.	Equation of Time. App.—Mean.	Var. per Hour.	Sidereal Time, or Right Ascension of Mean Sun.		
		h	m	s	s	°	'	"	"	'	"	m	s	h	m	s
Nov. 16	Th	15	25	44.17	10.315	—18	44	9.8	—37.53	16 12.62	8.90	+15 9.80	—0.459	15	40	53.96
17	Fr	15	29	52.15	10.350	18	59	0.5	36.69	16 12.82	8.90	14 58.37	0.494	15	44	50.52
18	Sa	15	34	0.98	10.386	19	13	30.9	35.84	16 13.02	8.91	14 46.10	0.529	15	48	47.08
19	Su	15	38	10.66	10.421	19	27	40.6	34.97	16 13.22	8.91	14 32.97	0.564	15	52	43.63
20	Mo	15	42	21.18	10.456	19	41	29.3	34.08	16 13.41	8.91	14 19.00	0.599	15	56	40.19
21	Tu	15	46	32.54	10.490	—19	54	56.6	—33.18	16 13.60	8.91	+14 4.21	—0.634	16	0	36.75
22	We	15	50	44.71	10.524	20	8	2.0	32.26	16 13.79	8.91	13 48.59	0.668	16	4	33.30
23	Th	15	54	57.69	10.557	20	20	45.3	31.33	16 13.98	8.92	13 32.17	0.701	16	8	29.86
24	Fr	15	59	11.46	10.590	20	33	6.0	30.39	16 14.16	8.92	13 14.96	0.734	16	12	26.42
25	Sa	16	3	26.00	10.622	20	45	3.8	29.42	16 14.34	8.92	12 56.97	0.766	16	16	22.97
26	Su	16	7	41.30	10.653	—20	56	38.4	—28.45	16 14.51	8.92	+12 38.23	—0.797	16	20	19.53
27	Mo	16	11	57.33	10.683	21	7	49.4	27.46	16 14.68	8.92	12 18.76	0.827	16	24	16.09
28	Tu	16	16	14.07	10.712	21	18	36.4	26.46	16 14.85	8.92	11 58.58	0.856	16	28	12.65
29	We	16	20	31.49	10.740	21	28	59.2	25.44	16 15.02	8.92	11 37.71	0.884	16	32	9.20
30	Th	16	24	49.59	10.767	21	38	57.5	24.41	16 15.18	8.93	11 16.17	0.911	16	36	5.76
Dec. 1	Fr	16	29	8.33	10.793	—21	48	30.9	—23.37	16 15.34	8.93	+10 53.99	—0.937	16	40	2.32
2	Sa	16	33	27.69	10.819	21	57	39.3	22.32	16 15.50	8.93	10 31.19	0.962	16	43	58.88
3	Su	16	37	47.66	10.844	22	6	22.3	21.26	16 15.66	8.93	10 7.78	0.987	16	47	55.44
4	Mo	16	42	8.20	10.867	22	14	39.6	20.18	16 15.81	8.93	9 43.80	1.011	16	51	52.00
5	Tu	16	46	29.30	10.890	22	22	31.1	19.10	16 15.95	8.93	9 19.26	1.034	16	55	48.55
6	We	16	50	50.93	10.912	—22	29	56.5	—18.01	16 16.09	8.93	+ 8 54.18	—1.056	16	59	45.11
7	Th	16	55	13.08	10.933	22	36	55.6	16.91	16 16.22	8.93	8 28.59	1.076	17	3	41.67
8	Fr	16	59	35.72	10.953	22	43	28.2	15.80	16 16.35	8.94	8 2.51	1.096	17	7	38.23
9	Sa	17	3	58.82	10.972	22	49	34.0	14.68	16 16.47	8.94	7 35.97	1.115	17	11	34.79
10	Su	17	8	22.37	10.990	22	55	12.8	13.55	16 16.59	8.94	7 8.98	1.133	17	15	31.35
11	Mo	17	12	46.33	11.007	—23	0	24.5	—12.42	16 16.70	8.94	+ 6 41.58	—1.150	17	19	27.90
12	Tu	17	17	10.68	11.022	23	5	8.9	11.28	16 16.80	8.94	6 13.78	1.166	17	23	24.46
13	We	17	21	35.39	11.037	23	9	25.9	10.13	16 16.90	8.94	5 45.63	1.180	17	27	21.02
14	Th	17	26	0.44	11.050	23	13	15.2	8.98	16 16.99	8.94	5 17.14	1.193	17	31	17.58
15	Fr	17	30	25.79	11.062	23	16	36.7	7.82	16 17.08	8.94	4 48.34	1.205	17	35	14.14
16	Sa	17	34	51.42	11.073	—23	19	30.4	—6.65	16 17.16	8.94	+ 4 19.28	—1.216	17	39	10.70
17	Su	17	39	17.29	11.082	23	21	56.1	5.48	16 17.23	8.94	3 49.97	1.226	17	43	7.26
18	Mo	17	43	43.37	11.090	23	23	53.7	4.31	16 17.30	8.94	3 20.45	1.234	17	47	3.81
19	Tu	17	48	9.62	11.097	23	25	23.2	3.14	16 17.36	8.95	2 50.75	1.240	17	51	0.37
20	We	17	52	36.02	11.102	23	26	24.4	1.96	16 17.42	8.95	2 20.91	1.245	17	54	56.93
21	Th	17	57	2.52	11.106	—23	26	57.3	—0.78	16 17.48	8.95	+ 1 50.97	—1.249	17	58	53.49
22	Fr	18	1	29.09	11.108	23	27	1.9	+ 0.40	16 17.54	8.95	1 20.96	1.251	18	2	50.05
23	Sa	18	5	55.70	11.108	23	26	38.2	1.58	16 17.59	8.95	0 50.91	1.252	18	6	46.61
24	Su	18	10	22.30	11.107	23	25	46.2	2.76	16 17.64	8.95	+ 0 20.87	1.251	18	10	43.17
25	Mo	18	14	48.85	11.104	23	24	25.8	3.94	16 17.68	8.95	— 0 9.12	1.248	18	14	39.72
26	Tu	18	19	15.31	11.100	—23	22	37.2	+ 5.12	16 17.72	8.95	— 0 39.03	—1.243	18	18	36.28
27	We	18	23	41.64	11.094	23	20	20.4	6.20	16 17.75	8.95	1 8.80	1.237	18	22	32.84
28	Th	18	28	7.81	11.086	23	17	35.5	7.46	16 17.78	8.95	1 38.41	1.230	18	26	29.40
29	Fr	18	32	33.78	11.077	23	14	22.6	8.62	16 17.81	8.95	2 7.82	1.221	18	30	25.96
30	Sa	18	36	59.51	11.066	23	10	41.7	9.78	16 17.83	8.95	2 36.99	1.210	18	34	22.52
31	Su	18	41	24.96	11.054	—23	6	33.0	+10.94	16 17.85	8.95	— 3 5.88	—1.198	18	38	19.07
32	Mo	18	45	50.11	11.041	—23	1	56.7	+12.09	16 17.87	8.95	— 3 34.47	—1.184	18	42	15.63

FOR GREENWICH MEAN NOON.

Date.	Day of the Year.	True Longitude.	Var. per Hour.	Latitude.	Logarithm of the Radius Vector of the Earth.	Var. per Hour.	Prec. in Long.	Nut. in Long.	Aber-ration.	True Obliquity.	Mean Time of Sidereal Noon.
		" " "	"	"			"	"	"	23° 27'	h m s
Nov. 16	321	233 49 18.5	151.25	-0.13	9.995 0044	-37.9	44.00	+14.45	20.70	3.80	8 17 44.27
17	322	234 49 49.4	151.33	0.25	9.994 9144	37.2	44.14	14.47	20.70	3.77	8 13 48.36
18	323	235 50 22.2	151.40	0.36	9.994 8259	36.6	44.28	14.49	20.71	3.75	8 9 52.45
19	324	236 50 56.7	151.48	0.44	9.994 7388	36.0	44.42	14.52	20.71	3.72	8 5 56.54
20	325	237 51 33.0	151.55	0.49	9.994 6533	35.4	44.55	14.54	20.72	3.70	8 2 0.63
21	326	238 52 11.0	151.62	-0.52	9.994 5690	-34.8	44.68	+14.57	20.72	3.67	7 58 4.72
22	327	239 52 50.7	151.69	0.53	9.994 4860	34.3	44.82	14.60	20.72	3.65	7 54 8.81
23	328	240 53 32.0	151.75	0.50	9.994 4041	33.8	44.96	14.63	20.73	3.63	7 50 12.90
24	329	241 54 14.7	151.81	0.44	9.994 3234	33.4	45.10	14.66	20.73	3.60	7 46 16.98
25	330	242 54 58.9	151.86	0.36	9.994 2437	33.0	45.24	14.70	20.74	3.57	7 42 21.07
26	331	243 55 44.4	151.92	-0.26	9.994 1651	-32.5	45.37	+14.73	20.74	3.55	7 38 25.16
27	332	244 56 31.1	151.97	-0.13	9.994 0876	32.0	45.51	14.77	20.74	3.53	7 34 29.25
28	333	245 57 18.9	152.01	+0.01	9.994 0113	31.5	45.65	14.80	20.75	3.50	7 30 33.34
29	334	246 58 7.8	152.05	0.15	9.993 9364	30.9	45.79	14.84	20.75	3.48	7 26 37.43
30	335	247 58 57.5	152.09	0.28	9.993 8629	30.3	45.93	14.88	20.75	3.46	7 22 41.52
Dec. 1	336	248 59 48.2	152.13	+0.39	9.993 7910	-29.6	46.06	+14.92	20.76	3.43	7 18 45.60
2	337	250 0 39.7	152.16	0.48	9.993 7209	28.8	46.20	14.96	20.76	3.41	7 14 49.69
3	338	251 1 31.9	152.19	0.55	9.993 6528	28.0	46.34	15.00	20.76	3.39	7 10 53.78
4	339	252 2 25.0	152.23	0.59	9.993 5868	27.1	46.48	15.05	20.76	3.37	7 6 57.86
5	340	253 3 18.9	152.26	0.60	9.993 5230	26.1	46.62	15.09	20.77	3.35	7 3 1.95
6	341	254 4 13.5	152.29	+0.58	9.993 4617	-25.1	46.75	+15.14	20.77	3.33	6 59 6.04
7	342	255 5 9.0	152.33	0.53	9.993 4028	24.0	46.89	15.19	20.77	3.31	6 55 10.13
8	343	256 6 5.3	152.36	0.45	9.993 3465	22.9	47.03	15.24	20.78	3.29	6 51 14.22
9	344	257 7 2.5	152.40	0.35	9.993 2928	21.8	47.17	15.29	20.78	3.27	6 47 18.30
10	345	258 8 0.6	152.44	0.24	9.993 2417	20.7	47.31	15.34	20.78	3.25	6 43 22.39
11	346	259 8 59.5	152.48	+0.12	9.993 1932	-19.7	47.41	+15.39	20.78	3.24	6 39 26.48
12	347	260 9 59.4	152.51	-0.01	9.993 1473	18.6	47.58	15.44	20.79	3.22	6 35 30.57
13	348	261 11 0.2	152.56	0.14	9.993 1039	17.6	47.72	15.49	20.79	3.20	6 31 34.65
14	349	262 12 1.8	152.59	0.26	9.993 0630	16.5	47.86	15.54	20.79	3.19	6 27 38.74
15	350	263 13 4.5	152.63	0.36	9.993 0246	15.5	47.99	15.60	20.80	3.18	6 23 42.83
16	351	264 14 8.0	152.67	-0.44	9.992 9886	-14.5	48.12	+15.65	20.80	3.16	6 19 46.92
17	352	265 15 12.4	152.70	0.50	9.992 9548	13.6	48.26	15.70	20.80	3.15	6 15 51.00
18	353	266 16 17.7	152.74	0.54	9.992 9232	12.7	48.40	15.76	20.80	3.14	6 11 55.09
19	354	267 17 23.9	152.77	0.55	9.992 8938	11.9	48.54	15.81	20.81	3.13	6 7 59.18
20	355	268 18 30.8	152.80	0.54	9.992 8663	11.1	48.68	15.86	20.81	3.12	6 4 3.26
21	356	269 19 38.5	152.83	-0.49	9.992 8407	-10.3	48.81	+15.92	20.81	3.11	6 0 7.35
22	357	270 20 46.8	152.86	0.41	9.992 8169	9.6	48.95	15.97	20.81	3.10	5 56 11.44
23	358	271 21 55.8	152.88	0.30	9.992 7947	8.9	49.09	16.03	20.81	3.09	5 52 15.52
24	359	272 23 5.2	152.90	0.17	9.992 7740	8.2	49.23	16.08	20.81	3.08	5 48 19.61
25	360	273 24 15.0	152.91	-0.04	9.992 7550	7.6	49.37	16.13	20.81	3.07	5 44 23.70
26	361	274 25 25.0	152.92	+0.10	9.992 7374	-7.0	49.50	+16.18	20.81	3.07	5 40 27.79
27	362	275 26 35.1	152.92	0.24	9.992 7215	6.3	49.64	16.23	20.81	3.06	5 36 31.88
28	363	276 27 45.3	152.92	0.37	9.992 7073	5.5	49.78	16.28	20.81	3.06	5 32 35.96
29	364	277 28 55.4	152.92	0.47	9.992 6949	4.7	49.92	16.33	20.81	3.05	5 28 40.05
30	365	278 30 5.4	152.91	0.55	9.992 6845	3.9	50.06	16.39	20.81	3.05	5 24 44.14
31	366	279 31 15.2	152.90	+0.60	9.992 6762	-3.0	50.19	+16.44	20.81	3.05	5 20 48.22
32	367	280 32 24.7	152.89	+0.62	9.992 6701	-2.0	50.33	+16.49	20.81	3.04	5 16 52.31

GREENWICH MEAN TIME.

Date.	X True Equinox.		Reduc. to Mean Eq'x of 1916.0	Y True Equinox.		Reduc. to Mean Eq'x of 1916.0	Z True Equinox.		Reduc. to Mean Eq'x of 1916.0	
	Noon.	Midnight.		Noon.	Midnight.		Noon.	Midnight.		Noon.
Jan.	1	+0.166 6840	+0.175 2997	-632	-0.889 0088	-0.887 6115	-200	-0.385 6644	-0.385 0581	+189
	2	0.183 9019	0.192 4900	639	0.886 1451	0.884 6092	212	0.384 4218	0.383 7553	183
	3	0.201 0633	0.209 6211	646	0.883 0040	0.881 3297	224	0.383 0587	0.382 3321	177
	4	0.218 1625	0.226 6870	652	0.879 5864	0.877 7742	236	0.381 5756	0.380 7891	171
	5	0.235 1937	0.243 6820	658	0.875 8933	0.873 9439	248	0.379 9728	0.379 1268	164
	6	+0.252 1511	+0.260 6004	-664	-0.871 9260	-0.869 8400	-260	-0.378 2510	-0.377 3457	+158
	7	0.269 0291	0.277 4366	669	0.867 6860	0.865 4641	273	0.376 4109	0.375 4466	151
	8	0.285 8221	0.294 1850	674	0.863 1746	0.860 8178	286	0.374 4531	0.373 4304	144
	9	0.302 5246	0.310 8402	679	0.858 3939	0.855 9030	299	0.372 3785	0.371 2977	137
	10	0.319 1312	0.327 3970	684	0.853 3455	0.850 7217	312	0.370 1880	0.369 0495	130
	11	+0.335 6368	+0.343 8502	-688	-0.848 0316	-0.845 2757	-326	-0.367 8823	-0.366 6866	+123
	12	0.352 0365	0.360 1950	692	0.842 4542	0.839 5672	339	0.365 4625	0.364 2100	116
	13	0.368 3252	0.376 4264	695	0.836 6152	0.833 5982	353	0.362 9294	0.361 6206	108
	14	0.384 4981	0.392 5396	698	0.830 5167	0.827 3708	367	0.360 2839	0.358 9192	101
	15	0.400 5505	0.408 5300	700	0.824 1609	0.820 8872	381	0.357 5268	0.356 1068	93
	16	+0.416 4776	+0.424 3927	-702	-0.817 5499	-0.814 1495	-395	-0.354 6593	-0.353 1843	+ 85
	17	0.432 2748	0.440 1232	704	0.810 6860	0.807 1599	409	0.351 6821	0.350 1527	77
	18	0.447 9374	0.455 7169	705	0.803 5714	0.799 9208	423	0.348 5963	0.347 0130	69
	19	0.463 4611	0.471 1693	706	0.796 2084	0.792 4345	438	0.345 4028	0.343 7660	61
	20	0.478 8411	0.486 4759	707	0.788 5993	0.784 7032	452	0.342 1026	0.340 4128	53
	21	+0.494 0732	+0.501 6324	-707	-0.780 7464	-0.776 7293	-467	-0.338 6967	-0.336 9544	+ 45
	22	0.509 1529	0.516 6342	707	0.772 6521	0.768 5152	482	0.335 1860	0.333 3917	36
	23	0.524 0758	0.531 4770	706	0.764 3188	0.760 0632	496	0.331 5716	0.329 7258	28
	24	0.538 8375	0.546 1565	705	0.755 7489	0.751 3759	511	0.327 8544	0.325 9577	19
	25	0.553 4336	0.560 6682	703	0.746 9447	0.742 4556	526	0.324 0356	0.322 0884	11
	26	+0.567 8598	+0.575 0077	-701	-0.737 9088	-0.733 3048	-540	-0.320 1161	-0.318 1189	+ 2
	27	0.582 1114	0.589 1704	698	0.728 6438	0.723 9261	555	0.316 0970	0.314 0504	- 7
	28	0.596 1842	0.603 1520	696	0.719 1522	0.714 3223	570	0.311 9794	0.309 8841	16
	29	0.610 0734	0.616 9479	693	0.709 4368	0.704 4960	585	0.307 7646	0.305 6211	25
	30	0.623 7747	0.630 5534	689	0.699 5004	0.694 4502	599	0.303 4537	0.301 2627	34
	31	+0.637 2834	+0.643 9642	-685	-0.689 3460	-0.684 1880	-614	-0.299 0481	-0.296 8103	- 43
Feb.	1	0.650 5951	0.657 1756	680	0.678 9766	0.673 7124	629	0.294 5492	0.292 2652	53
	2	0.663 7052	0.670 1832	675	0.668 3957	0.663 0270	643	0.289 9585	0.287 6291	62
	3	0.676 6093	0.682 9827	669	0.657 6068	0.652 1353	658	0.285 2774	0.282 9035	71
	4	0.689 3030	0.695 5698	663	0.646 6133	0.641 0410	672	0.280 5076	0.278 0899	80
	5	+0.701 7825	+0.707 9406	-656	-0.635 4191	-0.629 7480	-686	-0.275 6508	-0.273 1903	- 90
	6	0.714 0437	0.720 0912	649	0.624 0282	0.618 2602	700	0.270 7087	0.268 2062	99
	7	0.726 0828	0.732 0181	642	0.612 4445	0.606 5816	714	0.265 6831	0.263 1396	109
	8	0.737 8965	0.743 7177	635	0.600 6720	0.594 7163	728	0.260 5758	0.257 9921	118
	9	0.749 4812	0.755 1866	627	0.588 7149	0.582 6684	742	0.255 3885	0.252 7654	128
	10	+0.760 8336	+0.766 4218	-618	-0.576 5772	-0.570 4419	-756	-0.250 1230	-0.247 4615	-137
	11	0.771 9507	0.777 4201	609	0.564 2630	0.558 0409	769	0.244 7811	0.242 0820	147
	12	0.782 8295	0.788 1786	599	0.551 7762	0.545 4693	782	0.239 3645	0.236 6287	156
	13	0.793 4669	0.798 6943	589	0.539 1209	0.532 7313	795	0.233 8749	0.231 1032	166
	14	0.803 8602	0.808 9644	579	0.526 3011	0.519 8308	808	0.228 3140	0.225 5074	175
	15	+0.814 0066	+0.818 9864	-568	-0.513 3210	-0.506 7720	-821	-0.222 6837	-0.219 8490	-185
	16	+0.823 9034	+0.828 7575	-557	-0.500 1845	-0.493 5590	-834	-0.216 9856	-0.214 1118	-194

GREENWICH MEAN TIME.

Date.	X True Equinox.		Reduc. to Mean Eq'x of 1916.0	Y True Equinox.		Reduc. to Mean Eq'x of 1916.0	Z True Equinox.		Reduc. to Mean Eq'x of 1916.0
	Noon.	Midnight.		Noon.	Midnight.		Noon.	Midnight.	
Feb. 16	+0.823 9034	+0.828 7575	-557	-0.500 1845	-0.493 5590	-834	-0.216 9856	-0.214 1118	-194
17	0.833 5481	0.838 2751	546	0.486 8958	0.480 1956	846	0.211 2216	0.208 3153	204
18	0.842 9381	0.847 5368	534	0.473 4589	0.466 6861	858	0.205 3932	0.202 4554	213
19	0.852 0710	0.856 5402	522	0.459 8778	0.453 0344	870	0.199 5021	0.196 5337	223
20	0.860 9443	0.865 2828	509	0.446 1564	0.439 2444	882	0.193 5503	0.190 5520	232
21	+0.869 5556	+0.873 7622	-496	-0.432 2988	-0.425 3202	-894	-0.187 5392	-0.184 5120	-242
22	0.877 9025	0.881 9762	483	0.418 3091	0.411 2659	905	0.181 4707	0.178 4154	251
23	0.885 9828	0.889 9222	469	0.404 1912	0.397 0855	916	0.175 3464	0.172 2639	261
24	0.893 7940	0.897 5980	455	0.389 9493	0.382 7830	927	0.169 1681	0.166 0592	270
25	0.901 3337	0.905 0010	441	0.375 5873	0.368 3626	937	0.162 9376	0.159 8033	279
26	+0.908 5995	+0.912 1288	-426	-0.361 1095	-0.353 8286	-948	-0.156 6566	-0.153 4978	-288
27	0.915 5889	0.918 9792	411	0.346 5202	0.339 1852	958	0.150 3272	0.147 1448	297
28	0.922 2997	0.925 5499	396	0.331 8238	0.324 4369	967	0.143 9511	0.140 7462	306
29	0.928 7296	0.931 8385	380	0.317 0249	0.309 5884	977	0.137 5304	0.134 3040	316
Mar. 1	0.934 8764	0.937 8430	364	0.302 1280	0.294 6444	986	0.131 0672	0.127 8203	325
2	+0.940 7380	+0.943 5613	-348	-0.287 1381	-0.279 6096	-995	-0.124 5636	-0.121 2973	-334
3	0.946 3127	0.948 9919	331	0.272 0598	0.264 4891	1004	0.118 0217	0.114 7371	342
4	0.951 5987	0.954 1330	314	0.256 8982	0.249 2877	1012	0.111 4438	0.108 1420	351
5	0.956 5946	0.958 9832	297	0.241 6583	0.234 0106	1020	0.104 8320	0.101 5142	360
6	0.961 2988	0.963 5413	279	0.226 3453	0.218 6629	1027	0.098 1886	0.094 8558	368
7	+0.965 7104	+0.967 8062	-262	-0.210 9640	-0.203 2494	-1034	-0.091 5158	-0.088 1691	-377
8	0.969 8285	0.971 7773	244	0.195 5197	0.187 7753	1041	0.084 8158	0.081 4562	385
9	0.973 6524	0.975 4537	225	0.180 0170	0.172 2454	1048	0.078 0906	0.074 7192	393
10	0.977 1812	0.978 8348	207	0.164 4611	0.156 6647	1054	0.071 3424	0.067 9004	401
11	0.980 4145	0.981 9202	188	0.148 8568	0.141 0380	1060	0.064 5734	0.061 1817	409
12	+0.983 3518	+0.984 7094	-169	-0.133 2089	-0.125 3701	-1066	-0.057 7855	-0.054 3852	-417
13	0.985 9929	0.987 2022	150	0.117 5222	0.109 6658	1072	0.050 9810	0.047 5730	425
14	0.988 3374	0.989 3983	131	0.101 8014	0.093 9297	1077	0.044 1617	0.040 7472	433
15	0.990 3851	0.991 2977	111	0.086 0512	0.078 1666	1082	0.037 3298	0.033 9096	440
16	0.992 1361	0.992 9003	91	0.070 2763	0.062 3810	1086	0.030 4871	0.027 0623	448
17	+0.993 5904	+0.994 2062	-71	-0.054 4813	-0.046 5776	-1090	-0.023 6356	-0.020 2072	-455
18	0.994 7478	0.995 2152	50	0.038 6706	0.030 7609	1094	0.016 7773	0.013 3462	462
19	0.995 6085	0.995 9276	30	0.022 8489	-0.014 9353	1098	0.009 9141	-0.006 4812	469
20	0.996 1725	0.996 3434	-9	-0.007 0205	+0.000 8948	1101	-0.003 0479	+0.000 3858	476
21	0.996 4401	0.996 4627	+12	+0.008 8102	0.016 7251	1104	+0.003 8195	0.007 2530	482
22	+0.996 4113	+0.996 2858	+33	+0.024 6389	+0.032 5511	-1107	+0.010 6861	+0.014 1185	-489
23	0.996 0862	0.995 8125	54	0.040 4612	0.048 3685	1109	0.017 5501	0.020 9804	495
24	0.995 4647	0.995 0428	75	0.056 2725	0.064 1727	1111	0.024 4095	0.027 8369	502
25	0.994 5470	0.993 9770	97	0.072 0684	0.079 9592	1112	0.031 2624	0.034 6858	508
26	0.993 3331	0.992 6153	118	0.087 8445	0.095 7235	1113	0.038 1068	0.041 5252	514
27	+0.991 8235	+0.990 9579	+140	+0.103 5959	+0.111 4609	-1114	+0.044 9406	+0.048 3529	-519
28	0.990 0184	0.989 0051	162	0.119 3180	0.127 1666	1115	0.051 7618	0.055 1670	525
29	0.987 9180	0.986 7573	184	0.135 0060	0.142 8358	1115	0.058 5682	0.061 9651	530
30	0.985 5230	0.984 2152	206	0.150 6551	0.158 4636	1115	0.065 3576	0.068 7453	535
31	0.982 8341	0.981 3797	228	0.166 2604	0.174 0451	1115	0.072 1280	0.075 5054	540
Apr. 1	+0.979 8522	+0.978 2517	+251	+0.181 8170	+0.189 5754	-1114	+0.078 8771	+0.082 2430	-545
2	+0.976 5734	+0.974 8325	+273	+0.197 3198	+0.205 0494	-1114	+0.085 6028	+0.088 9562	-550

GREENWICH MEAN TIME.

Date.	X True Equinox.		Reduc. to Mean Eq'x of 1916.0	Y True Equinox.		Reduc. to Mean Eq'x of 1916.0	Z True Equinox.		Reduc. to Mean Eq'x of 1916.0
	Noon.	Midnight.	Noon.	Noon.	Midnight.	Noon.	Noon.	Midnight.	Noon.
Apr. 1	+0.979 8522	+0.978 2517	+ 251	+0.181 8170	+0.189 5754	-1114	+0.078 8771	+0.082 2430	-545
2	0.976 5784	0.974 8325	273	0.197 3198	0.205 0494	1114	0.085 6028	0.088 9562	550
3	0.973 0140	0.971 1232	296	0.212 7639	0.220 4625	1113	0.092 3029	0.095 6427	554
4	0.969 1604	0.967 1256	319	0.228 1446	0.235 8097	1111	0.098 9753	0.102 3004	558
5	0.965 0191	0.962 8412	341	0.243 4571	0.251 0863	1109	0.105 6179	0.108 9275	562
6	+0.960 5920	+0.958 2717	+ 364	+0.258 6968	+0.266 2878	-1107	+0.112 2288	+0.115 5218	-566
7	0.955 8808	0.953 4193	387	0.273 8589	0.281 4095	1104	0.118 8060	0.122 0813	570
8	0.950 8875	0.948 2858	410	0.288 9391	0.296 4470	1101	0.125 3475	0.128 6043	573
9	0.945 6143	0.942 8732	433	0.303 9328	0.311 3960	1098	0.131 8514	0.135 0887	576
10	0.940 0630	0.937 1838	456	0.318 8359	0.326 2521	1095	0.138 3159	0.141 5328	579
11	+0.934 2359	+0.931 2196	+ 480	+0.333 6440	+0.341 0112	-1091	+0.144 7392	+0.147 9348	-582
12	0.928 1351	0.924 9828	503	0.348 3530	0.355 6690	1086	0.151 1194	0.154 2928	585
13	0.921 7630	0.918 4759	526	0.362 9587	0.370 2215	1082	0.157 4548	0.160 6051	587
14	0.915 1219	0.911 7012	550	0.377 4570	0.384 6648	1077	0.163 7437	0.166 8702	589
15	0.908 2142	0.904 6612	573	0.391 8442	0.398 9949	1072	0.169 9845	0.173 0863	591
16	+0.901 0424	+0.897 3581	+ 596	+0.406 1164	+0.413 2083	-1066	+0.176 1755	+0.179 2519	-593
17	0.893 6086	0.889 7943	620	0.420 2700	0.427 3012	1060	0.182 3152	0.185 3653	594
18	0.885 9153	0.881 9721	643	0.434 3012	0.441 2698	1054	0.188 4020	0.191 4250	595
19	0.877 9648	0.873 8939	667	0.448 2065	0.455 1107	1048	0.194 4343	0.197 4295	596
20	0.869 7595	0.865 5619	690	0.461 9820	0.468 8201	1041	0.200 4104	0.203 3770	597
21	+0.861 3014	+0.856 9784	+ 714	+0.475 6244	+0.482 3944	-1034	+0.206 3289	+0.209 2660	-598
22	0.852 5930	0.848 1455	737	0.489 1298	0.495 8299	1026	0.212 1882	0.215 0950	598
23	0.843 6363	0.839 0657	761	0.502 4943	0.509 1226	1018	0.217 9864	0.220 8622	598
24	0.834 4339	0.829 7414	784	0.515 7143	0.522 2688	1010	0.223 7220	0.226 5658	598
25	0.824 9884	0.820 1752	808	0.528 7858	0.535 2647	1001	0.229 3932	0.232 2041	597
26	+0.815 3022	+0.810 3697	+ 831	+0.541 7050	+0.548 1063	- 992	+0.234 9983	+0.237 7755	-597
27	0.805 3780	0.800 3275	855	0.554 4681	0.560 7898	983	0.240 5356	0.243 2782	596
28	0.795 2187	0.790 0519	878	0.567 0710	0.573 3112	973	0.246 0033	0.248 7106	595
29	0.784 8274	0.779 5459	902	0.579 5099	0.585 6667	963	0.251 3998	0.254 0708	594
30	0.774 2075	0.768 8128	925	0.591 7811	0.597 8526	953	0.256 7233	0.259 3572	592
May 1	+0.763 3621	+0.757 8560	+ 948	+0.603 8807	+0.609 8650	- 943	+0.261 9722	+0.264 5682	-590
2	0.752 2948	0.746 6790	972	0.615 8051	0.621 7004	932	0.267 1450	0.269 7023	588
3	0.741 0091	0.735 2856	995	0.627 5507	0.633 3554	921	0.272 2400	0.274 7579	586
4	0.729 5089	0.723 6794	1018	0.639 1141	0.644 8264	909	0.277 2558	0.279 7336	583
5	0.717 7978	0.711 8644	1041	0.650 4920	0.656 1104	897	0.282 1911	0.284 6281	580
6	+0.705 8797	+0.699 8442	+1064	+0.661 6812	+0.667 2040	- 885	+0.287 0445	+0.289 4400	-577
7	0.693 7584	0.687 6227	1087	0.672 6785	0.678 1042	872	0.291 8145	0.294 1679	574
8	0.681 4378	0.675 2041	1110	0.683 4809	0.688 8082	859	0.296 4999	0.298 8106	570
9	0.668 9220	0.662 5922	1133	0.694 0857	0.699 3131	846	0.301 0996	0.303 3669	567
10	0.656 2150	0.649 7911	1155	0.704 4900	0.709 6161	832	0.305 6123	0.307 8357	563
11	+0.643 3208	+0.636 8047	+1178	+0.714 6911	+0.719 7146	- 818	+0.310 0369	+0.312 2158	-558
12	0.630 2433	0.623 6371	1200	0.724 6864	0.729 6061	803	0.314 3723	0.316 5062	554
13	0.616 9866	0.610 2923	1222	0.734 4735	0.739 2883	788	0.318 6175	0.320 7060	549
14	0.603 5548	0.596 7744	1244	0.744 0501	0.748 7687	773	0.322 7716	0.324 8141	544
15	0.589 9517	0.583 0872	1266	0.753 4138	0.758 0152	758	0.326 8334	0.328 8295	539
16	+0.576 1813	+0.569 2346	+1288	+0.762 5625	+0.767 0556	- 742	+0.330 8022	+0.332 7514	-534
17	+0.562 2476	+0.555 2206	+1310	+0.771 4942	+0.775 8779	- 725	+0.334 6769	+0.336 5787	-528

GREENWICH MEAN TIME.

Date.	X True Equinox.		Reduc. to Mean Eq'x of 1916.0	Y True Equinox.		Reduc. to Mean Eq'x of 1916.0	Z True Equinox.		Reduc. to Mean Eq'x of 1916.0
	Noon.	Midnight.	Noon.	Noon.	Midnight.	Noon.	Noon.	Midnight.	Noon.
May 17	+0.562 2476	+0.555 2206	+1310	+0.771 4942	+0.775 8779	-725	+0.334 6769	+0.336 5787	-528
18	0.548 1542	0.541 0487	1331	0.780 2066	0.784 4800	709	0.338 4567	0.340 9106	522
19	0.533 9047	0.526 7227	1352	0.788 6977	0.792 8596	692	0.342 1405	0.343 9462	516
20	0.519 5030	0.512 2461	1373	0.796 9653	0.801 0146	674	0.345 7276	0.347 4845	510
21	0.504 9526	0.497 6229	1394	0.805 0071	0.808 9426	656	0.349 2167	0.350 9243	503
22	+0.490 2576	+0.482 8570	+1415	+0.812 8208	+0.816 6414	-638	+0.352 6070	+0.354 2647	-496
23	0.475 4217	0.467 9522	1435	0.820 4041	0.824 1086	620	0.355 8973	0.357 5046	489
24	0.460 4490	0.452 9126	1456	0.827 7546	0.831 3419	601	0.359 0866	0.360 6490	482
25	0.445 3437	0.437 7426	1476	0.834 8702	0.838 3392	582	0.362 1738	0.363 6788	474
26	0.430 1100	0.422 4464	1495	0.841 7486	0.845 0981	562	0.365 1580	0.366 6111	466
27	+0.414 7524	+0.407 0285	+1515	+0.848 3875	+0.851 6165	-542	+0.368 0381	+0.369 4389	-458
28	0.399 2753	0.391 4934	1534	0.854 7848	0.857 8923	521	0.370 8133	0.372 1613	450
29	0.383 6834	0.375 8458	1553	0.860 9387	0.863 9238	500	0.373 4828	0.374 7776	442
30	0.367 9813	0.360 0905	1572	0.866 8473	0.869 7091	479	0.376 0456	0.377 2868	433
31	0.352 1739	0.344 2322	1590	0.872 5088	0.875 2464	458	0.378 5012	0.379 6884	424
June 1	+0.336 2660	+0.328 2759	+1608	+0.877 9216	+0.880 5342	-436	+0.380 8487	+0.381 9817	-415
2	0.320 2625	0.312 2264	1626	0.883 0840	0.885 5709	414	0.383 0875	0.384 1660	406
3	0.304 1682	0.296 0885	1643	0.887 9948	0.890 3554	391	0.385 2171	0.386 2408	396
4	0.287 9880	0.279 8672	1660	0.892 6527	0.894 8864	368	0.387 2370	0.388 2056	387
5	0.271 7268	0.263 5674	1677	0.897 0565	0.899 1628	345	0.389 1466	0.390 0600	377
6	+0.255 3895	+0.247 1939	+1693	+0.901 2052	+0.903 1836	-321	+0.390 9456	+0.391 8035	-366
7	0.238 9810	0.230 7516	1709	0.905 0980	0.906 9481	297	0.392 6336	0.393 4359	356
8	0.222 5062	0.214 2454	1725	0.908 7339	0.910 4554	272	0.394 2103	0.394 9568	346
9	0.205 9700	0.197 6803	1740	0.912 1124	0.913 7048	247	0.395 6754	0.396 3660	335
10	0.189 3771	0.181 0610	1755	0.915 2327	0.916 6959	222	0.397 0286	0.397 6632	324
11	+0.172 7324	+0.164 3921	+1769	+0.918 0945	+0.919 4283	-197	+0.398 2696	+0.398 8484	-313
12	0.156 0405	0.147 6782	1783	0.920 6974	0.921 9017	171	0.399 3990	0.399 9214	302
13	0.139 3059	0.130 9240	1796	0.923 0411	0.924 1157	145	0.400 4158	0.400 8821	290
14	0.122 5332	0.114 1339	1809	0.925 1254	0.926 0702	119	0.401 3203	0.401 7303	279
15	0.105 7268	0.097 3123	1822	0.926 9499	0.927 7647	92	0.402 1122	0.402 4659	267
16	+0.088 8909	+0.080 4633	+1834	+0.928 5145	+0.929 1991	- 65	+0.402 7915	+0.403 0688	-255
17	0.072 0299	0.063 5912	1846	0.929 8186	0.930 3730	37	0.403 3579	0.403 5987	243
18	0.055 1479	0.046 7004	1857	0.930 8621	0.931 2860	- 10	0.403 8113	0.403 9955	231
19	0.038 2492	0.029 7951	1867	0.931 6445	0.931 9376	+ 18	0.404 1513	0.404 2788	219
20	0.021 3385	+0.012 8800	1878	0.932 1653	0.932 3274	46	0.404 3779	0.404 4485	206
21	+0.004 4202	-0.004 0403	+1888	+0.932 4241	+0.932 4551	+ 75	+0.404 4907	+0.404 5044	-193
22	-0.012 5010	0.020 9612	1897	0.932 4206	0.932 3203	104	0.404 4895	0.404 4462	180
23	0.029 4203	0.037 8778	1905	0.932 1543	0.931 9225	133	0.404 3743	0.404 2738	167
24	0.046 3330	0.054 7853	1913	0.931 6250	0.931 2618	162	0.404 1448	0.403 9872	154
25	0.063 2341	0.071 6787	1921	0.930 8328	0.930 3380	191	0.403 8011	0.403 5864	141
26	-0.080 1185	-0.088 5529	+1928	+0.929 7775	+0.929 1513	+221	+0.403 3432	+0.403 0713	-127
27	0.096 9812	0.105 4030	1934	0.928 4593	0.927 7017	251	0.402 7710	0.402 4421	114
28	0.113 8174	0.122 2240	1939	0.926 8785	0.925 9897	281	0.402 0848	0.401 6989	100
29	0.130 6220	0.139 0108	1944	0.925 0354	0.924 0157	312	0.401 2846	0.400 8419	86
30	0.147 3898	0.155 7584	1948	0.922 9305	0.921 7801	343	0.400 3709	0.399 8715	72
July 1	-0.164 1159	-0.172 4617	+1952	+0.920 5645	+0.919 2838	+374	+0.399 3438	+0.398 7878	- 58
2	-0.180 7952	-0.189 1158	+1956	+0.917 9381	+0.916 5275	+405	+0.398 2037	+0.397 5914	- 44

GREENWICH MEAN TIME.

Date.	X True Equinox.		Reduc. to Mean Eq'x of 1916.0	Y True Equinox.		Reduc. to Mean Eq'x of 1916.0	Z True Equinox.		Reduc. to Mean Eq'x of 1916.0
	Noon.	Midnight.	Noon.	Noon.	Midnight.	Noon.	Noon.	Midnight.	Noon.
July 1	-0.164 1159	-0.172 4617	+1952	+0.920 5645	+0.919 2838	+ 374	+0.399 3438	+0.398 7878	- 58
2	0.180 7952	0.189 1158	1956	0.917 9381	0.916 5275	405	0.398 2037	0.397 5914	44
3	0.197 4229	0.205 7158	1959	0.915 0521	0.913 5120	436	0.396 9510	0.396 2826	30
4	0.213 9939	0.222 2567	1961	0.911 9075	0.910 2385	467	0.395 5862	0.394 8619	15
5	0.230 5035	0.238 7337	1962	0.908 5053	0.906 7081	498	0.394 1098	0.393 3298	- 1
6	-0.246 9467	-0.255 1419	+1963	+0.904 8469	+0.902 9219	+ 530	+0.392 5222	+0.391 6870	+ 13
7	0.263 3188	0.271 4768	1963	0.900 9333	0.898 8813	562	0.390 8242	0.389 9339	28
8	0.279 6152	0.287 7336	1962	0.896 7661	0.894 5879	593	0.389 0163	0.388 0713	43
9	0.295 8314	0.303 9079	1961	0.892 3468	0.890 0430	625	0.387 0991	0.386 0998	57
10	0.311 9628	0.319 9953	1959	0.887 6769	0.885 2485	657	0.385 0734	0.384 0201	72
11	-0.328 0050	-0.335 9913	+1956	+0.882 7580	+0.880 2057	+ 689	+0.382 9400	+0.381 8330	+ 87
12	0.343 9538	0.351 8919	1953	0.877 5918	0.874 9164	721	0.380 6993	0.379 5391	102
13	0.359 8051	0.367 6930	1949	0.872 1798	0.869 3822	753	0.378 3523	0.377 1390	117
14	0.375 5550	0.383 3906	1944	0.866 5238	0.863 6048	785	0.375 8994	0.374 6335	132
15	0.391 1994	0.398 9809	1939	0.860 6254	0.857 5857	818	0.373 3414	0.372 0231	147
16	-0.406 7344	-0.414 4596	+1934	+0.854 4859	+0.851 3262	+ 850	+0.370 6788	+0.369 3085	+163
17	0.422 1560	0.429 8229	1927	0.848 1068	0.844 8279	882	0.367 9123	0.366 4902	178
18	0.437 4600	0.445 0666	1919	0.841 4896	0.838 0921	914	0.365 0424	0.363 5689	193
19	0.452 6424	0.460 1866	1911	0.834 6356	0.831 1204	946	0.362 0697	0.360 5450	208
20	0.467 6989	0.475 1786	1902	0.827 5464	0.823 9141	978	0.358 9949	0.357 4193	223
21	-0.482 6252	-0.490 0382	+1892	+0.820 2236	+0.816 4752	+1010	+0.355 8185	+0.354 1924	+239
22	0.497 4169	0.504 7608	1882	0.812 6689	0.808 8051	1041	0.352 5413	0.350 8651	254
23	0.512 0694	0.519 3421	1871	0.804 8840	0.800 9058	1073	0.349 1641	0.347 4383	270
24	0.526 5784	0.533 7777	1859	0.796 8709	0.792 7793	1105	0.345 6878	0.343 9127	285
25	0.540 9394	0.548 0631	1847	0.788 6316	0.784 4277	1137	0.342 1131	0.340 2893	300
26	-0.555 1481	-0.562 1939	+1834	+0.780 1682	+0.775 8532	+1168	+0.338 4412	+0.336 5691	+316
27	0.569 2000	0.576 1658	1820	0.771 4831	0.767 0582	1199	0.334 6731	0.332 7532	331
28	0.583 0909	0.589 9746	1805	0.762 5787	0.758 0450	1230	0.330 8097	0.328 8426	346
29	0.596 8165	0.603 6161	1790	0.753 4574	0.748 8163	1261	0.326 8522	0.324 8385	361
30	0.610 3727	0.617 0859	1774	0.744 1219	0.739 3746	1292	0.322 8017	0.320 7420	376
31	-0.623 7552	-0.630 3801	+1757	+0.734 5748	+0.729 7228	+1322	+0.318 6596	+0.316 5545	+392
Aug. 1	0.636 9600	0.643 4945	1739	0.724 8190	0.719 8637	1352	0.314 4269	0.312 2770	407
2	0.649 9830	0.656 4252	1721	0.714 8573	0.709 8003	1382	0.310 1051	0.307 9111	422
3	0.662 8204	0.669 1683	1702	0.704 6929	0.699 5356	1412	0.305 6954	0.303 4580	437
4	0.675 4685	0.681 7203	1682	0.694 3287	0.689 0727	1441	0.301 1992	0.298 9190	452
5	-0.687 9235	-0.694 0775	+1662	+0.683 7679	+0.678 4148	+1470	+0.296 6178	+0.294 2957	+467
6	0.700 1819	0.706 2364	1641	0.673 0138	0.667 5653	1499	0.291 9528	0.289 5894	482
7	0.712 2403	0.718 1935	1620	0.662 0697	0.656 5274	1527	0.287 2055	0.284 8015	496
8	0.724 0955	0.729 9459	1598	0.650 9388	0.645 3044	1556	0.282 3774	0.279 9334	511
9	0.735 7443	0.741 4904	1575	0.639 6245	0.633 8996	1584	0.277 4698	0.274 9867	525
10	-0.747 1837	-0.752 8240	+1551	+0.628 1300	+0.622 3162	+1611	+0.272 4842	+0.269 9625	+540
11	0.758 4110	0.763 9441	1527	0.616 4586	0.610 5576	1638	0.267 4219	0.264 8624	554
12	0.769 4231	0.774 8476	1502	0.604 6135	0.598 6267	1665	0.262 2842	0.259 6875	568
13	0.780 2174	0.785 5319	1477	0.592 5976	0.586 5267	1691	0.257 0724	0.254 4392	583
14	0.790 7908	0.795 9939	1450	0.580 4142	0.574 2605	1717	0.251 7879	0.249 1187	597
15	-0.801 1406	-0.806 2307	+1423	+0.568 0661	+0.561 8312	+1742	+0.246 4318	+0.243 7274	+611
16	-0.811 2638	-0.816 2394	+1396	+0.555 5564	+0.549 2419	+1767	+0.241 0056	+0.238 2665	+625

GREENWICH MEAN TIME.

Date.	X		Reduc.	Y		Reduc.	Z		Reduc.
	True Equinox.		to Mean Eq'x of 1916.0	True Equinox.		to Mean Eq'x of 1916.0	True Equinox.		to Mean Eq'x of 1916.0
	Noon.	Midnight.	Noon.	Noon.	Midnight.	Noon.	Noon.	Midnight.	Noon.
Aug. 16	-0.811 2638	-0.816 2394	+1396	+0.555 5564	+0.549 2419	+1767	+0.241 0056	+0.238 2665	+ 625
17	0.821 1573	0.826 0170	1368	0.542 8882	0.536 4957	1792	0.235 5104	0.232 7374	638
18	0.830 8181	0.835 5603	1339	0.530 0647	0.523 5957	1816	0.229 9476	0.227 1413	652
19	0.840 2431	0.844 8663	1310	0.517 0891	0.510 5453	1840	0.224 3187	0.221 4799	665
20	0.849 4293	0.853 9318	1280	0.503 9648	0.497 3479	1863	0.218 6251	0.215 7546	678
21	-0.858 3734	-0.862 7538	+1249	+0.490 6953	+0.484 0072	+1886	+0.212 8684	+0.209 9669	+ 691
22	0.867 0726	0.871 3294	1218	0.477 2841	0.470 5266	1908	0.207 0502	0.204 1185	704
23	0.875 5238	0.879 6555	1187	0.463 7351	0.456 9100	1930	0.201 1720	0.198 2110	717
24	0.883 7242	0.887 7294	1155	0.450 0519	0.443 1612	1951	0.195 2356	0.192 2460	730
25	0.891 6709	0.895 5482	1122	0.436 2384	0.429 2841	1972	0.189 2426	0.186 2255	742
26	-0.899 3612	-0.903 1094	+1089	+0.422 2986	+0.415 2826	+1992	+0.183 1948	+0.180 1510	+ 754
27	0.906 7925	0.910 4103	1055	0.408 2366	0.401 1610	2012	0.177 0940	0.174 0243	766
28	0.913 9623	0.917 4484	1021	0.394 0564	0.386 9234	2031	0.170 9421	0.167 8474	778
29	0.920 8682	0.924 2214	986	0.379 7624	0.372 5739	2049	0.164 7407	0.161 6221	790
30	0.927 5078	0.930 7270	951	0.365 3587	0.358 1171	2067	0.158 4919	0.155 3503	802
31	-0.933 8789	-0.936 9632	+ 916	+0.350 8498	+0.343 5572	+2084	+0.152 1976	+0.149 0340	+ 813
Sept. 1	0.939 9796	0.942 9279	880	0.336 2400	0.328 8987	2101	0.145 8597	0.142 6751	824
2	0.945 8079	0.948 6193	843	0.321 5338	0.314 1460	2117	0.139 4802	0.136 2755	835
3	0.951 3620	0.954 0358	806	0.306 7359	0.299 3038	2133	0.133 0610	0.129 8372	846
4	0.956 6406	0.959 1760	769	0.291 8505	0.284 3764	2148	0.126 6041	0.123 3621	856
5	-0.961 6421	-0.964 0385	+ 731	+0.276 8822	+0.269 3684	+2162	+0.120 1113	+0.116 8521	+ 866
6	0.966 3653	0.968 6221	693	0.261 8354	0.254 2839	2176	0.113 5846	0.110 3091	876
7	0.970 8090	0.972 9256	654	0.246 7144	0.239 1275	2189	0.107 0257	0.103 7348	885
8	0.974 9721	0.976 9481	615	0.231 5236	0.223 9033	2201	0.100 4366	0.097 1312	895
9	0.978 8536	0.980 6885	576	0.216 2672	0.208 6156	2213	0.093 8190	0.090 5000	904
10	-0.982 4526	-0.984 1459	+ 536	+0.200 9493	+0.193 2685	+2224	+0.087 1746	+0.083 8430	+ 913
11	0.985 7681	0.987 3193	496	0.185 5740	0.177 8660	2235	0.080 5053	0.077 1618	922
12	0.988 7991	0.990 2076	456	0.170 1453	0.162 4122	2245	0.073 8127	0.070 4582	930
13	0.991 5445	0.992 8098	415	0.154 6672	0.146 9110	2254	0.067 0986	0.063 7340	938
14	0.994 0032	0.995 1247	374	0.139 1440	0.131 3667	2263	0.060 3647	0.056 9908	946
15	-0.996 1741	-0.997 1513	+ 333	+0.123 5797	+0.115 7834	+2271	+0.053 6128	+0.050 2306	+ 954
16	0.998 0561	0.998 8884	292	0.107 9784	0.100 1653	2278	0.046 8447	0.043 4552	961
17	0.999 6481	1.000 3350	250	0.092 3445	0.084 5167	2285	0.040 0624	0.036 6664	968
18	1.000 9490	1.001 4900	208	0.076 6824	0.068 8421	2291	0.033 2677	0.029 8663	975
19	1.001 9580	1.002 3527	166	0.060 9965	0.053 1461	2296	0.026 4626	0.023 0567	982
20	-1.002 6741	-1.002 9222	+ 123	+0.045 2915	+0.037 4332	+2300	+0.019 6490	+0.016 2398	+ 988
21	1.003 0967	1.003 1977	81	0.029 5719	0.021 7081	2304	0.012 8292	0.009 4175	994
22	1.003 2251	1.003 1788	+ 38	+0.013 8424	+0.005 9754	2308	+0.006 0050	+0.002 5920	999
23	1.003 0587	1.002 8647	- 5	-0.001 8922	-0.009 7600	2311	-0.000 8213	-0.004 2347	1005
24	1.002 5970	1.002 2553	48	0.017 6273	0.025 4934	2313	0.007 6478	0.011 0605	1010
25	-1.001 8398	-1.001 3503	- 92	-0.033 3579	-0.041 2200	+2314	-0.014 4723	-0.017 8832	+1014
26	1.000 7870	1.000 1496	135	0.049 0792	0.056 9349	2315	0.021 2927	0.024 7007	1018
27	0.999 4384	0.998 6532	179	0.064 7863	0.072 6330	2315	0.028 1068	0.031 5108	1022
28	0.997 7942	0.996 8612	222	0.080 4742	0.088 3095	2314	0.034 9124	0.038 3114	1026
29	0.995 8545	0.994 7741	266	0.096 1381	0.103 9594	2312	0.041 7074	0.045 1003	1030
30	-0.993 6200	-0.992 3924	- 310	-0.111 7729	-0.119 5778	+2310	-0.048 4897	-0.051 8753	+1033
Oct. 1	-0.991 0913	-0.989 7168	- 354	-0.127 3736	-0.135 1597	+2307	-0.055 2570	-0.058 6344	+1036

GREENWICH MEAN TIME.

Date.	X True Equinox.		Reduc. to Mean Eq'x of 1916.0	Y True Equinox.		Reduc. to Mean Eq'x of 1916.0	Z True Equinox.		Reduc. to Mean Eq'x of 1916.0	
	Noon.	Midnight.		Noon.	Midnight.		Noon.	Midnight.		
Oct.	1	-0.991 0913	-0.989 7168	354	-0.127 3736	-0.135 1597	+2307	-0.055 2570	-0.058 6344	+1036
	2	0.988 2691	0.986 7483	398	0.142 9354	0.150 7002	2303	0.062 0073	0.065 3754	1038
	3	0.985 1544	0.983 4877	442	0.158 4535	0.166 1947	2299	0.068 7385	0.072 0964	1040
	4	0.981 7482	0.979 9362	486	0.173 9231	0.181 6384	2294	0.075 4486	0.078 7952	1042
	5	0.978 0518	0.976 0951	531	0.189 3398	0.197 0268	2289	0.082 1357	0.085 4699	1043
	6	-0.974 0663	-0.971 9655	575	-0.204 6989	-0.212 3555	+2282	-0.088 7977	-0.092 1188	+1044
	7	0.969 7930	0.967 5489	619	0.219 9960	0.227 6200	2275	0.095 4330	0.098 7400	1045
	8	0.965 2334	0.962 8466	663	0.235 2268	0.242 8161	2268	0.102 0396	0.105 3316	1046
	9	0.960 3887	0.957 8599	708	0.250 3872	0.257 9396	2260	0.108 6158	0.111 8918	1046
	10	0.955 2603	0.952 5900	752	0.265 4728	0.272 9862	2251	0.115 1596	0.118 4188	1045
	11	-0.949 8493	-0.947 0382	796	-0.280 4795	-0.287 9519	+2241	-0.121 6693	-0.124 9108	+1044
	12	0.944 1570	0.941 2057	840	0.295 4031	0.302 8324	2231	0.128 1432	0.131 3661	1043
	13	0.938 1845	0.935 0937	884	0.310 2394	0.317 6236	2220	0.134 5794	0.137 7828	1042
	14	0.931 9333	0.928 7035	928	0.324 9844	0.332 3212	2209	0.140 9761	0.144 1590	1040
	15	0.925 4046	0.922 0366	971	0.339 6335	0.346 9208	2197	0.147 3313	0.150 4927	1038
	16	-0.918 5997	-0.915 0942	1015	-0.354 1824	-0.361 4180	+2184	-0.153 6431	-0.156 7822	+1036
	17	0.911 5202	0.907 8779	1059	0.368 6268	0.375 8084	2170	0.159 9096	0.163 0253	1033
	18	0.904 1676	0.900 3895	1103	0.382 9622	0.390 0876	2156	0.166 1289	0.169 2202	1030
	19	0.896 5437	0.892 6306	1146	0.397 1841	0.404 2511	2141	0.172 2990	0.175 3650	1026
	20	0.888 6502	0.884 6030	1189	0.411 2881	0.418 2944	2126	0.178 4179	0.181 4575	1022
	21	-0.880 4890	-0.876 3087	1232	-0.425 2696	-0.432 2130	+2110	-0.184 4836	-0.187 4960	+1018
	22	0.872 0621	0.867 7497	1275	0.439 1242	0.446 0025	2093	0.190 4942	0.193 4782	1013
	23	0.863 3717	0.858 9284	1318	0.452 8474	0.459 6583	2075	0.196 4477	0.199 4024	1008
	24	0.854 4200	0.849 8470	1360	0.466 4347	0.473 1760	2057	0.202 3421	0.205 2666	1003
	25	0.845 2095	0.840 5080	1403	0.479 8817	0.486 5511	2038	0.208 1755	0.211 0687	997
	26	-0.835 7427	-0.830 9140	1445	-0.493 1837	-0.499 7790	+2018	-0.213 9458	-0.216 8068	+ 991
	27	0.826 0223	0.821 0680	1487	0.506 3364	0.512 8553	1998	0.219 6513	0.222 4790	985
	28	0.816 0514	0.810 9729	1529	0.519 3352	0.525 7755	1977	0.225 2898	0.228 0833	978
	29	0.805 8330	0.800 6320	1570	0.532 1758	0.538 5355	1956	0.230 8595	0.233 6180	971
	30	0.795 3704	0.790 0486	1611	0.544 8542	0.551 1312	1934	0.236 3587	0.239 0813	964
	31	-0.784 6670	-0.779 2261	1652	-0.557 3661	-0.563 5584	+1911	-0.241 7856	-0.244 4715	+ 956
Nov.	1	0.773 7262	0.768 1680	1693	0.569 7077	0.575 8134	1888	0.247 1386	0.249 7869	948
	2	0.762 5517	0.756 8779	1733	0.581 8751	0.587 8924	1864	0.252 4161	0.255 0260	939
	3	0.751 1470	0.745 3594	1773	0.593 8647	0.599 7918	1839	0.257 6164	0.260 1872	930
	4	0.739 5156	0.733 6160	1813	0.605 6731	0.611 5082	1814	0.262 7382	0.265 2692	921
	5	-0.727 6611	-0.721 6513	1852	-0.617 2967	-0.623 0383	+1788	-0.267 7800	-0.270 2704	+ 911
	6	0.715 5870	0.709 4688	1891	0.628 7324	0.634 3787	1762	0.272 7403	0.275 1895	901
	7	0.703 2970	0.697 0720	1930	0.639 9768	0.645 5262	1735	0.277 6178	0.280 0251	891
	8	0.690 7944	0.684 4646	1968	0.651 0267	0.656 4777	1707	0.282 4111	0.284 7757	880
	9	0.678 0830	0.671 6500	2006	0.661 8789	0.667 2300	1679	0.287 1188	0.289 4402	869
	10	-0.665 1660	-0.658 6316	2044	-0.672 5304	-0.677 7798	+1650	-0.291 7396	-0.294 0169	+ 857
	11	0.652 0471	0.645 4130	2081	0.682 9778	0.688 1240	1620	0.296 2719	0.298 5045	845
	12	0.638 7296	0.631 9976	2118	0.693 2180	0.698 2593	1590	0.300 7145	0.302 9017	833
	13	0.625 2172	0.618 3891	2154	0.703 2477	0.708 1826	1559	0.305 0659	0.307 2069	821
	14	0.611 5136	0.604 5913	2190	0.713 0638	0.717 8907	1528	0.309 3246	0.311 4188	808
	15	-0.597 6225	-0.590 6079	2226	-0.722 6630	-0.727 3804	+1496	-0.313 4893	-0.315 5359	+ 795
	16	-0.583 5478	-0.576 4428	2261	-0.732 0423	-0.736 6484	+1463	-0.317 5585	-0.319 5568	+ 782

GREENWICH MEAN TIME.

Date.	X True Equinox.		Reduc. to Mean Eq'x of 1916.0	Y True Equinox.		Reduc. to Mean Eq'x of 1916.0	Z True Equinox.		Reduc. to Mean Eq'x of 1916.0
	Noon.	Midnight.	Noon.	Noon.	Midnight.	Noon.	Noon.	Midnight.	Noon.
Nov. 16	-0.583 5478	-0.576 4428	-2261	-0.732 0423	-0.736 6484	+1463	-0.317 5585	-0.319 5568	+782
17	0.569 2933	0.562 1000	2295	0.741 1984	0.745 6918	1430	0.321 5308	0.323 4803	768
18	0.554 8632	0.547 5835	2329	0.750 1282	0.754 5073	1396	0.325 4050	0.327 3048	754
19	0.540 2616	0.532 8978	2362	0.758 8287	0.763 0920	1361	0.329 1796	0.331 0291	739
20	0.525 4927	0.518 0469	2395	0.767 2967	0.771 4426	1326	0.332 8532	0.334 6517	725
21	-0.510 5610	-0.503 0354	-2427	-0.775 5293	-0.779 5563	+1291	-0.336 4245	-0.338 1714	+710
22	0.495 4707	0.487 8676	2460	0.783 5234	0.787 4300	1255	0.339 8922	0.341 5868	695
23	0.480 2266	0.472 5483	2491	0.791 2760	0.795 0609	1218	0.343 2550	0.344 8967	679
24	0.464 8334	0.457 0824	2522	0.798 7844	0.802 4462	1180	0.346 5117	0.348 0999	663
25	0.449 2960	0.441 4749	2552	0.806 0458	0.809 5830	1142	0.349 6611	0.351 1952	647
26	-0.433 6196	-0.425 7308	-2582	-0.813 0575	-0.816 4690	+1104	-0.352 7021	-0.354 1816	+631
27	0.417 8091	0.409 8553	2611	0.819 8172	0.823 1017	1065	0.355 6336	0.357 0580	614
28	0.401 8700	0.393 8539	2639	0.826 3224	0.829 4790	1025	0.358 4547	0.359 8236	597
29	0.385 8076	0.377 7318	2667	0.832 5712	0.835 5989	985	0.361 1646	0.362 4776	579
30	0.369 6270	0.361 4942	2694	0.838 5617	0.841 4596	944	0.363 7624	0.365 0192	561
Dec. 1	-0.353 3337	-0.345 1463	-2720	-0.844 2922	-0.847 0594	+ 903	-0.366 2476	-0.367 4477	+543
2	0.336 9327	0.328 6934	2745	0.849 7611	0.852 3969	861	0.368 6194	0.369 7626	525
3	0.320 4292	0.312 1406	2770	0.854 9668	0.857 4706	819	0.370 8772	0.371 9632	507
4	0.303 8283	0.295 4930	2795	0.859 9081	0.862 2792	776	0.373 0204	0.374 0489	488
5	0.287 1352	0.278 7555	2819	0.864 5837	0.866 8214	733	0.375 0485	0.376 0192	469
6	-0.270 3546	-0.261 9330	-2842	-0.868 9923	-0.871 0961	+ 689	-0.376 9609	-0.377 8736	+450
7	0.253 4915	0.245 0306	2864	0.873 1327	0.875 1020	645	0.378 7572	0.379 6116	431
8	0.236 5510	0.228 0532	2885	0.877 0038	0.878 8380	600	0.380 4367	0.381 2326	411
9	0.219 5379	0.211 0056	2906	0.880 6044	0.882 3029	555	0.381 9990	0.382 7361	391
10	0.202 4570	0.193 8928	2926	0.883 9334	0.885 4956	509	0.383 4436	0.384 1216	371
11	-0.185 3135	-0.176 7197	-2945	-0.886 9896	-0.888 4152	+ 463	-0.384 7699	-0.385 3886	+351
12	0.168 1121	0.159 4913	2963	0.889 7721	0.891 0603	417	0.385 9775	0.386 5366	330
13	0.150 8580	0.142 2128	2980	0.892 2797	0.893 4301	370	0.387 0659	0.387 5652	310
14	0.133 5562	0.124 8891	2996	0.894 5115	0.895 5237	322	0.388 0346	0.388 4739	289
15	0.116 2120	0.107 5255	3012	0.896 4666	0.897 3400	274	0.388 8832	0.389 2623	268
16	-0.098 8303	-0.090 1271	-3027	-0.898 1440	-0.898 8783	+ 226	-0.389 6112	-0.389 9299	+246
17	0.061 4165	0.072 6993	3040	0.899 5429	0.900 1377	178	0.390 2183	0.390 4764	225
18	0.063 9760	0.055 2474	3053	0.900 6625	0.901 1174	129	0.390 7041	0.390 9014	203
19	0.046 5141	0.037 7767	3065	0.901 5022	0.901 8169	80	0.391 0684	0.391 2048	181
20	0.029 0361	0.020 2928	3077	0.902 0613	0.902 2355	+ 30	0.391 3108	0.391 3862	159
21	-0.011 5476	-0.002 8013	-3087	-0.902 3393	-0.902 3727	- 20	-0.391 4311	-0.391 4454	+137
22	+0.005 9456	+0.014 6923	3096	0.902 3356	0.902 2280	70	0.391 4290	0.391 3820	115
23	0.023 4380	0.032 1820	3104	0.902 0499	0.901 8013	121	0.391 3044	0.391 1962	93
24	0.040 9235	0.049 6619	3111	0.901 4821	0.901 0924	172	0.391 0574	0.390 8880	70
25	0.058 3964	0.067 1262	3117	0.900 6322	0.900 1016	223	0.390 6880	0.390 4574	48
26	+0.075 8507	+0.084 5690	3122	-0.899 5005	-0.898 8291	- 274	-0.390 1963	-0.389 9047	+ 25
27	0.093 2805	0.101 9845	3126	0.898 0874	0.897 2755	326	0.389 5826	0.389 2300	+ 2
28	0.110 6802	0.119 3669	3129	0.896 3936	0.895 4416	377	0.388 8471	0.388 4338	- 21
29	0.128 0439	0.136 7104	3131	0.894 4197	0.893 3281	429	0.387 9903	0.387 5165	44
30	0.145 3659	0.154 0097	3132	0.892 1669	0.890 9362	481	0.387 0126	0.386 4786	67
31	+0.162 6410	+0.171 2593	3132	-0.889 6362	-0.888 2671	- 533	-0.385 9145	-0.385 3205	- 90
32	+0.179 8638	+0.188 4540	3132	-0.886 8289	-0.885 3218	- 586	-0.384 6965	-0.384 0428	-114

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
JANUARY 1.					JANUARY 3.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	14 55 33.31	2.5091	-22 7 2.7	-9.914	0	17 4 49.80	2.8278	-26 54 25.3	-1.412
1	14 58 4.12	2.5179	22 16 53.6	9.782	1	17 7 39.55	2.8303	26 55 43.7	1.201
2	15 0 35.46	2.5268	22 26 36.5	9.646	2	17 10 29.44	2.8326	26 56 49.4	0.969
3	15 3 7.33	2.5355	22 36 11.1	9.508	3	17 13 19.46	2.8348	26 57 42.4	0.777
4	15 5 39.72	2.5442	22 45 37.4	9.368	4	17 16 9.61	2.8367	26 58 22.6	0.564
5	15 8 12.63	2.5529	22 54 55.3	9.228	5	17 18 59.86	2.8383	26 58 50.1	0.352
6	15 10 46.07	2.5617	23 4 4.7	9.084	6	17 21 50.21	2.8398	26 59 4.8	-0.138
7	15 13 20.03	2.5703	23 13 5.4	8.938	7	17 24 40.63	2.8409	26 59 6.7	+0.075
8	15 15 54.50	2.5788	23 21 57.2	8.798	8	17 27 31.12	2.8419	26 58 55.8	0.289
9	15 18 29.49	2.5874	23 30 40.1	8.640	9	17 30 21.66	2.8427	26 58 32.0	0.503
10	15 21 4.99	2.5958	23 39 14.0	8.488	10	17 33 12.24	2.8433	26 57 55.4	0.718
11	15 23 40.99	2.6043	23 47 38.7	8.334	11	17 36 2.85	2.8435	26 57 5.9	0.932
12	15 26 17.50	2.6127	23 55 54.1	8.178	12	17 38 53.46	2.8435	26 56 3.6	1.146
13	15 28 54.51	2.6209	24 4 0.0	8.019	13	17 41 44.07	2.8433	26 54 48.4	1.361
14	15 31 32.01	2.6291	24 11 56.4	7.860	14	17 44 34.66	2.8428	26 53 20.3	1.575
15	15 34 10.00	2.6373	24 19 43.2	7.698	15	17 47 25.21	2.8423	26 51 39.4	1.788
16	15 36 48.48	2.6453	24 27 20.2	7.533	16	17 50 15.72	2.8418	26 49 45.7	2.002
17	15 39 27.43	2.6532	24 34 47.2	7.367	17	17 53 6.17	2.8402	26 47 39.2	2.216
18	15 42 6.86	2.6610	24 42 4.2	7.199	18	17 55 56.54	2.8388	26 45 19.8	2.429
19	15 44 46.75	2.6688	24 49 11.1	7.030	19	17 58 46.82	2.8372	26 42 47.7	2.641
20	15 47 27.11	2.6764	24 56 7.8	6.858	20	18 1 37.00	2.8354	26 40 2.9	2.853
21	15 50 7.92	2.6839	25 2 54.1	6.684	21	18 4 27.07	2.8333	26 37 5.4	3.063
22	15 52 49.18	2.6913	25 9 29.9	6.508	22	18 7 17.00	2.8310	26 33 55.3	3.274
23	15 55 30.87	2.6985	-25 15 55.1	-6.332	23	18 10 6.79	2.8286	-26 30 32.5	+3.485
JANUARY 2.					JANUARY 4.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	15 58 13.00	2.7058	-25 22 9.7	-6.153	0	18 12 56.43	2.8259	-26 26 57.1	+3.694
1	16 0 55.58	2.7128	25 28 13.5	5.972	1	18 15 45.90	2.8229	26 23 9.2	3.903
2	16 3 38.53	2.7196	25 34 6.3	5.788	2	18 18 35.18	2.8197	26 19 8.8	4.110
3	16 6 21.91	2.7263	25 39 48.1	5.604	3	18 21 24.26	2.8163	26 14 56.0	4.317
4	16 9 5.69	2.7330	25 45 18.8	5.418	4	18 24 13.14	2.8128	26 10 30.8	4.523
5	16 11 49.87	2.7395	25 50 38.3	5.231	5	18 27 1.80	2.8090	26 5 53.3	4.728
6	16 14 34.43	2.7458	25 55 46.5	5.042	6	18 29 50.22	2.8050	26 1 3.5	4.931
7	16 17 19.36	2.7518	26 0 43.3	4.851	7	18 32 38.40	2.8008	25 56 1.6	5.133
8	16 20 4.65	2.7578	26 5 28.6	4.658	8	18 35 26.32	2.7965	25 50 47.6	5.334
9	16 22 50.29	2.7636	26 10 2.3	4.465	9	18 38 13.98	2.7920	25 45 21.5	5.534
10	16 25 36.28	2.7693	26 14 24.4	4.270	10	18 41 1.36	2.7872	25 39 43.5	5.733
11	16 28 22.60	2.7747	26 18 34.7	4.073	11	18 43 48.44	2.7822	25 33 53.6	5.930
12	16 31 9.24	2.7800	26 22 33.2	3.875	12	18 46 35.22	2.7771	25 27 51.9	6.126
13	16 33 56.20	2.7851	26 26 19.7	3.676	13	18 49 21.69	2.7718	25 21 38.5	6.320
14	16 36 43.45	2.7899	26 29 54.3	3.476	14	18 52 7.83	2.7663	25 15 13.5	6.513
15	16 39 30.99	2.7947	26 33 16.8	3.273	15	18 54 53.64	2.7607	25 8 37.0	6.703
16	16 42 18.81	2.7992	26 36 27.1	3.070	16	18 57 39.11	2.7549	25 1 49.1	6.893
17	16 45 6.89	2.8034	26 39 25.2	2.866	17	19 0 24.23	2.7489	24 54 49.8	7.082
18	16 47 55.22	2.8075	26 42 11.0	2.661	18	19 3 8.98	2.7428	24 47 39.3	7.268
19	16 50 43.79	2.8114	26 44 44.5	2.456	19	19 5 53.36	2.7365	24 40 17.6	7.453
20	16 53 32.59	2.8151	26 47 5.7	2.249	20	19 8 37.36	2.7301	24 32 44.9	7.635
21	16 56 21.60	2.8186	26 49 14.4	2.041	21	19 11 20.97	2.7236	24 25 1.4	7.816
22	16 59 10.82	2.8218	26 51 10.6	1.833	22	19 14 4.19	2.7169	24 17 7.0	7.996
23	17 2 0.22	2.8248	26 52 54.3	1.623	23	19 16 47.00	2.7101	24 9 1.9	8.173
24	17 4 49.80	2.8278	-26 54 25.3	-1.412	24	19 19 29.40	2.7031	-24 0 46.2	+8.348

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
JANUARY 5.					JANUARY 7.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	19 19 29.40	2.7081	-24 0 46.2	+ 8.348	0	21 20 0.03	2.3128	-14 38 55.1	+14.201
1	19 22 11.37	2.6960	23 52 20.1	8.532	1	21 22 18.56	2.3060	14 24 41.0	14.268
2	19 24 52.92	2.6899	23 43 43.6	8.808	2	21 24 36.63	2.2973	14 10 23.0	14.333
3	19 27 34.04	2.6817	23 34 56.9	8.963	3	21 26 54.23	2.2896	13 56 1.1	14.397
4	19 30 14.72	2.6743	23 26 0.1	9.080	4	21 29 11.38	2.2821	13 41 35.4	14.458
5	19 32 54.95	2.6668	23 16 53.3	9.196	5	21 31 28.08	2.2746	13 27 6.1	14.518
6	19 35 34.73	2.6592	23 7 36.7	9.358	6	21 33 44.33	2.2671	13 12 33.3	14.574
7	19 38 14.05	2.6515	22 58 10.3	9.520	7	21 36 0.13	2.2597	12 57 57.2	14.629
8	19 40 52.91	2.6438	22 48 34.3	9.679	8	21 38 15.49	2.2524	12 43 17.8	14.683
9	19 43 31.30	2.6358	22 38 48.8	9.836	9	21 40 30.42	2.2452	12 28 35.2	14.735
10	19 46 9.21	2.6279	22 28 54.0	9.991	10	21 42 44.91	2.2380	12 13 49.6	14.784
11	19 48 46.65	2.6200	22 18 49.9	10.143	11	21 44 58.98	2.2309	11 59 1.1	14.832
12	19 51 23.61	2.6119	22 8 36.8	10.293	12	21 47 12.62	2.2239	11 44 9.8	14.878
13	19 54 0.08	2.6038	21 58 14.7	10.442	13	21 49 25.85	2.2170	11 29 15.8	14.922
14	19 56 36.06	2.5956	21 47 43.8	10.588	14	21 51 38.66	2.2101	11 14 19.2	14.963
15	19 59 11.55	2.5874	21 37 4.2	10.732	15	21 53 51.06	2.2033	10 59 20.2	15.003
16	20 1 46.55	2.5792	21 26 16.0	10.873	16	21 56 3.06	2.1967	10 44 18.8	15.042
17	20 4 21.05	2.5708	21 15 19.4	11.013	17	21 58 14.66	2.1901	10 29 15.2	15.078
18	20 6 55.05	2.5625	21 4 14.5	11.149	18	22 0 25.87	2.1836	10 14 9.4	15.113
19	20 9 28.55	2.5541	20 53 1.5	11.284	19	22 2 36.69	2.1771	9 59 1.6	15.146
20	20 12 1.54	2.5457	20 41 40.4	11.417	20	22 4 47.12	2.1707	9 43 51.9	15.177
21	20 14 34.03	2.5373	20 30 11.5	11.546	21	22 6 57.17	2.1644	9 28 40.4	15.207
22	20 17 6.01	2.5288	20 18 34.9	11.674	22	22 9 6.85	2.1583	9 13 27.1	15.235
23	20 19 37.48	2.5203	-20 6 50.6	+11.800	23	22 11 16.16	2.1522	- 8 58 12.2	+15.261
JANUARY 6.					JANUARY 8.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	20 22 8.44	2.5118	-19 54 58.9	+11.923	0	22 13 25.11	2.1462	- 8 42 55.8	+15.285
1	20 24 38.89	2.5033	19 42 59.8	12.044	1	22 15 33.70	2.1403	8 27 38.0	15.308
2	20 27 8.83	2.4948	19 30 53.6	12.163	2	22 17 41.94	2.1344	8 12 18.9	15.329
3	20 29 38.26	2.4863	19 18 40.3	12.279	3	22 19 49.83	2.1286	7 56 58.5	15.349
4	20 32 7.18	2.4778	19 6 20.1	12.393	4	22 21 57.37	2.1229	7 41 37.0	15.367
5	20 34 35.59	2.4693	18 53 53.2	12.504	5	22 24 4.58	2.1174	7 26 14.5	15.383
6	20 37 3.49	2.4608	18 41 19.6	12.614	6	22 26 11.46	2.1119	7 10 51.1	15.398
7	20 39 30.88	2.4523	18 28 39.5	12.721	7	22 28 18.01	2.1065	6 55 26.8	15.411
8	20 41 57.76	2.4438	18 15 53.1	12.826	8	22 30 24.24	2.1012	6 40 1.8	15.423
9	20 44 24.13	2.4353	18 3 0.4	12.929	9	22 32 30.15	2.0959	6 24 36.1	15.433
10	20 46 50.00	2.4269	17 50 1.6	13.029	10	22 34 35.75	2.0908	6 9 9.8	15.443
11	20 49 15.36	2.4184	17 36 56.9	13.127	11	22 36 41.05	2.0858	5 53 43.0	15.449
12	20 51 40.21	2.4101	17 23 46.4	13.223	12	22 38 46.05	2.0808	5 38 15.9	15.454
13	20 54 4.57	2.4018	17 10 30.2	13.317	13	22 40 50.75	2.0760	5 22 48.5	15.459
14	20 56 28.42	2.3934	16 57 8.4	13.408	14	22 42 55.17	2.0713	5 7 20.8	15.463
15	20 58 51.78	2.3852	16 43 41.2	13.497	15	22 44 59.30	2.0666	4 51 53.0	15.464
16	21 1 14.64	2.3769	16 30 8.8	13.583	16	22 47 3.16	2.0620	4 36 25.1	15.465
17	21 3 37.01	2.3688	16 16 31.3	13.668	17	22 49 6.74	2.0575	4 20 57.2	15.463
18	21 5 58.89	2.3606	16 2 48.7	13.751	18	22 51 10.06	2.0532	4 5 29.5	15.460
19	21 8 20.28	2.3525	15 49 1.2	13.831	19	22 53 13.12	2.0488	3 50 2.0	15.457
20	21 10 41.19	2.3444	15 35 9.0	13.909	20	22 55 15.92	2.0446	3 34 34.7	15.453
21	21 13 1.61	2.3364	15 21 12.1	13.985	21	22 57 18.47	2.0404	3 19 7.7	15.446
22	21 15 21.56	2.3285	15 7 10.8	14.058	22	22 59 20.77	2.0364	3 3 41.2	15.438
23	21 17 41.03	2.3206	14 53 5.1	14.131	23	23 1 22.84	2.0325	2 48 15.2	15.429
24	21 20 0.03	2.3128	-14 38 55.1	+14.201	24	23 3 24.67	2.0286	- 2 32 49.7	+15.419

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
JANUARY 9.					JANUARY 11.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	23 3 24.67	2.0286	-2 32 49.7	+15.419	0	0 37 59.28	1.9435	+ 9 15 8.2	+13.718
1	23 5 26.27	2.0248	2 17 24.9	15.408	1	0 39 55.89	1.9437	9 28 49.6	13.662
2	23 7 27.65	2.0212	2 2 0.8	15.395	2	0 41 52.52	1.9439	9 42 27.6	13.604
3	23 9 28.81	2.0176	1 46 37.5	15.381	3	0 43 49.16	1.9442	9 56 2.1	13.546
4	23 11 29.76	2.0141	1 31 15.1	15.366	4	0 45 45.82	1.9445	10 9 33.1	13.487
5	23 13 30.50	2.0107	1 15 53.6	15.350	5	0 47 42.50	1.9448	10 23 0.5	13.427
6	23 15 31.04	2.0073	1 0 33.1	15.333	6	0 49 39.20	1.9453	10 36 24.3	13.367
7	23 17 31.38	2.0041	0 45 13.7	15.314	7	0 51 35.94	1.9460	10 49 44.5	13.306
8	23 19 31.53	2.0010	0 29 55.4	15.296	8	0 53 32.72	1.9466	11 3 1.0	13.243
9	23 21 31.50	1.9979	-0 14 38.3	15.274	9	0 55 29.53	1.9472	11 16 13.7	13.181
10	23 23 31.28	1.9949	+0 0 37.5	15.253	10	0 57 26.38	1.9479	11 29 22.7	13.118
11	23 25 30.89	1.9921	0 15 52.0	15.229	11	0 59 23.28	1.9487	11 42 27.8	13.053
12	23 27 30.33	1.9893	0 31 5.0	15.205	12	1 1 20.22	1.9495	11 55 29.1	12.989
13	23 29 29.60	1.9866	0 46 16.6	15.181	13	1 3 17.22	1.9505	12 8 26.5	12.923
14	23 31 28.72	1.9840	1 1 26.7	15.154	14	1 5 14.28	1.9515	12 21 19.9	12.857
15	23 33 27.68	1.9814	1 16 35.1	15.127	15	1 7 11.40	1.9525	12 34 9.3	12.790
16	23 35 26.49	1.9790	1 31 41.9	15.099	16	1 9 8.58	1.9536	12 46 54.7	12.723
17	23 37 25.16	1.9767	1 46 47.0	15.070	17	1 11 5.83	1.9548	12 59 36.0	12.654
18	23 39 23.69	1.9744	2 1 50.3	15.040	18	1 13 3.15	1.9560	13 12 13.2	12.586
19	23 41 22.09	1.9722	2 16 51.8	15.009	19	1 15 0.55	1.9573	13 24 46.3	12.517
20	23 43 20.35	1.9700	2 31 51.4	14.977	20	1 16 58.02	1.9585	13 37 15.2	12.446
21	23 45 18.49	1.9681	2 46 49.0	14.943	21	1 18 55.57	1.9599	13 49 39.8	12.374
22	23 47 16.52	1.9662	3 1 44.6	14.910	22	1 20 53.21	1.9614	14 2 0.1	12.303
23	23 49 14.43	1.9643	+3 16 38.2	+14.875	23	1 22 50.94	1.9629	+14 14 16.1	+12.230
JANUARY 10.					JANUARY 12.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	23 51 12.23	1.9625	+3 31 29.6	+14.838	0	1 24 48.76	1.9645	+14 26 27.7	+12.157
1	23 53 9.93	1.9608	3 46 18.8	14.802	1	1 26 46.68	1.9661	14 38 34.9	12.083
2	23 55 7.53	1.9592	4 1 5.8	14.764	2	1 28 44.69	1.9677	14 50 37.7	12.009
3	23 57 5.03	1.9577	4 15 50.5	14.726	3	1 30 42.80	1.9694	15 2 36.0	11.934
4	23 59 2.45	1.9563	4 30 32.9	14.687	4	1 32 41.02	1.9712	15 14 29.8	11.858
5	0 0 59.78	1.9548	4 45 12.9	14.646	5	1 34 39.34	1.9729	15 26 19.0	11.782
6	0 2 57.03	1.9536	4 59 50.4	14.604	6	1 36 37.77	1.9748	15 38 3.6	11.705
7	0 4 54.21	1.9524	5 14 25.4	14.563	7	1 38 36.32	1.9768	15 49 43.6	11.628
8	0 6 51.32	1.9513	5 28 57.9	14.519	8	1 40 34.98	1.9787	16 1 18.9	11.548
9	0 8 48.36	1.9502	5 43 27.7	14.475	9	1 42 33.76	1.9807	16 12 49.4	11.469
10	0 10 45.34	1.9492	5 57 54.9	14.430	10	1 44 32.66	1.9827	16 24 15.2	11.389
11	0 12 42.26	1.9483	6 12 19.3	14.384	11	1 46 31.68	1.9847	16 35 36.1	11.308
12	0 14 39.14	1.9476	6 26 41.0	14.338	12	1 48 30.82	1.9868	16 46 52.2	11.228
13	0 16 35.97	1.9468	6 40 59.9	14.291	13	1 50 30.10	1.9890	16 58 3.4	11.146
14	0 18 32.75	1.9461	6 55 15.9	14.243	14	1 52 29.50	1.9912	17 9 9.7	11.063
15	0 20 29.50	1.9456	7 9 29.0	14.194	15	1 54 29.04	1.9934	17 20 11.0	10.981
16	0 22 26.22	1.9451	7 23 39.2	14.144	16	1 56 28.71	1.9957	17 31 7.4	10.898
17	0 24 22.91	1.9446	7 37 46.3	14.093	17	1 58 28.52	1.9980	17 41 58.7	10.813
18	0 26 19.57	1.9442	7 51 50.4	14.043	18	2 0 28.47	2.0003	17 52 44.9	10.727
19	0 28 16.21	1.9439	8 5 51.4	13.991	19	2 2 28.56	2.0028	18 3 25.9	10.641
20	0 30 12.84	1.9437	8 19 49.3	13.938	20	2 4 28.80	2.0053	18 14 1.8	10.555
21	0 32 9.45	1.9435	8 33 43.9	13.883	21	2 6 29.19	2.0077	18 24 32.5	10.468
22	0 34 6.06	1.9435	8 47 35.3	13.829	22	2 8 29.72	2.0101	18 34 58.0	10.381
23	0 36 2.67	1.9435	9 1 23.4	13.774	23	2 10 30.40	2.0127	18 45 18.2	10.292
24	0 37 59.28	1.9435	+9 15 8.2	+13.718	24	2 12 31.24	2.0153	+18 55 33.0	+10.203

GREENWICH MEAN TIME.

Hour.	Right Ascension.			Var. per Min.	Declination.			Var. per Min.	Hour.	Right Ascension.			Var. per Min.	Declination.			Var. per Min.
JANUARY 13.									JANUARY 15.								
	h	m	s	s	°	'	"	"		h	m	s	s	°	'	"	"
0	2	12	31.24	2.0153	+18	55	33.0	+10.203	0	3	52	28.68	2.1493	+25	10	43.5	+5.200
1	2	14	32.23	2.0178	19	5	42.5	10.113	1	3	54	37.72	2.1518	25	15	52.0	5.082
2	2	16	33.38	2.0204	19	15	46.6	10.023	2	3	56	46.90	2.1543	25	20	53.3	4.963
3	2	18	34.68	2.0230	19	25	45.2	9.932	3	3	58	56.23	2.1567	25	25	47.5	4.844
4	2	20	36.14	2.0257	19	35	38.4	9.840	4	4	1	5.70	2.1590	25	30	34.6	4.725
5	2	22	37.76	2.0284	19	45	26.0	9.748	5	4	3	15.31	2.1614	25	35	14.5	4.605
6	2	24	39.55	2.0312	19	55	8.1	9.655	6	4	5	25.07	2.1638	25	39	47.2	4.484
7	2	26	41.50	2.0338	20	4	44.6	9.562	7	4	7	34.96	2.1659	25	44	12.6	4.363
8	2	28	43.61	2.0365	20	14	15.5	9.468	8	4	9	44.98	2.1681	25	48	30.8	4.243
9	2	30	45.88	2.0393	20	23	40.7	9.373	9	4	11	55.13	2.1703	25	52	41.7	4.121
10	2	32	48.33	2.0423	20	33	0.2	9.277	10	4	14	5.42	2.1725	25	56	45.3	3.999
11	2	34	50.95	2.0450	20	42	13.9	9.180	11	4	16	15.83	2.1746	26	0	41.6	3.877
12	2	36	53.73	2.0478	20	51	21.8	9.083	12	4	18	26.37	2.1767	26	4	30.5	3.753
13	2	38	56.68	2.0506	21	0	23.9	8.987	13	4	20	37.03	2.1786	26	8	12.0	3.630
14	2	40	59.80	2.0535	21	9	20.2	8.888	14	4	22	47.80	2.1805	26	11	46.1	3.507
15	2	43	3.10	2.0564	21	18	10.5	8.789	15	4	24	58.69	2.1824	26	15	12.8	3.383
16	2	45	6.57	2.0593	21	26	54.9	8.691	16	4	27	9.69	2.1843	26	18	32.0	3.258
17	2	47	10.21	2.0621	21	35	33.4	8.591	17	4	29	20.80	2.1860	26	21	43.8	3.134
18	2	49	14.02	2.0650	21	44	5.8	8.490	18	4	31	32.01	2.1878	26	24	48.1	3.009
19	2	51	18.01	2.0679	21	52	32.2	8.389	19	4	33	43.33	2.1895	26	27	44.9	2.883
20	2	53	22.17	2.0708	22	0	52.5	8.287	20	4	35	54.75	2.1911	26	30	34.1	2.758
21	2	55	26.51	2.0738	22	9	6.6	8.184	21	4	38	6.26	2.1926	26	33	15.8	2.632
22	2	57	31.03	2.0768	22	17	14.6	8.082	22	4	40	17.86	2.1941	26	35	49.9	2.505
23	2	59	35.72	2.0796	+22	25	16.4	+7.978	23	4	42	29.55	2.1955	+26	38	16.4	+2.379
JANUARY 14.									JANUARY 16.								
0	3	1	40.58	2.0825	+22	33	12.0	+7.874	0	4	44	41.32	2.1989	+26	40	35.4	+2.253
1	3	3	45.62	2.0854	22	41	1.3	7.780	1	4	46	53.18	2.1983	26	42	46.7	2.125
2	3	5	50.83	2.0883	22	48	44.3	7.686	2	4	49	5.11	2.1995	26	44	50.4	1.998
3	3	7	56.22	2.0913	22	56	20.9	7.558	3	4	51	17.12	2.2008	26	46	46.5	1.871
4	3	10	1.79	2.0943	23	3	51.2	7.451	4	4	53	29.20	2.2018	26	48	34.9	1.743
5	3	12	7.53	2.0971	23	11	15.0	7.343	5	4	55	41.34	2.2029	26	50	15.6	1.615
6	3	14	13.44	2.0999	23	18	32.4	7.236	6	4	57	53.55	2.2039	26	51	48.7	1.487
7	3	16	19.52	2.1028	23	25	43.3	7.128	7	5	0	5.81	2.2048	26	53	14.0	1.358
8	3	18	25.78	2.1058	23	32	47.7	7.018	8	5	2	18.13	2.2058	26	54	31.7	1.230
9	3	20	32.21	2.1087	23	39	45.5	6.908	9	5	4	30.50	2.2066	26	55	41.6	1.101
10	3	22	38.82	2.1116	23	46	36.7	6.798	10	5	6	42.92	2.2073	26	56	43.8	0.973
11	3	24	45.60	2.1143	23	53	21.3	6.688	11	5	8	55.38	2.2080	26	57	38.3	0.843
12	3	26	52.54	2.1171	23	59	59.3	6.578	12	5	11	7.88	2.2087	26	58	25.0	0.714
13	3	28	59.65	2.1199	24	6	30.6	6.465	13	5	13	20.42	2.2092	26	59	4.0	0.585
14	3	31	6.93	2.1228	24	12	55.1	6.353	14	5	15	32.98	2.2096	26	59	35.2	0.456
15	3	33	14.38	2.1255	24	19	12.9	6.240	15	5	17	45.57	2.2100	26	59	58.7	0.327
16	3	35	21.99	2.1283	24	25	23.9	6.126	16	5	19	58.18	2.2103	27	0	14.4	0.198
17	3	37	29.77	2.1310	24	31	28.0	6.012	17	5	22	10.81	2.2106	27	0	22.4	+0.068
18	3	39	37.71	2.1337	24	37	25.3	5.898	18	5	24	23.45	2.2108	27	0	22.6	-0.062
19	3	41	45.81	2.1363	24	43	15.7	5.783	19	5	26	36.11	2.2110	27	0	15.0	0.192
20	3	43	54.07	2.1390	24	48	59.2	5.668	20	5	28	48.77	2.2110	26	59	59.6	0.321
21	3	46	2.49	2.1417	24	54	35.8	5.552	21	5	31	1.43	2.2110	26	59	36.5	0.450
22	3	48	11.07	2.1443	25	0	5.4	5.435	22	5	33	14.09	2.2109	26	59	5.6	0.580
23	3	50	19.80	2.1468	25	5	28.0	5.318	23	5	35	26.74	2.2107	26	58	26.9	0.710
24	3	52	28.68	2.1493	+25	10	43.5	+5.200	24	5	37	39.37	2.2104	+26	57	40.4	-0.839

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
JANUARY 17.					JANUARY 19.				
	^h ^m ^s	^s	[°] ['] ["]	["]		^h ^m ^s	^s	[°] ['] ["]	["]
0	5 37 39.37	2.2104	+26 57 40.4	-0.839	0	7 22 15.27	2.1260	+23 52 15.9	-6.744
1	5 39 51.99	2.2102	26 56 46.2	0.968	1	7 24 22.74	2.1231	23 45 27.9	6.857
2	5 42 4.59	2.2098	26 55 44.2	1.098	2	7 26 30.04	2.1202	23 38 33.1	6.968
3	5 44 17.17	2.2094	26 54 34.5	1.227	3	7 28 37.16	2.1172	23 31 31.7	7.078
4	5 46 29.72	2.2089	26 53 17.0	1.356	4	7 30 44.10	2.1141	23 24 23.7	7.188
5	5 48 42.24	2.2083	26 51 51.8	1.485	5	7 32 50.85	2.1110	23 17 9.2	7.297
6	5 50 54.72	2.2077	26 50 18.8	1.614	6	7 34 57.42	2.1079	23 9 48.1	7.406
7	5 53 7.16	2.2069	26 48 38.1	1.743	7	7 37 3.80	2.1048	23 2 20.5	7.513
8	5 55 19.55	2.2061	26 46 49.6	1.872	8	7 39 10.00	2.1018	22 54 46.5	7.620
9	5 57 31.89	2.2053	26 44 53.5	2.000	9	7 41 16.01	2.0986	22 47 6.1	7.727
10	5 59 44.18	2.2044	26 42 49.6	2.129	10	7 43 21.83	2.0955	22 39 19.3	7.833
11	6 1 56.42	2.2034	26 40 38.0	2.257	11	7 45 27.47	2.0923	22 31 26.2	7.938
12	6 4 8.59	2.2023	26 38 18.8	2.384	12	7 47 32.91	2.0891	22 23 26.8	8.042
13	6 6 20.70	2.2013	26 35 51.9	2.512	13	7 49 38.16	2.0859	22 15 21.2	8.145
14	6 8 32.74	2.2000	26 33 17.4	2.639	14	7 51 43.22	2.0828	22 7 9.4	8.248
15	6 10 44.70	2.1988	26 30 35.2	2.767	15	7 53 48.09	2.0795	21 58 51.5	8.350
16	6 12 56.59	2.1975	26 27 45.4	2.894	16	7 55 52.76	2.0762	21 50 27.4	8.452
17	6 15 8.40	2.1961	26 24 47.9	3.021	17	7 57 57.23	2.0729	21 41 57.3	8.552
18	6 17 20.12	2.1946	26 21 42.9	3.147	18	8 0 1.51	2.0698	21 33 21.2	8.652
19	6 19 31.75	2.1931	26 18 30.3	3.273	19	8 2 5.60	2.0665	21 24 39.1	8.751
20	6 21 43.29	2.1916	26 15 10.2	3.398	20	8 4 9.49	2.0633	21 15 51.1	8.849
21	6 23 54.74	2.1899	26 11 42.6	3.523	21	8 6 13.19	2.0600	21 6 57.2	8.947
22	6 26 6.08	2.1882	26 8 7.4	3.649	22	8 8 16.69	2.0567	20 57 57.5	9.043
23	6 28 17.32	2.1864	+26 4 24.7	-3.774	23	8 10 19.99	2.0534	+20 48 52.0	-9.139
JANUARY 18.					JANUARY 20.				
0	6 30 28.45	2.1846	+26 0 34.5	-3.898	0	8 12 23.10	2.0502	+20 39 40.8	-9.234
1	6 32 39.47	2.1828	25 56 36.9	4.023	1	8 14 26.01	2.0469	20 30 23.9	9.329
2	6 34 50.38	2.1808	25 52 31.8	4.147	2	8 16 28.73	2.0437	20 21 1.3	9.423
3	6 37 1.17	2.1788	25 48 19.3	4.269	3	8 18 31.25	2.0403	20 11 33.1	9.516
4	6 39 11.84	2.1768	25 43 59.5	4.392	4	8 20 33.57	2.0371	20 1 59.4	9.608
5	6 41 22.39	2.1748	25 39 32.3	4.514	5	8 22 35.70	2.0338	19 52 20.1	9.700
6	6 43 32.81	2.1726	25 34 57.8	4.636	6	8 24 37.63	2.0306	19 42 35.4	9.790
7	6 45 43.10	2.1703	25 30 16.0	4.758	7	8 26 39.37	2.0274	19 32 45.3	9.880
8	6 47 53.25	2.1681	25 25 26.9	4.879	8	8 28 40.92	2.0242	19 22 49.8	9.969
9	6 50 3.27	2.1658	25 20 30.5	5.000	9	8 30 42.27	2.0210	19 12 49.0	10.057
10	6 52 13.15	2.1634	25 15 26.9	5.120	10	8 32 43.44	2.0178	19 2 43.0	10.144
11	6 54 22.88	2.1610	25 10 16.1	5.239	11	8 34 44.41	2.0146	18 52 31.7	10.231
12	6 56 32.47	2.1586	25 4 58.2	5.358	12	8 36 45.19	2.0114	18 42 15.3	10.316
13	6 58 41.91	2.1561	24 59 33.1	5.478	13	8 38 45.78	2.0083	18 31 53.8	10.401
14	7 0 51.20	2.1536	24 54 0.9	5.596	14	8 40 46.19	2.0052	18 21 27.2	10.486
15	7 3 0.34	2.1510	24 48 21.7	5.712	15	8 42 46.40	2.0020	18 10 55.5	10.569
16	7 5 9.32	2.1483	24 42 35.5	5.829	16	8 44 46.43	1.9989	18 0 18.9	10.651
17	7 7 18.14	2.1457	24 36 42.2	5.947	17	8 46 46.27	1.9958	17 49 37.4	10.733
18	7 9 26.80	2.1430	24 30 41.9	6.063	18	8 48 45.93	1.9928	17 38 51.0	10.813
19	7 11 35.30	2.1403	24 24 34.7	6.178	19	8 50 45.41	1.9898	17 27 59.8	10.893
20	7 13 43.63	2.1375	24 18 20.6	6.293	20	8 52 44.71	1.9868	17 17 3.8	10.973
21	7 15 51.80	2.1348	24 11 59.6	6.407	21	8 54 43.83	1.9838	17 6 3.1	11.051
22	7 17 59.80	2.1318	24 5 31.8	6.520	22	8 56 42.77	1.9809	16 54 57.7	11.128
23	7 20 7.62	2.1289	23 58 57.2	6.633	23	8 58 41.54	1.9780	16 43 47.7	11.205
24	7 22 15.27	2.1260	+23 52 15.9	-6.744	24	9 0 40.13	1.9751	+16 32 33.1	-11.281

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
JANUARY 21.					JANUARY 23.				
0	h m s	s	° ' "	"	0	h m s	s	° ' "	"
0	9 0 40.13	1.9751	+16 32 33.1	-11.281	0	10 32 53.54	1.8806	+6 20 1.9	-13.913
1	9 2 38.55	1.9722	16 21 14.0	11.355	1	10 34 46.72	1.8861	6 6 6.1	13.946
2	9 4 36.79	1.9693	16 9 50.5	11.429	2	10 36 39.87	1.8856	5 52 8.4	13.978
3	9 6 34.87	1.9666	15 58 22.5	11.503	3	10 38 32.99	1.8852	5 38 8.8	14.010
4	9 8 32.78	1.9638	15 46 50.1	11.575	4	10 40 26.09	1.8849	5 24 7.2	14.043
5	9 10 30.53	1.9611	15 35 13.5	11.646	5	10 42 19.18	1.8847	5 10 3.7	14.073
6	9 12 28.11	1.9583	15 23 32.6	11.717	6	10 44 12.25	1.8845	4 55 58.5	14.101
7	9 14 25.53	1.9557	15 11 47.5	11.787	7	10 46 5.32	1.8845	4 41 51.6	14.129
8	9 16 22.79	1.9530	14 59 58.2	11.856	8	10 47 58.39	1.8844	4 27 43.0	14.158
9	9 18 19.89	1.9504	14 48 4.8	11.924	9	10 49 51.45	1.8843	4 13 32.7	14.184
10	9 20 16.84	1.9479	14 36 7.3	11.992	10	10 51 44.51	1.8845	3 59 20.9	14.210
11	9 22 13.64	1.9454	14 24 5.8	12.058	11	10 53 37.59	1.8848	3 45 7.5	14.235
12	9 24 10.29	1.9429	14 12 0.4	12.123	12	10 55 30.88	1.8849	3 30 52.7	14.258
13	9 26 6.79	1.9405	13 59 51.1	12.188	13	10 57 23.78	1.8853	3 16 36.5	14.282
14	9 28 3.15	1.9381	13 47 37.9	12.252	14	10 59 16.91	1.8857	3 2 18.9	14.304
15	9 29 59.36	1.9357	13 35 20.9	12.314	15	11 1 10.06	1.8861	2 48 0.0	14.326
16	9 31 55.43	1.9334	13 23 0.2	12.377	16	11 3 3.24	1.8866	2 33 39.8	14.347
17	9 33 51.37	1.9312	13 10 35.7	12.438	17	11 4 56.45	1.8872	2 19 18.4	14.366
18	9 35 47.17	1.9290	12 58 7.6	12.498	18	11 6 49.70	1.8878	2 4 55.9	14.384
19	9 37 42.84	1.9268	12 45 35.9	12.558	19	11 8 42.99	1.8886	1 50 32.3	14.403
20	9 39 38.38	1.9246	12 33 0.6	12.617	20	11 10 36.33	1.8894	1 36 7.6	14.419
21	9 41 33.79	1.9225	12 20 21.9	12.674	21	11 12 29.72	1.8903	1 21 42.0	14.435
22	9 43 29.08	1.9205	12 7 39.7	12.732	22	11 14 23.17	1.8913	1 7 15.4	14.450
23	9 45 24.25	1.9185	+11 54 54.1	-12.788	23	11 16 16.67	1.8923	+0 52 48.0	-14.464
JANUARY 22.					JANUARY 24.				
0	9 47 19.30	1.9166	+11 42 5.2	-12.843	0	11 18 10.24	1.8934	+0 38 19.7	-14.478
1	9 49 14.24	1.9147	11 29 13.0	12.897	1	11 20 3.88	1.8946	0 23 50.7	14.490
2	9 51 9.06	1.9128	11 16 17.6	12.951	2	11 21 57.59	1.8958	+0 9 20.9	14.502
3	9 53 3.78	1.9111	11 3 18.9	13.004	3	11 23 51.38	1.8972	-0 5 9.5	14.512
4	9 54 58.39	1.9093	10 50 17.1	13.056	4	11 25 45.25	1.8986	0 19 40.5	14.521
5	9 56 52.90	1.9077	10 37 12.2	13.107	5	11 27 39.21	1.9001	0 34 12.0	14.529
6	9 58 47.31	1.9060	10 24 4.3	13.157	6	11 29 33.26	1.9016	0 48 44.0	14.538
7	10 0 41.62	1.9044	10 10 53.4	13.206	7	11 31 27.40	1.9033	1 3 16.5	14.544
8	10 2 35.84	1.9029	9 57 39.6	13.254	8	11 33 21.65	1.9050	1 17 49.3	14.549
9	10 4 29.97	1.9015	9 44 22.9	13.302	9	11 35 16.00	1.9068	1 32 22.4	14.554
10	10 6 24.02	1.9001	9 31 3.4	13.348	10	11 37 10.46	1.9087	1 46 55.8	14.558
11	10 8 17.98	1.8987	9 17 41.1	13.395	11	11 39 5.04	1.9106	2 1 29.4	14.562
12	10 10 11.86	1.8974	9 4 16.0	13.440	12	11 40 59.73	1.9126	2 16 3.2	14.563
13	10 12 5.67	1.8962	8 50 48.3	13.483	13	11 42 54.55	1.9148	2 30 37.0	14.564
14	10 13 59.40	1.8950	8 37 18.0	13.527	14	11 44 49.50	1.9169	2 45 10.9	14.564
15	10 15 53.07	1.8939	8 23 45.1	13.569	15	11 46 44.58	1.9192	2 59 44.7	14.563
16	10 17 46.67	1.8928	8 10 9.7	13.611	16	11 48 39.80	1.9215	3 14 18.4	14.561
17	10 19 40.21	1.8918	7 56 31.8	13.652	17	11 50 35.16	1.9239	3 28 52.0	14.558
18	10 21 33.68	1.8908	7 42 51.5	13.692	18	11 52 30.67	1.9264	3 43 25.4	14.554
19	10 23 27.11	1.8900	7 29 8.8	13.731	19	11 54 26.33	1.9289	3 57 58.5	14.548
20	10 25 20.48	1.8892	7 15 23.8	13.768	20	11 56 22.14	1.9316	4 12 31.2	14.542
21	10 27 13.81	1.8884	7 1 36.6	13.805	21	11 58 18.12	1.9344	4 27 3.5	14.535
22	10 29 7.09	1.8877	6 47 47.2	13.842	22	12 0 14.27	1.9373	4 41 35.4	14.528
23	10 31 0.33	1.8871	6 33 55.6	13.878	23	12 2 10.59	1.9402	4 56 6.8	14.518
24	10 32 53.54	1.8866	+ 6 20 1.9	-13.913	24	12 4 7.09	1.9432	-5 10 37.6	-14.508

GREENWICH MEAN TIME.

Hour.	Right Ascension.			Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.			Var. per Min.	Declination.	Var. per Min.				
JANUARY 25.							JANUARY 27.										
	h	m	s	s	°	'	"		h	m	s	s	°	'	"	"	
0	12	4	7.09	1.9432	-5	10	37.6	-14.506	0	13	42	22.35	2.1812	-16	13	36.5	-12.633
1	12	6	3.77	1.9462	5	25	7.7	14.497	1	13	44	33.42	2.1880	16	26	12.3	12.580
2	12	8	0.63	1.9493	5	39	37.2	14.485	2	13	46	44.91	2.1949	16	38	43.7	12.487
3	12	9	57.69	1.9526	5	54	5.9	14.471	3	13	48	56.81	2.2018	16	51	10.7	12.412
4	12	11	54.94	1.9558	6	8	33.7	14.457	4	13	51	9.12	2.2088	17	3	33.1	12.334
5	12	13	52.39	1.9598	6	23	0.7	14.442	5	13	53	21.86	2.2158	17	15	50.8	12.254
6	12	15	50.05	1.9628	6	37	26.7	14.425	6	13	55	35.02	2.2229	17	28	3.8	12.176
7	12	17	47.92	1.9663	6	51	51.7	14.408	7	13	57	48.61	2.2301	17	40	11.9	12.094
8	12	19	46.00	1.9699	7	6	15.6	14.389	8	14	0	2.63	2.2373	17	52	15.1	12.012
9	12	21	44.31	1.9737	7	20	38.4	14.369	9	14	2	17.08	2.2445	18	4	13.3	11.927
10	12	23	42.84	1.9774	7	34	59.9	14.348	10	14	4	31.97	2.2518	18	16	6.3	11.840
11	12	25	41.60	1.9813	7	49	20.1	14.326	11	14	6	47.30	2.2593	18	27	54.1	11.753
12	12	27	40.60	1.9853	8	3	39.0	14.303	12	14	9	3.08	2.2667	18	39	36.6	11.663
13	12	29	39.84	1.9894	8	17	56.5	14.278	13	14	11	19.30	2.2741	18	51	13.7	11.572
14	12	31	39.33	1.9935	8	32	12.4	14.253	14	14	13	35.97	2.2816	19	2	45.2	11.478
15	12	33	39.06	1.9977	8	46	26.8	14.226	15	14	15	53.09	2.2891	19	14	11.1	11.383
16	12	35	39.05	2.0020	9	0	39.5	14.198	16	14	18	10.66	2.2967	19	25	31.2	11.287
17	12	37	39.30	2.0064	9	14	50.5	14.169	17	14	20	28.69	2.3043	19	36	45.5	11.190
18	12	39	39.82	2.0108	9	28	59.8	14.139	18	14	22	47.18	2.3120	19	47	54.0	11.091
19	12	41	40.60	2.0153	9	43	7.2	14.108	19	14	25	6.13	2.3197	19	58	56.4	10.988
20	12	43	41.66	2.0200	9	57	12.7	14.075	20	14	27	25.54	2.3273	20	9	52.6	10.885
21	12	45	43.00	2.0248	10	11	16.2	14.042	21	14	29	45.41	2.3351	20	20	42.6	10.781
22	12	47	44.63	2.0295	10	25	17.7	14.007	22	14	32	5.75	2.3428	20	31	26.3	10.675
23	12	49	46.54	2.0343	-10	39	17.0	-13.970	23	14	34	26.55	2.3506	-20	42	3.6	-10.567
JANUARY 26.							JANUARY 28.										
0	12	51	48.75	2.0393	-10	53	14.1	-13.933	0	14	36	47.82	2.3584	-20	52	34.3	-10.457
1	12	53	51.26	2.0443	11	7	8.9	13.893	1	14	39	9.56	2.3663	21	2	58.4	10.345
2	12	55	54.07	2.0494	11	21	1.3	13.853	2	14	41	31.77	2.3742	21	13	15.7	10.232
3	12	57	57.19	2.0547	11	34	51.3	13.813	3	14	43	54.46	2.3821	21	23	26.2	10.117
4	13	0	0.63	2.0599	11	48	38.8	13.770	4	14	46	17.62	2.3899	21	33	29.7	9.999
5	13	2	4.38	2.0653	12	2	23.7	13.726	5	14	48	41.25	2.3978	21	43	26.1	9.880
6	13	4	8.46	2.0708	12	16	5.9	13.681	6	14	51	5.35	2.4056	21	53	15.3	9.760
7	13	6	12.87	2.0763	12	29	45.4	13.635	7	14	53	29.92	2.4135	22	2	57.3	9.638
8	13	8	17.61	2.0818	12	43	22.1	13.587	8	14	55	54.97	2.4214	22	12	31.9	9.514
9	13	10	22.68	2.0874	12	56	55.8	13.538	9	14	58	20.49	2.4293	22	21	59.0	9.388
10	13	12	28.10	2.0932	13	10	26.6	13.488	10	15	0	46.48	2.4371	22	31	18.5	9.261
11	13	14	33.86	2.0990	13	23	54.3	13.435	11	15	3	12.94	2.4450	22	40	30.3	9.132
12	13	16	39.98	2.1049	13	37	18.8	13.382	12	15	5	39.88	2.4529	22	49	34.3	9.001
13	13	18	46.45	2.1108	13	50	40.1	13.328	13	15	8	7.29	2.4607	22	58	30.4	8.868
14	13	20	53.28	2.1169	14	3	58.1	13.272	14	15	10	35.16	2.4684	23	7	18.5	8.733
15	13	23	0.48	2.1230	14	17	12.7	13.214	15	15	13	3.50	2.4762	23	15	58.4	8.597
16	13	25	8.04	2.1292	14	30	23.8	13.155	16	15	15	32.30	2.4839	23	24	30.1	8.459
17	13	27	15.98	2.1354	14	43	31.3	13.094	17	15	18	1.57	2.4917	23	32	53.5	8.319
18	13	29	24.29	2.1418	14	56	35.1	13.033	18	15	20	31.30	2.4993	23	41	8.4	8.178
19	13	31	32.99	2.1482	15	9	35.2	12.970	19	15	23	1.49	2.5070	23	49	14.8	8.035
20	13	33	42.07	2.1546	15	22	31.5	12.906	20	15	25	32.14	2.5146	23	57	12.6	7.890
21	13	35	51.54	2.1612	15	35	23.9	12.839	21	15	28	3.24	2.5221	24	5	1.6	7.743
22	13	38	1.41	2.1678	15	48	12.2	12.771	22	15	30	34.79	2.5296	24	12	41.7	7.594
23	13	40	11.68	2.1745	16	0	56.4	12.703	23	15	33	6.79	2.5371	24	20	12.9	7.444
24	13	42	22.35	2.1812	-16	13	36.5	-12.633	24	15	35	39.24	2.5445	-24	27	35.0	-7.293

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
JANUARY 29.					JANUARY 31.				
	^h ^m ^s	^s	[°] ['] ["]	["]		^h ^m ^s	^s	[°] ['] ["]	["]
0	15 35 39.24	2.5445	-24 27 35.0	-7.203	0	17 44 15.06	2.7506	-26 55 24.3	+1.538
1	15 38 12.13	2.5518	24 34 48.0	7.139	1	17 47 0.47	2.7508	26 53 46.0	1.740
2	15 40 45.45	2.5590	24 41 51.7	6.963	2	17 49 45.88	2.7508	26 51 55.5	1.943
3	15 43 19.21	2.5662	24 48 46.0	6.827	3	17 52 31.29	2.7508	26 49 52.9	2.143
4	15 45 53.39	2.5733	24 55 30.9	6.668	4	17 55 16.69	2.7504	26 47 38.3	2.344
5	15 48 28.00	2.5803	25 2 6.2	6.508	5	17 58 2.06	2.7558	26 45 11.6	2.546
6	15 51 3.03	2.5873	25 8 31.8	6.346	6	18 0 47.39	2.7553	26 42 32.8	2.747
7	15 53 38.47	2.5941	25 14 47.7	6.183	7	18 3 32.68	2.7543	26 39 42.0	2.947
8	15 56 14.32	2.6008	25 20 53.7	6.018	8	18 6 17.91	2.7532	26 36 39.2	3.148
9	15 58 50.57	2.6075	25 26 49.8	5.852	9	18 9 3.06	2.7518	26 33 24.3	3.348
10	16 1 27.22	2.6141	25 32 35.9	5.683	10	18 11 48.13	2.7504	26 29 57.4	3.548
11	16 4 4.26	2.6206	25 38 11.8	5.513	11	18 14 33.11	2.7488	26 26 18.6	3.746
12	16 6 41.69	2.6269	25 43 37.5	5.343	12	18 17 17.98	2.7468	26 22 27.9	3.944
13	16 9 19.49	2.6332	25 48 52.9	5.170	13	18 20 2.73	2.7448	26 18 25.3	4.143
14	16 11 57.67	2.6394	25 53 57.9	4.996	14	18 22 47.35	2.7426	26 14 10.8	4.340
15	16 14 36.22	2.6454	25 58 52.4	4.821	15	18 25 31.84	2.7408	26 9 44.5	4.537
16	16 17 15.12	2.6512	26 3 36.4	4.644	16	18 28 16.18	2.7376	26 5 6.4	4.733
17	16 19 54.37	2.6570	26 8 9.7	4.466	17	18 31 0.35	2.7348	26 0 16.6	4.928
18	16 22 33.96	2.6627	26 12 32.3	4.287	18	18 33 44.35	2.7318	25 55 15.1	5.122
19	16 25 13.89	2.6682	26 16 44.1	4.106	19	18 36 28.17	2.7288	25 50 2.0	5.314
20	16 27 54.14	2.6735	26 20 45.0	3.923	20	18 39 11.80	2.7255	25 44 37.4	5.507
21	16 30 34.71	2.6788	26 24 34.9	3.740	21	18 41 55.23	2.7221	25 39 1.2	5.698
22	16 33 15.59	2.6838	26 28 13.8	3.556	22	18 44 38.45	2.7188	25 33 13.6	5.888
23	16 35 56.77	2.6888	-26 31 41.6	-3.370	23	18 47 21.45	2.7147	-25 27 14.6	+6.078
JANUARY 30.					FEBRUARY 1.				
0	16 38 38.25	2.6937	-26 34 58.2	-3.183	0	18 50 4.21	2.7107	-25 21 4.2	+6.267
1	16 41 20.01	2.6983	26 38 3.5	2.995	1	18 52 46.73	2.7096	25 14 42.6	6.453
2	16 44 2.04	2.7027	26 40 57.6	2.807	2	18 55 29.00	2.7024	25 8 9.8	6.639
3	16 46 44.33	2.7070	26 43 40.3	2.616	3	18 58 11.02	2.6961	25 1 25.9	6.824
4	16 49 26.88	2.7113	26 46 11.5	2.425	4	19 0 52.77	2.6935	24 54 30.9	7.008
5	16 52 9.68	2.7153	26 48 31.3	2.233	5	19 3 34.24	2.6888	24 47 25.0	7.189
6	16 54 52.71	2.7190	26 50 39.5	2.040	6	19 6 15.42	2.6839	24 40 8.2	7.369
7	16 57 35.96	2.7226	26 52 36.1	1.846	7	19 8 56.31	2.6790	24 32 40.7	7.548
8	17 0 19.42	2.7261	26 54 21.0	1.652	8	19 11 36.90	2.6740	24 25 2.4	7.727
9	17 3 3.09	2.7295	26 55 54.3	1.458	9	19 14 17.19	2.6688	24 17 13.5	7.903
10	17 5 46.96	2.7326	26 57 15.9	1.261	10	19 16 57.16	2.6635	24 9 14.0	8.078
11	17 8 31.00	2.7356	26 58 25.6	1.063	11	19 19 36.81	2.6581	24 1 4.1	8.251
12	17 11 15.22	2.7383	26 59 23.5	0.866	12	19 22 16.13	2.6525	23 52 43.9	8.423
13	17 13 59.60	2.7409	27 0 9.5	0.668	13	19 24 55.11	2.6469	23 44 13.4	8.593
14	17 16 44.13	2.7433	27 0 43.6	0.469	14	19 27 33.75	2.6411	23 35 32.8	8.761
15	17 19 28.79	2.7454	27 1 5.8	0.270	15	19 30 12.04	2.6352	23 26 42.1	8.928
16	17 22 13.58	2.7474	27 1 16.0	-0.070	16	19 32 49.97	2.6292	23 17 41.5	9.093
17	17 24 58.48	2.7493	27 1 14.2	+0.130	17	19 35 27.54	2.6232	23 8 31.0	9.257
18	17 27 43.49	2.7509	27 1 0.4	0.330	18	19 38 4.75	2.6170	22 59 10.7	9.418
19	17 30 28.59	2.7523	27 0 34.6	0.531	19	19 40 41.58	2.6108	22 49 40.8	9.578
20	17 33 13.77	2.7536	26 59 56.7	0.733	20	19 43 18.04	2.6044	22 40 1.4	9.735
21	17 35 59.02	2.7547	26 59 6.7	0.933	21	19 45 54.11	2.5980	22 30 12.6	9.892
22	17 38 44.33	2.7555	26 58 4.7	1.135	22	19 48 29.80	2.5915	22 20 14.4	10.047
23	17 41 29.68	2.7561	26 56 50.5	1.337	23	19 51 5.09	2.5849	22 10 7.0	10.198
24	17 44 15.06	2.7566	-26 55 24.3	+1.538	24	19 53 39.99	2.5788	-21 59 50.6	+10.348

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
FEBRUARY 2.					FEBRUARY 4.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	19 53 39.99	2.5783	-21 59 50.6	+10.348	0	21 49 21.48	2.2475	-11 28 43.7	+15.143
1	19 56 14.49	2.5717	21 49 25.2	10.498	1	21 51 36.15	2.2414	11 13 33.6	15.193
2	19 58 48.59	2.5649	21 38 50.9	10.644	2	21 53 50.45	2.2353	10 58 20.6	15.240
3	20 1 22.28	2.5581	21 28 7.9	10.788	3	21 56 4.39	2.2294	10 43 4.8	15.286
4	20 3 55.56	2.5513	21 17 16.3	10.932	4	21 58 17.98	2.2236	10 27 46.3	15.330
5	20 6 28.43	2.5443	21 6 16.1	11.073	5	22 0 31.22	2.2178	10 12 25.2	15.373
6	20 9 0.88	2.5373	20 55 7.6	11.210	6	22 2 44.11	2.2120	9 57 1.7	15.411
7	20 11 32.91	2.5303	20 43 50.9	11.347	7	22 4 56.66	2.2063	9 41 35.9	15.449
8	20 14 4.52	2.5233	20 32 26.0	11.482	8	22 7 8.87	2.2008	9 26 7.8	15.486
9	20 16 35.71	2.5163	20 20 53.1	11.615	9	22 9 20.75	2.1963	9 10 37.6	15.519
10	20 19 6.48	2.5093	20 9 12.2	11.746	10	22 11 32.30	2.1898	8 55 5.5	15.552
11	20 21 36.82	2.5021	19 57 23.6	11.873	11	22 13 43.52	2.1843	8 39 31.4	15.583
12	20 24 6.73	2.4949	19 45 27.4	12.000	12	22 15 54.42	2.1791	8 23 55.5	15.612
13	20 26 36.21	2.4878	19 33 23.6	12.124	13	22 18 5.01	2.1738	8 8 18.0	15.638
14	20 29 5.27	2.4807	19 21 12.5	12.246	14	22 20 15.28	2.1687	7 52 38.9	15.664
15	20 31 33.89	2.4734	19 8 54.1	12.366	15	22 22 25.25	2.1636	7 36 58.3	15.688
16	20 34 2.08	2.4663	18 56 28.6	12.484	16	22 24 34.91	2.1585	7 21 16.4	15.709
17	20 36 29.84	2.4591	18 43 56.0	12.600	17	22 26 44.27	2.1536	7 5 33.2	15.730
18	20 38 57.17	2.4518	18 31 16.6	12.713	18	22 28 53.34	2.1488	6 49 48.8	15.748
19	20 41 24.06	2.4446	18 18 30.4	12.825	19	22 31 2.12	2.1440	6 34 3.4	15.765
20	20 43 50.52	2.4374	18 5 37.6	12.934	20	22 33 10.62	2.1393	6 18 17.0	15.780
21	20 46 16.55	2.4303	17 52 38.3	13.042	21	22 35 18.83	2.1346	6 2 29.8	15.793
22	20 48 42.15	2.4231	17 39 32.6	13.147	22	22 37 26.77	2.1301	5 46 41.8	15.806
23	20 51 7.32	2.4158	-17 26 20.7	+13.249	23	22 39 34.44	2.1257	- 5 30 53.2	+15.815
FEBRUARY 3.					FEBRUARY 5.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	20 53 32.05	2.4087	-17 13 2.7	+13.351	0	22 41 41.85	2.1213	- 5 15 4.0	+15.822
1	20 55 56.36	2.4016	16 59 38.6	13.450	1	22 43 48.99	2.1169	4 59 14.4	15.830
2	20 58 20.24	2.3945	16 46 8.7	13.546	2	22 45 55.88	2.1128	4 43 24.4	15.836
3	21 0 43.70	2.3874	16 32 33.1	13.640	3	22 48 2.52	2.1086	4 27 34.1	15.840
4	21 3 6.73	2.3803	16 18 51.9	13.733	4	22 50 8.91	2.1044	4 11 43.6	15.843
5	21 5 29.34	2.3733	16 5 5.2	13.823	5	22 52 15.05	2.1004	3 55 53.0	15.843
6	21 7 51.52	2.3663	15 51 13.2	13.911	6	22 54 20.96	2.0966	3 40 2.5	15.841
7	21 10 13.29	2.3593	15 37 15.9	13.998	7	22 56 26.64	2.0928	3 24 12.1	15.839
8	21 12 34.64	2.3523	15 23 13.5	14.082	8	22 58 32.09	2.0890	3 8 21.8	15.836
9	21 14 55.57	2.3454	15 9 6.1	14.163	9	23 0 37.32	2.0853	2 52 31.8	15.830
10	21 17 16.09	2.3386	14 54 53.9	14.243	10	23 2 42.33	2.0818	2 36 42.2	15.823
11	21 19 36.20	2.3318	14 40 37.0	14.320	11	23 4 47.13	2.0783	2 20 53.0	15.816
12	21 21 55.90	2.3249	14 26 15.5	14.396	12	23 6 51.72	2.0748	2 5 4.3	15.806
13	21 24 15.19	2.3182	14 11 49.5	14.469	13	23 8 56.11	2.0715	1 49 16.3	15.794
14	21 26 34.08	2.3115	13 57 19.2	14.540	14	23 11 0.30	2.0682	1 33 29.0	15.782
15	21 28 52.57	2.3048	13 42 44.7	14.610	15	23 13 4.29	2.0649	1 17 42.5	15.768
16	21 31 10.66	2.2983	13 28 6.0	14.678	16	23 15 8.09	2.0618	1 1 56.8	15.753
17	21 33 28.36	2.2918	13 13 23.4	14.743	17	23 17 11.71	2.0588	0 46 12.1	15.737
18	21 35 45.67	2.2853	12 58 36.9	14.806	18	23 19 15.15	2.0559	0 30 28.4	15.719
19	21 38 2.59	2.2788	12 43 46.7	14.867	19	23 21 18.42	2.0531	- 0 14 45.9	15.698
20	21 40 19.12	2.2723	12 28 52.9	14.927	20	23 23 21.52	2.0503	+ 0 0 55.4	15.678
21	21 42 35.27	2.2661	12 13 55.5	14.984	21	23 25 24.45	2.0475	0 16 35.5	15.658
22	21 44 51.05	2.2598	11 58 54.8	15.039	22	23 27 27.22	2.0449	0 32 14.3	15.634
23	21 47 6.45	2.2536	11 43 50.8	15.093	23	23 29 29.84	2.0423	0 47 51.6	15.609
24	21 49 21.48	2.2475	-11 28 43.7	+15.143	24	23 31 32.30	2.0398	+ 1 3 27.4	+15.583

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
FEBRUARY 6.					FEBRUARY 8.				
0	h m s	s	° ' "	"	0	h m s	s	° ' "	"
0	23 31 32.30	2.0306	+ 1 3 27.4	+15.583	0	1 8 0.66	2.0061	+12 40 52.2	+13.100
1	23 33 34.62	2.0375	1 19 1.6	15.557	1	1 10 1.05	2.0069	12 53 56.0	13.026
2	23 35 36.80	2.0352	1 34 34.2	15.529	2	1 12 1.49	2.0078	13 6 55.3	12.951
3	23 37 38.84	2.0329	1 50 5.1	15.499	3	1 14 1.99	2.0088	13 19 50.1	12.876
4	23 39 40.75	2.0306	2 5 34.1	15.468	4	1 16 2.55	2.0098	13 32 40.4	12.800
5	23 41 42.53	2.0287	2 21 1.3	15.437	5	1 18 3.17	2.0109	13 45 26.1	12.723
6	23 43 44.19	2.0267	2 36 26.5	15.403	6	1 20 3.86	2.0121	13 58 7.1	12.644
7	23 45 45.73	2.0248	2 51 49.7	15.370	7	1 22 4.62	2.0133	14 10 43.4	12.566
8	23 47 47.16	2.0229	3 7 10.9	15.335	8	1 24 5.45	2.0144	14 23 15.0	12.488
9	23 49 48.48	2.0211	3 22 29.9	15.298	9	1 26 6.35	2.0157	14 35 41.9	12.408
10	23 51 49.69	2.0193	3 37 46.7	15.261	10	1 28 7.33	2.0170	14 48 3.9	12.327
11	23 53 50.80	2.0173	3 53 1.2	15.222	11	1 30 8.39	2.0183	15 0 21.1	12.245
12	23 55 51.82	2.0168	4 8 13.3	15.182	12	1 32 9.53	2.0198	15 12 33.3	12.163
13	23 57 52.75	2.0148	4 23 23.0	15.141	13	1 34 10.76	2.0212	15 24 40.6	12.080
14	23 59 53.59	2.0133	4 38 30.2	15.099	14	1 36 12.07	2.0227	15 36 42.9	11.997
15	0 1 54.35	2.0120	4 53 34.9	15.057	15	1 38 13.48	2.0243	15 48 40.2	11.913
16	0 3 55.03	2.0108	5 8 37.0	15.013	16	1 40 14.98	2.0258	16 0 32.5	11.828
17	0 5 55.64	2.0096	5 23 36.4	14.968	17	1 42 16.58	2.0274	16 12 19.6	11.742
18	0 7 56.18	2.0085	5 38 33.1	14.921	18	1 44 18.27	2.0291	16 24 1.5	11.656
19	0 9 56.66	2.0074	5 53 26.9	14.873	19	1 46 20.07	2.0308	16 35 38.3	11.569
20	0 11 57.07	2.0064	6 8 17.9	14.826	20	1 48 21.97	2.0325	16 47 9.8	11.481
21	0 13 57.43	2.0056	6 23 6.0	14.777	21	1 50 23.97	2.0342	16 58 36.0	11.393
22	0 15 57.74	2.0048	6 37 51.1	14.727	22	1 52 26.07	2.0360	17 9 56.9	11.303
23	0 17 58.00	2.0039	+ 6 52 33.2	+14.675	23	1 54 28.29	2.0379	+17 21 12.4	+11.213
FEBRUARY 7.					FEBRUARY 9.				
0	0 19 58.21	2.0038	+ 7 7 12.1	+14.623	0	1 56 30.62	2.0398	+17 32 22.5	+11.123
1	0 21 58.39	2.0027	7 21 47.9	14.569	1	1 58 33.06	2.0417	17 43 27.2	11.033
2	0 23 58.53	2.0021	7 36 20.4	14.515	2	2 0 35.62	2.0436	17 54 26.4	10.941
3	0 25 58.64	2.0017	7 50 49.7	14.461	3	2 2 38.29	2.0455	18 5 20.1	10.848
4	0 27 58.73	2.0013	8 5 15.7	14.405	4	2 4 41.08	2.0476	18 16 8.2	10.755
5	0 29 58.79	2.0008	8 19 38.3	14.348	5	2 6 44.00	2.0496	18 26 50.7	10.662
6	0 31 58.83	2.0006	8 33 57.4	14.289	6	2 8 47.03	2.0516	18 37 27.6	10.568
7	0 33 58.86	2.0003	8 48 13.0	14.231	7	2 10 50.19	2.0538	18 47 58.8	10.473
8	0 35 58.87	2.0002	9 2 25.1	14.171	8	2 12 53.48	2.0559	18 58 24.3	10.377
9	0 37 58.88	2.0001	9 16 33.5	14.110	9	2 14 56.90	2.0580	19 8 44.0	10.281
10	0 39 58.88	2.0001	9 30 38.3	14.049	10	2 17 0.44	2.0602	19 18 58.0	10.184
11	0 41 58.89	2.0002	9 44 39.4	13.987	11	2 19 4.12	2.0624	19 29 6.1	10.086
12	0 43 58.90	2.0003	9 58 36.7	13.923	12	2 21 7.93	2.0646	19 39 8.3	9.988
13	0 45 58.92	2.0004	10 12 30.2	13.859	13	2 23 11.87	2.0668	19 49 4.7	9.890
14	0 47 58.95	2.0006	10 26 19.8	13.794	14	2 25 15.95	2.0691	19 58 55.1	9.790
15	0 49 58.99	2.0008	10 40 5.5	13.728	15	2 27 20.16	2.0713	20 8 39.5	9.690
16	0 51 59.05	2.0013	10 53 47.2	13.662	16	2 29 24.51	2.0736	20 18 17.9	9.590
17	0 53 59.14	2.0017	11 7 24.9	13.595	17	2 31 28.99	2.0759	20 27 50.3	9.489
18	0 55 59.25	2.0021	11 20 58.6	13.527	18	2 33 33.62	2.0783	20 37 16.6	9.388
19	0 57 59.39	2.0027	11 34 28.1	13.458	19	2 35 38.38	2.0805	20 46 36.8	9.285
20	0 59 59.57	2.0033	11 47 53.5	13.388	20	2 37 43.28	2.0829	20 55 50.8	9.182
21	1 1 59.78	2.0038	12 1 14.6	13.317	21	2 39 48.33	2.0853	21 4 58.6	9.078
22	1 4 0.03	2.0045	12 14 31.5	13.245	22	2 41 53.51	2.0876	21 14 0.2	8.975
23	1 6 0.32	2.0053	12 27 44.0	13.173	23	2 43 58.84	2.0900	21 22 55.6	8.870
24	1 8 0.66	2.0061	+12 40 52.2	+13.100	24	2 46 4.31	2.0923	+21 31 44.6	+ 8.764

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
FEBRUARY 10.					FEBRUARY 12.				
	^h ^m ^s	^s	[°] ['] ["]	["]		^h ^m ^s	^s	[°] ['] ["]	["]
0	2 46 4.31	2.0923	+21 31 44.6	+8.764	0	4 29 7.05	2.1928	+26 21 39.5	+3.146
1	2 48 9.92	2.0948	21 40 27.3	8.659	1	4 31 18.65	2.1940	26 24 44.6	3.022
2	2 50 15.68	2.0972	21 49 3.7	8.553	2	4 33 30.33	2.1953	26 27 42.1	2.895
3	2 52 21.58	2.0996	21 57 33.7	8.446	3	4 35 42.09	2.1966	26 30 32.0	2.769
4	2 54 27.63	2.1020	22 5 57.2	8.338	4	4 37 53.92	2.1978	26 33 14.4	2.643
5	2 56 33.82	2.1044	22 14 14.3	8.231	5	4 40 5.82	2.1988	26 35 49.1	2.514
6	2 58 40.16	2.1068	22 22 24.9	8.122	6	4 42 17.78	2.1999	26 38 16.1	2.387
7	3 0 46.64	2.1093	22 30 28.9	8.013	7	4 44 29.81	2.2010	26 40 35.5	2.259
8	3 2 53.26	2.1116	22 38 26.4	7.903	8	4 46 41.90	2.2019	26 42 47.2	2.132
9	3 5 0.03	2.1140	22 46 17.3	7.793	9	4 48 54.04	2.2028	26 44 51.3	2.004
10	3 7 6.94	2.1164	22 54 1.6	7.683	10	4 51 6.24	2.2037	26 46 47.7	1.876
11	3 9 14.00	2.1188	23 1 39.2	7.572	11	4 53 18.48	2.2044	26 48 36.4	1.748
12	3 11 21.20	2.1212	23 9 10.2	7.460	12	4 55 30.77	2.2053	26 50 17.4	1.619
13	3 13 28.54	2.1236	23 16 34.4	7.348	13	4 57 43.11	2.2059	26 51 50.7	1.491
14	3 15 36.03	2.1260	23 23 51.9	7.235	14	4 59 55.48	2.2065	26 53 16.3	1.363
15	3 17 43.66	2.1283	23 31 2.6	7.122	15	5 2 7.89	2.2071	26 54 34.2	1.233
16	3 19 51.42	2.1306	23 38 6.5	7.008	16	5 4 20.33	2.2076	26 55 44.3	1.104
17	3 21 59.33	2.1330	23 45 8.6	6.894	17	5 6 32.80	2.2081	26 56 46.7	0.976
18	3 24 7.38	2.1353	23 51 53.8	6.779	18	5 8 45.30	2.2085	26 57 41.4	0.847
19	3 26 15.57	2.1376	23 58 37.1	6.664	19	5 10 57.82	2.2088	26 58 28.3	0.718
20	3 28 23.89	2.1399	24 5 13.5	6.549	20	5 13 10.36	2.2091	26 59 7.5	0.589
21	3 30 32.36	2.1423	24 11 43.0	6.433	21	5 15 22.91	2.2093	26 59 39.0	0.460
22	3 32 40.96	2.1444	24 18 5.5	6.317	22	5 17 35.47	2.2094	27 0 2.7	0.330
23	3 34 49.69	2.1467	+24 24 21.0	+6.199	23	5 19 48.04	2.2096	+27 0 18.6	+0.201
FEBRUARY 11.					FEBRUARY 13.				
0	3 36 58.56	2.1489	+24 30 29.4	+6.082	0	5 22 0.62	2.2097	+27 0 26.8	+0.072
1	3 39 7.56	2.1511	24 36 30.8	5.964	1	5 24 13.20	2.2096	27 0 27.2	-0.058
2	3 41 16.69	2.1533	24 42 25.1	5.846	2	5 26 25.77	2.2095	27 0 19.9	0.186
3	3 43 25.95	2.1554	24 48 12.3	5.727	3	5 28 38.34	2.2094	27 0 4.9	0.315
4	3 45 35.34	2.1576	24 53 52.3	5.608	4	5 30 50.90	2.2092	26 59 42.1	0.445
5	3 47 44.86	2.1597	24 59 25.2	5.488	5	5 33 3.44	2.2088	26 59 11.5	0.574
6	3 49 54.50	2.1617	25 4 50.9	5.368	6	5 35 15.96	2.2086	26 58 33.2	0.703
7	3 52 4.26	2.1638	25 10 9.4	5.248	7	5 37 28.47	2.2083	26 57 47.2	0.832
8	3 54 14.15	2.1658	25 15 20.7	5.128	8	5 39 40.95	2.2078	26 56 53.4	0.961
9	3 56 24.15	2.1677	25 20 24.7	5.006	9	5 41 53.40	2.2073	26 55 51.9	1.090
10	3 58 34.27	2.1697	25 25 21.4	4.884	10	5 44 5.82	2.2067	26 54 42.6	1.218
11	4 0 44.51	2.1716	25 30 10.8	4.763	11	5 46 18.20	2.2060	26 53 25.7	1.347
12	4 2 54.86	2.1734	25 34 52.9	4.640	12	5 48 30.54	2.2053	26 52 1.0	1.476
13	4 5 5.32	2.1753	25 39 27.6	4.518	13	5 50 42.84	2.2046	26 50 28.6	1.604
14	4 7 15.89	2.1771	25 43 55.0	4.395	14	5 52 55.09	2.2038	26 48 48.5	1.732
15	4 9 26.57	2.1788	25 48 15.0	4.272	15	5 55 7.30	2.2030	26 47 0.8	1.859
16	4 11 37.35	2.1806	25 52 27.6	4.148	16	5 57 19.45	2.2020	26 45 5.4	1.988
17	4 13 48.23	2.1822	25 56 32.8	4.024	17	5 59 31.54	2.2010	26 43 2.3	2.116
18	4 15 59.21	2.1838	26 0 30.5	3.900	18	6 1 43.57	2.2000	26 40 51.5	2.243
19	4 18 10.29	2.1855	26 4 20.8	3.776	19	6 3 55.54	2.1990	26 38 33.1	2.370
20	4 20 21.47	2.1870	26 8 3.6	3.651	20	6 6 7.45	2.1978	26 36 7.1	2.498
21	4 22 32.73	2.1884	26 11 38.9	3.525	21	6 8 19.28	2.1966	26 33 33.4	2.626
22	4 24 44.08	2.1899	26 15 6.6	3.399	22	6 10 31.04	2.1953	26 30 52.1	2.751
23	4 26 55.52	2.1914	26 18 26.8	3.274	23	6 12 42.72	2.1940	26 28 3.3	2.877
24	4 29 7.05	2.1928	+26 21 39.5	+3.148	24	6 14 54.32	2.1926	+26 25 6.9	+3.003

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
FEBRUARY 14.					FEBRUARY 16.				
	^h ^m ^s	^s	[°] ['] ["]	["]		^h ^m ^s	^s	[°] ['] ["]	["]
0	6 14 54.32	2.1926	+26 25 6.9	-3.003	0	7 57 42.94	2.0787	+21 43 5.2	-8.554
1	6 17 5.83	2.1912	26 22 2.9	3.129	1	7 59 47.57	2.0758	21 34 28.9	8.656
2	6 19 17.26	2.1898	26 18 51.4	3.254	2	8 1 52.03	2.0728	21 25 46.5	8.757
3	6 21 28.60	2.1882	26 15 32.4	3.380	3	8 3 56.31	2.0699	21 16 58.1	8.857
4	6 23 39.84	2.1866	26 12 5.8	3.506	4	8 6 0.42	2.0670	21 8 3.7	8.956
5	6 25 50.99	2.1850	26 8 31.7	3.630	5	8 8 4.35	2.0640	20 59 3.4	9.055
6	6 28 2.04	2.1833	26 4 50.2	3.754	6	8 10 8.10	2.0611	20 49 57.1	9.153
7	6 30 12.98	2.1814	26 1 1.2	3.878	7	8 12 11.68	2.0582	20 40 45.0	9.250
8	6 32 23.81	2.1797	25 57 4.8	4.002	8	8 14 15.06	2.0552	20 31 27.1	9.347
9	6 34 34.54	2.1779	25 53 1.0	4.125	9	8 16 18.30	2.0522	20 22 3.4	9.443
10	6 36 45.16	2.1760	25 48 49.8	4.248	10	8 18 21.34	2.0493	20 12 34.0	9.538
11	6 38 55.66	2.1740	25 44 31.3	4.370	11	8 20 24.21	2.0464	20 2 58.9	9.633
12	6 41 6.04	2.1720	25 40 5.4	4.493	12	8 22 26.91	2.0435	19 53 18.1	9.727
13	6 43 16.30	2.1700	25 35 32.2	4.614	13	8 24 29.43	2.0406	19 43 31.7	9.819
14	6 45 26.44	2.1679	25 30 51.7	4.736	14	8 26 31.78	2.0377	19 33 39.8	9.911
15	6 47 36.45	2.1658	25 26 3.9	4.857	15	8 28 33.95	2.0348	19 23 42.4	10.003
16	6 49 46.34	2.1637	25 21 8.9	4.977	16	8 30 35.95	2.0319	19 13 39.5	10.093
17	6 51 56.09	2.1614	25 16 6.7	5.097	17	8 32 37.78	2.0290	19 3 31.2	10.183
18	6 54 5.71	2.1593	25 10 57.3	5.217	18	8 34 39.43	2.0261	18 53 17.6	10.272
19	6 56 15.20	2.1570	25 5 40.7	5.336	19	8 36 40.91	2.0233	18 42 58.6	10.361
20	6 58 24.55	2.1547	25 0 17.0	5.454	20	8 38 42.23	2.0206	18 32 34.3	10.448
21	7 0 33.76	2.1523	24 54 46.2	5.573	21	8 40 43.38	2.0178	18 22 4.8	10.535
22	7 2 42.82	2.1498	24 49 8.3	5.690	22	8 42 44.36	2.0149	18 11 30.1	10.622
23	7 4 51.74	2.1475	+24 43 23.4	-5.808	23	8 44 45.17	2.0122	+18 0 50.2	-10.707
FEBRUARY 15.					FEBRUARY 17.				
	^h ^m ^s	^s	[°] ['] ["]	["]		^h ^m ^s	^s	[°] ['] ["]	["]
0	7 7 0.52	2.1450	+24 37 31.4	-5.925	0	8 46 45.82	2.0094	+17 50 5.3	-10.790
1	7 9 9.14	2.1425	24 31 32.4	6.041	1	8 48 46.30	2.0067	17 39 15.4	10.874
2	7 11 17.62	2.1401	24 25 26.5	6.156	2	8 50 46.62	2.0040	17 28 20.4	10.958
3	7 13 25.95	2.1375	24 19 13.7	6.271	3	8 52 46.78	2.0013	17 17 20.5	11.039
4	7 15 34.12	2.1348	24 12 54.0	6.386	4	8 54 46.78	1.9987	17 6 15.7	11.120
5	7 17 42.13	2.1322	24 6 27.4	6.500	5	8 56 46.62	1.9961	16 55 6.1	11.200
6	7 19 49.96	2.1296	23 59 54.0	6.613	6	8 58 46.31	1.9935	16 43 51.7	11.280
7	7 21 57.68	2.1270	23 53 13.8	6.727	7	9 0 45.84	1.9909	16 32 32.5	11.359
8	7 24 5.22	2.1243	23 46 26.8	6.839	8	9 2 45.22	1.9883	16 21 8.6	11.437
9	7 26 12.59	2.1215	23 39 33.1	6.951	9	9 4 44.44	1.9858	16 9 40.1	11.513
10	7 28 19.80	2.1188	23 32 32.7	7.062	10	9 6 43.51	1.9833	15 58 7.0	11.590
11	7 30 26.84	2.1160	23 25 25.7	7.173	11	9 8 42.44	1.9809	15 46 29.3	11.666
12	7 32 33.72	2.1133	23 18 12.0	7.283	12	9 10 41.22	1.9785	15 34 47.1	11.740
13	7 34 40.43	2.1104	23 10 51.8	7.392	13	9 12 39.86	1.9761	15 23 0.5	11.813
14	7 36 46.97	2.1077	23 3 25.0	7.501	14	9 14 38.35	1.9737	15 11 9.5	11.887
15	7 38 53.35	2.1048	22 55 51.7	7.609	15	9 16 36.70	1.9713	14 59 14.1	11.959
16	7 40 59.55	2.1019	22 48 11.9	7.717	16	9 18 34.91	1.9691	14 47 14.4	12.030
17	7 43 5.58	2.0991	22 40 25.7	7.823	17	9 20 32.99	1.9668	14 35 10.5	12.100
18	7 45 11.44	2.0963	22 32 33.1	7.930	18	9 22 30.93	1.9646	14 23 2.4	12.170
19	7 47 17.13	2.0933	22 24 34.1	8.036	19	9 24 28.74	1.9624	14 10 50.1	12.238
20	7 49 22.64	2.0904	22 16 28.8	8.141	20	9 26 26.42	1.9603	13 58 33.8	12.306
21	7 51 27.96	2.0875	22 8 17.2	8.245	21	9 28 23.97	1.9582	13 46 13.4	12.373
22	7 53 33.14	2.0846	21 59 59.4	8.348	22	9 30 21.40	1.9561	13 33 49.0	12.439
23	7 55 38.13	2.0817	21 51 35.4	8.452	23	9 32 18.70	1.9540	13 21 20.7	12.504
24	7 57 42.94	2.0787	+21 43 5.2	-8.554	24	9 34 15.88	1.9520	+13 8 48.5	-12.568

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
FEBRUARY 18.					FEBRUARY 20.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	9 34 15.88	1.9520	+13 8 48.5	-12.568	0	11 6 36.22	1.9168	+2 8 40.6	-14.576
1	9 36 12.94	1.9501	12 56 12.5	12.632	1	11 8 31.25	1.9175	1 54 5.5	14.593
2	9 38 9.89	1.9483	12 43 32.7	12.694	2	11 10 26.32	1.9183	1 39 29.4	14.611
3	9 40 6.73	1.9464	12 30 49.2	12.756	3	11 12 21.45	1.9193	1 24 52.2	14.628
4	9 42 3.46	1.9446	12 18 2.0	12.817	4	11 14 16.63	1.9201	1 10 14.1	14.643
5	9 44 0.08	1.9428	12 5 11.2	12.877	5	11 16 11.86	1.9211	0 55 35.1	14.657
6	9 45 56.59	1.9410	11 52 16.8	12.936	6	11 18 7.16	1.9222	0 40 55.3	14.669
7	9 47 53.00	1.9393	11 39 18.9	12.994	7	11 20 2.52	1.9233	0 26 14.8	14.681
8	9 49 49.31	1.9378	11 26 17.5	13.052	8	11 21 57.95	1.9245	+0 11 33.6	14.692
9	9 51 45.53	1.9362	11 13 12.7	13.108	9	11 23 53.46	1.9258	-0 3 8.2	14.703
10	9 53 41.65	1.9346	11 0 4.6	13.163	10	11 25 49.04	1.9271	0 17 50.6	14.711
11	9 55 37.68	1.9331	10 46 53.2	13.218	11	11 27 44.71	1.9285	0 32 33.5	14.719
12	9 57 33.62	1.9317	10 33 38.5	13.271	12	11 29 40.46	1.9299	0 47 16.9	14.726
13	9 59 29.48	1.9303	10 20 20.7	13.323	13	11 31 36.30	1.9315	1 2 0.6	14.731
14	10 1 25.25	1.9288	10 6 59.7	13.376	14	11 33 32.24	1.9332	1 16 44.6	14.736
15	10 3 20.94	1.9276	9 53 35.6	13.427	15	11 35 28.28	1.9348	1 31 28.9	14.740
16	10 5 16.56	1.9264	9 40 8.5	13.476	16	11 37 24.42	1.9365	1 46 13.4	14.743
17	10 7 12.11	1.9252	9 26 38.5	13.525	17	11 39 20.66	1.9383	2 0 58.0	14.745
18	10 9 7.58	1.9240	9 13 5.5	13.573	18	11 41 17.02	1.9403	2 15 42.6	14.748
19	10 11 2.99	1.9230	8 59 29.7	13.621	19	11 43 13.50	1.9423	2 30 27.2	14.749
20	10 12 58.34	1.9220	8 45 51.0	13.668	20	11 45 10.09	1.9442	2 45 11.7	14.749
21	10 14 53.63	1.9210	8 32 9.6	13.713	21	11 47 6.80	1.9463	2 59 56.0	14.738
22	10 16 48.86	1.9201	8 18 25.5	13.757	22	11 49 3.65	1.9486	3 14 40.2	14.734
23	10 18 44.04	1.9192	+ 8 4 38.8	-13.800	23	11 51 0.63	1.9508	-3 29 24.1	-14.728
FEBRUARY 19.					FEBRUARY 21.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	10 20 39.16	1.9183	+ 7 50 49.5	-13.843	0	11 52 57.74	1.9531	-3 44 7.6	-14.722
1	10 22 34.24	1.9176	7 36 57.7	13.884	1	11 54 55.00	1.9555	3 58 50.7	14.714
2	10 24 29.27	1.9169	7 23 3.4	13.925	2	11 56 52.40	1.9579	4 13 33.3	14.706
3	10 26 24.27	1.9163	7 9 6.7	13.965	3	11 58 49.95	1.9604	4 28 15.4	14.696
4	10 28 19.23	1.9157	6 55 7.6	14.003	4	12 0 47.65	1.9630	4 42 56.8	14.685
5	10 30 14.15	1.9152	6 41 6.3	14.041	5	12 2 45.51	1.9658	4 57 37.6	14.673
6	10 32 9.05	1.9148	6 27 2.7	14.078	6	12 4 43.54	1.9686	5 12 17.6	14.660
7	10 34 3.92	1.9143	6 12 56.9	14.114	7	12 6 41.74	1.9713	5 26 56.8	14.646
8	10 35 58.76	1.9139	5 58 49.0	14.149	8	12 8 40.10	1.9742	5 41 35.1	14.631
9	10 37 53.59	1.9137	5 44 39.0	14.183	9	12 10 38.64	1.9772	5 56 12.5	14.614
10	10 39 48.40	1.9134	5 30 27.0	14.217	10	12 12 37.36	1.9803	6 10 48.8	14.596
11	10 41 43.20	1.9133	5 16 13.0	14.248	11	12 14 36.27	1.9833	6 25 24.0	14.577
12	10 43 37.99	1.9132	5 1 57.2	14.279	12	12 16 35.36	1.9865	6 39 58.0	14.557
13	10 45 32.78	1.9132	4 47 39.5	14.309	13	12 18 34.65	1.9898	6 54 30.8	14.535
14	10 47 27.57	1.9132	4 33 20.1	14.338	14	12 20 34.13	1.9931	7 9 2.2	14.513
15	10 49 22.36	1.9133	4 18 58.9	14.368	15	12 22 33.82	1.9965	7 23 32.3	14.489
16	10 51 17.16	1.9133	4 4 36.0	14.394	16	12 24 33.71	1.9999	7 38 0.9	14.463
17	10 53 11.96	1.9135	3 50 11.6	14.420	17	12 26 33.81	2.0035	7 52 27.9	14.438
18	10 55 6.78	1.9138	3 35 45.6	14.446	18	12 28 34.13	2.0071	8 6 53.4	14.411
19	10 57 1.62	1.9142	3 21 18.1	14.470	19	12 30 34.66	2.0108	8 21 17.2	14.383
20	10 58 56.48	1.9146	3 6 49.2	14.493	20	12 32 35.42	2.0146	8 35 39.2	14.351
21	11 0 51.37	1.9150	2 52 19.0	14.515	21	12 34 36.41	2.0184	8 49 59.3	14.320
22	11 2 46.28	1.9155	2 37 47.4	14.537	22	12 36 37.63	2.0223	9 4 17.6	14.288
23	11 4 41.23	1.9162	2 23 14.6	14.557	23	12 38 39.08	2.0262	9 18 33.9	14.254
24	11 6 36.22	1.9168	+ 2 8 40.6	-14.576	24	12 40 40.77	2.0303	-9 32 48.1	-14.219

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
FEBRUARY 22.					FEBRUARY 24.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	12 40 40.77	2.0308	-9 32 48.1	-14.219	0	14 24 0.43	2.2658	-19 49 32.5	-10.930
1	12 42 42.71	2.0344	9 47 0.2	14.183	1	14 26 18.58	2.2625	20 0 25.2	10.826
2	12 44 44.90	2.0386	10 1 10.1	14.146	2	14 28 36.73	2.2691	20 11 11.6	10.720
3	12 46 47.34	2.0428	10 15 17.7	14.107	3	14 30 55.47	2.2158	20 21 51.6	10.613
4	12 48 50.04	2.0472	10 29 22.9	14.067	4	14 33 14.62	2.2224	20 32 25.1	10.503
5	12 50 53.00	2.0515	10 43 25.7	14.026	5	14 35 34.16	2.2290	20 42 52.0	10.393
6	12 52 56.22	2.0559	10 57 28.0	13.983	6	14 37 54.10	2.2358	20 53 12.2	10.280
7	12 54 59.71	2.0605	11 11 23.7	13.939	7	14 40 14.45	2.2425	21 3 25.6	10.166
8	12 57 3.48	2.0651	11 25 18.7	13.894	8	14 42 35.20	2.2492	21 13 32.1	10.051
9	12 59 7.52	2.0698	11 39 11.0	13.848	9	14 44 56.35	2.2558	21 23 31.7	9.934
10	13 1 11.85	2.0745	11 53 0.4	13.799	10	14 47 17.90	2.2625	21 33 24.2	9.815
11	13 3 16.46	2.0798	12 6 46.9	13.750	11	14 49 39.85	2.2693	21 43 9.5	9.695
12	13 5 21.36	2.0842	12 20 30.4	13.699	12	14 52 2.21	2.2759	21 52 47.6	9.574
13	13 7 26.56	2.0891	12 34 10.8	13.648	13	14 54 24.96	2.2826	22 2 18.4	9.451
14	13 9 32.05	2.0940	12 47 48.1	13.595	14	14 56 48.12	2.2893	22 11 41.7	9.326
15	13 11 37.84	2.0991	13 1 22.2	13.540	15	14 59 11.68	2.2960	22 20 57.5	9.200
16	13 13 43.94	2.1043	13 14 52.9	13.483	16	15 1 35.64	2.4026	22 30 5.7	9.072
17	13 15 50.35	2.1094	13 28 20.2	13.426	17	15 3 59.99	2.4092	22 39 6.1	8.943
18	13 17 57.07	2.1147	13 41 44.0	13.368	18	15 6 24.74	2.4158	22 47 58.8	8.813
19	13 20 4.11	2.1199	13 55 4.3	13.308	19	15 8 49.89	2.4224	22 56 43.6	8.680
20	13 22 11.46	2.1253	14 8 20.9	13.246	20	15 11 15.43	2.4289	23 5 20.4	8.547
21	13 24 19.14	2.1308	14 21 33.8	13.183	21	15 13 41.36	2.4354	23 13 49.2	8.412
22	13 26 27.15	2.1363	14 34 42.9	13.118	22	15 16 7.68	2.4419	23 22 9.8	8.275
23	13 28 35.49	2.1418	-14 47 48.0	-13.053	23	15 18 34.39	2.4484	-23 30 22.2	-8.137
FEBRUARY 23.					FEBRUARY 25.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	13 30 44.16	2.1473	-15 0 49.2	-12.986	0	15 21 1.49	2.4548	-23 38 26.2	-7.997
1	13 32 53.17	2.1530	15 13 46.3	12.917	1	15 23 28.97	2.4613	23 46 21.8	7.866
2	13 35 2.52	2.1588	15 26 39.2	12.847	2	15 25 56.84	2.4676	23 54 8.9	7.713
3	13 37 12.22	2.1645	15 39 27.9	12.776	3	15 28 25.08	2.4738	24 1 47.4	7.569
4	13 39 22.26	2.1708	15 52 12.3	12.703	4	15 30 53.70	2.4801	24 9 17.2	7.423
5	13 41 32.65	2.1762	16 4 52.2	12.628	5	15 33 22.69	2.4863	24 16 38.2	7.277
6	13 43 43.40	2.1822	16 17 27.6	12.552	6	15 35 52.05	2.4925	24 23 50.4	7.129
7	13 45 54.51	2.1881	16 29 58.4	12.474	7	15 38 21.77	2.4984	24 30 53.7	6.979
8	13 48 5.97	2.1941	16 42 24.5	12.396	8	15 40 51.86	2.5045	24 37 47.9	6.828
9	13 50 17.80	2.2008	16 54 45.9	12.316	9	15 43 22.31	2.5104	24 44 33.0	6.675
10	13 52 30.00	2.2068	17 7 2.4	12.234	10	15 45 53.11	2.5163	24 51 8.9	6.522
11	13 54 42.56	2.2124	17 19 14.0	12.151	11	15 48 24.26	2.5220	24 57 35.6	6.368
12	13 56 55.49	2.2187	17 31 20.5	12.066	12	15 50 55.75	2.5278	25 3 53.0	6.211
13	13 59 8.80	2.2249	17 43 21.9	11.980	13	15 53 27.59	2.5334	25 10 0.9	6.053
14	14 1 22.48	2.2312	17 55 18.1	11.892	14	15 55 59.76	2.5390	25 15 59.3	5.893
15	14 3 36.54	2.2375	18 7 8.9	11.802	15	15 58 32.27	2.5445	25 21 48.1	5.733
16	14 5 50.98	2.2438	18 18 54.3	11.712	16	16 1 5.10	2.5498	25 27 27.3	5.573
17	14 8 5.80	2.2503	18 30 34.3	11.620	17	16 3 38.25	2.5552	25 32 56.8	5.409
18	14 10 21.01	2.2567	18 42 8.7	11.526	18	16 6 11.72	2.5603	25 38 16.4	5.245
19	14 12 36.60	2.2631	18 53 37.4	11.430	19	16 8 45.49	2.5654	25 43 26.2	5.081
20	14 14 52.58	2.2697	19 5 0.3	11.333	20	16 11 19.57	2.5704	25 48 26.1	4.915
21	14 17 8.96	2.2762	19 16 17.4	11.235	21	16 13 53.94	2.5753	25 53 16.0	4.748
22	14 19 25.72	2.2827	19 27 28.5	11.135	22	16 16 28.61	2.5802	25 57 55.8	4.578
23	14 21 42.88	2.2893	19 38 33.6	11.033	23	16 19 3.56	2.5848	26 2 25.4	4.408
24	14 24 0.43	2.2958	-19 49 32.5	-10.930	24	16 21 38.79	2.5894	-26 6 44.8	-4.238

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
FEBRUARY 26.					FEBRUARY 28.				
0	h m s	s	° ' "	"	0	h m s	s	° ' "	"
0	16 21 38.79	2.5894	-26 6 44.8	-4.238	0	18 28 36.94	2.6430	-26 0 55.7	+ 4.569
1	16 24 14.29	2.5939	26 10 54.0	4.067	1	18 31 15.44	2.6404	25 56 16.1	4.750
2	16 26 50.06	2.5983	26 14 52.8	3.893	2	18 33 53.79	2.6378	25 51 25.7	4.930
3	16 29 26.08	2.6024	26 18 41.2	3.720	3	18 36 31.97	2.6349	25 46 24.5	5.110
4	16 32 2.35	2.6066	26 22 19.2	3.546	4	18 39 9.98	2.6319	25 41 12.5	5.289
5	16 34 38.87	2.6106	26 25 46.7	3.370	5	18 41 47.80	2.6288	25 35 49.8	5.466
6	16 37 15.62	2.6144	26 29 3.6	3.193	6	18 44 25.43	2.6255	25 30 16.4	5.645
7	16 39 52.60	2.6182	26 32 9.9	3.017	7	18 47 2.86	2.6221	25 24 32.4	5.822
8	16 42 29.80	2.6218	26 35 5.6	2.838	8	18 49 40.08	2.6187	25 18 37.8	5.996
9	16 45 7.21	2.6253	26 37 50.5	2.659	9	18 52 17.10	2.6151	25 12 32.7	6.172
10	16 47 44.83	2.6286	26 40 24.7	2.480	10	18 54 53.89	2.6113	25 6 17.2	6.345
11	16 50 22.64	2.6318	26 42 48.1	2.299	11	18 57 30.46	2.6075	24 59 51.3	6.515
12	16 53 0.64	2.6348	26 45 0.6	2.118	12	19 0 6.79	2.6035	24 53 15.1	6.689
13	16 55 38.82	2.6378	26 47 2.3	1.937	13	19 2 42.88	2.5994	24 46 28.6	6.860
14	16 58 17.17	2.6405	26 48 53.0	1.753	14	19 5 18.72	2.5953	24 39 31.9	7.029
15	17 0 55.68	2.6431	26 50 32.7	1.570	15	19 7 54.31	2.5910	24 32 25.1	7.197
16	17 3 34.34	2.6456	26 52 1.4	1.387	16	19 10 29.64	2.5866	24 25 8.3	7.363
17	17 6 13.15	2.6479	26 53 19.1	1.203	17	19 13 4.70	2.5821	24 17 41.5	7.530
18	17 8 52.09	2.6501	26 54 25.7	1.018	18	19 15 39.49	2.5775	24 10 4.7	7.694
19	17 11 31.16	2.6521	26 55 21.3	0.833	19	19 18 14.00	2.5728	24 2 18.2	7.856
20	17 14 10.34	2.6539	26 56 5.7	0.647	20	19 20 48.23	2.5681	23 54 21.8	8.020
21	17 16 49.63	2.6558	26 56 38.9	0.461	21	19 23 22.17	2.5633	23 46 15.8	8.180
22	17 19 29.03	2.6573	26 57 1.0	0.275	22	19 25 55.82	2.5583	23 38 0.2	8.339
23	17 22 8.51	2.6587	-26 57 11.9	-0.088	23	19 28 29.17	2.5533	-23 29 35.1	+ 8.496
FEBRUARY 27.					FEBRUARY 29.				
0	17 24 48.07	2.6599	-26 57 11.6	+0.096	0	19 31 2.21	2.5482	-23 21 0.5	+ 8.654
1	17 27 27.70	2.6610	26 57 0.1	0.286	1	19 33 34.95	2.5430	23 12 16.6	8.809
2	17 30 7.39	2.6620	26 56 37.3	0.473	2	19 36 7.37	2.5378	23 3 23.4	8.963
3	17 32 47.14	2.6628	26 56 3.3	0.661	3	19 38 39.48	2.5326	22 54 21.1	9.115
4	17 35 26.92	2.6633	26 55 18.0	0.848	4	19 41 11.27	2.5272	22 45 9.6	9.266
5	17 38 6.74	2.6638	26 54 21.5	1.036	5	19 43 42.74	2.5218	22 35 49.2	9.415
6	17 40 46.58	2.6642	26 53 13.7	1.224	6	19 46 13.88	2.5162	22 26 19.8	9.563
7	17 43 26.44	2.6643	26 51 54.6	1.412	7	19 48 44.68	2.5106	22 16 41.6	9.709
8	17 46 6.30	2.6643	26 50 24.3	1.599	8	19 51 15.15	2.5051	22 6 54.7	9.853
9	17 48 46.15	2.6641	26 48 42.7	1.788	9	19 53 45.29	2.4994	21 56 59.2	9.997
10	17 51 25.99	2.6638	26 46 49.8	1.975	10	19 56 15.08	2.4937	21 46 55.1	10.138
11	17 54 5.81	2.6633	26 44 45.7	2.163	11	19 58 44.53	2.4880	21 36 42.6	10.278
12	17 56 45.59	2.6627	26 42 30.3	2.350	12	20 1 13.64	2.4823	21 26 21.7	10.417
13	17 59 25.33	2.6618	26 40 3.7	2.537	13	20 3 42.40	2.4764	21 15 52.6	10.553
14	18 2 5.01	2.6608	26 37 25.9	2.723	14	20 6 10.81	2.4706	21 5 15.3	10.688
15	18 4 44.63	2.6598	26 34 36.9	2.910	15	20 8 38.86	2.4646	20 54 30.0	10.821
16	18 7 24.18	2.6585	26 31 36.7	3.097	16	20 11 6.56	2.4588	20 43 36.8	10.953
17	18 10 3.65	2.6571	26 28 25.3	3.283	17	20 13 33.91	2.4528	20 32 35.7	11.083
18	18 12 43.03	2.6555	26 25 2.8	3.468	18	20 16 0.90	2.4468	20 21 26.8	11.212
19	18 15 22.31	2.6538	26 21 29.2	3.653	19	20 18 27.53	2.4408	20 10 10.3	11.338
20	18 18 1.49	2.6520	26 17 44.5	3.837	20	20 20 53.80	2.4349	19 58 46.3	11.463
21	18 20 40.55	2.6499	26 13 48.8	4.020	21	20 23 19.72	2.4289	19 47 14.8	11.586
22	18 23 19.48	2.6478	26 9 42.1	4.203	22	20 25 45.27	2.4228	19 35 36.0	11.707
23	18 25 58.28	2.6455	26 5 24.4	4.387	23	20 28 10.46	2.4168	19 23 50.0	11.827
24	18 28 36.94	2.6430	-26 0 55.7	+4.569	24	20 30 35.29	2.4108	-19 11 56.8	+11.945

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
MARCH 1.					MARCH 3.				
	^h ^m ^s	^s	[°] ['] ["]	["]		^h ^m ^s	^s	[°] ['] ["]	["]
0	20 30 35.29	2.4108	-19 11 56.8	+11.946	0	22 19 45.25	2.1638	-7 57 16.3	+15.477
1	20 32 59.76	2.4048	18 59 56.6	12.090	1	22 21 54.36	2.1498	7 41 46.8	15.507
2	20 35 23.86	2.3987	18 47 49.6	12.174	2	22 24 3.22	2.1468	7 26 15.5	15.536
3	20 37 47.60	2.3927	18 35 35.7	12.268	3	22 26 11.85	2.1418	7 10 42.5	15.563
4	20 40 10.98	2.3866	18 23 15.1	12.398	4	22 28 20.24	2.1380	6 55 7.9	15.588
5	20 42 33.99	2.3806	18 10 48.0	12.506	5	22 30 28.41	2.1343	6 39 31.9	15.612
6	20 44 56.65	2.3747	17 58 14.4	12.613	6	22 32 36.35	2.1304	6 23 54.5	15.634
7	20 47 18.95	2.3686	17 45 34.4	12.719	7	22 34 44.06	2.1268	6 8 15.8	15.654
8	20 49 40.88	2.3626	17 32 48.1	12.823	8	22 36 51.56	2.1232	5 52 36.0	15.678
9	20 52 2.46	2.3567	17 19 55.7	12.923	9	22 38 58.84	2.1196	5 36 55.0	15.692
10	20 54 23.68	2.3507	17 6 57.3	13.023	10	22 41 5.91	2.1162	5 21 13.0	15.708
11	20 56 44.54	2.3448	16 53 52.9	13.122	11	22 43 12.78	2.1128	5 5 30.1	15.721
12	20 59 5.05	2.3388	16 40 42.7	13.218	12	22 45 19.44	2.1094	4 49 46.5	15.733
13	21 1 25.20	2.3329	16 27 26.8	13.312	13	22 47 25.91	2.1062	4 34 2.2	15.744
14	21 3 45.00	2.3271	16 14 5.3	13.404	14	22 49 32.18	2.1030	4 18 17.2	15.754
15	21 6 4.45	2.3212	16 0 38.3	13.496	15	22 51 38.27	2.1000	4 2 31.7	15.762
16	21 8 23.55	2.3154	15 47 5.9	13.584	16	22 53 44.18	2.0969	3 46 45.8	15.768
17	21 10 42.30	2.3096	15 33 28.2	13.671	17	22 55 49.90	2.0939	3 30 59.5	15.773
18	21 13 0.70	2.3038	15 19 45.4	13.756	18	22 57 55.45	2.0910	3 15 13.0	15.776
19	21 15 18.76	2.2981	15 5 57.5	13.840	19	23 0 0.82	2.0882	2 59 26.4	15.778
20	21 17 36.47	2.2924	14 52 4.6	13.922	20	23 2 6.03	2.0855	2 43 39.7	15.778
21	21 19 53.85	2.2868	14 38 6.9	14.001	21	23 4 11.08	2.0828	2 27 53.0	15.778
22	21 22 10.89	2.2813	14 24 4.5	14.078	22	23 6 15.97	2.0802	2 12 6.4	15.775
23	21 24 27.60	2.2757	-14 9 57.5	+14.154	23	23 8 20.70	2.0776	-1 56 20.0	+15.771
MARCH 2.					MARCH 4.				
	^h ^m ^s	^s	[°] ['] ["]	["]		^h ^m ^s	^s	[°] ['] ["]	["]
0	21 26 43.97	2.2701	-13 55 46.0	+14.228	0	23 10 25.28	2.0752	-1 40 33.9	+15.765
1	21 29 0.01	2.2647	13 41 30.1	14.301	1	23 12 29.72	2.0728	1 24 48.2	15.758
2	21 31 15.73	2.2593	13 27 9.9	14.372	2	23 14 34.01	2.0704	1 9 3.0	15.749
3	21 33 31.13	2.2539	13 12 45.5	14.441	3	23 16 38.17	2.0683	0 53 18.3	15.740
4	21 35 46.20	2.2486	12 58 17.0	14.508	4	23 18 42.20	2.0661	0 37 34.2	15.728
5	21 38 0.96	2.2433	12 43 44.6	14.573	5	23 20 46.10	2.0639	0 21 50.9	15.715
6	21 40 15.40	2.2381	12 29 8.3	14.637	6	23 22 49.87	2.0618	-0 6 8.4	15.701
7	21 42 29.53	2.2329	12 14 28.2	14.698	7	23 24 53.52	2.0598	+0 9 33.2	15.686
8	21 44 43.35	2.2278	11 59 44.5	14.758	8	23 26 57.05	2.0580	0 25 13.9	15.669
9	21 46 56.86	2.2227	11 44 57.3	14.816	9	23 29 0.48	2.0563	0 40 53.5	15.651
10	21 49 10.07	2.2177	11 30 6.6	14.873	10	23 31 3.80	2.0544	0 56 32.0	15.631
11	21 51 22.98	2.2127	11 15 12.6	14.927	11	23 33 7.01	2.0527	1 12 9.2	15.610
12	21 53 35.59	2.2078	11 0 15.4	14.979	12	23 35 10.12	2.0511	1 27 45.2	15.588
13	21 55 47.91	2.2030	10 45 15.1	15.030	13	23 37 13.14	2.0496	1 43 19.8	15.564
14	21 57 59.95	2.1983	10 30 11.8	15.079	14	23 39 16.07	2.0481	1 58 52.9	15.539
15	22 0 11.70	2.1935	10 15 5.6	15.127	15	23 41 18.91	2.0467	2 14 24.5	15.513
16	22 2 23.17	2.1888	9 59 56.6	15.173	16	23 43 21.67	2.0453	2 29 54.4	15.484
17	22 4 34.36	2.1843	9 44 44.9	15.216	17	23 45 24.35	2.0441	2 45 22.6	15.456
18	22 6 45.28	2.1798	9 29 30.7	15.258	18	23 47 26.96	2.0428	3 0 49.1	15.427
19	22 8 55.93	2.1753	9 14 13.9	15.300	19	23 49 29.49	2.0417	3 16 13.8	15.396
20	22 11 6.31	2.1708	8 58 54.7	15.338	20	23 51 31.96	2.0406	3 31 36.5	15.362
21	22 13 16.43	2.1665	8 43 33.3	15.375	21	23 53 34.36	2.0396	3 46 57.2	15.328
22	22 15 26.29	2.1623	8 28 9.7	15.411	22	23 55 36.71	2.0387	4 2 15.8	15.298
23	22 17 35.90	2.1580	8 12 44.0	15.445	23	23 57 39.00	2.0378	4 17 32.3	15.257
24	22 19 45.25	2.1538	-7 57 16.3	+15.477	24	23 59 41.25	2.0371	+4 32 46.6	+15.219

GREENWICH MEAN TIME.

Hour	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
MARCH 5.					MARCH 7.				
0	h m s	s	° ' "	"	0	h m s	s	° ' "	"
0	23 59 41.25	2.0371	+ 4 32 46.6	+15.219	0	1 37 39.12	2.0645	+15 38 40.9	+12.139
1	0 1 43.45	2.0363	4 47 58.6	15.180	1	1 39 43.04	2.0663	15 50 46.6	12.053
2	0 3 45.60	2.0355	5 3 8.2	15.140	2	1 41 47.07	2.0680	16 2 47.1	11.963
3	0 5 47.71	2.0349	5 18 15.4	15.098	3	1 43 51.20	2.0698	16 14 42.2	11.874
4	0 7 49.79	2.0344	5 33 20.0	15.055	4	1 45 55.44	2.0716	16 26 32.0	11.785
5	0 9 51.84	2.0339	5 48 22.0	15.012	5	1 47 59.79	2.0733	16 38 16.4	11.694
6	0 11 53.86	2.0335	6 3 21.4	14.968	6	1 50 4.24	2.0752	16 49 55.3	11.603
7	0 13 55.86	2.0332	6 18 18.1	14.922	7	1 52 8.81	2.0771	17 1 28.7	11.511
8	0 15 57.84	2.0328	6 33 12.0	14.874	8	1 54 13.49	2.0789	17 12 56.6	11.418
9	0 17 59.80	2.0326	6 48 3.0	14.826	9	1 56 18.28	2.0808	17 24 18.9	11.325
10	0 20 1.75	2.0324	7 2 51.1	14.777	10	1 58 23.19	2.0826	17 35 35.6	11.230
11	0 22 3.69	2.0323	7 17 36.2	14.726	11	2 0 28.21	2.0847	17 46 46.5	11.134
12	0 24 5.62	2.0322	7 32 18.2	14.674	12	2 2 33.35	2.0867	17 57 51.7	11.038
13	0 26 7.55	2.0322	7 46 57.1	14.622	13	2 4 38.61	2.0887	18 8 51.1	10.942
14	0 28 9.48	2.0323	8 1 32.8	14.568	14	2 6 43.90	2.0907	18 19 44.7	10.845
15	0 30 11.42	2.0324	8 16 5.2	14.512	15	2 8 49.49	2.0926	18 30 32.5	10.747
16	0 32 13.37	2.0326	8 30 34.2	14.456	16	2 10 55.12	2.0948	18 41 14.3	10.648
17	0 34 15.33	2.0328	8 44 59.9	14.399	17	2 13 0.87	2.0968	18 51 50.2	10.548
18	0 36 17.30	2.0331	8 59 22.1	14.341	18	2 15 6.74	2.0989	19 2 20.1	10.448
19	0 38 19.30	2.0335	9 13 40.8	14.282	19	2 17 12.74	2.1011	19 12 43.9	10.347
20	0 40 21.32	2.0338	9 27 55.9	14.222	20	2 19 18.87	2.1033	19 23 1.7	10.246
21	0 42 23.36	2.0343	9 42 7.4	14.160	21	2 21 25.13	2.1053	19 33 13.4	10.143
22	0 44 25.43	2.0348	9 56 15.1	14.098	22	2 23 31.51	2.1074	19 43 18.9	10.040
23	0 46 27.54	2.0354	+10 10 19.1	+14.034	23	2 25 38.02	2.1096	+19 53 18.2	+ 9.936
MARCH 6.					MARCH 8.				
0	0 48 29.68	2.0360	+10 24 19.2	+13.960	0	2 27 44.66	2.1118	+20 3 11.2	+ 9.832
1	0 50 31.86	2.0367	10 38 15.4	13.904	1	2 29 51.43	2.1138	20 12 58.0	9.727
2	0 52 34.08	2.0373	10 52 7.7	13.838	2	2 31 58.32	2.1160	20 22 38.4	9.621
3	0 54 36.34	2.0381	11 5 56.0	13.771	3	2 34 5.35	2.1183	20 32 12.5	9.515
4	0 56 38.65	2.0389	11 19 40.2	13.703	4	2 36 12.51	2.1204	20 41 40.2	9.408
5	0 58 41.01	2.0398	11 33 20.3	13.633	5	2 38 19.80	2.1226	20 51 1.4	9.300
6	1 0 43.43	2.0408	11 46 56.1	13.562	6	2 40 27.22	2.1248	21 0 16.2	9.193
7	1 2 45.90	2.0417	12 0 27.7	13.491	7	2 42 34.77	2.1269	21 9 24.5	9.083
8	1 4 48.43	2.0427	12 13 55.0	13.419	8	2 44 42.45	2.1292	21 18 26.2	8.974
9	1 6 51.02	2.0438	12 27 18.0	13.346	9	2 46 50.27	2.1313	21 27 21.4	8.864
10	1 8 53.68	2.0448	12 40 36.5	13.271	10	2 48 58.21	2.1335	21 36 9.9	8.753
11	1 10 56.40	2.0460	12 53 50.5	13.196	11	2 51 6.29	2.1358	21 44 51.8	8.643
12	1 12 59.20	2.0473	13 7 0.0	13.120	12	2 53 14.50	2.1379	21 53 27.0	8.531
13	1 15 2.07	2.0484	13 20 4.9	13.043	13	2 55 22.84	2.1400	22 1 55.5	8.418
14	1 17 5.01	2.0497	13 33 5.2	12.966	14	2 57 31.30	2.1421	22 10 17.2	8.305
15	1 19 8.03	2.0510	13 46 0.8	12.887	15	2 59 39.89	2.1443	22 18 32.1	8.192
16	1 21 11.13	2.0524	13 58 51.6	12.807	16	3 1 48.62	2.1465	22 26 40.2	8.078
17	1 23 14.32	2.0538	14 11 37.6	12.727	17	3 3 57.47	2.1486	22 34 41.5	7.964
18	1 25 17.59	2.0553	14 24 18.8	12.645	18	3 6 6.45	2.1507	22 42 35.9	7.849
19	1 27 20.95	2.0568	14 36 55.0	12.563	19	3 8 15.55	2.1528	22 50 23.4	7.733
20	1 29 24.40	2.0583	14 49 26.3	12.480	20	3 10 24.78	2.1549	22 58 3.9	7.617
21	1 31 27.94	2.0598	15 1 52.6	12.396	21	3 12 34.14	2.1570	23 5 37.4	7.500
22	1 33 31.57	2.0613	15 14 13.8	12.311	22	3 14 43.62	2.1590	23 13 3.9	7.383
23	1 35 35.30	2.0629	15 26 29.9	12.226	23	3 16 53.22	2.1610	23 20 23.4	7.266
24	1 37 39.12	2.0645	+15 38 40.9	+12.139	24	3 19 2.94	2.1630	+23 27 35.8	+ 7.148

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
MARCH 9.					MARCH 11.				
	<i>h m s</i>	<i>s</i>	<i>° ' "</i>	<i>"</i>		<i>h m s</i>	<i>s</i>	<i>° ' "</i>	<i>"</i>
0	3 19 2.94	2.1630	+23 27 35.8	+7.148	0	5 4 34.77	2.2174	+26 47 49.2	+1.101
1	3 21 12.78	2.1660	23 34 41.1	7.029	1	5 6 47.81	2.2173	26 48 51.4	0.972
2	3 23 22.74	2.1670	23 41 39.3	6.910	2	5 9 0.85	2.2173	26 49 45.8	0.841
3	3 25 32.82	2.1690	23 48 30.3	6.791	3	5 11 13.88	2.2171	26 50 32.3	0.711
4	3 27 43.02	2.1709	23 55 14.2	6.672	4	5 13 26.90	2.2168	26 51 11.1	0.582
5	3 29 53.33	2.1728	24 1 50.9	6.551	5	5 15 39.90	2.2166	26 51 42.1	0.453
6	3 32 3.75	2.1747	24 8 20.3	6.430	6	5 17 52.88	2.2162	26 52 5.4	0.323
7	3 34 14.29	2.1765	24 14 42.5	6.309	7	5 20 5.84	2.2158	26 52 20.8	0.192
8	3 36 24.93	2.1783	24 20 57.4	6.188	8	5 22 18.78	2.2154	26 52 28.4	+0.063
9	3 38 35.69	2.1802	24 27 5.0	6.066	9	5 24 31.69	2.2148	26 52 28.3	-0.067
10	3 40 46.55	2.1818	24 33 5.3	5.943	10	5 26 44.56	2.2143	26 52 20.4	0.196
11	3 42 57.51	2.1836	24 38 58.2	5.820	11	5 28 57.40	2.2136	26 52 4.8	0.325
12	3 45 8.58	2.1853	24 44 43.7	5.698	12	5 31 10.19	2.2128	26 51 41.4	0.455
13	3 47 19.75	2.1870	24 50 21.9	5.574	13	5 33 22.94	2.2122	26 51 10.2	0.584
14	3 49 31.02	2.1886	24 55 52.6	5.450	14	5 35 35.65	2.2114	26 50 31.3	0.713
15	3 51 42.38	2.1902	25 1 15.9	5.326	15	5 37 48.31	2.2106	26 49 44.7	0.841
16	3 53 53.84	2.1918	25 6 31.7	5.202	16	5 40 0.92	2.2097	26 48 50.4	0.970
17	3 56 5.40	2.1933	25 11 40.1	5.078	17	5 42 13.47	2.2087	26 47 48.3	1.098
18	3 58 17.04	2.1948	25 16 41.0	4.952	18	5 44 25.96	2.2077	26 46 38.6	1.226
19	4 0 28.77	2.1962	25 21 34.3	4.826	19	5 46 38.39	2.2066	26 45 21.2	1.354
20	4 2 40.58	2.1975	25 26 20.1	4.701	20	5 48 50.75	2.2054	26 43 56.1	1.483
21	4 4 52.47	2.1989	25 30 58.4	4.575	21	5 51 3.04	2.2043	26 42 23.3	1.610
22	4 7 4.45	2.2003	25 35 29.1	4.448	22	5 53 15.26	2.2031	26 40 42.9	1.738
23	4 9 16.50	2.2015	+25 39 52.2	+4.322	23	5 55 27.41	2.2018	+26 38 54.8	-1.865
MARCH 10.					MARCH 12.				
	<i>h m s</i>	<i>s</i>	<i>° ' "</i>	<i>"</i>		<i>h m s</i>	<i>s</i>	<i>° ' "</i>	<i>"</i>
0	4 11 28.63	2.2028	+25 44 7.7	+4.195	0	5 57 39.48	2.2005	+26 36 59.1	-1.992
1	4 13 40.83	2.2039	25 48 15.6	4.068	1	5 59 51.47	2.1991	26 34 55.8	2.118
2	4 15 53.10	2.2051	25 52 15.8	3.940	2	6 2 3.37	2.1977	26 32 44.9	2.244
3	4 18 5.44	2.2063	25 56 8.4	3.813	3	6 4 15.19	2.1962	26 30 26.5	2.370
4	4 20 17.85	2.2073	25 59 53.4	3.686	4	6 6 26.91	2.1946	26 28 0.5	2.497
5	4 22 30.31	2.2082	26 3 30.7	3.558	5	6 8 38.54	2.1931	26 25 26.9	2.623
6	4 24 42.83	2.2092	26 7 0.3	3.429	6	6 10 50.08	2.1914	26 22 45.8	2.748
7	4 26 55.41	2.2101	26 10 22.2	3.301	7	6 13 1.51	2.1897	26 19 57.2	2.873
8	4 29 8.04	2.2110	26 13 36.4	3.173	8	6 15 12.84	2.1880	26 17 1.1	2.998
9	4 31 20.73	2.2118	26 16 42.9	3.043	9	6 17 24.07	2.1863	26 13 57.5	3.122
10	4 33 33.46	2.2125	26 19 41.6	2.914	10	6 19 35.19	2.1844	26 10 46.5	3.245
11	4 35 46.23	2.2132	26 22 32.6	2.786	11	6 21 46.20	2.1826	26 7 28.1	3.369
12	4 37 59.04	2.2138	26 25 15.9	2.657	12	6 23 57.10	2.1807	26 4 2.2	3.493
13	4 40 11.89	2.2144	26 27 51.4	2.528	13	6 26 7.88	2.1788	26 0 28.9	3.616
14	4 42 24.77	2.2150	26 30 19.2	2.398	14	6 28 18.55	2.1768	25 56 48.3	3.738
15	4 44 37.69	2.2155	26 32 39.2	2.268	15	6 30 29.09	2.1747	25 53 0.3	3.861
16	4 46 50.63	2.2158	26 34 51.4	2.139	16	6 32 39.51	2.1727	25 49 5.0	3.983
17	4 49 3.59	2.2163	26 36 55.9	2.010	17	6 34 49.81	2.1706	25 45 2.4	4.103
18	4 51 16.58	2.2167	26 38 52.6	1.880	18	6 36 59.98	2.1684	25 40 52.6	4.224
19	4 53 29.59	2.2169	26 40 41.5	1.750	19	6 39 10.02	2.1663	25 36 35.5	4.346
20	4 55 42.61	2.2171	26 42 22.6	1.620	20	6 41 19.93	2.1640	25 32 11.1	4.467
21	4 57 55.64	2.2173	26 43 55.9	1.491	21	6 43 29.70	2.1618	25 27 39.5	4.586
22	5 0 8.68	2.2173	26 45 21.5	1.362	22	6 45 39.34	2.1595	25 23 0.8	4.706
23	5 2 21.72	2.2174	26 46 39.3	1.231	23	6 47 48.84	2.1572	25 18 14.9	4.824
24	5 4 34.77	2.2174	+26 47 49.2	+1.101	24	6 49 58.20	2.1548	+25 13 21.9	-4.943

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
MARCH 13.					MARCH 15.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	6 49 58.20	2.1548	+25 13 21.9	-4.943	0	8 30 20.52	2.0253	+19 9 27.9	-9.994
1	6 52 7.42	2.1525	25 8 21.8	5.061	1	8 32 21.96	2.0228	18 59 25.5	10.064
2	6 54 16.50	2.1501	25 3 14.6	5.178	2	8 34 23.25	2.0203	18 49 17.8	10.173
3	6 56 25.43	2.1476	24 58 0.4	5.296	3	8 36 24.39	2.0177	18 39 4.7	10.282
4	6 58 34.21	2.1451	24 52 39.1	5.413	4	8 38 25.37	2.0151	18 28 46.4	10.349
5	7 0 42.84	2.1427	24 47 10.9	5.528	5	8 40 26.20	2.0126	18 18 22.8	10.437
6	7 2 51.33	2.1402	24 41 35.7	5.644	6	8 42 26.88	2.0101	18 7 54.0	10.533
7	7 4 59.66	2.1376	24 35 53.6	5.760	7	8 44 27.41	2.0076	17 57 20.0	10.609
8	7 7 7.84	2.1350	24 30 4.5	5.875	8	8 46 27.79	2.0052	17 46 40.9	10.694
9	7 9 15.86	2.1324	24 24 8.6	5.988	9	8 48 28.03	2.0028	17 35 56.7	10.778
10	7 11 23.73	2.1298	24 18 5.9	6.103	10	8 50 28.13	2.0004	17 25 7.5	10.862
11	7 13 31.44	2.1272	24 11 56.3	6.216	11	8 52 28.08	1.9980	17 14 13.3	10.945
12	7 15 38.99	2.1245	24 5 40.0	6.328	12	8 54 27.89	1.9957	17 3 14.1	11.028
13	7 17 46.38	2.1218	23 59 17.0	6.440	13	8 56 27.56	1.9934	16 52 10.0	11.108
14	7 19 53.61	2.1192	23 52 47.2	6.553	14	8 58 27.10	1.9912	16 41 1.1	11.188
15	7 22 0.68	2.1165	23 46 10.7	6.663	15	9 0 26.50	1.9889	16 29 47.4	11.268
16	7 24 7.59	2.1138	23 39 27.6	6.773	16	9 2 25.77	1.9868	16 18 28.9	11.348
17	7 26 14.33	2.1110	23 32 37.9	6.883	17	9 4 24.91	1.9846	16 7 5.6	11.427
18	7 28 20.91	2.1083	23 25 41.6	6.993	18	9 6 23.92	1.9824	15 55 37.7	11.504
19	7 30 27.32	2.1055	23 18 38.7	7.103	19	9 8 22.80	1.9803	15 44 5.1	11.581
20	7 32 33.57	2.1028	23 11 29.3	7.210	20	9 10 21.56	1.9783	15 32 28.0	11.657
21	7 34 39.65	2.0999	23 4 13.5	7.318	21	9 12 20.20	1.9763	15 20 46.3	11.733
22	7 36 45.56	2.0971	22 56 51.2	7.425	22	9 14 18.72	1.9743	15 9 0.1	11.807
23	7 38 51.30	2.0943	+22 49 22.5	-7.532	23	9 16 17.12	1.9723	+14 57 9.5	-11.881
MARCH 14.					MARCH 16.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	7 40 56.88	2.0916	+22 41 47.4	-7.638	0	9 18 15.40	1.9704	+14 45 14.4	-11.964
1	7 43 2.29	2.0888	22 34 6.0	7.743	1	9 20 13.57	1.9686	14 33 15.0	12.027
2	7 45 7.53	2.0860	22 26 18.3	7.848	2	9 22 11.63	1.9668	14 21 11.2	12.098
3	7 47 12.60	2.0831	22 18 24.3	7.953	3	9 24 9.58	1.9650	14 9 3.2	12.169
4	7 49 17.50	2.0803	22 10 24.0	8.057	4	9 26 7.43	1.9633	13 56 50.9	12.239
5	7 51 22.24	2.0776	22 2 17.5	8.159	5	9 28 5.17	1.9615	13 44 34.5	12.308
6	7 53 26.81	2.0747	21 54 4.9	8.261	6	9 30 2.81	1.9599	13 32 13.9	12.377
7	7 55 31.20	2.0718	21 45 46.2	8.363	7	9 32 0.36	1.9583	13 19 49.3	12.444
8	7 57 35.43	2.0691	21 37 21.4	8.464	8	9 33 57.81	1.9568	13 7 20.6	12.511
9	7 59 39.49	2.0663	21 28 50.5	8.565	9	9 35 55.17	1.9552	12 54 48.0	12.577
10	8 1 43.38	2.0635	21 20 13.6	8.664	10	9 37 52.43	1.9537	12 42 11.4	12.643
11	8 3 47.11	2.0608	21 11 30.8	8.763	11	9 39 49.61	1.9523	12 29 30.9	12.707
12	8 5 50.67	2.0579	21 2 42.0	8.863	12	9 41 46.70	1.9508	12 16 46.6	12.770
13	8 7 54.06	2.0551	20 53 47.3	8.960	13	9 43 43.71	1.9496	12 3 58.5	12.833
14	8 9 57.28	2.0523	20 44 46.8	9.058	14	9 45 40.65	1.9483	11 51 6.6	12.895
15	8 12 0.34	2.0496	20 35 40.4	9.154	15	9 47 37.51	1.9471	11 38 11.1	12.966
16	8 14 3.23	2.0468	20 26 28.3	9.250	16	9 49 34.30	1.9459	11 25 11.9	13.017
17	8 16 5.96	2.0441	20 17 10.4	9.346	17	9 51 31.02	1.9448	11 12 9.1	13.077
18	8 18 8.52	2.0413	20 7 46.8	9.440	18	9 53 27.67	1.9436	10 59 2.7	13.135
19	8 20 10.92	2.0387	19 58 17.6	9.534	19	9 55 24.25	1.9426	10 45 52.9	13.192
20	8 22 13.16	2.0360	19 48 42.7	9.628	20	9 57 20.78	1.9417	10 32 39.7	13.249
21	8 24 15.24	2.0333	19 39 2.3	9.720	21	9 59 17.25	1.9407	10 19 23.0	13.306
22	8 26 17.16	2.0307	19 29 16.3	9.813	22	10 1 13.66	1.9398	10 6 3.0	13.361
23	8 28 18.92	2.0280	19 19 24.8	9.903	23	10 3 10.02	1.9389	9 52 39.7	13.415
24	8 30 20.52	2.0253	+19 9 27.9	-9.994	24	10 5 6.33	1.9382	+ 9 39 13.2	-13.468

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
MARCH 17.					MARCH 19.				
	^h ^m ^s	^s	[°] ['] ["]	["]		^h ^m ^s	^s	[°] ['] ["]	["]
0	10 5 6.33	1.9382	+9 39 13.2	-13.468	0	11 38 22.15	1.9722	- 1 51 6.4	-14.907
1	10 7 2.60	1.9375	9 25 43.5	13.521	1	11 40 20.55	1.9745	2 6 0.9	14.910
2	10 8 58.83	1.9368	9 12 10.7	13.573	2	11 42 19.09	1.9768	2 20 55.6	14.913
3	10 10 55.02	1.9362	8 58 34.8	13.624	3	11 44 17.77	1.9793	2 35 50.5	14.915
4	10 12 51.17	1.9356	8 44 55.8	13.674	4	11 46 16.60	1.9818	2 50 45.4	14.915
5	10 14 47.29	1.9352	8 31 13.9	13.723	5	11 48 15.59	1.9844	3 5 40.3	14.913
6	10 16 43.39	1.9348	8 17 29.1	13.771	6	11 50 14.73	1.9871	3 20 35.0	14.911
7	10 18 39.46	1.9343	8 3 41.4	13.818	7	11 52 14.04	1.9898	3 35 29.6	14.908
8	10 20 35.51	1.9340	7 49 50.9	13.865	8	11 54 13.51	1.9926	3 50 24.0	14.904
9	10 22 31.54	1.9337	7 35 57.6	13.910	9	11 56 13.15	1.9955	4 5 18.1	14.896
10	10 24 27.55	1.9335	7 22 1.7	13.954	10	11 58 12.97	1.9984	4 20 1.8	14.891
11	10 26 23.56	1.9334	7 8 3.1	13.998	11	12 0 12.96	2.0014	4 35 5.0	14.883
12	10 28 19.56	1.9333	6 54 1.9	14.041	12	12 2 13.14	2.0045	4 49 57.7	14.873
13	10 30 15.56	1.9333	6 39 58.2	14.083	13	12 4 13.50	2.0076	5 4 49.8	14.862
14	10 32 11.55	1.9333	6 25 52.0	14.123	14	12 6 14.05	2.0108	5 19 41.1	14.849
15	10 34 7.55	1.9333	6 11 43.4	14.163	15	12 8 14.80	2.0142	5 34 31.7	14.836
16	10 36 3.55	1.9334	5 57 32.4	14.203	16	12 10 15.75	2.0175	5 49 21.4	14.821
17	10 37 59.56	1.9337	5 43 19.1	14.241	17	12 12 16.90	2.0209	6 4 10.2	14.805
18	10 39 55.59	1.9340	5 29 3.5	14.278	18	12 14 18.26	2.0244	6 18 58.0	14.788
19	10 41 51.64	1.9343	5 14 45.8	14.313	19	12 16 19.83	2.0279	6 33 44.7	14.769
20	10 43 47.71	1.9347	5 0 26.0	14.348	20	12 18 21.61	2.0316	6 48 30.3	14.749
21	10 45 43.80	1.9351	4 46 4.0	14.383	21	12 20 23.62	2.0353	7 3 14.6	14.728
22	10 47 39.92	1.9357	4 31 40.1	14.415	22	12 22 25.85	2.0391	7 17 57.6	14.705
23	10 49 36.08	1.9363	+4 17 14.2	-14.448	23	12 24 28.31	2.0429	- 7 32 39.2	-14.681
MARCH 18.					MARCH 20.				
0	10 51 32.27	1.9368	+4 2 46.4	-14.478	0	12 26 31.00	2.0468	- 7 47 19.3	-14.655
1	10 53 28.50	1.9376	3 48 16.8	14.506	1	12 28 33.92	2.0508	8 1 57.8	14.628
2	10 55 24.78	1.9384	3 33 45.4	14.538	2	12 30 37.09	2.0548	8 16 34.7	14.600
3	10 57 21.11	1.9393	3 19 12.3	14.566	3	12 32 40.50	2.0589	8 31 9.8	14.571
4	10 59 17.49	1.9401	3 4 37.5	14.593	4	12 34 44.16	2.0631	8 45 43.2	14.540
5	11 1 13.92	1.9411	2 50 1.2	14.618	5	12 36 48.07	2.0673	9 0 14.6	14.507
6	11 3 10.42	1.9422	2 35 23.3	14.644	6	12 38 52.24	2.0716	9 14 44.0	14.473
7	11 5 6.98	1.9432	2 20 43.9	14.668	7	12 40 56.66	2.0759	9 29 11.4	14.438
8	11 7 3.60	1.9443	2 6 3.2	14.690	8	12 43 1.35	2.0804	9 43 36.6	14.401
9	11 9 0.30	1.9457	1 51 21.1	14.713	9	12 45 6.31	2.0849	9 57 59.5	14.363
10	11 10 57.08	1.9469	1 36 37.7	14.733	10	12 47 11.54	2.0894	10 12 20.1	14.324
11	11 12 53.93	1.9483	1 21 53.1	14.753	11	12 49 17.04	2.0940	10 26 38.4	14.283
12	11 14 50.87	1.9498	1 7 7.4	14.771	12	12 51 22.82	2.0987	10 40 54.1	14.240
13	11 16 47.90	1.9513	0 52 20.6	14.788	13	12 53 28.88	2.1034	10 55 7.2	14.196
14	11 18 45.02	1.9528	0 37 32.8	14.805	14	12 55 35.23	2.1083	11 9 17.6	14.151
15	11 20 42.23	1.9543	0 22 44.0	14.820	15	12 57 41.87	2.1132	11 23 25.3	14.104
16	11 22 39.54	1.9561	+0 7 54.4	14.833	16	12 59 48.81	2.1181	11 37 30.1	14.056
17	11 24 36.96	1.9579	-0 6 56.0	14.847	17	13 1 56.04	2.1230	11 51 32.0	14.006
18	11 26 34.49	1.9598	0 21 47.2	14.859	18	13 4 3.57	2.1281	12 5 30.8	13.954
19	11 28 32.13	1.9617	0 36 39.1	14.870	19	13 6 11.41	2.1333	12 19 26.5	13.901
20	11 30 29.89	1.9636	0 51 31.6	14.880	20	13 8 19.56	2.1383	12 33 18.9	13.847
21	11 32 27.76	1.9656	1 6 24.7	14.888	21	13 10 28.01	2.1434	12 47 8.1	13.792
22	11 34 25.76	1.9678	1 21 18.2	14.895	22	13 12 36.77	2.1488	13 0 53.9	13.734
23	11 36 23.89	1.9699	1 36 12.1	14.902	23	13 14 45.86	2.1542	13 14 36.2	13.675
24	11 38 22.15	1.9722	-1 51 6.4	-14.907	24	13 16 55.27	2.1595	-13 28 14.9	-13.614

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
MARCH 21.					MARCH 23.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	13 16 55.27	2.1695	-13 28 14.9	-13.614	0	15 7 27.31	2.4515	-22 41 42.8	-8.530
1	13 19 5.00	2.1649	13 41 49.9	13.552	1	15 9 54.58	2.4574	22 50 28.5	8.602
2	13 21 15.06	2.1704	13 55 21.1	13.488	2	15 12 22.20	2.4633	22 59 5.8	8.552
3	13 23 25.45	2.1759	14 8 48.5	13.423	3	15 14 50.18	2.4693	23 7 34.7	8.410
4	13 25 36.17	2.1814	14 22 11.9	13.357	4	15 17 18.51	2.4751	23 15 55.0	8.267
5	13 27 47.22	2.1871	14 35 31.3	13.288	5	15 19 47.19	2.4806	23 24 6.7	8.123
6	13 29 58.62	2.1928	14 48 46.5	13.218	6	15 22 16.21	2.4866	23 32 9.8	7.978
7	13 32 10.36	2.1986	15 1 57.5	13.147	7	15 24 45.58	2.4923	23 40 4.1	7.831
8	13 34 22.45	2.2043	15 15 4.1	13.073	8	15 27 15.28	2.4978	23 47 49.5	7.682
9	13 36 34.88	2.2101	15 28 6.3	12.999	9	15 29 45.31	2.5033	23 55 25.9	7.533
10	13 38 47.66	2.2159	15 41 4.0	12.923	10	15 32 15.68	2.5088	24 2 53.4	7.382
11	13 41 0.79	2.2218	15 53 57.1	12.845	11	15 34 46.37	2.5142	24 10 11.7	7.230
12	13 43 14.28	2.2278	16 6 45.4	12.765	12	15 37 17.38	2.5194	24 17 20.9	7.076
13	13 45 28.12	2.2337	16 19 28.9	12.684	13	15 39 48.70	2.5247	24 24 20.8	6.921
14	13 47 42.32	2.2396	16 32 7.5	12.602	14	15 42 20.34	2.5299	24 31 11.4	6.764
15	13 49 56.89	2.2458	16 44 41.1	12.518	15	15 44 52.29	2.5349	24 37 52.5	6.606
16	13 52 11.82	2.2518	16 57 9.6	12.431	16	15 47 24.53	2.5396	24 44 24.1	6.448
17	13 54 27.11	2.2579	17 9 32.8	12.343	17	15 49 57.07	2.5448	24 50 46.2	6.288
18	13 56 42.77	2.2640	17 21 50.8	12.255	18	15 52 29.90	2.5496	24 56 58.6	6.127
19	13 58 58.79	2.2702	17 34 3.4	12.164	19	15 55 3.02	2.5543	25 3 1.4	5.965
20	14 1 15.19	2.2764	17 46 10.5	12.072	20	15 57 36.41	2.5588	25 8 54.4	5.802
21	14 3 31.96	2.2826	17 58 12.0	11.978	21	16 0 10.08	2.5633	25 14 37.6	5.638
22	14 5 49.10	2.2888	18 10 7.8	11.882	22	16 2 44.01	2.5677	25 20 10.9	5.472
23	14 8 6.62	2.2951	-18 21 57.8	-11.784	23	16 5 18.20	2.5720	-25 25 34.2	-5.305
MARCH 22.					MARCH 24.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	14 10 24.51	2.3013	-18 33 41.9	-11.685	0	16 7 52.65	2.5762	-25 30 47.5	-5.138
1	14 12 42.78	2.3077	18 45 20.0	11.585	1	16 10 27.34	2.5803	25 35 50.7	4.966
2	14 15 1.43	2.3139	18 56 52.1	11.483	2	16 13 2.28	2.5843	25 40 43.7	4.796
3	14 17 20.45	2.3202	19 8 18.0	11.378	3	16 15 37.45	2.5880	25 45 26.5	4.626
4	14 19 39.85	2.3266	19 19 37.5	11.273	4	16 18 12.84	2.5918	25 49 59.1	4.457
5	14 21 59.64	2.3329	19 30 50.7	11.166	5	16 20 48.46	2.5953	25 54 21.3	4.284
6	14 24 19.80	2.3392	19 41 57.4	11.058	6	16 23 24.28	2.5988	25 58 33.2	4.112
7	14 26 40.34	2.3455	19 52 57.6	10.948	7	16 26 0.31	2.6022	26 2 34.7	3.938
8	14 29 1.26	2.3519	20 3 51.1	10.836	8	16 28 36.54	2.6054	26 6 25.7	3.763
9	14 31 22.57	2.3583	20 14 37.9	10.723	9	16 31 12.96	2.6085	26 10 6.2	3.588
10	14 33 44.26	2.3646	20 25 17.8	10.607	10	16 33 49.56	2.6115	26 13 36.2	3.411
11	14 36 6.32	2.3708	20 35 50.7	10.490	11	16 36 26.34	2.6143	26 16 55.5	3.233
12	14 38 28.76	2.3772	20 46 16.6	10.372	12	16 39 3.28	2.6170	26 20 4.2	3.056
13	14 40 51.58	2.3835	20 56 35.3	10.252	13	16 41 40.38	2.6196	26 23 2.2	2.878
14	14 43 14.78	2.3898	21 6 46.8	10.131	14	16 44 17.63	2.6220	26 25 49.5	2.699
15	14 45 38.36	2.3961	21 16 51.0	10.008	15	16 46 55.02	2.6243	26 28 26.1	2.520
16	14 48 2.31	2.4023	21 26 47.7	9.883	16	16 49 32.54	2.6263	26 30 51.9	2.339
17	14 50 26.64	2.4086	21 36 36.9	9.757	17	16 52 10.18	2.6283	26 33 6.8	2.158
18	14 52 51.34	2.4148	21 46 18.5	9.630	18	16 54 47.94	2.6302	26 35 10.9	1.978
19	14 55 16.42	2.4210	21 55 52.4	9.499	19	16 57 25.80	2.6319	26 37 4.2	1.797
20	14 57 41.86	2.4272	22 5 18.4	9.368	20	17 0 3.77	2.6335	26 38 46.5	1.615
21	15 0 7.68	2.4333	22 14 36.6	9.237	21	17 2 41.82	2.6348	26 40 18.0	1.433
22	15 2 33.86	2.4393	22 23 46.8	9.103	22	17 5 19.95	2.6362	26 41 38.5	1.250
23	15 5 0.40	2.4454	22 32 48.9	8.967	23	17 7 58.16	2.6373	26 42 48.0	1.068
24	15 7 27.31	2.4515	-22 41 42.8	-8.830	24	17 10 36.43	2.6383	-26 43 46.6	-0.885

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
MARCH 25.					MARCH 27.				
	^h ^m ^s	^s	[°] ['] ["]	["]		^h ^m ^s	^s	[°] ['] ["]	["]
0	17 10 36.43	2.6383	-26 43 46.6	-0.885	0	19 15 36.55	2.5213	-23 59 29.2	+7.492
1	17 13 14.75	2.6390	26 44 34.2	0.702	1	19 18 7.67	2.5162	23 51 55.1	7.644
2	17 15 53.11	2.6397	26 45 10.8	0.518	2	19 20 38.49	2.5110	23 44 11.9	7.796
3	17 18 31.51	2.6402	26 45 36.3	0.334	3	19 23 8.99	2.5058	23 36 19.6	7.947
4	17 21 9.93	2.6405	26 45 50.9	-0.152	4	19 25 39.18	2.5006	23 28 18.3	8.097
5	17 23 48.37	2.6408	26 45 54.5	+0.032	5	19 28 9.05	2.4951	23 20 8.0	8.245
6	17 26 26.82	2.6408	26 45 47.1	0.216	6	19 30 38.59	2.4907	23 11 48.9	8.391
7	17 29 5.27	2.6408	26 45 28.6	0.400	7	19 33 7.81	2.4843	23 3 21.1	8.536
8	17 31 43.71	2.6405	26 44 59.1	0.583	8	19 35 36.70	2.4788	22 54 44.6	8.680
9	17 34 22.13	2.6401	26 44 18.6	0.766	9	19 38 5.26	2.4732	22 45 59.5	8.823
10	17 37 0.52	2.6396	26 43 27.2	0.949	10	19 40 33.48	2.4675	22 37 5.9	8.963
11	17 39 38.87	2.6388	26 42 24.7	1.133	11	19 43 1.36	2.4618	22 28 3.9	9.103
12	17 42 17.18	2.6380	26 41 11.2	1.317	12	19 45 28.90	2.4562	22 18 53.5	9.242
13	17 44 55.43	2.6370	26 39 46.7	1.499	13	19 47 56.10	2.4504	22 9 34.9	9.378
14	17 47 33.62	2.6359	26 38 11.3	1.681	14	19 50 22.95	2.4447	22 0 8.1	9.514
15	17 50 11.74	2.6346	26 36 25.0	1.863	15	19 52 49.46	2.4389	21 50 33.2	9.648
16	17 52 49.77	2.6331	26 34 27.7	2.046	16	19 55 15.62	2.4332	21 40 50.4	9.779
17	17 55 27.71	2.6316	26 32 19.5	2.227	17	19 57 41.44	2.4273	21 30 59.7	9.910
18	17 58 5.56	2.6299	26 30 0.5	2.408	18	20 0 6.90	2.4214	21 21 1.2	10.040
19	18 0 43.30	2.6280	26 27 30.6	2.588	19	20 2 32.01	2.4156	21 10 54.9	10.168
20	18 3 20.92	2.6260	26 24 49.9	2.768	20	20 4 56.76	2.4097	21 0 41.0	10.294
21	18 5 58.42	2.6238	26 21 58.4	2.948	21	20 7 21.17	2.4038	20 50 19.6	10.418
22	18 8 35.78	2.6216	26 18 56.2	3.127	22	20 9 45.22	2.3978	20 39 50.8	10.542
23	18 11 13.01	2.6192	-26 15 43.2	+3.306	23	20 12 8.91	2.3919	-20 29 14.6	+10.664
MARCH 26.					MARCH 28.				
0	18 13 50.09	2.6167	-26 12 19.5	+3.483	0	20 14 32.25	2.3860	-20 18 31.1	+10.784
1	18 16 27.01	2.6139	26 8 45.2	3.661	1	20 16 55.23	2.3801	20 7 40.5	10.903
2	18 19 3.76	2.6111	26 5 0.2	3.838	2	20 19 17.86	2.3743	19 56 42.8	11.020
3	18 21 40.34	2.6083	26 1 4.7	4.013	3	20 21 40.14	2.3683	19 45 38.1	11.135
4	18 24 16.74	2.6052	25 56 58.6	4.188	4	20 24 2.06	2.3623	19 34 26.6	11.248
5	18 26 52.96	2.6020	25 52 42.1	4.362	5	20 26 23.62	2.3564	19 23 8.3	11.362
6	18 29 28.98	2.5987	25 48 15.2	4.536	6	20 28 44.83	2.3506	19 11 43.2	11.473
7	18 32 4.80	2.5953	25 43 37.8	4.709	7	20 31 5.69	2.3445	19 0 11.6	11.582
8	18 34 40.41	2.5917	25 38 50.1	4.880	8	20 33 26.20	2.3388	18 48 33.4	11.690
9	18 37 15.80	2.5880	25 33 52.2	5.051	9	20 35 46.35	2.3329	18 36 48.8	11.796
10	18 39 50.97	2.5843	25 28 44.0	5.222	10	20 38 6.15	2.3271	18 24 57.9	11.900
11	18 42 25.91	2.5804	25 23 25.6	5.391	11	20 40 25.60	2.3213	18 13 0.8	12.003
12	18 45 0.62	2.5764	25 17 57.1	5.560	12	20 42 44.71	2.3155	18 0 57.6	12.103
13	18 47 35.08	2.5723	25 12 18.5	5.726	13	20 45 3.46	2.3097	17 48 48.4	12.203
14	18 50 9.30	2.5682	25 6 30.0	5.892	14	20 47 21.87	2.3040	17 36 33.2	12.302
15	18 52 43.26	2.5638	25 0 31.5	6.057	15	20 49 39.94	2.2983	17 24 12.2	12.398
16	18 55 16.96	2.5594	24 54 23.2	6.220	16	20 51 57.67	2.2926	17 11 45.5	12.493
17	18 57 50.39	2.5549	24 48 5.1	6.383	17	20 54 15.05	2.2868	16 59 13.1	12.586
18	19 0 23.55	2.5504	24 41 37.2	6.546	18	20 56 32.09	2.2813	16 46 35.2	12.678
19	19 2 56.44	2.5458	24 34 59.6	6.706	19	20 58 48.80	2.2757	16 33 51.8	12.768
20	19 5 29.04	2.5410	24 28 12.5	6.865	20	21 1 5.17	2.2701	16 21 3.0	12.857
21	19 8 1.36	2.5363	24 21 15.8	7.024	21	21 3 21.21	2.2646	16 8 9.0	12.943
22	19 10 33.39	2.5313	24 14 9.6	7.181	22	21 5 36.92	2.2591	15 55 9.8	13.028
23	19 13 5.12	2.5263	24 6 54.1	7.337	23	21 7 52.90	2.2537	15 42 5.6	13.112
24	19 15 36.55	2.5213	-23 59 29.2	+7.492	24	21 10 7.36	2.2483	-15 28 56.4	+13.194

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
MARCH 29.					MARCH 31.				
	^h ^m ^s ^s		[°] ['] ["] ["]			^h ^m ^s ^s		[°] ['] ["] ["]	
0	21 10 7.36	2.2453	-15 28 56.4	+13.194	0	22 52 52.30	2.0577	-3 50 24.9	+15.338
1	21 12 22.09	2.2428	15 15 42.3	13.374	1	22 54 55.69	2.0553	3 35 4.3	15.347
2	21 14 36.50	2.2376	15 2 23.5	13.353	2	22 56 58.94	2.0531	3 19 43.3	15.353
3	21 16 50.60	2.2323	14 49 0.0	13.431	3	22 59 2.06	2.0509	3 4 21.9	15.360
4	21 19 4.38	2.2271	14 35 31.8	13.507	4	23 1 5.05	2.0486	2 49 0.1	15.366
5	21 21 17.85	2.2219	14 21 59.2	13.581	5	23 3 7.92	2.0466	2 33 38.0	15.369
6	21 23 31.01	2.2168	14 9 22.1	13.653	6	23 5 10.67	2.0445	2 18 15.8	15.371
7	21 25 43.87	2.2118	13 54 40.8	13.724	7	23 7 13.30	2.0426	2 2 53.5	15.373
8	21 27 56.42	2.2068	13 40 55.2	13.794	8	23 9 15.82	2.0411	1 47 31.1	15.373
9	21 30 8.68	2.2018	13 27 5.5	13.862	9	23 11 18.23	2.0398	1 32 8.8	15.371
10	21 32 20.64	2.1968	13 13 11.8	13.928	10	23 13 20.54	2.0377	1 16 46.6	15.368
11	21 34 32.30	2.1919	12 59 14.1	13.993	11	23 15 22.75	2.0360	1 1 24.7	15.363
12	21 36 43.67	2.1872	12 45 12.6	14.056	12	23 17 24.86	2.0344	0 46 3.1	15.357
13	21 38 54.76	2.1826	12 31 7.4	14.118	13	23 19 26.88	2.0330	0 30 41.9	15.350
14	21 41 5.57	2.1778	12 16 58.5	14.178	14	23 21 28.82	2.0317	0 15 21.1	15.343
15	21 43 16.10	2.1732	12 2 46.0	14.238	15	23 23 30.68	2.0303	-0 0 0.8	15.333
16	21 45 26.35	2.1686	11 48 30.0	14.294	16	23 25 32.46	2.0291	+0 15 18.8	15.321
17	21 47 36.33	2.1641	11 34 10.7	14.349	17	23 27 34.17	2.0279	0 30 37.7	15.309
18	21 49 46.04	2.1597	11 19 48.1	14.403	18	23 29 35.81	2.0268	0 45 55.9	15.296
19	21 51 55.49	2.1553	11 5 22.3	14.456	19	23 31 37.38	2.0257	1 1 13.2	15.281
20	21 54 4.67	2.1509	10 50 53.4	14.508	20	23 33 38.89	2.0245	1 16 29.6	15.265
21	21 56 13.60	2.1468	10 36 21.4	14.558	21	23 35 40.35	2.0233	1 31 45.0	15.246
22	21 58 22.28	2.1426	10 21 46.5	14.605	22	23 37 41.75	2.0220	1 46 59.3	15.229
23	22 0 30.71	2.1384	-10 7 8.8	+14.651	23	23 39 43.10	2.0222	+2 2 12.5	+15.210
MARCH 30.					APRIL 1.				
0	22 2 38.89	2.1343	-9 52 28.4	+14.696	0	23 41 44.41	2.0215	+2 17 24.5	+15.188
1	22 4 46.83	2.1303	9 37 45.3	14.739	1	23 43 45.68	2.0208	2 32 35.1	15.166
2	22 6 54.53	2.1264	9 22 59.7	14.781	2	23 45 46.91	2.0203	2 47 44.4	15.143
3	22 9 2.00	2.1226	9 8 11.6	14.822	3	23 47 48.10	2.0197	3 2 52.3	15.118
4	22 11 9.24	2.1188	8 53 21.1	14.861	4	23 49 49.27	2.0193	3 17 58.6	15.092
5	22 13 16.26	2.1151	8 38 28.3	14.898	5	23 51 50.41	2.0188	3 33 3.3	15.065
6	22 15 23.05	2.1114	8 23 33.3	14.934	6	23 53 51.53	2.0185	3 48 6.4	15.037
7	22 17 29.63	2.1078	8 8 36.2	14.969	7	23 55 52.63	2.0183	4 3 7.7	15.007
8	22 19 35.99	2.1043	7 53 37.0	15.003	8	23 57 53.72	2.0181	4 18 7.2	14.976
9	22 21 42.15	2.1009	7 38 35.9	15.034	9	23 59 54.80	2.0179	4 33 4.8	14.944
10	22 23 48.10	2.0975	7 23 32.9	15.064	10	0 1 55.87	2.0178	4 48 0.5	14.911
11	22 25 53.85	2.0943	7 8 28.2	15.093	11	0 3 56.94	2.0178	5 2 54.1	14.876
12	22 27 59.41	2.0910	6 53 21.8	15.120	12	0 5 58.01	2.0179	5 17 45.6	14.840
13	22 30 4.77	2.0878	6 38 13.8	15.146	13	0 7 59.09	2.0180	5 32 34.9	14.803
14	22 32 9.95	2.0848	6 23 4.3	15.170	14	0 10 0.17	2.0182	5 47 22.0	14.766
15	22 34 14.94	2.0817	6 7 53.4	15.193	15	0 12 1.27	2.0184	6 2 6.8	14.727
16	22 36 19.75	2.0788	5 52 41.1	15.215	16	0 14 2.38	2.0187	6 16 49.2	14.687
17	22 38 24.39	2.0759	5 37 27.6	15.234	17	0 16 3.51	2.0191	6 31 29.2	14.645
18	22 40 28.86	2.0731	5 22 13.0	15.253	18	0 18 4.67	2.0195	6 46 6.6	14.602
19	22 42 33.16	2.0703	5 6 57.2	15.272	19	0 20 5.85	2.0199	7 0 41.4	14.558
20	22 44 37.29	2.0676	4 51 40.4	15.288	20	0 22 7.06	2.0204	7 15 13.6	14.513
21	22 46 41.27	2.0651	4 36 22.7	15.302	21	0 24 8.30	2.0210	7 29 43.0	14.467
22	22 48 45.10	2.0625	4 21 4.2	15.315	22	0 26 9.58	2.0217	7 44 9.6	14.419
23	22 50 48.77	2.0600	4 5 44.9	15.328	23	0 28 10.90	2.0223	7 58 33.3	14.371
24	22 52 52.30	2.0577	-3 50 24.9	+15.338	24	0 30 12.26	2.0231	+8 12 54.1	+14.322

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
APRIL 2.					APRIL 4.				
0	h m s	s	° ' "	"	0	h m s	s	° ' "	"
0	0 30 12.26	2.0231	+ 8 12 54.1	+14.322	0	2 9 2.26	2.1083	+18 23 7.6	+10.724
1	0 32 13.67	2.0239	8 27 11.9	14.271	1	2 11 8.83	2.1107	18 33 48.1	10.626
2	0 34 15.13	2.0248	8 41 26.6	14.219	2	2 13 15.54	2.1131	18 44 22.7	10.528
3	0 36 16.64	2.0257	8 55 38.2	14.167	3	2 15 22.40	2.1155	18 54 51.4	10.428
4	0 38 18.21	2.0267	9 9 46.6	14.113	4	2 17 29.40	2.1179	19 5 14.1	10.328
5	0 40 19.84	2.0277	9 23 51.7	14.057	5	2 19 36.55	2.1204	19 15 30.8	10.228
6	0 42 21.53	2.0288	9 37 53.4	14.001	6	2 21 43.85	2.1228	19 25 41.4	10.125
7	0 44 23.29	2.0298	9 51 51.8	13.944	7	2 23 51.29	2.1253	19 35 45.8	10.022
8	0 46 25.11	2.0310	10 5 46.7	13.885	8	2 25 58.88	2.1278	19 45 44.0	9.918
9	0 48 27.01	2.0323	10 19 38.0	13.826	9	2 28 6.62	2.1302	19 55 36.0	9.815
10	0 50 28.98	2.0335	10 33 25.8	13.766	10	2 30 14.50	2.1326	20 5 21.8	9.710
11	0 52 31.03	2.0348	10 47 9.9	13.704	11	2 32 22.53	2.1351	20 15 1.2	9.603
12	0 54 33.15	2.0361	11 0 50.3	13.642	12	2 34 30.71	2.1375	20 24 34.2	9.497
13	0 56 35.36	2.0375	11 14 26.9	13.578	13	2 36 39.03	2.1399	20 34 0.8	9.390
14	0 58 37.65	2.0389	11 27 59.6	13.513	14	2 38 47.50	2.1424	20 43 21.0	9.283
15	1 0 40.03	2.0405	11 41 28.4	13.447	15	2 40 56.12	2.1448	20 52 34.7	9.173
16	1 2 42.51	2.0421	11 54 53.2	13.380	16	2 43 4.88	2.1472	21 1 41.8	9.064
17	1 4 45.08	2.0436	12 8 14.0	13.312	17	2 45 13.78	2.1496	21 10 42.4	8.954
18	1 6 47.74	2.0452	12 21 30.6	13.243	18	2 47 22.83	2.1520	21 19 36.3	8.843
19	1 8 50.50	2.0468	12 34 43.1	13.173	19	2 49 32.02	2.1543	21 28 23.6	8.733
20	1 10 53.36	2.0485	12 47 51.4	13.103	20	2 51 41.35	2.1567	21 37 4.2	8.620
21	1 12 56.32	2.0502	13 0 55.4	13.030	21	2 53 50.82	2.1590	21 45 38.0	8.508
22	1 14 59.38	2.0520	13 13 55.0	12.957	22	2 56 0.43	2.1614	21 54 5.1	8.394
23	1 17 2.56	2.0539	+13 26 50.2	+12.883	23	2 58 10.19	2.1638	+22 2 25.3	+ 8.279
APRIL 3.					APRIL 5.				
0	1 19 5.85	2.0558	+13 39 41.0	+12.806	0	3 0 20.08	2.1660	+22 10 38.6	+ 8.165
1	1 21 9.25	2.0576	13 52 27.2	12.732	1	3 2 30.11	2.1683	22 18 45.1	8.050
2	1 23 12.76	2.0595	14 5 8.8	12.655	2	3 4 40.27	2.1705	22 26 44.6	7.934
3	1 25 16.39	2.0614	14 17 45.8	12.578	3	3 6 50.57	2.1728	22 34 37.2	7.818
4	1 27 20.13	2.0633	14 30 18.1	12.498	4	3 9 1.00	2.1749	22 42 22.8	7.701
5	1 29 23.99	2.0654	14 42 45.6	12.418	5	3 11 11.56	2.1771	22 50 1.3	7.583
6	1 31 27.98	2.0675	14 55 8.2	12.337	6	3 13 22.25	2.1793	22 57 32.8	7.465
7	1 33 32.09	2.0696	15 7 26.0	12.255	7	3 15 33.07	2.1813	23 4 57.1	7.346
8	1 35 36.32	2.0716	15 19 38.8	12.173	8	3 17 44.01	2.1834	23 12 14.3	7.227
9	1 37 40.68	2.0738	15 31 46.7	12.089	9	3 19 55.08	2.1855	23 19 24.3	7.108
10	1 39 45.17	2.0759	15 43 49.5	12.004	10	3 22 6.27	2.1875	23 26 27.2	6.988
11	1 41 49.79	2.0781	15 55 47.2	11.918	11	3 24 17.58	2.1896	23 33 22.8	6.866
12	1 43 54.54	2.0803	16 7 39.7	11.832	12	3 26 29.01	2.1915	23 40 11.1	6.745
13	1 45 59.42	2.0825	16 19 27.0	11.745	13	3 28 40.56	2.1934	23 46 52.2	6.623
14	1 48 4.44	2.0848	16 31 9.1	11.657	14	3 30 52.22	2.1953	23 53 25.9	6.501
15	1 50 9.59	2.0870	16 42 45.8	11.567	15	3 33 3.99	2.1972	23 59 52.3	6.378
16	1 52 14.88	2.0893	16 54 17.1	11.477	16	3 35 15.88	2.1990	24 6 11.3	6.255
17	1 54 20.31	2.0917	17 5 43.0	11.386	17	3 37 27.87	2.2007	24 12 22.9	6.131
18	1 56 25.88	2.0940	17 17 3.4	11.294	18	3 39 39.96	2.2024	24 18 27.0	6.007
19	1 58 31.59	2.0963	17 28 18.3	11.201	19	3 41 52.16	2.2042	24 24 23.7	5.883
20	2 0 37.44	2.0987	17 39 27.5	11.107	20	3 44 4.46	2.2058	24 30 13.0	5.758
21	2 2 43.43	2.1010	17 50 31.1	11.013	21	3 46 16.86	2.2074	24 35 54.7	5.633
22	2 4 49.56	2.1034	18 1 29.0	10.918	22	3 48 29.35	2.2089	24 41 28.9	5.507
23	2 6 55.84	2.1058	18 12 21.2	10.822	23	3 50 41.93	2.2105	24 46 55.5	5.381
24	2 9 2.26	2.1083	+18 23 7.6	+10.724	24	3 52 54.61	2.2120	+24 52 14.6	+ 5.255

GREENWICH MEAN TIME.

Hour.	Right Ascension.			Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.			Var. per Min.	Declination.	Var. per Min.				
APRIL 6.							APRIL 8.										
	h	m	s	s	°	'	''		h	m	s	s	°	'	''	''	
0	3	52	54.61	2.2120	+24	52	14.6	+5.255	0	5	39	43.24	2.2154	+26	35	12.7	-0.979
1	3	55	7.37	2.2134	24	57	26.1	5.128	1	5	41	56.12	2.2140	26	34	10.1	1.108
2	3	57	20.22	2.2148	25	2	30.0	5.002	2	5	44	8.92	2.2126	26	32	59.8	1.233
3	3	59	33.14	2.2160	25	7	26.3	4.874	3	5	46	21.63	2.2111	26	31	41.9	1.363
4	4	1	46.14	2.2173	25	12	14.9	4.746	4	5	48	34.25	2.2095	26	30	16.3	1.491
5	4	3	59.22	2.2186	25	16	55.8	4.618	5	5	50	46.77	2.2078	26	28	43.0	1.618
6	4	6	12.37	2.2198	25	21	29.0	4.490	6	5	52	59.19	2.2062	26	27	2.1	1.745
7	4	8	25.59	2.2208	25	25	54.6	4.362	7	5	55	11.51	2.2045	26	25	13.6	1.872
8	4	10	38.87	2.2219	25	30	12.4	4.233	8	5	57	23.73	2.2028	26	23	17.5	1.998
9	4	12	52.22	2.2229	25	34	22.5	4.103	9	5	59	35.84	2.2008	26	21	13.9	2.123
10	4	15	5.62	2.2238	25	38	24.8	3.974	10	6	1	47.83	2.1989	26	19	2.7	2.249
11	4	17	19.08	2.2248	25	42	19.4	3.845	11	6	3	59.71	2.1970	26	16	44.0	2.374
12	4	19	32.59	2.2256	25	46	6.2	3.715	12	6	6	11.47	2.1950	26	14	17.8	2.499
13	4	21	46.15	2.2264	25	49	45.2	3.586	13	6	8	23.11	2.1930	26	11	44.1	2.623
14	4	23	59.76	2.2272	25	53	16.5	3.457	14	6	10	34.63	2.1909	26	9	3.0	2.748
15	4	26	13.41	2.2278	25	56	40.0	3.326	15	6	12	46.02	2.1888	26	6	14.4	2.872
16	4	28	27.09	2.2283	25	59	55.6	3.195	16	6	14	57.29	2.1867	26	3	18.4	2.995
17	4	30	40.81	2.2289	26	3	3.4	3.065	17	6	17	8.42	2.1844	26	0	15.0	3.118
18	4	32	54.56	2.2294	26	6	3.4	2.934	18	6	19	19.42	2.1822	25	57	4.2	3.241
19	4	35	8.34	2.2298	26	8	55.5	2.803	19	6	21	30.28	2.1798	25	53	46.1	3.363
20	4	37	22.14	2.2302	26	11	39.8	2.673	20	6	23	41.00	2.1775	25	50	20.7	3.484
21	4	39	35.96	2.2305	26	14	16.2	2.542	21	6	25	51.58	2.1751	25	46	48.0	3.605
22	4	41	49.80	2.2308	26	16	44.8	2.411	22	6	28	2.01	2.1727	25	43	8.1	3.728
23	4	44	3.65	2.2309	+26	19	5.5	+2.279	23	6	30	12.30	2.1703	+25	39	20.9	-3.847
APRIL 7.							APRIL 9.										
	h	m	s	s	°	'	''		h	m	s	s	°	'	''	''	
0	4	46	17.51	2.2311	+26	21	18.3	+2.148	0	6	32	22.44	2.1678	+25	35	26.5	-3.967
1	4	48	31.38	2.2312	26	23	23.3	2.018	1	6	34	32.43	2.1653	25	31	24.9	4.086
2	4	50	45.25	2.2312	26	25	20.4	1.887	2	6	36	42.27	2.1627	25	27	16.2	4.204
3	4	52	59.12	2.2311	26	27	9.7	1.756	3	6	38	51.95	2.1600	25	23	0.4	4.323
4	4	55	12.98	2.2309	26	28	51.1	1.624	4	6	41	1.47	2.1574	25	18	37.4	4.442
5	4	57	26.83	2.2308	26	30	24.6	1.493	5	6	43	10.84	2.1548	25	14	7.4	4.558
6	4	59	40.67	2.2305	26	31	50.2	1.362	6	6	45	20.04	2.1520	25	9	30.4	4.676
7	5	1	54.49	2.2302	26	33	8.0	1.231	7	6	47	29.08	2.1493	25	4	46.3	4.793
8	5	4	8.29	2.2298	26	34	17.9	1.100	8	6	49	37.96	2.1466	24	59	55.3	4.908
9	5	6	22.07	2.2294	26	35	20.0	0.969	9	6	51	46.67	2.1438	24	54	57.3	5.024
10	5	8	35.82	2.2288	26	36	14.2	0.838	10	6	53	55.22	2.1411	24	49	52.4	5.139
11	5	10	49.53	2.2283	26	37	0.6	0.708	11	6	56	3.60	2.1382	24	44	40.6	5.254
12	5	13	3.21	2.2277	26	37	39.1	0.577	12	6	58	11.80	2.1353	24	39	21.9	5.368
13	5	15	16.85	2.2270	26	38	9.8	0.447	13	7	0	19.84	2.1325	24	33	56.4	5.482
14	5	17	30.45	2.2263	26	38	32.7	0.316	14	7	2	27.70	2.1295	24	28	24.1	5.594
15	5	19	41.00	2.2254	26	38	47.7	0.185	15	7	4	35.38	2.1266	24	22	45.1	5.706
16	5	21	57.50	2.2245	26	38	54.9	+0.055	16	7	6	42.89	2.1238	24	16	59.4	5.818
17	5	24	10.94	2.2236	26	38	54.3	-0.075	17	7	8	50.23	2.1208	24	11	6.9	5.930
18	5	26	24.33	2.2226	26	38	45.9	0.204	18	7	10	57.39	2.1178	24	5	7.8	6.040
19	5	28	37.65	2.2215	26	38	29.8	0.333	19	7	13	4.37	2.1149	23	59	2.1	6.150
20	5	30	50.91	2.2205	26	38	5.9	0.463	20	7	15	11.18	2.1119	23	52	49.8	6.260
21	5	33	4.11	2.2193	26	37	34.2	0.593	21	7	17	17.80	2.1088	23	46	30.9	6.369
22	5	35	17.23	2.2180	26	36	54.8	0.722	22	7	19	24.24	2.1058	23	40	5.5	6.478
23	5	37	30.27	2.2168	26	36	7.6	0.851	23	7	21	30.50	2.1028	23	33	33.6	6.586
24	5	39	43.24	2.2154	+26	35	12.7	-0.979	24	7	23	36.58	2.0998	+23	26	55.2	-6.693

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
APRIL 10.					APRIL 12.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	7 23 36.58	2.0906	+23 26 55.2	-6.693	0	9 1 1.77	1.9668	+16 13 40.2	-11.117
1	7 25 42.48	2.0908	23 20 10.4	6.799	1	9 2 59.71	1.9647	16 2 30.9	11.193
2	7 27 48.19	2.0937	23 13 19.3	6.905	2	9 4 57.53	1.9627	15 51 17.1	11.268
3	7 29 53.72	2.0907	23 6 21.8	7.011	3	9 6 55.23	1.9606	15 39 58.7	11.343
4	7 31 59.07	2.0877	22 59 18.0	7.116	4	9 8 52.80	1.9586	15 28 35.9	11.418
5	7 34 4.24	2.0846	22 52 7.9	7.221	5	9 10 50.28	1.9568	15 17 8.6	11.492
6	7 36 9.22	2.0815	22 44 51.5	7.324	6	9 12 47.61	1.9548	15 5 36.9	11.565
7	7 38 14.02	2.0785	22 37 29.0	7.427	7	9 14 44.84	1.9529	14 54 0.8	11.637
8	7 40 18.64	2.0754	22 30 0.3	7.530	8	9 16 41.96	1.9512	14 42 20.5	11.708
9	7 42 23.07	2.0723	22 22 25.4	7.632	9	9 18 38.98	1.9494	14 30 35.8	11.779
10	7 44 27.32	2.0693	22 14 44.5	7.733	10	9 20 35.89	1.9477	14 18 47.0	11.849
11	7 46 31.39	2.0663	22 6 57.5	7.833	11	9 22 32.70	1.9461	14 6 53.9	11.919
12	7 48 35.28	2.0633	21 59 4.5	7.933	12	9 24 29.42	1.9445	13 54 56.7	11.986
13	7 50 38.99	2.0603	21 51 5.5	8.033	13	9 26 26.04	1.9429	13 42 55.4	12.056
14	7 52 42.51	2.0572	21 43 0.5	8.133	14	9 28 22.57	1.9414	13 30 50.0	12.123
15	7 54 45.85	2.0542	21 34 49.6	8.231	15	9 30 19.01	1.9399	13 18 40.6	12.190
16	7 56 49.01	2.0512	21 26 32.8	8.328	16	9 32 15.36	1.9385	13 6 27.2	12.257
17	7 58 51.99	2.0483	21 18 10.2	8.425	17	9 34 11.63	1.9373	12 54 9.8	12.323
18	8 0 54.80	2.0453	21 9 41.8	8.522	18	9 36 7.83	1.9360	12 41 48.5	12.387
19	8 2 57.42	2.0423	21 1 7.6	8.618	19	9 38 3.95	1.9347	12 29 23.4	12.450
20	8 4 59.87	2.0393	20 52 27.7	8.713	20	9 39 59.99	1.9334	12 16 54.5	12.513
21	8 7 2.14	2.0364	20 43 42.1	8.807	21	9 41 55.96	1.9323	12 4 21.8	12.577
22	8 9 4.24	2.0335	20 34 50.9	8.901	22	9 43 51.87	1.9313	11 51 45.3	12.638
23	8 11 6.16	2.0306	+20 25 54.0	-8.994	23	9 45 47.71	1.9303	+11 39 5.2	-12.699
APRIL 11.					APRIL 13.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	8 13 7.91	2.0278	+20 16 51.6	-9.087	0	9 47 43.50	1.9293	+11 26 21.4	-12.760
1	8 15 9.49	2.0248	20 7 43.6	9.179	1	9 49 39.23	1.9283	11 13 34.0	12.819
2	8 17 10.89	2.0219	19 58 30.1	9.270	2	9 51 34.90	1.9274	11 0 43.1	12.878
3	8 19 12.12	2.0192	19 49 11.2	9.361	3	9 53 30.52	1.9267	10 47 48.6	12.937
4	8 21 13.19	2.0164	19 39 46.8	9.451	4	9 55 26.10	1.9260	10 34 50.7	12.993
5	8 23 14.09	2.0137	19 30 17.1	9.540	5	9 57 21.64	1.9253	10 21 49.4	13.050
6	8 25 14.83	2.0109	19 20 42.0	9.629	6	9 59 17.14	1.9247	10 8 44.7	13.107
7	8 27 15.40	2.0081	19 11 1.6	9.718	7	10 1 12.60	1.9241	9 55 36.6	13.163
8	8 29 15.80	2.0054	19 1 15.9	9.805	8	10 3 8.03	1.9236	9 42 25.2	13.217
9	8 31 16.05	2.0028	18 51 25.0	9.892	9	10 5 3.43	1.9231	9 29 10.6	13.270
10	8 33 16.14	2.0002	18 41 28.9	9.978	10	10 6 58.80	1.9226	9 15 52.8	13.323
11	8 35 16.07	1.9976	18 31 27.6	10.063	11	10 8 54.16	1.9225	9 2 31.9	13.375
12	8 37 15.85	1.9950	18 21 21.3	10.148	12	10 10 49.50	1.9223	8 49 7.8	13.427
13	8 39 15.47	1.9924	18 11 9.9	10.233	13	10 12 44.83	1.9220	8 35 40.7	13.477
14	8 41 14.94	1.9899	18 0 53.4	10.317	14	10 14 40.14	1.9218	8 22 10.6	13.527
15	8 43 14.26	1.9874	17 50 31.9	10.399	15	10 16 35.45	1.9218	8 8 37.5	13.576
16	8 45 13.43	1.9850	17 40 5.5	10.482	16	10 18 30.76	1.9218	7 55 1.5	13.624
17	8 47 12.46	1.9826	17 29 34.1	10.563	17	10 20 26.06	1.9218	7 41 22.6	13.672
18	8 49 11.34	1.9803	17 18 57.9	10.644	18	10 22 21.37	1.9219	7 27 40.9	13.718
19	8 51 10.09	1.9779	17 8 16.8	10.725	19	10 24 16.69	1.9222	7 13 56.5	13.763
20	8 53 8.69	1.9756	16 57 30.9	10.804	20	10 26 12.03	1.9224	7 0 9.3	13.809
21	8 55 7.16	1.9734	16 46 40.3	10.883	21	10 28 7.38	1.9227	6 46 19.4	13.853
22	8 57 5.50	1.9712	16 35 45.0	10.962	22	10 30 2.75	1.9231	6 32 26.9	13.897
23	8 59 3.70	1.9689	16 24 44.9	11.040	23	10 31 58.15	1.9235	6 18 31.8	13.939
24	9 1 1.77	1.9668	+16 13 40.2	-11.117	24	10 33 53.57	1.9240	+ 6 4 34.2	-13.980

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
APRIL 14.					APRIL 16.				
	^h ^m ^s	^s	[°] ['] ["]	["]		^h ^m ^s	^s	[°] ['] ["]	["]
0	10 33 53.57	1.9240	+6 4 34.2	-13.980	0	12 8 10.49	2.0325	- 5 36 32.4	-14.825
1	10 35 49.03	1.9246	5 50 34.2	-14.021	1	12 10 12.56	2.0346	5 51 21.6	-14.814
2	10 37 44.52	1.9253	5 36 31.7	-14.062	2	12 12 14.88	2.0406	6 6 10.1	-14.803
3	10 39 40.06	1.9260	5 22 26.8	-14.101	3	12 14 17.45	2.0449	6 20 57.9	-14.789
4	10 41 35.64	1.9268	5 8 19.6	-14.138	4	12 16 20.27	2.0492	6 35 44.8	-14.774
5	10 43 31.27	1.9276	4 54 10.2	-14.176	5	12 18 23.35	2.0536	6 50 30.8	-14.758
6	10 45 26.95	1.9285	4 39 58.5	-14.213	6	12 20 26.70	2.0580	7 5 15.8	-14.741
7	10 47 22.69	1.9296	4 25 44.7	-14.248	7	12 22 30.31	2.0625	7 19 59.7	-14.723
8	10 49 18.49	1.9306	4 11 28.7	-14.283	8	12 24 34.20	2.0672	7 34 42.5	-14.703
9	10 51 14.35	1.9317	3 57 10.7	-14.317	9	12 26 38.37	2.0718	7 49 24.0	-14.681
10	10 53 10.29	1.9329	3 42 50.7	-14.349	10	12 28 42.82	2.0766	8 4 4.2	-14.658
11	10 55 6.30	1.9342	3 28 28.8	-14.381	11	12 30 47.56	2.0813	8 18 43.0	-14.633
12	10 57 2.39	1.9355	3 14 5.0	-14.413	12	12 32 52.58	2.0862	8 33 20.2	-14.607
13	10 58 58.56	1.9369	2 59 39.3	-14.443	13	12 34 57.90	2.0912	8 47 55.8	-14.580
14	11 0 54.82	1.9384	2 45 11.9	-14.471	14	12 37 3.52	2.0962	9 2 29.8	-14.551
15	11 2 51.17	1.9399	2 30 42.8	-14.499	15	12 39 9.44	2.1013	9 17 1.9	-14.520
16	11 4 47.61	1.9415	2 16 12.0	-14.527	16	12 41 15.67	2.1064	9 31 32.2	-14.489
17	11 6 44.15	1.9433	2 1 39.6	-14.553	17	12 43 22.21	2.1116	9 46 0.6	-14.456
18	11 8 40.80	1.9451	1 47 5.7	-14.578	18	12 45 29.06	2.1169	10 0 26.9	-14.420
19	11 10 37.56	1.9469	1 32 30.3	-14.603	19	12 47 36.24	2.1223	10 14 51.0	-14.383
20	11 12 34.43	1.9488	1 17 53.4	-14.626	20	12 49 43.74	2.1277	10 29 12.9	-14.345
21	11 14 31.42	1.9508	1 3 15.2	-14.648	21	12 51 51.56	2.1332	10 43 32.4	-14.305
22	11 16 28.53	1.9528	0 48 35.7	-14.668	22	12 53 59.72	2.1388	10 57 49.5	-14.264
23	11 18 25.76	1.9549	+0 33 55.0	-14.688	23	12 56 8.21	2.1443	-11 12 4.1	-14.222
APRIL 15.					APRIL 17.				
	^h ^m ^s	^s	[°] ['] ["]	["]		^h ^m ^s	^s	[°] ['] ["]	["]
0	11 20 23.12	1.9572	+0 19 13.1	-14.708	0	12 58 17.04	2.1500	-11 26 16.1	-14.178
1	11 22 20.62	1.9594	+0 4 30.1	-14.726	1	13 0 26.21	2.1558	11 40 25.4	-14.131
2	11 24 18.25	1.9618	-0 10 14.0	-14.743	2	13 2 35.73	2.1616	11 54 31.8	-14.083
3	11 26 16.03	1.9643	0 24 59.0	-14.758	3	13 4 45.60	2.1674	12 8 35.3	-14.035
4	11 28 13.96	1.9668	0 39 45.0	-14.774	4	13 6 55.82	2.1733	12 22 35.8	-13.985
5	11 30 12.04	1.9693	0 54 31.9	-14.788	5	13 9 6.40	2.1793	12 36 33.2	-13.936
6	11 32 10.28	1.9720	1 9 19.5	-14.799	6	13 11 17.34	2.1854	12 50 27.4	-13.887
7	11 34 8.68	1.9747	1 24 7.8	-14.811	7	13 13 28.65	2.1915	13 4 18.3	-13.838
8	11 36 7.24	1.9775	1 38 56.8	-14.822	8	13 15 40.32	2.1976	13 18 5.8	-13.788
9	11 38 5.98	1.9804	1 53 46.4	-14.831	9	13 17 52.36	2.2038	13 31 49.8	-13.738
10	11 40 4.89	1.9833	2 8 36.5	-14.839	10	13 20 4.78	2.2102	13 45 30.1	-13.681
11	11 42 3.98	1.9863	2 23 27.1	-14.846	11	13 22 17.58	2.2164	13 59 6.7	-13.577
12	11 44 3.25	1.9894	2 38 18.0	-14.851	12	13 24 30.75	2.2226	14 12 39.5	-13.511
13	11 46 2.71	1.9926	2 53 9.2	-14.856	13	13 26 44.31	2.2292	14 26 8.4	-13.444
14	11 48 2.36	1.9958	3 8 0.7	-14.859	14	13 28 58.25	2.2356	14 39 33.2	-13.377
15	11 50 2.21	1.9993	3 22 52.3	-14.862	15	13 31 12.58	2.2421	14 52 53.9	-13.309
16	11 52 2.27	2.0027	3 37 44.1	-14.863	16	13 33 27.90	2.2487	15 6 10.3	-13.233
17	11 54 2.53	2.0061	3 52 35.9	-14.863	17	13 35 42.42	2.2553	15 19 22.4	-13.16
18	11 56 3.00	2.0096	4 7 27.6	-14.860	18	13 37 57.93	2.2619	15 32 30.0	-13.08
19	11 58 3.68	2.0132	4 22 19.1	-14.858	19	13 40 13.85	2.2687	15 45 33.0	-13.01
20	12 0 4.58	2.0169	4 37 10.5	-14.854	20	13 42 30.17	2.2753	15 58 31.4	-12.93
21	12 2 5.71	2.0208	4 52 1.6	-14.848	21	13 44 46.89	2.2820	16 11 25.0	-12.85
22	12 4 7.07	2.0246	5 6 52.3	-14.842	22	13 47 4.01	2.2888	16 24 13.7	-12.77
23	12 6 8.66	2.0285	5 21 42.6	-14.834	23	13 49 21.54	2.2956	16 36 57.4	-12.68
24	12 8 10.49	2.0325	-5 36 32.4	-14.825	24	13 51 39.48	2.3024	-16 49 35.9	-12.59

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
APRIL 18.					APRIL 20.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	13 51 39.48	2.3024	-16 49 35.9	-12.598	0	15 50 0.70	2.6142	-24 40 30.2	-6.356
1	13 53 57.83	2.3093	17 2 9.2	12.511	1	15 52 37.70	2.6191	24 46 46.5	6.186
2	13 56 16.59	2.3162	17 14 37.2	12.422	2	15 55 14.99	2.6238	24 52 52.5	6.015
3	13 58 35.77	2.3232	17 26 59.8	12.330	3	15 57 52.55	2.6283	24 58 48.3	5.843
4	14 0 55.37	2.3301	17 39 16.8	12.237	4	16 0 30.39	2.6329	25 4 33.7	5.670
5	14 3 15.38	2.3370	17 51 28.2	12.142	5	16 3 8.50	2.6373	25 10 8.7	5.496
6	14 5 35.81	2.3439	18 3 33.8	12.043	6	16 5 46.87	2.6416	25 15 33.2	5.321
7	14 7 56.65	2.3508	18 15 33.4	11.944	7	16 8 25.49	2.6457	25 20 47.2	5.144
8	14 10 17.91	2.3579	18 27 27.1	11.844	8	16 11 4.35	2.6496	25 25 50.5	4.967
9	14 12 39.60	2.3650	18 39 14.7	11.741	9	16 13 43.44	2.6534	25 30 43.2	4.788
10	14 15 1.71	2.3720	18 50 56.0	11.636	10	16 16 22.76	2.6572	25 35 25.1	4.608
11	14 17 24.24	2.3789	19 2 31.0	11.530	11	16 19 2.30	2.6607	25 39 56.2	4.428
12	14 19 47.18	2.3859	19 13 59.6	11.422	12	16 21 42.04	2.6641	25 44 16.5	4.247
13	14 22 10.55	2.3930	19 25 21.6	11.312	13	16 24 21.99	2.6673	25 48 25.8	4.064
14	14 24 34.34	2.4000	19 36 37.0	11.200	14	16 27 2.12	2.6703	25 52 24.2	3.882
15	14 26 58.55	2.4071	19 47 45.6	11.086	15	16 29 42.43	2.6733	25 56 11.6	3.698
16	14 29 23.19	2.4141	19 58 47.3	10.970	16	16 32 22.92	2.6762	25 59 47.9	3.513
17	14 31 48.24	2.4210	20 9 42.0	10.853	17	16 35 3.57	2.6787	26 3 13.1	3.328
18	14 34 13.71	2.4280	20 20 29.6	10.733	18	16 37 44.36	2.6811	26 6 27.2	3.142
19	14 36 39.60	2.4349	20 31 10.0	10.612	19	16 40 25.30	2.6834	26 9 30.1	2.955
20	14 39 5.90	2.4418	20 41 43.0	10.488	20	16 43 6.37	2.6856	26 12 21.8	2.768
21	14 41 32.62	2.4488	20 52 8.6	10.364	21	16 45 47.57	2.6876	26 15 2.2	2.580
22	14 43 59.75	2.4556	21 2 26.7	10.238	22	16 48 28.88	2.6893	26 17 31.4	2.393
23	14 46 27.29	2.4625	-21 12 37.1	-10.109	23	16 51 10.29	2.6910	-26 19 49.3	-2.203
APRIL 19.					APRIL 21.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	14 48 55.25	2.4693	-21 22 39.8	-9.979	0	16 53 51.80	2.6924	-26 21 55.8	-2.014
1	14 51 23.61	2.4761	21 32 34.6	9.847	1	16 56 33.38	2.6937	26 23 51.0	1.825
2	14 53 52.38	2.4828	21 42 21.4	9.713	2	16 59 15.04	2.6948	26 25 34.8	1.634
3	14 56 21.55	2.4895	21 52 0.1	9.578	3	17 1 56.75	2.6957	26 27 7.1	1.444
4	14 58 51.12	2.4962	22 1 30.7	9.440	4	17 4 38.52	2.6965	26 28 28.1	1.253
5	15 1 21.09	2.5028	22 10 52.9	9.301	5	17 7 20.33	2.6971	26 29 37.7	1.064
6	15 3 51.46	2.5094	22 20 6.8	9.161	6	17 10 2.17	2.6975	26 30 35.8	0.873
7	15 6 22.22	2.5158	22 29 12.2	9.018	7	17 12 44.03	2.6977	26 31 22.5	0.683
8	15 8 53.36	2.5223	22 38 9.0	8.874	8	17 15 25.89	2.6978	26 31 57.8	0.493
9	15 11 24.89	2.5286	22 46 57.1	8.728	9	17 18 7.76	2.6978	26 32 21.6	0.302
10	15 13 56.79	2.5349	22 55 36.4	8.581	10	17 20 49.62	2.6975	26 32 34.0	-0.111
11	15 16 29.08	2.5412	23 4 6.8	8.432	11	17 23 31.46	2.6970	26 32 34.9	+0.080
12	15 19 1.73	2.5473	23 12 28.2	8.281	12	17 26 13.26	2.6963	26 32 24.4	0.270
13	15 21 34.75	2.5533	23 20 40.5	8.128	13	17 28 55.01	2.6954	26 32 2.5	0.461
14	15 24 8.13	2.5593	23 28 43.6	7.975	14	17 31 36.71	2.6945	26 31 29.1	0.652
15	15 26 41.87	2.5653	23 36 37.5	7.820	15	17 34 18.35	2.6933	26 30 44.3	0.841
16	15 29 15.97	2.5712	23 44 22.0	7.663	16	17 36 59.91	2.6920	26 29 48.2	1.030
17	15 31 50.41	2.5768	23 51 57.0	7.504	17	17 39 41.39	2.6905	26 28 40.7	1.220
18	15 34 25.19	2.5824	23 59 22.5	7.345	18	17 42 22.77	2.6888	26 27 21.8	1.409
19	15 37 0.30	2.5880	24 6 38.4	7.183	19	17 45 4.05	2.6871	26 25 51.6	1.597
20	15 39 35.75	2.5935	24 13 44.5	7.020	20	17 47 45.22	2.6851	26 24 10.2	1.784
21	15 42 11.52	2.5988	24 20 40.8	6.857	21	17 50 26.26	2.6829	26 22 17.5	1.973
22	15 44 47.61	2.6040	24 27 27.3	6.692	22	17 53 7.17	2.6806	26 20 13.5	2.160
23	15 47 24.00	2.6091	24 34 3.8	6.524	23	17 55 47.93	2.6781	26 17 58.3	2.346
24	15 50 0.70	2.6142	-24 40 30.2	-6.356	24	17 58 28.54	2.6754	-26 15 32.0	+2.532

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
APRIL 22.					APRIL 24.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	17 58 28.54	2.6754	-26 15 32.0	+ 2.532	0	20 1 29.80	2.4179	-20 59 44.6	+10.113
1	18 1 8.98	2.6726	26 12 54.5	2.717	1	20 3 54.67	2.4112	20 49 34.2	10.234
2	18 3 49.25	2.6697	26 10 6.0	2.901	2	20 6 19.14	2.4044	20 39 16.5	10.354
3	18 6 29.34	2.6666	26 7 6.4	3.085	3	20 8 43.20	2.3976	20 28 51.7	10.473
4	18 9 9.24	2.6633	26 3 55.8	3.268	4	20 11 6.85	2.3906	20 18 19.8	10.589
5	18 11 48.94	2.6599	26 0 34.3	3.449	5	20 13 30.10	2.3841	20 7 41.0	10.704
6	18 14 28.43	2.6564	25 57 1.9	3.630	6	20 15 52.94	2.3773	19 56 55.3	10.815
7	18 17 7.71	2.6528	25 53 18.7	3.810	7	20 18 15.38	2.3707	19 46 2.8	10.930
8	18 19 46.76	2.6498	25 49 24.7	3.990	8	20 20 37.42	2.3639	19 35 3.7	11.040
9	18 22 25.57	2.6449	25 45 19.9	4.169	9	20 22 59.05	2.3572	19 23 58.0	11.149
10	18 25 4.15	2.6408	25 41 4.4	4.346	10	20 25 20.28	2.3505	19 12 45.8	11.258
11	18 27 42.47	2.6366	25 36 38.4	4.522	11	20 27 41.11	2.3438	19 1 27.3	11.361
12	18 30 20.54	2.6323	25 32 1.8	4.698	12	20 30 1.54	2.3372	18 50 2.5	11.464
13	18 32 58.34	2.6278	25 27 14.7	4.872	13	20 32 21.57	2.3306	18 38 31.6	11.568
14	18 35 35.87	2.6231	25 22 17.2	5.045	14	20 34 41.21	2.3240	18 26 54.6	11.667
15	18 38 13.11	2.6183	25 17 9.3	5.217	15	20 37 0.45	2.3174	18 15 11.6	11.766
16	18 40 50.07	2.6136	25 11 51.2	5.388	16	20 39 19.30	2.3108	18 3 22.7	11.863
17	18 43 26.74	2.6088	25 6 22.8	5.558	17	20 41 37.75	2.3043	17 51 28.1	11.958
18	18 46 3.10	2.6035	25 0 44.3	5.726	18	20 43 55.82	2.2979	17 39 27.8	12.052
19	18 48 39.16	2.5984	24 54 55.7	5.893	19	20 46 13.50	2.2914	17 27 21.9	12.143
20	18 51 14.91	2.5932	24 48 57.1	6.059	20	20 48 30.79	2.2850	17 15 10.6	12.233
21	18 53 50.34	2.5878	24 42 48.6	6.223	21	20 50 47.70	2.2788	17 2 53.9	12.322
22	18 56 25.44	2.5823	24 36 30.3	6.387	22	20 53 4.24	2.2724	16 50 31.9	12.411
23	18 59 0.21	2.5768	-24 30 2.2	+ 6.549	23	20 55 20.39	2.2661	-16 38 4.6	+12.497
APRIL 23.					APRIL 25.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	19 1 34.65	2.5711	-24 23 24.4	+ 6.710	0	20 57 36.17	2.2599	-16 25 32.3	+12.580
1	19 4 8.74	2.5653	24 16 37.0	6.889	1	20 59 51.58	2.2538	16 12 55.0	12.663
2	19 6 42.49	2.5595	24 9 40.1	7.027	2	21 2 6.62	2.2477	16 0 12.8	12.744
3	19 9 15.88	2.5536	24 2 33.8	7.163	3	21 4 21.30	2.2416	15 47 25.8	12.822
4	19 11 48.92	2.5477	23 55 18.2	7.338	4	21 6 35.61	2.2355	15 34 34.1	12.900
5	19 14 21.60	2.5417	23 47 53.3	7.492	5	21 8 49.56	2.2295	15 21 37.8	12.976
6	19 16 53.92	2.5356	23 40 19.2	7.643	6	21 11 3.15	2.2236	15 8 37.0	13.050
7	19 19 25.87	2.5294	23 32 36.1	7.793	7	21 13 16.39	2.2178	14 55 31.8	13.122
8	19 21 57.45	2.5232	23 24 44.0	7.943	8	21 15 29.29	2.2121	14 42 22.2	13.196
9	19 24 28.65	2.5168	23 16 43.0	8.090	9	21 17 41.84	2.2063	14 29 8.3	13.266
10	19 26 59.47	2.5105	23 8 33.2	8.236	10	21 19 54.04	2.2005	14 15 50.3	13.333
11	19 29 29.91	2.5042	23 0 14.7	8.380	11	21 22 5.90	2.1949	14 2 28.3	13.400
12	19 31 59.97	2.4977	22 51 47.6	8.523	12	21 24 17.43	2.1894	13 49 2.3	13.466
13	19 34 29.63	2.4912	22 43 12.0	8.664	13	21 26 28.63	2.1839	13 35 32.4	13.526
14	19 36 58.91	2.4848	22 34 27.9	8.804	14	21 28 39.50	2.1785	13 21 58.8	13.589
15	19 39 27.80	2.4782	22 25 35.5	8.943	15	21 30 50.05	2.1732	13 8 21.4	13.652
16	19 41 56.29	2.4715	22 16 34.8	9.079	16	21 33 0.28	2.1678	12 54 40.4	13.711
17	19 44 24.38	2.4648	22 7 26.0	9.213	17	21 35 10.19	2.1626	12 40 55.9	13.771
18	19 46 52.07	2.4583	21 58 9.2	9.347	18	21 37 19.79	2.1574	12 27 8.0	13.828
19	19 49 19.37	2.4516	21 48 44.4	9.478	19	21 39 29.08	2.1522	12 13 16.8	13.881
20	19 51 46.26	2.4448	21 39 11.8	9.608	20	21 41 38.07	2.1473	11 59 22.3	13.934
21	19 54 12.75	2.4382	21 29 31.4	9.738	21	21 43 46.75	2.1423	11 45 24.6	13.986
22	19 56 38.84	2.4314	21 19 43.3	9.864	22	21 45 55.14	2.1374	11 31 23.8	14.038
23	19 59 4.52	2.4247	21 9 47.7	9.989	23	21 48 3.24	2.1327	11 17 20.1	14.091
24	20 1 29.80	2.4179	-20 59 44.6	+10.113	24	21 50 11.06	2.1279	-11 3 13.4	+14.131

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
APRIL 26.					APRIL 28.				
	^h ^m ^s	^s	[°] ['] ["]	["]		^h ^m ^s	^s	[°] ['] ["]	["]
0	21 50 11.06	2.1279	-11 3 13.4	+14.135	0	23 28 18.53	1.9903	+ 0 44 58.1	+14.893
1	21 52 18.59	2.1233	10 49 3.9	14.181	1	23 30 17.92	1.9893	0 59 51.3	14.880
2	21 54 25.85	2.1187	10 34 51.7	14.226	2	23 32 17.25	1.9884	1 14 43.7	14.865
3	21 56 32.83	2.1141	10 20 36.8	14.269	3	23 34 16.53	1.9877	1 29 35.1	14.848
4	21 58 39.54	2.1097	10 6 19.4	14.312	4	23 36 15.77	1.9869	1 44 25.5	14.832
5	22 0 45.99	2.1053	9 51 59.4	14.353	5	23 38 14.96	1.9861	1 59 14.9	14.813
6	22 2 52.18	2.1010	9 37 37.1	14.392	6	23 40 14.10	1.9854	2 14 3.1	14.794
7	22 4 58.11	2.0968	9 23 12.4	14.430	7	23 42 13.21	1.9849	2 28 50.2	14.774
8	22 7 3.79	2.0927	9 8 45.5	14.467	8	23 44 12.29	1.9845	2 43 36.0	14.753
9	22 9 9.23	2.0886	8 54 16.4	14.502	9	23 46 11.35	1.9841	2 58 20.5	14.730
10	22 11 14.42	2.0846	8 39 45.3	14.535	10	23 48 10.38	1.9837	3 13 3.6	14.707
11	22 13 19.38	2.0807	8 25 12.2	14.568	11	23 50 9.39	1.9834	3 27 45.3	14.682
12	22 15 24.10	2.0768	8 10 37.1	14.600	12	23 52 8.39	1.9833	3 42 25.4	14.656
13	22 17 28.60	2.0731	7 56 0.2	14.629	13	23 54 7.38	1.9831	3 57 4.0	14.629
14	22 19 32.87	2.0693	7 41 21.6	14.658	14	23 56 6.36	1.9830	4 11 40.9	14.601
15	22 21 36.92	2.0658	7 26 41.3	14.686	15	23 58 5.34	1.9831	4 26 16.1	14.572
16	22 23 40.76	2.0623	7 11 59.3	14.712	16	0 0 4.33	1.9832	4 40 49.5	14.542
17	22 25 44.39	2.0588	6 57 15.9	14.736	17	0 2 3.32	1.9833	4 55 21.1	14.510
18	22 27 47.81	2.0553	6 42 31.0	14.760	18	0 4 2.32	1.9834	5 9 50.7	14.478
19	22 29 51.03	2.0521	6 27 44.7	14.782	19	0 6 1.33	1.9837	5 24 18.4	14.445
20	22 31 54.06	2.0489	6 12 57.2	14.803	20	0 8 0.36	1.9841	5 38 44.1	14.411
21	22 33 56.90	2.0458	5 58 8.4	14.823	21	0 9 59.42	1.9845	5 53 7.7	14.375
22	22 35 59.55	2.0427	5 43 18.5	14.841	22	0 11 58.50	1.9849	6 7 29.1	14.338
23	22 38 2.02	2.0397	- 5 28 27.5	+14.858	23	0 13 57.61	1.9854	+ 6 21 48.3	+14.301
APRIL 27.					APRIL 29.				
0	22 40 4.31	2.0368	- 5 13 35.5	+14.873	0	0 15 56.75	1.9890	+ 6 36 5.2	+14.263
1	22 42 6.43	2.0340	4 58 42.7	14.898	1	0 17 55.93	1.9867	6 50 19.8	14.223
2	22 44 8.39	2.0313	4 43 49.0	14.902	2	0 19 55.15	1.9874	7 4 31.9	14.182
3	22 46 10.18	2.0285	4 28 54.5	14.913	3	0 21 54.42	1.9882	7 18 41.6	14.140
4	22 48 11.81	2.0259	4 13 59.4	14.924	4	0 23 53.73	1.9889	7 32 48.7	14.097
5	22 50 13.29	2.0235	3 59 3.6	14.934	5	0 25 53.09	1.9898	7 46 53.2	14.053
6	22 52 14.63	2.0211	3 44 7.3	14.943	6	0 27 52.51	1.9908	8 0 55.1	14.009
7	22 54 15.82	2.0187	3 29 10.5	14.950	7	0 29 51.99	1.9918	8 14 54.3	13.963
8	22 56 16.87	2.0163	3 14 13.3	14.956	8	0 31 51.53	1.9929	8 28 50.6	13.915
9	22 58 17.78	2.0142	2 59 15.8	14.961	9	0 33 51.14	1.9941	8 42 44.1	13.868
10	23 0 18.57	2.0121	2 44 18.0	14.964	10	0 35 50.82	1.9953	8 56 34.7	13.818
11	23 2 19.23	2.0100	2 29 20.1	14.967	11	0 37 50.57	1.9964	9 10 22.3	13.768
12	23 4 19.77	2.0081	2 14 22.0	14.968	12	0 39 50.39	1.9977	9 24 6.9	13.718
13	23 6 20.20	2.0062	1 59 23.9	14.968	13	0 41 50.29	1.9991	9 37 48.4	13.665
14	23 8 20.51	2.0043	1 44 25.9	14.967	14	0 43 50.28	2.0005	9 51 26.7	13.612
15	23 10 20.72	2.0026	1 29 27.9	14.965	15	0 45 50.35	2.0019	10 5 1.8	13.558
16	23 12 20.82	2.0009	1 14 30.1	14.962	16	0 47 50.51	2.0034	10 18 33.7	13.503
17	23 14 20.83	1.9993	0 59 32.5	14.958	17	0 49 50.76	2.0050	10 32 2.2	13.447
18	23 16 20.74	1.9978	0 44 35.2	14.952	18	0 51 51.11	2.0067	10 45 27.3	13.389
19	23 18 20.57	1.9964	0 29 38.3	14.944	19	0 53 51.56	2.0083	10 58 48.9	13.331
20	23 20 20.31	1.9950	- 0 14 41.9	14.936	20	0 55 52.10	2.0099	11 12 7.0	13.272
21	23 22 19.97	1.9938	+ 0 0 14.0	14.928	21	0 57 52.75	2.0118	11 25 21.5	13.212
22	23 24 19.56	1.9926	0 15 9.4	14.918	22	0 59 53.51	2.0135	11 38 32.4	13.151
23	23 26 19.08	1.9914	0 30 4.1	14.906	23	1 1 54.37	2.0153	11 51 39.6	13.088
24	23 28 18.53	1.9903	+ 0 44 58.1	+14.893	24	1 3 55.35	2.0173	+12 4 43.0	+13.025

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
APRIL 30.					MAY 2.				
	^h ^m ^s	^s	[°] ['] ["]	["]		^h ^m ^s	^s	[°] ['] ["]	["]
0	1 3 55.35	2.0173	+12 4 43.0	+13.025	0	2 43 32.61	2.1407	+20 58 53.8	+8.885
1	1 5 56.44	2.0192	12 17 42.6	12.961	1	2 45 41.13	2.1434	21 7 43.7	8.778
2	1 7 57.65	2.0212	12 30 38.3	12.895	2	2 47 49.82	2.1462	21 16 27.2	8.671
3	1 9 58.98	2.0232	12 43 30.0	12.829	3	2 49 58.67	2.1489	21 25 4.2	8.562
4	1 12 0.43	2.0253	12 56 17.8	12.763	4	2 52 7.69	2.1516	21 33 34.6	8.452
5	1 14 2.01	2.0273	13 9 1.5	12.694	5	2 54 16.86	2.1542	21 41 58.4	8.342
6	1 16 3.71	2.0295	13 21 41.1	12.625	6	2 56 26.19	2.1569	21 50 15.6	8.231
7	1 18 5.55	2.0317	13 34 16.5	12.554	7	2 58 35.69	2.1597	21 58 26.1	8.119
8	1 20 7.51	2.0338	13 46 47.6	12.483	8	3 0 45.35	2.1623	22 6 29.9	8.008
9	1 22 9.61	2.0362	13 59 14.5	12.412	9	3 2 55.16	2.1648	22 14 27.0	7.894
10	1 24 11.85	2.0385	14 11 37.0	12.338	10	3 5 5.12	2.1673	22 22 17.2	7.780
11	1 26 14.23	2.0408	14 23 55.1	12.264	11	3 7 15.24	2.1699	22 30 0.6	7.666
12	1 28 16.74	2.0431	14 36 8.7	12.189	12	3 9 25.51	2.1724	22 37 37.1	7.551
13	1 30 19.40	2.0455	14 48 17.8	12.113	13	3 11 35.93	2.1749	22 45 6.7	7.436
14	1 32 22.20	2.0479	15 0 22.3	12.037	14	3 13 46.50	2.1774	22 52 29.4	7.319
15	1 34 25.15	2.0503	15 12 22.2	11.959	15	3 15 57.22	2.1798	22 59 45.0	7.202
16	1 36 28.24	2.0528	15 24 17.4	11.880	16	3 18 8.08	2.1822	23 6 53.6	7.085
17	1 38 31.49	2.0554	15 36 7.8	11.800	17	3 20 19.08	2.1845	23 13 55.2	6.968
18	1 40 34.89	2.0579	15 47 53.4	11.719	18	3 22 30.22	2.1868	23 20 49.7	6.848
19	1 42 38.44	2.0605	15 59 34.1	11.638	19	3 24 41.50	2.1892	23 27 37.0	6.729
20	1 44 42.15	2.0631	16 11 9.9	11.555	20	3 26 52.92	2.1914	23 34 17.2	6.610
21	1 46 46.01	2.0657	16 22 40.7	11.472	21	3 29 4.47	2.1936	23 40 50.2	6.489
22	1 48 50.03	2.0683	16 34 6.5	11.388	22	3 31 16.15	2.1958	23 47 15.9	6.366
23	1 50 54.21	2.0710	+16 45 27.2	+11.302	23	3 33 27.96	2.1979	+23 53 34.4	+6.247
MAY 1.					MAY 3.				
	^h ^m ^s	^s	[°] ['] ["]	["]		^h ^m ^s	^s	[°] ['] ["]	["]
0	1 52 58.55	2.0737	+16 56 42.7	+11.215	0	3 35 39.90	2.2000	+23 59 45.5	+6.124
1	1 55 3.05	2.0763	17 7 53.0	11.128	1	3 37 51.96	2.2019	24 5 49.3	6.003
2	1 57 7.71	2.0790	17 18 58.1	11.041	2	3 40 4.13	2.2038	24 11 45.8	5.880
3	1 59 12.53	2.0818	17 29 57.9	10.952	3	3 42 16.42	2.2058	24 17 34.9	5.757
4	2 1 17.52	2.0846	17 40 52.3	10.862	4	3 44 28.83	2.2078	24 23 16.6	5.633
5	2 3 22.68	2.0873	17 51 41.3	10.771	5	3 46 41.35	2.2096	24 28 50.8	5.506
6	2 5 28.00	2.0901	18 2 24.8	10.679	6	3 48 53.98	2.2113	24 34 17.6	5.384
7	2 7 33.49	2.0928	18 13 2.8	10.587	7	3 51 6.71	2.2131	24 39 36.9	5.258
8	2 9 39.14	2.0956	18 23 35.2	10.493	8	3 53 19.55	2.2148	24 44 48.6	5.133
9	2 11 44.96	2.0985	18 34 2.0	10.399	9	3 55 32.48	2.2163	24 49 52.8	5.007
10	2 13 50.96	2.1013	18 44 23.1	10.304	10	3 57 45.51	2.2179	24 54 49.4	4.881
11	2 15 57.12	2.1041	18 54 38.5	10.208	11	3 59 58.63	2.2194	24 59 38.5	4.754
12	2 18 3.45	2.1069	19 4 48.1	10.111	12	4 2 11.84	2.2208	25 4 19.9	4.627
13	2 20 9.95	2.1098	19 14 51.8	10.013	13	4 4 25.13	2.2223	25 8 53.7	4.499
14	2 22 16.62	2.1125	19 24 49.7	9.915	14	4 6 38.51	2.2236	25 13 19.8	4.372
15	2 24 23.45	2.1153	19 34 41.6	9.816	15	4 8 51.96	2.2248	25 17 38.3	4.244
16	2 26 30.46	2.1182	19 44 27.6	9.716	16	4 11 5.49	2.2260	25 21 49.1	4.116
17	2 28 37.64	2.1210	19 54 7.5	9.614	17	4 13 19.08	2.2271	25 25 52.2	3.987
18	2 30 44.98	2.1238	20 3 41.3	9.513	18	4 15 32.74	2.2283	25 29 47.5	3.856
19	2 32 52.50	2.1268	20 13 9.0	9.410	19	4 17 46.47	2.2293	25 33 35.1	3.729
20	2 35 0.19	2.1295	20 22 30.5	9.307	20	4 20 0.25	2.2302	25 37 15.0	3.600
21	2 37 8.04	2.1323	20 31 45.8	9.203	21	4 22 14.09	2.2311	25 40 47.1	3.471
22	2 39 16.06	2.1351	20 40 54.8	9.098	22	4 24 27.98	2.2318	25 44 11.5	3.341
23	2 41 24.25	2.1379	20 49 57.5	8.992	23	4 26 41.91	2.2326	25 47 28.0	3.210
24	2 43 32.61	2.1407	+20 58 53.8	+8.885	24	4 28 55.89	2.2333	+25 50 36.7	+3.080

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
MAY 4.					MAY 6.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	4 28 55.89	2.2333	+25 50 36.7	+3.080	0	6 15 35.90	2.1856	+25 48 35.4	-3.097
1	4 31 9.91	2.2339	25 53 37.6	2.960	1	6 17 46.96	2.1830	25 45 25.9	3.218
2	4 33 23.96	2.2345	25 56 30.7	2.819	2	6 19 57.86	2.1804	25 42 9.2	3.339
3	4 35 38.05	2.2350	25 59 15.9	2.688	3	6 22 8.61	2.1778	25 38 45.2	3.460
4	4 37 52.16	2.2353	26 1 53.3	2.558	4	6 24 19.20	2.1752	25 35 14.0	3.581
5	4 40 6.29	2.2357	26 4 22.9	2.428	5	6 26 29.63	2.1726	25 31 35.5	3.701
6	4 42 20.44	2.2360	26 6 44.6	2.296	6	6 28 39.90	2.1698	25 27 49.9	3.819
7	4 44 34.61	2.2363	26 8 58.4	2.165	7	6 30 50.00	2.1670	25 23 57.2	3.938
8	4 46 48.79	2.2363	26 11 4.4	2.034	8	6 32 59.94	2.1642	25 19 57.3	4.057
9	4 49 2.97	2.2363	26 13 2.5	1.903	9	6 35 9.70	2.1613	25 15 50.4	4.174
10	4 51 17.15	2.2363	26 14 52.7	1.772	10	6 37 19.29	2.1584	25 11 36.4	4.293
11	4 53 31.33	2.2363	26 16 35.1	1.641	11	6 39 28.71	2.1555	25 7 15.3	4.409
12	4 55 45.50	2.2361	26 18 9.6	1.509	12	6 41 37.95	2.1526	25 2 47.3	4.524
13	4 57 59.66	2.2358	26 19 36.2	1.378	13	6 43 47.01	2.1495	24 58 12.4	4.640
14	5 0 13.80	2.2356	26 20 55.0	1.248	14	6 45 55.89	2.1465	24 53 30.5	4.756
15	5 2 27.93	2.2353	26 22 5.9	1.116	15	6 48 4.59	2.1434	24 48 41.7	4.870
16	5 4 42.03	2.2348	26 23 8.9	0.985	16	6 50 13.10	2.1403	24 43 46.1	4.984
17	5 6 56.10	2.2343	26 24 4.1	0.854	17	6 52 21.42	2.1372	24 38 43.6	5.098
18	5 9 10.14	2.2337	26 24 51.4	0.723	18	6 54 29.56	2.1340	24 33 34.4	5.209
19	5 11 24.14	2.2330	26 25 30.8	0.592	19	6 56 37.50	2.1308	24 28 18.5	5.322
20	5 13 38.10	2.2323	26 26 2.4	0.462	20	6 58 45.25	2.1276	24 22 55.8	5.433
21	5 15 52.02	2.2315	26 26 26.2	0.332	21	7 0 52.81	2.1244	24 17 26.5	5.544
22	5 18 5.88	2.2306	26 26 42.2	0.201	22	7 3 0.18	2.1212	24 11 50.5	5.655
23	5 20 19.69	2.2298	+26 26 50.3	+0.071	23	7 5 7.35	2.1178	+24 6 7.9	-5.764
MAY 5.					MAY 7.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	5 22 33.45	2.2288	+26 26 50.7	-0.058	0	7 7 14.32	2.1146	+24 0 18.8	-5.873
1	5 24 47.14	2.2277	26 26 43.3	0.189	1	7 9 21.10	2.1113	23 54 23.2	5.982
2	5 27 0.77	2.2266	26 26 28.0	0.319	2	7 11 27.68	2.1079	23 48 21.0	6.090
3	5 29 14.33	2.2253	26 26 5.0	0.448	3	7 13 34.05	2.1046	23 42 12.4	6.197
4	5 31 27.81	2.2240	26 25 34.2	0.578	4	7 15 40.23	2.1013	23 35 57.4	6.303
5	5 33 41.21	2.2227	26 24 55.7	0.707	5	7 17 46.21	2.0979	23 29 36.0	6.410
6	5 35 54.53	2.2213	26 24 9.4	0.835	6	7 19 51.98	2.0945	23 23 8.2	6.515
7	5 38 7.76	2.2198	26 23 15.5	0.963	7	7 21 57.55	2.0912	23 16 34.2	6.619
8	5 40 20.91	2.2183	26 22 13.8	1.093	8	7 24 2.92	2.0878	23 9 53.9	6.723
9	5 42 33.96	2.2167	26 21 4.4	1.220	9	7 26 8.09	2.0844	23 3 7.4	6.827
10	5 44 46.91	2.2150	26 19 47.4	1.348	10	7 28 13.05	2.0810	22 56 14.7	6.930
11	5 46 59.76	2.2133	26 18 22.7	1.475	11	7 30 17.81	2.0776	22 49 15.8	7.032
12	5 49 12.50	2.2115	26 16 50.4	1.602	12	7 32 22.36	2.0742	22 42 10.9	7.133
13	5 51 25.14	2.2097	26 15 10.5	1.728	13	7 34 26.71	2.0708	22 34 59.9	7.234
14	5 53 37.66	2.2077	26 13 23.0	1.855	14	7 36 30.85	2.0673	22 27 42.8	7.334
15	5 55 50.06	2.2058	26 11 27.9	1.982	15	7 38 34.79	2.0639	22 20 19.8	7.433
16	5 58 2.35	2.2038	26 9 25.2	2.107	16	7 40 38.52	2.0605	22 12 50.8	7.533
17	6 0 14.61	2.2017	26 7 15.1	2.231	17	7 42 42.05	2.0571	22 5 15.9	7.630
18	6 2 26.55	2.1996	26 4 57.5	2.357	18	7 44 45.37	2.0537	21 57 35.2	7.728
19	6 4 38.45	2.1973	26 2 32.3	2.482	19	7 46 48.49	2.0503	21 49 48.6	7.825
20	6 6 50.22	2.1950	25 59 59.7	2.605	20	7 48 51.41	2.0469	21 41 56.2	7.921
21	6 9 1.85	2.1927	25 57 19.7	2.728	21	7 50 54.12	2.0435	21 33 58.1	8.016
22	6 11 13.34	2.1903	25 54 32.3	2.852	22	7 52 56.63	2.0402	21 25 54.3	8.111
23	6 13 24.69	2.1880	25 51 37.5	2.974	23	7 54 58.94	2.0368	21 17 44.8	8.205
24	6 15 35.90	2.1856	+25 48 35.4	-3.097	24	7 57 1.05	2.0335	+21 9 29.7	-8.298

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
MAY 8.					MAY 10.				
	^h ^m ^s	^s	[°] ['] ["]	["]		^h ^m ^s	^s	[°] ['] ["]	["]
0	7 57 1.05	2.0335	+21 9 29.7	-8.298	0	9 31 15.85	1.9079	+12 56 7.8	-12.004
1	7 59 2.96	2.0302	21 1 9.0	8.391	1	9 33 10.28	1.9064	12 44 5.7	12.065
2	8 1 4.67	2.0268	20 52 42.8	8.483	2	9 35 4.62	1.9049	12 32 0.0	12.126
3	8 3 6.18	2.0235	20 44 11.0	8.575	3	9 36 58.87	1.9035	12 19 50.6	12.186
4	8 5 7.49	2.0203	20 35 33.8	8.666	4	9 38 53.04	1.9022	12 7 37.7	12.245
5	8 7 8.61	2.0170	20 26 51.1	8.757	5	9 40 47.13	1.9009	11 55 21.2	12.304
6	8 9 9.53	2.0138	20 18 3.0	8.846	6	9 42 41.15	1.8997	11 43 1.2	12.362
7	8 11 10.26	2.0105	20 9 9.6	8.934	7	9 44 35.09	1.8985	11 30 37.8	12.415
8	8 13 10.79	2.0073	20 0 10.9	9.023	8	9 46 28.97	1.8974	11 18 11.0	12.475
9	8 15 11.13	2.0041	19 51 6.9	9.110	9	9 48 22.78	1.8963	11 5 40.8	12.531
10	8 17 11.28	2.0009	19 41 57.7	9.197	10	9 50 16.53	1.8953	10 53 7.3	12.586
11	8 19 11.24	1.9978	19 32 43.3	9.283	11	9 52 10.22	1.8943	10 40 30.5	12.641
12	8 21 11.02	1.9948	19 23 23.8	9.368	12	9 54 3.85	1.8935	10 27 50.4	12.695
13	8 23 10.61	1.9917	19 13 59.1	9.453	13	9 55 57.44	1.8928	10 15 7.1	12.748
14	8 25 10.02	1.9886	19 4 29.4	9.537	14	9 57 50.98	1.8919	10 2 20.7	12.800
15	8 27 9.24	1.9855	18 54 54.7	9.620	15	9 59 44.47	1.8913	9 49 31.1	12.853
16	8 29 8.28	1.9826	18 45 15.0	9.703	16	10 1 37.93	1.8908	9 36 38.4	12.903
17	8 31 7.15	1.9797	18 35 30.3	9.786	17	10 3 31.36	1.8902	9 23 42.7	12.954
18	8 33 5.84	1.9767	18 25 40.7	9.867	18	10 5 24.75	1.8896	9 10 43.9	13.004
19	8 35 4.35	1.9738	18 15 46.3	9.947	19	10 7 18.11	1.8892	8 57 42.2	13.053
20	8 37 2.69	1.9709	18 5 47.1	10.028	20	10 9 11.45	1.8889	8 44 37.5	13.102
21	8 39 0.86	1.9681	17 55 43.0	10.108	21	10 11 4.78	1.8887	8 31 30.0	13.149
22	8 40 58.86	1.9653	17 45 34.2	10.186	22	10 12 58.09	1.8883	8 18 19.6	13.197
23	8 42 56.70	1.9626	+17 35 20.7	-10.264	23	10 14 51.38	1.8882	+ 8 5 6.4	-13.243
MAY 9.					MAY 11.				
	^h ^m ^s	^s	[°] ['] ["]	["]		^h ^m ^s	^s	[°] ['] ["]	["]
0	8 44 54.37	1.9598	+17 25 2.5	-10.342	0	10 16 44.67	1.8882	+ 7 51 50.4	-13.290
1	8 46 51.88	1.9572	17 14 39.7	10.418	1	10 18 37.96	1.8882	7 38 31.7	13.333
2	8 48 49.23	1.9545	17 4 12.3	10.495	2	10 20 31.25	1.8882	7 25 10.4	13.378
3	8 50 46.42	1.9519	16 53 40.3	10.571	3	10 22 24.54	1.8883	7 11 46.4	13.422
4	8 52 43.46	1.9493	16 43 3.8	10.645	4	10 24 17.85	1.8886	6 58 19.8	13.465
5	8 54 40.34	1.9468	16 32 22.9	10.718	5	10 26 11.17	1.8888	6 44 50.6	13.508
6	8 56 37.08	1.9444	16 21 37.6	10.793	6	10 28 4.50	1.8891	6 31 18.9	13.548
7	8 58 33.67	1.9419	16 10 47.8	10.866	7	10 29 57.86	1.8895	6 17 44.8	13.588
8	9 0 30.11	1.9395	15 59 53.7	10.938	8	10 31 51.24	1.8900	6 4 8.3	13.625
9	9 2 26.41	1.9372	15 48 55.2	11.010	9	10 33 44.66	1.8906	5 50 29.4	13.668
10	9 4 22.57	1.9349	15 37 52.5	11.081	10	10 35 38.11	1.8912	5 36 48.1	13.708
11	9 6 18.60	1.9327	15 26 45.5	11.151	11	10 37 31.60	1.8919	5 23 4.5	13.745
12	9 8 14.49	1.9304	15 15 34.4	11.220	12	10 39 25.14	1.8927	5 9 18.7	13.782
13	9 10 10.25	1.9283	15 4 19.1	11.289	13	10 41 18.72	1.8935	4 55 30.7	13.819
14	9 12 5.88	1.9262	14 52 59.7	11.358	14	10 43 12.36	1.8944	4 41 40.6	13.853
15	9 14 1.39	1.9242	14 41 36.2	11.425	15	10 45 6.05	1.8954	4 27 48.3	13.888
16	9 15 56.78	1.9222	14 30 8.7	11.492	16	10 46 59.81	1.8965	4 13 54.0	13.923
17	9 17 52.05	1.9202	14 18 37.2	11.558	17	10 48 53.63	1.8976	3 59 57.6	13.956
18	9 19 47.20	1.9183	14 7 1.7	11.624	18	10 50 47.52	1.8988	3 45 59.3	13.988
19	9 21 42.24	1.9164	13 55 22.3	11.689	19	10 52 41.49	1.9002	3 31 59.1	14.019
20	9 23 37.17	1.9146	13 43 39.0	11.754	20	10 54 35.54	1.9015	3 17 57.0	14.051
21	9 25 31.99	1.9128	13 31 51.8	11.818	21	10 56 29.67	1.9029	3 3 55.0	14.081
22	9 27 26.71	1.9112	13 20 0.9	11.880	22	10 58 23.89	1.9045	2 49 47.3	14.110
23	9 29 21.33	1.9095	13 8 6.2	11.943	23	11 0 18.21	1.9061	2 35 39.8	14.138
24	9 31 15.85	1.9079	+12 56 7.8	-12.004	24	11 2 12.62	1.9078	+ 2 21 30.7	-14.166

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
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MAY 12.					MAY 14.				
	h	m	s	"		h	m	s	"
0	11	2	12.62	1.9078 +2 21 30.7 -14.166	0	12	37	14.89	2.0638 -9 12 7.8 -14.315
1	11	4	7.14	1.9066 2 7 19.9 14.193	1	12	39	20.09	2.0606 9 26 25.9 14.288
2	11	6	1.76	1.9113 1 53 7.6 14.218	2	12	41	25.63	2.0663 9 40 42.4 14.261
3	11	7	56.50	1.9133 1 38 53.7 14.243	3	12	43	31.52	2.1011 9 54 57.2 14.231
4	11	9	51.35	1.9153 1 24 38.4 14.268	4	12	45	37.76	2.1070 10 9 10.1 14.199
5	11	11	46.33	1.9173 1 10 21.6 14.292	5	12	47	44.36	2.1130 10 23 21.1 14.168
6	11	13	41.43	1.9196 0 56 3.4 14.314	6	12	49	51.32	2.1191 10 37 30.2 14.134
7	11	15	36.67	1.9218 0 41 43.9 14.335	7	12	51	58.65	2.1253 10 51 37.2 14.098
8	11	17	32.04	1.9240 0 27 23.2 14.355	8	12	54	6.35	2.1314 11 5 42.0 14.061
9	11	19	27.55	1.9264 +0 13 1.3 14.375	9	12	56	14.42	2.1377 11 19 44.5 14.023
10	11	21	23.21	1.9289 -0 1 21.8 14.394	10	12	58	22.87	2.1441 11 33 44.7 13.983
11	11	23	19.02	1.9314 0 15 46.0 14.412	11	13	0	31.71	2.1506 11 47 42.4 13.941
12	11	25	14.98	1.9340 0 30 11.2 14.428	12	13	2	40.94	2.1571 12 1 37.6 13.898
13	11	27	11.10	1.9368 0 44 37.4 14.444	13	13	4	50.56	2.1637 12 15 30.1 13.853
14	11	29	7.39	1.9396 0 59 4.5 14.459	14	13	7	0.58	2.1703 12 29 19.9 13.806
15	11	31	3.85	1.9426 1 13 32.5 14.474	15	13	9	11.00	2.1770 12 43 6.8 13.758
16	11	33	0.49	1.9454 1 28 1.4 14.488	16	13	11	21.82	2.1838 12 56 50.8 13.706
17	11	34	57.30	1.9484 1 42 31.0 14.499	17	13	13	33.06	2.1908 13 10 31.7 13.656
18	11	36	54.30	1.9516 1 57 1.3 14.510	18	13	15	44.71	2.1977 13 24 9.5 13.603
19	11	38	51.49	1.9548 2 11 32.2 14.520	19	13	17	56.78	2.2047 13 37 44.0 13.548
20	11	40	48.87	1.9580 2 26 3.7 14.530	20	13	20	9.27	2.2117 13 51 15.2 13.491
21	11	42	46.45	1.9614 2 40 35.8 14.538	21	13	22	22.18	2.2188 14 4 42.9 13.433
22	11	44	44.24	1.9648 2 55 8.3 14.544	22	13	24	35.52	2.2260 14 18 7.1 13.373
23	11	46	42.23	1.9683 -3 9 41.1 -14.550	23	13	26	49.30	2.2333 -14 31 27.6 -13.310

MAY 13.					MAY 15.				
	h	m	s	"		h	m	s	"
0	11	48	40.44	1.9720 -3 24 14.3 -14.556	0	13	29	3.51	2.2406 -14 44 44.3 -13.246
1	11	50	38.87	1.9757 3 38 47.8 14.559	1	13	31	18.16	2.2478 14 57 57.1 13.180
2	11	52	37.52	1.9796 3 53 21.4 14.562	2	13	33	33.25	2.2553 15 11 5.9 13.113
3	11	54	36.41	1.9834 4 7 55.2 14.563	3	13	35	48.79	2.2628 15 24 10.6 13.043
4	11	56	35.53	1.9873 4 22 29.0 14.563	4	13	38	4.78	2.2703 15 37 11.1 12.973
5	11	58	34.89	1.9914 4 37 2.8 14.563	5	13	40	21.22	2.2778 15 50 7.3 12.899
6	12	0	34.50	1.9955 4 51 36.6 14.562	6	13	42	38.12	2.2855 16 2 59.0 12.824
7	12	2	34.35	1.9997 5 6 10.2 14.558	7	13	44	55.48	2.2931 16 15 46.2 12.748
8	12	4	34.46	2.0040 5 20 43.6 14.554	8	13	47	13.29	2.3008 16 28 28.7 12.668
9	12	6	34.83	2.0083 5 35 16.7 14.549	9	13	49	31.57	2.3086 16 41 6.4 12.588
10	12	8	35.46	2.0128 5 49 49.5 14.543	10	13	51	50.32	2.3163 16 53 39.2 12.506
11	12	10	36.36	2.0173 6 4 21.8 14.534	11	13	54	9.53	2.3241 17 6 7.0 12.421
12	12	12	37.54	2.0220 6 18 53.6 14.525	12	13	56	29.21	2.3320 17 18 29.7 12.334
13	12	14	39.00	2.0267 6 33 24.8 14.515	13	13	58	49.37	2.3399 17 30 47.1 12.246
14	12	16	40.74	2.0314 6 47 55.4 14.504	14	14	1	10.00	2.3478 17 42 59.2 12.156
15	12	18	42.77	2.0363 7 2 25.3 14.491	15	14	3	31.10	2.3557 17 55 5.8 12.063
16	12	20	45.09	2.0412 7 16 54.3 14.476	16	14	5	52.68	2.3637 18 7 6.8 11.968
17	12	22	47.71	2.0463 7 31 22.4 14.461	17	14	8	14.74	2.3718 18 19 2.0 11.872
18	12	24	50.64	2.0514 7 45 49.6 14.444	18	14	10	37.29	2.3798 18 30 51.4 11.773
19	12	26	53.88	2.0566 8 0 15.7 14.426	19	14	13	0.31	2.3877 18 42 34.8 11.673
20	12	28	57.43	2.0618 8 14 40.7 14.407	20	14	15	23.81	2.3958 18 54 12.2 11.572
21	12	31	1.30	2.0673 8 29 4.5 14.386	21	14	17	47.80	2.4038 19 5 43.4 11.467
22	12	33	5.50	2.0728 8 43 27.0 14.363	22	14	20	12.27	2.4118 19 17 8.2 11.360
23	12	35	10.03	2.0783 8 57 48.1 14.340	23	14	22	37.22	2.4199 19 28 26.6 11.252
24	12	37	14.89	2.0838 -9 12 7.8 -14.315	24	14	25	2.66	2.4280 -19 39 38.4 -11.142

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
MAY 16.					MAY 18.				
	^h ^m ^s	^s	[°] ['] ["]	["]		^h ^m ^s	^s	[°] ['] ["]	["]
0	14 25 2.66	2.4280	-19 39 38.4	-11.142	0	16 30 2.03	2.7439	-25 50 16.7	-3.635
1	14 27 28.58	2.4361	19 50 43.6	11.020	1	16 32 46.77	2.7474	25 53 49.0	3.442
2	14 29 54.99	2.4442	20 1 41.9	10.914	2	16 35 31.72	2.7508	25 57 9.7	3.248
3	14 32 21.88	2.4522	20 12 33.3	10.798	3	16 38 16.86	2.7538	26 0 18.8	3.053
4	14 34 49.25	2.4602	20 23 17.6	10.679	4	16 41 2.18	2.7568	26 3 16.1	2.858
5	14 37 17.10	2.4683	20 33 54.8	10.559	5	16 43 47.67	2.7595	26 6 1.7	2.661
6	14 39 45.44	2.4763	20 44 24.7	10.437	6	16 46 33.32	2.7621	26 8 35.4	2.463
7	14 42 14.26	2.4843	20 54 47.2	10.312	7	16 49 19.12	2.7644	26 10 57.3	2.267
8	14 44 43.55	2.4922	21 5 2.1	10.185	8	16 52 5.05	2.7665	26 13 7.4	2.068
9	14 47 13.32	2.5001	21 15 9.4	10.057	9	16 54 51.10	2.7684	26 15 5.5	1.869
10	14 49 43.56	2.5079	21 25 8.9	9.925	10	16 57 37.26	2.7702	26 16 51.7	1.670
11	14 52 14.27	2.5158	21 35 0.4	9.793	11	17 0 23.52	2.7718	26 18 25.9	1.470
12	14 54 45.46	2.5238	21 44 44.0	9.658	12	17 3 9.87	2.7731	26 19 48.1	1.270
13	14 57 17.12	2.5315	21 54 19.4	9.521	13	17 5 56.29	2.7743	26 20 58.3	1.069
14	14 59 49.24	2.5392	22 3 46.5	9.383	14	17 8 42.78	2.7752	26 21 56.4	0.868
15	15 2 21.82	2.5469	22 13 5.5	9.243	15	17 11 29.31	2.7758	26 22 12.5	0.666
16	15 4 54.87	2.5546	22 22 15.6	9.100	16	17 14 15.88	2.7763	26 23 16.6	0.467
17	15 7 28.37	2.5621	22 31 17.3	8.955	17	17 17 2.47	2.7767	26 25 38.5	0.265
18	15 10 2.32	2.5695	22 40 10.2	8.808	18	17 19 49.08	2.7768	26 23 48.4	-0.064
19	15 12 36.71	2.5769	22 48 54.3	8.661	19	17 22 35.69	2.7767	26 23 46.2	+0.138
20	15 15 11.55	2.5843	22 57 29.5	8.511	20	17 25 22.28	2.7763	26 23 31.9	0.338
21	15 17 46.83	2.5916	23 5 55.6	8.358	21	17 28 8.85	2.7758	26 23 5.6	0.539
22	15 20 22.54	2.5988	23 14 12.5	8.205	22	17 30 55.38	2.7752	26 22 27.2	0.741
23	15 22 58.68	2.6059	-23 22 20.2	-8.050	23	17 33 41.87	2.7743	-26 21 36.7	+0.943
MAY 17.					MAY 19.				
	^h ^m ^s	^s	[°] ['] ["]	["]		^h ^m ^s	^s	[°] ['] ["]	["]
0	15 25 35.25	2.6130	-23 30 18.5	-7.892	0	17 36 28.29	2.7731	-26 20 34.1	+1.143
1	15 28 12.24	2.6199	23 38 7.2	7.732	1	17 39 14.64	2.7718	26 19 19.5	1.343
2	15 30 49.64	2.6267	23 45 46.3	7.570	2	17 42 0.90	2.7702	26 17 53.0	1.543
3	15 33 27.44	2.6333	23 53 15.6	7.407	3	17 44 47.06	2.7684	26 16 14.4	1.743
4	15 36 5.64	2.6400	24 0 35.1	7.243	4	17 47 33.11	2.7665	26 14 23.9	1.941
5	15 38 44.24	2.6466	24 7 44.7	7.077	5	17 50 19.04	2.7644	26 12 21.5	2.139
6	15 41 23.23	2.6529	24 14 44.3	6.908	6	17 53 4.84	2.7621	26 10 7.2	2.337
7	15 44 2.59	2.6592	24 21 33.7	6.738	7	17 55 50.49	2.7595	26 7 41.1	2.534
8	15 46 42.33	2.6654	24 28 12.9	6.568	8	17 58 35.98	2.7568	26 5 3.1	2.731
9	15 49 22.44	2.6714	24 34 41.8	6.394	9	18 1 21.31	2.7540	26 2 13.4	2.926
10	15 52 2.90	2.6773	24 41 0.2	6.219	10	18 4 6.46	2.7509	25 59 12.0	3.121
11	15 54 43.71	2.6830	24 47 8.1	6.044	11	18 6 51.42	2.7476	25 55 58.9	3.315
12	15 57 24.86	2.6887	24 53 5.5	5.868	12	18 9 36.17	2.7441	25 52 34.2	3.508
13	16 0 6.35	2.6942	24 58 52.2	5.688	13	18 12 20.71	2.7405	25 48 57.9	3.701
14	16 2 48.16	2.6996	25 4 28.0	5.507	14	18 15 5.03	2.7367	25 45 10.1	3.892
15	16 5 30.29	2.7047	25 9 53.0	5.326	15	18 17 49.11	2.7327	25 41 10.9	4.083
16	16 8 12.72	2.7096	25 15 7.1	5.143	16	18 20 32.95	2.7285	25 37 0.2	4.273
17	16 10 55.44	2.7145	25 20 10.1	4.958	17	18 23 16.53	2.7242	25 32 38.2	4.460
18	16 13 38.46	2.7193	25 25 2.0	4.773	18	18 25 59.85	2.7198	25 28 5.0	4.647
19	16 16 21.76	2.7238	25 29 42.8	4.586	19	18 28 42.90	2.7152	25 23 20.6	4.833
20	16 19 5.32	2.7282	25 34 12.3	4.398	20	18 31 25.67	2.7104	25 18 25.1	5.018
21	16 21 49.14	2.7323	25 38 30.5	4.209	21	18 34 8.15	2.7055	25 13 18.5	5.201
22	16 24 33.20	2.7363	25 42 37.4	4.019	22	18 36 50.33	2.7003	25 8 1.0	5.383
23	16 27 17.50	2.7403	25 46 32.8	3.828	23	18 39 32.19	2.6951	25 2 32.6	5.564
24	16 30 2.03	2.7439	-25 50 16.7	-3.635	24	18 42 13.74	2.6898	-24 56 53.3	+5.744

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
MAY 20.					MAY 22.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	18 42 13.74	2.6806	-24 56 53.3	+ 5.744	0	20 43 28.16	2.2468	-17 26 20.1	+12.323
1	18 44 54.96	2.6843	24 51 3.3	5.922	1	20 45 48.74	2.2393	17 13 58.0	12.413
2	18 47 35.85	2.6786	24 45 2.7	6.006	2	20 48 8.88	2.2320	17 1 30.5	12.503
3	18 50 16.39	2.6728	24 38 51.6	6.273	3	20 50 28.58	2.2248	16 48 57.7	12.590
4	18 52 56.58	2.6669	24 32 30.0	6.447	4	20 52 47.85	2.2175	16 36 19.7	12.676
5	18 55 36.42	2.6609	24 25 58.0	6.619	5	20 55 6.68	2.2103	16 23 36.6	12.759
6	18 58 15.89	2.6548	24 19 15.7	6.789	6	20 57 25.08	2.2031	16 10 48.6	12.841
7	19 0 54.99	2.6486	24 12 23.3	6.958	7	20 59 43.05	2.2059	15 57 55.7	12.922
8	19 3 33.72	2.6423	24 5 20.8	7.125	8	21 2 0.59	2.2088	15 44 58.0	13.000
9	19 6 12.06	2.6358	23 58 8.3	7.292	9	21 4 17.71	2.2019	15 31 55.7	13.077
10	19 8 50.01	2.6293	23 50 45.8	7.456	10	21 6 34.42	2.2750	15 18 48.8	13.152
11	19 11 27.57	2.6226	23 43 13.6	7.618	11	21 8 50.71	2.2680	15 5 37.5	13.224
12	19 14 4.72	2.6158	23 35 31.7	7.778	12	21 11 6.58	2.2612	14 52 21.9	13.295
13	19 16 41.47	2.6090	23 27 40.2	7.937	13	21 13 22.05	2.2544	14 39 2.1	13.365
14	19 19 17.80	2.6021	23 19 39.3	8.093	14	21 15 37.11	2.2477	14 25 38.1	13.433
15	19 21 53.72	2.5951	23 11 29.0	8.249	15	21 17 51.77	2.2411	14 12 10.1	13.499
16	19 24 29.21	2.5880	23 3 9.4	8.403	16	21 20 6.04	2.2345	13 58 38.2	13.563
17	19 27 4.28	2.5809	22 54 40.7	8.554	17	21 22 19.91	2.2279	13 45 2.5	13.626
18	19 29 38.92	2.5738	22 46 2.9	8.704	18	21 24 33.39	2.2215	13 31 23.1	13.688
19	19 32 13.13	2.5666	22 37 16.2	8.853	19	21 26 46.49	2.2152	13 17 40.0	13.748
20	19 34 46.91	2.5593	22 28 20.6	8.999	20	21 28 59.21	2.2089	13 3 53.4	13.805
21	19 37 20.24	2.5518	22 19 16.3	9.143	21	21 31 11.56	2.2027	12 50 3.4	13.861
22	19 39 53.13	2.5444	22 10 3.4	9.286	22	21 33 23.53	2.1964	12 36 10.1	13.915
23	19 42 25.57	2.5370	-22 0 42.0	+ 9.427	23	21 35 35.13	2.1903	-12 22 13.6	+13.968
MAY 21.					MAY 23.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	19 44 57.57	2.5295	-21 51 12.2	+ 9.565	0	21 37 46.37	2.1843	-12 8 13.9	+14.020
1	19 47 29.11	2.5219	21 41 34.2	9.702	1	21 39 57.25	2.1784	11 54 11.2	14.069
2	19 50 0.20	2.5144	21 31 48.0	9.838	2	21 42 7.78	2.1726	11 40 5.6	14.118
3	19 52 30.84	2.5068	21 21 53.7	9.971	3	21 44 17.96	2.1668	11 25 57.1	14.164
4	19 55 1.02	2.4992	21 11 51.5	10.102	4	21 46 27.79	2.1610	11 11 45.9	14.209
5	19 57 30.74	2.4916	21 1 41.5	10.231	5	21 48 37.28	2.1554	10 57 32.0	14.253
6	20 0 0.01	2.4840	20 51 23.8	10.358	6	21 50 46.44	2.1499	10 43 15.6	14.294
7	20 2 28.82	2.4763	20 40 58.5	10.483	7	21 52 55.27	2.1444	10 28 56.7	14.335
8	20 4 57.16	2.4685	20 30 25.8	10.607	8	21 55 3.77	2.1390	10 14 35.4	14.374
9	20 7 25.04	2.4606	20 19 45.7	10.728	9	21 57 11.95	2.1338	10 0 11.8	14.411
10	20 9 52.46	2.4532	20 8 58.4	10.848	10	21 59 19.82	2.1286	9 45 46.1	14.447
11	20 12 19.42	2.4455	19 58 3.9	10.967	11	22 1 27.38	2.1234	9 31 18.2	14.483
12	20 14 45.92	2.4378	19 47 2.4	11.083	12	22 3 34.63	2.1183	9 16 48.2	14.516
13	20 17 11.95	2.4301	19 35 54.0	11.196	13	22 5 41.58	2.1133	9 2 16.3	14.547
14	20 19 37.53	2.4225	19 24 38.9	11.308	14	22 7 48.23	2.1084	8 47 42.6	14.577
15	20 22 2.65	2.4148	19 13 17.1	11.418	15	22 9 54.59	2.1037	8 33 7.1	14.606
16	20 24 27.31	2.4071	19 1 48.8	11.526	16	22 12 0.67	2.0990	8 18 29.9	14.633
17	20 26 51.50	2.3994	18 50 14.0	11.633	17	22 14 6.47	2.0943	8 3 51.1	14.660
18	20 29 15.24	2.3918	18 38 32.9	11.737	18	22 16 11.99	2.0898	7 49 10.7	14.685
19	20 31 38.52	2.3843	18 26 45.6	11.839	19	22 18 17.24	2.0853	7 34 28.9	14.708
20	20 34 1.35	2.3768	18 14 52.2	11.940	20	22 20 22.22	2.0809	7 19 45.8	14.729
21	20 36 23.73	2.3692	18 2 52.8	12.038	21	22 22 26.95	2.0767	7 5 1.4	14.750
22	20 38 45.65	2.3617	17 50 47.6	12.134	22	22 24 31.42	2.0724	6 50 15.8	14.770
23	20 41 7.13	2.3543	17 38 36.7	12.229	23	22 26 35.64	2.0683	6 35 29.0	14.788
24	20 43 28.16	2.3468	-17 26 20.1	+12.323	24	22 28 39.61	2.0643	- 6 20 41.2	+14.805

GREENWICH MEAN TIME.

Hour.	Right Ascension.			Var. per Min.	Declination.			Var. per Min.	Hour.	Right Ascension.			Var. per Min.	Declination.			Var. per Min.
MAY 24.									MAY 26.								
	h	m	s	s	°	'	"	"		h	m	s	s	°	'	"	"
0	22	28	39.61	2.0643	-6	20	41.2	+14.805	0	0	4	42.24	1.9690	+5	26	52.5	+14.262
1	22	30	43.35	2.0603	6	5	52.4	14.820	1	0	6	40.38	1.9690	5	41	7.1	14.224
2	22	32	46.35	2.0564	5	51	2.8	14.834	2	0	8	38.52	1.9690	5	55	19.4	14.187
3	22	34	50.12	2.0526	5	36	12.3	14.848	3	0	10	36.66	1.9691	6	9	29.5	14.148
4	22	36	53.16	2.0489	5	21	21.1	14.859	4	0	12	34.81	1.9693	6	23	37.2	14.108
5	22	38	55.99	2.0454	5	6	29.2	14.870	5	0	14	32.97	1.9695	6	37	42.5	14.068
6	22	40	58.61	2.0418	4	51	36.7	14.879	6	0	16	31.15	1.9698	6	51	45.4	14.028
7	22	43	1.01	2.0383	4	36	43.7	14.888	7	0	18	29.34	1.9701	7	5	45.8	13.963
8	22	45	3.21	2.0350	4	21	50.2	14.894	8	0	20	27.56	1.9706	7	19	43.6	13.942
9	22	47	5.21	2.0318	4	6	56.4	14.899	9	0	22	25.81	1.9711	7	33	38.8	13.898
10	22	49	7.02	2.0286	3	52	2.3	14.903	10	0	24	24.09	1.9717	7	47	31.3	13.853
11	22	51	8.64	2.0255	3	37	8.0	14.907	11	0	26	22.41	1.9723	8	1	21.1	13.807
12	22	53	10.08	2.0225	3	22	13.5	14.909	12	0	28	20.76	1.9729	8	15	8.1	13.759
13	22	55	11.34	2.0196	3	7	18.9	14.910	13	0	30	19.16	1.9737	8	28	52.2	13.712
14	22	57	12.43	2.0168	2	52	24.3	14.909	14	0	32	17.60	1.9745	8	42	33.5	13.663
15	22	59	13.35	2.0140	2	37	29.8	14.908	15	0	34	16.10	1.9754	8	56	11.8	13.614
16	23	1	14.11	2.0113	2	22	35.4	14.905	16	0	36	14.65	1.9763	9	9	47.2	13.564
17	23	3	14.71	2.0088	2	7	41.2	14.902	17	0	38	13.26	1.9773	9	23	19.5	13.512
18	23	5	15.16	2.0063	1	52	47.2	14.897	18	0	40	11.93	1.9784	9	36	48.6	13.459
19	23	7	15.46	2.0038	1	37	53.6	14.891	19	0	42	10.67	1.9796	9	50	14.6	13.406
20	23	9	15.62	2.0015	1	23	0.3	14.884	20	0	44	9.48	1.9808	10	3	37.3	13.352
21	23	11	15.64	1.9993	1	8	7.5	14.875	21	0	46	8.36	1.9820	10	16	56.8	13.296
22	23	13	15.53	1.9972	0	53	15.3	14.866	22	0	48	7.32	1.9833	10	30	13.0	13.241
23	23	15	15.30	1.9951	-0	38	23.6	+14.856	23	0	50	6.36	1.9847	+10	43	25.7	+13.183
MAY 25.									MAY 27.								
	h	m	s	s	°	'	"	"		h	m	s	s	°	'	"	"
0	23	17	14.94	1.9930	-0	23	32.6	+14.844	0	0	52	5.48	1.9861	+10	56	35.0	+13.126
1	23	19	14.46	1.9911	-0	8	42.3	14.832	1	0	54	4.69	1.9876	11	9	40.8	13.068
2	23	21	13.87	1.9893	+0	6	7.2	14.818	2	0	56	3.99	1.9891	11	22	43.1	13.008
3	23	23	13.18	1.9876	0	20	55.8	14.803	3	0	58	3.38	1.9907	11	35	41.8	12.948
4	23	25	12.38	1.9859	0	35	43.5	14.788	4	1	0	2.87	1.9923	11	48	36.9	12.887
5	23	27	11.49	1.9843	0	50	30.3	14.772	5	1	2	2.46	1.9940	12	1	28.2	12.824
6	23	29	10.50	1.9828	1	5	16.1	14.753	6	1	4	2.15	1.9958	12	14	15.8	12.762
7	23	31	9.42	1.9813	1	20	0.7	14.733	7	1	6	1.95	1.9976	12	26	59.6	12.698
8	23	33	8.26	1.9800	1	34	44.1	14.714	8	1	8	1.86	1.9994	12	39	39.5	12.633
9	23	35	7.02	1.9788	1	49	26.4	14.694	9	1	10	1.88	2.0013	12	52	15.5	12.567
10	23	37	5.71	1.9776	2	4	7.4	14.672	10	1	12	2.01	2.0032	13	4	47.5	12.500
11	23	39	4.33	1.9765	2	18	47.0	14.648	11	1	14	2.26	2.0052	13	17	15.5	12.433
12	23	41	2.89	1.9755	2	33	25.2	14.625	12	1	16	2.63	2.0073	13	29	39.4	12.364
13	23	43	1.39	1.9745	2	48	2.0	14.600	13	1	18	3.13	2.0093	13	41	59.2	12.295
14	23	44	59.83	1.9736	3	2	37.2	14.573	14	1	20	3.75	2.0114	13	54	14.8	12.225
15	23	46	58.22	1.9728	3	17	10.8	14.547	15	1	22	4.50	2.0136	14	6	26.2	12.154
16	23	48	56.57	1.9721	3	31	42.8	14.519	16	1	24	5.38	2.0158	14	18	33.3	12.082
17	23	50	54.87	1.9714	3	46	13.1	14.490	17	1	26	6.40	2.0181	14	30	36.0	12.009
18	23	52	53.14	1.9709	4	0	41.6	14.460	18	1	28	7.55	2.0203	14	42	34.4	11.936
19	23	54	51.38	1.9704	4	15	8.3	14.429	19	1	30	8.84	2.0227	14	54	28.3	11.861
20	23	56	49.59	1.9699	4	29	33.1	14.398	20	1	32	10.27	2.0250	15	6	17.7	11.786
21	23	58	47.77	1.9696	4	43	56.0	14.365	21	1	34	11.84	2.0274	15	18	2.6	11.710
22	0	0	45.94	1.9694	4	58	16.9	14.331	22	1	36	13.56	2.0299	15	29	42.9	11.633
23	0	2	44.10	1.9692	5	12	35.7	14.297	23	1	38	15.43	2.0323	15	41	18.5	11.554
24	0	4	42.24	1.9690	+5	26	52.5	+14.262	24	1	40	17.44	2.0348	+15	52	49.4	+11.475

GREENWICH MEAN TIME.

Hour.	Right Ascension.			Var. per Min.	Declination.			Var. per Min.	Hour.	Right Ascension.			Var. per Min.	Declination.			Var. per Min.
MAY 28.									MAY 30.								
	h	m	s	s	°	'	''	''		h	m	s	s	°	'	''	''
0	1	40	17.44	2.0848	+15	52	49.4	+11.475	0	3	21	10.53	2.1690	+23	17	16.9	+6.749
1	1	42	19.60	2.0873	16	4	15.5	11.396	1	3	23	20.75	2.1715	23	23	58.4	6.633
2	1	44	21.92	2.0400	16	15	36.9	11.316	2	3	25	31.11	2.1730	23	30	32.9	6.517
3	1	46	24.40	2.0426	16	26	53.4	11.234	3	3	27	41.62	2.1763	23	37	0.4	6.399
4	1	48	27.03	2.0451	16	38	5.0	11.153	4	3	29	52.27	2.1788	23	43	20.8	6.282
5	1	50	29.81	2.0478	16	49	11.7	11.069	5	3	32	3.07	2.1812	23	49	34.2	6.163
6	1	52	32.76	2.0505	17	0	13.3	10.985	6	3	34	14.01	2.1835	23	55	40.4	6.044
7	1	54	35.87	2.0532	17	11	9.9	10.901	7	3	36	25.09	2.1858	24	1	39.5	5.925
8	1	56	39.14	2.0559	17	22	1.4	10.815	8	3	38	36.30	2.1880	24	7	31.4	5.805
9	1	58	42.58	2.0587	17	32	47.7	10.728	9	3	40	47.65	2.1903	24	13	16.1	5.685
10	2	0	46.18	2.0614	17	43	28.8	10.641	10	3	42	59.13	2.1923	24	18	53.6	5.564
11	2	2	49.95	2.0643	17	54	4.6	10.553	11	3	45	10.73	2.1944	24	24	23.8	5.443
12	2	4	53.89	2.0671	18	4	35.1	10.464	12	3	47	22.46	2.1965	24	29	46.7	5.321
13	2	6	58.00	2.0698	18	15	0.3	10.374	13	3	49	34.31	2.1985	24	35	2.3	5.198
14	2	9	2.27	2.0726	18	25	20.0	10.283	14	3	51	46.28	2.2004	24	40	10.5	5.076
15	2	11	6.71	2.0755	18	35	34.3	10.193	15	3	53	58.36	2.2023	24	45	11.4	4.953
16	2	13	11.33	2.0784	18	45	43.1	10.100	16	3	56	10.56	2.2042	24	50	4.8	4.828
17	2	15	16.12	2.0813	18	55	46.3	10.007	17	3	58	22.86	2.2059	24	54	50.8	4.704
18	2	17	21.08	2.0842	19	5	43.9	9.913	18	4	0	35.27	2.2077	24	59	29.3	4.579
19	2	19	26.22	2.0871	19	15	35.9	9.818	19	4	2	47.78	2.2093	25	4	0.3	4.455
20	2	21	31.53	2.0900	19	25	22.1	9.723	20	4	5	0.39	2.2110	25	8	23.9	4.330
21	2	23	37.02	2.0929	19	35	2.6	9.627	21	4	7	13.10	2.2125	25	12	39.9	4.204
22	2	25	42.68	2.0958	19	44	37.3	9.530	22	4	9	25.89	2.2139	25	16	48.4	4.078
23	2	27	48.52	2.0988	+19	54	6.2	+9.432	23	4	11	38.77	2.2154	+25	20	49.3	+3.953
MAY 29.									MAY 31.								
0	2	29	54.33	2.1017	+20	3	29.1	+9.333	0	4	13	51.74	2.2168	+25	24	42.7	+3.826
1	2	32	0.72	2.1046	20	12	46.1	9.234	1	4	16	4.79	2.2181	25	28	28.4	3.698
2	2	34	7.08	2.1075	20	21	57.2	9.134	2	4	18	17.91	2.2198	25	32	6.5	3.572
3	2	36	13.62	2.1105	20	31	2.2	9.033	3	4	20	31.11	2.2205	25	35	37.0	3.444
4	2	38	20.34	2.1134	20	40	1.1	8.931	4	4	22	44.37	2.2216	25	38	59.8	3.317
5	2	40	27.23	2.1163	20	48	53.9	8.829	5	4	24	57.70	2.2227	25	42	15.0	3.189
6	2	42	34.30	2.1193	20	57	40.6	8.726	6	4	27	11.09	2.2236	25	45	22.5	3.060
7	2	44	41.54	2.1221	21	6	21.0	8.622	7	4	29	24.53	2.2245	25	48	22.2	2.931
8	2	46	48.95	2.1250	21	14	55.2	8.518	8	4	31	38.03	2.2254	25	51	14.2	2.803
9	2	48	56.54	2.1279	21	23	23.1	8.412	9	4	33	51.58	2.2262	25	53	58.6	2.675
10	2	51	4.30	2.1308	21	31	44.6	8.306	10	4	36	5.17	2.2268	25	56	35.2	2.545
11	2	53	12.23	2.1337	21	39	59.8	8.199	11	4	38	18.80	2.2274	25	59	4.0	2.416
12	2	55	20.34	2.1366	21	48	8.5	8.091	12	4	40	32.46	2.2280	26	1	25.1	2.287
13	2	57	28.62	2.1393	21	56	10.7	7.983	13	4	42	46.16	2.2285	26	3	38.4	2.157
14	2	59	37.06	2.1421	22	4	6.5	7.875	14	4	44	59.88	2.2288	26	5	43.9	2.028
15	3	1	45.67	2.1449	22	11	55.7	7.765	15	4	47	13.62	2.2292	26	7	41.7	1.898
16	3	3	54.45	2.1478	22	19	38.3	7.655	16	4	49	27.38	2.2295	26	9	31.7	1.768
17	3	6	3.40	2.1505	22	27	14.3	7.544	17	4	51	41.16	2.2297	26	11	13.9	1.638
18	3	8	12.51	2.1532	22	34	43.6	7.432	18	4	53	54.94	2.2298	26	12	48.3	1.508
19	3	10	21.78	2.1559	22	42	6.1	7.319	19	4	56	8.73	2.2298	26	14	14.9	1.378
20	3	12	31.22	2.1586	22	49	21.9	7.208	20	4	58	22.52	2.2298	26	15	33.7	1.248
21	3	14	40.81	2.1612	22	56	31.0	7.094	21	5	0	36.30	2.2297	26	16	44.7	1.118
22	3	16	50.56	2.1638	23	3	33.2	6.979	22	5	2	50.08	2.2295	26	17	47.9	0.988
23	3	19	0.47	2.1664	23	10	28.5	6.864	23	5	5	3.84	2.2293	26	18	43.3	0.858
24	3	21	10.53	2.1690	+23	17	16.9	+6.749	24	5	7	17.59	2.2289	+26	19	30.9	+0.728

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
JUNE 1.					JUNE 3.				
	^h ^m ^s	^s	[°] ['] ["]	["]		^h ^m ^s	^s	[°] ['] ["]	["]
0	5 7 17.59	2.2289	+26 19 30.9	+0.728	0	6 52 33.78	2.1339	+24 29 3.3	-5.186
1	5 9 31.31	2.2285	26 20 10.7	0.598	1	6 54 41.72	2.1308	24 23 48.8	5.206
2	5 11 45.01	2.2280	26 20 42.7	0.460	2	6 56 49.47	2.1275	24 18 27.6	5.408
3	5 13 58.67	2.2274	26 21 7.0	0.340	3	6 58 57.02	2.1241	24 12 59.8	5.518
4	5 16 12.30	2.2268	26 21 23.5	0.210	4	7 1 4.36	2.1208	24 7 25.4	5.638
5	5 18 25.89	2.2262	26 21 32.2	+0.080	5	7 3 11.51	2.1174	24 1 44.4	5.738
6	5 20 39.44	2.2253	26 21 33.1	-0.049	6	7 5 18.45	2.1140	23 55 56.9	5.846
7	5 22 52.93	2.2244	26 21 26.3	0.178	7	7 7 25.19	2.1106	23 50 2.9	5.953
8	5 25 6.37	2.2235	26 21 11.8	0.307	8	7 9 31.72	2.1071	23 44 2.5	6.061
9	5 27 19.75	2.2225	26 20 49.5	0.436	9	7 11 38.04	2.1036	23 37 55.6	6.168
10	5 29 33.07	2.2214	26 20 19.5	0.564	10	7 13 44.15	2.1002	23 31 42.4	6.273
11	5 31 46.32	2.2203	26 19 41.8	0.693	11	7 15 50.06	2.0967	23 25 22.8	6.378
12	5 33 59.51	2.2192	26 18 56.4	0.821	12	7 17 55.75	2.0931	23 18 57.0	6.483
13	5 36 12.62	2.2178	26 18 5.3	0.949	13	7 20 1.23	2.0896	23 12 24.9	6.587
14	5 38 25.65	2.2164	26 17 2.5	1.078	14	7 22 6.50	2.0860	23 5 46.6	6.689
15	5 40 38.59	2.2149	26 15 54.0	1.205	15	7 24 11.55	2.0824	22 59 2.2	6.792
16	5 42 51.44	2.2135	26 14 37.9	1.332	16	7 26 16.39	2.0788	22 52 11.6	6.893
17	5 45 4.21	2.2120	26 13 14.2	1.458	17	7 28 21.01	2.0753	22 45 15.0	6.993
18	5 47 16.88	2.2103	26 11 42.9	1.585	18	7 30 25.42	2.0717	22 38 12.4	7.094
19	5 49 29.44	2.2085	26 10 4.0	1.712	19	7 32 29.61	2.0680	22 31 3.7	7.194
20	5 51 41.90	2.2068	26 8 17.5	1.838	20	7 34 33.58	2.0644	22 23 49.1	7.293
21	5 53 54.25	2.2049	26 6 23.5	1.963	21	7 36 37.34	2.0608	22 16 28.5	7.392
22	5 56 6.49	2.2031	26 4 21.9	2.089	22	7 38 40.88	2.0572	22 9 2.1	7.488
23	5 58 18.62	2.2011	+26 2 12.8	-2.214	23	7 40 44.20	2.0536	+22 1 29.9	-7.585
JUNE 2.					JUNE 4.				
	^h ^m ^s	^s	[°] ['] ["]	["]		^h ^m ^s	^s	[°] ['] ["]	["]
0	6 0 30.62	2.1990	+25 59 56.2	-2.338	0	7 42 47.31	2.0500	+21 53 51.9	-7.682
1	6 2 42.50	2.1969	25 57 32.2	2.463	1	7 44 50.20	2.0463	21 46 8.1	7.777
2	6 4 54.25	2.1948	25 55 0.7	2.587	2	7 46 52.87	2.0427	21 38 18.7	7.871
3	6 7 5.87	2.1926	25 52 21.8	2.709	3	7 48 55.32	2.0390	21 30 23.6	7.965
4	6 9 17.36	2.1903	25 49 35.6	2.832	4	7 50 57.55	2.0354	21 22 22.9	8.058
5	6 11 28.71	2.1879	25 46 42.0	2.955	5	7 52 59.57	2.0318	21 14 16.6	8.150
6	6 13 39.91	2.1855	25 43 41.0	3.078	6	7 55 1.37	2.0283	21 6 4.9	8.243
7	6 15 50.97	2.1831	25 40 32.7	3.198	7	7 57 2.96	2.0247	20 57 47.6	8.333
8	6 18 1.88	2.1806	25 37 17.2	3.319	8	7 59 4.33	2.0210	20 49 24.9	8.433
9	6 20 12.64	2.1780	25 33 54.4	3.441	9	8 1 5.48	2.0174	20 40 56.8	8.513
10	6 22 23.24	2.1754	25 30 24.3	3.561	10	8 3 6.42	2.0139	20 32 23.4	8.601
11	6 24 33.69	2.1728	25 26 47.1	3.680	11	8 5 7.15	2.0103	20 23 44.7	8.689
12	6 26 43.97	2.1700	25 23 2.7	3.799	12	8 7 7.66	2.0068	20 15 0.7	8.778
13	6 28 54.09	2.1673	25 19 11.2	3.918	13	8 9 7.96	2.0033	20 6 11.4	8.864
14	6 31 4.04	2.1644	25 15 12.6	4.036	14	8 11 8.05	1.9998	19 57 17.0	8.949
15	6 33 13.82	2.1616	25 11 6.9	4.153	15	8 13 7.93	1.9963	19 48 17.5	9.034
16	6 35 23.43	2.1588	25 6 54.2	4.270	16	8 15 7.60	1.9928	19 39 12.9	9.118
17	6 37 32.87	2.1558	25 2 34.5	4.387	17	8 17 7.07	1.9894	19 30 3.3	9.203
18	6 39 42.12	2.1528	24 58 7.8	4.503	18	8 19 6.33	1.9859	19 20 48.6	9.286
19	6 41 51.20	2.1498	24 53 34.2	4.618	19	8 21 5.38	1.9825	19 11 29.0	9.368
20	6 44 0.09	2.1467	24 48 53.7	4.733	20	8 23 4.23	1.9791	19 2 4.5	9.449
21	6 46 8.80	2.1436	24 44 6.3	4.847	21	8 25 2.87	1.9758	18 52 35.1	9.530
22	6 48 17.32	2.1404	24 39 12.1	4.960	22	8 27 1.32	1.9725	18 43 0.9	9.609
23	6 50 25.65	2.1372	24 34 11.1	5.073	23	8 28 59.57	1.9692	18 33 22.0	9.688
24	6 52 33.78	2.1339	+24 29 3.3	-5.186	24	8 30 57.62	1.9658	+18 23 38.3	-9.768

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
JUNE 5.					JUNE 7.				
	^h ^m ^s	^s	[°] ['] ["]	["]		^h ^m ^s	^s	[°] ['] ["]	["]
0	8 30 57.62	1.9658	+18 23 38.3	-9.768	0	10 2 18.18	1.8591	+9 17 37.8	-12.720
1	8 32 55.47	1.9626	18 13 49.9	9.845	1	10 4 9.70	1.8582	9 4 53.2	12.765
2	8 34 53.13	1.9594	18 3 56.9	9.923	2	10 6 1.16	1.8573	8 52 6.0	12.809
3	8 36 50.60	1.9563	17 53 59.2	9.999	3	10 7 52.58	1.8567	8 39 16.1	12.853
4	8 38 47.88	1.9531	17 43 57.0	10.074	4	10 9 43.96	1.8560	8 26 23.6	12.896
5	8 40 44.97	1.9500	17 33 50.3	10.149	5	10 11 35.30	1.8553	8 13 28.6	12.938
6	8 42 41.88	1.9469	17 23 39.1	10.223	6	10 13 26.60	1.8548	8 0 31.0	12.980
7	8 44 38.60	1.9438	17 13 23.5	10.298	7	10 15 17.87	1.8543	7 47 31.0	13.021
8	8 46 35.14	1.9408	17 3 3.4	10.371	8	10 17 9.12	1.8539	7 34 28.5	13.062
9	8 48 31.49	1.9378	16 52 39.0	10.443	9	10 19 0.34	1.8535	7 21 23.6	13.102
10	8 50 27.67	1.9349	16 42 10.3	10.513	10	10 20 51.54	1.8533	7 8 16.3	13.141
11	8 52 23.68	1.9320	16 31 37.4	10.584	11	10 22 42.73	1.8531	6 55 6.7	13.178
12	8 54 19.51	1.9291	16 21 0.2	10.655	12	10 24 33.91	1.8529	6 41 54.9	13.216
13	8 56 15.17	1.9263	16 10 18.8	10.724	13	10 26 25.08	1.8528	6 28 40.8	13.253
14	8 58 10.67	1.9236	15 59 33.3	10.793	14	10 28 16.25	1.8528	6 15 24.5	13.289
15	9 0 6.00	1.9208	15 48 43.7	10.860	15	10 30 7.42	1.8529	6 2 6.1	13.325
16	9 2 1.17	1.9181	15 37 50.1	10.928	16	10 31 58.60	1.8531	5 48 45.5	13.360
17	9 3 56.17	1.9154	15 26 52.4	10.994	17	10 33 49.79	1.8533	5 35 22.9	13.394
18	9 5 51.02	1.9128	15 15 50.8	11.060	18	10 35 41.00	1.8537	5 21 58.2	13.428
19	9 7 45.71	1.9103	15 4 45.2	11.125	19	10 37 32.23	1.8540	5 8 31.5	13.462
20	9 9 40.25	1.9078	14 53 35.8	11.189	20	10 39 23.48	1.8544	4 55 2.8	13.493
21	9 11 34.65	1.9054	14 42 22.5	11.253	21	10 41 14.76	1.8550	4 41 32.3	13.524
22	9 13 28.90	1.9029	14 31 5.4	11.317	22	10 43 6.08	1.8556	4 27 59.9	13.555
23	9 15 23.00	1.9005	+14 19 44.5	-11.379	23	10 44 57.43	1.8562	+4 14 25.7	-13.585
JUNE 6.					JUNE 8.				
0	9 17 16.96	1.8982	+14 8 19.9	-11.441	0	10 46 48.82	1.8569	+4 0 49.7	-13.614
1	9 19 10.78	1.8959	13 56 51.6	11.502	1	10 48 40.26	1.8578	3 47 12.0	13.643
2	9 21 4.47	1.8938	13 45 19.7	11.562	2	10 50 31.75	1.8587	3 33 32.5	13.672
3	9 22 58.03	1.8916	13 33 44.2	11.622	3	10 52 23.30	1.8597	3 19 51.4	13.698
4	9 24 51.46	1.8894	13 22 5.1	11.681	4	10 54 14.91	1.8607	3 6 8.7	13.725
5	9 26 44.76	1.8873	13 10 22.5	11.739	5	10 56 6.58	1.8618	2 52 24.4	13.752
6	9 28 37.94	1.8853	12 58 36.4	11.797	6	10 57 58.32	1.8630	2 38 38.5	13.777
7	9 30 31.00	1.8834	12 46 46.9	11.853	7	10 59 50.14	1.8643	2 24 51.2	13.800
8	9 32 23.95	1.8815	12 34 54.0	11.910	8	11 1 42.03	1.8656	2 11 2.5	13.823
9	9 34 16.78	1.8796	12 22 57.7	11.966	9	11 3 34.01	1.8670	1 57 12.4	13.847
10	9 36 9.50	1.8778	12 10 58.1	12.021	10	11 5 26.07	1.8685	1 43 20.9	13.869
11	9 38 2.12	1.8762	11 58 55.2	12.075	11	11 7 18.23	1.8702	1 29 28.1	13.891
12	9 39 54.64	1.8745	11 46 49.1	12.128	12	11 9 10.49	1.8718	1 15 34.0	13.912
13	9 41 47.06	1.8729	11 34 39.8	12.181	13	11 11 2.85	1.8736	1 1 38.7	13.931
14	9 43 39.39	1.8713	11 22 27.4	12.233	14	11 12 55.32	1.8754	0 47 42.3	13.950
15	9 45 31.62	1.8698	11 10 11.8	12.286	15	11 14 47.90	1.8773	0 33 44.7	13.968
16	9 47 23.76	1.8683	10 57 53.1	12.337	16	11 16 40.59	1.8793	0 19 46.1	13.985
17	9 49 15.82	1.8670	10 45 31.4	12.387	17	11 18 33.41	1.8813	+0 5 46.5	14.003
18	9 51 7.80	1.8657	10 33 6.7	12.436	18	11 20 26.35	1.8835	-0 8 14.2	14.019
19	9 52 59.70	1.8644	10 20 39.1	12.485	19	11 22 19.43	1.8858	0 22 15.8	14.033
20	9 54 51.53	1.8633	10 8 8.5	12.534	20	11 24 12.64	1.8880	0 36 18.2	14.047
21	9 56 43.29	1.8621	9 55 35.0	12.582	21	11 26 5.99	1.8904	0 50 21.4	14.061
22	9 58 34.98	1.8610	9 42 58.7	12.628	22	11 27 59.49	1.8929	1 4 25.5	14.074
23	10 0 26.61	1.8600	9 30 19.6	12.674	23	11 29 53.14	1.8955	1 18 30.3	14.086
24	10 2 18.18	1.8591	+9 17 37.8	-12.720	24	11 31 46.95	1.8982	-1 32 35.8	-14.097

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
JUNE 9.					JUNE 11.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	11 31 46.95	1.9082	- 1 32 35.8	-14.087	0	13 7 34.78	2.1267	-12 43 10.3	-13.488
1	11 33 40.92	1.9090	1 46 41.9	14.107	1	13 9 42.58	2.1335	12 56 33.4	13.363
2	11 35 35.06	1.9038	2 0 48.6	14.116	2	13 11 50.80	2.1405	13 9 53.8	13.316
3	11 37 29.37	1.9066	2 14 55.8	14.124	3	13 13 59.44	2.1475	13 23 11.3	13.267
4	11 39 23.85	1.9096	2 29 3.5	14.132	4	13 16 8.50	2.1545	13 36 25.8	13.217
5	11 41 18.52	1.9127	2 43 11.6	14.138	5	13 18 17.98	2.1617	13 49 37.3	13.166
6	11 43 13.37	1.9158	2 57 20.0	14.143	6	13 20 27.90	2.1689	14 2 45.7	13.113
7	11 45 8.42	1.9191	3 11 28.8	14.148	7	13 22 38.25	2.1762	14 15 50.9	13.059
8	11 47 3.66	1.9223	3 25 37.8	14.153	8	13 24 49.04	2.1836	14 28 52.8	13.008
9	11 48 59.10	1.9258	3 39 47.1	14.156	9	13 27 0.28	2.1911	14 41 51.2	12.944
10	11 50 54.75	1.9293	3 53 56.5	14.157	10	13 29 11.97	2.1986	14 54 46.1	12.885
11	11 52 50.61	1.9328	4 8 5.9	14.158	11	13 31 24.11	2.2061	15 7 37.4	12.823
12	11 54 46.69	1.9366	4 22 15.4	14.158	12	13 33 36.70	2.2138	15 20 24.9	12.760
13	11 56 43.00	1.9403	4 36 24.9	14.158	13	13 35 49.76	2.2215	15 33 8.6	12.696
14	11 58 39.53	1.9441	4 50 34.3	14.155	14	13 38 3.28	2.2293	15 45 48.4	12.630
15	12 0 36.29	1.9480	5 4 43.5	14.152	15	13 40 17.27	2.2371	15 58 24.2	12.563
16	12 2 33.29	1.9521	5 18 52.5	14.148	16	13 42 31.73	2.2450	16 10 55.8	12.492
17	12 4 30.54	1.9563	5 33 1.2	14.143	17	13 44 46.67	2.2530	16 23 23.2	12.421
18	12 6 28.04	1.9604	5 47 9.6	14.138	18	13 47 2.09	2.2610	16 35 46.3	12.348
19	12 8 25.79	1.9647	6 1 17.7	14.131	19	13 49 17.99	2.2691	16 48 4.9	12.272
20	12 10 23.80	1.9691	6 15 25.3	14.122	20	13 51 34.38	2.2773	17 0 18.9	12.195
21	12 12 22.08	1.9736	6 29 32.3	14.113	21	13 53 51.26	2.2854	17 12 28.3	12.117
22	12 14 20.63	1.9781	6 43 38.8	14.103	22	13 56 8.63	2.2937	17 24 32.9	12.036
23	12 16 19.45	1.9827	- 6 57 44.7	-14.092	23	13 58 26.50	2.3019	-17 36 32.6	-11.953
JUNE 10.					JUNE 12.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	12 18 18.55	1.9874	- 7 11 49.8	-14.078	0	14 0 44.86	2.3102	-17 48 27.3	-11.880
1	12 20 17.94	1.9923	7 25 54.1	14.065	1	14 3 3.72	2.3186	18 0 16.9	11.783
2	12 22 17.62	1.9971	7 39 57.6	14.050	2	14 5 23.09	2.3271	18 12 1.2	11.694
3	12 24 17.59	2.0021	7 54 0.1	14.034	3	14 7 42.97	2.3355	18 23 40.2	11.604
4	12 26 17.87	2.0072	8 8 1.7	14.018	4	14 10 3.35	2.3440	18 35 13.7	11.512
5	12 28 18.45	2.0123	8 22 2.2	13.999	5	14 12 24.25	2.3526	18 46 41.6	11.418
6	12 30 19.35	2.0176	8 36 1.6	13.980	6	14 14 45.66	2.3611	18 58 3.9	11.323
7	12 32 20.56	2.0229	8 49 59.8	13.969	7	14 17 7.58	2.3697	19 9 20.3	11.224
8	12 34 22.10	2.0283	9 3 56.7	13.937	8	14 19 30.02	2.3783	19 20 30.8	11.124
9	12 36 23.96	2.0338	9 17 52.2	13.913	9	14 21 52.98	2.3869	19 31 35.2	11.023
10	12 38 26.16	2.0395	9 31 46.3	13.889	10	14 24 16.45	2.3955	19 42 33.5	10.919
11	12 40 28.70	2.0452	9 45 38.9	13.864	11	14 26 40.44	2.4043	19 53 25.5	10.813
12	12 42 31.58	2.0509	9 59 30.0	13.838	12	14 29 4.96	2.4130	20 4 11.1	10.706
13	12 44 34.81	2.0568	10 13 19.4	13.809	13	14 31 30.00	2.4217	20 14 50.2	10.596
14	12 46 38.39	2.0627	10 27 7.1	13.779	14	14 33 55.56	2.4303	20 25 22.6	10.485
15	12 48 42.33	2.0688	10 40 52.9	13.748	15	14 36 21.64	2.4390	20 35 48.2	10.366
16	12 50 46.64	2.0748	10 54 36.9	13.717	16	14 38 48.24	2.4478	20 46 6.9	10.253
17	12 52 51.31	2.0810	11 8 18.9	13.683	17	14 41 15.37	2.4565	20 56 18.6	10.136
18	12 54 56.36	2.0873	11 21 58.8	13.647	18	14 43 43.02	2.4652	21 6 23.2	10.016
19	12 57 1.79	2.0937	11 35 36.5	13.611	19	14 46 11.19	2.4738	21 16 20.5	9.893
20	12 59 7.60	2.1001	11 49 12.1	13.574	20	14 48 39.88	2.4825	21 26 10.4	9.766
21	13 1 13.80	2.1066	12 2 45.4	13.534	21	14 51 9.09	2.4912	21 35 52.8	9.643
22	13 3 20.39	2.1132	12 16 16.2	13.493	22	14 53 38.82	2.4998	21 45 27.6	9.515
23	13 5 27.38	2.1199	12 29 44.5	13.451	23	14 56 9.07	2.5084	21 54 54.6	9.385
24	13 7 34.78	2.1267	-12 43 10.3	-13.408	24	14 58 39.83	2.5170	-22 4 13.8	-9.253

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
JUNE 13.					JUNE 15.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	14 58 39.83	2.5170	-22 4 13.8	-0.253	0	17 7 45.96	2.8004	-26 20 23.4	-0.827
1	15 1 11.11	2.5256	22 13 25.0	9.119	1	17 10 34.59	2.8114	26 21 6.8	0.621
2	15 3 42.90	2.5341	22 22 28.1	8.963	2	17 13 23.33	2.8132	26 21 37.9	0.415
3	15 6 15.20	2.5426	22 31 22.9	8.843	3	17 16 12.17	2.8148	26 21 56.6	0.209
4	15 8 48.01	2.5510	22 40 9.3	8.703	4	17 19 1.10	2.8160	26 22 3.0	-0.008
5	15 11 21.32	2.5593	22 48 47.3	8.561	5	17 21 50.09	2.8170	26 21 56.9	+0.206
6	15 13 55.13	2.5677	22 57 16.6	8.416	6	17 24 39.14	2.8178	26 21 38.4	0.412
7	15 16 29.44	2.5759	23° 5 37.2	8.270	7	17 27 28.23	2.8184	26 21 7.5	0.618
8	15 19 4.24	2.5841	23 13 49.0	8.122	8	17 30 17.35	2.8189	26 20 24.2	0.826
9	15 21 39.53	2.5922	23 21 51.8	7.971	9	17 33 6.50	2.8191	26 19 28.4	1.033
10	15 24 15.30	2.6003	23 29 45.5	7.818	10	17 35 55.64	2.8190	26 18 20.2	1.241
11	15 26 51.56	2.6083	23 37 30.0	7.663	11	17 38 44.78	2.8188	26 16 59.5	1.448
12	15 29 28.29	2.6162	23 45 5.1	7.508	12	17 41 33.90	2.8183	26 15 26.4	1.655
13	15 32 5.50	2.6240	23 52 30.9	7.350	13	17 44 22.98	2.8176	26 13 40.9	1.863
14	15 34 43.17	2.6317	23 59 47.1	7.189	14	17 47 12.01	2.8167	26 11 42.9	2.069
15	15 37 21.30	2.6393	24 6 53.6	7.027	15	17 50 0.98	2.8156	26 9 32.6	2.275
16	15 39 59.89	2.6468	24 13 50.3	6.863	16	17 52 49.88	2.8143	26 7 9.9	2.481
17	15 42 38.92	2.6543	24 20 37.2	6.698	17	17 55 38.69	2.8127	26 4 34.9	2.686
18	15 45 18.40	2.6616	24 27 14.1	6.531	18	17 58 27.40	2.8108	26 1 47.6	2.891
19	15 47 58.31	2.6688	24 33 40.9	6.361	19	18 1 15.99	2.8088	25 58 48.0	3.096
20	15 50 38.66	2.6759	24 39 57.4	6.189	20	18 4 4.45	2.8065	25 55 36.2	3.298
21	15 53 19.42	2.6828	24 46 3.6	6.017	21	18 6 52.77	2.8042	25 52 12.2	3.502
22	15 56 0.60	2.6896	24 51 59.4	5.843	22	18 9 40.95	2.8016	25 48 36.0	3.704
23	15 58 42.19	2.6964	-24 57 44.7	-5.667	23	18 12 28.96	2.7988	-25 44 47.7	+3.906
JUNE 14.					JUNE 16.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	16 1 24.17	2.7029	-25 3 19.4	-5.489	0	18 15 16.80	2.7957	-25 40 47.4	+4.106
1	16 4 6.54	2.7093	25 8 43.4	5.309	1	18 18 4.44	2.7924	25 36 35.0	4.306
2	16 6 49.29	2.7157	25 13 56.5	5.128	2	18 20 51.89	2.7891	25 32 10.7	4.504
3	16 9 32.42	2.7218	25 18 58.7	4.945	3	18 23 39.13	2.7854	25 27 34.5	4.703
4	16 12 15.91	2.7278	25 23 49.9	4.761	4	18 26 26.14	2.7816	25 22 46.4	4.899
5	16 14 59.75	2.7336	25 28 30.0	4.575	5	18 29 12.92	2.7776	25 17 46.6	5.094
6	16 17 43.94	2.7393	25 32 58.9	4.388	6	18 31 59.45	2.7734	25 12 35.1	5.289
7	16 20 28.46	2.7448	25 37 16.5	4.199	7	18 34 45.73	2.7691	25 7 11.9	5.483
8	16 23 13.31	2.7501	25 41 22.8	4.010	8	18 37 31.74	2.7646	25 1 37.2	5.673
9	16 25 58.47	2.7552	25 45 17.7	3.819	9	18 40 17.48	2.7599	24 55 51.1	5.864
10	16 28 43.93	2.7602	25 49 1.1	3.627	10	18 43 2.93	2.7551	24 49 53.5	6.054
11	16 31 29.69	2.7650	25 52 32.9	3.433	11	18 45 48.09	2.7501	24 43 44.6	6.242
12	16 34 15.73	2.7696	25 55 53.0	3.238	12	18 48 32.94	2.7448	24 37 24.5	6.428
13	16 37 2.04	2.7740	25 59 1.4	3.042	13	18 51 17.47	2.7394	24 30 53.2	6.613
14	16 39 48.61	2.7783	26 1 58.0	2.845	14	18 54 1.67	2.7339	24 24 10.9	6.796
15	16 42 35.43	2.7823	26 4 42.8	2.647	15	18 56 45.54	2.7283	24 17 17.7	6.978
16	16 45 22.49	2.7862	26 7 15.6	2.448	16	18 59 29.06	2.7224	24 10 13.6	7.158
17	16 48 9.77	2.7898	26 9 36.5	2.248	17	19 2 12.23	2.7166	24 2 58.7	7.338
18	16 50 57.26	2.7932	26 11 45.3	2.047	18	19 4 55.05	2.7106	23 55 33.1	7.514
19	16 53 44.95	2.7964	26 13 42.1	1.846	19	19 7 37.50	2.7043	23 47 57.0	7.689
20	16 56 32.83	2.7994	26 15 26.8	1.643	20	19 10 19.57	2.6980	23 40 10.4	7.863
21	16 59 20.88	2.8022	26 16 59.3	1.440	21	19 13 1.26	2.6917	23 32 13.5	8.034
22	17 2 9.09	2.8048	26 18 19.6	1.236	22	19 15 42.57	2.6852	23 24 6.3	8.204
23	17 4 57.46	2.8073	26 19 27.6	1.032	23	19 18 23.48	2.6784	23 15 49.0	8.373
24	17 7 45.96	2.8094	-26 20 23.4	-0.827	24	19 21 3.98	2.6716	-23 7 21.6	+8.539

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
JUNE 17.					JUNE 19.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	19 21 3.98	2.6716	-23 7 21.6	+ 8.539	0	21 20 32.32	2.3048	-13 45 9.8	+14.053
1	19 23 44.07	2.6648	22 58 44.3	8.703	1	21 22 50.39	2.2977	13 31 3.6	14.137
2	19 26 23.75	2.6578	22 49 57.2	8.865	2	21 25 8.04	2.2907	13 16 53.6	14.196
3	19 29 3.01	2.6508	22 41 0.5	9.025	3	21 27 25.27	2.2837	13 2 39.9	14.238
4	19 31 41.84	2.6436	22 31 54.2	9.184	4	21 29 42.08	2.2768	12 48 22.7	14.315
5	19 34 20.24	2.6363	22 22 38.4	9.341	5	21 31 58.48	2.2699	12 34 2.1	14.372
6	19 36 58.20	2.6291	22 13 13.3	9.495	6	21 34 14.47	2.2632	12 19 38.1	14.427
7	19 39 35.73	2.6218	22 3 39.0	9.648	7	21 36 30.06	2.2564	12 5 10.9	14.475
8	19 42 12.81	2.6143	21 53 55.5	9.799	8	21 38 45.24	2.2497	11 50 40.6	14.520
9	19 44 49.44	2.6068	21 44 3.1	9.947	9	21 41 0.02	2.2432	11 36 7.3	14.570
10	19 47 25.62	2.5992	21 34 1.9	10.093	10	21 43 14.42	2.2368	11 21 31.1	14.626
11	19 50 1.34	2.5915	21 23 51.9	10.238	11	21 45 28.43	2.2303	11 6 52.2	14.671
12	19 52 36.60	2.5838	21 13 33.4	10.379	12	21 47 42.06	2.2240	10 52 10.6	14.715
13	19 55 11.40	2.5761	21 3 6.4	10.519	13	21 49 55.31	2.2178	10 37 26.4	14.757
14	19 57 45.73	2.5683	20 52 31.1	10.658	14	21 52 8.19	2.2116	10 22 39.8	14.799
15	20 0 19.60	2.5606	20 41 47.5	10.793	15	21 54 20.70	2.2055	10 7 50.9	14.834
16	20 2 53.00	2.5528	20 30 55.9	10.927	16	21 56 32.85	2.1994	9 52 59.7	14.871
17	20 5 25.93	2.5448	20 19 56.3	11.058	17	21 58 44.63	2.1934	9 38 6.4	14.908
18	20 7 58.38	2.5369	20 8 48.9	11.188	18	22 0 56.06	2.1877	9 23 11.0	14.950
19	20 10 30.36	2.5290	19 57 33.8	11.315	19	22 3 7.15	2.1819	9 8 13.7	14.971
20	20 13 1.86	2.5211	19 46 11.1	11.440	20	22 5 17.89	2.1762	8 53 14.5	15.001
21	20 15 32.89	2.5132	19 34 41.0	11.563	21	22 7 28.29	2.1706	8 38 13.6	15.029
22	20 18 3.44	2.5052	19 23 3.6	11.683	22	22 9 38.36	2.1651	8 23 11.0	15.058
23	20 20 33.51	2.4972	-19 11 19.0	+11.803	23	22 11 48.10	2.1597	- 8 8 6.9	+15.080
JUNE 18.					JUNE 20.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	20 23 3.10	2.4892	-18 59 27.3	+11.919	0	22 13 57.52	2.1543	- 7 53 1.4	+15.103
1	20 25 32.21	2.4813	18 47 28.7	12.033	1	22 16 6.62	2.1491	7 37 54.5	15.125
2	20 28 0.85	2.4733	18 35 23.4	12.144	2	22 18 15.41	2.1439	7 22 46.4	15.145
3	20 30 29.00	2.4653	18 23 11.4	12.254	3	22 20 23.89	2.1388	7 7 37.1	15.164
4	20 32 56.68	2.4573	18 10 52.9	12.362	4	22 22 32.06	2.1338	6 52 26.7	15.182
5	20 35 23.88	2.4494	17 58 28.0	12.468	5	22 24 39.94	2.1289	6 37 15.3	15.198
6	20 37 50.61	2.4415	17 45 56.8	12.571	6	22 26 47.53	2.1241	6 22 3.0	15.212
7	20 40 16.86	2.4336	17 33 19.5	12.672	7	22 28 54.83	2.1193	6 6 49.9	15.224
8	20 42 42.64	2.4258	17 20 36.2	12.771	8	22 31 1.85	2.1147	5 51 36.1	15.235
9	20 45 7.95	2.4178	17 7 47.0	12.868	9	22 33 8.59	2.1101	5 36 21.7	15.243
10	20 47 32.78	2.4099	16 54 52.1	12.963	10	22 35 15.06	2.1057	5 21 6.7	15.254
11	20 49 57.14	2.4022	16 41 51.5	13.055	11	22 37 21.27	2.1013	5 5 51.2	15.261
12	20 52 21.04	2.3944	16 28 45.5	13.145	12	22 39 27.21	2.0969	4 50 35.4	15.268
13	20 54 44.17	2.3867	16 15 34.1	13.233	13	22 41 32.90	2.0928	4 35 19.3	15.270
14	20 57 7.44	2.3791	16 2 17.5	13.320	14	22 43 38.34	2.0887	4 20 3.0	15.273
15	20 59 29.96	2.3714	15 48 55.7	13.405	15	22 45 43.54	2.0847	4 4 46.6	15.274
16	21 1 52.01	2.3638	15 35 28.9	13.487	16	22 47 48.50	2.0807	3 49 30.1	15.273
17	21 4 13.61	2.3563	15 21 57.3	13.567	17	22 49 53.22	2.0768	3 34 13.6	15.273
18	21 6 34.76	2.3488	15 8 20.9	13.645	18	22 51 57.72	2.0731	3 18 57.3	15.270
19	21 8 55.46	2.3413	14 54 39.9	13.721	19	22 54 1.99	2.0694	3 3 41.2	15.267
20	21 11 15.71	2.3338	14 40 51.4	13.795	20	22 56 6.05	2.0658	2 48 25.3	15.262
21	21 13 35.52	2.3265	14 27 4.5	13.867	21	22 58 9.89	2.0623	2 33 9.8	15.255
22	21 15 54.89	2.3192	14 13 10.4	13.937	22	23 0 13.53	2.0589	2 17 54.7	15.248
23	21 18 13.82	2.3119	13 59 12.1	14.005	23	23 2 16.96	2.0556	2 2 40.1	15.239
24	21 20 32.32	2.3048	-13 45 9.8	+14.071	24	23 4 20.20	2.0524	- 1 47 26.0	+15.229

MOON, 1916.

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	
JUNE 21.					JUNE 23.				
	^h ^m ^s	^s	[°] ['] ^{''}	^{''}		^h ^m ^s	^s	[°] ['] ^{''}	
0	23 4 20.20	2.0624	-1 47 26.0	+15.229	0	0 40 43.52	1.9940	+ 9 51 1.7	
1	23 6 23.25	2.0493	1 32 12.6	15.218	1	0 42 43.18	1.9946	10 4 29.6	
2	23 8 26.11	2.0462	1 16 59.9	15.205	2	0 44 42.87	1.9952	10 17 53.9	
3	23 10 28.79	2.0432	1 1 48.0	15.191	3	0 46 42.60	1.9959	10 31 14.6	
4	23 12 31.29	2.0403	0 46 37.0	15.176	4	0 48 42.38	1.9968	10 44 31.7	
5	23 14 33.63	2.0376	0 31 26.9	15.160	5	0 50 42.21	1.9976	10 57 45.1	
6	23 16 35.80	2.0348	0 16 17.8	15.143	6	0 52 42.09	1.9985	11 10 54.7	
7	23 18 37.81	2.0323	-0 1 9.8	15.124	7	0 54 42.03	1.9994	11 24 0.5	
8	23 20 39.67	2.0297	+0 13 57.1	15.106	8	0 56 42.02	2.0004	11 37 2.4	
9	23 22 41.37	2.0272	0 29 2.8	15.084	9	0 58 42.08	2.0016	11 50 0.4	
10	23 24 42.93	2.0248	0 44 7.2	15.063	10	1 0 42.21	2.0027	12 2 54.5	
11	23 26 44.35	2.0226	0 59 10.3	15.039	11	1 2 42.40	2.0038	12 15 44.6	
12	23 28 45.64	2.0204	1 14 11.9	15.015	12	1 4 42.67	2.0052	12 28 30.6	
13	23 30 46.80	2.0183	1 29 12.1	14.990	13	1 6 43.02	2.0064	12 41 12.5	
14	23 32 47.83	2.0163	1 44 10.7	14.963	14	1 8 43.44	2.0078	12 53 50.3	
15	23 34 48.75	2.0143	1 59 7.7	14.937	15	1 10 43.95	2.0092	13 6 23.9	
16	23 36 49.55	2.0124	2 14 3.1	14.908	16	1 12 44.54	2.0106	13 18 53.2	
17	23 38 50.24	2.0107	2 28 56.7	14.879	17	1 14 45.22	2.0122	13 31 18.3	
18	23 40 50.83	2.0090	2 43 48.6	14.849	18	1 16 46.00	2.0138	13 43 39.0	
19	23 42 51.32	2.0074	2 58 38.6	14.818	19	1 18 46.87	2.0153	13 55 55.3	
20	23 44 51.72	2.0059	3 13 26.7	14.785	20	1 20 47.84	2.0170	14 8 7.1	
21	23 46 52.03	2.0044	3 28 12.8	14.752	21	1 22 48.91	2.0188	14 20 14.5	
22	23 48 52.25	2.0030	3 42 56.9	14.718	22	1 24 50.09	2.0206	14 32 17.4	
23	23 50 52.39	2.0018	+3 57 38.9	+14.682	23	1 26 51.37	2.0223	+14 44 15.7	
JUNE 22.					JUNE 24.				
0	23 52 52.46	2.0006	+4 12 18.7	+14.645	0	1 28 52.76	2.0241	+14 56 9.4	
1	23 54 52.46	1.9994	4 26 56.3	14.608	1	1 30 54.26	2.0260	15 7 58.4	
2	23 56 52.39	1.9983	4 41 31.7	14.570	2	1 32 55.88	2.0279	15 19 42.7	
3	23 58 52.26	1.9974	4 56 4.7	14.530	3	1 34 57.61	2.0298	15 31 22.3	
4	0 0 52.08	1.9966	5 10 35.3	14.490	4	1 36 59.46	2.0319	15 42 57.0	
5	0 2 51.85	1.9958	5 25 3.5	14.449	5	1 39 1.44	2.0340	15 54 26.9	
6	0 4 51.57	1.9949	5 39 29.2	14.407	6	1 41 3.54	2.0361	16 5 51.9	
7	0 6 51.24	1.9943	5 53 52.3	14.363	7	1 43 5.77	2.0382	16 17 12.0	
8	0 8 50.88	1.9937	6 8 12.8	14.320	8	1 45 8.12	2.0403	16 28 27.1	
9	0 10 50.48	1.9932	6 22 30.7	14.275	9	1 47 10.60	2.0425	16 39 37.1	
10	0 12 50.06	1.9928	6 36 45.8	14.229	10	1 49 13.22	2.0448	16 50 42.1	
11	0 14 49.61	1.9923	6 50 58.2	14.183	11	1 51 15.97	2.0470	17 1 41.9	
12	0 16 49.14	1.9921	7 5 7.7	14.134	12	1 53 18.86	2.0493	17 12 36.6	
13	0 18 48.66	1.9918	7 19 14.3	14.086	13	1 55 21.89	2.0516	17 23 26.1	
14	0 20 48.16	1.9917	7 33 18.0	14.037	14	1 57 25.05	2.0539	17 34 10.3	
15	0 22 47.66	1.9916	7 47 18.7	13.986	15	1 59 28.36	2.0563	17 44 49.2	
16	0 24 47.15	1.9916	8 1 16.3	13.935	16	2 1 31.81	2.0588	17 55 22.8	
17	0 26 46.65	1.9917	8 15 10.9	13.883	17	2 3 35.41	2.0612	18 5 50.9	
18	0 28 46.15	1.9918	8 29 2.3	13.830	18	2 5 39.15	2.0636	18 16 13.6	
19	0 30 45.66	1.9920	8 42 50.5	13.777	19	2 7 43.04	2.0661	18 26 30.9	
20	0 32 45.19	1.9923	8 56 35.5	13.722	20	2 9 47.08	2.0686	18 36 42.6	
21	0 34 44.73	1.9926	9 10 17.1	13.666	21	2 11 51.27	2.0711	18 46 48.8	
22	0 36 44.30	1.9931	9 23 55.4	13.610	22	2 13 55.61	2.0736	18 56 49.4	
23	0 38 43.90	1.9935	9 37 30.3	13.553	23	2 16 0.10	2.0762	19 6 44.3	
24	0 40 43.52	1.9940	+9 51 1.7	+13.494	24	2 18 4.75	2.0788	+19 16 33.6	

GREENWICH MEAN TIME.

Hour.	Right Ascension.			Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.			Var. per Min.	Declination.	Var. per Min.
JUNE 25.							JUNE 27.						
	h	m	s	s	"	"		h	m	s	s	"	"
0	2 18	4.75	2.0788	+19 16	33.6	+9.773	0	4 0	48.59	2.1947	+25 3	34.0	+4.463
1	2 20	9.55	2.0813	19 26	17.1	9.677	1	4 3	0.32	2.1963	25 7	58.1	4.339
2	2 22	14.51	2.0840	19 35	54.8	9.580	2	4 5	12.15	2.1979	25 12	14.7	4.215
3	2 24	19.63	2.0867	19 45	26.7	9.483	3	4 7	24.07	2.1995	25 16	23.9	4.092
4	2 26	24.91	2.0893	19 54	52.8	9.386	4	4 9	36.09	2.2011	25 20	25.7	3.968
5	2 28	30.34	2.0918	20 4	13.0	9.287	5	4 11	48.20	2.2025	25 24	20.0	3.843
6	2 30	35.93	2.0945	20 13	27.2	9.188	6	4 14	0.39	2.2038	25 28	6.9	3.718
7	2 32	41.68	2.0972	20 22	35.5	9.088	7	4 16	12.66	2.2053	25 31	46.2	3.593
8	2 34	47.59	2.0998	20 31	37.7	8.987	8	4 18	25.02	2.2066	25 35	18.0	3.468
9	2 36	53.66	2.1025	20 40	33.9	8.885	9	4 20	37.45	2.2078	25 38	42.3	3.342
10	2 38	59.89	2.1051	20 49	23.9	8.783	10	4 22	49.96	2.2090	25 41	59.0	3.215
11	2 41	6.27	2.1078	20 58	7.8	8.680	11	4 25	2.53	2.2101	25 45	8.1	3.089
12	2 43	12.82	2.1105	21 6	45.5	8.577	12	4 27	15.17	2.2112	25 48	9.7	2.963
13	2 45	19.53	2.1132	21 15	17.0	8.473	13	4 29	27.87	2.2122	25 51	3.7	2.836
14	2 47	26.40	2.1158	21 23	42.2	8.368	14	4 31	40.63	2.2131	25 53	50.0	2.708
15	2 49	33.42	2.1184	21 32	1.1	8.263	15	4 33	53.44	2.2139	25 56	28.7	2.582
16	2 51	40.61	2.1212	21 40	13.7	8.157	16	4 36	6.30	2.2147	25 58	59.8	2.454
17	2 53	47.96	2.1238	21 48	19.9	8.049	17	4 38	19.20	2.2154	26 1	23.2	2.327
18	2 55	55.46	2.1264	21 56	19.6	7.942	18	4 40	32.15	2.2162	26 3	39.0	2.199
19	2 58	3.13	2.1291	22 4	12.9	7.834	19	4 42	45.14	2.2168	26 5	47.1	2.071
20	3 0	10.95	2.1317	22 11	59.7	7.726	20	4 44	58.16	2.2173	26 7	47.5	1.943
21	3 2	18.93	2.1343	22 19	40.0	7.617	21	4 47	11.21	2.2177	26 9	40.2	1.815
22	3 4	27.06	2.1368	22 27	13.7	7.507	22	4 49	24.28	2.2181	26 11	25.3	1.688
23	3 6	35.35	2.1394	+22 34	40.8	+7.397	23	4 51	37.38	2.2184	+26 13	2.7	+1.558
JUNE 26.							JUNE 28.						
0	3 8	43.79	2.1420	+22 42	1.3	+7.286	0	4 53	50.49	2.2187	+26 14	32.3	+1.429
1	3 10	52.39	2.1446	22 49	15.1	7.174	1	4 56	3.62	2.2188	26 15	54.2	1.302
2	3 13	1.14	2.1471	22 56	22.2	7.063	2	4 58	16.75	2.2189	26 17	8.5	1.174
3	3 15	10.04	2.1495	23 3	22.6	6.949	3	5 0	29.89	2.2190	26 18	15.1	1.045
4	3 17	19.08	2.1519	23 10	16.1	6.835	4	5 2	43.03	2.2190	26 19	13.9	0.916
5	3 19	28.27	2.1544	23 17	2.8	6.722	5	5 4	56.17	2.2189	26 20	5.0	0.788
6	3 21	37.61	2.1569	23 23	42.7	6.608	6	5 7	9.30	2.2188	26 20	48.4	0.659
7	3 23	47.10	2.1593	23 30	15.7	6.493	7	5 9	22.42	2.2185	26 21	24.1	0.531
8	3 25	56.73	2.1617	23 36	41.8	6.377	8	5 11	35.52	2.2182	26 21	52.1	0.403
9	3 28	6.50	2.1640	23 43	0.9	6.261	9	5 13	48.60	2.2178	26 22	12.4	0.274
10	3 30	16.41	2.1663	23 49	13.1	6.144	10	5 16	1.66	2.2174	26 22	25.0	0.147
11	3 32	26.46	2.1686	23 55	18.2	6.027	11	5 18	14.69	2.2168	26 22	30.0	+0.018
12	3 34	36.64	2.1708	24 1	16.3	5.910	12	5 20	27.68	2.2163	26 22	27.2	-0.111
13	3 36	46.96	2.1730	24 7	7.4	5.792	13	5 22	40.64	2.2156	26 22	16.7	0.238
14	3 38	57.40	2.1752	24 12	51.3	5.673	14	5 24	53.55	2.2148	26 21	58.6	0.366
15	3 41	7.98	2.1774	24 18	28.1	5.553	15	5 27	6.41	2.2140	26 21	32.8	0.494
16	3 43	18.69	2.1795	24 23	57.7	5.434	16	5 29	19.23	2.2132	26 20	59.3	0.623
17	3 45	29.52	2.1815	24 29	20.2	5.315	17	5 31	31.99	2.2122	26 20	18.1	0.750
18	3 47	40.47	2.1835	24 34	35.5	5.194	18	5 33	44.69	2.2112	26 19	29.3	0.877
19	3 49	51.54	2.1855	24 39	43.5	5.073	19	5 35	57.33	2.2101	26 18	32.9	1.003
20	3 52	2.73	2.1874	24 44	44.2	4.951	20	5 38	9.90	2.2089	26 17	28.9	1.130
21	3 54	14.03	2.1893	24 49	37.6	4.830	21	5 40	22.40	2.2077	26 16	17.3	1.257
22	3 56	25.44	2.1911	24 54	23.8	4.708	22	5 42	34.82	2.2063	26 14	58.1	1.383
23	3 58	36.96	2.1929	24 59	2.6	4.585	23	5 44	47.16	2.2050	26 13	31.3	1.510
24	4 0	48.59	2.1947	+25 3	34.0	+4.463	24	5 46	59.42	2.2036	+26 11	56.9	-1.636

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
JUNE 29.					JULY 1.				
0	h m s	s	° ' "	"	0	h m s	s	° ' "	"
0	5 46 59.42	2.2036	+26 11 56.9	-1.636	0	7 30 0.93	2.0723	+22 36 21.9	-7.138
1	5 49 11.59	2.2021	26 10 15.0	1.762	1	7 32 5.16	2.0687	22 29 10.6	7.238
2	5 51 23.67	2.2006	26 8 25.5	1.887	2	7 34 9.17	2.0651	22 21 53.4	7.336
3	5 53 35.65	2.1988	26 6 28.6	2.011	3	7 36 12.97	2.0615	22 14 30.3	7.434
4	5 55 47.53	2.1972	26 4 24.2	2.136	4	7 38 16.55	2.0578	22 7 1.3	7.533
5	5 57 59.31	2.1954	26 2 12.3	2.260	5	7 40 19.91	2.0543	21 59 26.4	7.629
6	6 0 10.98	2.1936	25 59 53.0	2.384	6	7 42 23.06	2.0507	21 51 45.8	7.725
7	6 2 22.54	2.1917	25 57 26.2	2.508	7	7 44 25.99	2.0471	21 43 59.4	7.820
8	6 4 33.98	2.1897	25 54 52.0	2.632	8	7 46 28.71	2.0435	21 36 7.4	7.914
9	6 6 45.30	2.1877	25 52 10.4	2.754	9	7 48 31.21	2.0398	21 28 9.7	8.008
10	6 8 56.50	2.1857	25 49 21.5	2.877	10	7 50 33.49	2.0362	21 20 6.4	8.101
11	6 11 7.58	2.1836	25 46 25.2	2.999	11	7 52 35.55	2.0325	21 11 57.6	8.193
12	6 13 18.52	2.1813	25 43 21.6	3.121	12	7 54 37.39	2.0289	21 3 43.2	8.285
13	6 15 29.33	2.1790	25 40 10.7	3.242	13	7 56 39.02	2.0253	20 55 23.4	8.376
14	6 17 40.00	2.1767	25 36 52.6	3.363	14	7 58 40.43	2.0217	20 46 58.1	8.466
15	6 19 50.53	2.1743	25 33 27.2	3.483	15	8 0 41.62	2.0181	20 38 27.5	8.554
16	6 22 0.91	2.1718	25 29 54.6	3.603	16	8 2 42.60	2.0145	20 29 51.6	8.643
17	6 24 11.15	2.1694	25 26 14.9	3.722	17	8 4 43.36	2.0108	20 21 10.3	8.732
18	6 26 21.24	2.1669	25 22 28.0	3.841	18	8 6 43.90	2.0073	20 12 23.8	8.818
19	6 28 31.18	2.1643	25 18 34.0	3.960	19	8 8 44.23	2.0038	20 3 32.2	8.903
20	6 30 40.96	2.1617	25 14 32.8	4.078	20	8 10 44.35	2.0002	19 54 35.4	8.990
21	6 32 50.58	2.1590	25 10 24.6	4.196	21	8 12 44.25	1.9966	19 45 33.4	9.075
22	6 35 0.03	2.1562	25 6 9.4	4.312	22	8 14 43.94	1.9931	19 36 26.4	9.158
23	6 37 9.32	2.1535	+25 1 47.2	-4.428	23	8 16 43.42	1.9895	+19 27 14.4	-9.241
JUNE 30.					JULY 2.				
0	6 39 18.45	2.1507	+24 57 18.0	-4.544	0	8 18 42.68	1.9859	+19 17 57.5	-9.323
1	6 41 27.40	2.1478	24 52 41.9	4.659	1	8 20 41.73	1.9825	19 8 35.6	9.406
2	6 43 36.18	2.1448	24 47 58.9	4.774	2	8 22 40.58	1.9791	18 59 8.9	9.485
3	6 45 44.78	2.1419	24 43 9.0	4.888	3	8 24 39.22	1.9756	18 49 37.4	9.565
4	6 47 53.21	2.1389	24 38 12.3	5.002	4	8 26 37.65	1.9721	18 40 1.1	9.645
5	6 50 1.45	2.1358	24 33 8.8	5.114	5	8 28 35.87	1.9687	18 30 20.0	9.723
6	6 52 9.51	2.1328	24 27 58.6	5.227	6	8 30 33.89	1.9653	18 20 34.3	9.801
7	6 54 17.38	2.1296	24 22 41.6	5.339	7	8 32 31.71	1.9620	18 10 43.9	9.878
8	6 56 25.06	2.1264	24 17 17.9	5.450	8	8 34 29.33	1.9586	18 0 49.0	9.963
9	6 58 32.55	2.1233	24 11 47.6	5.560	9	8 36 26.74	1.9553	17 50 49.5	10.029
10	7 0 39.85	2.1201	24 6 10.7	5.670	10	8 38 23.96	1.9520	17 40 45.5	10.104
11	7 2 46.96	2.1168	24 0 27.2	5.779	11	8 40 20.98	1.9487	17 30 37.0	10.178
12	7 4 53.87	2.1135	23 54 37.2	5.888	12	8 42 17.80	1.9454	17 20 24.2	10.250
13	7 7 0.58	2.1102	23 48 40.7	5.996	13	8 44 14.43	1.9422	17 10 7.0	10.323
14	7 9 7.09	2.1069	23 42 37.7	6.103	14	8 46 10.86	1.9390	16 59 45.4	10.395
15	7 11 13.41	2.1036	23 36 28.3	6.209	15	8 48 7.11	1.9359	16 49 19.6	10.465
16	7 13 19.52	2.1001	23 30 12.6	6.315	16	8 50 3.17	1.9328	16 38 49.6	10.535
17	7 15 25.42	2.0967	23 23 50.5	6.421	17	8 51 59.04	1.9297	16 28 15.4	10.604
18	7 17 31.12	2.0933	23 17 22.1	6.526	18	8 53 54.73	1.9267	16 17 37.1	10.673
19	7 19 36.61	2.0898	23 10 47.4	6.629	19	8 55 50.24	1.9237	16 6 54.7	10.741
20	7 21 41.90	2.0863	23 4 6.6	6.732	20	8 57 45.57	1.9207	15 56 8.2	10.808
21	7 23 46.97	2.0828	22 57 19.6	6.835	21	8 59 40.72	1.9177	15 45 17.7	10.874
22	7 25 51.83	2.0793	22 50 26.4	6.937	22	9 1 35.69	1.9148	15 34 23.3	10.939
23	7 27 56.49	2.0758	22 43 27.2	7.038	23	9 3 30.49	1.9119	15 23 25.0	11.004
24	7 30 0.93	2.0723	+22 36 21.9	-7.138	24	9 5 25.12	1.9091	+15 12 22.8	-11.068

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
JULY 3.					JULY 5.				
	<i>h m s</i>	<i>s</i>	<i>° ' "</i>	<i>"</i>		<i>h m s</i>	<i>s</i>	<i>° ' "</i>	<i>"</i>
0	9 5 25.12	1.9091	+15 12 22.8	-11.068	0	10 34 42.40	1.8326	+5 21 22.1	-13.282
1	9 7 19.58	1.9063	15 1 16.8	11.132	1	10 36 32.35	1.8325	5 8 4.3	13.269
2	9 9 13.88	1.9036	14 50 7.0	11.194	2	10 38 22.30	1.8325	4 54 44.9	13.338
3	9 11 8.01	1.9008	14 38 53.5	11.256	3	10 40 12.25	1.8325	4 41 23.8	13.363
4	9 13 1.98	1.8982	14 27 36.3	11.317	4	10 42 2.20	1.8326	4 28 1.1	13.392
5	9 14 55.79	1.8955	14 16 15.5	11.377	5	10 43 52.16	1.8328	4 14 36.8	13.418
6	9 16 49.44	1.8929	14 4 51.1	11.437	6	10 45 42.13	1.8330	4 1 10.9	13.443
7	9 18 42.94	1.8904	13 53' 23.1	11.495	7	10 47 32.12	1.8333	3 47 43.6	13.467
8	9 20 36.29	1.8879	13 41 51.7	11.553	8	10 49 22.12	1.8336	3 34 14.9	13.491
9	9 22 29.49	1.8855	13 30 16.8	11.610	9	10 51 12.15	1.8341	3 20 44.7	13.514
10	9 24 22.55	1.8832	13 18 38.5	11.667	10	10 53 2.21	1.8346	3 7 13.2	13.536
11	9 26 15.47	1.8808	13 6 56.8	11.723	11	10 54 52.30	1.8352	2 53 40.4	13.558
12	9 28 8.24	1.8784	12 55 11.8	11.778	12	10 56 42.43	1.8358	2 40 6.3	13.578
13	9 30 0.88	1.8763	12 43 23.5	11.832	13	10 58 32.60	1.8365	2 26 31.0	13.596
14	9 31 53.39	1.8740	12 31 32.0	11.885	14	11 0 22.81	1.8373	2 12 54.5	13.614
15	9 33 45.76	1.8718	12 19 37.3	11.938	15	11 2 13.08	1.8383	1 59 16.9	13.631
16	9 35 38.01	1.8698	12 7 39.4	11.991	16	11 4 3.40	1.8392	1 45 38.1	13.653
17	9 37 30.13	1.8677	11 55 38.4	12.042	17	11 5 53.78	1.8402	1 31 58.3	13.671
18	9 39 22.13	1.8657	11 43 34.4	12.093	18	11 7 44.22	1.8413	1 18 17.6	13.687
19	9 41 14.01	1.8638	11 31 27.3	12.143	19	11 9 34.73	1.8424	1 4 35.9	13.703
20	9 43 5.78	1.8619	11 19 17.3	12.192	20	11 11 25.31	1.8437	0 50 53.2	13.718
21	9 44 57.44	1.8600	11 7 4.3	12.241	21	11 13 15.97	1.8450	0 37 9.7	13.732
22	9 46 48.98	1.8582	10 54 48.4	12.288	22	11 15 6.71	1.8463	0 23 25.4	13.745
23	9 48 40.42	1.8565	+10 42 29.7	-12.335	23	11 16 57.53	1.8478	+0 9 40.3	-13.758
JULY 4.					JULY 6.				
	<i>h m s</i>	<i>s</i>	<i>° ' "</i>	<i>"</i>		<i>h m s</i>	<i>s</i>	<i>° ' "</i>	<i>"</i>
0	9 50 31.76	1.8548	+10 30 8.2	-12.382	0	11 18 48.45	1.8494	-0 4 5.6	-13.779
1	9 52 23.00	1.8532	10 17 43.9	12.428	1	11 20 39.46	1.8510	0 17 52.1	13.793
2	9 54 14.14	1.8516	10 5 16.9	12.472	2	11 22 30.57	1.8528	0 31 39.3	13.793
3	9 56 5.19	1.8501	9 52 47.3	12.516	3	11 24 21.79	1.8545	0 45 27.1	13.801
4	9 57 56.15	1.8487	9 40 15.0	12.559	4	11 26 13.11	1.8563	0 59 15.4	13.806
5	9 59 47.03	1.8473	9 27 40.2	12.602	5	11 28 4.55	1.8582	1 13 4.2	13.811
6	10 1 37.82	1.8459	9 15 2.8	12.645	6	11 29 56.10	1.8603	1 26 53.5	13.822
7	10 3 28.54	1.8448	9 2 22.8	12.687	7	11 31 47.78	1.8624	1 40 43.2	13.831
8	10 5 19.19	1.8435	8 49 40.4	12.727	8	11 33 39.59	1.8646	1 54 33.2	13.837
9	10 7 9.76	1.8423	8 36 55.6	12.767	9	11 35 31.53	1.8668	2 8 23.6	13.842
10	10 9 0.27	1.8413	8 24 8.4	12.806	10	11 37 23.61	1.8692	2 22 14.2	13.846
11	10 10 50.71	1.8402	8 11 18.9	12.844	11	11 39 15.83	1.8716	2 36 5.0	13.849
12	10 12 41.09	1.8393	7 58 27.1	12.883	12	11 41 8.20	1.8741	2 49 56.0	13.851
13	10 14 31.42	1.8383	7 45 33.0	12.919	13	11 43 0.72	1.8766	3 3 47.1	13.852
14	10 16 21.69	1.8375	7 32 36.8	12.955	14	11 44 53.39	1.8793	3 17 38.2	13.853
15	10 18 11.92	1.8368	7 19 38.4	12.992	15	11 46 46.23	1.8820	3 31 29.4	13.853
16	10 20 2.10	1.8360	7 6 37.8	13.027	16	11 48 39.23	1.8848	3 45 20.5	13.852
17	10 21 52.24	1.8354	6 53 35.2	13.060	17	11 50 32.41	1.8878	3 59 11.6	13.850
18	10 23 42.35	1.8348	6 40 30.6	13.094	18	11 52 25.76	1.8907	4 13 2.5	13.847
19	10 25 32.42	1.8343	6 27 23.9	13.128	19	11 54 19.29	1.8938	4 26 53.2	13.843
20	10 27 22.46	1.8338	6 14 15.3	13.159	20	11 56 13.01	1.8969	4 40 43.6	13.838
21	10 29 12.47	1.8333	6 1 4.8	13.191	21	11 58 6.92	1.9001	4 54 33.8	13.833
22	10 31 2.46	1.8331	5 47 52.4	13.223	22	12 0 1.02	1.9034	5 8 23.6	13.827
23	10 32 52.44	1.8328	5 34 38.1	13.253	23	12 1 55.33	1.9068	5 22 13.0	13.820
24	10 34 42.40	1.8326	+ 5 21 22.1	-13.282	24	12 3 49.84	1.9103	-5 36 2.0	-13.812

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
JULY 7.					JULY 9.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	12 3 49.84	1.9103	- 5 36 2.0	-13.812	0	13 41 6.89	2.1745	-16 9 38.5	-12.128
1	12 5 44.56	1.9138	5 49 50.4	13.803	1	13 43 17.58	2.1819	16 21 44.2	12.061
2	12 7 39.50	1.9175	6 3 38.3	13.793	2	13 45 28.72	2.1894	16 33 45.8	11.993
3	12 9 34.66	1.9213	6 17 25.5	13.781	3	13 47 40.31	2.1970	16 45 43.3	11.923
4	12 11 30.05	1.9251	6 31 12.0	13.769	4	13 49 52.36	2.2046	16 57 36.5	11.850
5	12 13 25.67	1.9289	6 44 57.8	13.757	5	13 52 4.86	2.2123	17 9 25.3	11.777
6	12 15 21.52	1.9328	6 58 42.8	13.743	6	13 54 17.83	2.2200	17 21 9.7	11.703
7	12 17 17.61	1.9369	7 12 26.9	13.728	7	13 56 31.26	2.2277	17 32 49.6	11.626
8	12 19 13.95	1.9411	7 26 10.1	13.712	8	13 58 45.15	2.2355	17 44 24.8	11.547
9	12 21 10.54	1.9453	7 39 52.3	13.695	9	14 0 59.52	2.2435	17 55 55.2	11.467
10	12 23 7.39	1.9497	7 53 33.5	13.678	10	14 3 14.37	2.2514	18 7 20.8	11.385
11	12 25 4.50	1.9541	8 7 13.6	13.658	11	14 5 29.69	2.2593	18 18 41.4	11.302
12	12 27 1.88	1.9586	8 20 52.5	13.638	12	14 7 45.49	2.2674	18 29 57.0	11.217
13	12 28 59.53	1.9631	8 34 30.2	13.618	13	14 10 1.78	2.2755	18 41 7.4	11.130
14	12 30 57.45	1.9678	8 48 6.6	13.596	14	14 12 18.55	2.2836	18 52 12.6	11.042
15	12 32 55.66	1.9725	9 1 41.7	13.573	15	14 14 35.81	2.2918	19 3 12.4	10.951
16	12 34 54.15	1.9773	9 15 15.3	13.548	16	14 16 53.57	2.3001	19 14 6.7	10.859
17	12 36 52.93	1.9822	9 28 47.4	13.523	17	14 19 11.82	2.3083	19 24 55.5	10.766
18	12 38 52.01	1.9872	9 42 18.0	13.497	18	14 21 30.57	2.3167	19 35 38.6	10.670
19	12 40 51.39	1.9923	9 55 47.0	13.469	19	14 23 49.82	2.3249	19 46 15.9	10.573
20	12 42 51.08	1.9974	10 9 14.3	13.441	20	14 26 9.56	2.3333	19 56 47.4	10.474
21	12 44 51.08	2.0027	10 22 39.9	13.411	21	14 28 29.81	2.3417	20 7 12.8	10.373
22	12 46 51.40	2.0080	10 36 3.6	13.379	22	14 30 50.56	2.3500	20 17 32.2	10.272
23	12 48 52.04	2.0133	-10 49 25.4	-13.348	23	14 33 11.81	2.3585	-20 27 45.4	-10.167
JULY 8.					JULY 10.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	12 50 53.00	2.0188	-11 2 45.3	-13.315	0	14 35 33.58	2.3671	-20 37 52.2	-10.060
1	12 52 54.30	2.0244	11 16 3.2	13.280	1	14 37 55.86	2.3755	20 47 52.6	9.953
2	12 54 55.93	2.0301	11 29 18.9	13.244	2	14 40 18.64	2.3839	20 57 46.5	9.843
3	12 56 57.91	2.0358	11 42 32.5	13.208	3	14 42 41.93	2.3924	21 7 33.7	9.731
4	12 59 0.23	2.0417	11 55 43.9	13.170	4	14 45 5.73	2.4010	21 17 14.2	9.618
5	13 1 2.91	2.0476	12 8 52.9	13.130	5	14 47 30.05	2.4096	21 26 47.8	9.502
6	13 3 5.94	2.0535	12 21 59.5	13.089	6	14 49 54.88	2.4181	21 36 14.4	9.384
7	13 5 9.33	2.0596	12 35 3.6	13.048	7	14 52 20.22	2.4268	21 45 33.9	9.265
8	13 7 13.09	2.0658	12 48 5.2	13.005	8	14 54 46.07	2.4351	21 54 46.2	9.144
9	13 9 17.22	2.0720	13 1 4.2	12.961	9	14 57 12.43	2.4436	22 3 51.2	9.021
10	13 11 21.73	2.0783	13 14 0.5	12.915	10	14 59 39.30	2.4521	22 12 48.7	8.896
11	13 13 26.62	2.0847	13 26 54.0	12.868	11	15 2 6.68	2.4606	22 21 38.7	8.770
12	13 15 31.89	2.0911	13 39 44.6	12.819	12	15 4 34.57	2.4691	22 30 21.1	8.642
13	13 17 37.55	2.0977	13 52 32.3	12.770	13	15 7 2.97	2.4775	22 38 55.7	8.511
14	13 19 43.61	2.1043	14 5 17.0	12.718	14	15 9 31.87	2.4859	22 47 22.4	8.378
15	13 21 50.07	2.1110	14 17 58.5	12.666	15	15 12 1.28	2.4944	22 55 41.1	8.244
16	13 23 56.93	2.1178	14 30 36.9	12.613	16	15 14 31.20	2.5028	23 3 51.7	8.108
17	13 26 4.20	2.1246	14 43 12.0	12.557	17	15 17 1.61	2.5110	23 11 54.1	7.971
18	13 28 11.88	2.1315	14 55 43.7	12.500	18	15 19 32.52	2.5193	23 19 48.2	7.831
19	13 30 19.98	2.1385	15 8 12.0	12.442	19	15 22 3.93	2.5277	23 27 33.8	7.688
20	13 32 28.50	2.1456	15 20 36.7	12.382	20	15 24 35.84	2.5358	23 35 10.8	7.545
21	13 34 37.45	2.1528	15 32 57.8	12.321	21	15 27 8.23	2.5439	23 42 39.2	7.400
22	13 36 46.83	2.1599	15 45 15.2	12.258	22	15 29 41.11	2.5520	23 49 58.8	7.253
23	13 38 56.64	2.1672	15 57 28.8	12.194	23	15 32 14.47	2.5601	23 57 9.5	7.103
24	13 41 6.89	2.1745	-16 9 38.5	-12.128	24	15 34 48.32	2.5681	-24 4 11.2	-6.953

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
JULY 11.					JULY 13.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	15 34 48.32	2.5681	-24 4 11.2	-6.953	0	17 45 2.96	2.7970	-26 14 31.7	+ 1.938
1	15 37 22.64	2.5760	24 11 3.8	6.800	1	17 47 50.79	2.7973	26 12 28.1	2.153
2	15 39 57.44	2.5838	24 17 47.2	6.645	2	17 50 38.63	2.7974	26 10 12.2	2.368
3	15 42 32.70	2.5916	24 24 21.2	6.488	3	17 53 26.48	2.7975	26 7 44.0	2.572
4	15 45 8.43	2.5993	24 30 45.8	6.330	4	17 56 14.31	2.7969	26 5 3.6	2.776
5	15 47 44.61	2.6068	24 37 0.8	6.170	5	17 59 2.11	2.7963	26 2 10.9	2.979
6	15 50 21.25	2.6143	24 43 6.2	6.008	6	18 1 49.87	2.7956	25 59 6.1	3.183
7	15 52 58.33	2.6217	24 49 1.8	5.845	7	18 4 37.58	2.7947	25 55 49.0	3.385
8	15 55 35.85	2.6290	24 54 47.6	5.681	8	18 7 25.23	2.7935	25 52 19.7	3.589
9	15 58 13.81	2.6363	25 0 23.5	5.514	9	18 10 12.80	2.7921	25 48 38.3	3.791
10	16 0 52.20	2.6433	25 5 49.3	5.345	10	18 13 0.28	2.7906	25 44 44.8	3.992
11	16 3 31.01	2.6503	25 11 4.9	5.175	11	18 15 47.67	2.7889	25 40 39.2	4.194
12	16 6 10.23	2.6571	25 16 10.3	5.003	12	18 18 34.95	2.7869	25 36 21.5	4.395
13	16 8 49.86	2.6639	25 21 5.3	4.830	13	18 21 22.10	2.7847	25 31 51.8	4.596
14	16 11 29.90	2.6706	25 25 49.9	4.656	14	18 24 9.11	2.7823	25 27 10.1	4.794
15	16 14 10.33	2.6771	25 30 24.0	4.479	15	18 26 55.98	2.7798	25 22 16.5	4.992
16	16 16 51.15	2.6834	25 34 47.4	4.301	16	18 29 42.69	2.7771	25 17 11.0	5.190
17	16 19 32.34	2.6896	25 39 0.1	4.122	17	18 32 29.23	2.7742	25 11 53.7	5.387
18	16 22 13.90	2.6957	25 43 2.0	3.941	18	18 35 15.59	2.7711	25 6 24.6	5.582
19	16 24 55.82	2.7017	25 46 53.0	3.758	19	18 38 1.76	2.7678	25 0 43.8	5.778
20	16 27 38.10	2.7075	25 50 33.0	3.575	20	18 40 47.73	2.7644	24 54 51.3	5.971
21	16 30 20.72	2.7131	25 54 2.0	3.391	21	18 43 33.49	2.7608	24 48 47.3	6.163
22	16 33 3.67	2.7186	25 57 19.9	3.204	22	18 46 19.03	2.7571	24 42 31.7	6.353
23	16 35 46.95	2.7239	-26 0 26.5	-3.016	23	18 49 4.34	2.7531	-24 36 4.7	+ 6.543
JULY 12.					JULY 14.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	16 38 30.54	2.7291	-26 3 21.8	-2.828	0	18 51 49.40	2.7489	-24 29 26.3	+ 6.734
1	16 41 14.44	2.7342	26 6 5.8	2.638	1	18 54 34.21	2.7446	24 22 36.6	6.922
2	16 43 58.64	2.7390	26 8 38.3	2.446	2	18 57 18.75	2.7401	24 15 35.7	7.108
3	16 46 43.12	2.7436	26 10 59.3	2.254	3	19 0 3.02	2.7355	24 8 23.6	7.293
4	16 49 27.87	2.7480	26 13 8.8	2.061	4	19 2 47.01	2.7308	24 1 0.5	7.477
5	16 52 12.88	2.7523	26 15 6.6	1.866	5	19 5 30.71	2.7259	23 53 26.4	7.658
6	16 54 58.15	2.7565	26 16 52.7	1.671	6	19 8 14.12	2.7209	23 45 41.5	7.839
7	16 57 43.66	2.7604	26 18 27.1	1.474	7	19 10 57.22	2.7158	23 37 45.7	8.019
8	17 0 29.40	2.7642	26 19 49.6	1.277	8	19 13 40.01	2.7104	23 29 39.2	8.196
9	17 3 15.36	2.7678	26 21 0.3	1.079	9	19 16 22.47	2.7050	23 21 22.2	8.371
10	17 6 1.53	2.7711	26 21 59.1	0.881	10	19 19 4.61	2.6995	23 12 54.7	8.543
11	17 8 47.89	2.7743	26 22 46.0	0.681	11	19 21 46.41	2.6938	23 4 16.8	8.714
12	17 11 34.44	2.7773	26 23 20.8	0.480	12	19 24 27.87	2.6880	22 55 28.5	8.889
13	17 14 21.16	2.7800	26 23 43.6	0.279	13	19 27 8.97	2.6820	22 46 30.1	9.058
14	17 17 8.04	2.7826	26 23 54.3	-0.078	14	19 29 49.71	2.6760	22 37 21.6	9.225
15	17 19 55.07	2.7850	26 23 52.9	+0.124	15	19 32 30.09	2.6699	22 28 3.1	9.390
16	17 22 42.24	2.7871	26 23 39.4	0.327	16	19 35 10.10	2.6638	22 18 34.8	9.553
17	17 25 29.52	2.7890	26 23 13.7	0.529	17	19 37 49.74	2.6574	22 8 56.7	9.715
18	17 28 16.92	2.7908	26 22 35.9	0.733	18	19 40 28.99	2.6510	21 59 9.0	9.874
19	17 31 4.42	2.7923	26 21 45.8	0.937	19	19 43 7.86	2.6446	21 49 11.8	10.032
20	17 33 52.00	2.7937	26 20 43.5	1.141	20	19 45 46.34	2.6380	21 39 5.2	10.188
21	17 36 39.66	2.7948	26 19 28.9	1.345	21	19 48 24.42	2.6313	21 28 49.3	10.342
22	17 39 27.38	2.7958	26 18 2.1	1.549	22	19 51 2.10	2.6246	21 18 24.2	10.493
23	17 42 15.15	2.7965	26 16 23.0	1.753	23	19 53 39.37	2.6178	21 7 50.1	10.643
24	17 45 2.96	2.7970	-26 14 31.7	+1.958	24	19 56 16.23	2.6109	-20 57 7.1	+10.790

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
JULY 15.					JULY 17.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	19 56 16.23	2.6109	-20 57 7.1	+10.790	0	21 53 21.11	2.2751	-10 10 41.5	+15.302
1	19 58 52.68	2.6040	20 46 15.3	10.936	1	21 55 37.43	2.2691	9 55 22.1	15.343
2	20 1 28.71	2.5970	20 35 14.8	11.080	2	21 57 53.40	2.2632	9 40 0.3	15.383
3	20 4 4.32	2.5900	20 24 5.7	11.221	3	22 0 9.01	2.2572	9 24 36.1	15.422
4	20 6 39.51	2.5830	20 12 48.3	11.359	4	22 2 24.26	2.2513	9 9 9.7	15.457
5	20 9 14.28	2.5758	20 1 22.6	11.497	5	22 4 39.17	2.2457	8 53 41.3	15.490
6	20 11 48.61	2.5687	19 49 48.7	11.632	6	22 6 53.74	2.2400	8 38 10.9	15.523
7	20 14 22.52	2.5615	19 38 6.8	11.764	7	22 9 7.97	2.2344	8 22 38.5	15.554
8	20 16 55.99	2.5543	19 26 17.0	11.894	8	22 11 21.87	2.2289	8 7 4.4	15.582
9	20 19 29.03	2.5470	19 14 19.5	12.023	9	22 13 35.44	2.2235	7 51 28.7	15.608
10	20 22 1.63	2.5398	19 2 14.3	12.149	10	22 15 48.69	2.2182	7 35 51.5	15.633
11	20 24 33.80	2.5324	18 50 1.6	12.273	11	22 18 1.62	2.2128	7 20 12.8	15.655
12	20 27 5.52	2.5250	18 37 41.6	12.394	12	22 20 14.23	2.2076	7 4 32.9	15.676
13	20 29 36.80	2.5178	18 25 14.3	12.514	13	22 22 26.53	2.2025	6 48 51.7	15.695
14	20 32 7.65	2.5105	18 12 39.9	12.631	14	22 24 38.53	2.1975	6 33 9.5	15.713
15	20 34 38.06	2.5031	17 59 58.6	12.745	15	22 26 50.23	2.1926	6 17 26.2	15.729
16	20 37 8.02	2.4957	17 47 10.5	12.858	16	22 29 1.64	2.1877	6 1 42.0	15.743
17	20 39 37.54	2.4883	17 34 15.6	12.969	17	22 31 12.75	2.1828	5 45 57.1	15.754
18	20 42 6.62	2.4810	17 21 14.2	13.077	18	22 33 23.58	2.1782	5 30 11.5	15.766
19	20 44 35.26	2.4736	17 8 6.4	13.183	19	22 35 34.13	2.1735	5 14 25.2	15.775
20	20 47 3.45	2.4663	16 54 52.3	13.287	20	22 37 44.40	2.1689	4 58 38.5	15.782
21	20 49 31.21	2.4590	16 41 32.0	13.388	21	22 39 54.40	2.1645	4 42 51.4	15.788
22	20 51 58.53	2.4517	16 28 5.7	13.488	22	22 42 4.14	2.1601	4 27 4.0	15.792
23	20 54 25.41	2.4443	-16 14 33.5	+13.584	23	22 44 13.61	2.1558	-4 11 16.4	+15.793
JULY 16.					JULY 18.				
0	20 56 51.85	2.4371	-16 0 55.6	+13.679	0	22 46 22.83	2.1516	-3 55 28.8	+15.793
1	20 59 17.86	2.4298	15 47 12.0	13.772	1	22 48 31.80	2.1474	3 39 41.2	15.793
2	21 1 43.43	2.4226	15 33 23.0	13.862	2	22 50 40.52	2.1433	3 23 53.6	15.792
3	21 4 8.57	2.4154	15 19 28.6	13.950	3	22 52 49.00	2.1394	3 8 6.2	15.788
4	21 6 33.28	2.4083	15 5 29.0	14.036	4	22 54 57.25	2.1356	2 52 19.1	15.782
5	21 8 57.57	2.4012	14 51 24.3	14.119	5	22 57 5.27	2.1318	2 36 32.4	15.775
6	21 11 21.42	2.3940	14 37 14.7	14.201	6	22 59 13.06	2.1280	2 20 46.1	15.767
7	21 13 44.85	2.3871	14 23 0.2	14.280	7	23 1 20.63	2.1243	2 5 0.4	15.757
8	21 16 7.87	2.3801	14 8 41.1	14.357	8	23 3 27.98	2.1208	1 49 15.3	15.746
9	21 18 30.46	2.3730	13 54 17.4	14.433	9	23 5 35.13	2.1174	1 33 30.9	15.733
10	21 20 52.63	2.3661	13 39 49.2	14.506	10	23 7 42.07	2.1140	1 17 47.3	15.719
11	21 23 14.39	2.3593	13 25 16.7	14.576	11	23 9 48.81	2.1107	1 2 4.6	15.703
12	21 25 35.74	2.3524	13 10 40.1	14.643	12	23 11 55.35	2.1074	0 46 22.9	15.686
13	21 27 56.68	2.3457	12 55 59.5	14.710	13	23 14 1.70	2.1043	0 30 42.3	15.668
14	21 30 17.22	2.3390	12 41 14.9	14.775	14	23 16 7.87	2.1013	-0 15 2.8	15.648
15	21 32 37.36	2.3323	12 26 26.5	14.837	15	23 18 13.86	2.0983	+0 0 35.4	15.627
16	21 34 57.10	2.3257	12 11 34.5	14.897	16	23 20 19.67	2.0955	0 16 12.4	15.605
17	21 37 16.44	2.3191	11 56 38.9	14.954	17	23 22 25.32	2.0928	0 31 48.0	15.581
18	21 39 35.39	2.3127	11 41 40.0	15.010	18	23 24 30.80	2.0900	0 47 22.1	15.555
19	21 41 53.96	2.3063	11 26 37.7	15.064	19	23 26 36.12	2.0873	1 2 54.6	15.528
20	21 44 12.14	2.2998	11 11 32.3	15.115	20	23 28 41.28	2.0848	1 18 25.5	15.502
21	21 46 29.94	2.2936	10 56 23.9	15.165	21	23 30 46.29	2.0823	1 33 54.8	15.473
22	21 48 47.37	2.2873	10 41 12.5	15.213	22	23 32 51.16	2.0799	1 49 22.2	15.442
23	21 51 4.42	2.2812	10 25 58.3	15.258	23	23 34 55.88	2.0776	2 4 47.8	15.411
24	21 53 21.11	2.2751	-10 10 41.5	+15.302	24	23 37 0.47	2.0754	+2 20 11.5	+15.378

GREENWICH MEAN TIME.

Hour.	Right Ascension.			Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.			Var. per Min.	Declination.	Var. per Min.
JULY 19.							JULY 21.						
	h	m	s	s	"	"		h	m	s	s	"	"
0	23	37	0.47	2.0754	+ 2 20 11.5	+15.378	0	1 15 29.18	2.0538	+13 40 13.8	+12.36		
1	23	39	4.93	2.0733	2 35 33.2	15.344	1	1 17 32.44	2.0548	13 52 46.8	12.30		
2	23	41	9.26	2.0712	2 50 52.8	15.309	2	1 19 35.76	2.0559	14 5 14.9	12.43		
3	23	43	13.47	2.0693	3 6 10.3	15.273	3	1 21 39.15	2.0571	14 17 38.2	12.36		
4	23	45	17.57	2.0673	3 21 25.5	15.235	4	1 23 42.61	2.0583	14 29 56.6	12.30		
5	23	47	21.55	2.0655	3 36 38.5	15.197	5	1 25 46.15	2.0596	14 42 10.0	12.10		
6	23	49	25.43	2.0638	3 51 49.1	15.157	6	1 27 49.76	2.0608	14 54 18.5	12.00		
7	23	51	29.20	2.0621	4 6 57.3	15.116	7	1 29 53.45	2.0622	15 6 21.9	12.04		
8	23	53	32.88	2.0605	4 22 3.0	15.074	8	1 31 57.22	2.0636	15 18 20.2	11.39		
9	23	55	36.46	2.0589	4 37 6.2	15.032	9	1 34 1.08	2.0650	15 30 13.4	11.40		
10	23	57	39.95	2.0575	4 52 6.8	14.988	10	1 36 5.02	2.0664	15 42 1.4	11.34		
11	23	59	43.36	2.0562	5 7 4.7	14.942	11	1 38 9.05	2.0679	15 53 44.1	11.60		
12	0	1	46.69	2.0549	5 21 59.8	14.895	12	1 40 13.17	2.0694	16 5 21.6	11.30		
13	0	3	49.95	2.0537	5 36 52.1	14.848	13	1 42 17.38	2.0710	16 16 53.8	11.46		
14	0	5	53.13	2.0525	5 51 41.5	14.799	14	1 44 21.69	2.0727	16 28 20.6	11.40		
15	0	7	56.25	2.0515	6 6 28.0	14.750	15	1 46 26.10	2.0743	16 39 42.1	11.34		
16	0	9	59.31	2.0505	6 21 11.5	14.699	16	1 48 30.61	2.0760	16 50 58.1	11.22		
17	0	12	2.31	2.0496	6 35 51.9	14.648	17	1 50 35.22	2.0777	17 2 8.7	11.10		
18	0	14	5.26	2.0488	6 50 29.2	14.595	18	1 52 39.93	2.0794	17 13 13.8	11.00		
19	0	16	8.16	2.0479	7 5 3.3	14.541	19	1 54 44.75	2.0813	17 24 13.3	10.40		
20	0	18	11.01	2.0472	7 19 34.1	14.487	20	1 56 49.68	2.0831	17 35 7.2	10.34		
21	0	20	13.82	2.0466	7 34 1.7	14.432	21	1 58 54.72	2.0849	17 45 55.4	10.02		
22	0	22	16.60	2.0460	7 48 25.9	14.375	22	2 0 59.87	2.0868	17 56 37.9	10.02		
23	0	24	19.34	2.0455	+ 8 2 46.7	+14.318	23	2 3 5.13	2.0886	+18 7 14.8	+10.50		
JULY 20.							JULY 22.						
0	0	26	22.06	2.0452	+ 8 17 4.0	+14.258	0	2 5 10.50	2.0905	+18 17 45.9	+10.40		
1	0	28	24.76	2.0448	8 31 17.7	14.199	1	2 7 15.99	2.0925	18 28 11.2	10.37		
2	0	30	27.44	2.0445	8 45 27.9	14.139	2	2 9 21.60	2.0944	18 38 30.6	10.27		
3	0	32	30.10	2.0443	8 59 34.4	14.078	3	2 11 27.32	2.0964	18 48 44.2	10.17		
4	0	34	32.75	2.0441	9 13 37.2	14.015	4	2 13 33.17	2.0984	18 58 51.8	10.07		
5	0	36	35.39	2.0440	9 27 36.2	13.953	5	2 15 39.13	2.1004	19 8 53.5	9.97		
6	0	38	38.03	2.0440	9 41 31.5	13.889	6	2 17 45.22	2.1025	19 18 49.2	9.87		
7	0	40	40.67	2.0441	9 55 22.9	13.823	7	2 19 51.43	2.1046	19 28 38.9	9.73		
8	0	42	43.32	2.0443	10 9 10.3	13.758	8	2 21 57.77	2.1067	19 38 22.5	9.60		
9	0	44	45.98	2.0443	10 22 53.8	13.691	9	2 24 4.23	2.1088	19 48 0.0	9.37		
10	0	46	48.64	2.0445	10 36 33.2	13.623	10	2 26 10.82	2.1108	19 57 31.3	9.40		
11	0	48	51.32	2.0448	10 50 8.6	13.555	11	2 28 17.53	2.1129	20 6 56.4	9.36		
12	0	50	54.02	2.0452	11 3 39.8	13.485	12	2 30 24.37	2.1151	20 16 15.3	9.28		
13	0	52	56.74	2.0456	11 17 6.8	13.415	13	2 32 31.34	2.1172	20 25 28.0	9.18		
14	0	54	59.49	2.0461	11 30 29.6	13.344	14	2 34 38.43	2.1193	20 34 34.4	9.03		
15	0	57	2.27	2.0466	11 43 48.1	13.273	15	2 36 45.66	2.1215	20 43 34.4	8.94		
16	0	59	5.08	2.0472	11 57 2.3	13.200	16	2 38 53.01	2.1236	20 52 28.0	8.81		
17	1	1	7.93	2.0478	12 10 12.1	13.127	17	2 41 0.49	2.1258	21 1 15.3	8.73		
18	1	3	10.82	2.0486	12 23 17.5	13.053	18	2 43 8.10	2.1279	21 9 56.2	8.62		
19	1	5	13.76	2.0493	12 36 18.4	12.977	19	2 45 15.84	2.1302	21 18 30.6	8.51		
20	1	7	16.74	2.0501	12 49 14.7	12.901	20	2 47 23.72	2.1323	21 26 58.5	8.40		
21	1	9	19.77	2.0509	13 2 6.5	12.824	21	2 49 31.72	2.1345	21 35 19.8	8.30		
22	1	11	22.85	2.0518	13 14 53.6	12.747	22	2 51 39.86	2.1367	21 43 34.6	8.19		
23	1	13	25.99	2.0528	13 27 36.1	12.668	23	2 53 48.12	2.1388	21 51 42.8	8.08		
24	1	15	29.18	2.0538	+13 40 13.8	+12.580	24	2 55 56.51	2.1409	+21 59 44.3	+7.90		

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
JULY 23.					JULY 25.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	2 55 56.51	2.1409	+21 59 44.3	+7.969	0	4 40 46.55	2.2132	+26 6 1.7	+2.153
1	2 58 5.03	2.1431	22 7 39.1	7.858	1	4 42 59.35	2.2136	26 8 7.4	2.031
2	3 0 13.68	2.1452	22 15 27.3	7.747	2	4 45 12.18	2.2140	26 10 5.4	1.903
3	3 2 22.45	2.1473	22 23 8.7	7.634	3	4 47 25.03	2.2143	26 11 55.8	1.776
4	3 4 31.35	2.1494	22 30 43.4	7.522	4	4 49 37.89	2.2145	26 13 38.5	1.648
5	3 6 40.38	2.1516	22 38 11.3	7.408	5	4 51 50.77	2.2147	26 15 13.5	1.519
6	3 8 49.54	2.1537	22 45 32.4	7.294	6	4 54 3.65	2.2148	26 16 40.8	1.392
7	3 10 58.82	2.1558	22 52 46.6	7.179	7	4 56 16.54	2.2148	26 18 0.5	1.264
8	3 13 8.23	2.1578	22 59 53.9	7.064	8	4 58 29.43	2.2148	26 19 12.5	1.136
9	3 15 17.76	2.1598	23 6 54.3	6.949	9	5 0 42.32	2.2148	26 20 16.8	1.008
10	3 17 27.41	2.1618	23 13 47.8	6.833	10	5 2 55.20	2.2146	26 21 13.4	0.880
11	3 19 37.18	2.1638	23 20 34.3	6.718	11	5 5 8.07	2.2143	26 22 2.4	0.753
12	3 21 47.07	2.1658	23 27 13.9	6.601	12	5 7 20.92	2.2141	26 22 43.7	0.624
13	3 23 57.08	2.1678	23 33 46.4	6.483	13	5 9 33.76	2.2138	26 23 17.3	0.496
14	3 26 7.21	2.1698	23 40 11.8	6.365	14	5 11 46.57	2.2133	26 23 43.2	0.368
15	3 28 17.45	2.1716	23 46 30.2	6.248	15	5 13 59.36	2.2129	26 24 1.5	0.241
16	3 30 27.80	2.1735	23 52 41.5	6.128	16	5 16 12.12	2.2123	26 24 12.1	+0.113
17	3 32 38.27	2.1754	23 58 45.6	6.009	17	5 18 24.84	2.2118	26 24 15.1	-0.014
18	3 34 48.85	2.1773	24 4 42.6	5.890	18	5 20 37.53	2.2112	26 24 10.4	0.142
19	3 36 59.54	2.1791	24 10 32.4	5.770	19	5 22 50.18	2.2104	26 23 58.1	0.260
20	3 39 10.34	2.1808	24 16 15.0	5.650	20	5 25 2.78	2.2096	26 23 38.1	0.397
21	3 41 21.24	2.1825	24 21 50.4	5.529	21	5 27 15.33	2.2088	26 23 10.5	0.523
22	3 43 32.24	2.1843	24 27 18.5	5.408	22	5 29 27.83	2.2078	26 22 35.3	0.651
23	3 45 43.35	2.1859	+24 32 39.3	+5.287	23	5 31 40.27	2.2068	+26 21 52.4	-0.778
JULY 24.					JULY 26.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	3 47 54.55	2.1875	+24 37 52.9	+5.166	0	5 33 52.65	2.2058	+26 21 2.0	-0.903
1	3 50 5.85	2.1892	24 42 59.2	5.043	1	5 36 4.96	2.2047	26 20 4.0	1.030
2	3 52 17.25	2.1908	24 47 58.1	4.920	2	5 38 17.21	2.2036	26 18 58.4	1.157
3	3 54 28.74	2.1923	24 52 49.6	4.797	3	5 40 29.39	2.2024	26 17 45.2	1.283
4	3 56 40.32	2.1937	24 57 33.7	4.674	4	5 42 41.50	2.2011	26 16 24.5	1.408
5	3 58 51.98	2.1951	25 2 10.5	4.551	5	5 44 53.52	2.1997	26 14 56.3	1.533
6	4 1 3.73	2.1965	25 6 39.8	4.427	6	5 47 5.46	2.1983	26 13 20.6	1.658
7	4 3 15.56	2.1979	25 11 1.7	4.303	7	5 49 17.31	2.1968	26 11 37.3	1.783
8	4 5 27.48	2.1993	25 15 16.1	4.178	8	5 51 29.08	2.1953	26 9 46.6	1.908
9	4 7 39.47	2.2004	25 19 23.1	4.054	9	5 53 40.75	2.1938	26 7 48.4	2.032
10	4 9 51.53	2.2017	25 23 22.6	3.929	10	5 55 52.33	2.1921	26 5 42.8	2.156
11	4 12 3.67	2.2029	25 27 14.6	3.803	11	5 58 3.80	2.1903	26 3 29.7	2.280
12	4 14 15.88	2.2040	25 30 59.0	3.678	12	6 0 15.17	2.1886	26 1 9.2	2.403
13	4 16 28.15	2.2050	25 34 35.9	3.553	13	6 2 26.43	2.1868	25 58 41.3	2.527
14	4 18 40.48	2.2061	25 38 5.3	3.428	14	6 4 37.58	2.1849	25 56 6.0	2.649
15	4 20 52.88	2.2071	25 41 27.2	3.301	15	6 6 48.62	2.1830	25 53 23.4	2.771
16	4 23 5.33	2.2079	25 44 41.4	3.174	16	6 8 59.54	2.1809	25 50 33.5	2.893
17	4 25 17.83	2.2088	25 47 48.1	3.048	17	6 11 10.33	2.1788	25 47 36.2	3.015
18	4 27 30.38	2.2096	25 50 47.2	2.922	18	6 13 21.00	2.1768	25 44 31.7	3.136
19	4 29 42.98	2.2103	25 53 38.7	2.795	19	6 15 31.55	2.1748	25 41 19.9	3.258
20	4 31 55.62	2.2110	25 56 22.6	2.668	20	6 17 41.97	2.1725	25 38 0.8	3.378
21	4 34 8.30	2.2117	25 58 58.8	2.540	21	6 19 52.25	2.1702	25 34 34.5	3.498
22	4 36 21.02	2.2123	26 1 27.4	2.413	22	6 22 2.39	2.1679	25 31 1.1	3.617
23	4 38 33.77	2.2128	26 3 48.4	2.286	23	6 24 12.40	2.1656	25 27 20.5	3.736
24	4 40 46.55	2.2132	+26 6 1.7	+2.158	24	6 26 22.26	2.1632	+25 23 32.8	-3.854

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
JULY 27.					JULY 29.				
0	h m s	s	° ' "	"	0	h m s	s	° ' "	"
0	6 26 22.26	2.1632	+25 23 32.8	-3.854	0	8 6 45.76	2.0118	+20 12 37.0	-8.861
1	6 28 31.98	2.1608	25 19 38.0	3.973	1	8 8 46.36	2.0083	20 3 43.3	8.338
2	6 30 41.55	2.1583	25 15 36.1	4.090	2	8 10 46.76	2.0049	19 54 44.4	9.025
3	6 32 50.97	2.1557	25 11 27.2	4.208	3	8 12 46.95	2.0015	19 45 40.3	9.111
4	6 35 0.23	2.1530	25 7 11.2	4.325	4	8 14 46.94	1.9982	19 36 31.1	9.196
5	6 37 9.33	2.1504	25 2 48.2	4.441	5	8 16 46.73	1.9948	19 27 16.9	9.277
6	6 39 18.28	2.1478	24 58 18.3	4.556	6	8 18 46.31	1.9913	19 17 57.6	9.362
7	6 41 27.07	2.1451	24 53 41.5	4.671	7	8 20 45.69	1.9880	19 8 33.3	9.446
8	6 43 35.69	2.1423	24 48 57.8	4.786	8	8 22 44.87	1.9846	18 59 4.1	9.527
9	6 45 44.14	2.1395	24 44 7.2	4.900	9	8 24 43.84	1.9813	18 49 30.1	9.608
10	6 47 52.43	2.1367	24 39 9.8	5.013	10	8 26 42.62	1.9780	18 39 51.2	9.688
11	6 50 0.54	2.1338	24 34 5.6	5.126	11	8 28 41.20	1.9747	18 30 7.5	9.768
12	6 52 8.48	2.1308	24 28 54.7	5.238	12	8 30 39.58	1.9713	18 20 19.1	9.846
13	6 54 16.24	2.1279	24 23 37.0	5.351	13	8 32 37.76	1.9681	18 10 26.0	9.923
14	6 56 23.83	2.1250	24 18 12.6	5.462	14	8 34 35.75	1.9649	18 0 28.3	10.001
15	6 58 31.24	2.1219	24 12 41.6	5.573	15	8 36 33.55	1.9617	17 50 25.9	10.078
16	7 0 38.46	2.1188	24 7 3.9	5.683	16	8 38 31.15	1.9585	17 40 18.9	10.153
17	7 2 45.50	2.1158	24 1 19.7	5.792	17	8 40 28.57	1.9553	17 30 7.5	10.228
18	7 4 52.36	2.1128	23 55 28.9	5.901	18	8 42 25.79	1.9522	17 19 51.6	10.302
19	7 6 59.03	2.1096	23 49 31.6	6.009	19	8 44 22.83	1.9491	17 9 31.3	10.377
20	7 9 5.51	2.1064	23 43 27.8	-6.117	20	8 46 19.68	1.9459	16 59 6.6	10.446
21	7 11 11.80	2.1033	23 37 17.6	6.223	21	8 48 16.34	1.9428	16 48 37.6	10.513
22	7 13 17.90	2.1000	23 31 1.0	6.329	22	8 50 12.82	1.9398	16 38 4.4	10.589
23	7 15 23.80	2.0968	+23 24 38.1	-6.435	23	8 52 9.12	1.9368	+16 27 26.9	-10.666
JULY 28.					JULY 30.				
0	7 17 29.51	2.0935	+23 18 8.8	-6.541	0	8 54 5.24	1.9338	+16 16 45.2	-10.729
1	7 19 35.02	2.0902	23 11 33.2	6.645	1	8 56 1.18	1.9308	16 5 59.4	10.798
2	7 21 40.33	2.0869	23 4 51.4	6.748	2	8 57 56.94	1.9279	15 55 9.5	10.866
3	7 23 45.45	2.0837	22 58 3.4	6.851	3	8 59 52.53	1.9251	15 44 15.5	10.933
4	7 25 50.37	2.0803	22 51 9.3	6.953	4	9 1 47.95	1.9223	15 33 17.6	10.999
5	7 27 55.08	2.0769	22 44 9.0	7.056	5	9 3 43.20	1.9194	15 22 15.7	11.064
6	7 29 59.60	2.0736	22 37 2.6	7.157	6	9 5 38.28	1.9166	15 11 9.9	11.128
7	7 32 3.91	2.0702	22 29 50.2	7.257	7	9 7 33.19	1.9138	15 0 0.3	11.192
8	7 34 8.02	2.0668	22 22 31.8	7.357	8	9 9 27.94	1.9111	14 48 46.9	11.255
9	7 36 11.92	2.0633	22 15 7.4	7.455	9	9 11 22.52	1.9084	14 37 29.7	11.318
10	7 38 15.62	2.0600	22 7 37.2	7.553	10	9 13 16.95	1.9058	14 26 8.8	11.378
11	7 40 19.12	2.0566	22 0 1.1	7.651	11	9 15 11.22	1.9032	14 14 44.3	11.439
12	7 42 22.41	2.0531	21 52 19.1	7.748	12	9 17 5.33	1.9006	14 3 16.1	11.500
13	7 44 25.49	2.0497	21 44 31.4	7.843	13	9 18 59.29	1.8981	13 51 44.3	11.558
14	7 46 28.37	2.0463	21 36 37.9	7.939	14	9 20 53.10	1.8956	13 40 9.1	11.616
15	7 48 31.04	2.0428	21 28 38.7	8.033	15	9 22 46.76	1.8932	13 28 30.4	11.674
16	7 50 33.50	2.0393	21 20 33.9	8.128	16	9 24 40.28	1.8908	13 16 48.2	11.731
17	7 52 35.76	2.0359	21 12 23.4	8.221	17	9 26 33.66	1.8884	13 5 2.7	11.786
18	7 54 37.81	2.0324	21 4 7.4	8.313	18	9 28 26.89	1.8861	12 53 13.9	11.842
19	7 56 39.65	2.0290	20 55 45.8	8.405	19	9 30 19.99	1.8838	12 41 21.7	11.897
20	7 58 41.29	2.0256	20 47 18.8	8.496	20	9 32 12.95	1.8816	12 29 26.3	11.950
21	8 0 42.72	2.0221	20 38 46.4	8.585	21	9 34 5.78	1.8793	12 17 27.7	12.003
22	8 2 43.94	2.0186	20 30 8.6	8.675	22	9 35 58.47	1.8772	12 5 26.0	12.054
23	8 4 44.95	2.0152	20 21 25.4	8.763	23	9 37 51.04	1.8752	11 53 21.2	12.106
24	8 6 45.76	2.0118	+20 12 37.0	-8.851	24	9 39 43.49	1.8731	+11 41 13.3	-12.157

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
JULY 31.					AUGUST 2.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	9 39 43.49	1.8731	+11 41 13.3	-12.157	0	11 8 16.81	1.8393	+1 14 13.9	-13.670
1	9 41 35.81	1.8711	11 29 2.4	12.206	1	11 10 7.19	1.8401	1 0 33.3	13.683
2	9 43 28.02	1.8692	11 16 48.6	12.255	2	11 11 57.62	1.8409	0 46 51.9	13.695
3	9 45 20.11	1.8672	11 4 31.8	12.303	3	11 13 48.10	1.8418	0 33 9.9	13.705
4	9 47 12.08	1.8653	10 52 12.2	12.351	4	11 15 38.64	1.8429	0 19 27.3	13.715
5	9 49 3.95	1.8636	10 39 49.7	12.398	5	11 17 29.25	1.8440	+0 5 44.1	13.725
6	9 50 55.71	1.8618	10 27 24.5	12.443	6	11 19 19.92	1.8452	-0 7 59.7	13.733
7	9 52 47.37	1.8601	10 14 56.6	12.488	7	11 21 10.67	1.8464	0 21 43.9	13.741
8	9 54 38.92	1.8584	10 2 26.0	12.533	8	11 23 1.49	1.8477	0 35 28.6	13.748
9	9 56 30.38	1.8568	9 49 52.7	12.577	9	11 24 52.39	1.8491	0 49 13.6	13.753
10	9 58 21.74	1.8553	9 37 16.8	12.619	10	11 26 43.38	1.8505	1 2 59.0	13.758
11	10 0 13.01	1.8538	9 24 38.4	12.661	11	11 28 34.45	1.8520	1 16 44.6	13.763
12	10 2 4.19	1.8523	9 11 57.5	12.702	12	11 30 25.62	1.8536	1 30 30.5	13.767
13	10 3 55.29	1.8509	8 59 14.2	12.742	13	11 32 16.88	1.8552	1 44 16.6	13.769
14	10 5 46.30	1.8496	8 46 28.5	12.782	14	11 34 8.24	1.8569	1 58 2.8	13.771
15	10 7 37.24	1.8483	8 33 40.4	12.822	15	11 35 59.71	1.8587	2 11 49.1	13.772
16	10 9 28.10	1.8471	8 20 49.9	12.860	16	11 37 51.28	1.8605	2 25 35.4	13.772
17	10 11 18.89	1.8459	8 7 57.2	12.897	17	11 39 42.97	1.8625	2 39 21.7	13.771
18	10 13 9.61	1.8448	7 55 2.3	12.933	18	11 41 34.78	1.8645	2 53 7.9	13.769
19	10 15 0.26	1.8437	7 42 5.3	12.968	19	11 43 26.71	1.8666	3 6 54.0	13.768
20	10 16 50.85	1.8427	7 29 6.1	13.004	20	11 45 18.77	1.8688	3 20 40.0	13.764
21	10 18 41.38	1.8418	7 16 4.8	13.038	21	11 47 10.96	1.8709	3 34 25.7	13.760
22	10 20 31.86	1.8409	7 3 1.5	13.072	22	11 49 3.28	1.8732	3 48 11.2	13.755
23	10 22 22.29	1.8401	+ 6 49 56.2	-13.105	23	11 50 55.74	1.8756	-4 1 56.3	-13.748
AUGUST 1.					AUGUST 3.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	10 24 12.67	1.8393	+ 6 36 48.9	-13.137	0	11 52 48.35	1.8780	-4 15 41.0	-13.742
1	10 26 3.01	1.8386	6 23 39.8	13.168	1	11 54 41.10	1.8805	4 29 25.3	13.734
2	10 27 53.30	1.8379	6 10 28.8	13.198	2	11 56 34.01	1.8832	4 43 9.1	13.726
3	10 29 43.56	1.8373	5 57 16.0	13.228	3	11 58 27.08	1.8858	4 56 52.4	13.717
4	10 31 33.78	1.8368	5 44 1.5	13.256	4	12 0 20.31	1.8886	5 10 35.1	13.706
5	10 33 23.97	1.8363	5 30 45.3	13.284	5	12 2 13.71	1.8913	5 24 17.1	13.694
6	10 35 14.14	1.8359	5 17 27.4	13.312	6	12 4 7.27	1.8942	5 37 58.4	13.683
7	10 37 4.28	1.8355	5 4 7.9	13.338	7	12 6 1.01	1.8972	5 51 39.0	13.669
8	10 38 54.40	1.8353	4 50 46.8	13.364	8	12 7 54.93	1.9003	6 5 18.7	13.655
9	10 40 44.51	1.8350	4 37 24.2	13.389	9	12 9 49.04	1.9033	6 18 57.6	13.640
10	10 42 34.60	1.8348	4 24 0.1	13.414	10	12 11 43.33	1.9065	6 32 35.5	13.624
11	10 44 24.69	1.8348	4 10 34.5	13.438	11	12 13 37.82	1.9098	6 46 12.5	13.608
12	10 46 14.77	1.8347	3 57 7.6	13.460	12	12 15 32.51	1.9132	6 59 48.4	13.589
13	10 48 4.85	1.8348	3 43 39.3	13.482	13	12 17 27.40	1.9165	7 13 23.2	13.570
14	10 49 54.94	1.8348	3 30 9.8	13.502	14	12 19 22.49	1.9200	7 26 56.8	13.551
15	10 51 45.03	1.8349	3 16 39.1	13.523	15	12 21 17.80	1.9236	7 40 29.3	13.531
16	10 53 35.13	1.8352	3 3 7.1	13.543	16	12 23 13.32	1.9272	7 54 0.5	13.508
17	10 55 25.25	1.8354	2 49 33.9	13.562	17	12 25 9.06	1.9309	8 7 30.3	13.486
18	10 57 15.38	1.8358	2 35 59.7	13.579	18	12 27 5.03	1.9347	8 20 58.8	13.463
19	10 59 5.54	1.8362	2 22 24.4	13.597	19	12 29 1.22	1.9385	8 34 25.9	13.438
20	11 0 55.72	1.8367	2 8 48.1	13.613	20	12 30 57.65	1.9425	8 47 51.4	13.412
21	11 2 45.94	1.8373	1 55 10.9	13.628	21	12 32 54.32	1.9465	9 1 15.3	13.385
22	11 4 36.19	1.8378	1 41 32.7	13.643	22	12 34 51.23	1.9506	9 14 37.6	13.358
23	11 6 26.48	1.8385	1 27 53.7	13.657	23	12 36 48.39	1.9548	9 27 58.3	13.330
24	11 8 16.81	1.8393	+ 1 14 13.9	-13.670	24	12 38 45.80	1.9590	-9 41 17.2	-13.300

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
AUGUST 4.					AUGUST 6.				
	h m s	s	" ' "	"		h m s	s	" ' "	"
0	12 38 45.80	1.9590	- 9 41 17.2	-13.300	0	14 19 2.29	2.2438	-19 23 29.0	-10.468
1	12 40 43.47	1.9633	9 54 34.3	13.269	1	14 21 17.14	2.2511	19 33 54.3	10.375
2	12 42 41.40	1.9677	10 7 49.5	13.237	2	14 23 32.42	2.2584	19 44 14.0	10.281
3	12 44 39.59	1.9721	10 21 2.7	13.203	3	14 25 48.15	2.2658	19 54 28.0	10.186
4	12 46 38.05	1.9767	10 34 13.9	13.170	4	14 28 4.32	2.2733	20 4 36.3	10.089
5	12 48 36.79	1.9813	10 47 23.1	13.136	5	14 30 20.94	2.2807	20 14 38.7	9.990
6	12 50 35.81	1.9860	11 0 30.2	13.099	6	14 32 38.00	2.2882	20 24 35.1	9.890
7	12 52 35.11	1.9908	11 13 35.0	13.062	7	14 34 55.52	2.2957	20 34 25.5	9.788
8	12 54 34.70	1.9957	11 26 37.6	13.024	8	14 37 13.48	2.3031	20 44 9.7	9.685
9	12 56 34.59	2.0006	11 39 37.9	12.985	9	14 39 31.89	2.3107	20 53 47.7	9.581
10	12 58 34.77	2.0055	11 52 35.8	12.944	10	14 41 50.76	2.3183	21 3 19.4	9.474
11	13 0 35.25	2.0106	12 5 31.2	12.902	11	14 44 10.08	2.3258	21 12 44.6	9.366
12	13 2 36.04	2.0158	12 18 24.0	12.858	12	14 46 29.86	2.3334	21 22 3.3	9.257
13	13 4 37.14	2.0209	12 31 14.2	12.815	13	14 48 50.09	2.3410	21 31 15.4	9.145
14	13 6 38.55	2.0262	12 44 1.8	12.770	14	14 51 10.78	2.3486	21 40 20.7	9.033
15	13 8 40.28	2.0315	12 56 46.6	12.723	15	14 53 31.92	2.3562	21 49 19.3	8.919
16	13 10 42.33	2.0369	13 9 28.6	12.676	16	14 55 53.52	2.3638	21 58 11.0	8.803
17	13 12 44.71	2.0424	13 22 7.7	12.627	17	14 58 15.58	2.3714	22 6 55.7	8.685
18	13 14 47.42	2.0480	13 34 43.8	12.577	18	15 0 38.09	2.3790	22 15 33.2	8.565
19	13 16 50.47	2.0537	13 47 16.9	12.526	19	15 3 1.06	2.3866	22 24 3.5	8.445
20	13 18 53.86	2.0593	13 59 46.9	12.473	20	15 5 24.48	2.3942	22 32 26.6	8.323
21	13 20 57.59	2.0651	14 12 13.7	12.420	21	15 7 48.36	2.4018	22 40 42.3	8.199
22	13 23 1.67	2.0709	14 24 37.3	12.365	22	15 10 12.70	2.4094	22 48 50.5	8.073
23	13 25 6.10	2.0768	-14 36 57.5	-12.309	23	15 12 37.49	2.4169	-22 56 51.1	-7.946
AUGUST 5.					AUGUST 7.				
	h m s	s	" ' "	"		h m s	s	" ' "	"
0	13 27 10.89	2.0828	-14 49 14.4	-12.252	0	15 15 2.73	2.4245	-23 4 44.0	-7.817
1	13 29 16.04	2.0888	15 1 27.7	12.193	1	15 17 28.43	2.4320	23 12 29.1	7.687
2	13 31 21.55	2.0949	15 13 37.5	12.133	2	15 19 54.57	2.4394	23 20 6.4	7.555
3	13 33 27.43	2.1011	15 25 43.7	12.072	3	15 22 21.16	2.4469	23 27 35.7	7.422
4	13 35 33.68	2.1073	15 37 46.1	12.008	4	15 24 48.20	2.4543	23 34 57.0	7.286
5	13 37 40.31	2.1137	15 49 44.7	11.945	5	15 27 15.68	2.4617	23 42 10.0	7.148
6	13 39 47.32	2.1200	16 1 39.5	11.880	6	15 29 43.60	2.4690	23 49 14.8	7.011
7	13 41 54.71	2.1264	16 13 30.3	11.813	7	15 32 11.96	2.4763	23 56 11.3	6.871
8	13 44 2.49	2.1329	16 25 17.1	11.746	8	15 34 40.76	2.4837	24 2 59.3	6.729
9	13 46 10.66	2.1395	16 36 59.8	11.677	9	15 37 10.00	2.4909	24 9 38.8	6.587
10	13 48 19.23	2.1461	16 48 38.3	11.606	10	15 39 39.67	2.4980	24 16 9.7	6.442
11	13 50 28.19	2.1527	17 0 12.5	11.533	11	15 42 9.76	2.5051	24 22 31.8	6.295
12	13 52 37.55	2.1594	17 11 42.3	11.460	12	15 44 40.28	2.5122	24 28 45.1	6.148
13	13 54 47.32	2.1662	17 23 7.7	11.385	13	15 47 11.22	2.5192	24 34 49.5	5.998
14	13 56 57.49	2.1729	17 34 28.5	11.309	14	15 49 42.58	2.5261	24 40 44.9	5.847
15	13 59 8.07	2.1798	17 45 44.8	11.232	15	15 52 14.35	2.5329	24 46 31.1	5.694
16	14 1 19.07	2.1868	17 56 56.3	11.153	16	15 54 46.53	2.5397	24 52 8.2	5.541
17	14 3 30.48	2.1937	18 8 3.1	11.073	17	15 57 19.11	2.5464	24 57 36.0	5.386
18	14 5 42.31	2.2008	18 19 5.0	10.990	18	15 59 52.10	2.5531	25 2 54.5	5.229
19	14 7 54.57	2.2078	18 30 1.9	10.907	19	16 2 25.48	2.5596	25 8 3.5	5.071
20	14 10 7.25	2.2149	18 40 53.8	10.822	20	16 4 59.25	2.5660	25 13 3.0	4.911
21	14 12 20.36	2.2222	18 51 40.5	10.735	21	16 7 33.40	2.5723	25 17 52.8	4.749
22	14 14 33.91	2.2293	19 2 22.0	10.648	22	16 10 7.93	2.5787	25 22 32.9	4.588
23	14 16 47.88	2.2365	19 12 58.2	10.558	23	16 12 42.84	2.5848	25 27 3.3	4.424
24	14 19 2.29	2.2438	-19 23 29.0	-10.468	24	16 15 18.11	2.5908	-25 31 23.8	-4.258

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
AUGUST 8.					AUGUST 10.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	16 15 18.11	2.5908	-25 31 23.8	-4.258	0	18 24 5.12	2.7138	-25 26 38.0	+4.061
1	16 17 53.74	2.5968	25 35 34.3	4.092	1	18 26 47.90	2.7123	25 21 52.6	4.852
2	16 20 29.73	2.6028	25 39 34.8	3.924	2	18 29 30.59	2.7107	25 16 55.8	5.041
3	16 23 6.07	2.6085	25 43 25.2	3.755	3	18 32 13.18	2.7088	25 11 47.7	5.230
4	16 25 42.75	2.6142	25 47 5.4	3.584	4	18 34 55.65	2.7068	25 6 28.2	5.418
5	16 28 19.77	2.6197	25 50 35.3	3.412	5	18 37 38.00	2.7047	25 0 57.5	5.606
6	16 30 57.11	2.6250	25 53 54.8	3.239	6	18 40 20.21	2.7023	24 55 15.5	5.793
7	16 33 34.77	2.6303	25 57 4.0	3.066	7	18 43 2.28	2.6999	24 49 22.3	5.979
8	16 36 12.75	2.6355	26 0 2.7	2.890	8	18 45 44.20	2.6973	24 43 18.0	6.164
9	16 38 51.03	2.6405	26 2 50.8	2.713	9	18 48 25.96	2.6946	24 37 2.6	6.348
10	16 41 29.61	2.6454	26 5 28.3	2.536	10	18 51 7.55	2.6917	24 30 36.2	6.532
11	16 44 8.48	2.6502	26 7 55.1	2.358	11	18 53 48.96	2.6887	24 23 58.8	6.714
12	16 46 47.63	2.6548	26 10 11.2	2.178	12	18 56 30.19	2.6855	24 17 10.5	6.896
13	16 49 27.05	2.6593	26 12 16.5	1.998	13	18 59 11.22	2.6822	24 10 11.3	7.077
14	16 52 6.74	2.6637	26 14 10.9	1.815	14	19 1 52.05	2.6787	24 3 1.3	7.256
15	16 54 46.69	2.6678	26 15 54.3	1.633	15	19 4 32.66	2.6751	23 55 40.6	7.434
16	16 57 26.88	2.6718	26 17 26.8	1.450	16	19 7 13.06	2.6714	23 48 9.2	7.611
17	17 0 7.31	2.6758	26 18 48.3	1.265	17	19 9 53.23	2.6676	23 40 27.3	7.787
18	17 2 47.97	2.6795	26 19 58.6	1.079	18	19 12 33.17	2.6636	23 32 34.8	7.962
19	17 5 28.85	2.6831	26 20 57.8	0.894	19	19 15 12.86	2.6595	23 24 31.9	8.135
20	17 8 9.94	2.6865	26 21 45.9	0.708	20	19 17 52.31	2.6554	23 16 18.6	8.307
21	17 10 51.23	2.6898	26 22 22.7	0.519	21	19 20 31.51	2.6511	23 7 55.1	8.477
22	17 13 32.71	2.6928	26 22 48.2	0.331	22	19 23 10.44	2.6467	22 59 21.4	8.647
23	17 16 14.37	2.6958	-26 23 2.4	-0.143	23	19 25 49.11	2.6422	-22 50 37.5	+8.815
AUGUST 9.					AUGUST 11.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	17 18 56.21	2.6987	-26 23 5.3	+0.047	0	19 28 27.50	2.6375	-22 41 43.6	+8.981
1	17 21 38.21	2.7013	26 22 56.8	0.237	1	19 31 5.61	2.6328	22 32 39.8	9.146
2	17 24 20.36	2.7037	26 22 36.9	0.428	2	19 33 43.43	2.6279	22 23 26.1	9.309
3	17 27 2.65	2.7059	26 22 5.5	0.619	3	19 36 20.96	2.6230	22 14 2.7	9.471
4	17 29 45.07	2.7080	26 21 22.6	0.810	4	19 38 58.19	2.6180	22 4 29.6	9.632
5	17 32 27.61	2.7099	26 20 28.3	1.001	5	19 41 35.12	2.6129	21 54 46.9	9.790
6	17 35 10.26	2.7117	26 19 22.5	1.193	6	19 44 11.74	2.6078	21 44 54.8	9.947
7	17 37 53.01	2.7133	26 18 5.1	1.387	7	19 46 48.05	2.6025	21 34 53.3	10.102
8	17 40 35.86	2.7148	26 16 36.1	1.579	8	19 49 24.04	2.5972	21 24 42.6	10.255
9	17 43 18.78	2.7159	26 14 55.6	1.772	9	19 51 59.71	2.5918	21 14 22.7	10.408
10	17 46 1.77	2.7171	26 13 3.5	1.965	10	19 54 35.06	2.5864	21 3 53.7	10.558
11	17 48 44.83	2.7180	26 10 59.8	2.158	11	19 57 10.08	2.5808	20 53 15.7	10.707
12	17 51 27.93	2.7187	26 8 44.6	2.351	12	19 59 44.76	2.5753	20 42 28.9	10.853
13	17 54 11.07	2.7193	26 6 17.7	2.545	13	20 2 19.11	2.5696	20 31 33.4	10.997
14	17 56 54.24	2.7196	26 3 39.2	2.738	14	20 4 53.11	2.5638	20 20 29.3	11.140
15	17 59 37.42	2.7198	26 0 49.1	2.932	15	20 7 26.77	2.5581	20 9 16.6	11.282
16	18 2 20.61	2.7198	25 57 47.4	3.125	16	20 10 0.08	2.5523	19 57 55.5	11.420
17	18 5 3.79	2.7196	25 54 34.1	3.318	17	20 12 33.05	2.5465	19 46 26.2	11.557
18	18 7 46.96	2.7193	25 51 9.3	3.510	18	20 15 5.66	2.5406	19 34 48.7	11.693
19	18 10 30.11	2.7188	25 47 32.9	3.703	19	20 17 37.92	2.5347	19 23 3.1	11.826
20	18 13 13.22	2.7182	25 43 44.9	3.896	20	20 20 9.82	2.5287	19 11 9.6	11.958
21	18 15 56.29	2.7173	25 39 45.4	4.088	21	20 22 41.36	2.5228	18 59 8.2	12.088
22	18 18 39.30	2.7163	25 35 34.4	4.279	22	20 25 12.55	2.5168	18 46 59.1	12.214
23	18 21 22.25	2.7152	25 31 11.9	4.470	23	20 27 43.37	2.5107	18 34 42.5	12.339
24	18 24 5.12	2.7138	-25 26 38.0	+4.661	24	20 30 13.83	2.5047	-18 22 18.4	+12.463

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
AUGUST 12.					AUGUST 14.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	20 30 13.83	2.5047	-18 22 18.4	+12.463	0	22 23 41.96	2.2377	-6 41 21.4	+15.947
1	20 32 43.93	2.4986	18 9 46.9	12.585	1	22 25 56.09	2.2333	6 25 23.9	15.969
2	20 35 13.66	2.4925	17 57 8.2	12.704	2	22 28 9.96	2.2290	6 9 25.1	15.990
3	20 37 43.03	2.4864	17 44 22.4	12.822	3	22 30 23.57	2.2248	5 53 25.1	16.010
4	20 40 12.03	2.4803	17 31 29.6	12.937	4	22 32 36.93	2.2207	5 37 23.9	16.028
5	20 42 40.66	2.4741	17 18 30.0	13.049	5	22 34 50.05	2.2167	5 21 21.8	16.043
6	20 45 8.92	2.4680	17 5 23.7	13.161	6	22 37 2.93	2.2127	5 5 18.8	16.057
7	20 47 36.82	2.4619	16 52 10.7	13.271	7	22 39 15.57	2.2088	4 49 15.0	16.068
8	20 50 4.35	2.4558	16 38 51.2	13.378	8	22 41 27.98	2.2049	4 33 10.6	16.078
9	20 52 31.51	2.4497	16 25 25.4	13.483	9	22 43 40.16	2.2011	4 17 5.6	16.087
10	20 54 58.31	2.4436	16 11 53.3	13.586	10	22 45 52.11	2.1973	4 1 0.2	16.093
11	20 57 24.74	2.4374	15 58 15.1	13.686	11	22 48 3.84	2.1938	3 44 54.4	16.098
12	20 59 50.80	2.4313	15 44 31.0	13.784	12	22 50 15.36	2.1903	3 28 48.4	16.101
13	21 2 16.50	2.4253	15 30 41.0	13.881	13	22 52 26.67	2.1868	3 12 42.3	16.102
14	21 4 41.83	2.4192	15 16 45.3	13.975	14	22 54 37.77	2.1833	2 56 36.2	16.102
15	21 7 6.80	2.4132	15 2 44.0	14.068	15	22 56 48.67	2.1800	2 40 30.1	16.100
16	21 9 31.41	2.4073	14 48 37.2	14.158	16	22 58 59.37	2.1768	2 24 24.2	16.096
17	21 11 55.67	2.4013	14 34 25.0	14.247	17	23 1 9.88	2.1736	2 8 18.6	16.091
18	21 14 19.56	2.3953	14 20 7.6	14.332	18	23 3 20.20	2.1705	1 52 13.3	16.084
19	21 16 43.10	2.3893	14 5 45.2	14.415	19	23 5 30.34	2.1674	1 36 8.5	16.075
20	21 19 6.28	2.3834	13 51 17.8	14.498	20	23 7 40.29	2.1644	1 20 4.3	16.064
21	21 21 29.11	2.3776	13 36 45.5	14.578	21	23 9 50.07	2.1610	1 4 0.8	16.053
22	21 23 51.59	2.3718	13 22 8.5	14.655	22	23 11 59.68	2.1588	0 47 58.0	16.039
23	21 26 13.72	2.3659	-13 7 26.9	+14.730	23	23 14 9.12	2.1560	-0 31 56.1	+16.023
AUGUST 13.					AUGUST 15.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	21 28 35.50	2.3602	-12 52 40.9	+14.803	0	23 16 18.40	2.1533	-0 15 55.2	+16.006
1	21 30 56.94	2.3545	12 37 50.6	14.874	1	23 18 27.52	2.1508	+0 0 4.6	15.988
2	21 33 18.04	2.3488	12 22 56.0	14.944	2	23 20 36.49	2.1483	0 16 3.3	15.968
3	21 35 38.80	2.3432	12 7 57.3	15.011	3	23 22 45.31	2.1458	0 32 0.8	15.947
4	21 37 59.22	2.3376	11 52 54.7	15.075	4	23 24 53.99	2.1434	0 47 56.9	15.923
5	21 40 19.31	2.3321	11 37 48.3	15.138	5	23 27 2.52	2.1411	1 3 51.5	15.898
6	21 42 39.07	2.3266	11 22 38.1	15.199	6	23 29 10.92	2.1389	1 19 44.7	15.873
7	21 44 58.50	2.3212	11 7 24.4	15.258	7	23 31 19.19	2.1368	1 35 36.3	15.845
8	21 47 17.61	2.3158	10 52 7.2	15.314	8	23 33 27.33	2.1347	1 51 26.1	15.816
9	21 49 36.39	2.3104	10 36 46.7	15.368	9	23 35 35.35	2.1327	2 7 14.2	15.786
10	21 51 54.86	2.3052	10 21 23.0	15.421	10	23 37 43.25	2.1308	2 23 0.4	15.754
11	21 54 13.01	2.2999	10 5 56.2	15.472	11	23 39 51.04	2.1289	2 38 44.7	15.722
12	21 56 30.85	2.2948	9 50 26.4	15.520	12	23 41 58.72	2.1271	2 54 27.0	15.687
13	21 58 48.38	2.2897	9 34 53.8	15.567	13	23 44 6.29	2.1253	3 10 7.1	15.650
14	22 1 5.61	2.2847	9 19 18.4	15.611	14	23 46 13.76	2.1238	3 25 45.0	15.613
15	22 3 22.54	2.2797	9 3 40.5	15.653	15	23 48 21.14	2.1223	3 41 20.6	15.573
16	22 5 39.17	2.2748	8 48 0.1	15.693	16	23 50 28.42	2.1207	3 56 53.8	15.533
17	22 7 55.51	2.2698	8 32 17.3	15.732	17	23 52 35.62	2.1193	4 12 24.6	15.493
18	22 10 11.55	2.2650	8 16 32.2	15.768	18	23 54 42.73	2.1178	4 27 52.9	15.449
19	22 12 27.31	2.2603	8 0 45.1	15.803	19	23 56 49.76	2.1165	4 43 18.5	15.405
20	22 14 42.79	2.2557	7 44 55.9	15.836	20	23 58 56.71	2.1153	4 58 41.5	15.360
21	22 16 57.99	2.2511	7 29 4.8	15.866	21	0 1 3.59	2.1141	5 14 1.7	15.313
22	22 19 12.92	2.2465	7 13 12.0	15.894	22	0 3 10.40	2.1130	5 29 19.1	15.263
23	22 21 27.57	2.2420	6 57 17.5	15.922	23	0 5 17.15	2.1120	5 44 33.5	15.215
24	22 23 41.96	2.2377	-6 41 21.4	+15.947	24	0 7 23.84	2.1111	+5 59 44.9	+15.163

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
AUGUST 16.					AUGUST 18.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	0 7 23.84	2.1111	+ 5 59 44.9	+15.165	0	1 48 44.00	2.1302	+16 48 28.3	+11.493
1	0 9 30.48	2.1102	6 14 53.3	15.113	1	1 50 51.85	2.1316	16 59 54.9	11.394
2	0 11 37.06	2.1093	6 29 58.5	15.060	2	1 52 59.79	2.1331	17 11 15.6	11.295
3	0 13 43.59	2.1085	6 45 0.5	15.006	3	1 55 7.82	2.1345	17 22 30.3	11.195
4	0 15 50.08	2.1078	6 59 59.2	14.951	4	1 57 15.93	2.1360	17 33 39.0	11.095
5	0 17 56.53	2.1073	7 14 54.6	14.894	5	1 59 24.14	2.1376	17 44 41.7	10.994
6	0 20 2.95	2.1067	7 29 46.5	14.836	6	2 1 32.44	2.1391	17 55 38.3	10.892
7	0 22 9.33	2.1062	7 44 34.9	14.777	7	2 3 40.83	2.1406	18 6 28.7	10.789
8	0 24 15.69	2.1058	7 59 19.7	14.717	8	2 5 49.31	2.1422	18 17 13.0	10.686
9	0 26 22.02	2.1053	8 14 0.9	14.656	9	2 7 57.89	2.1438	18 27 51.0	10.582
10	0 28 28.33	2.1050	8 28 38.4	14.593	10	2 10 6.56	2.1453	18 38 22.8	10.478
11	0 30 34.62	2.1047	8 43 12.1	14.530	11	2 12 15.33	2.1470	18 48 48.3	10.372
12	0 32 40.89	2.1045	8 57 42.0	14.466	12	2 14 24.20	2.1487	18 59 7.4	10.266
13	0 34 47.16	2.1044	9 12 8.0	14.400	13	2 16 33.17	2.1503	19 9 20.2	10.160
14	0 36 53.42	2.1043	9 26 30.0	14.333	14	2 18 42.23	2.1519	19 19 26.6	10.053
15	0 38 59.67	2.1042	9 40 47.9	14.264	15	2 20 51.40	2.1537	19 29 26.5	9.944
16	0 41 5.92	2.1043	9 55 1.7	14.196	16	2 23 0.67	2.1553	19 39 19.9	9.836
17	0 43 12.18	2.1043	10 9 11.4	14.126	17	2 25 10.04	2.1570	19 49 6.8	9.727
18	0 45 18.44	2.1045	10 23 16.8	14.055	18	2 27 19.51	2.1587	19 58 47.1	9.618
19	0 47 24.72	2.1048	10 37 18.0	13.983	19	2 29 29.08	2.1603	20 8 20.9	9.508
20	0 49 31.01	2.1049	10 51 14.8	13.909	20	2 31 38.75	2.1621	20 17 48.0	9.396
21	0 51 37.31	2.1052	11 5 7.1	13.835	21	2 33 48.53	2.1638	20 27 8.4	9.284
22	0 53 43.63	2.1056	11 18 55.0	13.761	22	2 35 58.41	2.1655	20 36 22.1	9.173
23	0 55 49.98	2.1060	+11 32 38.4	+13.685	23	2 38 8.39	2.1673	+20 45 29.1	+ 9.060
AUGUST 17.					AUGUST 19.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	0 57 56.35	2.1064	+11 46 17.2	+13.608	0	2 40 18.48	2.1690	+20 54 29.3	+ 8.947
1	1 0 2.75	2.1069	11 59 51.3	13.530	1	2 42 28.67	2.1707	21 3 22.7	8.833
2	1 2 9.18	2.1075	12 13 20.8	13.452	2	2 44 38.96	2.1723	21 12 9.3	8.719
3	1 4 15.65	2.1081	12 26 45.5	13.371	3	2 46 49.35	2.1740	21 20 49.0	8.604
4	1 6 22.15	2.1087	12 40 5.3	13.290	4	2 48 59.84	2.1758	21 29 21.8	8.489
5	1 8 28.69	2.1094	12 53 20.3	13.208	5	2 51 10.44	2.1774	21 37 47.7	8.373
6	1 10 35.28	2.1102	13 6 30.3	13.126	6	2 53 21.13	2.1791	21 46 6.6	8.257
7	1 12 41.91	2.1109	13 19 35.4	13.043	7	2 55 31.93	2.1808	21 54 18.5	8.140
8	1 14 48.59	2.1118	13 32 35.4	12.958	8	2 57 42.83	2.1824	22 2 23.4	8.023
9	1 16 55.32	2.1127	13 45 30.3	12.873	9	2 59 53.82	2.1840	22 10 21.2	7.904
10	1 19 2.11	2.1136	13 58 20.1	12.787	10	3 2 4.91	2.1858	22 18 11.9	7.787
11	1 21 8.95	2.1145	14 11 4.7	12.699	11	3 4 16.11	2.1874	22 25 55.6	7.668
12	1 23 15.85	2.1155	14 23 44.0	12.611	12	3 6 27.40	2.1890	22 33 32.1	7.548
13	1 25 22.81	2.1165	14 36 18.0	12.523	13	3 8 38.79	2.1906	22 41 1.4	7.429
14	1 27 29.83	2.1176	14 48 46.7	12.433	14	3 10 50.27	2.1921	22 48 23.6	7.309
15	1 29 36.92	2.1187	15 1 10.0	12.343	15	3 13 1.84	2.1937	22 55 38.5	7.188
16	1 31 44.07	2.1198	15 13 27.8	12.251	16	3 15 13.51	2.1953	23 2 46.2	7.068
17	1 33 51.30	2.1211	15 25 40.1	12.159	17	3 17 25.27	2.1968	23 9 46.7	6.947
18	1 35 58.60	2.1223	15 37 46.9	12.067	18	3 19 37.12	2.1983	23 16 39.8	6.824
19	1 38 5.97	2.1235	15 49 48.1	11.973	19	3 21 49.06	2.1997	23 23 25.6	6.703
20	1 40 13.42	2.1248	16 1 43.6	11.878	20	3 24 1.08	2.2011	23 30 4.1	6.580
21	1 42 20.95	2.1261	16 13 33.4	11.783	21	3 26 13.19	2.2026	23 36 35.2	6.457
22	1 44 28.55	2.1273	16 25 17.5	11.687	22	3 28 25.39	2.2040	23 42 58.9	6.334
23	1 46 36.23	2.1288	16 36 55.8	11.590	23	3 30 37.67	2.2053	23 49 15.3	6.211
24	1 48 44.00	2.1302	+16 48 28.3	+11.493	24	3 32 50.02	2.2066	+23 55 24.2	+ 6.087

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
AUGUST 20.					AUGUST 22.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	3 32 50.02	2.2066	+23 55 24.2	+6.087	0	5 19 30.08	2.2188	+26 20 44.4	-0.063
1	3 35 2.46	2.2079	24 1 25.7	5.963	1	5 21 43.17	2.2177	26 20 36.8	0.191
2	3 37 14.97	2.2092	24 7 19.7	5.838	2	5 23 56.20	2.2166	26 20 21.5	0.318
3	3 39 27.56	2.2104	24 13 6.2	5.713	3	5 26 9.16	2.2154	26 19 58.6	0.446
4	3 41 40.22	2.2116	24 18 45.2	5.588	4	5 28 22.05	2.2142	26 19 28.0	0.573
5	3 43 52.95	2.2128	24 24 16.7	5.463	5	5 30 34.86	2.2129	26 18 49.8	0.701
6	3 46 5.76	2.2140	24 29 40.7	5.337	6	5 32 47.60	2.2116	26 18 3.9	0.828
7	3 48 18.63	2.2150	24 34 57.1	5.210	7	5 35 0.25	2.2102	26 17 10.4	0.954
8	3 50 31.56	2.2160	24 40 5.9	5.084	8	5 37 12.82	2.2088	26 16 9.4	1.080
9	3 52 44.55	2.2171	24 45 7.2	4.958	9	5 39 25.30	2.2073	26 15 0.8	1.207
10	3 54 57.61	2.2181	24 50 0.8	4.831	10	5 41 37.69	2.2057	26 13 44.6	1.333
11	3 57 10.72	2.2190	24 54 46.9	4.704	11	5 43 49.98	2.2040	26 12 20.9	1.458
12	3 59 23.89	2.2199	24 59 25.3	4.577	12	5 46 2.17	2.2024	26 10 49.6	1.584
13	4 1 37.11	2.2208	25 3 56.1	4.449	13	5 48 14.27	2.2008	26 9 10.8	1.708
14	4 3 50.38	2.2216	25 8 19.2	4.321	14	5 50 26.26	2.1990	26 7 24.6	1.831
15	4 6 3.70	2.2223	25 12 34.6	4.193	15	5 52 38.14	2.1971	26 5 30.9	1.957
16	4 8 17.06	2.2231	25 16 42.4	4.066	16	5 54 49.91	2.1953	26 3 29.8	2.081
17	4 10 30.47	2.2238	25 20 42.5	3.938	17	5 57 1.57	2.1934	26 1 21.2	2.205
18	4 12 43.91	2.2243	25 24 34.9	3.809	18	5 59 13.12	2.1914	25 59 5.2	2.328
19	4 14 57.39	2.2249	25 28 19.6	3.681	19	6 1 24.54	2.1893	25 56 41.8	2.451
20	4 17 10.90	2.2254	25 31 56.6	3.552	20	6 3 35.84	2.1873	25 54 11.1	2.573
21	4 19 24.44	2.2259	25 35 25.8	3.423	21	6 5 47.01	2.1852	25 51 33.0	2.696
22	4 21 38.01	2.2263	25 38 47.3	3.294	22	6 7 58.06	2.1831	25 48 47.6	2.818
23	4 23 51.60	2.2268	+25 42 1.1	+3.165	23	6 10 8.98	2.1808	+25 45 54.9	-2.938
AUGUST 21.					AUGUST 23.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	4 26 5.22	2.2272	+25 45 7.1	+3.036	0	6 12 19.76	2.1785	+25 42 55.0	-3.059
1	4 28 18.86	2.2274	25 48 5.4	2.907	1	6 14 30.40	2.1763	25 39 47.8	3.180
2	4 30 32.51	2.2276	25 50 55.9	2.778	2	6 16 40.91	2.1740	25 36 33.4	3.300
3	4 32 46.17	2.2278	25 53 38.7	2.648	3	6 18 51.28	2.1716	25 33 11.8	3.420
4	4 34 59.84	2.2279	25 56 13.7	2.519	4	6 21 1.50	2.1691	25 29 43.0	3.539
5	4 37 13.52	2.2280	25 58 41.0	2.390	5	6 23 11.57	2.1666	25 26 7.1	3.658
6	4 39 27.20	2.2280	26 1 0.5	2.260	6	6 25 21.49	2.1641	25 22 24.1	3.776
7	4 41 40.88	2.2279	26 3 12.2	2.130	7	6 27 31.26	2.1616	25 18 34.0	3.894
8	4 43 54.55	2.2278	26 5 16.1	2.000	8	6 29 40.88	2.1590	25 14 36.8	4.012
9	4 46 8.22	2.2277	26 7 12.2	1.871	9	6 31 50.34	2.1564	25 10 32.6	4.128
10	4 48 21.87	2.2274	26 9 0.6	1.742	10	6 33 59.65	2.1538	25 6 21.4	4.244
11	4 50 35.51	2.2273	26 10 41.2	1.613	11	6 36 8.79	2.1510	25 2 3.3	4.360
12	4 52 49.14	2.2270	26 12 14.1	1.483	12	6 38 17.77	2.1483	24 57 38.2	4.476
13	4 55 2.75	2.2266	26 13 39.2	1.353	13	6 40 26.58	2.1455	24 53 6.2	4.591
14	4 57 16.33	2.2262	26 14 56.5	1.224	14	6 42 35.23	2.1428	24 48 27.3	4.703
15	4 59 29.89	2.2257	26 16 6.1	1.095	15	6 44 43.71	2.1399	24 43 41.6	4.818
16	5 1 43.41	2.2251	26 17 7.9	0.966	16	6 46 52.02	2.1371	24 38 49.1	4.932
17	5 3 56.90	2.2245	26 18 2.0	0.838	17	6 49 0.16	2.1342	24 33 49.8	5.045
18	5 6 10.35	2.2238	26 18 48.4	0.708	18	6 51 8.12	2.1312	24 28 43.7	5.158
19	5 8 23.76	2.2232	26 19 27.0	0.579	19	6 53 15.90	2.1283	24 23 30.9	5.268
20	5 10 37.13	2.2224	26 19 57.9	0.451	20	6 55 23.51	2.1253	24 18 11.5	5.379
21	5 12 50.45	2.2215	26 20 31.1	0.322	21	6 57 30.94	2.1223	24 12 45.4	5.490
22	5 15 3.71	2.2206	26 20 36.5	0.193	22	6 59 38.18	2.1193	24 7 12.7	5.599
23	5 17 16.92	2.2198	26 20 44.3	+0.066	23	7 1 45.25	2.1163	24 1 33.5	5.708
24	5 19 30.08	2.2188	+26 20 44.4	-0.063	24	7 3 52.13	2.1132	+23 55 47.7	-5.818

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
AUGUST 24.					AUGUST 26.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	7 3 52.13	2.1132	+23 55 47.7	-5.818	0	8 41 34.93	1.9597	+17 23 37.0	-10.256
1	7 5 58.83	2.1101	23 49 55.4	5.926	1	8 43 32.42	1.9568	17 13 19.4	10.331
2	7 8 5.34	2.1069	23 43 56.6	6.033	2	8 45 29.74	1.9538	17 2 57.3	10.406
3	7 10 11.66	2.1038	23 37 51.4	6.140	3	8 47 26.88	1.9509	16 52 30.7	10.479
4	7 12 17.79	2.1007	23 31 39.8	6.247	4	8 49 23.85	1.9481	16 41 59.8	10.552
5	7 14 23.74	2.0975	23 25 21.8	6.353	5	8 51 20.65	1.9453	16 31 24.5	10.624
6	7 16 29.49	2.0943	23 18 57.5	6.458	6	8 53 17.29	1.9426	16 20 44.9	10.695
7	7 18 35.05	2.0911	23 12 26.9	6.563	7	8 55 13.76	1.9398	16 10 1.1	10.765
8	7 20 40.42	2.0878	23 5 50.0	6.666	8	8 57 10.07	1.9372	15 59 13.1	10.834
9	7 22 45.59	2.0846	22 59 7.0	6.768	9	8 59 6.22	1.9344	15 48 21.0	10.903
10	7 24 50.57	2.0814	22 52 17.8	6.871	10	9 1 2.20	1.9318	15 37 24.7	10.972
11	7 26 55.36	2.0782	22 45 22.5	6.973	11	9 2 58.03	1.9292	15 26 24.4	11.039
12	7 28 59.95	2.0748	22 38 21.0	7.075	12	9 4 53.70	1.9266	15 15 20.0	11.106
13	7 31 4.34	2.0716	22 31 13.5	7.175	13	9 6 49.22	1.9241	15 4 11.7	11.172
14	7 33 8.54	2.0683	22 24 0.0	7.275	14	9 8 44.59	1.9216	14 52 59.4	11.237
15	7 35 12.54	2.0651	22 16 40.5	7.374	15	9 10 39.81	1.9191	14 41 43.3	11.301
16	7 37 18.35	2.0618	22 9 15.1	7.473	16	9 12 34.88	1.9167	14 30 23.3	11.365
17	7 39 19.95	2.0583	22 1 43.8	7.571	17	9 14 29.81	1.9143	14 18 59.5	11.428
18	7 41 23.35	2.0551	21 54 6.6	7.668	18	9 16 24.59	1.9119	14 7 32.0	11.489
19	7 43 26.56	2.0518	21 46 23.6	7.764	19	9 18 19.24	1.9097	13 56 0.8	11.550
20	7 45 29.57	2.0485	21 38 34.9	7.860	20	9 20 13.75	1.9073	13 44 26.0	11.611
21	7 47 32.38	2.0453	21 30 40.4	7.956	21	9 22 8.12	1.9051	13 32 47.5	11.671
22	7 49 35.00	2.0419	21 22 40.2	8.051	22	9 24 2.36	1.9028	13 21 5.5	11.729
23	7 51 37.41	2.0386	+21 14 34.3	-8.144	23	9 25 56.46	1.9007	+13 9 20.0	-11.788
AUGUST 25.					AUGUST 27.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	7 53 39.63	2.0353	+21 6 22.9	-8.237	0	9 27 50.44	1.8986	+12 57 31.0	-11.845
1	7 55 41.65	2.0320	20 58 5.9	8.329	1	9 29 44.29	1.8965	12 45 38.6	11.902
2	7 57 43.47	2.0288	20 49 43.4	8.421	2	9 31 38.02	1.8945	12 33 42.8	11.958
3	7 59 45.10	2.0255	20 41 15.4	8.513	3	9 33 31.63	1.8925	12 21 43.7	12.013
4	8 1 46.53	2.0222	20 32 41.9	8.603	4	9 35 25.12	1.8905	12 9 41.3	12.067
5	8 3 47.76	2.0189	20 24 3.0	8.693	5	9 37 18.49	1.8886	11 57 35.7	12.120
6	8 5 48.80	2.0157	20 15 18.8	8.781	6	9 39 11.75	1.8868	11 45 26.9	12.173
7	8 7 49.64	2.0124	20 6 29.3	8.869	7	9 41 4.90	1.8849	11 33 15.0	12.224
8	8 9 50.29	2.0092	19 57 34.5	8.957	8	9 42 57.94	1.8832	11 21 0.0	12.276
9	8 11 50.74	2.0059	19 48 34.5	9.043	9	9 44 50.88	1.8815	11 8 41.9	12.327
10	8 13 51.00	2.0028	19 39 29.3	9.130	10	9 46 43.72	1.8798	10 56 20.8	12.376
11	8 15 51.07	1.9996	19 30 18.9	9.215	11	9 48 36.46	1.8782	10 43 56.8	12.424
12	8 17 50.95	1.9964	19 21 3.5	9.299	12	9 50 29.10	1.8766	10 31 29.9	12.473
13	8 19 50.64	1.9933	19 11 43.0	9.383	13	9 52 21.65	1.8750	10 19 0.1	12.520
14	8 21 50.14	1.9901	19 2 17.5	9.466	14	9 54 14.10	1.8735	10 6 27.5	12.566
15	8 23 49.45	1.9869	18 52 47.1	9.548	15	9 56 6.47	1.8722	9 53 52.2	12.612
16	8 25 48.57	1.9838	18 43 11.7	9.631	16	9 57 58.76	1.8708	9 41 14.1	12.657
17	8 27 47.50	1.9807	18 33 31.4	9.712	17	9 59 50.96	1.8694	9 28 33.4	12.700
18	8 29 46.25	1.9777	18 23 46.3	9.791	18	10 1 43.09	1.8682	9 15 50.1	12.743
19	8 31 44.82	1.9746	18 13 56.5	9.870	19	10 3 35.14	1.8669	9 3 4.2	12.786
20	8 33 43.20	1.9715	18 4 1.9	9.949	20	10 5 27.12	1.8658	8 50 15.8	12.828
21	8 35 41.40	1.9685	17 54 2.6	10.028	21	10 7 19.03	1.8646	8 37 24.9	12.868
22	8 37 39.42	1.9655	17 43 58.6	10.104	22	10 9 10.87	1.8634	8 24 31.6	12.908
23	8 39 37.26	1.9626	17 33 50.1	10.180	23	10 11 2.64	1.8624	8 11 35.9	12.948
24	8 41 34.93	1.9597	+17 23 37.0	-10.256	24	10 12 54.36	1.8615	+7 58 37.9	-12.986

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
AUGUST 28.					AUGUST 30.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	10 12 54.36	1.8615	+7 58 37.9	-12.986	0	11 42 13.27	1.8833	-2 53 13.6	-13.846
1	10 14 46.02	1.8606	7 45 37.6	13.023	1	11 44 6.32	1.8852	3 7 4.2	13.841
2	10 16 37.63	1.8598	7 32 35.1	13.060	2	11 45 59.49	1.8873	3 20 54.5	13.837
3	10 18 29.19	1.8589	7 19 30.4	13.096	3	11 47 52.79	1.8893	3 34 44.6	13.832
4	10 20 20.70	1.8581	7 6 23.6	13.132	4	11 49 46.21	1.8915	3 48 34.3	13.825
5	10 22 12.16	1.8574	6 53 14.6	13.167	5	11 51 39.77	1.8938	4 2 23.6	13.818
6	10 24 3.59	1.8568	6 40 3.6	13.199	6	11 53 33.47	1.8962	4 16 12.4	13.808
7	10 25 54.98	1.8562	6 26 50.7	13.232	7	11 55 27.31	1.8985	4 30 0.6	13.799
8	10 27 46.33	1.8557	6 13 35.8	13.264	8	11 57 21.29	1.9009	4 43 48.2	13.788
9	10 29 37.66	1.8553	6 0 19.0	13.296	9	11 59 15.42	1.9034	4 57 35.2	13.778
10	10 31 28.96	1.8548	5 47 0.3	13.326	10	12 1 9.70	1.9060	5 11 21.5	13.765
11	10 33 20.23	1.8543	5 33 39.9	13.355	11	12 3 4.14	1.9087	5 25 7.0	13.751
12	10 35 11.48	1.8541	5 20 17.7	13.384	12	12 4 58.74	1.9113	5 38 51.7	13.738
13	10 37 2.72	1.8538	5 6 53.8	13.412	13	12 6 53.50	1.9141	5 52 35.5	13.722
14	10 38 53.94	1.8536	4 53 28.3	13.438	14	12 8 48.43	1.9170	6 6 18.3	13.708
15	10 40 45.15	1.8535	4 40 1.2	13.464	15	12 10 43.54	1.9199	6 20 0.1	13.698
16	10 42 36.36	1.8534	4 26 32.6	13.490	16	12 12 38.82	1.9229	6 33 40.9	13.679
17	10 44 27.56	1.8534	4 13 2.4	13.515	17	12 14 34.29	1.9260	6 47 20.5	13.660
18	10 46 18.77	1.8535	3 59 30.8	13.538	18	12 16 29.94	1.9290	7 0 58.9	13.639
19	10 48 9.98	1.8535	3 45 57.8	13.561	19	12 18 25.77	1.9322	7 14 36.1	13.608
20	10 50 1.19	1.8537	3 32 23.5	13.583	20	12 20 21.80	1.9354	7 28 11.9	13.586
21	10 51 52.42	1.8539	3 18 47.9	13.604	21	12 22 18.02	1.9388	7 41 46.4	13.563
22	10 53 43.66	1.8542	3 5 11.0	13.625	22	12 24 14.45	1.9422	7 55 19.4	13.539
23	10 55 34.92	1.8545	+2 51 32.9	-13.644	23	12 26 11.08	1.9456	-8 8 50.9	-13.515
AUGUST 29.					AUGUST 31.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	10 57 26.20	1.8549	+2 37 53.7	-13.663	0	12 28 7.92	1.9491	-8 22 20.9	-13.489
1	10 59 17.51	1.8554	2 24 13.4	13.680	1	12 30 4.97	1.9527	8 35 49.2	13.453
2	11 1 8.85	1.8559	2 10 32.1	13.697	2	12 32 2.24	1.9563	8 49 15.9	13.417
3	11 3 0.22	1.8565	1 56 49.8	13.713	3	12 33 59.73	1.9600	9 2 40.8	13.380
4	11 4 51.63	1.8572	1 43 6.6	13.728	4	12 35 57.44	1.9638	9 16 3.8	13.343
5	11 6 43.08	1.8578	1 29 22.5	13.743	5	12 37 55.38	1.9676	9 29 25.0	13.305
6	11 8 34.57	1.8580	1 15 37.5	13.756	6	12 39 53.55	1.9715	9 42 44.2	13.267
7	11 10 26.11	1.8594	1 1 51.8	13.768	7	12 41 51.96	1.9755	9 56 1.4	13.229
8	11 12 17.70	1.8603	0 48 5.3	13.780	8	12 43 50.61	1.9795	10 9 16.5	13.225
9	11 14 9.35	1.8613	0 34 18.2	13.791	9	12 45 49.50	1.9836	10 22 29.5	13.19
10	11 16 1.05	1.8623	0 20 30.4	13.801	10	12 47 48.64	1.9878	10 35 40.2	13.16
11	11 17 52.82	1.8633	+0 6 42.1	13.810	11	12 49 48.03	1.9919	10 48 48.7	13.12
12	11 19 44.65	1.8645	-0 7 6.8	13.818	12	12 51 47.67	1.9963	11 1 54.8	13.08
13	11 21 36.56	1.8658	0 20 56.1	13.825	13	12 53 47.58	2.0007	11 14 58.5	13.04
14	11 23 28.54	1.8670	0 34 45.8	13.832	14	12 55 47.75	2.0050	11 27 59.7	12.99
15	11 25 20.60	1.8683	0 48 35.9	13.838	15	12 57 48.18	2.0094	11 40 58.3	12.94
16	11 27 12.74	1.8697	1 2 26.3	13.842	16	12 59 48.88	2.0140	11 53 54.3	12.90
17	11 29 4.96	1.8712	1 16 16.9	13.845	17	13 1 49.86	2.0187	12 6 47.6	12.86
18	11 30 57.28	1.8728	1 30 7.7	13.848	18	13 3 51.12	2.0233	12 19 38.1	12.81
19	11 32 49.69	1.8743	1 43 58.7	13.850	19	13 5 52.66	2.0280	12 32 25.8	12.77
20	11 34 42.19	1.8759	1 57 49.7	13.851	20	13 7 54.48	2.0328	12 45 10.6	12.72
21	11 36 34.80	1.8777	2 11 40.8	13.851	21	13 9 56.59	2.0377	12 57 52.4	12.68
22	11 38 27.51	1.8794	2 25 31.8	13.850	22	13 11 59.00	2.0426	13 10 31.2	12.63
23	11 40 20.33	1.8813	2 39 22.8	13.848	23	13 14 1.70	2.0475	13 23 6.9	12.58
24	11 42 13.27	1.8833	-2 53 13.6	-13.845	24	13 16 4.70	2.0525	-13 35 39.3	-12.53

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
SEPTEMBER 1.					SEPTEMBER 3.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	13 16 4.70	2.0525	-13 35 39.3	-12.513	0	15 1 16.94	2.3433	-22 9 46.3	-8.388
1	13 18 8.00	2.0576	13 48 8.5	12.458	1	15 3 37.73	2.3498	22 18 6.0	8.268
2	13 20 11.61	2.0628	14 0 34.3	12.402	2	15 5 58.91	2.3563	22 26 18.5	8.148
3	13 22 15.53	2.0679	14 12 56.7	12.344	3	15 8 20.48	2.3627	22 34 23.7	8.025
4	13 24 19.76	2.0732	14 25 15.8	12.286	4	15 10 42.43	2.3691	22 42 21.5	7.901
5	13 26 24.31	2.0785	14 37 31.0	12.226	5	15 13 4.77	2.3756	22 50 11.8	7.776
6	13 28 29.18	2.0839	14 49 42.7	12.164	6	15 15 27.50	2.3820	22 57 54.6	7.649
7	13 30 34.38	2.0893	15 1 50.7	12.103	7	15 17 50.61	2.3884	23 5 29.7	7.521
8	13 32 39.90	2.0948	15 13 55.0	12.038	8	15 20 14.11	2.3948	23 12 57.1	7.392
9	13 34 45.75	2.1003	15 25 55.3	11.973	9	15 22 37.99	2.4011	23 20 16.7	7.261
10	13 36 51.93	2.1058	15 37 51.7	11.908	10	15 25 2.24	2.4073	23 27 28.4	7.128
11	13 38 58.45	2.1114	15 49 44.2	11.840	11	15 27 26.87	2.4136	23 34 32.1	6.995
12	13 41 5.30	2.1170	16 1 32.5	11.770	12	15 29 51.87	2.4198	23 41 27.8	6.861
13	13 43 12.49	2.1228	16 13 16.6	11.700	13	15 32 17.25	2.4260	23 48 15.4	6.724
14	13 45 20.03	2.1286	16 24 56.5	11.629	14	15 34 42.99	2.4321	23 54 54.7	6.586
15	13 47 27.92	2.1344	16 36 32.1	11.556	15	15 37 9.10	2.4382	24 1 25.7	6.448
16	13 49 36.16	2.1403	16 48 3.2	11.482	16	15 39 35.57	2.4443	24 7 48.4	6.308
17	13 51 44.75	2.1462	16 59 29.9	11.407	17	15 42 2.41	2.4503	24 14 2.6	6.166
18	13 53 53.70	2.1521	17 10 52.0	11.329	18	15 44 29.60	2.4561	24 20 8.3	6.023
19	13 56 3.00	2.1581	17 22 9.4	11.251	19	15 46 57.14	2.4620	24 26 5.4	5.879
20	13 58 12.67	2.1642	17 33 22.1	11.172	20	15 49 25.04	2.4678	24 31 53.8	5.733
21	14 0 22.70	2.1702	17 44 30.0	11.092	21	15 51 53.28	2.4736	24 37 33.4	5.587
22	14 2 33.09	2.1763	17 55 33.1	11.010	22	15 54 21.87	2.4793	24 43 4.2	5.439
23	14 4 43.85	2.1824	-18 6 31.2	-10.926	23	15 56 50.79	2.4848	-24 48 26.1	-5.291
SEPTEMBER 2.					SEPTEMBER 4.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	14 6 54.98	2.1886	-18 17 24.2	-10.841	0	15 59 20.05	2.4904	-24 53 39.1	-5.141
1	14 9 6.48	2.1948	18 28 12.1	10.755	1	16 1 49.64	2.4959	24 58 43.0	4.989
2	14 11 18.35	2.2010	18 38 54.8	10.667	2	16 4 19.56	2.5013	25 3 37.8	4.837
3	14 13 30.60	2.2073	18 49 32.1	10.578	3	16 6 49.80	2.5066	25 8 23.4	4.683
4	14 15 43.23	2.2137	19 0 4.1	10.488	4	16 9 20.35	2.5118	25 12 59.7	4.528
5	14 17 56.24	2.2199	19 10 30.6	10.396	5	16 11 51.22	2.5170	25 17 26.7	4.372
6	14 20 9.62	2.2263	19 20 51.6	10.303	6	16 14 22.39	2.5220	25 21 44.3	4.214
7	14 22 23.39	2.2327	19 31 7.0	10.209	7	16 16 53.86	2.5269	25 25 52.4	4.056
8	14 24 37.54	2.2391	19 41 16.7	10.113	8	16 19 25.62	2.5318	25 29 51.0	3.897
9	14 26 52.08	2.2456	19 51 20.6	10.016	9	16 21 57.68	2.5367	25 33 40.0	3.737
10	14 29 7.01	2.2520	20 1 18.6	9.917	10	16 24 30.02	2.5413	25 37 19.4	3.576
11	14 31 22.32	2.2584	20 11 10.6	9.817	11	16 27 2.63	2.5458	25 40 49.1	3.413
12	14 33 38.02	2.2649	20 20 56.6	9.716	12	16 29 35.52	2.5504	25 44 9.0	3.249
13	14 35 54.11	2.2714	20 30 36.5	9.613	13	16 32 8.68	2.5548	25 47 19.0	3.085
14	14 38 10.59	2.2779	20 40 10.1	9.508	14	16 34 42.09	2.5593	25 50 19.2	2.920
15	14 40 27.46	2.2844	20 49 37.5	9.403	15	16 37 15.75	2.5631	25 53 9.4	2.754
16	14 42 44.72	2.2909	20 58 58.5	9.296	16	16 39 49.66	2.5672	25 55 49.7	2.588
17	14 45 2.37	2.2975	21 8 13.0	9.187	17	16 42 23.81	2.5711	25 58 19.9	2.418
18	14 47 20.42	2.3041	21 17 20.9	9.077	18	16 44 58.19	2.5749	26 0 39.9	2.249
19	14 49 38.86	2.3106	21 26 22.2	8.966	19	16 47 32.80	2.5787	26 2 49.8	2.080
20	14 51 57.69	2.3171	21 35 16.8	8.853	20	16 50 7.63	2.5823	26 4 49.5	1.910
21	14 54 16.91	2.3237	21 44 4.6	8.739	21	16 52 42.67	2.5857	26 6 39.0	1.739
22	14 56 36.53	2.3303	21 52 45.5	8.623	22	16 55 17.91	2.5890	26 8 18.2	1.567
23	14 58 56.54	2.3368	22 1 19.4	8.507	23	16 57 53.35	2.5923	26 9 47.0	1.394
24	15 1 16.94	2.3433	-22 9 46.3	-8.388	24	17 0 28.98	2.5953	-26 11 5.5	-1.222

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
SEPTEMBER 5.					SEPTEMBER 7.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	17 0 28.98	2.5953	-26 11 5.5	-1.222	0	19 6 2.14	2.5848	-23 45 14.7	+7.234
1	17 3 4.79	2.5983	26 12 13.6	1.048	1	19 8 37.13	2.5815	23 37 55.7	7.398
2	17 5 40.77	2.6011	26 13 11.2	0.873	2	19 11 11.92	2.5782	23 30 26.9	7.562
3	17 8 16.92	2.6038	26 13 58.3	0.698	3	19 13 46.51	2.5748	23 22 48.3	7.725
4	17 10 53.23	2.6064	26 14 34.9	0.523	4	19 16 20.89	2.5713	23 14 59.9	7.888
5	17 13 29.69	2.6088	26 15 1.0	0.347	5	19 18 55.06	2.5676	23 7 1.8	8.048
6	17 16 6.29	2.6111	26 15 16.5	-0.170	6	19 21 29.00	2.5638	22 58 54.2	8.207
7	17 18 43.02	2.6133	26 15 21.4	+0.008	7	19 24 2.72	2.5601	22 50 37.0	8.366
8	17 21 19.88	2.6153	26 15 15.6	0.185	8	19 26 36.21	2.5563	22 42 10.3	8.523
9	17 23 56.85	2.6172	26 14 59.2	0.363	9	19 29 9.47	2.5523	22 33 34.2	8.679
10	17 26 33.94	2.6190	26 14 32.1	0.541	10	19 31 42.48	2.5482	22 24 48.8	8.834
11	17 29 11.13	2.6206	26 13 54.3	0.720	11	19 34 15.25	2.5442	22 15 54.1	8.988
12	17 31 48.41	2.6221	26 13 5.7	0.899	12	19 36 47.78	2.5400	22 6 50.2	9.141
13	17 34 25.78	2.6234	26 12 6.4	1.078	13	19 39 20.05	2.5358	21 57 37.2	9.292
14	17 37 3.22	2.6245	26 10 56.4	1.257	14	19 41 52.07	2.5314	21 48 15.2	9.441
15	17 39 40.72	2.6255	26 9 35.6	1.437	15	19 44 23.82	2.5270	21 38 44.3	9.589
16	17 42 18.28	2.6265	26 8 4.0	1.617	16	19 46 55.31	2.5227	21 29 4.5	9.736
17	17 44 55.90	2.6273	26 6 21.6	1.796	17	19 49 26.54	2.5182	21 19 16.0	9.881
18	17 47 33.56	2.6279	26 4 28.5	1.976	18	19 51 57.49	2.5136	21 9 18.8	10.026
19	17 50 11.25	2.6284	26 2 24.5	2.156	19	19 54 28.17	2.5091	20 59 12.9	10.169
20	17 52 48.97	2.6288	26 0 9.8	2.335	20	19 56 58.58	2.5045	20 48 58.5	10.310
21	17 55 26.70	2.6289	25 57 44.3	2.515	21	19 59 28.71	2.4998	20 38 35.7	10.450
22	17 58 4.44	2.6290	25 55 8.0	2.695	22	20 1 58.56	2.4952	20 28 4.5	10.588
23	18 0 42.18	2.6289	-25 52 20.9	+2.875	23	20 4 28.13	2.4904	-20 17 25.1	+10.725
SEPTEMBER 6.					SEPTEMBER 8.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	18 3 19.91	2.6288	-25 49 23.0	+3.055	0	20 6 57.41	2.4856	-20 6 37.5	+10.860
1	18 5 57.63	2.6284	25 46 14.3	3.234	1	20 9 26.40	2.4808	19 55 41.9	10.993
2	18 8 35.32	2.6278	25 42 54.9	3.413	2	20 11 55.11	2.4760	19 44 38.3	11.126
3	18 11 12.97	2.6272	25 39 24.7	3.593	3	20 14 23.52	2.4711	19 33 26.8	11.257
4	18 13 50.58	2.6264	25 35 43.8	3.771	4	20 16 51.64	2.4662	19 22 7.5	11.386
5	18 16 28.14	2.6256	25 31 52.2	3.949	5	20 19 19.46	2.4613	19 10 40.5	11.513
6	18 19 5.65	2.6246	25 27 49.9	4.128	6	20 21 46.99	2.4563	18 59 6.0	11.638
7	18 21 43.09	2.6234	25 23 36.9	4.305	7	20 24 14.22	2.4513	18 47 23.9	11.763
8	18 24 20.46	2.6221	25 19 13.3	4.482	8	20 26 41.15	2.4463	18 35 34.5	11.884
9	18 26 57.74	2.6207	25 14 39.1	4.658	9	20 29 7.78	2.4414	18 23 37.8	12.006
10	18 29 34.94	2.6192	25 9 54.3	4.835	10	20 31 34.12	2.4365	18 11 33.8	12.125
11	18 32 12.04	2.6174	25 4 58.9	5.012	11	20 34 0.16	2.4314	17 59 22.8	12.242
12	18 34 49.03	2.6156	24 59 52.9	5.188	12	20 36 25.89	2.4263	17 47 4.8	12.358
13	18 37 25.91	2.6137	24 54 36.4	5.362	13	20 38 51.32	2.4214	17 34 39.9	12.472
14	18 40 2.67	2.6116	24 49 9.5	5.535	14	20 41 16.46	2.4164	17 22 8.2	12.583
15	18 42 39.30	2.6094	24 43 32.2	5.708	15	20 43 41.29	2.4113	17 9 29.9	12.694
16	18 45 15.80	2.6072	24 37 44.5	5.882	16	20 46 5.82	2.4063	16 56 44.9	12.803
17	18 47 52.16	2.6048	24 31 46.4	6.053	17	20 48 30.05	2.4013	16 43 53.5	12.909
18	18 50 28.37	2.6022	24 25 38.1	6.224	18	20 50 53.98	2.3964	16 30 55.8	13.014
19	18 53 4.42	2.5995	24 19 19.5	6.395	19	20 53 17.62	2.3914	16 17 51.8	13.118
20	18 55 40.31	2.5968	24 12 50.7	6.564	20	20 55 40.95	2.3864	16 4 41.6	13.220
21	18 58 16.04	2.5940	24 6 11.8	6.733	21	20 58 3.99	2.3815	15 51 25.4	13.319
22	19 0 51.59	2.5910	23 59 22.8	6.900	22	21 0 26.73	2.3765	15 38 3.3	13.418
23	19 3 26.96	2.5879	23 52 23.8	7.068	23	21 2 49.17	2.3716	15 24 35.3	13.514
24	19 6 2.14	2.5848	-23 45 14.7	+7.234	24	21 5 11.32	2.3668	-15 11 1.6	+13.608

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
SEPTEMBER 9.					SEPTEMBER 11.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	21 5 11.32	2.3668	-15 11 1.6	+13.608	0	22 53 53.36	2.1827	-3 4 1.8	+15.982
1	21 7 33.18	2.3618	14 57 23.3	13.700	1	22 56 4.25	2.1803	2 48 2.7	15.988
2	21 9 54.74	2.3569	14 43 37.6	13.791	2	22 58 15.00	2.1780	2 32 3.3	15.992
3	21 12 16.01	2.3521	14 29 47.4	13.881	3	23 0 25.61	2.1757	2 16 3.7	15.994
4	21 14 36.99	2.3473	14 15 51.9	13.968	4	23 2 36.08	2.1734	2 0 4.0	15.995
5	21 16 57.69	2.3426	14 1 51.3	14.053	5	23 4 46.42	2.1713	1 44 4.3	15.993
6	21 19 18.10	2.3378	13 47 45.6	14.136	6	23 6 56.64	2.1693	1 28 4.8	15.990
7	21 21 38.23	2.3332	13 33 35.0	14.218	7	23 9 6.74	2.1673	1 12 5.5	15.986
8	21 23 58.08	2.3284	13 19 19.5	14.298	8	23 11 16.72	2.1653	0 56 6.5	15.980
9	21 26 17.64	2.3238	13 4 59.3	14.375	9	23 13 26.58	2.1634	0 40 7.9	15.972
10	21 28 36.93	2.3193	12 50 34.5	14.451	10	23 15 36.33	2.1617	0 24 9.9	15.963
11	21 30 55.95	2.3147	12 36 5.2	14.526	11	23 17 45.98	2.1600	-0 8 12.4	15.952
12	21 33 14.69	2.3101	12 21 31.4	14.598	12	23 19 55.53	2.1583	+0 7 44.3	15.938
13	21 35 33.16	2.3057	12 6 53.4	14.668	13	23 22 4.98	2.1567	0 23 40.2	15.924
14	21 37 51.37	2.3013	11 52 11.2	14.738	14	23 24 14.33	2.1551	0 39 35.2	15.908
15	21 40 9.31	2.2968	11 37 24.9	14.804	15	23 26 23.59	2.1537	0 55 29.2	15.891
16	21 42 26.99	2.2925	11 22 34.7	14.868	16	23 28 32.77	2.1523	1 11 22.1	15.873
17	21 44 44.41	2.2882	11 7 40.7	14.932	17	23 30 41.87	2.1509	1 27 13.9	15.852
18	21 47 1.57	2.2839	10 52 42.9	14.993	18	23 32 50.88	2.1496	1 43 4.3	15.828
19	21 49 18.48	2.2797	10 37 41.5	15.053	19	23 34 59.82	2.1484	1 58 53.3	15.805
20	21 51 35.13	2.2755	10 22 36.6	15.110	20	23 37 8.69	2.1473	2 14 40.9	15.780
21	21 53 51.54	2.2715	10 7 28.3	15.166	21	23 39 17.49	2.1462	2 30 26.9	15.753
22	21 56 7.71	2.2674	9 52 16.7	15.219	22	23 41 26.23	2.1452	2 46 11.3	15.725
23	21 58 23.63	2.2634	- 9 37 2.0	+15.271	23	23 43 34.91	2.1443	+3 1 53.9	+15.695
SEPTEMBER 10.					SEPTEMBER 12.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	22 0 39.32	2.2595	- 9 21 44.2	+15.321	0	23 45 43.54	2.1433	+3 17 34.7	+15.664
1	22 2 54.77	2.2556	9 6 23.5	15.360	1	23 47 52.11	2.1425	3 33 13.6	15.631
2	22 5 9.99	2.2518	8 50 59.9	15.416	2	23 50 0.64	2.1418	3 48 50.4	15.596
3	22 7 24.98	2.2479	8 35 33.6	15.461	3	23 52 9.12	2.1410	4 4 25.1	15.560
4	22 9 39.74	2.2442	8 20 4.6	15.504	4	23 54 17.56	2.1404	4 19 57.6	15.523
5	22 11 54.28	2.2406	8 4 33.1	15.544	5	23 56 25.97	2.1398	4 35 27.8	15.484
6	22 14 8.61	2.2370	7 48 59.3	15.583	6	23 58 34.34	2.1393	4 50 55.7	15.444
7	22 16 22.72	2.2334	7 33 23.1	15.621	7	0 0 42.68	2.1388	5 6 21.1	15.403
8	22 18 36.62	2.2299	7 17 44.8	15.656	8	0 2 50.99	2.1383	5 21 44.0	15.359
9	22 20 50.31	2.2265	7 2 4.4	15.690	9	0 4 59.28	2.1381	5 37 4.2	15.314
10	22 23 3.80	2.2232	6 46 22.0	15.723	10	0 7 7.56	2.1378	5 52 21.7	15.268
11	22 25 17.09	2.2198	6 30 37.7	15.753	11	0 9 15.82	2.1375	6 7 36.4	15.222
12	22 27 30.18	2.2166	6 14 51.7	15.780	12	0 11 24.06	2.1373	6 22 48.3	15.173
13	22 29 43.08	2.2134	5 59 4.1	15.807	13	0 13 32.30	2.1373	6 37 57.2	15.123
14	22 31 55.79	2.2103	5 43 14.9	15.832	14	0 15 40.53	2.1372	6 53 3.0	15.071
15	22 34 8.32	2.2073	5 27 24.3	15.854	15	0 17 48.76	2.1372	7 8 5.7	15.018
16	22 36 20.66	2.2043	5 11 32.4	15.876	16	0 19 56.99	2.1373	7 23 5.2	14.964
17	22 38 32.83	2.2013	4 55 39.2	15.896	17	0 22 5.23	2.1374	7 38 1.4	14.909
18	22 40 44.82	2.1985	4 39 44.9	15.913	18	0 24 13.48	2.1376	7 52 54.3	14.853
19	22 42 56.65	2.1958	4 23 49.6	15.929	19	0 26 21.74	2.1378	8 7 43.7	14.794
20	22 45 8.31	2.1929	4 7 53.4	15.943	20	0 28 30.01	2.1380	8 22 29.6	14.734
21	22 47 19.80	2.1903	3 51 56.5	15.955	21	0 30 38.30	2.1383	8 37 11.8	14.673
22	22 49 31.14	2.1878	3 35 58.8	15.967	22	0 32 46.61	2.1387	8 51 50.4	14.613
23	22 51 42.33	2.1852	3 20 0.5	15.975	23	0 34 54.94	2.1391	9 6 25.3	14.549
24	22 53 53.36	2.1827	- 3 4 1.8	+15.982	24	0 37 3.30	2.1396	+9 20 56.3	+14.484

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
SEPTEMBER 13.					SEPTEMBER 15.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	0 37 3.30	2.1396	+ 9 20 56.3	+14.484	0	2 21 1.73	2.2025	+19 20 30.8	+10.118
1	0 39 11.69	2.1402	9 35 23.4	14.418	1	2 23 13.93	2.2043	19 30 34.5	10.005
2	0 41 20.12	2.1408	9 49 46.5	14.352	2	2 25 26.24	2.2060	19 40 31.4	9.892
3	0 43 28.58	2.1413	10 4 5.6	14.283	3	2 27 38.65	2.2077	19 50 21.5	9.778
4	0 45 37.08	2.1420	10 18 20.5	14.213	4	2 29 51.16	2.2093	20 0 4.7	9.663
5	0 47 45.62	2.1427	10 32 31.2	14.143	5	2 32 3.77	2.2110	20 9 41.0	9.547
6	0 49 54.20	2.1434	10 46 37.7	14.072	6	2 34 16.48	2.2128	20 19 10.3	9.431
7	0 52 2.83	2.1443	11 0 39.8	13.998	7	2 36 29.30	2.2144	20 28 32.7	9.314
8	0 54 11.51	2.1451	11 14 37.5	13.924	8	2 38 42.21	2.2160	20 37 48.0	9.196
9	0 56 20.24	2.1459	11 28 30.7	13.849	9	2 40 55.22	2.2177	20 46 56.2	9.078
10	0 58 29.02	2.1468	11 42 19.4	13.773	10	2 43 8.33	2.2193	20 55 57.3	8.959
11	1 0 37.86	2.1478	11 56 3.4	13.694	11	2 45 21.54	2.2210	21 4 51.3	8.840
12	1 2 46.76	2.1488	12 9 42.7	13.616	12	2 47 34.85	2.2226	21 13 38.1	8.720
13	1 4 55.72	2.1499	12 23 17.3	13.536	13	2 49 48.25	2.2241	21 22 17.7	8.599
14	1 7 4.75	2.1510	12 36 47.0	13.454	14	2 52 1.74	2.2257	21 30 50.0	8.478
15	1 9 13.84	2.1521	12 50 11.8	13.373	15	2 54 15.33	2.2273	21 39 15.1	8.357
16	1 11 23.00	2.1533	13 3 31.7	13.289	16	2 56 29.01	2.2288	21 47 32.8	8.234
17	1 13 32.23	2.1544	13 16 46.5	13.205	17	2 58 42.78	2.2303	21 55 43.2	8.112
18	1 15 41.53	2.1557	13 29 56.3	13.120	18	3 0 56.65	2.2318	22 3 46.2	7.988
19	1 17 50.91	2.1569	13 43 0.9	13.033	19	3 3 10.60	2.2332	22 11 41.8	7.864
20	1 20 0.36	2.1582	13 56 0.3	12.946	20	3 5 24.63	2.2346	22 19 29.9	7.740
21	1 22 9.89	2.1595	14 8 54.4	12.858	21	3 7 38.75	2.2360	22 27 10.6	7.616
22	1 24 19.50	2.1608	14 21 43.2	12.768	22	3 9 52.95	2.2374	22 34 43.8	7.490
23	1 26 29.19	2.1622	+14 34 26.6	+12.678	23	3 12 7.24	2.2388	+22 42 9.4	+7.364
SEPTEMBER 14.					SEPTEMBER 16.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	1 28 38.96	2.1636	+14 47 4.5	+12.586	0	3 14 21.61	2.2402	+22 49 27.5	+7.239
1	1 30 48.82	2.1651	14 59 36.9	12.493	1	3 16 36.06	2.2414	22 56 38.1	7.113
2	1 32 58.77	2.1665	15 12 3.7	12.400	2	3 18 50.58	2.2426	23 3 41.0	6.985
3	1 35 8.80	2.1679	15 24 24.9	12.306	3	3 21 5.17	2.2438	23 10 36.3	6.858
4	1 37 18.92	2.1695	15 36 40.4	12.210	4	3 23 19.83	2.2450	23 17 23.9	6.730
5	1 39 29.14	2.1710	15 48 50.1	12.113	5	3 25 34.57	2.2462	23 24 3.9	6.603
6	1 41 39.44	2.1725	16 0 54.0	12.017	6	3 27 49.37	2.2473	23 30 36.2	6.474
7	1 43 49.84	2.1741	16 12 52.1	11.918	7	3 30 4.24	2.2483	23 37 0.8	6.346
8	1 46 0.33	2.1757	16 24 44.2	11.819	8	3 32 19.17	2.2493	23 43 17.7	6.217
9	1 48 10.92	2.1773	16 36 30.4	11.719	9	3 34 34.16	2.2503	23 49 26.8	6.087
10	1 50 21.61	2.1789	16 48 10.5	11.618	10	3 36 49.21	2.2513	23 55 28.1	5.957
11	1 52 32.39	2.1805	16 59 44.5	11.516	11	3 39 4.32	2.2523	24 1 21.6	5.827
12	1 54 43.27	2.1822	17 11 12.4	11.413	12	3 41 19.48	2.2531	24 7 7.3	5.697
13	1 56 54.25	2.1838	17 22 34.1	11.310	13	3 43 34.69	2.2539	24 12 45.2	5.567
14	1 59 5.33	2.1855	17 33 49.6	11.206	14	3 45 49.95	2.2547	24 18 15.3	5.436
15	2 1 16.51	2.1873	17 44 58.8	11.101	15	3 48 5.25	2.2554	24 23 37.5	5.304
16	2 3 27.80	2.1889	17 56 1.7	10.995	16	3 50 20.60	2.2562	24 28 51.8	5.173
17	2 5 39.18	2.1906	18 6 58.2	10.888	17	3 52 35.99	2.2568	24 33 58.2	5.042
18	2 7 50.67	2.1923	18 17 48.2	10.780	18	3 54 51.41	2.2573	24 38 56.8	4.910
19	2 10 2.26	2.1940	18 28 31.8	10.672	19	3 57 6.86	2.2578	24 43 47.4	4.778
20	2 12 13.95	2.1957	18 39 8.8	10.563	20	3 59 22.35	2.2583	24 48 30.1	4.646
21	2 14 25.74	2.1973	18 49 39.3	10.453	21	4 1 37.86	2.2587	24 53 4.9	4.514
22	2 16 37.63	2.1991	19 0 3.1	10.342	22	4 3 53.39	2.2591	24 57 31.8	4.382
23	2 18 49.63	2.2008	19 10 20.3	10.231	23	4 6 8.95	2.2595	25 1 50.7	4.248
24	2 21 1.73	2.2025	+19 20 30.8	+10.118	24	4 8 24.53	2.2598	+25 6 1.6	+4.116

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
SEPTEMBER 17.					SEPTEMBER 19.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	4 8 24.53	2.2598	+25 6 1.6	+4.116	0	5 56 7.30	2.2006	+25 51 31.7	-2.150
1	4 10 40.12	2.2600	25 10 4.6	3.983	1	5 58 19.62	2.2042	25 49 19.0	2.274
2	4 12 55.73	2.2602	25 13 59.6	3.851	2	6 0 31.80	2.2018	25 46 58.8	2.398
3	4 15 11.34	2.2603	25 17 46.7	3.718	3	6 2 43.83	2.1993	25 44 31.3	2.520
4	4 17 26.96	2.2603	25 21 25.8	3.585	4	6 4 55.71	2.1967	25 41 56.4	2.643
5	4 19 42.58	2.2603	25 24 56.9	3.452	5	6 7 7.43	2.1940	25 39 14.2	2.764
6	4 21 58.20	2.2603	25 28 20.0	3.318	6	6 9 18.99	2.1914	25 36 24.7	2.886
7	4 24 13.81	2.2602	25 31 35.1	3.185	7	6 11 30.40	2.1888	25 33 27.9	3.007
8	4 26 29.42	2.2600	25 34 42.2	3.052	8	6 13 41.64	2.1860	25 30 23.9	3.128
9	4 28 45.01	2.2598	25 37 41.3	2.919	9	6 15 52.72	2.1833	25 27 12.6	3.248
10	4 31 0.59	2.2595	25 40 32.5	2.787	10	6 18 3.63	2.1804	25 23 54.2	3.367
11	4 33 16.15	2.2592	25 43 15.7	2.653	11	6 20 14.37	2.1776	25 20 28.6	3.486
12	4 35 31.69	2.2588	25 45 50.9	2.520	12	6 22 24.94	2.1748	25 16 55.9	3.604
13	4 37 47.21	2.2583	25 48 18.1	2.387	13	6 24 35.34	2.1718	25 13 16.1	3.723
14	4 40 2.69	2.2578	25 50 37.3	2.254	14	6 26 45.56	2.1689	25 9 29.2	3.840
15	4 42 18.14	2.2573	25 52 48.6	2.122	15	6 28 55.61	2.1660	25 5 35.3	3.957
16	4 44 33.56	2.2567	25 54 51.9	1.988	16	6 31 5.48	2.1630	25 1 34.4	4.073
17	4 46 48.94	2.2559	25 56 47.2	1.855	17	6 33 15.17	2.1599	24 57 26.5	4.189
18	4 49 4.27	2.2552	25 58 34.5	1.723	18	6 35 24.67	2.1568	24 53 11.7	4.304
19	4 51 19.56	2.2544	26 0 13.9	1.591	19	6 37 33.99	2.1538	24 48 50.0	4.419
20	4 53 34.80	2.2536	26 1 45.4	1.458	20	6 39 43.12	2.1507	24 44 21.4	4.533
21	4 55 49.99	2.2527	26 3 8.9	1.326	21	6 41 52.07	2.1476	24 39 46.0	4.648
22	4 58 5.12	2.2517	26 4 24.5	1.194	22	6 44 0.83	2.1444	24 35 3.7	4.761
23	5 0 20.19	2.2506	+26 5 32.2	+1.063	23	6 46 9.40	2.1412	+24 30 14.7	-4.873
SEPTEMBER 18.					SEPTEMBER 20.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	5 2 35.19	2.2495	+26 6 32.0	+0.931	0	6 48 17.77	2.1379	+24 25 19.0	-4.984
1	5 4 50.13	2.2483	26 7 23.9	0.799	1	6 50 25.95	2.1348	24 20 16.6	5.096
2	5 7 4.99	2.2471	26 8 7.9	0.668	2	6 52 33.94	2.1315	24 15 7.5	5.207
3	5 9 19.78	2.2459	26 8 44.0	0.536	3	6 54 41.73	2.1283	24 9 51.8	5.317
4	5 11 34.50	2.2446	26 9 12.2	0.405	4	6 56 49.33	2.1249	24 4 29.5	5.426
5	5 13 49.13	2.2432	26 9 32.6	0.275	5	6 58 56.72	2.1216	23 59 0.7	5.535
6	5 16 3.68	2.2418	26 9 45.2	0.144	6	7 1 3.92	2.1183	23 53 25.3	5.643
7	5 18 18.14	2.2403	26 9 49.9	+0.013	7	7 3 10.92	2.1150	23 47 43.5	5.751
8	5 20 32.51	2.2387	26 9 46.8	-0.117	8	7 5 17.72	2.1117	23 41 55.2	5.858
9	5 22 46.78	2.2371	26 9 35.9	0.246	9	7 7 24.32	2.1083	23 36 0.5	5.964
10	5 25 0.96	2.2354	26 9 17.3	0.375	10	7 9 30.72	2.1049	23 29 59.5	6.070
11	5 27 15.03	2.2337	26 8 50.9	0.504	11	7 11 36.91	2.1015	23 23 52.1	6.176
12	5 29 29.00	2.2319	26 8 16.8	0.633	12	7 13 42.90	2.0981	23 17 38.4	6.280
13	5 31 42.86	2.2301	26 7 35.0	0.761	13	7 15 48.68	2.0947	23 11 18.5	6.383
14	5 33 56.61	2.2282	26 6 45.5	0.889	14	7 17 54.26	2.0913	23 4 52.4	6.487
15	5 36 10.24	2.2263	26 5 48.3	1.018	15	7 19 59.64	2.0879	22 58 20.1	6.590
16	5 38 23.76	2.2243	26 4 43.4	1.146	16	7 22 4.81	2.0845	22 51 41.6	6.693
17	5 40 37.16	2.2223	26 3 30.9	1.272	17	7 24 9.78	2.0811	22 44 57.0	6.793
18	5 42 50.43	2.2202	26 2 10.8	1.398	18	7 26 14.54	2.0777	22 38 6.4	6.893
19	5 45 3.58	2.2181	26 0 43.1	1.524	19	7 28 19.10	2.0743	22 31 9.8	6.993
20	5 47 16.60	2.2158	25 59 7.9	1.650	20	7 30 23.45	2.0708	22 24 7.2	7.093
21	5 49 29.48	2.2135	25 57 25.1	1.776	21	7 32 27.59	2.0673	22 16 58.6	7.193
22	5 51 42.22	2.2113	25 55 34.8	1.901	22	7 34 31.53	2.0639	22 9 44.1	7.291
23	5 53 54.83	2.2090	25 53 37.0	2.026	23	7 36 35.26	2.0605	22 2 23.7	7.388
24	5 56 7.30	2.2066	+25 51 31.7	-2.150	24	7 38 38.79	2.0571	+21 54 57.6	-7.483

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
SEPTEMBER 21.					SEPTEMBER 23.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	7 38 38.79	2.0571	+21 54 57.6	-7.483	0	9 13 45.32	1.9159	+14 17 9.3	-11.326
1	7 40 42.11	2.0537	21 47 25.7	7.580	1	9 15 40.21	1.9138	14 5 47.9	11.388
2	7 42 45.23	2.0503	21 39 48.0	7.676	2	9 17 34.97	1.9116	13 54 22.7	11.451
3	7 44 48.15	2.0469	21 32 4.6	7.771	3	9 19 29.60	1.9095	13 42 53.8	11.513
4	7 46 50.86	2.0435	21 24 15.5	7.865	4	9 21 24.11	1.9075	13 31 21.2	11.573
5	7 48 53.37	2.0402	21 16 20.8	7.958	5	9 23 18.50	1.9056	13 19 45.0	11.633
6	7 50 55.68	2.0368	21 8 20.5	8.051	6	9 25 12.78	1.9037	13 8 5.2	11.693
7	7 52 57.79	2.0334	21 0 14.7	8.143	7	9 27 6.94	1.9018	12 56 21.9	11.751
8	7 54 59.69	2.0300	20 52 3.4	8.234	8	9 29 0.99	1.8999	12 44 35.1	11.809
9	7 57 1.39	2.0268	20 43 46.6	8.325	9	9 30 54.93	1.8981	12 32 44.8	11.867
10	7 59 2.90	2.0234	20 35 24.4	8.415	10	9 32 48.76	1.8963	12 20 51.1	11.923
11	8 1 4.20	2.0201	20 26 56.8	8.504	11	9 34 42.49	1.8947	12 8 54.1	11.978
12	8 3 5.31	2.0168	20 18 23.9	8.593	12	9 36 36.12	1.8930	11 56 53.7	12.033
13	8 5 6.22	2.0135	20 9 45.7	8.681	13	9 38 29.65	1.8914	11 44 50.1	12.088
14	8 7 6.93	2.0103	20 1 2.2	8.768	14	9 40 23.09	1.8899	11 32 43.2	12.142
15	8 9 7.45	2.0071	19 52 13.5	8.855	15	9 42 16.44	1.8884	11 20 33.1	12.195
16	8 11 7.78	2.0038	19 43 19.6	8.942	16	9 44 9.70	1.8870	11 8 19.8	12.247
17	8 13 7.91	2.0006	19 34 20.5	9.027	17	9 46 2.88	1.8856	10 56 3.5	12.298
18	8 15 7.85	1.9974	19 25 16.4	9.111	18	9 47 55.97	1.8842	10 43 44.1	12.348
19	8 17 7.60	1.9943	19 16 7.2	9.195	19	9 49 48.98	1.8828	10 31 21.7	12.398
20	8 19 7.17	1.9913	19 6 53.0	9.278	20	9 51 41.91	1.8817	10 18 56.3	12.448
21	8 21 6.55	1.9881	18 57 33.9	9.360	21	9 53 34.78	1.8805	10 6 28.0	12.496
22	8 23 5.74	1.9850	18 48 9.8	9.443	22	9 55 27.57	1.8793	9 53 56.8	12.543
23	8 25 4.75	1.9819	+18 38 40.8	-9.523	23	9 57 20.29	1.8782	+9 41 22.8	-12.590
SEPTEMBER 22.					SEPTEMBER 24.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	8 27 3.57	1.9788	+18 29 7.0	-9.603	0	9 59 12.95	1.8772	+9 28 46.0	-12.636
1	8 29 2.21	1.9759	18 19 28.4	9.683	1	10 1 5.55	1.8762	9 16 6.5	12.682
2	8 31 0.68	1.9729	18 9 45.0	9.763	2	10 2 58.09	1.8753	9 3 24.2	12.727
3	8 32 58.96	1.9699	17 59 56.9	9.841	3	10 4 50.58	1.8744	8 50 39.3	12.771
4	8 34 57.07	1.9671	17 50 4.1	9.919	4	10 6 43.02	1.8736	8 37 51.7	12.814
5	8 36 55.01	1.9642	17 40 6.6	9.996	5	10 8 35.41	1.8728	8 25 1.6	12.856
6	8 38 52.77	1.9613	17 30 4.6	10.072	6	10 10 27.76	1.8721	8 12 9.0	12.898
7	8 40 50.36	1.9585	17 19 58.0	10.148	7	10 12 20.06	1.8714	7 59 13.9	12.938
8	8 42 47.79	1.9558	17 9 46.9	10.223	8	10 14 12.33	1.8709	7 46 16.4	12.978
9	8 44 45.05	1.9529	16 59 31.3	10.297	9	10 16 4.57	1.8703	7 33 16.5	13.018
10	8 46 42.14	1.9502	16 49 11.3	10.370	10	10 17 56.77	1.8698	7 20 14.2	13.057
11	8 48 39.07	1.9474	16 38 46.9	10.443	11	10 19 48.94	1.8693	7 7 9.7	13.094
12	8 50 35.83	1.9448	16 28 18.1	10.516	12	10 21 41.09	1.8690	6 54 2.9	13.132
13	8 52 32.44	1.9422	16 17 45.0	10.587	13	10 23 33.22	1.8687	6 40 53.9	13.168
14	8 54 28.89	1.9396	16 7 7.7	10.657	14	10 25 25.33	1.8684	6 27 42.8	13.203
15	8 56 25.19	1.9371	15 56 26.2	10.727	15	10 27 17.43	1.8683	6 14 29.6	13.238
16	8 58 21.34	1.9346	15 45 40.5	10.797	16	10 29 9.52	1.8681	6 1 14.3	13.271
17	9 0 17.34	1.9321	15 34 50.6	10.865	17	10 31 1.60	1.8680	5 47 57.1	13.303
18	9 2 13.19	1.9296	15 23 56.7	10.933	18	10 32 53.68	1.8679	5 34 37.9	13.336
19	9 4 8.89	1.9272	15 12 58.7	11.000	19	10 34 45.75	1.8679	5 21 16.8	13.368
20	9 6 4.45	1.9248	15 1 56.7	11.067	20	10 36 37.83	1.8681	5 7 53.8	13.398
21	9 7 59.87	1.9225	14 50 50.7	11.133	21	10 38 29.92	1.8683	4 54 29.0	13.428
22	9 9 55.15	1.9203	14 39 40.8	11.198	22	10 40 22.02	1.8685	4 41 2.4	13.458
23	9 11 50.30	1.9181	14 28 27.0	11.263	23	10 42 14.14	1.8688	4 27 34.1	13.485
24	9 13 45.32	1.9159	+14 17 9.3	-11.326	24	10 44 6.27	1.8690	+4 14 4.2	-13.512

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
SEPTEMBER 25.					SEPTEMBER 27.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	10 44 6.27	1.8690	+4 14 4.2	-13.512	0	12 15 22.54	1.9583	-6 48 59.5	-13.747
1	10 45 58.42	1.8694	4 0 32.7	13.538	1	12 17 20.14	1.9618	7 2 43.7	13.726
2	10 47 50.60	1.8698	3 46 59.6	13.564	2	12 19 17.95	1.9653	7 16 26.6	13.704
3	10 49 42.80	1.8703	3 33 25.0	13.589	3	12 21 15.97	1.9688	7 30 8.2	13.683
4	10 51 35.04	1.8709	3 19 48.9	13.613	4	12 23 14.21	1.9724	7 43 48.5	13.660
5	10 53 27.31	1.8716	3 6 11.5	13.635	5	12 25 12.66	1.9761	7 57 27.4	13.635
6	10 55 19.63	1.8723	2 52 32.7	13.658	6	12 27 11.34	1.9798	8 11 4.7	13.609
7	10 57 11.99	1.8730	2 38 52.5	13.680	7	12 29 10.24	1.9836	8 24 40.5	13.583
8	10 59 4.39	1.8738	2 25 11.1	13.700	8	12 31 9.37	1.9875	8 38 14.6	13.554
9	11 0 56.84	1.8747	2 11 28.5	13.719	9	12 33 8.74	1.9914	8 51 47.0	13.525
10	11 2 49.35	1.8757	1 57 44.8	13.738	10	12 35 8.34	1.9953	9 5 17.6	13.495
11	11 4 41.92	1.8767	1 44 0.0	13.756	11	12 37 8.18	1.9994	9 18 46.4	13.464
12	11 6 34.55	1.8778	1 30 14.1	13.773	12	12 39 8.27	2.0035	9 32 13.3	13.431
13	11 8 27.25	1.8788	1 16 27.2	13.789	13	12 41 8.60	2.0077	9 45 38.1	13.397
14	11 10 20.01	1.8800	1 2 39.4	13.804	14	12 43 9.19	2.0119	9 59 0.9	13.362
15	11 12 12.85	1.8813	0 48 50.7	13.818	15	12 45 10.03	2.0162	10 12 21.5	13.325
16	11 14 5.77	1.8826	0 35 1.2	13.832	16	12 47 11.13	2.0206	10 25 39.9	13.288
17	11 15 58.76	1.8839	0 21 10.9	13.844	17	12 49 12.50	2.0250	10 38 56.0	13.249
18	11 17 51.84	1.8854	+0 7 19.9	13.857	18	12 51 14.13	2.0293	10 52 9.8	13.209
19	11 19 45.01	1.8869	-0 6 31.9	13.868	19	12 53 16.02	2.0338	11 5 21.1	13.168
20	11 21 38.27	1.8885	0 20 24.2	13.876	20	12 55 18.19	2.0384	11 18 29.9	13.125
21	11 23 31.63	1.8902	0 34 17.0	13.885	21	12 57 20.63	2.0431	11 31 36.1	13.082
22	11 25 25.09	1.8918	0 48 10.4	13.893	22	12 59 23.36	2.0478	11 44 39.7	13.037
23	11 27 18.65	1.8935	-1 2 4.2	-13.899	23	13 1 26.37	2.0525	-11 57 40.5	-12.990
SEPTEMBER 26.					SEPTEMBER 28.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	11 29 12.31	1.8953	-1 15 58.3	-13.905	0	13 3 29.66	2.0573	-12 10 38.5	-12.943
1	11 31 6.09	1.8973	1 29 52.8	13.911	1	13 5 33.24	2.0622	12 23 33.6	12.893
2	11 32 59.98	1.8992	1 43 47.6	13.915	2	13 7 37.12	2.0671	12 36 25.7	12.843
3	11 34 53.99	1.9013	1 57 42.6	13.918	3	13 9 41.29	2.0720	12 49 14.7	12.791
4	11 36 48.13	1.9033	2 11 37.7	13.919	4	13 11 45.76	2.0770	13 2 0.6	12.738
5	11 38 42.39	1.9054	2 25 32.9	13.921	5	13 13 50.53	2.0820	13 14 43.3	12.684
6	11 40 36.78	1.9077	2 39 28.2	13.922	6	13 15 55.60	2.0872	13 27 22.7	12.629
7	11 42 31.31	1.9099	2 53 23.5	13.921	7	13 18 0.99	2.0923	13 39 58.8	12.573
8	11 44 25.97	1.9123	3 7 18.7	13.918	8	13 20 6.68	2.0975	13 52 31.4	12.514
9	11 46 20.78	1.9147	3 21 13.7	13.915	9	13 22 12.69	2.1028	14 5 0.5	12.455
10	11 48 15.73	1.9171	3 35 8.5	13.912	10	13 24 19.01	2.1080	14 17 26.0	12.394
11	11 50 10.83	1.9197	3 49 3.1	13.907	11	13 26 25.65	2.1134	14 29 47.8	12.332
12	11 52 6.09	1.9223	4 2 57.3	13.900	12	13 28 32.62	2.1188	14 42 5.8	12.268
13	11 54 1.51	1.9249	4 16 51.1	13.893	13	13 30 39.91	2.1242	14 54 20.0	12.203
14	11 55 57.08	1.9276	4 30 44.5	13.886	14	13 32 47.52	2.1297	15 6 30.2	12.137
15	11 57 52.82	1.9304	4 44 37.4	13.877	15	13 34 55.47	2.1353	15 18 36.4	12.069
16	11 59 48.73	1.9333	4 58 29.7	13.867	16	13 37 3.75	2.1408	15 30 38.5	12.000
17	12 1 44.81	1.9362	5 12 21.4	13.855	17	13 39 12.36	2.1463	15 42 36.4	11.930
18	12 3 41.07	1.9392	5 26 12.3	13.843	18	13 41 21.31	2.1520	15 54 30.1	11.858
19	12 5 37.51	1.9422	5 40 2.5	13.829	19	13 43 30.60	2.1577	16 6 19.4	11.784
20	12 7 34.13	1.9453	5 53 51.8	13.814	20	13 45 40.23	2.1633	16 18 4.2	11.710
21	12 9 30.94	1.9484	6 7 40.2	13.799	21	13 47 50.20	2.1691	16 29 44.6	11.635
22	12 11 27.94	1.9517	6 21 27.7	13.783	22	13 50 0.52	2.1749	16 41 20.4	11.558
23	12 13 25.14	1.9550	6 35 14.1	13.765	23	13 52 11.19	2.1808	16 52 51.5	11.478
24	12 15 22.54	1.9583	-6 48 59.5	-13.747	24	13 54 22.21	2.1866	-17 4 17.8	-11.398

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
SEPTEMBER 29.					OCTOBER 1.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	13 54 22.21	2.1866	-17 4 17.8	-11.398	0	15 46 13.30	2.4677	-24 12 1.0	-5.803
1	13 56 33.58	2.1924	17 15 39.3	11.317	1	15 48 41.51	2.4726	24 17 50.2	5.747
2	13 58 45.30	2.1983	17 26 55.8	11.233	2	15 51 10.01	2.4775	24 23 30.6	5.598
3	14 0 57.37	2.2042	17 38 7.3	11.148	3	15 53 38.81	2.4824	24 29 2.0	5.449
4	14 3 9.80	2.2102	17 49 13.6	11.063	4	15 56 7.90	2.4872	24 34 24.5	5.299
5	14 5 22.59	2.2162	18 0 14.8	10.976	5	15 58 37.27	2.4918	24 39 37.9	5.148
6	14 7 35.74	2.2222	18 11 10.7	10.887	6	16 1 6.91	2.4963	24 44 42.2	4.995
7	14 9 49.25	2.2282	18 22 1.2	10.797	7	16 3 36.83	2.5008	24 49 37.3	4.842
8	14 12 3.12	2.2342	18 32 46.3	10.705	8	16 6 7.01	2.5052	24 54 23.2	4.687
9	14 14 17.35	2.2402	18 43 25.8	10.612	9	16 8 37.45	2.5095	24 58 59.7	4.531
10	14 16 31.94	2.2463	18 53 59.7	10.518	10	16 11 8.15	2.5138	25 3 26.9	4.375
11	14 18 46.90	2.2524	19 4 27.9	10.422	11	16 13 39.10	2.5179	25 7 44.7	4.218
12	14 21 2.23	2.2585	19 14 50.3	10.324	12	16 16 10.30	2.5219	25 11 53.1	4.060
13	14 23 17.92	2.2646	19 25 6.8	10.226	13	16 18 41.73	2.5258	25 15 51.9	3.901
14	14 25 33.98	2.2707	19 35 17.4	10.126	14	16 21 13.40	2.5297	25 19 41.2	3.741
15	14 27 50.40	2.2768	19 45 21.9	10.023	15	16 23 45.29	2.5333	25 23 20.8	3.579
16	14 30 7.19	2.2829	19 55 20.2	9.920	16	16 26 17.40	2.5370	25 26 50.7	3.418
17	14 32 24.35	2.2891	20 5 12.3	9.816	17	16 28 49.73	2.5405	25 30 10.9	3.256
18	14 34 41.88	2.2952	20 14 58.1	9.710	18	16 31 22.26	2.5438	25 33 21.4	3.093
19	14 36 59.77	2.3013	20 24 37.5	9.603	19	16 33 54.99	2.5472	25 36 22.0	2.928
20	14 39 18.03	2.3074	20 34 10.4	9.493	20	16 36 27.92	2.5503	25 39 12.7	2.763
21	14 41 36.66	2.3135	20 43 36.7	9.383	21	16 39 1.03	2.5533	25 41 53.6	2.598
22	14 43 55.65	2.3196	20 52 56.4	9.273	22	16 41 34.32	2.5563	25 44 24.5	2.432
23	14 46 15.01	2.3257	-21 2 9.4	-9.159	23	16 44 7.79	2.5592	-25 46 45.4	-2.265
SEPTEMBER 30.					OCTOBER 2.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	14 48 34.73	2.3318	-21 11 15.5	-9.044	0	16 46 41.42	2.5618	-25 48 56.3	-2.095
1	14 50 54.82	2.3378	21 20 14.7	8.928	1	16 49 15.21	2.5644	25 50 57.2	1.930
2	14 53 15.27	2.3438	21 29 6.9	8.811	2	16 51 49.15	2.5668	25 52 47.9	1.761
3	14 55 36.08	2.3498	21 37 52.0	8.693	3	16 54 23.23	2.5691	25 54 28.5	1.593
4	14 57 57.25	2.3558	21 46 30.0	8.573	4	16 56 57.44	2.5713	25 55 59.0	1.423
5	15 0 18.78	2.3618	21 55 0.7	8.451	5	16 59 31.78	2.5734	25 57 19.2	1.253
6	15 2 40.67	2.3678	22 3 24.1	8.328	6	17 2 6.25	2.5754	25 58 29.3	1.083
7	15 5 2.92	2.3738	22 11 40.1	8.204	7	17 4 40.83	2.5772	25 59 29.1	0.912
8	15 7 25.52	2.3796	22 19 48.6	8.078	8	17 7 15.51	2.5788	26 0 18.7	0.741
9	15 9 48.47	2.3855	22 27 49.5	7.952	9	17 9 50.29	2.5804	26 0 58.0	0.569
10	15 12 11.78	2.3913	22 35 42.8	7.823	10	17 12 25.16	2.5819	26 1 27.0	0.397
11	15 14 35.43	2.3971	22 43 28.3	7.693	11	17 15 0.12	2.5833	26 1 45.6	0.224
12	15 16 59.43	2.4028	22 51 6.0	7.563	12	17 17 35.15	2.5843	26 1 53.9	-0.053
13	15 19 23.77	2.4085	22 58 35.8	7.430	13	17 20 10.24	2.5853	26 1 51.9	+0.120
14	15 21 48.45	2.4142	23 5 57.6	7.297	14	17 22 45.39	2.5863	26 1 39.5	0.293
15	15 24 13.47	2.4198	23 13 11.4	7.163	15	17 25 20.59	2.5871	26 1 16.7	0.466
16	15 26 38.82	2.4253	23 20 17.1	7.027	16	17 27 55.84	2.5878	26 0 43.6	0.638
17	15 29 4.51	2.4308	23 27 14.6	6.889	17	17 30 31.12	2.5882	26 0 0.1	0.812
18	15 31 30.52	2.4363	23 34 3.8	6.750	18	17 33 6.42	2.5885	25 59 6.2	0.986
19	15 33 56.86	2.4417	23 40 44.6	6.610	19	17 35 41.74	2.5888	25 58 1.8	1.159
20	15 36 23.52	2.4470	23 47 17.0	6.469	20	17 38 17.08	2.5890	25 56 47.1	1.332
21	15 38 50.50	2.4523	23 53 40.9	6.328	21	17 40 52.42	2.5889	25 55 22.0	1.505
22	15 41 17.79	2.4574	23 59 56.3	6.184	22	17 43 27.75	2.5888	25 53 46.5	1.678
23	15 43 45.39	2.4626	24 6 3.0	6.039	23	17 46 3.07	2.5885	25 52 0.6	1.851
24	15 46 13.30	2.4677	-24 12 1.0	-5.893	24	17 48 38.37	2.5881	-25 50 4.4	+2.023

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
OCTOBER 3.					OCTOBER 5.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	17 48 38.37	2.5881	-25 50 4.4	+2.023	0	19 50 15.47	2.4454	-21 3 23.1	+9.600
1	17 51 13.64	2.5875	25 47 57.8	2.197	1	19 52 42.06	2.4406	20 53 43.1	9.733
2	17 53 48.87	2.5868	25 45 40.8	2.369	2	19 55 8.36	2.4360	20 43 55.1	9.865
3	17 56 24.06	2.5861	25 43 13.5	2.542	3	19 57 34.38	2.4313	20 33 59.3	9.995
4	17 58 59.20	2.5852	25 40 35.8	2.714	4	20 0 0.12	2.4267	20 23 55.7	10.124
5	18 1 34.28	2.5841	25 37 47.8	2.885	5	20 2 25.58	2.4219	20 13 44.4	10.252
6	18 4 9.29	2.5829	25 34 49.6	3.057	6	20 4 50.75	2.4171	20 3 25.5	10.378
7	18 6 44.23	2.5817	25 31 41.0	3.228	7	20 7 15.63	2.4123	19 52 59.1	10.503
8	18 9 19.09	2.5808	25 28 22.2	3.398	8	20 9 40.23	2.4076	19 42 25.2	10.626
9	18 11 53.86	2.5798	25 24 53.2	3.568	9	20 12 4.54	2.4027	19 31 44.0	10.748
10	18 14 28.54	2.5771	25 21 14.0	3.738	10	20 14 28.55	2.3978	19 20 55.5	10.868
11	18 17 3.11	2.5753	25 17 24.6	3.908	11	20 16 52.27	2.3930	19 9 59.9	10.987
12	18 19 37.57	2.5733	25 13 25.0	4.078	12	20 19 15.71	2.3883	18 58 57.1	11.106
13	18 22 11.91	2.5713	25 9 15.3	4.246	13	20 21 38.86	2.3834	18 47 47.3	11.221
14	18 24 46.13	2.5693	25 4 55.5	4.413	14	20 24 1.72	2.3786	18 36 30.6	11.335
15	18 27 20.22	2.5670	25 0 25.7	4.580	15	20 26 24.29	2.3737	18 25 7.1	11.448
16	18 29 54.17	2.5647	24 55 45.9	4.747	16	20 28 46.56	2.3688	18 13 36.8	11.560
17	18 32 27.98	2.5623	24 50 56.1	4.913	17	20 31 8.55	2.3641	18 1 59.9	11.670
18	18 35 1.64	2.5597	24 45 56.3	5.078	18	20 33 30.25	2.3593	17 50 16.4	11.779
19	18 37 35.14	2.5570	24 40 46.7	5.243	19	20 35 51.66	2.3544	17 38 26.4	11.887
20	18 40 8.48	2.5543	24 35 27.2	5.407	20	20 38 12.78	2.3497	17 26 30.0	11.993
21	18 42 41.66	2.5515	24 29 57.9	5.569	21	20 40 33.62	2.3449	17 14 27.3	12.097
22	18 45 14.66	2.5486	24 24 18.9	5.732	22	20 42 54.17	2.3401	17 2 18.4	12.199
23	18 47 47.48	2.5454	-24 18 30.1	+5.893	23	20 45 14.43	2.3353	-16 50 3.4	+12.300
OCTOBER 4.					OCTOBER 6.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	18 50 20.11	2.5423	-24 12 31.7	+6.053	0	20 47 34.41	2.3307	-16 37 42.4	+12.399
1	18 52 52.55	2.5391	24 6 23.7	6.213	1	20 49 54.11	2.3260	16 25 15.5	12.466
2	18 55 24.80	2.5358	24 0 6.1	6.373	2	20 52 13.53	2.3213	16 12 42.7	12.595
3	18 57 56.84	2.5323	23 53 39.0	6.531	3	20 54 32.66	2.3166	16 0 4.1	12.690
4	19 0 28.68	2.5288	23 47 2.4	6.688	4	20 56 51.52	2.3120	15 47 19.9	12.783
5	19 3 0.30	2.5253	23 40 16.4	6.844	5	20 59 10.10	2.3074	15 34 30.1	12.876
6	19 5 31.71	2.5217	23 33 21.1	6.999	6	21 1 28.41	2.3029	15 21 34.8	12.966
7	19 8 2.90	2.5179	23 26 16.5	7.153	7	21 3 46.45	2.2984	15 8 34.2	13.054
8	19 10 33.86	2.5141	23 19 2.8	7.306	8	21 6 4.22	2.2938	14 55 28.3	13.142
9	19 13 4.59	2.5103	23 11 39.9	7.458	9	21 8 21.71	2.2893	14 42 17.2	13.228
10	19 15 35.09	2.5063	23 4 7.9	7.609	10	21 10 38.94	2.2850	14 29 0.9	13.313
11	19 18 5.35	2.5023	22 56 26.8	7.759	11	21 12 55.91	2.2806	14 15 39.7	13.395
12	19 20 35.36	2.4982	22 48 36.8	7.908	12	21 15 12.61	2.2762	14 2 13.5	13.477
13	19 23 5.13	2.4941	22 40 37.9	8.055	13	21 17 29.05	2.2719	13 48 42.5	13.556
14	19 25 34.65	2.4899	22 32 30.2	8.202	14	21 19 45.24	2.2677	13 35 6.8	13.633
15	19 28 3.92	2.4857	22 24 13.7	8.348	15	21 22 1.17	2.2634	13 21 26.5	13.709
16	19 30 32.93	2.4814	22 15 48.5	8.492	16	21 24 16.85	2.2593	13 7 41.7	13.784
17	19 33 1.69	2.4771	22 7 14.7	8.635	17	21 26 32.28	2.2552	12 53 52.4	13.858
18	19 35 30.18	2.4726	21 58 32.3	8.777	18	21 28 47.47	2.2511	12 39 58.7	13.930
19	19 37 58.40	2.4682	21 49 41.5	8.917	19	21 31 2.41	2.2470	12 26 0.8	13.999
20	19 40 26.36	2.4638	21 40 42.3	9.066	20	21 33 17.11	2.2430	12 11 58.8	14.068
21	19 42 54.05	2.4593	21 31 34.8	9.194	21	21 35 31.57	2.2391	11 57 52.7	14.135
22	19 45 21.47	2.4547	21 22 19.0	9.331	22	21 37 45.80	2.2353	11 43 42.6	14.201
23	19 47 48.61	2.4500	21 12 55.1	9.466	23	21 39 59.80	2.2313	11 29 28.6	14.265
24	19 50 15.47	2.4454	-21 3 23.1	+9.600	24	21 42 13.56	2.2275	-11 15 10.8	+14.326

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
OCTOBER 7.					OCTOBER 9.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	21 42 13.56	2.2275	-11 15 10.8	+14.328	0	23 25 56.73	2.1191	+ 0 54 29.2	+15.485
1	21 44 27.10	2.2238	11 0 49.3	14.388	1	23 28 3.85	2.1184	1 9 57.9	15.472
2	21 46 40.42	2.2202	10 46 24.3	14.446	2	23 30 10.94	2.1179	1 25 25.8	15.458
3	21 48 53.52	2.2166	10 31 55.8	14.503	3	23 32 18.00	2.1174	1 40 52.8	15.442
4	21 51 6.41	2.2130	10 17 23.9	14.559	4	23 34 25.03	2.1169	1 56 18.8	15.424
5	21 53 19.08	2.2094	10 2 48.7	14.614	5	23 36 32.03	2.1165	2 11 43.7	15.408
6	21 55 31.54	2.2060	9 48 10.2	14.668	6	23 38 39.01	2.1162	2 27 7.5	15.388
7	21 57 43.80	2.2027	9 33 28.6	14.718	7	23 40 45.97	2.1159	2 42 30.0	15.363
8	21 59 55.86	2.1993	9 18 44.0	14.768	8	23 42 52.92	2.1158	2 57 51.1	15.340
9	22 2 7.72	2.1960	9 3 56.5	14.816	9	23 44 59.86	2.1156	3 13 10.8	15.313
10	22 4 19.38	2.1928	8 49 6.1	14.863	10	23 47 6.79	2.1155	3 28 28.9	15.289
11	22 6 30.85	2.1897	8 34 13.0	14.907	11	23 49 13.72	2.1156	3 43 45.5	15.263
12	22 8 42.14	2.1867	8 19 17.3	14.950	12	23 51 20.66	2.1157	3 59 0.4	15.233
13	22 10 53.25	2.1836	8 4 19.0	14.993	13	23 53 27.60	2.1157	4 14 13.5	15.203
14	22 13 4.17	2.1806	7 49 18.2	15.033	14	23 55 34.54	2.1158	4 29 24.7	15.171
15	22 15 14.92	2.1777	7 34 15.1	15.071	15	23 57 41.50	2.1162	4 44 34.0	15.138
16	22 17 25.49	2.1748	7 19 9.7	15.108	16	23 59 48.48	2.1164	4 59 41.3	15.103
17	22 19 35.90	2.1721	7 4 2.1	15.143	17	0 1 55.47	2.1168	5 14 46.4	15.068
18	22 21 46.14	2.1694	6 48 52.5	15.178	18	0 4 2.49	2.1173	5 29 49.4	15.031
19	22 23 56.23	2.1668	6 33 40.8	15.211	19	0 6 9.54	2.1177	5 44 50.1	14.992
20	22 26 6.15	2.1641	6 18 27.2	15.241	20	0 8 16.61	2.1182	5 59 48.4	14.952
21	22 28 15.92	2.1617	6 3 11.9	15.270	21	0 10 23.72	2.1188	6 14 44.3	14.910
22	22 30 25.55	2.1593	5 47 54.8	15.298	22	0 12 30.86	2.1193	6 29 37.6	14.867
23	22 32 35.03	2.1568	- 5 32 36.1	+15.324	23	0 14 38.04	2.1201	+ 6 44 28.3	+14.823
OCTOBER 8.					OCTOBER 10.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	22 34 44.37	2.1545	- 5 17 15.9	+15.348	0	0 16 45.27	2.1208	+ 6 59 16.4	+14.778
1	22 36 53.57	2.1523	5 1 54.3	15.372	1	0 18 52.54	2.1216	7 14 1.7	14.731
2	22 39 2.64	2.1501	4 46 31.3	15.393	2	0 20 59.86	2.1225	7 28 44.1	14.683
3	22 41 11.58	2.1480	4 31 7.1	15.413	3	0 23 7.24	2.1234	7 43 23.6	14.633
4	22 43 20.40	2.1460	4 15 41.7	15.433	4	0 25 14.67	2.1243	7 58 0.0	14.582
5	22 45 29.10	2.1440	4 0 15.2	15.450	5	0 27 22.16	2.1253	8 12 33.4	14.530
6	22 47 37.68	2.1420	3 44 47.7	15.465	6	0 29 29.71	2.1264	8 27 3.6	14.476
7	22 49 46.14	2.1402	3 29 19.4	15.478	7	0 31 37.33	2.1275	8 41 30.5	14.421
8	22 51 54.50	2.1384	3 13 50.3	15.491	8	0 33 45.01	2.1286	8 55 54.1	14.365
9	22 54 2.75	2.1367	2 58 20.5	15.503	9	0 35 52.76	2.1298	9 10 14.3	14.308
10	22 56 10.90	2.1351	2 42 50.0	15.512	10	0 38 0.59	2.1312	9 24 31.0	14.248
11	22 58 18.96	2.1335	2 27 19.1	15.519	11	0 40 8.50	2.1324	9 38 44.1	14.188
12	23 0 26.92	2.1320	2 11 47.7	15.526	12	0 42 16.48	2.1337	9 52 53.6	14.128
13	23 2 34.80	2.1306	1 56 16.0	15.530	13	0 44 24.54	2.1351	10 6 59.4	14.064
14	23 4 42.59	2.1292	1 40 44.1	15.533	14	0 46 32.69	2.1366	10 21 1.3	13.999
15	23 6 50.30	2.1278	1 25 12.0	15.536	15	0 48 40.93	2.1380	10 34 59.3	13.934
16	23 8 57.93	2.1266	1 9 39.8	15.537	16	0 50 49.25	2.1394	10 48 53.4	13.868
17	23 11 5.49	2.1254	0 54 7.6	15.535	17	0 52 57.66	2.1410	11 2 43.5	13.801
18	23 13 12.98	2.1243	0 38 35.6	15.532	18	0 55 6.17	2.1427	11 16 29.5	13.732
19	23 15 20.41	2.1233	0 23 3.8	15.528	19	0 57 14.78	2.1443	11 30 11.3	13.661
20	23 17 27.78	2.1223	- 0 7 32.3	15.523	20	0 59 23.49	2.1459	11 43 48.8	13.589
21	23 19 35.09	2.1214	+ 0 7 58.9	15.516	21	1 1 32.29	2.1476	11 57 22.0	13.517
22	23 21 42.35	2.1206	0 23 29.6	15.507	22	1 3 41.20	2.1494	12 10 50.8	13.443
23	23 23 49.56	2.1198	0 38 59.7	15.497	23	1 5 50.22	2.1512	12 24 15.1	13.368
24	23 25 56.73	2.1191	+ 0 54 29.2	+15.485	24	1 7 59.34	2.1529	+12 37 34.9	+13.291

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
OCTOBER 11.					OCTOBER 13.				
	^h ^m ^s	^s	[°] ['] ["]	["]		^h ^m ^s	^s	[°] ['] ["]	["]
0	1 7 59.34	2.1529	+12 37 34.9	+13.291	0	2 53 44.78	2.2543	+21 26 51.2	+8.394
1	1 10 8.57	2.1548	12 50 50.0	13.213	1	2 56 0.09	2.2561	21 35 11.2	8.271
2	1 12 17.91	2.1567	13 4 0.5	13.135	2	2 58 15.51	2.2579	21 43 23.7	8.147
3	1 14 27.37	2.1586	13 17 6.2	13.055	3	3 0 31.04	2.2597	21 51 28.8	8.023
4	1 16 36.94	2.1604	13 30 7.1	12.974	4	3 2 46.67	2.2614	21 59 26.4	7.898
5	1 18 46.62	2.1623	13 43 3.1	12.892	5	3 5 2.41	2.2632	22 7 16.5	7.773
6	1 20 56.42	2.1643	13 55 54.1	12.806	6	3 7 18.25	2.2648	22 14 59.1	7.646
7	1 23 6.34	2.1664	14 8 40.0	12.723	7	3 9 34.19	2.2665	22 22 34.0	7.519
8	1 25 16.39	2.1685	14 21 20.8	12.638	8	3 11 50.23	2.2681	22 30 1.4	7.393
9	1 27 26.56	2.1705	14 33 56.5	12.551	9	3 14 6.36	2.2697	22 37 21.1	7.265
10	1 29 36.85	2.1726	14 46 26.9	12.463	10	3 16 22.59	2.2713	22 44 33.2	7.137
11	1 31 47.26	2.1746	14 58 52.0	12.373	11	3 18 38.91	2.2727	22 51 37.5	7.008
12	1 33 57.80	2.1766	15 11 11.7	12.283	12	3 20 55.31	2.2741	22 58 34.1	6.879
13	1 36 8.47	2.1789	15 23 26.0	12.193	13	3 23 11.80	2.2755	23 5 23.0	6.749
14	1 38 19.27	2.1810	15 35 34.8	12.100	14	3 25 28.37	2.2768	23 12 4.0	6.618
15	1 40 30.19	2.1832	15 47 38.0	12.006	15	3 27 45.01	2.2780	23 18 37.2	6.488
16	1 42 41.25	2.1853	15 59 35.5	11.911	16	3 30 1.73	2.2793	23 25 2.5	6.357
17	1 44 52.43	2.1875	16 11 27.3	11.816	17	3 32 18.52	2.2804	23 31 20.0	6.226
18	1 47 3.75	2.1896	16 23 13.4	11.720	18	3 34 35.38	2.2816	23 37 29.6	6.094
19	1 49 15.20	2.1920	16 34 53.7	11.622	19	3 36 52.31	2.2827	23 43 31.3	5.962
20	1 51 26.79	2.1943	16 46 28.0	11.523	20	3 39 9.30	2.2836	23 49 25.0	5.828
21	1 53 38.51	2.1964	16 57 56.4	11.423	21	3 41 26.34	2.2845	23 55 10.7	5.696
22	1 55 50.36	2.1986	17 9 18.8	11.323	22	3 43 43.44	2.2855	24 0 48.5	5.563
23	1 58 2.34	2.2008	+17 20 35.2	+11.222	23	3 46 0.60	2.2863	+24 6 18.3	+5.429
OCTOBER 12.					OCTOBER 14.				
	^h ^m ^s	^s	[°] ['] ["]	["]		^h ^m ^s	^s	[°] ['] ["]	["]
0	2 0 14.46	2.2032	+17 31 45.4	+11.118	0	3 48 17.80	2.2871	+24 11 40.0	+5.295
1	2 2 26.72	2.2054	17 42 49.4	11.015	1	3 50 35.05	2.2878	24 16 53.7	5.162
2	2 4 39.11	2.2076	17 53 47.2	10.911	2	3 52 52.34	2.2885	24 21 59.4	5.028
3	2 6 51.63	2.2098	18 4 38.7	10.805	3	3 55 9.67	2.2891	24 26 57.0	4.893
4	2 9 4.29	2.2121	18 15 23.8	10.698	4	3 57 27.03	2.2896	24 31 46.5	4.758
5	2 11 17.08	2.2143	18 26 2.5	10.592	5	3 59 44.42	2.2901	24 36 27.9	4.623
6	2 13 30.00	2.2165	18 36 34.8	10.483	6	4 2 1.84	2.2905	24 41 1.2	4.488
7	2 15 43.06	2.2188	18 47 0.5	10.374	7	4 4 19.28	2.2908	24 45 26.4	4.353
8	2 17 56.26	2.2210	18 57 19.7	10.264	8	4 6 36.74	2.2911	24 49 43.5	4.217
9	2 20 9.58	2.2232	19 7 32.2	10.153	9	4 8 54.21	2.2913	24 53 52.4	4.081
10	2 22 23.04	2.2254	19 17 38.1	10.042	10	4 11 11.70	2.2915	24 57 53.2	3.945
11	2 24 36.63	2.2276	19 27 37.2	9.928	11	4 13 29.19	2.2916	25 1 45.8	3.809
12	2 26 50.35	2.2298	19 37 29.5	9.815	12	4 15 46.69	2.2917	25 5 30.3	3.673
13	2 29 4.20	2.2319	19 47 15.0	9.701	13	4 18 4.19	2.2916	25 9 6.6	3.538
14	2 31 18.18	2.2341	19 56 53.6	9.586	14	4 20 21.68	2.2914	25 12 34.8	3.402
15	2 33 32.29	2.2362	20 6 25.3	9.470	15	4 22 39.16	2.2912	25 15 54.8	3.265
16	2 35 46.52	2.2383	20 15 50.0	9.353	16	4 24 56.62	2.2909	25 19 6.6	3.128
17	2 38 0.88	2.2405	20 25 7.7	9.236	17	4 27 14.07	2.2907	25 22 10.2	2.993
18	2 40 15.36	2.2423	20 34 18.3	9.118	18	4 29 31.50	2.2903	25 25 5.7	2.857
19	2 42 29.96	2.2444	20 43 21.8	8.998	19	4 31 48.90	2.2898	25 27 53.0	2.720
20	2 44 44.69	2.2464	20 52 18.1	8.879	20	4 34 6.27	2.2893	25 30 32.1	2.584
21	2 46 59.53	2.2484	21 1 7.3	8.759	21	4 36 23.61	2.2887	25 33 3.1	2.448
22	2 49 14.50	2.2504	21 9 49.2	8.638	22	4 38 40.91	2.2879	25 35 25.9	2.312
23	2 51 29.58	2.2523	21 18 23.9	8.517	23	4 40 58.16	2.2872	25 37 40.5	2.176
24	2 53 44.78	2.2543	+21 26 51.2	+8.394	24	4 43 15.37	2.2864	+25 39 47.0	+2.040

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
OCTOBER 15.					OCTOBER 17.				
	<small>h m s</small>	<small>s</small>	<small>° ' "</small>	<small>"</small>		<small>h m s</small>	<small>s</small>	<small>° ' "</small>	<small>"</small>
0	4 43 15.37	2.2864	+25 39 47.0	+2.040	0	6 30 50.18	2.1747	+24 46 28.5	-4.098
1	4 45 32.53	2.2855	25 41 45.3	1.904	1	6 33 05.56	2.1712	24 42 19.1	4.214
2	4 47 49.63	2.2846	25 43 35.5	1.769	2	6 35 10.72	2.1676	24 38 2.8	4.329
3	4 50 6.68	2.2836	25 45 17.6	1.634	3	6 37 20.67	2.1641	24 33 39.6	4.443
4	4 52 23.66	2.2825	25 46 51.6	1.498	4	6 39 30.41	2.1606	24 29 9.6	4.557
5	4 54 40.58	2.2813	25 48 17.4	1.363	5	6 41 39.93	2.1568	24 24 32.8	4.670
6	4 56 57.42	2.2801	25 49 35.1	1.228	6	6 43 49.23	2.1533	24 19 49.2	4.783
7	4 59 14.19	2.2788	25 50 44.7	1.093	7	6 45 58.32	2.1497	24 14 58.9	4.894
8	5 1 30.88	2.2774	25 51 46.3	0.959	8	6 48 7.19	2.1460	24 10 1.9	5.005
9	5 3 47.48	2.2759	25 52 39.8	0.825	9	6 50 15.84	2.1423	24 4 58.3	5.115
10	5 6 3.99	2.2744	25 53 25.3	0.691	10	6 52 24.26	2.1385	23 59 48.1	5.225
11	5 8 20.41	2.2729	25 54 2.7	0.557	11	6 54 32.46	2.1348	23 54 31.3	5.334
12	5 10 36.74	2.2713	25 54 32.1	0.423	12	6 56 40.44	2.1311	23 49 8.0	5.443
13	5 12 52.97	2.2696	25 54 53.5	0.290	13	6 58 48.19	2.1273	23 43 38.2	5.550
14	5 15 9.09	2.2678	25 55 6.9	0.158	14	7 0 55.72	2.1236	23 38 2.0	5.657
15	5 17 25.10	2.2659	25 55 12.4	+0.025	15	7 3 3.02	2.1198	23 32 19.4	5.763
16	5 19 41.00	2.2641	25 55 9.9	-0.108	16	7 5 10.10	2.1161	23 26 30.5	5.866
17	5 21 56.79	2.2622	25 54 59.5	0.239	17	7 7 16.95	2.1123	23 20 35.3	5.973
18	5 24 12.46	2.2601	25 54 41.2	0.371	18	7 9 23.57	2.1084	23 14 33.7	6.078
19	5 26 28.00	2.2580	25 54 15.0	0.502	19	7 11 29.96	2.1047	23 8 25.9	6.181
20	5 28 43.42	2.2559	25 53 41.0	0.633	20	7 13 36.13	2.1008	23 2 12.0	6.283
21	5 30 58.71	2.2537	25 52 59.1	0.763	21	7 15 42.06	2.0970	22 55 51.9	6.386
22	5 33 13.86	2.2514	25 52 9.4	0.893	22	7 17 47.77	2.0933	22 49 25.7	6.488
23	5 35 28.88	2.2491	+25 51 11.9	-1.023	23	7 19 53.25	2.0893	+22 42 53.4	-6.588
OCTOBER 16.					OCTOBER 18.				
	<small>h m s</small>	<small>s</small>	<small>° ' "</small>	<small>"</small>		<small>h m s</small>	<small>s</small>	<small>° ' "</small>	<small>"</small>
0	5 37 43.75	2.2467	+25 50 6.7	-1.152	0	7 21 58.49	2.0855	+22 36 15.1	-6.688
1	5 39 58.48	2.2443	25 48 53.7	1.281	1	7 24 3.51	2.0818	22 29 30.8	6.788
2	5 42 13.06	2.2418	25 47 33.0	1.408	2	7 26 8.30	2.0779	22 22 40.6	6.886
3	5 44 27.49	2.2392	25 46 4.7	1.536	3	7 28 12.86	2.0741	22 15 44.5	6.983
4	5 46 41.76	2.2366	25 44 28.7	1.664	4	7 30 17.19	2.0703	22 8 42.6	7.081
5	5 48 55.88	2.2339	25 42 45.0	1.791	5	7 32 21.29	2.0664	22 1 34.8	7.178
6	5 51 9.83	2.2312	25 40 53.8	1.917	6	7 34 25.16	2.0627	21 54 21.3	7.273
7	5 53 23.62	2.2284	25 38 55.0	2.043	7	7 36 28.81	2.0589	21 47 2.0	7.369
8	5 55 37.24	2.2256	25 36 48.7	2.168	8	7 38 32.23	2.0552	21 39 37.0	7.463
9	5 57 50.69	2.2228	25 34 34.8	2.293	9	7 40 35.43	2.0514	21 32 6.4	7.557
10	6 0 3.97	2.2198	25 32 13.5	2.418	10	7 42 38.40	2.0477	21 24 30.2	7.649
11	6 2 17.07	2.2168	25 29 44.7	2.542	11	7 44 41.15	2.0439	21 16 48.5	7.742
12	6 4 29.99	2.2138	25 27 8.5	2.665	12	7 46 43.67	2.0402	21 9 1.2	7.833
13	6 6 42.73	2.2108	25 24 24.9	2.788	13	7 48 45.97	2.0364	21 1 8.5	7.924
14	6 8 55.29	2.2078	25 21 34.0	2.909	14	7 50 48.04	2.0328	20 53 10.3	8.014
15	6 11 7.66	2.2046	25 18 35.8	3.031	15	7 52 49.90	2.0291	20 45 6.8	8.103
16	6 13 19.84	2.2014	25 15 30.3	3.152	16	7 54 51.53	2.0253	20 36 57.9	8.193
17	6 15 31.83	2.1982	25 12 17.6	3.273	17	7 56 52.94	2.0218	20 28 43.7	8.281
18	6 17 43.62	2.1949	25 8 57.6	3.393	18	7 58 54.14	2.0182	20 20 24.2	8.366
19	6 19 55.22	2.1917	25 5 30.5	3.512	19	8 0 55.12	2.0146	20 11 59.5	8.454
20	6 22 6.62	2.1883	25 1 56.2	3.631	20	8 2 55.89	2.0110	20 3 29.7	8.540
21	6 24 17.82	2.1849	24 58 14.8	3.748	21	8 4 56.44	2.0074	19 54 54.7	8.626
22	6 26 28.81	2.1815	24 54 26.4	3.866	22	8 6 56.78	2.0039	19 46 14.6	8.710
23	6 28 39.60	2.1781	24 50 30.9	3.983	23	8 8 56.91	2.0004	19 37 29.5	8.794
24	6 30 50.18	2.1747	+24 46 28.5	-4.098	24	8 10 56.83	1.9969	+19 28 39.3	-8.878

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
OCTOBER 19.					OCTOBER 21.				
	^h ^m ^s	^s	[°] ['] ["]	["]		^h ^m ^s	^s	[°] ['] ["]	["]
0	8 10 56.83	1.9999	+19 28 39.3	-8.578	0	9 43 29.09	1.8760	+10 59 37.7	-12.076
1	8 12 56.54	1.9035	19 19 44.2	8.960	1	9 45 21.61	1.8747	10 47 31.6	12.127
2	8 14 56.05	1.9001	19 10 44.1	9.042	2	9 47 14.05	1.8734	10 35 22.5	12.176
3	8 16 55.35	1.9067	19 1 39.2	9.123	3	9 49 6.42	1.8722	10 23 10.5	12.226
4	8 18 54.45	1.9033	18 52 29.4	9.203	4	9 50 58.71	1.8710	10 10 55.5	12.274
5	8 20 53.35	1.9000	18 43 14.8	9.283	5	9 52 50.94	1.8700	9 58 37.6	12.322
6	8 22 52.05	1.9767	18 33 55.5	9.362	6	9 54 43.11	1.8690	9 46 16.9	12.368
7	8 24 50.55	1.9734	18 24 31.4	9.441	7	9 56 35.22	1.8680	9 33 53.4	12.415
8	8 26 48.86	1.9702	18 15 2.6	9.518	8	9 58 27.27	1.8671	9 21 27.1	12.461
9	8 28 46.97	1.9669	18 5 29.2	9.595	9	10 0 19.27	1.8663	9 8 58.1	12.506
10	8 30 44.89	1.9638	17 55 51.2	9.672	10	10 2 11.23	1.8656	8 56 26.4	12.551
11	8 32 42.62	1.9607	17 46 8.6	9.747	11	10 4 3.14	1.8648	8 43 52.0	12.594
12	8 34 40.17	1.9576	17 36 21.6	9.821	12	10 5 55.00	1.8641	8 31 15.1	12.637
13	8 36 37.53	1.9545	17 26 30.1	9.896	13	10 7 46.83	1.8633	8 18 35.6	12.679
14	8 38 34.71	1.9515	17 16 34.1	9.970	14	10 9 38.62	1.8629	8 5 53.6	12.721
15	8 40 31.71	1.9485	17 6 33.7	10.043	15	10 11 30.38	1.8625	7 53 9.1	12.762
16	8 42 28.53	1.9456	16 56 29.0	10.115	16	10 13 22.12	1.8621	7 40 22.2	12.802
17	8 44 25.18	1.9428	16 46 19.9	10.187	17	10 15 13.83	1.8617	7 27 32.9	12.842
18	8 46 21.66	1.9398	16 36 6.6	10.267	18	10 17 5.52	1.8614	7 14 41.2	12.881
19	8 48 17.96	1.9369	16 25 49.1	10.328	19	10 18 57.20	1.8613	7 1 47.2	12.918
20	8 50 14.09	1.9342	16 15 27.3	10.398	20	10 20 48.87	1.8611	6 48 51.0	12.956
21	8 52 10.06	1.9315	16 5 1.4	10.466	21	10 22 40.53	1.8609	6 35 52.5	12.993
22	8 54 5.87	1.9288	15 54 31.4	10.533	22	10 24 32.18	1.8608	6 22 51.8	13.029
23	8 56 1.52	1.9262	+15 43 57.4	-10.601	23	10 26 23.83	1.8609	+ 6 9 49.0	-13.064
OCTOBER 20.					OCTOBER 22.				
0	8 57 57.01	1.9236	+15 33 19.3	-10.668	0	10 28 15.49	1.8610	+ 5 56 44.1	-13.099
1	8 59 52.35	1.9210	15 22 37.2	10.734	1	10 30 7.15	1.8612	5 43 37.1	13.133
2	9 1 47.53	1.9184	15 11 51.2	10.800	2	10 31 58.83	1.8614	5 30 28.1	13.167
3	9 3 42.56	1.9160	15 1 1.2	10.865	3	10 33 50.52	1.8617	5 17 17.1	13.199
4	9 5 37.45	1.9137	14 50 7.4	10.929	4	10 35 42.23	1.8621	5 4 4.2	13.231
5	9 7 32.20	1.9113	14 39 9.7	10.993	5	10 37 33.97	1.8625	4 50 49.4	13.262
6	9 9 26.80	1.9089	14 28 8.2	11.056	6	10 39 25.73	1.8629	4 37 32.8	13.292
7	9 11 21.27	1.9067	14 17 3.0	11.118	7	10 41 17.52	1.8634	4 24 14.4	13.322
8	9 13 15.60	1.9044	14 5 54.0	11.180	8	10 43 9.34	1.8641	4 10 54.2	13.351
9	9 15 9.80	1.9023	13 54 41.4	11.240	9	10 45 1.21	1.8648	3 57 32.3	13.378
10	9 17 3.87	1.9002	13 43 25.2	11.301	10	10 46 53.12	1.8655	3 44 8.8	13.406
11	9 18 57.82	1.8981	13 32 5.3	11.361	11	10 48 45.07	1.8663	3 30 43.7	13.432
12	9 20 51.64	1.8960	13 20 41.9	11.419	12	10 50 37.07	1.8672	3 17 17.0	13.458
13	9 22 45.34	1.8941	13 9 15.0	11.478	13	10 52 29.13	1.8682	3 3 48.8	13.483
14	9 24 38.93	1.8923	12 57 44.6	11.536	14	10 54 21.25	1.8692	2 50 19.1	13.507
15	9 26 32.41	1.8903	12 46 10.7	11.593	15	10 56 13.43	1.8702	2 36 48.0	13.530
16	9 28 25.77	1.8884	12 34 33.4	11.649	16	10 58 5.67	1.8713	2 23 15.5	13.553
17	9 30 19.02	1.8867	12 22 52.8	11.704	17	10 59 57.99	1.8726	2 9 41.7	13.574
18	9 32 12.17	1.8851	12 11 8.9	11.759	18	11 1 50.38	1.8738	1 56 6.6	13.596
19	9 34 5.23	1.8834	11 59 21.7	11.813	19	11 3 42.85	1.8753	1 42 30.2	13.616
20	9 35 58.18	1.8818	11 47 31.3	11.868	20	11 5 35.41	1.8767	1 28 52.7	13.634
21	9 37 51.04	1.8803	11 35 37.6	11.922	21	11 7 28.05	1.8782	1 15 14.1	13.653
22	9 39 43.81	1.8788	11 23 40.7	11.974	22	11 9 20.79	1.8798	1 1 34.3	13.672
23	9 41 36.49	1.8773	11 11 40.7	12.025	23	11 11 13.62	1.8813	0 47 53.5	13.688
24	9 43 29.09	1.8760	+10 59 37.7	-12.076	24	11 13 6.55	1.8831	+ 0 34 11.7	-13.704

GREENWICH MEAN TIME.

Hour.	Right Ascension.			Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.			Var. per Min.	Declination.	Var. per Min.				
OCTOBER 23.							OCTOBER 25.										
	h	m	s	s	°	'	''		h	m	s	s	°	'	''	''	
0	11	13	6.55	1.8831	+ 0	34	11.7	-13.704	0	12	46	46.10	2.0458	-10	24	3.1	-13.315
1	11	14	59.59	1.8848	0	20	29.0	13.719	1	12	48	49.00	2.0509	10	37	20.9	13.278
2	11	16	52.73	1.8866	+ 0	6	45.4	13.733	2	12	50	52.21	2.0560	10	50	36.5	13.242
3	11	18	45.98	1.8885	- 0	6	59.0	13.747	3	12	52	55.72	2.0612	11	3	49.9	13.203
4	11	20	39.35	1.8905	0	20	44.2	13.760	4	12	54	59.55	2.0664	11	17	0.8	13.162
5	11	22	32.84	1.8925	0	34	30.2	13.772	5	12	57	3.69	2.0717	11	30	9.3	13.121
6	11	24	26.45	1.8946	0	48	16.8	13.782	6	12	59	8.15	2.0770	11	43	15.3	13.078
7	11	26	20.19	1.8968	1	2	4.0	13.792	7	13	1	12.93	2.0823	11	56	18.7	13.034
8	11	28	14.07	1.8991	1	15	51.8	13.801	8	13	3	18.03	2.0878	12	9	19.4	12.988
9	11	30	8.08	1.9014	1	29	40.1	13.809	9	13	5	23.46	2.0933	12	22	17.3	12.942
10	11	32	2.24	1.9038	1	43	28.9	13.817	10	13	7	29.23	2.0989	12	35	12.4	12.893
11	11	33	56.54	1.9063	1	57	18.1	13.823	11	13	9	35.33	2.1045	12	48	4.5	12.843
12	11	35	50.99	1.9088	2	11	7.6	13.828	12	13	11	41.77	2.1102	13	0	53.6	12.793
13	11	37	45.60	1.9114	2	24	57.4	13.833	13	13	13	48.55	2.1159	13	13	39.6	12.739
14	11	39	40.36	1.9140	2	38	47.5	13.836	14	13	15	55.68	2.1217	13	26	22.3	12.685
15	11	41	35.28	1.9168	2	52	37.7	13.838	15	13	18	3.15	2.1275	13	39	1.8	12.630
16	11	43	30.37	1.9196	3	6	28.0	13.839	16	13	20	10.98	2.1334	13	51	37.9	12.573
17	11	45	25.63	1.9225	3	20	18.4	13.840	17	13	22	19.16	2.1393	14	4	10.6	12.515
18	11	47	21.07	1.9255	3	34	8.8	13.839	18	13	24	27.69	2.1453	14	16	39.7	12.454
19	11	49	16.69	1.9285	3	47	59.1	13.838	19	13	26	36.59	2.1513	14	29	5.1	12.393
20	11	51	12.49	1.9315	4	1	49.3	13.835	20	13	28	45.85	2.1573	14	41	26.8	12.330
21	11	53	8.47	1.9347	4	15	39.3	13.832	21	13	30	55.47	2.1634	14	53	44.7	12.266
22	11	55	4.65	1.9380	4	29	29.1	13.828	22	13	33	5.46	2.1696	15	5	58.7	12.200
23	11	57	1.03	1.9413	- 4	43	18.6	-13.822	23	13	35	15.82	2.1758	-15	18	8.7	-12.133
OCTOBER 24.							OCTOBER 26.										
0	11	58	57.60	1.9446	- 4	57	7.7	-13.815	0	13	37	26.55	2.1820	-15	30	14.6	-12.063
1	12	0	54.38	1.9481	5	10	56.4	13.806	1	13	39	37.66	2.1883	15	42	16.3	11.993
2	12	2	51.37	1.9516	5	24	44.6	13.798	2	13	41	49.14	2.1946	15	54	13.7	11.921
3	12	4	48.57	1.9551	5	38	32.2	13.788	3	13	44	1.01	2.2009	16	6	6.8	11.848
4	12	6	45.98	1.9588	5	52	19.2	13.778	4	13	46	13.25	2.2073	16	17	55.4	11.773
5	12	8	43.62	1.9625	6	6	5.5	13.766	5	13	48	25.88	2.2138	16	29	39.5	11.696
6	12	10	41.48	1.9663	6	19	51.1	13.753	6	13	50	38.90	2.2202	16	41	18.9	11.618
7	12	12	39.57	1.9702	6	33	35.8	13.738	7	13	52	52.30	2.2266	16	52	53.6	11.538
8	12	14	37.90	1.9741	6	47	19.7	13.723	8	13	55	6.09	2.2331	17	4	23.4	11.455
9	12	16	36.46	1.9780	7	1	2.6	13.707	9	13	57	20.27	2.2396	17	15	48.2	11.373
10	12	18	35.26	1.9821	7	14	44.5	13.690	10	13	59	34.84	2.2461	17	27	8.1	11.290
11	12	20	34.31	1.9863	7	28	25.3	13.670	11	14	1	49.80	2.2527	17	38	22.9	11.203
12	12	22	33.61	1.9904	7	42	4.9	13.650	12	14	4	5.16	2.2593	17	49	32.4	11.114
13	12	24	33.16	1.9947	7	55	43.3	13.628	13	14	6	20.91	2.2658	18	0	36.6	11.025
14	12	26	32.97	1.9990	8	9	20.3	13.606	14	14	8	37.06	2.2725	18	11	35.4	10.934
15	12	28	33.04	2.0034	8	22	56.0	13.583	15	14	10	53.61	2.2792	18	22	28.7	10.843
16	12	30	33.38	2.0079	8	36	30.3	13.558	16	14	13	10.56	2.2858	18	33	16.4	10.748
17	12	32	33.99	2.0124	8	50	3.0	13.532	17	14	15	27.90	2.2923	18	43	58.5	10.653
18	12	34	34.87	2.0169	9	3	34.1	13.504	18	14	17	45.64	2.2990	18	54	34.7	10.554
19	12	36	36.02	2.0216	9	17	3.5	13.476	19	14	20	3.78	2.3057	19	5	5.0	10.455
20	12	38	37.46	2.0263	9	30	31.2	13.447	20	14	22	22.32	2.3123	19	15	29.3	10.355
21	12	40	39.18	2.0311	9	43	57.1	13.416	21	14	24	41.26	2.3190	19	25	47.6	10.253
22	12	42	41.19	2.0360	9	57	21.1	13.383	22	14	27	0.60	2.3257	19	35	59.7	10.149
23	12	44	43.50	2.0409	10	10	43.1	13.350	23	14	29	20.34	2.3323	19	46	5.5	10.043
24	12	46	46.10	2.0458	-10	24	3.1	-13.315	24	14	31	40.48	2.3390	-19	56	4.9	-9.937

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
OCTOBER 27.					OCTOBER 29.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	14 31 40.48	2.3390	-19 56 4.9	-9.987	0	16 30 50.41	2.5974	-25 21 4.8	-3.006
1	14 34 1.02	2.3457	20 5 57.9	9.828	1	16 33 26.35	2.6004	25 24 5.4	2.924
2	14 36 21.96	2.3523	20 15 44.3	9.718	2	16 36 2.46	2.6033	25 26 55.7	2.753
3	14 38 43.29	2.3588	20 25 24.0	9.806	3	16 38 38.74	2.6069	25 29 35.8	2.582
4	14 41 5.02	2.3655	20 34 56.9	9.492	4	16 41 15.17	2.6085	25 32 5.5	2.408
5	14 43 27.15	2.3721	20 44 23.0	9.378	5	16 43 51.76	2.6110	25 34 24.8	2.236
6	14 45 49.67	2.3786	20 53 42.2	9.261	6	16 46 28.49	2.6133	25 36 33.8	2.063
7	14 48 12.58	2.3852	21 2 54.3	9.143	7	16 49 5.35	2.6154	25 38 32.3	1.888
8	14 50 35.89	2.3917	21 11 59.3	9.023	8	16 51 42.34	2.6174	25 40 20.3	1.713
9	14 52 59.58	2.3981	21 20 57.0	8.901	9	16 54 19.44	2.6193	25 41 57.8	1.538
10	14 55 23.66	2.4046	21 29 47.4	8.778	10	16 56 56.65	2.6210	25 43 24.8	1.363
11	14 57 48.13	2.4110	21 38 30.4	8.654	11	16 59 33.96	2.6226	25 44 41.3	1.187
12	15 0 12.98	2.4174	21 47 5.9	8.528	12	17 2 11.36	2.6240	25 45 47.2	1.010
13	15 2 38.22	2.4238	21 55 33.7	8.400	13	17 4 48.84	2.6253	25 46 42.5	0.833
14	15 5 3.83	2.4300	22 3 53.9	8.272	14	17 7 26.39	2.6263	25 47 27.2	0.657
15	15 7 29.82	2.4363	22 12 6.3	8.141	15	17 10 4.00	2.6273	25 48 1.3	0.479
16	15 9 56.18	2.4424	22 20 10.8	8.009	16	17 12 41.66	2.6281	25 48 24.7	0.302
17	15 12 22.91	2.4486	22 28 7.4	7.876	17	17 15 19.37	2.6288	25 48 37.5	-0.124
18	15 14 50.01	2.4547	22 35 55.9	7.740	18	17 17 57.11	2.6293	25 48 39.6	+0.063
19	15 17 17.47	2.4607	22 43 36.2	7.603	19	17 20 34.88	2.6297	25 48 31.1	0.231
20	15 19 45.29	2.4667	22 51 8.3	7.466	20	17 23 12.67	2.6298	25 48 11.9	0.408
21	15 22 13.47	2.4726	22 58 32.1	7.327	21	17 25 50.46	2.6299	25 47 42.1	0.586
22	15 24 42.00	2.4783	23 5 47.5	7.186	22	17 28 28.26	2.6298	25 47 1.6	0.764
23	15 27 10.87	2.4841	-23 12 54.4	-7.043	23	17 31 6.04	2.6296	-25 46 10.4	+0.942
OCTOBER 28.					OCTOBER 30.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	15 29 40.09	2.4898	-23 19 52.7	-6.900	0	17 33 43.81	2.6292	-25 45 8.6	+1.119
1	15 32 9.65	2.4965	23 26 42.4	6.755	1	17 36 21.54	2.6296	25 43 56.1	1.297
2	15 34 39.55	2.5010	23 33 23.3	6.608	2	17 38 59.24	2.6279	25 42 33.0	1.474
3	15 37 9.77	2.5064	23 39 55.4	6.461	3	17 41 36.89	2.6271	25 40 59.2	1.652
4	15 39 40.32	2.5118	23 46 18.6	6.312	4	17 44 14.49	2.6261	25 39 14.8	1.828
5	15 42 11.19	2.5171	23 52 32.8	6.162	5	17 46 52.02	2.6248	25 37 19.8	2.004
6	15 44 42.37	2.5223	23 58 38.0	6.011	6	17 49 29.47	2.6236	25 35 14.3	2.180
7	15 47 13.86	2.5274	24 4 34.1	5.858	7	17 52 6.85	2.6223	25 32 58.2	2.356
8	15 49 45.66	2.5324	24 10 21.0	5.704	8	17 54 44.14	2.6207	25 30 31.6	2.532
9	15 52 17.75	2.5373	24 15 58.6	5.548	9	17 57 21.33	2.6189	25 27 54.4	2.708
10	15 54 50.14	2.5422	24 21 26.8	5.392	10	17 59 58.41	2.6171	25 25 6.7	2.882
11	15 57 22.81	2.5468	24 26 45.6	5.235	11	18 2 35.38	2.6151	25 22 8.6	3.055
12	15 59 55.75	2.5513	24 31 55.0	5.077	12	18 5 12.22	2.6129	25 19 0.1	3.228
13	16 2 28.97	2.5559	24 36 54.8	4.917	13	18 7 48.93	2.6107	25 15 41.2	3.402
14	16 5 2.46	2.5603	24 41 45.0	4.756	14	18 10 25.50	2.6083	25 12 11.9	3.574
15	16 7 36.21	2.5646	24 46 25.5	4.593	15	18 13 1.92	2.6058	25 8 32.3	3.746
16	16 10 10.21	2.5688	24 50 56.2	4.431	16	18 15 38.19	2.6032	25 4 42.4	3.917
17	16 12 44.46	2.5728	24 55 17.2	4.268	17	18 18 14.30	2.6003	25 0 42.3	4.087
18	16 15 18.94	2.5766	24 59 28.3	4.108	18	18 20 50.23	2.5974	24 56 32.0	4.256
19	16 17 53.65	2.5804	25 3 29.5	3.937	19	18 23 25.99	2.5944	24 52 11.6	4.425
20	16 20 28.59	2.5841	25 7 20.7	3.770	20	18 26 1.56	2.5913	24 47 41.0	4.593
21	16 23 3.74	2.5876	25 11 1.9	3.608	21	18 28 36.94	2.5882	24 43 0.4	4.760
22	16 25 39.10	2.5910	25 14 33.0	3.434	22	18 31 12.13	2.5848	24 38 9.8	4.926
23	16 28 14.66	2.5943	25 17 54.0	3.265	23	18 33 47.11	2.5812	24 33 9.3	5.092
24	16 30 50.41	2.5974	-25 21 4.8	-3.006	24	18 36 21.87	2.5775	-24 27 58.8	+5.257

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
OCTOBER 31.					NOVEMBER 2.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	18 36 21.87	2.5775	-24 27 58.8	+ 5.257	0	20 34 32.83	2.3321	-17 28 39.2	+11.690
1	18 38 56.41	2.5738	24 22 38.5	5.420	1	20 36 52.59	2.3365	17 16 54.8	11.788
2	18 41 30.73	2.5701	24 17 8.4	5.583	2	20 39 12.01	2.3310	17 5 4.6	11.885
3	18 44 4.82	2.5662	24 11 28.6	5.743	3	20 41 31.11	2.3157	16 53 8.6	11.981
4	18 46 38.67	2.5622	24 5 39.2	5.904	4	20 43 49.89	2.3103	16 41 6.9	12.075
5	18 49 12.28	2.5581	23 59 40.1	6.064	5	20 46 8.34	2.3048	16 28 59.6	12.168
6	18 51 45.64	2.5538	23 53 31.5	6.223	6	20 48 26.47	2.2995	16 16 46.8	12.258
7	18 54 18.74	2.5495	23 47 13.4	6.380	7	20 50 44.28	2.2942	16 4 28.6	12.348
8	18 56 51.58	2.5452	23 40 45.9	6.536	8	20 53 1.77	2.2888	15 52 5.0	12.437
9	18 59 24.16	2.5408	23 34 9.1	6.691	9	20 55 18.94	2.2836	15 39 36.2	12.523
10	19 1 56.47	2.5362	23 27 23.0	6.845	10	20 57 35.80	2.2784	15 27 2.3	12.606
11	19 4 28.50	2.5316	23 20 27.7	6.998	11	20 59 52.35	2.2733	15 14 23.3	12.691
12	19 7 0.26	2.5269	23 13 23.2	7.150	12	21 2 8.59	2.2682	15 1 39.4	12.773
13	19 9 31.73	2.5221	23 6 9.7	7.300	13	21 4 24.53	2.2631	14 48 50.6	12.853
14	19 12 2.91	2.5173	22 58 47.2	7.449	14	21 6 40.16	2.2580	14 35 57.1	12.931
15	19 14 33.80	2.5124	22 51 15.8	7.597	15	21 8 55.49	2.2530	14 22 58.9	13.006
16	19 17 4.40	2.5075	22 43 35.6	7.743	16	21 11 10.52	2.2481	14 9 56.1	13.084
17	19 19 34.70	2.5024	22 35 46.6	7.888	17	21 13 25.26	2.2432	13 56 48.8	13.158
18	19 22 4.69	2.4973	22 27 49.0	8.033	18	21 15 39.70	2.2383	13 43 37.1	13.232
19	19 24 34.37	2.4922	22 19 42.7	8.176	19	21 17 53.86	2.2337	13 30 21.0	13.303
20	19 27 3.75	2.4870	22 11 27.9	8.317	20	21 20 7.74	2.2289	13 17 0.7	13.373
21	19 29 32.81	2.4818	22 3 4.7	8.457	21	21 22 21.33	2.2242	13 3 36.3	13.441
22	19 32 1.56	2.4765	21 54 33.1	8.596	22	21 24 34.64	2.2196	12 50 7.8	13.506
23	19 34 29.99	2.4711	-21 45 53.2	+ 8.733	23	21 26 47.68	2.2150	-12 36 35.4	+13.573
NOVEMBER 1.					NOVEMBER 3.				
0	19 36 58.09	2.4657	-21 37 5.1	+ 8.869	0	21 29 0.44	2.2105	-12 22 59.1	+13.637
1	19 39 25.87	2.4603	21 28 8.9	9.003	1	21 31 12.94	2.2061	12 9 19.0	13.696
2	19 41 53.32	2.4548	21 19 4.7	9.136	2	21 33 25.17	2.2017	11 55 35.3	13.759
3	19 44 20.45	2.4494	21 9 52.6	9.268	3	21 35 37.14	2.1973	11 41 47.9	13.819
4	19 46 47.25	2.4439	21 0 32.6	9.398	4	21 37 48.85	2.1931	11 27 57.0	13.877
5	19 49 13.72	2.4384	20 51 4.8	9.528	5	21 40 0.31	2.1889	11 14 2.7	13.933
6	19 51 39.86	2.4328	20 41 29.3	9.654	6	21 42 11.52	2.1848	11 0 5.0	13.989
7	19 54 5.66	2.4273	20 31 46.3	9.780	7	21 44 22.48	2.1807	10 46 4.0	14.043
8	19 56 31.13	2.4218	20 21 55.7	9.905	8	21 46 33.20	2.1767	10 31 59.9	14.094
9	19 58 56.27	2.4162	20 11 57.7	10.028	9	21 48 43.68	2.1727	10 17 52.7	14.144
10	20 1 21.07	2.4105	20 1 52.4	10.148	10	21 50 53.92	2.1688	10 3 42.6	14.193
11	20 3 45.53	2.4048	19 51 39.9	10.268	11	21 53 3.94	2.1651	9 49 29.5	14.242
12	20 6 9.65	2.3992	19 41 20.2	10.387	12	21 55 13.73	2.1613	9 35 13.6	14.288
13	20 8 33.43	2.3936	19 30 53.5	10.503	13	21 57 23.30	2.1577	9 20 55.0	14.333
14	20 10 56.88	2.3880	19 20 19.8	10.619	14	21 59 32.65	2.1541	9 6 33.7	14.376
15	20 13 19.99	2.3823	19 9 39.2	10.733	15	22 1 41.79	2.1506	8 52 9.9	14.418
16	20 15 42.76	2.3767	18 58 51.8	10.846	16	22 3 50.72	2.1471	8 37 43.5	14.459
17	20 18 5.19	2.3711	18 47 57.7	10.957	17	22 5 59.44	2.1437	8 23 14.8	14.498
18	20 20 27.20	2.3655	18 36 57.0	11.066	18	22 8 7.96	2.1403	8 8 43.8	14.536
19	20 22 49.05	2.3598	18 25 49.8	11.173	19	22 10 16.28	2.1371	7 54 10.5	14.573
20	20 25 10.47	2.3543	18 14 36.2	11.280	20	22 12 24.41	2.1339	7 39 35.1	14.608
21	20 27 31.56	2.3488	18 3 16.2	11.385	21	22 14 32.35	2.1308	7 24 57.6	14.642
22	20 29 52.32	2.3432	17 51 50.0	11.488	22	22 16 40.11	2.1278	7 10 18.1	14.674
23	20 32 12.74	2.3376	17 40 17.6	11.590	23	22 18 47.68	2.1248	6 55 36.7	14.705
24	20 34 32.83	2.3321	-17 28 39.2	+11.690	24	22 20 55.08	2.1219	- 6 40 53.5	+14.734

GREENWICH MEAN TIME.

Hour.	Right Ascension.			Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.			Var. per Min.	Declination.	Var. per Min.				
NOVEMBER 4.							NOVEMBER 6.										
	h	m	s	s	°	'	''		h	m	s	s	°	'	''	''	
0	22	20	55.08	2.1219	-6	40	53.5	+14.734	0	0	0	50.99	2.0698	+5	15	8.7	+14.605
1	22	23	2.31	2.1191	6	26	8.6	14.763	1	0	2	55.20	2.0705	5	29	44.0	14.572
2	22	25	9.37	2.1168	6	11	22.0	14.789	2	0	4	59.45	2.0712	5	44	17.3	14.538
3	22	27	16.27	2.1137	5	56	33.9	14.814	3	0	7	3.74	2.0719	5	58	48.5	14.501
4	22	29	23.01	2.1111	5	41	44.3	14.839	4	0	9	8.08	2.0726	6	13	17.4	14.463
5	22	31	29.60	2.1086	5	26	53.2	14.862	5	0	11	12.47	2.0736	6	27	44.1	14.425
6	22	33	36.04	2.1062	5	12	0.9	14.883	6	0	13	16.91	2.0745	6	42	8.4	14.385
7	22	35	42.34	2.1038	4	57	7.3	14.903	7	0	15	21.41	2.0756	6	56	30.3	14.344
8	22	37	48.49	2.1014	4	42	12.6	14.921	8	0	17	25.98	2.0767	7	10	49.7	14.302
9	22	39	54.51	2.0993	4	27	16.8	14.938	9	0	19	30.61	2.0778	7	25	6.5	14.258
10	22	42	0.40	2.0972	4	12	20.0	14.955	10	0	21	35.31	2.0790	7	39	20.7	14.213
11	22	44	6.17	2.0951	3	57	22.2	14.970	11	0	23	40.09	2.0803	7	53	32.1	14.168
12	22	46	11.81	2.0930	3	42	23.6	14.983	12	0	25	44.94	2.0815	8	7	40.8	14.121
13	22	48	17.33	2.0911	3	27	24.2	14.995	13	0	27	49.87	2.0828	8	21	46.6	14.073
14	22	50	22.74	2.0893	3	12	24.2	15.005	14	0	29	54.88	2.0843	8	35	49.5	14.023
15	22	52	28.04	2.0875	2	57	23.6	15.014	15	0	31	59.98	2.0858	8	49	49.4	13.973
16	22	54	33.24	2.0858	2	42	22.5	15.023	16	0	34	5.17	2.0873	9	3	46.2	13.920
17	22	56	38.34	2.0843	2	27	20.9	15.030	17	0	36	10.45	2.0888	9	17	39.8	13.867
18	22	58	43.35	2.0827	2	12	18.9	15.036	18	0	38	15.82	2.0903	9	31	30.2	13.813
19	23	0	48.26	2.0811	1	57	16.6	15.039	19	0	40	21.29	2.0921	9	45	17.3	13.758
20	23	2	53.08	2.0796	1	42	14.2	15.042	20	0	42	26.87	2.0938	9	59	1.1	13.702
21	23	4	57.83	2.0785	1	27	11.6	15.044	21	0	44	32.55	2.0956	10	12	41.5	13.643
22	23	7	2.50	2.0772	1	12	8.9	15.044	22	0	46	38.34	2.0973	10	26	18.3	13.584
23	23	9	7.09	2.0760	-0	57	6.3	+15.043	23	0	48	44.23	2.0992	+10	39	51.6	+13.524
NOVEMBER 5.							NOVEMBER 7.										
0	23	11	11.62	2.0749	-0	42	3.7	+15.042	0	0	50	50.24	2.1012	+10	53	21.2	+13.463
1	23	13	16.08	2.0739	0	27	1.3	15.038	1	0	52	56.37	2.1031	11	6	47.1	13.400
2	23	15	20.49	2.0730	-0	11	59.2	15.032	2	0	55	2.61	2.1050	11	20	9.2	13.337
3	23	17	24.84	2.0721	+0	3	2.5	15.026	3	0	57	8.97	2.1071	11	33	27.5	13.272
4	23	19	29.14	2.0713	0	18	3.9	15.018	4	0	59	15.46	2.1093	11	46	41.8	13.205
5	23	21	33.39	2.0705	0	33	4.7	15.009	5	1	1	22.08	2.1114	11	59	52.1	13.138
6	23	23	37.60	2.0698	0	48	5.0	15.000	6	1	3	28.83	2.1136	12	12	58.4	13.070
7	23	25	41.77	2.0693	1	3	4.7	14.990	7	1	5	35.71	2.1158	12	26	0.5	13.000
8	23	27	45.91	2.0687	1	18	3.7	14.977	8	1	7	42.72	2.1179	12	38	58.4	12.930
9	23	29	50.01	2.0682	1	33	1.9	14.963	9	1	9	49.86	2.1203	12	51	52.1	12.858
10	23	31	54.09	2.0678	1	47	59.2	14.948	10	1	11	57.15	2.1226	13	4	41.4	12.785
11	23	33	58.15	2.0676	2	2	55.6	14.931	11	1	14	4.57	2.1248	13	17	26.3	12.712
12	23	36	2.20	2.0673	2	17	50.9	14.913	12	1	16	12.13	2.1273	13	30	6.8	12.637
13	23	38	6.23	2.0672	2	32	45.2	14.895	13	1	18	19.84	2.1297	13	42	42.7	12.560
14	23	40	10.26	2.0671	2	47	38.3	14.874	14	1	20	27.69	2.1321	13	55	14.0	12.483
15	23	42	14.28	2.0670	3	2	30.1	14.853	15	1	22	35.69	2.1347	14	7	40.6	12.403
16	23	44	18.30	2.0671	3	17	20.7	14.831	16	1	24	43.85	2.1372	14	20	2.4	12.324
17	23	46	22.33	2.0673	3	32	9.8	14.807	17	1	26	52.15	2.1396	14	32	19.5	12.243
18	23	48	26.37	2.0674	3	46	57.5	14.783	18	1	29	0.60	2.1422	14	44	31.6	12.161
19	23	50	30.42	2.0676	4	1	43.7	14.756	19	1	31	9.21	2.1448	14	56	38.8	12.079
20	23	52	34.48	2.0679	4	16	28.2	14.728	20	1	33	17.97	2.1473	15	8	41.1	11.995
21	23	54	38.57	2.0683	4	31	11.0	14.699	21	1	35	26.89	2.1500	15	20	38.2	11.909
22	23	56	42.68	2.0688	4	45	52.1	14.670	22	1	37	35.97	2.1527	15	32	30.2	11.823
23	23	58	46.82	2.0693	5	0	31.4	14.638	23	1	39	45.21	2.1553	15	44	17.0	11.736
24	0	0	50.99	2.0698	+5	15	8.7	+14.805	24	1	41	54.61	2.1580	+15	55	58.5	+11.648

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
NOVEMBER 8.					NOVEMBER 10.				
	^h ^m ^s	^s	[°] ['] ["]	["]		^h ^m ^s	^s	[°] ['] ["]	["]
0	1 41 54.61	2.1580	+15 55 58.5	+11.648	0	3 28 33.80	2.2781	+23 14 51.4	+6.316
1	1 44 4.17	2.1607	16 7 34.7	11.558	1	3 30 50.54	2.2798	23 21 6.5	6.198
2	1 46 13.89	2.1634	16 19 5.5	11.468	2	3 33 7.37	2.2813	23 27 13.9	6.058
3	1 48 23.78	2.1662	16 30 30.8	11.376	3	3 35 24.30	2.2830	23 33 13.5	5.928
4	1 50 33.83	2.1688	16 41 50.6	11.283	4	3 37 41.33	2.2845	23 39 5.2	5.797
5	1 52 44.04	2.1716	16 53 4.8	11.190	5	3 39 58.44	2.2859	23 44 49.1	5.667
6	1 54 54.42	2.1744	17 4 13.4	11.096	6	3 42 15.64	2.2873	23 50 25.2	5.535
7	1 57 4.97	2.1772	17 15 16.3	11.000	7	3 44 32.92	2.2886	23 55 53.3	5.403
8	1 59 15.68	2.1799	17 26 13.4	10.903	8	3 46 50.27	2.2898	24 1 13.5	5.271
9	2 1 26.56	2.1827	17 37 4.6	10.805	9	3 49 7.70	2.2911	24 6 25.8	5.138
10	2 3 37.60	2.1854	17 47 50.0	10.707	10	3 51 25.20	2.2922	24 11 30.1	5.005
11	2 5 48.81	2.1883	17 58 29.4	10.607	11	3 53 42.76	2.2933	24 16 26.4	4.872
12	2 8 0.19	2.1911	18 9 2.8	10.507	12	3 56 0.39	2.2943	24 21 14.7	4.738
13	2 10 11.74	2.1938	18 19 30.2	10.405	13	3 58 18.07	2.2952	24 25 55.0	4.604
14	2 12 23.45	2.1966	18 29 51.4	10.302	14	4 0 35.81	2.2960	24 30 27.2	4.470
15	2 14 35.33	2.1993	18 40 6.4	10.198	15	4 2 53.59	2.2968	24 34 51.4	4.336
16	2 16 47.37	2.2021	18 50 15.2	10.094	16	4 5 11.42	2.2975	24 39 7.5	4.201
17	2 18 59.58	2.2049	19 0 17.7	9.988	17	4 7 29.29	2.2981	24 43 15.5	4.066
18	2 21 11.96	2.2077	19 10 13.8	9.882	18	4 9 47.19	2.2986	24 47 15.4	3.930
19	2 23 24.50	2.2104	19 20 3.5	9.774	19	4 12 5.12	2.2991	24 51 7.1	3.795
20	2 25 37.21	2.2132	19 29 46.7	9.666	20	4 14 23.08	2.2996	24 54 50.8	3.660
21	2 27 50.08	2.2158	19 39 23.4	9.558	21	4 16 41.06	2.2998	24 58 26.3	3.523
22	2 30 3.11	2.2185	19 48 53.6	9.448	22	4 18 59.06	2.3001	25 1 53.6	3.388
23	2 32 16.30	2.2213	+19 58 17.1	+9.336	23	4 21 17.07	2.3002	+25 5 12.8	+3.252
NOVEMBER 9.					NOVEMBER 11.				
	^h ^m ^s	^s	[°] ['] ["]	["]		^h ^m ^s	^s	[°] ['] ["]	["]
0	2 34 29.66	2.2240	+20 7 33.9	+9.224	0	4 23 35.08	2.3003	+25 8 23.8	+3.115
1	2 36 43.18	2.2266	20 16 44.0	9.112	1	4 25 53.10	2.3003	25 11 26.6	2.979
2	2 38 56.85	2.2292	20 25 47.3	8.998	2	4 28 11.12	2.3003	25 14 21.3	2.843
3	2 41 10.68	2.2318	20 34 43.8	8.884	3	4 30 29.13	2.3001	25 17 7.8	2.707
4	2 43 24.66	2.2343	20 43 33.4	8.768	4	4 32 47.13	2.2999	25 19 46.1	2.570
5	2 45 38.79	2.2368	20 52 16.0	8.653	5	4 35 5.12	2.2996	25 22 16.2	2.434
6	2 47 53.08	2.2394	21 0 51.7	8.537	6	4 37 23.08	2.2992	25 24 38.2	2.298
7	2 50 7.52	2.2419	21 9 20.4	8.419	7	4 39 41.02	2.2988	25 26 52.0	2.162
8	2 52 22.11	2.2443	21 17 42.0	8.301	8	4 41 58.93	2.2982	25 28 57.6	2.025
9	2 54 36.84	2.2468	21 25 56.5	8.182	9	4 44 16.80	2.2975	25 30 55.0	1.888
10	2 56 51.72	2.2492	21 34 3.8	8.062	10	4 46 34.63	2.2968	25 32 44.2	1.753
11	2 59 6.74	2.2515	21 42 3.9	7.942	11	4 48 52.42	2.2961	25 34 25.3	1.617
12	3 1 21.90	2.2538	21 49 56.8	7.821	12	4 51 10.16	2.2952	25 35 58.2	1.480
13	3 3 37.20	2.2561	21 57 42.4	7.698	13	4 53 27.84	2.2943	25 37 22.9	1.344
14	3 5 52.63	2.2583	22 5 20.6	7.576	14	4 55 45.47	2.2933	25 38 59.5	1.209
15	3 8 8.20	2.2606	22 12 51.5	7.453	15	4 58 3.03	2.2921	25 39 48.0	1.073
16	3 10 23.90	2.2627	22 20 15.0	7.329	16	5 0 20.52	2.2909	25 40 48.3	0.938
17	3 12 39.72	2.2648	22 27 31.0	7.204	17	5 2 37.94	2.2897	25 41 40.5	0.803
18	3 14 55.67	2.2668	22 34 39.5	7.079	18	5 4 55.28	2.2883	25 42 24.6	0.668
19	3 17 11.74	2.2688	22 41 40.5	6.953	19	5 7 12.53	2.2868	25 43 0.6	0.533
20	3 19 27.93	2.2708	22 48 33.9	6.827	20	5 9 29.70	2.2854	25 43 28.6	0.399
21	3 21 44.23	2.2726	22 55 19.7	6.701	21	5 11 46.78	2.2838	25 43 48.5	0.264
22	3 24 0.64	2.2745	23 1 58.0	6.574	22	5 14 3.76	2.2822	25 44 0.3	+0.130
23	3 26 17.17	2.2763	23 8 28.6	6.445	23	5 16 20.64	2.2805	25 44 4.1	-0.003
24	3 28 33.80	2.2781	+23 14 51.4	+6.316	24	5 18 37.42	2.2787	+25 43 59.9	-0.137

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
NOVEMBER 12.					NOVEMBER 14.				
0	h m s	s	° ' "	"	0	h m s	s	° ' "	"
0	5 18 37.42	2.3767	+25 43 59.9	-0.137	0	7 4 43.02	2.1234	+23 12 56.2	-5.923
1	5 20 54.06	2.3768	25 43 47.7	0.370	1	7 6 50.30	2.1193	23 6 57.7	6.028
2	5 23 10.63	2.3748	25 43 27.5	0.403	2	7 8 57.34	2.1153	23 0 52.9	6.131
3	5 25 27.06	2.3728	25 42 59.4	0.535	3	7 11 4.13	2.1111	22 54 42.0	6.233
4	5 27 43.37	2.3708	25 42 23.3	0.668	4	7 13 10.67	2.1069	22 48 24.9	6.335
5	5 29 59.55	2.3685	25 41 39.3	0.798	5	7 15 16.96	2.1028	22 42 1.8	6.436
6	5 32 15.59	2.3663	25 40 47.5	0.929	6	7 17 23.00	2.0986	22 35 32.6	6.537
7	5 34 31.50	2.3640	25 39 47.8	1.060	7	7 19 28.79	2.0944	22 28 57.4	6.636
8	5 36 47.27	2.3616	25 38 40.3	1.190	8	7 21 34.33	2.0903	22 22 16.3	6.734
9	5 39 2.89	2.3592	25 37 25.0	1.320	9	7 23 39.62	2.0861	22 15 29.3	6.833
10	5 41 18.37	2.3567	25 36 1.9	1.450	10	7 25 44.66	2.0819	22 8 36.4	6.930
11	5 43 33.69	2.3540	25 34 31.0	1.579	11	7 27 49.45	2.0778	22 1 37.7	7.026
12	5 45 48.85	2.3513	25 32 52.4	1.706	12	7 29 53.99	2.0736	21 54 33.3	7.122
13	5 48 3.85	2.3487	25 31 6.1	1.835	13	7 31 58.28	2.0694	21 47 23.1	7.217
14	5 50 18.69	2.3459	25 29 12.2	1.963	14	7 34 2.32	2.0653	21 40 7.3	7.310
15	5 52 33.36	2.3431	25 27 10.6	2.069	15	7 36 6.11	2.0611	21 32 45.9	7.403
16	5 54 47.86	2.3402	25 25 1.5	2.215	16	7 38 9.65	2.0569	21 25 18.9	7.496
17	5 57 2.18	2.3373	25 22 44.8	2.341	17	7 40 12.94	2.0528	21 17 46.4	7.588
18	5 59 16.32	2.3343	25 20 20.6	2.467	18	7 42 15.98	2.0486	21 10 8.4	7.678
19	6 1 30.28	2.3311	25 17 48.8	2.592	19	7 44 18.77	2.0445	21 2 25.0	7.768
20	6 3 44.05	2.3279	25 15 9.6	2.716	20	7 46 21.32	2.0404	20 54 36.2	7.858
21	6 5 57.63	2.3248	25 12 22.9	2.839	21	7 48 23.62	2.0363	20 46 42.1	7.947
22	6 8 11.02	2.3216	25 9 28.9	2.962	22	7 50 25.68	2.0323	20 38 42.6	8.035
23	6 10 24.22	2.3183	+25 6 27.5	-3.084	23	7 52 27.50	2.0283	+20 30 37.9	-8.122
NOVEMBER 13.					NOVEMBER 15.				
0	6 12 37.21	2.3149	+25 3 18.8	-3.206	0	7 54 29.07	2.0242	+20 22 28.0	-8.206
1	6 14 50.01	2.3116	25 0 2.8	3.328	1	7 56 30.40	2.0202	20 14 13.0	8.293
2	6 17 2.60	2.3081	24 56 39.5	3.448	2	7 58 31.49	2.0162	20 5 52.8	8.378
3	6 19 14.98	2.3046	24 53 9.0	3.568	3	8 0 32.34	2.0122	19 57 27.6	8.463
4	6 21 27.15	2.3011	24 49 31.4	3.687	4	8 2 32.95	2.0082	19 48 57.3	8.546
5	6 23 39.11	2.1975	24 45 46.6	3.806	5	8 4 33.32	2.0043	19 40 22.1	8.628
6	6 25 50.85	2.1939	24 41 54.7	3.923	6	8 6 33.46	2.0004	19 31 41.9	8.710
7	6 28 2.38	2.1903	24 37 55.8	4.041	7	8 8 33.37	1.9965	19 22 56.9	8.790
8	6 30 13.68	2.1866	24 33 49.8	4.158	8	8 10 33.04	1.9926	19 14 7.1	8.871
9	6 32 24.76	2.1828	24 29 36.9	4.273	9	8 12 32.48	1.9888	19 5 12.4	8.951
10	6 34 35.62	2.1791	24 25 17.1	4.388	10	8 14 31.69	1.9849	18 56 13.0	9.029
11	6 36 46.25	2.1753	24 20 50.4	4.502	11	8 16 30.87	1.9812	18 47 8.9	9.108
12	6 38 56.65	2.1714	24 16 16.9	4.616	12	8 18 29.43	1.9775	18 38 0.1	9.185
13	6 41 6.82	2.1676	24 11 36.5	4.729	13	8 20 27.97	1.9738	18 28 46.7	9.261
14	6 43 16.76	2.1637	24 6 49.4	4.842	14	8 22 26.28	1.9700	18 19 28.8	9.337
15	6 45 26.46	2.1598	24 1 55.5	4.963	15	8 24 24.37	1.9664	18 10 6.3	9.412
16	6 47 35.93	2.1558	23 56 55.0	5.063	16	8 26 22.25	1.9628	18 0 39.4	9.486
17	6 49 45.16	2.1519	23 51 47.9	5.173	17	8 28 19.91	1.9593	17 51 8.0	9.560
18	6 51 54.16	2.1479	23 46 34.2	5.283	18	8 30 17.36	1.9558	17 41 32.2	9.633
19	6 54 2.91	2.1438	23 41 13.9	5.392	19	8 32 14.60	1.9523	17 31 52.0	9.705
20	6 56 11.42	2.1398	23 35 47.2	5.499	20	8 34 11.63	1.9488	17 22 7.6	9.776
21	6 58 19.69	2.1358	23 30 14.0	5.607	21	8 36 8.45	1.9453	17 12 18.9	9.847
22	7 0 27.71	2.1317	23 24 34.4	5.713	22	8 38 5.07	1.9420	17 2 26.0	9.917
23	7 2 35.49	2.1276	23 18 48.5	5.818	23	8 40 1.49	1.9386	16 52 28.9	9.986
24	7 4 43.02	2.1234	+23 12 56.2	-5.923	24	8 41 57.70	1.9353	+16 42 27.7	-10.054

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
NOVEMBER 16.					NOVEMBER 18.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	8 41 57.70	1.9353	+16 42 27.7	-10.054	0	10 12 0.14	1.8383	+7 33 35.9	-12.567
1	8 43 53.72	1.9321	16 32 22.4	10.123	1	10 13 50.42	1.8377	7 21 0.8	12.003
2	8 45 49.55	1.9288	16 22 13.0	10.190	2	10 15 40.66	1.8373	7 8 23.5	12.630
3	8 47 45.18	1.9256	16 11 59.6	10.256	3	10 17 30.88	1.8368	6 55 44.1	12.674
4	8 49 40.62	1.9225	16 1 42.3	10.322	4	10 19 21.07	1.8364	6 43 2.6	12.709
5	8 51 35.88	1.9195	15 51 21.0	10.388	5	10 21 11.25	1.8362	6 30 19.0	12.743
6	8 53 30.96	1.9164	15 40 55.8	10.452	6	10 23 1.41	1.8359	6 17 33.4	12.777
7	8 55 25.85	1.9134	15 30 26.8	10.515	7	10 24 51.56	1.8358	6 4 45.8	12.810
8	8 57 20.57	1.9105	15 19 54.0	10.578	8	10 26 41.71	1.8358	5 51 56.2	12.843
9	8 59 15.11	1.9076	15 9 17.4	10.641	9	10 28 31.85	1.8358	5 39 4.7	12.874
10	9 1 9.48	1.9048	14 58 37.1	10.703	10	10 30 22.00	1.8358	5 26 11.3	12.906
11	9 3 3.68	1.9019	14 47 53.1	10.763	11	10 32 12.15	1.8359	5 13 16.0	12.936
12	9 4 57.71	1.8992	14 37 5.5	10.823	12	10 34 2.81	1.8362	5 0 19.0	12.965
13	9 6 51.58	1.8965	14 26 14.3	10.883	13	10 35 52.49	1.8365	4 47 20.2	12.994
14	9 8 45.29	1.8938	14 15 19.5	10.943	14	10 37 42.69	1.8366	4 34 19.7	13.023
15	9 10 38.84	1.8913	14 4 21.2	11.001	15	10 39 32.91	1.8372	4 21 17.5	13.051
16	9 12 32.24	1.8888	13 53 19.4	11.068	16	10 41 23.15	1.8377	4 8 13.6	13.078
17	9 14 25.49	1.8863	13 42 14.2	11.115	17	10 43 13.43	1.8383	3 55 8.1	13.104
18	9 16 18.59	1.8838	13 31 5.6	11.172	18	10 45 3.75	1.8390	3 42 1.1	13.130
19	9 18 11.55	1.8815	13 19 53.6	11.228	19	10 46 54.11	1.8397	3 28 52.5	13.155
20	9 20 4.37	1.8792	13 8 38.3	11.283	20	10 48 44.51	1.8404	3 15 42.5	13.179
21	9 21 57.05	1.8768	12 57 19.7	11.337	21	10 50 34.96	1.8413	3 2 31.0	13.203
22	9 23 49.59	1.8746	12 45 57.9	11.391	22	10 52 25.47	1.8423	2 49 18.1	13.227
23	9 25 42.00	1.8725	+12 34 32.8	-11.444	23	10 54 16.03	1.8433	+2 36 3.8	-13.248
NOVEMBER 17.					NOVEMBER 19.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	9 27 34.29	1.8704	+12 23 4.6	-11.497	0	10 56 6.66	1.8443	+2 22 48.3	-13.270
1	9 29 26.45	1.8683	12 11 33.2	11.548	1	10 57 57.35	1.8454	2 9 31.4	13.292
2	9 31 18.49	1.8663	11 59 58.8	11.599	2	10 59 48.11	1.8467	1 56 13.3	13.312
3	9 33 10.41	1.8644	11 48 21.3	11.650	3	11 1 38.95	1.8480	1 42 54.0	13.332
4	9 35 2.22	1.8626	11 36 40.8	11.700	4	11 3 29.87	1.8494	1 29 33.5	13.351
5	9 36 53.92	1.8608	11 24 57.3	11.749	5	11 5 20.88	1.8508	1 16 11.9	13.368
6	9 38 45.51	1.8590	11 13 10.9	11.798	6	11 7 11.97	1.8523	1 2 49.3	13.385
7	9 40 37.00	1.8573	11 1 21.6	11.846	7	11 9 3.16	1.8539	0 49 25.6	13.403
8	9 42 28.39	1.8558	10 49 29.4	11.893	8	11 10 54.44	1.8556	0 36 1.0	13.418
9	9 44 19.69	1.8542	10 37 34.4	11.940	9	11 12 45.83	1.8573	0 22 35.4	13.434
10	9 46 10.89	1.8526	10 25 36.6	11.987	10	11 14 37.32	1.8592	+0 9 8.9	13.449
11	9 48 2.00	1.8512	10 13 36.0	12.032	11	11 16 28.93	1.8611	-0 4 18.5	13.463
12	9 49 53.03	1.8498	10 1 32.8	12.076	12	11 18 20.65	1.8630	0 17 46.6	13.475
13	9 51 43.98	1.8485	9 49 26.9	12.121	13	11 20 12.49	1.8651	0 31 15.5	13.488
14	9 53 34.85	1.8473	9 37 18.3	12.165	14	11 22 4.46	1.8673	0 44 45.1	13.499
15	9 55 25.65	1.8461	9 25 7.1	12.208	15	11 23 56.56	1.8694	0 58 15.4	13.510
16	9 57 16.38	1.8449	9 12 53.4	12.249	16	11 25 48.79	1.8717	1 11 46.3	13.520
17	9 59 7.04	1.8438	9 0 37.2	12.291	17	11 27 41.16	1.8740	1 25 17.8	13.529
18	10 0 57.64	1.8428	8 48 18.5	12.333	18	11 29 33.67	1.8764	1 38 49.8	13.538
19	10 2 48.18	1.8418	8 35 57.3	12.373	19	11 31 26.33	1.8790	1 52 22.3	13.545
20	10 4 38.66	1.8409	8 23 33.7	12.413	20	11 33 19.15	1.8816	2 5 55.2	13.552
21	10 6 29.09	1.8402	8 11 7.7	12.453	21	11 35 12.12	1.8843	2 19 28.5	13.558
22	10 8 19.48	1.8395	7 58 39.4	12.491	22	11 37 5.26	1.8870	2 33 2.1	13.563
23	10 10 9.83	1.8388	7 46 8.8	12.529	23	11 38 58.56	1.8898	2 46 36.0	13.567
24	10 12 0.14	1.8383	+ 7 33 35.9	-12.567	24	11 40 52.03	1.8927	-3 0 10.1	-13.570

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
NOVEMBER 20.					NOVEMBER 22.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	11 40 52.08	1.9927	- 3 0 10.1	-13.570	0	13 16 30.90	2.1214	-13 36 42.8	-12.518
1	11 42 45.68	1.9967	3 13 44.4	13.573	1	13 18 38.38	2.1279	13 49 12.3	12.466
2	11 44 39.51	1.9988	3 27 18.8	13.574	2	13 20 46.25	2.1344	14 1 38.7	12.413
3	11 46 33.53	1.9918	3 40 53.3	13.575	3	13 22 54.51	2.1411	14 14 1.8	12.357
4	11 48 27.73	1.9960	3 54 27.8	13.574	4	13 25 3.18	2.1478	14 26 21.5	12.300
5	11 50 22.13	1.9983	4 8 2.2	13.573	5	13 27 12.25	2.1546	14 38 37.8	12.243
6	11 52 16.73	1.9117	4 21 36.6	13.572	6	13 29 21.73	2.1613	14 50 50.6	12.183
7	11 54 11.53	1.9151	4 35 10.8	13.569	7	13 31 31.61	2.1682	15 2 59.7	12.121
8	11 56 6.54	1.9186	4 48 44.9	13.566	8	13 33 41.91	2.1752	15 15 5.1	12.058
9	11 58 1.76	1.9222	5 2 18.7	13.560	9	13 35 52.63	2.1821	15 27 6.7	11.994
10	11 59 57.20	1.9259	5 15 52.1	13.554	10	13 38 3.76	2.1890	15 39 4.4	11.928
11	12 1 52.87	1.9297	5 29 25.2	13.548	11	13 40 15.31	2.1961	15 50 58.1	11.861
12	12 3 48.76	1.9334	5 42 57.9	13.541	12	13 42 27.29	2.2032	16 2 47.7	11.792
13	12 5 44.88	1.9373	5 56 30.1	13.532	13	13 44 39.69	2.2103	16 14 33.1	11.721
14	12 7 41.24	1.9413	6 10 1.7	13.522	14	13 46 52.53	2.2176	16 26 14.2	11.648
15	12 9 37.84	1.9454	6 23 32.7	13.512	15	13 49 5.80	2.2248	16 37 50.9	11.574
16	12 11 34.69	1.9496	6 37 3.1	13.500	16	13 51 19.51	2.2321	16 49 23.1	11.499
17	12 13 31.79	1.9538	6 50 32.7	13.488	17	13 53 33.65	2.2393	17 0 50.8	11.423
18	12 15 29.15	1.9581	7 4 1.6	13.474	18	13 55 48.23	2.2467	17 12 13.8	11.348
19	12 17 26.76	1.9623	7 17 29.6	13.459	19	13 58 3.25	2.2541	17 23 32.0	11.263
20	12 19 24.63	1.9668	7 30 56.7	13.443	20	14 0 18.72	2.2616	17 34 45.3	11.180
21	12 21 22.78	1.9714	7 44 22.8	13.427	21	14 2 34.64	2.2690	17 45 53.6	11.096
22	12 23 21.20	1.9760	7 57 47.9	13.409	22	14 4 51.00	2.2764	17 56 56.8	11.011
23	12 25 19.90	1.9807	- 8 11 11.9	-13.390	23	14 7 7.81	2.2840	-18 7 54.9	-10.924
NOVEMBER 21.					NOVEMBER 23.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	12 27 18.88	1.9854	- 8 24 34.7	-13.370	0	14 9 25.08	2.2916	-18 18 47.7	-10.835
1	12 29 18.15	1.9903	8 37 56.3	13.348	1	14 11 42.80	2.2991	18 29 35.1	10.744
2	12 31 17.71	1.9952	8 51 16.5	13.325	2	14 14 0.97	2.3066	18 40 17.0	10.652
3	12 33 17.57	2.0002	9 4 35.3	13.302	3	14 16 19.59	2.3142	18 50 53.3	10.558
4	12 35 17.73	2.0052	9 17 52.7	13.278	4	14 18 38.67	2.3218	19 1 23.9	10.462
5	12 37 18.19	2.0103	9 31 8.6	13.252	5	14 20 58.21	2.3294	19 11 48.7	10.364
6	12 39 18.97	2.0156	9 44 22.9	13.226	6	14 23 18.20	2.3370	19 22 7.6	10.264
7	12 41 20.06	2.0208	9 57 35.6	13.197	7	14 25 38.65	2.3447	19 32 20.4	10.163
8	12 43 21.47	2.0262	10 10 46.5	13.167	8	14 27 59.56	2.3523	19 42 27.1	10.060
9	12 45 23.20	2.0316	10 23 55.6	13.136	9	14 30 20.92	2.3599	19 52 27.6	9.956
10	12 47 25.26	2.0371	10 37 2.8	13.104	10	14 32 42.75	2.3676	20 2 21.8	9.849
11	12 49 27.65	2.0427	10 50 8.1	13.071	11	14 35 5.03	2.3752	20 12 9.5	9.741
12	12 51 30.38	2.0483	11 3 11.3	13.036	12	14 37 27.77	2.3828	20 21 50.7	9.632
13	12 53 33.45	2.0541	11 16 12.4	13.000	13	14 39 50.97	2.3904	20 31 25.3	9.520
14	12 55 36.87	2.0598	11 29 11.3	12.963	14	14 42 14.62	2.3980	20 40 53.1	9.406
15	12 57 40.63	2.0656	11 42 8.0	12.925	15	14 44 38.73	2.4056	20 50 14.0	9.290
16	12 59 44.74	2.0716	11 55 2.3	12.885	16	14 47 3.29	2.4132	20 59 27.9	9.173
17	13 1 49.22	2.0777	12 7 54.2	12.844	17	14 49 28.31	2.4207	21 8 34.8	9.055
18	13 3 54.06	2.0837	12 20 43.6	12.802	18	14 51 53.77	2.4282	21 17 34.5	8.934
19	13 5 59.26	2.0898	12 33 30.4	12.758	19	14 54 19.69	2.4358	21 26 26.9	8.812
20	13 8 4.83	2.0960	12 46 14.6	12.713	20	14 56 46.06	2.4433	21 35 11.9	8.688
21	13 10 10.78	2.1023	12 58 56.0	12.667	21	14 59 12.88	2.4506	21 43 49.5	8.563
22	13 12 17.10	2.1086	13 11 34.6	12.618	22	15 1 40.13	2.4579	21 52 19.4	8.434
23	13 14 23.81	2.1150	13 24 10.2	12.568	23	15 4 7.83	2.4653	22 0 41.6	8.306
24	13 16 30.90	2.1214	-13 36 42.8	-12.518	24	15 6 35.97	2.4727	-22 8 56.0	-8.174

GREENWICH MEAN TIME.

Hour.	Right Ascension.			Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.			Var. per Min.	Declination.	Var. per Min.				
NOVEMBER 24.							NOVEMBER 26.										
	h	m	s	s	°	'	"		h	m	s	s	°	'	"	"	
0	15	6	35.97	2.4727	-22	8	56.0	-8.174	0	17	12	0.01	2.7029	-25	41	39.0	-0.234
1	15	9	4.55	2.4799	22	17	2.5	8.042	1	17	14	42.22	2.7040	25	41	47.4	-0.047
2	15	11	33.56	2.4871	22	25	1.0	7.908	2	17	17	24.49	2.7049	25	41	44.6	+0.140
3	15	14	3.00	2.4943	22	32	51.4	7.771	3	17	20	6.81	2.7057	25	41	30.6	0.328
4	15	16	32.87	2.5013	22	40	33.5	7.633	4	17	22	49.17	2.7063	25	41	5.3	0.516
5	15	19	3.16	2.5083	22	48	7.3	7.493	5	17	25	31.56	2.7067	25	40	28.7	0.703
6	15	21	33.87	2.5153	22	55	32.7	7.353	6	17	28	13.97	2.7069	25	39	40.9	0.891
7	15	24	4.99	2.5222	23	2	49.6	7.210	7	17	30	56.39	2.7069	25	38	41.8	1.078
8	15	26	36.53	2.5290	23	9	57.9	7.066	8	17	33	38.80	2.7068	25	37	31.5	1.266
9	15	29	8.47	2.5357	23	16	57.5	6.920	9	17	36	21.20	2.7064	25	36	9.9	1.454
10	15	31	40.81	2.5423	23	23	48.3	6.772	10	17	39	3.57	2.7059	25	34	37.0	1.642
11	15	34	13.55	2.5489	23	30	30.1	6.622	11	17	41	45.91	2.7053	25	32	52.9	1.828
12	15	36	46.68	2.5554	23	37	2.9	6.472	12	17	44	28.20	2.7043	25	30	57.6	2.016
13	15	39	20.20	2.5618	23	43	26.7	6.319	13	17	47	10.43	2.7033	25	28	51.0	2.203
14	15	41	54.10	2.5681	23	49	41.2	6.164	14	17	49	52.59	2.7021	25	26	33.3	2.388
15	15	44	28.37	2.5743	23	55	46.4	6.009	15	17	52	34.68	2.7008	25	24	4.4	2.574
16	15	47	3.01	2.5804	24	1	42.3	5.853	16	17	55	16.68	2.6991	25	21	24.4	2.760
17	15	49	38.02	2.5864	24	7	28.7	5.694	17	17	57	58.57	2.6973	25	18	33.2	2.945
18	15	52	13.38	2.5923	24	13	5.6	5.535	18	18	0	40.35	2.6954	25	15	31.0	3.129
19	15	54	49.09	2.5980	24	18	32.9	5.373	19	18	3	22.02	2.6934	25	12	17.7	3.313
20	15	57	25.14	2.6036	24	23	50.4	5.211	20	18	6	3.56	2.6912	25	8	53.4	3.497
21	16	0	1.52	2.6091	24	28	58.2	5.048	21	18	8	44.96	2.6888	25	5	18.1	3.679
22	16	2	38.23	2.6146	24	33	56.1	4.882	22	18	11	26.21	2.6862	25	1	31.9	3.861
23	16	5	15.27	2.6199	-24	38	44.0	-4.715	23	18	14	7.30	2.6834	-24	57	34.8	+4.043
NOVEMBER 25.							NOVEMBER 27.										
0	16	7	52.62	2.6251	-24	43	21.9	-4.548	0	18	16	48.22	2.6805	-24	53	26.8	+4.223
1	16	10	30.28	2.6301	24	47	49.7	4.378	1	18	19	28.96	2.6775	24	49	8.0	4.403
2	16	13	8.23	2.6349	24	52	7.3	4.206	2	18	22	9.52	2.6743	24	44	38.5	4.581
3	16	15	46.47	2.6397	24	56	14.7	4.037	3	18	24	49.88	2.6710	24	39	58.3	4.759
4	16	18	24.99	2.6443	25	0	11.7	3.863	4	18	27	30.04	2.6676	24	35	7.4	4.936
5	16	21	3.78	2.6488	25	3	58.3	3.690	5	18	30	9.99	2.6639	24	30	6.0	5.112
6	16	23	42.84	2.6531	25	7	34.5	3.516	6	18	32	49.71	2.6601	24	24	54.0	5.287
7	16	26	22.15	2.6572	25	11	0.2	3.340	7	18	35	29.20	2.6562	24	19	31.6	5.460
8	16	29	1.70	2.6612	25	14	15.3	3.163	8	18	38	8.45	2.6521	24	13	58.8	5.633
9	16	31	41.49	2.6651	25	17	19.8	2.986	9	18	40	47.45	2.6479	24	8	15.6	5.806
10	16	34	21.51	2.6688	25	20	13.6	2.808	10	18	43	26.20	2.6437	24	2	22.2	5.975
11	16	37	1.75	2.6723	25	22	56.7	2.628	11	18	46	4.69	2.6393	23	56	18.6	6.145
12	16	39	42.19	2.6757	25	25	29.0	2.448	12	18	48	42.91	2.6347	23	50	4.8	6.313
13	16	42	22.83	2.6789	25	27	50.4	2.266	13	18	51	20.85	2.6300	23	43	41.0	6.480
14	16	45	3.66	2.6820	25	30	0.9	2.084	14	18	53	58.51	2.6253	23	37	7.2	6.645
15	16	47	44.67	2.6848	25	32	0.5	1.902	15	18	56	35.88	2.6203	23	30	23.6	6.806
16	16	50	25.84	2.6875	25	33	49.1	1.718	16	18	59	12.95	2.6153	23	23	30.2	6.972
17	16	53	7.17	2.6901	25	35	26.7	1.535	17	19	1	49.72	2.6103	23	16	27.0	7.133
18	16	55	48.65	2.6924	25	36	53.3	1.351	18	19	4	26.18	2.6050	23	9	14.2	7.293
19	16	58	30.26	2.6946	25	38	8.8	1.166	19	19	7	2.32	2.5997	23	1	51.8	7.453
20	17	1	12.00	2.6966	25	39	13.1	0.979	20	19	9	38.14	2.5943	22	54	19.9	7.609
21	17	3	53.85	2.6984	25	40	6.3	0.794	21	19	12	13.64	2.5888	22	46	38.7	7.764
22	17	6	35.81	2.7002	25	40	48.4	0.608	22	19	14	48.80	2.5833	22	38	48.2	7.919
23	17	9	17.87	2.7017	25	41	19.3	0.422	23	19	17	23.63	2.5777	22	30	48.4	8.073
24	17	12	0.01	2.7029	-25	41	39.0	-0.234	24	19	19	58.12	2.5719	-22	22	39.5	+8.223

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
NOVEMBER 28.					NOVEMBER 30.				
	^h ^m ^s	^s	[°] ['] ["]	["]		^h ^m ^s	^s	[°] ['] ["]	["]
0	19 19 58.12	2.5719	-22 22 39.5	+ 8.323	0	21 16 8.41	2.2693	-13 25 58.8	+13.463
1	19 22 32.26	2.5661	22 14 21.6	8.373	1	21 18 24.40	2.2637	13 12 29.0	13.530
2	19 25 6.05	2.5602	22 5 54.8	8.521	2	21 20 40.05	2.2580	12 58 55.2	13.595
3	19 27 39.48	2.5542	21 57 19.1	8.668	3	21 22 55.36	2.2524	12 45 17.6	13.658
4	19 30 12.55	2.5482	21 48 34.7	8.812	4	21 25 10.34	2.2468	12 31 36.2	13.720
5	19 32 45.26	2.5422	21 39 41.7	8.955	5	21 27 24.98	2.2413	12 17 51.2	13.780
6	19 35 17.61	2.5361	21 30 40.1	9.097	6	21 29 39.29	2.2358	12 4 2.6	13.838
7	19 37 49.59	2.5308	21 21 30.1	9.237	7	21 31 53.28	2.2305	11 50 10.6	13.894
8	19 40 21.19	2.5236	21 12 11.7	9.375	8	21 34 6.95	2.2252	11 36 15.3	13.949
9	19 42 52.42	2.5173	21 2 45.1	9.512	9	21 36 20.30	2.2199	11 22 16.7	14.003
10	19 45 23.27	2.5110	20 53 10.3	9.647	10	21 38 33.34	2.2148	11 8 15.0	14.064
11	19 47 53.74	2.5046	20 43 27.5	9.779	11	21 40 46.07	2.2097	10 54 10.2	14.105
12	19 50 23.82	2.4983	20 33 36.8	9.911	12	21 42 58.50	2.2047	10 40 2.4	14.153
13	19 52 53.52	2.4918	20 23 38.2	10.041	13	21 45 10.63	2.1997	10 25 51.8	14.200
14	19 55 22.83	2.4853	20 13 31.9	10.168	14	21 47 22.46	2.1948	10 11 38.4	14.246
15	19 57 51.76	2.4789	20 3 18.0	10.304	15	21 49 34.00	2.1899	9 57 22.3	14.289
16	20 0 20.30	2.4723	19 52 56.6	10.418	16	21 51 45.25	2.1852	9 43 3.7	14.332
17	20 2 48.44	2.4658	19 42 27.8	10.542	17	21 53 56.22	2.1806	9 28 42.5	14.373
18	20 5 16.20	2.4593	19 31 51.6	10.663	18	21 56 6.91	2.1758	9 14 19.0	14.412
19	20 7 43.56	2.4528	19 21 8.2	10.782	19	21 58 17.32	2.1713	8 59 53.1	14.450
20	20 10 10.53	2.4462	19 10 17.8	10.899	20	22 0 27.47	2.1670	8 45 25.0	14.486
21	20 12 37.10	2.4396	18 59 20.3	11.015	21	22 2 37.36	2.1626	8 30 54.8	14.521
22	20 15 3.28	2.4331	18 48 16.0	11.128	22	22 4 46.98	2.1583	8 16 22.5	14.555
23	20 17 29.07	2.4265	-18 37 4.9	+11.241	23	22 6 56.35	2.1540	- 8 1 48.2	+14.587
NOVEMBER 29.					DECEMBER 1.				
0	20 19 54.46	2.4199	-18 25 47.1	+11.351	0	22 9 5.46	2.1498	- 7 47 12.1	+14.617
1	20 22 19.46	2.4133	18 14 22.8	11.458	1	22 11 14.33	2.1458	7 32 34.2	14.646
2	20 24 44.06	2.4068	18 2 52.1	11.565	2	22 13 22.95	2.1418	7 17 54.6	14.673
3	20 27 8.27	2.4003	17 51 15.0	11.671	3	22 15 31.34	2.1379	7 3 13.4	14.699
4	20 29 32.09	2.3938	17 39 31.6	11.774	4	22 17 39.50	2.1341	6 48 30.7	14.724
5	20 31 55.52	2.3872	17 27 42.1	11.875	5	22 19 47.43	2.1303	6 33 46.5	14.748
6	20 34 18.55	2.3807	17 15 46.6	11.974	6	22 21 55.14	2.1267	6 19 1.0	14.769
7	20 36 41.20	2.3743	17 3 45.2	12.072	7	22 24 2.63	2.1231	6 4 14.2	14.790
8	20 39 3.46	2.3678	16 51 38.0	12.168	8	22 26 9.91	2.1196	5 49 26.2	14.809
9	20 41 25.33	2.3613	16 39 25.0	12.263	9	22 28 16.98	2.1161	5 34 37.1	14.827
10	20 43 46.81	2.3549	16 27 6.5	12.354	10	22 30 23.84	2.1128	5 19 47.0	14.843
11	20 46 7.92	2.3485	16 14 42.5	12.445	11	22 32 30.51	2.1095	5 4 55.9	14.858
12	20 48 28.64	2.3422	16 2 13.1	12.534	12	22 34 36.98	2.1063	4 50 4.0	14.872
13	20 50 48.98	2.3359	15 49 38.4	12.621	13	22 36 43.27	2.1033	4 35 11.3	14.884
14	20 53 8.95	2.3297	15 36 58.6	12.706	14	22 38 49.37	2.1002	4 20 17.9	14.895
15	20 55 28.54	2.3234	15 24 13.7	12.789	15	22 40 55.29	2.0973	4 5 23.9	14.905
16	20 57 47.76	2.3173	15 11 23.9	12.871	16	22 43 1.04	2.0944	3 50 29.3	14.914
17	21 0 6.61	2.3111	14 58 29.2	12.952	17	22 45 6.62	2.0916	3 35 34.2	14.921
18	21 2 25.09	2.3049	14 45 29.7	13.030	18	22 47 12.03	2.0888	3 20 38.8	14.927
19	21 4 43.20	2.2988	14 32 25.6	13.107	19	22 49 17.28	2.0863	3 5 43.0	14.932
20	21 7 0.95	2.2929	14 19 16.9	13.182	20	22 51 22.38	2.0838	2 50 47.0	14.934
21	21 9 18.35	2.2870	14 6 3.8	13.255	21	22 53 27.33	2.0813	2 35 50.9	14.936
22	21 11 35.39	2.2811	13 52 46.3	13.327	22	22 55 32.13	2.0789	2 20 54.7	14.938
23	21 13 52.08	2.2752	13 39 24.6	13.396	23	22 57 36.80	2.0767	2 5 58.4	14.938
24	21 16 8.41	2.2693	-13 25 58.8	+13.463	24	22 59 41.33	2.0744	- 1 51 2.2	+14.935

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
DECEMBER 2.					DECEMBER 4.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	22 59 41.33	2.0744	-1 51 2.2	+14.935	0	0 38 12.26	2.0685	+ 9 41 41.0	+13.503
1	23 1 45.73	2.0723	1 36 6.2	14.932	1	0 40 15.81	2.0698	9 55 9.5	13.447
2	23 3 50.00	2.0708	1 21 10.4	14.928	2	0 42 19.43	2.0612	10 8 34.6	13.389
3	23 5 54.16	2.0683	1 6 14.8	14.923	3	0 44 23.15	2.0628	10 21 56.2	13.331
4	23 7 58.20	2.0664	0 51 19.6	14.916	4	0 46 26.96	2.0642	10 35 14.3	13.272
5	23 10 2.13	2.0646	0 36 24.9	14.908	5	0 48 30.85	2.0658	10 48 28.8	13.212
6	23 12 5.95	2.0628	0 21 30.7	14.898	6	0 50 34.85	2.0674	11 1 39.7	13.150
7	23 14 9.67	2.0613	-0 6 37.1	14.889	7	0 52 38.94	2.0690	11 14 46.8	13.085
8	23 16 13.30	2.0597	+0 8 16.0	14.878	8	0 54 43.13	2.0708	11 27 50.2	13.025
9	23 18 16.83	2.0582	0 23 8.3	14.865	9	0 56 47.43	2.0726	11 40 49.8	12.961
10	23 20 20.28	2.0568	0 37 59.8	14.851	10	0 58 51.84	2.0744	11 53 45.5	12.895
11	23 22 23.65	2.0555	0 52 50.4	14.836	11	1 0 56.36	2.0763	12 6 37.2	12.828
12	23 24 26.94	2.0543	1 7 40.1	14.820	12	1 3 1.00	2.0783	12 19 24.9	12.761
13	23 26 30.16	2.0531	1 22 28.8	14.803	13	1 5 5.75	2.0802	12 32 8.5	12.693
14	23 28 33.31	2.0520	1 37 16.4	14.784	14	1 7 10.62	2.0822	12 44 48.0	12.623
15	23 30 36.40	2.0510	1 52 2.9	14.764	15	1 9 15.61	2.0843	12 57 23.3	12.553
16	23 32 39.43	2.0501	2 6 48.1	14.743	16	1 11 20.73	2.0864	13 9 54.4	12.482
17	23 34 42.41	2.0493	2 21 32.1	14.722	17	1 13 25.98	2.0886	13 22 21.1	12.409
18	23 36 45.34	2.0484	2 36 14.7	14.699	18	1 15 31.36	2.0908	13 34 43.5	12.336
19	23 38 48.22	2.0477	2 50 56.0	14.675	19	1 17 36.87	2.0929	13 47 1.4	12.262
20	23 40 51.06	2.0471	3 5 35.7	14.649	20	1 19 42.51	2.0952	13 59 14.9	12.187
21	23 42 53.87	2.0466	3 20 13.9	14.623	21	1 21 48.29	2.0975	14 11 23.8	12.110
22	23 44 56.65	2.0461	3 34 50.5	14.596	22	1 23 54.21	2.0999	14 23 28.1	12.033
23	23 46 59.40	2.0457	+3 49 25.4	+14.568	23	1 26 0.28	2.1023	+14 35 27.7	+11.954
DECEMBER 3.					DECEMBER 5.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	23 49 2.13	2.0453	+4 3 58.6	+14.538	0	1 28 6.49	2.1048	+14 47 22.6	+11.875
1	23 51 4.84	2.0451	4 18 29.9	14.507	1	1 30 12.85	2.1072	14 59 12.7	11.795
2	23 53 7.54	2.0450	4 32 59.4	14.475	2	1 32 19.35	2.1096	15 10 58.0	11.714
3	23 55 10.24	2.0449	4 47 26.9	14.442	3	1 34 26.00	2.1122	15 22 38.4	11.633
4	23 57 12.93	2.0448	5 1 52.4	14.408	4	1 36 32.81	2.1148	15 34 13.9	11.549
5	23 59 15.62	2.0448	5 16 15.8	14.373	5	1 38 39.77	2.1173	15 45 44.3	11.464
6	0 1 18.31	2.0449	5 30 37.1	14.337	6	1 40 46.88	2.1199	15 57 9.6	11.379
7	0 3 21.01	2.0452	5 44 56.2	14.299	7	1 42 54.16	2.1226	16 8 29.8	11.294
8	0 5 23.73	2.0454	5 59 13.0	14.260	8	1 45 1.59	2.1252	16 19 44.9	11.208
9	0 7 26.46	2.0457	6 13 27.4	14.221	9	1 47 9.18	2.1278	16 30 54.7	11.119
10	0 9 29.21	2.0461	6 27 39.5	14.181	10	1 49 16.93	2.1306	16 41 59.2	11.031
11	0 11 31.99	2.0466	6 41 49.1	14.139	11	1 51 24.85	2.1333	16 52 58.4	10.941
12	0 13 34.80	2.0472	6 55 56.2	14.097	12	1 53 32.93	2.1360	17 3 52.1	10.850
13	0 15 37.65	2.0478	7 10 0.7	14.053	13	1 55 41.17	2.1388	17 14 40.4	10.759
14	0 17 40.53	2.0483	7 24 2.5	14.008	14	1 57 49.58	2.1416	17 25 23.2	10.667
15	0 19 43.45	2.0490	7 38 1.6	13.962	15	1 59 58.16	2.1444	17 36 0.4	10.573
16	0 21 46.41	2.0498	7 51 57.9	13.915	16	2 2 6.91	2.1472	17 46 31.9	10.478
17	0 23 49.43	2.0508	8 5 51.4	13.868	17	2 4 15.82	2.1499	17 56 57.8	10.384
18	0 25 52.50	2.0517	8 19 42.0	13.818	18	2 6 24.90	2.1528	18 7 18.0	10.288
19	0 27 55.63	2.0527	8 33 29.6	13.768	19	2 8 34.15	2.1557	18 17 32.3	10.190
20	0 29 58.82	2.0538	8 47 14.2	13.718	20	2 10 43.58	2.1585	18 27 40.8	10.093
21	0 32 2.08	2.0548	9 0 55.7	13.665	21	2 12 53.17	2.1613	18 37 43.4	9.994
22	0 34 5.40	2.0559	9 14 34.0	13.612	22	2 15 2.93	2.1641	18 47 40.1	9.894
23	0 36 8.79	2.0572	9 28 9.1	13.558	23	2 17 12.86	2.1670	18 57 30.7	9.793
24	0 38 12.26	2.0585	+9 41 41.0	+13.503	24	2 19 22.97	2.1699	+19 7 15.3	+ 9.693

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
DECEMBER 6.					DECEMBER 8.				
	^h ^m ^s	^s	[°] ['] ["]	["]		^h ^m ^s	^s	[°] ['] ["]	["]
0	2 19 22.97	2.1699	+19 7 15.3	+9.693	0	4 6 27.86	2.2772	+24 41 13.9	+3.983
1	2 21 33.25	2.1727	19 16 53.8	9.590	1	4 8 44.52	2.2781	24 45 8.9	3.851
2	2 23 43.69	2.1755	19 26 26.1	9.487	2	4 11 1.23	2.2790	24 48 56.0	3.719
3	2 25 54.31	2.1784	19 35 52.2	9.383	3	4 13 18.00	2.2799	24 52 35.2	3.587
4	2 28 5.10	2.1813	19 45 12.0	9.278	4	4 15 34.82	2.2808	24 56 6.4	3.454
5	2 30 16.06	2.1841	19 54 25.5	9.173	5	4 17 51.69	2.2814	24 59 29.7	3.322
6	2 32 27.19	2.1869	20 3 32.7	9.067	6	4 20 8.59	2.2820	25 2 45.0	3.188
7	2 34 38.49	2.1898	20 12 33.5	8.959	7	4 22 25.53	2.2826	25 5 52.3	3.056
8	2 36 49.96	2.1926	20 21 27.8	8.851	8	4 24 42.50	2.2830	25 8 51.7	2.923
9	2 39 1.60	2.1953	20 30 15.6	8.742	9	4 26 59.49	2.2834	25 11 43.1	2.789
10	2 41 13.40	2.1981	20 38 56.8	8.632	10	4 29 16.51	2.2838	25 14 28.4	2.656
11	2 43 25.37	2.2009	20 47 31.4	8.522	11	4 31 33.54	2.2840	25 17 1.8	2.523
12	2 45 37.51	2.2037	20 55 59.4	8.411	12	4 33 50.59	2.2842	25 19 29.1	2.388
13	2 47 49.81	2.2063	21 4 20.7	8.298	13	4 36 7.64	2.2843	25 21 48.4	2.255
14	2 50 2.27	2.2091	21 12 35.2	8.186	14	4 38 24.70	2.2843	25 23 59.7	2.121
15	2 52 14.90	2.2118	21 20 43.0	8.073	15	4 40 41.76	2.2843	25 26 2.9	1.987
16	2 54 27.68	2.2143	21 28 43.9	7.958	16	4 42 58.81	2.2841	25 27 58.1	1.853
17	2 56 40.62	2.2170	21 36 37.9	7.843	17	4 45 15.85	2.2838	25 29 45.3	1.719
18	2 58 53.72	2.2197	21 44 25.0	7.728	18	4 47 32.87	2.2835	25 31 24.4	1.585
19	3 1 6.98	2.2223	21 52 5.2	7.611	19	4 49 49.87	2.2831	25 32 55.5	1.452
20	3 3 20.39	2.2248	21 59 38.3	7.493	20	4 52 6.84	2.2826	25 34 18.6	1.318
21	3 5 33.95	2.2273	22 7 4.4	7.376	21	4 54 23.78	2.2821	25 35 33.6	1.183
22	3 7 47.66	2.2298	22 14 23.4	7.258	22	4 56 40.69	2.2814	25 36 40.6	1.050
23	3 10 1.52	2.2322	+22 21 35.3	+7.138	23	4 58 57.55	2.2807	+25 37 39.6	+0.917
DECEMBER 7.					DECEMBER 9.				
	^h ^m ^s	^s	[°] ['] ["]	["]		^h ^m ^s	^s	[°] ['] ["]	["]
0	3 12 15.52	2.2346	+22 28 40.0	+7.018	0	5 1 14.37	2.2799	+25 38 30.6	+0.783
1	3 14 29.67	2.2370	22 35 37.5	6.898	1	5 3 31.14	2.2790	25 39 13.6	0.649
2	3 16 43.96	2.2393	22 42 27.8	6.778	2	5 5 47.85	2.2781	25 39 48.5	0.516
3	3 18 58.38	2.2415	22 49 10.8	6.656	3	5 8 4.51	2.2771	25 40 15.5	0.383
4	3 21 12.94	2.2438	22 55 46.5	6.533	4	5 10 21.10	2.2759	25 40 34.5	0.250
5	3 23 27.63	2.2460	23 2 14.8	6.410	5	5 12 37.62	2.2747	25 40 45.5	+0.118
6	3 25 42.46	2.2482	23 8 35.7	6.287	6	5 14 54.06	2.2733	25 40 48.6	-0.015
7	3 27 57.41	2.2502	23 14 49.2	6.163	7	5 17 10.42	2.2720	25 40 43.7	0.148
8	3 30 12.48	2.2524	23 20 55.2	6.038	8	5 19 26.70	2.2706	25 40 30.9	0.279
9	3 32 27.68	2.2543	23 26 53.8	5.913	9	5 21 42.89	2.2691	25 40 10.2	0.411
10	3 34 42.99	2.2562	23 32 44.8	5.788	10	5 23 58.99	2.2675	25 39 41.6	0.543
11	3 36 58.42	2.2581	23 38 28.3	5.662	11	5 26 14.99	2.2658	25 39 5.1	0.673
12	3 39 13.96	2.2599	23 44 4.2	5.535	12	5 28 30.88	2.2640	25 38 20.8	0.804
13	3 41 29.61	2.2617	23 49 32.5	5.408	13	5 30 46.67	2.2622	25 37 28.6	0.935
14	3 43 45.36	2.2634	23 54 53.1	5.280	14	5 33 2.34	2.2602	25 36 28.6	1.065
15	3 46 1.22	2.2651	24 0 6.1	5.153	15	5 35 17.89	2.2582	25 35 20.8	1.195
16	3 48 17.17	2.2667	24 5 11.4	5.024	16	5 37 33.32	2.2562	25 34 5.2	1.324
17	3 50 33.22	2.2683	24 10 9.0	4.895	17	5 39 48.63	2.2541	25 32 41.9	1.453
18	3 52 49.36	2.2697	24 14 58.8	4.766	18	5 42 3.81	2.2518	25 31 10.8	1.583
19	3 55 5.58	2.2711	24 19 40.9	4.636	19	5 44 18.85	2.2495	25 29 32.0	1.710
20	3 57 21.89	2.2724	24 24 15.1	4.506	20	5 46 33.75	2.2472	25 27 45.6	1.838
21	3 59 38.27	2.2737	24 28 41.6	4.376	21	5 48 48.51	2.2448	25 25 51.5	1.965
22	4 1 54.73	2.2749	24 33 0.2	4.245	22	5 51 3.12	2.2423	25 23 49.8	2.092
23	4 4 11.26	2.2761	24 37 11.0	4.114	23	5 53 17.58	2.2398	25 21 40.5	2.218
24	4 6 27.86	2.2772	+24 41 13.9	+3.983	24	5 55 31.89	2.2372	+25 19 23.6	-2.344

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
DECEMBER 10.					DECEMBER 12.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	5 55 31.89	2.2372	+25 19 23.6	-2.344	0	7 38 55.04	2.0679	+21 13 49.3	-7.606
1	5 57 46.04	2.2344	25 16 59.2	2.470	1	7 40 58.39	2.0637	21 6 10.1	7.699
2	6 0 0.02	2.2316	25 14 27.2	2.595	2	7 43 1.48	2.0494	20 58 25.4	7.789
3	6 2 13.83	2.2288	25 11 47.8	2.718	3	7 45 4.32	2.0453	20 50 35.4	7.878
4	6 4 27.47	2.2259	25 9 1.0	2.843	4	7 47 6.91	2.0410	20 42 40.1	7.966
5	6 6 40.94	2.2230	25 6 6.7	2.966	5	7 49 9.24	2.0368	20 34 39.5	8.053
6	6 8 54.23	2.2200	25 3 5.1	3.088	6	7 51 11.32	2.0326	20 26 33.7	8.140
7	6 11 7.34	2.2169	24 59 56.1	3.211	7	7 53 13.15	2.0284	20 18 22.7	8.227
8	6 13 20.26	2.2138	24 56 39.8	3.332	8	7 55 14.73	2.0242	20 10 6.5	8.312
9	6 15 32.99	2.2106	24 53 16.3	3.453	9	7 57 16.05	2.0200	20 1 45.3	8.396
10	6 17 45.53	2.2073	24 49 45.5	3.573	10	7 59 17.13	2.0158	19 53 19.0	8.479
11	6 19 57.87	2.2041	24 46 7.5	3.693	11	8 1 17.95	2.0117	19 44 47.8	8.561
12	6 22 10.02	2.2008	24 42 22.4	3.812	12	8 3 18.53	2.0076	19 36 11.7	8.643
13	6 24 21.96	2.1973	24 38 30.1	3.930	13	8 5 18.86	2.0034	19 27 30.7	8.724
14	6 26 33.70	2.1939	24 34 30.8	4.048	14	8 7 18.94	1.9993	19 18 44.8	8.804
15	6 28 45.23	2.1904	24 30 24.4	4.165	15	8 9 18.78	1.9953	19 9 54.2	8.883
16	6 30 56.55	2.1868	24 26 11.0	4.281	16	8 11 18.38	1.9913	19 0 58.9	8.961
17	6 33 7.65	2.1833	24 21 50.7	4.397	17	8 13 17.73	1.9872	18 51 58.9	9.039
18	6 35 18.54	2.1797	24 17 23.4	4.512	18	8 15 16.84	1.9832	18 42 54.2	9.117
19	6 37 29.21	2.1760	24 12 49.3	4.626	19	8 17 15.71	1.9793	18 33 44.9	9.193
20	6 39 39.66	2.1723	24 8 8.3	4.740	20	8 19 14.35	1.9753	18 24 31.1	9.268
21	6 41 49.88	2.1685	24 3 20.5	4.853	21	8 21 12.75	1.9713	18 15 12.8	9.342
22	6 43 59.88	2.1648	23 58 26.0	4.964	22	8 23 10.91	1.9674	18 5 50.1	9.415
23	6 46 9.65	2.1609	+23 53 24.8	-5.076	23	8 25 8.84	1.9635	+17 56 23.0	-9.488
DECEMBER 11.					DECEMBER 13.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	6 48 19.19	2.1571	+23 48 16.9	-5.187	0	8 27 6.53	1.9596	+17 46 51.5	-9.561
1	6 50 28.50	2.1532	23 43 2.4	5.297	1	8 29 3.99	1.9558	17 37 15.7	9.632
2	6 52 37.57	2.1492	23 37 41.3	5.406	2	8 31 1.23	1.9521	17 27 35.7	9.702
3	6 54 46.40	2.1453	23 32 13.7	5.514	3	8 32 58.24	1.9483	17 17 51.5	9.772
4	6 56 55.00	2.1413	23 26 39.6	5.622	4	8 34 55.03	1.9447	17 8 3.1	9.841
5	6 59 3.36	2.1373	23 20 59.1	5.728	5	8 36 51.60	1.9410	16 58 10.6	9.909
6	7 1 11.48	2.1333	23 15 12.2	5.835	6	8 38 47.95	1.9373	16 48 14.0	9.977
7	7 3 19.35	2.1292	23 9 18.9	5.940	7	8 40 44.08	1.9337	16 38 13.4	10.043
8	7 5 26.98	2.1252	23 3 19.4	6.044	8	8 42 39.99	1.9301	16 28 8.9	10.108
9	7 7 34.37	2.1211	22 57 13.6	6.148	9	8 44 35.69	1.9266	16 18 0.4	10.174
10	7 9 41.51	2.1169	22 51 1.6	6.252	10	8 46 31.18	1.9231	16 7 48.0	10.238
11	7 11 48.40	2.1128	22 44 43.4	6.354	11	8 48 26.46	1.9197	15 57 31.8	10.301
12	7 13 55.04	2.1086	22 38 19.1	6.455	12	8 50 21.54	1.9163	15 47 11.9	10.363
13	7 16 1.43	2.1044	22 31 48.8	6.555	13	8 52 16.41	1.9128	15 36 48.2	10.426
14	7 18 7.57	2.1003	22 25 12.5	6.655	14	8 54 11.08	1.9095	15 26 20.8	10.487
15	7 20 13.46	2.0960	22 18 30.2	6.754	15	8 56 5.55	1.9063	15 15 49.8	10.548
16	7 22 19.09	2.0918	22 11 42.0	6.853	16	8 57 59.83	1.9031	15 5 15.1	10.608
17	7 24 24.47	2.0876	22 4 47.9	6.950	17	8 59 53.92	1.8998	14 54 36.9	10.667
18	7 26 29.60	2.0834	21 57 48.0	7.046	18	9 1 47.81	1.8966	14 43 55.1	10.725
19	7 28 34.48	2.0792	21 50 42.4	7.142	19	9 3 41.51	1.8935	14 33 9.9	10.783
20	7 30 39.10	2.0749	21 43 31.0	7.237	20	9 5 35.03	1.8904	14 22 21.2	10.840
21	7 32 43.47	2.0707	21 36 14.0	7.331	21	9 7 28.36	1.8874	14 11 29.1	10.896
22	7 34 47.58	2.0664	21 28 51.3	7.424	22	9 9 21.52	1.8845	14 0 35.7	10.951
23	7 36 51.44	2.0622	21 21 23.1	7.517	23	9 11 14.50	1.8816	13 49 35.0	11.006
24	7 38 55.04	2.0579	+21 13 49.3	-7.608	24	9 13 7.31	1.8788	+13 38 33.0	-11.060

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
DECEMBER 14.					DECEMBER 16.				
	^h ^m ^s	^s	[°] ['] ["]	["]		^h ^m ^s	^s	[°] ['] ["]	["]
0	9 13 7.31	1.8788	+13 38 33.0	-11.080	0	10 41 3.62	1.8092	+3 58 20.4	-12.866
1	9 14 59.95	1.8789	13 27 27.8	11.113	1	10 42 52.17	1.8093	3 45 27.8	12.888
2	9 16 52.42	1.8731	13 16 19.4	11.106	2	10 44 40.74	1.8096	3 32 33.8	12.911
3	9 18 44.72	1.8708	13 5 7.9	11.218	3	10 46 29.32	1.8098	3 19 38.5	12.931
4	9 20 36.86	1.8677	12 53 53.3	11.268	4	10 48 17.92	1.8108	3 6 42.1	12.951
5	9 22 28.84	1.8651	12 42 35.7	11.319	5	10 50 6.55	1.8107	2 53 44.4	12.971
6	9 24 20.67	1.8626	12 31 15.0	11.369	6	10 51 55.20	1.8112	2 40 45.6	12.989
7	9 26 12.35	1.8601	12 19 51.4	11.418	7	10 53 43.89	1.8118	2 27 45.7	13.008
8	9 28 3.88	1.8576	12 8 24.8	11.467	8	10 55 32.61	1.8123	2 14 44.7	13.026
9	9 29 55.26	1.8552	11 56 55.4	11.514	9	10 57 21.37	1.8131	2 1 42.7	13.043
10	9 31 46.50	1.8528	11 45 23.1	11.562	10	10 59 10.18	1.8139	1 48 39.6	13.069
11	9 33 37.60	1.8505	11 33 48.0	11.608	11	11 0 59.04	1.8148	1 35 35.6	13.074
12	9 35 28.56	1.8483	11 22 10.2	11.653	12	11 2 47.96	1.8158	1 22 30.7	13.089
13	9 37 19.39	1.8461	11 10 29.6	11.698	13	11 4 36.93	1.8168	1 9 24.9	13.103
14	9 39 10.09	1.8440	10 58 46.4	11.742	14	11 6 25.97	1.8178	0 56 18.3	13.117
15	9 41 0.67	1.8420	10 47 0.6	11.786	15	11 8 15.07	1.8190	0 43 10.9	13.130
16	9 42 51.13	1.8400	10 35 12.1	11.829	16	11 10 4.25	1.8203	0 30 2.7	13.143
17	9 44 41.47	1.8380	10 23 21.1	11.872	17	11 11 53.50	1.8215	0 16 53.8	13.154
18	9 46 31.69	1.8361	10 11 27.5	11.913	18	11 13 42.83	1.8229	+0 3 44.2	13.166
19	9 48 21.80	1.8343	9 59 31.5	11.953	19	11 15 32.25	1.8244	-0 9 26.1	13.176
20	9 50 11.81	1.8326	9 47 33.1	11.994	20	11 17 21.76	1.8260	0 22 36.9	13.185
21	9 52 1.71	1.8308	9 35 32.2	12.034	21	11 19 11.37	1.8276	0 35 48.3	13.195
22	9 53 51.51	1.8293	9 23 29.0	12.073	22	11 21 1.07	1.8293	0 49 0.3	13.203
23	9 55 41.22	1.8277	+ 9 11 23.4	-12.112	23	11 22 50.88	1.8311	-1 2 12.7	-13.210
DECEMBER 15.					DECEMBER 17.				
	^h ^m ^s	^s	[°] ['] ["]	["]		^h ^m ^s	^s	[°] ['] ["]	["]
0	9 57 30.83	1.8261	+ 8 59 15.6	-12.140	0	11 24 40.80	1.8329	-1 15 25.5	-13.217
1	9 59 20.35	1.8247	8 47 5.5	12.187	1	11 26 30.83	1.8348	1 28 38.7	13.223
2	10 1 9.79	1.8233	8 34 53.2	12.223	2	11 28 20.98	1.8368	1 41 52.3	13.229
3	10 2 59.14	1.8219	8 22 38.7	12.259	3	11 30 11.25	1.8389	1 55 6.2	13.233
4	10 4 48.42	1.8207	8 10 22.1	12.294	4	11 32 1.65	1.8411	2 8 20.3	13.238
5	10 6 37.62	1.8195	7 58 3.4	12.328	5	11 33 52.18	1.8433	2 21 34.7	13.242
6	10 8 26.76	1.8184	7 45 42.7	12.363	6	11 35 42.85	1.8457	2 34 49.3	13.244
7	10 10 15.83	1.8173	7 33 19.9	12.397	7	11 37 33.66	1.8481	2 48 4.0	13.246
8	10 12 4.83	1.8162	7 20 55.1	12.429	8	11 39 24.62	1.8506	3 1 18.8	13.248
9	10 13 53.77	1.8153	7 8 28.4	12.461	9	11 41 15.73	1.8531	3 14 33.7	13.248
10	10 15 42.66	1.8144	6 55 59.8	12.492	10	11 43 6.99	1.8557	3 27 48.6	13.248
11	10 17 31.50	1.8136	6 43 29.4	12.523	11	11 44 58.41	1.8584	3 41 3.4	13.246
12	10 19 20.29	1.8128	6 30 57.1	12.553	12	11 46 50.00	1.8613	3 54 18.1	13.244
13	10 21 9.04	1.8122	6 18 23.0	12.583	13	11 48 41.76	1.8641	4 7 32.7	13.242
14	10 22 57.75	1.8116	6 5 47.2	12.612	14	11 50 33.69	1.8670	4 20 47.1	13.238
15	10 24 46.43	1.8110	5 53 9.6	12.640	15	11 52 25.80	1.8701	4 34 1.3	13.234
16	10 26 35.07	1.8106	5 40 30.4	12.668	16	11 54 18.10	1.8732	4 47 15.2	13.229
17	10 28 23.69	1.8101	5 27 49.5	12.695	17	11 56 10.58	1.8763	5 0 28.8	13.223
18	10 30 12.28	1.8098	5 15 7.0	12.722	18	11 58 3.26	1.8797	5 13 42.0	13.217
19	10 32 0.86	1.8095	5 2 22.9	12.748	19	11 59 56.14	1.8830	5 26 54.8	13.209
20	10 33 49.42	1.8093	4 49 37.3	12.773	20	12 1 49.22	1.8864	5 40 7.1	13.201
21	10 35 37.98	1.8093	4 36 50.2	12.797	21	12 3 42.51	1.8900	5 53 18.9	13.193
22	10 37 26.53	1.8091	4 24 1.7	12.821	22	12 5 36.01	1.8935	6 6 30.2	13.183
23	10 39 15.07	1.8091	4 11 11.7	12.844	23	12 7 29.73	1.8973	6 19 40.8	13.171
24	10 41 3.62	1.8092	+ 3 58 20.4	-12.866	24	12 9 23.68	1.9010	-6 32 50.7	-13.159

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
DECEMBER 18.					DECEMBER 20.				
	^h ^m ^s	^s	[°] ['] ["]	["]		^h ^m ^s	^s	[°] ['] ["]	["]
0	12 9 23.68	1.9010	- 6 32 50.7	-13.159	0	13 46 29.01	2.1735	-16 31 55.2	-11.354
1	12 11 17.85	1.9048	6 45 59.9	13.147	1	13 48 39.64	2.1809	16 43 14.4	11.286
2	12 13 12.26	1.9088	6 59 8.3	13.133	2	13 50 50.72	2.1884	16 54 29.5	11.216
3	12 15 6.90	1.9127	7 12 15.9	13.119	3	13 53 2.25	2.1959	17 5 40.3	11.143
4	12 17 1.78	1.9168	7 25 22.6	13.104	4	13 55 14.23	2.2034	17 16 46.7	11.070
5	12 18 56.91	1.9210	7 38 28.4	13.088	5	13 57 26.66	2.2111	17 27 48.7	10.995
6	12 20 52.30	1.9253	7 51 33.2	13.071	6	13 59 39.56	2.2188	17 38 46.1	10.918
7	12 22 47.94	1.9295	8 4 36.9	13.053	7	14 1 52.92	2.2265	17 49 38.9	10.840
8	12 24 43.84	1.9339	8 17 39.5	13.034	8	14 4 6.74	2.2342	18 0 26.9	10.760
9	12 26 40.01	1.9384	8 30 41.0	13.014	9	14 6 21.02	2.2420	18 11 10.1	10.679
10	12 28 36.45	1.9430	8 43 41.2	12.993	10	14 8 35.78	2.2499	18 21 48.4	10.596
11	12 30 33.17	1.9477	8 56 40.1	12.971	11	14 10 51.01	2.2578	18 32 21.6	10.511
12	12 32 30.17	1.9523	9 9 37.7	12.948	12	14 13 6.71	2.2657	18 42 49.7	10.425
13	12 34 27.45	1.9572	9 22 33.9	12.924	13	14 15 22.89	2.2736	18 53 12.6	10.337
14	12 36 25.03	1.9621	9 35 28.6	12.899	14	14 17 39.54	2.2816	19 3 30.1	10.247
15	12 38 22.90	1.9670	9 48 21.8	12.873	15	14 19 56.68	2.2897	19 13 42.2	10.156
16	12 40 21.07	1.9721	10 1 13.4	12.847	16	14 22 14.30	2.2977	19 23 48.8	10.063
17	12 42 19.55	1.9773	10 14 3.4	12.819	17	14 24 32.40	2.3058	19 33 49.8	9.968
18	12 44 18.34	1.9824	10 26 51.7	12.790	18	14 26 50.99	2.3139	19 43 45.0	9.872
19	12 46 17.44	1.9877	10 39 38.2	12.760	19	14 29 10.07	2.3221	19 53 34.4	9.774
20	12 48 16.86	1.9931	10 52 22.8	12.728	20	14 31 29.64	2.3302	20 3 17.9	9.674
21	12 50 16.61	1.9986	11 5 5.5	12.696	21	14 33 49.69	2.3383	20 12 55.3	9.573
22	12 52 16.69	2.0041	11 17 46.3	12.663	22	14 36 10.23	2.3464	20 22 26.6	9.469
23	12 54 17.10	2.0097	-11 30 25.0	-12.628	23	14 38 31.26	2.3546	-20 31 51.6	-9.364
DECEMBER 19.					DECEMBER 21.				
	^h ^m ^s	^s	[°] ['] ["]	["]		^h ^m ^s	^s	[°] ['] ["]	["]
0	12 56 17.85	2.0153	-11 43 1.7	-12.593	0	14 40 52.78	2.3628	-20 41 10.3	-9.258
1	12 58 18.94	2.0211	11 55 36.1	12.555	1	14 43 14.79	2.3710	20 50 22.5	9.149
2	13 0 20.38	2.0269	12 8 8.3	12.518	2	14 45 37.30	2.3793	20 59 28.2	9.039
3	13 2 22.17	2.0328	12 20 38.2	12.478	3	14 48 0.30	2.3874	21 8 27.2	8.927
4	13 4 24.32	2.0388	12 33 5.7	12.438	4	14 50 23.79	2.3956	21 17 19.4	8.813
5	13 6 26.83	2.0448	12 45 30.7	12.395	5	14 52 47.77	2.4038	21 26 4.7	8.696
6	13 8 29.70	2.0510	12 57 53.1	12.353	6	14 55 12.24	2.4119	21 34 43.1	8.581
7	13 10 32.95	2.0573	13 10 13.0	12.309	7	14 57 37.20	2.4201	21 43 14.4	8.461
8	13 12 36.58	2.0636	13 22 30.2	12.263	8	15 0 2.65	2.4283	21 51 38.4	8.339
9	13 14 40.58	2.0698	13 34 44.6	12.216	9	15 2 28.59	2.4363	21 59 55.1	8.218
10	13 16 44.96	2.0763	13 46 56.1	12.168	10	15 4 55.01	2.4444	22 8 4.5	8.093
11	13 18 49.74	2.0829	13 59 4.7	12.119	11	15 7 21.92	2.4525	22 16 6.3	7.967
12	13 20 54.91	2.0894	14 11 10.4	12.069	12	15 9 49.31	2.4606	22 24 0.5	7.839
13	13 23 0.47	2.0961	14 23 13.0	12.017	13	15 12 17.19	2.4686	22 31 47.0	7.709
14	13 25 6.44	2.1028	14 35 12.4	11.963	14	15 14 45.54	2.4765	22 39 25.6	7.578
15	13 27 12.81	2.1095	14 47 8.6	11.909	15	15 17 14.37	2.4844	22 46 56.3	7.444
16	13 29 19.58	2.1163	14 59 1.5	11.853	16	15 19 43.67	2.4923	22 54 18.9	7.306
17	13 31 26.77	2.1233	15 10 51.0	11.796	17	15 22 13.45	2.5002	23 1 33.3	7.172
18	13 33 34.38	2.1303	15 22 37.0	11.737	18	15 24 43.69	2.5079	23 8 39.5	7.033
19	13 35 42.41	2.1374	15 34 19.4	11.677	19	15 27 14.40	2.5157	23 15 37.3	6.893
20	13 37 50.87	2.1445	15 45 58.2	11.616	20	15 29 45.57	2.5233	23 22 26.6	6.751
21	13 39 59.75	2.1517	15 57 33.3	11.553	21	15 32 17.20	2.5310	23 29 7.4	6.606
22	13 42 9.07	2.1589	16 9 4.5	11.488	22	15 34 49.29	2.5385	23 35 39.5	6.462
23	13 44 18.82	2.1662	16 20 31.9	11.423	23	15 37 21.82	2.5460	23 42 2.8	6.314
24	13 46 29.01	2.1735	-16 31 55.2	-11.354	24	15 39 54.80	2.5533	-23 48 17.2	-6.165

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
DECEMBER 22.					DECEMBER 24.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	15 39 54.80	2.5638	-23 48 17.2	-6.166	0	17 48 40.64	2.7508	-25 26 31.0	+ 2.438
1	15 42 28.22	2.5607	23 54 22.6	6.015	1	17 51 25.69	2.7506	25 23 58.9	2.633
2	15 45 2.08	2.5679	24 0 19.0	5.963	2	17 54 10.71	2.7501	25 21 15.1	2.827
3	15 47 36.37	2.5750	24 6 6.2	5.709	3	17 56 55.70	2.7496	25 18 19.7	3.019
4	15 50 11.08	2.5820	24 11 44.1	5.553	4	17 59 40.66	2.7489	25 15 12.8	3.212
5	15 52 46.21	2.5890	24 17 12.6	5.307	5	18 2 25.57	2.7479	25 11 54.3	3.405
6	15 55 21.76	2.5959	24 22 31.7	5.238	6	18 5 10.41	2.7468	25 8 24.2	3.598
7	15 57 57.72	2.6027	24 27 41.2	5.078	7	18 7 55.18	2.7455	25 4 42.6	3.789
8	16 0 34.08	2.6098	24 32 41.0	4.916	8	18 10 39.87	2.7440	25 0 49.5	3.980
9	16 3 10.83	2.6158	24 37 31.1	4.753	9	18 13 24.46	2.7423	24 56 45.0	4.170
10	16 5 47.97	2.6222	24 42 11.3	4.588	10	18 16 8.94	2.7404	24 52 29.1	4.360
11	16 8 25.49	2.6285	24 46 41.6	4.422	11	18 18 53.31	2.7384	24 48 1.8	4.550
12	16 11 3.39	2.6348	24 51 1.9	4.254	12	18 21 37.55	2.7362	24 43 23.1	4.739
13	16 13 41.66	2.6408	24 55 12.1	4.085	13	18 24 21.65	2.7338	24 38 33.1	4.927
14	16 16 20.28	2.6467	24 59 12.1	3.914	14	18 27 5.60	2.7312	24 33 31.9	5.113
15	16 18 59.26	2.6525	25 3 1.8	3.742	15	18 29 49.39	2.7284	24 28 19.5	5.300
16	16 21 38.58	2.6582	25 6 41.1	3.568	16	18 32 33.01	2.7255	24 22 55.9	5.485
17	16 24 18.24	2.6637	25 10 10.0	3.394	17	18 35 16.45	2.7224	24 17 21.3	5.669
18	16 26 58.22	2.6690	25 13 28.4	3.219	18	18 37 59.70	2.7192	24 11 35.6	5.853
19	16 29 38.52	2.6743	25 16 36.3	3.043	19	18 40 42.75	2.7158	24 5 38.9	6.036
20	16 32 19.13	2.6793	25 19 33.5	2.864	20	18 43 25.59	2.7123	23 59 31.3	6.217
21	16 35 0.04	2.6843	25 22 20.0	2.685	21	18 46 8.22	2.7086	23 53 12.9	6.397
22	16 37 41.24	2.6890	25 24 55.7	2.504	22	18 48 50.62	2.7048	23 46 43.7	6.576
23	16 40 22.72	2.6937	-25 27 20.5	-2.323	23	18 51 32.79	2.7008	-23 40 3.8	+ 6.753
DECEMBER 23.					DECEMBER 25.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	16 43 4.48	2.6982	-25 29 34.4	-2.140	0	18 54 14.71	2.6966	-23 33 13.3	+ 6.930
1	16 45 46.50	2.7024	25 31 37.3	1.967	1	18 56 56.38	2.6923	23 26 12.2	7.105
2	16 48 28.77	2.7065	25 33 29.2	1.773	2	18 59 37.78	2.6878	23 19 0.7	7.278
3	16 51 11.28	2.7104	25 35 10.0	1.587	3	19 2 18.92	2.6833	23 11 38.8	7.451
4	16 53 54.02	2.7142	25 36 39.6	1.400	4	19 4 59.78	2.6787	23 4 6.6	7.623
5	16 56 36.98	2.7178	25 37 58.0	1.213	5	19 7 40.36	2.6738	22 56 24.1	7.793
6	16 59 20.15	2.7212	25 39 5.1	1.025	6	19 10 20.64	2.6689	22 48 31.5	7.960
7	17 2 3.52	2.7244	25 40 1.0	0.837	7	19 13 0.63	2.6639	22 40 28.9	8.127
8	17 4 47.08	2.7275	25 40 45.5	0.647	8	19 15 40.31	2.6588	22 32 16.3	8.292
9	17 7 30.82	2.7304	25 41 18.6	0.457	9	19 18 19.68	2.6535	22 23 53.9	8.455
10	17 10 14.73	2.7332	25 41 40.3	0.267	10	19 20 58.73	2.6481	22 15 21.7	8.618
11	17 12 58.80	2.7357	25 41 50.6	-0.076	11	19 23 37.45	2.6426	22 6 39.8	8.778
12	17 15 43.01	2.7379	25 41 49.4	+0.116	12	19 26 15.84	2.6370	21 57 48.4	8.936
13	17 18 27.35	2.7401	25 41 36.7	0.308	13	19 28 53.89	2.6313	21 48 47.5	9.093
14	17 21 11.82	2.7420	25 41 12.4	0.502	14	19 31 31.60	2.6257	21 39 37.3	9.248
15	17 23 56.39	2.7437	25 40 36.5	0.695	15	19 34 8.97	2.6198	21 30 17.8	9.402
16	17 26 41.06	2.7453	25 39 49.0	0.888	16	19 36 45.98	2.6138	21 20 49.1	9.553
17	17 29 25.82	2.7467	25 38 50.0	1.081	17	19 39 22.63	2.6078	21 11 11.4	9.703
18	17 32 10.66	2.7478	25 37 39.3	1.275	18	19 41 58.92	2.6018	21 1 24.8	9.851
19	17 34 55.56	2.7488	25 36 17.0	1.468	19	19 44 34.85	2.5958	20 51 29.3	9.998
20	17 37 40.52	2.7496	25 34 43.1	1.663	20	19 47 10.41	2.5895	20 41 25.1	10.142
21	17 40 25.51	2.7502	25 32 57.5	1.857	21	19 49 45.59	2.5832	20 31 12.3	10.283
22	17 43 10.54	2.7507	25 31 0.3	2.050	22	19 52 20.39	2.5768	20 20 51.1	10.424
23	17 45 55.59	2.7508	25 28 51.5	2.244	23	19 54 54.81	2.5706	20 10 21.4	10.563
24	17 48 40.64	2.7508	-25 26 31.0	+2.438	24	19 57 28.85	2.5641	-19 59 43.5	+10.699

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
DECEMBER 26.					DECEMBER 28.				
	^h ^m ^s	^s	[°] ['] ["]	["]		^h ^m ^s	^s	[°] ['] ["]	["]
0	19 57 28.85	2.5641	-19 59 43.5	+10.009	0	21 52 58.45	2.2678	-9 27 7.8	+14.886
1	20 0 2.50	2.5576	19 48 57.5	10.834	1	21 55 13.76	2.2625	9 12 13.5	14.925
2	20 2 35.76	2.5510	19 38 3.4	10.968	2	21 57 28.75	2.2473	8 57 16.8	14.963
3	20 5 8.62	2.5444	19 27 1.4	11.098	3	21 59 43.43	2.2420	8 42 17.9	14.996
4	20 7 41.09	2.5379	19 15 51.7	11.226	4	22 1 57.79	2.2368	8 27 17.0	15.032
5	20 10 13.17	2.5313	19 4 34.3	11.353	5	22 4 11.85	2.2318	8 12 14.1	15.064
6	20 12 44.84	2.5246	18 53 9.3	11.478	6	22 6 25.61	2.2269	7 57 9.3	15.095
7	20 15 16.12	2.5179	18 41 36.9	11.601	7	22 8 39.08	2.2220	7 42 2.7	15.124
8	20 17 46.99	2.5112	18 29 57.2	11.721	8	22 10 52.25	2.2172	7 26 54.4	15.151
9	20 20 17.46	2.5045	18 18 10.4	11.839	9	22 13 5.14	2.2124	7 11 44.6	15.176
10	20 22 47.53	2.4978	18 6 16.5	11.967	10	22 15 17.74	2.2078	6 56 33.3	15.200
11	20 25 17.19	2.4909	17 54 15.6	12.072	11	22 17 30.07	2.2032	6 41 20.6	15.222
12	20 27 46.44	2.4842	17 42 7.9	12.184	12	22 19 42.12	2.1986	6 26 6.7	15.242
13	20 30 15.29	2.4774	17 29 53.5	12.294	13	22 21 53.90	2.1942	6 10 51.6	15.261
14	20 32 43.73	2.4707	17 17 32.6	12.403	14	22 24 5.42	2.1898	5 55 35.4	15.278
15	20 35 11.77	2.4639	17 5 5.2	12.509	15	22 26 16.68	2.1856	5 40 18.3	15.293
16	20 37 39.40	2.4571	16 52 31.5	12.613	16	22 28 27.69	2.1814	5 25 0.3	15.307
17	20 40 6.62	2.4503	16 39 51.6	12.716	17	22 30 38.45	2.1773	5 9 41.5	15.319
18	20 42 33.44	2.4437	16 27 5.6	12.816	18	22 32 48.96	2.1732	4 54 22.0	15.330
19	20 44 59.86	2.4369	16 14 13.7	12.913	19	22 34 59.23	2.1693	4 39 1.9	15.339
20	20 47 25.87	2.4302	16 1 16.0	13.009	20	22 37 9.27	2.1654	4 23 41.3	15.348
21	20 49 51.48	2.4235	15 48 12.6	13.103	21	22 39 19.08	2.1616	4 8 20.2	15.353
22	20 52 16.69	2.4168	15 35 3.6	13.196	22	22 41 28.66	2.1578	3 52 58.9	15.358
23	20 54 41.50	2.4102	-15 21 49.1	+13.286	23	22 43 38.02	2.1542	-3 37 37.3	+15.361
DECEMBER 27.					DECEMBER 29.				
	^h ^m ^s	^s	[°] ['] ["]	["]		^h ^m ^s	^s	[°] ['] ["]	["]
0	20 57 5.91	2.4035	-15 8 29.3	+13.373	0	22 45 47.16	2.1506	-3 22 15.6	+15.363
1	20 59 29.92	2.3969	14 55 4.3	13.459	1	22 47 56.09	2.1472	3 6 53.8	15.363
2	21 1 53.54	2.3904	14 41 34.2	13.543	2	22 50 4.82	2.1438	2 51 32.1	15.361
3	21 4 16.77	2.3839	14 27 59.1	13.625	3	22 52 13.35	2.1406	2 36 10.5	15.358
4	21 6 39.61	2.3774	14 14 19.2	13.704	4	22 54 21.69	2.1373	2 20 49.2	15.353
5	21 9 2.06	2.3709	14 0 34.6	13.782	5	22 56 29.83	2.1341	2 5 28.1	15.348
6	21 11 24.12	2.3644	13 46 45.4	13.858	6	22 58 37.78	2.1311	1 50 7.4	15.342
7	21 13 45.79	2.3580	13 32 51.7	13.932	7	23 0 45.56	2.1282	1 34 47.1	15.333
8	21 16 7.08	2.3518	13 18 53.6	14.003	8	23 2 53.16	2.1252	1 19 27.4	15.323
9	21 18 28.00	2.3455	13 4 51.3	14.073	9	23 5 0.58	2.1223	1 4 8.4	15.311
10	21 20 48.54	2.3393	12 50 44.9	14.140	10	23 7 7.84	2.1197	0 48 50.1	15.298
11	21 23 8.71	2.3330	12 36 34.5	14.206	11	23 9 14.94	2.1171	0 33 32.6	15.285
12	21 25 28.50	2.3268	12 22 20.2	14.270	12	23 11 21.89	2.1145	0 18 15.9	15.270
13	21 27 47.93	2.3206	12 8 2.1	14.332	13	23 13 28.68	2.1120	-0 3 0.2	15.253
14	21 30 7.00	2.3148	11 53 40.4	14.391	14	23 15 35.33	2.1097	+0 12 14.5	15.236
15	21 32 25.70	2.3088	11 39 15.2	14.448	15	23 17 41.84	2.1073	0 27 28.1	15.217
16	21 34 44.05	2.3029	11 24 46.6	14.505	16	23 19 48.21	2.1050	0 42 40.5	15.196
17	21 37 2.05	2.2971	11 10 14.6	14.560	17	23 21 54.44	2.1028	0 57 51.6	15.174
18	21 39 19.70	2.2913	10 55 39.4	14.612	18	23 24 0.55	2.1008	1 13 1.4	15.151
19	21 41 37.00	2.2855	10 41 1.2	14.662	19	23 26 6.54	2.0988	1 28 9.7	15.127
20	21 43 53.96	2.2798	10 26 20.0	14.710	20	23 28 12.41	2.0969	1 43 16.6	15.102
21	21 46 10.58	2.2743	10 11 36.0	14.757	21	23 30 18.17	2.0951	1 58 21.9	15.074
22	21 48 26.87	2.2687	9 56 49.2	14.802	22	23 32 23.82	2.0933	2 13 25.5	15.047
23	21 50 42.82	2.2632	9 41 59.8	14.845	23	23 34 29.37	2.0917	2 28 27.5	15.018
24	21 52 58.54	2.2578	-9 27 7.8	+14.886	24	23 36 34.82	2.0901	+2 43 27.7	+14.988

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
DECEMBER 30.					DECEMBER 31.				
	^h ^m ^s	^s	[°] ['] ["]	["]		^h ^m ^s	^s	[°] ['] ["]	["]
0	23 36 34.82	2.0001	+2 43 27.7	+14.988	0	0 26 28.15	2.0744	+ 8 31 39.2	+13.924
1	23 38 40.18	2.0886	2 58 26.0	14.986	1	0 28 32.62	2.0746	8 45 32.9	13.967
2	23 40 45.45	2.0871	3 13 22.4	14.923	2	0 30 37.10	2.0748	8 59 23.2	13.808
3	23 42 50.63	2.0858	3 28 16.8	14.880	3	0 32 41.60	2.0753	9 13 9.9	13.749
4	23 44 55.74	2.0845	3 43 9.1	14.854	4	0 34 46.13	2.0758	9 26 53.1	13.689
5	23 47 0.77	2.0833	3 57 59.3	14.818	5	0 36 50.69	2.0762	9 40 32.6	13.628
6	23 49 5.73	2.0822	4 12 47.3	14.781	6	0 38 55.27	2.0767	9 54 8.4	13.565
7	23 51 10.63	2.0811	4 27 33.0	14.743	7	0 40 59.89	2.0773	10 7 40.4	13.502
8	23 53 15.46	2.0801	4 42 16.4	14.703	8	0 43 4.55	2.0780	10 21 8.6	13.438
9	23 55 20.24	2.0792	4 56 57.4	14.663	9	0 45 9.25	2.0787	10 34 33.0	13.373
10	23 57 24.96	2.0783	5 11 35.9	14.621	10	0 47 13.99	2.0794	10 47 53.4	13.307
11	23 59 29.64	2.0777	5 26 11.9	14.578	11	0 49 18.78	2.0803	11 1 9.8	13.240
12	0 1 34.28	2.0770	5 40 45.3	14.534	12	0 51 23.63	2.0813	11 14 22.2	13.173
13	0 3 38.88	2.0763	5 55 16.0	14.488	13	0 53 28.53	2.0822	11 27 30.5	13.103
14	0 5 43.44	2.0758	6 9 43.9	14.443	14	0 55 33.49	2.0832	11 40 34.6	13.033
15	0 7 47.98	2.0754	6 24 9.1	14.396	15	0 57 38.51	2.0843	11 53 34.5	12.963
16	0 9 52.49	2.0749	6 38 31.4	14.347	16	0 59 43.60	2.0854	12 6 30.1	12.891
17	0 11 56.97	2.0746	6 52 50.7	14.298	17	1 1 48.76	2.0866	12 19 21.4	12.818
18	0 14 1.44	2.0744	7 7 7.1	14.248	18	1 3 53.99	2.0878	12 32 8.3	12.745
19	0 16 5.90	2.0743	7 21 20.4	14.196	19	1 5 59.30	2.0891	12 44 50.8	12.671
20	0 18 10.35	2.0742	7 35 30.6	14.144	20	1 8 4.68	2.0903	12 57 28.8	12.596
21	0 20 14.80	2.0741	7 49 37.7	14.091	21	1 10 10.14	2.0918	13 10 2.3	12.520
22	0 22 19.24	2.0741	8 3 41.5	14.036	22	1 12 15.69	2.0933	13 22 31.2	12.443
23	0 24 23.69	2.0743	8 17 42.0	13.981	23	1 14 21.33	2.0947	13 34 55.4	12.364
24	0 26 28.15	2.0744	+8 31 39.2	+13.924	24	1 16 27.05	2.0961	+13 47 14.9	+12.285

PHASES OF THE MOON.

	Jan.	^d ^h ^m	Apr.	^d ^h ^m	June	^d ^h ^m	Sept.	^d ^h ^m
● New Moon		4 16 45.4		2 4 21.2		29 22 43.4		26 19 34.1
○ First Quarter		11 15 37.6		10 2 35.7		7 23 55.0		3 23 0.5
○ Full Moon		19 20 29.0		17 17 7.5		14 16 40.0		10 19 1.1
(Last Quarter		27 12 35.1		24 10 38.3		21 11 33.0		18 13 8.7
● New Moon	Feb.	3 4 5.6	May	1 17 28.9	Aug.	29 14 15.4	Nov.	26 8 37.0
○ First Quarter		10 10 20.4		9 20 47.1		6 9 5.6		2 5 50.6
○ Full Moon		18 14 28.6		17 2 11.3		13 0 0.3		9 8 18.0
(Last Quarter		25 21 23.8		23 17 16.4		20 0 52.8		17 10 0.5
● New Moon	Mar.	3 15 57.6		31 7 37.3		28 5 24.7		24 20 50.4
○ First Quarter		11 6 32.9	June	8 11 59.0	Sept.	4 16 26.5	Dec.	1 13 55.5
○ Full Moon		19 5 26.7		15 9 41.7		11 8 30.9		9 0 43.9
(Last Quarter		26 4 22.4		22 1 16.3		18 17 35.3		17 6 6.4
● New Moon	Apr.	2 4 21.2		29 22 43.4		26 19 34.1		24 8 31.2
○ First Quarter		10 2 35.7	July	7 23 55.0	Oct.	3 23 0.5		31 0 7.2

APOGEE.

	^d ^h	June	^d ^h
January	16 17.1	July	30 16.2
February	13 9.4	August	27 19.5
March	12 5.4	September	24 5.0
April	9 1.7	October	20 21.6
May	6 19.7	November	18 17.2
June	3 9.5	December	15 14.0
			13 8.8

PERIGEE.

	^d ^h	July	^d ^h
January	4 2.3	August	14 12.3
February	1 12.1	September	11 21.3
March	29 8.7	October	9 1.4
April	26 1.2	November	6 10.5
May	20 23.6	December	31 6.8
June	18 20.0		27 7.7
	16 2.6		25 12.5

GREENWICH MEAN TIME.

G. M. T.		Longitude.	Latitude.	Semi-diameter.	Horizontal Parallax.	Var. per Hour.	Age.	Transit, Meridian of Greenwich.			Var. per Hour.	
		° ' "	° ' "	' "	' "	"	d			h m	m	
Jan.	1.0	227 54 17.5	-5 9 8.9	16 21.5	59 56.21	+1.999	25.7	Jan.	1	L	8 36.8	2.52
	1.5	235 13 54.7	5 0 2.5	16 27.7	60 18.98	1.795	26.2		1	U	21 7.7	2.63
	2.0	242 38 55.3	4 45 49.7	16 33.2	60 39.07	1.544	26.7		2	L	9 39.9	2.72
	2.5	250 8 30.3	4 26 35.6	16 37.7	60 55.81	1.238	27.2		2	U	22 12.9	2.78
	3.0	257 41 39.5	4 2 34.3	16 41.2	61 8.58	0.884	27.7		3	L	10 46.5	2.81
	3.5	265 17 14.5	-3 34 8.2	16 43.5	61 16.87	+0.493	28.2		3	U	23 20.1	2.79
	4.0	272 54 0.7	3 1 48.1	16 44.4	61 20.30	+0.079	28.7		4	L	11 53.2	2.73
	4.5	280 30 40.8	2 26 12.7	16 44.0	61 18.73	-0.344	29.2				.....	.....
	5.0	288 5 56.9	1 48 6.2	16 42.2	61 12.09	0.760	0.3		5	U	0 25.5	2.65
	5.5	295 38 35.1	1 8 17.0	16 39.0	61 0.59	1.152	0.8		5	L	12 56.7	2.54
	6.0	303 7 27.9	-0 27 34.6	16 34.7	60 44.59	-1.506	1.3		6	U	1 26.5	2.43
	6.5	310 31 36.4	+0 13 12.1	16 29.2	60 24.65	1.811	1.8		6	L	13 55.0	2.32
	7.0	317 50 12.1	0 53 16.6	16 22.9	60 1.35	2.060	2.3		7	U	2 22.1	2.21
	7.5	325 2 37.2	1 31 57.4	16 15.8	59 35.45	2.249	2.8		7	L	14 48.1	2.11
	8.0	332 8 26.3	2 8 37.5	16 8.3	59 7.65	2.375	3.3		8	U	3 12.9	2.03
	8.5	339 7 24.5	+2 42 46.7	16 0.4	58 38.71	-2.441	3.8		8	L	15 36.8	1.96
	9.0	345 59 27.4	3 14 0.3	15 52.4	58 9.29	2.452	4.3		9	U	4 0.0	1.91
	9.5	352 44 39.7	3 41 59.4	15 44.4	57 40.05	2.413	4.8		9	L	16 22.7	1.87
	10.0	359 23 14.1	4 6 30.6	15 36.6	57 11.52	2.332	5.3		10	U	4 45.0	1.85
	10.5	5 55 29.5	4 27 24.4	15 29.2	56 44.23	2.215	5.8		10	L	17 7.0	1.84
	11.0	12 21 49.6	+4 44 35.5	15 22.2	56 18.49	-2.071	6.3		11	U	5 29.1	1.84
	11.5	18 42 42.2	4 58 1.8	15 15.6	55 54.60	1.905	6.8		11	L	17 51.2	1.85
	12.0	24 58 37.6	5 7 43.2	15 9.7	55 32.85	1.722	7.3		12	U	6 13.4	1.87
	12.5	31 10 7.5	5 13 42.1	15 4.4	55 13.32	1.530	7.8		12	L	18 36.0	1.90
	13.0	37 17 44.9	5 16 1.8	14 59.7	54 56.13	1.333	8.3		13	U	6 58.9	1.93
	13.5	43 22 2.0	+5 14 47.5	14 55.7	54 41.31	-1.135	8.8		13	L	19 22.3	1.97
	14.0	49 23 30.9	5 10 4.9	14 52.3	54 28.89	0.938	9.3		14	U	7 46.1	2.01
	14.5	55 22 42.9	5 2 1.0	14 49.5	54 18.79	0.746	9.8		14	L	20 10.4	2.04
	15.0	61 20 7.4	4 50 43.5	14 47.4	54 10.95	0.561	10.3		15	U	8 35.1	2.08
	15.5	67 16 12.7	4 36 20.8	14 45.9	54 5.28	0.386	10.8		15	L	21 0.2	2.10
	16.0	73 11 25.0	+4 19 2.6	14 44.9	54 1.65	-0.221	11.3		16	U	9 25.5	2.12
	16.5	79 6 8.7	3 58 59.2	14 44.4	53 59.93	-0.067	11.8		16	L	21 50.9	2.12
	17.0	85 0 46.4	3 36 22.2	14 44.4	54 0.01	+0.076	12.3		17	U	10 16.3	2.11
	17.5	90 55 38.2	3 11 24.6	14 44.9	54 1.72	0.207	12.8		17	L	22 41.5	2.09
	18.0	96 51 3.2	2 44 20.2	14 45.8	54 4.94	0.327	13.3		18	U	11 6.5	2.07
	18.5	102 47 18.7	+2 15 24.4	14 47.0	54 9.54	+0.437	13.8		18	L	23 31.1	2.03
	19.0	108 44 40.6	1 44 53.7	14 48.6	54 15.41	0.538	14.3		19	U	11 55.2	1.99
	19.5	114 43 23.2	1 13 6.0	14 50.5	54 22.42	0.630	14.8				.....	.....
	20.0	120 43 40.5	0 40 20.5	14 52.7	54 30.51	0.716	15.3		20	L	0 18.8	1.95
	20.5	126 45 45.4	+0 6 57.3	14 55.2	54 39.59	0.796	15.8		20	U	12 41.9	1.90
	21.0	132 49 50.6	-0 26 42.4	14 57.9	54 49.61	+0.872	16.3		21	L	1 4.5	1.86
	21.5	138 56 8.3	1 0 16.4	15 0.9	55 0.52	0.947	16.8		21	U	13 26.6	1.83
	22.0	145 4 51.3	1 33 22.1	15 4.1	55 12.34	1.021	17.3		22	L	1 48.4	1.80
	22.5	151 16 12.4	2 5 36.4	15 7.6	55 25.03	1.095	17.8		22	U	14 9.9	1.78
	23.0	157 30 24.7	2 36 35.9	15 11.3	55 38.61	1.170	18.3		23	L	2 31.2	1.77
	23.5	163 47 42.0	-3 5 57.2	15 15.2	55 53.11	+1.247	18.8		23	U	14 52.5	1.77
	24.0	170 8 18.7	-3 33 16.9	15 19.4	56 8.54	+1.324	19.3		24	L	3 13.8	1.78

GREENWICH MEAN TIME.

G. M. T.	Longitude.	Latitude.	Semi-diameter.	Horizontal Parallax.	Var. per Hour.	Age.	Transit, Meridian of Greenwich.				Var. per Hour.
									h m	m	
Jan. 24.0	170 8 18.7	-3 33 16.9	15 19.4	56 8.54	+1.324	19.3	Jan. 24	L	3 13.8	1.78	
24.5	176 32 29.5	3 58 12.2	15 23.9	56 24.88	1.401	19.8	24	U	15 35.4	1.81	
25.0	183 0 29.3	4 20 20.9	15 28.6	56 42.14	1.477	20.3	25	L	3 57.3	1.84	
25.5	189 32 33.0	4 39 21.2	15 33.6	57 0.31	1.550	20.8	25	U	16 19.7	1.90	
26.0	196 8 54.5	4 54 53.0	15 38.7	57 19.31	1.615	21.3	26	L	4 42.9	1.97	
26.5	202 49 47.0	-5 6 37.0	15 44.1	57 39.04	+1.670	21.8	26	U	17 6.9	2.04	
27.0	209 35 21.4	5 14 16.0	15 49.6	57 59.34	1.711	22.3	27	L	5 31.9	2.13	
27.5	216 25 46.0	5 17 35.0	15 55.3	58 20.01	1.732	22.8	27	U	17 58.0	2.22	
28.0	223 21 5.3	5 16 21.8	16 0.9	58 40.79	1.737	23.3	28	L	6 25.3	2.33	
28.5	230 21 19.3	5 10 27.8	16 6.5	59 1.32	1.691	23.8	28	U	18 54.0	2.43	
29.0	237 26 22.3	-4 59 48.2	16 12.0	59 21.23	+1.690	24.3	29	L	7 23.8	2.52	
29.5	244 36 2.6	4 44 23.4	16 17.1	59 40.07	1.610	24.8	29	U	19 54.7	2.61	
30.0	251 50 1.2	4 24 19.6	16 21.8	59 57.33	1.358	25.3	30	L	8 26.5	2.67	
30.5	259 7 51.7	3 59 49.1	16 25.9	60 12.47	1.161	25.8	30	U	20 58.9	2.71	
31.0	266 29 0.2	3 31 11.0	16 29.3	60 25.02	0.922	26.3	31	L	9 31.4	2.69	
31.5	273 52 45.3	-2 58 51.3	16 31.9	60 34.46	+0.645	26.8	31	U	22 3.6	2.66	
Feb. 1.0	281 18 19.1	2 23 22.5	16 33.5	60 40.36	+0.335	27.3	Feb. 1	L	10 35.3	2.60	
1.5	288 44 48.5	1 45 22.8	16 34.1	60 42.40	0.000	27.8	1	U	23 6.1	2.52	
2.0	296 11 16.4	1 5 35.7	16 33.5	60 40.32	-0.347	28.3	2	L	11 35.8	2.42	
2.5	303 36 44.1	-0 24 47.1	16 31.8	60 34.08	0.694	28.8			.....	...
3.0	311 0 12.8	+0 16 15.5	16 29.0	60 23.72	-1.028	29.3	3	U	0 4.3	2.33	
3.5	318 20 46.4	0 56 45.3	16 25.1	60 9.49	1.339	0.3	3	L	12 31.7	2.24	
4.0	325 37 32.1	1 35 57.7	16 20.3	59 51.71	1.616	0.8	4	U	0 58.1	2.15	
4.5	332 49 44.1	2 13 12.4	16 14.6	59 30.87	1.850	1.3	4	L	13 23.4	2.07	
5.0	339 56 43.3	2 47 54.3	16 8.2	59 7.52	2.033	1.8	5	U	1 47.9	2.02	
5.5	346 57 59.2	+3 19 34.1	16 1.4	58 42.30	-2.164	2.3	5	L	14 11.8	1.97	
6.0	353 53 10.0	3 47 49.2	15 54.1	58 15.78	2.242	2.8	6	U	2 35.2	1.93	
6.5	0 42 2.9	4 12 22.6	15 46.7	57 48.68	2.371	3.3	6	L	14 58.2	1.91	
7.0	7 24 33.6	4 33 2.7	15 39.3	57 21.49	2.232	3.8	7	U	3 21.0	1.90	
7.5	14 0 46.0	4 49 44.1	15 32.1	56 54.83	2.188	4.3	7	L	15 43.7	1.90	
8.0	20 30 51.2	+5 2 24.8	15 25.1	56 29.16	-2.085	4.8	8	U	4 6.5	1.90	
8.5	26 55 7.1	5 11 6.4	15 18.5	56 4.91	1.960	5.3	8	L	16 29.4	1.92	
9.0	33 13 56.4	5 15 53.3	15 12.3	55 42.45	1.790	5.8	9	U	4 52.6	1.95	
9.5	39 27 46.5	5 16 52.1	15 6.8	55 22.02	1.610	6.3	9	L	17 16.2	1.98	
10.0	45 37 8.0	5 14 10.7	15 1.8	55 3.87	1.414	6.8	10	U	5 40.1	2.00	
10.5	51 42 34.3	+5 7 58.0	14 57.5	54 48.13	-1.207	7.3	10	L	18 4.3	2.03	
11.0	57 44 40.0	4 58 23.8	14 53.9	54 34.92	0.994	7.8	11	U	6 29.0	2.07	
11.5	63 44 1.2	4 45 38.5	14 51.0	54 24.30	0.779	8.3	11	L	18 53.9	2.09	
12.0	69 41 14.2	4 29 52.7	14 48.8	54 16.23	0.565	8.8	12	U	7 19.1	2.11	
12.5	75 36 54.8	4 11 17.6	14 47.3	54 10.71	0.365	9.3	12	L	19 44.5	2.12	
13.0	81 31 38.1	+3 50 4.9	14 46.5	54 7.69	-0.152	9.8	13	U	8 9.9	2.12	
13.5	87 25 58.6	3 26 26.6	14 46.3	54 7.03	+0.041	10.3	13	L	20 35.2	2.10	
14.0	93 20 28.8	3 0 35.9	14 46.8	54 8.63	0.222	10.8	14	U	9 0.4	2.08	
14.5	99 15 39.6	2 32 46.5	14 47.8	54 12.31	0.390	11.3	14	L	21 25.2	2.06	
15.0	105 11 59.4	2 3 13.1	14 49.3	54 17.94	0.544	11.8	15	U	9 49.7	2.02	
15.5	111 9 54.8	+1 32 11.9	14 51.3	54 25.32	+0.683	12.3	15	L	22 13.7	1.98	
16.0	117 9 49.5	+1 0 0.2	14 53.8	54 34.26	+0.805	12.8	16	U	10 37.3	1.94	

GREENWICH MEAN TIME.

G. M. T.	Longitude.	Latitude.	Semi-diameter.	Horizontal Parallax.	Var. per Hour.	Age.	Transit, Meridian of Greenwich.				Var. per Hour.
									h m	m	
Feb.	16.0	117 9 49.5	+1 0 0.2	14 53.8	54 34.26	+0.805	12.8	Feb. 16	U	10 37.3	1.94
	16.5	123 12 4.7	+0 26 56.6	14 56.6	54 44.56	0.909	13.3	16	L	23 0.4	1.90
	17.0	129 16 58.6	-0 6 38.5	14 59.7	54 56.00	0.997	13.8	17	U	11 23.0	1.87
	17.5	135 24 46.7	0 40 23.6	15 3.1	55 8.42	1.068	14.3	17	L	23 45.3	1.84
	18.0	141 35 41.6	1 13 55.8	15 6.6	55 21.59	1.124	14.8	18	U	12 7.3	1.82
	18.5	147 49 52.8	-1 46 51.0	15 10.4	55 35.33	+1.166	15.3			.....	...
	19.0	154 7 27.2	2 18 44.6	15 14.3	55 49.53	1.195	15.8	19	L	0 29.0	1.81
	19.5	160 28 29.1	2 49 11.0	15 18.2	56 3.96	1.212	16.3	19	U	12 50.7	1.80
	20.0	166 53 0.6	3 17 45.0	15 22.2	56 18.57	1.220	16.8	20	L	1 12.3	1.81
	20.5	173 21 1.4	3 44 1.4	15 26.2	56 33.22	1.221	17.3	20	U	13 34.1	1.82
	21.0	179 52 29.4	-4 7 36.0	15 30.2	56 47.84	+1.215	17.8	21	L	1 56.1	1.85
	21.5	186 27 21.5	4 28 5.7	15 34.1	57 2.36	1.206	18.3	21	U	14 18.5	1.88
	22.0	193 5 32.9	4 45 9.6	15 38.0	57 16.75	1.193	18.8	22	L	2 41.4	1.93
	22.5	199 46 58.3	4 58 28.7	15 41.9	57 31.00	1.180	19.3	22	U	15 5.0	2.00
	23.0	206 31 32.6	5 7 46.9	15 45.8	57 45.06	1.164	19.8	23	L	3 29.5	2.07
	23.5	213 19 9.4	-5 12 51.0	15 49.5	57 58.89	+1.145	20.3	23	U	15 54.8	2.15
	24.0	220 9 43.0	5 13 31.4	15 53.2	58 12.49	1.121	20.8	24	L	4 21.2	2.24
	24.5	227 3 7.4	5 9 41.9	15 56.8	58 25.78	1.092	21.3	24	U	16 48.6	2.33
	25.0	233 59 16.0	5 1 20.6	16 0.4	58 38.70	1.067	21.8	25	L	5 17.1	2.42
	25.5	240 58 2.3	4 48 29.7	16 3.8	58 51.12	1.010	22.3	25	U	17 46.6	2.49
	26.0	247 59 18.6	-4 31 15.6	16 7.0	59 2.87	+0.949	22.8	26	L	6 16.9	2.55
	26.5	255 2 56.2	4 9 49.8	16 9.9	59 13.81	0.870	23.3	26	U	18 47.8	2.59
	27.0	262 8 44.5	3 44 28.0	16 12.6	59 23.69	0.772	23.8	27	L	7 19.1	2.60
	27.5	269 16 30.9	3 15 31.0	16 15.0	59 32.27	0.652	24.3	27	U	19 50.3	2.59
	28.0	276 25 59.2	2 43 24.0	16 16.9	59 39.24	0.508	24.8	28	L	8 21.3	2.55
	28.5	283 36 50.8	-2 8 36.5	16 18.3	59 44.39	+0.341	25.3	28	U	20 51.6	2.49
	29.0	290 48 43.1	1 31 42.6	16 19.1	59 47.35	+0.151	25.8	29	L	9 21.2	2.42
	29.5	298 1 9.6	0 53 19.0	16 19.2	59 47.95	-0.058	26.3	29	U	21 49.9	2.35
Mar.	1.0	305 13 40.2	-0 14 5.4	16 18.7	59 45.91	0.282	26.8	Mar. 1	L	10 17.6	2.27
	1.5	312 25 41.2	+0 26 17.2	16 17.4	59 41.13	0.516	27.3	1	U	22 44.3	2.19
	2.0	319 36 36.8	+1 4 7.5	16 15.3	59 33.54	-0.752	27.8	2	L	11 10.2	2.12
	2.5	326 45 49.3	1 41 45.5	16 12.5	59 23.12	0.984	28.3	2	U	23 35.2	2.06
	3.0	333 52 40.0	2 17 33.2	16 8.9	59 9.98	1.202	28.8	3	L	11 59.6	2.01
	3.5	340 56 31.1	2 50 56.2	16 4.6	58 54.35	1.400	29.3			.....	...
	4.0	347 56 46.6	3 21 24.6	15 59.8	58 36.49	1.571	0.3	4	U	0 23.5	1.97
	4.5	354 52 54.7	+3 48 33.7	15 54.4	58 16.75	-1.711	0.8	4	L	12 47.0	1.95
	5.0	1 44 27.3	4 12 4.1	15 48.6	57 55.55	1.815	1.3	5	U	1 10.3	1.93
	5.5	8 31 2.2	4 31 42.1	15 42.6	57 33.34	1.881	1.8	5	L	13 33.4	1.93
	6.0	15 12 23.6	4 47 19.4	15 36.4	57 10.58	1.906	2.3	6	U	1 56.6	1.94
	6.5	21 48 22.3	4 58 52.4	15 30.1	56 47.76	1.892	2.8	6	L	14 19.9	1.95
	7.0	28 18 56.2	+5 6 21.8	15 24.0	56 25.29	-1.843	3.3	7	U	2 43.4	1.97
	7.5	34 44 9.7	5 9 52.2	15 18.1	56 3.65	1.761	3.8	7	L	15 7.1	1.99
	8.0	41 4 13.6	5 9 30.6	15 12.5	55 43.17	1.647	4.3	8	U	3 31.2	2.02
	8.5	47 19 25.3	5 5 26.4	15 7.4	55 24.23	1.506	4.8	8	L	15 55.6	2.05
	9.0	53 30 6.9	4 57 50.5	15 2.7	55 7.13	1.342	5.3	9	U	4 20.4	2.07
	9.5	59 36 45.1	+4 46 55.0	14 58.6	54 52.10	-1.159	5.8	9	L	16 45.4	2.09
	10.0	65 39 50.7	+4 32 52.5	14 55.2	54 39.36	-0.962	6.3	10	U	5 10.7	2.12

GREENWICH MEAN TIME.

G. M. T.	Longitude.	Latitude.	Semi-diameter.	Horizontal Parallax.	Var. per Hour.	Age.	Transit, Meridian of Greenwich.				Var. per Hour.
	" ' "	" ' "	" "	" "	"	d			h m	m	
Mar. 10.0	65 39 50.7	+4 32 52.5	14 55.2	54 39.36	-0.963	6.3	Mar. 10	U	5 10.7	2.12	
10.5	71 39 57.2	4 15 56.0	14 52.3	54 29.05	0.754	6.8	10	L	17 36.2	2.12	
11.0	77 37 41.0	3 56 18.9	14 50.2	54 21.30	0.539	7.3	11	U	6 1.7	2.12	
11.5	83 33 39.8	3 34 14.4	14 48.8	54 16.17	0.319	7.8	11	L	18 27.1	2.11	
12.0	89 28 32.7	3 9 56.3	14 48.1	54 13.65	-0.099	8.3	12	U	6 52.4	2.09	
12.5	95 22 58.9	+2 43 38.3	14 48.2	54 13.77	+0.117	8.8	12	L	19 17.4	2.07	
13.0	101 17 37.9	2 15 34.6	14 48.9	54 16.43	0.327	9.3	13	U	7 42.1	2.04	
13.5	107 13 8.2	1 45 59.8	14 50.3	54 21.58	0.529	9.8	13	L	20 6.3	2.00	
14.0	113 10 7.4	1 15 9.7	14 52.3	54 29.08	0.720	10.3	14	U	8 30.1	1.97	
14.5	119 9 11.4	0 43 20.6	14 55.0	54 38.78	0.895	10.8	14	L	20 53.5	1.93	
15.0	125 10 53.4	+0 10 50.2	14 58.2	54 50.50	+1.053	11.3	15	U	9 16.5	1.89	
15.5	131 15 43.8	-0 22 2.5	15 1.8	55 3.97	1.191	11.8	15	L	21 39.0	1.87	
16.0	137 24 10.3	0 54 57.0	15 6.0	55 18.99	1.307	12.3	16	U	10 1.3	1.84	
16.5	143 36 35.7	1 27 31.2	15 10.4	55 35.25	1.400	12.8	16	L	22 23.3	1.83	
17.0	149 53 18.8	1 59 21.8	15 15.1	55 52.49	1.468	13.3	17	U	10 45.2	1.82	
17.5	156 14 33.4	-2 30 3.7	15 20.0	56 10.38	+1.510	13.8	17	L	23 7.1	1.82	
18.0	162 40 27.7	2 59 11.2	15 24.9	56 28.62	1.525	14.3	18	U	11 29.1	1.84	
18.5	169 11 4.4	3 26 18.0	15 29.9	56 46.88	1.514	14.8	18	L	23 51.3	1.87	
19.0	175 46 20.6	3 50 57.3	15 34.8	57 4.86	1.478	15.3	19	U	12 13.9	1.90	
19.5	182 26 7.6	4 12 43.4	15 39.5	57 22.28	1.420	15.8			.....	...
20.0	189 10 11.0	-4 31 11.7	15 44.1	57 38.87	+1.343	16.3	20	L	0 36.9	1.94	
20.5	195 58 12.3	4 46 0.0	15 48.3	57 54.44	1.248	16.8	20	U	13 0.6	2.01	
21.0	202 49 48.4	4 56 49.0	15 52.2	58 8.78	1.140	17.3	21	L	1 25.1	2.07	
21.5	209 44 33.8	5 3 22.9	15 55.8	58 21.77	1.024	17.8	21	U	13 50.4	2.15	
22.0	216 42 0.3	5 5 30.7	15 58.9	58 33.31	0.902	18.3	22	L	2 16.7	2.23	
22.5	223 41 39.9	-5 3 5.7	16 1.6	58 43.41	+0.778	18.8	22	U	14 44.0	2.31	
23.0	230 43 4.0	4 56 6.6	16 4.0	58 52.00	0.655	19.3	23	L	3 12.3	2.39	
23.5	237 45 46.4	4 44 37.1	16 5.9	58 59.15	0.535	19.8	23	U	15 41.5	2.47	
24.0	244 49 22.7	4 28 46.2	16 7.5	59 4.86	0.420	20.3	24	L	4 11.5	2.52	
24.5	251 53 31.1	4 8 47.6	16 8.7	59 9.24	0.310	20.8	24	U	16 42.1	2.57	
25.0	258 57 53.7	-3 44 59.4	16 9.5	59 12.33	+0.206	21.3	25	L	5 13.1	2.58	
25.5	266 2 15.3	3 17 44.1	16 10.0	59 14.20	0.106	21.8	25	U	17 44.0	2.57	
26.0	273 6 23.6	2 47 27.4	16 10.2	59 14.90	+0.009	22.3	26	L	6 14.7	2.53	
26.5	280 10 8.9	2 14 38.2	16 10.1	59 14.41	-0.087	22.8	26	U	18 44.8	2.47	
27.0	287 13 22.9	1 39 47.9	16 9.7	59 12.81	0.183	23.3	27	L	7 14.2	2.41	
27.5	294 15 58.9	-1 3 29.8	16 8.9	59 10.02	-0.282	23.8	27	U	19 42.7	2.33	
28.0	301 17 49.4	-0 26 18.5	16 7.8	59 6.02	0.385	24.3	28	L	8 10.2	2.25	
28.5	308 18 46.7	+0 11 10.8	16 6.4	59 0.79	0.492	24.8	28	U	20 36.8	2.18	
29.0	315 18 41.7	0 48 22.5	16 4.6	58 54.19	0.603	25.3	29	L	9 2.5	2.11	
29.5	322 17 23.0	1 24 41.8	16 2.4	58 46.27	0.719	25.8	29	U	21 27.5	2.05	
30.0	329 14 37.4	+1 59 35.2	15 59.9	58 36.94	-0.837	26.3	30	L	9 51.7	2.00	
30.5	336 10 8.8	2 32 31.0	15 57.0	58 26.20	0.954	26.8	30	U	22 15.5	1.96	
31.0	343 3 39.3	3 3 0.3	15 53.6	58 14.07	1.069	27.3	31	L	10 38.8	1.93	
31.5	349 54 49.3	3 30 37.5	15 50.0	58 0.57	1.178	27.8	31	U	23 1.9	1.92	
Apr. 1.0	356 43 17.9	3 55 0.6	15 46.0	57 45.84	1.276	28.3	Apr. 1	L	11 24.9	1.91	
1.5	3 28 44.3	+4 15 52.2	15 41.6	57 30.01	-1.359	28.8	1	U	23 47.8	1.92	
2.0	10 10 48.0	+4 32 58.9	15 37.1	57 13.27	-1.427	29.3	2	L	12 10.9	1.94	

GREENWICH MEAN TIME.

G. M. T.		Longitude.	Latitude.	Semi-diameter.	Horizontal Parallax.	Var. per Hour.	Age.	Transit, Meridian of Greenwich.				Var. per Hour.
		° ' "	° ' "	' "	' "	"	d			h m	m	
Apr.	1.0	356 43 17.9	+3 55 0.6	15 46.0	57 45.84	-1.376	28.3	Apr.	1	L	11 24.9	1.91
	1.5	3 28 44.3	4 15 52.2	15 41.6	57 30.01	1.359	28.8		1	U	23 47.8	1.92
	2.0	10 10 48.0	4 32 58.9	15 37.1	57 13.27	1.427	29.3		2	L	12 10.9	1.94
	2.5	16 49 11.3	4 46 12.2	15 32.3	56 55.82	1.475	0.3			.....	...
	3.0	23 23 38.1	4 55 27.7	15 27.5	56 37.97	1.499	0.8		3	U	0 34.3	1.96
	3.5	29 53 56.9	+5 0 45.1	15 22.6	56 19.95	-1.499	1.3		3	L	12 57.9	1.98
	4.0	36 19 59.8	5 2 8.1	15 17.7	56 2.10	1.478	1.8		4	U	1 21.8	2.01
	4.5	42 41 44.5	4 59 43.4	15 13.0	55 44.69	1.423	2.3		4	L	13 46.2	2.04
	5.0	48 59 13.1	4 53 40.2	15 8.4	55 28.04	1.346	2.8		5	U	2 10.9	2.07
	5.5	55 12 33.5	4 44 9.8	15 4.2	55 12.48	1.246	3.3		5	L	14 36.0	2.10
	6.0	61 21 58.8	+4 31 25.2	15 0.3	54 58.24	-1.128	3.8		6	U	3 1.3	2.12
	6.5	67 27 47.2	4 15 40.5	14 56.8	54 45.62	0.979	4.3		6	L	15 26.9	2.14
	7.0	73 30 21.1	3 57 10.3	14 53.9	54 34.84	0.816	4.8		7	U	3 52.6	2.14
	7.5	79 30 7.6	3 36 9.7	14 51.5	54 26.11	0.636	5.3		7	L	16 18.3	2.13
	8.0	85 27 37.1	3 12 54.0	14 49.8	54 19.63	0.443	5.8		8	U	4 43.8	2.11
	8.5	91 23 23.8	+2 47 38.4	14 48.6	54 15.52	-0.240	6.3		8	L	17 9.0	2.09
	9.0	97 18 4.1	2 20 38.1	14 48.2	54 13.90	-0.029	6.8		9	U	5 33.9	2.06
	9.5	103 12 16.6	1 52 8.7	14 48.5	54 14.84	+0.186	7.3		9	L	17 58.4	2.02
	10.0	109 6 41.4	1 22 25.5	14 49.4	54 18.38	0.404	7.8		10	U	6 22.4	1.98
	10.5	115 1 59.9	0 51 44.3	14 51.1	54 24.53	0.620	8.3		10	L	18 45.9	1.94
	11.0	120 58 53.5	+0 20 21.2	14 53.5	54 33.25	+0.833	8.8		11	U	7 8.9	1.90
	11.5	126 58 3.2	-0 11 26.5	14 56.5	54 44.47	1.036	9.3		11	L	19 31.5	1.87
	12.0	133 0 9.3	0 43 21.1	15 0.2	54 58.07	1.227	9.8		12	U	7 53.8	1.84
	12.5	139 5 50.1	1 15 3.5	15 4.5	55 13.84	1.402	10.3		12	L	20 15.8	1.82
	13.0	145 15 41.6	1 46 13.2	15 9.4	55 31.62	1.557	10.8		13	U	8 37.6	1.81
	13.5	151 30 16.0	-2 16 28.5	15 14.7	55 51.13	+1.689	11.3		13	L	20 59.3	1.81
	14.0	157 50 1.0	2 45 26.2	15 20.4	56 12.04	1.793	11.8		14	U	9 21.1	1.82
	14.5	164 15 19.0	3 12 41.7	15 26.4	56 34.05	1.966	12.3		14	L	21 43.1	1.84
	15.0	170 46 26.4	3 37 49.3	15 32.6	56 56.71	1.906	12.8		15	U	10 5.4	1.87
	15.5	177 23 31.2	4 0 22.9	15 38.8	57 19.62	1.907	13.3		15	L	22 28.1	1.92
	16.0	184 6 34.1	-4 19 56.3	15 45.0	57 42.31	+1.870	13.8		16	U	10 51.5	1.98
	16.5	190 55 26.7	4 36 4.1	15 51.0	58 4.33	1.793	14.3		16	L	23 15.7	2.05
	17.0	197 49 51.8	4 48 23.0	15 56.7	58 25.21	1.679	14.8		17	U	11 40.8	2.13
	17.5	204 49 23.9	4 56 32.2	16 2.0	58 44.52	1.531	15.3			.....	...
	18.0	211 53 29.4	5 0 15.0	16 6.7	59 1.85	1.352	15.8		18	L	0 6.8	2.22
	18.5	219 1 27.4	-4 59 19.8	16 10.8	59 16.85	+1.148	16.3		18	U	12 34.0	2.31
	19.0	226 12 32.5	4 53 40.8	16 14.2	59 29.32	0.925	16.8		19	L	1 2.3	2.40
	19.5	233 25 55.7	4 43 18.4	16 16.8	59 39.01	0.690	17.3		19	U	13 31.7	2.49
	20.0	240 40 47.2	4 28 20.0	16 18.7	59 45.85	0.432	17.8		20	L	2 2.1	2.56
	20.5	247 56 17.7	4 8 59.3	16 19.8	59 49.87	+0.218	18.3		20	U	14 33.2	2.61
	21.0	255 11 41.4	-3 45 36.2	16 20.1	59 51.14	-0.006	18.8		21	L	3 4.8	2.64
	21.5	262 26 16.8	3 18 35.8	16 19.8	59 49.80	0.214	19.3		21	U	15 36.5	2.63
	22.0	269 39 28.2	2 48 27.6	16 18.7	59 46.06	0.402	19.8		22	L	4 8.0	2.60
	22.5	276 50 46.6	2 15 44.5	16 17.1	59 40.23	0.567	20.3		22	U	16 39.0	2.54
	23.0	283 59 50.1	1 41 1.5	16 15.0	59 32.56	0.710	20.8		23	L	5 9.1	2.47
	23.5	291 6 22.0	-1 4 54.8	16 12.5	59 23.29	-0.830	21.3		23	U	17 38.3	2.39
	24.0	298 10 12.0	-0 28 0.6	16 9.6	59 12.74	-0.927	21.8		24	L	6 6.4	2.29

GREENWICH MEAN TIME.

G. M. T.	Longitude.	Latitude.	Semi-diameter.	Horizontal Parallax.	Var. per Hour.	Age.	Transit, Meridian of Greenwich.				Var. per Hour.
	" " "	" " "	" "	" "	"	d			h m	m	
Apr. 24.0	298 10 12.0	-0 28 0.6	16 9.6	59 12.74	-0.927	21.8	Apr. 24	L	6 6.4	2.20	
24.5	305 11 14.9	+0 9 5.3	16 6.5	59 1.15	1.004	22.3	24	U	18 33.4	2.21	
25.0	312 9 28.6	0 45 47.8	16 3.1	58 48.71	1.065	22.8	25	L	6 59.4	2.13	
25.5	319 4 54.1	1 21 34.4	15 59.5	58 35.64	1.112	23.3	25	U	19 24.5	2.06	
26.0	325 57 33.3	1 55 54.1	15 55.8	58 22.09	1.147	23.8	26	L	7 48.8	1.99	
26.5	332 47 29.2	+2 28 18.7	15 52.0	58 8.15	-1.174	24.3	26	U	20 12.4	1.94	
27.0	339 34 44.1	2 58 22.4	15 48.2	57 53.94	1.196	24.8	27	L	8 35.5	1.91	
27.5	346 19 19.5	3 25 42.5	15 44.2	57 39.49	1.212	25.3	27	U	20 58.3	1.89	
28.0	353 1 15.1	3 49 59.4	15 40.2	57 24.88	1.224	25.8	28	L	9 20.8	1.88	
28.5	359 40 29.3	4 10 56.6	15 36.2	57 10.12	1.233	26.3	28	U	21 43.4	1.88	
29.0	6 16 59.0	+4 28 21.2	15 32.2	56 55.29	-1.239	26.8	29	L	10 5.9	1.89	
29.5	12 50 39.4	4 42 3.6	15 28.1	56 40.40	1.242	27.3	29	U	22 28.7	1.91	
30.0	19 21 24.7	4 51 57.8	15 24.1	56 25.50	1.239	27.8	30	L	10 51.8	1.94	
30.5	25 49 9.1	4 58 1.2	15 20.0	56 10.70	1.229	28.3	30	U	23 15.2	1.97	
May 1.0	32 13 46.4	5 0 14.5	15 16.0	55 56.05	1.210	28.8	May 1	L	11 39.1	2.01	
1.5	38 35 12.2	+4 58 41.6	15 12.1	55 41.68	-1.182	29.3			.....	...
2.0	44 53 22.6	4 53 29.0	15 8.3	55 27.71	1.142	0.3	2	U	0 3.4	2.04	
2.5	51 8 17.1	4 44 46.0	15 4.7	55 14.33	1.099	0.8	2	L	12 28.1	2.08	
3.0	57 19 57.1	4 32 43.9	15 1.2	55 1.66	1.021	1.3	3	U	0 53.3	2.11	
3.5	63 28 27.5	4 17 35.8	14 58.0	54 49.88	0.938	1.8	3	L	13 18.7	2.13	
4.0	69 33 57.1	+3 59 36.3	14 55.1	54 39.18	-0.840	2.3	4	U	1 44.4	2.14	
4.5	75 36 37.9	3 39 0.7	14 52.5	54 29.77	0.796	2.8	4	L	14 10.1	2.14	
5.0	81 36 45.9	3 16 5.1	14 50.4	54 21.84	0.696	3.3	5	U	2 35.8	2.13	
5.5	87 34 41.3	2 51 6.4	14 48.7	54 15.55	0.450	3.8	5	L	15 1.3	2.11	
6.0	93 30 47.4	2 24 21.0	14 47.4	54 11.07	0.290	4.3	6	U	3 26.5	2.08	
6.5	99 25 31.5	+1 56 5.9	14 46.8	54 8.63	-0.118	4.8	6	L	15 51.3	2.04	
7.0	105 19 23.8	1 26 37.9	14 46.7	54 8.31	+0.066	5.3	7	U	4 15.5	2.00	
7.5	111 12 57.7	0 56 13.7	14 47.2	54 10.26	0.261	5.8	7	L	16 39.3	1.96	
8.0	117 6 49.0	+0 25 10.2	14 48.4	54 14.60	0.464	6.3	8	U	5 2.5	1.91	
8.5	123 1 35.9	-0 6 15.9	14 50.2	54 21.40	0.671	6.8	8	L	17 25.2	1.87	
9.0	128 57 57.6	-0 37 47.2	14 52.8	54 30.71	+0.881	7.3	9	U	5 47.4	1.83	
9.5	134 56 35.2	1 9 6.2	14 56.0	54 42.54	1.091	7.8	9	L	18 9.2	1.81	
10.0	140 58 9.5	1 39 54.5	14 59.9	54 56.86	1.295	8.3	10	U	6 30.8	1.79	
10.5	147 3 21.7	2 9 53.1	15 4.5	55 13.60	1.491	8.8	10	L	18 52.2	1.78	
11.0	153 12 51.8	2 38 41.9	15 9.7	55 32.60	1.675	9.3	11	U	7 13.5	1.77	
11.5	159 27 17.1	-3 5 59.5	15 15.4	55 53.75	+1.842	9.8	11	L	19 34.8	1.79	
12.0	165 47 12.6	3 31 23.7	15 21.7	56 16.74	1.996	10.3	12	U	7 56.4	1.82	
12.5	172 13 8.8	3 54 31.1	15 28.4	56 41.30	2.102	10.8	12	L	20 18.4	1.85	
13.0	178 45 30.2	4 14 57.4	15 35.4	57 7.07	2.185	11.3	13	U	8 40.9	1.90	
13.5	185 24 35.0	4 32 18.1	15 42.6	57 33.58	2.228	11.8	13	L	21 4.1	1.97	
14.0	192 10 32.1	-4 46 8.8	15 49.9	58 0.36	+2.227	12.3	14	U	9 28.1	2.04	
14.5	199 3 21.9	4 56 6.3	15 57.1	58 26.83	2.178	12.8	14	L	21 53.2	2.14	
15.0	206 2 53.4	5 1 49.5	16 4.1	58 52.44	2.080	13.3	15	U	10 19.4	2.23	
15.5	213 8 45.6	5 3 0.5	16 10.7	59 16.55	1.931	13.8	15	L	22 46.8	2.34	
16.0	220 20 25.4	4 59 26.3	16 16.7	59 38.58	1.731	14.3	16	U	11 15.6	2.45	
16.5	227 37 10.2	-4 50 59.6	16 22.0	59 57.94	+1.487	14.8	16	L	23 45.6	2.54	
17.0	234 58 7.5	-4 37 40.2	16 26.4	60 14.12	+1.205	15.3	17	U	12 16.7	2.63	

GREENWICH MEAN TIME.

G. M. T.		Longitude.	Latitude.	Semi-diameter.	Horizontal Parallax.	Var. per Hour.	Age.	Transit, Meridian of Greenwich.				Var. per Hour.
		° ' "	° ' "	' "	' "	"	d					
May	17.0	234 58 7.5	-4 37 40.2	16 26.4	60 14.12	+1.205	15.3	May 17	U	12 16.7	2.63	
	17.5	242 22 18.4	4 19 35.2	16 29.8	60 26.72	0.893	15.8			.....	...
	18.0	249 48 38.4	3 56 59.9	16 32.2	60 35.46	0.563	16.3	18	L	0 48.8	2.00	
	18.5	257 16 1.9	3 30 17.1	16 33.5	60 40.15	+0.222	16.8	18	U	13 21.4	2.72	
	19.0	264 43 23.9	2 59 56.6	16 33.6	60 40.81	-0.113	17.3	19	L	1 54.2	2.72	
	19.5	272 9 42.7	-2 26 33.8	16 32.7	60 37.52	-0.431	17.8	19	U	14 26.6	2.68	
	20.0	279 34 2.7	1 50 48.4	16 30.8	60 30.56	0.723	18.3	20	L	2 58.5	2.62	
	20.5	286 55 36.0	1 13 22.4	16 28.0	60 20.27	0.984	18.8	20	U	15 29.4	2.53	
	21.0	294 13 43.4	-0 34 58.9	16 24.5	60 7.08	1.208	19.3	21	L	3 59.2	2.43	
	21.5	301 27 53.9	+0 3 40.2	16 20.2	59 51.45	1.300	19.8	21	U	16 27.7	2.32	
	22.0	308 37 46.4	+0 41 54.5	16 15.4	59 33.90	-1.530	20.3	22	L	4 55.0	2.22	
	22.5	315 43 7.3	1 19 6.8	16 10.2	59 14.92	1.630	20.8	22	U	17 21.1	2.14	
	23.0	322 43 50.4	1 54 43.4	16 4.8	58 54.94	1.692	21.3	23	L	5 46.3	2.06	
	23.5	329 39 55.5	2 28 14.5	15 59.2	58 34.43	1.722	21.8	23	U	18 10.5	1.99	
	24.0	336 31 26.8	2 59 14.5	15 53.6	58 13.74	1.724	22.3	24	L	6 34.1	1.94	
	24.5	343 18 32.5	+3 27 21.6	15 48.0	57 53.17	-1.703	22.8	24	U	18 57.1	1.90	
	25.0	350 1 22.6	3 52 17.9	15 42.4	57 32.94	1.663	23.3	25	L	7 19.7	1.87	
	25.5	356 40 8.4	4 13 49.4	15 37.1	57 13.31	1.600	23.8	25	U	19 42.1	1.86	
	26.0	3 15 2.4	4 31 45.1	15 31.9	56 54.38	1.545	24.3	26	L	8 4.4	1.86	
	26.5	9 46 16.1	4 45 57.7	15 27.0	56 36.26	1.474	24.8	26	U	20 26.8	1.87	
	27.0	16 14 0.8	+4 56 22.4	15 22.3	56 19.02	-1.398	25.3	27	L	8 49.4	1.80	
	27.5	22 38 26.8	5 2 57.5	15 17.9	56 2.69	1.322	25.8	27	U	21 12.3	1.92	
	28.0	28 59 43.4	5 5 43.8	15 13.7	55 47.26	1.246	26.3	28	L	9 35.6	1.96	
	28.5	35 17 58.9	5 4 44.8	15 9.7	55 32.80	1.168	26.8	28	U	21 59.3	1.99	
	29.0	41 33 21.0	5 0 6.1	15 6.0	55 19.25	1.090	27.3	29	L	10 23.5	2.03	
	29.5	47 45 56.3	+4 51 55.5	15 2.6	55 6.63	-1.012	27.8	29	U	22 48.1	2.07	
	30.0	53 55 51.7	4 40 22.8	14 59.4	54 54.97	0.933	28.3	30	L	11 13.1	2.10	
	30.5	60 3 13.7	4 25 39.6	14 56.5	54 44.26	0.851	28.8	30	U	23 38.5	2.12	
	31.0	66 8 10.2	4 7 59.1	14 53.8	54 34.55	0.766	29.3	31	L	12 4.1	2.14	
	31.5	72 10 49.5	3 47 36.1	14 51.5	54 25.91	0.676	0.2			.....	...
June	1.0	78 11 21.9	+3 24 45.9	14 49.4	54 18.35	-0.579	-0.7	June 1	U	0 29.8	2.14	
	1.5	84 9 58.4	2 59 45.3	14 47.7	54 12.02	0.475	1.2	1	L	12 55.4	2.12	
	2.0	90 6 53.1	2 32 51.4	14 46.3	54 6.98	0.364	1.7	2	U	1 20.8	2.10	
	2.5	96 2 22.0	2 4 22.0	14 45.3	54 3.32	0.243	2.2	2	L	13 45.8	2.07	
	3.0	101 56 43.2	1 34 35.0	14 44.7	54 1.18	-0.112	2.7	3	U	2 10.4	2.03	
	3.5	107 50 18.0	+1 3 48.4	14 44.6	54 0.68	+0.030	3.2	3	L	14 34.5	1.96	
	4.0	113 43 29.9	0 32 20.4	14 45.0	54 1.94	0.182	3.7	4	U	2 58.0	1.93	
	4.5	119 36 45.5	+0 0 29.1	14 45.8	54 5.08	0.344	4.2	4	L	15 20.9	1.89	
	5.0	125 30 33.2	-0 31 27.4	14 47.2	54 10.23	0.515	4.7	5	U	3 43.3	1.84	
	5.5	131 25 23.5	1 3 10.9	14 49.2	54 17.49	0.695	5.2	5	L	16 5.2	1.81	
	6.0	137 21 50.8	-1 34 23.4	14 51.8	54 26.95	+0.883	5.7	6	U	4 26.7	1.78	
	6.5	143 20 29.3	2 4 46.3	14 55.0	54 38.69	1.074	6.2	6	L	16 47.9	1.75	
	7.0	149 21 56.0	2 34 1.1	14 58.8	54 52.74	1.267	6.7	7	U	5 8.8	1.74	
	7.5	155 26 47.8	3 1 48.7	15 3.2	55 9.10	1.460	7.2	7	L	17 29.7	1.74	
	8.0	161 35 42.2	3 27 49.2	15 8.3	55 27.74	1.647	7.7	8	U	5 50.6	1.75	
	8.5	167 49 16.5	-3 51 42.4	15 14.0	55 48.58	+1.825	8.2	8	L	18 11.7	1.77	
	9.0	174 8 6.0	-4 13 7.7	15 20.3	56 11.49	+1.990	8.7	9	U	6 33.1	1.81	

GREENWICH MEAN TIME.

G. M. T.	Longitude.	Latitude.	Semi-diameter.	Horizontal Parallax.	Var. per Hour.	Age.	Transit, Meridian of Greenwich.				Var. per Hour.
	" " "	" " "	" "	" "	"	d			h m	m	
June 9.0	174 8 6.0	-4 13 7.7	15 20.3	56 11.49	+1.990	8.7	June 9	U	6 33.1	1.81	
9.5	180 32 43.7	4 31 43.4	15 27.0	56 36.26	2.135	9.2	9	L	18 55.1	1.86	
10.0	187 3 39.0	4 47 7.9	15 34.2	57 2.64	2.264	9.7	10	U	7 17.7	1.92	
10.5	193 41 16.0	4 58 59.6	15 41.7	57 30.23	2.341	10.2	10	L	19 41.2	2.00	
11.0	200 25 52.9	5 6 57.6	15 49.5	57 58.66	2.389	10.7	11	U	8 5.7	2.09	
11.5	207 17 38.8	-5 10 42.4	15 57.3	58 27.37	+2.391	11.2	11	L	20 31.4	2.19	
12.0	214 16 34.3	5 9 57.0	16 5.0	58 55.82	2.341	11.7	12	U	8 58.4	2.31	
12.5	221 22 29.6	5 4 28.0	16 12.5	59 23.34	2.236	12.2	12	L	21 26.8	2.42	
13.0	228 35 2.7	4 54 6.6	16 19.6	59 49.27	2.074	12.7	13	U	9 56.6	2.54	
13.5	235 53 40.7	4 38 50.6	16 26.0	60 12.88	1.852	13.2	13	L	22 27.7	2.64	
14.0	243 17 38.6	-4 18 44.7	16 31.6	60 33.48	+1.574	13.7	14	U	10 59.9	2.71	
14.5	250 46 2.0	3 54 2.1	16 36.3	60 50.47	1.249	14.2	14	L	23 32.8	2.76	
15.0	258 17 47.3	3 25 3.9	16 39.8	61 3.31	0.885	14.7	15	U	12 6.1	2.77	
15.5	265 51 44.9	2 52 19.9	16 42.0	61 11.60	0.493	15.2			.....	....
16.0	273 26 41.8	2 16 27.0	16 43.0	61 15.10	+0.087	15.7	16	L	0 39.3	2.74	
16.5	281 1 25.0	-1 38 8.3	16 42.6	61 13.72	-0.315	16.2	16	U	13 12.0	2.69	
17.0	288 34 43.4	0 58 10.7	16 41.0	61 7.61	0.700	16.7	17	L	1 43.8	2.60	
17.5	296 5 32.1	-0 17 23.2	16 38.1	60 57.06	1.055	17.2	17	U	14 14.4	2.50	
18.0	303 32 52.6	+0 23 25.5	16 34.1	60 42.45	1.370	17.7	18	L	2 43.8	2.39	
18.5	310 55 56.4	1 3 28.8	16 29.2	60 24.38	1.636	18.2	18	U	15 11.9	2.29	
19.0	318 14 4.0	+1 42 3.8	16 23.4	60 3.42	-1.248	18.7	19	L	3 38.8	2.19	
19.5	325 26 46.4	2 18 32.8	16 17.1	59 40.25	2.006	19.2	19	U	16 4.6	2.11	
20.0	332 33 44.1	2 52 23.4	16 10.4	59 15.50	2.111	19.7	20	L	4 29.4	2.03	
20.5	339 34 46.8	3 23 9.2	16 3.4	58 49.80	2.165	20.2	20	U	16 53.4	1.98	
21.0	346 29 52.0	3 50 29.8	15 56.3	58 23.71	2.175	20.7	21	L	5 16.9	1.94	
21.5	353 19 4.1	+4 14 9.6	15 49.2	57 57.73	-2.148	21.2	21	U	17 39.9	1.90	
22.0	0 2 33.3	4 33 58.1	15 42.3	57 32.90	2.088	21.7	22	L	6 2.6	1.89	
22.5	6 40 33.3	4 49 48.9	15 35.6	57 7.74	2.000	22.2	22	U	18 25.2	1.89	
23.0	13 13 21.6	5 1 39.5	15 29.2	56 44.36	1.893	22.7	23	L	6 47.9	1.89	
23.5	19 41 17.7	5 9 30.0	15 23.2	56 22.35	1.773	23.2	23	U	19 10.7	1.91	
24.0	26 4 42.4	+5 13 23.7	15 17.6	56 1.84	-1.645	23.7	24	L	7 33.8	1.94	
24.5	32 23 56.9	5 13 25.6	15 12.5	55 42.92	1.509	24.2	24	U	19 57.2	1.97	
25.0	38 39 22.6	5 9 42.4	15 7.8	55 25.64	1.370	24.7	25	L	8 21.0	2.00	
25.5	44 51 20.5	5 2 23.1	15 3.5	55 10.03	1.233	25.2	25	U	20 45.2	2.03	
26.0	51 0 11.1	4 51 37.6	14 59.7	54 56.04	1.096	25.7	26	L	9 9.8	2.07	
26.5	57 6 13.5	+4 37 37.4	14 56.3	54 43.66	-0.967	26.2	26	U	21 34.9	2.10	
27.0	63 9 46.4	4 20 34.9	14 53.4	54 32.82	0.841	26.7	27	L	10 0.2	2.11	
27.5	69 11 7.3	4 0 43.8	14 50.8	54 23.47	0.718	27.2	27	U	22 25.6	2.12	
28.0	75 10 33.1	3 38 18.9	14 48.7	54 15.58	0.599	27.7	28	L	10 51.1	2.12	
28.5	81 8 19.7	3 13 35.9	14 46.9	54 9.07	0.485	28.2	28	U	23 16.6	2.11	
29.0	87 4 43.0	+2 46 51.1	14 45.5	54 3.94	-0.373	28.7	29	L	11 41.8	2.08	
29.5	92 59 58.4	2 18 21.7	14 44.5	54 0.12	0.262	29.2			.....	....
30.0	98 54 21.8	1 48 25.7	14 43.8	53 57.65	0.150	0.0	30	U	0 6.6	2.05	
30.5	104 48 9.0	1 17 21.5	14 43.5	53 56.54	-0.038	0.5	30	L	12 31.0	2.01	
July 1.0	110 41 37.0	0 45 27.8	14 43.5	53 56.73	+0.078	1.0	July 1	U	0 54.9	1.97	
1.5	116 35 3.1	+0 13 3.7	14 44.0	53 58.34	+0.193	1.5	1	L	13 18.3	1.92	
2.0	122 28 46.0	-0 19 31.9	14 44.8	54 1.41	+0.316	2.0	2	U	1 41.0	1.87	

GREENWICH MEAN TIME.

G. M. T.		Longitude.	Latitude.	Semi-diameter.	Horizontal Parallax.	Var. per Hour.	Age.	Transit, Meridian of Greenwich.				Var. per Hour.
		" ' "	" ' "	" "	" "	"	d			h m	m	
July	1.0	110 41 37.0	+0 45 27.8	14 43.5	53 56.73	+0.076	1.0	July	1	U	0 54.9	1.97
	1.5	116 35 3.1	+0 13 3.7	14 44.0	53 58.34	0.193	1.5		1	L	13 18.3	1.92
	2.0	122 28 46.0	-0 19 31.9	14 44.8	54 1.41	0.316	2.0		2	U	1 41.0	1.87
	2.5	128 23 5.8	0 51 59.2	14 46.0	54 5.95	0.446	2.5		2	L	14 3.2	1.83
	3.0	134 18 24.0	1 23 59.3	14 47.7	54 12.10	0.562	3.0		3	U	2 24.9	1.79
	3.5	140 15. 3.4	-1 55 12.8	14 49.8	54 19.91	+0.723	3.5		3	L	14 46.2	1.76
	4.0	146 13 28.6	2 25 20.5	14 52.4	54 29.47	0.871	4.0		4	U	3 7.1	1.74
	4.5	152 14 5.5	2 54 3.4	14 55.6	54 40.86	1.026	4.5		4	L	15 27.9	1.72
	5.0	158 17 21.9	3 21 2.4	14 59.2	54 54.11	1.185	5.0		5	U	3 48.5	1.72
	5.5	164 23 46.3	3 45 58.5	15 3.3	55 9.30	1.348	5.5		5	L	16 9.1	1.72
	6.0	170 33 47.8	-4 8 33.0	15 8.0	55 26.45	+1.511	6.0		6	U	4 29.9	1.74
	6.5	176 47 56.9	4 28 28.8	15 13.2	55 45.54	1.671	6.5		6	L	16 51.0	1.77
	7.0	183 6 42.9	4 45 21.4	15 18.9	56 6.52	1.825	7.0		7	U	5 12.5	1.82
	7.5	189 30 34.5	4 58 58.2	15 25.1	56 29.30	1.969	7.5		7	L	17 34.7	1.88
	8.0	195 59 58.7	5 8 59.2	15 31.8	56 53.71	2.097	8.0		8	U	5 57.6	1.95
	8.5	202 35 19.5	-5 15 7.5	15 38.8	57 19.54	+2.203	8.5		8	L	18 21.5	2.04
	9.0	209 16 57.1	5 17 7.1	15 46.1	57 46.47	2.289	9.0		9	U	6 46.5	2.14
	9.5	216 5 6.7	5 14 44.1	15 53.7	58 14.12	2.322	9.5		9	L	19 12.8	2.24
	10.0	222 59 56.4	5 7 47.7	16 1.3	58 42.05	2.333	10.0		10	U	7 40.4	2.36
	10.5	230 1 27.2	4 56 10.3	16 8.8	59 9.68	2.276	10.5		10	L	20 9.4	2.47
	11.0	237 9 30.9	-4 39 49.4	16 16.1	59 36.44	+2.174	11.0		11	U	8 39.7	2.57
	11.5	244 23 49.5	4 18 48.5	16 23.0	60 1.65	2.015	11.5		11	L	21 11.1	2.66
	12.0	251 43 54.4	3 53 17.4	16 29.2	60 24.58	1.797	12.0		12	U	9 43.5	2.72
	12.5	259 9 7.1	3 23 34.0	16 34.7	60 44.58	1.523	12.5		12	L	22 16.4	2.74
	13.0	266 38 38.0	2 50 3.9	16 39.1	61 0.94	1.198	13.0		13	U	10 49.4	2.74
	13.5	274 11 29.9	-2 13 20.2	16 42.5	61 13.14	+0.828	13.5		13	L	23 22.1	2.70
	14.0	281 46 37.5	1 34 3.8	16 44.5	61 20.69	0.427	14.0		14	U	11 54.2	2.63
	14.5	289 22 50.8	0 53 0.6	16 45.2	61 23.32	+0.008	14.5					
	15.0	296 58 57.5	-0 11 0.8	16 44.6	61 20.89	-0.412	15.0		15	L	0 25.3	2.54
	15.5	304 33 45.5	+0 31 4.1	16 42.6	61 13.49	0.818	15.5		15	U	12 55.3	2.45
	16.0	312 6 5.8	+1 12 22.9	16 39.2	61 1.35	-1.196	16.0		16	L	1 24.1	2.35
	16.5	319 34 55.1	1 52 7.6	16 34.8	60 44.94	1.534	16.5		16	U	13 51.7	2.26
	17.0	326 59 17.4	2 29 34.6	16 29.3	60 24.76	1.820	17.0		17	L	2 18.3	2.17
	17.5	334 18 25.7	3 4 6.8	16 22.9	60 1.50	2.048	17.5		17	U	14 43.9	2.10
	18.0	341 31 43.0	3 35 13.5	16 15.9	59 35.85	2.217	18.0		18	L	3 8.8	2.04
	18.5	348 38 42.8	+4 2 31.6	16 8.5	59 8.52	-2.328	18.5		18	U	15 33.0	2.00
	19.0	355 39 8.8	4 25 45.0	16 0.8	58 40.20	2.382	19.0		19	L	3 56.8	1.97
	19.5	2 32 53.6	4 44 43.6	15 53.0	58 11.56	2.385	19.5		19	U	16 20.2	1.94
	20.0	9 19 58.8	4 59 23.0	15 45.2	57 43.14	2.343	20.0		20	L	4 43.5	1.94
	20.5	16 0 33.8	5 9 43.6	15 37.7	57 15.46	2.263	20.5		20	U	17 6.8	1.94
	21.0	22 34 53.8	+5 15 49.5	15 30.5	56 46.95	-2.153	21.0		21	L	5 30.2	1.96
	21.5	29 3 19.1	5 17 47.7	15 23.6	56 23.91	2.018	21.5		21	U	17 53.8	1.98
	22.0	35 26 13.7	5 15 47.5	15 17.3	56 0.62	1.863	22.0		22	L	6 17.7	2.00
	22.5	41 44 4.8	5 10 0.0	15 11.5	55 39.25	1.696	22.5		22	U	18 41.9	2.03
	23.0	47 57 21.0	5 0 37.2	15 6.2	55 19.92	1.522	23.0		23	L	7 6.5	2.06
	23.5	54 6 32.4	+4 47 52.3	15 1.5	55 2.73	-1.344	23.5		23	U	19 31.4	2.08
	24.0	60 12 8.6	+4 31 59.0	14 57.4	54 47.66	-1.166	24.0		24	L	7 56.5	2.10

GREENWICH MEAN TIME.

G. M. T.	Longitude.	Latitude.	Semi-diameter.	Horizontal Parallax.	Var. per Hour.	Age.	Transit, Meridian of Greenwich.			Var. per Hour.
	" ' "	" ' "	" "	" "	" "	d		h m	m	
July 24.0	60 12 8.6	+4 31 59.0	14 57.4	54 47.66	-1.163	24.0	July 24	L	7 56.5	2.10
24.5	66 14 40.1	4 13 11.6	14 53.9	54 34.74	0.990	24.5	24	U	20 21.9	2.12
25.0	72 14 35.7	3 51 44.9	14 50.9	54 23.88	0.820	25.0	25	L	8 47.4	2.12
25.5	78 12 24.0	3 27 54.2	14 48.5	54 15.04	0.656	25.5	25	U	21 12.8	2.11
26.0	84 8 31.9	3 1 55.3	14 46.6	54 8.11	0.499	26.0	26	L	9 38.1	2.09
26.5	90 3 24.6	+2 34 4.5	14 45.2	54 3.04	-0.351	26.5	26	U	22 3.1	2.07
27.0	95 57 26.4	2 4 38.8	14 44.3	53 59.67	0.210	27.0	27	L	10 27.8	2.04
27.5	101 50 59.8	1 33 55.6	14 43.9	53 57.95	-0.078	27.5	27	U	22 52.0	1.99
28.0	107 44 26.0	1 2 12.9	14 43.8	53 57.77	+0.046	28.0	28	L	11 15.7	1.96
28.5	113 38 4.5	+0 29 49.4	14 44.2	53 59.03	0.163	28.5	28	U	23 38.9	1.91
29.0	119 32 14.1	-0 2 55.7	14 44.9	54 1.67	+0.276	29.0	29	L	12 1.5	1.86
29.5	125 27 12.3	0 35 42.9	14 46.0	54 5.64	0.384	29.5			.....	...
30.0	131 23 16.0	1 8 12.4	14 47.4	54 10.86	0.487	0.4	30	U	0 23.6	1.83
30.5	137 20 41.3	1 40 3.9	14 49.1	54 17.32	0.589	0.9	30	L	12 45.3	1.79
31.0	143 19 44.0	2 10 57.3	14 51.2	54 25.02	0.693	1.4	31	U	1 6.5	1.76
31.5	149 20 39.7	-2 40 32.3	14 53.7	54 33.94	+0.796	1.9	31	L	13 27.5	1.74
Aug. 1.0	155 23 44.3	3 8 29.0	14 56.4	54 44.12	0.899	2.4	Aug. 1	U	1 48.2	1.72
1.5	161 29 13.7	3 34 27.6	14 59.6	54 55.52	1.008	2.9	1	L	14 8.8	1.72
2.0	167 37 24.3	3 58 9.3	15 3.0	55 8.24	1.114	3.4	2	U	2 29.5	1.73
2.5	173 48 33.2	4 19 15.3	15 6.8	55 22.30	1.226	3.9	2	L	14 50.3	1.74
3.0	180 2 57.6	-4 37 28.1	15 11.0	55 37.69	+1.340	4.4	3	U	3 11.4	1.77
3.5	186 20 55.4	4 52 30.6	15 15.6	55 54.45	1.454	4.9	3	L	15 32.9	1.82
4.0	192 42 44.7	5 4 7.1	15 20.5	56 12.58	1.567	5.4	4	U	3 55.0	1.87
4.5	199 8 43.9	5 12 3.1	15 25.8	56 32.04	1.675	5.9	4	L	16 17.8	1.93
5.0	205 39 10.6	5 16 5.5	15 31.5	56 52.74	1.776	6.4	5	U	4 41.4	2.01
5.5	212 14 21.5	-5 16 3.1	15 37.4	57 14.59	+1.864	6.9	5	L	17 6.1	2.10
6.0	218 54 32.3	5 11 46.9	15 43.7	57 37.41	1.936	7.4	6	U	5 31.9	2.20
6.5	225 39 55.2	5 3 10.4	15 50.1	58 0.96	1.986	7.9	6	L	17 58.9	2.30
7.0	232 30 40.6	4 50 10.4	15 56.6	58 24.95	2.008	8.4	7	U	6 27.1	2.40
7.5	239 26 54.0	4 32 47.6	16 3.2	58 49.04	1.995	8.9	7	L	18 56.5	2.49
8.0	246 28 35.6	-4 11 6.9	16 9.6	59 12.69	+1.943	9.4	8	U	7 26.9	2.57
8.5	253 35 40.0	3 45 18.9	16 15.8	59 35.48	1.847	9.9	8	L	19 58.2	2.63
9.0	260 47 54.1	3 15 39.5	16 21.7	59 56.84	1.704	10.4	9	U	8 30.0	2.66
9.5	268 4 57.5	2 42 31.0	16 26.9	60 16.17	1.510	10.9	9	L	21 2.0	2.66
10.0	275 26 20.9	2 6 22.3	16 31.5	60 32.88	1.266	11.4	10	U	9 33.9	2.64
10.5	282 51 26.8	-1 27 48.5	16 35.2	60 46.39	+0.977	11.9	10	L	22 5.3	2.58
11.0	290 19 29.7	0 47 30.1	16 37.8	60 56.20	0.650	12.4	11	U	10 35.9	2.52
11.5	297 49 36.3	-0 6 12.3	16 39.4	61 1.85	+0.291	12.9	11	L	23 5.7	2.44
12.0	305 20 47.7	+0 35 16.5	16 39.7	61 3.10	-0.087	13.4	12	U	11 34.5	2.36
12.5	312 52 0.5	1 16 7.1	16 38.8	60 59.77	0.870	13.9			.....	...
13.0	320 22 9.4	+1 55 31.0	16 36.7	60 51.87	-0.844	14.4	13	L	0 2.3	2.27
13.5	327 50 9.3	2 32 42.8	16 33.3	60 39.60	1.196	14.9	13	U	12 29.2	2.21
14.0	335 14 58.0	3 7 1.8	16 28.9	60 23.30	1.513	15.4	14	L	0 55.3	2.14
14.5	342 35 38.4	3 37 53.7	16 23.5	60 3.45	1.796	15.9	14	U	13 20.7	2.09
15.0	349 51 20.0	4 4 51.1	16 17.2	59 40.63	2.009	16.4	15	L	1 45.6	2.05
15.5	357 1 21.6	+4 27 34.3	16 10.4	59 15.45	-2.177	16.9	15	U	14 10.0	2.02
16.0	4 5 11.0	+4 45 51.0	16 3.1	58 48.62	-2.267	17.4	16	L	2 34.2	2.01

GREENWICH MEAN TIME.

G. M. T.	Longitude.	Latitude.	Semi-diameter.	Horizontal Parallax.	Var. per Hour.	Age.	Transit, Meridian of Greenwich.			Var. per Hour.
	° ' "	° ' "	' "	' "	"	d			h m	m
Aug. 16.0	4 5 11.0	+4 45 51.0	16 3.1	58 48.62	-2.287	17.4	Aug. 16	L	2 34.2	2.01
16.5	11 2 26.6	4 59 35.7	15 55.5	58 20.77	2.343	17.9	16	U	14 58.3	2.01
17.0	17 52 56.6	5 8 48.6	15 47.8	57 52.57	2.349	18.4	17	L	3 22.4	2.01
17.5	24 36 38.8	5 13 35.4	15 40.2	57 24.60	2.308	18.9	17	U	15 46.5	2.02
18.0	31 13 39.6	5 14 5.0	15 32.8	56 57.37	2.225	19.4	18	L	4 10.9	2.04
18.5	37 44 13.6	+5 10 29.8	15 25.7	56 31.33	-2.109	19.9	18	U	16 35.5	2.06
19.0	44 8 41.1	5 3 3.9	15 19.0	56 6.86	1.965	20.4	19	L	5 0.4	2.06
19.5	50 27 28.3	4 52 2.8	15 12.8	55 44.25	1.799	20.9	19	U	17 25.5	2.10
20.0	56 41 5.3	4 37 42.8	15 7.2	55 23.73	1.618	21.4	20	L	5 50.8	2.12
20.5	62 50 5.1	4 20 20.5	15 2.3	55 5.47	1.426	21.9	20	U	18 16.4	2.13
21.0	68 55 3.2	+4 0 12.6	14 57.9	54 49.56	-1.226	22.4	21	L	6 42.0	2.13
21.5	74 56 35.5	3 37 35.8	14 54.2	54 36.06	1.022	22.9	21	U	19 7.6	2.13
22.0	80 55 18.9	3 12 46.6	14 51.2	54 24.99	0.820	23.4	22	L	7 33.1	2.12
22.5	86 51 50.1	2 46 1.5	14 48.9	54 16.34	0.623	23.9	22	U	19 58.4	2.09
23.0	92 46 44.4	2 17 37.1	14 47.1	54 10.01	0.432	24.4	23	L	8 23.4	2.06
23.5	98 40 36.6	+1 47 50.2	14 46.0	54 5.93	-0.248	24.9	23	U	20 47.9	2.02
24.0	104 33 59.6	1 16 57.8	14 45.5	54 4.01	-0.074	25.4	24	L	9 11.9	1.96
24.5	110 27 24.2	0 45 17.2	14 45.5	54 4.10	+0.088	25.9	24	U	21 35.5	1.94
25.0	116 21 19.1	+0 13 6.4	14 46.1	54 6.07	0.238	26.4	25	L	9 58.5	1.89
25.5	122 16 10.8	-0 19 16.3	14 47.1	54 9.75	0.376	26.9	25	U	22 21.0	1.86
26.0	128 12 23.1	-0 51 31.9	14 48.5	54 15.04	+0.502	27.4	26	L	10 43.1	1.82
26.5	134 10 17.4	1 23 20.6	14 50.4	54 21.75	0.615	27.9	26	U	23 4.7	1.79
27.0	140 10 12.3	1 54 22.5	14 52.5	54 29.75	0.716	28.4	27	L	11 26.0	1.77
27.5	146 12 23.9	2 24 16.9	14 55.0	54 38.88	0.806	28.9	27	U	23 47.1	1.75
28.0	152 17 6.0	2 52 43.3	14 57.8	54 49.06	0.886	29.4	28	L	12 8.0	1.74
28.5	158 24 29.5	-3 19 20.8	15 0.8	55 0.12	+0.958	0.3			.....	...
29.0	164 34 44.0	3 43 49.3	15 4.0	55 12.04	1.022	0.8	29	U	0 28.8	1.74
29.5	170 47 56.5	4 5 48.7	15 7.5	55 24.67	1.079	1.3	29	L	12 49.7	1.75
30.0	177 4 12.8	4 25 0.3	15 11.1	55 37.94	1.133	1.8	30	U	1 10.9	1.77
30.5	183 23 36.9	4 41 6.3	15 14.9	55 51.85	1.184	2.3	30	L	13 32.3	1.80
31.0	189 46 12.8	-4 53 50.6	15 18.8	56 6.33	+1.231	2.8	31	U	1 54.2	1.85
31.5	196 12 3.1	5 2 59.0	15 22.9	56 21.36	1.276	3.3	31	L	14 16.7	1.90
Sept. 1.0	202 41 11.0	5 8 19.4	15 27.2	56 36.95	1.320	3.8	Sept. 1	U	2 39.9	1.97
1.5	209 13 39.2	5 9 42.1	15 31.6	56 53.03	1.361	4.3	1	L	15 3.9	2.04
2.0	215 49 30.9	5 7 0.0	15 36.1	57 9.59	1.399	4.8	2	U	3 28.8	2.12
2.5	222 28 49.4	-5 0 9.3	15 40.7	57 26.58	+1.432	5.3	2	L	15 54.7	2.20
3.0	229 11 38.8	4 49 8.7	15 45.4	57 43.94	1.467	5.8	3	U	4 21.7	2.29
3.5	235 58 2.6	4 34 0.9	15 50.2	58 1.55	1.474	6.3	3	L	16 49.7	2.37
4.0	242 48 4.5	4 14 51.8	15 55.1	58 19.27	1.477	6.8	4	U	5 18.7	2.45
4.5	249 41 47.2	3 51 51.5	15 59.9	58 36.92	1.461	7.3	4	L	17 48.5	2.51
5.0	256 39 12.1	-3 25 14.1	16 4.6	58 54.26	+1.423	7.8	5	U	6 18.9	2.54
5.5	263 40 18.0	2 55 18.0	16 9.2	59 10.98	1.360	8.3	5	L	18 49.6	2.56
6.0	270 45 1.4	2 22 25.8	16 13.5	59 26.77	1.267	8.8	6	U	7 20.4	2.56
6.5	277 53 14.1	1 47 5.1	16 17.4	59 41.24	1.141	9.3	6	L	19 51.0	2.53
7.0	285 4 43.0	1 9 47.3	16 20.9	59 54.03	0.981	9.8	7	U	8 21.2	2.49
7.5	292 19 9.8	-0 31 8.3	16 23.8	60 4.66	+0.788	10.3	7	L	20 50.8	2.43
8.0	299 36 9.6	+0 8 13.0	16 26.0	60 12.81	+0.563	10.8	8	U	9 19.5	2.36

GREENWICH MEAN TIME.

G. M. T.	Longitude.			Latitude.	Semi-diameter.	Horizontal Parallax.	Var. per Hour.	Age.	Transit, Meridian of Greenwich.			Var. per Hour.
	°	'	"	°	'	"					h m	m
Sept. 8.0	299	36	9.6	+0 8 13.0	16 26.0	60 12.81	+0.563	10.8	Sept. 8	U	9 19.5	2.36
8.5	306	55	11.0	0 47 35.1	16 27.4	60 18.05	0.306	11.3	8	L	21 47.5	2.30
9.0	314	15	35.9	1 26 14.7	16 28.0	60 20.10	+0.030	11.8	9	U	10 14.7	2.24
9.5	321	36	40.6	2 3 29.1	16 27.6	60 18.72	-0.262	12.3	9	L	22 41.2	2.18
10.0	328	57	36.2	2 38 36.8	16 26.3	60 13.78	0.560	12.8	10	U	11 7.0	2.12
10.5	336	17	30.8	+3 10 59.3	16 24.0	60 5.27	-0.356	13.3	10	L	23 32.2	2.09
11.0	343	35	30.4	3 40 2.8	16 20.7	59 53.29	1.137	13.8	11	U	11 57.2	2.07
11.5	350	50	41.7	4 5 19.0	16 16.6	59 38.08	1.393	14.3			.....	...
12.0	358	2	13.9	4 26 26.5	16 11.6	59 19.98	1.618	14.8	12	L	0 21.8	2.04
12.5	5	9	20.8	4 43 10.2	16 6.0	58 59.39	1.806	15.3	12	U	12 46.3	2.04
13.0	12	11	22.9	+4 55 22.3	15 59.8	58 36.81	-1.960	15.8	13	L	1 10.8	2.04
13.5	19	7	48.2	5 3 1.3	15 53.3	58 12.77	2.047	16.3	13	U	13 35.4	2.05
14.0	25	58	13.4	5 6 11.4	15 46.5	57 47.85	2.099	16.8	14	L	2 0.1	2.07
14.5	32	42	24.5	5 5 1.8	15 39.6	57 22.58	2.107	17.3	14	U	14 25.1	2.09
15.0	39	20	16.9	4 59 45.2	15 32.8	56 57.46	2.072	17.8	15	L	2 50.4	2.12
15.5	45	51	54.3	+4 50 37.4	15 26.1	56 33.01	-1.998	18.3	15	U	15 15.9	2.13
16.0	52	17	28.4	4 37 55.9	15 19.8	56 9.63	1.890	18.8	16	L	3 41.6	2.15
16.5	58	37	18.4	4 21 59.4	15 13.8	55 47.75	1.764	19.3	16	U	16 7.6	2.17
17.0	64	51	49.6	4 3 7.0	15 8.3	55 27.64	1.596	19.8	17	L	4 33.6	2.17
17.5	71	1	31.4	3 41 37.9	15 3.4	55 9.56	1.415	20.3	17	U	16 59.7	2.17
18.0	77	6	58.1	+3 17 51.0	14 59.1	54 53.75	-1.219	20.8	18	L	5 25.6	2.15
18.5	83	8	46.9	2 52 4.8	14 55.4	54 40.34	1.014	21.3	18	U	17 51.3	2.13
19.0	89	7	36.2	2 24 37.2	14 52.4	54 29.42	0.803	21.8	19	L	6 16.7	2.09
19.5	95	4	6.8	1 55 45.8	14 50.2	54 21.08	0.589	22.3	19	U	18 41.6	2.06
20.0	100	58	58.9	1 25 47.8	14 48.6	54 15.30	0.375	22.8	20	L	7 6.1	2.02
20.5	106	52	53.4	+0 55 0.0	14 47.7	54 12.07	-0.164	23.3	20	U	19 30.0	1.97
21.0	112	46	30.0	+0 23 39.5	14 47.5	54 11.34	+0.040	23.8	21	L	7 53.4	1.92
21.5	118	40	27.0	-0 7 56.5	14 48.0	54 13.00	0.234	24.3	21	U	20 16.2	1.88
22.0	124	35	21.3	0 39 30.8	14 49.0	54 16.93	0.417	24.8	22	L	8 38.6	1.84
22.5	130	31	46.8	1 10 45.3	14 50.7	54 22.97	0.588	25.3	22	U	21 0.5	1.81
23.0	136	30	15.1	-1 41 21.4	14 52.8	54 30.95	+0.742	25.8	23	L	9 22.1	1.79
23.5	142	31	14.7	2 11 0.3	14 55.5	54 40.71	0.879	26.3	23	U	21 43.4	1.77
24.0	148	35	9.7	2 39 21.9	14 58.6	54 51.99	0.998	26.8	24	L	10 4.5	1.75
24.5	154	42	21.3	3 6 6.1	15 2.0	55 4.59	1.099	27.3	24	U	22 25.5	1.75
25.0	160	53	5.4	3 30 52.4	15 5.8	55 18.29	1.179	27.8	25	L	10 46.6	1.77
25.5	167	7	34.2	-3 53 20.2	15 9.7	55 32.80	+1.239	28.3	25	U	23 7.9	1.78
26.0	173	25	54.8	4 13 9.3	15 13.8	55 47.96	1.282	28.8	26	L	11 29.4	1.81
26.5	179	48	10.4	4 30 0.1	15 18.1	56 3.50	1.305	29.3	26	U	23 51.4	1.85
27.0	186	14	19.5	4 43 34.5	15 22.4	56 19.20	1.311	0.2	27	L	12 13.8	1.89
27.5	192	44	16.5	4 53 36.2	15 26.6	56 34.90	1.302	0.7			.....	...
28.0	199	17	52.7	-4 59 51.1	15 30.9	56 50.40	+1.280	1.2	28	U	0 36.9	1.96
28.5	205	54	56.7	5 2 8.1	15 35.0	57 5.58	1.247	1.7	28	L	13 0.8	2.03
29.0	212	35	14.8	5 0 19.5	15 39.0	57 20.29	1.205	2.2	29	U	1 25.6	2.10
29.5	219	18	32.3	4 54 21.1	15 42.9	57 34.45	1.156	2.7	29	L	13 51.3	2.18
30.0	226	4	34.3	4 44 12.9	15 46.6	57 48.03	1.103	3.2	30	U	2 18.0	2.26
30.5	232	53	6.2	-4 29 58.8	15 50.1	58 0.94	+1.049	3.7	30	L	14 45.6	2.34
Oct. 1.0	239	43	54.7	-4 11 47.2	15 53.4	58 13.17	+0.993	4.2	Oct. 1	U	3 14.2	2.41

GREENWICH MEAN TIME.

G. M. T.		Longitude.	Latitude.	Semi-diameter.	Horizontal Parallax.	Var. per Hour.	Age.	Transit, Meridian of Greenwich.				Var. per Hour.
		° ' "	° ' "	' "	' "	"	d			h m	m	
Oct.	1.0	239 43 51.7	-4 11 47.2	15 53.4	58 13.17	+0.993	4.2	Oct.	1	U	3 14.2	2.41
	1.5	246 36 48.2	3 49 50.3	15 56.6	58 24.71	0.932	4.7		1	L	15 43.5	2.47
	2.0	253 31 36.6	3 24 24.6	15 59.5	58 35.54	0.870	5.2		2	U	4 13.4	2.50
	2.5	260 28 12.6	2 55 50.1	16 2.2	58 45.62	0.808	5.7		2	L	16 43.6	2.52
	3.0	267 26 29.9	2 24 30.4	16 4.8	58 54.93	0.741	6.2		3	U	5 13.9	2.52
	3.5	274 26 24.1	-1 50 52.3	16 7.1	59 3.36	+0.666	6.7		3	L	17 41.0	2.49
	4.0	281 27 51.0	1 15 25.6	16 9.1	59 10.88	0.584	7.2		4	U	6 13.7	2.45
	4.5	288 30 46.6	0 38 42.2	16 10.9	59 17.33	0.491	7.7		4	L	18 42.8	2.39
	5.0	295 35 5.4	-0 1 16.3	16 12.3	59 22.61	0.385	8.2		5	U	7 11.2	2.33
	5.5	302 40 40.6	+0 36 16.5	16 13.4	59 26.52	0.265	8.7		5	L	19 38.8	2.27
	6.0	309 47 21.8	+1 13 19.8	16 14.0	59 28.90	+0.130	9.2		6	U	8 5.7	2.22
	6.5	316 54 55.0	1 49 16.9	16 14.2	59 29.56	-0.021	9.7		6	L	20 32.2	2.15
	7.0	324 3 2.0	2 23 31.8	16 13.9	59 28.32	0.186	10.2		7	U	8 57.4	2.09
	7.5	331 11 19.8	2 55 30.1	16 13.0	59 25.04	0.262	10.7		7	L	21 22.4	2.07
	8.0	338 19 20.7	3 24 39.9	16 11.5	59 19.61	0.547	11.2		8	U	9 47.0	2.04
	8.5	345 26 33.4	+3 50 32.5	16 9.4	59 11.90	-0.736	11.7		8	L	22 11.3	2.02
	9.0	352 32 22.3	4 12 43.7	16 6.7	59 1.94	0.923	12.2		9	U	10 35.5	2.02
	9.5	359 36 10.4	4 30 54.0	16 3.4	58 49.79	1.103	12.7		9	L	22 59.8	2.02
	10.0	6 37 19.9	4 44 49.7	15 59.5	58 35.52	1.270	13.2		10	U	11 24.1	2.03
	10.5	13 35 13.8	4 54 22.6	15 55.1	58 19.39	1.418	13.7		10	L	23 48.6	2.06
	11.0	20 29 17.5	+4 59 30.4	15 50.2	58 1.61	-1.542	14.2		11	U	12 13.5	2.09
	11.5	27 19 0.4	5 0 15.9	15 45.0	57 42.49	1.639	14.7			.....	...
	12.0	34 3 57.4	4 56 47.1	15 39.6	57 22.39	1.705	15.2		12	L	0 38.7	2.11
	12.5	40 43 49.9	4 49 16.1	15 33.9	57 1.70	1.738	15.7		12	U	13 4.2	2.14
	13.0	47 18 25.7	4 37 58.1	15 28.2	56 40.82	1.738	16.2		13	L	1 30.0	2.17
	13.5	53 47 40.5	+4 23 11.1	15 22.6	56 20.11	-1.705	16.7		13	U	13 56.2	2.19
	14.0	60 11 37.0	4 5 14.8	15 17.1	56 0.00	1.640	17.2		14	L	2 22.6	2.20
	14.5	66 30 24.7	3 44 29.8	15 11.9	55 40.85	1.546	17.7		14	U	14 49.0	2.20
	15.0	72 44 20.3	3 21 16.9	15 7.0	55 23.01	1.425	18.2		15	L	3 15.4	2.19
	15.5	78 53 45.7	2 55 57.1	15 2.6	55 6.74	1.281	18.7		15	U	15 41.7	2.17
	16.0	84 59 8.1	+2 28 51.0	14 58.7	54 52.36	-1.115	19.2		16	L	4 7.6	2.14
	16.5	91 0 59.1	2 0 18.1	14 55.3	54 40.06	0.932	19.7		16	U	16 33.1	2.11
	17.0	96 59 54.0	1 30 37.7	14 52.6	54 30.03	0.735	20.2		17	L	4 58.2	2.06
	17.5	102 56 30.4	1 0 8.0	14 50.5	54 22.46	0.528	20.7		17	U	17 22.6	2.01
	18.0	108 51 28.4	+0 29 6.8	14 49.2	54 17.42	0.313	21.2		18	L	5 46.4	1.96
	18.5	114 45 29.4	-0 2 8.8	14 48.5	54 14.96	-0.094	21.7		18	U	18 9.7	1.92
	19.0	120 39 15.5	0 33 21.6	14 48.6	54 15.16	+0.126	22.2		19	L	6 32.4	1.87
	19.5	126 33 28.8	1 4 15.0	14 49.3	54 17.97	0.342	22.7		19	U	18 54.5	1.82
	20.0	132 28 50.7	1 34 31.9	14 50.8	54 23.35	0.553	23.2		20	L	7 16.2	1.79
	20.5	138 26 1.6	2 3 55.1	14 52.9	54 31.20	0.755	23.7		20	U	19 37.6	1.77
	21.0	144 25 40.2	-2 32 6.9	14 55.7	54 41.42	+0.946	24.2		21	L	7 58.7	1.75
	21.5	150 28 22.2	2 58 49.1	14 59.1	54 53.84	1.120	24.7		21	U	20 19.7	1.75
	22.0	156 34 40.3	3 23 43.0	15 3.0	55 8.22	1.275	25.2		22	L	8 40.7	1.75
	22.5	162 45 3.2	3 46 29.1	15 7.4	55 24.35	1.409	25.7		22	U	21 1.7	1.76
	23.0	168 59 54.7	4 6 47.7	15 12.2	55 41.94	1.517	26.2		23	L	9 23.0	1.79
	23.5	175 19 33.5	-4 24 19.2	15 17.3	56 0.66	+1.599	26.7		23	U	21 44.7	1.83
	24.0	181 44 12.1	-4 38 44.2	15 22.6	56 20.20	+1.651	27.2		24	L	10 6.9	1.88

GREENWICH MEAN TIME.

G. M. T.	Longitude.	Latitude.	Semi-diameter.	Horizontal Parallax.	Var. per Hour.	Age.	Transit, Meridian of Greenwich.				Var. per Hour.
	" " "	" " "	" "	" "	"	d			h m	m	
Oct. 24.0	181 44 12.1	-4 38 44.2	15 22 6	56 20.20	+1.651	27.2	Oct. 24	L	10 6.9	1.88	
24.5	188 13 56.3	4 49 44.2	15 28.1	56 40.18	1.673	27.7	24	U	22 29.8	1.94	
25.0	194 48 45.4	4 57 2.5	15 33.5	57 0.24	1.665	28.2	25	L	10 53.4	2.00	
25.5	201 28 31 9	5 0 24.0	15 38.9	57 19.99	1.624	28.7	25	U	23 17.9	2.06	
26.0	208 13 1.3	4 59 37.4	15 44.1	57 39.09	1.568	29.2	26	L	11 43.4	2.17	
26.5	215 1 53.2	-4 54 35.0	15 49.0	57 57.14	+1.454	0.1			.....	...
27.0	221 54 42.1	4 45 13.2	15 53.6	58 13.89	1.333	0.6	27	U	0 10.0	2.26	
27.5	228 50 58.2	4 31 34.1	15 57.8	58 29.08	1.193	1.1	27	L	12 37.6	2.34	
28.0	235 50 8.9	4 13 44.5	16 1.4	58 42.47	1.037	1.6	28	U	1 6.2	2.42	
28.5	242 51 40.7	3 51 57.3	16 4.5	58 53.91	0.872	2.1	28	L	13 35.8	2.49	
29.0	249 54 59.9	-3 26 29.9	16 7.1	59 3.36	+0.702	2.6	29	U	2 6.0	2.53	
29.5	256 59 34.4	2 57 45.1	16 9.1	59 10.80	0.534	3.1	29	L	14 36.7	2.57	
30.0	264 4 55.0	2 26 10.0	16 10.6	59 16.22	0.372	3.6	30	U	3 7.6	2.57	
30.5	271 10 35.8	1 52 15.0	16 11.6	59 19.74	0.218	4.1	30	L	15 38.3	2.54	
31.0	278 16 15.0	1 16 33.3	16 12.0	59 21.48	+0.075	4.6	31	U	4 8.5	2.49	
31.5	285 21 35.3	-0 39 40.1	16 12.0	59 21.57	-0.067	5.1	31	L	16 38.1	2.43	
Nov. 1.0	292 26 22.9	-0 2 11.3	16 11.7	59 20.16	0.176	5.6	Nov. 1	U	5 6.9	2.36	
1.5	299 30 27.7	+0 35 16.9	16 10.9	59 17.39	0.263	6.1	1	L	17 34.8	2.29	
2.0	306 33 42.0	1 12 8.8	16 9.8	59 13.42	0.379	6.6	2	U	6 1.8	2.22	
2.5	313 36 0.2	1 47 49.8	16 8.4	59 8.34	0.466	7.1	2	L	18 28.0	2.15	
3.0	320 37 17.3	+2 21 46.9	16 6.8	59 2.25	-0.548	7.6	3	U	6 53.4	2.06	
3.5	327 37 28.5	2 53 29.7	16 4.9	58 55.19	0.625	8.1	3	L	19 18.1	2.04	
4.0	334 36 27.8	3 22 29.9	16 2.7	58 47.24	0.700	8.6	4	U	7 42.3	2.00	
4.5	341 34 7.8	3 48 22.5	16 0.3	58 38.40	0.775	9.1	4	L	20 6.2	1.96	
5.0	348 30 18.8	4 10 46.0	15 57.6	58 28.64	0.850	9.6	5	U	8 29.9	1.97	
5.5	355 24 48.8	+4 29 22.7	15 54.7	58 18.00	-0.924	10.1	5	L	20 53.5	1.97	
6.0	2 17 23.6	4 43 58.8	15 51.6	58 6.48	0.998	10.6	6	U	9 17.1	1.97	
6.5	9 7 46.7	4 54 24.8	15 48.2	57 54.05	1.072	11.1	6	L	21 40.9	1.99	
7.0	15 55 40.4	5 0 35.7	15 44.6	57 40.77	1.143	11.6	7	U	10 5.0	2.02	
7.5	22 40 45.6	5 2 31.0	15 40.7	57 26.65	1.207	12.1	7	L	22 29.5	2.06	
8.0	29 22 43.8	+5 0 14.5	15 36.7	57 11.83	-1.263	12.6	8	U	10 54.5	2.09	
8.5	36 1 17.5	4 53 53.6	15 32.5	56 56.38	1.310	13.1	8	L	23 19.8	2.13	
9.0	42 36 10.5	4 43 40.0	15 28.1	56 40.45	1.343	13.6	9	U	11 45.6	2.16	
9.5	49 7 10.2	4 29 48.3	15 23.7	56 24.21	1.360	14.1			.....	...
10.0	55 34 7.1	4 12 35.7	15 19.3	56 7.88	1.358	14.6	10	L	0 11.7	2.19	
10.5	61 56 56.1	+3 52 21.5	15 14.9	55 51.70	-1.337	15.1	10	U	12 38.1	2.21	
11.0	68 15 36.5	3 29 26.1	15 10.5	55 35.88	1.294	15.6	11	L	1 4.7	2.22	
11.5	74 30 12.6	3 4 11.3	15 6.4	55 20.71	1.230	16.1	11	U	13 31.3	2.20	
12.0	80 40 53.9	2 36 58.9	15 2.5	55 6.43	1.146	16.6	12	L	1 57.6	2.18	
12.5	86 47 54.4	2 8 10.5	14 58.9	54 53.31	1.040	17.1	12	U	14 23.7	2.15	
13.0	92 51 32.7	+1 38 7.7	14 55.7	54 41.57	-0.913	17.6	13	L	2 49.3	2.11	
13.5	98 52 11.6	1 7 11.0	14 53.0	54 31.46	0.767	18.1	13	U	15 14.4	2.06	
14.0	104 50 18.5	0 35 40.2	14 50.8	54 23.22	0.604	18.6	14	L	3 38.8	2.01	
14.5	110 46 23.6	+0 3 54.6	14 49.1	54 17.03	0.425	19.1	14	U	16 2.6	1.95	
15.0	116 41 0.6	-0 27 47.7	14 48.0	54 13.06	0.234	19.6	15	L	4 25.7	1.90	
15.5	122 34 45.4	-0 59 8.9	14 47.5	54 11.46	-0.032	20.1	15	U	16 48.2	1.85	
16.0	128 28 16.4	-1 29 52.2	14 47.8	54 12.33	+0.179	20.6	16	L	5 10.2	1.81	

GREENWICH MEAN TIME.

G. M. T.		Longitude.	Latitude.	Semi-diameter.	Horizontal Parallax.	Var. per Hour.	Age.	Transit, Meridian of Greenwich.				Var. per Hour.
		" ' "	" ' "	" "	" "	"	d			h m	m	
Nov.	16.0	128 28 16.4	-1 29 52.2	14 47.8	54 12.33	+0.179	20.6	Nov. 16	L	5 10.2	1.81	
	16.5	134 22 13.0	1 59 40.7	14 48.7	54 15.77	0.395	21.1	16	U	17 31.6	1.77	
	17.0	140 17 16.3	2 28 18.0	14 50.4	54 21.82	0.614	21.6	17	L	5 52.7	1.74	
	17.5	146 14 7.1	2 55 27.7	14 52.7	54 30.50	0.832	22.1	17	U	18 13.5	1.73	
	18.0	152 13 26.5	3 20 53.1	14 55.8	54 41.78	1.045	22.6	18	L	6 34.2	1.72	
	18.5	158 15 54.3	-3 44 17.1	14 59.6	54 55.57	+1.250	23.1	18	U	18 54.8	1.72	
	19.0	164 22 9.1	4 5 22.5	15 4.0	55 11.74	1.443	23.6	19	L	7 15.6	1.74	
	19.5	170 32 46.5	4 23 51.6	15 9.0	55 30.14	1.619	24.1	19	U	19 36.6	1.77	
	20.0	176 48 18.9	4 39 26.5	15 14.5	55 50.51	1.773	24.6	20	L	7 58.1	1.81	
	20.5	183 9 14.4	4 51 49.2	15 20.6	56 12.60	1.902	25.1	20	U	20 20.1	1.86	
	21.0	189 35 55.4	-5 0 42.2	15 26.9	56 36.03	+1.999	25.6	21	L	8 42.8	1.92	
	21.5	196 8 37.8	5 5 49.0	15 33.6	57 0.41	2.059	26.1	21	U	21 6.3	2.00	
	22.0	202 47 30.2	5 6 54.5	15 40.4	57 25.29	2.080	26.6	22	L	9 30.9	2.09	
	22.5	209 32 33.2	5 3 46.4	15 47.2	57 50.17	2.068	27.1	22	U	21 56.6	2.19	
	23.0	216 23 38.2	4 56 15.5	15 53.8	58 14.51	1.991	27.6	23	L	10 23.4	2.29	
	23.5	223 20 28.3	-4 44 17.1	16 0.1	58 37.77	+1.879	28.1	23	U	22 51.5	2.39	
	24.0	230 22 36.9	4 27 51.8	16 6.0	58 59.42	1.723	28.6	24	L	11 20.8	2.48	
	24.5	237 29 30.3	4 7 6.3	16 11.3	59 18.93	1.525	29.1	24	U	23 51.1	2.56	
	25.0	244 40 27.1	3 42 13.8	16 16.0	59 35.87	1.292	0.1	25	L	12 22.3	2.62	
	25.5	251 54 41.2	3 13 34.0	16 19.8	59 49.84	1.032	0.6			.....	.....
	26.0	259 11 22.4	-2 41 33.3	16 22.7	60 0.58	+0.753	1.1	26	U	0 54.0	2.64	
	26.5	266 29 39.4	2 6 44.2	16 24.7	60 7.90	0.465	1.6	26	L	13 25.8	2.64	
	27.0	273 48 41.1	1 29 43.3	16 25.7	60 11.74	-0.178	2.1	27	U	1 57.5	2.62	
	27.5	281 7 38.8	0 51 11.3	16 25.8	60 12.22	-0.099	2.6	27	L	14 28.6	2.56	
	28.0	288 25 48.1	-0 11 50.2	16 25.1	60 9.44	0.358	3.1	28	U	2 58.9	2.49	
	28.5	295 42 29.7	+0 27 36.6	16 23.5	60 3.70	-0.591	3.6	28	L	15 28.3	2.40	
	29.0	302 57 9.9	1 6 27.8	16 21.3	59 55.38	0.795	4.1	29	U	3 56.6	2.32	
	29.5	310 9 21.8	1 44 3.1	16 18.4	59 44.77	0.966	4.6	29	L	16 23.9	2.23	
	30.0	317 18 44.2	2 19 46.2	16 15.0	59 32.32	1.105	5.1	30	U	4 50.2	2.15	
	30.5	324 25 1.8	2 53 4.4	16 11.2	59 18.39	1.211	5.6	30	L	17 15.6	2.08	
Dec.	1.0	331 28 4.2	+3 23 28.9	16 7.1	59 3.35	-1.288	6.1	Dec. 1	U	5 40.2	2.03	
	1.5	338 27 45.2	3 50 35.6	16 2.8	58 47.57	1.340	6.6	1	L	18 4.3	1.99	
	2.0	345 24 2.0	4 14 4.9	15 58.4	58 31.29	1.368	7.1	2	U	6 28.0	1.96	
	2.5	352 16 54.1	4 33 41.5	15 53.9	58 14.80	1.378	7.6	2	L	18 51.4	1.95	
	3.0	359 6 22.5	4 49 14.4	15 49.4	57 58.27	1.374	8.1	3	U	7 14.7	1.94	
	3.5	5 52 29.1	+5 0 36.5	15 44.9	57 41.87	-1.360	8.6	3	L	19 38.1	1.95	
	4.0	12 35 16.5	5 7 44.6	15 40.5	57 25.66	1.339	9.1	4	U	8 1.6	1.97	
	4.5	19 14 46.5	5 10 39.0	15 36.1	57 9.75	1.313	9.6	4	L	20 25.4	1.99	
	5.0	25 51 0.9	5 9 23.3	15 31.9	56 54.16	1.284	10.1	5	U	8 49.5	2.03	
	5.5	32 24 1.4	5 4 4.3	15 27.7	56 38.95	1.254	10.6	5	L	21 14.1	2.07	
	6.0	38 53 49.0	+4 54 51.9	15 23.7	56 24.08	-1.223	11.1	6	U	9 39.1	2.10	
	6.5	45 20 24.2	4 41 58.2	15 19.7	56 9.61	1.189	11.6	6	L	22 4.6	2.14	
	7.0	51 43 47.9	4 25 37.8	15 15.9	55 55.53	1.155	12.1	7	U	10 30.4	2.17	
	7.5	58 4 1.3	4 6 7.6	15 12.2	55 41.90	1.119	12.6	7	L	22 56.6	2.19	
	8.0	64 21 6.1	3 43 46.0	15 8.6	55 28.71	1.078	13.1	8	U	11 22.9	2.19	
	8.5	70 35 5.2	+3 18 52.8	15 5.1	55 16.05	-1.031	13.6	8	L	23 49.3	2.19	
	9.0	76 46 3.1	+2 51 48.8	15 1.9	55 4.00	-0.976	14.1	9	U	12 15.5	2.17	

GREENWICH MEAN TIME.

G. M. T.	Longitude.			Latitude.			Semi-diameter.	Horizontal Parallax.	Var. per Hour.	Age.	Transit, Meridian of Greenwich.				Var. per Hour.	
	°	'	"	°	'	"	'	"	"	d			h	m	m	
Dec. 9.0	76	46	3.1	+2	51	48.8	15	1.9	55	4.00	-0.976	14.1	Dec. 9	U	12 15.5	2.17
9.5	82	54	6.1	2	22	55.4	14	58.8	54	52.66	0.912	14.6			.....	...
10.0	88	59	22.9	1	52	34.5	14	55.9	54	42.14	0.839	15.1	10	L	0 41.4	2.14
10.5	95	2	4.2	1	21	7.8	14	53.3	54	32.58	0.753	15.6	10	U	13 6.9	2.10
11.0	101	2	23.5	0	48	56.8	14	51.0	54	24.13	0.664	16.1	11	L	1 31.9	2.05
11.5	107	0	37.1	+0	16	22.4	14	49.0	54	16.93	-0.542	16.6	11	U	13 56.2	2.00
12.0	112	57	4.0	-0	16	15.1	14	47.5	54	11.17	0.416	17.1	12	L	2 19.9	1.94
12.5	118	52	5.4	0	48	36.1	14	46.3	54	7.01	0.276	17.6	12	U	14 42.9	1.89
13.0	124	46	6.3	1	20	21.7	14	45.7	54	4.61	-0.122	18.1	13	L	3 5.3	1.84
13.5	130	39	33.5	1	51	14.2	14	45.6	54	4.14	+0.045	18.6	13	U	15 27.1	1.79
14.0	136	32	56.2	-2	20	56.2	14	46.0	54	5.75	+0.224	19.1	14	L	3 48.3	1.75
14.5	142	26	46.3	2	49	11.2	14	47.0	54	9.58	0.414	19.6	14	U	16 9.2	1.72
15.0	148	21	37.3	3	15	43.1	14	48.7	54	15.71	0.612	20.1	15	L	4 29.7	1.70
15.5	154	18	4.4	3	40	16.0	14	51.0	54	24.28	0.817	20.6	15	U	16 50.1	1.69
16.0	160	16	44.0	4	2	34.6	14	54.0	54	35.33	1.026	21.1	16	L	5 10.4	1.69
16.5	166	18	13.4	-4	22	23.4	14	57.7	54	48.89	+1.236	21.6	16	U	17 30.8	1.71
17.0	172	23	10.0	4	39	27.2	15	2.1	55	4.97	1.442	22.1	17	L	5 51.4	1.73
17.5	178	32	10.5	4	53	30.6	15	7.2	55	23.45	1.640	22.6	17	U	18 12.3	1.77
18.0	184	45	50.7	5	4	18.6	15	12.8	55	44.27	1.826	23.1	18	L	6 33.8	1.82
18.5	191	4	44.2	5	11	36.2	15	19.1	56	7.22	1.996	23.6	18	U	18 56.0	1.88
19.0	197	29	21.2	-5	15	9.2	15	25.9	56	32.08	+2.142	24.1	19	L	7 19.0	1.96
19.5	204	0	7.6	5	14	44.0	15	33.1	56	58.52	2.258	24.6	19	U	19 43.0	2.04
20.0	210	37	24.3	5	10	9.3	15	40.6	57	26.13	2.339	25.1	20	L	8 8.1	2.14
20.5	217	21	25.1	5	1	15.8	15	48.3	57	54.48	2.376	25.6	20	U	20 34.5	2.25
21.0	224	12	16.0	4	47	57.5	15	56.1	58	22.96	2.365	26.1	21	L	9 2.2	2.36
21.5	231	9	54.0	-4	30	12.7	16	3.7	58	51.01	+2.300	26.6	21	U	21 31.2	2.47
22.0	238	14	6.7	4	8	5.4	16	11.1	59	17.94	2.178	27.1	22	L	10 1.4	2.56
22.5	245	24	30.8	3	41	45.7	16	17.9	59	43.07	1.998	27.6	22	U	22 32.6	2.63
23.0	252	40	33.2	3	11	30.4	16	24.1	60	5.68	1.763	28.1	23	L	11 4.6	2.68
23.5	260	1	31.1	2	37	44.0	16	29.4	60	25.16	1.477	28.6	23	U	23 37.0	2.69
24.0	267	26	32.7	-2	0	58.4	16	33.7	60	40.95	+1.146	29.1	24	L	12 9.3	2.68
24.5	274	54	39.6	1	21	51.8	16	36.8	60	52.54	0.733	0.1			.....	...
25.0	282	24	48.3	-0	41	8.2	16	38.8	60	59.66	0.401	0.6	25	U	0 41.3	2.64
25.5	289	55	53.1	+0	0	24.7	16	39.5	61	2.14	+0.013	1.1	25	L	13 12.6	2.57
26.0	297	26	47.5	0	41	57.5	16	38.9	61	0.02	-0.366	1.6	26	U	1 43.0	2.49
26.5	304	56	28.0	+1	22	40.8	16	37.1	60	53.46	-0.722	2.1	26	L	14 12.3	2.39
27.0	312	23	55.5	2	1	47.7	16	34.2	60	42.84	1.043	2.6	27	U	2 40.5	2.31
27.5	319	48	17.5	2	38	35.3	16	30.3	60	28.60	1.322	3.1	27	L	15 7.7	2.22
28.0	327	8	48.9	3	12	26.1	16	25.6	60	11.29	1.553	3.6	28	U	3 33.9	2.15
28.5	334	24	53.2	3	42	49.3	16	20.2	59	51.51	1.733	4.1	28	L	15 59.3	2.09
29.0	341	36	3.2	+4	9	20.0	16	14.3	59	29.89	-1.863	4.6	29	U	4 24.1	2.04
29.5	348	41	59.7	4	31	40.4	16	8.1	59	6.99	1.945	5.1	29	L	16 48.3	2.00
30.0	355	42	31.3	4	49	38.9	16	1.6	58	43.41	1.982	5.6	30	U	5 12.2	1.98
30.5	2	37	34.3	5	8	9.4	15	55.2	58	19.60	1.980	6.1	30	L	17 35.9	1.97
31.0	9	27	10.9	5	12	10.7	15	48.7	57	56.00	1.948	6.6	31	U	5 59.6	1.98
31.5	16	11	28.1	+5	16	45.8	15	42.4	57	32.94	-1.890	7.1	31	L	18 23.4	1.99

GREENWICH MEAN TIME.

Date.	Apparent Right Ascension.	Var. per Hour.	Apparent Declination.	Var. per Hour.	Logarithm of Distance from Earth.	Var. per Hour.	Semi- diam- eter.	Hor. Paral- lax.	Transit, Meridian of Green- wich.
	Noon.	Noon.	Noon.	Noon.	Noon.	Noon.	Noon.	Noon.	
	h m s	s	° ' "	"			"	"	h m
Jan. 1	19 25 8.05	+17.640	-24 11 13.2	+34.68	0.130 8872	-1530.9	2.47	6.51	0 46.0
2	19 32 10.66	17.576	23 56 33.8	38.61	0.127 0725	1649.0	2.49	6.57	0 49.1
3	19 39 11.53	17.494	23 40 20.1	42.53	0.122 9668	1773.4	2.52	6.63	0 52.2
4	19 46 10.22	17.394	23 22 32.8	46.42	0.118 5547	1904.5	2.54	6.70	0 55.2
5	19 53 6.24	17.271	23 3 12.4	50.28	0.113 8197	2042.8	2.57	6.77	0 58.2
6	19 59 59.01	+17.123	-22 42 20.0	+54.08	0.108 7441	-2188.4	2.60	6.85	1 1.2
7	20 6 47.92	16.948	22 19 57.3	57.80	0.103 3090	2342.3	2.63	6.94	1 4.0
8	20 13 32.24	16.741	21 56 6.2	61.43	0.097 4945	2504.7	2.67	7.03	1 6.8
9	20 20 11.19	16.498	21 30 49.6	64.93	0.091 2797	2675.8	2.71	7.13	1 9.5
10	20 26 43.84	16.215	21 4 11.0	68.26	0.084 6432	2856.1	2.75	7.24	1 12.1
11	20 33 9.17	+15.887	-20 36 14.7	+71.40	0.077 5629	-3045.7	2.79	7.36	1 14.6
12	20 39 26.01	15.507	20 7 6.1	74.29	0.070 0167	3244.3	2.84	7.49	1 17.0
13	20 45 33.04	15.069	19 36 51.7	76.86	0.061 9832	3451.7	2.90	7.63	1 19.1
14	20 51 28.78	14.564	19 5 39.6	79.08	0.053 4420	3667.2	2.95	7.78	1 21.1
15	20 57 11.54	13.986	18 33 39.0	80.89	0.044 3750	3889.5	3.02	7.94	1 22.9
16	21 2 39.45	+13.326	-18 1 1.0	+82.19	0.034 7676	-4117.2	3.08	8.12	1 24.4
17	21 7 50.43	12.574	17 27 58.7	82.90	0.024 6101	4347.6	3.16	8.32	1 25.6
18	21 12 42.16	11.720	16 54 46.9	82.96	0.013 8994	4577.5	3.23	8.52	1 26.5
19	21 17 12.14	10.789	16 21 42.7	82.26	0.002 6416	4802.7	3.32	8.75	1 27.0
20	21 21 17.66	9.681	15 49 5.3	80.71	9.990 8541	5018.2	3.41	8.99	1 27.1
21	21 24 55.85	+ 8.481	-15 17 15.9	+78.24	9.978 5683	-5216.9	3.51	9.25	1 26.8
22	21 28 3.75	7.167	14 46 37.6	74.78	9.965 8323	5391.8	3.61	9.52	1 25.9
23	21 30 38.38	5.709	14 17 35.0	70.25	9.952 7141	5533.8	3.72	9.81	1 24.5
24	21 32 36.82	4.143	13 50 34.1	64.65	9.939 3038	5633.5	3.84	10.12	1 22.5
25	21 33 56.41	2.473	13 26 0.7	57.96	9.925 7154	5680.6	3.96	10.44	1 19.9
26	21 34 34.85	+ 0.719	-13 4 20.2	+50.23	9.912 0880	-5664.2	4.09	10.77	1 16.6
27	21 34 30.46	- 1.091	12 45 56.8	41.57	9.898 5858	5574.8	4.22	11.11	1 12.5
28	21 33 42.33	2.919	12 31 11.1	32.12	9.885 3952	5403.3	4.35	11.46	1 7.8
29	21 32 10.55	4.720	12 20 19.6	22.09	9.872 7207	5143.7	4.48	11.80	1 2.2
30	21 29 56.39	6.441	12 13 33.4	11.74	9.860 7784	4793.0	4.60	12.13	0 56.1
31	21 27 2.47	- 8.024	-12 10 56.9	+ 1.35	9.849 7861	-4352.6	4.72	12.44	0 49.2
Feb. 1	21 23 32.77	9.413	12 12 26.6	- 8.74	9.839 9529	3828.7	4.83	12.72	0 41.8
2	21 19 32.61	10.555	12 17 51.5	18.20	9.831 4665	3232.6	4.92	12.97	0 33.9
3	21 15 8.47	11.404	12 26 53.1	26.75	9.824 4812	2580.8	5.00	13.18	0 25.6
4	21 10 27.75	11.933	12 39 6.1	34.13	9.819 1077	1993.0	5.06	13.35	0 17.0
5	21 5 38.34	-12.128	-12 54 0.5	-40.17	9.815 4060	-1191.4	5.11	13.46	0 8.2
6	21 0 48.24	11.993	13 11 3.1	44.80	9.813 3827	- 497.9	5.13	13.52	23 51.0
7	20 56 5.10	11.553	13 29 39.8	48.01	9.812 9934	+ 167.0	5.14	13.54	23 42.6
8	20 51 35.87	10.841	13 49 17.4	49.89	9.814 1482	786.4	5.12	13.50	23 34.5
9	20 47 26.52	9.905	14 9 25.0	50.55	9.816 7216	1347.5	5.09	13.42	23 26.9
10	20 43 41.85	- 8.792	-14 29 35.4	-50.16	9.820 5632	+1842.3	5.05	13.30	23 19.7
11	20 40 25.46	7.566	14 49 25.5	48.87	9.825 5088	2267.2	4.99	13.15	23 13.0
12	20 37 39.79	6.241	15 8 36.1	46.89	9.831 3900	2623.1	4.92	12.97	23 6.9
13	20 35 26.20	4.889	15 26 52.0	44.35	9.838 0427	2911.0	4.85	12.78	23 1.2
14	20 33 45.18	3.534	15 44 1.6	41.38	9.845 3131	3138.0	4.77	12.57	22 56.2
15	20 32 36.48	- 2.199	-15 59 55.9	-38.10	9.853 0608	+3309.8	4.68	12.34	22 51.6
16	20 31 59.28	- 0.909	-16 14 28.7	-34.60	9.861 1611	+3433.0	4.60	12.11	22 47.5

GREENWICH MEAN TIME.

Date.	Apparent Right Ascension.			Var. per Hour.	Apparent Declination.	Var. per Hour.	Logarithm of Distance from Earth.	Var. per Hour.	Semi-diameter.	Hor. Parallax.	Transit, Meridian of Greenwich.
	h	m	s								
Feb. 16	20	31	59.28	- 0.909	-16 14 28.7	- 34.60	9.861 1611	+3433.0	4.60	12.11	22 47.5
17	20	31	52.39	+ 0.324	16 27 35.5	30.94	9.869 5061	3514.8	4.51	11.88	22 43.9
18	20	32	14.30	1.490	16 39 13.2	27.18	9.878 0042	3561.6	4.42	11.65	22 40.8
19	20	33	3.37	2.586	16 49 19.9	23.37	9.886 5784	3579.1	4.34	11.43	22 38.1
20	20	34	17.86	3.609	16 57 54.6	19.52	9.895 1648	3572.6	4.25	11.20	22 35.7
21	20	35	56.00	+ 4.558	-17 4 56.7	- 15.66	9.903 7118	+3546.1	4.17	10.98	22 33.8
22	20	37	56.08	5.437	17 10 26.2	11.80	9.912 1782	3506.1	4.09	10.77	22 32.2
23	20	40	16.43	6.248	17 14 23.3	7.97	9.920 5313	3453.1	4.01	10.57	22 30.9
24	20	42	55.45	6.994	17 16 48.4	4.14	9.928 7456	3390.9	3.94	10.37	22 29.8
25	20	45	51.65	7.680	17 17 42.1	- 0.35	9.936 8022	3322.0	3.86	10.18	22 29.1
26	20	49	3.63	+ 8.310	-17 17 5.2	+ 3.42	9.944 6871	+3248.1	3.79	10.00	22 28.6
27	20	52	30.09	8.887	17 14 58.4	7.15	9.952 3904	3171.2	3.73	9.82	22 28.3
28	20	56	9.83	9.417	17 11 22.4	10.85	9.959 9054	3091.4	3.66	9.65	22 28.2
29	21	0	1.75	9.903	17 6 18.1	14.51	9.967 2284	3011.0	3.60	9.49	22 28.3
Mar. 1	21	4	4.84	10.348	16 59 46.3	18.14	9.974 3578	2930.2	3.54	9.34	22 28.5
2	21	8	18.18	+10.767	-16 51 47.8	+ 21.73	9.981 2937	+2849.8	3.49	9.19	22 29.0
3	21	12	40.92	11.132	16 42 23.4	25.30	9.988 0376	2770.2	3.43	9.05	22 29.6
4	21	17	12.31	11.478	16 31 33.9	28.83	9.994 5919	2691.9	3.38	8.91	22 30.3
5	21	21	51.65	11.796	16 19 20.1	32.32	0.000 9598	2615.0	3.33	8.78	22 31.1
6	21	26	38.32	12.069	16 5 42.8	35.78	0.007 1451	2539.8	3.29	8.66	22 32.0
7	21	31	31.75	+12.360	-15 50 42.7	+ 39.22	0.013 1521	+2466.4	3.24	8.54	22 33.1
8	21	36	31.44	12.611	15 34 20.5	42.62	0.018 9851	2394.8	3.20	8.42	22 34.2
9	21	41	36.92	12.843	15 16 37.0	46.00	0.024 6484	2325.0	3.16	8.31	22 35.4
10	21	46	47.79	13.060	14 57 32.8	49.35	0.030 1465	2267.1	3.12	8.21	22 36.8
11	21	52	3.69	13.263	14 37 8.6	52.67	0.035 4838	2191.0	3.08	8.11	22 38.2
12	21	57	24.30	+13.453	-14 15 25.0	+ 55.96	0.040 6646	+2126.6	3.04	8.01	22 39.6
13	22	2	49.33	13.632	13 52 22.7	59.23	0.045 6929	2063.8	3.01	7.92	22 41.2
14	22	8	18.53	13.800	13 28 2.4	62.46	0.050 5725	2002.7	2.97	7.83	22 42.8
15	22	13	51.68	13.961	13 2 24.7	65.68	0.055 3069	1942.9	2.94	7.75	22 44.5
16	22	19	28.61	14.115	12 35 30.2	68.86	0.059 8993	1884.3	2.91	7.67	22 46.2
17	22	25	9.16	+14.263	-12 7 19.5	+ 72.03	0.064 3524	+1826.8	2.88	7.59	22 48.0
18	22	30	53.21	14.407	11 37 53.3	75.16	0.068 6687	1770.3	2.85	7.51	22 49.8
19	22	36	40.64	14.546	11 7 12.1	78.27	0.072 8501	1714.4	2.82	7.44	22 51.7
20	22	42	31.38	14.683	10 35 16.6	81.35	0.076 8982	1659.1	2.80	7.37	22 53.7
21	22	48	25.39	14.818	10 2 7.5	84.40	0.080 8142	1604.2	2.77	7.31	22 55.7
22	22	54	22.63	+14.963	- 9 27 45.4	+ 87.43	0.084 5985	+1549.3	2.75	7.24	22 57.8
23	23	0	23.10	15.087	8 52 10.9	90.43	0.088 2509	1494.3	2.72	7.18	22 59.9
24	23	6	26.80	15.222	8 15 24.7	93.40	0.091 7710	1439.0	2.70	7.12	23 2.1
25	23	12	33.77	15.350	7 37 27.6	96.34	0.095 1574	1382.9	2.68	7.07	23 4.3
26	23	18	44.05	15.498	6 58 20.4	99.25	0.098 4082	1326.9	2.66	7.01	23 6.6
27	23	24	57.71	+15.641	- 6 18 3.9	+102.12	0.101 5208	+1267.7	2.64	6.96	23 8.9
28	23	31	14.84	15.787	5 36 39.0	104.95	0.104 4918	1207.8	2.63	6.92	23 11.3
29	23	37	35.53	15.938	4 54 6.8	107.73	0.107 3169	1146.0	2.61	6.87	23 13.8
30	23	43	59.90	16.094	4 10 28.3	110.47	0.109 9910	1081.9	2.59	6.83	23 16.3
31	23	50	28.07	16.255	3 25 44.8	113.15	0.112 5080	1015.1	2.58	6.79	23 18.9
Apr. 1	23	57	0.19	+16.423	- 2 39 57.7	+115.77	0.114 8609	+ 945.1	2.56	6.75	23 21.6
2	0	3	36.40	+16.566	- 1 53 8.4	+118.32	0.117 0415	+ 871.4	2.55	6.72	23 24.3

GREENWICH MEAN TIME.

Date.	Apparent Right Ascension.			Var. per Hour.	Apparent Declination.			Var. per Hour.	Logarithm of Distance from Earth.	Var. per Hour.	Semi- diam- eter.	Hor. Paral- lax.	Transit, Meridian of Green- wich.	
	Noon.				Noon.									Noon.
	h	m	s	s	°	'	"	"	Noon.	Noon.	"	"	h	m
Apr.	1	23	57	0.19	+16.423	- 2	39	57.7	+115.77	0.114 8609	+ 945.1	2.56	6.75	23 21.6
	2	0	3	36.40	16.596	1	53	8.4	118.32	0.117 0415	871.4	2.55	6.72	23 24.3
	3	0	10	16.86	16.777	1	5	18.9	120.80	0.119 0404	793.6	2.54	6.69	23 27.2
	4	0	17	1.74	16.964	- 0	16	31.1	123.18	0.120 8469	711.0	2.53	6.66	23 30.0
	5	0	23	51.20	17.159	+ 0	33	12.8	125.46	0.122 4491	623.3	2.52	6.64	23 33.0
	6	0	30	45.41	+17.360	+ 1	23	50.0	+127.62	0.123 8339	+ 529.8	2.51	6.62	23 36.0
	7	0	37	44.51	17.567	2	15	17.4	129.64	0.124 9866	429.7	2.50	6.60	23 39.2
	8	0	44	48.65	17.779	3	7	31.4	131.50	0.125 8906	322.4	2.50	6.59	23 42.4
	9	0	51	57.96	17.997	4	0	28.0	133.18	0.126 5282	207.6	2.50	6.57	23 45.7
	10	0	59	12.53	18.217	4	54	2.4	134.65	0.126 8805	+ 84.6	2.49	6.57	23 49.1
	11	1	6	32.40	+18.439	+ 5	48	9.2	+135.88	0.126 9271	- 47.3	2.49	6.57	23 52.6
	12	1	13	57.59	18.660	6	42	42.3	136.83	0.126 6462	188.4	2.50	6.57	23 56.2
	13	1	21	28.04	18.877	7	37	34.6	137.47	0.126 0153	339.0	2.50	6.58	23 59.8
	14	1	29	3.62	19.087	8	32	38.2	137.76	0.125 0113	499.3	2.50	6.60	. . . .
	15	1	36	44.11	19.285	9	27	44.3	137.68	0.123 6111	669.2	2.51	6.62	0 3.6
	16	1	44	29.20	+19.469	+10	22	43.3	+137.17	0.121 7918	- 848.5	2.52	6.65	0 7.4
	17	1	52	18.47	19.633	11	17	24.6	136.19	0.119 5315	1036.5	2.54	6.68	0 11.3
	18	2	0	11.38	19.772	12	11	36.8	134.73	0.116 8101	1232.5	2.55	6.72	0 15.2
	19	2	8	7.28	19.881	13	5	7.9	132.77	0.113 6098	1435.4	2.57	6.77	0 19.2
	20	2	16	5.38	19.955	13	57	45.4	130.27	0.109 9161	1643.4	2.59	6.83	0 23.3
	21	2	24	4.80	+19.990	+14	49	16.7	+127.25	0.105 7185	-1855.0	2.62	6.90	0 27.3
	22	2	32	4.53	19.981	15	39	29.1	123.70	0.101 0108	2068.2	2.65	6.97	0 31.4
	23	2	40	3.49	19.925	16	28	10.3	119.65	0.095 7917	2280.8	2.68	7.06	0 35.4
	24	2	48	0.51	19.819	17	15	8.7	115.14	0.090 0649	2490.9	2.71	7.15	0 39.5
	25	2	55	54.40	19.663	18	0	13.5	110.19	0.083 8392	2696.2	2.75	7.25	0 43.4
	26	3	3	43.93	+19.456	+18	43	15.0	+104.88	0.077 1283	-2894.9	2.80	7.37	0 47.3
	27	3	11	27.88	19.200	19	24	5.1	99.25	0.069 9501	3085.4	2.84	7.49	0 51.1
	28	3	19	5.06	18.892	20	2	37.0	93.38	0.062 3261	3266.2	2.89	7.62	0 54.8
	29	3	26	34.31	18.538	20	38	45.5	87.31	0.054 2810	3436.2	2.95	7.77	0 58.3
	30	3	33	54.53	18.140	21	12	26.7	81.11	0.045 8418	3594.5	3.01	7.92	1 1.7
May	1	3	41	4.68	+17.700	+21	43	38.3	+ 74.85	0.037 0369	-3740.8	3.07	8.08	1 4.9
	2	3	48	3.79	17.220	22	12	19.3	68.57	0.027 8956	3874.8	3.13	8.25	1 8.0
	3	3	54	50.96	16.705	22	38	29.8	62.32	0.018 4478	3996.3	3.20	8.43	1 10.8
	4	4	1	25.36	16.157	23	2	11.0	56.13	0.008 7233	4105.5	3.27	8.62	1 13.4
	5	4	7	46.22	15.577	23	23	24.7	50.03	9.998 7513	4202.6	3.35	8.83	1 15.8
	6	4	13	52.81	+14.968	+23	42	13.7	+ 44.07	9.988 5605	-4267.8	3.43	9.03	1 18.0
	7	4	19	44.45	14.332	23	58	41.2	38.25	9.978 1792	4361.3	3.51	9.25	1 19.9
	8	4	25	20.52	13.670	24	12	50.7	32.58	9.967 6352	4423.4	3.60	9.48	1 21.5
	9	4	30	40.41	12.984	24	24	46.1	27.07	9.956 9559	4474.2	3.69	9.72	1 22.9
	10	4	35	43.57	12.276	24	34	31.6	21.74	9.946 1682	4513.7	3.78	9.96	1 24.0
	11	4	40	29.45	+11.545	+24	42	11.2	+ 16.59	9.935 2990	-4542.1	3.88	10.21	1 24.9
	12	4	44	57.53	10.793	24	47	49.3	11.61	9.924 3753	4559.1	3.97	10.47	1 25.3
	13	4	49	7.32	10.020	24	51	29.9	6.80	9.913 4248	4564.4	4.08	10.74	1 25.5
	14	4	52	58.34	9.229	24	53	17.3	+ 2.17	9.902 4759	4557.6	4.18	11.02	1 25.4
	15	4	56	30.15	8.420	24	53	15.6	- 2.29	9.891 5582	4538.3	4.29	11.30	1 25.0
	16	4	59	42.34	+ 7.594	+24	51	28.7	- 6.59	9.880 7026	-4505.8	4.40	11.58	1 24.2
	17	5	2	34.54	+ 6.754	+24	48	0.5	- 10.73	9.869 9416	-4450.4	4.51	11.87	1 23.1

GREENWICH MEAN TIME.

Date.	Apparent Right Ascension.			Var. per Hour.	Apparent Declination.			Var. per Hour.	Logarithm of Distance from Earth.	Var. per Hour.	Semi-diameter.	Hor. Parallax.	Transit, Meridian of Greenwich.
	Noon.			Noon.	Noon.			Noon.	Noon.	Noon.	Noon.	Noon.	
	h	m	s	s	°	'	"	"			"	"	h m
May 17	5	2	34.54	+ 6.754	+24	48	0.5	-10.73	9.869 9416	-4459.4	4.51	11.87	1 23.1
18	5	5	6.44	5.902	24	42	54.9	14.71	9.859 3094	4398.2	4.62	12.17	1 21.7
19	5	7	17.76	5.040	24	36	15.7	18.53	9.848 8426	4321.4	4.73	12.46	1 19.9
20	5	9	8.31	4.172	24	28	6.7	22.19	9.838 5800	4227.9	4.84	12.76	1 17.8
21	5	10	37.99	3.301	24	18	31.6	26.70	9.828 5626	4116.9	4.96	13.06	1 15.3
22	5	11	46.79	+ 2.423	+24	7	34.2	-29.05	9.818 8339	-3987.2	5.07	13.35	1 12.5
23	5	12	34.82	1.571	23	55	18.6	32.22	9.809 4397	3838.0	5.18	13.65	1 9.4
24	5	13	2.32	+ 0.723	23	41	49.1	35.20	9.800 4279	3668.4	5.29	13.93	1 5.9
25	5	13	9.70	- 0.105	23	27	10.3	37.99	9.791 8484	3477.6	5.39	14.21	1 2.0
26	5	12	57.51	0.905	23	11	27.2	40.56	9.783 7525	3285.2	5.50	14.48	0 57.9
27	5	12	26.51	- 1.671	+22	54	45.3	-42.88	9.776 1925	-3081.1	5.59	14.73	0 53.4
28	5	11	37.65	2.392	22	37	10.9	44.92	9.769 2206	2775.2	5.68	14.97	0 48.7
29	5	10	32.09	3.061	22	18	50.9	46.68	9.762 8884	2498.2	5.77	15.19	0 43.7
30	5	9	11.21	3.668	21	59	52.8	48.09	9.757 2455	2200.9	5.84	15.39	0 38.4
31	5	7	36.59	4.205	21	40	25.4	49.13	9.752 3388	1886.0	5.91	15.56	0 32.9
June 1	5	5	50.00	- 4.665	+21	20	38.0	-49.75	9.748 2107	-1552.5	5.96	15.71	0 27.2
2	5	3	53.38	5.039	21	0	40.8	49.94	9.744 8978	1206.0	6.01	15.83	0 21.3
3	5	1	48.86	5.323	20	40	44.6	49.66	9.742 4307	948.2	6.04	15.92	0 15.3
4	4	59	38.65	5.512	20	21	0.9	48.90	9.740 8326	482.5	6.07	15.98	0 9.2
5	4	57	25.05	5.605	20	1	41.5	47.64	9.740 1183	- 112.4	6.08	16.01	0 3.1
6	4	55	10.42	- 5.599	+19	42	58.3	-45.88	9.740 2936	+ 258.2	6.07	16.00	23 50.8
7	4	52	57.08	5.497	19	25	3.2	43.63	9.741 3555	625.8	6.06	15.96	23 44.7
8	4	50	47.32	5.301	19	8	7.6	40.92	9.743 2922	986.6	6.03	15.89	23 38.7
9	4	48	43.32	5.017	18	52	22.3	37.78	9.746 0831	1327.2	5.99	15.79	23 32.9
10	4	46	47.15	4.651	18	37	57.3	34.24	9.749 7001	1674.5	5.94	15.66	23 27.2
11	4	45	0.71	- 4.208	+18	25	1.4	-30.37	9.754 1082	+1995.9	5.88	15.50	23 21.7
12	4	43	25.74	3.696	18	13	42.1	26.20	9.759 2666	2299.5	5.81	15.32	23 16.4
13	4	42	3.78	3.125	18	4	5.5	21.82	9.765 1301	2583.4	5.74	15.11	23 11.3
14	4	40	56.16	2.502	17	56	16.3	17.26	9.771 6501	2846.4	5.65	14.89	23 6.5
15	4	40	4.03	1.835	17	50	17.7	12.61	9.778 7756	3067.9	5.56	14.65	23 2.0
16	4	39	28.35	- 1.133	+17	46	11.5	- 7.91	9.786 4546	+3207.6	5.46	14.39	22 57.7
17	4	39	9.90	- 0.401	17	43	58.2	- 3.21	9.794 6349	3505.7	5.36	14.12	22 53.8
18	4	39	9.29	+ 0.353	17	43	36.8	+ 1.42	9.803 2651	3682.6	5.25	13.84	22 50.1
19	4	39	26.98	1.123	17	45	5.4	5.94	9.812 2951	3839.0	5.14	13.56	22 46.8
20	4	40	3.31	1.906	17	48	20.8	10.31	9.821 6766	3975.7	5.04	13.27	22 43.7
21	4	40	58.52	+ 2.695	+17	53	19.1	+14.50	9.831 3636	+4093.7	4.92	12.98	22 41.0
22	4	42	12.74	3.490	17	59	55.4	18.48	9.841 3126	4194.2	4.81	12.68	22 38.6
23	4	43	46.05	4.286	18	8	4.5	22.22	9.851 4828	4278.3	4.70	12.39	22 36.5
24	4	45	38.46	5.082	18	17	40.1	25.70	9.861 8361	4347.0	4.59	12.10	22 34.8
25	4	47	49.97	5.877	18	28	35.9	28.90	9.872 3367	4401.2	4.48	11.81	22 33.3
26	4	50	20.52	+ 6.668	+18	40	44.9	+31.80	9.882 9511	+4442.0	4.37	11.52	22 32.2
27	4	53	10.04	7.458	18	53	59.7	34.38	9.893 6482	4470.2	4.27	11.24	22 31.4
28	4	56	18.48	8.245	19	8	12.7	36.65	9.904 3985	4486.5	4.16	10.97	22 30.9
29	4	59	45.77	9.029	19	23	15.9	38.57	9.915 1742	4491.5	4.06	10.70	22 30.7
30	5	3	31.84	9.810	19	39	1.0	40.13	9.925 9488	4485.6	3.96	10.44	22 30.8
July 1	5	7	36.63	+10.589	+19	55	19.3	+41.33	9.936 6969	+4469.4	3.86	10.18	22 31.2
2	5	12	0.08	+11.365	+20	12	2.0	+42.16	9.947 3936	+4442.9	3.77	9.93	22 32.0

GREENWICH MEAN TIME.

Date.	Apparent Right Ascension.			Var. per Hour.	Apparent Declination.			Var. per Hour.	Logarithm of Distance from Earth.	Var. per Hour.	Semi- diam- eter.	Hor. Paral- lax.	Transit, Meridian of Green- wich.
	Noon.			Noon.	Noon.			Noon.	Noon.	Noon.	Noon.	Noon.	
	h	m	s	s	°	'	"	"			"	"	h m
July	1	5	7 36.63	+10.589	+19	55	19.3	+ 41.33	9.936 6969	+4469.4	3.86	10.18	22 31.2
	2	5	12 0.08	11.365	20	12	2.0	42.16	9.947 3936	4442.9	3.77	9.93	22 32.0
	3	5	16 42.15	12.140	20	28	59.7	42.58	9.958 0145	4406.2	3.68	9.69	22 33.0
	4	5	21 42.77	12.911	20	46	2.8	42.60	9.968 5353	4359.5	3.59	9.46	22 34.4
	5	5	27 1.87	13.680	21	3	1.4	42.20	9.978 9317	4302.5	3.51	9.24	22 36.1
	6	5	32 39.37	+14.444	+21	19	45.0	+ 41.36	9.989 1790	+4235.2	3.42	9.02	22 38.0
	7	5	38 35.13	15.202	21	36	2.9	40.06	9.999 2519	4157.1	3.35	8.82	22 40.3
	8	5	44 48.99	15.951	21	51	43.9	38.28	0.009 1242	4068.0	3.27	8.62	22 42.9
	9	5	51 20.70	16.689	22	6	36.6	36.02	0.018 7692	3967.6	3.20	8.43	22 45.8
	10	5	58 9.93	17.411	22	20	29.1	33.27	0.028 1596	3855.8	3.13	8.25	22 48.9
	11	6	5 16.27	+18.113	+22	33	9.5	+ 30.01	0.037 2673	+3732.0	3.06	8.08	22 52.4
	12	6	12 39.17	18.790	22	44	25.5	26.24	0.046 0636	3596.2	3.00	7.91	22 56.1
	13	6	20 17.92	19.434	22	54	5.2	21.99	0.054 5197	3448.5	2.95	7.76	23 0.0
	14	6	28 11.68	20.039	23	1	56.9	17.24	0.062 6073	3289.2	2.89	7.62	23 4.2
	15	6	36 19.43	20.598	23	7	49.1	12.04	0.070 2988	3118.6	2.84	7.48	23 8.6
	16	6	44 39.97	+21.104	+23	11	31.3	+ 6.41	0.077 5683	+2937.7	2.79	7.36	23 13.2
	17	6	53 11.93	21.549	23	12	54.0	+ 0.42	0.084 3921	2747.4	2.75	7.25	23 18.0
	18	7	1 53.81	21.929	23	11	49.2	- 5.87	0.090 7497	2549.4	2.71	7.14	23 22.9
	19	7	10 43.94	22.237	23	8	10.2	12.42	0.096 6242	2345.2	2.67	7.04	23 27.9
	20	7	19 40.57	22.470	23	1	52.1	19.11	0.102 0031	2136.8	2.64	6.96	23 33.0
	21	7	28 41.88	+22.627	+22	52	52.1	- 25.88	0.106 8788	+1926.1	2.61	6.88	23 38.1
	22	7	37 46.06	22.708	22	41	9.4	32.66	0.111 2485	1715.4	2.59	6.81	23 43.3
	23	7	46 51.29	22.716	22	26	44.9	39.35	0.115 1143	1506.6	2.56	6.75	23 48.5
	24	7	55 55.86	22.654	22	9	41.5	45.88	0.118 4834	1301.8	2.54	6.70	23 53.6
	25	8	4 58.16	22.528	21	50	3.9	52.20	0.121 3672	1102.5	2.53	6.65	23 58.6
	26	8	13 56.72	+22.343	+21	27	58.1	- 58.24	0.123 7807	+ 910.0	2.51	6.62	...
	27	8	22 50.23	22.108	21	3	31.2	63.95	0.125 7418	725.6	2.50	6.59	0 3.6
	28	8	31 37.57	21.830	20	36	51.5	69.31	0.127 2709	550.1	2.49	6.56	0 8.4
	29	8	40 17.80	21.517	20	8	7.5	74.29	0.128 3899	384.0	2.48	6.55	0 13.2
	30	8	48 50.13	21.174	19	37	28.5	78.89	0.129 1215	227.3	2.48	6.54	0 17.8
Aug.	31	8	57 13.98	+20.810	+19	5	3.7	- 83.11	0.129 4886	+ 80.2	2.48	6.53	0 22.3
	1	9	5 28.88	20.430	18	31	2.1	86.95	0.129 5138	- 57.6	2.48	6.53	0 26.6
	2	9	13 34.53	20.040	17	55	32.9	90.42	0.129 2193	186.3	2.48	6.53	0 30.7
	3	9	21 30.74	19.644	17	18	44.8	93.53	0.128 6262	306.5	2.48	6.54	0 34.7
	4	9	29 17.41	19.246	16	40	46.1	96.30	0.127 7542	418.8	2.49	6.56	0 38.6
	5	9	36 54.54	+18.849	+16	1	44.8	- 98.75	0.126 6218	- 523.6	2.50	6.57	0 42.3
	6	9	44 22.19	18.456	15	21	48.4	100.90	0.125 2465	621.4	2.50	6.59	0 45.8
	7	9	51 40.48	18.069	14	41	3.8	102.77	0.123 6440	713.0	2.51	6.62	0 49.1
	8	9	58 49.57	17.690	13	59	37.6	104.38	0.121 8283	799.1	2.52	6.65	0 52.4
	9	10	5 49.66	17.319	13	17	35.8	105.74	0.119 8122	880.2	2.53	6.68	0 55.4
	10	10	12 40.97	+16.958	+12	35	4.1	-106.87	0.117 6072	- 956.7	2.55	6.71	0 58.3
	11	10	19 23.74	16.606	11	52	7.8	107.79	0.115 2234	1029.2	2.56	6.75	1 1.1
	12	10	25 58.22	16.267	11	8	51.7	108.52	0.112 6699	1098.2	2.58	6.79	1 3.7
	13	10	32 24.64	15.937	10	25	20.3	109.07	0.109 9542	1164.4	2.59	6.83	1 6.2
	14	10	38 43.27	15.617	9	41	37.9	109.44	0.107 0829	1228.0	2.61	6.88	1 8.6
	15	10	44 54.35	+15.308	+ 8	57	48.3	-109.67	0.104 0616	-1289.4	2.63	6.92	1 10.8
	16	10	50 58.11	+15.008	+ 8	13	55.2	-109.74	0.100 8951	-1349.1	2.65	6.98	1 12.9

GREENWICH MEAN TIME.

Date.	Apparent Right Ascension.			Var. per Hour.	Apparent Declination.			Var. per Hour.	Logarithm of Distance from Earth.	Var. per Hour.	Semi-diameter.	Hor. Parallax.	Transit, Meridian of Greenwich.			
	Noon.				Noon.									Noon.	Noon.	Noon.
	h	m	s	"	°	'	"	"	Noon.	Noon.	Noon.	Noon.	h	m		
Aug.	16	10	50	58.11	+15.008	+	8	13	55.2	-109.74	0.100 8951	-1349.1	2.65	6.98	1 12.9	
	17	10	56	54.78	14.717		7	30	2.0	109.67	0.097 5870	1407.5	2.67	7.03	1 14.9	
	18	11	2	44.57	14.434		6	46	11.9	109.48	0.094 1401	1404.8	2.69	7.08	1 16.8	
	19	11	8	27.67	14.159		6	2	28.0	109.16	0.090 5565	1521.4	2.71	7.14	1 18.6	
	20	11	14	4.27	13.892		5	18	53.3	108.72	0.086 8377	1577.5	2.73	7.20	1 20.3	
	21	11	19	34.54	+13.631	+	4	35	30.5	-108.17	0.082 9844	-1633.5	2.76	7.27	1 21.8	
	22	11	24	58.61	13.375		3	52	22.2	107.50	0.078 9967	1689.5	2.78	7.34	1 23.3	
	23	11	30	16.61	13.125		3	9	31.1	106.73	0.074 8743	1745.8	2.81	7.41	1 24.6	
	24	11	35	28.64	12.878		2	26	59.8	106.86	0.070 6162	1802.7	2.84	7.48	1 25.9	
	25	11	40	34.79	12.635		1	44	50.7	104.88	0.066 2210	1860.1	2.87	7.55	1 27.0	
	26	11	45	35.10	+12.392	+	1	3	6.3	-103.80	0.061 6870	-1918.4	2.90	7.63	1 28.1	
	27	11	50	29.61	12.150		+ 0	21	49.1	102.62	0.057 0120	1977.7	2.93	7.72	1 29.0	
	28	11	55	18.32	11.909		- 0	18	58.4	101.33	0.052 1933	2038.1	2.96	7.80	1 29.9	
	29	12	0	1.22	11.665		0	59	13.7	99.93	0.047 2280	2099.8	3.00	7.89	1 30.7	
	30	12	4	38.25	11.420		1	38	54.2	98.43	0.042 1129	2163.0	3.03	7.99	1 31.3	
	Sept.	31	12	9	9.32	+11.199	-	2	17	57.2	-96.81	0.036 8445	-2227.6	3.07	8.08	1 31.9
		1	12	13	34.31	10.912		2	56	19.9	95.07	0.031 4191	2293.8	3.11	8.18	1 32.4
		2	12	17	53.07	10.649		3	33	59.5	93.20	0.025 8330	2361.6	3.15	8.29	1 32.7
		3	12	22	5.40	10.377		4	10	52.8	91.21	0.020 0823	2431.0	3.19	8.40	1 33.0
		4	12	26	11.07	10.093		4	46	56.6	89.08	0.014 1632	2501.9	3.23	8.52	1 33.1
		5	12	30	9.79	+ 9.797	-	5	22	7.5	-86.80	0.008 0719	-2574.4	3.28	8.64	1 33.2
		6	12	34	1.24	9.487		5	56	21.7	84.36	0.001 8049	2648.3	3.33	8.76	1 33.1
		7	12	37	45.03	9.160		6	29	35.3	81.75	9.995 3589	2723.5	3.38	8.89	1 32.8
		8	12	41	20.74	8.813		7	1	44.0	78.95	9.988 7311	2799.8	3.43	9.03	1 32.5
		9	12	44	47.85	8.443		7	32	43.1	75.94	9.981 9194	2876.8	3.48	9.17	1 32.0
		10	12	48	5.81	+ 8.049	-	8	2	27.5	-72.72	9.974 9225	-2954.0	3.54	9.32	1 31.3
		11	12	51	13.98	7.627		8	30	51.5	69.25	9.967 7402	3031.2	3.60	9.48	1 30.5
		12	12	54	11.67	7.175		8	57	49.2	65.51	9.960 3736	3107.5	3.66	9.64	1 29.5
		13	12	56	58.09	6.688		9	23	13.8	61.49	9.952 8258	3182.0	3.72	9.81	1 28.3
		14	12	59	32.38	6.163		9	46	58.0	57.14	9.945 1020	3253.9	3.79	9.99	1 26.9
15		13	1	53.59	+ 5.596	-10	8	53.7	-52.44	9.937 2102	-3321.8	3.86	10.17	1 25.3		
16		13	4	0.71	4.968		10	28	51.8	47.34	9.929 1617	3384.2	3.93	10.36	1 23.5	
17		13	5	52.61	4.329		10	46	42.6	41.82	9.920 9723	3438.9	4.01	10.56	1 21.4	
18		13	7	28.11	3.620		11	2	15.4	35.83	9.912 6631	3483.6	4.08	10.76	1 19.0	
19		13	8	45.95	2.858		11	15	18.5	29.34	9.904 2610	3515.7	4.16	10.97	1 16.4	
20		13	9	44.84	+ 2.040	-11	25	39.4	-22.30	9.895 8005	-3531.7	4.24	11.19	1 13.4		
21		13	10	23.46	1.168		11	33	4.4	14.68	9.887 3249	3577.6	4.33	11.41	1 10.1	
22		13	10	40.50	+ 0.243		11	37	19.4	- 6.46	9.878 8876	3499.0	4.41	11.63	1 6.4	
23		13	10	34.73	- 0.732		11	38	9.6	+ 2.39	9.870 5537	3440.5	4.50	11.86	1 2.4	
24		13	10	5.02	1.750		11	35	20.2	11.84	9.862 4011	3346.8	4.58	12.08	0 57.9	
25		13	9	10.49	- 2.800	-11	28	36.6	+ 21.88	9.854 5224	-3211.3	4.67	12.30	0 53.1		
26		13	7	50.53	3.866		11	17	45.7	32.43	9.847 0254	3027.7	4.75	12.52	0 47.8	
27		13	6	4.97	4.929		11	2	36.6	43.38	9.840 0331	2789.8	4.83	12.72	0 42.1	
28		13	3	54.18	5.964		10	43	1.6	54.56	9.833 6826	2492.0	4.90	12.91	0 36.0	
29		13	1	19.19	6.940		10	18	58.3	65.70	9.828 1231	2129.9	4.96	13.07	0 29.5	
Oct.	30	12	58	21.84	- 7.820	-	9	50	30.8	+ 76.51	9.823 5125	-1701.0	5.01	13.21	0 22.6	
	1	12	55	4.85	- 8.570	-	9	17	51.3	+ 86.62	9.820 0117	-1206.5	5.05	13.32	0 15.5	

GREENWICH MEAN TIME.

Date.	Apparent Right Ascension.			Var. per Hour.	Apparent Declination.			Var. per Hour.	Logarithm of Distance from Earth.	Var. per Hour.	Semi- diam- eter.	Hor. Paral- ax.	Transit Meridian of Green- wich.
	Noon.			Noon.	Noon.			Noon.	Noon.	Noon.	Noon.	Noon.	
	h	m	s	s	°	'	"	"					h m
Oct.	1	12 55	4.85	- 8.570	- 9 17	51.3	+ 86.62	9.820 0117	-1205.5	5.05	13.32	0 15.5	
	2	12 51	31.84	9.148	8 41	22.0	95.60	9.817 7762	647.6	5.08	13.39	0 8.0	
	3	12 47	47.38	9.518	8 1	35.3	103.00	9.816 9465	- 35.7	5.09	13.41	{ 0 8.0 23 52.5	
	4	12 43	56.84	9.650	7 19	14.1	108.40	9.817 6382	+ 617.9	5.08	13.39	23 44.9	
	5	12 40	6.25	9.520	6 35	11.1	111.43	9.819 9328	1297.0	5.06	13.32	23 37.2	
	6	12 36	22.02	- 9.119	- 5 50	26.4	+111.83	9.823 8686	+1982.2	5.01	13.20	23 29.8	
	7	12 32	50.67	8.450	5 6	5.0	109.48	9.829 4352	2652.4	4.95	13.03	23 22.7	
	8	12 29	38.45	7.528	4 23	12.9	104.41	9.836 5718	3287.2	4.87	12.82	23 16.0	
	9	12 26	51.08	6.385	3 42	53.5	96.80	9.845 1706	3968.0	4.77	12.57	23 9.8	
	10	12 24	33.42	5.059	3 6	3.9	86.98	9.855 0826	4379.4	4.66	12.29	23 4.1	
	11	12 22	49.33	- 3.595	- 2 33	32.6	+ 75.36	9.866 1274	+4810.5	4.55	11.98	22 59.0	
	12	12 21	41.56	2.041	2 5	57.3	62.39	9.878 1040	5155.2	4.42	11.65	22 54.5	
	13	12 21	11.68	- 0.445	1 43	44.7	48.55	9.890 8020	5411.8	4.29	11.32	22 50.7	
	14	12 21	20.20	+ 1.151	1 27	10.1	34.30	9.904 0120	5582.7	4.17	10.98	22 47.5	
	15	12 22	6.66	2.711	1 16	18.7	20.01	9.917 5346	5673.4	4.04	10.64	22 45.0	
	16	12 23	29.78	+ 4.202	- 1 11	6.8	+ 6.05	9.931 1864	+5691.8	3.91	10.31	22 43.0	
	17	12 25	27.63	5.602	1 11	23.2	- 7.30	9.944 8046	5647.0	3.79	9.99	22 41.5	
	18	12 27	57.83	6.896	1 16	50.9	19.85	9.958 2497	5549.1	3.68	9.69	22 40.5	
	19	12 30	57.70	8.073	1 27	9.0	31.48	9.971 4059	5407.9	3.57	9.40	22 40.0	
	20	12 34	24.39	9.131	1 41	53.6	42.07	9.984 1807	5232.8	3.46	9.13	22 39.9	
	21	12 38	15.04	+10.070	- 2 0	39.6	- 51.59	9.996 5033	+5032.5	3.37	8.87	22 40.2	
	22	12 42	26.86	10.895	2 23	1.2	60.04	0.008 3225	4814.4	3.28	8.63	22 40.7	
	23	12 46	57.17	11.613	2 48	33.0	67.44	0.019 5040	4585.4	3.19	8.41	22 41.5	
	24	12 51	43.52	12.233	3 16	50.3	73.85	0.030 3279	4350.7	3.11	8.21	22 42.5	
	25	12 56	43.66	12.764	3 47	29.9	79.31	0.040 4865	4114.9	3.04	8.02	22 43.8	
	26	13 1	55.57	+13.216	- 4 20	10.1	- 83.91	0.050 0813	+3881.4	2.98	7.84	22 45.2	
	27	13 7	17.46	13.598	4 54	31.1	87.72	0.069 1210	3652.7	2.91	7.68	22 46.8	
	28	13 12	47.80	13.921	5 30	14.8	90.82	0.067 6197	3430.8	2.86	7.53	22 48.5	
	29	13 18	25.25	14.192	6 7	4.8	93.26	0.075 5955	3217.2	2.81	7.39	22 50.2	
	30	13 24	8.66	14.419	6 44	46.5	95.13	0.083 0692	3012.5	2.76	7.27	22 52.1	
	31	13 29	57.08	+14.610	- 7 23	7.0	- 96.50	0.090 0627	+2817.1	2.71	7.15	22 54.0	
Nov.	1	13 35	49.69	14.770	8 1	54.6	97.40	0.096 5988	2631.3	2.67	7.05	22 56.0	
	2	13 41	45.84	14.905	8 40	59.2	97.92	0.102 7005	2455.0	2.64	6.95	22 58.1	
	3	13 47	44.97	15.020	9 20	11.8	98.08	0.108 3903	2288.0	2.60	6.86	23 0.1	
	4	13 53	46.65	15.118	9 59	24.5	97.93	0.113 6899	2129.8	2.57	6.77	23 2.3	
	5	13 59	50.51	+15.203	-10 38	30.2	- 97.51	0.118 6201	+1980.1	2.54	6.70	23 4.4	
	6	14 5	56.28	15.277	11 17	22.9	96.85	0.123 2006	1838.3	2.51	6.63	23 6.6	
	7	14 12	3.75	15.344	11 55	57.1	95.98	0.127 4500	1704.0	2.49	6.56	23 8.8	
	8	14 18	12.75	15.405	12 34	8.0	94.91	0.131 3855	1576.7	2.47	6.50	23 11.1	
	9	14 24	23.17	15.462	13 11	51.4	93.68	0.135 0232	1455.8	2.45	6.45	23 13.3	
	10	14 30	34.91	+15.516	-13 49	3.4	- 92.30	0.138 3779	+1340.8	2.43	6.40	23 15.6	
	11	14 36	47.94	15.569	14 25	40.7	90.78	0.141 4633	1231.2	2.41	6.35	23 17.9	
	12	14 43	2.22	15.621	15 1	40.1	89.15	0.144 2919	1126.7	2.40	6.31	23 20.2	
	13	14 49	17.74	15.673	15 36	58.9	87.40	0.146 8752	1026.7	2.38	6.27	23 22.6	
	14	14 55	34.52	15.726	16 11	34.7	85.56	0.149 2235	930.8	2.37	6.24	23 24.9	
	15	15 1	52.57	+15.779	-16 45	25.0	- 83.62	0.151 3461	+ 838.6	2.36	6.21	23 27.3	
	16	15 8	11.92	+15.834	-17 18	27.7	- 81.59	0.153 2517	+ 749.9	2.35	6.18	23 29.7	

GREENWICH MEAN TIME.

Date.	Apparent Right Ascension.			Var. per Hour.	Apparent Declination.			Var. per Hour.	Logarithm of Distance from Earth.	Var. per Hour.	Semi- diameter.	Hor. Paral- lax.	Transit, Meridian of Green- wich.
	h	m	s		°	'	"							h	m
Nov. 16	15	8	11.92	+15.834	-17	18	27.7	-81.59	0.153 2517	+ 749.9	2.35	6.18	23 29.7
17	15	14	32.61	15.891	17	50	40.8	79.49	0.154 9480	664.1	2.34	6.16	23 32.1
18	15	20	54.68	15.949	18	22	2.5	77.31	0.156 4417	581.0	2.33	6.14	23 34.6
19	15	27	18.17	16.009	18	52	30.9	75.06	0.157 7388	500.3	2.32	6.12	23 37.1
20	15	33	43.12	16.071	19	22	4.4	72.72	0.158 8448	421.7	2.32	6.10	23 39.6
21	15	40	9.58	+16.135	-19	50	41.3	-70.34	0.159 7643	+ 344.9	2.31	6.09	23 42.1
22	15	46	37.58	16.200	20	18	20.2	67.90	0.160 5014	269.6	2.31	6.08	23 44.7
23	15	53	7.17	16.266	20	44	59.4	65.37	0.161 0593	195.5	2.30	6.07	23 47.2
24	15	59	38.37	16.334	21	10	37.5	62.79	0.161 4407	122.5	2.30	6.07	23 49.8
25	16	6	11.21	16.403	21	35	13.0	60.15	0.161 6480	+ 50.3	2.30	6.06	23 52.5
26	16	12	45.71	+16.473	-21	58	44.4	-57.45	0.161 6828	- 21.2	2.30	6.06	23 55.2
27	16	19	21.88	16.542	22	21	10.3	54.70	0.161 5462	92.5	2.30	6.07	23 57.8
28	16	25	59.73	16.612	22	42	29.3	51.87	0.161 2389	163.6	2.30	6.07	...
29	16	32	39.25	16.681	23	2	39.9	49.00	0.160 7610	234.7	2.31	6.08	0 0.6
30	16	39	20.43	16.750	23	21	40.9	46.07	0.160 1120	306.2	2.31	6.09	0 3.3
Dec. 1	16	46	3.24	+16.818	-23	39	30.7	-43.08	0.159 2910	- 378.1	2.31	6.10	0 6.1
2	16	52	47.66	16.884	23	56	8.0	40.02	0.158 2966	450.7	2.32	6.11	0 8.9
3	16	59	33.63	16.947	24	11	31.3	36.91	0.157 1268	524.3	2.33	6.13	0 11.7
4	17	6	21.10	17.008	24	25	39.3	33.74	0.155 7791	599.0	2.33	6.15	0 14.6
5	17	13	10.00	17.066	24	38	30.6	30.52	0.154 2503	675.2	2.34	6.17	0 17.5
6	17	20	0.24	+17.120	-24	50	3.8	-27.26	0.152 5368	- 753.0	2.35	6.19	0 20.4
7	17	26	51.72	17.169	25	0	17.5	23.90	0.150 6342	832.8	2.36	6.22	0 23.3
8	17	33	44.31	17.212	25	9	10.4	20.50	0.148 5375	914.8	2.37	6.25	0 26.2
9	17	40	37.87	17.250	25	16	41.1	17.05	0.146 2412	999.3	2.38	6.28	0 29.2
10	17	47	32.25	17.289	25	22	48.3	13.54	0.143 7389	1086.5	2.40	6.32	0 32.1
11	17	54	27.26	+17.302	-25	27	30.8	- 9.99	0.141 0234	-1176.9	2.41	6.36	0 35.1
12	18	1	22.68	17.315	25	30	47.4	6.39	0.138 0869	1270.8	2.43	6.40	0 38.1
13	18	8	18.28	17.317	25	32	36.9	- 2.73	0.134 9207	1368.4	2.45	6.45	0 41.1
14	18	15	13.79	17.307	25	32	58.2	+ 0.96	0.131 5154	1470.1	2.47	6.50	0 44.1
15	18	22	8.90	17.283	25	31	50.5	4.69	0.127 8606	1576.4	2.49	6.56	0 47.1
16	18	29	3.27	+17.245	-25	29	12.8	+ 8.45	0.123 9449	-1687.6	2.51	6.61	0 50.0
17	18	35	56.52	17.190	25	25	4.5	12.24	0.119 7560	1804.1	2.53	6.68	0 53.0
18	18	42	48.20	17.114	25	19	25.1	16.05	0.115 2805	1926.5	2.56	6.75	0 55.9
19	18	49	37.84	17.018	25	12	14.3	19.85	0.110 5041	2055.0	2.59	6.82	0 58.8
20	18	56	24.88	16.897	25	3	32.1	28.66	0.105 4114	2190.1	2.62	6.90	1 1.6
21	19	3	8.69	+16.749	-24	53	18.7	+27.45	0.099 9860	-2332.3	2.65	6.99	1 4.4
22	19	9	48.59	16.570	24	41	34.7	31.20	0.094 2103	2482.0	2.69	7.08	1 7.2
23	19	16	23.77	16.356	24	28	21.3	34.90	0.088 0660	2639.6	2.73	7.18	1 9.8
24	19	22	53.35	16.102	24	13	40.0	38.52	0.081 5339	2805.2	2.77	7.29	1 12.3
25	19	29	16.31	15.803	23	57	33.0	42.04	0.074 5942	2979.2	2.81	7.41	1 14.8
26	19	35	31.51	+15.454	-23	40	3.2	+45.42	0.067 2269	-3161.6	2.86	7.54	1 17.1
27	19	41	37.66	15.048	23	21	14.3	48.63	0.059 4119	3352.2	2.91	7.67	1 19.2
28	19	47	33.29	14.578	23	1	11.0	51.62	0.051 1300	3550.6	2.97	7.82	1 21.2
29	19	53	16.78	14.034	22	39	59.0	54.34	0.042 3632	3756.1	3.03	7.98	1 23.0
30	19	58	46.25	13.408	22	17	45.3	56.74	0.033 0959	3967.5	3.09	8.15	1 24.5
31	20	3	59.65	+12.692	-21	54	38.4	+58.76	0.023 3160	-4183.0	3.16	8.34	1 25.8
32	20	8	54.66	+11.878	-21	30	48.2	+60.35	0.013 0168	-4399.8	3.24	8.54	1 26.7

FOR GREENWICH MEAN NOON.

Date.		Heliocentric Longitude, Mean Equinox of Date.	Var. per Day.	Reduction to Orbit.	Heliocentric Latitude.	Var. per Day.	Logarithm of Radius Vector.	Var. per Day.
		° ' "	° ' "	' "	° ' "	' "		
Jan.	1	312 38 27.7	3 27 27.6	+ 2 5.5	-6 58 47.7	- 2 3.3	9.621 3339	-50225
	2	316 8 23.7	3 32 28.0	+ 0 32.3	7 0 6.0	- 0 32.2	9.616 1735	52875
	3	319 43 30.7	3 37 49.5	- 1 4.1	6 59 49.7	+ 1 6.0	9.610 7615	55362
	4	323 24 9.9	3 43 32.6	2 41.7	6 57 51.6	2 51.6	9.605 1061	57739
	5	327 10 43.1	3 49 37.5	4 19.2	6 54 3.9	4 45.1	9.599 2177	60006
	6	331 3 32.4	3 56 4.8	- 5 54.9	-6 48 18.6	+ 6 47.0	9.593 1098	-62133
	7	335 3 0.3	4 2 54.8	7 26.4	6 40 27.1	8 57.4	9.586 7971	64078
	8	339 9 29.4	4 10 7.1	8 51.6	6 30 20.9	11 16.5	9.580 3014	66796
	9	343 23 21.9	4 17 41.5	10 8.1	6 17 51.3	13 44.2	9.573 6469	67245
	10	347 44 59.5	4 25 37.2	11 13.1	6 2 49.8	16 20.1	9.566 8632	68372
	11	352 14 42.8	4 33 52.6	-12 3.9	-5 45 8.6	+19 3.6	9.559 9853	-69118
	12	356 52 50.5	4 42 25.6	12 37.8	5 24 40.5	21 53.6	9.553 0547	69414
	13	1 39 39.1	4 51 14.0	12 52.0	5 1 19.9	24 48.3	9.546 1197	69194
	14	6 35 22.2	5 0 13.8	12 44.2	4 35 3.0	27 45.7	9.539 2354	68287
	15	11 40 8.7	5 9 20.3	12 12.6	4 5 48.6	30 42.8	9.532 4643	66918
	16	16 54 3.0	5 18 28.0	-11 15.9	-3 33 38.7	+33 36.0	9.525 8762	-64717
	17	22 17 2.8	5 27 30.2	9 53.9	2 58 39.4	36 20.9	9.519 5473	61722
	18	27 48 59.0	5 36 19.1	8 7.8	2 21 1.4	38 52.5	9.513 5600	57862
	19	33 29 33.4	5 44 45.4	6 0.0	1 41 0.8	41 5.1	9.508 0001	53169
	20	39 18 19.0	5 52 39.5	3 34.4	0 58 59.5	42 52.9	9.502 9557	47576
	21	45 14 38.2	5 59 50.8	- 0 56.6	-0 15 25.1	+44 10.3	9.498 5135	-41131
	22	51 17 42.9	6 6 8.9	+ 1 46.8	+0 29 9.3	44 52.0	9.494 7559	33897
	23	57 26 34.7	6 11 23.2	4 27.8	1 14 5.6	44 53.6	9.491 7571	25074
	24	63 40 4.8	6 15 24.1	6 58.1	1 58 42.1	44 12.0	9.489 5797	17496
	25	69 56 55.8	6 18 3.7	9 9.7	2 42 15.0	42 46.5	9.488 2709	- 8632
	26	76 15 43.2	6 19 16.2	+10 55.2	+3 24 0.8	+40 38.1	9.487 8598	+ 425
	27	82 34 58.0	6 18 58.2	12 8.9	4 3 17.8	37 49.7	9.488 3555	9470
	28	88 53 9.2	6 17 9.2	12 47.1	4 39 28.6	34 26.7	9.489 7469	18305
	29	95 8 46.9	6 13 51.9	12 48.3	5 12 1.7	30 35.4	9.492 0032	26738
	30	101 20 25.3	6 9 11.7	12 13.6	5 40 32.6	26 23.6	9.495 0756	34003
Feb.	31	107 26 45.2	6 3 16.5	+11 6.1	+6 4 44.8	+21 59.4	9.498 9004	+41767
	1	113 26 36.5	5 56 16.1	9 30.6	6 24 29.7	17 30.3	9.503 4024	48135
	2	119 18 59.4	5 48 21.6	7 33.0	6 39 46.2	13 3.6	9.508 4988	53645
	3	125 3 5.4	5 39 44.3	5 20.0	6 50 39.7	8 45.2	9.514 1021	58277
	4	130 38 17.7	5 30 36.2	2 58.3	6 57 21.0	4 40.0	9.520 1249	62033
	5	136 4 10.9	5 21 7.7	+ 0 34.0	+7 0 5.3	+ 0 51.6	9.526 4812	+64954
	6	141 20 29.6	5 11 28.9	- 1 47.2	6 59 10.5	- 2 37.9	9.533 0896	67086
	7	146 27 8.2	5 1 48.6	4 0.7	6 54 56.2	5 47.3	9.539 8742	68489
	8	151 24 8.8	4 52 14.1	6 2.9	6 47 42.7	8 36.2	9.546 7658	69239
	9	156 11 40.2	4 42 51.3	7 51.0	6 37 50.6	11 4.8	9.553 7027	69407
	10	160 49 56.9	4 33 45.1	- 9 23.3	+6 25 39.5	-13 14.3	9.560 6303	+69065
	11	165 19 17.1	4 24 59.0	10 38.7	6 11 28.0	15 5.8	9.567 5010	68282
	12	169 40 2.4	4 16 35.7	11 36.9	5 55 33.4	16 40.7	9.574 2740	67121
	13	173 52 36.5	4 8 36.7	12 18.1	5 38 11.7	18 0.4	9.580 9147	65644
	14	177 57 24.2	4 1 3.1	12 42.9	5 19 37.1	19 6.7	9.587 3940	63903
	15	181 54 51.4	3 53 55.5	-12 52.2	+5 0 2.3	-20 0.9	9.593 6879	+61942
	16	185 45 23.9	3 47 13.7	-12 47.2	+4 39 38.8	-20 44.4	9.599 7764	+59803

FOR GREENWICH MEAN NOON.

Date.	Heliocentric Longitude, Mean Equinox of Date.	Var. per Day.	Reduction to Orbit.	Heliocentric Latitude.	Var. per Day.	Logarithm of Radius Vector.	Var. per Day.
	" ' "	" ' "	" ' "	" ' "	" ' "		
Feb. 16	185 45 23.9	3 47 13.7	-12 47.2	+4 39 38.8	-20 44.4	9.599 7764	+59808
17	189 29 27.4	3 40 57.6	12 29.1	4 18 36.5	21 18.7	9.605 6436	57520
18	193 7 27.4	3 35 6.4	11 59.2	3 57 4.1	21 44.8	9.611 2767	56124
19	196 39 48.3	3 29 39.4	11 19.0	3 35 9.2	22 3.9	9.616 6654	52638
20	200 6 54.1	3 24 36.0	10 29.6	3 12 58.4	22 16.8	9.621 8019	50084
21	203 29 7.8	3 19 55.0	- 9 32.7	+2 50 37.4	-22 24.3	9.626 6806	+47483
22	206 46 51.3	3 15 35.6	8 29.3	2 28 11.3	22 27.2	9.631 2971	44841
23	210 0 25.9	3 11 36.8	7 20.6	2 5 44.2	22 26.4	9.635 6482	42176
24	213 10 11.5	3 7 57.6	6 7.8	1 43 19.7	22 22.0	9.639 7320	39497
25	216 16 27.5	3 4 37.4	4 51.9	1 21 1.1	22 14.7	9.643 5475	36811
26	219 19 32.3	3 1 35.1	- 3 34.0	+0 58 51.1	-22 4.9	9.647 0943	+34124
27	222 19 43.4	2 58 50.0	2 14.8	0 36 52.1	21 52.8	9.650 3724	31489
28	225 17 17.7	2 56 21.3	- 0 55.4	+0 15 6.1	21 38.9	9.653 3823	28759
29	228 12 31.2	2 54 8.3	+ 0 23.6	-0 6 25.2	21 23.4	9.656 1244	26085
Mar. 1	231 5 39.3	2 52 10.5	1 41.3	0 27 40.1	21 6.2	9.658 5998	23424
2	233 56 57.0	2 50 27.3	+ 2 57.3	-0 48 37.1	-20 47.7	9.660 8095	+20771
3	236 46 38.6	2 48 58.2	4 10.8	1 9 15.1	20 28.0	9.662 7544	18128
4	239 34 57.9	2 47 42.7	5 21.2	1 29 32.8	20 7.2	9.664 4355	15494
5	242 22 8.4	2 46 40.5	6 28.1	1 49 29.1	19 45.2	9.665 8538	12872
6	245 8 23.3	2 45 51.4	7 31.0	2 9 2.9	19 22.2	9.667 0101	10256
7	247 53 55.5	2 45 18.0	+ 8 29.3	-2 28 13.2	-18 58.2	9.667 9051	+ 7645
8	250 38 57.4	2 44 50.9	9 22.8	2 46 59.0	18 33.2	9.668 5393	5039
9	253 23 41.5	2 44 39.3	10 10.9	3 5 19.2	18 7.1	9.668 9132	+ 2439
10	256 8 20.1	2 44 40.0	10 53.4	3 23 12.8	17 39.9	9.669 0271	- 161
11	258 53 5.5	2 44 52.9	11 29.9	3 40 38.5	17 11.4	9.668 8810	2762
12	261 38 9.9	2 45 17.9	+12 0.0	-3 57 35.1	-16 41.6	9.668 4748	- 5362
13	264 23 45.4	2 45 55.1	12 23.6	4 14 1.3	16 10.5	9.667 8083	7967
14	267 10 4.3	2 46 44.8	12 40.3	4 29 55.7	15 38.0	9.666 8811	10578
15	269 57 19.2	2 47 47.0	12 49.9	4 45 16.8	15 3.8	9.665 6925	13196
16	272 45 42.6	2 49 1.9	12 52.2	5 0 2.7	14 27.7	9.664 2417	15822
17	275 35 27.4	2 50 29.8	+12 47.0	-5 14 11.6	-13 49.8	9.662 5279	-18456
18	278 26 46.7	2 52 11.0	12 34.3	5 27 41.5	13 9.6	9.660 5502	21099
19	281 19 54.0	2 54 5.9	12 13.7	5 40 29.9	12 26.9	9.658 3077	23753
20	284 15 3.1	2 56 14.7	11 45.4	5 52 34.5	11 41.7	9.655 7993	26416
21	287 12 28.3	2 58 38.1	11 9.4	6 3 52.4	10 53.5	9.653 0240	29080
22	290 12 24.3	3 1 16.5	+10 25.6	-6 14 20.5	-10 2.1	9.649 9810	-31771
23	293 15 6.5	3 4 10.5	9 34.1	6 23 55.4	9 7.1	9.646 6696	34458
24	296 20 50.6	3 7 20.5	8 35.2	6 32 33.4	8 8.2	9.643 0894	37147
25	299 29 53.2	3 10 47.4	7 29.1	6 40 10.4	7 5.0	9.639 2404	39832
26	302 42 31.3	3 14 31.7	6 16.2	6 46 41.8	5 57.0	9.635 1233	42807
27	305 59 2.7	3 18 34.2	+ 4 57.1	-6 52 2.8	- 4 44.0	9.630 7398	-45170
28	309 19 46.0	3 22 55.5	3 32.3	6 56 8.0	3 25.4	9.626 0902	47807
29	312 45 0.3	3 27 36.5	2 2.7	6 58 51.5	2 0.6	9.621 1793	50404
30	316 15 5.7	3 32 37.7	+ 0 29.2	7 0 7.0	- 0 29.3	9.616 0111	52950
31	319 50 22.6	3 37 59.7	- 1 7.1	6 59 47.7	+ 1 9.1	9.610 5917	55425
Apr. 1	323 31 12.3	3 43 43.3	- 2 44.7	-6 57 46.3	+ 2 55.0	9.604 9290	-57811
2	327 17 56.6	3 49 49.0	- 4 22.2	-6 53 55.1	+ 4 48.8	9.599 0336	-60076

FOR GREENWICH MEAN NOON.

Date.		Heliocentric Longitude, Mean Equinox of Date.	Var. per Day.	Reduction to Orbit.	Heliocentric Latitude.	Var. per Day.	Logarithm of Radius Vector.	Var. per Day.
		° ' "	° ' "	' "	° ' "	' "		
Apr.	1	323 31 12.3	3 43 43.3	- 2 44.7	-6 57 46.3	+ 2 55.0	9.604 9290	-57811
	2	327 17 56.6	3 49 49.0	4 22.2	6 53 55.1	4 48.8	9.599 0336	60076
	3	331 10 57.8	3 56 17.1	5 57.7	6 48 6.0	6 50.9	9.592 9188	62194
	4	335 10 38.3	4 3 7.7	7 29.1	6 40 10.5	9 1.5	9.586 6009	64131
	5	339 17 20.6	4 10 20.7	8 54.1	6 30 0.1	11 20.9	9.580 1001	65845
	6	343 31 27.1	4 17 55.8	-10 10.3	-6 17 26.0	+13 48.8	9.573 4412	-67284
	7	347 53 19.2	4 25 52.0	11 14.9	6 2 19.7	16 25.0	9.566 6540	68401
	8	352 23 17.6	4 34 8.0	12 5.3	5 44 33.4	19 8.8	9.559 7738	69133
	9	357 1 41.0	4 42 41.7	12 38.6	5 24 0.1	21 58.8	9.552 8423	69417
	10	1 48 45.9	4 51 30.3	12 52.1	5 0 34.2	24 53.7	9.545 9079	69179
	11	6 44 45.4	5 0 30.3	-12 43.6	-4 34 11.8	+27 51.3	9.539 0261	-68352
	12	11 49 48.7	5 9 37.0	12 11.2	4 4 51.9	30 48.3	9.532 2596	69862
	13	17 3 59.7	5 18 44.6	11 13.7	3 32 36.8	33 41.2	9.525 6782	64638
	14	22 27 16.2	5 27 46.6	9 51.0	2 57 32.4	36 25.8	9.519 3586	61617
	15	27 59 28.4	5 36 34.8	8 4.2	2 19 49.8	38 56.8	9.513 3831	57750
	16	33 40 18.3	5 45 0.4	- 5 55.8	-1 39 45.2	+41 8.8	9.507 8378	-53009
	17	39 29 18.3	5 52 53.3	3 29.8	0 57 40.6	42 55.8	9.502 8106	47200
	18	45 25 50.6	6 0 3.3	- 0 51.6	-0 14 3.8	44 12.2	9.498 3881	40921
	19	51 29 7.0	6 6 19.5	+ 1 51.8	+0 30 31.9	44 52.7	9.494 6526	33664
	20	57 38 8.3	6 11 31.6	4 32.6	1 15 28.2	44 52.9	9.491 6782	25720
	21	63 51 45.7	6 15 30.2	+ 7 2.5	+2 0 3.3	+44 10.1	9.489 5268	-17230
	22	70 8 41.5	6 18 7.3	9 13.3	2 43 33.6	42 43.2	9.488 2450	- 8358
	23	76 27 31.1	6 19 17.0	10 57.9	3 25 15.4	40 83.4	9.487 8615	+ 703
	24	82 46 45.3	6 18 56.1	12 10.6	4 4 27.3	37 44.1	9.488 3850	9746
	25	89 4 53.0	6 17 4.4	12 47.6	4 40 31.9	34 19.9	9.489 8035	18571
	26	95 20 24.7	6 13 44.6	+12 47.8	+5 12 57.8	+30 27.9	9.492 0856	+26988
	27	101 31 54.5	6 9 1.9	12 12.0	5 41 21.0	26 15.7	9.495 1821	24634
	28	107 38 3.5	6 3 4.5	11 3.6	6 5 25.1	21 51.2	9.499 0289	41974
	29	113 37 41.9	5 56 2.3	9 27.3	6 25 1.8	17 22.1	9.503 5503	48315
	30	119 29 50.2	5 48 6.3	7 29.1	6 40 10.1	12 55.6	9.508 6633	53799
May	1	125 13 40.4	5 39 28.0	+ 5 15.8	+6 50 55.7	+ 8 37.5	9.514 2807	+58405
	2	130 48 36.0	5 30 19.0	2 53.9	6 57 29.5	4 32.8	9.520 3148	62138
	3	136 14 11.7	5 20 50.0	+ 0 29.6	7 0 6.8	+ 0 44.9	9.526 6800	65031
	4	141 30 12.7	5 11 11.2	- 1 51.5	6 59 5.6	- 2 44.0	9.533 2949	67140
	5	146 36 33.5	5 1 30.9	4 4.7	6 54 45.4	5 52.8	9.540 0838	68523
	6	151 33 16.5	4 51 56.7	- 6 6.5	+6 47 26.8	- 8 41.0	9.546 9777	+69253
	7	156 20 30.8	4 42 34.4	7 54.1	6 37 30.1	11 9.0	9.553 9150	69404
	8	160 58 30.7	4 33 28.7	9 25.9	6 25 15.0	13 18.0	9.560 8414	69046
	9	165 27 34.9	4 24 43.3	10 40.7	6 11 0.1	15 9.0	9.567 7096	68251
	10	169 48 4.8	4 16 20.6	11 38.4	5 55 2.7	16 43.3	9.574 4791	67082
	11	174 0 24.3	4 8 22.5	-12 19.1	+5 37 38.5	-18 2.6	9.581 1153	+65595
	12	178 4 58.2	4 0 49.7	12 43.4	5 19 1.9	19 8.5	9.587 5893	63845
	13	182 2 12.3	3 53 42.8	12 52.2	4 59 25.5	20 2.4	9.593 8771	61879
	14	185 52 32.5	3 47 1.9	12 46.8	4 39 0.6	20 45.7	9.599 9591	59736
	15	189 36 24.6	3 40 46.5	12 28.2	4 17 57.2	21 19.6	9.605 8194	57450
	16	193 14 13.8	3 34 56.1	-11 58.1	+3 56 24.0	-21 45.5	9.611 4451	+56049
	17	196 46 24.8	3 29 29.8	-11 17.6	+3 34 28.5	-22 4.4	9.616 8262	+52560

FOR GREENWICH MEAN NOON.

Date.	Helio- centric Longitude, Mean Equinox of Date.	Var. per Day.	Reduction to Orbit.	Helio- centric Latitude.	Var. per Day.	Logarithm of Radius Vector.	Var. per Day.
	° ' "	° ' "	' "	° ' "	' "		
May 17	196 46 24.8	3 20 29.8	-11 17.6	+3 34 28.5	-22 4.4	9.616 8262	+52860
18	200 13 21.3	3 24 37.1	10 28.0	3 12 17.3	22 17.0	9.621 9550	50006
19	203 35 26.5	3 19 46.8	9 30.8	2 49 56.2	22 24.5	9.626 8257	47401
20	206 53 2.1	3 15 28.0	8 27.2	2 27 29.9	22 27.4	9.631 4340	44760
21	210 6 29.4	3 11 29.8	7 18.4	2 5 2.8	22 26.2	9.635 7770	42096
22	213 16 8.3	3 7 51.3	- 6 5.5	+1 42 38.5	-22 21.8	9.639 8528	+39417
23	216 22 18.2	3 4 31.6	4 49.5	1 20 20.1	22 14.5	9.643 6603	36731
24	219 25 17.4	3 1 29.8	3 31.5	0 58 10.4	22 4.6	9.647 1990	34044
25	222 25 23.5	2 58 45.2	2 12.4	0 36 11.7	21 52.5	9.650 4690	31357
26	225 22 53.2	2 56 16.9	- 0 53.0	+0 14 26.1	21 38.5	9.653 4708	28678
27	228 18 2.6	2 54 4.4	+ 0 26.0	-0 7 4.7	-21 22.7	9.656 2050	+26007
28	231 11 7.1	2 52 7.1	1 43.7	0 28 19.0	21 6.6	9.658 6724	23344
29	234 2 21.6	2 50 24.3	2 59.6	0 49 15.5	20 47.2	9.660 8741	20691
30	236 52 0.4	2 48 55.6	4 13.0	1 9 52.9	20 27.4	9.662 8110	18048
31	239 40 17.4	2 47 40.6	5 23.3	1 30 9.9	20 6.5	9.664 4842	15416
June 1	242 27 26.0	2 46 38.8	+ 6 30.1	-1 50 5.5	-19 44.5	9.665 8946	+12793
2	245 13 39.4	2 45 50.0	7 32.9	2 9 38.6	19 21.5	9.667 0431	10178
3	247 59 10.3	2 45 13.9	8 31.1	2 28 48.2	18 57.5	9.667 9303	7567
4	250 44 11.4	2 44 50.3	9 24.4	2 47 33.2	18 32.4	9.668 5568	4962
5	253 28 55.1	2 44 39.1	10 12.3	3 5 52.6	18 6.2	9.668 9230	+ 2362
6	256 13 33.7	2 44 40.1	+10 54.6	-3 23 45.3	-17 39.0	9.669 0292	- 238
7	258 58 19.3	2 44 53.3	11 30.9	3 41 10.1	17 10.5	9.668 8754	2638
8	261 43 24.3	2 45 18.6	12 0.9	3 58 5.8	16 40.7	9.668 4615	5441
9	264 29 0.8	2 45 56.3	12 24.2	4 14 31.1	16 9.6	9.667 7873	8045
10	267 15 21.1	2 46 46.4	12 40.7	4 30 24.5	15 36.9	9.666 8523	10655
11	270 2 37.7	2 47 48.9	+12 50.1	-4 45 44.4	-15 2.6	9.665 6559	-13274
12	272 51 3.2	2 49 4.2	12 52.1	5 0 29.2	14 26.6	9.664 1973	15900
13	275 40 50.4	2 50 22.5	12 46.7	5 14 37.0	13 48.6	9.662 4757	18534
14	278 32 12.6	2 52 14.1	12 33.7	5 28 5.6	13 8.2	9.660 4902	21178
15	281 25 23.2	2 54 9.3	12 13.0	5 40 52.7	12 26.6	9.658 2398	23832
16	284 20 35.9	2 56 18.6	+11 44.4	-5 52 55.9	-11 40.3	9.655 7235	-26495
17	287 18 5.2	2 58 42.4	11 8.1	6 4 12.3	10 52.0	9.652 9403	29170
18	290 18 5.8	3 1 21.3	10 24.1	6 14 38.8	10 0.4	9.649 8893	31851
19	293 20 53.0	3 4 15.7	9 32.3	6 24 12.0	9 5.4	9.646 5699	34538
20	296 26 42.6	3 7 26.2	8 33.3	6 32 48.2	8 6.3	9.642 9817	37227
21	299 35 51.1	3 10 53.6	+ 7 27.0	-6 40 23.2	- 7 3.0	9.639 1247	-39912
22	302 48 35.7	3 14 38.5	6 13.9	6 46 52.6	5 55.0	9.634 9996	42588
23	306 5 14.2	3 18 41.6	4 54.6	6 52 11.4	4 41.7	9.630 6076	45249
24	309 26 5.2	3 23 3.4	3 29.7	6 56 14.2	3 22.9	9.625 9506	47884
25	312 51 27.6	3 27 44.8	1 59.9	6 58 55.1	1 57.9	9.621 0318	50482
26	316 21 41.7	3 32 46.8	+ 0 26.3	-7 0 7.8	- 0 26.4	9.615 8559	-53026
27	319 57 8.0	3 38 9.4	- 1 10.0	6 59 45.5	+ 1 12.1	9.610 4290	55499
28	323 38 7.8	3 43 53.8	2 47.7	6 57 41.0	2 58.2	9.604 7591	57882
29	327 25 2.9	3 50 0.1	4 25.1	6 53 46.4	4 52.3	9.598 8567	60145
30	331 18 15.4	3 56 28.8	6 0.5	6 47 53.6	6 54.7	9.592 7352	62258
July 1	335 18 8.0	4 3 20.1	- 7 31.7	-6 39 54.2	+ 9 5.6	9.586 4112	-64189
2	339 25 3.1	4 10 33.8	- 8 56.5	-6 29 39.5	+11 25.2	9.579 9050	-65894

FOR GREENWICH MEAN NOON.

Date.		Heliocentric Longitude, Mean Equinox of Date.	Var. per Day.	Reduction to Orbit.	Heliocentric Latitude.	Var. per Day.	Logarithm of Radius Vector.	Var. per Day.
July	1	335 18 8.0	4 3 20.1	- 7 31.7	-6 39 54.2	+ 9 5.6	9.586 4112	-64189
	2	339 25 3.1	4 10 33.8	8 56.5	6 29 39.5	11 26.2	9.579 9050	65894
	3	343 39 23.0	4 18 9.6	10 12.4	6 17 0.9	13 53.4	9.573 2415	67327
	4	348 1 29.2	4 26 6.3	11 16.7	6 1 50.0	16 29.8	9.566 4506	68432
	5	352 31 42.2	4 34 22.9	12 6.5	5 43 58.8	19 13.8	9.559 5680	69151
	6	357 10 20.9	4 42 57.2	-12 39.2	-5 23 20.4	+22 4.0	9.552 6354	-69421
	7	1 57 41.5	4 51 46.3	12 52.2	4 59 49.2	24 59.0	9.545 7012	69170
	8	6 53 57.1	5 0 46.5	12 42.9	4 33 21.6	27 56.5	9.538 8212	68325
	9	11 59 16.7	5 9 53.4	12 9.8	4 3 56.4	30 53.5	9.532 0585	66811
	10	17 13 44.2	5 19 1.2	11 11.6	3 31 36.0	33 46.3	9.525 4834	64563
	11	22 37 16.9	5 28 2.8	- 9 48.2	-2 56 26.7	+36 30.5	9.519 1723	-61521
	12	28 9 45.2	5 36 50.6	8 0.7	2 18 39.6	39 1.0	9.513 2076	57629
	13	33 50 50.5	5 45 15.4	5 51.7	1 38 31.1	41 12.4	9.507 6758	52860
	14	39 40 5.0	5 53 7.3	3 25.2	0 56 23.2	42 58.7	9.502 6647	47216
	15	45 36 50.6	6 0 15.8	- 0 46.7	-0 12 44.0	44 14.1	9.498 2609	40722
	16	51 40 18.6	6 6 30.3	+ 1 56.7	+0 31 52.9	+44 53.4	9.494 5465	-33442
	17	57 49 29.8	6 11 40.5	4 37.3	1 16 49.3	44 52.4	9.491 5952	25480
	18	64 3 14.9	6 15 36.8	7 6.8	2 1 23.2	44 8.1	9.489 4686	16974
	19	70 20 16.1	6 18 11.3	9 16.9	2 44 50.9	42 40.0	9.488 2130	- 8092
	20	76 39 8.4	6 19 18.4	11 0.7	3 26 28.9	40 29.0	9.487 8563	+ 972
	21	82 58 22.7	6 18 54.9	+12 12.3	+4 5 35.7	+37 38.3	9.488 4066	+10012
	22	89 16 27.8	6 17 0.4	12 48.2	4 41 34.1	34 13.3	9.489 8513	18829
	23	95 31 54.2	6 13 38.0	12 47.2	5 13 53.1	30 20.7	9.492 1586	27233
	24	101 43 16.2	6 8 53.0	12 10.4	5 42 8.7	26 7.9	9.495 2786	35060
	25	107 49 15.3	6 2 53.5	11 1.0	6 6 4.8	21 43.0	9.499 1469	42179
	26	113 48 41.7	5 55 49.4	+ 9 24.0	+6 25 33.3	+17 14.0	9.503 6875	+48494
	27	119 40 36.4	5 47 51.9	7 25.3	6 40 33.6	12 47.6	9.508 8172	53953
	28	125 24 11.6	5 39 12.5	5 11.5	6 51 11.4	8 29.9	9.514 4488	58533
	29	130 58 51.3	5 30 2.8	2 49.5	6 57 37.8	4 26.5	9.520 4945	62240
	30	136 24 10.6	5 20 33.4	+ 0 25.2	7 0 8.1	+ 0 38.2	9.526 8688	65110
	31	141 39 54.7	5 10 54.1	- 1 55.7	+6 59 0.5	- 2 50.1	9.533 4904	+67196
Aug.	1	146 45 58.5	5 1 13.9	4 8.6	6 54 34.6	5 58.2	9.540 2838	68558
	2	151 42 24.6	4 51 39.9	6 10.0	6 47 10.8	8 45.9	9.547 1804	69270
	3	156 29 22.3	4 42 17.9	7 57.2	6 37 9.5	11 13.4	9.554 1187	69405
	4	161 7 6.1	4 33 12.8	9 28.4	6 24 50.4	13 21.7	9.561 0445	69033
	5	165 35 54.7	4 24 28.0	-10 42.8	+6 10 32.1	-15 12.1	9.567 9108	+68226
	6	169 56 9.7	4 16 6.0	11 39.9	5 54 31.7	16 46.0	9.574 6773	67047
	7	174 8 14.9	4 8 8.6	12 20.1	5 37 5.1	18 4.9	9.581 3096	65552
	8	178 12 35.3	4 0 36.6	12 43.9	5 18 26.3	19 10.5	9.587 7788	63794
	9	182 9 36.7	3 53 30.5	12 52.3	4 58 48.2	20 3.9	9.594 0611	61821
	10	185 59 44.9	3 46 50.2	-12 46.4	+4 38 22.0	-20 46.9	9.600 1371	+59673
	11	189 43 25.7	3 40 35.6	12 27.5	4 17 17.5	21 20.7	9.605 9909	57381
	12	193 21 4.4	3 34 45.9	11 57.0	3 55 43.4	21 46.3	9.611 6097	54979
	13	196 53 5.5	3 29 20.3	11 16.4	3 33 47.3	22 4.9	9.616 9837	52489
	14	200 19 52.9	3 24 18.3	10 26.4	3 11 35.7	22 17.4	9.622 1052	49931
	15	203 41 49.6	3 19 38.6	- 9 28.9	+2 49 14.3	-22 24.6	9.626 9684	+47325
	16	206 59 17.3	3 15 20.4	- 8 25.1	+2 26 48.0	-22 27.4	9.631 5690	+44683

FOR GREENWICH MEAN NOON.

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	° ' "	° ' "	' "	° ' "	' "		
Aug. 16	206 59 17.3	3 15 20.4	- 8 25.1	+2 28 48.0	-22 27.4	9.631 5690	+44683
17	210 12 37.3	3 11 22.9	7 16.2	2 4 20.9	22 26.2	9.635 9042	42019
18	213 22 9.6	3 7 44.9	6 3.1	1 41 56.7	22 21.7	9.639 9722	39339
19	216 28 13.4	3 4 25.8	4 47.1	1 19 38.5	22 14.2	9.643 7717	36651
20	219 31 7.1	3 1 24.5	3 29.1	0 57 29.1	22 4.2	9.647 3024	33904
21	222 31 8.1	2 58 40.3	- 2 9.9	+0 35 30.8	-21 32.1	9.650 5645	+31278
22	225 28 33.2	2 56 12.6	- 0 50.5	+0 13 45.6	21 38.0	9.653 5582	28598
23	228 23 38.5	2 54 0.6	+ 0 28.4	-0 7 44.7	21 22.3	9.656 2843	25926
24	231 16 39.4	2 52 3.7	1 46.1	0 28 58.5	21 5.1	9.658 7438	23265
25	234 7 50.7	2 50 21.3	3 1.9	0 49 54.4	20 46.5	9.660 9376	20612
26	236 57 26.7	2 48 53.0	+ 4 15.2	-1 10 31.1	-20 26.7	9.662 8666	+17970
27	239 45 41.3	2 47 38.4	5 25.5	1 30 47.5	20 5.8	9.664 5319	15338
28	242 32 48.0	2 46 37.1	6 32.2	1 50 42.4	19 43.8	9.665 9344	12714
29	245 18 59.8	2 45 48.7	7 34.7	2 10 14.8	19 20.8	9.667 0749	10098
30	248 4 29.5	2 45 12.9	8 32.7	2 29 23.6	18 56.7	9.667 9541	7498
31	250 49 29.8	2 44 49.7	+ 9 25.9	-2 48 7.8	-18 31.6	9.668 5727	+ 4885
Sept. 1	253 34 13.0	2 44 38.8	10 13.7	3 6 26.4	18 5.4	9.668 9310	+ 2282
2	256 18 51.5	2 44 40.2	10 55.8	3 24 18.2	17 38.0	9.669 0292	- 318
3	259 3 37.5	2 44 53.8	11 31.9	3 41 42.1	17 9.6	9.668 8674	2918
4	261 48 43.2	2 45 19.6	12 1.7	3 58 36.9	16 39.8	9.668 4455	5520
5	264 34 20.7	2 45 57.6	+12 24.8	-4 15 1.2	-16 8.6	9.667 7632	- 8126
6	267 20 42.5	2 46 48.0	12 41.1	4 30 53.6	15 35.9	9.666 8201	10737
7	270 8 0.9	2 47 51.0	12 50.3	4 46 12.5	15 1.6	9.665 6156	13355
8	272 56 28.7	2 49 6.7	12 52.1	5 0 56.2	14 25.4	9.664 1489	15981
9	275 46 18.6	2 50 35.3	12 46.5	5 15 2.7	13 47.3	9.662 4191	18617
10	278 37 43.8	2 52 17.4	+12 33.3	-5 28 30.0	-13 7.0	9.660 4254	-21259
11	281 30 57.9	2 54 13.1	12 12.2	5 41 15.8	12 24.2	9.658 1668	23914
12	284 26 14.6	2 56 22.9	11 43.4	5 53 17.6	11 38.8	9.655 6423	26577
13	287 23 48.3	2 58 47.0	11 6.9	6 4 32.5	10 50.4	9.652 8508	29253
14	290 23 53.7	3 1 26.4	10 22.6	6 14 57.4	9 58.8	9.649 7915	31625
15	293 28 46.2	3 4 21.2	+ 9 30.6	-6 24 28.9	- 9 3.6	9.646 4638	-34622
16	296 32 41.6	3 7 32.3	8 31.3	6 33 3.2	8 4.4	9.642 8672	37311
17	299 41 56.5	3 11 0.3	7 24.8	6 40 36.3	7 1.0	9.639 0019	39995
18	302 54 48.0	3 14 45.7	6 11.5	6 47 3.6	5 52.8	9.634 8684	42672
19	306 11 34.0	3 18 49.3	4 52.1	6 52 20.1	4 39.3	9.630 4680	45332
20	309 32 32.9	3 23 11.8	+ 3 27.0	-6 56 20.4	- 3 20.3	9.625 8027	-47968
21	312 58 4.1	3 27 53.9	1 57.1	6 58 58.7	1 55.2	9.620 8758	50563
22	316 28 27.5	3 32 56.4	+ 0 23.4	7 0 8.6	- 0 23.5	9.615 6919	53105
23	320 4 3.8	3 38 19.8	- 1 13.0	6 59 43.3	+ 1 15.4	9.610 2571	55577
24	323 45 14.2	3 44 4.7	2 50.7	6 57 35.4	3 1.7	9.604 5796	57955
25	327 32 20.6	3 50 11.8	- 4 28.1	-6 53 37.3	+ 4 56.0	9.598 6700	-60215
26	331 25 45.2	3 56 41.3	6 3.4	6 47 40.7	6 58.6	9.592 5417	62324
27	335 25 50.6	4 3 33.2	7 34.5	6 39 37.3	9 9.8	9.586 2115	64247
28	339 32 59.1	4 10 47.6	8 59.0	6 29 18.3	11 29.7	9.579 6999	66944
29	343 47 33.2	4 18 24.1	10 14.6	6 16 35.1	13 58.1	9.573 0318	67368
30	348 9 54.3	4 26 21.5	-11 18.4	-6 1 19.3	+16 34.8	9.566 2373	-68463
Oct. 1	352 40 22.8	4 34 38.7	-12 7.8	-5 43 23.0	+19 19.0	9.559 3523	-69170

FOR GREENWICH MEAN NOON.

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		° ' "	° ' "	° ' "	° ' "	' "		
Oct.	1	352 40 22.8	4 34 38.7	-12 7.8	-5 43 23.0	+19 19.0	9.559 3523	-69170
	2	357 19 17.5	4 43 13.4	12 40.0	5 22 39.3	23 9.4	9.552 4187	69423
	3	2 6 54.5	4 52 2.9	12 52.3	4 59 2.7	25 4.5	9.545 4852	69154
	4	7 3 27.0	5 1 3.6	12 42.4	4 32 29.5	28 2.0	9.538 6077	68291
	5	12 9 3.8	5 10 10.6	12 8.4	4 2 58.9	30 58.9	9.531 8495	66756
	6	17 23 48.4	5 19 18.2	-11 9.4	-3 30 33.1	+33 51.6	9.525 2811	-64485
	7	22 47 38.1	5 28 19.6	9 45.2	2 55 18.7	36 35.4	9.518 9792	61416
	8	28 20 22.9	5 37 6.8	7 57.0	2 17 26.9	39 5.5	9.513 0264	57496
	9	34 1 44.0	5 45 30.8	5 47.3	1 37 14.2	41 16.2	9.507 5092	52701
	10	39 51 13.4	5 53 21.5	3 20.4	0 55 3.0	43 1.5	9.502 5154	47028
	11	45 48 12.5	6 0 28.5	- 0 41.7	-0 11 21.5	+44 15.8	9.498 1318	-40508
	12	51 51 52.4	6 6 41.3	+ 2 1.8	+0 33 16.6	44 53.9	9.494 4399	33206
	13	58 1 13.5	6 11 49.3	4 42.2	1 18 12.9	44 51.7	9.491 5132	25223
	14	64 15 6.2	6 15 43.1	7 11.1	2 2 45.5	44 6.2	9.489 4132	16702
	15	70 32 12.4	6 18 15.1	9 20.6	2 46 10.5	42 36.6	9.488 1853	- 7813
	16	76 51 7.1	6 19 19.3	+11 3.4	+3 27 44.4	+40 24.3	9.487 8567	+ 1255
	17	83 10 20.8	6 18 53.0	12 13.9	4 6 45.9	37 32.5	9.488 4351	10291
	18	89 28 22.7	6 16 55.9	12 48.7	4 42 38.0	34 6.4	9.489 9073	19098
	19	95 43 43.0	6 13 30.6	12 46.6	5 14 49.7	30 12.9	9.492 2408	27488
	20	101 54 56.4	6 8 43.1	12 8.7	5 42 57.5	26 59.8	9.495 3854	35295
	21	108 0 44.4	6 2 41.4	+10 58.4	+6 6 45.4	+21 34.7	9.499 2760	+42389
	22	113 59 57.8	5 55 35.6	9 20.5	6 26 5.5	17 5.5	9.503 8364	49679
	23	119 51 37.8	5 47 36.5	7 21.2	6 40 57.4	12 39.4	9.508 9833	54113
	24	125 34 57.0	5 38 56.0	5 7.2	6 51 27.2	8 22.0	9.514 6295	58064
	25	131 9 19.7	5 29 45.3	2 45.0	6 57 46.0	4 18.1	9.520 6870	62344
Nov.	26	136 34 21.2	5 20 15.4	+ 0 20.7	+7 0 9.2	+ 0 31.4	9.527 0704	+65189
	27	141 49 47.4	5 10 36.1	- 2 0.0	6 58 55.1	- 2 56.3	9.533 6988	67352
	28	146 55 33.1	5 0 56.0	4 12.6	6 54 23.3	6 3.8	9.540 4968	68592
	29	151 51 41.4	4 51 22.2	6 13.6	6 46 54.3	8 50.8	9.547 3957	69284
	30	156 38 21.6	4 42 0.7	8 0.3	6 36 48.4	11 17.7	9.554 3345	69404
	31	161 15 48.4	4 32 56.1	- 9 31.0	+6 24 25.3	-13 25.4	9.561 2594	+69017
	1	165 44 20.6	4 24 12.0	10 44.8	6 10 3.6	15 15.2	9.568 1234	68196
	2	170 4 20.0	4 15 50.8	11 41.4	5 54 0.3	16 48.8	9.574 8863	67004
	3	174 16 10.3	4 7 54.1	12 21.1	5 36 31.1	18 7.2	9.581 5139	65500
	4	178 20 16.6	4 0 22.9	12 44.4	5 17 50.4	19 12.2	9.587 9777	63736
	5	182 17 4.7	3 53 17.5	-12 52.3	+4 58 10.6	-20 5.5	9.594 2540	+61758
	6	186 7 0.3	3 46 38.2	12 46.0	4 37 43.0	20 48.1	9.600 3234	59607
	7	189 50 29.5	3 40 24.3	12 26.8	4 16 37.5	21 21.5	9.606 1702	57311
	8	193 27 57.2	3 34 35.2	11 55.9	3 55 2.6	21 47.0	9.611 7817	54904
	9	196 59 48.1	3 29 10.6	11 14.7	3 33 5.9	22 5.4	9.617 1479	52409
	10	200 26 26.1	3 24 9.2	-10 24.7	+3 10 53.9	-22 17.7	9.622 2613	+49650
	11	203 48 13.9	3 19 30.2	9 27.0	2 48 32.3	22 24.7	9.627 1163	47244
	12	207 5 33.6	3 15 12.7	8 23.1	2 26 5.9	22 27.4	9.631 7088	44602
	13	210 18 46.2	3 11 15.7	7 13.9	2 3 38.8	22 26.1	9.636 0359	41937
	14	213 28 11.6	3 7 38.3	6 0.8	1 41 14.8	22 21.4	9.640 0955	39255
	15	216 34 9.1	3 4 19.8	- 4 44.7	+1 18 56.9	-22 13.9	9.643 8866	+36567
	16	219 36 57.1	3 1 19.0	- 3 26.6	+0 56 47.8	-22 3.9	9.647 4090	+33881

FOR GREENWICH MEAN NOON.

Date.		Heliocentric Longitude, Mean Equinox of Date.	Var. per Day.	Reduction to Orbit.	Heliocentric Latitude.	Var. per Day.	Logarithm of Radius Vector.	Var. per Day.
		° ' "	° ' "	' "	° ' "	' "		
Nov.	16	219 36 57.1	3 1 19.0	- 3 26.6	+0 56 47.8	-22 3.9	9.647 4090	+53881
	17	222 36 52.9	2 58 35.4	2 7.4	0 34 49.9	21 51.7	9.650 6627	31195
	18	225 34 13.4	2 56 8.2	- 0 48.0	+0 13 5.1	21 37.6	9.653 6481	28515
	19	228 29 14.5	2 53 56.6	+ 0 30.9	-0 8 24.7	21 21.8	9.656 3659	25843
	20	231 22 11.7	2 52 0.2	1 48.5	0 29 37.9	21 4.5	9.658 8171	23182
	21	234 13 19.8	2 50 18.3	+ 3 4.3	-0 50 33.2	-20 46.0	9.661 0026	+20530
	22	237 2 53.0	2 48 50.5	4 17.5	1 11 9.4	20 26.2	9.662 9234	17887
	23	239 51 5.3	2 47 36.3	5 27.6	1 31 25.1	20 5.1	9.664 5804	15254
	24	242 38 10.0	2 46 35.3	6 34.2	1 51 19.3	19 43.1	9.665 9747	12633
	25	245 24 20.2	2 45 47.3	7 36.6	2 10 51.0	19 20.1	9.667 1071	10017
	26	248 9 48.8	2 45 12.0	+ 8 34.5	-2 29 59.1	-18 55.9	9.667 9782	+ 7407
	27	250 54 48.3	2 44 49.1	9 27.5	2 48 42.5	18 30.7	9.668 5886	4801
	28	253 39 31.2	2 44 38.7	10 15.1	3 7 0.2	18 4.5	9.668 9387	+ 2201
	29	256 24 9.8	2 44 40.4	10 57.1	3 24 51.2	17 37.2	9.669 0288	- 399
	30	259 8 56.1	2 44 54.4	11 33.0	3 42 14.2	17 8.7	9.668 8589	3000
Dec.	1	261 54 2.6	2 45 20.6	+12 2.5	-3 59 8.1	-16 38.8	9.668 4289	- 5601
	2	264 39 41.3	2 45 58.9	12 25.4	4 15 31.4	16 7.5	9.667 7385	8207
	3	267 26 4.6	2 46 49.8	12 41.5	4 31 22.7	15 34.8	9.666 7872	10619
	4	270 13 25.1	2 47 53.1	12 50.4	4 46 40.5	15 0.5	9.665 5745	13437
	5	273 1 55.1	2 49 9.2	12 52.0	5 1 23.1	14 24.3	9.664 0996	16063
	6	275 51 47.8	2 50 38.3	+12 46.2	-5 15 28.5	-13 46.1	9.662 3616	-18698
	7	278 43 16.2	2 52 20.7	12 32.7	5 28 54.6	13 5.6	9.660 3597	21342
	8	281 36 33.8	2 54 16.8	12 11.4	5 41 39.0	12 22.8	9.658 0928	23998
	9	284 31 54.5	2 56 27.0	11 42.4	5 53 39.3	11 37.4	9.655 5598	26663
	10	287 29 32.7	2 58 51.8	11 5.6	6 4 52.7	10 48.9	9.652 7599	29337
	11	290 29 43.1	3 1 31.5	+10 21.1	-6 15 16.0	- 9 57.2	9.649 6922	-32018
	12	293 32 41.0	3 4 26.9	9 28.9	6 24 45.8	9 1.8	9.646 3561	34705
	13	296 38 42.4	3 7 38.6	8 29.3	6 33 18.3	8 2.5	9.642 7512	37394
	14	299 48 3.8	3 11 7.0	7 22.6	6 40 49.4	6 58.9	9.638 8775	39079
	15	303 1 2.3	3 14 53.0	6 9.2	6 47 14.5	5 50.5	9.634 7357	42756
	16	306 17 55.8	3 18 57.2	+ 4 49.5	-6 52 28.7	- 4 37.0	9.630 3269	-45417
	17	309 39 2.9	3 23 20.3	3 24.2	6 56 26.6	3 17.8	9.625 6533	48050
	18	313 4 42.9	3 28 3.1	1 54.2	6 59 2.3	1 52.4	9.620 7183	50643
	19	316 35 15.8	3 33 6.1	+ 0 20.4	7 0 9.3	- 0 20.5	9.615 5265	53184
	20	320 11 2.1	3 38 30.2	- 1 16.1	6 59 40.9	+ 1 18.5	9.610 0840	55653
	21	323 52 23.3	3 44 15.8	- 2 53.8	-6 57 29.7	+ 3 5.1	9.604 3991	-58027
	22	327 39 41.1	3 50 23.6	4 31.1	6 53 28.0	4 59.7	9.598 4826	60281
	23	331 33 17.9	3 56 53.8	6 6.3	6 47 27.6	7 2.5	9.592 3479	62385
	24	335 33 36.1	4 3 46.4	7 37.2	6 39 20.1	9 14.0	9.586 0117	64304
	25	339 40 58.1	4 11 1.5	9 1.5	6 28 56.7	11 34.2	9.579 4947	65994
	26	343 55 46.4	4 18 38.6	-10 16.7	-6 16 8.9	+14 2.8	9.572 8221	-67407
	27	348 18 22.3	4 26 36.8	11 20.2	6 0 48.3	16 39.8	9.566 0242	68491
	28	352 49 6.4	4 34 54.5	12 9.1	5 42 46.9	19 24.2	9.559 1369	69185
	29	357 28 17.1	4 43 29.7	12 40.7	5 21 57.9	22 14.8	9.552 2025	69422
	30	2 16 10.6	4 52 19.7	12 52.3	4 58 15.8	25 10.0	9.545 2699	69137
	31	7 12 59.9	5 1 20.6	-12 41.7	-4 31 37.1	+28 7.5	9.538 3951	-68254
	32	12 18 53.7	.....	-12 6.9	-4 2 0.9	.....	9.531 6416	.....

GREENWICH MEAN TIME.

Date.	Apparent Right Ascension.			Var. per Hour.	Apparent Declination.			Var. per Hour.	Logarithm of Distance from Earth.	Var. per Hour.	Semi-diameter.	Hor. Parallax.	Transit, Meridian of Greenwich.		
	Noon.			Noon.	Noon.			Noon.	Noon.	Noon.	Noon.	Noon.	h m		
Jan.	1	h	m	s	s	°	'	''	''				h m		
	2	20	39	32.04	+12.800	-20	10	44.7	+46.71	0.159 5504	-567.6	5.92	6.10	2 0.4	
	3	20	44	38.57	12.744	19	51	46.4	48.14	0.158 1810	573.6	5.93	6.11	2 1.6	
	4	20	49	43.75	12.688	19	32	14.2	49.54	0.156 7971	579.7	5.95	6.13	2 2.7	
	5	20	54	47.57	12.631	19	12	8.8	50.90	0.155 3984	585.9	5.97	6.15	2 3.8	
	6	20	59	50.01	12.573	18	51	31.1	52.23	0.153 9847	592.2	5.99	6.17	2 4.9	
	7	21	4	51.06	+12.515	-18	30	21.8	+53.53	0.152 5557	-598.6	6.01	6.19	2 6.0	
	8	21	9	50.72	12.457	18	8	41.7	54.80	0.151 1113	605.0	6.03	6.21	2 7.0	
	9	21	14	48.98	12.398	17	46	31.5	56.04	0.149 6515	611.5	6.05	6.23	2 8.0	
	10	21	19	45.83	12.339	17	23	52.0	57.24	0.148 1761	618.0	6.07	6.25	2 9.0	
	11	21	24	41.28	12.281	17	0	44.1	58.41	0.146 6849	624.6	6.09	6.27	2 10.0	
	12	21	29	35.34	+12.224	-16	37	8.5	+59.55	0.145 1779	-631.3	6.12	6.30	2 11.0	
	13	21	34	28.01	12.166	16	13	6.0	60.65	0.143 6548	638.0	6.14	6.32	2 11.9	
	14	21	39	19.29	12.108	15	48	37.5	61.72	0.142 1157	644.7	6.16	6.34	2 12.8	
	15	21	44	9.21	12.051	15	23	43.7	62.76	0.140 5605	651.4	6.18	6.36	2 13.7	
	16	21	48	57.77	11.995	14	58	25.4	63.76	0.138 9891	658.2	6.20	6.38	2 14.6	
	17	21	53	44.98	+11.940	-14	32	43.4	+64.73	0.137 4014	-665.0	6.23	6.41	2 15.4	
	18	21	58	30.88	11.885	14	6	38.6	65.67	0.135 7973	671.8	6.25	6.43	2 16.2	
	19	22	3	15.47	11.831	13	40	11.7	66.57	0.134 1766	678.7	6.27	6.45	2 17.0	
	20	22	7	58.79	11.779	13	13	23.4	67.44	0.132 5393	685.7	6.30	6.48	2 17.8	
	21	22	12	40.85	11.727	12	46	14.6	68.28	0.130 8852	692.7	6.33	6.51	2 18.6	
	22	22	17	21.68	+11.676	-12	18	46.0	+69.09	0.129 2142	-699.8	6.35	6.54	2 19.3	
	23	22	22	1.30	11.626	11	50	58.5	69.86	0.127 5260	707.0	6.38	6.57	2 20.0	
	24	22	26	39.75	11.578	11	22	52.8	70.60	0.125 8207	714.2	6.40	6.59	2 20.7	
	25	22	31	17.05	11.531	10	54	29.6	71.31	0.124 0980	721.5	6.43	6.62	2 21.4	
	26	22	35	53.24	11.485	10	25	49.8	71.99	0.122 3576	728.9	6.45	6.65	2 22.0	
	27	22	40	28.35	+11.441	-	9	56	54.1	+72.64	0.120 5993	-736.4	6.48	6.67	2 22.6
	28	22	45	2.41	11.398	9	27	43.3	73.25	0.118 8229	744.0	6.51	6.69	2 23.3	
	29	22	49	35.45	11.356	8	58	18.1	73.83	0.117 0282	751.7	6.53	6.72	2 23.9	
	30	22	54	7.52	11.316	8	28	39.3	74.39	0.115 2148	759.5	6.56	6.75	2 24.5	
	31	22	58	38.64	11.277	7	58	47.6	74.91	0.113 3823	767.5	6.58	6.78	2 25.1	
Feb.	1	23	3	8.84	+11.240	-	7	28	43.9	+75.40	0.111 5306	-775.6	6.61	6.81	2 25.6
	2	23	7	38.17	11.205	6	58	28.9	75.85	0.109 6593	783.9	6.64	6.84	2 26.1	
	3	23	12	6.66	11.170	6	28	3.4	76.27	0.107 7680	792.3	6.67	6.87	2 26.7	
	4	23	16	34.34	11.137	5	57	28.1	76.66	0.105 8562	800.9	6.70	6.90	2 27.2	
	5	23	21	1.25	11.105	5	26	43.9	77.02	0.103 9238	809.5	6.73	6.93	2 27.7	
	6	23	25	27.41	+11.075	-	4	55	51.5	+77.35	0.101 9705	-818.3	6.76	6.96	2 28.2
	7	23	29	52.86	11.046	4	24	51.6	77.64	0.099 9959	827.2	6.79	6.99	2 28.7	
	8	23	34	17.64	11.019	3	53	45.1	77.90	0.097 9997	836.3	6.82	7.02	2 29.2	
	9	23	38	41.79	10.993	3	22	32.7	78.13	0.095 9817	845.4	6.85	7.05	2 29.7	
	10	23	43	5.33	10.969	2	51	15.2	78.32	0.093 9418	854.6	6.88	7.08	2 30.2	
	11	23	47	28.29	+10.946	-	2	19	53.3	+78.48	0.091 8797	-863.9	6.92	7.12	2 30.6
	12	23	51	50.72	10.924	1	48	27.8	78.62	0.089 7952	873.2	6.95	7.15	2 31.0	
	13	23	56	12.65	10.904	1	16	59.5	78.73	0.087 6882	882.7	6.99	7.18	2 31.4	
	14	0	0	34.12	10.885	0	45	29.0	78.81	0.085 5582	892.3	7.02	7.22	2 31.8	
	15	0	4	55.16	10.868	-	0	13	57.0	78.85	0.083 4052	901.9	7.06	7.26	2 32.2
	16	0	9	15.82	+10.853	+	0	17	35.6	+78.86	0.081 2291	-911.6	7.09	7.30	2 32.6
17	0	13	36.12	+10.839	+	0	49	8.2	+78.84	0.079 0295	-921.5	7.12	7.33	2 33.0	

GREENWICH MEAN TIME.

Date.	Apparent Right Ascension.			Var. per Hour.	Apparent Declination.			Var. per Hour.	Logarithm of Distance from Earth.	Var. per Hour.	Semi-diameter.	Hor. Parallax.	Transit, Meridian of Greenwich.
	Noon.			Noon.	Noon.			Noon.	Noon.	Noon.	Noon.	Noon.	
	h	m	s	s	°	'	"	"			"	"	h m
Feb. 16	0	13	36.12	+10.839	+ 0	49	8.2	+78.84	0.079 0296	- 921.5	7.12	7.33	2 33.0
17	0	17	56.10	10.827	1	20	40.0	78.80	0.076 8061	931.4	7.16	7.37	2 33.4
18	0	22	15.81	10.816	1	52	10.4	78.73	0.074 5587	941.4	7.20	7.41	2 33.8
19	0	26	35.27	10.807	2	23	38.7	78.62	0.072 2873	951.5	7.24	7.45	2 34.2
20	0	30	54.53	10.799	2	55	4.1	78.49	0.069 9915	961.7	7.28	7.49	2 34.5
21	0	35	13.62	+10.793	+ 3	26	26.0	+78.33	0.067 6712	- 972.0	7.32	7.53	2 34.9
22	0	39	32.59	10.788	3	57	43.7	78.14	0.065 3259	982.5	7.36	7.57	2 35.3
23	0	43	51.46	10.785	4	28	56.4	77.92	0.062 9553	993.1	7.40	7.61	2 35.7
24	0	48	10.27	10.783	5	0	3.6	77.67	0.060 5591	1003.8	7.44	7.65	2 36.0
25	0	52	29.06	10.783	5	31	4.5	77.39	0.058 1370	1014.7	7.48	7.70	2 36.4
26	0	56	47.87	+10.784	+ 6	1	58.5	+77.09	0.055 6885	-1025.8	7.52	7.74	2 36.8
27	1	1	6.72	10.787	6	32	44.8	76.76	0.053 2134	1037.0	7.57	7.78	2 37.2
28	1	5	25.66	10.792	7	3	22.7	76.40	0.050 7111	1048.4	7.61	7.82	2 37.5
29	1	9	44.72	10.797	7	33	51.7	76.01	0.048 1811	1060.0	7.66	7.87	2 37.9
Mar. 1	1	14	3.93	10.804	8	4	11.0	75.59	0.045 6230	1071.9	7.70	7.92	2 38.3
2	1	18	23.31	+10.811	+ 8	34	19.8	+75.14	0.043 0361	-1084.0	7.74	7.97	2 38.7
3	1	22	42.88	10.820	9	4	17.5	74.66	0.040 4201	1096.2	7.79	8.02	2 39.0
4	1	27	2.68	10.830	9	34	3.3	74.15	0.037 7744	1108.6	7.84	8.07	2 39.4
5	1	31	22.72	10.841	10	3	36.5	73.61	0.035 0987	1121.3	7.89	8.12	2 39.8
6	1	35	43.03	10.852	10	32	56.5	73.04	0.032 3923	1134.1	7.94	8.17	2 40.2
7	1	40	3.61	+10.864	+11	2	2.5	+72.45	0.029 6550	-1147.1	7.99	8.22	2 40.6
8	1	44	24.50	10.877	11	30	53.8	71.82	0.026 8862	1160.3	8.04	8.27	2 41.0
9	1	48	45.72	10.891	11	59	29.7	71.16	0.024 0855	1173.7	8.09	8.32	2 41.4
10	1	53	7.27	10.906	12	27	49.5	70.48	0.021 2525	1187.2	8.14	8.38	2 41.8
11	1	57	29.17	10.920	12	55	52.6	69.77	0.018 3869	1200.9	8.20	8.44	2 42.3
12	2	1	51.43	+10.935	+13	23	38.3	+69.03	0.015 4883	-1214.7	8.25	8.49	2 42.7
13	2	6	14.07	10.951	13	51	5.9	68.26	0.012 5564	1228.7	8.30	8.55	2 43.1
14	2	10	37.09	10.967	14	18	14.7	67.46	0.009 5907	1242.8	8.36	8.61	2 43.5
15	2	15	0.50	10.983	14	45	4.0	66.64	0.006 5911	1257.0	8.42	8.67	2 44.0
16	2	19	24.31	11.000	15	11	33.2	65.79	0.003 5571	1271.4	8.48	8.73	2 44.5
17	2	23	48.52	+11.017	+15	37	41.8	+64.91	0.000 4883	-1286.0	8.54	8.79	2 45.0
18	2	28	13.14	11.035	16	3	29.0	64.01	9.997 3842	1300.8	8.60	8.85	2 45.5
19	2	32	38.18	11.052	16	28	54.2	63.08	9.994 2446	1315.7	8.66	8.91	2 45.9
20	2	37	3.63	11.069	16	53	56.8	62.13	9.991 0690	1330.7	8.72	8.98	2 46.4
21	2	41	29.50	11.086	17	18	36.2	61.15	9.987 8572	1345.9	8.79	9.05	2 46.9
22	2	45	55.78	+11.103	+17	42	51.8	+60.14	9.984 6088	-1361.3	8.86	9.12	2 47.4
23	2	50	22.46	11.120	18	6	43.0	59.11	9.981 3232	1376.8	8.93	9.19	2 47.9
24	2	54	49.55	11.137	18	30	9.2	58.06	9.978 0000	1392.6	9.00	9.26	2 48.4
25	2	59	17.05	11.154	18	53	9.9	56.99	9.974 6386	1408.7	9.06	9.33	2 48.9
26	3	3	44.93	11.170	19	15	44.6	55.89	9.971 2383	1425.0	9.13	9.40	2 49.4
27	3	8	13.19	+11.185	+19	37	52.6	+54.77	9.967 7987	-1441.5	9.20	9.47	2 49.9
28	3	12	41.81	11.199	19	59	33.4	53.62	9.964 3192	1458.3	9.27	9.55	2 50.4
29	3	17	10.77	11.213	20	20	46.4	52.45	9.960 7990	1475.3	9.35	9.63	2 51.0
30	3	21	40.05	11.226	20	41	31.1	51.26	9.957 2374	1492.8	9.43	9.71	2 51.6
31	3	26	9.62	11.237	21	1	47.0	50.05	9.953 6337	1510.5	9.51	9.79	2 52.1
Apr. 1	3	30	39.44	+11.247	+21	21	33.6	+48.82	9.949 9871	-1528.5	9.59	9.87	2 52.6
2	3	35	9.48	+11.255	+21	40	50.3	+47.57	9.946 2970	-1546.8	9.67	9.95	2 53.2

GREENWICH MEAN TIME.

Date.	Apparent Right Ascension.			Var. per Hour.	Apparent Declination.			Var. per Hour.	Logarithm of Distance from Earth.	Var. per Hour.	Semi- diam- eter.	Hor. Paral- lax.	Transit, Meridian of Green- wich.		
	Noon.				Noon.										
	h	m	s	s	°	'	"	"	Noon.	Noon.	Noon.	Noon.	h	m	
Apr.	1	3	30	39.44	+11.247	+21	21	33.6	+48.82	9.949 9871	-1528.5	9.59	9.87	2	52.6
	2	3	35	9.48	11.255	21	40	50.3	47.57	9.946 2970	1546.8	9.67	9.95	2	53.2
	3	3	39	39.71	11.262	21	59	36.7	46.29	9.942 5626	1565.3	9.75	10.04	2	53.8
	4	3	44	10.07	11.267	22	17	52.3	45.00	9.938 7832	1584.2	9.84	10.13	2	54.4
	5	3	48	40.52	11.270	22	35	36.7	43.69	9.934 9581	1603.4	9.93	10.22	2	55.0
	6	3	53	11.01	+11.270	+22	52	49.5	+42.36	9.931 0867	-1622.8	10.02	10.31	2	55.5
	7	3	57	41.48	11.268	23	9	30.2	41.02	9.927 1683	1642.5	10.11	10.40	2	56.0
	8	4	2	11.88	11.264	23	25	38.4	39.66	9.923 2025	1662.4	10.20	10.50	2	56.6
	9	4	6	42.14	11.257	23	41	13.8	38.29	9.919 1886	1682.6	10.29	10.60	2	57.2
	10	4	11	12.19	11.247	23	56	16.2	36.90	9.915 1259	1703.0	10.39	10.70	2	57.7
	11	4	15	41.97	+11.234	+24	10	45.1	+35.50	9.911 0138	-1723.7	10.49	10.80	2	58.2
	12	4	20	11.42	11.219	24	24	40.3	34.09	9.906 8518	1744.7	10.59	10.90	2	58.8
	13	4	24	40.46	11.200	24	38	1.5	32.67	9.902 6392	1765.9	10.69	11.01	2	59.4
	14	4	29	9.00	11.178	24	50	48.5	31.25	9.898 3756	1787.3	10.79	11.12	2	59.9
	15	4	33	36.97	11.153	25	3	1.2	29.81	9.894 0604	1808.8	10.90	11.23	3	0.4
	16	4	38	4.30	+11.124	+25	14	39.4	+28.37	9.889 6932	-1830.6	11.01	11.34	3	0.9
	17	4	42	30.89	11.092	25	25	42.9	26.92	9.885 2733	1852.6	11.12	11.46	3	1.4
	18	4	46	56.67	11.056	25	36	11.7	25.47	9.880 8004	1874.8	11.24	11.58	3	1.9
	19	4	51	21.54	11.016	25	46	5.6	24.02	9.876 2739	1897.3	11.36	11.70	3	2.4
	20	4	55	45.42	10.973	25	55	24.6	22.57	9.871 6933	1920.0	11.48	11.82	3	2.9
	21	5	0	8.22	+10.926	+26	4	8.8	+21.11	9.867 0580	-1942.9	11.61	11.95	3	3.3
	22	5	4	29.84	10.875	26	12	18.1	19.66	9.862 3674	1966.0	11.74	12.08	3	3.7
	23	5	8	50.19	10.820	26	19	52.6	18.21	9.857 6208	1989.5	11.87	12.21	3	4.1
	24	5	13	9.18	10.761	26	26	52.3	16.76	9.852 8174	2013.4	12.00	12.34	3	4.5
	25	5	17	26.70	10.698	26	33	17.3	15.32	9.847 9565	2037.6	12.13	12.48	3	4.8
	26	5	21	42.64	+10.630	+26	39	7.9	+13.89	9.843 0372	-2062.0	12.27	12.62	3	5.1
	27	5	25	56.90	10.558	26	44	24.1	12.46	9.838 0588	2086.8	12.41	12.77	3	5.4
	28	5	30	9.37	10.481	26	49	6.2	11.04	9.833 0206	2111.9	12.55	12.92	3	5.7
	29	5	34	19.92	10.398	26	53	14.3	9.63	9.827 9217	2137.3	12.70	13.07	3	5.9
	30	5	38	28.43	10.310	26	56	48.7	8.24	9.822 7612	2163.1	12.85	13.23	3	6.1
May	1	5	42	34.77	+10.217	+26	59	49.8	+ 6.86	9.817 5383	-2189.3	13.01	13.39	3	6.3
	2	5	46	38.82	10.119	27	2	17.9	5.49	9.812 2523	2215.8	13.17	13.56	3	6.4
	3	5	50	40.44	10.015	27	4	13.3	4.14	9.806 9024	2242.5	13.33	13.73	3	6.5
	4	5	54	39.48	9.905	27	5	36.5	2.80	9.801 4881	2269.5	13.50	13.90	3	6.5
	5	5	58	35.81	9.789	27	6	27.8	1.48	9.796 0087	2296.7	13.67	14.08	3	6.5
	6	6	2	29.29	+ 9.667	+27	6	47.8	+ 0.19	9.790 4639	-2324.1	13.85	14.26	3	6.4
	7	6	6	19.76	9.538	27	6	37.0	- 1.06	9.784 8531	2351.7	14.03	14.45	3	6.3
	8	6	10	7.06	9.403	27	5	55.9	2.38	9.779 1759	2379.4	14.21	14.64	3	6.2
	9	6	13	51.05	9.262	27	4	45.0	3.56	9.773 4321	2407.2	14.40	14.83	3	6.0
	10	6	17	31.57	9.114	27	3	5.1	4.76	9.767 6215	2435.0	14.59	15.03	3	5.7
	11	6	21	8.46	+ 8.959	+27	0	56.7	- 5.93	9.761 7440	-2462.9	14.79	15.23	3	5.4
	12	6	24	41.54	8.797	26	58	20.4	7.08	9.755 7997	2490.7	14.99	15.44	3	5.0
	13	6	28	10.64	8.627	26	55	17.0	8.19	9.749 7887	2518.4	15.20	15.66	3	4.5
	14	6	31	35.60	8.451	26	51	47.2	9.27	9.743 7115	2545.9	15.42	15.88	3	3.9
	15	6	34	56.25	8.268	26	47	51.7	10.33	9.737 5684	2573.2	15.64	16.10	3	3.3
	16	6	38	12.42	+ 8.077	+26	43	31.3	-11.36	9.731 3602	-2600.2	15.86	16.33	3	2.6
	17	6	41	23.92	+ 7.879	+26	38	46.7	-12.35	9.725 0877	-2626.8	16.09	16.57	3	1.8

GREENWICH MEAN TIME.

Date.	Apparent Right Ascension.			Var. per Hour.	Apparent Declination.			Var. per Hour.	Logarithm of Distance from Earth.	Var. per Hour.	Semi-diameter.	Hor. Parallax.	Transit Meridian of Greenwich.	
	Hours.	Minutes.	Seconds.		Hours.	Minutes.	Seconds.							
	h	m	s	s	°	'	"	"					h	m
May	17	6 41	23.92	+7.879	+26 38	46.7	-12.35	9.725 0877	-2626.8	16.09	16.57	3 1.8		
	18	6 44	30.57	7.674	26 33	38.6	13.31	9.718 7519	2653.0	16.33	16.82	3 1.0		
	19	6 47	32.21	7.461	26 28	7.9	14.23	9.712 3538	2678.7	16.57	17.07	3 0.1		
	20	6 50	28.64	7.240	26 22	15.5	15.12	9.705 8946	2703.8	16.82	17.32	2 59.1		
	21	6 53	19.68	7.012	26 16	2.2	15.98	9.699 3758	2728.3	17.07	17.58	2 58.0		
	22	6 56	5.15	+6.776	+26 9	28.7	-16.80	9.692 7989	-2752.2	17.33	17.85	2 56.8		
	23	6 58	44.85	6.531	26 2	35.8	17.50	9.686 1656	2775.3	17.60	18.12	2 55.5		
	24	7 1	18.58	6.278	25 55	24.4	18.34	9.679 4779	2797.6	17.87	18.40	2 54.1		
	25	7 3	46.13	6.016	25 47	55.4	19.06	9.672 7379	2818.9	18.15	18.69	2 52.6		
	26	7 6	7.28	5.746	25 40	9.6	19.74	9.665 9482	2839.0	18.43	18.98	2 51.0		
June	27	7 8	21.84	+5.466	+25 32	7.9	-20.39	9.659 1115	-2857.9	18.73	19.28	2 49.3		
	28	7 10	29.58	5.177	25 23	51.2	21.00	9.652 2313	2875.3	19.03	19.60	2 47.5		
	29	7 12	30.26	4.878	25 15	20.3	21.57	9.645 3112	2891.1	19.34	19.91	2 45.6		
	30	7 14	23.63	4.599	25 6	36.2	22.10	9.638 3554	2905.0	19.65	20.23	2 43.5		
	31	7 16	9.46	4.250	24 57	39.8	22.60	9.631 3686	2916.8	19.97	20.56	2 41.3		
	1	7 17	47.50	+3.920	+24 48	31.8	-23.06	9.624 3562	-2926.3	20.30	20.89	2 39.0		
	2	7 19	17.51	3.579	24 39	13.2	23.48	9.617 3242	2933.1	20.63	21.24	2 36.5		
	3	7 20	39.22	3.220	24 29	44.9	23.87	9.610 2795	2936.9	20.97	21.59	2 33.9		
	4	7 21	52.40	2.899	24 20	7.6	24.28	9.603 2297	2937.4	21.31	21.94	2 31.2		
	5	7 22	56.81	2.498	24 10	22.2	24.55	9.596 1831	2934.1	21.66	22.30	2 28.3		
	6	7 23	52.20	+2.117	+24 0	29.4	-24.84	9.589 1491	-2926.8	22.01	22.66	2 25.3		
	7	7 24	38.32	1.726	23 50	30.0	25.10	9.582 1378	2915.1	22.37	23.03	2 22.1		
	8	7 25	14.95	1.325	23 40	24.8	25.33	9.575 1603	2898.5	22.73	23.41	2 18.8		
	9	7 25	41.87	0.916	23 30	14.3	25.54	9.568 2289	2876.7	23.10	23.79	2 15.3		
	10	7 25	58.88	0.499	23 19	59.2	25.72	9.561 3568	2849.0	23.48	24.16	2 11.6		
	11	7 26	5.81	+0.076	+23 9	40.1	-25.87	9.554 5587	-2815.0	23.85	24.54	2 7.8		
	12	7 26	2.50	-0.353	22 59	17.5	26.00	9.547 8502	2774.3	24.22	24.92	2 3.8		
	13	7 25	48.83	0.787	22 48	52.0	26.12	9.541 2479	2726.4	24.59	25.31	1 59.6		
	14	7 25	24.72	1.224	22 38	24.0	26.22	9.534 7697	2670.8	24.95	25.69	1 55.2		
	15	7 24	50.11	1.661	22 27	53.8	26.30	9.528 4345	2607.2	25.32	26.06	1 50.7		
	16	7 24	5.02	-2.097	+22 17	21.8	-26.37	9.522 2619	-2535.2	25.68	26.44	1 46.0		
	17	7 23	9.51	2.529	22 6	48.2	26.48	9.516 2726	2454.5	26.03	26.80	1 41.2		
	18	7 22	3.69	2.955	21 56	13.3	26.48	9.510 4877	2364.8	26.38	27.16	1 36.1		
	19	7 20	47.74	3.373	21 45	37.3	26.52	9.504 9289	2266.0	26.72	27.52	1 30.9		
	20	7 19	21.89	3.780	21 35	0.6	26.54	9.499 6179	2158.2	27.06	27.85	1 25.6		
	21	7 17	46.44	-4.172	+21 24	23.4	-26.56	9.494 5768	-2041.2	27.38	28.18	1 20.1		
	22	7 16	1.76	4.548	21 13	46.1	26.55	9.489 8276	1915.0	27.68	28.49	1 14.4		
	23	7 14	8.30	4.904	21 3	9.2	26.52	9.485 3922	1779.7	27.96	28.78	1 8.6		
	24	7 12	6.57	5.237	20 52	33.1	26.48	9.481 2920	1635.7	28.22	29.05	1 2.6		
	25	7 9	57.13	5.545	20 41	58.4	26.40	9.477 5476	1483.3	28.47	29.30	0 56.5		
	26	7 7	40.64	-5.824	+20 31	26.0	-26.29	9.474 1785	-1223.0	28.70	29.53	0 50.3		
	27	7 5	17.82	6.072	20 20	56.7	26.15	9.471 2028	1155.5	28.90	29.74	0 44.0		
	28	7 2	49.47	6.285	20 10	31.4	25.96	9.468 6371	981.5	29.07	29.91	0 37.6		
	29	7 0	16.43	6.462	20 0	11.4	25.71	9.466 4963	801.7	29.21	30.06	0 31.2		
	30	6 57	39.58	6.602	19 49	57.9	25.40	9.464 7928	617.2	29.32	30.18	0 24.7		
	July	1	6 54	59.87	-6.701	+19 39	52.5	-25.03	9.463 5367	-429.0	29.41	30.26	0 18.1	
	2	6 52	18.27	-6.769	+19 29	56.7	-24.60	9.462 7354	-238.3	29.46	30.32	0 11.5		

GREENWICH MEAN TIME.

Date.	Apparent Right Ascension.			Var. per Hour.	Apparent Declination.			Var. per Hour.	Logarithm of Distance from Earth.	Var. per Hour.	Semi-diameter.	Hor. Paral- lax.	Transit Meridian of Green- wich.	
	Noon.			Noon.	Noon.			Noon.	Noon.	Noon.	Noon.	Noon.		
July		h	m	s	s	°	'	"	"		"	"	h	m
	1	6	54	59.87	-6.701	+19	39	52.5	-25.03	9.463 5367	- 429.0	29.41	30.26	0 18.1
	2	6	52	18.27	6.759	19	29	56.7	24.60	9.462 7354	238.3	29.46	30.32	0 11.5
	3	6	49	35.77	6.775	19	20	12.1	24.10	9.462 3937	- 46.3	29.48	30.34	23 54.1
	4	6	46	53.38	6.750	19	10	40.6	23.51	9.462 5133	+ 145.8	29.46	30.34	23 51.6
	5	6	44	12.10	6.684	19	1	24.1	22.85	9.463 0928	336.8	29.42	30.30	23 45.1
	6	6	41	32.90	-6.576	+18	52	24.4	-22.11	9.464 1284	+ 526.6	29.36	30.22	23 38.6
	7	6	38	56.76	6.429	18	43	43.4	21.29	9.465 6133	711.0	29.27	30.12	23 32.1
	8	6	36	24.60	6.245	18	35	22.9	20.40	9.467 5379	891.9	29.14	29.99	23 25.7
	9	6	33	57.29	6.026	18	27	24.6	19.44	9.469 8902	1067.3	28.97	29.83	23 19.5
	10	6	31	35.65	5.773	18	19	50.2	18.41	9.472 6559	1236.3	28.78	29.64	23 13.3
	11	6	29	20.46	-5.489	+18	12	41.5	-17.31	9.475 8185	+1398.0	28.58	29.42	23 7.3
	12	6	27	12.42	5.177	18	5	59.6	16.17	9.479 3599	1551.8	28.35	29.18	23 1.3
	13	6	25	12.15	4.841	17	59	45.6	14.99	9.483 2604	1697.2	28.10	28.92	22 55.5
	14	6	23	20.20	4.484	17	54	0.3	13.78	9.487 4991	1833.6	27.82	28.64	22 49.9
	15	6	21	37.04	4.109	17	48	44.4	12.54	9.492 0541	1960.7	27.54	28.34	22 44.4
	16	6	20	3.09	-3.718	+17	43	58.4	-11.28	9.496 9030	+2078.4	27.24	28.03	22 39.0
	17	6	18	38.68	3.315	17	39	42.7	10.03	9.502 0228	2186.5	26.92	27.70	22 33.8
	18	6	17	24.04	2.903	17	35	57.1	8.78	9.507 3906	2285.1	26.58	27.36	22 28.8
	19	6	16	19.37	2.485	17	32	41.5	7.54	9.512 9838	2374.3	26.23	27.01	22 24.0
	20	6	15	24.77	2.064	17	29	55.3	6.33	9.518 7801	2454.5	25.89	26.65	22 19.3
	21	6	14	40.29	-1.642	+17	27	37.8	- 5.14	9.524 7582	+2525.9	25.54	26.29	22 14.8
	22	6	14	5.94	1.221	17	25	48.3	3.99	9.530 8975	2588.9	25.18	25.92	22 10.5
	23	6	13	41.67	0.803	17	24	25.9	2.89	9.537 1786	2644.0	24.82	25.54	22 6.3
	24	6	13	27.37	-0.389	17	23	29.4	1.83	9.543 5830	2691.7	24.45	25.17	22 2.3
	25	6	13	22.94	+0.019	17	22	57.7	- 0.82	9.550 0932	2732.3	24.09	24.80	21 58.4
	26	6	13	28.21	+0.419	+17	22	49.5	+ 0.13	9.556 6931	+2766.5	23.73	24.42	21 54.7
	27	6	13	43.01	0.812	17	23	3.3	1.02	9.563 3677	2794.6	23.37	24.05	21 51.2
	28	6	14	7.15	1.198	17	23	37.7	1.84	9.570 1030	2817.2	23.00	23.68	21 47.8
	29	6	14	40.41	1.574	17	24	31.1	2.60	9.576 8861	2834.6	22.64	23.31	21 44.5
	30	6	15	22.59	1.940	17	25	42.1	3.30	9.583 7054	2847.4	22.29	22.95	21 41.4
Aug.	31	6	16	13.44	+2.296	+17	27	8.9	+ 3.93	9.590 5501	+2855.8	21.95	22.59	21 38.4
	1	6	17	12.72	2.643	17	28	50.0	4.49	9.597 4103	2890.3	21.61	22.24	21 35.6
	2	6	18	20.21	2.980	17	30	43.7	4.98	9.604 2770	2931.3	21.27	21.89	21 33.0
	3	6	19	35.65	3.306	17	32	48.3	5.40	9.611 1421	2959.1	20.93	21.55	21 30.5
	4	6	20	58.81	3.623	17	35	2.3	5.76	9.617 9984	2984.0	20.60	21.21	21 28.0
	5	6	22	29.46	+3.930	+17	37	24.0	+ 6.06	9.624 8392	+2946.3	20.28	20.88	21 25.6
	6	6	24	7.36	4.227	17	39	51.9	6.27	9.631 6587	2936.3	19.96	20.55	21 23.4
	7	6	25	52.28	4.515	17	42	24.2	6.42	9.638 4516	2924.2	19.65	20.23	21 21.3
	8	6	27	44.00	4.793	17	44	59.4	6.51	9.645 2131	2910.2	19.35	19.92	21 19.3
	9	6	29	42.29	5.063	17	47	36.0	6.53	9.651 9391	2794.5	19.05	19.61	21 17.4
	10	6	31	46.95	+5.324	+17	50	12.4	+ 6.49	9.658 6257	+2777.4	18.76	19.31	21 15.7
	11	6	33	57.77	5.577	17	52	47.0	6.38	9.665 2694	2758.8	18.47	19.02	21 14.0
	12	6	36	14.55	5.821	17	55	18.4	6.22	9.671 8670	2739.0	18.19	18.73	21 12.4
	13	6	38	37.10	6.067	17	57	45.2	6.00	9.678 4156	2718.0	17.92	18.45	21 10.9
	14	6	41	5.21	6.284	18	0	6.0	5.72	9.684 9127	2696.0	17.65	18.17	21 9.5
	15	6	43	38.69	+6.504	+18	2	19.3	+ 5.38	9.691 3559	+2673.1	17.39	17.91	21 8.2
	16	6	46	17.36	+6.716	+18	4	23.8	+ 4.99	9.697 7430	+2649.4	17.14	17.64	21 7.0

GREENWICH MEAN TIME.

Date.	Apparent Right Ascension.			Var. per Hour.	Apparent Declination.			Var. per Hour.	Logarithm of Distance from Earth.	Var. per Hour.	Semi-diameter.	Hor. Parallax.	Transit, Meridian of Greenwich.
	h	m	s		°	'	"							h	m
Aug. 16	6	46	17.36	+ 6.716	+18	4	23.8	+ 4.99	9.697 7430	+2640.4	17.14	17.64	21 7.0
17	6	49	1.03	6.921	18	6	18.4	4.55	9.704 0723	2634.9	16.89	17.39	21 5.9
18	6	51	49.52	7.118	18	8	1.8	4.05	9.710 3423	2599.9	16.65	17.14	21 4.8
19	6	54	42.64	7.307	18	9	32.7	3.51	9.716 5516	2574.4	16.41	16.90	21 3.8
20	6	57	40.21	7.489	18	10	50.1	2.93	9.722 6993	2548.6	16.18	16.66	21 2.9
21	7	0	42.05	+ 7.664	+18	11	53.0	+ 2.31	9.728 7847	+2522.5	15.96	16.43	21 2.1
22	7	3	48.01	7.832	18	12	40.4	1.64	9.734 8072	2496.2	15.74	16.20	21 1.3
23	7	6	57.91	7.993	18	13	11.3	0.93	9.740 7663	2469.7	15.52	15.98	21 0.6
24	7	10	11.59	8.147	18	13	24.6	+ 0.18	9.746 6618	2443.2	15.31	15.76	20 59.9
25	7	13	28.91	8.295	18	13	19.6	- 0.60	9.752 4936	2416.7	15.11	15.55	20 59.3
26	7	16	49.71	+ 8.437	+18	12	55.5	- 1.42	9.758 2619	+2390.3	14.91	15.35	20 58.7
27	7	20	13.85	8.573	18	12	11.5	2.27	9.763 9668	2363.9	14.72	15.15	20 58.2
28	7	23	41.19	8.704	18	11	6.9	3.14	9.769 6086	2337.7	14.53	14.96	20 57.8
29	7	27	11.59	8.829	18	9	40.8	4.04	9.775 1877	2311.6	14.34	14.77	20 57.4
30	7	30	44.92	8.948	18	7	52.7	4.97	9.780 7045	2285.8	14.16	14.58	20 57.1
31	7	34	21.05	+ 9.062	+18	5	41.9	- 5.93	9.786 1596	+2260.2	13.98	14.40	20 56.8
Sept. 1	7	37	59.86	9.171	18	3	7.8	6.92	9.791 5536	2234.8	13.81	14.22	20 56.5
2	7	41	41.24	9.276	18	0	9.9	7.92	9.796 8871	2209.8	13.64	14.05	20 56.3
3	7	45	25.07	9.376	17	56	47.7	8.94	9.802 1609	2185.1	13.47	13.88	20 56.1
4	7	49	11.24	9.472	17	53	0.6	9.99	9.807 3757	2160.7	13.31	13.71	20 56.0
5	7	52	59.65	+ 9.563	+17	48	48.2	-11.06	9.812 5323	+2136.5	13.15	13.55	20 55.9
6	7	56	50.20	9.650	17	44	10.0	12.13	9.817 6313	2112.7	13.00	13.39	20 55.8
7	8	0	42.79	9.732	17	39	5.7	13.23	9.822 6734	2089.1	12.85	13.24	20 55.8
8	8	4	37.33	9.811	17	33	34.7	14.35	9.827 6594	2065.9	12.70	13.09	20 55.8
9	8	8	33.73	9.887	17	27	36.9	15.48	9.832 5900	2042.9	12.56	12.94	20 55.8
10	8	12	31.91	+ 9.960	+17	21	11.8	-16.62	9.837 4657	+2020.1	12.42	12.80	20 55.8
11	8	16	31.79	10.029	17	14	19.1	17.77	9.842 2869	1997.6	12.28	12.66	20 55.9
12	8	20	33.28	10.094	17	6	58.6	18.93	9.847 0542	1975.2	12.15	12.52	20 56.0
13	8	24	36.29	10.156	16	59	10.1	20.10	9.851 7681	1953.0	12.02	12.39	20 56.1
14	8	28	40.75	10.215	16	50	53.5	21.28	9.856 4290	1931.0	11.89	12.26	20 56.3
15	8	32	46.58	+10.270	+16	42	8.6	-22.46	9.861 0374	+1909.3	11.77	12.13	20 56.5
16	8	36	53.69	10.322	16	32	55.3	23.65	9.865 5937	1887.7	11.65	12.00	20 56.7
17	8	41	2.02	10.371	16	23	13.6	24.83	9.870 0985	1866.3	11.53	11.87	20 56.9
18	8	45	11.48	10.416	16	13	3.4	26.02	9.874 5524	1845.2	11.41	11.75	20 57.1
19	8	49	22.00	10.459	16	2	24.7	27.21	9.878 9558	1824.3	11.30	11.63	20 57.3
20	8	53	33.51	+10.499	+15	51	17.5	-28.39	9.883 3093	+1803.7	11.19	11.51	20 57.6
21	8	57	45.95	10.536	15	39	42.1	29.56	9.887 6136	1783.3	11.08	11.40	20 57.9
22	9	1	59.25	10.571	15	27	38.5	30.73	9.891 8692	1763.1	10.97	11.29	20 58.2
23	9	6	13.34	10.603	15	15	6.8	31.90	9.896 0768	1743.2	10.86	11.18	20 58.5
24	9	10	28.17	10.632	15	2	7.2	33.06	9.900 2370	1723.6	10.76	11.07	20 58.8
25	9	14	43.67	+10.659	+14	48	39.9	-34.21	9.904 3505	+1704.3	10.66	10.97	20 59.1
26	9	18	59.79	10.684	14	34	45.1	35.35	9.908 4180	1685.3	10.56	10.87	20 59.5
27	9	23	16.48	10.707	14	20	23.0	36.48	9.912 4401	1666.5	10.46	10.77	20 59.9
28	9	27	33.69	10.728	14	5	33.9	37.60	9.916 4175	1648.1	10.36	10.67	21 0.2
29	9	31	51.38	10.746	13	50	18.1	38.71	9.920 3510	1629.9	10.27	10.57	21 0.5
30	9	35	9.49	+10.763	+13	34	35.8	-39.81	9.924 2412	+1612.0	10.18	10.47	21 0.9
Oct. 1	9	40	28.00	+10.779	+13	18	27.5	-40.89	9.928 0890	+1594.5	10.09	10.38	21 1.3

GREENWICH MEAN TIME.

Date.	Apparent Right Ascension.			Var. per Hour.	Apparent Declination.			Var. per Hour.	Logarithm of Distance from Earth.	Var. per Hour.	Semi-diameter.	Hor. Parallax.	Transit, Meridian of Greenwich.
	Noon.			Noon.	Noon.			Noon.	Noon.	Noon.	Noon.	Noon.	h m
Oct.	1	9 40	28.00	+10.779	+13 18	27.5		-40.89	9.928 0890	+1594.5	10.09	10.38	21 1.3
	2	9 44	46.86	10.793	13 1	53.4		41.95	9.931 8950	1577.3	10.00	10.29	21 1.6
	3	9 49	6.04	10.805	12 44	53.8		43.01	9.935 6599	1560.3	9.91	10.20	21 2.0
	4	9 53	25.51	10.816	12 27	29.0		44.05	9.939 3844	1543.5	9.82	10.11	21 2.4
	5	9 57	45.25	10.827	12 9	39.5		45.07	9.943 0692	1527.1	9.74	10.03	21 2.8
	6	10 2	5.22	+10.837	+11 51	25.6		-46.08	9.946 7149	+1511.0	9.66	9.95	21 3.2
	7	10 6	25.42	10.846	11 32	47.7		47.07	9.950 3221	1495.1	9.58	9.87	21 3.6
	8	10 10	45.81	10.854	11 13	46.2		48.05	9.953 8914	1479.4	9.50	9.79	21 4.0
	9	10 15	6.39	10.861	10 54	21.5		49.01	9.957 4232	1463.9	9.42	9.71	21 4.4
	10	10 19	27.14	10.868	10 34	34.0		49.95	9.960 9180	1448.5	9.34	9.63	21 4.8
	11	10 23	48.05	+10.874	+10 14	24.1		-50.87	9.964 3761	+1433.3	9.27	9.55	21 5.2
	12	10 28	9.10	10.880	9 53	52.4		51.77	9.967 7978	1418.2	9.20	9.48	21 5.6
	13	10 32	30.30	10.886	9 32	59.3		52.65	9.971 1835	1403.3	9.13	9.40	21 6.0
	14	10 36	51.63	10.891	9 11	45.3		53.51	9.974 5335	1388.5	9.06	9.33	21 6.4
	15	10 41	13.08	10.896	8 50	11.1		54.34	9.977 8482	1373.8	8.99	9.26	21 6.8
	16	10 45	34.63	+10.901	+ 8 28	17.1		-55.15	9.981 1279	+1359.3	8.92	9.19	21 7.3
	17	10 49	56.29	10.905	8 6	3.8		55.94	9.984 3730	1344.9	8.86	9.12	21 7.7
	18	10 54	18.05	10.909	7 43	31.9		56.71	9.987 5836	1330.6	8.79	9.05	21 8.1
	19	10 58	39.92	10.913	7 20	42.0		57.45	9.990 7602	1316.6	8.73	8.98	21 8.5
	20	11 3	1.89	10.917	6 57	34.6		58.16	9.993 9032	1302.6	8.67	8.92	21 9.0
	21	11 7	23.95	+10.921	+ 6 34	10.4		-58.85	9.997 0129	+1288.8	8.61	8.86	21 9.4
	22	11 11	46.10	10.925	6 10	30.0		59.51	0.000 0896	1275.2	8.55	8.80	21 9.8
	23	11 16	8.36	10.929	5 46	34.0		60.15	0.003 1338	1261.7	8.49	8.74	21 10.2
	24	11 20	30.72	10.934	5 22	23.1		60.76	0.006 1457	1248.3	8.43	8.68	21 10.7
	25	11 24	53.19	10.939	4 57	57.9		61.34	0.009 1259	1235.2	8.37	8.62	21 11.1
	26	11 29	15.79	+10.944	+ 4 33	19.0		-61.89	0.012 0746	+1222.1	8.31	8.56	21 11.5
	27	11 33	38.51	10.949	4 8	27.2		62.42	0.014 9923	1209.3	8.26	8.50	21 11.9
	28	11 38	1.37	10.955	3 43	23.1		62.92	0.017 8794	1196.7	8.20	8.44	21 12.4
	29	11 42	24.37	10.962	3 18	7.4		63.39	0.020 7366	1184.3	8.14	8.38	21 12.9
	30	11 46	47.53	10.969	2 52	40.7		63.83	0.023 5642	1172.1	8.09	8.33	21 13.3
	31	11 51	10.87	+10.977	+ 2 27	3.8		-64.24	0.026 3626	+1160.0	8.04	8.28	21 13.7
Nov.	1	11 55	34.41	10.985	2 1	17.2		64.63	0.029 1323	1148.2	7.99	8.23	21 14.2
	2	11 59	58.16	10.994	1 35	21.5		65.00	0.031 8738	1136.5	7.94	8.18	21 14.7
	3	12 4	22.14	11.004	1 9	17.5		65.33	0.034 5875	1125.0	7.89	8.13	21 15.2
	4	12 8	46.38	11.016	0 43	5.9		65.63	0.037 2739	1113.7	7.84	8.08	21 15.7
	5	12 13	10.91	+11.028	+ 0 16	47.3		-65.91	0.039 9332	+1102.5	7.79	8.03	21 16.1
	6	12 17	35.74	11.041	- 0 9	37.5		66.16	0.042 5657	1091.4	7.75	7.98	21 16.5
	7	12 22	0.90	11.056	0 36	8.0		66.38	0.045 1719	1080.5	7.70	7.93	21 17.0
	8	12 26	26.42	11.072	1 2	43.6		66.57	0.047 7520	1069.6	7.65	7.88	21 17.5
	9	12 30	52.34	11.089	1 29	23.4		66.73	0.050 3062	1058.9	7.61	7.83	21 18.0
	10	12 35	18.68	+11.107	- 1 56	6.7		-66.87	0.052 8348	+1048.3	7.57	7.79	21 18.5
	11	12 39	45.46	11.125	2 22	52.9		66.97	0.055 3379	1037.7	7.53	7.75	21 19.0
	12	12 44	12.70	11.145	2 49	41.2		67.04	0.057 8157	1027.1	7.48	7.70	21 19.5
	13	12 48	40.43	11.166	3 16	30.8		67.08	0.060 2682	1016.7	7.44	7.65	21 20.1
	14	12 53	8.69	11.189	3 43	21.1		67.10	0.062 6958	1006.3	7.40	7.61	21 20.7
	15	12 57	37.50	+11.213	- 4 10	11.3		-67.08	0.065 0985	+ 996.0	7.36	7.57	21 21.2
	16	13 2	6.90	+11.237	- 4 37	0.6		-67.03	0.067 4767	+ 985.8	7.32	7.53	21 21.7

GREENWICH MEAN TIME.

Date.	Apparent Right Ascension.			Var. per Hour.	Apparent Declination.			Var. per Hour.	Logarithm of Distance from Earth.	Var. per Hour.	Semi-diameter.	Hor. Paral- lax.	Transit of Meridian of Green- wich.		
	Noon.				Noon.										
	h	m	s	s	°	'	"	"					h	m	
Nov.	16	13	2	6.90	+11.237	-	4	37	0.6	-67.03	0.067 4767	+985.8	7.32	7.53	21 21.7
	17	13	6	36.90	11.263		5	3	48.2	66.94	0.069 8304	975.7	7.28	7.49	21 22.3
	18	13	11	7.53	11.290		5	30	33.5	66.82	0.072 1600	965.6	7.24	7.45	21 22.9
	19	13	15	38.81	11.318		5	57	15.6	66.67	0.074 4655	955.7	7.20	7.41	21 23.5
	20	13	20	10.78	11.347		6	23	53.7	66.49	0.076 7472	945.8	7.16	7.37	21 24.1
	21	13	24	43.46	+11.377	-	6	50	27.1	-66.28	0.079 0052	+935.9	7.13	7.33	21 24.7
	22	13	29	16.87	11.408		7	16	55.0	66.04	0.081 2396	926.2	7.09	7.29	21 25.3
	23	13	33	51.04	11.440		7	43	16.6	65.76	0.083 4508	916.5	7.05	7.25	21 25.9
	24	13	38	25.99	11.473		8	9	31.1	65.45	0.085 6389	907.0	7.01	7.21	21 26.6
	25	13	43	1.75	11.507		8	35	37.7	65.10	0.087 8042	897.5	6.98	7.18	21 27.3
Dec.	26	13	47	38.34	+11.542	-	9	1	35.6	-64.72	0.089 9471	+888.2	6.95	7.15	21 28.0
	27	13	52	15.78	11.578		9	27	24.0	64.31	0.092 0678	879.0	6.91	7.11	21 28.7
	28	13	56	54.10	11.615		9	53	2.1	63.86	0.094 1666	870.0	6.87	7.08	21 29.4
	29	14	1	33.32	11.653		10	18	29.1	63.38	0.096 2438	861.1	6.84	7.05	21 30.1
	30	14	6	13.46	11.692		10	43	44.4	62.87	0.098 2998	852.3	6.81	7.02	21 30.8
	1	14	10	54.55	+11.732	-	11	8	47.0	-62.33	0.100 3350	+842.7	6.78	6.99	21 31.6
	2	14	15	36.62	11.773		11	33	36.2	61.76	0.102 3496	835.2	6.75	6.95	21 32.4
	3	14	20	19.68	11.815		11	58	11.3	61.15	0.104 3438	826.7	6.72	6.92	21 33.1
	4	14	25	3.76	11.858		12	22	31.4	60.51	0.106 3179	818.4	6.69	6.89	21 33.9
	5	14	29	48.89	11.902		12	46	35.7	59.84	0.108 2722	810.2	6.66	6.86	21 34.8
	6	14	34	35.08	+11.947	-	13	10	23.5	-59.14	0.110 2070	+802.1	6.63	6.83	21 35.7
	7	14	39	22.36	11.993		13	33	54.0	58.40	0.112 1223	794.0	6.60	6.80	21 36.5
	8	14	44	10.75	12.040		13	57	6.4	57.63	0.114 0183	786.0	6.57	6.77	21 37.3
	9	14	49	0.26	12.087		14	19	59.9	56.82	0.115 8952	778.1	6.54	6.74	21 38.2
	10	14	53	50.92	12.135		14	42	33.7	55.98	0.117 7532	770.2	6.51	6.71	21 39.1
	11	14	58	42.74	+12.183	-	15	4	46.9	-55.11	0.119 5923	+763.4	6.49	6.68	21 40.1
	12	15	3	35.72	12.232		15	26	38.9	54.21	0.121 4126	754.6	6.46	6.65	21 41.1
	13	15	8	29.88	12.281		15	48	8.8	53.27	0.123 2143	746.8	6.43	6.62	21 42.0
	14	15	13	25.24	12.331		16	9	15.9	52.30	0.124 9975	739.2	6.40	6.59	21 43.0
	15	15	18	21.79	12.381		16	29	59.2	51.30	0.126 7623	731.5	6.38	6.57	21 44.0
	16	15	23	19.54	+12.431	-	16	50	18.1	-50.27	0.128 5088	+723.9	6.36	6.55	21 45.0
	17	15	28	18.49	12.481		17	10	11.7	49.20	0.130 2370	716.3	6.33	6.52	21 46.1
	18	15	33	18.64	12.531		17	29	39.3	48.10	0.131 9471	708.8	6.30	6.49	21 47.2
	19	15	38	19.99	12.581		17	48	40.1	46.97	0.133 6391	701.3	6.28	6.46	21 48.3
	20	15	43	22.53	12.631		18	7	13.3	45.80	0.135 3132	693.8	6.26	6.44	21 49.4
	21	15	48	26.26	+12.680	-	18	25	18.2	-44.60	0.136 9694	+686.4	6.24	6.42	21 50.6
	22	15	53	31.17	12.729		18	42	54.0	43.37	0.138 6079	679.0	6.21	6.39	21 51.8
	23	15	58	37.23	12.777		19	0	0.0	42.12	0.140 2288	671.8	6.18	6.36	21 52.9
	24	16	3	44.44	12.824		19	16	35.5	40.83	0.141 8323	664.5	6.16	6.34	21 54.1
	25	16	8	52.78	12.870		19	32	39.7	39.51	0.143 4186	657.4	6.14	6.32	21 55.3
	26	16	14	2.22	+12.916	-	19	48	12.0	-38.17	0.144 9879	+650.3	6.12	6.30	21 56.5
	27	16	19	12.74	12.961		20	3	11.7	36.80	0.146 5403	643.4	6.09	6.27	21 57.8
28	16	24	24.33	13.006		20	17	38.2	35.40	0.148 0762	636.6	6.07	6.25	21 59.1	
29	16	29	36.95	13.047		20	31	30.7	33.98	0.149 5957	629.8	6.05	6.23	22 0.4	
30	16	34	50.58	13.088		20	44	48.8	32.53	0.151 0992	623.1	6.03	6.21	22 1.7	
31	16	40	5.19	+13.128	-	20	57	31.8	-31.05	0.152 5868	+616.6	6.01	6.19	22 3.0	
32	16	45	20.74	+13.167	-	21	9	39.0	-29.55	0.154 0588	+610.2	5.99	6.17	22 4.3	

FOR GREENWICH MEAN NOON.

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		" ' "	" ' "	" "	" ' "	" "		
Jan.	1	345 23 20.2	1 35 14.4	+0 3.4	-3 23 37.3	-0 3.2	9.861 7336	-473
	3	348 33 51.5	1 35 16.9	-0 16.6	3 23 24.9	+0 15.6	9.861 6353	509
	5	351 44 28.0	1 35 19.5	0 36.5	3 22 35.1	0 34.3	9.861 5300	544
	7	354 55 9.8	1 35 22.2	0 55.9	3 21 7.9	0 52.9	9.861 4178	577
	9	358 5 57.0	1 35 25.0	1 14.6	3 19 3.6	1 11.4	9.861 2992	609
	11	1 16 49.7	1 35 27.8	-1 32.4	-3 16 22.6	+1 20.7	9.861 1744	-639
	13	4 27 48.0	1 35 30.6	1 49.1	3 13 5.2	1 47.7	9.861 0438	666
	15	7 38 52.0	1 35 33.4	2 4.4	3 9 12.0	2 5.4	9.860 9079	692
	17	10 50 1.7	1 35 36.3	2 18.2	3 4 43.6	2 22.8	9.860 7671	715
	19	14 1 17.3	1 35 39.3	2 30.3	2 59 40.8	2 39.8	9.860 6218	737
	21	17 12 38.8	1 35 42.3	-2 40.6	-2 54 4.5	+2 56.4	9.860 4723	-757
	23	20 24 6.3	1 35 45.3	2 48.9	2 47 55.6	3 12.4	9.860 3192	774
	25	23 35 39.9	1 35 48.4	2 55.1	2 41 15.2	3 27.9	9.860 1630	788
	27	26 47 19.8	1 35 51.5	2 59.1	2 34 4.5	3 42.7	9.860 0041	800
	29	29 59 5.9	1 35 54.6	3 0.9	2 26 24.8	3 56.9	9.859 8430	810
	31	33 10 58.2	1 35 57.8	-3 0.5	-2 18 17.5	+4 10.4	9.859 6802	-817
Feb.	2	36 22 57.0	1 36 1.0	2 57.8	2 9 43.9	4 23.1	9.859 5163	822
	4	39 35 2.3	1 36 4.3	2 52.9	2 0 45.7	4 35.0	9.859 3516	824
	6	42 47 14.2	1 36 7.6	2 45.8	1 51 24.4	4 46.1	9.859 1867	824
	8	45 59 32.7	1 36 10.9	2 36.6	1 41 41.8	4 56.3	9.859 0222	821
	10	49 11 58.0	1 36 14.3	-2 25.5	-1 31 39.7	+5 5.6	9.858 8586	-815
	12	52 24 30.2	1 36 17.8	2 12.5	1 21 19.9	5 14.0	9.858 6963	807
	14	55 37 9.3	1 36 21.3	1 57.9	1 10 44.3	5 21.4	9.858 5359	796
	16	58 49 55.3	1 36 24.8	1 41.8	0 59 55.0	5 27.8	9.858 3779	783
	18	62 2 48.4	1 36 28.3	1 24.4	0 48 53.9	5 33.2	9.858 2227	766
	20	65 15 48.7	1 36 31.9	-1 5.9	-0 37 43.0	+5 37.5	9.858 0710	-749
	22	68 28 56.1	1 36 35.5	0 46.5	0 26 24.6	5 40.7	9.857 9232	729
	24	71 42 10.7	1 36 39.1	0 26.6	0 15 0.7	5 42.9	9.857 7796	706
	26	74 55 32.5	1 36 42.7	-0 6.3	-0 3 33.5	5 44.1	9.857 6408	681
	28	78 9 1.5	1 36 46.3	+0 14.1	+0 7 54.9	5 44.1	9.857 5074	653
Mar.	1	81 22 37.7	1 36 49.9	+0 34.3	+0 19 22.1	+5 42.9	9.857 3797	-624
	3	84 36 20.9	1 36 53.4	0 54.1	0 30 46.0	5 40.7	9.857 2580	593
	5	87 50 11.2	1 36 56.9	1 13.2	0 42 4.4	5 37.5	9.857 1428	559
	7	91 4 8.4	1 37 0.3	1 31.4	0 53 15.2	5 33.1	9.857 0345	524
	9	94 18 12.4	1 37 3.6	1 48.4	1 4 16.1	5 27.6	9.856 9334	487
	11	97 32 23.0	1 37 6.9	+2 4.1	+1 15 5.0	+5 21.1	9.856 8398	-449
	13	100 46 40.0	1 37 10.0	2 18.1	1 25 39.8	5 13.5	9.856 7541	408
	15	104 1 3.1	1 37 13.0	2 30.5	1 35 58.4	5 4.9	9.856 6766	367
	17	107 15 32.1	1 37 15.9	2 40.9	1 45 58.8	4 55.3	9.856 6075	324
	19	110 30 6.6	1 37 18.6	2 49.2	1 55 39.1	4 44.8	9.856 5470	281
	21	113 44 46.3	1 37 21.1	+2 55.4	+2 4 57.3	+4 33.3	9.856 4953	-236
	23	116 59 30.9	1 37 23.4	2 59.4	2 13 51.6	4 20.9	9.856 4526	191
	25	120 14 19.8	1 37 25.4	3 1.0	2 22 20.2	4 7.6	9.856 4191	145
	27	123 29 12.5	1 37 27.2	3 0.3	2 30 21.5	3 53.3	9.856 3948	98
	29	126 44 8.6	1 37 28.8	2 57.3	2 37 53.9	3 38.7	9.856 3798	52
	31	129 59 7.6	1 37 30.1	+2 52.0	+2 44 55.9	+3 23.2	9.856 3742	- 4
Apr.	2	133 14 8.8	1 37 31.0	+2 44.5	+2 51 26.1	+3 6.9	9.856 3781	+ 43

FOR GREENWICH MEAN NOON.

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		° ' "	° ' "	' "	° ' "	' "		
Apr.	2	133 14 8.8	1 37 31.0	+2 44.5	+2 51 26.1	+3 6.9	9.856 3781	+ 43
	4	136 29 11.6	1 37 31.7	2 34.9	2 57 23.2	2 50.1	9.856 3914	90
	6	139 44 15.5	1 37 32.1	2 23.3	3 2 46.1	2 32.7	9.856 4140	136
	8	142 59 19.8	1 37 32.1	2 9.9	3 7 33.8	2 14.9	9.856 4459	182
	10	146 14 23.8	1 37 31.8	1 54.8	3 11 45.3	1 56.5	9.856 4869	228
	12	149 29 26.8	1 37 31.1	+1 38.2	+3 15 19.7	+1 37.8	9.856 5370	+273
	14	152 44 28.1	1 37 30.1	1 20.4	3 18 16.5	1 18.9	9.856 5959	317
	16	155 59 27.1	1 37 28.7	1 1.5	3 20 35.1	0 59.6	9.856 6636	360
	18	159 14 23.0	1 37 27.0	0 41.8	3 22 15.0	0 40.2	9.856 7397	401
	20	162 29 15.1	1 37 24.9	0 21.7	3 23 15.9	0 20.7	9.856 8240	442
	22	165 44 2.7	1 37 22.5	+0 1.3	+3 23 37.8	+0 1.2	9.856 9163	+481
	24	168 58 45.2	1 37 19.8	-0 19.2	3 23 20.6	-0 18.4	9.857 0162	518
	26	172 13 21.8	1 37 16.8	0 39.4	3 22 24.4	0 37.8	9.857 1234	553
	28	175 27 52.0	1 37 13.4	0 59.1	3 20 49.4	0 57.1	9.857 2375	587
May	30	178 42 15.2	1 37 9.7	1 18.0	3 18 36.0	1 16.2	9.857 3582	619
	2	181 56 30.7	1 37 5.7	-1 35.9	+3 15 44.8	-1 34.9	9.857 4851	+649
	4	185 10 38.0	1 37 1.5	1 52.6	3 12 16.3	1 53.4	9.857 6178	677
	6	188 24 36.6	1 36 57.1	2 7.8	3 8 11.2	2 11.5	9.857 7559	703
	8	191 38 26.1	1 36 52.4	2 21.4	3 3 30.4	2 29.1	9.857 8988	726
	10	194 52 6.0	1 36 47.5	2 33.2	2 58 15.0	2 46.2	9.858 0462	747
	12	198 5 36.0	1 36 42.4	-2 43.1	+2 52 26.0	-3 2.7	9.858 1976	+766
	14	201 18 55.7	1 36 37.2	2 50.9	2 46 4.6	3 18.6	9.858 3524	782
	16	204 32 4.9	1 36 31.9	2 56.5	2 39 12.0	3 33.9	9.858 5102	796
	18	207 45 3.4	1 36 26.5	2 59.9	2 31 49.6	3 48.4	9.858 6705	807
	20	210 57 51.1	1 36 21.1	3 1.0	2 23 58.9	4 2.1	9.858 8328	816
	22	214 10 27.8	1 36 15.6	-2 59.9	+2 15 41.5	-4 15.1	9.858 9966	+822
	24	217 22 53.5	1 36 10.1	2 56.5	2 6 59.0	4 27.2	9.859 1613	825
	26	220 35 8.2	1 36 4.6	2 50.9	1 57 53.1	4 38.5	9.859 3284	826
June	28	223 47 12.1	1 35 59.2	2 43.2	1 48 25.5	4 48.9	9.859 4915	824
	30	226 59 5.2	1 35 53.9	2 33.4	1 38 38.1	4 58.4	9.859 6560	820
	1	230 10 47.7	1 35 48.6	-2 21.7	+1 28 32.7	-5 6.9	9.859 8193	+813
	3	233 22 19.8	1 35 43.5	2 8.3	1 18 11.3	5 14.4	9.859 9810	804
	5	236 33 41.8	1 35 38.5	1 53.3	1 7 35.8	5 20.9	9.860 1407	792
	7	239 44 54.0	1 35 33.7	1 37.0	0 56 48.3	5 26.4	9.860 2978	778
	9	242 55 56.8	1 35 29.1	1 19.4	0 45 50.7	5 31.0	9.860 4517	761
	11	246 6 50.6	1 35 24.7	-1 0.9	+0 34 45.0	-5 34.5	9.860 6021	+742
	13	249 17 35.9	1 35 20.6	0 41.6	0 23 33.4	5 37.0	9.860 7485	721
	15	252 28 13.1	1 35 16.7	0 21.8	0 12 17.9	5 38.4	9.860 8905	698
	17	255 38 42.6	1 35 13.0	-0 1.8	+0 1 0.5	5 38.8	9.861 0276	672
	19	258 49 5.1	1 35 9.6	+0 18.2	-0 10 16.6	5 38.2	9.861 1593	645
	21	261 59 21.0	1 35 6.5	+0 38.0	-0 21 31.4	-5 36.5	9.861 2854	+616
	23	265 9 30.9	1 35 3.6	0 57.4	0 32 41.9	5 33.8	9.861 4055	585
July	25	268 19 35.3	1 35 1.0	1 16.0	0 43 46.0	5 30.1	9.861 5191	551
	27	271 29 34.9	1 34 58.7	1 33.7	0 54 41.8	5 25.4	9.861 6259	517
	29	274 39 30.2	1 34 56.7	1 50.2	1 5 27.3	5 19.8	9.861 7257	481
	1	277 49 21.8	1 34 55.0	+2 5.4	-1 16 0.5	-5 13.2	9.861 8181	+443
	3	280 59 10.3	1 34 53.6	+2 19.0	-1 26 19.5	-5 5.6	9.861 9028	+404

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		° ' "	° ' "	' "	° ' "	' "		
July	1	277 49 21.8	1 34 55.0	+2 5.4	-1 16 0.5	-5 13.2	9.861 8181	+443
	3	280 59 10.3	1 34 53.6	2 19.0	1 26 19.5	5 5.6	9.861 9028	404
	5	284 8 56.3	1 34 52.5	2 30.9	1 36 22.5	4 57.2	9.861 9796	364
	7	287 18 40.3	1 34 51.6	2 41.0	1 46 7.8	4 47.9	9.862 0483	323
	9	290 28 22.8	1 34 51.0	2 49.2	1 55 33.5	4 37.7	9.862 1087	281
	11	293 38 4.4	1 34 50.7	+2 55.2	-2 4 37.9	-4 26.6	9.862 1605	+333
	13	296 47 45.7	1 34 50.7	2 59.2	2 13 19.5	4 14.8	9.862 2037	194
	15	299 57 27.2	1 34 50.9	3 0.9	2 21 36.7	4 2.2	9.862 2381	150
	17	303 7 9.3	1 34 51.3	3 0.5	2 29 28.0	3 48.9	9.862 2636	105
	19	306 16 52.4	1 34 51.9	2 57.8	2 36 51.9	3 34.9	9.862 2801	60
	21	309 26 37.1	1 34 52.8	+2 53.0	-2 43 47.2	-3 20.3	9.862 2876	+ 15
	23	312 36 23.7	1 34 53.9	2 46.1	2 50 12.6	3 5.1	9.862 2860	- 30
	25	315 46 12.7	1 34 55.2	2 37.2	2 56 7.0	2 49.3	9.862 2754	76
	27	318 56 4.4	1 34 56.6	2 26.4	3 1 29.2	2 32.9	9.862 2557	121
	29	322 5 59.1	1 34 58.2	2 13.7	3 6 18.3	2 16.1	9.862 2271	165
	31	325 15 57.2	1 35 0.0	+1 59.5	-3 10 33.4	-1 58.9	9.862 1896	-209
Aug.	2	328 25 59.0	1 35 1.9	1 43.7	3 14 13.7	1 41.3	9.862 1434	253
	4	331 36 4.7	1 35 3.9	1 26.7	3 17 18.5	1 23.4	9.862 0885	296
	6	334 46 14.5	1 35 6.0	1 8.7	3 19 47.2	1 5.2	9.862 0252	339
	8	337 56 28.7	1 35 8.2	0 49.8	3 21 39.4	0 46.8	9.861 9535	379
	10	341 6 47.5	1 35 10.6	+0 30.3	-3 22 54.7	-0 28.3	9.861 8737	-418
	12	344 17 11.1	1 35 13.0	+0 10.4	3 23 32.7	-0 9.7	9.861 7862	457
	14	347 27 39.6	1 35 15.5	-0 9.7	3 23 33.3	+0 9.0	9.861 6910	494
	16	350 38 13.2	1 35 18.1	0 29.6	3 22 56.5	0 27.7	9.861 5885	530
	18	353 48 52.0	1 35 20.7	0 49.2	3 21 42.4	0 46.4	9.861 4790	564
	20	356 59 36.2	1 35 23.4	-1 8.1	-3 19 51.1	+1 4.9	9.861 3629	-596
	22	0 10 25.8	1 35 26.2	1 26.3	3 17 22.8	1 23.3	9.861 2405	637
	24	3 21 20.9	1 35 29.0	1 43.4	3 14 18.1	1 41.4	9.861 1121	656
	26	6 32 21.7	1 35 31.8	1 59.2	3 10 37.4	1 59.2	9.860 9781	683
	28	9 43 28.3	1 35 34.7	2 13.6	3 6 21.3	2 16.8	9.860 8390	707
Sept.	30	12 54 40.7	1 35 37.6	-2 26.3	-3 1 30.4	+2 34.0	9.860 6952	-730
	1	16 5 59.0	1 35 40.6	2 37.2	2 56 5.7	2 50.7	9.860 5470	751
	3	19 17 23.3	1 35 43.6	2 46.2	2 50 8.1	3 6.8	9.860 3950	769
	5	22 28 53.6	1 35 46.7	2 53.2	2 43 38.7	3 22.4	9.860 2396	785
	7	25 40 30.1	1 35 49.8	2 58.0	2 36 38.6	3 37.5	9.860 0813	798
	9	28 52 12.8	1 35 52.9	-3 0.6	-2 29 9.0	+3 51.9	9.859 9206	-809
	11	32 4 1.9	1 35 56.1	3 0.9	2 21 11.2	4 5.7	9.859 7579	817
	13	35 15 57.4	1 35 59.4	2 59.0	2 12 46.7	4 18.7	9.859 5938	823
	15	38 27 59.4	1 36 2.7	2 54.8	2 3 57.0	4 30.9	9.859 4288	827
	17	41 40 8.0	1 36 6.0	2 48.5	1 54 43.6	4 42.3	9.859 2633	827
	19	44 52 23.2	1 36 9.3	-2 40.1	-1 45 8.4	+4 52.8	9.859 0980	-825
	21	48 4 45.2	1 36 12.7	2 29.6	1 35 13.0	5 2.5	9.858 9333	821
	23	51 17 14.0	1 36 16.1	2 17.3	1 24 59.2	5 11.2	9.858 7698	814
	25	54 29 49.8	1 36 19.6	2 3.2	1 14 29.0	5 18.9	9.858 6079	804
Oct.	27	57 42 32.6	1 36 23.1	1 47.6	1 3 44.3	5 25.7	9.858 4482	792
	29	60 55 22.5	1 36 26.7	-1 30.7	-0 52 47.1	+5 31.4	9.858 2912	-777
	1	64 8 19.5	1 36 30.3	-1 12.5	-0 41 39.5	+5 36.0	9.858 1373	-760

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		" ' "	" ' "	" ' "	" ' "	" ' "		
Oct.	1	64 8 19.5	1 36 30.3	-1 12.5	-0 41 39.5	+5 36.0	9.858 1373	-780
	3	67 21 23.7	1 36 33.9	0 53.4	0 30 23.6	5 39.7	9.857 9871	741
	5	70 34 35.1	1 36 37.5	0 33.7	0 19 1.4	5 42.3	9.857 8411	719
	7	73 47 53.8	1 36 41.2	-0 13.5	-0 7 35.1	5 43.8	9.857 6997	695
	9	77 1 19.8	1 36 44.8	+0 6.9	+0 3 53.1	5 44.2	9.857 5633	669
	11	80 14 53.0	1 36 48.4	+0 27.2	+0 15 20.9	+5 43.5	9.857 4324	-640
	13	83 28 33.3	1 36 52.0	0 47.2	0 26 46.2	5 41.6	9.857 3075	609
	15	86 42 20.8	1 36 55.5	1 6.6	0 38 6.7	5 38.7	9.857 1889	577
	17	89 56 15.3	1 36 59.0	1 25.1	0 49 20.4	5 34.8	9.857 0770	542
	19	93 10 16.7	1 37 2.4	1 42.6	1 0 25.0	5 29.7	9.856 9722	505
	21	96 24 24.8	1 37 5.7	+1 58.7	+1 11 18.4	+5 23.5	9.856 8749	-467
	23	99 38 39.4	1 37 8.9	2 13.4	1 21 58.4	5 16.3	9.856 7853	428
	25	102 53 0.3	1 37 12.0	2 26.4	1 32 22.9	5 8.0	9.856 7037	387
	27	106 7 27.3	1 37 14.9	2 37.5	1 42 29.9	4 58.8	9.856 6305	345
	29	109 22 0.0	1 37 17.7	2 46.5	1 52 17.5	4 48.6	9.856 5657	302
	31	112 36 38.1	1 37 20.3	+2 53.5	+2 1 43.6	+4 37.4	9.856 5098	-257
Nov.	2	115 51 21.1	1 37 22.7	2 58.2	2 10 46.5	4 25.3	9.856 4628	212
	4	119 6 8.7	1 37 24.9	3 0.7	2 19 24.4	4 12.4	9.856 4249	166
	6	122 21 0.5	1 37 26.8	3 0.8	2 27 35.5	3 58.6	9.856 3963	120
	8	125 35 55.9	1 37 28.5	2 58.6	2 35 18.2	3 44.0	9.856 3770	72
	10	128 50 54.3	1 37 29.9	+2 54.1	+2 42 31.0	+3 28.7	9.856 3671	-26
	12	132 5 55.2	1 37 31.0	2 47.4	2 49 12.6	3 12.7	9.856 3666	+21
	14	135 20 58.1	1 37 31.8	2 38.5	2 55 21.5	2 56.1	9.856 3755	68
	16	138 36 2.3	1 37 32.3	2 27.6	3 0 56.6	2 38.9	9.856 3938	115
	18	141 51 7.1	1 37 32.4	2 14.8	3 5 56.7	2 21.2	9.856 4215	162
	20	145 6 11.9	1 37 32.2	+2 0.2	+3 10 21.0	+2 3.0	9.856 4584	+208
	22	148 21 16.0	1 37 31.7	1 44.2	3 14 8.6	1 44.4	9.856 5045	253
	24	151 36 18.8	1 37 30.9	1 26.7	3 17 18.7	1 25.5	9.856 5595	297
	26	154 51 19.5	1 37 29.7	1 8.2	3 19 50.7	1 6.4	9.856 6233	341
	28	158 6 17.4	1 37 28.1	0 48.8	3 21 44.2	0 47.1	9.856 6957	383
	30	161 21 11.8	1 37 26.2	+0 28.8	+3 22 58.9	+0 27.6	9.856 7765	+424
Dec.	2	164 36 2.0	1 37 23.9	+0 8.4	3 23 34.5	+0 8.0	9.856 8653	464
	4	167 50 47.3	1 37 21.3	-0 12.1	3 23 31.0	-0 11.5	9.856 9619	502
	6	171 5 27.0	1 37 18.4	0 32.4	3 22 48.4	0 31.0	9.857 0660	539
	8	174 20 0.6	1 37 15.1	0 52.3	3 21 27.0	0 50.3	9.857 1772	573
	10	177 34 27.3	1 37 11.5	-1 11.5	+3 19 27.1	-1 9.5	9.857 2952	+606
	12	180 48 46.6	1 37 7.7	1 29.8	3 16 49.0	1 28.5	9.857 4196	637
	14	184 2 57.9	1 37 3.6	1 46.9	3 13 33.4	1 47.1	9.857 5500	666
	16	187 17 0.7	1 36 59.2	2 2.7	3 9 41.0	2 5.3	9.857 6859	693
	18	190 30 54.6	1 36 54.6	2 16.9	3 5 12.6	2 28.0	9.857 8270	717
	20	193 44 39.0	1 36 49.8	-2 29.3	+3 0 9.2	-2 40.3	9.857 9727	+739
	22	196 58 13.6	1 36 44.8	2 39.9	2 54 31.8	2 57.0	9.858 1226	759
	24	200 11 38.1	1 36 39.6	2 48.4	2 48 21.5	3 13.1	9.858 2762	777
	26	203 24 52.2	1 36 34.4	2 54.8	2 41 39.6	3 28.6	9.858 4331	792
	28	206 37 55.6	1 36 29.0	2 59.0	2 34 27.5	3 43.4	9.858 5927	801
	30	209 50 48.2	1 36 23.6	-3 0.9	+2 26 46.5	-3 57.4	9.858 7545	+814
	32	213 3 29.8	1 36 18.1	-3 0.5	+2 18 38.2	-4 10.7	9.858 9181	+821

GREENWICH MEAN TIME.

Date.	Apparent Right Ascension.			Var. per Hour.	Apparent Declination.			Var. per Hour.	Logarithm of Distance from Earth.	Var. per Hour.	Semi-diameter.	Hor. Paral- lax.	Transit, Meridian of Green- wich.
	Noon.			Noon.	Noon.			Noon.	Noon.	Noon.	Noon.	Noon.	
	h	m	s	s	°	'	"	"			"	"	h m
Jan.	1	10 12 48.01	+0.073	+14 50 16.4	+ 5.86	9.916 9873	-1501.2	6.11	10.65	15 31.0			
	2	10 12 48.23	-0.054	14 52 45.3	6.55	9.913 3960	1491.4	6.16	10.74	15 27.0			
	3	10 12 45.41	0.182	14 55 30.9	7.25	9.909 8299	1480.2	6.22	10.83	15 23.0			
	4	10 12 39.50	0.311	14 58 33.3	7.95	9.906 2920	1467.7	6.27	10.92	15 18.9			
	5	10 12 30.48	0.441	15 1 52.3	8.64	9.902 7859	1453.8	6.32	11.00	15 14.8			
	6	10 12 18.32	-0.572	+15 5 28.0	+ 9.33	9.899 3150	-1438.4	6.37	11.09	15 10.7			
	7	10 12 3.01	0.704	15 9 20.1	10.01	9.895 8828	1421.5	6.42	11.18	15 6.4			
	8	10 11 44.53	0.836	15 13 28.7	10.70	9.892 4931	1403.1	6.47	11.27	15 2.2			
	9	10 11 22.87	0.969	15 17 53.4	11.37	9.889 1493	1383.2	6.51	11.35	14 57.9			
	10	10 10 58.03	1.101	15 22 34.2	12.03	9.885 8550	1361.8	6.57	11.44	14 53.5			
	11	10 10 30.00	-1.234	+15 27 30.7	+12.68	9.882 6139	-1338.8	6.62	11.53	14 49.0			
	12	10 9 58.78	1.367	15 32 42.7	13.32	9.879 4298	1314.3	6.67	11.62	14 44.6			
	13	10 9 24.39	1.499	15 38 9.8	13.94	9.876 3064	1288.2	6.72	11.70	14 40.0			
	14	10 8 46.82	1.631	15 43 51.6	14.55	9.873 2477	1260.5	6.76	11.78	14 35.5			
	15	10 8 6.09	1.763	15 49 47.8	15.14	9.870 2575	1231.1	6.81	11.86	14 30.8			
	16	10 7 22.22	-1.893	+15 55 57.9	+15.70	9.867 3397	-1200.1	6.86	11.95	14 26.1			
	17	10 6 35.24	2.022	16 2 21.4	16.25	9.864 4984	1167.4	6.91	12.03	14 21.4			
	18	10 5 45.17	2.150	16 8 57.9	16.78	9.861 7376	1133.0	6.95	12.11	14 16.6			
	19	10 4 52.04	2.277	16 15 46.7	17.28	9.859 0615	1096.9	6.99	12.18	14 11.8			
	20	10 3 55.90	2.401	16 22 47.3	17.76	9.856 4740	1059.1	7.03	12.25	14 6.9			
	21	10 2 56.79	-2.524	+16 29 59.1	+18.21	9.853 9793	-1019.6	7.07	12.32	14 1.9			
	22	10 1 54.78	2.644	16 37 21.4	18.64	9.851 5815	978.4	7.11	12.39	13 56.9			
	23	10 0 49.91	2.761	16 44 53.4	19.02	9.849 2846	935.5	7.15	12.46	13 51.9			
	24	9 59 42.26	2.876	16 52 34.4	19.38	9.847 0925	890.9	7.19	12.52	13 46.8			
	25	9 58 31.91	2.986	17 0 23.6	19.71	9.845 0095	844.6	7.22	12.58	13 41.7			
	26	9 57 18.94	-3.093	+17 8 20.2	+20.00	9.843 0396	- 796.7	7.25	12.64	13 36.5			
	27	9 56 3.44	3.197	17 16 23.1	20.24	9.841 1866	747.2	7.28	12.69	13 31.3			
	28	9 54 45.51	3.296	17 24 31.5	20.45	9.839 4544	696.0	7.31	12.74	13 26.1			
	29	9 53 25.27	3.390	17 32 44.4	20.62	9.837 8468	643.4	7.34	12.79	13 20.8			
	30	9 52 2.84	3.479	17 41 0.8	20.74	9.836 3672	589.4	7.36	12.83	13 15.5			
	31	9 50 38.35	-3.561	+17 49 19.5	+20.82	9.835 0189	- 534.0	7.39	12.87	13 10.1			
Feb.	1	9 49 11.95	3.638	17 57 39.6	20.85	9.833 8051	477.3	7.41	12.91	13 4.8			
	2	9 47 43.79	3.708	18 5 59.8	20.83	9.832 7287	419.5	7.43	12.94	12 59.3			
	3	9 46 14.03	3.771	18 14 19.1	20.77	9.831 7921	360.8	7.44	12.97	12 53.9			
	4	9 44 42.85	3.827	18 22 36.3	20.66	9.830 9974	301.2	7.46	12.99	12 48.5			
	5	9 43 10.41	-3.875	+18 30 50.3	+20.50	9.830 3470	- 240.8	7.47	13.01	12 43.0			
	6	9 41 36.90	3.916	18 39 0.0	20.30	9.829 8418	180.1	7.48	13.03	12 37.5			
	7	9 40 2.50	3.949	18 47 4.2	20.05	9.829 4829	119.0	7.48	13.03	12 32.0			
	8	9 38 27.40	3.974	18 55 2.0	19.76	9.829 2709	- 57.6	7.48	13.03	12 26.5			
	9	9 36 51.79	3.992	19 2 52.2	19.42	9.829 2063	+ 3.8	7.48	13.04	12 21.0			
	10	9 35 15.85	-4.001	+19 10 34.0	+19.05	9.829 2889	+ 65.1	7.48	13.04	12 15.5			
	11	9 33 39.78	4.003	19 18 6.3	18.64	9.829 5185	126.2	7.48	13.03	12 9.9			
	12	9 32 3.76	3.997	19 25 28.4	18.20	9.829 8944	187.0	7.47	13.02	12 4.4			
	13	9 30 27.99	3.983	19 32 39.4	17.72	9.830 4157	247.3	7.47	13.01	11 58.9			
	14	9 28 52.64	3.961	19 39 38.6	17.21	9.831 0809	307.0	7.46	12.99	11 53.4			
	15	9 27 17.90	-3.932	+19 46 25.3	+16.67	9.831 8885	+ 365.9	7.44	12.96	11 47.9			
	16	9 25 43.94	-3.896	+19 52 58.8	+16.11	9.832 8367	+ 424.1	7.42	12.93	11 42.4			

GREENWICH MEAN TIME.

Date.	Apparent Right Ascension.			Var. per Hour.	Apparent Declination.			Var. per Hour.	Logarithm of Distance from Earth.	Var. per Hour.	Semi-diameter.	Hor. Parallax.	Transit, Meridian of Greenwich.	
	Noon.			Noon.	Noon.			Noon.	Noon.	Noon.	Noon.	Noon.		
	h	m	s	s	°	'	"	"			"	"	h	m
Feb.	16	9 25	43.94	-3.896	+19 52	58.8		+16.11	9.832 8367	+ 424.1	7.42	12.93	11 42.4	
	17	9 24	10.94	3.853	19 59	18.6		15.53	9.833 9234	481.3	7.40	12.90	11 37.0	
	18	9 22	39.07	3.802	20 5	24.1		14.92	9.835 1462	537.5	7.38	12.86	11 31.5	
	19	9 21	8.50	3.745	20 11	14.8		14.30	9.836 5027	592.7	7.36	12.82	11 26.1	
	20	9 19	39.38	3.681	20 16	50.3		13.66	9.837 9901	646.6	7.33	12.78	11 20.7	
	21	9 18	11.87	-3.611	+20 22	10.2		+13.00	9.839 6056	+ 699.4	7.31	12.74	11 15.3	
	22	9 16	46.12	3.535	20 27	14.2		12.33	9.841 3460	750.8	7.28	12.69	11 10.0	
	23	9 15	22.26	3.452	20 32	2.0		11.65	9.843 2083	800.9	7.25	12.63	11 4.7	
	24	9 14	0.44	3.365	20 36	33.4		10.97	9.845 1891	849.5	7.22	12.57	10 59.4	
	25	9 12	40.78	3.272	20 40	48.3		10.27	9.847 2848	896.7	7.18	12.51	10 54.2	
Mar.	26	9 11	23.41	-3.174	+20 44	46.5		+ 9.57	9.849 4920	+ 942.4	7.14	12.45	10 49.0	
	27	9 10	8.45	3.072	20 48	27.9		8.87	9.851 8069	986.5	7.10	12.38	10 43.8	
	28	9 8	56.01	2.964	20 51	52.4		8.17	9.854 2258	1029.0	7.06	12.31	10 38.7	
	29	9 7	46.19	2.853	20 55	0.0		7.46	9.856 7450	1069.9	7.02	12.24	10 33.7	
	1	9 6	39.10	2.737	20 57	50.7		6.76	9.859 3601	1109.0	6.98	12.17	10 28.6	
	2	9 5	34.83	-2.618	+21 0	24.4		+ 6.05	9.862 0670	+1146.4	6.94	12.10	10 23.7	
	3	9 4	33.47	2.495	21 2	41.3		5.35	9.864 8614	1182.0	6.90	12.02	10 18.7	
	4	9 3	35.08	2.370	21 4	41.4		4.66	9.867 7391	1215.7	6.85	11.94	10 13.9	
	5	9 2	39.74	2.242	21 6	24.9		3.97	9.870 6956	1247.7	6.80	11.85	10 9.0	
	6	9 1	47.48	2.112	21 7	52.0		3.29	9.873 7266	1277.8	6.75	11.77	10 4.3	
	7	9 0	58.37	-1.980	+21 9	2.8		+ 2.62	9.876 8278	+1306.1	6.70	11.68	9 59.5	
	8	9 0	12.44	1.847	21 9	57.7		1.96	9.879 9947	1332.7	6.66	11.60	9 54.9	
	9	8 59	29.71	1.714	21 10	36.9		1.31	9.883 2233	1357.5	6.61	11.51	9 50.2	
	10	8 58	50.20	1.579	21 11	0.7		0.67	9.886 5095	1380.7	6.56	11.43	9 45.7	
	11	8 58	13.93	1.444	21 11	9.2		+ 0.04	9.889 8492	1402.1	6.51	11.34	9 41.2	
	12	8 57	40.90	-1.309	+21 11	2.9		- 0.57	9.893 2385	+1422.0	6.46	11.25	9 36.7	
	13	8 57	11.10	1.174	21 10	42.1		1.17	9.896 6735	1440.3	6.41	11.16	9 32.3	
	14	8 56	44.54	1.040	21 10	7.0		1.76	9.900 1506	1457.1	6.35	11.07	9 28.0	
	15	8 56	21.19	0.906	21 9	17.9		2.33	9.903 6663	1472.4	6.30	10.98	9 23.7	
	16	8 56	1.04	0.773	21 8	15.2		2.89	9.907 2170	1486.3	6.25	10.90	9 19.4	
	17	8 55	44.06	-0.642	+21 6	59.1		- 3.44	9.910 7995	+1498.9	6.20	10.81	9 15.2	
	18	8 55	30.23	0.511	21 5	30.0		3.98	9.914 4109	1510.3	6.15	10.72	9 11.1	
	19	8 55	19.51	0.382	21 3	48.2		4.50	9.918 0480	1520.5	6.10	10.63	9 7.0	
	20	8 55	11.88	0.254	21 1	54.0		5.01	9.921 7082	1529.5	6.05	10.54	9 3.0	
	21	8 55	7.29	0.128	20 59	47.6		5.52	9.925 3889	1537.5	6.00	10.45	8 59.0	
	22	8 55	5.71	-0.004	+20 57	29.3		- 6.01	9.929 0875	+1544.5	5.95	10.36	8 55.0	
23	8 55	7.11	+0.120	20 54	59.4		6.49	9.932 8016	1550.5	5.90	10.27	8 51.1		
24	8 55	11.44	0.241	20 52	18.1		6.96	9.936 5290	1555.5	5.85	10.19	8 47.3		
25	8 55	18.66	0.361	20 49	25.6		7.42	9.940 2675	1559.7	5.80	10.10	8 43.5		
26	8 55	28.74	0.479	20 46	22.1		7.87	9.944 0150	1563.0	5.75	10.02	8 39.7		
27	8 55	41.62	+0.595	+20 43	7.8		- 8.32	9.947 7694	+1565.5	5.70	9.93	8 36.0		
28	8 55	57.28	0.710	20 39	42.8		8.76	9.951 5290	1567.2	5.65	9.84	8 32.4		
29	8 56	15.68	0.823	20 36	7.2		9.20	9.955 2916	1568.1	5.60	9.76	8 28.8		
30	8 56	36.76	0.934	20 32	21.4		9.62	9.959 0555	1568.3	5.55	9.67	8 25.2		
31	8 57	0.48	1.043	20 28	25.4		10.04	9.962 8187	1567.6	5.50	9.59	8 21.7		
Apr.	1	8 57	26.81	+1.151	+20 24	19.4		-10.45	9.966 5796	+1566.3	5.46	9.51	8 18.2	
	2	8 57	55.70	+1.256	+20 20	3.6		-10.86	9.970 3365	+1564.3	5.41	9.43	8 14.8	

GREENWICH MEAN TIME.

Date.	Apparent Right Ascension.			Var. per Hour.	Apparent Declination.			Var. per Hour.	Logarithm of Distance from Earth.	Var. per Hour.	Semi- diam- eter.	Hor. Paral- lax.	Transit, Meridian of Green- wich.
	Noon.			Noon.	Noon.			Noon.	Noon.	Noon.	Noon.	Noon.	
	h	m	s	s	°	'	"	"			"	"	h m
Apr.	1	8 57	26.81	+1.151	+20 24	19.4		-10.45	9.966 5796	+1566.3	5.46	9.51	8 18.2
	2	8 57	55.70	1.256	20 20	3.6		10.86	9.970 3365	1564.3	5.41	9.43	8 14.8
	3	8 58	27.09	1.360	20 15	38.0		11.26	9.974 0876	1561.5	5.37	9.35	8 11.4
	4	8 59	0.94	1.461	20 11	2.9		11.66	9.977 8314	1558.2	5.32	9.27	8 8.0
	5	8 59	37.20	1.560	20 6	18.3		12.05	9.981 5664	1554.2	5.28	9.19	8 4.7
	6	9 0	15.81	+1.657	+20 1	24.5		-12.43	9.985 2912	+1549.7	5.23	9.11	8 1.4
	7	9 0	56.74	1.752	19 56	21.5		12.81	9.989 0046	1544.7	5.18	9.03	7 58.2
	8	9 1	39.91	1.845	19 51	9.6		13.18	9.992 7053	1539.2	5.14	8.96	7 55.0
	9	9 2	25.29	1.936	19 45	48.9		13.55	9.996 3923	1533.2	5.10	8.88	7 51.8
	10	9 3	12.82	2.024	19 40	19.4		13.91	0.000 0645	1526.8	5.05	8.80	7 48.7
	11	9 4	2.44	+2.110	+19 34	41.4		-14.26	0.003 7208	+1520.0	5.01	8.72	7 45.6
	12	9 4	54.10	2.195	19 28	54.9		14.61	0.007 3604	1512.9	4.97	8.65	7 42.5
	13	9 5	47.76	2.276	19 23	0.1		14.96	0.010 9825	1505.5	4.92	8.58	7 39.5
	14	9 6	43.35	2.356	19 16	57.0		15.30	0.014 5864	1497.7	4.88	8.51	7 36.5
	15	9 7	40.83	2.434	19 10	45.8		15.63	0.018 1714	1489.7	4.84	8.44	7 33.5
	16	9 8	40.14	+2.509	+19 4	26.7		-15.96	0.021 7370	+1481.6	4.80	8.37	7 30.6
	17	9 9	41.25	2.583	18 57	59.7		16.29	0.025 2827	1473.2	4.76	8.30	7 27.7
	18	9 10	44.10	2.654	18 51	24.9		16.61	0.028 8081	1464.6	4.72	8.23	7 24.8
	19	9 11	48.64	2.724	18 44	42.4		16.93	0.032 3128	1456.0	4.68	8.16	7 21.9
	20	9 12	54.85	2.793	18 37	52.2		17.25	0.035 7966	1447.2	4.64	8.10	7 19.1
	21	9 14	2.67	+2.859	+18 30	54.4		-17.57	0.039 2592	+1438.3	4.61	8.03	7 16.3
	22	9 15	12.06	2.924	18 23	48.9		17.88	0.042 7003	1429.3	4.57	7.97	7 13.5
	23	9 16	22.99	2.967	18 16	36.0		18.19	0.046 1197	1420.2	4.54	7.91	7 10.8
	24	9 17	35.43	3.049	18 9	15.6		18.51	0.049 5171	1411.0	4.51	7.85	7 8.1
	25	9 18	49.34	3.110	18 1	47.7		18.82	0.052 8924	1401.7	4.47	7.79	7 5.4
	26	9 20	4.69	+3.169	+17 54	12.4		-19.12	0.056 2452	+1392.3	4.44	7.73	7 2.7
	27	9 21	21.44	3.227	17 46	29.7		19.43	0.059 5752	1382.7	4.40	7.67	7 0.0
	28	9 22	39.56	3.283	17 38	39.6		19.74	0.062 8821	1373.0	4.37	7.61	6 57.4
	29	9 23	59.03	3.339	17 30	42.2		20.04	0.066 1657	1363.3	4.33	7.55	6 54.8
	30	9 25	19.81	3.392	17 22	37.5		20.35	0.069 4258	1353.4	4.30	7.50	6 52.2
May	1	9 26	41.86	+3.445	+17 14	25.5		-20.65	0.072 6619	+1343.4	4.27	7.44	6 49.7
	2	9 28	5.15	3.496	17 6	6.3		20.96	0.075 8740	1333.3	4.24	7.39	6 47.1
	3	9 29	29.66	3.546	16 57	39.9		21.25	0.079 0617	1323.1	4.21	7.34	6 44.6
	4	9 30	55.35	3.595	16 49	6.4		21.54	0.082 2250	1312.9	4.18	7.29	6 42.1
	5	9 32	22.19	3.642	16 40	25.9		21.83	0.085 3635	1302.5	4.15	7.23	6 39.6
	6	9 33	50.14	+3.688	+16 31	38.4		-22.12	0.088 4772	+1292.2	4.12	7.18	6 37.1
	7	9 35	19.19	3.732	16 22	43.9		22.42	0.091 5660	1281.8	4.09	7.13	6 34.7
	8	9 36	49.29	3.776	16 13	42.5		22.70	0.094 6297	1271.3	4.06	7.08	6 32.2
	9	9 38	20.43	3.818	16 4	34.3		22.98	0.097 6683	1260.9	4.04	7.03	6 29.8
	10	9 39	52.56	3.859	15 55	19.4		23.26	0.100 6818	1250.4	4.01	6.98	6 27.4
	11	9 41	25.66	+3.899	+15 45	57.8		-23.54	0.103 6702	+1239.9	3.98	6.93	6 25.0
	12	9 42	59.70	3.938	15 36	29.5		23.82	0.106 6334	1229.5	3.95	6.88	6 22.7
	13	9 44	34.66	3.975	15 26	54.6		24.09	0.109 5717	1219.1	3.92	6.83	6 20.3
	14	9 46	10.51	4.012	15 17	13.3		24.36	0.112 4850	1208.7	3.90	6.79	6 18.0
	15	9 47	47.22	4.047	15 7	25.5		24.62	0.115 3734	1198.3	3.87	6.75	6 15.7
	16	9 49	24.76	+4.082	+14 57	31.3		-24.89	0.118 2371	+1188.1	3.85	6.70	6 13.4
	17	9 51	3.13	+4.115	+14 47	30.7		-25.15	0.121 0763	+1177.9	3.82	6.65	6 11.1

GREENWICH MEAN TIME.

Date.	Apparent Right Ascension.			Var. per Hour.	Apparent Declination.			Var. per Hour.	Logarithm of Distance from Earth.	Var. per Hour.	Semi- diam- eter.	Hor. Paral- lax.	Transit, Meridian of Green- wich.
	Noon.			Noon.	Noon.			Noon.	Noon.	Noon.	Noon.	Noon.	
	h	m	s	s	°	'	"	"			"	"	h m
May 17	9	51	3.13	+4.115	+14	47	30.7	-25.15	0.121 0763	+1177.9	3.82	6.65	6 11.1
18	9	52	42.28	4.148	14	37	23.9	25.41	0.123 8913	1167.9	3.79	6.61	6 8.8
19	9	54	22.21	4.180	14	27	10.8	25.67	0.126 6823	1157.9	3.77	6.57	6 6.5
20	9	56	2.89	4.210	14	16	51.5	25.93	0.129 4494	1148.0	3.75	6.53	6 4.2
21	9	57	44.31	4.241	14	6	26.0	26.19	0.132 1928	1138.2	3.73	6.49	6 2.0
22	9	59	26.46	+4.271	+13	55	54.4	-26.45	0.134 9127	+1128.5	3.70	6.45	5 59.8
23	10	1	9.32	4.300	13	45	16.6	26.70	0.137 6094	1118.7	3.68	6.41	5 57.6
24	10	2	52.87	4.329	13	34	32.8	26.96	0.140 2827	1109.1	3.66	6.37	5 55.3
25	10	4	37.11	4.357	13	23	42.7	27.21	0.142 9330	1099.5	3.63	6.33	5 53.1
26	10	6	22.01	4.385	13	12	46.6	27.46	0.145 5601	1089.8	3.61	6.29	5 50.9
27	10	8	7.57	+4.412	+13	1	44.4	-27.72	0.148 1642	+1080.3	3.59	6.25	5 48.8
28	10	9	53.78	4.438	12	50	36.2	27.97	0.150 7454	1070.7	3.57	6.22	5 46.6
29	10	11	40.61	4.464	12	39	22.0	28.21	0.153 3036	1061.1	3.55	6.18	5 44.4
30	10	13	28.06	4.490	12	28	1.9	28.46	0.155 8389	1051.6	3.53	6.15	5 42.3
31	10	15	16.11	4.515	12	16	35.9	28.70	0.158 3513	1042.1	3.51	6.11	5 40.2
June 1	10	17	4.76	+4.539	+12	5	4.1	-28.94	0.160 8408	+1032.6	3.49	6.08	5 38.0
2	10	18	53.98	4.562	11	53	26.6	29.18	0.163 3076	1023.1	3.47	6.04	5 35.9
3	10	20	43.76	4.586	11	41	43.4	29.42	0.165 7516	1013.6	3.45	6.01	5 33.8
4	10	22	34.10	4.609	11	29	54.5	29.65	0.168 1730	1004.2	3.43	5.97	5 31.7
5	10	24	24.97	4.631	11	18	0.1	29.88	0.170 5719	994.9	3.41	5.94	5 29.6
6	10	26	16.37	+4.652	+11	6	0.2	-30.11	0.172 9484	+ 985.5	3.39	5.91	5 27.5
7	10	28	8.28	4.673	10	53	54.9	30.33	0.175 3025	976.2	3.37	5.88	5 25.5
8	10	30	0.69	4.694	10	41	44.2	30.55	0.177 6344	967.0	3.35	5.84	5 23.4
9	10	31	53.58	4.714	10	29	28.3	30.77	0.179 9442	957.8	3.33	5.81	5 21.3
10	10	33	46.95	4.733	10	17	7.2	30.99	0.182 2321	948.7	3.32	5.78	5 19.3
11	10	35	40.78	+4.752	+10	4	41.0	-31.20	0.184 4983	+ 939.7	3.30	5.75	5 17.3
12	10	37	35.06	4.771	9	52	9.7	31.41	0.186 7430	930.8	3.29	5.72	5 15.2
13	10	39	29.79	4.790	9	39	33.4	31.61	0.188 9663	922.0	3.27	5.69	5 13.2
14	10	41	24.96	4.807	9	26	52.3	31.81	0.191 1686	913.3	3.25	5.66	5 11.2
15	10	43	20.55	4.825	9	14	6.3	32.02	0.193 3501	904.7	3.23	5.63	5 9.2
16	10	45	16.56	+4.842	+ 9	1	15.5	-32.21	0.195 5111	+ 896.1	3.21	5.60	5 7.2
17	10	47	12.98	4.860	8	48	20.0	32.41	0.197 6517	887.7	3.20	5.58	5 5.2
18	10	49	9.82	4.876	8	35	19.8	32.60	0.199 7723	879.4	3.19	5.55	5 3.2
19	10	51	7.05	4.893	8	22	15.0	32.80	0.201 8731	871.2	3.17	5.53	5 1.2
20	10	53	4.69	4.910	8	9	5.5	32.99	0.203 9543	863.1	3.16	5.50	4 59.2
21	10	55	2.72	+4.926	+ 7	55	51.5	-33.18	0.206 0161	+ 855.0	3.15	5.48	4 57.2
22	10	57	1.16	4.943	7	42	32.9	33.37	0.208 0585	847.0	3.13	5.45	4 55.3
23	10	58	59.99	4.960	7	29	9.8	33.55	0.210 0817	839.0	3.12	5.43	4 53.3
24	11	0	59.22	4.976	7	15	42.3	33.74	0.212 0857	831.0	3.10	5.40	4 51.4
25	11	2	58.84	4.992	7	2	10.5	33.91	0.214 0707	823.1	3.09	5.38	4 49.4
26	11	4	58.85	+5.009	+ 6	48	34.4	-34.09	0.216 0368	+ 815.3	3.07	5.35	4 47.5
27	11	6	59.25	5.025	6	34	54.1	34.27	0.217 9840	807.4	3.06	5.33	4 45.5
28	11	9	0.03	5.040	6	21	9.6	34.44	0.219 9125	799.7	3.04	5.30	4 43.6
29	11	11	1.19	5.056	6	7	30.9	34.61	0.221 8224	791.9	3.03	5.28	4 41.7
30	11	13	2.72	5.071	5	53	28.3	34.77	0.223 7135	784.1	3.02	5.26	4 39.8
July 1	11	15	4.62	+5.087	+ 5	39	31.7	-34.94	0.225 5861	+ 776.4	3.01	5.24	4 37.9
2	11	17	6.90	+5.103	+ 5	25	31.3	-35.10	0.227 4401	+ 768.6	2.99	5.21	4 36.0

GREENWICH MEAN TIME.

Date.	Apparent Right Ascension.			Var. per Hour.	Apparent Declination.			Var. per Hour.	Logarithm of Distance from Earth.	Var. per Hour.	Semi-diameter.	Hor. Parallax.	Transit, Meridian of Greenwich.
	Noon.			Noon.	Noon.			Noon.	Noon.	Noon.	Noon.	Noon.	
	h	m	s	s	°	'	"	"			"	"	h m
July	1	11	15	4.62	+5.087	+5	39	31.7	-34.94	0.225 5861	+776.4	3.01	5.24 4 37.9
	2	11	17	6.90	5.103	5	25	31.3	35.10	0.227 4401	768.6	2.99	5.21 4 36.0
	3	11	19	9.55	5.118	5	11	27.1	35.25	0.229 2756	761.0	2.98	5.19 4 34.1
	4	11	21	12.56	5.133	4	57	19.2	35.40	0.231 0927	753.3	2.97	5.17 4 32.2
	5	11	23	15.93	5.148	4	43	7.7	35.55	0.232 8916	745.8	2.96	5.15 4 30.3
	6	11	25	19.66	+5.163	+4	28	52.7	-35.70	0.234 6724	+738.2	2.94	5.13 4 28.4
	7	11	27	23.74	5.177	4	14	34.3	35.84	0.236 4352	730.8	2.93	5.11 4 26.6
	8	11	29	28.17	5.192	4	0	12.5	35.97	0.238 1803	723.4	2.92	5.09 4 24.7
	9	11	31	32.95	5.206	3	45	47.5	36.11	0.239 9076	716.0	2.91	5.07 4 22.8
	10	11	33	38.08	5.221	3	31	19.4	36.23	0.241 6173	708.8	2.90	5.05 4 21.0
	11	11	35	43.55	+5.235	+3	16	48.3	-36.36	0.243 3098	+701.6	2.89	5.03 4 19.1
	12	11	37	49.36	5.249	3	2	14.2	36.48	0.244 9852	694.5	2.88	5.01 4 17.3
	13	11	39	55.51	5.263	2	47	37.2	36.60	0.246 6437	687.6	2.86	4.99 4 15.5
	14	11	42	2.00	5.278	2	32	57.4	36.71	0.248 2856	680.7	2.85	4.97 4 13.6
	15	11	44	8.84	5.292	2	18	14.9	36.83	0.249 9110	673.9	2.84	4.95 4 11.8
	16	11	46	16.02	+5.306	+2	3	29.7	-36.94	0.251 5203	+667.2	2.83	4.93 4 10.0
	17	11	48	23.54	5.321	1	48	42.0	37.04	0.253 1135	660.6	2.82	4.91 4 8.2
	18	11	50	31.41	5.335	1	33	51.8	37.14	0.254 6909	654.0	2.81	4.89 4 6.4
	19	11	52	39.63	5.350	1	18	59.1	37.25	0.256 2527	647.5	2.80	4.88 4 4.6
	20	11	54	48.22	5.365	1	4	3.9	37.35	0.257 7989	641.0	2.79	4.86 4 2.8
	21	11	56	57.16	+5.380	+0	49	6.5	-37.44	0.259 3296	+634.6	2.78	4.85 4 1.0
	22	11	59	6.47	5.396	0	34	6.8	37.53	0.260 8451	628.2	2.77	4.83 3 59.2
	23	12	1	16.15	5.411	0	19	4.9	37.62	0.262 3452	621.9	2.76	4.82 3 57.4
	24	12	3	26.20	5.427	+0	4	0.9	37.71	0.263 8302	615.6	2.75	4.80 3 55.6
	25	12	5	36.63	5.442	-0	11	5.0	37.79	0.265 3000	609.3	2.74	4.78 3 53.9
	26	12	7	47.43	+5.458	-0	26	12.8	-37.86	0.266 7547	+603.0	2.73	4.76 3 52.1
	27	12	9	58.61	5.474	0	41	22.5	37.94	0.268 1944	596.7	2.72	4.75 3 50.4
	28	12	12	10.18	5.490	0	56	33.9	38.01	0.269 6190	590.5	2.71	4.73 3 48.6
	29	12	14	22.13	5.506	1	11	46.9	38.07	0.271 0288	584.3	2.71	4.72 3 46.9
	30	12	16	34.47	5.522	1	27	1.4	38.14	0.272 4237	578.1	2.70	4.70 3 45.1
Aug.	31	12	18	47.20	+5.539	-1	42	17.4	-38.19	0.273 8038	+572.0	2.69	4.69 3 43.4
	1	12	21	0.32	5.555	1	57	34.7	38.25	0.275 1692	565.9	2.68	4.67 3 41.7
	2	12	23	13.84	5.572	2	12	53.2	38.29	0.276 5199	559.8	2.67	4.66 3 40.0
	3	12	25	27.76	5.588	2	28	12.8	38.34	0.277 8561	553.7	2.66	4.64 3 38.3
	4	12	27	42.07	5.605	2	43	33.3	38.37	0.279 1779	547.7	2.66	4.63 3 36.6
	5	12	29	56.78	+5.621	-2	58	54.7	-38.40	0.280 4853	+541.8	2.65	4.61 3 34.9
	6	12	32	11.89	5.638	3	14	16.8	38.43	0.281 7785	535.9	2.64	4.60 3 33.2
	7	12	34	27.40	5.655	3	29	39.6	38.46	0.283 0575	530.0	2.63	4.58 3 31.5
	8	12	36	43.31	5.671	3	45	2.8	38.48	0.284 3226	524.2	2.62	4.57 3 29.8
	9	12	38	59.63	5.689	4	0	26.5	38.49	0.285 5738	518.5	2.62	4.56 3 28.2
	10	12	41	16.36	+5.706	-4	15	50.5	-38.50	0.286 8115	+512.9	2.61	4.55 3 26.5
	11	12	43	33.51	5.723	4	31	14.6	38.51	0.288 0357	507.3	2.60	4.53 3 24.8
	12	12	45	51.07	5.741	4	46	38.8	38.51	0.289 2466	501.8	2.59	4.52 3 23.2
	13	12	48	9.06	5.758	5	2	3.0	38.51	0.290 4445	496.4	2.59	4.51 3 21.6
	14	12	50	27.47	5.776	5	17	27.1	38.50	0.291 6296	491.2	2.58	4.49 3 19.9
	15	12	52	46.32	+5.796	-5	32	50.9	-38.49	0.292 8021	+485.9	2.57	4.48 3 18.3
	16	12	55	5.61	+5.813	-5	48	14.5	-38.47	0.293 9620	+480.7	2.57	4.47 3 16.7

GREENWICH MEAN TIME.

Date.	Apparent Right Ascension.			Var. per Hour.	Apparent Declination.			Var. per Hour.	Logarithm of Distance from Earth.	Var. per Hour.	Semi-diameter.	Hor. Parallax.	Transit, Meridian of Greenwich.
	h	m	s		°	'	"							h	m
Aug. 16	12	55	5.61	+5.813	— 5	48	14.5	—38.47	0.293 9620	+480.7	2.57	4.47	3 16.7
17	12	57	25.34	5.831	6	3	37.6	38.45	0.295 1095	475.5	2.56	4.46	3 15.1
18	12	59	45.52	5.851	6	19	0.3	38.43	0.296 2446	470.4	2.55	4.45	3 13.5
19	13	2	6.17	5.870	6	34	22.3	38.40	0.297 3676	465.4	2.55	4.44	3 11.9
20	13	4	27.28	5.890	6	49	43.7	38.37	0.298 4784	460.3	2.54	4.43	3 10.3
21	13	6	48.88	+5.910	— 7	5	4.2	—38.34	0.299 5771	+455.3	2.54	4.42	3 8.7
22	13	9	10.95	5.930	7	20	23.8	38.29	0.300 6637	450.2	2.53	4.41	3 7.1
23	13	11	33.51	5.950	7	35	42.3	38.25	0.301 7382	445.2	2.52	4.39	3 5.6
24	13	13	56.57	5.971	7	50	59.6	38.19	0.302 8007	440.2	2.51	4.38	3 4.0
25	13	16	20.12	5.992	8	6	15.6	38.14	0.303 8513	435.2	2.51	4.37	3 2.5
26	13	18	44.18	+6.013	— 8	21	30.2	—38.07	0.304 8899	+430.3	2.50	4.36	3 0.9
27	13	21	8.74	6.034	8	36	43.2	38.01	0.305 9167	425.4	2.50	4.35	2 59.4
28	13	23	33.82	6.056	8	51	54.5	37.93	0.306 9317	420.4	2.49	4.34	2 57.9
29	13	25	59.41	6.077	9	7	4.0	37.85	0.307 9348	415.5	2.49	4.33	2 56.4
30	13	28	25.53	6.099	9	22	11.5	37.77	0.308 9263	410.7	2.48	4.32	2 54.9
Sept. 31	13	30	52.17	+6.121	— 9	37	16.9	—37.68	0.309 9061	+405.8	2.47	4.31	2 53.4
1	13	33	19.35	6.143	9	52	20.0	37.58	0.310 8742	401.0	2.47	4.30	2 51.9
2	13	35	47.05	6.165	10	7	20.7	37.47	0.311 8309	396.2	2.46	4.29	2 50.4
3	13	38	15.29	6.188	10	22	18.8	37.36	0.312 7761	391.5	2.46	4.28	2 48.9
4	13	40	44.07	6.210	10	37	14.2	37.25	0.313 7099	386.8	2.45	4.28	2 47.5
5	13	43	13.38	+6.233	—10	52	6.8	—37.13	0.314 6326	+382.1	2.45	4.27	2 46.0
6	13	45	43.25	6.256	11	6	56.4	37.00	0.315 5441	377.5	2.44	4.26	2 44.6
7	13	48	13.66	6.279	11	21	42.9	36.87	0.316 4448	373.0	2.44	4.25	2 43.1
8	13	50	44.63	6.302	11	36	26.1	36.73	0.317 3347	368.6	2.43	4.24	2 41.7
9	13	53	16.15	6.325	11	51	5.8	36.58	0.318 2140	364.2	2.43	4.23	2 40.3
10	13	55	48.24	+6.349	—12	5	42.0	—36.43	0.319 0829	+359.9	2.42	4.22	2 38.9
11	13	58	20.90	6.373	12	20	14.4	36.27	0.319 9415	355.6	2.42	4.21	2 37.5
12	14	0	54.14	6.397	12	34	43.1	36.11	0.320 7899	351.4	2.41	4.20	2 36.1
13	14	3	27.95	6.421	12	49	7.7	35.94	0.321 6284	347.3	2.41	4.20	2 34.7
14	14	6	2.36	6.446	13	3	28.3	35.77	0.322 4569	343.2	2.40	4.19	2 33.4
15	14	8	37.36	+6.471	—13	17	44.6	—35.59	0.323 2757	+339.2	2.40	4.18	2 32.0
16	14	11	12.97	6.496	13	31	56.5	35.40	0.324 0849	335.1	2.39	4.17	2 30.7
17	14	13	49.18	6.522	13	46	3.9	35.21	0.324 8844	331.1	2.39	4.16	2 29.3
18	14	16	26.02	6.548	14	0	6.6	35.01	0.325 6744	327.2	2.38	4.16	2 28.0
19	14	19	3.48	6.574	14	14	4.4	34.80	0.326 4549	323.2	2.38	4.15	2 26.7
20	14	21	41.57	+6.600	—14	27	57.2	—34.59	0.327 2258	+319.2	2.38	4.14	2 25.4
21	14	24	20.29	6.627	14	41	44.9	34.38	0.327 9873	315.3	2.37	4.13	2 24.1
22	14	26	59.65	6.653	14	55	27.3	34.15	0.328 7393	311.4	2.37	4.12	2 22.8
23	14	29	39.65	6.680	15	9	4.3	33.92	0.329 4819	307.5	2.36	4.12	2 21.5
24	14	32	20.30	6.707	15	22	35.6	33.68	0.330 2152	303.6	2.36	4.11	2 20.3
25	14	35	1.60	+6.735	—15	36	1.1	—33.44	0.330 9391	+299.7	2.35	4.10	2 19.0
26	14	37	43.56	6.762	15	49	20.6	33.18	0.331 6537	295.8	2.35	4.10	2 17.8
27	14	40	26.17	6.789	16	2	33.9	32.92	0.332 3590	292.0	2.35	4.09	2 16.6
28	14	43	9.44	6.817	16	15	40.9	32.66	0.333 0551	288.1	2.34	4.08	2 15.3
29	14	45	53.37	6.844	16	28	41.4	32.38	0.333 7420	284.3	2.34	4.08	2 14.1
30	14	48	37.97	+6.872	—16	41	35.2	—32.10	0.334 4197	+280.5	2.34	4.07	2 12.9
Oct. 1	14	51	23.23	+6.900	—16	54	22.1	—31.81	0.335 0884	+276.7	2.34	4.07	2 11.7

GREENWICH MEAN TIME.

Date.	Apparent Right Ascension.			Var. per Hour.	Apparent Declination.			Var. per Hour.	Logarithm of Distance from Earth.	Var. per Hour.	Semi-diameter.	Hor. Paral- lax.	Transit Meridian of Green- wich.
	Noon.			Noon.	Noon.			Noon.	Noon.	Noon.	Noon.	Noon.	
	h	m	s	s	°	'	"	"			"	"	h m
Oct.	1	14 51	23.23	+6.900	-16 54	22.1	-31.81	0.335 0884	+276.7	2.34	4.07	2 11.7	
	2	14 54	9.15	6.927	17 7	2.0	31.51	0.335 7481	273.0	2.33	4.06	2 10.6	
	3	14 56	55.74	6.955	17 19	34.6	31.21	0.336 3989	269.3	2.32	4.05	2 9.4	
	4	14 59	42.99	6.982	17 31	59.9	30.90	0.337 0409	265.7	2.32	4.04	2 8.3	
	5	15 2	30.90	7.010	17 44	17.5	30.57	0.337 6744	262.2	2.32	4.04	2 7.1	
	6	15 5	19.48	+7.038	-17 56	27.4	-30.25	0.338 2994	+258.7	2.31	4.03	2 6.0	
	7	15 8	8.73	7.066	18 8	29.3	29.91	0.338 9160	255.2	2.31	4.03	2 4.9	
	8	15 10	58.64	7.094	18 20	23.1	29.57	0.339 5244	251.8	2.31	4.02	2 3.7	
	9	15 13	49.22	7.121	18 32	8.6	29.22	0.340 1248	248.5	2.31	4.02	2 2.6	
	10	15 16	40.47	7.149	18 43	45.8	28.87	0.340 7173	245.2	2.30	4.01	2 1.6	
	11	15 19	32.39	+7.177	-18 55	14.4	-28.51	0.341 3019	+242.0	2.30	4.01	2 0.5	
	12	15 22	24.99	7.206	19 6	34.1	28.14	0.341 8789	238.8	2.30	4.00	1 59.4	
	13	15 25	18.27	7.234	19 17	44.9	27.76	0.342 4482	235.7	2.30	4.00	1 58.4	
	14	15 28	12.23	7.262	19 28	46.6	27.38	0.343 0101	232.6	2.29	3.99	1 57.3	
	15	15 31	6.87	7.291	19 39	38.9	26.98	0.343 5645	229.5	2.29	3.99	1 56.3	
	16	15 34	2.20	+7.320	-19 50	21.7	-26.59	0.344 1117	+226.5	2.28	3.98	1 55.3	
	17	15 36	58.20	7.348	20 0	54.9	26.18	0.344 6515	223.4	2.28	3.98	1 54.3	
	18	15 39	54.89	7.376	20 11	18.3	25.77	0.345 1841	220.4	2.28	3.97	1 53.3	
	19	15 42	52.26	7.405	20 21	31.7	25.35	0.345 7096	217.4	2.28	3.97	1 52.3	
	20	15 45	50.31	7.433	20 31	34.9	24.92	0.346 2278	214.4	2.27	3.96	1 51.3	
	21	15 48	49.04	+7.461	-20 41	27.7	-24.48	0.346 7388	+211.4	2.27	3.96	1 50.4	
	22	15 51	48.45	7.490	20 51	9.9	24.04	0.347 2425	208.4	2.27	3.95	1 49.4	
	23	15 54	48.54	7.517	21 0	41.4	23.59	0.347 7391	205.5	2.26	3.94	1 48.5	
	24	15 57	49.29	7.545	21 10	2.0	23.13	0.348 2285	202.5	2.26	3.94	1 47.5	
	25	16 0	57.71	7.573	21 19	11.5	22.66	0.348 7109	199.5	2.26	3.93	1 46.6	
	26	16 3	52.79	+7.600	-21 28	9.8	-22.19	0.349 1863	+196.6	2.26	3.93	1 45.7	
	27	16 6	55.53	7.628	21 36	56.5	21.71	0.349 6546	193.7	2.26	3.93	1 44.8	
	28	16 9	58.92	7.655	21 45	31.7	21.22	0.350 1160	190.8	2.25	3.92	1 43.9	
	29	16 13	2.95	7.681	21 53	55.0	20.72	0.350 5705	187.9	2.25	3.92	1 43.1	
	30	16 16	7.61	7.707	22 2	6.3	20.22	0.351 0181	185.1	2.25	3.91	1 42.2	
	31	16 19	12.90	+7.733	-22 10	5.5	-19.71	0.351 4588	+182.2	2.25	3.91	1 41.3	
Nov.	1	16 22	18.81	7.759	22 17	52.3	19.19	0.351 8928	179.5	2.25	3.91	1 40.5	
	2	16 25	25.32	7.784	22 25	26.5	18.66	0.352 3202	176.7	2.24	3.91	1 39.7	
	3	16 28	32.43	7.809	22 32	48.1	18.13	0.352 7411	174.1	2.24	3.90	1 38.8	
	4	16 31	40.14	7.833	22 39	56.9	17.60	0.353 1557	171.5	2.24	3.90	1 38.0	
	5	16 34	48.42	+7.857	-22 46	52.8	-17.05	0.353 5641	+168.9	2.24	3.89	1 37.2	
	6	16 37	57.28	7.881	22 53	35.5	16.50	0.353 9664	166.4	2.24	3.89	1 36.4	
	7	16 41	6.70	7.904	23 0	4.9	15.95	0.354 3629	164.0	2.23	3.89	1 35.7	
	8	16 44	16.69	7.927	23 6	20.9	15.38	0.354 7535	161.6	2.23	3.88	1 34.9	
	9	16 47	27.22	7.950	23 12	23.3	14.81	0.355 1385	159.2	2.23	3.88	1 34.1	
	10	16 50	38.30	+7.973	-23 18	11.9	-14.24	0.355 5179	+156.9	2.23	3.87	1 33.3	
	11	16 53	49.91	7.996	23 23	46.7	13.66	0.355 8918	154.7	2.22	3.87	1 32.6	
	12	16 57	2.05	8.017	23 29	7.4	13.07	0.356 2603	152.4	2.22	3.87	1 31.9	
	13	17 0	14.71	8.038	23 34	13.9	12.47	0.356 6234	150.1	2.22	3.87	1 31.1	
	14	17 3	27.87	8.059	23 39	6.1	11.87	0.356 9812	148.0	2.22	3.86	1 30.4	
	15	17 6	41.53	+8.079	-23 43	43.9	-11.27	0.357 3338	+145.8	2.22	3.86	1 29.7	
	16	17 9	55.67	+8.099	-23 48	7.2	-10.66	0.357 6812	+143.7	2.22	3.86	1 29.0	

GREENWICH MEAN TIME.

Date.	Apparent Right Ascension.			Var. per Hour.	Apparent Declination.			Var. per Hour.	Logarithm of Distance from Earth.	Var. per Hour.	Semi-diameter.	Hor. Parallax.	Transit, Meridian of Greenwich.
	h	m	s		°	'	"							h	m
Nov. 16	17	9	55.67	+8.099	-23	48	7.2	-10.66	0.357 6812	+143.7	2.22	3.86	1 29.0
17	17	13	10.28	8.119	23	52	15.8	10.06	0.358 0235	141.5	2.22	3.86	1 28.3
18	17	16	25.36	8.138	23	56	9.5	9.43	0.358 3606	139.4	2.21	3.85	1 27.6
19	17	19	40.89	8.156	23	59	48.3	8.80	0.358 6927	137.3	2.21	3.85	1 26.9
20	17	22	56.86	8.174	24	3	12.0	8.17	0.359 0196	135.2	2.21	3.84	1 26.2
21	17	26	13.24	+8.191	-24	6	20.5	-7.54	0.359 3415	+133.0	2.21	3.84	1 25.6
22	17	29	30.04	8.208	24	9	13.7	6.90	0.359 6582	130.9	2.20	3.84	1 24.9
23	17	32	47.24	8.225	24	11	51.5	6.25	0.359 9698	128.8	2.20	3.84	1 24.3
24	17	36	4.82	8.240	24	14	13.8	5.60	0.360 2763	126.6	2.20	3.83	1 23.6
25	17	39	22.76	8.255	24	16	20.4	4.95	0.360 5777	124.6	2.20	3.83	1 22.9
26	17	42	41.04	+8.269	-24	18	11.4	-4.30	0.360 8742	+122.5	2.20	3.83	1 22.3
27	17	45	59.65	8.282	24	19	46.6	3.64	0.361 1657	120.4	2.20	3.83	1 21.7
28	17	49	18.57	8.294	24	21	6.0	2.98	0.361 4522	118.4	2.20	3.83	1 21.1
29	17	52	37.78	8.306	24	22	9.5	2.31	0.361 7340	116.4	2.19	3.82	1 20.5
30	17	55	57.27	8.317	24	22	56.9	1.64	0.362 0111	114.5	2.19	3.82	1 19.8
Dec. 1	17	59	17.01	+8.327	-24	23	28.3	-0.97	0.362 2835	+112.6	2.19	3.82	1 19.2
2	18	2	36.99	8.337	24	23	43.5	-0.30	0.362 5515	110.7	2.19	3.82	1 18.6
3	18	5	57.19	8.346	24	23	42.6	+0.38	0.362 8151	108.9	2.19	3.82	1 18.0
4	18	9	17.59	8.354	24	23	25.4	1.05	0.363 0744	107.2	2.19	3.82	1 17.4
5	18	12	38.18	8.361	24	22	52.0	1.73	0.363 3297	105.5	2.19	3.81	1 16.8
6	18	15	58.94	+8.368	-24	22	2.3	+2.41	0.363 5810	+103.9	2.19	3.81	1 16.2
7	18	19	19.85	8.374	24	20	56.3	3.09	0.363 8284	102.3	2.19	3.81	1 15.6
8	18	22	40.91	8.380	24	19	33.9	3.77	0.364 0720	100.7	2.18	3.81	1 15.0
9	18	26	2.09	8.385	24	17	55.1	4.46	0.364 3119	99.2	2.18	3.80	1 14.4
10	18	29	23.88	8.390	24	15	59.9	5.14	0.364 5482	97.7	2.18	3.80	1 13.8
11	18	32	44.76	+8.392	-24	13	48.3	+5.83	0.364 7809	+96.2	2.18	3.80	1 13.3
12	18	36	6.22	8.396	24	11	20.2	6.51	0.365 0101	94.8	2.18	3.80	1 12.7
13	18	39	27.75	8.398	24	8	35.7	7.20	0.365 2359	93.4	2.18	3.80	1 12.1
14	18	42	49.32	8.400	24	5	34.8	7.88	0.365 4582	91.9	2.17	3.79	1 11.5
15	18	46	10.93	8.401	24	2	17.4	8.57	0.365 6771	90.5	2.17	3.79	1 10.9
16	18	49	32.56	+8.401	-23	58	43.6	+9.25	0.365 8927	+89.1	2.17	3.79	1 10.3
17	18	52	54.19	8.401	23	54	53.4	9.94	0.366 1050	87.7	2.17	3.79	1 9.8
18	18	56	15.80	8.400	23	50	46.7	10.62	0.366 3139	86.4	2.17	3.79	1 9.2
19	18	59	37.38	8.398	23	46	23.7	11.30	0.366 5196	85.0	2.17	3.78	1 8.6
20	19	2	58.92	8.396	23	41	44.3	11.98	0.366 7220	83.6	2.17	3.78	1 8.0
21	19	6	20.40	+8.393	-23	36	48.7	+12.66	0.366 9211	+82.3	2.17	3.78	1 7.4
22	19	9	41.80	8.390	23	31	36.8	13.33	0.367 1170	80.9	2.17	3.78	1 6.8
23	19	13	3.10	8.385	23	26	8.7	14.00	0.367 3095	79.5	2.17	3.78	1 6.2
24	19	16	24.29	8.380	23	20	24.6	14.67	0.367 4987	78.1	2.17	3.77	1 5.7
25	19	19	45.36	8.375	23	14	24.3	15.34	0.367 6846	76.7	2.17	3.77	1 5.1
26	19	23	6.28	+8.368	-23	8	8.1	+16.01	0.367 8671	+75.4	2.17	3.77	1 4.5
27	19	26	27.03	8.361	23	1	36.0	16.67	0.368 0465	74.1	2.16	3.77	1 3.9
28	19	29	47.60	8.353	22	54	48.1	17.32	0.368 2228	72.8	2.16	3.77	1 3.3
29	19	33	7.98	8.345	22	47	44.5	17.98	0.368 3961	71.6	2.16	3.77	1 2.7
30	19	36	28.14	8.335	22	40	25.2	18.62	0.368 5664	70.4	2.16	3.77	1 2.1
31	19	39	48.08	+8.326	-22	32	50.5	+19.27	0.368 7339	+69.2	2.16	3.77	1 1.5
32	19	43	7.78	....	-22	25	0.4	....	0.368 8986	....	2.16	3.76	1 0.8

FOR GREENWICH MEAN NOON.

Date.		Heliocentric Longitude, Mean Equinox of Date.	Var. per Day.	Reduction to Orbit.	Heliocentric Latitude.	Var. per Day.	Logarithm of Radius Vector.	Var. per Day.
		° ' "	' "	"	° ' "	"		
Jan.	1	122 26 13.2	27 1.9	+29.2	+1 46 28.0	+14.8	0.214 8775	+1834
	3	123 20 14.3	26 59.2	27.8	1 46 56.8	14.0	0.215 2394	1786
	5	124 14 10.1	26 56.6	26.4	1 47 24.0	13.2	0.215 5917	1738
	7	125 8 0.8	26 54.1	24.9	1 47 49.6	12.4	0.215 9344	1689
	9	126 1 46.5	26 51.6	23.4	1 48 13.6	11.6	0.216 2675	1641
	11	126 55 27.4	26 49.2	+21.8	+1 48 36.0	+10.8	0.216 5908	+1592
	13	127 49 3.5	26 46.9	20.3	1 48 56.8	10.0	0.216 9044	1543
	15	128 42 35.0	26 44.7	18.7	1 49 16.0	9.2	0.217 2081	1494
	17	129 36 2.2	26 42.5	17.2	1 49 33.5	8.4	0.217 5020	1445
	19	130 29 25.2	26 40.4	15.6	1 49 49.4	7.6	0.217 7860	1395
	21	131 22 44.0	26 38.4	+14.0	+1 50 3.7	+ 6.8	0.218 0602	+1346
	23	132 15 58.9	26 36.5	12.4	1 50 16.4	6.0	0.218 3243	1296
	25	133 9 10.0	26 34.7	10.7	1 50 27.6	5.2	0.218 5785	1246
	27	134 2 17.5	26 32.9	9.1	1 50 37.2	4.4	0.218 8227	1196
	29	134 55 21.5	26 31.2	7.4	1 50 45.1	3.6	0.219 0569	1146
	31	135 48 22.1	26 29.5	+ 5.8	+1 50 51.4	+ 2.8	0.219 2810	+1095
Feb.	2	136 41 19.5	26 28.0	4.2	1 50 56.2	2.0	0.219 4950	1045
	4	137 34 13.9	26 26.5	2.5	1 50 59.4	1.2	0.219 6989	994
	6	138 27 5.4	26 25.0	+ 0.9	1 51 1.0	+ 0.4	0.219 8926	943
	8	139 19 54.1	26 23.7	- 0.8	1 51 1.0	- 0.4	0.220 0761	892
	10	140 12 40.3	26 22.5	- 2.4	+1 50 59.4	- 1.2	0.220 2495	+ 841
	12	141 5 24.0	26 21.3	4.1	1 50 56.3	2.0	0.220 4126	790
	14	141 58 5.4	26 20.2	5.7	1 50 51.6	2.7	0.220 5655	739
	16	142 50 44.6	26 19.1	7.4	1 50 45.4	3.5	0.220 7081	688
	18	143 43 21.8	26 18.1	9.0	1 50 37.6	4.3	0.220 8405	636
	20	144 35 57.1	26 17.2	-10.6	+1 50 28.3	- 5.0	0.220 9626	+ 584
	22	145 28 30.7	26 16.4	12.2	1 50 17.5	5.8	0.221 0743	533
	24	146 21 2.8	26 15.7	13.8	1 50 5.0	6.6	0.221 1758	482
	26	147 13 33.5	26 15.0	15.4	1 49 51.1	7.4	0.221 2670	430
	28	148 6 2.9	26 14.4	17.0	1 49 35.6	8.1	0.221 3478	378
Mar.	1	148 58 31.2	26 13.9	-18.5	+1 49 18.7	- 8.9	0.221 4183	+ 327
	3	149 50 58.6	26 13.5	20.0	1 49 0.2	9.7	0.221 4785	275
	5	150 43 25.1	26 13.1	21.6	1 48 40.1	10.4	0.221 5282	223
	7	151 35 51.0	26 12.8	23.0	1 48 18.6	11.2	0.221 5677	171
	9	152 28 16.3	26 12.6	24.5	1 47 55.5	11.9	0.221 5967	119
	11	153 20 41.3	26 12.4	-26.0	+1 47 30.9	-12.7	0.221 6154	68
	13	154 13 6.1	26 12.4	27.4	1 47 4.9	13.4	0.221 6238	+ 16
	15	155 5 30.8	26 12.4	28.8	1 46 37.4	14.1	0.221 6217	- 36
	17	155 57 55.6	26 12.4	30.2	1 46 8.4	14.9	0.221 6093	88
	19	156 50 20.6	26 12.6	31.5	1 45 37.9	15.6	0.221 5865	140
	21	157 42 46.0	26 12.8	-32.8	+1 45 5.9	-16.4	0.221 5533	- 192
	23	158 35 11.9	26 13.1	34.1	1 44 32.4	17.1	0.221 5098	243
	25	159 27 38.5	26 13.5	35.4	1 43 57.5	17.8	0.221 4560	295
	27	160 20 5.9	26 14.0	36.6	1 43 21.2	18.5	0.221 3918	347
	29	161 12 34.3	26 14.5	37.8	1 42 43.4	19.3	0.221 3172	399
Apr.	31	162 5 3.9	26 15.1	-38.9	+1 42 4.1	-20.0	0.221 2323	- 450
	2	162 57 34.7	26 15.7	-40.0	+1 41 23.4	-20.7	0.221 1371	- 502

FOR GREENWICH MEAN NOON.

Date.		Heliocentric Longitude, Mean Equinox of Date.	Var. per Day.	Reduction to Orbit.	Heliocentric Latitude.	Var. per Day.	Logarithm of Radius Vector.	Var. per Day.
		° ' "	' "	"	° ' "	"		
Apr.	2	162 57 34.7	26 15.7	-40.0	+1 41 23.4	-20.7	0.221 1371	- 502
	4	163 50 6.9	26 16.5	41.1	1 40 41.2	21.4	0.221 0316	553
	6	164 42 40.6	26 17.3	42.2	1 39 57.6	22.2	0.220 9158	605
	8	165 35 16.1	26 18.2	43.2	1 39 12.6	22.9	0.220 7897	656
	10	166 27 53.5	26 19.2	44.1	1 38 26.1	23.6	0.220 6533	708
	12	167 20 32.9	26 20.2	-45.0	+1 37 38.3	-24.3	0.220 5067	- 759
	14	168 13 14.5	26 21.3	45.9	1 36 49.0	25.0	0.220 3498	810
	16	169 5 58.3	26 22.5	46.8	1 35 58.3	25.7	0.220 1827	861
	18	169 58 44.7	26 23.8	47.6	1 35 6.2	26.4	0.220 0053	912
	20	170 51 33.6	26 25.1	48.3	1 34 12.8	27.1	0.219 8178	963
	22	171 44 25.3	26 26.6	-49.0	+1 33 18.0	-27.8	0.219 6202	-1013
	24	172 37 19.9	26 28.1	49.7	1 32 21.8	28.5	0.219 4124	1064
	26	173 30 17.6	26 29.7	50.3	1 31 24.2	29.1	0.219 1945	1114
	28	174 23 18.6	26 31.3	50.8	1 30 25.2	29.8	0.218 9666	1165
	30	175 16 22.8	26 33.0	51.4	1 29 25.0	30.5	0.218 7286	1215
May	2	176 9 30.7	26 34.8	-51.8	+1 28 23.3	-31.2	0.218 4805	-1265
	4	177 2 42.1	26 36.7	52.3	1 27 20.3	31.8	0.218 2225	1315
	6	177 55 57.4	26 38.6	52.6	1 26 15.9	32.5	0.217 9545	1365
	8	178 49 16.6	26 40.6	53.0	1 25 10.3	33.1	0.217 6765	1414
	10	179 42 40.0	26 42.8	53.2	1 24 3.3	33.8	0.217 3887	1464
	12	180 36 7.7	26 44.9	-53.4	+1 22 55.1	-34.5	0.217 0911	-1513
	14	181 29 39.7	26 47.2	53.6	1 21 45.4	35.1	0.216 7836	1562
	16	182 23 16.4	26 49.5	53.7	1 20 34.6	35.8	0.216 4664	1611
	18	183 16 57.7	26 51.9	53.8	1 19 22.4	36.4	0.216 1394	1659
	20	184 10 44.0	26 54.4	53.8	1 18 9.0	37.0	0.215 8028	1707
	22	185 4 35.3	26 56.9	-53.7	+1 16 54.3	-37.6	0.215 4565	-1756
	24	185 58 31.7	26 59.5	53.6	1 15 38.4	38.2	0.215 1006	1804
	26	186 52 33.5	27 2.2	53.5	1 14 21.3	38.9	0.214 7351	1851
	28	187 46 40.7	27 5.0	53.3	1 13 2.8	39.5	0.214 3601	1898
	30	188 40 53.5	27 7.9	53.0	1 11 43.2	40.1	0.213 9757	1945
June	1	189 35 12.2	27 10.8	-52.7	+1 10 22.3	-40.7	0.213 5820	-1992
	3	190 29 36.7	27 13.8	52.4	1 9 0.2	41.3	0.213 1788	2039
	5	191 24 7.4	27 16.9	52.0	1 7 37.0	41.9	0.212 7665	2085
	7	192 18 44.3	27 20.0	51.6	1 6 12.5	42.5	0.212 3449	2131
	9	193 13 27.6	27 23.3	51.1	1 4 46.9	43.1	0.211 9141	2177
	11	194 8 17.4	27 26.6	-50.5	+1 3 20.1	-43.7	0.211 4743	-2222
	13	195 3 13.9	27 30.0	49.8	1 1 52.2	44.2	0.211 0255	2266
	15	195 58 17.2	27 33.4	49.1	1 0 23.1	44.8	0.210 5678	2311
	17	196 53 27.5	27 37.0	48.4	0 58 52.9	45.4	0.210 1011	2355
	19	197 48 45.0	27 40.6	47.6	0 57 21.7	45.9	0.209 6257	2399
	21	198 44 9.8	27 44.2	-46.8	+0 55 49.3	-46.5	0.209 1416	-2442
	23	199 39 42.0	27 48.0	45.9	0 54 15.9	47.0	0.208 6488	2485
	25	200 35 21.8	27 51.8	44.9	0 52 41.3	47.5	0.208 1474	2528
	27	201 31 9.3	27 55.7	43.9	0 51 5.7	48.1	0.207 6376	2570
	29	202 27 4.7	27 59.7	42.9	0 49 29.1	48.6	0.207 1193	2612
July	1	203 23 8.1	28 3.8	-41.8	+0 47 51.5	-49.1	0.206 5928	-2653
	3	204 19 19.7	28 7.9	-40.7	+0 46 12.8	-49.6	0.206 0581	-2694

FOR GREENWICH MEAN NOON.

Date.		Heliocentric Longitude, Mean Equinox of Date.	Var. per Day.	Reduction to Orbit.	Heliocentric Latitude.	Var. per Day.	Logarithm of Radius Vector.	Var. per Day.
		° ' "	' "	"	° ' "	"		
July	1	203 23 8.1	28 3.8	-41.8	+0 47 51.5	-49.1	0.206 5928	-2653
	3	204 19 19.7	28 7.9	40.7	0 46 12.8	49.6	0.206 0581	2604
	5	205 15 39.6	28 12.1	39.5	0 44 33.2	50.0	0.205 5152	2734
	7	206 12 8.1	28 16.4	38.3	0 42 52.6	50.5	0.204 9643	2774
	9	207 8 45.1	28 20.7	37.0	0 41 11.1	51.0	0.204 4055	2813
	11	208 5 30.9	28 25.1	-35.7	+0 39 28.6	-51.5	0.203 8390	-2852
	13	209 2 25.6	28 29.6	34.4	0 37 45.2	51.9	0.203 2647	2890
	15	209 59 29.4	28 34.2	33.0	0 36 0.9	52.4	0.202 6828	2928
	17	210 56 42.4	28 38.8	31.6	0 34 15.7	52.8	0.202 0935	2965
	19	211 54 4.7	28 43.5	30.1	0 32 29.7	53.2	0.201 4968	3002
	21	212 51 36.5	28 48.3	-28.6	+0 30 42.8	-53.6	0.200 8928	-3038
	23	213 49 18.0	28 53.2	27.0	0 28 55.1	54.0	0.200 2818	3073
	25	214 47 9.3	28 58.1	25.5	0 27 6.6	54.4	0.199 6637	3108
	27	215 45 10.4	29 3.1	23.9	0 25 17.3	54.8	0.199 0387	3142
	29	216 43 21.7	29 8.2	22.2	0 23 27.3	55.2	0.198 4070	3175
	31	217 41 43.1	29 13.3	-20.5	+0 21 36.6	-55.6	0.197 7688	-3208
Aug.	2	218 40 14.9	29 18.5	18.8	0 19 45.1	55.9	0.197 1240	3240
	4	219 38 57.2	29 23.8	17.1	0 17 52.9	56.2	0.196 4730	3271
	6	220 37 50.0	29 29.1	15.3	0 16 0.1	56.5	0.195 8158	3301
	8	221 36 53.5	29 34.5	13.6	0 14 6.7	56.8	0.195 1527	3330
	10	222 36 8.0	29 40.0	-11.8	+0 12 12.7	-57.1	0.194 4836	-3360
	12	223 35 33.4	29 45.5	9.9	0 10 18.1	57.4	0.193 8089	3388
	14	224 35 10.0	29 51.1	8.1	0 8 22.9	57.7	0.193 1286	3415
	16	225 34 57.9	29 56.7	6.2	0 6 27.3	57.9	0.192 4429	3442
	18	226 34 57.0	30 2.5	4.4	0 4 31.2	58.3	0.191 7520	3467
	20	227 35 7.8	30 8.3	- 2.5	+0 2 34.6	-58.4	0.191 0561	-3492
	22	228 35 30.1	30 14.1	- 0.6	+0 0 37.6	58.6	0.190 3554	3518
	24	229 36 4.1	30 20.0	+ 1.3	-0 1 19.8	58.8	0.189 6500	3538
	26	230 36 50.1	30 26.0	3.2	0 3 17.6	59.0	0.188 9401	3560
	28	231 37 48.0	30 32.0	5.1	0 5 15.7	59.1	0.188 2260	3581
	30	232 38 57.9	30 38.0	+ 7.0	-0 7 14.0	-59.2	0.187 5078	-3601
Sept.	1	233 40 20.1	30 44.2	8.9	0 9 12.7	59.4	0.186 7857	3620
	3	234 41 54.6	30 50.4	10.8	0 11 11.5	59.5	0.186 0599	3638
	5	235 43 41.5	30 56.6	12.7	0 13 10.5	59.6	0.185 3306	3655
	7	236 45 40.9	31 2.8	14.5	0 15 9.7	59.6	0.184 5981	3670
	9	237 47 52.9	31 9.2	+16.4	-0 17 9.0	-59.6	0.183 8625	-3685
	11	238 50 17.6	31 15.6	18.3	0 19 8.3	59.6	0.183 1242	3698
	13	239 52 55.1	31 22.0	20.1	0 21 7.6	59.7	0.182 3832	3711
	15	240 55 45.5	31 28.4	21.9	0 23 7.0	59.7	0.181 6398	3722
	17	241 58 48.9	31 35.0	23.7	0 25 6.3	59.6	0.180 8943	3732
	19	243 2 5.4	31 41.5	+25.4	-0 27 5.4	-59.6	0.180 1470	-3741
	21	244 5 35.0	31 48.1	27.2	0 29 4.5	59.5	0.179 3980	3748
	23	245 9 17.8	31 54.7	28.9	0 31 3.4	59.4	0.178 6476	3755
	25	246 13 13.8	32 1.4	30.6	0 33 2.0	59.2	0.177 8961	3760
	27	247 17 23.2	32 8.1	32.2	0 35 0.4	59.1	0.177 1437	3764
	29	248 21 46.1	32 14.8	+33.8	-0 36 58.5	-58.9	0.176 3907	-3766
Oct.	1	249 26 22.3	32 21.5	+35.3	-0 38 56.1	-58.7	0.175 6373	-3767

FOR GREENWICH MEAN NOON.

Date.		Helioentric Longitude, Mean Equinox of Date.	Var. per Day.	Reduction to Orbit.	Helioentric Latitude.	Var. per Day.	Logarithm of Radius Vector.	Var. per Day.
		" ' "	" "	"	" ' "	"		
Oct.	1	249 26 22.3	32 21.5	+35.3	-0 38 58.1	-58.7	0.175 6373	-3767
	3	250 31 12.1	32 28.3	36.8	0 40 53.4	58.5	0.174 8839	3766
	5	251 36 15.5	32 35.1	38.3	0 42 50.1	58.2	0.174 1307	3765
	7	252 41 32.5	32 41.9	39.7	0 44 46.4	58.0	0.173 3780	3762
	9	253 47 3.1	32 48.7	41.0	0 46 42.0	57.7	0.172 6260	3758
	11	254 52 47.4	32 55.6	+42.3	-0 48 37.1	-57.4	0.171 8750	-3752
	13	255 58 45.4	33 2.4	43.6	0 50 31.5	57.0	0.171 1254	3744
	15	257 4 57.2	33 9.3	44.8	0 52 25.1	56.6	0.170 3775	3735
	17	258 11 22.7	33 16.2	45.9	0 54 18.0	56.2	0.169 6314	3725
	19	259 18 2.0	33 23.1	46.9	0 56 10.1	55.8	0.168 8876	3713
	21	260 24 55.1	33 30.0	+47.9	-0 58 1.3	-55.3	0.168 1463	-3699
	23	261 32 1.9	33 36.8	48.8	0 59 51.5	54.8	0.167 4079	3684
	25	262 39 22.5	33 43.7	49.7	1 1 40.7	54.3	0.166 6726	3668
	27	263 46 56.8	33 50.6	50.4	1 3 28.8	53.8	0.165 9409	3649
	29	264 54 44.7	33 57.4	51.2	1 5 15.9	53.2	0.165 2129	3629
	31	266 2 46.5	34 4.3	+51.8	-1 7 1.8	-52.6	0.164 4891	-3608
Nov.	2	267 11 1.8	34 11.1	52.3	1 8 46.4	52.0	0.163 7697	3585
	4	268 19 30.9	34 17.9	52.8	1 10 29.8	51.4	0.163 0550	3560
	6	269 28 13.5	34 24.7	53.1	1 12 11.8	50.7	0.162 3455	3534
	8	270 37 9.6	34 31.4	53.4	1 13 52.4	49.9	0.161 6414	3506
	10	271 46 19.2	34 38.1	+53.6	-1 15 31.5	-49.2	0.160 9431	-3476
	12	272 55 42.1	34 44.8	53.8	1 17 9.1	48.4	0.160 2509	3445
	14	274 5 18.5	34 51.5	53.8	1 18 45.1	47.6	0.159 5651	3412
	16	275 15 8.0	34 58.0	53.7	1 20 19.5	46.8	0.158 8861	3377
	18	276 25 10.6	35 4.6	53.6	1 21 52.2	45.9	0.158 2142	3341
	20	277 35 26.3	35 11.1	+53.4	-1 23 23.1	-45.0	0.157 5498	-3302
Dec.	22	278 45 54.9	35 17.5	53.0	1 24 52.2	44.1	0.156 8932	3263
	24	279 56 36.4	35 23.9	52.6	1 26 19.5	43.1	0.156 2447	3221
	26	281 7 30.5	35 30.2	52.1	1 27 44.7	42.1	0.155 6048	3178
	28	282 18 37.2	35 36.4	51.5	1 29 8.0	41.1	0.154 9736	3133
	30	283 29 56.3	35 42.6	+50.8	-1 30 29.2	-40.1	0.154 3515	-3086
	2	284 41 27.7	35 48.7	50.0	1 31 48.3	39.0	0.153 7390	3038
	4	285 53 11.1	35 54.7	49.2	1 33 5.2	37.9	0.153 1363	2988
	6	287 5 6.6	36 0.6	48.2	1 34 19.9	36.8	0.152 5438	2936
	8	288 17 13.7	36 6.5	47.2	1 35 32.4	35.6	0.151 9617	2883
	10	289 29 32.5	36 12.8	+46.0	-1 36 42.5	-34.4	0.151 3905	-2828
	12	290 42 2.7	36 17.9	44.8	1 37 50.2	33.2	0.150 8305	2771
	14	291 54 44.1	36 23.4	43.5	1 38 55.4	32.0	0.150 2820	2713
	16	293 7 36.4	36 28.9	42.1	1 39 58.2	30.8	0.149 7452	2653
	18	294 20 39.6	36 34.2	40.7	1 40 58.4	29.5	0.149 2206	2592
	20	295 33 53.3	36 39.4	+39.1	-1 41 56.0	-28.1	0.148 7084	-2529
	22	296 47 17.3	36 44.5	37.5	1 42 50.9	26.8	0.148 2089	2465
	24	298 0 51.3	36 49.5	35.9	1 43 43.2	25.4	0.147 7225	2399
	26	299 14 35.2	36 54.4	34.1	1 44 32.7	24.0	0.147 2494	2331
	28	300 28 28.7	36 59.1	32.3	1 45 19.4	22.6	0.146 7900	2262
	30	301 42 31.6	37 3.7	+30.4	-1 46 3.3	-21.2	0.146 3445	-2192
	32	302 56 43.4	37 8.1	+28.5	-1 46 44.3	-19.8	0.145 9131	-2120

GREENWICH MEAN TIME.

Date.	Apparent Right Ascension.			Var. per Hour.	Apparent Declination.			Var. per Hour.	Logarithm of Distance from Earth.	Var. per Hour.	Polar Semi- diam- eter.	Hor. Paral- lax.	Transit, Meridian of Green- wich.	
	Noon.			Noon.	Noon.			Noon.	Noon.	Noon.	Noon.	Noon.		
Jan.		h	m	s	s	°	'	"	"		"	"	h	m
	1	23	33	35.59	+1.317	—4	12	53.6	+ 9.04	0.712 7957	+530.3	18.23	1.70	4 53.6
	2	23	34	7.45	1.338	4	9	14.8	9.18	0.714 0635	526.2	18.18	1.70	4 50.2
	3	23	34	39.83	1.360	4	5	32.8	9.32	0.715 3214	522.1	18.13	1.70	4 46.8
	4	23	35	12.73	1.381	4	1	47.5	9.45	0.716 5693	517.8	18.08	1.69	4 43.4
	5	23	35	46.13	1.402	3	57	59.0	9.59	0.717 8069	513.5	18.03	1.69	4 40.1
	6	23	36	20.03	+1.423	—3	54	7.3	+ 9.72	0.719 0340	+509.1	17.98	1.68	4 36.7
	7	23	36	54.42	1.443	3	50	12.5	9.84	0.720 2504	504.6	17.92	1.68	4 33.3
	8	23	37	29.29	1.463	3	46	14.8	9.97	0.721 4558	499.9	17.87	1.67	4 30.0
	9	23	38	4.64	1.483	3	42	13.9	10.10	0.722 6500	495.2	17.82	1.67	4 26.6
	10	23	38	40.45	1.502	3	38	10.1	10.22	0.723 8330	490.5	17.78	1.66	4 23.3
	11	23	39	16.72	+1.521	—3	34	3.5	+10.34	0.725 0046	+485.8	17.73	1.66	4 20.0
	12	23	39	53.44	1.539	3	29	54.0	10.45	0.726 1646	480.9	17.68	1.65	4 16.7
	13	23	40	30.61	1.558	3	25	41.7	10.57	0.727 3129	476.0	17.63	1.65	4 13.3
	14	23	41	8.21	1.575	3	21	26.7	10.68	0.728 4494	471.1	17.59	1.65	4 10.0
	15	23	41	46.23	1.593	3	17	9.0	10.79	0.729 5740	466.1	17.54	1.64	4 6.7
	16	23	42	24.67	+1.610	—3	12	48.6	+10.90	0.730 6865	+461.0	17.50	1.64	4 3.4
	17	23	43	3.53	1.628	3	8	25.6	11.01	0.731 7868	455.9	17.45	1.33	4 0.2
	18	23	43	42.79	1.644	3	4	0.1	11.11	0.732 8749	450.8	17.41	1.63	3 56.9
	19	23	44	22.45	1.661	2	59	32.1	11.22	0.733 9506	445.6	17.37	1.62	3 53.6
	20	23	45	2.50	1.677	2	55	1.6	11.32	0.735 0139	440.4	17.32	1.62	3 50.3
	21	23	45	42.95	+1.693	—2	50	28.6	+11.43	0.736 0646	+435.2	17.28	1.62	3 47.1
	22	23	46	23.77	1.709	2	45	53.2	11.52	0.737 1027	429.9	17.24	1.61	3 43.8
	23	23	47	4.96	1.724	2	41	15.5	11.62	0.738 1281	424.6	17.20	1.61	3 40.6
	24	23	47	46.52	1.739	2	36	35.5	11.71	0.739 1407	419.2	17.16	1.60	3 37.3
	25	23	48	28.45	1.754	2	31	53.2	11.81	0.740 1404	413.8	17.12	1.60	3 34.1
	26	23	49	10.73	+1.769	—2	27	8.7	+11.90	0.741 1270	+408.4	17.08	1.60	3 30.9
	27	23	49	53.36	1.784	2	22	22.0	11.99	0.742 1006	402.9	17.04	1.59	3 27.6
	28	23	50	36.34	1.798	2	17	33.1	12.08	0.743 0610	397.4	17.01	1.59	3 24.4
	29	23	51	19.65	1.812	2	12	42.1	12.17	0.744 0081	391.8	16.97	1.59	3 21.2
	30	23	52	3.30	1.825	2	7	49.0	12.25	0.744 9418	386.2	16.93	1.58	3 18.0
Feb.	31	23	52	47.27	+1.839	—2	2	53.9	+12.34	0.745 8619	+380.6	16.90	1.58	3 14.8
	1	23	53	31.57	1.852	1	57	56.7	12.42	0.746 7685	374.9	16.86	1.58	3 11.6
	2	23	54	16.18	1.865	1	52	57.6	12.50	0.747 6613	369.1	16.83	1.57	3 8.4
	3	23	55	1.10	1.878	1	47	56.7	12.58	0.748 5403	363.4	16.79	1.57	3 5.2
	4	23	55	46.32	1.890	1	42	53.9	12.65	0.749 4055	357.6	16.76	1.57	3 2.1
	5	23	56	31.84	+1.903	—1	37	49.4	+12.73	0.750 2536	+351.7	16.73	1.56	2 58.9
	6	23	57	17.64	1.914	1	32	43.1	12.80	0.751 0936	345.8	16.70	1.56	2 55.7
	7	23	58	3.72	1.926	1	27	35.2	12.87	0.751 9164	339.9	16.66	1.56	2 52.5
	8	23	58	50.08	1.937	1	22	25.5	12.94	0.752 7250	334.0	16.63	1.53	2 49.4
	9	23	59	36.71	1.948	1	17	14.2	13.00	0.753 5195	328.1	16.60	1.55	2 46.2
	10	0	0	23.59	+1.959	—1	12	1.4	+13.07	0.754 2996	+322.1	16.57	1.55	2 43.1
	11	0	1	10.74	1.970	1	6	47.0	13.13	0.755 0655	316.2	16.54	1.55	2 39.9
	12	0	1	58.13	1.980	1	1	31.1	13.19	0.755 8171	310.2	16.51	1.54	2 36.8
	13	0	2	45.77	1.990	0	56	13.8	13.25	0.756 5543	304.2	16.49	1.54	2 33.6
	14	0	3	33.64	1.999	0	50	55.2	13.30	0.757 2772	298.2	16.46	1.54	2 30.5
15	0	4	21.74	+2.009	—0	45	35.2	+13.36	0.757 9857	+292.2	16.43	1.54	2 27.4	
16	0	5	10.07	+2.018	—0	40	13.9	+13.41	0.758 6797	+286.2	16.41	1.53	2 24.2	

GREENWICH MEAN TIME.

Date.	Apparent Right Ascension.			Var. per Hour.	Apparent Declination.			Var. per Hour.	Logarithm of Distance from Earth.	Var. per Hour.	Polar Semi- diam- eter.	Hor. Paral- lax.	Transit, Meridian of Green- wich.			
	Noon.				Noon.											
	h	m	s	s	°	'	"	"	Noon.	Noon.	"	"	h	m		
Feb.	16	0	5	10.07	+2.018	-0	40	13.9	+13.41	0.758 6797	+286.2	16.41	1.53	2	24.2	
	17	0	5	58.62	2.027	0	34	51.4	13.46	0.759 3593	280.1	16.38	1.53	2	21.1	
	18	0	6	47.38	2.036	0	29	27.6	13.52	0.760 0244	274.1	16.36	1.53	2	18.0	
	19	0	7	36.36	2.045	0	24	2.6	13.56	0.760 6751	268.1	13.33	1.53	2	14.9	
	20	0	8	25.54	2.053	0	18	36.5	13.61	0.761 3113	262.1	16.31	1.53	2	11.8	
	21	0	9	14.92	+2.062	-0	13	9.3	+13.66	0.731 9330	+266.0	16.28	1.52	2	8.6	
	22	0	10	4.50	2.070	0	7	41.0	13.70	0.762 5402	250.0	16.26	1.52	2	5.5	
	23	0	10	54.27	2.078	-0	2	11.6	13.75	0.763 1329	243.9	16.24	1.52	2	2.4	
	24	0	11	44.23	2.085	+0	3	18.8	13.79	0.763 7109	237.8	16.22	1.52	1	59.3	
	25	0	12	34.37	2.093	0	8	50.1	13.83	0.764 2744	231.8	16.20	1.52	1	56.2	
Mar.	26	0	13	24.69	+2.100	+0	14	22.4	+13.86	0.764 8233	+225.6	16.18	1.51	1	53.1	
	27	0	14	15.19	2.108	0	19	55.6	13.90	0.765 3575	219.5	16.16	1.51	1	50.0	
	28	0	15	5.85	2.114	0	25	29.7	13.94	0.765 8769	213.4	16.14	1.51	1	46.9	
	29	0	15	56.68	2.121	0	31	4.6	13.97	0.766 3816	207.2	16.12	1.51	1	43.9	
	1	0	16	47.67	2.128	0	36	40.3	14.00	0.766 8715	201.1	16.10	1.51	1	40.8	
	2	0	17	38.81	+2.134	+0	42	16.8	+14.03	0.767 3466	+194.8	16.08	1.50	1	37.7	
	3	0	18	30.10	2.140	0	47	53.9	14.06	0.767 8067	188.6	16.06	1.50	1	34.6	
	4	0	19	21.54	2.146	0	53	31.7	14.09	0.768 2518	182.4	16.05	1.50	1	31.5	
	5	0	20	13.11	2.151	0	59	10.1	14.11	0.768 6820	176.1	16.03	1.50	1	28.4	
	6	0	21	4.81	2.157	1	4	49.1	14.13	0.769 0972	169.9	16.02	1.50	1	25.4	
	7	0	21	56.64	+2.162	+1	10	28.5	+14.15	0.769 4974	+163.6	16.00	1.50	1	22.3	
	8	0	22	48.59	2.167	1	16	8.5	14.18	0.769 8827	157.4	15.99	1.50	1	19.2	
	9	0	23	40.65	2.172	1	21	48.9	14.19	0.770 2530	151.2	15.97	1.49	1	16.2	
	10	0	24	32.83	2.176	1	27	29.7	14.21	0.770 6084	145.0	15.96	1.49	1	13.1	
	11	0	25	25.11	2.180	1	33	10.8	14.22	0.770 9489	138.8	15.95	1.49	1	10.0	
	12	0	26	17.49	+2.185	+1	38	52.3	+14.23	0.771 2744	+132.5	15.94	1.49	1	7.0	
	13	0	27	9.97	2.189	1	44	34.0	14.24	0.771 5850	126.3	15.92	1.49	1	3.9	
	14	0	28	2.54	2.192	1	50	16.0	14.26	0.771 8807	120.1	15.91	1.49	1	0.8	
	15	0	28	55.20	2.196	1	55	58.3	14.26	0.772 1616	113.9	15.90	1.49	0	57.8	
	16	0	29	47.94	2.199	2	1	40.7	14.27	0.772 4276	107.8	15.89	1.49	0	54.7	
	17	0	30	40.76	+2.202	+2	7	23.2	+14.28	0.772 6789	+101.6	15.88	1.49	0	51.7	
	18	0	31	33.65	2.205	2	13	5.9	14.28	0.772 9153	95.4	15.88	1.49	0	48.6	
	19	0	32	26.61	2.208	2	18	48.6	14.28	0.773 1370	89.3	15.87	1.48	0	45.6	
	20	0	33	19.64	2.211	2	24	31.4	14.28	0.773 3439	83.1	15.86	1.48	0	42.5	
	21	0	34	12.73	2.213	2	30	14.2	14.28	0.773 5361	77.0	15.85	1.48	0	39.5	
	22	0	35	5.88	+2.216	+2	35	57.0	+14.28	0.773 7136	+70.9	15.85	1.48	0	36.4	
	23	0	35	59.08	2.218	2	41	39.8	14.28	0.773 8763	64.7	15.84	1.48	0	33.4	
	24	0	36	52.34	2.220	2	47	22.5	14.28	0.774 0243	58.6	15.84	1.48	0	30.3	
	25	0	37	45.65	2.222	2	53	5.1	14.27	0.774 1575	52.4	15.83	1.48	0	27.3	
	26	0	38	39.00	2.224	2	58	47.5	14.26	0.774 2759	46.3	15.83	1.48	0	24.2	
	27	0	39	32.39	+2.225	+3	4	29.8	+14.26	0.774 3796	+40.1	15.82	1.48	0	21.2	
	28	0	40	25.82	2.227	3	10	11.9	14.25	0.774 4685	33.9	15.82	1.48	0	18.1	
	29	0	41	19.28	2.228	3	15	53.8	14.24	0.774 5425	27.7	15.82	1.48	0	15.1	
	30	0	42	12.77	2.229	3	21	35.4	14.23	0.774 6016	21.5	15.82	1.48	0	12.0	
	31	0	43	6.28	2.230	3	27	16.6	14.21	0.774 6459	15.3	15.81	1.48	0	9.0	
	Apr.	1	0	43	59.81	+2.231	+3	32	57.5	+14.20	0.774 6752	+9.1	15.81	1.48	0	5.9
		2	0	44	53.35	+2.231	+3	38	38.0	+14.18	0.774 6897	+2.9	15.81	1.48	0	2.9

GREENWICH MEAN TIME.

Date.	Apparent Right Ascension.			Var. per Hour.	Apparent Declination.			Var. per Hour.	Logarithm of Distance from Earth.	Var. per Hour.	Polar Semi-diameter.	Hor. Parallax.	Transit, Meridian of Greenwich.			
	Noon.			Noon.	Noon.			Noon.	Noon.	Noon.	Noon.	Noon.				
	h	m	s	s	°	'	"	"			"	"	h	m	s	
Apr.	1	0	43	59.81	+2.231	+3	32	57.5	+14.20	0.774 6752	+ 9.1	15.81	1.48	0	5.9	
	2	0	44	53.35	2.231	3	38	38.0	14.18	0.774 6897	+ 2.9	15.81	1.48	{	0 23 56.8	
	3	0	45	46.91	2.231	3	44	18.0	14.16	0.774 6893	- 3.3	15.81	1.48			23 56.8
	4	0	46	40.46	2.231	3	49	57.6	14.14	0.774 6741	9.4	15.81	1.48			23 53.8
	5	0	47	34.01	2.231	3	55	36.7	14.12	0.774 6441	15.6	15.81	1.48	23 50.7		
	6	0	48	27.55	+2.231	+4	1	15.2	+14.09	0.774 5994	- 21.7	15.82	1.48	23 47.7		
	7	0	49	21.09	2.230	4	6	53.1	14.07	0.774 5399	27.8	15.82	1.48	23 44.6		
	8	0	50	14.60	2.229	4	12	30.5	14.04	0.774 4658	33.9	15.82	1.48	23 41.6		
	9	0	51	8.10	2.229	4	18	7.2	14.01	0.774 3770	40.1	15.82	1.48	23 38.5		
	10	0	52	1.57	2.227	4	23	43.1	13.98	0.774 2735	46.2	15.83	1.48	23 35.5		
	11	0	52	55.01	+2.226	+4	29	18.4	+13.95	0.774 1554	- 52.3	15.83	1.48	23 32.4		
	12	0	53	48.41	2.224	4	34	52.9	13.92	0.774 0227	58.3	15.84	1.48	23 29.4		
	13	0	54	41.78	2.223	4	40	26.6	13.89	0.773 8755	64.4	15.84	1.48	23 26.3		
	14	0	55	35.12	2.221	4	45	59.6	13.86	0.773 7138	70.4	15.85	1.48	23 23.3		
	15	0	56	28.41	2.219	4	51	31.7	13.82	0.773 5377	76.4	15.85	1.48	23 20.2		
	16	0	57	21.64	+2.217	+4	57	2.9	+13.78	0.773 3472	- 82.4	15.86	1.48	23 17.2		
	17	0	58	14.82	2.215	5	2	33.3	13.75	0.773 1423	88.4	15.87	1.48	23 14.1		
	18	0	59	7.95	2.213	5	8	2.8	13.71	0.772 9231	94.3	15.88	1.49	23 11.1		
	19	1	0	1.02	2.210	5	13	31.3	13.67	0.772 6896	100.3	15.89	1.49	23 8.0		
	20	1	0	54.03	2.207	5	18	58.8	13.63	0.772 4418	106.2	15.90	1.49	23 5.0		
	21	1	1	46.97	+2.205	+5	24	25.4	+13.59	0.772 1797	-112.2	15.90	1.49	23 1.9		
	22	1	2	39.85	2.201	5	29	51.0	13.54	0.771 9032	118.2	15.92	1.49	22 58.9		
	23	1	3	32.64	2.198	5	35	15.5	13.50	0.771 6125	124.1	15.93	1.49	22 55.8		
	24	1	4	25.36	2.195	5	40	38.9	13.45	0.771 3074	130.1	15.94	1.49	22 52.8		
	25	1	5	18.00	2.191	5	46	1.2	13.41	0.770 9880	136.1	15.95	1.49	22 49.7		
	26	1	6	10.55	+2.188	+5	51	22.4	+13.36	0.770 6543	-142.0	15.95	1.49	22 46.6		
	27	1	7	3.01	2.184	5	56	42.5	13.31	0.770 3063	148.0	15.97	1.49	22 43.6		
	28	1	7	55.38	2.180	6	2	1.3	13.26	0.769 9440	153.9	15.99	1.50	22 40.5		
	29	1	8	47.64	2.175	6	7	18.8	13.20	0.769 5674	159.9	16.00	1.50	22 37.4		
	30	1	9	39.80	2.171	6	12	35.1	13.15	0.769 1765	165.8	16.01	1.50	22 34.4		
May	1	1	10	31.85	+2.166	+6	17	50.1	+13.10	0.768 7713	-171.8	16.03	1.50	22 31.3		
	2	1	11	23.78	2.161	6	23	3.7	13.04	0.768 3520	177.7	16.04	1.50	22 28.2		
	3	1	12	15.59	2.156	6	28	15.9	12.98	0.767 9184	183.6	16.06	1.50	22 25.2		
	4	1	13	7.27	2.151	6	33	26.7	12.92	0.767 4706	189.5	16.08	1.50	22 22.1		
	5	1	13	58.82	2.145	6	38	36.1	12.86	0.767 0088	195.3	16.09	1.50	22 19.0		
	6	1	14	50.24	+2.139	+6	43	44.0	+12.80	0.766 5330	-201.1	16.11	1.51	22 15.9		
	7	1	15	41.51	2.133	6	48	50.4	12.74	0.766 0433	207.0	16.13	1.51	22 12.8		
	8	1	16	32.34	2.127	6	53	55.3	12.67	0.765 5396	212.8	16.15	1.51	22 9.8		
	9	1	17	23.62	2.121	6	58	58.6	12.60	0.765 0221	218.5	16.17	1.51	22 6.7		
	10	1	18	14.44	2.114	7	4	0.3	12.54	0.764 4908	224.3	16.19	1.51	22 3.6		
	11	1	19	5.10	+2.108	+7	9	0.4	+12.47	0.763 9457	-230.0	16.21	1.52	22 0.5		
	12	1	19	55.60	2.101	7	13	58.9	12.40	0.763 3869	235.7	16.23	1.52	21 57.4		
	13	1	20	45.93	2.093	7	18	55.7	12.33	0.762 8144	241.4	16.25	1.52	21 54.3		
	14	1	21	36.08	2.086	7	23	50.8	12.26	0.762 2284	247.0	16.27	1.52	21 51.2		
	15	1	22	26.06	2.079	7	28	44.2	12.19	0.761 6289	252.6	16.30	1.52	21 48.1		
	16	1	23	15.86	+2.071	+7	33	35.8	+12.11	0.761 0159	-258.2	16.32	1.53	21 45.0		
	17	1	24	5.48	+2.063	+7	38	25.7	+12.04	0.760 3894	-263.8	16.34	1.53	21 41.9		

GREENWICH MEAN TIME.

Date.	Apparent Right Ascension.			Var. per Hour.	Apparent Declination.			Var. per Hour.	Logarithm of Distance from Earth.	Var. per Hour.	Polar Semi-diameter.	Hor. Parallax.	Transit, Meridian of Greenwich.
	Hours.	Minutes.	Seconds.		Hours.	Minutes.	Seconds.						
May	17	1 24	5.48	+2.063	+ 7 38	25.7	+12.04	0.760 3894	-263.8	16.34	1.53	21 41.9	
	18	1 24	54.90	2.055	7 43	13.9	11.97	0.759 7495	269.4	16.36	1.53	21 38.7	
	19	1 25	44.13	2.047	7 48	0.3	11.89	0.759 0961	275.0	16.39	1.53	21 35.6	
	20	1 26	33.17	2.039	7 52	44.8	11.82	0.758 4294	280.6	16.42	1.53	21 32.5	
	21	1 27	22.00	2.030	7 57	27.5	11.74	0.757 7493	286.1	16.44	1.54	21 29.4	
	22	1 28	10.63	+2.022	+ 8 2	8.3	+11.66	0.757 0559	-291.7	16.47	1.54	21 26.2	
	23	1 28	59.05	2.013	8 6	47.2	11.58	0.756 3492	297.2	16.49	1.54	21 23.1	
	24	1 29	47.25	2.004	8 11	24.2	11.50	0.755 6293	302.8	16.52	1.55	21 20.0	
	25	1 30	35.22	1.994	8 15	59.1	11.41	0.754 8960	308.3	16.55	1.55	21 16.8	
	26	1 31	22.96	1.984	8 20	32.1	11.33	0.754 1496	313.8	16.58	1.55	21 13.7	
	27	1 32	10.47	+1.975	+ 8 25	3.1	+11.25	0.753 3897	-319.3	13.61	1.55	21 10.6	
	28	1 32	57.75	1.965	8 29	31.9	11.16	0.752 6168	324.8	16.64	1.56	21 7.4	
June	1	1 33	44.77	1.954	8 33	58.7	11.07	0.751 8308	330.2	16.67	1.51	21 4.2	
	2	1 34	31.54	1.943	8 38	23.4	10.98	0.751 0317	335.6	16.70	1.56	21 1.1	
	3	1 35	18.05	1.933	8 42	45.9	10.89	0.750 2197	341.0	16.73	1.56	20 57.9	
	4	1 36	4.30	+1.921	+ 8 47	6.2	+10.80	0.749 3947	-346.4	16.76	1.57	20 54.8	
	5	1 36	50.27	1.910	8 51	24.3	10.71	0.748 5570	351.7	16.79	1.57	20 51.6	
	6	1 37	35.97	1.898	8 55	40.2	10.61	0.747 7065	357.0	16.83	1.57	20 48.4	
	7	1 38	21.39	1.886	8 59	53.8	10.52	0.746 8434	362.2	16.86	1.58	20 45.2	
	8	1 39	6.51	1.874	9 4	5.1	10.42	0.745 9678	367.4	16.89	1.58	20 42.0	
	9	1 39	51.34	+1.862	+ 9 8	14.1	+10.33	0.745 0797	-372.6	16.93	1.58	20 38.9	
	10	1 40	35.87	1.849	9 12	20.7	10.23	0.744 1793	377.7	16.96	1.59	20 35.7	
	11	1 41	29.10	1.836	9 16	25.0	10.13	0.743 2666	382.8	17.00	1.59	20 32.5	
	12	1 42	4.02	1.823	9 20	26.9	10.03	0.742 3417	387.9	17.03	1.59	20 29.2	
July	1	1 42	47.62	1.810	9 24	26.4	9.93	0.741 4047	392.9	17.07	1.60	20 26.0	
	2	1 43	30.89	+1.796	+ 9 28	28.4	+ 9.83	0.740 4557	-397.9	17.11	1.60	20 22.8	
	3	1 44	13.84	1.783	9 32	18.0	9.72	0.739 4948	402.8	17.15	1.60	20 19.6	
	4	1 44	56.45	1.769	9 36	10.1	9.62	0.738 5221	407.7	17.19	1.61	20 16.3	
	5	1 45	38.73	1.754	9 39	59.7	9.51	0.737 5377	412.6	17.22	1.61	20 13.1	
	6	1 46	20.66	1.740	9 43	46.8	9.41	0.736 5416	417.5	17.26	1.61	20 9.9	
	7	1 47	2.25	+1.725	+ 9 47	31.4	+ 9.30	0.735 5339	-422.3	17.30	1.62	20 6.6	
	8	1 47	43.48	1.710	9 51	13.4	9.19	0.734 5147	427.0	17.34	1.62	20 3.4	
	9	1 48	24.35	1.695	9 54	52.9	9.09	0.733 4841	431.8	17.39	1.63	20 0.1	
	10	1 49	4.86	1.680	9 58	29.7	8.98	0.732 4422	436.5	17.43	1.63	19 56.8	
	11	1 49	45.00	1.665	10 2	3.9	8.87	0.731 3889	441.2	17.47	1.63	19 53.6	
	12	1 50	24.76	+1.649	+10 5	35.4	+ 8.76	0.730 3245	-445.8	17.51	1.64	19 50.3	

GREENWICH MEAN TIME.

Date.	Apparent Right Ascension.			Var. per Hour.	Apparent Declination.			Var. per Hour.	Logarithm of Distance from Earth.	Var. per Hour.	Polar Semi- diam- eter.	Hor. Paral- lax.	Transit, Meridian of Green- wich.
	Noon.			Noon.	Noon.			Noon.	Noon.	Noon.	Noon.	Noon.	
July	1	h m s	s	"	"	"	"	"	"	"	"	"	h m
	1	1 56 39.87	+1.472	+10 38 17.3	+7.57	0.719 0845	-489.8	17.97	1.68	19 17.1			
	2	1 57 14.98	1.453	10 41 17.6	7.45	0.717 9040	493.9	18.02	1.69	19 13.8			
	3	1 57 49.62	1.434	10 44 14.8	7.32	0.716 7138	497.9	18.07	1.69	19 10.4			
	4	1 58 23.79	1.414	10 47 9.1	7.20	0.715 5142	501.8	18.12	1.69	19 7.0			
	5	1 58 57.47	1.393	10 50 -0.2	7.07	0.714 3053	505.6	18.17	1.70	19 3.3			
	6	1 59 30.67	+1.373	+10 52 48.3	+6.94	0.713 0873	-509.4	18.22	1.70	19 0.3			
	7	2 0 3.37	1.352	10 55 33.3	6.81	0.711 8604	513.0	18.27	1.71	18 56.9			
	8	2 0 35.58	1.331	10 58 15.2	6.68	0.710 6247	516.6	18.33	1.71	18 53.5			
	9	2 1 7.27	1.310	11 0 54.0	6.55	0.709 3806	520.1	18.38	1.72	18 50.1			
	10	2 1 38.45	1.289	11 3 29.6	6.42	0.708 1282	523.6	18.43	1.72	18 46.7			
	11	2 2 9.12	+1.267	+11 6 2.0	+6.29	0.706 8675	-526.9	18.48	1.73	18 43.2			
	12	2 2 39.26	1.245	11 8 31.3	6.15	0.705 5989	530.2	18.54	1.73	18 39.8			
	13	2 3 8.86	1.223	11 10 57.4	6.02	0.704 3225	533.4	18.59	1.74	18 36.3			
	14	2 3 37.94	1.200	11 13 20.3	5.89	0.703 0385	536.6	18.65	1.74	18 32.9			
	15	2 4 6.47	1.177	11 15 39.9	5.75	0.701 7470	539.7	18.70	1.75	18 29.4			
	16	2 4 34.44	+1.154	+11 17 56.2	+5.61	0.700 4482	-542.6	18.76	1.75	18 25.9			
	17	2 5 1.86	1.131	11 20 9.2	5.47	0.699 1424	545.5	18.82	1.76	18 22.5			
	18	2 5 28.72	1.107	11 22 18.9	5.33	0.697 8297	548.4	18.87	1.76	18 19.0			
	19	2 5 55.00	1.083	11 24 25.3	5.20	0.696 5102	551.1	18.93	1.77	18 15.5			
	20	2 6 20.70	1.059	11 26 28.3	5.05	0.695 1843	553.8	18.99	1.78	18 11.9			
	21	2 6 45.81	+1.034	+11 28 27.9	+4.91	0.693 8521	-556.4	19.05	1.78	18 8.4			
	22	2 7 10.33	1.009	11 30 24.1	4.77	0.692 5139	558.8	19.11	1.79	18 4.9			
	23	2 7 34.24	0.984	11 32 16.8	4.62	0.691 1698	561.2	19.16	1.79	18 1.3			
	24	2 7 57.55	0.958	11 34 6.0	4.48	0.689 8203	563.4	19.22	1.80	17 57.8			
	25	2 8 20.23	0.932	11 35 51.7	4.33	0.688 4655	565.5	19.28	1.80	17 54.2			
	26	2 8 42.28	+0.906	+11 37 33.8	+4.18	0.687 1058	-567.5	19.34	1.81	17 50.6			
	27	2 9 3.70	0.879	11 39 12.4	4.04	0.685 7414	569.4	19.41	1.82	17 47.0			
	28	2 9 24.47	0.852	11 40 47.5	3.89	0.684 3727	571.2	19.47	1.82	17 43.5			
	29	2 9 44.60	0.825	11 42 18.9	3.73	0.682 9999	572.8	19.53	1.83	17 39.9			
	30	2 10 4.07	0.798	11 43 46.7	3.58	0.681 6234	574.3	19.59	1.83	17 36.2			
Aug.	31	2 10 22.88	+0.770	+11 45 10.8	+3.43	0.680 2435	-575.6	19.65	1.84	17 32.6			
	1	2 10 41.02	0.742	11 46 31.3	3.28	0.678 8607	576.8	19.72	1.84	17 29.0			
	2	2 10 58.48	0.713	11 47 48.2	3.13	0.677 4752	577.8	19.78	1.85	17 25.3			
	3	2 11 15.26	0.685	11 49 1.3	2.97	0.676 0875	578.6	19.84	1.86	17 21.7			
	4	2 11 31.34	0.656	11 50 10.7	2.81	0.674 6978	579.3	19.91	1.86	17 18.0			
	5	2 11 46.74	+0.627	+11 51 16.4	+2.66	0.673 3066	-579.9	19.97	1.87	17 14.3			
	6	2 12 1.44	0.598	11 52 18.3	2.50	0.671 9142	580.3	20.03	1.87	17 10.6			
	7	2 12 15.45	0.569	11 53 16.5	2.35	0.670 5209	580.6	20.10	1.88	17 6.9			
	8	2 12 28.75	0.540	11 54 11.0	2.19	0.669 1272	580.8	20.16	1.89	17 3.2			
	9	2 12 41.35	0.510	11 55 1.8	2.04	0.667 7334	580.7	20.23	1.89	16 59.4			
	10	2 12 53.22	+0.480	+11 55 48.7	+1.88	0.666 3398	-580.5	20.29	1.90	16 55.7			
	11	2 13 4.38	0.450	11 56 31.9	1.72	0.664 9469	580.2	20.36	1.90	16 51.9			
	12	2 13 14.81	0.419	11 57 11.2	1.56	0.663 5549	579.7	20.42	1.91	16 48.2			
	13	2 13 24.51	0.389	11 57 46.8	1.40	0.662 1644	579.1	20.49	1.92	16 44.4			
	14	2 13 33.47	0.358	11 58 18.5	1.24	0.660 7755	578.3	20.55	1.92	16 40.6			
	15	2 13 41.70	+0.327	+11 58 46.4	+1.08	0.659 3887	-577.3	20.62	1.93	16 36.8			
	16	2 13 49.18	+0.296	+11 59 10.4	+0.92	0.658 0045	-576.1	20.69	1.93	16 33.0			

GREENWICH MEAN TIME.

Date.	Apparent Right Ascension.			Var. per Hour.	Apparent Declination.			Var. per Hour.	Logarithm of Distance from Earth.	Var. per Hour.	Polar Semi-diameter.	Hor. Parallax.	Transit, Meridian of Greenwich.
	h	m	s		°	'	"							h	m
Aug.	16	2 13 49.18	+0.296	+11 59 10.4	+0.92	0.658 0045	-576.1	20.69	1.93	16 33.0			
	17	2 13 55.92	0.265	11 59 30.5	0.76	0.656 6233	574.8	20.75	1.94	16 29.1			
	18	2 14 1.90	0.234	11 59 46.8	0.60	0.655 2455	573.3	20.82	1.95	16 25.3			
	19	2 14 7.13	0.202	11 59 59.2	0.43	0.653 8715	571.6	20.88	1.95	16 21.5			
	20	2 14 11.60	0.170	12 0 7.6	0.27	0.652 5018	569.7	20.95	1.96	16 17.6			
	21	2 14 15.30	+0.138	+12 0 12.2	+0.11	0.651 1370	-567.6	21.02	1.97	16 13.7			
	22	2 14 18.24	0.106	12 0 12.8	-0.06	0.649 7774	565.3	21.08	1.97	16 9.8			
	23	2 14 20.40	0.074	12 0 9.4	0.22	0.648 4236	562.8	21.15	1.98	16 5.9			
	24	2 14 21.79	0.042	12 0 2.1	0.39	0.647 0762	560.0	21.21	1.98	16 2.0			
	25	2 14 22.41	+0.010	11 59 50.9	0.55	0.645 7356	557.1	21.28	1.99	15 58.1			
	26	2 14 22.25	-0.023	+11 59 35.7	-0.72	0.644 4024	-553.9	21.34	2.00	15 54.1			
	27	2 14 21.31	0.055	11 59 16.5	0.88	0.643 0772	550.4	21.41	2.00	15 50.2			
	28	2 14 19.59	0.088	11 58 53.5	1.04	0.641 7604	546.8	21.47	2.01	15 46.2			
	29	2 14 17.09	0.120	11 58 26.5	1.21	0.640 4527	542.9	21.54	2.01	15 42.2			
	30	2 14 13.81	0.153	11 57 55.6	1.37	0.639 1547	538.8	21.60	2.02	15 38.2			
Sept.	31	2 14 9.75	-0.185	+11 57 20.8	-1.53	0.637 8669	-534.4	21.67	2.03	15 34.2			
	1	2 14 4.92	0.218	11 56 42.1	1.69	0.636 5899	529.8	21.73	2.03	15 30.2			
	2	2 13 59.31	0.250	11 55 59.6	1.85	0.635 3243	524.9	21.80	2.04	15 26.2			
	3	2 13 52.94	0.281	11 55 13.2	2.01	0.634 0706	519.8	21.86	2.04	15 22.1			
	4	2 13 45.80	0.313	11 54 23.0	2.17	0.632 8293	514.5	21.92	2.05	15 18.1			
	5	2 13 37.90	-0.345	+11 53 29.0	-2.33	0.631 6010	-509.0	21.98	2.06	15 14.0			
	6	2 13 29.24	0.376	11 52 31.2	2.49	0.630 3863	503.2	22.04	2.06	15 9.9			
	7	2 13 19.83	0.408	11 51 29.6	2.64	0.629 1857	497.2	22.10	2.07	15 5.8			
	8	2 13 9.67	0.439	11 50 24.3	2.80	0.627 9999	490.9	22.17	2.07	15 1.7			
	9	2 12 58.76	0.470	11 49 15.3	2.95	0.626 8294	484.5	22.23	2.08	14 57.6			
	10	2 12 47.11	-0.500	+11 48 2.6	-3.11	0.625 6747	-477.8	22.28	2.08	14 53.5			
	11	2 12 34.74	0.531	11 46 46.2	3.26	0.624 5363	470.9	22.34	2.09	14 49.3			
	12	2 12 21.64	0.561	11 45 26.2	3.41	0.623 4147	463.8	22.40	2.09	14 45.2			
	13	2 12 7.81	0.591	11 44 2.7	3.55	0.622 3105	456.4	22.46	2.10	14 41.0			
	14	2 11 53.27	0.620	11 42 35.6	3.70	0.621 2243	448.8	22.52	2.11	14 36.8			
	15	2 11 38.03	-0.650	+11 41 5.0	-3.85	0.620 1567	-440.9	22.57	2.11	14 32.6			
	16	2 11 22.08	0.679	11 39 30.9	3.99	0.619 1083	432.8	22.62	2.12	14 28.4			
	17	2 11 5.44	0.708	11 37 53.3	4.14	0.618 0796	424.4	22.68	2.12	14 24.2			
	18	2 10 48.12	0.736	11 36 12.3	4.28	0.617 0713	415.8	22.73	2.13	14 20.0			
	19	2 10 30.12	0.764	11 34 28.0	4.41	0.616 0839	407.0	22.78	2.13	14 15.7			
	20	2 10 11.45	-0.791	+11 32 40.4	-4.55	0.615 1181	-397.9	22.83	2.14	14 11.5			
	21	2 9 52.13	0.818	11 30 49.5	4.69	0.614 1744	388.5	22.88	2.14	14 7.2			
	22	2 9 32.17	0.845	11 28 55.4	4.82	0.613 2534	378.9	22.93	2.14	14 3.0			
	23	2 9 11.58	0.871	11 26 58.2	4.95	0.612 3558	369.0	22.98	2.15	13 58.7			
	24	2 8 50.37	0.896	11 24 57.9	5.07	0.611 4822	359.0	23.02	2.15	13 54.5			
	25	2 8 28.55	-0.921	+11 22 54.7	-5.19	0.610 6330	-348.6	23.07	2.16	13 50.1			
	26	2 8 6.15	0.945	11 20 48.6	5.31	0.609 8090	338.0	23.11	2.16	13 45.8			
	27	2 7 43.17	0.969	11 18 39.6	5.43	0.609 0107	327.2	23.16	2.17	13 41.5			
	28	2 7 19.63	0.992	11 16 27.9	5.54	0.608 2385	316.2	23.20	2.17	13 37.2			
	29	2 6 55.55	1.015	11 14 13.5	5.65	0.607 4930	305.0	23.24	2.17	13 32.8			
	30	2 6 30.94	-1.036	+11 11 56.5	-5.76	0.606 7748	-293.5	23.28	2.18	13 28.5			
Oct.	1	2 6 5.84	-1.056	+11 9 37.0	-5.86	0.606 0843	-281.9	23.31	2.18	13 24.1			

GREENWICH MEAN TIME.

Date.	Apparent Right Ascension.			Var. per Hour.	Apparent Declination.			Var. per Hour.	Logarithm of Distance from Earth.	Var. per Hour.	Polar Semi- diam- eter.	Hor. Paral- lax.	Transit, Meridian of Green- wich.	
	Noon.			Noon.	Noon.			Noon.	Noon.	Noon.	Noon.	Noon.		
Oct.	h	m	s	s	°	'	"	"			"	"	h	m
	1	2	6	5.84	-1.056	+11	9	37.0	-5.86	0.606 0843	-281.9	23.31	2.18	13 24.1
	2	2	5	40.25	1.076	11	7	15.2	5.96	0.605 4220	270.0	23.35	2.18	13 19.8
	3	2	5	14.19	1.095	11	4	51.1	6.05	0.604 7883	258.0	23.38	2.19	13 15.4
	4	2	4	47.68	1.114	11	2	24.9	6.14	0.604 1836	245.9	23.42	2.19	13 11.0
	5	2	4	20.74	1.131	10	59	56.5	6.23	0.603 6084	233.5	23.45	2.19	13 6.6
	6	2	3	53.39	-1.148	+10	57	26.1	-6.31	0.603 0629	-221.1	23.48	2.20	13 2.2
	7	2	3	25.66	1.163	10	54	53.8	6.38	0.602 5475	208.4	23.50	2.20	12 57.8
	8	2	2	57.56	1.178	10	52	19.8	6.45	0.602 0626	195.6	23.53	2.20	12 53.4
	9	2	2	29.11	1.193	10	49	44.1	6.52	0.601 6086	182.7	23.55	2.20	12 49.0
	10	2	2	0.33	1.206	10	47	6.8	6.58	0.601 1858	169.7	23.58	2.21	12 44.6
	11	2	1	31.24	-1.218	+10	44	28.1	-6.64	0.600 7944	-156.5	23.60	2.21	12 40.2
	12	2	1	1.86	1.230	10	41	48.0	6.70	0.600 4347	143.2	23.62	2.21	12 35.8
	13	2	0	32.22	1.240	10	39	6.6	6.75	0.600 1069	129.9	23.64	2.21	12 31.4
	14	2	0	2.33	1.250	10	36	24.1	6.79	0.599 8113	116.4	23.65	2.21	12 26.9
	15	1	59	32.21	1.259	10	33	40.5	6.83	0.599 5483	102.8	23.67	2.21	12 22.5
	16	1	59	1.89	-1.267	+10	30	56.1	-6.87	0.599 3180	-89.1	23.68	2.21	12 18.1
	17	1	58	31.39	1.274	10	28	10.9	6.90	0.599 1207	75.3	23.69	2.22	12 13.6
	18	1	58	0.74	1.280	10	25	25.0	6.92	0.598 9567	61.4	23.70	2.22	12 9.2
	19	1	57	29.95	1.285	10	22	38.6	6.94	0.598 8261	47.4	23.71	2.22	12 4.7
	20	1	56	59.05	1.290	10	19	51.9	6.95	0.598 7291	33.4	23.71	2.22	12 0.3
	21	1	56	28.06	-1.293	+10	17	4.8	-6.96	0.598 6658	-19.3	23.72	2.22	11 55.9
	22	1	55	57.01	1.295	10	14	17.6	6.97	0.598 6363	- 5.3	23.72	2.22	11 51.4
	23	1	55	25.92	1.296	10	11	30.4	6.96	0.598 6406	+ 8.8	23.72	2.22	11 47.0
	24	1	54	54.83	1.296	10	8	43.4	6.95	0.598 6789	23.0	23.71	2.22	11 42.5
	25	1	54	23.74	1.295	10	5	56.6	6.94	0.598 7512	37.2	23.71	2.22	11 38.1
	26	1	53	52.69	-1.293	+10	3	10.3	-6.92	0.598 8575	+ 51.4	23.70	2.22	11 33.6
	27	1	53	21.71	1.289	10	0	24.5	6.89	0.598 9979	65.5	23.70	2.22	11 29.2
	28	1	52	50.81	1.285	9	57	39.4	6.86	0.599 1721	79.6	23.69	2.22	11 24.8
	29	1	52	20.02	1.280	9	54	55.2	6.82	0.599 3802	93.7	23.68	2.21	11 20.3
	30	1	51	49.38	1.274	9	52	11.9	6.78	0.599 6229	107.7	23.66	2.21	11 15.9
31	1	51	18.89	-1.266	+ 9	49	29.8	-6.73	0.599 8973	+121.6	23.65	2.21	11 11.4	
Nov.	1	1	50	48.60	1.258	9	46	48.9	6.68	0.600 2059	135.5	23.63	2.21	11 7.0
	2	1	50	18.51	1.249	9	44	9.4	6.61	0.600 5475	149.2	23.61	2.21	11 2.5
	3	1	49	48.66	1.239	9	41	31.5	6.55	0.600 9220	162.8	23.59	2.21	10 58.1
	4	1	49	19.06	1.228	9	38	55.2	6.48	0.601 3290	176.3	23.57	2.20	10 53.7
	5	1	48	49.74	-1.216	+ 9	36	20.6	-6.40	0.601 7683	+189.7	23.55	2.20	10 49.3
	6	1	48	20.72	1.203	9	33	47.9	6.32	0.602 2396	203.0	23.52	2.20	10 44.9
	7	1	47	52.03	1.189	9	31	17.2	6.24	0.602 7425	216.1	23.49	2.20	10 40.5
	8	1	47	23.67	1.174	9	28	48.5	6.15	0.603 2768	229.1	23.46	2.19	10 36.1
	9	1	46	55.68	1.159	9	26	22.1	6.05	0.603 8420	241.9	23.43	2.19	10 31.7
	10	1	46	28.06	-1.143	+ 9	23	58.1	-5.95	0.604 4378	+254.6	23.40	2.19	10 27.3
	11	1	46	0.84	1.126	9	21	36.5	5.85	0.605 0639	267.1	23.37	2.19	10 22.9
	12	1	45	34.04	1.108	9	19	17.5	5.74	0.605 7198	279.5	23.33	2.18	10 18.6
	13	1	45	7.68	1.089	9	17	1.1	5.63	0.606 4052	291.7	23.30	2.18	10 14.2
	14	1	44	41.77	1.070	9	14	47.5	5.51	0.607 1197	303.7	23.26	2.18	10 9.8
	15	1	44	16.34	-1.050	+ 9	12	36.8	-5.39	0.607 8630	+315.6	23.22	2.17	10 5.5
	16	1	43	51.39	-1.029	+ 9	10	29.0	-5.26	0.608 6346	+327.3	23.18	2.17	10 1.1

GREENWICH MEAN TIME.

Date.	Apparent Right Ascension.			Var. per Hour.	Apparent Declination.			Var. per Hour.	Logarithm of Distance from Earth.	Var. per Hour.	Polar Semi- diam- eter.	Hor. Paral- lax.	Transit, Meridian of Green- wich.	
	Noon.				Noon.									Noon.
	h	m	s	s	°	'	"	"	Noon.	Noon.	"	"	h	m
Nov. 16	1	43	51.39	-1.029	+9	10	29.0	-5.26	0.608 6346	+327.3	23.18	2.17	10	1.1
17	1	43	26.96	1.007	9	8	24.3	5.13	0.609 4340	338.8	23.13	2.16	9	56.8
18	1	43	3.05	0.985	9	6	22.8	4.99	0.610 2608	350.1	23.09	2.16	9	52.5
19	1	42	39.69	0.962	9	4	24.6	4.86	0.611 1145	361.3	23.04	2.15	9	48.2
20	1	42	16.88	0.938	9	2	29.7	4.71	0.611 9947	372.2	23.00	2.15	9	43.9
21	1	41	54.66	-0.914	+9	0	38.4	-4.56	0.612 9008	+382.9	22.95	2.15	9	39.6
22	1	41	33.02	0.889	8	58	50.6	4.41	0.613 8323	393.3	22.90	2.14	9	35.3
23	1	41	11.99	0.864	8	57	6.5	4.26	0.614 7886	403.6	22.85	2.14	9	31.0
24	1	40	51.88	0.838	8	55	26.1	4.10	0.615 7693	413.6	22.80	2.13	9	26.7
25	1	40	31.80	0.811	8	53	49.5	3.94	0.616 7737	423.3	22.75	2.13	9	22.5
26	1	40	12.68	-0.783	+8	52	16.8	-3.78	0.617 8012	+432.8	22.69	2.12	9	18.2
27	1	39	54.22	0.755	8	50	48.1	3.61	0.618 8512	442.1	22.64	2.12	9	14.0
28	1	39	36.44	0.726	8	49	23.4	3.44	0.619 9230	451.1	22.58	2.11	9	9.8
29	1	39	19.35	0.698	8	48	2.9	3.27	0.621 0160	459.8	22.52	2.11	9	5.6
30	1	39	2.96	0.668	8	46	46.5	3.10	0.622 1296	468.2	22.47	2.10	9	1.4
Dec. 1	1	38	47.27	-0.639	+8	45	34.3	-2.92	0.623 2631	+476.4	22.41	2.10	8	57.2
2	1	38	32.30	0.609	8	44	26.4	2.74	0.624 4160	484.3	22.35	2.09	8	53.0
3	1	38	18.04	0.579	8	43	22.8	2.56	0.625 5875	491.9	22.29	2.08	8	48.9
4	1	38	4.52	0.548	8	42	23.5	2.38	0.626 7771	499.3	22.23	2.08	8	44.7
5	1	37	51.74	0.517	8	41	28.5	2.20	0.627 9840	506.4	22.17	2.07	8	40.6
6	1	37	39.70	-0.486	+8	40	38.0	-2.01	0.629 2076	+513.3	22.10	2.07	8	36.4
7	1	37	28.40	0.455	8	39	51.9	1.83	0.630 4475	519.9	22.04	2.06	8	32.3
8	1	37	17.86	0.424	8	39	10.2	1.64	0.631 7030	526.3	21.98	2.06	8	28.2
9	1	37	8.07	0.392	8	38	33.0	1.46	0.632 9733	532.3	21.91	2.05	8	24.1
10	1	36	59.05	0.360	8	38	0.3	1.27	0.634 2580	538.2	21.85	2.04	8	20.0
11	1	36	50.79	-0.328	+8	37	32.1	-1.08	0.635 5565	+543.8	21.78	2.04	8	16.0
12	1	36	43.30	0.296	8	37	8.4	0.89	0.636 8682	549.2	21.72	2.03	8	11.9
13	1	36	36.68	0.264	8	36	49.3	0.70	0.638 1925	554.4	21.65	2.02	8	7.9
14	1	36	30.64	0.231	8	36	34.7	0.51	0.639 5289	559.3	21.59	2.02	8	3.9
15	1	36	25.48	0.199	8	36	24.8	0.32	0.640 8767	563.9	21.52	2.01	7	59.8
16	1	36	21.11	-0.166	+8	36	19.4	-0.13	0.642 2355	+568.4	21.45	2.01	7	55.9
17	1	36	17.61	0.134	8	36	18.6	+0.06	0.643 6048	572.6	21.38	2.00	7	51.9
18	1	36	14.70	0.101	8	36	22.4	0.26	0.644 9838	576.6	21.32	1.99	7	47.9
19	1	36	12.68	0.068	8	36	30.9	0.45	0.646 3721	580.3	21.25	1.99	7	43.9
20	1	36	11.44	0.035	8	36	43.9	0.64	0.647 7691	583.8	21.18	1.98	7	40.0
21	1	36	10.99	-0.002	+8	37	1.5	+0.83	0.649 1741	+587.0	21.11	1.97	7	36.0
22	1	36	11.33	+0.031	8	37	23.7	1.02	0.650 5867	590.1	21.04	1.97	7	32.1
23	1	36	12.47	0.064	8	37	50.5	1.21	0.652 0062	592.8	20.97	1.96	7	28.2
24	1	36	14.39	0.097	8	38	21.9	1.40	0.653 4321	595.4	20.90	1.95	7	24.3
25	1	36	17.11	0.130	8	38	57.9	1.59	0.654 8639	597.7	20.84	1.95	7	20.4
26	1	36	20.61	+0.162	+8	39	38.4	+1.78	0.656 3009	+599.8	20.77	1.94	7	16.6
27	1	36	24.90	0.195	8	40	23.5	1.97	0.657 7426	603.6	20.70	1.94	7	12.7
28	1	36	29.97	0.228	8	41	13.1	2.16	0.659 1885	606.2	20.63	1.93	7	8.9
29	1	36	35.83	0.260	8	42	7.2	2.35	0.660 6379	608.6	20.56	1.92	7	5.0
30	1	36	42.46	0.292	8	43	5.7	2.53	0.662 0903	606.7	20.49	1.92	7	1.2
31	1	36	49.86	+0.324	+8	44	8.7	+2.71	0.663 5452	+606.7	20.42	1.91	6	57.4
32	1	36	58.03	...	+8	45	15.9	...	0.665 0022	...	20.36	1.90	6	53.6

FOR GREENWICH MEAN NOON.

Date.		Heliocentric Longitude, Mean Equinox of Date.	Var. per Day.	Reduction to Orbit.	Heliocentric Latitude.	Var. per Day.	Logarithm of Radius Vector.	Var. per Day.
		" ' "	" "	"	" ' "	"		
Jan.	3	3 22 1.6	5 29.51	+5.8	-1 18 3.9	-0.82	0.695 1165	-53.3
	7	3 43 59.7	5 29.54	5.5	1 18 7.1	0.77	0.695 0956	51.3
	11	4 5 57.9	5 29.57	5.1	1 18 10.1	0.72	0.695 0755	49.3
	15	4 27 56.3	5 29.61	4.8	1 18 12.8	0.67	0.695 0562	47.3
	19	4 49 54.8	5 29.64	4.5	1 18 15.4	0.62	0.695 0377	45.3
	23	5 11 53.4	5 29.66	+4.1	-1 18 17.8	-0.57	0.695 0199	-43.3
	27	5 33 52.1	5 29.68	3.8	1 18 20.0	0.52	0.695 0030	41.3
	31	5 55 50.9	5 29.70	3.4	1 18 22.0	0.48	0.694 9869	39.3
Feb.	4	6 17 49.7	5 29.73	3.1	1 18 23.8	0.43	0.694 9716	37.3
	8	6 39 48.7	5 29.75	2.8	1 18 25.4	0.38	0.694 9570	35.3
	12	7 1 47.8	5 29.77	+2.4	-1 18 26.9	-0.33	0.694 9433	-33.3
	16	7 23 46.9	5 29.79	2.1	1 18 28.1	0.28	0.694 9304	31.3
	20	7 45 46.1	5 29.81	1.7	1 18 29.1	0.24	0.694 9183	29.3
	24	8 7 45.4	5 29.83	1.4	1 18 30.0	0.19	0.694 9070	27.2
	28	8 29 44.7	5 29.85	1.0	1 18 30.7	0.14	0.694 8965	25.1
Mar.	3	8 51 44.2	5 29.86	+0.7	-1 18 31.1	-0.09	0.694 8869	-23.1
	7	9 13 43.6	5 29.87	+0.4	1 18 31.4	-0.05	0.694 8781	21.1
	11	9 35 43.1	5 29.88	0.0	1 18 31.5	0.00	0.694 8700	19.1
	15	9 57 42.7	5 29.89	-0.3	1 18 31.4	+0.05	0.694 8628	17.0
	19	10 19 42.3	5 29.90	0.7	1 18 31.1	0.10	0.694 8564	15.0
	23	10 41 41.9	5 29.90	-1.0	-1 18 30.6	+0.15	0.694 8508	-13.0
	27	11 3 41.5	5 29.91	1.4	1 18 29.9	0.20	0.694 8460	10.9
	31	11 25 41.2	5 29.92	1.7	1 18 29.0	0.25	0.694 8421	8.9
Apr.	4	11 47 40.9	5 29.93	2.1	1 18 27.9	0.30	0.694 8389	6.9
	8	12 9 40.6	5 29.93	2.4	1 18 26.6	0.34	0.694 8366	4.9
	12	12 31 40.3	5 29.93	-2.7	-1 18 25.2	+0.39	0.694 8350	-2.8
	16	12 53 40.1	5 29.93	3.1	1 18 23.5	0.43	0.694 8343	-0.8
	20	13 15 39.8	5 29.93	3.4	1 18 21.7	0.48	0.694 8344	+1.3
	24	13 37 39.5	5 29.93	3.8	1 18 19.7	0.53	0.694 8353	3.3
	28	13 59 39.2	5 29.93	4.1	1 18 17.4	0.58	0.694 8370	5.3
May	2	14 21 38.9	5 29.93	-4.4	-1 18 15.0	+0.63	0.694 8396	+7.3
	6	14 43 38.6	5 29.92	4.8	1 18 12.4	0.68	0.694 8429	9.3
	10	15 5 38.3	5 29.91	5.1	1 18 9.6	0.73	0.694 8470	11.4
	14	15 27 37.9	5 29.90	5.5	1 18 6.6	0.78	0.694 8520	13.5
	18	15 49 37.5	5 29.90	5.8	1 18 3.4	0.82	0.694 8578	15.5
	22	16 11 37.1	5 29.89	-6.1	-1 18 0.0	+0.87	0.694 8644	+17.6
	26	16 33 36.6	5 29.88	6.5	1 17 56.5	0.91	0.694 8719	19.6
	30	16 55 36.1	5 29.86	6.8	1 17 52.7	0.96	0.694 8801	21.7
June	3	17 17 35.5	5 29.84	7.1	1 17 48.8	1.01	0.694 8892	23.7
	7	17 39 34.8	5 29.83	7.5	1 17 44.6	1.06	0.694 8991	25.7
	11	18 1 34.1	5 29.82	-7.8	-1 17 40.3	+1.11	0.694 9098	+27.7
	15	18 23 33.4	5 29.80	8.1	1 17 35.7	1.16	0.694 9213	29.7
	19	18 45 32.5	5 29.78	8.4	1 17 31.0	1.20	0.694 9335	31.7
	23	19 7 31.6	5 29.76	8.8	1 17 26.1	1.25	0.694 9466	33.7
	27	19 29 30.6	5 29.74	9.1	1 17 21.0	1.30	0.694 9605	35.8
July	1	19 51 29.5	5 29.72	-9.4	-1 17 15.7	+1.34	0.694 9752	+37.8
	5	20 13 28.4	5 29.70	-9.7	-1 17 10.3	+1.39	0.694 9907	+39.8

FOR GREENWICH MEAN NOON.

Date.		Heliocentric Longitude, Mean Equinox of Date.	Var. per Day.	Reduction to Orbit.	Heliocentric Latitude.	Var. per Day.	Logarithm of Radius Vector.	Var. per Day.
		" ' "	" "	"	" ' "	"		
July	1	19 51 29.5	5 29.72	- 9.4	-1 17 15.7	+1.34	0.694 9752	+ 37.8
	5	20 13 28.4	5 29.70	9.7	1 17 10.3	1.39	0.694 9907	39.8
	9	20 35 27.1	5 29.67	10.0	1 17 4.6	1.44	0.695 0070	41.8
	13	20 57 25.7	5 29.64	10.4	1 16 58.8	1.49	0.695 0242	43.8
	17	21 19 24.2	5 29.62	10.7	1 16 52.7	1.53	0.695 0421	45.8
	21	21 41 22.7	5 29.59	-11.0	-1 16 46.5	+1.58	0.695 0608	+ 47.8
	25	22 3 21.0	5 29.56	11.3	1 16 40.1	1.62	0.695 0803	49.7
	29	22 25 19.1	5 29.53	11.6	1 16 33.5	1.67	0.695 1006	51.7
Aug.	2	22 47 17.2	5 29.50	11.9	1 16 26.7	1.72	0.695 1216	53.7
	6	23 9 15.1	5 29.46	12.2	1 16 19.7	1.76	0.695 1435	55.7
	10	23 31 12.9	5 29.42	-12.5	-1 16 12.6	+1.81	0.695 1662	+ 57.7
	14	23 53 10.5	5 29.39	12.8	1 16 5.3	1.86	0.695 1897	59.7
	18	24 15 8.0	5 29.36	13.1	1 15 57.7	1.91	0.695 2140	61.7
	22	24 37 5.4	5 29.32	13.4	1 15 50.0	1.96	0.695 2391	63.7
	26	24 59 2.5	5 29.28	13.7	1 15 42.1	1.99	0.695 2650	65.7
	30	25 20 59.6	5 29.23	-14.0	-1 15 34.1	+2.04	0.695 2916	+ 67.6
Sept.	3	25 42 56.4	5 29.19	14.3	1 15 25.8	2.09	0.695 3191	69.6
	7	26 4 53.1	5 29.15	14.6	1 15 17.3	2.14	0.695 3473	71.5
	11	26 26 49.6	5 29.10	14.9	1 15 8.7	2.18	0.695 3763	73.5
	15	26 48 45.9	5 29.06	15.2	1 14 59.9	2.22	0.695 4061	75.5
	19	27 10 42.1	5 29.01	-15.5	-1 14 50.9	+2.27	0.695 4367	+ 77.5
	23	27 32 38.0	5 28.96	15.8	1 14 41.7	2.32	0.695 4681	79.4
	27	27 54 33.8	5 28.91	16.0	1 14 32.3	2.37	0.695 5002	81.4
Oct.	1	28 16 29.3	5 28.86	16.3	1 14 22.7	2.41	0.695 5332	83.3
	5	28 38 24.7	5 28.81	16.6	1 14 13.0	2.45	0.695 5669	85.2
	9	29 0 19.8	5 28.75	-16.8	-1 14 3.1	+2.50	0.695 6013	+ 87.1
	13	29 22 14.7	5 28.70	17.1	1 13 53.0	2.54	0.695 6366	89.1
	17	29 44 9.4	5 28.65	17.4	1 13 42.8	2.58	0.695 6726	90.9
	21	30 6 3.9	5 28.60	17.6	1 13 32.4	2.62	0.695 7093	92.9
	25	30 27 58.2	5 28.54	17.9	1 13 21.8	2.67	0.695 7469	94.8
	29	30 49 52.2	5 28.48	-18.1	-1 13 11.0	+2.72	0.695 7852	+ 96.7
Nov.	2	31 11 46.0	5 28.41	18.4	1 13 0.0	2.77	0.695 8243	98.6
	6	31 33 39.5	5 28.35	18.6	1 12 48.9	2.81	0.695 8641	100.5
	10	31 55 32.8	5 28.30	18.9	1 12 37.5	2.86	0.695 9047	102.5
	14	32 17 25.9	5 28.23	19.1	1 12 26.0	2.89	0.695 9461	104.4
	18	32 39 18.7	5 28.16	-19.4	-1 12 14.4	+2.94	0.695 9882	+106.2
	22	33 1 11.2	5 28.09	19.6	1 12 2.5	2.99	0.696 0311	108.1
	26	33 23 3.4	5 28.02	19.8	1 11 50.5	3.02	0.696 0747	110.0
	30	33 44 55.4	5 27.96	20.0	1 11 38.4	3.06	0.696 1191	111.9
Dec.	4	34 6 47.1	5 27.90	20.3	1 11 26.0	3.11	0.696 1642	113.8
	8	34 28 38.6	5 27.82	-20.5	-1 11 13.5	+3.15	0.696 2101	+115.6
	12	34 50 29.7	5 27.75	20.7	1 11 0.8	3.20	0.696 2567	117.4
	16	35 12 20.6	5 27.68	20.9	1 10 47.9	3.24	0.696 3040	119.2
	20	35 34 11.2	5 27.60	21.2	1 10 34.9	3.28	0.696 3521	121.1
	24	35 56 1.4	5 27.52	21.4	1 10 21.7	3.32	0.696 4009	123.0
	28	36 17 51.4	5 27.45	-21.6	-1 10 8.3	+3.36	0.696 4505	+124.8
	32	36 39 41.0	5 27.38	-21.8	-1 9 54.8	+3.40	0.696 5008	+126.6

GREENWICH MEAN TIME.

Date.	Apparent Right Ascension.			Var. per Hour.	Apparent Declination.			Var. per Hour.	Logarithm of Distance from Earth.	Var. per Hour.	Polar Semi-diameter.	Hor. Parallax.	Transit Meridian of Greenwich.
	Noon.			Noon.	Noon.			Noon.	Noon.	Noon.	Noon.	Noon.	
	h	m	s	s	°	'	"	"			"	"	h m
Jan.	1	6 57	33.82	-0.886	+22 18	3.2		+1.48	0.905 3597	- 21.9	9.63	1.10	12 16.1
	2	6 57	12.54	0.887	22 18	38.8		1.48	0.905 3158	14.6	9.63	1.10	12 11.8
	3	6 56	51.24	0.888	22 19	14.3		1.48	0.905 2893	7.4	9.63	1.10	12 7.5
	4	6 56	29.92	0.889	22 19	49.7		1.47	0.905 2802	- 0.2	9.63	1.10	12 3.2
	5	6 56	8.59	0.889	22 20	25.0		1.47	0.905 2884	+ 7.0	9.63	1.10	11 59.0
	6	6 55	47.27	-0.888	+22 21	0.2		+1.46	0.905 3140	+ 14.3	9.63	1.09	11 54.7
	7	6 55	25.97	0.887	22 21	35.3		1.46	0.905 3569	21.5	9.63	1.09	11 50.4
	8	6 55	4.71	0.885	22 22	10.2		1.45	0.905 4171	28.7	9.63	1.09	11 46.1
	9	6 54	43.49	0.883	22 22	44.9		1.44	0.905 4945	35.8	9.63	1.09	11 41.8
	10	6 54	22.33	0.880	22 23	19.4		1.43	0.905 5880	42.9	9.63	1.09	11 37.5
	11	6 54	1.24	-0.877	+22 23	53.7		+1.42	0.905 7006	+ 50.1	9.63	1.09	11 33.3
	12	6 53	40.24	0.873	22 24	27.8		1.41	0.905 8293	57.1	9.63	1.09	11 29.0
	13	6 53	19.33	0.869	22 25	1.6		1.41	0.905 9749	64.2	9.62	1.09	11 24.7
	14	6 52	58.53	0.864	22 25	35.3		1.40	0.905 1373	71.2	9.62	1.09	11 20.4
	15	6 52	37.86	0.859	22 26	8.6		1.38	0.906 3165	78.1	9.61	1.09	11 16.2
	16	6 52	17.32	-0.853	+22 26	41.7		+1.37	0.906 5124	+ 85.0	9.61	1.09	11 11.9
	17	6 51	56.92	0.847	22 27	14.4		1.36	0.906 7247	91.9	9.60	1.09	11 7.6
	18	6 51	36.61	0.840	22 27	46.8		1.34	0.906 9535	98.7	9.60	1.09	11 3.3
	19	6 51	16.60	0.833	22 28	18.9		1.33	0.907 1986	105.5	9.59	1.09	10 59.1
	20	6 50	56.70	0.825	22 28	50.7		1.32	0.907 4598	112.2	9.59	1.09	10 54.8
	21	6 50	36.99	-0.817	+22 29	22.2		+1.30	0.907 7370	+118.8	9.58	1.09	10 50.6
	22	6 50	17.47	0.809	22 29	53.3		1.29	0.908 0300	125.4	9.57	1.09	10 46.3
	23	6 49	58.17	0.800	22 30	24.1		1.28	0.908 3388	131.9	9.56	1.09	10 42.1
	24	6 49	39.08	0.790	22 30	54.5		1.26	0.908 6631	138.4	9.56	1.09	10 37.8
	25	6 49	20.23	0.781	22 31	24.5		1.24	0.909 0029	144.7	9.55	1.09	10 33.6
	26	6 49	1.61	-0.770	+22 31	54.2		+1.23	0.909 3579	+151.1	9.54	1.08	10 29.3
	27	6 48	43.25	0.760	22 32	23.5		1.21	0.909 7281	157.4	9.53	1.08	10 25.1
	28	6 48	25.15	0.748	22 32	52.4		1.20	0.910 1133	163.6	9.52	1.08	10 20.9
	29	6 48	7.33	0.737	22 33	20.9		1.18	0.910 5134	169.7	9.52	1.08	10 16.7
	30	6 47	49.79	0.725	22 33	49.0		1.16	0.910 9280	175.7	9.51	1.08	10 12.4
Feb.	31	6 47	32.53	-0.713	+22 34	16.7		+1.14	0.911 3570	+181.7	9.50	1.08	10 8.2
	1	6 47	15.58	0.700	22 34	43.9		1.13	0.911 8002	187.6	9.49	1.08	10 4.0
	2	6 46	58.95	0.686	22 35	10.8		1.11	0.912 2573	193.3	9.48	1.08	9 59.8
	3	6 46	42.63	0.673	22 35	37.1		1.09	0.912 7281	199.0	9.47	1.08	9 55.6
	4	6 46	26.65	0.659	22 36	3.1		1.07	0.913 2124	204.6	9.45	1.08	9 51.4
	5	6 46	11.01	-0.644	+22 36	28.6		+1.05	0.913 7100	+210.0	9.44	1.07	9 47.2
	6	6 45	55.72	0.630	22 36	53.6		1.03	0.914 2206	215.4	9.43	1.07	9 43.0
	7	6 45	40.79	0.615	22 37	18.2		1.01	0.914 7440	220.7	9.42	1.07	9 38.9
	8	6 45	26.22	0.599	22 37	42.3		0.99	0.915 2798	225.8	9.41	1.07	9 34.7
	9	6 45	12.03	0.583	22 38	5.9		0.97	0.915 8278	230.8	9.40	1.07	9 30.5
	10	6 44	58.22	-0.567	+22 38	29.1		+0.95	0.916 3878	+235.7	9.39	1.07	9 26.4
	11	6 44	44.80	0.551	22 38	51.7		0.93	0.916 9593	240.5	9.38	1.07	9 22.2
	12	6 44	31.78	0.534	22 39	13.9		0.91	0.917 5422	245.2	9.36	1.07	9 18.1
	13	6 44	19.15	0.518	22 39	35.6		0.90	0.918 1362	249.7	9.35	1.06	9 13.9
	14	6 44	6.93	0.500	22 39	56.9		0.88	0.918 7409	254.2	9.34	1.06	9 9.8
	15	6 43	55.13	-0.483	+22 40	17.7		+0.86	0.919 3563	+258.5	9.32	1.06	9 5.7
	16	6 43	43.74	-0.466	+22 40	38.0		+0.84	0.919 9819	+262.7	9.31	1.06	9 1.5

GREENWICH MEAN TIME.

Date.	Apparent Right Ascension.			Var. per Hour.	Apparent Declination.			Var. per Hour.	Logarithm of Distance from Earth.	Var. per Hour.	Polar Semi- diam- eter.	Hor. Paral- lax.	Transit, Meridian of Green- wich.	
	Noon.	Noon.	Noon.		Noon.	Noon.	Noon.							Noon.	Noon.
	h	m	s	s	°	'	"	"	Noon.	Noon.	Noon.	Noon.	h	m
Feb.	16	6 48	43.74	-0.466	+22 40	38.0		+0.84	0.919 9819	+202.7	9.31	1.06	9	1.5
	17	6 48	32.77	0.448	22 40	57.8		0.81	0.920 6175	206.9	9.30	1.06	8	57.4
	18	6 48	22.23	0.430	22 41	17.1		0.79	0.921 2620	270.9	9.29	1.05	8	53.3
	19	6 48	12.12	0.412	22 41	36.0		0.77	0.921 9176	274.7	9.27	1.05	8	49.2
	20	6 48	2.45	0.394	22 41	54.3		0.75	0.922 5815	278.5	9.26	1.05	8	45.2
	21	6 42	53.22	-0.375	+22 42	12.2		+0.74	0.923 2542	+282.1	9.25	1.05	8	41.1
	22	6 42	44.43	0.357	22 42	29.6		0.71	0.923 9356	285.6	9.23	1.05	8	37.0
	23	6 42	36.09	0.338	22 42	46.5		0.69	0.924 6253	289.1	9.22	1.04	8	32.9
	24	6 42	28.21	0.319	22 43	2.9		0.67	0.925 3231	292.4	9.20	1.04	8	28.9
	25	6 42	20.78	0.300	22 43	18.8		0.65	0.926 0287	295.6	9.19	1.04	8	24.8
Mar.	26	6 42	13.82	-0.286	+22 43	34.3		+0.63	0.926 7419	+298.7	9.17	1.04	8	20.8
	27	6 42	7.32	0.261	22 43	49.2		0.61	0.927 4624	301.7	9.16	1.04	8	16.7
	28	6 42	1.28	0.242	22 44	3.7		0.59	0.928 1899	304.5	9.14	1.03	8	12.7
	29	6 41	55.71	0.222	22 44	17.7		0.57	0.928 9241	307.3	9.13	1.03	8	8.7
	1	6 41	50.62	0.202	22 44	31.2		0.55	0.929 6648	309.9	9.11	1.03	8	4.7
	2	6 41	46.01	-0.182	+22 44	44.3		+0.53	0.930 4116	+312.4	9.09	1.03	8	0.7
	3	6 41	41.87	0.162	22 44	56.8		0.51	0.931 1642	314.8	9.08	1.03	7	56.7
	4	6 41	38.22	0.142	22 45	8.8		0.49	0.931 9224	317.0	9.06	1.03	7	52.7
	5	6 41	35.05	0.122	22 45	20.3		0.47	0.932 6858	319.1	9.05	1.03	7	48.7
	6	6 41	32.37	0.101	22 45	31.3		0.45	0.933 4541	321.1	9.03	1.03	7	44.7
	7	6 41	30.18	-0.081	+22 45	41.8		+0.43	0.934 2271	+323.0	9.01	1.02	7	40.7
	8	6 41	28.47	0.061	22 45	51.8		0.41	0.935 0045	324.7	9.00	1.02	7	36.8
	9	6 41	27.25	0.041	22 46	1.3		0.39	0.935 7858	326.4	8.98	1.02	7	32.8
	10	6 41	26.52	-0.020	22 46	10.3		0.36	0.936 5710	327.9	8.97	1.02	7	28.9
	11	6 41	26.27	0.000	22 46	18.8		0.34	0.937 3595	329.2	8.95	1.02	7	25.0
	12	6 41	26.51	+0.020	+22 46	26.8		+0.32	0.938 1512	+330.5	8.93	1.02	7	21.0
	13	6 41	27.24	0.041	22 46	34.3		0.30	0.938 9459	331.7	8.92	1.02	7	17.1
	14	6 41	28.46	0.061	22 46	41.3		0.28	0.939 7432	332.7	8.90	1.01	7	13.2
	15	6 41	30.16	0.081	22 46	47.8		0.26	0.940 5428	333.6	8.88	1.01	7	9.3
	16	6 41	32.35	0.101	22 46	53.8		0.24	0.941 3446	334.5	8.86	1.01	7	5.4
	17	6 41	35.01	+0.121	+22 46	59.3		+0.22	0.942 1483	+335.2	8.85	1.01	7	1.5
	18	6 41	38.16	0.141	22 47	4.2		0.20	0.942 9537	335.9	8.83	1.01	6	57.7
	19	6 41	41.78	0.161	22 47	8.7		0.18	0.943 7604	336.4	8.81	1.00	6	53.8
	20	6 41	45.88	0.181	22 47	12.7		0.16	0.944 5683	336.8	8.80	1.00	6	49.9
	21	6 41	50.46	0.201	22 47	16.2		0.13	0.945 3772	337.2	8.78	1.00	6	46.1
	22	6 41	55.52	+0.221	+22 47	19.1		+0.11	0.946 1868	+337.4	8.76	1.00	6	42.2
	23	6 42	1.05	0.240	22 47	21.6		0.09	0.946 9968	337.5	8.75	1.00	6	38.4
	24	6 42	7.05	0.260	22 47	23.6		0.07	0.947 8070	337.6	8.73	0.99	6	34.6
	25	6 42	13.53	0.280	22 47	25.0		0.05	0.948 6173	337.6	8.72	0.99	6	30.7
	26	6 42	20.47	0.299	22 47	25.9		0.03	0.949 4273	337.4	8.70	0.99	6	26.9
	27	6 42	27.88	+0.319	+22 47	26.3		+0.01	0.950 2369	+337.2	8.68	0.99	6	23.1
28	6 42	35.76	0.338	22 47	26.2		-0.02	0.951 0459	336.9	8.67	0.99	6	19.3	
29	6 42	44.10	0.357	22 47	25.5		0.04	0.951 8540	336.5	8.65	0.98	6	15.5	
30	6 42	52.90	0.376	22 47	24.3		0.06	0.952 6611	336.0	8.64	0.98	6	11.8	
31	6 43	2.16	0.395	22 47	22.6		0.08	0.953 4667	335.3	8.62	0.98	6	8.0	
Apr.	1	6 43	11.88	+0.414	+22 47	20.3		-0.11	0.954 2707	+334.6	8.60	0.98	6	4.2
	2	6 43	22.05	+0.433	+22 47	17.5		-0.13	0.955 0729	+333.8	8.59	0.98	6	0.4

GREENWICH MEAN TIME.

Date.	Apparent Right Ascension.			Var. per Hour.	Apparent Declination.	Var. per Hour.	Logarithm of Distance from Earth.	Var. per Hour.	Polar Semi- diam- eter.	Hor. Paral- lax.	Transit Meridian of Green- wich.
	Noon.			Noon.	Noon.	Noon.	Noon.	Noon.	Noon.	Noon.	Noon.
	h	m	s	s	°	'	''	''	''	''	h m
Apr.	1	6 43	11.88	+0.414	+22 47	20.3	-0.11	0.954 2707	+334.6	8.60	6 4.2
	2	6 43	22.05	0.433	22 47	17.5	0.13	0.955 0729	333.8	8.59	6 0.4
	3	6 43	32.67	0.452	22 47	14.2	0.15	0.955 8730	332.9	8.57	5 56.7
	4	6 43	43.74	0.471	22 47	10.3	0.17	0.956 6708	331.9	8.56	5 52.9
	5	6 43	55.26	0.489	22 47	5.9	0.20	0.957 4662	330.9	8.54	5 49.2
	6	6 44	7.22	+0.507	+22 47	0.9	-0.22	0.958 2589	+329.7	8.53	5 45.5
	7	6 44	19.61	0.525	22 46	55.4	0.24	0.959 0488	328.5	8.51	5 41.7
	8	6 44	32.43	0.543	22 46	49.3	0.27	0.959 8355	327.1	8.50	5 38.0
	9	6 44	45.69	0.561	22 46	42.6	0.29	0.960 6189	325.7	8.48	5 34.3
	10	6 44	59.37	0.579	22 46	35.4	0.31	0.961 3988	324.2	8.47	5 30.6
	11	6 45	13.47	+0.596	+22 46	27.6	-0.34	0.962 1751	+322.6	8.45	5 26.9
	12	6 45	27.98	0.613	22 46	19.3	0.36	0.962 9475	321.0	8.44	5 23.2
	13	6 45	42.91	0.631	22 46	10.4	0.38	0.963 7159	319.3	8.42	5 19.5
	14	6 45	58.25	0.647	22 46	0.9	0.41	0.964 4801	317.5	8.41	5 15.9
	15	6 46	13.99	0.664	22 45	50.8	0.43	0.965 2400	315.7	8.39	5 12.2
	16	6 46	30.12	+0.680	+22 45	40.2	-0.45	0.965 9954	+313.8	8.38	5 8.5
	17	6 46	46.65	0.697	22 45	29.0	0.50	0.966 7462	311.8	8.36	5 4.9
	18	6 47	3.58	0.713	22 45	17.2	0.53	0.967 4922	309.8	8.35	5 1.2
	19	6 47	20.88	0.729	22 45	4.8	0.58	0.968 2334	307.8	8.33	4 57.6
	20	6 47	38.57	0.745	22 44	51.9	0.55	0.968 9694	305.6	8.32	4 53.9
	21	6 47	56.64	+0.761	+22 44	38.4	-0.58	0.969 7003	+303.4	8.31	4 50.3
	22	6 48	15.09	0.776	22 44	24.3	0.60	0.970 4258	301.1	8.29	4 46.7
	23	6 48	33.90	0.792	22 44	9.6	0.63	0.971 1458	298.8	8.28	4 43.1
	24	6 48	53.08	0.807	22 43	54.3	0.65	0.971 8602	296.5	8.27	4 39.5
	25	6 49	12.63	0.822	22 43	38.4	0.67	0.972 5689	294.1	8.26	4 35.9
	26	6 49	32.53	+0.837	+22 43	21.9	-0.70	0.973 2718	+291.6	8.24	4 32.3
	27	6 49	52.79	0.851	22 43	4.7	0.73	0.973 9685	289.0	8.23	4 28.7
	28	6 50	13.39	0.866	22 42	47.0	0.75	0.974 5591	286.4	8.22	4 25.1
	29	6 50	34.35	0.880	22 42	28.6	0.78	0.975 3433	283.8	8.20	4 21.5
	30	6 50	55.64	0.894	22 42	9.6	0.81	0.976 0211	281.0	8.19	4 17.9
May	1	6 51	17.28	+0.908	+22 41	49.9	-0.83	0.976 6922	+278.2	8.18	4 14.3
	2	6 51	39.24	0.922	22 41	29.7	0.86	0.977 3566	275.4	8.17	4 10.8
	3	6 52	1.53	0.936	22 41	8.8	0.88	0.978 0142	272.5	8.15	4 7.2
	4	6 52	24.15	0.949	22 40	47.3	0.91	0.978 6648	269.6	8.14	4 3.7
	5	6 52	47.08	0.962	22 40	25.1	0.94	0.979 3083	266.6	8.13	4 0.1
	6	6 53	10.33	+0.975	+22 40	2.3	-0.96	0.979 9445	+263.6	8.12	3 56.6
	7	6 53	33.88	0.988	22 39	38.9	0.99	0.980 5734	260.5	8.11	3 53.0
	8	6 53	57.74	1.000	22 39	14.8	1.02	0.981 1948	257.4	8.09	3 49.5
	9	6 54	21.89	1.012	22 38	50.1	1.04	0.981 8087	254.2	8.08	3 45.9
	10	6 54	46.33	1.024	22 38	24.7	1.07	0.982 4149	251.0	8.07	3 42.4
	11	6 55	11.06	+1.036	+22 37	58.7	-1.10	0.983 0134	+247.8	8.06	3 38.9
	12	6 55	36.07	1.048	22 37	32.0	1.13	0.983 6041	244.5	8.05	3 35.4
	13	6 56	1.35	1.059	22 37	4.7	1.15	0.984 1869	241.2	8.04	3 31.9
	14	6 56	26.91	1.070	22 36	36.8	1.18	0.984 7617	237.8	8.03	3 28.4
	15	6 56	52.73	1.081	22 36	8.2	1.21	0.985 3285	234.5	8.02	3 24.9
	16	6 57	18.81	+1.092	+22 35	38.9	-1.23	0.985 8871	+231.1	8.00	3 21.4
	17	6 57	45.15	+1.103	+22 35	9.0	-1.26	0.986 4876	+227.6	7.99	3 17.9

GREENWICH MEAN TIME.

Date.	Apparent Right Ascension.			Var. per Hour.	Apparent Declination.			Var. per Hour.	Logarithm of Distance from Earth.	Var. per Hour.	Polar Semi-diameter.	Hor. Parallax.	Transit Meridian of Greenwich.	
	Noon.			Noon.	Noon.			Noon.	Noon.	Noon.	Noon.	Noon.		
	h	m	s	s	°	'	"	"			"	"	h	m
May	17	6 57	45.15	+1.103	+22 35	9.0	-1.26	0.986 4376	+227.6	7.99	0.91		3 17.9	
	18	6 58	11.74	1.113	22 34	38.5	1.29	0.986 9798	224.2	7.98	0.90		3 14.4	
	19	6 58	38.58	1.123	22 34	7.3	1.31	0.987 5138	220.8	7.97	0.90		3 10.9	
	20	6 59	5.66	1.133	22 33	35.4	1.34	0.988 0394	217.3	7.96	0.90		3 7.4	
	21	6 59	32.97	1.143	22 33	2.9	1.37	0.988 5566	213.7	7.95	0.90		3 3.9	
	22	7 0	0.52	+1.153	+22 32	29.8	-1.39	0.989 0652	+210.1	7.94	0.90		3 0.5	
	23	7 0	28.31	1.163	22 31	56.0	1.42	0.989 5653	206.5	7.94	0.90		2 57.0	
	24	7 0	56.32	1.172	22 31	21.5	1.45	0.990 0566	202.9	7.93	0.90		2 53.5	
	25	7 1	24.55	1.181	22 30	46.3	1.48	0.990 5392	199.3	7.92	0.90		2 50.1	
	26	7 1	53.00	1.190	22 30	10.5	1.51	0.991 0130	195.6	7.91	0.89		2 46.6	
	27	7 2	21.66	+1.199	+22 29	34.0	-1.53	0.991 4779	+191.8	7.90	0.89		2 43.1	
	28	7 2	50.54	1.207	22 28	56.9	1.56	0.991 9337	188.0	7.90	0.89		2 39.7	
June	29	7 3	19.61	1.215	22 28	19.1	1.59	0.992 3805	184.3	7.89	0.89		2 36.2	
	30	7 3	48.88	1.224	22 27	40.6	1.62	0.992 8181	180.4	7.88	0.89		2 32.8	
	31	7 4	18.34	1.231	22 27	1.5	1.65	0.993 2466	176.6	7.87	0.89		2 29.4	
	1	7 4	47.99	+1.239	+22 26	21.6	-1.68	0.993 6658	+172.7	7.87	0.89		2 25.9	
	2	7 5	17.83	1.247	22 25	41.1	1.70	0.994 0756	168.8	7.86	0.89		2 22.5	
	3	7 5	47.84	1.254	22 25	0.0	1.73	0.994 4760	164.9	7.85	0.89		2 19.0	
	4	7 6	18.02	1.261	22 24	18.2	1.75	0.994 8670	160.9	7.85	0.89		2 15.6	
	5	7 6	48.37	1.268	22 23	35.8	1.78	0.995 2485	157.0	7.84	0.89		2 12.2	
	6	7 7	18.88	+1.275	+22 22	52.7	-1.81	0.995 6205	+153.0	7.83	0.89		2 8.8	
	7	7 7	49.55	1.281	22 22	9.0	1.83	0.995 9829	149.0	7.82	0.89		2 5.3	
	8	7 8	20.37	1.287	22 21	24.7	1.86	0.996 3358	145.0	7.82	0.89		2 1.9	
	9	7 8	51.34	1.293	22 20	39.7	1.89	0.996 6790	141.0	7.81	0.89		1 58.5	
	10	7 9	22.45	1.299	22 19	54.1	1.91	0.997 0126	137.0	7.80	0.89		1 55.1	
	11	7 9	53.70	+1.305	+22 19	7.8	-1.94	0.997 3364	+132.9	7.80	0.89		1 51.7	
	12	7 10	25.08	1.310	22 18	20.9	1.97	0.997 6505	128.9	7.79	0.89		1 48.3	
	13	7 10	56.58	1.315	22 17	33.4	1.99	0.997 9550	124.8	7.79	0.89		1 44.8	
	14	7 11	28.21	1.320	22 16	45.3	2.02	0.998 2496	120.7	7.78	0.89		1 41.4	
	15	7 11	59.95	1.325	22 15	56.6	2.04	0.998 5345	116.7	7.77	0.88		1 38.0	
	16	7 12	31.81	+1.330	+22 15	7.3	-2.07	0.998 8096	+112.6	7.77	0.88		1 34.6	
	17	7 13	3.79	1.335	22 14	17.3	2.10	0.999 0749	108.5	7.76	0.88		1 31.2	
	18	7 13	35.87	1.339	22 13	26.7	2.12	0.999 3303	104.4	7.76	0.88		1 27.8	
	19	7 14	8.05	1.343	22 12	35.5	2.15	0.999 5759	100.3	7.75	0.88		1 24.4	
	20	7 14	40.33	1.347	22 11	43.7	2.17	0.999 8115	96.1	7.75	0.88		1 21.0	
	21	7 15	12.70	+1.351	+22 10	51.3	-2.19	1.000 0372	+92.0	7.74	0.88		1 17.6	
	22	7 15	45.17	1.354	22 9	58.4	2.22	1.000 2529	87.8	7.74	0.88		1 14.2	
	23	7 16	17.71	1.358	22 9	4.8	2.24	1.000 4586	83.6	7.74	0.88		1 10.9	
	24	7 16	50.34	1.361	22 8	10.7	2.27	1.000 6542	79.4	7.74	0.88		1 7.5	
	25	7 17	23.05	1.364	22 7	15.9	2.29	1.000 8397	75.2	7.73	0.88		1 4.1	
	26	7 17	55.83	+1.367	+22 6	20.6	-2.32	1.001 0151	+71.0	7.73	0.88		1 0.7	
	27	7 18	28.68	1.370	22 5	24.7	2.34	1.001 1803	66.7	7.73	0.88		0 57.3	
	28	7 19	1.59	1.372	22 4	28.3	2.36	1.001 3353	62.5	7.72	0.88		0 53.9	
	29	7 19	34.55	1.375	22 3	31.3	2.39	1.001 4801	58.2	7.72	0.88		0 50.5	
	30	7 20	7.57	1.377	22 2	33.8	2.41	1.001 6146	53.9	7.72	0.88		0 47.1	
	July	1	7 20	40.63	+1.379	+22 1	35.7	-2.43	1.001 7389	+49.7	7.72	0.88		0 43.7
		2	7 21	13.74	+1.380	+22 0	37.1	-2.45	1.001 8530	+45.4	7.71	0.88		0 40.4

GREENWICH MEAN TIME.

Date.	Apparent Right Ascension.			Var. per Hour.	Apparent Declination.			Var. per Hour.	Logarithm of Distance from Earth.	Var. per Hour.	Polar Semi-diameter.	Hor. Parallax.	Transit, Meridian of Greenwich.
	Noon.			Noon.	Noon.			Noon.	Noon.	Noon.	Noon.	Noon.	
	h	m	s	s	°	'	"	"			"	"	h m
July	1	7 20	40.63	+1.379	+22 1	35.7		-2.43	1.001 7389	+ 40.7	7.72	0.88	0 43.7
	2	7 21	13.74	1.380	22 0	37.1		2.45	1.001 8530	46.4	7.71	0.88	0 40.4
	3	7 21	46.88	1.381	21 59	38.0		2.48	1.001 9567	41.1	7.71	0.88	0 37.0
	4	7 22	20.06	1.383	21 58	38.3		2.50	1.002 0502	36.8	7.71	0.88	0 33.6
	5	7 22	53.27	1.384	21 57	38.2		2.51	1.002 1333	32.5	7.71	0.87	0 30.2
	6	7 23	26.50	+1.385	+21 56	37.6		-2.54	1.002 2061	+ 28.2	7.71	0.87	0 26.9
	7	7 23	59.74	1.385	21 55	36.5		2.56	1.002 2686	28.9	7.70	0.87	0 23.5
	8	7 24	33.00	1.386	21 54	34.9		2.58	1.002 3209	19.6	7.70	0.87	0 20.1
	9	7 25	6.27	1.386	21 53	32.9		2.59	1.002 3628	15.3	7.70	0.87	0 16.7
	10	7 25	39.54	1.386	21 52	30.4		2.61	1.002 3945	11.1	7.70	0.87	0 13.3
	11	7 26	12.82	+1.386	+21 51	27.4		-2.63	1.002 4160	+ 6.8	7.70	0.87	0 9.9
	12	7 26	46.08	1.386	21 50	24.1		2.65	1.002 4272	+ 2.5	7.70	0.87	0 6.6
	13	7 27	19.34	1.385	21 49	20.3		2.67	1.002 4281	- 1.8	7.70	0.87	{ 0 3.3
	14	7 27	52.58	1.385	21 48	16.1		2.69	1.002 4188	6.0	7.70	0.87	23 56.4
	15	7 28	25.81	1.384	21 47	11.4		2.70	1.002 3992	10.3	7.71	0.87	23 53.0
	16	7 28	59.02	+1.383	+21 46	6.4		-2.72	1.002 3695	- 14.5	7.71	0.87	23 49.6
	17	7 29	32.21	1.382	21 45	1.0		2.73	1.002 3295	18.8	7.71	0.87	23 46.3
	18	7 30	5.37	1.381	21 43	55.2		2.75	1.002 2794	28.0	7.71	0.87	23 42.9
	19	7 30	38.50	1.380	21 42	49.0		2.76	1.002 2191	27.3	7.71	0.87	23 39.5
	20	7 31	11.69	1.378	21 41	42.5		2.78	1.002 1485	31.5	7.71	0.87	23 36.1
	21	7 31	44.64	+1.376	+21 40	35.7		-2.79	1.002 0677	- 35.8	7.71	0.87	23 32.7
	22	7 32	17.65	1.374	21 39	28.5		2.81	1.001 9766	40.1	7.72	0.87	23 29.3
	23	7 32	50.60	1.372	21 38	20.9		2.82	1.001 8752	44.4	7.72	0.87	23 26.0
	24	7 33	23.51	1.370	21 37	13.1		2.83	1.001 7636	48.7	7.72	0.87	23 22.6
	25	7 33	56.35	1.367	21 36	4.9		2.85	1.001 6416	53.0	7.72	0.88	23 19.2
	26	7 34	29.13	+1.365	+21 34	56.4		-2.86	1.001 5094	- 57.2	7.72	0.88	23 15.8
	27	7 35	1.85	1.362	21 33	47.7		2.87	1.001 3670	61.5	7.73	0.88	23 12.4
	28	7 35	34.40	1.358	21 32	38.7		2.88	1.001 2143	65.8	7.73	0.88	23 9.0
	29	7 36	7.05	1.355	21 31	29.5		2.89	1.001 0514	70.0	7.73	0.88	23 5.6
	30	7 36	39.53	1.351	21 30	20.1		2.90	1.000 8782	74.3	7.73	0.88	23 2.2
Aug.	31	7 37	11.92	+1.348	+21 29	10.4		-3.91	1.000 6949	- 78.5	7.74	0.88	22 58.8
	1	7 37	44.23	1.344	21 28	0.5		2.91	1.000 5913	82.8	7.74	0.88	22 55.4
	2	7 38	16.43	1.340	21 26	50.5		2.92	1.000 2976	87.0	7.75	0.88	22 52.0
	3	7 38	48.53	1.335	21 25	40.3		2.93	1.000 0837	91.2	7.75	0.88	22 48.6
	4	7 39	20.53	1.331	21 24	29.9		2.94	0.999 8598	95.4	7.75	0.88	22 45.2
	5	7 39	52.41	+1.326	+21 23	19.4		-3.94	0.999 6258	- 99.6	7.76	0.88	22 41.8
	6	7 40	24.18	1.321	21 22	8.8		2.94	0.999 3819	108.7	7.76	0.88	22 38.4
	7	7 40	56.83	1.316	21 20	58.1		2.95	0.999 1280	107.8	7.77	0.88	22 35.0
	8	7 41	27.35	1.311	21 19	47.3		2.95	0.998 8643	112.0	7.77	0.88	22 31.6
	9	7 41	58.74	1.305	21 18	36.4		2.95	0.998 5906	116.1	7.77	0.88	22 28.2
	10	7 42	30.00	+1.300	+21 17	25.5		-3.96	0.998 3071	-120.2	7.78	0.88	22 24.8
	11	7 43	1.13	1.294	21 16	14.5		2.96	0.998 0138	124.3	7.78	0.88	22 21.3
	12	7 43	32.11	1.288	21 15	3.5		2.96	0.997 7107	128.3	7.79	0.88	22 17.9
	13	7 44	2.95	1.282	21 13	52.4		2.96	0.997 3980	133.3	7.79	0.88	22 14.5
	14	7 44	35.64	1.276	21 12	41.4		2.96	0.997 0756	138.3	7.80	0.89	22 11.1
	15	7 45	4.18	+1.269	+21 11	30.4		-3.96	0.996 7436	-140.3	7.80	0.89	22 7.7
	16	7 45	34.57	+1.263	+21 10	19.4		-3.96	0.996 4029	-144.4	7.81	0.89	22 4.2

GREENWICH MEAN TIME.

Date.	Apparent Right Ascension.			Var. per Hour.	Apparent Declination.			Var. per Hour.	Logarithm of Distance from Earth.	Var. per Hour.	Polar Semi- diam- eter.	Hor. Paral- lax.	Transit, Meridian of Green- wich.
	Noon.			Noon.	Noon.			Noon.	Noon.	Noon.	Noon.	Noon.	
	h	m	s	s	°	'	"	"			"	"	h m
Aug. 16	7	45	34.57	+1.263	+21	10	19.4	-2.96	0.996 4020	-144.4	7.81	0.89	22 4.2
17	7	46	4.79	1.256	21	9	8.5	2.95	0.996 0507	148.4	7.81	0.89	22 0.8
18	7	46	34.85	1.240	21	7	57.6	2.95	0.995 6899	152.3	7.82	0.89	21 57.3
19	7	47	4.74	1.242	21	6	46.8	2.95	0.995 3195	156.3	7.83	0.89	21 53.9
20	7	47	34.46	1.235	21	5	36.1	2.94	0.994 9396	160.3	7.84	0.89	21 50.5
21	7	48	4.00	+1.227	+21	4	25.5	-2.94	0.994 5501	-164.3	7.84	0.89	21 47.0
22	7	48	33.35	1.219	21	3	15.0	2.93	0.994 1512	168.2	7.85	0.89	21 43.6
23	7	49	2.52	1.211	21	2	4.7	2.93	0.993 7428	172.1	7.86	0.89	21 40.1
24	7	49	31.49	1.203	21	0	54.6	2.92	0.993 3251	176.0	7.87	0.90	21 36.7
25	7	50	0.26	1.195	20	59	44.7	2.91	0.992 8981	179.9	7.88	0.90	21 33.2
26	7	50	28.83	+1.186	+20	58	35.0	-2.90	0.992 4618	-183.7	7.88	0.90	21 29.7
27	7	50	57.19	1.178	20	57	25.6	2.89	0.992 0163	187.5	7.89	0.90	21 26.3
28	7	51	25.35	1.169	20	56	16.4	2.88	0.991 5616	191.3	7.90	0.90	21 22.8
29	7	51	53.28	1.159	20	55	7.4	2.87	0.991 0980	195.1	7.91	0.90	21 19.3
30	7	52	20.99	1.150	20	53	58.8	2.85	0.990 6253	198.8	7.92	0.90	21 15.9
31	7	52	48.47	+1.140	+20	52	50.5	-2.84	0.990 1437	-202.5	7.93	0.90	21 12.4
Sept. 1	7	53	15.73	1.131	20	51	42.6	2.83	0.989 6533	206.1	7.94	0.90	21 8.9
2	7	53	42.74	1.120	20	50	35.0	2.81	0.989 1542	209.8	7.95	0.90	21 5.4
3	7	54	9.51	1.110	20	49	27.7	2.79	0.988 6464	213.4	7.95	0.91	21 1.9
4	7	54	36.04	1.100	20	48	20.9	2.78	0.988 1300	217.0	7.96	0.91	20 58.4
5	7	55	2.32	+1.090	+20	47	14.5	-2.76	0.987 6050	-220.5	7.97	0.91	20 54.9
6	7	55	28.34	1.079	20	46	8.6	2.74	0.987 0717	223.9	7.98	0.91	20 51.4
7	7	55	54.11	1.068	20	45	3.1	2.72	0.986 5301	227.4	7.99	0.91	20 47.9
8	7	56	19.61	1.057	20	43	58.1	2.70	0.985 9802	230.8	8.00	0.91	20 44.4
9	7	56	44.84	1.046	20	42	53.6	2.68	0.985 4221	234.2	8.01	0.91	20 40.9
10	7	57	9.81	+1.035	+20	41	49.7	-2.65	0.984 8560	-237.5	8.02	0.91	20 37.4
11	7	57	34.50	1.023	20	40	46.2	2.63	0.984 2819	240.8	8.03	0.91	20 33.9
12	7	57	58.92	1.011	20	39	43.3	2.61	0.983 7000	244.1	8.04	0.91	20 30.3
13	7	58	23.05	1.000	20	38	41.0	2.59	0.983 1102	247.4	8.06	0.92	20 26.8
14	7	58	46.90	0.988	20	37	39.2	2.56	0.982 5127	250.5	8.07	0.92	20 23.2
15	7	59	10.45	+0.975	+20	36	38.1	-2.53	0.981 9076	-253.7	8.08	0.92	20 19.7
16	7	59	33.71	0.963	20	35	37.6	2.51	0.981 2949	256.9	8.09	0.92	20 16.1
17	7	59	56.68	0.951	20	34	37.8	2.48	0.980 6747	260.0	8.10	0.92	20 12.6
18	8	0	19.34	0.938	20	33	38.7	2.45	0.980 0470	263.0	8.11	0.92	20 9.0
19	8	0	41.69	0.925	20	32	40.2	2.42	0.979 4121	266.0	8.12	0.92	20 5.5
20	8	1	8.73	+0.911	+20	31	42.4	-2.39	0.978 7700	-269.0	8.14	0.92	20 1.9
21	8	1	25.44	0.898	20	30	45.4	2.36	0.978 1209	271.9	8.15	0.92	19 58.3
22	8	1	46.84	0.885	20	29	49.2	2.33	0.977 4648	274.8	8.16	0.92	19 54.7
23	8	2	7.90	0.871	20	28	53.8	2.29	0.976 8018	277.6	8.17	0.93	19 51.2
24	8	2	28.64	0.857	20	27	59.2	2.26	0.976 1321	280.4	8.18	0.93	19 47.6
25	8	2	49.03	+0.843	+20	27	5.5	-2.22	0.975 4557	-283.2	8.20	0.93	19 44.0
26	8	3	9.09	0.829	20	26	12.6	2.19	0.974 7729	285.8	8.21	0.93	19 40.4
27	8	3	28.80	0.814	20	25	20.5	2.15	0.974 0837	288.4	8.22	0.93	19 36.8
28	8	3	48.15	0.799	20	24	29.4	2.11	0.973 3884	291.0	8.23	0.93	19 33.2
29	8	4	7.15	0.784	20	23	39.2	2.07	0.972 6871	293.4	8.25	0.93	19 29.5
30	8	4	25.79	+0.769	+20	22	49.9	-2.03	0.971 9799	-295.9	8.26	0.94	19 25.9
Oct. 1	8	4	44.07	+0.754	+20	22	1.6	-1.99	0.971 2670	-298.4	8.28	0.94	19 22.2

GREENWICH MEAN TIME.

Date.	Apparent Right Ascension.			Var. per Hour.	Apparent Declination.			Var. per Hour.	Logarithm of Distance from Earth.	Var. per Hour.	Polar Semi-diameter.	Hor. Parallax.	Transit Meridian of Greenwich.	
	Noon.			Noon.	Noon.			Noon.	Noon.	Noon.	Noon.	Noon.		
	h	m	s	s	°	'	"	"			"	"	h	m
Oct.	1	8	4 44.07	+0.754	+20	22	1.6	-1.99	0.971 2670	-298.4	8.28	0.94	19	22.2
	2	8	5 1.98	0.739	20	21	14.3	1.95	0.970 5485	300.5	8.29	0.94	19	18.6
	3	8	5 19.52	0.723	20	20	28.0	1.91	0.969 8246	302.7	8.30	0.94	19	15.0
	4	8	5 36.68	0.707	20	19	42.7	1.86	0.969 0955	304.9	8.32	0.94	19	11.3
	5	8	5 53.47	0.691	20	18	58.5	1.82	0.968 3613	306.9	8.33	0.95	19	7.7
	6	8	6 9.87	+0.675	+20	18	15.3	-1.78	0.967 6222	-308.9	8.35	0.95	19	4.0
	7	8	6 25.89	0.659	20	17	33.2	1.73	0.966 8784	310.9	8.36	0.95	19	0.3
	8	8	6 41.52	0.643	20	16	52.1	1.69	0.966 1300	312.8	8.37	0.95	18	56.6
	9	8	6 56.76	0.627	20	16	12.2	1.64	0.965 3770	314.6	8.39	0.95	18	53.0
	10	8	7 11.60	0.610	20	15	33.4	1.59	0.964 6198	316.3	8.40	0.95	18	49.3
	11	8	7 26.05	+0.594	+20	14	55.7	-1.55	0.963 8586	-318.0	8.42	0.95	18	45.6
	12	8	7 40.09	0.577	20	14	19.2	1.50	0.963 0934	319.6	8.43	0.95	18	41.9
	13	8	7 53.73	0.560	20	13	43.8	1.45	0.962 3245	321.1	8.45	0.96	18	38.2
	14	8	8 6.96	0.543	20	13	9.7	1.40	0.961 5519	322.6	8.46	0.96	18	34.4
	15	8	8 19.78	0.525	20	12	36.7	1.35	0.960 7759	324.0	8.48	0.96	18	30.7
	16	8	8 32.18	+0.508	+20	12	5.0	-1.30	0.959 9967	-325.3	8.49	0.96	18	27.0
	17	8	8 44.16	0.490	20	11	34.5	1.24	0.959 2143	326.6	8.51	0.96	18	23.3
	18	8	8 55.72	0.473	20	11	5.3	1.19	0.958 4290	327.8	8.53	0.96	18	19.5
	19	8	9 6.85	0.455	20	10	37.4	1.14	0.957 6410	328.9	8.54	0.96	18	15.8
	20	8	9 17.55	0.437	20	10	10.7	1.08	0.956 8505	329.9	8.56	0.97	18	12.0
	21	8	9 27.82	+0.419	+20	9	45.4	-1.03	0.956 0577	-330.8	8.57	0.97	18	8.2
	22	8	9 37.65	0.400	20	9	21.4	0.97	0.955 2628	331.6	8.59	0.97	18	4.4
	23	8	9 47.04	0.382	20	8	58.7	0.92	0.954 4661	332.3	8.61	0.97	18	0.6
	24	8	9 55.98	0.363	20	8	37.4	0.86	0.953 6677	333.0	8.62	0.97	17	56.9
	25	8	10 4.48	0.345	20	8	17.5	0.80	0.952 8679	333.5	8.64	0.98	17	53.1
	26	8	10 12.53	+0.326	+20	7	58.9	-0.74	0.952 0670	-333.9	8.65	0.98	17	49.3
	27	8	10 20.12	0.307	20	7	41.8	0.69	0.951 2651	334.3	8.67	0.98	17	45.5
	28	8	10 27.27	0.288	20	7	26.0	0.63	0.950 4626	334.5	8.69	0.98	17	41.7
	29	8	10 33.96	0.269	20	7	11.7	0.56	0.949 6596	334.6	8.70	0.98	17	37.8
	30	8	10 40.19	0.250	20	6	58.9	0.50	0.948 8565	334.6	8.72	0.99	17	34.0
Nov.	31	8	10 45.96	+0.231	+20	6	47.5	-0.45	0.948 0535	-334.5	8.73	0.99	17	30.2
	1	8	10 51.27	0.212	20	6	37.5	0.39	0.947 2508	334.3	8.75	0.99	17	26.3
	2	8	10 56.12	0.192	20	6	28.8	0.33	0.946 4487	334.0	8.77	0.99	17	22.4
	3	8	11 0.50	0.173	20	6	21.7	0.26	0.945 6474	333.6	8.78	0.99	17	18.6
	4	8	11 4.42	0.154	20	6	16.1	0.21	0.944 8473	333.1	8.80	1.00	17	14.7
	5	8	11 7.88	+0.135	+20	6	11.8	-0.15	0.944 0484	-332.5	8.81	1.00	17	10.8
	6	8	11 10.88	0.115	20	6	9.1	0.08	0.943 2512	331.8	8.83	1.00	17	6.9
	7	8	11 13.41	0.096	20	6	7.8	-0.02	0.942 4558	331.0	8.85	1.00	17	3.0
	8	8	11 15.47	0.076	20	6	8.0	+0.04	0.941 6624	330.1	8.86	1.00	16	59.2
	9	8	11 17.07	0.057	20	6	9.7	0.10	0.940 8714	329.1	8.88	1.01	16	55.2
	10	8	11 18.20	+0.037	+20	6	12.8	+0.16	0.940 0829	-328.0	8.89	1.01	16	51.3
	11	8	11 18.86	+0.018	20	6	17.4	0.22	0.939 2972	326.7	8.91	1.01	16	47.4
	12	8	11 19.06	-0.002	20	6	23.5	0.28	0.938 5146	325.4	8.93	1.01	16	43.4
	13	8	11 18.78	0.021	20	6	31.0	0.34	0.937 7354	323.9	8.94	1.01	16	39.5
	14	8	11 18.04	0.041	20	6	40.0	0.41	0.936 9597	322.4	8.96	1.02	16	35.5
	15	8	11 16.83	-0.060	+20	6	50.5	+0.47	0.936 1878	-320.7	8.97	1.02	16	31.6
	16	8	11 15.15	-0.080	+20	7	2.4	+0.53	0.935 4201	-318.9	8.99	1.02	16	27.6

GREENWICH MEAN TIME.

Date.	Apparent Right Ascension.			Var. per Hour.	Apparent Declination.			Var. per Hour.	Logarithm of Distance from Earth.	Var. per Hour.	Polar Semi- diam- eter.	Hor. Paral- lax.	Transit, Meridian of Green- wich.	
	Noon.				Noon.									Noon.
	h	m	s	s	°	'	"	"	Noon.	Noon.	"	"	h	m
Nov. 16	8	11	15.15	-0.080	+20	7	2.4	+0.53	0.935 4201	-318.9	8.99	1.02	16	27.6
17	8	11	13.01	0.099	20	7	15.9	0.59	0.934 6569	317.0	9.01	1.02	16	23.7
18	8	11	10.39	0.119	20	7	30.8	0.65	0.933 8983	315.0	9.02	1.02	16	19.7
19	8	11	7.31	0.138	20	7	47.2	0.71	0.933 1448	312.9	9.04	1.03	16	15.7
20	8	11	3.76	0.158	20	8	5.1	0.78	0.932 3966	310.6	9.05	1.03	16	11.7
21	8	10	59.74	-0.177	+20	8	24.4	+0.84	0.931 6539	-308.2	9.07	1.03	16	7.7
22	8	10	55.27	0.196	20	8	45.2	0.90	0.930 9172	305.7	9.08	1.03	16	3.7
23	8	10	50.33	0.216	20	9	7.4	0.96	0.930 1866	303.1	9.10	1.03	15	59.6
24	8	10	44.92	0.235	20	9	31.1	1.01	0.929 4625	300.3	9.11	1.04	15	55.6
25	8	10	39.06	0.254	20	9	56.1	1.07	0.928 7452	297.4	9.13	1.04	15	51.6
26	8	10	32.75	-0.272	+20	10	22.6	+1.13	0.928 0350	-294.4	9.14	1.04	15	47.6
27	8	10	25.99	0.291	20	10	50.5	1.19	0.927 3323	291.2	9.15	1.04	15	43.5
28	8	10	18.78	0.310	20	11	19.8	1.25	0.926 6374	287.9	9.17	1.04	15	39.4
29	8	10	11.12	0.328	20	11	50.5	1.31	0.925 9505	284.5	9.18	1.04	15	35.4
30	8	10	3.03	0.346	20	12	22.5	1.36	0.925 2719	281.0	9.20	1.04	15	31.3
Dec. 1	8	9	54.50	-0.365	+20	12	55.8	+1.41	0.924 6019	-277.3	9.21	1.04	15	27.2
2	8	9	45.53	0.383	20	13	30.4	1.47	0.923 9409	273.5	9.22	1.05	15	23.2
3	8	9	36.14	0.400	20	14	6.3	1.52	0.923 2889	269.7	9.24	1.05	15	19.1
4	8	9	26.33	0.418	20	14	43.5	1.58	0.922 6464	265.7	9.25	1.05	15	15.0
5	8	9	16.10	0.435	20	15	21.9	1.63	0.922 0135	261.6	9.27	1.05	15	10.9
6	8	9	5.47	-0.452	+20	16	1.5	+1.68	0.921 3906	-257.4	9.28	1.05	15	6.7
7	8	8	54.42	0.469	20	16	42.4	1.73	0.920 7780	253.1	9.29	1.05	15	2.6
8	8	8	42.98	0.485	20	17	24.4	1.78	0.920 1758	248.7	9.30	1.05	14	58.5
9	8	8	31.14	0.502	20	18	7.6	1.82	0.919 5843	244.2	9.32	1.06	14	54.4
10	8	8	18.90	0.518	20	18	51.9	1.87	0.919 0038	239.5	9.33	1.06	14	50.2
11	8	8	6.29	-0.533	+20	19	37.3	+1.91	0.918 4345	-234.8	9.34	1.06	14	46.1
12	8	7	53.30	0.549	20	20	23.8	1.96	0.917 8767	230.0	9.35	1.06	14	41.9
13	8	7	39.93	0.565	20	21	11.4	2.00	0.917 3306	225.0	9.36	1.06	14	37.8
14	8	7	26.20	0.580	20	22	0.0	2.05	0.916 7965	220.0	9.38	1.07	14	33.6
15	8	7	12.11	0.595	20	22	49.7	2.09	0.916 2747	214.8	9.39	1.07	14	29.4
16	8	6	57.66	-0.609	+20	23	40.3	+2.13	0.915 7654	-209.5	9.40	1.07	14	25.3
17	8	6	42.87	0.623	20	24	31.9	2.17	0.915 2689	204.1	9.41	1.07	14	21.1
18	8	6	27.74	0.637	20	25	24.4	2.21	0.914 7855	198.6	9.42	1.07	14	16.9
19	8	6	12.28	0.651	20	26	17.8	2.24	0.914 3154	193.0	9.43	1.07	14	12.7
20	8	5	56.50	0.664	20	27	12.1	2.28	0.913 8589	187.4	9.44	1.07	14	8.5
21	8	5	40.40	-0.677	+20	28	7.2	+2.31	0.913 4161	-181.6	9.45	1.07	14	4.3
22	8	5	23.99	0.690	20	29	3.2	2.35	0.912 9873	175.7	9.46	1.08	14	0.1
23	8	5	7.28	0.702	20	29	59.9	2.38	0.912 5728	169.7	9.47	1.08	13	55.9
24	8	4	50.29	0.714	20	30	57.4	2.41	0.912 1727	163.6	9.48	1.08	13	51.7
25	8	4	33.02	0.725	20	31	55.6	2.44	0.911 7873	157.5	9.49	1.08	13	47.5
26	8	4	15.48	-0.736	+20	32	54.5	+2.47	0.911 4168	-151.2	9.50	1.08	13	43.2
27	8	3	57.69	0.746	20	33	54.0	2.49	0.911 0614	144.9	9.51	1.08	13	39.0
28	8	3	39.65	0.757	20	34	54.0	2.51	0.910 7212	138.5	9.51	1.08	13	34.8
29	8	3	21.37	0.766	20	35	54.6	2.54	0.910 3966	132.0	9.52	1.08	13	30.5
30	8	3	2.87	0.775	20	36	55.7	2.56	0.910 0876	125.5	9.52	1.08	13	26.3
31	8	2	44.16	-0.784	+20	37	57.3	+2.58	0.909 7943	-118.9	9.53	1.08	13	22.1
32	8	2	25.24		+20	38	59.3	..	0.909 5168	..	9.54	1.09	13	17.8

FOR GREENWICH MEAN NOON.

Date.		Heliocentric Longitude, Mean Equinox of Date.	Var. per Day.	Reduction to Orbit.	Heliocentric Latitude.	Var. per Day.	Logarithm of Radius Vector.	Var. per Day.
		° ' "	' "	"	° ' "	"		
Jan.	7	103 7 35.3	2 14.48	-32.7	-0 25 33.3	+5.76	0.955 3942	+31.3
	15	103 25 31.1	2 14.47	31.8	0 24 47.2	5.76	0.955 4196	32.1
	23	103 43 26.8	2 14.45	30.8	0 24 1.1	5.77	0.955 4456	32.9
	31	104 1 22.3	2 14.44	29.9	0 23 14.9	5.78	0.955 4722	33.6
Feb.	8	104 19 17.8	2 14.43	28.9	0 22 28.7	5.78	0.955 4994	34.4
	16	104 37 13.1	2 14.41	-27.9	-0 21 42.5	+5.78	0.955 5273	+35.2
	24	104 55 8.3	2 14.39	26.9	0 20 56.2	5.79	0.955 5557	35.9
Mar.	3	105 13 3.4	2 14.37	26.0	0 20 9.9	5.79	0.955 5847	36.6
	11	105 30 58.3	2 14.35	25.0	0 19 23.6	5.79	0.955 6142	37.3
	19	105 48 53.0	2 14.34	24.0	0 18 37.3	5.79	0.955 6444	38.1
	27	106 6 47.7	2 14.33	-23.0	-0 17 50.9	+5.80	0.955 6752	+38.8
Apr.	4	106 24 42.2	2 14.31	22.0	0 17 4.5	5.80	0.955 7065	39.6
	12	106 42 36.6	2 14.29	21.0	0 16 18.1	5.80	0.955 7385	40.3
	20	107 0 30.8	2 14.26	20.0	0 15 31.7	5.81	0.955 7710	41.1
	28	107 18 24.8	2 14.24	19.0	0 14 45.2	5.81	0.955 8042	41.8
May	6	107 36 18.7	2 14.23	-18.0	-0 13 58.7	+5.81	0.955 8379	+42.6
	14	107 54 12.5	2 14.21	17.0	0 13 12.2	5.81	0.955 8723	43.4
	22	108 12 6.1	2 14.19	16.0	0 12 25.7	5.81	0.955 9073	44.1
	30	108 29 59.5	2 14.16	15.0	0 11 39.2	5.81	0.955 9428	44.8
June	7	108 47 52.7	2 14.14	14.0	0 10 52.7	5.82	0.955 9789	45.6
	15	109 5 45.8	2 14.12	-13.0	-0 10 6.1	+5.82	0.956 0157	+46.3
	23	109 23 38.7	2 14.10	12.0	0 9 19.6	5.82	0.956 0530	47.1
July	1	109 41 31.4	2 14.08	11.0	0 8 33.1	5.82	0.956 0910	47.8
	9	109 59 24.0	2 14.06	10.0	0 7 46.5	5.82	0.956 1295	48.6
	17	110 17 16.4	2 14.04	9.0	0 7 0.0	5.82	0.956 1687	49.3
	25	110 35 8.6	2 14.01	- 8.0	-0 6 13.4	+5.82	0.956 2084	+50.1
Aug.	2	110 53 0.6	2 13.99	7.0	0 5 26.9	5.82	0.956 2488	50.8
	10	111 10 52.4	2 13.97	6.0	0 4 40.3	5.82	0.956 2897	51.6
	18	111 28 44.1	2 13.95	4.9	0 3 53.8	5.82	0.956 3313	52.3
	26	111 46 35.6	2 13.92	3.9	0 3 7.2	5.82	0.956 3734	53.0
Sept.	3	112 4 26.9	2 13.90	- 2.9	-0 2 20.7	+5.82	0.956 4161	+53.7
	11	112 22 18.0	2 13.87	1.9	0 1 34.1	5.82	0.956 4594	54.4
	19	112 40 8.9	2 13.84	- 0.9	0 0 47.6	5.82	0.956 5032	55.2
	27	112 57 59.5	2 13.82	+ 0.1	-0 0 1.0	5.82	0.956 5477	55.9
Oct.	5	113 15 50.0	2 13.80	1.1	+0 0 45.5	5.81	0.956 5927	56.6
	13	113 33 40.3	2 13.77	+ 2.2	+0 1 32.0	+5.81	0.956 6382	+57.3
	21	113 51 30.3	2 13.74	3.2	0 2 18.5	5.81	0.956 6844	58.1
	29	114 9 20.1	2 13.72	4.2	0 3 5.0	5.81	0.956 7312	58.8
Nov.	6	114 27 9.8	2 13.69	5.2	0 3 51.5	5.81	0.956 7785	59.4
	14	114 44 59.2	2 13.66	6.2	0 4 37.9	5.81	0.956 8263	60.1
	22	115 2 48.4	2 13.64	+ 7.2	+0 5 24.4	+5.81	0.956 8747	+60.9
	30	115 20 37.4	2 13.61	8.2	0 6 10.8	5.80	0.956 9237	61.6
Dec.	8	115 38 26.1	2 13.58	9.2	0 6 57.2	5.80	0.956 9732	62.3
	16	115 56 14.7	2 13.55	10.2	0 7 43.6	5.79	0.957 0233	62.9
	24	116 14 2.9	2 13.52	11.2	0 8 29.9	5.79	0.957 0739	63.6
	32	116 31 51.0	2 13.49	+12.2	+0 9 16.3	+5.79	0.957 1250	+64.3
	40	116 49 38.8	2 13.46	+13.2	+0 10 2.6	+5.79	0.957 1767	+65.0

GREENWICH MEAN TIME.

Date.	Apparent Right Ascension.			Var. per Day.	Apparent Declination.			Var. per Day.	Logarithm of Distance from Earth.	Var. per Day.	Semi-diameter.	Hor. Parallax.	Transit, Meridian of Greenwich.		
	Noon.			Noon.	Noon.			Noon.	Noon.	Noon.	Noon.	Noon.			
	h	m	s	s	°	'	"	"			"	"	h m		
Jan.	1	21	5	30.73	+12.157	-17	20	39.6	+53.26	1.316 7273	+2045.1	1.62	0.42	2 25.9	
	5	21	6	20.15	12.543	17	17	2.9	55.05	1.317 5041	1836.8	1.61	0.42	2 11.0	
	9	21	7	11.01	12.880	17	13	19.5	56.61	1.318 1960	1621.3	1.61	0.42	1 56.1	
	13	21	8	3.13	13.170	17	9	30.3	57.96	1.318 8005	1401.2	1.61	0.42	1 41.2	
	17	21	8	56.31	13.410	17	5	36.1	59.13	1.319 3164	1177.0	1.61	0.42	1 26.4	
	21	21	9	50.35	+13.607	-17	1	37.5	+60.12	1.319 7416	+ 948.8	1.61	0.42	1 11.5	
	25	21	10	45.10	13.759	16	57	35.3	60.94	1.320 0751	718.3	1.60	0.42	0 56.7	
	29	21	11	40.36	13.864	16	53	30.3	61.54	1.320 3159	484.9	1.60	0.42	0 41.9	
	Feb.	2	21	12	35.95	13.921	16	49	23.3	61.94	1.320 4627	248.9	1.60	0.42	0 27.1
		6	21	13	31.67	13.931	16	45	15.1	62.10	1.320 5149	+ 11.9	1.60	0.42	0 12.3
	10	21	14	27.33	+13.888	-16	41	6.8	+62.03	1.320 4724	- 223.8	1.60	0.42	23 53.8	
	14	21	15	22.71	13.797	16	36	59.1	61.77	1.320 3362	456.8	1.60	0.42	23 39.0	
	18	21	16	17.65	13.666	16	32	52.9	61.31	1.320 1074	686.9	1.60	0.42	23 24.2	
	22	21	17	11.98	13.490	16	28	48.9	60.64	1.319 7871	914.0	1.61	0.42	23 9.3	
	26	21	18	5.51	13.271	16	24	48.1	59.74	1.319 3766	1138.4	1.61	0.42	22 54.5	
Mar.	1	21	18	58.09	+13.009	-16	20	51.2	+58.66	1.318 8769	-1369.1	1.61	0.42	22 39.6	
	5	21	19	49.52	12.698	16	16	59.1	57.35	1.318 2900	1574.4	1.61	0.42	22 24.7	
	9	21	20	39.62	12.345	16	13	12.7	55.80	1.317 6183	1782.5	1.61	0.42	22 9.8	
	13	21	21	28.23	11.953	16	9	33.0	54.04	1.316 8651	1982.2	1.62	0.43	21 54.9	
	17	21	22	15.19	11.522	16	6	0.6	52.13	1.316 0337	2173.4	1.62	0.43	21 40.0	
	21	21	23	0.36	+11.067	-16	2	36.2	+60.04	1.315 1275	-2366.3	1.62	0.43	21 25.0	
	25	21	23	43.60	10.558	15	59	20.5	47.77	1.314 1498	2531.0	1.63	0.43	21 10.0	
	29	21	24	24.78	10.025	15	56	14.3	45.29	1.313 1039	2696.9	1.63	0.43	20 54.9	
	Apr.	2	21	25	3.75	9.453	15	53	18.4	42.64	1.311 9938	2851.1	1.63	0.43	20 39.8
		6	21	25	40.36	8.850	15	50	33.4	39.81	1.310 8246	2993.1	1.63	0.43	20 24.7
	10	21	26	14.51	+ 8.219	-15	48	0.1	+36.83	1.309 6010	-3122.4	1.64	0.43	20 9.5	
	14	21	26	46.08	7.562	15	45	38.9	33.73	1.308 3284	3238.4	1.65	0.43	19 54.3	
	18	21	27	14.98	6.884	15	43	30.4	30.53	1.307 0120	3341.2	1.65	0.43	19 39.0	
	22	21	27	41.13	6.188	15	41	34.8	27.22	1.305 6572	3430.8	1.66	0.44	19 23.7	
	26	21	28	4.46	5.471	15	39	52.8	23.78	1.304 2691	3507.5	1.66	0.44	19 8.4	
	30	21	28	24.87	+ 4.731	-15	38	24.7	+20.24	1.302 8532	-3569.3	1.67	0.44	18 53.0	
	May	4	21	28	42.29	3.975	15	37	11.0	16.61	1.301 4159	3614.0	1.67	0.44	18 37.5
		8	21	28	56.66	3.211	15	36	11.9	12.93	1.299 9642	3642.1	1.68	0.44	18 22.1
	12	21	29	7.97	2.442	15	35	27.6	9.24	1.298 5044	3653.7	1.69	0.44	18 6.5	
	16	21	29	16.19	1.669	15	34	58.0	5.55	1.297 0434	3649.0	1.69	0.44	17 50.9	
	20	21	29	21.32	+ 0.896	-15	34	43.2	+ 1.85	1.295 5872	-3629.5	1.70	0.45	17 35.3	
	24	21	29	23.36	+ 0.124	15	34	43.2	- 1.85	1.294 1420	3593.4	1.70	0.45	17 19.6	
	28	21	29	22.31	- 0.649	15	34	58.0	5.53	1.292 7148	3539.8	1.71	0.45	17 3.8	
	June	1	21	29	18.18	1.414	15	35	27.4	9.18	1.291 3125	3469.0	1.71	0.45	16 48.0
		5	21	29	11.02	2.164	15	36	11.3	12.74	1.289 9421	3379.3	1.72	0.45	16 32.1
	9	21	29	0.89	- 2.896	-15	37	9.1	-16.14	1.288 6113	-3372.6	1.72	0.45	16 16.2	
	13	21	28	47.88	3.604	15	38	20.3	19.46	1.287 3261	3150.7	1.73	0.45	16 0.3	
	17	21	28	32.09	4.288	15	39	44.6	22.64	1.286 0928	3013.4	1.74	0.46	15 44.3	
	21	21	28	13.61	4.947	15	41	21.2	25.68	1.284 9174	2861.2	1.74	0.46	15 28.2	
	25	21	27	52.55	5.578	15	43	9.7	28.56	1.283 8059	2693.2	1.74	0.46	15 12.2	
	29	21	27	29.03	- 6.177	-15	45	9.4	-31.25	1.282 7649	-2509.3	1.75	0.46	14 56.0	
	July 3	21	27	3.19	- 6.734	-15	47	19.4	-33.71	1.281 8004	-2311.0	1.75	0.46	14 39.9	

GREENWICH MEAN TIME.

Date.	Apparent Right Ascension.			Var. per Day.	Apparent Declination.			Var. per Day.	Logarithm of Distance from Earth.	Var. per Day.	Semi- diam- eter.	Hor. Paral- ax.	Transit, Meridian of Green- wich.	
	Noon.				Noon.									
		h	m	s		°	'	"					h	m
July	3	21	27	3.19	- 6.734	-15	47	19.4	-33.71	1.281 8004	-2311.0	1.75	0.46	14 39.9
	7	21	26	35.22	7.244	15	49	38.8	35.96	1.280 9178	2100.2	1.76	0.46	14 23.7
	11	21	26	5.30	7.708	15	52	6.7	37.92	1.280 1218	1877.4	1.76	0.46	14 7.4
	15	21	25	33.62	8.122	15	54	41.9	39.64	1.279 4172	1645.0	1.76	0.46	13 51.2
	19	21	25	0.39	8.488	15	57	23.5	41.14	1.278 8069	1404.6	1.76	0.46	13 34.9
	23	21	24	25.78	- 8.806	-16	0	10.7	-42.39	1.278 2948	-1154.3	1.77	0.47	13 18.6
	27	21	23	50.02	9.064	16	3	2.2	43.32	1.277 8846	895.5	1.77	0.47	13 2.3
Aug.	31	21	23	13.35	9.260	16	5	56.9	43.96	1.277 5793	630.1	1.77	0.47	12 45.9
	4	21	22	36.02	9.395	16	8	53.5	44.30	1.277 3810	361.2	1.77	0.47	12 29.6
	8	21	21	58.27	9.468	16	11	50.9	44.34	1.277 2906	- 90.5	1.77	0.47	12 13.2
	12	21	21	20.36	- 9.478	-16	14	47.8	-44.08	1.277 3087	+ 180.8	1.77	0.47	11 56.9
	16	21	20	42.53	9.427	16	17	43.2	43.57	1.277 4351	450.8	1.77	0.47	11 40.5
	20	21	20	5.02	9.319	16	20	36.0	42.77	1.277 6692	719.5	1.77	0.47	11 24.2
	24	21	19	28.06	9.148	16	23	25.0	41.70	1.278 0105	986.6	1.77	0.47	11 7.9
Sept.	28	21	18	51.92	8.913	16	26	9.2	40.35	1.278 4579	1249.3	1.77	0.47	10 51.5
	1	21	18	16.84	- 8.614	-16	28	47.4	-38.71	1.279 0090	+1504.7	1.76	0.46	10 35.2
	5	21	17	43.09	8.254	16	31	18.5	36.80	1.279 6605	1750.9	1.76	0.46	10 18.9
	9	21	17	10.88	7.844	16	33	41.5	34.68	1.280 4084	1986.7	1.76	0.46	10 2.7
	13	21	16	40.41	7.381	16	35	55.7	32.37	1.281 2484	2211.7	1.75	0.46	9 46.4
	17	21	16	11.90	6.869	16	38	0.2	29.84	1.282 1763	2425.9	1.75	0.46	9 30.2
	21	21	15	45.52	- 6.310	-16	39	54.2	-27.14	1.283 1875	+2628.3	1.75	0.46	9 14.1
Oct.	25	21	15	21.48	5.705	16	41	37.1	24.24	1.284 2771	2816.8	1.74	0.46	8 58.0
	29	21	14	59.94	5.056	16	43	7.9	21.15	1.285 4389	2989.5	1.74	0.46	8 41.9
	3	21	14	41.08	4.369	16	44	26.1	17.92	1.286 6665	3145.9	1.73	0.45	8 25.9
	7	21	14	25.03	3.653	16	45	31.1	14.60	1.287 9533	3284.4	1.73	0.45	8 9.9
	11	21	14	11.89	- 2.914	-16	46	22.8	-11.22	1.289 2918	+3405.9	1.72	0.45	7 53.9
	15	21	14	1.75	2.152	16	47	0.7	7.71	1.290 6758	3510.8	1.72	0.45	7 38.0
	19	21	13	54.70	1.370	16	47	24.4	4.15	1.292 0982	3598.9	1.71	0.45	7 22.2
Nov.	23	21	13	50.81	- 0.571	16	47	33.8	- 0.54	1.293 5526	3669.8	1.71	0.45	7 6.4
	27	21	13	50.15	+ 0.241	16	47	28.6	+ 3.15	1.295 0313	3720.8	1.70	0.45	6 50.7
	31	21	13	52.75	+ 1.061	-16	47	8.6	+ 6.84	1.296 5267	+3752.6	1.69	0.44	6 35.0
	4	21	13	58.64	1.880	16	46	33.9	10.51	1.298 0309	3765.5	1.69	0.44	6 19.4
	8	21	14	7.78	2.688	16	45	44.6	14.13	1.299 5368	3761.0	1.68	0.44	6 3.8
	12	21	14	20.14	3.491	16	44	40.9	17.73	1.301 0375	3739.9	1.68	0.44	5 48.3
	16	21	14	35.70	4.287	16	43	22.8	21.30	1.302 5264	3702.0	1.67	0.44	5 32.8
Dec.	20	21	14	54.42	+ 5.070	-16	41	50.6	+24.81	1.303 9969	+3647.9	1.66	0.44	5 17.4
	24	21	15	16.24	5.837	16	40	4.4	28.28	1.305 4422	3575.8	1.66	0.44	5 2.0
	28	21	15	41.09	6.583	16	38	4.5	31.63	1.306 8553	3486.9	1.65	0.43	4 46.7
	2	21	16	8.87	7.301	16	35	51.5	34.88	1.308 2297	3383.1	1.65	0.43	4 31.4
	6	21	16	39.46	7.989	16	33	25.6	38.01	1.309 5598	3264.2	1.64	0.43	4 16.2
	10	21	17	12.74	+ 8.645	-16	30	47.6	+40.99	1.310 8394	+3132.7	1.64	0.43	4 1.1
	14	21	17	48.58	9.272	16	27	57.8	43.87	1.312 0644	2989.9	1.63	0.43	3 45.9
	18	21	18	26.87	9.866	16	24	56.8	46.61	1.313 2296	2834.1	1.63	0.43	3 30.8
	22	21	19	7.46	10.425	16	21	45.1	49.21	1.314 3301	2666.6	1.63	0.43	3 15.8
	26	21	19	50.22	10.946	16	18	23.3	51.67	1.315 3613	2487.0	1.62	0.43	3 0.8
	30	21	20	34.97	+11.421	-16	14	52.0	+53.93	1.316 3183	+2297.6	1.62	0.43	2 45.8
	34	21	21	21.53	...	-16	11	12.3	...	1.317 1981	...	1.62	0.43	2 30.8

FOR GREENWICH MEAN NOON.

Date.		Heliocentric Longitude, Mean Equinox of Date.	Var per Day.	Reduction to Orbit.	Heliocentric Latitude.	Var per Day.	Logarithm of Radius Vector.	Var. per Day.
		" ' "	"	"	" ' "	"		
Jan.	1	315 17 38.6	39.30	+7.8	-0 40 48.8	-0.25	1.299 4672	+21.6
	11	315 24 11.6	39.30	7.8	0 40 51.3	0.25	1.299 4888	21.5
	21	315 30 44.6	39.30	7.8	0 40 53.8	0.25	1.299 5102	21.4
	31	315 37 17.5	39.29	+7.8	-0 40 56.3	-0.25	1.299 5315	+21.3
Feb.	10	315 43 50.4	39.28	7.8	0 40 58.8	0.25	1.299 5528	21.2
	20	315 50 23.2	39.28	7.7	0 41 1.3	0.25	1.299 5740	21.2
Mar.	1	315 56 56.0	39.28	+7.7	-0 41 3.7	-0.25	1.299 5952	+21.1
	11	316 3 28.7	39.27	7.7	0 41 6.2	0.24	1.299 6162	21.0
	21	316 10 1.4	39.26	7.7	0 41 8.6	0.24	1.299 6372	20.9
	31	316 16 34.0	39.26	+7.6	-0 41 11.1	-0.24	1.299 6581	+20.9
Apr.	10	316 23 6.6	39.26	7.6	0 41 13.5	0.24	1.299 6789	20.8
	20	316 29 39.2	39.25	7.6	0 41 15.9	0.24	1.299 6997	20.8
	30	316 36 11.7	39.25	+7.6	-0 41 18.3	-0.24	1.299 7204	+20.7
May	10	316 42 44.1	39.24	7.6	0 41 20.7	0.24	1.299 7410	20.6
	20	316 49 16.5	39.24	7.5	0 41 23.1	0.24	1.299 7615	20.5
	30	316 55 48.9	39.24	+7.5	-0 41 25.5	-0.24	1.299 7819	+20.4
June	9	317 2 21.2	39.23	7.5	0 41 27.9	0.24	1.299 8023	20.3
	19	317 8 53.4	39.22	7.5	0 41 30.3	0.23	1.299 8226	20.2
	29	317 15 25.6	39.22	+7.5	-0 41 32.6	-0.23	1.299 8428	+20.2
July	9	317 21 57.8	39.21	7.4	0 41 34.9	0.23	1.299 8630	20.1
	19	317 28 29.9	39.21	7.4	0 41 37.2	0.23	1.299 8831	20.1
	29	317 35 2.0	39.20	+7.4	-0 41 39.6	-0.23	1.299 9031	+20.0
Aug.	8	317 41 34.0	39.20	7.4	0 41 41.9	0.23	1.299 9231	19.9
	18	317 48 6.0	39.19	7.4	0 41 44.2	0.23	1.299 9429	19.8
	28	317 54 37.9	39.19	+7.3	-0 41 46.5	-0.23	1.299 9627	+19.8
Sept.	7	318 1 9.8	39.19	7.3	0 41 48.8	0.23	1.299 9825	19.7
	17	318 7 41.7	39.18	7.3	0 41 51.0	0.23	1.300 0022	19.6
	27	318 14 13.5	39.18	+7.3	-0 41 53.3	-0.22	1.300 0217	+19.5
Oct.	7	318 20 45.2	39.17	7.2	0 41 55.5	0.22	1.300 0412	19.5
	17	318 27 16.9	39.17	7.2	0 41 57.8	0.22	1.300 0607	19.4
	27	318 33 48.6	39.16	+7.2	-0 42 0.0	-0.22	1.300 0801	+19.4
Nov.	6	318 40 20.2	39.16	7.2	0 42 2.3	0.22	1.300 0994	19.3
	16	318 46 51.7	39.15	7.1	0 42 4.5	0.22	1.300 1186	19.2
	26	318 53 23.2	39.15	+7.1	-0 42 6.7	-0.22	1.300 1378	+19.1
Dec.	6	318 59 54.7	39.14	7.1	0 42 8.9	0.22	1.300 1569	19.0
	16	319 6 26.1	39.14	7.1	0 42 11.1	0.22	1.300 1759	19.0
	26	319 12 57.5	39.13	+7.1	-0 42 13.2	-0.22	1.300 1949	+18.9
	36	319 19 28.8	39.13	+7.0	-0 42 15.4	-0.22	1.300 2137	+18.8

GREENWICH MEAN TIME.

Date.		Apparent Right Ascension.		Var. per Day.	Apparent Declination.		Var. per Day.	Logarithm of Distance from Earth.	Var. per Day.	Semi- diam- eter.	Hor. Paral- ax.	Transit Meridian of Green- wich.	
		Noon.			Noon.								
		h	m s	s	°	' "	"						
Jan.	1	8 16	10.61	-6.357	+19 27	15.0	+21.00	1.463 8600	- 970.9	1.33	0.30	13 34.6	
	5	8 15	44.73	6.577	19 28	40.4	21.69	1.463 5064	795.8	1.33	0.30	13 18.5	
	9	8 15	18.05	6.753	19 30	8.3	22.24	1.463 2240	616.1	1.33	0.30	13 2.3	
	13	8 14	50.77	6.880	19 31	38.1	22.63	1.463 0140	433.0	1.33	0.30	12 46.1	
	17	8 14	23.07	6.963	19 33	9.1	22.86	1.462 8779	247.7	1.33	0.30	12 29.9	
	21	8 13	55.12	-7.003	+19 34	40.8	+22.96	1.462 8159	- 62.1	1.33	0.30	12 13.7	
Feb.	25	8 13	27.10	6.998	19 36	12.6	22.92	1.462 8282	+ 123.5	1.33	0.30	11 57.6	
	29	8 12	59.19	6.949	19 37	44.0	22.73	1.462 9147	309.4	1.33	0.30	11 41.4	
	2	8 12	31.57	6.853	19 39	14.3	22.41	1.463 0756	494.4	1.33	0.30	11 25.2	
	6	8 12	4.43	6.709	19 40	43.1	21.95	1.463 3097	675.6	1.33	0.30	11 9.0	
	10	8 11	37.95	-6.522	+19 42	9.7	+21.32	1.463 6154	+ 852.0	1.33	0.30	10 52.8	
	14	8 11	12.31	6.290	19 43	33.5	20.57	1.463 9905	1022.2	1.33	0.30	10 36.7	
	18	8 10	47.68	6.021	19 44	54.1	19.72	1.464 4323	1185.7	1.33	0.30	10 20.5	
	22	8 10	24.19	5.716	19 46	11.1	18.76	1.464 9382	1342.9	1.33	0.30	10 4.4	
	26	8 10	2.00	5.374	19 47	24.0	17.70	1.465 5056	1492.3	1.32	0.30	9 48.3	
	Mar.	1	8 9	41.24	-5.001	+19 48	32.5	+16.53	1.466 1309	+1633.4	1.32	0.30	9 32.3
5	8 9	22.04	4.591	19 49	36.1	15.25	1.466 8111	1765.4	1.32	0.30	9 16.2		
9	8 9	4.55	4.150	19 50	34.4	13.89	1.467 5418	1886.7	1.32	0.30	9 0.2		
Apr.	13	8 8	48.87	3.685	19 51	27.1	12.47	1.468 3189	1996.3	1.32	0.30	8 44.2	
	17	8 8	35.09	3.201	19 52	14.1	10.99	1.469 1373	2094.7	1.31	0.30	8 28.3	
	21	8 8	23.28	-2.703	+19 52	54.9	+ 9.46	1.469 9932	+2182.2	1.31	0.30	8 12.3	
	25	8 8	13.49	2.184	19 53	29.7	7.88	1.470 8816	2259.0	1.31	0.30	7 56.5	
	29	8 8	5.83	1.648	19 53	58.0	6.25	1.471 7989	2324.5	1.31	0.30	7 40.6	
	2	8 8	0.32	1.101	19 54	19.7	4.60	1.472 7396	2377.9	1.30	0.30	7 24.8	
	6	8 7	57.02	-0.549	19 54	34.8	2.92	1.473 6995	2418.7	1.30	0.30	7 9.0	
	10	8 7	55.93	+0.006	+19 54	43.1	+ 1.22	1.474 6729	+2446.8	1.30	0.30	6 53.3	
	14	8 7	57.07	0.564	19 54	44.6	- 0.46	1.475 6553	2462.5	1.29	0.29	6 37.6	
	18	8 8	0.44	1.120	19 54	39.4	2.15	1.476 6414	2467.0	1.29	0.29	6 21.9	
May	22	8 8	6.02	1.667	19 54	27.4	3.84	1.477 6276	2462.1	1.29	0.29	6 6.3	
	26	8 8	13.77	2.211	19 54	8.7	5.51	1.478 6096	2445.8	1.28	0.29	5 50.7	
	30	8 8	23.70	+2.752	+19 53	43.3	- 7.18	1.479 5827	+2417.7	1.28	0.29	5 35.1	
	4	8 8	35.77	3.281	19 53	11.3	8.81	1.480 5423	2379.0	1.28	0.29	5 19.6	
	8	8 8	49.93	3.795	19 52	32.8	10.42	1.481 4845	2329.5	1.28	0.29	5 4.1	
	12	8 9	6.11	4.293	19 51	47.9	12.01	1.482 4045	2269.5	1.27	0.29	4 48.6	
	16	8 9	24.25	4.773	19 50	56.8	13.52	1.483 2990	2201.5	1.27	0.29	4 33.2	
	20	8 9	44.27	+5.233	+19 49	59.8	-15.00	1.484 1646	+2125.2	1.27	0.29	4 17.9	
	24	8 10	6.09	5.675	19 48	56.9	16.43	1.484 9980	2040.5	1.27	0.29	4 2.5	
	28	8 10	29.65	6.100	19 47	48.4	17.82	1.485 7959	1947.5	1.26	0.29	3 47.2	
June	1	8 10	54.86	6.502	19 46	34.4	19.16	1.486 5549	1845.8	1.26	0.29	3 31.9	
	5	8 11	21.63	6.876	19 45	15.2	20.42	1.487 2716	1737.2	1.26	0.29	3 16.6	
	9	8 11	49.84	+7.226	+19 43	51.1	-21.61	1.487 9438	+1622.2	1.26	0.29	3 1.3	
	13	8 12	19.40	7.546	19 42	22.4	22.72	1.488 5686	1501.2	1.26	0.29	2 46.0	
	17	8 12	50.18	7.842	19 40	49.4	23.77	1.489 1441	1375.7	1.25	0.29	2 30.8	
	21	8 13	22.10	8.113	19 39	12.3	24.75	1.489 6685	1245.6	1.25	0.29	2 15.6	
	25	8 13	55.04	8.354	19 37	31.5	25.65	1.490 1399	1110.1	1.25	0.28	2 0.4	
	29	8 14	28.89	+8.567	+19 35	47.2	-26.50	1.490 5560	+ 970.1	1.25	0.28	1 45.3	
	July	3	8 15	3.54	+8.751	+19 33	59.7	-27.23	1.490 9155	+ 826.4	1.25	0.28	1 30.1

GREENWICH MEAN TIME.

Date.	Apparent Right Ascension.			Var. per Day.	Apparent Declination.			Var. per Day.	Logarithm of Distance from Earth.	Var. per Day.	Semi-diameter.	Hor. Parallax.	Transit, Meridian of Greenwich.
	h	m	s		°	'	"							h	m
July 3	8	15	3.54	+8.751	+19	33	59.7	-27.23	1.490 9155	+ 826.4	1.25	0.28	1 30.1
7	8	15	38.86	8.903	19	32	9.5	27.86	1.491 2167	679.0	1.25	0.28	1 15.0
11	8	16	14.72	9.023	19	30	17.0	28.40	1.491 4585	530.2	1.25	0.28	0 59.8
15	8	16	51.00	9.113	19	28	22.5	28.83	1.491 6409	380.7	1.25	0.28	0 44.7
19	8	17	27.58	9.174	19	26	26.5	29.20	1.491 7629	229.6	1.25	0.28	0 29.6
23	8	18	4.35	+9.206	+19	24	29.1	-29.47	1.491 8244	+ 76.7	1.25	0.28	0 14.5
27	8	18	41.19	9.306	19	22	30.9	29.63	1.491 8241	- 77.6	1.25	0.28	23 55.6
31	8	19	17.96	9.174	19	20	32.2	29.71	1.491 7623	231.6	1.25	0.28	23 40.5
Aug. 4	8	19	54.54	9.110	19	18	33.4	29.63	1.491 6389	384.7	1.25	0.28	23 25.3
8	8	20	30.80	9.014	19	16	35.3	29.46	1.491 4547	536.4	1.25	0.28	23 10.2
12	8	21	6.61	+8.885	+19	14	37.9	-29.20	1.491 2101	- 685.6	1.25	0.28	22 55.1
16	8	21	41.85	8.733	19	12	41.9	28.83	1.490 9065	832.3	1.25	0.28	22 39.9
20	8	22	16.43	8.550	19	10	47.4	28.37	1.490 5446	977.1	1.25	0.28	22 24.8
24	8	22	50.21	8.335	19	8	55.1	27.78	1.490 1252	1119.2	1.25	0.28	22 9.6
28	8	23	23.07	8.089	19	7	5.3	27.07	1.489 6497	1257.9	1.25	0.29	21 54.4
Sept. 1	8	23	54.89	+7.814	+19	5	18.7	-26.26	1.489 1195	-1391.8	1.25	0.29	21 39.2
5	8	24	25.54	7.509	19	3	35.4	25.34	1.488 5371	1519.6	1.26	0.29	21 24.0
9	8	24	54.93	7.179	19	1	56.1	24.30	1.487 9046	1641.8	1.26	0.29	21 8.7
13	8	25	22.94	6.825	19	0	21.1	23.19	1.487 2245	1757.6	1.26	0.29	20 53.5
17	8	25	49.50	6.446	18	58	50.7	21.99	1.486 4993	1867.6	1.26	0.29	20 38.2
21	8	26	14.48	+6.042	+18	57	25.3	-20.66	1.485 7313	-1970.7	1.26	0.29	20 22.8
25	8	26	37.80	5.614	18	56	5.5	19.25	1.484 9237	2066.6	1.27	0.29	20 7.5
29	8	26	59.36	5.163	18	54	51.4	17.75	1.484 0791	2154.0	1.27	0.29	19 52.1
Oct. 3	8	27	19.07	4.688	18	53	43.6	16.13	1.483 2018	2231.0	1.27	0.29	19 36.7
7	8	27	36.84	4.197	18	52	42.4	14.47	1.482 2956	2298.6	1.27	0.29	19 21.3
11	8	27	52.03	+3.693	+18	51	47.9	-12.76	1.481 3642	-2356.9	1.28	0.29	19 5.8
15	8	28	6.37	3.176	18	51	0.4	10.97	1.480 4114	2405.1	1.28	0.29	18 50.3
19	8	28	18.02	2.643	18	50	20.2	9.12	1.479 4415	2443.3	1.28	0.29	18 34.8
23	8	28	27.50	2.096	18	49	47.5	7.22	1.478 4582	2471.0	1.28	0.29	18 19.2
27	8	28	34.78	1.542	18	49	22.5	5.28	1.477 4664	2486.0	1.29	0.29	18 3.6
31	8	28	39.83	+0.983	+18	49	5.3	- 3.31	1.476 4711	-2488.2	1.29	0.29	17 47.9
Nov. 4	8	28	42.64	+0.421	18	48	56.0	- 1.32	1.475 4774	2478.5	1.29	0.29	17 32.2
8	8	28	43.20	-0.140	18	48	54.7	+ 0.64	1.474 4899	2457.0	1.30	0.30	17 16.5
12	8	28	41.53	0.696	18	49	1.1	2.60	1.473 5134	2423.2	1.30	0.30	17 0.8
16	8	28	37.64	1.247	18	49	15.5	4.57	1.472 5529	2377.8	1.30	0.30	16 45.0
20	8	28	31.56	-1.792	+18	49	37.6	+ 6.49	1.471 6128	-2320.1	1.31	0.30	16 29.1
24	8	28	23.31	2.331	18	50	7.3	8.39	1.470 6984	2249.7	1.31	0.30	16 13.3
28	8	28	12.94	2.852	18	50	44.6	10.24	1.469 8147	2166.1	1.31	0.30	15 57.4
Dec. 2	8	28	0.53	3.350	18	51	29.1	12.00	1.468 9672	2069.9	1.31	0.30	15 41.4
6	8	27	46.17	3.826	18	52	20.4	13.66	1.468 1602	1963.3	1.32	0.30	15 25.4
10	8	27	29.95	-4.279	+18	53	18.2	+15.23	1.467 3978	-1846.2	1.32	0.30	15 9.4
14	8	27	11.97	4.706	18	54	22.1	16.72	1.466 6846	1718.8	1.32	0.30	14 53.4
18	8	26	52.34	5.105	18	55	31.8	18.12	1.466 0240	1582.1	1.32	0.30	14 37.3
22	8	26	31.17	5.474	18	56	46.9	19.38	1.465 4202	1435.0	1.32	0.30	14 21.3
26	8	26	8.60	5.804	18	58	6.7	20.51	1.464 8772	1278.7	1.33	0.30	14 5.2
30	8	25	44.79	-6.095	+18	59	30.8	+21.52	1.464 3982	-1115.1	1.33	0.30	13 49.0
34	8	25	19.89	...	+19	0	58.6	...	1.463 9859	...	1.33	0.30	13 32.9

FOR GREENWICH MEAN NOON.

Date.		Heliocentric Longitude, Mean Equinox of Date.	Var. per Day.	Reduction to Orbit.	Heliocentric Latitude.	Var. per Day.	Logarithm of Radius Vector.	Var. per Day.
		" ' "	"	"	" ' "	"		
Jan.	1	121 8 52.6	21.73	-16.5	-0 17 59.3	+0.66	1.477 2821	+4.8
	11	121 12 29.9	21.73	16.5	0 17 52.7	0.66	1.477 2868	4.8
	21	121 16 7.2	21.73	16.4	0 17 46.1	0.66	1.477 2916	4.8
	31	121 19 44.5	21.73	-16.3	-0 17 39.5	+0.66	1.477 2963	+4.8
Feb.	10	121 23 21.8	21.73	16.2	0 17 32.8	0.66	1.477 3011	4.8
	20	121 26 59.1	21.73	16.0	0 17 26.2	0.66	1.477 3058	4.8
Mar.	1	121 30 36.4	21.73	-16.0	-0 17 19.5	+0.66	1.477 3106	+4.8
	11	121 34 13.7	21.73	15.9	0 17 12.9	0.66	1.477 3153	4.8
	21	121 37 51.1	21.73	15.8	0 17 6.2	0.66	1.477 3201	4.8
	31	121 41 28.4	21.73	-15.7	-0 16 59.6	+0.66	1.477 3248	+4.8
Apr.	10	121 45 5.7	21.73	15.5	0 16 53.0	0.66	1.477 3296	4.8
	20	121 48 43.0	21.73	15.4	0 16 46.4	0.66	1.477 3344	4.8
	30	121 52 20.4	21.73	-15.4	-0 16 39.7	+0.66	1.477 3392	+4.8
May	10	121 55 57.7	21.73	15.3	0 16 33.1	0.66	1.477 3440	4.8
	20	121 59 35.1	21.73	15.2	0 16 26.4	0.66	1.477 3488	4.8
	30	122 3 12.4	21.73	-15.0	-0 16 19.8	+0.66	1.477 3536	+4.8
June	9	122 6 49.8	21.73	14.9	0 16 13.1	0.66	1.477 3584	4.8
	19	122 10 27.1	21.73	14.9	0 16 6.5	0.66	1.477 3632	4.8
	29	122 14 4.5	21.73	-14.8	-0 15 59.8	+0.66	1.477 3681	+4.8
July	9	122 17 41.8	21.73	14.6	0 15 53.2	0.66	1.477 3729	4.8
	19	122 21 19.2	21.74	14.5	0 15 46.5	0.66	1.477 3777	4.8
	29	122 24 56.5	21.74	-14.5	-0 15 39.9	+0.66	1.477 3825	+4.8
Aug.	8	122 28 33.9	21.74	14.4	0 15 33.2	0.66	1.477 3873	4.8
	18	122 32 11.3	21.74	14.3	0 15 26.6	0.66	1.477 3921	4.8
	28	122 35 48.7	21.74	-14.2	-0 15 19.9	+0.66	1.477 3970	+4.8
Sept.	7	122 39 26.0	21.74	14.0	0 15 13.3	0.66	1.477 4018	4.8
	17	122 43 3.4	21.74	13.9	0 15 6.6	0.66	1.477 4066	4.8
	27	122 46 40.8	21.74	-13.9	-0 15 0.0	+0.66	1.477 4114	+4.8
Oct.	7	122 50 18.2	21.74	13.8	0 14 53.3	0.66	1.477 4163	4.8
	17	122 53 55.5	21.74	13.6	0 14 46.7	0.66	1.477 4211	4.8
	27	122 57 32.9	21.74	-13.5	-0 14 40.0	+0.66	1.477 4259	+4.8
Nov.	6	123 1 10.3	21.74	13.5	0 14 33.4	0.66	1.477 4307	4.8
	16	123 4 47.7	21.74	13.4	0 14 26.7	0.67	1.477 4356	4.8
	26	123 8 25.1	21.74	-13.3	-0 14 20.1	+0.67	1.477 4404	+4.8
Dec.	6	123 12 2.5	21.74	13.1	0 14 13.4	0.67	1.477 4453	4.8
	16	123 15 39.9	21.74	13.0	0 14 6.7	0.67	1.477 4501	4.8
	26	123 19 17.3	21.74	-12.9	-0 14 0.0	+0.67	1.477 4550	+4.8
	36	123 22 54.7	21.74	-12.8	-0 13 53.4	+0.67	1.477 4598	+4.8

PART II.

ASTRONOMICAL EPHEMERIS FOR THE MERIDIAN OF WASHINGTON.

200 FORMULÆ FOR THE REDUCTION OF STARS, 1916.

The constants of precession, nutation and aberration adopted by the *Conférence Internationale des Étoiles Fondamentales* which met in Paris in May, 1896, are given on page xviii, and together with the notation of BESSEL are used in the formulæ which follow.

BESSELIAN STAR-NUMBERS.

<i>Terms of Long Period.</i>	<i>Terms of Short Period.</i>
$A = \tau - 0.342\ 20 \sin \Omega$	$-0.004\ 05 \sin 2 \zeta$
$+ 0.004\ 15 \sin 2 \Omega$	$+0.000\ 23 \sin (\zeta + I')$
$- 0.025\ 26 \sin 2 L$	$+0.001\ 34 \sin (\zeta - I')$
$+ 0.002\ 51 \sin (L - I)$	$-0.000\ 68 \sin (2 \zeta - \Omega)$
$- 0.000\ 99 \sin (3 L - I)$	$-0.000\ 52 \sin (3 \zeta - I')$
$+ 0.000\ 42 \sin (L + I)$	$+0.000\ 30 \sin (\zeta - 2 L + I')$
$+ 0.000\ 25 \sin (2 L - \Omega)$	$+0.000\ 12 \sin 2 (\zeta - L)$
"	"
$B = - 9.210 \cos \Omega$	$-0.088 \cos 2 \zeta$
$+ 0.090 \cos 2 \Omega$	$-0.018 \cos (2 \zeta - \Omega)$
$- 0.552 \cos 2 L$	$-0.011 \cos (3 \zeta - I')$
$- 0.022 \cos (3 L - I)$	$+0.005 \cos (\zeta + I')$
$+ 0.009 \cos (L + I)$	
$+ 0.007 \cos (2 L - \Omega)$	
$C = -20.4700 \cos \omega \cos \odot$	
$D = -20.4700 \sin \odot$	
$E = - 0.0417 \sin \Omega + 0''.0005 \sin 2 \Omega - 0''.0031 \sin 2 L$	

BESSEL'S Star-Constants.

$a = 3''.072\ 63 + 1''.336\ 37 \sin \alpha_0 \tan \delta_0$	$a' = 20''.0455 \cos \alpha_0$
$b = \frac{1}{15} \cos \alpha_0 \tan \delta_0$	$b' = -\sin \alpha_0$
$c = \frac{1}{15} \cos \alpha_0 \sec \delta_0$	$c' = \tan \omega \cos \delta_0 - \sin \alpha_0 \sin \delta_0$
$d = \frac{1}{15} \sin \alpha_0 \sec \delta_0$	$d' = \cos \alpha_0 \sin \delta_0$

Formulæ for Reduction to Apparent Position.

$$\alpha = \alpha_0 + \tau\mu + Aa + Bb + Cc + Dd + \frac{1}{15}E \quad (\text{in time})$$

$$\delta = \delta_0 + \tau\mu' + Aa' + Bb' + Cc' + Dd' \quad (\text{in arc})$$

INDEPENDENT STAR-NUMBERS.

$$f + f' = + 46''.0895 A + E \quad (\text{in arc})$$

$$= + 3''.07263 A + \frac{1}{15}E \quad (\text{in time})$$

$$f' = - 0''.0124 \sin 2 \zeta + 0''.0041 \sin (\zeta - I') + 0''.0007 \sin (\zeta + I')$$

$$- 0''.0021 \sin (2 \zeta - \Omega) - 0''.0016 \sin (3 \zeta - I')$$

$$+ 0''.0009 \sin (\zeta - 2 L + I') + 0''.0004 \sin 2 (\zeta - L)$$

$$g \sin G = B \quad h \sin H = C \quad i = C \tan \omega$$

$$g \cos G = 20''.0455 A \quad h \cos H = D$$

Formulæ for Reduction to Apparent Position.

$$\alpha = \alpha_0 + f + f' + \tau\mu + \frac{1}{15}g \sin (G + \alpha_0) \tan \delta_0 + \frac{1}{15}h \sin (H + \alpha_0) \sec \delta_0 \quad (\text{in time})$$

$$\delta = \delta_0 + \tau\mu' + g \cos (G + \alpha_0) + h \cos (H + \alpha_0) \sin \delta_0 + i \cos \delta_0 \quad (\text{in arc})$$

In the above formulæ,

τ denotes the time reckoned in units of one year, from the beginning of the Besselian fictitious year (1916, January 0^d.975, Washington mean time),

α_0, δ_0 , the star's mean R. A. and Decl. at the beginning of the fictitious year,
 α, δ , the star's apparent right ascension and declination at the time τ ,
 μ, μ' , the annual proper motion in right ascension and declination,

\odot , the Sun's true longitude,
 L , the Sun's mean longitude,
 Ω , the longitude of the Moon's ascending node,

ω , the obliquity of the ecliptic,
 I , the long. of the Sun's perigee,
 I' , the long. of the Moon's perigee,
 ζ , the Moon's mean longitude.

The independent star-numbers are more convenient than BESSEL'S, when only one or two apparent positions of a star are required, or when BESSEL'S star-constants are not known with sufficient accuracy.

In using the star-constants of the *British Association Catalogue*, $a, b, c, d, a', b', c', d'$, with the star-numbers of this Ephemeris, the quantities to be computed are $Ac, Bd, Ca, Db, -Ac', -Bd', -Ca', -Db'$.

In the computation of the Besselian star-numbers given for Washington mean midnight of each day of the year, on pages 202-205, the short-period terms—that is, the terms involving the Moon's mean longitude—have been included.

In the computation of the independent star-numbers, pages 206-213, the short-period terms have been included in the two columns headed G and $\text{Log } g$. The quantities f and f' give separately the effect of the long-period and short-period terms. f' differs but slightly from the quantity $-0''.1866 \sin 2 \zeta + 0''.0622 \sin (\zeta - \Gamma')$ given on page 37 of the *Procès-Verbaux* of the Paris Conference of 1896, which quantity that conference decided should be omitted in the reduction of stars from mean to apparent place.

In computing the ephemerides of the circumpolar stars in this volume, all short-period terms have been included. The quantity f' , which was omitted from the ephemerides of the circumpolar stars given in the *American Ephemeris and Nautical Almanac* for the years 1900 to 1915, inclusive, is now included in these ephemerides in accordance with the decision of the *Congrès International des Éphémérides Astronomiques* held at Paris in October, 1911. See page 43 of *Procès-Verbaux* of that Congress.

In the computation of the ephemerides of the ten-day stars, no short-period terms have been included. These terms attain two maxima and two minima during the tropical month. At maximum and minimum they may amount in right ascension to $\pm 0''.008 \tan \delta$, and in declination to $\pm 0''.13$. For computing the effect of these terms for the correction of the positions of stars interpolated from the ten-day ephemerides, the following formulæ may be used, in which $\Delta\alpha$ and $\Delta\delta$ denote the effect of the short-period terms in right ascension and declination, respectively, and $\delta''\psi$ and $\delta''\omega$, the sum of the short-period terms of the nutation in longitude and obliquity:

$$\begin{aligned}\Delta\alpha &= D_{\psi}\alpha \delta''\psi + D_{\omega}\alpha \delta''\omega \\ \Delta\delta &= D_{\psi}\delta \delta''\psi + D_{\omega}\delta \delta''\omega\end{aligned}$$

The values of $\delta''\psi$ and of $\delta''\omega$ for Washington mean midnight are given for each day of the year on pages 215-216, and have been computed as follows:

$$\delta''\psi = 50''.37 A_2 \qquad \delta''\omega = -B_2$$

in which A_2 and B_2 are the sums of the short-period terms given in the expressions for A and B on page 200.

The quantities $D_{\psi}\alpha, D_{\omega}\alpha, D_{\psi}\delta$, and $D_{\omega}\delta$ are given for each ten-day star on pages 316-513, and have been computed by means of the following formulæ:

$$\begin{aligned}D_{\psi}\alpha &= \frac{1}{15} (\cos \omega + \sin \alpha \tan \delta \sin \omega) & D_{\omega}\alpha &= -\frac{1}{15} \cos \alpha \tan \delta \\ D_{\psi}\delta &= \cos \alpha \sin \omega & D_{\omega}\delta &= \sin \alpha\end{aligned}$$

In the *Star List of the American Ephemeris* for the years 1910 and 1911 and in the *American Ephemeris and Nautical Almanac* for the years 1912 to 1915, inclusive, the value used for the derivative of the right ascension with reference to ψ was

$$D'_{\psi}\alpha = \frac{1}{15} \sin \alpha \tan \delta \sin \omega$$

and the addition of the term $\frac{1}{15} \cos \omega$ is made in accordance with the above-mentioned decision of the *Congrès International des Éphémérides Astronomiques* of 1911 with reference to the quantity f' .

FOR WASHINGTON MEAN MIDNIGHT.

Solar Day. (Sid. Hr.)	Log A.	Log B.	Log C.	Log D.	Solar Day. (Sid. Hr.)	Log A.	Log B.	Log C.	Log D.
Jan. 0	+9.41507	-0.7284	-0.48985	+1.30516	Feb. 15	+9.62468	-0.7601	-1.19336	+1.05624
1	9.42344	0.7247	0.53382	1.30380	16	9.62787	0.7637	1.19838	1.04458
2	9.43318	0.7222	0.57362	1.30230	17	9.63034	0.7676	1.20321	1.03247
3	9.44352	0.7217	0.60995	1.30065	18	9.63202	0.7711	1.20785	1.01988
4	9.45345	0.7233	0.64335	1.29886	19	9.63297	0.7738	1.21230	1.00678
h					h				
(7.0) 5	+9.46216	-0.7267	-0.67423	+1.29693	(10.0) 20	+9.63348	-0.7753	-1.21658	+0.99314
6	9.46916	0.7311	0.70294	1.29485	21	9.63391	0.7752	1.22068	0.97893
7	9.47426	0.7354	0.72973	1.29262	22	9.63477	0.7736	1.22460	0.96410
8	9.47776	0.7387	0.75483	1.29024	23	9.63641	0.7710	1.22836	0.94861
9	9.48028	0.7404	0.77842	1.28771	24	9.63911	0.7680	1.23195	0.93242
10	+9.48256	-0.7403	-0.80067	+1.28502	25	+9.64282	-0.7654	-1.23538	+0.91547
11	9.48522	0.7387	0.82170	1.28218	26	9.64733	0.7642	1.23865	0.89770
12	9.48875	0.7362	0.84162	1.27919	27	9.65206	0.7648	1.24176	0.87904
13	9.49331	0.7333	0.86054	1.27604	28	9.65653	0.7672	1.24471	0.85941
14	9.49885	0.7307	0.87853	1.27272	29	9.66018	0.7709	1.24751	0.83872
15	+9.50509	-0.7291	-0.89566	+1.26924	Mar. 1	+9.66275	-0.7751	-1.25015	+0.81686
16	9.51171	0.7287	0.91202	1.26560	2	9.66424	0.7788	1.25265	0.79372
17	9.51833	0.7296	0.92764	1.26179	3	9.66486	0.7813	1.25500	0.76915
18	9.52461	0.7318	0.94259	1.25781	4	9.66503	0.7822	1.25720	0.74297
19	9.53026	0.7351	0.95690	1.25365	h				
h					(11.0) 5	9.66525	0.7814	1.25926	0.71498
(8.0) 20	+9.53504	-0.7390	-0.97063	+1.24932	6	+9.66587	-0.7793	-1.26118	+0.68495
21	9.53881	0.7430	0.98379	1.24480	7	9.66718	0.7764	1.26296	0.65256
22	9.54157	0.7466	0.99644	1.24010	8	9.66923	0.7733	1.26459	0.61743
23	9.54353	0.7493	1.00859	1.23521	9	9.67187	0.7708	1.26609	0.57909
24	9.54507	0.7504	1.02028	1.23013	10	9.67496	0.7691	1.26745	0.53692
25	+9.54669	-0.7500	-1.03152	+1.22485	11	+9.67823	-0.7685	-1.26867	+0.49009
26	9.54900	0.7480	1.04235	1.21937	12	9.68140	0.7691	1.26976	0.43748
27	9.55247	0.7452	1.05278	1.21368	13	9.68431	0.7707	1.27071	0.37750
28	9.55725	0.7424	1.06282	1.20777	14	9.68676	0.7730	1.27153	0.30777
29	9.56318	0.7405	1.07251	1.20165	15	9.68864	0.7757	1.27222	0.22457
30	+9.56984	-0.7403	-1.08185	+1.19530	16	+9.68989	-0.7782	-1.27277	+0.12146
31	9.57655	0.7420	1.09086	1.18872	17	9.69052	0.7801	1.27319	9.98590
Feb. 1	9.58263	0.7456	1.09955	1.18190	18	9.69071	0.7809	1.27348	9.78771
2	9.58751	0.7503	1.10793	1.17484	19	9.69078	0.7802	1.27364	+9.41272
3	9.59102	0.7552	1.11601	1.16753	20	9.69108	0.7779	1.27368	-8.98189
h					h				
(9.0) 4	+9.59327	-0.7594	-1.12382	+1.15995	(12.0) 21	+9.69197	-0.7744	-1.27358	-9.65348
5	9.59460	0.7622	1.13134	1.15210	22	9.69375	0.7703	1.27334	9.90542
6	9.59553	0.7632	1.13861	1.14397	23	9.69648	0.7663	1.27298	0.06368
7	9.59667	0.7627	1.14562	1.13556	24	9.70002	0.7634	1.27249	0.17927
8	9.59838	0.7609	1.15238	1.12684	25	9.70396	0.7621	1.27187	0.27032
9	+9.60083	-0.7586	-1.15890	+1.11781	26	+9.70779	-0.7626	-1.27112	-0.34542
10	9.60408	0.7564	1.16519	1.10845	27	9.71107	0.7647	1.27024	0.40928
11	9.60799	0.7549	1.17125	1.09875	28	9.71347	0.7676	1.26923	0.46480
12	9.61229	0.7544	1.17709	1.08870	29	9.71488	0.7703	1.26808	0.51389
13	9.61670	0.7552	1.18272	1.07827	30	9.71548	0.7720	1.26681	0.55785
14	+9.62090	-0.7571	-1.18814	+1.06746	31	+9.71559	-0.7722	-1.26540	-0.59762
15	+9.62468	-0.7601	-1.19336	+1.05624	Apr. 1	+9.71562	-0.7706	-1.26386	-0.63392

FOR WASHINGTON MEAN MIDNIGHT.

Solar Day. (Sid. Hr.)	Log A.	Log B.	Log C.	Log D.	Solar Day. (Sid. Hr.)	Log A.	Log B.	Log C.	Log D.
Apr. 1	+9.71562	-0.7706	-1.26386	-0.63392	May 17	+9.80422	-0.6711	-1.01070	-1.23432
2	9.71598	0.7675	1.26218	0.66729	18	9.80801	0.6667	0.99930	1.23899
3	9.71694	0.7634	1.26037	0.69813	19	9.81196	0.6646	0.98746	1.24348
4	9.71857	0.7588	1.25843	0.72679	20	9.81573	0.6649	0.97517	1.24780
h 5	9.72086	0.7546	1.25635	0.75354	h 21	9.81894	0.6668	0.96241	1.25196
(13.0) 6	+9.72360	-0.7512	-1.25413	-0.77860	(16.0) 22	+9.82138	-0.6695	-0.94913	-1.25595
7	9.72661	0.7489	1.25178	0.80215	23	9.82307	0.6717	0.93531	1.25979
8	9.72960	0.7479	1.24928	0.82436	24	9.82416	0.6725	0.92092	1.26347
9	9.73240	0.7480	1.24664	0.84536	25	9.82494	0.6713	0.90591	1.26700
10	9.73485	0.7490	1.24386	0.86525	26	9.82581	0.6679	0.89024	1.27038
11	+9.73680	-0.7504	-1.24094	-0.88414	27	+9.82699	-0.6628	-0.87386	-1.27361
12	9.73824	0.7519	1.23787	0.90210	28	9.82871	0.6568	0.85672	1.27670
13	9.73917	0.7528	1.23465	0.91922	29	9.83100	0.6507	0.83875	1.27964
14	9.73971	0.7529	1.23128	0.93555	30	9.83373	0.6453	0.81989	1.28244
15	9.74002	0.7514	1.22776	0.95118	31	9.83678	0.6414	0.80005	1.28510
16	+9.74046	-0.7484	-1.22409	-0.96612	June 1	+9.83994	-0.6390	-0.77914	-1.28762
17	9.74140	0.7438	1.22026	0.98043	2	9.84302	0.6383	0.75704	1.29001
18	9.74306	0.7384	1.21627	0.99416	3	9.84586	0.6391	0.73364	1.29226
19	9.74559	0.7328	1.21212	1.00734	4	9.84838	0.6409	0.70880	1.29438
h 20	9.74890	0.7280	1.20780	1.02000	h 5	9.85047	0.6431	0.68231	1.29637
(14.0) 21	+9.75271	-0.7248	-1.20332	-1.03217	(17.0) 6	+9.85215	-0.6452	-0.65399	-1.29823
22	9.75656	0.7236	1.19866	1.04389	7	9.85345	0.6464	0.62358	1.29996
23	9.76007	0.7243	1.19383	1.05517	8	9.85449	0.6463	0.59075	1.30156
24	9.76286	0.7262	1.18882	1.06604	9	9.85546	0.6444	0.55512	1.30303
25	9.76477	0.7284	1.18363	1.07651	10	9.85663	0.6406	0.51618	1.30438
26	+9.76588	-0.7298	-1.17825	-1.08661	11	+9.85825	-0.6353	-0.47328	-1.30560
27	9.76646	0.7297	1.17268	1.09636	12	9.86048	0.6292	0.42555	1.30670
28	9.76684	0.7277	1.16691	1.10576	13	9.86336	0.6235	0.37180	1.30768
29	9.76744	0.7239	1.16094	1.11484	14	9.86678	0.6192	0.31033	1.30853
30	9.76851	0.7187	1.15476	1.12361	15	9.87050	0.6172	0.23857	1.30926
May 1	+9.77018	-0.7130	-1.14838	-1.13208	16	+9.87415	-0.6179	-0.15242	-1.30987
2	9.77251	0.7073	1.14177	1.14026	17	9.87741	0.6209	0.04470	1.31036
3	9.77531	0.7024	1.13494	1.14816	18	9.88005	0.6252	0.90099	1.31073
4	9.77840	0.6988	1.12787	1.15579	19	9.88196	0.6293	0.68454	1.31098
h 5	9.78156	0.6966	1.12057	1.16317	h 20	9.88331	0.6322	-0.23315	1.31110
(15.0) 6	+9.78458	-0.6958	-1.11302	-1.17030	(18.0) 21	+9.88427	-0.6330	+0.15095	-1.31111
7	9.78732	0.6960	1.10521	1.17719	22	9.88513	0.6315	0.65721	1.31099
8	9.78963	0.6970	1.09714	1.18384	23	9.88621	0.6280	0.88458	1.31076
9	9.79149	0.6982	1.08879	1.19027	24	9.88767	0.6232	0.03296	1.31040
10	9.79290	0.6991	1.08016	1.19648	25	9.88964	0.6180	0.14326	1.30992
11	+9.79393	-0.6991	-1.07124	-1.20248	26	+9.89202	-0.6134	+0.23105	-1.30933
12	9.79472	0.6977	1.06200	1.20827	27	9.89469	0.6102	0.30393	1.30861
13	9.79555	0.6945	1.05245	1.21386	28	9.89754	0.6088	0.36622	1.30777
14	9.79670	0.6897	1.04256	1.21926	29	9.90032	0.6093	0.42058	1.30680
15	9.79848	0.6836	1.03231	1.22446	30	9.90293	0.6114	0.46877	1.30572
16	+9.80098	-0.6770	-1.02170	-1.22948	July 1	+9.90530	-0.6146	+0.51204	-1.30451
17	+9.80422	-0.6711	-1.01070	-1.23432	2	+9.90724	-0.6185	+0.55127	-1.30318

FOR WASHINGTON MEAN MIDNIGHT.

Solar Day. (Sid. Hr.)	Log A.	Log B.	Log C.	Log D.	Solar Day. (Sid. Hr.)	Log A.	Log B.	Log C.	Log D.
July 1	+9.90530	-0.6146	+0.51204	-1.30451	Aug. 16	+9.97610	-0.6599	+1.18134	-1.08090
2	9.90724	0.6185	0.55127	1.30318	17	9.97665	0.6576	1.18656	1.07070
3	9.90881	0.6224	0.58714	1.30172	18	9.97754	0.6542	1.19159	1.06013
4	9.91003	0.6256	0.62016	1.30014	19	9.97880	0.6509	1.19645	1.04917
h 5	9.91097	0.6276	0.65073	1.29843	h 20	9.98038	0.6484	1.20113	1.03779
(19.0) 6	+9.91180	-0.6278	+0.67917	-1.29659	(22.0) 21	+9.98214	-0.6473	+1.20565	-1.02597
7	9.91268	0.6260	0.70575	1.29462	22	9.98394	0.6479	1.21000	1.01369
8	9.91387	0.6226	0.73069	1.29253	23	9.98565	0.6500	1.21418	1.00092
9	9.91554	0.6182	0.75415	1.29030	24	9.98717	0.6534	1.21821	0.98763
10	9.91775	0.6136	0.77630	1.28795	25	9.98843	0.6575	1.22208	0.97379
11	+9.92052	-0.6103	+0.79726	-1.28546	26	+9.98938	-0.6619	+1.22579	-0.95935
12	9.92362	0.6090	0.81713	1.28283	27	9.99000	0.6659	1.22935	0.94428
13	9.92677	0.6105	0.83603	1.28006	28	9.99038	0.6690	1.23277	0.92854
14	9.92969	0.6144	0.85402	1.27716	29	9.99056	0.6706	1.23603	0.91207
15	9.93212	0.6199	0.87118	1.27412	30	9.99069	0.6706	1.23915	0.89481
16	+9.93395	-0.6258	+0.88758	-1.27093	31	+9.99093	-0.6688	+1.24212	-0.87670
17	9.93518	0.6307	0.90326	1.26760	Sept. 1	9.99144	0.6657	1.24496	0.85767
18	9.93602	0.6337	0.91829	1.26412	2	9.99238	0.6618	1.24765	0.83762
19	9.93666	0.6343	0.93270	1.26048	3	9.99378	0.6581	1.25020	0.81646
h 20	9.93741	0.6328	0.94653	1.25670	h 4	9.99554	0.6557	1.25261	0.79408
(20.0) 21	+9.93843	-0.6297	+0.95982	-1.25276	(23.0) 5	+9.99756	-0.6553	+1.25489	-0.77034
22	9.93985	0.6259	0.97261	1.24866	6	9.99952	0.6572	1.25704	0.74509
23	9.94168	0.6224	0.98491	1.24440	7	0.00124	0.6610	1.25905	0.71813
24	9.94382	0.6201	0.99676	1.23998	8	0.00254	0.6658	1.26092	0.68924
25	9.94610	0.6195	1.00819	1.23538	9	0.00334	0.6705	1.26267	0.65815
26	+9.94839	-0.6206	+1.01920	-1.23061	10	+0.00370	-0.6739	+1.26429	-0.62450
27	9.95055	0.6234	1.02983	1.22567	11	0.00380	0.6753	1.26577	0.58786
28	9.95246	0.6275	1.04008	1.22055	12	0.00384	0.6744	1.26713	0.54769
29	9.95407	0.6322	1.04999	1.21524	13	0.00404	0.6716	1.26835	0.50326
30	9.95535	0.6371	1.05955	1.20974	14	0.00457	0.6675	1.26945	0.45359
31	+9.95628	-0.6414	+1.06880	-1.20405	15	+0.00546	-0.6630	+1.27043	-0.39731
Aug. 1	9.95694	0.6447	1.07773	1.19815	16	0.00668	0.6591	1.27127	0.33245
2	9.95740	0.6463	1.08637	1.19206	17	0.00812	0.6563	1.27199	0.25597
3	9.95787	0.6461	1.09472	1.18575	18	0.00966	0.6551	1.27258	0.16287
4	9.95853	0.6442	1.10280	1.17922	h 19	0.01114	0.6555	1.27304	0.04394
h 5	+9.95956	-0.6410	+1.11061	-1.17247	(0.0) 20	+0.01247	-0.6572	+1.27338	-9.87931
(21.0) 6	9.96105	0.6374	1.11817	1.16548	21	0.01355	0.6598	1.27359	9.61050
7	9.96304	0.6345	1.12548	1.15826	22	0.01438	0.6627	1.27368	-8.76340
8	9.96542	0.6333	1.13255	1.15079	23	0.01493	0.6654	1.27364	+9.46553
9	9.96793	0.6345	1.13939	1.14306	24	0.01522	0.6674	1.27347	9.80775
10	+9.97034	-0.6380	+1.14601	-1.13507	25	+0.01533	-0.6682	+1.27317	+9.99676
11	9.97239	0.6434	1.15240	1.12680	26	0.01536	0.6672	1.27274	0.12800
12	9.97390	0.6494	1.15859	1.11825	27	0.01545	0.6645	1.27219	0.22858
13	9.97490	0.6548	1.16457	1.10939	28	0.01577	0.6602	1.27151	0.31013
14	9.97545	0.6587	1.17036	1.10022	29	0.01645	0.6549	1.27070	0.37869
15	+9.97577	-0.6604	+1.17594	-1.09073	30	+0.01754	-0.6494	+1.26975	+0.43780
16	+9.97610	-0.6599	+1.18134	-1.08090	Oct. 1	+0.01906	-0.6448	+1.26868	+0.48974

FOR WASHINGTON MEAN MIDNIGHT.

Solar Day. (Sid. Hr.)	Log A.	Log B.	Log C.	Log D.	Solar Day. (Sid. Hr.)	Log A.	Log B.	Log C.	Log D.
Oct. 1	+0.01906	-0.6448	+1.26868	+0.48974	Nov. 16	+0.06732	-0.5398	+1.03719	+1.22203
2	0.02083	0.6420	1.26748	0.53603	17	0.06813	0.5406	1.02625	1.22738
3	0.02267	0.6415	1.26614	0.57776	18	0.06876	0.5404	1.01488	1.23253
h 4	0.02436	0.6432	1.26466	0.61573	h 19	0.06927	0.5384	1.00306	1.23749
(1.0) 5	0.02570	0.6463	1.26306	0.65054	(4.0) 20	0.06979	0.5343	0.99076	1.24226
6	+0.02657	-0.6497	+1.26132	+0.68266	21	+0.07042	-0.5279	+0.97793	+1.24685
7	0.02702	0.6521	1.25944	0.71247	22	0.07131	0.5198	0.96463	1.25126
8	0.02718	0.6526	1.25742	0.74025	23	0.07257	0.5106	0.95074	1.25549
9	0.02721	0.6509	1.25526	0.76625	24	0.07422	0.5017	0.93623	1.25955
10	0.02734	0.6468	1.25296	0.79068	25	0.07616	0.4946	0.92108	1.26343
11	+0.02778	-0.6411	+1.25051	+0.81369	26	+0.07832	-0.4903	+0.90524	+1.26715
12	0.02855	0.6347	1.24792	0.83544	27	0.08046	0.4894	0.88865	1.27071
13	0.02969	0.6284	1.24518	0.85604	28	0.08238	0.4915	0.87125	1.27410
14	0.03111	0.6232	1.24230	0.87559	29	0.08395	0.4952	0.85298	1.27734
15	0.03265	0.6197	1.23926	0.89418	30	0.08511	0.4989	0.83376	1.28041
16	+0.03421	-0.6179	+1.23606	+0.91190	Dec. 1	+0.08590	-0.5010	+0.81350	+1.28333
17	0.03563	0.6177	1.23271	0.92881	2	0.08646	0.5003	0.79210	1.28609
18	0.03685	0.6186	1.22920	0.94497	3	0.08699	0.4963	0.76945	1.28870
19	0.03783	0.6201	1.22552	0.96044	h 4	0.08768	0.4894	0.74540	1.29117
h 20	0.03856	0.6216	1.22168	0.97525	(5.0) 5	0.08863	0.4806	0.71979	1.29348
(2.0) 21	+0.03906	-0.6224	+1.21767	+0.98946	6	+0.08996	-0.4713	+0.69242	+1.29564
22	0.03935	0.6220	1.21349	1.00310	7	0.09155	0.4630	0.66306	1.29766
23	0.03957	0.6200	1.20913	1.01620	8	0.09333	0.4567	0.63141	1.29954
24	0.03981	0.6161	1.20460	1.02880	9	0.09520	0.4532	0.59712	1.30127
25	0.04025	0.6103	1.19988	1.04092	10	0.09702	0.4525	0.55973	1.30286
26	+0.04098	-0.6031	+1.19497	+1.05260	11	+0.09870	-0.4540	+0.51866	+1.30430
27	0.04212	0.5954	1.18987	1.06384	12	0.10017	0.4570	0.47312	1.30561
28	0.04367	0.5883	1.18457	1.07468	13	0.10139	0.4605	0.42208	1.30677
29	0.04552	0.5829	1.17906	1.08513	14	0.10240	0.4638	0.36406	1.30780
30	0.04751	0.5800	1.17336	1.09521	15	0.10322	0.4659	0.29690	1.30869
31	+0.04940	-0.5797	+1.16744	+1.10493	16	+0.10388	-0.4663	+0.21722	+1.30944
Nov. 1	0.05101	0.5815	1.16130	1.11432	17	0.10451	0.4643	0.11938	1.31005
2	0.05222	0.5842	1.15493	1.12338	18	0.10520	0.4599	0.99266	1.31052
3	0.05299	0.5863	1.14834	1.13213	19	0.10608	0.4532	0.81273	1.31086
h 4	0.05344	0.5866	1.14150	1.14058	h 20	0.10726	0.4452	+0.49960	1.31106
(3.0) 5	+0.05372	-0.5844	+1.13441	+1.14874	(6.0) 21	+0.10879	-0.4371	-0.25547	+1.31112
6	0.05406	0.5795	1.12707	1.15662	22	0.11063	0.4306	0.94657	1.31104
7	0.05461	0.5723	1.11947	1.16424	23	0.11272	0.4271	0.83630	1.31083
8	0.05551	0.5638	1.11159	1.17160	24	0.11483	0.4275	0.00848	1.31048
9	0.05676	0.5552	1.10342	1.17870	25	0.11681	0.4315	0.13135	1.30999
10	+0.05830	-0.5477	+1.09495	+1.18556	26	+0.11851	-0.4380	-0.22691	+1.30936
11	0.06002	0.5420	1.08618	1.19219	27	0.11982	0.4453	0.30508	1.30859
12	0.06179	0.5385	1.07709	1.19859	28	0.12074	0.4511	0.37118	1.30769
13	0.06346	0.5370	1.06766	1.20477	29	0.12141	0.4542	0.42842	1.30664
14	0.06497	0.5372	1.05787	1.21073	30	0.12197	0.4537	0.47885	1.30546
15	+0.06626	-0.5384	+1.04772	+1.21648	31	+0.12259	-0.4498	-0.52391	+1.30413
16	+0.06732	-0.5398	+1.03719	+1.22203	32	+0.12342	-0.4435	-0.56460	+1.30267

$E = +0''.04 = +0''.002$

FOR WASHINGTON MEAN MIDNIGHT.

Solar Day. (Sidereal Hour.)	τ	f	f'	G		H		Log g .	Log h .	i	Log i .	
		In Time.	In Time.	In Arc.	In Time.	In Arc.	In Time.					
		s	s	$^{\circ}$	$'$	$^{\circ}$	$'$			$''$		
Jan.	0	-0.0013	+0.819	-0.018	314 15.2	20 57.0	351 18.1	23 25.2	0.87334	1.31019	-1.34	-0.1271
	1	+0.0014	0.831	0.014	315 3.1	21 0.2	350 21.7	23 21.4	0.87559	1.30998	1.48	0.1711
	2	0.0042	0.843	-0.007	315 51.4	21 3.4	349 25.2	23 17.7	0.87932	1.30975	1.62	0.2109
	3	0.0069	0.854	+0.001	316 34.5	21 6.3	348 28.7	23 13.9	0.88444	1.30949	1.77	0.2472
	4	0.0097	0.866	0.009	317 7.1	21 8.5	347 32.1	23 10.1	0.89050	1.30922	1.91	0.2806
	5	0.0124	+0.878	+0.015	317 28.0	21 9.9	346 35.5	23 6.4	0.89676	1.30893	-2.05	-0.3115
	6	0.0151	0.889	0.018	317 38.6	21 10.6	345 38.7	23 2.6	0.90256	1.30862	2.19	0.3402
	7	0.0179	0.901	0.017	317 41.6	21 10.8	344 41.9	22 58.8	0.90733	1.30829	2.33	0.3670
	8	0.0206	0.912	0.013	317 42.5	21 10.8	343 45.0	22 55.0	0.91071	1.30795	2.47	0.3921
	9	0.0234	0.924	+0.007	317 45.8	21 11.1	342 48.0	22 51.2	0.91285	1.30758	2.60	0.4157
h (7.0)	10	0.0261	+0.935	0.000	317 54.9	21 11.7	341 51.0	22 47.4	0.91409	1.30718	-2.74	-0.4379
	11	0.0288	0.947	-0.005	318 11.6	21 12.8	340 53.8	22 43.6	0.91485	1.30678	2.88	0.4590
	12	0.0316	0.958	0.009	318 35.6	21 14.4	339 56.5	22 39.8	0.91569	1.30636	3.01	0.4789
	13	0.0343	0.969	0.010	319 4.8	21 16.3	338 59.1	22 35.9	0.91702	1.30593	3.15	0.4978
	14	0.0370	0.980	0.009	319 36.4	21 18.4	338 1.6	22 32.1	0.91914	1.30547	3.28	0.5158
	15	0.0398	+0.991	-0.006	320 7.2	21 20.5	337 4.1	22 28.3	0.92210	1.30500	-3.40	-0.5329
	16	0.0425	1.002	-0.001	320 34.7	21 22.3	336 6.4	22 24.4	0.92586	1.30451	3.54	0.5493
	17	0.0452	1.013	+0.003	320 56.6	21 23.8	335 8.5	22 20.6	0.93019	1.30401	3.67	0.5649
	18	0.0480	1.024	0.007	321 12.4	21 24.8	334 10.6	22 16.7	0.93486	1.30350	3.80	0.5799
	19	0.0507	1.034	0.010	321 21.6	21 25.4	333 12.5	22 12.8	0.93958	1.30297	3.93	0.5942
h (8.0)	20	0.0535	+1.045	+0.011	321 25.0	21 25.7	332 14.3	22 9.0	0.94402	1.30243	-4.05	-0.6079
	21	0.0562	1.055	0.009	321 23.8	21 25.6	331 15.9	22 5.1	0.94791	1.30188	4.18	0.6211
	22	0.0589	1.066	+0.006	321 20.5	21 25.4	330 17.4	22 1.2	0.95100	1.30131	4.30	0.6337
	23	0.0617	1.076	0.000	321 18.0	21 25.2	329 18.8	21 57.3	0.95322	1.30073	4.42	0.6459
	24	0.0644	1.086	-0.006	321 19.4	21 25.3	328 20.0	21 53.3	0.95461	1.30014	4.55	0.6576
	25	0.0672	+1.097	-0.012	321 27.5	21 25.8	327 21.1	21 49.4	0.95542	1.29954	-4.66	-0.6688
	26	0.0699	1.107	0.017	321 43.8	21 26.9	326 22.0	21 45.5	0.95609	1.29893	4.78	0.6796
	27	0.0726	1.117	0.018	322 7.9	21 28.5	325 22.7	21 41.5	0.95718	1.29832	4.90	0.6900
	28	0.0754	1.127	0.016	322 36.8	21 30.5	324 23.3	21 37.6	0.95912	1.29769	5.01	0.7001
	29	0.0781	1.137	0.010	323 6.8	21 32.5	323 23.7	21 33.6	0.96221	1.29706	5.13	0.7098
Feb.	30	0.0808	+1.146	-0.003	323 33.1	21 34.2	322 24.0	21 29.6	0.96639	1.29642	-5.24	-0.7191
	31	0.0836	1.156	+0.005	323 52.0	21 35.5	321 24.1	21 25.6	0.97135	1.29577	5.35	0.7281
	1	0.0863	1.165	0.012	324 1.2	21 36.1	320 24.0	21 21.6	0.97655	1.29512	5.46	0.7368
	2	0.0891	1.175	0.016	324 1.7	21 36.1	319 23.8	21 17.6	0.98140	1.29446	5.56	0.7452
	3	0.0918	1.184	0.016	323 56.5	21 35.8	318 23.4	21 13.6	0.98540	1.29381	5.67	0.7533
	4	0.0945	+1.193	+0.014	323 49.2	21 35.3	317 22.8	21 9.5	0.98833	1.29315	-5.77	-0.7611
	5	0.0973	1.202	0.008	323 43.8	21 34.9	316 22.1	21 5.5	0.99016	1.29249	5.87	0.7686
	6	0.1000	1.211	+0.002	323 43.3	21 34.9	315 21.2	21 1.4	0.99113	1.29182	5.97	0.7759
	7	0.1028	1.220	-0.004	323 49.7	21 35.3	314 20.2	20 57.3	0.99168	1.29116	6.07	0.7829
	8	0.1055	1.229	0.008	324 2.7	21 36.2	313 19.0	20 53.3	0.99220	1.29050	6.16	0.7896
h (9.0)	9	0.1082	+1.238	-0.010	324 20.6	21 37.4	312 17.6	20 49.2	0.99302	1.28984	-6.25	-0.7962
	10	0.1110	1.246	0.009	324 41.0	21 38.7	311 16.1	20 45.1	0.99443	1.28919	6.35	0.8025
	11	0.1137	1.255	0.006	325 1.2	21 40.1	310 14.4	20 41.0	0.99654	1.28853	6.44	0.8085
	12	0.1164	1.263	-0.002	325 18.9	21 41.3	309 12.5	20 36.8	0.99928	1.28787	6.52	0.8144
	13	0.1192	1.272	+0.002	325 32.4	21 42.2	308 10.5	20 32.7	1.00253	1.28723	6.61	0.8200
	14	0.1219	+1.280	+0.006	325 40.7	21 42.7	307 8.4	20 28.6	1.00600	1.28659	-6.69	-0.8254
	15	0.1246	+1.288	+0.009	325 43.9	21 42.9	306 6.1	20 24.4	1.00951	1.28596	-6.77	-0.8306

FOR WASHINGTON MEAN MIDNIGHT.

Solar Day. (Sidereal Hour.)	τ	f	f'	G		H		Log ϕ .	Log λ .	i	Log i .
		In Time.	In Time.	In Arc.	In Time.	In Arc.	In Time.				
	y	s	s	$^{\circ}$ $'$	h m	$^{\circ}$ $'$	h m			$''$	
Feb. 15	0.1246	+1.288	+0.009	325 43.9	21 42.9	306 6.1	20 24.4	1.00951	1.28596	-6.77	-0.8306
16	0.1274	1.296	0.011	325 42.2	21 42.8	305 3.6	20 20.2	1.01284	1.28533	6.85	0.8356
17	0.1301	1.304	0.010	325 37.2	21 42.5	304 1.0	20 16.1	1.01574	1.28472	6.93	0.8405
18	0.1329	1.312	0.008	325 30.2	21 42.0	302 58.3	20 11.9	1.01803	1.28411	7.00	0.8451
19	0.1356	1.320	+0.003	325 23.7	21 41.6	301 55.4	20 7.7	1.01955	1.28352	7.07	0.8496
h (10.0) 20	0.1383	+1.327	-0.004	325 20.1	21 41.3	300 52.3	20 3.5	1.02037	1.28293	-7.14	-0.8538
21	0.1411	1.335	0.010	325 22.1	21 41.5	299 49.1	19 59.3	1.02063	1.28236	7.21	0.8580
22	0.1438	1.342	0.015	325 31.0	21 42.1	298 45.8	19 55.1	1.02069	1.28180	7.28	0.8619
23	0.1466	1.350	0.017	325 46.9	21 43.1	297 42.3	19 50.8	1.02101	1.28124	7.34	0.8656
24	0.1493	1.357	0.016	326 7.9	21 44.5	296 38.6	19 46.6	1.02189	1.28070	7.40	0.8692
25	0.1520	+1.364	-0.012	326 30.7	21 46.0	295 34.9	19 42.3	1.02367	1.28018	-7.46	-0.8726
26	0.1548	1.372	-0.005	326 51.4	21 47.4	294 31.0	19 38.1	1.02647	1.27968	7.52	0.8759
27	0.1575	1.379	+0.003	327 6.4	21 48.4	293 27.0	19 33.8	1.02997	1.27920	7.57	0.8790
28	0.1602	1.386	0.010	327 13.9	21 48.9	292 22.9	19 29.5	1.03383	1.27873	7.62	0.8820
29	0.1630	1.393	0.015	327 13.7	21 48.9	291 18.7	19 25.2	1.03749	1.27827	7.67	0.8848
Mar. 1	0.1657	+1.400	+0.016	327 7.9	21 48.5	290 14.4	19 21.0	1.04053	1.27783	-7.72	-0.8874
2	0.1685	1.407	0.014	326 59.9	21 48.0	289 10.0	19 16.7	1.04268	1.27742	7.76	0.8899
3	0.1712	1.413	0.009	326 53.1	21 47.5	288 5.5	19 12.4	1.04385	1.27702	7.80	0.8923
4	0.1739	1.420	+0.003	326 50.4	21 47.4	287 1.0	19 8.1	1.04425	1.27664	7.84	0.8945
h (11.0) 5	0.1767	1.427	-0.003	326 54.2	21 47.6	285 56.3	19 3.8	1.04415	1.27628	7.88	0.8965
6	0.1794	+1.434	-0.008	327 4.1	21 48.3	284 51.5	18 59.4	1.04396	1.27595	-7.91	-0.8984
7	0.1822	1.440	0.010	327 19.3	21 49.3	283 46.8	18 55.1	1.04404	1.27564	7.95	0.9002
8	0.1849	1.447	0.010	327 37.5	21 50.5	282 41.9	18 50.8	1.04462	1.27535	7.98	0.9019
9	0.1876	1.453	0.008	327 56.2	21 51.8	281 37.0	18 46.5	1.04577	1.27508	8.01	0.9034
10	0.1904	1.460	-0.004	328 13.1	21 52.9	280 32.1	18 42.1	1.04753	1.27483	8.03	0.9047
11	0.1931	+1.466	+0.001	328 26.8	21 53.8	279 27.2	18 37.8	1.04975	1.27461	-8.05	-0.9059
12	0.1958	1.473	0.005	328 35.8	21 54.4	278 22.2	18 33.5	1.05221	1.27441	8.07	0.9070
13	0.1986	1.479	0.009	328 40.5	21 54.7	277 17.2	18 29.1	1.05476	1.27423	8.09	0.9080
14	0.2013	1.486	0.011	328 40.8	21 54.7	276 12.2	18 24.8	1.05718	1.27408	8.11	0.9088
15	0.2040	1.492	0.011	328 38.0	21 54.5	275 7.2	18 20.5	1.05928	1.27395	8.12	0.9095
16	0.2068	+1.498	+0.009	328 33.5	21 54.2	274 2.2	18 16.1	1.06087	1.27385	-8.13	-0.9100
17	0.2095	1.505	+0.004	328 29.0	21 53.9	272 57.2	18 11.8	1.06185	1.27377	8.14	0.9105
18	0.2123	1.511	-0.001	328 27.1	21 53.8	271 52.3	18 7.5	1.06219	1.27371	8.14	0.9108
19	0.2150	1.517	0.007	328 29.9	21 54.0	270 47.4	18 3.2	1.06204	1.27368	8.15	0.9109
20	0.2177	1.524	0.013	328 38.8	21 54.6	269 42.4	17 58.8	1.06166	1.27369	8.15	0.9110
h (12.0) 21	0.2205	+1.530	-0.016	328 54.1	21 55.6	268 37.6	17 54.5	1.06137	1.27370	-8.15	-0.9109
22	0.2232	1.536	0.016	329 14.9	21 57.0	267 32.7	17 50.2	1.06158	1.27374	8.14	0.9106
23	0.2260	1.543	0.013	329 38.1	21 58.5	266 28.0	17 45.9	1.06258	1.27381	8.13	0.9102
24	0.2287	1.549	-0.007	330 0.4	22 0.0	265 23.3	17 41.6	1.06448	1.27390	8.12	0.9098
25	0.2314	1.555	+0.001	330 18.3	22 1.2	264 18.6	17 37.2	1.06712	1.27402	8.11	0.9091
26	0.2342	+1.562	+0.008	330 29.6	22 2.0	263 14.0	17 32.9	1.07014	1.27416	-8.10	-0.9084
27	0.2369	1.568	0.014	330 33.6	22 2.2	262 9.5	17 28.6	1.07314	1.27432	8.08	0.9075
28	0.2396	1.574	0.016	330 32.0	22 2.1	261 5.0	17 24.3	1.07565	1.27451	8.06	0.9065
29	0.2424	1.581	0.015	330 27.5	22 1.8	260 0.7	17 20.0	1.07738	1.27472	8.04	0.9054
30	0.2451	1.587	0.011	330 23.7	22 1.6	258 56.4	17 15.8	1.07825	1.27495	8.02	0.9041
31	0.2479	+1.594	+0.005	330 23.4	22 1.6	257 52.3	17 11.5	1.07838	1.27520	-7.99	-0.9027
Apr. 1	0.2506	+1.600	-0.002	330 28.8	22 1.9	256 48.3	17 7.2	1.07803	1.27548	-7.96	-0.9011

FOR WASHINGTON MEAN MIDNIGHT.

Solar Day. (Sidereal Hour.)	r	f		f'		G		H		Log g .	Log h .	i	Log i .
		In Time.	In Time.	In Arc.	In Time.	In Arc.	In Time.						
		y	s	s	$^{\circ}$ $'$	h m	$^{\circ}$ $'$	h m					
Apr. h (13.0)	1	0.2506	+1.600	-0.002	330 28.8	22 1.9	256 48.3	17 7.2	1.07803	1.27548	-7.96	-0.9011	
	2	0.2533	1.607	0.007	330 40.7	22 2.7	255 44.4	17 3.0	1.07754	1.27577	7.93	0.8994	
	3	0.2561	1.614	0.010	330 57.9	22 3.9	254 40.6	16 58.7	1.07729	1.27609	7.90	0.8976	
	4	0.2588	1.620	0.011	331 18.4	22 5.2	253 37.0	16 54.5	1.07749	1.27643	7.87	0.8957	
	5	0.2616	1.627	0.009	331 40.0	22 6.7	252 33.5	16 50.2	1.07830	1.27679	7.83	0.8936	
	6	0.2643	+1.634	-0.005	332 0.2	22 8.0	251 30.1	16 46.0	1.07968	1.27717	-7.79	-0.8914	
	7	0.2670	1.640	-0.001	332 17.5	22 9.2	250 26.9	16 41.8	1.08152	1.27757	7.75	0.8891	
	8	0.2698	1.647	+0.004	332 30.6	22 10.0	249 23.9	16 37.6	1.08365	1.27798	7.70	0.8866	
	9	0.2725	1.654	0.007	332 39.4	22 10.6	248 21.0	16 33.4	1.08588	1.27841	7.65	0.8839	
	10	0.2752	1.661	0.010	332 44.2	22 10.9	247 18.3	16 29.2	1.08801	1.27886	7.60	0.8811	
	11	0.2780	+1.668	+0.010	332 45.7	22 11.0	246 15.8	16 25.1	1.08986	1.27933	-7.55	-0.8782	
	12	0.2807	1.675	0.009	332 45.6	22 11.0	245 13.4	16 20.9	1.09131	1.27981	7.50	0.8751	
	13	0.2834	1.682	+0.005	332 45.3	22 11.0	244 11.2	16 16.7	1.09226	1.28030	7.45	0.8719	
	14	0.2862	1.689	0.000	332 47.0	22 11.1	243 9.2	16 12.6	1.09269	1.28080	7.39	0.8686	
	15	0.2889	1.697	-0.006	332 52.9	22 11.5	242 7.4	16 8.5	1.09262	1.28133	7.33	0.8650	
h (14.0)	16	0.2917	+1.704	-0.012	333 4.1	22 12.3	241 5.8	16 4.4	1.09233	1.28186	-7.27	-0.8614	
	17	0.2944	1.711	0.015	333 21.5	22 13.4	240 4.3	16 0.3	1.09217	1.28241	7.20	0.8575	
	18	0.2971	1.719	0.016	333 44.0	22 14.9	239 3.1	15 56.2	1.09241	1.28297	7.14	0.8535	
	19	0.2999	1.726	0.014	334 9.4	22 16.6	238 2.0	15 52.1	1.09338	1.28354	7.07	0.8494	
	20	0.3026	1.734	0.008	334 34.4	22 18.3	237 1.1	15 48.1	1.09517	1.28412	7.00	0.8451	
	21	0.3054	+1.742	-0.001	334 55.7	22 19.7	236 0.5	15 44.0	1.09771	1.28470	-6.93	-0.8406	
	22	0.3081	1.749	+0.007	335 10.9	22 20.7	235 0.0	15 40.0	1.10067	1.28530	6.85	0.8359	
	23	0.3108	1.757	0.013	335 19.5	22 21.3	233 59.7	15 36.0	1.10367	1.28590	6.78	0.8311	
	24	0.3136	1.765	0.017	335 22.1	22 21.5	232 59.6	15 32.0	1.10631	1.28651	6.70	0.8261	
	25	0.3163	1.773	0.017	335 21.3	22 21.4	231 59.7	15 28.0	1.10827	1.28713	6.62	0.8209	
	26	0.3190	+1.781	+0.013	335 20.4	22 21.4	231 0.0	15 24.0	1.10944	1.28775	-6.54	-0.8155	
	27	0.3218	1.789	0.007	335 22.5	22 21.5	230 0.5	15 20.0	1.10989	1.28837	6.46	0.8100	
	28	0.3245	1.798	+0.001	335 29.6	22 22.0	229 1.2	15 16.1	1.10986	1.28900	6.37	0.8042	
	29	0.3273	1.806	-0.005	335 42.8	22 22.9	228 2.1	15 12.1	1.10970	1.28963	6.28	0.7982	
	30	0.3300	1.814	0.009	336 1.1	22 24.1	227 3.2	15 8.2	1.10973	1.29026	6.19	0.7920	
May h (15.0)	1	0.3327	+1.823	-0.011	336 22.9	22 25.5	226 4.5	15 4.3	1.11019	1.29090	-6.10	-0.7856	
	2	0.3355	1.832	0.010	336 46.0	22 27.1	225 6.0	15 0.4	1.11126	1.29153	6.01	0.7790	
	3	0.3382	1.840	0.007	337 7.9	22 28.5	224 7.7	14 56.5	1.11289	1.29216	5.92	0.7722	
	4	0.3410	1.849	-0.002	337 26.7	22 29.8	223 9.6	14 52.6	1.11497	1.29280	5.82	0.7651	
	5	0.3437	1.858	+0.002	337 41.7	22 30.8	222 11.7	14 48.8	1.11736	1.29343	5.73	0.7578	
	6	0.3464	+1.867	+0.006	337 52.4	22 31.5	221 14.0	14 44.9	1.11982	1.29406	-5.63	-0.7503	
	7	0.3492	1.876	0.009	337 59.2	22 31.9	220 16.4	14 41.1	1.12222	1.29468	5.53	0.7425	
	8	0.3519	1.885	0.010	338 2.8	22 32.2	219 19.1	14 37.3	1.12434	1.29530	5.43	0.7344	
	9	0.3546	1.894	0.009	338 4.6	22 32.3	218 22.0	14 33.5	1.12611	1.29592	5.32	0.7261	
	10	0.3574	1.903	0.006	338 6.0	22 32.4	217 25.0	14 29.7	1.12745	1.29653	5.22	0.7174	
	11	0.3601	+1.913	+0.001	338 8.9	22 32.6	216 28.3	14 25.9	1.12834	1.29714	-5.11	-0.7085	
	12	0.3628	1.922	-0.005	338 14.9	22 33.0	215 31.7	14 22.1	1.12881	1.29774	5.00	0.6993	
	13	0.3656	1.932	0.011	338 25.8	22 33.7	214 35.4	14 18.4	1.12910	1.29834	4.89	0.6897	
	14	0.3683	1.941	0.015	338 42.0	22 34.8	213 39.2	14 14.6	1.12945	1.29892	4.78	0.6798	
	15	0.3711	1.951	0.017	339 2.9	22 36.2	212 43.1	14 10.9	1.13021	1.29949	4.67	0.6696	
	16	0.3738	+1.961	-0.016	339 26.3	22 37.7	211 47.3	14 7.2	1.13158	1.30006	-4.56	-0.6590	
	17	0.3765	+1.971	-0.011	339 50.3	22 39.3	210 51.7	14 3.4	1.13370	1.30063	-4.45	-0.6480	

FOR WASHINGTON MEAN MIDNIGHT.

Solar Day. (Sidereal Hour.)	τ	f		f'		G		H		Log g .	Log h .	i	Log i .
		In Time.		In Time.		In Arc.	In Time.	In Arc.	In Time.				
	y	s		s		$^{\circ}$ $'$	h m	$^{\circ}$ $'$	h m			$''$	
May	17	0.3765	+1.971	-0.011		339 50.3	22 39.3	210 51.7	14 3.4	1.13370	1.30063	-4.45	-0.6480
	18	0.3793	1.981	-0.004		340 11.1	22 40.7	209 56.2	13 59.7	1.13654	1.30118	4.33	0.6366
	19	0.3820	1.991	+0.004		340 26.2	22 41.7	209 0.8	13 56.1	1.13980	1.30172	4.21	0.6247
	20	0.3848	2.001	0.012		340 35.1	22 42.3	208 5.6	13 52.4	1.14318	1.30224	4.10	0.6124
	21	0.3875	2.011	0.017		340 38.2	22 42.5	207 10.5	13 48.7	1.14625	1.30276	3.98	0.5997
h	(16.0)	22	0.3902	+2.021	+0.018	340 37.6	22 42.5	206 15.6	13 45.0	1.14872	1.30326	-3.86	-0.5864
	23	0.3930	2.031	0.015		340 36.3	22 42.4	205 20.9	13 41.4	1.15047	1.30375	3.74	0.5726
	24	0.3957	2.042	0.010		340 37.0	22 42.5	204 26.3	13 37.8	1.15152	1.30423	3.62	0.5582
	25	0.3984	2.052	+0.003		340 42.0	22 42.8	203 31.8	13 34.1	1.15208	1.30470	3.49	0.5432
	26	0.4012	2.062	-0.003		340 52.5	22 43.5	202 37.4	13 30.5	1.15249	1.30515	3.37	0.5275
	27	0.4039	+2.073	-0.008		341 7.7	22 44.5	201 43.2	13 26.9	1.15301	1.30559	-3.24	-0.5111
	28	0.4067	2.083	0.010		341 26.4	22 45.8	200 49.0	13 23.3	1.15392	1.30602	3.12	0.4940
	29	0.4094	2.094	0.010		341 46.2	22 47.1	199 55.0	13 19.7	1.15538	1.30642	2.99	0.4760
	30	0.4121	2.105	0.008		342 5.1	22 48.3	199 1.2	13 16.1	1.15734	1.30682	2.87	0.4572
	31	0.4149	2.116	-0.003		342 21.3	22 49.4	198 7.4	13 12.5	1.15973	1.30720	2.74	0.4373
June	1	0.4176	+2.127	+0.001		342 33.8	22 50.3	197 13.8	13 8.9	1.16241	1.30756	-2.61	-0.4164
	2	0.4204	2.137	0.005		342 42.2	22 50.8	196 20.2	13 5.3	1.16514	1.30791	2.48	0.3943
	3	0.4231	2.148	0.009		342 46.9	22 51.1	195 26.7	13 1.8	1.16779	1.30824	2.35	0.3709
	4	0.4258	2.159	0.010		342 48.6	22 51.2	194 33.4	12 58.2	1.17025	1.30855	2.22	0.3461
h	5	0.4286	2.170	0.010		342 48.3	22 51.2	193 40.1	12 54.7	1.17235	1.30884	2.09	0.3196
(17.0)	6	0.4313	+2.181	+0.007		342 47.4	22 51.2	192 46.9	12 51.1	1.17406	1.30912	-1.96	-0.2913
	7	0.4340	2.192	+0.002		342 47.4	22 51.2	191 53.8	12 47.6	1.17536	1.30938	1.82	0.2608
	8	0.4368	2.203	-0.003		342 50.0	22 51.3	191 0.8	12 44.1	1.17630	1.30962	1.69	0.2280
	9	0.4395	2.215	0.010		342 56.4	22 51.8	190 7.9	12 40.5	1.17702	1.30985	1.56	0.1924
	10	0.4422	2.226	0.015		343 7.4	22 52.5	189 15.0	12 37.0	1.17777	1.31006	1.42	0.1534
	11	0.4450	+2.237	-0.018		343 22.5	22 53.5	188 22.2	12 33.5	1.17881	1.31025	-1.29	-0.1106
	12	0.4477	2.248	0.018		343 40.5	22 54.7	187 29.4	12 30.0	1.18037	1.31042	1.16	0.0628
	13	0.4505	2.259	0.014		343 58.7	22 55.9	186 36.7	12 26.4	1.18258	1.31057	1.02	0.0091
	14	0.4532	2.271	-0.007		344 14.8	22 57.0	185 44.0	12 22.9	1.18543	1.31071	0.89	9.9476
	15	0.4559	2.282	+0.001		344 26.5	22 57.8	184 51.4	12 19.4	1.18873	1.31082	0.75	9.8758
	16	0.4587	+2.293	+0.009		344 32.4	22 58.2	183 58.8	12 15.9	1.19217	1.31092	-0.62	-9.7897
	17	0.4614	2.304	0.015		344 33.1	22 58.2	183 6.3	12 12.4	1.19541	1.31100	0.48	9.6820
	18	0.4642	2.316	0.018		344 29.8	22 58.0	182 13.8	12 8.9	1.19817	1.31106	0.35	9.5383
	19	0.4669	2.327	0.017		344 25.2	22 57.7	181 21.2	12 5.4	1.20024	1.31110	0.21	9.3218
h	20	0.4696	2.338	0.013		344 22.1	22 57.5	180 28.7	12 1.9	1.20170	1.31112	-0.07	-8.8704
(18.0)	21	0.4724	+2.350	+0.006		344 22.3	22 57.5	179 36.2	11 58.4	1.20265	1.31112	+0.06	+8.7882
	22	0.4751	2.361	0.000		344 27.2	22 57.8	178 43.7	11 54.9	1.20333	1.31110	0.20	9.2945
	23	0.4778	2.372	-0.006		344 36.6	22 58.4	177 51.2	11 51.4	1.20409	1.31107	0.33	9.5218
	24	0.4806	2.384	0.009		344 49.2	22 59.3	176 58.7	11 47.9	1.20511	1.31101	0.47	9.6702
	25	0.4833	2.395	0.009		345 3.4	23 0.2	176 6.2	11 44.4	1.20660	1.31093	0.60	9.7805
	26	0.4861	+2.406	-0.008		345 17.0	23 1.1	175 13.7	11 40.9	1.20853	1.31083	+0.74	+9.8683
	27	0.4888	2.418	-0.004		345 28.4	23 1.9	174 21.0	11 37.4	1.21082	1.31073	0.87	9.9412
	28	0.4915	2.429	0.000		345 36.5	23 2.4	173 28.4	11 33.9	1.21340	1.31060	1.01	0.0035
	29	0.4943	2.440	+0.005		345 40.9	23 2.7	172 35.7	11 30.4	1.21604	1.31044	1.14	0.0578
	30	0.4970	2.451	0.008		345 41.9	23 2.8	171 43.1	11 26.9	1.21862	1.31027	1.28	0.1060
July	1	0.4998	+2.463	+0.011		345 40.4	23 2.7	170 50.4	11 23.4	1.22101	1.31008	+1.41	+0.1493
	2	0.5025	+2.474	+0.011		345 36.6	23 2.4	169 57.6	11 19.8	1.22310	1.30988	+1.54	+0.1885

FOR WASHINGTON MEAN MIDNIGHT.

Solar Day. (Sidereal Hour.)		τ	f	f'	G		H		Log g .	Log h .	i	Log i .	
			In Time.	In Time.	In Arc.	In Time.	In Arc.	In Time.					
July	y	s	s	° ' "	h m	° ' "	h m				"		
	1	0.4998	+2.463	+0.011	345 40.4	23 2.7	170 50.4	11 23.4	1.22101	1.31008	+1.41	+0.1493	
	2	0.5025	2.474	0.011	345 36.6	23 2.4	169 57.6	11 19.8	1.22310	1.30988	1.54	0.1885	
	3	0.5052	2.485	0.009	345 32.1	23 2.1	169 4.8	11 16.3	1.22482	1.30966	1.68	0.2244	
	4	0.5080	2.496	+0.004	345 28.3	23 1.9	168 11.9	11 12.8	1.22616	1.30942	1.81	0.2574	
	h	5	0.5107	-0.001	345 26.3	23 1.8	167 19.0	11 9.3	1.22717	1.30916	1.94	0.2880	
	(19.0)	6	0.5134	+2.518	-0.007	345 27.5	23 1.8	166 26.0	11 5.7	1.22796	1.30888	+2.07	+0.3164
	7	0.5162	2.529	0.013	345 32.5	23 2.2	165 32.9	11 2.2	1.22867	1.30858	2.20	0.3430	
	8	0.5189	2.540	0.017	345 41.3	23 2.8	164 39.8	10 58.7	1.22958	1.30827	2.33	0.3680	
	9	0.5216	2.551	0.019	345 52.9	23 3.5	163 46.6	10 55.1	1.23088	1.30795	2.46	0.3914	
	10	0.5244	2.561	0.016	346 5.4	23 4.4	162 53.3	10 51.6	1.23270	1.30761	2.59	0.4136	
	11	0.5271	+2.572	-0.011	346 16.6	23 5.1	162 0.0	10 48.0	1.23512	1.30725	+2.72	+0.4345	
	12	0.5299	2.583	-0.003	346 24.5	23 5.6	161 6.5	10 44.4	1.23798	1.30688	2.85	0.4544	
	13	0.5326	2.594	+0.005	346 27.6	23 5.8	160 12.9	10 40.9	1.24103	1.30648	2.97	0.4733	
	14	0.5353	2.604	0.012	346 25.8	23 5.7	159 19.3	10 37.3	1.24401	1.30608	3.10	0.4913	
	15	0.5381	2.615	0.016	346 20.3	23 5.4	158 25.5	10 33.7	1.24662	1.30566	3.22	0.5084	
h	16	0.5408	+2.625	+0.016	346 12.9	23 4.9	157 31.6	10 30.1	1.24866	1.30523	+3.35	+0.5248	
	17	0.5436	2.636	0.014	346 6.1	23 4.4	156 37.6	10 26.5	1.25011	1.30478	3.47	0.5405	
	18	0.5463	2.646	0.008	346 2.1	23 4.1	155 43.5	10 22.9	1.25107	1.30432	3.59	0.5556	
	19	0.5490	2.656	+0.002	346 2.1	23 4.1	154 49.2	10 19.3	1.25171	1.30384	3.72	0.5700	
	h	20	0.5518	-0.004	346 6.3	23 4.4	153 54.8	10 15.7	1.25230	1.30336	3.84	0.5838	
	(20.0)	21	0.5545	+2.677	-0.008	346 13.9	23 4.9	153 0.3	10 12.0	1.25308	1.30286	+3.96	+0.5971
	22	0.5572	2.687	0.009	346 23.3	23 5.6	152 5.6	10 8.4	1.25424	1.30235	4.07	0.6099	
	23	0.5600	2.697	0.008	346 32.9	23 6.2	151 10.9	10 4.7	1.25578	1.30182	4.19	0.6222	
	24	0.5627	2.707	-0.005	346 40.8	23 6.7	150 15.9	10 1.1	1.25769	1.30129	4.31	0.6340	
	25	0.5655	2.717	0.000	346 46.0	23 7.1	149 20.7	9 57.4	1.25981	1.30075	4.42	0.6455	
	26	0.5682	+2.727	+0.004	346 48.0	23 7.2	148 25.5	9 53.7	1.26204	1.30019	+4.53	+0.6565	
	27	0.5709	2.736	0.008	346 46.9	23 7.1	147 30.1	9 50.0	1.26423	1.29963	4.65	0.6671	
	28	0.5737	2.746	0.011	346 43.1	23 6.9	146 34.6	9 46.3	1.26626	1.29906	4.76	0.6774	
	29	0.5764	2.756	0.011	346 37.6	23 6.5	145 38.8	9 42.6	1.26803	1.29849	4.87	0.6873	
	30	0.5792	2.765	0.010	346 31.2	23 6.1	144 42.9	9 38.9	1.26950	1.29790	4.98	0.6968	
Aug.	31	0.5819	+2.774	+0.007	346 25.1	23 5.7	143 46.9	9 35.1	1.27062	1.29730	+5.08	+0.7061	
	1	0.5846	2.784	+0.001	346 20.6	23 5.4	142 50.6	9 31.4	1.27141	1.29670	5.19	0.7150	
	2	0.5874	2.793	-0.005	346 18.2	23 5.2	141 54.2	9 27.6	1.27195	1.29610	5.29	0.7236	
	3	0.5901	2.802	0.011	346 19.4	23 5.3	140 57.7	9 23.8	1.27238	1.29548	5.40	0.7320	
	4	0.5928	2.811	0.016	346 24.1	23 5.6	140 0.9	9 20.1	1.27290	1.29496	5.50	0.7401	
	h	5	0.5956	+2.820	-0.018	346 31.6	23 6.1	139 4.0	9 16.3	1.27370	1.29425	+5.60	+0.7479
	(21.0)	6	0.5983	2.829	0.018	346 40.7	23 6.7	138 6.9	9 12.5	1.27492	1.29362	5.69	0.7554
	7	0.6010	2.838	0.013	346 49.3	23 7.3	137 9.6	9 8.6	1.27665	1.29301	5.79	0.7628	
	8	0.6038	2.847	-0.007	346 55.6	23 7.7	136 12.2	9 4.8	1.27884	1.29238	5.89	0.7698	
	9	0.6065	2.855	+0.001	346 57.9	23 7.9	135 14.5	9 1.0	1.28128	1.29175	5.98	0.7767	
	10	0.6093	+2.864	+0.009	346 55.9	23 7.7	134 16.7	8 57.1	1.28375	1.29112	+6.07	+0.7833	
	11	0.6120	2.872	0.014	346 50.2	23 7.3	133 18.7	8 53.2	1.28597	1.29049	6.16	0.7897	
	12	0.6147	2.881	0.015	346 42.3	23 6.8	132 20.6	8 49.4	1.28772	1.28987	6.25	0.7959	
	13	0.6175	2.889	0.014	346 34.3	23 6.3	131 22.2	8 45.5	1.28896	1.28924	6.34	0.8018	
	14	0.6202	2.897	0.009	346 28.4	23 5.9	130 23.6	8 41.6	1.28969	1.28863	6.42	0.8076	
	15	0.6230	+2.905	+0.003	346 25.9	23 5.7	129 24.9	8 37.7	1.29008	1.28800	+6.51	+0.8132	
16	0.6257	+2.914	-0.003	346 27.5	23 5.8	128 26.0	8 33.7	1.29037	1.28739	+6.59	+0.8186		

FOR WASHINGTON MEAN MIDNIGHT.

Solar Day. (Sidereal Hour.)	τ	f	f'	G		H		Log g .	Log A .	i	Log i .
		In Time.	In Time.	In Arc.	In Time.	In Arc.	In Time.				
	y	s	s	$^{\circ}$ $'$	h m	$^{\circ}$ $'$	h m			$''$	
Aug. 16	0.6257	+2.914	-0.003	346 27.5	23 5.8	128 26.0	8 33.7	1.29037	1.28739	+6.59	+0.8186
17	0.6284	2.922	0.007	346 32.6	23 6.2	127 26.8	8 29.8	1.29076	1.28678	6.67	0.8238
18	0.6312	2.930	0.009	346 40.1	23 6.7	126 27.5	8 25.8	1.29143	1.28618	6.74	0.8289
19	0.6339	2.937	0.008	346 48.3	23 7.2	125 28.0	8 21.9	1.29244	1.28558	6.82	0.8337
20	0.6366	2.945	0.005	346 55.4	23 7.7	124 28.3	8 17.9	1.29381	1.28499	6.89	0.8384
h (22.0) 21	0.6394	+2.953	-0.001	347 0.3	23 8.0	123 28.3	8 13.9	1.29543	1.28440	+6.96	+0.8429
22	0.6421	2.960	+0.004	347 2.5	23 8.2	122 28.2	8 9.9	1.29716	1.28383	7.04	0.8473
23	0.6449	2.968	0.008	347 1.7	23 8.1	121 28.0	8 5.9	1.29890	1.28326	7.10	0.8514
24	0.6476	2.975	0.011	346 58.6	23 7.9	120 27.5	8 1.8	1.30051	1.28270	7.17	0.8555
25	0.6503	2.982	0.012	346 53.5	23 7.6	119 26.8	7 57.8	1.30191	1.28216	7.23	0.8594
26	0.6531	+2.990	+0.011	346 47.5	23 7.2	118 26.0	7 53.7	1.30304	1.28162	+7.30	+0.8631
27	0.6558	2.997	0.008	346 41.6	23 6.8	117 25.0	7 49.7	1.30385	1.28110	7.36	0.8666
28	0.6586	3.004	+0.004	346 36.8	23 6.5	116 23.8	7 45.6	1.30437	1.28059	7.41	0.8700
29	0.6613	3.011	-0.002	346 34.1	23 6.3	115 22.5	7 41.5	1.30463	1.28009	7.47	0.8733
30	0.6640	3.018	0.008	346 34.4	23 6.3	114 20.9	7 37.4	1.30475	1.27960	7.52	0.8764
31	0.6668	+3.025	-0.014	346 38.0	23 6.5	113 19.3	7 33.3	1.30488	1.27914	+7.58	+0.8794
Sept. 1	0.6695	3.032	0.017	346 44.4	23 7.0	112 17.4	7 29.2	1.30520	1.27869	7.62	0.8822
2	0.6722	3.039	0.017	346 53.0	23 7.5	111 15.4	7 25.0	1.30588	1.27825	7.67	0.8849
3	0.6750	3.046	0.014	347 1.8	23 8.1	110 13.3	7 20.9	1.30703	1.27783	7.72	0.8875
h (23.0) 4	0.6777	3.052	0.009	347 9.0	23 8.6	109 11.0	7 16.7	1.30858	1.27741	7.76	0.8899
5	0.6804	+3.059	-0.001	347 13.2	23 8.9	108 8.6	7 12.6	1.31047	1.27703	+7.80	+0.8922
6	0.6832	3.066	+0.006	347 13.3	23 8.9	107 6.0	7 8.4	1.31243	1.27668	7.84	0.8943
7	0.6859	3.072	0.012	347 9.7	23 8.6	106 3.3	7 4.2	1.31428	1.27633	7.88	0.8963
8	0.6887	3.079	0.014	347 3.7	23 8.2	105 0.5	7 0.0	1.31573	1.27600	7.91	0.8982
9	0.6914	3.085	0.014	346 56.9	23 7.8	103 57.6	6 55.8	1.31672	1.27569	7.94	0.8999
10	0.6941	+3.092	+0.010	346 51.6	23 7.4	102 54.6	6 51.6	1.31724	1.27541	+7.97	+0.9016
11	0.6969	3.098	+0.004	346 49.3	23 7.3	101 51.4	6 47.4	1.31741	1.27514	8.00	0.9030
12	0.6996	3.104	-0.002	346 50.9	23 7.4	100 48.1	6 43.2	1.31740	1.27489	8.02	0.9044
13	0.7024	3.111	0.007	346 56.2	23 7.7	99 44.7	6 39.0	1.31744	1.27466	8.05	0.9056
14	0.7051	3.117	0.010	347 4.2	23 8.3	98 41.3	6 34.8	1.31774	1.27447	8.07	0.9067
15	0.7078	+3.123	-0.009	347 13.4	23 8.9	97 37.7	6 30.5	1.31837	1.27429	+8.09	+0.9077
16	0.7106	3.130	0.007	347 22.2	23 9.5	96 34.0	6 26.3	1.31933	1.27413	8.10	0.9085
17	0.7133	3.136	-0.003	347 29.3	23 10.0	95 30.3	6 22.0	1.32058	1.27400	8.12	0.9093
18	0.7160	3.142	+0.002	347 33.9	23 10.3	94 26.5	6 17.8	1.32199	1.27388	8.13	0.9098
19	0.7188	3.148	0.007	347 35.6	23 10.4	93 22.7	6 13.5	1.32342	1.27380	8.13	0.9103
h (0.0) 20	0.7215	+3.154	+0.010	347 35.1	23 10.3	92 18.7	6 9.2	1.32477	1.27374	+8.14	+0.9106
21	0.7242	3.161	0.012	347 32.5	23 10.2	91 14.7	6 5.0	1.32591	1.27369	8.15	0.9109
22	0.7270	3.167	0.012	347 29.0	23 9.9	90 10.6	6 0.7	1.32685	1.27368	8.15	0.9110
23	0.7297	3.173	0.010	347 25.4	23 9.7	89 6.5	5 56.4	1.32750	1.27369	8.15	0.9109
24	0.7325	3.179	+0.005	347 22.6	23 9.5	88 2.4	5 52.2	1.32787	1.27373	8.14	0.9107
25	0.7352	+3.185	0.000	347 21.5	23 9.4	86 58.3	5 47.9	1.32801	1.27378	+8.14	+0.9104
26	0.7379	3.192	-0.006	347 23.2	23 9.5	85 54.1	5 43.6	1.32799	1.27385	8.13	0.9100
27	0.7407	3.198	0.012	347 27.9	23 9.9	84 49.9	5 39.3	1.32794	1.27396	8.12	0.9095
28	0.7434	3.204	0.015	347 35.6	23 10.4	83 45.7	5 35.0	1.32805	1.27409	8.11	0.9088
29	0.7462	3.210	0.017	347 45.5	23 11.0	82 41.6	5 30.8	1.32846	1.27424	8.09	0.9080
30	0.7489	+3.216	-0.015	347 56.2	23 11.8	81 37.4	5 26.5	1.32926	1.27441	+8.07	+0.9070
Oct. 1	0.7516	+3.223	-0.010	348 6.0	23 12.4	80 33.3	5 22.2	1.33052	1.27460	+8.05	+0.9060

FOR WASHINGTON MEAN MIDNIGHT.

Solar Day. (Sidereal Hour.)	r	f		f'		G		H		Log g.	Log h.	i	Log i.
		In Time.		In Time.		In Arc.	In Time.	In Arc.	In Time.				
	y	s		s		° ' "	h m	° ' "	h m			"	
Oct.	1	0.7516	+3.223	-0.010		348 6.0	23 12.4	80 33.3	5 22.2	1.33052	1.27460	+8.05	+0.9060
	2	0.7544	3.229	-0.003		348 13.3	23 12.9	79 29.2	5 18.0	1.33209	1.27483	8.03	0.9048
	3	0.7571	3.235	+0.004		348 17.0	23 13.1	78 25.1	5 13.7	1.33383	1.27508	8.01	0.9034
	4	0.7598	3.242	0.010		348 17.0	23 13.1	77 21.1	5 9.4	1.33552	1.27534	7.98	0.9019
	5	0.7626	3.248	0.014		348 14.2	23 12.9	76 17.1	5 5.1	1.33694	1.27563	7.95	0.9003
	6	0.7653	+3.254	+0.014		348 10.2	23 12.7	75 13.2	5 0.9	1.33792	1.27593	+7.92	+0.8986
	7	0.7681	3.261	0.011		348 7.1	23 12.5	74 9.3	4 56.6	1.33845	1.27626	7.88	0.8967
	8	0.7708	3.267	+0.006		348 6.5	23 12.4	73 5.5	4 52.4	1.33863	1.27661	7.85	0.8947
	9	0.7735	3.274	0.000		348 9.3	23 12.6	72 1.8	4 48.1	1.33858	1.27698	7.81	0.8925
	10	0.7763	3.281	-0.006		348 15.9	23 13.1	70 58.2	4 43.9	1.33853	1.27737	7.77	0.8902
	11	0.7790	+3.287	-0.010		348 25.5	23 13.7	69 54.6	4 39.6	1.33872	1.27777	+7.72	+0.8878
	12	0.7818	3.294	0.010		348 36.9	23 14.5	68 51.1	4 35.4	1.33920	1.27820	7.68	0.8852
	13	0.7845	3.301	0.008		348 48.0	23 15.2	67 47.7	4 31.2	1.34006	1.27864	7.63	0.8824
	14	0.7872	3.308	-0.005		348 57.8	23 15.9	66 44.5	4 27.0	1.34124	1.27911	7.58	0.8796
	15	0.7900	3.315	0.000		349 5.4	23 16.4	65 41.3	4 22.7	1.34259	1.27959	7.53	0.8765
	16	0.7927	+3.322	+0.005		349 10.3	23 16.7	64 38.1	4 18.5	1.34403	1.28008	+7.47	+0.8733
	17	0.7954	3.329	0.009		349 12.7	23 16.8	63 35.1	4 14.3	1.34540	1.28059	7.41	0.8700
	18	0.7982	3.336	0.011		349 13.1	23 16.9	62 32.3	4 10.2	1.34661	1.28112	7.35	0.8665
	19	0.8009	3.343	0.012		349 12.4	23 16.8	61 29.5	4 6.0	1.34760	1.28165	7.29	0.8628
	20	0.8036	3.350	0.010		349 11.3	23 16.7	60 26.9	4 1.8	1.34836	1.28221	7.23	0.8590
h (2.0)	21	0.8064	+3.358	+0.006		349 10.8	23 16.7	59 24.3	3 57.6	1.34887	1.28278	+7.16	+0.8549
	22	0.8091	3.365	+0.001		349 11.7	23 16.8	58 21.9	3 53.5	1.34914	1.28336	7.09	0.8508
	23	0.8119	3.372	-0.004		349 15.0	23 17.0	57 19.6	3 49.3	1.34928	1.28394	7.02	0.8464
	24	0.8146	3.380	0.010		349 21.0	23 17.4	56 17.5	3 45.2	1.34938	1.28454	6.95	0.8419
	25	0.8173	3.388	0.014		349 29.9	23 18.0	55 15.6	3 41.0	1.34960	1.28516	6.87	0.8372
	26	0.8201	+3.395	-0.016		349 41.0	23 18.7	54 13.7	3 36.9	1.35008	1.28576	+6.80	+0.8322
	27	0.8228	3.403	0.015		349 53.3	23 19.6	53 12.0	3 32.8	1.35094	1.28638	6.72	0.8271
	28	0.8256	3.411	0.011		350 5.0	23 20.3	52 10.3	3 28.7	1.35223	1.28702	6.63	0.8218
	29	0.8283	3.419	-0.005		350 14.7	23 21.0	51 8.9	3 24.6	1.35387	1.28765	6.55	0.8163
	30	0.8310	3.427	+0.003		350 21.1	23 21.4	50 7.7	3 20.5	1.35572	1.28829	6.47	0.8106
Nov.	31	0.8338	+3.436	+0.010		350 23.9	23 21.6	49 6.6	3 16.4	1.35754	1.28894	+6.38	+0.8047
	1	0.8365	3.444	0.014		350 23.6	23 21.6	48 5.6	3 12.4	1.35916	1.28958	6.29	0.7996
	2	0.8392	3.452	0.015		350 21.8	23 21.5	47 4.8	3 8.3	1.36041	1.29023	6.20	0.7922
	3	0.8420	3.461	0.013		350 20.0	23 21.3	46 4.2	3 4.3	1.36122	1.29090	6.10	0.7866
	4	0.8447	3.469	0.008		350 20.2	23 21.3	45 3.6	3 0.2	1.36167	1.29155	6.01	0.7788
	5	0.8475	+3.478	+0.002		350 23.4	23 21.6	44 3.3	2 56.2	1.36188	1.29221	+5.91	+0.7717
	6	0.8502	3.487	-0.004		350 30.3	23 22.0	43 3.1	2 52.2	1.36207	1.29286	5.81	0.7643
	7	0.8529	3.496	0.009		350 40.2	23 22.7	42 3.1	2 48.2	1.36242	1.29352	5.71	0.7567
	8	0.8557	3.505	0.011		350 51.9	23 23.5	41 3.2	2 44.2	1.36307	1.29417	5.61	0.7489
	9	0.8584	3.514	0.010		351 4.0	23 24.3	40 3.5	2 40.2	1.36408	1.29482	5.50	0.7407
h (3.0)	10	0.8612	+3.523	-0.006		351 14.9	23 25.0	39 4.0	2 36.3	1.36540	1.29547	+5.40	+0.7322
	11	0.8639	3.532	-0.002		351 23.7	23 25.6	38 4.6	2 32.3	1.36696	1.29611	5.29	0.7234
	12	0.8666	3.541	+0.003		351 29.8	23 26.0	37 5.3	2 28.4	1.36861	1.29675	5.18	0.7144
	13	0.8694	3.551	0.008		351 33.4	23 26.2	36 6.1	2 24.4	1.37021	1.29738	5.07	0.7049
	14	0.8721	3.560	0.011		351 34.9	23 26.3	35 7.1	2 20.5	1.37169	1.29800	4.96	0.6951
	15	0.8748	+3.570	+0.012		351 35.1	23 26.3	34 8.3	2 16.6	1.37298	1.29861	+4.84	+0.6850
	16	0.8776	+3.580	+0.010		351 34.7	23 26.3	33 9.6	2 12.6	1.37405	1.29923	+4.73	+0.6745

FOR WASHINGTON MEAN MIDNIGHT.

Solar Day. (Sidereal Hour.)	r	f		f'		G		H		Log g.	Log h.	i	Log i.
		In Time.		In Time.		In Arc.	In Time.	In Arc.	In Time.				
	γ	s		s		° ' "	h m	° ' "	h m			"	
Nov. 16	0.8776	+3.580	+0.010	351 34.7	23 26.3	33 9.6	2 12.6	1.37405	1.29923	+4.73	+0.6745		
17	0.8803	3.589	0.007	351 34.6	23 26.3	32 11.0	2 8.7	1.37486	1.29983	4.61	0.6635		
18	0.8830	3.599	+0.003	351 35.6	23 26.4	31 12.5	2 4.8	1.37547	1.30042	4.49	0.6522		
h 19	0.8858	3.609	-0.003	351 38.5	23 26.6	30 14.2	2 0.9	1.37593	1.30100	4.37	0.6403		
(4.0) 20	0.8885	3.620	0.009	351 43.7	23 26.9	29 16.0	1 57.1	1.37635	1.30157	4.25	0.6280		
21	0.8913	+3.630	-0.014	351 51.5	23 27.4	28 17.9	1 53.2	1.37684	1.30212	+4.12	+0.6152		
22	0.8940	3.640	0.017	352 1.5	23 28.1	27 20.0	1 49.3	1.37755	1.30268	4.00	0.6019		
23	0.8967	3.650	0.017	352 12.8	23 28.9	26 22.2	1 45.5	1.37861	1.30321	3.87	0.5880		
24	0.8995	3.661	0.013	352 23.7	23 29.6	25 24.5	1 41.6	1.38008	1.30372	3.74	0.5735		
25	0.9022	3.671	-0.007	352 33.1	23 30.2	24 26.9	1 37.8	1.38186	1.30422	3.62	0.5584		
26	0.9050	+3.682	0.000	352 39.6	23 30.6	23 29.4	1 34.0	1.38391	1.30472	+3.49	+0.5425		
27	0.9077	3.693	+0.008	352 42.6	23 30.8	22 32.0	1 30.1	1.38600	1.30520	3.36	0.5259		
28	0.9104	3.703	0.013	352 42.5	23 30.8	21 34.7	1 26.3	1.38792	1.30566	3.22	0.5085		
29	0.9132	3.714	0.016	352 40.3	23 30.7	20 37.6	1 22.5	1.38953	1.30611	3.09	0.4902		
30	0.9159	3.725	0.015	352 37.7	23 30.5	19 40.5	1 18.7	1.39074	1.30653	2.96	0.4710		
Dec. 1	0.9186	+3.736	+0.011	352 36.5	23 30.4	18 43.5	1 14.9	1.39155	1.30695	+2.82	+0.4508		
2	0.9214	3.747	+0.005	352 37.8	23 30.5	17 46.7	1 11.1	1.39208	1.30734	2.69	0.4294		
3	0.9241	3.758	-0.002	352 42.3	23 30.8	16 49.9	1 7.3	1.39254	1.30772	2.55	0.4067		
h 4	0.9269	3.769	0.007	352 49.9	23 31.3	15 53.2	1 3.5	1.39311	1.30807	2.41	0.3827		
(5.0) 5	0.9296	3.781	0.010	352 59.2	23 31.9	14 56.6	0 59.8	1.39391	1.30842	2.28	0.3571		
6	0.9323	+3.792	-0.010	353 9.3	23 32.6	14 0.0	0 56.0	1.39509	1.30874	+2.14	+0.3297		
7	0.9351	3.803	0.007	353 18.5	23 33.2	13 3.5	0 52.2	1.39654	1.30904	2.00	0.3003		
8	0.9378	3.815	-0.003	353 25.8	23 33.7	12 7.1	0 48.5	1.39821	1.30932	1.86	0.2687		
9	0.9406	3.826	+0.002	353 30.6	23 34.0	11 10.8	0 44.7	1.40001	1.30959	1.72	0.2344		
10	0.9433	3.838	0.007	353 32.9	23 34.2	10 14.5	0 41.0	1.40180	1.30983	1.57	0.1970		
11	0.9460	+3.849	+0.010	353 33.0	23 34.2	9 18.2	0 37.2	1.40348	1.31005	+1.43	+0.1559		
12	0.9488	3.861	0.012	353 31.7	23 34.1	8 22.0	0 33.5	1.40497	1.31026	1.29	0.1104		
13	0.9515	3.872	0.011	353 29.6	23 34.0	7 25.8	0 29.7	1.40622	1.31044	1.15	0.0594		
14	0.9542	3.884	0.008	353 27.6	23 33.8	6 29.6	0 26.0	1.40725	1.31060	1.00	0.0013		
15	0.9570	3.895	+0.004	353 26.4	23 33.8	5 33.5	0 22.2	1.40809	1.31074	0.86	9.9342		
16	0.9597	+3.907	-0.002	353 26.7	23 33.8	4 37.4	0 18.5	1.40875	1.31085	+0.72	+9.8545		
17	0.9624	3.919	0.008	353 29.0	23 33.9	3 41.3	0 14.8	1.40935	1.31095	0.57	9.7566		
18	0.9652	3.930	0.013	353 33.5	23 34.2	2 45.2	0 11.0	1.40997	1.31102	0.43	9.6299		
19	0.9679	3.942	0.017	353 40.1	23 34.7	1 49.2	0 7.3	1.41076	1.31108	0.28	9.4500		
h 20	0.9707	3.954	0.018	353 48.0	23 35.2	0 53.1	0 3.5	1.41183	1.31111	+0.14	+9.1369		
(6.0) 21	0.9734	+3.966	-0.016	353 56.1	23 35.7	359 57.0	23 59.8	1.41325	1.31112	-0.01	-7.8927		
22	0.9761	3.977	0.011	354 3.0	23 36.2	359 1.0	23 56.1	1.41500	1.31110	0.15	9.1838		
23	0.9789	3.989	-0.003	354 7.5	23 36.5	358 4.8	23 52.3	1.41702	1.31107	0.30	9.4736		
24	0.9816	4.001	+0.005	354 8.8	23 36.6	357 8.6	23 48.6	1.41912	1.31102	0.44	9.6457		
25	0.9844	4.012	0.011	354 7.3	23 36.5	356 12.5	23 44.8	1.42112	1.31095	0.59	9.7686		
26	0.9871	+4.024	+0.015	354 3.4	23 36.2	355 16.3	23 41.1	1.42287	1.31084	-0.73	-9.8642		
27	0.9898	4.036	0.016	353 58.5	23 35.9	354 20.1	23 37.3	1.42426	1.31072	0.88	9.9424		
28	0.9926	4.047	0.013	353 54.4	23 36.6	353 23.9	23 33.6	1.42522	1.31058	1.02	0.0084		
29	0.9953	4.059	0.007	353 52.4	23 35.5	352 27.6	23 29.8	1.42592	1.31041	1.16	0.0657		
30	0.9980	4.070	+0.001	353 53.3	23 35.6	351 31.3	23 26.1	1.42647	1.31023	1.31	0.1161		
31	1.0008	+4.082	-0.005	353 57.0	23 35.8	350 34.9	23 22.3	1.42704	1.31003	-1.45	-0.1612		
32	1.0035	+4.094	-0.008	354 2.9	23 36.2	349 38.5	23 18.6	1.42779	1.30980	-1.59	-0.2019		

214 BESSELIAN AND INDEPENDENT STAR-NUMBERS, 1916.

FOR WASHINGTON SIDEREAL TWELVE HOURS.

Mean Solar Date.	Log A ₁ .	Log B ₁ .	Log C.	Log D.	f	G ₁	H	Log g ₁ .	Log λ.	Log i.
Jan. 0.72	+9.4261	-0.7301	-0.5001	+1.3049	+0.822	314 52	351 6	0.8796	1.3101	-0.1373
10.70	9.4834	0.7326	0.8049	1.2845	0.936	318 28	341 40	0.9111	1.3071	0.4422
20.67	9.5314	0.7394	0.9729	1.2486	1.047	321 9	332 5	0.9419	1.3023	0.6101
30.64	9.5714	0.7487	1.0831	1.1944	1.147	323 7	322 16	0.9704	1.2963	0.7204
Feb. 9.61	9.6046	0.7586	1.1596	1.1168	1.239	324 35	312 11	0.9955	1.2898	0.7969
19.59	+9.6323	-0.7674	-1.2127	+1.0056	+1.320	325 45	301 50	1.0170	1.2835	-0.8500
29.56	9.6557	0.7733	1.2477	0.8375	1.393	326 49	291 15	1.0351	1.2782	0.8849
Mar. 10.53	9.6762	0.7754	1.2675	+0.5355	1.460	327 55	280 30	1.0502	1.2748	0.9048
20.50	9.6947	0.7729	1.2737	-8.9881	1.524	329 9	269 42	1.0630	1.2737	0.9110
30.48	9.7125	0.7655	1.2668	0.5569	1.587	330 36	258 58	1.0744	1.2749	0.9041
Apr. 9.45	+9.7304	-0.7534	-1.2468	-0.8443	+1.654	332 15	248 24	1.0854	1.2784	-0.8840
19.42	9.7489	0.7371	1.2125	1.0063	1.726	334 6	238 7	1.0969	1.2835	0.8497
29.40	9.7685	0.7176	1.1616	1.1139	1.805	336 5	228 8	1.1096	1.2896	0.7969
May 9.37	9.7892	0.6961	1.0899	1.1894	1.893	338 4	218 29	1.1238	1.2958	0.7272
19.34	9.8107	0.6743	0.9894	1.2428	1.989	339 59	209 9	1.1398	1.3016	0.6266
29.31	+9.8327	-0.6541	-0.8422	-1.2791	+2.091	341 42	200 5	1.1572	1.3064	-0.4795
June 8.29	9.8547	0.6372	0.5981	1.3012	2.201	343 11	191 12	1.1757	1.3096	0.2354
18.26	9.8763	0.6251	-9.9402	1.3107	2.313	344 22	182 26	1.1946	1.3110	-9.5775
28.23	9.8969	0.6188	+0.3504	1.3080	2.426	345 16	173 42	1.2134	1.3106	+9.9876
July 8.20	9.9163	0.6184	0.7235	1.2932	2.537	345 54	164 55	1.2316	1.3084	0.3608
18.18	+9.9341	-0.6231	+0.9135	-1.2653	+2.643	346 18	156 1	1.2487	1.3045	+0.5508
28.15	9.9502	0.6315	1.0365	1.2224	2.743	346 32	146 54	1.2644	1.2993	0.6738
Aug. 7.12	9.9646	0.6418	1.1228	1.1610	2.835	346 39	137 31	1.2785	1.2932	0.7600
17.10	9.9772	0.6521	1.1845	1.0749	2.918	346 43	127 51	1.2910	1.2870	0.8218
27.07	9.9883	0.6604	1.2278	0.9509	2.994	346 48	117 51	1.3020	1.2813	0.8651
Sept. 6.04	+9.9982	-0.6651	+1.2561	-0.7569	+3.063	346 57	107 35	1.3116	1.2768	+0.8933
16.01	0.0072	0.6650	1.2709	-0.3653	3.127	347 13	97 5	1.3201	1.2742	0.9082
25.99	0.0157	0.6591	1.2730	+0.0655	3.188	347 37	86 27	1.3280	1.2738	0.9102
Oct. 5.96	0.0242	0.6470	1.2623	0.6656	3.251	348 11	75 48	1.3355	1.2758	0.8995
15.93	0.0330	0.6284	1.2379	0.9020	3.318	348 53	65 14	1.3433	1.2798	0.8752
25.90	+0.0425	-0.6040	+1.1979	+1.0457	+3.391	349 42	54 51	1.3516	1.2854	+0.8352
Nov. 4.88	0.0528	0.5746	1.1389	1.1437	3.472	350 35	44 41	1.3608	1.2918	0.7761
14.85	0.0641	0.5422	1.0544	1.2128	3.564	351 28	34 47	1.3710	1.2982	0.6917
24.82	0.0762	0.5094	0.9314	1.2608	3.664	352 18	25 6	1.3821	1.3039	0.5687
Dec. 4.79	0.0889	0.4795	0.7381	1.2919	3.773	353 0	15 37	1.3941	1.3082	0.3754
14.77	+0.1018	-0.4560	+0.3471	+1.3081	+3.887	353 34	6 15	1.4066	1.3106	+9.9844
24.74	0.1146	0.4417	-0.0413	1.3104	4.004	353 57	356 55	1.4191	1.3110	-9.6785
34.71	+0.1270	-0.4380	-0.6425	+1.2989	+4.119	354 10	347 34	1.4313	1.3092	-0.2798

$E = +0^s.002$

The above numbers give the same reductions from mean to apparent place as are employed in computing the apparent places of the fixed stars, given on pages 316 to 513, from the mean places, given on pages 217 to 230. In order to render exact interpolation possible through intervals of ten days, all short period terms have been omitted.

TERMS OF SHORT PERIOD IN THE NUTATION, 1916. 215

FOR WASHINGTON MEAN MIDNIGHT.

Date.	$\delta''\phi$	$\delta''\omega$	Date.	$\delta''\phi$	$\delta''\omega$	Date.	$\delta''\phi$	$\delta''\omega$	Date.	$\delta''\phi$	$\delta''\omega$
Jan. 0	"	"	Feb. 15	"	"	Apr. 1	"	"	May 17	"	"
1	-0.29	-0.02	16	+0.15	-0.05	2	-0.03	+0.10	18	-0.18	-0.08
2	0.23	0.07	17	0.18	-0.02	3	0.12	0.07	19	-0.06	0.10
3	-0.12	0.10	18	0.17	+0.02	4	0.17	+0.03	20	+0.07	0.10
4	+0.01	0.11	19	0.12	0.06	5	0.18	-0.02	21	0.19	0.08
5	0.15	0.09	20	+0.04	0.09	6	0.15	0.05	22	0.27	-0.03
6	+0.25	-0.05	21	-0.06	+0.10	7	-0.09	-0.08	23	+0.29	+0.02
7	0.29	0.00	22	0.16	0.09	8	-0.02	0.09	24	0.25	0.07
8	0.28	+0.05	23	0.24	0.06	9	+0.06	0.09	25	0.17	0.10
9	0.21	0.09	24	0.28	+0.01	10	0.12	0.07	26	+0.06	0.10
10	0.11	0.10	25	0.27	-0.04	11	0.16	-0.04	27	-0.05	0.09
11	+0.01	+0.10	26	-0.20	-0.08	12	+0.17	0.00	28	-0.13	+0.06
12	-0.08	0.07	27	-0.08	0.10	13	0.14	+0.04	29	0.17	+0.01
13	0.14	+0.03	28	+0.04	0.10	14	+0.09	0.07	30	0.16	-0.03
14	0.16	-0.01	29	0.16	0.08	15	0.00	0.09	31	0.12	0.07
15	0.14	0.05	30	0.24	-0.03	16	-0.10	0.10		-0.06	0.09
16	-0.09	-0.08	Mar. 1	+0.26	+0.02	17	-0.19	+0.08	June 1	+0.02	-0.09
17	-0.02	0.09	2	0.23	0.07	18	0.25	+0.04	2	0.09	0.08
18	+0.05	0.09	3	0.15	0.10	19	0.27	0.00	3	0.14	0.06
19	0.11	0.07	4	+0.05	0.10	20	0.23	-0.05	4	0.17	-0.02
20	0.16	-0.04	5	-0.05	0.09	21	0.14	0.09	5	0.16	+0.02
21	+0.17	0.00	6	-0.13	+0.06	22	-0.01	-0.10	6	+0.12	+0.05
22	0.15	+0.04	7	0.16	+0.02	23	+0.11	0.10	7	+0.04	0.08
23	+0.09	0.07	8	0.16	-0.03	24	0.22	0.06	8	-0.06	0.09
24	0.00	0.10	9	0.13	0.06	25	0.27	-0.02	9	0.16	0.09
25	-0.10	0.10	10	-0.06	0.09	26	0.27	+0.04	10	0.24	0.07
26	-0.20	+0.08	11	+0.01	-0.09	27	+0.21	+0.08	11	-0.29	+0.03
27	0.28	+0.04	12	0.08	0.08	28	0.12	0.10	12	0.29	-0.02
28	0.30	0.00	13	0.14	0.06	29	+0.01	0.10	13	0.23	0.07
29	0.26	-0.05	14	0.17	-0.03	30	-0.09	0.08	14	-0.12	0.10
30	0.17	0.09	15	0.17	+0.01		0.15	+0.04	15	+0.01	0.10
31	-0.04	-0.11	16	+0.14	+0.05	May 1	-0.18	0.00	16	+0.14	-0.09
Feb. 1	+0.09	0.10	17	+0.07	0.08	2	0.16	-0.04	17	0.24	-0.05
2	0.20	0.06	18	-0.02	0.10	3	0.11	0.08	18	0.29	0.00
3	0.26	-0.02	19	0.12	0.09	4	-0.04	0.09	19	0.27	+0.05
4	0.27	+0.04	20	0.21	0.07	5	+0.04	0.09	20	0.21	0.09
5	+0.22	+0.08	21	-0.26	+0.03	6	+0.10	-0.08	21	+0.11	+0.10
6	0.13	0.10	22	0.26	-0.02	7	0.15	0.05	22	0.00	0.10
7	+0.03	0.10	23	0.21	0.07	8	0.16	-0.01	23	-0.09	0.07
8	-0.06	0.08	24	-0.11	0.10	9	0.15	+0.03	24	0.15	+0.03
9	0.13	+0.05	25	+0.02	0.10	10	0.10	0.06	25	0.16	-0.02
10	-0.16	0.00	26	+0.14	-0.09	11	+0.02	+0.09	26	-0.13	-0.06
11	0.15	-0.04	27	0.23	-0.05	12	-0.08	0.10	27	-0.07	0.08
12	0.11	0.07	28	0.27	0.00	13	0.18	0.08	28	+0.01	0.09
13	-0.04	0.09	29	0.25	+0.05	14	0.25	0.05	29	0.08	0.09
14	+0.03	0.09	30	0.18	0.09	15	0.28	+0.01	30	0.14	0.07
15	+0.10	-0.08	31	+0.08	+0.10	16	-0.26	-0.04	July 1	+0.17	-0.03
16	+0.15	-0.05	Apr. 1	-0.03	+0.10	17	-0.18	-0.08	2	+0.17	0.00

216 TERMS OF SHORT PERIOD IN THE NUTATION, 1916.

FOR WASHINGTON MEAN MIDNIGHT.

Date.	$\delta''\phi$	$\delta''\omega$	Date.	$\delta''\phi$	$\delta''\omega$	Date.	$\delta''\phi$	$\delta''\omega$	Date.	$\delta''\phi$	$\delta''\omega$
	"	"		"	"		"	"		"	"
July 1	+0.17	-0.03	Aug. 16	-0.05	+0.09	Oct. 1	-0.16	-0.09	Nov. 16	+0.17	+0.02
2	0.17	0.00	17	0.12	0.05	2	-0.05	0.10	17	0.12	0.06
3	0.14	+0.04	18	0.15	+0.01	3	+0.07	0.09	18	+0.04	0.08
4	+0.07	0.07	19	0.14	-0.04	4	0.17	0.06	19	-0.05	0.09
5	-0.02	0.09	20	0.09	0.07	5	0.23	-0.01	20	0.15	0.08
6	-0.12	+0.09	21	-0.02	-0.09	6	+0.23	+0.04	21	-0.23	+0.06
7	0.22	0.08	22	+0.06	0.09	7	0.18	0.08	22	0.27	+0.02
8	0.29	+0.04	23	0.13	0.08	8	+0.09	0.10	23	0.27	-0.02
9	0.30	-0.01	24	0.17	0.05	9	-0.01	0.10	24	0.22	0.06
10	0.27	0.05	25	0.19	-0.02	10	0.10	0.08	25	-0.12	0.09
11	-0.18	-0.09	26	+0.18	+0.02	11	-0.16	+0.04	26	0.00	-0.10
12	-0.06	0.10	27	0.14	0.06	12	0.17	-0.01	27	+0.13	0.08
13	+0.08	0.09	28	+0.06	0.08	13	0.14	0.05	28	0.22	-0.05
14	0.19	0.06	29	-0.03	0.09	14	-0.08	0.08	29	0.26	0.00
15	0.26	-0.01	30	0.13	0.09	15	0.00	0.09	30	0.25	+0.05
16	+0.27	+0.04	31	-0.22	+0.06	16	+0.08	-0.09	Dec. 1	+0.18	+0.09
17	0.22	0.08	Sept. 1	0.28	+0.02	17	0.15	0.07	2	+0.08	0.10
18	0.14	0.10	2	0.28	-0.02	18	0.18	-0.04	3	-0.03	0.09
19	+0.03	0.10	3	0.23	0.06	19	0.19	0.00	4	0.12	0.06
20	-0.06	0.08	4	0.14	0.09	20	0.16	+0.04	5	0.16	+0.02
21	-0.13	+0.04	5	-0.02	-0.10	21	+0.11	+0.07	6	-0.16	-0.02
22	0.15	-0.01	6	+0.10	0.08	22	+0.02	0.09	7	0.12	0.06
23	0.13	0.05	7	0.19	-0.05	23	-0.07	0.09	8	-0.05	0.09
24	-0.07	0.08	8	0.24	0.00	24	0.17	0.08	9	+0.03	0.09
25	0.00	0.09	9	0.22	+0.05	25	0.24	0.05	10	0.11	0.08
26	+0.07	-0.09	10	+0.16	+0.09	26	-0.27	+0.01	11	+0.16	-0.06
27	0.14	0.07	11	+0.07	0.10	27	0.25	-0.04	12	0.19	-0.02
28	0.18	0.04	12	-0.03	0.09	28	0.18	0.08	13	0.18	+0.01
29	0.19	-0.01	13	0.11	0.07	29	-0.08	0.10	14	0.14	0.05
30	0.16	+0.03	14	0.16	+0.02	30	+0.05	0.10	15	+0.07	0.08
31	+0.11	+0.07	15	-0.15	-0.02	31	+0.16	-0.07	16	-0.03	+0.09
Aug. 1	+0.02	0.09	16	0.11	0.06	Nov. 1	0.23	-0.03	17	0.13	0.09
2	-0.08	0.09	17	-0.05	0.09	2	0.25	+0.02	18	0.22	0.07
3	0.18	0.08	18	+0.03	0.09	3	0.21	0.07	19	0.28	+0.03
4	0.26	0.05	19	0.11	0.08	4	0.13	0.10	20	0.29	-0.01
5	-0.30	+0.01	20	+0.16	-0.06	5	+0.03	+0.10	21	-0.26	-0.05
6	0.29	-0.04	21	0.19	-0.03	6	-0.07	0.09	22	0.17	0.08
7	0.22	0.08	22	0.19	+0.01	7	0.15	0.05	23	-0.05	0.10
8	-0.11	0.10	23	0.16	0.05	8	0.17	+0.01	24	+0.07	0.09
9	+0.02	0.10	24	+0.09	0.07	9	0.16	-0.04	25	0.18	0.06
10	+0.14	-0.07	25	0.00	+0.09	10	-0.10	-0.07	26	+0.25	-0.01
11	0.22	-0.03	26	-0.10	0.09	11	-0.03	0.09	27	0.26	+0.04
12	0.25	+0.02	27	0.19	0.07	12	+0.06	0.09	28	0.21	0.08
13	0.22	0.07	28	0.25	+0.04	13	0.13	0.08	29	0.12	0.10
14	0.15	0.10	29	0.27	-0.01	14	0.17	0.05	30	+0.02	0.10
15	+0.05	+0.10	30	-0.24	-0.05	15	+0.19	-0.01	31	-0.08	+0.08
16	-0.05	+0.09	Oct. 1	-0.16	-0.09	16	+0.17	+0.02	32	-0.14	+0.04

MEAN PLACES OF TEN-DAY STARS, 1916. 217

FOR JANUARY 0^d.975, WASHINGTON MEAN TIME.

Name of Star.	Magni- tude.	Spectr- um.	Right Ascension.			Annual Vari- ation.	Annual P. M.	Declination.	Annual Vari- ation.	Annual P. M.
			h	m	s	s	s	° ' "	"	"
33 Piscium	4.7	K0	0	1	2.184	+3.0714	-.0006	- 6 10 38.90	+20.136	+0.091
α Andromedæ (<i>Alpheratz</i>)	2.2	A0p	0	4	2.546	3.0962	+0.0107	+28 37 36.11	19.860	-0.163
β Cassiopeizæ	2.4	F5	0	4	41.242	3.1856	+0.0680	+58 41 11.42	19.981	-0.180
ε Phœnicis	3.9	K0	0	5	9.038	3.0510	+0.0096	-46 12 39.56	19.848	-0.193
22 Andromedæ	5.1	F0	0	5	57.008	3.1101	+0.0021	+45 36 17.41	20.034	-0.004
γ Pegasi	2.9	B2	0	8	54.507	+3.0686	+0.0003	+14 42 59.83	+20.020	-0.010
δ Andromedæ	4.5	A2	0	13	56.123	3.1279	-.0044	+36 19 10.37	19.962	-0.047
ζ Ceti	3.8	K0	0	15	8.902	3.0589	-.0013	- 9 17 22.15	19.972	-0.030
ζ Tucanæ	4.3	F8	0	15	42.336	3.1470	+0.2739	-65 22 5.12	21.170	+1.172
44 Piscium	6.0	G5	0	21	5.761	3.0744	-.0014	+ 1 28 28.25	19.937	-0.022
β Hydri	2.9	G0	0	21	21.425	+3.1985	+0.6975	-77 43 38.37	+20.277	+0.318
α Phœnicis	2.4	K0	0	22	8.145	2.9722	+0.0188	-42 45 43.75	19.549	-0.403
12 Ceti	6.0	K5	0	25	45.133	3.0622	+0.0011	- 4 25 16.57	19.919	0.000
13 Ceti	5.2	G0	0	30	55.429	3.0871	+0.0273	- 4 3 18.18	19.846	-0.017
ζ Cassiopeizæ	3.7	B2	0	32	17.061	3.3292	+0.0036	+53 26 5.23	19.840	-0.007
π Andromedæ	4.4	B3	0	32	23.421	+3.1980	+0.0019	+33 15 25.61	+19.846	0.000
ε Andromedæ	4.5	G5	0	34	6.788	3.1646	-.0172	+28 51 20.97	19.570	-0.254
δ Andromedæ	3.5	K0	0	34	49.946	3.2023	+0.0110	+30 24 4.85	19.717	-0.097
α Cassiopeizæ (<i>Schedir</i>)	† var.	K0	0	35	43.885	3.3875	+0.0063	+56 4 36.64	19.771	-0.032
μ Phœnicis	4.6	K0	0	37	21.444	2.8391	-.0046	-46 32 46.93	19.748	-0.032
β Ceti	2.2	K0	0	39	22.431	+3.0124	+0.0160	-18 26 50.64	+19.792	+0.041
ο Cassiopeizæ	4.7	B2	0	40	2.285	3.3318	+0.0028	+47 49 29.55	19.734	-0.006
21 Cassiopeizæ	5.6	A2	0	40	4.601	3.9077	-.0050	+74 31 44.93	19.713	-0.026
ζ Andromedæ	4.3	K0	0	42	52.972	3.1750	-.0073	+23 48 37.52	19.618	-0.078
η Cassiopeizæ	† 3.6	F8	0	44	0.577	3.6142	+0.1432	+57 22 16.35	19.201	-0.476
δ Piscium	4.6	K5	0	44	19.361	+3.1102	+0.0055	+ 7 7 41.35	+19.628	-0.044
λ Hydri	5.0	K5	0	45	41.158	2.1007	+0.0426	-75 22 49.23	19.648	-0.001
20 Ceti	4.9	K0	0	48	42.811	3.0642	-.0005	- 1 36 0.06	19.591	-0.003
γ Cassiopeizæ	2.2	B0p	0	51	37.632	3.5987	+0.0036	+60 15 43.70	19.534	-0.005
μ Andromedæ	3.9	A2	0	52	5.138	3.3214	+0.0132	+38 2 38.24	19.560	+0.030
α Sculptoris	4.4	B5	0	54	33.480	+2.8904	-.0018	-29 48 41.17	+19.468	-0.013
ε Piscium	4.4	K0	0	58	34.919	3.1113	-.0054	+ 7 26 17.32	19.420	+0.026
β Phœnicis	† 3.4	K0	1	2	20.127	2.6796	-.0067	-47 10 7.34	19.284	-0.024
μ Cassiopeizæ	5.3	G5	1	2	40.235	3.9705	+0.3918	+54 30 31.99	17.746	-1.555
η Ceti	3.6	K0	1	4	21.845	3.0175	+0.0143	-10 37 37.79	19.134	-0.126
β Andromedæ	2.4	Ma	1	5	1.411	+3.3511	+0.0148	+35 10 31.73	+19.127	-0.117
τ Piscium	4.7	K0	1	7	1.793	3.2675	+0.0056	+29 38 38.39	19.166	-0.029
ζ Piscium	† 5.6	A5	1	9	20.465	3.1320	+0.0096	+ 7 7 53.28	19.083	-0.052
κ Tucanæ	† 5.0	F8	1	12	55.270	2.0394	+0.0744	-69 19 20.40	19.128	+0.089
ψ Piscium	5.3	A2	1	13	27.895	3.0927	-.0033	+ 3 10 20.65	18.999	-0.026
υ Piscium	4.7	A2	1	14	50.728	+3.2910	+0.0016	+26 49 22.39	+18.977	-0.006
θ Ceti	3.8	K0	1	19	49.446	2.9978	-.0067	- 8 36 59.31	18.627	-0.215
δ Cassiopeizæ	2.8	A5	1	20	18.542	3.9014	+0.0406	+59 47 57.48	18.790	-0.037
γ Phœnicis	3.4	K5	1	24	43.107	2.6076	-.0029	-43 44 54.70	18.466	-0.226
38 Cassiopeizæ	6.0	F5	1	24	57.396	4.4170	+0.0263	+69 49 58.33	18.612	-0.072
η Piscium	3.7	G5	1	26	59.130	+3.2090	+0.0015	+14 54 47.45	+18.616	-0.003
40 Cassiopeizæ	5.5	K0	1	31	46.572	4.7352	-.0011	+72 36 45.24	18.458	-0.002
υ Andromedæ	4.2	G0	1	31	51.637	3.5103	-.0153	+40 59 8.80	18.080	-0.377
π Piscium	5.6	F0	1	32	38.574	3.1767	-.0049	+11 42 43.88	18.464	+0.034
υ Persei	3.8	K0	1	32	49.688	3.6680	+0.0064	+48 12 10.96	18.304	-0.119
α Eridani (<i>Achernar</i>)	0.6	B5	1	34	35.215	+2.2363	+0.0104	-57 39 47.99	+18.322	-0.041
ω Cassiopeizæ	5.5	A0p	1	36	6.007	4.4028	+0.0068	+67 37 7.51	18.307	-0.002
ν Piscium	4.7	K0	1	37	3.497	3.1198	-.0015	+ 5 3 46.67	18.278	+0.003
φ Persei	4.2	B0p	1	38	23.218	3.7449	+0.0031	+50 15 57.89	18.210	-0.015
τ Ceti	3.6	K0	1	40	9.908	2.7866	-.1198	-16 22 45.85	19.020	+0.859
ο Piscium	4.5	K0	1	40	57.351	+3.1651	+0.0049	+ 8 44 7.28	+18.177	+0.045
ε Sculptoris	† 5.4	F0	1	41	42.486	+2.8045	+0.0052	-25 28 18.88	+18.052	-0.052

12 Ceti, dup. 5^m.5, 6^m.2, 0^m.3
 ε Cassiop., var. irreg. 2^m.2, 2^m.8
 ψ Cassiop. comp. 7^m.6, 4^m.8 pr.

β Phœnicis, dup. 4^m.1, 4^m.1, 1^m.
 ζ Piscium, star 6^m.5, 24^m.1 n. f.

κ Tucanæ, comp. 7^m.6, 6^m.1 n.
 ε Sculptoris, comp. 9^m.6, 5^m.1 n. f.

218 MEAN PLACES OF TEN-DAY STARS, 1916.

FOR JANUARY 0^d.975, WASHINGTON MEAN TIME.

Name of Star.	Magni- tude.	Spect- rum.	Right Ascension.	Annual Vari- ation.	Annual P. M.	Declination.	Annual Vari- ation.	Annual P. M.
			^h ^m ^s	^s	^s	[°] ['] ["]	["]	["]
ζ Ceti	3.9	K0	1 47 18.824	+2.9601	+0.0020	-10 44 58.29	+17.861	-0.027
α Trianguli	3.6	F5	1 48 17.332	3.4136	+0.0015	+29 10 12.50	17.618	-0.231
ε Cassiopeiae	3.4	B3	1 48 20.201	4.2854	+0.0053	+63 15 25.37	17.832	-0.015
ξ Piscium	4.8	K0	1 49 12.319	3.1038	+0.0015	+ 2 46 23.92	17.833	+0.021
β Arietis	2.7	A5	1 49 59.749	3.3085	+0.0064	+20 23 52.37	17.670	-0.111
φ Phoenicis	4.4	Mb	1 50 16.598	+2.4036	-.0124	-46 42 50.53	+17.665	-0.104
ν Ceti	4.2	K5	1 56 2.792	2.3257	+0.0082	-21 29 3.65	17.522	-0.006
α Hydri	3.0	F0	1 56 6.963	1.8818	+0.0277	-61 58 41.94	17.554	+0.037
50 Cassiopeiae	4.1	A0	1 56 13.963	5.0629	-.0092	+72 0 55.96	17.542	+0.030
γ Andromedæ pr.	2.3	K0	1 58 44.191	3.6716	+0.0046	+41 55 38.10	17.364	-0.061
γ Andromedæ seq.	5.1	A	Δα + 0.842	.....	.....	Δδ + 4.58	.....	.....
α Arietis	2.2	K2	2 2 26.052	+3.3763	+0.0139	+23 3 56.89	+17.106	-0.144
β Trianguli	3.1	A5	2 4 32.403	3.6618	+0.0126	+34 35 25.87	17.114	-0.044
55 Cassiopeiae	6.2	F5	2 7 52.281	4.6696	-.0020	+66 7 53.27	17.003	-0.002
6 Persei	5.4	K0	2 8 0.582	3.9740	+0.0368	+50 40 34.43	16.832	-0.167
ξ ¹ Ceti	4.5	G5	2 8 32.733	+3.1770	-.0012	+ 8 27 11.13	+16.968	-0.016
μ Fornacis	5.2	A0	2 9 12.269	2.6378	-.0037	-31 7 3.96	16.921	-0.022
γ Trianguli	4.1	A0	2 12 18.931	3.5587	+0.0040	+33 27 33.48	16.745	-0.052
67 Ceti	5.7	G5	2 12 47.543	2.9907	+0.0054	- 6 48 31.69	16.663	-0.110
φ Eridani	3.8	B8	2 13 30.414	2.1412	+0.0062	-51 54 2.59	16.711	-0.029
ο Ceti (Mira)	†	var.	Md	2 15 6.121	+3.0292	+ 3 21 30.26	+16.434	-0.229
κ Fornacis	5.4	F5	2 18 41.901	2.7448	+0.0138	-24 11 51.70	16.408	-0.077
δ Hydri	4.3	A2	2 20 14.958	1.0586	-.0097	-69 2 28.91	16.427	+0.020
ι Cassiopeiae	†	A5p	2 22 7.604	4.9043	-.0003	+67 1 32.18	16.323	+0.010
ξ ² Ceti	4.3	A0	2 23 41.431	3.1865	+0.0025	+ 8 5 2.97	16.226	-0.007
σ Ceti	4.8	F5	2 28 6.275	+2.8415	-.0063	-15 36 45.35	+15.901	-0.102
36 H. Cassiopeiae	5.3	K0	2 30 0.986	5.6404	-.0052	+72 27 6.78	15.920	+0.017
ν Ceti	5.0	G5	2 31 27.821	+3.1452	-.0025	+ 5 13 38.55	15.806	-0.018
μ Hydri	5.3	K0	2 33 25.067	-1.3486	+0.0426	-79 28 33.79	15.681	-0.038
ν Arietis	5.4	A2	2 34 2.605	+3.4022	+0.0001	+21 35 55.63	15.664	-0.021
δ Ceti	4.0	B2	2 35 10.534	+3.0732	+0.0011	- 0 1 59.38	+15.628	+0.004
ε Hydri	4.3	B9	2 38 17.548	0.9142	+0.0169	-68 37 36.20	15.456	+0.006
θ Persei	4.2	G0	2 38 27.276	4.0838	+0.0353	+48 52 26.40	15.355	-0.067
γ Ceti seq.	†	A0	2 38 56.770	3.1080	-.0096	+ 2 52 56.70	15.264	-0.151
π Ceti	4.4	B5	2 40 7.415	2.8538	-.0012	-14 12 49.84	15.337	-0.012
μ Ceti	4.4	A5	2 40 23.914	+3.2395	+0.0188	+ 9 45 36.78	+15.308	-0.025
η Persei	†	K0	2 44 33.586	4.3553	+0.0041	+55 32 52.02	15.065	-0.012
41 Arietis	3.7	B8	2 45 2.107	3.5251	+0.0050	+26 54 54.20	14.968	-0.111
β Fornacis	4.5	K0	2 45 34.504	2.5121	+0.0080	-32 45 29.75	15.193	+0.158
σ Arietis	5.5	B5	2 46 51.120	3.3082	+0.0016	+14 44 11.38	14.929	-0.034
τ ² Eridani	4.8	K0	2 47 13.613	+2.7200	-.0044	-21 20 58.54	+14.926	-0.017
τ Persei	4.1	G0p	2 48 17.574	4.2370	+0.0008	+52 25 10.56	14.876	-0.008
η Eridani	4.0	K0	2 52 19.399	2.9302	+0.0060	- 9 13 54.52	14.426	-0.213
ε Arietis (mean)	†	A2	2 54 24.310	3.4256	-.0009	+21 0 18.17	14.506	-0.010
47 H. Cephei	5.7	Ma	2 54 51.755	7.8531	-.0102	+79 5 18.03	14.496	+0.010
θ Eridani	†	A2	2 55 4.687	+2.2767	-.0025	-40 38 26.84	+14.500	+0.024
α Ceti	2.8	Ma	2 57 53.189	3.1333	-.0009	+ 3 45 39.08	14.226	-0.078
τ ³ Eridani	4.2	A3	2 58 41.300	2.6449	-.0104	-23 57 10.96	14.211	-0.044
γ Persei	3.1	G0p	2 58 42.207	4.3296	+0.0010	+53 10 42.50	14.250	-0.004
ρ Persei	†	Mb	2 59 47.281	3.8356	+0.0116	+38 30 55.88	14.072	-0.115
μ Horologii	5.2	F0	3 1 37.770	+1.4078	-.0123	-60 3 46.89	+14.019	-0.054
θ Hydri	5.5	B8	3 2 4.223	0.1009	+0.0034	-72 13 49.75	14.060	+0.014
β Persei (Algol)	†	B8	3 2 41.830	3.8938	+0.0008	+40 37 58.42	14.005	-0.002
δ Arietis	4.5	K0	3 6 49.362	3.4293	+0.0110	+19 24 35.44	13.747	+0.001
12 Eridani	†	F8	3 8 30.108	2.5467	+0.0241	-29 19 3.72	14.275	+0.636
48 H. Cephei	5.5	F0	3 9 36.856	+7.5042	+0.0204	+77 25 39.91	+13.512	-0.065
ξ Arietis	5.0	A0	3 10 4.187	+3.4438	-.0019	+20 44 1.81	+13.456	-0.062

ο Ceti, var., 331^d, 1^m.7-9^m.6, star 9^m.1, 8^m.
 ε Cassiop., triple, 7^m, 8^m, 2^m, 8^m.
 γ Ceti, comp. 6^m.2, 2^m.7 pr.

η Persei, star 8^m.5, 28^m n. pr.
 ε Arietis, dup., 5^m.2, 5^m.6, 1^m.2
 θ Eridani, comp. 4^m.4, 1^m.8

ο Persei, var. irreg., 3^m.4-4^m.2
 β Persei, var. 2^m.87, 2^m.1-3^m.2
 12 Eridani, comp. 7^m, 1^m.4 n. pr.

MEAN PLACES OF TEN-DAY STARS, 1916. 219

FOR JANUARY 0^d.975, WASHINGTON MEAN TIME.

Name of Star.	Magni- tude.	Spec- trum.	Right Ascension.			Annual Vari- ation.	Annual P. M.	Declination.			Annual Vari- ation.	Annual P. M.
			h	m	s	s	s	°	'	"	"	"
38 G. Horologii	† 5.7	N	3	10	25.278	+1.5148	-.0005	-57	38	9.11	+13.509	-0.008
ζ Eridani	4.9	A3	3	11	45.116	2.9124	-.0008	- 9	7	51.61	13.482	+0.053
γ Arietis	5.2	B3	3	16	22.469	3.4595	+0.0023	+20	50	41.90	13.093	-0.033
ε Eridani	4.3	G5	3	16	34.358	+2.3990	+2808	-43	23	25.47	13.871	+0.757
ι Hydri	5.5	F2	3	18	1.586	-1.5516	+0.0382	-77	41	44.73	13.067	+0.040
α Persei	1.9	F5	3	18	19.065	+4.2805	+0.0080	+49	33	47.48	+12.990	-0.028
ο Tauri	3.8	G5	3	20	17.438	3.2255	-.0046	+ 8	44	2.54	12.792	-0.074
2 H. Camelopardalis	4.4	A0	3	22	15.401	4.8380	+0.0027	+59	38	55.40	12.734	+0.001
ξ Tauri	3.8	B8	3	22	36.879	3.2485	+0.0040	+ 9	26	25.64	12.662	-0.046
γ Tauri	4.3	K0	3	26	13.995	3.3092	+0.0016	+12	38	58.64	12.465	+0.002
ε Eridani	† 3.8	K0p	3	28	58.316	+2.8253	-.0080	- 9	44	30.51	+12.300	+0.026
γ ³ Eridani	4.3	B8	3	30	4.554	2.6483	+0.0023	-21	54	50.59	12.159	-0.039
δ Persei	3.1	B5	3	36	56.244	4.2604	+0.0035	+47	31	11.99	11.680	-0.036
δ Eridani	3.7	K0	3	39	13.421	2.8730	-.0061	-10	2	49.84	12.284	+0.731
γ Persei	3.9	F5	3	39	28.910	4.0672	-.0004	+42	18	51.41	11.535	0.000
5 H. Camelopardalis	4.7	A0	3	41	28.175	+6.2856	+0.0069	+71	4	29.21	+11.335	-0.067
η Tauri (<i>Alcyone</i>)	† 3.0	B5	3	42	29.281	3.5618	+0.0016	+23	50	46.45	11.269	-0.050
γ ⁴ Eridani	4.3	F8	3	43	14.014	2.5806	-.0115	-23	29	47.47	10.793	-0.481
g Eridani	4.2	K0	3	46	18.679	+2.2451	-.0036	-36	27	13.90	11.013	-0.028
γ Hydri	3.2	Ma	3	48	31.478	-.0942	+0.0096	-74	29	47.94	10.996	+0.117
ζ Persei	2.9	B1	3	48	50.870	+3.7658	+0.0010	+31	38	6.39	+10.841	-0.014
9 H. Camelopardalis	† 5.2	K0p	3	49	57.839	5.0947	+0.0003	+60	51	50.38	10.756	-0.017
ε Persei	† 3.0	B0	3	52	12.766	4.0195	+0.0081	+39	46	5.65	10.580	-0.027
ξ Persei	4.0	Oe5	3	53	30.643	3.8871	+0.0012	+35	33	1.17	10.498	-0.017
γ Eridani	3.2	K5	3	54	6.591	2.7985	+0.0047	-13	44	48.28	10.355	-0.110
λ Tauri	† var.	B3	3	56	1.481	+3.3216	+0.0002	+12	15	13.87	+10.311	-0.011
δ Reticuli	4.4	Ma	3	57	24.627	0.9410	-.0020	-61	38	12.59	10.216	-0.002
γ Tauri	3.9	A0	3	58	41.191	3.1897	+0.0008	+ 5	45	25.40	10.117	-0.008
Δ Tauri	† 4.5	K0	3	59	43.595	3.5434	+0.0069	+21	51	11.97	9.985	-0.058
c Persei	4.0	B3p	4	2	33.497	4.3474	+0.0042	+47	29	21.59	9.796	-0.032
p Tauri	5.6	F0	4	5	42.728	+3.6404	-.0024	+26	15	45.53	+ 9.545	-0.042
σ ¹ Eridani	4.1	F5	4	7	45.861	2.9274	+0.0007	- 7	3	20.77	9.515	+0.086
μ Tauri	4.3	B3	4	10	58.288	3.2557	+0.0016	+ 8	40	58.24	9.156	-0.024
α Horologii	3.8	K0	4	11	13.084	1.9874	+0.0040	-42	30	4.63	8.981	-0.230
α Reticuli	3.4	G5	4	13	20.306	0.7652	+0.0048	-62	41	2.04	9.040	+0.044
γ Tauri	3.9	K0	4	15	0.665	+3.4117	+0.0083	+15	25	32.48	+ 8.839	-0.026
δ Tauri	3.9	K0	4	18	5.298	3.4570	+0.0075	+17	20	47.12	8.592	-0.030
ν ⁴ Eridani	4.1	K5	4	20	52.886	+2.2539	+0.0052	-34	12	41.02	8.444	+0.042
δ Mensæ	5.6	K0	4	23	37.125	-4.1448	+0.0042	-80	24	42.07	8.255	+0.072
ε Tauri	3.6	K0	4	23	42.585	+3.5008	+0.0082	+18	59	42.29	8.142	-0.084
m Persei	† 6.1	F0	4	27	30.041	+4.2153	+0.0012	+42	53	8.12	+ 7.876	+0.004
α Tauri (<i>Aldebaran</i>)	1.1	K5	4	31	5.918	3.4401	+0.0047	+16	20	28.92	7.393	-0.189
ν Eridani	4.1	B2	4	32	7.236	2.9958	-.0005	- 3	31	23.92	7.499	0.000
α Doradus	3.5	A0p	4	32	10.814	1.2948	+0.0067	-55	13	6.35	7.484	-0.011
53 Eridani	4.0	K0	4	34	19.901	2.7456	-.0061	-14	28	2.58	7.166	-0.154
γ Tauri	4.3	B5	4	37	12.093	+3.5987	+0.0007	+22	47	48.28	+ 7.066	-0.020
Groombridge 848	6.0	F0	4	37	30.341	8.0214	+0.0095	+75	47	25.25	6.916	-0.144
α Caeli	4.5	F2	4	37	51.195	1.9300	-.0149	-42	1	26.21	6.926	-0.106
4 Camelopardalis	5.4	A2	4	41	0.023	4.9870	+0.0062	+56	36	33.72	6.625	-0.148
μ Eridani	4.2	B5	4	41	18.093	2.9988	+0.0011	- 3	24	27.84	6.740	-0.009
π ³ Orionis	3.3	F8	4	45	16.727	+3.2552	+0.0312	+ 6	48	56.31	+ 6.444	+0.023
9 Camelopardalis	4.4	B0	4	45	41.488	5.9488	+0.0038	+66	12	5.88	6.391	+0.005
ι Tauri	5.1	F0	4	46	27.503	3.5077	+0.0059	+18	41	52.33	6.288	-0.035
π ⁴ Orionis	3.9	B3	4	49	52.504	3.1241	+0.0002	+ 2	18	14.77	6.043	+0.005
ι Aurigæ	2.9	K2	4	51	31.252	3.9040	+0.0009	+33	2	3.02	5.879	-0.021
ε Aurigæ	† var.	F5p	4	55	56.319	+4.3014	+0.0012	+43	42	0.60	+ 5.517	-0.013
β Camelopardalis	4.2	G0	4	55	56.349	+5.3260	-.0004	+60	19	15.57	+ 5.519	-0.011

38 Horologii, remarkable purplish red star.

ε Eridani, comp. 9^m, s. 7^m

γ Tauri, quad., comps. 6^m=3, 7^m=6, 8^m=2, 11^m, 18^m, 19^m

9 H. Camelop., comp. 8^m, 1^m, 9 n. f.

ε Persei, comp. 8^m, 6^m, 6 n. f.

λ Tauri, var., 34.95, 3^m=3-4^m=2

Δ Tauri, star 6^m=5 f. 39^m, 270^m s.

m Persei, star 6^m, 115^m s. pr.

ε Aurigæ, var. irreg., 3^m=0-4^m=5.

220 MEAN PLACES OF TEN-DAY STARS, 1916.

FOR JANUARY 0^d.975, WASHINGTON MEAN TIME.

Name of Star.	Magni- tude.	Spec- trum.	Right Ascension.	Annual Vari- ation.	Annual P. M.	Declination.	Annual Vari- ation.	Annual P. M.
			^h ^m ^s	^s	^s	[°] ['] ["]	["]	["]
ζ Aurigæ	3.9	K0p	4 56 36.212	+ 4.1897	+ .0013	+40 57 15.99	+5.453	-0.022
ι Tauri	4.7	A5	4 58 4.422	3.5848	+ .0056	+21 28 15.14	5.301	-0.040
11 Orionis	4.6	B9	4 59 46.076	3.4267	+ .0013	+15 17 17.13	5.172	-0.086
η Aurigæ	3.3	B3	5 0 37.321	4.2043	+ .0039	+41 7 19.26	5.064	-0.071
ε Leporis	3.3	K5	5 1 54.273	2.5385	+ .0012	-22 28 59.19	4.963	-0.064
β Eridani	2.9	A2	5 3 43.198	+ 2.9492	- .0056	- 5 11 38.82	+4.799	-0.074
μ Aurigæ	4.8	A3	5 7 40.639	4.1018	- .0020	+38 23 10.05	4.457	-0.080
19 H. Camelopardalis	5.2	F8	5 8 41.347	9.8354	- .0281	+79 8 14.63	4.606	+0.135
μ Leporis	3.3	A0p	5 9 9.467	2.6940	+ .0027	-16 18 14.84	4.353	-0.028
α Aurigæ (Capella)	0.2	G0	5 10 28.877	4.4288	+ .0086	+45 54 49.80	3.899	-0.429
β Orionis (Rigel)	† 0.3	B8p	5 10 30.009	+ 2.8823	.0000	- 8 17 52.14	+4.296	0.000
λ Aurigæ	4.8	G0	5 13 13.803	4.2178	+ .0461	+40 1 32.22	3.403	-0.656
τ Orionis	3.7	B5	5 13 31.639	2.9125	- .0009	- 6 56 3.50	4.032	-0.065
ο Columbæ	4.9	K0	5 14 27.134	2.1588	+ .0027	-34 58 36.96	3.606	-0.352
γ Orionis (Bellatrix)	1.7	B2	5 20 37.494	3.2170	- .0004	+ 6 16 28.16	3.410	-0.017
β Tauri	1.8	B8	5 20 58.844	+ 3.7914	+ .0025	+28 32 15.30	+3.220	-0.177
17 Camelopardalis	5.8	K5	5 22 13.983	5.6600	+ .0003	+62 59 54.93	3.281	-0.007
β Leporis	3.0	G0	5 24 38.769	2.5703	.0000	-20 49 32.17	2.991	-0.089
χ Aurigæ	4.9	B1	5 27 15.567	3.9040	+ .0006	+32 7 51.48	2.841	-0.013
δ Orionis	† 2.5	B0	5 27 42.873	3.0643	.0000	- 0 21 37.50	2.812	-0.002
Groombridge 966	6.4	K5	5 28 29.055	+ 8.0094	- .0002	+74 59 25.67	+2.765	+0.017
α Leporis	2.7	F0	5 29 1.511	2.6457	+ .0003	-17 52 53.95	2.701	0.000
φ Orionis	4.5	B0	5 30 12.485	3.2926	- .0002	+ 9 26 0.76	2.583	-0.015
ι Orionis	† 2.9	Oe5	5 31 19.425	2.9342	+ .0001	- 5 57 51.16	2.499	-0.002
ε Orionis	1.8	B0	5 31 57.032	3.0436	.0000	- 1 15 16.65	2.448	+0.001
ζ Tauri	3.0	B3	5 32 37.435	+ 3.5850	+ .0006	+21 5 32.05	+2.357	-0.023
ι Orionis	† 2.0	B0	5 36 31.200	3.0270	+ .0005	- 1 59 10.51	2.036	-0.014
α Columbæ	2.8	B5p	5 36 36.437	2.1725	+ .0006	-34 7 6.00	2.004	-0.038
ο Aurigæ	5.5	A0	5 39 23.462	4.6453	- .0018	+49 47 26.62	1.782	-0.018
ζ Leporis	3.7	A2	5 43 8.926	2.7179	- .0013	-14 51 8.79	1.472	-0.001
κ Orionis	2.2	B0	5 43 46.341	+ 2.8449	+ .0001	- 9 41 55.07	+1.415	-0.003
δ Doradus	4.5	A5	5 44 37.210	0.1022	- .0081	-65 46 1.35	1.343	-0.001
ν Aurigæ	4.2	K0	5 45 40.041	4.1574	- .0001	+39 7 30.42	1.266	+0.013
δ Leporis	3.9	K0	5 47 42.504	2.5796	+ .0162	-20 53 7.54	0.426	-0.640
α Orionis (Betelgeux)	† var.	Ma	5 50 37.435	3.2479	+ .0020	+ 7 23 32.49	0.820	+0.009
η Leporis	3.8	F5	5 52 34.729	+ 2.7323	- .0028	-14 10 56.06	+0.790	+0.141
δ Aurigæ	3.9	K0	5 52 36.694	4.9419	+ .0118	+54 16 47.15	0.528	-0.118
β Aurigæ	2.1	A0p	5 53 22.062	4.4018	- .0038	+44 56 24.64	0.574	-0.006
θ Aurigæ	† 2.7	A0p	5 53 59.593	4.0917	+ .0047	+37 12 28.13	+0.435	-0.091
1 Geminorum	4.3	G5	5 59 0.858	3.6475	+ .0002	+23 16 7.86	-0.023	-0.109
1 G. Puppis	† 6.2	F8	6 2 3.356	+ 1.7258	- .0088	-45 2 9.85	+0.045	+0.225
ν Orionis	4.4	B2	6 2 46.584	3.4264	+ .0012	+14 46 46.06	-0.268	-0.025
22 H. Camelopardalis	4.7	A0	6 9 35.607	6.1683	+ .0026	+69 21 4.42	0.963	-0.114
γ Geminorum	† var.	Ma	6 9 48.476	3.6227	- .0039	+22 31 55.79	0.874	-0.016
2 Lyncis	4.4	A0	6 12 12.906	5.2985	+ .0012	+59 2 34.56	1.038	+0.030
ζ Canis Majoris	3.1	B3	6 17 5.227	+ 2.3018	- .0006	-30 1 32.51	-1.517	-0.023
μ Geminorum	3.2	Ma	6 17 52.755	3.6307	+ .0046	+22 33 27.98	1.677	-0.114
ψ Aurigæ	5.1	K2	6 18 25.912	4.6259	+ .0029	+49 19 55.64	1.614	-0.004
β Canis Majoris	2.0	B1	6 19 0.013	2.6416	- .0006	-17 54 48.02	1.656	+0.004
8 Monocerotis	† 4.5	A5	6 19 19.045	3.1802	- .0004	+ 4 38 11.22	1.679	+0.069
α Argus (Canopus)	-0.9	F0	6 22 5.233	+ 1.3319	+ .0022	-52 38 58.12	-1.920	+0.009
10 Monocerotis	5.0	B3	6 23 48.754	2.9641	+ .0010	- 4 42 33.46	2.073	+0.006
ν Geminorum	4.1	B5	6 23 58.542	3.5829	- .0005	+20 15 58.87	2.109	-0.016
8 Lyncis	6.0	G0	6 30 1.113	5.4919	- .0267	+61 33 23.74	2.894	-0.276
ξ ² Canis Majoris	4.5	A0	6 31 32.170	2.6157	+ .0022	-22 53 49.14	2.715	+0.035
23 H. Camelopardalis	5.6	F8	6 31 55.274	+10.2973	- .0277	+79 39 29.35	-3.416	-0.633
51 Aurigæ	5.7	K0	6 32 50.375	+ 4.1596	- .0020	+39 27 57.77	-2.975	-0.118

β Orionis, comp. 8^m.0, 9^s.5 s. pr.δ Orionis, star 6^m.9, 52^s.6 n.ι Orionis, comp. 7^m.3, 11^s.5 s. f.ζ Orionis, comp. 4^m.2, 2^s.4 s. f.α Orionis, red star, var. irreg. 1^m.0-1^m.4.ε Aurigæ, comp. 7^m.5, 2^s.5, n. pr.1 Puppis, star, 5^m.8, 150^s. s. f.γ Gem., var. 231^d.4, 3^m.2-4^m.2, comp. 6^m.8, 1^s.2 n. pr.8 Monoc., star 6^m.5, 13^s.7 n. f.

MEAN PLACES OF TEN-DAY STARS, 1916. 221

FOR JANUARY 0^d.975, WASHINGTON MEAN TIME.

Name of Star.	Magni- tude.	Spec- trum.	Right Ascension.	Annual Vari- ation.	Annual P. M.	Declination.	Annual Vari- ation.	Annual P. M.
			^h ^m ^s	^s	^s	[°] ['] ["]	["]	["]
γ Geminorum	1.9	A0	6 32 51.596	+3.4670	+0.0033	+16 28 18.98	-2.912	-0.048
τ Argus	3.2	B8	6 35 11.546	1.8367	+0.0008	-43 7 18.49	3.965	-0.019
8 Monocerotis	4.7	Oe5	6 36 21.140	3.3047	.0000	+ 9 58 27.69	3.174	-0.008
ε Geminorum	3.2	G5	6 38 45.897	3.6928	-.0001	+25 12 55.35	3.392	-0.018
ξ Geminorum	3.4	F5	6 40 34.528	3.3684	-.0076	+12 59 13.76	3.723	-0.193
♂ Aurigæ	5.3	G0	6 40 41.291	+4.3297	+0.0018	+43 39 44.08	-3.380	+0.160
α Canis Majoris (Sirius) †	-1.6	A0	6 41 26.790	2.6434	-.0373	-16 36 0.58	4.812	-1.207
18 Monocerotis	4.7	K0	6 43 28.835	3.1281	-.0020	+ 2 30 18.00	3.796	-0.016
43 Camelopardalis	5.1	B5	6 44 39.362	6.4880	+0.0021	+68 59 16.09	3.869	+0.012
θ Geminorum	3.6	A2	6 47 15.287	3.9681	+0.0010	+34 3 49.17	4.154	-0.060
α Pictoris	3.3	A5	6 47 19.858	+0.6176	-.0105	-61 51 4.03	-3.873	+0.238
τ Argus	2.8	K0	6 47 51.096	1.4883	+0.0025	-50 30 52.06	4.262	-0.107
15 Lynxis	4.5	K0	6 50 0.597	5.2067	+0.0021	+58 32 3.62	4.469	-0.130
θ Canis Majoris	4.2	K2	6 50 17.260	2.7879	-.0091	-11 55 56.87	4.370	-0.007
ε Canis Majoris	1.6	B1	6 55 19.459	2.3574	-.0001	-28 51 25.31	4.789	+0.003
ζ Geminorum	†	var.	G0 6 59 7.687	+3.5606	-.0002	+20 41 40.18	-5.122	-0.007
α² Canis Majoris	3.1	B5p	6 59 31.015	2.5048	-.0006	-23 42 35.14	5.142	+0.005
γ Canis Majoris	4.1	B5	6 59 57.505	2.7148	+0.0003	-15 30 30.09	5.194	-0.010
δ Canis Majoris	2.0	F8	7 4 58.493	2.4381	-.0015	-26 15 32.77	5.604	+0.003
63 Aurigæ	5.1	K2	7 5 52.857	4.1327	+0.0052	+39 27 31.38	5.686	-0.003
51 Geminorum	5.3	Mb	7 8 32.969	+3.4480	+0.0019	+16 18 8.93	-5.948	-0.042
γ² Volantis	3.9	K0	7 9 27.782	-0.5015	+0.0004	-70 21 45.79	5.905	+0.078
λ Geminorum	3.6	A2	7 13 16.021	+3.4502	-.0029	+16 41 34.15	6.345	-0.045
π Argus	2.7	K5	7 14 10.561	2.1189	-.0008	-36 56 46.56	6.385	-0.010
δ Geminorum	†	F0	7 15 6.499	+3.5864	-.0010	+22 8 16.82	6.467	-0.015
δ Volantis	4.0	F5	7 16 52.978	-0.0196	+0.0004	-67 48 12.73	-6.605	-0.006
ι Geminorum	3.9	K0	7 20 30.708	+3.7303	-.0086	+27 57 57.79	6.966	-0.088
η Canis Majoris	2.4	B5p	7 20 46.397	3.7338	+0.0003	-29 8 18.70	6.912	+0.007
Groombridge 1308	5.8	K0	7 22 9.238	6.2741	+0.0018	+68 38 19.97	7.078	-0.045
β Canis Minoris	3.1	B8	7 22 35.794	3.2554	-.0032	+ 8 27 34.04	7.116	-0.047
ρ Geminorum	4.2	F0	7 23 42.652	+3.8630	+0.0118	+31 57 9.91	-6.977	+0.183
σ Argus	†	K5	7 26 33.898	1.9016	-.0072	-43 7 50.87	7.212	+0.180
α² Geminorum (Castor)	2.0	A0	7 29 14.569	3.8330	-.0144	+32 4 26.76	7.692	-0.062
α¹ Geminorum	2.8	A0	Δα - 0.259	.....	Δδ - 4.13	.....	.....	.....
25 Monocerotis	5.2	F5	7 33 6.082	2.9819	-.0066	- 3 55 21.06	7.899	+0.022
α Can. Min. (Procyon) †	0.5	F5	7 34 54.334	+3.1420	-.0471	+ 5 26 27.47	-9.108	-1.037
24 Lynxis	5.0	A2	7 35 54.485	5.0932	-.0042	+58 54 29.69	8.202	-0.056
κ Geminorum	†	G5	7 39 22.749	3.6264	-.0014	+24 36 1.18	8.482	-0.060
β Geminorum (Pollux)	1.2	K0	7 40 10.693	3.6756	-.0470	+28 13 48.17	8.541	-0.055
4 Puppis	5.1	F2	7 42 4.799	2.7636	-.0003	-14 21 31.95	8.638	-0.002
ξ Argus	3.5	G0	7 45 45.688	+2.5232	-.0004	-24 38 53.84	-8.925	0.000
φ Geminorum	5.0	A2	7 48 21.559	3.6765	-.0020	+26 59 3.30	9.155	-0.027
26 Lynxis	5.7	K0	7 48 36.153	4.3811	-.0022	+47 47 0.54	9.153	-0.006
Groombridge 1374	5.6	K0	7 50 10.049	7.2422	-.0023	+74 8 38.80	9.306	-0.037
χ Argus	3.6	B3	7 54 38.618	1.5259	-.0043	-52 45 24.32	9.609	+0.006
ω Cancri	5.9	K0	7 55 51.041	+3.6338	+0.0003	+25 37 25.16	-9.711	-0.004
χ Geminorum	5.0	K0	7 58 21.749	3.6902	-.0012	+28 1 50.57	9.951	-0.063
27 Lynxis	4.9	A2	8 2 8.868	4.5295	-.0032	+51 44 59.99	10.188	-0.003
ρ Argus	2.9	F5	8 3 57.982	2.5546	-.0065	-24 3 40.92	10.269	+0.062
3 H. Ursæ Majoris	5.5	G5	8 4 28.232	6.0107	+0.0002	+68 43 22.22	10.355	+0.005
γ Argus	†	Onp	8 6 56.697	+1.8498	-.0003	-47 5 19.21	-10.555	-0.011
ζ Cancri (mean)	†	G0	8 7 23.797	3.4444	+0.0051	+17 54 7.45	10.706	-0.129
Bradley 1147	5.7	G5	8 9 1.463	7.6181	+0.0077	+76 0 53.87	10.706	-0.008
20 Puppis	5.0	G5	8 9 28.314	2.7580	-.0009	-15 32 3.85	10.731	+0.001
β Cancri	3.8	K2	8 11 57.660	3.2556	-.0035	+ 9 26 42.90	10.967	-0.062
31 Lynxis	4.4	K5	8 17 5.535	+4.1205	+0.0015	+43 27 31.09	-11.388	-0.100
δ Cancri	5.9	F0	8 18 33.377	+3.4390	-.0038	+18 36 9.73	-11.425	-0.031

8 Monoc., comp. 8=8, 2" 9 s. pr.
 15 Lynxis, dup., 4=9, 6=2, 0" 7 s.
 α Can. Maj., comp. 6=7, 7" 8 s. f.
 ζ Gem., var., 10=15, 3=7, 4=2.

γ² Volantis, comp. 5=8, 12" 9 n. pr.
 γ Gem., comp. 6=7, 0" 5 s. pr.
 σ Argus, star 8=, 22" 4 n. f.
 κ Gem., comp. 8=5, 6" 6 s. pr.

γ Argus, star 5=, 42" 5 s. pr.
 ζ Cancri, triple; binary 5=6, 6=3, 1" with comp. 6=0, 5" 4 s. f.

Positions given for Sirius and Procyon are those of the centers of their orbits. Corrections given on page xii remain to be applied to reduce to the positions of the stars.

222 MEAN PLACES OF TEN-DAY STARS, 1916.

FOR JANUARY 0^d.975, WASHINGTON MEAN TIME.

Name of Star.	Magni- tude.	Specu- trum.	Right Ascension.	Annual Vari- ation.	Annual P. M.	Declination.	Annual Vari- ation.	Annual P. M.
			h m s	s	s	° ' "	"	"
<i>e</i> Argus	1.7	KOp	8 20 47.481	+1.2337	-.0042	-59 14 20.02	-11.547	+0.008
30 Monocerotis	4.0	A0	8 21 27.868	+2.9996	-.0039	- 3 37 53.80	11.622	-0.020
<i>θ</i> Chamæleontis	4.3	K0	8 23 10.871	-1.7489	-.0451	-77 12 50.51	11.707	+0.017
<i>o</i> Urseæ Majoris	3.5	G0	8 23 17.919	+5.0114	-.0160	+61 0 0.62	11.845	-0.112
Groombridge 1450	6.0	K0	8 27 27.627	3.9090	-.0082	+38 18 19.40	12.205	-0.179
<i>η</i> Cancri	5.5	B5p	8 27 51.235	+3.4742	-.0025	+20 43 38.24	-12.108	-0.055
Groombridge 1446	6.3	K0	8 30 23.950	6.7426	-.0043	+73 55 28.86	12.348	-0.117
<i>δ</i> Hydræ	4.2	A0	8 33 12.642	3.1781	-.0048	+ 5 59 50.75	12.439	-0.014
<i>σ</i> Hydræ	4.5	K0	8 34 22.106	3.1382	-.0008	+ 3 38 13.72	12.516	-0.013
<i>γ</i> Cancri	4.7	A0	8 38 25.678	3.4767	-.0071	+21 46 16.99	12.822	-0.043
<i>δ</i> Cancri	4.2	K0	8 39 54.842	+3.4137	-.0009	+18 27 49.59	-13.119	-0.240
<i>α</i> Pyxidias	3.7	B2	8 40 12.973	2.4110	-.0003	-32 52 58.79	12.889	+0.011
<i>ε</i> Cancri	4.2	G5	8 41 37.098	3.6377	-.0006	+29 4 4.64	13.044	-0.051
<i>ε</i> Hydræ	3.5	F8	8 42 19.761	3.1797	-.0127	+ 6 43 40.04	13.089	-0.048
<i>δ</i> Argus	2.0	A0	8 42 22.850	1.6617	-.0035	-64 24 1.33	13.144	-0.100
<i>σ</i> Cancri (<i>mean</i>)	5.5	K0	8 49 7.423	+3.6678	+ .0034	+30 53 54.01	-13.507	-0.021
<i>ζ</i> Hydræ	3.3	K0	8 50 57.329	3.1744	-.0060	+ 6 15 57.40	13.597	+0.007
<i>ι</i> Urseæ Majoris	3.1	A5	8 53 27.836	4.1223	-.0435	+48 22 20.25	14.013	-0.349
<i>α</i> Cancri	4.3	A3	8 53 53.709	3.2844	+ .0024	+12 11 0.76	13.833	-0.042
<i>b</i> Carinæ	5.1	B3	8 54 55.031	1.4681	-.0034	-58 54 17.78	13.875	-0.019
<i>κ</i> Urseæ Majoris	3.7	A0	8 57 53.888	+4.1102	-.0027	+47 29 22.42	-14.110	-0.067
<i>σ</i> Urseæ Majoris	4.9	F8	9 3 1.322	5.3208	-.0003	+67 28 35.96	14.426	-0.066
<i>κ</i> Cancri	5.1	B8	9 3 11.972	3.2526	-.0012	+11 0 24.87	14.384	-0.013
<i>λ</i> Argus	2.2	K5	9 4 54.344	2.2062	-.0015	-43 5 35.32	14.481	-0.007
<i>θ</i> Hydræ	3.8	A0	9 9 59.736	3.1235	+ .0088	+ 2 40 9.65	15.091	-0.312
<i>β</i> Argus	1.8	A0	9 12 16.995	+0.6696	-.0310	-69 22 16.01	-14.820	+0.094
83 Cancri	6.6	F5	9 14 17.778	3.3635	-.0076	+18 3 43.50	15.167	-0.136
<i>ι</i> Argus	2.2	F0	9 14 50.386	1.6040	-.0065	-58 55 20.51	15.055	+0.006
40 Lyncis	3.3	K5	9 15 56.542	3.6632	-.0178	+34 44 54.51	15.113	+0.012
<i>α</i> Pyxidias	4.9	Ma	9 17 46.232	2.6514	-.0048	-25 36 28.15	15.262	-0.032
<i>θ</i> Hydræ	2.2	K2	9 23 27.602	+2.9486	-.0010	- 8 17 37.92	-15.516	+0.033
<i>h</i> Urseæ Majoris	3.8	F0	9 24 55.424	4.7642	+ .0183	+63 25 47.95	15.605	+0.024
<i>d</i> Urseæ Majoris	4.6	G0	9 27 4.820	5.3585	-.0112	+70 12 1.73	15.675	+0.071
<i>o</i> Urseæ Majoris	3.3	F8	9 27 14.885	4.0298	-.1026	+52 3 39.40	16.298	-0.543
<i>φ</i> Argus	3.6	F5	9 27 23.322	2.3594	-.0181	-40 5 55.75	15.725	+0.038
<i>ξ</i> Leonis	5.1	G5	9 27 25.210	+3.2368	-.0063	+11 40 20.74	-15.848	-0.064
10 Leonis Minoris	4.6	G5	9 29 4.967	3.6849	+ .0011	+36 46 16.43	15.875	-0.021
<i>o</i> Leonis	3.8	F5p	9 36 40.165	3.2049	-.0096	+10 16 30.54	16.285	-0.033
<i>θ</i> Antilæ	5.0	F5	9 40 27.407	2.6731	-.0036	-27 23 3.84	16.414	+0.029
<i>ε</i> Leonis	3.1	G0p	9 41 5.182	3.4108	-.0034	+24 9 41.52	16.497	-0.022
<i>v</i> Argus	3.2	F0	9 45 0.188	+1.5008	-.0025	-64 40 56.03	-16.683	-0.017
<i>v</i> Urseæ Majoris	3.9	F0	9 45 1.743	4.2913	-.0382	+59 26 4.34	16.826	-0.157
<i>δ</i> Sextantis	6.0	A3	9 47 0.112	3.0245	+ .0011	- 3 50 56.80	16.792	-0.028
<i>μ</i> Leonis	4.1	K0	9 47 59.338	3.4169	-.0171	+26 24 11.38	16.865	-0.054
Groombridge 1586	6.0	K0	9 50 54.168	5.4283	-.0197	+73 16 46.76	17.009	-0.060
19 Leonis Minoris	5.2	F5	9 52 32.714	+3.6847	-.0112	+41 27 22.69	-17.047	-0.022
<i>φ</i> Argus	3.7	B5	9 53 54.658	2.1017	-.0033	-54 10 4.00	17.108	-0.020
<i>π</i> Leonis	4.9	Ma	9 55 46.547	3.1721	-.0029	+ 8 26 51.90	17.199	-0.027
<i>η</i> Leonis	3.6	A0p	10 2 45.224	3.2726	-.0022	+17 10 22.03	17.483	-0.004
<i>α</i> Leonis (<i>Regulus</i>)	1.3	B8	10 3 54.023	3.1981	-.0169	+12 22 41.53	17.530	-0.003
<i>λ</i> Hydræ	3.8	K0	10 6 29.579	+2.9247	-.0137	-11 56 18.16	-17.724	-0.088
<i>g</i> Velorum	4.1	A2	10 11 12.373	2.5130	-.0153	-41 42 19.48	17.797	+0.032
32 Urseæ Majoris	5.7	A3	10 11 57.046	4.3922	-.0140	+65 31 40.72	17.871	-0.012
<i>ζ</i> Leonis	3.6	F0	10 12 1.296	3.3421	+ .0014	+23 50 11.01	17.870	-0.009
<i>λ</i> Urseæ Majoris	3.5	A0	10 12 2.266	3.6307	-.0142	+43 20 3.86	17.900	-0.038
<i>γ</i> Leonis <i>pr.</i>	2.6	K0	10 15 20.627	+3.3114	+ .0212	+20 16 0.85	-18.143	-0.152
<i>μ</i> Urseæ Majoris	3.2	K5	10 17 19.861	+3.5855	-.0069	+41 55 20.79	-18.040	+0.027

ε Canori, star 6^m.6, 30^u.6 n. pr.
ε Hydræ, triple; binary 3^m.5,
 0^u.2, with comp. 7^m.8, 3^u.3
δ Argus, comp. 5^m, 2^u. s.

α Canori, dup. 3^m.9, 6^m.4, 1^u.4
δ Carinæ, comp. 7^m.2, 5^u. f.
σ Urs. Maj., binary 4^m.9, 8^m, 1^u.3

ψ Argus, dup. 3^m.8, 6^m.0, 0^u.8
v Urseæ, comp. 6^m.0, 4^u.9 s. f.
γ Leonis, comp. 3^m.8, 3^u.7 s. f.

MEAN PLACES OF TEN-DAY STARS, 1916. 223

FOR JANUARY 0^h.975, WASHINGTON MEAN TIME.

Name of Star.	Magni- tude.	Spectr- um.	Right Ascension.	Annual Vari- ation.	Annual P. M.	Declination.	Annual Vari- ation.	Annual P. M.
			h m s	s	s	° ' "	"	"
30 H. Ursæ Majoris . . .	4.9	A0	10 18 5.802	+4.3608	-.0024	+65 59 30.34	-18.114	-0.018
μ Hydræ . . .	4.1	K5	10 22 1.636	2.9006	-.0089	-16 24 25.35	18.321	-0.079
31 Leonis Minoris . . .	4.4	K0	10 23 1.899	3.4788	-.0064	+37 8 16.80	18.390	-0.112
α Antliæ . . .	4.4	K5	10 23 18.372	2.7425	-.0060	-30 38 24.24	18.311	-0.023
36 Ursæ Majoris . . .	4.8	F5	10 25 15.712	3.9601	-.0208	+56 24 42.15	18.306	-0.039
9 H. Draconis . . .	5.0	G5	10 27 59.569	+5.1818	-.0084	+76 8 46.50	-18.461	-0.009
ρ Leonis . . .	3.8	B0p	10 28 23.397	3.1615	-.0004	+ 9 44 21.40	18.469	-0.003
33 Sextantis . . .	6.4	K0	10 37 7.785	3.0519	-.0100	- 1 17 57.93	18.859	-0.110
41 Leonis Minoris . . .	5.0	A2	10 38 51.109	3.2669	-.0084	+23 37 42.71	18.798	+0.009
† Argus . . .	3.0	B0	10 39 57.356	2.1326	-.0043	-63 57 16.84	18.862	-0.027
42 Leonis Minoris . . .	5.4	B9	10 41 11.871	+3.3423	-.0024	+31 7 30.24	-18.914	-0.041
η Argus . . .	† var.	Pec.	10 41 47.913	2.3210	-.0002	-59 14 33.68	18.899	-0.009
μ Argus . . .	†	G5	10 43 9.184	2.5738	+0.0066	-48 58 34.92	19.010	-0.061
† Leonis . . .	5.3	A0	10 44 50.630	3.1564	+0.0001	+10 59 23.67	19.010	-0.033
52 Chamaeleontis . . .	†	B3	10 45 0.424	0.5631	-.0192	-80 5 49.65	18.986	-0.004
γ Hydræ . . .	3.3	Ma	10 45 28.732	+2.9583	+0.0061	-15 45 12.88	-18.784	+0.211
46 Leonis Minoris . . .	3.9	K0	10 48 37.110	3.3633	+0.0074	+34 40 5.07	19.364	-0.283
54 Leonis . . .	†	A0	10 51 4.066	3.2529	-.0060	+25 11 53.08	19.164	-0.018
† Antliæ . . .	4.7	K0	10 52 48.311	2.7962	+0.0112	-36 41 9.55	19.326	-0.138
Groombridge 1706 . . .	6.3	G5	10 53 16.364	4.8857	-.0265	+78 13 13.78	19.237	-0.035
α Crateris . . .	4.2	K0	10 55 40.816	+2.9207	-.0327	-17 51 5.11	-19.153	+0.108
d Leonis . . .	5.0	K0	10 56 13.381	3.0992	+0.0004	+ 4 4 7.38	19.267	-0.022
β Ursæ Majoris . . .	2.4	A0	10 56 46.955	3.6400	+0.0105	+56 49 58.62	19.262	+0.026
α Ursæ Majoris . . .	2.0	K0	10 58 33.405	3.7278	-.0164	+62 12 17.10	19.400	-0.071
χ Leonis . . .	4.7	F0	11 0 41.109	3.0961	-.0234	+ 7 47 25.80	19.418	-0.041
ρ ¹ Leonis . . .	5.7	K0	11 2 37.184	+3.0613	-.0253	+ 2 24 42.76	-19.501	-0.080
ρ Ursæ Majoris . . .	3.2	K0	11 4 56.853	3.3848	-.0063	+44 57 16.31	19.503	-0.033
β Crateris . . .	4.5	A2	11 7 31.477	2.9477	-.0000	-22 22 1.77	19.639	-0.106
δ Leonis . . .	2.6	A2	11 9 38.629	3.1951	+0.0108	+20 59 2.71	19.704	-0.141
9 Leonis . . .	3.4	A0	11 9 50.010	3.1804	-.0049	+15 53 19.97	19.662	-0.085
γ Ursæ Majoris . . .	3.7	K0	11 13 56.750	+3.2478	-.0018	+33 33 10.36	-19.616	+0.026
δ Crateris . . .	3.8	K0	11 15 8.378	2.9975	-.0088	-14 19 25.72	19.468	+0.195
σ Leonis . . .	4.1	A0	11 16 48.365	3.0950	-.0062	+ 6 29 23.80	19.703	-0.013
α Centauri . . .	4.3	B5	11 17 10.273	2.7264	-.0041	-54 1 49.95	19.710	-0.013
† Leonis . . .	†	F5	11 19 32.763	3.1286	+0.0103	+10 59 31.49	19.817	-0.063
τ Leonis . . .	5.2	K0	11 23 37.070	+3.0857	+0.0008	+ 3 19 8.48	-19.810	-0.016
λ Draconis . . .	4.1	Ma	11 26 26.035	3.5953	-.0072	+69 47 41.40	19.852	-0.421
ε Hydræ . . .	3.7	G5	11 28 52.058	2.9464	-.0158	-31 23 34.10	19.915	-0.055
λ Centauri . . .	3.3	B9	11 31 53.892	2.7506	-.0073	-62 33 17.95	19.922	-0.027
ν Leonis . . .	4.5	K0	11 32 38.870	3.0716	-.0000	- 0 21 35.47	19.864	+0.089
z Chamaeleontis . . .	5.7	F0	11 33 47.279	+2.4536	-.0323	-75 25 53.52	-19.937	-0.023
3 Draconis . . .	5.5	K0	11 37 48.021	3.3723	-.0080	+67 12 35.51	19.917	+0.035
ζ Crateris . . .	4.9	G5	11 40 30.191	3.0378	+0.0018	-17 53 1.28	20.014	-0.041
χ Ursæ Majoris . . .	3.8	K0	11 41 37.269	3.1797	-.0128	+48 14 42.70	19.961	+0.020
β Leonis (<i>Denebola</i>) . . .	2.2	A2	11 44 46.591	3.0623	-.0341	+15 2 30.04	20.120	-0.118
β Virginis . . .	3.8	F8	11 46 19.185	+3.1252	+0.0494	+ 2 14 17.45	-20.284	-0.375
Groombridge 1830 . . .	6.5	G5	11 48 8.543	3.4674	+3.401	+38 19 17.90	26.802	-5.783
γ Ursæ Majoris . . .	2.5	A0	11 49 25.184	3.1696	+0.0115	+54 9 42.49	20.020	+0.004
z Virginis . . .	4.6	A3	11 56 34.106	3.0742	-.0009	+ 7 4 57.80	20.075	-0.082
o Virginis . . .	4.2	G5	12 0 55.851	3.0570	-.0148	+ 9 11 57.96	20.013	+0.082
δ Centauri . . .	2.9	B3p	12 3 59.891	+3.0956	-.0050	-50 15 17.12	-20.072	-0.030
ε Corvi . . .	3.2	K0	12 5 48.125	3.0613	-.0051	-22 9 9.56	20.036	+0.003
4 H. Draconis . . .	5.1	A5	12 8 16.804	2.8465	+0.0026	+78 4 58.72	20.013	+0.019
δ Crucis . . .	3.1	B3	12 10 40.888	3.1755	+0.0021	-58 16 55.26	20.062	-0.038
δ Ursæ Majoris . . .	3.4	A2	12 11 16.633	2.9644	+0.0150	+57 29 57.52	20.016	+0.005
γ Corvi . . .	2.8	B8	12 11 29.023	+3.0818	-.0114	-17 4 31.83	-20.004	+0.017
2 Canum Venaticorum † . . .	5.8	K5	12 11 55.340	+3.0158	+0.0038	+41 7 39.33	-20.064	-0.046

† Argus, var., irreg., 1^m.6-6^m.6
 α Argus, comp. 7^m, 2^m.2 n. f.

δ² Cham., star 5^m.5 pr. 32^m, 256^m n.
 54 Leonis, comp. 6^m.3, 61^m.4 s. f.

† Leonis, comp. 6^m.8, 2^m.6 n. f.
 2 Can. Ven., star 5^m, 11^m.6 s. pr.

224 MEAN PLACES OF TEN-DAY STARS, 1916.

FOR JANUARY 0^d.975, WASHINGTON MEAN TIME.

Name of Star.	Magni- tude.	Spect- rum.	Right Ascension.	Annual Vari- ation.	Annual P. M.	Declination.	Annual Vari- ation.	Annual P. M.
			h m s	s	s	" ' "	" "	" "
β Chamæleontis . . .	4.4	B5	12 13 23.374	+3.4496	-.0188	-78 50 44.94	-19.994	+0.017
η Virginis . . .	4.0	A0	12 15 36.498	3.0694	-.0036	-0 12 0.28	20.026	-0.027
α^1 Crucis . . .	1.6	B1	12 21 54.868	3.3127	-.0064	-62 38 1.43	19.993	-0.069
α^2 Crucis . . .	2.1		$\Delta\alpha + 0.630$	...	...	$\Delta\delta - 1.89$	...	...
20 Comæ . . .	5.7	A2	12 25 30.199	3.0182	+0.0036	+21 21 40.14	19.957	-0.036
δ Corvi . . .	3.1	A0	12 25 30.964	+3.1013	-.0140	-16 2 52.41	-20.070	-0.149
γ Crucis . . .	1.6	Mb	12 26 29.724	3.3040	-.0028	-56 38 34.07	20.172	-0.201
8 Canum Venaticorum . . .	4.3	G0	12 29 45.482	2.8562	-.0617	+41 48 49.41	19.597	+0.279
κ Draconis . . .	3.9	B5p	12 29 54.348	2.5771	-.0112	+70 15 4.12	19.865	+0.010
β Corvi . . .	2.8	G5	12 29 58.260	3.1456	-.0008	-22 55 56.47	19.936	-0.061
24 Comæ seq. . .	5.2	K0	12 30 55.021	+3.0106	-.0007	+18 50 21.36	-19.850	+0.013
α Muscæ . . .	2.9	B3	12 32 9.530	3.5426	-.0088	-68 40 22.30	19.877	-0.029
χ Virginis . . .	4.8	K0	12 34 54.542	3.0938	-.0056	-7 32 0.49	19.844	-0.031
γ Centauri . . .	2.4	A0	12 36 52.657	3.2951	-.0196	-48 29 55.28	19.806	-0.025
γ Virginis (mean) . . .	2.9	F0	12 37 24.250	3.0398	-.0365	-0 59 19.84	19.775	+0.004
ρ Virginis . . .	5.0	A0	12 37 38.011	+3.0372	+0.0058	+10 41 53.77	-19.882	-0.107
76 Ursæ Majoris . . .	5.9	A0	12 37 54.021	2.6311	-.0065	+63 10 26.67	19.790	-0.018
β Crucis . . .	1.5	B1	12 42 48.163	3.4830	-.0064	-59 13 47.41	19.730	-0.033
31 Comæ . . .	5.1	G0	12 47 36.483	2.9239	-.0022	+27 59 51.16	19.639	-0.024
η Centauri . . .	4.3	A5	12 48 46.748	3.3132	+0.0060	-39 43 20.14	19.628	-0.035
ϵ Ursæ Majoris (Alioth) . . .	1.7	A0p	12 50 20.288	+2.6479	+0.0138	+56 24 56.04	-19.576	-0.013
δ Virginis . . .	3.7	Ma	12 51 22.287	3.0208	-.0318	+3 51 13.40	19.604	-0.060
α Canum Venat. seq. . .	2.9	A0p	12 52 6.046	2.8104	-.0203	+38 46 18.47	19.481	+0.049
δ Muscæ . . .	3.6	K2	12 56 28.181	4.0741	+0.0496	-71 5 45.69	19.471	-0.031
ϵ Virginis . . .	3.0	K0	12 57 59.727	2.9865	-.0186	+11 24 37.35	19.392	+0.012
θ Virginis . . .	4.4	A0	13 5 35.932	+3.1033	-.0029	-5 5 26.99	-19.270	-0.040
43 Comæ . . .	4.3	G0	13 7 57.316	2.8025	-.0599	+28 18 13.34	18.292	+0.879
20 Canum Venaticorum . . .	4.7	F0	13 13 46.752	2.6955	-.0094	-41 0 52.61	19.001	+0.015
γ Hydræ . . .	3.3	G5	13 14 21.082	3.2557	+0.0046	-22 43 43.15	19.052	-0.051
τ Centauri . . .	2.9	A2	13 15 52.103	3.3620	-.0294	-36 16 10.35	19.034	-0.097
ζ^1 Ursæ Maj. (Mizar) . . .	2.4	A0p	13 20 32.827	+2.4220	+0.0153	+55 21 49.53	-18.849	-0.030
ζ^2 Ursæ Majoris . . .	4.0	A0	$\Delta\alpha + 0.916$	...	...	$\Delta\delta - 12.40$	...	...
α Virginis (Spica) . . .	1.2	B2	13 20 45.933	3.1572	-.0028	-10 43 23.35	18.846	-0.032
Groombridge 2001 . . .	6.1	K5	13 23 59.391	1.5244	+0.0012	+72 49 38.63	18.733	-0.019
70 Virginis . . .	5.2	G5	13 24 19.293	2.9340	-.0168	+14 13 37.52	19.288	-0.584
ζ Virginis . . .	3.4	A2	13 30 24.680	+3.0546	-.0195	-0 10 0.30	-18.466	+0.640
17 H. Canum Venaticorum . . .	5.0	F0	13 31 2.891	2.6816	+0.0073	+37 36 45.03	18.488	-0.001
ϵ Centauri . . .	2.6	B1	13 34 33.348	3.7808	-.0039	-53 2 23.50	18.403	-0.039
m Virginis . . .	5.2	Ma	13 37 12.055	3.1453	-.0073	-8 16 46.32	18.237	+0.002
r Boötis . . .	4.5	F5	13 43 16.220	2.8508	-.0341	+17 52 29.81	18.018	+0.026
η Ursæ Majoris (Alkaid) . . .	1.9	B3	13 44 13.973	+2.3679	-.0118	+49 43 55.60	-18.030	-0.023
89 Virginis . . .	5.1	K0	13 45 18.232	3.2542	-.0077	-17 42 58.11	18.007	-0.040
ζ Centauri . . .	3.1	B2p	13 50 17.497	3.7261	-.0070	-46 52 31.56	17.833	-0.064
η Boötis . . .	2.8	G0	13 50 41.111	2.8567	-.0044	-18 49 6.09	18.116	-0.263
θ Apodis . . .	var.	Mb	13 57 5.955	5.7429	-.0293	-76 23 31.31	17.514	-0.029
11 Boötis . . .	6.1	A3	13 57 22.007	+2.7215	-.0060	+27 47 30.50	-17.469	+0.003
τ Virginis . . .	4.3	A2	13 57 22.216	3.0514	+0.0010	+1 57 2.06	17.503	-0.029
β Centauri . . .	0.9	B1	13 57 53.025	4.2066	-.0033	-59 58 6.04	17.485	-0.033
π Hydræ . . .	3.5	K0	14 1 35.034	3.4096	+0.0031	-26 16 41.74	17.436	-0.146
θ Centauri . . .	2.3	K0	14 1 43.998	3.5199	-.0437	-35 57 26.03	17.808	-0.525
α Draconis . . .	3.6	A0	14 2 6.929	+1.6245	-.0071	+64 46 37.27	-17.255	+0.611
d Boötis . . .	4.8	F5	14 6 34.127	2.7370	-.0014	+25 29 20.44	17.143	-0.078
κ Virginis . . .	4.3	K0	14 8 24.758	+3.1969	+0.0006	-9 52 59.74	16.848	+0.132
4 Ursæ Minoris . . .	5.0	K0	14 9 9.331	-0.2801	-.0108	+77 56 31.80	16.920	+0.026
ϵ Virginis . . .	4.2	F5	14 11 36.449	+3.1426	-.0013	-5 36 0.56	17.258	-0.427
α Boötis (Arcturus) . . .	0.2	K0	14 11 49.765	+2.7355	-.0780	+19 37 9.21	-18.823	-2.003
λ Boötis . . .	4.3	A0	14 13 11.522	+2.2831	-.0172	+46 28 24.87	-16.604	+0.151

δ Corvi, star 8^m, 24'' 4 s. pr.
 γ Crucis, star 6^m, 85'' n. f.
 24 Comæ, star 6^m, 7, 20'' 6 pr.
 γ Cent., dup., 3^m.1, 3^m.1, 1'' 7

γ Virginis, binary, 3^m.7, 3^m.7, 6'' 2,
 P=325^s
 α Can. Ven., star 5^m, 19'' 8 s. pr.
 θ Virginis, comp. 9^m, 7'' 1 n. pr.

ζ^1 Urs. Maj., star Alcor 4^m.0, 1 7^m 2
 222'' n.
 θ Apodis, var. irreg., 5^m.5-6^m.6

MEAN PLACES OF TEN-DAY STARS, 1916. 225

FOR JANUARY 0^d.975, WASHINGTON MEAN TIME.

Name of Star.	Magni- tude.	Spec- trum.	Right Ascension.	Annual Vari- ation.	Annual P. M.	Declination.	Annual Vari- ation.	Annual P. M.
			h m s	s	s	° ' "	"	"
λ Virginis	4.6	A2	14 14 33.671	+3.2409	-.0024	-12 59 6.04	-16.668	+0.021
2 Libræ	6.3	K0	14 18 54.254	3.2228	-.0014	-11 19 51.36	16.442	-0.067
θ Boötis	4.1	F8	14 22 20.286	2.0433	-.0254	+52 14 18.90	16.707	-0.406
f Boötis	5.4	A5	14 22 32.913	2.7901	-.0052	+19 36 14.39	16.277	+0.015
φ Virginis	5.0	K0	14 23 52.369	+3.0890	-.0090	- 1 51 6.92	16.228	-0.004
5 Ursæ Minoris	4.4	K2	14 27 41.140	-0.1616	+0.0022	+76 4 10.14	-16.004	+0.021
ρ Boötis	3.8	K0	14 28 12.622	+2.5865	-.0073	+30 44 22.61	15.864	+0.114
γ Boötis	3.0	F0	14 28 41.783	2.4171	-.0091	+38 40 30.73	15.827	+0.145
η Centauri	2.6	B3p	14 30 10.028	3.7973	-.0032	-41 47 21.99	15.926	-0.032
σ Boötis	4.5	F0	14 31 1.423	2.6131	+0.0150	+30 6 34.32	15.724	+0.126
α Centauri	0.1	G0	14 33 52.996	+4.0554	-.4861	-60 29 21.74	-14.971	+0.728
33 Boötis	5.4	A0	14 35 42.735	2.2341	-.0056	+44 45 59.17	15.638	-0.043
α Apodis	3.8	K5	14 37 21.667	7.2994	-.0088	-78 41 21.95	15.527	-0.024
μ Virginis	4.0	F5	14 38 37.891	3.1587	+0.0071	- 5 17 37.04	15.784	-0.322
ε Boötis	2.7	K0p	14 41 19.114	2.6203	-.0035	+27 25 39.84	15.272	+0.009
109 Virginis	3.8	A0	14 42 0.055	+3.0312	-.0074	+ 2 14 46.45	-15.277	-0.085
8 Libræ	5.3	F5	14 46 2.248	3.3134	-.0073	+15 38 54.95	15.065	-0.074
α Libræ	2.9	A2	14 46 13.694	3.3139	-.0078	-15 41 36.13	15.076	-0.077
Groombridge 2164	5.7	K2	14 49 18.404	+1.5202	-.0165	+59 38 5.92	14.702	+0.118
β Ursæ Minoris	2.2	K5	14 50 56.263	-0.2026	-.0065	+74 29 55.53	14.721	+0.003
ζ Libræ	5.6	K0	14 52 12.430	+3.2506	-.0006	-11 4 16.88	-14.649	-0.001
Piazzi 221	5.8	A0	14 52 15.264	2.8298	-.0021	+14 47 6.49	14.656	-0.011
β Lupi	2.8	B2p	14 53 1.265	3.9135	-.0070	-42 47 47.39	14.662	-0.062
δ Libræ	var.	A0	14 56 28.892	3.2014	-.0051	- 8 11 10.73	14.405	-0.015
β Boötis	3.6	G5	14 58 46.922	2.2600	-.0036	+40 43 16.74	14.289	-0.040
γ Scorpis	3.4	Ma	14 59 9.007	+3.5060	-.0056	-24 57 8.92	-14.274	-0.048
φ Boötis	4.7	K0	15 0 50.764	2.5704	-.0133	+27 16 28.36	14.136	-0.014
ε Boötis	5.0	F0	15 3 36.691	2.6347	+0.0136	+25 11 44.23	14.134	-0.184
ζ Lupi	3.5	K0	15 6 14.526	4.2923	-.0126	-51 46 48.79	13.849	-0.066
ι Libræ	4.7	A0p	15 7 25.778	3.4143	-.0031	-19 28 28.82	13.761	-0.068
3 Serpentis	5.4	K0	15 11 0.727	+2.9800	-.0017	+ 5 15 1.88	-13.482	-0.005
γ Trianguli Australis	3.1	A0	15 11 2.806	5.5541	-.0137	-68 22 13.66	13.517	-0.042
δ Boötis	3.5	K0	15 12 6.987	2.4193	+0.0075	+33 37 39.12	13.531	-0.126
β Libræ	2.7	B8	15 12 29.068	+3.2249	-.0066	- 9 4 25.32	13.406	-0.024
γ Ursæ Minoris	3.1	A2	15 20 51.174	-0.1150	-.0020	+72 7 58.30	12.815	+0.013
μ Boötis pr.	4.5	F0	15 21 19.029	+2.2664	-.0121	+37 40 16.22	-12.715	+0.081
τ ¹ Serpentis	5.5	Ma	15 21 53.543	2.7800	-.0024	+15 43 21.54	12.782	-0.024
ι Draconis	3.5	K0	15 23 3.659	1.3335	+0.0014	+59 15 35.64	12.669	+0.010
32 Libræ	5.9	K0	15 23 30.975	3.3789	+0.0006	-16 25 28.01	12.662	-0.043
β Coronæ Borealis	3.7	Fp	15 24 21.949	2.4738	-.0130	+29 23 40.60	12.512	+0.078
ν ¹ Boötis	5.2	K5	15 27 54.726	+2.1552	+0.0016	+41 7 7.70	-12.361	-0.014
γ Lupi (mean)	3.0	B3	15 29 32.242	3.9872	-.0020	-40 53 7.75	12.284	-0.049
γ Libræ	4.0	K0	15 30 49.503	3.3525	+0.0047	-14 30 36.17	12.189	+0.006
α Coronæ Borealis	2.3	A0	15 31 7.852	2.5395	+0.0090	+26 59 48.03	12.224	-0.100
ζ Coronæ Borealis seq. †	5.1	B8	15 36 12.892	2.2596	-.0005	+36 54 28.51	11.779	-0.012
α Serpentis	2.8	K0	15 40 7.749	+2.9531	+0.0089	+ 6 41 20.94	-11.446	+0.042
β Serpentis	3.7	A2	15 42 18.645	2.7685	+0.0054	+15 41 2.06	11.387	-0.055
κ Serpentis	4.3	K5	15 44 57.464	2.6996	-.0035	+18 24 0.59	11.299	-0.099
μ Serpentis	3.6	A0	15 45 14.077	3.1265	-.0058	- 3 10 26.23	11.148	-0.028
12 H. Draconis	5.1	A2	15 45 22.961	0.9074	+0.0047	+62 51 31.84	11.177	-0.068
ε Serpentis	3.8	A0	15 46 37.636	+2.9684	+0.0081	+ 4 43 47.80	-10.948	+0.070
ζ Ursæ Minoris	4.3	A2	15 47 1.892	-2.2017	+0.0082	+78 3 12.36	10.992	-0.004
β Trianguli Australis	3.0	F0	15 47 43.747	+5.2580	-.0290	-63 10 21.58	11.345	-0.408
λ Libræ	5.1	B3	15 48 27.273	3.4775	-.0017	-19 55 1.09	10.930	-0.046
γ Serpentis	3.9	F8	15 52 34.337	2.7698	+0.0212	+15 56 6.11	11.869	-1.289
π Scorpis	3.0	B2p	15 53 46.018	+3.6239	-.0010	-25 52 23.56	-10.539	-0.048
ε Coronæ Borealis	4.2	K0	15 54 6.526	+2.4623	-.0066	+27 7 13.44	-10.533	-0.067

† Virginis, comp. 9^m, 4^s.5 s. f.
ε Boötis, comp. 5^m.1, 2^s.8 n. pr.

δ Libræ, var. 2^d.33, 4^m.8-6^m.2
μ Boötis, var. 6^m.7, 10^s.9 s.

γ Lupi, binary 3^m.7, 3^m.9, 0^s.4
Cor. B., comp. 6^m.0, 6^s.2 n. pr.

α Centauri, dup., 0^m.3, 1^m.7; companion s. pr. The position given is that of the center of gravity of the system. Corrections given on page xii remain to be applied to reduce to the position of α Centauri.

226 MEAN PLACES OF TEN-DAY STARS, 1916.

FOR JANUARY 0^d.975, WASHINGTON MEAN TIME.

Name of Star.	Magni- tude.	Spect- rum.	Right Ascension.	Annual Vari- ation.	Annual P. M.	Declination.	Annual Vari- ation.	Annual P. M.
			h m s	s	s	" "	" "	" "
δ Scorpii	2.5	B1p	15 55 21.789	+3.5424	-.0011	-22 23 0.78	-10.406	-0.035
θ Draconis	4.1	F8	16 0 18.856	1.1218	-.0391	+58 47 21.45	9.660	+0.339
β Scorpii	2.9	B1	16 0 32.956	3.4837	-.0011	-19 34 34.99	10.009	-0.028
κ Herculis	5.3	G5	16 4 16.932	2.7051	-.0039	+17 16 11.16	9.720	-0.021
Groombridge 2320	5.4	A0	16 6 5.318	0.1532	-.0074	+68 1 52.50	9.506	+0.352
φ Herculis	4.3	A0	16 6 7.374	+1.8898	-.0017	+45 9 16.64	-9.519	+0.036
δ ¹ Apodis	4.8	Mb	16 7 44.863	8.8598	-.0050	-78 29 10.94	9.186	-0.056
δ Ophiuchi	3.0	Ma	16 9 56.514	3.1416	-.0031	-3 28 43.81	9.405	-0.144
σ Coronæ Bor. seq.	5.8	G0	16 11 31.942	+2.2459	-.0223	+34 4 15.60	9.208	-0.071
19 Ursæ Minoris	5.5	B8	16 13 12.164	-1.7471	+0.0007	+76 5 22.09	8.999	+0.008
γ ² Normæ	4.1	K0	16 13 32.721	+4.4724	-.0216	-49 57 2.23	-9.043	-0.064
ε Ophiuchi	3.3	K0	16 13 52.498	3.1719	+0.0054	-4 29 18.92	8.917	+0.037
σ Scorpii	3.1	B1	16 16 4.779	3.6417	-.0011	-25 23 32.01	8.820	-0.039
τ Herculis	3.9	B5	16 17 12.953	1.8032	+0.0001	+46 30 46.11	8.662	+0.029
γ Herculis	3.8	F0	16 18 12.831	+2.6455	-.0034	+19 20 58.45	8.576	+0.037
η Ursæ Minoris	5.0	F0	16 19 56.530	-1.7893	-.0231	+75 56 57.77	-8.224	+0.252
γ Apodis	3.9	K0	16 20 31.517	+9.1055	-.0409	-78 42 38.92	8.512	-0.083
ω Herculis	4.5	Ap	16 21 32.083	2.7619	-.0028	+14 13 33.19	8.409	-0.059
η Draconis	2.9	G5	16 22 51.082	0.8080	-.0020	+61 42 14.65	8.187	+0.038
α Scorpii (Antares)	1.2	Map	16 24 15.249	3.6743	-.0006	-26 14 47.60	8.161	-0.028
β Herculis	2.8	K0	16 26 36.454	+2.5775	-.0076	+21 40 18.47	-7.969	-0.025
λ Ophiuchi	3.8	A0	16 26 40.530	+3.0240	-.0022	+2 10 0.96	8.018	-0.079
Δ Draconis	5.0	B8p	16 28 8.454	-0.1293	-.0048	+68 56 59.63	7.785	+0.036
τ Scorpii	2.9	B0	16 30 39.012	+3.7298	-.0013	-28 2 33.99	7.652	-0.034
σ Herculis	4.2	A0	16 31 23.682	1.9335	-.0006	+42 36 34.34	7.532	+0.026
ζ Ophiuchi	2.7	B0	16 32 31.894	+3.3009	+0.0007	-10 23 52.23	-7.444	+0.022
24 Scorpii	5.0	K0	16 36 42.753	3.4666	-.0017	-17 34 49.68	7.129	-0.004
ζ Herculis	3.0	G0	16 38 7.157	2.2614	-.0364	+31 45 15.50	6.620	+0.390
α Trianguli Australis	1.9	K2	16 39 45.431	6.3214	+0.0028	-68 52 30.55	6.925	-0.049
η Herculis	3.6	K0	16 40 0.928	2.0558	+0.0031	+39 4 52.71	6.948	-0.093
Groombridge 2377	4.9	F0	16 43 42.208	+1.1374	+0.0046	+56 55 53.99	-6.489	+0.062
ε Scorpii	2.4	K0	16 44 43.148	3.8799	-.0505	-34 8 30.98	6.731	-0.264
49 Herculis	6.4	A0	16 48 15.353	2.7302	+0.0010	+15 6 51.28	6.187	-0.014
ε ¹ Aræ	4.2	K2	16 52 52.977	4.7714	-.0011	-53 1 58.16	5.803	-0.017
κ Ophiuchi	3.4	K0	16 53 41.476	2.8383	-.0199	+9 30 17.13	5.730	-0.011
30 Ophiuchi	5.0	K0	16 56 37.836	+3.1630	-.0018	-4 5 51.02	-5.548	-0.076
ε Herculis	3.9	A0	16 57 4.510	2.2946	-.0036	+31 2 57.72	5.412	+0.023
δ Herculis	5.3	A2	16 58 30.204	2.2121	-.0016	+33 41 20.81	5.323	-0.009
η Ophiuchi	2.6	A0	17 5 33.513	3.4375	+0.0017	-15 37 18.62	4.626	+0.091
η Scorpii	3.4	F2	17 6 8.027	4.2924	+0.0023	-43 7 47.17	4.974	-0.306
ζ Draconis	3.2	B5	17 8 32.474	+0.1691	-.0021	+65 49 4.72	-4.446	+0.018
α Herculis	var.	Mb	17 10 48.996	2.7345	-.0008	+14 29 6.70	4.239	+0.029
δ Herculis	3.2	A0	17 11 34.833	2.4632	-.0019	+24 56 14.97	4.362	-0.158
π Herculis	3.4	K2	17 12 7.227	2.0885	-.0025	+36 54 11.30	4.158	-0.001
θ Ophiuchi	3.4	B3	17 16 50.939	3.0818	-.0006	-24 55 0.35	3.788	-0.036
w Herculis	5.4	G0	17 17 30.923	+2.2430	+0.0095	+32 34 30.02	-4.741	-1.047
β Aræ	2.8	K2	17 18 18.843	4.9811	-.0004	-55 27 6.14	3.653	-0.027
b Ophiuchi	4.3	F0	17 21 14.287	3.6609	-.0009	-24 5 57.17	3.512	-0.137
σ Ophiuchi	4.4	K0	17 22 20.777	2.9757	+0.0002	+4 12 45.16	3.271	+0.008
δ Aræ	3.8	B8	17 23 30.632	5.4060	-.0098	-60 36 55.76	3.298	-0.120
α Aræ	3.0	B3p	17 25 20.740	+4.6330	-.0036	-49 48 39.11	-3.103	-0.083
λ Herculis	4.5	K0	17 27 20.598	2.4241	+0.0016	+26 10 23.59	2.828	+0.018
λ Scorpii	1.7	B2	17 27 54.161	4.0710	-.0004	-37 2 36.78	2.826	-0.027
β Draconis	3.0	G0	17 28 32.038	1.3543	-.0017	+52 21 47.19	2.735	+0.009
α Ophiuchi	2.1	A5	17 31 2.073	2.7838	+0.0080	+12 37 12.90	2.762	-0.235
ε Serpentinis	3.6	A5	17 32 46.509	+3.4330	-.0038	-15 20 47.56	-2.436	-0.060
ι Herculis	3.8	B3	17 37 5.633	+1.6936	+0.0003	+46 3 1.81	-1.997	+0.003

β Scorpii, comp. 5^m.1, 13^m.3 n. f.
κ Herculis, star 6^m.5, 29^m.7 n. f.
σ Cor. Bor., comp. 6^m.7, 4^m.6 s. pr.
σ Scorpii, star 8^m, 21^m pr.
η Draconis, comp. 8^m, 5^m.4 s. f.

α Scorpii, comp. 7^m, 3^m.2 pr.
λ Ophiuchi, comp. 6^m, 1^m.2 n. f.
ζ Herculis, binary, 3^m.0, 6^m.0, 1^m.
η Ophiuchi, binary, 3^m.2, 3^m.7, 0^m.5

α Herculis, var. irreg., 3^m.1-3^m.9, dup.
comp. 6^m, 4^m.6 s. f.
δ Herculis, binary, comp. 8^m, 12^m s. pr.

MEAN PLACES OF TEN-DAY STARS, 1916. 227

FOR JANUARY 0^d.975, WASHINGTON MEAN TIME.

Name of Star.	Magni- tude.	Spec- trum.	Right Ascension.	Annual Variation.	Annual P. M.	Declination.	Annual Variation.	Annual P. M.
			h m s	s	s	° ' "	"	"
α Draconis	4.9	F5	17 37 26.494	-0.3541	+0.0014	+68 47 48.67	-1.652	+0.318
η Pavonis	3.6	K0	17 37 29.038	+5.8815	-.0028	-64 41 7.02	2.046	-0.080
γ Ophiuchi	2.9	K0	17 39 19.350	2.9629	-.0026	+ 4 36 5.45	1.649	+0.158
β Scorpii	3.1	F5p	17 41 42.557	4.1948	+0.0006	-40 5 44.12	1.806	-0.008
μ Herculis	3.5	G5	17 43 10.225	+2.3471	-.0238	+27 46 8.64	2.220	-0.749
φ Draconis †	4.9	F5	17 43 25.732	-1.0740	+0.0023	+72 11 25.40	-1.716	-0.268
γ Ophiuchi	3.7	A0	17 43 40.805	+3.0073	-.0016	+ 2 44 16.87	1.499	-0.073
89 Herculis	5.5	F2	17 52 1.889	2.4207	+0.0013	+26 3 45.44	0.691	+0.006
ξ Draconis	3.9	K0	17 52 4.646	+1.0381	+0.0131	+56 53 7.86	0.616	+0.077
35 Draconis	5.0	F5	17 53 12.489	-2.6900	+0.0116	+76 58 29.06	0.351	+0.243
θ Herculis	4.0	K0	17 53 22.320	+2.0571	+0.0006	+37 15 39.49	-0.575	+0.004
ν Ophiuchi	3.5	K0	17 54 24.092	3.3019	-.0006	- 9 45 51.32	0.609	-0.120
ξ Herculis	3.8	K0	17 54 30.046	2.3315	+0.0072	+29 15 22.39	0.499	-0.018
γ Draconis	2.4	K5	17 54 39.325	1.3925	-.0006	+51 29 53.85	0.491	-0.024
67 Ophiuchi	3.9	B5p	17 56 26.297	3.0049	+0.0008	+ 2 56 4.98	0.324	-0.013
θ Aræ	3.9	B1	18 0 5.496	+4.6699	-.0010	-50 5 54.75	-0.042	-0.050
γ Sagittarii	3.1	K0	18 0 24.630	3.8520	-.0055	-30 25 34.40	0.162	-0.198
70 Ophiuchi †	4.1	K0	18 1 12.528	3.0816	+0.0177	+ 2 31 4.89	-1.016	-1.122
72 Ophiuchi	3.7	A2	18 3 22.004	2.8433	-.0045	+ 9 33 4.03	+0.381	+0.087
α Herculis	3.8	A0	18 4 15.919	2.3394	-.0002	+28 45 0.57	0.375	+0.002
α Sagittarii	4.0	B8p	18 8 44.356	+3.5870	-.0004	-21 4 54.61	+0.763	-0.002
η Sagittarii	3.2	M5	18 11 56.636	4.0597	-.0109	-36 47 16.04	0.892	-0.152
Groombridge 2533	5.4	B5	18 13 1.984	1.8652	-.0006	+42 7 48.39	1.138	-0.001
36 Draconis	5.0	F5	18 13 24.805	0.3456	+0.0535	+64 22 7.11	1.198	+0.026
δ Sagittarii	2.8	K0	18 15 36.982	3.8406	+0.0023	-29 51 53.67	1.331	-0.034
η Serpentis	3.4	K0	18 16 57.745	+3.1028	-.0378	- 2 55 17.24	+0.790	-0.692
ε Sagittarii	2.0	A0	18 18 35.774	3.9814	-.0041	-34 25 31.06	1.502	-0.122
109 Herculis	3.9	K0	18 20 7.085	2.5559	+0.0139	+21 43 50.07	1.496	-0.261
α Telescopii	3.8	B3	18 20 44.715	+4.4499	-.0017	-46 0 57.43	1.744	-0.068
χ Draconis	3.7	F8	18 22 34.431	-1.0786	+0.1176	+72 41 47.81	1.599	-0.372
λ Sagittarii	2.9	K0	18 22 47.209	+3.7027	-.0083	-25 28 9.43	+1.791	-0.199
c Serpentis	5.4	G5	18 25 18.673	3.1215	+0.0015	- 2 25 25.95	2.174	-0.035
1 Aquilæ	4.1	K0	18 30 38.155	3.2646	-.0013	- 8 18 13.41	2.356	-0.315
ζ Pavonis	4.1	K0	18 33 13.415	7.0195	-.0087	-71 30 6.93	2.731	-0.165
α Lyrae (Vega)	0.1	A0	18 34 5.663	2.0314	+0.0178	+38 42 17.36	3.261	+0.280
2 Aquilæ	4.7	F0	18 37 40.531	+3.2866	+0.0020	- 9 8 1.93	+3.275	-0.006
φ Sagittarii	3.3	B8	18 40 24.515	3.7487	+0.0084	-27 4 41.31	3.510	-0.006
110 Herculis	4.3	F5	18 42 2.740	2.5804	-.0019	+20 27 54.20	3.313	-0.344
θ Aquilæ	4.5	G0	18 42 43.048	3.1829	-.0009	- 4 50 19.26	3.092	-0.023
λ Pavonis	4.4	B2	18 44 26.221	5.5658	-.0080	-62 17 6.89	3.840	-0.022
β Lyrae †	var.	B2p	18 46 58.704	+2.2147	+0.0004	+33 15 52.03	+4.075	-0.005
50 Draconis	5.4	A0	18 49 5.505	-1.9205	-.0081	+75 20 6.80	4.312	+0.051
α Draconis †	4.8	K0	18 49 57.842	+0.8881	+0.0116	+59 17 7.39	4.359	+0.023
θ Sagittarii	2.1	B3	18 50 3.394	3.7900	-.0003	-26 24 7.93	4.260	-0.075
δ Serpentis pr. †	4.5	A5	18 52 2.600	2.9622	+0.0027	+ 4 5 36.22	4.541	+0.028
R Lyrae †	var.	Mb	18 52 46.762	+1.8260	+0.0026	+43 50 5.54	+4.654	+0.078
γ Lyrae	3.3	A0	18 55 48.054	2.2435	-.0006	+32 34 24.91	4.827	-0.006
ε Aquilæ	4.2	K0	18 55 48.579	2.7221	-.0042	+14 57 11.98	4.752	-0.081
ζ Sagittarii †	2.7	A2	18 57 16.066	3.8178	-.0024	-30 0 5.20	4.938	-0.019
ζ Aquilæ	3.0	A0	19 1 32.941	2.7569	-.0008	+13 44 15.90	5.220	-0.099
λ Aquilæ	3.6	A0	19 1 47.467	+3.1834	-.0020	- 5 0 33.46	+5.257	-0.063
α Coronæ Australis	4.1	A2	19 3 45.474	4.0830	+0.0061	-38 2 11.72	5.387	-0.118
ε Lyrae	5.1	B5	19 4 18.278	2.1413	+0.0005	+35 58 4.02	5.645	-0.006
π Sagittarii	3.0	F2	19 4 46.144	3.5688	-.0005	-21 9 29.17	5.554	-0.036
φ Sagittarii	4.9	F5	19 10 23.449	3.6801	+0.0025	-25 24 8.98	6.025	-0.035
δ Draconis	3.2	K0	19 12 32.392	+0.0221	+0.0175	+67 30 49.52	+6.327	+0.068
d Sagittarii	5.0	K0	19 12 43.247	+3.5109	-.0015	-19 6 12.12	+6.238	-0.017

† Draconis, star 6=1, 30".4 n. s.
70 Ophiuchi, comp. 6=, 2".1 s.

β Lyrae, var., 12^d.9, 3=4=1, star 7=,
16". s. f.
α Draconis, star 7=6, 32".1 n. pr.

δ Serpentis, star 5=4, 22".2 s. f.
R Lyrae, var., 46^d.4, 4=0=7.
ζ Sag., binary, 3=4, 3=6, 0".5.

228 MEAN PLACES OF TEN-DAY STARS, 1916.

FOR JANUARY 0^d.975, WASHINGTON MEAN TIME.

Name of Star.	Magni- tude.	Spec- trum.	Right Ascension.	Annual Vari- ation.	Annual P. M.	Declination.	Annual Vari- ation.	Annual P. M.
			h m s	s	s	° ' "	"	"
θ Lyrae	4.5	K0	19 13 27.107	+2.0808	-.0015	+37 59 0.86	+ 6.321	+0.006
ω Aquilæ	5.1	A5	19 13 52.420	2.8158	-.0002	+11 26 35.12	6.364	+0.014
κ Cygni	4.0	K0	19 15 9.742	+1.3878	+.0072	+53 12 46.93	6.578	+0.121
τ Draconis	4.6	K0	19 17 10.673	-1.1362	-.0312	+73 11 59.63	6.733	+0.109
δ Aquilæ	3.4	F0	19 21 15.794	+3.0249	+.0168	+ 2 56 47.17	7.041	+0.081
β Cygni	3.2	K0p	19 27 20.007	+2.4189	-.0002	+27 46 56.96	+ 7.445	-0.010
ι Cygni	3.9	A2	19 27 35.322	1.5133	+.0023	+51 33 1.31	7.004	+0.129
μ Aquilæ	4.6	K0	19 29 59.182	2.9812	+.0145	+ 7 11 59.58	7.524	-0.146
h Sagittarii	4.7	B9	19 31 35.806	3.6530	+.0045	-25 4 11.96	7.772	-0.027
κ Aquilæ	5.0	B0	19 32 22.409	3.2288	+.0006	- 7 12 54.00	7.864	+0.002
ο Cygni	4.6	F5	19 34 11.354	+1.8089	-.0024	+50 1 33.80	+ 8.259	+0.250
54 Sagittarii	5.4	K0	19 35 54.728	3.4356	+.0046	-16 29 12.42	8.099	-0.047
β Sagittæ	4.4	K0	19 37 16.549	2.6939	+.0001	+17 16 50.45	8.223	-0.032
15 Cygni	5.0	K0	19 41 14.869	2.1640	+.0068	+37 9 3.39	8.611	+0.040
γ Sagittarii	5.1	K0	19 41 27.794	3.5014	-.0099	-19 57 50.06	8.499	-0.088
γ Aquilæ	2.8	K2	19 42 15.965	+2.8519	+.0007	+10 24 27.84	+ 8.648	-0.003
δ Cygni	3.0	A0	19 42 21.021	1.8760	+.0055	+44 55 30.53	8.702	+0.044
δ Sagittæ	3.8	Map	19 43 38.540	2.6748	+.0004	+18 19 34.84	8.776	+0.017
α Aquilæ (Altair)	0.9	A5	19 46 41.097	2.9271	+.0360	+ 8 38 44.21	9.376	+0.379
γ Aquilæ	var.	G0	19 48 11.663	+3.0587	+.0005	+ 0 47 21.24	9.107	-0.008
ε Draconis	4.0	K0	19 48 27.939	-0.1881	+.0170	+70 3 14.24	+ 9.164	+0.027
ι Sagittarii	4.2	K0	19 49 28.069	+4.1429	-.0017	-42 5 23.95	9.259	+0.045
ε Pavonis	4.1	A0	19 50 53.723	6.9856	+.0112	-73 8 0.88	9.206	-0.120
β Aquilæ	3.9	K0	19 51 11.228	2.9468	+.0026	+ 6 11 46.21	8.867	-0.481
γ Sagittæ	3.7	K5	19 55 1.264	2.6673	+.0041	+19 15 47.78	9.668	+0.025
ε Sagittarii	4.6	Mb	19 57 29.714	+3.6927	+.0023	-27 56 39.49	+ 9.846	+0.013
τ Aquilæ	5.6	K0	20 0 2.205	2.9306	+.0010	+ 7 2 25.31	10.055	+0.029
ο Aquilæ	3.4	A0	20 6 58.275	3.0959	+.0020	- 1 4 17.03	10.552	+0.006
ο Cygni seq.	4.0	K0p	20 10 59.242	+1.8901	+.0014	+46 29 9.86	10.848	+0.005
κ Cephei	4.4	B9	20 11 44.499	-1.9670	+.0025	+77 27 32.26	10.924	+0.028
24 Vulpeculæ	5.4	K0	20 13 11.441	+2.5673	+.0017	+24 24 42.01	+10.963	-0.012
α ² Capricorni	3.8	K0	20 13 23.716	3.3303	+.0040	-12 48 21.57	11.028	+0.008
β Capricorni	3.2	G0p	20 16 17.627	3.7372	+.0030	-15 2 50.73	11.237	+0.007
α Pavonis	2.1	B3	20 19 0.575	4.7637	.0000	-57 0 19.20	11.234	-0.092
γ Cygni	2.3	F8p	20 19 12.795	2.1527	+.0004	+39 59 14.03	11.442	+0.001
π Capricorni	5.2	B8	20 22 30.878	+3.4362	+.0004	-18 29 15.96	+11.675	-0.002
ρ Capricorni	5.0	F0	20 24 4.266	3.4245	-.0013	-18 5 31.78	11.767	-0.020
41 Cygni	4.1	F5	20 25 57.846	2.4516	+.0014	+30 5 15.56	11.919	-0.002
θ Cephei	4.3	A5	20 28 10.504	1.0116	+.0066	+62 42 41.18	12.058	-0.013
ε Delphini	4.0	B5	20 29 12.011	+2.8664	+.0007	+11 1 1.28	12.122	-0.025
Groombridge 3241	6.4	K2	20 30 22.763	-0.2394	-.0047	+72 14 49.78	+12.211	-0.018
α Indi	3.2	K0	20 31 39.731	+4.2294	+.0027	-47 35 7.61	12.371	+0.063
β Delphini	3.7	F5	20 33 36.640	2.8138	+.0082	+14 18 8.02	12.417	-0.035
υ Capricorni	5.3	M0	20 35 16.187	3.4180	-.0018	-18 26 6.01	12.550	-0.007
α Delphini	3.9	B8	20 35 44.201	2.7868	+.0047	+15 36 55.00	12.614	+0.017
β Pavonis	3.6	A5	20 37 24.239	+5.4420	-.0079	-66 30 22.61	+12.707	-0.003
α Cygni (Deneb)	1.3	A2p	20 38 34.074	2.0447	+.0004	+44 58 46.61	12.786	-0.002
δ Delphini	4.5	A2	20 39 32.244	2.8008	-.0014	+14 46 20.78	12.804	-0.050
φ Capricorni	4.3	F8	20 41 7.495	3.5565	-.0041	-25 34 24.00	12.812	-0.148
γ Delphini seq.	4.5	G5	20 42 45.661	2.7832	-.0023	+15 49 15.31	12.873	-0.196
ε Cygni	2.6	K0	20 42 48.741	+2.4275	+.0294	+33 39 18.08	+13.399	+0.326
ε Aquarii	3.8	A0	20 43 7.805	3.2492	+.0017	- 9 48 14.23	13.063	-0.030
η Cephei	3.6	K0	20 43 35.002	1.2244	+.0132	+61 30 44.08	13.943	+0.820
μ Aquarii	4.8	A3	20 48 7.468	3.2377	+.0025	- 9 17 57.56	13.383	-0.039
β Indi	3.7	K0	20 48 15.267	4.7108	+.0018	-58 46 18.40	13.421	-0.008
32 Vulpeculæ	5.2	K2	20 50 58.781	+2.5563	-.0003	+27 44 15.30	+13.610	+0.004

β Cygni, star 5=4, 34^m.7 n. f.
δ Cygni, comp. 8^m, 1^m.6 n. pr.
γ Aquilæ, var., 74.18, 3^m.7-4^m.4
ε Draconis, comp. 7^m.6, 3^m.1 n.

ο Cygni, star 5=0 pr. 19^m, 270^m n.,
star 7=3 f. 1^m, 90^m s.
κ Cephei, comp. 8^m, 7^m.5 s. f.
α² Capricor., α¹ Capricor. 4=8 pr. 24^m,
137^m n.

β Capricor., star 6=2 pr. 14^m, 10^m s.
π Capricor., comp. 9^m, 3^m.4 s. f.
ρ Capricor., comp. 7^m.6, 2^m.8 s.
β Delphini, binary 4=1, 5=4, 0^m.5
γ Delphini, comp. 5=5, 11^m.2 pr.

FOR JANUARY 0^d.975, WASHINGTON MEAN TIME.

Name of Star.	Magni- tude.	Spec- trum.	Right Ascension.	Annual Vari- ation.	Annual P. M.	Declination.	Annual Vari- ation.	Annual P. M.
			h m s	s	s	° ' "	"	"
220 H ¹ . Draconis . . .	5.6	K0	20 51 26.354	-2.6315	-.0105	+80 14 16.73	+13.610	-0.025
γ Cygni . . .	4.0	A0	20 54 2.454	+2.2356	+0.0068	+40 50 35.39	12.783	-0.018
α Octantis . . .	5.2	F2	20 54 35.039	7.3790	-.0007	-77 20 44.90	13.446	-0.389
γ Microscopii . . .	4.7	G5	20 56 8.573	3.6963	-.0004	-32 35 12.49	13.929	-0.004
δ Capricorni . . .	4.2	A0	21 1 13.626	3.3753	+0.0061	-17 34 2.73	14.184	-0.066
ε Cygni . . .	3.9	K5	21 1 52.493	+2.1813	+0.0009	+43 35 32.37	+14.298	+0.006
61 Cygni pr. . .	5.6	K5	21 3 7.780	2.6853	+3496	+38 20 8.51	17.615	+3.249
61 Cygni seq. . .	6.3	K5	Δα +1.501	.....	.....	Δδ -15.48	.....	.....
γ Aquarii . . .	4.5	K0	21 5 1.177	+3.2699	+0.0057	-11 42 44.50	14.475	-0.006
Bradley 2777 . . .	5.9	A	21 7 12.344	-1.1432	+0.0102	+77 47 9.47	14.642	+0.029
3 Piacis Australis . . .	5.6	K5	21 8 18.644	+3.5632	+0.0075	-27 57 45.42	+14.573	-0.106
ζ Cygni . . .	3.4	K0	21 9 21.624	2.5521	-.0002	+29 52 54.35	14.680	-0.061
τ Cygni . . .	3.8	F0	21 11 26.242	2.3940	+0.0141	+37 41 10.81	15.297	+0.434
α Equulei . . .	4.1	F8p	21 11 37.506	2.9992	+0.0034	+ 4 53 59.81	14.789	-0.065
σ Cygni . . .	4.3	A0p	21 14 6.946	2.3548	-.0001	+39 2 32.10	15.023	+0.003
θ ¹ Microscopii . . .	4.9	A2p	21 15 23.444	+3.8444	+0.0028	-41 9 55.14	+15.098	+0.005
α Cephei . . .	2.6	A5	21 16 34.588	1.4349	+0.0224	+62 13 45.72	15.211	+0.050
ι Capricorni . . .	4.3	K0	21 17 34.307	3.3440	+0.0022	-17 11 34.54	15.222	+0.004
1 Pegasi . . .	4.2	K0	21 18 12.090	2.7741	+0.0075	+19 26 40.38	15.318	+0.064
γ Pavonis . . .	4.3	F8	21 19 30.871	4.9996	+0.0154	-65 44 50.38	16.112	+0.784
ζ Capricorni . . .	3.9	G5p	21 21 52.463	+3.4301	+0.0004	-22 46 32.88	+15.480	+0.020
γ Cygni . . .	5.3	K0	21 26 20.928	2.2127	+0.0050	+46 10 11.31	15.812	+0.105
β Aquarii . . .	3.1	G0	21 27 8.282	3.1598	+0.0012	- 5 56 28.85	15.739	-0.011
β Cephei . . .	3.3	B1	21 27 34.947	0.7857	+0.0026	+70 11 30.44	15.779	+0.005
ε Aquarii . . .	4.8	A5	21 33 16.894	3.1956	+0.0075	- 8 13 53.34	16.053	-0.023
74 Cygni . . .	5.1	A5	21 33 34.888	+2.4034	+0.0003	+40 2 8.40	+16.101	+0.009
γ Capricorni . . .	3.8	F0p	21 35 26.349	3.3271	+0.0129	-17 2 32.07	16.171	-0.017
ε Pegasi . . .	2.5	K0	21 40 3.607	2.9461	+0.0016	+ 9 29 21.56	16.423	0.000
11 Cephei . . .	4.8	K0	21 40 41.728	0.8878	+0.0221	+70 55 27.95	16.548	+0.063
δ Capricorni . . .	3.0	A5	21 42 24.384	3.3140	+0.0176	-16 30 32.51	16.243	-0.297
π ² Cygni . . .	4.3	B3	21 43 41.324	+2.2146	+0.0009	+48 55 13.83	+16.602	-0.001
μ Capricorni . . .	5.2	F0	21 48 43.068	3.2729	+0.0204	-13 56 52.27	16.846	+0.001
γ Gruis . . .	3.2	B8	21 48 50.774	3.6408	+0.0077	-37 45 38.01	16.830	-0.021
16 Pegasi . . .	5.0	B3	21 49 14.353	2.7285	+0.0005	+25 31 46.33	16.676	+0.006
79 Draconis . . .	6.6	A0	21 51 48.529	0.7183	+0.0100	+73 18 16.99	17.006	+0.016
ε Indi . . .	4.7	K5	21 56 56.495	+4.0089	+0.4784	-57 7 54.26	+14.652	-2.573
20 Pegasi . . .	5.7	F2	21 56 59.793	2.9222	+0.0038	+12 43 1.36	17.174	-0.064
α Aquarii . . .	3.2	G0	22 1 28.213	3.0620	+0.0010	- 0 43 42.04	17.422	-0.002
ι Aquarii . . .	4.4	B8	22 1 54.120	3.2424	+0.0022	-14 16 39.78	17.381	-0.062
20 Cephei . . .	5.4	K5	22 2 27.298	1.8228	+0.0032	+62 22 31.67	17.518	+0.051
α Gruis . . .	2.2	B5	22 2 56.683	+3.7932	+0.0110	-47 22 6.74	+17.313	-0.174
ι Pegasi . . .	4.0	F5	22 3 5.985	2.7915	+0.0222	+24 56 3.68	17.514	+0.020
θ Pegasi . . .	3.7	A0	22 5 57.779	3.0267	+0.0187	+ 5 47 3.19	17.650	+0.036
π Pegasi . . .	4.4	F5	22 6 15.333	2.6627	-.0003	+32 45 56.25	17.608	-0.018
ζ Cephei . . .	3.6	K0	22 7 56.287	2.0782	+0.0018	+57 47 12.95	17.707	+0.010
24 Cephei . . .	5.0	G5	22 8 11.728	+1.1575	+0.0044	+71 55 37.91	+17.710	+0.004
θ Aquarii . . .	4.3	K0	22 12 24.128	3.1671	+0.0074	- 8 12 6.99	17.858	-0.019
α Tucanæ . . .	2.9	K2	22 12 45.362	4.1340	-.0118	-60 40 42.90	17.856	-0.035
γ Aquarii . . .	4.0	A0	22 17 19.086	3.0991	+0.0081	- 1 48 39.31	18.082	+0.015
31 Pegasi . . .	4.9	B3p	22 17 23.007	2.9530	+0.0010	+11 46 53.43	18.076	+0.007
3 Lacertæ . . .	4.6	K0	22 20 15.280	+2.3558	-.0007	+51 48 28.38	+17.988	-0.188
π Aquarii . . .	4.6	B1	22 20 59.227	3.0637	+0.0004	+ 0 57 2.49	18.203	-0.001
δ Aquarii . . .	4.9	A0	22 26 12.213	3.1770	.0000	-11 6 29.24	18.364	-0.026
α Lacertæ . . .	3.8	A0	22 27 49.732	2.4682	+0.0157	+49 51 0.97	18.460	+0.014
ν Aquarii . . .	5.3	F5	22 30 6.015	3.2849	+0.0148	-21 8 20.46	18.269	-0.154
226 B. Cephei . . .	5.7	A0	22 30 48.168	+1.0645	-.0062	+75 47 36.47	+18.546	0.000

γ Cygni, comp. 7^m, 0^h.8γ Cygni, star 6^m.7 f. 10^s, 420^h.5.β Cephei, star 8^m, 13^h.3 s. pr.

FOR JANUARY 0^d.975, WASHINGTON MEAN TIME.

Name of Star.	Magni- tude.	Spectr- um.	Right Ascension.			Annual Vari- ation.	Annual P. M.	Declination.	Annual Vari- ation.	Annual P. M.
			h	m	s	s	s	° ' "	" "	" "
η Aquarii	4.1	B8	22	31	2.420	+3.0832	+0.0057	- 0 33 2.80	+18.501	-0.033
10 Lacertæ	4.9	Oe5	22	35	29.414	2.6891	+0.0011	+38 36 45.76	18.687	-0.011
ε Piscis Australis	4.2	B8	22	36	0.724	3.3225	+0.0008	-27 28 56.21	18.703	-0.011
ζ Pegasi	3.6	B8	22	37	16.334	2.9915	+0.0054	+10 23 32.93	18.740	-0.014
β Gruis	2.2	Mb	22	37	39.444	3.5956	+0.0133	-47 19 27.71	18.739	-0.025
η Pegasi	3.1	G0	22	39	3.756	+2.8093	+0.0011	+29 46 53.28	+18.771	-0.037
λ Pegasi	4.1	K0	22	42	28.996	2.8870	+0.0037	+23 7 23.87	18.901	-0.009
ε Gruis	3.7	A2	22	43	29.198	3.6376	+0.0093	-51 45 31.65	18.880	-0.029
τ Aquarii	4.2	K5	22	45	8.778	3.1790	-0.0008	-14 2 10.37	18.953	-0.033
μ Pegasi	3.7	K0	22	45	56.855	2.8933	+0.0110	+24 9 27.86	18.966	-0.042
ι Cephei	3.7	K0	22	46	41.181	+2.1283	-0.0111	+65 45 30.08	+18.903	-0.128
λ Aquarii	3.8	Ma	22	48	13.982	3.1309	+0.0002	- 8 1 36.81	19.106	+0.035
ρ Indi	6.1	G5	22	48	49.737	4.2140	-0.0133	-70 31 22.17	19.140	+0.054
δ Aquarii	3.5	A2	22	50	11.621	3.1862	-0.0034	-16 16 4.20	19.097	-0.026
α Pisc. Aust. (Fomalhaut)	1.3	A3	22	53	0.729	3.3207	+0.0252	-30 4 4.01	19.024	-0.171
ο Andromedæ	3.6	B5p	22	58	3.161	+2.7548	+0.0020	+41 52 27.39	+19.308	-0.010
β Pegasi	† var.	Ma	22	59	42.002	2.9033	+0.0146	+27 37 36.74	19.491	+0.135
α Pegasi (Markab)	2.6	A0	23	0	34.516	2.9864	+0.0040	+14 45 11.08	19.236	-0.039
55 Pegasi	4.7	Ma	23	2	46.322	3.0209	+0.0003	+ 8 57 19.55	19.412	-0.012
ε² Aquarii	3.8	K0	23	4	58.174	3.2019	+0.0032	-21 37 43.16	19.512	+0.041
π Cephei	† 4.6	G5	23	5	13.335	+1.8997	+0.0023	+74 55 59.63	+19.443	-0.032
ι Gruis	4.1	K0	23	5	36.516	3.4067	+0.0121	-45 42 7.14	19.452	-0.031
59 Pegasi	5.2	A3	23	7	29.692	3.0278	-0.0007	+ 8 15 49.65	19.526	+0.004
5 H¹ Cassiopeiæ	5.6	K2	23	9	14.017	2.8791	+0.2535	+56 42 16.13	19.854	+0.299
φ Aquarii	4.4	Ma	23	9	58.342	3.1071	+0.0015	- 6 30 7.44	19.375	-0.194
ψ Aquarii	† 4.5	K0	23	11	29.521	+3.1448	+0.0250	- 9 32 43.58	+19.593	-0.005
γ Tucanæ	4.1	F2	23	12	32.033	3.5189	-0.0057	-58 41 48.44	19.678	+0.060
γ Piscium	3.8	K0	23	12	48.622	3.1094	+0.0502	+ 2 49 23.30	19.643	+0.021
γ Sculptoris	4.5	K0	23	14	17.440	3.2447	+0.0002	-32 59 23.46	19.582	-0.066
ο Cephei	† 4.9	G5	23	15	10.218	2.4522	+0.0113	+67 39 6.39	19.681	+0.018
τ Pegasi	4.6	A5	23	16	28.620	+2.9659	+0.0018	+23 16 49.19	+19.673	-0.012
h¹ Aquarii	4.2	K0	23	18	33.608	3.1529	-0.0099	-20 33 33.70	19.629	-0.089
4 Cassiopeiæ	5.2	K5	23	21	5.941	2.6508	-0.0004	+61 49 17.45	19.748	-0.010
υ Pegasi	4.6	G0	23	21	11.076	2.9907	+0.0134	+22 56 29.14	19.789	+0.030
κ Piscium	4.9	A2p	23	22	37.584	3.0752	+0.0056	+ 0 47 44.38	19.687	-0.063
θ Piscium	4.4	G5	23	23	42.376	+3.0420	-0.0088	+ 5 55 2.99	+19.754	-0.041
70 Pegasi	4.7	K0	23	24	54.306	3.0322	+0.0040	+12 17 49.25	19.846	+0.035
β Sculptoris	4.5	B9	23	28	28.231	3.2244	+0.0071	-38 16 59.26	19.862	+0.006
72 Pegasi (mean)	† 5.2	K2	23	29	46.957	2.9711	+0.0035	+30 51 42.00	19.862	-0.009
λ Andromedæ	4.0	K0	23	33	26.900	2.9285	+0.0158	+46 0 10.72	19.491	-0.427
ι Andromedæ	4.3	B8	23	34	0.732	+2.9351	+0.0025	+42 48 10.65	+19.916	0.000
ι Piscium	4.3	G0	23	35	37.741	3.0844	+0.0246	+ 5 10 15.28	19.496	-0.458
γ Cephei	3.4	K0	23	35	53.418	2.4395	-0.0173	+77 9 48.73	20.092	+0.157
κ Andromedæ	4.3	A0	23	36	15.986	2.9477	+0.0078	+43 52 7.22	19.914	-0.024
ω² Aquarii	4.6	A0	23	38	22.031	3.1127	+0.0063	-15 0 33.66	19.894	-0.063
ι¹ Aquarii	5.3	B8	23	39	50.782	+3.1144	+0.0019	-18 44 35.88	+19.962	-0.006
ψ Andromedæ	5.1	K0	23	41	52.003	2.9640	+0.0005	+45 57 13.62	19.975	-0.008
41 H. Cephei	5.0	A0	23	43	53.121	2.8501	+0.0024	+67 20 23.90	19.986	-0.010
δ Sculptoris	4.6	A0	23	44	33.113	3.1276	+0.0059	-28 35 42.75	19.897	-0.133
φ Pegasi	5.2	Ma	23	48	12.732	3.0482	-0.0013	+18 39 13.42	19.980	-0.039
ρ Cassiopeiæ	4.8	F8p	23	50	10.729	+2.9821	-0.0022	+57 1 55.46	+20.029	+0.002
Groombridge 4163	6.6	B9	23	50	43.583	2.8808	-0.0040	+73 56 34.20	20.024	-0.005
ω Piscium	4.0	F5	23	54	59.818	3.0796	+0.0102	+ 6 23 53.99	19.933	-0.108
ε Tucanæ	4.7	B9	23	55	33.604	3.1385	+0.0076	-66 2 39.06	20.034	-0.007
30 Piscium	4.7	Mb	23	57	39.136	3.0771	+0.0030	- 6 28 51.21	20.007	-0.037
2 Ceti	4.6	A0	23	59	26.264	+3.0752	+0.0015	-17 48 13.25	+20.032	-0.013

β Pegasi, var. irreg., 2^m 2-2^m 7
 π Cephei, comp. 7^m, 0^m 9 f.

ψ Aquarii, star 8^m 5, 49^m 4 n. pr.
 ο Cephei, comp. 8^m, 2^m 9 s. pr.

72 Pegasi, binary, 6^m 0, 6^m 0, 0^m 4

MEAN PLACES OF CIRCUMPOLAR STARS, 1916. 231

FOR JANUARY 0^d.975, WASHINGTON MEAN TIME.

Name of Star.	Magni- tude.	Spec- trum.	Right Ascension.	Annual Vari- ation.	Annual P. M.	Declination.	Annual Vari- ation.	Annual P. M.
			h m s	s	s	° ' "	"	"
43 H. Cephei . . .	4.5	K0	0 57 1.657	+ 7.6349	+ .0729	+85 48 25.87	+19.424	-0.004
α Ursæ Min. (<i>Polaris</i>) . †	2.1	F8	1 29 44.254	+28.7793	+ .1465	+88 51 25.03	+18.530	+0.002
4 G. Octantis . . .	5.6	K0	1 42 6.102	- 3.7682	+ .0086	-85 11 39.58	+18.116	+0.028
Groombridge 750 . . .	6.7	F8	4 9 44.952	+17.5996	+ .0128	+85 20 1.04	+ 9.318	+0.042
Groombridge 944 . . .	6.4	K0	5 34 54.014	+18.7661	+ .0130	+85 9 28.07	+ 2.187	-0.004
31 G. Mensæ . . .	6.2	A0	5 46 26.439	-11.6639	-.0134	-84 49 48.17	+ 1.272	+0.067
ζ Mensæ . . .	5.6	A2	6 47 3.489	- 4.9433	-.0037	-80 43 34.16	- 4.005	+0.062
51 H. Cephei . . .	5.3	Ma	7 1 34.861	+29.2025	-.0677	+87 11 0.11	- 5.356	-0.035
25 H. Camelopardalis . . .	5.1	Mb	7 13 29.477	+12.8200	+ .0132	+82 34 36.50	- 6.365	-0.047
7 G. Octantis . . .	6.4	F5	7 16 40.555	-20.2494	-.0146	-86 54 0.14	- 6.576	+0.005
Groombridge 1119 . . .	7.0	A0	8 14 48.311	+60.2322	-.0408	+88 53 11.43	-11.106	+0.017
ζ Octantis . . .	5.4	A3	9 9 6.085	- 8.1380	-.1147	-85 19 42.77	-14.683	+0.043
1 H. Draconis . . .	4.6	K0	9 25 12.930	+ 8.7932	-.0059	+81 41 57.18	-15.072	-0.027
ζ Chamæleontis . . .	5.2	B3	9 36 24.003	- 1.6644	-.0121	-80 33 50.61	-16.219	+0.019
30 H. Camelopardalis . . .	5.3	F5	10 20 57.259	+ 7.5763	-.0463	+82 59 12.27	-18.194	+0.009
η Octantis . . .	6.3	A0	10 50 55.642	- 0.3506	-.0673	-94 8 81.24	-19.306	-0.005
Bradley 1672 . . .	6.3	F0	12 14 28.053	+ 0.3686	-.0718	+86 9 56.03	-19.947	+0.066
1 Octantis . . .	5.4	K0	12 46 1.183	+ 5.9648	+ .0365	-84 40 2.72	-19.619	+0.024
32 H. Camelop. seg. . †	5.3	A2	12 48 29.976	+ 0.4406	-.0184	+83 52 10.05	-19.582	+0.016
κ Octantis . . .	5.6	A2	13 27 5.514	+ 9.0969	-.0763	-85 21 23.59	-18.630	-0.024
δ Octantis . . .	4.1	K2	14 13 18.531	+ 9.2673	-.0610	-83 17 4.27	-16.763	-0.014
Groombridge 2283 . . .	7.2	K0	15 4 0.607	-19.4646	-.0086	+87 33 24.43	-13.994	+0.031
ρ Octantis . . .	5.7	A2	15 23 43.237	+13.3505	+ .0842	-84 11 17.84	-12.554	+0.080
ε Ursæ Minoris . . .	4.4	G5	16 54 31.741	- 6.2645	+ .0057	+82 10 38.40	- 5.650	-0.001
59 G. Apodis . . .	5.9	Mb	17 15 43.730	+11.1646	+ .0086	-80 47 2.69	- 3.987	-0.039
δ Ursæ Minoris . . .	4.4	A0	17 59 20.805	-19.4980	+ .0176	+86 36 51.19	- 0.009	+0.048
χ Octantis . . .	5.2	K0	18 5 36.163	+35.7319	-.0972	-87 39 52.21	+ 0.364	-0.126
λ Ursæ Minoris . . .	6.6	Mb	19 3 51.560	-71.8229	-.1100	+89 0 56.70	+ 5.519	+0.006
σ Octantis . . .	5.5	F0	19 26 7.189	+95.2774	+ .1067	-89 13 35.99	+ 7.356	-0.001
76 Draconis . . .	5.7	A0	20 48 44.660	- 4.1628	+ .0131	+82 13 16.38	+13.486	+0.025
λ Octantis . . . †	5.4	G0p	21 38 10.025	+ 9.5240	+ .0389	-83 6 23.31	+16.315	-0.012
ν Octantis . . .	5.7	K0	22 15 56.333	+12.3385	-.0400	-86 23 45.22	+16.089	+0.074
β Octantis . . .	4.3	F0	22 37 32.703	+ 6.3165	-.0303	-81 49 21.11	+18.764	+0.002
39 H. Cephei . . .	5.6	F0	23 27 44.392	- 0.2642	+ .0638	+86 50 39.03	+19.867	+0.920
γ ¹ Octantis . . .	5.1	G5	23 47 12.813	+ 3.6130	-.0248	-82 29 8.43	+29.003	-0.012

ε Ursæ Min., star 9^m, 18^m s. pr.

32 H. Camelop., star 5^m, 19^m.8 s. pr. | λ Octantis, binary, 5=5, 8=0, 3^m.2 n. f.

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

43 H. Cephei. Mag. 4.5			α Ursæ Minoris. (Polaris.) Mag. 2.1			4 G. Octantis. Mag. 5.6			Groombridge 750. Mag. 6.7			Groombridge 944. Mag. 6.4		
Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.
Jan.	h m 0 56	° +85 48	Jan.	h m 1 29	° +88 51	Jan.	h m 1 42	° -85 11	Jan.	h m 4 9	° +85 20	Jan.	h m 5 35	° +85 9
	s "	"		s "	"		s "	"		s "	"		s "	"
0.3	60.76	52.40	0.3	51.61	51.67	0.3	13.73	52.16	0.4	61.04	20.08	0.5	14.03	39.07
1.3	60.54	52.50	1.3	50.79	51.80	1.3	13.41	52.20	1.4	60.96	20.34	1.5	14.05	39.35
2.3	60.31	52.60	2.3	49.96	51.95	2.3	13.11	52.20	2.4	60.91	20.62	2.5	14.08	39.63
3.3	60.06	52.72	3.3	49.08	52.11	3.3	12.82	52.17	3.4	60.84	20.93	3.4	14.12	39.94
4.3	59.79	52.85	4.3	48.11	52.29	4.3	12.54	52.12	4.4	60.76	21.24	4.4	14.14	40.27
5.3	59.50	52.97	5.3	47.04	52.45	5.3	12.28	52.07	5.4	60.66	21.57	5.4	14.15	40.61
6.2	59.18	53.06	6.3	45.90	52.60	6.3	12.04	52.01	6.4	60.54	21.89	6.4	14.14	40.98
7.2	58.86	53.11	7.3	44.71	52.71	7.3	11.80	51.98	7.4	60.40	22.19	7.4	14.09	41.33
8.2	58.53	53.13	8.3	43.52	52.80	8.3	11.57	51.98	8.4	60.22	22.46	8.4	14.03	41.67
9.2	58.22	53.13	9.3	42.36	52.87	9.3	11.32	51.97	9.4	60.04	22.72	9.4	13.94	42.00
10.2	57.93	53.11	10.3	41.26	52.91	10.3	11.03	51.98	10.4	59.87	22.95	10.4	13.85	42.28
11.2	57.64	53.09	11.3	40.23	52.93	11.3	10.75	51.98	11.4	59.69	23.15	11.4	13.75	42.56
12.2	57.37	53.09	12.3	39.25	52.95	12.3	10.46	51.97	12.4	59.54	23.34	12.4	13.67	42.80
13.2	57.14	53.08	13.3	38.32	52.99	13.3	10.14	51.96	13.4	59.39	23.53	13.4	13.61	43.06
14.2	56.90	53.06	14.2	37.40	53.03	14.3	9.83	51.93	14.4	59.25	23.74	14.4	13.55	43.31
15.2	56.65	53.06	15.2	36.48	53.07	15.3	9.54	51.88	15.4	59.12	23.96	15.4	13.48	43.57
16.2	56.39	53.07	16.2	35.51	53.13	16.3	9.24	51.80	16.4	58.98	24.18	16.4	13.43	43.85
17.2	56.12	53.08	17.2	34.50	53.19	17.2	8.95	51.70	17.4	58.83	24.40	17.4	13.38	44.13
18.2	55.84	53.08	18.2	33.43	53.26	18.2	8.68	51.59	18.3	58.68	24.65	18.4	13.31	44.43
19.2	55.55	53.08	19.2	32.31	53.31	19.2	8.43	51.49	19.3	58.50	24.90	19.4	13.22	44.75
20.2	55.23	53.06	20.2	31.14	53.34	20.2	8.18	51.37	20.3	58.32	25.16	20.4	13.14	45.07
21.2	54.91	53.02	21.2	29.94	53.35	21.2	7.93	51.26	21.3	58.10	25.39	21.4	13.02	45.39
22.2	54.59	52.96	22.2	28.74	53.35	22.2	7.69	51.16	22.3	57.88	25.60	22.4	12.89	45.68
23.2	54.28	52.88	23.2	27.55	53.32	23.2	7.44	51.07	23.3	57.65	25.79	23.4	12.74	45.96
24.2	53.98	52.78	24.2	26.40	53.28	24.2	7.18	51.00	24.3	57.42	25.98	24.4	12.57	46.22
25.2	53.70	52.65	25.2	25.32	53.21	25.2	6.91	50.92	25.3	57.19	26.13	25.4	12.43	46.46
26.2	53.45	52.54	26.2	24.32	53.15	26.2	6.63	50.84	26.3	56.98	26.26	26.4	12.27	46.67
27.2	53.21	52.43	27.2	23.39	53.09	27.2	6.32	50.75	27.3	56.78	26.38	27.4	12.13	46.87
28.2	52.98	52.35	28.2	22.51	53.05	28.2	6.01	50.62	28.3	56.59	26.49	28.4	12.00	47.08
29.2	52.76	52.27	29.2	21.63	53.01	29.2	5.70	50.47	29.3	56.43	26.63	29.4	11.90	47.30
30.2	52.54	52.19	30.2	20.73	53.00	30.2	5.41	50.29	30.3	56.27	26.80	30.4	11.81	47.52
31.2	52.30	52.14	31.2	19.77	52.99	31.2	5.14	50.09	31.3	56.09	26.97	31.4	11.71	47.77
13.70	+13.67		50.47	+50.46		11.95	-11.90		12.31	+12.27		11.86	+11.81	
0 ^h 57 ^m	1° 657		1 ^h 29 ^m	44° 254		1 ^h 42 ^m	6° 102		4 ^h 9 ^m	44° 952		5 ^h 34 ^m	54° 014	
+85° 48'	25'' .87		+88° 51'	25'' .03		-85° 11'	39'' .58		+85° 20'	1'' .04		+85° 9'	28'' .07	

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

Groombridge 1119. Mag. 7.0			ζ Octantis. Mag. 5.4			1 H. Draconis. Mag. 4.6			ζ Chamæleontis. Mag. 5.2			30 H. Camelop. Mag. 5.3		
Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.
Jan.	h m 8 16 s	° ' " +88 53 "	Jan.	h m 9 9 s	° ' " -85 19 "	Jan.	h m 9 25 s	° ' " +81 41 "	Jan.	h m 9 36 s	° ' " -80 33 "	Jan.	h m 10 21 s	° ' " +82 58 "
0.6	17.56	4.27	0.6	13.87	30.42	0.6	24.08	42.59	0.6	27.67	37.61	0.7	8.04	52.69
1.6	18.23	4.47	1.6	14.02	30.80	1.6	24.22	42.70	1.6	27.78	37.98	1.7	8.21	52.77
2.6	18.96	4.69	2.6	14.14	31.19	2.6	24.35	42.83	2.6	27.88	38.36	2.6	8.39	52.84
3.6	19.75	4.93	3.6	14.24	31.58	3.6	24.50	42.97	3.6	27.96	38.73	3.6	8.58	52.92
4.6	20.56	5.18	4.6	14.34	31.96	4.6	24.65	43.14	4.6	28.02	39.10	4.6	8.78	53.00
5.6	21.36	5.46	5.6	14.40	32.30	5.6	24.81	43.32	5.6	28.08	39.48	5.6	8.98	53.10
6.6	22.09	5.77	6.6	14.48	32.63	6.6	24.96	43.54	6.6	28.14	39.82	6.6	9.18	53.24
7.5	22.73	6.10	7.6	14.56	32.94	7.6	25.10	43.78	7.6	28.20	40.13	7.6	9.38	53.41
8.5	23.26	6.42	8.6	14.64	33.27	8.6	25.21	44.02	8.6	28.25	40.44	8.6	9.54	53.59
9.5	23.70	6.75	9.6	14.74	33.58	9.6	25.32	44.27	9.6	28.32	40.75	9.6	9.69	53.78
10.5	24.04	7.05	10.6	14.85	33.92	10.6	25.41	44.51	10.6	28.40	41.06	10.6	9.83	53.97
11.5	24.37	7.33	11.6	14.97	34.28	11.6	25.51	44.74	11.6	28.48	41.41	11.6	9.97	54.15
12.5	24.67	7.62	12.6	15.08	34.66	12.6	25.59	44.96	12.6	28.56	41.78	12.6	10.10	54.35
13.5	24.99	7.89	13.6	15.19	35.04	13.6	25.67	45.16	13.6	28.63	42.14	13.6	10.22	54.51
14.5	25.36	8.15	14.6	15.28	35.46	14.6	25.76	45.36	14.6	28.69	42.54	14.6	10.35	54.66
15.5	25.76	8.41	15.6	15.35	35.86	15.6	25.86	45.56	15.6	28.76	42.96	15.6	10.50	54.81
16.5	26.18	8.69	16.6	15.41	36.27	16.6	25.96	45.76	16.6	28.81	43.35	16.6	10.64	54.97
17.5	26.61	8.98	17.6	15.46	36.65	17.6	26.07	45.98	17.6	28.86	43.74	17.6	10.79	55.14
18.5	27.05	9.28	18.6	15.48	37.05	18.6	26.18	46.21	18.6	28.90	44.13	18.6	10.95	55.32
19.5	27.48	9.59	19.6	15.50	37.41	19.6	26.29	46.47	19.6	28.94	44.51	19.6	11.11	55.51
20.5	27.84	9.91	20.6	15.52	37.78	20.6	26.40	46.74	20.6	28.98	44.87	20.6	11.27	55.73
21.5	28.15	10.27	21.5	15.54	38.12	21.6	26.50	47.03	21.6	29.00	45.22	21.6	11.42	55.97
22.5	28.38	10.62	22.5	15.55	38.45	22.6	26.58	47.32	22.6	29.03	45.57	22.6	11.56	56.24
23.5	28.53	10.96	23.5	15.58	38.80	23.6	26.65	47.62	23.6	29.06	45.91	23.6	11.68	56.50
24.5	28.59	11.32	24.5	15.62	39.15	24.6	26.70	47.92	24.6	29.10	46.26	24.6	11.79	56.76
25.5	28.60	11.64	25.5	15.67	39.52	25.5	26.76	48.20	25.6	29.14	46.63	25.6	11.88	57.01
26.5	28.60	11.94	26.5	15.71	39.89	26.5	26.80	48.46	26.6	29.18	47.01	26.6	11.96	57.26
27.5	28.60	12.22	27.5	15.75	40.32	27.5	26.85	48.71	27.6	29.23	47.42	27.6	12.06	57.49
28.5	28.64	12.50	28.5	15.77	40.75	28.5	26.90	48.94	28.5	29.27	47.84	28.6	12.15	57.69
29.5	28.76	12.76	29.5	15.78	41.19	29.5	26.96	49.18	29.5	29.30	48.29	29.6	12.25	57.89
30.5	28.93	13.03	30.5	15.78	41.62	30.5	27.04	49.40	30.5	29.32	48.73	30.6	12.36	58.08
31.5	29.13	13.30	31.5	15.73	42.05	31.5	27.13	49.64	31.5	29.33	49.17	31.6	12.49	58.28
51.42	+51.41	12.27	-12.23	6.92	+6.85	6.10	-6.02	8.18	+8.12					
8 ^h 14 ^m 48 ^s .311	9 ^h 9 ^m 6 ^s .085	9 ^h 25 ^m 12 ^s .930	9 ^h 36 ^m 24 ^s .003	10 ^h 20 ^m 57 ^s .259										
+88° 53' 11".43	-85° 19' 42".77	+81° 41' 57".18	-80° 33' 50".61	+82° 59' 12".27										

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

η Octantis. Mag. 6.3			Bradley 1672. Mag. 6.3			ι Octantis. Mag. 5.4			32 H. Camelopard. seq. Mag. 5.3			κ Octantis. Mag. 5.6		
Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.
Jan.	h m	" '	Jan.	h m	" '	Jan.	h m	" '	Jan.	h m	" '	Jan.	h m	" '
	10 59	-84 8		12 14	+88 9		12 45	-84 39		12 48	+83 51		13 27	-85 21
	s	"		s	"		s	"		s	"		s	"
0.7	57.62	16.46	0.7	43.13	30.10	0.8	58.34	48.72	0.8	32.63	43.39	0.8	0.11	10.70
1.7	57.84	16.75	1.7	43.73	30.05	1.8	58.64	48.81	1.8	32.82	43.27	1.8	0.46	10.73
2.7	58.05	17.04	2.7	44.36	29.99	2.7	58.94	48.95	2.8	33.01	43.14	2.8	0.81	10.78
3.7	58.24	17.33	3.7	45.05	29.91	3.7	59.22	49.11	3.7	33.23	43.01	3.8	1.15	10.87
4.7	58.42	17.62	4.7	45.78	29.83	4.7	59.47	49.29	4.7	33.45	42.88	4.8	1.46	10.96
5.7	58.56	17.90	5.7	46.56	29.77	5.7	59.72	49.45	5.7	33.69	42.77	5.8	1.74	11.06
6.7	58.72	18.17	6.7	47.35	29.75	6.7	59.94	49.59	6.7	33.93	42.67	6.8	2.02	11.16
7.7	58.87	18.42	7.7	48.15	29.75	7.7	60.17	49.71	7.7	34.17	42.62	7.8	2.29	11.23
8.7	59.02	18.65	8.7	48.90	29.79	8.7	60.39	49.81	8.7	34.40	42.59	8.8	2.55	11.27
9.7	59.19	18.87	9.7	49.61	29.84	9.7	60.62	49.90	9.7	34.63	42.59	9.8	2.83	11.31
10.7	59.38	19.12	10.7	50.27	29.89	10.7	60.88	49.99	10.7	34.83	42.59	10.8	3.13	11.35
11.7	59.56	19.39	11.7	50.88	29.97	11.7	61.15	50.09	11.7	35.02	42.59	11.8	3.44	11.39
12.6	59.76	19.67	12.7	51.47	30.02	12.7	61.42	50.22	12.7	35.21	42.60	12.8	3.77	11.43
13.6	59.95	19.96	13.7	52.04	30.06	13.7	61.70	50.38	13.7	35.40	42.60	13.7	4.10	11.50
14.6	60.13	20.28	14.7	52.63	30.11	14.7	61.98	50.54	14.7	35.59	42.60	14.7	4.44	11.60
15.6	60.31	20.61	15.7	53.24	30.14	15.7	62.26	50.72	15.7	35.78	42.58	15.7	4.78	11.72
16.6	60.48	20.93	16.7	53.88	30.19	16.7	62.52	50.92	16.7	35.98	42.55	16.7	5.10	11.86
17.6	60.63	21.27	17.7	54.55	30.22	17.7	62.77	51.13	17.7	36.20	42.53	17.7	5.42	12.01
18.6	60.77	21.62	18.7	55.24	30.24	18.7	63.01	51.35	18.7	36.42	42.52	18.7	5.71	12.16
19.6	60.89	21.94	19.7	55.98	30.31	19.7	63.24	51.57	19.7	36.65	42.52	19.7	5.99	12.31
20.6	61.01	22.26	20.7	56.70	30.39	20.7	63.45	51.78	20.7	36.88	42.53	20.7	6.26	12.46
21.6	61.13	22.57	21.7	57.42	30.48	21.7	63.66	51.98	21.7	37.11	42.57	21.7	6.53	12.61
22.6	61.25	22.87	22.7	58.13	30.61	22.7	63.87	52.16	22.7	37.34	42.65	22.7	6.78	12.74
23.6	61.37	23.17	23.7	58.81	30.74	23.7	64.08	52.35	23.7	37.55	42.73	23.7	7.05	12.88
24.6	61.50	23.45	24.7	59.43	30.90	24.7	64.30	52.53	24.7	37.75	42.82	24.7	7.31	13.01
25.6	61.64	23.77	25.7	60.01	31.07	25.7	64.54	52.71	25.7	37.95	42.93	25.7	7.61	13.12
26.6	61.79	24.10	26.7	60.54	31.24	26.7	64.79	52.90	26.7	38.12	43.03	26.7	7.92	13.25
27.6	61.94	24.46	27.7	61.05	31.38	27.7	65.06	53.12	27.7	38.30	43.13	27.7	8.25	13.41
28.6	62.09	24.83	28.7	61.54	31.50	28.7	65.33	53.38	28.7	38.47	43.19	28.7	8.58	13.59
29.6	62.23	25.22	29.7	62.07	31.61	29.7	65.57	53.66	29.7	38.64	43.24	29.7	8.91	13.80
30.6	62.35	25.63	30.7	62.63	31.71	30.7	65.82	53.95	30.7	38.82	43.29	30.7	9.22	14.04
31.6	62.45	26.04	31.6	63.24	31.81	31.7	66.05	54.26	31.7	39.03	43.35	31.7	9.52	14.29
9.79	-9.74		31.12	+31.10		10.75	-10.71		9.35	+9.30		12.34	-12.30	
10 ^h 59 ^m 55 ^s .642			12 ^h 14 ^m 28 ^s .053			12 ^h 46 ^m 1 ^s .183			12 ^h 48 ^m 29 ^s .976			13 ^h 27 ^m 5 ^s .514		
-84° 8' 31".24			+88° 9' 56".03			-84° 40' 2".72			+83° 52' 10".05			-85° 21' 23".59		

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

δ Octantis. Mag. 4.1			Groombridge 2283. Mag. 7.2			ρ Octantis. Mag. 5.7			ϵ Ursæ Minoris. Mag. 4.4			59 G. Apodis. Mag. 5.9		
Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.
	h m	s		h m	s		h m	s		h m	s		h m	s
Jan.	14 13	-83 16	Jan.	15 3	+87 32	Jan.	15 23	-84 11	Jan.	16 54	+82 10	Jan.	17 15	-80 46
0.8	13.64	53.26	0.8	42.15	60.59	0.9	35.54	10.31	0.9	21.80	22.92	0.9	38.26	62.20
1.8	13.89	53.23	1.8	42.43	60.33	1.9	35.80	10.13	1.9	21.85	22.61	1.9	38.38	61.90
2.8	14.13	53.21	2.8	42.72	60.06	2.9	36.06	10.01	2.9	21.88	22.27	2.9	38.51	61.63
3.8	14.37	53.22	3.8	43.03	59.79	3.9	36.32	9.89	3.9	21.92	21.91	3.9	38.64	61.38
4.8	14.59	53.26	4.8	43.38	59.51	4.9	36.57	9.81	4.9	21.97	21.55	4.9	38.76	61.15
5.8	14.83	53.30	5.8	43.78	59.22	5.8	36.81	9.74	5.9	22.02	21.18	5.9	38.88	60.93
6.8	15.01	53.31	6.8	44.21	58.96	6.8	37.02	9.66	6.9	22.10	20.81	6.9	38.99	60.72
7.8	15.21	53.33	7.8	44.66	58.71	7.8	37.22	9.58	7.9	22.18	20.46	7.9	39.09	60.55
8.8	15.39	53.31	8.8	45.14	58.49	8.8	37.43	9.47	8.9	22.27	20.13	8.9	39.18	60.33
9.8	15.58	53.28	9.8	45.59	58.31	9.8	37.63	9.35	9.9	22.35	19.81	9.9	39.26	60.08
10.8	15.79	53.25	10.8	46.03	58.14	10.8	37.85	9.23	10.9	22.44	19.53	10.9	39.36	59.81
11.8	16.01	53.23	11.8	46.42	57.98	11.8	38.08	9.08	11.9	22.53	19.26	11.9	39.45	59.54
12.8	16.24	53.21	12.8	46.84	57.84	12.8	38.33	8.94	12.9	22.62	19.00	12.9	39.57	59.26
13.8	16.48	53.21	13.8	47.23	57.69	13.8	38.59	8.82	13.9	22.70	18.74	13.9	39.70	58.99
14.8	16.71	53.24	14.8	47.60	57.52	14.8	38.86	8.71	14.9	22.78	18.47	14.9	39.84	58.73
15.8	16.96	53.27	15.8	47.99	57.35	15.8	39.13	8.63	15.9	22.86	18.20	15.9	39.97	58.49
16.8	17.19	53.33	16.8	48.39	57.17	16.8	39.40	8.57	16.9	22.94	17.92	16.9	40.11	58.28
17.8	17.43	53.41	17.8	48.82	56.99	17.8	39.67	8.54	17.9	23.03	17.61	17.9	40.26	58.08
18.8	17.66	53.49	18.8	49.27	56.80	18.8	39.92	8.52	18.9	23.12	17.30	18.9	40.40	57.88
19.8	17.86	53.58	19.8	49.75	56.62	19.8	40.17	8.50	19.9	23.23	16.99	19.9	40.54	57.72
20.8	18.06	53.68	20.8	50.25	56.45	20.8	40.41	8.48	20.9	23.34	16.69	20.9	40.67	57.56
21.8	18.26	53.77	21.8	50.77	56.30	21.8	40.64	8.45	21.9	23.46	16.40	21.9	40.79	57.40
22.8	18.45	53.86	22.8	51.30	56.16	22.8	40.85	8.42	22.9	23.58	16.12	22.9	40.91	57.23
23.8	18.64	53.91	23.8	51.83	56.05	23.8	41.09	8.39	23.9	23.71	15.87	23.9	41.03	57.04
24.8	18.84	53.96	24.8	52.34	55.97	24.8	41.31	8.33	24.9	23.83	15.62	24.9	41.15	56.85
25.7	19.05	54.02	25.8	52.83	55.90	25.8	41.56	8.26	25.9	23.96	15.41	25.9	41.27	56.65
26.7	19.29	54.07	26.8	53.28	55.83	26.8	41.82	8.21	26.9	24.07	15.20	26.9	41.40	56.43
27.7	19.53	54.14	27.8	53.72	55.77	27.8	42.09	8.17	27.9	24.18	15.02	27.9	41.55	56.20
28.7	19.78	54.26	28.8	54.13	55.72	28.8	42.38	8.13	28.9	24.29	14.83	28.9	41.72	55.99
29.7	20.03	54.39	29.8	54.53	55.62	29.8	42.69	8.13	29.8	24.40	14.61	29.9	41.89	55.80
30.7	20.28	54.57	30.8	54.97	55.50	30.8	42.99	8.17	30.8	24.52	14.38	30.9	42.06	55.63
31.7	20.51	54.74	31.8	55.42	55.37	31.8	43.28	8.22	31.8	24.64	14.13	31.9	42.24	55.50
8.55	-8.49		23.39	+23.36		9.87	-9.82		7.34	+7.27		6.24	-6.16	
14 ^h 13 ^m 18 ^s .531			15 ^h 3 ^m 0 ^s .607			15 ^h 23 ^m 43 ^s .237			16 ^h 54 ^m 31 ^s .741			17 ^h 15 ^m 43 ^s .730		
-83° 17' 4''.27			+87° 33' 24''.43			-84° 11' 17''.84			+82° 10' 38''.40			-80° 47' 2''.69		

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

δ Ursæ Minoris. Mag. 4.4			χ Octantis. Mag. 5.2			λ Ursæ Minoris. Mag. 6.6			σ Octantis. Mag. 5.5			76 Draconis. Mag. 5.7		
Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.
Jan.	h m	° ' "	Jan.	h m	° ' "	Jan.	h m	° ' "	Jan.	h m	° ' "	Jan.	h m	° ' "
	17 58	+86 36		18 5	-87 39		19 2	+89 0		19 25	-89 13		20 48	+82 13
	s	"		s	"		s	"		s	"		s	"
0.9	52.98	42.45	0.9	12.67	54.70	1.0	8.38	55.32	1.0	3.13	43.37	1.1	33.38	26.77
1.9	52.94	42.13	1.9	12.95	54.34	2.0	7.93	55.06	2.0	3.31	42.95	2.1	33.28	26.57
2.9	52.91	41.81	2.9	13.28	54.00	3.0	7.43	54.77	3.0	3.63	42.56	3.1	33.18	26.36
3.9	52.86	41.47	3.9	13.63	53.68	4.0	6.91	54.45	4.0	4.05	42.18	4.1	33.07	26.13
4.9	52.84	41.10	4.9	13.98	53.39	5.0	6.41	54.11	5.0	4.51	41.86	5.1	32.96	25.87
5.9	52.84	40.74	5.9	14.32	53.10	6.0	5.99	53.75	6.0	4.95	41.52	6.1	32.85	25.31
6.9	52.87	40.35	6.9	14.61	52.83	6.9	5.66	53.39	7.0	5.30	41.21	7.1	32.74	25.29
7.9	52.92	39.97	7.9	14.87	52.57	7.9	5.45	53.03	8.0	5.57	40.92	8.1	32.65	24.95
8.9	53.01	39.62	8.9	15.11	52.28	8.9	5.35	52.66	9.0	5.76	40.59	9.1	32.56	24.64
9.9	53.11	39.30	9.9	15.35	51.98	9.9	5.34	52.33	10.0	5.89	40.26	10.1	32.49	24.34
10.9	53.23	38.99	10.9	15.60	51.67	10.9	5.37	52.02	11.0	6.03	39.90	11.1	32.43	24.03
11.9	53.33	38.70	11.9	15.87	51.33	11.9	5.41	51.72	12.0	6.22	39.52	12.1	32.37	23.74
12.9	53.43	38.42	12.9	16.17	50.99	12.9	5.42	51.43	12.9	6.48	39.12	13.1	32.32	23.47
13.9	53.52	38.14	13.9	16.52	50.64	13.9	5.40	51.14	13.9	6.86	38.73	14.1	32.26	23.20
14.9	53.60	37.86	14.9	16.89	50.30	14.9	5.36	50.85	14.9	7.34	38.34	15.0	32.21	22.94
15.9	53.68	37.57	15.9	17.30	49.98	15.9	5.28	50.55	15.9	7.92	37.96	16.0	32.16	22.69
16.9	53.77	37.26	16.9	17.72	49.69	16.9	5.21	50.23	16.9	8.60	37.60	17.0	32.09	22.43
17.9	53.85	36.94	17.9	18.15	49.40	17.9	5.13	49.90	17.9	9.33	37.23	18.0	32.02	22.13
18.9	53.95	36.60	18.9	18.59	49.15	18.9	5.09	49.58	18.9	10.08	36.88	19.0	31.96	21.82
19.9	54.07	36.25	19.9	19.02	48.91	19.9	5.09	49.24	19.9	10.84	36.57	20.0	31.90	21.50
20.9	54.21	35.90	20.9	19.42	48.67	20.9	5.15	48.88	20.9	11.56	36.28	21.0	31.83	21.14
21.9	54.37	35.56	21.9	19.81	48.43	21.9	5.31	48.52	21.9	12.25	35.97	22.0	31.77	20.78
22.9	54.55	35.22	22.9	20.18	48.18	22.9	5.55	48.17	22.9	12.88	35.65	23.0	31.73	20.42
23.9	54.75	34.91	23.9	20.54	47.92	23.9	5.87	47.83	23.9	13.46	35.33	24.0	31.70	20.07
24.9	54.95	34.62	24.9	20.91	47.67	24.9	6.25	47.51	24.9	14.02	34.99	25.0	31.68	19.75
25.9	55.16	34.34	25.9	21.28	47.39	25.9	6.64	47.22	25.9	14.60	34.64	26.0	31.67	19.43
26.9	55.35	34.11	26.9	21.69	47.07	26.9	7.04	46.94	26.9	15.24	34.28	27.0	31.66	19.13
27.9	55.54	33.88	27.9	22.14	46.77	27.9	7.39	46.66	27.9	16.01	33.91	28.0	31.64	18.84
28.9	55.70	33.65	28.9	22.66	46.48	28.9	7.66	46.38	28.9	16.91	33.52	29.0	31.63	18.57
29.9	55.85	33.40	29.9	23.21	46.21	29.9	7.88	46.11	29.9	17.97	33.15	30.0	31.62	18.31
30.9	56.00	33.15	30.9	23.79	45.96	30.9	8.06	45.84	30.9	19.16	32.80	31.0	31.58	18.02
31.9	56.17	32.87	31.9	24.37	45.76	31.9	8.24	45.54	31.9	20.40	32.46	32.0	31.54	17.70
16.91	+16.88		24.53	-24.51		58.11	+58.11		74.14	-74.14		7.39	+7.32	
17 ^h 59 ^m 20 ^s .805			18 ^h 5 ^m 36 ^s .163			19 ^h 3 ^m 51 ^s .560			19 ^h 26 ^m 7 ^s .189			20 ^h 48 ^m 44 ^s .660		
+86° 36' 51".19			-87° 39' 52".21			+89° 0' 56".70			-89° 13' 35".99			+82° 13' 16".38		

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

λ Octantis. Mag. 5.4			ν Octantis. Mag. 5.7			β Octantis. Mag. 4.3			39 H. Cephei. Mag. 5.6			γ^1 Octantis. Mag. 5.1		
Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.
Jan.	h m	° '	Jan.	h m	° '	Jan.	h m	° '	Jan.	h m	° '	Jan.	h m	° '
	21 38	-83 6		22 15	-86 23		22 37	-81 49		23 27	+86 50		23 47	-82 29
	s	"		s	"		s	"		s	"		s	"
1.1	6.92	36.69	1.1	52.12	59.54	1.2	31.91	35.75	1.2	30.51	62.88	1.2	14.19	23.41
2.1	6.83	36.35	2.1	51.87	59.21	2.2	31.80	35.48	2.2	30.17	62.87	2.2	14.03	23.23
3.1	6.76	36.01	3.1	51.66	58.88	3.2	31.70	35.19	3.2	29.81	62.86	3.2	13.88	23.03
4.1	6.71	35.67	4.1	51.48	58.56	4.2	31.61	34.89	4.2	29.41	62.86	4.2	13.75	22.81
5.1	6.66	35.34	5.1	51.33	58.25	5.2	31.53	34.64	5.2	29.00	62.84	5.2	13.62	22.61
6.1	6.62	35.05	6.1	51.17	57.97	6.1	31.46	34.39	6.2	28.56	62.78	6.2	13.50	22.41
7.1	6.57	34.78	7.1	51.01	57.72	7.1	31.39	34.14	7.2	28.13	62.68	7.2	13.39	22.25
8.1	6.50	34.50	8.1	50.83	57.47	8.1	31.30	33.92	8.2	27.69	62.58	8.2	13.26	22.10
9.1	6.42	34.24	9.1	50.64	57.21	9.1	31.22	33.71	9.2	27.30	62.46	9.2	13.12	21.96
10.1	6.34	33.95	10.1	50.42	56.94	10.1	31.11	33.48	10.2	26.93	62.33	10.2	12.97	21.80
11.1	6.25	33.64	11.1	50.19	56.66	11.1	31.00	33.24	11.2	26.59	62.20	11.2	12.82	21.63
12.1	6.16	33.31	12.1	49.95	56.38	12.1	30.88	32.97	12.2	26.27	62.07	12.2	12.66	21.46
13.1	6.07	32.98	13.1	49.72	56.06	13.1	30.77	32.70	13.2	25.98	61.95	13.2	12.50	21.27
14.1	6.00	32.63	14.1	49.50	55.72	14.1	30.67	32.40	14.2	25.68	61.83	14.2	12.34	21.04
15.1	5.94	32.26	15.1	49.31	55.38	15.1	30.57	32.08	15.2	25.36	61.73	15.2	12.20	20.81
16.1	5.89	31.89	16.1	49.13	55.04	16.1	30.48	31.77	16.2	25.04	61.63	16.2	12.05	20.57
17.1	5.85	31.53	17.1	48.99	54.69	17.1	30.41	31.44	17.2	24.69	61.52	17.2	11.92	20.33
18.1	5.83	31.16	18.1	48.87	54.33	18.1	30.36	31.11	18.2	24.33	61.42	18.2	11.81	20.06
19.1	5.82	30.82	19.1	48.76	54.00	19.1	30.30	30.81	19.1	23.96	61.29	19.2	11.70	19.80
20.1	5.80	30.48	20.1	48.66	53.67	20.1	30.25	30.52	20.1	23.59	61.12	20.2	11.60	19.55
21.1	5.78	30.17	21.1	48.55	53.34	21.1	30.20	30.22	21.1	23.21	60.96	21.2	11.49	19.31
22.1	5.75	29.85	22.1	48.45	53.05	22.1	30.14	29.93	22.1	22.84	60.76	22.2	11.39	19.09
23.1	5.72	29.53	23.1	48.33	52.74	23.1	30.08	29.64	23.1	22.50	60.56	23.2	11.28	18.85
24.1	5.68	29.24	24.1	48.20	52.45	24.1	30.01	29.37	24.1	22.16	60.34	24.1	11.16	18.64
25.1	5.64	28.92	25.1	48.04	52.13	25.1	29.92	29.08	25.1	21.87	60.12	25.1	11.03	18.41
26.1	5.60	28.55	26.1	47.86	51.79	26.1	29.84	28.78	26.1	21.59	59.90	26.1	10.89	18.18
27.1	5.54	28.19	27.1	47.71	51.43	27.1	29.75	28.44	27.1	21.35	59.70	27.1	10.75	17.91
28.1	5.50	27.80	28.1	47.57	51.05	28.1	29.68	28.08	28.1	21.11	59.50	28.1	10.62	17.63
29.0	5.49	27.38	29.1	47.47	50.63	29.1	29.62	27.70	29.1	20.88	59.33	29.1	10.49	17.30
30.0	5.49	26.96	30.1	47.38	50.23	30.1	29.57	27.31	30.1	20.61	59.18	30.1	10.38	16.98
31.0	5.51	26.56	31.1	47.33	49.81	31.1	29.54	26.92	31.1	20.33	59.03	31.1	10.29	16.64
32.0	5.54	26.17	32.1	47.31	49.41	32.1	29.53	26.52	32.1	20.02	58.85	32.1	10.20	16.28
8.33	-8.27		15.92	-15.89		7.03	-6.96		18.20	+18.17		7.65	-7.58	
21 ^h 38 ^m 10 ^s .025			22 ^h 15 ^m 56 ^s .333			22 ^h 37 ^m 32 ^s .703			23 ^h 27 ^m 44 ^s .392			23 ^h 47 ^m 12 ^s .813		
-83° 6' 23".31			-86° 23' 45".22			-81° 49' 21".11			+86° 50' 39".03			-82° 29' 8".43		

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

43 H. Cephei. Mag. 4.5			α Ursæ Minoris. (Polaris.) Mag. 2.1			4 G. Octantis. Mag. 5.6			Groombridge 750. Mag. 6.7			Groombridge 944. Mag. 6.4		
Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.
	h m	s		h m	s		h m	s		h m	s		h m	s
Feb.	0 56	+85 48	Feb.	1 28	+88 51	Feb.	1 41	-85 11	Feb.	4 9	+85 20	Feb.	5 35	+85 9
	s	"		s	"		s	"		s	"		s	"
0.2	52.30	52.14	0.2	79.77	52.99	0.2	65.14	50.09	0.3	56.09	26.97	0.4	11.71	47.77
1.2	52.03	52.08	1.2	78.73	52.99	1.2	64.89	49.87	1.3	55.91	27.16	1.4	11.59	48.04
2.2	51.74	52.00	2.2	77.61	52.94	2.2	64.66	49.65	2.3	55.69	27.35	2.4	11.45	48.31
3.2	51.44	51.90	3.2	76.44	52.89	3.2	64.43	49.45	3.3	55.46	27.52	3.4	11.29	48.58
4.2	51.14	51.77	4.2	75.26	52.82	4.2	64.20	49.27	4.3	55.19	27.68	4.4	11.11	48.85
5.2	50.85	51.61	5.2	74.11	52.72	5.2	63.98	49.09	5.3	54.93	27.83	5.4	10.91	49.09
6.2	50.57	51.42	6.2	73.02	52.58	6.2	63.74	48.94	6.3	54.65	27.92	6.4	10.71	49.29
7.2	50.32	51.22	7.2	72.01	52.44	7.2	63.48	48.79	7.3	54.40	28.00	7.4	10.50	49.48
8.2	50.08	51.03	8.2	71.09	52.31	8.2	63.21	48.64	8.3	54.16	28.05	8.3	10.29	49.64
9.2	49.88	50.84	9.2	70.22	52.16	9.2	62.93	48.47	9.3	53.93	28.09	9.3	10.10	49.79
10.2	49.68	50.66	10.2	69.38	52.01	10.2	62.65	48.28	10.3	53.70	28.14	10.3	9.91	49.94
11.1	49.49	50.50	11.2	68.55	51.89	11.2	62.38	48.07	11.3	53.49	28.20	11.3	9.75	50.08
12.1	49.29	50.34	12.2	67.71	51.75	12.2	62.10	47.85	12.3	53.28	28.26	12.3	9.58	50.24
13.1	49.08	50.19	13.2	66.83	51.65	13.2	61.86	47.59	13.3	53.06	28.35	13.3	9.41	50.41
14.1	48.85	50.03	14.2	65.91	51.52	14.2	61.62	47.35	14.3	52.84	28.43	14.3	9.25	50.60
15.1	48.61	49.85	15.2	64.95	51.40	15.2	61.39	47.08	15.3	52.61	28.54	15.3	9.07	50.80
16.1	48.37	49.68	16.2	63.95	51.26	16.2	61.17	46.80	16.3	52.36	28.62	16.3	8.87	50.99
17.1	48.13	49.50	17.2	62.93	51.14	17.2	60.98	46.56	17.3	52.10	28.69	17.3	8.66	51.18
18.1	47.88	49.29	18.2	61.90	50.97	18.2	60.78	46.31	18.3	51.83	28.76	18.3	8.43	51.37
19.1	47.63	49.06	19.1	60.89	50.77	19.2	60.58	46.06	19.3	51.54	28.81	19.3	8.19	51.55
20.1	47.38	48.82	20.1	59.91	50.57	20.2	60.37	45.83	20.3	51.25	28.82	20.3	7.98	51.69
21.1	47.18	48.55	21.1	59.01	50.34	21.2	60.15	45.61	21.3	50.96	28.83	21.3	7.70	51.79
22.1	46.98	48.28	22.1	58.19	50.09	22.2	59.92	45.38	22.3	50.69	28.80	22.3	7.42	51.87
23.1	46.82	48.02	23.1	57.47	49.87	23.1	59.68	45.15	23.2	50.45	28.76	23.3	7.20	51.97
24.1	46.67	47.77	24.1	56.82	49.64	24.1	59.43	44.92	24.2	50.22	28.72	24.3	6.98	52.04
25.1	46.54	47.54	25.1	56.21	49.45	25.1	59.18	44.64	25.2	50.00	28.67	25.3	6.79	52.11
26.1	46.41	47.33	26.1	55.57	49.26	26.1	58.93	44.31	26.2	49.80	28.67	26.3	6.60	52.18
27.1	46.26	47.15	27.1	54.90	49.08	27.1	58.70	43.99	27.2	49.60	28.65	27.3	6.42	52.28
28.1	46.09	46.95	28.1	54.16	48.94	28.1	58.51	43.65	28.2	49.37	28.69	28.3	6.23	52.39
29.1	45.92	46.74	29.1	53.35	48.77	29.1	58.32	43.31	29.2	49.15	28.69	29.3	6.04	52.52
30.1	45.72	46.51	30.1	52.50	48.57	30.1	58.17	42.99	30.2	48.88	28.71	30.3	5.81	52.65
31.1	45.51	46.26	31.1	51.63	48.34	31.1	58.01	42.66	31.2	48.62	28.70	31.3	5.57	52.78
13.70	+13.66		50.45	+50.44		11.94	-11.90		12.31	+12.27		11.86	+11.82	
0 ^h 57 ^m	1 ^s .657		1 ^h 29 ^m	44 ^s .254		1 ^h 42 ^m	6 ^s .102		4 ^h 9 ^m	44 ^s .952		5 ^h 34 ^m	54 ^s .014	
+85° 48'	25'''.87		+88° 51'	25'''.03		-85° 11'	39'''.58		+85° 20'	1'''.04		+85° 9'	28'''.07	

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

31 G. Mensæ. Mag. 6.2			ζ Mensæ. Mag. 5.6			51 H. Cephei. Mag. 5.3			25 H. Camelop. Mag. 5.1			7 G. Octantis. Mag. 6.4		
Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.
Feb.	h m ° '		Feb.	h m ° '		Feb.	h m ° '		Feb.	h m ° '		Feb.	h m ° '	
	5 46 -84 49			6 47 -80 43			7 2 +87 11			7 13 +82 34			7 16 -86 54	
	s "			s "			s "			s "			s "	
0.4	33.18	55.82	0.4	8.47	39.94	0.4	12.56	10.87	0.4	44.78	45.40	0.4	53.69	4.25
1.4	32.93	56.01	1.4	8.37	40.22	1.4	12.51	11.19	1.4	44.77	45.72	1.4	53.37	4.55
2.4	32.69	56.20	2.4	8.27	40.49	2.4	12.43	11.52	2.4	44.76	46.04	2.4	53.08	4.84
3.4	32.46	56.35	3.4	8.16	40.73	3.4	12.31	11.86	3.4	44.73	46.38	3.4	52.80	5.12
4.4	32.24	56.52	4.4	8.06	40.97	4.4	12.15	12.19	4.4	44.68	46.71	4.4	52.53	5.38
5.4	32.03	56.71	5.4	7.97	41.24	5.4	11.94	12.50	5.4	44.62	47.01	5.4	52.29	5.66
6.4	31.81	56.92	6.4	7.87	41.51	6.4	11.71	12.79	6.4	44.53	47.30	6.4	52.05	5.97
7.4	31.59	57.14	7.4	7.79	41.82	7.4	11.48	13.06	7.4	44.44	47.57	7.4	51.82	6.28
8.4	31.37	57.36	8.4	7.69	42.13	8.4	11.23	13.31	8.4	44.37	47.81	8.4	51.57	6.61
9.4	31.14	57.59	9.4	7.58	42.44	9.4	11.00	13.56	9.4	44.29	48.04	9.4	51.30	6.96
10.4	30.89	57.81	10.4	7.48	42.76	10.4	10.79	13.78	10.4	44.22	48.27	10.4	51.02	7.30
11.3	30.62	58.04	11.4	7.37	43.08	11.4	10.59	14.01	11.4	44.17	48.49	11.4	50.71	7.63
12.3	30.35	58.24	12.4	7.24	43.36	12.4	10.41	14.24	12.4	44.11	48.73	12.4	50.38	7.95
13.3	30.08	58.40	13.4	7.12	43.62	13.4	10.22	14.49	13.4	44.05	48.97	13.4	50.03	8.25
14.3	29.81	58.55	14.4	7.00	43.87	14.4	10.04	14.76	14.4	44.00	49.24	14.4	49.67	8.54
15.3	29.54	58.70	15.4	6.87	44.10	15.4	9.84	15.02	15.4	43.94	49.50	15.4	49.31	8.81
16.3	29.27	58.81	16.4	6.74	44.31	16.4	9.62	15.30	16.4	43.86	49.79	16.4	48.95	9.06
17.3	29.02	58.91	17.4	6.62	44.51	17.4	9.39	15.59	17.4	43.78	50.08	17.4	48.60	9.29
18.3	28.77	59.02	18.4	6.50	44.71	18.4	9.11	15.87	18.4	43.70	50.35	18.4	48.26	9.54
19.3	28.52	59.13	19.4	6.38	44.91	19.4	8.80	16.14	19.4	43.59	50.63	19.4	47.93	9.77
20.3	28.28	59.26	20.4	6.26	45.13	20.4	8.48	16.39	20.4	43.47	50.87	20.4	47.61	10.02
21.3	28.04	59.41	21.4	6.16	45.36	21.4	8.14	16.62	21.4	43.34	51.12	21.4	47.29	10.26
22.3	27.78	59.55	22.4	6.03	45.60	22.4	7.79	16.81	22.4	43.22	51.32	22.4	46.98	10.54
23.3	27.51	59.73	23.4	5.90	45.85	23.4	7.45	17.01	23.4	43.09	51.52	23.4	46.65	10.83
24.3	27.24	59.89	24.4	5.78	46.11	24.4	7.13	17.17	24.4	43.00	51.69	24.4	46.29	11.13
25.3	26.95	60.03	25.4	5.64	46.36	25.4	6.85	17.32	25.4	42.89	51.84	25.4	45.91	11.42
26.3	26.66	60.13	26.4	5.50	46.61	26.4	6.60	17.49	26.4	42.80	52.01	26.4	45.49	11.71
27.3	26.34	60.26	27.3	5.35	46.81	27.4	6.35	17.68	27.4	42.72	52.20	27.4	45.06	11.95
28.3	26.03	60.35	28.3	5.20	46.99	28.4	6.11	17.87	28.4	42.65	52.42	28.4	44.60	12.19
29.3	25.74	60.39	29.3	5.05	47.15	29.4	5.84	18.10	29.4	42.57	52.64	29.4	44.17	12.38
30.3	25.45	60.41	30.3	4.90	47.29	30.3	5.54	18.33	30.4	42.47	52.88	30.4	43.73	12.55
31.3	25.17	60.44	31.3	4.76	47.42	31.3	5.21	18.56	31.4	42.34	53.11	31.4	43.32	12.73
11.10	-11.06		6.21	-6.13		20.38	+20.36		7.74	+7.68		18.51	-18.48	
5 ^h 46 ^m	26° 43' 49"		6 ^h 47 ^m	3° 48' 16"		7 ^h 1 ^m	34° 8' 56"		7 ^h 13 ^m	29° 47' 57"		7 ^h 16 ^m	40° 55' 55"	
-84° 49'	48'' 17		-80° 43'	34'' 16		+87° 11'	0'' 11		+82° 34'	36'' 50		-86° 54'	0'' 14	

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

Groombridge 1119. Mag. 7.0			ζ Octantis. Mag. 5.4			1 H. Draconis. Mag. 4.6			ζ Chamaleontis. Mag. 5.2			30 H. Camelop. Mag. 5.3		
Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.
	h m	° ' "		h m	° ' "		h m	° ' "		h m	° ' "		h m	° ' "
Feb.	8 16	+88 53	Feb.	9 9	-85 18	Feb.	9 25	+81 41	Feb.	9 36	-80 33	Feb.	10 21	+82 58
	s	"		s	"		s	"		s	"		s	"
0.5	29.13	13.30	0.5	15.73	42.05	0.5	27.13	49.64	0.5	29.33	49.17	0.6	12.49	58.28
1.5	29.33	13.62	1.5	15.68	42.44	1.5	27.21	49.92	1.5	29.34	49.59	1.6	12.62	58.51
2.5	29.49	13.96	2.5	15.61	42.82	2.5	27.29	50.22	2.5	29.33	49.97	2.6	12.76	58.77
3.5	29.56	14.32	3.5	15.56	43.19	3.5	27.35	50.54	3.5	29.32	50.35	3.6	12.87	59.05
4.5	29.53	14.68	4.5	15.51	43.52	4.5	27.40	50.86	4.5	29.32	50.72	4.6	12.97	59.34
5.5	29.38	15.02	5.5	15.47	43.88	5.5	27.43	51.19	5.5	29.31	51.07	5.6	13.06	59.64
6.5	29.16	15.36	6.5	15.45	44.24	6.5	27.45	51.51	6.5	29.32	51.44	6.6	13.12	59.95
7.5	28.88	15.67	7.5	15.43	44.61	7.5	27.45	51.81	7.5	29.33	51.80	7.6	13.18	60.25
8.5	28.58	15.95	8.5	15.42	45.00	8.5	27.46	52.11	8.5	29.35	52.20	8.5	13.22	60.53
9.5	28.28	16.23	9.5	15.40	45.42	9.5	27.47	52.39	9.5	29.36	52.61	9.5	13.26	60.80
10.5	28.02	16.51	10.5	15.35	45.83	10.5	27.47	52.66	10.5	29.37	53.03	10.5	13.31	61.07
11.5	27.78	16.78	11.5	15.31	46.26	11.5	27.50	52.93	11.5	29.37	53.45	11.5	13.37	61.31
12.4	27.58	17.05	12.5	15.24	46.65	12.5	27.52	53.20	12.5	29.36	53.88	12.5	13.43	61.58
13.4	27.40	17.33	13.5	15.15	47.06	13.5	27.54	53.47	13.5	29.35	54.30	13.5	13.51	61.85
14.4	27.22	17.62	14.5	15.06	47.45	14.5	27.57	53.76	14.5	29.33	54.72	14.5	13.57	62.13
15.4	27.03	17.94	15.5	14.95	47.83	15.5	27.59	54.06	15.5	29.30	55.11	15.5	13.64	62.41
16.4	26.81	18.27	16.5	14.84	48.20	16.5	27.62	54.38	16.5	29.26	55.50	16.5	13.71	62.70
17.4	26.54	18.59	17.5	14.72	48.55	17.5	27.64	54.70	17.5	29.23	55.87	17.5	13.77	63.02
18.4	26.18	18.93	18.5	14.61	48.88	18.5	27.64	55.02	18.5	29.19	56.22	18.5	13.82	63.35
19.4	25.74	19.28	19.5	14.51	49.21	19.5	27.64	55.36	19.5	29.16	56.59	19.5	13.86	63.67
20.4	25.25	19.59	20.5	14.42	49.54	20.5	27.62	55.70	20.5	29.13	56.93	20.5	13.87	64.02
21.4	24.66	19.88	21.5	14.32	49.90	21.5	27.58	56.03	21.5	29.11	57.29	21.5	13.88	64.36
22.4	24.06	20.17	22.5	14.25	50.26	22.5	27.54	56.33	22.5	29.09	57.66	22.5	13.88	64.68
23.4	23.45	20.41	23.5	14.17	50.63	23.5	27.51	56.61	23.5	29.07	58.07	23.5	13.88	64.98
24.4	22.87	20.65	24.5	14.08	51.05	24.5	27.47	56.87	24.5	29.05	58.48	24.5	13.88	65.26
25.4	22.36	20.87	25.5	13.98	51.46	25.5	27.46	57.12	25.5	29.02	58.91	25.5	13.87	65.53
26.4	21.92	21.09	26.4	13.84	51.88	26.5	27.44	57.37	26.5	28.98	59.33	26.5	13.88	65.77
27.4	21.52	21.33	27.4	13.69	52.27	27.5	27.43	57.63	27.5	28.93	59.77	27.5	13.91	66.04
28.4	21.14	21.58	28.4	13.51	52.65	28.5	27.42	57.91	28.5	28.87	60.16	28.5	13.95	66.31
29.4	20.72	21.87	29.4	13.33	53.00	29.5	27.42	58.19	29.5	28.81	60.54	29.5	13.98	66.59
30.4	20.25	22.15	30.4	13.15	53.32	30.4	27.41	58.51	30.5	28.74	60.90	30.5	14.00	66.90
31.4	19.68	22.45	31.4	12.98	53.64	31.4	27.37	58.83	31.5	28.67	61.22	31.5	14.01	67.25
51.54	+51.53	12.28	-12.24	6.93	+6.85	6.10	-6.02	8.19	+8.13					
9 ^h 14 ^m 48 ^s .311	9 ^h 9 ^m 6 ^s .085	9 ^h 25 ^m 12 ^s .930	9 ^h 36 ^m 24 ^s .003	10 ^h 20 ^m 57 ^s .259										
+88° 53' 11".43	-85° 19' 42".77	+81° 41' 57".18	-80° 33' 50".61	+82° 59' 12".27										

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

η Octantis. Mag. 6.3			Bradley 1672. Mag. 6.3			ϵ Octantis. Mag. 5.4			32 H. Camelop. seq. Mag. 5.3			κ Octantis. Mag. 5.6		
Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.
Feb.	h m	° '	Feb.	h m	° '	Feb.	h m	° '	Feb.	h m	° '	Feb.	h m	° '
	s	"		s	"		s	"		s	"		s	"
0.6	2.45	26.04	0.6	3.24	31.81	0.7	6.05	54.26	0.7	39.03	43.35	0.7	9.52	14.29
1.6	2.54	26.42	1.6	3.88	31.90	1.7	6.25	54.57	1.7	39.25	43.41	1.7	9.81	14.54
2.6	2.62	26.80	2.6	4.55	32.04	2.7	6.44	54.86	2.7	39.47	43.50	2.7	10.04	14.79
3.6	2.68	27.14	3.6	5.22	32.21	3.7	6.62	55.14	3.7	39.68	43.61	3.7	10.29	15.03
4.6	2.76	27.49	4.6	5.85	32.40	4.7	6.79	55.40	4.7	39.89	43.75	4.7	10.51	15.22
5.6	2.84	27.82	5.6	6.46	32.61	5.7	6.97	55.63	5.7	40.09	43.92	5.7	10.76	15.42
6.6	2.92	28.15	6.6	6.97	32.83	6.7	7.17	55.87	6.7	40.27	44.10	6.7	11.02	15.61
7.6	3.03	28.51	7.6	7.45	33.06	7.7	7.37	56.12	7.7	40.44	44.26	7.7	11.29	15.78
8.6	3.13	28.88	8.6	7.87	33.30	8.6	7.60	56.36	8.7	40.59	44.44	8.7	11.56	15.98
9.6	3.25	29.25	9.6	8.29	33.49	9.6	7.83	56.64	9.6	40.73	44.61	9.7	11.86	16.21
10.6	3.34	29.65	10.6	8.70	33.69	10.6	8.06	56.95	10.6	40.89	44.78	10.7	12.15	16.44
11.6	3.43	30.06	11.6	9.13	33.89	11.6	8.28	57.26	11.6	41.04	44.93	11.7	12.45	16.72
12.6	3.52	30.46	12.6	9.58	34.08	12.6	8.48	57.58	12.6	41.20	45.08	12.7	12.72	16.98
13.6	3.58	30.88	13.6	10.04	34.27	13.6	8.67	57.92	13.6	41.36	45.23	13.7	13.00	17.26
14.6	3.63	31.29	14.6	10.54	34.49	14.6	8.86	58.25	14.6	41.54	45.39	14.7	13.24	17.55
15.6	3.68	31.70	15.6	11.05	34.67	15.6	9.03	58.60	15.6	41.72	45.54	15.7	13.48	17.85
16.6	3.71	32.09	16.6	11.57	34.90	16.6	9.18	58.94	16.6	41.90	45.72	16.7	13.70	18.15
17.6	3.74	32.48	17.6	12.08	35.14	17.6	9.32	59.27	17.6	42.08	45.91	17.7	13.91	18.44
18.5	3.76	32.84	18.6	12.57	35.42	18.6	9.46	59.58	18.6	42.25	46.14	18.7	14.11	18.71
19.5	3.79	33.20	19.6	13.04	35.68	19.6	9.59	59.89	19.6	42.41	46.36	19.6	14.30	18.95
20.5	3.82	33.56	20.6	13.46	35.95	20.6	9.74	60.19	20.6	42.56	46.61	20.6	14.52	19.21
21.5	3.86	33.92	21.6	13.81	36.24	21.6	9.91	60.48	21.6	42.69	46.87	21.6	14.74	19.46
22.5	3.92	34.29	22.6	14.11	36.54	22.6	10.08	60.77	22.6	42.81	47.14	22.6	14.98	19.72
23.5	3.98	34.67	23.6	14.39	36.81	23.6	10.26	61.09	23.6	42.92	47.38	23.6	15.23	19.99
24.5	4.04	35.09	24.6	14.62	37.10	24.6	10.45	61.43	24.6	43.03	47.63	24.6	15.50	20.28
25.5	4.09	35.53	25.6	14.89	37.32	25.6	10.64	61.80	25.6	43.13	47.82	25.6	15.76	20.59
26.5	4.12	35.98	26.6	15.17	37.56	26.6	10.82	62.17	26.6	43.26	48.03	26.6	16.01	20.92
27.5	4.14	36.42	27.6	15.49	37.78	27.6	10.98	62.59	27.6	43.38	48.22	27.6	16.25	21.30
28.5	4.13	36.86	28.6	15.85	38.02	28.6	11.11	62.98	28.6	43.51	48.42	28.6	16.45	21.66
29.5	4.11	37.29	29.6	16.24	38.26	29.6	11.22	63.37	29.6	43.66	48.63	29.6	16.63	22.02
30.5	4.09	37.68	30.6	16.63	38.54	30.6	11.32	63.75	30.6	43.80	48.87	30.6	16.81	22.37
31.5	4.07	38.06	31.6	17.00	38.84	31.6	11.41	64.11	31.6	43.94	49.14	31.6	16.96	22.70
9.80	-9.75		31.14	+31.12		10.76	-10.71		9.35	+9.30		12.35	-12.31	
10 ^b 59 ^m	55°.642		12 ^b 14 ^m	28°.053		12 ^b 46 ^m	1°.183		12 ^b 48 ^m	29°.976		13 ^b 27 ^m	5°.514	
-84°	8'	31''.24	+88°	9'	56''.03	-84°	40'	2''.72	+83°	52'	10''.05	-85°	21'	23''.59

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

δ Octantis. Mag. 4.1			Groombridge 3383. Mag. 7.2			ρ Octantis. Mag. 5.7			ϵ Ursæ Minoris. Mag. 4.4			59 G. Apodis. Mag. 5.9		
Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.
h m	s	° ' "	h m	s	° ' "	h m	s	° ' "	h m	s	° ' "	h m	s	° ' "
Feb. 14 13	-83 16		Feb. 15 3	+87 32		Feb. 15 23	-84 11		Feb. 16 54	+82 10		Feb. 17 15	-80 46	
0.7	20.51	54.74	0.8	55.42	55.37	0.8	43.28	8.22	0.8	24.64	14.13	0.9	42.24	55.50
1.7	20.73	54.94	1.8	55.91	55.26	1.8	43.55	8.30	1.8	24.76	13.87	1.9	42.41	55.39
2.7	20.93	55.13	2.8	56.45	55.15	2.8	43.80	8.38	2.8	24.89	13.62	2.9	42.57	55.30
3.7	21.12	55.30	3.8	57.00	55.06	3.8	44.05	8.45	3.8	25.02	13.37	3.8	42.72	55.21
4.7	21.31	55.46	4.8	57.56	55.00	4.8	44.28	8.49	4.8	25.17	13.15	4.8	42.86	55.10
5.7	21.49	55.60	5.8	58.12	54.97	5.8	44.50	8.53	5.8	25.33	12.94	5.8	42.99	54.98
6.7	21.69	55.73	6.8	58.65	54.96	6.8	44.73	8.54	6.8	25.47	12.78	6.8	43.13	54.84
7.7	21.89	55.85	7.7	59.15	54.97	7.8	44.99	8.56	7.8	25.62	12.63	7.8	43.27	54.68
8.7	22.11	56.00	8.7	59.63	55.00	8.8	45.25	8.58	8.8	25.75	12.50	8.8	43.42	54.52
9.7	22.33	56.12	9.7	60.09	55.02	9.8	45.53	8.61	9.8	25.91	12.37	9.8	43.58	54.36
10.7	22.56	56.29	10.7	60.54	55.04	10.8	45.81	8.65	10.8	26.04	12.25	10.8	43.75	54.21
11.7	22.79	56.46	11.7	60.99	55.05	11.8	46.09	8.72	11.8	26.18	12.13	11.8	43.92	54.09
12.7	23.01	56.68	12.7	61.44	55.04	12.7	46.38	8.80	12.8	26.31	11.99	12.8	44.10	53.97
13.7	23.23	56.90	13.7	61.91	55.03	13.7	46.66	8.90	13.8	26.45	11.83	13.8	44.29	53.87
14.7	23.44	57.14	14.7	62.41	55.02	14.7	46.93	9.02	14.8	26.59	11.68	14.8	44.46	53.82
15.7	23.63	57.38	15.7	62.92	55.01	15.7	47.18	9.15	15.8	26.74	11.51	15.8	44.63	53.75
16.7	23.81	57.61	16.7	63.45	55.01	16.7	47.43	9.28	16.8	26.90	11.35	16.8	44.80	53.71
17.7	23.99	57.84	17.7	63.99	55.03	17.7	47.67	9.41	17.8	27.06	11.20	17.8	44.96	53.67
18.7	24.16	58.06	18.7	64.54	55.06	18.7	47.90	9.55	18.8	27.23	11.06	18.8	45.11	53.64
19.7	24.33	58.27	19.7	65.09	55.12	19.7	48.12	9.66	19.8	27.40	10.95	19.8	45.25	53.59
20.7	24.50	58.46	20.7	65.62	55.20	20.7	48.35	9.77	20.8	27.56	10.86	20.8	45.40	53.51
21.7	24.68	58.65	21.7	66.18	55.30	21.7	48.58	9.84	21.8	27.73	10.80	21.8	45.55	53.42
22.7	24.87	58.85	22.7	66.60	55.42	22.7	48.83	9.92	22.8	27.89	10.76	22.8	45.71	53.34
23.7	25.08	59.06	23.7	67.04	55.54	23.7	49.10	10.02	23.8	28.05	10.74	23.8	45.88	53.24
24.7	25.29	59.29	24.7	67.47	55.65	24.7	49.37	10.13	24.8	28.20	10.71	24.8	46.05	53.14
25.7	25.50	59.54	25.7	67.87	55.74	25.7	49.66	10.26	25.8	28.34	10.67	25.8	46.24	53.07
26.7	25.71	59.81	26.7	68.27	55.81	26.7	49.95	10.41	26.8	28.49	10.62	26.8	46.44	53.02
27.7	25.92	60.12	27.7	68.69	55.88	27.7	50.23	10.60	27.8	28.62	10.54	27.8	46.64	53.00
28.7	26.11	60.43	28.7	69.14	55.94	28.7	50.50	10.82	28.8	28.76	10.46	28.8	46.83	53.02
29.7	26.27	60.75	29.7	69.63	56.00	29.7	50.74	11.03	29.8	28.93	10.37	29.8	47.02	53.03
30.6	26.42	61.04	30.7	70.14	56.08	30.7	50.96	11.24	30.8	29.10	10.30	30.8	47.18	53.06
31.6	26.57	61.33	31.7	70.65	56.19	31.7	51.18	11.42	31.8	29.27	10.23	31.8	47.34	53.11
8.55	-8.49		23.38	+23.36		9.87	-9.82		7.34	+7.27		6.24	-6.16	
14 ^h 13 ^m	18 ^s .531		15 ^h 4 ^m	0 ^s .607		15 ^h 23 ^m	43 ^s .237		16 ^h 54 ^m	31 ^s .741		17 ^h 15 ^m	43 ^s .730	
-83° 17'	4'' .27		+87° 33'	24'' .43		-84° 11'	17'' .84		+82° 10'	38'' .40		-80° 47'	2'' .69	

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

δ Ursæ Minoris. Mag. 4.4			χ Octantis. Mag. 5.2			λ Ursæ Minoris. Mag. 6.6			σ Octantis. Mag. 5.5			76 Draconis. Mag. 5.7		
Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.
	h m	"		h m	"		h m	"		h m	"		h m	"
Feb.	17 58	+86 36	Feb.	18 5	-87 39	Feb.	19 2	+89 0	Feb.	19 25	-89 13	Feb.	20 48	+82 13
	s	"		s	"		s	"		s	"		s	"
0.9	56.17	32.87	0.9	24.37	45.76	0.9	8.24	45.54	0.9	20.40	32.46	1.0	31.54	17.70
1.9	56.35	32.55	1.9	24.93	45.57	1.9	8.47	45.21	1.9	21.64	32.15	2.0	31.51	17.36
2.9	56.55	32.24	2.9	25.47	45.38	2.9	8.78	44.87	2.9	22.83	31.87	2.9	31.49	17.01
3.9	56.78	31.94	3.9	25.98	45.19	3.9	9.22	44.52	3.9	23.93	31.59	3.9	31.47	16.65
4.9	57.04	31.65	4.9	26.45	45.02	4.9	9.76	44.19	4.9	24.91	31.31	4.9	31.46	16.28
5.9	57.31	31.39	5.9	26.90	44.81	5.9	10.39	43.89	5.9	25.84	31.03	5.9	31.47	15.93
6.9	57.59	31.16	6.9	27.35	44.58	6.9	11.08	43.60	6.9	26.72	30.73	6.9	31.50	15.59
7.9	57.87	30.93	7.9	27.81	44.34	7.9	11.78	43.32	7.9	27.63	30.41	7.9	31.52	15.26
8.9	58.14	30.74	8.9	28.31	44.09	8.9	12.48	43.07	8.9	28.63	30.08	8.9	31.55	14.94
9.9	58.40	30.56	9.9	28.84	43.84	9.9	13.14	42.83	9.9	29.71	29.74	9.9	31.58	14.64
10.9	58.65	30.37	10.9	29.40	43.60	10.9	13.76	42.59	10.9	30.88	29.41	10.9	31.61	14.35
11.9	58.91	30.19	11.9	30.00	43.37	11.9	14.35	42.35	11.9	32.15	29.08	11.9	31.64	14.07
12.9	59.15	29.98	12.9	30.60	43.16	12.9	14.92	42.10	12.9	33.50	28.76	12.9	31.66	13.77
13.8	59.40	29.77	13.9	31.23	42.97	13.9	15.50	41.84	13.9	34.92	28.44	13.9	31.68	13.46
14.8	59.67	29.55	14.9	31.85	42.82	14.9	16.09	41.57	14.9	36.36	28.16	14.9	31.70	13.14
15.8	59.94	29.32	15.8	32.45	42.67	15.9	16.71	41.28	15.9	37.82	27.89	15.9	31.72	12.82
16.8	60.21	29.09	16.8	33.04	42.53	16.9	17.39	41.01	16.9	39.24	27.64	16.9	31.74	12.48
17.8	60.52	28.85	17.8	33.61	42.40	17.9	18.13	40.73	17.9	40.62	27.39	17.9	31.77	12.13
18.8	60.84	28.62	18.8	34.17	42.28	18.9	18.96	40.45	18.9	41.95	27.15	18.9	31.80	11.78
19.8	61.18	28.43	19.8	34.69	42.16	19.9	19.87	40.20	19.9	43.20	26.92	19.9	31.85	11.44
20.8	61.52	28.26	20.8	35.20	42.00	20.9	20.83	39.96	20.9	44.41	26.66	20.9	31.90	11.09
21.8	61.87	28.11	21.8	35.74	41.82	21.9	21.82	39.73	21.9	45.63	26.38	21.9	31.97	10.76
22.8	62.21	27.97	22.8	36.29	41.65	22.9	22.81	39.52	22.9	46.87	26.10	22.9	32.04	10.46
23.8	62.54	27.87	23.8	36.88	41.45	23.9	23.77	39.33	23.9	48.20	25.80	23.9	32.12	10.19
24.8	62.84	27.78	24.8	37.51	41.27	24.9	24.66	39.17	24.9	49.66	25.50	24.9	32.20	9.93
25.8	63.13	27.66	25.8	38.19	41.11	25.9	25.48	38.98	25.9	51.26	25.21	25.9	32.26	9.68
26.8	63.42	27.54	26.8	38.89	40.96	26.9	26.24	38.80	26.9	52.98	24.94	26.9	32.32	9.44
27.8	63.70	27.40	27.8	39.61	40.85	27.9	26.98	38.60	27.9	54.77	24.68	27.9	32.38	9.18
28.8	63.98	27.24	28.8	40.31	40.78	28.9	27.75	38.38	28.9	56.58	24.44	28.9	32.43	8.89
29.8	64.30	27.09	29.8	40.97	40.72	29.9	28.58	38.16	29.9	58.35	24.24	29.9	32.48	8.58
30.8	64.63	26.95	30.8	41.61	40.67	30.9	29.49	37.93	30.9	60.04	24.05	30.9	32.54	8.26
31.8	64.99	26.77	31.8	42.21	40.60	31.8	30.51	37.72	31.9	61.61	23.86	31.9	32.62	7.94
16.90	+16.87		24.51	-24.49		57.96	+57.95		73.88	-73.87		7.39	+7.32	
17 ^h 59 ^m 20 ^s .805			18 ^h 5 ^m 36 ^s .163			19 ^h 3 ^m 51 ^s .560			19 ^h 26 ^m 7 ^s .189			20 ^h 48 ^m 44 ^s .660		
+86° 36' 51".19			-87° 39' 52".21			+89° 0' 56".70			-89° 13' 35".99			+82° 13' 16".38		

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

λ Octantis. Mag. 5.4			ν Octantis. Mag. 5.7			β Octantis. Mag. 4.3			39 H. Cephei. Mag. 5.6			γ^1 Octantis. Mag. 5.1		
Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.
	h m	° ' "		h m	° ' "		h m	° ' "		h m	° ' "		h m	° ' "
Feb. 21 38	-83 6		Feb. 22 15	-86 28		Feb. 22 37	-81 49		Feb. 23 27	+86 50		Feb. 23 47	-82 29	
1.0	5.54	26.17	1.1	47.31	49.41	1.1	29.53	26.52	1.1	20.02	58.85	1.1	10.20	16.28
2.0	5.58	25.81	2.1	47.30	49.04	2.1	29.52	26.16	2.1	19.70	58.66	2.1	10.12	15.94
3.0	5.62	25.46	3.1	47.29	48.66	3.1	29.51	25.82	3.1	19.38	58.44	3.1	10.06	15.62
4.0	5.64	25.12	4.1	47.27	48.32	4.1	29.48	25.49	4.1	19.06	58.18	4.1	9.99	15.33
5.0	5.66	24.81	5.1	47.22	47.98	5.1	29.44	25.16	5.1	18.77	57.91	5.1	9.90	15.05
6.0	5.66	24.48	6.0	47.17	47.67	6.1	29.41	24.86	6.1	18.51	57.64	6.1	9.81	14.76
7.0	5.65	24.13	7.0	47.08	47.31	7.1	29.35	24.54	7.1	18.29	57.35	7.1	9.71	14.49
8.0	5.64	23.76	8.0	47.00	46.94	8.1	29.30	24.20	8.1	18.08	57.08	8.1	9.60	14.21
9.0	5.64	23.39	9.0	46.91	46.58	9.1	29.25	23.83	9.1	17.90	56.81	9.1	9.48	13.90
10.0	5.63	22.98	10.0	46.84	46.19	10.1	29.20	23.46	10.1	17.74	56.55	10.1	9.38	13.57
11.0	5.65	22.67	11.0	46.79	45.75	11.1	29.17	23.06	11.1	17.57	56.31	11.1	9.28	13.21
12.0	5.69	22.16	12.0	46.77	45.34	12.0	29.15	22.67	12.1	17.39	56.08	12.1	9.19	12.86
13.0	5.73	21.76	13.0	46.76	44.92	13.0	29.14	22.27	13.1	17.21	55.84	13.1	9.12	12.51
14.0	5.78	21.36	14.0	46.79	44.51	14.0	29.14	21.87	14.1	17.00	55.59	14.1	9.06	12.14
15.0	5.84	20.99	15.0	46.83	44.12	15.0	29.14	21.48	15.1	16.78	55.35	15.1	8.99	11.76
15.9	5.91	20.61	16.0	46.87	43.74	16.0	29.15	21.09	16.1	16.56	55.08	16.1	8.94	11.39
16.9	5.97	20.27	17.0	46.92	43.37	17.0	29.16	20.73	17.1	16.34	54.81	17.1	8.90	11.06
17.9	6.04	19.93	18.0	46.98	43.01	18.0	29.17	20.39	18.1	16.11	54.51	18.1	8.85	10.71
18.9	6.09	19.59	19.0	47.02	42.69	19.0	29.17	20.04	19.1	15.91	54.21	19.1	8.81	10.39
19.9	6.15	19.25	20.0	47.04	42.32	20.0	29.17	19.70	20.1	15.73	53.89	20.1	8.75	10.06
20.9	6.19	18.92	21.0	47.05	41.97	21.0	29.16	19.36	21.1	15.59	53.56	21.1	8.68	9.74
21.9	6.22	18.56	22.0	47.05	41.61	22.0	29.15	19.00	22.1	15.48	53.22	22.1	8.61	9.42
22.9	6.25	18.19	23.0	47.04	41.23	23.0	29.13	18.62	23.1	15.39	52.90	23.1	8.52	9.09
23.9	6.29	17.80	24.0	47.05	40.83	24.0	29.11	18.22	24.0	15.33	52.62	24.1	8.44	8.72
24.9	6.34	17.38	24.9	47.07	40.41	25.0	29.11	17.80	25.0	15.27	52.35	25.1	8.38	8.31
25.9	6.42	16.97	25.9	47.11	39.97	26.0	29.12	17.38	26.0	15.19	52.10	26.1	8.33	7.90
26.9	6.51	16.56	26.9	47.20	39.52	27.0	29.15	16.93	27.0	15.10	51.84	27.1	8.29	7.48
27.9	6.61	16.14	27.9	47.32	39.08	28.0	29.20	16.52	28.0	14.98	51.60	28.1	8.27	7.06
28.9	6.72	15.77	28.9	47.48	38.69	29.0	29.25	16.11	29.0	14.85	51.33	29.1	8.26	6.65
29.9	6.84	15.42	29.9	47.61	38.32	30.0	29.29	15.73	30.0	14.71	51.03	30.0	8.25	6.26
30.9	6.95	15.09	30.9	47.75	37.99	30.9	29.34	15.38	31.0	14.57	50.71	31.0	8.25	5.88
31.9	7.04	14.77	31.9	47.87	37.65	31.9	29.38	15.04	32.0	14.46	50.35	32.0	8.24	5.51
8.33	-8.27		15.91	-15.88		7.03	-6.96		18.19	+18.16		7.65	-7.58	
21 ^h 38 ^m	10° 02' 5		22 ^h 15 ^m	56° 33' 3		22 ^h 37 ^m	32° 70' 3		23 ^h 27 ^m	44° 39' 2		23 ^h 47 ^m	12° 8' 13	
-83° 6'	23'' .31		-86° 23'	45'' .22		-81° 49'	21'' .11		+86° 50'	39'' .03		-82° 29'	8'' .43	

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

43 H. Cephei. Mag. 4.5			α Ursæ Minoris. (Polaris.) Mag. 2.1			4 G. Octantis. Mag. 5.6			Groombridge 750. Mag. 6.7			Groombridge 944. Mag. 6.4		
Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.
Mar.	h m 0 56	s +85 48	Mar.	h m 1 28	s +88 51	Mar.	h m 1 41	s -85 11	Mar.	h m 4 9	s +85 20	Mar.	h m 5 34	s +85 9
0.1	45.92	46.74	0.1	53.35	48.77	0.1	58.32	43.31	0.2	49.15	28.69	0.3	66.04	52.52
1.1	45.72	46.51	1.1	52.50	48.57	1.1	58.17	42.99	1.2	48.88	28.71	1.3	65.81	52.65
2.1	45.51	46.26	2.1	51.63	48.34	2.1	58.01	42.66	2.2	48.62	28.70	2.3	65.57	52.78
3.1	45.32	45.99	3.1	50.78	48.10	3.1	57.85	42.38	3.2	48.33	28.68	3.3	65.29	52.88
4.1	45.14	45.70	4.1	50.00	47.83	4.1	57.68	42.09	4.2	48.04	28.61	4.3	65.03	52.95
5.1	44.99	45.38	5.1	49.30	47.56	5.1	57.49	41.81	5.2	47.77	28.53	5.3	64.75	52.99
6.1	44.86	45.06	6.1	48.68	47.26	6.1	57.29	41.55	6.2	47.50	28.41	6.3	64.48	53.00
7.1	44.75	44.76	7.1	48.15	46.98	7.1	57.09	41.28	7.2	47.26	28.31	7.3	64.23	53.00
8.1	44.67	44.47	8.1	47.68	46.70	8.1	56.88	41.01	8.2	47.03	28.18	8.3	63.99	52.98
9.1	44.59	44.19	9.1	47.23	46.45	9.1	56.68	40.68	9.2	46.81	28.08	9.3	63.76	52.97
10.1	44.50	43.91	10.1	46.79	46.20	10.1	56.48	40.35	10.2	46.60	27.97	10.3	63.54	52.98
11.1	44.42	43.65	11.1	46.32	45.95	11.1	56.29	39.98	11.2	46.39	27.87	11.3	63.33	52.99
12.1	44.32	43.39	12.1	45.82	45.70	12.1	56.13	39.63	12.2	46.17	27.78	12.3	63.12	53.01
13.1	44.22	43.12	13.1	45.28	45.46	13.1	55.97	39.25	13.2	45.96	27.72	13.3	62.90	53.02
14.1	44.11	42.84	14.1	44.72	45.21	14.1	55.84	38.88	14.2	45.72	27.63	14.3	62.67	53.06
15.1	43.98	42.57	15.1	44.12	44.93	15.1	55.71	38.53	15.2	45.49	27.54	15.3	62.44	53.10
16.1	43.85	42.27	16.1	43.53	44.65	16.1	55.60	38.19	16.2	45.23	27.45	16.3	62.18	53.12
17.1	43.74	41.96	17.1	42.95	44.37	17.1	55.48	37.84	17.2	44.97	27.35	17.2	61.91	53.13
18.1	43.63	41.63	18.1	42.40	44.06	18.1	55.35	37.51	18.2	44.70	27.22	18.2	61.64	53.11
19.0	43.54	41.30	19.1	41.92	43.74	19.1	55.23	37.19	19.2	44.46	27.06	19.2	61.36	53.09
20.0	43.49	40.97	20.1	41.53	43.42	20.1	55.10	36.88	20.2	44.21	26.89	20.2	61.09	53.03
21.0	43.44	40.62	21.1	41.25	43.08	21.1	54.94	36.58	21.2	43.98	26.68	21.2	60.83	52.94
22.0	43.44	40.29	22.1	41.04	42.76	22.1	54.78	36.27	22.2	43.77	26.47	22.2	60.59	52.84
23.0	43.45	39.98	23.1	40.89	42.47	23.1	54.62	35.91	23.2	43.59	26.28	23.2	60.36	52.74
24.0	43.45	39.70	24.1	40.76	42.18	24.1	54.46	35.53	24.2	43.42	26.09	24.2	60.18	52.65
25.0	43.45	39.43	25.1	40.60	41.91	25.1	54.32	35.14	25.2	43.27	25.94	25.2	59.98	52.56
26.0	43.44	39.18	26.1	40.40	41.67	26.1	54.20	34.73	26.2	43.11	25.78	26.2	59.80	52.50
27.0	43.41	38.92	27.0	40.12	41.42	27.1	54.10	34.30	27.2	42.93	25.66	27.2	59.61	52.46
28.0	43.36	38.65	28.0	39.79	41.16	28.1	54.02	33.89	28.2	42.74	25.53	28.2	59.38	52.43
29.0	43.31	38.36	29.0	39.42	40.87	29.1	53.96	33.51	29.2	42.51	25.38	29.2	59.15	52.40
30.0	43.26	38.04	30.0	39.07	40.55	30.1	53.90	33.13	30.2	42.29	25.20	30.2	58.90	52.33
31.0	43.21	37.69	31.0	38.78	40.23	31.0	53.84	32.80	31.2	42.06	24.99	31.2	58.63	52.24
13.69	+13.66		50.37	+50.36		11.94	-11.89		12.31	+12.27		11.86	+11.82	
0 ^h 57 ^m 1 ^s .657			1 ^h 29 ^m 44 ^s .254			1 ^h 42 ^m 6 ^s .102			4 ^h 9 ^m 44 ^s .952			5 ^h 34 ^m 54 ^s .014		
+85° 48' 25".87			+88° 51' 25".03			-85° 11' 39".58			+85° 20' 1".04			+85° 9' 28".07		

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

31 G. Mensae. Mag. 6.2			ζ Mensae. Mag. 5.6			51 H. Cephei. Mag. 5.3			25 H. Camelop. Mag. 5.1			7 G. Octantis. Mag. 6.4		
Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.
Mar.	h m 5 46 s	° ' " -84 50 "	Mar.	h m 6 47 s	° ' " -80 43 "	Mar.	h m 7 1 s	° ' " +87 11 "	Mar.	h m 7 13 s	° ' " +82 34 "	Mar.	h m 7 16 s	° ' " -86 54 "
0.3	25.74	0.39	0.3	5.05	47.15	0.4	65.84	18.10	0.4	42.57	52.64	0.4	44.17	12.38
1.3	25.45	0.41	1.3	4.90	47.29	1.3	65.54	18.33	1.4	42.47	52.88	1.4	43.73	12.55
2.3	25.17	0.44	2.3	4.76	47.42	2.3	65.21	18.56	2.4	42.34	53.11	2.4	43.32	12.73
3.3	24.91	0.49	3.3	4.62	47.54	3.3	64.84	18.80	3.4	42.21	53.34	3.4	42.94	12.90
4.3	24.65	0.56	4.3	4.49	47.70	4.3	64.43	18.98	4.3	42.06	53.54	4.4	42.56	13.09
5.3	24.39	0.63	5.3	4.36	47.86	5.3	64.02	19.13	5.3	41.91	53.72	5.3	42.20	13.30
6.3	24.13	0.71	6.3	4.22	48.04	6.3	63.60	19.27	6.3	41.75	53.86	6.3	41.82	13.53
7.3	23.86	0.81	7.3	4.09	48.24	7.3	63.18	19.41	7.3	41.60	54.00	7.3	41.44	13.76
8.3	23.57	0.91	8.3	3.95	48.43	8.3	62.81	19.52	8.3	41.46	54.14	8.3	41.03	13.99
9.3	23.28	0.99	9.3	3.80	48.61	9.3	62.44	19.61	9.3	41.33	54.26	9.3	40.62	14.22
10.3	22.97	1.05	10.3	3.66	48.78	10.3	62.09	19.74	10.3	41.20	54.37	10.3	40.18	14.45
11.3	22.66	1.09	11.3	3.50	48.93	11.3	61.75	19.86	11.3	41.09	54.49	11.3	39.73	14.64
12.3	22.37	1.11	12.3	3.34	49.08	12.3	61.42	19.97	12.3	40.98	54.63	12.3	39.25	14.82
13.3	22.07	1.12	13.3	3.18	49.18	13.3	61.08	20.11	13.3	40.85	54.77	13.3	38.79	14.97
14.3	21.77	1.11	14.3	3.03	49.26	14.3	60.71	20.25	14.3	40.72	54.92	14.3	38.32	15.11
15.3	21.49	1.07	15.3	2.87	49.34	15.3	60.34	20.39	15.3	40.60	55.07	15.3	37.86	15.25
16.3	21.20	1.03	16.3	2.72	49.40	16.3	59.94	20.53	16.3	40.45	55.22	16.3	37.42	15.36
17.3	20.93	0.99	17.3	2.57	49.46	17.3	59.52	20.68	17.3	40.30	55.36	17.3	36.99	15.47
18.3	20.67	0.97	18.3	2.42	49.54	18.3	59.07	20.80	18.3	40.12	55.51	18.3	36.56	15.60
19.2	20.40	0.96	19.3	2.28	49.62	19.3	58.62	20.90	19.3	39.95	55.61	19.3	36.15	15.73
20.2	20.13	0.97	20.3	2.14	49.72	20.3	58.15	20.95	20.3	39.78	55.70	20.3	35.75	15.87
21.2	19.87	1.01	21.3	2.00	49.83	21.3	57.69	21.01	21.3	39.60	55.77	21.3	35.34	16.04
22.2	19.58	1.02	22.3	1.86	49.97	22.3	57.26	21.02	22.3	39.45	55.81	22.3	34.91	16.22
23.2	19.29	1.03	23.3	1.70	50.10	23.3	56.86	21.02	23.3	39.30	55.85	23.3	34.46	16.39
24.2	18.98	1.02	24.3	1.53	50.20	24.3	56.49	21.05	24.3	39.17	55.88	24.3	33.98	16.55
25.2	18.67	1.00	25.3	1.36	50.29	25.3	56.14	21.08	25.3	39.04	55.91	25.3	33.47	16.69
26.2	18.36	0.93	26.3	1.20	50.34	26.3	55.81	21.12	26.3	38.93	55.96	26.3	32.94	16.79
27.2	18.06	0.85	27.3	1.04	50.38	27.3	55.45	21.16	27.3	38.81	56.00	27.3	32.44	16.89
28.2	17.77	0.74	28.3	0.87	50.37	28.3	55.09	21.24	28.3	38.67	56.11	28.3	31.93	16.92
29.2	17.49	0.63	29.3	0.72	50.36	29.3	54.68	21.32	29.3	38.53	56.21	29.3	31.46	16.96
30.2	17.22	0.54	30.3	0.56	50.36	30.3	54.25	21.38	30.3	38.37	56.30	30.3	31.00	17.01
31.2	16.97	0.44	31.3	0.42	50.35	31.3	53.79	21.42	31.3	38.19	56.36	31.3	30.57	17.04
11.11	-11.06		6.21	-6.13		20.39	+20.37		7.75	+7.68		18.52	-18.49	
5 ^h 46 ^m	26°.439		6 ^h 47 ^m	3°.489		7 ^h 1 ^m	34°.861		7 ^h 13 ^m	29°.477		7 ^h 16 ^m	40°.555	
-84° 49' 48".17			-80° 43' 34".16			+87° 11' 0".11			+82° 34' 36".50			-86° 54' 0".14		

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

Groombridge 1119. Mag. 7.0			ζ Octantis. Mag. 5.4			1 H. Draconis. Mag. 4.6			ζ Chamaeleontis. Mag. 5.2			80 H. Camelopard. Mag. 5.3		
Wash. Mean Time.	Right Ascen- sion.	Declina- tion.	Wash. Mean Time.	Right Ascen- sion.	Declina- tion.	Wash. Mean Time.	Right Ascen- sion.	Declina- tion.	Wash. Mean Time.	Right Ascen- sion.	Declina- tion.	Wash. Mean Time.	Right Ascen- sion.	Declina- tion.
Mar.	h m 8 15	° +88 53	Mar.	h m 9 9	° -85 18	Mar.	h m 9 25	° +81 41	Mar.	h m 9 36	° -80 34	Mar.	h m 10 21	° +82 59
	s "	"		s "	"		s "	"		s "	"		s "	"
0.4	80.72	21.87	0.4	13.33	53.00	0.5	27.42	58.19	0.5	28.81	0.54	0.5	13.98	6.59
1.4	80.25	22.15	1.4	13.15	53.32	1.4	27.41	58.51	1.5	28.74	0.90	1.5	14.00	6.90
2.4	79.68	22.45	2.4	12.98	53.64	2.4	27.37	58.83	2.5	28.67	1.22	2.5	14.01	7.25
3.4	79.01	22.74	3.4	12.83	53.95	3.4	27.33	59.16	3.5	28.61	1.56	3.5	14.01	7.59
4.4	78.25	23.02	4.4	12.68	54.24	4.4	27.28	59.49	4.4	28.55	1.89	4.5	13.98	7.92
5.4	77.43	23.27	5.4	12.55	54.55	5.4	27.21	59.78	5.4	28.50	2.23	5.5	13.94	8.27
6.4	76.59	23.50	6.4	12.41	54.90	6.4	27.13	60.06	6.4	28.45	2.59	6.5	13.90	8.59
7.4	75.75	23.73	7.4	12.27	55.24	7.4	27.05	60.34	7.4	28.41	2.96	7.5	13.85	8.88
8.4	74.93	23.92	8.4	12.14	55.61	8.4	26.99	60.57	8.4	28.35	3.33	8.5	13.80	9.16
9.4	74.16	24.11	9.4	11.98	55.99	9.4	26.92	60.80	9.4	28.30	3.71	9.5	13.75	9.44
10.4	73.42	24.29	10.4	11.80	56.37	10.4	26.87	61.04	10.4	28.24	4.10	10.5	13.72	9.71
11.4	72.72	24.47	11.4	11.62	56.71	11.4	26.80	61.29	11.4	28.17	4.48	11.5	13.68	9.98
12.4	72.04	24.67	12.4	11.42	57.06	12.4	26.76	61.54	12.4	28.09	4.82	12.5	13.65	10.26
13.4	71.35	24.88	13.4	11.22	57.39	13.4	26.71	61.81	13.4	28.01	5.18	13.5	13.63	10.54
14.4	70.63	25.11	14.4	11.01	57.67	14.4	26.66	62.08	14.4	27.92	5.53	14.5	13.62	10.82
15.4	69.89	25.34	15.4	10.77	57.97	15.4	26.59	62.36	15.4	27.83	5.85	15.5	13.58	11.13
16.4	69.08	25.56	16.4	10.57	58.25	16.4	26.53	62.64	16.4	27.74	6.14	16.4	13.53	11.45
17.4	68.22	25.78	17.4	10.36	58.51	17.4	26.44	62.93	17.4	27.65	6.42	17.4	13.48	11.77
18.4	67.27	26.01	18.4	10.16	58.77	18.4	26.35	63.21	18.4	27.57	6.70	18.4	13.42	12.09
19.4	66.26	26.20	19.4	9.97	59.04	19.4	26.26	63.48	19.4	27.48	7.00	19.4	13.33	12.41
20.4	65.23	26.38	20.4	9.78	59.32	20.4	26.14	63.72	20.4	27.42	7.32	20.4	13.24	12.71
21.3	64.18	26.53	21.4	9.61	59.63	21.4	26.03	63.94	21.4	27.35	7.64	21.4	13.14	12.98
22.3	63.16	26.67	22.4	9.43	59.94	22.4	25.92	64.14	22.4	27.28	7.97	22.4	13.05	13.25
23.3	62.20	26.78	23.4	9.23	60.27	23.4	25.82	64.32	23.4	27.20	8.34	23.4	12.95	13.48
24.3	61.30	26.88	24.4	9.01	60.60	24.4	25.73	64.50	24.4	27.12	8.69	24.4	12.87	13.69
25.3	60.48	26.99	25.4	8.78	60.92	25.4	25.65	64.67	25.4	27.02	9.03	25.4	12.81	13.92
26.3	59.70	27.12	26.4	8.53	61.23	26.4	25.59	64.86	26.4	26.92	9.37	26.4	12.75	14.14
27.3	58.91	27.26	27.4	8.26	61.49	27.4	25.52	65.06	27.4	26.80	9.67	27.4	12.69	14.37
28.3	58.09	27.40	28.4	7.99	61.72	28.4	25.44	65.28	28.4	26.70	9.95	28.4	12.63	14.64
29.3	57.18	27.57	29.4	7.74	61.95	29.4	25.35	65.50	29.4	26.58	10.20	29.4	12.56	14.92
30.3	56.19	27.71	30.4	7.49	62.15	30.4	25.25	65.74	30.4	26.47	10.44	30.4	12.47	15.20
31.3	55.13	27.86	31.4	7.25	62.36	31.4	25.14	65.99	31.4	26.36	10.68	31.4	12.37	15.49
51.64	+51.63		12.29	-12.25		6.93	+6.86		6.10	-6.02		8.19	+8.13	
8 ^h 14 ^m	48°.311		9 ^h 9 ^m	6°.085		9 ^h 25 ^m	12°.930		9 ^h 36 ^m	24°.003		10 ^h 20 ^m	57°.259	
+88° 53'	11''.43		-85° 19'	42''.77		+81° 41'	57''.18		-80° 33'	50''.61		+82° 59'	12''.27	

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

7 Octantis. Mag. 6.3			Bradley 1672. Mag. 6.3			1 Octantis. Mag. 5.4			22 H. Camelop. seq. Mag. 5.3			κ Octantis. Mag. 5.6		
Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.
	h m	° '		h m	° '		h m	° '		h m	° '		h m	° '
Mar.	11 0	-84 8	Mar.	12 15	+88 9	Mar.	12 46	-84 40	Mar.	12 48	+83 51	Mar.	13 27	-85 21
	s	"		s	"		s	"		s	"		s	"
0.5	4.11	37.29	0.6	16.24	38.26	0.6	11.22	3.37	0.6	43.66	48.63	0.6	16.63	22.02
1.5	4.09	37.68	1.6	16.63	38.54	1.6	11.32	3.75	1.6	43.80	48.87	1.6	16.81	22.37
2.5	4.07	38.06	2.6	17.00	38.84	2.6	11.41	4.11	2.6	43.94	49.14	2.6	16.96	22.70
3.5	4.05	38.42	3.6	17.31	39.15	3.6	11.51	4.46	3.6	44.07	49.42	3.6	17.10	23.01
4.5	4.03	38.78	4.6	17.57	39.48	4.6	11.61	4.78	4.6	44.18	49.74	4.6	17.28	23.31
5.5	4.04	39.14	5.6	17.77	39.81	5.6	11.75	5.11	5.6	44.27	50.05	5.6	17.46	23.59
6.5	4.05	39.51	6.6	17.92	40.13	6.6	11.87	5.44	6.6	44.34	50.36	6.6	17.66	23.87
7.5	4.06	39.90	7.6	18.04	40.45	7.6	12.00	5.78	7.6	44.40	50.65	7.6	17.86	24.19
8.5	4.07	40.31	8.6	18.13	40.75	8.6	12.14	6.15	8.6	44.46	50.94	8.6	18.08	24.51
9.5	4.08	40.73	9.5	18.25	41.03	9.6	12.29	6.52	9.6	44.54	51.22	9.6	18.28	24.85
10.5	4.07	41.16	10.5	18.37	41.32	10.6	12.42	6.92	10.6	44.62	51.49	10.6	18.48	25.21
11.5	4.04	41.59	11.5	18.50	41.58	11.6	12.53	7.33	11.6	44.69	51.75	11.6	18.67	25.58
12.5	4.01	42.01	12.5	18.68	41.85	12.6	12.62	7.72	12.6	44.78	52.02	12.6	18.83	25.95
13.5	3.96	42.40	13.5	18.85	42.13	13.6	12.71	8.14	13.6	44.86	52.29	13.6	18.98	26.34
14.5	3.90	42.79	14.5	19.04	42.42	14.6	12.77	8.54	14.6	44.95	52.56	14.6	19.13	26.73
15.5	3.84	43.18	15.5	19.23	42.73	15.6	12.83	8.93	15.6	45.05	52.83	15.6	19.25	27.09
16.5	3.77	43.55	16.5	19.40	43.05	16.5	12.89	9.30	16.6	45.13	53.14	16.6	19.35	27.47
17.5	3.71	43.89	17.5	19.54	43.38	17.5	12.93	9.65	17.5	45.19	53.46	17.6	19.46	27.80
18.5	3.65	44.25	18.5	19.64	43.71	18.5	12.98	10.01	18.5	45.25	53.78	18.6	19.57	28.13
19.5	3.60	44.60	19.5	19.88	44.06	19.5	13.04	10.35	19.5	45.30	54.12	19.6	19.70	28.46
20.5	3.55	44.95	20.5	19.67	44.43	20.5	13.12	10.70	20.5	45.32	54.46	20.6	19.84	28.78
21.5	3.52	45.30	21.5	19.61	44.76	21.5	13.21	11.06	21.5	45.33	54.81	21.6	19.99	29.10
22.5	3.49	45.70	22.5	19.52	45.08	22.5	13.31	11.43	22.5	45.34	55.13	22.6	20.14	29.46
23.5	3.46	46.11	23.5	19.42	45.37	23.5	13.41	11.83	23.5	45.34	55.43	23.6	20.31	29.83
24.5	3.41	46.53	24.5	19.34	45.65	24.5	13.49	12.24	24.5	45.35	55.71	24.6	20.47	30.24
25.5	3.35	46.96	25.5	19.29	45.92	25.5	13.56	12.68	25.5	45.36	55.97	25.6	20.62	30.65
26.4	3.26	47.37	26.5	19.30	46.19	26.5	13.62	13.10	26.5	45.40	56.24	26.6	20.73	31.07
27.4	3.16	47.76	27.5	19.33	46.46	27.5	13.64	13.54	27.5	45.45	56.50	27.5	20.82	31.49
28.4	3.05	48.14	28.5	19.37	46.76	28.5	13.65	13.94	28.5	45.49	56.78	28.5	20.88	31.89
29.4	2.93	48.48	29.5	19.39	47.08	29.5	13.65	14.33	29.5	45.53	57.08	29.5	20.94	32.26
30.4	2.82	48.80	30.5	19.38	47.41	30.5	13.65	14.68	30.5	45.55	57.41	30.5	21.00	32.63
31.4	2.72	49.12	31.5	19.32	47.76	31.5	13.65	15.04	31.5	45.56	57.77	31.5	21.06	32.98
9.80	-9.75		31.18	+31.16		10.76	-10.72		9.36	+9.30		12.35	-12.31	
10 ^h 59 ^m	55 ^s .642		12 ^h 14 ^m	28 ^s .053		12 ^h 46 ^m	1 ^s .183		12 ^h 48 ^m	29 ^s .976		13 ^h 27 ^m	5 ^s .514	
-84° 8'	31''.24		+88° 9'	56''.03		-84° 40'	2''.72		+83° 52'	10''.05		-85° 21'	23''.59	

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

δ Octantis. Mag. 4.1			Groombridge 2283. Mag. 7.2			ρ Octantis. Mag. 5.7			ϵ Ursæ Minoris. Mag. 4.4			59 G. Apodis. Mag. 5.9		
Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.
	h m	° '		h m	° '		h m	° '		h m	° '		h m	° '
Mar.	14 13	-83 17	Mar.	15 4	+87 32	Mar.	15 23	-84 11	Mar.	16 54	+82 10	Mar.	17 15	-80 46
	s	"		s	"		s	"		s	"		s	"
0.7	26.27	0.75	0.7	9.63	56.00	0.7	50.74	11.03	0.8	28.93	10.37	0.8	47.02	53.03
1.6	26.42	1.04	1.7	10.14	56.08	1.7	50.96	11.24	1.8	29.10	10.30	1.8	47.18	53.06
2.6	26.57	1.33	2.7	10.65	56.19	2.7	51.18	11.42	2.8	29.27	10.23	2.8	47.34	53.11
3.6	26.71	1.59	3.7	11.16	56.33	3.7	51.39	11.59	3.8	29.45	10.20	3.8	47.49	53.12
4.6	26.86	1.82	4.7	11.65	56.50	4.7	51.61	11.75	4.8	29.62	10.20	4.8	47.64	53.11
5.6	27.02	2.07	5.7	12.11	56.68	5.7	51.83	11.89	5.8	29.78	10.23	5.8	47.79	53.08
6.6	27.19	2.32	6.7	12.53	56.86	6.7	52.06	12.04	6.8	29.94	10.26	6.8	47.95	53.04
7.6	27.37	2.58	7.7	12.92	57.07	7.7	52.31	12.20	7.7	30.10	10.32	7.8	48.12	53.01
8.6	27.55	2.84	8.7	13.31	57.26	8.7	52.56	12.37	8.7	30.26	10.35	8.8	48.30	52.98
9.6	27.73	3.14	9.7	13.67	57.43	9.7	52.82	12.55	9.7	30.41	10.40	9.8	48.48	52.96
10.6	27.91	3.43	10.7	14.04	57.60	10.7	53.07	12.73	10.7	30.56	10.45	10.8	48.67	52.98
11.6	28.08	3.76	11.7	14.41	57.76	11.7	53.32	12.95	11.7	30.71	10.48	11.8	48.86	53.01
12.6	28.24	4.08	12.7	14.80	57.91	12.7	53.57	13.19	12.7	30.86	10.51	12.7	49.05	53.07
13.6	28.39	4.41	13.7	15.21	58.06	13.7	53.80	13.44	13.7	31.01	10.53	13.7	49.23	53.13
14.6	28.53	4.76	14.7	15.62	58.22	14.7	54.01	13.70	14.7	31.17	10.54	14.7	49.40	53.21
15.6	28.65	5.09	15.6	16.04	58.40	15.7	54.21	13.95	15.7	31.34	10.58	15.7	49.56	53.30
16.6	28.77	5.42	16.6	16.48	58.58	16.7	54.41	14.20	16.7	31.50	10.61	16.7	49.72	53.38
17.6	28.88	5.72	17.6	16.92	58.78	17.7	54.60	14.44	17.7	31.67	10.67	17.7	49.87	53.47
18.6	29.00	6.02	18.6	17.33	59.01	18.7	54.78	14.67	18.7	31.84	10.75	18.7	50.02	53.52
19.6	29.12	6.31	19.6	17.72	59.27	19.7	54.97	14.87	19.7	32.00	10.86	19.7	50.17	53.58
20.6	29.25	6.59	20.6	18.07	59.53	20.6	55.17	15.07	20.7	32.16	10.98	20.7	50.31	53.62
21.6	29.39	6.88	21.6	18.38	59.80	21.6	55.39	15.28	21.7	32.31	11.12	21.7	50.48	53.64
22.6	29.54	7.18	22.6	18.68	60.06	22.6	55.61	15.49	22.7	32.45	11.27	22.7	50.65	53.68
23.6	29.70	7.51	23.6	18.93	60.30	23.6	55.85	15.72	23.7	32.59	11.41	23.7	50.83	53.71
24.6	29.84	7.86	24.6	19.18	60.54	24.6	56.09	15.98	24.7	32.72	11.55	24.7	51.02	53.79
25.6	30.00	8.22	25.6	19.44	60.75	25.6	56.33	16.26	25.7	32.85	11.66	25.7	51.22	53.88
26.6	30.14	8.61	26.6	19.73	60.95	26.6	56.54	16.58	26.7	32.99	11.76	26.7	51.40	54.02
27.6	30.25	9.00	27.6	20.04	61.15	27.6	56.75	16.89	27.7	33.13	11.85	27.7	51.59	54.16
28.6	30.34	9.38	28.6	20.36	61.37	28.6	56.93	17.21	28.7	33.27	11.95	28.7	51.75	54.31
29.6	30.42	9.73	29.6	20.70	61.60	29.6	57.10	17.50	29.7	33.42	12.05	29.7	51.90	54.46
30.6	30.50	10.07	30.6	21.05	61.86	30.6	57.25	17.79	30.7	33.57	12.17	30.7	52.04	54.58
31.6	30.58	10.39	31.6	21.37	62.15	31.6	57.41	18.05	31.7	33.72	12.33	31.7	52.18	54.70
8.55	-8.49		23.39	+23.37		9.87	-9.82		7.34	+7.27		6.24	-6.16	
14 ^h 13 ^m 18 ^s .531			15 ^h 4 ^m 0 ^s .607			15 ^h 23 ^m 43 ^s .237			16 ^h 54 ^m 31 ^s .741			17 ^h 15 ^m 43 ^s .730		
-83° 17' 4".27			+87° 33' 24".43			-84° 11' 17".84			+82° 10' 38".40			-80° 47' 2".69		

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

δ Ursae Minoris. Mag. 4.4			χ Octantis. Mag. 5.2			λ Ursae Minoris. Mag. 6.8			σ Octantis. Mag. 5.5			76 Draconis. Mag. 5.7		
Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.
Mar.	h m	° ' "	Mar.	h m	° ' "	Mar.	h m	° ' "	Mar.	h m	° ' "	Mar.	h m	° ' "
	17 59	+86 36		18 5	-87 39		19 2	+89 0		19 25	-89 13		20 48	+82 13
0.8	4.30	27.09	0.8	40.97	40.72	0.9	28.58	38.16	0.9	58.35	24.24	0.9	32.48	8.58
1.8	4.63	26.95	1.8	41.61	40.67	1.9	29.49	37.93	1.9	60.04	24.05	1.9	32.54	8.26
2.8	4.99	26.77	2.8	42.21	40.60	2.8	30.51	37.72	2.9	61.61	23.86	2.9	32.62	7.94
3.8	5.36	26.64	3.8	42.78	40.52	3.8	31.62	37.52	3.9	63.11	23.66	3.9	32.70	7.62
4.8	5.75	26.54	4.8	43.84	40.43	4.8	32.79	37.33	4.9	64.53	23.45	4.9	32.79	7.32
5.8	6.13	26.48	5.8	43.90	40.32	5.8	33.98	37.18	5.9	65.95	23.23	5.9	32.89	7.05
6.8	6.51	26.42	6.8	44.50	40.20	6.8	35.17	37.04	6.9	67.41	23.01	6.9	33.00	6.80
7.8	6.88	26.38	7.8	45.12	40.08	7.8	36.32	36.90	7.9	68.94	22.76	7.9	33.11	6.58
8.8	7.21	26.36	8.8	45.77	39.96	8.8	37.42	36.78	8.8	70.57	22.52	8.9	33.22	6.35
9.8	7.56	26.33	9.8	46.45	39.85	9.8	38.47	36.67	9.8	72.29	22.29	9.9	33.32	6.13
10.8	7.88	26.30	10.8	47.14	39.77	10.8	39.49	36.55	10.8	74.09	22.06	10.9	33.42	5.91
11.8	8.20	26.26	11.8	47.84	39.72	11.8	40.48	36.43	11.8	75.94	21.85	11.9	33.52	5.69
12.8	8.54	26.21	12.8	48.54	39.69	12.8	41.48	36.31	12.8	77.82	21.66	12.9	33.62	5.46
13.8	8.87	26.15	13.8	49.22	39.66	13.8	42.50	36.18	13.8	79.70	21.50	13.9	33.72	5.22
14.8	9.21	26.09	14.8	49.88	39.65	14.8	43.56	36.04	14.8	81.55	21.35	14.9	33.81	4.97
15.8	9.58	26.02	15.8	50.53	39.65	15.8	44.66	35.90	15.8	83.36	21.20	15.9	33.91	4.71
16.8	9.96	25.95	16.8	51.15	39.65	16.8	45.83	35.75	16.8	85.12	21.07	16.9	34.02	4.45
17.8	10.34	25.90	17.8	51.75	39.65	17.8	47.07	35.62	17.8	86.79	20.95	17.9	34.14	4.19
18.8	10.75	25.90	18.8	52.33	39.63	18.8	48.35	35.51	18.8	88.40	20.82	18.9	34.26	3.95
19.8	11.14	25.90	19.8	52.91	39.59	19.8	49.67	35.43	19.8	89.98	20.67	19.9	34.39	3.73
20.8	11.52	25.95	20.8	53.50	39.55	20.8	50.99	35.38	20.8	91.58	20.49	20.9	34.53	3.53
21.8	11.90	26.02	21.8	54.12	39.49	21.8	52.28	35.32	21.8	93.23	20.31	21.9	34.68	3.36
22.7	12.25	26.08	22.8	54.77	39.43	22.8	53.50	35.31	22.8	94.98	20.12	22.9	34.81	3.21
23.7	12.59	26.15	23.8	55.47	39.39	23.8	54.64	35.29	23.8	96.84	19.95	23.9	34.95	3.07
24.7	12.90	26.21	24.7	56.20	39.37	24.8	55.70	35.27	24.8	98.84	19.78	24.9	35.08	2.94
25.7	13.21	26.26	25.7	56.94	39.37	25.8	56.72	35.24	25.8	100.91	19.64	25.9	35.20	2.80
26.7	13.52	26.26	26.7	57.67	39.42	26.8	57.73	35.19	26.8	103.02	19.52	26.9	35.32	2.63
27.7	13.84	26.28	27.7	58.38	39.48	27.8	58.77	35.13	27.8	105.09	19.42	27.9	35.43	2.46
28.7	14.18	26.29	28.7	59.04	39.55	28.8	59.87	35.07	28.8	107.07	19.35	28.9	35.55	2.28
29.7	14.54	26.31	29.7	59.66	39.61	29.8	61.08	35.00	29.8	108.93	19.29	29.8	35.68	2.08
30.7	14.92	26.35	30.7	60.25	39.65	30.8	62.38	34.94	30.8	110.70	19.22	30.8	35.82	1.88
31.7	15.31	26.43	31.7	60.82	39.70	31.8	63.73	34.92	31.8	112.39	19.14	31.8	35.96	1.70
16.90	+16.87		24.50	-24.48		57.88	+57.87		73.70	-73.69		7.39	+7.32	
17 ^h 59 ^m	20°.805		18 ^h 5 ^m	36°.163		19 ^h 3 ^m	51°.560		19 ^h 26 ^m	7°.189		20 ^h 48 ^m	44°.660	
+86° 36' 51".19			-87° 39' 52".21			+89° 0' 56".70			-89° 13' 35".99			+82° 13' 16".38		

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

λ Octantis. Mag. 5.4			ν Octantis. Mag. 5.7			β Octantis. Mag. 4.3			39 H. Cephei. Mag. 5.6			γ^1 Octantis. Mag. 5.1		
Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.
	h m	s		h m	s		h m	s		h m	s		h m	s
Mar.	21 38	-83 6	Mar.	22 15	-86 23	Mar.	22 37	-81 49	Mar.	23 27	+86 50	Mar.	23 47	-82 28
0.9	6.84	15.42	0.9	47.61	38.32	1.0	29.29	15.73	1.0	14.71	51.03	1.0	8.25	66.26
1.9	6.95	15.09	1.9	47.75	37.99	1.9	29.34	15.38	2.0	14.57	50.71	2.0	8.25	65.88
2.9	7.04	14.77	2.9	47.87	37.65	2.9	29.38	15.04	3.0	14.46	50.35	3.0	8.24	65.51
3.9	7.13	14.45	3.9	47.97	37.29	3.9	29.40	14.69	4.0	14.38	50.00	4.0	8.21	65.18
4.9	7.20	14.14	4.9	48.05	36.91	4.9	29.42	14.34	5.0	14.33	49.66	5.0	8.16	64.84
5.9	7.27	13.82	5.9	48.10	36.55	5.9	29.44	13.97	6.0	14.32	49.32	6.0	8.13	64.47
6.9	7.34	13.45	6.9	48.17	36.18	6.9	29.45	13.61	7.0	14.33	48.99	7.0	8.08	64.11
7.9	7.42	13.06	7.9	48.25	35.79	7.9	29.47	13.22	8.0	14.35	48.67	8.0	8.04	63.74
8.9	7.50	12.69	8.9	48.34	35.40	8.9	29.50	12.80	9.0	14.38	48.38	9.0	8.00	63.34
9.9	7.61	12.31	9.9	48.45	34.99	9.9	29.53	12.40	10.0	14.40	48.10	10.0	7.98	62.98
10.9	7.72	11.91	10.9	48.59	34.58	10.9	29.58	11.98	11.0	14.41	47.82	11.0	7.97	62.51
11.9	7.85	11.54	11.9	48.75	34.17	11.9	29.64	11.58	12.0	14.41	47.52	12.0	7.97	62.09
12.9	7.98	11.20	12.9	48.93	33.78	12.9	29.71	11.19	13.0	14.41	47.24	13.0	7.97	61.66
13.9	8.11	10.85	13.9	49.12	33.39	13.9	29.78	10.80	13.9	14.39	46.95	14.0	7.98	61.25
14.9	8.25	10.53	14.9	49.32	33.04	14.9	29.87	10.42	14.9	14.37	46.63	15.0	8.01	60.87
15.9	8.39	10.22	15.9	49.51	32.70	15.9	29.94	10.07	15.9	14.35	46.31	16.0	8.03	60.48
16.9	8.52	9.93	16.9	49.71	32.36	16.9	30.00	9.74	16.9	14.34	45.98	17.0	8.05	60.12
17.9	8.64	9.63	17.9	49.89	32.03	17.9	30.07	9.39	17.9	14.36	45.64	18.0	8.06	59.75
18.9	8.75	9.35	18.9	50.04	31.71	18.9	30.12	9.06	18.9	14.41	45.28	18.9	8.07	59.40
19.9	8.86	9.04	19.9	50.18	31.38	19.9	30.17	8.73	19.9	14.49	44.95	19.9	8.07	59.04
20.9	8.96	8.71	20.9	50.32	31.04	20.9	30.22	8.38	20.9	14.61	44.61	20.9	8.06	58.68
21.9	9.06	8.38	21.9	50.45	30.69	21.9	30.26	8.01	21.9	14.74	44.29	21.9	8.06	58.31
22.9	9.18	8.04	22.9	50.61	30.30	22.9	30.31	7.62	22.9	14.88	44.00	22.9	8.06	57.91
23.9	9.31	7.68	23.9	50.78	29.91	23.9	30.38	7.20	23.9	15.02	43.73	23.9	8.06	57.49
24.9	9.46	7.30	24.9	50.99	29.51	24.9	30.46	6.80	24.9	15.15	43.46	24.9	8.08	57.05
25.9	9.62	6.95	25.9	51.23	29.12	25.9	30.56	6.39	25.9	15.26	43.21	25.9	8.12	56.61
26.9	9.80	6.62	26.9	51.50	28.75	26.9	30.66	6.00	26.9	15.34	42.94	26.9	8.17	56.18
27.9	9.99	6.33	27.9	51.78	28.41	27.9	30.77	5.63	27.9	15.40	42.68	27.9	8.23	55.77
28.9	10.17	6.05	28.9	52.05	28.09	28.9	30.89	5.29	28.9	15.46	42.39	28.9	8.29	55.38
29.9	10.32	5.80	29.9	52.31	27.80	29.9	31.00	4.97	29.9	15.54	42.07	29.9	8.35	55.00
30.9	10.47	5.56	30.9	52.54	27.51	30.9	31.11	4.66	30.9	15.64	41.75	30.9	8.40	54.64
31.9	10.61	5.30	31.9	52.75	27.21	31.9	31.18	4.36	31.9	15.79	41.43	31.9	8.44	54.31
8.33	-8.27		15.89	-15.86		7.03	-6.96		18.18	+18.15		7.64	-7.58	
21 ^h 38 ^m 10 ^s .025			22 ^h 15 ^m 56 ^s .333			22 ^h 37 ^m 32 ^s .703			23 ^h 27 ^m 44 ^s .392			23 ^h 47 ^m 12 ^s .813		
-83° 6' 23".31			-86° 23' 45".22			-81° 49' 21".11			+86° 50' 39".03			-82° 29' 8".43		

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

43 H. Cephei. Mag. 4.5			α Ursæ Minoris. (Polaris.) Mag. 2.1			4 G. Oestantis. Mag. 5.6			Groombridge 750. Mag. 6.7			Groombridge 944. Mag. 6.4		
Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.
Apr.	h m ° ' "		Apr.	h m ° ' "		Apr.	h m ° ' "		Apr.	h m ° ' "		Apr.	h m ° ' "	
0.0	43.21 37.69	0.0	38.78 40.23	0.0	53.84 32.80	0.2	42.06 24.99	0.2	58.63 52.24	0.2	58.63 52.24	0.2	58.63 52.24	0.2
1.0	43.20 37.35	1.0	38.57 39.89	1.0	53.75 32.47	1.1	41.84 24.77	1.2	58.37 52.14	1.2	58.37 52.14	1.2	58.37 52.14	1.2
2.0	43.22 37.00	2.0	38.46 39.52	2.0	53.66 32.13	2.1	41.64 24.54	2.2	58.11 52.00	2.2	58.11 52.00	2.2	58.11 52.00	2.2
3.0	43.26 36.65	3.0	38.44 39.17	3.0	53.55 31.80	3.1	41.45 24.25	3.2	57.87 51.85	3.2	57.87 51.85	3.2	57.87 51.85	3.2
4.0	43.31 36.31	4.0	38.47 38.83	4.0	53.44 31.45	4.1	41.29 23.99	4.2	57.64 51.68	4.2	57.64 51.68	4.2	57.64 51.68	4.2
5.0	43.38 36.00	5.0	38.56 38.52	5.0	53.34 31.09	5.1	41.14 23.74	5.2	57.44 51.50	5.2	57.44 51.50	5.2	57.44 51.50	5.2
5.9	43.45 35.71	6.0	38.66 38.23	6.0	53.24 30.71	6.1	41.00 23.50	6.2	57.25 51.35	6.2	57.25 51.35	6.2	57.25 51.35	6.2
6.9	43.52 35.43	7.0	38.75 37.93	7.0	53.15 30.31	7.1	40.87 23.27	7.2	57.07 51.20	7.2	57.07 51.20	7.2	57.07 51.20	7.2
7.9	43.58 35.15	8.0	38.80 37.64	8.0	53.07 29.89	8.1	40.74 23.05	8.2	56.89 51.05	8.2	56.89 51.05	8.2	56.89 51.05	8.2
8.9	43.63 34.87	9.0	38.83 37.36	9.0	53.02 29.48	9.1	40.61 22.83	9.2	56.74 50.92	9.2	56.74 50.92	9.2	56.74 50.92	9.2
9.9	43.68 34.60	10.0	38.83 37.07	10.0	52.98 29.07	10.1	40.45 22.62	10.2	56.52 50.79	10.2	56.52 50.79	10.2	56.52 50.79	10.2
10.9	43.71 34.30	11.0	38.80 36.79	11.0	52.96 28.69	11.1	40.31 22.42	11.2	56.32 50.67	11.2	56.32 50.67	11.2	56.32 50.67	11.2
11.9	43.75 34.00	12.0	38.76 36.48	12.0	52.95 28.29	12.1	40.14 22.23	12.2	56.11 50.55	12.2	56.11 50.55	12.2	56.11 50.55	12.2
12.9	43.78 33.71	13.0	38.73 36.16	13.0	52.93 27.91	13.1	39.97 21.99	13.2	55.89 50.42	13.2	55.89 50.42	13.2	55.89 50.42	13.2
13.9	43.82 33.39	13.9	38.73 35.86	14.0	52.92 27.54	14.1	39.81 21.74	14.2	55.66 50.28	14.2	55.66 50.28	14.2	55.66 50.28	14.2
14.9	43.87 33.07	14.9	38.79 35.53	15.0	52.89 27.21	15.1	39.64 21.48	15.2	55.43 50.10	15.2	55.43 50.10	15.2	55.43 50.10	15.2
15.9	43.96 32.72	15.9	38.92 35.18	16.0	52.86 26.86	16.1	39.49 21.18	16.2	55.21 49.89	16.2	55.21 49.89	16.2	55.21 49.89	16.2
16.9	44.06 32.38	16.9	39.15 34.85	17.0	52.83 26.52	17.1	39.35 20.89	17.2	55.01 49.68	17.2	55.01 49.68	17.2	55.01 49.68	17.2
17.9	44.20 32.09	17.9	39.47 34.50	17.9	52.77 26.18	18.1	39.25 20.56	18.2	54.82 49.44	18.2	54.82 49.44	18.2	54.82 49.44	18.2
18.9	44.34 31.80	18.9	39.87 34.18	18.9	52.72 25.81	19.1	39.16 20.25	19.2	54.65 49.19	19.2	54.65 49.19	19.2	54.65 49.19	19.2
19.9	44.51 31.52	19.9	40.29 33.90	19.9	52.67 25.43	20.1	39.10 19.96	20.2	54.50 48.96	20.2	54.50 48.96	20.2	54.50 48.96	20.2
20.9	44.67 31.27	20.9	40.72 33.62	20.9	52.63 25.02	21.1	39.04 19.68	21.2	54.38 48.72	21.2	54.38 48.72	21.2	54.38 48.72	21.2
21.9	44.82 31.03	21.9	41.09 33.35	21.9	52.61 24.58	22.1	38.98 19.44	22.1	54.26 48.52	22.1	54.26 48.52	22.1	54.26 48.52	22.1
22.9	44.93 30.80	22.9	41.41 33.11	22.9	52.60 24.17	23.1	38.93 19.21	23.1	54.14 48.34	23.1	54.14 48.34	23.1	54.14 48.34	23.1
23.9	45.04 30.59	23.9	41.66 32.88	23.9	52.63 23.74	24.1	38.84 18.98	24.1	54.01 48.16	24.1	54.01 48.16	24.1	54.01 48.16	24.1
24.9	45.15 30.35	24.9	41.86 32.60	24.9	52.68 23.32	25.1	38.76 18.73	25.1	53.86 48.00	25.1	53.86 48.00	25.1	53.86 48.00	25.1
25.9	45.24 30.08	25.9	42.05 32.32	25.9	52.72 22.95	26.1	38.65 18.48	26.1	53.67 47.82	26.1	53.67 47.82	26.1	53.67 47.82	26.1
26.9	45.34 29.79	26.9	42.28 32.00	26.9	52.77 22.58	27.1	38.53 18.22	27.1	53.49 47.60	27.1	53.49 47.60	27.1	53.49 47.60	27.1
27.9	45.47 29.49	27.9	42.59 31.70	27.9	52.81 22.24	28.1	38.42 17.91	28.1	53.30 47.38	28.1	53.30 47.38	28.1	53.30 47.38	28.1
28.9	45.61 29.19	28.9	42.99 31.38	28.9	52.83 21.91	29.1	38.32 17.61	29.1	53.12 47.13	29.1	53.12 47.13	29.1	53.12 47.13	29.1
29.9	45.79 28.91	29.9	43.48 31.07	29.9	52.83 21.56	30.1	38.24 17.26	30.1	52.97 46.84	30.1	52.97 46.84	30.1	52.97 46.84	30.1
30.9	45.97 28.63	30.9	44.03 30.76	30.9	52.84 21.22	31.1	38.19 16.93	31.1	52.81 46.54	31.1	52.81 46.54	31.1	52.81 46.54	31.1
13.68	+13.65	50.25	+50.24	11.93'	-11.89	12.31	+12.27	11.86	+11.82					
0 ^h 57 ^m	1°.657	1 ^h 29 ^m	44°.254	1 ^h 42 ^m	6°.102	4 ^h 9 ^m	44°.952	5 ^h 34 ^m	54°.014					
+85° 48'	25''.87	+88° 51'	25''.03	-85° 11'	39''.58	+85° 20'	1''.04	+85° 9'	28''.07					

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

31 G. Mensæ. Mag. 6.2			ζ Mensæ. Mag. 5.6			51 H. Cephei. Mag. 5.3			25 H. Camelop. Mag. 5.1			7 G. Octantis. Mag. 6.4		
Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.
Apr.	h m	° ' "	Apr.	h m	° ' "	Apr.	h m	° ' "	Apr.	h m	° ' "	Apr.	h m	° ' "
	5 46	-84 49		6 46	-80 43		7 1	+87 11		7 13	+82 34		7 16	-86 54
	s	"		s	"		s	"		s	"		s	"
0.2	16.97	60.44	0.3	60.42	50.35	0.3	53.79	21.42	0.3	38.19	56.36	0.3	30.57	17.04
1.2	16.72	60.38	1.3	60.27	50.38	1.3	53.30	21.44	1.3	38.01	56.39	1.3	30.15	17.11
2.2	16.47	60.32	2.3	60.13	50.41	2.3	52.82	21.41	2.3	37.82	56.39	2.3	29.73	17.21
3.2	16.20	60.27	3.2	59.98	50.47	3.3	52.35	21.39	3.3	37.65	56.39	3.3	29.32	17.30
4.2	15.93	60.23	4.2	59.84	50.53	4.3	51.92	21.33	4.3	37.48	56.34	4.3	28.85	17.42
5.2	15.65	60.18	5.2	59.69	50.58	5.3	51.49	21.28	5.3	37.33	56.32	5.3	28.40	17.51
6.2	15.36	60.10	6.2	59.54	50.60	6.3	51.11	21.20	6.3	37.19	56.28	6.3	27.94	17.60
7.2	15.08	60.01	7.2	59.37	50.61	7.3	50.72	21.16	7.3	37.05	56.23	7.3	27.45	17.67
8.2	14.80	59.90	8.2	59.22	50.60	8.2	50.35	21.13	8.3	36.91	56.22	8.3	26.95	17.72
9.2	14.52	59.77	9.2	59.05	50.58	9.2	49.98	21.10	9.3	36.78	56.21	9.3	26.45	17.73
10.2	14.24	59.64	10.2	58.88	50.55	10.2	49.60	21.07	10.2	36.64	56.20	10.3	25.94	17.75
11.2	13.97	59.47	11.2	58.73	50.48	11.2	49.22	21.05	11.2	36.50	56.20	11.2	25.47	17.74
12.2	13.72	59.30	12.2	58.58	50.40	12.2	48.82	21.04	12.2	36.36	56.20	12.2	25.00	17.73
13.2	13.47	59.12	13.2	58.43	50.32	13.2	48.40	21.01	13.2	36.19	56.19	13.2	24.53	17.70
14.2	13.23	58.97	14.2	58.29	50.24	14.2	47.96	20.97	14.2	36.01	56.19	14.2	24.10	17.68
15.2	13.01	58.82	15.2	58.15	50.17	15.2	47.49	20.91	15.2	35.84	56.14	15.2	23.67	17.68
16.2	12.77	58.71	16.2	58.01	50.14	16.2	47.03	20.83	16.2	35.68	56.08	16.2	23.24	17.68
17.2	12.53	58.60	17.2	57.88	50.10	17.2	46.59	20.72	17.2	35.50	55.99	17.2	22.83	17.70
18.2	12.29	58.48	18.2	57.74	50.07	18.2	46.16	20.58	18.2	35.34	55.86	18.2	22.40	17.73
19.2	12.03	58.36	19.2	57.59	50.06	19.2	45.77	20.44	19.2	35.19	55.73	19.2	21.96	17.77
20.2	11.76	58.23	20.2	57.44	50.03	20.2	45.41	20.29	20.2	35.06	55.60	20.2	21.49	17.79
21.2	11.49	58.10	21.2	57.29	49.99	21.2	45.09	20.14	21.2	34.96	55.49	21.2	20.99	17.80
22.2	11.22	57.92	22.2	57.13	49.92	22.2	44.77	20.00	22.2	34.84	55.38	22.2	20.49	17.79
23.2	10.96	57.72	23.2	56.97	49.83	23.2	44.48	19.90	23.2	34.73	55.29	23.2	19.98	17.75
24.2	10.71	57.49	24.2	56.82	49.69	24.2	44.17	19.80	24.2	34.62	55.22	24.2	19.48	17.66
25.1	10.47	57.25	25.2	56.67	49.55	25.2	43.82	19.72	25.2	34.48	55.16	25.2	19.00	17.58
26.1	10.25	57.02	26.2	56.53	49.38	26.2	43.45	19.65	26.2	34.34	55.09	26.2	18.56	17.47
27.1	10.05	56.79	27.2	56.40	49.23	27.2	43.03	19.54	27.2	34.18	55.00	27.2	18.13	17.39
28.1	9.85	56.60	28.2	56.26	49.11	28.2	42.62	19.40	28.2	34.03	54.90	28.2	17.74	17.31
29.1	9.65	56.41	29.2	56.14	48.99	29.2	42.19	19.22	29.2	33.87	54.75	29.2	17.35	17.27
30.1	9.45	56.24	30.2	56.02	48.91	30.2	41.78	19.03	30.2	33.71	54.61	30.2	16.95	17.22
31.1	9.23	56.06	31.2	55.89	48.82	31.2	41.40	18.84	31.2	33.56	54.42	31.2	16.54	17.19
11.10	-11.06		6.21	-6.13		20.39	+20.37		7.75	+7.68		18.52	-18.49	
5 ^h 46 ^m	26°.439		6 ^h 47 ^m	3°.489		7 ^h 1 ^m	34°.861		7 ^h 13 ^m	29°.477		7 ^h 16 ^m	40°.555	
-84° 49'	48".17		-80° 43'	34".16		+87° 11'	0".11		+82° 34'	36".50		-86° 54'	0".14	

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

Groombridge 1119. Mag. 7.0			ζ Octantis. Mag. 5.4			1 H. Draconis. Mag. 4.6			ζ Chamæleontis. Mag. 5.2			30 H. Camelop. Mag. 5.3		
Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.
Apr.	h m	° ' "	Apr.	h m	° ' "	Apr.	h m	° ' "	Apr.	h m	° ' "	Apr.	h m	° ' "
	8 15	+88 53		9 8	-85 20		9 25	+81 42		9 36	-80 34		10 21	+82 59
	s	"		s	"		s	"		s	"		s	"
0.3	55.13	27.86	0.4	67.25	2.36	0.4	25.14	5.99	0.4	26.36	10.68	0.4	12.37	15.49
1.3	53.98	28.00	1.4	67.03	2.58	1.4	25.00	6.21	1.4	26.27	10.92	1.4	12.25	15.78
2.3	52.82	28.09	2.4	66.82	2.82	2.4	24.86	6.41	2.4	26.18	11.18	2.4	12.12	16.05
3.3	51.65	28.15	3.4	66.62	3.07	3.4	24.73	6.59	3.4	26.08	11.45	3.4	11.98	16.29
4.3	50.52	28.21	4.3	66.39	3.33	4.4	24.59	6.74	4.4	25.99	11.73	4.4	11.84	16.51
5.3	49.44	28.27	5.3	66.16	3.58	5.4	24.44	6.88	5.4	25.90	12.02	5.4	11.72	16.71
6.3	48.41	28.30	6.3	65.92	3.85	6.4	24.35	7.01	6.4	25.80	12.31	6.4	11.61	16.91
7.3	47.42	28.35	7.3	65.67	4.11	7.4	24.25	7.14	7.4	25.69	12.59	7.4	11.49	17.09
8.3	46.47	28.39	8.3	65.40	4.34	8.3	24.14	7.27	8.4	25.58	12.86	8.4	11.38	17.28
9.3	45.53	28.46	9.3	65.13	4.56	9.3	24.04	7.41	9.4	25.45	13.11	9.4	11.28	17.47
10.3	44.59	28.52	10.3	64.85	4.76	10.3	23.94	7.55	10.4	25.33	13.34	10.4	11.18	17.68
11.3	43.63	28.59	11.3	64.56	4.96	11.3	23.83	7.71	11.3	25.20	13.57	11.4	11.08	17.90
12.3	42.63	28.65	12.3	64.29	5.11	12.3	23.72	7.88	12.3	25.08	13.76	12.4	10.97	18.12
13.3	41.58	28.73	13.3	64.00	5.27	13.3	23.59	8.05	13.3	24.96	13.96	13.4	10.85	18.33
14.3	40.47	28.81	14.3	63.74	5.43	14.3	23.46	8.20	14.3	24.83	14.16	14.4	10.72	18.56
15.3	39.30	28.85	15.3	63.50	5.56	15.3	23.32	8.36	15.3	24.72	14.34	15.4	10.57	18.78
16.3	38.10	28.87	16.3	63.25	5.73	16.3	23.16	8.48	16.3	24.61	14.52	16.4	10.42	18.98
17.3	36.88	28.88	17.3	63.02	5.91	17.3	23.02	8.58	17.3	24.50	14.72	17.4	10.25	19.17
18.3	35.70	28.84	18.3	62.78	6.09	18.3	22.87	8.66	18.3	24.40	14.95	18.4	10.10	19.32
19.3	34.57	28.80	19.3	62.54	6.30	19.3	22.72	8.72	19.3	24.29	15.18	19.4	9.94	19.46
20.3	33.53	28.74	20.3	62.28	6.51	20.3	22.59	8.77	20.3	24.18	15.41	20.4	9.79	19.57
21.3	32.58	28.69	21.3	62.00	6.71	21.3	22.48	8.81	21.3	24.06	15.64	21.4	9.65	19.66
22.3	31.68	28.62	22.3	61.71	6.90	22.3	22.36	8.85	22.3	23.93	15.87	22.3	9.52	19.76
23.3	30.80	28.60	23.3	61.40	7.05	23.3	22.26	8.91	23.3	23.80	16.06	23.3	9.41	19.88
24.3	29.92	28.58	24.3	61.09	7.18	24.3	22.16	8.99	24.3	23.65	16.21	24.3	9.30	20.01
25.3	28.98	28.58	25.3	60.78	7.27	25.3	22.05	9.08	25.3	23.52	16.35	25.3	9.18	20.16
26.2	27.97	28.58	26.3	60.49	7.36	26.3	21.91	9.16	26.3	23.37	16.48	26.3	9.05	20.32
27.2	26.87	28.57	27.3	60.21	7.44	27.3	21.78	9.26	27.3	23.24	16.58	27.3	8.90	20.49
28.2	25.71	28.54	28.3	59.94	7.52	28.3	21.63	9.34	28.3	23.11	16.68	28.3	8.73	20.65
29.2	24.52	28.50	29.3	59.70	7.61	29.3	21.47	9.40	29.3	23.01	16.81	29.3	8.56	20.79
30.2	23.33	28.40	30.3	59.45	7.72	30.3	21.31	9.44	30.3	22.89	16.93	30.3	8.37	20.91
31.2	22.18	28.30	31.3	59.21	7.84	31.3	21.16	9.45	31.3	22.78	17.09	31.3	8.18	21.01
51.68	+51.67	12.30	-12.25	6.93	+6.86	6.10	-6.02	8.19	+8.13					
8 ^h 14 ^m	48°.311	9 ^h 9 ^m	6°.085	9 ^h 25 ^m	12°.930	9 ^h 36 ^m	24°.003	10 ^h 20 ^m	57°.259					
+88° 53'	11''.43	-85° 19'	42''.77	+81° 41'	57''.18	-80° 33'	50''.61	+82° 59'	12''.27					

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

7 Octantis. Mag. 6.3			Bradley 1672. Mag. 6.3			1 Octantis. Mag. 5.4			32 H. Camelop. seq. Mag. 5.3			κ Octantis. Mag. 5.6		
Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.
Apr.	h m 10 59	° ' " -84 8	Apr.	h m 12 15	° ' " +88 9	Apr.	h m 12 46	° ' " -84 40	Apr.	h m 12 48	° ' " +83 51	Apr.	h m 13 27	° ' " -85 21
0.4	62.72	49.12	0.5	19.32	47.76	0.5	13.65	15.04	0.5	45.56	57.77	0.5	21.06	32.98
1.4	62.63	49.43	1.5	19.19	48.12	1.5	13.67	15.38	1.5	45.56	58.13	1.5	21.13	33.31
2.4	62.55	49.75	2.5	19.00	48.47	2.5	13.70	15.72	2.5	45.53	58.47	2.5	21.22	33.64
3.4	62.49	50.09	3.5	18.77	48.79	3.5	13.74	16.09	3.5	45.49	58.81	3.5	21.32	33.98
4.4	62.41	50.45	4.5	18.52	49.11	4.5	13.79	16.45	4.5	45.45	59.15	4.5	21.42	34.35
5.4	62.34	50.82	5.5	18.28	49.39	5.5	13.84	16.84	5.5	45.41	59.46	5.5	21.53	34.70
6.4	62.25	51.19	6.5	18.03	49.67	6.5	13.87	17.24	6.5	45.37	59.76	6.5	21.63	35.08
7.4	62.16	51.55	7.5	17.83	49.94	7.5	13.89	17.66	7.5	45.34	60.04	7.5	21.72	35.49
8.4	62.05	51.92	8.5	17.64	50.21	8.5	13.90	18.06	8.5	45.31	60.33	8.5	21.78	35.90
9.4	61.92	52.27	9.5	17.45	50.47	9.5	13.90	18.47	9.5	45.30	60.61	9.5	21.83	36.30
10.4	61.78	52.61	10.5	17.30	50.74	10.5	13.87	18.85	10.5	45.29	60.88	10.5	21.86	36.71
11.4	61.64	52.93	11.5	17.14	51.02	11.5	13.84	19.24	11.5	45.28	61.17	11.5	21.88	37.10
12.4	61.49	53.23	12.5	16.97	51.32	12.5	13.80	19.62	12.5	45.24	61.47	12.5	21.88	37.49
13.4	61.35	53.52	13.5	16.79	51.61	13.5	13.75	19.98	13.5	45.22	61.80	13.5	21.89	37.86
14.4	61.21	53.80	14.5	16.56	51.92	14.5	13.71	20.32	14.5	45.19	62.13	14.5	21.88	38.20
15.4	61.08	54.07	15.4	16.27	52.24	15.5	13.66	20.66	15.5	45.14	62.47	15.5	21.89	38.53
16.4	60.97	54.35	16.4	15.95	52.56	16.5	13.65	20.99	16.5	45.06	62.80	16.5	21.92	38.87
17.4	60.86	54.65	17.4	15.57	52.85	17.5	13.63	21.32	17.5	44.98	63.13	17.5	21.96	39.20
18.4	60.76	54.96	18.4	15.15	53.14	18.5	13.63	21.67	18.5	44.89	63.43	18.5	22.01	39.54
19.4	60.65	55.27	19.4	14.72	53.38	19.5	13.63	22.03	19.5	44.79	63.72	19.5	22.06	39.90
20.4	60.52	55.59	20.4	14.30	53.64	20.5	13.64	22.42	20.5	44.70	63.99	20.5	22.11	40.30
21.4	60.39	55.93	21.4	13.91	53.86	21.5	13.62	22.83	21.5	44.61	64.23	21.5	22.16	40.71
22.4	60.25	56.26	22.4	13.58	54.06	22.4	13.58	23.24	22.5	44.55	64.46	22.5	22.17	41.12
23.4	60.09	56.59	23.4	13.28	54.27	23.4	13.52	23.65	23.4	44.49	64.70	23.5	22.17	41.53
24.4	59.91	56.88	24.4	13.00	54.50	24.4	13.44	24.03	24.4	44.43	64.95	24.5	22.13	41.94
25.4	59.73	57.14	25.4	12.72	54.75	25.4	13.36	24.41	25.4	44.38	65.22	25.5	22.08	42.32
26.4	59.55	57.38	26.4	12.39	55.02	26.4	13.26	24.73	26.4	44.30	65.48	26.5	22.03	42.69
27.4	59.38	57.60	27.4	12.04	55.29	27.4	13.17	25.05	27.4	44.22	65.79	27.5	21.97	43.02
28.4	59.22	57.82	28.4	11.63	55.57	28.4	13.08	25.36	28.4	44.13	66.10	28.5	21.93	43.34
29.4	59.08	58.05	29.4	11.17	55.84	29.4	13.03	25.66	29.4	44.01	66.40	29.5	21.89	43.64
30.4	58.95	58.30	30.4	10.65	56.10	30.4	12.96	25.97	30.4	43.88	66.70	30.5	21.88	43.97
31.4	58.81	58.54	31.4	10.09	56.34	31.4	12.92	26.28	31.4	43.76	66.99	31.5	21.88	44.28
9.81	-9.76		31.22	+31.20		10.77	-10.72		9.36	+9.31		12.36	-12.32	
10 ^h 59 ^m 55 ^s .642			12 ^h 14 ^m 28 ^s .053			12 ^h 46 ^m 1 ^s .183			12 ^h 48 ^m 29 ^s .976			13 ^h 27 ^m 5 ^s .514		
-84° 8' 31".24			+88° 9' 56".03			-84° 40' 2".72			+83° 52' 10".05			-85° 21' 23".59		

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

δ Octantis. Mag. 4.1			Groombridge 2283. Mag. 7.2			ρ Octantis. Mag. 5.7			ϵ Ursæ Minoris. Mag. 4.4			59 G. Apodis. Mag. 5.9		
Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.
	h m	° '		h m	° '		h m	° '		h m	° '		h m	° '
Apr. 14 13	-83 17		Apr. 15 4	+87 33		Apr. 15 23	-84 11		Apr. 16 54	+82 10		Apr. 17 15	-80 46	
	s	"		s	"		s	"		s	"		s	"
0.6	30.58	10.39	0.6	21.37	2.15	0.6	57.41	18.05	0.7	33.72	12.33	0.7	52.18	54.70
1.6	30.67	10.71	1.6	21.66	2.44	1.6	57.56	18.30	1.7	33.88	12.51	1.7	52.32	54.81
2.6	30.76	11.02	2.6	21.91	2.76	2.6	57.73	18.55	2.7	34.03	12.73	2.7	52.46	54.90
3.6	30.87	11.33	3.6	22.13	3.07	3.6	57.91	18.80	3.7	34.16	12.95	3.7	52.61	54.98
4.6	30.99	11.65	4.6	22.32	3.37	4.6	58.10	19.05	4.7	34.28	13.17	4.7	52.77	55.05
5.6	31.11	11.99	5.6	22.48	3.67	5.6	58.30	19.31	5.7	34.40	13.38	5.7	52.94	55.15
6.6	31.22	12.36	6.6	22.64	3.96	6.6	58.50	19.59	6.7	34.52	13.59	6.7	53.12	55.27
7.6	31.33	12.72	7.6	22.83	4.23	7.6	58.69	19.90	7.7	34.63	13.79	7.7	53.28	55.42
8.5	31.42	13.10	8.6	23.00	4.49	8.6	58.87	20.22	8.7	34.75	13.99	8.7	53.45	55.58
9.5	31.50	13.49	9.6	23.18	4.75	9.6	59.04	20.55	9.7	34.87	14.17	9.7	53.61	55.75
10.5	31.57	13.86	10.6	23.39	5.01	10.6	59.19	20.88	10.7	34.99	14.34	10.7	53.77	55.94
11.5	31.63	14.25	11.6	23.60	5.28	11.6	59.34	21.21	11.7	35.12	14.52	11.7	53.92	56.14
12.5	31.68	14.62	12.6	23.82	5.55	12.6	59.47	21.54	12.6	35.25	14.71	12.7	54.06	56.35
13.5	31.73	14.97	13.6	24.03	5.84	13.6	59.58	21.86	13.6	35.38	14.91	13.7	54.20	56.53
14.5	31.77	15.31	14.6	24.24	6.15	14.6	59.70	22.16	14.6	35.50	15.13	14.7	54.32	56.71
15.5	31.82	15.63	15.6	24.41	6.48	15.6	59.83	22.45	15.6	35.62	15.38	15.7	54.44	56.87
16.5	31.88	15.96	16.6	24.55	6.82	16.6	59.95	22.73	16.6	35.74	15.64	16.7	54.56	57.03
17.5	31.94	16.27	17.6	24.65	7.17	17.6	60.09	23.00	17.6	35.85	15.92	17.6	54.70	57.15
18.5	32.02	16.59	18.6	24.72	7.51	18.6	60.24	23.26	18.6	35.94	16.21	18.6	54.84	57.29
19.5	32.10	16.95	19.6	24.74	7.85	19.6	60.40	23.57	19.6	36.03	16.50	19.6	54.99	57.43
20.5	32.18	17.31	20.6	24.76	8.16	20.6	60.56	23.88	20.6	36.12	16.79	20.6	55.16	57.60
21.5	32.25	17.70	21.5	24.79	8.44	21.6	60.72	24.20	21.6	36.20	17.05	21.6	55.32	57.79
22.5	32.32	18.10	22.5	24.82	8.71	22.6	60.88	24.55	22.6	36.28	17.30	22.6	55.48	58.01
23.5	32.36	18.52	23.5	24.87	8.97	23.6	61.02	24.92	23.6	36.36	17.52	23.6	55.64	58.26
24.5	32.39	18.91	24.5	24.96	9.24	24.6	61.13	25.31	24.6	36.45	17.74	24.6	55.78	58.51
25.5	32.41	19.28	25.5	25.05	9.51	25.6	61.22	25.66	25.6	36.55	17.95	25.6	55.91	58.77
26.5	32.42	19.65	26.5	25.16	9.82	26.5	61.30	25.99	26.6	36.65	18.22	26.6	56.02	59.01
27.5	32.43	19.98	27.5	25.24	10.13	27.5	61.37	26.33	27.6	36.75	18.48	27.6	56.12	59.22
28.5	32.43	20.31	28.5	25.30	10.48	28.5	61.44	26.63	28.6	36.84	18.78	28.6	56.23	59.42
29.5	32.45	20.63	29.5	25.31	10.82	29.5	61.53	26.92	29.6	36.93	19.09	29.6	56.34	59.61
30.5	32.48	20.94	30.5	25.30	11.17	30.5	61.62	27.20	30.6	37.00	19.42	30.6	56.45	59.78
31.5	32.51	21.25	31.5	25.26	11.53	31.5	61.73	27.50	31.6	37.07	19.74	31.6	56.58	59.98
8.56	-8.50		23.41	+23.39		9.88	-9.83		7.34	+7.27		6.24	-6.16	
14 ^h 13 ^m 18 ^s .531			15 ^h 4 ^m 0 ^s .607			15 ^h 23 ^m 43 ^s .237			16 ^h 54 ^m 31 ^s .741			17 ^h 15 ^m 43 ^s .730		
-83° 17' 4''.27			+87° 33' 24''.43			-84° 11' 17''.84			+82° 10' 38''.40			-80° 47' 2''.69		

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

δ Ursæ Minoris. Mag. 4.4			χ Octantis. Mag. 5.2			λ Ursæ Minoris. Mag. 6.6			σ Octantis. Mag. 5.5			76 Draconis. Mag. 5.7		
Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.
Apr.	h m	° '	Apr.	h m	° '	Apr.	h m	° '	Apr.	h m	° '	Apr.	h m	° '
	17 59	+86 36		18 6	-87 39		19 3	+89 0		19 26	-89 13		20 48	+82 13
	s	"		s	"		s	"		s	"		s	"
0.7	15.31	26.43	0.7	0.82	39.70	0.8	3.73	34.92	0.8	52.39	19.14	0.8	35.96	1.70
1.7	15.69	26.51	1.7	1.38	39.75	1.8	5.09	34.92	1.8	54.03	19.05	1.8	36.12	1.56
2.7	16.08	26.64	2.7	1.97	39.77	2.8	6.44	34.95	2.8	55.69	18.95	2.8	36.29	1.43
3.7	16.43	26.78	3.7	2.56	39.77	3.8	7.76	34.99	3.8	57.40	18.83	3.8	36.45	1.33
4.7	16.77	26.90	4.7	3.20	39.78	4.8	9.02	35.03	4.8	59.19	18.72	4.8	36.61	1.24
5.7	17.10	27.05	5.7	3.85	39.81	5.8	10.21	35.08	5.8	61.08	18.61	5.8	36.77	1.16
6.7	17.42	27.21	6.7	4.53	39.85	6.8	11.34	35.13	6.8	63.03	18.51	6.8	36.92	1.09
7.7	17.72	27.32	7.7	5.21	39.92	7.8	12.46	35.18	7.8	65.02	18.42	7.8	37.06	1.01
8.7	18.01	27.45	8.7	5.88	40.00	8.7	13.54	35.21	8.8	67.05	18.36	8.8	37.20	0.92
9.7	18.31	27.56	9.7	6.54	40.08	9.7	14.62	35.25	9.8	69.08	18.31	9.8	37.34	0.83
10.7	18.62	27.65	10.7	7.19	40.20	10.7	15.73	35.27	10.8	71.08	18.29	10.8	37.49	0.73
11.7	18.94	27.75	11.7	7.81	40.33	11.7	16.88	35.30	11.8	73.02	18.28	11.8	37.62	0.63
12.7	19.27	27.86	12.7	8.40	40.46	12.7	18.06	35.34	12.8	74.92	18.28	12.8	37.77	0.53
13.7	19.62	27.98	13.7	8.97	40.60	13.7	19.30	35.38	13.8	76.72	18.28	13.8	37.92	0.42
14.7	19.96	28.13	14.7	9.52	40.71	14.7	20.58	35.44	14.7	78.45	18.27	14.8	38.08	0.32
15.7	20.31	28.29	15.7	10.04	40.81	15.7	21.89	35.52	15.7	80.12	18.26	15.8	38.26	0.24
16.7	20.64	28.49	16.7	10.58	40.89	16.7	23.20	35.61	16.7	81.78	18.23	16.8	38.42	0.18
17.7	20.97	28.71	17.7	11.13	40.97	17.7	24.47	35.73	17.7	83.47	18.18	17.8	38.60	0.15
18.7	21.26	28.93	18.7	11.72	41.05	18.7	25.67	35.86	18.7	85.23	18.13	18.8	38.78	0.15
19.7	21.54	29.16	19.7	12.33	41.12	19.7	26.78	36.00	19.7	87.10	18.09	19.8	38.95	0.17
20.7	21.79	29.38	20.7	12.98	41.21	20.7	27.80	36.14	20.7	89.08	18.03	20.8	39.11	0.21
21.7	22.03	29.58	21.7	13.65	41.33	21.7	28.76	36.28	21.7	91.14	18.01	21.8	39.26	0.24
22.7	22.26	29.77	22.7	14.32	41.48	22.7	29.68	36.41	22.7	93.25	18.00	22.8	39.40	0.25
23.7	22.50	29.95	23.7	14.97	41.65	23.7	30.60	36.52	23.7	95.33	18.03	23.8	39.54	0.25
24.7	22.75	30.10	24.7	15.57	41.84	24.7	31.57	36.62	24.7	97.34	18.09	24.8	39.68	0.24
25.7	23.02	30.25	25.7	16.13	42.04	25.7	32.63	36.71	25.7	99.24	18.16	25.8	39.83	0.21
26.7	23.30	30.45	26.7	16.64	42.23	26.7	33.74	36.82	26.7	101.00	18.24	26.8	39.99	0.18
27.6	23.60	30.65	27.7	17.11	42.40	27.7	34.93	36.94	27.7	102.66	18.30	27.8	40.16	0.16
28.6	23.90	30.89	28.7	17.59	42.55	28.7	36.14	37.08	28.7	104.25	18.35	28.8	40.33	0.17
29.6	24.19	31.12	29.6	18.07	42.70	29.7	37.33	37.26	29.7	105.82	18.37	29.8	40.50	0.20
30.6	24.46	31.40	30.6	18.56	42.82	30.7	38.49	37.46	30.7	107.44	18.39	30.8	40.68	0.25
31.6	24.70	31.68	31.6	19.07	42.95	31.7	39.58	37.68	31.7	109.10	18.41	31.8	40.86	0.33
16.91	+16.88		24.50	-24.48		57.87	+57.86		73.62	-73.61		7.38	+7.32	
17 ^h 59 ^m	20°.805		18 ^h 5 ^m	36°.163		19 ^h 3 ^m	51°.560		19 ^h 26 ^m	7°.189		20 ^h 48 ^m	44°.660	
+86°	36' 51".19		-87° 39' 52".21			+89° 0' 56".70			-89° 13' 35".99			+82° 13' 16".38		

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

λ Octantis. Mag. 5.4			ν Octantis. Mag. 5.7			β Octantis. Mag. 4.3			39 H. Cephei. Mag. 5.6			γ^1 Octantis. Mag. 5.1		
Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.
	h m	° '		h m	° '		h m	° '		h m	° '		h m	° '
Apr. 21 38	-83 5		Apr. 22 15	-86 23		Apr. 22 37	-81 48		Apr. 23 27	+86 50		Apr. 23 47	-82 28	
	"	"		"	"		"	"		"	"		"	"
0.9	10.61	65.30	0.9	52.75	27.21	0.9	31.18	64.36	0.9	15.79	41.43	0.9	8.44	54.31
1.9	10.75	65.03	1.9	52.95	26.90	1.9	31.24	64.05	1.9	15.97	41.12	1.9	8.46	53.97
2.9	10.87	64.75	2.9	53.14	26.59	2.9	31.31	63.72	2.9	16.17	40.80	2.9	8.48	53.63
3.9	11.00	64.47	3.9	53.33	26.28	3.9	31.39	63.39	3.9	16.40	40.52	3.9	8.51	53.26
4.9	11.14	64.18	4.9	53.54	25.94	4.9	31.47	63.04	4.9	16.63	40.25	4.9	8.54	52.88
5.9	11.29	63.86	5.9	53.77	25.60	5.9	31.56	62.68	5.9	16.86	40.00	5.9	8.59	52.48
6.9	11.46	63.56	6.9	54.01	25.26	6.9	31.65	62.31	6.9	17.08	39.75	6.9	8.63	52.07
7.9	11.64	63.28	7.9	54.29	24.92	7.9	31.77	61.96	7.9	17.28	39.52	7.9	8.69	51.66
8.9	11.81	63.00	8.9	54.58	24.60	8.9	31.89	61.60	8.9	17.47	39.27	8.9	8.77	51.25
9.9	12.00	62.74	9.9	54.88	24.29	9.9	32.02	61.26	9.9	17.65	39.03	9.9	8.85	50.86
10.9	12.19	62.49	10.9	55.20	24.00	10.9	32.15	60.94	10.9	17.82	38.78	10.9	8.94	50.48
11.9	12.38	62.29	11.9	55.51	23.73	11.9	32.27	60.64	11.9	17.99	38.52	11.9	9.03	50.12
12.8	12.57	62.08	12.9	55.81	23.47	12.9	32.41	60.35	12.9	18.17	38.24	12.9	9.11	49.78
13.8	12.75	61.88	13.9	56.10	23.22	13.9	32.52	60.07	13.9	18.36	37.97	13.9	9.19	49.43
14.8	12.91	61.67	14.9	56.38	22.98	14.9	32.63	59.82	14.9	18.59	37.69	14.9	9.26	49.09
15.8	13.06	61.47	15.9	56.64	22.74	15.9	32.73	59.56	15.9	18.84	37.42	15.9	9.33	48.77
16.8	13.22	61.28	16.9	56.88	22.49	16.9	32.83	59.28	16.9	19.12	37.17	16.9	9.39	48.46
17.8	13.36	61.04	17.9	57.12	22.23	17.9	32.93	58.99	17.9	19.44	36.93	17.9	9.45	48.12
18.8	13.52	60.79	18.9	57.37	21.94	18.9	33.03	58.69	18.9	19.76	36.72	18.9	9.51	47.76
19.8	13.70	60.53	19.9	57.64	21.63	19.9	33.14	58.35	19.9	20.08	36.52	19.9	9.58	47.37
20.8	13.88	60.26	20.9	57.94	21.32	20.9	33.27	58.02	20.9	20.38	36.35	20.9	9.66	46.99
21.8	14.08	60.01	21.8	58.27	21.03	21.9	33.40	57.69	21.9	20.67	36.18	21.9	9.76	46.61
22.8	14.31	59.78	22.8	58.62	20.74	22.9	33.55	57.36	22.9	20.92	36.02	22.9	9.87	46.22
23.8	14.53	59.57	23.8	59.00	20.49	23.9	33.71	57.06	23.9	21.17	35.84	23.9	10.00	45.84
24.8	14.74	59.38	24.8	59.37	20.23	24.9	33.88	56.79	24.9	21.41	35.66	24.9	10.12	45.49
25.8	14.95	59.23	25.8	59.72	20.03	25.9	34.03	56.57	25.9	21.64	35.45	25.9	10.23	45.16
26.8	15.15	59.10	26.8	60.06	19.84	26.9	34.17	56.35	26.9	21.90	35.24	26.9	10.35	44.87
27.8	15.33	58.96	27.8	60.37	19.67	27.8	34.31	56.14	27.9	22.19	35.02	27.9	10.46	44.59
28.8	15.49	58.82	28.8	60.66	19.49	28.8	34.43	55.91	28.9	22.51	34.81	28.9	10.55	44.31
29.8	15.65	58.66	29.8	60.94	19.28	29.8	34.53	55.70	29.9	22.87	34.60	29.9	10.64	44.02
30.8	15.82	58.48	30.8	61.21	19.07	30.8	34.65	55.45	30.9	23.24	34.40	30.9	10.73	43.72
31.8	16.00	58.31	31.8	61.50	18.84	31.8	34.77	55.18	31.9	23.61	34.23	31.9	10.81	43.41
8.32	-8.26		15.88	-15.85		7.02	-6.95		18.16	+18.13		7.64	-7.58	
21 ^h 38 ^m 10 ^s .025			22 ^h 15 ^m 56 ^s .333			22 ^h 37 ^m 32 ^s .703			23 ^h 27 ^m 44 ^s .392			23 ^h 47 ^m 12 ^s .813		
-83° 6' 23".31			-86° 23' 45".22			-81° 49' 21".11			+86° 50' 39".03			-82° 29' 8".43		

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

43 H. Cephei. Mag. 4.5			α Ursæ Minoris. (Polaris.) Mag. 2.1			4 G. Octantis. Mag. 5.6			Groombridge 750. Mag. 6.7			Groombridge 944. Mag. 6.4		
Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.
	h m s	° ' "		h m s	° ' "		h m s	° ' "		h m s	° ' "		h m s	° ' "
May 0 56	+85 48		May 1 28	+88 51		May 1 41	-85 11		May 4 9	+85 20		May 5 34	+85 9	
0.9	45.97	28.63	0.9	44.03	30.76	0.9	52.84	21.22	1.1	38.19	16.93	1.1	52.81	46.54
1.9	46.20	28.37	1.9	44.65	30.47	1.9	52.84	20.88	2.1	38.15	16.59	2.1	52.69	46.25
2.9	46.41	28.13	2.9	45.30	30.20	2.9	52.84	20.52	3.1	38.14	16.27	3.1	52.58	45.97
3.9	46.63	27.90	3.9	45.92	29.93	3.9	52.86	20.14	4.1	38.13	15.95	4.1	52.49	45.69
4.9	46.82	27.70	4.9	46.52	29.69	4.9	52.89	19.78	5.1	38.13	15.67	5.1	52.39	45.43
5.9	47.02	27.50	5.9	47.10	29.46	5.9	52.94	19.37	6.1	38.13	15.41	6.1	52.30	45.18
6.9	47.20	27.30	6.9	47.63	29.23	6.9	53.00	18.98	7.0	38.11	15.14	7.1	52.21	44.95
7.9	47.38	27.10	7.9	48.14	29.00	7.9	53.09	18.58	8.0	38.08	14.86	8.1	52.11	44.69
8.9	47.55	26.87	8.9	48.62	28.75	8.9	53.18	18.20	9.0	38.05	14.60	9.1	52.01	44.46
9.9	47.72	26.65	9.9	49.10	28.50	9.9	53.28	17.82	10.0	38.01	14.31	10.1	51.90	44.23
10.9	47.89	26.41	10.9	49.60	28.24	10.9	53.38	17.49	11.0	37.98	14.05	11.1	51.77	44.03
11.9	48.07	26.19	11.9	50.13	27.97	11.9	53.47	17.15	12.0	37.93	13.74	12.1	51.64	43.76
12.9	48.27	25.95	12.9	50.75	27.69	12.9	53.55	16.84	13.0	37.90	13.41	13.1	51.51	43.47
13.9	48.50	25.72	13.9	51.43	27.40	13.9	53.63	16.53	14.0	37.89	13.09	14.1	51.41	43.15
14.9	48.74	25.49	14.9	52.21	27.15	14.9	53.71	16.22	15.0	37.89	12.74	15.1	51.32	42.85
15.9	49.01	25.28	15.9	53.07	26.90	15.9	53.78	15.90	16.0	37.94	12.39	16.1	51.27	42.51
16.9	49.30	25.10	16.9	53.96	26.67	16.9	53.83	15.57	17.0	37.99	12.06	17.1	51.22	42.17
17.9	49.57	24.96	17.9	54.87	26.48	17.9	53.88	15.21	18.0	38.08	11.75	18.1	51.20	41.85
18.9	49.84	24.83	18.9	55.75	26.31	18.9	53.95	14.83	19.0	38.16	11.47	19.1	51.20	41.56
19.9	50.10	24.70	19.9	56.57	26.16	19.9	54.03	14.44	20.0	38.25	11.21	20.1	51.18	41.31
20.9	50.33	24.58	20.9	57.32	25.99	20.9	54.16	14.06	21.0	38.30	10.97	21.1	51.17	41.06
21.9	50.55	24.45	21.9	57.99	25.82	21.9	54.30	13.68	22.0	38.36	10.72	22.1	51.14	40.80
22.9	50.76	24.29	22.9	58.64	25.64	22.9	54.45	13.36	23.0	38.40	10.45	23.1	51.09	40.55
23.9	50.97	24.13	23.9	59.29	25.45	23.9	54.61	13.03	24.0	38.40	10.18	24.1	51.03	40.28
24.9	51.18	23.95	24.9	60.01	25.22	24.9	54.75	12.73	24.9	38.44	9.87	25.1	50.96	40.00
25.9	51.42	23.78	25.9	60.81	24.99	25.9	54.88	12.45	25.9	38.46	9.56	26.1	50.90	39.68
26.9	51.70	23.60	26.9	61.68	24.75	26.9	55.01	12.20	26.9	38.51	9.23	27.1	50.84	39.36
27.9	51.98	23.44	27.9	62.63	24.54	27.9	55.11	11.92	27.9	38.59	8.89	28.1	50.80	39.02
28.9	52.30	23.29	28.9	63.65	24.36	28.9	55.22	11.65	28.9	38.68	8.56	29.0	50.80	38.66
29.9	52.62	23.16	29.9	64.70	24.19	29.9	55.32	11.36	29.9	38.78	8.22	30.0	50.80	38.31
30.8	52.93	23.06	30.9	65.74	24.04	30.9	55.45	11.07	30.9	38.90	7.92	31.0	50.83	37.97
31.8	53.22	22.98	31.9	66.75	23.90	31.9	55.57	10.75	31.9	39.04	7.63	32.0	50.86	37.68
13.68	+13.64		50.15	+50.14		11.92	-11.88		12.30	+12.26		11.86	+11.81	
0 ^h 57 ^m 1 ^s .657			1 ^h 29 ^m 44 ^s .254			1 ^h 42 ^m 6 ^s .102			4 ^h 9 ^m 44 ^s .952			5 ^h 34 ^m 54 ^s .014		
+85° 48' 25".87			+88° 51' 25".03			-85° 11' 39".58			+85° 20' 1".04			+85° 9' 28".07		

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

31 G. Mensæ. Mag. 6.2			ζ Mensæ. Mag. 5.6			51 H. Cephei. Mag. 5.3			25 H. Camelop. Mag. 5.1			7 G. Octantis. Mag. 6.4		
Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.
May	h m 5 46 s	° ' -84 49 "	May	h m 6 46 s	° ' -80 43 "	May	h m 7 1 s	° ' +87 11 "	May	h m 7 13 s	° ' +82 34 "	May	h m 7 16 s	° ' -86 54 "
1.1	9.23	56.06	1.2	55.89	48.82	1.2	41.40	18.84	1.2	33.56	54.42	1.2	16.54	17.19
2.1	9.01	55.91	2.2	55.76	48.73	2.2	41.05	18.62	2.2	33.42	54.24	2.2	16.13	17.16
3.1	8.79	55.72	3.2	55.62	48.63	3.2	40.72	18.41	3.2	33.29	54.05	3.2	15.70	17.13
4.1	8.57	55.53	4.2	55.49	48.52	4.2	40.42	18.22	4.2	33.19	53.85	4.2	15.25	17.05
5.1	8.35	55.31	5.2	55.35	48.38	5.2	40.13	18.03	5.2	33.08	53.68	5.2	14.79	16.97
6.1	8.12	55.09	6.2	55.21	48.22	6.2	39.86	17.83	6.2	32.98	53.52	6.2	14.34	16.89
7.1	7.91	54.82	7.2	55.07	48.04	7.2	39.58	17.68	7.2	32.88	53.37	7.2	13.88	16.76
8.1	7.71	54.56	8.2	54.95	47.86	8.2	39.29	17.50	8.2	32.78	53.21	8.2	13.46	16.62
9.1	7.52	54.28	9.2	54.81	47.65	9.2	39.01	17.34	9.2	32.66	53.07	9.2	13.02	16.48
10.1	7.34	53.99	10.1	54.69	47.45	10.2	38.69	17.17	10.2	32.54	52.92	10.2	12.61	16.32
11.1	7.17	53.72	11.1	54.57	47.25	11.2	38.37	16.99	11.2	32.41	52.78	11.2	12.23	16.16
12.1	7.00	53.46	12.1	54.46	47.05	12.2	38.03	16.81	12.2	32.28	52.61	12.2	11.85	16.00
13.1	6.85	53.22	13.1	54.35	46.88	13.2	37.68	16.61	13.2	32.15	52.41	13.2	11.50	15.86
14.1	6.68	53.00	14.1	54.25	46.73	14.1	37.34	16.35	14.2	32.02	52.21	14.2	11.16	15.76
15.1	6.51	52.79	15.1	54.14	46.57	15.1	37.03	16.08	15.2	31.89	51.97	15.2	10.80	15.65
16.1	6.34	52.57	16.1	54.03	46.42	16.1	36.74	15.81	16.2	31.79	51.72	16.2	10.43	15.56
17.1	6.16	52.35	17.1	53.92	46.27	17.1	36.51	15.51	17.1	31.69	51.46	17.2	10.03	15.46
18.1	5.98	52.11	18.1	53.79	46.11	18.1	36.30	15.23	18.1	31.63	51.20	18.1	9.62	15.35
19.1	5.79	51.85	19.1	53.67	45.92	19.1	36.12	14.98	19.1	31.56	50.94	19.1	9.20	15.22
20.1	5.60	51.57	20.1	53.55	45.70	20.1	35.97	14.73	20.1	31.51	50.72	20.1	8.78	15.05
21.1	5.41	51.25	21.1	53.42	45.48	21.1	35.80	14.51	21.1	31.45	50.52	21.1	8.35	14.86
22.1	5.26	50.92	22.1	53.32	45.20	22.1	35.61	14.30	22.1	31.37	50.33	22.1	7.96	14.66
23.1	5.12	50.59	23.1	53.21	44.94	23.1	35.40	14.07	23.1	31.29	50.13	23.1	7.58	14.43
24.1	4.99	50.28	24.1	53.11	44.67	24.1	35.16	13.87	24.1	31.20	49.94	24.1	7.24	14.20
25.1	4.89	49.98	25.1	53.02	44.42	25.1	34.89	13.64	25.1	31.09	49.72	25.1	6.92	14.00
26.1	4.77	49.69	26.1	52.93	44.19	26.1	34.62	13.37	26.1	30.99	49.47	26.1	6.62	13.81
27.1	4.66	49.45	27.1	52.85	43.97	27.1	34.37	13.10	27.1	30.88	49.21	27.1	6.33	13.62
28.1	4.54	49.19	28.1	52.76	43.77	28.1	34.13	12.79	28.1	30.79	48.92	28.1	6.05	13.47
29.1	4.41	48.94	29.1	52.68	43.57	29.1	33.93	12.47	29.1	30.71	48.62	29.1	5.73	13.31
30.1	4.28	48.70	30.1	52.59	43.37	30.1	33.74	12.13	30.1	30.66	48.32	30.1	5.41	13.15
31.0	4.15	48.43	31.1	52.50	43.14	31.1	33.60	11.85	31.1	30.59	48.03	31.1	5.08	12.97
32.0	4.02	48.14	32.1	52.40	42.92	32.1	33.49	11.53	32.1	30.54	47.75	32.1	4.74	12.79
11.10	-11.05		6.21	-6.13		20.38	+20.36		7.74	+7.68		18.52	-18.49	
5 ^h 46 ^m 26 ^s .439			6 ^h 47 ^m 3 ^s .489			7 ^h 1 ^m 34 ^s .861			7 ^h 13 ^m 29 ^s .477			7 ^h 16 ^m 40 ^s .555		
-84° 49' 48".17			-80° 43' 34".16			+87° 11' 0".11			+82° 34' 36".50			-86° 54' 0".14		

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

Groombridge 1119. Mag. 7.0			ζ Octantis. Mag. 5.4			1 H. Draconis. Mag. 4.6			ζ Chamæleontis. Mag. 5.2			30 H. Camelop. Mag. 5.3		
Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.
h m s	° ' "		h m s	° ' "		h m s	° ' "		h m s	° ' "		h m s	° ' "	
May 8 14	+88 53		May 9 8	-85 20		May 9 25	+81 42		May 9 36	-80 34		May 10 21	+82 59	
1.2	82.18	28.30	1.3	59.21	7.84	1.3	21.16	9.45	1.3	22.78	17.09	1.3	8.18	21.01
2.2	81.07	28.17	2.3	58.95	7.97	2.3	21.00	9.46	2.3	22.68	17.24	2.3	8.01	21.09
3.2	80.03	28.04	3.3	58.69	8.10	3.3	20.86	9.45	3.3	22.55	17.40	3.3	7.85	21.15
4.2	79.07	27.93	4.3	58.41	8.22	4.3	20.73	9.41	4.3	22.42	17.54	4.3	7.70	21.21
5.2	78.14	27.81	5.3	58.13	8.33	5.3	20.61	9.39	5.3	22.29	17.70	5.3	7.54	21.26
6.2	77.25	27.70	6.3	57.83	8.43	6.3	20.49	9.38	6.3	22.16	17.81	6.3	7.41	21.31
7.2	76.37	27.61	7.3	57.52	8.48	7.3	20.38	9.39	7.3	22.02	17.92	7.3	7.27	21.37
8.2	75.49	27.50	8.3	57.21	8.53	8.3	20.26	9.38	8.3	21.87	17.99	8.3	7.13	21.43
9.2	74.58	27.42	9.3	56.92	8.57	9.3	20.14	9.37	9.3	21.73	18.05	9.3	6.99	21.49
10.2	73.65	27.34	10.2	56.62	8.56	10.3	20.01	9.40	10.3	21.59	18.11	10.3	6.84	21.58
11.2	72.65	27.24	11.2	56.34	8.57	11.3	19.87	9.42	11.3	21.45	18.15	11.3	6.68	21.67
12.2	71.62	27.14	12.2	56.07	8.57	12.3	19.73	9.43	12.3	21.33	18.19	12.3	6.51	21.74
13.2	70.54	27.01	13.2	55.80	8.58	13.3	19.58	9.41	13.3	21.20	18.23	13.3	6.33	21.81
14.2	69.47	26.87	14.2	55.56	8.62	14.2	19.43	9.37	14.3	21.09	18.28	14.3	6.15	21.86
15.2	68.41	26.69	15.2	55.32	8.65	15.2	19.27	9.30	15.3	20.98	18.35	15.3	5.96	21.87
16.2	67.41	26.50	16.2	55.07	8.71	16.2	19.12	9.22	16.3	20.86	18.44	16.3	5.78	21.87
17.2	66.50	26.27	17.2	54.80	8.77	17.2	18.98	9.11	17.2	20.75	18.53	17.3	5.61	21.84
18.2	65.68	26.06	18.2	54.54	8.83	18.2	18.87	8.99	18.2	20.62	18.62	18.3	5.46	21.78
19.2	64.95	25.86	19.2	54.25	8.88	19.2	18.76	8.88	19.2	20.49	18.69	19.3	5.31	21.72
20.2	64.28	25.67	20.2	53.93	8.91	20.2	18.66	8.77	20.2	20.35	18.76	20.3	5.17	21.68
21.2	63.60	25.48	21.2	53.63	8.91	21.2	18.56	8.67	21.2	20.20	18.80	21.3	5.04	21.64
22.2	62.91	25.31	22.2	53.32	8.87	22.2	18.46	8.61	22.2	20.05	18.82	22.3	4.91	21.63
23.2	62.14	25.16	23.2	53.03	8.82	23.2	18.35	8.55	23.2	19.91	18.78	23.3	4.77	21.63
24.2	61.31	25.00	24.2	52.74	8.76	24.2	18.22	8.50	24.2	19.77	18.74	24.3	4.62	21.65
25.2	60.40	24.84	25.2	52.48	8.68	25.2	18.09	8.44	25.2	19.64	18.71	25.3	4.46	21.65
26.2	59.46	24.65	26.2	52.24	8.63	26.2	17.95	8.35	26.2	19.53	18.67	26.3	4.28	21.64
27.2	58.51	24.42	27.2	52.01	8.59	27.2	17.80	8.22	27.2	19.42	18.65	27.3	4.09	21.61
28.2	57.60	24.20	28.2	51.77	8.56	28.2	17.66	8.09	28.2	19.30	18.64	28.2	3.90	21.57
29.2	56.74	23.95	29.2	51.54	8.55	29.2	17.52	7.96	29.2	19.20	18.66	29.2	3.72	21.49
30.2	55.96	23.68	30.2	51.31	8.53	30.2	17.39	7.78	30.2	19.08	18.67	30.2	3.55	21.40
31.2	55.25	23.42	31.2	51.05	8.50	31.2	17.28	7.62	31.2	18.96	18.67	31.2	3.40	21.30
32.2	54.61	23.14	32.2	50.78	8.47	32.2	17.17	7.45	32.2	18.83	18.66	32.2	3.25	21.18
51.66	+51.65		12.30	-12.26		6.93	+6.86		6.10	-6.02		8.19	+8.13	
8 ^h 14 ^m 48 ^s .311			9 ^h 9 ^m 6 ^s .085			9 ^h 25 ^m 12 ^s .930			9 ^h 36 ^m 24 ^s .003			10 ^h 20 ^m 57 ^s .259		
+88° 53' 11".43			-85° 19' 42".77			+81° 41' 57".18			-80° 33' 50".61			+82° 59' 12".27		

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

7 Octantis. Mag. 6.3			Bradley 1672. Mag. 6.3			1 Octantis. Mag. 5.4			32 H. Camelop. seq. Mag. 5.3			κ Octantis. Mag. 5.6		
Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.
	h m	° '		h m	° '		h m	° '		h m	° '		h m	° '
May	10 59	-84 8	May	12 14	+88 9	May	12 46	-84 40	May	12 48	+83 52	May	13 27	-85 21
	s	"		s	"		s	"		s	"		s	"
1.4	58.81	58.54	1.4	70.09	56.34	1.4	12.92	26.28	1.4	43.76	6.99	1.5	21.88	44.28
2.3	58.69	58.81	2.4	69.56	56.55	2.4	12.87	26.60	2.4	43.62	7.23	2.5	21.87	44.64
3.3	58.53	59.07	3.4	69.03	56.73	3.4	12.82	26.95	3.4	43.49	7.48	3.4	21.87	45.00
4.3	58.38	59.34	4.4	68.51	56.92	4.4	12.76	27.30	4.4	43.35	7.71	4.4	21.86	45.36
5.3	58.21	59.59	5.4	68.03	57.10	5.4	12.68	27.65	5.4	43.24	7.93	5.4	21.82	45.74
6.3	58.03	59.83	6.4	67.57	57.28	6.4	12.59	28.00	6.4	43.13	8.13	6.4	21.76	46.10
7.3	57.85	60.06	7.4	67.13	57.44	7.4	12.49	28.34	7.4	43.02	8.34	7.4	21.70	46.47
8.3	57.65	60.29	8.4	66.70	57.62	8.4	12.37	28.68	8.4	42.93	8.57	8.4	21.61	46.83
9.3	57.46	60.48	9.4	66.27	57.82	9.4	12.24	29.00	9.4	42.82	8.80	9.4	21.51	47.18
10.3	57.26	60.67	10.4	65.82	58.03	10.4	12.11	29.30	10.4	42.71	9.04	10.4	21.40	47.50
11.3	57.07	60.84	11.4	65.35	58.22	11.4	11.97	29.59	11.4	42.59	9.28	11.4	21.29	47.81
12.3	56.88	60.99	12.4	64.84	58.43	12.4	11.85	29.86	12.4	42.46	9.54	12.4	21.19	48.11
13.3	56.70	61.14	13.4	64.28	58.64	13.4	11.73	30.12	13.4	42.32	9.80	13.4	21.09	48.38
14.3	56.55	61.31	14.4	63.68	58.85	14.4	11.63	30.37	14.4	42.15	10.04	14.4	21.02	48.67
15.3	56.39	61.49	15.4	63.02	59.03	15.4	11.54	30.63	15.4	41.98	10.28	15.4	20.96	48.97
16.3	56.24	61.69	16.4	62.36	59.17	16.4	11.45	30.94	16.4	41.80	10.47	16.4	20.91	49.28
17.3	56.08	61.90	17.4	61.71	59.29	17.4	11.37	31.24	17.4	41.64	10.63	17.4	20.86	49.60
18.3	55.91	62.12	18.4	61.09	59.39	18.4	11.29	31.56	18.4	41.48	10.77	18.4	20.81	49.93
19.3	55.73	62.32	19.4	60.50	59.48	19.4	11.17	31.88	19.4	41.34	10.90	19.4	20.73	50.29
20.3	55.53	62.51	20.4	59.97	59.66	20.4	11.04	32.19	20.4	41.20	11.05	20.4	20.62	50.64
21.3	55.31	62.69	21.3	59.46	59.65	21.4	10.89	32.52	21.4	41.05	11.18	21.4	20.50	51.01
22.3	55.09	62.83	22.3	58.97	59.77	22.4	10.72	32.80	22.4	40.92	11.32	22.4	20.36	51.35
23.3	54.87	62.95	23.3	58.48	59.90	23.4	10.55	33.06	23.4	40.80	11.50	23.4	20.20	51.65
24.3	54.67	63.05	24.3	57.94	60.03	24.4	10.37	33.30	24.4	40.66	11.68	24.4	20.03	51.92
25.3	54.46	63.13	25.3	57.35	60.18	25.4	10.22	33.51	25.4	40.49	11.88	25.4	19.87	52.18
26.3	54.28	63.21	26.3	56.71	60.32	26.4	10.07	33.71	26.4	40.32	12.06	26.4	19.74	52.42
27.3	54.10	63.30	27.3	56.03	60.46	27.4	9.93	33.89	27.4	40.13	12.25	27.4	19.63	52.66
28.3	53.93	63.42	28.3	55.32	60.55	28.4	9.80	34.13	28.4	39.94	12.41	28.4	19.52	52.90
29.3	53.77	63.56	29.3	54.61	60.65	29.3	9.68	34.37	29.4	39.74	12.55	29.4	19.42	53.15
30.3	53.60	63.68	30.3	53.89	60.72	30.3	9.56	34.61	30.3	39.55	12.68	30.4	19.32	53.42
31.3	53.42	63.80	31.3	53.22	60.78	31.3	9.43	34.85	31.3	39.36	12.79	31.4	19.20	53.69
32.3	53.23	63.91	32.3	52.55	60.82	32.3	9.30	35.11	32.3	39.17	12.87	32.4	19.07	53.96
9.81	-9.76		31.25	+31.24		10.78	-10.73		9.36	+9.31		12.37	-12.33	
10 ^h 59 ^m	55 ^s .642		12 ^h 14 ^m	28 ^s .053		12 ^h 46 ^m	1 ^s .183		12 ^h 48 ^m	29 ^s .976		13 ^h 27 ^m	5 ^s .514	
-84° 8'	31'".24		+88° 9'	56'".03		-84° 40'	2'".72		+83° 52'	10'".05		-85° 21'	23'".59	

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

δ Octantis. Mag. 4.1			Groombridge 2283. Mag. 7.2			ρ Octantis. Mag. 5.7			ϵ Ursæ Minoris. Mag. 4.4			59 G. Apodis. Mag. 5.9		
Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.
May	h m 14 13	° ' -83 17	May	h m 15 4	° ' +87 33	May	h m 15 24	° ' -84 11	May	h m 16 54	° ' +82 10	May	h m 17 15	° ' -80 46
	s "	"		s "	"		s "	"		s "	"		s "	"
1.5	32.51	21.25	1.5	25.26	11.53	1.5	1.73	27.50	1.6	37.07	19.74	1.6	56.58	59.98
2.5	32.56	21.57	2.5	25.18	11.88	2.5	1.85	27.81	2.6	37.13	20.07	2.6	56.71	60.15
3.5	32.60	21.92	3.5	25.09	12.19	3.5	1.96	28.13	3.6	37.19	20.39	3.6	56.84	60.36
4.5	32.63	22.28	4.5	25.00	12.51	4.5	2.06	28.46	4.6	37.25	20.70	4.6	56.98	60.58
5.5	32.65	22.66	5.5	24.92	12.79	5.5	2.17	28.82	5.6	37.30	20.99	5.6	57.10	60.82
6.5	32.66	23.03	6.5	24.85	13.07	6.5	2.26	29.18	6.6	37.36	21.25	6.6	57.24	61.08
7.5	32.66	23.41	7.5	24.80	13.36	7.5	2.33	29.54	7.6	37.42	21.52	7.6	57.35	61.34
8.5	32.65	23.78	8.5	24.75	13.63	8.5	2.39	29.90	8.6	37.47	21.79	8.6	57.46	61.62
9.5	32.62	24.14	9.5	24.72	13.93	9.5	2.44	30.27	9.6	37.52	22.06	9.6	57.56	61.90
10.5	32.59	24.49	10.5	24.69	14.24	10.5	2.48	30.62	10.6	37.58	22.36	10.6	57.66	62.18
11.5	32.57	24.82	11.5	24.64	14.55	11.5	2.51	30.97	11.6	37.65	22.66	11.6	57.74	62.45
12.5	32.53	25.11	12.5	24.57	14.88	12.5	2.54	31.28	12.6	37.70	22.97	12.6	57.83	62.71
13.5	32.50	25.41	13.5	24.47	15.22	13.5	2.57	31.58	13.6	37.75	23.32	13.6	57.91	62.92
14.4	32.49	25.70	14.5	24.33	15.57	14.5	2.61	31.87	14.6	37.80	23.68	14.6	57.99	63.14
15.4	32.48	26.01	15.5	24.16	15.91	15.5	2.67	32.17	15.6	37.83	24.05	15.6	58.09	63.35
16.4	32.48	26.33	16.5	23.95	16.23	16.5	2.75	32.47	16.6	37.85	24.41	16.6	58.18	63.56
17.4	32.48	26.65	17.5	23.72	16.54	17.5	2.83	32.79	17.6	37.86	24.76	17.6	58.31	63.78
18.4	32.50	27.02	18.5	23.48	16.81	18.5	2.90	33.12	18.6	37.88	25.10	18.6	58.43	64.04
19.4	32.50	27.37	19.5	23.26	17.06	19.5	2.97	33.48	19.5	37.89	25.40	19.6	58.54	64.31
20.4	32.47	27.75	20.5	23.05	17.30	20.5	3.02	33.86	20.5	37.90	25.70	20.6	58.65	64.61
21.4	32.43	28.12	21.5	22.88	17.54	21.5	3.05	34.23	21.5	37.91	25.98	21.6	58.76	64.90
22.4	32.38	28.48	22.5	22.72	17.79	22.5	3.07	34.60	22.5	37.92	26.24	22.6	58.83	65.25
23.4	32.30	28.80	23.5	22.58	18.06	23.5	3.06	34.96	23.5	37.94	26.53	23.6	58.90	65.57
24.4	32.23	29.09	24.5	22.42	18.33	24.5	3.04	35.29	24.5	37.97	26.84	24.5	58.96	65.86
25.4	32.17	29.38	25.5	22.25	18.64	25.5	3.02	35.59	25.5	38.00	27.17	25.5	59.02	66.14
26.4	32.10	29.62	26.5	22.03	18.96	26.5	3.00	35.87	26.5	38.02	27.52	26.5	59.08	66.39
27.4	32.05	29.89	27.4	21.79	19.27	27.5	3.00	36.16	27.5	38.02	27.89	27.5	59.13	66.63
28.4	32.00	30.15	28.4	21.50	19.59	28.5	3.01	36.45	28.5	38.02	28.27	28.5	59.20	66.87
29.4	31.97	30.42	29.4	21.19	19.89	29.5	3.03	36.72	29.5	38.02	28.64	29.5	59.28	67.11
30.4	31.93	30.71	30.4	20.88	20.17	30.5	3.05	37.03	30.5	38.00	29.00	30.5	59.36	67.36
31.4	31.90	31.01	31.4	20.56	20.42	31.5	3.07	37.34	31.5	37.98	29.34	31.5	59.44	67.61
32.4	31.85	31.32	32.4	20.24	20.66	32.4	3.08	37.68	32.5	37.96	29.63	32.5	59.51	67.90
8.56	-8.50		23.44	+23.41		9.88	-9.83		7.34	+7.28		6.24	-6.16	
14 ^h 13 ^m 18 ^s .531			15 ^h 4 ^m 0 ^s .607			15 ^h 23 ^m 43 ^s .237			16 ^h 54 ^m 31 ^s .741			17 ^h 15 ^m 43 ^s .730		
-83° 17' 4'' .27			+87° 33' 24'' .43			-84° 11' 17'' .84			+82° 10' 38'' .40			-80° 47' 2'' .69		

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

δ Ursæ Minoris. Mag. 4.4			χ Octantis. Mag. 5.2			λ Ursæ Minoris. Mag. 6.6			σ Octantis. Mag. 5.5			76 Draconis. Mag. 5.7		
Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.
May	h m	° ' "	May	h m	° ' "	May	h m	° ' "	May	h m	° ' "	May	h m	° ' "
	17 59	+86 36		18 6	-87 39		19 3	+89 0		19 27	-89 13		20 48	+82 13
	s	"		s	"		s	"		s	"		s	"
1.6	24.70	31.68	1.6	19.07	42.95	1.7	39.58	37.68	1.7	49.10	18.41	1.8	40.86	0.33
2.6	24.93	31.97	2.6	19.62	43.08	2.7	40.60	37.88	2.7	50.86	18.41	2.8	41.03	0.43
3.6	25.13	32.24	3.6	20.17	43.23	3.7	41.54	38.08	3.7	52.67	18.44	3.8	41.19	0.53
4.6	25.33	32.51	4.6	20.74	43.40	4.7	42.43	38.28	4.7	54.53	18.49	4.8	41.35	0.63
5.6	25.52	32.75	5.6	21.31	43.58	5.7	43.29	38.48	5.7	56.43	18.53	5.7	41.50	0.71
6.6	25.71	33.00	6.6	21.87	43.78	6.7	44.12	38.67	6.7	58.32	18.62	6.7	41.65	0.78
7.6	25.90	33.24	7.6	22.39	44.01	7.7	44.96	38.85	7.7	60.19	18.72	7.7	41.79	0.85
8.6	26.10	33.46	8.6	22.89	44.25	8.7	45.83	39.03	8.7	61.99	18.84	8.7	41.93	0.92
9.6	26.30	33.69	9.6	23.37	44.49	9.7	46.72	39.20	9.7	63.75	18.98	9.7	42.08	0.99
10.6	26.51	33.93	10.6	23.81	44.73	10.7	47.66	39.38	10.7	65.38	19.11	10.7	42.23	1.07
11.6	26.73	34.17	11.6	24.22	44.96	11.7	48.63	39.57	11.7	66.93	19.25	11.7	42.39	1.14
12.6	26.95	34.45	12.6	24.62	45.18	12.7	49.62	39.77	12.7	68.43	19.37	12.7	42.56	1.23
13.6	27.16	34.74	13.6	25.02	45.38	13.7	50.62	39.99	13.7	69.87	19.47	13.7	42.72	1.33
14.6	27.35	35.06	14.6	25.42	45.57	14.6	51.58	40.25	14.7	71.34	19.56	14.7	42.89	1.46
15.6	27.52	35.38	15.6	25.85	45.75	15.6	52.47	40.52	15.7	72.84	19.66	15.7	43.06	1.63
16.6	27.67	35.73	16.6	26.30	45.93	16.6	53.28	40.80	16.7	74.43	19.72	16.7	43.22	1.81
17.6	27.78	36.06	17.6	26.79	46.11	17.6	53.98	41.07	17.7	76.11	19.80	17.7	43.37	1.99
18.6	27.88	36.39	18.6	27.30	46.32	18.6	54.59	41.34	18.7	77.88	19.89	18.7	43.52	2.19
19.6	27.97	36.67	19.6	27.82	46.56	19.6	55.13	41.61	19.7	79.72	20.01	19.7	43.66	2.36
20.6	28.06	36.95	20.6	28.31	46.81	20.6	55.67	41.87	20.6	81.54	20.17	20.7	43.78	2.53
21.6	28.16	37.20	21.6	28.77	47.09	21.6	56.23	42.10	21.6	83.31	20.35	21.7	43.91	2.69
22.6	28.28	37.46	22.6	29.19	47.38	22.6	56.84	42.32	22.6	84.96	20.54	22.7	44.03	2.84
23.6	28.40	37.72	23.6	29.56	47.68	23.6	57.52	42.55	23.6	86.46	20.73	23.7	44.17	2.96
24.6	28.54	37.99	24.6	29.90	47.95	24.6	58.26	42.79	24.6	87.84	20.91	24.7	44.30	3.10
25.6	28.68	38.30	25.6	30.18	48.22	25.6	59.06	43.04	25.6	89.12	21.09	25.7	44.45	3.26
26.6	28.82	38.63	26.6	30.47	48.45	26.6	59.84	43.31	26.6	90.34	21.25	26.7	44.60	3.44
27.6	28.94	38.97	27.6	30.78	48.69	27.6	60.58	43.61	27.6	91.59	21.41	27.7	44.76	3.65
28.6	29.04	39.34	28.6	31.10	48.89	28.6	61.25	43.92	28.6	92.87	21.55	28.7	44.92	3.87
29.6	29.10	39.70	29.6	31.45	49.12	29.6	61.84	44.24	29.6	94.22	21.69	29.7	45.06	4.10
30.6	29.16	40.06	30.6	31.81	49.34	30.6	62.36	44.57	30.6	95.63	21.83	30.7	45.20	4.34
31.6	29.21	40.40	31.6	32.19	49.57	31.6	62.81	44.88	31.6	97.10	21.99	31.7	45.34	4.59
32.6	29.24	40.74	32.6	32.56	49.84	32.6	63.20	45.19	32.6	98.59	22.16	32.7	45.47	4.83
16.91	+16.88		24.52	-24.50		57.95	+57.94		73.66	-73.65		7.38	+7.32	
17 ^h 59 ^m 20 ^s .805			18 ^h 5 ^m 36 ^s .163			19 ^h 3 ^m 51 ^s .560			19 ^h 26 ^m 7 ^s .189			20 ^h 48 ^m 44 ^s .660		
+86° 36' 51".19			-87° 39' 52".21			+89° 0' 56".70			-89° 13' 35".99			+82° 13' 16".38		

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

λ Octantis. Mag. 5.4			ν Octantis. Mag. 5.7			β Octantis. Mag. 4.3			39 H. Cephei. Mag. 5.6			γ^1 Octantis. Mag. 5.1		
Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.
May	h m 21 38	° ' -83 5	May	h m 22 16	° ' -86 23	May	h m 22 37	° ' -81 48	May	h m 23 27	° ' +86 50	May	h m 23 47	° ' -82 28
	s "	"		s "	"		s "	"		s "	"		s "	"
1.8	16.00	58.31	1.8	1.50	18.84	1.8	34.77	55.18	1.9	23.61	34.23	1.9	10.81	43.41
2.8	16.17	58.10	2.8	1.79	18.61	2.8	34.91	54.94	2.9	23.99	34.10	2.9	10.90	43.10
3.8	16.35	57.93	3.8	2.12	18.38	3.8	35.04	54.69	3.9	24.36	33.96	3.9	11.00	42.78
4.8	16.56	57.75	4.8	2.45	18.15	4.8	35.18	54.42	4.9	24.70	33.85	4.9	11.13	42.43
5.8	16.78	57.59	5.8	2.82	17.94	5.8	35.35	54.16	5.9	25.04	33.74	5.9	11.26	42.10
6.8	17.00	57.44	6.8	3.19	17.75	6.8	35.51	53.92	6.9	25.36	33.61	6.9	11.39	41.77
7.8	17.22	57.32	7.8	3.57	17.57	7.8	35.67	53.70	7.9	25.66	33.48	7.9	11.53	41.46
8.8	17.43	57.22	8.8	3.95	17.42	8.8	35.84	53.51	8.8	25.97	33.36	8.9	11.68	41.18
9.8	17.63	57.11	9.8	4.34	17.26	9.8	36.00	53.33	9.8	26.28	33.23	9.9	11.83	40.91
10.8	17.84	57.03	10.8	4.70	17.14	10.8	36.16	53.18	10.8	26.59	33.08	10.9	11.97	40.66
11.8	18.03	56.98	11.8	5.04	17.01	11.8	36.31	53.01	11.8	26.92	32.94	11.9	12.10	40.42
12.8	18.22	56.91	12.8	5.37	16.89	12.8	36.46	52.85	12.8	27.28	32.81	12.9	12.21	40.18
13.8	18.39	56.82	13.8	5.69	16.77	13.8	36.59	52.69	13.8	27.67	32.67	13.9	12.32	39.94
14.8	18.56	56.73	14.8	5.98	16.63	14.8	36.72	52.51	14.8	28.08	32.57	14.8	12.43	39.70
15.8	18.73	56.61	15.8	6.29	16.48	15.8	36.85	52.34	15.8	28.50	32.47	15.8	12.55	39.44
16.8	18.92	56.48	16.8	6.61	16.31	16.8	36.99	52.14	16.8	28.94	32.41	16.8	12.68	39.17
17.7	19.10	56.35	17.8	6.94	16.14	17.8	37.14	51.94	17.8	29.36	32.38	17.8	12.81	38.90
18.7	19.33	56.22	18.8	7.32	15.96	18.8	37.32	51.71	18.8	29.75	32.35	18.8	12.94	38.58
19.7	19.56	56.11	19.8	7.71	15.79	19.8	37.49	51.50	19.8	30.13	32.32	19.8	13.09	38.28
20.7	19.79	56.03	20.8	8.14	15.65	20.8	37.67	51.32	20.8	30.47	32.30	20.8	13.27	38.00
21.7	20.03	55.98	21.8	8.54	15.54	21.8	37.86	51.16	21.8	30.79	32.28	21.8	13.45	37.74
22.7	20.25	55.95	22.8	8.95	15.45	22.8	38.05	51.03	22.8	31.12	32.24	22.8	13.61	37.52
23.7	20.46	55.94	23.8	9.34	15.40	23.8	38.21	50.93	23.8	31.45	32.18	23.8	13.77	37.32
24.7	20.64	55.93	24.8	9.69	15.34	24.8	38.37	50.83	24.8	31.81	32.11	24.8	13.93	37.13
25.7	20.83	55.93	25.8	10.03	15.29	25.8	38.52	50.76	25.8	32.20	32.04	25.8	14.08	36.95
26.7	21.00	55.93	26.7	10.35	15.24	26.8	38.66	50.67	26.8	32.61	31.97	26.8	14.21	36.78
27.7	21.17	55.90	27.7	10.66	15.18	27.8	38.80	50.57	27.8	33.05	31.93	27.8	14.34	36.61
28.7	21.34	55.86	28.7	10.97	15.10	28.8	38.93	50.44	28.8	33.49	31.92	28.8	14.46	36.42
29.7	21.52	55.81	29.7	11.29	15.01	29.8	39.07	50.31	29.8	33.93	31.92	29.8	14.59	36.22
30.7	21.71	55.76	30.7	11.62	14.92	30.8	39.23	50.19	30.8	34.38	31.94	30.8	14.74	36.01
31.7	21.90	55.72	31.7	11.98	14.83	31.8	39.39	50.07	31.8	34.79	31.97	31.8	14.88	35.79
32.7	22.11	55.70	32.7	12.35	14.76	32.7	39.57	49.94	32.8	35.18	32.02	32.8	15.04	35.58
8.32	-8.26		15.87	-15.84		7.02	-6.95		18.15	+18.13		7.64	-7.57	
21 ^h 38 ^m 10 ^s .025			22 ^h 15 ^m 56 ^s .333			22 ^h 37 ^m 32 ^s .703			23 ^h 27 ^m 44 ^s .392			23 ^h 47 ^m 12 ^s .813		
-83° 6' 23".31			-86° 23' 45".22			-81° 49' 21".11			+86° 50' 39".03			-82° 29' 8".43		

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

43 H. Cephei. Mag. 4.5			α Ursæ Minoris. (Polaris.) Mag. 2.1			4 G. Octantis. Mag. 5.6			Groombridge 750. Mag. 6.7			Groombridge 944. Mag. 6.4		
Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.
	h m s	" "		h m s	" "		h m s	" "		h m s	" "		h m s	" "
June 0 56	+85 48		June 1 29	+88 51		June 1 41	-85 11		June 4 9	+85 20		June 5 34	+85 9	
0.8	53.22	22.98	0.9	6.75	23.90	0.9	55.57	10.75	0.9	39.04	7.63	1.0	50.86	37.68
1.8	53.52	22.91	1.9	7.73	23.78	1.9	55.71	10.43	1.9	39.17	7.35	2.0	50.90	37.38
2.8	53.80	22.84	2.9	8.66	23.67	2.9	55.87	10.11	2.9	39.30	7.11	3.0	50.93	37.08
3.8	54.06	22.75	3.9	9.54	23.55	3.9	56.05	9.79	3.9	39.40	6.86	4.0	50.94	36.82
4.8	54.32	22.67	4.9	10.40	23.42	4.9	56.23	9.49	4.9	39.51	6.62	5.0	50.96	36.56
5.8	54.57	22.59	5.9	11.24	23.30	5.9	56.43	9.21	5.9	39.60	6.36	6.0	50.98	36.31
6.8	54.82	22.51	6.9	12.08	23.16	6.9	56.61	8.93	6.9	39.69	6.11	7.0	50.99	36.03
7.8	55.07	22.41	7.8	12.95	23.01	7.9	56.81	8.69	7.9	39.78	5.85	8.0	50.99	35.73
8.8	55.34	22.31	8.8	13.87	22.87	8.9	57.00	8.44	8.9	39.87	5.56	9.0	50.99	35.41
9.8	55.64	22.19	9.8	14.86	22.71	9.9	57.17	8.23	9.9	39.99	5.26	10.0	51.00	35.09
10.8	55.96	22.09	10.8	15.93	22.56	10.9	57.32	8.00	10.9	40.13	4.95	11.0	51.02	34.75
11.8	56.29	22.02	11.8	17.08	22.45	11.8	57.48	7.75	11.9	40.27	4.64	12.0	51.08	34.39
12.8	56.63	21.98	12.8	18.27	22.34	12.8	57.62	7.54	12.9	40.45	4.34	13.0	51.15	34.04
13.8	56.98	21.96	13.8	19.48	22.24	13.8	57.76	7.29	13.9	40.64	4.06	14.0	51.25	33.70
14.8	57.32	21.95	14.8	20.67	22.19	14.8	57.94	7.03	14.9	40.86	3.81	15.0	51.36	33.39
15.8	57.66	21.96	15.8	21.82	22.15	15.8	58.11	6.73	15.9	41.06	3.59	15.9	51.49	33.10
16.8	57.95	21.99	16.8	22.87	22.12	16.8	58.31	6.45	16.9	41.27	3.41	16.9	51.60	32.82
17.8	58.24	22.03	17.8	23.86	22.09	17.8	58.51	6.17	17.9	41.46	3.19	17.9	51.71	32.57
18.8	58.50	22.05	18.8	24.78	22.06	18.8	58.74	5.92	18.9	41.61	2.99	18.9	51.80	32.32
19.8	58.76	22.04	19.8	25.70	22.01	19.8	59.00	5.69	19.9	41.76	2.78	19.9	51.86	32.08
20.8	59.03	22.01	20.8	26.65	21.96	20.8	59.23	5.48	20.9	41.90	2.55	20.9	51.92	31.80
21.8	59.31	21.97	21.8	27.65	21.88	21.8	59.46	5.32	21.9	42.05	2.32	21.9	51.98	31.50
22.8	59.62	21.94	22.8	28.73	21.79	22.8	59.65	5.16	22.9	42.22	2.05	22.9	52.05	31.18
23.8	59.95	21.91	23.8	29.88	21.70	23.8	59.86	5.01	23.9	42.39	1.78	23.9	52.13	30.85
24.8	60.29	21.91	24.8	31.10	21.63	24.8	60.04	4.86	24.9	42.59	1.50	24.9	52.23	30.51
25.8	60.66	21.93	25.8	32.36	21.60	25.8	60.21	4.69	25.9	42.82	1.26	25.9	52.35	30.17
26.8	61.01	21.97	26.8	33.61	21.57	26.8	60.39	4.51	26.9	43.05	1.00	26.9	52.49	29.85
27.8	61.35	22.03	27.8	34.83	21.57	27.8	60.59	4.31	27.9	43.30	0.77	27.9	52.65	29.56
28.8	61.68	22.11	28.8	36.01	21.60	28.8	60.81	4.11	28.9	43.53	0.57	28.9	52.81	29.27
29.8	61.99	22.19	29.8	37.15	21.64	29.8	61.04	3.92	29.9	43.78	0.38	29.9	52.96	29.00
30.8	62.28	22.26	30.8	38.22	21.65	30.8	61.27	3.73	30.9	44.00	0.21	30.9	53.11	28.76
31.8	62.57	22.34	31.8	39.26	21.67	31.8	61.51	3.54	31.9	44.22	0.03	31.9	53.26	28.52
13.67	+13.64		50.10	+50.09		11.91	-11.87		12.29	+12.25		11.85	+11.81	
0 ^h 57 ^m	1°.657		1 ^h 29 ^m	44°.254		1 ^h 42 ^m	6°.102		4 ^h 9 ^m	44°.952		5 ^h 34 ^m	54°.014	
+85° 48'	25''.87		+88° 51'	25''.03		-85° 11'	39''.58		+85° 20'	1''.04		+85° 9'	28''.07	

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

31 G. Mensæ. Mag. 6.2			ζ Mensæ. Mag. 5.6			51 H. Cephei. Mag. 5.3			25 H. Camelop. Mag. 5.1			7 G. Octantis. Mag. 6.4		
Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.
	h m	° '		h m	° '		h m	° '		h m	° '		h m	° '
June	5 46	-84 49	June	6 46	-80 43	June	7 1	+87 11	June	7 13	+82 34	June	7 15	-86 54
	s	"		s	"		s	"		s	"		s	"
1.0	4.02	48.14	1.1	52.40	42.92	1.1	33.49	11.53	1.1	30.54	47.75	1.1	64.74	12.79
2.0	3.89	47.83	2.1	52.30	42.69	2.1	33.38	11.24	2.1	30.50	47.48	2.1	64.40	12.57
3.0	3.78	47.50	3.1	52.21	42.41	3.1	33.28	10.96	3.1	30.47	47.22	3.1	64.05	12.35
4.0	3.67	47.18	4.1	52.13	42.11	4.1	33.18	10.69	4.1	30.44	46.98	4.1	63.72	12.11
5.0	3.57	46.84	5.1	52.04	41.81	5.1	33.06	10.44	5.1	30.38	46.73	5.1	63.42	11.86
6.0	3.49	46.50	6.1	51.96	41.50	6.1	32.93	10.20	6.1	30.33	46.48	6.1	63.13	11.60
7.0	3.41	46.16	7.1	51.89	41.18	7.1	32.79	9.92	7.1	30.28	46.25	7.1	62.85	11.32
8.0	3.35	45.83	8.1	51.83	40.90	8.1	32.64	9.66	8.1	30.22	46.00	8.1	62.60	11.06
9.0	3.30	45.52	9.1	51.77	40.62	9.1	32.50	9.37	9.1	30.16	45.73	9.1	62.37	10.81
10.0	3.24	45.23	10.1	51.71	40.33	10.1	32.32	9.05	10.1	30.09	45.44	10.1	62.14	10.57
11.0	3.18	44.94	11.1	51.66	40.10	11.1	32.17	8.74	11.1	30.02	45.12	11.1	61.93	10.35
12.0	3.11	44.68	12.1	51.60	39.86	12.1	32.07	8.38	12.1	29.98	44.80	12.1	61.71	10.15
13.0	3.03	44.41	13.1	51.54	39.62	13.1	32.00	8.01	13.1	29.96	44.45	13.1	61.47	9.96
14.0	2.95	44.12	14.1	51.48	39.39	14.1	31.99	7.66	14.1	29.95	44.10	14.1	61.19	9.76
15.0	2.87	43.81	15.0	51.40	39.12	15.1	31.99	7.32	15.1	29.94	43.75	15.1	60.91	9.53
16.0	2.78	43.50	16.0	51.32	38.82	16.1	32.03	6.98	16.1	29.96	43.46	16.1	60.63	9.28
17.0	2.71	43.17	17.0	51.27	38.51	17.1	32.06	6.69	17.1	29.98	43.17	17.1	60.33	9.00
17.9	2.66	42.80	18.0	51.21	38.18	18.1	32.09	6.41	18.1	29.98	42.89	18.1	60.07	8.72
18.9	2.61	42.42	19.0	51.15	37.83	19.1	32.09	6.14	19.1	29.99	42.65	19.1	59.83	8.39
19.9	2.59	42.07	20.0	51.10	37.50	20.0	32.05	5.88	20.1	29.98	42.41	20.1	59.63	8.08
20.9	2.58	41.73	21.0	51.05	37.16	21.0	32.00	5.60	21.1	29.95	42.14	21.1	59.45	7.77
21.9	2.58	41.40	22.0	51.02	36.84	22.0	31.94	5.29	22.0	29.91	41.86	22.1	59.31	7.47
22.9	2.58	41.08	23.0	51.00	36.56	23.0	31.87	4.95	23.0	29.88	41.53	23.0	59.17	7.23
23.9	2.58	40.80	24.0	50.97	36.28	24.0	31.82	4.59	24.0	29.87	41.19	24.0	59.03	6.97
24.9	2.57	40.54	25.0	50.94	36.02	25.0	31.81	4.24	25.0	29.86	40.85	25.0	58.89	6.72
25.9	2.56	40.27	26.0	50.91	35.76	26.0	31.83	3.85	26.0	29.87	40.49	26.0	58.74	6.48
26.9	2.52	39.99	27.0	50.88	35.47	27.0	31.88	3.49	27.0	29.88	40.13	27.0	58.56	6.25
27.9	2.51	39.68	28.0	50.84	35.18	28.0	31.96	3.15	28.0	29.91	39.80	28.0	58.38	5.98
28.9	2.50	39.36	29.0	50.81	34.88	29.0	32.04	2.81	29.0	29.95	39.48	29.0	58.21	5.72
29.9	2.49	39.02	30.0	50.78	34.55	30.0	32.15	2.50	30.0	29.99	39.17	30.0	58.03	5.42
30.9	2.49	38.69	31.0	50.74	34.22	31.0	32.25	2.20	31.0	30.02	38.88	31.0	57.87	5.10
31.9	2.50	38.32	32.0	50.72	33.86	32.0	32.35	1.92	32.0	30.06	38.61	32.0	57.73	4.77
11.09	-11.05		6.21	-6.12		20.36	+20.34		7.74	+7.68		18.51	-18.48	
5 ^h 46 ^m	26°.439		6 ^h 47 ^m	3°.489		7 ^h 1 ^m	34°.861		7 ^h 13 ^m	29°.477		7 ^h 16 ^m	40°.555	
-84° 49'	48''.17		-80° 43'	34''.16		+87° 11'	0''.11		+82° 34'	36''.50		-86° 54'	0''.14	

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

Groombridge 1119. Mag. 7.0			ζ Octantis. Mag. 5.4			1 H. Draconis. Mag. 4.6			ζ Chamæleontis. Mag. 5.2			30 H. Camelop. Mag. 5.3		
Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.
June	h m	" "	June	h m	" "	June	h m	" "	June	h m	" "	June	h m	" "
	8 14	+88 53		9 8	-85 20		9 25	+81 42		9 36	-80 34		10 20	+82 59
	s	"		s	"		s	"		s	"		s	"
1.2	54.61	23.14	1.2	50.78	8.47	1.2	17.17	7.45	1.2	18.83	18.66	1.2	63.25	21.18
2.1	54.01	22.91	2.2	50.51	8.42	2.2	17.07	7.28	2.2	18.71	18.64	2.2	63.10	21.07
3.1	53.44	22.68	3.2	50.24	8.34	3.2	16.97	7.12	3.2	18.57	18.61	3.2	62.97	20.97
4.1	52.88	22.45	4.2	49.95	8.26	4.2	16.88	6.97	4.2	18.44	18.57	4.2	62.84	20.90
5.1	52.30	22.23	5.2	49.68	8.15	5.2	16.79	6.82	5.2	18.31	18.50	5.2	62.70	20.81
6.1	51.70	22.01	6.2	49.41	8.02	6.2	16.69	6.69	6.2	18.17	18.41	6.2	62.57	20.73
7.1	51.06	21.80	7.2	49.15	7.88	7.2	16.58	6.56	7.2	18.04	18.30	7.2	62.43	20.67
8.1	50.38	21.57	8.2	48.91	7.75	8.2	16.47	6.43	8.2	17.92	18.18	8.2	62.27	20.60
9.1	49.67	21.33	9.2	48.68	7.61	9.2	16.34	6.28	9.2	17.81	18.07	9.2	62.11	20.52
10.1	48.93	21.07	10.2	48.46	7.50	10.2	16.21	6.11	10.2	17.70	17.97	10.2	61.94	20.41
11.1	48.22	20.77	11.2	48.26	7.40	11.2	16.09	5.93	11.2	17.60	17.88	11.2	61.76	20.29
12.1	47.57	20.44	12.2	48.07	7.29	12.2	15.98	5.70	12.2	17.50	17.82	12.2	61.60	20.15
13.1	46.99	20.13	13.2	47.85	7.23	13.2	15.87	5.46	13.2	17.39	17.75	13.2	61.45	19.97
14.1	46.51	19.81	14.2	47.62	7.15	14.2	15.78	5.21	14.2	17.29	17.70	14.2	61.30	19.76
15.1	46.15	19.47	15.2	47.38	7.06	15.2	15.69	4.95	15.2	17.19	17.64	15.2	61.17	19.57
16.1	45.85	19.15	16.1	47.12	6.98	16.2	15.64	4.70	16.2	17.05	17.57	16.2	61.06	19.36
17.1	45.58	18.87	17.1	46.85	6.83	17.2	15.58	4.47	17.2	16.93	17.48	17.2	60.95	19.17
18.1	45.31	18.61	18.1	46.60	6.67	18.2	15.52	4.26	18.2	16.80	17.35	18.2	60.85	18.99
19.1	45.00	18.34	19.1	46.35	6.48	19.2	15.45	4.06	19.2	16.67	17.21	19.2	60.74	18.85
20.1	44.61	18.09	20.1	46.11	6.26	20.1	15.37	3.87	20.2	16.56	17.02	20.2	60.62	18.71
21.1	44.15	17.82	21.1	45.90	6.08	21.1	15.27	3.68	21.2	16.44	16.84	21.2	60.49	18.56
22.1	43.65	17.55	22.1	45.71	5.87	22.1	15.18	3.46	22.2	16.34	16.67	22.2	60.35	18.43
23.1	43.13	17.25	23.1	45.52	5.69	23.1	15.07	3.24	23.1	16.24	16.49	23.2	60.20	18.25
24.1	42.63	16.93	24.1	45.35	5.51	24.1	14.97	3.00	24.1	16.16	16.33	24.2	60.04	18.07
25.1	42.18	16.58	25.1	45.18	5.36	25.1	14.88	2.72	25.1	16.07	16.19	25.2	59.88	17.86
26.1	41.81	16.24	26.1	45.01	5.20	26.1	14.78	2.45	26.1	15.99	16.07	26.2	59.74	17.63
27.1	41.52	15.89	27.1	44.82	5.05	27.1	14.72	2.15	27.1	15.90	15.94	27.2	59.61	17.39
28.1	41.30	15.54	28.1	44.63	4.88	28.1	14.65	1.85	28.1	15.80	15.80	28.2	59.50	17.15
29.1	41.13	15.19	29.1	44.43	4.71	29.1	14.59	1.55	29.1	15.70	15.67	29.2	59.40	16.90
30.1	41.00	14.86	30.1	44.22	4.52	30.1	14.54	1.28	30.1	15.60	15.49	30.2	59.30	16.66
31.1	40.90	14.55	31.1	44.01	4.30	31.1	14.50	1.01	31.1	15.49	15.31	31.2	59.21	16.42
32.1	40.80	14.26	32.1	43.80	4.06	32.1	14.46	0.77	32.1	15.39	15.09	32.2	59.11	16.21
51.56	+51.55		12.30	-12.26		6.93	+6.86		6.10	-6.02		8.19	+8.13	
8 ^h 14 ^m	48°.311		9 ^h 9 ^m	6°.085		9 ^h 25 ^m	12°.930		9 ^h 36 ^m	24°.003		10 ^h 20 ^m	57°.259	
+88° 53'	11''.43		-85° 19'	42''.77		+81° 41'	57''.18		-80° 33'	50''.61		+82° 59'	12''.27	

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

η Octantis. Mag. 6.3			Bradley 1672. Mag. 6.3			ι Octantis. Mag. 5.4			32 H. Camelop. <i>seq.</i> Mag. 5.3			κ Octantis. Mag. 5.6		
Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.
	h m s	° ' "		h m s	° ' "		h m s	° ' "		h m s	° ' "		h m s	° ' "
June 10 59	10 59	-84 9	June 12 14	12 14	+88 10	June 12 46	12 46	-84 40	June 12 48	12 48	+83 52	June 13 27	13 27	-85 21
1.3	53.23	3.91	1.3	52.55	0.82	1.3	9.30	35.11	1.3	39.17	12.87	1.4	19.07	53.96
2.3	53.04	4.02	2.3	51.93	0.85	2.3	9.13	35.36	2.3	39.00	12.96	2.4	18.93	54.26
3.3	52.81	4.12	3.3	51.34	0.87	3.3	8.95	35.60	3.3	38.88	13.04	3.4	18.78	54.55
4.3	52.59	4.19	4.3	50.76	0.91	4.3	8.78	35.85	4.3	38.69	13.14	4.4	18.60	54.83
5.3	52.38	4.25	5.3	50.19	0.96	5.3	8.59	36.05	5.3	38.53	13.22	5.4	18.41	55.07
6.3	52.16	4.30	6.3	49.63	1.01	6.3	8.39	36.25	6.3	38.38	13.32	6.4	18.21	55.32
7.2	51.94	4.33	7.3	49.04	1.08	7.3	8.19	36.40	7.3	38.20	13.43	7.4	18.02	55.54
8.2	51.73	4.35	8.3	48.43	1.12	8.3	7.99	36.56	8.3	38.03	13.56	8.4	17.82	55.74
9.2	51.54	4.36	9.3	47.77	1.18	9.3	7.80	36.71	9.3	37.84	13.69	9.3	17.62	55.92
10.2	51.35	4.36	10.3	47.06	1.24	10.3	7.63	36.83	10.3	37.65	13.81	10.3	17.46	56.12
11.2	51.17	4.39	11.3	46.32	1.26	11.3	7.48	36.98	11.3	37.42	13.90	11.3	17.31	56.30
12.2	51.01	4.43	12.3	45.56	1.27	12.3	7.33	37.14	12.3	37.22	13.96	12.3	17.16	56.49
13.2	50.84	4.48	13.3	44.81	1.25	13.3	7.18	37.31	13.3	37.01	14.02	13.3	17.02	56.71
14.2	50.66	4.54	14.3	44.08	1.21	14.3	7.04	37.49	14.3	36.80	14.04	14.3	16.89	56.95
15.2	50.48	4.61	15.3	43.39	1.15	15.3	6.88	37.69	15.3	36.60	14.04	15.3	16.73	57.17
16.2	50.28	4.66	16.3	42.75	1.07	16.3	6.70	37.90	16.3	36.41	14.03	16.3	16.56	57.44
17.2	50.05	4.70	17.3	42.16	1.00	17.3	6.50	38.09	17.3	36.24	14.01	17.3	16.37	57.68
18.2	49.83	4.71	18.3	41.60	0.95	18.3	6.29	38.26	18.3	36.09	14.00	18.3	16.14	57.91
19.2	49.60	4.69	19.3	41.05	0.93	19.3	6.06	38.41	19.3	35.93	14.01	19.3	15.91	58.12
20.2	49.38	4.64	20.3	40.46	0.89	20.3	5.83	38.51	20.3	35.75	14.03	20.3	15.66	58.30
21.2	49.17	4.58	21.3	39.84	0.89	21.3	5.62	38.60	21.3	35.57	14.08	21.3	15.43	58.44
22.2	48.98	4.52	22.3	39.18	0.87	22.3	5.41	38.68	22.3	35.38	14.13	22.3	15.22	58.56
23.2	48.81	4.46	23.3	38.47	0.86	23.3	5.22	38.76	23.3	35.17	14.16	23.3	15.02	58.68
24.2	48.64	4.41	24.3	37.73	0.82	24.3	5.04	38.82	24.3	34.95	14.20	24.3	14.83	58.80
25.2	48.48	4.37	25.3	36.97	0.76	25.3	4.86	38.91	25.3	34.72	14.20	25.3	14.65	58.92
26.2	48.32	4.33	26.3	36.22	0.67	26.3	4.71	39.01	26.3	34.50	14.18	26.3	14.48	59.05
27.2	48.15	4.32	27.2	35.50	0.58	27.3	4.54	39.12	27.3	34.30	14.15	27.3	14.30	59.19
28.2	47.97	4.29	28.2	34.82	0.48	28.3	4.36	39.24	28.3	34.09	14.09	28.3	14.12	59.36
29.2	47.78	4.25	29.2	34.17	0.35	29.3	4.17	39.35	29.3	33.90	14.03	29.3	13.91	59.53
30.2	47.58	4.21	30.2	33.56	0.22	30.3	3.97	39.44	30.3	33.71	13.96	30.3	13.69	59.68
31.2	47.38	4.13	31.2	32.97	0.11	31.3	3.74	39.52	31.3	33.54	13.89	31.3	13.46	59.82
32.2	47.17	4.06	32.2	32.40	0.01	32.3	3.52	39.59	32.3	33.37	13.82	32.3	13.21	59.96
9.81	-9.76		31.26	+31.25		10.78	-10.73		9.37	+9.31		12.38	-12.34	
10 ^h 59 ^m 55 ^s .642			12 ^h 14 ^m 28 ^s .053			12 ^h 46 ^m 1 ^s .183			12 ^h 48 ^m 29 ^s .976			13 ^h 27 ^m 5 ^s .514		
-84° 8' 31".24			+88° 9' 56".03			-84° 40' 2".72			+83° 52' 10".05			-85° 21' 23".59		

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

δ Octantis. Mag. 4.1			Groombridge 2283. Mag. 7.2			ρ Octantis. Mag. 5.7			ϵ Ursæ Minoris. Mag. 4.4			59 G. Apodis. Mag. 5.9		
Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.
	h m	° ' "		h m	° ' "		h m	° ' "		h m	° ' "		h m	° ' "
June	14 13	-83 17	June	15 4	+87 33	June	15 24	-84 11	June	16 54	+82 10	June	17 15	-80 47
	s	"		s	"		s	"		s	"		s	"
1.4	31.85	31.32	1.4	20.24	20.66	1.4	3.08	37.68	1.5	37.96	29.63	1.5	59.51	7.90
2.4	31.80	31.63	2.4	19.94	20.89	2.4	3.09	38.02	2.5	37.94	29.98	2.5	59.58	8.21
3.4	31.72	31.95	3.4	19.64	21.11	3.4	3.07	38.37	3.5	37.92	30.28	3.5	59.65	8.53
4.4	31.64	32.25	4.4	19.35	21.33	4.4	3.04	38.72	4.5	37.90	30.57	4.5	59.72	8.84
5.4	31.55	32.54	5.4	19.09	21.56	5.4	3.00	39.06	5.5	37.87	30.85	5.5	59.76	9.16
6.4	31.45	32.83	6.4	18.83	21.80	6.4	2.95	39.37	6.5	37.86	31.15	6.5	59.81	9.48
7.4	31.34	33.08	7.4	18.57	22.02	7.4	2.89	39.67	7.5	37.84	31.46	7.5	59.84	9.79
8.4	31.23	33.33	8.4	18.28	22.28	8.4	2.82	39.96	8.5	37.82	31.77	8.5	59.86	10.09
9.4	31.13	33.58	9.4	17.97	22.55	9.4	2.76	40.24	9.5	37.80	32.11	9.5	59.88	10.36
10.4	31.03	33.79	10.4	17.64	22.82	10.4	2.70	40.50	10.5	37.77	32.47	10.5	59.91	10.61
11.4	30.96	34.00	11.4	17.26	23.08	11.4	2.66	40.75	11.5	37.73	32.83	11.5	59.94	10.86
12.4	30.89	34.21	12.4	16.85	23.34	12.4	2.64	41.01	12.5	37.68	33.17	12.5	59.99	11.10
13.4	30.83	34.46	13.4	16.41	23.58	13.4	2.62	41.27	13.5	37.62	33.52	13.5	60.04	11.35
14.4	30.76	34.72	14.4	15.97	23.79	14.4	2.60	41.56	14.5	37.55	33.86	14.5	60.09	11.61
15.4	30.70	35.00	15.4	15.53	23.98	15.4	2.58	41.88	15.5	37.49	34.17	15.5	60.15	11.91
16.4	30.62	35.29	16.4	15.11	24.14	16.4	2.55	42.20	16.5	37.42	34.46	16.5	60.21	12.22
17.4	30.50	35.58	17.4	14.71	24.28	17.4	2.49	42.52	17.5	37.35	34.71	17.5	60.26	12.54
18.4	30.38	35.84	18.4	14.35	24.42	18.4	2.42	42.85	18.5	37.29	34.97	18.5	60.28	12.88
19.4	30.25	36.08	19.4	14.00	24.58	19.4	2.33	43.16	19.5	37.24	35.23	19.5	60.30	13.22
20.3	30.13	36.30	20.4	13.65	24.77	20.4	2.22	43.46	20.5	37.19	35.50	20.5	60.31	13.54
21.3	29.99	36.50	21.4	13.29	24.97	21.4	2.11	43.71	21.5	37.14	35.80	21.5	60.30	13.84
22.3	29.85	36.66	22.4	12.90	25.17	22.4	2.01	43.94	22.5	37.08	36.11	22.5	60.30	14.12
23.3	29.73	36.81	23.4	12.48	25.39	23.4	1.91	44.16	23.5	37.02	36.45	23.5	60.29	14.37
24.3	29.62	36.98	24.4	12.03	25.61	24.4	1.82	44.37	24.4	36.94	36.78	24.5	60.29	14.62
25.3	29.53	37.16	25.4	11.54	25.82	25.4	1.75	44.59	25.4	36.86	37.12	25.5	60.30	14.86
26.3	29.44	37.33	26.4	11.04	26.01	26.4	1.68	44.82	26.4	36.77	37.43	26.5	60.31	15.11
27.3	29.33	37.51	27.4	10.54	26.17	27.4	1.61	45.06	27.4	36.68	37.74	27.5	60.33	15.36
28.3	29.22	37.70	28.4	10.05	26.31	28.4	1.53	45.32	28.4	36.59	38.03	28.5	60.34	15.65
29.3	29.11	37.90	29.4	9.57	26.46	29.4	1.45	45.59	29.4	36.49	38.30	29.5	60.36	15.95
30.3	28.99	38.10	30.4	9.10	26.54	30.4	1.35	45.85	30.4	36.39	38.56	30.4	60.36	16.25
31.3	28.85	38.30	31.4	8.65	26.65	31.4	1.24	46.13	31.4	36.30	38.80	31.4	60.37	16.56
32.3	28.71	38.49	32.4	8.22	26.76	32.4	1.12	46.38	32.4	36.22	39.03	32.4	60.36	16.87
8.56	-8.50		23.46	+23.44		9.89	-9.84		7.35	+7.28		6.25	-6.17	
14 ^h 13 ^m 18 ^s .531			15 ^h 4 ^m 0 ^s .607			15 ^h 23 ^m 43 ^s .237			16 ^h 54 ^m 31 ^s .741			17 ^h 15 ^m 43 ^s .730		
-83° 17' 4".27			+87° 33' 24".43			-84° 11' 17".84			+82° 10' 38".40			-80° 47' 2".69		

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

δ Ursæ Minoris. Mag. 4.4			χ Octantis. Mag. 5.2			λ Ursæ Minoris. Mag. 6.6			σ Octantis. Mag. 5.5			76 Draconis. Mag. 5.7		
Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.
	h m	s		h m	s		h m	s		h m	s		h m	s
June	17 59	+86 36	June	18 6	-87 39	June	19 4	+89 0	June	19 28	-89 13	June	20 48	+82 13
	s	"		s	"		s	"		s	"		s	"
1.6	29.24	40.74	1.6	32.56	49.84	1.6	3.20	45.19	1.6	38.59	22.16	1.7	45.47	-4.83
2.6	29.25	41.05	2.6	32.92	50.12	2.6	3.57	45.48	2.6	40.08	22.35	2.7	45.59	5.07
3.5	29.28	41.34	3.6	33.26	50.43	3.6	3.93	45.76	3.6	41.54	22.55	3.7	45.70	5.29
4.5	29.31	41.63	4.6	33.58	50.74	4.6	4.29	46.04	4.6	42.92	22.77	4.7	45.80	5.50
5.5	29.34	41.92	5.5	33.87	51.06	5.6	4.70	46.32	5.6	44.26	23.02	5.7	45.91	5.71
6.5	29.38	42.19	6.5	34.11	51.37	6.6	5.11	46.59	6.6	45.49	23.27	6.7	46.03	5.91
7.5	29.43	42.50	7.5	34.33	51.68	7.6	5.57	46.86	7.6	46.63	23.51	7.7	46.15	6.13
8.5	29.47	42.81	8.5	34.53	51.97	8.6	6.05	47.14	8.6	47.68	23.74	8.7	46.27	6.35
9.5	29.52	43.14	9.5	34.70	52.24	9.6	6.52	47.45	9.6	48.67	23.96	9.7	46.39	6.59
10.5	29.56	43.50	10.5	34.89	52.51	10.6	6.98	47.78	10.6	49.64	24.17	10.6	46.53	6.85
11.5	29.56	43.86	11.5	35.09	52.76	11.6	7.39	48.12	11.6	50.63	24.37	11.6	46.65	7.14
12.5	29.54	44.24	12.5	35.32	52.99	12.6	7.71	48.47	12.6	51.67	24.55	12.6	46.78	7.45
13.5	29.50	44.62	13.5	35.58	53.24	13.6	7.92	48.83	13.6	52.81	24.73	13.6	46.89	7.76
14.5	29.45	44.97	14.5	35.86	53.50	14.6	8.02	49.19	14.6	54.05	24.93	14.6	46.99	8.10
15.5	29.35	45.31	15.5	36.15	53.78	15.6	8.05	49.53	15.6	55.35	25.14	15.6	47.09	8.42
16.5	29.25	45.63	16.5	36.44	54.08	16.6	8.03	49.85	16.6	56.65	25.37	16.6	47.18	8.72
17.5	29.17	45.91	17.5	36.70	54.40	17.6	8.02	50.14	17.6	57.91	25.63	17.6	47.26	9.01
18.5	29.11	46.19	18.5	36.90	54.75	18.6	8.04	50.44	18.6	59.08	25.90	18.6	47.33	9.29
19.5	29.05	46.46	19.5	37.06	55.10	19.6	8.14	50.73	19.6	60.10	26.20	19.6	47.41	9.53
20.5	29.01	46.75	20.5	37.17	55.43	20.5	8.30	51.02	20.6	60.98	26.48	20.6	47.49	9.80
21.5	28.98	47.07	21.5	37.25	55.75	21.5	8.49	51.32	21.6	61.73	26.76	21.6	47.59	10.06
22.5	28.94	47.40	22.5	37.30	56.04	22.5	8.71	51.64	22.6	62.39	27.04	22.6	47.69	10.32
23.5	28.90	47.74	23.5	37.36	56.32	23.5	8.90	52.00	23.6	63.03	27.29	23.6	47.79	10.62
24.5	28.82	48.13	24.5	37.44	56.58	24.5	9.04	52.37	24.6	63.70	27.51	24.6	47.89	10.94
25.5	28.73	48.51	25.5	37.54	56.83	25.5	9.11	52.73	25.6	64.42	27.73	25.6	47.99	11.30
26.5	28.61	48.87	26.5	37.66	57.09	26.5	9.07	53.10	26.5	65.19	27.96	26.6	48.08	11.66
27.5	28.48	49.21	27.5	37.79	57.37	27.5	8.97	53.45	27.5	66.02	28.20	27.6	48.16	12.02
28.5	28.33	49.53	28.5	37.93	57.66	28.5	8.80	53.80	28.5	66.88	28.44	28.6	48.22	12.37
29.5	28.18	49.83	29.5	38.05	57.96	29.5	8.59	54.15	29.5	67.74	28.70	29.6	48.28	12.71
30.5	28.03	50.15	30.5	38.15	58.28	30.5	8.35	54.47	30.5	68.57	28.99	30.6	48.34	13.04
31.5	27.88	50.43	31.5	38.23	58.62	31.5	8.14	54.79	31.5	69.35	29.29	31.6	48.40	13.37
32.5	27.74	50.71	32.5	38.28	58.96	32.5	7.94	55.09	32.5	70.06	29.60	32.6	48.45	13.67
16.92	+16.89		24.54	-24.52		58.10	+58.09		73.80	-73.80		7.39	+7.32	
17 ^h 59 ^m 20 ^s .805			18 ^h 5 ^m 36 ^s .163			19 ^h 3 ^m 51 ^s .560			19 ^h 26 ^m 7 ^s .189			20 ^h 48 ^m 44 ^s .660		
+86° 36' 51".19			-87° 39' 52".21			+89° 0' 56".70			-89° 13' 35".99			+82° 13' 16".38		

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

λ Octantis. Mag. 5.4			ν Octantis. Mag. 5.7			β Octantis. Mag. 4.3			39 H. Cephei. Mag. 5.6			γ^1 Octantis. Mag. 5.1		
Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.
h m	s	"	h m	s	"	h m	s	"	h m	s	"	h m	s	"
June 21 38	-83	5	June 22 16	-86	23	June 22 37	-81	48	June 23 27	+86	50	June 23 47	-82	28
1.7	22.11	55.70	1.7	12.35	14.76	1.7	39.57	49.94	1.8	35.18	32.02	1.8	15.04	35.58
2.7	22.32	55.70	2.7	12.74	14.69	2.7	39.74	49.83	2.8	35.56	32.07	2.8	15.22	35.38
3.7	22.53	55.69	3.7	13.14	14.63	3.7	39.93	49.75	3.8	35.92	32.10	3.8	15.40	35.20
4.7	22.75	55.71	4.7	13.54	14.62	4.7	40.11	49.69	4.8	36.26	32.13	4.8	15.58	35.02
5.7	22.96	55.77	5.7	13.95	14.63	5.7	40.29	49.64	5.8	36.61	32.15	5.8	15.76	34.87
6.7	23.16	55.84	6.7	14.31	14.64	6.7	40.46	49.62	6.8	36.96	32.16	6.8	15.94	34.72
7.7	23.34	55.91	7.7	14.67	14.66	7.7	40.62	49.60	7.8	37.33	32.16	7.8	16.10	34.62
8.7	23.52	55.98	8.7	15.01	14.68	8.7	40.78	49.57	8.8	37.72	32.18	8.8	16.26	34.51
9.7	23.69	56.03	9.7	15.33	14.70	9.7	40.92	49.56	9.8	38.13	32.21	9.8	16.41	34.40
10.7	23.85	56.09	10.7	15.64	14.71	10.7	41.06	49.53	10.8	38.55	32.26	10.8	16.56	34.30
11.7	24.01	56.14	11.7	15.94	14.70	11.7	41.19	49.49	11.8	38.99	32.32	11.8	16.70	34.19
12.7	24.18	56.16	12.7	16.25	14.69	12.7	41.33	49.44	12.8	39.44	32.40	12.8	16.84	34.07
13.7	24.35	56.18	13.7	16.57	14.68	13.7	41.48	49.37	13.8	39.88	32.52	13.8	16.99	33.93
14.7	24.53	56.19	14.7	16.92	14.65	14.7	41.65	49.32	14.7	40.31	32.65	14.8	17.15	33.77
15.7	24.73	56.21	15.7	17.29	14.63	15.7	41.83	49.25	15.7	40.70	32.79	15.8	17.33	33.62
16.7	24.94	56.25	16.7	17.69	14.62	16.7	42.01	49.21	16.7	41.06	32.95	16.8	17.52	33.46
17.7	25.16	56.34	17.7	18.09	14.64	17.7	42.20	49.18	17.7	41.40	33.08	17.8	17.70	33.33
18.7	25.37	56.42	18.7	18.49	14.70	18.7	42.39	49.18	18.7	41.73	33.19	18.8	17.90	33.24
19.7	25.57	56.55	19.7	18.88	14.79	19.7	42.57	49.21	19.7	42.05	33.30	19.7	18.10	33.16
20.7	25.75	56.70	20.7	19.22	14.88	20.7	42.72	49.27	20.7	42.38	33.38	20.7	18.28	33.11
21.7	25.90	56.83	21.7	19.55	14.98	21.7	42.87	49.32	21.7	42.76	33.47	21.7	18.44	33.07
22.7	26.05	56.95	22.7	19.83	15.07	22.7	43.01	49.38	22.7	43.16	33.56	22.7	18.59	33.05
23.6	26.19	57.06	23.7	20.11	15.16	23.7	43.14	49.44	23.7	43.57	33.66	23.7	18.74	33.02
24.6	26.33	57.18	24.7	20.39	15.23	24.7	43.27	49.48	24.7	44.00	33.79	24.7	18.88	32.97
25.6	26.47	57.27	25.7	20.67	15.29	25.7	43.40	49.51	25.7	44.42	33.94	25.7	19.03	32.92
26.6	26.62	57.36	26.7	20.96	15.34	26.7	43.54	49.53	26.7	44.84	34.11	26.7	19.18	32.86
27.6	26.79	57.46	27.7	21.28	15.39	27.7	43.69	49.55	27.7	45.23	34.29	27.7	19.34	32.80
28.6	26.96	57.57	28.7	21.61	15.48	28.7	43.85	49.57	28.7	45.61	34.48	28.7	19.51	32.73
29.6	27.13	57.69	29.7	21.95	15.56	29.7	44.02	49.61	29.7	45.97	34.67	29.7	19.69	32.67
30.6	27.31	57.82	30.7	22.30	15.64	30.7	44.19	49.66	30.7	46.30	34.88	30.7	19.88	32.63
31.6	27.49	57.97	31.7	22.65	15.75	31.7	44.35	49.73	31.7	46.62	35.07	31.7	20.06	32.62
32.6	27.65	58.15	32.6	22.99	15.89	32.7	44.50	49.81	32.7	46.93	35.25	32.7	20.24	32.61
8.32	-8.26		15.87	-15.84		7.02	-6.95		18.15	+18.13		7.64	-7.57	
21 ^h 38 ^m 10 ^s .025			22 ^h 15 ^m 56 ^s .333			22 ^h 37 ^m 32 ^s .703			23 ^h 27 ^m 44 ^s .392			23 ^h 47 ^m 12 ^s .813		
-83° 6' 23".31			-86° 23' 45".22			-81° 49' 21".11			+86° 50' 39".03			-82° 29' 8".43		

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

48 H. Cephei. Mag. 4.5			α Ursæ Minoris. (Polaris.) Mag. 2.1			4 G. Octantis. Mag. 5.6			Groombridge 750. Mag. 6.7			Groombridge 944. Mag. 6.4		
Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.
July	h m s		July	h m s		July	h m s		July	h m s		July	h m s	
	0 57	-85 49		1 29	-88 51		1 42	-85 11		4 9	-85 19		5 34	+85 9
	s	"		s	"		s	"		s	"		s	"
0.5	2.25	22.26	0.5	38.22	21.65	0.5	1.27	3.73	0.9	44.00	60.21	0.9	53.11	28.76
1.5	2.57	22.34	1.5	39.26	21.67	1.5	1.51	3.54	1.9	44.22	60.03	1.9	53.26	28.52
2.5	2.55	22.41	2.5	40.28	21.69	2.5	1.78	3.36	2.9	44.42	59.86	2.9	53.39	28.28
3.5	3.12	22.45	3.5	41.26	21.71	3.5	2.04	3.22	3.9	44.62	59.70	3.9	53.52	28.03
4.5	3.40	22.52	4.5	42.26	21.71	4.5	2.29	3.09	4.9	44.81	59.52	4.9	53.66	27.78
5.5	3.65	22.56	5.5	43.30	21.71	5.5	2.54	2.99	5.9	45.01	59.33	5.9	53.77	27.52
6.7	3.99	22.61	6.5	44.39	21.70	6.5	2.78	2.90	6.9	45.22	59.12	6.9	53.89	27.25
7.7	4.30	22.66	7.5	45.55	21.70	7.5	3.00	2.81	7.9	45.44	58.90	7.9	54.03	26.94
8.7	4.63	22.73	8.5	46.79	21.70	8.5	3.22	2.74	8.9	45.68	58.68	8.9	54.17	26.63
9.7	4.99	22.83	9.5	48.07	21.75	9.5	3.42	2.64	9.9	45.95	58.48	9.9	54.35	26.33
10.7	5.35	22.95	10.5	49.38	21.80	10.5	3.61	2.54	10.9	46.23	58.27	10.9	54.55	26.04
11.7	5.69	23.09	11.5	50.67	21.89	11.5	3.83	2.41	11.9	46.53	58.09	11.9	54.78	25.75
12.7	6.03	23.26	12.5	51.91	21.99	12.5	4.05	2.27	12.9	46.85	57.95	12.9	55.01	25.51
13.7	6.35	23.44	13.5	53.05	22.12	13.5	4.29	2.14	13.9	47.14	57.83	13.9	55.24	25.26
14.7	6.63	23.62	14.5	54.17	22.24	14.5	4.55	2.01	14.9	47.43	57.74	14.9	55.46	25.07
15.7	6.91	23.78	15.5	55.18	22.35	15.5	4.83	1.88	15.9	47.68	57.66	15.9	55.67	24.87
16.7	7.16	23.94	16.5	56.16	22.45	16.5	5.11	1.79	16.9	47.93	57.56	16.9	55.86	24.68
17.7	7.42	24.07	17.5	57.13	22.54	17.5	5.38	1.72	17.9	48.17	57.44	17.9	56.03	24.48
18.7	7.69	24.18	18.5	58.15	22.60	18.5	5.64	1.71	18.9	48.39	57.31	18.9	56.21	24.26
19.7	7.98	24.29	19.5	59.24	22.68	19.5	5.89	1.70	19.8	48.63	57.16	19.9	56.37	24.01
20.7	8.29	24.43	20.7	60.40	22.75	20.7	6.12	1.69	20.8	48.89	57.02	20.9	56.54	23.74
21.7	8.62	24.56	21.7	61.64	22.82	21.7	6.35	1.69	21.8	49.16	56.84	21.9	56.76	23.47
22.7	8.95	24.71	22.7	62.88	22.92	22.7	6.56	1.66	22.8	49.45	56.69	22.9	56.99	23.19
23.7	9.28	24.89	23.7	64.14	23.04	23.7	6.77	1.65	23.8	49.77	56.55	23.9	57.20	22.93
24.7	9.61	25.08	24.7	65.38	23.18	24.7	6.99	1.61	24.8	50.07	56.45	24.9	57.45	22.70
25.7	9.92	25.28	25.7	66.57	23.33	25.7	7.22	1.57	25.8	50.39	56.35	25.9	57.70	22.48
26.7	10.21	25.51	26.7	67.71	23.49	26.7	7.47	1.52	26.8	50.71	56.27	26.9	57.96	22.27
27.7	10.49	25.73	27.7	68.78	23.65	27.7	7.72	1.48	27.8	51.01	56.21	27.9	58.21	22.08
28.7	10.76	25.96	28.7	69.80	23.81	28.7	7.99	1.46	28.8	51.30	56.16	28.9	58.46	21.91
29.7	11.01	26.18	29.7	70.78	23.99	29.7	8.26	1.45	29.8	51.58	56.12	29.9	58.70	21.73
30.7	11.25	26.39	30.7	71.73	24.15	30.7	8.54	1.45	30.8	51.86	56.06	30.9	58.93	21.58
31.7	11.49	26.57	31.7	72.68	24.30	31.7	8.81	1.48	31.8	52.10	56.00	31.9	59.14	21.43
13.68	+13.64		50.10	+50.09		11.91	-11.87		12.29	+12.25		11.84	+11.80	
0 ^h 57 ^m	1°.657		1 ^h 29 ^m	44°.254		1 ^h 42 ^m	6°.102		4 ^h 9 ^m	44°.952		5 ^h 34 ^m	54°.014	
+85° 48'	25''.87		+88° 51'	25''.03		-85° 11'	39''.58		+85° 20'	1''.04		+85° 9'	28''.07	

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

31 G. Mensæ. Mag. 6.2			ζ Mensæ. Mag. 5.6			51 H. Cephei. Mag. 5.3			25 H. Camelop. Mag. 5.1			7 G. Octantis. Mag. 6.4		
Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.
July	h m	° '	July	h m	° '	July	h m	° '	July	h m	° '	July	h m	° '
	s	"		s	"		s	"		s	"		s	"
0.9	2.49	38.69	1.0	50.74	34.22	1.0	32.25	62.20	1.0	30.02	38.88	1.0	57.87	65.10
1.9	2.50	38.32	2.0	50.72	33.86	2.0	32.35	61.92	2.0	30.06	38.61	2.0	57.73	64.77
2.9	2.53	37.96	3.0	50.71	33.53	3.0	32.44	61.63	3.0	30.10	38.32	3.0	57.59	64.45
3.9	2.58	37.61	3.9	50.69	33.17	4.0	32.49	61.37	4.0	30.11	38.06	4.0	57.49	64.11
4.9	2.61	37.27	4.9	50.69	32.83	5.0	32.56	61.08	5.0	30.13	37.79	5.0	57.40	63.78
5.9	2.66	36.94	5.9	50.69	32.49	6.0	32.61	60.76	6.0	30.14	37.50	6.0	57.34	63.47
6.9	2.72	36.64	6.9	50.69	32.17	7.0	32.65	60.44	7.0	30.15	37.18	7.0	57.30	63.16
7.9	2.77	36.36	7.9	50.69	31.87	7.9	32.71	60.10	8.0	30.17	36.84	8.0	57.25	62.86
8.9	2.83	36.10	8.9	50.70	31.59	8.9	32.80	59.75	9.0	30.20	36.48	9.0	57.21	62.61
9.9	2.88	35.84	9.9	50.70	31.33	9.9	32.91	59.39	10.0	30.24	36.12	10.0	57.15	62.35
10.9	2.92	35.57	10.9	50.70	31.05	10.9	33.07	59.02	10.9	30.29	35.76	10.9	57.07	62.07
11.9	2.95	35.29	11.9	50.69	30.77	11.9	33.26	58.64	11.9	30.37	35.41	11.9	56.99	61.83
12.9	2.98	34.98	12.9	50.69	30.48	12.9	33.50	58.29	12.9	30.46	35.07	12.9	56.88	61.55
13.9	3.01	34.66	13.9	50.68	30.16	13.9	33.74	57.96	13.9	30.55	34.77	13.9	56.78	61.24
14.9	3.06	34.32	14.9	50.67	29.80	14.9	33.98	57.67	14.9	30.65	34.48	14.9	56.68	60.91
15.9	3.13	33.98	15.9	50.68	29.44	15.9	34.19	57.38	15.9	30.74	34.22	15.9	56.62	60.57
16.9	3.21	33.64	16.9	50.69	29.06	16.9	34.38	57.11	16.9	30.79	33.95	16.9	56.58	60.22
17.9	3.30	33.31	17.9	50.72	28.72	17.9	34.55	56.85	17.9	30.85	33.69	17.9	56.58	59.87
18.9	3.41	33.02	18.9	50.75	28.37	18.9	34.70	56.58	18.9	30.91	33.40	18.9	56.61	59.55
19.9	3.51	32.73	19.9	50.78	28.06	19.9	34.83	56.25	19.9	30.96	33.09	19.9	56.66	59.25
20.9	3.62	32.47	20.9	50.81	27.78	20.9	34.97	55.92	20.9	31.00	32.78	20.9	56.70	58.97
21.9	3.73	32.24	21.9	50.85	27.51	21.9	35.15	55.58	21.9	31.06	32.43	21.9	56.75	58.71
22.9	3.83	32.01	22.9	50.89	27.24	22.9	35.36	55.22	22.9	31.14	32.08	22.9	56.80	58.47
23.9	3.93	31.77	23.9	50.92	26.95	23.9	35.59	54.88	23.9	31.23	31.73	23.9	56.83	58.20
24.9	4.02	31.52	24.9	50.95	26.68	24.9	35.85	54.55	24.9	31.33	31.40	24.9	56.84	57.94
25.9	4.11	31.25	25.9	50.98	26.41	25.9	36.13	54.22	25.9	31.42	31.07	25.9	56.85	57.66
26.9	4.21	30.98	26.9	51.01	26.09	26.9	36.43	53.92	26.9	31.56	30.78	26.9	56.87	57.35
27.9	4.31	30.70	27.9	51.04	25.78	27.9	36.72	53.64	27.9	31.66	30.49	27.9	56.90	57.03
28.9	4.44	30.40	28.9	51.07	25.45	28.9	37.01	53.36	28.9	31.77	30.22	28.9	56.93	56.72
29.9	4.56	30.10	29.9	51.11	25.13	29.9	37.30	53.12	29.9	31.88	29.98	29.9	56.98	56.38
30.9	4.69	29.80	30.9	51.16	24.79	30.9	37.58	52.86	30.9	31.98	29.71	30.9	57.07	56.05
31.9	4.84	29.51	31.9	51.21	24.47	31.9	37.82	52.62	31.9	32.07	29.45	31.9	57.16	55.70
11.09	-11.04		6.20	-6.12		20.34	+20.32		7.74	+7.67		18.49	-18.46	
5 ^h 46 ^m	26 ^s .439		6 ^h 47 ^m	3 ^s .489		7 ^h 1 ^m	34 ^s .861		7 ^h 13 ^m	29 ^s .477		7 ^h 16 ^m	40 ^s .555	
-84° 49'	48".17		-80° 43'	34".16		+87° 11'	0".11		+82° 34'	36".50		-86° 54'	0".14	

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

Groombridge 1119. Mag. 7.0			ζ Octantis. Mag. 5.4			1 H. Draconis. Mag. 4.6			ζ Chamæleontis. Mag. 5.2			30 H. Camelop. Mag. 5.3		
Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.
	h m ° '			h m ° '			h m ° '			h m ° '			h m ° '	
July	8 14	+88 53	July	9 8	-85 19	July	9 25	+81 41	July	9 36	-80 34	July	10 20	+82 59
	s	"		s	"		s	"		s	"		s	"
1.1	40.90	14.55	1.1	44.01	64.30	1.1	14.50	61.01	1.1	15.49	15.31	1.2	59.21	16.42
2.1	40.80	14.26	2.1	43.80	64.06	2.1	14.46	60.77	2.1	15.39	15.09	2.2	59.11	16.21
3.1	40.66	13.97	3.1	43.61	63.83	3.1	14.41	60.51	3.1	15.29	14.87	3.2	59.02	16.01
4.1	40.50	13.68	4.1	43.42	63.56	4.1	14.35	60.26	4.1	15.19	14.64	4.1	58.92	15.80
5.1	40.31	13.39	5.1	43.25	63.32	5.1	14.29	60.03	5.1	15.09	14.40	5.1	58.82	15.61
6.1	40.08	13.08	6.1	43.10	63.06	6.1	14.22	59.79	6.1	15.00	14.16	6.1	58.70	15.39
7.1	39.83	12.76	7.1	42.95	62.83	7.1	14.15	59.52	7.1	14.93	13.93	7.1	58.57	15.16
8.0	39.58	12.43	8.1	42.82	62.60	8.1	14.08	59.23	8.1	14.87	13.72	8.1	58.44	14.92
9.0	39.37	12.06	9.1	42.71	62.38	9.1	14.00	58.92	9.1	14.79	13.51	9.1	58.32	14.65
10.0	39.24	11.67	10.1	42.58	62.19	10.1	13.94	58.59	10.1	14.73	13.30	10.1	58.21	14.37
11.0	39.20	11.28	11.1	42.45	61.99	11.1	13.89	58.24	11.1	14.66	13.12	11.1	58.11	14.06
12.0	39.27	10.90	12.1	42.30	61.81	12.1	13.87	57.90	12.1	14.59	12.94	12.1	58.02	13.74
13.0	39.44	10.53	13.1	42.13	61.60	13.1	13.85	57.56	13.1	14.51	12.78	13.1	57.95	13.41
14.0	39.65	10.18	14.1	41.96	61.36	14.1	13.84	57.22	14.1	14.42	12.56	14.1	57.90	13.12
15.0	39.89	9.85	15.1	41.79	61.10	15.1	13.83	56.91	15.1	14.34	12.33	15.1	57.84	12.81
16.0	40.09	9.53	16.1	41.63	60.82	16.1	13.83	56.62	16.1	14.25	12.05	16.1	57.80	12.53
17.0	40.22	9.24	17.1	41.49	60.53	17.1	13.81	56.33	17.1	14.16	11.78	17.1	57.74	12.28
18.0	40.29	8.94	18.1	41.35	60.21	18.1	13.78	56.06	18.1	14.09	11.50	18.1	57.66	12.04
19.0	40.30	8.62	19.1	41.25	59.92	19.1	13.75	55.75	19.1	14.03	11.23	19.1	57.58	11.77
20.0	40.28	8.29	20.1	41.16	59.63	20.1	13.71	55.44	20.1	13.99	10.93	20.1	57.48	11.51
21.0	40.27	7.93	21.1	41.08	59.35	21.1	13.64	55.11	21.1	13.93	10.66	21.1	57.38	11.21
22.0	40.30	7.56	22.0	41.01	59.11	22.1	13.61	54.78	22.1	13.89	10.41	22.1	57.28	10.89
23.0	40.40	7.19	23.0	40.96	58.86	23.1	13.58	54.41	23.1	13.84	10.17	23.1	57.19	10.57
24.0	40.58	6.79	24.0	40.87	58.64	24.1	13.56	54.05	24.1	13.80	9.94	24.1	57.12	10.24
25.0	40.83	6.41	25.0	40.78	58.36	25.1	13.55	53.72	25.1	13.75	9.69	25.1	57.06	9.90
25.9	41.14	6.06	26.0	40.68	58.12	26.0	13.55	53.34	26.1	13.70	9.46	26.1	57.01	9.54
26.9	41.50	5.72	27.0	40.59	57.85	27.0	13.56	52.99	27.1	13.65	9.21	27.1	56.96	9.21
27.9	41.89	5.37	28.0	40.49	57.56	28.0	13.56	52.68	28.1	13.60	8.94	28.1	56.93	8.89
28.9	42.29	5.04	29.0	40.42	57.24	29.0	13.58	52.35	29.0	13.54	8.64	29.1	56.89	8.56
29.9	42.66	4.71	30.0	40.37	56.92	30.0	13.59	52.03	30.0	13.48	8.34	30.1	56.86	8.24
30.9	43.01	4.40	31.0	40.32	56.60	31.0	13.60	51.71	31.0	13.43	8.02	31.1	56.83	7.95
31.9	43.33	4.10	32.0	40.27	56.26	32.0	13.60	51.42	32.0	13.38	7.69	32.1	56.79	7.65
51.44	+51.43		12.29	-12.25		6.93	+6.85		6.10	-6.02		8.19	+8.13	
8 ^h 14 ^m 48 ^s .311			9 ^h 9 ^m 6 ^s .085			9 ^h 25 ^m 12 ^s .930			9 ^h 36 ^m 24 ^s .003			10 ^h 20 ^m 57 ^s .259		
+88° 53' 11".43			-85° 19' 42".77			+81° 41' 57".18			-80° 33' 50".61			+82° 59' 12".27		

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

7 Octantis. Mag. 6.3			Bradley 1672. Mag. 6.3			1 Octantis. Mag. 5.4			32 H. Camelop. seq. Mag. 5.3			κ Octantis. Mag. 5.6		
Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.
	h m	° '		h m	° '		h m	° '		h m	° '		h m	° '
July	10 59	-84 8	July	12 14	+88 9	July	12 45	-84 40	July	12 48	+83 52	July	13 27	-85 21
	s	"		s	"		s	"		s	"		s	"
1.2	47.38	64.13	1.2	32.97	60.11	1.3	63.74	39.52	1.3	33.54	13.89	1.3	13.46	59.82
2.2	47.17	64.06	2.2	32.40	60.01	2.3	63.52	39.59	2.3	33.37	13.82	2.3	13.21	59.96
3.2	46.96	63.95	3.2	31.84	59.90	3.3	63.28	39.64	3.3	33.20	13.77	3.3	12.96	60.07
4.2	46.76	63.82	4.2	31.27	59.81	4.2	63.05	39.68	4.3	33.03	13.73	4.3	12.70	60.16
5.2	46.57	63.70	5.2	30.67	59.70	5.2	62.82	39.69	5.2	32.84	13.69	5.3	12.45	60.23
6.2	46.38	63.56	6.2	30.05	59.62	6.2	62.59	39.69	6.2	32.66	13.66	6.3	12.19	60.29
7.2	46.21	63.41	7.2	29.39	59.53	7.2	62.40	39.68	7.2	32.46	13.63	7.3	11.96	60.34
8.2	46.06	63.27	8.2	28.69	59.40	8.2	62.20	39.67	8.2	32.23	13.59	8.3	11.74	60.37
9.2	45.91	63.16	9.2	27.97	59.28	9.2	62.02	39.67	9.2	32.02	13.52	9.3	11.54	60.41
10.2	45.76	63.05	10.2	27.25	59.10	10.2	61.86	39.67	10.2	31.80	13.42	10.3	11.35	60.47
11.2	45.63	62.95	11.2	26.55	58.93	11.2	61.68	39.71	11.2	31.59	13.30	11.3	11.17	60.54
12.2	45.47	62.88	12.2	25.88	58.70	12.2	61.52	39.76	12.2	31.39	13.14	12.3	10.98	60.64
13.2	45.30	62.80	13.2	25.27	58.48	13.2	61.33	39.81	13.2	31.20	12.98	13.3	10.76	60.74
14.1	45.11	62.71	14.2	24.72	58.25	14.2	61.10	39.86	14.2	31.02	12.80	14.3	10.54	60.84
15.1	44.93	62.58	15.2	24.22	58.05	15.2	60.89	39.89	15.2	30.86	12.65	15.2	10.27	60.93
16.1	44.72	62.41	16.2	23.72	57.86	16.2	60.65	39.91	16.2	30.71	12.49	16.2	10.01	61.00
17.1	44.52	62.23	17.2	23.23	57.70	17.2	60.41	39.86	17.2	30.56	12.37	17.2	9.74	61.03
18.1	44.35	62.03	18.2	22.70	57.52	18.2	60.18	39.80	18.2	30.38	12.26	18.2	9.46	61.02
19.1	44.20	61.83	19.2	22.14	57.37	19.2	59.94	39.72	19.2	30.21	12.15	19.2	9.21	60.99
20.1	44.05	61.63	20.2	21.53	57.22	20.2	59.75	39.64	20.2	30.01	12.05	20.2	8.97	60.96
21.1	43.92	61.44	21.2	20.87	57.06	21.2	59.56	39.54	21.2	29.81	11.91	21.2	8.74	60.95
22.1	43.81	61.28	22.2	20.21	56.86	22.2	59.39	39.47	22.2	29.60	11.78	22.2	8.54	60.93
23.1	43.69	61.08	23.2	19.54	56.63	23.2	59.22	39.42	23.2	29.39	11.64	23.2	8.34	60.92
24.1	43.55	60.92	24.2	18.91	56.39	24.2	59.05	39.37	24.2	29.19	11.45	24.2	8.14	60.93
25.1	43.43	60.76	25.2	18.31	56.16	25.2	58.88	39.30	25.2	29.00	11.25	25.2	7.93	60.93
26.1	43.29	60.59	26.2	17.75	55.89	26.2	58.69	39.26	26.2	28.81	11.07	26.2	7.71	60.94
27.1	43.14	60.41	27.2	17.24	55.61	27.2	58.49	39.21	27.2	28.65	10.83	27.2	7.48	60.94
28.1	42.99	60.21	28.2	16.76	55.37	28.2	58.28	39.16	28.2	28.49	10.62	28.2	7.24	60.93
29.1	42.84	60.00	29.2	16.29	55.12	29.2	58.06	39.07	29.2	28.35	10.41	29.2	6.98	60.89
30.1	42.68	59.77	30.2	15.84	54.87	30.2	57.84	38.98	30.2	28.19	10.21	30.2	6.70	60.86
31.1	42.53	59.53	31.2	15.40	54.64	31.2	57.61	38.87	31.2	28.04	10.02	31.2	6.44	60.78
32.1	42.38	59.27	32.2	14.95	54.40	32.2	57.39	38.74	32.2	27.89	9.83	32.2	6.17	60.71
9.81	-9.76		31.25	+31.23		10.78	-10.73		9.37	+9.31		12.38	-12.34	
10 ^h 59 ^m	55°.642		12 ^h 14 ^m	28°.053		12 ^h 46 ^m	1°.183		12 ^h 48 ^m	29°.976		13 ^h 27 ^m	5°.514	
-84° 8'	31''.24		+88° 9'	56''.03		-84° 40'	2''.72		+83° 52'	10''.05		-85° 21'	23''.59	

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

δ Octantis. Mag. 4.1			Groombridge 2283. Mag. 7.2			ρ Octantis. Mag. 5.7			ϵ Ursæ Minoris. Mag. 4.4			59 G. Apodis. Mag. 5.9		
Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.
July	h m " ' "		July	h m " ' "		July	h m " ' "		July	h m " ' "		July	h m " ' "	
	14 13 -83 17			15 3 +87 33			15 23 -84 11			16 54 +82 10			17 15 -80 47	
	s "			s "			s "			s "			s "	
1.3	28.85 38.30	1.4	68.65 26.65	1.4	61.24 46.13	1.4	36.30 38.80	1.4	60.37 16.56			1.4	60.37 16.56	
2.3	28.71 38.49	2.4	68.22 26.76	2.4	61.12 46.38	2.4	36.22 39.03	2.4	60.36 16.87			2.4	60.36 16.87	
3.3	28.55 38.65	3.3	67.79 26.87	3.4	60.99 46.63	3.4	36.13 39.27	3.4	60.33 17.18			3.4	60.33 17.18	
4.3	28.39 38.81	4.3	67.37 26.99	4.4	60.85 46.85	4.4	36.05 39.52	4.4	60.30 17.48			4.4	60.30 17.48	
5.3	28.23 38.93	5.3	66.95 27.12	5.4	60.70 47.06	5.4	35.96 39.78	5.4	60.26 17.77			5.4	60.26 17.77	
6.3	28.07 39.04	6.3	66.50 27.26	6.4	60.55 47.24	6.4	35.86 40.05	6.4	60.22 18.02			6.4	60.22 18.02	
7.3	27.92 39.13	7.3	66.02 27.41	7.4	60.40 47.42	7.4	35.77 40.32	7.4	60.18 18.27			7.4	60.18 18.27	
8.3	27.77 39.23	8.3	65.51 27.55	8.3	60.27 47.59	8.4	35.67 40.63	8.4	60.15 18.50			8.4	60.15 18.50	
9.3	27.65 39.31	9.3	64.98 27.71	9.3	60.15 47.76	9.4	35.55 40.93	9.4	60.13 18.72			9.4	60.13 18.72	
10.3	27.54 39.43	10.3	64.40 27.82	10.3	60.05 47.93	10.4	35.43 41.21	10.4	60.11 18.95			10.4	60.11 18.95	
11.3	27.43 39.56	11.3	63.82 27.92	11.3	59.95 48.12	11.4	35.31 41.48	11.4	60.10 19.18			11.4	60.10 19.18	
12.3	27.31 39.69	12.3	63.25 27.99	12.3	59.85 48.33	12.4	35.18 41.73	12.4	60.10 19.43			12.4	60.10 19.43	
13.3	27.18 39.85	13.3	62.69 28.02	13.3	59.75 48.54	13.4	35.04 41.94	13.4	60.09 19.70			13.4	60.09 19.70	
14.3	27.04 40.00	14.3	62.16 28.04	14.3	59.63 48.77	14.4	34.91 42.14	14.4	60.08 20.00			14.4	60.08 20.00	
15.3	26.89 40.15	15.3	61.66 28.06	15.3	59.49 48.99	15.4	34.79 42.31	15.4	60.05 20.31			15.4	60.05 20.31	
16.3	26.72 40.27	16.3	61.18 28.07	16.3	59.32 49.20	16.4	34.67 42.48	16.4	60.01 20.61			16.4	60.01 20.61	
17.3	26.55 40.36	17.3	60.71 28.11	17.3	59.15 49.40	17.4	34.55 42.67	17.4	59.96 20.89			17.4	59.96 20.89	
18.3	26.36 40.42	18.3	60.25 28.18	18.3	58.97 49.56	18.4	34.44 42.86	18.4	59.89 21.15			18.4	59.89 21.15	
19.3	26.19 40.49	19.3	59.77 28.24	19.3	58.79 49.70	19.4	34.32 43.09	19.4	59.81 21.39			19.4	59.81 21.39	
20.3	26.03 40.52	20.3	59.24 28.32	20.3	58.62 49.82	20.4	34.20 43.33	20.4	59.74 21.61			20.4	59.74 21.61	
21.3	25.87 40.53	21.3	58.69 28.40	21.3	58.46 49.92	21.4	34.06 43.59	21.4	59.68 21.79			21.4	59.68 21.79	
22.3	25.74 40.55	22.3	58.12 28.49	22.3	58.32 50.01	22.4	33.93 43.84	22.4	59.63 21.98			22.4	59.63 21.98	
23.3	25.60 40.58	23.3	57.52 28.54	23.3	58.17 50.12	23.4	33.78 44.07	23.4	59.57 22.15			23.4	59.57 22.15	
24.3	25.48 40.61	24.3	56.92 28.57	24.3	58.04 50.24	24.4	33.63 44.29	24.4	59.53 22.34			24.4	59.53 22.34	
25.3	25.34 40.65	25.3	56.34 28.59	25.3	57.90 50.38	25.4	33.48 44.48	25.4	59.49 22.56			25.4	59.49 22.56	
26.2	25.19 40.72	26.3	55.76 28.58	26.3	57.76 50.51	26.4	33.33 44.66	26.4	59.44 22.79			26.4	59.44 22.79	
27.2	25.04 40.78	27.3	55.20 28.56	27.3	57.60 50.64	27.4	33.18 44.82	27.4	59.39 23.03			27.4	59.39 23.03	
28.2	24.88 40.84	28.3	54.67 28.53	28.3	57.43 50.78	28.4	33.03 44.96	28.4	59.34 23.27			28.4	59.34 23.27	
29.2	24.71 40.88	29.3	54.15 28.50	29.3	57.25 50.93	29.4	32.88 45.09	29.4	59.27 23.52			29.4	59.27 23.52	
30.2	24.53 40.91	30.3	53.64 28.46	30.3	57.06 51.06	30.4	32.74 45.23	30.4	59.19 23.76			30.4	59.19 23.76	
31.2	24.34 40.91	31.3	53.15 28.45	31.3	56.86 51.17	31.3	32.60 45.37	31.4	59.10 24.01			31.4	59.10 24.01	
32.2	24.15 40.90	32.3	52.65 28.44	32.3	56.66 51.24	32.3	32.47 45.52	32.4	59.01 24.22			32.4	59.01 24.22	
8.56 -8.50		23.47 +23.45		9.89 -9.84		7.35 +7.28		6.25 -6.17						
14 ^h 13 ^m 18 ^s .531		15 ^h 4 ^m 0 ^s .607		15 ^h 23 ^m 43 ^s .237		16 ^h 54 ^m 31 ^s .741		17 ^h 15 ^m 43 ^s .730						
-83° 17' 4".27		+87° 33' 24".43		-84° 11' 17".84		+82° 10' 38".40		-80° 47' 2".69						

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

δ Ursae Minoris. Mag. 4.4			χ Octantis. Mag. 5.2			λ Ursae Minoris. Mag. 6.6			σ Octantis. Mag. 5.5			76 Draconis. Mag. 5.7		
Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.
	h m	° ' "		h m	° ' "		h m	° ' "		h m	° ' "		h m	° ' "
July 17 59	+86 36		July 18 6	-87 39		July 19 3	+89 0		July 19 29	-89 13		July 20 48	+82 13	
1.5	27.88	50.43	1.5	38.23	58.62	1.5	68.14	54.79	1.5	9.35	29.29	1.6	48.40	13.37
2.5	27.74	50.71	2.5	38.28	58.96	2.5	67.94	55.09	2.5	10.06	29.60	2.6	48.45	13.67
3.5	27.61	50.98	3.5	38.29	59.30	3.5	67.77	55.38	3.5	10.67	29.92	3.6	48.50	13.97
4.5	27.48	51.27	4.5	38.27	59.63	4.5	67.62	55.70	4.5	11.17	30.24	4.6	48.58	14.27
5.5	27.36	51.56	5.5	38.22	59.94	5.5	67.51	56.01	5.5	11.58	30.55	5.6	48.61	14.57
6.5	27.24	51.87	6.5	38.15	60.24	6.5	67.41	56.33	6.5	11.92	30.83	6.6	48.68	14.89
7.5	27.11	52.20	7.5	38.08	60.52	7.5	67.30	56.67	7.5	12.20	31.12	7.6	48.74	15.20
8.5	26.95	52.52	8.5	38.02	60.79	8.5	67.15	57.03	8.5	12.47	31.38	8.6	48.81	15.57
9.4	26.78	52.88	9.5	37.97	61.05	9.5	66.91	57.40	9.5	12.79	31.63	9.6	48.87	15.95
10.4	26.58	53.22	10.5	37.97	61.29	10.5	66.58	57.77	10.5	13.19	31.88	10.6	48.93	16.34
11.4	26.35	53.56	11.4	37.98	61.54	11.5	66.15	58.14	11.5	13.68	32.14	11.6	48.97	16.74
12.4	26.11	53.88	12.4	38.02	61.82	12.5	65.61	58.50	12.5	14.24	32.40	12.6	49.01	17.14
13.4	25.84	54.16	13.4	38.07	62.12	13.5	65.02	58.84	13.5	14.84	32.68	13.6	49.03	17.52
14.4	25.59	54.42	14.4	38.07	62.44	14.5	64.41	59.15	14.5	15.41	33.00	14.6	49.04	17.89
15.4	25.34	54.66	15.4	38.05	62.76	15.5	63.83	59.43	15.5	15.89	33.31	15.6	49.05	18.23
16.4	25.11	54.88	16.4	37.98	63.11	16.5	63.29	59.73	16.5	16.25	33.63	16.6	49.06	18.55
17.4	24.92	55.12	17.4	37.84	63.44	17.5	62.83	60.00	17.5	16.46	33.98	17.5	49.08	18.87
18.4	24.72	55.38	18.4	37.67	63.74	18.5	62.43	60.32	18.5	16.52	34.30	18.5	49.10	19.18
19.4	24.52	55.66	19.4	37.49	64.02	19.5	62.07	60.64	19.5	16.47	34.60	19.5	49.13	19.52
20.4	24.30	55.95	20.4	37.29	64.29	20.5	61.68	60.98	20.5	16.39	34.89	20.5	49.17	19.88
21.4	24.08	56.27	21.4	37.11	64.53	21.5	61.26	61.32	21.5	16.29	35.17	21.5	49.20	20.26
22.4	23.85	56.59	22.4	36.95	64.76	22.5	60.76	61.67	22.5	16.22	35.43	22.5	49.23	20.65
23.4	23.57	56.89	23.4	36.80	65.00	23.5	60.19	62.01	23.5	16.23	35.68	23.5	49.25	21.05
24.4	23.30	57.18	24.4	36.67	65.24	24.5	59.52	62.35	24.5	16.28	35.94	24.5	49.26	21.45
25.4	22.99	57.45	25.4	36.55	65.49	25.5	58.80	62.68	25.5	16.37	36.21	25.5	49.26	21.85
26.4	22.68	57.70	26.4	36.42	65.76	26.4	58.05	63.00	26.5	16.47	36.49	26.5	49.26	22.22
27.4	22.39	57.95	27.4	36.28	66.05	27.4	57.26	63.30	27.5	16.54	36.79	27.5	49.25	22.60
28.4	22.09	58.18	28.4	36.12	66.33	28.4	56.46	63.60	28.5	16.57	37.10	28.5	49.23	22.96
29.4	21.80	58.40	29.4	35.93	66.62	29.4	55.69	63.88	29.5	16.55	37.44	29.5	49.22	23.29
30.4	21.51	58.60	30.4	35.71	66.92	30.4	54.94	64.16	30.5	16.41	37.76	30.5	49.20	23.63
31.4	21.23	58.80	31.4	35.44	67.22	31.4	54.23	64.42	31.5	16.16	38.09	31.5	49.18	23.96
32.4	20.96	59.02	32.4	35.15	67.51	32.4	53.55	64.69	32.4	15.83	38.41	32.5	49.16	24.29
16.94	+16.91		24.57	-24.55		58.26	+58.25		74.02	-74.01		7.39	+7.32	
17 ^h 59 ^m 20 ^s .805			18 ^h 5 ^m 36 ^s .163			19 ^h 3 ^m 51 ^s .560			19 ^h 26 ^m 7 ^s .189			20 ^h 48 ^m 44 ^s .660		
+86° 36' 51".19			-87° 39' 52".21			+89° 0' 56".70			-89° 13' 35".99			+82° 13' 16".38		

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

λ Octantis. Mag. 5.4			ν Octantis. Mag. 5.7			β Octantis. Mag. 4.3			39 H. Cephei. Mag. 5.6			γ^1 Octantis. Mag. 5.1		
Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.
July	h m	° ' "	July	h m	° ' "	July	h m	° ' "	July	h m	° ' "	July	h m	° ' "
21.68	21 68	-83 5	22.16	22 16	-86 23	22.37	22 37	-81 48	23.27	23 27	+86 50	23.47	23 47	-82 28
1.6	27.49	57.97	1.7	22.65	15.75	1.7	44.35	49.73	1.7	46.62	35.07	1.7	20.06	32.62
2.6	27.65	58.15	2.6	22.99	15.89	2.7	44.50	49.81	2.7	46.93	35.25	2.7	20.24	32.61
3.6	27.81	58.33	3.6	23.32	16.04	3.7	44.67	49.92	3.7	47.24	35.40	3.7	20.43	32.62
4.6	27.97	58.53	4.6	23.63	16.20	4.7	44.81	50.06	4.7	47.55	35.56	4.7	20.60	32.65
5.6	28.11	58.73	5.6	23.91	16.37	5.7	44.96	50.19	5.7	47.88	35.72	5.7	20.77	32.69
6.6	28.23	58.93	6.6	24.18	16.53	6.7	45.09	50.32	6.7	48.23	35.89	6.7	20.92	32.73
7.6	28.34	59.12	7.6	24.43	16.70	7.7	45.20	50.46	7.7	48.60	36.07	7.7	21.07	32.78
8.6	28.45	59.31	8.6	24.67	16.85	8.6	45.31	50.57	8.7	48.98	36.26	8.7	21.21	32.82
9.6	28.57	59.46	9.6	24.90	16.99	9.6	45.42	50.67	9.7	49.38	36.48	9.7	21.35	32.85
10.6	28.69	59.62	10.6	25.15	17.11	10.6	45.55	50.75	10.7	49.76	36.73	10.7	21.50	32.87
11.6	28.83	59.76	11.6	25.41	17.22	11.6	45.69	50.84	11.7	50.13	37.00	11.7	21.64	32.88
12.6	28.97	59.90	12.6	25.70	17.34	12.6	45.83	50.91	12.7	50.48	37.28	12.7	21.80	32.87
13.6	29.12	60.04	13.6	26.02	17.47	13.6	45.98	51.01	13.7	50.78	37.57	13.7	21.99	32.88
14.6	29.28	60.23	14.6	26.34	17.61	14.6	46.13	51.13	14.7	51.06	37.85	14.7	22.17	32.90
15.6	29.44	60.45	15.6	26.66	17.79	15.6	46.29	51.27	15.7	51.30	38.11	15.7	22.35	32.94
16.6	29.58	60.69	16.6	26.97	17.98	16.6	46.44	51.43	16.7	51.55	38.36	16.7	22.54	33.01
17.6	29.72	60.93	17.6	27.25	18.21	17.6	46.58	51.60	17.7	51.82	38.58	17.7	22.71	33.10
18.6	29.83	61.20	18.6	27.49	18.43	18.6	46.70	51.79	18.7	52.10	38.80	18.7	22.86	33.21
19.6	29.92	61.44	19.6	27.70	18.67	19.6	46.80	51.99	19.7	52.40	39.03	19.7	23.01	33.34
20.6	30.00	61.68	20.6	27.90	18.90	20.6	46.90	52.18	20.6	52.72	39.27	20.7	23.14	33.47
21.6	30.07	61.92	21.6	28.07	19.10	21.6	46.99	52.36	21.6	53.06	39.52	21.7	23.26	33.58
22.6	30.15	62.11	22.6	28.25	19.30	22.6	47.09	52.53	22.6	53.40	39.78	22.7	23.39	33.69
23.6	30.24	62.31	23.6	28.45	19.49	23.6	47.18	52.69	23.6	53.73	40.07	23.7	23.52	33.78
24.6	30.33	62.52	24.6	28.65	19.67	24.6	47.29	52.83	24.6	54.04	40.39	24.7	23.66	33.87
25.6	30.43	62.73	25.6	28.87	19.86	25.6	47.40	52.99	25.6	54.33	40.70	25.7	23.80	33.96
26.6	30.54	62.95	26.6	29.09	20.05	26.6	47.52	53.15	26.6	54.59	41.02	26.6	23.95	34.06
27.6	30.65	63.17	27.6	29.33	20.26	27.6	47.64	53.33	27.6	54.84	41.34	27.6	24.10	34.17
28.6	30.75	63.42	28.6	29.58	20.48	28.6	47.76	53.53	28.6	55.06	41.64	28.6	24.26	34.29
29.6	30.86	63.70	29.6	29.81	20.72	29.6	47.88	53.75	29.6	55.26	41.94	29.6	24.42	34.42
30.5	30.95	63.98	30.6	30.03	20.99	30.6	47.99	53.98	30.6	55.46	42.24	30.6	24.58	34.57
31.5	31.04	64.28	31.6	30.23	21.27	31.6	48.10	54.22	31.6	55.68	42.52	31.6	24.72	34.75
32.5	31.10	64.58	32.6	30.41	21.54	32.6	48.19	54.48	32.6	55.91	42.78	32.6	24.87	34.92
8.32	-8.26		15.87	-15.84		7.02	-6.95		18.16	+18.14		7.64	-7.57	
21 ^h 38 ^m	10 ^s .025		22 ^h 15 ^m	56 ^s .333		22 ^h 37 ^m	32 ^s .703		28 ^h 27 ^m	44 ^s .392		23 ^h 47 ^m	12 ^s .813	
-83° 6'	23''.31		-86° 23'	45''.22		-81° 49'	21''.11		+86° 50'	39''.03		-82° 29'	8''.43	

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

48 H. Cephei. Mag. 4.5			α Ursæ Minoris. (Polaris.) Mag. 2.1			4 G. Octantis. Mag. 5.6			Groombridge 750. Mag. 6.7			Groombridge 944. Mag. 6.4		
Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.
Aug.	h m s	° ' "	Aug.	h m s	° ' "	Aug.	h m s	° ' "	Aug.	h m s	° ' "	Aug.	h m s	° ' "
0.7	11.49	26.57	0.7	12.68	24.30	0.7	8.81	1.48	0.8	52.10	56.00	0.9	59.14	21.43
1.7	11.74	26.76	1.7	13.64	24.44	1.7	9.07	1.53	1.8	52.37	55.92	1.9	59.35	21.26
2.7	11.99	26.94	2.7	14.64	24.58	2.7	9.32	1.60	2.8	52.63	55.84	2.9	59.55	21.07
3.7	12.26	27.12	3.7	15.72	24.73	3.7	9.56	1.68	3.8	52.90	55.76	3.9	59.77	20.86
4.7	12.54	27.31	4.7	16.85	24.88	4.7	9.79	1.76	4.8	53.20	55.65	4.9	60.00	20.64
5.7	12.86	27.52	5.7	18.02	25.05	5.7	9.99	1.82	5.8	53.52	55.56	5.9	60.25	20.42
6.7	13.17	27.76	6.7	19.23	25.22	6.7	10.19	1.88	6.8	53.84	55.49	6.9	60.53	20.20
7.7	13.46	28.03	7.7	20.42	25.44	7.7	10.41	1.95	7.8	54.19	55.45	7.9	60.82	20.00
8.7	13.76	28.33	8.7	21.58	25.67	8.7	10.63	1.96	8.8	54.53	55.40	8.9	61.14	19.81
9.7	14.04	28.62	9.7	22.68	25.93	9.7	10.85	1.98	9.8	54.89	55.40	9.9	61.44	19.68
10.7	14.29	28.93	10.7	23.68	26.20	10.7	11.09	2.02	10.8	55.23	55.42	10.8	61.74	19.56
11.6	14.51	29.24	11.7	24.59	26.45	11.7	11.36	2.05	11.8	55.55	55.46	11.8	62.05	19.46
12.6	14.72	29.52	12.7	25.45	26.69	12.7	11.62	2.11	12.8	55.84	55.49	12.8	62.32	19.36
13.6	14.92	29.78	13.7	26.29	26.93	13.7	11.83	2.19	13.8	56.12	55.51	13.8	62.58	19.25
14.6	15.12	30.03	14.7	27.15	27.14	14.7	12.14	2.28	14.8	56.39	55.50	14.8	62.81	19.13
15.6	15.35	30.27	15.7	28.06	27.33	15.7	12.38	2.42	15.8	56.67	55.49	15.8	63.06	18.99
16.6	15.59	30.51	16.7	29.04	27.52	16.7	12.61	2.58	16.8	56.96	55.45	16.8	63.30	18.82
17.6	15.85	30.76	17.7	30.09	27.73	17.7	12.80	2.74	17.8	57.27	55.40	17.8	63.57	18.65
18.6	16.12	31.04	18.7	31.17	27.96	18.7	12.99	2.88	18.8	57.59	55.37	18.8	63.85	18.47
19.6	16.39	31.32	19.6	32.26	28.20	19.7	13.18	3.03	19.8	57.93	55.35	19.8	64.14	18.32
20.6	16.64	31.62	20.6	33.35	28.46	20.7	13.37	3.16	20.8	58.26	55.36	20.8	64.46	18.18
21.6	16.89	31.95	21.6	34.38	28.74	21.7	13.57	3.28	21.8	58.62	55.40	21.8	64.78	18.07
22.6	17.13	32.28	22.6	35.33	29.02	22.7	13.77	3.41	22.8	58.96	55.44	22.8	65.10	17.96
23.6	17.35	32.60	23.6	36.24	29.32	23.7	13.99	3.53	23.8	59.29	55.49	23.8	65.42	17.89
24.6	17.54	32.93	24.6	37.08	29.62	24.6	14.22	3.66	24.8	59.61	55.57	24.8	65.73	17.81
25.6	17.72	33.26	25.6	37.87	29.92	25.6	14.44	3.79	25.7	59.93	55.64	25.8	66.02	17.76
26.6	17.89	33.58	26.6	38.61	30.20	26.6	14.68	3.93	26.7	60.22	55.72	26.8	66.31	17.71
27.6	18.06	33.88	27.6	39.36	30.46	27.6	14.91	4.12	27.7	60.50	55.79	27.8	66.58	17.66
28.6	18.23	34.18	28.6	40.09	30.73	28.6	15.13	4.30	28.7	60.78	55.87	28.8	66.85	17.60
29.6	18.40	34.48	29.6	40.85	30.98	29.6	15.34	4.50	29.7	61.05	55.92	29.8	67.12	17.53
30.6	18.58	34.77	30.6	41.66	31.23	30.6	15.53	4.74	30.7	61.34	55.96	30.8	67.38	17.45
31.6	18.78	35.06	31.6	42.52	31.48	31.6	15.71	4.96	31.7	61.63	56.00	31.8	67.66	17.35
13.68	+13.65		50.16	+50.15		11.91	-11.87		12.29	+12.25		11.94	+11.80	
0 ^h 57 ^m	1°.657		1 ^h 29 ^m	44°.254		1 ^h 42 ^m	6°.102		4 ^h 9 ^m	44°.952		5 ^h 34 ^m	54°.014	
+85° 48'	26''.87		+88° 51'	25''.03		-85° 11'	39''.58		+85° 20'	1''.04		+85° 9'	28''.07	

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

31 G. Mensæ. Mag. 6.2			ζ Mensæ. Mag. 5.6			51 H. Cephei. Mag. 5.3			25 H. Camelop. Mag. 5.1			7 G. Octantis. Mag. 6.4		
Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.
Aug.	h m ° ' "		Aug.	h m ° ' "		Aug.	h m ° ' "		Aug.	h m ° ' "		Aug.	h m ° ' "	
	5 46 -84 49			6 46 -80 43			7 1 +87 10			7 13 +82 34			7 15 -86 53	
	s "			s "			s "			s "			s "	
0.9	4.84 29.51		0.9	51.21 24.47		0.9	37.82 52.62		0.9	32.07 29.45		0.9	57.16 55.70	
1.9	5.01 29.25		1.9	51.27 24.15		1.9	38.07 52.34		1.9	32.16 29.19		1.9	57.29 55.37	
2.9	5.18 29.00		2.9	51.34 23.86		2.9	38.30 52.06		2.9	32.24 28.92		2.9	57.43 55.05	
3.9	5.34 28.77		3.9	51.40 23.57		3.9	38.53 51.77		3.9	32.32 28.64		3.9	57.58 54.77	
4.9	5.50 28.58		4.9	51.47 23.32		4.9	38.80 51.45		4.9	32.41 28.33		4.9	57.73 54.50	
5.9	5.65 28.39		5.9	51.54 23.08		5.9	39.07 51.12		5.9	32.51 28.00		5.9	57.88 54.26	
6.9	5.79 28.19		6.9	51.60 22.86		6.9	39.40 50.80		6.9	32.64 27.67		6.9	58.01 54.02	
7.9	5.93 28.01		7.9	51.67 22.62		7.9	39.76 50.48		7.9	32.78 27.34		7.9	58.12 53.78	
8.9	6.06 27.78		8.9	51.72 22.35		8.9	40.16 50.18		8.9	32.92 27.05		8.9	58.22 53.50	
9.9	6.19 27.55		9.9	51.77 22.08		9.9	40.57 49.90		9.9	33.09 26.76		9.9	58.30 53.24	
10.9	6.33 27.31		10.9	51.83 21.78		10.9	40.99 49.66		10.9	33.26 26.51		10.9	58.39 52.95	
11.9	6.47 27.05		11.9	51.89 21.47		11.9	41.39 49.43		11.9	33.41 26.26		11.9	58.51 52.63	
12.8	6.65 26.77		12.9	51.97 21.16		12.9	41.77 49.21		12.9	33.55 26.05		12.9	58.65 52.31	
13.8	6.84 26.54		13.9	52.04 20.85		13.9	42.11 48.99		13.9	33.68 25.83		13.9	58.82 51.99	
14.8	7.05 26.33		14.9	52.13 20.57		14.9	42.44 48.76		14.9	33.80 25.60		14.9	59.02 51.68	
15.8	7.24 26.14		15.9	52.22 20.33		15.9	42.75 48.52		15.9	33.92 25.35		15.9	59.25 51.42	
16.8	7.44 25.97		16.9	52.32 20.09		16.9	43.06 48.24		16.9	34.01 25.09		16.9	59.49 51.17	
17.8	7.64 25.82		17.9	52.41 19.89		17.9	43.38 47.97		17.9	34.15 24.80		17.9	59.73 50.94	
18.8	7.84 25.68		18.9	52.50 19.69		18.9	43.74 47.69		18.9	34.27 24.51		18.9	59.96 50.72	
19.8	8.02 25.56		19.9	52.59 19.49		19.9	44.14 47.38		19.9	34.41 24.21		19.9	60.18 50.52	
20.8	8.20 25.42		20.9	52.67 19.30		20.9	44.55 47.10		20.9	34.57 23.91		20.9	60.38 50.33	
21.8	8.37 25.27		21.9	52.77 19.10		21.9	44.98 46.86		21.9	34.74 23.66		21.9	60.58 50.09	
22.8	8.55 25.11		22.9	52.85 18.87		22.9	45.44 46.62		22.9	34.91 23.41		22.9	60.77 49.86	
23.8	8.74 24.94		23.9	52.93 18.64		23.9	45.89 46.39		23.9	35.09 23.18		23.9	60.97 49.61	
24.8	8.93 24.76		24.9	53.03 18.39		24.9	46.34 46.19		24.9	35.26 22.98		24.9	61.19 49.34	
25.8	9.12 24.59		25.9	53.12 18.16		25.9	46.77 46.00		25.9	35.43 22.79		25.9	61.42 49.07	
26.8	9.35 24.41		26.9	53.22 17.92		26.9	47.19 45.82		26.9	35.58 22.60		26.9	61.67 48.79	
27.8	9.57 24.23		27.8	53.32 17.67		27.9	47.61 45.64		27.9	35.73 22.40		27.9	61.91 48.55	
28.8	9.80 24.08		28.8	53.43 17.43		28.9	47.99 45.44		28.9	35.88 22.20		28.9	62.20 48.30	
29.8	10.03 23.95		29.8	53.56 17.24		29.9	48.38 45.26		29.9	36.02 22.00		29.9	62.52 48.05	
30.8	10.27 23.84		30.8	53.68 17.03		30.9	48.74 45.07		30.9	36.16 21.78		30.9	62.84 47.81	
31.8	10.51 23.76		31.8	53.79 16.88		31.9	49.13 44.84		31.9	36.30 21.55		31.9	63.16 47.63	
11.08 -11.04			6.20 -6.12			20.33 +20.30			7.74 +7.67			18.48 -18.45		
5 ^h 46 ^m 26 ^s .439			6 ^h 47 ^m 3 ^s .489			7 ^h 1 ^m 34 ^s .861			7 ^h 13 ^m 29 ^s .477			7 ^h 16 ^m 40 ^s .555		
-84° 49' 48".17			-80° 43' 34".16			+87° 11' 0".11			+82° 34' 36".50			-86° 54' 0".14		

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

Groombridge 1119. Mag. 7.0			ζ Octantis. Mag. 5.4			1 H. Draconis. Mag. 4.6			ζ Chamæleontis. Mag. 5.2			30 H. Camelop. Mag. 5.3		
Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.
Aug.	h m s	° ' " +88 52	Aug.	h m s	° ' " -85 19	Aug.	h m s	° ' " +81 41	Aug.	h m s	° ' " -80 33	Aug.	h m s	° ' " +82 58
0.9	43.33	64.10	1.0	40.27	56.26	1.0	13.60	51.42	1.0	13.38	67.69	1.1	56.79	67.65
1.9	43.61	63.78	2.0	40.22	55.94	2.0	13.60	51.11	2.0	13.34	67.36	2.1	56.74	67.36
2.9	43.86	63.46	3.0	40.14	55.61	3.0	13.59	50.79	3.0	13.32	67.04	3.1	56.69	67.05
3.9	44.10	63.13	4.0	40.07	55.32	4.0	13.58	50.47	4.0	13.30	66.74	4.1	56.63	66.75
4.9	44.35	62.78	5.0	40.05	55.02	5.0	13.56	50.13	5.0	13.29	66.44	5.1	56.57	66.41
5.9	44.67	62.41	6.0	40.04	54.74	6.0	13.55	49.76	6.0	13.27	66.15	6.1	56.50	66.05
6.9	45.08	62.04	7.0	40.04	54.50	7.0	13.56	49.38	7.0	13.26	65.92	7.1	56.45	65.67
7.9	45.58	61.63	8.0	40.02	54.23	8.0	13.59	48.97	8.0	13.24	65.67	8.1	56.44	65.26
8.9	46.19	61.25	8.9	39.98	53.97	9.0	13.63	48.58	9.0	13.23	65.42	9.0	56.42	64.87
9.9	46.87	60.90	9.9	39.93	53.76	10.0	13.69	48.20	10.0	13.20	65.14	10.0	56.42	64.49
10.9	47.58	60.57	10.9	39.88	53.39	11.0	13.74	47.84	11.0	13.16	64.85	11.0	56.43	64.11
11.9	48.28	60.25	11.9	39.83	53.08	12.0	13.80	47.50	12.0	13.13	64.54	12.0	56.45	63.76
12.9	48.92	59.96	12.9	39.79	52.74	12.9	13.86	47.19	13.0	13.11	64.23	13.0	56.47	63.42
13.9	49.51	59.67	13.9	39.78	52.42	13.9	13.88	46.88	14.0	13.09	63.88	14.0	56.47	63.10
14.9	50.02	59.38	14.9	39.79	52.06	14.9	13.91	46.57	15.0	13.07	63.54	15.0	56.46	62.78
15.9	50.48	59.06	15.9	39.82	51.73	15.9	13.92	46.25	15.9	13.07	63.21	16.0	56.43	62.47
16.9	50.94	58.75	16.9	39.86	51.41	16.9	13.94	45.91	16.9	13.07	62.89	17.0	56.40	62.13
17.9	51.43	58.40	17.9	39.91	51.12	17.9	13.95	45.54	17.9	13.09	62.60	18.0	56.37	61.77
18.9	51.97	58.03	18.9	39.97	50.85	18.9	13.99	45.15	18.9	13.11	62.30	19.0	56.35	61.38
19.9	52.57	57.68	19.9	40.02	50.57	19.9	14.02	44.77	19.9	13.13	62.02	20.0	56.34	61.01
20.9	53.26	57.33	20.9	40.07	50.30	20.9	14.07	44.38	20.9	13.15	61.74	21.0	56.34	60.61
21.9	54.01	56.99	21.9	40.11	50.05	21.9	14.12	44.00	21.9	13.16	61.46	22.0	56.34	60.22
22.9	54.82	56.66	22.9	40.13	49.77	22.9	14.20	43.62	22.9	13.17	61.19	23.0	56.37	59.83
23.9	55.65	56.35	23.9	40.16	49.48	23.9	14.28	43.28	23.9	13.17	60.89	24.0	56.41	59.45
24.9	56.49	56.06	24.9	40.19	49.18	24.9	14.36	42.93	24.9	13.17	60.58	25.0	56.46	59.08
25.9	57.33	55.78	25.9	40.22	48.86	25.9	14.44	42.61	25.9	13.18	60.26	26.0	56.50	58.73
26.9	58.13	55.52	26.9	40.26	48.52	26.9	14.49	42.30	26.9	13.18	59.94	26.9	56.53	58.39
27.9	58.90	55.24	27.9	40.32	48.19	27.9	14.56	41.99	27.9	13.20	59.61	27.9	56.56	58.05
28.9	59.63	54.97	28.9	40.40	47.85	28.9	14.62	41.67	28.9	13.23	59.26	28.9	56.58	57.72
29.9	60.33	54.70	29.9	40.49	47.53	29.9	14.66	41.34	29.9	13.26	58.92	29.9	56.60	57.39
30.9	60.99	54.40	30.9	40.59	47.24	30.9	14.71	41.02	30.9	13.30	58.58	30.9	56.61	57.05
31.9	61.68	54.09	31.9	40.72	46.94	31.9	14.76	40.69	31.9	13.34	58.29	31.9	56.61	56.68
51.30	+51.29	12.29	-12.24	6.92	+6.85	6.10	-6.02	8.19	+8.13					
8 ^h 14 ^m 48 ^s .311	9 ^h 9 ^m 6 ^s .085	9 ^h 25 ^m 12 ^s .930	9 ^h 36 ^m 24 ^s .003	10 ^h 20 ^m 57 ^s .259										
+88° 53' 11".43	-85° 19' 42".77	+81° 41' 57".18	-80° 33' 50".61	+82° 59' 12".27										

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

7 Octantis. Mag. 6.3			Bradley 1672. Mag. 6.3			1 Octantis. Mag. 5.4			32 H. Camelop. seq. Mag. 5.3			κ Octantis. Mag. 5.6		
Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.
Aug.	h m ° ' "		Aug.	h m ° ' "		Aug.	h m ° ' "		Aug.	h m ° ' "		Aug.	h m ° ' "	
	10 59 -84 8			12 14 +88 9			12 45 -84 40			12 48 +83 52			13 26 -85 21	
	s " "			s " "			s " "			s " "			s " "	
1.1	42.38 59.27	1.2	14.95 54.40	1.2	57.39 38.74	1.2	27.89 9.83	1.2	66.17 60.71					
2.1	42.25 59.01	2.1	14.48 54.17	2.2	57.19 38.59	2.2	27.73 9.66	2.2	65.91 60.62					
3.1	42.14 58.73	3.1	13.96 53.96	3.2	56.99 38.42	3.2	27.56 9.48	3.2	65.67 60.51					
4.1	42.03 58.48	4.1	13.39 53.74	4.2	56.80 38.24	4.2	27.37 9.32	4.2	65.43 60.39					
5.1	41.95 58.23	5.1	12.84 53.48	5.2	56.64 38.08	5.2	27.19 9.12	5.2	65.23 60.29					
6.1	41.87 58.00	6.1	12.26 53.21	6.2	56.49 37.95	6.2	27.00 8.90	6.2	65.04 60.19					
7.1	41.79 57.78	7.1	11.70 52.90	7.2	56.35 37.82	7.2	26.81 8.64	7.2	64.86 60.12					
8.1	41.70 57.58	8.1	11.17 52.58	8.2	56.21 37.70	8.2	26.63 8.37	8.2	64.67 60.07					
9.1	41.61 57.38	9.1	10.69 52.24	9.2	56.03 37.59	9.2	26.48 8.08	9.2	64.48 60.00					
10.1	41.50 57.16	10.1	10.28 51.91	10.1	55.87 37.48	10.2	26.33 7.79	10.2	64.26 59.96					
11.1	41.37 56.93	11.1	9.92 51.58	11.1	55.68 37.40	11.1	26.20 7.49	11.2	64.04 59.91					
12.1	41.25 56.69	12.1	9.59 51.28	12.1	55.49 37.26	12.1	26.08 7.21	12.2	63.79 59.82					
13.1	41.12 56.41	13.1	9.27 50.99	13.1	55.28 37.10	13.1	25.96 6.93	13.2	63.52 59.70					
14.1	41.02 56.09	14.1	8.92 50.70	14.1	55.08 36.91	14.1	25.83 6.69	14.2	63.27 59.55					
15.1	40.92 55.78	15.1	8.56 50.44	15.1	54.88 36.69	15.1	25.70 6.45	15.2	63.03 59.38					
16.1	40.86 55.50	16.1	8.13 50.17	16.1	54.72 36.47	16.1	25.55 6.22	16.2	62.80 59.19					
17.1	40.80 55.21	17.1	7.68 49.87	17.1	54.58 36.24	17.1	25.40 5.99	17.2	62.61 59.03					
18.1	40.75 54.92	18.1	7.21 49.56	18.1	54.43 36.01	18.1	25.22 5.72	18.2	62.42 58.85					
19.0	40.71 54.65	19.1	6.73 49.24	19.1	54.30 35.81	19.1	25.05 5.46	19.2	62.24 58.68					
20.0	40.66 54.40	20.1	6.26 48.89	20.1	54.18 35.61	20.1	24.90 5.17	20.2	62.07 58.54					
21.0	40.61 54.15	21.1	5.85 48.53	21.1	54.06 35.42	21.1	24.75 4.85	21.1	61.90 58.39					
22.0	40.56 53.88	22.1	5.47 48.17	22.1	53.93 35.24	22.1	24.61 4.53	22.1	61.72 58.24					
23.0	40.50 53.62	23.1	5.14 47.82	23.1	53.78 35.05	23.1	24.48 4.20	23.1	61.54 58.08					
24.0	40.44 53.36	24.1	4.84 47.44	24.1	53.64 34.86	24.1	24.38 3.86	24.1	61.34 57.95					
25.0	40.36 53.08	25.1	4.58 47.11	25.1	53.48 34.64	25.1	24.28 3.55	25.1	61.14 57.76					
26.0	40.28 52.77	26.1	4.34 46.77	26.1	53.31 34.43	26.1	24.17 3.24	26.1	60.91 57.58					
27.0	40.23 52.44	27.1	4.12 46.43	27.1	53.14 34.21	27.1	24.07 2.93	27.1	60.68 57.41					
28.0	40.17 52.11	28.1	3.88 46.12	28.1	52.99 33.96	28.1	23.98 2.63	28.1	60.47 57.20					
29.0	40.12 51.78	29.1	3.61 45.81	29.1	52.84 33.69	29.1	23.88 2.34	29.1	60.26 56.95					
30.0	40.09 51.44	30.1	3.33 45.48	30.1	52.69 33.41	30.1	23.76 2.06	30.1	60.06 56.73					
31.0	40.08 51.11	31.1	3.02 45.18	31.1	52.57 33.11	31.1	23.63 1.78	31.1	59.89 56.48					
32.0	40.08 50.78	32.1	2.66 44.85	32.1	52.47 32.82	32.1	23.50 1.48	32.1	59.74 56.22					
9.81	-9.76	31.21	+31.20	10.78	-10.73	9.36	+9.31	12.38	-12.34					
10 ^h 59 ^m 55 ^s .642		12 ^h 14 ^m 28 ^s .053		12 ^h 46 ^m 1 ^s .183		12 ^h 48 ^m 29 ^s .976		13 ^h 27 ^m 5 ^s .514						
-84° 8' 31".24		+88° 9' 56".03		-84° 40' 2".72		+83° 52' 10".05		-85° 21' 23".59						

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

δ Octantis. Mag. 4.1			Groombridge 2283. Mag. 7.2			ρ Octantis. Mag. 5.7			ϵ Ursæ Minoris. Mag. 4.4			59 G. Apodis. Mag. 5.9		
Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.
Aug.	h m 14 13 s	° -83 17 "	Aug.	h m 15 3 s	° +87 33 "	Aug.	h m 15 23 s	° -84 11 "	Aug.	h m 16 54 s	° +82 10 "	Aug.	h m 17 15 s	° -80 47 "
1.2	24.15	40.90	1.3	52.65	28.44	1.3	56.66	51.24	1.3	32.47	45.52	1.4	59.01	24.22
2.2	23.97	40.86	2.3	52.15	28.43	2.3	56.45	51.31	2.3	32.33	45.68	2.4	58.91	24.43
3.2	23.79	40.83	3.3	51.62	28.45	3.3	56.25	51.36	3.3	32.19	45.85	3.4	58.81	24.60
4.2	23.62	40.76	4.3	51.08	28.45	4.3	56.06	51.40	4.3	32.04	46.02	4.4	58.71	24.76
5.2	23.47	40.70	5.3	50.50	28.46	5.3	55.89	51.42	5.3	31.88	46.20	5.3	58.63	24.90
6.2	23.33	40.64	6.3	49.88	28.45	6.3	55.73	51.45	6.3	31.71	46.38	6.3	58.55	25.03
7.2	23.20	40.59	7.3	49.25	28.42	7.3	55.58	51.48	7.3	31.54	46.54	7.3	58.48	25.15
8.2	23.07	40.57	8.2	48.63	28.35	8.3	55.42	51.54	8.3	31.36	46.68	8.3	58.42	25.32
9.2	22.94	40.56	9.2	48.02	28.25	9.3	55.28	51.62	9.3	31.18	46.79	9.3	58.36	25.50
10.2	22.80	40.56	10.2	47.45	28.13	10.3	55.12	51.71	10.3	31.01	46.88	10.3	58.30	25.69
11.2	22.64	40.56	11.2	46.91	28.01	11.3	54.94	51.79	11.3	30.84	46.94	11.3	58.22	25.90
12.2	22.47	40.54	12.2	46.37	27.90	12.3	54.76	51.87	12.3	30.68	47.00	12.3	58.14	26.11
13.2	22.28	40.50	13.2	45.88	27.80	13.2	54.54	51.93	13.3	30.52	47.06	13.3	58.03	26.30
14.2	22.09	40.42	14.2	45.38	27.69	14.2	54.32	51.95	14.3	30.36	47.13	14.3	57.91	26.48
15.2	21.91	40.31	15.2	44.88	27.63	15.2	54.11	51.96	15.3	30.20	47.21	15.3	57.79	26.63
16.2	21.75	40.19	16.2	44.37	27.56	16.2	53.90	51.92	16.3	30.05	47.32	16.3	57.67	26.75
17.2	21.59	40.07	17.2	43.80	27.50	17.2	53.70	51.88	17.3	29.88	47.45	17.3	57.56	26.86
18.2	21.45	39.93	18.2	43.22	27.42	18.2	53.51	51.83	18.3	29.70	47.57	18.3	57.46	26.94
19.2	21.31	39.80	19.2	42.62	27.35	19.2	53.34	51.79	19.3	29.53	47.69	19.3	57.36	27.02
20.2	21.18	39.69	20.2	42.01	27.26	20.2	53.18	51.75	20.3	29.35	47.81	20.3	57.26	27.10
21.2	21.06	39.59	21.2	41.42	27.12	21.2	53.02	51.73	21.3	29.15	47.88	21.3	57.18	27.19
22.2	20.93	39.49	22.2	40.84	27.00	22.2	52.85	51.71	22.3	28.97	47.93	22.3	57.08	27.30
23.2	20.79	39.39	23.2	40.27	26.83	23.2	52.68	51.70	23.3	28.78	47.96	23.3	57.00	27.43
24.2	20.64	39.29	24.2	39.73	26.67	24.2	52.50	51.69	24.3	28.61	47.98	24.3	56.90	27.54
25.2	20.48	39.18	25.2	39.21	26.51	25.2	52.30	51.68	25.3	28.43	47.99	25.3	56.79	27.66
26.2	20.31	39.06	26.2	38.72	26.33	26.2	52.10	51.66	26.3	28.26	48.00	26.3	56.67	27.79
27.2	20.14	38.94	27.2	38.24	26.16	27.2	51.90	51.63	27.3	28.09	48.01	27.3	56.55	27.91
28.2	19.97	38.77	28.2	37.77	26.00	28.2	51.68	51.57	28.3	27.92	48.01	28.3	56.42	28.02
29.2	19.81	38.60	29.2	37.29	25.85	29.2	51.46	51.49	29.3	27.75	48.03	29.3	56.28	28.09
30.2	19.65	38.40	30.2	36.80	25.71	30.2	51.25	51.39	30.3	27.58	48.06	30.3	56.15	28.16
31.2	19.50	38.19	31.2	36.29	25.59	31.2	51.04	51.27	31.3	27.41	48.11	31.3	56.01	28.19
32.1	19.36	37.98	32.2	35.74	25.47	32.2	50.85	51.14	32.3	27.24	48.15	32.3	55.88	28.21
8.56	-8.50		23.47	+23.45		9.89	-9.84		7.35	+7.28		6.25	-6.17	
14 ^h 13 ^m 18 ^s .531	15 ^h 4 ^m 0 ^s .607		15 ^h 23 ^m 43 ^s .237	16 ^h 54 ^m 31 ^s .741		17 ^h 15 ^m 43 ^s .730								
-83° 17'	4° 27'		+87° 33' 24".43	-84° 11' 17".84		+82° 10' 38".40						-80° 47'	2° 27'.69	

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

δ Ursæ Minoris. Mag. 4.4			χ Octantis. Mag. 5.2			λ Ursæ Minoris. Mag. 6.6			σ Octantis. Mag. 5.5			76 Draconis. Mag. 5.7		
Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.
Aug.	h m s	° ' "	Aug.	h m s	° ' "	Aug.	h m s	° ' "	Aug.	h m s	° ' "	Aug.	h m s	° ' "
	17 59	+86 36		18 6	-87 40		19 3	+89 1		19 28	-89 13		20 48	+82 13
1.4	20.96	59.02	1.4	35.15	7.51	1.4	53.55	4.69	1.4	75.83	38.41	1.5	49.16	24.29
2.4	20.69	59.25	2.4	34.84	7.76	2.4	52.90	4.98	2.4	75.42	38.72	2.5	49.15	24.63
3.4	20.42	59.49	3.4	34.52	7.99	3.4	52.25	5.28	3.4	74.92	39.01	3.5	49.14	24.99
4.4	20.14	59.76	4.4	34.21	8.20	4.4	51.56	5.60	4.4	74.41	39.29	4.5	49.14	25.35
5.4	19.83	60.02	5.4	33.91	8.40	5.4	50.83	5.91	5.4	73.92	39.55	5.5	49.13	25.75
6.4	19.52	60.28	6.4	33.64	8.59	6.4	50.01	6.23	6.4	73.48	39.79	6.5	49.12	26.15
7.4	19.16	60.53	7.4	33.40	8.79	7.4	49.09	6.57	7.4	73.14	40.02	7.5	49.09	26.56
8.4	18.79	60.78	8.4	33.19	9.01	8.4	48.06	6.88	8.4	72.87	40.27	8.5	49.06	26.98
9.4	18.40	60.97	9.4	32.99	9.24	9.4	46.97	7.16	9.4	72.67	40.54	9.5	49.02	27.38
10.4	18.01	61.17	10.4	32.77	9.48	10.4	45.84	7.43	10.4	72.46	40.82	10.5	48.97	27.76
11.4	17.63	61.33	11.4	32.52	9.74	11.4	44.72	7.69	11.4	72.19	41.12	11.5	48.91	28.12
12.4	17.26	61.48	12.4	32.23	10.01	12.4	43.65	7.93	12.4	71.83	41.45	12.5	48.84	28.45
13.4	16.93	61.62	13.4	31.89	10.27	13.4	42.65	8.17	13.4	71.32	41.76	13.5	48.78	28.79
14.4	16.60	61.78	14.4	31.51	10.51	14.4	41.72	8.41	14.4	70.65	42.07	14.5	48.73	29.11
15.3	16.28	61.96	15.4	31.11	10.72	15.4	40.84	8.65	15.4	69.87	42.36	15.5	48.68	29.43
16.3	15.96	62.15	16.4	30.69	10.91	16.4	39.96	8.92	16.4	69.03	42.62	16.5	48.64	29.76
17.3	15.63	62.34	17.3	30.28	11.08	17.4	39.06	9.19	17.4	68.15	42.88	17.5	48.61	30.12
18.3	15.27	62.56	18.3	29.89	11.23	18.4	38.10	9.48	18.4	67.31	43.09	18.5	48.57	30.50
19.3	14.90	62.77	19.3	29.53	11.37	19.4	37.06	9.78	19.4	66.54	43.30	19.5	48.52	30.89
20.3	14.49	62.97	20.3	29.18	11.52	20.4	35.95	10.07	20.4	65.81	43.52	20.5	48.47	31.28
21.3	14.09	63.17	21.3	28.84	11.67	21.4	34.78	10.33	21.4	65.12	43.75	21.5	48.40	31.66
22.3	13.68	63.33	22.3	28.51	11.84	22.4	33.56	10.56	22.4	64.46	43.97	22.4	48.33	32.04
23.3	13.27	63.46	23.3	28.16	12.02	23.4	32.30	10.80	23.4	63.78	44.23	23.4	48.25	32.40
24.3	12.86	63.61	24.3	27.80	12.20	24.4	31.06	11.02	24.4	63.08	44.49	24.4	48.16	32.74
25.3	12.46	63.71	25.3	27.42	12.39	25.4	29.83	11.23	25.4	62.32	44.75	25.4	48.07	33.06
26.3	12.07	63.81	26.3	27.01	12.58	26.4	28.62	11.43	26.4	61.46	45.02	26.4	47.98	33.37
27.3	11.70	63.91	27.3	26.57	12.77	27.4	27.45	11.61	27.4	60.54	45.31	27.4	47.89	33.67
28.3	11.32	64.01	28.3	26.09	12.94	28.4	26.32	11.82	28.4	59.51	45.57	28.4	47.81	33.97
29.3	10.96	64.12	29.3	25.59	13.10	29.4	25.22	12.01	29.4	58.39	45.81	29.4	47.73	34.29
30.3	10.59	64.24	30.3	25.10	13.25	30.4	24.14	12.23	30.4	57.19	46.04	30.4	47.66	34.60
31.3	10.22	64.38	31.3	24.60	13.36	31.4	23.04	12.45	31.4	55.97	46.26	31.4	47.58	34.92
32.3	9.84	64.53	32.3	24.10	13.45	32.3	21.93	12.67	32.4	54.74	46.46	32.4	47.51	35.27
16.95 +16.92			24.59 -24.57			58.41 +58.40			74.26 -74.25			7.39 +7.32		
17 ^h 59 ^m 20 ^s .805			18 ^h 5 ^m 36 ^s .163			19 ^h 3 ^m 51 ^s .560			19 ^h 26 ^m 7 ^s .189			20 ^h 48 ^m 44 ^s .660		
+86° 36' 51".19			-87° 39' 52".21			+89° 0' 56".70			-89° 13' 35".99			+82° 13' 16".38		

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

λ Octantis. Mag. 5.4			ν Octantis. Mag. 5.7			β Octantis. Mag. 4.3			39 H. Cephei. Mag. 5.6			γ^1 Octantis. Mag. 5.1		
Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.
Aug.	h m	° '	Aug.	h m	° '	Aug.	h m	° '	Aug.	h m	° '	Aug.	h m	° '
	21 38	-83 6		22 16	-86 23		22 37	-81 48		23 27	+86 50		23 47	-82 28
	s	"		s	"		s	"		s	"		s	"
1.5	31.10	4.58	1.6	30.41	21.54	1.6	48.19	54.48	1.6	55.91	42.78	1.6	24.87	34.92
2.5	31.15	4.88	2.6	30.56	21.82	2.6	48.28	54.74	2.6	56.13	43.06	2.6	24.99	35.12
3.5	31.20	5.16	3.6	30.69	22.10	3.6	48.35	55.00	3.6	56.38	43.33	3.6	25.10	35.32
4.5	31.24	5.45	4.6	30.80	22.37	4.6	48.40	55.25	4.6	56.65	43.63	4.6	25.20	35.53
5.5	31.27	5.69	5.6	30.90	22.61	5.6	48.47	55.49	5.6	56.92	43.95	5.6	25.31	35.72
6.5	31.31	5.93	6.6	31.01	22.84	6.6	48.53	55.70	6.6	57.20	44.29	6.6	25.40	35.89
7.5	31.35	6.16	7.6	31.14	23.06	7.6	48.60	55.90	7.6	57.45	44.65	7.6	25.52	36.04
8.5	31.42	6.37	8.5	31.28	23.28	8.6	48.69	56.09	8.6	57.68	45.03	8.6	25.64	36.19
9.5	31.49	6.60	9.5	31.46	23.50	9.6	48.79	56.28	9.6	57.88	45.41	9.6	25.77	36.33
10.5	31.56	6.85	10.5	31.64	23.73	10.6	48.88	56.49	10.6	58.05	45.80	10.6	25.90	36.47
11.5	31.64	7.13	11.5	31.82	24.01	11.6	48.98	56.72	11.6	58.18	46.17	11.6	26.04	36.65
12.5	31.71	7.42	12.5	31.99	24.28	12.6	49.08	56.98	12.6	58.31	46.52	12.6	26.19	36.84
13.5	31.77	7.74	13.5	32.14	24.60	13.6	49.16	57.26	13.6	58.44	46.85	13.6	26.32	37.06
14.5	31.80	8.06	14.5	32.26	24.91	14.5	49.22	57.55	14.6	58.58	47.17	14.6	26.43	37.29
15.5	31.81	8.38	15.5	32.34	25.22	15.5	49.27	57.85	15.6	58.74	47.48	15.6	26.53	37.54
16.5	31.82	8.68	16.5	32.39	25.54	16.5	49.32	58.14	16.6	58.92	47.80	16.6	26.61	37.80
17.5	31.81	8.98	17.5	32.43	25.83	17.5	49.35	58.42	17.6	59.12	48.14	17.6	26.69	38.05
18.5	31.80	9.26	18.5	32.46	26.09	18.5	49.38	58.68	18.6	59.33	48.49	18.6	26.76	38.30
19.5	31.80	9.51	19.5	32.50	26.35	19.5	49.41	58.92	19.6	59.54	48.85	19.6	26.83	38.53
20.5	31.80	9.76	20.5	32.54	26.61	20.5	49.45	59.17	20.6	59.72	49.24	20.6	26.91	38.74
21.5	31.81	10.02	21.5	32.60	26.87	21.5	49.49	59.41	21.6	59.88	49.64	21.6	26.99	38.96
22.5	31.83	10.29	22.5	32.67	27.13	22.5	49.53	59.66	22.6	60.01	50.03	22.6	27.09	39.18
23.5	31.85	10.55	23.5	32.75	27.39	23.5	49.59	59.92	23.6	60.12	50.42	23.6	27.18	39.40
24.5	31.87	10.84	24.5	32.83	27.67	24.5	49.64	60.19	24.6	60.21	50.80	24.6	27.27	39.63
25.5	31.89	11.15	25.5	32.90	27.98	25.5	49.69	60.47	25.6	60.28	51.17	25.6	27.37	39.86
26.5	31.90	11.46	26.5	32.97	28.30	26.5	49.74	60.77	26.5	60.34	51.53	26.6	27.47	40.13
27.5	31.90	11.78	27.5	33.01	28.62	27.5	49.78	61.09	27.5	60.41	51.90	27.6	27.57	40.41
28.5	31.88	12.11	28.5	33.03	28.95	28.5	49.80	61.42	28.5	60.48	52.25	28.6	27.65	40.70
29.5	31.85	12.43	29.5	33.05	29.29	29.5	49.82	61.75	29.5	60.56	52.58	29.6	27.71	41.00
30.5	31.81	12.76	30.5	33.02	29.62	30.5	49.83	62.07	30.5	60.65	52.92	30.6	27.76	41.31
31.5	31.75	13.06	31.5	32.97	29.93	31.5	49.82	62.39	31.5	60.76	53.26	31.6	27.81	41.62
32.5	31.69	13.34	32.5	32.92	30.23	32.5	49.81	62.69	32.5	60.89	53.63	32.5	27.85	41.92
8.33	-8.27		15.88	-15.85		7.02	-6.95		18.18	+18.15		7.64	-7.57	
21 ^h 38 ^m	10 ^s .025		22 ^h 15 ^m	56 ^s .333		22 ^h 37 ^m	32 ^s .703		23 ^h 27 ^m	44 ^s .392		23 ^h 47 ^m	12 ^s .813	
-83° 6'	23'''.31		-86° 23'	45'''.22		-81° 49'	21'''.11		+86° 50'	39'''.03		-82° 29'	8'''.43	

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

43 H. Cephei. Mag. 4.5			α Ursæ Minoris. (Polaris.) Mag. 2.1			4 G. Octantis. Mag. 5.6			Groombridge 750. Mag. 6.7			Groombridge 944. Mag. 6.4		
Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.
Sept.	h m 0 57	+85 48	Sept.	h m 1 30	+88 51	Sept.	h m 1 42	-85 11	Sept.	h m 4 10	+85 19	Sept.	h m 5 35	+85 9
	s "	"		s "	"		s "	"		s "	"		s "	"
0.6	18.78	35.06	0.6	42.52	31.48	0.6	15.71	4.96	0.7	1.63	56.00	0.8	7.66	17.35
1.6	18.98	35.36	1.6	43.44	31.75	1.6	15.87	5.21	1.7	1.95	56.03	1.8	7.94	17.24
2.6	19.21	35.68	2.6	44.38	32.03	2.6	16.02	5.40	2.7	2.28	56.07	2.8	8.27	17.14
3.6	19.44	36.02	3.6	45.33	32.35	3.6	16.16	5.61	3.7	2.63	56.13	3.8	8.59	17.03
4.6	19.65	36.40	4.6	46.25	32.68	4.6	16.31	5.79	4.7	2.99	56.22	4.8	8.94	16.97
5.6	19.84	36.78	5.6	47.11	33.03	5.6	16.49	5.96	5.7	3.35	56.35	5.8	9.30	16.93
6.6	20.01	37.18	6.6	47.87	33.39	6.6	16.66	6.12	6.7	3.69	56.48	6.8	9.65	16.92
7.6	20.15	37.58	7.6	48.55	33.75	7.6	16.84	6.30	7.7	4.03	56.63	7.8	9.99	16.92
8.6	20.28	37.96	8.6	49.16	34.09	8.6	17.04	6.49	8.7	4.32	56.79	8.8	10.30	16.94
9.6	20.38	38.32	9.6	49.71	34.43	9.6	17.24	6.71	9.7	4.61	56.94	9.8	10.60	16.96
10.6	20.49	38.65	10.6	50.26	34.76	10.6	17.43	6.95	10.7	4.87	57.09	10.8	10.88	16.96
11.6	20.62	38.98	11.6	50.85	35.06	11.6	17.59	7.23	11.7	5.14	57.21	11.8	11.15	16.95
12.6	20.76	39.29	12.6	51.50	35.35	12.6	17.74	7.50	12.7	5.42	57.31	12.8	11.43	16.94
13.6	20.91	39.60	13.6	52.23	35.64	13.6	17.88	7.80	13.7	5.71	57.40	13.8	11.71	16.90
14.6	21.09	39.93	14.6	52.99	35.95	14.6	17.98	8.08	14.7	6.03	57.48	14.8	12.02	16.84
15.6	21.26	40.29	15.6	53.78	36.27	15.6	18.09	8.34	15.7	6.34	57.58	15.8	12.34	16.79
16.6	21.43	40.66	16.6	54.55	36.60	16.6	18.20	8.62	16.7	6.67	57.72	16.7	12.67	16.77
17.5	21.58	41.05	17.6	55.28	36.96	17.6	18.30	8.85	17.7	7.01	57.85	17.7	13.01	16.76
18.5	21.72	41.45	18.6	55.95	37.35	18.6	18.42	9.09	18.7	7.34	58.03	18.7	13.35	16.76
19.5	21.83	41.84	19.6	56.54	37.71	19.6	18.55	9.35	19.7	7.66	58.21	19.7	13.69	16.79
20.5	21.93	42.23	20.6	57.08	38.09	20.6	18.68	9.59	20.7	7.95	58.40	20.7	14.03	16.84
21.5	22.02	42.62	21.6	57.55	38.48	21.6	18.81	9.83	21.7	8.25	58.59	21.7	14.35	16.91
22.5	22.10	43.01	22.6	57.96	38.85	22.6	18.95	10.09	22.7	8.53	58.79	22.7	14.64	16.98
23.5	22.15	43.38	23.6	58.35	39.20	23.6	19.09	10.37	23.7	8.78	58.99	23.7	14.93	17.05
24.5	22.20	43.73	24.6	58.74	39.55	24.6	19.21	10.66	24.7	9.03	59.18	24.7	15.22	17.11
25.5	22.26	44.08	25.5	59.14	39.88	25.6	19.32	10.97	25.7	9.29	59.35	25.7	15.49	17.18
26.5	22.35	44.42	26.5	59.58	40.19	26.6	19.42	11.30	26.7	9.54	59.50	26.7	15.77	17.23
27.5	22.42	44.77	27.5	60.04	40.52	27.6	19.51	11.63	27.7	9.81	59.66	27.7	16.05	17.26
28.5	22.52	45.11	28.5	60.58	40.84	28.6	19.57	11.96	28.7	10.08	59.82	28.7	16.34	17.27
29.5	22.64	45.48	29.5	61.14	41.21	29.6	19.61	12.29	29.7	10.37	59.97	29.7	16.66	17.28
30.5	22.75	45.86	30.5	61.72	41.58	30.5	19.66	12.59	30.6	10.68	60.15	30.7	16.97	17.32
31.5	22.85	46.26	31.5	62.27	41.97	31.5	19.69	12.88	31.6	11.00	60.35	31.7	17.32	17.37
13.69 +13.66			50.27 +50.26			11.91 -11.87			12.29 +12.25			11.84 +11.80		
0 ^h 57 ^m 1 ^s .657			1 ^h 29 ^m 44 ^s .254			1 ^h 42 ^m 6 ^s .102			4 ^h 9 ^m 44 ^s .952			5 ^h 34 ^m 54 ^s .014		
+85° 48' 25".87			+88° 51' 25".03			-85° 11' 39".58			+85° 20' 1".04			+85° 9' 28".07		

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

31 G. Mensæ. Mag. 6.2			ζ Mensæ. Mag. 5.6			51 H. Cephei. Mag. 5.3			25 H. Camelop. Mag. 5.1			7 G. Octantis. Mag. 6.4		
Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.
Sept.	h m 5 46	° ' -84 49	Sept.	h m 6 46	° ' -80 43	Sept.	h m 7 1	° ' +87 10	Sept.	h m 7 13	° ' +82 34	Sept.	h m 7 16	° ' -86 53
	s "	"		s "	"		s "	"		s "	"		s "	"
0.8	10.51	23.76	0.8	53.79	16.88	0.9	49.13	44.84	0.9	36.30	21.55	0.9	3.16	47.63
1.8	10.72	23.71	1.8	53.91	16.75	1.8	49.54	44.61	1.9	36.45	21.30	1.9	3.48	47.49
2.8	10.92	23.66	2.8	54.02	16.61	2.8	49.99	44.37	2.9	36.63	21.07	2.9	3.78	47.33
3.8	11.15	23.61	3.8	54.13	16.50	3.8	50.46	44.14	3.8	36.80	20.81	3.9	4.06	47.19
4.8	11.34	23.52	4.8	54.23	16.38	4.8	50.98	43.90	4.8	36.99	20.57	4.8	4.33	47.04
5.8	11.54	23.45	5.8	54.33	16.23	5.8	51.51	43.71	5.8	37.20	20.37	5.8	4.58	46.87
6.8	11.73	23.35	6.8	54.44	16.07	6.8	52.05	43.53	6.8	37.41	20.16	6.8	4.83	46.69
7.8	11.94	23.25	7.8	54.54	15.88	7.8	52.58	43.39	7.8	37.61	20.02	7.8	5.10	46.46
8.8	12.17	23.13	8.8	54.66	15.70	8.8	53.09	43.26	8.8	37.81	19.87	8.8	5.38	46.25
9.8	12.40	23.03	9.8	54.78	15.51	9.8	53.57	43.14	9.8	38.00	19.75	9.8	5.70	46.04
10.8	12.65	22.95	10.8	54.91	15.35	10.8	54.01	43.02	10.8	38.15	19.61	10.8	6.03	45.84
11.8	12.90	22.89	11.8	55.03	15.22	11.8	54.44	42.88	11.8	38.31	19.44	11.8	6.39	45.65
12.8	13.15	22.86	12.8	55.17	15.09	12.8	54.86	42.71	12.8	38.46	19.27	12.8	6.78	45.52
13.8	13.38	22.86	13.8	55.31	15.02	13.8	55.29	42.54	13.8	38.64	19.09	13.8	7.15	45.39
14.8	13.64	22.87	14.8	55.43	14.96	14.8	55.75	42.36	14.8	38.81	18.90	14.8	7.54	45.29
15.8	13.86	22.90	15.8	55.57	14.90	15.8	56.25	42.17	15.8	39.00	18.70	15.8	7.90	45.19
16.8	14.08	22.92	16.8	55.71	14.85	16.8	56.75	41.98	16.8	39.18	18.50	16.8	8.24	45.09
17.8	14.30	22.93	17.8	55.81	14.80	17.8	57.29	41.82	17.8	39.39	18.30	17.8	8.57	45.00
18.7	14.52	22.93	18.8	55.93	14.71	18.8	57.84	41.68	18.8	39.60	18.15	18.8	8.89	44.89
19.7	14.73	22.93	19.8	56.06	14.64	19.8	58.40	41.55	19.8	39.83	18.00	19.8	9.22	44.78
20.7	14.95	22.91	20.8	56.18	14.55	20.8	58.94	41.45	20.8	40.02	17.89	20.8	9.55	44.65
21.7	15.18	22.90	21.8	56.30	14.44	21.8	59.47	41.38	21.8	40.23	17.79	21.8	9.88	44.51
22.7	15.42	22.88	22.8	56.43	14.35	22.8	59.99	41.30	22.8	40.43	17.69	22.8	10.25	44.38
23.7	15.67	22.87	23.8	56.57	14.25	23.8	60.48	41.24	23.8	40.62	17.60	23.8	10.62	44.23
24.7	15.91	22.88	24.8	56.70	14.17	24.8	60.97	41.17	24.8	40.80	17.52	24.8	11.00	44.10
25.7	16.17	22.92	25.8	56.84	14.11	25.8	61.43	41.09	25.8	40.98	17.44	25.8	11.42	44.01
26.7	16.44	22.97	26.8	56.99	14.08	26.8	61.89	41.00	26.8	41.16	17.31	26.8	11.84	43.96
27.7	16.68	23.04	27.8	57.13	14.07	27.8	62.35	40.89	27.8	41.32	17.19	27.8	12.26	43.91
28.7	16.92	23.14	28.8	57.28	14.09	28.8	62.82	40.78	28.8	41.50	17.06	28.8	12.68	43.87
29.7	17.15	23.27	29.8	57.42	14.13	29.8	63.33	40.65	29.8	41.69	16.92	29.8	13.09	43.85
30.7	17.37	23.38	30.8	57.56	14.16	30.8	63.86	40.53	30.8	41.89	16.77	30.8	13.47	43.86
31.7	17.58	23.49	31.8	57.68	14.21	31.8	64.43	40.41	31.8	42.11	16.63	31.8	13.84	43.87
11.08	-11.04		6.20	-6.12		20.31	+20.29		7.73	+7.67		18.47	-18.44	
5 ^h 46 ^m	26° 43' 9"		6 ^h 47 ^m	3° 48' 30"		7 ^h 1 ^m	34° 8' 61"		7 ^h 13 ^m	29° 47' 7"		7 ^h 16 ^m	40° 55' 55"	
-84° 49'	48'' 17		-80° 43'	34'' 16		+87° 11'	0'' 11		+82° 34'	36'' 50		-86° 54'	0'' 14	

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

Groombridge 1119. Mag. 7.0			ζ Octantis. Mag. 5.4			1 H. Draconis. Mag. 4.6			ζ Chamæleontis. Mag. 5.2			30 H. Camelop. Mag. 5.3		
Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.
	h m	s		h m	s		h m	s		h m	s		h m	s
Sept.	8 15	+88 52	Sept.	9 8	-85 19	Sept.	9 25	+81 41	Sept.	9 36	-80 33	Sept.	10 20	+82 58
	s	"		s	"		s	"		s	"		s	"
0.9	1.68	54.09	0.9	40.72	46.94	0.9	14.76	40.69	0.9	13.34	58.29	0.9	56.61	56.68
1.9	2.40	53.77	1.9	40.85	46.68	1.9	14.82	40.33	1.9	13.39	58.01	1.9	56.62	56.30
2.9	3.18	53.44	2.9	40.95	46.44	2.9	14.87	39.95	2.9	13.44	57.75	2.9	56.64	55.91
3.9	4.06	53.12	3.9	41.07	46.19	3.9	14.96	39.56	3.9	13.49	57.50	3.9	56.68	55.50
4.9	5.03	52.79	4.9	41.18	45.96	4.9	15.04	39.17	4.9	13.54	57.26	4.9	56.73	55.09
5.9	6.09	52.47	5.9	41.27	45.71	5.9	15.14	38.81	5.9	13.58	56.99	5.9	56.81	54.67
6.9	7.19	52.19	6.9	41.35	45.44	6.9	15.26	38.46	6.9	13.61	56.72	6.9	56.89	54.28
7.9	8.29	51.95	7.9	41.43	45.18	7.9	15.37	38.12	7.9	13.65	56.45	7.9	56.97	53.90
8.9	9.36	51.71	8.9	41.51	44.87	8.9	15.49	37.80	8.9	13.68	56.14	8.9	57.06	53.54
9.9	10.36	51.48	9.9	41.61	44.55	9.9	15.59	37.52	9.9	13.71	55.83	9.9	57.12	53.20
10.9	11.28	51.25	10.9	41.74	44.23	10.9	15.68	37.23	10.9	13.76	55.50	10.9	57.19	52.88
11.9	12.15	51.02	11.9	41.89	43.95	11.9	15.76	36.93	11.9	13.82	55.19	11.9	57.25	52.54
12.9	12.99	50.77	12.9	42.06	43.67	12.9	15.82	36.62	12.9	13.89	54.88	12.9	57.29	52.20
13.9	13.83	50.51	13.9	42.23	43.43	13.9	15.91	36.30	13.9	13.97	54.61	13.9	57.33	51.84
14.9	14.72	50.23	14.9	42.42	43.21	14.9	15.99	35.96	14.9	14.05	54.37	14.9	57.37	51.47
15.9	15.68	49.94	15.9	42.59	42.99	15.9	16.07	35.33	15.9	14.14	54.14	15.9	57.42	51.10
16.9	16.69	49.65	16.9	42.77	42.79	16.9	16.18	35.25	16.9	14.22	53.90	16.9	57.50	50.71
17.9	17.80	49.37	17.9	42.92	42.58	17.9	16.28	34.89	17.9	14.28	53.67	17.9	57.58	50.30
18.9	18.94	49.13	18.9	43.08	42.35	18.9	16.41	34.55	18.9	14.35	53.44	18.9	57.67	49.92
19.8	20.11	48.88	19.9	43.22	42.15	19.9	16.54	34.23	19.9	14.42	53.20	19.9	57.77	49.55
20.8	21.28	48.65	20.9	43.38	41.92	20.9	16.68	33.93	20.9	14.48	52.95	20.9	57.88	49.19
21.8	22.46	48.46	21.9	43.52	41.67	21.9	16.80	33.64	21.9	14.55	52.68	21.9	57.98	48.84
22.8	23.61	48.27	22.9	43.69	41.40	22.9	16.93	33.35	22.9	14.62	52.41	22.9	58.09	48.51
23.8	24.73	48.08	23.9	43.87	41.15	23.9	17.04	33.08	23.9	14.70	52.13	23.9	58.20	48.18
24.8	25.81	47.92	24.9	44.04	40.91	24.9	17.15	32.82	24.9	14.78	51.87	24.9	58.29	47.88
25.8	26.83	47.73	25.9	44.24	40.63	25.9	17.26	32.56	25.9	14.87	51.61	25.9	58.38	47.56
26.8	27.82	47.52	26.9	44.46	40.42	26.9	17.36	32.29	26.9	14.96	51.36	26.9	58.47	47.24
27.8	28.81	47.33	27.9	44.69	40.23	27.9	17.47	32.00	27.9	15.06	51.11	27.9	58.54	46.91
28.8	29.83	47.11	28.9	44.92	40.03	28.9	17.57	31.70	28.9	15.17	50.89	28.9	58.61	46.56
29.8	30.88	46.88	29.9	45.16	39.89	29.9	17.68	31.38	29.9	15.28	50.71	29.9	58.70	46.19
30.8	32.02	46.65	30.9	45.39	39.74	30.9	17.81	31.06	30.9	15.40	50.52	30.9	58.79	45.81
31.8	33.25	46.42	31.9	45.61	39.59	31.9	17.94	30.74	31.9	15.51	50.37	31.9	58.90	45.42
51.19	+51.18		12.28	-12.24		6.92	+6.85		6.10	-6.02		8.18	+8.12	
8 ^h 14 ^m 48 ^s .311			9 ^h 9 ^m 6 ^s .085			9 ^h 25 ^m 12 ^s .930			9 ^h 36 ^m 24 ^s .003			10 ^h 20 ^m 57 ^s .259		
+88° 53' 11".43			-85° 19' 42".77			+81° 41' 57".18			-80° 33' 50".61			+82° 59' 12".27		

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

7 Octantis. Mag. 6.3			Bradley 1672. Mag. 6.3			2 Octantis. Mag. 5.4			32 H. Camelop. seq. Mag. 5.3			κ Octantis. Mag. 5.6		
Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.
	h m	s "		h m	s "		h m	s "		h m	s "		h m	s "
Sept.	10 59	-84 8	Sept.	12 13	+88 9	Sept.	12 45	-84 40	Sept.	12 48	+83 51	Sept.	13 26	-85 21
	s	"		s	"		s	"		s	"		s	"
1.0	40.08	50.78	1.1	62.66	44.85	1.1	52.47	32.82	1.1	23.50	61.48	1.1	59.74	56.22
2.0	40.09	50.49	2.1	62.30	44.50	2.1	52.39	32.55	2.1	23.37	61.17	2.1	59.59	55.97
3.0	40.10	50.19	3.1	61.96	44.13	3.1	52.31	32.31	3.1	23.23	60.85	3.1	59.46	55.73
4.0	40.11	49.93	4.1	61.64	43.75	4.1	52.24	32.07	4.1	23.11	60.49	4.1	59.35	55.54
5.0	40.11	49.67	5.1	61.38	43.33	5.1	52.16	31.85	5.1	23.01	60.11	5.1	59.23	55.33
5.9	40.10	49.41	6.1	61.16	42.92	6.1	52.07	31.63	6.1	22.91	59.71	6.1	59.09	55.15
6.9	40.09	49.15	7.0	61.01	42.48	7.1	51.97	31.41	7.1	22.84	59.30	7.1	58.94	54.95
7.9	40.06	48.86	8.0	60.91	42.11	8.1	51.85	31.17	8.1	22.78	58.92	8.1	58.76	54.77
8.9	40.03	48.55	9.0	60.82	41.74	9.1	51.72	30.91	9.1	22.72	58.57	9.1	58.59	54.54
9.9	40.02	48.22	10.0	60.72	41.36	10.1	51.60	30.62	10.1	22.67	58.22	10.1	58.40	54.30
10.9	40.02	47.87	11.0	60.60	41.04	11.1	51.50	30.29	11.1	22.59	57.89	11.1	58.25	54.01
11.9	40.03	47.53	12.0	60.43	40.70	12.1	51.40	29.98	12.1	22.51	57.58	12.1	58.08	53.74
12.9	40.07	47.19	13.0	60.23	40.37	13.1	51.34	29.65	13.1	22.42	57.28	13.1	57.95	53.43
13.9	40.12	46.86	14.0	60.00	40.01	14.1	51.29	29.33	14.1	22.33	56.95	14.1	57.85	53.14
14.9	40.18	46.57	15.0	59.77	39.64	15.0	51.25	29.04	15.1	22.22	56.59	15.1	57.77	52.84
15.9	40.24	46.28	16.0	59.55	39.24	16.0	51.21	28.75	16.0	22.13	56.23	16.1	57.69	52.56
16.9	40.31	46.00	17.0	59.36	38.83	17.0	51.19	28.47	17.0	22.04	55.83	17.1	57.62	52.29
17.9	40.36	45.73	18.0	59.22	38.41	18.0	51.15	28.21	18.0	21.97	55.46	18.1	57.54	52.06
18.9	40.40	45.46	19.0	59.12	38.00	19.0	51.11	27.94	19.0	21.91	55.04	19.1	57.45	51.80
19.9	40.44	45.19	20.0	59.06	37.59	20.0	51.06	27.68	20.0	21.86	54.63	20.1	57.36	51.55
20.9	40.48	44.90	21.0	59.05	37.18	21.0	51.01	27.40	21.0	21.83	54.24	21.1	57.25	51.30
21.9	40.52	44.59	22.0	59.05	36.79	22.0	50.95	27.11	22.0	21.79	53.86	22.1	57.14	51.03
22.9	40.56	44.28	23.0	59.08	36.41	23.0	50.89	26.80	23.0	21.76	53.47	23.1	57.01	50.74
23.9	40.60	43.97	24.0	59.09	36.04	24.0	50.83	26.47	24.0	21.74	53.12	24.1	56.90	50.45
24.9	40.65	43.65	24.9	59.10	35.66	25.0	50.77	26.15	25.0	21.71	52.76	25.1	56.80	50.12
25.9	40.72	43.31	25.9	59.10	35.31	26.0	50.73	25.81	26.0	21.68	52.43	26.0	56.70	49.79
26.9	40.80	42.98	26.9	59.07	34.97	27.0	50.71	25.45	27.0	21.63	52.09	27.0	56.62	49.47
27.9	40.90	42.69	27.9	58.98	34.62	28.0	50.71	25.11	28.0	21.59	51.73	28.0	56.57	49.13
28.9	41.02	42.40	28.9	58.90	34.25	29.0	50.72	24.77	29.0	21.52	51.37	29.0	56.54	48.80
29.9	41.14	42.11	29.9	58.81	33.87	30.0	50.76	24.45	30.0	21.46	51.00	30.0	56.54	48.49
30.9	41.26	41.86	30.9	58.75	33.46	31.0	50.80	24.15	31.0	21.42	50.59	31.0	56.53	48.19
31.9	41.36	41.64	31.9	58.72	33.05	32.0	50.83	23.88	32.0	21.37	50.16	32.0	56.53	47.91
9.81	-9.75		31.16	+31.15		10.77	-10.73		9.36	+9.30		12.37	-12.33	
10 ^h 59 ^m 55 ^s .642			12 ^h 14 ^m 28 ^s .053			12 ^h 46 ^m 1 ^s .183			12 ^h 48 ^m 29 ^s .976			13 ^h 27 ^m 5 ^s .514		
-84° 8' 31".24			+88° 9' 56".03			-84° 40' 2".72			+83° 52' 10".05			-85° 21' 23".59		

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

δ Octantis. Mag. 4.1			Groombridge 2283. Mag. 7.2			ρ Octantis. Mag. 5.7			ϵ Ursæ Minoris. Mag. 4.4			59 G. Apodis. Mag. 5.9		
Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.
Sept.	h m	° '	Sept.	h m	° '	Sept.	h m	° '	Sept.	h m	° '	Sept.	h m	° '
	14 13	-83 17		15 3	+87 33		15 23	-84 11		16 54	+82 10		17 15	-80 47
	s	"		s	"		s	"		s	"		s	"
1.1	19.36	37.98	1.2	35.74	25.47	1.2	50.85	51.14	1.3	27.24	48.15	1.3	55.88	28.21
2.1	19.24	37.78	2.2	35.18	25.33	2.2	50.68	51.01	2.3	27.06	48.21	2.3	55.77	28.22
3.1	19.14	37.58	3.2	34.60	25.18	3.2	50.53	50.88	3.3	26.87	48.23	3.3	55.66	28.22
4.1	19.04	37.40	4.2	34.02	25.00	4.2	50.38	50.77	4.3	26.67	48.25	4.3	55.56	28.24
5.1	18.94	37.23	5.2	33.45	24.76	5.2	50.24	50.68	5.2	26.48	48.24	5.3	55.47	28.28
6.1	18.82	37.08	6.2	32.90	24.52	6.2	50.09	50.61	6.2	26.28	48.21	6.3	55.39	28.32
7.1	18.70	36.94	7.2	32.39	24.26	7.2	49.92	50.54	7.2	26.09	48.15	7.3	55.29	28.39
8.1	18.57	36.79	8.2	31.91	24.01	8.2	49.74	50.46	8.2	25.91	48.07	8.3	55.17	28.46
9.1	18.42	36.61	9.2	31.47	23.78	9.2	49.54	50.37	9.2	25.73	47.99	9.3	55.05	28.51
10.1	18.28	36.41	10.2	31.04	23.56	10.2	49.34	50.26	10.2	25.56	47.91	10.2	54.92	28.53
11.1	18.13	36.19	11.2	30.60	23.33	11.2	49.14	50.12	11.2	25.39	47.86	11.2	54.78	28.57
12.1	18.00	35.93	12.2	30.15	23.12	12.2	48.93	49.95	12.2	25.22	47.83	12.2	54.62	28.56
13.1	17.88	35.67	13.2	29.68	22.95	13.2	48.75	49.76	13.2	25.05	47.80	13.2	54.48	28.50
14.1	17.77	35.40	14.1	29.18	22.77	14.2	48.59	49.55	14.2	24.87	47.79	14.2	54.35	28.45
15.1	17.68	35.14	15.1	28.66	22.56	15.2	48.44	49.36	15.2	24.69	47.78	15.2	54.24	28.40
16.1	17.60	34.89	16.1	28.13	22.34	16.2	48.30	49.16	16.2	24.50	47.75	16.2	54.13	28.33
17.1	17.52	34.66	17.1	27.60	22.11	17.2	48.16	48.98	17.2	24.31	47.70	17.2	54.03	28.27
18.1	17.44	34.44	18.1	27.10	21.86	18.2	48.03	48.82	18.2	24.12	47.62	18.2	53.93	28.22
19.1	17.36	34.22	19.1	26.61	21.57	19.1	47.90	48.66	19.2	23.93	47.54	19.2	53.82	28.18
20.1	17.26	34.00	20.1	26.16	21.30	20.1	47.75	48.51	20.2	23.74	47.42	20.2	53.71	28.15
21.1	17.17	33.77	21.1	25.72	21.01	21.1	47.59	48.35	21.2	23.56	47.30	21.2	53.59	28.13
22.1	17.06	33.55	22.1	25.32	20.72	22.1	47.42	48.18	22.2	23.38	47.17	22.2	53.47	28.10
23.1	16.95	33.29	23.1	24.93	20.42	23.1	47.25	48.01	23.2	23.22	47.02	23.2	53.35	28.07
24.1	16.84	33.02	24.1	24.55	20.15	24.1	47.07	47.81	24.2	23.06	46.90	24.2	53.21	28.03
25.1	16.73	32.75	25.1	24.18	19.88	25.1	46.90	47.61	25.2	22.89	46.78	25.2	53.08	27.96
26.1	16.63	32.45	26.1	23.80	19.63	26.1	46.73	47.37	26.2	22.73	46.67	26.2	52.93	27.87
27.1	16.54	32.14	27.1	23.40	19.38	27.1	46.58	47.13	27.2	22.57	46.57	27.2	52.79	27.77
28.1	16.47	31.83	28.1	22.99	19.14	28.1	46.43	46.88	28.2	22.40	46.48	28.2	52.66	27.64
29.1	16.41	31.52	29.1	22.56	18.89	29.1	46.30	46.61	29.2	22.22	46.40	29.2	52.54	27.49
30.1	16.36	31.22	30.1	22.10	18.64	30.1	46.19	46.36	30.2	22.04	46.30	30.2	52.43	27.34
31.1	16.33	30.94	31.1	21.64	18.35	31.1	46.10	46.11	31.2	21.86	46.20	31.2	52.34	27.21
32.1	16.30	30.68	32.1	21.19	18.04	32.1	46.01	45.87	32.2	21.67	46.06	32.2	52.25	27.07
8.56	-8.50		23.45	+23.43		9.89	-9.84		7.35	+7.28		6.25	-6.17	
14 ^h 13 ^m	18° 53'		15 ^h 3 ^m	0° 60'		15 ^h 23 ^m	43° 23'		16 ^h 54 ^m	31° 74'		17 ^h 15 ^m	43° 73'	
-83° 17'	4'' 27		+87° 33'	24'' 43		-84° 11'	17'' 84		+82° 10'	38'' 40		-80° 47'	2'' 69	

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

δ Ursæ Minoris. Mag. 4.4			χ Octantis. Mag. 5.2			λ Ursæ Minoris. Mag. 6.6			σ Octantis. Mag. 5.5			76 Draconis. Mag. 5.7		
Wash. Mean Time.	Right Ascen- sion.	Declin- ation.	Wash. Mean Time.	Right Ascen- sion.	Declin- ation.	Wash. Mean Time.	Right Ascen- sion.	Declin- ation.	Wash. Mean Time.	Right Ascen- sion.	Declin- ation.	Wash. Mean Time.	Right Ascen- sion.	Declin- ation.
Sept.	h m	° ' "	Sept.	h m	° ' "	Sept.	h m	° ' "	Sept.	h m	° ' "	Sept.	h m	° ' "
	17 58	+86 37		18 6	-87 40		19 2	+89 1		19 28	-89 13		20 48	+82 13
	s	"		s	"		s	"		s	"		s	"
1.3	69.84	4.53	1.3	24.10	13.45	1.3	81.93	12.67	1.4	54.74	46.46	1.4	47.51	35.27
2.3	69.43	4.68	2.3	23.05	13.53	2.3	80.75	12.90	2.4	53.58	46.63	2.4	47.44	35.63
3.3	69.01	4.83	3.3	23.22	13.60	3.3	79.45	13.14	3.4	52.49	46.79	3.4	47.35	36.00
4.3	68.56	4.97	4.3	22.83	13.67	4.3	78.08	13.36	4.4	51.49	46.95	4.4	47.25	36.38
5.3	68.10	5.06	5.3	22.45	13.76	5.3	76.64	13.58	5.4	50.57	47.12	5.4	47.14	36.74
6.3	67.64	5.12	6.3	22.08	13.87	6.3	75.13	13.77	6.4	49.69	47.31	6.4	47.02	37.08
7.3	67.18	5.18	7.3	21.68	14.00	7.3	73.64	13.93	7.3	48.76	47.52	7.4	46.90	37.40
8.3	66.74	5.22	8.3	21.25	14.14	8.3	72.18	14.08	8.3	47.77	47.73	8.4	46.79	37.69
9.3	66.32	5.24	9.3	20.79	14.27	9.3	70.79	14.22	9.3	46.65	47.96	9.4	46.66	37.97
10.3	65.91	5.27	10.3	20.28	14.38	10.3	69.47	14.36	10.3	45.41	48.18	10.4	46.55	38.23
11.3	65.53	5.31	11.3	19.74	14.47	11.3	68.22	14.50	11.3	44.01	48.38	11.4	46.44	38.50
12.3	65.14	5.37	12.3	19.18	14.54	12.3	67.00	14.66	12.3	42.57	48.55	12.4	46.34	38.78
13.3	64.75	5.46	13.3	18.63	14.58	13.3	65.78	14.84	13.3	41.06	48.72	13.4	46.23	39.08
14.3	64.34	5.55	14.3	18.10	14.60	14.3	64.51	15.02	14.3	39.60	48.84	14.4	46.13	39.39
15.3	63.91	5.63	15.3	17.61	14.61	15.3	63.18	15.20	15.3	38.19	48.95	15.4	46.03	39.72
16.3	63.48	5.71	16.3	17.14	14.61	16.3	61.78	15.38	16.3	36.86	49.07	16.4	45.92	40.05
17.3	63.01	5.77	17.3	16.68	14.62	17.3	60.31	15.55	17.3	35.59	49.17	17.4	45.80	40.36
18.3	62.55	5.83	18.3	16.24	14.63	18.3	58.80	15.70	18.3	34.35	49.28	18.4	45.66	40.66
19.3	62.09	5.85	19.3	15.80	14.65	19.3	57.25	15.83	19.3	33.13	49.41	19.4	45.53	40.95
20.2	61.62	5.86	20.3	15.35	14.68	20.3	55.71	15.96	20.3	31.89	49.55	20.4	45.39	41.23
21.2	61.18	5.84	21.3	14.87	14.73	21.3	54.19	16.05	21.3	30.61	49.68	21.4	45.25	41.48
22.2	60.75	5.81	22.2	14.38	14.77	22.3	52.70	16.14	22.3	29.28	49.82	22.4	45.10	41.71
23.2	60.32	5.77	23.2	13.87	14.81	23.3	51.25	16.22	23.3	27.86	49.97	23.4	44.95	41.93
24.2	59.91	5.74	24.2	13.32	14.84	24.3	49.85	16.29	24.3	26.35	50.11	24.4	44.82	42.15
25.2	59.51	5.70	25.2	12.77	14.86	25.3	48.49	16.36	25.3	24.78	50.25	25.4	44.68	42.37
26.2	59.12	5.70	26.2	12.20	14.84	26.3	47.16	16.44	26.3	23.14	50.34	26.4	44.54	42.60
27.2	58.73	5.68	27.2	11.62	14.81	27.3	45.84	16.53	27.3	21.45	50.42	27.4	44.42	42.83
28.2	58.32	5.69	28.2	11.06	14.75	28.3	44.50	16.63	28.3	19.78	50.49	28.3	44.29	43.09
29.2	57.89	5.72	29.2	10.54	14.66	29.3	43.11	16.74	29.3	18.15	50.53	29.3	44.17	43.36
30.2	57.45	5.73	30.2	10.06	14.58	30.3	41.65	16.86	30.3	16.59	50.55	30.3	44.03	43.64
31.2	57.00	5.73	31.2	9.61	14.50	31.3	40.10	16.97	31.3	15.14	50.56	31.3	43.90	43.93
32.2	56.52	5.73	32.2	9.18	14.44	32.3	38.48	17.07	32.3	13.81	50.59	32.3	43.75	44.21
16.95	+16.92		24.60	-24.58		58.52	+58.51		74.44	-74.43		7.39	+7.33	
17 ^h 59 ^m 20 ^s .805			18 ^h 5 ^m 36 ^s .163			19 ^h 3 ^m 51 ^s .560			19 ^h 26 ^m 7 ^s .189			20 ^h 48 ^m 44 ^s .660		
+86° 36' 51".19			-87° 39' 52".21			+89° 0' 56".70			-89° 13' 35".99			+82° 13' 16".38		

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

λ Octantis. Mag. 5.4			ν Octantis. Mag. 5.7			β Octantis. Mag. 4.3			39 H. Cephei. Mag. 5.6			γ^1 Octantis. Mag. 5.1		
Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.
Sept.	h m 21 38 s	° ' -83 6	Sept.	h m 22 16 s	° ' -86 23	Sept.	h m 22 37 s	° ' -81 49	Sept.	h m 23 28 s	° ' +86 50	Sept.	h m 23 47 s	° ' -82 28
1.5	31.69	13.34	1.5	32.92	30.23	1.5	49.81	2.69	1.5	0.89	53.63	1.5	27.85	41.92
2.5	31.64	13.60	2.5	32.85	30.51	2.5	49.80	2.97	2.5	1.02	54.02	2.5	27.87	42.19
3.5	31.60	13.85	3.5	32.80	30.77	3.5	49.79	3.22	3.5	1.13	54.42	3.5	27.91	42.44
4.4	31.56	14.08	4.5	32.77	31.02	4.5	49.79	3.47	4.5	1.22	54.84	4.5	27.95	42.69
5.4	31.54	14.30	5.5	32.76	31.27	5.5	49.81	3.71	5.5	1.28	55.27	5.5	28.00	42.94
6.4	31.53	14.58	6.5	32.76	31.54	6.5	49.82	3.97	6.5	1.31	55.70	6.5	28.06	43.17
7.4	31.52	14.84	7.5	32.77	31.84	7.5	49.85	4.24	7.5	1.31	56.12	7.5	28.13	43.42
8.4	31.50	15.13	8.5	32.78	32.15	8.5	49.87	4.53	8.5	1.29	56.51	8.5	28.20	43.70
9.4	31.46	15.45	9.5	32.77	32.47	9.5	49.89	4.84	9.5	1.26	56.89	9.5	28.26	44.00
10.4	31.41	15.76	10.5	32.72	32.80	10.5	49.89	5.18	10.5	1.23	57.25	10.5	28.31	44.31
11.4	31.33	16.08	11.5	32.64	33.14	11.5	49.87	5.52	11.5	1.23	57.59	11.5	28.34	44.64
12.4	31.24	16.37	12.5	32.53	33.45	12.5	49.83	5.84	12.5	1.25	57.95	12.5	28.35	44.96
13.4	31.16	16.66	13.4	32.40	33.74	13.5	49.78	6.16	13.5	1.29	58.30	13.5	28.36	45.30
14.4	31.06	16.92	14.4	32.26	34.03	14.5	49.74	6.46	14.5	1.34	58.68	14.5	28.36	45.62
15.4	30.97	17.15	15.4	32.12	34.31	15.5	49.69	6.74	15.5	1.40	59.07	15.5	28.35	45.91
16.4	30.87	17.38	16.4	31.99	34.55	16.5	49.65	7.00	16.5	1.43	59.48	16.5	28.34	46.20
17.4	30.79	17.60	17.4	31.88	34.80	17.5	49.62	7.25	17.5	1.44	59.90	17.5	28.34	46.48
18.4	30.73	17.83	18.4	31.77	35.06	18.5	49.58	7.51	18.5	1.43	60.31	18.5	28.35	46.75
19.4	30.66	18.07	19.4	31.68	35.33	19.4	49.56	7.77	19.5	1.39	60.74	19.5	28.37	47.03
20.4	30.59	18.32	20.4	31.58	35.59	20.1	49.54	8.04	20.5	1.33	61.14	20.5	28.39	47.31
21.4	30.52	18.59	21.4	31.49	35.87	21.4	49.51	8.33	21.5	1.24	61.51	21.5	28.40	47.61
22.4	30.44	18.86	22.4	31.39	36.16	22.4	49.47	8.63	22.5	1.15	61.90	22.5	28.42	47.91
23.4	30.35	19.13	23.4	31.27	36.46	23.4	49.43	8.94	23.5	1.05	62.28	23.5	28.43	48.23
24.4	30.25	19.40	24.4	31.13	36.77	24.4	49.39	9.25	24.5	0.95	62.64	24.5	28.43	48.55
25.4	30.14	19.67	25.4	30.96	37.08	25.4	49.34	9.57	25.5	0.87	62.98	25.5	28.43	48.89
26.4	30.02	19.95	26.4	30.78	37.38	26.4	49.27	9.88	26.5	0.81	63.34	26.5	28.40	49.23
27.4	29.89	20.21	27.4	30.58	37.67	27.4	49.19	10.18	27.5	0.76	63.70	27.5	28.36	49.57
28.4	29.75	20.44	28.4	30.35	37.95	28.4	49.11	10.46	28.5	0.72	64.07	28.5	28.32	49.91
29.4	29.61	20.64	29.4	30.12	38.19	29.4	49.02	10.72	29.5	0.68	64.43	29.5	28.27	50.23
30.4	29.48	20.83	30.4	29.91	38.41	30.4	48.94	10.96	30.5	0.64	64.82	30.5	28.23	50.51
31.4	29.37	21.00	31.4	29.70	38.61	31.4	48.87	11.19	31.4	0.58	65.24	31.5	28.18	50.78
32.4	29.26	21.16	32.4	29.50	38.80	32.4	48.81	11.41	32.4	0.50	65.66	32.5	28.13	51.04
8.33	-8.27		15.89	-15.86		7.03	-6.96		18.20	+18.17		7.64	-7.57	
21 ^h 38 ^m 10 ^s .025			22 ^h 15 ^m 56 ^s .333			22 ^h 37 ^m 32 ^s .703			23 ^h 27 ^m 44 ^s .392			23 ^h 47 ^m 12 ^s .813		
=83° 6' 23".31			=86° 23' 45".22			=81° 49' 21".11			+86° 50' 39".03			=82° 29' 8".43		

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

43 H. Cephei. Mag. 4.5			α Ursæ Minoris. (Polaris.) Mag. 2.1			4 G. Octantis. Mag. 5.6			Groombridge 750. Mag. 6.7			Groombridge 944. Mag. 6.4		
Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.
Oct.	h m	s	Oct.	h m	s	Oct.	h m	s	Oct.	h m	s	Oct.	h m	s
	0 57	+85 48		1 31	+88 51		1 42	-85 11		4 10	+85 20		5 35	+85 9
	s	"		s	"		s	"		s	"		s	"
0.5	22.75	45.86	0.5	1.72	41.58	0.5	19.66	12.59	0.6	10.68	0.15	0.7	16.97	17.32
1.5	22.85	46.26	1.5	2.27	41.97	1.5	19.69	12.88	1.6	11.00	0.35	1.7	17.32	17.37
2.5	22.95	46.68	2.5	2.77	42.37	2.5	19.74	13.15	2.6	11.32	0.56	2.7	17.67	17.45
3.5	23.01	47.12	3.5	3.19	42.79	3.5	19.80	13.41	3.6	11.62	0.82	3.7	18.01	17.53
4.5	23.05	47.54	4.5	3.51	43.21	4.5	19.86	13.67	4.6	11.91	1.09	4.7	18.36	17.67
5.5	23.06	47.96	5.5	3.74	43.63	5.5	19.95	13.94	5.6	12.19	1.36	5.7	18.68	17.81
6.5	23.07	48.36	6.5	3.92	44.00	6.5	20.03	14.22	6.8	12.42	1.63	6.7	18.97	17.95
7.5	23.07	48.75	7.5	4.06	44.38	7.5	20.11	14.55	7.6	12.65	1.88	7.7	19.25	18.09
8.5	23.06	49.08	8.5	4.24	44.73	8.5	20.16	14.88	8.6	12.87	2.12	8.7	19.52	18.22
9.5	23.07	49.43	9.5	4.46	45.07	9.5	20.20	15.24	9.6	13.09	2.33	9.7	19.78	18.32
10.5	23.11	49.77	10.5	4.74	45.41	10.5	20.22	15.58	10.6	13.32	2.53	10.7	20.05	18.41
11.5	23.16	50.12	11.5	5.08	45.77	11.5	20.22	15.94	11.6	13.56	2.73	11.7	20.32	18.46
12.5	23.20	50.48	12.5	5.45	46.13	12.5	20.20	16.28	12.6	13.83	2.94	12.7	20.62	18.54
13.5	23.25	50.87	13.5	5.81	46.51	13.5	20.18	16.61	13.6	14.11	3.16	13.7	20.92	18.63
14.5	23.30	51.28	14.5	6.14	46.90	14.5	20.16	16.92	14.6	14.38	3.39	14.7	21.24	18.74
15.5	23.32	51.69	15.5	6.41	47.30	15.5	20.15	17.23	15.6	14.64	3.66	15.7	21.57	18.87
16.5	23.33	52.10	16.5	6.61	47.71	16.5	20.14	17.52	16.6	14.92	3.92	16.7	21.89	19.01
17.5	23.33	52.50	17.5	6.72	48.13	17.5	20.15	17.80	17.6	15.16	4.22	17.7	22.20	19.18
18.5	23.29	52.91	18.5	6.77	48.54	18.5	20.14	18.10	18.6	15.39	4.52	18.7	22.49	19.36
19.5	23.24	53.30	19.5	6.80	48.93	19.5	20.16	18.38	19.6	15.61	4.82	19.7	22.77	19.56
20.5	23.18	53.68	20.5	6.74	49.31	20.5	20.17	18.71	20.6	15.81	5.11	20.7	23.04	19.75
21.5	23.13	54.04	21.5	6.68	49.68	21.5	20.17	19.02	21.6	16.00	5.40	21.7	23.29	19.93
22.5	23.06	54.38	22.5	6.63	50.04	22.5	20.16	19.35	22.6	16.18	5.70	22.6	23.53	20.11
23.5	23.01	54.71	23.5	6.60	50.40	23.5	20.12	19.71	23.6	16.35	5.96	23.6	23.77	20.29
24.4	22.96	55.04	24.5	6.62	50.74	24.5	20.08	20.06	24.6	16.53	6.22	24.6	24.01	20.44
25.4	22.93	55.39	25.5	6.66	51.07	25.5	20.02	20.43	25.6	16.73	6.48	25.6	24.26	20.59
26.4	22.92	55.74	26.5	6.76	51.44	26.5	19.93	20.77	26.6	16.94	6.72	26.6	24.53	20.71
27.4	22.91	56.10	27.5	6.89	51.81	27.5	19.85	21.10	27.6	17.16	6.95	27.6	24.80	20.86
28.4	22.90	56.48	28.5	7.00	52.19	28.5	19.75	21.41	28.6	17.40	7.24	28.6	25.09	21.02
29.4	22.87	56.90	29.5	7.07	52.60	29.5	19.66	21.70	29.6	17.63	7.54	29.6	25.40	21.20
30.4	22.83	57.30	30.5	7.07	53.01	30.5	19.58	21.96	30.6	17.87	7.86	30.6	25.70	21.41
31.4	22.75	57.70	31.4	6.96	53.44	31.5	19.50	22.23	31.6	18.08	8.21	31.6	25.99	21.64
13.70	+13.66		50.40	+50.39		11.92	-11.88		12.29	+12.25		11.84	+11.80	
0 ^h 57 ^m 1 ^s .657			1 ^h 29 ^m 44 ^s .254			1 ^h 42 ^m 6 ^s .102			4 ^h 9 ^m 44 ^s .952			5 ^h 34 ^m 54 ^s .014		
+85° 48' 25".87			+88° 51' 25".03			-85° 11' 39".58			+85° 20' 1".04			+85° 9' 28".07		

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

31 G. Mensæ. Mag. 6.2			ζ Mensæ. Mag. 5.6			51 H. Cephei. Mag. 5.3			25 H. Camelop. Mag. 5.1			7 G. Octantis. Mag. 6.4		
Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.
Oct.	h m 5 46	° ' -84 49	Oct.	h m 6 46	° ' -80 43	Oct.	h m 7 2	° ' +87 10	Oct.	h m 7 13	° ' +82 34	Oct.	h m 7 16	° ' -86 53
	s "	"		s "	"		s "	"		s "	"		s "	"
0.7	17.37	23.38	0.8	57.56	14.16	0.8	3.86	40.53	0.8	41.89	16.77	0.8	13.47	43.86
1.7	17.58	23.49	1.8	57.68	14.21	1.8	4.43	40.41	1.8	42.11	16.63	1.8	13.84	43.87
2.7	17.78	23.58	2.8	57.81	14.21	2.8	5.02	40.32	2.8	42.35	16.52	2.8	14.17	43.86
3.7	17.98	23.66	3.7	57.93	14.23	3.8	5.62	40.28	3.8	42.59	16.44	3.8	14.51	43.82
4.7	18.21	23.72	4.7	58.06	14.22	4.8	6.22	40.23	4.8	42.82	16.39	4.8	14.84	43.78
5.7	18.41	23.77	5.7	58.18	14.21	5.8	6.79	40.24	5.8	43.04	16.35	5.8	15.20	43.73
6.7	18.63	23.82	6.7	58.31	14.19	6.8	7.32	40.22	6.8	43.25	16.33	6.8	15.58	43.68
7.7	18.87	23.90	7.7	58.46	14.18	7.7	7.83	40.21	7.8	43.44	16.31	7.8	15.99	43.62
8.7	19.11	24.02	8.7	58.59	14.20	8.7	8.31	40.21	8.8	43.63	16.28	8.8	16.40	43.58
9.7	19.36	24.15	9.7	58.74	14.24	9.7	8.78	40.18	9.7	43.80	16.23	9.8	16.84	43.58
10.7	19.59	24.32	10.7	58.88	14.31	10.7	9.25	40.14	10.7	43.99	16.17	10.7	17.28	43.61
11.7	19.82	24.50	11.7	59.03	14.42	11.7	9.74	40.09	11.7	44.17	16.08	11.7	17.71	43.67
12.7	20.04	24.69	12.7	59.17	14.56	12.7	10.25	40.03	12.7	44.36	16.00	12.7	18.13	43.74
13.7	20.23	24.89	13.7	59.31	14.67	13.7	10.79	39.97	13.7	44.58	15.93	13.7	18.52	43.82
14.7	20.43	25.07	14.7	59.43	14.78	14.7	11.36	39.91	14.7	44.80	15.87	14.7	18.89	43.90
15.7	20.62	25.24	15.7	59.56	14.89	15.7	11.93	39.90	15.7	45.02	15.81	15.7	19.27	43.95
16.7	20.81	25.41	16.7	59.69	15.00	16.7	12.50	39.89	16.7	45.25	15.77	16.7	19.62	44.01
17.7	21.01	25.57	17.7	59.81	15.08	17.7	13.07	39.92	17.7	45.47	15.77	17.7	19.98	44.06
18.7	21.20	25.71	18.7	59.94	15.15	18.7	13.63	39.95	18.7	45.69	15.79	18.7	20.34	44.09
19.7	21.39	25.85	19.7	60.06	15.24	19.7	14.17	40.00	19.7	45.89	15.82	19.7	20.71	44.14
20.7	21.60	26.00	20.7	60.19	15.31	20.7	14.69	40.07	20.7	46.10	15.86	20.7	21.10	44.17
21.7	21.82	26.18	21.7	60.32	15.41	21.7	15.20	40.14	21.7	46.29	15.88	21.7	21.51	44.22
22.7	22.04	26.36	22.7	60.46	15.54	22.7	15.67	40.20	22.7	46.48	15.91	22.7	21.91	44.28
23.7	22.24	26.55	23.7	60.60	15.67	23.7	16.13	40.24	23.7	46.63	15.92	23.7	22.34	44.36
24.6	22.44	26.78	24.7	60.74	15.81	24.7	16.59	40.27	24.7	46.84	15.94	24.7	22.76	44.47
25.6	22.65	27.03	25.7	60.87	15.98	25.7	17.06	40.30	25.7	47.02	15.94	25.7	23.19	44.61
26.6	22.83	27.30	26.7	61.01	16.20	26.7	17.56	40.31	26.7	47.20	15.94	26.7	23.59	44.74
27.6	23.01	27.58	27.7	61.13	16.42	27.7	18.06	40.31	27.7	47.41	15.92	27.7	23.97	44.93
28.6	23.16	27.84	28.7	61.26	16.62	28.7	18.61	40.32	28.7	47.63	15.91	28.7	24.33	45.10
29.6	23.31	28.10	29.7	61.36	16.80	29.7	19.18	40.37	29.7	47.85	15.91	29.7	24.66	45.26
30.6	23.45	28.34	30.7	61.46	17.00	30.7	19.76	40.42	30.7	48.08	15.96	30.7	24.97	45.41
31.6	23.59	28.56	31.7	61.57	17.18	31.7	20.34	40.52	31.7	48.32	16.01	31.7	25.29	45.55
11.08	-11.04		6.20	-6.12		20.31	+20.28		7.73	+7.67		18.46	-18.44	
5 ^h 46 ^m	26° 43' 9"		6 ^h 47 ^m	3° 48' 9"		7 ^h 1 ^m	34° 8' 61"		7 ^h 13 ^m	29° 47' 7"		7 ^h 16 ^m	40° 55' 55"	
-84° 49'	48'' 17"		-80° 43'	34'' 16"		+87° 11'	0'' 11"		+82° 34'	36'' 50"		-86° 54'	0'' 14"	

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

Groombridge 1119. Mag. 7.0			ζ Octantis. Mag. 5.4			1 H. Draconis. Mag. 4.6			ζ Chamæleontis. Mag. 5.2			30 H. Camelop. Mag. 5.3		
Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.
Oct.	h m	° ' "	Oct.	h m	° ' "	Oct.	h m	° ' "	Oct.	h m	° ' "	Oct.	h m	° ' "
	s	"		s	"		s	"		s	"		s	"
0.8	32.02	46.65	0.9	45.39	39.74	0.9	17.81	31.06	0.9	15.40	50.52	0.9	58.79	45.81
1.8	33.25	46.42	1.9	45.61	39.59	1.9	17.94	30.74	1.9	15.51	50.37	1.9	58.90	45.42
2.8	34.54	46.21	2.9	45.81	39.46	2.9	18.09	30.42	2.9	15.60	50.21	2.9	59.04	45.04
3.8	35.90	46.01	3.8	46.01	39.32	3.9	18.24	30.11	3.9	15.70	50.04	3.9	59.18	44.68
4.8	37.27	45.86	4.8	46.20	39.16	4.9	18.42	29.83	4.9	15.78	49.85	4.9	59.33	44.34
5.8	38.61	45.71	5.8	46.38	38.97	5.9	18.58	29.59	5.9	15.87	49.66	5.9	59.48	44.01
6.8	39.91	45.57	6.8	46.58	38.78	6.9	18.74	29.36	6.9	15.97	49.44	6.9	59.63	43.70
7.8	41.11	45.47	7.8	46.79	38.58	7.8	18.88	29.13	7.9	16.07	49.22	7.9	59.77	43.42
8.8	42.24	45.34	8.8	47.02	38.40	8.8	19.01	28.92	8.9	16.17	49.02	8.9	59.90	43.14
9.8	43.32	45.20	9.8	47.26	38.23	9.8	19.13	28.70	9.9	16.29	48.83	9.9	60.00	42.86
10.8	44.40	45.05	10.8	47.53	38.09	10.8	19.25	28.46	10.9	16.42	48.65	10.9	60.10	42.56
11.8	45.50	44.88	11.8	47.81	37.99	11.8	19.37	28.19	11.8	16.55	48.51	11.9	60.20	42.24
12.8	46.65	44.71	12.8	48.08	37.88	12.8	19.50	27.92	12.8	16.69	48.38	12.9	60.32	41.92
13.8	47.86	44.53	13.8	48.35	37.81	13.8	19.64	27.65	13.8	16.82	48.28	13.9	60.45	41.59
14.8	49.15	44.37	14.8	48.60	37.73	14.8	19.79	27.37	14.8	16.94	48.18	14.9	60.59	41.25
15.8	50.48	44.22	15.8	48.85	37.65	15.8	19.95	27.12	15.8	17.06	48.07	15.9	60.74	40.92
16.8	51.84	44.09	16.8	49.09	37.57	16.8	20.12	26.87	16.8	17.18	47.97	16.9	60.89	40.60
17.8	53.22	43.99	17.8	49.33	37.49	17.8	20.30	26.63	17.8	17.29	47.85	17.9	61.07	40.31
18.8	54.58	43.89	18.8	49.56	37.39	18.8	20.47	26.44	18.8	17.41	47.74	18.9	61.24	40.02
19.8	55.92	43.83	19.8	49.79	37.30	19.8	20.64	26.24	19.8	17.52	47.61	19.9	61.41	39.75
20.8	57.22	43.76	20.8	50.03	37.18	20.8	20.80	26.05	20.8	17.63	47.49	20.9	61.56	39.50
21.8	58.48	43.70	21.8	50.28	37.09	21.8	20.95	25.87	21.8	17.75	47.35	21.8	61.72	39.26
22.8	59.69	43.65	22.8	50.54	36.98	22.8	21.10	25.71	22.8	17.88	47.22	22.8	61.88	39.01
23.8	60.85	43.59	23.8	50.81	36.91	23.8	21.25	25.54	23.8	18.02	47.12	23.8	62.01	38.78
24.8	61.98	43.50	24.8	51.10	36.85	24.8	21.39	25.36	24.8	18.16	47.02	24.8	62.15	38.53
25.8	63.13	43.42	25.8	51.38	36.80	25.8	21.52	25.18	25.8	18.31	46.94	25.8	62.29	38.27
26.7	64.29	43.32	26.8	51.70	36.79	26.8	21.68	24.96	26.8	18.46	46.88	26.8	62.43	38.00
27.7	65.53	43.23	27.8	51.99	36.80	27.8	21.82	24.75	27.8	18.61	46.85	27.8	62.58	37.72
28.7	66.85	43.11	28.8	52.28	36.81	28.8	22.00	24.52	28.8	18.75	46.84	28.8	62.74	37.42
29.7	68.23	43.02	29.8	52.54	36.84	29.8	22.17	24.30	29.8	18.90	46.86	29.8	62.92	37.13
30.7	69.67	42.96	30.8	52.78	36.86	30.8	22.33	24.10	30.8	19.02	46.85	30.8	63.11	36.85
31.7	71.14	42.90	31.8	53.02	36.86	31.8	22.56	23.94	31.8	19.15	46.83	31.8	63.31	36.58
51.11	+51.10		12.27	-12.23		6.92	+6.85		6.10	-6.02		8.18	+8.12	
8 ^h 14 ^m 48 ^s .311			9 ^h 9 ^m 6 ^s .085			9 ^h 25 ^m 12 ^s .930			9 ^h 36 ^m 24 ^s .003			10 ^h 20 ^m 57 ^s .259		
+88° 53' 11".43			-85° 19' 42".77			+81° 41' 57".18			-80° 33' 50".61			+82° 59' 12".27		

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

77 Octantis. Mag. 6.3			Bradley 1672. Mag. 6.3			1 Octantis. Mag. 5.4			32 H. Camelop. seq. Mag. 5.3			κ Octantis. Mag. 5.6		
Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.
Oct.	h m 10 59	° ' -84 8	Oct.	h m 12 13	° ' +88 9	Oct.	h m 12 45	° ' -84 40	Oct.	h m 12 48	° ' +83 51	Oct.	h m 13 26	° ' -85 21
	s "	"		s "	"		s "	"		s "	"		s "	"
0.9	41.26	41.86	0.9	58.75	33.46	1.0	50.80	24.15	1.0	21.42	50.59	1.0	56.53	48.19
1.9	41.36	41.64	1.9	58.72	33.05	2.0	50.83	23.88	2.0	21.37	50.16	2.0	56.53	47.91
2.9	41.47	41.29	2.9	58.75	32.62	2.9	50.86	23.62	3.0	21.36	49.73	3.0	56.52	47.65
3.9	41.57	41.20	3.9	58.83	32.18	3.9	50.87	23.35	3.9	21.36	49.31	4.0	56.49	47.39
4.9	41.65	40.95	4.9	58.98	31.74	4.9	50.88	23.09	4.9	21.36	48.88	5.0	56.44	47.13
5.9	41.72	40.68	5.9	59.17	31.34	5.9	50.87	22.81	5.9	21.39	48.47	6.0	56.39	46.85
6.9	41.81	40.38	6.9	59.35	30.96	6.9	50.86	22.50	6.9	21.42	48.08	7.0	56.34	46.55
7.9	41.91	40.09	7.9	59.51	30.59	7.9	50.86	22.18	7.9	21.43	47.71	8.0	56.28	46.22
8.9	42.01	39.79	8.9	59.65	30.25	8.9	50.86	21.84	8.9	21.44	47.36	9.0	56.26	45.86
9.9	42.15	39.51	9.9	59.75	29.90	9.9	50.91	21.50	9.9	21.43	47.00	10.0	56.25	45.51
10.9	42.30	39.24	10.9	59.79	29.54	10.9	50.97	21.17	10.9	21.41	46.65	11.0	56.25	45.17
11.9	42.45	39.00	11.9	59.83	29.18	11.9	51.05	20.82	11.9	21.40	46.29	12.0	56.30	44.82
12.9	42.61	38.76	12.9	59.87	28.81	12.9	51.13	20.51	12.9	21.38	45.91	12.9	56.36	44.49
13.9	42.78	38.54	13.9	59.95	28.39	13.9	51.23	20.22	13.9	21.37	45.50	13.9	56.41	44.20
14.9	42.93	38.36	14.9	60.06	27.98	14.9	51.32	19.94	14.9	21.37	45.09	14.9	56.47	43.92
15.9	43.09	38.16	15.9	60.22	27.59	15.9	51.40	19.67	15.9	21.39	44.67	15.9	56.52	43.64
16.9	43.24	37.97	16.9	60.43	27.17	16.9	51.47	19.42	16.9	21.43	44.26	16.9	56.57	43.34
17.9	43.37	37.77	17.9	60.67	26.77	17.9	51.55	19.14	17.9	21.47	43.84	17.9	56.60	43.06
18.9	43.51	37.55	18.9	60.94	26.40	18.9	51.61	18.87	18.9	21.52	43.43	18.9	56.62	42.79
19.9	43.64	37.33	19.9	61.24	26.01	19.9	51.68	18.59	19.9	21.58	43.05	19.9	56.65	42.49
20.9	43.77	37.10	20.9	61.51	25.67	20.9	51.74	18.31	20.9	21.64	42.67	20.9	56.63	42.17
21.9	43.92	36.87	21.9	61.83	25.33	21.9	51.80	17.99	21.9	21.69	42.30	21.9	56.69	41.85
22.9	44.07	36.65	22.9	62.11	24.99	22.9	51.88	17.68	22.9	21.74	41.96	22.9	56.74	41.53
23.9	44.25	36.42	23.9	62.35	24.67	23.9	51.96	17.35	23.9	21.80	41.61	23.9	56.79	41.20
24.9	44.44	36.21	24.9	62.58	24.34	24.9	52.06	17.04	24.9	21.84	41.27	24.9	56.88	40.87
25.9	44.63	36.01	25.9	62.77	24.00	25.9	52.20	16.74	25.9	21.86	40.91	25.9	56.97	40.53
26.9	44.84	35.84	26.9	62.96	23.64	26.9	52.35	16.45	26.9	21.89	40.54	26.9	57.10	40.20
27.9	45.05	35.70	27.9	63.16	23.27	27.9	52.50	16.16	27.9	21.92	40.16	27.9	57.23	39.91
28.9	45.25	35.56	28.9	63.39	22.88	28.9	52.66	15.94	28.9	21.97	39.74	28.9	57.37	39.64
29.9	45.45	35.45	29.9	63.68	22.49	29.9	52.80	15.72	29.9	22.02	39.33	29.9	57.51	39.40
30.9	45.64	35.34	30.9	64.00	22.10	30.9	52.96	15.51	30.9	22.10	38.92	30.9	57.64	39.15
31.8	45.81	35.22	31.9	64.42	21.70	31.9	53.09	15.31	31.9	22.19	38.49	31.9	57.75	38.91
9.80	-9.75		31.10	+31.09		10.77	-10.72		9.35	+9.30		12.37	-12.33	
10 ^h 59 ^m	55 ^s .642		12 ^h 14 ^m	28 ^s .053		12 ^h 46 ^m	1 ^s .183		12 ^h 48 ^m	29 ^s .976		13 ^h 27 ^m	5 ^s .514	
-84°	8'	31''.24	+88°	9'	56''.03	-84°	40'	2''.72	+83°	52'	10''.05	-85°	21'	23''.59

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

δ Octantis. Mag. 4.1			Groombridge 2283. Mag. 7.2			ρ Octantis. Mag. 5.7			ε Ursæ Minoris. Mag. 4.4			59 G. Apodis. Mag. 5.9		
Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.
Oct.	h m	° '	Oct.	h m	° '	Oct.	h m	° '	Oct.	h m	° '	Oct.	h m	° '
	14 13	-83 17		15 3	+87 33		15 23	-84 11		16 54	+82 10		17 15	-80 47
	s	"		s	"		s	"		s	"		s	"
1.1	16.33	30.94	1.1	21.64	18.35	1.1	46.10	46.11	1.2	21.86	46.20	1.2	52.34	27.21
2.1	16.30	30.68	2.1	21.19	18.04	2.1	46.01	45.87	2.2	21.67	46.06	2.2	52.25	27.07
3.1	16.27	30.43	3.1	20.75	17.73	3.1	45.92	45.69	3.2	21.48	45.90	3.2	52.16	26.96
4.1	16.23	30.18	4.1	20.34	17.36	4.1	45.83	45.47	4.2	21.30	45.70	4.2	52.08	26.88
5.1	16.17	29.94	5.1	20.00	17.02	5.1	45.71	45.27	5.2	21.13	45.48	5.2	51.98	26.81
6.1	16.11	29.69	6.1	19.69	16.66	6.1	45.59	45.05	6.2	20.97	45.26	6.2	51.86	26.73
7.0	16.04	29.42	7.1	19.39	16.32	7.1	45.47	44.82	7.2	20.82	45.05	7.2	51.74	26.64
8.0	15.97	29.11	8.1	19.10	16.01	8.1	45.31	44.57	8.2	20.66	44.85	8.2	51.61	26.51
9.0	15.90	28.77	9.1	18.81	15.72	9.1	45.18	44.30	9.2	20.52	44.68	9.2	51.48	26.34
10.0	15.86	28.44	10.1	18.50	15.43	10.1	45.07	44.00	10.2	20.36	44.53	10.2	51.36	26.16
11.0	15.83	28.10	11.1	18.15	15.15	11.1	44.96	43.68	11.2	20.20	44.37	11.2	51.25	25.97
12.0	15.82	27.75	12.1	17.79	14.87	12.1	44.89	43.36	12.1	20.05	44.24	12.2	51.15	25.76
13.0	15.82	27.44	13.1	17.42	14.56	13.1	44.82	43.05	13.1	19.88	44.08	13.2	51.05	25.54
14.0	15.83	27.12	14.1	17.05	14.25	14.1	44.76	42.75	14.1	19.71	43.91	14.2	50.96	25.33
15.0	15.83	26.85	15.1	16.69	13.91	15.1	44.71	42.47	15.1	19.55	43.70	15.2	50.88	25.15
16.0	15.84	26.56	16.1	16.35	13.55	16.1	44.66	42.20	16.1	19.38	43.48	16.2	50.80	24.97
17.0	15.84	26.28	17.1	16.05	13.17	17.1	44.61	41.94	17.1	19.22	43.25	17.2	50.72	24.78
18.0	15.83	26.00	18.1	15.78	12.81	18.1	44.53	41.69	18.1	19.07	42.99	18.1	50.64	24.62
19.0	15.82	25.72	19.1	15.53	12.44	19.1	44.46	41.43	19.1	18.96	42.73	19.1	50.55	24.46
20.0	15.80	25.43	20.0	15.32	12.06	20.1	44.38	41.16	20.1	18.79	42.47	20.1	50.45	24.29
21.0	15.79	25.12	21.0	15.11	11.72	21.1	44.29	40.89	21.1	18.65	42.21	21.1	50.35	24.10
22.0	15.77	24.80	22.0	14.92	11.38	22.1	44.21	40.58	22.1	18.52	41.97	22.1	50.25	23.91
23.0	15.76	24.48	23.0	14.73	11.03	23.1	44.13	40.27	23.1	18.40	41.73	23.1	50.14	23.69
24.0	15.75	24.15	24.0	14.52	10.72	24.1	44.06	39.95	24.1	18.27	41.51	24.1	50.04	23.45
24.9	15.77	23.81	25.0	14.30	10.41	25.0	44.01	39.59	25.1	18.14	41.29	25.1	49.94	23.19
25.9	15.80	23.46	26.0	14.06	10.09	26.0	43.98	39.24	26.1	18.01	41.07	26.1	49.86	22.93
26.9	15.84	23.12	27.0	13.80	9.78	27.0	43.96	38.90	27.1	17.86	40.85	27.1	49.78	22.66
27.9	15.90	22.79	28.0	13.52	9.44	28.0	43.96	38.57	28.1	17.72	40.62	28.1	49.72	22.37
28.9	15.96	22.50	29.0	13.25	9.07	29.0	43.97	38.27	29.1	17.57	40.38	29.1	49.67	22.12
29.9	16.04	22.24	30.0	13.00	8.68	30.0	43.98	37.98	30.1	17.43	40.13	30.1	49.62	21.87
30.9	16.10	21.99	31.0	12.80	8.28	31.0	44.00	37.73	31.1	17.29	39.82	31.1	49.58	21.64
31.9	16.16	21.73	32.0	12.64	7.86	32.0	44.00	37.46	32.1	17.16	39.50	32.1	49.54	21.44
8.56	-8.50		23.43	+23.41		9.89	-9.84		7.35	+7.28		6.25	-6.17	
14 ^h 13 ^m 18 ^s .531			15 ^h 4 ^m 0 ^s .607			15 ^h 23 ^m 43 ^s .237			16 ^h 54 ^m 31 ^s .741			17 ^h 15 ^m 43 ^s .730		
-83° 17' 4".27			+87° 33' 24".43			-84° 11' 17".84			+82° 10' 38".40			-80° 47' 2".69		

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

δ Ursæ Minoris. Mag. 4.4			χ Octantis. Mag. 5.2			λ Ursæ Minoris. Mag. 6.6			σ Octantis. Mag. 5.5			76 Draconis. Mag. 5.7		
Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.
Oct.	h m ° ' "		Oct.	h m ° ' "		Oct.	h m ° ' "		Oct.	h m ° ' "		Oct.	h m ° ' "	
	17 58 +86 37			18 5 -87 40			19 1 +89 1			19 27 -89 13			20 48 +82 11	
	s " "			s " "			s " "			s " "			s " "	
1.2	57.00 5.73	1.2	69.61 14.50	1.3	100.10 16.97	1.3	75.14 50.56	1.3	43.90 43.93					
2.2	56.52 5.73	2.2	69.18 14.44	2.3	98.48 17.07	2.3	73.81 50.59	2.3	43.75 44.21					
3.2	56.04 5.68	3.2	68.77 14.36	3.3	96.81 17.16	3.3	72.52 50.63	3.3	43.58 44.46					
4.2	55.57 5.59	4.2	68.35 14.33	4.3	95.14 17.21	4.3	71.24 50.69	4.3	43.41 44.69					
5.2	55.12 5.50	5.2	67.91 14.31	5.3	93.50 17.22	5.3	69.92 50.76	5.3	43.24 44.89					
6.2	54.69 5.38	6.2	67.43 14.29	6.3	91.92 17.22	6.3	68.50 50.84	6.3	43.08 45.08					
7.2	54.27 5.27	7.2	66.91 14.25	7.2	90.43 17.23	7.3	66.96 50.91	7.3	42.92 45.24					
8.2	53.87 5.17	8.2	66.37 14.18	8.2	89.02 17.24	8.3	65.31 50.96	8.3	42.76 45.39					
9.2	53.49 5.09	9.2	65.82 14.07	9.2	87.65 17.26	9.3	63.57 50.98	9.3	42.61 45.56					
10.2	53.11 5.03	10.2	65.27 13.93	10.2	86.30 17.28	10.3	61.79 50.99	10.3	42.47 45.74					
11.2	52.72 4.97	11.2	64.74 13.78	11.2	84.93 17.34	11.3	60.04 50.97	11.3	42.32 45.94					
12.2	52.31 4.94	12.2	64.25 13.62	12.2	83.52 17.39	12.3	58.35 50.93	12.3	42.18 46.14					
13.2	51.88 4.88	13.2	63.79 13.47	13.2	82.03 17.46	13.2	56.75 50.86	13.3	42.03 46.36					
14.2	51.44 4.80	14.2	63.36 13.32	14.2	80.49 17.50	14.2	55.24 50.81	14.3	41.88 46.57					
15.2	51.00 4.74	15.2	62.95 13.19	15.2	78.90 17.53	15.2	53.79 50.78	15.3	41.71 46.77					
16.2	50.55 4.64	16.2	62.55 13.05	16.2	77.28 17.53	16.2	52.40 50.73	16.3	41.54 46.95					
17.2	50.11 4.52	17.2	62.14 12.92	17.2	75.67 17.53	17.2	51.00 50.69	17.3	41.37 47.11					
18.2	49.68 4.37	18.2	61.73 12.82	18.2	74.08 17.49	18.2	49.57 50.66	18.3	41.19 47.25					
19.2	49.27 4.20	19.2	61.29 12.71	19.2	72.52 17.45	19.2	48.12 50.64	19.3	41.01 47.38					
20.2	48.89 4.04	20.2	60.83 12.59	20.2	71.01 17.39	20.2	46.61 50.61	20.3	40.83 47.49					
21.2	48.50 3.88	21.2	60.36 12.45	21.2	69.55 17.32	21.2	45.04 50.59	21.3	40.66 47.59					
22.2	48.13 3.72	22.2	59.88 12.30	22.2	68.16 17.25	22.2	43.39 50.57	22.3	40.49 47.68					
23.2	47.77 3.56	23.2	59.39 12.14	23.2	66.81 17.19	23.2	41.69 50.52	23.3	40.33 47.77					
24.2	47.42 3.41	24.2	58.90 11.96	24.2	65.49 17.15	24.2	39.97 50.44	24.3	40.17 47.88					
25.2	47.06 3.28	25.2	58.42 11.75	25.2	64.15 17.13	25.2	38.26 50.34	25.3	40.02 48.00					
26.2	46.69 3.18	26.2	57.98 11.51	26.2	62.79 17.10	26.2	36.59 50.23	26.3	39.86 48.13					
27.1	46.30 3.06	27.2	57.57 11.26	27.2	61.38 17.07	27.2	35.06 50.10	27.3	39.70 48.27					
28.1	45.90 2.93	28.2	57.22 11.02	28.2	59.90 17.05	28.2	33.53 49.95	28.3	39.54 48.42					
29.1	45.50 2.79	29.1	56.88 10.79	29.2	58.33 17.01	29.2	32.19 49.79	29.3	39.37 48.56					
30.1	45.07 2.61	30.1	56.58 10.57	30.2	56.72 16.95	30.2	30.92 49.65	30.3	39.19 48.68					
31.1	44.65 2.43	31.1	56.29 10.37	31.2	55.10 16.87	31.2	29.72 49.53	31.3	39.01 48.79					
32.1	44.25 2.20	32.1	55.99 10.19	32.2	53.50 16.76	32.2	28.49 49.43	32.3	38.81 48.87					
16.95	+16.92	24.60	-24.58	58.56	+58.55	74.49	-74.48	7.40	+7.33					
17 ^h 59 ^m 20 ^s .805		18 ^h 5 ^m 36 ^s .163		19 ^h 3 ^m 51 ^s .560		19 ^h 26 ^m 7 ^s .189		20 ^h 48 ^m 44 ^s .660						
+86° 36' 51".19		-87° 39' 52".21		+89° 0' 56".70		-89° 13' 35".99		+82° 13' 16".38						

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

λ Octantis. Mag. 5.4			ν Octantis. Mag. 5.7			β Octantis. Mag. 4.3			39 H. Cephei. Mag. 5.6			γ^1 Octantis. Mag. 5.1		
Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.
Oct.	h m	° ' "	Oct.	h m	° ' "	Oct.	h m	° ' "	Oct.	h m	° ' "	Oct.	h m	° ' "
	21 38	-83 6		22 16	-86 23		22 37	-81 49		23 27	+86 51		23 47	-82 28
	s	"		s	"		s	"		s	"		s	"
1.4	29.37	21.00	1.4	29.70	38.61	1.4	48.87	11.19	1.4	60.58	5.24	1.5	28.18	50.78
2.4	29.26	21.16	2.4	29.50	38.80	2.4	48.81	11.41	2.4	60.50	5.66	2.5	28.13	51.04
3.4	29.16	21.34	3.4	29.34	39.00	3.4	48.74	11.63	3.4	60.38	6.09	3.5	28.11	51.30
4.4	29.06	21.53	4.4	29.20	39.22	4.4	48.69	11.86	4.4	60.23	6.51	4.5	28.10	51.56
5.4	28.97	21.74	5.4	29.04	39.46	5.4	48.63	12.11	5.4	60.05	6.89	5.5	28.08	51.83
6.4	28.86	21.97	6.4	28.87	39.71	6.4	48.58	12.37	6.4	59.86	7.26	6.5	28.05	52.12
7.4	28.74	22.19	7.4	28.68	39.98	7.4	48.51	12.65	7.4	59.68	7.61	7.4	28.02	52.43
8.4	28.61	22.42	8.4	28.45	40.25	8.4	48.43	12.93	8.4	59.51	7.94	8.4	27.98	52.76
9.4	28.45	22.65	9.4	28.20	40.51	9.4	48.33	13.22	9.4	59.37	8.27	9.4	27.92	53.09
10.4	28.28	22.85	10.4	27.92	40.76	10.4	48.22	13.49	10.4	59.25	8.60	10.4	27.84	53.42
11.3	28.11	23.02	11.4	27.62	40.97	11.4	48.10	13.74	11.4	59.14	8.93	11.4	27.76	53.74
12.3	27.93	23.17	12.4	27.34	41.16	12.4	47.98	13.96	12.4	59.03	9.29	12.4	27.66	54.03
13.3	27.78	23.31	13.4	27.05	41.34	13.4	47.86	14.15	13.4	58.91	9.66	13.4	27.58	54.29
14.3	27.64	23.42	14.4	26.78	41.50	14.4	47.76	14.33	14.4	58.78	10.04	14.4	27.50	54.55
15.3	27.49	23.52	15.4	26.52	41.66	15.4	47.66	14.54	15.4	58.62	10.42	15.4	27.42	54.80
16.3	27.36	23.66	16.4	26.28	41.84	16.4	47.56	14.73	16.4	58.44	10.79	16.4	27.36	55.04
17.3	27.23	23.80	17.4	26.05	42.01	17.4	47.47	14.91	17.4	58.23	11.16	17.4	27.29	55.30
18.3	27.10	23.93	18.4	25.83	42.19	18.4	47.38	15.12	18.4	58.00	11.51	18.4	27.23	55.56
19.3	26.96	24.08	19.4	25.57	42.38	19.4	47.29	15.35	19.4	57.76	11.86	19.4	27.17	55.82
20.3	26.82	24.23	20.3	25.32	42.58	20.4	47.19	15.57	20.4	57.51	12.19	20.4	27.10	56.10
21.3	26.67	24.39	21.3	25.06	42.79	21.4	47.09	15.78	21.4	57.26	12.51	21.4	27.01	56.38
22.3	26.50	24.54	22.3	24.78	42.98	22.4	46.97	16.00	22.4	57.02	12.80	22.4	26.93	56.67
23.3	26.33	24.68	23.3	24.47	43.17	23.4	46.85	16.23	23.4	56.79	13.09	23.4	26.83	56.96
24.3	26.15	24.81	24.3	24.15	43.35	24.4	46.71	16.44	24.4	56.59	13.37	24.4	26.72	57.25
25.3	25.96	24.91	25.3	23.81	43.52	25.4	46.57	16.63	25.4	56.39	13.68	25.4	26.60	57.53
26.3	25.76	25.01	26.3	23.46	43.65	26.3	46.43	16.80	26.4	56.20	14.00	26.4	26.48	57.78
27.3	25.58	25.06	27.3	23.11	43.74	27.3	46.28	16.95	27.4	56.02	14.32	27.4	26.35	58.02
28.3	25.41	25.11	28.3	22.78	43.84	28.3	46.14	17.09	28.4	55.82	14.67	28.4	26.22	58.23
29.3	25.25	25.13	29.3	22.47	43.93	29.3	46.02	17.21	29.4	55.60	15.03	29.4	26.11	58.43
30.3	25.10	25.17	30.3	22.18	43.99	30.3	45.91	17.31	30.4	55.35	15.38	30.4	26.01	58.60
31.3	24.96	25.20	31.3	21.92	44.05	31.3	45.81	17.42	31.4	55.07	15.72	31.4	25.92	58.78
32.3	24.84	25.26	32.3	21.65	44.15	32.3	45.71	17.55	32.4	54.76	16.04	32.4	25.82	58.96
8.33	-8.27	15.90	-15.87	7.03	-6.96	18.21	+18.19	7.64	-7.58					
21 ^h 38 ^m	10 ^s .025	22 ^h 15 ^m	56 ^s .333	22 ^h 37 ^m	32 ^s .703	23 ^h 27 ^m	44 ^s .392	23 ^h 47 ^m	12 ^s .813					
-83° 6'	23''.31	-86° 23'	45''.22	-81° 49'	21''.11	+86° 50'	39''.03	-82° 29'	8''.43					

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

43 H. Cephei. Mag. 4.5			α Ursæ Minoris. (Polaris.) Mag. 2.1			4 G. Octantis. Mag. 5.6			Groombridge 750. Mag. 6.7			Groombridge 944. Mag. 6.4		
Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.
Nov.	h m 0 57	° ' +85 48	Nov.	h m 1 30	° ' +88 51	Nov.	h m 1 42	° ' -85 11	Nov.	h m 4 10	° ' +85 20	Nov.	h m 5 35	° ' +85 9
	s "	"		s "	"		s "	"		s "	"		s "	"
0.4	22.75	57.70	0.4	66.96	53.44	0.5	19.50	22.23	0.6	18.08	8.21	0.6	25.99	21.64
1.4	22.65	58.09	1.4	66.76	53.86	1.5	19.45	22.50	1.6	18.27	8.56	1.6	26.28	21.91
2.4	22.52	58.47	2.4	66.49	54.25	2.5	19.40	22.78	2.6	18.44	8.93	2.6	26.52	22.15
3.4	22.40	58.82	3.4	66.17	54.62	3.5	19.35	23.07	3.6	18.59	9.26	3.6	26.75	22.41
4.4	22.27	59.15	4.4	65.86	54.97	4.5	19.27	23.39	4.6	18.72	9.59	4.6	26.97	22.66
5.4	22.16	59.47	5.4	65.59	55.30	5.4	19.19	23.72	5.6	18.84	9.88	5.6	27.16	22.88
6.4	22.05	59.77	6.4	65.37	55.63	6.4	19.09	24.06	6.5	18.96	10.15	6.6	27.36	23.09
7.4	21.96	60.08	7.4	65.21	55.96	7.4	18.95	24.39	7.5	19.11	10.42	7.6	27.58	23.27
8.4	21.91	60.39	8.4	65.10	56.29	8.4	18.82	24.72	8.5	19.28	10.70	8.6	27.80	23.46
9.4	21.83	60.73	9.4	65.00	56.65	9.4	18.66	25.02	9.5	19.45	10.97	9.6	28.04	23.64
10.4	21.75	61.07	10.4	64.86	57.01	10.4	18.51	25.31	10.5	19.62	11.29	10.6	28.28	23.86
11.4	21.66	61.44	11.4	64.67	57.38	11.4	18.36	25.58	11.5	19.80	11.60	11.6	28.54	24.08
12.4	21.56	61.80	12.4	64.42	57.76	12.4	18.22	25.82	12.5	19.96	11.94	12.6	28.79	24.32
13.4	21.42	62.15	13.4	64.10	58.14	13.4	18.09	26.06	13.5	20.11	12.30	13.6	29.03	24.59
14.4	21.28	62.50	14.4	63.69	58.52	14.4	17.97	26.30	14.5	20.25	12.66	14.6	29.26	24.87
15.4	21.11	62.82	15.4	63.23	58.89	15.4	17.84	26.57	15.5	20.35	13.03	15.6	29.46	25.16
16.4	20.94	63.13	16.4	62.72	59.22	16.4	17.72	26.83	16.5	20.46	13.39	16.6	29.66	25.46
17.4	20.75	63.43	17.4	62.20	59.56	17.4	17.60	27.09	17.5	20.55	13.72	17.6	29.84	25.75
18.4	20.57	63.72	18.4	61.66	59.88	18.4	17.46	27.38	18.5	20.62	14.06	18.6	30.01	26.03
19.4	20.40	64.00	19.4	61.15	60.20	19.4	17.32	27.66	19.5	20.69	14.40	19.6	30.16	26.31
20.4	20.22	64.26	20.4	60.67	60.48	20.4	17.15	27.95	20.5	20.76	14.71	20.6	30.31	26.56
21.4	20.07	64.53	21.4	60.22	60.77	21.4	16.98	28.25	21.5	20.83	15.00	21.6	30.48	26.81
22.4	19.94	64.79	22.4	59.82	61.06	22.4	16.79	28.54	22.5	20.91	15.30	22.6	30.65	27.04
23.4	19.80	65.06	23.4	59.46	61.38	23.4	16.56	28.79	23.5	21.02	15.60	23.6	30.83	27.28
24.4	19.68	65.36	24.4	59.11	61.69	24.4	16.35	29.03	24.5	21.13	15.91	24.6	31.02	27.51
25.4	19.54	65.68	25.4	58.73	62.04	25.4	16.13	29.23	25.5	21.26	16.22	25.6	31.24	27.77
26.4	19.38	66.00	26.4	58.28	62.39	26.4	15.94	29.42	26.5	21.37	16.59	26.6	31.45	28.05
27.4	19.20	66.33	27.4	57.76	62.75	27.4	15.74	29.60	27.5	21.48	16.96	27.6	31.65	28.36
28.4	19.01	66.65	28.4	57.12	63.11	28.4	15.56	29.76	28.5	21.56	17.34	28.5	31.84	28.69
29.3	18.78	66.95	29.4	56.40	63.46	29.4	15.39	29.94	29.5	21.61	17.72	29.5	32.00	29.03
30.3	18.54	67.22	30.4	55.64	63.75	30.4	15.23	30.12	30.5	21.65	18.11	30.5	32.14	29.37
31.3	18.30	67.45	31.4	54.85	64.05	31.4	15.05	30.34	31.5	21.66	18.45	31.5	32.25	29.71
13.71	+13.67		50.55	+50.54		11.93	-11.89		12.30	+12.26		11.84	+11.80	
0 ^h 57 ^m	1°.657		1 ^h 29 ^m	44°.254		1 ^h 42 ^m	6°.102		4 ^h 9 ^m	44°.952		5 ^h 34 ^m	54°.014	
+85° 48'	25''.87		+88° 51'	25''.03		-85° 11'	39''.58		+85° 20'	1''.04		+85° 9'	28''.07	

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

31 G. Mensæ. Mag. 6.2			5 Mensæ. Mag. 5.6			51 H. Cephei. Mag. 5.3			25 H. Camelop. Mag. 5.1			7 G. Octantis. Mag. 6.4		
Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.
Nov.	h m	s	Nov.	h m	s	Nov.	h m	s	Nov.	h m	s	Nov.	h m	s
	5 46	-84 49		6 47	-80 43		7 2	+87 10		7 13	+82 34		7 16	-86 53
	s	"		s	"		s	"		s	"		s	"
0.6	23.59	28.56	0.7	1.57	17.18	0.7	20.34	40.52	0.7	48.32	16.01	0.7	25.29	45.55
1.6	23.73	28.76	1.7	1.38	17.32	1.7	20.91	40.65	1.7	48.54	16.11	1.7	25.60	45.65
2.6	23.90	28.97	2.7	1.79	17.48	2.7	21.43	40.78	2.7	48.75	16.21	2.7	25.93	45.76
3.6	24.07	29.19	3.7	1.90	17.65	3.7	21.92	40.92	3.7	48.95	16.31	3.7	26.29	45.87
4.6	24.24	29.43	4.7	2.03	17.83	4.7	22.38	41.04	4.7	49.12	16.43	4.7	26.67	46.01
5.6	24.42	29.70	5.7	2.16	18.02	5.7	22.81	41.15	5.7	49.30	16.52	5.7	27.06	46.18
6.6	24.57	29.98	6.7	2.28	18.25	6.7	23.23	41.25	6.7	49.47	16.59	6.7	27.44	46.35
7.6	24.73	30.31	7.7	2.40	18.51	7.7	23.68	41.32	7.7	49.63	16.63	7.7	27.83	46.59
8.6	24.88	30.64	8.6	2.51	18.80	8.7	24.14	41.40	8.7	49.81	16.68	8.7	28.20	46.81
9.6	25.01	30.98	9.6	2.62	19.09	9.7	24.60	41.47	9.7	49.99	16.73	9.7	28.53	47.05
10.6	25.11	31.30	10.6	2.72	19.36	10.7	25.11	41.56	10.7	50.19	16.79	10.7	28.85	47.28
11.6	25.22	31.60	11.6	2.82	19.64	11.7	25.62	41.66	11.7	50.40	16.88	11.7	29.15	47.53
12.6	25.32	31.89	12.6	2.91	19.89	12.7	26.13	41.80	12.7	50.62	16.97	12.7	29.44	47.76
13.6	25.43	32.18	13.6	3.00	20.16	13.6	26.65	41.94	13.7	50.83	17.09	13.7	29.71	47.98
14.6	25.53	32.46	14.6	3.09	20.40	14.6	27.14	42.11	14.7	51.03	17.23	14.7	29.99	48.17
15.6	25.63	32.73	15.6	3.18	20.63	15.6	27.62	42.29	15.6	51.22	17.40	15.7	30.27	48.38
16.6	25.75	33.00	16.6	3.28	20.85	16.6	28.09	42.48	16.6	51.40	17.56	16.6	30.56	48.58
17.6	25.86	33.29	17.6	3.37	21.11	17.6	28.51	42.67	17.6	51.57	17.70	17.6	30.88	48.81
18.6	25.99	33.57	18.6	3.47	21.34	18.6	28.92	42.85	18.6	51.73	17.86	18.6	31.19	49.02
19.6	26.11	33.88	19.6	3.57	21.62	19.6	29.30	43.04	19.6	51.88	18.03	19.6	31.50	49.23
20.6	26.22	34.21	20.6	3.67	21.91	20.6	29.68	43.21	20.6	52.04	18.18	20.6	31.82	49.49
21.6	26.31	34.56	21.6	3.76	22.23	21.6	30.06	43.38	21.6	52.18	18.32	21.6	32.14	49.76
22.6	26.40	34.94	22.6	3.84	22.56	22.6	30.46	43.52	22.6	52.36	18.45	22.6	32.44	50.05
23.6	26.49	35.31	23.6	3.93	22.90	23.6	30.87	43.66	23.6	52.52	18.57	23.6	32.72	50.36
24.6	26.54	35.69	24.6	4.01	23.27	24.6	31.29	43.81	24.6	52.69	18.69	24.6	32.96	50.68
25.6	26.58	36.03	25.6	4.07	23.61	25.6	31.76	43.96	25.6	52.89	18.81	25.6	33.18	50.99
26.6	26.61	36.38	26.6	4.13	23.94	26.6	32.24	44.14	26.6	53.07	18.94	26.6	33.37	51.30
27.6	26.64	36.71	27.6	4.20	24.24	27.6	32.72	44.35	27.6	53.28	19.13	27.6	33.55	51.57
28.6	26.69	37.01	28.6	4.25	24.52	28.6	33.18	44.58	28.6	53.46	19.32	28.6	33.73	51.85
29.6	26.71	37.29	29.6	4.30	24.81	29.6	33.60	44.82	29.6	53.65	19.56	29.6	33.92	52.08
30.5	26.75	37.60	30.6	4.37	25.09	30.6	33.98	45.09	30.6	53.80	19.78	30.6	34.13	52.32
31.5	26.81	37.91	31.6	4.43	25.37	31.6	34.33	45.35	31.6	53.94	20.03	31.6	34.35	52.60
11.08	-11.04		6.20	-6.12		20.31	+20.29		7.73	+7.67		18.47	-18.45	
5 ^h 46 ^m	26° 43' 39"		6 ^h 47 ^m	3° 48' 16"		7 ^h 1 ^m	34° 8' 86"		7 ^h 13 ^m	29° 47' 7"		7 ^h 16 ^m	40° 5' 55"	
-84° 49'	48'' 17		-80° 43'	34'' 16		+87° 11'	0'' 11		+82° 34'	36'' 50		-86° 54'	0'' 14	

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

Groombridge 1119. Mag. 7.0			ζ Octantis. Mag. 5.4			1 H. Draconis. Mag. 4.6			ζ Chamæleontis. Mag. 5.2			30 H. Camelop. Mag. 5.3		
Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.
Nov.	h m ° ' "		Nov.	h m ° ' "		Nov.	h m ° ' "		Nov.	h m ° ' "		Nov.	h m ° ' "	
	8 16 +88 52			9 8 -85 19			9 25 +81 41			9 36 -80 33			10 21 +82 58	
	s "			s "			s "			s "			s "	
0.7	11.14 42.90	0.8	53.02 36.86	0.8	22.56 23.94	0.8	19.15 46.83	0.8	3.31 36.58					
1.7	12.60 42.89	1.8	53.25 36.85	1.8	22.76 23.79	1.8	19.27 46.79	1.8	3.51 36.34					
2.7	13.98 42.89	2.8	53.49 36.85	2.8	22.95 23.66	2.8	19.39 46.75	2.8	3.72 36.13					
3.7	15.29 42.91	3.8	53.76 36.83	3.8	23.13 23.56	3.8	19.52 46.70	3.8	3.91 35.94					
4.7	16.52 42.93	4.8	54.02 36.80	4.8	23.29 23.46	4.8	19.65 46.64	4.8	4.09 35.76					
5.7	17.68 42.94	5.8	54.30 36.78	5.8	23.44 23.35	5.8	19.79 46.61	5.8	4.24 35.59					
6.7	18.80 42.94	6.8	54.61 36.82	6.8	23.59 23.23	6.8	19.94 46.60	6.8	4.40 35.42					
7.7	19.91 42.92	7.8	54.92 36.87	7.8	23.73 23.10	7.8	20.10 46.62	7.8	4.55 35.21					
8.7	21.08 42.89	8.8	55.22 36.94	8.8	23.88 22.95	8.8	20.26 46.66	8.8	4.70 34.98					
9.7	22.30 42.85	9.7	55.51 37.03	9.8	24.06 22.80	9.8	20.41 46.71	9.8	4.87 34.76					
10.7	23.58 42.83	10.7	55.80 37.14	10.8	24.23 22.65	10.8	20.56 46.77	10.8	5.06 34.52					
11.7	24.91 42.81	11.7	56.07 37.23	11.8	24.40 22.50	11.8	20.71 46.84	11.8	5.24 34.32					
12.7	26.27 42.81	12.7	56.32 37.33	12.8	24.60 22.39	12.8	20.85 46.92	12.8	5.44 34.11					
13.7	27.64 42.84	13.7	56.57 37.42	13.7	24.78 22.28	13.8	20.98 46.97	13.8	5.65 33.92					
14.7	29.00 42.90	14.7	56.81 37.49	14.7	24.98 22.19	14.8	21.11 47.03	14.8	5.86 33.74					
15.7	30.33 42.96	15.7	57.06 37.55	15.7	25.17 22.13	15.8	21.24 47.07	15.8	6.07 33.59					
16.7	31.61 43.05	16.7	57.30 37.62	16.7	25.36 22.08	16.7	21.37 47.12	16.8	6.28 33.45					
17.7	32.85 43.14	17.7	57.57 37.68	17.7	25.53 22.03	17.7	21.50 47.16	17.8	6.48 33.33					
18.7	34.02 43.23	18.7	57.83 37.77	18.7	25.71 22.02	18.7	21.64 47.23	18.8	6.68 33.22					
19.7	35.14 43.31	19.7	58.10 37.85	19.7	25.86 21.99	19.7	21.78 47.29	19.8	6.88 33.12					
20.7	36.22 43.40	20.7	58.38 37.96	20.7	26.01 21.95	20.7	21.93 47.38	20.8	7.03 33.02					
21.7	37.30 43.45	21.7	58.67 38.09	21.7	26.16 21.90	21.7	22.08 47.46	21.8	7.19 32.90					
22.7	38.37 43.49	22.7	58.96 38.26	22.7	26.32 21.85	22.7	22.23 47.58	22.8	7.37 32.76					
23.7	39.49 43.54	23.7	59.25 38.43	23.7	26.48 21.77	23.7	22.39 47.72	23.8	7.55 32.61					
24.7	40.68 43.59	24.7	59.52 38.62	24.7	26.66 21.69	24.7	22.54 47.88	24.8	7.74 32.45					
25.7	41.93 43.64	25.7	59.77 38.83	25.7	26.84 21.62	25.7	22.68 48.06	25.8	7.94 32.30					
26.7	43.25 43.72	26.7	60.00 39.03	26.7	27.03 21.56	26.7	22.81 48.23	26.8	8.16 32.15					
27.7	44.61 43.80	27.7	60.22 39.22	27.7	27.23 21.51	27.7	22.94 48.41	27.7	8.39 32.02					
28.7	45.93 43.93	28.7	60.43 39.40	28.7	27.44 21.51	28.7	23.06 48.57	28.7	8.61 31.92					
29.7	47.22 44.06	29.7	60.65 39.55	29.7	27.64 21.51	29.7	23.17 48.72	29.7	8.84 31.84					
30.7	48.42 44.23	30.7	60.86 39.71	30.7	27.82 21.56	30.7	23.29 48.85	30.7	9.06 31.78					
31.6	49.52 44.40	31.7	61.09 39.86	31.7	28.00 21.60	31.7	23.42 48.99	31.7	9.26 31.73					
51.10	+51.09	12.27	-12.23	6.92	+6.85	6.10	-6.02	8.18	+8.12					
8 ^h 14 ^m 48 ^s .311		9 ^h 9 ^m 6 ^s .085		9 ^h 25 ^m 12 ^s .930		9 ^h 36 ^m 24 ^s .003		10 ^h 20 ^m 57 ^s .259						
+88° 53' 11".43		-85° 19' 42".77		+81° 41' 57".18		-80° 33' 50".61		+82° 59' 12".27						

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

77 Octantis. Mag. 6.3			Bradley 1672. Mag. 6.3			i Octantis. Mag. 5.4			32 H. Camelop. seq. Mag. 5.3			κ Octantis. Mag. 5.6		
Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.
	h m	° '		h m	° '		h m	° '		h m	° '		h m	° '
Nov. 10 59	-84 8		Nov. 12 14	+88 9		Nov. 12 45	-84 40		Nov. 12 48	+83 51		Nov. 13 26	-85 21	
	s	"		s	"		s	"		s	"		s	"
0.8	45.81	35.22	0.9	4.42	21.70	0.9	53.09	15.31	0.9	22.19	38.49	0.9	57.75	38.91
1.8	45.97	35.08	1.9	4.86	21.31	1.9	53.20	15.10	1.9	22.30	38.11	1.9	57.84	38.67
2.8	46.13	34.96	2.9	5.32	20.99	2.9	53.31	14.86	2.9	22.41	37.72	2.9	57.92	38.40
3.8	46.30	34.79	3.9	5.75	20.67	3.9	53.42	14.60	3.9	22.52	37.37	3.9	58.01	38.13
4.8	46.49	34.62	4.9	6.18	20.35	4.9	53.55	14.32	4.9	22.61	37.05	4.9	58.10	37.82
5.8	46.69	34.44	5.9	6.56	20.06	5.9	53.69	14.04	5.9	22.70	36.73	5.9	58.23	37.50
6.8	46.92	34.30	6.9	6.90	19.75	6.9	53.86	13.78	6.9	22.78	36.42	6.9	58.37	37.18
7.8	47.14	34.18	7.9	7.20	19.47	7.9	54.05	13.51	7.9	22.85	36.10	7.9	58.55	36.90
8.8	47.38	34.08	8.9	7.51	19.16	8.9	54.25	13.25	8.9	22.91	35.76	8.9	58.73	36.61
9.8	47.62	34.03	9.9	7.82	18.84	9.9	54.45	13.02	9.9	22.99	35.39	9.9	58.93	36.33
10.8	47.85	33.96	10.9	8.19	18.51	10.9	54.65	12.83	10.9	23.07	35.03	10.9	59.12	36.09
11.8	48.07	33.89	11.9	8.59	18.17	11.9	54.86	12.64	11.9	23.17	34.66	11.9	59.32	35.86
12.8	48.28	33.85	12.9	9.05	17.82	12.9	55.04	12.45	12.9	23.29	34.30	12.9	59.50	35.63
13.8	48.48	33.80	13.9	9.54	17.50	13.9	55.23	12.27	13.9	23.42	33.94	13.9	59.68	35.41
14.8	48.68	33.74	14.9	10.07	17.18	14.9	55.40	12.08	14.9	23.56	33.57	14.9	59.85	35.19
15.8	48.88	33.69	15.9	10.62	16.89	15.9	55.57	11.89	15.9	23.69	33.23	15.9	60.00	34.97
16.8	49.07	33.61	16.9	11.16	16.61	16.9	55.73	11.71	16.9	23.83	32.89	16.9	60.16	34.76
17.8	49.27	33.53	17.9	11.71	16.33	17.9	55.90	11.50	17.9	23.98	32.61	17.9	60.31	34.50
18.8	49.48	33.46	18.9	12.24	16.09	18.9	56.07	11.30	18.9	24.12	32.30	18.9	60.49	34.24
19.8	49.70	33.40	19.8	12.75	15.84	19.9	56.26	11.10	19.9	24.26	32.01	19.9	60.67	33.98
20.8	49.94	33.34	20.8	13.23	15.60	20.9	56.47	10.89	20.9	24.38	31.74	20.9	60.87	33.73
21.8	50.17	33.29	21.8	13.67	15.38	21.9	56.69	10.68	21.9	24.48	31.47	21.9	61.09	33.50
22.8	50.43	33.29	22.8	14.10	15.14	22.9	56.93	10.51	22.9	24.60	31.18	22.9	61.33	33.27
23.8	50.68	33.28	23.8	14.55	14.86	23.9	57.18	10.35	23.9	24.71	30.88	23.9	61.59	33.06
24.8	50.93	33.31	24.8	15.00	14.59	24.9	57.43	10.23	24.9	24.84	30.55	24.9	61.86	32.87
25.8	51.18	33.37	25.8	15.49	14.31	25.9	57.70	10.14	25.9	24.97	30.23	25.9	62.13	32.72
26.8	51.41	33.43	26.8	16.05	14.03	26.9	57.93	10.02	26.9	25.12	29.89	26.9	62.37	32.57
27.8	51.62	33.50	27.8	16.65	13.74	27.8	58.16	9.94	27.9	25.29	29.55	27.9	62.61	32.45
28.8	51.82	33.56	28.8	17.30	13.45	28.8	58.37	9.87	28.8	25.48	29.23	28.9	62.83	32.32
29.8	52.02	33.59	29.8	18.00	13.22	29.8	58.57	9.77	29.8	25.66	28.94	29.9	63.03	32.17
30.8	52.22	33.60	30.8	18.69	13.00	30.8	58.76	9.66	30.8	25.85	28.66	30.9	63.23	32.00
31.8	52.43	33.61	31.8	19.31	12.81	31.8	58.97	9.52	31.8	26.03	28.42	31.9	63.45	31.82
9.80	-9.75		31.05	+31.04		10.77	-10.72		9.35	+9.29		12.36	-12.32	
10 ^h 59 ^m	55 ^s .642		12 ^h 14 ^m	28 ^s .053		12 ^h 46 ^m	1 ^s .183		12 ^h 48 ^m	29 ^s .976		13 ^h 27 ^m	5 ^s .514	
-84° 8' 31".24			+88° 9' 56".03			-84° 40' 2".72			+83° 52' 10".05			-85° 21' 23".59		

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

δ Octantis. Mag. 4.1			Groombridge 2283. Mag. 7.2			ρ Octantis. Mag. 5.7			ϵ Ursæ Minoris. Mag. 4.4			59 G. Apodis. Mag. 5.9		
Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.
Nov.	h m	° '	Nov.	h m	° '	Nov.	h m	° '	Nov.	h m	° '	Nov.	h m	° '
	14 13	-83 17		15 3	+87 32		15 23	-84 11		16 54	+82 10		17 15	-80 47
	s	"		s	"		s	"		s	"		s	"
0.9	16.16	21.73	1.0	12.64	67.86	1.0	44.00	37.46	1.1	17.16	39.50	1.1	49.54	21.44
1.9	16.19	21.47	2.0	12.51	67.45	2.0	43.98	37.20	2.1	17.05	39.15	2.1	49.47	21.24
2.9	16.22	21.19	3.0	12.41	67.05	3.0	43.95	36.92	3.1	16.94	38.82	3.1	49.41	21.03
3.9	16.25	20.90	4.0	12.33	66.68	4.0	43.92	36.62	4.1	16.83	38.51	4.1	49.33	20.80
4.9	16.28	20.57	5.0	12.25	66.34	5.0	43.90	36.30	5.1	16.73	38.22	5.1	49.25	20.53
5.9	16.32	20.25	6.0	12.17	65.98	6.0	43.88	35.97	6.1	16.64	37.95	6.1	49.18	20.27
6.9	16.39	19.91	6.9	12.05	65.66	7.0	43.88	35.62	7.1	16.54	37.70	7.1	49.11	19.96
7.9	16.47	19.58	7.9	11.91	65.35	8.0	43.91	35.26	8.1	16.42	37.47	8.1	49.05	19.65
8.9	16.56	19.26	8.9	11.75	65.03	9.0	43.95	34.92	9.1	16.31	37.21	9.1	49.00	19.33
9.9	16.67	18.96	9.9	11.60	64.65	10.0	44.00	34.56	10.1	16.20	36.94	10.1	48.98	19.01
10.9	16.78	18.68	10.9	11.45	64.29	11.0	44.06	34.26	11.1	16.09	36.65	11.1	48.96	18.71
11.9	16.89	18.42	11.9	11.35	63.91	11.9	44.12	33.96	12.1	15.98	36.34	12.1	48.94	18.43
12.9	16.99	18.17	12.9	11.25	63.51	12.9	44.18	33.66	13.1	15.88	36.01	13.1	48.91	18.16
13.9	17.09	17.93	13.9	11.19	63.11	13.9	44.24	33.39	14.1	15.77	35.66	14.1	48.89	17.90
14.9	17.18	17.69	14.9	11.17	62.71	14.9	44.28	33.12	15.1	15.69	35.31	15.1	48.86	17.64
15.9	17.27	17.44	15.9	11.16	62.32	15.9	44.32	32.84	16.1	15.61	34.96	16.1	48.82	17.39
16.9	17.35	17.17	16.9	11.19	61.93	16.9	44.35	32.56	17.0	15.54	34.61	17.1	48.79	17.13
17.9	17.43	16.90	17.9	11.23	61.54	17.9	44.38	32.25	18.0	15.47	34.26	18.1	48.75	16.85
18.9	17.51	16.63	18.9	11.27	61.19	18.9	44.42	31.95	19.0	15.40	33.92	19.1	48.71	16.58
19.9	17.60	16.36	19.9	11.30	60.83	19.9	44.46	31.62	20.0	15.34	33.58	20.1	48.66	16.26
20.9	17.71	16.07	20.9	11.32	60.54	20.9	44.52	31.29	21.0	15.27	33.28	21.1	48.64	15.94
21.9	17.83	15.76	21.9	11.34	60.20	21.9	44.60	30.94	22.0	15.21	32.99	22.1	48.62	15.60
22.9	17.97	15.49	22.9	11.32	59.88	22.9	44.69	30.59	23.0	15.14	32.70	23.0	48.61	15.24
23.9	18.12	15.22	23.9	11.29	59.54	23.9	44.81	30.27	24.0	15.06	32.42	24.0	48.60	14.88
24.9	18.29	14.99	24.9	11.26	59.18	24.9	44.94	29.97	25.0	14.99	32.11	25.0	48.62	14.55
25.9	18.45	14.78	25.9	11.25	58.81	25.9	45.07	29.69	26.0	14.91	31.78	26.0	48.65	14.25
26.9	18.60	14.59	26.9	11.27	58.41	26.9	45.20	29.44	27.0	14.84	31.42	27.0	48.67	13.95
27.9	18.76	14.42	27.9	11.31	58.01	27.9	45.32	29.22	28.0	14.77	31.03	28.0	48.70	13.69
28.9	18.90	14.25	28.9	11.41	57.61	28.9	45.43	28.98	29.0	14.72	30.62	29.0	48.72	13.43
29.9	19.02	14.06	29.9	11.55	57.22	29.9	45.54	28.73	30.0	14.68	30.22	30.0	48.73	13.17
30.9	19.15	13.86	30.9	11.71	56.85	30.9	45.62	28.47	31.0	14.64	29.84	31.0	48.73	12.91
31.9	19.27	13.64	31.9	11.89	56.50	31.9	45.70	28.21	32.0	14.62	29.49	32.0	48.72	12.61
8.56	-8.50		23.40	+23.38		9.88	-9.83		7.35	+7.28		6.25	-6.17	
14 ^h 13 ^m 18 ^s .531			15 ^h 3 ^m 0 ^s .607			15 ^h 23 ^m 43 ^s .237			16 ^h 54 ^m 31 ^s .741			17 ^h 15 ^m 43 ^s .730		
-83° 17' 4".27			+87° 33' 24".43			-84° 11' 17".84			+82° 10' 38".40			-80° 47' 2".69		

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

δ Ursæ Minoris. Mag. 4.4			χ Octantis. Mag. 5.2			λ Ursæ Minoris. Mag. 6.6			σ Octantis. Mag. 5.5			76 Draconis. Mag. 5.7		
Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.
	h m	° '		h m	° '		h m	° '		h m	° '		h m	° '
Nov. 17 58	+86 36		Nov. 18 5	-87 40		Nov. 19 1	+89 1		Nov. 19 26	-89 13		Nov. 20 48	+82 13	
	s	"		s	"		s	"		s	"		s	"
1.1	44.25	62.20	1.1	55.99	10.19	1.2	53.50	16.76	1.2	88.49	49.43	1.3	38.81	48.87
2.1	43.87	61.96	2.1	55.66	10.01	2.2	51.98	16.63	2.2	87.22	49.32	2.3	38.62	48.91
3.1	43.52	61.72	3.1	55.30	9.82	3.2	50.55	16.49	3.2	85.85	49.24	3.2	38.43	48.94
4.1	43.20	61.48	4.1	54.90	9.62	4.2	49.20	16.37	4.2	84.36	49.12	4.2	38.26	48.96
5.1	42.88	61.27	5.1	54.48	9.40	5.2	47.93	16.23	5.2	82.79	48.99	5.2	38.09	48.98
6.1	42.58	61.07	6.1	54.07	9.15	6.2	46.72	16.12	6.2	81.19	48.83	6.2	37.93	49.01
7.1	42.27	60.89	7.1	53.68	8.87	7.2	45.48	16.03	7.2	79.60	48.65	7.2	37.78	49.06
8.1	41.96	60.71	8.1	53.33	8.57	8.2	44.23	15.93	8.2	78.07	48.45	8.2	37.62	49.10
9.1	41.62	60.54	9.1	53.02	8.26	9.2	42.92	15.84	9.2	76.65	48.22	9.2	37.46	49.17
10.1	41.27	60.36	10.1	52.75	7.96	10.2	41.56	15.75	10.2	75.34	48.01	10.2	37.29	49.25
11.1	40.92	60.15	11.1	52.50	7.66	11.2	40.15	15.65	11.2	74.11	47.79	11.2	37.12	49.31
12.1	40.57	59.92	12.1	52.27	7.41	12.2	38.71	15.52	12.2	72.98	47.58	12.2	36.95	49.35
13.1	40.23	59.68	13.1	52.05	7.15	13.1	37.27	15.38	13.2	71.86	47.40	13.2	36.77	49.38
14.1	39.89	59.41	14.1	51.84	6.90	14.1	35.86	15.21	14.2	70.76	47.23	14.2	36.59	49.38
15.1	39.58	59.14	15.1	51.60	6.66	15.1	34.50	15.03	15.2	69.64	47.02	15.2	36.40	49.35
16.1	39.28	58.85	16.1	51.35	6.41	16.1	33.19	14.85	16.2	68.48	46.83	16.2	36.22	49.32
17.1	38.99	58.56	17.1	51.09	6.16	17.1	31.95	14.65	17.2	67.27	46.68	17.2	36.04	49.26
18.1	38.73	58.27	18.1	50.81	5.90	18.1	30.77	14.46	18.2	66.02	46.48	18.2	35.87	49.19
19.1	38.49	57.99	19.1	50.52	5.64	19.1	29.64	14.26	19.1	64.72	46.27	19.2	35.71	49.13
20.1	38.25	57.75	20.1	50.24	5.34	20.1	28.56	14.08	20.1	63.41	46.05	20.2	35.55	49.07
21.1	38.00	57.50	21.1	49.97	5.02	21.1	27.50	13.89	21.1	62.09	45.81	21.2	35.41	49.02
22.1	37.76	57.28	22.1	49.73	4.68	22.1	26.43	13.72	22.1	60.82	45.54	22.2	35.25	49.01
23.1	37.50	57.05	23.1	49.54	4.34	23.1	25.33	13.57	23.1	59.64	45.25	23.2	35.09	48.98
24.1	37.23	56.84	24.1	49.38	3.98	24.1	24.17	13.42	24.1	58.58	44.95	24.2	34.94	48.97
25.1	36.95	56.59	25.1	49.28	3.64	25.1	22.94	13.25	25.1	57.66	44.65	25.2	34.77	48.94
26.1	36.66	56.31	26.1	49.21	3.31	26.1	21.66	13.08	26.1	56.85	44.35	26.2	34.61	48.91
27.1	36.37	56.03	27.1	49.16	3.00	27.1	20.34	12.86	27.1	56.15	44.06	27.2	34.44	48.87
28.1	36.10	55.71	28.1	49.11	2.71	28.1	19.06	12.64	28.1	55.47	43.81	28.2	34.26	48.80
29.1	35.85	55.36	29.1	49.03	2.43	29.1	17.85	12.41	29.1	54.75	43.57	29.2	34.08	48.72
30.1	35.61	55.02	30.1	48.93	2.16	30.1	16.71	12.14	30.1	53.96	43.34	30.2	33.90	48.59
31.1	35.42	54.68	31.1	48.80	1.89	31.1	15.69	11.87	31.1	53.07	43.09	31.2	33.73	48.44
32.0	35.24	54.36	32.1	48.65	1.59	32.1	14.77	11.59	32.1	52.11	42.83	32.2	33.58	48.29
16.94	+16.91		24.58	-24.56		58.52	+58.51		74.39	-74.38		7.40	+7.33	
17 ^h 59 ^m 20 ^s .805			18 ^h 5 ^m 36 ^s .163			19 ^h 3 ^m 51 ^s .560			19 ^h 26 ^m 7 ^s .189			20 ^h 48 ^m 44 ^s .660		
+86° 36' 51".19			-87° 39' 52".21			+89° 0' 56".70			-89° 13' 35".99			+82° 13' 16".38		

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

λ Octantis. Mag. 5.4			ν Octantis. Mag. 5.7			β Octantis. Mag. 4.3			39 H. Cephei. Mag. 5.6			γ^1 Octantis. Mag. 5.1		
Wash. Mean Time.	Right Ascen- sion.	Declina- tion.	Wash. Mean Time.	Right Ascen- sion.	Declina- tion.	Wash. Mean Time.	Right Ascen- sion.	Declina- tion.	Wash. Mean Time.	Right Ascen- sion.	Declina- tion.	Wash. Mean Time.	Right Ascen- sion.	Declina- tion.
	h m ° '		h m ° '			h m ° '			h m ° '			h m ° '		
Nov. 21 38	-83 6		Nov. 22 16	-86 23		Nov. 22 37	-81 49		Nov. 23 27	+86 51		Nov. 23 47	-82 23	
	s "			s "			s "			s "			s "	
1.3	24.84	25.26	1.3	21.65	44.15	1.3	45.71	17.55	1.4	54.76	16.04	1.4	25.82	58.96
2.3	24.70	25.33	2.3	21.39	44.24	2.3	45.60	17.69	2.4	54.43	16.35	2.4	25.73	59.17
3.3	24.55	25.41	3.3	21.12	44.37	3.3	45.47	17.85	3.4	54.10	16.62	3.4	25.63	59.40
4.3	24.37	25.49	4.3	20.81	44.51	4.3	45.35	17.99	4.4	53.78	16.86	4.4	25.52	59.64
5.3	24.19	25.58	5.3	20.47	44.63	5.3	45.21	18.15	5.4	53.49	17.10	5.4	25.40	59.89
6.3	23.99	25.64	6.3	20.10	44.75	6.3	45.06	18.29	6.4	53.22	17.34	6.4	25.25	60.11
7.3	23.79	25.63	7.3	19.73	44.83	7.3	44.89	18.42	7.3	52.97	17.59	7.4	25.11	60.34
8.3	23.59	25.67	8.3	19.34	44.89	8.3	44.74	18.52	8.3	52.73	17.85	8.4	24.96	60.53
9.3	23.40	25.65	9.3	18.97	44.93	9.3	44.58	18.60	9.3	52.49	18.13	9.4	24.80	60.71
10.3	23.22	25.62	10.3	18.62	44.94	10.3	44.43	18.65	10.3	52.22	18.41	10.4	24.65	60.96
11.3	23.06	25.57	11.3	18.27	44.96	11.3	44.28	18.70	11.3	51.94	18.70	11.4	24.51	61.01
12.3	22.90	25.53	12.3	17.95	44.95	12.3	44.15	18.74	12.3	51.63	18.97	12.4	24.37	61.15
13.3	22.75	25.50	13.3	17.65	44.97	13.3	44.02	18.79	13.3	51.31	19.24	13.3	24.24	61.22
14.3	22.59	25.50	14.3	17.36	45.01	14.3	43.89	18.85	14.3	50.97	19.50	14.3	24.12	61.42
15.3	22.44	25.48	15.3	17.05	45.04	15.3	43.77	18.90	15.3	50.60	19.74	15.3	24.00	61.57
16.2	22.29	25.46	16.3	16.74	45.08	16.3	43.65	18.97	16.3	50.23	19.97	16.3	23.88	61.72
17.2	22.12	25.46	17.3	16.43	45.11	17.3	43.51	19.05	17.3	49.85	20.17	17.3	23.74	61.88
18.2	21.95	25.46	18.3	16.10	45.13	18.3	43.37	19.12	18.3	49.49	20.36	18.3	23.60	62.05
19.2	21.77	25.44	19.3	15.75	45.16	19.3	43.23	19.18	19.3	49.15	20.55	19.3	23.47	62.21
20.2	21.58	25.40	20.3	15.38	45.19	20.3	43.07	19.25	20.3	48.81	20.72	20.3	23.31	62.37
21.2	21.40	25.35	21.3	15.01	45.20	21.3	42.90	19.30	21.3	48.48	20.90	21.3	23.13	62.53
22.2	21.20	25.27	22.3	14.62	45.17	22.3	42.73	19.31	22.3	48.18	21.08	22.3	22.96	62.66
23.2	21.01	25.17	23.3	14.23	45.12	23.3	42.57	19.30	23.3	47.90	21.28	23.3	22.79	62.76
24.2	20.83	25.04	24.3	13.86	45.03	24.3	42.41	19.28	24.3	47.59	21.51	24.3	22.61	62.83
25.2	20.67	24.90	25.2	13.52	44.94	25.3	42.26	19.23	25.3	47.27	21.73	25.3	22.45	62.89
26.2	20.53	24.76	26.2	13.19	44.85	26.3	42.12	19.17	26.3	46.93	21.95	26.3	22.31	62.94
27.2	20.38	24.63	27.2	12.91	44.74	27.3	42.00	19.11	27.3	46.55	22.17	27.3	22.16	62.98
28.2	20.25	24.50	28.2	12.62	44.67	28.3	41.88	19.06	28.3	46.15	22.37	28.3	22.02	63.03
29.2	20.13	24.40	29.2	12.34	44.60	29.3	41.77	19.03	29.3	45.73	22.56	29.3	21.90	63.07
30.2	19.99	24.29	30.2	12.06	44.54	30.3	41.64	19.01	30.3	45.30	22.71	30.3	21.76	63.13
31.2	19.85	24.22	31.2	11.75	44.49	31.2	41.51	19.01	31.3	44.88	22.83	31.3	21.62	63.21
32.2	19.68	24.14	32.2	11.43	44.44	32.2	41.37	19.00	32.3	44.49	22.93	32.3	21.46	63.30
8.33	-8.27		15.91	-15.88		7.03	-6.96		18.23	+18.20		7.64	-7.58	
21 ^h 38 ^m 10 ^s .025			22 ^h 15 ^m 56 ^s .333			22 ^h 37 ^m 32 ^s .703			23 ^h 27 ^m 44 ^s .392			23 ^h 47 ^m 12 ^s .813		
-83° 6' 23".31			-86° 23' 45".22			-81° 49' 21".11			+86° 50' 39".03			-82° 29' 8".43		

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

43 H. Cephei. Mag. 4.5			α Ursæ Minoris. (Polaris.) Mag. 2.1			4 G. Octantis. Mag. 5.6			Groombridge 750. Mag. 6.7			Groombridge 944. Mag. 6.4		
Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.
Dec.	h m 0 57 s	° ' +85 49 " "	Dec.	h m 1 30 s	° ' +88 52 " "	Dec.	h m 1 42 s	° ' -85 11 " "	Dec.	h m 4 10 s	° ' +85 20 " "	Dec.	h m 5 35 s	° ' +85 9 " "
0.3	18.54	7.22	0.4	55.64	3.75	0.4	15.23	30.12	0.5	21.65	18.11	0.5	32.14	29.37
1.3	18.30	7.45	1.4	54.85	4.05	1.4	15.05	30.34	1.5	21.66	18.45	1.5	32.25	29.71
2.3	18.06	7.67	2.4	54.09	4.32	2.4	14.86	30.57	2.5	21.66	18.79	2.5	32.35	30.02
3.3	17.84	7.87	3.4	53.39	4.55	3.4	14.65	30.81	3.5	21.66	19.11	3.5	32.47	30.31
4.3	17.65	8.06	4.4	52.76	4.78	4.4	14.42	31.05	4.5	21.67	19.39	4.5	32.55	30.58
5.3	17.46	8.27	5.4	52.18	5.04	5.4	14.19	31.28	5.5	21.70	19.69	5.5	32.65	30.83
6.3	17.28	8.50	6.4	51.61	5.28	6.4	13.93	31.48	6.5	21.74	19.99	6.5	32.78	31.09
7.3	17.10	8.73	7.3	51.05	5.56	7.4	13.66	31.66	7.5	21.78	20.30	7.5	32.90	31.36
8.3	16.92	8.97	8.3	50.44	5.83	8.4	13.42	31.80	8.5	21.83	20.61	8.5	33.05	31.66
9.3	16.72	9.21	9.3	49.77	6.10	9.4	13.17	31.93	9.5	21.87	20.95	9.5	33.19	31.97
10.3	16.49	9.44	10.3	49.04	6.39	10.4	12.94	32.08	10.5	21.89	21.30	10.5	33.32	32.28
11.3	16.25	9.66	11.3	48.22	6.67	11.3	12.72	32.18	11.5	21.90	21.65	11.5	33.43	32.62
12.3	15.98	9.87	12.3	47.35	6.91	12.3	12.50	32.31	12.4	21.89	22.01	12.5	33.53	32.97
13.3	15.71	10.08	13.3	46.43	7.16	13.3	12.29	32.44	13.4	21.85	22.37	13.5	33.62	33.31
14.3	15.43	10.28	14.3	45.49	7.39	14.3	12.08	32.58	14.4	21.81	22.73	14.5	33.67	33.66
15.3	15.15	10.45	15.3	44.54	7.62	15.3	11.85	32.72	15.4	21.75	23.06	15.5	33.72	34.00
16.3	14.88	10.60	16.3	43.60	7.82	16.3	11.62	32.86	16.4	21.70	23.39	16.5	33.76	34.34
17.3	14.62	10.73	17.3	42.69	8.01	17.3	11.38	33.02	17.4	21.63	23.68	17.5	33.79	34.65
18.3	14.37	10.84	18.3	41.82	8.18	18.3	11.13	33.17	18.4	21.56	23.97	18.5	33.82	34.92
19.3	14.13	10.97	19.3	41.01	8.35	19.3	10.86	33.31	19.4	21.51	24.25	19.5	33.86	35.23
20.3	13.91	11.11	20.3	40.24	8.51	20.3	10.57	33.42	20.4	21.47	24.53	20.5	33.90	35.50
21.3	13.69	11.25	21.3	39.50	8.70	21.3	10.27	33.53	21.4	21.44	24.80	21.5	33.96	35.77
22.3	13.47	11.41	22.3	38.76	8.92	22.3	9.98	33.60	22.4	21.43	25.09	22.5	34.04	36.05
23.3	13.25	11.59	23.3	37.96	9.14	23.3	9.70	33.66	23.4	21.42	25.40	23.5	34.13	36.37
24.3	13.01	11.77	24.3	37.10	9.37	24.3	9.43	33.70	24.4	21.38	25.75	24.5	34.20	36.70
25.3	12.73	11.93	25.3	36.14	9.62	25.3	9.18	33.70	25.4	21.34	26.09	25.5	34.26	37.06
26.3	12.44	12.09	26.3	35.10	9.83	26.3	8.94	33.72	26.4	21.26	26.44	26.5	34.31	37.43
27.3	12.13	12.23	27.3	34.00	10.02	27.3	8.70	33.76	27.4	21.17	26.79	27.5	34.33	37.80
28.3	11.81	12.33	28.3	32.88	10.17	28.3	8.47	33.80	28.4	21.05	27.11	28.5	34.32	38.15
29.3	11.50	12.40	29.3	31.78	10.30	29.3	8.23	33.85	29.4	20.92	27.41	29.5	34.28	38.48
30.3	11.21	12.45	30.3	30.70	10.40	30.3	7.96	33.94	30.4	20.79	27.67	30.5	34.24	38.80
31.3	10.94	12.49	31.3	29.73	10.50	31.3	7.69	34.01	31.4	20.66	27.91	31.5	34.20	39.06
13.72	+13.68		50.65	+50.64		11.93	-11.89		12.31	+12.27		11.85	+11.81	
0 ^h 57 ^m	1 ^s .657		1 ^h 29 ^m	44 ^s .254		1 ^h 42 ^m	6 ^s .102		4 ^h 9 ^m	44 ^s .952		5 ^h 34 ^m	54 ^s .014	
+85° 48'	25''.87		+88° 51'	25''.03		-85° 11'	39''.58		+85° 20'	1''.04		+85° 9'	28''.07	

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

31 G. Mensæ. Mag. 6.2			ζ Mensæ. Mag. 5.6			51 H. Cephei. Mag. 5.3			25 H. Camelop. Mag. 5.1			7 G. Octantis. Mag. 6.4		
Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.
Dec.	h m	° '	Dec.	h m	° '	Dec.	h m	° '	Dec.	h m	° '	Dec.	h m	° '
	5 46	-84 49		6 47	-80 43		7 2	+87 10		7 13	+82 34		7 16	-86 53
	s	"		s	"		s	"		s	"		s	"
0.5	26.75	37.60	0.6	4.37	25.09	0.6	33.98	45.09	0.6	53.80	19.78	0.6	34.13	52.32
1.5	26.81	37.91	1.6	4.43	25.37	1.6	34.33	45.35	1.6	53.94	20.03	1.6	34.35	52.60
2.5	26.87	38.23	2.6	4.50	25.68	2.6	34.65	45.60	2.6	54.08	20.24	2.6	34.58	52.87
3.5	26.93	38.59	3.6	4.57	26.01	3.6	34.94	45.83	3.6	54.21	20.44	3.6	34.83	53.15
4.5	26.97	38.97	4.6	4.64	26.39	4.6	35.23	46.03	4.6	54.32	20.63	4.6	35.07	53.50
5.5	27.00	39.36	5.6	4.70	26.77	5.6	35.55	46.23	5.6	54.44	20.81	5.6	35.28	53.86
6.5	27.01	39.76	6.6	4.76	27.14	6.6	35.88	46.42	6.6	54.59	20.99	6.6	35.47	54.22
7.5	27.01	40.15	7.6	4.81	27.53	7.6	36.23	46.61	7.6	54.73	21.17	7.6	35.65	54.59
8.5	27.00	40.52	8.6	4.84	27.90	8.6	36.59	46.83	8.6	54.88	21.35	8.6	35.79	54.96
9.5	26.98	40.89	9.6	4.89	28.27	9.6	36.96	47.06	9.6	55.04	21.56	9.6	35.91	55.29
10.5	26.96	41.23	10.6	4.92	28.62	10.6	37.31	47.33	10.6	55.19	21.79	10.6	36.02	55.63
11.5	26.93	41.56	11.6	4.94	28.95	11.6	37.67	47.59	11.6	55.34	22.02	11.6	36.14	55.95
12.5	26.91	41.87	12.6	4.97	29.29	12.6	38.01	47.88	12.6	55.48	22.29	12.6	36.24	56.25
13.5	26.90	42.17	13.6	5.00	29.61	13.6	38.30	48.17	13.6	55.62	22.57	13.6	36.35	56.56
14.5	26.89	42.49	14.6	5.03	29.93	14.6	38.58	48.48	14.6	55.73	22.84	14.6	36.48	56.86
15.5	26.87	42.81	15.5	5.07	30.27	15.6	38.82	48.79	15.6	55.83	23.12	15.6	36.61	57.16
16.5	26.87	43.14	16.5	5.09	30.60	16.6	39.06	49.08	16.6	55.93	23.39	16.6	36.74	57.48
17.5	26.85	43.51	17.5	5.12	30.97	17.6	39.25	49.36	17.6	56.02	23.64	17.6	36.88	57.81
18.5	26.82	43.88	18.5	5.15	31.33	18.6	39.45	49.62	18.6	56.11	23.88	18.6	37.01	58.16
19.5	26.79	44.26	19.5	5.18	31.73	19.5	39.66	49.87	19.6	56.20	24.12	19.6	37.12	58.55
20.5	26.75	44.65	20.5	5.19	32.14	20.5	39.88	50.11	20.6	56.28	24.35	20.6	37.22	58.93
21.5	26.67	45.04	21.5	5.21	32.56	21.5	40.12	50.35	21.6	56.39	24.56	21.6	37.28	59.32
22.5	26.59	45.41	22.5	5.22	32.97	22.5	40.38	50.58	22.5	56.52	24.77	22.6	37.32	59.72
23.5	26.50	45.77	23.5	5.21	33.36	23.5	40.66	50.85	23.5	56.64	25.01	23.5	37.32	60.11
24.5	26.40	46.11	24.5	5.20	33.73	24.5	40.95	51.15	24.5	56.77	25.27	24.5	37.32	60.48
25.5	26.30	46.41	25.5	5.19	34.08	25.5	41.22	51.45	25.5	56.89	25.55	25.5	37.28	60.81
26.5	26.20	46.70	26.5	5.17	34.41	26.5	41.46	51.79	26.5	57.00	25.88	26.5	37.27	61.13
27.5	26.11	46.99	27.5	5.16	34.75	27.5	41.66	52.13	27.5	57.10	26.20	27.5	37.27	61.45
28.5	26.03	47.30	28.5	5.15	35.06	28.5	41.83	52.48	28.5	57.18	26.53	28.5	37.27	61.77
29.5	25.96	47.61	29.5	5.15	35.39	29.5	41.95	52.82	29.5	57.23	26.84	29.5	37.30	62.10
30.5	25.88	47.95	30.5	5.15	35.76	30.5	42.05	53.14	30.5	57.29	27.14	30.5	37.34	62.46
31.5	25.81	48.31	31.5	5.15	36.15	31.5	42.13	53.42	31.5	57.32	27.41	31.5	37.37	62.82
11.08	-11.04		6.20	-6.12		20.33	+20.30		7.74	+7.67		18.49	-18.46	
5 ^h 46 ^m 26 ^s .439			6 ^h 47 ^m 3 ^s .489			7 ^h 1 ^m 34 ^s .861			7 ^h 13 ^m 29 ^s .477		7 ^h 16 ^m 40 ^s .555			
-84° 49' 48".17			-80° 43' 34".16			+87° 11' 0".11			+82° 34' 36".50		-86° 54' 0".14			

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

Groombridge 1119. Mag. 7.0			ζ Octantis. Mag. 5.4			1 H. Draconis. Mag. 4.6			ζ Chamæleontis. Mag. 5.2			30 H. Camelop. Mag. 5.3		
Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.
	h m ° ' "			h m ° ' "			h m ° ' "			h m ° ' "			h m ° ' "	
Dec.	8 16 +88 52		Dec.	9 9 -85 19		Dec.	9 25 +81 41		Dec.	9 36 -80 33		Dec.	10 21 +82 58	
	s "			s "			s "			s "			s "	
0.7	48.42	44.23	0.7	0.86	39.71	0.7	27.82	21.56	0.7	23.29	48.85	0.7	9.06	31.78
1.6	49.52	44.40	1.7	1.09	39.86	1.7	28.00	21.60	1.7	23.42	48.99	1.7	9.26	31.73
2.6	50.53	44.55	2.7	1.33	40.03	2.7	28.15	21.65	2.7	23.55	49.13	2.7	9.45	31.70
3.6	51.49	44.70	3.7	1.61	40.20	3.7	28.30	21.69	3.7	23.69	49.29	3.7	9.63	31.67
4.6	52.42	44.83	4.7	1.87	40.42	4.7	28.44	21.72	4.7	23.83	49.46	4.7	9.81	31.64
5.6	53.38	44.94	5.7	2.13	40.65	5.7	28.59	21.73	5.7	23.98	49.67	5.7	9.98	31.59
6.6	54.35	45.06	6.7	2.38	40.93	6.7	28.74	21.72	6.7	24.12	49.90	6.7	10.15	31.53
7.6	55.40	45.17	7.7	2.63	41.19	7.7	28.92	21.73	7.7	24.26	50.14	7.7	10.34	31.45
8.6	56.50	45.29	8.7	2.85	41.46	8.7	29.09	21.73	8.7	24.40	50.38	8.7	10.53	31.38
9.6	57.61	45.44	9.7	3.05	41.72	9.7	29.26	21.76	9.7	24.51	50.62	9.7	10.74	31.33
10.6	58.74	45.61	10.7	3.25	41.98	10.7	29.44	21.80	10.7	24.62	50.86	10.7	10.96	31.30
11.6	59.86	45.79	11.7	3.44	42.22	11.7	29.63	21.86	11.7	24.74	51.10	11.7	11.18	31.28
12.6	60.95	45.98	12.7	3.62	42.44	12.7	29.80	21.94	12.7	24.85	51.33	12.7	11.40	31.26
13.6	61.99	46.21	13.7	3.80	42.68	13.7	29.97	22.05	13.7	24.96	51.53	13.7	11.61	31.27
14.6	62.96	46.44	14.6	3.99	42.90	14.7	30.13	22.19	14.7	25.07	51.74	14.7	11.81	31.31
15.6	63.87	46.67	15.6	4.18	43.14	15.7	30.29	22.31	15.7	25.17	51.96	15.7	12.02	31.36
16.6	64.72	46.90	16.6	4.38	43.38	16.7	30.44	22.43	16.7	25.29	52.18	16.7	12.20	31.42
17.6	65.51	47.13	17.6	4.61	43.63	17.7	30.58	22.56	17.7	25.40	52.40	17.7	12.38	31.48
18.6	66.27	47.34	18.6	4.81	43.90	18.6	30.72	22.68	18.7	25.53	52.64	18.7	12.55	31.53
19.6	67.02	47.54	19.6	5.02	44.19	19.6	30.85	22.78	19.7	25.65	52.92	19.7	12.72	31.57
20.6	67.80	47.72	20.6	5.23	44.51	20.6	30.98	22.87	20.7	25.77	53.21	20.7	12.88	31.59
21.6	68.62	47.92	21.6	5.43	44.86	21.6	31.13	22.92	21.6	25.89	53.53	21.7	13.06	31.60
22.6	69.50	48.10	22.6	5.61	45.19	22.6	31.28	23.00	22.6	26.00	53.86	22.7	13.24	31.61
23.6	70.45	48.29	23.6	5.76	45.56	23.6	31.44	23.11	23.6	26.11	54.19	23.7	13.44	31.62
24.6	71.43	48.50	24.6	5.90	45.89	24.6	31.62	23.21	24.6	26.21	54.52	24.7	13.65	31.63
25.6	72.41	48.73	25.6	6.02	46.22	25.6	31.79	23.34	25.6	26.30	54.84	25.7	13.87	31.67
26.6	73.33	49.00	26.6	6.14	46.51	26.6	31.97	23.48	26.6	26.38	55.14	26.7	14.09	31.74
27.6	74.19	49.28	27.6	6.26	46.81	27.6	32.12	23.67	27.6	26.45	55.42	27.7	14.29	31.84
28.6	74.94	49.57	28.6	6.39	47.10	28.6	32.26	23.87	28.6	26.54	55.69	28.7	14.48	31.98
29.6	75.59	49.85	29.6	6.53	47.37	29.6	32.39	24.07	29.6	26.62	55.97	29.7	14.66	32.12
30.6	76.16	50.13	30.6	6.68	47.68	30.6	32.50	24.27	30.6	26.72	56.27	30.7	14.81	32.25
31.6	76.68	50.38	31.6	6.86	47.99	31.6	32.61	24.46	31.6	26.82	56.57	31.7	14.97	32.37
51.14	+51.13		12.28	-12.24		6.92	+6.85		6.10	-6.02		8.18	+8.12	
8 ^h 14 ^m 48 ^s .311			9 ^h 9 ^m 6 ^s .085			9 ^h 25 ^m 12 ^s .930			9 ^h 36 ^m 24 ^s .003			10 ^h 20 ^m 57 ^s .259		
+88° 53' 11".43			-85° 19' 42".77			+81° 41' 57".18			-80° 33' 50".61			+82° 59' 12".27		

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

γ Octantis. Mag. 6.3			Bradley 1672. Mag. 6.3			ι Octantis. Mag. 5.4			32 H. Camelop. seq. Mag. 5.3			κ Octantis. Mag. 5.6		
Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.
Dec.	h m	s	Dec.	h m	s	Dec.	h m	s	Dec.	h m	s	Dec.	h m	s
	10 59	-84 8		12 14	+88 9		12 45	-84 40		12 48	+83 51		13 27	-85 21
0.8	52.22	33.60	0.8	18.66	13.00	0.8	58.76	9.66	0.8	25.85	28.66	0.9	3.23	32.00
1.8	52.43	33.61	1.8	19.31	12.81	1.8	58.97	9.52	1.8	26.03	28.42	1.9	3.45	31.82
2.8	52.65	33.62	2.8	19.92	12.63	2.8	59.19	9.38	2.8	26.20	28.22	2.9	3.67	31.65
3.8	52.89	33.65	3.8	20.49	12.46	3.8	59.43	9.25	3.8	26.35	28.00	3.9	3.92	31.45
4.8	53.14	33.69	4.8	21.01	12.30	4.8	59.69	9.11	4.8	26.50	27.78	4.9	4.19	31.25
5.8	53.41	33.76	5.8	21.53	12.12	5.8	59.96	9.02	5.8	26.64	27.55	5.9	4.48	31.08
6.8	53.67	33.85	6.8	22.03	11.92	6.8	60.24	8.94	6.8	26.78	27.31	6.9	4.77	30.94
7.7	53.91	33.97	7.8	22.58	11.72	7.8	60.52	8.89	7.8	26.94	27.05	7.8	5.08	30.83
8.7	54.16	34.10	8.8	23.16	11.51	8.8	60.79	8.84	8.8	27.11	26.80	8.8	5.37	30.72
9.7	54.38	34.23	9.8	23.79	11.28	9.8	61.04	8.81	9.8	27.29	26.55	9.8	5.66	30.62
10.7	54.60	34.37	10.8	24.45	11.09	10.8	61.29	8.80	10.8	27.48	26.29	10.8	5.94	30.55
11.7	54.80	34.49	11.8	25.15	10.90	11.8	61.54	8.77	11.8	27.68	26.04	11.8	6.20	30.48
12.7	55.00	34.59	12.8	25.87	10.74	12.8	61.77	8.72	12.8	27.88	25.82	12.8	6.45	30.38
13.7	55.22	34.70	13.8	26.59	10.58	13.8	62.00	8.71	13.8	28.09	25.61	13.8	6.70	30.29
14.7	55.40	34.80	14.8	27.31	10.45	14.8	62.22	8.67	14.8	28.30	25.42	14.8	6.94	30.21
15.7	55.61	34.90	15.8	28.02	10.35	15.8	62.45	8.63	15.8	28.51	25.26	15.8	7.20	30.10
16.7	55.83	35.01	16.8	28.70	10.25	16.8	62.69	8.59	16.8	28.71	25.10	16.8	7.46	30.00
17.7	56.06	35.12	17.8	29.35	10.17	17.8	62.95	8.55	17.8	28.89	24.96	17.8	7.74	29.89
18.7	56.29	35.25	18.8	29.96	10.08	18.8	63.22	8.49	18.8	29.08	24.82	18.8	8.03	29.78
19.7	56.52	35.40	19.8	30.55	9.98	19.8	63.49	8.49	19.8	29.26	24.68	19.8	8.34	29.68
20.7	56.77	35.58	20.8	31.12	9.88	20.8	63.78	8.49	20.8	29.42	24.51	20.8	8.67	29.61
21.7	57.00	35.78	21.8	31.71	9.74	21.8	64.09	8.52	21.8	29.59	24.34	21.8	9.01	29.57
22.7	57.24	36.01	22.8	32.33	9.62	22.8	64.38	8.57	22.8	29.77	24.17	22.8	9.35	29.56
23.7	57.46	36.24	23.8	32.98	9.49	23.8	64.66	8.66	23.8	29.98	23.98	23.8	9.68	29.57
24.7	57.66	36.47	24.8	33.68	9.36	24.8	64.94	8.75	24.8	30.18	23.78	24.8	9.98	29.60
25.7	57.85	36.71	25.8	34.44	9.25	25.8	65.18	8.84	25.8	30.41	23.60	25.8	10.27	29.63
26.7	58.02	36.92	26.7	35.22	9.18	26.8	65.42	8.92	26.8	30.65	23.45	26.8	10.56	29.66
27.7	58.20	37.12	27.7	36.01	9.09	27.8	65.65	8.99	27.8	30.89	23.34	27.8	10.81	29.67
28.7	58.37	37.30	28.7	36.77	9.06	28.8	65.88	9.03	28.8	31.12	23.24	28.8	11.08	29.65
29.7	58.56	37.47	29.7	37.49	9.04	29.8	66.11	9.07	29.8	31.32	23.15	29.8	11.35	29.64
30.7	58.76	37.66	30.7	38.16	9.03	30.8	66.38	9.12	30.8	31.53	23.09	30.8	11.63	29.60
31.7	58.98	37.88	31.7	38.79	9.03	31.8	66.64	9.16	31.8	31.72	23.04	31.8	11.96	29.57
9.80	-9.75		31.02	+31.01		10.76	-10.72		9.35	+9.29		12.36	-12.32	
10 ^h 59 ^m 55 ^s .642			12 ^h 14 ^m 28 ^s .053			12 ^h 46 ^m 1 ^s .183			12 ^h 48 ^m 29 ^s .976			13 ^h 27 ^m 5 ^s .514		
-84° 8' 31".24			+88° 9' 56".03			-84° 40' 2".72			+83° 52' 10".05			-85° 21' 23".59		

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

δ Octantis. Mag. 4.1			Groombridge 2283. Mag. 7.2			ρ Octantis. Mag. 5.7			ϵ Ursæ Minoris. Mag. 4.4			59 G. Apodis. Mag. 5.9		
Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.
Dec.	h m	s "	Dec.	h m	s "	Dec.	h m	s "	Dec.	h m	s "	Dec.	h m	s "
0.9	19.15	13.86	0.9	11.71	56.85	0.9	45.62	28.47	1.0	14.64	29.84	1.0	48.73	12.91
1.9	19.27	13.64	1.9	11.89	56.50	1.9	45.70	28.21	2.0	14.62	29.49	2.0	48.72	12.61
2.9	19.40	13.40	2.9	12.04	56.18	2.9	45.79	27.92	3.0	14.60	29.15	3.0	48.71	12.29
3.9	19.54	13.15	3.9	12.20	55.88	3.9	45.91	27.61	4.0	14.57	28.82	4.0	48.71	11.94
4.9	19.71	12.91	4.9	12.31	55.58	4.9	46.03	27.29	4.9	14.54	28.51	5.0	48.73	11.58
5.9	19.88	12.69	5.9	12.42	55.27	5.9	46.18	26.97	5.9	14.51	28.20	6.0	48.75	11.22
6.9	20.07	12.49	6.9	12.52	54.96	6.9	46.35	26.68	6.9	14.47	27.88	7.0	48.79	10.87
7.9	20.27	12.31	7.9	12.61	54.63	7.9	46.52	26.40	7.9	14.44	27.56	8.0	48.83	10.54
8.9	20.46	12.15	8.9	12.73	54.28	8.9	46.70	26.14	8.9	14.41	27.22	9.0	48.88	10.22
9.9	20.65	12.01	9.9	12.85	53.92	9.9	46.87	25.92	9.9	14.39	26.86	9.9	48.94	9.93
10.9	20.83	11.86	10.9	13.05	53.55	10.9	47.04	25.70	10.9	14.37	26.48	10.9	48.99	9.65
11.9	21.00	11.73	11.9	13.27	53.19	11.9	47.20	25.50	11.9	14.36	26.08	11.9	49.04	9.38
12.9	21.16	11.61	12.9	13.51	52.82	12.9	47.35	25.29	12.9	14.35	25.69	12.9	49.10	9.11
13.9	21.32	11.47	13.9	13.77	52.45	13.9	47.50	25.08	13.9	14.36	25.30	13.9	49.14	8.84
14.9	21.48	11.33	14.9	14.05	52.17	14.9	47.63	24.86	14.9	14.37	24.92	14.9	49.17	8.55
15.9	21.65	11.18	15.9	14.33	51.86	15.9	47.77	24.64	15.9	14.39	24.55	15.9	49.20	8.26
16.9	21.82	11.02	16.9	14.62	51.58	16.9	47.91	24.38	16.9	14.40	24.19	16.9	49.24	7.97
17.9	21.99	10.86	17.9	14.90	51.31	17.9	48.08	24.12	17.9	14.42	23.86	17.9	49.28	7.65
18.9	22.18	10.69	18.9	15.15	51.04	18.9	48.25	23.87	18.9	14.44	23.55	18.9	49.32	7.32
19.8	22.38	10.53	19.9	15.39	50.79	19.9	48.43	23.62	19.9	14.45	23.24	19.9	49.38	6.99
20.8	22.60	10.40	20.9	15.61	50.53	20.9	48.65	23.39	20.9	14.46	22.93	20.9	49.46	6.65
21.8	22.82	10.29	21.9	15.82	50.24	21.9	48.87	23.17	21.9	14.47	22.60	21.9	49.55	6.32
22.8	23.05	10.22	22.9	16.04	49.93	22.9	49.10	22.98	22.9	14.49	22.28	22.9	49.63	6.01
23.8	23.28	10.16	23.9	16.29	49.62	23.9	49.33	22.82	23.9	14.49	21.93	23.9	49.73	5.72
24.8	23.50	10.12	24.9	16.56	49.30	24.9	49.57	22.68	24.9	14.52	21.56	24.9	49.84	5.46
25.8	23.70	10.08	25.9	16.86	48.97	25.9	49.78	22.55	25.9	14.55	21.17	25.9	49.94	5.22
26.8	23.89	10.05	26.9	17.22	48.65	26.9	49.98	22.42	26.9	14.58	20.78	26.9	50.02	5.00
27.8	24.08	10.00	27.9	17.61	48.36	27.9	50.16	22.28	27.9	14.62	20.40	27.9	50.10	4.77
28.8	24.26	9.93	28.9	18.00	48.09	28.9	50.34	22.11	28.9	14.68	20.04	28.9	50.17	4.51
29.8	24.44	9.85	29.9	18.39	47.86	29.9	50.53	21.94	29.9	14.74	19.70	29.9	50.24	4.25
30.8	24.63	9.76	30.9	18.77	47.63	30.9	50.72	21.76	30.9	14.80	19.38	30.9	50.31	3.96
31.8	24.85	9.66	31.9	19.12	47.42	31.9	50.93	21.57	31.9	14.86	19.09	31.9	50.39	3.65
8.55	-8.50		23.37	+23.35		9.88	-9.83		7.34	+7.28		6.24	-6.16	
14 ^h 13 ^m 18 ^s .531			15 ^h 4 ^m 0 ^s .607			15 ^h 23 ^m 43 ^s .237			16 ^h 54 ^m 31 ^s .741			17 ^h 15 ^m 43 ^s .730		
-83° 17' 4''.27			+87° 33' 24'' .43			-84° 11' 17'' .84			+82° 10' 38'' .40			-80° 47' 2'' .69		

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

δ Ursæ Minoris. Mag. 4.4			χ Octantis. Mag. 5.2			λ Ursæ Minoris. Mag. 6.6			σ Octantis. Mag. 5.5			76 Draconis. Mag. 5.7		
Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.
	h m	° '		h m	° '		h m	° '		h m	° '		h m	° '
Dec.	17 58	+86° 36'	Dec.	18 5	-87° 39'	Dec.	19 0	+89° 1'	Dec.	19 26	-89° 13'	Dec.	20 48	+82° 13'
	s	"		s	"		s	"		s	"		s	"
1.1	35.42	54.68	1.1	48.80	61.89	1.1	75.69	11.87	1.1	53.07	43.09	1.2	33.73	48.44
2.0	35.24	54.36	2.1	48.65	61.59	2.1	74.77	11.59	2.1	52.11	42.83	2.2	33.58	48.29
3.0	35.07	54.05	3.1	48.49	61.28	3.1	73.92	11.35	3.1	51.09	42.56	3.2	33.43	48.14
4.0	34.92	53.77	4.0	48.35	60.92	4.1	73.10	11.12	4.1	50.07	42.26	4.2	33.29	48.03
5.0	34.75	53.50	5.0	48.24	60.55	5.1	72.26	10.90	5.1	49.13	41.94	5.2	33.16	47.93
6.0	34.59	53.24	6.0	48.18	60.17	6.1	71.39	10.68	6.1	48.29	41.61	6.2	33.03	47.83
7.0	34.40	52.97	7.0	48.16	59.80	7.1	70.46	10.47	7.1	47.54	41.27	7.2	32.89	47.73
8.0	34.21	52.68	8.0	48.17	59.44	8.1	69.49	10.25	8.1	46.92	40.93	8.2	32.74	47.64
9.0	34.02	52.38	9.0	48.21	59.09	9.1	68.51	10.04	9.1	46.41	40.60	9.2	32.59	47.53
10.0	33.83	52.06	10.0	48.26	58.75	10.1	67.51	9.78	10.1	45.95	40.27	10.1	32.43	47.40
11.0	33.65	51.72	11.0	48.31	58.44	11.1	66.55	9.52	11.1	45.53	39.97	11.1	32.28	47.25
12.0	33.49	51.36	12.0	48.36	58.15	12.1	65.63	9.21	12.1	45.11	39.67	12.1	32.13	47.09
13.0	33.34	51.01	13.0	48.40	57.85	13.1	64.78	8.91	13.1	44.65	39.38	13.1	31.98	46.9
14.0	33.23	50.67	14.0	48.42	57.53	14.1	63.99	8.60	14.1	44.17	39.09	14.1	31.83	46.71
15.0	33.13	50.32	15.0	48.42	57.22	15.1	63.27	8.29	15.1	43.63	38.80	15.1	31.68	46.51
16.0	33.05	49.97	16.0	48.42	56.92	16.1	62.64	7.99	16.1	43.07	38.50	16.1	31.55	46.29
17.0	32.98	49.63	17.0	48.41	56.60	17.1	62.05	7.71	17.1	42.47	38.19	17.1	31.42	46.07
18.0	32.92	49.31	18.0	48.42	56.24	18.1	61.50	7.40	18.1	41.90	37.85	18.1	31.30	45.86
19.0	32.86	49.01	19.0	48.47	55.88	19.0	60.97	7.14	19.1	41.34	37.50	19.1	31.19	45.66
20.0	32.79	48.73	20.0	48.54	55.50	20.0	60.41	6.87	20.1	40.88	37.12	20.1	31.09	45.48
20.9	32.72	48.43	21.0	48.68	55.12	21.0	59.82	6.61	21.1	40.52	36.75	21.1	30.97	45.31
21.9	32.64	48.13	22.0	48.82	54.74	22.0	59.17	6.35	22.1	40.32	36.36	22.1	30.85	45.15
22.9	32.55	47.82	22.9	49.00	54.38	23.0	58.47	6.09	23.1	40.25	35.96	23.1	30.73	44.99
23.9	32.46	47.50	23.9	49.25	54.03	24.0	57.72	5.80	24.1	40.30	35.60	24.1	30.60	44.81
24.9	32.36	47.15	24.9	49.49	53.71	25.0	56.98	5.49	25.0	40.41	35.26	25.1	30.47	44.60
25.9	32.26	46.78	25.9	49.73	53.41	26.0	56.30	5.17	26.0	40.52	34.93	26.1	30.34	44.38
26.9	32.20	46.37	26.9	49.94	53.12	27.0	55.71	4.82	27.0	40.58	34.61	27.1	30.20	44.13
27.9	32.15	45.98	27.9	50.11	52.85	28.0	55.22	4.47	28.0	40.55	34.31	28.1	30.08	43.84
28.9	32.14	45.61	28.9	50.25	52.55	29.0	54.86	4.13	29.0	40.43	34.00	29.1	29.97	43.55
29.9	32.16	45.28	29.9	50.39	52.24	30.0	54.59	3.81	30.0	40.25	33.67	30.1	29.87	43.28
30.9	32.20	44.94	30.9	50.53	51.91	31.0	54.37	3.48	31.0	40.04	33.32	31.1	29.77	43.01
31.9	32.24	44.64	31.9	50.69	51.53	32.0	54.17	3.20	32.0	39.88	32.96	32.1	29.69	42.76
16.93	+16.90		24.55	-24.53		58.41	+58.40		74.17	-74.16		7.40	+7.33	
17 ^h 59 ^m 20 ^s .805			18 ^h 5 ^m 36 ^s .163			19 ^h 3 ^m 51 ^s .560			19 ^h 26 ^m 7 ^s .189			20 ^h 48 ^m 44 ^s .660		
+86° 36' 51 ^{''} .19			-87° 39' 52 ^{''} .21			+89° 0' 56 ^{''} .70			-89° 13' 35 ^{''} .99			+82° 13' 16 ^{''} .38		

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

λ Octantis. Mag. 5.4			ν Octantis. Mag. 5.7			β Octantis. Mag. 4.3			39 H. Cephei. Mag. 5.6			γ^1 Octantis. Mag. 5.1		
Wash. Mean Time.	Right Ascen- sion.	Declina- tion.	Wash. Mean Time.	Right Ascen- sion.	Declina- tion.	Wash. Mean Time.	Right Ascen- sion.	Declina- tion.	Wash. Mean Time.	Right Ascen- sion.	Declina- tion.	Wash. Mean Time.	Right Ascen- sion.	Declina- tion.
Dec.	h m 21 38 s	° ' -83 6	Dec.	h m 22 16 s	° ' -86 23	Dec.	h m 22 37 s	° ' -81 49	Dec.	h m 23 27 s	° ' +86 51	Dec.	h m 23 47 s	° ' -82 29
1.2	19.85	24.22	1.2	11.75	44.49	1.2	41.51	19.01	1.3	44.88	22.83	1.3	21.62	3.21
2.2	19.68	24.14	2.2	11.43	44.44	2.2	41.37	19.00	2.3	44.49	22.93	2.3	21.46	3.30
3.2	19.50	24.03	3.2	11.06	44.38	3.2	41.21	18.98	3.3	44.12	23.03	3.3	21.29	3.38
4.2	19.32	23.90	4.2	10.69	44.31	4.2	41.05	18.95	4.3	43.77	23.13	4.3	21.11	3.45
5.2	19.14	23.75	5.2	10.32	44.20	5.2	40.88	18.89	5.3	43.44	23.24	5.3	20.93	3.51
6.2	18.97	23.57	6.2	9.96	44.06	6.2	40.72	18.80	6.3	43.12	23.36	6.3	20.74	3.54
7.2	18.81	23.38	7.2	9.60	43.92	7.2	40.56	18.70	7.3	42.79	23.49	7.3	20.56	3.54
8.2	18.66	23.17	8.2	9.26	43.74	8.2	40.41	18.57	8.3	42.44	23.63	8.3	20.38	3.54
9.2	18.53	22.95	9.2	8.95	43.57	9.2	40.28	18.45	9.3	42.06	23.77	9.3	20.22	3.51
10.2	18.39	22.74	10.2	8.67	43.42	10.2	40.15	18.33	10.3	41.67	23.90	10.3	20.08	3.47
11.2	18.27	22.54	11.2	8.38	43.26	11.2	40.03	18.21	11.3	41.26	24.02	11.3	19.93	3.43
12.2	18.16	22.36	12.2	8.11	43.11	12.2	39.91	18.09	12.3	40.83	24.10	12.3	19.79	3.41
13.2	18.04	22.18	13.2	7.86	42.97	13.2	39.79	17.97	13.2	40.40	24.17	13.3	19.64	3.40
14.2	17.92	22.03	14.2	7.59	42.83	14.2	39.66	17.87	14.2	39.97	24.23	14.3	19.50	3.38
15.2	17.79	21.87	15.2	7.29	42.70	15.2	39.54	17.79	15.2	39.54	24.26	15.3	19.35	3.37
16.2	17.64	21.69	16.2	6.98	42.56	16.2	39.41	17.70	16.2	39.12	24.29	16.3	19.19	3.36
17.2	17.50	21.50	17.2	6.67	42.42	17.2	39.26	17.60	17.2	38.73	24.30	17.3	19.01	3.35
18.2	17.36	21.30	18.2	6.35	42.27	18.2	39.11	17.48	18.2	38.36	24.28	18.3	18.84	3.34
19.2	17.20	21.08	19.2	6.01	42.09	19.2	38.96	17.35	19.2	38.01	24.30	19.2	18.66	3.31
20.2	17.05	20.84	20.2	5.67	41.88	20.2	38.82	17.18	20.2	37.67	24.33	20.2	18.47	3.26
21.2	16.91	20.58	21.2	5.35	41.63	21.2	38.67	16.98	21.2	37.32	24.37	21.2	18.29	3.18
22.2	16.78	20.29	22.2	5.06	41.38	22.2	38.53	16.77	22.2	36.98	24.43	22.2	18.12	3.06
23.2	16.68	20.00	23.2	4.80	41.12	23.2	38.41	16.56	23.2	36.61	24.49	23.2	17.95	2.93
24.1	16.60	19.70	24.2	4.56	40.84	24.2	38.31	16.33	24.2	36.21	24.55	24.2	17.81	2.79
25.1	16.52	19.42	25.2	4.35	40.60	25.2	38.22	16.11	25.2	35.79	24.58	25.2	17.67	2.66
26.1	16.44	19.17	26.2	4.15	40.35	26.2	38.13	15.90	26.2	35.35	24.59	26.2	17.55	2.53
27.1	16.37	18.92	27.2	3.93	40.14	27.2	38.04	15.70	27.2	34.90	24.60	27.2	17.42	2.40
28.1	16.28	18.69	28.2	3.71	39.94	28.2	37.94	15.51	28.2	34.46	24.56	28.2	17.28	2.29
29.1	16.18	18.45	29.2	3.48	39.73	29.2	37.82	15.34	29.2	34.03	24.49	29.2	17.14	2.19
30.1	16.08	18.21	30.2	3.22	39.51	30.2	37.69	15.17	30.2	33.63	24.42	30.2	16.98	2.10
31.1	15.96	17.96	31.2	2.94	39.29	31.2	37.57	14.99	31.2	33.28	24.35	31.2	16.80	2.01
32.1	15.83	17.67	32.1	2.64	39.06	32.2	37.43	14.78	32.2	32.94	24.28	32.2	16.63	1.91
8.33	-8.27		15.90	-15.87		7.03	-6.96		18.24	+18.21		7.65	-7.58	
21 ^h 38 ^m 10 ^s .025			22 ^h 15 ^m 56 ^s .333			22 ^h 37 ^m 32 ^s .703			23 ^h 27 ^m 44 ^s .392			23 ^h 47 ^m 12 ^s .813		
-83° 6' 23".31			-86° 23' 45".22			-81° 49' 21".11			+86° 50' 39".03			-82° 29' 8".43		

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	33 Piscium. Mag. 4.7		α Andromedæ. (Alpheratz.) Mag. 2.2		β Cassiopeiæ. Mag. 2.4		ϵ Phœnicis. Mag. 3.9	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 0 1	° ' " 10	h m 0 4	° ' " 37	h m 0 4	° ' " 41	h m 0 5	° ' " 12
Jan. 0.2	2.843	37.03	2.970	50.08	41.151	33.48	9.974	49.66
10.2	2.743	37.56	2.839	49.21	40.851	32.80	9.779	49.28
20.2	2.650	38.00	2.714	48.07	40.563	31.60	9.598	48.45
30.1	2.568	38.30	2.602	46.73	40.298	29.93	9.440	47.17
Feb. 9.1	2.501	38.44	2.507	45.24	40.071	27.86	9.307	45.49
19.1	2.455	38.40	2.437	43.65	39.890	25.50	9.207	43.44
29.1	2.434	38.18	2.398	42.05	39.770	22.91	9.144	41.07
Mar. 10.0	2.444	37.74	2.394	40.52	39.718	20.23	9.123	38.42
20.0	2.487	37.06	2.432	39.13	39.740	17.56	9.148	35.56
30.0	2.567	36.15	2.515	37.95	39.842	15.03	9.222	32.53
Apr. 9.0	2.685	35.00	2.645	37.05	40.024	12.72	9.347	29.41
18.9	2.843	33.61	2.821	36.48	40.282	10.74	9.524	26.25
28.9	3.039	32.02	3.041	36.28	40.612	9.17	9.751	23.10
May 8.9	3.271	30.23	3.301	36.47	41.004	8.06	10.026	20.06
18.8	3.532	28.30	3.596	37.05	41.448	7.45	10.344	17.17
28.8	3.820	26.25	3.918	38.00	41.933	7.37	10.697	14.51
June 7.8	4.128	24.13	4.258	39.33	42.444	7.82	11.077	12.12
17.8	4.446	22.02	4.610	40.98	42.967	8.79	11.477	10.08
27.7	4.767	19.96	4.962	42.91	43.490	10.25	11.885	8.44
July 7.7	5.082	17.99	5.306	45.08	43.999	12.17	12.291	7.23
17.7	5.384	16.17	5.635	47.43	44.480	14.48	12.682	6.48
27.7	5.665	14.53	5.940	49.90	44.925	17.15	13.050	6.22
Aug. 6.6	5.920	13.12	6.215	52.43	45.323	20.11	13.386	6.43
16.6	6.142	11.97	6.454	54.98	45.667	23.28	13.679	7.10
26.6	6.328	11.07	6.655	57.49	45.953	26.62	13.924	8.22
Sept. 5.5	6.478	10.48	6.815	59.90	46.176	30.04	14.113	9.72
15.5	6.585	10.15	6.933	62.18	46.336	33.48	14.247	11.54
25.5	6.656	10.05	7.011	64.29	46.431	36.88	14.323	13.63
Oct. 5.5	6.689	10.19	7.051	66.19	46.464	40.16	14.344	15.86
15.4	6.691	10.55	7.056	67.86	46.438	43.24	14.310	18.17
25.4	6.662	11.05	7.028	69.28	46.356	46.09	14.229	20.45
Nov. 4.4	6.610	11.65	6.974	70.42	46.223	48.61	14.107	22.59
14.4	6.537	12.36	6.894	71.27	46.043	50.76	13.951	24.53
24.3	6.452	13.12	6.797	71.81	45.823	52.48	13.770	26.16
Dec. 4.3	6.354	13.88	6.683	72.03	45.570	53.72	13.571	27.42
14.3	6.249	14.62	6.559	71.93	45.292	54.44	13.363	28.27
24.2	6.142	15.31	6.428	71.52	44.998	54.63	13.153	28.67
34.2	6.038	15.91	6.294	70.79	44.696	54.27	12.947	28.60
Mean Place	2.184	38.90	2.546	36.11	41.242	11.42	9.038	39.56
Sec δ , Tan δ	1.006	-0.108	1.140	+0.546	1.924	+1.645	1.445	-1.043
$D\psi\alpha$, $D\omega\alpha$	+0.06	+0.01	+0.06	-0.04	+0.06	-0.11	+0.06	+0.07
$D\psi\delta$, $D\omega\delta$	+0.4	0.0	+0.4	0.0	+0.4	0.0	+0.4	0.0

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	22 Andromedæ. Mag. 5.1		γ Pegasi. Mag. 2.9		σ Andromedæ. Mag. 4.5		ι Ceti. Mag. 3.8	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 0 5	° ' " +45 36	h m 0 8	° ' " +14 42	h m 0 13	° ' " +36 19	h m 0 15	° ' " - 9 16
	s	"	s	"	s	"	s	"
Jan. 0.2	57.232	36.43	55.081	69.24	56.546	27.00	9.662	81.06
10.2	57.038	35.63	54.973	68.45	56.393	26.21	9.556	81.58
20.2	56.851	34.41	54.869	67.55	56.242	25.10	9.455	81.95
30.2	56.681	32.83	54.774	66.58	56.103	23.69	9.364	82.15
Feb. 9.1	56.534	30.95	54.696	65.57	55.982	22.05	9.286	82.17
19.1	56.420	28.84	54.636	64.58	55.887	20.25	9.227	81.99
29.1	56.348	26.61	54.604	63.66	55.827	18.39	9.193	81.60
Mar. 10.0	56.324	24.35	54.602	62.88	55.805	16.52	9.186	80.98
20.0	56.353	22.17	54.637	62.27	55.829	14.76	9.214	80.13
30.0	56.440	20.15	54.711	61.90	55.904	13.18	9.279	79.04
Apr. 9.0	56.588	18.39	54.827	61.80	56.029	11.85	9.382	77.73
18.9	56.792	16.95	54.986	61.99	56.205	10.85	9.525	76.18
28.9	57.051	15.92	55.185	62.50	56.431	10.21	9.709	74.44
May 8.9	57.358	15.33	55.420	63.32	56.700	9.98	9.930	72.53
18.8	57.707	15.20	55.690	64.46	57.007	10.16	10.184	70.49
28.8	58.088	15.56	55.986	65.87	57.346	10.79	10.466	68.35
June 7.8	58.492	16.38	56.300	67.54	57.706	11.82	10.769	66.18
17.8	58.906	17.66	56.627	69.41	58.079	13.21	11.085	64.03
27.7	59.322	19.35	56.956	71.43	58.453	14.97	11.407	61.95
July 7.7	59.727	21.40	57.279	73.58	58.821	17.03	11.726	60.00
17.7	60.113	23.78	57.589	75.77	59.175	19.36	12.033	58.21
27.7	60.470	26.43	57.879	77.97	59.504	21.87	12.324	56.66
Aug. 6.6	60.790	29.26	58.140	80.10	59.801	24.53	12.588	55.34
16.6	61.070	32.24	58.371	82.15	60.064	27.22	12.823	54.31
26.6	61.302	35.31	58.566	84.06	60.286	29.97	13.022	53.57
Sept. 5.5	61.487	38.38	58.722	85.80	60.466	32.68	13.183	53.12
15.5	61.622	41.40	58.840	87.35	60.601	35.32	13.305	52.97
25.5	61.709	44.32	58.920	88.68	60.695	37.81	13.389	53.08
Oct. 5.5	61.748	47.08	58.966	89.78	60.747	40.12	13.438	53.43
15.4	61.743	49.62	58.978	90.66	60.760	42.22	13.451	53.98
25.4	61.699	51.92	58.960	91.31	60.738	44.07	13.433	54.69
Nov. 4.4	61.617	53.89	58.918	91.74	60.685	45.62	13.391	55.50
14.4	61.502	55.51	58.854	91.94	60.603	46.87	13.326	56.38
24.3	61.362	56.75	58.773	91.95	60.498	47.78	13.245	57.27
Dec. 4.3	61.198	57.56	58.680	91.74	60.372	48.32	13.151	58.15
14.3	61.018	57.93	58.576	91.35	60.234	48.51	13.048	58.97
24.2	60.827	57.84	58.466	90.78	60.085	48.31	12.940	59.69
34.2	60.630	57.30	58.354	90.05	59.929	47.73	12.830	60.30
Mean Place	57.008	17.41	54.507	59.83	56.123	10.37	8.902	82.15
Sec δ, Tan δ	1.430	+1.022	1.034	+0.263	1.241	+0.735	1.013	-0.164
Dφ α, D ₀ α	+0.06	-0.07	+0.06	-0.02	+0.06	-0.05	+0.06	+0.01
Dφ δ, D ₀ δ	+0.4	0.0	+0.4	0.0	+0.4	+0.1	+0.4	+0.1

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	ζ Tucanæ. Mag. 4.3		44 Piscium. Mag. 6.0		β Hydri. Mag. 2.9		α Phœnicis. Mag. 2.4	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 0 15	° ' " -65 21	h m 0 21	° ' " + 1 28	h m 0 21	° ' " -77 43	h m 0 22	° ' " -42 45
	s	"	s	"	s	"	s	"
Jan. 0.2	43.62	78.50	6.493	33.26	23.38	52.78	9.166	52.75
10.2	43.22 40	77.69 81	6.389 104	32.60 66	22.46 92	51.74 104	8.980 186	52.64 11
20.2	42.84 38	76.32 137	6.289 100	31.97 63	21.61 85	50.11 163	8.804 176	52.08 54
30.2	42.50 34	74.41 191	6.196 93	31.41 56	20.84 77	47.94 217	8.645 159	51.08 100
Feb. 9.1	42.21 29	72.05 236	6.115 81	30.94 47	20.16 68	45.29 265	8.506 139	49.68 140
	24	277	61	36	56	307	111	179
19.1	41.97 17	69.28 312	6.054 40	30.58 19	19.60 43	42.22 338	8.395 78	47.89 212
29.1	41.80 10	66.16 337	6.014 11	30.39 2	19.17 27	38.84 364	8.317 41	45.77 242
Mar. 10.0	41.70 2	62.79 359	6.003 24	30.37 19	18.90 14	35.20 379	8.276 2	43.35 268
20.0	41.68 6	59.20 367	6.027 60	30.56 43	18.76 2	31.41 388	8.278 49	40.67 286
30.0	41.74 14	55.53 373	6.087 99	30.99 68	18.78 18	27.53 387	8.327 99	37.81 301
Apr. 9.0	41.88 21	51.80 368	6.186 140	31.67 92	18.96 33	23.66 379	8.426 148	34.80 336
18.9	42.09 30	48.12 356	6.326 180	32.59 120	19.29 48	19.87 361	8.574 197	31.72 311
28.9	42.39 38	44.56 339	6.506 218	33.79 142	19.77 63	16.26 338	8.771 245	28.61 304
May 8.9	42.77 44	41.17 310	6.724 252	35.21 164	20.40 75	12.88 306	9.016 324	25.57 296
18.9	43.21 51	38.07 278	6.976 278	36.85 181	21.15 86	9.82 267	9.305 324	22.62 275
28.8	43.72 55	35.29 238	7.254 302	38.66 194	22.01 96	7.15 224	9.629 356	19.86 261
June 7.8	44.27 58	32.91 193	7.556 314	40.60 203	22.97 102	4.91 175	9.985 375	17.35 280
17.8	44.85 60	30.98 143	7.870 320	42.63 208	23.99 107	3.16 121	10.360 388	15.15 186
27.7	45.45 60	29.55 89	8.190 317	44.71 205	25.06 108	1.95 66	10.748 388	13.29 143
July 7.7	46.05 59	28.66 35	8.507 307	46.76 198	26.14 107	1.29 7	11.136 380	11.86 100
17.7	46.64 57	28.31 20	8.814 289	48.74 186	27.21 101	1.22 51	11.516 360	10.86 52
27.7	47.21 51	28.51 75	9.103 265	50.60 170	28.22 94	1.73 106	11.876 332	10.34 5
Aug. 6.6	47.72 45	29.26 127	9.368 236	52.30 151	29.16 84	2.79 158	12.208 295	10.29 42
16.6	48.17 39	30.53 173	9.604 201	53.81 128	30.00 71	4.37 205	12.503 252	10.71 87
26.6	48.56 30	32.26 215	9.805 166	55.09 103	30.71 54	6.42 245	12.755 203	11.58 128
Sept. 5.6	48.86 21	34.41 247	9.971 127	56.12 78	31.25 37	8.87 274	12.958 151	12.86 164
15.5	49.07 10	36.88 269	10.098 55	56.90 53	31.62 19	11.61 296	13.109 97	14.50 192
25.5	49.17 2	39.57 282	10.191 22	57.43 30	31.81 0	14.57 305	13.206 44	16.42 213
Oct. 5.5	49.19 7	42.39 283	10.246 6	57.73 10	31.81 37	17.62 288	13.250 50	18.55 224
15.4	49.12 16	45.22 273	10.268 33	57.81 29	31.62 53	20.64 260	13.244 92	20.79 217
25.4	48.96 24	47.95 218	10.262 53	57.71 41	31.25 67	23.52 222	13.194 127	23.05 202
Nov. 4.4	48.72 30	50.44 176	10.229 73	57.42 51	30.72 79	26.12 176	13.102 152	25.22 173
14.4	48.42 36	52.62 127	10.176 85	57.01 61	30.05 88	28.34 121	12.975 173	27.24 144
24.3	48.06 42	54.38 73	10.103 96	56.50 66	29.26 93	30.10 61	12.823 186	28.99 106
Dec. 4.3	47.67 43	55.65 16	10.018 103	55.89 68	28.38 94	31.31 1	12.650 192	30.43 63
14.3	47.25 42	56.38 45	9.922 107	55.23 69	27.45 94	31.91 64	12.464 192	31.49 18
24.3	46.82	56.54	9.819	54.55	26.51	31.91	12.272	32.12
34.2	46.40	56.09	9.712	53.86	25.57	31.27	12.080	32.30
Mean Place	42.336	65.12	5.761	28.25	21.425	38.37	8.145	43.75
Sec δ , Tan δ	2.399	-2.180	1.000	+0.026	4.703	-4.596	1.362	-0.925
$D\phi a$, $D_m a$	+0.06	+0.15	+0.06	0.00	+0.05	+0.31	+0.06	+0.06
$D\phi \delta$, $D_m \delta$	+0.4	+0.1	+0.4	+0.1	+0.4	+0.1	+0.4	+0.1

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	12 Ceti. Mag. 6.0			13 Ceti. Mag. 5.2			ζ Cassiopeæ. Mag. 3.7			π Andromedæ. Mag. 4.4		
	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.
	h m 0 25	s 0 25	" -4 24	h m 0 30	s 0 30	" -4 2	h m 0 32	s +53 26	" +53 26	h m 0 32	s +33 15	" +33 15
Jan. 0.2	45.927	106	73.56	56.251	105	74.95	17.451	248	26.88	24.028	145	41.74
10.2	45.821	102	74.16	56.146	104	75.55	17.203	248	26.46	23.883	146	41.08
20.2	45.719	96	74.66	56.042	98	76.07	16.955	236	25.54	23.737	139	40.13
30.2	45.623	84	75.04	55.944	86	76.46	16.719	213	24.18	23.598	124	38.90
Feb. 9.1	45.539	60	75.27	55.858	70	76.71	16.506	179	22.42	23.474	104	37.46
19.1	45.473	44	75.35	55.788	47	76.80	16.327	133	20.35	23.370	73	35.88
29.1	45.429	15	75.24	55.741	20	76.71	16.194	79	18.06	23.297	38	34.19
Mar. 10.1	45.414	17	74.91	55.721	13	76.41	16.115	53	15.64	23.259	5	32.51
20.0	45.431	55	74.36	55.734	50	75.86	16.098	17	13.19	23.264	52	30.93
30.0	45.486	92	73.58	55.784	88	75.12	16.151	122	10.83	23.316	102	29.49
Apr. 9.0	45.578	135	72.55	55.872	130	74.12	16.273	193	8.66	23.418	152	28.29
18.9	45.713	175	71.28	56.002	172	72.88	16.466	259	6.77	23.570	201	27.37
28.9	45.888	212	69.79	56.174	208	71.41	16.725	321	5.22	23.771	248	26.80
May 8.9	46.100	248	68.09	56.382	244	69.74	17.046	373	4.09	24.019	285	26.61
18.9	46.348	275	66.23	56.626	273	67.88	17.419	417	3.42	24.304	321	26.81
28.8	46.623	299	64.23	56.899	297	65.91	17.836	449	3.23	24.625	345	27.40
June 7.8	46.922	312	62.15	57.196	311	63.83	18.285	466	3.53	24.970	360	28.37
17.8	47.234	320	60.04	57.507	321	61.73	18.751	474	4.32	25.330	367	29.71
27.8	47.554	318	57.95	57.828	318	59.63	19.225	470	5.57	25.697	364	31.37
July 7.7	47.872	308	55.94	58.146	312	57.61	19.695	452	7.25	26.061	352	33.31
17.7	48.180	293	54.04	58.458	295	55.72	20.147	427	9.32	26.413	332	35.49
27.7	48.473	268	52.34	58.753	272	53.99	20.574	391	11.72	26.745	306	37.84
Aug. 6.6	48.741	240	50.82	59.025	243	52.47	20.965	349	14.42	27.051	273	40.32
16.6	48.981	206	49.56	59.268	212	51.20	21.314	301	17.32	27.324	237	42.86
26.6	49.187	169	48.56	59.480	174	50.18	21.615	248	20.41	27.561	197	45.42
Sept. 5.6	49.356	133	47.85	59.654	138	49.43	21.863	195	23.57	27.758	156	47.95
15.5	49.489	96	47.40	59.792	100	48.97	22.058	139	26.78	27.914	115	50.39
25.5	49.585	59	47.23	59.892	66	48.77	22.197	86	29.95	28.029	75	52.70
Oct. 5.5	49.644	25	47.29	59.958	32	48.81	22.283	34	33.03	28.104	38	54.84
15.5	49.669	4	47.57	59.990	1	49.08	22.317	17	35.96	28.142	4	56.80
25.4	49.665	31	48.02	59.991	25	49.53	22.300	63	38.68	28.146	20	58.51
Nov. 4.4	49.634	53	48.61	59.966	47	50.10	22.237	108	41.13	28.117	56	59.97
14.4	49.581	72	49.31	59.919	68	50.80	22.129	144	43.25	28.061	83	61.15
24.3	49.509	85	50.06	59.851	82	51.55	21.985	181	45.00	27.978	103	62.02
Dec. 4.3	49.424	97	50.84	59.769	94	52.33	21.804	210	46.32	27.875	122	62.56
14.3	49.327	104	51.61	59.675	102	53.10	21.594	231	47.18	27.753	136	62.77
24.3	49.223	107	52.33	59.573	107	53.84	21.363	246	47.54	27.617	144	62.64
34.2	49.116		53.00	59.466		54.52	21.117		47.41	27.473		62.17
Mean Place	45.133		76.57	55.429		78.18	17.061		5.23	23.421		25.61
Sec δ, Tan δ	1.003		-0.077	1.002		-0.071	1.679		+1.348	1.196		+0.656
D _α α, D _ω α	+0.06		+0.01	+0.06		0.00	+0.07		-0.09	+0.06		-0.04
D _δ δ, D _ω δ	+0.4		+0.1	+0.4		+0.1	+0.4		+0.1	+0.4		+0.1

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	ϵ Andromedæ. Mag. 4.5			δ Andromedæ. Mag. 3.5			α Cassiopeiæ. (Schedr.) Var. 2.2-2.8			μ Phœnicis. Mag. 4.6		
	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.
	h m	s	° ' "	h m	s	° ' "	h m	s	° ' "	h m	s	° ' "
	0 34		+28 51	0 34		+30 24	0 35		+56 4	0 37		-46 32
Jan. 0.2	7.439	134	35.73 68	50.593	137	20.13 66	44.278	272	58.95 35	22.601	213	56.55 1
10.2	7.305	135	35.05 93	50.456	138	19.47 93	44.006	273	58.60 86	22.388	205	56.50 42
20.2	7.170	129	34.12 116	50.318	133	18.54 117	43.733	260	57.74 132	22.183	192	55.97 108
30.2	7.041	115	32.96 134	50.185	118	17.37 136	43.473	237	56.42 174	21.991	172	54.96 183
Feb. 9.1	6.926	97	31.62 144	50.067	100	16.01 149	43.236	201	54.68 208	21.819	144	53.51 18
19.1	6.829	68	30.18 150	49.967	71	14.52 156	43.035	152	52.60 233	21.675	111	51.65 22
29.1	6.761	35	28.68 147	49.896	36	12.96 154	42.883	93	50.27 248	21.564	72	49.42 35
Mar. 10.1	6.726	5	27.21 138	49.860	4	11.42 145	42.790	27	47.79 252	21.492	26	46.87 26
20.0	6.731	49	25.83 120	49.864	49	9.97 129	42.763	46	45.27 246	21.466	22	44.07 20
30.0	6.780	97	24.63 98	49.913	97	8.68 105	42.809	121	42.81 229	21.488	74	41.05 217
Apr. 9.0	6.877	144	23.65 67	50.010	147	7.63 76	42.930	197	40.52 201	21.562	129	37.88 23
18.9	7.021	102	22.98 35	50.157	195	6.87 44	43.127	268	38.51 168	21.691	181	34.63 127
28.9	7.213	235	22.63 0	50.352	239	6.43 7	43.395	333	36.83 127	21.872	233	31.36 223
May 8.9	7.448	275	22.63 38	50.591	277	6.36 31	43.728	390	35.56 81	22.105	282	28.14 308
18.9	7.723	307	23.01 75	50.868	312	6.67 69	44.118	437	34.75 32	22.387	323	25.06 20
28.8	8.030	331	23.76 110	51.180	336	7.36 104	44.555	469	34.43 17	22.710	357	22.15 265
June 7.8	8.361	347	24.86 142	51.516	352	8.40 138	45.024	492	34.60 67	23.067	385	19.50 22
17.8	8.708	355	26.28 172	51.868	359	9.78 170	45.516	499	35.27 115	23.452	399	17.18 194
27.8	9.063	351	28.00 196	52.227	357	11.48 194	46.015	494	36.42 160	23.851	406	15.24 152
July 7.7	9.414	341	29.96 216	52.584	345	13.42 217	46.509	480	38.02 200	24.257	398	13.72 194
17.7	9.755	323	32.12 230	52.929	327	15.59 230	46.989	451	40.02 236	24.655	383	12.68 2
27.7	10.078	296	34.42 238	53.256	301	17.89 241	47.440	416	42.38 267	25.038	357	12.12 4
Aug. 6.6	10.374	266	36.80 242	53.557	269	20.30 246	47.856	371	45.05 290	25.395	321	12.08 81
16.6	10.640	231	39.22 239	53.826	236	22.76 245	48.227	322	47.95 310	25.716	278	12.52 30
26.6	10.871	192	41.61 234	54.062	195	25.21 240	48.549	267	51.05 321	25.994	227	13.45 130
Sept. 5.6	11.063	153	43.95 223	54.257	156	27.61 230	48.816	212	54.26 326	26.221	175	14.81 173
15.5	11.216	114	46.18 207	54.413	117	29.91 216	49.028	151	57.52 326	26.396	119	16.56 265
25.5	11.330	75	48.25 191	54.530	77	32.07 199	49.179	94	60.78 318	26.515	62	18.63 27
Oct. 5.5	11.405	41	50.16 169	54.607	42	34.06 179	49.273	39	63.96 303	26.577	9	20.90 242
15.5	11.446	5	51.85 147	54.649	8	35.85 156	49.312	15	66.99 284	26.586	43	23.32 26
25.4	11.451	24	53.32 121	54.657	24	37.41 131	49.297	65	69.83 258	26.543	88	25.77 226
Nov. 4.4	11.427	51	54.53 95	54.633	50	38.72 104	49.232	114	72.41 225	26.455	128	28.13 220
14.4	11.376	75	55.48 67	54.583	76	39.76 74	49.118	156	74.66 189	26.327	161	30.33 194
24.3	11.301	95	56.15 38	54.507	96	40.50 45	48.962	194	76.55 145	26.166	185	32.27 160
Dec. 4.3	11.206	112	56.53 7	54.411	114	40.95 13	48.768	227	78.00 98	25.981	204	33.87 130
14.3	11.094	124	56.60 23	54.297	127	41.08 19	48.541	253	78.98 46	25.777	214	35.07 75
24.3	10.970	134	56.37 53	54.170	137	40.89 48	48.288	268	79.44 4	25.563	218	35.82 57
34.2	10.836		55.84	54.033		40.41	48.020		79.40	25.345		36.09
Mean Place	6.788		20.97	49.946		4.85	43.885		36.64	21.444		46.93
Sec δ , Tan δ	1.142		+0.551	1.160		+0.587	1.792		+1.487	1.454		-1.055
$D\psi a$, $D_{\omega} a$	+0.06		-0.04	+0.06		-0.04	+0.07		-0.10	+0.06		+0.07
$D\psi \delta$, $D_{\omega} \delta$	+0.4		+0.1	+0.4		+0.2	+0.4		+0.2	+0.4		+0.2

APPARENT PLACES OF STARS, 1916.

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FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	β Ceti. Mag. 2.2		σ Cassiopeiae. Mag. 4.7		ϵ Cassiopeiae. Mag. 5.6		ζ Andromedæ. Mag. 4.3	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 0 39	° ' " -18 26	h m 0 40	° ' " +47 49	h m 0 40	° ' " +74 31	h m 0 42	° ' " +23 48
	s "	"	s "	"	s "	"	s "	"
Jan. 0.3	23.380	52.18	2.836	49.98	4.51	70.44	53.721	50.79
10.2	23.260	52.66	2.629	49.56	3.82	70.51	53.597	50.14
20.2	23.142	52.87	2.420	48.69	3.12	69.95	53.471	49.29
30.2	23.030	52.84	2.218	47.41	2.46	68.82	53.349	48.27
Feb. 9.1	22.929	52.53	2.033	45.78	1.86	67.14	53.237	47.10
19.1	22.844	51.95	1.877	43.88	1.33	64.99	53.142	45.87
29.1	22.783	51.10	1.758	41.77	0.92	62.47	53.072	44.62
Mar. 10.1	22.750	49.99	1.685	39.55	0.65	59.69	53.033	43.42
20.0	22.747	48.63	1.667	37.33	0.51	56.76	53.030	42.32
30.0	22.784	47.01	1.709	35.21	0.52	53.80	53.069	41.40
Apr. 9.0	22.861	45.18	1.813	33.26	0.70	50.94	53.155	40.71
19.0	22.980	43.13	1.980	31.59	1.03	48.29	53.286	40.29
28.9	23.142	40.95	2.208	30.26	1.50	45.93	53.464	40.19
May 8.9	23.344	38.64	2.493	29.30	2.11	43.97	53.685	40.42
18.9	23.582	36.25	2.827	28.79	2.82	42.47	53.944	40.99
28.8	23.854	33.84	3.200	28.74	3.62	41.48	54.237	41.89
June 7.8	24.151	31.46	3.605	29.15	4.48	41.03	54.553	43.11
17.8	24.466	29.18	4.029	30.01	5.39	41.13	54.888	44.61
27.8	24.792	27.05	4.462	31.30	6.32	41.77	55.230	46.37
July 7.7	25.120	25.11	4.892	32.99	7.25	42.94	55.572	48.31
17.7	25.442	23.44	5.310	35.03	8.14	44.62	55.906	50.42
27.7	25.748	22.06	5.705	37.37	8.99	46.76	56.224	52.62
Aug. 6.7	26.033	21.01	6.070	39.96	9.77	49.31	56.517	54.86
16.6	26.290	20.31	6.399	42.74	10.47	52.22	56.782	57.10
26.6	26.514	19.96	6.684	45.65	11.06	55.42	57.015	59.29
Sept. 5.6	26.702	19.97	6.924	48.62	11.56	58.86	57.210	61.38
15.5	26.851	20.31	7.115	51.61	11.96	62.45	57.369	63.34
25.5	26.960	20.96	7.258	54.56	12.23	66.13	57.490	65.15
Oct. 5.5	27.030	21.85	7.353	57.40	12.38	69.82	57.574	66.75
15.5	27.064	22.96	7.401	60.09	12.41	73.46	57.624	68.16
25.4	27.065	24.20	7.405	62.57	12.33	76.94	57.641	69.35
Nov. 4.4	27.036	25.53	7.367	64.78	12.14	80.21	57.629	70.31
14.4	26.982	26.87	7.291	66.70	11.82	83.17	57.592	71.02
24.4	26.905	28.17	7.180	68.26	11.41	85.75	57.530	71.49
Dec. 4.3	26.811	29.35	7.038	69.43	10.91	87.88	57.448	71.70
14.3	26.705	30.40	6.869	70.17	10.33	89.48	57.349	71.67
24.3	26.588	31.26	6.681	70.47	9.69	90.52	57.236	71.38
34.2	26.466	31.89	6.478	70.30	9.01	90.95	57.113	70.86
Mean Place	22.431	50.64	2.285	29.55	4.601	44.93	52.972	37.52
Sec δ , Tan δ	1.054	-0.334	1.490	+1.104	3.750	+3.615	1.093	+0.441
$D\phi a$, $D\omega a$	+0.06	+0.02	+0.07	-0.07	+0.08	-0.24	+0.06	-0.03
$D\phi \delta$, $D\omega \delta$	+0.4	+0.2	+0.4	+0.2	+0.4	+0.2	+0.4	+0.2

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	η Cassiopeiae. Mag. 3.6		δ Piscium. Mag. 4.6		λ Hydri. Mag. 5.0		20 Ceti. Mag. 4.9	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 0 43	° ' " +57 22	h m 0 44	° ' " + 7 7	h m 0 45	° ' " -75 22	h m 0 48	° ' " - 1 35
	s	"	s	"	s	"	s	"
Jan. 0.3	61.062	39.09	20.205	48.83	43.33	63.02	43.723	55.61
10.2	60.782 280	38.84 25	20.097 108	48.16 67	42.54 79	62.40 62	43.616 107	56.26 66
20.2	60.498 284	38.09 75	19.989 108	47.46 70	41.77 77	61.17 123	43.507 109	56.83 27
30.2	60.224 274	36.85 124	19.884 105	46.77 69	41.05 72	59.38 179	43.401 106	57.32 49
Feb. 9.1	59.972 252	35.16 169	19.787 97	46.11 66	40.40 65	57.07 231	43.303 98	57.67 35
	216	202	82	58	56	276	83	29
19.1	59.756	33.14	19.705	45.53	39.84	54.31	43.220	57.87
29.1	59.588 168	30.84 230	19.646 59	45.05 48	39.38 46	51.17 314	43.157 63	57.91 4
Mar. 10.1	59.480 108	28.34 250	19.613 33	44.71 34	39.04 34	47.71 346	43.121 36	57.74 17
20.0	59.441 39	25.80 254	19.612 1	44.57 14	38.81 23	44.06 365	43.115 6	57.38 28
30.0	59.476 35	23.29 251	19.650 38	44.64 7	38.72 9	40.27 379	43.146 31	56.78 60
	112	237	78	31	4	386	71	83
Apr. 9.0	59.588	20.92	19.728	44.95	38.76	36.41	43.217	55.95
19.0	59.781 193	18.80 212	19.848 120	45.51 56	38.93 17	32.59 382	43.331 114	54.86 109
28.9	60.048 267	17.01 179	20.011 163	46.35 84	39.23 30	28.87 372	43.485 154	53.55 131
May 8.9	60.383 335	15.61 140	20.214 203	47.45 110	39.66 43	25.35 352	43.679 194	52.03 152
18.9	60.778 395	14.66 95	20.452 238	48.79 134	40.22 56	22.08 327	43.909 230	50.30 173
	445	47	271	157	66	292	263	187
28.8	61.223	14.19	20.723	50.36	40.88	19.16	44.172	48.43
June 7.8	61.707 484	14.22 3	21.017 294	52.10 174	41.63 75	16.64 252	44.460 288	46.44 199
17.8	62.213 506	14.74 52	21.330 313	53.99 189	42.45 82	14.58 206	44.766 306	44.38 206
27.8	62.731 518	15.75 101	21.651 321	55.98 199	43.32 87	13.02 156	45.083 317	42.31 207
July 7.7	63.247 516	17.21 146	21.973 322	58.02 204	44.22 90	12.00 102	45.401 318	40.27 204
	501	187	315	202	90	43	314	193
17.7	63.748	19.08	22.288	60.04	45.12	11.57	45.715	38.34
27.7	64.224 476	21.34 226	22.588 300	62.00 196	45.99 87	11.74 17	46.013 298	36.55 179
Aug. 6.7	64.664 440	23.92 258	22.868 280	63.85 185	46.82 83	12.47 73	46.293 280	34.95 169
16.6	65.062 398	26.74 282	23.120 252	65.55 170	47.57 75	13.75 128	46.547 254	33.56 139
26.6	65.408 346	29.78 304	23.340 220	67.07 152	48.22 65	15.54 179	46.769 222	32.42 114
	294	317	188	132	52	224	190	88
Sept. 5.6	65.702	32.95	23.528	68.39	48.74	17.78	46.959	31.54
15.5	65.937 235	36.20 325	23.679 151	69.47 108	49.13 39	20.39 261	47.113 154	30.95 28
25.5	66.113 176	39.45 325	23.795 116	70.33 86	49.37 24	23.27 288	47.231 118	30.62 23
Oct. 5.5	66.230 117	42.65 320	23.876 81	70.95 62	49.45 8	26.32 305	47.313 82	30.52 10
15.5	66.289 59	45.73 308	23.924 48	71.35 40	49.38 7	29.40 308	47.364 51	30.65 13
	2	290	17	19	23	301	18	33
25.4	66.291	48.63	23.941	71.54	49.15	32.41	47.382	30.98
Nov. 4.4	66.241 50	51.28 265	23.932 9	71.55 1	48.76 39	35.21 280	47.374 8	31.47 49
14.4	66.139 102	53.62 234	23.898 34	71.39 16	48.26 50	37.71 250	47.341 33	32.07 60
24.4	65.991 148	55.59 197	23.843 55	71.08 31	47.65 61	39.79 208	47.287 54	32.78 71
Dec. 4.3	65.802 189	57.15 156	23.770 73	70.66 42	46.95 70	41.37 158	47.213 74	33.51 75
	226	110	87	53	76	101	86	76
14.3	65.576	58.25	23.683	70.13	46.19	42.38	47.127	34.27
24.3	65.321 255	58.83 58	23.585 98	69.53 60	45.40 70	42.78 40	47.028 99	35.01 74
34.2	65.045 276	58.90 7	23.479 106	68.87 66	44.59 81	42.57 21	46.921 107	35.70 69
Mean Place	60.577	16.35	19.361	41.35	41.158	49.23	42.811	60.06
Sec δ , Tan δ	1.855	+1.563	1.008	+0.125	3.961	-3.833	1.000	-0.028
$D\psi\alpha$, $D_\omega\alpha$	+0.07	-0.10	+0.06	-0.01	+0.04	+0.26	+0.06	0.00
$D\psi\delta$, $D_\omega\delta$	+0.4	+0.2	+0.4	+0.2	+0.4	+0.2	+0.4	+0.2

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	γ Cassiopeiæ. Mag. 2.2		μ Andromedæ. Mag. 3.9		α Sculptoris. Mag. 4.4		ϵ Piscium. Mag. 4.4	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 0 51 s	° ' " +60 15 "	h m 0 52 s	° ' " +38 2 "	h m 0 54 s	° ' " -29 48 "	h m 0 58 s	° ' " + 7 26 "
Jan. 0.3	38.19	67.11	5.882	56.15	34.590	45.99	35.851	25.16
10.2	37.87	67.03	5.723	55.71	34.444	46.41	35.743	24.51
20.2	37.55	66.41	5.558	54.90	34.297	46.46	35.631	23.83
30.2	37.23	65.29	5.397	53.78	34.155	46.14	35.519	23.16
Feb. 9.2	36.94	63.70	5.246	52.40	34.024	45.47	35.415	22.51
19.1	36.69	61.71	5.116	50.79	33.911	44.44	35.323	21.93
29.1	36.48	59.43	5.014	49.05	33.819	43.08	35.251	21.45
Mar. 10.1	36.34	56.93	4.949	47.24	33.758	41.41	35.204	21.11
20.0	36.28	54.33	4.928	45.46	33.731	39.46	35.189	20.95
30.0	36.30	51.75	4.956	43.80	33.743	37.24	35.212	20.99
Apr. 9.0	36.39	49.28	5.038	42.30	33.799	34.83	35.276	21.27
19.0	36.58	47.04	5.175	41.08	33.900	32.23	35.383	21.79
28.9	36.84	45.09	5.366	40.16	34.047	29.53	35.532	22.59
May 8.9	37.19	43.54	5.606	39.62	34.238	26.75	35.722	23.63
18.9	37.60	42.41	5.892	39.46	34.470	23.96	35.951	24.93
28.9	38.07	41.77	6.215	39.70	34.740	21.23	36.213	26.44
June 7.8	38.58	41.62	6.568	40.35	35.041	18.62	36.502	28.15
17.8	39.11	41.98	6.941	41.39	35.364	16.19	36.810	29.99
27.8	39.66	42.83	7.324	42.77	35.702	14.00	37.129	31.94
July 7.7	40.21	44.15	7.709	44.50	36.046	12.10	37.451	33.93
17.7	40.75	45.92	8.085	46.49	36.386	10.56	37.768	35.93
27.7	41.26	48.08	8.443	48.72	36.715	9.40	38.072	37.86
Aug. 6.7	41.74	50.58	8.778	51.12	37.025	8.66	38.359	39.70
16.6	42.17	53.37	9.081	53.65	37.308	8.35	38.619	41.39
26.6	42.54	56.40	9.348	56.25	37.557	8.46	38.852	42.91
Sept. 5.6	42.87	59.58	9.577	58.86	37.768	8.98	39.050	44.22
15.6	43.13	62.87	9.765	61.43	37.938	9.90	39.215	45.30
25.5	43.33	66.20	9.911	63.92	38.065	11.15	39.344	46.17
Oct. 5.5	43.47	69.49	10.015	66.29	38.150	12.68	39.440	46.79
15.5	43.54	72.70	10.080	68.48	38.194	14.41	39.503	47.20
25.4	43.55	75.73	10.107	70.48	38.199	16.25	39.534	47.39
Nov. 4.4	43.49	78.55	10.099	72.24	38.169	18.15	39.538	47.41
14.4	43.39	81.07	10.058	73.73	38.108	20.00	39.516	47.27
24.4	43.23	83.22	9.987	74.90	38.021	21.73	39.473	46.97
Dec. 4.3	43.02	84.96	9.890	75.75	37.911	23.26	39.408	46.56
14.3	42.77	86.24	9.768	76.25	37.785	24.55	39.328	46.05
24.3	42.49	87.01	9.628	76.38	37.646	25.55	39.233	45.46
34.3	42.18	87.24	9.472	76.14	37.499	26.20	39.128	44.81
Mean Place	37.632	43.70	5.138	38.24	33.480	41.17	34.919	17.32
Sec δ , Tan δ	2.016	+1.751	1.270	+0.783	1.153	-0.573	1.008	+0.131
$D\psi_a, D\omega_a$	+0.07	-0.11	+0.07	-0.05	+0.06	+0.04	+0.06	-0.01
$D\psi_\delta, D\omega_\delta$	+0.4	+0.2	+0.4	+0.2	+0.4	+0.2	+0.4	+0.3

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	β Phœnicis. Mag. 3.4		μ Cassiopeiæ. Mag. 5.3		η Ceti. Mag. 3.6		β Andromedæ. Mag. 2.4	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 1 2	° ' " —47 9	h m 1 2	° ' " +54 30	h m 1 4	° ' " —10 37	h m 1 5	° ' " +35 10
	s	"	s	"	s	"	s	"
Jan. 0.3	21.461	76.52 22	40.997	54.31	22.891	36.22	2.281	48.93
10.2	21.236 ²²⁵	76.74 22	40.756 ²⁴¹	54.18 13	22.778 ¹¹³	36.86 ⁶⁴	2.134 ¹⁴⁷	48.54 ³⁹
20.2	21.012 ²²⁴	76.46 28	40.505 ²⁵¹	53.58 60	22.662 ¹¹⁶	37.34 ⁴⁸	1.978 ¹⁵⁶	47.83 ⁷¹
30.2	20.797 ²¹⁵	75.68 78	40.257 ²⁴⁸	52.51 ¹⁰⁷	22.546 ¹¹⁶	37.61 ²⁷	1.822 ¹⁵⁶	46.84 ⁹⁹
Feb. 9.2	20.596 ²⁰¹	74.44 ¹²⁴	40.023 ²³⁴	51.01 ¹⁵⁰	22.436 ¹¹⁰	37.68 ¹⁶	1.673 ¹⁴⁹	45.58 ¹²⁶
	176	169	206	187	98	18	132	145
19.1	20.420	72.75	39.817	49.14	22.338	37.52	1.541	44.13
29.1	20.271 ¹⁴⁹	70.66 ²⁰⁹	39.651 ¹⁶⁶	47.00 ²¹⁴	22.280 ⁷⁸	37.13 ³⁹	1.434 ¹⁰⁷	42.55 ¹⁵⁸
Mar. 10.1	20.160 ¹¹¹	68.22 ²⁴⁴	39.536 ¹¹⁵	44.66 ²³⁴	22.206 ⁵⁴	36.50 ⁶³	1.361 ⁷³	40.91 ¹⁶⁴
20.0	20.093 ⁶⁷	65.49 ²⁷³	39.481 ⁵⁵	42.24 ²⁴²	22.183 ²³	35.63 ⁸⁷	1.328 ³³	39.28 ¹⁶³
30.0	20.075 ¹⁸	62.50 ²⁹⁹	39.496 ¹⁵	39.82 ²⁴²	22.196 ¹³	34.51 ¹¹²	1.343 ¹⁵	37.76 ¹⁵²
	33	316	86	231	52	135	66	138
Apr. 9.0	20.108	59.34	39.582	37.51	22.248	33.16	1.409	36.40
19.0	20.197 ⁸⁹	56.05 ³²⁹	39.743 ¹⁶¹	35.43 ²⁰⁸	22.342 ⁹⁴	31.57 ¹⁵⁹	1.527 ¹¹⁸	35.29 ¹¹¹
28.9	20.344 ¹⁴⁷	52.72 ³³³	39.977 ²³⁴	33.63 ¹⁸⁰	22.479 ¹³⁷	29.79 ¹⁷⁸	1.699 ¹⁷²	34.48 ⁸¹
May 8.9	20.543 ¹⁹⁹	49.40 ³³²	40.276 ²⁹⁹	32.19 ¹⁴⁴	22.658 ¹⁷⁹	27.64 ¹⁹⁵	1.920 ²²¹	34.00 ⁶⁸
18.9	20.795 ²⁵²	46.17 ³²³	40.638 ³⁶²	31.16 ¹⁰³	22.875 ²¹⁷	25.73 ²¹¹	2.187 ²⁶⁷	33.89 ¹¹
	298	305	411	58	252	219	306	28
28.9	21.093	43.12	41.049	30.58	23.127	23.54	2.493	34.15
June 7.8	21.432 ³³⁹	40.29 ²⁸³	41.500 ⁴⁵¹	30.48 ¹⁰	23.406 ²⁷⁹	21.31 ²²³	2.829 ³³⁶	34.80 ⁶⁶
17.8	21.800 ³⁶⁸	37.77 ²⁵²	41.980 ⁴⁸⁰	30.84 ³⁶	23.708 ³⁰²	19.09 ²²²	3.188 ³⁵⁹	35.80 ¹⁰⁰
27.8	22.191 ³⁹¹	35.62 ²¹⁵	42.476 ⁴⁹⁶	31.66 ⁸²	24.022 ³¹⁴	16.94 ²¹³	3.560 ³⁷²	37.14 ¹³⁴
July 7.7	22.594 ⁴⁰³	33.89 ¹⁷³	42.973 ⁴⁹⁷	32.93 ¹²⁷	24.342 ³²⁰	14.91 ²⁰³	3.935 ³⁷⁵	38.79 ¹⁶⁵
	403	127	490	166	318	186	370	190
17.7	22.997	32.62	43.463	34.59	24.660	13.05	4.305	40.69
27.7	23.389 ³⁹²	31.86 ⁷⁶	43.933 ⁴⁷⁰	36.64 ²⁰⁵	24.966 ³⁰⁶	11.42 ¹⁶³	4.659 ³⁵⁴	42.81 ²¹²
Aug. 6.7	23.761 ³⁷²	31.60 ²⁶	44.374 ⁴⁴¹	38.99 ²³⁵	25.256 ²⁹⁰	10.05 ¹³⁷	4.994 ³³⁵	45.07 ²²⁶
16.6	24.102 ³⁴¹	31.88 ²⁸	44.780 ⁴⁰⁶	41.59 ²⁶⁰	25.521 ²⁶⁵	8.99 ¹⁰⁶	5.299 ³⁰⁵	47.45 ²³⁸
26.6	24.405 ³⁰³	32.66 ⁷⁸	45.142 ³⁶²	44.40 ²⁸¹	25.758 ²³⁷	8.24 ⁷⁵	5.572 ²⁷³	49.88 ²⁴³
	258	125	313	295	204	43	237	244
Sept. 5.6	24.663	33.91	45.455	47.35	25.962	7.81	5.809	52.32
15.6	24.869 ²⁰⁶	35.59 ¹⁶⁸	45.717 ²⁶²	50.39 ³⁰⁴	26.131 ¹⁶⁹	7.70 ¹¹	6.008 ¹⁹⁹	54.72 ²⁴⁰
25.5	25.022 ¹⁵³	37.62 ²⁰³	45.926 ²⁰⁹	53.46 ³⁰⁷	26.264 ¹³³	7.90 ²⁰	6.166 ¹⁵⁸	57.04 ²³²
Oct. 5.5	25.117 ⁹⁵	39.91 ²²⁹	46.081 ¹⁵⁵	56.47 ³⁰¹	26.361 ⁹⁷	8.36 ⁴⁶	6.285 ¹¹⁹	59.23 ²¹⁹
15.5	25.159 ⁴²	42.39 ²⁴⁸	46.183 ¹⁰²	59.40 ²⁹³	26.424 ⁶³	9.06 ⁷⁰	6.366 ⁸¹	61.25 ²⁰²
	11	257	48	277	30	88	46	155
25.4	25.148	44.96	46.231	62.17	26.454	9.94	6.412	63.10
Nov. 4.4	25.088 ⁶⁰	47.49 ²⁵³	46.228 ³	64.72 ²⁵⁵	26.455 ¹	10.95 ¹⁰¹	6.422 ¹⁰	64.71 ¹⁶¹
14.4	24.984 ¹⁰⁴	49.89 ²⁴⁰	46.177 ⁵¹	67.00 ²²⁸	26.428 ²⁷	12.04 ¹⁰⁹	6.399 ²³	66.07 ¹³⁶
24.4	24.843 ¹⁴¹	52.06 ¹⁴¹	46.080 ⁹⁷	68.93 ¹⁹³	26.379 ⁴⁹	13.16 ¹¹²	6.347 ⁵²	67.16 ¹⁰⁰
Dec. 4.3	24.670 ¹⁷³	53.91 ¹⁸⁵	45.942 ¹³⁸	70.50 ¹⁵⁷	26.309 ⁷⁰	14.25 ¹⁰⁹	6.266 ⁸¹	67.94 ⁷³
	197	147	177	114	87	102	104	48
14.3	24.473	55.38	45.765	71.64	26.222	15.27	6.162	68.42
24.3	24.258 ²¹⁵	56.41 ¹⁰³	45.558 ²⁰⁷	72.31 ⁶⁷	26.122 ¹⁰⁰	16.18 ⁹¹	6.036 ¹²⁶	68.55 ¹³
34.3	24.033 ²²⁵	56.96 ⁵⁵	45.326 ²³²	72.48 ¹⁷	26.011 ¹¹¹	16.94 ⁷⁶	5.894 ¹⁴²	68.34 ²¹
Mean Place	20.127	67.34	40.235	31.99	21.845	37.79	1.411	31.73
Sec δ , Tan δ	1.471	—1.079	1.723	+1.403	1.017	—0.188	1.223	+0.705
$D\psi\alpha$, $D_\omega\alpha$	+0.05	+0.07	+0.07	—0.09	+0.06	+0.01	+0.07	—0.05
$D\psi\delta$, $D_\omega\delta$	+0.4	+0.3	+0.4	+0.3	+0.4	+0.3	+0.4	+0.3

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	τ Piscium. Mag. 4.7			ζ Piscium. Mag. 5.6			κ Tucanæ. Mag. 5.0			f Piscium. Mag. 5.3		
	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.
	h m 1 7	s 1 7	° ' " +29 38	h m 1 9	s 1 9	° ' " +7 7	h m 1 12	s 1 12	° ' " -69 18	h m 1 13	s 1 13	° ' " +3 10
Jan. 0.3	2.697		53.88	21.462		61.16	57.35		92.96	28.932		27.20
10.2	2.564	133	53.44 44	21.355	107	60.53 63	56.79	56	92.88 8	28.826	106	26.53 67
20.2	2.423	141	52.72 72	21.241	114	59.86 67	56.25	54	92.18 70	28.713	113	25.90 63
30.2	2.282	141	51.78 94	21.128	113	59.19 67	55.73	52	90.91 127	28.598	115	25.33 57
Feb. 9.2	2.146	136	50.63 115	21.019	109	58.57 62	55.24	49	89.09 182	28.489	109	24.82 51
19.1	2.026	120	49.34 129	20.920	99	58.01 56	54.80	44	86.78 231	28.388	101	24.41 41
29.1	1.927	99	47.96 138	20.841	79	57.57 44	54.42	38	84.03 275	28.305	83	24.15 26
Mar. 10.1	1.860	67	46.56 140	20.786	55	57.26 31	54.11	31	80.93 310	28.246	59	24.04 11
20.1	1.830	30	45.20 136	20.763	23	57.12 14	53.89	22	77.54 339	28.217	29	24.12 8
30.0	1.844	14	43.99 121	20.774	11	57.17 5	53.76	13	73.93 361	28.226	9	24.40 28
Apr. 9.0	1.905	61	42.94 105	20.827	53	57.45 28	53.72	4	70.21 372	28.272	40	24.92 52
19.0	2.016	111	42.14 80	20.923	96	57.97 52	53.78	6	66.42 379	28.360	88	25.69 77
28.9	2.177	161	41.61 53	21.063	140	58.75 78	53.95	17	62.66 376	28.495	135	26.69 100
May 8.9	2.384	207	41.41 20	21.244	181	59.78 103	54.21	26	59.02 364	28.670	175	27.93 124
18.9	2.638	254	41.58 17	21.464	220	61.05 127	54.56	35	55.55 347	28.884	214	29.38 145
28.9	2.928	290	42.07 49	21.720	256	62.53 148	55.00	44	52.35 320	29.133	249	31.04 166
June 7.8	3.247	319	42.92 85	22.002	282	64.23 170	55.52	52	49.50 285	29.412	279	32.85 181
17.8	3.587	340	44.09 117	22.305	303	66.06 183	56.10	58	47.05 245	29.710	298	34.77 192
27.8	3.942	355	45.54 145	22.622	317	67.97 191	56.73	63	45.06 199	30.021	311	36.73 196
July 7.8	4.299	357	47.27 173	22.944	322	69.93 196	57.39	66	43.60 146	30.339	318	38.71 198
17.7	4.652	353	49.19 192	23.264	320	71.88 195	58.06	67	42.69 91	30.657	318	40.66 195
27.7	4.993	341	51.29 210	23.572	308	73.79 191	58.72	66	42.36 33	30.964	307	42.52 186
Aug. 6.7	5.313	320	53.48 219	23.863	291	75.61 182	59.36	64	42.62 26	31.254	290	44.22 170
16.6	5.606	293	55.74 226	24.129	266	77.27 166	59.95	59	43.46 84	31.523	269	45.75 153
26.6	5.868	262	58.01 227	24.369	240	78.75 148	60.48	53	44.84 138	31.764	241	47.09 134
Sept. 5.6	6.096	228	60.25 224	24.576	207	80.04 129	60.93	45	46.74 190	31.974	210	48.18 109
15.6	6.288	192	62.40 215	24.750	174	81.09 105	61.29	36	49.07 233	32.151	177	49.02 84
25.5	6.442	154	64.44 204	24.892	142	81.90 81	61.55	26	51.73 266	32.294	143	49.63 61
Oct. 5.5	6.559	117	66.35 191	24.998	106	82.50 60	61.70	15	54.65 292	32.403	109	49.98 35
15.5	6.639	80	68.07 172	25.072	74	82.89 39	61.74	4	57.71 306	32.480	77	50.10 12
25.5	6.685	46	69.59 152	25.116	44	83.06 17	61.66	8	60.79 308	32.526	46	50.01 9
Nov. 4.4	6.699	14	70.90 131	25.132	16	83.03 3	61.48	18	63.78 299	32.542	16	49.76 25
14.4	6.682	17	71.97 107	25.120	12	82.85 18	61.21	27	66.52 274	32.533	9	49.36 40
24.4	6.638	44	72.78 81	25.085	35	82.53 32	60.85	36	68.91 239	32.499	34	48.86 50
Dec. 4.3	6.567	71	73.33 55	25.029	56	82.10 43	60.42	43	70.89 198	32.443	56	48.26 60
14.3	6.475	92	73.59 26	24.952	77	81.57 53	59.93	49	72.37 148	32.369	74	47.58 68
24.3	6.363	112	73.58 1	24.864	88	80.98 59	59.40	53	73.28 91	32.279	90	46.91 67
34.3	6.235	128	73.28 30	24.760	104	80.34 64	58.85	55	73.60 32	32.177	102	46.23 68
Mean Place	1.793		38.39	20.465		53.28	55.270		80.40	27.895		20.65
Sec δ , Tan δ	1.151		+0.569	1.008		+0.125	2.831		-2.649	1.002		+0.055
$D\psi\alpha$, $D\omega\alpha$	+0.07		-0.04	+0.06		-0.01	+0.04		+0.18	+0.06		0.00
$D\psi\delta$, $D\omega\delta$	+0.4		+0.3	+0.4		+0.3	+0.4		+0.3	+0.4		+0.3

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	ν Piscium. Mag. 4.7		θ Ceti. Mag. 3.8		δ Cassiopeiae. Mag. 2.8		γ Phoenicis. Mag. 3.4	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m l 14	° ' " +26 49	h m l 19	° ' " - 8 36	h m l 20	° ' " +59 47	h m l 24	° ' " -43 44
	s	"	s	"	s	"	s	"
Jan. 0.3	51.701	37.05	50.570	56.77	19.534	80.96	44.535	62.54
10.3	51.575 ¹²⁶	36.62 ⁴³	50.459 ¹¹¹	57.47 ⁷⁰	19.235 ²⁹⁹	81.20 ²⁴	44.328 ²⁰⁷	63.06 ²²
20.2	51.440 ¹³⁵	35.94 ⁶⁸	50.340 ¹¹⁹	58.02 ⁵⁵	18.920 ³¹⁵	80.92 ²⁸	44.115 ²¹³	63.10 ¹
30.2	51.302 ¹³⁸	35.07 ⁸⁷	50.219 ¹²¹	58.39 ³⁷	18.601 ³¹⁹	80.12 ⁸⁰	43.905 ²¹⁰	62.67 ⁴
Feb. 9.2	51.168 ¹³⁴	34.02 ¹⁰⁵	50.103 ¹¹⁶	58.56 ¹⁷	18.296 ³⁰⁵	78.85 ¹²⁷	43.703 ²⁰²	61.76 ¹¹
	120	118	108	4	280	170	185	136
19.1	51.048 ¹⁰¹	32.84 ¹²⁵	49.995 ⁹¹	58.52 ²⁶	18.016 ²³⁶	77.15 ²⁰⁵	43.518 ¹⁶¹	60.40 ¹⁷⁹
29.1	50.947 ⁷²	31.59 ¹²⁵	49.904 ⁶⁷	58.26 ⁴⁹	17.780 ¹⁸¹	75.10 ²³⁰	43.357 ¹²⁸	58.61 ²¹⁴
Mar. 10.1	50.875 ³⁶	30.34 ¹¹⁹	49.837 ³⁸	57.77 ⁷³	17.599 ¹¹³	72.80 ²⁴⁶	43.229 ⁹¹	56.47 ²⁴⁹
20.1	50.839 ⁶	29.15 ¹⁰⁸	49.799 ³	57.04 ⁹⁷	17.486 ³⁴	70.34 ²⁵²	43.138 ⁴⁶	53.98 ²⁷⁵
30.0	50.845 ⁵²	28.07 ⁹⁰	49.796 ³⁶	56.07 ¹²²	17.452 ⁴⁹	67.82 ²⁴⁷	43.092 ⁵	51.23 ²⁸⁹
Apr. 9.0	50.897 ¹⁰¹	27.17 ⁶⁵	49.832 ⁷⁹	54.85 ¹⁴³	17.501 ¹³⁴	65.35 ²³¹	43.097 ⁵⁶	48.24 ²¹⁴
19.0	50.998 ¹⁵¹	26.52 ³⁹	49.911 ¹²²	53.42 ¹⁶⁷	17.635 ²¹⁷	63.04 ²⁰⁷	43.153 ¹¹¹	45.19 ²²⁴
29.0	51.149 ¹⁹⁷	26.13 ⁷	50.033 ¹⁶⁵	51.75 ¹⁸⁴	17.852 ²⁹⁸	60.97 ¹⁷³	43.264 ¹⁶⁴	41.86 ³²⁷
May 8.9	51.346 ²⁴⁰	26.06 ²⁶	50.198 ²⁰⁵	49.91 ²⁰⁰	18.150 ³⁷⁰	59.24 ¹³⁶	43.428 ²¹⁶	38.59 ³²²
18.9	51.586 ²⁷⁸	26.32 ⁵⁸	50.403 ²³⁹	47.91 ²¹²	18.520 ⁴³²	57.88 ⁹²	43.644 ²⁶⁴	35.36 ³¹¹
28.9	51.864 ³⁰⁹	26.90 ⁹⁰	50.642 ²⁷¹	45.79 ²¹⁷	18.952 ⁴⁸¹	56.96 ⁴⁵	43.908 ³⁰⁵	32.25 ²⁸⁰
June 7.8	52.173 ³³¹	27.80 ¹²¹	50.913 ²⁹³	43.62 ²²⁰	19.433 ⁵¹⁸	56.51 ²	44.213 ³³⁷	29.32 ²⁶⁷
17.8	52.504 ³⁴⁵	29.01 ¹⁴⁷	51.206 ³¹⁰	41.42 ²¹³	19.951 ⁵⁴²	56.53 ⁵¹	44.550 ³⁶⁴	26.65 ²³⁵
27.8	52.849 ³⁵¹	30.48 ¹⁷¹	51.516 ³¹⁷	39.29 ²⁰⁵	20.493 ⁵⁵⁰	57.04 ⁹⁷	44.914 ³⁷⁸	24.30 ¹⁹⁶
July 7.8	53.200 ³⁴⁷	32.19 ¹⁸⁸	51.833 ³¹⁷	37.24 ¹⁹⁰	21.043 ⁵⁴⁸	58.01 ¹⁴⁰	45.292 ³⁸⁴	22.34 ¹⁵³
17.7	53.547 ³³⁶	34.07 ²⁰³	52.150 ³⁰⁷	35.34 ¹⁶⁸	21.591 ⁵³⁰	59.41 ¹⁸²	45.676 ³⁷⁸	20.81 ¹⁰⁴
27.7	53.883 ³¹⁸	36.10 ²¹²	52.457 ²⁹⁴	33.66 ¹⁴⁴	22.121 ⁵⁰⁵	61.23 ²¹⁸	46.054 ³⁶⁵	19.77 ⁵⁴
Aug. 6.7	54.201 ²⁹³	38.22 ²¹⁵	52.751 ²⁷²	32.22 ¹¹⁶	22.626 ⁴⁶⁸	63.41 ²⁴⁹	46.419 ³³⁹	19.23 ³
16.7	54.494 ²⁶⁴	40.37 ²¹⁵	53.023 ²⁴⁵	31.06 ⁸⁵	23.094 ⁴²³	65.90 ²⁷⁵	46.758 ³⁰⁷	19.20 ³⁰
26.6	54.758 ²³¹	42.52 ²⁰⁹	53.268 ²¹⁴	30.21 ⁵⁵	23.517 ³⁷¹	68.65 ²⁹⁵	47.065 ²⁶⁸	19.70 ²⁹
Sept. 5.6	54.989 ¹⁹⁶	44.61 ²⁰⁰	53.482 ¹⁸³	29.66 ²²	23.888 ³¹⁷	71.60 ³⁰⁹	47.333 ²²³	20.69 ¹⁴²
15.6	55.185 ¹⁵⁹	46.61 ¹⁸⁸	53.665 ¹⁴⁷	29.44 ⁸	24.205 ²⁵⁸	74.69 ³¹⁷	47.556 ¹⁷⁵	22.11 ¹⁸³
25.5	55.344 ¹²³	48.49 ¹⁷³	53.812 ¹¹²	29.52 ³⁷	24.463 ¹⁹⁷	77.86 ³¹⁹	47.731 ¹²⁵	23.94 ²¹⁶
Oct. 5.5	55.467 ⁹⁰	50.22 ¹⁵⁴	53.924 ⁷⁸	29.89 ⁶⁰	24.660 ¹³⁶	81.05 ³¹⁵	47.856 ⁷³	26.10 ²³⁷
15.5	55.557 ⁵⁴	51.76 ¹³⁶	54.002 ⁴⁷	30.49 ⁸⁰	24.796 ⁷⁴	84.20 ³⁰³	47.929 ²⁴	28.47 ²⁵¹
25.5	55.611 ²³	53.12 ¹¹⁴	54.049 ¹⁶	31.29 ⁹⁴	24.870 ¹⁴	87.23 ²⁸⁰	47.953 ²³	30.98 ²⁵⁵
Nov. 4.4	55.634 ⁶	54.26 ⁹³	54.065 ¹¹	32.23 ¹⁰⁴	24.884 ⁴⁶	90.09 ²⁶²	47.930 ⁶⁶	33.53 ²⁴⁷
14.4	55.628 ³⁵	55.19 ⁶⁹	54.054 ³⁶	33.27 ¹⁰⁹	24.838 ¹⁰⁴	92.71 ²³²	47.864 ¹⁰⁵	36.00 ²²¹
24.4	55.593 ⁶¹	55.88 ⁴⁵	54.018 ⁵⁸	34.36 ¹⁰⁸	24.734 ¹⁵⁷	95.03 ¹⁹⁴	47.759 ¹³⁸	38.31 ²⁰³
Dec. 4.4	55.532 ⁸³	56.33 ¹⁹	53.960 ⁷⁹	35.44 ¹⁰²	24.577 ²⁰⁷	96.97 ¹⁵²	47.621 ¹⁶⁶	40.34 ¹⁰⁹
14.3	55.449 ¹⁰⁴	56.52 ⁵	53.881 ⁹⁴	36.46 ⁹⁴	24.370 ²⁵⁰	98.49 ¹⁰⁶	47.455 ¹⁸⁸	42.03 ¹²⁹
24.3	55.345 ¹²¹	56.47 ³¹	53.787 ¹⁰⁷	37.40 ⁸²	24.120 ²⁸⁴	99.55 ⁵⁵	47.267 ²⁰³	43.32 ⁸⁴
34.3	55.224	56.16	53.680	38.22	23.836	100.10	47.064	44.16
Mean Place	50.728	22.39	49.446	59.31	18.542	57.48	43.107	54.70
Sec δ , Tan δ	1.121	+0.506	1.011	-0.151	1.988	+1.718	1.384	-0.957
$D\psi\alpha$, $D_\omega\alpha$	+0.06	-0.03	+0.06	+0.01	+0.08	-0.11	+0.05	+0.06
$D\psi\delta$, $D_\omega\delta$	+0.4	+0.3	+0.4	+0.3	+0.4	+0.3	+0.4	+0.4

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	38 Cassiopeiæ. Mag. 6.0			7 Piscium. Mag. 3.7			40 Cassiopeiæ. Mag. 5.5			v Andromedæ. Mag. 4.2		
	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.
	h m 1 24	s	° ' "	h m 1 26	s	° ' "	h m 1 31	s	° ' "	h m 1 31	s	° ' "
			+69 49			+14 54			+72 36			+40 59
Jan. 0.3	58.53		83.47	60.217		58.23	47.91		70.71	52.738		27.77
10.3	58.04	49	84.01	60.108	109	57.69	47.35	56	71.42	52.576	162	27.71
20.2	57.53	51	83.96	59.987	121	57.04	46.75	60	71.53	52.400	176	27.25
30.2	57.02	51	83.85	59.863	124	56.31	46.14	61	71.03	52.216	184	26.46
Feb. 9.2	56.53	49	82.19	59.740	123	55.55	45.55	59	69.96	52.033	183	25.34
		45			113			54			169	
19.1	56.08		80.50	59.627		54.77	45.01		68.38	51.864		23.97
29.1	55.70	38	78.41	59.529	98	54.02	44.54	47	66.34	51.720	144	22.37
Mar. 10.1	55.39	31	75.99	59.457	72	53.34	44.16	38	63.94	51.607	113	20.62
20.1	55.19	20	73.33	59.414	43	52.77	43.90	26	61.27	51.536	71	18.85
30.0	55.10	9	70.55	59.409	5	52.37	43.76	14	58.47	51.514	22	17.10
		3			37			1			34	
Apr. 9.0	55.13		67.78	59.446		52.17	43.77		55.63	51.548		15.43
19.0	55.29	16	65.12	59.529	83	52.19	43.91	14	52.87	51.639	91	13.94
29.0	55.56	27	62.65	59.657	128	52.48	44.20	29	50.30	51.788	149	12.70
May 8.9	55.95	39	60.51	59.829	172	53.02	44.62	42	48.01	51.995	207	11.77
18.9	56.44	49	58.74	60.044	215	53.85	45.15	53	46.08	52.253	268	11.20
		58			251			65			302	
28.9	57.02		57.39	60.295		54.93	45.80		44.58	52.555		10.99
June 7.8	57.67	65	56.53	60.576	231	56.25	46.53	73	43.55	52.897	342	11.17
17.8	58.38	71	56.16	60.882	306	57.77	47.32	79	43.02	53.268	371	11.72
27.8	59.12	74	56.31	61.202	320	59.47	48.15	83	43.00	53.656	388	12.64
July 7.8	59.87	75	56.97	61.531	329	61.28	49.01	86	43.51	54.054	398	13.93
		76			328			86			397	
17.7	60.63		58.13	61.859		63.17	49.87		44.52	54.451		15.50
27.7	61.36	73	59.74	62.178	319	65.09	50.71	84	46.00	54.838	387	17.34
Aug. 6.7	62.06	70	61.79	62.482	304	66.98	51.51	80	47.93	55.209	371	19.42
16.7	62.72	66	64.21	62.766	284	68.81	52.27	76	50.24	55.553	344	21.66
26.6	63.31	59	66.97	63.022	256	70.53	52.96	69	52.92	55.869	316	24.02
		52			228			60			282	
Sept. 5.6	63.83		69.98	63.250		72.10	53.56		55.90	56.151		26.46
15.6	64.28	45	73.21	63.445	195	73.51	54.09	53	59.10	56.393	242	28.93
25.5	64.64	36	76.58	63.607	162	74.73	54.53	44	62.47	56.597	204	31.38
Oct. 5.5	64.92	28	80.04	63.735	128	75.75	54.86	33	65.95	56.760	163	33.76
15.5	65.11	19	83.50	63.831	96	76.58	55.09	23	69.47	56.881	121	36.04
		9			64			12			82	
25.5	65.20		86.88	63.895		77.19	55.21		72.94	56.963		38.16
Nov. 4.4	65.21	1	90.13	63.930	35	77.63	55.23	2	76.30	57.005	42	40.09
14.4	65.12	9	93.17	63.937	7	77.87	55.13	10	79.45	57.011	6	41.81
24.4	64.94	18	95.91	63.916	21	77.95	54.94	19	82.33	56.982	29	43.28
Dec. 4.4	64.68	26	98.26	63.872	44	77.87	54.63	31	84.85	56.914	68	44.44
		34			66			38			100	
14.3	64.34		100.20	63.806		77.63	54.25		86.93	56.814		45.29
24.3	63.93	41	101.62	63.719	87	77.26	53.77	48	88.52	56.686	128	45.78
34.3	63.47	46	102.50	63.617	102	76.77	53.24	53	89.57	56.537	149	45.91
Mean Place	57.396		58.33	59.130		47.45	46.572		45.24	51.637		8.80
Sec δ , Tan δ	2.902		+2.724	1.035		+0.266	3.347		+3.195	1.325		+0.869
$D\psi\alpha$, $D_\omega\alpha$	+0.09		-0.18	+0.06		-0.02	+0.09		-0.20	+0.07		-0.05
$D\psi\delta$, $D_\omega\delta$	+0.4		+0.4	+0.4		+0.4	+0.4		+0.4	+0.4		+0.4

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	π Piscium. Mag. 5.6			υ Persei. Mag. 3.8			α Eridani. (Achernar.) Mag. 0.6			ω Cassiopeiæ. Mag. 5.5		
	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.
	h m 1 32	s 106	° ' " +11 42	h m 1 32	s 195	° ' " +48 12	h m 1 34	s 326	° ' " -57 39	h m 1 36	s 41	° ' " +67 37
Jan. 0.3	39.703		53.60	50.812		31.82	36.991		58.33	7.34		32.26
10.3	39.597	106	53.04	50.617	195	31.92	36.665	326	58.76	6.93	41	32.88
20.2	39.480	117	52.40	50.404	213	31.59	36.333	332	58.64	6.47	46	32.94
30.2	39.358	122	51.72	50.185	219	30.85	36.003	330	57.96	6.01	46	32.43
Feb. 9.2	39.235	123	51.04	49.969	216	29.71	35.686	317	56.74	5.57	44	31.37
		114			201			292			41	
19.2	39.121		50.38	49.768		28.24	35.394		55.01	5.16		29.83
29.1	39.022	99	49.78	49.594	174	26.49	35.134	290	52.83	4.80	36	27.85
Mar. 10.1	38.945	77	49.25	49.458	136	24.55	34.917	217	50.24	4.51	29	25.54
20.1	38.899	46	48.85	49.370	88	22.50	34.750	167	47.31	4.31	20	22.98
30.0	38.890	9	48.65	49.339	31	20.43	34.642	108	44.10	4.20	11	20.30
		30			31			43			0	
Apr. 9.0	38.920		48.63	49.370		18.44	34.599		40.69	4.20		17.60
19.0	38.995	75	48.83	49.467	97	16.60	34.623	24	37.13	4.33	13	14.99
29.0	39.114	119	49.30	49.629	162	15.00	34.718	95	33.51	4.56	23	12.56
May 8.9	39.279	165	50.04	49.854	225	13.72	34.882	164	29.92	4.89	33	10.42
18.9	39.483	204	51.00	50.137	283	12.77	35.116	234	26.42	5.32	43	8.63
		243			335			295			53	
28.9	39.726		52.21	50.472		12.23	35.411		23.10	5.85		7.26
June 7.9	40.000	274	53.62	50.847	375	12.10	35.763	352	20.03	6.43	55	6.35
17.8	40.298	298	55.24	51.255	408	12.39	36.163	400	17.29	7.07	64	5.92
27.8	40.613	315	56.99	51.684	429	13.10	36.600	437	14.93	7.75	68	6.00
July 7.8	40.936	323	58.81	52.123	439	14.20	37.061	461	13.04	8.44	69	6.57
		323			439			475			70	
17.7	41.259		60.70	52.562		15.65	37.536		11.66	9.14		7.62
27.7	41.576	317	62.58	52.991	429	17.44	38.010	474	10.81	9.82	68	9.12
Aug. 6.7	41.878	302	64.42	53.400	409	19.52	38.470	460	10.54	10.48	66	11.04
16.7	42.160	282	66.16	53.783	383	21.82	38.904	434	10.83	11.09	61	13.33
26.6	42.418	258	67.75	54.133	350	24.31	39.300	396	11.69	11.66	57	15.97
		230			311			347			50	
Sept. 5.6	42.648		69.17	54.444		26.94	39.647		13.08	12.16		18.86
15.6	42.846	198	70.41	54.713	269	29.64	39.938	291	14.95	12.60	44	21.97
25.6	43.010	164	71.44	54.939	226	32.36	40.163	225	17.24	12.96	36	25.22
Oct. 5.5	43.144	134	72.27	55.119	180	35.05	40.321	158	19.85	13.25	29	28.57
15.5	43.243	99	72.89	55.254	135	37.68	40.408	87	22.68	13.46	21	31.93
		69			89			17			12	
25.5	43.312	40	73.31	55.343	45	40.18	40.425	52	25.62	13.58	3	35.24
Nov. 4.4	43.352	10	73.54	55.388	1	42.51	40.373	115	28.57	13.61	4	38.43
14.4	43.362		73.62	55.389		44.61	40.258		31.39	13.57		41.41
24.4	43.348	14	73.52	55.347	42	46.45	40.086	172	33.97	13.45	12	44.12
Dec. 4.4	43.307	41	73.28	55.264	83	47.97	39.864	222	36.22	13.25	20	46.50
		63			121			264			28	
14.3	43.244		72.92	55.143		49.13	39.600		38.05	12.97		48.45
24.3	43.161	83	72.47	54.988	155	49.90	39.303	297	39.40	12.63	34	49.92
34.3	43.062	99	71.92	54.805	183	50.25	38.984	319	40.21	12.24	39	50.86
Mean Place	38.574		43.88	49.688		10.96	35.215		47.99	6.007		7.51
Sec δ , Tan δ	1.021		+0.207	1.500		+1.119	1.869		-1.580	2.627		+2.429
$D\phi\alpha$, $D\omega\alpha$	+0.06		-0.01	+0.07		-0.07	+0.04		+0.10	+0.09		-0.15
$D\phi\delta$, $D\omega\delta$	+0.4		+0.4	+0.4		+0.4	+0.4		+0.4	+0.4		+0.4

APPARENT PLACES OF STARS, 1916.

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FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	♋ Piscium. Mag. 4.7		♊ Persei. Mag. 4.2		♋ Ceti. Mag. 3.6		♏ Piscium. Mag. 4.5	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 1 37	° ' " + 5 3	h m 1 38	° ' " +50 15	h m 1 40	° ' " -16 22	h m 1 40	° ' " + 8 44
	s "	"	s "	"	s "	"	s "	"
Jan. 0.3	4.668	54.15	24.412	79.22	11.161	45.67	58.539	16.06
10.3	4.564 ¹⁰⁴	53.50 ⁶⁵	24.205 ²⁰⁷	79.43 ²¹	11.039 ¹²²	46.42 ⁷⁵	58.438 ¹⁰³	15.46 ⁶⁰
20.2	4.449 ¹¹⁵	52.87 ⁶³	23.981 ²²⁴	79.19 ²⁴	10.906 ¹³³	46.93 ⁵¹	58.319 ¹¹⁷	14.84 ⁶²
30.2	4.328 ¹²¹	52.28 ⁵⁹	23.747 ²³⁴	78.52 ⁶⁷	10.768 ¹³⁸	47.17 ²⁴	58.196 ¹²³	14.21 ⁶³
Feb. 9.2	4.207 ¹²¹	51.74 ⁵⁴	23.516 ²³¹	77.43 ¹⁰⁹	10.632 ¹³⁶	47.14 ³	58.073 ¹²³	13.60 ⁶¹
	113	46	216	143	128	33	117	56
19.2	4.094 ¹⁰¹	51.28 ³⁴	23.300 ¹⁹¹	76.00 ¹⁷⁴	10.504 ¹¹³	46.81 ⁶⁰	57.956 ¹⁰³	13.04 ⁴⁹
29.1	3.993 ⁷⁸	50.94 ²⁰	23.109 ¹⁵⁰	74.26 ¹⁹⁶	10.391 ⁹²	46.21 ⁸⁸	57.853 ⁸²	12.55 ³⁷
Mar. 10.1	3.915 ⁵⁰	50.74 ³	22.959 ¹⁰¹	72.30 ²¹⁰	10.299 ⁶³	45.33 ¹¹⁶	57.771 ⁵⁴	12.18 ²²
20.1	3.865 ¹⁵	50.71 ¹⁷	22.858 ⁴¹	70.20 ²¹²	10.236 ²⁸	44.17 ¹⁴²	57.717 ¹⁸	11.96 ⁶
30.0	3.850 ²⁴	50.88 ³⁷	22.817 ²¹	68.08 ²⁰⁸	10.208 ¹²	42.75 ¹⁶⁸	57.699 ²²	11.90 ¹⁶
Apr. 9.0	3.874 ⁶⁷	51.25 ⁶¹	22.838 ⁹¹	66.00 ¹⁹⁴	10.220 ⁵⁴	41.07 ¹⁵⁹	57.721 ⁶⁵	12.06 ³⁸
19.0	3.941 ¹¹²	51.86 ⁸⁵	22.929 ¹⁵⁹	64.06 ¹⁷¹	10.274 ⁹⁹	39.18 ²⁰⁹	57.786 ¹¹⁰	12.44 ⁶²
29.0	4.053 ¹⁵⁵	52.71 ¹⁰⁹	23.088 ²²⁴	62.35 ¹⁴²	10.373 ¹⁴²	37.09 ²²⁵	57.896 ¹⁵⁵	13.06 ⁸⁷
May 8.9	4.208 ¹⁹⁷	53.80 ¹³⁰	23.312 ²⁸⁷	60.93 ¹⁰⁷	10.515 ¹⁸⁶	34.84 ²³⁷	58.051 ¹⁹⁷	13.93 ¹¹⁰
18.9	4.405 ²³³	55.10 ¹⁵⁰	23.599 ³³⁹	59.86 ⁶⁸	10.701 ²²⁴	32.47 ²⁴³	58.248 ²³⁴	15.03 ¹³²
28.9	4.638 ²⁶⁶	56.60 ¹⁶⁸	23.938 ³⁸⁴	59.18 ²⁶	10.925 ²⁵⁷	30.04 ²⁴⁵	58.482 ²⁶⁶	16.35 ¹⁵²
June 7.9	4.904 ²⁹⁰	58.28 ¹⁸⁰	24.322 ⁴¹⁸	58.92 ¹⁶	11.182 ²⁸³	27.59 ²⁴⁰	58.748 ²⁹²	17.57 ¹⁶⁸
17.8	5.194 ³⁰⁸	60.08 ¹⁸⁸	24.740 ⁴⁴²	59.08 ⁵⁸	11.465 ³⁰³	25.19 ²²⁹	59.040 ³¹⁰	19.55 ¹⁷⁸
27.8	5.502 ³¹⁸	61.96 ¹⁹³	25.182 ⁴⁵³	59.66 ⁹⁸	11.768 ³¹⁴	22.90 ²¹²	59.350 ³¹⁹	21.33 ¹⁸⁶
July 7.8	5.820 ³¹⁸	63.89 ¹⁹⁰	25.635 ⁴⁵⁵	60.64 ¹³⁶	12.082 ³¹⁸	20.78 ¹⁹¹	59.669 ³²¹	23.19 ¹⁸⁷
17.7	6.138 ³¹³	65.79 ¹⁸³	26.090 ⁴⁴⁵	62.00 ¹⁷¹	12.400 ³¹²	18.87 ¹⁶³	59.990 ³¹⁶	25.06 ¹⁸⁴
27.7	6.451 ²⁹⁹	67.62 ¹⁷²	26.535 ⁴²⁷	63.71 ²⁰¹	12.712 ³⁰⁰	17.24 ¹³¹	60.306 ³⁰³	26.90 ¹⁷⁷
Aug. 6.7	6.750 ²⁸¹	69.34 ¹⁵⁶	26.962 ⁴⁰¹	65.72 ²²⁶	13.012 ²⁸²	15.93 ⁹⁷	60.609 ²⁸⁵	28.67 ¹⁶³
16.7	7.031 ²⁵⁶	70.90 ¹³⁷	27.363 ³⁶⁷	67.98 ²⁴⁷	13.294 ²⁵⁶	14.96 ⁶⁰	60.894 ²⁶⁰	30.30 ¹⁴⁸
26.6	7.287 ²²⁹	72.27 ¹¹⁴	27.730 ³³⁰	70.45 ²⁶³	13.550 ²²⁷	14.36 ²²	61.154 ²³⁴	31.78 ¹³⁰
Sept. 5.6	7.516 ¹⁹⁸	73.41 ⁹¹	28.060 ²⁸⁶	73.08 ²⁷²	13.777 ¹⁹⁶	14.14 ¹⁵	61.388 ²⁰²	33.08 ¹⁰⁷
15.6	7.714 ¹⁶⁵	74.32 ⁶⁷	28.346 ²⁴²	75.80 ²⁷⁶	13.973 ¹⁶⁰	14.29 ⁴⁸	61.590 ¹⁷¹	34.15 ⁸⁷
25.6	7.879 ¹³⁴	74.99 ⁴³	28.588 ¹⁹⁵	78.56 ²⁷⁷	14.133 ¹²⁵	14.77 ⁸⁰	61.761 ¹⁴⁰	35.02 ⁶³
Oct. 5.5	8.013 ¹⁰¹	75.42 ²⁰	28.783 ¹⁴⁸	81.33 ²⁷⁰	14.258 ⁹¹	15.57 ¹⁰⁶	61.901 ¹⁰⁷	35.65 ⁴²
15.5	8.114 ⁷⁰	75.62 ⁰	28.931 ¹⁰⁰	84.03 ²⁵⁹	14.349 ⁵⁶	16.63 ¹²⁷	62.008 ⁷⁶	36.07 ²²
25.5	8.184 ⁴¹	75.62 ¹⁸	29.031 ⁵³	86.62 ²⁴⁴	14.405 ²⁴	17.90 ¹⁴⁰	62.084 ⁴⁷	36.29 ⁴
Nov. 4.4	8.225 ¹²	75.44 ³³	29.084 ⁶	89.06 ²²²	14.429 ⁶	19.30 ¹⁴⁷	62.131 ¹⁸	36.33 ¹²
14.4	8.237 ¹⁴	75.11 ⁴⁶	29.090 ³⁸	91.28 ¹⁹⁷	14.423 ³⁴	20.77 ¹⁴⁸	62.149 ⁸	36.21 ²⁷
24.4	8.223 ³⁷	74.65 ⁵⁴	29.052 ⁸³	93.25 ¹⁶⁴	14.389 ⁵⁹	22.25 ¹⁴¹	62.141 ³³	35.94 ³⁷
Dec. 4.4	8.186 ⁵⁹	74.11 ⁶¹	28.969 ¹²³	94.89 ¹²⁹	14.330 ⁸²	23.66 ¹³⁰	62.108 ⁵⁶	35.57 ⁴⁷
14.3	8.127 ⁸¹	73.50 ⁶⁵	28.846 ¹⁶¹	96.18 ⁸⁰	14.248 ¹⁰²	24.96 ¹¹²	62.052 ⁷⁹	35.10 ⁵⁴
24.3	8.046 ⁹⁹	72.85 ⁶⁶	28.685 ¹⁹¹	97.07 ⁴⁷	14.146 ¹¹⁸	26.08 ⁹³	61.973 ⁹⁶	34.56 ⁵⁹
34.3	7.947	72.19	28.494	97.54	14.028	27.01	61.877	33.97
Mean Place	3.497	46.67	23.218	57.89	9.908	45.85	57.351	7.28
Sec δ, Tan δ	1.004	+0.089	1.565	+1.203	1.042	-0.294	1.012	+0.154
Dψα, Dωα	+0.06	-0.01	+0.07	-0.07	+0.06	+0.02	+0.06	-0.01
Dψδ, Dωδ	+0.4	+0.4	+0.4	+0.4	+0.4	+0.4	+0.4	+0.4

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	ε Sculptoris. Mag. 5.4			ζ Ceti. Mag. 3.9			α Trianguli. Mag. 3.6			ε Cassiopeiæ. Mag. 3.4		
	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.
	h	m	° ' "	h	m	° ' "	h	m	° ' "	h	m	° ' "
	1	41	-25 27	1	47	-10 44	1	48	+29 10	1	48	+63 15
	s		"	s		"	s		"	s		"
Jan. 0.3	43.824		81.37	20.108		56.02	18.559		27.97	21.67		49.25
10.3	43.688	136	82.17	19.998	110	56.84	18.436	123	27.76	21.34	33	49.91
20.2	43.541	147	82.66	19.874	124	57.45	18.297	139	27.30	20.98	36	50.03
30.2	43.390	151	82.79	19.745	129	57.86	18.148	149	26.61	20.61	37	49.61
Feb. 9.2	43.239	151	82.56	19.614	131	58.04	17.997	151	25.73	20.24	37	48.68
		143	58		125	4		144	105		35	141
19.2	43.096		81.98	19.489		58.00	17.853		24.68	19.89		47.27
29.1	42.971	125	81.07	19.377	112	57.71	17.723	130	23.50	19.58	31	45.45
Mar. 10.1	42.866	105	79.81	19.285	92	57.17	17.620	103	22.27	19.33	25	43.29
20.1	42.793	73	78.25	19.220	65	56.37	17.549	71	21.04	19.14	19	40.90
30.1	42.755	38	76.40	19.189	31	55.33	17.519	30	19.88	19.05	9	38.38
		3	211		8	129		17	104		1	256
Apr. 9.0	42.758		74.29	19.197		54.04	17.536		18.84	19.04		35.82
19.0	42.804	46	71.97	19.247	50	52.52	17.602	66	17.99	19.12	8	33.34
29.0	42.898	94	69.47	19.340	93	50.77	17.720	118	17.37	19.30	18	31.03
May 8.9	43.037	139	66.83	19.478	138	48.85	17.888	168	17.03	19.57	27	28.99
18.9	43.221	184	64.12	19.659	181	46.76	18.104	216	16.97	19.93	36	27.28
		226	273		219	218		258	26		44	122
28.9	43.447		61.39	19.878		44.58	18.362		17.23	20.37		25.96
June 7.9	43.708	261	58.71	20.130	252	42.33	18.656	204	17.81	20.86	49	25.07
17.8	43.998	290	56.15	20.409	279	40.08	18.978	322	18.68	21.41	55	24.65
27.8	44.311	313	53.76	20.709	300	37.88	19.321	343	19.84	21.99	58	24.69
July 7.8	44.636	325	51.61	21.021	312	35.79	19.675	354	21.23	22.59	60	25.21
		330	187		316	193		356	162		61	96
17.8	44.966		49.74	21.337		33.86	20.031		22.85	23.20		26.19
27.7	45.294	328	48.24	21.650	313	32.16	20.381	350	24.63	23.80	60	27.59
Aug. 6.7	45.611	317	47.11	21.952	302	30.71	20.720	339	26.52	24.38	58	29.40
16.7	45.908	297	46.41	22.237	285	29.57	21.039	319	28.49	24.93	55	31.56
26.6	46.182	274	46.13	22.499	262	28.75	21.332	293	30.49	25.44	51	34.04
		243	15		236	48		265	199		46	272
Sept. 5.6	46.425		46.28	22.735		28.27	21.597		32.48	25.90		36.76
15.6	46.634	209	46.85	22.939	204	28.13	21.830	233	34.43	26.30	40	39.69
25.6	46.806	172	47.79	23.111	172	28.32	22.029	199	36.28	26.64	34	42.77
Oct. 5.5	46.941	135	49.08	23.250	139	28.80	22.194	165	38.02	26.92	28	45.93
15.5	47.038	97	50.64	23.356	106	29.56	22.324	130	39.61	27.14	22	49.10
		59	175		73	96		96	144		14	314
25.5	47.097		52.39	23.429		30.52	22.420		41.05	27.28		52.24
Nov. 4.5	47.121	24	54.26	23.471	42	31.66	22.483	63	42.32	27.35	7	55.25
14.4	47.112	9	56.18	23.484	13	32.89	22.513	30	43.39	27.36	1	58.09
24.4	47.073	39	58.05	23.468	16	34.16	22.511	2	44.25	27.30	6	60.68
Dec. 4.4	47.005	68	59.81	23.427	41	35.42	22.478	33	44.89	27.15	15	62.95
		93	156		65	118		62	42		19	190
14.3	46.912		61.37	23.362		36.60	22.416		45.31	26.96		64.85
24.3	46.798	114	62.70	23.277	85	37.68	22.328	88	45.47	26.70	26	66.29
34.3	46.668	130	63.73	23.173	104	38.62	22.216	112	45.39	26.40	30	67.25
Mean Place	42.486		78.88	18.824		58.29	17.332		12.50	20.201		25.37
Sec δ, Tan δ	1.108		-0.476	1.018		-0.190	1.145		+0.558	2.222		+1.985
Dψ α, Dω α	+0.06		+0.03	+0.06		+0.01	+0.07		-0.03	+0.08		-0.12
Dψ δ, Dω δ	+0.4		+0.4	+0.4		+0.5	+0.4		+0.5	+0.4		+0.5

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	ξ Piscium. Mag. 4.8			β Arietis. Mag. 2.7			ψ Phœnicis. Mag. 4.4			ν Ceti. Mag. 4.2		
	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.
	h m 1 49	s + 2 46	"	h m 1 49	s +20 23	"	h m 1 50	s -46 42	"	h m 1 56	s -21 28	"
Jan. 0.3	13.568	102	30.74	60.982	109	65.06	18.227	226	58.29	126	64.62	92
10.3	13.466	115	30.06	60.873	125	64.68	18.001	237	59.07	139	65.54	61
20.2	13.351	123	29.43	60.748	133	64.15	17.764	241	59.35	147	66.15	29
30.2	13.228	126	28.86	60.615	136	63.47	17.523	237	59.12	148	66.44	3
Feb. 9.2	13.102	119	28.37	60.479	132	62.69	17.286	225	58.38	144	66.41	36
19.2	12.983	109	27.99	60.347	116	61.84	17.061	203	57.17	130	66.05	69
29.1	12.874	88	27.75	60.231	96	60.96	16.858	173	55.50	111	65.36	100
Mar. 10.1	12.786	61	27.65	60.135	65	60.08	16.685	137	53.42	83	64.36	131
20.1	12.725	27	27.73	60.070	27	59.27	16.548	91	50.97	49	63.05	160
30.1	12.698	12	28.02	60.043	15	58.57	16.457	41	48.22	9	61.45	185
Apr. 9.0	12.710	54	28.51	60.058	61	58.03	16.416	14	45.21	34	59.60	210
19.0	12.764	100	29.24	60.119	100	57.69	16.430	71	42.01	79	57.50	229
29.0	12.864	142	30.20	60.228	156	57.58	16.501	130	38.69	126	55.21	244
May 8.9	13.006	185	31.39	60.384	202	57.74	16.631	187	35.31	170	52.77	256
18.9	13.191	223	32.78	60.586	242	58.17	16.818	238	31.95	212	50.21	260
28.9	13.414	257	34.37	60.828	275	58.88	17.056	286	28.68	248	47.61	259
June 7.9	13.671	282	36.10	61.103	303	59.84	17.342	325	25.59	277	45.02	253
17.8	13.953	303	37.95	61.406	322	61.04	17.667	358	22.73	301	42.49	239
27.8	14.256	313	39.86	61.728	334	62.46	18.025	379	20.20	316	40.10	219
July 7.8	14.569	316	41.78	62.062	336	64.06	18.404	390	18.06	323	37.91	194
17.8	14.885	313	43.67	62.398	333	65.77	18.794	393	16.35	322	35.97	163
27.7	15.198	302	45.47	62.731	320	67.58	19.187	384	15.13	313	34.34	127
Aug. 6.7	15.500	285	47.13	63.051	301	69.42	19.571	366	14.44	297	33.07	89
16.7	15.785	262	48.62	63.352	279	71.25	19.937	337	14.28	276	32.18	48
26.6	16.047	237	49.88	63.631	251	73.03	20.274	301	14.67	248	31.70	6
Sept. 5.6	16.284	206	50.92	63.882	221	74.73	20.575	258	15.58	217	31.64	35
15.6	16.490	176	51.70	64.103	190	76.30	20.833	210	16.99	185	31.99	73
25.6	16.666	144	52.23	64.293	157	77.73	21.043	160	18.84	148	32.72	107
Oct. 5.5	16.810	113	52.51	64.450	124	79.00	21.203	108	21.06	112	33.79	134
15.5	16.923	81	52.56	64.574	93	80.09	21.311	55	23.55	77	35.13	158
25.5	17.004	53	52.39	64.667	61	81.01	21.366	3	26.22	43	36.71	173
Nov. 4.5	17.057	23	52.04	64.728	30	81.74	21.369	46	28.95	10	38.44	179
14.4	17.080	3	51.57	64.758	3	82.29	21.323	90	31.65	21	40.23	178
24.4	17.077	30	50.97	64.761	27	82.67	21.233	130	34.19	48	42.01	170
Dec. 4.4	17.047	52	50.31	64.734	52	82.87	21.103	166	36.50	76	43.71	155
14.3	16.995	76	49.59	64.682	79	82.90	20.937	194	38.47	98	45.26	136
24.3	16.919	94	48.86	64.603	99	82.75	20.743	218	40.04	111	46.62	110
34.3	16.825		48.14	64.504		82.43	20.525		41.15		47.72	
Mean Place	12.319		23.92	59.749		52.37	16.598		50.53		63.65	
Sec δ , Tan δ	1.001		+0.048	1.067		+0.372	1.458		-1.062		-0.394	
$D\psi\alpha$, $D\omega\alpha$	+0.06		0.00	+0.07		-0.02	+0.05		+0.06		+0.06	
$D\psi\delta$, $D\omega\delta$	+0.4		+0.5	+0.4		+0.5	+0.4		+0.5		+0.3	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	α Hydr. Mag. 3.0		50 Cassiopeiæ. Mag. 4.1		γ Andromedæ pr. Mag. 2.3		α Arietis. Mag. 2.2	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 1 56	° ' " -61 58	h m 1 56	° ' " +72 0	h m 1 58	° ' " +41 55	h m 2 2	° ' " +23 3
	s	"	s	"	s	"	s	"
Jan. 0.3	9.07	52.19	15.89	81.01	45.548	57.13	27.372	70.42
10.3	8.68	52.86	15.37	82.00	45.393	57.31	27.263	70.13
20.3	8.27	52.95	14.81	82.40	45.218	57.12	27.137	69.67
30.2	7.86	52.44	14.22	82.22	45.029	56.58	27.000	69.06
Feb. 9.2	7.47	51.38	13.64	81.46	44.835	55.70	26.857	68.30
19.2	7.10	49.79	13.09	80.16	44.648	54.53	26.716	67.45
29.1	6.76	47.71	12.60	78.38	44.480	53.12	26.588	66.53
Mar. 10.1	6.46	45.20	12.18	76.20	44.339	51.51	26.482	65.59
20.1	6.21	42.32	11.86	73.70	44.237	49.81	26.404	64.67
30.1	6.03	39.12	11.67	71.01	44.183	48.08	26.364	63.84
Apr. 9.0	5.92	35.68	11.60	68.23	44.185	46.41	26.366	63.16
19.0	5.89	32.09	11.68	65.47	44.243	44.85	26.416	62.64
29.0	5.93	28.42	11.89	62.84	44.362	43.50	26.515	62.35
May 9.0	6.07	24.74	12.23	60.43	44.540	42.41	26.662	62.30
18.9	6.27	21.13	12.70	58.33	44.774	41.63	26.856	62.54
28.9	6.55	17.69	13.27	56.61	45.058	41.18	27.091	63.03
June 7.9	6.90	14.47	13.94	55.33	45.383	41.10	27.363	63.81
17.8	7.30	11.58	14.68	54.51	45.743	41.38	27.666	64.83
27.8	7.75	9.08	15.47	54.18	46.128	42.02	27.988	66.09
July 7.8	8.24	7.03	16.30	54.36	46.528	43.00	28.324	67.53
17.8	8.76	5.48	17.14	55.03	46.933	44.30	28.666	69.14
27.7	9.28	4.48	17.98	56.18	47.332	45.88	29.005	70.86
Aug. 6.7	9.80	4.08	18.80	57.78	47.721	47.69	29.334	72.64
16.7	10.29	4.26	19.57	59.80	48.091	49.70	29.646	74.44
26.7	10.76	5.02	20.30	62.18	48.433	51.87	29.938	76.22
Sept. 5.6	11.17	6.35	20.96	64.89	48.744	54.14	30.202	77.94
15.6	11.53	8.19	21.54	67.86	49.022	56.46	30.438	79.56
25.6	11.80	10.48	22.03	71.03	49.262	58.79	30.643	81.07
Oct. 5.5	12.02	13.14	22.44	74.36	49.464	61.11	30.816	82.44
15.5	12.15	16.05	22.76	77.75	49.626	63.35	30.957	83.64
25.5	12.20	19.13	22.97	81.16	49.748	65.47	31.065	84.69
Nov. 4.5	12.17	22.23	23.07	84.51	49.830	67.46	31.141	85.57
14.4	12.05	25.23	23.06	87.70	49.872	69.27	31.187	86.27
24.4	11.88	28.03	22.95	90.67	49.875	70.85	31.201	86.80
Dec. 4.4	11.64	30.51	22.74	93.33	49.839	72.19	31.185	87.15
14.4	11.34	32.57	22.43	95.60	49.765	73.23	31.141	87.31
24.3	11.00	34.16	22.02	97.43	49.656	73.94	31.068	87.30
34.3	10.62	35.21	21.55	98.74	49.517	74.31	30.972	87.10
Mean Place	6.963	41.94	13.963	55.96	44.191	38.10	26.052	56.89
Sec δ , Tan δ	2.128	-1.879	3.240	+3.082	1.344	+0.898	1.087	+0.426
$D\psi\alpha$, $D\omega\alpha$	+0.04	+0.11	+0.10	-0.18	+0.07	-0.05	+0.07	-0.02
$D\psi\delta$, $D\omega\delta$	+0.3	+0.5	+0.3	+0.5	+0.3	+0.5	+0.3	+0.5

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	β Trianguli. Mag. 3.1		55 Cassiopeiæ. Mag. 6.2		6 Persei. Mag. 5.4		ξ^1 Ceti. Mag. 4.5	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 2 4	° ' " +34 35	h m 2 7	° ' " +66 7	h m 2 8	° ' " +50 40	h m 2 8	° ' " + 8 27
	s	"	s	"	s	"	s	"
Jan. 0.3	33.772	42.82	54.17	77.23	2.112	55.44	34.083	19.94
10.3	33.644	42.85	53.82	78.18	1.922	55.94	33.987	19.35
20.3	33.495	42.57	53.42	78.60	1.704	56.01	33.872	18.75
30.2	33.332	42.03	53.00	78.47	1.469	55.64	33.747	18.16
Feb. 9.2	33.163	41.22	52.57	77.80	1.227	54.86	33.615	17.59
19.2	32.999	40.19	52.16	76.62	0.992	53.70	33.485	17.07
29.1	32.848	38.97	51.78	74.98	0.777	52.21	33.365	16.63
Mar. 10.1	32.722	37.63	51.46	72.95	0.594	50.45	33.262	16.30
20.1	32.628	36.24	51.21	70.65	0.456	48.51	33.185	16.10
30.1	32.578	34.85	51.06	68.14	0.373	46.46	33.141	16.05
Apr. 9.0	32.575	33.54	50.99	65.53	0.354	44.41	33.136	16.20
19.0	32.627	32.38	51.03	62.96	0.402	42.43	33.174	16.56
29.0	32.732	31.41	51.18	60.50	0.520	40.61	33.257	17.13
May 9.0	32.891	30.71	51.45	58.24	0.708	39.04	33.386	17.95
18.9	33.101	30.28	51.80	56.28	0.960	37.75	33.558	18.98
28.9	33.358	30.17	52.24	54.67	1.271	36.80	33.770	20.22
June 7.9	33.656	30.38	52.75	53.47	1.633	36.24	34.018	21.64
17.8	33.985	30.91	53.33	52.72	2.036	36.07	34.294	23.22
27.8	34.338	31.76	53.95	52.43	2.468	36.31	34.592	24.91
July 7.8	34.705	32.89	54.60	52.61	2.922	36.93	34.904	26.67
17.8	35.079	34.28	55.27	53.26	3.383	37.94	35.224	28.45
27.7	35.450	35.88	55.94	54.35	3.842	39.28	35.541	30.20
Aug. 6.7	35.811	37.06	56.59	55.87	4.289	40.95	35.849	31.86
16.7	36.153	39.56	57.21	57.76	4.718	42.89	36.146	33.42
26.7	36.474	41.56	57.80	60.01	5.118	45.06	36.422	34.83
Sept. 5.6	36.766	43.60	58.35	62.55	5.486	47.41	36.673	36.04
15.6	37.027	45.65	58.83	65.33	5.816	49.89	36.898	37.05
25.6	37.254	47.66	59.25	68.30	6.105	52.48	37.094	37.83
Oct. 5.5	37.447	49.60	59.61	71.41	6.349	55.09	37.258	38.39
15.5	37.604	51.45	59.88	74.58	6.547	57.67	37.393	38.74
25.5	37.725	53.17	60.08	77.77	6.699	60.21	37.498	38.89
Nov. 4.5	37.811	54.73	60.21	80.89	6.803	62.65	37.571	38.84
14.4	37.862	56.12	60.26	83.86	6.857	64.92	37.617	38.63
24.4	37.876	57.30	60.23	86.65	6.864	66.97	37.633	38.31
Dec. 4.4	37.855	58.28	60.11	89.14	6.823	68.77	37.621	37.88
14.4	37.802	59.00	59.91	91.28	6.734	70.24	37.583	37.38
24.3	37.716	59.46	59.65	93.01	6.602	71.37	37.520	36.82
34.3	37.600	59.64	59.33	94.26	6.431	72.10	37.433	36.22
Mean Place	32.403	25.87	52.281	53.27	0.582	34.43	32.733	11.13
Sec δ , Tan δ	1.215	+0.690	2.472	+2.261	1.578	+1.221	1.011	+0.149
$D\phi a, D\omega a$	+0.07	-0.04	+0.09	-0.13	+0.08	-0.07	+0.06	-0.01
$D\phi \delta, D\omega \delta$	+0.3	+0.5	+0.3	+0.5	+0.3	+0.5	+0.3	+0.5

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	μ Fornacis. Mag. 5.2		γ Trianguli. Mag. 4.1		67 Ceti. Mag. 5.7		ϕ Eridani. Mag. 3.8	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 2 9	° ' " -31 6	h m 2 12	° ' " +33 27	h m 2 12	° ' " - 6 48	h m 2 13	° ' " -51 53
	s	"	s	"	s	"	s	"
Jan. 0.3	13.796	67.39	20.355	50.00	48.945	27.80	32.291	70.59
10.3	13.647 ¹⁴⁹	68.42 ¹⁰³	20.232 ¹²³	50.04 ⁴	48.845 ¹⁰⁰	28.67 ⁸⁷	32.029 ²⁶²	71.61 ¹⁰²
20.3	13.482 ¹⁶⁵	69.07 ⁶⁵	20.089 ¹⁴³	49.80 ²⁴	48.726 ¹¹⁹	29.37 ⁷⁰	31.749 ²⁸⁰	72.10 ⁴⁹
30.2	13.308 ¹⁷⁴	69.32 ²⁵	19.929 ¹⁶⁰	49.31 ⁴⁹	48.596 ¹³⁰	29.91 ⁵⁴	31.460 ²⁸⁹	72.04 ⁶
Feb. 9.2	13.131 ¹⁷⁷	69.16 ¹⁶	19.762 ¹⁶⁷	48.55 ⁷⁸	48.460 ¹³⁶	30.26 ³⁵	31.170 ²⁹⁰	71.45 ⁵⁹
	175	58	104	96	134	13	281	111
19.2	12.956	68.58	19.598	47.59	48.326	30.39	30.889	70.34
29.2	12.796 ¹⁶⁰	67.63 ⁹⁵	19.445 ¹⁵³	46.45 ¹¹⁴	48.200 ¹²⁶	30.32 ⁷	30.629 ²⁶⁰	68.74 ¹⁶⁰
Mar. 10.1	12.655 ¹⁴¹	66.29 ¹³⁴	19.315 ¹³⁰	45.19 ¹²⁶	48.092 ¹⁰⁸	30.02 ³⁰	30.396 ²³³	66.69 ²⁶⁵
20.1	12.543 ¹¹²	64.60 ¹⁶⁹	19.216 ⁹⁹	43.88 ¹³¹	48.008 ⁸⁴	29.49 ⁵³	30.203 ¹⁹³	64.25 ²⁴⁴
30.1	12.467 ⁷⁶	62.59 ²⁰¹	19.158 ⁵⁸	42.56 ¹³²	47.954 ⁵⁴	28.72 ⁷⁷	30.055 ¹⁴⁸	61.47 ²⁷⁸
	36	227	11	124	15	101	93	359
Apr. 9.0	12.431	60.32	19.147	41.32	47.939	27.71	29.962	58.39
19.0	12.441 ¹⁰	57.79 ²⁵³	19.188 ⁴¹	40.22 ¹¹⁰	47.965 ²⁶	26.46 ¹²⁵	29.929 ³³	55.11 ³²⁸
29.0	12.498 ⁵⁷	55.08 ²⁷¹	19.284 ⁹⁶	39.30 ⁹²	48.036 ⁷¹	25.00 ¹⁴⁶	29.956 ²⁷	51.68 ³⁴³
May 9.0	12.605 ¹⁰⁷	52.23 ²⁸⁵	19.432 ¹⁴⁸	38.62 ⁶⁸	48.151 ¹¹⁵	23.32 ¹⁶⁸	30.050 ⁹⁴	48.18 ³⁵⁰
18.9	12.761 ¹⁵⁶	49.30 ²⁹³	19.632 ²⁰⁰	38.22 ⁴⁰	48.310 ¹⁵⁹	21.48 ¹⁸⁴	30.206 ¹⁵⁶	44.68 ³⁵⁰
	201	294	248	10	200	198	217	342
28.9	12.962	46.36	19.880	38.12	48.510	19.50	30.423	41.26
June 7.9	13.204 ²⁴²	43.47 ²⁸⁹	20.167 ²⁸⁷	38.34 ²²	48.744 ²³⁴	17.43 ²⁰⁷	30.695 ²⁷²	38.00 ³²⁶
17.9	13.480 ²⁷⁶	40.71 ²⁷⁶	20.488 ³²¹	38.85 ⁵¹	49.009 ²⁶⁵	15.30 ²¹³	31.015 ³²⁰	35.00 ³⁶⁰
27.8	13.784 ³⁰⁴	38.16 ²⁵⁵	20.834 ³⁴⁶	39.67 ⁸²	49.297 ²⁸⁸	13.20 ²¹⁰	31.377 ³⁶²	32.30 ²⁷⁰
July 7.8	14.107 ³²³	35.85 ²³¹	21.196 ³⁶²	40.77 ¹¹⁰	49.601 ³⁰⁴	11.15 ²⁰⁵	31.769 ³⁹²	30.00 ²⁹⁰
	334	196	369	133	311	193	411	186
17.8	14.441	33.89	21.565	42.10	49.912	9.22	32.180	28.14
27.7	14.778 ³³⁷	32.30 ¹⁵⁹	21.933 ³⁶⁸	43.64 ¹⁵⁴	50.225 ³¹³	7.46 ¹⁷⁶	32.600 ⁴²⁰	26.79 ¹³⁵
Aug. 6.7	15.110 ³³²	31.14 ¹¹⁶	22.292 ³⁵⁹	45.36 ¹⁷²	50.530 ³⁰⁵	5.93 ¹⁵³	33.018 ⁴¹⁸	25.98 ⁸¹
16.7	15.428 ³¹⁸	30.43 ⁷¹	22.634 ³⁴²	47.19 ¹⁸³	50.822 ²⁹²	4.67 ¹²⁶	33.422 ⁴⁰⁴	25.74 ²⁴
26.7	15.725 ²⁹⁷	30.20 ²³	22.956 ³²²	49.11 ¹⁹²	51.096 ²⁷⁴	3.69 ⁹⁸	33.802 ³⁸⁰	26.06 ³²
	270	24	295	195	250	65	347	91
Sept. 5.6	15.995	30.44	23.251	51.06	51.346	3.04	34.149	26.97
15.6	16.234 ²³⁹	31.15 ⁷¹	23.516 ²⁶⁵	53.02 ¹⁹⁶	51.569 ²²³	2.72 ³²	34.453 ³⁰⁴	28.40 ¹⁴³
25.6	16.437 ²⁰³	32.30 ¹¹⁵	23.750 ²³⁴	54.94 ¹⁹²	51.763 ¹⁹⁴	2.70 ²	34.709 ²⁵⁶	30.29 ¹⁸⁹
Oct. 5.6	16.602 ¹⁶⁵	33.81 ¹⁵¹	23.949 ¹⁹⁹	56.79 ¹⁸⁵	51.926 ¹⁶³	2.99 ²⁹	34.910 ²⁰¹	32.60 ²³¹
15.5	16.728 ¹²⁶	35.64 ¹⁸³	24.113 ¹⁶⁴	58.54 ¹⁷⁵	52.059 ¹³³	3.55 ⁵⁶	35.055 ¹⁴⁵	35.23 ²⁶³
	87	207	129	163	100	79	85	284
25.5	16.815	37.71	24.242	60.17	52.159	4.34	35.140	38.07
Nov. 4.5	16.864 ⁴⁹	39.92 ²²¹	24.337 ⁹⁵	61.66 ¹⁴⁹	52.229 ⁷⁰	5.30 ⁹⁶	35.167 ²⁷	41.02 ²⁹⁵
14.4	16.874 ¹⁰	42.18 ²²⁶	24.396 ⁵⁰	62.98 ¹³²	52.270 ⁴¹	6.39 ¹⁰⁹	35.137 ³⁰	43.97 ²⁹⁵
24.4	16.849 ²⁵	44.41 ²²³	24.419 ²³	64.10 ¹¹²	52.280 ¹⁰	7.56 ¹¹⁷	35.053 ¹³⁴	46.77 ²⁸⁰
Dec. 4.4	16.790 ⁵⁹	46.50 ²⁰⁹	24.407 ¹²	65.02 ⁹²	52.263 ¹⁷	8.75 ¹¹⁹	34.919 ⁸⁴	49.35 ²⁵⁸
	88	190	45	69	44	114	179	225
14.4	16.702	48.40	24.362	65.71	52.219	9.89	34.740	51.60
24.3	16.585 ¹¹⁷	50.02 ¹⁶²	24.284 ⁷⁸	66.16 ⁴⁵	52.150 ⁶⁹	10.97 ¹⁰⁸	34.523 ²¹⁷	53.42 ¹⁸²
34.3	16.446 ¹³⁹	51.30 ¹²⁸	24.175 ¹⁰⁹	66.33 ¹⁷	52.059 ⁹¹	11.94 ⁹⁷	34.273 ²⁵⁰	54.78 ¹⁹⁶
Mean Place	12.269	63.96	18.931	33.48	47.543	31.69	30.414	62.59
Soc δ , Tan δ	1.168	-0.604	1.199	+0.661	1.007	-0.119	1.620	-1.275
$D\psi\alpha$, $D\omega\alpha$	+0.05	+0.03	+0.07	-0.04	+0.06	+0.01	+0.04	+0.07
$D\psi\delta$, $D\omega\delta$	+0.3	+0.5	+0.3	+0.5	+0.3	+0.5	+0.3	+0.6

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	α Ceti. (Mira.) Var. 1.7-9.6			κ Fornacis. Mag. 5.4			δ Hydri. Mag. 4.3			ι Cassiopeiæ. Mag. 4.6		
	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.
	h	m	"	h	m	"	h	m	"	h	m	"
	2	15	- 3 21	2	18	-24 11	2	20	-69 1	2	22	+67 1
	s		"	s		"	s		"	s		"
Jan. 0.3	7.526		25.26	43.417		52.98	17.71		98.99	9.81		55.88
10.3	7.428	98	26.07	43.290	127	54.07	17.17	54	99.91	9.45	36	57.03
20.3	7.313	115	26.76	43.146	144	54.83	16.60	57	100.22	9.04	41	57.63
30.2	7.185	128	27.33	42.990	156	55.25	16.01	59	99.93	8.60	44	57.69
Feb. 9.2	7.050	135	27.73	42.828	162	55.30	15.43	58	99.05	8.15	45	57.20
		133			161			56			44	
19.2	6.917		27.98	42.667		55.00	14.87		97.60	7.71		56.20
29.2	6.791	126	28.02	42.516	151	54.34	14.35	52	95.64	7.30	41	54.70
Mar. 10.1	6.683	108	27.88	42.383	133	53.35	13.88	47	93.22	6.95	35	52.82
20.1	6.598	85	27.52	42.275	108	52.01	13.47	41	90.40	6.66	29	50.59
30.1	6.545	53	26.94	42.200	75	50.37	13.15	32	87.26	6.47	19	48.16
		15			36			24			10	
Apr. 9.0	6.530		26.14	42.164		48.47	12.91	15	83.84	6.37		45.57
19.0	6.555	25	25.10	42.170	6	46.30	12.76		80.24	6.38	1	42.98
29.0	6.625	70	23.84	42.223	53	43.93	12.72	4	76.52	6.50	12	40.45
May 9.0	6.740	115	22.38	42.323	100	41.38	12.79	7	72.78	6.73	23	38.10
18.9	6.898	158	20.73	42.470	147	38.73	12.95	16	69.11	7.07	34	36.02
		199			189			27			42	
28.9	7.097		18.91	42.659		36.03	13.22		65.57	7.49		34.27
June 7.9	7.332	235	16.99	42.889	230	33.33	13.58	36	62.25	8.00	51	32.89
17.9	7.597	265	14.99	43.153	264	30.70	14.02	44	59.25	8.58	58	31.91
27.8	7.884	287	12.96	43.443	290	28.21	14.53	51	56.61	9.21	63	31.42
July 7.8	8.187	303	10.98	43.754	311	25.92	15.11	58	54.42	9.88	67	31.38
		311			321			61			69	
17.8	8.498		9.10	44.075		23.90	15.72		52.72	10.57		31.80
27.7	8.811	313	7.35	44.399	324	22.21	16.36	64	51.58	11.26	69	32.69
Aug. 6.7	9.116	305	5.78	44.719	320	20.88	17.01	65	51.04	11.94	68	33.98
16.7	9.408	292	4.44	45.027	308	19.96	17.64	63	51.10	12.61	67	35.68
26.7	9.681	273	3.37	45.317	290	19.47	18.24	50	51.73	13.23	62	37.75
		251			265			55			58	
Sept. 5.6	9.932		2.60	45.582		19.43	18.79		53.00	13.81		40.12
15.6	10.158	226	2.12	45.820	238	19.82	19.28	49	54.80	14.34	53	42.76
25.6	10.353	195	1.94	46.025	205	20.63	19.68	40	57.08	14.81	47	45.63
Oct. 5.6	10.519	166	2.05	46.196	171	21.82	19.99	31	59.77	15.21	40	48.64
15.5	10.655	136	2.42	46.332	136	23.31	20.19	20	62.77	15.54	33	51.77
		105			99			10			25	
25.5	10.760		3.01	46.431	65	25.06	20.29		65.94	15.79		54.94
Nov. 4.5	10.834	74	3.79	46.496	29	26.97	20.28	1	69.19	15.96	17	58.06
14.4	10.878	44	4.69	46.525	29	28.97	20.17	11	72.38	16.04	8	61.08
24.4	10.893	15	5.68	46.522	3	30.98	19.95	22	75.39	16.04	0	63.92
Dec. 4.4	10.880	13	6.71	46.486	36	32.91	19.64	31	78.09	15.95	9	66.53
		38			65			40			17	
14.4	10.842		7.74	46.421		34.69	19.24		80.41	15.78		68.81
24.3	10.777	65	8.71	46.329	92	36.26	18.78	46	82.24	15.53	25	70.70
34.3	10.690	87	9.62	46.212	117	37.55	18.26	52	83.54	15.21	32	72.12
Mean Place	6.121		30.26	41.901		51.70	14.958		88.91	7.604		32.18
Sec δ , Tan δ	1.002		-0.059	1.096		-0.449	2.795		-2.610	2.562		+2.359
$D_{\psi} \alpha$, $D_{\omega} \alpha$	+0.06		0.00	+0.05		+0.02	+0.02		+0.14	+0.10		-0.13
$D_{\psi} \delta$, $D_{\omega} \delta$	+0.3		+0.6	+0.3		+0.6	+0.3		+0.6	+0.3		+0.6

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	ξ^2 Ceti. Mag. 4.3			σ Ceti. Mag. 4.8			36 H. Cassiopeiæ. Mag. 5.3			γ Ceti. Mag. 5.0		
	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.
	h	m	"	h	m	"	h	m	"	h	m	"
	2	23	+ 8 5	2	28	-15 36	2	29	+72 27	2	31	+ 5 13
	s	"	"	s	"	"	s	"	"	s	"	"
Jan. 0.3	42.870	91	11.68	7.787	108	43.97	63.78	30.92	138	29.301	90	46.36
10.3	42.779	112	11.09	7.679	128	45.02	63.30	32.30	84	29.211	110	45.69
20.3	42.667	126	10.50	7.551	111	45.83	62.76	33.14	27	29.101	127	45.06
30.2	42.541	135	9.92	7.410	150	46.38	62.16	33.41	31	28.974	134	44.48
Feb. 9.2	42.406	136	9.37	7.260	150	46.65	61.55	33.10	88	28.840	137	43.96
19.2	42.270	129	8.88	7.110	143	46.62	60.95	32.22	140	28.703	132	43.52
29.2	42.141	112	8.46	6.967	128	46.30	60.40	30.82	185	28.571	119	43.20
Mar. 10.1	42.029	90	8.14	6.839	105	45.69	59.90	28.97	223	28.452	95	43.01
20.1	41.939	57	7.96	6.734	74	44.80	59.50	26.74	252	28.357	62	42.95
30.1	41.882	19	7.93	6.660	37	43.62	59.20	24.22	268	28.295	27	43.07
Apr. 9.1	41.863	23	8.09	6.623	4	42.18	59.03	21.54	275	28.268	14	43.37
19.0	41.886	68	8.44	6.627	49	40.48	59.01	18.79	270	28.282	59	43.88
29.0	41.954	115	9.00	6.676	95	38.57	59.12	16.09	256	28.341	104	44.61
May 9.0	42.069	158	9.80	6.771	140	36.46	59.37	13.53	234	28.445	149	45.55
18.9	42.227	201	10.80	6.911	182	34.20	59.77	11.19	202	28.594	190	46.71
28.9	42.428	236	12.02	7.093	222	31.85	60.27	9.17	165	28.784	229	48.04
June 7.9	42.664	268	13.41	7.315	253	29.43	60.89	7.52	123	29.013	260	49.54
17.9	42.932	290	14.95	7.568	278	27.04	61.59	6.29	78	29.273	283	51.19
27.8	43.222	309	16.61	7.846	301	24.71	62.36	5.51	30	29.556	303	52.90
July 7.8	43.531	316	18.33	8.147	310	22.50	63.19	5.21	18	29.859	313	54.66
17.8	43.847	317	20.06	8.457	314	20.49	64.06	5.39	65	30.172	314	56.41
27.8	44.164	312	21.77	8.771	310	18.74	64.94	6.04	111	30.486	310	58.12
Aug. 6.7	44.476	299	23.39	9.081	300	17.27	65.80	7.15	154	30.796	299	59.70
16.7	44.775	283	24.90	9.381	282	16.14	66.64	8.69	194	31.095	284	61.15
26.7	45.058	260	26.25	9.663	262	15.39	67.44	10.63	229	31.379	263	62.43
Sept. 5.6	45.318	236	27.41	9.925	236	15.02	68.19	12.92	261	31.642	239	63.47
15.6	45.554	208	28.36	10.161	208	15.04	68.88	15.53	286	31.881	211	64.29
25.6	45.762	180	29.08	10.369	177	15.45	69.50	18.39	307	32.092	184	64.86
Oct. 5.6	45.942	149	29.58	10.546	144	16.19	70.02	21.46	321	32.276	156	65.19
15.5	46.091	120	29.86	10.690	112	17.25	70.46	24.67	320	32.432	125	65.29
25.5	46.211	90	29.95	10.802	80	18.56	70.79	27.96	329	32.557	96	65.19
Nov. 4.5	46.301	60	29.86	10.882	47	20.04	71.01	31.25	323	32.653	66	64.90
14.5	46.361	30	29.62	10.929	16	21.66	71.13	34.48	307	32.719	35	64.47
24.4	46.391	3	29.26	10.945	15	23.32	71.13	37.55	285	32.754	8	63.91
Dec. 4.4	46.394	27	28.80	10.930	44	24.97	71.01	40.40	253	32.762	23	63.29
14.4	46.367	54	28.27	10.886	71	26.52	70.78	42.93	214	32.739	50	62.61
24.3	46.313	81	27.70	10.815	97	27.92	70.45	45.07	168	32.689	77	61.92
34.3	46.232		27.09	10.718		29.13	70.02	46.75		32.612		61.22
Mean Place	41.431		2.97	6.275		45.35	60.986		6.78	27.821		38.55
Sec δ , Tan δ	1.010		+0.142	1.038		-0.279	3.318		+3.164	1.004		+0.092
$D\psi\alpha$, $D_\omega\alpha$	+0.06		-0.01	+0.06		+0.01	+0.11		-0.17	+0.06		-0.01
$D\psi\delta$, $D_\omega\delta$	+0.3		+0.6	+0.3		+0.6	+0.3		+0.6	+0.3		+0.6

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	μ Hydr. Mag. 5.3			ν Arietis. Mag. 5.4			δ Ceti. Mag. 4.0			ϵ Hydr. Mag. 4.3		
	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.
	h m	s	"	h m	s	"	h m	s	"	h m	s	"
	2 33		-79 27	2 34		+21 35	2 35		- 0 1	2 38		-68 36
Jan. 0.3	29.92		103.95	4.131		68.43	12.038		53.19	20.42		105.45
10.3	28.75	117	104.86	4.038	93	68.21	11.949	89	53.99	19.90	52	106.63
20.3	27.52	123	105.17	3.920	118	67.87	11.838	111	54.68	19.34	56	107.22
30.2	26.26	126	104.88	3.785	135	67.39	11.712	126	55.28	18.76	58	107.20
Feb. 9.2	25.01	125	104.00	3.638	147	66.80	11.575	137	55.76	18.18	58	106.60
19.2	23.80	121	102.54	3.489	149	66.10	11.435	140	56.09	17.61	57	105.43
29.2	22.66	114	100.57	3.345	197	65.35	11.301	134	56.26	17.07	54	103.73
Mar. 10.1	21.61	105	98.14	3.217	243	64.57	11.180	121	56.28	16.57	50	101.54
20.1	20.70	91	95.32	3.114	282	63.81	11.081	99	56.09	16.13	44	98.92
30.1	19.92	78	92.16	3.045	316	63.12	11.012	69	55.72	15.77	36	95.94
Apr. 9.1	19.31	61	88.76	3.016	340	62.52	10.980	32	55.13	15.48	29	92.67
19.0	18.89	42	85.16	3.033	360	62.07	10.988	8	54.32	15.30	18	89.17
29.0	18.64	25	81.46	3.098	370	61.81	11.040	52	53.29	15.21	9	85.52
May 9.0	18.60	4	77.75	3.212	371	61.76	11.138	98	52.05	15.22	1	81.81
18.9	18.75	15	74.09	3.374	366	61.96	11.279	141	50.61	15.33	11	78.12
June 28.9	19.09	34	70.58	3.581	351	62.39	11.463	184	49.00	15.56	23	74.54
7.9	19.63	54	67.29	3.827	329	63.07	11.685	222	47.27	15.87	31	71.13
17.9	20.32	69	64.31	4.106	298	63.96	11.939	254	45.43	16.27	40	67.99
27.8	21.16	84	61.71	4.412	260	65.08	12.217	278	43.54	16.74	47	65.19
July 7.8	22.13	97	59.54	4.736	217	66.36	12.513	296	41.66	17.28	54	62.82
17.8	23.21	108	57.89	5.070	165	67.78	12.823	310	39.82	17.86	58	60.94
27.8	24.35	114	56.79	5.406	110	69.30	13.134	311	38.09	18.48	62	59.59
Aug. 6.7	25.52	117	56.29	5.738	50	70.88	13.441	307	36.52	19.12	64	58.82
16.7	26.69	117	56.38	6.060	9	72.48	13.740	299	35.14	19.75	63	58.66
26.7	27.81	112	57.08	6.363	112	74.05	14.023	283	34.00	20.35	60	59.12
Sept. 5.6	28.84	103	58.38	6.647	130	75.55	14.285	262	33.11	20.92	57	60.17
15.6	29.77	93	60.22	6.905	284	76.97	14.525	240	32.52	21.43	51	61.79
25.6	30.55	78	62.55	7.137	258	78.27	14.737	212	32.20	21.86	43	63.93
Oct. 5.6	31.14	59	65.28	7.339	233	79.43	14.923	186	32.15	22.20	34	66.51
15.5	31.55	41	68.33	7.511	202	80.45	15.078	155	32.36	22.44	24	69.44
Nov. 25.5	31.72	17	71.55	7.653	142	81.33	15.204	126	32.78	22.59	15	72.60
4.5	31.69	3	74.85	7.763	110	82.04	15.301	97	33.39	22.63	4	75.88
14.5	31.43	26	78.08	7.841	78	82.61	15.367	66	34.15	22.57	6	79.14
24.4	30.96	47	81.13	7.889	48	83.04	15.403	36	35.01	22.40	17	82.27
Dec. 4.4	30.28	68	83.88	7.903	305	83.32	15.411	8	35.92	22.12	28	85.15
14.4	29.43	85	86.23	7.883	275	83.45	15.388	23	36.84	21.77	35	87.66
24.3	28.43	100	88.08	7.834	235	83.45	15.338	50	37.74	21.34	43	89.73
34.3	27.31	112	89.39	7.755	185	83.31	15.261	77	38.60	20.85	49	91.27
Mean Place	25.067		93.79	2.605		55.63	10.534		59.38	17.548		96.20
Sec δ , Tan δ	5.473		-5.382	1.076		+0.396	1.000		-0.001	2.744		-2.555
$D_{\delta} \alpha$, $D_{\delta} \alpha$	-0.03		+0.28	+0.07		-0.02	+0.06		0.00	+0.02		+0.13
$D_{\delta} \delta$, $D_{\delta} \delta$	+0.3		+0.6	+0.3		+0.6	+0.3		+0.6	+0.3		+0.6

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	θ Persei. Mag. 4.2		γ Ceti seq. Mag. 3.7		π Ceti. Mag. 4.4		μ Ceti. Mag. 4.4	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 2 38	° ' +48 52	h m 2 38	° ' + 2 52	h m 2 40	° ' -14 12	h m 2 40	° ' + 9 48
	s "	"	s "	"	s "	"	s "	"
Jan. 0.3	29.105	46.24 70	58.289	63.78 72	8.978	47.87 109	25.447	45.96 84
10.3	28.947 158	46.94 32	58.203 86	63.06 87	8.878 100	48.96 109	25.363 84	45.42 84
20.3	28.754 193	47.26 32	58.095 108	62.39 87	8.754 124	49.83 87	25.256 107	44.86 107
30.3	28.535 219	47.18 8	57.969 126	61.79 60	8.615 139	50.44 61	25.130 126	44.31 126
Feb. 9.2	28.301 234	46.71 47	57.832 137	61.29 50	8.465 150	50.77 33	24.993 137	43.77 137
	237	86	141	40	152	7	142	
19.2	28.064	45.85 119	57.691 135	60.89 26	8.313 148	50.84 23	24.851 137	43.27 137
29.2	27.838 226	44.66 148	57.556 122	60.63 12	8.165 135	50.61 50	24.714 123	42.82 123
Mar. 10.1	27.637 201	43.18 170	57.434 102	60.51 4	8.030 112	50.11 80	24.591 101	42.45 101
20.1	27.473 164	41.48 183	57.332 71	60.55 23	7.918 83	49.31 107	24.490 71	42.20 107
30.1	27.358 115	39.65 190	57.261 35	60.78 42	7.835 48	48.24 133	24.419 34	42.08 133
Apr. 9.1	27.299 8	37.75 187	57.226 5	61.20 63	7.787 7	46.91 159	24.385 8	42.13 159
19.0	27.307 73	35.88 178	57.231 50	61.83 84	7.780 38	45.32 181	24.393 53	42.37 181
29.0	27.380 143	34.10 158	57.281 96	62.67 106	7.818 84	43.51 201	24.446 100	42.80 201
May 9.0	27.523 207	32.52 136	57.377 139	63.73 126	7.902 129	41.50 217	24.546 145	43.45 217
19.0	27.730 268	31.16 106	57.516 183	64.99 143	8.031 172	39.33 228	24.691 188	44.31 228
28.9	27.998 321	30.10 73	57.699 220	66.42 160	8.203 211	37.05 235	24.879 226	45.37 235
June 7.9	28.319 368	29.37 39	57.919 253	68.02 169	8.414 245	34.70 236	25.105 259	46.62 236
17.9	28.687 403	28.98 3	58.172 278	69.71 178	8.659 273	32.34 231	25.364 285	48.02 231
27.8	29.090 427	28.95 35	58.450 297	71.49 180	8.931 293	30.03 218	25.649 304	49.55 218
July 7.8	29.517 445	29.30 69	58.747 309	73.29 177	9.224 307	27.85 202	25.953 315	51.16 202
17.8	29.962 449	29.99 101	59.056 312	75.06 169	9.531 311	25.83 180	26.268 318	52.81 180
27.8	30.411 444	31.00 133	59.368 310	76.75 157	9.842 310	24.03 150	26.586 315	54.43 150
Aug. 6.7	30.855 432	32.33 160	59.678 299	78.32 141	10.152 301	22.53 118	26.901 306	56.00 118
16.7	31.287 413	33.93 182	59.977 285	79.73 119	10.453 287	21.35 81	27.207 291	57.48 81
26.7	31.700 385	35.75 200	60.262 265	80.92 97	10.740 266	20.54 45	27.498 272	58.81 45
Sept. 5.7	32.085 355	37.75 217	60.527 243	81.89 70	11.006 245	20.09 6	27.770 248	59.96 6
15.6	32.440 319	39.92 226	60.770 217	82.59 45	11.251 216	20.03 33	28.018 223	60.93 33
25.6	32.759 283	42.18 233	60.987 189	83.04 19	11.467 187	20.36 67	28.241 197	61.68 67
Oct. 5.6	33.042 240	44.51 235	61.176 160	83.23 5	11.654 156	21.03 98	28.438 167	62.22 98
15.5	33.282 197	46.86 234	61.336 132	83.18 27	11.810 125	22.01 125	28.605 139	62.56 125
25.5	33.479 151	49.20 226	61.468 101	82.91 45	11.935 93	23.26 144	28.744 108	62.70 144
Nov. 4.5	33.630 104	51.46 216	61.569 71	82.46 59	12.028 61	24.70 157	28.852 78	62.67 157
14.5	33.734 57	53.62 200	61.640 43	81.87 71	12.089 28	26.27 163	28.930 49	62.49 163
24.4	33.791 6	55.62 180	61.683 11	81.16 78	12.117 2	27.90 163	28.979 17	62.19 163
Dec. 4.4	33.797 43	57.42 155	61.694 18	80.38 80	12.115 33	29.53 155	28.996 13	61.80 155
14.4	33.754 91	58.97 125	61.676 46	79.58 81	12.082 62	31.08 143	28.983 42	61.34 143
24.4	33.663 135	60.22 91	61.630 74	78.77 78	12.020 88	32.51 124	28.941 71	60.82 124
34.3	33.528	61.13 91	61.556	77.99 78	11.932	33.75	28.870	60.27 78
Mean Place	27.276	26.40	56.770	56.70	7.415	49.84	23.914	36.78
Sec δ , Tan δ	1.520	+1.146	1.001	+0.050	1.031	-0.253	1.015	+0.172
$D\psi\alpha$, $D\omega\alpha$	+0.08	-0.06	+0.06	0.00	+0.06	+0.01	+0.06	-0.01
$D\psi\delta$, $D\omega\delta$	+0.3	+0.6	+0.3	+0.6	+0.3	+0.6	+0.3	+0.6

APPARENT PLACES OF STARS, 1916.

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FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	7 Persei. Mag. 3.9		41 Arietis. Mag. 3.7		β Fornacis. Mag. 4.5		σ Arietis. Mag. 5.5	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 2 44	° ' " +55 32	h m 2 45	° ' " +26 54	h m 2 45	° ' " -32 44	h m 2 46	° ' " +14 44
	s	"	s	"	s	"	s	"
Jan. 0.3	35.645	73.00	3.732	68.35	36.222	92.59	52.697	22.00
10.3	35.451	73.98	3.639	68.35	36.079	93.97	52.615	21.60
20.3	35.216	74.54	3.518	68.15	35.912	94.95	52.507	21.14
30.3	34.949	74.64	3.376	67.79	35.728	95.51	52.380	20.65
Feb. 9.2	34.664	74.30	3.220	67.25	35.534	95.63	52.239	20.11
19.2	34.375	73.51	3.060	66.55	35.338	95.33	52.094	19.54
29.2	34.098	72.33	2.903	65.73	35.147	94.60	51.951	18.99
Mar. 10.1	33.850	70.79	2.761	64.83	34.972	93.46	51.821	18.48
20.1	33.643	68.98	2.645	63.89	34.821	91.94	51.714	18.03
30.1	33.492	66.97	2.563	62.96	34.702	90.08	51.637	17.66
Apr. 9.1	33.408	64.84	2.522	62.10	34.622	87.89	51.598	17.45
19.0	33.396	62.69	2.528	61.35	34.588	85.42	51.599	17.38
29.0	33.462	60.62	2.584	60.76	34.601	82.74	51.648	17.51
May 9.0	33.607	58.69	2.692	60.36	34.664	79.88	51.745	17.86
19.0	33.826	56.98	2.849	60.20	34.778	76.91	51.886	18.40
28.9	34.117	55.55	3.054	60.28	34.941	73.90	52.073	19.17
June 7.9	34.469	54.45	3.301	60.62	35.148	70.91	52.299	20.13
17.9	34.875	53.72	3.583	61.20	35.396	68.01	52.559	21.29
27.8	35.324	53.38	3.894	62.02	35.676	65.28	52.845	22.59
July 7.8	35.805	53.41	4.226	63.05	35.983	62.81	53.153	24.00
17.8	36.305	53.84	4.569	64.27	36.307	60.64	53.472	25.48
27.8	36.813	54.65	4.918	65.63	36.641	58.84	53.795	27.04
Aug. 6.7	37.318	55.81	5.263	67.10	36.977	57.47	54.117	28.57
16.7	37.811	57.29	5.600	68.64	37.307	56.56	54.430	30.05
26.7	38.284	59.07	5.921	70.21	37.622	56.15	54.728	31.44
Sept. 5.7	38.729	61.10	6.221	71.77	37.916	56.24	55.007	32.72
15.6	39.140	63.32	6.498	73.29	38.184	56.83	55.264	33.82
25.6	39.512	65.71	6.748	74.75	38.422	57.90	55.497	34.78
Oct. 5.6	39.840	68.21	6.970	76.11	38.626	59.40	55.702	35.55
15.5	40.121	70.80	7.162	77.37	38.791	61.25	55.881	36.14
25.5	40.351	73.41	7.321	78.50	38.919	63.41	56.029	36.57
Nov. 4.5	40.528	75.97	7.449	79.51	39.008	65.75	56.146	36.82
14.5	40.649	78.46	7.545	80.39	39.057	68.21	56.235	36.94
24.4	40.713	80.81	7.605	81.12	39.067	70.68	56.291	36.92
Dec. 4.4	40.716	82.95	7.631	81.71	39.038	73.06	56.315	36.81
14.4	40.662	84.85	7.621	82.13	38.974	75.25	56.309	36.59
24.4	40.550	86.42	7.577	82.39	38.876	77.20	56.272	36.28
34.3	40.384	87.64	7.500	82.48	38.746	78.82	56.202	35.91
Mean Place	33.586	52.02	2.107	54.20	34.504	89.75	51.120	11.38
Sec δ , Tan δ	1.768	+1.458	1.122	+0.508	1.189	-0.643	1.034	+0.263
$D\delta a$, $D\omega a$	+0.09	-0.07	+0.07	-0.03	+0.05	+0.03	+0.07	-0.01
$D\delta \delta$, $D\omega \delta$	+0.3	+0.7	+0.3	+0.7	+0.3	+0.7	+0.3	+0.7

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	τ^2 Eridani. Mag. 4.8		τ Persei. Mag. 4.1		η Eridani. Mag. 4.0		ϵ Arietis (mean). Mag. 4.6	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 2 47 s	° ' " -21 20 "	h m 2 48 s	° ' " +52 25 "	h m 2 52 s	° ' " - 9 13 "	h m 2 54 s	° ' " +21 0 "
Jan. 0.3	15.245	58.43	19.589	30.80	21.002	50.96	25.959	30.49
10.3	15.133	59.69	19.419	31.71	20.913	52.02	25.876	30.32
20.3	14.999	60.65	19.209	32.22	20.799	52.90	25.766	30.01
30.3	14.847	61.29	18.969	32.30	20.666	53.57	25.634	29.61
Feb. 9.2	14.683	61.58	18.709	31.96	20.521	54.02	25.488	29.10
19.2	14.516	61.54	18.444	31.21	20.371	54.23	25.334	28.51
29.2	14.354	61.15	18.190	30.08	20.223	54.20	25.183	27.84
Mar. 10.2	14.204	60.41	17.959	28.63	20.086	53.91	25.042	27.18
20.1	14.076	59.35	17.767	26.91	19.970	53.38	24.926	26.50
30.1	13.977	57.99	17.626	25.02	19.881	52.60	24.840	25.85
Apr. 9.1	13.914	56.33	17.546	23.02	19.827	51.57	24.793	25.31
19.0	13.893	54.41	17.533	21.01	19.813	50.28	24.789	24.88
29.0	13.918	52.24	17.593	19.07	19.843	48.78	24.832	24.63
May 9.0	13.989	49.90	17.727	17.28	19.918	47.07	24.926	24.57
19.0	14.107	47.41	17.930	15.71	20.038	45.19	25.067	24.73
28.9	14.269	44.81	18.200	14.41	20.201	43.17	25.254	25.11
June 7.9	14.473	42.19	18.529	13.42	20.404	41.04	25.483	25.69
17.9	14.713	39.61	18.909	12.79	20.641	38.88	25.747	26.51
27.9	14.983	37.11	19.328	12.53	20.906	36.73	26.039	27.51
July 7.8	15.275	34.78	19.777	12.65	21.193	34.65	26.354	28.69
17.8	15.583	32.68	20.245	13.12	21.495	32.69	26.681	29.98
27.8	15.899	30.85	20.721	13.95	21.803	30.91	27.015	31.39
Aug. 6.7	16.215	29.38	21.196	15.11	22.110	29.38	27.348	32.84
16.7	16.523	28.29	21.661	16.56	22.410	28.12	27.674	34.30
26.7	16.819	27.61	22.106	18.28	22.699	27.18	27.983	35.74
Sept. 5.7	17.096	27.37	22.527	20.23	22.971	26.58	28.277	37.12
15.6	17.348	27.56	22.916	22.36	23.220	26.33	28.549	38.40
25.6	17.574	28.18	23.268	24.63	23.444	26.44	28.796	39.57
Oct. 5.6	17.769	29.17	23.581	27.01	23.642	26.86	29.016	40.61
15.6	17.932	30.52	23.851	29.44	23.810	27.60	29.209	41.52
25.5	18.061	32.15	24.075	31.89	23.949	28.59	29.371	42.27
Nov. 4.5	18.158	33.98	24.251	34.30	24.057	29.79	29.502	42.90
14.5	18.220	35.94	24.375	36.63	24.134	31.13	29.603	43.39
24.4	18.247	37.94	24.445	38.81	24.180	32.55	29.670	43.75
Dec. 4.4	18.242	39.91	24.461	40.82	24.194	33.99	29.704	43.98
14.4	18.203	41.77	24.422	42.58	24.176	35.40	29.705	44.10
24.4	18.133	43.44	24.328	44.05	24.130	36.72	29.672	44.10
34.3	18.036	44.90	24.184	45.17	24.053	37.90	29.606	43.98
Mean Place	13.613	58.54	17.574	10.56	19.399	54.52	24.310	18.17
Sec δ , Tan δ	1.074	-0.391	1.640	+1.299	1.013	-0.163	1.071	+0.384
$D\psi\alpha$, $D\omega\alpha$	+0.05	+0.02	+0.08	-0.06	+0.06	+0.01	+0.07	-0.02
$D\psi\delta$, $D\omega\delta$	+0.3	+0.7	+0.3	+0.7	+0.3	+0.7	+0.3	+0.7

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	47 H. Cephei. Mag. 5.7		θ Eridani. Mag. 3.4		α Ceti. Mag. 2.8		τ^3 Eridani. Mag. 4.2	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 2 54	° ' " +79 5	h m 2 55	° ' " -40 37	h m 2 57	° ' " + 3 45	h m 2 58	° ' " -23 56
	s	"	s	"	s	"	s	"
Jan. 0.3	56.64	41.75	6.551	91.15	54.807	46.41	42.998	71.31
10.3	55.89	43.59	6.379	92.67	54.729	45.69	42.885	72.68
20.3	55.02	44.90	6.180	93.75	54.627	45.01	42.747	73.74
30.3	54.05	45.63	5.961	94.35	54.502	44.41	42.591	74.46
Feb. 9.2	53.04	45.75	5.731	94.46	54.364	43.90	42.419	74.81
19.2	52.01	45.25	5.498	94.08	54.219	43.48	42.241	74.80
29.2	51.03	44.18	5.270	93.24	54.075	43.20	42.068	74.42
Mar. 10.2	50.14	42.58	5.058	91.95	53.942	43.04	41.906	73.66
20.1	49.38	40.52	4.871	90.23	53.828	43.03	41.764	72.58
30.1	48.79	38.11	4.718	88.14	53.742	43.20	41.650	71.15
Apr. 9.1	48.38	35.41	4.606	85.70	53.690	43.54	41.571	69.42
19.0	48.18	32.57	4.541	82.99	53.678	44.09	41.536	67.41
29.0	48.20	29.68	4.528	80.06	53.710	44.85	41.544	65.17
May 9.0	48.45	26.84	4.571	76.94	53.790	45.81	41.601	62.74
19.0	48.89	24.18	4.671	73.72	53.914	46.97	41.705	60.15
28.9	49.55	21.74	4.822	70.46	54.081	48.31	41.855	57.48
June 7.9	50.38	19.64	5.023	67.26	54.287	49.79	42.047	54.76
17.9	51.37	17.92	5.269	64.20	54.527	51.41	42.279	52.08
27.9	52.49	16.63	5.553	61.32	54.796	53.10	42.542	49.52
July 7.8	53.72	15.79	5.869	58.74	55.085	54.82	42.830	47.12
17.8	55.01	15.44	6.207	56.50	55.389	56.53	43.135	44.95
27.8	56.35	15.58	6.561	54.68	55.699	58.16	43.451	43.10
Aug. 6.7	57.70	16.20	6.918	53.33	56.010	59.70	43.769	41.59
16.7	59.04	17.29	7.271	52.49	56.313	61.07	44.083	40.48
26.7	60.34	18.83	7.613	52.18	56.605	62.24	44.383	39.81
Sept. 5.7	61.57	20.78	7.935	52.43	56.880	63.20	44.668	39.60
15.6	62.73	23.09	8.228	53.22	57.135	63.90	44.930	39.84
25.6	63.78	25.75	8.490	54.52	57.366	64.35	45.166	40.52
Oct. 5.6	64.71	28.68	8.714	56.28	57.571	64.54	45.373	41.62
15.6	65.48	31.83	8.897	58.44	57.751	64.50	45.547	43.07
25.5	66.11	35.14	9.038	60.90	57.901	64.24	45.689	44.84
Nov. 4.5	66.57	38.53	9.133	63.58	58.022	63.80	45.795	46.81
14.5	66.84	41.93	9.183	66.36	58.115	63.21	45.867	48.94
24.4	66.93	45.26	9.188	69.14	58.175	62.50	45.902	51.10
Dec. 4.4	66.82	48.43	9.149	71.81	58.205	61.74	45.908	53.23
14.4	66.51	51.33	9.068	74.27	58.204	60.94	45.869	55.26
24.4	66.02	53.89	8.947	76.43	58.170	60.13	45.802	57.08
34.3	65.35	56.03	8.791	78.23	58.107	59.35	45.705	58.66
Mean Place	51.755	18.03	4.687	86.84	53.189	39.08	41.300	70.96
Sec δ , Tan δ	5.285	+5.190	1.317	-0.858	1.002	+0.066	1.094	-0.444
$D\psi a, D\omega a$	+0.16	-0.25	+0.05	+0.04	+0.06	0.00	+0.05	+0.02
$D\psi \delta, D\omega \delta$	+0.3	+0.7	+0.3	+0.7	+0.3	+0.7	+0.3	+0.7

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	γ Persei. Mag. 3.1		ρ Persei. Var. 3.4-4.2		μ Horologii. Mag. 5.2		θ Hydri. Mag. 5.5	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 2 58	° ' +53 10	h m 2 59	° ' +38 30	h m 3 1	° ' -60 3	h m 3 2	° ' -72 13
	s "	s "	s "	s "	s "	s "	s "	s "
Jan. 0.3	44.358	62.48	49.129	72.63	40.22	54.16	7.71	58.13
10.3	44.194	63.50	49.024	73.12	39.89	55.74	7.09	59.60
20.3	43.985	64.13	48.885	73.32	39.52	56.79	6.41	60.48
30.3	43.744	64.33	48.717	73.24	39.13	57.26	5.69	60.78
Feb. 9.2	43.479	64.11	48.532	72.86	38.72	57.16	4.96	60.48
19.2	43.206	63.47	48.338	72.21	38.31	56.50	4.23	59.60
29.2	42.941	62.44	48.147	71.32	37.91	55.29	3.53	58.16
Mar. 10.2	42.696	61.07	47.972	70.21	37.53	53.58	2.87	56.23
20.1	42.489	59.42	47.822	68.95	37.19	51.40	2.27	53.84
30.1	42.332	57.57	47.710	67.60	36.91	48.82	1.75	51.06
Apr. 9.1	42.236	55.59	47.644	66.21	36.68	45.89	1.33	47.94
19.0	42.207	53.57	47.631	64.86	36.51	42.69	1.01	44.58
29.0	42.251	51.59	47.675	63.61	36.43	39.27	0.80	41.02
May 9.0	42.369	49.74	47.776	62.52	36.42	35.70	0.71	37.36
19.0	42.561	48.09	47.935	61.63	36.49	32.09	0.76	33.68
28.9	42.820	46.69	48.147	61.00	36.63	28.50	0.92	30.06
June 7.9	43.141	45.59	48.408	60.62	36.85	25.02	1.19	26.60
17.9	43.515	44.83	48.712	60.54	37.14	21.73	1.58	23.35
27.9	43.932	44.43	49.048	60.75	37.48	18.73	2.07	20.42
July 7.8	44.382	44.39	49.411	61.23	37.89	16.09	2.64	17.89
17.8	44.853	44.72	49.789	61.99	38.33	13.87	3.29	15.81
27.8	45.335	45.40	50.176	62.99	38.80	12.15	3.98	14.26
Aug. 6.7	45.819	46.41	50.564	64.21	39.28	10.98	4.70	13.28
16.7	46.295	47.73	50.944	65.60	39.77	10.40	5.44	12.89
26.7	46.755	49.33	51.310	67.14	40.24	10.44	6.16	13.12
Sept. 5.7	47.191	51.16	51.656	68.80	40.69	11.07	6.85	13.97
15.6	47.597	53.19	51.980	70.52	41.09	12.31	7.48	15.42
25.6	47.969	55.38	52.275	72.28	41.46	14.09	8.03	17.41
Oct. 5.6	48.302	57.69	52.540	74.05	41.77	16.37	8.48	19.88
15.6	48.593	60.07	52.774	75.80	42.01	19.06	8.83	22.73
25.5	48.837	62.49	52.972	77.50	42.19	22.06	9.06	25.88
Nov. 4.5	49.033	64.89	53.134	79.13	42.29	25.25	9.17	29.19
14.5	49.176	67.23	53.257	80.67	42.31	28.51	9.13	32.54
24.4	49.264	69.46	53.340	82.08	42.26	31.73	8.97	35.81
Dec. 4.4	49.296	71.52	53.381	83.34	42.13	34.77	8.69	38.86
14.4	49.270	73.36	53.381	84.41	41.94	37.54	8.29	41.60
24.4	49.188	74.92	53.338	85.28	41.69	39.92	7.79	43.92
34.3	49.052	76.14	53.253	85.90	41.38	41.85	7.21	45.74
Mean Place	42.207	42.50	47.281	55.88	37.770	46.89	4.223	49.75
Sec δ , Tan δ	1.669	+1.336	1.278	+0.796	2.004	-1.736	3.276	-3.120
D ψ α , D ω α	+0.09	-0.06	+0.08	-0.04	+0.03	+0.08	0.00	+0.15
D ψ δ , D ω δ	+0.3	+0.7	+0.3	+0.7	+0.3	+0.7	+0.3	+0.7

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.		β Persei. (Algol). Var. 2.1-3.2		δ Arietis. Mag. 4.5		12 Eridani. Mag. 4.0		48 H. Cephei. Mag. 5.5	
		Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
		h m 3 2	" +40 37	h m 3 6	" +19 24	h m 3 8	" -29 18	h m 3 9	" +77 25
		s "	" "	s "	" "	s "	" "	s "	" "
Jan.	0.4	43.733	75.59	51.077	47.10	31.891	65.14	41.68	62.71
	10.3	43.624	76.17	51.002	46.89	31.769	66.66	41.09	64.66
	20.3	43.480	76.45	50.899	46.59	31.621	67.82	40.37	66.09
	30.3	43.306	76.44	50.771	46.21	31.449	68.59	39.56	66.96
Feb.	9.2	43.113	76.11	50.626	45.74	31.264	68.95	38.70	67.24
	19.2	42.911	75.49	50.473	45.21	31.071	68.90	37.82	66.93
	29.2	42.711	74.60	50.318	44.62	30.880	68.45	36.96	66.04
Mar.	10.2	42.526	73.47	50.174	44.02	30.699	67.59	36.17	64.60
	20.1	42.368	72.17	50.051	43.42	30.539	66.35	35.48	62.71
	30.1	42.249	70.75	49.955	42.88	30.407	64.75	34.91	60.42
Apr.	9.1	42.176	69.29	49.897	42.42	30.310	62.83	34.51	57.85
	19.1	42.158	67.84	49.882	42.08	30.255	60.61	34.30	55.09
	29.0	42.197	66.48	49.913	41.91	30.247	58.15	34.26	52.26
May	9.0	42.298	65.28	49.994	41.92	30.288	55.48	34.42	49.45
	19.0	42.456	64.26	50.122	42.14	30.379	52.67	34.76	46.76
	28.9	42.670	63.49	50.297	42.55	30.518	49.78	35.29	44.30
June	7.9	42.934	62.99	50.513	43.19	30.702	46.87	35.99	42.12
	17.9	43.242	62.79	50.767	44.01	30.927	44.01	36.82	40.28
	27.9	43.585	62.89	51.049	45.01	31.187	41.27	37.77	38.85
July	7.8	43.954	63.27	51.355	46.17	31.474	38.74	38.82	37.87
	17.8	44.341	63.94	51.676	47.44	31.782	36.47	39.96	37.36
	27.8	44.737	64.86	52.004	48.79	32.103	34.53	41.13	37.32
Aug.	6.8	45.134	66.02	52.334	50.17	32.429	32.99	42.32	37.73
	16.7	45.525	67.38	52.658	51.55	32.753	31.89	43.51	38.62
	26.7	45.902	68.90	52.971	52.90	33.067	31.25	44.68	39.94
Sept.	5.7	46.259	70.55	53.267	54.17	33.365	31.12	45.79	41.69
	15.6	46.593	72.30	53.545	55.33	33.642	31.47	46.85	43.80
	25.6	46.899	74.10	53.799	56.37	33.892	32.30	47.82	46.26
Oct.	5.6	47.175	75.93	54.029	57.28	34.112	33.58	48.70	49.00
	15.6	47.417	77.77	54.231	58.04	34.301	35.25	49.45	51.99
	25.5	47.624	79.57	54.404	58.66	34.453	37.22	50.07	55.15
Nov.	4.5	47.794	81.31	54.549	59.15	34.568	39.44	50.55	58.42
	14.5	47.923	82.96	54.662	59.51	34.646	41.81	50.87	61.73
	24.5	48.011	84.49	54.742	59.74	34.686	44.22	51.02	65.00
Dec.	4.4	48.056	85.88	54.790	59.87	34.689	46.60	51.01	68.13
	14.4	48.056	87.07	54.802	59.90	34.654	48.84	50.81	71.05
	24.4	48.012	88.06	54.778	59.83	34.582	50.86	50.46	73.65
	34.3	47.925	88.78	54.721	59.67	34.476	52.60	49.95	75.86
Mean Place		41.830	58.42	49.362	35.44	30.108	63.72	36.856	39.91
Sec δ , Tan δ		1.318	+0.858	1.060	+0.352	1.147	-0.561	4.596	+4.486
$D\phi a$, $D\omega a$		+0.08	-0.04	+0.07	-0.02	+0.05	+0.03	+0.15	-0.20
$D\phi \delta$, $D\omega \delta$		+0.3	+0.7	+0.3	+0.7	+0.3	+0.7	+0.3	+0.7

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	♈ Arietis. Mag. 5.0			♊ 38 G. Horologii Mag. 5.7			♋ Eridani. Mag. 4.9			♈ Arietis. Mag. 5.2		
	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.
	h m	s	° ' "	h m	s	° ' "	h m	s	° ' "	h m	s	° ' "
	3 10		+20 44	3 10		-57 37	3 11		- 9 7	3 16		+20 50
	s	"	"	s	"	"	s	"	"	s	"	"
Jan. 0.4	5.928		13.76	27.665		75.65	46.805		47.87	24.246		53.74
10.3	5.854	74	13.61	27.370	295	77.37	46.724	81	49.00	24.174	72	53.60
20.3	5.751	103	13.34	27.039	331	78.56	46.617	107	49.95	24.075	99	53.36
30.3	5.622	129	13.00	26.678	361	79.19	46.487	130	50.69	23.948	127	53.03
Feb. 9.2	5.476	146	12.55	26.302	376	79.25	46.340	147	51.20	23.802	146	52.00
19.2	5.319	157	12.02	25.921	381	78.75	46.185	155	51.48	23.646	156	52.10
29.2	5.162	157	11.42	25.548	373	77.71	46.029	156	51.51	23.488	158	51.53
Mar. 10.2	5.016	146	10.81	25.196	352	76.16	45.883	146	51.29	23.338	150	50.93
20.1	4.888	128	10.17	24.877	319	74.14	45.753	130	50.82	23.206	132	50.31
30.1	4.790	98	9.58	24.601	276	71.70	45.649	104	50.09	23.102	104	49.73
		61			222			72			65	
Apr. 9.1	4.729		9.04	24.379		68.90	45.577		49.11	23.036		49.21
19.1	4.711	18	8.63	24.219	160	65.80	45.546	31	47.88	23.012	24	48.80
29.0	4.737	26	8.38	24.128	91	62.47	45.557	11	46.44	23.033	21	48.54
May 9.0	4.815	78	8.29	24.108	20	58.97	45.612	55	44.79	23.105	72	48.44
19.0	4.942	127	8.41	24.163	55	55.41	45.714	102	42.95	23.225	120	48.53
		172			128			145			167	
28.9	5.114		8.74	24.291		51.84	45.859		40.97	23.392		48.83
June 7.9	5.329	215	9.26	24.491	200	48.36	46.045	186	38.88	23.602	210	49.33
17.9	5.580	251	10.02	24.754	263	45.05	46.267	222	36.74	23.850	248	50.03
27.9	5.863	283	10.94	25.076	322	42.00	46.519	252	34.60	24.128	278	50.91
July 7.8	6.169	306	12.02	25.449	373	39.28	46.795	276	32.52	24.432	304	51.95
		323			411			293			319	
17.8	6.492		13.21	25.860		36.98	47.088		30.56	24.751		53.12
27.8	6.822	330	14.52	26.299	439	35.15	47.391	303	28.77	25.080	329	54.36
Aug. 6.8	7.154	332	15.86	26.754	455	33.85	47.699	308	27.21	25.411	331	55.67
16.7	7.480	326	17.22	27.213	459	33.14	48.000	301	25.92	25.739	328	57.00
26.7	7.796	316	18.56	27.662	449	33.02	48.292	292	24.95	26.058	319	58.29
		299			429			278			302	
Sept. 5.7	8.095		19.85	28.091		33.53	48.570		24.32	26.360		59.53
15.6	8.378	283	21.02	28.489	398	34.62	48.831	261	24.04	26.646	286	60.67
25.6	8.635	257	22.09	28.844	355	36.28	49.068	237	24.14	26.909	263	61.73
Oct. 5.6	8.870	235	23.05	29.149	305	38.44	49.281	213	24.57	27.148	239	62.66
15.6	9.076	206	23.86	29.395	246	41.04	49.466	185	25.30	27.361	213	63.43
		180			181			157			186	
25.5	9.256		24.54	29.576		43.95	49.623		26.31	27.547		64.10
Nov. 4.5	9.405	149	25.08	29.691	115	47.10	49.751	128	27.53	27.702	155	64.63
14.5	9.522	117	25.52	29.735	44	50.35	49.846	95	28.92	27.826	139	65.05
24.5	9.607	85	25.84	29.711	24	53.57	49.910	64	30.38	27.917	91	65.36
Dec. 4.4	9.658	51	26.03	29.618	93	56.65	49.942	32	31.88	27.972	55	65.55
		13			157			1			21	
14.4	9.671		26.14	29.461		59.49	49.941		33.36	27.993		65.65
24.4	9.651	20	26.13	29.246	215	61.96	49.908	33	34.74	27.979	14	65.66
34.3	9.595	56	26.02	28.977	269	64.01	49.843	65	36.00	27.928	51	65.64
Mean Place	4.187		1.81	25.278		69.11	45.116		51.61	22.469		41.90
Sec δ, Tan δ	1.069		+0.379	1.868		-1.578	1.013		-0.161	1.070		+0.381
D ψ α , D ω α	+0.07		-0.02	+0.03		+0.07	+0.06		+0.01	+0.07		-0.02
D ψ δ , D ω δ	+0.3		+0.7	+0.3		+0.7	+0.3		+0.7	+0.3		+0.8

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	ϵ Eridani. Mag. 4.3		ζ Hydri. Mag. 5.5		α Persei. Mag. 1.9		θ Tauri. Mag. 3.8	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 3 16	s -43 22	h m 3 17	s -77 41	h m 3 18	s +49 33	h m 3 20	s + 8 44
Jan. 0.4	36.362	89.54	66.42	52.55	21.305	65.90	19.176	11.09
10.3	36.194	91.29	65.50	54.16	21.180	66.92	19.111	10.51
20.3	35.995	92.58	64.48	55.21	21.008	67.60	19.017	9.94
30.3	35.771	93.39	63.41	55.66	20.799	67.92	18.897	9.39
Feb. 9.3	35.530	93.70	62.31	55.52	20.564	67.84	18.759	8.89
19.2	35.281	93.51	61.21	54.80	20.315	67.40	18.610	8.44
29.2	35.034	92.81	60.13	53.52	20.066	66.58	18.459	8.06
Mar. 10.2	34.800	91.63	59.12	51.73	19.831	65.44	18.314	7.76
20.1	34.588	90.02	58.18	49.49	19.626	64.03	18.186	7.57
30.1	34.408	88.00	57.35	46.83	19.463	62.40	18.083	7.50
Apr. 9.1	34.270	85.62	56.64	43.84	19.352	60.64	18.014	7.57
19.1	34.178	82.92	56.08	40.58	19.304	58.83	17.984	7.82
29.0	34.139	79.96	55.68	37.13	19.321	57.03	17.998	8.24
May 9.0	34.155	76.81	55.44	33.53	19.408	55.34	18.058	8.86
19.0	34.228	73.54	55.37	29.89	19.562	53.79	18.165	9.66
29.0	34.359	70.21	55.47	26.30	19.782	52.46	18.316	10.65
June 7.9	34.543	66.91	55.75	22.83	20.062	51.40	18.508	11.81
17.9	34.776	63.72	56.19	19.59	20.394	50.64	18.736	13.10
27.9	35.053	60.72	56.78	16.62	20.768	50.19	18.996	14.50
July 7.8	35.366	57.36	57.50	14.02	21.178	50.08	19.278	15.98
17.8	35.708	55.57	58.33	11.87	21.611	50.29	19.579	17.48
27.8	36.068	53.58	59.25	10.22	22.060	50.81	19.888	18.97
Aug. 6.8	36.439	52.07	60.23	9.14	22.514	51.64	20.201	20.40
16.7	36.811	51.07	61.24	8.66	22.964	52.75	20.511	21.72
26.7	37.176	50.64	62.25	8.75	23.402	54.10	20.811	22.89
Sept. 5.7	37.525	50.76	63.22	9.49	23.823	55.67	21.099	23.89
15.7	37.850	51.45	64.12	10.85	24.220	57.42	21.370	24.68
25.6	38.146	52.69	64.93	12.73	24.589	59.31	21.619	25.27
Oct. 5.6	38.407	54.42	65.61	15.13	24.925	61.32	21.847	25.64
15.6	38.626	56.58	66.14	17.93	25.223	63.42	22.049	25.79
25.5	38.802	59.09	66.50	21.04	25.482	65.55	22.224	25.75
Nov. 4.5	38.932	61.83	66.68	24.34	25.697	67.68	22.372	25.54
14.5	39.013	64.73	66.66	27.71	25.866	69.76	22.489	25.20
24.5	39.046	67.66	66.45	31.03	25.984	71.78	22.576	24.74
Dec. 4.4	39.031	70.52	66.06	34.16	26.049	73.67	22.630	24.20
14.4	38.969	73.18	65.49	37.00	26.060	75.36	22.650	23.62
24.4	38.863	75.57	64.77	39.45	26.015	76.85	22.636	23.01
34.4	38.716	77.59	63.92	41.40	25.917	78.04	22.589	22.40
Mean Place	34.358	85.47	61.586	44.73	19.065	47.48	17.438	2.54
Sec δ , Tan δ	1.376	-0.945	4.691	-4.584	1.542	+1.174	1.012	+0.154
$D\epsilon a$, $D\omega a$	+0.04	+0.04	-0.03	+0.20	+0.08	-0.05	+0.06	-0.01
$D\epsilon \delta$, $D\omega \delta$	+0.3	+0.8	+0.3	+0.8	+0.3	+0.8	+0.3	+0.8

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	2 H. Camelop. Mag. 4.4		ξ Tauri. Mag. 3.8		f Tauri. Mag. 4.3		ε Eridani. Mag. 3.8	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 3 22	" +59 38	h m 3 22	" + 9 26	h m 3 26	" +12 38	h m 3 28	" - 9 44
Jan. 0.4	18.102	75.37	38.629	34.35	15.777	68.14	60.064	26.96
10.3	17.920	76.82	38.565	33.79	15.716	67.70	59.987	28.17
20.3	17.679	77.86	38.473	33.24	15.625	67.24	59.881	29.19
30.3	17.391	78.46	38.354	32.71	15.506	66.78	59.751	29.99
Feb. 9.3	17.069	78.60	38.217	32.22	15.367	66.31	59.602	30.55
19.2	16.731	78.26	38.068	31.77	15.216	65.86	59.443	30.86
29.2	16.393	77.47	37.916	31.38	15.061	65.43	59.280	30.92
Mar. 10.2	16.074	76.26	37.770	31.06	14.913	65.04	59.123	30.72
20.1	15.794	74.69	37.642	30.85	14.780	64.72	58.981	30.26
30.1	15.566	72.84	37.538	30.75	14.673	64.50	58.865	29.54
Apr. 9.1	15.405	70.76	37.467	30.80	14.600	64.39	58.780	28.57
19.1	15.321	68.57	37.435	31.01	14.566	64.40	58.732	27.35
29.0	15.322	66.34	37.448	31.38	14.576	64.60	58.727	25.89
May 9.0	15.409	64.16	37.506	31.95	14.633	64.97	58.768	24.23
19.0	15.582	62.13	37.611	32.71	14.738	65.53	58.854	22.40
29.0	15.837	60.29	37.760	33.65	14.887	66.28	58.985	20.42
June 7.9	16.168	58.72	37.951	34.76	15.078	67.19	59.157	18.34
17.9	16.564	57.46	38.178	36.01	15.306	68.26	59.367	16.20
27.9	17.018	56.54	38.437	37.37	15.567	69.48	59.608	14.07
July 7.8	17.516	56.00	38.721	38.81	15.851	70.78	59.875	12.00
17.8	18.047	55.83	39.021	40.28	16.154	72.15	60.160	10.04
27.8	18.598	56.05	39.331	41.75	16.467	73.53	60.457	8.25
Aug. 6.8	19.160	56.63	39.645	43.16	16.783	74.88	60.760	6.71
16.7	19.720	57.56	39.956	44.47	17.098	76.17	61.061	5.45
26.7	20.268	58.83	40.258	45.64	17.404	77.35	61.355	4.49
Sept. 5.7	20.796	60.41	40.547	46.64	17.699	78.41	61.636	3.89
15.7	21.296	62.23	40.821	47.46	17.977	79.29	61.902	3.66
25.6	21.762	64.30	41.072	48.06	18.234	79.99	62.147	3.79
Oct. 5.6	22.186	66.56	41.302	48.45	18.470	80.51	62.367	4.26
15.6	22.564	68.97	41.507	48.63	18.681	80.85	62.563	5.07
25.5	22.889	71.48	41.686	48.63	18.867	81.00	62.732	6.16
Nov. 4.5	23.158	74.06	41.836	48.46	19.024	81.02	62.870	7.46
14.5	23.365	76.63	41.955	48.15	19.150	80.90	62.977	8.93
24.5	23.505	79.15	42.045	47.73	19.247	80.66	63.052	10.50
Dec. 4.4	23.573	81.56	42.102	47.23	19.309	80.35	63.095	12.10
14.4	23.573	83.77	42.124	46.68	19.336	79.98	63.102	13.67
24.4	23.498	85.74	42.112	46.10	19.328	79.56	63.075	15.16
34.4	23.353	87.39	42.067	45.51	19.286	79.11	63.016	16.50
Mean Place	15.401	55.40	36.879	25.64	13.995	58.64	58.316	30.51
Sec δ, Tan δ	1.979	+1.708	1.014	+0.166	1.025	+0.224	1.014	-0.172
Dψ α, Dω α	+0.10	-0.07	+0.06	-0.01	+0.06	-0.01	+0.06	+0.01
Dψ δ, Dω δ	+0.3	+0.8	+0.3	+0.8	+0.2	+0.8	+0.2	+0.8

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	τ^5 Eridani. Mag. 4.3		δ Persei. Mag. 3.1		δ Eridani. Mag. 3.7		γ Persei. Mag. 3.9	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 3 30	° ' " -21 54	h m 3 36	° ' " +47 31	h m 3 39	° ' " -10 2	h m 3 39	° ' " +42 18
	s	"	s	"	s	"	s	"
Jan. 0.4	6.363	49.83	58.591	29.11	15.222	46.15	31.137	67.39
10.3	6.272	51.37	58.491	30.17	15.154	47.42	31.055	68.25
20.3	6.148	52.63	58.344	30.92	15.057	48.49	30.929	68.84
30.3	6.001	53.58	58.157	31.35	14.931	49.34	30.765	69.14
Feb. 9.3	5.834	54.17	57.938	31.42	14.786	49.95	30.572	69.14
19.2	5.656	54.41	57.702	31.14	14.627	50.31	30.361	68.84
29.2	5.475	54.28	57.460	30.50	14.462	50.41	30.143	68.24
Mar. 10.2	5.300	53.81	57.226	29.56	14.302	50.24	29.933	67.38
20.2	5.142	52.98	57.017	28.34	14.154	49.82	29.743	66.29
30.1	5.006	51.81	56.844	26.90	14.030	49.13	29.586	65.02
Apr. 9.1	4.904	50.35	56.718	25.32	13.935	48.20	29.472	63.64
19.1	4.839	48.58	56.650	23.64	13.877	47.00	29.409	62.21
29.0	4.819	46.55	56.644	21.97	13.860	45.59	29.405	60.79
May 9.0	4.845	44.33	56.704	20.36	13.888	43.93	29.460	59.44
19.0	4.918	41.92	56.830	18.88	13.962	42.10	29.577	58.24
29.0	5.037	39.36	57.020	17.57	14.081	40.13	29.752	57.20
June 7.9	5.201	36.75	57.269	16.50	14.242	38.03	29.982	56.40
17.9	5.404	34.15	57.570	15.69	14.442	35.88	30.261	55.83
27.9	5.641	31.60	57.918	15.16	14.673	33.73	30.582	55.53
July 7.9	5.909	29.19	58.300	14.93	14.934	31.63	30.936	55.49
17.8	6.198	26.98	58.711	15.00	15.214	29.63	31.315	55.73
27.8	6.500	25.02	59.139	15.37	15.508	27.81	31.711	56.22
Aug. 6.8	6.811	23.40	59.575	16.01	15.809	26.21	32.115	56.95
16.7	7.122	22.14	60.012	16.91	16.112	24.89	32.519	57.88
26.7	7.426	21.31	60.443	18.04	16.409	23.88	32.916	59.01
Sept. 5.7	7.720	20.93	60.860	19.37	16.696	23.23	33.302	60.28
15.7	7.997	21.00	61.257	20.88	16.969	22.95	33.671	61.68
25.6	8.252	21.51	61.630	22.53	17.223	23.03	34.016	63.18
Oct. 5.6	8.483	22.45	61.975	24.29	17.456	23.48	34.337	64.76
15.6	8.685	23.78	62.287	26.14	17.663	24.26	34.628	66.38
25.6	8.857	25.44	62.563	28.04	17.845	25.33	34.886	68.04
Nov. 4.5	8.997	27.36	62.799	29.96	17.998	26.63	35.108	69.67
14.5	9.104	29.45	62.991	31.87	18.120	28.17	35.291	71.28
24.5	9.174	31.63	63.135	33.73	18.211	29.69	35.431	72.84
Dec. 4.4	9.208	33.82	63.228	35.49	18.267	31.32	35.524	74.31
14.4	9.206	35.93	63.267	37.11	18.288	32.93	35.569	75.65
24.4	9.168	37.89	63.251	38.56	18.274	34.45	35.564	76.82
34.4	9.092	39.65	63.182	39.76	18.226	35.85	35.509	77.80
Mean Place	4.554	50.59	56.244	11.99	13.421	49.84	28.910	51.41
Sec δ , Tan δ	1.078	-0.402	1.481	+1.092	1.015	-0.177	1.353	+0.911
$D\psi a$, $D\omega a$	+0.05	+0.02	+0.08	-0.04	+0.06	+0.01	+0.08	-0.04
$D\psi \delta$, $D\omega \delta$	+0.2	+0.8	+0.2	+0.8	+0.2	+0.8	+0.2	+0.8

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	5 H. Camelop. Mag. 4.7		7 ^h Tauri. (Alcyone.) Mag. 3.0		7 ^h Eridani. Mag. 4.3		8 ^h Eridani. Mag. 4.2	
	Right Ascension.		Right Ascension.		Right Ascension.		Right Ascension.	
	Declina- tion.		Declina- tion.		Declina- tion.		Declina- tion.	
	h	m	h	m	h	m	h	m
	3	41	3	42	3	43	3	46
	s	"	s	"	s	"	s	"
Jan. 0.4	32.31	49.46	31.229	58.31	15.883	46.78	20.683	75.68
10.4	32.01	51.48	31.177	58.35	15.794	48.48	20.559	77.66
20.3	31.62	53.07	31.087	58.29	15.673	49.89	20.399	79.26
30.3	31.15	54.17	30.965	58.12	15.525	50.96	20.209	80.43
Feb. 9.3	30.62	54.75	30.820	57.83	15.355	51.66	19.995	81.14
19.2	30.06	54.76	30.657	57.43	15.171	52.00	19.768	81.39
29.2	29.49	54.24	30.488	56.94	14.982	51.97	19.536	81.17
Mar 10.2	28.94	53.20	30.324	56.38	14.797	51.54	19.309	80.49
20.2	28.44	51.69	30.173	55.76	14.626	50.77	19.098	79.38
30.1	28.02	49.79	30.049	55.12	14.478	49.64	18.911	77.85
Apr. 9.1	27.69	47.56	29.959	54.51	14.360	48.20	18.758	75.95
19.1	27.48	45.11	29.909	53.96	14.281	46.45	18.646	73.71
29.1	27.40	42.51	29.906	53.51	14.245	44.42	18.581	71.17
May 9.0	27.43	39.89	29.952	53.19	14.254	42.18	18.566	68.41
19.0	27.61	37.34	30.050	53.04	14.312	39.74	18.604	65.47
29.0	27.92	34.92	30.196	53.06	14.417	37.17	18.695	62.40
June 7.9	28.33	32.74	30.386	53.28	14.566	34.52	18.836	59.31
17.9	28.86	30.84	30.618	53.68	14.757	31.87	19.024	56.25
27.9	29.47	29.28	30.884	54.26	14.984	29.28	19.254	53.30
July 7.9	30.17	28.10	31.178	55.02	15.242	26.82	19.521	50.54
17.8	30.92	27.32	31.493	55.90	15.523	24.55	19.816	48.05
27.8	31.73	26.96	31.821	56.90	15.821	22.56	20.133	45.91
Aug. 6.8	32.56	27.03	32.156	57.97	16.131	20.90	20.463	44.19
16.8	33.40	27.51	32.491	59.08	16.442	19.62	20.800	42.93
26.7	34.23	28.41	32.821	60.21	16.749	18.76	21.135	42.17
Sept. 5.7	35.04	29.70	33.141	61.30	17.049	18.36	21.462	41.95
15.7	35.81	31.35	33.445	62.35	17.333	18.43	21.772	42.29
25.6	36.54	33.33	33.732	63.33	17.597	18.97	22.061	43.16
Oct. 5.6	37.22	35.59	33.997	64.22	17.838	19.95	22.323	44.55
15.6	37.85	38.12	34.239	65.02	18.052	21.33	22.555	46.39
25.6	38.37	40.84	34.454	65.71	18.238	23.07	22.750	48.63
Nov. 4.5	38.81	43.71	34.642	66.31	18.390	25.09	22.907	51.16
14.5	39.14	46.68	34.797	66.82	18.509	27.29	23.023	53.90
24.5	39.38	49.64	34.919	67.25	18.591	29.60	23.096	56.73
Dec. 4.5	39.50	52.54	35.005	67.59	18.637	31.93	23.124	59.56
14.4	39.51	55.32	35.053	67.84	18.643	34.18	23.108	62.27
24.4	39.39	57.88	35.061	68.02	18.612	36.29	23.048	64.78
34.4	39.15	60.09	35.029	68.10	18.544	38.18	22.946	67.00
Mean Place	28.175	29.21	29.281	46.45	14.014	47.47	18.679	73.90
Sec δ , Tan δ	3.084	+2.917	1.093	+0.442	1.090	-0.434	1.243	-0.739
$D\psi\alpha$, $D\omega\alpha$	+0.12	-0.11	+0.07	-0.02	+0.05	+0.02	+0.04	+0.03
$D\psi\delta$, $D\omega\delta$	+0.2	+0.8	+0.2	+0.8	+0.2	+0.8	+0.2	+0.8

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	γ Hydri. Mag. 3.2		ζ Persei. Mag. 2.9		9 H. Camelop. Mag. 5.2		ϵ Persei. Mag. 3.0	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 3 48	° ' " -74 29	h m 3 48	° ' " +31 38	h m 3 49	° ' " +60 51	h m 3 52	° ' " +39 46
	s	"	s	"	s	"	s	"
Jan. 0.4	35.74	53.92	52.953	19.75	60.95	68.86	15.024	20.50
10.4	35.09	55.99	52.897	20.16	60.80	70.56	14.960	21.29
20.3	34.33	57.54	52.803	20.40	60.58	71.89	14.851	21.87
30.3	33.51	58.53	52.673	20.47	60.31	72.81	14.703	22.19
Feb. 9.3	32.65	58.93	52.514	20.35	59.98	73.29	14.524	22.25
19.2	31.77	58.75	52.338	20.03	59.63	73.28	14.324	22.02
29.2	30.89	58.01	52.153	19.54	59.27	72.82	14.114	21.54
Mar. 10.2	30.03	56.73	51.972	18.88	58.92	71.90	13.908	20.80
20.2	29.23	54.95	51.806	18.09	58.59	70.59	13.719	19.86
30.1	28.51	52.71	51.667	17.22	58.32	68.93	13.560	18.76
Apr. 9.1	27.87	50.08	51.563	16.30	58.11	67.02	13.439	17.52
19.1	27.33	47.11	51.503	15.38	57.97	64.90	13.367	16.24
29.1	26.92	43.89	51.494	14.51	57.93	62.69	13.349	14.96
May 9.0	26.64	40.46	51.536	13.75	57.96	60.47	13.389	13.76
19.0	26.49	36.91	51.633	13.12	58.09	58.32	13.489	12.66
29.0	26.48	33.32	51.782	12.66	58.30	56.30	13.645	11.72
June 7.9	26.61	29.79	51.979	12.41	58.59	54.49	13.854	10.99
17.9	26.89	26.39	52.220	12.35	58.97	52.94	14.113	10.47
27.9	27.29	23.22	52.497	12.51	59.40	51.71	14.413	10.19
July 7.9	27.80	20.34	52.807	12.86	59.88	50.79	14.746	10.15
17.8	28.43	17.86	53.138	13.41	60.41	50.24	15.107	10.36
27.8	29.13	15.84	53.487	14.13	60.97	50.05	15.484	10.79
Aug. 6.8	29.90	14.34	53.843	14.99	61.54	50.23	15.873	11.43
16.8	30.71	13.43	54.200	15.96	62.12	50.75	16.264	12.26
26.7	31.53	13.12	54.552	17.02	62.70	51.62	16.651	13.25
Sept. 5.7	32.34	13.44	54.896	18.13	63.27	52.81	17.029	14.38
15.7	33.12	14.40	55.225	19.27	63.81	54.28	17.392	15.61
25.6	33.84	15.94	55.535	20.42	64.33	56.02	17.736	16.92
Oct. 5.6	34.46	18.03	55.825	21.55	64.81	57.99	18.057	18.29
15.6	34.99	20.62	56.089	22.65	65.25	60.16	18.351	19.70
25.6	35.39	23.59	56.328	23.71	65.64	62.48	18.615	21.13
Nov. 4.5	35.64	26.83	56.535	24.72	65.96	64.91	18.847	22.56
14.5	35.77	30.23	56.709	25.68	66.23	67.41	19.041	23.97
24.5	35.73	33.66	56.847	26.57	66.43	69.91	19.193	25.34
Dec. 4.5	35.54	37.01	56.946	27.38	66.56	72.37	19.302	26.64
14.4	35.20	40.14	57.002	28.09	66.61	74.70	19.364	27.83
24.4	34.73	42.95	57.014	28.70	66.58	76.83	19.376	28.90
34.4	34.15	45.34	56.983	29.19	66.48	78.71	19.340	29.79
Mean Place	31.478	47.94	50.870	6.39	57.839	50.38	12.766	5.65
Sec δ , Tan δ	3.740	-3.604	1.175	+0.616	2.054	+1.794	1.301	+0.832
$D_{\phi} a$, $D_{\omega} a$	-0.02	+0.13	+0.07	-0.02	+0.10	-0.06	+0.08	-0.03
$D_{\phi} \delta$, $D_{\omega} \delta$	+0.2	+0.8	+0.2	+0.8	+0.2	+0.8	+0.2	+0.8

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	ξ Persei. Mag. 4.0		γ Eridani. Mag. 3.2		λ Tauri. Var. 3.3-4.2		δ Reticuli. Mag. 4.4	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m s 53	° ' " +35 33	h m s 54	° ' " -13 44	h m s 56	° ' " +12 15	h m s 57	° ' " -61 37
Jan. 0.4	32.821	15.12 61	8.454	45.32	3.400	22.68	27.44	77.27
10.4	32.765 ⁵⁶	15.73 42	8.391 ⁶³	46.81 ¹⁴⁹	3.359 ⁴¹	22.22 ⁴⁶	27.14 ³⁰	79.56 ²²⁹
20.3	32.667 ⁹⁸	16.15 20	8.296 ⁹⁵	48.06 ¹²⁵	3.282 ⁷⁷	21.76 ⁴⁶	26.78 ³⁶	81.34 ¹⁷⁸
30.3	32.531 ¹³⁶	16.35 1	8.170 ¹²⁶	49.07 ¹⁰¹	3.173 ¹⁰⁹	21.32 ⁴⁴	26.37 ⁴¹	82.60 ¹⁸⁰
Feb. 9.3	32.364 ¹⁶⁷	16.34 26	8.022 ¹⁴⁸	49.79 ⁷²	3.040 ¹³³	20.89 ⁴³	25.93 ⁴⁴	83.30 ⁷⁰
19.3	32.178 ¹⁸⁶	16.08 46	7.856 ¹⁶⁶	50.24 ⁴⁵	2.889 ¹⁵¹	20.48 ⁴¹	25.47 ⁴⁶	83.44 ¹⁴
29.2	31.983 ¹⁹⁵	15.62 68	7.684 ¹⁷²	50.38 ¹⁴	2.729 ¹⁶⁰	20.11 ³⁷	25.01 ⁴⁶	83.01 ⁴³
Mar. 10.2	31.790 ¹⁹³	14.94 85	7.513 ¹⁷¹	50.23 ¹⁵	2.570 ¹⁵⁹	19.78 ³³	24.56 ⁴⁵	82.03 ⁹⁸
20.2	31.612 ¹⁷⁸	14.09 97	7.354 ¹⁵⁹	49.79 ⁴⁴	2.422 ¹⁴⁸	19.51 ²⁷	24.13 ⁴³	80.54 ¹⁴⁹
30.1	31.462 ¹⁵⁰	13.12 106	7.215 ¹³⁹	49.05 ⁷⁴	2.296 ¹²⁶	19.32 ¹⁹	23.74 ³⁹	78.57 ¹⁸⁷
Apr. 9.1	31.349 ¹¹³	12.06 109	7.105 ¹¹⁰	48.05 ¹⁰⁰	2.199 ⁹⁷	19.23 ⁹	23.40 ³⁴	76.18 ²³⁹
19.1	31.281 ⁶⁸	10.97 106	7.031 ⁷⁴	46.76 ¹²⁹	2.140 ⁵⁹	19.27 ⁴	23.12 ²⁸	73.43 ²⁷⁵
29.1	31.264 ¹⁷	9.91 99	6.998 ³³	45.22 ¹⁵⁴	2.123 ¹⁷	19.45 ¹⁸	22.91 ²¹	70.37 ³⁰⁶
May 9.0	31.302 ³⁸	8.92 86	7.009 ¹¹	43.47 ¹⁷⁵	2.152 ²⁹	19.79 ³⁴	22.78 ¹³	67.08 ³²⁹
19.0	31.397 ⁹⁵	8.06 69	7.066 ⁵⁷	41.52 ¹⁹⁵	2.227 ⁷⁵	20.29 ⁵⁰	22.73 ⁵	63.61 ³⁴⁷
29.0	31.546 ¹⁴⁹	7.37 52	7.168 ¹⁰²	39.41 ²¹¹	2.348 ¹²¹	20.96 ⁶⁷	22.76 ³	60.06 ³⁵⁵
June 7.9	31.745 ¹⁹⁹	6.85 29	7.314 ¹⁴⁶	37.21 ²²⁰	2.513 ¹⁶⁵	21.79 ⁸³	22.87 ¹¹	56.52 ³⁵⁴
17.9	31.991 ²⁴⁶	6.56 8	7.498 ¹⁸⁴	34.95 ²²⁶	2.717 ²⁰⁴	22.76 ⁹⁷	23.06 ¹⁹	53.06 ³⁴⁶
27.9	32.275 ²⁸⁴	6.48 15	7.718 ²²⁰	32.69 ²²⁶	2.954 ²³⁷	23.85 ¹⁰⁹	23.33 ²⁷	49.79 ³²⁷
July 7.9	32.593 ³¹⁸	6.63 35	7.967 ²⁴⁹	30.49 ²²⁰	3.220 ²⁶⁶	25.03 ¹¹⁸	23.66 ³³	46.79 ³⁰⁰
17.8	32.937 ³⁴⁴	6.98 55	8.239 ²⁷²	28.43 ²⁰⁶	3.507 ²⁸⁷	26.27 ¹²⁴	24.05 ³⁹	44.13 ²⁸⁶
27.8	33.296 ³⁵⁹	7.53 73	8.527 ²⁸⁸	26.55 ¹⁸⁸	3.810 ³⁰³	27.51 ¹²⁴	24.49 ⁴⁴	41.91 ²²²
Aug. 6.8	33.665 ³⁶⁹	8.26 87	8.825 ²⁹⁸	24.93 ¹⁶²	4.121 ⁸¹¹	28.73 ¹²²	24.96 ⁴⁷	40.18 ¹⁷³
16.8	34.037 ³⁷²	9.13 99	9.128 ³⁰³	23.61 ¹³²	4.434 ³¹³	29.87 ¹¹⁴	25.45 ⁴⁹	39.01 ¹¹⁷
26.7	34.406 ³⁶⁹	10.12 109	9.428 ³⁰⁰	22.63 ⁹⁸	4.744 ³¹⁰	30.92 ¹⁰⁵	25.95 ⁵⁰	38.43 ⁵⁸
Sept. 5.7	34.765 ³⁵⁹	11.21 117	9.720 ²⁹²	22.03 ⁶⁰	5.045 ³⁰¹	31.82 ⁹⁰	26.44 ⁴⁹	38.49 ⁶
15.7	35.109 ³⁴⁴	12.38 121	10.000 ²⁸⁰	21.84 ¹⁹	5.336 ²⁹¹	32.56 ⁷⁴	26.92 ⁴⁸	39.18 ⁶⁰
25.6	35.437 ³²⁸	13.59 122	10.263 ²⁶³	22.05 ²¹	5.611 ²⁷⁵	33.12 ⁵⁶	27.36 ⁴⁴	40.49 ¹²¹
Oct. 5.6	35.742 ³⁰⁵	14.81 123	10.507 ²⁴⁴	22.65 ⁶⁰	5.866 ²⁵⁵	33.50 ³⁸	27.76 ⁴⁰	42.36 ¹⁸⁷
15.6	36.023 ²⁸¹	16.04 123	10.726 ²¹⁹	23.61 ⁹⁶	6.101 ²³⁹	33.68 ¹⁸	28.10 ³⁴	44.75 ²³⁹
25.6	36.275 ²⁵²	17.27 130	10.922 ¹⁹⁶	24.90 ¹²⁹	6.312 ²¹¹	33.71 ³	28.38 ²⁸	47.56 ²⁸¹
Nov. 4.5	36.497 ²²²	18.47 115	11.087 ¹⁶⁵	26.43 ¹⁵³	6.498 ¹⁸⁶	33.59 ¹²	28.59 ²¹	50.70 ³¹⁴
14.5	36.684 ¹⁸⁷	19.62 111	11.223 ¹³⁶	28.17 ¹⁷⁴	6.656 ¹⁵⁸	33.34 ²⁵	28.72 ¹³	54.05 ³³⁵
24.5	36.832 ¹⁴⁸	20.73 111	11.325 ¹⁰²	30.02 ¹⁸⁵	6.781 ¹²⁵	33.00 ³⁴	28.77 ⁵	57.47 ³⁴³
Dec. 4.5	36.939 ¹⁰⁷	21.77 104	11.393 ⁶⁸	31.92 ¹⁹⁰	6.873 ⁹²	32.58 ⁴²	28.73 ⁴	60.86 ³³⁹
14.4	37.002 ⁶³	22.72 84	11.423 ³⁰	33.79 ¹⁸⁷	6.929 ⁵⁶	32.13 ⁴⁵	28.62 ¹¹	64.09 ³²³
24.4	37.018 ¹⁶	23.56 68	11.417 ⁶	35.57 ¹⁷⁸	6.946 ¹⁷	31.65 ⁴⁸	28.43 ¹⁹	67.04 ²⁹⁶
34.4	36.987 ³¹	24.24 68	11.375 ⁴²	37.18 ¹⁶¹	6.925 ²¹	31.17 ⁴⁸	28.16 ²⁷	69.62 ²⁵⁸
Mean Place	30.643	1.17	6.591	48.28	1.481	13.87	24.627	72.59
Sec δ , Tan δ	1.229	+0.715	1.029	-0.245	1.024	+0.217	2.105	-1.852
$D\psi\alpha$, $D\omega\alpha$	+0.08	-0.03	+0.06	+0.01	+0.07	-0.01	+0.02	+0.06
$D\psi\delta$, $D\omega\delta$	+0.2	+0.9	+0.2	+0.9	+0.2	+0.9	+0.2	+0.9

APPARENT PLACES OF STARS, 1916.

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FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	α Tauri. Mag. 3.9		A Tauri. Mag. 4.5		c Persei. Mag. 4.0		p Tauri. Mag. 5.6	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 3 58	° ' " + 5 45	h m 3 59	° ' " +21 51	h m 4 2	° ' " +47 29	h m 4 5	° ' " +26 15
	s	"	s	"	s	"	s	"
Jan. 0.4	43.087	32.70	45.609	22.84	36.050	37.25	44.826	57.05
10.4	43.047	31.95	45.570	22.78	35.980	38.44	44.789	57.26
20.3	42.970	31.27	45.492	22.68	35.856	39.38	44.712	57.35
30.3	42.865	30.66	45.381	22.51	35.685	40.01	44.598	57.33
Feb. 9.3	42.731	30.13	45.242	22.24	35.477	40.31	44.456	57.19
19.3	42.581	29.70	45.084	21.91	35.243	40.28	44.291	56.92
29.2	42.422	29.36	44.915	21.51	34.998	39.89	44.115	56.54
Mar. 10.2	42.264	29.15	44.748	21.05	34.755	39.18	43.940	56.04
20.2	42.116	29.05	44.592	20.54	34.528	38.18	43.775	55.46
30.1	41.989	29.08	44.459	20.03	34.333	36.93	43.632	54.82
Apr. 9.1	41.889	29.28	44.357	19.54	34.181	35.49	43.522	54.17
19.1	41.826	29.63	44.293	19.12	34.082	33.93	43.452	53.54
29.1	41.804	30.15	44.274	18.78	34.043	32.31	43.427	52.97
May 9.0	41.827	30.86	44.302	18.57	34.069	30.71	43.451	52.49
19.0	41.895	31.73	44.381	18.48	34.161	29.18	43.525	52.14
29.0	42.009	32.77	44.508	18.57	34.317	27.78	43.649	51.95
June 8.0	42.165	33.96	44.679	18.83	34.534	26.58	43.821	51.92
17.9	42.360	35.27	44.892	19.25	34.807	25.58	44.036	52.08
27.9	42.588	36.67	45.141	19.82	35.129	24.84	44.288	52.40
July 7.9	42.845	38.11	45.421	20.55	35.490	24.36	44.572	52.89
17.8	43.123	39.57	45.723	21.39	35.884	24.17	44.880	53.51
27.8	43.417	40.99	46.040	22.32	36.301	24.23	45.205	54.26
Aug. 6.8	43.721	42.32	46.366	23.31	36.731	24.57	45.540	55.10
16.8	44.025	43.51	46.697	24.32	37.167	25.15	45.879	56.01
26.7	44.328	44.55	47.024	25.33	37.602	25.97	46.217	56.94
Sept. 5.7	44.624	45.38	47.344	26.29	38.029	26.98	46.549	57.88
15.7	44.909	45.98	47.652	27.17	38.441	28.19	46.868	58.80
25.7	45.178	46.35	47.944	27.98	38.836	29.55	47.175	59.66
Oct. 5.6	45.429	46.47	48.218	28.68	39.207	31.04	47.462	60.48
15.6	45.660	46.36	48.469	29.28	39.549	32.66	47.727	61.23
25.6	45.867	46.03	48.698	29.79	39.857	34.35	47.969	61.91
Nov. 4.5	46.049	45.54	48.898	30.20	40.129	36.09	48.184	62.52
14.5	46.202	44.90	49.070	30.52	40.357	37.87	48.368	63.09
24.5	46.324	44.14	49.209	30.74	40.540	39.64	48.518	63.58
Dec. 4.5	46.414	43.32	49.312	30.93	40.672	41.36	48.632	64.02
14.4	46.467	42.48	49.377	31.06	40.747	42.99	48.705	64.39
24.4	46.483	41.64	49.401	31.11	40.766	44.49	48.735	64.71
34.4	46.462	40.84	49.383	31.10	40.728	45.81	48.723	64.94
Mean Place	41.191	25.40	43.595	11.97	33.497	21.59	42.728	45.53
Sec δ, Tan δ	1.005	+0.101	1.077	+0.401	1.480	+1.091	1.115	+0.494
D _ψ α, D _ω α	+0.06	0.00	+0.07	-0.01	+0.09	-0.04	+0.07	-0.02
D _ψ δ, D _ω δ	+0.2	+0.9	+0.2	+0.9	+0.2	+0.9	+0.2	+0.9

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	ϵ^1 Eridani. Mag. 4.1		μ Tauri. Mag. 4.3		α Horologii. Mag. 3.8		α Reticuli. Mag. 3.4	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 4 7	° ' " - 7 2	h m 4 10	° ' " + 8 40	h m 4 11	° ' " - 42 29	h m 4 13	° ' " - 62 40
	s	"	s	"	s	"	s	"
Jan. 0.4	47.763	76.33	60.246	65.93	15.262	66.46	23.23	65.95
10.4	47.718	77.63	60.215	65.30	15.131	68.79	22.94	68.41
20.3	47.637	78.76	60.146	64.70	14.958	70.71	22.58	70.41
30.3	47.525	79.69	60.045	64.16	14.748	72.18	22.17	71.90
Feb. 9.3	47.388	80.41	59.915	63.68	14.509	73.17	21.72	72.82
19.3	47.233	80.91	59.765	63.27	14.250	73.66	21.24	73.18
29.2	47.066	81.17	59.604	62.93	13.981	73.65	20.75	72.98
Mar. 10.2	46.900	81.20	59.443	62.67	13.713	73.14	20.26	72.22
20.2	46.742	80.97	59.291	62.50	13.458	72.16	19.80	70.94
30.2	46.602	80.52	59.157	62.44	13.225	70.74	19.37	69.18
Apr. 9.1	46.490	79.82	59.050	62.50	13.026	68.89	18.99	66.95
19.1	46.412	78.89	58.978	62.70	12.867	66.66	18.67	64.35
29.1	46.373	77.72	58.946	63.05	12.755	64.11	18.42	61.41
May 9.0	46.378	76.35	58.960	63.56	12.695	61.30	18.26	58.21
19.0	46.428	74.78	59.018	64.24	12.691	58.27	18.17	54.82
29.0	46.521	73.06	59.123	65.08	12.744	55.11	18.16	51.31
June 8.0	46.658	71.21	59.271	66.06	12.851	51.89	18.24	47.78
17.9	46.836	69.27	59.459	67.17	13.010	48.69	18.40	44.31
27.9	47.048	67.31	59.681	68.38	13.219	45.58	18.65	40.98
July 7.9	47.289	65.36	59.933	69.64	13.470	42.64	18.96	37.90
17.9	47.554	63.49	60.208	70.95	13.757	40.00	19.33	35.12
27.8	47.836	61.75	60.499	72.23	14.073	37.67	19.76	32.77
Aug. 6.8	48.129	60.22	60.800	73.45	14.411	35.78	20.23	30.91
16.8	48.428	58.92	61.107	74.58	14.762	34.38	20.72	29.57
26.7	48.726	57.90	61.413	75.57	15.117	33.49	21.24	28.83
Sept. 5.7	49.018	57.21	61.713	76.37	15.467	33.18	21.75	28.72
15.7	49.301	56.86	62.004	76.99	15.808	33.45	22.25	29.25
25.7	49.570	56.86	62.282	77.38	16.131	34.30	22.72	30.40
Oct. 5.6	49.820	57.22	62.544	77.57	16.429	35.71	23.15	32.13
15.6	50.051	57.90	62.786	77.54	16.695	37.62	23.53	34.42
25.6	50.257	58.87	63.007	77.33	16.928	39.96	23.84	37.16
Nov. 4.6	50.439	60.09	63.203	76.95	17.118	42.67	24.08	40.26
14.5	50.592	61.49	63.370	76.44	17.264	45.61	24.24	43.60
24.5	50.712	63.01	63.507	75.82	17.362	48.71	24.32	47.06
Dec. 4.5	50.799	64.59	63.610	75.15	17.409	51.83	24.32	50.52
14.4	50.851	66.17	63.678	74.45	17.405	54.85	24.23	53.86
24.4	50.864	67.69	63.708	73.74	17.351	57.69	24.05	56.95
34.4	50.840	69.10	63.698	73.06	17.249	60.25	23.80	59.70
Mean Place	45.861	80.77	58.288	58.24	13.084	64.63	20.306	62.04
Sec δ , Tan δ	1.008	-0.124	1.012	+0.153	1.356	-0.916	2.179	-1.936
$D\psi\alpha$, $D\omega\alpha$	+0.06	0.00	+0.06	0.00	+0.04	+0.03	+0.02	+0.06
$D\psi\delta$, $D\omega\delta$	+0.2	+0.9	+0.2	+0.9	+0.2	+0.9	+0.2	+0.9

APPARENT PLACES OF STARS, 1916.

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FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	γ Tauri. Mag. 3.9		δ Tauri. Mag. 3.9		ν^5 Eridani. Mag. 4.1		δ Mensæ. Mag. 5.6	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 4 15	° ' " +15 25	h m 4 18	° ' " +17 20	h m 4 20	° ' " -34 12	h m 4 23	° ' " -80 24
	s	"	s	"	s	"	s	"
Jan. 0.4	2.684	41.47	7.351	56.41	54.962	41.33	43.77	46.10
10.4	2.659	41.14	7.327	56.17	54.873	43.57	42.76	48.54
20.3	2.593	40.81	7.263	55.92	54.742	45.46	41.57	50.49
30.3	2.494	40.48	7.164	55.65	54.575	46.96	40.26	51.93
Feb. 9.3	2.365	40.14	7.034	55.34	54.378	48.04	38.85	52.81
19.3	2.214	39.79	6.882	55.04	54.161	48.66	37.37	53.16
29.2	2.052	39.45	6.717	54.70	53.931	48.82	35.87	52.93
Mar. 10.2	1.887	39.11	6.551	54.35	53.701	48.52	34.39	52.16
20.2	1.730	38.80	6.391	54.01	53.479	47.80	32.96	50.86
30.2	1.592	38.53	6.250	53.68	53.276	46.64	31.62	49.11
Apr. 9.1	1.482	38.33	6.137	53.41	53.102	45.10	30.41	46.89
19.1	1.408	38.22	6.060	53.21	52.964	43.19	29.33	44.33
29.1	1.375	38.21	6.025	53.10	52.868	40.98	28.43	41.44
May 9.0	1.387	38.34	6.036	53.12	52.820	38.47	27.73	38.30
19.0	1.446	38.62	6.093	53.27	52.821	35.74	27.23	34.99
29.0	1.552	39.04	6.198	53.58	52.875	32.86	26.96	31.57
June 8.0	1.703	39.61	6.348	54.03	52.978	29.89	26.90	28.13
17.9	1.894	40.33	6.538	54.62	53.129	26.90	27.07	24.74
27.9	2.122	41.17	6.766	55.35	53.323	23.96	27.45	21.51
July 7.9	2.381	42.10	7.025	56.19	53.557	21.17	28.04	18.54
17.9	2.661	43.11	7.307	57.10	53.822	18.59	28.83	15.85
27.8	2.962	44.16	7.609	58.06	54.114	16.30	29.77	13.60
Aug. 6.8	3.272	45.21	7.921	59.04	54.424	14.38	30.85	11.81
16.8	3.587	46.21	8.239	60.00	54.746	12.89	32.04	10.54
26.7	3.903	47.15	8.557	60.90	55.073	11.90	33.29	9.85
Sept. 5.7	4.213	47.98	8.871	61.72	55.399	11.42	34.56	9.79
15.7	4.514	48.67	9.176	62.42	55.715	11.49	35.82	10.37
25.7	4.802	49.22	9.469	63.00	56.018	12.09	37.01	11.57
Oct. 5.6	5.075	49.63	9.746	63.45	56.301	13.23	38.10	13.34
15.6	5.327	49.86	10.004	63.75	56.558	14.86	39.05	15.61
25.6	5.559	49.97	10.242	63.92	56.786	16.92	39.81	18.38
Nov. 4.6	5.766	49.95	10.454	63.99	56.980	19.33	40.37	21.46
14.5	5.944	49.82	10.639	63.96	57.137	22.00	40.69	24.79
24.5	6.092	49.59	10.792	63.86	57.253	24.83	40.76	28.23
Dec. 4.5	6.205	49.32	10.910	63.70	57.326	27.71	40.58	31.65
14.4	6.281	49.01	10.991	63.51	57.353	30.54	40.15	34.98
24.4	6.317	48.68	11.031	63.29	57.334	33.23	39.48	38.04
34.4	6.314	48.34	11.031	63.04	57.268	35.67	38.59	40.74
Mean Place	0.665	32.48	5.298	47.12	52.886	41.02	37.125	42.07
Sec δ , Tan δ	1.038	+0.276	1.048	+0.312	1.209	-0.680	6.002	-5.918
$D\phi\alpha$, $D\omega\alpha$	+0.07	-0.01	+0.07	-0.01	+0.04	+0.02	-0.08	+0.16
$D\phi\delta$, $D\omega\delta$	+0.2	+0.9	+0.2	+0.9	+0.2	+0.9	+0.2	+0.9

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	ϵ Tauri. Mag. 3.6		m Persei. Mag. 6.1		α Tauri. (Aldebaran.) Mag. 1.1		ν Eridani. Mag. 4.1	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 4 23	° ' " +18 59	h m 4 27	° ' " +42 53	h m 4 31	° ' " +16 20	h m 4 32	° ' " - 3 31
Jan. 0.4	44.677	51.71	32.613	21.50	8.012	37.57	9.217	18.91
10.4	44.658	51.56	32.579	22.57	7.999	37.28	9.194	20.16
20.4	44.597	51.38	32.493	23.46	7.944	37.00	9.131	21.25
30.3	44.501	51.18	32.358	24.11	7.853	36.71	9.035	22.19
Feb. 9.3	44.372	50.93	32.183	24.51	7.728	36.41	8.907	22.93
19.3	44.220	50.65	31.977	24.61	7.580	36.11	8.757	23.48
29.2	44.053	50.33	31.755	24.44	7.415	35.80	8.592	23.84
Mar. 10.2	43.883	49.98	31.528	23.98	7.246	35.49	8.423	23.98
20.2	43.721	49.62	31.311	23.25	7.084	35.19	8.260	23.92
30.2	43.576	49.27	31.117	22.29	6.937	34.92	8.111	23.63
Apr. 9.1	43.459	48.93	30.958	21.17	6.816	34.70	7.987	23.14
19.1	43.377	48.67	30.844	19.89	6.730	34.55	7.893	22.43
29.1	43.337	48.48	30.784	18.55	6.683	34.49	7.837	21.53
May 9.1	43.343	48.40	30.782	17.21	6.681	34.54	7.824	20.41
19.0	43.396	48.44	30.840	15.92	6.725	34.73	7.854	19.12
29.0	43.497	48.63	30.956	14.71	6.817	35.05	7.929	17.66
June 8.0	43.643	48.97	31.131	13.64	6.953	35.51	8.047	16.07
17.9	43.831	49.44	31.359	12.74	7.132	36.10	8.205	14.38
27.9	44.057	50.05	31.635	12.04	7.347	36.82	8.399	12.64
July 7.9	44.314	50.77	31.951	11.55	7.595	37.63	8.625	10.89
17.9	44.595	51.59	32.300	11.30	7.867	38.51	8.877	9.19
27.8	44.897	52.46	32.675	11.26	8.159	39.43	9.147	7.60
Aug. 6.8	45.210	53.36	33.067	11.43	8.466	40.35	9.432	6.15
16.8	45.530	54.25	33.470	11.82	8.779	41.25	9.726	4.91
26.8	45.851	55.11	33.875	12.37	9.095	42.08	10.021	3.91
Sept. 5.7	46.169	55.90	34.278	13.11	9.408	42.80	10.316	3.21
15.7	46.479	56.58	34.673	13.98	9.714	43.42	10.605	2.81
25.7	46.776	57.16	35.055	14.96	10.011	43.89	10.883	2.75
Oct. 5.6	47.059	57.62	35.418	16.08	10.293	44.23	11.147	3.01
15.6	47.324	57.97	35.760	17.28	10.559	44.42	11.395	3.58
25.6	47.569	58.19	36.076	18.55	10.805	44.48	11.623	4.43
Nov. 4.6	47.789	58.32	36.359	19.90	11.027	44.42	11.827	5.51
14.5	47.982	58.36	36.607	21.28	11.223	44.27	12.005	6.78
24.5	48.142	58.33	36.813	22.68	11.388	44.04	12.163	8.18
Dec. 4.5	48.267	58.26	36.974	24.07	11.519	43.78	12.267	9.65
14.5	48.355	58.16	37.083	25.42	11.612	43.48	12.344	11.12
24.4	48.402	58.02	37.137	26.69	11.664	43.18	12.382	12.56
34.4	48.406	57.87	37.135	27.82	11.674	42.87	12.381	13.90
Mean Place	42.585	42.29	30.041	8.12	5.918	28.92	7.236	23.92
Sec δ , Tan δ	1.058	+0.344	1.365	+0.929	1.042	+0.293	1.002	-0.062
$D\psi\alpha$, $D\omega\alpha$	+0.07	-0.01	+0.08	-0.02	+0.07	-0.01	+0.06	0.00
$D\psi\delta$, $D\omega\delta$	+0.2	+0.9	+0.2	+0.9	+0.2	+0.9	+0.1	+0.9

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	α Doradus. Mag. 3.5		53 Eridani. Mag. 4.0		τ Tauri. Mag. 4.3		Groombridge 848. Mag. 6.0	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 4 32	° ' " -55 12	h m 4 34	° ' " -14 27	h m 4 37	° ' " +22 47	h m 4 37	° ' " +75 47
	s	"	s	"	s	"	s	"
Jan. 0.4	13.407	68.66	21.887	59.47	14.286	57.84	36.81	41.50
10.4	13.218	71.32	21.851	61.18	14.278	57.90	36.57	44.06
20.4	12.971	73.56	21.777	62.69	14.226	57.91	36.18	46.29
30.3	12.675	75.32	21.667	63.93	14.134	57.87	35.65	48.11
Feb. 9.3	12.341	76.56	21.527	64.90	14.007	57.76	35.01	49.45
19.3	11.977	77.26	21.364	65.56	13.855	57.59	34.27	50.25
29.3	11.599	77.41	21.187	65.92	13.685	57.33	33.50	50.50
Mar. 10.2	11.218	77.02	21.005	65.98	13.507	57.01	32.71	50.17
20.2	10.848	76.10	20.828	65.73	13.337	56.63	31.96	49.31
30.2	10.504	74.67	20.667	65.18	13.181	56.21	31.28	47.94
Apr. 9.1	10.194	72.80	20.528	64.33	13.053	55.78	30.68	46.12
19.1	9.932	70.51	20.422	63.20	12.958	55.36	30.20	43.94
29.1	9.724	67.85	20.353	61.81	12.905	54.99	29.87	41.49
May 9.1	9.580	64.89	20.326	60.18	12.899	54.70	29.71	38.84
19.0	9.501	61.70	20.343	58.35	12.941	54.52	29.71	36.10
29.0	9.492	58.37	20.406	56.35	13.031	54.44	29.87	33.37
June 8.0	9.552	54.94	20.513	54.20	13.168	54.50	30.21	30.71
18.0	9.679	51.51	20.660	52.00	13.349	54.71	30.69	28.22
27.9	9.874	48.18	20.845	49.76	13.569	55.04	31.31	25.96
July 7.9	10.126	45.05	21.064	47.57	13.822	55.49	32.05	24.00
17.9	10.430	42.17	21.309	45.49	14.101	56.06	32.92	22.36
27.8	10.779	39.66	21.578	43.58	14.403	56.70	33.87	21.10
Aug. 6.8	11.163	37.59	21.860	41.91	14.719	57.41	34.88	20.23
16.8	11.572	36.03	22.153	40.51	15.043	58.13	35.94	19.76
26.8	11.997	35.03	22.450	39.47	15.371	58.84	37.03	19.72
Sept. 5.7	12.426	34.65	22.748	38.81	15.698	59.52	38.14	20.10
15.7	12.849	34.88	23.038	38.55	16.019	60.16	39.23	20.89
25.7	13.254	35.75	23.319	38.72	16.330	60.73	40.29	22.07
Oct. 5.7	13.633	37.22	23.585	39.29	16.627	61.21	41.30	23.63
15.6	13.975	39.25	23.833	40.25	16.909	61.62	42.26	25.53
25.6	14.272	41.77	24.061	41.56	17.170	61.94	43.13	27.76
Nov. 4.6	14.516	44.70	24.262	43.19	17.409	62.19	43.89	30.26
14.5	14.700	47.91	24.435	45.02	17.619	62.38	44.53	32.97
24.5	14.821	51.29	24.578	47.01	17.799	62.54	45.04	35.85
Dec. 4.5	14.874	54.74	24.684	49.08	17.943	62.66	45.40	38.81
14.5	14.857	58.12	24.752	51.15	18.047	62.76	45.59	41.78
24.4	14.772	61.32	24.781	53.14	18.108	62.84	45.62	44.66
34.4	14.621	64.23	24.768	55.00	18.125	62.88	45.49	47.37
Mean Place	10.814	66.35	19.901	62.58	12.093	48.28	30.341	25.25
Sec δ , Tan δ	1.753	-1.440	1.033	-0.258	1.085	+0.420	4.075	+3.950
$D\phi\alpha$, $D\omega\alpha$	+0.03	+0.03	+0.05	+0.01	+0.07	-0.01	+0.16	-0.09
$D\phi\delta$, $D\omega\delta$	+0.1	+0.9	+0.1	+0.9	+0.1	+0.9	+0.1	+0.9

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	α Coeli. Mag. 4.5		4 Camelop. Mag. 5.4		μ Eridani. Mag. 4.2		π^3 Orionis. Mag. 3.3	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 4 37	° ' " -42 0	h m 4 41	° ' " +56 36	h m 4 41	° ' " - 3 24	h m 4 45	° ' " + 6 48
	s	"	s	"	s	"	s	"
Jan. 0.4	53.428	86.97	3.342	47.95	20.098	22.89	18.788	62.91
10.4	53.326	89.53	3.294	49.74	20.082	24.17	18.783	62.10
20.4	53.175	91.71	3.173	51.28	20.026	25.29	18.739	61.40
30.3	52.982	93.47	2.985	52.52	19.934	26.26	18.655	60.77
Feb. 9.3	52.754	94.76	2.743	53.40	19.811	27.02	18.539	60.25
19.3	52.500	95.57	2.459	53.90	19.663	27.60	18.398	59.81
29.3	52.230	95.88	2.147	53.98	19.499	27.98	18.240	59.48
Mar. 10.2	51.957	95.69	1.828	53.64	19.330	28.15	18.074	59.25
20.2	51.691	95.02	1.519	52.90	19.164	28.11	17.912	59.12
30.2	51.443	93.89	1.235	51.80	19.011	27.85	17.763	59.12
Apr. 9.1	51.222	92.32	0.996	50.39	18.882	27.39	17.636	59.24
19.1	51.038	90.35	0.814	48.72	18.781	26.71	17.539	59.51
29.1	50.898	88.03	0.697	46.88	18.719	25.84	17.480	59.91
May 9.1	50.808	85.41	0.656	44.93	18.697	24.76	17.463	60.45
19.0	50.772	82.53	0.691	42.95	18.719	23.50	17.490	61.16
29.0	50.791	79.48	0.805	41.01	18.785	22.08	17.561	62.00
June 8.0	50.865	76.32	0.995	39.16	18.895	20.53	17.677	62.97
18.0	50.992	73.14	1.254	37.48	19.045	18.87	17.833	64.05
27.9	51.168	70.02	1.580	35.99	19.231	17.16	18.025	65.23
July 7.9	51.389	67.03	1.960	34.75	19.450	15.44	18.250	66.44
17.9	51.650	64.26	2.388	33.76	19.695	13.78	18.503	67.69
27.8	51.944	61.81	2.853	33.07	19.962	12.20	18.775	68.89
Aug. 6.8	52.263	59.74	3.346	32.67	20.243	10.76	19.062	70.03
16.8	52.600	58.13	3.857	32.57	20.534	9.54	19.360	71.05
26.8	52.948	57.03	4.379	32.76	20.829	8.56	19.661	71.91
Sept. 5.7	53.298	56.49	4.902	33.23	21.125	7.87	19.963	72.59
15.7	53.643	56.53	5.419	33.97	21.415	7.46	20.260	73.07
25.7	53.976	57.17	5.922	34.96	21.696	7.41	20.550	73.30
Oct. 5.7	54.291	58.39	6.405	36.20	21.966	7.68	20.829	73.29
15.6	54.580	60.13	6.862	37.65	22.219	8.26	21.090	73.08
25.6	54.838	62.35	7.285	39.30	22.453	9.11	21.337	72.66
Nov. 4.6	55.058	64.97	7.667	41.11	22.665	10.21	21.560	72.06
14.5	55.236	67.89	8.001	43.06	22.851	11.50	21.759	71.32
24.5	55.367	70.98	8.277	45.10	23.007	12.91	21.927	70.47
Dec. 4.5	55.450	74.17	8.492	47.19	23.129	14.40	22.065	69.57
14.5	55.481	77.32	8.636	49.28	23.215	15.90	22.164	68.66
24.4	55.459	80.34	8.708	51.30	23.263	17.37	22.225	67.76
34.4	55.383	83.09	8.702	53.19	23.269	18.74	22.242	66.91
Mean Place	51.195	86.21	0.023	33.72	18.093	27.84	16.727	56.31
Sec δ , Tan δ	1.346	-0.901	1.818	+1.517	1.002	-0.060	1.007	+0.120
$D\psi\alpha$, $D\omega\alpha$	+0.04	+0.02	+0.10	-0.03	+0.06	0.00	+0.06	0.00
$D\psi\delta$, $D\omega\delta$	+0.1	+0.9	+0.1	+0.9	+0.1	+0.9	+0.1	+0.9

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	9 Camelop. Mag. 4.4			♉ Tauri. Mag. 5.1			♋ Orionis. Mag. 3.9			♊ Aurigæ. Mag. 2.9		
	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.
	h m	s	° ' "	h m	s	° ' "	h m	s	° ' "	h m	s	° ' "
	4 45		+66 12	4 46		+18 41	4 49		+ 2 18	4 51		+33 2
	s	"	"	s	"	"	s	"	"	s	"	"
Jan. 0.4	45.81		20.67	29.680		60.83	54.556		20.54	33.686		13.44
10.4	45.72	9	22.91	29.678	2	60.66	54.552	4	19.51	33.690	4	14.06
20.4	45.55	17	24.88	29.634	44	60.48	54.506	46	18.59	33.642	48	14.58
30.3	45.26	29	26.48	29.550	84	60.30	54.422	84	17.80	33.548	94	14.99
Feb. 9.3	44.91	35	27.67	29.431	119	60.10	54.306	116	17.15	33.414	134	15.24
		41			146			142			167	
19.3	44.50		28.41	29.285		59.89	54.164		16.64	33.247		15.34
29.3	44.06	44	28.64	29.121	164	59.63	54.003	161	16.27	33.060	187	15.26
Mar. 10.2	43.60	46	28.39	28.948	173	59.35	53.834	169	16.06	32.863	197	14.99
20.2	43.16	44	27.66	28.778	170	59.06	53.670	164	16.00	32.670	193	14.56
30.2	42.75	41	26.48	28.624	154	58.77	53.516	154	16.09	32.491	179	13.98
		35			130			131			152	
Apr. 9.2	42.40		24.91	28.494		58.50	53.385		16.36	32.339		13.28
19.1	42.12	28	23.02	28.396	98	58.27	53.283	102	16.78	32.224	115	12.50
29.1	41.94	18	20.88	28.337	59	58.10	53.218	65	17.37	32.152	72	11.68
May 9.1	41.85		18.59	28.321	16	58.03	53.194	24	18.15	32.130	22	10.86
19.0	41.86	1	16.21	28.352	31	58.06	53.213	19	19.08	32.159	29	10.08
		11			79			64			83	
29.0	41.97		13.83	28.431		58.22	53.277		20.16	32.242		9.39
June 8.0	42.20	23	11.53	28.555	124	58.50	53.383	106	21.38	32.375	133	8.80
18.0	42.51	31	9.38	28.722	167	58.89	53.531	148	22.70	32.557	182	8.34
27.9	42.91	40	7.43	28.927	205	59.41	53.716	185	24.10	32.782	225	8.03
July 7.9	43.39	48	5.75	29.165	238	60.02	53.931	215	25.52	33.045	263	7.87
		54			265			242			295	
17.9	43.93		4.34	29.430		60.72	54.173		26.94	33.340		7.85
27.9	44.63	60	3.27	29.717	287	61.47	54.439	266	28.30	33.659	319	7.97
Aug. 6.8	45.17	64	2.54	30.020	303	62.22	54.719	280	29.56	33.996	337	8.22
16.8	45.85	68	2.16	30.333	313	62.97	55.010	291	30.65	34.347	351	8.58
26.8	46.54	69	2.13	30.650	317	63.67	55.307	297	31.58	34.704	357	9.02
		68			318			297			357	
Sept. 5.7	47.22		2.46	30.968		64.31	55.604		32.25	35.061		9.54
15.7	47.91	69	3.14	31.283	315	64.84	55.898	294	32.66	35.415	354	10.10
25.7	48.58	67	4.14	31.590	307	65.28	56.184	286	32.81	35.761	346	10.70
Oct. 5.7	49.23	65	5.47	31.884	294	65.60	56.460	276	32.68	36.095	334	11.32
15.6	49.84	61	7.10	32.164	280	65.80	56.721	261	32.29	36.414	319	11.96
		57			262			244			299	
25.6	50.41		8.98	32.426		65.89	56.965		31.65	36.713		12.62
Nov. 4.6	50.92	51	11.10	32.665	239	65.89	57.188	223	30.81	36.989	276	13.29
14.5	51.36	44	13.41	32.879	214	65.81	57.386	198	29.81	37.236	247	13.97
24.5	51.72	36	15.87	33.064	185	65.67	57.554	168	28.69	37.446	210	14.68
Dec. 4.5	51.99	27	18.41	33.213	149	65.51	57.691	137	27.49	37.619	173	15.39
		18			110			100			129	
14.5	52.17		20.97	33.323		65.33	57.791		26.29	37.748		16.08
24.4	52.25	8	23.46	33.392	69	65.14	57.850	59	25.13	37.829	81	16.75
34.4	52.22	3	25.81	33.418	26	64.94	57.869	19	24.03	37.860	31	17.39
Mean Place	41.488		5.88	27.503		52.33	52.504		14.77	31.252		3.02
Sec δ, Tan δ	2.478		+2.268	1.056		+0.338	1.001		+0.040	1.193		+0.650
Dψα, Dωα	+0.12		-0.05	+0.07		-0.01	+0.06		0.00	+0.08		-0.01
Dψδ, Dωδ	+0.1		+0.9	+0.1		+0.9	+0.1		+1.0	+0.1		+1.0

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	ϵ Aurigæ. Var. 3.0-4.5		β Camelop. Mag. 4.2		ζ Aurigæ. Mag. 3.9		ι Tauri. Mag. 4.7	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 4 55	° ' " +43 42	h m 4 55	° ' " +60 19	h m 4 56	° ' " +40 57	h m 4 58	° ' " +21 28
	s	"	s	"	s	"	s	"
Jan. 0.4	59.081	12.16	60.09	28.95	38.884	27.13	6.674	23.55
10.4	59.081	13.35	60.06	30.96	38.886	28.20	6.685	23.53
20.4	59.022	14.40	59.94	32.76	38.832	29.12	6.649	23.50
30.3	58.909	15.27	59.74	34.25	38.725	29.86	6.572	23.45
Feb. 9.3	58.749	15.89	59.48	35.38	38.577	30.40	6.457	23.37
19.3	58.552	16.25	59.17	36.11	38.391	30.70	6.312	23.24
29.3	58.329	16.33	58.82	36.40	38.179	30.74	6.145	23.06
Mar. 10.2	58.096	16.11	58.46	36.24	37.957	30.53	5.969	22.83
20.2	57.865	15.63	58.10	35.65	37.738	30.06	5.794	22.53
30.2	57.652	14.87	57.76	34.65	37.536	29.37	5.633	22.22
Apr. 9.2	57.468	13.91	57.48	33.31	37.361	28.49	5.492	21.89
19.1	57.325	12.76	57.25	31.65	37.226	27.44	5.385	21.57
29.1	57.233	11.50	57.09	29.76	37.137	26.31	5.316	21.28
May 9.1	57.197	10.17	57.01	27.72	37.102	25.12	5.291	21.07
19.0	57.219	8.83	57.01	25.60	37.125	23.93	5.312	20.93
29.0	57.302	7.53	57.11	23.47	37.207	22.77	5.382	20.89
June 8.0	57.444	6.33	57.28	21.41	37.343	21.71	5.497	20.96
18.0	57.641	5.25	57.53	19.47	37.532	20.78	5.656	21.16
27.9	57.889	4.32	57.86	17.70	37.770	20.01	5.855	21.46
July 7.9	58.181	3.58	58.25	16.17	38.051	19.38	6.088	21.87
17.9	58.509	3.02	58.70	14.90	38.368	18.96	6.351	22.36
27.9	58.869	2.66	59.19	13.89	38.713	18.72	6.637	22.92
Aug. 6.8	59.250	2.51	59.72	13.19	39.079	18.64	6.941	23.52
16.8	59.648	2.53	60.27	12.80	39.462	18.73	7.256	24.12
26.8	60.054	2.75	60.85	12.72	39.854	18.99	7.577	24.70
Sept. 5.7	60.463	3.13	61.42	12.95	40.248	19.38	7.901	25.24
15.7	60.870	3.66	62.00	13.48	40.639	19.89	8.222	25.72
25.7	61.267	4.34	62.55	14.30	41.023	20.54	8.537	26.09
Oct. 5.7	61.654	5.15	63.10	15.40	41.393	21.30	8.841	26.40
15.6	62.023	6.07	63.62	16.75	41.750	22.14	9.133	26.61
25.6	62.369	7.10	64.10	18.35	42.083	23.06	9.408	26.74
Nov. 4.6	62.688	8.23	64.54	20.15	42.391	24.06	9.662	26.81
14.6	62.974	9.45	64.94	22.13	42.666	25.12	9.891	26.82
24.5	63.219	10.73	65.27	24.26	42.902	26.26	10.080	26.79
Dec. 4.5	63.418	12.05	65.52	26.47	43.096	27.43	10.253	26.75
14.5	63.565	13.38	65.71	28.72	43.242	28.58	10.378	26.71
24.4	63.656	14.70	65.80	30.94	43.333	29.73	10.460	26.66
34.4	63.688	15.94	65.81	33.04	43.369	30.82	10.496	26.62
Mean Place	56.319	0.60	56.349	15.57	36.212	15.99	4.422	15.14
Sec δ , Tan δ	1.383	+0.956	2.020	+1.755	1.324	+0.868	1.075	+0.393
$D_{\psi} \alpha$, $D_{\omega} \alpha$	+0.09	-0.02	+0.11	-0.03	+0.08	-0.02	+0.07	-0.01
$D_{\psi} \delta$, $D_{\omega} \delta$	+0.1	+1.0	+0.1	+1.0	+0.1	+1.0	+0.1	+1.0

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	11 Orionis. Mag. 4.6		77 Aurigæ. Mag. 3.3		ε Leporis. Mag. 3.3		β Eridani. Mag. 2.9	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 4 59 s	° ' " +15 17 "	h m 5 0 s	° ' " +41 7 "	h m 5 1 s	° ' " -22 28 "	h m 5 3 s	° ' " - 5 11 "
Jan. 0.4	48.256	24.59	40.018	30.16	56.342	56.95	45.254	34.35
10.4	48.265	24.23	40.026	31.23	56.316	59.13	45.255	35.79
20.4	48.232	23.89	39.976	32.18	56.246	61.06	45.213	37.08
30.4	48.157	23.58	39.874	32.95	56.137	62.68	45.131	38.17
Feb. 9.3	48.045	23.29	39.725	33.53	55.994	63.97	45.015	39.07
19.3	47.904	23.03	39.541	33.86	55.822	64.91	44.872	39.74
29.3	47.745	22.80	39.330	33.94	55.631	65.46	44.708	40.20
Mar. 10.2	47.575	22.57	39.108	33.76	55.431	65.65	44.535	40.43
20.2	47.406	22.35	38.887	33.33	55.231	65.46	44.362	40.43
30.2	47.248	22.15	38.682	32.65	55.043	64.90	44.200	40.21
Apr. 9.2	47.112	22.01	38.504	31.78	54.875	64.00	44.057	39.76
19.1	47.006	21.94	38.365	30.76	54.735	62.75	43.942	39.08
29.1	46.936	21.93	38.273	29.62	54.632	61.20	43.861	38.20
May 9.1	46.908	22.03	38.234	28.42	54.569	59.38	43.820	37.11
19.1	46.927	22.23	38.252	27.21	54.551	57.30	43.819	35.84
29.0	46.990	22.56	38.328	26.06	54.577	55.05	43.864	34.40
June 8.0	47.099	22.99	38.460	24.98	54.650	52.64	43.951	32.83
18.0	47.249	23.54	38.646	24.02	54.766	50.15	44.080	31.14
27.9	47.438	24.18	38.882	23.20	54.923	47.63	44.246	29.41
July 7.9	47.660	24.91	39.159	22.55	55.115	45.17	44.445	27.67
17.9	47.911	25.70	39.474	22.07	55.341	42.82	44.673	25.97
27.9	48.185	26.51	39.818	21.78	55.593	40.67	44.925	24.37
Aug. 6.8	48.476	27.30	40.183	21.66	55.865	38.78	45.194	22.93
16.8	48.778	28.04	40.564	21.70	56.153	37.22	45.476	21.70
26.8	49.088	28.71	40.954	21.91	56.451	36.05	45.766	20.72
Sept. 5.8	49.400	29.29	41.348	22.26	56.753	35.31	46.059	20.04
15.7	49.708	29.75	41.740	22.73	57.053	35.04	46.351	19.68
25.7	50.011	30.05	42.126	23.32	57.349	35.26	46.638	19.66
Oct. 5.7	50.307	30.19	42.501	24.03	57.635	35.95	46.916	20.00
15.6	50.588	30.20	42.858	24.83	57.905	37.10	47.182	20.66
25.6	50.853	30.08	43.196	25.72	58.155	38.67	47.430	21.62
Nov. 4.6	51.098	29.82	43.507	26.69	58.383	40.60	47.660	22.85
14.6	51.319	29.48	43.789	27.73	58.583	42.81	47.864	24.28
24.5	51.511	29.09	44.033	28.83	58.748	45.22	48.039	25.85
Dec. 4.5	51.669	28.65	44.232	29.98	58.876	47.75	48.183	27.52
14.5	51.788	28.21	44.383	31.15	58.962	50.29	48.289	29.20
24.5	51.869	27.79	44.478	32.30	59.006	52.77	48.355	30.83
34.4	51.903	27.39	44.519	33.40	59.007	55.09	48.379	32.37
Mean Place	46.076	17.13	37.321	19.26	54.273	59.19	43.198	38.82
Sec δ, Tan δ	1.037	+0.273	1.328	+0.873	1.082	-0.414	1.004	-0.091
Dψ α, Dω α	+0.07	0.00	+0.08	-0.02	+0.05	+0.01	+0.06	0.00
Dψ δ, Dω δ	+0.1	+1.0	+0.1	+1.0	+0.1	+1.0	+0.1	+1.0

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	μ Aurigæ. Mag. 4.8		19 H. Camelop. Mag. 5.2		μ Leporis. Mag. 3.3		α Aurigæ. (Capella). Mag. 0.2	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 5 7	° ' " +38 23	h m 5 8	° ' " +79 8	h m 5 9	° ' " -16 17	h m 5 10	° ' " +45 54
	s	"	s	"	s	"	s	"
Jan. 0.4	43.282	20.13	50.28	28.13	11.529	71.80	31.802	60.53
10.4	43.300	21.06	50.08	30.96	11.520	73.77	31.818	61.86
20.4	43.262	21.90	49.67	33.52	11.468	75.52	31.771	63.05
30.4	43.172	22.59	49.06	35.72	11.376	77.01	31.665	64.07
Feb. 9.3	43.036	23.11	48.28	37.48	11.245	78.20	31.508	64.86
19.3	42.862	23.42	47.37	38.74	11.091	79.10	31.309	65.38
29.3	42.664	23.52	46.37	39.43	10.914	79.68	31.081	65.61
Mar. 10.2	42.450	23.38	45.33	39.55	10.727	79.92	30.838	65.54
20.2	42.238	23.03	44.29	39.08	10.538	79.84	30.594	65.14
30.2	42.039	22.46	43.31	38.08	10.360	79.43	30.363	64.46
Apr. 9.2	41.866	21.70	42.42	36.56	10.200	78.72	30.162	63.54
19.1	41.725	20.80	41.69	34.62	10.069	77.71	30.000	62.40
29.1	41.633	19.81	41.11	32.31	9.970	76.42	29.887	61.11
May 9.1	41.590	18.76	40.73	29.73	9.913	74.87	29.829	59.71
19.1	41.601	17.70	40.56	26.97	9.896	73.11	29.833	58.27
29.0	41.667	16.68	40.59	24.13	9.923	71.15	29.898	56.84
June 8.0	41.788	15.74	40.84	21.29	9.996	69.03	30.024	55.46
18.0	41.961	14.90	41.29	18.54	10.109	66.83	30.208	54.18
27.9	42.181	14.21	41.95	15.94	10.262	64.58	30.447	53.05
July 7.9	42.444	13.65	42.77	13.57	10.452	62.38	30.731	52.07
17.9	42.741	13.24	43.74	11.49	10.672	60.24	31.056	51.27
27.9	43.067	13.01	44.87	9.74	10.917	58.26	31.415	50.67
Aug. 6.8	43.417	12.91	46.10	8.35	11.183	56.52	31.800	50.26
16.8	43.781	12.96	47.41	7.36	11.464	55.04	32.204	50.06
26.8	44.156	13.13	48.79	6.78	11.754	53.92	32.620	50.04
Sept. 5.8	44.535	13.43	50.20	6.63	12.050	53.18	33.043	50.22
15.7	44.913	13.83	51.62	6.90	12.346	52.85	33.466	50.55
25.7	45.286	14.32	53.04	7.60	12.636	52.96	33.884	51.06
Oct. 5.7	45.651	14.89	54.41	8.72	12.919	53.51	34.291	51.73
15.6	46.000	15.53	55.72	10.23	13.190	54.48	34.683	52.54
25.6	46.332	16.26	56.93	12.11	13.442	55.85	35.055	53.48
Nov. 4.6	46.639	17.04	58.03	14.34	13.672	57.53	35.399	54.55
14.6	46.918	17.89	58.99	16.87	13.879	59.49	35.711	55.75
24.5	47.161	18.80	59.77	19.63	14.054	61.63	35.983	57.04
Dec. 4.5	47.363	19.75	60.37	22.55	14.193	63.89	36.208	58.41
14.5	47.519	20.73	60.76	25.58	14.295	66.17	36.379	59.81
24.5	47.622	21.71	60.92	28.60	14.355	68.38	36.492	61.22
34.4	47.670	22.65	60.86	31.53	14.372	70.49	36.543	62.59
Mean Place	40.639	10.05	41.347	14.63	9.467	74.84	28.877	49.80
Sec δ , Tan δ	1.276	+0.792	5.307	+5.213	1.042	-0.292	1.437	+1.033
$D\phi\alpha$, $D\omega\alpha$	+0.08	-0.01	+0.20	-0.08	+0.05	0.00	+0.09	-0.01
$D\phi\delta$, $D\omega\delta$	+0.1	+1.0	+0.1	+1.0	+0.1	+1.0	+0.1	+1.0

APPARENT PLACES OF STARS, 1916.

361

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	β Orionis. (Rigel.) Mag. 0.3			λ Aurigæ. Mag. 4.8			τ Orionis. Mag. 3.7			σ Columbæ. Mag. 4.9		
	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.
	h m	s	"	h m	s	"	h m	s	"	h m	s	"
	5 10		- 8 17	5 13		+40 1	5 13		- 6 55	5 14		-34 58
	s	"	"	s	"	"	s	"	"	s	"	"
Jan. 0.4	32.073		48.13	16.521		42.10	33.710		59.34	29.318		35.74
10.4	32.076	3	49.74	16.545	24	43.12	33.716	6	60.90	29.276	42	38.42
20.4	32.036	40	51.18	16.511	34	44.02	33.680	36	62.30	29.185	91	40.81
30.4	31.955	81	52.41	16.423	88	44.80	33.603	77	63.49	29.049	136	42.83
Feb. 9.3	31.839	116	53.42	16.288	135	45.40	33.491	112	64.47	28.873	176	44.46
		144			173			141			207	
19.3	31.695		54.17	16.115		45.78	33.350		65.21	28.666		45.65
29.3	31.530	165	54.68	15.912	203	45.93	33.186	164	65.72	28.438	228	46.38
Mar. 10.3	31.354	176	54.93	15.696	216	45.83	33.012	174	65.98	28.197	241	46.66
20.2	31.177	177	54.93	15.478	218	45.49	32.837	175	66.00	27.955	242	46.48
30.2	31.010	167	54.67	15.272	206	44.92	32.671	166	65.77	27.723	232	45.86
		149			181			150			211	
Apr. 9.2	30.861		54.17	15.091		44.14	32.521		65.31	27.512		44.81
19.1	30.739	122	53.41	14.945	146	43.21	32.399	122	64.61	27.329	183	43.36
29.1	30.651	88	52.43	14.846	99	42.16	32.309	90	63.69	27.183	146	41.53
May 9.1	30.600	51	51.22	14.796	50	41.03	32.258	51	62.55	27.081	102	39.37
19.1	30.591	9	49.82	14.802	6	39.87	32.248	10	61.23	27.024	57	36.95
		37			61			34			8	
29.0	30.628		48.24	14.863		38.74	32.282		59.74	27.018		34.29
June 8.0	30.707	79	46.52	14.981	118	37.68	32.358	76	58.10	27.058	42	31.48
18.0	30.826	119	44.71	15.151	170	36.71	32.477	119	56.36	27.149	91	28.57
28.0	30.984	158	42.84	15.370	219	35.87	32.634	157	54.57	27.287	138	25.66
July 7.9	31.175	191	40.97	15.634	264	35.17	32.823	189	52.77	27.466	179	22.81
		222			300			221			219	
17.9	31.397		39.15	15.934		34.64	33.044		51.02	27.685		20.10
27.9	31.643	246	37.45	16.262	328	34.26	33.288	244	49.38	27.937	252	17.63
Aug. 6.8	31.908	265	35.92	16.617	355	34.04	33.552	264	47.89	28.215	278	15.47
16.8	32.187	270	34.61	16.988	371	33.96	33.829	277	46.63	28.515	300	13.69
26.8	32.475	288	33.59	17.370	382	34.03	34.117	288	45.62	28.830	315	12.37
		292			387			292			323	
Sept. 5.8	32.767		32.90	17.757		34.23	34.409		44.93	29.153		11.55
15.7	33.060	293	32.55	18.147	390	34.54	34.701	292	44.58	29.479	326	11.27
25.7	33.348	288	32.56	18.530	383	34.96	34.990	289	44.58	29.801	322	11.55
Oct. 5.7	33.629	281	32.96	18.906	376	35.49	35.272	282	44.95	30.114	313	12.41
15.6	33.898	269	33.72	19.268	362	36.11	35.542	270	45.67	30.410	296	13.79
		252			344			254			275	
25.6	34.150		34.80	19.612		36.81	35.796		46.69	30.685		15.67
Nov. 4.6	34.383	233	36.16	19.933	321	37.61	36.032	236	48.01	30.932	247	17.98
14.6	34.591	208	37.76	20.224	291	38.48	36.243	211	49.54	31.147	215	20.63
24.5	34.772	181	39.51	20.479	255	39.43	36.427	184	51.24	31.323	176	23.53
Dec. 4.5	34.919	147	41.36	20.693	214	40.43	36.577	150	53.02	31.457	134	26.59
		110			166			114			88	
14.5	35.029		43.23	20.859		41.48	36.691		54.83	31.545		29.67
24.5	35.099	70	45.05	20.971	112	42.53	36.765	74	56.59	31.582	37	32.67
34.4	35.126	27	46.78	21.029	58	43.56	36.796	31	58.25	31.571	11	35.52
Mean Place	30.009		52.14	13.803		32.22	31.639		63.50	27.134		36.96
Sec δ , Tan δ	1.011		-0.146	1.306		+0.840	1.007		-0.122	1.220		-0.699
$D\phi\alpha$, $D\omega\alpha$	+0.06		0.00	+0.08		-0.01	+0.06		0.00	+0.04		+0.01
$D\phi\delta$, $D\omega\delta$	+0.1		+1.0	+0.1		+1.0	+0.1		+1.0	+0.1		+1.0

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	γ Orionis. (Bellatrix.) Mag. 1.7			β Tauri. Mag. 1.8			17 Camelop. Mag. 5.8			β Leporis. Mag. 3.0		
	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.
	h m	s	'	h m	s	'	h m	s	'	h m	s	'
	5 20		+ 6 16	5 20		+28 32	5 22		+62 59	5 24		-20 49
	s	"	"	s	"	"	s	"	"	s	"	"
Jan. 0.4	39.645	24	33.75	61.290	34	23.41	18.22	1	66.15	40.863	2	29.47
10.4	39.669	20	32.85	61.324	18	23.78	18.23	9	68.37	40.861	2	31.72
20.4	39.649	62	32.04	61.306	65	24.13	18.14	18	70.41	40.813	48	33.73
30.4	39.587	100	31.36	61.241	109	24.44	17.96	27	72.19	40.723	90	35.46
Feb. 9.3	39.487	131	30.79	61.132	144	24.66	17.69	32	73.64	40.595	128	36.89
19.3	39.356	154	30.32	60.988	172	24.79	17.37	37	74.70	40.435	160	37.95
29.3	39.202	168	29.97	60.816	185	24.81	17.00	40	75.33	40.253	182	38.67
Mar. 10.3	39.034	170	29.75	60.631	189	24.71	16.60	40	75.50	40.058	195	39.02
20.2	38.864	161	29.62	60.442	181	24.47	16.20	38	75.21	39.860	192	39.02
30.2	38.703	145	29.62	60.261	159	24.13	15.82	35	74.48	39.668	174	38.65
Apr. 9.2	38.558	118	29.73	60.102	129	23.70	15.47	29	73.34	39.494	150	37.94
19.1	38.440	85	29.98	59.973	92	23.19	15.18	21	71.84	39.344	117	36.89
29.1	38.355	48	30.35	59.881	48	22.64	14.97	13	70.05	39.227	78	35.55
May 9.1	38.307	4	30.86	59.833	1	22.08	14.84	6	68.03	39.149	37	33.91
19.1	38.303	39	31.52	59.834	50	21.55	14.78	4	65.87	39.112	8	32.03
29.0	38.342	82	32.29	59.884	98	21.07	14.82	12	63.63	39.120	52	29.94
June 8.0	38.424	123	33.19	59.982	145	20.67	14.94	23	61.39	39.172	94	27.69
18.0	38.547	161	34.19	60.127	187	20.35	15.17	30	59.22	39.266	136	25.34
28.0	38.708	195	35.26	60.314	226	20.15	15.47	37	57.18	39.402	174	22.94
July 7.9	38.903	224	36.38	60.540	258	20.05	15.84	44	55.31	39.576	206	20.57
17.9	39.127	250	37.51	60.798	287	20.04	16.28	50	53.66	39.782	235	18.28
27.9	39.377	267	38.60	61.085	307	20.12	16.78	54	52.26	40.017	258	16.17
Aug. 6.8	39.644	283	39.63	61.392	322	20.28	17.32	57	51.15	40.275	275	14.27
16.8	39.927	292	40.53	61.714	334	20.51	17.89	61	50.34	40.550	289	12.69
26.8	40.219	296	41.27	62.048	339	20.77	18.50	61	49.83	40.839	297	11.48
Sept. 5.8	40.515	299	41.83	62.387	341	21.04	19.11	63	49.64	41.136	299	10.66
15.7	40.814	296	42.17	62.728	338	21.32	19.74	62	49.74	41.435	298	10.30
25.7	41.110	290	42.28	63.066	332	21.60	20.36	61	50.20	41.733	292	10.42
Oct. 5.7	41.400	281	42.14	63.398	322	21.86	20.97	59	50.96	42.025	281	11.00
15.7	41.681	267	41.78	63.720	306	22.10	21.56	56	52.01	42.306	263	12.05
25.6	41.948	249	41.21	64.026	288	22.34	22.12	52	53.34	42.569	245	13.52
Nov. 4.6	42.197	228	40.44	64.314	264	22.57	22.64	46	54.93	42.814	218	15.35
14.6	42.425	200	39.54	64.578	244	22.82	23.10	41	56.76	43.032	189	17.50
24.5	42.625	169	38.54	64.812	198	23.08	23.51	33	58.80	43.221	152	19.86
Dec. 4.5	42.794	133	37.48	65.010	157	23.36	23.84	23	60.99	43.373	112	22.36
14.5	42.927	93	36.42	65.167	111	23.68	24.07	16	63.28	43.485	70	24.90
24.5	43.020	49	35.38	65.278	62	24.02	24.23	6	65.60	43.555	24	27.40
34.4	43.069		34.41	65.340		24.38	24.29		67.87	43.579		29.75
Mean Place	37.494		28.16	58.844		15.30	13.983		54.93	38.769		32.17
Sec δ , Tan δ	1.006		+0.110	1.138		+0.544	2.203		+1.963	1.070		-0.380
$D\psi a$, $D_{\omega} a$	+0.06		0.00	+0.08		-0.01	+0.11		-0.02	+0.05		0.00
$D\psi \delta$, $D_{\omega} \delta$	+0.1		+1.0	+0.1		+1.0	+0.1		+1.0	+0.1		+1.0

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	χ Aurigæ. Mag. 4.9		δ Orionis. Mag. 2.5		Groombridge 966. Mag. 6.4		α Leporis. Mag. 2.7	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 5 27	° ' " +32 7	h m 5 27	° ' " - 0 21	h m 5 28	° ' " +74 59	h m 5 29	° ' " -17 52
	s	"	s	"	s	"	s	"
Jan. 0.5	18.114	59.57	44.995	32.80	36.04	36.99	3.605	50.95
10.4	18.153	60.15	45.020	34.08	36.00	39.73	3.612	53.08
20.4	18.140	60.72	45.001	35.22	35.78	42.26	3.573	55.01
30.4	18.074	61.21	44.940	36.21	35.42	44.50	3.491	56.67
Feb. 9.3	17.965	61.60	44.841	37.03	34.93	46.34	3.370	58.04
19.3	17.818	61.87	44.710	37.66	34.32	47.74	3.219	59.08
29.3	17.642	62.00	44.556	38.12	33.62	48.63	3.043	59.79
Mar. 10.3	17.450	61.95	44.387	38.39	32.89	48.97	2.854	60.16
20.2	17.253	61.75	44.215	38.49	32.15	48.77	2.661	60.20
30.2	17.063	61.40	44.049	38.41	31.44	48.03	2.474	59.90
Apr. 9.2	16.895	60.91	43.899	38.14	30.78	46.79	2.304	59.27
19.2	16.755	60.33	43.775	37.70	30.21	45.10	2.158	58.34
29.1	16.655	59.67	43.681	37.07	29.76	43.04	2.044	57.10
May 9.1	16.600	58.96	43.626	36.28	29.45	40.69	1.968	55.60
19.1	16.593	58.25	43.611	35.32	29.28	38.12	1.932	53.85
29.0	16.637	57.57	43.639	34.20	29.26	35.44	1.940	51.91
June 8.0	16.730	56.96	43.709	32.96	29.40	32.71	1.992	49.79
18.0	16.872	56.42	43.820	31.61	29.69	30.02	2.085	47.58
28.0	17.058	55.97	43.969	30.20	30.12	27.45	2.218	45.31
July 7.9	17.284	55.63	44.151	28.76	30.69	25.06	2.389	43.06
17.9	17.546	55.39	44.365	27.33	31.38	22.91	2.593	40.87
27.9	17.835	55.27	44.603	25.98	32.17	21.03	2.823	38.85
Aug. 6.9	18.148	55.24	44.862	24.74	33.05	19.48	3.078	37.04
16.8	18.479	55.27	45.135	23.67	33.99	18.28	3.349	35.51
26.8	18.822	55.41	45.420	22.80	34.99	17.46	3.634	34.32
Sept. 5.8	19.173	55.58	45.711	22.18	36.03	17.02	3.926	33.49
15.7	19.526	55.78	46.005	21.85	37.08	16.99	4.223	33.15
25.7	19.878	56.02	46.297	21.81	38.14	17.36	4.519	33.23
Oct. 5.7	20.224	56.28	46.584	22.08	39.18	18.12	4.809	33.76
15.7	20.560	56.58	46.863	22.63	40.18	19.28	5.089	34.72
25.6	20.883	56.89	47.129	23.47	41.12	20.80	5.354	36.10
Nov. 4.6	21.185	57.25	47.378	24.53	42.00	22.66	5.602	37.83
14.6	21.463	57.62	47.606	25.78	42.78	24.85	5.824	39.86
24.6	21.713	58.06	47.807	27.17	43.43	27.29	6.017	42.10
Dec. 4.5	21.925	58.56	47.976	28.63	43.97	29.95	6.176	44.47
14.5	22.091	59.09	48.110	30.11	44.35	32.73	6.296	46.88
24.5	22.214	59.64	48.204	31.56	44.56	35.56	6.373	49.26
34.4	22.284	60.20	48.255	32.93	44.62	38.36	6.406	51.52
Mean Place	15.567	51.48	42.873	37.50	29.055	25.67	1.511	53.95
Sec δ , Tan δ	1.181	+0.628	1.000	-0.006	3.862	+3.730	1.050	-0.323
$D\psi\alpha$, $D\omega\alpha$	+0.08	-0.01	+0.06	0.00	+0.16	-0.03	+0.05	0.00
$D\psi\delta$, $D\omega\delta$	+0.1	+1.0	+0.1	+1.0	+0.1	+1.0	+0.1	+1.0

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	ϕ^1 Orionis. Mag. 4.5		ι Orionis. Mag. 2.9		ϵ Orionis. Mag. 1.8		ζ Tauri. Mag. 3.0	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 5 30	° ' " + 9 26	h m 5 31	° ' " - 5 57	h m 5 31	° ' " - 1 15	h m 5 32	° ' " +21 5
	s	"	s	"	s	"	s	"
Jan. 0.5	14.679	6.39	21.529	47.06	59.156	12.12	39.780	38.74
10.4	14.714	5.65	21.553	48.65	59.184	13.46	39.824	38.66
20.4	14.703	4.99	21.531	50.07	59.168	14.66	39.818	38.63
30.4	14.649	4.43	21.468	51.30	59.109	15.70	39.766	38.61
Feb. 9.3	14.557	3.95	21.365	52.32	59.013	16.56	39.672	38.59
19.3	14.430	3.57	21.232	53.10	58.883	17.22	39.541	38.55
29.3	14.279	3.28	21.074	53.66	58.729	17.71	39.383	38.48
Mar. 10.3	14.112	3.07	20.902	53.98	58.560	18.00	39.210	38.38
20.2	13.942	2.94	20.726	54.07	58.387	18.10	39.031	38.23
30.2	13.778	2.90	20.555	53.92	58.221	18.02	38.859	38.04
Apr. 9.2	13.629	2.94	20.400	53.55	58.068	17.74	38.704	37.82
19.2	13.506	3.08	20.270	52.95	57.941	17.28	38.576	37.60
29.1	13.415	3.33	20.169	52.13	57.844	16.63	38.481	37.38
May 9.1	13.362	3.68	20.107	51.11	57.785	15.80	38.426	37.19
19.1	13.351	4.15	20.084	49.88	57.766	14.81	38.416	37.06
29.0	13.383	4.73	20.104	48.50	57.790	13.66	38.452	36.99
June 8.0	13.458	5.42	20.166	46.98	57.855	12.38	38.534	37.00
18.0	13.575	6.21	20.269	45.34	57.962	11.01	38.659	37.09
28.0	13.731	7.07	20.409	43.64	58.105	9.56	38.826	37.27
July 7.9	13.921	7.98	20.585	41.93	58.284	8.09	39.028	37.53
17.9	14.142	8.90	20.791	40.27	58.494	6.63	39.262	37.85
27.9	14.388	9.82	21.023	38.69	58.728	5.25	39.524	38.21
Aug. 6.9	14.654	10.68	21.277	37.25	58.984	3.98	39.806	38.59
16.8	14.935	11.45	21.546	36.03	59.255	2.90	40.104	38.97
26.8	15.227	12.09	21.828	35.05	59.538	2.02	40.416	39.32
Sept. 5.8	15.526	12.57	22.117	34.38	59.827	1.40	40.733	39.61
15.7	15.828	12.86	22.409	34.03	60.120	1.07	41.054	39.83
25.7	16.128	12.96	22.700	34.03	60.413	1.04	41.374	39.97
Oct. 5.7	16.424	12.85	22.986	34.38	60.701	1.33	41.690	40.02
15.7	16.712	12.53	23.265	35.09	60.981	1.93	41.997	39.98
25.6	16.988	12.03	23.531	36.10	61.249	2.79	42.293	39.87
Nov. 4.6	17.246	11.36	23.779	37.40	61.500	3.91	42.573	39.69
14.6	17.485	10.58	24.007	38.92	61.730	5.21	42.830	39.49
24.6	17.697	9.72	24.207	40.61	61.934	6.65	43.061	39.26
Dec. 4.5	17.877	8.81	24.376	42.38	62.107	8.17	43.259	39.04
14.5	18.023	7.91	24.507	44.19	62.245	9.72	43.419	38.85
24.5	18.128	7.03	24.600	45.97	62.341	11.23	43.536	38.70
34.4	18.188	6.22	24.649	47.64	62.395	12.66	43.607	38.58
Mean Place	12.485	0.76	19.425	51.16	57.032	16.65	37.435	32.05
Sec δ , Tan δ	1.014	+0.166	1.005	-0.104	1.000	-0.022	1.072	+0.386
$D\psi\alpha$, $D\omega\alpha$	+0.07	0.00	+0.06	0.00	+0.06	0.00	+0.07	0.00
$D\psi\delta$, $D\omega\delta$	+0.1	+1.0	0.0	+1.0	0.0	+1.0	0.0	+1.0

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	ζ Orionis. Mag. 2.0			α Columbæ. Mag. 2.8			ο Aurigæ. Mag. 5.5			ζ Leporis. Mag. 3.7		
	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.
	h m 5 36	s — 1 58	° ' "	h m 5 36	s — 34 6	° ' "	h m 5 39	s + 49 47	° ' "	h m 5 43	s — 14 50	° ' "
Jan. 0.5	33.326	31	66.13	38.634	17	64.08	26.710	52	35.30	11.031	24	65.50
10.4	33.357	13	67.53	38.617	68	66.88	26.762	18	36.89	11.055	22	67.56
20.4	33.344	56	68.79	38.549	116	69.40	26.744	86	38.39	11.033	67	69.44
30.4	33.288	94	69.87	38.433	158	71.60	26.658	148	39.74	10.966	106	71.07
Feb. 9.3	33.194	128	70.76	38.275	193	73.41	26.510	198	40.87	10.860	140	72.44
19.3	33.066	152	71.47	38.082	220	74.82	26.312	236	41.75	10.720	166	73.50
29.3	32.914	169	71.97	37.862	235	75.77	26.076	262	42.31	10.554	181	74.25
Mar. 10.3	32.745	174	72.28	37.627	240	76.27	25.814	269	42.54	10.373	189	74.69
20.2	32.571	167	72.40	37.387	235	76.32	25.545	261	42.44	10.184	183	74.82
30.2	32.404	154	72.31	37.152	218	75.92	25.284	240	42.00	10.001	170	74.63
Apr. 9.2	32.250	130	72.02	36.934	194	75.09	25.044	203	41.25	9.831	140	74.15
19.2	32.120	100	71.55	36.740	159	73.86	24.841	156	40.23	9.682	117	73.36
29.1	32.020	63	70.88	36.581	119	72.24	24.685	100	38.98	9.565	82	72.30
May 9.1	31.957	23	70.04	36.462	76	70.28	24.585	38	37.55	9.483	42	70.99
19.1	31.934	18	69.03	36.386	28	68.02	24.547	24	36.01	9.441	2	69.43
29.0	31.952	60	67.85	36.358	20	65.51	24.571	90	34.41	9.439	43	67.68
June 8.0	32.012	101	66.55	36.378	67	62.81	24.661	152	32.79	9.482	83	65.77
18.0	32.113	139	65.15	36.445	114	60.00	24.813	211	31.22	9.565	123	63.74
28.0	32.252	175	63.68	36.559	157	57.13	25.024	265	29.74	9.688	160	61.65
July 7.9	32.427	205	62.19	36.716	196	54.30	25.289	311	28.38	9.848	191	59.55
17.9	32.632	230	60.72	36.912	230	51.59	25.600	353	27.17	10.039	221	57.51
27.9	32.862	253	59.32	37.142	261	49.07	25.953	386	26.12	10.260	244	55.59
Aug. 6.9	33.115	269	58.04	37.403	284	46.84	26.339	411	25.28	10.504	263	53.88
16.8	33.384	280	56.94	37.687	304	44.95	26.750	431	24.64	10.767	278	52.40
26.8	33.664	288	56.05	37.991	315	43.50	27.181	445	24.19	11.045	287	51.24
Sept. 5.8	33.952	293	55.43	38.306	323	42.54	27.626	451	23.95	11.332	293	50.45
15.7	34.245	293	55.10	38.629	323	42.11	28.077	453	23.90	11.625	295	50.05
25.7	34.538	289	55.08	38.952	318	42.24	28.530	448	24.08	11.920	291	50.07
Oct. 5.7	34.827	281	55.40	39.270	306	42.92	28.978	438	24.43	12.211	285	50.53
15.7	35.108	270	56.01	39.576	289	44.16	29.416	421	24.99	12.496	272	51.41
25.6	35.378	253	56.90	39.865	266	45.90	29.837	397	25.74	12.768	255	52.69
Nov. 4.6	35.631	234	58.06	40.131	238	48.10	30.234	365	26.68	13.023	235	54.31
14.6	35.865	207	59.40	40.369	201	50.67	30.599	326	27.80	13.258	206	56.22
24.6	36.072	176	60.89	40.570	161	53.52	30.925	278	29.07	13.464	175	58.34
Dec. 4.5	36.248	141	62.47	40.731	114	56.55	31.203	222	30.48	13.639	136	60.59
14.5	36.389	101	64.08	40.845	64	59.66	31.425	159	32.00	13.775	96	62.90
24.5	36.490	56	65.65	40.909	13	62.72	31.584	91	33.58	13.871	50	65.18
34.4	36.546		67.14	40.922		65.65	31.675		35.17	13.921		67.37
Mean Place	31.200		70.51	36.437		66.00	23.462		26.62	8.926		68.79
Sec δ, Tan δ	1.001		-0.035	1.208		-0.677	1.549		+1.183	1.035		-0.265
Dψ α, Dω α	+0.06		0.00	+0.04		0.00	+0.09		-0.01	+0.05		0.00
Dψ δ, Dω δ	0.0		+1.0	0.0		+1.0	0.0		+1.0	0.0		+1.0

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	κ Orionis. Mag. 2.2			δ Doradus. Mag. 4.5			ν Aurigæ. Mag. 4.2			δ Leporis. Mag. 3.9		
	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.
	h	m	° ' "	h	m	° ' "	h	m	° ' "	h	m	° ' "
	5	43	- 9 41	5	44	-65 45	5	45	+39 7	5	47	-20 52
	s	"	"	s	"	"	s	"	"	s	"	"
Jan. 0.5	48.451	51.41	40.53	60.22	42.843	37.81	44.620	64.62				
10.4	48.482	53.23	40.35	63.58	42.904	38.80	44.640	67.00				
20.4	48.467	54.88	40.08	66.64	42.906	39.75	44.613	69.16				
30.4	48.408	56.31	39.72	69.32	42.851	40.63	44.540	71.07				
Feb. 9.4	48.310	57.50	39.29	71.55	42.743	41.38	44.427	72.66				
19.3	48.177	58.44	38.79	73.26	42.590	41.97	44.280	73.91				
29.3	48.019	59.10	38.25	74.47	42.404	42.36	44.104	74.82				
Mar 10.3	47.845	59.51	37.69	75.11	42.195	42.53	43.912	75.35				
20.2	47.664	59.63	37.12	75.20	41.977	42.47	43.714	75.52				
30.2	47.487	59.49	36.56	74.75	41.764	42.17	43.518	75.34				
Apr. 9.2	47.325	59.10	36.02	73.79	41.568	41.67	43.335	74.81				
19.2	47.183	58.44	35.52	72.33	41.402	40.97	43.175	73.93				
29.1	47.072	57.55	35.07	70.42	41.275	40.13	43.045	72.74				
May 9.1	46.997	56.42	34.70	68.08	41.193	39.18	42.949	71.27				
19.1	46.961	55.09	34.40	65.41	41.162	38.15	42.894	69.52				
29.1	46.966	53.57	34.18	62.43	41.185	37.10	42.881	67.56				
June 8.0	47.012	51.90	34.05	59.25	41.262	36.05	42.911	65.42				
18.0	47.100	50.12	34.01	55.92	41.391	35.05	42.985	63.16				
28.0	47.227	48.28	34.07	52.55	41.570	34.13	43.099	60.83				
July 7.9	47.389	46.42	34.21	49.24	41.793	33.31	43.252	58.50				
17.9	47.583	44.60	34.44	46.06	42.057	32.60	43.437	56.24				
27.9	47.805	42.90	34.75	43.11	42.354	32.00	43.655	54.13				
Aug. 6.9	48.049	41.35	35.14	40.49	42.678	31.52	43.897	52.23				
16.8	48.312	40.02	35.58	38.30	43.026	31.16	44.161	50.62				
26.8	48.588	38.97	36.08	36.59	43.389	30.93	44.440	49.35				
Sept. 5.8	48.873	38.25	36.62	35.46	43.763	30.79	44.731	48.48				
15.8	49.165	37.88	37.18	34.95	44.144	30.76	45.029	48.05				
25.7	49.457	37.89	37.74	35.08	44.527	30.83	45.329	48.10				
Oct. 5.7	49.747	38.29	38.30	35.86	44.907	31.00	45.627	48.62				
15.7	50.030	39.07	38.84	37.31	45.280	31.27	45.918	49.61				
25.6	50.302	40.21	39.33	39.35	45.641	31.64	46.197	51.04				
Nov. 4.6	50.558	41.65	39.76	41.90	45.983	32.10	46.458	52.86				
14.6	50.794	43.36	40.13	44.90	46.300	32.67	46.697	55.01				
24.6	51.002	45.24	40.41	48.27	46.587	33.36	46.906	57.40				
Dec. 4.5	51.180	47.24	40.60	51.84	46.835	34.14	47.082	59.96				
14.5	51.323	49.29	40.69	55.53	47.037	35.01	47.219	62.58				
24.5	51.423	51.31	40.68	59.19	47.187	35.94	47.314	65.17				
34.5	51.479	53.24	40.56	62.71	47.282	36.90	47.361	67.67				
Mean Place	46.341	55.07	37.210	61.35	40.041	30.42	42.504	67.54				
Sec δ , Tan δ	1.015	-0.171	2.436	-2.222	1.289	+0.813	1.070	-0.382				
$D\psi a, Dm a$	+0.06	0.00	0.00	+0.01	+0.08	0.00	+0.05	0.00				
$D\psi \delta, Dm \delta$	0.0	+1.0	0.0	+1.0	0.0	+1.0	0.0	+1.0				

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	α Orionis. (Betelgeux.) Var. 1.0-1.4			η Leporis. Mag. 3.8			δ Aurigæ. Mag. 3.9			β Aurigæ. Mag. 2.1		
	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.
	h m	s	"	h m	s	"	h m	s	"	h m	s	"
	5 50		+ 7 23	5 52		-14 10	5 52		+54 16	5 53		+44 56
Jan. 0.5	39.646		37.25	36.840		52.73	40.285		54.94	25.118		31.81
10.4	39.700	54	36.34	36.873	33	54.80	40.356	71	56.76	25.190	72	33.13
20.4	39.707	7	35.53	36.860	13	56.69	40.348	8	58.52	25.195	5	34.41
30.4	39.666	41	34.85	36.802	58	58.34	40.264	84	60.11	25.138	57	35.58
Feb. 9.4	39.584	82	34.28	36.704	98	59.73	40.110	154	61.51	25.022	116	36.62
19.3	39.467	117	33.84	36.570	134	60.83	39.898	212	62.62	24.856	166	37.45
29.3	39.323	144	33.50	36.409	161	61.62	39.639	259	63.40	24.650	206	38.03
Mar. 10.3	39.159	164	33.29	36.230	179	62.11	39.351	288	63.82	24.420	230	38.33
20.3	38.988	171	33.16	36.044	186	62.28	39.050	301	63.86	24.178	242	38.35
30.2	38.821	167	33.14	35.860	184	62.14	38.752	298	63.52	23.940	238	38.07
Apr. 9.2	38.666	155	33.23	35.688	172	61.72	38.475	277	62.82	23.719	221	37.53
19.2	38.533	133	33.43	35.537	151	60.99	38.236	239	61.80	23.527	192	36.74
29.1	38.430	103	33.73	35.415	122	60.00	38.045	191	60.50	23.377	150	35.74
May 9.1	38.362	68	34.15	35.327	88	58.75	37.912	133	58.97	23.276	101	34.57
19.1	38.335	27	34.68	35.278	49	57.27	37.844	68	57.27	23.230	46	33.30
29.1	38.348	13	35.33	35.270	8	55.58	37.845	1	55.47	23.241	11	31.96
June 8.0	38.404	56	36.09	35.304	34	53.73	37.917	72	53.63	23.310	69	30.59
18.0	38.500	96	36.93	35.379	75	51.77	38.057	140	51.79	23.437	127	29.25
28.0	38.635	135	37.84	35.494	115	49.73	38.262	205	50.02	23.617	180	27.97
July 7.9	38.805	170	38.79	35.646	152	47.69	38.528	266	48.36	23.847	230	26.79
17.9	39.007	202	39.75	35.829	183	45.69	38.847	319	46.83	24.121	274	25.72
27.9	39.236	229	40.68	36.043	214	43.80	39.213	366	45.47	24.433	312	24.78
Aug. 6.9	39.487	251	41.54	36.280	237	42.10	39.619	406	44.31	24.778	345	23.98
16.8	39.755	268	42.29	36.538	258	40.64	40.058	439	43.36	25.147	369	23.35
26.8	40.037	282	42.91	36.811	273	39.48	40.521	463	42.64	25.536	389	22.86
Sept. 5.8	40.328	291	43.34	37.096	285	38.68	41.001	480	42.13	25.941	405	22.53
15.8	40.625	297	43.57	37.387	291	38.26	41.493	492	41.88	26.353	412	22.36
25.7	40.925	300	43.57	37.681	294	38.26	41.991	498	41.85	26.769	416	22.34
Oct. 5.7	41.223	298	43.34	37.974	293	38.70	42.487	496	42.08	27.185	416	22.47
15.7	41.516	293	42.90	38.262	288	39.54	42.973	486	42.53	27.594	409	22.76
25.6	41.800	284	42.25	38.539	277	40.78	43.444	471	43.24	27.989	395	23.20
Nov. 4.6	42.071	271	41.42	38.800	261	42.37	43.891	447	44.17	28.367	378	23.81
14.6	42.322	251	40.46	39.041	241	44.24	44.305	414	45.34	28.719	352	24.58
24.6	42.550	228	39.40	39.256	215	46.35	44.677	372	46.70	29.036	317	25.49
Dec. 4.5	42.749	199	38.30	39.440	184	48.58	44.997	320	48.25	29.313	277	26.54
14.5	42.911	162	37.20	39.586	146	50.88	45.256	259	49.95	29.540	227	27.72
24.5	43.034	123	36.14	39.691	105	53.16	45.445	180	51.74	29.710	170	28.98
34.5	43.112	78	35.15	39.750	59	55.33	45.560	115	53.56	29.819	109	30.28
Mean Place	37.435		32.49	34.729		56.06	36.694		47.15	22.062		24.64
Sec δ , Tan δ	1.008		+0.130	1.031		-0.253	1.712		+1.391	1.413		+0.998
$D\psi\alpha$, $D\omega\alpha$	+0.06		0.00	+0.05		0.00	+0.10		0.00	+0.09		0.00
$D\psi\delta$, $D\omega\delta$	0.0		+1.0	0.0		+1.0	0.0		+1.0	0.0		+1.0

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	θ Aurigæ. Mag. 2.7		1 Geminorum. Mag. 4.3		1 G. Puppis. Mag. 6.2		γ Orionis. Mag. 4.4	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 5 53	° ' " +37 12	h m 5 59	° ' " +23 16	h m 6 2	° ' " -45 1	h m 6 2	° ' " +14 46
	s "	"	s "	"	s "	"	s "	"
Jan. 0.5	62.358	34.75	3.292	13.28	5.721	67.52	48.893	50.80
10.4	62.430	35.62	3.363	13.29	5.704	70.76	48.963	50.29
20.4	62.442	36.48	3.382	13.36	5.625	73.74	48.983	49.88
30.4	62.397	37.29	3.351	13.46	5.490	76.40	48.955	49.55
Feb. 9.4	62.300	37.99	3.273	13.58	5.303	78.66	48.883	49.30
19.3	62.158	38.57	3.156	13.69	5.073	80.47	48.772	49.11
29.3	61.980	38.97	3.008	13.76	4.808	81.81	48.631	48.97
Mar. 10.3	61.779	39.17	2.837	13.78	4.522	82.65	48.468	48.86
20.3	61.568	39.16	2.656	13.74	4.226	82.99	48.296	48.78
30.2	61.360	38.94	2.477	13.64	3.930	82.83	48.125	48.73
Apr. 9.2	61.166	38.52	2.311	13.48	3.647	82.17	47.965	48.70
19.2	61.001	37.93	2.166	13.27	3.388	81.05	47.826	48.72
29.1	60.872	37.19	2.054	13.02	3.162	79.49	47.716	48.78
May 9.1	60.786	36.34	1.979	12.78	2.974	77.53	47.641	48.88
19.1	60.750	35.42	1.946	12.55	2.835	75.22	47.606	49.05
29.1	60.765	34.47	1.957	12.34	2.746	72.60	47.613	49.30
June 8.0	60.832	33.53	2.014	12.17	2.709	69.76	47.661	49.61
18.0	60.950	32.62	2.115	12.06	2.727	66.74	47.753	49.99
28.0	61.117	31.77	2.257	12.01	2.798	63.65	47.884	50.43
July 8.0	61.327	31.00	2.438	12.01	2.920	60.55	48.051	50.92
17.9	61.576	30.33	2.654	12.06	3.091	57.56	48.251	51.43
27.9	61.858	29.76	2.897	12.15	3.308	54.73	48.478	51.94
Aug. 6.9	62.169	29.29	3.166	12.27	3.564	52.18	48.730	52.42
16.8	62.502	28.92	3.454	12.39	3.853	50.00	49.000	52.85
26.8	62.853	28.64	3.759	12.48	4.172	48.26	49.286	53.19
Sept. 5.8	63.215	28.46	4.075	12.54	4.513	47.02	49.582	53.40
15.8	63.586	28.35	4.397	12.55	4.869	46.35	49.888	53.49
25.7	63.959	28.33	4.724	12.50	5.232	46.28	50.196	53.43
Oct. 5.7	64.332	28.38	5.050	12.38	5.595	46.83	50.506	53.21
15.7	64.700	28.51	5.371	12.20	5.948	47.99	50.811	52.85
25.7	65.056	28.73	5.685	11.95	6.287	49.73	51.111	52.36
Nov. 4.6	65.397	29.04	5.985	11.69	6.600	51.99	51.398	51.76
14.6	65.716	29.45	6.268	11.42	6.881	54.70	51.668	51.08
24.6	66.005	29.96	6.526	11.16	7.121	57.77	51.915	50.35
Dec. 4.5	66.257	30.57	6.752	10.94	7.314	61.08	52.132	49.61
14.5	66.466	31.29	6.942	10.77	7.452	64.52	52.315	48.92
24.5	66.624	32.08	7.089	10.66	7.532	67.98	52.457	48.27
34.5	66.728	32.92	7.185	10.62	7.552	71.35	52.552	47.69
Mean Place	59.593	28.13	0.858	7.86	3.356	69.85	46.584	46.06
Sec δ , Tan δ	1.256	+0.759	1.089	+0.430	1.415	-1.001	1.034	+0.264
$D_{\psi} \alpha$, $D_{\omega} \alpha$	+0.08	0.00	+0.07	0.00	+0.03	0.00	+0.07	0.00
$D_{\psi} \delta$, $D_{\omega} \delta$	0.0	+1.0	0.0	+1.0	0.0	+1.0	0.0	+1.0

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	22 H. Camelop. Mag. 4.7		♊ Geminorum. Var. 3.2-4.2		2 Lyncis. Mag. 4.4		♋ Canis Majoris. Mag. 3.1	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 6 9	° ' " +69 20	h m 6 9	° ' " +22 31	h m 6 12	° ' " +59 2	h m 6 17	° ' " -30 1
Jan. 0.5	41.24	71.19	50.915	60.55	16.981	40.66	7.394	29.49
10.5	41.35 ¹¹	73.73 ²⁵⁴	50.996 ⁸¹	60.50 ⁵	17.085 ¹⁰⁴	42.73 ²⁰⁷	7.429 ³⁵	32.37 ²⁸⁸
20.4	41.33 ²	76.21 ²⁴⁸	51.025 ²⁹	60.53 ³	17.099 ¹⁴	44.76 ²⁰³	7.412 ¹⁷	35.03 ²⁶⁶
30.4	41.18 ¹⁵	78.52 ²³¹	51.004 ²¹	60.60 ⁷	17.026 ⁷³	46.66 ¹⁹⁰	7.344 ⁶⁸	37.43 ²⁴⁰
Feb. 9.4	40.90 ²⁸	80.54 ²⁰²	50.935 ⁶⁹	60.71 ¹¹	16.871 ¹⁵⁵	48.36 ¹⁷⁰	7.230 ¹¹⁴	39.48 ²⁰⁵
19.3	40.54 ³⁶	82.23 ¹⁶⁹	50.824 ¹¹¹	60.82 ¹¹	16.645 ²²⁶	49.78 ¹⁴²	7.075 ¹⁵⁵	41.16 ¹⁶⁸
29.3	40.10 ⁴⁴	83.49 ¹²⁶	50.681 ¹⁴³	60.91 ⁹	16.361 ²⁸⁴	50.86 ¹⁰⁸	6.888 ¹⁸⁷	42.45 ¹²⁹
Mar. 10.3	39.60 ⁵⁰	84.29 ⁸⁰	50.514 ¹⁶⁷	60.96 ⁵	16.037 ³²⁴	51.55 ⁶⁹	6.678 ²¹⁰	43.32 ⁸⁷
20.3	39.07 ⁵³	84.60 ³¹	50.335 ¹⁷⁹	60.96 ⁰	15.692 ³⁴⁵	51.84 ²⁹	6.457 ²²¹	43.77 ⁴⁵
30.2	38.54 ⁵³	84.39 ²¹	50.156 ¹⁷⁹	60.91 ⁵	15.346 ³⁴⁶	51.70 ¹⁴	6.233 ²²⁴	43.79 ²
Apr. 9.2	38.04 ⁵⁰	83.70 ⁶⁹	49.988 ¹⁶⁸	60.80 ¹¹	15.015 ³³¹	51.15 ⁵⁵	6.020 ²¹³	43.39 ⁴⁰
19.2	37.58 ⁴⁶	82.56 ¹¹⁴	49.839 ¹⁴⁹	60.64 ¹⁶	14.719 ²⁹⁶	50.23 ⁹²	5.823 ¹⁹⁷	42.58 ⁸¹
29.2	37.19 ³⁹	81.00 ¹⁵⁶	49.721 ¹¹⁸	60.46 ¹⁸	14.471 ²⁴⁸	48.96 ¹²⁷	5.654 ¹⁶⁹	41.40 ¹¹⁸
May 9.1	36.89 ³⁰	79.11 ¹⁸⁹	49.639 ⁸²	60.26 ²⁰	14.285 ¹⁸⁶	47.40 ¹⁵⁶	5.518 ¹³⁶	39.86 ¹⁵⁴
19.1	36.70 ¹⁹	76.92 ²¹⁹	49.598 ⁴¹	60.07 ¹⁹	14.167 ¹¹⁸	45.62 ¹⁷⁸	5.419 ⁹⁹	38.02 ¹⁸⁴
29.1	36.60 ¹⁰	74.55 ²³⁷	49.599 ¹	59.89 ¹⁸	14.126 ⁴¹	43.67 ¹⁹⁵	5.363 ⁵⁶	35.89 ²¹³
June 8.0	36.62 ²	72.05 ²⁵⁰	49.645 ⁴⁶	59.76 ¹³	14.162 ³⁶	41.61 ²⁰⁶	5.350 ¹³	33.54 ²³⁵
18.0	36.75 ¹³	69.50 ²⁵⁵	49.735 ⁹⁰	59.68 ⁸	14.273 ¹¹¹	39.52 ²⁰⁹	5.382 ³²	31.03 ²⁵¹
28.0	37.00 ²⁵	66.96 ²⁵⁴	49.866 ¹³¹	59.64 ⁴	14.460 ¹⁸⁷	37.44 ²⁰⁸	5.458 ⁷⁶	28.41 ²⁶²
July 8.0	37.34 ³⁴	64.51 ²⁴¹	50.036 ¹⁷⁰	59.65 ¹	14.718 ²⁵⁸	35.43 ²⁰¹	5.575 ¹¹⁷	25.77 ²⁶⁴
17.9	37.77 ⁴³	62.20 ²³¹	50.240 ²⁰⁴	59.69 ⁴	15.038 ³²⁰	33.54 ¹⁸⁹	5.731 ¹⁵⁶	23.19 ²⁵⁸
27.9	38.29 ⁵²	60.09 ²¹¹	50.473 ²³³	59.77 ⁸	15.416 ³⁷⁸	31.81 ¹⁷³	5.921 ¹⁹⁰	20.75 ²⁴⁴
Aug. 6.9	38.88 ⁵⁹	58.19 ¹⁹⁰	50.733 ²⁶⁰	59.85 ⁸	15.842 ⁴²⁶	30.27 ¹⁵⁴	6.145 ²²⁴	18.52 ²²³
16.9	39.53 ⁶⁵	56.59 ¹⁶⁰	51.012 ²⁷⁹	59.93 ⁸	16.308 ⁴⁶⁶	28.93 ¹³⁴	6.394 ²⁴⁹	16.57 ¹⁹⁵
26.8	40.25 ⁷²	55.27 ¹³²	51.308 ²⁹⁶	59.97 ⁴	16.809 ⁵⁰¹	27.84 ¹⁰⁹	6.667 ²⁷³	15.00 ¹⁵⁷
Sept. 5.8	40.99 ⁷⁴	54.27 ¹⁰⁹	51.618 ³¹⁰	59.97 ⁰	17.336 ⁵²⁷	26.99 ⁸⁵	6.958 ²⁹¹	13.86 ¹¹⁴
15.8	41.77 ⁷⁸	53.62 ⁶⁵	51.936 ³¹⁸	59.91 ⁶	17.881 ⁵⁴⁵	26.41 ⁵⁸	7.264 ³⁰⁶	13.21 ⁶⁵
25.7	42.56 ⁷⁹	53.32 ³⁰	52.259 ³²³	59.77 ¹⁴	18.437 ⁵⁵⁶	26.11 ³⁰	7.577 ³¹³	13.08 ¹³
Oct. 5.7	43.35 ⁷⁹	53.39 ⁷	52.584 ³²⁵	59.56 ²¹	18.996 ⁵⁵⁹	26.08 ³	7.893 ³¹⁶	13.50 ⁴²
15.7	44.13 ⁷⁸	53.81 ⁴²	52.907 ³²³	59.28 ²⁸	19.550 ⁵⁵⁴	26.35 ²⁷	8.206 ³¹³	14.46 ⁹⁶
25.7	44.89 ⁷⁶	54.62 ⁸¹	53.224 ³¹⁷	58.95 ³³	20.090 ⁵⁴⁰	26.90 ⁵⁵	8.511 ³⁰⁵	15.93 ¹⁴⁷
Nov. 4.6	45.61 ⁷²	55.78 ¹¹⁶	53.530 ³⁰⁶	58.58 ³⁷	20.609 ⁵¹⁹	27.75 ⁸⁵	8.801 ²⁹⁰	17.87 ¹⁹⁴
14.6	46.28 ⁶⁷	57.28 ¹⁵⁰	53.818 ²⁸⁸	58.20 ³⁸	21.093 ⁴⁸⁴	28.88 ¹¹³	9.069 ²⁶⁸	20.20 ²³³
24.6	46.88 ⁶⁰	59.10 ¹⁸²	54.083 ²⁶⁵	57.84 ³⁶	21.531 ⁴³⁸	30.26 ¹³⁸	9.309 ²⁴⁰	22.89 ²⁶⁹
Dec. 4.6	47.39 ⁵¹	61.20 ²¹⁰	54.320 ²³⁷	57.52 ³²	21.914 ³⁸³	31.89 ¹⁶³	9.514 ²⁰⁵	25.78 ²⁸⁹
14.5	47.81 ⁴²	63.51 ²³¹	54.519 ¹⁹⁹	57.26 ²⁶	22.230 ³¹⁶	33.71 ¹⁸²	9.677 ¹⁶³	28.80 ³⁰²
24.5	48.11 ³⁰	65.97 ²⁴⁶	54.675 ¹⁵⁶	57.08 ¹⁸	22.469 ²³⁹	35.67 ¹⁹⁶	9.792 ¹¹⁵	31.85 ³⁰⁵
34.5	48.28 ¹⁷	68.51 ²⁵⁴	54.784 ¹⁰⁹	56.97 ¹¹	22.624 ¹⁵⁵	37.71 ²⁰⁴	9.859 ⁶⁷	34.82 ²⁹⁷
Mean Place	35.607	64.42	48.476	55.79	12.906	34.56	5.227	32.51
Sec δ, Tan δ	2.836	+2.654	1.082	+0.415	1.944	+1.667	1.155	+0.578
D _ψ α, D _ω α	+0.13	+0.01	+0.07	0.00	+0.11	+0.01	+0.05	0.00
D _ψ δ, D _ω δ	0.0	+1.0	0.0	+1.0	0.0	+1.0	0.0	+1.0

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	μ Geminorum. Mag. 3.2			ψ^1 Aurigæ. Mag. 5.1			β Canis Majoris. Mag. 2.0			δ Monocerotis. Mag. 4.5		
	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.
	h m	s	° ' "	h m	s	° ' "	h m	s	° ' "	h m	s	° ' "
	6 17		+22 33	6 18		+49 19	6 19		-17 54	6 19		+4 38
Jan. 0.5	55.203	90	32.26	29.262	109	60.79	2.136		44.80	21.259		14.91
10.5	55.293	38	32.20	29.371	35	62.34	2.191	55	47.18	21.336	77	13.75
20.4	55.331	15	32.21	29.406	35	63.89	2.197	42	49.36	21.366	30	12.72
30.4	55.316	62	32.29	29.371	103	65.37	2.155	87	51.31	21.348	18	11.83
Feb. 9.4	55.254	105	32.40	29.268	162	66.72	2.068	125	52.98	21.285	63	11.11
19.3	55.149	139	32.53	29.106	210	67.87	1.943	156	54.34	21.185	134	10.54
29.3	55.010	164	32.65	28.896	242	68.77	1.787	178	55.37	21.051	185	10.11
Mar. 10.3	54.846	178	32.73	28.654	264	69.36	1.609	190	56.07	20.896	169	9.84
20.3	54.668	179	32.76	28.390	265	69.64	1.419	192	56.42	20.727	170	9.70
30.2	54.489	170	32.73	28.125	252	69.60	1.227	184	56.45	20.557	161	9.68
Apr. 9.2	54.319	151	32.65	27.873	226	69.21	1.043	166	56.14	20.396	144	9.79
19.2	54.168	122	32.52	27.647	189	68.52	0.877	142	55.51	20.252	118	10.04
29.2	54.046	87	32.36	27.458	140	67.57	0.735	110	54.58	20.134	87	10.40
May 9.1	53.959	49	32.17	27.318	85	66.38	0.625	73	53.36	20.047	51	10.89
19.1	53.910	5	31.98	27.233	26	65.02	0.552	34	51.89	19.996	11	11.50
29.1	53.905	39	31.81	27.207	35	63.52	0.518	6	50.18	19.985	29	12.23
June 8.0	53.944	83	31.66	27.242	98	61.94	0.524	46	48.29	20.014	68	13.06
18.0	54.027	123	31.55	27.340	155	60.33	0.570	87	46.26	20.082	107	13.97
28.0	54.150	162	31.49	27.495	210	58.72	0.657	125	44.13	20.189	141	14.95
July 8.0	54.312	197	31.46	27.705	259	57.18	0.782	159	41.98	20.330	175	15.95
17.9	54.509	226	31.46	27.964	304	55.72	0.941	190	39.88	20.505	203	16.95
27.9	54.735	264	31.49	28.268	343	54.37	1.131	218	37.87	20.708	228	17.91
Aug. 6.9	54.989	274	31.52	28.611	374	53.15	1.349	241	36.03	20.936	248	18.79
16.9	55.263	292	31.54	28.985	402	52.10	1.590	261	34.45	21.184	265	19.54
26.8	55.555	307	31.52	29.387	421	51.20	1.851	276	33.17	21.449	279	20.14
Sept. 5.8	55.862	316	31.46	29.808	437	50.48	2.127	288	32.24	21.728	288	20.54
15.8	56.178	323	31.34	30.245	447	49.98	2.415	296	31.73	22.016	296	20.70
25.7	56.501	325	31.14	30.692	451	49.57	2.711	297	31.66	22.312	298	20.62
Oct. 5.7	56.826	321	30.86	31.143	460	49.41	3.010	291	32.05	22.610	283	20.27
15.7	57.151	309	30.52	31.593	440	49.45	3.307	280	32.90	22.908	264	19.69
25.7	57.472	295	30.13	32.033	425	49.71	3.598	261	34.18	23.201	247	18.86
Nov. 4.6	57.781	273	29.70	32.458	402	50.17	3.878	238	35.84	23.485	220	17.83
14.6	58.076	243	29.26	32.860	368	50.86	4.139	206	37.85	23.754	188	16.64
24.6	58.349	207	28.85	33.228	276	51.75	4.377	170	40.11	24.001	147	15.34
Dec. 4.6	58.592	166	28.48	33.554	215	52.84	4.583	129	42.55	24.221	103	13.98
14.5	58.799	117	28.17	33.830	148	54.12	4.753	82	45.08	24.409	63	12.61
24.5	58.965		27.96	34.045		55.53	4.882		47.62	24.556		11.29
34.5	59.082		27.83	34.193		57.03	4.964		50.09	24.659		10.04
Mean Place	52.755		27.98	25.912		55.64	0.013		48.02	19.045		11.22
Sec δ , Tan δ	1.083		+0.415	1.534		+1.164	1.051		-0.323	1.003		+0.081
$D_{\psi} \alpha$, $D_{\mu} \alpha$	+0.07		0.00	+0.09		+0.01	+0.05		0.00	+0.06		0.00
$D_{\psi} \delta$, $D_{\mu} \delta$	0.0		+1.0	0.0		+1.0	0.0		+1.0	0.0		+1.0

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	α Argus. (Canopus.) Mag. -0.9		10 Monocerotis. Mag. 5.0		γ Geminorum. Mag. 4.1		δ Lynx. Mag. 6.0	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 6 22	° ' " -52 38	h m 6 23	° ' " - 4 42	h m 6 23	° ' " +20 15	h m 6 30	° ' " +61 33
Jan. 0.5	7.784	55.00	50.906	30.09	60.955	62.73	5.53	28.11
10.5	7.770 ¹⁴	58.50 ³⁵⁰	50.979 ⁷³	31.79 ¹⁷⁰	61.047 ⁹²	62.52 ²¹	5.67 ¹⁴	30.28 ²¹⁷
20.4	7.683 ⁸⁷	61.78 ³²⁸	51.005 ²⁶	33.34 ¹⁵⁵	61.090 ⁴³	62.39 ¹³	5.72 ⁵	32.44 ²¹⁶
30.4	7.528 ¹⁵⁵	64.76 ²⁹⁸	50.983 ²²	34.72 ¹³⁸	61.082 ¹³⁸	62.34 ⁵	5.66 ⁶	34.51 ²⁰⁷
Feb. 9.4	7.313 ²¹⁵	67.35 ²⁵⁹	50.918 ⁶⁵	35.87 ¹¹⁵	61.025 ⁵⁷	62.35 ¹	5.52 ¹⁴	36.41 ¹⁹⁰
19.4	7.045 ²⁶⁸	69.50 ²¹⁵	50.813 ¹⁰⁵	36.81 ⁹⁴	60.927 ⁹⁸	62.40 ⁸	5.28 ²⁴	38.04 ¹⁶³
29.3	6.735 ³¹⁰	71.17 ¹⁶⁷	50.677 ¹³⁶	37.51 ⁷⁰	60.793 ¹³⁴	62.46 ⁶	4.99 ²⁹	39.34 ¹³⁰
Mar. 10.3	6.396 ³³⁹	72.33 ¹¹⁶	50.518 ¹⁵⁹	37.99 ⁴⁸	60.633 ¹⁶⁰	62.52 ⁶	4.65 ³⁴	40.27 ⁹³
20.3	6.040 ³⁵⁶	72.97 ⁶⁴	50.347 ¹⁷¹	38.23 ²⁴	60.460 ¹⁷³	62.55 ⁸	4.28 ³⁷	40.76 ⁴⁹
30.2	5.681 ³⁵⁹	73.08 ¹¹	50.172 ¹⁷⁵	38.27 ⁴	60.283 ¹⁷⁷	62.56 ¹	3.90 ³⁸	40.82 ⁶
Apr. 9.2	5.333 ³⁴⁸	72.68 ⁴⁰	50.006 ¹⁶⁶	38.07 ²⁰	60.115 ¹⁶⁸	62.52 ⁴	3.53 ³⁷	40.43 ³⁹
19.2	5.005 ³²⁸	71.77 ⁹¹	49.856 ¹⁵⁰	37.68 ³⁹	59.964 ¹⁵¹	62.47 ⁵	3.19 ³⁴	39.63 ⁸⁰
29.2	4.710 ²⁹⁵	70.40 ¹³⁷	49.730 ¹²⁶	37.08 ⁶⁰	59.840 ¹²⁴	62.39 ⁸	2.89 ³⁰	38.45 ¹¹⁸
May 9.1	4.456 ²⁵⁴	68.57 ¹⁸³	49.634 ⁹⁶	36.28 ⁸⁰	59.748 ⁹²	62.31 ⁸	2.66 ²³	36.94 ¹⁵¹
19.1	4.250 ²⁰⁶	66.35 ²²²	49.574 ⁶⁰	35.30 ⁹⁸	59.696 ⁵²	62.23 ⁸	2.51 ¹⁵	35.16 ¹⁷⁸
29.1	4.099 ¹⁵¹	63.79 ²⁵⁶	49.552 ²²	34.15 ¹¹⁵	59.686 ¹⁰	62.18 ⁵	2.42 ⁹	33.17 ¹⁹⁹
June 8.1	4.006 ⁹³	60.97 ²⁸²	49.570 ¹⁸	32.87 ¹²⁸	59.718 ³²	62.15 ³	2.42 ⁰	31.02 ²¹⁵
18.0	3.974 ³²	57.92 ³⁰⁵	49.628 ⁵⁸	31.49 ¹³⁸	59.793 ⁷⁵	62.16 ¹	2.50 ⁸	28.79 ²²³
28.0	4.002 ²⁸	54.76 ³¹⁶	49.722 ⁹⁴	30.02 ¹⁴⁷	59.908 ¹¹⁵	62.22 ⁶	2.66 ¹⁶	26.55 ²²⁴
July 8.0	4.091 ⁸⁹	51.57 ³¹⁹	49.852 ¹³⁰	28.52 ¹⁵⁰	60.062 ¹⁵⁴	62.30 ⁸	2.90 ²⁴	24.34 ²²¹
17.9	4.238 ¹⁴⁷	48.43 ³¹⁴	50.015 ¹⁶³	27.04 ¹⁴⁸	60.249 ¹⁸⁷	62.40 ¹⁰	3.20 ³⁰	22.22 ²¹²
27.9	4.441 ²⁰³	45.44 ²⁹⁹	50.207 ¹⁹²	25.63 ¹⁴¹	60.467 ²¹⁸	62.52 ¹²	3.57 ³⁷	20.22 ²⁰⁰
Aug. 6.9	4.694 ²⁵³	42.69 ²⁷⁵	50.425 ²¹⁸	24.33 ¹³⁰	60.710 ²⁴³	62.63 ¹¹	4.00 ⁴³	18.39 ¹⁸³
16.9	4.992 ²⁹⁶	40.30 ²³⁹	50.664 ²³⁹	23.23 ¹¹⁰	60.976 ²⁶⁶	62.71 ⁸	4.47 ⁴⁷	16.77 ¹⁶²
26.8	5.329 ³³⁷	38.33 ¹⁹⁷	50.922 ²⁵⁸	22.33 ⁹⁰	61.260 ²⁸⁴	62.74 ³	4.99 ⁵²	15.37 ¹⁴⁰
36.8		146 ²⁷¹		62 ⁶²	298 ²⁹⁸	4 ⁴	54 ⁵⁴	115 ¹¹⁵
Sept. 5.8	5.697 ³⁹²	36.87 ⁸⁸	51.193 ²⁸³	21.71 ³¹	61.558 ³¹⁰	62.70 ¹²	5.53 ⁵⁸	14.22 ⁸⁹
15.8	6.089 ⁴⁰⁷	35.99 ²⁸	51.476 ²⁹⁰	21.40 ²	61.868 ³¹⁷	62.58 ²⁴	6.11 ⁵⁸	13.33 ⁵⁸
25.8	6.496 ⁴¹²	35.71 ³⁶	51.766 ²⁹⁵	21.42 ³⁷	62.185 ³²⁰	62.34 ³¹	6.69 ⁶⁰	12.75 ²⁹
Oct. 5.7	6.908 ⁴⁰⁸	36.07 ¹⁰²	52.061 ²⁹⁴	21.79 ⁷¹	62.505 ³²¹	62.03 ⁴¹	7.29 ⁶⁰	12.46 ²
15.7	7.316 ³⁹²	37.09 ¹⁶²	52.355 ²⁹⁰	22.50 ¹⁰³	62.826 ³¹⁷	61.62 ⁴⁹	7.89 ⁵⁹	12.48 ³⁴
25.7	7.708 ³⁶⁷	38.71 ²²⁰	52.645 ²⁸⁰	23.53 ¹³²	63.143 ³⁰⁷	61.13 ⁵⁴	8.48 ⁵⁷	12.82 ⁶⁷
Nov. 4.6	8.075 ³³²	40.91 ²⁷⁰	52.925 ²⁶⁵	24.85 ¹⁵⁵	63.450 ²⁹⁴	60.59 ⁵⁷	9.05 ⁵⁴	13.49 ⁹⁷
14.6	8.407 ²⁸⁶	43.61 ³¹¹	53.190 ²⁴⁵	26.40 ¹⁷⁴	63.744 ²⁷²	60.02 ⁵⁷	9.59 ⁵⁰	14.46 ¹³⁰
24.6	8.693 ²²⁹	46.72 ³⁴⁰	53.435 ²¹⁷	28.14 ¹⁸⁵	64.016 ²⁴⁴	59.45 ⁵³	10.09 ⁴⁴	15.76 ¹⁵⁷
Dec. 4.6	8.922 ¹⁶⁹	50.12 ³⁶⁰	53.652 ¹⁸⁴	29.99 ¹⁸⁹	64.260 ²⁰⁹	58.92 ⁴⁶	10.53 ³⁶	17.33 ¹⁸⁰
14.5	9.091 ⁹⁹	53.72 ³⁶⁶	53.836 ¹⁴³	31.88 ¹⁸³	64.469 ¹⁶⁹	58.46 ³⁹	10.89 ²⁹	19.13 ²⁰⁰
24.5	9.190 ²⁹	57.38 ³⁸⁰	53.979 ¹⁰⁰	33.76 ¹⁸⁰	64.638 ¹²¹	58.07 ²⁸	11.18 ¹⁹	21.13 ²¹³
34.5	9.219	60.98	54.079	35.56	64.759	57.79	11.37	23.26
Mean Place	5.233	58.12	48.754	33.46	58.542	58.87	1.113	23.74
Sec δ, Tan δ	1.648	-1.310	1.003	-0.082	1.066	+0.369	2.100	+1.846
Dϕ α, Dω α	+0.03	-0.01	+0.06	0.00	+0.07	0.00	+0.11	+0.02
Dϕ δ, Dω δ	0.0	+1.0	0.0	+1.0	0.0	+1.0	-0.1	+1.0

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	ϵ^2 Canis Majoris. Mag. 4.5		23 H. Camelop. Mag. 5.6		51 Aurigæ. Mag. 5.7		γ Geminorum. Mag. 1.9	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 6 31	° ' —22 53	h m 6 31	° ' +79 39	h m 6 32	° ' +39 27	h m 6 32	° ' +16 28
	s 61	" 265	s 21	" 292	s 119	" 94	s 100	" 48
Jan. 0.5	34.299	45.88	65.89	33.94	53.291	61.40	53.955	22.30
10.5	34.360	48.53	66.10	36.86	53.410	62.34	54.055	21.82
20.4	34.371	51.00	66.08	39.74	53.466	63.35	54.105	21.46
30.4	34.332	53.22	65.80	42.48	53.461	64.36	54.103	21.20
Feb. 9.4	34.247	55.15	65.30	44.95	53.396	65.32	54.055	21.02
19.4	34.120	56.75	64.59	47.08	53.278	66.18	53.963	20.93
29.3	33.960	57.99	63.71	48.75	53.117	66.89	53.835	20.89
Mar. 10.3	33.776	58.85	62.72	49.92	52.925	67.42	53.683	20.88
20.3	33.579	59.36	61.65	50.55	52.711	67.72	53.514	20.89
30.2	33.377	59.48	60.55	50.60	52.493	67.80	53.341	20.91
Apr. 9.2	33.180	59.22	59.47	50.09	52.283	67.63	53.175	20.93
19.2	33.000	58.63	58.47	49.04	52.091	67.25	53.024	20.96
29.2	32.844	57.68	57.58	47.49	51.931	66.68	52.899	21.01
May 9.1	32.718	56.41	56.84	45.51	51.809	65.91	52.804	21.07
19.1	32.626	54.85	56.27	43.18	51.732	65.02	52.747	21.16
29.1	32.573	53.05	55.89	40.55	51.704	64.02	52.729	21.29
June 8.1	32.561	51.03	55.73	37.73	51.727	62.96	52.753	21.47
18.0	32.590	48.84	55.77	34.79	51.801	61.87	52.818	21.68
28.0	32.660	46.55	56.03	31.80	51.925	60.78	52.921	21.94
July 8.0	32.768	44.22	56.48	28.84	52.094	59.71	53.061	22.22
17.9	32.912	41.92	57.14	26.00	52.306	58.69	53.236	22.51
27.9	33.091	39.72	57.97	23.33	52.556	57.72	53.441	22.79
Aug. 6.9	33.300	37.71	58.97	20.88	52.838	56.83	53.671	23.03
16.9	33.533	35.94	60.11	18.72	53.150	56.02	53.925	23.23
26.8	33.790	34.49	61.36	16.86	53.484	55.30	54.197	23.34
Sept. 5.8	34.065	33.44	62.71	15.37	53.838	54.65	54.484	23.35
15.8	34.354	32.81	64.14	14.26	54.207	54.08	54.783	23.24
25.8	34.653	32.66	65.62	13.56	54.586	53.61	55.092	22.99
Oct. 5.7	34.958	33.00	67.12	13.28	54.971	53.24	55.405	22.61
15.7	35.263	33.84	68.62	13.45	55.359	52.98	55.720	22.09
25.7	35.563	35.15	70.09	14.06	55.743	52.84	56.033	21.46
Nov. 4.6	35.854	36.90	71.49	15.11	56.117	52.83	56.337	20.74
14.6	36.127	39.02	72.79	16.59	56.474	52.96	56.630	19.95
24.6	36.375	41.44	73.96	18.46	56.807	53.27	56.903	19.15
Dec. 4.6	36.593	44.09	74.98	20.69	57.107	53.72	57.149	18.37
14.5	36.773	46.85	75.81	23.22	57.365	54.34	57.362	17.64
24.5	36.911	49.65	76.40	25.97	57.574	55.11	57.534	16.98
34.5	37.002	52.39	76.76	28.84	57.727	55.99	57.662	16.43
Mean Place	32.170	49.14	55.274	29.35	50.375	57.77	51.596	18.98
Sec δ , Tan δ	1.085	—0.422	5.571	+5.481	1.295	+0.823	1.043	+0.296
D ϕ α , D ω α	+0.05	0.00	+0.20	+0.05	+0.08	+0.01	+0.07	0.00
D ϕ δ , D ω δ	—0.1	+1.0	—0.1	+1.0	—0.1	+1.0	—0.1	+1.0

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	ν Argus. Mag. 3.2		S Monocerotis. Mag. 4.7		ε Geminorum. Mag. 3.2		ζ Geminorum. Mag. 3.4	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 6 35	° ' " —43 6	h m 6 36	° ' " + 9 58	h m 6 38	° ' " +25 12	h m 6 40	° ' " +12 59
	s	"	s	"	s	"	s	"
Jan. 0.5	13.850	74.94	23.415	30.81	48.416	58.39	36.840	16.69
10.5	13.882 ³²	78.32 ³³⁸	23.513 ⁹⁸	29.92 ⁸⁹	48.529 ¹¹³	58.44 ⁵	36.945 ¹⁰⁵	15.97 ⁷²
20.4	13.853 ²⁹	81.51 ³¹⁹	23.562 ⁴⁹	29.17 ⁷⁵	48.589 ⁶⁰	58.60 ¹⁶	36.999 ⁵⁴	15.38 ⁵⁹
30.4	13.764 ⁸⁹	84.41 ²⁹⁰	23.562 ⁰	28.54 ⁶³	48.594 ⁵	58.84 ²⁴	37.004 ⁵	14.90 ⁴⁸
Feb. 9.4	13.619 ¹⁴⁵	86.95 ²⁵⁴	23.515 ⁴⁷	28.04 ⁵⁰	48.548 ⁴⁶	59.11 ²⁷	36.961 ⁴³	14.55 ³⁵
	193	215	89	38	92	29	86	24
19.4	13.426	89.10	23.426	27.66	48.456	59.40	36.875	14.31
29.3	13.196 ²³⁰	90.80 ¹⁷⁰	23.301 ¹²⁵	27.41 ²⁵	48.325 ¹³¹	59.67 ²⁷	36.752 ¹²³	14.15 ¹⁶
Mar. 10.3	12.936 ²⁶⁰	92.03 ¹²³	23.153 ¹⁴⁸	27.25 ¹⁶	48.166 ¹⁵⁹	59.89 ²²	36.603 ¹⁴⁹	14.06 ⁹
20.3	12.660 ²⁷⁶	92.78 ⁷⁵	22.987 ¹⁶⁶	27.18 ¹⁷⁷	47.989 ¹⁸³	60.05 ¹⁶	36.439 ¹⁶⁴	14.03 ³
30.3	12.378 ²⁸²	93.03 ²⁵	22.818 ¹⁶⁹	27.18 ⁰	47.806 ¹⁷⁷	60.12 ⁷	36.268 ¹⁷¹	14.04 ¹
	276	23	163	7	177	1	165	6
Apr. 9.2	12.102	92.80	22.655	27.25	47.629	60.11	36.103	14.10
19.2	11.843 ²⁵⁹	92.09 ⁷¹	22.505 ¹⁵⁰	27.39 ¹⁴	47.469 ¹⁶⁰	60.02 ⁹	35.952 ¹⁵¹	14.20 ¹⁰
29.2	11.609 ²³⁴	90.92 ¹¹⁷	22.380 ¹²⁵	27.62 ²³	47.332 ¹³⁷	59.85 ¹⁷	35.825 ¹²⁷	14.34 ¹⁴
May 9.1	11.410 ¹⁹⁹	89.34 ¹⁵⁸	22.285 ⁹⁵	27.91 ²⁹	47.229 ¹⁰³	59.61 ²⁴	35.726 ⁹⁹	14.52 ¹⁸
19.1	11.251 ¹⁵⁹	87.37 ¹⁹⁷	22.225 ⁶⁰	28.27 ³⁶	47.164 ⁹⁵	59.34 ²⁷	35.664 ⁶²	14.77 ²⁵
	114	229	22	44	23	29	25	20
29.1	11.137	85.08	22.203	28.71	47.141	59.05	35.639	15.06
June 8.1	11.071 ⁶⁶	82.49 ²⁵⁹	22.221 ¹⁸	29.22 ⁵¹	47.161 ²⁰	58.75 ³⁰	35.655 ¹⁶	15.40 ³⁴
18.0	11.055 ¹⁶	79.71 ²⁷⁸	22.278 ⁵⁷	29.79 ⁵⁷	47.224 ⁶³	58.46 ²⁹	35.710 ⁵⁵	15.79 ³⁹
28.0	11.089 ³⁴	76.78 ²⁹³	22.373 ⁹⁵	30.41 ⁶²	47.329 ¹⁰⁵	58.18 ²⁸	35.803 ⁹³	16.22 ⁴³
July 8.0	11.173 ⁸⁴	73.80 ²⁹⁸	22.504 ¹³¹	31.06 ⁶⁵	47.473 ¹⁴⁴	57.92 ²⁶	35.933 ¹³⁰	16.67 ⁴⁵
	132	295	165	65	180	22	163	46
18.0	11.305	70.85	22.669	31.71	47.653	57.70	36.096	17.13
27.9	11.482 ¹⁷⁷	68.01 ²⁸⁴	22.862 ¹⁹³	32.33 ⁶²	47.865 ²¹²	57.47 ²³	36.289 ¹⁹³	17.56 ⁴³
Aug. 6.9	11.700 ²¹⁸	65.40 ²⁶¹	23.083 ²²¹	32.89 ⁵⁶	48.105 ²⁴⁰	57.25 ²²	36.509 ²²⁰	17.95 ³¹
16.9	11.954 ²⁵⁴	63.08 ²³²	23.324 ²⁴¹	33.36 ⁴⁷	48.370 ²⁶⁵	57.01 ²⁴	36.751 ²⁴²	18.26 ³⁹
26.8	12.242 ²⁸⁸	61.16 ¹⁹²	23.586 ²⁶²	33.70 ³⁴	48.654 ²⁸⁴	56.76 ²⁵	37.014 ²⁶³	18.45 ¹⁹
	315	145	276	18	303	29	277	8
Sept. 5.8	12.557	59.71	23.862	33.88	48.957	56.47	37.291	18.53
15.8	12.892 ³³⁵	58.79 ⁹²	24.150 ²⁸⁸	33.89 ¹	49.272 ³¹⁵	56.13 ³⁴	37.581 ²⁹⁰	18.44 ⁹
25.8	13.243 ³⁵¹	58.45 ³⁴	24.448 ²⁹⁸	33.68 ²¹	49.597 ³²⁵	55.75 ³⁸	37.882 ³⁰¹	18.19 ²⁵
Oct. 5.7	13.601 ³⁵⁸	58.71 ²⁶	24.753 ³⁰⁵	33.29 ³⁹	49.929 ³³²	55.32 ⁴³	38.190 ³⁰⁸	17.77 ⁴²
15.7	13.959 ³⁵⁸	59.59 ⁸⁸	25.058 ³⁰⁵	32.70 ⁵⁹	50.264 ³³⁵	54.85 ⁴⁷	38.500 ³¹⁰	17.17 ⁶⁰
	349	148	303	79	334	49	309	75
25.7	14.308	61.07	25.361	31.91	50.598	54.36	38.809	16.42
Nov. 4.7	14.642 ³³⁴	63.10 ²⁰³	25.658 ²⁹⁷	30.98 ⁹³	50.924 ³²⁶	53.86 ⁵⁰	39.111 ³⁰²	15.55 ⁸⁷
14.6	14.951 ³⁰⁹	65.60 ²⁵⁰	25.943 ²⁸⁵	29.94 ¹⁰⁴	51.238 ³¹⁴	53.39 ⁴⁷	39.403 ²⁹²	14.59 ⁹⁶
24.6	15.225 ²⁷⁴	68.53 ²⁹³	26.208 ²⁶⁵	28.82 ¹¹²	51.531 ²⁹³	52.97 ⁴²	39.676 ²⁷³	13.58 ¹⁰¹
Dec. 4.6	15.458 ²³³	71.74 ³²¹	26.449 ²⁴¹	27.67 ¹¹⁵	51.797 ²⁶⁶	52.62 ³⁵	39.923 ²⁴⁷	12.57 ¹⁰¹
	184	340	208	112	233	24	215	98
14.5	15.642	75.14	26.657	26.55	52.030	52.38	40.138	11.59
24.5	15.770 ¹²⁸	78.64 ³⁵⁰	26.826 ¹⁶⁹	25.48 ¹⁰⁷	52.219 ¹⁸⁹	52.24 ¹⁴	40.314 ¹⁷⁶	10.68 ⁹¹
34.5	15.839 ⁶⁹	82.10 ³⁴⁶	26.951 ¹²⁵	24.51 ⁹⁷	52.361 ¹⁴²	52.21 ³	40.445 ¹³¹	9.88 ⁸⁰
Mean Place	11.546	78.49	21.140	27.69	45.897	55.35	34.528	13.76
Sec δ, Tan δ	1.370	−0.936	1.015	+0.176	1.105	+0.471	1.026	+0.231
D♂ α, D♂ α	+0.04	−0.01	+0.07	0.00	+0.07	+0.01	+0.07	0.00
D♂ δ, D♂ δ	−0.1	+1.0	−0.1	+1.0	−0.1	+1.0	−0.1	+1.0

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	ψ^5 Aurigæ. Mag. 5.3		α Canis Majoris. (Sirius.) Mag. -1.6		18 Monocerotis. Mag. 4.7		43 Camelopardalis. Mag. 5.1	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 6 40	° ' " +43 39	h m 6 41	° ' " -16 35	h m 6 43	° ' " + 2 30	h m 6 44	° ' " +68 59
	s	"	s	"	s	"	s	"
Jan. 0.5	44.384	47.09	28.765	58.06	31.036	20.89	45.05	19.03
10.5	44.517	48.29	28.838	60.48	31.135	19.53	45.25	21.52
20.4	44.584	49.53	28.862	62.74	31.185	18.31	45.32	24.03
30.4	44.584	50.78	28.837	64.76	31.187	17.26	45.26	26.46
Feb. 9.4	44.522	51.97	28.766	66.50	31.142	16.38	45.07	28.72
19.4	44.402	53.05	28.655	67.96	31.055	15.69	44.78	30.70
29.3	44.234	53.95	28.509	69.09	30.934	15.16	44.40	32.32
Mar. 10.3	44.030	54.63	28.338	69.90	30.787	14.81	43.95	33.52
20.3	43.804	55.07	28.154	70.38	30.623	14.62	43.45	34.26
30.3	43.570	55.22	27.964	70.53	30.454	14.58	42.93	34.50
Apr. 9.2	43.341	55.10	27.780	70.36	30.290	14.68	42.42	34.25
19.2	43.132	54.72	27.611	69.90	30.138	14.94	41.94	33.52
29.2	42.952	54.10	27.463	69.12	30.009	15.32	41.51	32.34
May 9.1	42.812	53.25	27.345	68.08	29.908	15.84	41.15	30.75
19.1	42.719	52.23	27.261	66.77	29.841	16.50	40.88	28.84
29.1	42.675	51.06	27.214	65.25	29.811	17.27	40.72	26.64
June 8.1	42.688	49.80	27.207	63.54	29.818	18.14	40.65	24.25
18.0	42.753	48.48	27.239	61.69	29.863	19.09	40.68	21.73
28.0	42.870	47.14	27.309	59.74	29.946	20.10	40.83	19.14
July 8.0	43.038	45.82	27.417	57.75	30.065	21.15	41.07	16.56
18.0	43.251	44.53	27.559	55.79	30.216	22.19	41.42	14.04
27.9	43.506	43.31	27.734	53.91	30.396	23.19	41.85	11.64
Aug. 6.9	43.797	42.18	27.937	52.20	30.604	24.09	42.36	9.40
16.9	44.118	41.12	28.163	50.71	30.833	24.86	42.94	7.37
26.8	44.466	40.17	28.411	49.51	31.082	25.46	43.58	5.62
Sept. 5.8	44.836	39.34	28.678	48.65	31.349	25.85	44.27	4.13
15.8	45.224	38.63	28.959	48.18	31.628	25.99	45.00	2.94
25.8	45.625	38.04	29.249	48.14	31.918	25.86	45.76	2.10
Oct. 5.7	46.034	37.58	29.546	48.55	32.214	25.46	46.54	1.61
15.7	46.445	37.29	29.845	49.40	32.514	24.77	47.32	1.50
25.7	46.854	37.15	30.141	50.69	32.812	23.85	48.09	1.76
Nov. 4.7	47.254	37.18	30.428	52.35	33.105	22.68	48.84	2.41
14.6	47.637	37.41	30.700	54.36	33.387	21.34	49.56	3.44
24.6	47.995	37.83	30.950	56.63	33.650	19.86	50.21	4.83
Dec. 4.6	48.319	38.46	31.172	59.08	33.889	18.31	50.78	6.56
14.5	48.599	39.26	31.360	61.64	34.095	16.74	51.28	8.59
24.5	48.827	40.24	31.507	64.22	34.264	15.21	51.66	10.85
34.5	48.996	41.35	31.608	66.73	34.388	13.76	51.93	13.28
Mean Place	41.291	44.08	26.790	60.58	28.835	18.00	39.362	16.09
Sec δ , Tan δ	1.382	+0.954	1.044	-0.298	1.001	+0.044	2.789	+2.603
$D\psi\alpha$, $D_\alpha\alpha$	+0.09	+0.01	+0.05	0.00	+0.06	0.00	+0.13	+0.03
$D\psi\delta$, $D_\delta\delta$	-0.1	+1.0	-0.1	+1.0	-0.1	+1.0	-0.1	+1.0

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	θ Geminorum. Mag. 3.6		α Pictoris. Mag. 3.3		γ Argus. Mag. 2.8		ϵ Lynxis. Mag. 4.5	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 6 47	° ' +34 3	h m 6 47	° ' -61 50	h m 6 47	° ' -50 30	h m 6 50	° ' +58 31
	s "	"	s "	"	s "	"	s "	"
Jan. 0.5	18.032 ¹³²	51.60 ⁵⁹	22.77 ⁰	59.51 ³⁷²	53.539 ³²	47.87 ³⁶⁰	4.714 ¹⁷²	65.86 ¹⁹⁸
10.5	18.164 ⁷²	52.19 ⁶⁸	22.77 ¹¹	63.23 ³⁵⁵	53.571 ³⁹	51.47 ⁸⁴¹	4.886 ⁸²	67.84 ²⁰³
20.5	18.236 ¹³	52.87 ⁷⁴	22.66 ¹⁹	66.78 ³³⁰	53.532 ¹⁰⁵	54.88 ³¹⁶	4.968 ⁹	69.87 ²⁰¹
30.4	18.249 ⁴³	53.61 ⁷⁴	22.47 ²⁷	70.08 ²⁹⁴	53.427 ¹⁶⁸	58.04 ²⁸³	4.959 ⁹⁶	71.88 ¹⁸⁸
Feb. 9.4	18.206 ⁹⁵	54.35 ⁶⁹	22.20 ³⁴	73.02 ²⁵⁴	53.259 ²²³	60.87 ²⁴¹	4.863 ¹⁷⁵	73.76 ¹⁶⁹
19.4	18.111 ¹³⁹	55.04 ⁶²	21.86 ³⁹	75.56 ²⁰⁷	53.036 ²⁶⁹	63.28 ¹⁹⁶	4.688 ²⁴²	75.45 ¹⁴¹
29.3	17.972 ¹⁷¹	55.66 ⁴⁹	21.47 ⁴⁴	77.63 ¹⁵⁷	52.767 ³⁰³	65.24 ¹⁴⁸	4.446 ²⁹²	76.86 ¹⁰⁸
Mar. 10.3	17.801 ¹⁹²	56.15 ³⁴	21.03 ⁴⁷	79.20 ¹⁰⁵	52.464 ³²⁴	66.72 ⁹⁷	4.154 ³²⁵	77.94 ⁶⁹
20.3	17.609 ²⁰⁰	56.49 ¹⁶	20.56 ⁴⁸	80.25 ⁵¹	52.140 ³³³	67.69 ⁴⁶	3.829 ³³⁷	78.63 ²⁸
30.3	17.409 ¹⁹⁷	56.65 ¹	20.08 ⁴⁷	80.76 ³	51.807 ³³¹	68.15 ⁶	3.490 ³³⁷	78.91 ¹³
Apr. 9.2	17.212 ¹⁸⁰	56.64 ²⁰	19.61 ⁴⁶	80.73 ⁵⁴	51.476 ³¹⁴	68.09 ⁵⁶	3.153 ³¹³	78.78 ⁸³
19.2	17.032 ¹⁵⁵	56.44 ³⁵	19.15 ⁴³	80.19 ¹⁰⁷	51.162 ²⁹¹	67.53 ¹⁰⁵	2.840 ²⁷⁸	78.25 ⁹¹
29.2	16.877 ¹²⁰	56.09 ⁵⁰	18.72 ³⁸	79.12 ¹⁵⁴	50.871 ²⁵⁵	66.48 ¹⁸⁰	2.562 ²²⁷	77.34 ¹²⁵
May 9.2	16.757 ⁸⁰	55.59 ⁶¹	18.34 ³³	77.58 ¹⁹⁷	50.616 ²¹³	64.98 ¹⁹¹	2.335 ¹⁶⁷	76.09 ¹⁵⁴
19.1	16.677 ³⁶	54.98 ⁷¹	18.01 ²⁷	75.61 ²³⁷	50.403 ¹⁶⁵	63.07 ²²⁹	2.168 ⁹⁸	74.55 ¹⁷⁷
29.1	16.641 ¹⁰	54.27 ⁷⁶	17.74 ²⁰	73.24 ²⁷⁰	50.238 ¹¹²	60.78 ²⁶⁰	2.070 ²⁸	72.78 ¹⁹⁵
June 8.1	16.651 ⁵⁷	53.51 ⁸⁰	17.54 ¹²	70.54 ²⁹⁷	50.126 ⁵⁸	58.18 ²⁸⁴	2.042 ⁴⁶	70.83 ²⁰⁶
18.0	16.708 ¹⁰²	52.71 ⁸¹	17.42 ⁵	67.57 ³¹³	50.068 ¹	55.34 ³⁰²	2.088 ¹¹⁷	68.77 ²¹⁴
28.0	16.810 ¹⁴⁶	51.90 ⁸¹	17.37 ³	64.44 ³²⁴	50.069 ⁵⁵	52.32 ³⁰⁸	2.205 ¹⁸⁷	66.63 ²¹⁴
July 8.0	16.956 ¹⁸⁴	51.09 ⁷⁸	17.40 ¹⁰	61.20 ³²³	50.124 ¹¹¹	49.24 ³¹⁰	2.392 ²⁵¹	64.49 ²⁰⁸
18.0	17.140 ²²¹	50.31 ⁷⁶	17.50 ¹⁷	57.97 ³¹⁵	50.235 ¹⁶⁵	46.14 ²⁹⁸	2.643 ³¹¹	62.41 ²⁰²
27.9	17.361 ²⁵²	49.55 ⁷³	17.67 ²⁵	54.82 ²⁹³	50.400 ²¹⁶	43.16 ²⁸⁰	2.954 ³⁶⁵	60.39 ¹⁸⁹
Aug. 6.9	17.613 ²⁸⁰	48.82 ⁶⁸	17.92 ³²	51.89 ²⁶⁴	50.616 ²⁶¹	40.36 ²⁴⁹	3.319 ⁴¹²	58.50 ¹⁷⁴
16.9	17.893 ³⁰⁴	48.14 ⁶⁶	18.24 ³⁷	49.25 ²²⁵	50.877 ³⁰²	37.87 ²¹¹	3.731 ⁴⁵³	56.76 ¹⁵⁴
26.9	18.197 ³²²	47.48 ⁶³	18.61 ⁴³	47.00 ¹⁷⁶	51.179 ³³⁷	35.76 ¹⁶⁵	4.184 ⁴⁸⁶	55.22 ¹³⁵
Sept. 5.8	18.519 ³³⁹	46.85 ⁶⁰	19.04 ⁴⁶	45.24 ¹²²	51.516 ³⁶⁵	34.11 ¹¹¹	4.670 ⁵¹⁵	53.87 ¹¹⁰
15.8	18.858 ³⁵²	46.25 ⁵⁷	19.50 ⁵⁰	44.02 ⁶⁰	51.881 ³⁸⁶	33.00 ⁵²	5.185 ⁵³⁵	52.77 ⁸⁶
25.8	19.210 ³⁶⁰	45.68 ⁵²	20.00 ⁵⁰	43.42 ⁵	52.267 ³⁹⁸	32.48 ¹²	5.720 ⁵⁴⁷	51.91 ⁵⁸
Oct. 5.7	19.570 ³⁶⁴	45.16 ⁴⁸	20.50 ⁵¹	43.47 ⁷¹	52.665 ³⁹⁹	32.60 ⁷⁵	6.267 ⁵⁵⁴	51.33 ³⁰
15.7	19.934 ³⁶⁴	44.68 ⁴⁰	21.01 ⁵⁰	44.18 ¹³⁷	53.064 ³⁹⁴	33.35 ¹³⁹	6.821 ⁵⁶¹	51.03 ⁰
25.7	20.298 ³⁵⁸	44.28 ³²	21.51 ⁴⁸	45.55 ¹⁹⁹	53.458 ³⁷⁷	34.74 ¹⁹⁷	7.372 ⁵³⁸	51.03 ³¹
Nov. 4.7	20.656 ³⁴⁵	43.96 ¹⁹	21.99 ⁴³	47.54 ²⁵³	53.835 ³⁴⁸	36.71 ²⁵⁰	7.910 ⁵¹⁶	51.34 ⁶³
14.6	21.001 ³²⁵	43.77 ⁸	22.42 ³⁶	50.07 ³⁰¹	54.183 ³¹¹	39.21 ²⁹⁶	8.426 ⁴⁸¹	51.97 ⁹⁴
24.6	21.326 ²⁹⁵	43.69 ⁷	22.78 ³¹	53.08 ³³⁶	54.494 ²⁶²	42.17 ³²⁹	8.907 ⁴³⁴	52.91 ¹²⁴
Dec. 4.6	21.621 ²⁵⁹	43.76 ²¹	23.09 ²²	56.44 ³⁶³	54.756 ²⁰⁶	45.46 ³⁵⁴	9.341 ³⁷⁴	54.15 ¹⁵⁰
14.6	21.880 ²¹³	43.97 ³⁷	23.31 ¹⁴	60.07 ³⁷⁶	54.962 ¹⁴²	49.00 ³⁶⁶	9.715 ³⁰³	55.65 ¹⁷⁴
24.5	22.093 ¹⁶²	44.34 ⁵¹	23.45 ⁶	63.83 ³⁷⁸	55.104 ⁷⁶	52.66 ³⁶⁶	10.018 ²²¹	57.39 ¹⁹⁰
34.5	22.255	44.85	23.51	67.61	55.180	56.32	10.239	59.29
Mean Place	15.287	49.17	19.858	64.03	51.096	52.06	0.597	63.62
Sec δ , Tan δ	1.207	+0.676	2.119	-1.869	1.572	-1.214	1.916	+1.634
$D_{\phi} \alpha$, $D_{\omega} \alpha$	+0.08	+0.01	+0.01	-0.03	+0.08	-0.02	+0.10	+0.02
$D_{\phi} \delta$, $D_{\omega} \delta$	-0.1	+1.0	-0.1	+1.0	-0.1	+1.0	-0.1	+1.0

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	θ Canis Majoris. Mag. 4.2		ϵ Canis Majoris. Mag. 1.6		ζ Geminorum. Var. 3.7-4.3		δ^2 Canis Majoris. Mag. 3.1	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 6 50	° ' " -11 55	h m 6 55	° ' " -28 51	h m 6 59	° ' " +20 41	h m 6 59	° ' " -23 42
Jan. 0.5	19.378	92	21.590	21.67	10.119	41.99	33.120	31.69
10.5	19.470	43	21.670	24.65	10.249	41.71	33.211	34.46
20.5	19.513	203	21.696	27.48	10.327	41.55	33.249	37.08
30.4	19.507	6	21.669	30.06	10.352	41.51	33.236	39.49
Feb. 9.4	19.454	53	21.592	32.36	10.325	41.57	33.174	41.62
19.4	19.361	132	21.470	34.31	10.251	41.69	33.067	43.43
29.3	19.231	103	21.310	35.89	10.137	41.85	32.924	44.89
Mar. 10.3	19.075	156	21.122	37.08	9.993	42.02	32.752	45.99
20.3	18.902	173	20.916	37.85	9.828	42.18	32.561	46.72
30.3	18.722	180	20.700	38.21	9.654	42.31	32.362	47.05
Apr. 9.2	18.545	177	20.488	38.18	9.482	42.41	32.164	47.03
19.2	18.382	163	20.287	37.73	9.322	42.46	31.976	46.63
29.2	18.238	144	20.105	36.89	9.183	42.47	31.808	45.88
May 9.2	18.121	117	19.952	35.69	9.072	42.44	31.665	44.79
19.1	18.037	84	19.832	34.15	8.996	42.39	31.555	43.41
29.1	17.987	50	19.749	32.33	8.958	42.33	31.481	41.75
June 8.1	17.975	12	19.704	30.25	8.959	42.26	31.444	39.86
18.0	18.002	27	19.702	27.97	9.001	42.20	31.446	37.78
28.0	18.066	64	19.741	25.55	9.082	42.15	31.488	35.57
July 8.0	18.165	99	19.820	23.06	9.201	42.09	31.569	33.28
18.0	18.299	134	19.938	20.57	9.356	42.04	31.687	31.02
27.9	18.464	165	20.092	18.16	9.541	41.97	31.839	28.80
Aug. 6.9	18.657	193	20.279	15.92	9.756	41.87	32.022	26.76
16.9	18.875	218	20.498	13.92	9.995	41.73	32.235	24.92
26.9	19.115	240	20.743	12.25	10.257	41.52	32.472	23.40
Sept. 5.8	19.374	259	21.013	10.96	10.537	41.24	32.733	22.23
15.8	19.648	274	21.300	10.13	10.834	40.87	33.012	21.49
25.8	19.934	286	21.604	9.80	11.143	40.40	33.303	21.22
Oct. 5.7	20.228	294	21.918	10.00	11.462	39.83	33.610	21.43
15.7	20.526	298	22.236	10.74	11.787	39.18	33.920	22.15
25.7	20.824	298	22.554	12.00	12.114	38.44	34.230	23.36
Nov. 4.7	21.116	292	22.863	13.75	12.438	37.67	34.534	25.03
14.6	21.396	280	23.158	15.93	12.752	36.88	34.825	27.10
24.6	21.657	261	23.429	18.48	13.049	36.12	35.096	29.50
Dec. 4.6	21.893	236	23.672	21.30	13.324	35.41	35.339	32.16
14.6	22.096	203	23.876	24.29	13.566	34.79	35.547	34.97
24.5	22.259	163	24.035	27.37	13.769	34.28	35.713	37.86
34.5	22.378	119	24.146	30.43	13.927	33.91	35.833	40.71
Mean Place	17.260	56.87	19.459	25.31	7.687	40.18	31.015	35.14
Sec δ , Tan δ	1.022	-0.211	1.142	-0.551	1.069	+0.378	1.092	-0.439
$D\phi a$, $D\omega a$	+0.06	0.00	+0.05	-0.01	+0.07	+0.01	+0.05	-0.01
$D\phi \delta$, $D\omega \delta$	-0.1	+1.0	-0.1	+1.0	-0.1	+1.0	-0.1	+1.0

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	γ Canis Majoris. Mag. 4.1		δ Canis Majoris. Mag. 2.0		63 Aurigæ. Mag. 5.1		51 Geminorum. Mag. 5.3	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 6 59	° ' " -15 30	h m 7 4	° ' " -26 15	h m 7 5	° ' " +39 27	h m 7 8	° ' " +16 18
Jan. 0.5	59.609 ⁹⁹	26.97 ²⁴¹	60.601 ⁹³	29.12 ²⁹²	55.789 ¹⁶⁰	32.22 ⁸⁸	35.321 ¹³⁵	10.37 ⁶⁰
10.5	59.708 ⁴⁹	29.38 ²²⁵	60.694 ⁴¹	32.04 ²⁷⁶	55.949 ⁹⁶	33.10 ⁹⁸	35.456 ⁸⁴	9.77 ⁴⁶
20.5	59.757 ²	31.63 ²⁰⁴	60.735 ¹²	34.80 ²⁵⁴	56.045 ³⁴	34.08 ¹⁰⁴	35.540 ³³	9.31 ³²
30.4	59.755 ⁴⁸	33.67 ¹⁷⁹	60.723 ⁶³	37.34 ²²⁵	56.079 ²⁹	35.12 ¹⁰⁶	35.573 ¹⁸	8.99 ¹⁸
Feb. 9.4	59.707 ⁹²	35.46 ¹⁵⁰	60.660 ¹⁰⁷	39.59 ¹⁹⁵	56.050 ⁸⁷	36.18 ¹⁰²	35.555 ⁶⁵	8.81 ⁸
19.4	59.615 ¹²⁸	36.96 ¹²⁰	60.553 ¹⁴⁵	41.54 ¹⁵⁸	55.963 ¹³⁶	37.20 ⁹¹	35.490 ¹⁰⁶	8.73 ⁰
29.4	59.487 ¹⁵⁷	38.16 ⁸⁹	60.408 ¹⁷⁶	43.12 ¹¹⁹	55.827 ¹⁷⁵	38.11 ⁷⁵	35.385 ¹³⁵	8.73 ⁶
Mar. 10.3	59.330 ¹⁷⁴	39.05 ⁵⁸	60.232 ¹⁹⁵	44.31 ⁸¹	55.652 ²⁰⁰	38.86 ⁵⁶	35.250 ¹⁵⁷	8.79 ⁹
20.3	59.156 ¹⁸³	39.63 ²⁵	60.037 ²⁰⁵	45.12 ⁴²	55.452 ²¹⁴	39.42 ³⁴	35.093 ¹⁶⁰	8.88 ¹¹
30.3	58.973 ¹⁸²	39.88 ⁵	59.832 ²⁰⁵	45.54 ⁴	55.238 ²¹³	39.76 ¹¹	34.924 ¹⁶⁷	8.99 ¹²
Apr. 9.2	58.791 ¹⁷⁰	39.83 ³⁶	59.627 ¹⁹⁵	45.58 ³⁶	55.025 ²⁰¹	39.87 ¹⁴	34.757 ¹⁵⁸	9.11 ¹³
19.2	58.621 ¹⁵²	39.47 ⁶⁵	59.432 ¹⁷⁶	45.22 ⁷⁴	54.824 ¹⁷⁷	39.73 ³⁵	34.599 ¹³⁹	9.24 ¹²
29.2	58.469 ¹²⁶	38.82 ⁹²	59.256 ¹⁵¹	44.48 ¹⁰⁸	54.647 ¹⁴⁶	39.38 ⁵⁶	34.460 ¹¹³	9.36 ¹²
May 9.2	58.343 ⁹⁶	37.90 ¹¹⁸	59.105 ¹¹⁹	43.40 ¹⁴⁰	54.501 ¹⁰⁵	38.82 ⁷⁴	34.347 ⁸⁰	9.48 ¹²
19.1	58.247 ⁶⁰	36.72 ¹⁴⁰	58.986 ⁸³	42.00 ¹⁶⁹	54.396 ⁶⁰	38.08 ⁸⁹	34.267 ⁴⁵	9.60 ¹⁴
29.1	58.187 ²³	35.32 ¹⁶¹	58.903 ⁴⁷	40.31 ¹⁹⁴	54.336 ¹³	37.19 ¹⁰⁰	34.222 ⁷	9.74 ¹⁵
June 8.1	58.164 ¹³	33.71 ¹⁷⁵	58.856 ⁶	38.37 ²¹⁵	54.323 ³⁶	36.19 ¹⁰⁹	34.215 ³²	9.89 ¹⁶
18.1	58.177 ⁵²	31.96 ¹⁸⁶	58.850 ³⁴	36.22 ²²⁸	54.359 ⁸⁴	35.10 ¹¹⁴	34.247 ⁷¹	10.05 ¹⁷
28.0	58.229 ⁵⁸	30.10 ¹⁹²	58.884 ⁷²	33.94 ²³⁶	54.443 ¹³⁰	33.96 ¹¹⁶	34.318 ¹⁰⁶	10.22 ¹⁸
July 8.0	58.317 ¹²³	28.18 ¹⁹²	58.956 ¹¹¹	31.58 ²³⁷	54.573 ¹⁷³	32.80 ¹¹⁷	34.424 ¹⁴⁰	10.40 ¹⁷
18.0	58.440 ¹⁵⁵	26.26 ¹⁸⁵	59.067 ¹⁴⁵	29.21 ²³⁰	54.746 ²¹²	31.63 ¹¹⁶	34.564 ¹⁷²	10.57 ¹⁴
27.9	58.595 ¹⁸⁴	24.41 ¹⁷¹	59.212 ¹⁷⁹	26.91 ²¹⁵	54.958 ²⁴⁸	30.47 ¹¹²	34.736 ²⁰¹	10.71 ⁹
Aug. 6.9	58.779 ²¹¹	22.70 ¹⁵²	59.391 ²⁰⁷	24.76 ¹⁹³	55.206 ²⁷⁹	29.35 ¹⁰⁸	34.937 ²²⁵	10.80 ³
16.9	58.990 ²³⁴	21.18 ¹²⁵	59.598 ²³⁵	22.83 ¹⁶²	55.485 ³⁰⁸	28.27 ¹⁰³	35.162 ²¹⁷	10.83 ⁷
26.9	59.224 ²⁵⁵	19.93 ⁹⁴	59.833 ²⁶⁰	21.21 ¹²⁵	55.793 ³³⁰	27.24 ⁹⁸	35.409 ²⁶⁸	10.76 ¹⁸
Sept. 5.8	59.479 ²⁷²	18.99 ⁵⁵	60.093 ²⁸⁰	19.96 ⁸²	56.123 ³⁵²	26.26 ⁹¹	35.677 ²⁸³	10.58 ³¹
15.8	59.751 ²⁸⁵	18.44 ¹⁴	60.373 ²⁹⁵	19.14 ³⁴	56.475 ³⁶⁹	25.35 ⁸³	35.960 ²⁹⁸	10.27 ⁴⁵
25.8	60.036 ²⁹⁶	18.30 ²⁹	60.668 ³⁰⁹	18.80 ¹⁷	56.844 ³⁸⁰	24.52 ⁷³	36.258 ³⁰⁹	9.82 ⁵⁹
Oct. 5.8	60.332 ³⁰¹	18.59 ⁷³	60.977 ³¹⁴	18.97 ⁶⁶	57.224 ³⁸⁸	23.79 ⁶⁴	36.567 ³¹⁶	9.23 ⁷³
15.7	60.633 ³⁰²	19.32 ¹¹⁶	61.291 ³¹⁵	19.65 ¹²¹	57.612 ³⁹²	23.15 ⁵¹	36.883 ³²⁰	8.50 ⁸⁴
25.7	60.935 ²⁹⁶	20.48 ¹⁵⁵	61.606 ³¹⁰	20.86 ¹⁶⁷	58.004 ³⁸⁸	22.64 ³⁷	37.203 ³¹⁸	7.66 ⁹⁴
Nov. 4.7	61.233 ²⁸⁷	22.03 ¹⁸⁸	61.916 ²⁹⁷	22.53 ²¹⁰	58.392 ³⁷⁸	22.27 ¹⁹	37.521 ³⁰⁹	6.72 ⁹⁹
14.6	61.520 ²⁶⁸	23.91 ²¹⁶	62.213 ²⁷⁸	24.63 ²⁴⁶	58.770 ³⁵⁸	22.08 ¹	37.830 ²⁹⁶	5.73 ¹⁰¹
24.6	61.788 ²⁴³	26.08 ²³⁷	62.491 ²⁴⁹	27.09 ²⁷³	59.128 ²⁹³	22.07 ³⁹	38.126 ²⁴³	4.72 ⁹⁸
Dec. 4.6	62.031 ²¹⁰	28.44 ²⁴⁹	62.740 ²¹³	29.82 ²⁹⁰	59.459 ²⁹³	22.26 ¹⁹	38.401 ²⁴³	3.74 ⁹³
14.6	62.241 ¹⁷¹	30.93 ²⁵²	62.953 ¹⁷²	32.72 ²⁹⁹	59.752 ²⁴⁶	22.65 ⁵⁹	38.644 ²⁰⁶	2.81 ⁸¹
24.5	62.412 ¹²⁶	33.45 ²⁴⁹	63.125 ¹²³	35.71 ²⁹⁶	59.998 ¹⁹⁴	23.24 ⁷⁷	38.850 ¹⁶⁰	2.00 ⁶⁹
34.5	62.538	35.94	63.248	38.69	60.192	24.01	39.010	1.31
Mean Place	57.505	30.09	58.493	32.77	52.857	31.38	32.969	8.93
Sec δ , Tan δ	1.038	-0.277	1.115	-0.493	1.295	+0.823	1.042	+0.292
$D\alpha$, D_{α}	+0.05	0.00	+0.05	-0.01	+0.08	+0.02	+0.08	+0.01
$D\delta$, D_{δ}	-0.1	+1.0	-0.1	+1.0	-0.1	+1.0	-0.1	+1.0

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	γ^2 Volantis. Mag. 3.9		λ Geminorum. Mag. 3.6		π Argus. Mag. 2.7		δ Geminorum. Mag. 3.5	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 7 9	° ' " -70 21	h m 7 13	° ' " +16 41	h m 7 14	° ' " -36 56	h m 7 15	° ' " +22 8
Jan. 0.5	31.36	39.81	18.378	35.31	12.721	42.14	8.951	17.60
10.5	31.36	43.62	18.518	34.72	12.813	45.47	9.099	17.36
20.5	31.23	47.32	18.607	34.28	12.848	48.68	9.193	17.25
30.4	30.97	50.84	18.644	33.98	12.824	51.66	9.234	17.28
Feb. 9.4	30.60	54.05	18.630	33.82	12.745	54.36	9.222	17.42
19.4	30.14	56.89	18.569	33.76	12.616	56.72	9.161	17.63
29.4	29.59	59.32	18.466	33.78	12.445	58.67	9.057	17.89
Mar. 10.3	28.97	61.26	18.333	33.86	12.240	60.21	8.921	18.16
20.3	28.31	62.71	18.177	33.97	12.014	61.30	8.760	18.40
30.3	27.63	63.60	18.009	34.10	11.774	61.94	8.587	18.61
Apr. 9.3	26.94	63.98	17.842	34.23	11.532	62.12	8.414	18.77
19.2	26.26	63.82	17.683	34.36	11.299	61.86	8.250	18.86
29.2	25.61	63.14	17.542	34.48	11.085	61.15	8.104	18.89
May 9.2	25.01	61.94	17.427	34.60	10.894	60.03	7.985	18.87
19.1	24.47	60.28	17.344	34.71	10.737	58.52	7.898	18.80
29.1	24.01	58.19	17.296	34.83	10.616	56.68	7.846	18.69
June 8.1	23.64	55.73	17.286	34.97	10.536	54.52	7.834	18.56
18.1	23.36	52.96	17.314	35.10	10.497	52.13	7.862	18.40
28.0	23.18	49.95	17.379	35.25	10.502	49.53	7.929	18.24
July 8.0	23.10	46.78	17.481	35.39	10.550	46.84	8.034	18.06
18.0	23.14	43.56	17.617	35.52	10.641	44.12	8.173	17.86
28.0	23.29	40.39	17.785	35.63	10.774	41.45	8.345	17.65
Aug. 6.9	23.54	37.35	17.981	35.68	10.946	38.94	8.548	17.39
16.9	23.89	34.54	18.203	35.67	11.154	36.65	8.775	17.09
26.9	24.34	32.09	18.447	35.56	11.393	34.68	9.028	16.73
Sept. 5.8	24.86	30.09	18.712	35.33	11.664	33.11	9.301	16.29
15.8	25.46	28.59	18.994	34.98	11.960	32.01	9.591	15.77
25.8	26.11	27.68	19.290	34.50	12.276	31.44	9.898	15.17
Oct. 5.8	26.79	27.41	19.599	33.88	12.607	31.45	10.217	14.47
15.7	27.48	27.80	19.916	33.11	12.947	32.02	10.544	13.70
25.7	28.16	28.88	20.236	32.24	13.289	33.18	10.876	12.88
Nov. 4.7	28.82	30.58	20.557	31.28	13.626	34.89	11.208	12.03
14.7	29.42	32.86	20.870	30.28	13.948	37.10	11.532	11.17
24.6	29.94	35.67	21.169	29.26	14.247	39.73	11.842	10.37
Dec. 4.6	30.38	38.90	21.447	28.27	14.514	42.71	12.132	9.64
14.6	30.70	42.45	21.695	27.35	14.741	45.92	12.390	9.01
24.5	30.91	46.19	21.906	26.54	14.921	49.27	12.611	8.51
34.5	30.99	50.02	22.073	25.86	15.048	52.65	12.786	8.16
Mean Place	27.782	45.79	16.021	34.15	10.561	46.56	6.499	16.82
Sec δ , Tan δ	2.975	-2.803	1.044	+0.300	1.251	-0.752	1.080	+0.407
$D\psi\alpha$, $D_\omega\alpha$	-0.01	-0.06	+0.07	+0.01	+0.04	-0.02	+0.07	+0.01
$\eta\delta$, $D_\omega\delta$	-0.1	+1.0	-0.1	+0.9	-0.1	+0.9	-0.1	+0.9

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	δ Volantis. Mag. 4.0		ϵ Geminorum. Mag. 3.9		γ Canis Majoris. Mag. 2.4		Groombridge 1308. Mag. 5.8	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 7 16	° ' " -67 47	h m 7 20	° ' " +27 57	h m 7 20	° ' " -29 8	h m 7 22	° ' " +68 38
	s	"	s	"	s	"	s	"
Jan. 0.5	56.23	66.48	33.282	57.92	48.490	14.70	14.89	18.75
10.5	56.27 ⁴	70.32 ³⁸⁴	33.442 ¹⁶⁰	58.01 ⁹	48.598 ¹⁰⁸	17.76 ³⁰⁸	15.18 ²⁹	21.11 ²³⁶
20.5	56.18 ⁹	74.07 ³⁷⁵	33.547 ¹⁰⁵	58.27 ²⁶	48.653 ⁵⁵	20.71 ²⁹⁵	15.34 ¹⁶	23.59 ²⁴⁸
30.4	55.99 ¹⁹	77.63 ³⁵⁶	33.594 ⁴⁷	58.64 ³⁷	48.652 ¹	23.45 ²⁷⁴	15.37 ³	26.09 ²⁶⁰
Feb. 9.4	55.69 ³⁹	80.90 ²²⁷	33.587 ⁷	59.10 ⁴⁶	48.600 ⁵²	25.92 ²⁴⁷	15.28 ⁹	28.51 ²⁴²
19.4	55.30 ³⁰	83.83 ²⁹³	33.527 ⁶⁰	59.81 ⁵¹	48.500 ¹⁰⁰	28.06 ²¹⁴	15.07 ²¹	30.73 ²²²
29.4	54.84 ⁴⁶	86.33 ²⁵⁰	33.422 ¹⁰⁵	60.12 ⁵¹	48.360 ¹⁴⁰	29.84 ¹⁷⁸	14.75 ³²	32.70 ¹⁹⁷
Mar. 10.3	54.30 ⁵⁴	88.37 ²⁰⁴	33.282 ¹⁴⁰	60.60 ⁴⁸	48.187 ¹⁷³	31.25 ¹⁴¹	14.35 ⁴⁰	34.29 ¹⁵⁹
20.3	53.73 ⁵⁷	89.90 ¹⁵³	33.115 ¹⁶⁷	61.01 ⁴¹	47.992 ¹⁹⁵	32.25 ¹⁰⁰	13.90 ⁴⁵	35.46 ¹¹⁷
30.3	53.14 ⁵⁹	90.91 ¹⁰¹	32.935 ¹⁸⁰	61.33 ³²	47.783 ²⁰⁹	32.84 ⁵⁹	13.40 ⁵⁰	36.17 ⁷¹
Apr. 9.3	52.54 ⁶⁰	91.38 ⁴⁷	32.752 ¹⁸³	61.52 ¹⁹	47.573 ²¹⁰	33.02 ¹⁸	12.89 ⁵¹	36.38 ²¹
19.2	51.94 ⁶⁰	91.31 ⁷	32.578 ¹⁷⁴	61.59 ⁷	47.369 ²⁰⁴	32.79 ²³	12.40 ⁴⁹	36.10 ²⁸
29.2	51.37 ⁵⁷	90.72 ⁵⁹	32.423 ¹⁵⁵	61.54 ⁵	47.181 ¹⁸⁸	32.18 ⁶¹	11.94 ⁴⁶	35.34 ⁷⁶
May 9.2	50.84 ⁵³	89.62 ¹¹⁰	32.294 ¹²⁹	61.38 ¹⁶	47.016 ¹⁶⁵	31.19 ⁹⁹	11.54 ⁴⁰	34.14 ¹²⁰
19.1	50.38 ⁴⁶	88.05 ¹⁵⁷	32.197 ⁹⁷	61.11 ²⁷	46.880 ¹³⁶	29.86 ¹³³	11.22 ³²	32.54 ¹⁶⁰
29.1	49.97 ⁴¹	86.03 ²⁰²	32.139 ⁵⁸	60.76 ³⁵	46.779 ¹⁰¹	28.21 ¹⁶⁵	10.97 ²⁵	30.61 ¹⁹³
June 8.1	49.63 ³⁴	83.64 ²³⁹	32.120 ¹⁹	60.35 ⁴¹	46.716 ⁶³	26.29 ¹⁹²	10.82 ¹⁵	28.39 ²²²
18.1	49.38 ²⁵	80.92 ²⁷²	32.143 ²³	59.88 ⁴⁷	46.691 ²⁵	24.14 ²¹⁵	10.76 ⁶	25.97 ²⁴²
28.0	49.23 ¹⁵	77.94 ²⁹⁸	32.206 ⁶³	59.37 ⁵¹	46.705 ¹⁴	21.84 ²³⁰	10.80 ⁴	23.39 ²⁵⁸
July 8.0	49.16 ⁷	74.82 ³¹²	32.309 ¹⁰³	58.84 ⁵³	46.758 ⁵³	19.43 ²⁴¹	10.96 ¹⁶	20.73 ²⁶⁶
18.0	49.19 ³	71.61 ³²¹	32.449 ¹⁴⁰	58.28 ⁵⁶	46.849 ⁹¹	16.99 ²⁴⁴	11.20 ²⁴	18.06 ²⁶⁷
28.0	49.32 ¹³	68.43 ³¹⁸	32.624 ¹⁷⁵	57.70 ⁵⁸	46.978 ¹²⁹	14.60 ²³⁹	11.53 ³³	15.42 ²⁶⁴
Aug. 6.9	49.32 ²²	65.38 ³⁰⁵	32.830 ²⁰⁶	57.10 ⁶⁰	47.142 ¹⁶⁴	12.34 ²²⁶	11.94 ⁴¹	12.89 ²⁵³
16.9	49.54 ³⁰	62.55 ²⁸³	33.063 ²³³	56.47 ⁶³	47.339 ¹⁹⁷	10.31 ²⁰³	12.44 ⁵⁰	10.49 ²⁴⁰
26.9	50.24 ⁴⁰	60.06 ²⁴⁹	33.323 ²⁶⁰	55.82 ⁶⁵	47.564 ²²⁵	8.55 ¹⁷⁶	13.00 ⁵⁶	8.28 ²²¹
Sept. 5.8	50.70 ⁴⁶	57.99 ²⁰⁷	33.605 ²⁸²	55.12 ⁷⁰	47.817 ²⁵³	7.15 ¹⁴⁰	13.62 ⁶²	6.30 ¹⁹⁸
15.8	51.23 ⁵³	56.44 ¹⁵⁵	33.907 ³⁰²	54.38 ⁷⁴	48.092 ²⁷⁵	6.19 ⁹⁶	14.29 ⁶⁷	4.59 ¹⁷¹
25.8	51.81 ⁵⁸	55.47 ⁹⁷	34.225 ³¹⁸	53.62 ⁷⁶	48.387 ²⁹⁵	5.72 ⁴⁷	15.00 ⁷¹	3.17 ¹⁴²
Oct. 5.8	52.42 ⁶¹	55.13 ³⁴	34.556 ³³¹	52.82 ⁸⁰	48.698 ³¹¹	5.78 ⁶	15.74 ⁷⁴	2.10 ¹⁰⁷
15.7	53.04 ⁶²	55.45 ³²	34.898 ³⁴²	52.01 ⁸¹	49.017 ³¹⁹	6.36 ⁵⁸	16.50 ⁷⁶	1.38 ⁷²
25.7	53.67 ⁶³	56.44 ⁹⁹	35.245 ³⁴⁷	51.20 ⁸¹	49.341 ³²⁴	7.48 ¹¹²	17.27 ⁷⁷	1.05 ³³
Nov. 4.7	54.27 ⁶⁰	58.07 ¹⁶³	35.593 ³⁴⁸	50.43 ⁷⁷	49.662 ³²¹	9.10 ¹⁶²	18.04 ⁷⁷	1.12 ⁷
14.7	54.83 ⁵⁶	60.30 ²²³	35.935 ³⁴²	49.72 ⁷¹	49.971 ³⁰⁹	11.18 ²⁰⁸	18.77 ⁷³	1.59 ⁴⁷
24.6	55.32 ⁴⁹	63.06 ²⁷⁶	36.262 ³²⁷	49.11 ⁶¹	50.263 ²⁹²	13.65 ²⁴⁷	19.47 ⁷⁰	2.49 ⁹⁰
Dec. 4.6	55.73 ⁴¹	66.27 ³²¹	36.568 ³⁰⁶	48.61 ⁵⁰	50.528 ²⁶⁵	16.43 ²⁷⁸	20.11 ⁶⁴	3.79 ¹³⁰
14.6	56.05 ³²	69.80 ³⁵³	36.842 ²⁷⁴	48.26 ³⁵	50.757 ²²⁹	19.42 ²⁹⁹	20.68 ⁵⁷	5.45 ¹⁶⁶
24.5	56.27 ²²	73.55 ³⁷⁵	37.078 ²³⁶	48.09 ¹⁷	50.946 ¹⁸⁹	22.53 ³¹¹	21.14 ⁴⁶	7.42 ¹⁹⁷
34.5	56.38 ¹¹	77.39 ³⁸⁴	37.267 ¹⁸⁹	48.08 ¹	51.085 ¹³⁹	25.65 ³¹²	21.50 ³⁶	9.66 ²²⁴
Mean Place	52.978	72.73	30.708	57.79	46.397	18.70	9.238	19.97
Sec δ , Tan δ	2.647	-2.451	1.133	+0.531	1.145	-0.557	2.746	+2.556
$D\phi\alpha$, $D\alpha\alpha$	0.00	-0.05	+0.07	+0.01	+0.05	-0.01	+0.13	+0.06
$D\phi\delta$, $D\delta\delta$	-0.1	+0.9	-0.1	+0.9	-0.1	+0.9	-0.1	+0.9

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	β Canis Minoris. Mag. 3.1			ρ Geminorum. Mag. 4.2			σ Argus. Mag. 3.3			α^2 Geminorum. (Castor.) Mag. 2.0		
	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.
	h m 7 22	s 142	° ' " + 8 27	h m 7 23	s 169	° ' " + 31 56	h m 7 26	s 102	° ' " - 43 7	h m 7 29	s 174	° ' " + 32 4
Jan. 0.5	38.030	142	35.23	45.328	169	69.59	36.103	102	45.71	17.243	174	26.01
10.5	38.172	92	34.11	45.497	113	69.94	36.205	38	49.24	17.417	118	26.34
20.5	38.264	41	33.13	45.610	53	70.43	36.243	24	52.68	17.555	50	26.82
30.5	38.305	8	32.32	45.663	6	71.04	36.219	84	55.93	17.594	1	27.43
Feb. 9.4	38.297	55	31.69	45.657	59	71.75	36.135	139	58.89	17.593	54	28.13
19.4	38.242	93	31.21	45.598	107	72.47	35.996	186	61.51	17.539	103	28.87
29.4	38.149	127	30.88	45.491	144	73.16	35.810	222	63.73	17.436	141	29.58
Mar. 10.3	38.022	149	30.70	45.347	172	73.79	35.587	251	65.53	17.295	171	30.24
20.3	37.873	161	30.62	45.175	187	74.32	35.336	266	66.86	17.124	186	30.80
30.3	37.712	163	30.64	44.988	191	74.72	35.070	270	67.71	16.938	191	31.22
Apr. 9.3	37.549	156	30.75	44.797	182	74.95	34.800	265	68.09	16.747	184	31.48
19.2	37.393	140	30.94	44.615	165	75.02	34.535	218	67.98	16.563	166	31.58
29.2	37.253	116	31.21	44.450	136	74.93	34.287	224	67.40	16.397	142	31.51
May 9.2	37.137	88	31.53	44.314	103	74.68	34.063	193	66.37	16.255	107	31.28
19.2	37.049	55	31.93	44.211	64	74.30	33.870	156	64.93	16.148	69	30.91
June 29.1	36.994	19	32.38	44.147	23	73.80	33.714	115	63.09	16.079	29	30.42
8.1	36.975	17	32.89	44.124	19	73.21	33.599	70	60.91	16.050	13	29.81
18.1	36.992	52	33.44	44.143	62	72.54	33.529	24	58.46	16.063	55	29.13
28.0	37.044	87	34.03	44.205	103	71.80	33.505	23	55.79	16.118	95	28.39
July 8.0	37.131	121	34.62	44.308	141	71.03	33.528	70	52.98	16.213	136	27.60
18.0	37.252	150	35.21	44.449	178	70.24	33.598	116	50.12	16.349	171	26.77
28.0	37.402	179	35.75	44.627	211	69.42	33.714	160	47.29	16.520	205	25.92
Aug. 6.9	37.581	205	36.22	44.838	240	68.59	33.874	201	44.57	16.725	233	25.05
16.9	37.786	228	36.59	45.078	267	67.75	34.075	241	42.08	16.958	263	24.16
26.9	38.014	247	36.80	45.345	290	66.90	34.316	275	39.90	17.221	285	23.26
Sept. 5.9	38.261	268	36.86	45.635	312	66.05	34.591	307	38.12	17.506	309	22.35
15.8	38.529	282	36.71	45.947	330	65.18	34.898	331	36.81	17.815	325	21.42
25.8	38.811	294	36.37	46.277	343	64.31	35.229	351	36.03	18.140	342	20.50
Oct. 5.8	39.105	306	35.80	46.620	356	63.45	35.580	363	35.84	18.482	354	19.58
15.7	39.411	310	35.00	46.976	361	62.61	35.943	368	36.27	18.836	361	18.68
25.7	39.721	311	34.00	47.337	362	61.83	36.311	363	37.30	19.197	363	17.83
Nov. 4.7	40.032	305	32.84	47.699	355	61.12	36.674	349	38.92	19.560	356	17.06
14.7	40.337	293	31.55	48.054	342	60.51	37.023	325	41.09	19.916	345	16.41
24.6	40.630	274	30.17	48.396	318	60.03	37.348	291	43.74	20.261	324	15.88
Dec. 4.6	40.904	245	28.76	48.714	289	59.72	37.639	248	46.77	20.585	292	15.51
14.6	41.149	210	27.36	49.003	247	59.57	37.887	197	50.08	20.877	252	15.33
24.6	41.359	167	26.03	49.250	190	59.61	38.084	138	53.58	21.129	204	15.34
34.5	41.526		24.81	49.449		59.85	38.222		57.14	21.333		15.55
Mean Place	35.794		34.04	42.652		69.91	33.898		50.87	14.569		26.76
Sec δ , Tan δ	1.011		+0.149	1.178		+0.624	1.370		-0.937	1.180		+0.627
$D\psi \alpha, D\omega \alpha$	+0.07		0.00	+0.08		+0.01	+0.05		-0.02	+0.08		+0.02
$D\psi \delta, D\omega \delta$	-0.1		+0.9	-0.1		+0.9	-0.1		+0.9	-0.2		+0.9

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	25 Monocerotis. Mag. 5.2			α Canis Minoris. (Procyon.) Mag. 0.5			24 Lyncis. Mag. 5.0			κ Geminorum. Mag. 3.7		
	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.
	h m 7 33	s — 3 55	° ' "	h m 7 34	s + 5 26	° ' "	h m 7 35	s +58 54	° ' "	h m 7 39	s +24 35	° ' "
Jan. 0.5	8.192	141	19.23	56.463	146	28.21	58.630	27.14	25.224	176	60.23	19
10.5	8.333	92	21.12	56.609	137	26.84	58.885	28.97	25.400	122	60.04	1
20.5	8.425	43	22.86	56.708	97	25.64	59.050	30.97	25.522	67	60.03	15
30.5	8.468	—	24.41	56.752	46	24.61	59.121	33.05	25.589	12	60.18	28
Feb. 9.4	8.461	7	25.76	56.749	3	23.76	59.099	35.12	25.601	40	60.46	36
19.4	8.409	92	26.87	56.700	91	23.11	58.991	37.09	25.561	87	60.82	42
29.4	8.317	125	27.76	56.609	123	22.64	58.804	38.88	25.474	125	61.24	43
Mar. 10.4	8.192	147	28.40	56.486	145	22.32	58.553	40.39	25.349	151	61.67	41
20.3	8.045	161	28.84	56.341	160	22.17	58.255	41.57	25.198	170	62.08	35
30.3	7.884	165	29.04	56.181	163	22.13	57.928	42.37	25.028	174	62.43	28
Apr. 9.3	7.719	160	29.05	56.018	157	22.21	57.588	42.76	24.854	168	62.71	18
19.2	7.559	146	28.84	55.861	143	22.40	57.254	42.74	24.686	155	62.89	9
29.2	7.413	124	28.46	55.718	120	22.69	56.944	42.30	24.531	133	62.98	0
May 9.2	7.289	98	27.90	55.598	94	23.07	56.671	41.46	24.398	103	62.98	9
19.2	7.191	67	27.17	55.504	61	23.53	56.447	40.27	24.295	69	62.89	16
29.1	7.124	34	26.29	55.443	28	24.06	56.280	38.78	24.226	32	62.73	24
June 8.1	7.090	1	25.27	55.415	8	24.67	56.178	37.01	24.194	6	62.49	29
18.1	7.089	35	24.15	55.423	41	25.33	56.144	35.03	24.200	43	62.20	33
28.1	7.124	68	22.94	55.464	77	26.02	56.177	32.89	24.243	82	61.87	37
July 8.0	7.192	100	21.70	55.541	109	26.72	56.280	30.66	24.325	117	61.50	41
18.0	7.292	132	20.45	55.650	139	27.41	56.449	28.37	24.442	151	61.09	46
28.0	7.424	161	19.27	55.789	168	28.04	56.681	26.09	24.593	182	60.63	50
Aug. 6.9	7.585	186	18.16	55.957	193	28.60	56.971	23.83	24.775	210	60.13	55
16.9	7.771	212	17.19	56.150	218	29.04	57.314	21.66	24.985	236	59.58	62
26.9	7.983	233	16.44	56.368	238	29.32	57.706	19.62	25.221	261	58.96	70
Sept. 5.9	8.216	254	15.91	56.606	259	29.42	58.141	17.72	25.482	281	58.26	76
15.8	8.470	271	15.67	56.865	274	29.30	58.613	16.02	25.763	301	57.50	83
25.8	8.741	286	15.74	57.139	289	28.94	59.118	14.53	26.064	317	56.67	90
Oct. 5.8	9.027	296	16.14	57.428	299	28.33	59.649	13.29	26.381	329	55.77	96
15.8	9.323	305	16.89	57.727	308	27.48	60.198	12.32	26.710	339	54.81	98
25.7	9.628	305	17.96	58.035	308	26.39	60.758	11.67	27.049	342	53.83	100
Nov. 4.7	9.933	300	19.32	58.343	304	25.10	61.318	11.35	27.391	339	52.83	96
14.7	10.233	290	20.94	58.647	293	23.65	61.870	11.36	27.730	330	51.87	89
24.6	10.523	270	22.76	58.940	275	22.09	62.397	11.75	28.060	309	50.98	78
Dec. 4.6	10.793	244	24.72	59.215	247	20.47	62.889	12.50	28.369	284	50.20	64
14.6	11.037	208	26.74	59.462	213	18.85	63.331	13.61	28.653	247	49.56	48
24.6	11.245	167	28.77	59.675	171	17.29	63.708	15.02	28.900	203	49.08	31
34.5	11.412	—	30.73	59.846	—	15.83	64.011	16.72	29.103	—	48.77	—
Mean Place	6.082	21.06	54.334	27.47	54.485	29.69	22.749	61.18				
Sec δ , Tan δ	1.002	-0.069	1.005	+0.095	1.936	+1.657	1.100	+0.458				
$D\phi\alpha$, $D\omega\alpha$	+0.06	0.00	+0.06	0.00	+0.10	+0.04	+0.07	+0.01				
$D\phi\delta$, $D\omega\delta$	-0.2	+0.9	-0.2	+0.9	-0.2	+0.9	-0.2	+0.9				

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	β Geminorum. (Pollux.) Mag. 1.2		γ Puppi. Mag. 5.1		ξ Argus. Mag. 3.5		ϕ Geminorum. Mag. 5.0	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	<div>h m 7 40</div>	<div>° ' +28 13</div>	<div>h m 7 42</div>	<div>° ' -14 21</div>	<div>h m 7 45</div>	<div>° ' -24 38</div>	<div>h m 7 48</div>	<div>° ' +26 58</div>
	<div>s</div>	<div>"</div>	<div>s</div>	<div>"</div>	<div>s</div>	<div>"</div>	<div>s</div>	<div>"</div>
Jan. 0.5	13.251	46.88	6.843	29.26	47.715	49.83	24.075	61.52
10.5	13.431 ¹⁸⁰	46.91 ³	6.985 ¹⁴²	31.73 ²⁴⁷	47.855 ¹⁴⁰	52.79 ²⁹⁶	24.263 ¹⁸⁸	61.45 ⁷
20.5	13.556 ¹²⁵	47.14 ²⁸	7.077 ⁹²	34.06 ²³³	47.943 ⁸⁸	55.63 ²⁸⁴	24.396 ¹³³	61.57 ¹²
30.5	13.625 ⁶⁹	47.50 ³⁶	7.119 ⁴²	36.20 ²¹⁴	47.977 ³⁴	58.29 ²⁶⁶	24.473 ⁷⁷	61.85 ²⁸
Feb. 9.4	13.636 ¹¹	47.98 ⁴⁸	7.111 ⁸	38.11 ¹⁹¹	47.959 ¹⁸	60.70 ²⁴¹	24.494 ²¹	62.26 ⁴¹
	⁴³	⁵⁶	⁵⁵	¹⁶⁶	⁶⁷	²¹³	³³	⁵¹
19.4	13.593	48.54	7.056	39.77	47.892	62.83	24.461	62.77
29.4	13.503 ⁹⁰	49.13 ⁵⁹	6.961 ⁹⁵	41.14 ¹³⁷	47.783 ¹⁰⁹	64.64 ¹⁸¹	24.380 ⁸¹	63.32 ⁵⁵
Mar. 10.4	13.374 ¹²⁹	49.70 ⁵⁷	6.832 ¹²⁹	42.20 ¹⁰⁶	47.640 ¹⁴³	66.09 ¹⁴⁵	24.259 ¹²¹	63.87 ⁵⁵
20.3	13.215 ¹⁵⁹	50.21 ⁵¹	6.678 ¹⁵⁴	42.97 ⁷⁷	47.469 ¹⁷¹	67.17 ¹⁰⁸	24.109 ¹⁵⁰	64.38 ⁵¹
30.3	13.040 ¹⁷⁵	50.64 ⁴³	6.509 ¹⁶⁹	43.44 ⁴⁷	47.283 ¹⁸⁶	67.87 ⁷⁰	23.941 ¹⁶⁸	64.82 ⁴⁴
	¹⁸²	³¹	¹⁷³	¹⁵	¹⁹²	³³	¹⁷⁵	³⁵
Apr. 9.3	12.858	50.95	6.336	43.59	47.091	68.20	23.766	65.17
19.2	12.681 ¹⁷⁷	51.12 ¹⁷	6.167 ¹⁶⁹	43.46 ¹³	46.901 ¹⁹⁰	68.17 ³	23.593 ¹⁷³	65.40 ²³
29.2	12.520 ¹⁶¹	51.17 ⁵	6.009 ¹⁵⁸	43.04 ⁴²	46.723 ¹⁷⁸	67.77 ⁴⁰	23.432 ¹⁶¹	65.51 ¹¹
May 9.2	12.380 ¹⁴⁰	51.09 ⁸	5.871 ¹³⁸	42.37 ⁶⁷	46.565 ¹⁵⁶	67.01 ⁷⁶	23.293 ¹³⁹	65.50 ¹
19.2	12.272 ¹⁰⁸	50.89 ²⁰	5.758 ¹¹³	41.45 ⁹²	46.430 ¹³⁵	65.93 ¹⁰⁸	23.183 ¹¹⁰	65.37 ¹³
	⁷⁴	³⁰	⁸³	¹¹⁵	¹⁰⁶	¹³⁶	⁷⁷	²⁴
29.1	12.198	50.59	5.675	40.30	46.325	64.57	23.106	65.13
June 8.1	12.161 ³⁷	50.19 ⁴⁰	5.623 ⁵²	38.95 ¹³⁵	46.254 ⁷¹	62.93 ¹⁶⁴	23.064 ⁴²	64.81 ³³
18.1	12.163 ²	49.72 ⁴⁷	5.605 ¹⁸	37.42 ¹⁵³	46.217 ³⁷	61.08 ¹⁸⁵	23.060 ⁴	64.43 ³⁸
28.1	12.206 ⁴³	49.19 ⁵³	5.622 ¹⁷	35.77 ¹⁶⁵	46.215 ²	59.04 ²⁰⁴	23.095 ³⁵	63.95 ⁴⁸
July 8.0	12.288 ⁸²	48.61 ⁵⁸	5.673 ⁵¹	34.06 ¹⁷¹	46.251 ³⁶	56.91 ²¹³	23.169 ⁷⁴	63.42 ⁵³
	¹¹⁸	⁶⁴	⁸⁴	¹⁷⁵	⁷²	²¹⁸	¹⁰⁹	⁵⁴
18.0	12.406	47.97	5.757	32.31	46.323	54.73	23.278	62.86
28.0	12.559 ¹⁵³	47.30 ⁶⁷	5.873 ¹¹⁶	30.60 ¹⁷¹	46.429 ¹⁰⁶	52.56 ²¹⁷	23.420 ¹⁴²	62.23 ⁶³
Aug. 6.9	12.744 ¹⁸⁵	46.58 ⁷²	6.020 ¹⁴⁷	28.99 ¹⁶¹	46.568 ¹³⁹	50.50 ²⁰⁶	23.595 ¹⁷⁵	61.55 ⁶⁶
16.9	12.959 ²¹⁵	45.83 ⁷⁵	6.196 ¹⁷⁶	27.53 ¹⁴⁶	46.741 ¹⁷³	48.60 ¹⁹⁰	23.801 ²⁰⁶	60.82 ⁷³
26.9	13.200 ²⁴¹	45.04 ⁷⁹	6.398 ²⁰²	26.31 ¹²²	46.943 ²⁰²	46.96 ¹⁶⁴	24.035 ²³⁴	60.04 ⁷⁸
	²⁶⁷	⁸⁴	²²⁷	⁹³	²²⁸	¹³²	²⁶⁰	⁸⁵
Sept. 5.9	13.467	44.20	6.625	25.38	47.171	45.64	24.295	59.19
15.8	13.755 ²⁸⁸	43.31 ⁸⁹	6.873 ²⁴⁸	24.79 ⁵⁹	47.426 ²⁵⁵	44.70 ⁹⁴	24.576 ²⁸¹	58.27 ⁹²
25.8	14.063 ³⁰⁸	42.38 ⁹³	7.141 ²⁶⁸	24.59 ²⁰	47.702 ²⁷⁶	44.22 ⁴⁸	24.876 ³⁰⁰	57.32 ⁹⁶
Oct. 5.8	14.388 ³²⁵	41.42 ⁹⁶	7.429 ²⁸⁸	24.79 ²⁰	47.998 ²⁹⁶	44.21 ¹	25.194 ³¹⁸	56.32 ¹⁰⁰
15.8	14.726 ³³⁸	40.44 ⁹⁸	7.728 ²⁹⁹	25.42 ⁶³	48.308 ³¹⁰	44.71 ⁵⁰	25.528 ³³⁴	55.27 ¹⁰⁵
	³⁴⁶	⁹⁷	³⁰⁷	¹⁰⁶	³¹⁸	¹⁰⁰	³⁴⁶	¹⁰⁴
25.7	15.072	39.47	8.035	26.48	48.626	45.71	25.874	54.23
Nov. 4.7	15.423 ³⁵¹	38.53 ⁹⁴	8.344 ³⁰⁹	27.93 ¹⁴⁵	48.947 ³²¹	47.19 ¹⁴⁸	26.224 ³⁵⁰	53.20 ¹⁰³
14.7	15.772 ³⁴⁹	37.66 ⁸⁷	8.650 ³⁰⁶	29.73 ¹⁸⁰	49.263 ³¹⁶	49.11 ¹⁹²	26.571 ³⁴⁷	52.23 ⁹⁷
24.6	16.110 ³³⁸	36.90 ⁷⁶	8.945 ²⁹⁵	31.84 ²¹¹	49.565 ³⁰²	51.41 ²³⁰	26.909 ³³⁸	51.36 ⁸⁷
Dec. 4.6	16.429 ³¹⁹	36.27 ⁶³	9.219 ²⁷⁴	34.16 ²³²	49.847 ²⁸²	54.02 ²⁶¹	27.230 ³²¹	50.61 ⁷⁸
	²⁹⁰	⁴⁶	²⁴⁷	²⁴⁸	²⁶¹	²⁸²	²⁹⁶	⁵⁷
14.6	16.719	35.81	9.466	36.64	50.098	56.84	27.526	50.04
24.6	16.972 ²⁵³	35.54 ²⁷	9.678 ²¹²	39.18 ²⁵⁴	50.312 ²¹⁴	59.79 ²⁹⁵	27.785 ²⁶⁹	49.66 ³⁸
34.5	17.180 ²⁰⁸	35.45 ⁹	9.846 ¹⁶⁸	41.71 ²⁵³	50.479 ¹⁶⁷	62.77 ²⁹⁸	27.999 ²¹⁴	49.46 ²⁰
Mean Place	10.693	48.17	4.799	31.95	45.688	53.64	21.559	63.30
Sec δ , Tan δ	1.135	+0.537	1.032	-0.256	1.100	-0.459	1.122	+0.509
$D\psi\alpha$, $D_\alpha\alpha$	+0.07	+0.02	+0.05	-0.01	+0.05	-0.01	+0.07	+0.02
$D\psi\delta$, $D_\alpha\delta$	-0.2	+0.9	-0.2	+0.9	-0.2	+0.9	-0.2	+0.9

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	26 Lyncis. Mag. 5.7		Groombridge 1374. Mag. 5.6		χ Argus. Mag. 3.6		ω Cancri Mag. 5.9	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 7 48	° ' " +47 46	h m 7 50	° ' " +74 8	h m 7 54	° ' " -52 45	h m 7 55	° ' " +25 37
Jan. 0.6	39.423	57.21	17.28	34.40	40.918	17.45	53.512	23.01
10.5	39.653 ²³⁰	58.39 ¹¹⁸	17.72 ⁴⁴	36.84 ²⁴⁴	41.055 ¹³⁷	21.23 ³⁷⁸	53.705 ¹⁹³	22.83 ¹⁸
20.5	39.815 ¹⁶²	59.76 ¹³⁷	18.00 ²⁸	39.49 ²⁶⁵	41.119 ⁶⁴	24.97 ³⁷⁴	53.846 ¹⁴¹	22.83 ⁰
30.5	39.903 ⁸⁸	61.25 ¹⁴⁹	18.11 ¹¹	42.21 ²⁷²	41.108 ¹¹	28.59 ³⁶²	53.930 ⁸⁴	23.02 ¹⁹
Feb. 9.4	39.919 ¹⁶	62.82 ¹⁵⁷	18.05 ⁶	44.90 ²⁶⁹	41.025 ⁸³	31.98 ³³⁹	53.958 ²⁸	23.36 ³⁴
19.4	39.864	64.37 ¹⁵⁵	17.84 ²¹	47.45 ²⁵⁵	40.874 ¹⁵¹	35.06 ³⁰⁸	53.932 ²⁶	23.79 ⁴³
29.4	39.747 ¹¹⁷	65.83 ¹⁴⁶	17.46 ³⁸	49.77 ²³²	40.665 ²⁰⁹	37.78 ²⁷²	53.860 ⁷²	24.29 ⁵⁰
Mar. 10.4	39.578 ¹⁶⁹	67.13 ¹³⁰	16.97 ⁴⁹	51.73 ¹⁹⁶	40.409 ²⁵⁶	40.09 ²³¹	53.747 ¹¹³	24.81 ⁵²
20.3	39.369 ²⁰⁹	68.20 ¹⁰⁷	16.39 ⁵⁸	53.28 ¹⁵⁵	40.115 ²⁹⁴	41.93 ¹⁸⁴	53.603 ¹⁴⁴	25.32 ⁵¹
30.3	39.134 ²³⁵	69.00 ⁸⁰	15.74 ⁶⁶	54.35 ¹⁰⁷	39.797 ³¹⁸	43.28 ¹³⁵	53.439 ¹⁶⁴	25.78 ⁴⁶
Apr. 9.3	38.887 ²⁴⁷	69.50 ⁵⁰	15.05 ⁶⁹	54.91 ⁵⁶	39.466 ³³¹	44.13 ⁸⁵	53.267 ¹⁷²	26.15 ³⁷
19.3	38.642 ²⁴⁵	69.68 ¹⁸	14.36 ⁶⁹	54.94 ³	39.135 ³³¹	44.48 ³⁵	53.096 ¹⁷¹	26.41 ²⁶
29.2	38.414 ²²⁸	69.54 ¹⁴	13.70 ⁶⁶	54.42 ⁵²	38.813 ³²²	44.30 ¹⁸	52.936 ¹⁶⁰	26.56 ¹⁵
May 9.2	38.213 ²⁰¹	69.09 ⁴⁵	13.10 ⁶⁰	53.42 ¹⁰⁰	38.512 ³⁰¹	43.63 ⁶⁷	52.797 ¹³⁹	26.62 ⁶
19.2	38.047 ¹⁶⁶	68.33 ⁷⁶	12.57 ⁵³	51.95 ¹⁴⁷	38.240 ²⁷²	42.48 ¹¹⁵	52.686 ¹¹¹	26.57 ⁵
29.1	37.925 ¹²²	67.33 ¹⁰⁰	12.14 ⁴³	50.08 ¹⁸⁷	38.004 ²³⁶	40.89 ¹⁵⁹	52.605 ⁸¹	26.41 ¹⁶
June 8.1	37.850 ⁷⁵	66.09 ¹²⁴	11.83 ³¹	47.85 ²²³	37.809 ¹⁹⁵	38.89 ²⁰⁰	52.558 ⁴⁷	26.15 ²⁶
18.1	37.826 ²⁴	64.67 ¹⁴²	11.63 ²⁰	45.33 ²⁵²	37.663 ¹⁴⁶	36.55 ²³⁴	52.549 ⁹	25.82 ³³
28.1	37.853 ²⁷	63.10 ¹⁵⁷	11.56 ⁷	42.60 ²⁷³	37.569 ⁹⁴	33.91 ²⁶⁴	52.576 ²⁷	25.45 ³⁷
July 8.0	37.933 ⁸⁰	61.42 ¹⁶⁸	11.62 ⁶	39.73 ²⁸⁷	37.528 ⁴¹	31.06 ²⁸³	52.640 ⁶⁴	24.99 ⁴⁶
18.0	38.062 ¹²⁹	59.67 ¹⁷⁵	11.82 ²⁰	36.78 ²⁹⁵	37.543 ¹⁵	28.11 ²⁹⁷	52.741 ¹⁰¹	24.47 ⁵²
28.0	38.238 ¹⁷⁶	57.87 ¹⁸⁰	12.13 ³¹	33.81 ²⁹⁷	37.613 ⁷⁰	25.11 ³⁰⁰	52.875 ¹³⁴	23.92 ⁵⁵
Aug. 7.0	38.458 ²²⁰	56.07 ¹⁹⁰	12.56 ⁴³	30.89 ²⁹²	37.739 ¹²⁶	22.16 ²⁹⁵	53.041 ¹⁶⁶	23.29 ⁶³
16.9	38.718 ²⁶⁰	54.28 ¹⁷⁹	13.10 ⁵⁴	28.07 ²⁸²	37.920 ¹⁸¹	19.38 ²⁷⁸	53.238 ¹⁹⁷	22.59 ⁷⁰
26.9	39.016 ²⁹⁸	52.55 ¹⁷³	13.75 ⁶⁵	25.43 ²⁶⁴	38.154 ²³⁴	16.87 ²⁵¹	53.461 ²²³	21.84 ⁷⁵
Sept. 5.9	39.347 ³³¹	50.89 ¹⁶⁶	14.48 ⁷³	23.00 ²⁴³	38.436 ²⁸²	14.72 ²¹⁵	53.711 ²⁵⁰	21.00 ⁸⁴
15.8	39.710 ³⁶³	49.32 ¹⁵⁷	15.29 ⁸¹	20.83 ²¹⁷	38.762 ³²⁶	13.01 ¹⁷¹	53.984 ²⁷³	20.10 ⁹⁰
25.8	40.099 ³⁸⁹	47.87 ¹⁴⁵	16.17 ⁸⁸	18.95 ¹⁸⁸	39.127 ³⁶⁵	11.83 ¹¹⁸	54.278 ²⁹⁴	19.11 ⁹⁹
Oct. 5.8	40.510 ⁴¹¹	46.55 ¹³²	17.11 ⁹⁴	17.44 ¹⁵¹	39.523 ³⁹⁶	11.24 ⁵⁹	54.590 ³¹²	18.07 ¹⁰⁴
15.8	40.939 ⁴²⁹	45.43 ¹¹²	18.08 ⁹⁷	16.31 ¹¹³	39.940 ⁴¹⁷	11.29 ⁵	54.917 ³²⁷	16.98 ¹⁰⁹
25.7	41.381 ⁴⁴²	44.50 ⁹³	19.08 ¹⁰⁰	15.60 ⁷¹	40.369 ⁴²⁹	11.98 ⁶⁹	55.258 ³⁴¹	15.86 ¹¹²
Nov. 4.7	41.828 ⁴⁴⁷	43.81 ⁶⁹	20.07 ⁹⁹	15.32 ²⁸	40.798 ⁴²⁹	13.31 ¹³³	55.605 ³⁴⁷	14.75 ¹¹¹
14.7	42.271 ⁴⁴³	43.37 ⁴⁴	21.06 ⁹⁹	15.51 ¹⁹	41.216 ⁴¹⁸	15.25 ¹⁹⁴	55.951 ³⁴⁶	13.69 ¹⁰⁶
24.7	42.700 ⁴²⁹	43.22 ¹⁵	22.00 ⁹⁴	16.18 ⁶⁷	41.609 ³⁹³	17.74 ²⁴⁹	56.291 ³⁴⁰	12.71 ⁹⁸
Dec. 4.6	43.106 ⁴⁰⁶	43.38 ¹⁶	22.87 ⁸⁷	17.31 ¹¹³	41.966 ³⁵⁷	20.69 ²⁹⁵	56.614 ³²³	11.86 ⁸⁵
14.6	43.476 ³⁷⁰	43.83 ⁴⁵	23.65 ⁷⁸	18.87 ¹⁵⁶	42.274 ³⁰⁸	24.01 ³³²	56.911 ²⁹⁷	11.18 ⁶⁸
24.6	43.801 ³²⁵	44.58 ⁷⁵	24.32 ⁶⁷	20.82 ¹⁹⁶	42.523 ²⁴⁹	27.61 ³⁶⁰	57.174 ²⁶³	10.67 ⁵¹
34.5	44.068 ²⁶⁷	45.59 ¹⁰¹	24.84 ⁵²	23.10 ²²⁸	42.705 ¹⁸²	31.35 ³⁷⁴	57.395 ²²¹	10.34 ³³
Mean Place	36.153	60.54	10.049	38.80	38.618	24.32	51.041	25.16
Sec δ , Tan δ	1.488	+1.102	3.660	+3.521	1.652	-1.315	1.109	+0.480
D ϕ α , D ω α	+0.09	+0.03	+0.14	+0.11	+0.03	-0.04	+0.07	+0.02
D ϕ δ , D ω δ	-0.2	+0.9	-0.2	+0.9	-0.2	+0.9	-0.2	+0.9

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	χ Geminorum. Mag. 5.0			27 Lyncis. Mag. 4.9			ρ Argus. Mag. 2.9			3 H. Ursæ Majoris. Mag. 5.5		
	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.
	h m 7 58	s	° ' "	h m 8 2	s	° ' "	h m 8 3	s	° ' "	h m 8 4	s	° ' "
Jan. 0.6	24.270		48.00	12.350		55.13	59.965		37.14	33.78		76.32
10.5	24.470 ²⁰⁰		47.95 5	12.614 ²⁶⁴		56.44 131	60.124 ¹⁵⁹		40.09 ²⁹⁵	34.17 ³⁹		78.47 ²¹⁵
20.5	24.616 ¹⁴⁶		48.10 15	12.803 ¹⁸⁹		57.99 155	60.233 ¹⁰⁹		42.96 ²⁸⁷	34.44 ²⁷		80.83 ²³⁶
30.5	24.704 ⁸⁸		48.43 33	12.914 ¹¹¹		59.70 171	60.287 ⁵⁴		45.66 ²⁷⁰	34.58 ¹⁴		83.33 ²⁵⁰
Feb. 9.5	24.735 ³¹		48.90 47	12.944 ³⁰		61.48 178	60.289 ²		48.12 ²⁴⁶	34.59 ¹		85.87 ²⁵⁴
		23	57		45	178		47	220		11	246
19.4	24.712		49.47	12.899		63.26	60.242		50.32	34.48		88.33
29.4	24.639 ⁷³		50.09 62	12.784 ¹¹⁵		64.94 168	60.150 ⁹²		52.21 ¹⁸⁹	34.24 ²⁴		90.60 ²²⁷
Mar. 10.4	24.524 ¹¹⁵		50.72 63	12.611 ¹⁷³		66.46 152	60.020 ¹³⁰		53.75 ¹⁵⁴	33.92 ³²		92.59 ¹⁹⁹
20.3	24.379 ¹⁴⁵		51.31 59	12.391 ²²⁰		67.74 128	59.862 ¹⁵⁸		54.94 ¹¹⁹	33.51 ⁴¹		94.22 ¹⁶³
30.3	24.212 ¹⁶⁷		51.83 52	12.138 ²⁵³		68.73 99	59.687 ¹⁷⁵		55.76 ⁸²	33.05 ⁴⁶		95.42 ¹³⁰
		176	41		268	65		186	46		50	74
Apr. 9.3	24.036		52.24 28	11.870 ²⁶⁹		69.38 30	59.501 ¹⁸⁵		56.22 ⁹	32.55 ⁵⁰		96.16 ²⁶
19.3	23.861 ¹⁷⁵		52.52 15	11.601 ²⁵⁶		69.68 6	59.316 ¹⁷⁷		56.31 ²⁷	32.05 ⁴⁹		96.42 ²⁴
29.2	23.698 ¹⁶³		52.67 1	11.345 ²³³		69.62 42	59.139 ¹⁶⁰		56.04 ⁶¹	31.56 ⁴⁵		96.18 ⁷⁴
May 9.2	23.554 ¹⁴⁴		52.68 11	11.112 ¹⁹⁵		69.20 76	58.979 ¹³⁹		55.43 ⁹³	31.11 ³⁹		95.44 ¹¹⁸
19.2	23.438 ¹¹⁶		52.57 24	10.917 ¹⁵³		68.44 106	58.840 ¹¹¹		54.50 ¹²⁴	30.72 ³²		94.26 ¹⁵⁹
		85			153							
29.2	23.353 ⁵⁰		52.33 35	10.764 ¹⁰³		67.38 132	58.729 ⁸²		53.26 ¹⁵⁰	30.40 ²⁵		92.67 ¹⁹⁴
June 8.1	23.303 ¹²		51.98 44	10.661 ⁵¹		66.06 156	58.647 ⁵⁰		51.76 ¹⁷⁴	30.15 ¹⁵		90.73 ²²⁴
18.1	23.291 ²⁶		51.54 52	10.610 ⁵		64.50 174	58.597 ¹⁵		50.02 ¹⁹¹	30.00 ⁷		88.49 ²⁴⁸
28.1	23.317 ⁶³		51.02 59	10.615 ⁵⁹		62.76 188	58.582 ²⁰		48.11 ²⁰⁴	29.93 ³		86.01 ²⁶⁶
July 8.0	23.380 ¹⁰⁰		50.43 66	10.674 ¹¹²		60.88 198	58.602 ⁵⁵		46.07 ²¹²	29.96 ¹³		83.35 ²⁷⁶
18.0	23.480		49.77 73	10.786 ¹⁶⁴		58.90 204	58.657 ⁸⁸		43.95 ²¹⁰	30.09 ²²		80.59 ²⁸¹
28.0	23.614 ¹³⁴		49.04 77	10.950 ²¹²		56.86 207	58.745 ¹²²		41.85 ²⁰²	30.31 ³¹		77.78 ²⁸¹
Aug. 7.0	23.781 ¹⁶⁷		48.27 84	11.162 ²⁵⁸		54.79 205	58.867 ¹⁵⁵		39.83 ¹⁸⁸	30.62 ³⁸		74.97 ²⁷⁵
16.9	23.979 ¹⁹⁸		47.43 89	11.420 ³⁰⁰		52.74 201	59.022 ¹⁸⁴		37.95 ¹⁶⁴	31.00 ⁴⁷		72.22 ²⁶⁴
26.9	24.204 ²²⁵		46.54 95	11.720 ³³⁹		50.73 194	59.206 ²¹⁵		36.31 ¹³³	31.47 ⁵³		69.58 ²⁴⁷
		252										
Sept. 5.9	24.456 ²⁷⁵		45.59 101	12.059 ³⁷³		48.79 183	59.421 ²⁴¹		34.98 ⁹⁸	32.00 ⁶⁰		67.11 ²²⁵
15.8	24.731 ²⁹⁹		44.58 108	12.432 ⁴⁰⁶		46.96 168	59.662 ²⁶⁷		34.00 ⁵⁵	32.60 ⁶⁶		64.86 ²⁶⁰
25.8	25.030 ³¹⁶		43.50 111	12.838 ⁴³³		45.28 152	59.929 ²⁸⁷		33.45 ⁷	33.26 ⁷⁰		62.86 ¹⁷¹
Oct. 5.8	25.346 ³³⁴		42.39 113	13.271 ⁴⁵⁵		43.76 132	60.216 ³⁰⁶		33.38 ⁴¹	33.96 ⁷³		61.15 ¹³⁸
15.8	25.680 ³⁴⁶		41.26 113	13.726 ⁴⁷¹		42.44 107	60.522 ³¹⁷		33.79 ⁹¹	34.69 ⁷⁶		59.77 ⁹⁸
25.7	26.026 ³⁵⁴		40.13 109	14.197 ⁴⁸⁰		41.37 81	60.839 ³²⁴		34.70 ¹³⁹	35.45 ⁷⁷		58.79 ⁵⁷
Nov. 4.7	26.380 ³⁵³		39.04 103	14.677 ⁴⁷⁹		40.56 51	61.163 ³²²		36.09 ¹⁸³	36.22 ⁷⁷		58.22 ¹⁵
14.7	26.733 ³⁴⁶		38.01 92	15.156 ⁴⁶⁸		40.05 18	61.485 ³¹²		37.92 ²²⁵	36.99 ⁷⁴		58.07 ³⁹
24.7	27.079 ³³¹		37.09 77	15.624 ⁴⁴⁶		39.87 17	61.797 ²⁹⁴		40.17 ²⁵⁵	37.73 ⁷⁰		58.37 ⁷⁸
Dec. 4.6	27.410 ³⁰⁵		36.32 60	16.070 ⁴⁰⁹		40.04 50	62.091 ²⁶⁶		42.72 ²⁷⁷	38.43 ⁶⁴		59.13 ¹¹⁸
14.6	27.715 ²⁷⁰		35.72 40	16.479 ³⁶¹		40.54 84	62.357 ²³¹		45.49 ²⁹²	39.07 ⁵⁵		60.31 ¹⁵⁹
24.6	27.985 ²²⁷		35.32 19	16.840 ³⁰¹		41.38 116	62.588 ¹⁸⁸		48.41 ²⁹⁷	39.62 ⁴⁵		61.90 ¹⁹⁷
34.5	28.212		35.13	17.141		42.54	62.776		51.38	40.07		63.87
Mean Place	21.749		50.57	8.868		59.99	57.982		40.92	28.232		82.22
Sec δ , Tan δ	1.133		+0.532	1.615		+1.268	1.095		-0.447	2.755		+2.567
$D\psi\alpha$, $D\omega\alpha$	+0.07		+0.02	+0.09		+0.04	+0.05		-0.02	+0.12		+0.09
$D\psi\delta$, $D\omega\delta$	-0.2		+0.9	-0.2		+0.9	-0.2		+0.9	-0.2		+0.9

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	γ Argus. Mag. 2.2			ζ Cancri (<i>mean</i>). Mag. 4.7			Bradley 1147. Mag. 5.7			30 Puppis. Mag. 5.0		
	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.
	h m 8 6	° ' 5	—47 5	h m 8 7	° ' 53	+17 53	h m 8 9	° ' 0	+76 0	h m 8 9	° ' 31	—15 31
	s	"	"	s	"	"	s	"	"	s	"	"
Jan. 0.6	58.831 ₁₅₉	12.52 ₃₆₈		26.092 ₁₉₅	65.46 ₇₄		9.43 ₅₅	47.34 ₂₃₉		30.293 ₁₆₉	61.28 ₂₅₈	
10.5	58.990 ₉₀	16.20 ₃₆₆		26.287 ₁₄₅	64.72 ₅₀		9.98 ₃₇	49.73 ₂₆₅		30.462 ₁₂₁	63.86 ₂₄₇	
20.5	59.080 ₂₅	19.86 ₃₅₄		26.432 ₈₉	64.22 ₃₂		10.35 ₁₉	52.38 ₂₇₇		30.583 ₆₉	66.33 ₂₃₀	
30.5	59.105 ₄₃	23.40 ₃₃₄		26.521 ₃₈	63.90 ₁₄		10.54 ₁	55.15 ₂₇₉		30.652 ₁₈	68.63 ₂₀₈	
Feb. 9.5	59.062 ₁₀₄	26.74 ₃₀₄		26.559 ₁₃	63.76 ₂		10.53 ₁₉	57.94 ₂₆₉		30.670 ₃₀	70.71 ₁₈₃	
19.4	58.958 ₁₅₈	29.78 ₂₆₉		26.546 ₅₈	63.74 ₁₃		10.34 ₃₆	60.63 ₂₄₉		30.640 ₇₅	72.54 ₁₅₃	
29.4	58.800 ₂₀₅	32.47 ₂₃₀		26.488 ₉₉	63.87 ₂₂		9.98 ₅₁	63.12 ₂₁₇		30.565 ₁₁₁	74.07 ₁₂₄	
Mar. 10.4	58.595 ₂₄₀	34.77 ₁₈₆		26.389 ₁₃₁	64.09 ₂₉		9.47 ₆₄	65.29 ₁₇₆		30.454 ₁₃₈	75.31 ₉₄	
20.3	58.355 ₂₆₅	36.63 ₁₃₈		26.258 ₁₄₇	64.38 ₃₁		8.83 ₇₁	67.05 ₁₃₁		30.316 ₁₅₇	76.25 ₆₂	
30.3	58.090 ₂₇₈	38.01 ₉₃		26.111 ₁₅₈	64.69 ₃₀		8.12 ₇₇	68.36 ₇₉		30.159 ₁₆₈	76.87 ₃₂	
Apr. 9.3	57.812 ₂₈₁	38.94 ₄₂		25.953 ₁₆₁	64.99 ₂₈		7.35 ₇₉	69.15 ₂₆		29.991 ₁₆₈	77.19 ₃	
19.3	57.531 ₂₇₄	39.36 ₇		25.792 ₁₄₉	65.27 ₂₄		6.56 ₇₇	69.41 ₂₈		29.823 ₁₅₉	77.22 ₂₇	
29.2	57.257 ₂₆₆	39.29 ₅₅		25.643 ₁₃₃	65.51 ₂₄		5.79 ₇₂	69.13 ₈₁		29.664 ₁₄₆	76.95 ₅₃	
May 9.2	57.001 ₂₃₄	38.74 ₁₀₁		25.510 ₁₀₈	65.75 ₁₆		5.07 ₆₄	68.32 ₁₃₁		29.518 ₁₂₃	76.42 ₈₁	
19.2	56.767 ₂₀₁	37.73 ₁₄₄		25.402 ₈₄	65.91 ₁₃		4.43 ₅₄	67.01 ₁₇₅		29.395 ₉₉	75.61 ₁₀₄	
29.2	56.566 ₁₆₅	36.29 ₁₈₃		25.318 ₄₉	66.04 ₁₀		3.89 ₄₃	65.26 ₂₁₅		29.296 ₆₉	74.57 ₁₂₅	
June 8.1	56.401 ₁₂₅	34.46 ₂₁₉		25.269 ₁₇	66.14 ₄		3.46 ₃₀	63.11 ₂₄₇		29.227 ₃₉	73.32 ₁₄₃	
18.1	56.276 ₈₀	32.27 ₂₄₆		25.252 ₁₇	66.18 ₃		3.16 ₁₇	60.64 ₂₇₂		29.188 ₇	71.89 ₁₅₈	
28.1	56.196 ₃₄	29.81 ₂₆₈		25.269 ₅₃	66.21 ₄		2.99 ₁	57.92 ₂₉₂		29.181 ₂₆	70.31 ₁₆₈	
July 8.0	56.162 ₁₄	27.13 ₂₈₁		25.322 ₈₈	66.17 ₈		2.98 ₁₂	55.00 ₃₀₅		29.207 ₅₈	68.63 ₁₇₂	
18.0	56.176 ₆₂	24.32 ₂₈₆		25.405 ₁₁₄	66.09 ₁₅		3.10 ₂₆	51.95 ₃₀₉		29.265 ₉₀	66.91 ₁₇₀	
28.0	56.238 ₁₁₀	21.46 ₂₈₂		25.519 ₁₄₆	65.94 ₂₄		3.36 ₄₁	48.86 ₃₀₉		29.355 ₁₂₁	65.21 ₁₆₁	
Aug. 7.0	56.348 ₁₅₈	18.64 ₂₆₆		25.665 ₁₇₄	65.70 ₃₀		3.77 ₅₃	45.77 ₃₀₀		29.476 ₁₅₁	63.60 ₁₄₉	
16.9	56.506 ₂₀₅	15.98 ₂₄₄		25.839 ₂₀₂	65.40 ₄₃		4.30 ₆₅	42.77 ₂₈₇		29.627 ₁₇₉	62.11 ₁₂₆	
26.9	56.711 ₂₄₈	13.54 ₂₀₉		26.041 ₂₂₆	64.97 ₅₆		4.95 ₇₆	39.90 ₂₆₈		29.806 ₂₀₇	60.85 ₁₀₁	
Sept. 5.9	56.959 ₂₈₉	11.45 ₁₆₇		26.267 ₂₅₁	64.41 ₆₈		5.71 ₈₅	37.22 ₂₄₄		30.013 ₂₃₁	59.84 ₆₆	
15.9	57.248 ₃₂₃	9.78 ₁₁₆		26.518 ₂₇₃	63.73 ₈₁		6.56 ₉₅	34.78 ₂₁₄		30.244 ₂₅₇	59.18 ₂₉	
25.8	57.571 ₃₅₅	8.62 ₆₀		26.791 ₂₉₀	62.92 ₉₈		7.51 ₁₀₁	32.64 ₁₈₀		30.501 ₂₇₆	58.89 ₁₁	
Oct. 5.8	57.926 ₃₇₇	8.02 ₁		27.081 ₃₁₀	61.94 ₁₀₈		8.52 ₁₀₇	30.84 ₁₄₂		30.777 ₂₉₄	59.00 ₅₅	
15.8	58.303 ₃₉₁	8.03 ₆₃		27.391 ₃₂₂	60.86 ₁₂₀		9.59 ₁₁₀	29.42 ₉₉		31.071 ₃₀₈	59.55 ₉₈	
25.7	58.694 ₃₉₇	8.66 ₁₂₅		27.713 ₃₃₁	59.66 ₁₂₄		10.69 ₁₁₁	28.43 ₅₄		31.379 ₃₁₄	60.53 ₁₃₈	
Nov. 4.7	59.091 ₃₉₁	9.91 ₁₈₄		28.044 ₃₃₁	58.42 ₁₃₀		11.80 ₁₁₁	27.89 ₆		31.693 ₃₁₆	61.91 ₁₇₆	
14.7	59.482 ₃₇₄	11.75 ₂₃₉		28.375 ₃₂₈	57.12 ₁₃₀		12.91 ₁₀₇	27.83 ₄₄		32.009 ₃₀₇	63.67 ₂₀₉	
24.7	59.856 ₃₄₄	14.14 ₂₈₄		28.703 ₃₁₂	55.82 ₁₂₃		13.98 ₁₀₁	28.27 ₉₃		32.316 ₂₉₃	65.76 ₂₃₄	
Dec. 4.6	60.200 ₃₀₅	16.98 ₃₂₁		29.015 ₂₉₂	54.59 ₁₁₄		14.99 ₉₂	29.20 ₁₄₀		32.609 ₂₆₈	68.10 ₂₅₁	
14.6	60.505 ₂₅₅	20.19 ₃₄₉		29.307 ₂₅₈	53.45 ₁₀₂		15.91 ₇₈	30.60 ₁₈₄		32.877 ₂₃₇	70.61 ₂₆₁	
24.6	60.760 ₁₉₇	23.68 ₃₆₄		29.565 ₂₂₂	52.43 ₈₃		16.69 ₆₅	32.44 ₂₂₀		33.114 ₁₉₅	73.22 ₂₆₂	
34.6	60.957	27.32		29.787	51.60		17.34	34.64		33.309	75.84	
Mean Place	56.697	19.21		23.797	67.45		1.463	53.87		28.314	63.85	
Sec δ , Tan δ	1.469	—1.076		1.050	+0.323		4.138	+4.015		1.038	—0.278	
$D\alpha$, D_{α}	+0.04	—0.04		+0.07	+0.01		+0.15	+0.14		+0.05	—0.01	
$D\delta$, D_{δ}	—0.2	+0.9		—0.2	+0.8		—0.2	+0.8		—0.2	+0.8	

APPARENT PLACES OF STARS, 1916.

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	β Cancri. Mag. 3.8		31 Lyncis. Mag. 4.4		d^1 Cancri. Mag. 5.9		ϵ Argus. Mag. 1.7	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 8 11	° ' " + 9 26	h m 8 17	° ' " +43 27	h m 8 18	° ' " +18 35	h m 8 20	° ' " -59 14
Jan. 0.6	59.822	41.79	8.519	25.48	35.655	66.99	49.850	11.58
10.5	60.012 190	40.55 124	8.772 253	26.26 78	35.861 206	66.28 71	50.039 189	15.41 281
20.5	60.153 141	39.49 106	8.962 190	27.27 101	36.018 137	65.77 51	50.142 103	19.30 280
30.5	60.243 90	38.62 87	9.086 124	28.50 123	36.121 103	65.46 31	50.158 16	23.12 282
Feb. 9.5	60.282 39	37.97 65	9.139 53	29.85 135	36.170 49	65.34 12	50.091 67	26.78 341
19.4	60.271 11	37.49 48	9.126 13	31.26 141	36.167 3	65.39 5	49.943 148	30.19 341
29.4	60.215 56	37.19 30	9.052 74	32.67 141	36.118 49	65.57 18	49.725 218	33.28 309
Mar. 10.4	60.122 93	37.04 15	8.924 128	33.99 132	36.027 91	65.85 28	49.446 279	35.98 279
20.4	59.999 123	37.01 3	8.755 169	35.16 117	35.904 123	66.18 33	49.118 328	38.25 227
30.3	59.856 143	37.10 9	8.556 199	36.13 97	35.760 144	66.54 36	48.755 363	40.04 129
Apr. 9.3	59.703 153	37.27 17	8.339 217	36.85 72	35.604 156	66.90 36	48.370 385	41.34 130
19.3	59.550 153	37.51 24	8.119 220	37.30 45	35.445 159	67.23 33	47.975 395	42.12 78
29.2	59.404 146	37.80 29	7.908 211	37.45 15	35.294 151	67.53 30	47.583 392	42.37 21
May 9.2	59.274 130	38.13 33	7.714 194	37.31 14	35.157 137	67.76 23	47.206 377	42.10 27
19.2	59.167 83	38.50 40	7.550 130	36.91 69	35.043 88	67.95 14	46.854 319	41.32 28
29.2	59.084 52	38.90 43	7.420 92	36.22 91	34.955 58	68.09 8	46.535 276	40.06 172
June 8.1	59.032 20	39.33 44	7.328 48	35.31 112	34.897 26	68.17 3	46.259 228	38.34 212
18.1	59.012 11	39.77 44	7.280 3	34.19 130	34.871 8	68.20 3	46.031 173	36.22 248
28.1	59.023 43	40.21 43	7.277 42	32.89 144	34.879 41	68.17 9	45.858 113	33.76 273
July 8.1	59.066 75	40.64 39	7.319 86	31.45 156	34.920 74	68.08 14	45.745 48	31.03 283
18.0	59.141 105	41.03 34	7.405 129	29.89 166	34.994 105	67.94 23	45.697 16	28.10 303
28.0	59.246 134	41.37 25	7.534 169	28.23 171	35.099 135	67.71 29	45.713 83	25.07 303
Aug. 7.0	59.380 162	41.62 15	7.703 208	26.52 174	35.234 164	67.42 39	45.796 152	22.04 293
16.9	59.542 188	41.77 2	7.911 245	24.78 176	35.396 191	67.03 51	45.948 217	19.11 275
26.9	59.730 214	41.79 17	8.156 279	23.02 174	35.589 219	66.52 62	46.165 281	16.36 262
Sept. 5.9	59.944 236	41.62 35	8.435 311	21.28 172	35.808 242	65.90 77	46.446 340	13.94 262
15.9	60.180 259	41.27 55	8.746 340	19.56 164	36.050 266	65.13 90	46.786 392	11.91 153
25.8	60.439 278	40.72 77	9.086 365	17.92 158	36.316 287	64.23 102	47.178 436	10.38 96
Oct. 5.8	60.717 296	39.95 98	9.451 387	16.34 145	36.603 306	63.21 116	47.614 470	9.42 34
15.8	61.013 310	38.97 118	9.838 407	14.89 130	36.909 320	62.05 126	48.084 492	9.08 30
25.8	61.323 318	37.79 135	10.245 417	13.59 110	37.229 330	60.79 132	48.576 501	9.38 98
Nov. 4.7	61.641 321	36.44 147	10.662 421	12.49 88	37.559 336	59.47 136	49.077 492	10.36 161
14.7	61.962 317	34.97 155	11.083 416	11.61 62	37.895 331	58.11 135	49.569 471	11.97 221
24.7	62.279 303	33.42 158	11.499 399	10.99 32	38.226 321	56.76 127	50.040 433	14.18 274
Dec. 4.6	62.582 283	31.84 155	11.898 373	10.67 3	38.547 298	55.49 118	50.473 379	16.92 319
14.6	62.865 252	30.29 146	12.271 334	10.64 29	38.845 269	54.31 103	50.852 316	20.11 353
24.6	63.117 214	28.83 135	12.605 284	10.93 60	39.114 230	53.28 83	51.168 239	23.64 374
34.6	63.331	27.48	12.889	11.53	39.344	52.45	51.407	27.38
Mean Place	57.660	42.90	5.535	31.09	33.377	69.73	47.481	20.02
Sec δ , Tan δ	1.014	+0.166	1.378	+0.948	1.055	+0.337	1.955	-1.680
$D\psi\alpha$, $D\omega\alpha$	+0.06	+0.01	+0.08	+0.04	+0.07	+0.01	+0.02	-0.06
$D\psi\delta$, $D\omega\delta$	-0.2	+0.8	-0.2	+0.8	-0.2	+0.8	-0.2	+0.8

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	80 Monocerotis. Mag. 4.0		θ Chamæleontis. Mag. 4.3		ο Ursa Majoris. Mag. 3.5		Groombridge 1450. Mag. 6.0	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 8 21	° ' " - 3 37	h m 8 23	° ' " -77 12	h m 8 23	° ' " +60 59	h m 8 27	° ' " +38 17
	s	"	s	"	s	"	s	"
Jan. 0.6	29.879	53.27	14.97	40.53	22.14	53.06	30.374	73.48
10.5	30.065 ¹⁸⁶	55.28 ²⁰¹	15.25 ²⁸	44.31 ³⁷⁸	22.49 ³⁵	54.72 ¹⁶⁶	30.624 ²⁵⁰	73.88 ⁴⁰
20.5	30.206 ¹⁴¹	57.14 ¹⁸⁶	15.34 ⁹	48.20 ³⁸⁹	22.75 ²⁶	56.65 ¹⁹³	30.816 ¹⁹²	74.55 ⁶⁷
30.5	30.296 ⁹⁰	58.82 ¹⁶⁸	15.23 ¹¹	52.09 ³⁸⁹	22.91 ¹⁶	58.78 ²¹³	30.946 ¹³⁰	75.44 ⁸⁹
Feb. 9.5	30.335 ³⁹	60.29 ¹⁴⁷	14.94 ²⁹	55.86 ³⁷⁷	22.96 ⁵	61.01 ²²³	31.012 ⁶⁶	76.49 ¹⁰⁵
	8	122	45	356	3	223	2	117
19.4	30.327	61.51	14.49	59.42	22.93	63.24	31.014	77.66
29.4	30.274 ⁵³	62.51 ¹⁰⁰	13.88 ⁶¹	62.71 ³²⁹	22.80 ¹³	65.37 ²¹³	30.959 ⁵⁵	78.86 ¹²⁰
Mar. 10.4	30.184 ⁹⁰	63.27 ⁷⁶	13.14 ⁷⁴	65.65 ²⁹⁴	22.60 ²⁰	67.32 ¹⁹⁵	30.853 ¹⁰⁶	80.02 ¹¹⁶
20.4	30.064 ¹²⁰	63.81 ⁵⁴	12.30 ⁸⁴	68.17 ²⁵²	22.33 ²⁷	68.99 ¹⁶⁷	30.707 ¹⁴⁶	81.10 ¹⁰⁶
30.3	29.925 ¹³⁹	64.11 ³⁰	11.37 ⁹⁸	70.24 ²⁰⁷	22.02 ³¹	70.31 ¹³²	30.531 ¹⁷⁶	82.03 ⁹³
	152	11	98	159	35	94	192	73
Apr. 9.3	29.773	64.22	10.39	71.83	21.67	71.25	30.339	82.76
19.3	29.620 ¹⁵³	64.14 ⁸	9.38 ¹⁰¹	72.90 ¹⁰⁷	21.31 ³⁶	71.76 ⁵¹	30.141 ¹⁹⁸	83.27 ⁵¹
29.2	29.473 ¹⁴⁷	63.87 ²⁷	8.36 ¹⁰²	73.43 ⁵³	20.96 ³⁵	71.82 ⁶	29.948 ¹⁹³	83.54 ²⁷
May 9.2	29.339 ¹³⁴	63.44 ⁴³	7.36 ¹⁰⁰	73.42 ¹	20.63 ³³	71.45 ³⁷	29.771 ¹⁷⁷	83.58 ⁴
19.2	29.226 ¹¹³	62.85 ⁵⁹	6.41 ⁹⁵	72.89 ⁵³	20.34 ²⁹	70.65 ⁸⁰	29.619 ¹⁵²	83.36 ²²
	91	74	89	103	24	119	122	45
29.2	29.135	62.11	5.52	71.86	20.10	69.46	29.497	82.91
June 8.1	29.072 ⁶³	61.25 ⁸⁶	4.71 ⁸¹	70.34 ¹⁵²	19.91 ¹⁹	67.93 ¹⁵³	29.410 ⁸⁷	82.25 ⁶⁶
18.1	29.038 ³⁴	60.29 ⁹⁶	4.01 ⁷⁰	68.37 ¹⁹⁷	19.78 ¹³	66.09 ¹⁸⁴	29.360 ⁵⁰	81.40 ⁸⁵
28.1	29.034 ⁴	59.25 ¹⁰⁴	3.44 ⁵⁷	66.03 ²³⁴	19.72 ⁶	63.99 ²¹⁰	29.351 ⁹	80.39 ¹⁰¹
July 8.1	29.061 ²⁷	58.17 ¹⁰⁸	3.00 ⁴⁴	63.36 ²⁶⁷	19.74 ²	61.71 ²²⁸	29.383 ³²	79.21 ¹¹⁸
	58	109	28	290	8	245	71	128
18.0	29.119	57.08	2.72	60.46	19.82	59.26	29.454	77.93
28.0	29.206 ⁸⁷	56.02 ¹⁰⁶	2.60 ¹²	57.40 ³⁰⁶	19.96 ¹⁴	56.73 ²⁵³	29.564 ¹¹⁰	76.53 ¹⁴⁰
Aug. 7.0	29.322 ¹¹⁶	55.04 ⁹⁸	2.64 ⁴	54.29 ³¹¹	20.17 ²¹	54.13 ²⁶⁰	29.712 ¹⁴⁸	75.07 ¹⁴⁶
16.9	29.466 ¹⁴⁴	54.19 ⁸⁵	2.85 ²¹	51.25 ³⁰⁴	20.44 ²⁷	51.56 ²⁵⁷	29.894 ¹⁸²	73.54 ¹⁵³
26.9	29.638 ¹⁷²	53.52 ⁶⁷	3.23 ³⁸	48.35 ²⁹⁰	20.76 ³²	49.02 ²⁵⁴	30.111 ²¹⁷	71.96 ¹⁵⁸
	197	46	54	263	38	244	249	161
Sept. 5.9	29.835	53.06	3.77	45.72	21.14	46.58	30.360	70.35
15.9	30.059 ²²⁴	52.88 ¹⁸	4.45 ⁶⁸	43.47 ²²⁵	21.58 ⁴⁴	44.28 ²³⁰	30.639 ²⁷⁹	68.74 ¹⁶¹
25.8	30.304 ²⁴⁵	53.00 ¹²	5.26 ⁸¹	41.68 ¹⁷⁹	22.06 ⁴⁸	42.16 ²¹²	30.948 ³⁰⁹	67.13 ¹⁶¹
Oct. 5.8	30.573 ²⁶⁹	53.42 ⁴²	6.17 ⁹¹	40.44 ¹²⁴	22.58 ⁵²	40.26 ¹⁹⁰	31.281 ³³³	65.56 ¹⁵⁷
15.8	30.859 ²⁸⁶	54.18 ⁷⁶	7.16 ⁹⁹	39.81 ⁶³	23.13 ⁵⁵	38.63 ¹⁶³	31.639 ³⁵⁸	64.05 ¹⁵¹
	302	109	103	3	57	132	375	141
25.8	31.161	55.27	8.19	39.84	23.70	37.31	32.014	62.64
Nov. 4.7	31.472 ³¹¹	56.65 ¹³⁸	9.23 ¹⁰⁴	40.52 ⁶⁸	24.29 ⁵⁹	36.33 ⁹⁸	32.403 ³⁸⁹	61.36 ¹²⁸
14.7	31.786 ³¹⁴	58.31 ¹⁶⁶	10.24 ¹⁰¹	41.88 ¹³⁶	24.88 ⁵⁹	35.74 ⁵⁹	32.798 ³⁹⁵	60.27 ¹⁰⁹
24.7	32.098 ³¹²	60.18 ¹⁸⁷	11.19 ⁹⁵	43.84 ¹⁹⁶	25.47 ⁵⁹	35.55 ¹⁹	33.191 ³⁹³	59.39 ⁹⁸
Dec. 4.6	32.396 ²⁹⁶	62.19 ²⁰¹	12.03 ⁸⁴	46.37 ²⁵³	26.03 ⁵⁶	35.80 ²⁵	33.571 ³⁸⁰	58.76 ⁶³
	280	212	72	302	51	66	357	35
14.6	32.676	64.31	12.75	49.39	26.54	36.46	33.928	58.41
24.6	32.924 ²⁴⁸	66.42 ²¹¹	13.31 ⁵⁶	52.79 ³⁴⁰	27.00 ⁴⁶	37.54 ¹⁰⁸	34.251 ³²³	58.34 ⁷
34.6	33.135 ²¹¹	68.49 ²⁰⁷	13.70 ³⁹	56.46 ³⁶⁷	27.40 ⁴⁰	38.98 ¹⁴⁴	34.529 ²⁷⁸	58.58 ²⁴
Mean Place	27.868	53.80	10.871	50.51	17.919	60.62	27.627	79.40
Sec δ, Tan δ	1.002	-0.063	4.519	-4.407	2.063	+1.804	1.274	+0.790
D _α α, D _α α	+0.06	0.00	-0.03	-0.17	+0.10	+0.07	+0.08	+0.03
D _δ δ, D _α δ	-0.2	+0.8	-0.2	+0.8	-0.2	+0.8	-0.2	+0.8

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	η Cancr. Mag. 5.5		Groombridge 1446. Mag. 6.3		δ Hydræ. Mag. 4.2		σ Hydræ. Mag. 4.5	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m	° '	h m	° '	h m	° '	h m	° '
	8 27	+20 43	8 30	+73 55	8 33	+ 5 59	8 34	+ 3 30
	s	"	s	"	s	"	s	"
Jan. 0.6	53.528	34.63	30.80	20.02	14.706	49.25	24.141	72.59
10.6	53.746 ²¹⁸	34.01 ⁶²	31.36 ⁵⁶	22.18 ²¹⁶	14.912 ²⁰⁶	47.73 ¹⁵²	24.345 ²⁰⁴	70.95 ¹⁵⁴
20.5	53.913 ¹⁶⁷	33.60 ⁴¹	31.77 ⁴¹	24.63 ²⁴⁵	15.071 ¹⁵⁹	46.41 ¹³²	24.503 ¹⁵⁸	69.49 ¹⁴⁸
30.5	54.028 ¹¹⁵	33.41 ¹⁹	32.02 ²⁵	27.28 ²⁶⁵	15.179 ¹⁰⁸	45.28 ¹¹³	24.612 ¹⁰⁹	68.20 ¹³⁵
Feb. 9.5	54.088 ⁶⁰	33.40 ¹	32.09 ⁷	30.01 ²⁷³	15.237 ⁵⁸	44.37 ⁹¹	24.669 ⁵⁷	67.15 ¹⁰⁵
19.4	54.094 ⁶	33.57 ¹⁷	32.00 ⁹	32.71 ²⁷⁰	15.245 ⁸	43.67 ⁷⁰	24.677 ⁸	66.29 ⁹⁶
29.4	54.052 ⁴²	33.88 ³¹	31.75 ²⁵	35.26 ²⁵⁵	15.206 ³⁹	43.16 ⁵¹	24.639 ³⁸	65.68 ⁶¹
Mar. 10.4	53.967 ⁸⁵	34.27 ³⁹	31.37 ³⁸	37.58 ²³²	15.129 ⁷⁷	42.85 ³¹	24.564 ⁷⁵	65.22 ⁴⁶
20.4	53.849 ¹¹⁸	34.71 ⁴⁴	30.88 ⁴⁹	39.54 ¹⁹⁶	15.019 ¹¹⁰	42.70 ¹⁵	24.455 ¹⁰⁹	64.97 ²⁵
30.3	53.708 ¹⁴¹	35.16 ⁴⁵	30.29 ⁵⁹	41.07 ¹⁵³	14.889 ¹³⁰	42.70 ⁰	24.325 ¹³⁰	64.88 ⁹
Apr. 9.3	53.552 ¹⁵⁶	35.59 ⁴³	29.65 ⁶⁴	42.13 ¹⁰⁶	14.744 ¹⁴⁵	42.81 ¹¹	24.184 ¹⁴¹	64.94 ⁴
19.3	53.393 ¹⁵⁹	35.97 ³⁸	28.98 ⁶⁷	42.68 ⁵⁵	14.596 ¹⁴⁸	43.02 ²¹	24.037 ¹⁴⁷	65.11 ¹⁷
29.3	53.239 ¹⁵⁴	36.30 ³³	28.31 ⁶⁷	42.69 ¹	14.453 ¹⁴³	43.32 ³⁰	23.893 ¹⁴⁴	65.41 ²⁰
May 9.2	53.099 ¹⁴⁰	36.54 ²⁴	27.68 ⁶³	42.18 ⁵¹	14.320 ¹³³	43.69 ³⁷	23.761 ¹³²	65.79 ²⁶
19.2	52.980 ¹¹⁹	36.71 ¹⁷	27.09 ⁵⁹	41.17 ¹⁰¹	14.207 ¹¹³	44.13 ⁴⁴	23.646 ¹¹⁵	66.27 ⁴⁸
29.2	52.886 ⁹⁴	36.81 ¹⁰	26.58 ⁵¹	39.69 ¹⁴⁸	14.116 ⁹¹	44.62 ⁴⁹	23.553 ⁹³	66.82 ²⁵
June 8.1	52.822 ⁶⁴	36.82 ¹	26.16 ⁴²	37.80 ¹⁸⁹	14.052 ⁶⁴	45.16 ⁵⁴	23.488 ⁶⁵	67.41 ⁵⁰
18.1	52.789 ³³	36.76 ⁶	25.86 ³⁰	35.53 ²²⁷	14.014 ³⁸	45.72 ⁵⁶	23.450 ³⁸	68.07 ⁶⁶
28.1	52.788 ¹	36.63 ¹³	25.66 ²⁰	32.97 ²⁵⁶	14.009 ⁵	46.29 ⁵⁷	23.439 ¹¹	68.75 ⁶⁶
July 8.1	52.822 ³⁴	36.42 ²¹	25.58 ⁸	30.16 ²⁸¹	14.032 ²³	46.86 ⁵⁷	23.462 ²³	69.43 ⁶⁸
18.0	52.887 ⁶⁵	36.14 ²⁸	25.62 ⁴	27.20 ²⁹⁶	14.085 ⁵³	47.40 ⁵⁴	23.511 ⁴⁹	70.10 ⁶⁷
28.0	52.984 ⁹⁷	35.77 ³⁷	25.79 ¹⁷	24.12 ³⁰⁸	14.167 ⁸²	47.88 ⁴⁸	23.592 ⁸¹	70.74 ⁶⁴
Aug. 7.0	53.112 ¹²⁸	35.33 ⁴⁴	26.07 ²⁸	21.02 ³¹⁰	14.278 ¹¹¹	48.29 ⁴⁸	23.699 ¹⁰⁷	71.26 ⁵²
17.0	53.270 ¹⁵⁸	34.78 ⁵⁵	26.47 ⁴⁰	17.94 ³⁰⁸	14.417 ¹³⁹	48.58 ²¹	23.836 ¹³⁷	71.68 ⁴²
26.9	53.454 ¹⁸⁴	34.11 ⁶⁷	26.97 ⁵⁰	14.95 ²⁹⁹	14.584 ¹⁶⁷	48.72 ¹⁴	23.999 ¹⁶³	71.95 ²⁷
Sept. 5.9	53.667 ²¹³	33.34 ⁷⁷	27.58 ⁶¹	12.09 ²⁸⁶	14.776 ¹⁹²	48.67 ⁵	24.192 ¹⁹³	72.01 ⁴
15.9	53.905 ²³⁸	32.45 ⁸⁹	28.27 ⁶⁹	9.44 ²⁶⁵	14.995 ²¹⁹	48.42 ²⁵	24.409 ²¹⁷	71.86 ¹⁵
25.8	54.168 ²⁶³	31.43 ¹⁰²	29.04 ⁷⁷	7.03 ²⁴¹	15.237 ²⁴²	47.92 ⁵⁰	24.647 ²³⁸	71.45 ⁴¹
Oct. 5.8	54.453 ²⁸⁵	30.28 ¹¹⁵	29.90 ⁸⁶	4.94 ²⁰⁹	15.502 ²⁶⁵	47.20 ⁷²	24.911 ²⁶⁴	70.80 ⁶⁵
15.8	54.760 ³⁰⁷	29.03 ¹²⁵	30.80 ⁹⁰	3.20 ¹⁷⁴	15.789 ²⁸⁷	46.21 ⁹⁹	25.195 ²⁸⁴	69.87 ⁹³
25.8	55.082 ³²²	27.71 ¹³²	31.74 ⁹⁴	1.86 ¹³⁴	16.091 ³⁰²	45.01 ¹²⁰	25.496 ³⁰¹	68.69 ¹¹⁸
Nov. 4.7	55.416 ³³⁴	26.33 ¹³⁸	32.71 ⁹⁷	0.96 ⁹⁰	16.406 ³¹⁵	43.58 ¹⁴³	25.810 ³¹⁴	67.27 ¹⁴²
14.7	55.756 ³⁴⁰	24.94 ¹³⁹	33.70 ⁹⁹	0.52 ⁴⁴	16.726 ³²⁰	42.00 ¹⁵⁸	26.129 ³¹⁹	65.66 ¹⁶¹
24.7	56.096 ³⁴⁰	23.59 ¹³⁵	34.65 ⁹⁵	0.58 ⁶	17.047 ³²¹	40.30 ¹⁷⁰	26.448 ³¹⁹	63.91 ¹⁷⁵
Dec. 4.7	56.424 ³²⁸	22.32 ¹²⁷	35.57 ⁹²	1.14 ⁵⁶	17.357 ³¹⁰	38.53 ¹⁷⁷	26.758 ³¹⁰	62.07 ¹⁸⁴
14.6	56.733 ³⁰⁹	21.20 ¹¹²	36.42 ⁸⁵	2.19 ¹⁰⁵	17.649 ²⁹²	36.76 ¹⁷⁷	27.047 ²⁸⁹	60.21 ¹⁸⁶
24.6	57.013 ²⁸⁰	20.23 ⁹⁷	37.18 ⁷⁶	3.71 ¹⁵²	17.915 ²⁶⁶	35.05 ¹⁷¹	27.312 ²⁶⁵	58.38 ¹⁸³
34.6	57.254 ²⁴¹	19.47 ⁷⁶	37.80 ⁶²	5.65 ¹⁹⁴	18.142 ²²⁷	33.45 ¹⁶⁰	27.539 ²²⁷	56.66 ¹⁷³
Mean Place	51.235	38.24	23.950	28.86	12.642	50.75	22.106	73.72
Sec δ , Tan δ	1.069	+0.378	3.611	+3.470	1.005	+0.105	1.002	+0.064
$D\psi\alpha$, $D_\alpha\alpha$	+0.07	+0.02	+0.13	+0.14	+0.06	0.00	+0.06	0.00
$D\psi\delta$, $D_\delta\delta$	-0.2	+0.8	-0.2	+0.8	-0.2	+0.8	-0.2	+0.8

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	γ Cancri. Mag. 4.7		δ Cancri. Mag. 4.2		α Pyxidis. Mag. 3.7		ϵ Cancri. Mag. 4.2	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 8 38	° ' " +21 45	h m 8 39	° ' " +18 27	h m 8 40	° ' " -32 52	h m 8 41	° ' " +29 3
Jan. 0.6	27.956	72.59	57.058	45.64	14.855	53.49	39.525	58.89
10.6	28.185	71.97	57.283	44.81	15.053	56.78	39.769	58.68
20.5	28.364	71.58	57.460	44.22	15.199	60.06	39.962	58.73
30.5	28.490	71.42	57.586	43.84	15.287	63.24	40.097	59.02
Feb. 9.5	28.561	71.47	57.657	43.68	15.319	66.23	40.176	59.51
19.4	28.580	71.71	57.675	43.71	15.297	68.98	40.197	60.17
29.4	28.549	72.07	57.644	43.89	15.225	71.43	40.164	60.94
Mar. 10.4	28.471	72.52	57.571	44.18	15.109	73.54	40.085	61.75
20.4	28.359	73.03	57.462	44.56	14.960	75.28	39.968	62.57
30.3	28.222	73.55	57.390	44.97	14.784	76.62	39.823	63.33
Apr. 9.3	28.070	74.05	57.182	45.39	14.593	77.57	39.659	63.99
19.3	27.912	74.50	57.029	45.79	14.396	78.10	39.490	64.53
29.3	27.758	74.87	56.878	46.15	14.199	78.22	39.324	64.93
May 9.2	27.615	75.15	56.739	46.45	14.012	77.93	39.169	65.16
19.2	27.491	75.33	56.619	46.69	13.842	77.24	39.034	65.23
29.2	27.391	75.43	56.522	46.87	13.692	76.19	38.924	65.14
June 8.1	27.319	75.43	56.452	46.99	13.569	74.80	38.843	64.89
18.1	27.277	75.34	56.410	47.03	13.476	73.11	38.794	64.49
28.1	27.268	75.17	56.401	47.01	13.414	71.16	38.779	63.96
July 8.1	27.291	74.89	56.423	46.92	13.387	69.01	38.798	63.30
18.0	27.346	74.54	56.475	46.75	13.394	66.73	38.851	62.53
28.0	27.432	74.09	56.559	46.48	13.437	64.38	38.939	61.66
Aug. 7.0	27.550	73.55	56.673	46.13	13.517	62.05	39.060	60.68
17.0	27.697	72.90	56.815	45.67	13.634	59.83	39.212	59.61
26.9	27.874	72.14	56.986	45.09	13.788	57.80	39.395	58.43
Sept. 5.9	28.078	71.27	57.185	44.37	13.977	56.04	39.608	57.18
15.9	28.309	70.28	57.410	43.51	14.201	54.62	39.849	55.84
25.8	28.567	69.16	57.661	42.50	14.458	53.64	40.118	54.44
Oct. 5.8	28.847	67.93	57.935	41.35	14.744	53.13	40.413	52.98
15.8	29.150	66.60	58.233	40.07	15.056	53.17	40.730	51.49
25.8	29.470	65.20	58.547	38.69	15.387	53.74	41.069	50.00
Nov. 4.7	29.805	63.76	58.876	37.23	15.732	54.85	41.422	48.54
14.7	30.148	62.32	59.213	35.73	16.081	56.49	41.784	47.17
24.7	30.491	60.92	59.551	34.25	16.427	58.62	42.146	45.92
Dec. 4.7	30.826	59.62	59.880	32.83	16.757	61.15	42.500	44.84
14.6	31.142	58.48	60.191	31.52	17.062	64.01	42.836	43.97
24.6	31.432	57.49	60.477	30.38	17.334	67.13	43.142	43.34
34.6	31.683	56.68	60.725	29.43	17.561	70.38	43.411	42.96
Mean Place	25.678	76.99	54.842	49.59	12.973	58.79	37.098	64.64
Sec δ , Tan δ	1.077	+0.399	1.054	+0.334	1.191	-0.647	1.144	+0.556
$D\phi\alpha$, $D\phi\delta$	+0.07	+0.02	+0.07	+0.01	+0.05	-0.03	+0.07	+0.02
$D\phi\delta$, $D\phi\alpha$	-0.3	+0.8	-0.3	+0.8	-0.3	+0.8	-0.3	+0.8

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	ϵ Hydræ. Mag. 3.5			δ Argus. Mag. 2.0			σ^2 Cancri (<i>mean</i>). Mag. 5.5			ζ Hydræ. Mag. 3.3		
	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.
	h m	s	"	h m	s	"	h m	s	"	h m	s	"
	8 42		+ 6 43	8 42		-54 23	8 49		+30 53	8 50		+ 6 15
Jan. 0.6	21.804		38.05	24.956		52.76	9.867		47.45	59.342		55.13
10.6	22.017	213	36.55	25.176	220	56.51	10.121	254	47.31	59.563	221	53.58
20.5	22.185	168	35.23	25.322	146	60.34	10.324	203	47.44	59.739	176	52.21
30.5	22.304	119	34.12	25.392	70	64.14	10.471	147	47.82	59.865	126	51.06
Feb. 9.5	22.371	67	33.22	25.384	90	67.82	10.558	87	48.41	59.941	76	50.12
		17			79			30			25	
19.5	22.388		32.55	25.305		71.27	10.588		49.18	59.966		49.41
29.4	22.359	29	32.08	25.159	146	74.44	10.563	25	50.04	59.944	22	48.90
Mar. 10.4	22.289	70	31.80	24.956	203	77.26	10.489	74	50.97	59.881	63	48.59
20.4	22.188	101	31.67	24.706	250	79.66	10.376	113	51.88	59.786	95	48.45
30.3	22.061	127	31.68	24.420	286	81.61	10.233	143	52.74	59.664	122	48.45
		140			311			163			136	
Apr. 9.3	21.921		31.82	24.109		83.09	10.070		53.48	59.528		48.57
19.3	21.775	146	32.06	23.786	323	84.08	9.899	171	54.10	59.385	143	48.81
29.3	21.631	144	32.37	23.461	325	84.54	9.729	170	54.55	59.243	142	49.12
May 9.2	21.498	133	32.74	23.145	316	84.50	9.570	159	54.81	59.110	133	49.50
19.2	21.382	116	33.17	22.846	299	83.97	9.429	141	54.90	58.993	117	49.94
		95			274			117			97	
29.2	21.287		33.64	22.572		82.94	9.312		54.79	58.896		50.42
June 8.2	21.218	69	34.14	22.332	240	81.47	9.223	89	54.50	58.823	73	50.93
18.1	21.175	43	34.67	22.129	203	79.59	9.166	57	54.06	58.775	48	51.47
28.1	21.162	13	35.20	21.972	157	77.35	9.143	23	53.45	58.756	19	52.01
July 8.1	21.178	16	35.71	21.863	109	74.80	9.155	12	52.71	58.764	8	52.54
		46			57			46			38	
18.0	21.224		36.20	21.806		72.06	9.201		51.84	58.802		53.04
28.0	21.299	75	36.62	21.805	1	69.17	9.282	81	50.85	58.869	67	53.47
Aug. 7.0	21.401	102	36.96	21.861	56	66.24	9.396	114	49.74	58.962	93	53.82
17.0	21.533	132	37.17	21.973	112	63.37	9.541	145	48.53	59.085	123	54.04
26.9	21.692	159	37.24	22.144	171	60.67	9.719	178	47.23	59.236	151	54.13
		185			229			200			177	
Sept. 5.9	21.877		37.14	22.373		58.23	9.928		45.85	59.413		54.02
15.9	22.089	212	36.82	22.655	282	56.16	10.166	238	44.39	59.618	205	53.70
25.9	22.325	236	36.28	22.989	334	54.56	10.434	268	42.87	59.847	229	53.17
Oct. 5.8	22.586	261	35.49	23.365	376	53.48	10.728	294	41.31	60.103	256	52.38
15.8	22.868	282	34.48	23.777	412	53.00	11.047	319	39.73	60.380	277	51.35
		301			439			340			299	
25.8	23.169		33.23	24.216		53.14	11.387		38.17	60.679		50.09
Nov. 4.7	23.482	313	31.79	24.670	454	53.94	11.744	357	36.65	60.992	313	48.63
14.7	23.803	321	30.18	25.126	456	55.38	12.111	367	35.24	61.314	322	46.99
24.7	24.126	323	28.46	25.569	443	57.41	12.480	369	33.97	61.638	324	45.24
Dec. 4.7	24.440	314	26.68	25.988	419	59.98	12.841	361	32.89	61.956	318	43.42
		297			379			345			302	
14.6	24.737		24.91	26.367		63.02	13.186		32.03	62.258		41.61
24.6	25.008	271	23.20	26.692	325	66.42	13.502	316	31.44	62.535	277	39.85
34.6	25.245	237	21.61	26.955	263	70.06	13.781	279	31.13	62.778	243	38.20
Mean Place	19.761		40.04	22.850		61.33	7.423		54.01	57.329		57.40
Sec δ , Tan δ	1.007		+0.118	1.718		-1.397	1.166		+0.598	1.006		+0.110
$D\psi a, D\omega a$	+0.06		+0.01	+0.03		-0.06	+0.07		+0.03	+0.06		0.00
$D\psi \delta, D\omega \delta$	-0.3		+0.8	-0.3		+0.8	-0.3		+0.7	-0.3		+0.7

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	♌ Ursa Majoris. Mag. 3.1		♋ Canceri. Mag. 4.3		♏ Carinae. Mag. 5.1		♉ Ursa Majoris. Mag. 3.7	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 8 53	° ' " +48 21	h m 8 53	° ' " +12 10	h m 8 54	° ' " -58 54	h m 8 57	° ' " +47 28
	s	"	s	"	s	"	s	"
Jan. 0.6	30.912	70.93	55.784	57.20	57.177	8.27	56.897	72.81
10.6	31.225 ³¹²	71.72 ⁷⁹	56.013 ²²⁹	55.97 ¹²³	57.431 ²⁵⁴	12.03 ³⁷⁶	57.211 ³¹⁴	73.52 ⁷¹
20.5	31.474 ²⁴⁹	72.84 ¹¹²	56.197 ¹⁸⁴	54.94 ¹⁰⁸	57.604 ¹⁷³	15.90 ³⁸⁷	57.464 ²⁵³	74.57 ¹⁰⁵
30.5	31.651 ¹⁷⁷	74.22 ¹³⁸	56.332 ¹³⁵	54.14 ⁸⁰	57.693 ⁸⁹	19.79 ³⁸⁹	57.647 ¹⁸³	75.89 ¹³²
Feb. 9.5	31.754 ¹⁰³	75.81 ¹⁵⁹	56.414 ⁸²	53.56 ⁵⁸	57.696 ³	23.59 ³⁸⁰	57.757 ¹¹⁰	77.43 ¹⁵⁴
	31	171	30	36	77	362	37	168
19.5	31.785	77.52	56.444	53.20	57.619	27.21	57.794	79.11
29.4	31.744 ⁴¹	79.27 ¹⁷⁵	56.427 ¹⁷	53.03 ¹⁷	57.466 ¹⁵³	30.56 ³³⁵	57.762 ³²	80.83 ¹⁷²
Mar. 10.4	31.641 ¹⁰³	80.96 ¹⁶⁹	56.367 ⁶⁰	53.03 ⁰	57.249 ²¹⁷	33.58 ³⁰²	57.667 ⁹⁵	82.51 ¹⁶⁸
20.4	31.485 ¹⁵⁶	82.52 ¹⁵⁶	56.273 ⁹⁴	53.15 ¹²	56.980 ²⁶⁹	36.21 ²⁶³	57.521 ¹⁴⁶	84.09 ¹⁵⁸
30.4	31.290 ¹⁹⁵	83.89 ¹³⁷	56.152 ¹²¹	53.39 ²⁴	56.663 ³¹⁷	38.41 ²²⁰	57.334 ¹⁸⁷	85.47 ¹³⁸
	224	110	136	29	347	171	215	113
Apr. 9.3	31.066	84.99	56.016	53.68	56.316	40.12 ¹²⁴	57.119	86.60
19.3	30.829 ²³⁷	85.78 ⁷⁹	55.871 ¹⁴⁵	54.02 ²⁴	55.952 ³⁶⁴	41.36 ⁷⁰	56.890 ²²⁹	87.44 ⁸⁴
29.3	30.591 ²³⁸	86.26 ⁴⁸	55.728 ¹⁴³	54.39 ³⁷	55.583 ³⁶⁹	42.06 ¹⁹	56.659 ²³¹	87.96 ⁵²
May 9.2	30.363 ²²⁸	86.38 ¹²	55.593 ¹³⁵	54.77 ³²⁸	55.217 ³⁶⁶	42.25 ³²	56.437 ²²²	88.14 ¹⁸
19.2	30.157 ²⁰⁶	86.16 ²²	55.475 ¹¹⁸	55.15 ³⁸	54.866 ³⁵¹	41.93 ⁸³	56.235 ²⁰²	87.98 ¹⁶
	176	56	99	35	327	83	174	48
29.2	29.981 ¹⁴²	85.60 ⁸⁶	55.376 ⁷⁵	55.50 ³⁴	54.539 ²⁸⁵	41.10 ¹³²	56.061 ¹⁴⁰	87.50
June 8.2	29.839 ¹⁰¹	84.74 ¹¹⁶	55.301 ⁴⁹	55.84 ³²	54.244 ²⁶⁵	39.78 ¹⁷⁴	55.921 ¹⁰¹	86.70 ⁸⁰
18.1	29.738 ⁵⁷	83.58 ¹⁴¹	55.252 ²⁰	56.16 ²⁷	53.989 ²⁰⁸	38.04 ²¹⁴	55.820 ⁵⁹	85.60 ¹¹⁰
28.1	29.681 ¹²	82.17 ¹⁶³	55.232 ⁸	56.43 ²²	53.781 ¹⁵⁶	35.90 ²⁴⁷	55.761 ¹⁵	84.26 ¹³⁴
July 8.1	29.669 ³³	80.54 ¹⁸¹	55.240 ³⁸	56.65 ¹⁷	53.625 ⁹⁹	33.43 ²⁷²	55.746 ²⁹	82.69 ¹⁵⁷
								175
18.1	29.702 ⁷⁹	78.73 ¹⁹⁶	55.278 ⁶⁸	56.82 ⁹	53.526 ³⁷	30.71 ²⁹¹	55.775 ⁷³	80.94 ¹⁹²
28.0	29.781 ¹²⁴	76.77 ²⁰⁹	55.346 ⁹⁵	56.91 ¹	53.489 ²⁷	27.80 ²⁹⁷	55.848 ¹¹⁸	79.02 ²⁰³
Aug. 7.0	29.905 ¹⁶⁸	74.68 ²¹⁶	55.441 ¹²⁴	56.90 ¹²	53.516 ⁹³	24.83 ²⁹⁵	55.966 ¹⁶⁰	76.99 ²¹⁴
17.0	30.073 ²⁰⁹	72.52 ²²⁰	55.565 ¹⁵²	56.78 ²⁷	53.609 ¹⁶¹	21.88 ²⁸²	56.126 ²⁰¹	74.85 ²¹⁸
26.9	30.282 ²⁵¹	70.32 ²²²	55.717 ¹⁷⁹	56.51 ⁴³	53.770 ²²⁶	19.06 ²⁵⁹	56.327 ²⁴²	72.67 ²²⁰
Sept. 5.9	30.533	68.10	55.896	56.08	53.996	16.47	56.569	70.47
15.9	30.822 ²⁸⁹	65.90 ²²⁰	56.103 ²⁰⁷	55.46 ⁶²	54.288 ²⁹²	14.21 ²²⁶	56.849 ²⁸⁰	68.27 ²²⁰
25.9	31.148 ³²⁶	63.77 ²¹³	56.335 ²³²	54.66 ⁸⁰	54.638 ³⁰⁰	12.40 ¹⁸¹	57.167 ³¹⁸	66.12 ²¹⁵
Oct. 5.8	31.509 ³⁶¹	61.72 ²⁰⁵	56.594 ²⁶⁹	53.67 ⁹⁹	55.042 ⁴⁰⁴	11.09 ¹³¹	57.519 ³⁵²	64.06 ²⁰⁶
15.8	31.902 ³⁹³	59.81 ¹⁹¹	56.875 ²⁸¹	52.47 ¹²⁰	55.489 ⁴⁴⁷	10.39 ⁷⁰	57.904 ³⁸⁵	62.12 ¹⁹⁴
	418	172	303	136	480	8	411	177
25.8	32.320	58.09	57.178	51.11	55.969	10.31	58.315	60.35
Nov. 4.8	32.760 ⁴⁴⁰	56.58 ¹⁵¹	57.496 ³¹⁸	49.59 ¹⁵²	56.469 ⁵⁰⁰	10.89 ⁵⁸	58.746 ⁴³¹	58.90 ¹⁵⁵
14.7	33.212 ⁴⁵²	55.36 ¹²³	57.824 ³²⁸	47.97 ¹⁶²	56.975 ⁵⁰⁶	12.12 ¹²³	59.193 ⁴⁴⁷	57.51 ¹²⁹
24.7	33.666 ⁴⁵⁴	54.44 ⁹²	58.155 ³³¹	46.30 ¹⁶⁷	57.469 ⁴⁹⁴	13.97 ¹⁸⁵	59.643 ⁴⁵⁰	56.53 ⁹⁸
Dec. 4.7	34.111 ⁴⁴⁵	53.88 ⁵⁶	58.480 ³²⁵	44.63 ¹⁶⁷	57.938 ⁴⁶⁹	16.38 ²⁴¹	60.084 ⁴⁴¹	55.89 ⁶⁴
	425	19	309	161	427	293	423	27
14.6	34.536	53.69	58.789	43.02	58.365	19.31	60.507	55.62
24.6	34.925 ³⁸⁹	53.88 ¹⁹	59.075 ²⁸⁶	41.51 ¹⁵¹	58.734 ³⁶⁹	22.63 ³³²	60.896 ³⁸⁹	55.74 ¹²
34.6	35.268 ³⁴³	54.45 ⁵⁷	59.327 ²⁵²	40.16 ¹³⁵	59.037 ³⁰³	26.24 ³⁶¹	61.240 ³⁴⁴	56.22 ⁴⁸
Mean Place	27.836	80.25	53.709	60.76	55.031	17.78	53.888	82.42
Sec δ , Tan δ	1.505	+1.125	1.023	+0.216	1.936	-1.658	1.480	+1.091
D ϕ α , D α α	+0.08	+0.06	+0.07	+0.01	+0.03	-0.08	+0.08	+0.06
D ϕ δ , D α δ	-0.3	+0.7	-0.3	+0.7	-0.3	+0.7	-0.3	+0.7

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	σ^2 Ursa Majoris. Mag. 4.9		κ Cancri. Mag. 5.1		λ Argus. Mag. 2.2		θ Hydrae. Mag. 3.8	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	^h ^m 9 3	[°] ['] +67 28	^h ^m 9 3	[°] ['] +11 0	^h ^m 9 4	[°] ['] -43 5	^h ^m 9 9	[°] ['] + 2 3
	^s "	^s "	^s "	^s "	^s "	^s "	^s "	^s "
Jan. 0.6	6.20	24.03	13.998	21.11	56.174	27.97	61.644	67.40
10.6	6.69 49	25.65 162	14.234 236	19.77 134	56.409 235	31.49 352	61.880 236	65.59 13
20.6	7.09 40	27.65 200	14.425 191	18.65 112	56.587 178	35.07 356	62.071 191	63.96 16
30.5	7.37 28	29.93 228	14.567 142	17.75 90	56.702 118	38.64 357	62.214 143	62.52 11
Feb. 9.5	7.51 14	32.40 247	14.657 90	17.08 67	56.754 52	42.07 343	62.306 92	61.32 10
	4	255	40	45	9	325	42	
19.5	7.55	34.95	14.697	16.63	56.745	45.32	62.348	60.34
29.4	7.46 9	37.47 252	14.688 9	16.39 24	56.679 66	48.30 298	62.344 4	59.60
Mar. 10.4	7.27 30	39.86 239	14.637 51	16.32 7	56.563 116	50.94 264	62.298 46	59.67
20.4	6.97 30	42.00 214	14.550 87	16.40 8	56.405 158	53.22 228	62.217 81	58.74
30.4	6.61 36	43.81 181	14.436 114	16.59 19	56.215 190	55.10 188	62.109 108	58.60
	42	143	131	28	214	144	126	
Apr. 9.3	6.19	45.24	14.305	16.87	56.001	56.54	61.983	58.60
19.3	5.74 45	46.21 97	14.164 141	17.21 34	55.776 225	57.53 99	61.847 136	58.75
29.3	5.28 46	46.70 49	14.023 141	17.59 38	55.545 231	58.07 54	61.710 137	59.02
May 9.3	4.83 45	46.68 2	13.889 134	17.99 40	55.318 227	58.15 8	61.579 131	59.39
19.2	4.40 43	46.19 49	13.770 119	18.39 40	55.103 215	57.76 39	61.460 119	59.84
	38	95	102	40	198	82	103	
29.2	4.02	45.24	13.668	18.79	54.905	56.94	61.357	60.37
June 8.2	3.70 32	43.84 140	13.589 79	19.17 38	54.731 174	55.70 124	61.275 82	60.96
18.1	3.44 26	42.04 180	13.534 55	19.53 36	54.585 146	54.09 161	61.217 58	61.58
28.1	3.26 18	39.90 214	13.507 27	19.86 33	54.471 114	52.16 193	61.184 33	62.24
July 8.1	3.15 11	37.48 242	13.507 0	20.14 28	54.392 79	49.93 223	61.176 8	62.90
	3	266	29	20	40	242	21	
18.1	3.12	34.82	13.536	20.34	54.352	47.51	61.197	63.54
28.0	3.17 5	31.98 284	13.594 58	20.48 14	54.350 2	44.94 257	61.244 47	64.13
Aug. 7.0	3.32 15	29.03 295	13.679 85	20.53 5	54.392 42	42.33 261	61.319 75	64.63
17.0	3.54 22	26.02 301	13.793 114	20.45 8	54.478 86	39.77 256	61.421 102	65.02
27.0	3.84 30	23.00 302	13.935 142	20.22 23	54.609 131	37.34 243	61.552 131	65.25
	37	296	170	39	174	219	159	
Sept. 5.9	4.21	20.04	14.105	19.83	54.783	35.15	61.711	65.30
15.9	4.65 44	17.19 285	14.303 198	19.25 58	55.002 219	33.27 188	61.897 186	65.11
25.9	5.16 51	14.50 269	14.528 225	18.46 79	55.263 261	31.81 146	62.112 215	64.69
Oct. 5.8	5.74 58	12.04 246	14.779 251	17.47 99	55.562 299	30.83 98	62.354 242	63.99
15.8	6.36 62	9.86 218	15.054 275	16.28 119	55.895 333	30.42 41	62.621 267	63.03
	67	187	298	137	361	15	290	
25.8	7.03	7.99	15.352	14.91	56.256	30.57	62.911	61.79
Nov. 4.8	7.73 70	6.52 147	15.666 314	13.38 153	56.637 381	31.32 75	63.219 306	60.31
14.7	8.45 72	5.47 105	15.992 326	11.71 167	57.027 390	32.67 185	63.540 321	58.62
24.7	9.18 73	4.89 58	16.323 331	9.99 172	57.415 388	34.58 191	63.865 325	56.77
Dec. 4.7	9.89 71	4.79 10	16.649 326	8.25 174	57.791 376	36.99 241	64.187 322	54.82
	68	41	312	170	351	284	309	
14.6	10.57	5.20	16.961	6.55	58.142	39.83	64.496	52.82
24.6	11.18 61	6.11 91	17.252 291	4.96 159	58.456 314	43.01 318	64.783 287	50.85
34.6	11.72 54	7.47 136	17.508 256	3.51 145	58.724 268	46.42 341	65.038 265	48.97
Mean Place	1.322	35.96	11.972	24.87	54.344	35.32	59.736	69.65
Sec δ , Tan δ	2.610	+2.411	1.019	+0.194	1.369	-0.936	1.001	+0.047
$D\delta a$, $D\alpha a$	+0.11	+0.12	+0.06	+0.01	+0.04	-0.04	+0.06	0.00
$D\delta \delta$, $D\alpha \delta$	-0.3	+0.7	-0.3	+0.7	-0.3	+0.7	-0.3	+0.7

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	β Argus. Mag. 1.8		δ Cancr. Mag. 6.6		ϵ Argus. Mag. 2.2		40 Lynceis. Mag. 3.3	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 9 12	° ' " -69 22	h m 9 14	° ' " +18 3	h m 9 14	° ' " -58 55	h m 9 15	° ' " +34 44
	s	"	s	"	s	"	s	"
Jan. 0.6	19.47	4.77	19.864	37.72	52.391	10.46	58.979	45.38
10.6	19.83	8.45	20.118	36.71	52.682	14.13	59.266	45.28
20.6	20.06	12.33	20.327	35.96	52.896	17.97	59.508	45.51
30.5	20.19	16.29	20.485	35.46	53.026	21.86	59.683	46.02
Feb. 9.5	20.21	20.24	20.591	35.21	53.072	25.70	59.804	46.80
19.5	20.10	24.08	20.644	35.18	53.036	29.41	59.863	47.78
29.4	19.89	27.70	20.647	35.35	52.925	32.89	59.863	48.89
Mar. 10.4	19.58	31.06	20.604	35.66	52.745	36.07	59.811	50.09
20.4	19.19	34.06	20.523	36.08	52.506	38.89	59.715	51.27
30.4	18.74	36.64	20.412	36.58	52.222	41.30	59.582	52.40
Apr. 9.3	18.23	38.79	20.281	37.10	51.901	43.26	59.424	53.41
19.3	17.68	40.44	20.140	37.62	51.558	44.73	59.253	54.26
29.3	17.12	41.57	19.995	38.10	51.201	45.70	59.077	54.90
May 9.3	16.55	42.18	19.857	38.54	50.843	46.14	58.907	55.33
19.2	15.98	42.24	19.731	38.90	50.495	46.07	58.750	55.52
29.2	15.45	41.76	19.621	39.18	50.164	45.50	58.612	55.48
June 8.2	14.95	40.77	19.533	39.38	49.860	44.43	58.501	55.21
18.1	14.49	39.30	19.471	39.50	49.591	42.91	58.418	54.72
28.1	14.10	37.39	19.435	39.52	49.363	40.97	58.365	54.01
July 8.1	13.78	35.08	19.427	39.45	49.182	38.68	58.347	53.13
18.1	13.55	32.44	19.448	39.28	49.065	36.09	58.363	52.07
28.0	13.40	29.58	19.496	38.99	48.987	33.30	58.411	50.83
Aug. 7.0	13.35	26.57	19.575	38.59	48.982	30.38	58.495	49.47
17.0	13.39	23.51	19.682	38.07	49.041	27.45	58.613	47.97
27.0	13.54	20.50	19.817	37.40	49.168	24.59	58.763	46.35
Sept. 5.9	13.80	17.68	19.981	36.58	49.364	21.93	58.948	44.65
15.9	14.15	15.13	20.175	35.61	49.625	19.56	59.167	42.86
25.9	14.60	12.97	20.399	34.47	49.960	17.59	59.418	41.02
Oct. 5.8	15.13	11.30	20.650	33.18	50.332	15.10	59.699	39.15
15.8	15.73	10.18	20.926	31.74	50.784	12.18	60.012	37.27
25.8	16.39	9.69	21.228	30.19	51.235	14.87	60.350	35.44
Nov. 4.8	17.09	9.85	21.549	28.53	51.734	15.21	60.711	33.68
14.7	17.79	10.68	21.883	26.84	52.244	16.21	61.087	32.07
24.7	18.47	12.18	22.224	25.15	52.752	17.83	61.471	30.63
Dec. 4.7	19.13	14.28	22.564	23.53	53.239	20.05	61.854	29.43
14.7	19.73	16.95	22.892	22.02	53.691	22.79	62.224	28.49
24.6	20.25	20.07	23.197	20.66	54.092	25.97	62.569	27.87
34.6	20.67	23.56	23.473	19.52	54.433	29.47	62.879	27.57
Mean Place	16.995	16.01	17.778	43.50	50.386	20.51	56.542	54.51
Sec δ , Tan δ	2.838	-2.657	1.051	+0.326	1.937	-1.659	1.217	+0.694
$D\psi\alpha$, $D_\alpha\alpha$	+0.01	-0.13	+0.07	+0.02	+0.03	-0.08	+0.07	+0.03
$D\psi\delta$, $D_\alpha\delta$	-0.3	+0.7	-0.3	+0.7	-0.3	+0.7	-0.3	+0.7

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	θ Pyxidis. Mag. 4.9		α Hydræ. Mag. 2.2		h Ursæ Majoris. Mag. 3.8		d Ursæ Majoris. Mag. 4.6	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 9 17	° ' " -25 36	h m 9 23	° ' " - 8 17	h m 9 24	° ' " +63 25	h m 9 27	° ' " +70 11
Jan. 0.6	47.956	24.19	29.372	38.04	59.49	34.21	9.98	47.30
10.6	48.192	27.20	29.612	40.39	59.97	35.47	10.57	48.82
20.6	48.381	30.22	29.809	42.63	60.36	37.13	11.05	50.74
30.5	48.518	33.15	29.959	44.70	60.65	39.14	11.42	53.03
Feb. 9.5	48.602	35.93	30.058	46.58	60.83	41.40	11.64	55.55
19.5	48.633	38.49	30.108	48.23	60.91	43.80	11.74	58.20
29.5	48.615	40.79	30.111	49.63	60.89	46.25	11.69	60.88
Mar. 10.4	48.553	42.80	30.072	50.76	60.77	48.64	11.52	63.46
20.4	48.455	44.48	29.997	51.64	60.57	50.86	11.24	65.86
30.4	48.327	45.83	29.895	52.26	60.30	52.81	10.86	67.93
Apr. 9.3	48.180	46.82	29.772	52.66	59.97	54.43	10.41	69.63
19.3	48.020	47.45	29.638	52.81	59.61	55.65	9.91	70.89
29.3	47.856	47.72	29.501	52.75	59.23	56.42	9.39	71.66
May 9.3	47.695	47.66	29.367	52.48	58.85	56.74	8.87	71.93
19.2	47.544	47.25	29.243	52.02	58.49	56.58	8.36	71.68
29.2	47.407	46.52	29.133	51.39	58.17	55.96	7.88	70.93
June 8.2	47.289	45.49	29.040	50.61	57.88	54.90	7.47	69.71
18.2	47.193	44.19	28.969	49.70	57.64	53.44	7.12	68.05
28.1	47.123	42.66	28.920	48.67	57.46	51.60	6.84	65.98
July 8.1	47.083	40.94	28.896	47.57	57.34	49.46	6.64	63.60
18.1	47.066	39.09	28.897	46.43	57.28	47.04	6.53	60.92
28.0	47.083	37.16	28.926	45.28	57.29	44.39	6.51	58.02
Aug. 7.0	47.130	35.22	28.981	44.19	57.37	41.59	6.59	54.95
17.0	47.211	33.35	29.065	43.20	57.53	38.68	6.75	51.78
27.0	47.326	31.63	29.179	42.35	57.74	35.70	7.01	48.57
Sept. 5.9	47.475	30.11	29.321	41.72	58.01	32.73	7.35	45.38
15.9	47.657	28.89	29.494	41.33	58.36	29.80	7.78	42.26
25.9	47.873	28.03	29.697	41.25	58.76	26.98	8.29	39.30
Oct. 5.9	48.122	27.59	29.928	41.50	59.22	24.34	8.87	36.53
15.8	48.400	27.61	30.186	42.09	59.73	21.90	9.52	34.04
25.8	48.705	28.11	30.472	43.04	60.28	19.76	10.22	31.86
Nov. 4.8	49.029	29.11	30.777	44.35	60.89	17.95	10.98	30.07
14.7	49.367	30.58	31.096	45.98	61.51	16.52	11.77	28.72
24.7	49.708	32.47	31.421	47.88	62.14	15.53	12.57	27.85
Dec. 4.7	50.045	34.76	31.745	50.01	62.77	15.02	13.37	27.49
14.7	50.366	37.37	32.057	52.29	63.37	15.01	14.14	27.67
24.6	50.661	40.21	32.348	54.65	63.94	15.50	14.86	28.38
34.6	50.921	43.17	32.609	57.02	64.45	16.47	15.50	29.59
Mean Place	46.232	28.15	27.602	37.92	55.424	47.95	4.820	61.73
Sec δ , Tan δ	1.109	-0.479	1.011	-0.146	2.235	+1.999	2.952	+2.778
$D_{\phi} a, D_{\omega} a$	+0.05	-0.02	+0.06	-0.01	+0.09	+0.10	+0.11	+0.15
$D_{\phi} \delta, D_{\omega} \delta$	-0.3	+0.7	-0.3	+0.6	-0.3	+0.6	-0.3	+0.6

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	θ Ursae Majoris. Mag. 3.3		ψ Argus. Mag. 3.6		ξ Leonis. Mag. 5.1		10 Leonis Minoris. Mag. 4.6	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 9 27	° ' " +52 3	h m 9 27	° ' " -40 5	h m 9 27	° ' " +11 39	h m 9 29	° ' " +36 45
	s	"	s	"	s	"	s	"
Jan. 0.6	17.970	26.71	25.022	48.69	27.150	75.71	7.397	65.99
10.6	18.337 ³⁸⁷	27.40 ⁶⁹	25.281 ²⁵⁹	52.08 ³³⁹	27.405 ²⁵⁵	74.31 ¹⁴⁰	7.702 ³⁰⁵	65.91 ⁸
20.6	18.642 ³⁰⁶	28.49 ¹⁰⁹	25.486 ²⁰⁵	55.55 ³⁴⁷	27.619 ²¹⁴	73.14 ¹¹⁷	7.958 ²⁵⁶	66.18 ²⁷
30.5	18.875 ²³³	29.91 ¹⁴²	25.633 ¹⁴⁷	59.03 ²⁴⁸	27.785 ¹⁰⁶	72.21 ⁹³	8.157 ¹⁹⁹	66.77 ⁵⁹
Feb. 9.5	19.032 ¹⁵⁷	31.61 ¹⁷⁰	25.719 ⁹⁶	62.42 ³³⁹	27.900 ¹¹⁵	71.53 ⁶⁸	8.294 ¹³⁷	67.63 ⁸⁶
	77 ¹⁸⁹		28 ²⁸	322	64 ⁶⁴	45 ⁴⁵	76 ⁷⁶	108 ¹⁰⁸
19.5	19.109	33.50	25.747	65.64	27.964	71.08	8.370	68.71
29.5	19.108 ¹	35.48 ¹⁹⁸	25.718 ²⁹	68.61 ²⁹⁷	27.979 ¹⁵	70.86 ²²	8.386 ¹⁶	69.95 ¹²⁴
Mar. 10.4	19.038 ⁷⁰	37.46 ¹⁹⁸	25.640 ⁷⁸	71.28 ²⁶⁷	27.949 ³⁰	70.83 ³	8.346 ⁴⁰	71.27 ¹³²
20.4	18.905 ¹³³	39.35 ¹⁸⁹	25.519 ¹²¹	73.62 ²³⁴	27.882 ⁶⁷	70.96 ¹²	8.259 ⁸⁷	72.60 ¹³³
30.4	18.720 ¹³⁵	41.05 ¹⁷⁰	25.364 ¹⁵⁵	75.57 ¹⁹⁵	27.785 ⁹⁷	71.22 ²⁷	8.133 ¹²⁶	73.87 ¹²⁷
	223 ¹⁴⁶		182 ¹⁵⁵		119 ¹⁵⁵	35 ³⁵	153 ¹⁵³	113 ¹¹³
Apr. 9.3	18.498	42.51	25.182	77.12	27.666	71.57	7.980	75.00
19.3	18.253 ²⁴⁵	43.66 ¹¹⁵	24.955 ¹⁹⁷	78.24 ¹¹²	27.536 ¹³⁰	71.97 ⁴⁰	7.809 ¹⁷¹	75.98 ⁹⁸
29.3	17.996 ²⁵⁷	44.46 ⁸⁰	24.780 ²⁰⁵	78.93 ⁶⁹	27.401 ¹³⁵	72.39 ⁴²	7.631 ¹⁷⁸	76.73 ⁷⁵
May 9.3	17.741 ²⁵⁵	44.87 ⁴¹	24.575 ²⁰⁵	79.18 ²⁵	27.268 ¹³³	72.84 ⁴⁵	7.455 ¹⁷⁶	77.26 ⁵³
19.2	17.498 ²⁴³	44.93 ⁶	24.376 ¹⁹⁹	79.00 ¹⁸	27.146 ¹²²	73.29 ⁴⁵	7.291 ¹⁶⁴	77.52 ²⁶
	219 ³⁶		186 ⁶⁰		108 ¹⁰⁸	42 ⁴²	147 ¹⁴⁷	1 ¹
29.2	17.279	44.57	24.190	78.40	27.038	73.71	7.144	77.53
June 8.2	17.089 ¹⁹⁰	43.85 ⁷²	24.024 ¹⁶⁶	77.38 ¹⁰²	26.949 ⁸⁰	74.09 ³⁸	7.021 ¹²³	77.28 ²⁵
18.2	16.936 ¹⁵³	42.78 ¹⁰⁷	23.880 ¹⁴⁴	76.01 ¹³⁷	26.881 ⁶⁸	74.44 ³⁵	6.924 ⁹⁷	76.78 ⁵⁰
28.1	16.824 ¹¹²	41.40 ¹³⁸	23.762 ¹¹⁸	74.28 ¹⁷³	26.837 ⁴⁴	74.74 ³⁰	6.858 ⁶⁶	76.04 ⁷⁴
July 8.1	16.755 ⁶⁹	39.71 ¹⁶⁹	23.675 ⁸⁷	72.28 ²⁰⁰	26.819 ¹⁸	74.97 ²³	6.825 ³³	75.10 ⁹⁴
	23 ¹⁹²		58 ²²²		8 ⁸	15 ¹⁵	1 ¹	116 ¹¹⁶
18.1	16.732	37.79	23.620	70.06	26.827	75.12	6.824	73.94
28.0	16.756 ²⁴	35.65 ²¹⁴	23.602 ¹⁸	67.69 ²³⁷	26.862 ³⁵	75.19 ⁷	6.859 ³⁵	72.61 ¹³³
Aug. 7.0	16.827 ⁷¹	33.35 ²³⁰	23.622 ⁶¹	65.24 ²⁴⁵	26.924 ⁶²	75.15 ⁴	6.928 ⁶⁹	71.12 ¹⁴⁹
17.0	16.945 ¹¹⁸	30.91 ²⁴⁴	23.683 ²⁰	62.80 ²⁴⁴	27.014 ⁹⁰	74.97 ¹⁸	7.031 ¹⁰³	69.49 ¹⁶³
27.0	17.110 ¹⁶⁵	28.38 ²⁶³	23.786 ¹⁰³	60.46 ²³⁴	27.133 ¹¹⁹	74.65 ³²	7.168 ¹³⁷	67.72 ¹⁷⁷
	211 ²⁵⁹		145 ²¹³		146 ¹⁴⁶	49 ⁴⁹	174 ¹⁷⁴	187 ¹⁸⁷
Sept. 5.9	17.321	25.79	23.931	58.33	27.279	74.16	7.342	65.85
15.9	17.578 ²⁵⁷	23.20 ²⁵⁹	24.119 ¹⁸⁸	56.47 ¹⁸⁶	27.456 ¹⁷⁷	73.47 ⁶⁹	7.550 ²⁰⁸	63.90 ¹⁹⁵
25.9	17.879 ³⁰¹	20.66 ²⁵⁴	24.350 ²³¹	54.99 ¹⁴⁸	27.662 ²⁰⁶	72.59 ⁸⁸	7.792 ²⁴²	61.89 ²⁰¹
Oct. 5.9	18.223 ³⁴⁴	18.19 ²⁴⁷	24.621 ²⁷¹	53.96 ¹⁰³	27.895 ²³³	71.50 ¹⁰⁹	8.068 ²⁷⁶	59.86 ²⁰³
15.8	18.607 ³⁸⁴	15.86 ²³³	24.929 ³⁰⁸	53.44 ⁵²	28.158 ²⁶³	70.22 ¹²⁸	8.377 ³⁰⁹	57.83 ²⁰³
	418 ²¹⁴		340 ³⁴⁰	5 ⁵	287 ²⁸⁷	147 ¹⁴⁷	338 ³³⁸	198 ¹⁹⁸
25.8	19.025	13.72	25.269	53.49	28.445	68.75	8.715	55.85
Nov. 4.8	19.474 ⁴⁴⁹	11.82 ¹⁹⁰	25.631 ³⁶²	54.10 ⁶¹	28.754 ³⁰⁹	67.11 ¹⁶⁴	9.077 ³⁶²	53.97 ¹⁸⁸
14.7	19.944 ⁴⁷⁰	10.22 ¹⁶⁰	26.009 ³⁷⁸	55.29 ¹¹⁹	29.078 ³²⁴	65.36 ¹⁷⁵	9.458 ³⁸¹	52.24 ¹⁷³
24.7	20.426 ⁴⁸²	8.96 ¹²⁶	26.392 ³⁸³	57.02 ¹⁷³	29.411 ³³³	63.55 ¹⁸¹	9.850 ³⁹²	50.71 ¹⁵³
Dec. 4.7	20.907 ⁴⁸¹	8.10 ⁸⁶	26.769 ³⁷⁷	59.26 ²²⁴	29.741 ³³⁰	61.72 ¹⁸³	10.243 ³⁹³	49.44 ¹²⁷
	468 ⁴⁶		357 ²⁶⁸		327 ³²⁷	178 ¹⁷⁸	383 ³⁸³	98 ⁹⁸
14.7	21.375	7.64	27.126	61.94	30.068	59.94	10.626	48.46
24.6	21.813 ⁴³⁸	7.63 ¹	27.454 ³²⁸	64.96 ³⁰²	30.373 ³⁰⁵	58.28 ¹⁶⁶	10.986 ³⁶⁰	47.81 ⁶⁵
34.6	22.210 ³⁹⁷	8.05 ⁴²	27.742 ²⁸⁸	68.23 ³²⁷	30.648 ²⁷⁵	56.76 ¹⁵²	11.315 ³²⁹	47.52 ²⁹
Mean Place	14.885	39.40	23.322	55.75	25.210	80.74	4.967	76.43
Sec δ , Tan δ	1.626	+1.283	1.307	-0.842	1.021	+0.207	1.248	+0.747
$D_{\psi} a$, $D_{\omega} a$	+0.08	+0.07	+0.05	-0.04	+0.06	+0.01	+0.07	+0.04
$D_{\psi} \delta$, $D_{\omega} \delta$	-0.3	+0.6	-0.3	+0.6	-0.3	+0.6	-0.3	+0.6

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	O Leonis. Mag. 3.8			θ Antliae. Mag. 5.0			ϵ Leonis. Mag. 3.1			ν Argus. Mag. 3.2		
	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.
	h	m	"	h	m	"	h	m	"	h	m	"
	9	36	+10 16	9	40	-27 22	9	41	+24 9	9	44	-64 40
	s			s			s			s		
Jan. 0.6	42.047		25.44	29.030		59.58	7.255		32.89	62.12		44.47
10.6	42.308	261	23.94	29.288	258	62.60	7.539	284	32.07	62.50	38	47.99
20.6	42.528	220	22.65	29.501	213	65.66	7.780	241	31.55	62.81	31	51.75
30.5	42.701	173	21.61	29.664	163	68.67	7.972	192	31.34	63.02	21	55.66
Feb. 9.5	42.825	124	20.83	29.774	110	71.57	8.109	137	31.40	63.13	11	59.61
		73			57			84			1	
19.5	42.898		20.28	29.831		74.27	8.193		31.72	63.14		63.50
29.5	42.922	24	19.97	29.837	6	76.73	8.223	30	32.25	63.07	7	67.23
Mar. 10.4	42.900	22	19.86	29.797	40	78.90	8.204	19	32.93	62.91	16	70.74
20.4	42.841	59	19.92	29.718	79	80.77	8.143	61	33.71	62.68	23	73.94
30.4	42.753	88	20.13	29.608	110	82.31	8.048	95	34.54	62.38	30	76.78
		113			134			121			35	
Apr. 9.4	42.640		20.43	29.474		83.49	7.927		35.36	62.03		79.21
19.3	42.514	126	20.82	29.325	149	84.32	7.790	137	36.14	61.64	39	81.17
29.3	42.383	131	21.25	29.168	157	84.80	7.646	144	36.82	61.23	41	82.65
May 9.3	42.253	130	21.70	29.010	158	84.92	7.502	144	37.40	60.80	43	83.61
19.2	42.132	121	22.16	28.857	153	84.69	7.365	137	37.84	60.37	43	84.05
		110			143			122			42	
29.2	42.022		22.61	28.714		84.12	7.243		38.13	59.95		83.95
June 8.2	41.930	92	23.05	28.587	127	83.25	7.139	104	38.27	59.55	40	83.34
18.2	41.859	71	23.45	28.478	109	82.08	7.056	83	38.26	59.18	37	82.22
28.1	41.809	50	23.80	28.391	87	80.66	6.998	58	38.08	58.85	33	80.63
July 8.1	41.785	24	24.10	28.329	62	79.01	6.967	31	37.75	58.57	28	78.63
		1			35			5			23	
18.1	41.784		24.31	28.294		77.21	6.962		37.28	58.34	16	76.27
28.1	41.811	27	24.45	28.287	7	75.30	6.985	23	36.64	58.18	9	73.61
Aug. 7.0	41.863	52	24.48	28.311	24	73.36	7.037	52	35.86	58.09	9	70.77
17.0	41.943	80	24.38	28.368	57	71.44	7.119	82	34.93	58.08	1	67.81
27.0	42.052	109	24.11	28.458	90	69.63	7.231	112	33.85	58.15	7	64.84
		136			126			142			16	
Sept. 5.9	42.188		23.68	28.584		68.03	7.373		32.60	58.31		61.99
15.9	42.355	167	23.05	28.747	163	66.67	7.548	175	31.22	58.55	24	59.35
25.9	42.552	197	22.22	28.946	199	65.67	7.754	206	29.70	58.87	32	57.04
Oct. 5.9	42.778	226	21.17	29.180	234	65.06	7.991	237	28.05	59.20	42	55.15
15.8	43.034	256	19.90	29.449	269	64.90	8.260	269	26.29	59.76	47	53.79
		281			299			298			53	
25.8	43.315		18.44	29.748		65.22	8.558		24.47	60.29		53.00
Nov. 4.8	43.619	304	16.79	30.070	322	66.04	8.879	321	22.61	60.86	57	52.85
14.8	43.940	321	15.02	30.410	340	67.36	9.219	340	20.76	61.46	60	53.36
24.7	44.271	331	13.17	30.759	349	69.13	9.573	354	18.98	62.07	61	54.53
Dec. 4.7	44.605	334	11.28	31.106	347	71.31	9.929	356	17.32	62.66	59	56.32
		326			337			348			56	
14.7	44.931		9.43	31.443		73.83	10.277		15.83	63.22		58.70
24.6	45.238	307	7.67	31.756	313	76.61	10.609	332	14.57	63.73	51	61.58
34.6	45.519	281	6.06	32.038	282	79.58	10.913	304	13.58	64.18	45	64.87
Mean Place	40.165		30.54	27.407		63.84	5.182		41.52	60.188		56.03
Sec δ , Tan δ	1.016		+0.181	1.126		-0.518	1.096		+0.449	2.339		-2.114
$D_{\psi} \alpha$, $D_{\omega} \alpha$	+0.06		+0.01	+0.05		-0.03	+0.07		+0.02	+0.03		-0.12
$D_{\psi} \delta$, $D_{\omega} \delta$	-0.3		+0.6	-0.3		+0.6	-0.3		+0.6	-0.3		+0.6

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	♄ Ursa Majoris. Mag. 3.9		♄ Sextantis. Mag. 6.0		♄ Leonis. Mag. 4.1		Groombridge 1586. Mag. 6.0	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 9 45	° ' " +59 25	h m 9 47	° ' " -3 50	h m 9 47	° ' " +26 23	h m 9 50	° ' " +73 16
Jan. 0.6	5.215	49.24	1.815	58.66	61.416	61.86	59.74	29.98
10.6	5.664 449	50.11 87	2.074 280	60.84 218	61.710 294	61.11 75	60.47 73	31.34 136
20.6	6.043 379	51.43 132	2.294 230	62.89 208	61.960 260	60.67 44	61.08 61	33.18 184
30.6	6.340 287	53.13 170	2.469 175	64.77 185	62.161 201	60.56 11	61.56 48	35.42 224
Feb. 9.5	6.548 208	55.14 201	2.595 126	66.43 166	62.309 148	60.75 19	61.89 33	37.97 265
19.5	6.663 115	57.36 222	2.672 77	67.87 144	62.400 91	61.18 43	62.05 16	40.69 272
29.5	6.686 23	59.68 232	2.701 20	69.04 117	62.437 37	61.84 66	62.06 1	43.50 281
Mar. 10.4	6.621 65	62.02 234	2.687 14	69.98 94	62.425 12	62.65 81	61.93 13	46.25 275
20.4	6.478 143	64.25 223	2.636 51	70.67 69	62.369 56	63.55 60	61.65 28	48.84 259
30.4	6.271 207	66.28 203	2.553 83	71.14 47	62.277 92	64.50 95	61.25 40	51.17 233
Apr. 9.4	6.011 280	68.03 178	2.450 108	71.38 24	62.157 120	65.43 93	60.75 50	53.14 197
19.3	5.715 296	69.44 141	2.330 120	71.44 6	62.020 137	66.29 86	60.19 56	54.67 153
29.3	5.400 315	70.45 101	2.204 126	71.33 11	61.874 146	67.05 76	59.58 61	55.72 105
May 9.3	5.078 322	71.04 59	2.078 126	71.05 28	61.727 147	67.68 63	58.95 63	56.24 52
19.2	4.767 311	71.17 13	1.958 120	70.63 42	61.586 141	68.15 47	58.33 62	56.24 0
29.2	4.474 263	70.85 32	1.848 110	70.08 55	61.458 128	68.44 29	57.73 60	55.71 53
June 8.2	4.212 223	70.11 74	1.752 96	69.42 66	61.348 110	68.56 12	57.18 55	54.66 106
18.2	3.989 282	68.95 116	1.674 78	68.67 75	61.258 90	68.51 5	56.69 49	53.14 152
28.1	3.810 179	67.41 154	1.615 59	67.85 82	61.192 66	68.26 25	56.29 40	51.19 196
July 8.1	3.682 128	65.54 187	1.578 37	66.99 86	61.151 41	67.85 41	55.98 31	48.85 234
18.1	3.607 75	63.36 218	1.565 13	66.11 88	61.139 12	67.26 59	55.75 23	46.18 267
28.1	3.587 20	60.94 242	1.577 12	65.25 86	61.156 17	66.50 76	55.62 13	43.23 296
Aug. 7.0	3.624 37	58.30 264	1.613 36	64.45 80	61.200 44	65.59 91	55.61 1	40.08 315
17.0	3.719 95	55.52 278	1.677 64	63.76 69	61.275 75	64.52 107	55.70 9	36.78 330
27.0	3.872 153	52.63 289	1.769 92	63.20 56	61.381 106	63.28 124	55.90 20	33.40 338
Sept. 5.9	4.082 210	49.69 264	1.890 121	62.82 38	61.517 136	61.90 138	56.21 31	30.00 340
15.9	4.349 267	46.74 286	2.043 153	62.69 13	61.687 170	60.37 158	56.61 40	26.85 335
25.9	4.671 322	43.85 289	2.226 183	62.83 14	61.890 203	58.71 166	57.12 51	23.42 323
Oct. 5.9	5.049 378	41.07 278	2.440 214	63.25 42	62.124 234	56.94 177	57.72 60	20.38 304
15.8	5.477 423	38.46 261	2.685 245	64.00 75	62.391 267	55.08 186	58.42 70	17.57 281
25.8	5.950 478	36.07 239	2.958 273	65.07 107	62.688 297	53.16 192	59.19 77	15.09 248
Nov. 4.8	6.462 512	33.98 209	3.254 286	66.44 137	63.010 322	51.23 198	60.03 84	13.00 209
14.8	7.006 544	32.23 175	3.570 316	68.10 166	63.352 342	49.33 190	60.91 88	11.34 166
24.7	7.566 600	30.89 134	3.896 336	69.98 188	63.709 357	47.52 181	61.83 92	10.18 116
Dec. 4.7	8.131 565	30.00 89	4.224 328	72.06 208	64.070 361	45.86 166	62.75 92	9.54 64
14.7	8.685 554	29.59 41	4.547 323	74.25 219	64.425 355	44.39 147	63.65 90	9.48 6
24.6	9.210 525	29.67 8	4.851 304	76.49 224	64.765 340	43.17 122	64.50 85	9.98 50
34.6	9.690 480	30.25 58	5.129 278	78.71 222	65.077 312	42.23 94	65.28 78	11.03 105
Mean Place	1.743	64.34	0.112	56.80	59.338	71.38	54.168	46.76
Sec δ, Tan δ	1.966	+1.693	1.002	-0.067	1.116	+0.496	3.475	+3.328
D _♄ α, D _♄ α	+0.09	+0.09	+0.06	0.00	+0.07	+0.03	+0.11	+0.19
D _♄ δ, D _♄ δ	-0.3	+0.6	-0.3	+0.5	-0.3	+0.5	-0.3	+0.5

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	19 Leonis Minoris. Mag. 5.2		ϕ Argus. Mag. 3.7		π Leonis. Mag. 4.9		η Leonis. Mag. 3.6	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 9 52	° ' " +41 26	h m 9 53	° ' " -54 9	h m 9 55	° ' " + 8 26	h m 10 2	° ' " +17 9
	s	"	s	"	s	"	s	"
Jan. 0.6	35.152	69.74	56.302	53.94	48.324	46.45	47.077	73.95
10.6	35.493 ³⁴¹	69.70 ⁴	56.636 ³³⁴	57.39 ³⁴⁵	48.597 ²⁷³	44.80 ¹⁶⁵	47.365 ²⁸⁸	72.69 ¹²⁶
20.6	35.785 ²⁹²	70.07 ³⁷	56.907 ²⁷¹	61.04 ³⁶⁵	48.833 ²³⁶	43.35 ¹⁴⁵	47.614 ²⁴⁹	71.68 ¹⁰¹
30.6	36.019 ²³⁴	70.81 ⁷⁴	57.107 ²⁰⁰	64.81 ³⁷⁷	49.023 ¹⁸⁰	42.16 ¹¹⁹	47.818 ²⁰⁴	70.97 ⁷¹
Feb. 9.5	36.192 ¹⁷³	71.87 ¹⁰⁶	57.234 ¹²⁷	68.60 ³⁷⁹	49.164 ¹⁴¹	41.21 ⁹⁵	47.972 ¹⁵⁴	70.54 ⁴³
	107	130	56	371	91	68	103	1
19.5	36.299	73.17	57.290	72.31	49.255	40.53	48.075	70.39
29.5	36.343 ⁴⁴	74.67 ¹⁵⁰	57.271 ¹⁹	75.84 ³⁵³	49.297 ⁴²	40.08 ⁴⁵	48.126 ⁵¹	70.47 ⁸
Mar. 10.4	36.325 ¹⁸	76.27 ¹⁶⁰	57.191 ⁸⁰	79.15 ³³¹	49.294 ³	39.86 ²²	48.131 ⁵	70.78 ³¹
20.4	36.254 ⁷¹	77.88 ¹⁶¹	57.053 ¹³⁸	82.14 ²⁹⁹	49.252 ⁴²	39.83 ³	48.094 ³⁷	71.23 ⁴⁵
30.4	36.139 ¹¹⁵	79.44 ¹⁵⁶	56.868 ¹⁸⁵	84.77 ²⁶³	49.178 ⁷⁴	39.97 ¹⁴	48.022 ⁷²	71.80 ⁵⁷
	149	143	224	223	98	27	99	64
Apr. 9.4	35.990	80.87	56.644	87.00	49.080	40.24	47.923	72.44
19.3	35.816 ¹⁷⁴	82.10 ¹²³	56.391 ²⁵³	88.79 ¹⁷⁹	48.965 ¹¹⁵	40.60 ³⁶	47.806 ¹¹⁷	73.10 ⁶⁶
29.3	35.630 ¹⁸⁶	83.10 ¹⁰⁰	56.120 ²⁷¹	90.10 ¹³¹	48.842 ¹²³	41.02 ⁴²	47.680 ¹²⁶	73.75 ⁶⁵
May 9.3	35.440 ¹⁹⁰	83.82 ⁷²	55.839 ²⁸¹	90.94 ⁸⁴	48.717 ¹²⁵	41.49 ⁴⁷	47.550 ¹³⁰	74.36 ⁶¹
19.3	35.256 ¹⁸⁴	84.24 ⁴²	55.557 ²⁸²	91.28 ³⁴	48.598 ¹¹⁹	41.98 ⁴⁹	47.425 ¹²⁵	74.90 ³⁴
	170	11	276	15	110	49	116	45
29.2	35.086	84.35	55.281	91.13	48.488	42.47	47.309	75.36
June 8.2	34.934 ¹⁵²	84.15 ²⁰	55.019 ²⁶²	90.49 ⁶⁴	48.391 ⁹⁷	42.95 ⁴⁸	47.206 ¹⁰³	75.72 ³⁶
18.2	34.808 ¹²⁶	83.63 ⁵²	54.778 ²⁴¹	89.39 ¹¹⁰	48.313 ⁷⁸	43.41 ⁴⁶	47.119 ⁸⁷	75.96 ⁷⁴
28.1	34.711 ⁹⁷	82.83 ⁸⁰	54.566 ²¹²	87.85 ¹⁵⁴	48.253 ⁶⁰	43.84 ⁴³	47.054 ⁶⁵	76.10 ¹⁴
July 8.1	34.645 ⁶⁶	81.75 ¹⁰⁸	54.386 ¹⁸⁰	85.95 ¹⁹⁰	48.215 ³⁸	44.21 ³⁷	47.009 ⁴⁵	76.13 ³
	32	131	141	224	15	30	21	11
18.1	34.613	80.44	54.245	83.71	48.200	44.51	46.988	76.02
28.1	34.614 ¹	78.88 ¹⁵⁶	54.149 ⁹⁶	81.20 ²⁵¹	48.208 ⁸	44.72 ²¹	46.991 ³	75.77 ²³
Aug. 7.0	34.652 ³⁸	77.14 ¹⁷⁴	54.104 ⁴⁵	78.52 ²⁶⁸	48.242 ³⁴	44.83 ¹¹	47.021 ³⁰	75.38 ³⁶
17.0	34.727 ⁷⁵	75.22 ¹⁹²	54.110 ⁶	75.76 ²⁷⁶	48.302 ⁶⁰	44.81 ²	47.077 ⁵⁶	74.83 ⁵⁵
27.0	34.839 ¹¹²	73.14 ²⁰⁸	54.174 ⁶⁴	73.01 ²⁷⁵	48.390 ⁸⁸	44.63 ¹⁸	47.162 ⁸⁵	74.12 ⁷¹
	150	219	124	264	117	36	114	88
Sept. 6.0	34.989	70.95	54.298	70.37	48.507	44.27	47.276	73.25
15.9	35.177 ¹⁸⁸	68.67 ²²⁸	54.484 ¹⁸⁶	67.95 ²⁴²	48.654 ¹⁴⁷	43.71 ⁵⁶	47.421 ¹⁴⁵	72.17 ¹⁰⁶
25.9	35.404 ²²⁷	66.34 ²³³	54.729 ²⁴⁵	65.86 ²⁰⁹	48.833 ¹⁷⁹	42.92 ⁷⁹	47.599 ¹⁷⁸	70.91 ¹²⁸
Oct. 5.9	35.670 ²⁶⁶	63.99 ²³⁵	55.031 ³⁰²	64.19 ¹⁶⁷	49.044 ²¹¹	41.91 ¹⁰¹	47.809 ²¹⁰	69.48 ¹⁴³
15.8	35.973 ³⁰³	61.66 ²³³	55.388 ³⁵⁷	63.01 ¹¹⁸	49.284 ²⁴⁰	40.67 ¹²⁴	48.052 ²⁴³	67.87 ¹⁶¹
	339	226	402	61	271	146	273	174
25.8	36.312	59.40	55.790	62.40	49.555	39.21	48.325	66.13
Nov. 4.8	36.679 ³⁶⁷	57.29 ²¹¹	56.228 ⁴³⁸	62.41 ¹	49.851 ²⁹⁶	37.55 ¹⁶⁶	48.626 ³⁰¹	64.27 ¹⁸⁶
14.8	37.072 ³⁹³	55.34 ¹⁹⁵	56.690 ⁴⁶²	63.04 ⁶³	50.167 ³¹⁶	35.74 ¹⁸¹	48.948 ³²²	62.34 ¹⁹³
24.7	37.479 ⁴⁰⁷	53.65 ¹⁶⁹	57.164 ⁴⁷⁴	64.30 ¹²⁶	50.496 ³²⁹	33.82 ¹⁹²	49.286 ³³⁸	60.40 ¹⁹⁴
Dec. 4.7	37.895 ⁴¹⁶	52.24 ¹⁴¹	57.634 ⁴⁷⁰	66.17 ¹⁸⁷	50.830 ³³⁴	31.85 ¹⁹⁷	49.630 ³⁴⁴	58.50 ¹⁹⁰
	409	106	449	239	331	196	343	180
14.7	38.304	51.18	58.083	68.56	51.161	29.89	49.973	56.70
24.7	38.695 ³⁹¹	50.51 ⁶⁷	58.500 ⁴¹⁷	71.43 ²⁸⁷	51.476 ³¹⁵	28.00 ¹⁸⁹	50.302 ³²⁹	55.07 ¹⁹³
34.6	39.057 ³⁶²	50.24 ²⁷	58.869 ³⁶⁹	74.68 ³²⁵	51.767 ²⁹¹	26.24 ¹⁷⁶	50.607 ³⁰⁵	53.65 ¹⁴²
Mean Place	32.714	82.69	54.658	64.00	46.547	51.90	45.224	82.03
Sec δ , Tan δ	1.334	+0.883	1.708	-1.385	1.011	+0.148	1.047	+0.309
$D_{\phi} \alpha$, $D_{\omega} \alpha$	+0.07	+0.05	+0.04	-0.08	+0.06	+0.01	+0.06	+0.02
$D_{\phi} \delta$, $D_{\omega} \delta$	-0.3	+0.5	-0.3	+0.5	-0.3	+0.5	-0.3	+0.5

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	α Leonis. (Regulus.) Mag. 1.3		λ Hydræ. Mag. 3.8		η Velorum. Mag. 4.1		β Ursæ Majoris. Mag. 5.7	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 10 3	° ' " +12 22	h m 10 6	° ' " -11 56	h m 10 11	° ' " -41 42	h m 10 11	° ' " +65 31
Jan. 0.6	55.806	34.68	31.139	18.27	13.838	11.81	60.85	22.78
10.6	56.089 ²⁸³	33.18 ¹⁵⁰	31.412 ²⁷³	20.77 ²⁵⁰	14.149 ³¹¹	15.02 ³²¹	61.41 ⁵⁶	23.82 ⁸⁴
20.6	56.334 ²⁴⁵	31.92 ¹²⁶	31.648 ²³⁶	23.22 ²⁴⁵	14.412 ²⁶³	18.41 ³³⁹	61.90 ⁴⁹	24.96 ¹³⁴
30.6	56.534 ²⁰⁰	30.92 ¹⁰⁰	31.838 ¹⁹⁰	25.54 ²³²	14.619 ²⁰⁷	21.87 ³⁴⁶	62.30 ⁴⁰	26.75 ¹⁷⁹
Feb. 9.5	56.685 ¹⁵¹	30.20 ⁷²	31.980 ¹⁴²	27.69 ²¹⁵	14.768 ¹⁴⁹	25.32 ³⁴⁵	62.59 ²⁹	28.89 ²¹⁴
	101	46	93	193	88	335	19	242
19.5	56.786	29.74	32.073	29.62	14.856	28.67	62.78	31.31
29.5	56.837	29.54	32.118	31.31	14.888	31.84	62.85	33.88
Mar. 10.5	56.842 ⁵	29.55	32.120	32.75	14.867	34.77	62.82	36.48
20.4	56.807 ³⁵	29.75	32.082	33.91	14.798	37.41	62.69	39.01
30.4	56.738 ⁹⁹	30.09	32.012	34.82	14.688	39.72	62.47	41.38
	94	44	93	64	140	194	30	207
Apr. 9.4	56.644	30.53	31.919	35.46	14.548	41.66	62.17	43.45
19.3	56.531 ¹¹³	31.03	31.808 ¹¹¹	35.85	14.382	43.20	61.83	45.19
29.3	56.409 ¹²²	31.57	31.685 ¹²³	36.00	14.201	44.33	61.44	46.52
May 9.3	56.284 ¹²⁶	32.11	31.560 ¹²⁶	35.93	14.010	45.04	61.04	47.41
19.3	56.162 ¹²²	32.64	31.437 ¹²³	35.64	13.817	45.32	60.63	47.78
	112	49	116	48	189	16	39	13
29.2	56.050	33.13	31.321	35.16	13.628	45.16	60.24	47.65
June 8.2	55.949 ¹⁰¹	33.57	31.215 ¹⁰⁶	34.48	13.448	44.58	59.87	47.05
18.2	55.865 ⁸⁴	33.94	31.124 ⁹¹	33.65	13.283	43.61	59.54	45.98
28.2	55.801 ⁶⁴	34.25	31.050 ⁷⁴	32.68	13.136	42.26	59.25	44.48
July 8.1	55.756 ⁴⁶	34.46	30.994 ⁵⁶	31.60	13.013	40.58	59.02	42.56
	21	11	34	115	97	194	17	226
18.1	55.735	34.57	30.960	30.45	12.916	38.64	58.85	40.30
28.1	55.736 ¹	34.58	30.949 ¹¹	29.26	12.850	36.46	58.75	37.73
Aug. 7.0	55.764 ²⁸	34.46	30.963 ¹⁴	28.10	12.820	34.15	58.71	34.90
17.0	55.817 ⁵³	34.19	31.003 ⁴⁰	27.00	12.828	31.77	58.74	31.87
27.0	55.898 ⁸¹	33.77	31.074 ⁷¹	26.01	12.878	29.41	58.84	28.71
	111	60	100	81	94	225	18	323
Sept. 6.0	56.009	33.17	31.174	25.20	12.972	27.16	59.02	25.48
15.9	56.150 ¹⁴¹	32.36	31.307 ¹³³	24.62	13.113	25.13	59.27	22.19
25.9	56.323 ¹⁷³	31.36	31.473 ¹⁶⁶	24.33	13.301	23.40	59.59	18.96
Oct. 5.9	56.528 ²⁰⁵	30.14	31.674 ²⁰¹	24.35	13.535	22.06	59.98	15.84
15.9	56.765 ²³⁷	28.73	31.907 ²³³	24.74	13.815	21.17	60.44	12.86
	268	161	266	76	321	87	53	270
25.8	57.033	27.12	32.173	25.50	14.136	20.80	60.97	10.16
Nov. 4.8	57.328 ²⁹⁵	25.36	32.464 ²⁹¹	26.63	14.491	20.98	61.54	7.76
14.8	57.644 ³¹⁶	23.48	32.779 ³¹⁵	28.12	14.871	21.74	62.16	5.73
24.7	57.975 ³³¹	21.54	33.107 ³²⁸	29.92	15.267	23.05	62.81	4.12
Dec. 4.7	58.313 ³³⁸	19.58	33.441 ³³⁴	32.01	15.666	24.90	63.48	3.01
	336	191	330	229	390	233	66	57
14.7	58.649	17.67	33.771	34.30	16.056	27.23	64.14	2.44
24.7	58.972 ³²³	15.88	34.086 ³¹⁵	36.73	16.426	29.97	64.78	2.38
34.6	59.271 ²⁹⁹	14.26	34.377 ²⁹¹	39.22	16.761	33.03	65.39	2.90
		162		249	335	306	61	62
Mean Place	54.023	41.53	29.579	18.16	12.373	19.48	57.046	40.72
Sec δ , Tan δ	1.024	+0.219	1.022	-0.212	1.340	-0.891	2.413	+2.196
$D_{\delta} \alpha$, $D_{\delta} \alpha$	+0.06	+0.01	+0.06	-0.01	+0.05	-0.05	+0.09	+0.13
$D_{\delta} \delta$, $D_{\delta} \delta$	-0.3	+0.5	-0.3	+0.5	-0.4	+0.5	-0.4	+0.5

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	ζ Leonis. Mag. 3.6		λ Ursæ Majoris. Mag. 3.5		γ Leonis <i>pr.</i> Mag. 2.6		μ Ursæ Majoris. Mag. 3.2	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 10 12	° ' " +23 49	h m 10 12	° ' " +43 19	h m 10 15	° ' " +20 15	h m 10 17	° ' " +41 54
Jan. 0.7	3.201	60.75	4.637	49.18	22.457	51.35	22.147	66.05
10.6	3.506	59.74	5.000	49.07	22.757	50.16	22.508	65.83
20.6	3.773	59.05	5.318	49.39	23.021	49.25	22.825	66.04
30.6	3.994	58.69	5.579	50.12	23.241	48.66	23.088	66.67
Feb. 9.5	4.163	58.63	5.779	51.21	23.411	48.39	23.291	67.64
19.5	4.279	58.88	5.911	52.58	23.529	48.39	23.429	68.93
29.5	4.342	59.37	5.980	54.18	23.595	48.66	23.503	70.45
Mar. 10.5	4.356	60.06	5.985	55.90	23.613	49.14	23.516	72.13
20.4	4.324	60.88	5.932	57.67	23.588	49.77	23.473	73.85
30.4	4.256	61.80	5.831	59.41	23.526	50.52	23.382	75.56
Apr. 9.4	4.158	62.73	5.693	61.01	23.436	51.32	23.252	77.15
19.4	4.039	63.64	5.525	62.44	23.324	52.13	23.094	78.59
29.3	3.908	64.48	5.340	63.61	23.200	52.90	22.918	79.79
May 9.3	3.773	65.21	5.147	64.51	23.071	53.59	22.733	80.74
19.3	3.639	65.81	4.955	65.09	22.943	54.19	22.549	81.37
29.2	3.512	66.27	4.773	65.33	22.824	54.68	22.372	81.68
June 8.2	3.400	66.55	4.607	65.25	22.715	55.04	22.210	81.67
18.2	3.303	66.67	4.461	64.83	22.621	55.25	22.067	81.33
28.2	3.227	66.61	4.343	64.09	22.547	55.32	21.949	80.67
July 8.1	3.171	66.36	4.252	63.03	22.493	55.23	21.858	79.72
18.1	3.140	65.95	4.194	61.71	22.461	54.98	21.798	78.47
28.1	3.133	65.36	4.169	60.12	22.452	54.57	21.769	76.98
Aug. 7.0	3.153	64.59	4.180	58.30	22.471	54.01	21.773	75.23
17.0	3.201	63.65	4.226	56.27	22.515	53.26	21.814	73.29
27.0	3.278	62.53	4.312	54.08	22.588	52.35	21.891	71.16
Sept. 6.0	3.387	61.24	4.436	51.74	22.691	51.25	22.007	68.88
15.9	3.527	59.78	4.601	49.29	22.826	49.98	22.162	66.49
25.9	3.702	58.15	4.808	46.78	22.996	48.52	22.358	64.01
Oct. 5.9	3.911	56.39	5.056	44.23	23.198	46.90	22.596	61.48
15.9	4.154	54.50	5.345	41.70	23.433	45.13	22.873	58.96
25.8	4.429	52.52	5.672	39.24	23.702	43.24	23.190	56.49
Nov. 4.8	4.735	50.48	6.034	36.92	24.001	41.26	23.542	54.13
14.8	5.064	48.44	6.426	34.79	24.323	39.24	23.924	51.95
24.7	5.412	46.46	6.838	32.90	24.663	37.23	24.328	50.00
Dec. 4.7	5.769	44.58	7.261	31.33	25.013	35.29	24.743	48.34
14.7	6.124	42.89	7.684	30.13	25.362	33.49	25.160	47.06
24.7	6.468	41.42	8.093	29.32	25.701	31.89	25.563	46.15
34.6	6.790	40.23	8.476	28.95	26.018	30.52	25.942	45.67
Mean Place	1.296	71.01	2.266	63.86	20.627	60.85	19.861	80.79
Sec δ , Tan δ	1.093	+0.442	1.375	+0.943	1.066	+0.369	1.344	+0.898
$D_{\psi} \alpha$, $D_{\omega} \alpha$	+0.07	+0.03	+0.07	+0.06	+0.07	+0.02	+0.07	+0.05
$D_{\psi} \delta$, $D_{\omega} \delta$	-0.4	+0.5	-0.4	+0.5	-0.4	+0.4	-0.1	+0.4

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	30 H. Ursæ Majoris. Mag. 4.9		μ Hydre. Mag. 4.1		31 Leonis Minoris. Mag. 4.4		α Antile. Mag. 4.4	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 10 18	° ' +65 58	h m 10 22	° ' -16 24	h m 10 23	° ' +37 7	h m 10 23	° ' -30 38
Jan. 0.7	9.58	71.86	3.099	24.47	4.011	62.72	19.776	19.36
10.6	10.16	72.64	3.384	27.10	4.357	62.23	20.076	22.33
20.6	10.66	73.95	3.633	29.72	4.663	62.16	20.336	25.41
30.6	11.08	75.71	3.838	32.21	4.918	62.48	20.548	28.51
Feb. 9.5	11.40	77.84	3.995	34.64	5.118	63.17	20.708	31.54
19.5	11.59	80.25	4.104	36.83	5.257	64.17	20.816	34.44
29.5	11.68	82.84	4.164	38.80	5.336	65.43	20.872	37.16
Mar. 10.5	11.66	85.48	4.180	40.51	5.358	66.85	20.880	39.63
20.4	11.54	88.06	4.155	41.96	5.328	68.37	20.844	41.82
30.4	11.32	90.47	4.098	43.13	5.252	69.91	20.773	43.71
Apr. 9.4	11.03	92.62	4.014	44.03	5.140	71.39	20.672	45.26
19.4	10.69	94.41	3.910	44.64	5.001	72.74	20.549	46.46
29.3	10.30	95.81	3.793	44.99	4.846	73.91	20.411	47.31
May 9.3	9.89	96.74	3.670	45.08	4.680	74.86	20.264	47.81
19.3	9.47	97.19	3.546	44.91	4.515	75.55	20.115	47.95
29.2	9.07	97.14	3.427	44.52	4.356	75.97	19.968	47.73
June 8.2	8.69	96.60	3.315	43.90	4.209	76.08	19.829	47.18
18.2	8.34	95.59	3.214	43.09	4.079	75.91	19.700	46.30
28.2	8.04	94.13	3.128	42.10	3.972	75.45	19.588	45.13
July 8.1	7.80	92.26	3.060	40.95	3.887	74.71	19.492	43.69
18.1	7.61	90.02	3.011	39.70	3.831	73.71	19.419	42.05
28.1	7.49	87.46	2.984	38.39	3.803	72.46	19.369	40.25
Aug. 7.1	7.43	84.64	2.980	37.05	3.804	70.98	19.349	38.34
17.0	7.45	81.60	3.005	35.75	3.838	69.29	19.359	36.40
27.0	7.54	78.41	3.057	34.56	3.906	67.41	19.402	34.51
Sept. 6.0	7.70	75.13	3.141	33.51	4.010	65.35	19.484	32.73
15.9	7.94	71.82	3.259	32.69	4.150	63.17	19.604	31.18
25.9	8.25	68.54	3.413	32.13	4.329	60.86	19.765	29.90
Oct. 5.9	8.63	65.35	3.603	31.91	4.548	58.48	19.968	28.98
15.9	9.08	62.33	3.829	32.06	4.806	56.06	20.211	28.47
25.8	9.60	59.54	4.089	32.60	5.101	53.65	20.490	28.43
Nov. 4.8	10.17	57.06	4.379	33.53	5.431	51.31	20.804	28.87
14.8	10.79	54.95	4.693	34.87	5.790	49.08	21.143	29.83
24.8	11.45	53.27	5.024	36.57	6.171	47.05	21.501	31.27
Dec. 4.7	12.13	52.08	5.363	38.59	6.564	45.27	21.865	33.16
14.7	12.80	51.43	5.701	40.87	6.960	43.79	22.227	35.45
24.7	13.45	51.32	6.026	43.34	7.345	42.67	22.572	38.06
34.6	14.07	51.76	6.328	45.94	7.708	41.94	22.892	40.91
Mean Place	5.802	90.34	1.636	25.35	1.899	76.80	18.372	24.24
Sec. δ , Tan δ	2.458	+2.245	1.042	-0.294	1.254	+0.757	1.163	-0.592
$D_{\phi} \alpha$, $D_{\omega} \alpha$	+0.09	+0.14	+0.06	-0.02	+0.07	+0.05	+0.05	-0.04
$D_{\phi} \delta$, $D_{\omega} \delta$	-0.4	+0.4	-0.4	+0.4	-0.4	+0.4	-0.4	+0.4

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	36 Ursæ Majoris. Mag. 4.8			9 H. Draconis. Mag. 5.0			ρ Leonis. Mag. 3.8			33 Sextantis. Mag. 6.4		
	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.
	h m 10 25	° ' " +56 24	h m 10 27	° ' " +76 8	h m 10 28	° ' " +9 43	h m 10 37	° ' " -1 17				
	s	"	s	"	s	"	s	"				
Jan. 0.7	18.566	24.32	65.29	26.51	25.024	74.29	9.269	61.99				
10.6	19.025 ⁴⁵⁹	24.65 ³³	66.22 ⁹³	27.53 ¹⁰²	25.320 ²⁹⁶	72.60 ¹⁸⁹	9.562 ²⁹³	64.13 ²¹⁴				
20.6	19.430 ⁴⁰⁵	25.47 ⁸²	67.04 ⁸²	29.10 ¹⁵⁷	25.581 ²⁶¹	71.11 ¹⁴⁹	9.823 ²⁶¹	66.13 ²⁰⁰				
30.6	19.767 ³³⁷	26.76 ¹²⁹	67.70 ⁶⁶	31.15 ²⁰⁵	25.800 ²¹⁹	69.90 ¹²¹	10.043 ²²⁰	67.96 ¹⁸³				
Feb. 9.6	20.028 ²⁶¹	28.44 ¹⁶⁸	68.21 ⁵¹	33.58 ²⁴³	25.973 ¹⁷³	68.95 ⁹⁵	10.219 ¹⁷⁶	69.55 ¹⁵⁹				
	177	198	33	271	125	66	128	135				
19.5	20.205 ⁹³	30.42 ²²²	68.54 ¹⁴	36.29 ²⁸⁸	26.098 ⁷⁶	68.29 ⁴¹	10.347 ⁸¹	70.90 ¹⁰⁹				
29.5	20.298 ¹⁰	32.64 ²³²	68.68 ⁴	39.17 ²⁹²	26.174 ³⁰	67.88 ¹⁵	10.428 ³⁷	71.99 ⁸³				
Mar. 10.5	20.308 ⁶⁴	34.96 ²³²	68.64 ²²	42.09 ²⁸⁴	26.204 ¹¹	67.73 ⁵	10.465 ³	72.84 ⁵⁹				
20.4	20.244 ¹³¹	37.28 ²²³	68.42 ³⁸	44.93 ²⁶²	26.193 ⁴⁵	67.78 ²⁴	10.462 ³⁵	73.43 ³⁷				
30.4	20.113 ¹⁸⁷	39.51 ²⁰⁴	68.04 ⁵⁰	47.55 ²³⁴	26.148 ⁷⁴	68.02 ³⁶	10.424 ⁶⁶	73.80 ¹⁷				
Apr. 9.4	19.926 ²³⁰	41.55 ¹⁷⁶	67.54 ⁶²	49.89 ¹⁹⁴	26.074 ⁹⁴	68.38 ⁴⁶	10.358 ⁸⁶	73.97 ⁹				
19.4	19.696 ²⁶⁰	43.31 ¹⁴⁴	66.92 ⁷⁰	51.83 ¹⁴⁹	25.980 ¹⁰⁸	68.84 ⁵³	10.272 ¹⁰⁰	73.97 ¹⁷				
29.3	19.436 ²⁷⁵	44.75 ¹⁰⁵	66.22 ⁷⁵	53.32 ⁹⁷	25.872 ¹¹⁵	69.37 ⁵⁵	10.172 ¹⁰⁸	73.80 ²⁹				
May 9.3	19.161 ²⁸⁰	45.80 ⁶³	65.47 ⁷⁷	54.29 ⁴³	25.757 ¹¹⁶	69.92 ⁵⁷	10.064 ¹¹⁰	73.51 ⁴⁹				
19.3	18.881 ²⁷³	46.43 ²⁰	64.70 ⁷⁷	54.72 ¹¹	25.641 ¹¹⁰	70.49 ⁵⁴	9.954 ¹⁰⁸	73.11 ⁵⁰				
29.3	18.608 ²⁵⁶	46.63 ²⁴	63.93 ⁷²	54.61 ⁶⁵	25.531 ¹⁰³	71.03 ⁵²	9.846 ¹⁰¹	72.61 ⁵⁷				
June 8.2	18.352 ²³³	46.39 ⁶⁸	63.21 ⁶⁸	53.96 ¹¹⁷	25.428 ⁹⁰	71.55 ⁴⁷	9.745 ⁹²	72.04 ⁶²				
18.2	18.119 ²⁰¹	45.71 ¹⁰⁹	62.53 ⁶²	52.79 ¹⁶⁷	25.338 ⁷⁵	72.02 ⁴⁰	9.653 ⁸⁰	71.42 ⁶⁷				
28.2	17.918 ¹⁶⁵	44.62 ¹⁴⁷	61.91 ⁵²	51.12 ²¹¹	25.263 ⁵⁹	72.42 ³⁵	9.573 ⁶³	70.75 ⁶⁸				
July 8.1	17.753 ¹²³	43.15 ¹⁸¹	61.39 ⁴²	49.01 ²⁵²	25.204 ³⁹	72.77 ²⁴	9.510 ⁴⁷	70.07 ⁶⁸				
18.1	17.630 ⁸⁰	41.34 ²¹⁴	60.97 ³⁰	46.49 ²⁸⁴	25.165 ¹⁸	73.01 ¹²	9.463 ²⁷	69.39 ⁶⁴				
28.1	17.550 ³²	39.20 ²⁴⁰	60.67 ²⁰	43.05 ³¹⁴	25.147 ⁴	73.13 ²	9.436 ⁷	68.75 ⁵⁷				
Aug. 7.1	17.518 ¹⁷	36.80 ²⁶⁵	60.47 ⁸	40.51 ³³⁴	25.151 ³⁰	73.15 ¹³	9.429 ¹⁸	68.18 ⁴⁸				
17.0	17.535 ⁶⁸	34.15 ²⁸¹	60.39 ⁷	37.17 ³⁵⁰	25.181 ⁵⁵	73.02 ³¹	9.447 ⁴³	67.70 ³⁵				
27.0	17.603 ¹²⁰	31.34 ²⁹⁵	60.46 ¹⁸	33.67 ³⁵⁸	25.236 ⁸⁶	72.71 ⁴⁸	9.490 ⁷⁴	67.35 ¹⁶				
Sept. 6.0	17.723 ¹⁷⁵	28.39 ³⁰⁴	60.64 ³¹	30.09 ³⁰⁰	25.322 ¹¹⁵	72.23 ⁶⁹	9.564 ¹⁰⁵	67.19 ⁴				
16.0	17.898 ²³⁰	25.35 ³⁰⁶	60.95 ⁴⁶	26.49 ³⁵²	25.437 ¹⁵⁰	71.54 ⁹⁰	9.669 ¹³⁶	67.23 ³⁰				
25.9	18.128 ²⁸⁵	22.29 ³⁰³	61.41 ⁵⁶	22.97 ³⁴⁰	25.587 ¹⁸²	70.64 ¹¹⁴	9.805 ¹⁷³	67.53 ⁵⁵				
Oct. 5.9	18.413 ³³⁸	19.26 ²⁹³	61.97 ⁶⁸	19.57 ³¹⁹	25.769 ²¹⁷	69.50 ¹³⁵	9.978 ²⁰⁷	68.08 ⁸⁵				
15.9	18.751 ³⁹⁰	16.33 ²⁷⁸	62.65 ⁸⁰	16.38 ²⁹²	25.986 ²⁵⁰	68.15 ¹⁵⁷	10.185 ²⁴²	68.93 ¹¹⁴				
25.8	19.141 ⁴³⁵	13.55 ²⁵⁶	63.45 ⁸⁹	13.46 ²⁵⁶	26.236 ²⁸⁰	66.58 ¹⁷⁵	10.427 ²⁷²	70.07 ¹⁴¹				
Nov. 4.8	19.576 ⁴⁷⁴	10.99 ²²⁶	64.34 ⁹⁷	10.90 ²¹³	26.516 ³⁰⁶	64.83 ¹⁹⁰	10.699 ³⁰⁰	71.48 ¹⁶⁹				
14.8	20.050 ⁵⁰⁵	8.73 ¹⁹⁰	65.31 ¹⁰³	8.77 ¹⁶³	26.822 ³²⁵	62.93 ²⁰¹	10.999 ³¹⁹	73.17 ¹⁹⁰				
24.8	20.555 ⁵²¹	6.83 ¹⁴⁸	66.34 ¹⁰⁶	7.12 ¹¹⁰	27.147 ³³⁵	60.92 ²⁰⁶	11.318 ³³²	75.07 ²⁰⁷				
Dec. 4.7	21.076 ⁵²⁴	5.35 ¹⁰²	67.40 ¹⁰⁷	6.02 ⁵³	27.482 ³³⁸	58.86 ²⁰³	11.650 ³³⁴	77.14 ²¹⁷				
14.7	21.600 ⁵¹¹	4.33 ⁵⁰	68.47 ¹⁰³	5.49 ⁸	27.820 ³²⁹	56.83 ¹⁹⁶	11.984 ³²⁶	79.31 ²²¹				
24.7	22.111 ⁴⁸⁰	3.83 ²	69.50 ⁹⁸	5.57 ⁶⁸	28.149 ³⁰⁹	54.87 ¹⁸²	12.310 ³⁰⁸	81.52 ²¹⁷				
34.7	22.591	3.85	70.48	6.25	28.458	53.05	12.618	83.69				
Mean Place	15.712	42.15	59.569	46.50	23.397	81.40	7.785	57.93				
Sec δ , Tan δ	1.808	+1.505	4.175	+4.055	1.014	+0.172	1.000	-0.023				
$D\psi\alpha$, $D\omega\alpha$	+0.08	+0.09	+0.10	+0.25	+0.06	+0.01	+0.06	0.00				
$D\psi\delta$, $D\omega\delta$	-0.4	+0.4	-0.4	+0.4	-0.4	+0.4	-0.4	+0.4				

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	41 Leonis Minoris. Mag. 5.0		θ Argus. Mag. 3.0		42 Leonis Minoris. Mag. 5.4		γ Argus. Var. 1.6-6.6	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 10 38	° ' " +23 37	h m 10 39	° ' " -63 57	h m 10 41	° ' " +31 6	h m 10 41	° ' " -59 14
	s	"	s	"	s	"	s	"
Jan. 0.7	52.853	31.17	58.74	4.56	13.730	76.58	49.233	22.17
10.6	53.173 ³²⁰	29.99 ¹¹⁸	59.23 ⁴⁹	7.64 ³⁰⁸	14.069 ³³⁹	75.68 ⁹⁰	49.673 ⁴⁴⁰	25.26 ³⁰⁹
20.6	53.460 ²⁸⁷	29.15 ⁸⁴	59.64 ⁴¹	11.07 ³⁴³	14.372 ³⁰³	75.19 ⁴⁹	50.060 ³⁷⁷	28.68 ³⁴²
30.6	53.703 ²⁴³	28.65 ⁵⁰	59.97 ³³	14.75 ³⁶⁸	14.631 ²⁵⁹	75.09 ¹⁰	50.357 ³⁰⁷	32.32 ³⁶⁴
Feb. 9.6	53.898 ¹⁹⁵	28.50 ¹⁵	60.22 ²⁵	18.58 ³⁸³	14.839 ²⁰⁶	75.36 ²⁷	50.587 ²³⁰	36.09 ³⁷⁷
	144	17	15	388	153	61	151	381
19.5	54.042	28.67	60.37	22.46	14.992	75.97	50.738	39.90
29.5	54.132 ⁹⁰	29.11 ⁴⁴	60.45 ⁸	26.31 ³⁸⁵	15.090 ⁹⁸	76.85 ⁸⁸	50.812 ⁷⁴	43.66 ³⁷⁶
Mar. 10.5	54.174 ⁴²	29.79 ⁶⁸	60.43 ²	30.03 ³⁷²	15.133 ⁴³	77.97 ¹¹²	50.811 ¹	47.28 ³⁶²
20.4	54.172 ²	30.64 ⁸⁵	60.33 ¹⁰	33.56 ³⁵³	15.128 ⁵	79.23 ¹²⁶	50.743 ⁶⁸	50.67 ³³⁹
30.4	54.128 ⁴⁴	31.61 ⁹⁷	60.16 ¹⁷	36.80 ³²⁴	15.080 ⁴⁸	80.57 ¹³⁴	50.613 ¹³⁰	53.79 ³¹²
	76	102	23	290	84	135	183	278
Apr. 9.4	54.052	32.63	59.93	39.70	14.996	81.92	50.430	56.57
19.4	53.965 ⁹⁹	33.65 ¹⁰²	59.65 ²⁸	42.22 ²⁵²	14.885 ¹¹¹	83.20 ¹²⁸	50.203 ²²⁷	58.96 ²³⁹
29.3	53.835 ¹¹⁸	34.62 ⁹⁷	59.34 ³¹	44.30 ²⁰⁸	14.756 ¹²⁹	84.37 ¹¹⁷	49.942 ²⁶¹	60.93 ¹⁹⁷
May 9.3	53.709 ¹²⁶	35.50 ⁸⁸	58.99 ³⁵	45.92 ¹⁶²	14.616 ¹⁴⁰	85.33 ¹⁰¹	49.657 ²⁸⁵	62.43 ¹⁵⁰
19.3	53.580 ¹²⁹	36.24 ⁷⁴	58.62 ³⁷	47.03 ¹¹¹	14.472 ¹⁴⁴	86.20 ⁸²	49.354 ³⁰³	63.44 ¹⁰¹
	126	60	38	61	142	59	310	52
29.3	53.454	36.84 ⁴³	58.24	47.64 ⁹	14.330 ¹³³	86.79 ³⁴	49.044 ³¹¹	63.96 ⁰
June 8.2	53.336 ¹¹⁸	37.27 ²³	57.86 ³⁸	47.73 [—]	14.197 ¹²⁰	87.13 ¹⁰	48.733 ³⁰¹	63.96 ⁴⁹
18.2	53.230 ¹⁰⁶	37.50 ⁵	57.49 ³⁷	47.29 ⁴⁴	14.077 ¹²⁰	87.23 ¹⁷	48.432 ²⁸⁶	63.47 ⁹⁷
28.2	53.138 ⁹²	37.55 ¹⁵	57.14 ³⁵	46.35 ⁹⁴	13.972 ¹⁰⁵	87.06 ⁴⁰	48.146 ²⁶⁰	62.50 ¹⁴²
July 8.1	53.066 ⁵⁴	37.40 ³⁴	56.81 ³³	44.94 ¹⁴¹	13.886 ⁸⁶	86.66 ⁶⁷	47.886 ²²⁸	61.08 ¹⁸³
			28	185	63			
18.1	53.012 ³⁰	37.06 ⁵³	56.53 ²⁴	43.09 ²²¹	13.823 ⁴⁰	85.99 ⁸⁹	47.658 ¹⁸⁷	59.25 ²¹⁸
28.1	52.982 ⁸	36.53 ⁷⁴	56.29 ¹⁷	40.88 ²⁵²	13.783 ¹⁴	85.10 ¹¹³	47.471 ¹⁴⁰	57.07 ²⁴⁶
Aug. 7.1	52.974 ¹⁹	35.79 ⁹³	56.12 ¹¹	38.36 ²⁷³	13.769 ¹⁵	83.97 ¹³⁴	47.331 ⁸⁴	54.61 ²⁶⁷
17.0	52.993 ⁴⁷	34.86 ¹¹³	56.01 ³	35.63 ²⁸⁶	13.784 ⁴³	82.63 ¹⁵⁶	47.247 ²¹	51.94 ²⁷⁷
27.0	53.040 ⁷⁸	33.73 ¹³¹	55.98 ⁴	32.77 ²⁶⁸	13.827 ⁷⁸	81.07 ¹⁷⁴	47.226 ⁴⁸	49.17 ²⁷⁸
Sept. 6.0	53.118	32.42	56.02	29.89	13.905	79.33	47.274	46.39
16.0	53.229 ¹¹¹	30.92 ¹⁵⁰	56.15 ¹³	27.10 ²⁷⁹	14.018 ¹¹³	77.41 ¹⁹²	47.392 ¹¹⁸	43.71 ²⁶⁸
25.9	53.374 ¹⁴⁵	29.23 ¹⁶⁹	56.37 ²²	24.52 ²⁵⁸	14.168 ¹⁵⁰	75.32 ²⁰⁹	47.585 ¹⁹³	41.25 ²⁴⁶
Oct. 5.9	53.556 ¹⁸²	27.33 ¹⁸⁵	56.68 ³¹	22.25 ²²⁷	14.354 ¹⁸⁶	73.12 ²²⁰	47.862 ²⁶⁷	39.10 ²¹⁵
15.9	53.775 ²¹⁹	25.39 ¹⁹⁹	57.06 ³⁸	20.40 ¹⁸⁵	14.581 ²²⁷	70.82 ²³⁰	48.191 ³³⁹	37.37 ¹⁷³
	264	210	46	136	264	235	402	124
25.8	54.029	23.29	57.52	19.04	14.845	68.47	48.593	36.13
Nov. 4.8	54.315 ²⁸⁶	21.13 ²¹⁶	58.04 ⁵²	18.25 ⁷⁹	15.144 ²⁹⁹	66.11 ²³⁶	49.051 ⁴⁵⁸	35.46 ⁵
14.8	54.632 ³¹⁷	18.95 ²¹⁸	58.61 ⁵⁷	18.08 ¹⁷	15.475 ³³¹	63.81 ²³⁰	49.553 ⁵⁰²	35.41 ⁶⁷
24.8	54.970 ³³⁸	16.81 ²¹⁴	59.21 ⁶⁰	18.56 ⁴⁸	15.831 ³⁵⁶	61.63 ²¹⁸	50.082 ⁵²⁹	35.98 ⁵⁷
Dec. 4.7	55.324 ³⁵⁴	14.77 ²⁰⁴	59.82 ⁶¹	19.69 ¹¹³	16.201 ³⁷⁰	59.62 ²⁰¹	50.623 ⁵⁴¹	37.18 ¹²⁰
	356	188	60	173	376	176	534	180
14.7	55.680	12.89	60.42	21.42	16.577	57.86	51.157	58.98
24.7	56.031 ³⁵¹	11.25 ¹⁶⁴	61.00 ⁵⁸	23.73 ²³¹	16.947 ³⁷⁰	56.40 ¹⁴⁶	51.668 ⁵¹¹	41.34 ²³⁶
34.7	56.365 ³³⁴	9.88 ¹³⁷	61.52 ⁵²	26.53 ²⁸⁰	17.301 ³⁵⁴	55.29 ¹¹¹	52.139 ⁴⁷¹	44.15 ²⁸¹
Mean Place	51.109	42.71	57.356	16.84	11.871	90.24	47.913	33.68
Sec δ , Tan δ	1.091	+0.437	2.278	-2.046	1.168	+0.604	1.955	-1.680
D ϕ α , D ω α	+0.07	+0.03	+0.04	-0.13	+0.07	+0.04	+0.05	-0.11
D ϕ δ , D ω δ	-0.4	+0.3	-0.4	+0.3	-0.4	+0.3	-0.4	+0.3

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	μ Argus. Mag. 2.8			γ Leonis. Mag. 5.3			δ^2 Chamæleon. Mag. 4.6			ν Hydræ. Mag. 3.3		
	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.
	h	m	"	h	m	"	h	m	"	h	m	"
	10	43	-48 58	10	44	+10 58	10	44	-80 5	10	45	-15 45
	s		"	s		"	s		"	s		"
Jan. 0.7	10.458		25.50	52.184		75.55	62.31		35.39	30.078		12.61
10.6	10.830	372	28.58	52.490	306	73.84	63.39	108	38.19	30.379	301	15.17
20.6	11.154	324	31.91	52.764	274	72.37	64.30	91	41.46	30.647	268	17.72
30.6	11.420	266	35.43	52.999	235	71.17	65.01	71	45.05	30.873	226	20.21
Feb. 9.6	11.626	206	39.02	53.188	189	70.25	65.53	52	48.86	31.055	182	22.57
		141			141			29			135	
19.5	11.767	78	42.59	53.329	93	69.64	65.82		52.82	31.190	87	24.72
29.5	11.845		46.05	53.422		69.31	65.91	9	56.81	31.277		26.67
Mar. 10.5	11.863	18	49.36	53.468	46	69.22	65.79	12	60.75	31.319	42	28.37
20.5	11.827	36	52.41	53.473	5	69.35	65.47	32	64.57	31.322	3	29.82
30.4	11.742	85	55.19	53.441	32	69.37	64.97	50	68.13	31.288	34	30.99
		125			61			65			63	
Apr. 9.4	11.617		57.62	53.380		70.12	64.32		71.45	31.225		31.91
19.4	11.459	158	59.67	53.296	84	70.66	63.52	80	74.39	31.141	84	32.55
29.3	11.275	184	61.32	53.197	99	71.26	62.61	91	76.91	31.041	100	32.94
May 9.3	11.074	201	62.54	53.089	108	71.88	61.60	101	78.98	30.930	111	33.08
19.3	10.860	214	63.30	52.977	112	72.50	60.52	108	80.55	30.816	114	32.99
		218			110			112			115	
29.3	10.642		63.61	52.867		73.09	59.40		81.59	30.701		32.66
June 8.2	10.425	217	63.45	52.763	104	73.63	58.25	115	82.06	30.590	111	32.14
18.2	10.217	208	62.85	52.668	95	74.11	57.14	111	82.02	30.488	102	31.42
28.2	10.021	196	61.82	52.585	83	74.51	56.05	109	81.39	30.396	92	30.53
July 8.2	9.844	177	60.40	52.519	66	74.81	55.04	101	80.25	30.316	80	29.49
		152			51			91			62	
18.1	9.692		58.62	52.468		75.00	54.13		78.63	30.254		28.34
28.1	9.569	123	56.54	52.437	31	75.08	53.35	78	76.54	30.211	43	27.13
Aug. 7.1	9.483	86	54.24	52.426	11	75.03	52.72	63	74.17	30.189	22	25.89
17.0	9.438	45	51.79	52.440	14	74.81	52.28	44	71.37	30.192	3	24.68
27.0	9.439	1	49.27	52.479	39	74.43	52.05	23	68.44	30.222	30	23.55
		52			69			3			62	
Sept. 6.0	9.491		46.78	52.548		73.86	52.02		65.40	30.284		22.55
16.0	9.598	107	44.41	52.647	99	73.07	52.23	21	62.38	30.380	96	21.75
25.9	9.762	164	42.29	52.780	133	72.08	52.66	43	59.50	30.511	131	21.20
Oct. 5.9	9.982	220	40.50	52.948	168	70.85	53.33	67	56.86	30.681	170	20.97
15.9	10.259	277	39.11	53.152	204	69.42	54.19	86	54.59	30.888	207	21.07
		329			237			104			243	
25.9	10.588		38.22	53.389		67.77	55.23		52.78	31.131		21.55
Nov. 4.8	10.962	374	37.87	53.661	272	65.94	56.43	120	51.53	31.409	278	22.42
14.8	11.372	410	38.11	53.961	300	63.97	57.73	130	50.89	31.715	306	23.67
24.8	11.807	435	38.94	54.282	321	61.90	59.11	138	50.91	32.041	326	25.29
Dec. 4.7	12.253	446	40.36	54.618	336	59.80	60.51	140	51.56	32.380	339	27.21
		443			340			136			343	
14.7	12.696		42.33	54.958		57.73	61.87		52.91	32.723		29.42
24.7	13.123	427	44.76	55.293	335	55.74	63.16	129	51.86	33.057	334	31.80
34.7	13.519	396	47.61	55.611	318	53.91	64.32	116	57.31	33.574	317	34.31
Mean Place	9.184		34.92	50.630		83.67	60.424		49.65	28.732		12.88
Sec δ , Tan δ	1.524		-1.149	1.019		+0.194	5.817		-5.729	1.039		-0.282
$D\psi a, D_{\omega} a$	+0.05		-0.07	+0.06		+0.01	+0.01		-0.36	+0.06		-0.02
$D\psi \delta, D_{\omega} \delta$	-0.4		+0.3	-0.4		+0.3	-0.4		+0.3	-0.4		+0.3

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	46 Leonis Minoris. Mag. 3.9			54 Leonis. Mag. 4.5			Antlia. Mag. 4.7			Groombridge 1706. Mag. 6.3		
	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.
	h	m	° ' "	h	m	° ' "	h	m	° ' "	h	m	° ' "
	10	48	+34 39	10	51	+25 11	10	52	-36 41	10	53	+78 12
	s		"	s		"	s		"	s		"
Jan. 0.7	38.986		50.14	5.759		40.52	49.535		3.22	22.19		51.91
10.6	39.338	352	49.33 81	6.090	331	39.33 119	49.872	337	6.13 291	23.30	111	52.67 76
20.6	39.656	318	48.95 38	6.386	296	38.48 85	50.170	298	9.24 311	24.30	100	54.02 135
30.6	39.929	273	48.98 3	6.642	256	38.00 48	50.422	252	12.43 319	25.16	86	55.89 187
Feb. 9.6	40.151	222	49.40 42	6.850	208	37.91 9	50.624	202	15.64 321	25.82	66	58.20 231
		166	78		158	23		148	315		48	265
19.5	40.317		50.18	7.008		38.14	50.772		18.79	26.30		60.85
29.5	40.426	109	51.26 106	7.113	105	38.65 51	50.864	92	21.81 302	26.57	27	63.73 288
Mar. 10.5	40.480	54	52.55 129	7.168	55	39.44 79	50.907	43	24.61 280	26.62	5	66.70 297
20.5	40.481	1	53.99 144	7.176	8	40.38 94	50.904	3	27.17 256	26.47	15	69.65 305
30.4	40.437	44	55.51 152	7.142	34	41.46 108	50.860	44	29.47 230	26.12	35	72.46 281
		82	151		66	114		80	196		52	255
Apr. 9.4	40.355		57.02	7.076		42.60	50.780		31.43	25.60		75.01
19.4	40.242	113	58.46 144	6.982	94	43.73 113	50.673	107	33.05 162	24.94	66	77.20 219
29.3	40.109	133	59.76 130	6.871	111	44.80 107	50.546	127	34.31 126	24.15	79	78.96 176
May 9.3	39.963	146	60.87 111	6.747	124	45.76 96	50.403	143	35.21 90	23.30	85	80.24 128
19.3	39.811	152	61.76 89	6.620	127	46.59 83	50.251	152	35.72 51	22.39	91	80.98 74
		150	62		128	67		156	12		92	19
29.3	39.661		62.38	6.492		47.26	50.095		35.84	21.47		81.17
June 8.2	39.516	145	62.72 34	6.370	122	47.72 46	49.940	155	35.59 25	20.56	91	80.80 37
18.2	39.384	132	62.79 7	6.258	112	48.00 28	49.791	149	34.97 62	19.69	87	79.87 93
28.2	39.267	117	62.56 23	6.159	99	48.06 6	49.651	140	34.01 96	18.90	79	78.44 143
July 8.2	39.169	98	62.06 50	6.077	82	47.90 16	49.526	125	32.73 128	18.18	72	76.52 192
		75	79		64	37		107	157		61	235
18.1	39.094		61.27	6.013		47.53	49.419		31.16	17.57		74.17
28.1	39.042	52	60.23 104	5.970	43	46.95 58	49.334	85	29.39 177	17.08	49	71.43 274
Aug. 7.1	39.018	24	58.93 130	5.950	20	46.15 80	49.275	59	27.44 195	16.72	36	68.36 307
17.0	39.022	4	57.39 154	5.955	5	45.15 100	49.248	27	25.40 204	16.49	23	65.04 332
27.0	39.058	36	55.64 175	5.989	34	43.93 122	49.255	7	23.32 206	16.41	8	61.51 353
		69	195		64	141		47	201		7	365
Sept. 6.0	39.127		53.69	6.053		42.52	49.302		21.31	16.48		57.86
16.0	39.234	107	51.55 214	6.151	98	40.90 162	49.392	90	19.44 187	16.70	22	54.16 370
25.9	39.377	143	49.27 228	6.283	132	39.10 180	49.528	136	17.81 163	17.07	37	50.47 369
Oct. 5.9	39.562	185	46.88 239	6.454	171	37.15 195	49.710	182	16.50 131	17.60	53	46.88 359
15.9	39.787	225	44.41 247	6.661	207	35.04 211	49.939	229	15.57 93	18.28	68	43.46 342
		265	251		245	220		274	48		81	318
25.9	40.052		41.90	6.906		32.84	50.213		15.09	19.09		40.28
Nov. 4.8	40.355	303	39.42 248	7.188	282	30.57 227	50.526	313	15.13 4	20.03	94	37.45 283
14.8	40.689	334	37.02 240	7.500	312	28.29 228	50.874	348	15.67 54	21.08	105	35.02 243
24.8	41.051	362	34.76 226	7.838	338	26.07 222	51.246	372	16.73 106	22.22	114	33.06 196
Dec. 4.7	41.431	380	32.71 205	8.192	354	23.95 212	51.631	385	18.30 157	23.41	119	31.65 141
		386	174		361	192		387	202		122	84
14.7	41.817		30.97	8.553		22.03	52.018		20.32	24.63		30.81
24.7	42.200	383	29.53 144	8.910	357	20.34 169	52.396	378	22.75 243	25.83	120	30.58 23
34.7	42.565	365	28.49 104	9.252	342	18.95 139	52.752	356	25.49 274	26.99	116	30.99 41
Mean Place	37.110		65.07	4.066		53.08	48.311		9.55	16.364		73.78
Sec δ , Tan δ	1.216		+0.692	1.105		+0.470	1.247		-0.745	4.896		+4.793
$D_{\phi} \alpha$, $D_{\omega} \alpha$	+0.07		+0.04	+0.07		+0.03	+0.06		-0.05	+0.10		+0.31
$D_{\phi} \delta$, $D_{\omega} \delta$	-0.4		+0.3	-0.4		+0.3	-0.4		+0.3	-0.4		+0.3

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	α Crateris. Mag. 4.2		δ Leonis. Mag. 5.0		β Ursæ Majoris. Mag. 2.4		α Ursæ Majoris. Mag. 2.0	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 10 55	° ' " -17 51	h m 10 56	° ' " + 4 3	h m 10 56	° ' " +56 49	h m 10 58	° ' " +62 11
	s	"	s	"	s	"	s	"
Jan. 0.7	42.098	4.39	14.806	61.04	49.492	38.65	36.26	56.25
10.7	42.407	6.98	15.112	59.04	49.978	38.65	36.82	56.42
20.6	42.683	9.58	15.389	57.24	50.419	39.19	37.32	57.15
30.6	42.919	12.14	15.628	55.67	50.799	40.24	37.75	58.41
Feb. 9.6	43.110	14.59	15.824	54.34	51.109	41.74	38.10	60.12
19.5	43.254	16.87	15.973	53.31	51.339	43.62	38.36	62.22
29.5	43.350	18.93	16.075	52.51	51.486	45.79	38.52	64.59
Mar. 10.5	43.402	20.78	16.133	51.99	51.551	48.15	38.59	67.16
20.5	43.412	22.35	16.149	51.72	51.537	50.58	38.57	69.77
30.4	43.387	23.66	16.129	51.64	51.452	52.99	38.45	72.31
Apr. 9.4	43.332	24.70	16.081	51.75	51.306	55.27	38.27	74.71
19.4	43.253	25.47	16.008	52.02	51.108	57.30	38.03	76.85
29.4	43.156	25.98	15.919	52.39	50.873	59.05	37.74	78.66
May 9.3	43.049	26.22	15.819	52.85	50.611	60.45	37.42	80.08
19.3	42.936	26.22	15.715	53.37	50.336	61.44	37.08	81.05
29.3	42.821	25.98	15.610	53.92	50.058	61.99	36.74	81.56
June 8.2	42.707	25.52	15.508	54.49	49.786	62.09	36.40	81.58
18.2	42.600	24.84	15.413	55.06	49.531	61.73	36.08	81.12
28.2	42.501	23.98	15.329	55.62	49.297	60.94	35.78	80.19
July 8.2	42.415	22.95	15.258	56.14	49.093	59.73	35.52	78.81
18.1	42.343	21.79	15.200	56.60	48.924	58.11	35.30	77.02
28.1	42.289	20.54	15.160	56.99	48.793	56.15	35.13	74.85
Aug. 7.1	42.255	19.25	15.141	57.27	48.705	53.86	35.01	72.34
17.1	42.247	17.97	15.142	57.44	48.662	51.28	34.94	69.56
27.0	42.265	16.75	15.170	57.46	48.669	48.47	34.94	66.53
Sept. 6.0	42.315	15.64	15.226	57.28	48.729	45.47	34.99	63.34
16.0	42.399	14.73	15.312	56.91	48.843	42.34	35.10	60.02
25.9	42.521	14.06	15.433	56.30	49.015	39.14	35.29	56.64
Oct. 5.9	42.680	13.70	15.588	55.46	49.245	35.91	35.54	53.27
15.9	42.879	13.67	15.779	54.34	49.534	32.73	35.86	49.97
25.9	43.116	14.02	16.007	52.98	49.879	29.68	36.26	46.82
Nov. 4.8	43.387	14.77	16.269	51.37	50.278	26.81	36.71	43.90
14.8	43.691	15.92	16.559	49.56	50.725	24.20	37.21	41.28
24.8	44.017	17.45	16.874	47.58	51.211	21.94	37.76	39.04
Dec. 4.8	44.358	19.32	17.205	45.47	51.722	20.08	38.34	37.24
14.7	44.704	21.47	17.541	43.32	52.248	18.69	38.93	35.94
24.7	45.042	23.85	17.874	41.19	52.771	17.81	39.53	35.19
34.7	45.365	26.36	18.191	39.14	53.274	17.48	40.10	35.01
Mean Place	40.816	5.11	13.381	67.38	46.955	58.62	33.405	77.10
Sec δ , Tan δ	1.050	-0.322	1.003	+0.071	1.828	+1.530	2.144	+1.897
$D_{\phi} \alpha, D_{\omega} \alpha$	+0.06	-0.02	+0.06	0.00	+0.07	+0.10	+0.07	+0.12
$D_{\phi} \delta, D_{\omega} \delta$	-0.4	+0.3	-0.4	+0.3	-0.4	+0.3	-0.4	+0.3

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	χ Leonis. Mag. 4.7		p^4 Leonis. Mag. 5.7		ψ Ursa Majoris. Mag. 3.2		β Crateris. Mag. 4.5	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 11 0	° ' " + 7 46	h m 11 2	° ' " + 2 24	h m 11 4	° ' " +44 56	h m 11 7	° ' " -22 21
Jan. 0.7	42.543	78.12	38.562	36.77	58.847	58.12	32.673	59.82
10.7	42.863 ³¹⁰	76.24 ¹⁸⁸	38.873 ³¹¹	34.70 ²⁰⁷	59.250 ⁴⁰⁸	57.57 ⁵⁵	32.994 ³²¹	62.46 ²⁶⁴
20.6	43.135 ²⁸²	74.59 ¹⁶⁵	39.150 ²⁷⁷	32.83 ¹⁸⁷	59.618 ³⁶⁸	57.52 ⁵	33.284 ²⁹⁰	65.17 ²⁷¹
30.6	43.378 ²⁴³	73.17 ¹⁴²	39.392 ²⁴²	31.16 ¹⁶⁷	59.939 ³²¹	57.96 ⁴⁴	33.534 ²⁵⁰	67.88 ²⁷¹
Feb. 9.6	43.579 ²⁰¹	72.05 ¹¹²	39.590 ¹⁹⁸	29.73 ¹⁴³	60.204 ²⁶⁵	58.85 ⁸⁹	33.740 ²⁰⁶	70.52 ²⁶⁴
	154	83	154	116	203	128	158	250
19.5	43.733	71.22	39.744	28.57	60.407	60.13	33.898	73.02
29.5	43.840 ¹⁰⁷	70.66 ⁵⁶	39.851 ¹⁰⁷	27.66 ⁹¹	60.545 ¹³⁸	61.73 ¹⁶⁰	34.009 ¹¹¹	75.35 ²³³
Mar. 10.5	43.902 ⁶²	70.37 ²⁹	39.913 ⁶²	27.03 ⁶³	60.619 ⁷⁴	63.55 ¹⁸²	34.074 ⁶⁵	77.44 ²⁰⁹
20.5	43.922 ²⁰	70.31 ⁶	39.937 ²⁴	26.65 ³⁸	60.632 ¹³	65.53 ¹⁹⁸	34.096 ²²	79.30 ¹⁸⁶
30.4	43.905 ¹⁷	70.45 ¹⁴	39.922 ¹⁵	26.50 ¹⁵	60.590 ⁴²	67.55 ²⁰²	34.082 ¹⁴	80.88 ¹⁵⁸
	46	32	44	1	89	196	45	132
Apr. 9.4	43.859	70.77	39.878	26.51	60.501	69.53	34.037	82.20
19.4	43.788 ⁷¹	71.20 ⁴³	39.811 ⁶⁷	26.70 ¹⁹	60.373 ¹²⁸	71.38 ¹⁸⁵	33.965 ⁷²	83.22 ¹⁰²
29.4	43.700 ⁸⁸	71.72 ⁵²	39.726 ⁸⁵	27.03 ³³	60.216 ¹⁵⁷	73.02 ¹⁶⁴	33.875 ⁹⁰	83.96 ⁷⁴
May 9.3	43.601 ⁹⁰	72.29 ⁵⁷	39.630 ⁹⁶	27.42 ³⁹	60.039 ¹⁷⁷	74.40 ¹³⁸	33.772 ¹⁰³	84.43 ⁴⁷
19.3	43.495 ¹⁰⁶	72.89 ⁶⁰	39.528 ¹⁰²	27.92 ⁵⁰	59.852 ¹⁸⁷	75.48 ¹⁰⁸	33.659 ¹¹³	84.60 ¹⁷
	106	60	105	55	191	72	118	9
29.3	43.389	73.49	39.423	28.47	59.661	76.20	33.541	84.51
June 8.2	43.286 ¹⁰³	74.07 ⁵⁸	39.322 ¹⁰¹	29.05 ⁵⁸	59.474 ¹⁸⁷	76.57 ⁸⁷	33.425 ¹¹⁶	84.16 ³⁵
18.2	43.189 ⁹⁷	74.61 ⁵⁴	39.226 ⁹⁶	29.63 ⁵⁸	59.297 ¹⁷⁷	76.57 ⁰	33.311 ¹¹⁴	83.55 ⁶¹
28.2	43.102 ⁸⁷	75.10 ⁴⁹	39.140 ⁸⁶	30.22 ⁵⁹	59.136 ¹⁶¹	76.19 ³⁸	33.205 ¹⁰⁶	82.72 ⁸³
July 8.2	43.028 ⁷⁴	75.52 ⁴²	39.064 ⁷⁶	30.77 ⁵⁵	58.993 ¹⁴³	75.44 ⁷⁵	33.108 ⁹⁷	81.69 ¹⁰³
	61	33	62	51	117	110	84	119
18.1	42.967 ⁴⁴	75.85 ²³	39.002 ⁴⁶	31.28 ⁴⁶	58.876 ⁹²	74.34 ¹⁴²	33.024 ⁶⁶	80.50 ¹³⁴
28.1	42.923 ²³	76.07 ¹¹	38.956 ²⁶	31.74 ³⁶	58.784 ⁶¹	72.92 ¹⁷⁴	32.958 ⁴⁷	79.16 ¹⁴¹
Aug. 7.1	42.900 ³	76.18 ⁴	38.930 ⁵	32.10 ²⁵	58.723 ²⁸	71.18 ²⁰²	32.911 ²²	77.75 ¹⁴⁴
17.1	42.897 ²⁴	76.14 ²²	38.925 ²¹	32.35 ⁹	58.695 ⁸	69.16 ²²⁵	32.889 ⁴	76.31 ¹⁴²
27.0	42.921 ⁵⁰	75.92 ³⁹	38.946 ⁴⁷	32.44 ⁶	58.703 ⁴⁵	66.91 ²⁴⁷	32.893 ³⁸	74.89 ¹³²
Sept. 6.0	42.971	75.53	38.993	32.38	58.748	64.44	32.931	73.57
16.0	43.053 ⁸²	74.93 ⁶⁰	39.074 ⁸¹	32.11 ²⁷	58.837 ⁸⁹	61.79 ²⁶⁵	33.004 ⁷³	72.42 ¹¹⁵
25.9	43.169 ¹¹⁶	74.11 ⁸²	39.185 ¹¹¹	31.58 ⁵³	58.970 ¹³³	59.01 ²⁷⁸	33.116 ¹¹²	71.49 ⁹³
Oct. 5.9	43.320 ¹⁵¹	73.04 ¹⁰⁷	39.337 ¹⁵²	30.81 ⁷⁷	59.150 ¹⁸⁰	56.14 ²⁸⁷	33.268 ¹⁵²	70.86 ⁶³
15.9	43.507 ¹⁸⁷	71.74 ¹³⁰	39.522 ¹⁸⁵	29.78 ¹⁰³	59.378 ²²⁸	53.23 ²⁹¹	33.462 ¹⁹⁴	70.57 ²⁹
	225	149	223	128	275	288	234	10
25.9	43.732	70.25	39.745	28.50	59.653	50.35	33.696	70.67
Nov. 4.8	43.991 ²⁵⁹	68.51 ¹⁷⁴	39.999 ²⁵⁴	26.95 ¹⁵⁵	59.972 ³¹⁹	47.56 ²⁷⁹	33.968 ²⁷²	71.19 ⁵²
14.8	44.280 ²⁸⁹	66.59 ¹⁹²	40.288 ²⁸⁹	25.16 ¹⁷⁹	60.332 ³⁶⁰	44.93 ²⁶³	34.274 ³⁰⁶	72.12 ⁹³
24.8	44.594 ³¹⁴	64.54 ²⁰⁵	40.601 ³¹³	23.21 ¹⁹⁵	60.725 ³⁹³	42.53 ²⁴⁰	34.604 ³³⁰	73.48 ¹³⁶
Dec. 4.8	44.925 ³³¹	62.36 ²¹⁸	40.928 ³²⁷	21.12 ²⁰⁹	61.142 ⁴¹⁷	40.43 ²¹⁰	34.952 ³⁴⁸	75.21 ¹⁷³
	338	214	336	217	429	172	354	208
14.7	45.263	60.22	41.264	18.95	61.571	38.71	35.306	77.29
24.7	45.598 ³³⁵	58.14 ²⁰⁸	41.598 ³³⁴	16.78 ²¹⁷	62.001 ⁴³⁰	37.41 ¹⁸⁰	35.655 ³⁴⁹	79.62 ²³³
34.7	45.919 ³²¹	56.17 ¹⁹⁷	41.918 ³²⁰	14.66 ²¹²	62.416 ⁴¹⁵	36.58 ⁸³	35.989 ³³⁴	82.17 ²⁵⁵
Mean Place	41.109	85.80	37.184	42.76	56.853	76.31	31.477	61.77
Sec δ , Tan δ	1.009	+0.137	1.001	+0.042	1.413	+0.998	1.081	-0.412
$D_{\phi} \alpha$, $D_{\alpha} \alpha$	+0.06	+0.01	+0.06	0.00	+0.07	+0.06	+0.06	-0.03
$D_{\phi} \delta$, $D_{\alpha} \delta$	-0.4	+0.3	-0.4	+0.2	-0.4	+0.2	-0.4	+0.2

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	δ Leonis. Mag. 2.6		θ Leonis. Mag. 3.4		ν Ursæ Majoris. Mag. 3.7		δ Crateris. Mag. 3.8	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 11 9	° ' " +20 58	h m 11 9	° ' " +15 52	h m 11 13	° ' " +33 32	h m 11 15	° ' " -14 15
	s	"	s	"	s	"	s	"
Jan. 0.7	40.149	50.59	51.470	69.40	58.421	54.47	9.575	26.50
10.7	40.480 331	49.12 147	51.794 324	67.76 164	58.782 361	53.43 104	9.892 317	28.96 286
20.6	40.782 302	47.99 113	52.088 294	66.41 135	59.114 332	52.82 61	10.181 289	31.42 286
30.6	41.046 264	47.21 78	52.346 258	65.37 104	59.405 291	52.64 18	10.433 252	33.81 230
Feb. 9.6	41.267 221	46.78 43	52.561 215	64.67 70	59.649 244	52.89 25	10.642 209	36.08 257
	172	7	168	37	191	63	165	239
19.6	41.439 123	46.71 24	52.729 120	64.30 7	59.840 135	53.52 97	10.807 118	38.16 182
29.5	41.562 74	46.95 50	52.849 73	64.23 20	59.975 82	54.49 124	10.925 75	40.04 184
Mar. 10.5	41.636 29	47.45 74	52.922 30	64.43 43	60.057 30	55.73 143	11.000 23	41.68 129
20.5	41.665 12	48.19 89	52.952 10	64.86 61	60.087 16	57.16 154	11.033 3	43.07 112
30.4	41.653 45	49.08 99	52.942 42	65.47 75	60.071 56	58.70 159	11.030 34	44.20 49
Apr. 9.4	41.608 73	50.07 103	52.900 68	66.22 82	60.015 88	60.29 154	10.996 38	45.09 62
19.4	41.535 93	51.10 102	52.832 87	67.04 84	59.927 113	61.83 145	10.938 79	45.72 61
29.4	41.442 106	52.12 97	52.745 101	67.88 83	59.814 130	63.28 127	10.859 91	46.13 17
May 9.3	41.336 115	53.09 87	52.684 108	68.71 79	59.684 141	64.55 108	10.768 101	46.30 1
19.3	41.221 117	53.96 74	52.536 111	69.50 69	59.543 144	65.63 83	10.667 105	46.26 23
29.3	41.104 115	54.70 59	52.425 109	70.19 60	59.399 142	66.46 56	10.562 106	46.01 43
June 8.3	40.989 109	55.29 43	52.316 102	70.79 49	59.257 136	67.02 27	10.456 103	45.58 61
18.2	40.880 99	55.72 23	52.214 95	71.28 35	59.121 126	67.29 1	10.353 97	44.97 78
28.2	40.781 87	55.95 6	52.119 83	71.63 20	58.995 110	67.28 31	10.256 89	44.21 89
July 8.2	40.694 72	56.01 15	52.036 67	71.83 4	58.885 95	66.97 61	10.167 78	43.32 99
18.1	40.622 54	55.86 35	51.969 52	71.87 11	58.790 73	66.36 88	10.089 61	42.33 106
28.1	40.568 35	55.51 35	51.917 33	71.76 30	58.717 51	65.48 116	10.028 44	41.27 139
Aug. 7.1	40.533 11	54.96 76	51.884 10	71.46 48	58.666 24	64.32 140	9.984 22	40.18 156
17.1	40.522 15	54.20 97	51.874 15	70.93 68	58.642 4	62.92 167	9.962 2	39.10 101
27.0	40.537 42	53.23 119	51.889 42	70.30 88	58.646 37	61.25 188	9.964 33	38.09 89
Sept. 6.0	40.579 76	52.04 138	51.931 74	69.42 110	58.683 73	59.37 209	9.997 66	37.20 71
16.0	40.655 111	50.66 160	52.005 109	68.32 130	58.756 111	57.28 226	10.063 102	36.49 49
26.0	40.766 148	49.06 179	52.114 145	67.02 151	58.867 151	55.02 242	10.165 139	36.00 20
Oct. 5.9	40.914 185	47.27 197	52.259 182	65.51 173	59.018 194	52.60 253	10.304 180	35.80 11
15.9	41.099 226	45.30 211	52.441 220	63.78 189	59.212 236	50.07 260	10.484 220	35.91 46
25.9	41.325 262	43.19 222	52.661 257	61.89 206	59.448 277	47.47 260	10.704 257	36.36 83
Nov. 4.8	41.587 295	40.97 228	52.918 289	59.83 215	59.725 314	44.87 254	10.961 290	37.19 119
14.8	41.882 322	38.69 228	53.207 317	57.68 221	60.039 346	42.33 244	11.251 317	38.38 134
24.8	42.204 343	36.41 222	53.524 335	55.47 220	60.385 367	39.89 224	11.568 335	39.92 183
Dec. 4.8	42.547 353	34.19 208	53.859 345	53.27 212	60.752 380	37.65 198	11.903 343	41.75 220
14.7	42.900 351	32.11 190	54.204 344	51.15 199	61.132 382	35.67 165	12.246 341	43.85 229
24.7	43.251 341	30.21 163	54.548 333	49.16 178	61.514 371	34.02 128	12.587 329	46.14 260
34.7	43.592	28.58	54.881	47.38	61.885	32.74	12.916	48.54
Mean Place	38.629	62.71	50.010	79.97	56.750	70.36	8.378	25.72
Sec δ , Tan δ	1.071	+0.383	1.039	+0.285	1.200	+0.663	1.032	-0.255
$D_{\phi} \alpha, D_{\omega} \alpha$	+0.06	+0.02	+0.06	+0.02	+0.06	+0.04	+0.06	-0.02
$D_{\phi} \delta, D_{\omega} \delta$	-0.4	+0.2	-0.4	+0.2	-0.4	+0.2	-0.4	+0.2

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	σ Leonis. Mag. 4.1		π Centauri. Mag. 4.3		ι Leonis. Mag. 4.0		τ Leonis. Mag. 5.2	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 11 16	° ' " + 6 28	h m 11 17	° ' " -54 1	h m 11 19	° ' " +10 58	h m 11 23	° ' " + 3 18
Jan. 0.7	49.697	76.02	11.296	39.43	34.115	82.16	38.336	61.56
10.7	50.013 316	74.07 195	11.735 439	42.20 277	34.438 323	80.33 183	38.655 319	59.51 205
20.6	50.304 291	72.32 175	12.129 394	45.33 313	34.733 295	78.75 158	38.947 292	57.63 188
30.6	50.559 255	70.81 151	12.467 338	48.70 337	34.993 260	77.45 130	39.206 259	55.97 166
Feb. 9.6	50.773 214	69.58 123	12.741 274	52.24 354	35.213 230	70.44 101	39.425 219	54.55 142
	170	95	209	361	175	69	175	113
19.6	50.943 123	68.63 64	12.950 141	55.85 360	35.388 128	75.75 39	39.600 129	53.42 86
29.5	51.066 79	67.99 39	13.091 77	59.45 360	35.516 83	75.36 10	39.729 85	52.56 57
Mar. 10.5	51.145 36	67.60 12	13.168 15	62.94 349	35.599 41	75.26 15	39.814 46	51.99 33
20.5	51.181 1	67.48 8	13.183 41	66.27 309	35.640 2	75.41 34	39.860 7	51.66 11
30.4	51.182 32	67.56 26	13.142 90	69.36 281	35.642 30	75.75 49	39.867 25	51.55 9
Apr. 9.4	51.150 57	67.82 40	13.052 133	72.17 248	35.612 56	76.24 62	39.842 50	51.64 26
19.4	51.093 76	68.22 49	12.919 170	74.65 209	35.556 77	76.86 68	39.792 70	51.90 27
May 9.3	51.017 90	68.71 57	12.749 196	76.74 169	35.479 90	77.54 73	39.722 84	52.27 47
19.3	50.927 96	69.28 60	12.555 219	78.43 124	35.389 100	78.27 70	39.638 94	52.74 54
	101	69.88 62	12.334 234	79.67 78	35.289 103	78.97 69	39.544 98	53.28 58
29.3	50.728 101	70.50 60	12.100 242	80.45 31	35.186 103	79.66 63	39.446 99	53.86 59
June 8.3	50.627 97	71.10 58	11.858 244	80.76 16	35.083 100	80.29 56	39.347 97	54.45 50
18.2	50.530 81	71.68 53	11.614 239	80.60 62	34.983 93	80.85 46	39.250 91	55.04 58
28.2	50.439 91	72.21 47	11.375 226	79.98 107	34.890 83	81.81 36	39.159 83	55.62 54
July 8.2	50.358 68	72.68 36	11.147 206	78.91 148	34.807 70	81.67 23	39.076 70	56.16 40
18.1	50.290 54	73.06 28	10.939 182	77.43 183	34.737 56	81.89 10	39.006 58	56.65 41
28.1	50.236 37	73.34 17	10.757 148	75.60 215	34.681 39	81.99 5	38.948 43	57.06 31
Aug. 7.1	50.199 16	73.51 3	10.609 107	73.45 238	34.642 18	81.94 22	38.905 22	57.37 18
17.1	50.183 7	73.54 14	10.502 58	71.07 262	34.624 5	81.72 39	38.883 1	57.55 5
27.0	50.190 36	73.40 33	10.444 1	68.55 259	34.629 34	81.33 59	38.864 29	57.60 15
Sept. 6.0	50.226 66	73.07 52	10.443 58	65.96 265	34.663 64	80.74 81	38.913 50	57.45 34
16.0	50.292 99	72.55 76	10.501 123	63.41 240	34.727 96	79.93 102	38.972 92	57.11 56
26.0	50.391 135	71.79 100	10.624 192	61.01 214	34.823 134	78.91 127	39.064 129	56.55 82
Oct. 5.9	50.526 174	70.79 124	10.816 257	58.87 180	34.957 173	77.64 148	39.193 167	55.73 108
15.9	50.700 212	69.55 148	11.073 321	57.07 136	35.130 212	76.16 170	39.360 206	54.65 133
25.9	50.912 248	68.07 171	11.394 380	55.71 85	35.342 247	74.46 188	39.566 243	53.32 158
Nov. 4.8	51.160 280	66.36 190	11.774 428	54.86 29	35.589 280	72.58 204	39.809 276	51.74 179
14.8	51.440 308	64.46 205	12.202 463	54.57 30	35.869 309	70.54 215	40.085 305	49.95 198
24.8	51.748 337	62.41 215	12.665 487	54.87 91	36.178 328	68.39 220	40.390 324	47.97 212
Dec. 4.8	52.075 337	60.26 218	13.152 493	55.78 148	36.506 340	66.19 217	40.714 336	45.85 217
14.7	52.412 337	58.08 213	13.645 485	57.26 202	36.846 341	64.02 209	41.050 333	43.68 219
24.7	52.749 327	55.95 203	14.130 461	59.28 249	37.187 331	61.93 194	41.383 331	41.49 210
34.7	53.076	53.92	14.591	61.77	37.518	59.99	41.714	39.39
Mean Place	48.365	83.80	10.273	49.95	32.763	91.49	37.070	68.48
Sec δ , Tan δ	1.006	+0.114	1.702	-1.378	1.019	+0.184	1.002	+0.058
$D_{\phi} \alpha$, $D_{\omega} \alpha$	+0.06	+0.01	+0.05	-0.09	+0.06	+0.01	+0.06	0.00
$D_{\phi} \delta$, $D_{\omega} \delta$	-0.4	+0.2	-0.4	+0.2	-0.4	+0.2	-0.4	+0.2

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	λ Draconis. Mag. 4.1			ξ Hydræ. Mag. 3.7			λ Centauri. Mag. 3.3			ν Leonis. Mag. 4.5		
	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.
	h	m	° ' "	h	m	° ' "	h	m	° ' "	h	m	° ' "
	11	26	+69 46	11	28	-31 23	11	31	-62 33	11	32	- 0 21
	s		"	s		"	s		"	s		"
Jan. 0.7	29.13		78.12	53.092		29.65	54.76		5.80	40.059		41.39
10.7	29.86	73	78.20	53.440	348	32.29	55.30	54	8.36	40.380	321	43.53
20.6	30.54	68	78.88	53.759	319	35.10	55.80	50	11.33	40.676	296	45.55
30.6	31.14	60	80.14	54.039	280	38.00	56.23	43	14.63	40.940	264	47.38
Feb. 9.6	31.65	51	81.92	54.275	236	40.92	56.57	34	18.18	41.165	225	48.98
		38			221			28			182	
19.6	32.03		84.13	54.462		43.78	56.85		21.87	41.347		50.33
29.5	32.30	27	86.68	54.599	137	46.53	57.05	20	25.62	41.484	137	51.40
Mar. 10.5	32.45	15	89.43	54.689	90	49.10	57.16	11	29.34	41.579	95	52.21
					47			4			53	
20.5	32.46	1	92.29	54.736	5	51.46	57.20		32.95	41.632	16	52.77
30.5	32.36	10	95.13	54.741	5	53.56	57.17	3	36.37	41.648	16	53.08
		20			31			11			15	
Apr. 9.4	32.16		97.83	54.710		55.40	57.06		39.54	41.633		53.19
19.4	31.87	29	100.28	54.651	59	56.93	56.90	16	42.40	41.592	41	53.12
29.4	31.49	38	102.40	54.568	83	58.16	56.70	20	44.91	41.530	62	52.89
May 9.3	31.06	43	104.11	54.466	102	59.07	56.45	25	47.00	41.452	78	52.55
19.3	30.59	47	105.37	54.349	117	59.64	56.17	28	48.65	41.364	88	52.11
		50			125			31			94	
29.3	30.09		106.13	54.224		59.90	55.86		49.83	41.270		51.60
June 8.3	29.59	50	106.36	54.094	130	59.82	55.53	33	50.51	41.173	97	51.03
18.2	29.09	50	106.07	53.962	132	59.44	55.19	34	50.69	41.077	96	50.43
28.2	28.62	47	105.26	53.833	129	58.74	54.86	33	50.36	40.984	93	49.82
July 8.2	28.19	43	103.95	53.710	123	57.76	54.53	33	49.55	40.898	86	49.20
		39			111			31			76	
18.2	27.80		102.18	53.599		56.53	54.22		48.26	40.822		48.62
28.1	27.47	33	99.97	53.503	96	55.09	53.95	27	46.54	40.758	64	48.07
Aug. 7.1	27.20	27	97.38	53.426	77	53.48	53.71	24	44.45	40.709	49	47.60
		20			55			18			29	
17.1	27.00		94.46	53.371	25	51.77	53.53		42.06	40.680		47.23
27.0	26.88	12	91.27	53.346	11	50.01	53.40	13	39.44	40.671	9	46.99
		3			11			4			20	
Sept. 6.0	26.85		87.87	53.357		48.29	53.36		36.69	40.691		46.91
16.0	26.90	5	84.30	53.405	48	46.68	53.39	3	33.92	40.739	48	47.03
26.0	27.04	14	80.67	53.497	92	45.25	53.50	11	31.23	40.823	84	47.38
Oct. 5.9	27.27	23	77.01	53.634	137	44.09	53.69	19	28.74	40.943	120	47.98
15.9	27.60	33	73.44	53.818	184	43.25	53.98	29	26.56	41.103	160	48.84
		42			230			36			199	
25.9	28.02		70.00	54.048		42.82	54.34		24.78	41.302		49.98
Nov. 4.9	28.53	51	66.80	54.322	274	42.81	54.79	45	23.48	41.538	236	51.39
14.8	29.12	59	63.90	54.655	313	43.27	55.31	52	22.74	41.810	272	53.06
24.8	29.78	66	61.41	54.978	343	44.20	55.86	55	22.60	42.111	301	54.94
Dec. 4.8	30.49	71	59.38	55.343	365	45.59	56.45	59	23.09	42.433	322	57.01
		75			375			60			336	
14.7	31.24		57.88	55.718		47.40	57.05		24.19	42.769		59.17
24.7	32.00	76	56.98	56.092	374	49.57	57.65	60	25.88	43.106	337	61.37
34.7	32.74	74	56.68	56.453	361	52.05	58.22	57	28.11	43.435	329	63.56
Mean Place	26.035		101.40	52.058		34.10	53.892		17.95	38.870		35.47
Sec δ , Tan δ	2.895		+2.717	1.172		-0.610	2.170		-1.926	1.000		-0.006
$D\phi \alpha$, $D\omega \alpha$	+0.07		+0.18	+0.06		-0.04	+0.05		-0.13	+0.06		0.00
$D\phi \delta$, $D\omega \delta$	-0.4		+0.1	-0.4		+0.1	-0.4		+0.1	-0.4		+0.1

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	π Chamaeleontis. Mag. 5.7		β Draconis. Mag. 5.5		ζ Crateris. Mag. 4.9		χ Ursae Majoris. Mag. 3.8	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 11 33	° ' " -75 25	h m 11 37	° ' " +67 11	h m 11 40	° ' " -17 53	h m 11 41	° ' " +48 14
	s 11 33	" -75 25	s 11 37	" +67 11	s 11 40	" -17 53	s 11 41	" +48 14
Jan. 0.7	48.02	39.52	50.65	71.94	31.228	1.37	39.001	22.08
10.7	48.92	41.84	51.32	71.78	31.562	3.82	39.436	21.27
20.7	49.73	44.68	51.94	72.26	31.870	6.32	39.844	21.01
30.6	50.43	47.92	52.50	73.30	32.144	8.78	40.212	21.29
Feb. 9.6	51.01	51.47	52.97	74.89	32.378	11.17	40.528	22.08
19.6	51.45	55.22	53.36	76.94	32.569	13.42	40.785	23.33
29.5	51.75	59.11	53.63	79.35	32.716	15.49	40.976	24.97
Mar. 10.5	51.91	63.04	53.80	82.02	32.819	17.34	41.102	26.91
20.5	51.93	66.90	53.84	84.82	32.879	18.96	41.164	29.06
30.5	51.82	70.64	53.79	87.64	32.903	20.32	41.164	31.31
Apr. 9.4	51.60	74.16	53.64	90.37	32.894	21.43	41.110	33.58
19.4	51.26	77.40	53.40	92.88	32.858	22.31	41.010	35.74
29.4	50.83	80.29	53.10	95.10	32.798	22.93	40.872	37.49
May 9.4	50.31	82.78	52.74	96.94	32.722	23.31	40.704	39.49
19.3	49.71	84.81	52.34	98.35	32.634	23.46	40.516	40.94
29.3	49.06	86.36	51.91	99.28	32.536	23.39	40.315	42.03
June 8.3	48.38	87.39	51.48	99.71	32.434	23.10	40.109	42.73
18.2	47.67	87.87	51.04	99.62	32.328	22.62	39.906	43.02
28.2	46.96	87.80	50.63	99.02	32.225	21.96	39.707	42.91
July 8.2	46.27	87.20	50.24	97.92	32.125	21.14	39.523	42.38
18.2	45.61	86.07	49.88	96.34	32.033	20.16	39.357	41.46
28.1	45.02	84.46	49.57	94.33	31.953	19.10	39.212	40.14
Aug. 7.1	44.51	82.40	49.31	91.91	31.887	17.97	39.094	38.46
17.1	44.09	79.99	49.12	89.15	31.841	16.81	39.006	36.45
27.1	43.79	77.28	48.99	86.09	31.819	15.70	38.954	34.15
Sept. 6.0	43.63	74.38	48.93	82.79	31.826	14.64	38.941	31.57
16.0	43.63	71.39	48.95	79.31	31.865	13.74	38.972	28.78
26.0	43.77	68.43	49.05	75.71	31.942	13.05	39.050	25.80
Oct. 5.9	44.07	65.63	49.23	72.08	32.060	12.61	39.178	22.70
15.9	44.53	63.08	49.50	68.47	32.218	12.48	39.359	19.53
25.9	45.15	60.91	49.86	64.99	32.421	12.68	39.595	16.36
Nov. 4.9	45.90	59.20	50.30	61.69	32.665	13.24	39.883	13.27
14.8	46.75	58.05	50.82	58.68	32.945	14.20	40.219	10.31
24.8	47.69	57.50	51.40	56.03	33.256	15.51	40.598	7.57
Dec. 4.8	48.69	57.61	52.03	53.82	33.591	17.17	41.012	5.14
14.8	49.70	58.36	52.70	52.12	33.937	19.13	41.448	3.09
24.7	50.69	59.76	53.38	50.99	34.288	21.32	41.896	1.48
34.7	51.63	61.74	54.06	50.47	34.628	23.68	42.337	0.36
Mean Place	47.279	53.52	48.021	95.51	30.191	1.28	37.269	42.70
Sec δ , Tan δ	3.977	-3.849	2.581	+2.379	1.051	-0.323	1.501	+1.120
D_{α} , D_{α}	+0.05	-0.25	+0.07	+0.16	+0.06	-0.02	+0.06	+0.07
D_{δ} , D_{δ}	-0.4	+0.1	-0.4	+0.1	-0.4	+0.1	-0.4	+0.1

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	β Leonis. (Denebola.) Mag. 2.2			β Virginis. Mag. 3.8			Groombridge 1830. Mag. 6.5			γ Ursæ Majoris. Mag. 2.5		
	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.
	h m	s	° ' "	h m	s	° ' "	h m	s	° ' "	h m	s	° ' "
	11 44		+15 1	11 46		+ 2 13	11 48		+38 18	11 49		+54 8
Jan. 0.7	47.825		78.57	20.313		70.28	10.019		59.37	26.990		80.37
10.7	48.159	334	76.76	20.641	328	68.18	10.417	398	58.03	27.473	483	79.66
20.7	48.470	311	75.23	20.946	305	66.22	10.791	374	57.19	27.928	455	79.54
30.6	48.751	281	74.03	21.222	276	64.48	11.131	340	56.83	28.341	413	79.98
Feb. 9.6	48.993	242	73.18	21.460	238	62.98	11.426	295	56.96	28.699	358	80.97
		199			196			246			293	
19.6	49.192		72.66	21.656		61.75	11.672		57.52	28.992		82.43
29.6	49.345	153	72.48	21.809	153	60.81	11.861	189	58.48	29.213	221	84.29
Mar. 10.5	49.453	108	72.61	21.918	109	60.15	11.994	133	59.77	29.359	146	86.48
20.5	49.517	64	72.99	21.986	68	59.75	12.073	79	61.29	29.434	75	88.86
30.5	49.542	25	73.59	22.017	31	59.59	12.101	28	62.99	29.438	4	91.34
		10			0			18			59	
Apr. 9.4	49.532		74.36	22.017		59.62	12.083		64.74	29.379		93.82
19.4	49.494	38	75.23	21.987	30	59.84	12.028	55	66.46	29.265	114	96.20
29.4	49.431	63	76.15	21.937	50	60.19	11.939	89	68.10	29.105	160	98.36
May 9.4	49.351	80	77.09	21.868	69	60.64	11.826	113	69.57	28.909	196	100.26
19.3	49.259	92	77.99	21.788	80	61.16	11.697	129	70.80	28.685	224	101.81
		101			89			143			240	
29.3	49.158		78.82	21.699		61.73	11.554		71.78	28.445		102.97
June 8.3	49.054	104	79.55	21.606	93	62.33	11.408	146	72.43	28.197	248	103.70
18.3	48.949	105	80.16	21.512	94	62.94	11.261	147	72.76	27.948	249	103.99
28.2	48.847	102	80.65	21.419	93	63.53	11.117	144	72.75	27.705	243	103.83
July 8.2	48.750	97	80.98	21.331	88	64.09	10.984	133	72.39	27.475	230	103.21
		88			81			122			210	
18.2	48.662		81.13	21.250		64.60	10.862		71.68	27.265		102.16
28.1	48.587	75	81.11	21.180	70	65.04	10.757	105	70.63	27.079	189	100.69
Aug. 7.1	48.526	61	80.90	21.123	57	65.39	10.673	84	69.27	26.924	155	98.85
17.1	48.483	43	80.51	21.083	40	65.61	10.611	62	67.58	26.803	121	96.63
27.1	48.463	20	79.90	21.066	17	65.70	10.579	32	65.60	26.721	82	94.10
		5			6			1			37	
Sept. 6.0	48.468		79.08	21.072		65.62	10.578		63.36	26.684		91.30
16.0	48.504	36	78.04	21.110	38	65.33	10.614	36	60.88	26.696	12	88.27
26.0	48.574	70	76.76	21.181	71	64.82	10.690	76	58.19	26.762	66	85.07
Oct. 6.0	48.681	107	75.26	21.289	108	64.06	10.811	121	55.32	26.885	123	81.75
15.9	48.829	148	73.54	21.436	147	63.05	10.977	166	52.34	27.068	183	78.38
		187			188			215			243	
25.9	49.016		71.63	21.624		61.77	11.192		49.28	27.311		75.02
Nov. 4.9	49.243	227	69.53	21.851	227	60.24	11.453	261	46.22	27.614	303	71.76
14.8	49.509	266	67.32	22.115	264	58.48	11.759	306	43.21	27.973	359	68.69
24.8	49.806	297	65.03	22.411	296	56.52	12.102	343	40.33	28.381	408	65.86
Dec. 4.8	50.128	322	62.72	22.730	319	54.42	12.477	375	37.68	28.830	449	63.39
		339			334			396			476	
14.8	50.467		60.46	23.064		52.22	12.873		35.30	29.306		61.33
24.7	50.811	344	58.34	23.403	339	50.02	13.278	405	33.30	29.797	491	59.75
34.7	51.150	339	56.39	23.738	335	47.86	13.682	404	31.70	30.285	488	58.72
Mean Place	46.591		90.04	19.185		77.45	8.543		77.90	25.184		102.49
Sec δ , Tan δ	1.035		+0.269	1.001		+0.039	1.275		+0.790	1.708		+1.384
$D_{\psi} \alpha$, $D_{\mu} \alpha$	+0.06		+0.02	+0.06		0.00	+0.06		+0.05	+0.06		+0.09
$D_{\psi} \delta$, $D_{\mu} \delta$	-0.4		+0.1	-0.4		+0.1	-0.4		+0.1	-0.4		0.0

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	π Virginis. Mag. 4.6			\circ Virginis. Mag. 4.2			δ Centauri. Mag. 2.9			ϵ Corvi. Mag. 3.2		
	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.
	h m 11 56	s + 7 4	° ' "	h m 12 0	s + 9 11	° ' "	h m 12 3	s -50 15	° ' "	h m 12 5	s -22 9	° ' "
Jan. 0.7	35.205	331	48.89	56.939	333	48.01	60.583	451	7.89	48.996	348	8.68
10.7	35.536	311	48.87	57.272	314	48.02	61.034	420	10.20	49.344	328	11.04
20.7	35.847	283	44.85	57.586	286	44.27	61.454	379	12.88	49.672	290	13.51
30.6	36.130	246	43.29	57.872	250	42.77	61.833	329	15.86	49.968	260	16.02
Feb. 9.6	36.376	206	42.02	58.122	209	41.59	62.162	272	19.04	50.228	219	18.50
19.6	36.581	163	41.04	58.331	167	40.72	62.435	216	22.33	50.447	175	20.88
29.6	36.744	119	40.38	58.498	123	40.18	62.651	158	25.67	50.622	132	23.12
Mar. 10.5	36.863	77	40.01	58.621	82	39.95	62.809	101	28.98	50.754	91	25.17
20.5	36.940	40	39.92	58.703	48	39.98	62.910	48	32.18	50.845	51	27.03
30.5	36.980	6	40.06	58.746	9	40.26	62.958	1	35.20	50.896	17	28.64
Apr. 9.5	36.986	23	40.40	58.755	21	40.73	62.957	45	38.02	50.913	13	30.02
19.4	36.963	46	40.89	58.734	44	41.34	62.912	83	40.56	50.900	38	31.15
29.4	36.917	66	41.49	58.690	64	42.06	62.829	117	42.79	50.862	58	32.03
May 9.4	36.851	78	42.16	58.626	78	42.82	62.712	144	44.68	50.804	77	32.66
19.3	36.773	88	42.88	58.548	88	43.61	62.568	169	46.19	50.727	89	33.05
29.3	36.685	95	43.58	58.460	94	44.38	62.399	186	47.29	50.638	100	33.19
June 8.3	36.590	97	44.27	58.366	98	45.12	62.213	199	47.98	50.538	105	33.11
18.3	36.493	97	44.92	58.267	99	45.78	62.014	206	48.22	50.433	110	32.78
28.2	36.396	93	45.50	58.169	96	46.36	61.808	208	48.06	50.323	110	32.25
July 8.2	36.303	87	46.01	58.073	91	46.84	61.600	202	47.44	50.213	106	31.51
18.2	36.216	79	46.41	57.982	81	47.20	61.398	189	46.43	50.107	98	30.61
28.2	36.137	65	46.69	57.901	69	47.42	61.209	168	45.05	50.009	87	29.58
Aug. 7.1	36.072	49	46.85	57.832	54	47.49	61.041	141	43.33	49.922	69	28.40
17.1	36.023	28	46.85	57.778	33	47.40	60.900	104	41.34	49.853	49	27.17
27.1	35.995	5	46.68	57.745	9	47.13	60.796	59	39.13	49.804	19	25.92
Sept. 6.0	35.990	26	46.32	57.736	21	46.66	60.737	7	36.81	49.785	13	24.72
16.0	36.016	60	45.76	57.757	53	45.96	60.730	51	34.45	49.798	51	23.60
26.0	36.076	95	44.96	57.810	90	45.05	60.781	115	32.15	49.849	92	22.65
Oct. 6.0	36.171	125	43.93	57.900	121	43.89	60.896	180	30.02	49.941	137	21.94
15.9	36.306	175	42.65	58.031	173	42.49	61.076	246	28.13	50.078	184	21.49
25.9	36.481	217	41.13	58.204	213	40.86	61.322	307	26.61	50.262	229	21.38
Nov. 4.9	36.698	255	39.38	58.417	252	39.02	61.629	363	25.50	50.491	270	21.63
14.9	36.953	283	37.44	58.669	285	37.00	61.992	410	24.90	50.761	305	22.28
24.8	37.241	315	35.34	58.954	314	34.84	62.402	444	24.81	51.066	352	23.31
Dec. 4.8	37.556	332	33.15	59.268	330	32.60	62.846	465	25.30	51.399	352	24.69
14.8	37.888	339	30.92	59.598	340	30.34	63.311	471	26.32	51.751	368	26.43
24.7	38.227	336	28.72	59.938	337	28.14	63.782	462	27.88	52.109	355	28.46
31.7	38.563		26.63	60.275		26.07	64.244		29.91	52.464		30.69
Mean Place	34.106		57.80	55.851		57.96	59.891		17.12	48.125		9.56
Sec δ , Tan δ	1.008		+0.124	1.013		+0.162	1.564		-1.203	1.080		-0.407
$D_{\delta} \alpha$, $D_{\alpha} \alpha$	+0.06		+0.01	+0.06		+0.01	+0.06		-0.08	+0.06		-0.03
$D_{\delta} \delta$, $D_{\alpha} \delta$	-0.4		0.0	-0.4		0.0	-0.4		0.0	-0.4		0.0

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	4 H. Draconis. Mag. 5.1		δ Crucis. Mag. 3.1		δ Ursæ Majoris. Mag. 3.4		γ Corvi. Mag. 2.8	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 12 8	° ' " +78 4	h m 12 10	° ' " -58 16	h m 12 11	° ' " +57 29	h m 12 11	° ' " -17 4
Jan. 0.7	20.05	33.05	41.439	44.31	18.259	34.04	29.889	32.79
10.7	21.22	32.80	41.968	46.46	18.779	33.19	30.232	35.10
20.7	22.33	33.21	42.461	49.04	19.276	32.93	30.556	37.46
30.6	23.36	34.24	42.909	51.98	19.735	33.27	30.850	39.82
Feb. 9.6	24.27	35.85	43.300	55.19	20.142	34.18	31.110	42.10
19.6	25.03	37.97	43.626	58.59	20.484	35.62	31.330	44.25
29.6	25.59	40.51	43.885	62.09	20.753	37.51	31.508	46.23
Mar. 10.5	25.97	43.33	44.076	65.61	20.943	39.75	31.644	48.01
20.5	26.14	46.35	44.201	69.07	21.057	42.23	31.740	49.56
30.5	26.12	49.40	44.261	72.40	21.092	44.86	31.798	50.89
Apr. 9.5	25.90	52.39	44.261	75.55	21.057	47.52	31.821	51.97
19.4	25.50	55.19	44.207	78.44	20.959	50.08	31.816	52.82
29.4	24.96	57.69	44.103	81.03	20.805	52.47	31.784	53.44
May 9.4	24.28	59.81	43.956	83.27	20.605	54.59	31.733	53.84
19.3	23.48	61.49	43.773	85.13	20.371	56.38	31.664	54.02
29.3	22.63	62.67	43.556	86.56	20.110	57.77	31.582	54.01
June 8.3	21.72	63.31	43.314	87.54	19.834	58.73	31.490	53.80
18.3	20.79	63.40	43.055	88.06	19.550	59.24	31.392	53.42
28.2	19.87	62.93	42.781	88.10	19.267	59.26	31.289	52.88
July 8.2	18.98	61.92	42.507	87.68	18.992	58.80	31.186	52.17
18.2	18.14	60.39	42.237	86.79	18.733	57.87	31.085	51.35
28.2	17.39	58.38	41.981	85.46	18.495	56.50	30.960	50.43
Aug. 7.1	16.71	55.93	41.749	83.75	18.285	54.70	30.805	49.43
17.1	16.13	53.09	41.552	81.70	18.111	52.50	30.838	48.41
27.1	15.67	49.91	41.401	79.39	17.976	49.96	30.790	47.39
Sept. 6.0	15.36	46.46	41.304	76.90	17.888	47.12	30.768	46.44
16.0	15.17	42.80	41.270	74.30	17.851	44.01	30.777	45.61
26.0	15.13	39.01	41.809	71.74	17.872	40.71	30.820	44.96
Oct. 6.0	15.26	35.16	41.425	69.28	17.954	37.26	30.906	44.52
15.9	15.55	31.33	41.621	67.05	18.104	33.73	31.034	44.37
25.9	15.99	27.61	41.896	65.14	18.319	30.22	31.207	44.63
Nov. 4.9	16.60	24.09	42.245	63.65	18.603	26.78	31.425	45.02
14.9	17.35	20.84	42.663	62.65	18.950	23.50	31.683	45.87
24.8	18.25	17.98	43.137	62.20	19.355	20.49	31.978	47.07
Dec. 4.8	19.25	15.57	43.653	62.33	19.811	17.81	32.299	48.60
14.8	20.35	13.71	44.196	63.05	20.304	15.56	32.640	50.41
24.7	21.50	12.43	44.746	64.34	20.818	13.80	32.990	52.47
34.7	22.67	11.79	45.287	66.16	21.339	12.59	33.338	54.69
Mean Place	16.804	58.72	40.888	55.26	16.633	57.52	29.023	31.83
Sec δ , Tan δ	4.841	+4.736	1.902	-1.618	1.861	+1.670	1.046	-0.907
$D_{\delta} \alpha$, $D_{\alpha} \alpha$	+0.06	+0.32	+0.06	-0.11	+0.06	+0.10	+0.06	-0.02
$D_{\delta} \delta$, $D_{\alpha} \delta$	-0.4	0.0	-0.4	0.0	-0.4	0.0	-0.4	-0.1

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	ϵ Canum Venat. Mag. 5.8			β Chamaeleontis. Mag. 4.4			η Virginis. Mag. 4.0			α^1 Crucis. Mag. 1.6		
	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.
	h m 12 11	s 12 11	° ' " +41 6	h m 12 13	s 12 13	° ' " -78 50	h m 12 15	s 12 15	° ' " - 0 12	h m 12 21	s 12 21	° ' " -62 37
Jan. 0.7	56.644		79.34	23.17		30.91	37.439		7.29	55.25		49.80
10.7	57.047	403	78.03	24.42	125	32.66	37.773	384	9.43	55.85	60	51.74
20.7	57.432	385	77.23	25.58	116	34.95	38.090	317	11.47	56.41	56	54.16
30.7	57.787	355	76.96	26.63	105	37.72	38.380	290	13.32	56.92	51	56.97
Feb. 9.6	58.102	315	77.19	27.54	91	40.89	38.637	267	14.94	57.37	45	60.11
		266			75			219			39	
19.6	58.368		77.91	28.29		44.38	38.856		16.30	57.76		63.47
29.6	58.580	212	79.07	28.89	60	48.07	39.035	179	17.38	58.07	31	66.99
Mar. 10.5	58.737	157	80.60	29.31	42	51.90	39.173	138	18.18	58.31	24	70.56
20.5	58.837	100	82.40	29.55	24	55.78	39.270	97	18.73	58.47	16	74.13
30.5	58.884	47	84.39	29.62	7	59.61	39.329	59	19.01	58.55	8	77.59
		2			9			26			2	
Apr. 9.5	58.882		86.48	29.53		63.33	39.355		19.08	58.57		80.90
19.4	58.837	45	88.58	29.29	24	66.84	39.353	2	18.98	58.52	5	83.99
29.4	58.754	83	90.60	28.90	39	70.10	39.325	28	18.71	58.42	10	86.80
May 9.4	58.642	112	92.46	28.37	53	73.01	39.277	48	18.32	58.27	15	89.28
19.4	58.507	135	94.09	27.72	65	75.54	39.214	63	17.83	58.06	21	91.38
		152			74			77			24	
29.3	58.355		95.45	26.98		77.62	39.137		17.28	57.82		93.06
June 8.3	58.192	163	96.48	26.16	82	79.21	39.052	85	16.69	57.54	28	94.28
18.3	58.023	169	97.15	25.27	89	80.28	38.960	92	16.07	57.24	30	95.03
28.2	57.855	168	97.46	24.34	93	80.81	38.866	94	15.45	56.92	32	95.29
July 8.2	57.692	163	97.40	23.40	94	80.78	38.770	96	14.85	56.59	33	95.06
		155			92			98			33	
18.2	57.537		96.96	22.48		80.20	38.677		14.28	56.26		94.34
28.2	57.394	143	96.13	21.61	87	79.08	38.590	87	13.76	55.94	32	93.16
Aug. 7.1	57.270	124	94.94	20.81	80	77.46	38.514	76	13.32	55.65	29	91.55
17.1	57.166	104	93.40	20.11	70	75.41	38.450	64	12.98	55.40	25	89.56
27.1	57.090	76	91.55	19.56	55	72.96	38.405	45	12.78	55.20	20	87.27
		45			39			21			14	
Sept. 6.1	57.045		89.40	19.17		70.24	38.384		12.73	55.06		84.75
16.0	57.037	8	86.98	18.95	22	67.31	38.390	6	12.87	54.99	7	82.09
26.0	57.070	33	84.32	18.95	0	64.30	38.430	40	13.21	55.00	1	79.40
Oct. 6.0	57.149	79	81.47	19.15	20	61.32	38.508	78	13.79	55.11	11	76.79
15.9	57.276	127	78.49	19.57	42	58.48	38.626	118	14.63	55.30	19	74.36
		178			61			160			28	
25.9	57.454		75.41	20.18		55.92	38.786		15.75	55.58		72.22
Nov. 4.9	57.683	220	72.32	20.99	81	53.74	38.989	203	17.12	55.95	37	70.47
14.9	57.961	278	69.30	21.98	99	52.03	39.231	242	18.75	56.40	45	69.20
24.8	58.284	323	66.39	23.10	112	50.88	39.508	277	20.59	56.93	53	68.46
Dec. 4.8	58.643	359	63.70	24.32	122	50.33	39.816	308	22.60	57.50	57	68.30
		385			128			327			60	
14.8	59.028		61.30	25.60		50.43	40.143		24.75	58.10		68.75
24.8	59.431	403	59.27	26.91	131	51.16	40.480	337	26.94	58.72	62	69.79
34.7	59.837	406	57.68	28.19	128	52.51	40.817	387	29.12	59.32	60	71.38
Mean Place	55.340		99.33	23.374		44.94	36.498		0.28	54.868		61.43
Sec δ , Tan δ	1.327		+0.873	5.171		-5.073	1.000		-0.003	2.176		-1.933
$D_{\phi} \alpha$, $D_{\phi} \alpha$	+0.06		+0.06	+0.07		-0.34	+0.06		0.00	+0.06		-0.13
$D_{\phi} \delta$, $D_{\phi} \delta$	-0.4		-0.1	-0.4		-0.1	-0.4		-0.1	-0.4		-0.1

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	20 Comæ. Mag. 5.7		δ Corvi. Mag. 3.1		γ Crucis. Mag. 1.6		8 Canum Venat. Mag. 4.3	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 12 25	° ' " +21 21	h m 12 25	° ' " -16 2	h m 12 26	° ' " -56 38	h m 12 29	° ' " +41 46
Jan. 0.7	31.210	25.52	31.758	54.01	30.167	23.73	46.629	28.76
10.7	31.560 ³⁵⁰	23.66 ¹⁸⁶	32.103 ³⁴⁵	56.26 ²²⁵	30.688 ⁵²¹	25.72 ¹⁰⁹	47.035 ⁴⁰⁶	27.31 ¹⁶
20.7	31.896 ³³⁶	22.16 ¹⁵⁰	32.432 ³²⁹	58.56 ²³⁰	31.181 ⁴⁹³	28.14 ²⁴²	47.427 ³⁹²	26.39 ³²
30.7	32.208 ³¹²	21.05 ¹¹¹	32.734 ³⁰²	60.85 ²²⁹	31.633 ⁴⁵²	30.91 ²⁷⁷	47.792 ³⁶⁵	25.99 ⁶
Feb. 9.6	32.487 ²⁷⁹	20.33 ⁷²	33.004 ²⁷⁰	63.07 ²²²	32.034 ⁴⁰¹	33.99 ³⁰⁸	48.122 ³³⁰	26.13 ¹⁸
19.6	32.727 ²⁴⁰	20.03 ³⁰	33.237 ²³³	65.14 ²⁰⁷	32.378 ³⁴⁴	37.25 ³²⁶	48.405 ²⁸¹	26.78 ¹¹¹
29.6	32.924 ¹⁹⁷	20.12 ⁹	33.428 ¹⁹¹	67.05 ¹⁹¹	32.658 ²⁸⁰	40.62 ³³⁷	48.635 ²³⁰	27.99 ¹¹¹
Mar. 10.6	33.076 ¹⁵²	20.55 ⁴³	33.578 ¹⁵⁰	68.75 ¹⁷⁰	32.875 ²¹⁷	44.04 ³⁴²	48.812 ¹⁷⁷	29.41 ¹³⁹
20.5	33.184 ¹⁰⁸	21.31 ⁷⁶	33.688 ¹¹⁰	70.24 ¹⁴⁹	33.029 ¹⁵⁴	47.43 ³³⁹	48.933 ¹²¹	31.24 ¹⁰⁰
30.5	33.251 ⁶⁷	22.30 ⁹⁹	33.760 ⁷²	71.49 ¹²⁵	33.120 ⁹¹	50.69 ³²⁶	49.000 ⁶⁷	33.29 ³⁵
Apr. 9.5	33.279 ²⁸	23.49 ¹¹⁹	33.799 ³⁹	72.52 ¹⁰³	33.154 ³⁴	53.79 ³¹⁰	49.017 ¹⁷	35.47 ¹¹⁸
19.4	33.274 ⁵	24.78 ¹²⁹	33.807 ⁸	73.31 ⁷⁹	33.135 ¹⁹	56.68 ²⁸⁹	48.989 ²⁸	37.67 ²³⁸
29.4	33.241 ³³	26.13 ¹³⁵	33.790 ¹⁷	73.89 ⁵⁸	33.068 ⁶⁷	59.28 ²⁶⁰	48.921 ⁶⁸	39.82 ²³³
May 9.4	33.184 ⁸⁷	27.46 ¹³³	33.751 ³⁹	74.27 ³⁸	32.956 ¹¹²	61.56 ²⁸⁸	48.822 ⁹⁹	41.83 ²⁸⁰
19.4	33.106 ⁷⁸	28.72 ¹²⁶	33.693 ⁵⁸	74.44 ¹⁷	32.806 ¹⁵⁰	63.48 ¹⁹²	48.694 ¹²⁸	43.63 ¹⁸⁶
29.3	33.015 ⁹¹	29.87 ¹¹⁵	33.619 ⁷⁴	74.43 ¹	32.623 ¹⁸³	65.00 ¹⁵²	48.547 ¹⁴⁷	45.14 ¹³¹
June 8.3	32.913 ¹⁰²	30.87 ¹⁰⁰	33.534 ⁸⁵	74.23 ²⁰	32.411 ²¹²	66.09 ¹⁰⁹	48.385 ¹⁶²	46.35 ¹²⁸
18.3	32.805 ¹⁰⁸	31.69 ⁸²	33.440 ⁹⁴	73.88 ³⁵	32.177 ²³⁴	66.73 ⁶⁴	48.214 ¹⁷¹	47.20 ⁸¹
28.3	32.692 ¹¹³	32.30 ⁶¹	33.340 ¹⁰⁰	73.38 ⁵⁰	31.929 ²⁴⁸	66.92 ¹⁹	48.038 ¹⁷⁶	47.69 ⁸
July 8.2	32.578 ¹¹⁴	32.69 ³⁹	33.236 ¹⁰⁴	72.73 ⁶⁵	31.672 ²⁵⁷	66.65 ²⁷	47.863 ¹⁷⁵	47.77 ³
18.2	32.467 ¹¹¹	32.84 ¹⁵	33.133 ¹⁰³	71.97 ⁷⁶	31.415 ²⁵⁷	65.92 ⁷³	47.693 ¹⁷⁰	47.46 ²¹
28.2	32.362 ¹⁰⁵	32.76 ⁸	33.034 ⁹⁹	71.12 ⁸⁵	31.167 ²⁴⁸	64.76 ¹¹⁶	47.534 ¹⁵⁹	46.77 ⁵⁸
Aug. 7.1	32.267 ⁹⁵	32.41 ³⁵	32.942 ⁹²	70.20 ⁹²	30.936 ²³¹	63.21 ¹⁵⁵	47.389 ¹⁴⁵	45.69 ²⁹⁸
17.1	32.187 ⁸⁰	31.81 ⁶⁰	32.866 ⁷⁶	69.26 ⁹⁴	30.735 ²⁰¹	61.33 ¹⁸⁸	47.263 ¹²⁶	44.26 ¹⁶⁰
27.1	32.126 ⁶¹	30.96 ⁸⁵	32.806 ⁶⁰	68.33 ⁹³	30.573 ¹⁶²	59.15 ²¹⁸	47.161 ¹⁰²	42.47 ¹⁷⁹
Sept. 6.1	32.087 ³⁹	29.84 ¹¹²	32.772 ³⁴	67.46 ⁸⁷	30.460 ¹¹³	56.79 ²³⁶	47.090 ⁷¹	40.36 ²¹¹
16.0	32.079 ⁸	28.48 ¹³⁶	32.766 ⁶	66.71 ⁷⁵	30.407 ⁵³	54.31 ²⁴⁸	47.053 ³⁷	37.97 ²³⁰
26.0	32.104 ²⁵	26.86 ¹⁶²	32.797 ³¹	66.11 ⁶⁰	30.420 ¹³	51.80 ²⁵¹	47.058 ⁵	35.32 ²⁸⁶
Oct. 6.0	32.168 ⁶⁴	25.02 ¹⁸⁴	32.867 ⁷⁰	65.73 ³⁸	30.505 ⁸⁵	49.38 ²⁴²	47.110 ⁵²	32.47 ²⁸⁵
16.0	32.273 ¹⁰⁵	22.94 ²⁰⁸	32.981 ¹¹⁴	65.62 ¹¹	30.670 ¹⁶⁵	47.17 ²²¹	47.210 ¹⁰⁰	29.44 ²⁸⁰
25.9	32.422 ¹⁴⁹	20.69 ²²⁵	33.141 ¹⁶⁰	65.80 ¹⁸	30.912 ²⁴²	45.24 ¹⁹³	47.363 ¹⁵³	26.31 ²¹³
Nov. 4.9	32.616 ¹⁹⁴	18.28 ²⁴¹	33.345 ²⁰⁴	66.30 ⁵⁰	31.228 ³¹⁶	43.70 ¹⁵⁴	47.568 ²⁰⁵	23.14 ³²⁷
14.9	32.852 ²³⁶	15.76 ²⁵²	33.592 ²⁴⁷	67.15 ⁸⁵	31.614 ³⁸⁶	42.62 ¹⁰⁸	47.826 ²⁵⁸	20.01 ³¹³
24.8	33.129 ²⁷⁷	13.20 ²⁵⁶	33.876 ²⁸⁴	68.33 ¹¹⁸	32.057 ⁴⁴³	42.06 ⁵⁶	48.131 ³⁰⁵	17.00 ³⁸¹
Dec. 4.8	33.438 ³⁰⁰	10.67 ²⁵³	34.191 ³¹⁵	69.84 ¹⁵¹	32.545 ⁴⁸⁸	42.07 ¹	48.476 ³⁴⁵	14.17 ²⁸³
14.8	33.771 ³³³	8.23 ²⁴⁴	34.528 ³³⁷	71.62 ¹⁷⁸	33.065 ⁵²⁰	42.65 ⁵⁸	48.852 ³⁷⁶	11.64 ²⁵³
24.8	34.118 ³⁴⁷	5.96 ²²⁷	34.875 ³⁴⁷	73.62 ²⁰⁰	33.599 ⁵³⁴	43.78 ¹¹³	49.250 ³⁹⁸	9.48 ²⁷⁶
34.7	34.470 ³⁵²	3.95 ²⁰¹	35.224 ³⁴⁹	75.79 ²¹⁷	34.128 ⁵²⁹	45.44 ¹⁶⁶	49.655 ⁴⁰⁵	7.75 ¹⁷³
Mean Place	30.199	40.14	30.964	52.41	29.724	34.07	45.482	49.41
Sec δ, Tan δ	1.074	+0.391	1.040	-0.288	1.819	-1.519	1.342	+0.894
Dψ α, Dω α	+0.06	+0.03	+0.06	-0.02	+0.07	-0.10	+0.06	+0.06
Dψ δ, Dω δ	-0.4	-0.1	-0.4	-0.1	-0.4	-0.1	-0.4	-0.1

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	κ Draconis. Mag. 3.9		β Corvi. Mag. 2.8		γ Comae aeq. Mag. 5.2		α Muscae. Mag. 2.9	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 12 29	° ' +70 14	h m 12 29	° ' -22 55	h m 12 30	° ' +18 49	h m 12 32	° ' -68 40
	s	"	s	"	s	"	s	"
Jan. 0.7	56.13	38.43	58.990	55.79	55.978	67.45	9.63	9.83
10.7	56.88 ⁷⁶	37.67 ⁷⁶	59.346 ³⁵⁶	58.02 ²²³	56.325 ³⁴⁷	65.52 ¹⁹³	10.36 ⁷³	11.53 ¹⁷⁰
20.7	57.62 ⁷⁴	37.57 ¹⁰	59.687 ³⁴¹	60.38 ²³⁶	56.660 ³³⁵	63.93 ¹⁶⁹	11.06 ⁷⁰	13.74 ²²¹
30.7	58.31 ⁶⁹	38.12 ⁵⁵	60.001 ³¹⁴	62.80 ²⁴²	56.970 ³¹⁰	62.70 ¹²³	11.70 ⁶⁴	16.40 ²⁶⁶
Feb. 9.6	58.94 ⁶³	39.27 ¹¹⁵	60.282 ²⁸¹	65.21 ²⁴¹	57.249 ²⁷⁹	61.86 ⁸⁴	12.28 ⁵⁸	19.43 ³⁰³
19.6	59.47 ⁵³	40.99 ¹⁷²	60.524 ²⁴²	67.55 ²³⁴	57.490 ²⁴¹	61.40 ⁴⁶	12.77 ⁴⁹	22.75 ³³²
29.6	59.90 ⁴³	43.18 ²¹⁹	60.725 ²⁰¹	69.77 ²²²	57.690 ²⁰⁰	61.34 ⁶	13.17 ⁴⁰	26.27 ³⁵²
Mar. 10.6	60.20 ³⁰	45.74 ²⁵⁶	60.884 ¹⁵⁹	71.81 ²⁰⁴	57.846 ¹⁵⁶	61.64 ³⁰	13.48 ³¹	29.91 ³⁶⁴
20.6	60.40 ²⁰	48.55 ²⁸¹	61.002 ¹¹⁸	73.68 ¹⁸⁷	57.959 ¹¹³	62.24 ⁶⁰	13.69 ²¹	33.58 ³⁶⁷
30.6	60.47 ⁷	51.50 ²⁹⁵	61.082 ⁸⁰	75.33 ¹⁶⁶	58.032 ⁷³	63.10 ⁸⁶	13.82 ¹³	37.20 ³⁶²
Apr. 9.5	60.42 ⁵	54.48 ²⁹⁸	61.128 ⁴⁶	76.76 ¹⁴³	58.067 ³⁵	64.15 ¹⁰⁵	13.86 ⁴	40.70 ³⁵⁰
19.4	60.26 ¹⁶	57.35 ²⁸⁷	61.141 ¹³	77.95 ¹¹⁹	58.069 ²	65.34 ¹¹⁹	13.82 ⁴	44.02 ³³²
29.4	59.99 ²⁷	60.01 ²⁶⁶	61.126 ¹⁵	78.91 ⁹⁶	58.043 ²⁶	66.59 ¹²⁵	13.70 ¹²	47.08 ³⁰⁶
May 9.4	59.65 ³⁴	62.37 ²³⁶	61.088 ⁵⁸	79.63 ⁷²	57.993 ⁵⁰	67.85 ¹²⁶	13.50 ²⁰	49.83 ²⁷⁶
19.4	59.25 ⁴⁰	64.35 ¹⁹⁸	61.031 ³⁷	80.12 ⁴⁹	57.923 ⁷⁰	69.06 ¹²¹	13.24 ²⁶	52.21 ²³⁸
29.3	58.78 ⁴⁷	65.89 ¹⁸⁴	60.955 ⁷⁶	80.37 ²⁵	57.839 ⁸⁴	70.18 ¹¹²	12.93 ³¹	54.18 ¹⁹⁷
June 8.3	58.28 ⁵⁰	66.94 ¹⁰⁵	60.867 ⁸⁸	80.40 ³	57.743 ⁹⁶	71.17 ⁹⁹	12.57 ³⁶	55.70 ¹⁵²
18.3	57.76 ⁵²	67.47 ⁵³	60.767 ¹⁰⁰	80.19 ²¹	57.638 ¹⁰⁵	72.01 ⁸⁴	12.17 ⁴⁰	56.73 ¹⁰³
28.3	57.23 ⁵³	67.46 ¹	60.660 ¹⁰⁷	79.79 ⁴⁰	57.529 ¹⁰⁹	72.66 ⁶⁵	11.74 ⁴³	57.25 ⁵²
July 8.2	56.71 ⁵²	66.93 ⁵³	60.548 ¹¹²	79.18 ⁶¹	57.418 ¹¹¹	73.11 ⁴⁵	11.30 ⁴⁴	57.24 ¹
18.2	56.21 ⁵⁰	65.88 ¹⁰⁵	60.435 ¹¹³	78.38 ⁸⁰	57.309 ¹⁰⁹	73.34 ²³	10.86 ⁴⁴	56.73 ⁵¹
28.2	55.74 ⁴⁷	64.33 ¹⁵⁵	60.326 ¹⁰⁹	77.44 ⁹⁴	57.205 ¹⁰⁴	73.36 ²	10.42 ⁴⁴	55.71 ¹⁰²
Aug. 7.1	55.31 ⁴³	62.31 ²⁰²	60.225 ¹⁰¹	76.37 ¹⁰⁷	57.108 ⁹⁷	73.12 ²⁴	10.02 ⁴⁰	54.22 ¹⁴⁹
17.1	54.94 ³⁷	59.87 ²⁴⁴	60.137 ⁸⁸	75.20 ¹¹⁷	57.026 ⁸²	72.66 ⁴⁶	9.67 ³⁵	52.33 ¹⁸⁹
27.1	54.63 ³¹	57.05 ²⁸²	60.069 ⁶⁸	74.00 ¹²⁰	56.962 ⁶⁴	71.94 ⁷²	9.37 ³⁰	50.06 ²²⁷
Sept. 6.1	54.39 ²⁴	53.90 ³¹⁵	60.025 ⁴⁴	72.83 ¹¹⁷	56.931 ⁴¹	70.98 ⁹⁶	9.16 ²¹	47.50 ²⁵⁶
16.0	54.24 ¹⁵	50.48 ³⁴²	60.014 ¹¹	71.71 ¹¹²	56.908 ¹³	69.77 ¹²¹	9.03 ¹³	44.77 ²⁷³
26.0	54.17 ⁷	46.88 ³⁸⁰	60.040 ²⁶	70.72 ⁹⁹	56.929 ²¹	68.31 ¹⁴⁶	9.00 ³	41.95 ²⁸²
Oct. 6.0	54.20 ³	43.13 ³⁷⁵	60.108 ⁶⁸	69.93 ⁷⁹	56.986 ⁵⁷	66.60 ¹⁷¹	9.09 ⁹	39.15 ²⁸⁰
16.0	54.33 ¹³	39.33 ³⁸⁰	60.222 ¹¹⁴	69.39 ⁵⁴	57.085 ⁹⁹	64.67 ¹⁹³	9.30 ²¹	36.50 ²⁶⁵
25.9	54.57 ²⁴	35.55 ³⁷⁸	60.383 ¹⁶¹	69.16 ²³	57.228 ¹⁴³	62.53 ²¹⁴	9.62 ³²	34.09 ²⁴¹
Nov. 4.9	54.91 ³⁴	31.89 ³⁶⁶	60.592 ²⁰⁹	69.28 ¹²	57.415 ¹⁸⁷	60.23 ²⁸⁰	9.62 ⁴³	32.04 ²⁰⁵
14.9	55.34 ⁴³	28.45 ³⁴⁴	60.845 ²⁵³	69.75 ⁴⁷	57.646 ²³¹	57.81 ²⁴²	10.05 ⁵³	32.04 ¹⁵⁹
24.8	55.88 ⁵⁴	25.30 ³¹⁵	61.138 ²⁹³	70.60 ⁸⁵	57.916 ²⁷⁰	55.31 ²⁵⁰	10.58 ⁶¹	30.45 ¹⁰⁷
Dec. 4.8	56.49 ⁶¹	22.54 ²⁷⁶	61.462 ³²⁴	71.83 ¹²³	58.220 ³⁰⁴	52.81 ²⁵⁰	11.19 ⁶⁹	29.38 ⁴⁸
14.8	57.18 ⁶⁰	20.25 ²²⁰	61.810 ³⁴⁸	73.40 ¹⁵⁷	58.547 ³²⁷	50.38 ²⁴³	11.88 ⁷⁴	28.90 ¹²
24.8	57.90 ⁷²	18.51 ¹⁷⁴	62.170 ³⁶⁰	75.26 ¹⁸⁶	58.890 ³⁴³	48.09 ²²⁹	12.62 ⁷⁵	29.02 ⁷³
34.7	58.67 ⁷⁷	17.38 ¹¹³	62.530 ³⁶⁰	77.36 ²¹⁰	59.238 ³⁴⁸	46.03 ²⁰⁶	13.37 ⁷⁴	29.75 ¹³²
Mean Place	54.348	64.12	58.260	56.47	55.021	81.36	9.530	22.30
Sec δ , Tan δ	2.958	+2.785	1.086	-0.423	1.057	+0.341	2.750	-2.561
$D\phi\alpha$, $D\omega\alpha$	+0.05	+0.18	+0.06	-0.03	+0.06	+0.02	+0.07	-0.17
$D\phi\delta$, $D\omega\delta$	-0.4	-0.1	-0.4	-0.1	-0.4	-0.1	-0.4	-0.1

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	χ Virgins. Mag. 4.8		γ Centauri. Mag. 2.4		γ Virginis (mean). Mag. 2.9		ρ Virginis. Mag. 5.0	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 12 34 s	° ' " - 7 32 "	h m 12 36 s	° ' " -48 29 "	h m 12 37 s	° ' " - 0 59 "	h m 12 37 s	° ' " +10 41 "
Jan. 0.7	55.329	5.27	53.135	47.04	25.056	27.01	38.877	42.47
10.7	55.668 ³³⁰	7.45 ²¹⁵	53.591 ⁴⁵⁶	49.02 ¹⁹⁸	25.392 ³³⁶	29.16 ²¹⁵	39.217 ³⁴⁰	40.43 ²⁰⁴
20.7	55.993 ³²⁵	9.60 ²¹⁵	54.025 ⁴³⁴	51.37 ²³⁵	25.716 ³²⁴	31.20 ²⁰⁴	39.545 ³²⁸	38.61 ¹⁶²
30.7	56.295 ³⁰²	11.66 ²⁰⁶	54.427 ⁴⁰²	54.03 ²⁶⁶	26.016 ³⁰⁰	33.07 ¹⁵⁷	39.850 ³⁰⁵	37.08 ¹⁵³
Feb. 9.6	56.566 ²⁷¹	13.56 ¹⁹⁰	54.788 ³⁶¹	56.92 ²⁸⁰	26.287 ²⁷¹	34.72 ¹⁶⁵	40.127 ²⁷⁷	35.88 ¹²⁰
19.6	56.802 ²³⁶	15.25 ¹⁶⁰	55.100 ³¹²	59.96 ³⁰⁴	26.523 ²³⁶	36.13 ¹⁴¹	40.367 ²⁴⁰	35.02 ⁸⁶
29.6	56.998 ¹⁹⁶	16.72 ¹⁴⁷	55.360 ²⁸⁰	63.08 ³¹²	26.720 ¹⁹⁷	37.25 ¹¹²	40.567 ²⁰⁰	34.49 ⁵³
Mar. 10.6	57.156 ¹⁵⁸	17.94 ¹²²	55.567 ²⁰⁷	66.20 ³¹²	26.877 ¹⁶⁷	38.11 ⁹⁶	40.727 ¹⁶⁰	34.31 ¹⁸
20.5	57.274 ¹¹⁸	18.91 ⁹⁷	55.721 ¹⁸⁴	69.25 ³⁰⁵	26.996 ¹¹⁹	38.69 ⁸⁸	40.846 ¹¹⁹	34.44 ¹³
30.5	57.355 ⁸¹	19.64 ⁷³	55.824 ¹⁰³	72.19 ²⁰⁴	27.077 ⁸¹	39.01 ³²	40.927 ⁸¹	34.81 ³⁷
Apr. 9.5	57.404 ⁴⁹	20.15 ⁵¹	55.879 ⁵⁵	74.96 ²⁷⁷	27.126 ⁴⁹	39.11 ¹⁰	40.973 ⁴⁶	35.40 ⁵⁰
19.4	57.422 ¹⁸	20.43 ²⁸	55.889 ¹⁰	77.49 ²⁵³	27.143 ¹⁷	39.02 ⁹	40.966 ¹³	36.17 ⁷⁷
29.4	57.413 ⁹	20.54 ¹¹	55.859 ³⁰	79.78 ²²⁹	27.135 ⁸	38.76 ²⁶	40.973 ¹³	37.04 ⁸⁷
May 9.4	57.381 ²²	20.49 ⁵	55.793 ⁸⁶	81.76 ¹⁹⁶	27.103 ³²	38.38 ³⁸	40.937 ³⁶	37.97 ⁹³
19.4	57.332 ⁴⁹	20.28 ²¹	55.695 ⁹⁶	83.40 ¹⁶⁴	27.053 ⁵⁰	37.90 ⁴⁸	40.881 ⁵⁶	38.92 ⁸⁵
29.3	57.266 ⁶⁶	19.97 ³¹	55.567 ¹²⁸	84.69 ¹²⁹	26.987 ⁶⁶	37.34 ³⁶	40.809 ⁷²	39.85 ⁹³
June 8.3	57.189 ⁷⁷	19.55 ⁴²	55.417 ¹⁵⁰	85.61 ⁹²	26.909 ⁷⁸	36.74 ⁶⁰	40.725 ⁸⁴	39.85 ⁸⁷
18.3	57.102 ⁸⁷	19.04 ⁵¹	55.245 ¹⁷²	86.12 ⁵¹	26.822 ⁸⁷	36.12 ⁶²	40.632 ⁹³	40.72 ⁷⁹
28.3	57.008 ⁹⁴	18.47 ⁵⁷	55.060 ¹⁸⁵	86.22 ¹⁰	26.729 ⁹³	35.50 ⁶²	40.534 ⁹⁸	41.51 ⁶⁸
July 8.2	56.910 ⁹⁸	17.84 ⁶³	54.866 ¹⁹⁴	85.91 ³¹	26.631 ⁹⁶	34.88 ⁷²	40.432 ¹⁰²	42.19 ⁵⁵
18.2	56.811 ⁹⁹	17.19 ⁶⁶	54.668 ¹⁹⁸	85.21 ⁷⁰	26.532 ⁹⁹	34.30 ⁵⁸	40.329 ¹⁰³	42.74 ⁴¹
28.2	56.715 ⁹⁶	16.52 ⁶⁷	54.475 ¹⁹³	84.14 ¹⁰⁷	26.435 ⁹⁷	33.77 ⁵³	40.229 ¹⁰⁰	43.15 ²⁵
Aug. 7.1	56.626 ⁸⁹	15.85 ⁶⁷	54.293 ¹⁸²	82.72 ¹⁴²	26.345 ⁹⁰	33.31 ⁴⁶	40.138 ⁹¹	43.40 ⁵
17.1	56.549 ⁷⁷	15.25 ⁶⁰	54.131 ¹⁶²	81.01 ¹⁷¹	26.266 ⁷⁹	32.95 ³⁶	40.057 ⁸¹	43.48 ¹¹
27.1	56.487 ⁶²	14.71 ⁵⁴	53.999 ¹³²	79.06 ¹⁹⁵	26.203 ⁶³	32.71 ²⁴	39.993 ⁶⁴	43.37 ³¹
Sept. 6.1	56.447 ⁴⁰	14.27 ⁴⁴	53.903 ⁴⁷	76.94 ²¹²	26.161 ⁴²	32.62 ⁹	39.949 ⁴⁴	43.06 ⁵²
16.0	56.435 ¹²	14.00 ²⁷	53.856 ⁹⁶	74.73 ²²¹	26.147 ¹⁴	32.62 ⁸	39.949 ¹⁶	42.54 ⁷⁶
26.0	56.457 ²²	13.90 ¹⁰	53.862 ⁶	72.53 ²²⁰	26.164 ¹⁷	32.70 ²⁹	39.933 ¹⁷	41.78 ⁹⁶
Oct. 6.0	56.516 ⁵⁹	13.90 ¹³	53.928 ⁶⁶	70.44 ²⁰⁹	26.164 ⁵⁵	32.99 ⁵²	39.950 ⁵²	40.80 ⁵²
16.0	56.617 ¹⁰¹	14.03 ³⁷	53.928 ¹³⁰	68.52 ¹⁹²	26.219 ⁹⁶	33.51 ⁷⁸	40.002 ⁹²	39.57 ¹²²
25.9	56.761 ¹⁴⁴	14.40 ⁶⁶	54.058 ¹⁹⁶	68.52 ¹⁶²	26.315 ¹³⁸	34.29 ¹⁰³	40.094 ¹³⁷	38.10 ¹⁴⁷
Nov. 4.9	56.761 ¹⁹⁰	15.06 ⁹⁴	54.256 ²⁶¹	66.90 ¹²⁸	26.453 ¹⁸³	35.32 ¹²⁰	40.231 ¹⁸¹	38.10 ¹⁷¹
14.9	56.961 ²³¹	16.00 ¹²⁴	54.517 ³²¹	65.65 ⁸²	26.636 ²²⁵	36.62 ¹⁵⁶	40.412 ²²³	36.39 ¹⁹¹
24.8	57.182 ²⁷⁰	17.24 ¹⁵¹	54.838 ³⁷³	64.83 ³⁴	26.861 ²⁶⁴	38.18 ¹⁷⁷	40.635 ²⁶²	34.48 ²¹¹
Dec. 4.8	57.452 ³⁰²	18.75 ¹⁷⁵	55.211 ⁴¹⁶	64.49 ¹⁸	27.125 ²⁹⁵	39.95 ¹⁹⁶	40.897 ²⁹⁶	32.37 ²²⁴
14.8	57.754 ³²⁴	20.50 ¹⁹⁵	55.627 ⁴⁴⁵	64.67 ⁷¹	27.420 ³¹⁸	41.91 ²¹⁰	41.193 ³¹⁹	30.13 ²³¹
24.8	58.078 ³³⁸	22.45 ²⁰⁹	56.072 ⁴⁶¹	65.38 ¹²¹	27.738 ³³³	44.01 ²¹⁶	41.512 ³³⁵	27.82 ²³³
34.7	58.416 ³⁴¹	24.54 ²¹⁶	56.533 ⁴⁶¹	66.59 ¹⁶⁰	28.071 ³³⁷	46.17 ²¹⁷	41.847 ³⁴⁰	25.49 ²²⁸
Mean Place	54.542	0.49	52.657	55.28	24.250	19.84	38.011	53.77
Sec δ , Tan δ	1.009	-0.132	1.509	-1.131	1.000	-0.017	1.018	+0.189
$D\phi\alpha$, $D\alpha$	+0.06	-0.01	+0.07	-0.07	+0.06	0.00	+0.06	+0.01
$D\phi\delta$, $D\delta$	-0.4	-0.2	-0.4	-0.2	-0.4	-0.2	-0.4	-0.2

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	76 Ursæ Majoris. Mag. 5.9			β Crucis. Mag. 1.5			31 Comæ. Mag. 5.1			γ Centauri. Mag. 4.3		
	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.
	h m 12 37	s +63 9	° ' "	h m 12 42	s -59 13	° ' "	h m 12 47	s +27 59	° ' "	h m 12 48	s -39 43	° ' "
Jan. 0.8	55.40		61.65	48.424		36.84	37.372		34.03	47.242		14.54
10.7	55.99	59	60.62	48.986	562	38.56	37.737	365	32.17	47.654	412	16.50
20.7	56.58	59	60.22	49.523	537	40.76	38.089	352	30.71	48.050	396	18.77
30.7	57.12	54	60.45	50.022	499	43.35	38.421	332	29.69	48.421	371	21.28
Feb. 9.6	57.62	50	61.30	50.471	449	46.26	38.724	303	29.14	48.756	335	23.95
		42			391			267			294	
19.6	58.04		62.72	50.862		49.42	38.991		29.05	49.050		26.71
29.6	58.40	36	64.62	51.189	327	52.74	39.215	224	29.41	49.299	249	29.49
Mar. 10.6	58.66	26	66.94	51.451	262	56.13	39.394	179	30.16	49.503	204	32.24
20.5	58.84	18	69.56	51.647	196	59.53	39.528	134	31.26	49.660	157	34.90
30.5	58.92	8	72.36	51.776	129	62.86	39.618	90	32.62	49.773	113	37.41
		0			69			49			71	
Apr. 9.5	58.92		75.22	51.845		66.06	39.667		34.18	49.844		39.75
19.5	58.83	9	78.03	51.854	9	69.07	39.678	11	35.87	49.878	34	41.87
29.4	58.67	16	80.68	51.809	45	71.83	39.656	22	37.58	49.877	1	43.76
May 9.4	58.46	27	83.09	51.713	96	74.29	39.607	49	39.27	49.844	33	45.36
19.4	58.19	21	85.16	51.573	140	76.41	39.533	74	40.85	49.782	62	46.69
		31			181			98			86	
29.3	57.88		86.83	51.392		78.15	39.440		42.28	49.696		47.70
June 8.3	57.54	34	88.05	51.176	217	79.47	39.333	107	43.51	49.587	109	48.38
18.3	57.18	36	88.79	50.930	245	80.34	39.213	120	44.51	49.461	126	48.73
28.3	56.81	37	89.04	50.662	268	80.75	39.086	127	45.23	49.320	141	48.75
July 8.2	56.45	36	88.76	50.381	281	80.69	38.955	131	45.68	49.168	152	48.42
		36			286			131			156	
18.2	56.09		87.99	50.095		80.17	38.824		45.82	49.012		47.76
28.2	55.75	34	86.73	49.813	282	79.19	38.696	128	45.65	48.855	157	46.80
Aug. 7.2	55.41	31	85.00	49.548	265	77.80	38.577	119	45.19	48.706	149	45.56
17.1	55.17	27	82.85	49.308	240	76.03	38.470	107	44.40	48.570	136	44.09
27.1	54.94	23	80.30	49.107	201	73.93	38.380	90	43.31	48.457	113	42.42
		18			151			66			83	
Sept. 6.1	54.76		77.40	48.956		71.60	38.314		41.93	48.374		40.63
16.0	54.64	12	74.22	48.867	89	69.10	38.276	38	40.26	48.327	167	38.79
26.0	54.59	5	70.81	48.848	19	66.54	38.271	5	38.33	48.327	193	36.93
Oct. 6.0	54.61	2	67.21	48.908	60	64.02	38.306	35	36.13	48.377	50	35.29
16.0	54.70	9	63.51	49.052	144	61.64	38.384	78	33.73	48.482	105	33.78
		18			228			125			163	
25.9	54.88		59.81	49.280		59.53	38.509		31.14	48.645		32.55
Nov. 4.9	55.14	26	56.16	49.590	310	57.76	38.683	174	28.42	48.866	221	31.66
14.9	55.47	33	52.67	49.978	388	56.42	38.904	221	25.62	49.141	275	31.17
24.9	55.90	43	49.42	50.431	453	55.59	39.168	264	22.81	49.466	325	31.12
Dec. 4.8	56.38	48	46.52	50.938	507	55.29	39.469	301	20.07	49.830	364	31.53
		53			545			331			394	
14.8	56.91		44.04	51.483		55.58	39.800		17.48	50.224		32.41
24.8	57.48	57	42.07	52.048	565	56.43	40.152	352	15.10	50.634	410	33.73
34.7	58.06	58	40.68	52.616	568	57.82	40.512	360	13.04	51.048	414	35.45
Mean Place	54.021		86.67	48.163		47.41	36.483		51.16	46.748		20.14
Sec δ , Tan δ	2.215		+1.977	1.955		-1.679	1.133		+0.532	1.300		-0.831
$D\phi\alpha$, $D_\alpha\alpha$	+0.05		+0.13	+0.07		-0.11	+0.06		+0.03	+0.07		-0.05
$D\phi\delta$, $D_\alpha\delta$	-0.4		-0.2	-0.4		-0.2	-0.4		-0.2	-0.4		-0.2

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	ϵ Ursæ Majoris. (Alioth.) Mag. 1.7			δ Virginis. Mag. 3.7			α Can. Ven. seq. Mag. 2.9			δ Muscæ. Mag. 3.6		
	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.
	h	m	° ' "	h	m	° ' "	h	m	° ' "	h	m	° ' "
	12	50	+56 24	12	51	+3 50	12	52	+38 45	12	56	-71 5
	s		"	s		"	s		"	s		"
Jan. 0.8	21.363		31.90	23.035		64.24	6.960		58.22	27.86		33.45
10.7	21.869	506	30.56	23.372	337	62.12	7.353	393	56.50	28.69	83	34.71
20.7	22.365	496	29.82	23.700	328	60.15	7.739	386	55.28	29.50	81	36.55
30.7	22.838	473	29.70	24.007	307	58.41	8.103	364	54.58	30.26	76	38.87
Feb. 9.6	23.271	433	30.20	24.287	280	56.92	8.437	334	54.42	30.95	69	41.62
		379	106		246	118		294	36		61	
19.6	23.650		31.26	24.533		55.74	8.731		54.78	31.56		44.71
29.6	23.967	317	32.85	24.743	210	54.85	8.978	247	55.63	32.08	52	48.04
Mar. 10.6	24.215	248	34.88	24.913	170	54.28	9.176	198	56.91	32.49	41	51.56
20.5	24.390	175	37.23	25.044	131	54.00	9.322	146	58.55	32.82	33	55.17
30.5	24.491	101	39.83	25.139	95	53.97	9.417	95	60.45	33.04	22	58.79
		33	272		60	21		48	208		12	
Apr. 9.5	24.524		42.55	25.199		54.18	9.465		62.53	33.16		62.34
19.5	24.491	33	45.27	25.228	29	54.57	9.469	4	64.69	33.19	3	65.77
29.4	24.398	93	47.89	25.231	3	55.11	9.433	30	66.85	33.12	7	69.00
May 9.4	24.254	144	50.32	25.209	22	55.75	9.364	69	68.90	32.97	15	71.95
19.4	24.068	186	52.47	25.167	42	56.47	9.268	96	70.80	32.74	23	74.58
		223	181		59	75		122	166		31	
29.3	23.845		54.28	25.108		57.22	9.146		72.46	32.43		76.84
June 8.3	23.506	249	55.70	25.034	74	57.96	9.008	138	73.86	32.06	37	78.66
18.3	23.329	267	56.67	24.950	81	58.68	8.855	153	74.92	31.64	42	80.02
28.3	23.052	277	57.17	24.856	94	59.36	8.694	161	75.63	31.17	47	80.89
July 8.2	22.770	282	57.19	24.757	99	59.97	8.527	167	75.97	30.67	50	81.23
		278	45		103	54		165	3		51	
18.2	22.492		56.74	24.654		60.51	8.362		75.94	30.16		81.05
28.2	22.225	267	55.81	24.552	102	60.95	8.201	161	75.51	29.65	51	80.37
Aug. 7.2	21.976	249	54.41	24.454	98	61.27	8.049	152	74.71	29.17	48	79.12
17.1	21.752	224	52.59	24.366	88	61.44	7.911	138	73.53	28.73	44	77.51
27.1	21.558	194	50.37	24.292	74	61.47	7.794	117	72.00	28.35	38	75.45
		153	259		54	16		91	186		31	
Sept. 6.1	21.405		47.78	24.238		61.31	7.703		70.14	28.04		73.05
16.0	21.297	108	44.88	24.210	28	60.96	7.644	59	67.96	27.83	21	70.39
26.0	21.242	55	41.71	24.213	3	60.40	7.622	22	65.50	27.73	3	67.59
Oct. 6.0	21.247	5	38.33	24.251	38	59.59	7.644	22	62.80	27.76	10	64.73
16.0	21.315	68	34.79	24.331	80	58.53	7.714	70	59.90	27.91	15	61.95
		138	360		124	129		121	306		28	
25.9	21.453		31.19	24.455		57.24	7.835		56.84	28.19		59.35
Nov. 4.9	21.660	207	27.59	24.623	168	55.69	8.009	174	53.71	28.61	42	57.04
14.9	21.936	276	24.10	24.836	213	53.92	8.236	227	50.56	29.16	55	55.13
24.9	22.276	340	20.78	25.088	252	51.96	8.511	275	47.48	29.80	64	53.71
Dec. 4.8	22.674	398	17.75	25.373	285	49.84	8.829	318	44.54	30.53	73	52.83
		446	267		313	219		353	269		79	
14.8	23.120		15.08	25.686		47.65	9.182		41.85	31.32		52.54
24.8	23.599	479	12.87	26.015	329	45.43	9.559	377	39.46	32.15	83	52.85
34.7	24.098	499	11.18	26.351	336	43.26	9.948	389	37.48	32.99	84	53.77
Mean Place	20.288		56.04	22.287		73.40	6.046		78.47	28.181		45.69
Sec δ , Tan δ	1.808		+1.506	1.002		+0.067	1.283		+0.803	3.088		-2.921
$D\phi$ α , $D\omega$ α	+0.05		+0.10	+0.06		0.00	+0.06		+0.05	+0.08		-0.19
$D\phi$ δ , $D\omega$ δ	-0.4		-0.2	-0.4		-0.2	-0.4		-0.2	-0.4		-0.2

APPARENT PLACES OF STARS, 1916.

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FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	ϵ Virgins. Mag. 3.0		θ Virgins. Mag. 4.4		49 Comae. Mag. 4.3		20 Canum Venat. Mag. 4.7	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 12 57	° ' " +11 24	h m 13 5	° ' " - 5 5	h m 13 7	° ' " +28 17	h m 13 13	° ' " +41 0
Jan. 0.8	60.467 ³⁴⁰	25.44 ²⁰⁸	36.556 ³⁴¹	33.22 ²¹¹	58.051 ³⁶¹	55.85 ¹⁹⁶	47.475 ³⁹⁷	31.60 ¹⁸⁷
10.7	60.807 ³⁸³	23.36 ¹⁸⁵	36.897 ³³³	35.33 ²⁰⁷	58.412 ³⁵⁴	53.89 ¹⁵⁶	47.872 ³⁹⁵	29.73 ¹³⁶
20.7	61.140 ³¹³	21.51 ¹⁵⁶	37.230 ³¹⁴	37.40 ¹⁹⁵	58.766 ³⁴⁰	52.33 ¹¹¹	48.267 ³⁸¹	28.37 ⁸¹
30.7	61.453 ²⁸⁷	19.96 ¹²²	37.544 ²⁸⁹	39.35 ¹⁷⁸	59.106 ³¹²	51.22 ⁶³	48.648 ³⁵³	27.56 ²⁶
Feb. 9.7	61.740 ²⁵⁴	18.74 ⁸⁷	37.833 ²⁵⁸	41.13 ¹⁵⁵	59.418 ²⁹⁰	50.59 ¹⁵	49.001 ³¹⁷	27.30 ²⁹
19.6	61.994 ²¹⁷	17.87 ⁵¹	38.091 ²²²	42.68 ¹³²	59.698 ²⁴⁰	50.44 ³¹	49.318 ²⁷⁴	27.59 ⁸²
29.6	62.211 ¹⁷⁸	17.36 ¹⁵	38.313 ¹⁸⁵	44.00 ¹⁰⁵	59.938 ¹⁹⁷	50.75 ⁷⁴	49.592 ²²⁵	28.41 ¹²⁸
Mar. 10.6	62.389 ¹⁴⁰	17.21 ¹⁶	38.498 ¹⁴⁸	45.05 ⁷⁹	60.135 ¹⁵³	51.49 ¹¹⁰	49.817 ¹⁷⁵	29.69 ¹⁶⁷
20.6	62.529 ¹⁰⁰	17.37 ⁴³	38.646 ¹¹²	45.84 ⁵⁵	60.288 ¹¹⁰	52.59 ¹⁴⁰	49.992 ¹²⁴	31.36 ¹⁹⁷
30.5	62.629 ⁶⁵	17.80 ⁶⁷	38.753 ⁷⁸	46.39 ³²	60.398 ⁶⁹	53.99 ¹⁶³	50.116 ⁷⁵	33.33 ²²⁰
Apr. 9.5	62.694 ³²	18.47 ⁸⁴	38.836 ⁴⁰	46.71 ¹²	60.467 ³¹	55.62 ¹⁷⁷	50.191 ²⁷	35.53 ²³⁰
19.5	62.726 ⁴	19.31 ⁹⁶	38.884 ²⁸	46.83 ⁶	60.498 ³	57.39 ¹⁸²	50.218 ¹⁵	37.83 ²³²
29.4	62.730 ²¹	20.27 ¹⁰³	38.904 ⁵	46.77 ³²	60.495 ³⁴	59.21 ¹⁸²	50.203 ⁵²	40.15 ²²⁵
May 9.4	62.709 ⁴²	21.30 ¹⁰⁵	38.899 ²⁷	46.55 ⁴²	60.461 ⁶⁰	61.03 ¹⁷⁴	50.151 ⁸⁶	42.40 ²¹⁰
19.4	62.667 ⁶¹	22.35 ¹⁰²	38.872 ⁴⁵	46.23 ⁴²	60.401 ⁸²	62.77 ¹⁵⁸	50.065 ¹¹⁴	44.50 ¹⁸⁸
29.4	62.606 ⁷⁶	23.37 ⁹⁶	38.827 ⁶²	45.81 ⁵⁰	60.319 ¹⁰⁰	64.35 ¹⁴¹	49.951 ¹³⁷	46.38 ¹⁶⁰
June 8.3	62.530 ⁸⁹	24.33 ⁸⁸	38.765 ⁷⁷	45.31 ⁵⁵	60.219 ¹¹⁶	65.76 ¹¹⁶	49.814 ¹⁵⁴	47.98 ¹²⁶
18.3	62.441 ⁹⁸	25.21 ⁷⁵	38.688 ⁸⁷	44.76 ⁵⁹	60.103 ¹²⁷	66.92 ⁹¹	49.660 ¹⁶⁹	49.24 ⁹²
28.3	62.343 ¹⁰⁴	25.96 ⁶²	38.601 ⁹⁷	44.17 ⁶⁰	59.976 ¹³⁴	67.83 ⁶⁰	49.491 ¹⁷⁸	50.16 ⁵³
July 8.3	62.239 ¹⁰⁶	26.58 ⁴⁷	38.504 ¹⁰³	43.57 ⁶¹	59.842 ¹³⁸	68.43 ³⁰	49.313 ¹⁸²	50.69 ¹¹
18.2	62.131 ¹⁰⁸	27.05 ²⁸	38.401 ¹⁰⁴	42.96 ⁵⁹	59.704 ¹³⁹	68.73 ⁰	49.131 ¹⁸¹	50.80 ²⁹
28.2	62.023 ¹⁰⁵	27.33 ¹¹	38.297 ¹⁰³	42.37 ⁵⁶	59.565 ¹³⁴	68.72 ³⁴	48.950 ¹⁷⁵	50.51 ⁶⁹
Aug. 7.2	61.918 ⁹⁵	27.44 ⁹	38.194 ⁹⁶	41.81 ⁴⁹	59.431 ¹²⁵	68.39 ⁶⁶	48.775 ¹⁶³	49.82 ¹⁰⁹
17.1	61.823 ⁸²	27.35 ³⁰	38.098 ⁸⁴	41.32 ²⁹	59.306 ¹¹⁰	67.73 ⁹⁷	48.612 ¹⁴⁷	48.73 ¹⁴⁸
27.1	61.741 ⁶²	27.05 ⁵²	38.014 ⁶⁴	40.91 ²⁹	59.196 ⁹⁰	66.76 ¹²⁹	48.465 ¹²¹	47.25 ¹⁸³
Sept. 6.1	61.679 ³⁶	26.53 ⁷⁶	37.950 ⁴⁰	40.62 ¹⁴	59.106 ⁶²	65.47 ¹⁵⁹	48.344 ⁹⁴	45.42 ²¹⁸
16.1	61.643 ⁷	25.77 ⁹⁹	37.910 ⁸	40.48 ³	59.044 ²⁹	63.88 ¹⁸⁷	48.252 ⁵²	43.24 ²⁴⁸
26.0	61.636 ³⁰	24.78 ¹²⁵	37.902 ²⁸	40.51 ²⁵	59.015 ⁹	62.01 ²¹⁵	48.198 ⁹	40.76 ²⁷⁵
Oct. 6.0	61.666 ⁷²	23.53 ¹⁴⁹	37.930 ⁶⁹	40.76 ⁴⁹	59.024 ⁵³	59.86 ²³⁷	48.189 ³⁸	38.01 ²⁹⁸
16.0	61.738 ¹¹⁵	22.04 ¹⁷³	37.999 ¹¹⁴	41.25 ⁷⁵	59.077 ⁹⁹	57.49 ²⁵⁸	48.227 ⁹²	35.03 ³¹⁵
25.9	61.853 ¹⁶⁰	20.31 ¹⁹⁴	38.113 ¹⁶¹	42.00 ¹⁰¹	59.176 ¹⁴⁹	54.91 ²⁷³	48.319 ¹⁴⁷	31.88 ³²⁴
Nov. 4.9	62.013 ²⁰⁶	18.37 ²¹³	38.274 ²⁰⁵	43.01 ¹²⁹	59.325 ¹⁹⁸	52.18 ²⁸²	48.466 ²⁰²	28.64 ³²⁸
14.9	62.219 ²⁴⁶	16.24 ²³⁶	38.479 ²⁴⁷	44.30 ¹⁵⁴	59.523 ²⁴⁴	49.56 ²⁸⁵	48.668 ²⁵⁶	25.36 ³²²
24.9	62.465 ²⁸²	13.98 ²³⁵	38.726 ²⁸¹	45.84 ¹⁷⁵	59.767 ²⁸⁴	46.51 ²⁸¹	48.924 ³⁰³	22.14 ³⁰⁷
Dec. 4.8	62.747 ³¹⁰	11.63 ²³⁶	39.007 ³¹²	47.59 ¹⁹³	60.051 ³¹⁸	43.70 ²⁶⁶	49.227 ³⁴³	19.07 ²⁸⁶
14.8	63.057 ³²⁹	9.27 ²³²	39.319 ³²⁹	49.52 ²⁰⁴	60.369 ³⁴²	41.04 ²⁴⁶	49.570 ³⁷²	16.21 ²⁵³
24.8	63.386 ³³⁸	6.95 ²¹⁷	39.648 ³³⁸	51.56 ²¹²	60.711 ³⁵⁶	38.58 ²¹⁵	49.942 ³⁹¹	13.68 ²¹⁴
34.8	63.724	4.78	39.986	53.68	61.067	36.43	50.333	11.54
Mean Place	59.727	37.35	35.932	26.99	57.316	73.34	46.752	52.61
Sec δ , Tan δ	1.020	+0.202	1.004	-0.089	1.136	+0.538	1.325	+0.870
D ϕ α , D α α	+0.06	+0.01	+0.06	-0.01	+0.06	+0.03	+0.05	+0.06
D ϕ δ , D α δ	-0.4	-0.3	-0.4	-0.3	-0.4	-0.3	-0.4	-0.3

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	γ Hydræ. Mag. 3.3		ϵ Centauri. Mag. 2.9		ζ^1 Ursæ Majoris. (Mizar) Mag. 2.4		α Virginis. (Spica.) Mag. 1.2	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 13 14	° ' " -22 43	h m 13 15	° ' " -36 16	h m 13 20	° ' " +55 21	h m 13 20	° ' " -10 43
	s	"	s	"	s	"	s	"
Jan. 0.8	21.564	43.44	52.470	6.37	33.494	25.39	46.446	27.86
10.7	21.927	45.39	52.871	8.12	33.979	23.68	46.791	29.90
20.7	22.282	47.50	53.264	10.16	34.467	22.56	47.130	31.96
30.7	22.619	49.67	53.637	12.41	34.941	22.08	47.454	33.97
Feb. 9.7	22.930	51.86	53.981	14.81	35.384	22.22	47.754	35.86
19.6	23.210	53.99	54.290	17.30	35.784	22.97	48.024	37.60
29.6	23.454	56.04	54.560	19.82	36.131	24.29	48.262	39.13
Mar. 10.6	23.660	57.96	54.789	22.30	36.415	26.10	48.463	40.45
20.6	23.827	59.71	54.976	24.70	36.634	28.31	48.628	41.54
30.5	23.957	61.27	55.121	26.98	36.784	30.83	48.757	42.40
Apr. 9.5	24.053	62.64	55.226	29.09	36.865	33.52	48.854	43.03
19.5	24.116	63.80	55.295	31.03	36.883	36.31	48.919	43.47
29.4	24.148	64.76	55.328	32.75	36.841	39.06	48.956	43.72
May 9.4	24.154	65.51	55.330	34.25	36.743	41.68	48.966	43.80
19.4	24.134	66.07	55.302	35.49	36.598	44.08	48.952	43.74
29.4	24.093	66.43	55.248	36.48	36.413	46.18	48.919	43.55
June 8.3	24.031	66.58	55.167	37.18	36.194	47.92	48.866	43.25
18.3	23.951	66.54	55.066	37.60	35.949	49.25	48.796	42.86
28.3	23.856	66.31	54.945	37.71	35.684	50.13	48.711	42.38
July 8.3	23.749	65.91	54.810	37.53	35.409	50.55	48.615	41.84
18.2	23.632	65.33	54.664	37.07	35.128	50.46	48.510	41.24
28.2	23.512	64.59	54.513	36.32	34.848	49.90	48.400	40.61
Aug. 7.2	23.393	63.73	54.363	35.32	34.578	48.87	48.289	39.96
17.1	23.280	62.76	54.221	34.08	34.325	47.38	48.184	39.32
27.1	23.179	61.73	54.095	32.68	34.096	45.45	48.088	38.71
Sept. 6.1	23.099	60.68	53.992	31.14	33.900	43.14	48.011	38.18
16.1	23.045	59.66	53.922	29.54	33.743	40.45	47.957	37.74
26.0	23.027	58.72	53.892	27.94	33.637	37.45	47.935	37.47
Oct. 6.0	23.048	57.93	53.909	26.42	33.586	34.19	47.949	37.36
16.0	23.115	57.33	53.979	25.05	33.597	30.72	48.005	37.49
26.0	23.231	56.99	54.104	23.92	33.674	27.13	48.107	37.86
Nov. 4.9	23.398	56.94	54.287	23.09	33.823	23.49	48.257	38.51
14.9	23.614	57.22	54.527	22.60	34.042	19.87	48.453	39.44
24.9	23.875	57.84	54.817	22.52	34.330	16.40	48.693	40.65
Dec. 4.8	24.175	58.80	55.149	22.86	34.679	13.13	48.970	42.11
14.8	24.505	60.09	55.515	23.61	35.083	10.19	49.279	43.81
24.8	24.857	61.67	55.904	24.77	35.528	7.67	49.609	45.68
34.8	25.218	63.47	56.305	26.30	36.001	5.63	49.950	47.66
Mean Place	21.082	43.15	52.103	10.35	32.827	49.53	45.933	23.55
Sec δ , Tan δ	1.084	-0.419	1.240	-0.734	1.759	+1.447	1.018	-0.189
D ϕ α , D ω α	+0.06	-0.03	+0.07	-0.05	+0.05	+0.09	+0.06	-0.01
D ϕ δ , D ω δ	-0.4	-0.3	-0.4	-0.3	-0.4	-0.3	-0.4	-0.3

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FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.		Groombridge 3001. Mag. 6.1		70 Virginis. Mag. 5.2		C Virginis. Mag. 3.4		17 H. Canum Venet. Mag. 5.0	
		Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
		h m 13 23	° ' " +72 48	h m 13 24	° ' " +14 13	h m 13 30	° ' " - 0 10	h m 13 31	° ' " +37 36
		s 13	" 130	s 13	" 130	s 13	" 130	s 13	" 130
Jan.	0.8	59.92	72.21	19.872	24.36	25.181	8.63	3.453	24.81
	10.8	60.73 ⁸¹	70.82 ¹³⁰	20.213 ³⁴¹	22.20 ²¹⁶	25.518 ³³⁷	10.73 ²¹⁰	3.835 ³⁸²	22.76 ²⁰⁵
	20.7	61.57 ⁸⁴	70.07 ⁷⁵	20.551 ³³⁸	20.29 ¹⁹¹	25.852 ³³⁴	12.73 ²⁰⁰	4.218 ³⁸³	21.19 ¹⁵⁷
	30.7	62.38 ⁸¹	69.99 ⁸	20.875 ³²⁴	18.71 ¹⁵⁸	26.173 ³²¹	14.57 ¹⁸⁴	4.590 ³⁷²	20.13 ¹⁰⁶
Feb.	9.7	63.15 ⁷⁷	70.58 ⁵⁹	21.176 ³⁰¹	17.50 ¹²¹	26.472 ²⁹⁹	16.17 ¹⁶⁰	4.939 ³⁴⁹	19.63 ⁸⁰
		70	122	272	83	271	136	318	5
	19.6	63.85	71.80	21.448	16.67	26.743	17.53	5.257	19.68
	29.6	64.46	73.59	21.687	16.23	26.984	18.59	5.537	20.25
Mar.	10.6	64.95 ⁶¹	75.85 ¹⁷⁹	21.889 ²³⁹	16.17 ⁴⁴	27.189 ²⁴¹	19.36 ¹⁰⁶	5.773 ²⁸⁰	21.30 ⁵⁷
	20.6	65.31 ⁴⁹	78.51 ²²⁶	22.054 ²⁰²	16.46 ⁶	27.358 ²⁰⁵	19.86 ⁷⁷	5.962 ²³⁶	22.76 ¹⁰⁵
	30.5	65.54 ³⁶	81.42 ²⁶⁶	22.180 ¹⁶⁵	17.04 ²⁹	27.493 ¹⁶⁹	20.08 ⁵⁰	6.103 ¹⁸⁹	24.56 ¹⁴⁶
		10	307	91	85	101	1	96	180
Apr.	9.5	65.64 ³	84.49 ³⁰⁹	22.271 ⁵⁷	17.89 ¹⁰³	27.594 ⁶⁹	20.07 ²³	6.199 ⁵¹	26.62 ²²⁰
	19.5	65.61 ¹⁷	87.58 ²⁹⁸	22.328 ²⁸	18.92 ¹¹⁶	27.663 ⁴²	19.84 ³⁸	6.250 ¹¹	28.82 ²²⁷
	29.5	65.44 ²⁷	90.56 ²⁸⁰	22.356 ¹	20.08 ¹²³	27.705 ¹⁵	19.46 ⁵²	6.261 ²⁷	31.09 ²²³
May	9.4	65.17 ³⁷	93.36 ²⁵⁰	22.355 ²⁵	21.31 ¹²⁵	27.720 ⁸	18.94 ⁶¹	6.234 ⁵⁹	33.32 ²¹²
	19.4	64.80 ⁴⁶	95.86 ²¹²	22.330 ⁴⁷	22.56 ¹²¹	27.712 ³²	18.33 ⁶⁷	6.175 ⁸⁸	35.44 ¹⁹⁵
	29.4	64.34 ⁵³	97.98 ¹⁶⁹	22.283 ⁶⁵	23.77 ¹¹³	27.680 ⁵⁰	17.66 ⁷⁰	6.087 ¹¹³	37.39 ¹⁷⁰
June	8.3	63.81 ⁵⁸	99.67 ¹²⁰	22.218 ⁸²	24.90 ¹⁰²	27.630 ⁶⁸	16.96 ⁷⁰	5.974 ¹³³	39.09 ¹⁴¹
	18.3	63.23 ⁶¹	100.87 ⁶⁹	22.136 ⁹⁶	25.92 ¹⁰⁸	27.562 ⁸²	16.26 ⁶⁹	5.841 ¹⁵⁰	40.50 ¹⁵⁰
	28.3	62.62 ⁶⁶	101.56 ¹⁵	22.040 ¹⁰⁷	26.80 ⁷¹	27.480 ⁹⁵	15.57 ⁶⁶	5.691 ¹⁶³	41.58 ¹⁰²
July	8.3	61.96 ⁶⁵	101.71 ³⁹	21.933 ¹¹⁴	27.51 ⁵⁰	27.385 ¹⁰⁴	14.91 ⁶¹	5.528 ¹⁷¹	42.30 ³³
	18.2	61.31 ⁶³	101.32 ⁹³	21.819 ¹¹⁹	28.01 ³²	27.281 ¹¹⁰	14.30 ⁵³	5.357 ¹⁷³	42.63 ⁵
	28.2	60.68 ⁶²	100.39 ¹⁴⁴	21.700 ¹¹⁷	28.33 ¹⁰	27.171 ¹¹²	13.77 ⁴⁵	5.184 ¹⁷¹	42.58 ⁴⁴
Aug.	7.2	60.66 ⁵⁸	98.95 ¹⁹²	21.583 ¹¹⁴	28.43 ¹³	27.059 ¹⁰⁹	13.32 ³⁴	5.013 ¹⁶⁴	42.14 ⁸⁴
	17.2	59.48 ⁵²	97.03 ²²⁶	21.469 ¹⁰³	28.30 ³⁷	26.950 ¹⁰⁰	12.98 ²¹	4.849 ¹⁵¹	41.30 ¹²²
	27.1	58.96 ⁴⁶	94.67 ²⁷⁸	21.366 ⁸⁷	27.93 ⁶¹	26.850 ⁸⁴	12.77 ⁷	4.698 ¹³¹	40.08 ¹⁵⁹
Sept.	6.1	58.50 ³⁸	91.89 ³¹²	21.279 ⁶³	27.32 ⁸⁷	26.766 ⁶²	12.70 ¹⁰	4.567 ¹⁰³	38.49 ¹⁹³
	16.1	58.12 ²⁸	88.77 ³⁴³	21.216 ³³	26.45 ¹¹²	26.704 ³²	12.80 ³⁰	4.464 ⁶⁹	36.56 ²²⁶
	26.0	57.84 ¹⁸	85.34 ²⁶³	21.183 ⁰	25.33 ¹³⁹	26.672 ⁰	13.10 ⁵¹	4.395 ²⁹	34.30 ²⁵⁴
Oct.	6.0	57.66 ⁵	81.71 ³⁸⁰	21.183 ⁸²	23.94 ¹⁶²	26.672 ⁴²	13.61 ⁷⁶	4.366 ¹⁹	31.76 ³⁷⁹
	16.0	57.61 ⁵	77.91 ³⁸⁷	21.225 ⁸⁷	22.32 ¹⁸⁸	26.714 ⁸⁷	14.37 ¹⁰⁰	4.385 ⁶⁹	28.97 ²⁰⁰
	26.0	57.66 ¹⁸	74.04 ³⁸⁶	21.312 ¹³²	20.44 ²⁰⁹	26.801 ¹³³	15.37 ¹²⁶	4.454 ¹²³	25.97 ³¹⁴
Nov.	4.9	57.84 ³²	70.18 ³⁷⁵	21.444 ¹⁸¹	18.35 ²²⁷	26.934 ¹⁸⁰	16.63 ¹⁴⁸	4.577 ¹⁷⁸	22.83 ³²¹
	14.9	58.16 ⁴³	66.43 ³⁵³	21.625 ²²⁴	16.08 ²³⁹	27.114 ²²⁴	18.11 ¹⁷²	4.755 ²³¹	19.62 ³²⁰
	24.9	58.59 ⁵⁵	62.90 ³²⁴	21.849 ²⁶⁴	13.69 ²⁴⁸	27.338 ²⁶³	19.83 ¹⁹⁰	4.986 ²⁷⁹	16.42 ³¹⁰
Dec.	4.9	59.14 ⁶⁴	59.66 ²⁸³	22.113 ²⁹⁷	11.21 ²⁴⁶	27.601 ²⁸⁵	21.73 ²⁰²	5.265 ³²⁰	13.32 ²⁹⁴
	14.8	59.78 ⁷³	56.83 ²³³	22.410 ³²²	8.75 ²⁴¹	27.896 ³¹⁷	23.75 ²¹²	5.585 ³⁵³	10.38 ²⁶⁵
	24.8	60.51 ⁷⁹	54.50 ¹⁷⁷	22.732 ³²²	6.34 ²²⁶	28.213 ³³¹	25.87 ²¹⁰	5.938 ³⁷²	7.73 ²⁶⁵
	34.8	61.30	52.73	23.065	4.08	28.544	27.97	6.310	5.44 ²²⁹
Mean Place		59.391	98.63	19.293	37.52	24.680	0.30	2.891	45.03
Sec δ, Tan δ		3.386	+3.235	1.031	+0.253	1.000	-0.003	1.262	+0.770
D ₁ α, D ₂ α		+0.03	+0.20	+0.06	+0.02	+0.06	0.00	+0.05	+0.05
D ₁ δ, D ₂ δ		-0.4	-0.4	-0.4	-0.4	-0.4	-0.4	-0.4	-0.4

Washington Mean Time.	ε Centauri. Mag. 2.6		m Virginis. Mag. 5.2		τ Bootis. Mag. 4.5		γ Ursæ Majoris. (Alkaid). Mag. 1.9	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 13 34	° ' " -53 2	h m 13 37	° ' " - 8 16	h m 13 43	° ' " +17 51	h m 13 44	° ' " +49 4
Jan. 0.8	33.353	15.60	12.487	51.93	16.683	75.32	14.372	32.64
10.8	33.860	16.79	12.828	53.94	17.022	73.14	14.803	30.60
20.7	34.362	18.42	13.167	55.94	17.362	71.23	15.242	29.12
30.7	34.844	20.44	13.493	57.87	17.693	69.69	15.675	28.24
Feb. 9.7	35.295	22.77	13.799	59.67	18.004	68.53	16.085	27.97
19.7	35.707	25.36	14.079	61.27	18.291	67.80	16.464	28.32
29.6	36.073	28.12	14.327	62.67	18.545	67.49	16.800	29.25
Mar. 10.6	36.390	31.00	14.541	63.83	18.764	67.59	17.086	30.71
20.6	36.655	33.94	14.720	64.76	18.947	68.06	17.316	32.60
30.5	36.867	36.86	14.865	65.44	19.091	68.87	17.489	34.86
Apr. 9.5	37.027	39.72	14.977	65.91	19.200	69.95	17.604	37.38
19.5	37.137	42.46	15.057	66.16	19.274	71.22	17.663	40.04
29.5	37.198	45.03	15.109	66.25	19.317	72.63	17.669	42.74
May 9.4	37.213	47.40	15.134	66.18	19.329	74.11	17.626	45.39
19.4	37.182	49.50	15.135	65.96	19.315	75.60	17.539	47.88
29.4	37.109	51.33	15.112	65.65	19.277	77.04	17.413	50.14
June 8.4	36.998	52.81	15.069	65.25	19.217	78.39	17.252	52.09
18.3	36.851	53.94	15.007	64.78	19.137	79.59	17.064	53.68
28.3	36.672	54.68	14.928	64.25	19.041	80.62	16.852	54.87
July 8.3	36.468	55.02	14.836	63.69	18.931	81.45	16.624	55.63
18.2	36.245	54.95	14.732	63.11	18.809	82.05	16.385	55.93
28.2	36.012	54.47	14.621	62.51	18.681	82.42	16.141	55.77
Aug. 7.2	35.776	53.59	14.506	61.93	18.551	82.53	15.898	55.15
17.2	35.548	52.34	14.394	61.38	18.423	82.38	15.664	54.07
27.1	35.340	50.76	14.290	60.88	18.304	81.96	15.446	52.55
Sept. 6.1	35.163	48.91	14.200	60.46	18.199	81.26	15.251	50.62
16.1	35.028	46.83	14.134	60.17	18.114	80.30	15.089	48.31
26.1	34.945	44.64	14.097	60.02	18.059	79.05	14.966	45.64
Oct. 6.0	34.925	42.39	14.093	60.05	18.038	77.52	14.891	42.66
16.0	34.976	40.21	14.132	60.30	18.057	75.75	14.870	39.45
26.0	35.100	38.18	14.216	60.79	18.121	73.72	14.909	36.04
Nov. 4.9	35.302	36.39	14.347	61.55	18.233	71.48	15.013	32.51
14.9	35.578	34.92	14.526	62.56	18.393	69.07	15.181	28.94
24.9	35.921	33.86	14.750	63.84	18.600	66.54	15.414	25.44

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	89 Virginis. Mag. 5.1		5 Centauri. Mag. 3.1		7 Boötis. Mag. 2.8		θ Apodis. Var. 5.5-6.6	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 13 45	° ' " -17 42	h m 13 50	° ' " -46 52	h m 13 50	° ' " +18 48	h m 13 57	° ' " -76 23
	s	"	s	"	s	"	s	"
Jan. 0.8	18.577	60.68	17.523	25.81	41.525	51.30	4.20	20.31
10.8	18.930 ³⁵³	62.52 ¹⁸⁴	17.981 ⁴⁵⁸	26.77 ¹¹⁶	41.864 ³³⁹	49.08 ²²²	5.34 ¹¹⁴	20.55 ²⁴
20.7	19.279 ³⁴⁹	64.45 ¹⁹³	18.437 ⁴⁵⁶	28.31 ¹⁵⁴	42.205 ³⁴¹	47.14 ¹⁹⁴	6.48 ¹¹⁴	21.40 ⁸⁵
30.7	19.619 ³⁴⁰	66.42 ¹⁹⁷	18.880 ⁴⁴³	30.17 ¹⁸⁶	42.539 ³³⁴	45.57 ¹⁵⁷	7.60 ¹¹²	22.79 ¹³⁹
Feb. 9.7	19.939 ³²⁰	68.35 ¹⁹³	19.299 ⁴¹⁹	32.33 ²¹⁶	42.856 ³¹⁷	44.40 ¹¹⁷	8.66 ¹⁰⁶	24.67 ¹⁸⁸
	292 ¹⁸⁶		386 ²³⁵		291 ⁷⁴		100 ²³³	
19.7	20.231	70.21	19.685	34.68	43.147	43.66	9.66	27.00
29.6	20.493 ²⁶²	71.95 ¹⁷⁴	20.033 ³⁴⁸	37.19 ²⁵¹	43.407 ²⁶⁰	43.36 ³⁰	10.56 ⁹⁰	29.71 ²⁷¹
Mar. 10.6	20.722 ²²⁹	73.51 ¹⁵⁶	20.339 ³⁰⁶	39.80 ²⁶¹	43.633 ²²⁶	43.48 ¹²	11.36 ⁸⁰	32.72 ³⁰¹
20.6	20.916 ¹⁹⁴	74.90 ¹³⁹	20.600 ²⁶¹	42.42 ²⁶²	43.824 ¹⁹¹	43.97 ⁴⁹	12.04 ⁶⁸	35.95 ³²³
30.6	21.075 ¹⁶⁹	76.10 ¹²⁰	20.816 ²¹⁶	45.02 ²⁶⁰	43.977 ¹⁵³	44.82 ⁸⁵	12.60 ⁵⁶	39.37 ³⁴²
	126 ¹⁰¹		171 ²⁶³		117 ¹¹²		42 ³⁴⁶	
Apr. 9.5	21.201	77.11	20.987	47.55	44.094	45.94	13.02	42.83
19.5	21.296 ⁹⁵	77.93 ⁸²	21.114 ⁸⁵	49.97 ²⁴²	44.176 ⁸²	47.26 ¹³²	13.31 ²⁹	46.33 ³⁵⁰
29.5	21.360 ⁶⁴	78.56 ⁶³	21.199 ⁴⁴	52.24 ²²⁷	44.226 ⁵⁰	48.73 ¹⁴⁷	13.47 ¹⁶	49.75 ³⁴²
May 9.4	21.396 ³⁶	79.02 ⁴⁶	21.243 ³	54.32 ²⁰⁸	44.245 ¹⁹	50.27 ¹⁸⁴	13.49 ²	53.03 ³²⁸
19.4	21.405 ⁹	79.32 ³⁰	21.246 ³	56.18 ¹⁶⁶	44.238 ⁷	51.82 ¹⁵⁵	13.38 ¹¹	56.13 ³¹⁰
	15 ¹⁵		36 ¹⁶⁰		34 ¹⁵⁰		24 ²⁸⁵	
29.4	21.390	79.47	21.210	57.78	44.204	53.32	13.14	58.98
June 8.4	21.352 ³⁸	79.47 ⁰	21.139 ⁷¹	59.09 ¹³¹	44.148 ⁵⁶	54.72 ¹⁴⁰	12.79 ³⁵	61.46 ²⁴⁸
18.3	21.294 ⁵⁸	79.33 ¹⁴	21.035 ¹⁰⁴	60.10 ¹⁰¹	44.071 ⁷⁷	55.98 ¹²⁶	12.32 ⁴⁷	63.56 ²¹⁰
28.3	21.215 ⁷⁹	79.06 ²⁷	20.901 ¹³⁴	60.77 ⁶⁷	43.977 ⁹⁴	57.04 ¹⁰⁶	11.76 ⁵⁶	65.23 ¹⁶⁷
July 8.3	21.119 ⁹⁶	78.68 ³⁸	20.741 ¹⁶⁰	61.09 ³²	43.868 ¹⁰⁹	57.91 ⁸⁷	11.12 ⁶⁴	66.43 ¹²⁰
	108 ⁵⁰		180 ²		123 ⁶³		70 ⁶⁶	
18.3	21.011	78.18	20.561	61.07	43.745	58.54	10.42	67.09
28.2	20.892 ¹¹⁹	77.58 ⁶⁰	20.366 ¹⁹⁵	60.67 ⁴⁰	43.616 ¹²⁹	58.93 ³⁹	9.68 ⁷⁴	67.23 ¹⁴
Aug. 7.2	20.769 ¹²³	76.99 ⁶⁹	20.165 ²⁰¹	59.92 ⁷⁵	43.482 ¹³⁴	59.04 ¹¹	8.93 ⁷⁵	66.83 ⁴⁰
17.2	20.648 ¹²¹	76.15 ⁷⁴	19.967 ¹⁹⁸	58.84 ¹⁰⁸	43.350 ¹³²	58.89 ¹⁵	8.20 ⁷³	65.89 ⁹⁴
27.1	20.534 ¹¹⁴	75.38 ⁷⁷	19.780 ¹⁸⁷	57.48 ¹³⁶	43.225 ¹²⁵	58.46 ⁴³	7.51 ⁶⁹	64.46 ¹⁴³
	100 ⁷⁷		163 ¹⁶²		110 ⁷²		61 ¹⁸⁹	
Sept. 6.1	20.494	74.61	19.617	55.86	43.115	57.74	6.90	62.57
16.1	20.358 ⁷⁶	73.89 ⁷²	19.488 ¹²⁹	54.06 ¹⁸⁰	43.024 ⁹¹	56.75 ⁹⁹	6.40 ⁵⁰	60.29 ²²⁸
26.1	20.310 ⁴⁸	73.25 ⁶⁴	19.403 ⁸⁵	52.14 ¹⁹²	42.961 ⁶³	55.46 ¹²⁹	6.03 ³⁷	57.69 ²⁶⁰
Oct. 6.0	20.300 ¹⁰	72.74 ⁵¹	19.370 ³³	50.18 ¹⁹⁶	42.932 ²⁹	53.90 ¹⁵⁶	5.81 ²²	54.89 ²⁸⁰
16.0	20.333 ³³	72.42 ⁸²	19.398 ²⁸	48.28 ¹⁹⁰	42.944 ¹²	52.08 ¹⁸²	5.76 ⁵	51.96 ²⁹³
	81 ¹¹		95 ¹⁷⁷		56 ²⁰⁸		14 ²⁹²	
26.0	20.414	72.31	19.493	46.51	43.000	50.00	5.90	49.04
Nov. 5.0	20.545 ¹³¹	72.47 ¹⁶	19.655 ¹⁶²	44.96 ¹⁵⁵	43.104 ¹⁰⁴	47.72 ²²⁸	6.22 ³²	46.24 ²⁸⁰
14.9	20.725 ¹⁸⁰	72.91 ⁴⁴	19.886 ²³¹	43.72 ¹²⁴	43.257 ¹⁶³	45.25 ²⁴⁷	6.73 ⁵¹	43.68 ²⁵⁶
24.9	20.953 ²²⁸	73.65 ⁷⁴	20.180 ²⁹⁴	42.84 ⁸⁸	43.458 ²⁰¹	42.66 ²⁵⁹	7.41 ⁶⁸	41.48 ²²⁰
Dec. 4.9	21.223 ²⁷⁰	74.67 ¹⁰²	20.530 ³⁵⁰	42.36 ⁴⁸	43.702 ²⁴⁴	40.02 ²⁶⁴	8.23 ⁸²	39.70 ¹⁷⁸
	306 ¹³⁰		396 ²		281 ²⁶³		95 ¹²⁶	
14.8	21.529	75.97	20.926	42.34	43.983	37.39	9.18	38.44
24.8	21.859 ³³⁰	77.52 ¹⁵⁵	21.355 ⁴²⁹	42.77 ⁴²	44.294 ³¹¹	34.86 ²⁶³	10.23 ¹⁰⁵	37.72 ⁷²
34.8	22.205 ³⁴⁶	79.25 ¹⁷³	21.806 ⁴⁵¹	43.64 ⁸⁷	44.624 ³³⁰	32.50 ²³⁶	11.34 ¹¹¹	37.60 ¹²
Mean Place	18.232	58.11	17.497	31.56	41.111	66.09	5.955	31.31
Sec δ, Tan δ	1.050	-0.320	1.463	-1.068	1.056	+0.341	4.251	-4.132
D _φ α, D _ω α	+0.06	-0.02	+0.07	-0.06	+0.06	+0.02	+0.11	-0.24
D _φ δ, D _ω δ	-0.4	-0.4	-0.4	-0.5	-0.4	-0.5	-0.3	-0.5

APPARENT PLACES OF STARS, 1916.

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	11 Boötis. Mag. 6.1		τ Virginis. Mag. 4.3		β Centauri. Mag. 0.9		π Hydræ. Mag. 3.5	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 13 57	° ' +27 46	h m 13 57	° ' + 1 56	h m 13 57	° ' -59 57	h m 14 1	° ' -26 16
	s "	"	s "	"	s "	"	s "	"
Jan. 0.8	22.367	73.05	22.570	52.73	52.660	57.48	35.239	41.91
10.8	22.716 ³⁴⁹	70.78 ²²⁷	22.902 ³³²	50.63 ²¹⁰	53.250 ⁵⁹⁰	58.18 ⁷⁰	35.607 ³⁶⁸	43.46 ¹⁵⁵
20.7	23.071 ³⁵⁵	68.89 ¹⁸⁹	23.236 ³³⁴	48.65 ¹⁹⁸	53.840 ⁵⁹⁰	59.37 ¹¹⁹	35.977 ³⁷⁰	45.20 ¹⁷⁴
30.7	23.418 ³⁴⁷	67.45 ¹⁴⁴	23.562 ³²⁶	46.86 ¹⁷⁹	54.417 ⁵⁷⁷	61.01 ¹⁶⁴	36.337 ³⁶⁰	47.07 ¹⁵⁷
Feb. 9.7	23.750 ³³²	66.48 ⁹⁷	23.872 ³¹⁰	45.31 ¹⁵⁵	54.966 ⁵⁴⁹	63.04 ²⁰³	36.680 ³⁴³	49.01 ¹⁹⁴
19.7	24.057 ³⁰⁷	66.03 ⁴⁵	24.159 ²⁸⁷	44.04 ¹²⁷	55.476 ⁵¹⁰	65.39 ²³⁵	36.998 ³¹⁸	50.97 ¹⁹⁶
29.6	24.335 ²⁷⁸	66.06 ³	24.416 ²⁵⁷	43.06 ⁹⁶	55.939 ⁴⁶³	68.01 ²⁶²	37.287 ²⁹⁹	52.89 ¹⁹²
Mar. 10.6	24.576 ²⁴¹	66.57 ⁵¹	24.644 ²²⁸	42.40 ⁶⁶	56.349 ⁴¹⁰	70.83 ²⁸²	37.542 ²⁵⁵	54.74 ¹⁸⁵
20.6	24.778 ²⁰²	67.49 ⁹²	24.837 ¹⁹³	42.05 ³⁵	56.702 ³⁵³	73.78 ²⁹⁵	37.763 ²²¹	56.48 ¹⁷⁴
30.6	24.941 ¹⁶³	68.79 ¹³⁰	24.997 ¹⁶⁰	41.97 ⁸	56.994 ²⁹²	76.79 ³⁰¹	37.950 ¹⁸⁷	58.07 ¹⁵⁹
Apr. 9.5	25.064 ¹²³	70.39 ¹⁶⁰	25.124 ¹²⁷	42.15 ¹⁸	57.225 ²³¹	79.81 ³⁰²	38.102 ¹⁵²	59.53 ¹⁴⁶
19.5	25.150 ⁸⁶	72.19 ¹⁸⁰	25.221 ⁹⁷	42.54 ³⁹	57.225 ¹⁷²	82.79 ²⁹⁸	38.220 ¹¹⁸	60.82 ¹²⁹
29.5	25.200 ⁵⁰	74.11 ¹⁹²	25.287 ⁶⁶	43.10 ⁵⁶	57.397 ¹¹¹	85.65 ²⁸⁶	38.307 ⁸⁷	61.94 ¹¹²
May 9.4	25.216 ¹⁶	76.09 ¹⁹⁸	25.327 ⁴⁰	43.79 ⁶⁹	57.508 ⁵¹	88.35 ²⁷⁰	38.307 ⁵⁵	62.89 ⁹⁵
19.4	25.201 ¹⁵	78.04 ¹⁹⁵	25.340 ¹³	44.57 ⁷⁸	57.552 ⁷	90.83 ²⁴⁸	38.362 ²⁶	63.65 ⁷⁵
29.4	25.159 ⁴²	79.90 ¹⁸⁶	25.329 ¹¹	45.40 ⁸³	57.552 ⁶²	93.04 ²²¹	38.388 ¹	64.25 ⁶⁰
June 8.4	25.090 ⁶⁹	81.59 ¹⁶⁹	25.295 ³⁴	46.23 ⁸³	57.490 ¹¹⁶	93.04 ¹⁹¹	38.387 ³⁰	64.25 ⁴²
18.3	24.999 ⁹¹	83.08 ¹⁴⁹	25.241 ⁵⁴	47.06 ⁸³	57.374 ¹⁶⁵	94.95 ¹⁵⁵	38.357 ⁵³	64.67 ²²
28.3	24.887 ¹¹²	84.32 ¹²⁴	25.241 ⁷⁴	47.84 ⁷⁸	57.209 ¹⁶⁵	96.50 ¹⁵⁵	38.304 ⁵³	64.89 ²²
July 8.3	24.760 ¹²⁷	85.28 ⁹⁶	25.167 ⁷⁴	47.84 ⁷⁸	57.000 ²⁰⁹	97.67 ¹¹⁷	38.226 ⁷⁸	64.94 ³
18.3	24.620 ¹⁴⁰	85.28 ⁶⁵	25.078 ⁸⁹	48.55 ⁷¹	56.753 ²⁴⁷	98.41 ⁷⁴	38.128 ⁹⁸	64.81 ¹³
28.2	24.471 ¹⁴⁹	85.93 ³³	24.975 ¹⁰³	49.20 ⁶⁵	56.477 ²⁷⁶	98.81 ³¹	38.128 ¹¹⁵	64.81 ²³
Aug. 7.2	24.317 ¹⁵⁴	86.26 ³³	24.861 ¹¹⁴	49.75 ⁵⁵	56.181 ²⁹⁶	98.72 ¹⁴	38.013 ¹²⁹	64.48 ⁵⁹
17.2	24.165 ¹⁵²	86.26 ⁰	24.741 ¹²⁰	50.19 ⁴⁴	56.181 ²⁹⁶	98.58 ¹⁴	37.884 ¹²⁹	63.98 ⁵⁹
27.1	24.020 ¹⁴⁵	85.91 ³⁵	24.621 ¹²⁰	50.50 ³¹	55.874 ³⁰⁷	97.99 ⁵⁹	37.747 ¹³⁷	63.32 ⁶⁶
Sept. 6.1	24.020 ¹³²	85.21 ⁷⁰	24.507 ¹¹⁴	50.66 ¹⁶	55.573 ³⁰¹	96.97 ¹⁰²	37.609 ¹³⁸	62.52 ⁹⁰
16.1	23.888 ¹⁰⁹	84.18 ¹⁰³	24.404 ⁸⁵	50.66 ⁰	55.287 ²⁸⁶	95.56 ¹⁴¹	37.477 ¹⁴¹	61.60 ⁸²
26.1	23.779 ⁸¹	82.83 ¹³⁵	24.319 ⁵⁷	50.47 ¹⁹	55.034 ²⁰⁷	93.78 ²⁰⁷	37.358 ⁹⁷	60.60 ¹⁰³
Oct. 6.0	23.693 ⁴⁷	81.15 ¹⁶⁸	24.262 ²⁴	50.09 ³⁸	54.827 ¹⁴⁶	91.71 ²⁰⁷	37.261 ⁶⁵	59.57 ¹⁰³
16.0	23.651 ⁵	79.16 ¹⁹⁹	24.238 ¹⁵	49.48 ⁶¹	54.681 ⁷⁶	89.43 ²²⁸	37.196 ²⁸	58.54 ⁹⁵
26.0	23.646 ⁴³	76.90 ²²⁶	24.253 ⁵⁹	48.64 ¹⁰⁶	54.605 ⁹⁶	87.00 ²⁴³	37.168 ¹⁷	57.59 ⁸³
Nov. 5.0	23.689 ⁹³	74.39 ²⁷⁰	24.312 ¹⁰⁶	47.56 ¹³²	54.612 ⁷	84.56 ²⁴⁴	37.185 ⁶⁸	56.76 ⁶⁴
14.9	23.782 ¹⁴⁵	71.69 ²⁸⁶	24.418 ¹⁵³	46.24 ¹⁵⁶	54.708 ¹⁸⁸	82.18 ²¹⁹	37.253 ¹²²	56.12 ⁴²
24.9	23.927 ¹⁹⁵	68.83 ²⁹³	24.571 ²⁰⁰	44.68 ¹⁷⁷	54.896 ¹⁸⁸	79.99 ¹⁹⁴	37.375 ¹⁷⁴	55.70 ¹³
Dec. 4.9	24.122 ²⁴²	65.90 ²⁹³	24.771 ²⁴³	42.91 ¹⁹³	55.174 ²⁷⁸	78.05 ¹⁸⁴	37.549 ²²⁶	55.57 ¹⁵
14.8	24.364 ²⁸¹	62.96 ²⁸⁷	25.014 ²⁷⁷	40.98 ²⁰⁶	55.537 ³⁶³	76.48 ¹⁵⁷	37.775 ³¹²	55.75 ⁵⁰
24.8	24.645 ³¹⁶	60.09 ²⁷⁰	25.291 ³⁰⁶	38.92 ²¹³	55.975 ⁴³⁸	75.34 ¹¹⁴	38.048 ²⁷³	56.25 ⁵²
34.8	24.961 ³³⁷	57.39 ²⁴⁴	25.597 ³²³	36.79 ²¹⁰	56.475 ⁵⁰⁰	74.68 ⁶⁶	38.360 ³¹²	57.07 ¹¹³
Mean Place	22.007	90.50	22.216	62.06	53.025	66.04	35.034	41.74
Sec δ, Tan δ	1.130	+0.527	1.001	+0.034	1.998	-1.730	1.115	-0.494
D ₁ α, D ₂ α	+0.05	+0.03	+0.06	0.00	+0.08	-0.10	+0.07	-0.03
δ, D ₂ δ	-0.3	-0.5	-0.3	-0.5	-0.3	-0.5	-0.3	-0.5

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	θ Centauri. Mag. 2.3		α Draconis. Mag. 3.6		δ Boötis. Mag. 4.8		κ Virginis. Mag. 4.3	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 14 1	° ' -35 57	h m 14 2	° ' +64 45	h m 14 6	° ' +25 28	h m 14 8	° ' - 9 52
	s "	s "	s "	s "	s "	s "	s "	s "
Jan. 0.8	44.113	23.33	6.85	72.14	34.425	63.71	25.020	65.28
10.8	44.512 ³⁰⁰	24.65 ¹³²	7.42 ⁵⁷	70.13 ²⁰¹	34.767 ³⁴²	61.40 ²³¹	25.357 ³³⁷	67.15 ¹⁸⁷
20.8	44.911 ³⁰⁰	26.27 ¹⁶²	8.02 ⁶⁰	68.73 ¹⁴⁰	35.115 ³⁴⁸	59.45 ¹⁹⁶	25.698 ³⁴¹	69.03 ¹⁸⁸
30.7	45.302 ³⁶¹	28.11 ¹⁸⁴	8.62 ⁶⁰	67.98 ⁷⁵	35.460 ³⁴⁵	57.91 ¹⁵⁴	26.031 ³³³	70.86 ¹⁸³
Feb. 9.7	45.673 ³⁷¹	30.12 ²⁰¹	9.20 ⁵⁸	67.91 ⁷	35.790 ³³⁰	56.84 ¹⁰⁷	26.351 ³³⁰	72.59 ¹⁷³
	344	213	54	57	308	59	297	156
19.7	46.017	32.25	9.74	68.48	36.098	56.25 ¹⁰	26.648	74.15
29.6	46.329 ³¹²	34.44 ²¹⁹	10.23 ⁴⁹	69.69 ¹²¹	36.377 ²⁷⁹	56.15 [—]	26.917 ²⁶⁹	75.52 ¹³⁷
Mar. 10.6	46.607 ²⁷⁸	36.63 ²¹⁹	10.66 ⁴³	71.46 ¹⁷⁷	36.622 ²⁴⁵	56.52 ³⁷	27.158 ²⁴¹	76.67 ¹¹⁵
20.6	46.847 ²⁴⁰	33.79 ²¹⁶	11.01 ³⁵	73.70 ²²⁴	36.831 ²⁰⁹	57.32 ⁸⁰	27.366 ²⁰⁸	77.61 ⁹⁴
30.6	47.048 ²⁰¹	40.86 ²⁰⁷	11.26 ²⁵	76.33 ²⁶³	37.001 ¹⁷⁰	58.49 ¹¹⁷	27.542 ¹⁷⁶	78.31 ⁷⁰
	164	197	17	286	183	147	145	49
Apr. 9.5	47.212	42.83	11.43	79.21	37.134	59.96	27.687	78.80
19.5	47.340 ¹²⁸	44.68 ¹⁸⁵	11.52 ⁹	82.24 ³⁰³	37.231 ⁹⁷	61.66 ¹⁷⁰	27.800 ¹¹³	79.08 ²⁸
29.5	47.432 ⁹²	46.36 ¹⁶⁸	11.51 ¹	85.29 ³⁰⁵	37.292 ⁶¹	63.60 ¹⁸⁴	27.885 ⁸⁵	79.20 ¹²
May 9.5	47.489 ⁵⁷	47.87 ¹⁵¹	11.43 ⁸	88.28 ²⁹⁰	37.320 ²⁸	65.40 ¹⁹⁰	27.941 ⁵⁶	79.17 ³
19.4	47.513 ²⁴	49.19 ¹³²	11.26 ¹⁷	91.08 ²⁸⁰	37.318 ²	67.31 ¹⁹¹	27.970 ²⁹	79.01 ¹⁶
	7	110	23	252	31	182	4	28
29.4	47.506	50.29	11.03	93.60	37.287	69.13	27.974	78.73
June 8.4	47.467 ³⁹	51.18 ⁸⁹	10.74 ²⁹	95.76 ²¹⁶	37.230 ⁵⁷	70.82 ¹⁶⁹	27.952 ²²	78.38 ³⁵
18.3	47.399 ⁶⁸	51.82 ⁶⁴	10.41 ³³	97.52 ¹⁷⁶	37.149 ⁸¹	72.33 ¹⁵¹	27.909 ⁴³	77.98 ⁴²
28.3	47.305 ⁹⁴	52.21 ³⁹	10.03 ³⁸	98.83 ¹³¹	37.048 ¹⁰¹	73.60 ¹²⁷	27.843 ⁶⁶	77.48 ⁴⁸
July 8.3	47.186 ¹¹⁹	52.33 ¹²	9.63 ⁴⁰	99.64 ⁸¹	36.927 ¹²¹	74.62 ¹⁰²	27.759 ⁸⁴	76.96 ⁵²
	137	15	43	29	134	72	100	54
18.3	47.049	52.18	9.20	99.93	36.793	75.34	27.659	76.42
28.2	46.897 ¹⁵²	51.78 ⁴⁰	8.76 ⁴⁴	99.71 ²²	36.648 ¹⁴⁵	75.77 ⁴³	27.545 ¹¹⁴	75.86 ⁵⁶
Aug. 7.2	46.737 ¹⁶⁰	51.12 ⁶⁶	8.33 ⁴³	98.96 ⁷⁵	36.498 ¹⁶⁰	75.87 ¹⁰	27.423 ¹²²	75.29 ⁵⁷
17.2	46.576 ¹⁶¹	50.23 ⁸⁹	7.90 ⁴³	97.71 ¹²⁵	36.347 ¹⁵¹	75.64 ²³	27.299 ¹²⁴	74.75 ⁵⁴
27.2	46.421 ¹⁵⁵	49.12 ¹¹¹	7.50 ⁴⁰	95.98 ¹⁷³	36.201 ¹⁴⁶	75.08 ⁵⁶	27.180 ¹¹⁹	74.24 ⁵¹
	139	126	36	219	134	90	110	45
Sept. 6.1	46.282	47.86	7.14	93.79	36.067	74.18	27.070	73.79
16.1	46.170 ¹¹²	46.48 ¹³⁸	6.81 ³³	91.18 ²⁶¹	35.964 ¹¹³	72.96 ¹²²	26.978 ⁹²	73.43 ³⁶
26.1	46.092 ⁷⁸	45.04 ¹⁴⁴	6.55 ²⁶	88.21 ²⁹⁷	35.866 ⁸⁸	71.43 ¹⁵³	26.913 ⁶⁵	73.20 ²³
Oct. 6.0	46.057 ³⁵	43.61 ¹⁴³	6.36 ¹⁹	84.93 ³²⁸	35.813 ⁵³	69.60 ¹⁸³	26.882 ³¹	73.13 ⁷
16.0	46.072 ¹⁵	42.27 ¹³⁴	6.24 ¹²	81.39 ³⁵⁴	35.801 ¹²	67.47 ²¹³	26.890 ⁸	73.24 ¹¹
	72	119	3	371	34	236	54	38
26.0	46.144	41.08	6.21	77.68	35.835	65.11	26.944	73.57
Nov. 5.0	46.274 ¹³⁰	40.10 ⁹⁸	6.26 ⁵	73.87 ³⁸¹	35.918 ⁸³	62.51 ²⁶⁰	27.046 ¹⁰²	74.14 ⁵⁷
14.9	46.464 ¹⁹⁰	39.41 ⁶⁹	6.41 ¹⁵	70.05 ³⁸²	36.052 ¹³⁴	59.76 ²⁷⁵	27.197 ¹⁵¹	74.98 ⁸⁴
24.9	46.709 ²⁴⁵	39.06 ³⁵	6.66 ²⁵	66.33 ³⁷²	36.237 ¹⁸⁵	56.91 ²⁸⁵	27.396 ¹⁹⁹	76.07 ¹⁰⁹
Dec. 4.9	47.005 ²⁹⁶	39.05 ¹	7.01 ³⁵	62.80 ³⁵³	36.469 ²⁸²	54.03 ²⁸⁸	27.639 ²⁴³	77.38 ¹³¹
	338	87	42	324	274	283	279	153
14.9	47.343	39.42	7.43	59.56	36.743	51.20	27.918	78.91
24.8	47.712 ³⁶⁹	40.17 ⁷⁵	7.92 ⁴⁹	56.73 ²⁸³	37.050 ³⁰⁷	48.50 ²⁷⁰	28.228 ³¹⁰	80.61 ¹⁷⁰
34.8	48.101 ³⁸⁹	41.28 ¹¹¹	8.46 ⁵⁴	54.40 ²³³	37.379 ³²⁹	46.04 ²⁴⁶	28.556 ³²⁸	82.42 ¹⁸¹
Mean Place	43.998	26.03	6.929	97.27	34.127	80.44	24.758	59.74
Sec δ , Tan δ	1.235	-0.726	2.346	+2.122	1.108	+0.477	1.015	-0.174
D ϕ α , D ω α	+0.07	-0.04	+0.03	+0.12	+0.05	+0.03	+0.06	-0.01
D ϕ δ , D ω δ	-0.3	-0.5	-0.3	-0.5	-0.3	-0.5	-0.3	-0.5

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	4 Ursæ Minoris. Mag. 5.0		2 Virginis. Mag. 4.2		α Boötis. (Arcturus.) Mag. 0.2		λ Boötis. Mag. 4.3	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m s	° ' "	h m s	° ' "	h m s	° ' "	h m s	° ' "
	14 9	+77 55	14 11	- 5 36	14 11	+19 36	14 13	+46 27
Jan. 0.8	8.10	65.77	36.707	7.54	50.040	54.23	11.641	62.99
10.3	9.13	63.92	37.040	9.49	50.370	51.88	12.039	60.68
20.3	10.21	62.69	37.376	11.42	50.708	49.83	12.450	58.87
30.7	11.32	62.14	37.707	13.24	51.042	48.15	12.862	57.63
Feb. 9.7	12.41	62.25	38.024	14.91	51.363	46.87	13.262	56.99
19.7	13.45	63.04	38.319	16.39	51.662	46.03	13.638	56.99
29.6	14.38	64.46	38.588	17.62	51.935	45.65	13.980	57.57
Mar. 10.6	15.20	66.42	38.828	18.61	52.176	45.70	14.280	58.71
20.6	15.85	68.85	39.036	19.33	52.382	46.15	14.534	60.35
30.6	16.34	71.63	39.212	19.81	52.553	46.97	14.737	62.40
Apr. 9.5	16.63	74.67	39.357	20.05	52.690	48.09	14.889	64.76
19.5	16.75	77.82	39.471	20.10	52.791	49.44	14.989	67.34
29.5	16.68	80.97	39.556	19.97	52.859	50.95	15.039	70.03
May 9.5	16.42	84.01	39.613	19.68	52.897	52.55	15.042	72.72
19.4	16.01	86.84	39.643	19.30	52.904	54.17	15.001	75.32
29.4	15.45	89.36	39.648	18.82	52.884	55.76	14.919	77.76
June 8.4	14.75	91.50	39.627	18.29	52.839	57.25	14.800	79.95
18.3	13.95	93.20	39.585	17.72	52.770	58.60	14.649	81.83
28.3	13.06	94.42	39.520	17.12	52.681	59.76	14.472	83.34
July 8.3	12.12	95.11	39.438	16.53	52.573	60.71	14.272	84.44
18.3	11.13	95.26	39.338	15.95	52.448	61.41	14.053	85.12
28.2	10.12	94.88	39.226	15.39	52.313	61.87	13.822	85.35
Aug. 7.2	9.12	93.96	39.104	14.88	52.171	62.04	13.587	85.13
17.2	8.15	92.52	38.980	14.42	52.027	61.93	13.353	84.45
27.2	7.23	90.60	38.860	14.04	51.886	61.54	13.127	83.32
Sept. 6.1	6.38	88.24	38.748	13.77	51.757	60.84	12.918	81.76
16.1	5.62	85.46	38.655	13.62	51.646	59.86	12.734	79.79
26.1	4.99	82.33	38.587	13.61	51.560	58.56	12.584	77.45
Oct. 6.0	4.48	78.90	38.552	13.79	51.506	56.98	12.476	74.76
16.0	4.12	75.25	38.556	14.17	51.492	55.13	12.418	71.77
26.0	3.94	71.45	38.605	14.78	51.523	53.02	12.417	68.55
Nov. 5.0	3.92	67.59	38.701	15.62	51.601	50.68	12.475	65.15
14.9	4.09	63.76	38.846	16.72	51.730	48.15	12.597	61.66
24.9	4.45	60.04	39.038	18.04	51.908	45.50	12.733	58.15
Dec. 4.9	4.98	56.57	39.274	19.58	52.132	42.77	13.028	54.72
14.9	5.68	53.41	39.547	21.31	52.396	40.05	13.328	51.47
24.8	6.53	50.69	39.851	23.16	52.693	37.41	13.674	48.51
34.8	7.49	48.49	40.173	25.09	53.019	34.94	14.053	45.93
Mean Place	9.331	91.80	36.449	0.56	49.765	69.21	11.522	84.87
Sec δ , Tan δ	4.785	+4.680	1.005	-0.098	1.062	+0.356	1.452	+1.053
$D\psi a, D_{\omega} a$	-0.01	+0.26	+0.06	-0.01	+0.06	+0.02	+0.05	+0.06
$D\psi \delta, D_{\omega} \delta$	-0.3	-0.5	-0.3	-0.5	-0.3	-0.5	-0.3	-0.5

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	λ Virginis. Mag. 4.6		γ Libræ. Mag. 6.3		θ Boëtis. Mag. 4.1		f Boëtis. Mag. 5.4	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 14 14	° ' " -12 59	h m 14 18	° ' " -11 19	h m 14 22	° ' " +52 13	h m 14 22	° ' " +19 35
Jan. 0.8	33.889	10.65	54.455	56.55	20.223	56.14	33.118	59.48
10.8	34.229 ³⁴⁰	12.44 ¹⁷⁹	54.792 ³³⁷	58.36 ¹⁸¹	20.645 ⁴²²	53.75 ²³⁹	33.447 ³²⁹	57.15 ²³³
20.8	34.571 ³⁴²	14.24 ¹⁸⁰	55.135 ³⁴³	60.19 ¹⁸³	21.089 ⁴⁴⁴	51.91 ¹⁸⁴	33.785 ³³⁸	55.12 ²⁰³
30.7	34.910 ³³⁹	16.06 ¹⁸²	55.471 ³³⁶	61.98 ¹⁷⁹	21.535 ⁴⁴⁶	50.67 ¹²⁴	34.121 ³³⁶	53.44 ¹⁶⁸
Feb. 9.7	35.234 ³²⁴	17.81 ¹⁷⁵	55.794 ³²³	63.69 ¹⁷¹	21.974 ⁴³⁹	50.05 ⁶²	34.445 ³²⁴	52.18 ¹²⁶
19.7	35.537 ³⁰³	19.41 ¹⁶⁰	56.096 ³⁰²	65.26 ¹⁵⁷	22.390 ⁴¹⁶	50.09 ⁴	34.751 ³⁰⁶	51.36 ⁸²
29.7	35.813 ²⁷⁶	20.86 ¹⁴⁵	56.375 ²⁷⁹	66.65 ¹³⁹	22.771 ³⁸¹	50.75 ⁶⁶	35.031 ²⁸⁰	51.00 ³⁶
Mar. 10.6	36.062 ²⁴⁹	22.13 ¹²⁷	56.624 ²⁴⁹	67.84 ¹¹⁹	23.108 ³³⁷	51.99 ¹²⁴	35.281 ²⁵⁰	51.08 ⁸
20.6	36.276 ²¹⁴	23.19 ¹⁰⁶	56.842 ²¹⁸	68.81 ⁹⁷	23.394 ²⁸⁶	53.75 ¹⁷⁶	35.499 ²¹⁸	51.57 ⁴⁹
30.6	36.461 ¹⁸⁵	24.05 ⁸⁶	57.029 ¹⁸⁷	69.56 ⁷⁵	23.623 ²²⁹	55.93 ²¹⁸	35.682 ¹⁸³	52.43 ⁸⁶
Apr. 9.5	36.615 ¹⁵⁴	24.70 ⁶⁵	57.184 ¹⁵⁵	70.11 ⁵⁵	23.796 ¹⁷³	58.45 ²⁵²	35.830 ¹⁴⁸	53.60 ¹¹⁷
19.5	36.737 ¹²²	25.18 ⁴⁸	57.310 ¹²⁶	70.46 ³⁵	23.910 ¹¹⁴	61.18 ²⁷³	35.945 ¹¹⁵	55.01 ¹⁴¹
29.5	36.828 ⁹¹	25.47 ²⁹	57.405 ⁹⁵	70.65 ¹⁹	23.967 ⁵⁷	64.03 ²⁸⁵	36.026 ⁸¹	56.61 ¹⁶⁰
May 9.5	36.893 ⁶⁵	25.62 ¹⁵	57.472 ⁶⁷	70.68 ³	23.968 ¹	66.88 ²⁸⁵	36.076 ⁵⁰	58.30 ¹⁶⁹
19.4	36.927 ³⁴	25.61 ¹	57.511 ³⁹	70.59 ⁹	23.917 ⁵¹	69.65 ²⁷⁷	36.096 ²⁰	60.01 ¹⁷¹
29.4	36.939 ¹²	25.51 ¹⁰	57.525 ¹⁴	70.40 ¹⁹	23.819 ⁹⁸	72.23 ²⁵⁸	36.086 ¹⁰	61.70 ¹⁶⁹
June 8.4	36.922 ¹⁷	25.30 ²¹	57.511 ¹⁴	70.11 ²⁹	23.678 ¹⁴¹	74.55 ²³²	36.050 ³⁶	63.29 ¹⁵⁹
18.4	36.880 ⁴²	25.00 ³⁰	57.474 ³⁷	69.75 ³⁶	23.499 ¹⁷⁹	76.53 ¹⁹⁸	35.990 ⁶⁰	64.75 ¹⁴⁶
28.3	36.820 ⁶⁰	24.64 ³⁶	57.415 ⁵⁹	69.33 ⁴²	23.286 ²¹³	78.13 ¹⁶⁰	35.907 ⁸³	66.04 ¹²⁹
July 8.3	36.736 ⁸⁴	24.19 ⁴⁵	57.334 ⁸¹	68.85 ⁴⁸	23.047 ²³⁹	79.30 ¹¹⁷	35.804 ¹⁰³	67.11 ¹⁰⁷
18.3	36.635 ¹⁰¹	23.69 ⁵⁰	57.235 ⁹⁹	68.34 ⁵¹	22.785 ²⁶²	80.02 ⁷²	35.683 ¹²¹	67.93 ⁸²
28.2	36.519 ¹¹⁶	23.15 ⁵⁴	57.121 ¹¹⁴	67.81 ⁵³	22.511 ²⁷⁴	80.26 ²⁴	35.550 ¹³³	68.49 ⁵⁶
Aug. 7.2	36.397 ¹²²	22.58 ⁵⁷	56.999 ¹²²	67.26 ⁵⁵	22.228 ²⁸³	80.01 ²⁵	35.407 ¹⁴³	68.78 ²⁹
17.2	36.270 ¹²⁷	22.00 ⁵⁸	56.870 ¹²⁹	66.72 ⁵⁴	21.946 ²⁸²	79.29 ⁷²	35.260 ¹⁴⁷	68.79 ¹
27.2	36.144 ¹²⁶	21.43 ⁵⁷	56.744 ¹²⁶	66.19 ⁵³	21.673 ²⁷³	78.09 ¹²⁰	35.115 ¹⁴⁵	68.51 ²⁸
Sept. 6.1	36.029 ¹¹⁵	20.87 ⁵⁶	56.627 ¹¹⁷	65.71 ⁴⁸	21.419 ²⁵⁴	76.43 ¹⁶⁶	34.980 ¹³⁵	67.93 ⁵⁸
16.1	35.933 ⁹⁶	20.40 ⁴⁷	56.528 ⁹⁹	65.32 ³⁹	21.190 ²²⁹	74.35 ²⁰⁸	34.862 ¹¹⁸	67.04 ⁸⁹
26.1	35.862 ⁷¹	20.02 ³⁸	56.454 ⁷⁴	65.03 ²⁹	20.999 ¹⁹¹	71.88 ²⁴⁷	34.769 ⁹³	65.86 ¹¹⁸
Oct. 6.1	35.826 ³⁶	19.79 ²³	56.413 ⁴¹	64.87 ¹⁶	20.852 ¹⁴⁷	69.05 ²⁸³	34.708 ⁶⁴	64.37 ¹⁴⁹
16.0	35.828 ²	19.73 ⁶	56.412 ⁴³	64.90 ³	20.761 ⁹¹	65.91 ³¹⁴	34.684 ²⁴	62.60 ¹⁷⁷
26.0	35.877 ⁴⁹	19.85 ¹²	56.455 ⁴³	65.14 ²⁴	20.730 ³¹	62.53 ³³⁸	34.704 ²⁰	60.57 ²⁰³
Nov. 5.0	35.975 ⁹⁸	20.23 ³⁸	56.547 ⁹²	65.61 ⁴⁷	20.765 ³⁵	58.97 ³⁵⁶	34.773 ⁶⁹	58.31 ²²⁶
14.9	36.123 ¹⁴⁸	20.85 ⁶²	56.689 ¹⁴²	66.33 ⁷²	20.872 ¹⁰⁷	55.32 ³⁶⁵	34.893 ¹²⁰	55.86 ²⁴⁵
24.9	36.319 ¹⁹⁶	21.75 ⁹⁰	56.880 ¹⁹¹	67.30 ⁹⁷	21.048 ¹⁷⁶	51.67 ³⁶⁵	35.062 ¹⁶⁹	53.26 ²⁶⁰
Dec. 4.9	36.561 ²⁴²	22.86 ¹¹¹	57.116 ²³⁶	68.51 ¹²¹	21.293 ²⁴⁵	48.12 ³⁵³	35.279 ²¹⁷	50.59 ²⁶⁷
14.9	36.841 ²⁸⁰	24.23 ¹³⁷	57.392 ²⁷⁶	69.93 ¹⁴²	21.599 ³⁰⁶	44.75 ³³⁷	35.536 ²⁵⁷	47.92 ²⁶⁷
24.8	37.149 ³⁰⁸	25.79 ¹⁵⁶	57.698 ³⁰⁶	71.53 ¹⁶⁰	21.958 ³⁵⁹	41.70 ³⁰⁵	35.826 ²⁹⁰	45.31 ²⁶¹
34.8	37.479 ³³⁰	27.49 ¹⁷⁰	58.024 ³²⁶	73.26 ¹⁷³	22.359 ⁴⁰¹	39.05 ²⁶⁵	36.142 ³¹⁶	42.86 ²⁴⁵
Mean Place	33.671	6.04	54.254	51.36	20.286	78.90	32.913	74.39
Sec δ , Tan δ	1.026	-0.231	1.020	-0.200	1.632	+1.291	1.061	+0.356
$D_{\phi} \alpha$, $D_{\phi} \alpha$	+0.06	-0.01	+0.07	-0.01	+0.04	+0.07	+0.06	+0.02
$D_{\phi} \delta$, $D_{\phi} \delta$	-0.3	-0.6	-0.3	-0.6	-0.3	-0.6	-0.3	-0.6

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	ϕ Virginis. Mag. 5.0		ζ Ursæ Minoris. Mag. 4.4		ρ Boëtis. Mag. 3.8		γ Boëtis. Mag. 3.0	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 14 23 s	° ' " — 1 51 "	h m 14 27 s	° ' " +76 3 "	h m 14 28 s	° ' " +30 43 "	h m 14 28 s	° ' " +38 39 "
Jan. 0.8	52.572	15.20	39.60	44.76	12.743	64.69	41.839	70.88
10.8	52.898 ³²⁶	17.19 ¹⁹⁹	40.47 ⁸⁷	42.65 ²¹¹	13.083 ³⁴⁰	62.26 ²⁴³	42.199 ³⁶⁰	68.42 ²⁴⁶
20.8	53.229 ³³¹	19.10 ¹⁹¹	41.41 ⁹⁴	41.15 ¹⁵⁰	13.437 ³⁵⁴	60.22 ²⁰⁴	42.572 ³⁷³	66.41 ²⁰¹
30.7	53.558 ³²⁹	20.88 ¹⁷⁸	42.37 ⁹⁶	40.31 ⁸⁴	13.790 ³⁵³	58.63 ¹⁵⁹	42.949 ³⁷⁷	64.91 ¹⁵⁰
Feb. 9.7	53.876 ³¹⁸	22.47 ¹⁵⁹	43.34 ⁹⁷	40.16 ¹⁵	14.135 ³⁴⁵	57.55 ¹⁰⁸	43.317 ³⁶⁸	63.98 ⁵³
19.7	54.174 ²⁹⁸	23.82 ¹³⁵	44.27 ⁹³	40.68 ⁵²	14.461 ³²⁶	56.99 ⁵⁶	43.665 ³⁴⁸	63.62 ³⁶
29.7	54.448 ²⁷⁴	24.90 ¹⁰⁸	45.12 ⁸⁵	41.83 ¹¹⁵	14.761 ³⁰⁰	56.96 ³	43.988 ³²³	63.84 ²²
Mar. 10.6	54.694 ²⁴⁶	25.70 ⁸⁰	45.88 ⁷⁶	43.58 ¹⁷⁵	15.030 ²⁶⁹	57.46 ⁵⁰	44.274 ²⁸⁶	64.61 ⁷⁷
20.6	54.911 ²¹⁷	26.22 ⁵²	46.51 ⁶³	45.83 ²²⁵	15.264 ²³⁴	58.41 ⁹⁵	44.522 ²⁴⁸	65.88 ¹²⁷
30.6	55.096 ¹⁸⁵	26.46 ⁴	47.01 ⁵⁰	48.50 ²⁶⁷	15.459 ¹⁹⁵	59.78 ¹³⁷	44.728 ²⁰⁶	67.58 ¹⁷⁹
Apr. 9.6	55.250 ¹⁵⁴	26.46 ²⁰	47.34 ³³	51.46 ²⁹⁶	15.615 ¹⁵⁶	61.49 ¹⁷¹	44.890 ¹⁶²	69.62 ³⁰⁴
19.5	55.374 ¹²⁴	26.24 ²²	47.52 ¹⁸	54.57 ³¹¹	15.734 ¹¹⁹	63.44 ¹⁹⁵	45.009 ¹¹⁹	71.91 ²²⁹
29.5	55.469 ⁹⁵	25.85 ³⁹	47.54 ²	57.75 ³¹⁸	15.814 ⁸⁰	65.57 ²¹³	45.086 ⁷⁷	74.35 ²⁴⁴
May 9.5	55.535 ⁶⁶	25.32 ⁵³	47.40 ¹⁴	60.89 ³¹⁴	15.859 ⁴⁵	67.78 ²²¹	45.121 ³⁵	76.87 ²⁵³
19.4	55.574 ³⁹	24.68 ⁶⁴	47.12 ²⁸	63.85 ²⁹⁶	15.869 ¹⁰	69.99 ²²¹	45.118 ³	79.35 ²⁴⁸
29.4	55.586 ¹²	23.97 ⁷¹	46.70 ⁴²	66.55 ²⁷⁰	15.847 ²²	72.10 ²¹¹	45.078 ⁴⁰	81.72 ²²⁷
June 8.4	55.572 ¹⁴	23.23 ⁷⁴	46.16 ⁵¹	68.90 ²³⁵	15.795 ⁵²	74.08 ¹⁹⁸	45.003 ⁷⁵	83.88 ²¹⁶
18.4	55.536 ³⁶	22.48 ⁷⁵	45.51 ⁶⁵	70.85 ¹⁹⁵	15.714 ⁸¹	75.86 ¹⁷⁸	44.898 ¹⁰⁵	85.81 ¹⁹⁰
28.3	55.477 ⁵⁹	21.75 ⁷³	44.79 ⁷²	72.34 ¹⁴⁹	15.609 ¹⁰⁵	77.37 ¹⁵¹	44.767 ¹³¹	87.42 ¹⁶¹
July 8.3	55.397 ⁸⁰	21.06 ⁶⁹	43.99 ⁸⁰	73.34 ¹⁰⁰	15.481 ¹²⁸	78.60 ¹²³	44.610 ¹⁵⁷	88.69 ¹²⁷
18.3	55.299 ⁹⁸	20.41 ⁶⁵	43.15 ⁸⁴	73.79 ⁴⁵	15.335 ¹⁴⁶	79.50 ⁹⁰	44.436 ¹⁷⁴	89.58 ⁸⁹
28.3	55.186 ¹¹³	19.83 ⁵⁸	42.28 ⁸⁷	73.73 ⁶	15.173 ¹⁶²	80.05 ⁵⁵	44.246 ¹⁹⁰	90.08 ⁵⁰
Aug. 7.2	55.063 ¹²³	19.33 ⁵⁰	41.40 ⁸⁸	73.12 ⁶¹	15.004 ¹⁶⁹	80.23 ¹⁸	44.046 ²⁰⁰	90.15 ⁷
17.2	54.936 ¹²⁷	18.92 ⁴¹	40.54 ⁸⁶	71.98 ¹¹⁴	14.830 ¹⁷¹	80.05 ⁵⁸	43.844 ²⁰²	89.81 ²⁴
27.2	54.809 ¹²⁷	18.64 ²⁸	39.71 ⁸³	70.35 ¹⁶³	14.659 ¹⁷⁴	79.49 ¹⁶³	43.646 ¹⁹⁸	89.05 ⁷⁶
Sept. 6.1	54.692 ¹⁰³	18.47 ¹	38.93 ⁷¹	68.24 ²⁵⁴	14.498 ¹⁴⁴	78.57 ¹²⁹	43.458 ¹⁶⁷	87.87 ¹⁵⁸
16.1	54.589 ⁷⁸	18.46 ¹⁷	38.22 ⁶²	65.70 ²⁹³	14.354 ¹¹⁸	77.28 ¹⁶⁵	43.291 ¹⁴⁰	86.29 ¹⁹⁵
26.1	54.511 ⁴⁹	18.63 ³⁵	37.60 ⁵⁰	62.77 ³²⁷	14.236 ⁸⁴	75.63 ¹⁹⁷	43.151 ¹⁰³	84.34 ²²⁹
Oct. 6.1	54.462 ⁹	18.98 ⁵⁷	37.10 ³⁸	59.50 ³⁵³	14.152 ⁴⁴	73.66 ²²⁷	43.048 ⁶⁰	82.05 ²⁶³
16.0	54.453 ³³	19.55 ⁸⁰	36.72 ²⁴	55.97 ³⁷¹	14.108 ²	71.39 ²⁵⁶	42.988 ¹⁰	79.43 ²⁵⁸
26.0	54.486 ⁸¹	20.35 ¹⁰⁴	36.48 ⁸	52.26 ³⁸⁴	14.110 ⁵⁴	68.83 ²⁷⁸	42.978 ⁴⁶	76.55 ³¹¹
Nov. 5.0	54.567 ¹³¹	21.39 ¹²⁸	36.40 ⁸	48.42 ³⁸⁴	14.164 ¹⁰⁷	66.05 ²⁹⁴	43.024 ¹⁰²	73.44 ³²⁴
15.0	54.698 ¹⁷⁸	22.67 ¹⁴⁸	36.48 ²⁴	44.58 ³⁷⁷	14.271 ¹⁶²	63.11 ³⁰⁶	43.126 ¹⁶¹	70.20 ³³³
24.9	54.876 ²²³	24.15 ¹⁷⁰	36.72 ⁴¹	40.81 ³⁶⁰	14.433 ²¹²	60.05 ³⁰⁸	43.287 ²¹⁶	66.88 ³³⁰
Dec. 4.9	55.099 ²⁶¹	25.85 ¹⁸³	37.13 ⁵⁵	37.21 ³³⁰	14.645 ²⁵⁸	56.97 ³⁰⁰	43.503 ²⁶⁶	63.58 ³³⁰
14.9	55.360 ²⁹³	27.68 ¹⁹³	37.68 ⁷⁰	33.91 ²⁹³	14.903 ²⁹⁶	53.97 ²⁸⁶	43.769 ³⁰⁹	60.38 ²⁹⁷
24.8	55.653 ³¹⁵	29.61 ¹⁹⁸	38.38 ⁸⁰	30.98 ²⁴³	15.199 ³²⁵	51.11 ²⁶¹	44.078 ³⁴²	57.41 ²⁹⁷
34.8	55.968	31.59	39.18	28.55	15.524	48.50	44.420	54.74
Mean Place	52.369	6.92	41.140	70.14	12.622	82.61	41.783	90.73
Sec δ , Tan δ	1.001	-0.032	4.152	+4.030	1.163	+0.595	1.281	+0.800
$D\phi\alpha$, $D\alpha$	+0.06	0.00	0.00	+0.22	+0.05	+0.03	+0.05	+0.04
$D\phi\delta$, $D\delta$	-0.3	-0.6	-0.3	-0.6	-0.3	-0.6	-0.3	-0.6

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	7 Centauri. Mag. 2.6		σ Boötis. Mag. 4.5		α Centauri. Mag. 0.3		33 Boötis. Mag. 5.4	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 14 30 s	° ' " -41 47 "	h m 14 31 s	° ' " +30 6 "	h m 14 33 s	° ' " -60 29 "	h m 14 35 s	° ' " +44 45 "
Jan. 0.8	9.919	18.58	1.526	16.61	53.10	8.11	42.657	38.20
10.8	10.338 ⁴¹⁹	19.43 ⁸⁵	1.865 ³³⁹	14.17 ²⁴⁴	53.68 ⁵⁸	8.39 ²⁸	43.032 ³⁷⁵	35.69 ²⁵¹
20.8	10.766 ⁴²⁸	20.61 ¹¹⁸	2.217 ³⁵²	12.11 ²⁰⁶	54.27 ⁵⁹	9.14 ⁷⁵	43.425 ³⁹³	33.67 ²⁰²
30.7	11.191 ⁴²⁵	22.08 ¹⁴⁷	2.569 ³⁵²	10.50 ¹⁶¹	54.86 ⁵⁹	10.34 ¹²⁰	43.825 ⁴⁰⁰	32.19 ¹⁴⁸
Feb. 9.7	11.602 ⁴¹¹	23.80 ¹⁷²	2.912 ³⁴³	9.39 ¹¹¹	55.43 ⁵⁷	11.95 ¹⁶¹	44.219 ³⁹⁴	31.31 ⁸⁸
19.7	11.990 ³⁸⁸	25.70 ¹⁹⁰	3.238 ³²⁶	8.79 ⁶⁰	55.97 ⁵⁴	13.92 ¹⁹⁷	44.596 ³⁷⁷	31.03 ²⁸
29.7	12.350 ³⁰⁰	27.73 ²⁰³	3.540 ³⁰²	8.73 ⁶	56.47 ⁵⁰	16.17 ²²⁵	44.944 ³⁴⁸	31.37 ³⁴
Mar. 10.6	12.677 ³²⁷	29.85 ²¹²	3.810 ²⁷⁰	9.18 ⁴⁵	56.92 ⁴⁵	18.66 ²⁴⁹	45.257 ³¹³	32.28 ⁹¹
20.6	12.968 ²⁹¹	32.00 ²¹⁵	4.046 ²³⁶	10.10 ⁹²	57.32 ⁴⁰	21.31 ²⁶⁵	45.528 ²⁷¹	33.72 ¹⁴⁴
30.6	13.221 ²⁵³	34.15 ²¹⁵	4.243 ¹⁹⁷	11.43 ¹³³	57.66 ³⁴	24.07 ²⁷⁶	45.754 ²²⁶	35.60 ¹⁸⁸
Apr. 9.6	13.435 ²¹⁴	36.24 ²⁰⁹	4.403 ¹⁶⁰	13.12 ¹⁶⁹	57.93 ²⁷	26.89 ²⁸²	45.932 ¹⁷⁸	37.83 ²²³
19.5	13.611 ¹⁷⁶	38.26 ²⁰²	4.526 ¹²³	15.04 ¹⁹²	58.15 ²²	29.71 ²⁸³	46.062 ¹³⁰	40.34 ²⁵¹
29.5	13.749 ¹³⁸	40.19 ¹⁹³	4.610 ⁸⁴	17.15 ²¹¹	58.31 ¹⁶	32.48 ²⁷⁷	46.143 ⁸¹	43.00 ²⁶⁶
May 9.5	13.847 ⁹⁸	41.98 ¹⁷⁹	4.658 ¹⁵	19.33 ²¹⁸	58.41 ¹⁰	35.12 ²⁶⁴	46.178 ³⁵	45.71 ²⁷¹
19.4	13.907 ⁶⁰	43.60 ¹⁶²	4.673 ¹⁹	21.53 ²²⁰	58.44 ³	37.61 ²⁴⁹	46.169 ⁹	48.39 ²⁶⁸
29.4	13.929 ²²	45.04 ¹⁴⁴	4.654 ¹⁹	23.66 ²¹³	58.42 ²	39.89 ²²⁸	46.118 ⁵¹	50.93 ²⁵⁴
June 8.4	13.913 ¹⁶	46.27 ¹²³	4.607 ⁴⁷	25.63 ¹⁹⁷	58.34 ⁸	41.90 ²⁰¹	46.028 ⁹⁰	53.28 ²³⁵
18.4	13.862 ⁵¹	47.27 ¹⁰⁰	4.531 ⁷⁶	27.42 ¹⁷⁹	58.20 ¹⁴	43.62 ¹⁷²	45.903 ¹²⁵	55.34 ²⁰⁶
28.3	13.776 ⁸⁶	48.00 ⁷³	4.430 ¹⁰¹	28.94 ¹⁵²	58.01 ¹⁹	45.00 ¹³⁸	45.747 ¹⁵⁶	57.06 ¹⁷²
July 8.3	13.659 ¹¹⁷	48.47 ⁴⁷	4.306 ¹²⁴	30.18 ¹²⁴	57.76 ²⁵	45.98 ⁹⁸	45.566 ¹⁸¹	58.41 ¹³⁵
18.3	13.516 ¹⁴³	48.64 ¹⁷	4.162 ¹⁴⁴	31.11 ⁹³	57.48 ²⁸	46.56 ⁵⁸	45.361 ²⁰⁵	59.36 ⁹⁵
28.3	13.350 ¹⁶⁶	48.50 ¹⁴	4.005 ¹⁵⁷	31.68 ⁵⁷	57.18 ³⁰	46.72 ¹⁶	45.140 ²²¹	59.86 ⁵⁰
Aug. 7.2	13.169 ¹⁸¹	48.08 ⁴²	3.837 ¹⁶⁸	31.90 ²²	56.85 ³³	46.43 ²⁹	44.907 ²³³	59.91 ⁵
17.2	12.981 ¹⁸⁸	47.36 ⁷²	3.664 ¹⁷³	31.75 ¹⁵	56.52 ³³	45.70 ⁷³	44.671 ²³⁶	59.51 ⁴⁰
27.2	12.796 ¹⁸⁵	46.38 ⁹⁸	3.494 ¹⁷⁰	31.24 ⁵¹	56.19 ³³	44.56 ¹¹⁴	44.440 ²³¹	58.65 ⁸⁶
Sept. 6.1	12.623 ¹⁷³	45.15 ¹²³	3.332 ¹⁶²	30.35 ⁸⁹	55.89 ³⁰	43.04 ¹⁵²	44.221 ²¹⁹	57.36 ¹²⁹
16.1	12.472 ¹⁵¹	43.74 ¹⁴¹	3.188 ¹⁴⁴	29.10 ¹²⁵	55.64 ²⁵	41.19 ¹⁸⁵	44.021 ²⁰⁰	55.64 ¹⁷²
26.1	12.357 ¹¹⁵	42.19 ¹⁵⁵	3.069 ¹¹⁹	27.49 ¹⁶¹	55.44 ²⁰	39.07 ²¹²	43.851 ¹⁷⁰	53.52 ²¹²
Oct. 6.1	12.284 ⁷³	40.57 ¹⁶²	2.983 ⁸⁶	25.57 ¹⁹²	55.30 ¹⁴	36.76 ²³¹	43.719 ¹³²	51.02 ²⁵⁰
16.0	12.264 ²⁰	38.95 ¹⁶²	2.938 ²²⁴	23.33 ²²⁴	55.24 ⁶	34.36 ²⁴⁰	43.634 ⁸⁵	48.22 ²⁸⁰
26.0	12.304 ⁴⁰	37.41 ¹⁵⁴	2.937 ¹	20.82 ²⁵¹	55.27 ³	31.95 ²⁴¹	43.602 ³²	45.13 ³⁰⁹
Nov. 5.0	12.407 ¹⁰³	36.02 ¹³⁹	2.989 ⁵²	18.08 ²⁷⁴	55.39 ¹²	29.64 ²³¹	43.629 ²⁷	41.83 ³³⁰
15.0	12.575 ¹⁶⁸	34.86 ¹¹⁶	3.095 ¹⁰⁶	15.17 ²⁹¹	55.62 ²³	27.55 ²⁰⁹	43.719 ⁹⁰	38.40 ³⁴³
24.9	12.807 ²³²	34.00 ⁸⁶	3.253 ¹⁵⁸	12.13 ³⁰⁴	55.93 ³¹	25.73 ¹⁸²	43.871 ¹⁵²	34.90 ³⁵⁰
Dec. 4.9	13.096 ²⁸⁹	33.46 ⁵⁴	3.462 ²⁰⁹	9.08 ³⁰⁵	56.32 ³⁹	24.28 ¹⁴⁵	44.083 ²¹²	31.45 ³⁴⁵
14.9	13.435 ³³⁹	33.30 ¹⁶	3.719 ²⁵⁷	6.07 ³⁰¹	56.78 ⁴⁶	23.27 ¹⁰¹	44.352 ²⁶⁹	28.12 ³³³
24.8	13.812 ³⁷⁷	33.52 ²²	4.012 ²⁹³	3.22 ²⁸⁵	57.30 ⁵²	22.73 ⁵⁴	44.669 ³¹⁷	25.04 ³⁰⁸
34.8	14.219 ⁴⁰⁷	34.12 ⁶⁰	4.336 ³²⁴	0.61 ²⁶¹	57.86 ⁵⁶	22.67 ⁶	45.024 ³⁵⁵	22.29 ²⁷⁵
Mean Place	10.026	21.99	1.423	34.32	52.996	21.74	42.735	59.17
Sec δ, Tan δ	1.341	-0.894	1.156	+0.580	2.030	-1.767	1.408	+0.992
Dφ α, Dα α	+0.08	-0.05	+0.05	+0.03	+0.09	-0.09	+0.04	+0.05
Dφ δ, Dα δ	-0.3	-0.6	-0.3	-0.6	-0.3	-0.6	-0.3	-0.6

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	α Apodis. Mag. 3.8		μ Virginis. Mag. 4.0		ϵ Boötis. Mag. 2.7		109 Virginis. Mag. 3.8	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 14 37	° ' " -78 41	h m 14 38	° ' " - 5 17	h m 14 41	° ' " +27 25	h m 14 42	° ' " + 2 14
Jan. 0.8	18.73	12.48	38.013	44.35	19.162	23.01	0.169	36.82
10.8	20.04	12.07	38.337	46.23	19.491	20.54	0.486	34.77
20.8	21.40	12.22	38.670	48.08	19.833	18.42	0.813	32.84
30.8	22.77	12.93	39.001	49.83	20.179	16.72	1.141	31.07
Feb. 9.7	24.12	14.17	39.324	51.42	20.518	15.50	1.460	29.55
19.7	25.41	15.90	39.629	52.83	20.841	14.80	1.763	28.30
29.7	26.62	18.05	39.913	53.99	21.141	14.59	2.045	27.35
Mar. 10.6	27.74	20.59	40.171	54.90	21.414	14.89	2.301	26.73
20.6	28.72	23.42	40.401	55.55	21.654	15.66	2.531	26.43
30.6	29.57	26.49	40.601	55.95	21.857	16.84	2.730	26.42
Apr. 9.6	30.28	29.74	40.771	56.11	22.026	18.38	2.898	26.68
19.5	30.84	33.08	40.912	56.07	22.159	20.18	3.038	27.17
29.5	31.23	36.47	41.024	55.85	22.256	22.18	3.148	27.85
May 9.5	31.45	39.81	41.106	55.50	22.318	24.28	3.229	28.66
19.4	31.51	43.04	41.162	55.03	22.347	26.42	3.282	29.57
29.4	31.40	46.08	41.189	54.48	22.341	28.49	3.307	30.52
June 8.4	31.13	48.88	41.191	53.89	22.305	30.45	3.306	31.50
18.4	30.71	51.36	41.165	53.26	22.242	32.24	3.278	32.45
28.3	30.14	53.46	41.116	52.63	22.151	33.79	3.226	33.35
July 8.3	29.46	55.12	41.042	52.01	22.037	35.09	3.150	34.18
18.3	28.67	56.33	40.950	51.41	21.903	36.08	3.055	34.91
28.3	27.81	57.00	40.838	50.85	21.753	36.75	2.941	35.54
Aug. 7.2	26.90	57.14	40.715	50.34	21.590	37.09	2.816	36.05
17.2	25.97	56.73	40.585	49.89	21.422	37.06	2.683	36.42
27.2	25.07	55.77	40.453	49.52	21.253	36.68	2.548	36.63
Sept. 6.1	24.23	54.33	40.327	49.26	21.090	35.96	2.418	36.68
16.1	23.49	52.39	40.216	49.11	20.944	34.87	2.303	36.55
26.1	22.88	50.08	40.127	49.11	20.821	33.43	2.208	36.22
Oct. 6.1	22.44	47.43	40.068	49.28	20.730	31.66	2.143	35.68
16.0	22.19	44.58	40.046	49.64	20.675	29.59	2.115	34.90
26.0	22.15	41.61	40.068	50.21	20.666	27.24	2.129	33.90
Nov. 5.0	22.33	38.65	40.137	51.02	20.709	24.64	2.190	32.65
15.0	22.75	35.81	40.256	52.05	20.804	21.86	2.299	31.19
24.9	23.36	33.22	40.424	53.32	20.951	18.95	2.458	29.50
Dec. 4.9	24.20	30.97	40.637	54.78	21.149	15.97	2.662	27.66
14.9	25.22	29.15	40.891	56.43	21.392	13.02	2.908	25.68
24.8	26.36	27.82	41.178	58.20	21.675	10.19	3.186	23.63
34.8	27.02	27.03	41.490	60.04	21.988	7.57	3.491	21.57
Mean Place	21.667	21.95	37.891	37.04	19.114	39.84	0.055	46.45
Sec δ , Tan δ	5.101	-5.001	1.004	-0.093	1.127	+0.519	1.001	+0.039
$D\psi\alpha$, $D\omega\alpha$	+0.14	-0.26	+0.06	0.00	+0.05	+0.03	+0.06	0.00
$D\psi\delta$, $D\omega\delta$	-0.3	-0.6	-0.3	-0.6	-0.3	-0.6	-0.3	-0.6

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	8 Libræ. Mag. 5.3		α Libræ. Mag. 2.9		Groombridge 2164. Mag. 5.7		β Ursæ Minoris. Mag. 2.2	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 14 46	° ' -15 38	h m 14 46	° ' -15 41	h m 14 49	° ' +59 37	h m 14 50	° ' +74 29
	s "	"	s "	"	s "	"	s "	"
Jan. 0.8	2.302	59.21	13.749	40.38	17.790	42.91	54.33	31.21
10.8	2.636 ³⁹⁴	60.78 ¹⁵⁵	14.082 ³³³	41.92 ¹⁵⁴	18.246 ⁴⁵⁶	40.35 ²⁵⁶	55.08 ⁷⁵	28.81 ²⁴⁰
20.8	2.960 ³⁴⁴	62.39 ¹⁶³	14.425 ³⁴³	43.54 ¹⁶²	18.738 ⁴⁹²	38.34 ²⁰¹	55.89 ⁸¹	27.01 ¹⁸⁰
30.8	3.322 ³⁴²	64.03 ¹⁶⁴	14.768 ³⁴³	45.18 ¹⁶⁴	19.247 ⁵⁰⁹	36.94 ¹⁴⁰	56.76 ⁸⁷	25.83 ¹¹⁸
Feb. 9.7	3.657 ³³⁵	65.63 ¹⁶⁰	15.102 ³³⁴	46.79 ¹⁶¹	19.758 ⁵¹¹	36.19 ⁷⁵	57.64 ⁸⁸	25.33 ⁵⁰
	319	152	320	152	494	7	86	19
19.7	3.976	67.15	15.422	48.31	20.252	36.12	58.50	25.52
29.7	4.274 ²⁹⁸	68.55 ¹⁴⁰	15.719 ²⁹⁷	49.71 ¹⁴⁰	20.718 ⁴⁶⁶	36.70 ⁵⁸	59.31 ⁸¹	26.36 ⁸⁴
Mar. 10.6	4.546 ²⁷²	69.77 ¹²²	15.991 ²⁷²	50.94 ¹²³	21.138 ⁴²⁰	37.90 ¹²⁰	60.04 ⁷³	27.84 ¹⁴⁸
20.6	4.790 ²⁴⁴	70.84 ¹⁰⁷	16.235 ²⁴⁴	52.01 ¹⁰⁷	21.505 ³⁶⁷	39.67 ¹²⁷	60.68 ⁶⁴	29.86 ²⁰²
30.6	5.005 ²¹⁵	71.72 ⁸⁸	16.451 ²¹⁶	52.89 ⁸⁸	21.810 ³⁰⁵	41.92 ²²⁵	61.19 ⁵¹	32.34 ²⁴⁸
	185	70	186	70	227	262	39	283
Apr. 9.6	5.190	72.42	16.637	53.59	22.047	44.54	61.58	35.17
19.5	5.347 ¹⁵⁷	72.95 ⁵³	16.793 ¹⁵⁶	54.13 ⁵⁴	22.214 ¹⁶⁷	47.42 ²⁸⁸	61.83 ²⁵	38.24 ³⁰⁷
29.5	5.473 ¹²⁶	73.32 ³⁷	16.919 ¹²⁶	54.51 ³⁸	22.310 ⁹⁶	50.48 ³⁰⁶	61.92 ⁹	41.43 ³¹⁹
May 9.5	5.570 ⁹⁷	73.56 ²⁴	17.017 ⁹⁸	54.74 ²³	22.336 ²⁶	53.57 ³⁰⁹	61.89 ³	44.63 ³²⁰
19.5	5.638 ⁶⁸	73.68 ¹²	17.084 ⁶⁷	54.85 ¹¹	22.293 ⁴³	56.59 ³⁰²	61.72 ¹⁷	47.71 ³⁰⁸
	38	1	40	1	105	287	30	289
29.4	5.676 ⁹	73.67 ⁹	17.124 ¹⁰	54.86 ⁹	22.188	59.46	61.42	50.60
June 8.4	5.685 ¹⁶	73.58 ¹⁸	17.134 ¹⁸	54.77 ¹⁸	22.024 ¹⁶⁴	62.06 ²⁶⁰	60.99 ⁴³	53.19 ²⁵⁹
18.4	5.669 ¹⁶	73.40 ¹⁸	17.116 ¹⁸	54.59 ¹⁸	21.807 ²¹⁷	64.35 ²²⁹	60.47 ⁵²	55.42 ²²³
28.3	5.623 ⁴⁶	73.16 ²⁴	17.072 ⁴⁴	54.33 ²⁶	21.543 ²⁶⁴	66.26 ¹⁹¹	59.86 ⁶¹	57.22 ¹⁸⁰
July 8.3	5.554 ⁶⁹	72.82 ³⁴	17.001 ⁷¹	54.01 ³²	21.239 ³⁰⁴	67.73 ¹⁴⁷	59.18 ⁶⁸	58.55 ¹³³
	93	30	92	30	335	100	74	83
18.3	5.461	72.43	16.909	53.62	20.904	68.73	58.44	59.38
28.3	5.348 ¹¹³	71.99 ⁴⁴	16.796 ¹¹³	53.18 ⁴⁴	20.545 ³⁶⁹	69.23 ⁵⁰	57.67 ⁷⁷	59.68 ³⁰
Aug. 7.2	5.221 ¹²⁷	71.48 ⁵¹	16.669 ¹²⁷	52.68 ⁵⁰	20.171 ³⁷⁴	69.22 ¹	56.87 ⁸⁰	59.45 ²³
17.2	5.085 ¹³⁶	70.95 ⁵³	16.532 ¹³⁷	52.15 ⁵³	19.792 ³⁷⁹	68.70 ⁵²	56.07 ⁸⁰	58.69 ⁷⁶
27.2	4.946 ¹³⁹	70.41 ⁵⁴	16.394 ¹³⁸	51.60 ⁵⁵	19.418 ³⁷⁴	67.68 ¹⁰²	55.29 ⁷⁸	57.41 ¹²⁸
	133	57	134	55	358	151	75	177
Sept. 6.2	4.813	69.84	16.260	51.05	19.060	66.17	54.54	55.64
16.1	4.694 ¹¹⁹	69.33 ⁵¹	16.142 ¹¹⁸	50.52 ⁵³	18.728 ³³²	64.20 ¹⁹⁷	53.84 ⁷⁰	53.41 ²²³
26.1	4.598 ⁹⁶	68.87 ⁴⁶	16.044 ⁹⁸	50.05 ⁴⁷	18.436 ²⁹²	61.79 ²⁴¹	53.22 ⁶²	50.76 ²⁶⁵
Oct. 6.1	4.533 ⁶⁵	68.50 ³⁷	15.979 ⁶⁵	49.68 ³⁷	18.193 ²⁴³	59.01 ²⁷⁸	52.69 ⁵³	47.73 ³⁰³
16.0	4.505 ²⁸	68.27 ²³	15.952 ²⁷	49.45 ²³	18.012 ¹⁸¹	55.88 ³¹³	52.28 ⁴¹	44.41 ³³²
	18	6	17	6	113	342	30	350
26.0	4.523	68.21	15.969	49.39	17.899	52.46	51.98	40.82
Nov. 5.0	4.590 ⁶⁷	68.35 ¹⁴	16.037 ⁶⁸	49.53 ¹⁴	17.864 ³⁵	48.85 ³⁶¹	51.82 ¹⁶	37.07 ³⁷⁵
15.0	4.708 ¹¹⁸	68.72 ³⁷	16.156 ¹¹⁹	49.89 ³⁶	17.912 ⁴⁸	45.12 ³⁷³	51.80 ²	33.24 ³⁸³
24.9	4.879 ¹⁷¹	69.33 ⁶¹	16.325 ¹⁶⁹	50.50 ⁶¹	18.045 ¹³³	41.35 ³⁷⁷	51.94 ¹⁴	29.43 ³⁸¹
Dec. 4.9	5.096 ²¹⁷	70.19 ⁸⁶	16.543 ²¹⁸	51.35 ⁸⁵	18.260 ²¹⁵	37.65 ³⁷⁰	52.23 ²⁹	25.73 ³⁷⁰
	260	107	260	109	295	350	44	346
14.9	5.356	71.26	16.803	52.44	18.555	34.15	52.67	22.27
24.9	5.650 ²⁹⁴	72.55 ¹²⁹	17.098 ²⁹⁵	53.71 ¹²⁷	18.920 ³⁶⁵	30.92 ³²³	53.24 ⁵⁷	19.15 ³¹²
34.8	5.972 ³²²	74.00 ¹⁴⁵	17.418 ³²⁰	55.15 ¹⁴⁴	19.345 ⁴²⁵	28.09 ²⁸³	53.92 ⁶⁸	16.45 ²⁷⁰
Mean Place	2.248	54.95	13.694	36.13	18.404	65.92	56.263	55.53
Sec δ , Tan δ	1.039	-0.280	1.039	-0.281	1.978	+1.707	3.741	+3.605
$D\phi\alpha$, $D_{\alpha}\alpha$	+0.07	-0.01	+0.07	-0.01	+0.03	+0.08	0.00	+0.18
$D\phi\delta$, $D_{\alpha}\delta$	-0.3	-0.7	-0.3	-0.7	-0.3	-0.7	-0.3	-0.7

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	ξ^2 Libræ. Mag. 5.6		Piazzi 221. Mag. 5.8		β Lupi. Mag. 2.8		δ Libræ. Var. 4.8-6.2	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 14 52 s	° ' " -11 4 "	h m 14 52 s	° ' " +14 46 "	h m 14 53 s	° ' " -42 47 "	h m 14 56 s	° ' " - 6 11 "
Jan. 0.8	12.473	22.57	15.305	53.25	1.030	44.52	28.924	17.31
10.8	12.799 ³²⁶	24.21 ¹⁶⁴	15.617 ³¹²	50.93 ²³²	1.446 ⁴¹⁶	45.09 ⁵⁷	29.243 ³¹⁹	19.04 ¹⁷
20.8	13.134 ³³⁵	25.90 ¹⁶⁹	15.942 ³²⁵	48.86 ²⁰⁷	1.876 ⁴³⁰	45.98 ⁸⁹	29.574 ³³¹	20.78 ¹³⁴
30.8	13.470 ³³⁶	27.56 ¹⁶⁶	16.271 ³²⁹	47.08 ¹⁷⁸	2.308 ⁴³²	47.17 ¹¹⁹	29.907 ³³³	22.43 ¹⁵⁶
Feb. 9.7	13.799 ³²⁹	29.12 ¹⁵⁶	16.595 ³²⁴	45.64 ¹⁴⁴	2.732 ⁴²⁴	48.62 ¹⁴⁵	30.233 ³²⁶	23.96 ¹⁵²
	315	142	309	102	406	166	313	12
19.7	14.114	30.54	16.904	44.62	3.138	50.28	30.546	25.36
29.7	14.409 ²⁹⁵	31.80 ¹²⁶	17.194 ²⁹⁰	44.02 ⁶⁰	3.520 ³⁸²	52.09 ¹⁸¹	30.840 ²⁹⁴	26.54 ¹²
Mar. 10.7	14.679 ²⁷⁰	32.87 ¹⁰⁷	17.459 ²⁶⁵	43.84 ¹⁸	3.872 ³⁵²	54.01 ¹⁹²	31.110 ²⁷⁰	27.49 ⁴
20.6	14.923 ²⁴⁴	33.72 ⁸⁵	17.697 ²³⁸	44.06 ²²	4.191 ³¹⁹	55.99 ¹⁹⁸	31.354 ²⁴⁴	28.21 ³
30.6	15.138 ²¹⁵	34.35 ⁶³	17.904 ²⁰⁷	44.67 ⁶¹	4.476 ²⁸⁵	58.01 ²⁰²	31.571 ²¹⁷	28.69 ⁶
	187	44	176	91	247	200	189	7
Apr. 9.6	15.325	34.79	18.080	45.58	4.723	60.01	31.760	28.96
19.5	15.483 ¹⁵⁸	35.04 ²⁵	18.225 ¹⁴⁵	46.78 ¹²⁰	4.931 ²⁰⁸	61.97 ¹⁹⁶	31.919 ¹⁵⁹	29.03 ¹
29.5	15.612 ¹²⁹	35.12 ⁸	18.338 ¹¹³	48.16 ¹³⁸	5.101 ¹⁷⁰	63.86 ¹⁸⁹	32.051 ¹³²	28.94 ¹
May 9.5	15.712 ¹⁰⁰	35.06 ⁶	18.420 ⁸²	49.68 ¹⁵²	5.231 ¹³⁰	65.65 ¹⁷⁹	32.153 ¹⁰²	28.69 ²
19.5	15.784 ⁷²	34.89 ¹⁷	18.473 ⁵³	51.28 ¹⁶⁰	5.323 ⁹²	67.31 ¹⁶⁶	32.226 ⁷³	28.34 ¹⁵
	43	27	22	160	50	152	45	6
29.4	15.827	34.62	18.495	52.88	5.373	68.83	32.271	27.89
June 8.4	15.841 ¹⁴	34.29 ³³	18.490 ⁵	54.44 ¹⁵⁶	5.383 ¹⁰	70.17 ¹³⁴	32.238 ¹⁷	27.41 ⁸
18.4	15.828 ¹³	33.90 ³⁹	18.456 ³⁴	55.90 ¹⁴⁶	5.353 ³⁰	71.29 ¹¹²	32.276 ¹²	26.87 ³
28.4	15.788 ⁴⁰	33.46 ⁴⁴	18.396 ⁶⁰	57.23 ¹³³	5.285 ⁶⁸	72.19 ⁹⁰	32.239 ³⁷	26.31 ⁸
July 8.3	15.722 ⁶⁶	33.00 ⁴⁶	18.312 ⁸⁴	58.37 ¹¹⁴	5.182 ¹⁰³	72.82 ⁶³	32.174 ⁶⁵	25.75 ⁵
	90	49	106	96	135	35	90	5
18.3	15.632	32.51	18.206	59.33	5.047	73.17	32.084	25.30
28.3	15.523 ¹⁰⁹	32.01 ⁵⁰	18.082 ¹²⁴	60.06 ⁷³	4.884 ¹⁶³	73.24 ⁷	31.977 ¹⁰⁷	24.66 ⁵⁴
Aug. 7.2	15.398 ¹²⁵	31.51 ⁴⁹	17.944 ¹³⁸	60.56 ⁵⁰	4.702 ¹⁸²	73.01 ²³	31.853 ¹²⁴	24.15 ⁵¹
17.2	15.264 ¹³⁴	31.02 ⁵⁰	17.797 ¹⁴⁷	60.80 ²⁴	4.507 ¹⁹⁵	72.49 ⁵²	31.718 ¹³⁵	23.67 ⁵⁰
27.2	15.127 ¹³⁷	30.54 ⁴⁸	17.648 ¹⁴⁹	60.79 ¹	4.309 ¹⁹⁸	71.68 ⁸¹	31.580 ¹³⁸	23.26 ⁴
	134	43	145	29	190	108	134	54
Sept. 6.2	14.993	30.11	17.503	60.50	4.119	70.60	31.446	22.92
16.1	14.871 ¹²²	29.76 ³⁵	17.370 ¹³³	59.93 ⁵⁷	3.948 ¹⁷¹	69.32 ¹²⁸	31.322 ¹²⁴	22.66 ¹¹
26.1	14.773 ⁹⁸	29.49 ²⁷	17.259 ¹¹¹	59.08 ⁸⁵	3.807 ¹⁴¹	67.86 ¹⁴⁶	31.220 ¹⁰²	22.52 ¹¹
Oct. 6.1	14.703 ⁷⁰	29.35 ¹⁴	17.175 ⁸⁴	57.96 ¹¹²	3.707 ¹⁰⁰	66.29 ¹⁵⁷	31.146 ⁷⁴	22.53 ¹
16.1	14.669 ³⁴	29.37 ²	17.127 ⁴⁸	56.55 ¹⁴¹	3.660 ⁴⁷	64.68 ¹⁶¹	31.108 ³⁸	22.70 ¹⁷
	11	20	6	168	9	158	5	17
26.0	14.680	29.57	17.121	54.87	3.669	63.10	31.113	23.07
Nov. 5.0	14.739 ⁵⁹	29.98 ⁴¹	17.162 ⁴¹	52.95 ¹⁹²	3.743 ⁷⁴	61.62 ¹⁴⁸	31.168 ⁵⁵	23.64 ¹
15.0	14.848 ¹⁰⁹	30.62 ⁶⁴	17.253 ⁹¹	50.79 ²¹⁶	3.885 ¹⁴²	60.32 ¹³⁰	31.269 ¹⁰¹	24.45 ¹²³
24.9	15.008 ¹⁶⁰	31.48 ⁸⁶	17.395 ¹⁴²	48.47 ²³²	4.091 ²⁰⁶	59.28 ¹⁰⁴	31.422 ¹⁵³	25.45 ¹²³
Dec. 4.9	15.216 ²⁰⁸	32.57 ¹⁰⁹	17.583 ¹⁸⁸	46.03 ²⁴⁴	4.359 ²⁶⁸	58.54 ⁷⁴	31.623 ²⁰¹	26.72 ¹²³
	249	130	233	261	321	42	242	123
14.9	15.465	33.87	17.816	43.52	4.680	58.12	31.865	28.14
24.9	15.749 ²⁸⁴	35.32 ¹⁴⁵	18.085 ²⁶⁹	41.03 ²⁴⁹	5.047 ³⁶⁷	58.08 ⁴	32.145 ²⁸⁰	29.73 ¹²³
34.8	16.061 ³¹²	36.91 ¹⁵⁹	18.382 ²⁹⁷	38.64 ²³⁹	5.446 ³⁹⁹	58.40 ³²	32.449 ³⁰⁴	31.38 ¹²³
Mean Place	12.430	16.88	15.264	66.49	1.265	47.39	28.892	10.73
Sec δ , Tan δ	1.019	-0.196	1.034	+0.264	1.363	-0.926	1.010	-0.144
$D\phi\alpha$, $D\omega\alpha$	+0.07	-0.01	+0.06	+0.01	+0.08	-0.04	+0.06	-0.01
$D\phi\delta$, $D\omega\delta$	-0.3	-0.7	-0.3	-0.7	-0.3	-0.7	-0.3	-0.7

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	β Boötis. Mag. 3.6		γ Scorpi. Mag. 3.4		ψ Boötis. Mag. 4.7		ϵ Boötis. Mag. 5.0	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 14 58	° ' +40 42	h m 14 59	° ' -24 57	h m 15 0	° ' +27 15	h m 15 3	° ' +25 11
	s	"	s	"	s	"	s	"
Jan. 0.8	46.702	57.28	8.952	10.78	50.683	71.99	36.609	28.43
10.8	47.047 ³⁴⁵	54.62 ²⁶⁶	9.300 ³⁴⁸	11.93 ¹¹⁵	51.000 ³¹⁷	69.45 ²⁵⁴	36.923 ³¹⁴	25.91 ²⁵²
20.8	47.414 ³⁶⁷	52.39 ²²³	9.659 ³⁵⁹	13.25 ¹³²	51.334 ³³⁴	67.24 ²²¹	37.253 ³³⁰	23.69 ²²²
30.8	47.791 ³⁷⁷	50.67 ¹⁷²	10.021 ³⁶²	14.68 ¹⁴³	51.675 ³⁴¹	65.44 ¹⁸⁰	37.592 ³³⁹	21.87 ¹⁸²
Feb. 9.7	48.167 ³⁷⁶	49.51 ¹¹⁶	10.375 ³⁵⁴	16.18 ¹⁵⁰	52.014 ³³⁹	64.10 ¹²⁴	37.928 ³³⁶	20.50 ¹³⁷
19.7	48.532 ³⁶⁵	48.95 ⁵⁶	10.716 ³⁴¹	17.71 ¹⁵³	52.342 ³²⁸	63.27 ⁸³	38.251 ³²³	19.61 ⁸⁹
29.7	48.875 ³⁴³	49.00 ⁵	11.038 ³²²	19.21 ¹⁵⁰	52.649 ³⁰⁷	62.96 ³¹	38.558 ³⁰⁷	19.23 ³⁸
Mar. 10.7	49.189 ³¹⁴	49.62 ⁶²	11.334 ²⁶⁶	20.65 ¹⁴⁴	52.933 ²⁸⁴	63.16 ²⁰	38.841 ²⁸³	19.35 ¹²
20.6	49.470 ²⁸¹	50.78 ¹¹⁶	11.603 ²⁶⁹	22.00 ¹³⁵	53.187 ²⁵⁴	63.85 ⁶⁹	39.094 ²⁵³	19.95 ⁶⁰
30.6	49.710 ²⁴⁰	52.42 ¹⁶⁴	11.844 ²⁴¹	23.25 ¹²⁵	53.408 ¹²¹	64.98 ¹¹³	39.316 ²²²	20.97 ¹⁰²
	199	203	211	112	187	150	190	141
Apr. 9.6	49.909 ¹⁵⁵	54.45 ²³⁴	12.055 ¹⁸¹	24.37 ¹⁰⁰	53.595 ¹⁵²	66.48 ¹⁷⁹	39.506 ¹⁵⁴	22.38 ¹⁰⁹
19.5	50.064 ¹¹²	56.79 ²⁵⁴	12.236 ¹⁴⁹	25.37 ⁸⁸	53.747 ¹¹⁷	68.27 ²⁰¹	39.660 ¹²²	24.07 ¹⁹⁰
29.5	50.176 ⁶⁹	59.34 ²⁶⁵	12.385 ¹¹⁸	26.25 ⁷⁵	53.864 ⁸²	70.28 ²¹⁵	39.782 ⁸⁶	25.97 ²⁰⁷
May 9.5	50.245 ²⁶	61.99 ²⁶⁶	12.503 ⁸⁷	27.00 ⁶⁴	53.946 ⁴⁸	72.43 ²¹⁹	39.868 ⁵³	28.04 ²¹¹
19.5	50.271 ¹⁴	64.65 ²⁵⁸	12.590 ⁵⁵	27.64 ⁵²	53.994 ¹⁴	74.62 ²¹⁶	39.921 ²¹	30.15 ²⁰⁹
29.4	50.257 ⁵²	67.23 ²⁴³	12.645 ²³	28.16 ⁴⁰	54.008 ¹⁹	76.78 ²⁰⁶	39.942 ¹¹	32.24 ²⁰⁰
June 8.4	50.205 ⁸⁹	69.66 ²¹⁹	12.668 ⁹	28.56 ²⁶	53.989 ⁴⁹	78.84 ¹⁹¹	39.931 ⁴³	34.24 ¹⁸⁶
18.4	50.116 ¹²²	71.85 ¹⁹¹	12.659 ³⁸	28.82 ¹⁵	53.940 ⁷⁸	80.75 ¹⁶⁸	39.888 ⁷¹	36.10 ¹⁶⁶
28.4	49.994 ¹⁵³	73.76 ¹⁵⁷	12.621 ⁶⁹	28.97 ²	53.862 ¹⁰⁶	82.43 ¹⁴⁵	39.817 ⁹⁶	37.76 ¹⁴²
July 8.3	49.841 ¹⁷⁶	75.33 ¹¹⁹	12.552 ⁹⁵	28.99 ¹²	53.756 ¹²⁸	83.88 ¹¹⁴	39.721 ¹²³	39.18 ¹¹³
18.3	49.665 ¹⁹⁶	76.52 ⁷⁸	12.457 ¹¹⁹	28.87 ²⁷	53.628 ¹⁴⁹	85.02 ⁸²	39.598 ¹⁴²	40.31 ⁸⁵
28.3	49.467 ²¹⁵	77.30 ³⁵	12.338 ¹³⁶	28.60 ³⁹	53.479 ¹⁶⁵	85.84 ⁴⁹	39.456 ¹⁵⁸	41.16 ⁵⁰
Aug. 7.2	49.252 ²²⁴	77.65 ⁸	12.202 ¹⁴⁸	28.21 ⁵¹	53.314 ¹⁷³	86.33 ¹⁴	39.298 ¹⁶⁹	41.66 ¹⁹
17.2	49.030 ²²²	77.57 ⁵²	12.054 ¹⁵²	27.70 ⁶²	53.141 ¹⁷⁷	86.47 ²³	39.129 ¹⁷²	41.85 ¹⁸
27.2	48.806 ²¹⁷	77.05 ⁹⁴	11.902 ¹⁴⁹	27.08 ⁷⁴	52.964 ¹⁷²	86.24 ⁵⁹	38.957 ¹⁶⁹	41.67 ⁸⁰
Sept. 6.2	48.589 ²⁰²	76.11 ¹³⁹	11.753 ¹³⁶	26.34 ⁷⁸	52.792 ¹⁶⁰	85.65 ⁹⁴	38.788 ¹⁵⁷	41.17 ⁸⁷
16.1	48.387 ¹⁷⁸	74.72 ¹⁷⁹	11.617 ¹¹²	25.56 ⁸¹	52.632 ¹⁴⁰	84.71 ¹³⁰	38.631 ¹³⁷	40.30 ¹²¹
26.1	48.209 ¹⁴⁵	72.93 ²¹⁷	11.505 ⁸¹	24.75 ⁸⁰	52.492 ¹¹¹	83.41 ¹⁶⁵	38.494 ¹⁰⁸	39.09 ¹⁵⁵
Oct. 6.1	48.064 ¹⁰³	70.76 ²⁶³	11.424 ⁴⁰	23.95 ⁷²	52.381 ⁷⁴	81.76 ¹⁹⁶	38.386 ⁷²	37.54 ¹⁸⁶
16.1	47.961 ⁵³	68.23 ²⁸²	11.384 ⁶	23.23 ⁶¹	52.307 ²⁹	79.80 ²²⁷	38.314 ²⁹	35.68 ²¹⁶
26.0	47.908 ²	65.41 ³⁰⁹	11.390 ⁵⁹	22.62 ⁴⁶	52.278 ¹⁹	77.53 ²⁵³	38.285 ¹⁸	33.52 ²⁴²
Nov. 5.0	47.910 ⁶¹	62.32 ³²⁶	11.449 ¹¹³	22.16 ²³	52.297 ⁷¹	75.00 ²⁷³	38.303 ⁷¹	31.10 ²⁶⁵
15.0	47.971 ¹²⁰	59.06 ³³⁷	11.562 ¹⁶⁸	21.93 ²	52.368 ¹²⁵	72.27 ²⁹⁰	38.374 ¹²⁵	28.45 ²⁸⁰
24.9	48.091 ¹⁸⁰	55.69 ³⁴⁰	11.730 ²²⁰	21.91 ²⁵	52.493 ¹⁷⁶	69.38 ²⁹⁶	38.499 ¹⁷⁵	25.65 ²⁸⁹
Dec. 4.9	48.271 ²³⁷	52.29 ³³³	11.950 ²⁶⁵	22.16 ⁵⁰	52.669 ²²⁵	66.42 ²⁹⁷	38.674 ²²²	22.76 ²⁸⁹
14.9	48.508 ²⁸²	48.96 ³¹³	12.215 ³⁰⁴	22.66 ⁷⁷	52.894 ²⁶⁶	63.45 ²⁸⁷	38.896 ²⁶³	19.87 ²⁸³
24.9	48.790 ³²⁴	45.83 ²⁸⁷	12.519 ³³¹	23.43 ¹⁰⁰	53.160 ²⁹⁹	60.58 ²⁸⁸	39.159 ²⁹⁶	17.04 ²⁸³
34.8	49.114	42.96	12.850	24.43	53.459	57.90	39.455	14.39 ²⁶⁵
Mean Place	46.922	76.74	9.007	8.92	50.764	88.36	36.691	44.23
Sec δ , Tan δ	1.319	+0.861	1.103	-0.465	1.125	+0.516	1.105	+0.470
$D_{\phi} a, D_{\alpha} a$	+0.05	+0.04	+0.07	-0.02	+0.05	+0.02	+0.05	+0.02
$D_{\phi} \delta, D_{\alpha} \delta$	-0.3	-0.7	-0.3	-0.7	-0.3	-0.7	-0.3	-0.7

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	ζ Lupi. Mag. 3.5				z Libræ. Mag. 4.7				3 Serpentinis. Mag. 5.4				γ Triang. Aust. Mag. 3.1			
	Right Ascension.		Declina- tion.		Right Ascension.		Declina- tion.		Right Ascension.		Declina- tion.		Right Ascension.		Declina- tion.	
	h	m	°	'	h	m	°	'	h	m	°	'	h	m	°	'
	15	6	-51	46	15	7	-19	28	15	11	+5	14	15	11	-68	22
	s		"		s		"		s		"		s		"	
Jan. 0.9	14.027		44.51		25.722		32.34		0.693		51.46		1.38		6.94	
	470		8		330		128		304		207		72		58	
10.8	14.497		44.59		26.052		33.62		0.997		49.39		2.10		6.36	
	492		47		345		140		1.314		47.44		76		6.27	
20.8	14.989		45.06		26.397		35.02		1.637		45.68		3.64		6.67	
	497		85		348		146		321		150		77		87	
30.8	15.486		45.91		26.745		36.48		1.958		44.18		4.41		7.54	
	492		119		344		147		309		119		76		131	
Feb. 9.7	15.978		47.10		27.089		37.95		2.267		42.99		5.17		8.85	
	477		148		331		143		2.561		42.14		5.89		10.55	
19.7	16.455		48.58		27.420		39.38		2.834		41.62		6.57		12.58	
	452		174		313		135		3.082		41.45		7.20		14.90	
29.7	16.907		50.32		27.733		40.73		3.303		41.62		7.76		17.46	
	422		192		292		125		194		45		49		272	
Mar. 10.7	17.329		52.24		28.025		41.98		3.497		42.07		8.25		20.18	
	386		210		266		110		3.661		42.77		8.65		23.02	
20.6	17.715		54.34		28.291		43.08		3.798		43.68		8.99		25.93	
	347		219		238		96		3.904		44.73		9.24		28.84	
30.6	18.062		56.53		28.529		44.04		3.981		45.89		9.40		31.69	
	304		227		210		82		49		120		8		272	
Apr. 9.6	18.366		58.80		28.739		44.86		4.030		47.09		9.48		34.42	
	260		228		182		66		4.049		48.30		9.46		36.97	
19.6	18.626		61.08		28.921		45.52		4.040		49.45		9.36		39.28	
	215		227		152		53		3.798		43.68		8.99		25.93	
29.5	18.841		63.35		29.073		46.05		3.904		44.73		9.24		28.84	
	167		221		121		41		3.981		45.89		9.40		31.69	
May 9.5	19.008		65.56		29.194		46.46		4.030		47.09		9.48		34.42	
	117		211		92		29		4.049		48.30		9.46		36.97	
19.5	19.125		67.67		29.286		46.75		4.040		49.45		9.36		39.28	
	68		199		61		18		3.798		43.68		8.99		25.93	
29.4	19.193		69.66		29.347		46.93		3.904		44.73		9.24		28.84	
	18		181		30		9		3.981		45.89		9.40		31.69	
June 8.4	19.211		71.47		29.377		47.02		4.030		47.09		9.48		34.42	
	31		158		0		1		4.049		48.30		9.46		36.97	
18.4	19.180		73.05		29.377		47.03		4.040		49.45		9.36		39.28	
	80		134		32		9		3.798		43.68		8.99		25.93	
28.4	19.100		74.39		29.345		46.94		3.904		44.73		9.24		28.84	
	126		104		60		16		3.981		45.89		9.40		31.69	
July 8.3	18.974		75.43		29.285		46.78		4.030		47.09		9.48		34.42	
	165		72		85		26		4.049		48.30		9.46		36.97	
18.3	18.809		76.15		29.200		46.52		4.040		49.45		9.36		39.28	
	201		38		111		33		3.798		43.68		8.99		25.93	
28.3	18.608		76.53		29.089		46.19		3.904		44.73		9.24		28.84	
	227		3		128		41		3.981		45.89		9.40		31.69	
Aug. 7.3	18.381		76.56		28.961		45.78		4.030		47.09		9.48		34.42	
	243		35		141		48		4.049		48.30		9.46		36.97	
17.2	18.138		76.21		28.820		45.30		4.040		49.45		9.36		39.28	
	250		72		147		54		3.798		43.68		8.99		25.93	
27.2	17.888		75.49		28.673		44.76		3.904		44.73		9.24		28.84	
	243		105		145		58		3.981		45.89		9.40		31.69	
Sept. 6.2	17.645		74.44		28.528		44.18		4.030		47.09		9.48		34.42	
	222		136		135		59		4.049		48.30		9.46		36.97	
16.1	17.423		73.08		28.393		43.59		4.040		49.45		9.36		39.28	
	189		163		113		58		3.798		43.68		8.99		25.93	
26.1	17.234		71.45		28.280		43.01		3.904		44.73		9.24		28.84	
	141		182		85		52		3.981		45.89		9.40		31.69	
Oct. 6.1	17.093		69.63		28.195		42.49		4.030		47.09		9.48		34.42	
	84		195		48		44		4.049		48.30		9.46		36.97	
16.1	17.009		67.68		28.147		42.05		4.040		49.45		9.36		39.28	
	16		199		2		29		3.798		43.68		8.99		25.93	
26.0	16.993		65.69		28.145		41.76		3.904		44.73		9.24		28.84	
	60		105		48		14		3.981		45.89		9.40		31.69	
Nov. 5.0	17.053		63.74		28.193		41.62		4.030		47.09		9.48		34.42	
	137		182		100		7		4.049		48.30		9.46		36.97	
15.0	17.190		61.92		28.293		41.69		4.040		49.45		9.36		39.28	
	214		159		153		30		3.798		43.68		8.99		25.93	
25.0	17.404		60.33		28.446		41.99		3.904		44.73		9.24		28.84	
	287		132		204		52		3.981		45.89		9.40		31.69	
Dec. 4.9	17.691		59.01		28.650		42.51		4.030		47.09		9.48		34.42	
	353		98		249		77		4.049		48.30		9.46		36.97	
14.9	18.044		58.03		28.899		43.28		4.040		49.45		9.36		39.28	
	406		60		286		98		3.798		43.68		8.99		25.93	
24.9	18.450		57.43		29.185		44.26		3.904		44.73		9.24		28.84	
	449		20		316		118		3.981		45.89		9.40		31.69	
34.8	18.899		57.23		29.501		45.44		4.030		47.09		9.48		34.42	
Mean Place	14.526		48.79		25.778		28.82		0.727		61.88		2.806		13.66	
Sec δ, Tan δ	1.616		-1.270		1.061		-0.354		1.004		+0.092		2.714		-2.522	
Dψ a, Dω a	+0.08		-0.06		+0.07		-0.02		+0.06		0.00		+0.11		-0.11	
Dψ δ, Dω δ	-0.3		-0.7		-0.3		-0.7		-0.3		-0.7		-0.3		-0.7	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	δ Boötis. Mag. 3.5		β Libræ. Mag. 2.7		γ Ursæ Minoris. Mag. 3.1		μ Boötis pr. Mag. 4.5	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 15 12	° ' +33 37	h m 15 12	° ' - 9 4	h m 15 20	° ' +72 7	h m 15 21	° ' +37 39
	s	"	s	"	s	"	s	"
Jan. 0.9	6.764	21.60	29.027	31.77	48.93	35.68	18.682	58.19
10.8	7.084 ³²⁰	18.93 ²⁶⁷	29.340 ³¹³	33.39 ¹⁶²	49.53 ⁶⁰	32.96 ²⁷²	19.002 ³²⁰	55.43 ²⁷⁶
20.8	7.425 ³⁴¹	16.63 ²³⁰	29.667 ³²⁷	35.03 ¹⁶⁴	50.22 ⁶⁹	30.77 ²¹⁹	19.348 ³⁴⁶	53.06 ²³⁷
30.8	7.778 ³⁵³	14.77 ¹⁸⁶	29.999 ³³²	36.62 ¹⁵⁹	50.96 ⁷⁴	29.18 ¹⁵⁹	19.707 ³⁵⁹	51.16 ¹⁹⁰
Feb. 9.7	8.129 ³⁵¹	13.43 ¹³⁴	30.327 ³²⁸	38.11 ¹⁴⁹	51.73 ⁷⁷	28.26 ⁹²	20.069 ³⁶²	49.80 ¹³⁶
	344	80	318	134	76	25	356	80
19.7	8.473	12.63	30.645	39.45	52.49	28.01	20.425	49.00
29.7	8.800 ³²⁷	12.40 ²³	30.945 ³⁰⁰	40.59 ¹¹⁴	53.23 ⁷⁴	28.46 ⁴⁵	20.766 ³⁴¹	48.80 ²⁰
Mar. 10.7	9.102 ³⁰²	12.73 ³³	31.225 ²⁸⁰	41.52 ⁹³	53.92 ⁶⁹	29.55 ¹⁰⁹	21.083 ³¹⁷	49.17 ³⁷
20.6	9.375 ²⁷³	13.58 ⁸⁵	31.481 ²⁵⁶	42.22 ⁷⁰	54.54 ⁶²	31.24 ¹⁰⁹	21.372 ²⁸⁹	50.11 ⁹⁴
30.6	9.615 ²⁴⁰	14.91 ¹³³	31.712 ²³¹	42.70 ⁴⁸	55.06 ⁵²	33.45 ²²¹	21.626 ²⁵⁴	51.54 ¹⁴³
	204	173	202	26	43	264	217	186
Apr. 9.6	9.819	16.64	31.914	42.96	55.49	36.09	21.843	53.40
19.6	9.985 ¹⁶⁶	18.70 ²⁰⁶	32.089 ¹⁷⁵	43.03 ⁷	55.80 ³¹	39.04 ²⁰⁵	22.021 ¹⁷⁸	55.59 ²¹⁹
29.5	10.113 ¹²⁸	20.97 ²²⁷	32.237 ¹⁴⁸	42.94 ⁹	55.98 ¹⁸	42.19 ³¹⁵	22.160 ¹³⁹	58.03 ²⁴⁴
May 9.5	10.204 ⁹¹	23.39 ²⁴²	32.355 ¹¹⁸	42.70 ²⁴	56.05 ⁷	45.43 ³²⁴	22.258 ⁹⁸	60.63 ²⁶⁰
19.5	10.256 ⁵²	25.87 ²⁴⁸	32.445 ⁹⁰	42.36 ³⁴	56.00 ⁵	48.65 ³²²	22.314 ⁵⁶	63.28 ²⁶⁵
	15	243	59	42	16	307	17	260
29.4	10.271	28.30	32.504	41.94	55.84	51.72	22.331	65.88
June 8.4	10.250 ²¹	30.63 ²³³	32.534 ³⁰	41.47 ⁴⁷	55.56 ²⁸	54.59 ²⁵⁷	22.309 ²²	68.38 ²⁵⁰
18.4	10.195 ⁵⁵	32.77 ²¹⁴	32.536 ²	40.95 ⁵²	55.17 ³⁹	57.15 ²⁵⁶	22.250 ⁵⁹	70.69 ²³¹
28.4	10.108 ⁸⁷	34.68 ¹⁹¹	32.508 ²⁸	40.42 ⁵³	54.71 ⁴⁶	59.33 ²¹⁸	22.156 ⁹⁴	72.75 ²⁰⁶
July 8.3	9.990 ¹¹⁸	36.29 ¹⁶¹	32.452 ⁵⁶	39.88 ⁵⁴	54.17 ⁵⁴	61.08 ¹⁷⁵	22.028 ¹²⁸	74.50 ¹⁷⁵
	143	129	82	53	61	128	156	141
18.3	9.847	37.58	32.370	39.35	53.56	62.36	21.872	75.91
28.3	9.680 ¹⁶⁷	38.51 ⁹³	32.266 ¹⁰⁴	38.83 ⁵²	52.91 ⁶⁵	63.14 ⁷⁸	21.692 ¹⁸⁰	76.93 ¹⁰²
Aug. 7.3	9.497 ¹⁸³	39.05 ⁵⁴	32.143 ¹²³	38.33 ⁵⁰	52.22 ⁶⁹	63.40 ²⁶	21.492 ²⁰⁰	77.55 ⁶²
17.2	9.302 ¹⁹⁵	39.20 ¹⁵	32.008 ¹³⁵	37.87 ⁴⁶	51.51 ⁷¹	63.13 ²⁷	21.278 ²¹⁴	77.75 ²⁰
27.2	9.103 ¹⁹⁹	38.95 ²⁵	31.865 ¹⁴³	37.45 ⁴²	50.80 ⁷¹	62.33 ⁸⁰	21.059 ²¹⁹	77.52 ²³
	197	66	141	35	69	130	217	66
Sept. 6.2	8.906	38.29	31.724	37.10	50.11	61.03	20.842	76.86
16.1	8.720 ¹⁸⁶	37.23 ¹⁰⁶	31.592 ¹³²	36.83 ²⁷	49.45 ⁶⁶	59.23 ¹⁸⁰	20.636 ²⁰⁶	75.78 ¹⁰⁸
26.1	8.556 ¹⁶⁴	35.79 ¹⁴⁴	31.479 ¹¹³	36.66 ¹⁷	48.85 ⁶⁰	56.97 ²²⁶	20.449 ¹⁸⁷	74.28 ¹⁵⁰
Oct. 6.1	8.419 ¹³⁷	33.96 ¹⁸³	31.393 ⁸⁶	36.61 ⁵	48.32 ⁵³	54.30 ²⁶⁷	20.291 ¹⁵⁸	72.40 ¹⁸⁸
16.1	8.321 ⁹⁸	31.79 ²¹⁷	31.341 ⁵²	36.72 ¹¹	47.87 ⁴⁵	51.25 ³⁰⁵	20.171 ¹²⁰	70.14 ²²⁶
	53	249	10	29	35	335	74	259
26.0	8.268	29.30	31.331	37.01	47.52	47.90	20.097	67.55
Nov. 5.0	8.265 ³	26.55 ²⁷⁵	31.369 ³⁸	37.50 ⁴⁹	47.30 ²²	44.31 ³⁵⁹	20.075 ²²	64.69 ²⁸⁶
15.0	8.318 ⁵³	23.57 ²⁹⁸	31.456 ⁸⁷	38.21 ⁷¹	47.20 ¹⁰	40.57 ³⁷⁴	20.109 ³⁴	61.59 ³¹⁰
25.0	8.426 ¹⁰⁸	20.44 ³¹³	31.595 ¹³⁹	39.13 ⁹²	47.23 ³	36.77 ³⁸⁰	20.204 ⁹⁵	58.35 ³²⁴
Dec. 4.9	8.590 ¹⁶⁴	17.25 ³¹⁹	31.781 ¹⁸⁶	40.26 ¹¹³	47.41 ¹⁸	33.00 ³⁷⁷	20.355 ¹⁵¹	55.04 ³³¹
	215	317	231	131	30	360	206	328
14.9	8.805	14.08	32.012	41.57	47.71	29.40	20.561	51.76
24.9	9.065 ²⁶⁰	11.04 ³⁰⁴	32.280 ²⁶⁸	43.04 ¹⁴⁷	48.14 ⁴³	26.04 ³³⁶	20.816 ²⁵⁵	48.60 ³¹⁶
34.8	9.363 ²⁰⁸	8.20 ²⁸⁴	32.576 ²⁹⁶	44.60 ¹⁵⁶	48.67 ⁵³	23.06 ²⁰⁸	21.112 ²⁹⁶	45.67 ²⁹³
Mean Place	6.987	39.12	29.068	25.32	51.174	58.30	19.029	76.22
Sec δ , Tan δ	1.201	+0.665	1.013	-0.160	3.258	+3.901	1.263	+0.772
$D\phi a$, $D_\alpha a$	+0.05	+0.03	+0.06	-0.01	0.00	+0.13	+0.05	+0.03
$D\phi \delta$, $D_\alpha \delta$	-0.3	-0.7	-0.3	-0.7	-0.3	-0.8	-0.3	-0.8

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	γ 1 Serpentis. Mag. 5.5			ϵ Draconis. Mag. 3.5			β Libræ. Mag. 5.9			β Coronæ Borealis. Mag. 3.7		
	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.
	h m		° ' "	h m		° ' "	h m		° ' "	h m		° ' "
	15	21	+15 42	15	23	+59 15	15	23	-16 25	15	24	+29 23
Jan. 0.9	53.418	284	68.51	2.625	412	14.29	30.867	318	32.59	21.697	304	24.40
10.8	53.714	214	66.15	3.037	457	11.43	31.185	333	33.89	22.001	304	21.74
20.8	54.028	214	64.02	3.494	457	9.08	31.518	341	35.28	22.327	328	19.41
30.8	54.351	224	62.17	3.981	487	7.30	31.859	341	36.69	22.665	338	17.49
Feb. 9.8	54.675	234	60.68	4.481	500	6.15	32.198	339	38.08	23.005	340	16.04
19.7	54.990	215	59.59	4.976	496	5.68	32.526	328	39.40	23.340	325	15.12
29.7	55.290	300	58.93	5.456	480	5.89	32.841	315	40.61	23.660	320	14.73
Mar. 10.7	55.571	281	58.71	5.902	446	6.73	33.136	296	41.68	23.958	298	14.88
20.6	55.828	257	58.92	6.305	403	8.18	33.408	272	42.60	24.231	273	15.54
30.6	56.059	221	59.53	6.655	330	10.18	33.655	247	43.35	24.474	243	16.68
Apr. 9.6	56.260	201	60.48	6.944	289	12.61	33.875	220	43.94	24.684	210	18.22
19.6	56.432	172	61.73	7.169	225	15.39	34.068	193	44.36	24.860	176	20.08
29.5	56.574	142	63.20	7.325	156	18.40	34.233	165	44.66	25.002	142	22.20
May 9.5	56.684	110	64.85	7.411	86	21.54	34.369	136	44.84	25.107	106	24.47
19.5	56.764	80	66.57	7.430	50	24.69	34.475	106	44.90	25.176	69	26.82
29.5	56.813	49	68.33	7.380	17	27.74	34.550	75	44.87	25.210	34	29.17
June 8.4	56.830	17	70.06	7.269	111	30.62	34.594	44	44.78	25.210	0	31.44
18.4	56.816	14	71.68	7.098	271	33.22	34.607	13	44.62	25.174	36	33.55
28.4	56.774	42	73.19	6.873	151	35.49	34.589	15	44.41	25.106	98	35.46
July 8.3	56.703	71	74.53	6.599	274	37.36	34.540	49	44.14	25.008	68	37.11
18.3	56.606	97	75.65	6.285	314	38.79	34.462	78	43.83	24.882	126	38.47
28.3	56.486	120	76.56	5.937	348	39.75	34.359	103	43.47	24.732	150	39.50
Aug. 7.3	56.347	139	77.20	5.565	372	40.21	34.235	124	43.07	24.562	170	40.17
17.2	56.196	151	77.60	5.178	387	40.16	34.096	139	42.63	24.379	183	40.48
27.2	56.037	159	77.71	4.787	391	39.61	33.948	148	42.16	24.189	190	40.41
Sept. 6.2	55.878	159	77.53	4.401	386	38.53	33.800	148	41.69	23.999	190	39.97
16.2	55.727	151	77.07	4.034	367	36.98	33.660	140	41.22	23.818	181	39.13
26.1	55.592	135	76.31	3.698	336	34.95	33.536	124	40.79	23.655	163	37.92
Oct. 6.1	55.483	109	75.26	3.404	294	32.49	33.440	96	40.43	23.518	137	36.34
16.1	55.407	76	73.92	3.165	239	29.66	33.379	61	40.15	23.417	101	34.43
26.0	55.371	36	72.30	2.990	175	26.48	33.361	18	40.01	23.357	60	32.18
Nov. 5.0	55.380	9	70.42	2.890	100	23.03	33.391	4	40.06	23.347	10	29.66
15.0	55.439	59	68.30	2.870	20	19.40	33.474	22	40.27	23.389	42	26.91
25.0	55.549	110	66.00	2.935	65	15.66	33.608	43	40.70	23.486	97	23.98
Dec. 4.9	55.709	180	63.56	3.084	149	11.92	33.792	184	41.35	23.636	150	20.96
14.9	55.914	205	61.05	3.317	233	8.28	34.022	230	42.21	23.837	201	17.92
24.9	56.159	245	58.53	3.625	308	4.87	34.293	271	43.26	24.083	246	14.95
34.9	56.438	279	56.10	3.999	374	1.78	34.594	301	44.46	24.365	282	12.16
Mean Place	53.543		81.54	3.659		35.64	30.975		28.01	21.949		40.60
Sec δ , Tan δ	1.039		+0.281	1.956		+1.681	1.043		-0.295	1.148		+0.563
D ϕ α , D ω α	+0.06		+0.01	+0.03		+0.07	+0.07		-0.01	+0.05		+0.02
D ϕ δ , D ω δ	-0.3		-0.8	-0.3		-0.8	-0.3		-0.8	-0.2		-0.8

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	γ^1 Boötis. Mag. 5.2		γ Lupi (mean). Mag. 3.0		γ Libræ. Mag. 4.0		α Coronæ Borealis. Mag. 2.3	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 15 27	° ' " +41 6	h m 15 29	° ' " -40 53	h m 15 30	° ' " -14 30	h m 15 31	° ' " +26 59
Jan. 0.9	54.267	49.28	31.886	6.61	49.373	41.34	7.585	32.57
10.8	54.589	46.45	32.273	6.86	49.684	42.67	7.882	29.94
20.8	54.940	44.02	32.682	7.40	50.012	44.07	8.202	27.60
30.8	55.308	42.08	33.099	8.22	50.348	45.47	8.534	25.65
Feb. 9.8	55.682	40.70	33.517	9.26	50.693	46.84	8.870	24.16
19.7	56.051	39.89	33.925	10.51	51.011	48.12	9.201	23.16
29.7	56.406	39.70	34.317	11.90	51.325	49.25	9.518	22.69
Mar. 10.7	56.739	40.12	34.689	13.41	51.619	50.24	9.816	22.73
20.7	57.042	41.11	35.032	14.99	51.894	51.06	10.090	23.28
30.6	57.311	42.61	35.346	16.62	52.143	51.69	10.335	24.30
Apr. 9.6	57.542	44.55	35.629	18.27	52.368	52.16	10.550	25.72
19.6	57.731	46.84	35.878	19.91	52.566	52.45	10.733	27.48
29.5	57.878	49.40	36.092	21.52	52.735	52.61	10.882	29.48
May 9.5	57.982	52.11	36.268	23.08	52.877	52.64	10.996	31.67
19.5	58.043	54.88	36.406	24.56	52.989	52.58	11.075	33.94
29.5	58.060	57.62	36.503	25.95	53.070	52.43	11.120	36.22
June 8.4	58.036	60.24	36.558	27.22	53.120	52.21	11.130	38.43
18.4	57.972	62.67	36.571	28.33	53.138	51.94	11.106	40.50
28.4	57.870	64.83	36.543	29.29	53.124	51.63	11.048	42.39
July 8.4	57.734	66.69	36.474	30.03	53.080	51.29	10.961	44.04
18.3	57.566	68.18	36.367	30.56	53.007	50.93	10.845	45.42
28.3	57.372	69.27	36.228	30.83	52.908	50.53	10.705	46.48
Aug. 7.3	57.156	69.94	36.061	30.86	52.786	50.12	10.543	47.21
17.2	56.926	70.17	35.874	30.61	52.649	49.69	10.367	47.59
27.2	56.689	69.95	35.677	30.11	52.501	49.25	10.182	47.61
Sept. 6.2	56.452	69.29	35.478	29.35	52.352	48.82	9.997	47.26
16.2	56.226	68.18	35.290	28.36	52.210	48.42	9.819	46.53
26.1	56.020	66.64	35.125	27.18	52.084	48.06	9.658	45.44
Oct. 6.1	55.844	64.69	34.994	25.86	51.983	47.79	9.522	44.01
16.1	55.705	62.37	34.908	24.44	51.917	47.61	9.419	42.22
26.1	55.614	59.70	34.876	23.01	51.892	47.58	9.358	40.11
Nov. 5.0	55.576	56.74	34.904	21.62	51.914	47.71	9.344	37.72
15.0	55.596	53.56	34.996	20.35	51.987	48.03	9.382	35.08
25.0	55.677	50.22	35.153	19.26	52.113	48.56	9.473	32.27
Dec. 4.9	55.821	46.81	35.374	18.40	52.288	49.30	9.619	29.34
14.9	56.021	43.43	35.651	17.83	52.510	50.23	9.813	26.38
24.9	56.272	40.18	35.977	17.55	52.771	51.34	10.051	23.47
34.9	56.569	37.17	36.342	17.58	53.064	52.58	10.328	20.72
Mean Place	54.726	67.70	32.242	7.75	49.503	36.17	7.852	48.03
Sec δ , Tan δ	1.327	+0.873	1.323	-0.866	1.033	-0.259	1.122	+0.509
$D\phi\alpha$, $D\alpha\alpha$	+0.04	+0.04	+0.08	-0.04	+0.07	-0.01	+0.05	+0.02
$D\phi\delta$, $D\alpha\delta$	-0.2	-0.8	-0.2	-0.8	-0.2	-0.8	-0.2	-0.8

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	ζ Cor. Bor. seq. Mag. 5.1			α Serpentis. Mag. 2.8			β Serpentis. Mag. 3.7			κ Serpentis. Mag. 4.3		
	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.
	h m	s	° ' "	h m	s	° ' "	h m	s	° ' "	h m	s	° ' "
	15 36		+36 53	15 40		+ 6 40	15 42		+15 40	15 44		+18 23
Jan. 0.9	12.452		71.22	7.577		70.43	18.418		49.45	57.203		47.44
10.9	12.760 ³⁰⁸		68.41 281	7.863 ²⁸⁶		68.35 208	18.701 ²⁸³		47.08 237	57.484 ²⁸¹		44.99 245
20.8	13.094 ³³⁴		65.95 246	8.169 ³⁰⁶		66.38 197	19.006 ³⁰⁵		44.92 216	57.789 ³⁰⁵		42.76 223
30.8	13.445 ³⁵¹		63.95 200	8.485 ³¹⁶		64.63 175	19.323 ³¹⁷		43.02 190	58.107 ³¹⁸		40.83 193
Feb. 9.8	13.802 ³⁵⁷		62.46 149	8.803 ³¹⁸		63.12 151	19.644 ³²¹		41.48 154	58.429 ³²²		39.27 136
	13.802 ³⁵⁴		62.46 91	8.803 ³¹⁴		63.12 118	19.644 ³¹⁶		41.48 113	58.429 ³¹⁸		39.27 113
19.7	14.156 ³⁴³		61.55 34	9.117 ³⁰¹		61.94 83	19.960 ³⁰⁵		40.35 71	58.747 ³⁰⁸		38.14 98
29.7	14.499 ³²²		61.21 25	9.418 ²⁸⁵		61.11 48	20.265 ²⁹⁰		39.64 27	59.055 ²⁹²		37.46 21
Mar. 10.7	14.821 ²⁹⁶		61.46 82	9.703 ²⁶⁵		60.63 10	20.555 ²⁶⁸		39.37 17	59.347 ²⁷³		37.25 24
20.7	15.117 ²⁶⁵		62.28 133	9.968 ²⁴²		60.53 24	20.823 ²⁴⁵		39.54 58	59.620 ²⁴⁷		37.49 88
30.6	15.382 ²³¹		63.61 177	10.210 ²¹⁶		60.77 55	21.068 ²¹⁸		40.12 94	59.867 ²²⁰		38.17 106
Apr. 9.6	15.613 ¹⁹⁵		65.38 213	10.426 ¹⁹¹		61.32 83	21.286 ¹⁹¹		41.06 125	60.087 ¹⁹³		39.22 137
19.6	15.808 ¹⁵⁴		67.51 241	10.617 ¹⁶³		62.15 104	21.477 ¹⁶¹		42.31 150	60.280 ¹⁶³		40.59 163
29.6	15.962 ¹¹⁶		69.92 257	10.780 ¹³⁴		63.19 121	21.638 ¹³¹		43.81 168	60.443 ¹³¹		42.22 181
May 9.5	16.078 ⁷⁵		72.49 266	10.914 ¹⁰⁴		64.40 132	21.769 ¹⁰⁰		45.49 178	60.574 ¹⁰¹		44.03 182
19.5	16.153 ³³		75.15 265	11.018 ⁷⁴		65.72 136	21.869 ⁶⁷		47.27 183	60.675 ⁶⁷		45.95 196
29.5	16.186 ⁴		77.80 257	11.092 ⁴⁴		67.08 138	21.936 ³⁵		49.10 180	60.742 ³⁴		47.91 193
June 8.4	16.182 ⁴³		80.37 239	11.136 ¹¹		68.46 133	21.971 ⁴		50.90 173	60.776 ²		49.84 185
18.4	16.139 ⁸⁰		82.76 217	11.147 ¹⁹		69.79 127	21.975 ²⁸		52.63 160	60.778 ³¹		51.69 171
28.4	16.059 ¹¹⁵		84.93 186	11.128 ⁴⁸		71.05 114	21.947 ⁶⁰		54.23 144	60.747 ⁶²		53.40 153
July 8.4	15.944 ¹⁴⁵		86.79 155	11.080 ⁷⁸		72.19 101	21.887 ⁸⁷		55.67 123	60.685 ⁹¹		54.93 132
18.3	15.799 ¹⁷³		88.34 116	11.002 ¹⁰²		73.20 86	21.800 ¹¹⁴		56.90 102	60.594 ¹¹⁸		56.25 106
28.3	15.626 ¹⁹⁵		89.50 77	10.900 ¹²⁵		74.06 67	21.686 ¹³⁵		57.92 76	60.476 ¹⁴⁰		57.31 79
Aug. 7.3	15.431 ²¹⁰		90.27 36	10.775 ¹⁴¹		74.73 50	21.551 ¹⁵²		58.68 50	60.336 ¹⁵⁶		58.10 52
17.3	15.221 ²²⁰		90.63 7	10.634 ¹⁵¹		75.23 29	21.399 ¹⁶⁴		59.18 22	60.180 ¹⁶⁹		58.62 21
27.2	15.001 ²²⁰		90.56 50	10.483 ¹⁵⁴		75.52 9	21.235 ¹⁶⁵		59.40 6	60.011 ¹⁷¹		58.83 29
Sept. 6.2	14.781 ²¹⁴		90.06 93	10.329 ¹⁵⁰		75.61 14	21.070 ¹⁶¹		59.34 36	59.840 ¹⁶⁶		58.73 41
16.2	14.567 ¹⁹⁵		89.13 134	10.179 ¹³⁶		75.47 30	20.909 ¹⁴⁷		58.98 65	59.674 ¹⁵⁴		58.33 73
26.1	14.372 ¹⁶⁹		87.79 176	10.043 ¹¹²		75.11 61	20.762 ¹²⁴		58.33 95	59.520 ¹³⁰		57.60 126
Oct. 6.1	14.203 ¹³³		86.03 211	9.931 ⁸²		74.50 84	20.638 ⁹⁵		57.38 125	59.390 ¹⁰¹		56.55 133
16.1	14.070 ⁸⁹		83.92 240	9.849 ⁴³		73.66 110	20.543 ⁵⁵		56.13 154	59.289 ⁶¹		55.20 196
26.1	13.981 ³⁸		81.46 278	9.806 ¹		72.56 133	20.488 ¹⁰		54.59 180	59.228 ¹⁶		53.54 192
Nov. 5.0	13.943 ¹⁸		78.68 300	9.805 ⁵⁰		71.23 157	20.478 ³⁹		52.79 205	59.212 ³²		51.62 218
15.0	13.961 ⁷⁵		75.68 318	9.855 ⁹⁹		69.66 177	20.517 ⁸⁹		50.74 225	59.244 ⁸⁴		49.44 257
25.0	14.036 ¹³³		72.50 328	9.954 ¹⁴⁸		67.89 193	20.606 ¹³⁹		48.49 239	59.328 ¹³⁴		47.07 253
Dec. 5.0	14.169 ¹⁸⁹		69.22 327	10.102 ¹⁹⁴		65.96 205	20.745 ¹⁸⁶		46.10 249	59.462 ¹⁸³		44.54 261
14.9	14.358 ²³⁹		65.95 318	10.296 ²³³		63.91 213	20.931 ²³⁰		43.61 250	59.645 ²²⁵		41.93 260
24.9	14.597 ²⁸²		62.77 298	10.529 ²⁶⁷		61.78 211	21.161 ²⁶³		41.11 244	59.870 ²⁶¹		39.33 253
34.9	14.879		59.79	10.796		59.67	21.424		38.67	60.131		36.80
Mean Place	12.892		88.51	7.749		80.94	18.645		62.06	57.464		60.59
Sec δ , Tan δ	1.250		+0.751	1.007		+0.117	1.039		+0.281	1.053		+0.333
$D\psi\alpha$, $D\omega\alpha$	+0.04		+0.03	+0.06		0.00	+0.05		+0.01	+0.05		+0.01
$D\psi\delta$, $D\omega\delta$	-0.2		-0.8	-0.2		-0.8	-0.2		-0.8	-0.2		-0.8

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	μ Serpentis. Mag. 3.6			12 H. Draconis. Mag. 5.1			ϵ Serpentis. Mag. 3.8			ζ Ursæ Minoris. Mag. 4.3		
	Right Ascension.	Declina- tion.		Right Ascension.	Declina- tion.		Right Ascension.	Declina- tion.		Right Ascension.	Declina- tion.	
	h m 15 45	° ' " — 3 10		h m 15 45	° ' " +62 51		h m 15 46	° ' " + 4 43		h m 15 46	° ' " +78 2	
Jan. 0.9	13.906	34.30		21.40	11.45		37.443	37.84		57.36	51.20	
10.9	14.194 ²⁸⁸	36.02 ¹⁷²		21.81 ⁴¹	8.45 ³⁰⁰		37.725 ²⁸²	35.83 ²⁰¹		58.11 ⁷⁵	48.33 ²⁸⁷	
20.8	14.503 ³⁰⁹	37.69 ¹⁶⁷		22.28 ⁴⁷	5.92 ²⁵³		38.029 ³⁰⁴	33.93 ¹⁹⁰		58.99 ⁸⁸	45.97 ²³⁶	
30.8	14.821 ³¹⁸	39.27 ¹⁵⁸		22.79 ⁵¹	3.94 ¹⁹⁸		38.343 ³¹⁴	32.21 ¹⁷²		59.98 ⁹⁹	44.16 ¹⁸¹	
Feb. 9.8	15.142 ³²¹	40.69 ¹⁴²		23.33 ⁵⁴	2.59 ¹³⁵		38.660 ³¹⁷	30.72 ¹⁴⁹		61.04 ¹⁰⁶	42.99 ¹¹⁷	
19.7	15.458 ³¹⁶	41.89 ¹²⁰		23.87 ⁵⁴	1.90 ⁶⁹		38.974 ³¹⁴	29.54 ¹¹⁸		62.12 ¹⁰⁸	42.50 ⁴⁹	
29.7	15.762 ³⁰⁴	42.86 ⁹⁷		24.40 ⁵³	1.90 ⁰		39.276 ³⁰²	28.68 ⁸⁶		63.20 ¹⁰⁸	42.68 ¹⁸	
Mar. 10.7	16.052 ²⁹⁰	43.54 ⁶⁸		24.91 ⁵¹	2.56 ⁶⁶		39.564 ²⁸⁸	28.16 ⁵²		64.23 ¹⁰³	43.52 ⁸⁴	
20.7	16.323 ²⁷¹	43.96 ⁴²		25.38 ⁴⁷	3.86 ¹³⁰		39.833 ²⁶⁹	28.00 ¹⁶		65.18 ⁹⁵	44.99 ¹⁴⁷	
30.6	16.571 ²⁴⁸	44.09 ¹³		25.79 ⁴¹	5.72 ¹⁸⁶		40.079 ²⁴⁶	28.17 ¹⁷		66.01 ⁸³	47.01 ²⁰²	
Apr. 9.6	16.796 ²²⁵	43.97 ¹²		26.14 ³⁵	8.06 ²³⁴		40.301 ²²²	28.64 ⁴⁷		66.69 ⁶⁸	49.48 ²⁴⁷	
19.6	16.995 ¹⁹⁹	43.63 ³⁴		26.42 ²⁸	10.79 ²⁷³		40.498 ¹⁹⁷	29.38 ⁷⁴		67.22 ⁵³	52.31 ²⁸³	
29.6	17.167 ¹⁷²	43.11 ⁵²		26.62 ²⁰	13.81 ³⁰²		40.667 ¹⁶⁹	30.33 ⁹⁵		67.57 ³⁵	55.40 ³⁰⁹	
May 9.5	17.313 ¹⁴⁶	42.43 ⁶⁸		26.75 ¹³	16.99 ³¹⁸		40.809 ¹⁴²	31.45 ¹¹²		67.73 ¹⁶	58.63 ³²³	
19.5	17.429 ¹¹⁶	41.65 ⁷⁸		26.80 ⁵	20.22 ³²³		40.920 ¹¹¹	32.68 ¹²³		67.72 ¹	61.88 ³²⁵	
29.5	17.516 ⁸⁷	40.81 ⁸⁴		26.78 ²	23.40 ³¹⁸		41.001 ⁸¹	33.97 ¹²⁹		67.51 ²¹	65.04 ³¹⁶	
June 8.4	17.571 ⁵⁵	39.94 ⁸⁷		26.68 ¹⁰	26.44 ³⁰⁴		41.053 ⁵²	35.26 ¹²⁹		67.14 ³⁷	68.05 ³⁰¹	
18.4	17.595 ²⁴	39.07 ⁸⁷		26.51 ¹⁷	29.25 ²⁸¹		41.072 ¹⁹	36.53 ¹²⁷		66.62 ⁶²	70.79 ²⁷⁴	
28.4	17.588 ⁷	38.22 ⁸⁵		26.27 ²⁴	31.74 ²⁴⁹		41.059 ¹³	37.73 ¹²⁰		65.94 ⁵⁸	73.19 ²⁴⁰	
July 8.4	17.540 ³⁹	37.42 ⁸⁰		25.97 ³⁰	33.85 ²¹¹		41.016 ⁴³	38.83 ¹¹⁰		65.13 ⁸¹	75.19 ²⁰⁰	
18.3	17.480 ⁶⁹	36.69 ⁷³		25.61 ³⁶	35.54 ¹⁶⁹		40.944 ⁷²	39.82 ⁹⁹		64.22 ⁹¹	76.75 ¹⁵⁶	
28.3	17.386 ⁹⁴	36.03 ⁶⁶		25.22 ³⁹	36.77 ¹²³		40.846 ⁹⁸	40.66 ⁸⁴		63.23 ⁹⁹	77.82 ¹⁰⁷	
Aug. 7.3	17.268 ¹¹⁸	35.46 ⁵⁷		24.80 ⁴²	37.50 ⁷³		40.723 ¹²³	41.33 ⁶⁷		62.17 ¹⁰⁶	78.39 ⁵⁷	
17.3	17.133 ¹³⁵	34.98 ⁴⁸		24.35 ⁴⁵	37.72 ²²		40.585 ¹³⁸	41.85 ⁵²		61.06 ¹¹¹	78.43 ⁴	
27.2	16.986 ¹⁴⁷	34.61 ³⁷		23.89 ⁴⁶	37.42 ³⁰		40.435 ¹⁵⁰	42.18 ³³		59.95 ¹¹¹	77.95 ⁴⁸	
Sept. 6.2	16.835 ¹⁵¹	34.37 ²⁴		23.43 ⁴⁶	36.60 ⁸²		40.280 ¹⁵⁵	42.31 ¹³		58.84 ¹¹¹	76.96 ⁹⁹	
16.2	16.688 ¹⁴⁷	34.25 ¹²		22.98 ⁴⁵	35.27 ¹³³		40.129 ¹⁵¹	42.24 ⁷		57.77 ¹⁰⁷	75.48 ¹⁴⁸	
26.1	16.554 ¹³⁴	34.28 ³		22.56 ⁴²	33.46 ¹⁸¹		39.991 ¹³⁸	41.95 ²⁹		56.76 ¹⁰¹	73.52 ¹⁹⁶	
Oct. 6.1	16.443 ¹¹¹	34.48 ²⁰		22.19 ³⁷	31.19 ²²⁷		39.876 ¹¹⁵	41.45 ⁵⁰		55.84 ⁹²	71.12 ²⁴⁰	
16.1	16.363 ⁸⁰	34.85 ³⁷		21.87 ³²	28.51 ²⁶⁸		39.790 ⁸⁶	40.71 ⁷⁴		55.03 ⁹¹	68.34 ²⁷⁸	
26.1	16.321 ⁴²	35.41 ⁵⁶		21.62 ²⁵	25.46 ³⁰⁵		39.742 ⁴⁸	39.75 ⁹⁶		54.37 ⁶⁶	65.20 ³¹⁴	
Nov. 5.0	16.324 ³	36.19 ⁷⁸		21.45 ¹⁷	22.11 ³³⁵		39.737 ⁵	38.53 ¹²²		53.86 ⁵¹	61.80 ³⁴⁰	
15.0	16.375 ⁵¹	37.16 ⁹⁷		21.36 ⁹	18.53 ³⁵⁸		39.781 ⁴⁴	37.10 ¹⁴³		53.53 ³³	58.19 ³⁶¹	
25.0	16.477 ¹⁰²	38.35 ¹¹⁹		21.37 ¹	14.81 ³⁷²		39.877 ⁹⁶	35.46 ¹⁶⁴		53.40 ¹³	54.48 ³⁷¹	
Dec. 5.0	16.627 ¹⁵⁰	39.71 ¹³⁶		21.47 ¹⁰	11.05 ³⁷⁶		40.020 ¹⁴³	33.65 ¹⁸¹		53.46 ⁶	50.76 ³⁷²	
14.9	16.824 ¹⁹⁷	41.23 ¹⁵²		21.66 ¹⁹	7.35 ³⁷⁰		40.208 ¹⁸⁸	31.71 ¹⁹⁴		53.74 ²⁸	47.14 ³⁶²	
24.9	17.060 ²³⁶	42.87 ¹⁶⁴		21.95 ²⁹	3.84 ³⁵¹		40.438 ²³⁰	29.70 ²⁰¹		54.20 ⁴⁶	43.73 ³⁴¹	
34.9	17.329 ²⁶⁹	44.56 ¹⁶⁹		22.32 ³⁷	0.62 ³²²		40.702 ²⁶⁴	27.68 ²⁰²		54.84 ⁶⁴	40.63 ³¹⁰	
Mean Place	14.077	26.23		22.961	31.84		37.636	47.80		61.892	72.36	
Sec δ, Tan δ	1.002	-0.055		2.192	+1.951		1.003	+0.083		4.830	+4.725	
Dϕ α, Dα α	+0.06	0.00		+0.02	+0.07		+0.06	0.00		-0.04	+0.17	
Dϕ δ, Dα δ	-0.2	-0.8		-0.2	-0.8		-0.2	-0.8		-0.2	-0.8	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	β Triang. Aust. Mag. 3.0		λ Libræ. Mag. 5.1		γ Serpentis. Mag. 3.9		π Scorpii. Mag. 3.0	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 15 47	° ' " -63 10	h m 15 48	° ' " -19 55	h m 15 52	° ' " +15 55	h m 15 53	° ' " -25 52
	s	"	s	"	s	"	s	"
Jan. 0.9	42.54	17.41	27.059	5.17	34.061	53.71	45.752	26.40
10.9	43.11	16.55	27.369	6.18	34.336	51.29	46.071	27.10
20.8	43.72	16.11	27.699	7.30	34.636	49.08	46.411	27.95
30.8	44.36	16.09	28.040	8.48	34.949	47.14	46.765	28.92
Feb. 9.8	45.01	16.50	28.382	9.66	35.268	45.54	47.122	29.97
19.7	45.67	17.31	28.721	10.81	35.585	44.34	47.474	31.05
29.7	46.30	18.48	29.048	11.92	35.892	43.57	47.817	32.14
Mar. 10.7	46.90	19.97	29.360	12.90	36.186	43.25	48.145	33.20
20.7	47.47	21.76	29.652	13.79	36.461	43.37	48.453	34.20
30.6	48.00	23.79	29.922	14.54	36.712	43.91	48.739	35.12
Apr. 9.6	48.47	26.01	30.168	15.15	36.939	44.81	49.001	35.97
19.6	48.89	28.37	30.388	15.66	37.139	46.04	49.237	36.74
29.6	49.25	30.85	30.581	16.04	37.309	47.52	49.444	37.42
May 9.5	49.54	33.38	30.746	16.33	37.450	49.19	49.622	38.03
19.5	49.77	35.92	30.879	16.52	37.559	50.97	49.768	38.56
29.5	49.93	38.41	30.982	16.66	37.636	52.81	49.880	39.03
June 8.4	50.01	40.80	31.052	16.72	37.682	54.64	49.957	39.43
18.4	50.01	43.04	31.087	16.72	37.694	56.39	49.999	39.75
28.4	49.94	45.05	31.088	16.67	37.673	58.01	50.004	39.99
July 8.4	49.80	46.80	31.055	16.58	37.621	59.49	49.974	40.16
18.3	49.59	48.24	30.990	16.41	37.538	60.76	49.908	40.24
28.3	49.33	49.30	30.895	16.19	37.428	61.80	49.811	40.21
Aug. 7.3	49.01	49.97	30.774	15.90	37.295	62.59	49.685	40.06
17.3	48.66	50.20	30.634	15.55	37.144	63.12	49.540	39.80
27.2	48.29	50.00	30.479	15.16	36.981	63.36	49.378	39.43
Sept. 6.2	47.91	49.35	30.321	14.69	36.811	63.32	49.211	38.95
16.2	47.55	48.27	30.167	14.22	36.647	62.97	49.049	38.38
26.1	47.22	46.80	30.027	13.73	36.494	62.32	48.899	37.74
Oct. 6.1	46.95	44.98	29.912	13.26	36.362	61.38	48.775	37.07
16.1	46.74	42.88	29.829	12.84	36.260	60.14	48.685	36.39
26.1	46.62	40.60	29.788	12.51	36.196	58.59	48.636	35.76
Nov. 5.0	46.59	38.20	29.795	12.31	36.175	56.78	48.639	35.21
15.0	46.67	35.80	29.853	12.26	36.203	54.73	48.694	34.79
25.0	46.85	33.48	29.965	12.40	36.282	52.47	48.806	34.54
Dec. 5.0	47.13	31.36	30.129	12.73	36.411	50.05	48.972	34.48
14.9	47.51	29.49	30.342	13.27	36.588	47.54	49.189	34.63
24.9	47.98	27.96	30.599	14.00	36.808	45.00	49.451	34.99
34.9	48.51	26.82	30.888	14.90	37.064	42.53	49.749	35.54
Mean Place	43.747	21.58	27.273	1.09	34.337	66.11	46.018	23.56
Sec δ , Tan δ	2.216	-1.978	1.064	-0.362	1.040	+0.285	1.111	-0.485
$D\psi\alpha$, $D\omega\alpha$	+0.10	-0.07	+0.07	-0.01	+0.05	+0.01	+0.07	-0.02
$D\psi\delta$, $D\omega\delta$	-0.2	-0.8	-0.2	-0.8	-0.2	-0.8	-0.2	-0.9

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	ϵ Coronæ Borealis. Mag. 4.2		δ Scorpii. Mag. 2.5		θ Draconis. Mag. 4.1		β Scorpii. Mag. 2.9	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 15 54	° ' +27 6	h m 15 55	° ' -22 23	h m 16 0	° ' +58 46	h m 16 0	° ' -19 34
	s 15 54	" +27 6	s 15 55	" -22 23	s 16 0	" +58 46	s 16 0	" -19 34
Jan. 0.9	6.128	58.76	21.538	4.42	17.422	62.41	32.702	39.33
10.9	6.406 ²⁷⁸	56.08 ²⁶⁸	21.849 ³¹¹	5.27 ⁸⁵	17.776 ³⁵⁴	59.31 ³¹⁰	33.004 ³⁰²	40.27 ⁹⁴
20.8	6.713 ³⁰⁷	53.65 ²⁴³	22.181 ³³²	6.24 ⁹⁷	18.186 ⁴¹⁰	56.63 ²⁶⁸	33.327 ³²³	41.31 ¹⁰⁴
30.8	7.035 ³²²	51.61 ²⁰⁴	22.524 ³⁴³	7.29 ¹⁰⁸	18.636 ⁴⁵⁰	54.48 ²¹⁵	33.663 ³³⁶	42.41 ¹¹⁰
Feb. 9.8	7.365 ³³⁰	50.00 ¹⁶¹	22.872 ³⁴⁸	8.39 ¹¹⁰	19.112 ⁴⁷⁶	52.98 ¹⁵⁵	34.004 ³⁴¹	43.52 ¹¹¹
19.8	7.696 ³³¹	48.87 ¹¹³	23.216 ³⁴⁴	9.49 ¹¹⁰	19.598 ⁴⁸⁶	52.03 ⁹⁰	34.342 ³³⁸	44.60 ¹⁰⁸
29.7	8.018 ³²²	48.27 ⁶⁰	23.551 ³³⁵	10.55 ¹⁰⁶	20.079 ⁴⁸¹	51.81 ²²	34.671 ³²⁹	45.61 ¹⁰¹
Mar. 10.7	8.323 ³⁰⁵	48.21 ⁶	23.871 ³²⁰	11.54 ⁹⁹	20.542 ⁴⁶³	52.27 ⁴⁶	34.987 ³¹⁶	46.53 ⁹²
20.7	8.610 ²⁸⁷	48.66 ⁴⁵	24.172 ³⁰¹	12.44 ⁹⁰	20.973 ⁴³¹	53.35 ¹⁰⁸	35.285 ²⁹⁸	47.33 ⁸⁰
30.6	8.871 ²⁶¹	49.60 ⁹⁴	24.452 ²⁸⁰	13.24 ⁸⁰	21.362 ³⁸⁹	55.03 ¹⁶⁸	35.563 ²⁷⁸	47.99 ⁶⁶
Apr. 9.6	9.105 ²³⁴	50.97 ¹³⁷	24.708 ²⁵⁶	13.92 ⁶⁸	21.700 ³³⁵	57.22 ²¹⁹	35.817 ²⁵⁴	48.53 ⁵⁴
19.6	9.308 ²⁰³	52.70 ¹⁷³	24.939 ²³¹	14.51 ⁵⁹	21.979 ²⁷⁹	59.83 ²⁶¹	36.048 ²³¹	48.95 ⁴²
29.6	9.479 ¹⁷¹	54.72 ²⁰²	25.142 ²⁰³	15.00 ⁴⁹	22.196 ²¹⁷	62.75 ²⁹²	36.252 ²⁰⁴	49.26 ³¹
May 9.5	9.617 ¹³⁸	56.93 ²²¹	25.316 ¹⁷⁴	15.40 ⁴⁰	22.347 ¹⁵¹	65.89 ³¹⁴	36.428 ¹⁷⁶	49.47 ²¹
19.5	9.720 ¹⁰³	59.26 ²³³	25.461 ¹⁴⁵	15.72 ³²	22.430 ⁸³	69.11 ³²²	36.575 ¹⁴⁷	49.61 ¹⁴
29.5	9.787 ⁶⁷	61.63 ²³⁷	25.572 ¹¹¹	15.97 ²⁵	22.446 ¹⁶	72.33 ³²²	36.689 ¹¹⁴	49.69 ⁸
June 8.5	9.818 ³¹	63.95 ²³²	25.649 ⁷⁷	16.17 ²⁰	22.394 ⁵²	75.45 ³¹²	36.769 ⁸⁰	49.71 ²
18.4	9.813 ⁵	66.17 ²²²	25.692 ⁴³	16.30 ¹³	22.279 ¹¹⁵	78.36 ²⁹¹	36.816 ⁴⁷	49.68 ³
28.4	9.773 ⁷⁰	68.21 ²⁰⁴	25.698 ⁶	16.37 ⁷	22.102 ¹⁷⁷	81.00 ²⁶⁴	36.826 ¹⁰	49.61 ⁷
July 8.4	9.699 ⁴⁴	70.03 ¹⁸²	25.669 ²⁹	16.38 ¹	21.870 ¹³²	83.30 ²³⁰	36.801 ²⁵	49.49 ¹²
18.3	9.593 ¹⁰⁶	71.58 ¹⁵⁵	25.606 ⁶³	16.32 ⁶	21.590 ²⁸⁰	85.20 ¹⁹⁰	36.743 ⁵⁸	49.33 ¹⁶
28.3	9.460 ¹³³	72.82 ¹²⁴	25.513 ⁹³	16.19 ¹³	21.265 ³²⁵	86.66 ¹⁴⁶	36.654 ⁹⁹	49.12 ²¹
Aug. 7.3	9.301 ¹⁵⁹	73.75 ⁹³	25.392 ¹²¹	15.97 ²²	20.905 ³⁶⁰	87.64 ⁹⁸	36.537 ¹¹⁷	49.12 ²⁷
17.3	9.124 ¹⁷⁷	74.32 ⁵⁷	25.250 ¹⁴²	15.67 ³⁰	20.520 ³⁸⁵	88.13 ⁴⁹	36.399 ¹³⁸	48.85 ³¹
27.2	8.936 ¹⁸⁸	74.52 ²⁰	25.094 ¹⁵⁶	15.30 ³⁷	20.119 ⁴⁰¹	88.09 ⁴	36.246 ¹⁵³	48.54 ³⁶
Sept. 6.2	8.742 ¹⁹⁴	74.34 ¹⁸	24.931 ¹⁶³	14.86 ⁴⁴	19.715 ⁴⁰⁴	87.55 ⁵⁴	36.086 ¹⁶⁰	48.18 ⁴⁰
16.2	8.552 ¹⁹⁰	73.79 ⁵⁵	24.772 ¹⁵⁹	14.36 ⁵⁰	19.320 ³⁹⁵	86.50 ¹⁰⁵	35.928 ¹⁵⁸	47.78 ⁴⁴
26.2	8.375 ¹⁷⁷	72.88 ⁹¹	24.626 ¹⁴⁶	13.82 ⁵⁴	18.945 ³⁷⁵	84.96 ¹⁵⁴	35.782 ¹⁴⁶	47.34 ⁴⁵
Oct. 6.1	8.220 ¹⁵⁵	71.59 ¹²⁹	24.504 ¹²²	13.27 ⁵⁵	18.604 ³⁴¹	82.95 ²⁰¹	35.659 ¹²³	46.89 ⁴³
16.1	8.097 ¹²³	69.94 ¹⁶⁵	24.415 ⁸⁹	12.75 ⁵²	18.309 ²⁹⁵	80.51 ²⁴⁴	35.566 ⁹³	46.46 ³⁸
26.1	8.013 ⁸⁴	67.96 ¹⁹⁸	24.366 ⁴⁹	12.30 ⁴⁵	18.073 ²³⁶	77.69 ²⁸²	35.515 ⁵¹	46.08 ³⁰
Nov. 5.0	7.973 ⁴⁰	65.68 ²²⁸	24.367 ¹	11.95 ³⁵	17.905 ¹⁶⁸	74.50 ³¹⁹	35.509 ⁶	45.78 ¹⁹
15.0	7.985 ¹²	63.13 ²⁵⁵	24.420 ⁵³	11.74 ²¹	17.813 ⁹²	71.06 ³⁴⁴	35.556 ⁴⁷	45.59 ⁶
25.0	8.050 ⁶⁵	60.38 ²⁷⁵	24.528 ¹⁰⁸	11.70 ¹⁶	17.803 ¹⁰	67.45 ³⁶¹	35.656 ¹⁰⁰	45.53 ¹²
Dec. 5.0	8.169 ¹¹⁹	57.50 ²⁸⁸	24.688 ¹⁶⁰	11.86 ¹⁸	17.879 ⁷⁶	63.75 ³⁷⁰	35.807 ¹⁵¹	45.65 ³²
14.9	8.338 ¹⁶⁹	54.55 ²⁹⁵	24.897 ²⁰⁹	12.21 ³⁵	18.040 ¹⁶¹	60.07 ³⁸⁸	36.009 ²⁰²	45.97 ⁴⁹
24.9	8.555 ²¹⁷	51.62 ²⁹³	25.151 ²⁵⁴	12.75 ⁵⁴	18.280 ²⁴⁰	56.53 ³⁵⁴	36.253 ²⁴⁴	46.46 ⁶⁸
34.9	8.811 ²⁵⁶	48.82 ²⁸⁰	25.440 ²⁸⁹	13.49 ⁷⁴	18.593 ³¹³	53.23 ³³⁰	36.532 ²⁷⁹	47.14 ⁸⁴
Mean Place	6.526	73.44	21.789	0.78	18.856	81.45	32.956	34.99
Sec δ , Tan δ	1.123	+0.512	1.081	-0.412	1.929	+1.650	1.061	-0.356
D ϕ α , D ω α	+0.05	+0.02	+0.07	-0.01	+0.02	+0.06	+0.07	-0.01
D ϕ δ , D ω δ	-0.2	-0.9	-0.2	-0.9	-0.2	-0.9	-0.2	-0.9

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	κ Herculis. Mag. 5.3		Groombridge 2390. Mag. 5.4		ϕ Herculis. Mag. 4.3		δ^1 Apodis. Mag. 4.8	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 16 4	° ' " +17 15	h m 16 6	° ' " +68 1	h m 16 6	° ' " +45 8	h m 16 7	° ' " -78 29
Jan. 0.9	16.589	58.80	2.90	33.16	6.525	59.57	40.97	6.30
10.9	16.856	56.37	3.33	30.04	6.819	56.52	42.08	4.70
20.8	17.149	54.14	3.84	27.36	7.151	53.83	43.31	3.47
30.8	17.457	52.19	4.41	25.22	7.513	51.60	44.62	2.76
Feb. 9.8	17.773	50.59	5.02	23.70	7.891	49.91	45.98	2.54
19.8	18.089	49.40	5.66	22.83	8.274	48.82	47.37	2.79
29.7	18.399	48.65	6.30	22.65	8.653	48.37	48.74	3.54
Mar. 10.7	18.697	48.36	6.91	23.14	9.019	48.54	50.07	4.71
20.7	18.976	48.53	7.48	24.30	9.361	49.32	51.34	6.30
30.6	19.236	49.12	8.00	26.03	9.674	50.68	52.52	8.26
Apr. 9.6	19.470	50.11	8.45	28.29	9.953	52.53	53.60	10.54
19.6	19.678	51.42	8.82	30.97	10.192	54.82	54.56	13.07
29.6	19.858	53.01	9.09	33.95	10.388	57.42	55.38	15.83
May 9.5	20.011	54.80	9.28	37.16	10.539	60.25	56.05	18.74
19.5	20.130	56.72	9.36	40.44	10.643	63.21	56.56	21.75
29.5	20.218	58.69	9.35	43.73	10.699	66.20	56.90	24.76
June 8.5	20.272	60.66	9.24	46.91	10.707	69.13	57.06	27.73
18.4	20.291	62.55	9.04	49.86	10.669	71.91	57.05	30.57
28.4	20.275	64.32	8.76	52.55	10.585	74.45	56.85	33.23
July 8.4	20.228	65.93	8.40	54.88	10.459	76.71	56.49	35.62
18.3	20.150	67.33	7.96	56.80	10.292	78.63	55.97	37.68
28.3	20.040	68.50	7.48	58.27	10.091	80.14	55.31	39.34
Aug. 7.3	19.908	69.41	6.94	59.25	9.861	81.24	54.53	40.55
17.3	19.754	70.03	6.37	59.72	9.607	81.88	53.67	41.26
27.2	19.586	70.38	5.79	59.67	9.339	82.06	52.75	41.46
Sept. 6.2	19.413	70.40	5.19	59.09	9.064	81.76	51.81	41.09
16.2	19.240	70.13	4.61	57.99	8.793	80.99	50.89	40.21
26.2	19.078	69.55	4.06	56.41	8.536	79.76	50.04	38.81
Oct. 6.1	18.935	68.64	3.55	54.33	8.303	78.07	49.30	36.93
16.1	18.821	67.44	3.10	51.83	8.106	75.96	48.69	34.63
26.1	18.745	65.93	2.72	48.93	7.953	73.45	48.26	32.03
Nov. 5.0	18.711	64.15	2.44	45.69	7.852	70.62	48.02	29.19
15.0	18.726	62.09	2.25	42.19	7.811	67.50	48.01	26.24
25.0	18.790	59.84	2.18	38.54	7.833	64.17	48.22	23.26
Dec. 5.0	18.905	57.42	2.22	34.79	7.921	60.71	48.65	20.41
14.9	19.070	54.90	2.37	31.08	8.071	57.23	49.30	17.77
24.9	19.277	52.36	2.64	27.51	8.281	53.82	50.14	15.40
34.9	19.524	49.88	3.01	24.19	8.545	50.61	51.15	13.44
Mean Place	16.932	71.16	5.318	52.50	7.374	76.64	44.863	10.94
Sec δ , Tan δ	1.047	+0.311	2.672	+2.478	1.418	+1.005	5.011	-4.910
$D\phi$ α , $D\omega$ α	+0.05	+0.01	0.00	+0.08	+0.04	+0.03	+0.18	-0.16
$D\phi$ δ , $D\omega$ δ	-0.2	-0.9	-0.2	-0.9	-0.2	-0.9	-0.2	-0.9

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	δ Ophiuchi. Mag. 3.0		σ Cor. Bor. seq. Mag. 5.8		19 Ursae Minoris. Mag. 5.5		γ^2 Normae. Mag. 4.1	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 16 9	° ' " - 3 28	h m 16 11	° ' " +34 3	h m 16 13	° ' " +76 4	h m 16 13	° ' " -49 57
	s "	s "	s "	s "	s "	s "	s "	s "
Jan. 0.9	56.253	51.71	31.335	60.45	7.75	62.97	32.018	1.22
10.9	56.525 272	53.34 163	31.605 270	57.57 288	8.32 57	59.87 310	32.420 402	0.61 61
20.8	56.820 285	54.93 159	31.907 302	54.98 259	9.03 71	57.22 265	32.858 438	0.32 29
30.8	57.131 311	56.44 161	32.232 326	52.79 219	9.84 81	55.10 212	33.319 461	0.33 1
Feb. 9.8	57.447 316	57.79 138	32.571 339	51.05 174	10.73 89	53.58 182	33.792 473	0.66 33
	316	113	342	120	94	86	475	60
19.8	57.763	58.92	32.913	49.85	11.67	52.72	34.267	1.26
29.7	58.071 308	59.83 91	33.251 338	49.24 61	12.61 94	52.53 19	34.735 468	2.11 85
Mar. 10.7	58.369 298	60.46 63	33.577 326	49.22 2	13.53 92	53.03 50	35.188 453	3.17 106
20.7	58.651 282	60.82 24	33.884 307	49.72 50	14.40 87	54.16 113	35.620 432	4.44 127
30.7	58.914 263	60.91 9	34.168 284	50.78 106	15.18 78	55.89 173	36.026 406	5.86 143
	243	17	256	153	68	224	377	155
Apr. 9.6	59.157	60.74	34.424	52.31	15.86	58.13	36.403	7.41
19.6	59.376 219	60.36 38	34.649 226	54.26 196	16.41 55	60.80 267	36.745 342	9.07 166
29.6	59.570 194	59.78 58	34.840 191	56.49 223	16.81 40	63.79 299	37.051 306	10.79 172
May 9.5	59.739 169	59.05 73	34.995 155	58.98 249	17.06 25	66.98 319	37.313 262	12.57 178
19.5	59.880 141	58.22 83	35.111 116	61.61 263	17.16 10	70.26 328	37.530 217	14.35 178
	109	89	78	268	6	328	169	178
29.5	59.989	57.33	35.189	64.29	17.10	73.54	37.699	16.13
June 8.5	60.066 77	56.40 93	35.225 26	66.93 264	16.88 22	76.71 317	37.816 117	17.85 172
18.4	60.112 46	55.48 92	35.224 1	69.48 255	16.53 35	79.68 297	37.880 64	19.47 162
28.4	60.123 11	54.59 89	35.180 44	71.82 224	16.04 49	82.36 268	37.889 9	20.97 150
July 8.4	60.101 22	53.75 84	35.100 80	73.93 211	15.43 61	84.70 234	37.845 44	22.29 132
	54	77	116	180	73	193	97	111
18.4	60.047	52.98	34.984	75.73	14.70	86.63	37.748	23.40
28.3	59.963 84	52.31 67	34.834 150	77.21 148	13.89 81	88.12 149	37.605 143	24.26 86
Aug. 7.3	59.852 111	51.71 60	34.660 174	78.35 114	13.01 88	89.11 99	37.420 185	24.83 25
17.3	59.720 132	51.22 49	34.462 196	79.08 73	12.07 94	89.58 47	37.201 219	25.08 57
27.2	59.573 147	50.83 39	34.247 216	79.38 20	11.11 96	89.54 4	36.960 241	25.02 6
	155	25	221	10	97	55	253	40
Sept. 6.2	59.418	50.58	34.026	79.28	10.14	88.99	36.707	24.62
16.2	59.262 156	50.44 14	33.809 217	78.74 54	9.18 96	87.92 107	36.457 250	23.88 74
26.2	59.116 146	50.44 0	33.601 208	77.81 93	8.27 91	86.36 156	36.222 235	22.85 103
Oct. 6.1	58.990 126	50.60 16	33.411 190	76.44 137	7.41 86	84.33 203	36.019 203	21.54 131
16.1	58.891 99	50.92 32	33.253 158	74.69 175	6.65 76	81.86 247	35.858 161	20.01 153
	62	51	118	213	65	285	103	169
26.1	58.829	51.43	33.135	72.56	6.00	79.01	35.755	18.32
Nov. 5.1	58.809 20	52.14 71	33.061 74	70.10 246	5.47 53	75.83 318	35.718 37	16.55 177
15.0	58.837 28	53.03 89	33.041 20	67.36 274	5.10 37	72.38 345	35.753 35	14.77 178
25.0	58.914 77	54.13 110	33.078 37	64.40 296	4.90 20	68.76 362	35.863 110	13.05 172
Dec. 5.0	59.041 127	55.40 127	33.168 90	61.28 312	4.86 4	65.07 369	36.048 185	11.48 157
	175	142	147	318	13	368	254	138
14.9	59.216	56.82	33.315	58.10	4.99	61.39	36.302	10.10
24.9	59.432 216	58.35 153	33.513 198	54.96 314	5.31 32	57.86 353	36.620 318	8.99 111
34.9	59.683 251	59.94 159	33.758 245	51.95 301	5.78 47	54.59 327	36.992 372	8.17 82
Mean Place	56.514	43.81	31.942	75.60	12.164	82.09	32.721	2.23
Sec δ , Tan δ	1.002	-0.061	1.207	+0.676	4.158	+4.037	1.554	-1.190
$D\phi\alpha$, $D\omega\alpha$	+0.06	0.00	+0.05	+0.02	-0.03	+0.12	+0.09	-0.04
$D\phi\delta$, $D\omega\delta$	-0.2	-0.9	-0.2	-0.9	-0.2	-0.9	-0.2	-0.9

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	ϵ Ophiuchi. Mag. 3.3		σ Scorpii. Mag. 3.1		τ Herculis. Mag. 3.9		γ Herculis. Mag. 3.8	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 16 13	° ' " - 4 29	h m 16 16	° ' " - 25 23	h m 16 17	° ' " + 46 30	h m 16 18	° ' " +
Jan. 0.9	52.226 270	26.58 157	4.447 304	35.42 55	11.977 285	29.54 312	12.407 257	46
10.9	52.496 294	28.15 154	4.751 327	35.97 71	12.262 327	26.42 277	12.664 284	43
20.8	52.790 310	29.69 145	5.078 342	36.68 80	12.589 359	23.65 232	12.948 304	41
30.8	53.100 317	31.14 132	5.420 352	37.48 87	12.948 379	21.33 178	13.252 314	39
Feb. 9.8	53.417 316	32.46 111	5.772 351	38.35 90	13.327 388	19.55 118	13.566 317	37
19.8	53.733 311	33.57 90	6.123 345	39.25 90	13.715 386	18.37 55	13.883 312	36
29.7	54.044 298	34.47 63	6.468 334	40.15 87	14.101 376	17.82 10	14.195 302	35
Mar. 10.7	54.342 285	35.10 37	6.802 319	41.02 82	14.477 354	17.92 72	14.497 288	35
20.7	54.627 266	35.47 10	7.121 299	41.84 75	14.831 328	18.64 130	14.785 267	35
30.7	54.893 246	35.57 15	7.420 278	42.59 68	15.159 294	19.94 183	15.052 246	30
Apr. 9.6	55.139 224	35.42 35	7.698 255	43.27 59	15.453 254	21.77 226	15.298 220	37
19.6	55.363 199	35.07 54	7.953 227	43.86 54	15.707 212	24.03 262	15.518 194	38
29.6	55.562 173	34.53 69	8.180 199	44.40 47	15.919 166	26.65 286	15.712 163	40
May 9.5	55.735 145	33.84 79	8.379 168	44.87 43	16.085 118	29.51 300	15.875 131	42
19.5	55.880 114	33.05 86	8.547 136	45.30 37	16.203 69	32.51 306	16.006 99	44
29.5	55.994 82	32.19 88	8.683 100	45.67 32	16.272 19	35.57 300	16.105 64	46
June 8.5	56.076 50	31.31 88	8.783 63	45.99 28	16.291 30	38.57 288	16.169 29	48
18.4	56.126 15	30.43 86	8.846 25	46.27 21	16.261 78	41.45 265	16.198 6	50
28.4	56.141 19	29.57 81	8.871 14	46.48 17	16.183 124	44.10 237	16.192 42	52
July 8.4	56.122 50	28.76 74	8.857 49	46.65 11	16.059 165	46.47 203	16.150 75	54
18.4	56.072 82	28.02 66	8.808 85	46.76 2	15.894 204	48.50 165	16.075 106	55
28.3	55.990 109	27.36 59	8.723 116	46.78 7	15.690 235	50.15 122	15.969 133	57
Aug. 7.3	55.881 131	26.77 49	8.607 141	46.71 17	15.455 260	51.37 77	15.836 154	58
17.3	55.750 146	26.28 39	8.466 160	46.54 18	15.195 279	52.14 31	15.682 173	58
27.2	55.604 156	25.89 27	8.306 169	46.26 37	14.916 287	52.45 18	15.509 180	59
Sept. 6.2	55.448 156	25.62 16	8.137 170	45.89 46	14.629 285	52.27 66	15.329 181	59
16.2	55.292 147	25.46 3	7.967 158	45.43 53	14.344 274	51.61 113	15.148 171	59
26.2	55.145 128	25.43 11	7.809 140	44.90 58	14.070 249	50.48 159	14.977 155	58
Oct. 6.1	55.017 101	25.54 28	7.669 107	44.32 60	13.821 216	48.89 203	14.822 127	57
16.1	54.916 65	25.82 44	7.562 68	43.72 58	13.605 173	46.86 244	14.695 93	56
26.1	54.851 22	26.26 63	7.494 21	43.14 52	13.432 121	44.42 279	14.602 50	54
Nov. 5.1	54.829 25	26.89 82	7.473 32	42.62 41	13.311 61	41.63 309	14.552 2	53
15.0	54.854 74	27.71 101	7.505 87	42.21 27	13.250 4	38.54 332	14.550 49	51
25.0	54.928 125	28.72 120	7.592 143	41.94 12	13.254 69	35.22 346	14.599 100	48
Dec. 5.0	55.053 171	29.92 134	7.735 194	41.82 6	13.323 135	31.76 351	14.699 148	46
14.9	55.224 213	31.26 146	7.929 241	41.88 26	13.458 197	28.25 345	14.847 194	43
24.9	55.437 251	32.72 153	8.170 279	42.14 43	13.655 252	24.80 327	15.041 233	41
34.9	55.688	34.25	8.449	42.57	13.907	21.53	15.274	38
Mean Place	52.498	18.92	4.779	32.01	12.953	46.11	12.831	58
Sec δ , Tan δ	1.003	-0.079	1.107	-0.475	1.453	+1.054	1.060	+0
$D\psi a$, $D_w a$	+0.06	0.00	+0.07	-0.01	+0.04	+0.03	+0.05	+0
$D\psi \delta$, $D_w \delta$	-0.2	-0.9	-0.2	-0.9	-0.2	-0.9	-0.2	-0

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	γ Ursæ Minoris. Mag. 5.0		γ Apodis. Mag. 3.9		ω Herculis. Mag. 4.5		γ Draconis. Mag. 2.9	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 16 19	° ' +75 56	h m 16 20	° ' -78 42	h m 16 21	° ' +14 13	h m 16 22	° ' +61 41
	s 16 19	" +75 56	s 16 20	" -78 42	s 16 21	" +14 13	s 16 22	" +61 41
Jan. 0.9	52.03	39.21	27.44	35.14	31.695	21.94	49.18	57.00
10.9	52.57 ⁵⁴	36.10 ⁸¹¹	28.53 ¹⁰⁹	33.28 ¹⁸⁶	31.950 ²⁵⁵	19.62 ²³²	49.52 ³⁴	53.75 ³²⁵
20.9	53.25 ⁶⁸	33.40 ²⁷⁰	29.75 ¹²²	31.87 ¹⁴¹	32.230 ²⁸⁰	17.48 ²¹⁴	49.92 ⁴⁰	50.90 ²⁸⁵
30.8	54.04 ⁷⁹	31.21 ²¹⁹	31.06 ¹³¹	30.95 ⁹²	32.530 ³⁰⁰	15.56 ¹⁹²	50.37 ⁴⁵	48.56 ²³⁴
Feb. 9.8	54.91 ⁸⁷	29.61 ¹⁶⁰	32.44 ¹³⁸	30.51 ⁴⁴	32.840 ³¹⁰	13.96 ¹⁶⁰	50.87 ⁵⁰	46.77 ¹⁷⁹
	91	94	140	5	311	122	51	112
19.8	55.82	28.67	33.84	30.56	33.151	12.74	51.38	45.65
29.7	56.75 ⁹³	28.40 ²⁷	35.25 ¹⁴¹	31.08 ⁵²	33.460 ³⁰⁹	11.92 ⁸²	51.90 ⁵²	45.19 ⁴⁶
Mar. 10.7	57.67 ⁹²	28.81 ⁴¹	36.63 ¹³⁸	32.06 ⁹⁸	33.758 ²⁹⁸	11.54 ³⁸	52.41 ⁵¹	45.41 ²²
20.7	58.54 ⁸⁷	29.87 ¹⁰⁶	37.95 ¹³²	33.44 ¹³⁸	34.044 ²⁸⁶	11.60 ⁶	52.89 ⁴⁵	46.31 ⁹⁰
30.7	59.33 ⁷⁹	31.52 ¹⁶⁵	39.20 ¹²⁶	35.21 ¹⁷⁷	34.310 ²⁶⁶	12.06 ⁴⁶	53.34 ⁴⁸	47.79 ¹⁴⁸
	68	218	113	212	245	85	39	206
Apr. 9.6	60.01	33.70	40.33	37.33	34.555	12.91	53.73	49.84
19.6	60.57 ⁵⁶	36.32 ²⁶²	41.36 ¹⁰³	39.72 ²³⁹	34.777 ²²²	14.10 ¹¹⁹	54.07 ³⁴	52.36 ²⁵²
29.6	61.00 ⁴³	39.28 ²⁹⁶	42.25 ⁸⁹	42.35 ²⁶³	34.973 ¹⁹⁶	15.55 ¹⁴⁵	54.33 ²⁶	55.22 ²⁸⁶
May 9.6	61.27 ²⁷	42.45 ³¹⁷	43.00 ⁷⁸	45.16 ²⁸¹	35.141 ¹⁶⁸	17.21 ¹⁶⁶	54.52 ¹⁹	58.34 ³¹²
19.5	61.39 ¹²	45.74 ³²⁹	43.57 ⁵⁷	48.09 ³⁹³	35.279 ¹³⁸	19.01 ¹⁸⁰	54.65 ¹³	61.60 ³²⁶
	3	330	40	297	106	188	5	330
29.5	61.36	49.04	43.97	51.06	35.385	20.89	54.70	64.90
June 8.5	61.17 ¹⁹	52.25 ³²¹	44.19 ²²	54.04 ²⁹⁸	35.456 ⁷¹	22.77 ¹⁸⁸	54.87 ³	68.14 ³²⁴
18.4	60.84 ³³	55.27 ³⁰²	44.23 ⁴	56.91 ²⁸⁷	35.494 ³⁸	24.61 ¹⁸⁴	54.58 ⁹	71.21 ³⁰⁷
28.4	60.38 ⁴⁶	58.03 ²⁷⁶	44.09 ¹⁴	59.62 ²⁷¹	35.499 ⁵	26.35 ¹⁷⁴	54.41 ¹⁷	74.06 ²⁸⁵
July 8.4	59.79 ⁷⁹	60.45 ²⁴²	43.76 ³³	62.09 ²⁴⁷	35.468 ³¹	27.94 ¹⁵⁹	54.17 ²⁴	76.58 ²⁸²
	50	202	48	216	65	141	30	215
18.4	59.09 ⁷⁹	62.47 ¹⁵⁸	43.28	64.25	35.403	29.35	53.87	78.73
28.3	58.30 ⁸⁷	64.05 ¹¹⁰	42.64 ⁶⁴	66.04 ¹⁷⁹	35.309 ⁹⁴	30.55 ¹²⁰	53.52 ³⁵	80.46 ¹⁷³
Aug. 7.3	57.43 ⁹²	65.15 ⁶⁰	41.87 ⁷⁷	67.39 ¹³⁵	35.185 ¹²⁴	31.52 ⁹⁷	53.13 ³⁹	81.73 ¹²⁷
17.3	56.51 ⁹²	65.75 ⁹	41.01 ⁸⁶	68.27 ⁸⁸	35.041 ¹⁴⁴	32.22 ⁷⁰	52.71 ⁴²	82.50 ⁷⁷
27.3	55.56 ⁹⁵	65.84 ⁴³	40.08 ⁹⁸	68.63 ³⁶	34.878 ¹⁶³	32.67 ⁴⁵	52.26 ⁴⁵	82.76 ²⁶
	97		96	19	172	16	46	25
Sept. 6.2	54.59	65.41	39.12	68.44	34.706	32.83	51.80	82.51
16.2	53.64 ⁹⁵	64.45 ⁹⁶	38.17 ⁹⁵	67.70 ⁷⁴	34.534 ¹⁷²	32.70 ¹³	51.35 ⁴⁵	81.73 ⁷⁸
26.2	52.72 ⁹²	62.98 ¹⁴⁷	37.27 ⁹⁰	66.44 ¹²⁶	34.370 ¹⁶⁴	32.29 ⁴¹	50.91 ⁴⁴	80.45 ¹²⁸
Oct. 6.1	51.86 ⁸⁶	61.05 ¹⁹³	36.47 ⁸⁰	64.70 ¹⁷⁴	34.221 ¹⁴⁹	31.58 ⁷¹	50.50 ⁴¹	78.68 ¹⁷⁷
16.1	51.08 ⁷⁸	58.69 ²³⁶	35.81 ⁶⁶	62.53 ²¹⁷	34.099 ¹²²	30.58 ¹⁰⁰	50.14 ³⁶	76.44 ²²⁴
	67	278	80	265	87	130	31	266
26.1	50.41	55.91	35.31	59.98	34.012	29.28	49.83	73.78
Nov. 5.1	49.87 ⁵⁴	52.79 ³¹²	35.02 ²⁹	57.20 ²⁷⁸	33.966 ⁴⁶	27.70 ¹⁵⁸	49.61 ²²	70.76 ³⁰²
15.0	49.47 ²³	49.42 ³³⁷	34.93 ⁹	54.26 ²⁹⁴	33.967 ¹	25.88 ¹⁸²	49.45 ¹⁶	67.44 ³³²
25.0	49.24 ⁴⁰	45.84 ³⁶⁸	35.09 ¹⁶	51.27 ²⁹⁹	34.017 ⁵⁰	23.84 ²⁰⁴	49.38 ⁷	63.88 ³⁵⁶
Dec. 5.0	49.18 ⁶	42.16 ³⁶⁶	35.46 ⁵⁹	48.35 ²⁷⁵	34.117 ¹⁰⁰	21.63 ²²¹	49.40 ²	60.20 ³⁶⁸
	11		59	212	149	234	11	370
14.9	49.29	38.50	36.05	45.60	34.266	19.29	49.51	56.50
24.9	49.57 ²⁸	34.96 ³⁵⁴	36.87 ⁸²	43.13 ²⁴⁷	34.460 ¹⁹⁴	16.91 ²³⁸	49.73 ²²	52.88 ³⁶²
34.9	50.01 ⁴⁴	31.65 ³³¹	37.85 ⁹⁸	41.01	34.691 ²³¹	14.55	50.02 ²⁹	49.47 ³⁴¹
Mean Place	56.530	57.77	31.517	38.92	32.083	33.19	51.082	74.65
Sec δ , Tan δ	4.118	+3.995	5.110	-5.010	1.031	+0.253	2.109	+1.857
D ϕ a, D α a	-0.03	+0.11	+0.18	-0.14	+0.05	+0.01	+0.02	+0.05
D ϕ δ , D α δ	-0.2	-0.9	-0.2	-0.9	-0.2	-0.9	-0.2	-0.9

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	α Scorpii. (Antares.) Mag. 1.2			β Herculis. Mag. 2.8			λ Ophiuchi. Mag. 3.8			δ Draconis. Mag. 5.0		
	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.
	h	m	° ' "	h	m	° ' "	h	m	° ' "	h	m	° ' "
	16	24	-26 14	16	26	+21 39	16	26	+ 2 9	16	28	
	s		"	s		"	s		"	s		"
Jan. 0.9	14.891		51.02	35.968		66.06	40.198		52.10	5.58		
	298		46	251		257	256		182	39		
10.9	15.189		51.48	36.219		63.49	40.454		50.28	5.97		
	325		59	279		238	281		175	48		
20.9	15.514		52.07	36.498		61.11	40.735		48.53	6.45		
	341		72	301		207	298		160	55		
30.8	15.855		52.79	36.799		59.04	41.033		46.93	7.00		
	352		79	312		170	308		141	61		
Feb. 9.8	16.207		53.58	37.111		57.34	41.341		45.52	7.61		
	353		82	318		127	311		114	65		
19.8	16.560		54.40	37.429		56.07	41.652		44.38	8.26		
	349		83	315		80	306		85	66		
29.7	16.909		55.23	37.744		55.27	41.958		43.53	8.92		
	337		81	305		30	299		54	64		
Mar. 10.7	17.246		56.04	38.049		54.97	42.257		42.99	9.56		
	324		76	293		20	286		20	62		
20.7	17.570		56.80	38.342		55.17	42.543		42.79	10.18		
	306		70	275		67	269		13	57		
30.7	17.876		57.50	38.617		55.84	42.812		42.92	10.75		
	286		65	252		110	250		41	50		
Apr. 9.6	18.162		58.15	38.869		56.94	43.062		43.33	11.25		
	263		59	229		146	228		68	43		
19.6	18.425		58.74	39.098		58.40	43.290		44.01	11.68		
	238		53	200		178	204		90	34		
29.6	18.663		59.27	39.298		60.18	43.494		44.91	12.02		
	209		48	170		201	179		107	23		
May 9.6	18.872		59.75	39.468		62.19	43.673		45.98	12.25		
	178		43	139		216	150		120	14		
19.5	19.050		60.18	39.607		64.35	43.823		47.18	12.39		
	146		39	105		224	120		126	4		
29.5	19.196		60.57	39.712		66.59	43.943		48.44	12.43		
	100		36	69		224	89		129	6		
June 8.5	19.305		60.93	39.781		68.83	44.032		49.73	12.37		
	71		32	33		217	55		127	16		
18.4	19.376		61.25	39.814		71.00	44.087		51.00	12.21		
	33		27	2		205	20		122	27		
28.4	19.409		61.52	39.812		73.05	44.107		52.22	11.94		
	7		22	40		187	13		113	34		
July 8.4	19.402		61.74	39.772		74.92	44.094		53.35	11.60		
	44		14	74		165	48		102	42		
18.4	19.358		61.88	39.698		76.57	44.046		54.37	11.18		
	82		7	107		140	79		90	49		
28.3	19.276		61.95	39.591		77.97	43.967		55.27	10.69		
	114		2	135		111	108		74	35		
Aug. 7.3	19.162		61.93	39.456		79.08	43.859		56.01	10.14		
	139		12	159		80	131		60	59		
17.3	19.023		61.81	39.297		79.88	43.728		56.61	9.55		
	161		23	176		49	148		43	61		
27.3	18.862		61.58	39.121		80.37	43.580		57.04	8.94		
	172		34	186		14	160		25	63		
Sept. 6.2	18.690		61.24	38.935		80.51	43.420		57.29	8.31		
	173		43	188		20	161		7	63		
16.2	18.517		60.81	38.747		80.31	43.259		57.36	7.68		
	164		52	180		56	155		11	61		
26.2	18.353		60.29	38.567		79.75	43.104		57.25	7.07		
	145		58	163		89	139		32	57		
Oct. 6.1	18.208		59.71	38.404		78.86	42.965		56.93	6.50		
	114		61	139		124	113		53	52		
16.1	18.094		59.10	38.265		77.62	42.852		56.40	5.98		
	75		60	103		157	79		74	44		
26.1	18.019		58.50	38.162		76.05	42.773		55.66	5.54		
	28		56	61		186	38		96	36		
Nov. 5.1	17.991		57.94	38.101		74.19	42.735		54.70	5.18		
	24		47	15		216	8		117	25		
15.0	18.015		57.47	38.086		72.03	42.743		53.53	4.93		
	80		35	36		238	56		136	14		
25.0	18.095		57.12	38.122		69.65	42.799		52.17	4.79		
	134		19	88		257	106		155	3		
Dec. 5.0	18.229		56.93	38.210		67.08	42.905		50.62	4.76		
	187		2	138		267	153		169	0		
15.0	18.416		56.91	38.348		64.41	43.058		48.93	4.85		
	234		17	186		270	197		178	22		
24.9	18.650		57.08	38.534		61.71	43.255		47.15	5.07		
	275		33	226		265	233		181	32		
34.9	18.925		57.41	38.760		59.06	43.488		45.34	5.39		
Mean Place	15.249		47.60	36.454		78.47	40.530		60.96	8.454		
Sec δ , Tan δ	1.115		-0.493	1.076		+0.397	1.001		+0.038	2.783		
$D\psi\alpha$, $D\omega\alpha$	+0.07		-0.01	+0.05		+0.01	+0.06		0.00	0.00		
$D\psi\delta$, $D\omega\delta$	-0.2		-0.9	-0.2		-0.9	-0.2		-0.9	-0.2		

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	τ Scorpii. Mag. 2.9		σ Herculis. Mag. 4.2		ζ Ophiuchi. Mag. 2.7		η Scorpii. Mag. 5.0	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 16 30	° ' -28 2	h m 16 31	° ' +42 36	h m 16 32	° ' -10 23	h m 16 36	° ' -17 34
	s	"	s	"	s	"	s	"
Jan. 0.9	38.625	37.22	22.746	19.14	31.569	58.69	42.406	54.87
10.9	38.922 ²⁹⁷	37.54 ³²	23.007 ²⁶¹	16.02 ³¹²	31.832 ²⁶³	59.90 ¹²¹	42.677 ²⁷¹	55.69 ⁸²
20.9	39.247 ³²⁵	38.01 ⁴⁷	23.309 ³⁰²	13.22 ²⁸⁰	32.121 ²⁸⁹	61.13 ¹²³	42.975 ²⁹⁸	56.58 ⁸⁹
30.8	39.590 ³⁴³	38.60 ⁵⁹	23.643 ³³⁴	10.83 ²³⁹	32.430 ³⁰⁹	62.32 ¹¹⁹	43.291 ³¹⁵	57.51 ⁹³
Feb. 9.8	39.945 ³⁵⁵	39.29 ⁶⁹	23.998 ³⁵⁵	8.94 ¹⁸⁹	32.746 ³¹⁶	63.44 ¹¹²	43.617 ³²⁶	58.42 ⁹¹
	357	74	366	131	320	99	331	86
19.8	40.302	40.03	24.364	7.63	33.066	64.43	43.948	59.28
29.7	40.657 ³⁶⁵	40.79 ⁷⁶	24.731 ³⁶⁷	6.92 ⁷¹	33.383 ³¹⁷	65.25 ⁸²	44.276 ³²⁸	60.05 ⁷⁷
Mar. 10.7	41.001 ³⁴⁴	41.56 ⁷⁷	25.091 ³⁶⁰	6.84 ⁸	33.691 ³⁰⁸	65.88 ⁶³	44.597 ³²¹	60.70 ⁶⁵
20.7	41.332 ³³¹	42.30 ⁷⁴	25.435 ³⁴⁴	7.38 ⁵⁴	33.988 ²⁹⁷	66.31 ⁴³	44.905 ³⁰⁶	61.23 ⁵³
30.7	41.648 ³¹⁶	43.00 ⁷⁰	25.756 ³²¹	8.50 ¹¹²	34.270 ²⁸²	66.52 ²¹	45.200 ²⁹⁵	61.62 ³⁹
	294	67	293	165	263	2	276	25
Apr. 9.6	41.942	43.67	26.049	10.15	34.533	66.54	45.476	61.87
19.6	42.214 ²⁷²	44.29 ⁶²	26.308 ²⁵⁹	12.25 ²¹⁰	34.777 ²⁴⁴	66.38 ¹⁶	45.731 ²⁵⁵	62.01 ¹⁴
29.6	42.461 ²⁴⁷	44.87 ⁵⁸	26.529 ²²¹	14.73 ²⁴⁸	34.997 ²²⁰	66.06 ³²	45.964 ²³³	62.04 ³
May 9.6	42.679 ²¹⁸	45.41 ⁵⁴	26.710 ¹⁸¹	17.47 ²⁷⁴	35.192 ¹⁹⁵	65.63 ⁴³	46.170 ²⁰⁶	61.98 ⁶
19.5	42.867 ¹⁸⁸	45.92 ⁵¹	26.847 ¹³⁷	20.38 ²⁹¹	35.358 ¹⁶⁶	65.12 ⁵¹	46.349 ¹⁷⁹	61.86 ¹²
	153	47	92	298	138	57	148	16
29.5	43.020 ¹¹⁷	46.39 ⁴⁵	26.939 ⁴⁴	23.36 ²⁹⁷	35.496 ¹⁰⁴	64.55 ⁶¹	46.497 ¹¹³	61.70 ²⁰
June 8.5	43.137 ⁷⁹	46.84 ⁴⁰	26.983 ⁰	26.33 ²⁸⁷	35.600 ⁶⁹	63.94 ⁶⁰	46.610 ⁷⁹	61.50 ²¹
18.4	43.216 ³⁹	47.24 ³⁷	26.983 ⁴⁸	29.20 ²⁶⁸	35.669 ³⁹	63.34 ⁶⁰	46.689 ⁴²	61.29 ²¹
28.4	43.255 ¹	47.61 ³¹	26.935 ⁹³	31.88 ²⁴⁵	35.704 ¹	62.74 ⁶⁷	46.731 ⁵	61.08 ²²
July 8.4	43.254 ⁴¹	47.92 ²³	26.842 ¹³⁵	34.33 ²¹²	35.703 ³⁷	62.17 ⁵³	46.736 ³³	60.86 ²²
18.4	43.213 ⁷⁸	48.15 ¹⁵	26.707 ¹⁷³	36.45 ¹⁷⁷	35.666 ⁷¹	61.64 ⁵⁰	46.703 ⁶⁹	60.64 ²³
28.3	43.135 ¹⁴⁰	48.30 ⁶	26.534 ²⁰⁷	38.22 ¹³⁶	35.595 ¹⁰¹	61.14 ⁴⁴	46.634 ¹⁰⁰	60.41 ²⁴
Aug. 7.3	43.022 ¹¹³	48.36 ⁶	26.327 ²³³	39.58 ⁹⁶	35.494 ¹²⁷	60.70 ⁴⁰	46.534 ¹²⁸	60.17 ²⁷
17.3	42.882 ¹⁶³	48.30 ¹⁷	26.094 ²⁵⁴	40.54 ⁴⁹	35.367 ¹⁴⁵	60.30 ³⁶	46.406 ¹⁴⁸	59.90 ²⁷
27.3	42.719 ¹⁷⁴	48.13 ³¹	25.840 ²⁶⁴	41.03 ³	35.222 ¹⁵⁸	59.94 ³⁰	46.258 ¹⁶¹	59.63 ²⁹
Sept. 6.2	42.545 ¹⁷⁷	47.82 ⁴²	25.576 ²⁶⁶	41.06 ⁴⁴	35.064 ¹⁶¹	59.64 ²³	46.097 ¹⁶⁵	59.34 ³⁰
16.2	42.368 ¹⁶⁹	47.40 ⁵²	25.310 ²⁵⁷	40.62 ⁹⁰	34.903 ¹⁵⁴	59.41 ¹⁶	45.932 ¹⁶⁰	59.04 ³⁰
26.2	42.199 ¹⁵²	46.88 ⁶⁰	25.053 ²³⁹	39.72 ¹³⁶	34.749 ¹³⁹	59.25 ⁸	45.772 ¹⁴⁴	58.74 ²⁸
Oct. 6.1	42.047 ¹²¹	46.28 ⁶⁵	24.814 ²⁰⁸	38.36 ¹⁸⁰	34.610 ¹¹²	59.17 ²	45.628 ¹¹⁶	58.46 ²⁴
16.1	41.926 ⁸²	45.63 ⁶⁷	24.606 ¹⁶⁹	36.56 ²²¹	34.498 ⁷⁸	59.19 ¹⁴	45.512 ⁸²	58.22 ¹⁸
26.1	41.844 ³⁵	44.96 ⁶⁵	24.437 ¹²¹	34.35 ²⁵⁸	34.420 ³⁶	59.33 ²⁹	45.430 ⁴⁰	58.04 ¹⁰
Nov. 5.1	41.809 ¹⁷	44.31 ⁵⁸	24.316 ⁶⁶	31.77 ²⁸⁸	34.384 ¹¹	59.62 ⁴⁴	45.390 ¹⁰	57.94 ²
15.0	41.826 ⁷³	43.73 ⁴²	24.250 ⁷	28.89 ³¹⁶	34.395 ⁶¹	60.06 ⁷¹	45.400 ⁶¹	57.96 ¹⁶
25.0	41.899 ¹²⁹	43.26 ³⁷	24.243 ⁵⁷	25.73 ³³¹	34.456 ¹¹¹	60.67 ⁶⁸	45.461 ¹¹³	58.12 ³²
Dec. 5.0	42.028 ¹⁸³	42.94 ¹⁷	24.300 ¹¹⁸	22.42 ³⁴⁰	34.567 ¹⁵⁹	61.45 ⁹²	45.574 ¹⁶³	58.44 ⁴⁶
15.0	42.211 ²³²	42.77 ¹	24.418 ¹⁷⁶	19.02 ³³⁸	34.726 ²⁰⁴	62.37 ¹⁰⁵	45.737 ²⁰⁸	58.90 ⁶¹
24.9	42.443 ²⁷³	42.78 ¹⁹	24.594 ²³⁰	15.64 ³²³	34.930 ²⁴¹	63.42 ¹¹⁵	45.945 ²⁴⁷	59.51 ⁷⁴
34.9	42.716	42.97	24.824	12.41	35.171	64.57	46.192	60.25
Mean Place	39.012	33.99	23.682	34.34	31.894	52.23	42.753	49.68
Sec δ , Tan δ	1.133	-0.533	1.358	+0.920	1.017	-0.184	1.049	-0.317
D ϕ α , D α α	+0.07	-0.01	+0.04	+0.02	+0.07	0.00	+0.07	-0.01
D ϕ δ , D α δ	-0.2	-0.9	-0.2	-0.9	-0.1	-0.9	-0.1	-0.9

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	ζ Herculis. Mag. 3.0		α Triang. Aust. Mag. 1.9		η Herculis. Mag. 3.6		Groombridge Mag. 4.	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	
	h m 16 38	° ' " +31 44	h m 16 39	° ' " -68 52	h m 16 40	° ' " +39 4	h m 16 43	
	s 16 38	" +31 44	s 16 39	" -68 52	s 16 40	" +39 4	s 16 43	
Jan. 0.9	6.458	62.11	43.51	28.66	0.047	38.49	40.495	
10.9	6.702	59.22	44.11	26.94	0.295	35.41	40.775	
20.9	6.978	56.60	44.79	25.58	0.581	32.61	41.116	
30.8	7.282	54.32	45.52	24.64	0.899	30.21	41.506	
Feb. 9.8	7.603	52.47	46.29	24.12	1.238	28.27	41.933	
19.8	7.933	51.12	47.09	24.01	1.589	26.89	42.384	
29.8	8.264	50.30	47.88	24.32	1.941	26.09	42.844	
Mar. 10.7	8.589	50.07	48.67	25.01	2.288	25.90	43.300	
20.7	8.902	50.40	49.43	26.07	2.622	26.31	43.740	
30.7	9.196	51.27	50.16	27.45	2.937	27.30	44.152	
Apr. 9.6	9.468	52.63	50.84	29.14	3.227	28.82	44.529	
19.6	9.712	54.41	51.47	31.08	3.486	30.80	44.860	
29.6	9.926	56.55	52.02	33.25	3.711	33.13	45.137	
May 9.6	10.108	58.96	52.50	35.59	3.900	35.76	45.357	
19.5	10.253	61.55	52.91	38.06	4.047	38.57	45.515	
29.5	10.360	64.22	53.22	40.60	4.152	41.48	45.609	
June 8.5	10.428	66.91	53.44	43.15	4.214	44.39	45.639	
18.5	10.456	69.51	53.54	45.66	4.230	47.21	45.602	
28.4	10.443	71.98	53.56	48.06	4.202	49.87	45.500	
July 8.4	10.390	74.25	53.48	50.29	4.131	52.30	45.340	
18.4	10.300	76.24	53.30	52.26	4.018	54.45	45.123	
28.3	10.173	77.93	53.03	53.93	3.866	56.25	44.855	
Aug. 7.3	10.015	79.29	52.67	55.24	3.682	57.68	44.542	
17.3	9.831	80.27	52.25	56.14	3.469	58.71	44.194	
27.3	9.626	80.86	51.79	56.60	3.236	59.31	43.819	
Sept. 6.2	9.409	81.05	51.29	56.57	2.990	59.46	43.430	
16.2	9.190	80.82	50.80	56.07	2.740	59.15	43.036	
26.2	8.977	80.17	50.31	55.10	2.497	58.40	42.651	
Oct. 6.2	8.779	79.12	49.89	53.68	2.270	57.20	42.289	
16.1	8.607	77.68	49.52	51.85	2.071	55.56	41.961	
26.1	8.470	75.84	49.24	49.69	1.908	53.52	41.681	
Nov. 5.1	8.375	73.66	49.06	47.29	1.791	51.12	41.459	
15.0	8.331	71.17	49.00	44.71	1.726	48.38	41.304	
25.0	8.339	68.43	49.07	42.07	1.718	45.37	41.226	
Dec. 5.0	8.401	65.50	49.27	39.49	1.770	42.18	41.228	
15.0	8.518	62.45	49.59	37.02	1.880	38.90	41.311	
24.9	8.687	59.41	50.03	34.77	2.045	35.61	41.472	
34.9	8.902	56.44	50.57	32.82	2.262	32.43	41.708	
Mean Place	7.157	75.50	45.431	30.55	0.928	52.71	42.208	
Sec δ , Tan δ	1.176	+0.619	2.775	-2.589	1.288	+0.812	1.833	
$D\psi\alpha$, $D\omega\alpha$	+0.05	+0.01	+0.13	-0.06	+0.04	+0.02	+0.02	
$D\psi\delta$, $D\omega\delta$	-0.1	-0.9	-0.1	-0.9	-0.1	-0.9	-0.1	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	♌ Scorpii. Mag. 2.4			♐ Herculis. Mag. 6.4			♈ Aræ. Mag. 4.2			♏ Ophiuchi. Mag. 3.4		
	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.
	h m 16 44	s 300	° ' " -34 8	h m 16 48	s 232	° ' " +15 6	h m 16 52	s 380	° ' " -53 1	h m 16 53	s 229	° ' " + 9 29
Jan. 0.9	42.672		33.59	14.860		40.74	52.084		58.59	41.017		67.60
10.9	42.972	300	33.49	15.092	232	38.41	52.464	116	57.43	41.246	229	65.52
20.9	43.304	332	33.56	15.355	263	36.23	52.890	426	56.55	41.505	259	63.54
30.8	43.660	356	33.81	15.640	285	34.27	53.352	462	55.98	41.786	281	61.74
Feb. 9.8	44.023	368	34.20	15.939	299	32.62	53.836	484	55.70	42.081	295	60.21
	375		50	308		128	497		1	303		122
19.8	44.403		34.70	16.247		31.34	54.333		55.69	42.384		58.99
29.8	44.777	374	35.29	16.555	308	30.48	54.834	501	55.98	42.689	305	58.14
Mar. 10.7	45.145	368	35.94	16.857	302	30.05	55.328	494	56.51	42.990	301	57.67
20.7	45.501	356	36.65	17.151	294	30.06	55.810	482	57.28	43.282	292	57.61
30.7	45.842	341	37.38	17.431	280	30.52	56.273	463	58.26	43.561	279	57.93
	322		75	262		86	439		119	263		69
Apr. 9.7	46.164		38.13	17.693		31.38	56.712		59.45	43.824		58.62
19.6	46.463	299	38.89	17.935	242	32.59	57.121	409	60.79	44.069	245	59.62
29.6	46.738	275	39.67	18.152	217	34.09	57.495	374	62.28	44.292	223	60.91
May 9.6	46.983	245	40.45	18.344	192	35.83	57.828	333	63.89	44.489	197	62.40
19.5	47.195	212	41.23	18.506	162	37.73	58.116	288	65.58	44.658	169	64.04
	177		78	131		199	236		176	140		173
29.5	47.372	138	42.01	18.637	98	39.72	58.352	182	67.34	44.798	106	65.77
June 8.5	47.510	97	42.78	18.735	61	41.73	58.534	124	69.11	44.904	71	67.53
18.5	47.607	52	43.52	18.796	24	43.72	58.658	63	70.87	44.975	35	69.27
28.4	47.659	8	44.22	18.820	12	45.61	58.721	0	72.55	45.010	0	70.92
July 8.4	47.667	36	44.87	18.808	48	47.37	58.721	60	74.13	45.010	38	72.47
			55			157			143			140
18.4	47.631	78	45.42	18.760	82	48.94	58.661	116	75.56	44.972	72	73.87
28.4	47.553	116	45.87	18.678	114	50.31	58.545	172	76.77	44.900	104	75.10
Aug. 7.3	47.437	147	46.17	18.564	140	51.42	58.373	215	77.73	44.796	131	76.11
17.3	47.290	175	46.33	18.424	162	52.30	58.158	250	78.41	44.665	152	76.91
27.3	47.115	189	46.32	18.262	174	52.89	57.908	272	78.75	44.513	168	77.49
			20			31			34			33
Sept. 6.2	46.926		46.12	18.088		53.20	57.636		78.76	44.345		77.82
16.2	46.731	195	45.75	17.909	179	53.22	57.355	281	78.40	44.171	174	77.91
26.2	46.542	189	45.21	17.732	177	52.92	57.080	275	77.69	44.001	170	77.74
Oct. 6.2	46.372	170	44.51	17.571	161	52.33	56.829	251	76.65	43.843	158	77.31
16.1	46.229	143	43.70	17.430	141	51.44	56.614	215	75.33	43.707	136	76.61
	102		89	108		120	163		158	106		95
26.1	46.127		42.81	17.322		50.24	56.451		73.75	43.601		75.66
Nov. 5.1	46.072	55	41.89	17.252	70	48.76	56.352	99	71.99	43.533	68	74.45
15.1	46.074	2	40.98	17.226	26	47.01	56.325	27	70.12	43.509	24	73.00
25.0	46.134	60	40.13	17.249	23	45.03	56.376	51	68.22	43.533	24	71.31
Dec. 5.0	46.252	118	39.40	17.322	73	42.85	56.506	130	66.36	43.605	72	69.46
	175		59	122		230	208		175	121		201
15.0	46.427		38.81	17.444		40.55	56.714		64.61	43.726		67.45
24.9	46.656	229	38.38	17.612	168	38.17	56.994	280	63.05	43.891	165	65.37
34.9	46.928	272	38.15	17.820	208	35.81	57.337	343	61.71	44.097	206	63.27
Mean Place	43.148		30.98	15.353		51.28	52.977		58.16	41.476		77.13
Sec δ, Tan δ	1.209		-0.678	1.036		+0.270	1.663		-1.329	1.014		+0.167
D α , D α	+0.08		-0.01	+0.05		+0.01	+0.09		-0.03	+0.06		0.00
D δ , D δ	-0.1		-0.9	-0.1		-1.0	-0.1		-1.0	-0.1		-1.0

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	30 Ophiuchi. Mag. 5.0		ϵ Herculis. Mag. 3.9		δ Herculis. Mag. 5.3		η Ophi. Mag.	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	
	h m 16 56	° ' s — 4 5	h m 16 57	° ' s +31 2	h m 16 58	° ' s +33 40	h m 17 5	
	s	"	s	"	s	"	s	
Jan. 0.9	37.440	58.44	3.744	45.48	29.373	68.37	33.108	
	238	143	225	291	225	298	244	
10.9	37.678	59.87	3.969	42.57	29.598	65.39	33.352	
	266	140	262	267	261	275	274	
20.9	37.944	61.27	4.231	39.90	29.859	62.64	33.626	
	286	133	289	236	294	241	297	
30.8	38.230	62.60	4.520	37.54	30.153	60.23	33.923	
	302	118	311	194	314	198	312	
Feb. 9.8	38.532	63.78	4.831	35.60	30.467	58.25	34.235	
	308	100	323	146	328	149	319	
19.8	38.840	64.78	5.154	34.14	30.795	56.76	34.554	
	309	76	328	92	334	94	323	
29.8	39.149	65.54	5.482	33.22	31.129	55.82	34.877	
	304	51	325	37	333	36	319	
Mar. 10.7	39.453	66.05	5.807	32.85	31.462	55.46	35.196	
	298	24	317	19	323	20	313	
20.7	39.751	66.29	6.124	33.04	31.785	55.66	35.509	
	286	2	302	75	309	79	302	
30.7	40.037	66.27	6.426	33.79	32.094	56.45	35.811	
	271	28	284	124	288	129	289	
Apr. 9.7	40.308	65.99	6.710	35.03	32.382	57.74	36.100	
	252	49	259	169	264	176	273	
19.6	40.560	65.50	6.969	36.72	32.646	59.50	36.373	
	233	70	232	207	237	214	252	
29.6	40.793	64.80	7.201	38.79	32.883	61.64	36.625	
	208	84	201	235	204	242	229	
May 9.6	41.001	63.96	7.402	41.14	33.087	64.06	36.854	
	182	94	166	256	166	265	203	
19.5	41.183	63.02	7.568	43.70	33.253	66.71	37.057	
	153	101	129	268	130	277	172	
29.5	41.336	62.01	7.697	46.38	33.383	69.48	37.229	
	121	105	91	270	88	280	141	
June 8.5	41.457	60.96	7.788	49.08	33.471	72.28	37.370	
	87	103	49	267	47	276	104	
18.5	41.544	59.93	7.837	51.75	33.518	75.04	37.474	
	50	99	8	253	4	262	67	
28.4	41.594	58.94	7.845	54.28	33.522	77.66	37.541	
	13	93	34	236	40	244	27	
July 8.4	41.607	58.01	7.811	56.64	33.482	80.10	37.568	
	23	85	74	210	79	217	12	
18.4	41.584	57.16	7.737	58.74	33.403	82.27	37.556	
	59	74	112	183	118	191	49	
28.4	41.525	56.42	7.625	60.57	33.285	84.18	37.507	
	90	64	145	150	155	156	86	
Aug. 7.3	41.435	55.78	7.480	62.07	33.130	85.74	37.421	
	119	54	176	114	183	117	116	
17.3	41.316	55.24	7.304	63.21	32.947	86.91	37.305	
	142	42	197	75	207	79	141	
27.3	41.174	54.82	7.107	63.96	32.740	87.70	37.164	
	157	31	214	36	221	37	158	
Sept. 6.2	41.017	54.51	6.893	64.32	32.519	88.07	37.006	
	164	17	220	46	230	7	168	
16.2	40.853	54.34	6.673	64.27	32.289	88.00	36.838	
	161	4	218	5	229	47	161	
26.2	40.692	54.30	6.455	63.81	32.060	87.53	36.672	
	150	9	203	87	212	91	155	
Oct. 6.2	40.542	54.39	6.252	62.94	31.848	86.62	36.517	
	127	25	182	128	192	134	133	
16.1	40.415	54.64	6.070	61.66	31.656	85.28	36.384	
	98	40	149	168	159	173	102	
26.1	40.317	55.04	5.921	59.98	31.497	83.55	36.282	
	58	57	109	203	118	211	64	
Nov. 5.1	40.259	55.61	5.812	57.95	31.379	81.44	36.218	
	15	76	63	235	70	244	17	
15.1	40.244	56.37	5.749	55.60	31.309	79.00	36.201	
	33	91	10	264	17	271	12	
25.0	40.277	57.28	5.739	52.96	31.292	76.29	36.233	
	82	108	43	283	39	294	82	
Dec. 5.0	40.359	58.36	5.782	50.13	31.331	73.35	36.315	
	130	123	99	298	91	306	133	
15.0	40.489	59.59	5.881	47.15	31.422	70.29	36.448	
	174	133	149	302	147	311	178	
24.9	40.663	60.92	6.030	44.13	31.569	67.18	36.626	
	214	139	196	296	193	306	220	
34.9	40.877	62.31	6.226	41.17	31.762	64.12	36.846	
Mean Place	37.836	51.02	4.510	57.72	30.204	80.81	33.513	
Sec δ , Tan δ	1.003	-0.072	1.167	+0.602	1.202	+0.667	1.039	
D ψ α , D ω α	+0.06	0.00	+0.05	+0.01	+0.04	+0.01	+0.07	
D ψ δ , D ω δ	-0.1	-1.0	-0.1	-1.0	-0.1	-1.0	-0.1	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	η Scorpii. Mag. 3.4		ζ Draconis. Mag. 3.2		α Herculis. Var. 3.1-3.9		δ Herculis. Mag. 3.2	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 17 6	° ' -43 7	h m 17 8	° ' +65 48	h m 17 10	° ' +14 28	h m 17 11	° ' +24 55
	s 17 6	" -43 7	s 17 8	" +65 48	s 17 10	" +14 28	s 17 11	" +24 55
Jan. 0.9	7.378	49.31	29.62	50.73	48.441	57.09	34.131	64.20
10.9	7.690 ³¹²	48.56 ⁷⁵	29.90 ²⁸	47.30 ³⁴³	48.654 ²¹³	54.80 ²²⁹	34.341 ²¹⁰	61.49 ²⁷¹
20.9	8.042 ³⁵²	48.01 ⁵⁵	30.26 ³⁶	44.16 ³¹⁴	48.900 ²⁴⁶	52.66 ²¹⁴	34.585 ²⁴⁴	58.97 ²⁵²
30.9	8.423 ³⁸¹	47.68 ¹³	30.70 ⁴⁰	41.43 ²⁷³	49.170 ²⁷⁰	50.71 ¹⁹⁵	34.859 ²⁷⁴	56.72 ²²⁵
Feb. 9.8	8.826 ⁴⁰³	47.55 ²³	31.20 ⁵⁴	39.22 ²²¹	49.458 ²⁸⁸	49.05 ¹⁶⁶	35.153 ²⁹⁴	54.81 ¹⁹¹
	414	6	54	163	298	130	308	147
19.8	9.240	47.61	31.74	37.59	49.756	47.75	35.461	53.34
29.8	9.659 ⁴¹⁹	47.86 ²⁵	32.31 ⁵⁷	36.63 ⁹⁶	50.062 ³⁰⁶	46.83 ⁹²	35.775 ³¹⁴	52.35 ⁹⁹
Mar. 10.7	10.076 ⁴¹⁷	48.26 ⁴⁰	32.89 ⁵⁸	36.33 ³⁰	50.364 ³⁰²	46.36 ⁴⁷	36.089 ³¹⁴	51.89 ⁴⁶
20.7	10.484 ⁴⁰⁸	48.80 ⁵⁴	33.47 ⁵⁸	36.73 ⁴⁰	50.662 ²⁹⁸	46.33 ³	36.396 ³⁰⁷	51.94 ⁵
30.7	10.878 ³⁹⁴	49.48 ⁶⁸	34.01 ⁵⁴	37.77 ¹⁰⁴	50.949 ²⁸⁷	46.73 ⁴⁰	36.694 ²⁹⁸	52.51 ⁵⁷
	378	78	51	165	274	81	283	104
Apr. 9.7	11.256	50.26	34.52	39.42	51.223	47.54	36.977	53.55
19.6	11.611 ³⁵⁶	51.14 ⁸⁸	34.97 ⁴⁵	41.61 ²¹⁹	51.479 ²⁵⁶	48.72 ¹¹⁸	37.239 ²⁶²	55.02 ¹⁴⁷
29.6	11.940 ³²⁹	52.12 ⁹⁸	35.35 ³⁸	44.24 ²⁶³	51.714 ²³⁵	50.20 ¹⁴⁸	37.478 ²³⁹	56.85 ¹⁸³
May 9.6	12.237 ²⁹⁷	53.18 ¹⁰⁶	35.66 ³¹	47.23 ²⁹⁹	51.924 ²¹⁰	51.93 ¹⁷³	37.690 ²¹²	58.98 ²¹³
19.6	12.500 ²⁶³	54.30 ¹¹²	35.88 ²²	50.45 ³²²	52.108 ¹⁸⁴	53.83 ¹⁹⁰	37.870 ¹⁸⁰	61.31 ²³³
	222	119	13	336	152	201	148	246
29.5	12.722 ¹⁷⁸	55.49 ¹²⁰	36.01 ⁵	53.81 ³⁴⁰	52.260 ¹¹⁸	55.84 ²⁰⁶	38.018 ¹¹¹	63.77 ²⁵¹
June 8.5	12.900 ¹³¹	56.69 ¹²¹	36.06 ³	57.21 ³³⁴	52.378 ⁸³	57.90 ²⁰³	38.129 ⁷²	66.28 ²⁴⁸
18.5	13.031 ⁸⁰	57.90 ¹¹⁷	36.03 ¹⁴	60.55 ³¹⁹	52.461 ⁴⁶	59.93 ¹⁹⁷	38.201 ³²	68.76 ²⁴⁰
28.4	13.111 ²⁸	59.07 ¹¹⁸	35.89 ²²	63.74 ²⁹⁵	52.507 ⁷	61.90 ¹⁸⁴	38.233 ⁸	71.16 ²²⁴
July 8.4	13.139 ²³	60.20 ¹⁰³	35.67 ²⁹	66.69 ²⁶⁴	52.514 ³¹	63.74 ¹⁶⁶	38.225 ⁴⁷	73.40 ²⁰³
18.4	13.116	61.23	35.38	69.33	52.483	65.40	38.178	75.43
28.4	13.042 ⁷⁴	62.13 ⁹⁰	35.02 ³⁶	71.61 ²²⁸	52.415 ⁶⁸	66.87 ¹⁴⁷	38.091 ⁸⁷	77.21 ¹⁷⁸
Aug. 7.3	12.922 ¹²⁰	62.85 ⁷²	34.59 ⁴³	73.46 ¹⁸⁵	52.314 ¹⁰¹	68.11 ¹²⁴	37.970 ¹²¹	78.70 ¹⁴⁹
17.3	12.762 ¹⁶⁰	63.37 ⁵²	34.10 ⁴⁹	74.87 ¹⁴¹	52.182 ¹³²	69.09 ⁹⁸	37.819 ¹⁶¹	79.87 ¹¹⁷
27.3	12.570 ¹⁹²	63.66 ²⁹	33.58 ⁵²	75.78 ⁹¹	52.028 ¹⁵⁴	69.80 ⁷¹	37.642 ¹⁷⁷	80.70 ⁸³
	215	5	54	40	173	44	194	49
Sept. 6.3	12.355	63.71	33.04	76.18	51.855	70.24	37.448	81.19
16.2	12.129 ²²⁶	63.48 ²³	32.48 ⁵⁶	76.05 ¹³	51.674 ¹⁸¹	70.38 ¹⁴	37.246 ²⁰²	81.29 ¹⁰
26.2	11.905 ²²⁴	63.00 ⁴⁸	31.92 ⁵⁶	75.41 ⁶⁴	51.493 ¹⁸¹	70.22 ¹⁶	37.043 ²⁰³	81.02 ²⁷
Oct. 6.2	11.698 ²⁰⁷	62.26 ⁷⁴	31.39 ⁵³	74.23 ¹¹⁸	51.323 ¹⁷⁰	69.77 ⁴⁵	36.851 ¹⁹²	80.37 ⁶⁵
16.1	11.518 ¹⁸⁰	61.31 ⁹⁵	30.90 ⁴⁹	72.57 ¹⁶⁶	51.171 ¹⁸²	69.01 ⁷⁶	36.678 ¹⁷³	79.35 ¹⁰²
	139	115	44	214	123	104	144	138
26.1	11.379	60.16	30.46	70.43	51.048	67.97	36.534	77.97
Nov. 5.1	11.291 ⁸⁸	58.89 ¹²⁷	30.08 ³⁸	67.85 ²⁵⁸	50.961 ⁸⁷	66.62 ¹³⁵	36.428 ¹⁰⁶	76.24 ¹⁷³
15.1	11.261 ³⁰	57.55 ¹³⁴	29.78 ³⁰	64.88 ²⁹⁷	50.917 ⁴⁴	65.00 ¹⁶²	36.366 ⁶²	74.19 ²⁰⁵
25.0	11.296 ³⁵	56.19 ¹³⁶	29.58 ²⁰	61.60 ³²⁸	50.919 ²	63.15 ¹⁸⁵	36.352 ¹⁴	71.88 ²³¹
Dec. 5.0	11.397 ¹⁰¹	54.86 ¹³³	29.48 ¹⁰	58.10 ³⁵⁰	50.970 ⁵¹	61.09 ²⁰⁶	36.389 ³⁷	69.33 ²⁵⁵
	167	121	0	363	100	220	88	269
15.0	11.564	53.05	29.48	54.47	51.070	58.89	36.477	66.64
25.0	11.790 ²²⁶	52.57 ¹⁰⁸	29.59 ¹¹	50.82 ³⁶⁵	51.216 ¹⁴⁶	56.60 ²²⁹	36.614 ¹³⁷	63.88 ²⁷⁶
34.9	12.070 ²⁸⁰	51.67 ⁹⁰	29.80 ²¹	47.28 ³⁵⁴	51.403 ¹⁸⁷	54.30 ²³⁰	36.797 ¹⁸³	61.14 ²⁷⁴
Mean Place	8.027	47.17	32.474	64.72	48.996	66.70	34.833	74.97
Sec δ , Tan δ	1.370	-0.937	2.441	+2.227	1.033	+0.258	1.103	+0.465
$D_{\psi} \alpha$, $D_{\omega} \alpha$	+0.09	-0.01	0.00	+0.03	+0.05	0.00	+0.05	+0.01
$D_{\psi} \delta$, $D_{\omega} \delta$	-0.1	-1.0	-0.1	-1.0	-0.1	-1.0	-0.1	-1.0

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	π Herculis. Mag. 3.4		θ Ophiuchi. Mag. 3.4		w Herculis. Mag. 5.4		β Ar Mag. 5.4	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 17 12	s +36 53	h m 17 16	s -24 55	h m 17 17	s +32 34	h m 17 18	s +32 34
Jan. 0.9	6.257	59.40	50.484	4.97	30.044	18.85	17.822	363
10.9	6.467	56.33	50.735	5.16	30.249	15.87	18.185	418
20.9	6.720	53.47	51.017	5.44	30.494	13.08	18.603	460
30.9	7.007	50.95	51.326	5.79	30.768	10.60	19.063	492
Feb. 9.8	7.320	48.85	51.651	6.19	31.069	8.50	19.555	511
19.8	7.650	47.25	51.986	6.60	31.387	6.90	20.066	522
29.8	7.989	46.21	52.327	7.00	31.714	5.81	20.588	523
Mar. 10.8	8.330	45.77	52.667	7.36	32.042	5.29	21.111	517
20.7	8.665	45.92	53.002	7.67	32.367	5.34	21.628	504
30.7	8.988	46.66	53.327	7.93	32.679	5.96	22.132	483
Apr. 9.7	9.292	47.93	53.641	8.13	32.979	7.11	22.615	456
19.6	9.574	49.70	53.937	8.29	33.255	8.71	23.071	426
29.6	9.826	51.88	54.215	8.41	33.506	10.74	23.497	384
May 9.6	10.045	54.39	54.469	8.51	33.726	13.08	23.881	339
19.6	10.228	57.12	54.697	8.60	33.915	15.66	24.220	287
29.5	10.372	60.01	54.893	8.69	34.065	18.38	24.507	222
June 8.5	10.473	62.94	55.054	8.80	34.176	21.17	24.736	168
18.5	10.529	65.85	55.177	8.93	34.245	23.93	24.904	101
28.5	10.540	68.64	55.260	9.06	34.272	26.59	25.005	84
July 8.4	10.506	71.25	55.300	9.21	34.254	29.08	25.039	32
18.4	10.428	73.62	55.299	9.35	34.194	31.36	25.007	99
28.4	10.308	75.63	55.255	9.47	34.092	33.35	24.908	159
Aug. 7.3	10.150	77.40	55.172	9.56	33.954	35.02	24.749	212
17.3	9.960	78.75	55.054	9.60	33.782	36.33	24.537	256
27.3	9.743	79.70	54.908	9.58	33.584	37.25	24.281	285
Sept. 6.3	9.508	80.20	54.741	9.48	33.369	37.79	23.996	303
16.2	9.263	80.27	54.564	9.29	33.142	37.90	23.693	303
26.2	9.019	79.89	54.386	9.04	32.914	37.59	23.390	287
Oct. 6.2	8.786	79.07	54.219	8.70	32.697	36.84	23.103	254
16.2	8.574	77.80	54.072	8.31	32.498	35.68	22.849	205
26.1	8.394	76.11	53.957	7.90	32.330	34.11	22.644	143
Nov. 5.1	8.252	74.02	53.882	7.48	32.198	32.16	22.501	72
15.1	8.160	71.58	53.854	7.08	32.113	29.86	22.429	9
25.0	8.119	68.84	53.878	6.75	32.079	27.26	22.438	91
Dec. 5.0	8.135	65.86	53.955	6.52	32.098	24.43	22.529	171
15.0	8.207	62.73	54.085	6.38	32.170	21.44	22.700	231
25.0	8.335	59.54	54.264	6.35	32.295	18.38	22.951	330
34.9	8.515	56.40	54.487	6.45	32.469	15.35	23.271	
Mean Place	7.227	71.30	50.939	0.35	30.923	30.02	18.843	
Sec δ , Tan δ	1.250	+0.751	1.103	-0.465	1.187	+0.639	1.764	
$D\phi$ a, $D\omega$ a	+0.04	+0.01	+0.07	-0.01	+0.04	+0.01	+0.10	
$D\phi$ δ , $D\omega$ δ	-0.1	-1.0	-0.1	-1.0	-0.1	-1.0	-0.1	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	δ Ophiuchi. Mag. 4.3		σ Ophiuchi. Mag. 4.4		δ Arw. Mag. 3.8		α Arw. Mag. 3.0	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 17 21	° ' -24 5	h m 17 22	° ' + 4 12	h m 17 23	° ' -60 36	h m 17 25	° ' -49 48
	s "	"	s "	"	s "	"	s "	"
Jan. 0.9	13.832	61.96	20.285	37.10	29.35	57.03	19.912	41.37
10.9	14.075 ²⁴³	62.16 ²⁰	20.494 ²⁰⁹	35.34 ¹⁷⁶	29.75 ⁴⁰	55.23 ¹⁸⁰	20.231 ³¹⁹	40.11 ¹²⁶
20.9	14.354 ²⁷⁹	62.46 ³⁰	20.734 ²⁴⁰	33.64 ¹⁷⁰	30.21 ⁴⁶	53.70 ¹⁶³	20.599 ³⁶⁸	39.05 ¹⁰⁶
30.9	14.654 ³⁰⁰	62.82 ³⁶	20.999 ²⁶⁵	32.08 ¹⁵⁶	30.72 ⁵¹	52.47 ¹²³	21.005 ⁴⁰⁶	38.22 ⁸³
Feb. 9.8	14.976 ³²²	63.22 ⁴⁰	21.282 ²⁸³	30.71 ¹³⁷	31.27 ⁵⁵	51.54 ⁹³	21.439 ⁴³⁴	37.63 ⁵⁹
	332	40	294	111	58	59	452	34
19.8	15.308	63.62	21.576	29.60	31.85	50.95	21.891	37.29
29.8	15.644 ³³⁶	63.97 ³⁵	21.876 ³⁰⁰	28.80 ⁸⁰	32.45 ⁶⁰	50.68 ²⁷	22.353 ⁴⁶²	37.17 ¹²
Mar. 10.8	15.982 ³³⁸	64.31 ³⁴	22.177 ³⁰¹	28.33 ⁴⁷	33.04 ⁵⁹	50.72 ⁴	22.818 ⁴⁶⁵	37.27 ¹⁰
20.7	16.317 ³³⁵	64.60 ²⁹	22.474 ²⁹⁷	28.21 ¹²	33.63 ⁵⁹	51.07 ³⁵	23.279 ⁴⁶¹	37.59 ³²
30.7	16.641 ³²⁴	64.83 ²³	22.764 ²⁹⁰	28.44 ²³	34.21 ⁵⁸	51.72 ⁶⁵	23.726 ⁴⁴⁹	38.10 ⁵¹
	313	14	278	56	56	93	435	70
Apr. 9.7	16.954	64.97	23.042	29.00	34.77	52.65	24.163	38.80
19.6	17.254 ³⁰⁰	65.07 ¹⁰	23.305 ²⁶³	29.85 ⁸⁵	35.29 ⁵²	53.84 ¹¹⁹	24.576 ⁴¹³	39.66 ⁸⁶
29.6	17.532 ²⁷⁸	65.13 ⁶	23.550 ²⁴⁵	30.95 ¹¹⁰	35.78 ⁴⁹	55.25 ¹⁴¹	24.961 ³⁸⁵	40.69 ¹⁰³
May 9.6	17.787 ²⁵⁵	65.16 ³	23.773 ²²³	32.25 ¹³⁰	36.22 ⁴⁴	56.87 ¹⁶²	25.314 ³⁵³	41.87 ¹¹⁸
19.6	18.015 ²²⁸	65.19 ³	23.970 ¹⁹⁷	33.69 ¹⁴⁴	36.61 ³⁹	58.66 ¹⁷⁹	25.628 ³¹⁴	43.17 ¹³⁰
	200	1	169	154	33	192	269	140
29.5	18.215	65.20	24.139	35.23	36.94	60.58	25.897	44.57
June 8.5	18.378 ¹⁶³	65.26 ⁶	24.277 ¹³⁸	36.81 ¹⁵⁸	37.20 ²⁶	62.60 ²⁰²	26.117 ³²⁰	44.57 ¹⁴⁸
18.5	18.506 ¹²⁸	65.33 ⁷	24.379 ¹⁰²	38.37 ¹⁵⁶	37.39 ¹⁹	64.67 ²⁰⁷	26.284 ¹⁶⁷	46.05 ¹⁵²
28.5	18.592 ⁸⁶	65.39 ⁶	24.445 ⁶⁶	39.88 ¹⁵¹	37.51 ¹²	66.73 ²⁰⁶	26.392 ¹⁰⁸	47.57 ¹⁵²
July 8.4	18.637 ⁴⁵	65.48 ⁹	24.473 ²⁸	41.29 ¹⁴¹	37.54 ³	68.72 ¹⁹⁹	26.440 ⁴⁸	49.09 ¹⁴⁸
	2	10	10	130	4	187	11	138
18.4	18.639	65.58	24.463	42.59	37.50	70.59	26.429	51.95
28.4	18.597 ⁴²	65.67 ⁹	24.416 ⁴⁷	43.73 ¹¹⁴	37.39 ¹¹	72.27 ¹⁶⁸	26.358 ⁷¹	53.21 ¹²⁶
Aug. 7.3	18.517 ⁸⁰	65.76 ⁹	24.333 ⁸³	44.71 ⁹⁸	37.20 ¹⁹	73.71 ¹⁴⁴	26.233 ¹²⁵	54.28 ¹⁰⁷
17.3	18.402 ¹¹⁵	65.79 ³	24.219 ¹¹⁴	45.51 ⁸⁰	36.94 ²⁶	74.85 ¹¹⁴	26.058 ¹⁷⁵	55.13 ⁸⁵
27.3	18.258 ¹⁴⁴	65.75 ⁴	24.080 ¹³⁹	46.11 ⁶⁰	36.64 ³⁰	75.64 ⁷⁹	25.844 ²¹⁴	55.70 ⁵⁷
	163	8	158	41	33	40	244	28
Sept. 6.3	18.095	65.67	23.922	46.52	36.31	76.04	25.600	55.98
16.2	17.918 ¹⁷⁷	65.51 ¹⁶	23.752 ¹⁷⁰	46.72 ²⁰	35.95 ³⁶	76.04 ⁰	25.339 ²⁶¹	55.95 ³
26.2	17.741 ¹⁷⁷	65.27 ²⁴	23.581 ¹⁷¹	46.72 ⁰	35.59 ³⁶	75.61 ⁴³	25.077 ²⁶²	55.58 ³⁷
Oct. 6.2	17.573 ¹⁶⁸	64.97 ³⁰	23.420 ¹⁶¹	46.49 ²³	35.24 ³⁵	74.77 ⁸⁴	24.826 ²⁵¹	54.89 ⁶⁹
16.2	17.426 ¹⁴⁷	64.63 ³⁴	23.274 ¹⁴⁶	46.06 ⁴³	34.93 ³¹	73.54 ¹²³	24.603 ²²³	53.91 ⁹⁸
	116	35	118	66	24	158	181	124
26.1	17.310	64.28	23.156	45.40	34.69	71.96	24.422	52.67
Nov. 5.1	17.233 ⁷⁷	63.90 ³⁸	23.073 ⁸³	44.52 ⁸⁸	34.50 ¹⁹	70.10 ¹⁸⁶	24.293 ¹²⁹	51.21 ¹⁴⁶
15.1	17.199 ³⁴	63.56 ³⁴	23.030 ⁴³	43.42 ¹¹⁰	34.40 ¹⁰	68.02 ²⁰⁸	24.228 ⁶⁵	49.59 ¹⁶²
25.0	17.220 ²¹	63.29 ²⁷	23.033 ³	42.13 ¹²⁹	34.39 ¹	65.80 ²²²	24.234 ⁶	47.90 ¹⁶⁹
Dec. 5.0	17.292 ⁷²	63.09 ²⁰	23.083 ⁵⁰	40.66 ¹⁴⁷	34.47 ⁸	63.53 ²²⁷	24.311 ⁷⁷	46.18 ¹⁷²
	125	11	98	162	17	224	151	166
15.0	17.417	62.98	23.181	39.04	34.64	61.29	24.462	44.52
25.0	17.591 ¹⁷⁴	63.00 ²	23.323 ¹⁴²	37.33 ¹⁷¹	34.91 ²⁷	59.17 ²¹²	24.680 ²¹⁸	42.96 ¹⁵⁶
34.9	17.808 ²¹⁷	63.14 ¹⁴	23.506 ¹⁸³	35.57 ¹⁷⁸	35.26 ³⁵	57.21 ¹⁹⁶	24.961 ²⁸¹	41.55 ¹⁴¹
Mean Place	14.287	57.17	20.777	45.16	30.632	55.76	20.740	39.11
Sec δ , Tan δ	1.096	-0.447	1.003	+0.074	2.038	-1.776	1.549	-1.184
$D\phi\alpha$, $D\omega\alpha$	+0.07	-0.01	+0.06	0.00	+0.11	-0.02	+0.09	-0.01
$D\phi\delta$, $D\omega\delta$	-0.1	-1.0	-0.1	-1.0	-0.1	-1.0	-0.1	-1.0

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	λ Herculis. Mag. 4.5		λ Scorpii. Mag. 1.7		β Draconis. Mag. 3.0		α Ophiuchi. Mag. 2.1	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 17 27	° ' " +26 10	h m 17 27	° ' " -37 2	h m 17 28	° ' " +52 21	h m 17 31	° ' " +11
Jan. 1.0	19.826 ¹⁹³	13.57 ²⁷³	53.587 ²⁶⁷	40.34 ⁵⁸	30.335 ²⁰¹	35.55 ³⁴¹	1.490 ¹⁹⁶	64.2 ¹⁹⁶
10.9	20.019 ²³⁴	10.84 ²⁵⁸	53.854 ³⁰⁷	39.76 ⁴⁴	30.536 ²⁶⁰	32.14 ³¹⁷	1.686 ²²⁹	62.1 ²²⁹
20.9	20.253 ²⁶⁰	8.26 ²³³	54.161 ³³⁵	39.32 ²⁹	30.796 ³¹²	28.97 ²⁸³	1.915 ²⁵⁷	60.0 ²⁵⁷
30.9	20.513 ²⁸⁵	5.93 ¹⁹⁶	54.496 ³⁰⁰	39.03 ¹⁵	31.108 ³⁵⁵	26.14 ²³⁷	2.172 ²⁷⁶	58.1 ²⁷⁶
Feb. 9.8	20.798 ³⁰³	3.97 ¹⁵⁰	54.856 ³⁷³	38.88 ³	31.463 ³⁸⁵	23.77 ¹⁸²	2.448 ²⁹⁰	56.5 ²⁹⁰
19.8	21.101 ³¹²	2.41 ¹⁰⁵	55.229 ³⁸¹	38.85 ⁸	31.848 ⁴⁰⁶	21.95 ¹²¹	2.738 ²⁹⁹	55.2 ²⁹⁹
29.8	21.413 ³¹⁴	1.36 ⁵⁴	55.610 ³⁸³	38.93 ¹⁷	32.254 ⁴¹⁵	20.74 ⁵⁷	3.037 ³⁰¹	54.2 ³⁰¹
Mar. 10.8	21.727 ³¹³	0.82 ⁰	55.993 ³⁷⁹	39.10 ²⁶	32.669 ⁴¹³	20.17 ¹⁰	3.338 ²⁹⁹	53.7 ²⁹⁹
20.7	22.040 ³⁰⁴	0.82 ⁵²	56.372 ³⁷¹	39.36 ³²	33.082 ⁴⁰¹	20.27 ⁷⁵	3.637 ²⁹²	53.7 ²⁹²
30.7	22.344 ²⁹¹	1.34 ¹⁰⁰	56.743 ³⁵⁹	39.68 ⁴⁰	33.483 ³⁸⁰	21.02 ¹³⁵	3.929 ²⁸²	54.0 ²⁸²
Apr. 9.7	22.635 ²⁷⁴	2.34 ¹⁴⁵	57.102 ³⁴²	40.08 ⁴⁶	33.863 ³⁵⁰	22.37 ¹⁹²	4.211 ²⁶⁸	54.7 ²⁶⁸
19.7	22.909 ²⁵¹	3.79 ¹⁸⁵	57.444 ³²²	40.54 ⁵²	34.213 ³¹³	24.29 ²³⁷	4.479 ²⁴⁸	55.8 ²⁴⁸
29.6	23.160 ²²⁵	5.64 ²¹⁶	57.766 ²⁹⁶	41.06 ⁵⁹	34.526 ²⁶⁹	26.66 ²⁷⁶	4.727 ²²⁸	57.2 ²²⁸
May 9.6	23.385 ¹⁹⁶	7.80 ²³⁹	58.062 ²⁶⁶	41.65 ⁶⁶	34.795 ²¹⁹	29.42 ³⁰⁵	4.955 ²⁸¹	58.9 ²⁸¹
19.6	23.581 ¹⁶¹	10.19 ²⁵²	58.328 ²³¹	42.31 ⁷²	35.014 ¹⁶⁵	32.47 ³²³	5.156 ¹⁷¹	60.7 ¹⁷¹
29.5	23.742 ¹²⁷	12.71 ²⁶¹	58.559 ¹⁹³	43.03 ⁷⁶	35.179 ¹⁰⁸	35.70 ³³²	5.327 ¹⁴⁰	62.7 ¹⁴⁰
June 8.5	23.869 ⁸⁷	15.32 ²⁵⁸	58.752 ¹⁴⁸	43.79 ⁸⁰	35.287 ⁴⁷	39.02 ³³¹	5.467 ¹⁰⁴	64.7 ¹⁰⁴
18.5	23.956 ⁴⁵	17.90 ²⁵²	58.900 ¹⁰³	44.59 ⁸²	35.334 ¹²	42.33 ³²¹	5.571 ⁶⁵	66.7 ⁶⁵
28.5	24.001 ⁵	20.42 ²³⁷	59.003 ⁵⁴	45.41 ⁸⁰	35.322 ⁷²	45.54 ³⁰²	5.636 ²⁷	68.7 ²⁷
July 8.4	24.006 ³⁷	22.79 ²¹⁷	59.057 ⁴	46.21 ⁷⁷	35.250 ¹²⁹	48.56 ²⁷⁷	5.663 ¹³	70.5 ¹³
18.4	23.969 ⁷⁶	24.96 ¹⁹³	59.061 ⁴⁴	46.98 ⁶⁹	35.121 ¹⁸³	51.33 ²⁴⁴	5.650 ⁵⁰	72.2 ⁵⁰
28.4	23.893 ¹¹⁵	26.89 ¹⁶⁴	59.017 ⁸⁹	47.67 ⁶⁰	34.938 ²³³	53.77 ²⁰⁸	5.600 ⁸⁷	73.7 ⁸⁷
Aug. 7.4	23.778 ¹⁴⁹	28.53 ¹³²	58.928 ¹³¹	48.27 ⁴⁷	34.705 ²⁷⁵	55.85 ¹⁶⁵	5.513 ¹²⁰	74.9 ¹²⁰
17.3	23.629 ¹⁷⁵	29.85 ⁹⁷	58.797 ¹⁶⁵	48.74 ³⁰	34.430 ³¹⁰	57.50 ¹²⁰	5.393 ¹⁴⁵	76.0 ¹⁴⁵
27.3	23.454 ¹⁹⁴	30.82 ⁶³	58.632 ¹⁸⁹	49.04 ¹³	34.120 ³³⁴	58.70 ⁷³	5.248 ¹⁶⁷	76.8 ¹⁶⁷
Sept. 6.3	23.260 ²⁰⁶	31.45 ²³	58.443 ²⁰³	49.17 ⁸	33.786 ³⁴⁹	59.43 ²²	5.081 ¹⁷⁷	77.3 ¹⁷⁷
16.2	23.054 ²⁰⁹	31.68 ¹⁵	58.240 ²⁰⁷	49.09 ²⁹	33.437 ³⁵¹	59.65 ²⁸	4.904 ¹⁸¹	77.5 ¹⁸¹
26.2	22.845 ¹⁹⁹	31.53 ⁵³	58.033 ¹⁹⁷	48.80 ⁴⁷	33.086 ³⁴²	59.37 ⁸⁰	4.723 ¹⁷⁴	77.3 ¹⁷⁴
Oct. 6.2	22.646 ¹⁸⁵	31.00 ⁹¹	57.836 ¹⁷⁵	48.33 ⁶⁷	32.744 ³¹⁹	58.57 ¹²⁹	4.549 ¹⁵⁸	77.2 ¹⁵⁸
16.2	22.461 ¹⁵⁶	30.09 ¹³¹	57.661 ¹⁴²	47.66 ⁸⁰	32.425 ²⁸⁶	57.28 ¹⁷⁸	4.391 ¹³²	76.6 ¹³²
26.1	22.305 ¹²¹	28.78 ¹⁶⁶	57.519 ⁹⁸	46.86 ⁹³	32.139 ²⁴⁰	55.50 ²²³	4.259 ⁹⁹	75.7 ⁹⁹
Nov. 5.1	22.184 ⁷⁹	27.12 ¹⁹⁹	57.421 ⁴⁵	45.93 ⁹⁹	31.899 ¹⁸⁵	53.27 ²⁰⁴	4.160 ⁵⁸	74.5 ⁵⁸
15.1	22.105 ³²	25.13 ²²⁵	57.376 ¹¹	44.94 ¹⁰²	31.714 ¹²¹	50.63 ²⁹⁹	4.102 ¹⁴	73.0 ¹⁴
25.1	22.073 ¹⁹	22.88 ²⁵²	57.387 ⁷¹	43.92 ⁹⁹	31.593 ⁵³	47.64 ³²⁵	4.088 ³⁴	71.4 ³⁴
Dec. 5.0	22.092 ⁷¹	20.36 ²⁶⁹	57.458 ¹²⁹	42.93 ⁹³	31.540 ¹⁷	44.39 ³⁴³	4.122 ⁸²	69.5 ⁸²
15.0	22.163 ¹¹⁸	17.67 ²⁷⁵	57.587 ¹⁸⁶	42.00 ⁸²	31.557 ⁹¹	40.96 ³⁵²	4.204 ¹²⁷	67.4 ¹²⁷
25.0	22.281 ¹⁶⁶	14.92 ²⁷⁹	57.773 ²³⁷	41.18 ⁶⁸	31.648 ¹⁵⁸	37.44 ³⁴⁷	4.331 ¹⁷⁰	65.3 ¹⁷⁰
34.9	22.447	12.13	58.010	40.50	31.806	33.97	4.501	63.1
Mean Place	20.598	23.59	54.161	36.78	32.038	47.19	2.073	72.9
Sec δ , Tan δ	1.114	+0.491	1.253	-0.755	1.637	+1.296	1.025	+0.2
$D\psi a$, $D\omega a$	+0.05	0.00	+0.08	-0.01	+0.03	+0.01	+0.06	0.0
$D\psi \delta$, $D\omega \delta$	-0.1	-1.0	-0.1	-1.0	-0.1	-1.0	-0.1	-1.0

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	ξ Serpentis. Mag. 3.6		ζ Herculis. Mag. 3.8		ω Draconis. Mag. 4.9		γ Pavonis. Mag. 3.6	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 17 32	° ' -15 20	h m 17 37	° ' +46 2	h m 17 37	° ' +68 47	h m 17 37	° ' -64 41
	s 17 32	" -15 20	s 17 37	" +46 2	s 17 37	" +68 47	s 17 37	" -64 41
Jan. 1.0	46.062	53.39	4.230	51.19	22.85	37.43	27.46	8.79
10.9	46.283 ²²¹	54.05 ⁶⁶	4.415 ¹⁸⁵	47.87 ³³²	23.07 ²²	33.94 ³⁴⁹	27.88 ⁴²	6.69 ²¹⁰
20.9	46.535 ²⁵²	54.74 ⁶⁹	4.651 ²³⁶	44.77 ³¹⁰	23.40 ³³	30.66 ³²⁸	28.37 ⁴⁹	4.84 ¹⁸⁵
30.9	46.812 ²⁷⁷	55.42 ⁶⁸	4.932 ²⁸¹	41.97 ²⁸⁰	23.82 ⁴²	27.74 ²⁹²	28.92 ⁵⁵	3.28 ¹⁵⁶
Feb. 9.8	47.109 ²⁹⁷	56.07 ⁶⁵	5.252 ³²⁰	39.60 ²³⁷	24.32 ⁵⁰	25.28 ²⁴⁶	29.53 ⁶¹	2.04 ¹²⁴
	309	56	847	184	58	191	65	91
19.8	47.418	56.63	5.599	37.76	24.90	23.37	30.18	1.13
29.8	47.734 ³¹⁶	57.09 ⁴⁶	5.963 ³⁶⁴	36.48 ¹²⁸	25.51 ⁶¹	22.08 ¹²⁹	30.84 ⁶⁶	0.58 ⁵⁵
Mar. 10.8	48.051 ³¹⁷	57.39 ³⁰	6.337 ³⁷⁴	35.83 ⁶⁵	26.15 ⁶⁴	21.45 ⁶³	31.52 ⁶⁸	0.38 ²⁰
20.7	48.367 ³¹⁶	57.56 ¹⁷	6.712 ³⁷⁵	35.83 ⁰	26.79 ⁶⁴	21.51 ⁶	32.19 ⁶⁷	0.52 ¹⁴
30.7	48.676 ³⁰⁹	57.57 ¹	7.079 ³⁶⁷	36.45 ⁶²	27.42 ⁶³	22.23 ⁷²	32.85 ⁶⁶	0.99 ⁴⁷
	300	13	350	122	59	135	63	79
Apr. 9.7	48.976	57.44	7.429	37.67	28.01	23.58	33.48	1.78
19.7	49.263 ²⁸⁷	57.17 ²⁷	7.756 ³²⁷	39.43 ¹⁷⁶	28.56 ⁵⁵	25.52 ¹⁹⁴	34.09 ⁶¹	2.87 ¹⁰⁹
29.6	49.533 ²⁷⁰	56.80 ³⁷	8.052 ²⁹⁶	41.67 ²²⁴	29.04 ⁴⁸	27.95 ²⁴³	34.67 ⁵⁸	4.22 ¹³⁵
May 9.6	49.783 ²⁵⁰	56.35 ⁴⁵	8.313 ²⁶¹	44.30 ²⁶³	29.43 ³⁹	30.77 ²⁸²	35.19 ⁵²	5.83 ¹⁶¹
19.6	50.008 ²²⁵	55.86 ⁴⁹	8.532 ²¹⁹	47.21 ²⁹¹	29.74 ³¹	33.92 ³¹⁵	35.65 ⁴⁶	7.65 ¹⁸²
	197	52	173	312	20	334	39	199
29.5	50.205	55.34	8.705	50.33	29.94	37.26	36.04	9.64
June 8.5	50.370 ¹⁶⁵	54.82 ⁵²	8.830 ¹²⁵	53.54 ³²¹	30.06 ¹²	40.70 ³⁴⁴	36.36 ³²	11.77 ²¹³
18.5	50.500 ¹³⁰	54.32 ⁵⁰	8.902 ⁷²	56.76 ³²²	30.07 ¹	44.14 ³⁴⁴	36.60 ²⁴	13.98 ²²¹
28.5	50.592 ⁹²	53.87 ⁴⁵	8.921 ¹⁹	59.91 ³¹⁵	29.98 ⁹	47.50 ³³⁶	36.75 ¹⁵	16.20 ²²²
July 8.4	50.642 ⁵⁰	53.46 ⁴¹	8.886 ³⁵	62.88 ²⁹⁷	29.77 ²¹	50.69 ³¹⁹	36.80 ⁵	18.39 ²¹⁹
	10	36	87	275	28	292	3	207
18.4	50.652	53.10	8.799	65.63	29.49	53.61	36.77	20.46
28.4	50.621 ³¹	52.79 ³¹	8.663 ¹³⁶	68.07 ²⁴⁴	29.11 ³⁸	56.21 ²⁸⁰	36.65 ¹²	22.38 ¹⁹²
Aug. 7.4	50.552 ⁶⁹	52.52 ²⁷	8.479 ¹⁸⁴	70.17 ²¹⁰	28.65 ⁴⁶	58.44 ²²³	36.44 ²¹	24.04 ¹⁶⁶
17.3	50.449 ¹⁰³	52.31 ²¹	8.258 ²²¹	71.88 ¹⁷¹	28.13 ⁵²	60.24 ¹⁸⁰	36.17 ²⁷	25.40 ¹³⁶
27.3	50.317 ¹³²	52.11 ²⁰	8.001 ²⁵⁷	73.15 ¹²⁷	27.55 ⁵⁸	61.57 ¹³³	35.83 ³⁴	26.43 ¹⁰³
	154	17	280	82	62	84	39	61
Sept. 6.3	50.163	51.94	7.721	73.97	26.93	62.41	35.44	27.04
16.2	49.995 ¹⁶⁸	51.78 ¹⁶	7.426 ²⁹⁵	74.33 ³⁶	26.29 ⁶⁴	62.74 ³³	35.03 ⁴¹	27.22 ¹⁸
26.2	49.825 ¹⁷⁰	51.65 ¹³	7.126 ³⁰⁰	74.18 ¹⁵	25.64 ⁶⁵	62.54 ²⁰	34.60 ⁴³	26.94 ²⁸
Oct. 6.2	49.662 ¹⁶³	51.53 ¹²	6.832 ²⁹⁴	73.55 ⁶³	25.00 ⁶⁴	61.81 ⁷³	34.19 ⁴¹	26.21 ⁷³
16.2	49.515 ¹⁴⁷	51.45 ⁸	6.557 ²⁷⁵	72.42 ¹¹³	24.40 ⁶⁰	60.57 ¹²⁴	33.82 ³⁷	25.04 ¹¹⁷
	119	4	244	160	56	175	32	155
26.1	49.396 ⁸³	51.41 ³	6.313 ²⁰⁵	70.82 ²⁰⁴	23.84 ⁴⁹	58.82 ²²³	33.50 ²⁴	23.49 ¹⁸⁹
Nov. 5.1	49.313 ⁴¹	51.44 ¹¹	6.108 ¹⁵⁷	68.78 ²⁴⁵	23.35 ⁴¹	56.59 ²⁶⁵	33.26 ¹⁶	21.60 ²¹⁷
15.1	49.272 ⁶	51.55 ²¹	5.951 ¹⁰¹	68.33 ²⁸⁰	22.94 ³²	53.94 ³⁰²	33.10 ⁶	19.43 ²³⁶
25.1	49.278 ⁵⁵	51.76 ³¹	5.850 ³⁹	63.53 ³⁰⁸	22.62 ²⁰	50.92 ³³⁰	33.04 ⁶	17.07 ²⁴⁵
Dec. 5.0	49.333 ¹⁰⁶	52.07 ⁴²	5.811 ²³	60.45 ³²⁸	22.42 ⁹	47.62 ³⁵¹	33.10 ¹⁶	14.62 ²⁴⁶
	151	51	86	337	2	359	26	240
15.0	49.438	52.49	5.834	57.17	22.33	44.11	33.26	12.16
25.0	49.589 ¹⁵¹	53.00 ⁵¹	5.920 ⁸⁶	53.80 ³³⁷	22.35 ²	40.52 ³⁵⁷	33.52 ²⁶	9.76 ²⁴⁰
34.9	49.782 ¹⁹³	53.60 ⁶⁰	6.067 ¹⁴⁷	50.43 ³³⁷	22.50 ¹⁵	36.95 ³⁵⁷	33.87 ³⁵	7.51 ²²⁵
Mean Place	46.509	47.56	5.633	61.81	26.494	48.67	29.038	7.02
Sec δ , Tan δ	1.037	-0.274	1.441	+1.037	2.765	+2.577	2.339	-2.114
$D\psi\alpha$, $D_m\alpha$	+0.07	0.00	+0.03	+0.01	-0.01	+0.02	+0.11	-0.01
$D\psi\delta$, $D_m\delta$	0.0	-1.0	0.0	-1.0	0.0	-1.0	0.0	-1.0

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	β Ophiuchi. Mag. 2.9		γ Scorpii. Mag. 3.1		μ Herculis. Mag. 3.5		ψ Draconis. Mag. 4.9	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 17 39	° ' " + 4 35	h m 17 41	° ' " - 40 5	h m 17 43	° ' " + 27 45	h m 17 43	° ' " + 27 45
Jan. 1.0	18.826	57.81	41.930	47.87	9.379	59.45	21.20	74.1
10.9	19.019 193	56.07 174	42.191 261	47.01 86	9.556 177	56.64 281	21.41 21	71.1
20.9	19.245 226	54.40 167	42.494 303	46.31 70	9.772 216	53.99 265	21.75 34	67.1
30.9	19.498 253	52.85 155	42.830 336	45.74 57	10.022 250	51.57 242	22.21 46	64.1
Feb. 9.9	19.770 272	51.50 135	43.193 363	45.33 41	10.297 275	49.49 208	22.79 58	62.1
	287	109	381	27	294	165	65	
19.8	20.057	50.41	43.574	45.06	10.591	47.84	23.44	60.1
29.8	20.352 295	49.62 79	43.965 391	44.93 13	10.900 309	46.66 118	24.14 70	59.1
Mar. 10.8	20.651 299	49.16 46	44.361 396	44.91 2	11.214 314	46.01 65	24.88 74	58.1
20.7	20.949 298	49.06 10	44.756 395	45.01 10	11.529 315	45.90 11	25.63 75	58.1
30.7	21.242 293	49.32 26	45.147 391	45.22 21	11.839 310	46.33 43	26.36 73	59.1
	284	59	379	31	300	96	70	
Apr. 9.7	21.526	49.91	45.526	45.53	12.139	47.29	27.06	60.1
19.7	21.798 272	50.79 88	45.890 364	45.94 41	12.423 284	48.69 140	27.70 64	62.1
29.6	22.053 255	51.94 115	46.234 344	46.45 51	12.686 263	50.51 182	28.25 55	64.1
May 9.6	22.289 236	53.30 136	46.553 319	47.05 60	12.926 240	52.67 216	28.71 46	67.1
19.6	22.500 211	54.80 150	46.842 289	47.76 71	13.136 210	55.07 240	29.07 36	70.1
	184	161	254	79	177	259	25	
29.6	22.684	56.41	47.096	48.55	13.313	57.66	29.32	73.1
June 8.5	22.836 152	58.07 166	47.310 214	49.41 86	13.454 141	60.32 266	29.44 12	77.1
18.5	22.954 118	59.70 163	47.479 169	50.33 92	13.554 100	63.01 269	29.45 1	80.1
28.5	23.035 81	61.29 159	47.599 120	51.29 96	13.613 59	65.62 261	29.33 12	83.1
July 8.4	23.076 41	62.79 150	47.669 70	52.26 97	13.628 15	68.11 249	29.09 24	87.1
	4	137	17	94	27	230	35	
18.4	23.080	64.16	47.686	53.20	13.601	70.41	28.74	90.1
28.4	23.043 37	65.37 121	47.652 34	54.08 88	13.531 70	72.46 205	28.28 46	92.1
Aug. 7.4	22.970 73	66.43 106	47.569 83	54.86 78	13.422 109	74.24 178	27.74 54	94.1
17.3	22.863 107	67.29 86	47.441 128	55.49 63	13.279 143	75.70 146	27.11 63	96.1
27.3	22.730 133	67.96 67	47.275 166	55.96 47	13.105 174	76.81 111	26.42 69	98.1
	156	47	193	26	196	74	74	
Sept. 6.3	22.574	68.43	47.082	56.22	12.909	77.55	25.68	99.1
16.3	22.405 169	68.69 26	46.869 213	56.27 5	12.698 211	77.91 36	24.91 77	99.1
26.2	22.232 173	68.74 5	46.652 217	56.08 19	12.483 215	77.88 3	24.13 78	99.1
Oct. 6.2	22.064 168	68.57 17	46.441 211	55.67 41	12.273 210	77.44 44	23.36 77	98.1
16.2	21.913 151	68.18 39	46.249 192	55.03 64	12.078 195	76.60 84	22.62 74	97.1
	128	61	160	83	171	123	69	
26.1	21.785	67.57	46.089	54.20	11.907	75.37	21.93	95.1
Nov. 5.1	21.689 96	66.74 83	45.973 116	53.22 98	11.769 138	73.77 160	21.32 61	93.1
15.1	21.633 56	65.69 105	45.908 65	52.12 110	11.673 96	71.82 195	20.80 52	91.1
25.1	21.621 12	64.43 126	45.901 7	50.94 118	11.622 51	69.56 226	20.40 40	88.1
Dec. 5.0	21.655 34	63.00 143	45.955 51	49.77 117	11.622 0	67.04 252	20.11 29	84.1
	81	157	116	114	51	270	15	
15.0	21.736	61.43	46.071	48.63	11.673	64.34	19.96	81.1
25.0	21.862 126	59.74 169	46.245 174	47.56 107	11.773 100	61.53 281	19.95 1	77.1
35.0	22.029 167	58.01 173	46.474 229	46.60 96	11.920 147	58.70 283	20.08 13	74.1
Mean Place	19.350	65.45	42.557	44.12	10.225	68.64	25.732	85.1
Sec δ , Tan δ	1.003	+0.080	1.307	-0.842	1.130	+0.526	3.269	+3.1
$D\psi \alpha$, $D\omega \alpha$	+0.06	0.00	+0.08	0.00	+0.05	0.00	-0.02	+0.1
$D\psi \delta$, $D\omega \delta$	0.0	-1.0	0.0	-1.0	0.0	-1.0	0.0	-1.1

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	γ Ophiuchi. Mag. 3.7		θ Herculis. Mag. 5.5		ξ Draconis. Mag. 3.9		ζ Draconis. Mag. 5.0	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 17 43	° ' " + 2 44	h m 17 52	° ' " + 26 3	h m 17 52	° ' " + 56 52	h m 17 53	° ' " + 76 58
Jan. 1.0	40.288	9.51	1.059	36.89	2.497	58.24	5.88	19.47
10.9	40.478 ¹⁹⁰	7.88 ¹⁶³	1.227 ¹⁶⁸	34.18 ²⁷¹	2.664 ¹⁶⁷	54.76 ³⁴⁸	6.09 ²¹	16.01 ³⁴⁶
20.9	40.702 ²²⁴	6.30 ¹⁵⁸	1.435 ²⁰⁶	31.61 ²⁵⁷	2.902 ²³⁸	51.46 ³³⁰	6.47 ³⁸	12.73 ³²⁸
30.9	40.953 ²⁵¹	4.84 ¹⁴⁶	1.676 ²⁴¹	29.26 ²³⁵	3.202 ³⁰⁰	48.47 ²⁹⁹	7.02 ⁵⁶	9.76 ²⁹⁷
Feb. 9.9	41.223 ²⁷⁰	3.55 ¹²⁹	1.945 ²⁶⁹	27.22 ²⁰⁴	3.557 ³⁵⁵	45.91 ²⁵⁶	7.73 ⁷¹	7.20 ²⁵⁶
19.8	41.508 ²⁸⁵	2.51 ¹⁰⁴	2.233 ²⁸⁸	25.59 ¹⁶³	3.954 ³⁹⁷	43.85 ²⁰⁶	8.55 ⁸²	5.16 ²⁰⁴
29.8	41.803 ²⁹⁶	1.76 ⁷⁵	2.536 ³⁰³	24.42 ¹¹⁷	4.381 ⁴²⁷	42.40 ¹⁴⁵	9.47 ⁹²	3.72 ¹⁴⁴
Mar. 10.8	42.101 ²⁹⁸	1.32 ⁴⁴	2.846 ³¹⁰	23.76 ⁶⁶	4.829 ⁴⁴⁸	41.59 ⁸¹	10.43 ⁹⁶	2.91 ⁸¹
20.7	42.400 ²⁹⁹	1.21 ¹¹	3.159 ³¹³	23.62 ¹⁴	5.282 ⁴⁵³	41.44 ¹⁵	11.42 ⁹⁹	2.77 ¹⁴
30.7	42.694 ²⁹⁴	1.44 ²³	3.468 ³⁰⁹	24.01 ³⁹	5.728 ⁴⁴⁶	41.97 ⁵³	12.40 ⁹⁸	3.31 ⁵⁴
Apr. 9.7	42.980 ²⁸⁶	1.98 ⁵⁴	3.768 ³⁰⁰	24.91 ⁹⁰	6.160 ⁴³²	43.12 ¹¹⁵	13.33 ⁹⁸	4.47 ¹¹⁶
19.7	43.254 ²⁷⁴	2.82 ⁸⁴	4.055 ²⁸⁷	26.27 ¹³⁶	6.562 ⁴⁰²	44.86 ¹⁷⁴	14.19 ⁸⁶	6.21 ¹⁷⁴
29.6	43.512 ²⁵⁸	3.91 ¹⁰⁹	4.324 ²⁶⁹	28.04 ¹⁷⁷	6.927 ³⁶⁵	47.12 ²²⁶	14.95 ⁷⁶	8.47 ²²⁶
May 9.6	43.751 ²³⁹	5.18 ¹²⁷	4.569 ²⁴⁵	30.15 ²¹¹	7.246 ³¹⁹	49.81 ²⁶⁹	15.57 ⁶²	11.16 ²⁶⁹
19.6	43.966 ²¹⁵	6.60 ¹⁴²	4.787 ²¹⁸	32.51 ²³⁶	7.512 ²⁶⁶	52.83 ³⁰²	16.06 ⁴⁹	14.18 ³⁰²
29.6	44.155 ¹⁸⁹	8.12 ¹⁵²	4.974 ¹⁸⁷	35.06 ²⁵⁵	7.719 ²⁰⁷	56.08 ³²⁵	16.38 ³²	17.43 ³²⁵
June 8.5	44.313 ¹⁵⁸	9.69 ¹⁵⁷	5.125 ¹⁵¹	37.70 ²⁶⁴	7.863 ¹⁴⁴	59.47 ³³⁹	16.55 ¹⁷	20.82 ³³⁹
18.5	44.436 ¹²³	11.24 ¹⁵⁵	5.237 ¹¹²	40.36 ²⁶⁶	7.940 ⁷⁷	62.90 ³⁴³	16.55 ⁰	24.25 ³⁴³
28.5	44.522 ⁸⁶	12.75 ¹⁵¹	5.307 ⁷⁰	42.96 ²⁸⁰	7.947 ⁷	66.27 ³³⁷	16.39 ¹⁶	27.63 ³³⁸
July 8.4	44.571 ⁴⁹	14.16 ¹⁴¹	5.334 ²⁷	45.45 ²⁴⁹	7.887 ⁶⁰	69.50 ³²³	16.05 ³⁴	30.86 ³²³
18.4	44.579 ⁸	15.45 ¹²⁹	5.319 ¹⁵	47.77 ²³²	7.760 ¹²⁷	72.51 ³⁰¹	15.57 ⁴⁸	33.86 ³⁰⁰
28.4	44.548 ³¹	16.60 ¹¹⁵	5.261 ⁵⁸	49.86 ²⁰⁹	7.570 ¹⁹⁰	75.22 ²⁷¹	14.95 ⁶²	36.58 ²⁷²
Aug. 7.4	44.479 ⁶⁹	17.69 ⁹⁹	5.165 ⁹⁶	51.68 ¹⁸²	7.322 ²⁴⁸	77.60 ²³⁸	14.19 ⁷⁶	38.96 ²³⁸
17.3	44.378 ¹⁰¹	18.41 ⁸²	5.031 ¹³⁴	53.18 ¹⁵⁰	7.023 ²⁹⁹	79.57 ¹⁹⁷	13.33 ⁸⁶	40.93 ¹⁹⁷
27.3	44.246 ¹³²	19.04 ⁶³	4.866 ¹⁶⁵	54.35 ¹¹⁷	6.681 ³⁴²	81.10 ¹⁵³	12.38 ⁹⁵	42.46 ¹⁵³
Sept. 6.3	44.094 ¹⁵²	19.49 ⁴⁵	4.679 ¹⁸⁷	55.17 ⁸²	6.307 ³⁷⁴	82.15 ¹⁰⁵	11.35 ¹⁰⁸	43.52 ¹⁰⁶
16.3	43.927 ¹⁶⁷	19.74 ²⁵	4.476 ²⁰³	55.62 ⁴⁵	5.910 ³⁰⁷	82.70 ⁵⁵	10.29 ¹⁰⁶	44.08 ⁵⁶
26.2	43.755 ¹⁷²	19.80 ⁶	4.266 ²¹⁰	55.68 ⁶	5.506 ⁴⁰⁴	82.74 ⁴	9.20 ¹⁰⁹	44.12 ⁴
Oct. 6.2	43.589 ¹⁶⁶	19.65 ¹⁵	4.059 ²⁰⁷	55.35 ³³	5.107 ³⁹⁹	82.24 ⁵⁰	8.13 ¹⁰⁷	43.64 ⁴⁸
16.2	43.436 ¹⁵³	19.31 ³⁴	3.866 ¹⁹³	54.63 ⁷²	4.725 ³⁸²	81.24 ¹⁰⁰	7.09 ¹⁰⁴	42.64 ¹⁰⁰
26.1	43.308 ¹²⁸	18.77 ⁵⁴	3.696 ¹⁷⁰	53.53 ¹¹⁰	4.375 ³⁵⁰	79.72 ¹⁵²	6.11 ⁹⁸	41.13 ¹⁵¹
Nov. 5.1	43.210 ⁹⁸	18.01 ⁷⁶	3.557 ¹³⁹	52.07 ¹⁴⁶	4.068 ³⁰⁷	77.73 ¹⁹⁹	5.22 ⁸⁹	39.15 ¹⁹⁸
15.1	43.152 ⁵⁸	17.05 ⁹⁶	3.458 ⁹⁹	50.25 ¹⁸²	3.817 ²⁵¹	75.28 ²⁴⁵	4.45 ⁷⁷	36.71 ²⁴⁴
25.1	43.138 ¹⁴	15.89 ¹¹⁶	3.403 ⁵⁵	48.12 ²¹³	3.631 ¹⁸⁶	72.46 ²⁸²	3.83 ⁶²	33.91 ²⁸⁰
Dec. 5.0	43.169 ³¹	14.58 ¹³¹	3.397 ⁶	45.75 ²³⁷	3.516 ¹¹⁵	69.31 ⁸¹⁵	3.36 ⁴⁷	30.77 ⁸¹⁴
15.0	43.248 ⁷⁹	13.12 ¹⁴⁶	3.441 ⁴⁴	43.17 ²⁵⁸	3.479 ³⁷	65.93 ³³⁸	3.08 ²⁸	27.41 ³⁸⁶
25.0	43.372 ¹²⁴	11.55 ¹⁵⁷	3.535 ⁹⁴	40.48 ²⁶⁹	3.521 ⁴²	62.41 ³⁵²	2.98 ¹⁰	23.91 ³⁵⁰
35.0	43.537 ¹⁶⁵	9.94 ¹⁶¹	3.674 ¹³⁹	37.76 ²⁷²	3.640 ¹¹⁹	58.90 ³⁵¹	3.06 ⁸	20.41 ³⁵⁰
Mean Place	40.805	16.87	1.889	45.44	4.646	67.86	12.489	29.06
Sec δ , Tan δ	1.001	+0.048	1.113	+0.489	1.830	+1.533	4.436	+4.322
$D\phi$ α , $D\omega$ α	+0.06	0.00	+0.05	0.00	+0.02	0.00	-0.05	+0.01
$D\phi$ δ , $D\omega$ δ	0.0	-1.0	0.0	-1.0	0.0	-1.0	0.0	-1.0

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	θ Herculis. Mag. 4.0		ν Ophiuchi. Mag. 3.5		ξ Herculis. Mag. 3.8		γ Draconis. Mag. 2.4	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 17 53 s	° ' " +37 15 "	h m 17 54 s	° ' " - 9 45 "	h m 17 54 s	° ' " +29 14 "	h m 17 54 s	° ' " +51 29 "
Jan. 1.0	21.202	30.53	23.620	57.58	29.142	73.85	37.560	44.58
10.9	21.365 ¹⁶³	27.44 ³⁰⁹	23.812 ¹⁹²	58.47 ⁵⁹	29.307 ¹⁶⁵	71.02 ²⁸³	37.722 ¹⁶²	41.16 ³⁴²
20.9	21.575 ²¹⁰	24.50 ²⁹⁴	24.039 ²²⁷	59.36 ⁸⁹	29.514 ²⁰⁷	68.33 ²⁶⁹	37.943 ²²¹	37.92 ³²⁴
30.9	21.823 ²⁴⁸	21.83 ²⁶⁷	24.293 ²⁵⁴	60.20 ⁸⁴	29.754 ²⁴⁰	65.88 ²⁴⁵	38.219 ²⁷⁶	34.97 ²⁹⁵
Feb. 9.9	22.105 ²⁸²	19.52 ²³¹	24.568 ²⁷⁵	60.96 ⁷⁶	30.023 ²⁶⁹	63.76 ²¹²	38.542 ³²³	32.43 ²⁵⁴
19.8	22.413 ³⁰⁸	17.66 ¹⁸⁶	24.858 ²⁹⁰	61.58 ⁶²	30.314 ²⁹¹	62.05 ¹⁷¹	38.901 ³⁵⁹	30.39 ²⁰⁴
29.8	22.737 ³²⁴	16.34 ¹³²	25.159 ³⁰¹	62.04 ⁴⁶	30.621 ³⁰⁷	60.82 ¹²³	39.286 ³⁸⁵	28.94 ¹⁴⁵
Mar. 10.8	23.072 ³³⁵	15.58 ⁷⁶	25.466 ³⁰⁷	62.30 ⁷	30.937 ³¹⁶	60.12 ⁷⁰	39.688 ⁴⁰²	28.10 ⁸⁴
20.8	23.411 ³³⁹	15.43 ¹⁵	25.773 ³⁰⁷	62.37 ²⁶	31.255 ³¹⁸	59.96 ¹⁶	40.096 ⁴⁰⁸	27.93 ¹⁷
30.7	23.746 ³³⁵	15.88 ⁴⁵	26.077 ³⁰⁴	62.20 ¹⁷	31.570 ³¹⁵	60.36 ⁴⁰	40.498 ⁴⁰²	28.42 ⁴⁹
Apr. 9.7	24.072 ³²⁶	16.89 ¹⁰¹	26.376 ²⁹⁹	61.85 ³⁵	31.876 ³⁰⁶	61.28 ⁹²	40.888 ³⁹⁰	29.52 ¹¹⁰
19.7	24.380 ³⁰⁸	18.44 ¹⁵⁵	26.665 ²⁸⁹	61.32 ⁵³	32.169 ²⁹³	62.68 ¹⁴⁰	41.255 ³⁶⁷	31.20 ¹⁶⁶
29.6	24.667 ²⁸⁷	20.44 ²⁰⁰	26.940 ²⁷⁵	60.63 ⁶⁹	32.444 ²⁷⁵	64.51 ¹⁸³	41.590 ³³⁶	33.39 ²¹⁹
May 9.6	24.926 ²⁵⁹	22.81 ²³⁷	27.197 ²⁵⁷	59.84 ⁷⁹	32.693 ²⁴⁹	66.70 ²¹⁹	41.887 ²⁹⁷	36.00 ²⁶¹
19.6	25.152 ²²⁶	25.50 ²⁶⁰	27.433 ²³⁶	58.97 ⁸⁷	32.914 ²²¹	69.15 ²⁴⁵	42.139 ²⁵²	38.96 ²⁸⁶
29.6	25.342 ¹⁹⁰	28.39 ²⁸⁹	27.642 ²⁰⁹	58.05 ⁹²	33.103 ¹⁸⁹	71.81 ²⁶⁶	42.341 ²⁰²	42.14 ³¹⁸
June 8.5	25.490 ¹⁴⁸	31.40 ³⁰¹	27.820 ¹⁷⁸	57.14 ⁹¹	33.255 ¹⁵²	74.57 ²⁷⁶	42.488 ¹⁴⁷	45.45 ³³¹
18.5	25.593 ¹⁰³	34.44 ³⁰⁴	27.965 ¹⁴⁵	56.25 ⁸⁹	33.367 ¹¹²	77.35 ²⁷⁸	42.576 ⁸⁸	48.82 ³³⁷
28.5	25.649 ⁵⁶	37.44 ³⁰⁰	28.072 ¹⁰⁷	55.41 ⁸⁴	33.436 ⁶⁹	80.10 ²⁷⁵	42.604 ³¹	52.13 ³³¹
July 8.4	25.657 ⁸	40.30 ²⁸⁶	28.139 ⁶⁷	54.64 ⁷⁷	33.461 ²⁵	82.71 ²⁶¹	42.573 ²⁸	55.31 ³¹⁸
18.4	25.618 ³⁹	42.97 ²⁶⁷	28.164 ²⁵	53.96 ⁶⁸	33.442 ¹⁹	85.14 ²⁴³	42.481 ⁹²	58.27 ²⁹⁶
28.4	25.533 ⁸⁵	45.38 ²⁴¹	28.148 ¹⁶	53.36 ⁶⁰	33.380 ⁶²	87.34 ²²⁰	42.333 ¹⁴⁸	60.95 ²⁶⁸
Aug. 7.4	25.403 ¹³⁰	47.48 ²¹⁰	28.093 ⁵⁵	52.86 ⁵⁰	33.276 ¹⁰⁴	89.27 ¹⁹³	42.132 ¹⁹³	63.30 ²³⁵
17.3	25.235 ¹⁶⁸	49.23 ¹⁷⁵	28.003 ⁹⁰	52.45 ⁴¹	33.137 ¹³⁹	90.86 ¹⁵⁹	41.885 ²⁰⁷	65.26 ¹⁹⁶
27.3	25.033 ²⁰²	50.59 ¹³⁶	27.881 ¹²²	62.12 ³³	32.965 ¹⁷²	92.11 ¹²⁵	41.599 ²⁸⁶	66.79 ¹⁵³
Sept. 6.3	24.807 ²²⁶	51.55 ⁹⁶	27.735 ¹⁴⁶	51.89 ²³	32.769 ¹⁹⁶	92.99 ⁸⁸	41.282 ³¹⁷	67.85 ¹⁰⁶
16.3	24.564 ²⁴³	52.07 ⁵²	27.572 ¹⁶³	51.73 ¹⁶	32.557 ²¹²	93.48 ⁴⁹	40.946 ³³⁶	68.42 ⁵⁷
26.2	24.314 ²⁵⁰	52.13 ⁶	27.403 ¹⁶⁹	51.64 ⁹	32.338 ²¹⁹	93.56 ⁸	40.601 ³⁴⁵	68.50 ⁸
Oct. 6.2	24.066 ²⁴⁸	51.74 ³⁹	27.237 ¹⁶⁶	51.63 ¹	32.121 ²¹⁷	93.23 ³³	40.259 ³⁴²	68.07 ⁴³
16.2	23.833 ²³³	50.90 ⁸⁴	27.084 ¹⁵³	51.70 ⁷	31.919 ²⁰²	92.49 ⁷⁴	39.933 ³²⁶	67.11 ⁹⁶
26.1	23.624 ²⁰⁹	49.61 ¹²⁹	26.955 ¹²⁹	51.85 ¹⁵	31.738 ¹⁸¹	91.34 ¹¹⁵	39.635 ²⁹⁶	65.66 ¹⁴⁵
Nov. 5.1	23.449 ¹⁷⁵	47.89 ¹⁷²	26.856 ⁹⁹	52.12 ²⁷	31.590 ¹⁴⁸	89.80 ¹⁵⁴	39.377 ²⁵⁸	63.74 ¹⁹²
15.1	23.316 ¹³³	45.78 ²¹¹	26.798 ⁵⁸	52.49 ³⁷	31.481 ¹⁰⁹	87.92 ¹⁸⁸	39.168 ²⁰⁰	61.39 ²²⁵
25.1	23.231 ⁸⁵	43.31 ²⁴⁷	26.783 ¹⁵	52.97 ⁴⁸	31.417 ⁶⁴	85.70 ²²²	39.017 ¹⁵¹	58.64 ²⁷³
Dec. 5.0	23.199 ³²	40.57 ²⁷⁴	26.814 ³¹	53.56 ⁵⁹	31.402 ¹⁵	83.21 ²⁴⁹	38.931 ⁸⁶	55.58 ³⁰⁶
15.0	23.222 ²³	37.60 ²⁹⁷	26.893 ⁷⁹	54.27 ⁷¹	31.439 ³⁷	80.53 ²⁶⁸	38.912 ¹⁹	52.28 ³³⁰
25.0	23.300 ⁷⁸	34.50 ³¹⁰	27.018 ¹²⁵	55.06 ⁷⁹	31.527 ⁸⁸	77.72 ²⁸¹	38.964 ⁵²	48.85 ³⁴³
35.0	23.431 ¹³¹	31.38 ³¹²	27.185 ¹⁶⁷	55.91 ⁸⁵	31.662 ¹³⁵	74.58 ²⁸⁴	39.082 ¹¹⁸	45.40 ³⁴⁵
Mean Place	22.320	39.49	24.092	51.32	30.046	82.39	39.325	53.85
Sec δ , Tan δ	1.257	+0.761	1.015	-0.172	1.146	+0.560	1.606	+1.257
$D\phi\alpha$, $D\omega\alpha$	+0.04	0.00	+0.07	0.00	+0.05	0.00	+0.03	0.00
$D\phi\delta$, $D\omega\delta$	0.0	-1.0	0.0	-1.0	0.0	-1.0	0.0	-1.0

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	67 Ophiuchi. Mag. 3.9		θ Arae. Mag. 3.9		γ Sagittarii. Mag. 3.1		70 Ophiuchi. Mag. 4.1	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 17 56 s	° ' " + 2 55 "	h m 18 0 s	° ' " -50 5 "	h m 18 0 s	° ' " -30 25 "	h m 18 1 s	° ' " + 2 30 "
Jan. 1.0	25.762	57.95	4.653	58.53	24.106	39.35	11.991	58.01
10.9	25.941 ¹⁷⁹	58.35 ¹⁸⁰	4.926 ²⁷³	57.00 ¹⁵³	24.323 ²¹⁷	38.96 ³⁹	12.166 ¹⁷⁵	58.42 ¹⁵⁹
20.9	26.154 ²¹³	54.79 ¹⁵⁶	5.252 ³²⁶	55.61 ¹³⁹	24.579 ²⁵⁶	38.65 ³¹	12.375 ²⁰⁹	54.87 ¹⁵⁵
30.9	26.394 ²⁴⁰	53.34 ¹⁴⁵	5.622 ³⁷⁰	54.41 ¹²⁰	24.866 ²⁸⁷	38.42 ²³	12.614 ²³⁹	53.43 ¹⁴⁴
Feb. 9.9	26.657 ²⁶³	52.09 ¹²⁵	6.027 ⁴⁰⁵	53.41 ¹⁰⁰	25.179 ³¹³	38.24 ¹⁸	12.874 ²⁶⁰	52.16 ¹²⁷
	279	103	431	79	330	12	277	103
19.8	26.936	51.06	6.458	52.62	25.509	38.12	13.151	51.13
29.8	27.226 ²⁹⁰	50.32 ⁷⁴	6.907 ⁴⁴⁹	52.03 ⁵⁹	25.851 ³⁴²	38.02 ¹⁰	13.439 ²⁸⁸	50.37 ⁷⁶
Mar. 10.8	27.522 ²⁹⁶	49.89 ⁴³	7.367 ⁴⁶⁰	51.66 ³⁷	26.202 ³⁵¹	37.94 ⁸	13.734 ²⁹⁵	49.92 ⁴⁵
20.8	27.820 ²⁹⁸	49.80 ⁹	7.829 ⁴⁶²	51.51 ¹⁵	26.555 ³⁵³	37.87 ⁷	14.033 ²⁹⁹	49.81 ¹¹
30.7	28.116 ²⁹⁶	50.05 ²⁵	8.290 ⁴⁶¹	51.55 ⁴	26.904 ³⁴⁹	37.80 ⁷	14.329 ²⁹⁶	50.03 ²²
	290	58	452	26	345	5	293	54
Apr. 9.7	28.406	50.63	8.742	51.81	27.249	37.75	14.622	50.57
19.7	28.686 ²⁸⁰	51.48 ⁸⁵	9.180 ⁴³⁸	52.25 ⁴⁴	27.584 ³³⁵	37.72 ³	14.903 ²⁸¹	51.40 ⁸³
29.6	28.952 ²⁶⁸	52.60 ¹¹²	9.597 ⁴¹⁷	52.89 ⁶⁴	27.904 ³²⁰	37.72 ⁰	15.172 ²⁶⁹	52.48 ¹⁰⁸
May 9.6	29.200 ²⁴⁸	53.92 ¹³²	9.988 ³⁹¹	53.72 ⁸³	28.205 ³⁰¹	37.76 ⁴	15.425 ²⁵³	53.76 ¹²⁸
19.6	29.426 ²²⁶	55.38 ¹⁴⁶	10.342 ³⁵⁴	54.73 ¹⁰¹	28.483 ²⁷⁸	37.86 ¹⁰	15.654 ²²⁹	55.19 ¹⁴³
	199	157	316	115	247	16	203	153
29.6	29.625	56.95	10.658	55.88	28.730	38.02	15.857	56.72
June 8.5	29.793 ¹⁶⁸	58.56 ¹⁶¹	10.925 ²⁶⁷	57.17 ¹²⁹	28.942 ²¹²	38.26 ²⁴	16.032 ¹⁷⁵	58.30 ¹⁵⁸
18.5	29.929 ¹³⁶	60.16 ¹⁶⁰	11.139 ²¹⁴	58.57 ¹⁴⁰	29.116 ¹⁷⁴	38.55 ²⁹	16.173 ¹⁴¹	59.86 ¹⁵⁶
28.5	30.027 ⁹⁸	61.71 ¹⁵⁵	11.297 ¹⁵⁸	60.04 ¹⁴⁷	29.247 ¹³¹	38.91 ³⁶	16.275 ¹⁰²	61.37 ¹⁵¹
July 8.5	30.085 ⁵⁸	63.18 ¹⁴⁷	11.393 ⁹⁶	61.54 ¹⁵⁰	29.333 ⁸⁶	39.32 ⁴¹	16.339 ⁶⁴	62.80 ¹⁴³
	—	135	33	148	38	43	24	130
18.4	30.103	64.53	11.426	63.02	29.371	39.75	16.363	64.10
28.4	30.081 ²²	65.72 ¹¹⁹	11.395 ³¹	64.40 ¹³⁸	29.361 ¹⁰	40.20 ⁴⁵	16.344 ¹⁹	65.27 ¹¹⁷
Aug. 7.4	30.020 ⁶¹	66.76 ¹⁰⁴	11.306 ⁸⁹	65.67 ¹²⁷	29.305 ⁵⁶	40.63 ⁴³	16.288 ⁵⁶	66.28 ¹⁰¹
17.3	29.927 ⁹³	67.62 ⁸⁶	11.161 ¹⁴⁵	66.77 ¹¹⁰	29.207 ⁹⁸	41.01 ³⁸	16.195 ⁹³	67.11 ⁸³
27.3	29.801 ¹²⁶	68.29 ⁶⁷	10.967 ¹⁹⁴	67.65 ⁸⁸	29.073 ¹²⁴	41.31 ³⁰	16.074 ¹²¹	67.76 ⁶⁵
	149	49	231	58	164	20	147	46
Sept. 6.3	29.652	68.78	10.736	68.23	28.909	41.51	15.927	68.22
16.3	29.486 ¹⁶⁶	69.07 ²⁹	10.480 ²⁵⁶	68.53 ³⁰	28.727 ¹⁸²	41.59 ⁸	15.762 ¹⁶⁵	68.49 ²⁷
26.2	29.314 ¹⁷²	69.17 ¹⁰	10.211 ²⁶⁹	68.50 ³	28.535 ¹⁹²	41.55 ⁴	15.591 ¹⁷¹	68.56 ⁷
Oct. 6.2	29.145 ¹⁶⁹	69.07 ¹⁰	9.946 ²⁶⁵	68.16 ³⁴	28.346 ¹⁸⁹	41.36 ¹⁹	15.423 ¹⁶⁸	68.43 ¹³
16.2	28.988 ¹⁵⁷	68.75 ³²	9.701 ²⁴⁵	67.47 ⁶⁹	28.171 ¹⁷⁵	41.05 ³¹	15.267 ¹⁵⁶	68.11 ³²
	135	51	212	98	150	43	139	53
26.2	28.853	68.24	9.489	66.49	28.021	40.62	15.128	67.58
Nov. 5.1	28.748 ¹⁰⁵	67.51 ⁷³	9.322 ¹⁶⁷	65.24 ¹²⁵	27.907 ¹¹⁴	40.09 ⁵³	15.021 ¹⁰⁷	66.86 ⁷²
15.1	28.681 ⁶⁷	66.59 ⁹²	9.214 ¹⁰⁸	63.78 ¹⁴⁶	27.837 ⁷⁰	39.51 ⁵⁸	14.951 ⁷⁰	65.94 ⁹²
25.1	28.656 ²⁵	65.46 ¹¹³	9.168 ⁴⁶	62.16 ¹⁶²	27.817 ²⁰	38.89 ⁶²	14.923 ²⁸	64.82 ¹¹²
Dec. 5.0	28.676 ²⁰	64.18 ¹²⁸	9.195 ²⁷	60.43 ¹⁷³	27.849 ³²	38.27 ⁶²	14.941 ¹⁸	63.55 ¹²⁷
	67	143	98	174	87	58	64	142
15.0	28.743	62.75	9.293	58.69	27.996	37.69	15.005	62.13
25.0	28.854 ¹¹¹	61.22 ¹⁵³	9.460 ¹⁶⁷	56.98 ¹⁷¹	28.074 ¹³⁸	37.17 ⁵²	15.113 ¹⁰⁸	60.60 ¹⁵³
35.0	29.007 ¹⁵³	59.63 ¹⁵⁰	9.693 ²³³	55.35 ¹⁶³	28.261 ¹⁸⁷	36.72 ⁴⁵	15.261 ¹⁴⁸	59.03 ¹⁵⁷
Mean Place	26.297	64.98	5.496	54.75	24.630	34.40	12.528	64.89
Sec δ , Tan δ	1.001	+0.051	1.559	-1.196	1.160	-0.587	1.001	+0.044
D ϕ α , D α α	+0.06	0.00	+0.09	0.00	+0.08	0.00	+0.06	0.00
D ϕ δ , D α δ	0.0	-1.0	0.0	-1.0	0.0	-1.0	0.0	-1.0

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	72 Ophiuchi. Mag. 3.7		o Herculis. Mag. 3.8		μ Sagittarii. Mag. 4.0		η Sagittarii. Mag. 3.2	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 18 3	° ' " + 9 32	h m 18 4	° ' " +28 44	h m 18 8	° ' " -21 4	h m 18 11	° ' " -3
	s	"	s	"	s	"	s	"
Jan. 1.0	21.402	56.86	15.007	52.69	43.877	60.20	56.053	20.5
11.0	21.570	54.93	15.162	49.89	44.070	60.33	56.271	20.5
20.9	21.773	53.06	15.358	47.21	44.299	60.51	56.530	19.3
30.9	22.004	51.35	15.589	44.75	44.558	60.70	56.825	18.7
Feb. 9.9	22.259	49.84	15.850	42.61	44.841	60.88	57.148	18.1
19.8	22.532	48.62	16.134	40.87	45.143	61.02	57.495	17.7
29.8	22.818	47.73	16.436	39.61	45.457	61.10	57.855	17.3
Mar. 10.8	23.112	47.22	16.747	38.86	45.778	61.10	58.226	16.9
20.8	23.409	47.11	17.064	38.65	46.104	61.01	58.602	16.5
30.7	23.705	47.40	17.379	39.00	46.429	60.83	58.979	16.1
Apr. 9.7	23.996	48.07	17.687	39.87	46.750	60.55	59.351	15.7
19.7	24.278	49.08	17.985	41.22	47.064	60.22	59.713	15.3
29.7	24.546	50.40	18.265	43.01	47.364	60.00	60.061	14.9
May 9.6	24.796	51.98	18.522	45.17	47.648	59.43	60.391	14.5
19.6	25.024	53.74	18.752	47.59	47.911	59.02	60.695	14.1
29.6	25.225	55.63	18.950	50.23	48.148	58.63	60.968	13.7
June 8.5	25.395	57.59	19.112	52.98	48.353	58.29	61.207	13.3
18.5	25.531	59.55	19.234	55.77	48.522	58.00	61.404	12.9
28.5	25.629	61.47	19.314	58.53	48.653	57.78	61.556	12.5
July 8.5	25.687	63.30	19.349	61.16	48.740	57.63	61.658	12.1
18.4	25.705	64.98	19.340	63.64	48.784	57.54	61.708	11.7
28.4	25.681	66.50	19.287	65.89	48.783	57.50	61.706	11.3
Aug. 7.4	25.619	67.83	19.193	67.87	48.739	57.50	61.654	10.9
17.4	25.522	68.95	19.060	69.53	48.655	57.53	61.556	10.5
27.3	25.392	69.83	18.894	70.86	48.535	57.56	61.417	10.1
Sept. 6.3	25.239	70.46	18.703	71.82	48.389	57.59	61.245	9.7
16.3	25.068	70.85	18.493	72.38	48.222	57.59	61.050	9.3
26.2	24.891	70.97	18.276	72.55	48.045	57.55	60.843	8.9
Oct. 6.2	24.716	70.84	18.061	72.32	47.869	57.47	60.635	8.5
16.2	24.549	70.45	17.856	71.67	47.706	57.36	60.440	8.1
26.2	24.404	69.78	17.672	70.62	47.565	57.22	60.270	7.7
Nov. 5.1	24.289	68.87	17.519	69.19	47.455	57.06	60.136	7.3
15.1	24.210	67.70	17.404	67.39	47.385	56.91	60.047	6.9
25.1	24.173	66.32	17.333	65.25	47.359	56.79	60.009	6.5
Dec. 5.1	24.180	64.71	17.310	62.85	47.382	56.71	60.028	6.1
15.0	24.234	62.95	17.337	60.22	47.455	56.68	60.103	5.7
25.0	24.332	61.08	17.414	57.46	47.575	56.71	60.235	5.3
35.0	24.472	59.16	17.539	54.66	47.740	56.80	60.419	4.9
Mean Place	22.004	64.03	15.919	60.57	44.356	54.61	56.636	16.0
Sec δ , Tan δ	1.014	+0.168	1.141	+0.549	1.071	-0.386	1.248	-0.7
$D\psi \alpha$, $D\omega \alpha$	+0.06	0.00	+0.05	0.00	+0.07	0.00	+0.08	0.0
$D\psi \delta$, $D\omega \delta$	0.0	-1.0	0.0	-1.0	0.0	-1.0	0.0	-1.0

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	Groombridge 2533. Mag. 5.4		36 Draconis. Mag. 5.0		δ Sagittarii. Mag. 2.8		γ Serpentis. Mag. 3.4	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 18 13	° ' " +42 7	h m 18 13	° ' " +64 21	h m 18 15	° ' " -29 51	h m 18 16	° ' " - 2 55
	s 18 13	" +42 7	s 18 13	" +64 21	s 18 15	" -29 51	s 18 16	" - 2 55
Jan. 1.0	0.644	40.88	21.72	59.59	36.465	58.95	57.232	23.52
11.0	0.781 137	37.68 320	21.84 12	56.07 352	36.664 199	58.52 43	57.396 164	24.74 122
20.9	0.970 180	34.60 306	22.06 22	52.67 340	36.902 238	58.14 38	57.595 199	25.93 119
30.9	1.204 234	31.75 285	22.37 31	49.55 312	37.174 272	57.82 32	57.822 227	27.05 112
Feb. 9.9	1.478 274	29.26 249	22.76 39	46.80 275	37.474 300	57.54 28	58.074 252	28.03 98
	305	204	44	227	318	24	209	80
19.8	1.783	27.22 152	23.20 170	44.53 170	37.792 334	57.30 22	58.343 284	28.83 57
29.8	2.112 329	25.70 93	23.70 50	42.83 106	38.126 343	57.08 22	58.627 292	29.40 31
Mar. 10.8	2.457 345	24.77 33	24.23 53	41.77 40	38.469 349	56.86 22	58.919 298	29.71 4
20.8	2.812 354	24.44 29	24.78 55	41.37 27	38.818 349	56.64 21	59.217 299	29.75 25
30.7	3.166 348	24.73 89	25.33 53	41.64 94	39.167 347	56.43 20	59.516 296	29.50 51
Apr. 9.7	3.514	25.62 147	25.86 51	42.58 154	39.514 339	56.23 18	59.812 289	28.99 76
19.7	3.849 335	27.09 196	26.37 47	44.12 209	39.853 326	56.05 15	60.101 279	28.23 96
29.7	4.162 313	29.05 237	26.84 41	46.21 256	40.179 309	55.90 11	60.380 263	27.27 114
May 9.6	4.448 286	31.42 273	27.25 33	48.77 295	40.488 287	55.79 5	60.643 245	26.13 125
19.6	4.700 214	34.15 298	27.58 27	51.72 322	40.775 259	55.74 3	60.888 219	24.88 133
29.6	4.914 170	37.13 314	27.85 20	54.94 341	41.034 226	55.77 11	61.107 191	23.55 135
June 8.5	5.084 122	40.27 321	28.05 11	58.35 350	41.260 190	55.88 19	61.298 157	22.20 133
18.5	5.206 73	43.48 319	28.16 2	61.85 349	41.450 146	56.07 28	61.455 120	20.87 128
28.5	5.279 30	46.67 309	28.18 7	65.94 340	41.596 101	56.35 34	61.575 81	19.58 119
July 8.5	5.299 32	49.76 291	28.11 16	68.74 322	41.697 53	56.69 39	61.656 39	18.40 109
18.4	5.267	52.67 267	27.95 23	71.96 295	41.750 5	57.08 42	61.695 1	17.31 97
28.4	5.185 82	55.34 238	27.72 31	74.91 264	41.755 42	57.50 42	61.694 43	16.34 82
Aug. 7.4	5.054 131	57.72 203	27.41 37	77.55 226	41.713 85	57.92 40	61.651 81	15.52 67
17.4	4.880 212	59.75 163	27.04 43	79.81 183	41.628 124	58.32 35	61.570 113	14.85 54
27.3	4.668 241	61.38 121	26.61 48	81.64 137	41.504 156	58.67 26	61.457 140	14.31 38
Sept. 6.3	4.427	62.59 76	26.13 51	83.01 87	41.348 177	58.93 16	61.317 160	13.93 23
16.3	4.163 264	63.35 30	25.62 53	83.88 36	41.171 189	59.09 4	61.157 169	13.70 10
26.2	3.889 274	63.65 18	25.09 53	84.24 18	40.982 190	59.13 9	60.988 170	13.60 5
Oct. 6.2	3.614 275	63.47 67	24.56 51	84.06 71	40.792 180	59.04 23	60.818 160	13.65 20
16.2	3.351 244	62.80 114	24.05 48	83.35 124	40.612 156	58.81 34	60.658 141	13.85 35
26.2	3.107	61.66 180	23.57 44	82.11 175	40.456 123	58.47 45	60.517 114	14.20 48
Nov. 5.1	2.896 211	60.06 203	23.13 38	80.36 222	40.333 83	58.02 52	60.403 79	14.68 66
15.1	2.726 170	58.03 240	22.75 31	78.14 266	40.250 35	57.50 57	60.324 38	15.34 93
25.1	2.603 123	55.63 275	22.44 22	75.48 302	40.215 17	56.93 59	60.286 7	16.13 78
Dec. 5.1	2.534 12	52.88 300	22.22 12	72.46 329	40.232 69	56.34 57	60.293 51	17.06 106
15.0	2.522 47	49.88 316	22.10 3	69.17 348	40.301 121	55.77 54	60.344 94	18.12 115
25.0	2.569 102	46.72 321	22.07 6	65.69 354	40.422 169	55.23 49	60.438 138	19.27 120
35.0	2.671	43.51	22.13	62.15	40.591	54.74	60.576	20.47
Mean Place	1.984	48.39	24.806	67.11	36.982	53.67	57.745	17.24
Sec δ , Tan δ	1.348	+0.904	2.312	+2.084	1.153	-0.574	1.001	-0.061
$D\phi$ a , D_{ϕ} a	+0.04	0.00	+0.01	-0.01	+0.08	0.00	+0.06	0.00
$D\phi$ δ , D_{ϕ} δ	0.0	-1.0	0.0	-1.0	0.0	-1.0	0.0	-1.0

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	♄ Sagittarii. Mag. 2.0		109 Herculis. Mag. 3.9		α Telescopii. Mag. 3.8		χ Draconis. Mag. 3.	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 18 18	° ' " 25	h m 18 20	° ' " 43	h m 18 20	° ' " 46 0	h m 18 22	° ' " 4
	s	"	s	"	s	"	s	"
Jan. 1.0	35.219	36.23	6.294	43.34	43.988	62.26	29.43	41
11.0	35.424 ²⁰⁵	35.51 ⁷²	6.436 ¹⁴²	40.85 ²⁴⁹	44.217 ²²⁹	60.83 ¹⁴³	29.53 ¹⁰	37
20.9	35.670 ²⁴⁶	34.85 ⁶⁶	6.618 ¹⁸²	38.45 ²⁴⁰	44.497 ²⁸⁰	59.50 ¹³³	29.77 ²⁴	34
30.9	35.951 ²⁸¹	34.27 ⁵⁸	6.834 ²¹⁶	36.23 ²²²	44.821 ³²⁴	58.31 ¹¹⁹	30.13 ³⁶	31
Feb. 9.9	36.262 ³¹¹	33.76 ⁵¹	7.078 ²⁴⁴	34.26 ¹⁹⁷	45.179 ³⁵⁸	57.25 ¹⁰⁶	30.62 ⁴⁹	28
	331	45	268	161	384	90	58	
19.9	36.593	33.31	7.346	32.65	45.563	56.35	31.20	26
29.8	36.942 ³⁴⁹	32.93 ³⁸	7.630 ²⁸⁴	31.45 ¹²⁰	45.970 ⁴⁰⁷	55.62 ⁷³	31.88 ⁶⁸	24
Mar. 10.8	37.300 ³⁵⁸	32.60 ³³	7.927 ²⁹⁷	30.72 ⁷³	46.389 ⁴¹⁹	55.04 ⁵⁸	32.61 ⁷³	22
20.8	37.665 ³⁶⁵	32.31 ²⁹	8.232 ³⁰⁵	30.47 ²⁵	46.815 ⁴²⁶	54.63 ⁴¹	33.37 ⁷⁶	22
30.7	38.031 ³⁶⁶	32.09 ²²	8.537 ³⁰⁵	30.73 ²⁶	47.244 ⁴²⁹	54.41 ²²	34.14 ⁷⁷	22
	364	17	302	74	426	7	75	
Apr. 9.7	38.395	31.92	8.839	31.47	47.670	54.34	34.89	22
19.7	38.750 ³⁵⁵	31.80 ¹²	9.134 ²⁹⁵	32.66 ¹¹⁹	48.087 ⁴¹⁷	54.44 ¹⁰	35.61 ⁷²	22
29.7	39.094 ³⁴⁴	31.76 ⁴	9.416 ²⁸²	34.25 ¹⁵⁹	48.488 ⁴⁰¹	54.73 ²⁹	36.25 ⁶⁴	22
May 9.6	39.420 ³²⁶	31.81 ⁵	9.679 ²⁶³	36.17 ¹⁹²	48.869 ³⁸¹	55.18 ⁴⁵	36.83 ⁵⁸	22
19.6	39.722 ³⁰²	31.95 ¹⁴	9.920 ²⁴¹	38.37 ²²⁰	49.221 ³⁵²	55.82 ⁶⁴	37.30 ⁴⁷	33
	274	25	212	238	318	79	37	
29.6	39.996	32.20	10.132	40.75	49.539	56.61	37.67	33
June 8.6	40.235 ²³⁹	32.55 ³⁵	10.312 ¹⁸⁰	43.25 ²⁵⁰	49.816 ²⁷⁷	57.56 ⁹⁵	37.91 ²⁴	33
18.5	40.435 ²⁰⁰	32.99 ⁴⁴	10.456 ¹⁴⁴	45.80 ²⁵⁵	50.045 ²²⁹	58.63 ¹⁰⁷	38.04 ¹³	43
28.5	40.590 ¹⁵⁵	33.52 ⁵³	10.560 ¹⁰⁴	48.32 ²⁵²	50.221 ¹⁷⁶	59.82 ¹¹⁹	38.04 ⁰	43
July 8.5	40.697 ¹⁰⁷	34.12 ⁶⁰	10.621 ⁶¹	50.75 ²⁴³	50.341 ¹²⁰	61.06 ¹²⁴	37.92 ¹²	43
	57	65	17	229	62	128	26	
18.4	40.754 ⁶	34.77	10.638	53.04	50.403	62.34	37.66	53
28.4	40.760 ⁴³	35.44 ⁶⁷	10.613 ²⁵	55.12 ²⁰⁸	50.403 ⁰	63.59 ¹²⁵	37.29 ³⁷	53
Aug. 7.4	40.717 ⁸⁹	36.09 ⁶⁵	10.546 ⁶⁷	56.97 ¹⁸⁵	50.345 ⁵⁸	64.76 ¹¹⁷	36.82 ⁴⁷	53
17.4	40.628 ⁸⁹	36.69 ⁶⁰	10.440 ¹⁰⁶	58.55 ¹⁵⁸	50.234 ¹¹¹	65.83 ¹⁰⁷	36.25 ⁵⁷	63
27.3	40.497 ¹³¹	37.20 ⁵¹	10.302 ¹³⁸	59.82 ¹²⁷	50.074 ¹⁶⁰	66.73 ⁹⁰	35.60 ⁶⁵	63
	164	40	167	96	199	68	72	
Sept. 6.3	40.333	37.60	10.135	60.78	49.875	67.41	34.88	63
16.3	40.146 ¹⁸⁷	37.84 ²⁴	9.949 ¹⁸⁶	61.40 ⁶²	49.648 ²²⁷	67.85 ⁴⁴	34.12 ⁷⁶	63
26.3	39.947 ¹⁹⁹	37.92 ⁸	9.752 ¹⁹⁷	61.66 ²⁶	49.405 ²⁴³	68.01 ¹⁶	33.32 ⁸⁰	63
Oct. 6.2	39.745 ²⁰²	37.83 ⁹	9.554 ¹⁹⁸	61.57 ⁹	49.160 ²⁴⁵	67.87 ¹⁴	32.52 ⁸⁰	63
16.2	39.555 ¹⁹⁰	37.55 ²⁸	9.365 ¹⁸⁹	61.12 ⁴⁵	48.927 ²³³	67.45 ⁴²	31.73 ⁷⁹	63
	168	44	171	81	207	71	75	
26.2	39.387	37.11	9.194 ¹⁴⁵	60.31 ¹¹⁶	48.720 ¹⁶⁸	66.74 ⁹⁶	30.98 ⁷⁰	63
Nov. 5.1	39.255 ¹³²	36.52 ⁵⁹	9.049 ¹⁰⁹	59.15 ¹³⁰	48.552 ¹¹⁹	65.78 ¹¹⁹	30.28 ⁶¹	63
15.1	39.164 ⁴¹	35.81 ⁷⁹	8.940 ⁶⁸	57.65 ¹⁸⁰	48.433 ⁶¹	64.59 ¹³⁵	29.67 ⁵²	63
25.1	39.123 ¹²	35.02 ⁸⁴	8.872 ²⁴	55.85 ²⁰⁷	48.372 ³	63.24 ¹⁴⁶	29.15 ⁴⁰	53
Dec. 5.1	39.135 ⁶⁸	34.18 ⁸⁴	8.848 ²³	53.78 ²²⁶	48.375 ⁶⁶	61.78 ¹⁵³	28.75 ²⁶	53
15.0	39.203 ¹²²	33.34 ⁸³	8.871 ⁶⁹	51.52 ²⁴²	48.441 ¹³¹	60.25 ¹⁵³	28.49 ¹⁴	53
25.0	39.325 ¹⁷²	32.51 ⁷⁸	8.940 ¹¹⁵	49.10 ²⁴⁷	48.572 ¹⁹¹	58.72 ¹⁴⁸	28.35 ⁰	43
35.0	39.497	31.73	9.055	46.63	48.763	57.24	28.35	43
Mean Place	35.774	31.06	7.085	50.07	44.715	57.43	34.431	43
Sec δ, Tan δ	1.212	-0.685	1.076	+0.399	1.440	-1.036	3.362	43
Dψ α, Dω α	+0.08	0.00	+0.05	0.00	+0.09	+0.01	-0.02	-
Dψ δ, Dω δ	0.0	-1.0	0.0	-1.0	0.0	-1.0	0.0	-

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	λ Sagittarii. Mag. 2.9			c Serpentis. Mag. 5.4			1 Aquilæ. Mag. 4.1			ζ Pavonis. Mag. 4.1		
	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.
	h m	s	° ' "	h m	s	° ' "	h m	s	° ' "	h m	s	° ' "
	18 22		-25 28	18 25		- 2 2	18 30		- 8 18	18 33		-71 29
Jan. 1.0	46.717		14.99	18.152		32.05	37.662		19.33	11.16		71.62
11.0	46.901 ¹⁸⁴		14.80 ¹⁹	18.307 ¹⁵⁵		33.29 ¹²⁴	37.818 ¹⁵⁶		20.18 ⁸⁵	11.53 ³⁷		68.85 ²⁷⁷
20.9	47.124 ²²⁸		14.64 ¹⁶	18.499 ¹⁹²		34.49 ¹²⁰	38.011 ¹⁹³		21.02 ⁸⁴	12.01 ⁴⁸		66.23 ²⁶²
30.9	47.379 ²⁶⁵		14.51 ¹³	18.720 ²²¹		35.61 ¹¹²	38.233 ²²²		21.79 ⁷⁷	12.59 ⁵⁸		63.80 ²⁴³
Feb. 9.9	47.660 ²⁶¹		14.39 ¹²	18.967 ²⁴⁷		36.59 ⁹⁸	38.480 ²⁴⁷		22.47 ⁶⁸	13.27 ⁶⁸		61.64 ²¹⁶
19.9	47.963 ³⁰⁸		14.27 ¹²	19.231 ²⁶⁴		37.39 ⁸⁰	38.747 ²⁶⁷		23.01 ⁵⁴	14.02 ⁷⁵		59.78 ¹⁸⁶
29.8	48.280 ³¹⁷		14.12 ¹⁵	19.512 ²⁸¹		37.94 ⁵⁵	39.031 ²⁸⁴		23.36 ³⁵	14.82 ⁸⁰		58.26 ¹⁸²
Mar. 10.8	48.608 ³²⁸		13.93 ¹⁹	19.802 ²⁹⁰		38.23 ²⁹	39.324 ²⁹³		23.48 ¹²	15.66 ⁸⁴		57.11 ¹¹⁵
20.8	48.941 ³³³		13.69 ²⁴	20.097 ²⁹⁵		38.23 ⁰	39.626 ³⁰²		23.40 ⁸	16.54 ⁸⁸		56.34 ⁷⁷
30.7	49.277 ³³⁶		13.41 ²⁸	20.397 ³⁰⁰		37.96 ²⁷	39.931 ³⁰⁵		23.10 ³⁰	17.41 ⁸⁷		55.95 ³⁹
Apr. 9.7	49.612 ³³⁵		13.10 ³¹	20.695 ²⁹⁸		37.39 ⁵⁷	40.235 ³⁰⁴		22.59 ⁵¹	18.28 ⁸⁷		55.94 ¹
19.7	49.940 ³²⁸		12.77 ³³	20.988 ²⁹³		36.58 ⁸¹	40.536 ³⁰¹		21.86 ⁷³	19.15 ⁸⁷		56.32 ³⁸
29.7	50.257 ³¹⁷		12.43 ³⁴	21.269 ²⁸¹		35.54 ¹⁰⁴	40.825 ²⁸⁹		20.98 ⁸⁸	19.97 ⁸²		57.07 ⁷⁵
May 9.6	50.558 ³⁰¹		12.10 ³⁸	21.539 ²⁷⁰		34.34 ¹²⁰	41.103 ²⁷⁸		19.99 ⁹⁹	20.74 ⁷⁷		58.19 ¹¹²
19.6	50.840 ²⁸²		11.81 ²⁰	21.788 ²⁴⁹		33.01 ¹³³	41.362 ²⁵⁹		18.91 ¹⁰⁸	21.45 ⁷¹		59.62 ¹⁴³
29.6	51.095 ²⁶⁵		11.58 ²³	22.013 ²²⁵		31.60 ¹⁴¹	41.597 ²³⁵		17.79 ¹¹²	22.08 ⁶³		61.36 ¹⁷⁴
June 8.6	51.319 ²²⁴		11.41 ¹⁷	22.211 ¹⁹⁸		30.17 ¹⁴³	41.806 ²⁰⁹		16.64 ¹¹⁵	22.62 ⁵⁴		63.36 ²⁰⁰
18.5	51.509 ¹⁹⁰		11.32 ⁹	22.376 ¹⁶⁵		28.72 ¹⁴⁵	41.980 ¹⁷⁴		15.54 ¹¹⁰	23.05 ⁴³		65.56 ²²⁰
28.5	51.657 ¹⁴⁸		11.31 ¹	22.504 ¹²⁸		27.35 ¹³⁷	42.120 ¹⁴⁰		14.52 ¹⁰²	23.38 ³³		67.91 ²³⁵
July 8.5	51.768 ¹⁰⁶		11.38 ⁷	22.593 ⁸⁹		26.06 ¹²⁹	42.217 ⁹⁷		13.59 ⁹³	23.58 ²⁰		70.34 ²⁴³
18.4	51.821 ⁵⁸		11.52 ¹⁴	22.640 ⁴⁷		24.89 ¹¹⁷	42.273 ⁵⁶		12.75 ⁸⁴	23.66 ⁸		72.79 ²⁴⁵
28.4	51.833 ¹²		11.71 ¹⁹	22.646 ⁶		23.84 ¹⁰⁵	42.286 ¹³		12.01 ⁷⁴	23.60 ⁶		75.17 ²³⁸
Aug. 7.4	51.799 ⁸⁴		11.94 ²³	22.608 ³⁸		22.93 ⁹¹	42.257 ²⁹		11.39 ⁶²	23.43 ¹⁷		77.40 ²²³
17.4	51.722 ⁷⁷		12.17 ²³	22.535 ⁷³		22.20 ⁷³	42.188 ⁶⁹		10.90 ⁴⁹	23.14 ²⁹		79.40 ²⁰⁰
27.3	51.608 ¹¹⁴		12.40 ²⁸	22.426 ¹⁰⁹		21.60 ⁶⁰	42.084 ¹⁰⁴		10.53 ³⁷	22.75 ³⁹		81.09 ¹⁶⁹
Sept. 6.3	51.462 ¹⁴⁶		12.59 ¹⁹	22.290 ¹³⁶		21.16 ⁴⁴	41.953 ¹³¹		10.27 ²⁶	22.26 ⁴⁹		82.42 ¹³³
16.3	51.294 ¹⁶⁸		12.72 ¹³	22.135 ¹⁵⁵		20.87 ²⁹	41.798 ¹⁵⁵		10.11 ¹⁶	21.72 ⁵⁴		83.32 ⁹⁰
26.3	51.113 ¹⁸¹		12.77 ⁵	21.967 ¹⁶⁸		20.75 ¹²	41.632 ¹⁶⁶		10.04 ⁷	21.14 ⁵⁸		83.74 ⁴²
Oct. 6.2	50.930 ¹⁸³		12.74 ³	21.797 ¹⁷⁰		20.79 ⁴	41.462 ¹⁷⁰		10.07 ³	20.54 ⁶⁰		83.65 ⁹
16.2	50.758 ¹⁷²		12.63 ¹¹	21.635 ¹⁶²		20.98 ¹⁹	41.303 ¹⁵⁹		10.20 ¹³	19.96 ⁵⁸		83.06 ⁵⁹
26.2	50.604 ¹⁶⁴		12.43 ²⁰	21.492 ¹⁴³		21.31 ³³	41.157 ¹⁴⁶		10.40 ²⁰	19.42 ⁵⁴		81.96 ¹¹⁰
Nov. 5.1	50.481 ¹²³		12.16 ²⁷	21.375 ¹¹⁷		21.80 ⁴⁹	41.038 ¹¹⁹		10.72 ³²	18.96 ⁴⁶		80.39 ¹⁵⁷
15.1	50.397 ⁸⁴		11.85 ³¹	21.291 ⁸⁴		22.45 ⁶⁵	40.952 ⁸⁶		11.13 ⁴¹	18.60 ³⁶		78.41 ¹⁹⁸
25.1	50.358 ³⁹		11.52 ³³	21.249 ⁴²		23.24 ⁷⁹	40.909 ⁴³		11.63 ⁵⁰	18.34 ²⁶		76.09 ²³²
Dec. 5.1	50.368 ¹⁰		11.19 ³³	21.248 ¹		24.19 ⁹⁵	40.907 ²		12.24 ⁶¹	18.21 ¹³		73.50 ²⁵⁹
15.0	50.428 ⁶⁰		10.88 ³¹	21.292 ⁴⁴		25.25 ¹⁰⁶	40.952 ⁴⁵		12.94 ⁷⁰	18.23 ²		70.74 ²⁷⁶
25.0	50.537 ¹⁰⁹		10.60 ²⁸	21.380 ⁸⁸		26.40 ¹¹⁵	41.038 ⁸⁶		13.72 ⁷⁸	18.37 ¹⁴		67.90 ²⁸⁴
35.0	50.692 ¹⁵⁵		10.37 ²⁹	21.510 ¹³⁰		27.61 ¹²¹	41.169 ¹³¹		14.53 ⁸¹	18.64 ²⁷		65.07 ²⁸³
Mean Place	47.209		9.43	18.673		25.95	38.155		13.41	13.415		66.93
Sec δ, Tan δ	1.108		-0.476	1.001		-0.036	1.011		-0.146	3.162		-2.989
D ₁ α, D ₂ α	+0.07		0.00	+0.06		0.00	+0.06		0.00	+0.14		+0.03
D ₁ δ, D ₂ δ	0.0		-1.0	0.0		-1.0	+0.1		-1.0	+0.1		-1.0

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	α Lyrae. (Vega.) Mag. 0.1			2 Aquilæ. Mag. 4.7			ϕ Sagittarii. Mag. 3.3			110 Herculis Mag. 4.3		
	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.
	h	m	°	h	m	°	h	m	°	h	m	°
	18	34	+38 41	18	37	- 9 7	18	40	-27 4	18	42	+
	s	"	"	s	"	"	s	"	"	s	"	"
Jan. 1.0	4.418		71.60	40.044		67.76	24.025		47.06	1.957		48.38
11.0	4.533	115	68.52	40.195	151	68.52	24.192	167	46.69	2.078	121	46.46
20.9	4.696	163	65.53	40.380	185	69.26	24.399	207	46.34	2.238	160	44.44
30.9	4.904	208	62.73	40.597	217	69.94	24.641	242	46.00	2.433	195	41.41
Feb. 9.9	5.152	248	60.24	40.840	243	70.54	24.911	270	45.68	2.659	226	39.39
		278			264			293			251	
19.9	5.430		58.15	41.104		71.00	25.204		45.35	2.910		38.38
29.8	5.736	306	56.55	41.384	280	71.28	25.517	313	45.00	3.181	271	37.37
Mar. 10.8	6.061	325	55.50	41.676	292	71.37	25.842	325	44.63	3.467	286	36.36
20.8	6.398	337	55.05	41.976	300	71.25	26.176	334	44.22	3.764	297	36.36
30.8	6.741	343	55.19	42.282	306	70.90	26.516	340	43.79	4.067	303	36.36
		342			304			340			304	
Apr. 9.7	7.083		55.92	42.586		70.35	26.856		43.33	4.371		36.36
19.7	7.416	333	57.21	42.888	302	69.61	27.194	338	42.88	4.671	300	37.37
29.7	7.733	317	59.01	43.182	294	68.73	27.523	329	42.44	4.962	291	39.39
May 9.6	8.030	297	61.24	43.464	282	67.73	27.839	316	42.03	5.238	276	41.41
19.6	8.297	267	63.84	43.728	264	66.64	28.136	297	41.68	5.493	255	43.43
		235			242			274			231	
29.6	8.532		66.71	43.970		65.52	28.410		41.41	5.724		45.45
June 8.6	8.725	193	69.77	44.184	214	64.39	28.653	243	41.22	5.924	200	48.48
18.5	8.875	150	72.92	44.367	183	63.30	28.860	207	41.13	6.088	164	50.50
28.5	8.978	103	76.08	44.513	146	62.28	29.028	168	41.15	6.214	126	53.53
July 8.5	9.030	52	79.17	44.619	106	61.35	29.151	123	41.26	6.297	83	55.55
		2			63			77			40	
18.5	9.032		82.12	44.682	20	60.54	29.228		41.46	6.337		58.58
28.4	8.983	49	84.87	44.702	20	59.82	29.257	29	41.74	6.333	4	60.60
Aug. 7.4	8.886	97	87.34	44.680	22	59.24	29.237	20	42.06	6.286	47	62.62
17.4	8.745	141	89.50	44.617	63	58.77	29.173	64	42.40	6.199	87	63.63
27.3	8.564	181	91.29	44.518	99	58.42	29.068	105	42.73	6.075	124	65.65
		213			129			138			154	
Sept. 6.3	8.351		92.70	44.389		58.18	28.930		43.03	5.921		66.66
16.3	8.114	237	93.67	44.238	151	58.03	28.765	165	43.26	5.745	176	66.66
26.3	7.863	251	94.20	44.072	166	57.97	28.585	160	43.41	5.554	191	67.67
Oct. 6.2	7.607	256	94.27	43.903	169	57.99	28.399	186	43.46	5.358	196	67.67
16.2	7.357	250	93.87	43.741	162	58.09	28.218	181	43.41	5.168	190	67.67
		233			147			162			176	
26.2	7.124		93.00	43.594		58.28	28.056		43.25	4.992		66.66
Nov. 5.2	6.918	206	91.68	43.473	121	58.56	27.923	133	42.98	4.841	151	65.65
15.1	6.749	169	89.92	43.383	90	58.93	27.825	98	42.66	4.720	121	64.64
25.1	6.622	127	87.77	43.333	50	59.38	27.769	56	42.27	4.638	82	62.62
Dec. 5.1	6.543	79	85.27	43.326	7	59.92	27.761	8	41.86	4.597	41	60.60
		26			37			42			3	
15.0	6.517		82.50	43.363		60.54	27.803		41.43	4.600		58.58
25.0	6.545	28	79.54	43.444	81	61.24	27.895	92	41.01	4.648	48	56.56
35.0	6.626	81	76.48	43.567	123	61.98	28.032	137	40.61	4.741	93	53.53
Mean Place	5.663		77.36	40.531		61.93	24.515		41.31	2.740		54.54
Sec δ , Tan δ	1.281		+0.801	1.013		-0.161	1.123		-0.511	1.067		+0.401
$D\phi \alpha$, $D\omega \alpha$	+0.04		-0.01	+0.07		0.00	+0.07		+0.01	+0.05		0
$D\phi \delta$, $D\omega \delta$	+0.1		-1.0	+0.1		-1.0	+0.1		-1.0	+0.1		-1

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	♈ Aquilæ. Mag. 4.5		♎ Pavonis. Mag. 4.4		♌ Lyre. Var. 3.4-4.1		♉ Draconis. Mag. 5.4	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 18 42	° ' " - 4 50	h m 18 44	° ' " - 62 16	h m 18 46	° ' " + 33 15	h m 18 48	° ' " + 75 19
	s "	"	s "	"	s "	"	s "	"
Jan. 1.0	42.542	24.98	24.92	72.89	57.626	47.19	59.33	63.40
11.0	42.685 ¹⁴³	25.98 ¹⁰⁰	25.17 ²⁵	69.98 ²⁴¹	57.730 ¹⁰⁴	44.32 ²⁸⁷	59.32 ¹	59.95 ³⁴⁵
21.0	42.863 ¹⁷⁸	26.96 ⁹⁶	25.50 ³³	67.65 ²³³	57.880 ¹⁵⁰	41.49 ²³³	59.48 ¹⁶	56.52 ³⁴³
30.9	43.071 ²⁰⁶	27.88 ⁹²	25.90 ⁴⁰	65.49 ²¹⁶	58.070 ¹⁹⁰	38.85 ²⁶⁴	59.80 ³²	53.24 ³²⁶
Feb. 9.9	43.306 ²³⁵	28.66 ⁷⁸	26.37 ⁴⁷	63.51 ¹⁹⁶	58.297 ²²⁷	36.46 ²³⁹	60.26 ⁴⁶	50.27 ²⁰⁷
	253	63	51	173	259	201	61	256
19.9	43.561	29.29	26.88	61.78	58.556	34.45	60.87	47.71
29.8	43.834 ²⁷³	29.70 ⁴¹	27.43 ⁵⁵	60.31 ¹⁴⁷	58.840 ²⁸⁴	32.38 ¹⁸⁷	61.58 ⁷¹	45.64 ²⁰⁷
Mar. 10.8	44.120 ²⁸⁶	29.88 ⁻⁻⁻	28.02 ⁵⁹	59.13 ¹¹⁸	59.144 ³⁰⁴	31.83 ¹⁰⁵	62.38 ⁸⁰	44.14 ¹⁵⁰
20.8	44.414 ²⁹⁴	29.80 ⁸	28.62 ⁶⁰	58.24 ⁸⁹	59.462 ³¹⁸	31.34 ⁻⁻⁻	63.24 ⁸⁶	43.27 ⁸⁷
30.8	44.714 ³⁰⁰	29.46 ³⁴	29.23 ⁶¹	57.67 ⁵⁷	59.782 ³²⁵	31.41 ⁷	64.12 ⁵⁸	43.07 ²⁰
	301	59	62	26	327	63	88	47
Apr. 9.7	45.015	28.87	29.85	57.41	60.114	32.04	65.00	43.54
19.7	45.314 ²⁹⁹	28.05 ⁸²	30.45 ⁶⁰	57.47 ⁶	60.436 ³²²	33.21 ¹¹⁷	65.86 ⁸⁶	44.62 ¹⁰⁶
29.7	45.606 ²⁹²	27.04 ¹⁰¹	31.04 ⁵⁹	57.86 ³⁹	60.747 ³¹¹	34.87 ¹⁶⁶	66.65 ⁷⁹	46.29 ¹⁶⁷
May 9.7	45.886 ²⁸⁰	25.88 ¹¹⁶	31.60 ⁵⁶	58.57 ⁷¹	61.041 ²⁹⁴	36.96 ²⁰⁹	67.37 ⁷²	48.50 ²²¹
19.6	46.149 ²⁶³	24.60 ¹²⁸	32.13 ⁵³	59.56 ⁹⁹	61.310 ²⁶⁹	39.39 ²⁴³	67.98 ⁶¹	51.15 ²⁶⁵
	240	134	47	128	241	270	49	301
29.6	46.389	23.26	32.60	60.84	61.551	42.09	68.47	54.16
June 8.6	46.603 ²¹⁴	21.90 ¹³⁶	33.02 ⁴²	62.37 ¹⁵³	61.756 ²⁰⁵	44.99 ²⁹⁰	68.83 ³⁶	57.43 ³²⁷
18.5	46.787 ¹⁸⁴	20.57 ¹³³	33.37 ³⁵	64.11 ¹⁷⁴	61.921 ¹⁶⁵	47.99 ³⁰⁰	69.05 ²²	60.87 ³⁴⁴
28.5	46.932 ¹⁴⁵	19.29 ¹²⁸	33.63 ²⁶	66.01 ¹⁹⁰	62.043 ¹²²	51.01 ³⁰²	69.12 ⁷	64.40 ³⁵³
July 8.5	47.039 ¹⁰⁷	18.10 ¹¹⁹	33.82 ¹⁹	68.02 ²⁰¹	62.117 ⁷⁴	53.98 ²⁹⁷	69.05 ⁷	67.91 ³⁵¹
	64	107	11	206	27	263	23	343
18.5	47.103	17.03	33.93	70.08	62.144	56.81	68.82	71.34
28.4	47.125 ²²	16.09 ⁹⁴	33.94 ¹	72.12 ²⁰⁴	62.122 ²²	59.47 ²⁶⁶	68.46 ³⁶	74.58 ³²⁴
Aug. 7.4	47.105 ²⁶	15.28 ⁸¹	33.86 ⁸	74.08 ¹⁹⁶	62.053 ⁶⁹	61.88 ²⁴¹	67.96 ⁸⁰	77.56 ²⁹⁸
17.4	47.042 ⁶³	14.62 ⁶⁶	33.71 ¹⁵	75.87 ¹⁷⁹	61.940 ¹¹³	63.99 ²¹¹	67.34 ⁶²	80.25 ²⁶⁰
27.4	46.946 ⁹⁶	14.10 ⁵²	33.47 ²⁴	77.43 ¹⁵⁶	61.788 ¹⁵²	65.77 ¹⁷⁸	66.61 ⁷³	82.56 ²³¹
	127	37	29	125	184	142	81	180
Sept. 6.3	46.819	13.73	33.18	78.68	61.604	67.19	65.80	84.45
16.3	46.670 ¹⁴⁹	13.48 ²⁵	32.83 ³⁵	79.59 ⁹¹	61.394 ²¹⁰	68.21 ¹⁰²	64.92 ⁵⁸	85.91 ¹⁴⁶
26.3	46.505 ¹⁶⁵	13.37 ¹¹	32.46 ³⁷	80.10 ⁵¹	61.169 ²²⁵	68.81 ⁶⁰	63.99 ⁹³	86.85 ⁹⁴
Oct. 6.2	46.337 ¹⁶⁸	13.39 ²	32.07 ³⁹	80.17 ⁷	60.937 ²³²	68.98 ¹⁷	63.04 ⁹⁵	87.29 ⁴⁴
16.2	46.173 ¹⁶⁴	13.52 ¹³	31.66 ³⁹	79.79 ³⁸	60.709 ²²⁸	68.72 ²⁶	62.09 ⁹⁵	87.18 ¹¹
	148	29	35	81	212	71	92	65
26.2	46.025 ¹²⁵	13.81 ³⁷	31.33 ³¹	78.98 ¹²⁴	60.497 ¹⁹¹	68.01 ¹¹³	61.17 ⁸⁷	86.53 ¹¹⁷
Nov. 5.2	45.900 ⁹²	14.18 ⁵¹	31.02 ²⁸	77.74 ¹⁶⁰	60.306 ¹⁸⁷	66.88 ¹⁵⁵	60.30 ⁸⁰	85.36 ¹⁷²
15.1	45.808	14.69	30.77 ¹⁶	76.14 ¹⁹²	60.149 ¹¹⁸	65.33 ¹²⁷	59.50 ⁶⁹	83.64 ²¹⁷
25.1	45.755 ⁵³	15.34 ⁶⁵	30.61 ⁹	74.22 ²¹⁷	60.031 ⁷⁴	63.41 ¹⁹²	58.81 ⁵⁷	81.47 ²⁶¹
Dec. 5.1	45.739 ³¹	16.09 ⁸⁶	30.52 ¹	72.05 ²³³	59.957 ²⁶	61.14 ²⁵⁵	58.24 ⁴³	73.86 ²⁹⁸
15.1	45.770	16.95	30.53	69.72	59.931	58.59	57.81	75.88
25.0	45.844 ⁷⁴	17.89 ⁹⁴	30.63 ¹⁰	67.28 ²⁴⁴	59.955 ²⁴	55.86 ²⁷³	57.53 ²⁸	72.63 ³²⁵
35.0	45.959 ¹¹⁵	18.87 ⁹⁸	30.83 ²⁰	64.82 ²⁴⁶	60.027 ⁷²	53.00 ²⁸⁶	57.42 ¹¹	69.23 ³⁴⁰
Mean Place	43.048	19.26	26.221	66.89	58.704	52.03	65.505	66.80
Sec δ, Tan δ	1.004	-0.085	2.150	-1.904	1.196	+0.656	3.950	+3.821
D _φ α, D _α α	+0.06	0.00	+0.11	+0.02	+0.04	-0.01	-0.04	-0.05
D _φ δ, D _α δ	+0.1	-1.0	+0.1	-1.0	+0.1	-1.0	+0.1	-1.0

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	α Draconis, Mag. 4.8			σ Sagittarii, Mag. 2.1			θ Serpentis pr., Mag. 4.5			β Lyrae Var. 4.0—		
	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.
	h m	s	"	h m	s	"	h m	s	"	h m	s	"
	18 49		+59 16	18 50		-26 24	18 52		+ 4 5	18 52		
Jan. 1.0	55.238	62	63.60	2.915	156	13.81	2.033	126	30.89	45.291	85	6
11.0	55.350	142	60.15	3.071	197	13.44	2.159	161	29.40	45.376	139	5
21.0	55.492	215	56.74	3.268	230	13.09	2.320	192	27.94	45.515	189	5
30.9	55.707	286	53.60	3.498	261	12.74	2.512	221	26.57	45.704	235	4
Feb. 9.9	55.993	346	50.57	3.759	284	12.39	2.733	243	25.38	45.939	274	4
19.9	56.339	396	48.04	4.043	304	12.02	2.976	263	24.40	46.213	307	4
29.8	56.735	436	46.02	4.347	318	11.62	3.239	277	23.70	46.520	332	4
Mar. 10.8	57.171	461	44.59	4.665	329	11.19	3.516	287	23.31	46.852	351	4
20.8	57.632	476	43.79	4.994	336	10.71	3.803	295	23.25	47.203	362	4
30.8	58.108	478	43.66	5.330	338	10.20	4.098	298	23.55	47.565	363	4
Apr. 9.7	58.586	467	44.19	5.668	337	9.66	4.396	296	24.18	47.928	359	4
19.7	59.053	442	45.35	6.005	331	9.11	4.692	290	25.12	48.287	344	4
29.7	59.495	407	47.10	6.336	320	8.57	4.982	280	26.35	48.631	323	4
May 9.7	59.902	362	49.36	6.656	301	8.06	5.262	262	27.79	48.956	295	5
19.6	60.264	307	52.07	6.957	280	7.61	5.524	242	29.43	49.251	260	5
29.6	60.571	245	55.13	7.237	250	7.24	5.766	215	31.17	49.511	218	5
June 8.6	60.816	177	58.44	7.487	215	6.97	5.981	183	32.99	49.729	172	6
18.5	60.993	103	61.91	7.702	176	6.81	6.164	147	34.81	49.901	121	6
28.5	61.096	30	65.45	7.878	133	6.75	6.311	108	36.60	50.022	67	6
July 8.5	61.126	47	68.97	8.011	85	6.80	6.419	66	38.30	50.089	12	6
18.5	61.079	120	72.39	8.096	38	6.95	6.485	23	39.88	50.101	42	7
28.4	60.959	191	75.61	8.134	11	7.19	6.508	20	41.32	50.059	97	7
Aug. 7.4	60.768	255	78.57	8.123	56	7.48	6.488	60	42.59	49.962	145	7
17.4	60.513	312	81.21	8.067	97	7.81	6.428	95	43.66	49.817	188	8
27.4	60.201	360	83.47	7.970	134	8.15	6.333	127	44.54	49.629	227	8
Sept. 6.3	59.841	398	85.31	7.836	160	8.47	6.206	150	45.20	49.402	253	8
16.3	59.443	422	86.69	7.676	178	8.72	6.056	166	45.67	49.147	274	8
26.3	59.021	433	87.57	7.498	185	8.91	5.890	172	45.91	48.873	282	8
Oct. 6.2	58.588	431	87.93	7.313	180	9.01	5.718	167	45.95	48.591	280	8
16.2	58.157	415	87.76	7.133	163	9.01	5.551	155	45.78	48.311	266	8
26.2	57.742	384	87.05	6.970	140	8.91	5.396	133	45.40	48.045	243	8
Nov. 5.2	57.359	340	85.80	6.830	103	8.72	5.263	103	44.81	47.802	207	8
15.1	57.018	284	84.04	6.727	62	8.44	5.160	67	44.02	47.595	166	7
25.1	56.734	221	81.81	6.665	16	8.11	5.093	27	43.04	47.429	118	7
Dec. 5.1	56.513	148	79.16	6.649	32	7.74	5.066	15	41.88	47.311	83	7
15.1	56.365	70	76.16	6.681	80	7.35	5.081	57	40.58	47.248	48	7
25.0	56.295	10	72.90	6.761	127	6.96	5.138	99	39.17	47.240	147	7
35.0	56.305		69.50	6.888		6.57	5.237		37.70	47.288		6
Mean Place	57.842		67.39	3.394		7.93	2.600		36.22	46.762		6
Sec δ , Tan δ	1.958		+1.683	1.116		-0.496	1.003		+0.071	1.386		+
$D\psi\alpha$, $D\omega\alpha$	+0.02		-0.02	+0.07		+0.01	+0.06		0.00	+0.04		-
$D\psi\delta$, $D\omega\delta$	+0.1		-1.0	+0.1		-1.0	+0.1		-1.0	+0.1		-

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	γ Lyrae. Mag. 3.3			ϵ Aquilæ. Mag. 4.2			ζ Sagittarii. Mag. 2.7			ζ Aquilæ. Mag. 3.0		
	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.
	h m	s	° ' "	h m	s	° ' "	h m	s	° ' "	h m	s	° ' "
	18 55		+32 34	18 55		+14 56	18 57		-30 0	19 1		+13 44
Jan. 1.0	46.993		20.72	47.885		67.14	15.579		11.22	32.267		11.30
11.0	47.087	94	17.89	47.998	113	65.08	15.732	153	10.60	32.374	107	9.31
21.0	47.227	140	15.11	48.147	149	63.06	15.926	202	9.99	32.518	144	7.36
30.9	47.409	182	12.48	48.330	183	61.16	16.156	280	9.39	32.697	179	5.52
Feb. 9.9	47.627	218	10.10	48.544	214	59.47	16.418	262	8.80	32.907	210	3.89
		260			238			287			234	
19.9	47.877		8.07	48.782		58.05	16.705		8.21	33.141		2.50
29.8	48.153	276	6.48	49.042	280	56.98	17.014	309	7.62	33.397	256	1.47
Mar. 10.8	48.452	299	5.39	49.318	276	56.30	17.338	324	7.02	33.670	273	0.81
20.8	48.765	313	4.85	49.607	289	56.05	17.675	337	6.42	33.956	286	0.57
30.8	49.087	322	4.88	49.903	296	56.23	18.020	345	5.83	34.250	294	0.76
		326			300			349			300	
Apr. 9.7	49.413		5.46	50.203		56.85	18.369		5.24	34.550		1.37
19.7	49.736	323	6.57	50.501	298	57.87	18.718	349	4.68	34.849	299	2.38
29.7	50.050	314	8.17	50.793	292	59.26	19.061	343	4.16	35.143	294	3.75
May 9.7	50.347	297	10.21	51.074	281	60.98	19.393	332	3.71	35.426	288	5.43
19.6	50.624	277	12.56	51.336	262	62.93	19.709	316	3.35	35.693	267	7.36
		247			241			292			246	
29.6	50.871		15.27	51.577		65.09	20.001		3.11	35.939		9.48
June 8.6	51.084	213	18.13	51.789	212	67.37	20.265	264	2.97	36.156	217	11.72
18.5	51.259	175	21.11	51.969	180	69.71	20.493	228	2.95	36.342	186	14.00
28.5	51.390	131	24.13	52.112	143	72.02	20.682	189	3.07	36.491	149	16.28
July 8.5	51.475	85	27.10	52.214	102	74.26	20.826	144	3.31	36.599	108	18.50
		38			59			96			66	
18.5	51.513		29.95	52.273		76.41	20.921		3.65	36.665		20.59
28.4	51.502	11	32.62	52.289	16	78.39	20.966	45	4.08	36.687	22	22.53
Aug. 7.4	51.443	59	35.07	52.261	28	80.16	20.961	5	4.56	36.666	21	24.27
17.4	51.340	103	37.23	52.193	68	81.70	20.909	52	5.07	36.603	63	25.79
27.4	51.196	142	39.07	52.068	106	82.98	20.814	95	5.57	36.504	90	27.05
		177			136			134			132	
Sept. 6.3	51.021		40.54	51.952		83.99	20.680		6.02	36.372		28.06
16.3	50.817	204	41.63	51.790	162	84.70	20.518	162	6.41	36.215	157	28.73
26.3	50.596	219	42.31	51.614	176	85.13	20.396	182	6.69	36.042	173	29.22
Oct. 6.2	50.370	228	42.56	51.430	184	85.25	20.146	190	6.84	35.861	181	29.36
16.2	50.144	212	42.38	51.249	181	85.06	19.958	188	6.86	35.682	179	29.20
					166			173			167	
26.2	49.932		41.77	51.081		84.58	19.785		6.74	35.515		28.76
Nov. 5.2	49.741	191	40.73	50.933	148	83.78	19.637	148	6.47	35.367	148	28.01
15.1	49.581	160	39.27	50.815	118	82.69	19.523	114	6.09	35.249	118	26.99
25.1	49.459	122	37.44	50.732	83	81.34	19.452	71	5.62	35.164	85	25.70
Dec. 5.1	49.379	80	35.26	50.689	43	79.74	19.427	25	5.06	35.118	46	24.18
		33			1			24			4	
15.1	49.346		32.80	50.688		77.94	19.451		4.46	35.114		22.45
25.0	49.362	16	30.12	50.730	42	75.99	19.525	74	3.84	35.154	40	20.58
35.0	49.426	64	27.33	50.814	84	73.96	19.646	121	3.21	35.233	79	18.62
Mean Place	48.054		24.91	48.579		71.98	16.066		5.20	32.941		15.90
Sec δ , Tan δ	1.187		+0.639	1.035		+0.267	1.155		-0.577	1.029		+0.244
$D\phi\alpha$, $D\alpha\alpha$	+0.04		-0.01	+0.05		0.00	+0.08		+0.01	+0.05		0.00
$D\phi\delta$, $D\alpha\delta$	+0.1		-1.0	+0.1		-1.0	+0.1		-1.0	+0.1		-1.0

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	λ Aquilæ. Mag. 3.6			α Coronæ Australis. Mag. 4.1			ϵ Lyre. Mag. 5.1			π Sagittar. Mag. 3.0		
	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.
	h	m	° ' "	h	m	° ' "	h	m	° ' "	h	m	° ' "
	19	1	— 5 0	19	3	— 38 2	19	4	+35 57	19	4	—
	s		"	s		"	s		"	s		"
Jan. 1.0	46.973		38.80	44.930		18.01	17.114		60.64	45.692		3
11.0	47.096	123	39.74 94	45.086	156	16.86 115	17.195	81	57.73 291	45.827	135	3
21.0	47.256	160	40.65 91	45.288	202	15.75 111	17.323	128	54.84 289	46.001	174	3
30.9	47.446	190	41.48 83	45.531	243	14.65 110	17.496	173	52.09 275	46.208	207	3
Feb. 9.9	47.665	219	42.19 71	45.808	277	13.60 105	17.708	212	49.60 249	46.444	236	3
		242			308			247			263	
19.9	47.907		42.75 36	46.116		12.60 94	17.955		47.45 171	46.707		3
29.9	48.169	262	43.11 11	46.447	331	11.66 88	18.231	276	45.74 121	46.988	281	3
Mar. 10.8	48.446	277	43.22 15	46.798	351	10.78 81	18.532	301	44.53 66	47.287	299	3
20.8	48.735	289	43.07 39	47.163	365	9.97 72	18.850	318	43.87 51	47.597	310	3
30.8	49.032	297	42.68 65	47.539	376	9.25 63	19.180	330	43.80 51	47.917	320	3
		301			381			335			325	
Apr. 9.7	49.333		42.03 87	47.920		8.62 53	19.515		44.31 106	48.242		3
19.7	49.635	302	41.16 107	48.301	381	8.09 40	19.848	333	45.37 157	48.568	326	3
29.7	49.934	290	40.09 123	48.677	376	7.69 25	20.173	325	46.94 203	48.890	322	3
May 9.7	50.223	289	38.86 133	49.043	366	7.44 11	20.482	309	48.97 240	49.204	314	2
19.6	50.498	275	37.53 140	49.390	347	7.33 6	20.769	287	51.37 272	49.502	298	2
		254			323			259			280	
29.6	50.752		36.13 141	49.713		7.39 24	21.028		54.09 295	49.782		2
June 8.6	50.982	230	34.72 139	50.005	292	7.63 39	21.251	223	57.04 307	50.034	252	2
18.6	51.181	199	33.33 133	50.259	254	8.02 55	21.435	184	60.11 313	50.254	220	2
28.5	51.343	162	32.00 123	50.468	209	8.57 69	21.574	139	63.24 310	50.436	182	2
July 8.5	51.467	124	30.77 111	50.629	161	9.26 80	21.665	91	66.34 299	50.578	142	2
		82			108			42			96	
18.5	51.549		29.66 99	50.737		10.06 88	21.707		69.33 284	50.674		2
28.4	51.587	38	28.67 83	50.791	51	10.94 91	21.698	9	72.17 260	50.724	50	2
Aug. 7.4	51.582	5	27.84 68	50.789	2	11.85 90	21.640	58	74.77 233	50.727	3	2
17.4	51.536	46	27.16 53	50.734	55	12.75 85	21.536	104	77.10 199	50.685	42	2
27.4	51.451	85	26.63 39	50.631	103	13.60 75	21.389	147	79.09 162	50.601	84	2
		117			144			182			120	
Sept. 6.3	51.334		26.24 24	50.487		14.35 61	21.207		80.71 123	50.481		2
16.3	51.192	142	26.00 11	50.309	178	14.96 44	20.996	211	81.94 81	50.335	146	2
26.3	51.032	160	25.89 1	50.109	200	15.40 23	20.767	229	82.75 37	50.167	168	2
Oct. 5.3	50.865	167	25.90 13	49.896	213	15.63 2	20.528	239	83.12 9	49.992	175	2
16.2	50.701	164	26.03 26	49.688	208	15.65 22	20.289	239	83.03 54	49.819	173	2
		153			196			228			161	
26.2	50.548		26.29 37	49.492		15.43 42	20.061		82.49 99	49.658		2
Nov. 5.2	50.415	133	26.66 49	49.323	169	15.01 84	19.854	207	81.50 142	49.518	140	2
15.1	50.313	102	27.15 60	49.190	133	14.37 60	19.677	177	80.08 183	49.411	107	2
25.1	50.245	68	27.75 71	49.101	89	13.57 94	19.536	141	78.25 220	49.341	70	2
Dec. 5.1	50.217	28	28.46 80	49.062	39	12.63 104	19.439	97	76.05 250	49.313	28	2
		13			15			50			17	
15.1	50.230		29.26 88	49.077		11.59 111	19.389		73.55 273	49.330		2
25.0	50.286	56	30.14 91	49.146	69	10.48 114	19.388	1	70.82 287	49.392	62	2
35.0	50.381	95	31.05	49.268	122	9.34	19.437	49	67.95	49.498	108	2
Mean Place	47.467		33.46	45.474		11.72	18.278		64.02	46.144		
Sec δ , Tan δ	1.004		—0.088	1.270		—0.782	1.235		+0.726	1.072		
$D\phi a$, $D_{\omega} a$	+0.06		0.00	+0.08		+0.01	+0.04		—0.01	+0.07		
$D\phi \delta$, $D_{\omega} \delta$	+0.1		—1.0	+0.1		—1.0	+0.1		—1.0	+0.1		

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	ϕ Sagittarii. Mag. 4.9		δ Draconis. Mag. 3.2		d Sagittarii. Mag. 5.0		θ Lyrae. Mag. 4.5	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 19 10	° ' " -25 24	h m 19 12	° ' " +67 30	h m 19 12	° ' " -19 6	h m 19 13	° ' " +37 58
Jan. 1.0	22.998 ¹³²	15.03	28.61	48.47	42.808	17.93	25.874	58.34
11.0	23.130 ¹⁷³	14.66 ³⁷	28.60 ¹	45.06 ³⁴¹	42.932 ¹²⁴	17.95 ²	25.942 ⁶⁸	55.39 ²⁹⁵
21.0	23.303 ²⁰⁸	14.28 ³⁸	28.68 ⁸	41.61 ³⁴⁵	43.096 ¹⁶⁴	17.95 ⁰	26.059 ¹¹⁷	52.45 ²⁰⁴
30.9	23.511 ²³⁹	13.88 ⁴⁰	28.87 ¹⁹	38.27 ³³⁴	43.292 ¹⁹⁶	17.91 ⁴	26.221 ¹⁶²	49.63 ²⁸²
Feb. 9.9	23.750 ²⁶⁶	13.45 ⁴³	29.17 ³⁰	35.18 ³⁰⁹	43.517 ²²⁵	17.82 ⁹	26.425 ²⁰⁴	47.05 ²⁵⁸
19.9	24.016	12.99 ⁴⁶	29.55 ³⁸	32.44 ²⁷⁴	43.769	17.82 ¹⁷	26.665 ²⁴⁰	44.80 ²²⁵
29.9	24.302 ²⁸⁶	12.48 ⁵¹	30.01 ⁴⁶	30.16 ²²⁸	44.040 ²⁷¹	17.82 ²⁸	26.940 ²⁷⁵	42.99 ¹⁸¹
Mar. 10.8	24.608 ³⁰⁶	11.91 ⁵⁷	30.55 ⁵⁴	28.44 ¹⁷²	44.330 ²⁹⁰	16.99 ³⁸	27.240 ³²⁰	41.68 ¹³¹
20.8	24.926 ³¹⁸	11.29 ⁶²	31.12 ⁵⁷	27.33 ¹¹¹	44.634 ³⁰⁴	16.49 ⁵⁰	27.560 ³²⁰	40.93 ⁷⁵
30.8	25.255 ³²⁹	10.62 ⁶⁷	31.72 ⁶⁰	26.88 ⁴⁵	44.947 ³¹³	15.88 ⁶¹	27.894 ³³⁴	40.77 ¹⁶
Apr. 9.7	25.589	9.91 ⁷¹	32.34 ⁶²	27.08 ²⁰	45.267 ³²⁰	15.15 ⁷³	28.236 ³⁴²	41.19 ⁴²
19.7	25.926 ³³⁷	9.18 ⁷³	32.95 ⁶¹	27.94 ⁸⁶	45.589 ³²²	14.35 ⁸⁰	28.578 ³⁴²	42.19 ¹⁰⁰
29.7	26.260 ³³⁴	8.46 ⁷²	33.53 ⁵⁸	29.42 ¹⁴⁸	45.909 ³³⁰	13.50 ⁸⁵	28.912 ³³⁴	43.71 ¹⁵²
May 9.7	26.585 ³²⁵	7.77 ⁶⁹	34.06 ⁵³	31.45 ²⁰⁸	46.221 ³¹²	12.61 ⁸⁹	29.233 ³²¹	45.71 ²⁰⁰
19.6	26.895 ³¹⁰	7.13 ⁶⁴	34.54 ⁴⁸	33.97 ²⁵²	46.519 ²⁹⁸	11.73 ⁸⁸	29.531 ²⁹⁶	48.11 ²⁴⁰
29.6	27.186 ²⁹¹	6.57 ⁵⁶	34.96 ⁴²	36.89 ²⁹²	46.799 ²⁸⁰	10.88 ⁸⁵	29.801 ²⁷⁰	50.84 ²⁷³
June 8.6	27.450 ²⁶⁴	6.12 ⁴⁵	35.30 ³⁴	40.11 ³²²	47.053 ²⁵⁴	10.10 ⁷⁸	30.036 ²³⁵	53.61 ²⁹⁷
18.6	27.683 ²³³	5.78 ³⁴	35.54 ²⁴	43.56 ³⁴⁵	47.276 ²²³	9.42 ⁶⁸	30.231 ¹⁹⁵	56.93 ³¹²
28.5	27.877 ¹⁹⁴	5.58 ²⁰	35.69 ¹⁵	47.13 ³⁵⁷	47.465 ¹⁸⁹	8.84 ⁵⁸	30.380 ¹⁴⁹	60.12 ³¹⁹
July 8.5	28.028 ¹⁶¹	5.50 ⁸	35.73 ⁴	50.74 ³⁶¹	47.611 ¹⁴⁶	8.38 ⁴⁶	30.480 ¹⁰⁰	63.31 ³¹⁹
18.5	28.183 ¹⁰⁵	5.54 ⁴	35.69 ⁴	54.29 ³⁵⁵	47.714 ¹⁰⁶	8.04 ³⁴	30.529 ⁴⁹	66.40 ³⁰⁹
28.4	28.189 ⁵⁶	5.70 ¹⁶	35.54 ¹⁵	57.71 ³⁴²	47.770 ⁵⁶	7.84 ²⁰	30.525 ⁴	69.34 ²⁹⁴
Aug. 7.4	28.198 ⁹	5.95 ²⁵	35.30 ²⁴	60.93 ³²²	47.780 ¹⁰	7.74 ¹⁰	30.471 ⁵⁴	72.06 ²⁷²
17.4	28.160 ³⁸	6.26 ³¹	34.98 ³²	63.85 ²⁹²	47.745 ³⁵	7.74 ⁰	30.369 ¹⁰²	74.51 ²⁴⁵
27.4	28.078 ⁸²	6.60 ³⁴	34.56 ⁴²	66.44 ²⁵⁰	47.669 ⁷⁶	7.81 ⁷	30.223 ¹⁴⁶	76.63 ²¹²
Sept. 6.3	27.969 ¹¹⁹	6.95 ³⁵	34.08 ⁴⁸	68.63 ²¹⁹	47.555 ¹¹⁴	7.93 ¹²	30.039 ¹⁸⁴	78.88 ¹⁷⁵
16.3	27.811 ¹⁴⁸	7.28 ³³	33.56 ⁵²	70.38 ¹⁷⁵	47.414 ¹⁴¹	8.08 ¹⁵	29.826 ²¹³	79.74 ¹³⁶
26.3	27.641 ¹⁷⁰	7.54 ²⁶	32.99 ⁵⁷	71.65 ¹²⁷	47.252 ¹⁶²	8.24 ¹⁶	29.591 ²³⁵	80.69 ⁹⁵
Oct. 6.3	27.460 ¹⁸¹	7.74 ²⁰	32.40 ⁵⁹	72.41 ⁷⁶	47.081 ¹⁷¹	8.40 ¹⁶	29.345 ²⁴⁶	81.18 ⁴⁹
16.2	27.280 ¹⁸⁰	7.85 ¹¹	31.80 ⁶⁰	72.63 ²²	46.909 ¹⁷²	8.53 ¹³	29.096 ²⁴⁷	81.20 ²
26.2	27.113 ¹⁶⁷	7.86 ¹	31.21 ⁵⁹	72.90 ³³	46.749 ¹⁶⁰	8.63 ¹⁰	28.860 ²³⁸	80.76 ⁴⁴
Nov. 5.2	26.986 ¹⁴⁷	7.78 ⁸	30.65 ⁵⁶	71.42 ⁸⁸	46.608 ¹⁴¹	8.70 ⁷	28.642 ²¹⁸	79.86 ⁹⁰
15.1	26.851 ¹¹⁵	7.61 ¹⁷	30.13 ⁵²	69.99 ¹⁴³	46.497 ¹¹¹	8.74 ⁴	28.451 ¹⁹¹	78.50 ¹³⁶
25.1	26.773 ⁷⁸	7.36 ²⁵	29.69 ⁴⁴	68.06 ¹⁹³	46.422 ⁷⁵	8.77 ³	28.297 ¹⁵⁴	76.72 ¹⁷⁸
Dec. 5.1	26.739 ²⁴	7.07 ²⁹	29.31 ³⁸	65.65 ²⁴¹	46.388 ³⁴	8.78 ¹	28.186 ¹¹¹	74.55 ²¹⁷
15.1	26.751 ¹²	6.74 ³³	29.02 ²⁹	62.86 ²⁷⁹	46.397 ⁹	8.80 ²	28.121 ⁶⁵	72.06 ²⁴⁹
25.0	26.809 ⁵⁸	6.38 ³⁶	28.83 ¹⁹	59.73 ³¹³	46.450 ⁵³	8.81 ¹	28.105 ¹⁶	69.32 ²⁷⁴
35.0	26.911 ¹⁰²	6.01 ³⁷	28.74 ⁹	56.40 ³³³	46.547 ⁹⁷	8.83 ²	28.141 ³⁶	66.43 ²⁸⁹
Mean Place	23.449	8.98	32.392	49.52	43.247	12.12	27.107	60.86
Sec δ , Tan δ	1.107	-0.475	2.615	+2.416	1.058	-0.346	1.269	+0.781
$D_{\phi} \alpha$, $D_{\alpha} \alpha$	+0.07	+0.01	0.00	-0.05	+0.07	+0.01	+0.04	-0.02
$D_{\phi} \delta$, $D_{\delta} \delta$	+0.1	-1.0	+0.1	-1.0	+0.1	-1.0	+0.1	-0.9

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	α Aquilæ. Mag. 5.1			κ Cygni. Mag. 4.0			τ Draconis. Mag. 4.6			δ Aquilæ. Mag. 3.4		
	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.
	h	m	"	h	m	"	h	m	"	h	m	"
	19	13	26	19	15	12	19	17	11	19	21	+
	s	"	"	s	"	"	s	"	"	s	"	"
Jan. 1.0	51.784		31.00	7.719		45.45	5.35		59.36	15.259		42.
		97	183		35			8			97	41.
11.0	51.881	134	29.17	7.754	102	42.16	5.27	0	55.98	15.356	135	41.
21.0	52.015	169	27.37	7.856	165	38.84	5.33	20	52.55	15.491	167	40.
30.9	52.184	199	25.68	8.021	225	35.65	5.53	34	49.21	15.658	235	38.
Feb. 9.9	52.383	224	24.16	8.246	279	32.70	5.87	47	46.09	15.853	297	37.
			127			260						
19.9	52.607		22.89	8.525		30.10	6.34		43.30	16.076		36.
		247	96		326	214		57		234	244	36.
29.9	52.854	266	21.93	8.851	364	27.96	6.91	66	40.96	16.320	263	35.
Mar. 10.8	53.120	281	21.33	9.215	393	26.36	7.57	73	39.16	16.583	278	36.
			21		303	98				121		
20.8	53.401	291	21.12	9.608	412	25.38	8.30	77	37.95	16.861	289	36.
		298	61		421	29		78		54	297	36.
30.8	53.692		21.32	10.020		25.02	9.07		37.41	17.150		
										10		
Apr. 9.8	53.990		21.93	10.441		25.31	9.85		37.51	17.447		37.
		300	98		420	93		78		76	300	37.
19.7	54.290	297	22.91	10.861	407	26.24	10.63	75	38.27	17.747	299	37.
			133		380	151				138		
29.7	54.587	288	24.24	11.268	354	27.75	11.38	69	39.65	18.046	243	39.
May 9.7	54.875	275	25.87	11.654	289	29.80	12.07	51	41.58	18.339	261	40.
		253	206		313	289				284		
19.6	55.150		27.73	12.008		32.32	12.69		44.01	18.619		42.
29.6	55.403	229	29.79	12.321	264	35.21	13.20	42	46.85	18.880	239	44.
June 8.6	55.632	197	31.95	12.585	210	38.40	13.62	29	50.02	19.119	208	45.
			221		149	339				340		
18.6	55.829	161	34.16	12.795	85	41.79	13.91	17	53.42	19.327	174	47.
			220		21	345				356		
28.5	55.990	122	36.36	12.944		45.28	14.08	5	56.98	19.501	136	49.
July 8.5	56.112	79	38.50	13.029		48.80	14.13	10	60.57	19.637	95	51.
			203							355		
18.5	56.191	36	40.53	13.050	47	52.25	14.03	22	64.12	19.732	50	52.
			188		109	331				345		
28.5	56.227	8	42.41	13.003	169	55.56	13.81	34	67.57	19.782	6	54.
Aug. 7.4	56.219	49	44.09	12.894	169	58.65	13.47	45	70.82	19.788	35	55.
			148		223	246				299		
17.4	56.170	88	45.57	12.725	270	63.92	13.02	57	73.81	19.753	75	56.
			123			207				265		
27.4	56.082	122	46.80	12.502		65.99	12.45	64	76.46	19.678	109	57.
			99							228		
Sept. 6.3	55.960		47.79	12.232		67.63	11.81	71	78.74	19.569		58.
		147	72		305	117				184	135	58.
16.3	55.813	167	48.51	11.924	351	68.80	11.10	77	80.58	19.434	155	59.
			46		352	67				138		
26.3	55.646	176	48.97	11.590	344	69.63	10.33	81	81.96	19.279	167	59.
Oct. 6.3	55.470	165	49.15	11.239		71.92	9.52	82	82.84	19.112	106	59.
			9							34		
16.2	55.295		49.06	10.887		73.81	8.70	80	83.18	18.946		
			37							21	158	
26.2	55.130		48.69	10.543		75.92	7.90	78	82.97	18.788		58.
		149	64		324	90				76	142	58.
Nov. 5.2	54.981	121	48.05	10.219	290	76.92	7.12	72	82.21	18.646	114	57.
			90		247	191				131		
15.2	54.860	89	47.15	9.929	196	78.77	6.40	64	80.90	18.532	84	56.
			116		136	273				182		
25.1	54.771	52	45.99	9.682		80.90	5.76	56	79.08	18.448		55.
			137							231	8	
Dec. 5.1	54.719	11	44.62	9.486		82.97	5.20	43	76.77	18.400		
			156							272		
15.1	54.708		43.06	9.350		84.06	4.77	31	74.05	18.392		54.
		30	172		74	304				306	32	53.
25.0	54.738	70	41.34	9.276		85.93	4.46	17	70.99	18.424		52.
			179		8	322				328	72	
35.0	54.808		39.55	9.270		87.07	4.29		67.71	18.496		
Mean Place	52.420		35.12	9.742		46.93	10.673		59.63	15.794		47.
Sec δ , Tan δ	1.020		+0.202	1.670		+1.337	3.460		+3.312	1.001		+0.
$D\phi$ a , $D\omega$ a	+0.06		0.00	+0.03		-0.03	-0.02		-0.07	+0.06		0.
$D\phi$ δ , $D\omega$ δ	+0.1		-0.9	+0.1		-0.9	+0.1		-0.9	+0.1		-0.

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	β Cygni. Mag. 3.2		γ Cygni. Mag. 3.9		μ Aquilæ. Mag. 4.6		h Sagittarii. Mag. 4.7	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 19 27	° ' " +27 46	h m 19 27	° ' " +51 32	h m 19 29	° ' " + 7 11	h m 19 31	° ' " -25 4
	s	"	s	"	s	"	s	"
Jan. 1.0	19.086	54.81	33.426	60.96	58.613	55.86	35.392	18.14
11.0	19.153	52.27	33.447	57.74	58.699	54.31	35.501	17.74
21.0	19.262	49.73	33.531	54.48	58.821	52.79	35.651	17.30
31.0	19.410	47.29	33.678	51.31	58.977	51.94	35.836	16.82
Feb. 9.9	19.594	45.05	33.881	48.35	59.163	50.05	36.053	16.29
19.9	19.812	43.10	34.138	45.73	59.376	48.99	36.298	15.71
29.9	20.058	41.53	34.441	43.53	59.613	48.20	36.568	15.07
Mar. 10.8	20.329	40.41	34.784	41.86	59.871	47.73	36.858	14.35
20.8	20.619	39.78	35.158	40.76	60.144	47.62	37.166	13.57
30.8	20.925	39.68	35.554	40.31	60.430	47.87	37.486	12.74
Apr. 9.8	21.239	40.10	35.962	40.49	60.726	48.48	37.817	11.86
19.7	21.558	41.03	36.372	41.29	61.026	49.43	38.153	10.96
29.7	21.873	42.45	36.773	42.69	61.325	50.71	38.489	10.06
May 9.7	22.179	44.28	37.158	44.65	61.620	52.26	38.822	9.19
19.7	22.471	46.48	37.515	47.07	61.903	54.01	39.143	8.38
29.6	22.739	48.97	37.835	49.87	62.168	55.92	39.446	7.67
June 8.6	22.980	51.66	38.111	53.00	62.410	57.93	39.726	7.07
18.6	23.186	54.49	38.336	56.34	62.622	59.99	39.975	6.60
28.5	23.353	57.38	38.504	59.81	62.801	62.02	40.188	6.27
July 8.5	23.476	60.25	38.609	63.32	62.942	63.99	40.359	6.11
18.5	23.554	63.05	38.653	66.79	63.040	65.86	40.484	6.08
28.5	23.584	65.69	38.633	70.14	63.095	67.58	40.562	6.19
Aug. 7.4	23.566	68.15	38.550	73.29	63.106	69.10	40.590	6.42
17.4	23.504	70.34	38.407	76.16	63.075	70.44	40.570	6.73
27.4	23.399	72.27	38.211	78.72	63.003	71.55	40.505	7.10
Sept. 6.4	23.259	73.86	37.967	80.90	62.897	72.44	40.400	7.50
16.3	23.088	75.10	37.685	82.66	62.763	73.09	40.264	7.89
26.3	22.896	75.98	37.374	83.97	62.609	73.52	40.102	8.25
Oct. 6.3	22.692	76.47	37.046	84.78	62.441	73.69	39.927	8.54
16.2	22.485	76.56	36.711	85.09	62.271	73.63	39.748	8.75
26.2	22.284	76.24	36.383	84.88	62.110	73.33	39.578	8.87
Nov. 5.2	22.100	75.52	36.073	84.13	61.963	72.81	39.424	8.88
15.2	21.941	74.41	35.791	82.87	61.840	72.06	39.299	8.80
25.1	21.812	72.93	35.548	81.11	61.747	71.10	39.206	8.63
Dec. 5.1	21.720	71.11	35.353	78.91	61.690	69.94	39.155	8.38
15.1	21.671	69.00	35.212	76.30	61.672	68.63	39.147	8.08
25.1	21.664	66.67	35.130	73.39	61.692	67.20	39.183	7.73
35.0	21.702	64.19	35.111	70.25	61.751	65.69	39.263	7.35
Mean Place	20.007	56.96	35.322	61.31	59.182	59.58	35.806	11.96
Sec δ , Tan δ	1.130	+0.527	1.608	+1.259	1.008	+0.126	1.104	-0.468
$D\phi\alpha$, $D_m\alpha$	+0.05	-0.01	+0.03	-0.03	+0.06	0.00	+0.07	+0.01
$D\phi\delta$, $D_m\delta$	+0.1	-0.9	+0.1	-0.9	+0.2	-0.9	+0.2	-0.9

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	κ Aquilæ. Mag. 5.0		θ Cygni. Mag. 4.6		δ Sagittarii. Mag. 5.4		β Sagittæ. Mag. 4.4	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 19 32	° ' " - 7 12	h m 19 34	° ' " +50 1	h m 19 35	° ' " -16 29	h m 19 37	° ' " +17 16
	s	"	s	"	s	"	s	"
Jan. 1.0	21.962	58.86	9.565	33.99	54.321	17.98	15.850	47.99
11.0	22.058	59.55	9.581	30.83	54.421	18.11	15.919	45.95
21.0	22.189	60.22	9.657	27.62	54.556	18.19	16.027	43.90
31.0	22.353	60.82	9.793	24.48	54.726	18.22	16.168	41.97
Feb. 9.9	22.547	61.31	9.986	21.54	54.925	18.16	16.345	40.20
19.9	22.767	61.65	10.229	18.92	55.153	18.01	16.548	38.65
29.9	23.009	61.79	10.519	16.72	55.404	17.72	16.780	37.46
Mar. 10.8	23.272	61.74	10.847	15.02	55.674	17.31	17.034	36.64
20.8	23.549	61.44	11.207	13.90	55.962	16.74	17.309	36.25
30.8	23.840	60.92	11.590	13.41	56.264	16.02	17.597	36.29
Apr. 9.8	24.141	60.16	11.987	13.54	56.576	15.17	17.896	35.79
19.7	24.447	59.20	12.388	14.23	56.894	14.23	18.202	37.72
29.7	24.753	58.06	12.782	15.64	57.213	13.18	18.506	39.04
May 9.7	25.054	56.79	13.163	17.54	57.529	12.07	18.807	40.72
19.7	25.346	55.43	13.517	19.91	57.833	10.97	19.093	42.71
29.6	25.621	54.01	13.838	22.67	58.123	9.88	19.361	44.92
June 8.6	25.874	52.58	14.118	25.76	58.390	8.86	19.608	47.30
18.6	26.098	51.19	14.348	29.07	58.631	7.92	19.823	49.77
28.5	26.291	49.87	14.525	32.51	58.835	7.10	20.001	52.27
July 8.5	26.445	48.67	14.643	36.01	59.000	6.41	20.143	54.74
18.5	26.556	47.59	14.699	39.47	59.123	5.85	20.239	57.12
28.5	26.624	46.65	14.693	42.83	59.199	5.45	20.291	59.36
Aug. 7.4	26.647	45.87	14.626	45.99	59.230	5.19	20.297	61.41
17.4	26.626	45.25	14.501	48.89	59.213	5.05	20.260	63.25
27.4	26.564	44.78	14.322	51.49	59.155	5.03	20.184	64.81
Sept. 6.4	26.467	44.45	14.096	53.71	59.059	5.08	20.071	66.11
16.3	26.340	44.27	13.831	55.52	58.932	5.21	19.928	67.13
26.3	26.192	44.20	13.538	56.89	58.781	5.37	19.763	67.83
Oct. 6.3	26.031	44.24	13.225	57.78	58.617	5.56	19.586	68.20
16.2	25.867	44.38	12.905	58.16	58.449	5.76	19.405	68.28
26.2	25.710	44.62	12.591	58.02	58.287	5.95	19.229	68.02
Nov. 5.2	25.568	44.94	12.293	57.36	58.142	6.13	19.065	67.43
15.2	25.452	45.34	12.020	56.19	58.022	6.30	18.925	66.54
25.1	25.367	45.83	11.785	54.52	57.934	6.47	18.817	65.36
Dec. 5.1	25.316	46.38	11.594	52.39	57.883	6.62	18.742	63.90
15.1	25.305	47.00	11.456	49.87	57.871	6.77	18.703	62.20
25.1	25.334	47.67	11.373	47.03	57.901	6.91	18.705	60.32
35.0	25.403	48.37	11.350	43.95	57.973	7.04	18.746	58.33
Mean Place	22.409	54.00	11.354	33.80	54.728	12.42	16.549	50.45
Sec δ , Tan δ	1.008	-0.127	1.557	+1.193	1.043	-0.296	1.047	+0.311
$D_{\psi} u, D_{\omega} a$	+0.06	0.00	+0.03	-0.03	+0.07	+0.01	+0.05	-0.01
$D_{\psi} \delta, D_{\omega} \delta$	+0.2	-0.9	+0.2	-0.9	+0.2	-0.9	+0.2	-0.9

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	15 Cygni. Mag. 5.0		f Sagittarii. Mag. 5.1		γ Aquilæ. Mag. 2.8		δ Cygni. Mag. 3.0	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 19 41	° ' " +37 8	h m 19 41	° ' " -19 57	h m 19 42	° ' " +10 24	h m 19 42	° ' " +44 55
	s	"	s	"	s	"	s	"
Jan. 1.0	13.695	63.11	27.402	55.89	15.375	24.97	19.526	31.07
11.0	13.732 37	60.30 281	27.497 95	55.78 11	15.446 71	23.30 167	19.545 19	28.04 308
21.0	13.816 84	57.46 284	27.629 132	55.63 15	15.554 108	21.63 167	19.618 73	24.96 308
31.0	13.946 130	54.68 278	27.797 168	55.41 22	15.695 141	20.04 159	19.743 125	21.95 301
Feb. 9.9	14.118 172	52.09 259	27.997 200	55.13 28	15.868 173	18.61 143	19.919 176	19.11 284
	213	230	226	37	202	120	222	254
19.9	14.331	49.79 191	28.223 252	54.76 47	16.070 226	17.41 93	20.141 264	16.57 213
29.9	14.578 247	47.88 145	28.475 273	54.29 58	16.296 248	16.48 58	20.406 301	14.44 166
Mar. 10.9	14.856 308	46.43 91	28.748 290	53.71 71	16.544 280	15.90 21	20.706 329	12.78 110
20.8	15.160 364	45.52 36	29.038 306	53.00 81	16.813 282	15.69 19	21.035 353	11.68 49
30.8	15.482 336	45.16 22	29.344 317	52.19 90	17.095 294	15.88 58	21.388 366	11.19 11
Apr. 9.8	15.818	45.38 78	29.661 323	51.29 98	17.389 301	16.46 94	21.754 373	11.30 71
19.7	16.160 342	46.16 133	29.984 325	50.31 104	17.690 302	17.40 129	22.127 371	12.01 129
29.7	16.501 341	47.49 181	30.309 321	49.27 108	17.992 298	18.69 160	22.498 360	13.30 183
May 9.7	16.833 382	49.30 224	30.630 316	48.24 105	18.290 289	20.29 183	22.858 340	15.13 229
19.7	17.149 292	51.54 261	30.946 297	47.19 98	18.579 273	22.12 208	23.198 312	17.42 268
29.6	17.441 261	54.15 287	31.243 276	46.21 90	18.852 248	24.15 215	23.510 276	20.10 299
June 8.6	17.702 223	57.02 307	31.519 247	45.31 79	19.100 221	26.30 221	23.786 233	23.09 321
18.6	17.925 181	60.09 317	31.766 213	44.52 64	19.321 188	28.51 222	24.019 185	26.30 335
28.6	18.106 125	63.26 321	31.979 174	43.88 51	19.509 149	30.73 216	24.204 132	29.65 340
July 8.5	18.241 84	66.47 316	32.153 130	43.37 36	19.658 107	32.89 205	24.336 76	33.05 337
18.5	18.325 32	69.63 303	32.283 84	43.01 21	19.765 63	34.94 192	24.412 19	36.42 327
28.5	18.357 20	72.66 286	32.367 36	42.80 8	19.828 19	36.86 173	24.431 38	39.69 308
Aug. 7.4	18.337 69	75.52 260	32.403 11	42.72 5	19.847 25	38.59 154	24.393 93	42.77 264
17.4	18.268 116	78.12 233	32.392 55	42.77 14	19.822 65	40.13 131	24.300 144	45.61 254
27.4	18.152 156	80.45 197	32.337 93	42.91 22	19.757 101	41.44 106	24.156 187	48.15 219
Sept. 6.4	17.996 190	82.42 180	32.244 127	43.13 25	19.656 181	42.50 80	23.969 225	50.34 180
16.3	17.806 216	84.02 120	32.117 160	43.38 27	19.525 153	43.30 55	23.744 254	52.14 136
26.3	17.590 281	85.22 76	31.967 167	43.65 27	19.372 167	43.85 28	23.490 271	53.50 90
Oct. 6.3	17.359 288	85.98 82	31.800 171	43.92 24	19.205 171	44.13 3	23.219 279	54.40 48
16.3	17.121 235	86.30 15	31.629 165	44.16 20	19.034 166	44.16 25	22.940 276	54.83 8
26.2	16.886 230	86.15 61	31.464 150	44.36 14	18.868 153	43.91 49	22.664 261	54.75 58
Nov. 5.2	16.666 198	85.54 107	31.314 125	44.50 9	18.715 181	43.42 76	22.403 289	54.17 108
15.2	16.468 166	84.47 150	31.189 96	44.59 5	18.584 102	42.66 99	22.164 206	53.09 156
25.1	16.302 180	82.97 189	31.093 57	44.64 1	18.482 69	41.67 121	21.958 165	51.53 199
Dec. 5.1	16.172 87	81.08 225	31.036 17	44.65 3	18.413 83	40.46 140	21.793 120	49.54 238
15.1	16.085 42	78.83 254	31.019 26	44.62 6	18.380 7	39.06 155	21.673 69	47.16 271
25.1	16.043 6	76.29 273	31.045 67	44.56 9	18.387 44	37.51 164	21.604 16	44.45 291
35.0	16.049	73.56	31.112	44.47	18.431	35.87	21.588	41.54
Mean Place	14.869	63.39	27.794	50.06	15.965	27.84	21.021	30.53
Sec δ, Tan δ	1.255	+0.758	1.064	-0.363	1.017	+0.184	1.412	+0.997
Dφ α, D _m α	+0.04	-0.02	+0.07	+0.01	+0.06	-0.01	+0.04	-0.03
Dφ δ, D _m δ	+0.2	-0.9	+0.2	-0.9	+0.2	-0.9	+0.2	-0.9

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	δ Sagittæ. Mag. 3.8		α Aquilæ. (<i>Alair</i>). Mag. 0.9		η Aquilæ. Var. 3.7-4.4		ϵ Draconis. Mag. 4.0	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m	s	h m	s	h m	s	h m	s
	19 43	+18 19	19 46	+ 8 38	19 48	+ 0 47	19 48	+70 2
Jan. 1.0	37.834	32.86	40.533	41.23	11.187	17.57	23.64	77.33
11.0	37.896	30.80	40.605	39.68	11.260	16.44	23.50	74.08
21.0	37.994	28.73	40.713	38.13	11.370	15.34	23.50	70.70
31.0	38.130	26.74	40.854	36.67	11.511	14.31	23.60	67.33
Feb. 9.9	38.300	24.91	41.028	35.36	11.684	13.42	23.82	64.10
19.9	38.500	23.34	41.229	34.28	11.885	12.71	24.16	61.13
29.9	38.726	22.09	41.455	33.47	12.109	12.23	24.60	58.55
Mar. 10.9	38.977	21.22	41.704	32.97	12.355	12.03	25.12	56.45
20.8	39.248	20.78	41.972	32.85	12.621	12.12	25.71	54.92
30.8	39.535	20.78	42.254	33.10	12.902	12.51	26.35	54.01
Apr. 9.8	39.834	21.25	42.548	33.72	13.194	13.21	27.03	53.74
19.7	40.140	22.16	42.849	34.71	13.494	14.19	27.71	54.13
29.7	40.448	23.48	43.152	36.01	13.797	15.44	28.38	55.16
May 9.7	40.749	25.16	43.452	37.61	14.097	16.89	29.02	56.78
19.7	41.041	27.16	43.741	39.43	14.390	18.52	29.61	58.94
29.6	41.315	29.38	44.016	41.43	14.668	20.26	30.14	61.56
June 8.6	41.565	31.79	44.268	43.55	14.924	22.06	30.59	64.57
18.6	41.785	34.31	44.491	45.71	15.155	23.87	30.93	67.87
28.6	41.971	36.86	44.683	47.86	15.353	25.65	31.18	71.38
July 8.5	42.116	39.39	44.835	49.95	15.514	27.34	31.32	75.01
18.5	42.219	41.83	44.946	51.94	15.633	28.91	31.36	78.67
28.5	42.277	44.14	45.013	53.79	15.710	30.34	31.27	82.27
Aug. 7.4	42.288	46.26	45.035	55.44	15.742	31.59	31.09	85.74
17.4	42.256	48.16	45.015	56.91	15.730	32.67	30.80	89.00
27.4	42.182	49.81	44.954	58.14	15.678	33.54	30.41	91.98
Sept. 6.4	42.072	51.19	44.857	59.14	15.589	34.21	29.94	94.62
16.3	41.932	52.26	44.730	59.89	15.469	34.70	29.40	96.87
26.3	41.768	53.02	44.581	60.40	15.327	34.99	28.80	98.68
Oct. 6.3	41.591	53.47	44.417	60.65	15.169	35.10	28.17	100.00
16.3	41.408	53.59	44.250	60.67	15.006	35.04	27.51	100.80
26.2	41.230	53.37	44.087	60.42	14.848	34.79	26.84	101.06
Nov. 5.2	41.066	52.83	43.937	59.95	14.701	34.39	26.19	100.75
15.2	40.922	51.96	43.810	59.23	14.577	33.82	25.58	99.88
25.1	40.807	50.78	43.709	58.30	14.480	33.11	25.02	98.45
Dec. 5.1	40.726	49.34	43.642	57.16	14.416	32.26	24.52	96.50
15.1	40.681	47.64	43.611	55.86	14.388	31.30	24.11	94.09
25.1	40.675	45.75	43.619	54.43	14.399	30.24	23.80	91.29
35.0	40.710	43.74	43.664	52.90	14.446	29.13	23.59	88.17
Mean Place	38.540	34.84	41.097	44.21	11.663	21.24	27.939	74.24
Sec δ , Tan δ	1.053	+0.331	1.012	+0.152	1.000	+0.014	2.932	+2.756
$D\phi \alpha$, $D\omega \alpha$	+0.05	-0.01	+0.06	0.00	+0.06	0.00	0.00	-0.08
$D\phi \delta$, $D\omega \delta$	+0.2	-0.9	+0.2	-0.9	+0.2	-0.9	+0.2	-0.9

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	ϵ Sagittarii. Mag. 4.2		ϵ Pavonis. Mag. 4.1		β Aquilæ. Mag. 3.9		γ Sagittæ. Mag. 3.7	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 19 49	° ' " -42 5	h m 19 50	° ' " -73 7	h m 19 51	° ' " + 6 11	h m 19 55	° ' " +19 15
	s 19 49	" -42 5	s 19 50	" -73 7	s 19 51	" + 6 11	s 19 55	" +19 15
Jan. 1.1	27.587	31.57	51.70	69.75	10.704	43.26	0.562	46.53
11.0	27.687 100	30.08 149	51.81 11	66.69 306	10.770 66	41.83 143	0.610 48	44.51 206
21.0	27.836 149	28.53 155	52.06 25	63.59 310	10.872 102	40.41 142	0.698 88	42.43 208
31.0	28.030 194	26.95 158	52.44 38	60.52 307	11.007 135	39.06 135	0.822 124	40.42 201
Feb. 9.9	28.265 235	25.37 158	52.93 49	57.54 298	11.174 167	37.86 120	0.980 158	38.56 186
	272	157	60	280	196	100	188	162
19.9	28.537	23.80	53.53	54.74	11.369	36.86	1.168	36.94
29.9	28.842 305	22.28 152	54.22 69	52.17 257	11.590 221	36.12 44	1.387 219	35.64 130
Mar. 10.9	29.174 322	20.82 146	54.99 77	49.87 230	11.832 242	35.68 9	1.630 243	34.71 93
20.8	29.531 357	19.44 138	55.82 83	47.89 198	12.095 263	35.59 28	1.896 266	34.21 50
30.8	29.905 374	18.15 129	56.70 88	46.28 161	12.374 279	35.85 26	2.180 284	34.16 5
	390	115	92	124	291	62	297	41
Apr. 9.8	30.295	17.00	57.62	45.04	12.665	36.47	2.477	34.57
19.7	30.695 400	16.00 100	58.55 93	44.22 82	12.965 300	37.41 94	2.785 308	35.44 87
29.7	31.097 402	15.16 84	59.48 93	43.82 40	13.268 308	38.68 127	3.094 309	36.72 128
May 9.7	31.496 399	14.53 63	60.38 90	43.82 0	13.568 300	40.20 152	3.400 306	38.38 166
19.7	31.885 389	14.10 43	61.26 88	44.27 45	13.860 292	41.94 174	3.698 298	40.37 199
	370	19	82	85	279	189	282	223
29.6	32.255	13.91	62.08	45.12	14.139	43.83	3.980	42.60
(June 8.6	32.598 343	13.94 3	62.83 75	46.37 125	14.395 256	45.83 200	4.238 258	45.02 242
18.6	32.907 309	14.22 28	63.50 67	47.98 161	14.625 230	47.86 208	4.469 231	47.58 266
28.6	33.175 268	14.72 60	64.04 54	49.89 191	14.822 197	49.89 208	4.664 195	50.18 260
July 8.5	33.394 219	15.44 72	64.48 44	52.07 218	14.982 160	51.86 197	4.820 156	52.76 258
	165	89	31	236	118	186	113	251
18.5	33.559 108	16.33 104	64.79 17	54.43 249	15.100 75	53.72 170	4.933 68	55.27 239
28.5	33.667 47	17.37 115	64.96 1	56.92 252	15.175 31	55.42 170	5.001 22	57.66 230
Aug. 7.4	33.714 11	18.52 120	64.97 11	59.44 246	15.206 13	58.96 164	5.023 22	59.86 200
17.4	33.703 67	19.72 120	64.86 25	61.90 233	15.193 55	58.30 113	5.000 65	61.86 174
27.4	33.636 117	20.92 112	64.61 39	64.23 207	15.138 90	59.43 91	4.935 103	63.60 147
Sept. 6.4	33.519 159	22.04 102	64.22 48	66.30 176	15.048 122	60.34 67	4.832 134	65.07 117
16.3	33.360 192	23.06 85	63.74 56	68.06 136	14.926 144	61.01 45	4.698 159	66.24 85
26.3	33.168 216	23.91 64	63.18 63	69.42 90	14.782 159	61.46 21	4.529 174	67.09 54
Oct. 6.3	32.952 224	24.55 39	62.55 66	70.31 39	14.623 166	61.67 0	4.365 182	67.63 20
16.3	32.728 220	24.94 11	61.90 66	70.70 14	14.457 162	61.67 24	4.183 179	67.83 15
26.2	32.508 203	25.05 17	61.24 62	70.56 69	14.295 150	61.43 45	4.004 167	67.68 47
Nov. 5.2	32.305 175	24.88 45	60.62 57	69.87 122	14.145 128	60.98 67	3.837 148	67.21 80
15.2	32.130 138	24.43 71	60.05 49	68.65 170	14.017 103	60.31 86	3.689 122	66.41 113
25.1	31.992 92	23.72 94	59.56 36	66.95 214	13.914 70	59.45 104	3.567 91	65.28 140
Dec. 5.1	31.900 42	22.78 115	59.20 25	64.81 251	13.844 34	58.41 121	3.476 54	63.88 167
15.1	31.858 10	21.63 131	58.95 12	62.30 278	13.810 2	57.20 133	3.422 16	62.21 186
25.1	31.868 61	20.32 143	58.83 1	59.52 299	13.812 41	55.87 140	3.406 23	60.35 200
35.0	31.929	18.89	58.84	56.53	13.853	54.47	3.429	58.35
Mean Place	28.069	23.95	53.723	60.88	11.228	46.21	1.264	47.78
Sec δ , Tan δ	1.348	-0.903	3.446	-3.298	1.006	+0.108	1.060	+0.350
D ϕ α , D μ α	+0.08	+0.03	+0.14	+0.10	+0.06	0.00	+0.05	-0.01
D ϕ δ , D μ δ	+0.2	-0.9	+0.2	-0.9	+0.2	-0.9	+0.2	-0.9

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	<i>c</i> Sagittarii. Mag. 4.6			<i>τ</i> Aquilæ. Mag. 5.6			<i>θ</i> Aquilæ. Mag. 3.4			<i>o</i> Cygni seq. Mag. 4.0		
	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.
	h	m	°	h	m	°	h	m	°	h	m	°
	19	57	-27 56	20	0	+ 7 2	20	6	- 1 4	20	10	+46 28
	s		"	s		"	s		"	s		"
Jan. 1.1	29.353		46.08	1.688		22.82	57.853		20.33	57.734		73.18
11.0	29.436	83	45.44	1.743	55	21.39	57.911	58	21.30	57.712	22	70.27
21.0	29.559	123	44.73	1.837	94	19.96	58.002	143	22.24	57.745	33	67.25
31.0	29.719	160	43.96	1.962	125	18.61	58.128	143	23.11	57.831	86	64.22
Feb. 10.0	29.913	194	43.14	2.120	158	17.39	58.284	156	23.85	57.970	139	61.31
		226			188			184			189	
19.9	30.139		42.25	2.308		16.38	58.468		24.42	58.159		58.64
29.9	30.393	254	41.31	2.521	213	15.62	58.679	211	24.77	58.395	236	56.33
Mar. 10.9	30.670	277	40.30	2.759	238	15.17	58.913	234	24.87	58.674	279	54.45
20.8	30.969	299	39.25	3.018	259	15.05	59.169	256	24.69	58.990	316	53.10
30.8	31.285	316	38.16	3.294	276	15.30	59.442	273	24.22	59.335	345	52.32
		330			287			288			366	
Apr. 9.8	31.615		37.05	3.581		15.91	59.730		23.46	59.701		52.14
19.8	31.956	341	35.95	3.881	300	16.87	60.029	299	22.44	60.082	381	52.58
29.7	32.301	345	34.88	4.184	303	18.14	60.335	306	21.16	60.466	384	53.60
May 9.7	32.646	345	33.87	4.488	304	19.67	60.640	305	19.70	60.846	380	55.17
19.7	32.984	338	32.95	4.783	295	21.45	60.941	301	18.07	61.212	366	57.25
		324			281			289			342	
29.7	33.308		32.15	5.064		23.39	61.230		16.34	61.554		59.76
June 8.6	33.610	302	31.51	5.325	261	25.43	61.500	270	14.56	61.863	309	62.62
18.6	33.885	275	31.03	5.561	236	27.55	61.745	245	12.78	62.133	270	65.76
28.6	34.125	240	30.73	5.765	204	29.63	61.960	215	11.05	62.356	223	69.09
July 8.5	34.326	201	30.61	5.931	166	31.67	62.138	178	9.41	62.527	171	72.52
		154			126			139			114	
18.5	34.480		30.67	6.057		33.60	62.277		7.89	62.641		75.97
28.5	34.585	105	30.90	6.139	82	35.40	62.372	95	6.51	62.697	56	79.37
Aug. 7.5	34.640	55	31.26	6.179	40	37.02	62.422	50	5.32	62.693	4	82.63
17.4	34.645	5	31.73	6.173	6	38.43	62.428	6	4.31	62.633	60	85.69
27.4	34.601	44	32.28	6.127	46	39.64	62.392	36	3.48	62.518	115	88.50
		88			87			75			164	
Sept. 6.4	34.513		32.87	6.040		40.64	62.317		2.86	62.354		90.98
16.4	34.389	124	33.46	5.924	116	41.38	62.209	108	2.41	62.148	206	93.09
26.3	34.236	153	34.01	5.784	140	41.89	62.077	132	2.15	61.910	238	94.80
Oct. 6.3	34.064	172	34.48	5.626	158	42.16	61.927	150	2.05	61.646	234	96.06
16.3	33.883	181	34.85	5.463	163	42.22	61.769	158	2.12	61.369	277	96.84
		178			162			157			281	
26.2	33.705		35.08	5.301		42.03	61.612		2.35	61.088		97.12
Nov. 5.2	33.541	164	35.19	5.150	151	41.61	61.465	147	2.71	60.815	273	96.90
15.2	33.398	143	35.15	5.018	132	40.97	61.336	129	3.21	60.560	255	96.17
25.2	33.287	111	34.96	4.913	105	40.13	61.232	104	3.83	60.330	230	94.93
Dec. 5.1	33.213	74	34.66	4.836	77	39.10	61.159	73	4.58	60.136	194	93.22
		33			42			40			153	
15.1	33.180		34.24	4.794		37.91	61.119		5.42	59.983		91.08
25.1	33.189	9	33.73	4.788	6	36.57	61.114	5	6.33	59.876	107	88.57
35.1	33.242	53	33.13	4.819	31	35.19	61.147	33	7.29	59.821	55	85.80
Mean Place	29.714		39.49	2.205		25.31	58.275		17.03	59.242		69.86
Sec δ , Tan δ	1.132		-0.530	1.008		+0.124	1.000		-0.019	1.453		+1.054
$D_{\phi} a, D_{\omega} a$	+0.07		+0.02	+0.06		0.00	+0.06		0.00	+0.04		-0.04
$D_{\phi} \delta, D_{\omega} \delta$	+0.2		-0.9	+0.2		-0.9	+0.2		-0.9	+0.2		-0.8

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	κ Cephei. Mag. 4.4		γ Vulpeculae. Mag. 5.4		α^2 Capricorni. Mag. 3.8		β Capricorni. Mag. 3.2	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 20 11	° ' " +77 27	h m 20 13	° ' " +24 24	h m 20 13	° ' " -12 48	h m 20 16	° ' " -15 2
	s	"	s	"	s	"	s	"
Jan. 1.1	37.36	38.38	10.877	42.62	23.381	26.33	17.309	55.76
11.0	36.98	35.32	10.702	40.41	23.440	26.59	17.366	55.88
21.0	36.80	32.07	10.765	38.15	23.533	26.81	17.458	55.94
31.0	36.80	28.74	10.867	35.93	23.661	26.94	17.585	55.92
Feb. 10.0	37.00	25.47	11.004	33.85	23.821	26.96	17.744	55.80
19.9	37.38	22.39	11.177	31.99	24.009	26.85	17.931	55.54
29.9	37.93	19.62	11.382	30.44	24.224	26.58	18.146	55.14
Mar. 10.9	38.65	17.27	11.615	29.28	24.463	26.14	18.385	54.68
20.8	39.48	15.42	11.875	28.55	24.724	25.50	18.647	53.85
30.8	40.41	14.16	12.157	28.31	25.003	24.68	18.928	52.96
Apr. 9.8	41.41	13.52	12.457	28.55	25.299	23.70	19.226	51.92
19.8	42.43	13.53	12.768	29.27	25.607	22.55	19.536	50.75
29.7	43.46	14.17	13.086	30.46	25.922	21.28	19.853	49.48
May 9.7	44.44	15.42	13.403	32.08	26.239	19.93	20.173	48.14
19.7	45.37	17.22	13.712	34.06	26.552	18.52	20.490	46.78
29.7	46.20	19.54	14.008	36.34	26.854	17.12	20.795	45.43
June 8.6	46.91	22.29	14.283	38.88	27.140	15.76	21.085	44.14
18.6	47.47	25.39	14.528	41.57	27.401	14.47	21.350	42.95
28.6	47.90	28.75	14.740	44.35	27.632	13.30	21.586	41.87
July 8.5	48.16	32.31	14.911	47.16	27.826	12.26	21.786	40.94
18.5	48.24	35.95	15.039	49.93	27.979	11.38	21.944	40.19
28.5	48.16	39.60	15.121	52.59	28.088	10.68	22.057	39.60
Aug. 7.5	47.92	43.19	15.156	55.09	28.151	10.14	22.124	39.18
17.4	47.50	46.62	15.145	57.39	28.168	9.77	22.145	38.94
27.4	46.94	49.84	15.089	59.43	28.141	9.56	22.121	38.84
Sept. 6.4	46.25	52.78	14.993	61.19	28.073	9.48	22.055	38.87
16.4	45.43	55.37	14.863	62.65	27.971	9.51	21.955	39.00
26.3	44.51	57.55	14.705	63.78	27.841	9.64	21.826	39.22
Oct. 6.3	43.52	59.29	14.528	64.55	27.693	9.84	21.678	39.48
16.3	42.48	60.54	14.342	64.95	27.534	10.10	21.519	39.78
26.2	41.41	61.25	14.155	64.98	27.376	10.38	21.359	40.08
Nov. 5.2	40.34	61.41	13.975	64.64	27.227	10.69	21.208	40.38
15.2	39.31	60.99	13.813	63.92	27.096	11.00	21.074	40.67
25.2	38.33	60.00	13.672	62.84	26.990	11.33	20.966	40.94
Dec. 5.1	37.43	58.46	13.562	61.44	26.915	11.65	20.888	41.18
15.1	36.66	56.41	13.486	59.73	26.875	11.98	20.844	41.40
25.1	36.02	53.91	13.446	57.78	26.870	12.29	20.838	41.59
35.1	35.54	51.04	13.443	55.64	26.903	12.57	20.869	41.74
Mean Place	44.499	32.26	11.441	42.01	23.716	21.57	17.627	50.73
Sec δ , Tan δ	4.606	+4.496	1.098	+0.454	1.026	-0.227	1.035	-0.269
$D_{\phi} \alpha$, $D_{\omega} \alpha$	-0.04	-0.16	+0.05	-0.02	+0.07	+0.01	+0.07	+0.01
$D_{\phi} \delta$, $D_{\omega} \delta$	+0.2	-0.8	+0.2	-0.8	+0.2	-0.8	+0.2	-0.8

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	α Pavonis. Mag. 2.1		γ Cygni. Mag. 2.3		π Capricorni. Mag. 5.2		ρ Capricorni. Mag. 5.0	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 20 18	° ' " -57 0	h m 20 19	° ' " +39 58	h m 20 22	° ' " -18 29	h m 20 24	° ' " -18 5
Jan. 1.1	59.913	28.70	11.602	77.26	30.585	21.43	3.979	37.17
11.0	59.966 ⁵³	28.40 ²³⁰	11.588 ¹⁴	74.55 ²⁷¹	30.638 ⁵³	21.33 ¹⁰	4.029 ⁵⁰	37.10 ⁷
21.0	60.086 ¹²⁰	23.97 ²⁴³	11.623 ³⁵	71.74 ²⁶¹	30.724 ⁸⁶	21.17 ¹⁶	4.115 ⁸⁶	36.94 ¹⁶
31.0	60.271 ¹⁸⁵	21.47 ²⁵⁰	11.705 ⁸²	68.92 ²⁸²	30.847 ¹²³	20.91 ²⁶	4.236 ¹²¹	36.71 ²⁴
Feb. 10.0	60.516 ²⁴⁵	18.96 ²⁵¹	11.834 ¹²⁹	66.20 ²⁷²	31.003 ¹⁵⁶	20.54 ²⁷	4.389 ¹⁵³	36.37 ³⁴
	301 ²⁴⁶		172 ²⁴⁷			47 ¹⁸⁵		6 ¹⁸⁴
19.9	60.817	16.50	12.006	63.73	31.188	20.07	4.573	35.91
29.9	61.168 ³⁵¹	14.12 ²³⁸	12.221 ²¹⁵	61.58 ²¹⁵	31.401 ²¹³	19.46 ⁶¹	4.784 ²¹¹	35.32 ⁵⁹
Mar. 10.9	61.563 ³⁹⁵	11.88 ²²⁴	12.473 ²⁵²	59.84 ¹⁷⁴	31.641 ²⁴⁰	18.73 ⁷³	5.020 ²³⁶	34.58 ⁷¹
20.9	61.998 ⁴³⁵	9.82 ²⁰⁶	12.758 ²⁸⁵	58.60 ¹²⁴	31.902 ²⁶¹	17.84 ⁸⁹	5.282 ²⁶²	33.71 ⁸⁷
30.8	62.464 ⁴⁶⁶	7.96 ¹⁸⁶	13.072 ³¹⁴	57.90 ⁷⁰	32.188 ²⁸⁶	16.82 ¹⁰²	5.562 ²⁸⁰	32.69 ¹⁰²
	493 ¹⁰⁰		336 ¹²		300 ²⁴⁷	115 ¹¹⁵	300 ³⁰⁰	114 ¹¹⁴
Apr. 9.8	62.957	6.36	13.408	57.78	32.488	15.67	5.862	31.55
19.8	63.468 ⁵¹¹	5.02 ¹²⁴	13.759 ³⁵¹	58.25 ⁴⁷	32.800 ³¹²	14.44 ¹²³	6.174 ³¹²	30.31 ¹²³
29.7	63.990 ⁵²²	3.99 ¹⁰³	14.115 ³⁶⁶	59.26 ¹⁰¹	33.122 ³²²	13.14 ¹³⁰	6.495 ³²¹	29.00 ¹²³
May 9.7	64.514 ⁵²⁴	3.29 ⁷⁰	14.470 ³⁵⁵	60.81 ¹⁵⁵	33.449 ³³⁷	11.79 ¹³⁵	6.820 ³²⁵	27.66 ¹²⁴
19.7	65.030 ⁵¹⁶	2.94 ³⁵	14.815 ³⁴⁵	62.82 ²⁰¹	33.774 ³³⁵	10.47 ¹³²	7.143 ³²³	26.32 ¹²⁴
	496 ¹		338 ²⁴³		314 ³¹⁴	126 ¹²⁶	315 ³¹⁵	125 ¹²⁵
29.7	65.526	2.93	15.143	65.25	34.088	9.21	7.458	25.02
June 8.6	65.993 ⁴⁶⁷	3.28 ³⁵	15.443 ³⁰⁰	68.01 ²⁷⁶	34.385 ²⁹⁷	8.01 ¹²⁰	7.755 ²⁹⁷	23.81 ¹²³
18.6	66.418 ⁴²⁵	3.97 ⁶⁹	15.708 ²⁶⁵	71.03 ³⁰²	34.659 ²⁷⁴	6.94 ¹⁰⁷	8.030 ²⁷⁵	22.71 ¹¹⁸
28.6	66.791 ³⁷³	4.99 ¹⁰²	15.933 ²²⁵	74.23 ³²⁰	34.905 ²⁴⁶	6.01 ⁹³	8.275 ²⁴⁵	21.75 ⁹⁴
July 8.6	67.105 ³¹⁴	6.29 ¹³⁰	16.112 ¹⁷⁹	77.51 ³²⁸	35.112 ²⁶⁷	5.26 ⁷⁵	8.483 ²⁰⁶	20.96 ⁷¹
	244 ¹⁵⁶		128 ³³¹		166 ¹⁶⁶	58 ⁵⁸	168 ¹⁶⁸	61 ⁶¹
18.5	67.349	7.85	16.240	80.82	35.278	4.68	8.651	20.36
28.5	67.519 ¹⁷⁰	9.61 ¹⁷⁶	16.315 ⁷⁵	84.06 ³³⁴	35.402 ¹²⁴	4.28 ⁴⁰	8.774 ¹²³	19.93 ⁴¹
Aug. 7.5	67.610 ⁹¹	11.49 ¹⁸⁸	16.336 ²¹	87.16 ³¹⁰	35.475 ⁷³	4.06 ²²	8.850 ⁷⁶	19.69 ²⁴
17.4	67.622 ¹²	13.43 ¹⁹⁴	16.304 ³²	90.08 ²⁹²	35.502 ²⁷	4.00 ⁶	8.879 ²⁹	19.60 ⁷
27.4	67.557 ⁶⁵	15.36 ¹⁹³	16.221 ⁸³	92.75 ²⁶⁷	35.484 ¹⁸	4.09 ⁹	8.861 ¹⁸	19.66 ⁶
	138 ¹⁸³		128 ²³⁶		62 ⁶²	19 ¹⁹	60 ⁶⁰	13 ¹³
Sept. 6.4	67.419	17.19	16.093	95.11	35.422	4.28	8.801	19.84
16.4	67.218 ²⁰¹	18.85 ¹⁶⁶	15.924 ¹⁶⁹	97.12 ²⁰¹	35.323 ⁹⁹	4.57 ²⁹	8.708 ⁹⁵	20.13 ²⁹
26.3	66.965 ²⁵³	20.27 ¹⁴²	15.724 ²⁰⁰	98.74 ¹⁶²	35.197 ¹²⁶	4.91 ³⁴	8.579 ¹²⁷	20.46 ³¹
Oct. 6.3	66.673 ²⁹²	21.37 ¹¹⁰	15.502 ²²²	99.94 ¹²⁰	35.048 ¹⁴⁹	5.29 ³⁸	8.431 ¹⁴⁸	20.83 ³⁷
16.3	66.358 ³¹⁵	22.10 ⁷³	15.265 ²³⁷	100.70 ⁷⁶	34.886 ¹⁶²	5.67 ³⁸	8.272 ¹⁵⁹	21.19 ³⁸
	321 ³³		240 ²⁹		161 ¹⁶¹	34 ³⁴	161 ¹⁶¹	35 ³⁵
26.3	66.087	22.43	15.025	100.99	34.725	6.01	8.111	21.54
Nov. 5.2	65.727 ³¹⁰	22.34 ⁹	14.790 ²³⁵	100.80 ¹⁹	34.570 ¹⁸⁵	6.31 ³⁰	7.956 ¹⁸⁵	21.85 ³¹
15.2	65.443 ²⁸⁴	21.81 ⁵³	14.572 ²¹⁸	100.14 ⁶⁶	34.434 ¹³⁶	6.55 ²⁴	7.818 ¹³⁸	22.11 ²⁶
25.2	65.199 ²⁴⁴	20.87 ⁹⁴	14.376 ¹⁹⁶	99.00 ¹¹⁴	34.321 ¹¹³	6.73 ¹⁸	7.705 ¹¹³	22.31 ³⁰
Dec. 5.1	65.007 ¹⁹²	19.53 ¹³⁴	14.211 ¹⁶⁵	97.42 ¹⁵⁸	34.238 ⁸³	6.88 ¹⁵	7.621 ⁸⁴	22.46 ¹⁵
	131 ¹⁶⁸		137 ¹⁹⁸		49 ⁴⁹	8 ⁸	50 ⁵⁰	10 ¹⁰
15.1	64.876	17.85	14.084	95.44	34.189	6.96	7.571	22.56
25.1	64.810 ⁶⁶	15.89 ¹⁹⁶	13.997 ⁸⁷	93.13 ²³¹	34.177 ¹²	6.96 ⁰	7.558 ¹³	22.59 ³
35.1	64.815 ⁵	13.69 ²²⁰	13.955 ⁴²	90.53 ²⁶⁰	34.203 ²⁶	6.90 ⁶	7.581 ²³	22.56 ³
Mean Place	60.575	19.20	12.795	74.03	30.878	15.96	4.266	31.78
Sec δ , Tan δ	1.836	-1.540	1.305	+0.839	1.054	-0.334	1.052	-0.327
D ψ α , D ω α	+0.09	+0.06	+0.04	-0.03	+0.07	+0.01	+0.07	+0.01
D ψ δ , D ω δ	+0.2	-0.8	+0.2	-0.8	+0.2	-0.8	+0.2	-0.8

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	41 Cygni. Mag. 4.1		θ Cephei. Mag. 4.3		ϵ Delphini. Mag. 4.0		Groombridge 3241. Mag. 6.4	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 20 25	° ' +30 5	h m 20 28	° ' +62 42	h m 20 29	° ' +11 0	h m 20 30	° ' +72 14
	s "	"	s "	"	s "	"	s "	"
Jan. 1.1	56.983	17.90	7.73	47.95	11.516	60.71	18.09	57.62
11.0	56.985	15.53	7.60	44.95	11.542	59.17	17.81	54.63
21.0	57.028	13.08	7.54	41.75	11.603	57.62	17.66	51.44
31.0	57.111	10.66	7.57	38.47	11.697	56.11	17.64	48.12
Feb. 10.0	57.234	8.32	7.68	35.24	11.825	54.72	17.75	44.83
19.9	57.394	6.21	7.88	32.19	11.984	53.54	18.00	41.68
29.9	57.590	4.41	8.16	29.44	12.171	52.59	18.37	38.81
Mar. 10.9	57.819	2.98	8.52	27.10	12.386	51.97	18.85	36.34
20.9	58.078	2.02	8.93	25.26	12.626	51.71	19.43	34.35
30.8	58.363	1.54	9.39	24.00	12.889	51.82	20.08	32.94
Apr. 9.8	58.669	1.60	9.89	23.36	13.169	52.30	20.80	32.14
19.8	58.989	2.17	10.41	23.36	13.464	53.18	21.55	31.95
29.7	59.318	3.24	10.95	24.00	13.770	54.41	22.30	32.42
May 9.7	59.648	4.78	11.48	25.25	14.078	55.96	23.05	33.50
19.7	59.971	6.73	11.99	27.06	14.383	57.77	23.76	35.18
29.7	60.281	9.06	12.46	29.39	14.679	59.81	24.42	37.39
June 8.6	60.570	11.66	12.88	32.15	14.958	61.99	25.00	40.04
18.6	60.830	14.47	13.24	35.27	15.214	64.26	25.49	43.07
28.6	61.066	17.42	13.54	38.55	15.439	66.57	25.88	46.41
July 8.6	61.240	20.42	13.76	42.24	15.631	68.84	26.16	49.95
18.5	61.379	23.42	13.90	45.91	15.781	71.04	26.31	53.63
28.5	61.470	26.34	13.96	49.60	15.889	73.11	26.35	57.35
Aug. 7.5	61.513	29.12	13.94	53.22	15.961	75.02	26.26	61.02
17.4	61.606	31.70	13.82	56.69	15.969	76.72	26.06	64.58
27.4	61.454	34.05	13.64	59.95	15.944	78.22	25.74	67.94
Sept. 6.4	61.359	36.10	13.38	62.92	15.879	79.47	25.32	71.04
16.4	61.228	37.84	13.06	65.54	15.780	80.47	24.81	73.82
26.3	61.066	39.23	12.69	67.77	15.653	81.21	24.22	76.21
Oct. 6.3	60.881	40.24	12.28	69.54	15.506	81.69	23.57	78.15
16.3	60.686	40.85	11.84	70.82	15.348	81.91	22.87	79.62
26.3	60.485	41.06	11.38	71.57	15.186	81.86	22.15	80.54
Nov. 5.2	60.291	40.85	10.93	71.77	15.030	81.55	21.42	80.91
15.2	60.110	40.23	10.49	71.40	14.888	80.99	20.71	80.70
25.2	59.951	39.22	10.08	70.46	14.767	80.18	20.03	79.91
Dec. 5.1	59.820	37.80	9.71	68.98	14.672	79.16	19.41	78.55
15.1	59.722	36.05	9.39	66.98	14.607	77.94	18.86	76.66
25.1	59.659	34.02	9.13	64.53	14.575	76.56	18.40	74.30
35.1	59.635	31.76	8.94	61.73	14.577	75.07	18.05	71.51
Mean Place	57.846	15.56	10.504	41.18	12.011	61.28	22.763	49.78
Sec δ , Tan δ	1.156	+0.579	2.181	+1.939	1.019	+0.195	3.280	+3.124
$D_{\delta} \alpha$, $D_{\alpha} \alpha$	+0.05	-0.02	+0.02	-0.08	+0.06	-0.01	0.00	-0.13
$D_{\delta} \delta$, $D_{\alpha} \delta$	+0.2	-0.8	+0.2	-0.8	+0.2	-0.8	+0.2	-0.8

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	α Indi. Mag. 3.2		β Delphini. Mag. 3.7		γ Capricorni. Mag. 5.3		α Delphini. Mag. 3.9	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 20 31	° ' " -47 34	h m 20 33	° ' " +14 17	h m 20 35	° ' " -18 25	h m 20 35	° ' " +15 36
	s	"	s	"	s	"	s	"
Jan. 1.1	39.337	76.74	36.112	68.23	15.934	71.36	43.659	55.55
11.1	39.376	74.94	36.131	66.55	15.973	71.26	43.675	53.82
21.0	39.468	73.00	36.185	64.84	16.048	71.08	43.725	52.05
31.0	39.612	70.96	36.274	63.17	16.157	70.78	43.810	50.32
Feb. 10.0	39.802	68.85	36.394	61.62	16.298	70.39	43.929	48.71
19.9	40.036	66.73	36.548	60.25	16.471	69.87	44.080	47.28
29.9	40.312	64.64	36.731	59.16	16.672	69.21	44.261	46.12
Mar. 10.9	40.625	62.59	36.944	58.38	16.899	68.41	44.472	45.28
20.9	40.972	60.63	37.183	57.98	17.152	67.46	44.709	44.82
30.8	41.346	58.79	37.444	57.96	17.427	66.38	44.971	44.77
Apr. 9.8	41.746	57.11	37.725	58.37	17.720	65.16	45.252	45.13
19.8	42.164	55.61	38.021	59.18	18.031	63.85	45.548	45.91
29.8	42.595	54.34	38.328	60.37	18.352	62.48	45.856	47.09
May 9.7	43.031	53.31	38.639	61.92	18.679	61.06	46.167	48.63
19.7	43.465	52.57	38.946	63.75	19.005	59.66	46.478	50.47
29.7	43.887	52.11	39.245	65.84	19.324	58.31	46.777	52.57
June 8.6	44.287	51.96	39.528	68.09	19.628	57.04	47.061	54.86
18.6	44.658	52.13	39.786	70.47	19.911	55.91	47.321	57.28
28.6	44.988	52.59	40.016	72.91	20.164	54.91	47.552	59.76
July 8.6	45.270	53.35	40.209	75.33	20.383	54.08	47.747	62.24
18.5	45.497	54.37	40.362	77.69	20.561	53.46	47.901	64.67
28.5	45.664	55.61	40.472	79.94	20.695	53.02	48.012	66.98
Aug. 7.5	45.767	57.01	40.537	82.02	20.782	52.77	48.078	69.14
17.5	45.803	58.53	40.557	83.92	20.821	52.70	48.099	71.11
27.4	45.777	60.11	40.533	85.58	20.814	52.78	48.076	72.84
Sept. 6.4	45.689	61.65	40.469	87.01	20.764	53.00	48.012	74.35
16.4	45.548	63.12	40.370	88.16	20.675	53.32	47.914	75.56
26.3	45.362	64.42	40.243	89.04	20.555	53.69	47.786	76.51
Oct. 6.3	45.144	65.49	40.096	89.63	20.413	54.10	47.638	77.15
16.3	44.906	66.29	39.935	89.94	20.257	54.51	47.476	77.49
26.3	44.660	66.78	39.771	89.96	20.097	54.90	47.311	77.55
Nov. 5.2	44.419	66.92	39.612	89.68	19.942	55.25	47.150	77.30
15.2	44.199	66.71	39.465	89.13	19.801	55.54	47.001	76.76
25.2	44.008	66.15	39.339	88.30	19.684	55.77	46.871	75.92
Dec. 5.2	43.858	65.26	39.237	87.22	19.593	55.92	46.768	74.83
15.1	43.755	64.07	39.166	85.93	19.536	56.02	46.693	73.50
25.1	43.703	62.61	39.127	84.44	19.513	56.04	46.650	71.98
35.1	43.705	60.92	39.122	82.81	19.526	55.99	46.642	70.30
Mean Place	39.731	67.61	36.640	68.02	16.187	66.01	44.201	55.00
Sec δ , Tan δ	1.483	-1.095	1.032	+0.255	1.054	-0.333	1.039	+0.280
$D\psi \alpha$, $D_{\omega} \alpha$	+0.08	+0.04	+0.06	-0.01	+0.07	+0.01	+0.06	-0.01
$D\psi \delta$, $D_{\omega} \delta$	+0.2	-0.8	+0.2	-0.8	+0.2	-0.8	+0.3	-0.8

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	β Pavonis. Mag. 3.6		α Cygni. (Deneb.) Mag. 1.3		δ Delphini. Mag. 4.5		ψ Capricorni. Mag. 4.3	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 20 37 s	° ' " -66 30 "	h m 20 38 s	° ' " +44 58 "	h m 20 39 s	° ' " +14 46 "	h m 20 41 s	° ' " -25 34 "
Jan. 1.1	23.28	33.31	32.736	52.20	31.727	21.37	7.271	30.45
11.1	23.26 ²	30.59 ²⁷²	32.687 ⁴⁰	49.50 ²⁷⁰	31.740 ¹³	19.70 ¹⁶⁷	7.305 ³⁴	29.93 ⁵²
21.0	23.34 ⁸	27.70 ²⁸⁹	32.688 ¹	46.63 ²⁸⁷	31.787 ⁴⁷	17.99 ¹⁷¹	7.377 ⁷²	29.29 ⁶⁴
31.0	23.52 ¹⁸	24.71 ²⁹⁹	32.739 ⁵¹	43.71 ²⁹²	31.869 ⁸²	16.32 ¹⁶⁷	7.485 ¹⁰⁸	28.54 ⁷⁵
Feb. 10.0	23.78 ²⁶	21.69 ³⁰²	32.842 ¹⁰³	40.85 ²⁸⁶	31.984 ¹¹⁵	14.75 ¹⁵⁷	7.627 ¹⁴²	27.69 ⁸⁵
	35	296	152	267	147	138	175	96
19.9	24.13	18.73	32.994	38.18	32.131	13.37	7.802	26.73
29.9	24.54 ⁴¹	15.87 ²⁸⁶	33.194 ²⁰⁰	35.79 ²³⁹	32.309 ¹⁷⁸	12.26 ¹¹¹	8.007 ²⁰⁵	25.66 ¹⁰⁷
Mar. 10.9	25.02 ⁴⁸	13.17 ²⁷⁰	33.440 ²⁴⁶	33.81 ¹⁹⁸	32.517 ²⁰⁸	11.46 ⁸⁰	8.240 ²³³	24.48 ¹¹⁸
20.9	25.56 ⁵⁴	10.70 ²⁴⁷	33.724 ²⁸⁴	32.30 ¹⁵¹	32.751 ²³⁴	11.02 ⁴⁴	8.500 ²⁶⁰	23.22 ¹²⁶
30.8	26.14 ⁵⁸	8.49 ²²¹	34.044 ³²⁰	31.34 ⁹⁶	33.009 ²⁵⁸	10.98 ⁴	8.784 ²⁸⁴	21.89 ¹³³
	63	192	349	40	278	38	305	139
Apr. 9.8	26.77	6.57	34.393	30.94	33.287	11.36	9.089	20.50
19.8	27.43 ⁶⁶	5.00 ¹⁵⁷	34.760 ³⁶⁷	31.14 ²⁰	33.582 ²⁹⁵	12.14 ⁷⁸	9.410 ³²¹	19.07 ¹⁴³
29.8	28.11 ⁶⁸	3.81 ¹¹⁹	35.139 ³⁷⁹	31.93 ⁷⁹	33.888 ³⁰⁶	13.31 ¹¹⁷	9.744 ³³⁴	17.65 ¹⁴²
May 9.7	28.79 ⁶⁸	3.01 ⁸⁰	35.520 ³⁸¹	33.27 ¹³⁴	34.199 ³¹¹	14.84 ¹⁵³	10.085 ³⁴¹	16.27 ¹³⁸
19.7	29.47 ⁶⁶	2.63 ³⁸	35.893 ³⁷³	35.13 ¹⁶⁶	34.508 ³⁰⁰	16.66 ¹⁸²	10.426 ³⁴¹	14.97 ¹³⁰
		4	357	231	300	208	335	119
29.7	30.13	2.67	36.250	37.44	34.808	18.74	10.761	13.78
June 8.6	30.75 ⁶²	3.14 ⁴⁷	36.581 ³³¹	40.13 ²⁶⁹	35.093 ²⁸⁵	21.00 ²²⁶	11.081 ³²⁰	12.74 ¹⁰⁴
18.6	31.32 ⁵⁷	3.98 ⁸⁴	36.877 ²⁹⁶	43.14 ³⁰¹	35.355 ²⁶²	23.39 ²³⁹	11.380 ²⁹⁹	11.87 ⁸⁷
28.6	31.83 ⁵¹	5.23 ¹²⁵	37.131 ²⁵⁴	46.36 ³²²	35.589 ²³⁴	25.84 ²⁴⁵	11.650 ²⁷⁰	11.21 ⁶⁶
July 8.6	32.26 ⁴³	6.82 ¹⁵⁹	37.336 ²⁰⁵	49.73 ³³⁷	35.787 ¹⁹⁸	28.29 ²⁴⁵	11.884 ²³⁴	10.74 ⁴⁷
	34	188	153	343	159	239	192	23
18.5	32.60	8.70	37.489	53.16	35.946	30.68	12.076	10.51
28.5	32.83 ²³	10.80 ²¹⁰	37.585 ⁹⁶	56.57 ³⁴¹	36.063 ¹¹⁷	32.97 ²²⁹	12.222 ¹⁴⁶	10.47 ⁴
Aug. 7.5	32.97 ¹⁴	13.06 ²²⁶	37.624 ³⁹	59.89 ³³²	36.132 ⁶⁹	35.08 ²¹¹	12.320 ⁹⁸	10.64 ¹⁷
17.5	33.01 ⁴	15.39 ²³³	37.606 ¹⁸	63.06 ³¹⁷	36.157 ²⁵	37.02 ¹⁹⁴	12.367 ⁴⁷	10.97 ³³
27.4	32.94 ⁷	17.73 ²³⁴	37.533 ⁷³	65.99 ²⁹³	36.138 ¹⁹	38.73 ¹⁷¹	12.365 ²	11.45 ⁴⁸
	18	223	124	265	59	147	48	58
Sept. 6.4	32.76	19.96	37.409	68.64	36.079	40.20	12.317	12.03
16.4	32.49 ²⁷	21.99 ²⁰³	37.242 ¹⁶⁷	70.96 ²³²	35.985 ⁹⁴	41.39 ¹¹⁹	12.228 ⁸⁹	12.67 ⁶⁴
26.3	32.16 ³³	23.75 ¹⁷⁶	37.037 ²⁰⁶	72.90 ¹⁹⁴	35.861 ¹²⁴	42.32 ⁹³	12.105 ¹²³	13.33 ⁶⁶
Oct. 6.3	31.76 ⁴⁰	25.15 ⁹⁸	36.805 ²³²	74.42 ¹⁵²	35.716 ¹⁴⁵	42.95 ⁶³	11.957 ¹⁴⁸	13.97 ⁶⁴
16.3	31.32 ⁴⁴	26.13 ⁹⁰	36.554 ²⁵¹	75.49 ¹⁰⁷	35.557 ¹⁵⁹	43.29 ³⁴	11.793 ¹⁶⁴	14.55 ⁵⁸
	46	50	261	58	164	5	169	48
26.3	30.86	26.63	36.293	76.07	35.393	43.34	11.624	15.03
Nov. 5.2	30.40 ⁴⁶	26.62 ¹	36.035 ²⁵⁸	76.16 ⁹	35.234 ¹⁵⁹	43.09 ²⁵	11.460 ¹⁶⁴	15.40 ³⁷
15.2	29.97 ⁴³	26.10 ⁵²	35.787 ²⁴⁸	75.74 ⁴²	35.086 ¹⁴⁸	42.57 ⁵²	11.308 ¹⁵²	15.62 ²²
25.2	29.58 ³⁹	25.08 ¹⁰²	35.559 ²²⁸	74.82 ⁹²	34.956 ¹³⁰	41.77 ⁸⁰	11.180 ¹²⁸	15.71 ⁹
Dec. 5.2	29.25 ³³	23.60 ¹⁴⁸	35.359 ²⁰⁰	73.42 ¹⁴⁰	34.852 ¹⁰⁴	40.71 ¹⁰⁶	11.079 ¹⁰¹	15.66 ⁵
	25	191	165	185	76	128	66	20
15.1	29.00	21.69	35.194	71.57	34.776	39.43	11.013	15.46
25.1	28.84 ¹⁶	19.40 ²²⁹	35.069 ¹²⁵	69.33 ²²⁴	34.731 ⁴⁵	37.96 ¹⁴⁷	10.982 ³¹	15.12 ³⁴
35.1	28.77 ⁷	16.82 ²⁵⁸	34.989 ⁸⁰	66.78 ²⁵⁵	34.721 ¹⁰	36.33 ¹⁶³	10.988 ⁶	14.68 ⁴⁴
Mean Place	24.239	22.61	34.074	46.61	32.244	20.78	7.495	24.00
Sec δ , Tan δ	2.509	-2.301	1.414	+0.999	1.034	+0.264	1.108	-0.479
D ψ α , D ω α	+0.11	+0.10	+0.04	-0.04	+0.06	-0.01	+0.07	+0.02
D ψ δ , D ω δ	+0.3	-0.8	+0.3	-0.8	+0.3	-0.8	+0.3	-0.8

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	γ Delphini <i>seq.</i> Mag. 4.5		ϵ Cygni. Mag. 2.6		ϵ Aquarii. Mag. 3.8		η Cephei. Mag. 3.6	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 20 42	° ' " +15 49	h m 20 42	° ' " +33 39	h m 20 43	° ' " - 9 47	h m 20 43	° ' " +61 30
	s 20 42	" +15 49	s 20 42	" +33 39	s 20 43	" - 9 47	s 20 43	" +61 30
Jan. 1.1	45.139	16.29	47.836	22.24	7.542	78.01	32.47	52.28
11.1	45.149	14.58	47.816	19.87	7.571	78.40	32.32	49.43
21.0	45.191	12.82	47.836	17.37	7.634	78.73	32.24	46.33
31.0	45.270	11.09	47.898	14.84	7.728	78.96	32.24	43.13
Feb. 10.0	45.381	9.47	48.002	12.39	7.855	79.08	32.33	39.94
19.9	45.524	8.03	48.144	10.13	8.011	79.05	32.49	36.90
29.9	45.699	6.85	48.327	8.16	8.195	78.84	32.75	34.11
Mar. 10.9	45.905	5.99	48.547	6.55	8.407	78.44	33.06	31.71
20.9	46.137	5.50	48.800	5.39	8.644	77.82	33.44	29.79
30.8	46.393	5.41	49.082	4.73	8.905	76.99	33.87	28.43
Apr. 9.8	46.672	5.75	49.389	4.59	9.184	75.96	34.34	27.65
19.8	46.967	6.51	49.715	4.99	9.480	74.72	34.85	27.52
29.8	47.275	7.65	50.052	5.91	9.789	73.34	35.36	28.02
May 9.7	47.587	9.16	50.394	7.34	10.104	71.84	35.88	29.13
19.7	47.898	10.98	50.733	9.21	10.420	70.26	36.38	30.80
29.7	48.200	13.07	51.059	11.48	10.729	68.66	36.86	33.03
June 8.6	48.488	15.36	51.365	14.07	11.026	67.06	37.30	35.69
18.6	48.753	17.77	51.645	16.91	11.302	65.52	37.68	38.74
28.6	48.989	20.25	51.889	19.92	11.551	64.09	38.00	42.07
July 8.6	49.190	22.75	52.092	23.04	11.766	62.78	38.24	45.63
18.5	49.351	25.18	52.250	26.17	11.943	61.65	38.41	49.31
28.5	49.469	27.52	52.360	29.25	12.077	60.68	38.51	53.03
Aug. 7.5	49.541	29.60	52.419	32.23	12.166	59.92	38.52	56.71
17.5	49.568	31.68	52.427	35.04	12.209	59.33	38.45	60.26
27.4	49.551	33.45	52.387	37.61	12.209	58.92	38.31	63.63
Sept. 6.4	49.493	34.97	52.303	39.92	12.166	58.70	38.09	66.74
16.4	49.400	36.23	52.178	41.90	12.085	58.62	37.81	69.53
26.3	49.277	37.20	52.021	43.53	11.974	58.67	37.48	71.93
Oct. 6.3	49.132	37.88	51.840	44.79	11.842	58.83	37.11	73.89
16.3	48.973	38.26	51.643	45.64	11.695	59.09	36.71	75.38
26.3	48.809	38.34	51.438	46.06	11.543	59.40	36.28	76.35
Nov. 5.2	48.648	38.12	51.235	46.06	11.395	59.77	35.86	76.77
15.2	48.498	37.60	51.042	45.62	11.260	60.17	35.44	76.63
25.2	48.368	36.79	50.869	44.74	11.145	60.59	35.04	75.92
Dec. 5.2	48.259	35.74	50.719	43.45	11.053	61.03	34.68	74.65
15.1	48.181	34.43	50.600	41.78	10.993	61.48	34.36	72.86
25.1	48.133	32.93	50.516	39.78	10.965	61.92	34.11	70.60
35.1	48.119	31.27	50.468	37.53	10.969	62.34	33.91	67.95
Mean Place	45.664	15.31	48.741	18.08	7.805	74.23	35.002	44.08
Sec δ , Tan δ	1.039	+0.283	1.202	+0.666	1.015	-0.173	2.097	+1.843
$D\psi \alpha$, $D_{\omega} \alpha$	+0.06	-0.01	+0.05	-0.03	+0.06	+0.01	+0.02	-0.08
$D\psi \delta$, $D_{\omega} \delta$	+0.3	-0.8	+0.3	-0.8	+0.3	-0.8	+0.3	-0.8

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	μ Aquarii. Mag. 4.8		β Indi. Mag. 3.7		γ Vulpeculae. Mag. 5.2		γ H ¹ Draconis. Mag. 5.6	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 20 48	° ' " - 9 17	h m 20 48	° ' " -58 45	h m 20 50	° ' " +27 44	h m 20 51	° ' " +80 14
	s	"	s	"	s	"	s	"
Jan. 1.1	7.217	61.14	14.721	88.99	58.059	18.98	17.54	27.33
11.1	7.241	61.55	14.714	86.65	58.042	16.84	16.85	24.63
21.0	7.299	61.90	14.777	84.12	58.063	14.59	16.38	21.63
31.0	7.388	62.15	14.907	81.46	58.122	12.32	16.15	18.41
Feb. 10.0	7.509	62.29	15.102	78.75	58.217	10.13	16.15	15.15
20.0	7.660	62.28	15.358	76.01	58.351	8.12	16.42	11.95
29.9	7.840	62.08	15.670	73.33	58.521	6.37	16.91	8.96
Mar. 10.9	8.047	61.68	16.033	70.76	58.726	4.97	17.63	6.28
20.9	8.279	61.07	16.445	68.33	58.962	3.98	18.53	4.03
30.8	8.536	60.24	16.895	66.09	59.227	3.46	19.60	2.30
Apr. 9.8	8.813	59.20	17.381	64.10	59.517	3.43	20.80	1.11
19.8	9.107	57.97	17.894	62.37	59.826	3.90	22.06	0.56
29.8	9.415	56.58	18.427	60.95	60.149	4.86	23.36	0.65
May 9.7	9.729	55.06	18.970	59.89	60.477	6.27	24.65	1.33
19.7	10.044	53.46	19.510	59.19	60.805	8.10	25.90	2.62
29.7	10.355	51.82	20.089	58.87	61.123	10.28	27.04	4.47
June 8.7	10.652	50.19	20.546	58.94	61.425	12.76	28.08	6.82
18.6	10.931	48.62	21.017	59.38	61.703	15.45	28.97	9.58
28.6	11.182	47.14	21.439	60.21	61.949	18.29	29.67	12.69
July 8.6	11.400	45.79	21.804	61.38	62.157	21.21	30.19	16.07
18.5	11.581	44.61	22.102	62.85	62.324	24.14	30.50	19.65
28.5	11.719	43.60	22.323	64.58	62.445	27.01	30.61	23.34
Aug. 7.5	11.814	42.78	22.464	66.50	62.517	29.77	30.50	27.05
17.5	11.862	42.17	22.522	68.54	62.542	32.34	30.19	30.70
27.4	11.865	41.73	22.498	70.62	62.520	34.70	29.67	34.21
Sept. 6.4	11.826	41.48	22.394	72.67	62.454	36.80	28.96	37.54
16.4	11.750	41.37	22.220	74.59	62.350	38.61	28.10	40.58
26.4	11.644	41.41	21.982	76.29	62.214	40.08	27.08	43.29
Oct. 6.3	11.514	41.56	21.698	77.71	62.053	41.20	25.92	45.60
16.3	11.369	41.82	21.379	78.78	61.876	41.95	24.68	47.48
26.3	11.219	42.13	21.044	79.42	61.692	42.31	23.37	48.81
Nov. 5.2	11.071	42.50	20.709	79.64	61.508	42.29	22.02	49.65
15.2	10.935	42.91	20.393	79.41	61.334	41.87	20.67	49.90
25.2	10.818	43.35	20.107	78.71	61.177	41.07	19.35	49.57
Dec. 5.2	10.725	43.81	19.866	77.58	61.041	39.89	18.11	48.64
15.1	10.661	44.28	19.682	76.05	60.934	38.37	16.98	47.15
25.1	10.629	44.74	19.559	74.16	60.859	36.57	15.98	45.14
35.1	10.628	45.18	19.504	71.97	60.818	34.53	15.15	42.72
Mean Place	7.468	57.56	15.267	78.40	58.781	15.30	26.354	16.73
Sec δ , Tan δ	1.013	-0.164	1.928	-1.649	1.130	+0.526	5.899	+5.814
$D\alpha$, $D\alpha$	+0.06	+0.01	+0.09	+0.07	+0.05	-0.02	-0.05	-0.26
$D\delta$, $D\delta$	+0.3	-0.7	+0.3	-0.7	+0.3	-0.7	+0.3	-0.7

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	γ Cygni. Mag. 4.0		α Octantis. Mag. 5.2		γ Microscopii. Mag. 4.7		θ Capricorni. Mag. 4.2	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 20 54	° ' " +40 50	h m 20 54	° ' " -77 20	h m 20 56	° ' " -32 34	h m 21 1	° ' " -17 33
	s 20 54	" +40 50	s 20 54	" -77 20	s 20 56	" -32 34	s 21 1	" -17 33
Jan. 1.1	1.357 52	41.64 252	33.00 18	56.63 309	8.396 17	80.09 92	13.459 14	67.68 7
11.1	1.305 8	39.12 268	32.82 1	53.54 329	8.413 57	79.17 108	13.473 47	67.61 17
21.0	1.297 38	36.44 275	32.81 15	50.25 341	8.470 93	78.09 122	13.520 81	67.44 29
31.0	1.335 85	33.69 270	32.96 33	46.84 345	8.563 132	76.87 133	13.601 113	67.14 41
Feb. 10.0	1.420 131	30.99 255	33.29 48	43.39 340	8.695 168	75.54 143	13.714 144	66.73 55
20.0	1.551 176	28.44 229	33.77 62	39.99 328	8.863 201	74.11 152	13.858 175	66.18 71
29.9	1.727 219	26.15 192	34.39 76	36.71 308	9.064 232	72.59 160	14.033 204	65.47 87
Mar. 10.9	1.946 259	24.23 148	35.15 87	33.63 283	9.296 263	70.99 165	14.237 230	64.60 102
20.9	2.205 293	22.75 96	36.02 97	30.80 252	9.559 289	69.34 166	14.467 257	63.58 118
30.9	2.498 322	21.79 41	36.99 104	28.28 215	9.848 315	67.68 167	14.724 279	62.39 132
Apr. 9.8	2.820 346	21.38 15	38.03 112	26.13 176	10.163 334	66.01 162	15.003 299	61.07 148
19.8	3.166 359	21.53 71	39.15 114	24.37 133	10.497 351	64.39 166	15.302 314	59.65 161
29.8	3.525 366	22.24 125	40.29 116	23.04 86	10.848 359	62.83 145	15.616 324	58.14 176
May 9.7	3.891 363	23.49 176	41.45 116	22.18 39	11.207 363	61.38 131	15.940 327	56.58 186
19.7	4.254 350	25.25 220	42.61 113	21.79 9	11.570 358	60.07 113	16.267 324	55.02 192
29.7	4.604 331	27.45 258	43.74 107	21.88 57	11.928 345	58.94 92	16.591 314	53.50 198
June 8.7	4.935 300	30.03 287	44.81 99	22.45 103	12.273 326	58.02 67	16.905 295	52.07 202
18.6	5.235 264	32.90 312	45.80 88	23.48 145	12.599 296	57.35 43	17.200 270	50.75 215
28.6	5.499 220	36.02 325	46.68 74	24.93 184	12.895 260	56.92 7	17.470 239	49.60 229
July 8.6	5.719 172	39.27 332	47.42 61	26.77 217	13.155 217	56.75 7	17.709 200	48.62 237
18.5	5.891 119	42.59 332	48.03 43	28.94 243	13.372 168	56.82 33	17.909 157	47.85 246
28.5	6.010 66	45.91 324	48.46 25	31.37 262	13.540 118	57.15 54	18.066 112	47.29 256
Aug. 7.5	6.076 11	49.15 309	48.71 7	33.99 272	13.658 65	57.69 72	18.178 64	46.93 265
17.5	6.087 42	52.24 288	48.78 11	36.71 268	13.723 11	58.41 87	18.242 17	46.78 271
27.4	6.045 90	55.12 262	48.67 31	39.39 258	13.734 38	59.28 95	18.259 27	46.81 279
Sept. 6.4	5.955 134	57.74 232	48.36 47	41.97 238	13.696 83	60.23 99	18.232 67	47.00 286
16.4	5.821 171	60.06 194	47.89 61	44.35 207	13.613 122	61.22 98	18.165 100	47.30 296
26.4	5.650 199	62.00 156	47.28 74	46.42 168	13.491 151	62.20 91	18.065 128	47.70 306
Oct. 6.3	5.451 219	63.56 112	46.54 83	48.10 121	13.340 172	63.11 79	17.937 144	48.16 316
16.3	5.232 230	64.68 67	45.71 88	49.31 67	13.168 181	63.90 62	17.793 152	48.64 327
26.3	5.002 231	65.35 20	44.83 90	49.98 12	12.987 179	64.52 46	17.641 152	49.11 338
Nov. 5.2	4.771 224	65.55 28	43.93 87	50.10 50	12.808 168	64.98 23	17.489 143	49.56 349
15.2	4.547 207	65.27 77	43.06 82	49.60 106	12.640 149	65.21 1	17.346 125	49.96 360
25.2	4.340 184	64.50 122	42.24 71	48.54 162	12.491 120	65.22 22	17.221 102	50.29 371
Dec. 5.2	4.156 154	63.28 166	41.53 60	46.92 212	12.371 87	65.00 43	17.119 75	50.53 382
15.1	4.002 119	61.62 205	40.93 46	44.80 255	12.284 51	64.57 64	17.044 43	50.71 393
25.1	3.883 79	59.57 235	40.47 29	42.25 290	12.233 12	63.93 81	17.001 10	50.79 404
35.1	3.804	57.22	40.18		12.221	63.12	16.991	50.79
Mean Place	2.454	35.39	35.039	44.90	8.573	72.49	13.626	62.73
Sec δ , Tan δ	1.322	+0.865	4.564	-4.453	1.187	-0.639	1.049	-0.317
$D\phi\alpha$, $D\omega\alpha$	+0.04	-0.04	+0.15	+0.20	+0.07	+0.03	+0.07	+0.02
$D\phi\delta$, $D\omega\delta$	+0.3	-0.7	+0.3	-0.7	+0.3	-0.7	+0.3	-0.7

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	ξ Cygni. Mag. 3.9		61 Cygni Pr. Mag. 5.6		γ Aquarii. Mag. 4.5		Bradley 2777. Mag. 5.9	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 21 1	° ' " +43 35	h m 21 3	° ' " +38 19	h m 21 5	° ' " -11 42	h m 21 7	° ' " +77 46
	s 21 1	" +43 35	s 21 3	" +38 19	s 21 5	" -11 42	s 21 7	" +77 46
Jan. 1.1	51.323	39.71	6.798	74.81	0.998	48.23	5.73	81.57
11.1	51.253 ⁷⁰	37.19 ²⁵²	6.759 ³⁹	72.50 ²³¹	1.007 ⁹	48.48 ²⁵	5.15 ⁵⁸	78.98 ²⁵⁹
21.0	51.230 ²³	34.49 ²⁷⁰	6.760 ¹	70.03 ²⁴⁷	1.050 ⁴³	48.65 ¹⁷	4.73 ⁴²	76.05 ²⁹³
31.0	51.254 ²⁴	31.69 ²⁸⁰	6.805 ⁴⁵	67.48 ²⁵⁵	1.124 ⁷⁴	48.72 ⁷	4.50 ²³	72.89 ³¹⁶
Feb. 10.0	51.326 ⁷²	28.91 ²⁷⁸	6.894 ⁸⁹	64.98 ²⁵⁰	1.229 ¹⁰⁶	48.67 ⁵	4.46 ⁴	69.63 ³²⁶
	122	263	134	236	135	21	16	322
20.0	51.448	26.28	7.028	62.62	1.364	48.46	4.62	66.41
29.9	51.618 ¹⁷⁰	23.89 ²⁴⁰	7.205 ¹⁷⁷	60.52 ²¹⁰	1.530 ¹⁶⁶	48.08 ³⁸	4.97 ³⁵	63.36 ³⁰⁵
Mar. 10.9	51.834 ²¹⁶	21.84 ²⁰⁴	7.423 ²¹⁸	58.78 ¹⁷⁴	1.723 ¹⁹³	47.51 ⁵⁷	5.49 ⁵²	60.58 ²⁷⁸
20.9	52.093 ²⁵⁹	20.23 ¹⁶¹	7.680 ²⁵⁷	57.47 ¹³¹	1.945 ²²²	46.73 ⁷⁸	6.19 ⁷⁰	58.20 ²³⁸
30.9	52.389 ²⁹⁶	19.13 ¹¹⁰	7.972 ²⁹²	56.65 ⁸²	2.192 ²⁴⁷	45.76 ⁹⁷	7.01 ⁸²	56.33 ¹⁸⁷
	328	56	320	29	270	117	94	133
Apr. 9.8	52.717	18.57	8.292	56.36	2.462	44.59	7.95	55.00
19.8	53.070 ³⁵³	18.60 ³	8.636 ³⁴⁴	56.63 ²⁷	2.752 ²⁹⁰	43.26 ¹³³	8.96 ¹⁰¹	54.28 ⁷²
29.8	53.440 ³⁷⁰	19.19 ⁵⁹	8.995 ³⁵⁹	57.44 ⁸¹	3.058 ³⁰⁶	41.78 ¹⁴⁸	10.01 ¹⁰⁵	54.19 ⁹
May 9.7	53.817 ³⁷⁷	20.34 ¹¹⁵	9.361 ³⁶⁶	58.79 ¹³⁵	3.374 ³¹⁶	40.20 ¹⁵⁸	11.08 ¹⁰⁷	54.73 ⁵⁴
19.7	54.193 ³⁷⁶	22.00 ¹⁶⁶	9.727 ³⁶⁶	60.62 ¹³³	3.695 ³²¹	38.55 ¹⁶⁵	12.12 ¹⁰⁴	55.87 ¹¹⁴
	365	214	356	226	317	166	98	170
29.7	54.558	24.14	10.083	62.88	4.012	36.89	13.10	57.57
June 8.7	54.902 ³⁴⁴	26.67 ²⁵³	10.420 ³³⁷	65.52 ²⁶⁴	4.319 ³⁰⁷	35.28 ¹⁶¹	13.99 ⁸⁹	59.79 ²²²
18.6	55.217 ³¹⁵	29.53 ²⁸⁶	10.730 ³¹⁰	68.44 ²⁹²	4.610 ²⁹¹	33.73 ¹⁵⁵	14.78 ⁷⁹	62.46 ²⁶⁷
28.6	55.494 ²⁷⁷	32.65 ³¹²	11.006 ²⁷⁶	71.59 ³¹⁵	4.875 ²⁶⁵	32.29 ¹⁴⁴	15.43 ⁶⁵	65.51 ³⁰⁵
July 8.6	55.727 ²³³	35.95 ³³⁰	11.240 ²³⁴	74.87 ³²⁸	5.110 ²³⁵	31.00 ¹²⁹	15.94 ⁵¹	68.85 ³³⁴
	183	337	186	335	197	110	35	357
18.6	55.910 ¹²⁹	39.32 ³⁴⁰	11.426 ¹³⁷	78.22 ³³⁴	5.307 ¹⁵⁶	29.90 ⁹¹	16.29 ¹⁷	72.42 ³⁶⁹
28.5	56.039 ⁷⁴	42.72 ³⁴⁰	11.563 ⁸⁵	81.56 ³³⁴	5.463 ¹¹¹	28.99 ⁷¹	16.46 ²	76.11 ³⁷⁵
Aug. 7.5	56.113 ¹⁸	46.06 ³³⁴	11.648 ³²	84.82 ³²⁶	5.574 ⁶⁵	28.28 ⁵¹	16.48 ¹⁷	79.86 ³⁷⁵
17.5	56.131 ³⁸	49.27 ³⁰⁰	11.680 ²⁰	87.93 ²⁹¹	5.639 ¹⁹	27.77 ³¹	16.31 ³²	83.59 ³⁶²
27.4	56.093 ⁸⁸	52.27 ²⁷⁷	11.660 ⁶⁷	90.84 ²⁶⁴	5.658 ²⁴	27.46 ¹³	15.99 ⁴⁷	87.21 ³⁴⁴
Sept. 6.4	56.005	55.04	11.593	93.48	5.634	27.33	15.52	90.65
16.4	55.871 ¹³⁴	57.49 ²⁴⁵	11.483 ¹¹⁰	95.83 ²³⁵	5.572 ⁶²	27.35 ²	14.91 ⁶¹	93.85 ³²⁰
26.4	55.698 ¹⁷³	59.59 ²¹⁰	11.338 ¹⁴⁵	97.81 ¹⁹⁸	5.477 ⁹⁵	27.50 ¹⁵	14.18 ⁷⁵	96.71 ²⁸⁶
Oct. 6.3	55.493 ²⁰⁵	61.29 ¹⁷⁰	11.163 ¹⁷⁵	99.42 ¹⁶¹	5.355 ¹²²	27.76 ²⁶	13.31 ⁸⁵	99.20 ²⁴⁹
16.3	55.267 ²²⁶	62.56 ¹²⁷	10.969 ¹⁹⁴	100.61 ¹¹⁹	5.218 ¹³⁷	28.10 ³⁴	12.37 ⁹⁴	101.25 ²⁰⁵
	240	82	205	75	147	38	100	157
26.3	55.027	63.38	10.764	101.36	5.071	28.48	11.37	102.82
Nov. 5.3	54.784 ²⁴³	63.71 ³³	10.556 ²⁰⁸	101.66 ³⁰	4.925 ¹⁴⁶	28.90 ⁴²	10.33 ¹⁰⁴	103.85 ¹⁰³
15.2	54.547 ²³⁷	63.54 ¹⁷	10.356 ²⁰⁰	101.49 ¹⁷	4.786 ¹³⁹	29.32 ⁴²	9.28 ¹⁰⁵	104.30 ⁴⁵
25.2	54.323 ²²⁴	62.88 ⁶⁶	10.169 ¹⁸⁷	100.86 ⁶³	4.665 ¹²¹	29.75 ⁴³	8.25 ¹⁰³	104.17 ¹³
Dec. 5.2	54.123 ²⁰⁰	61.73 ¹¹⁵	10.006 ¹⁶³	99.79 ¹⁰⁷	4.564 ¹⁰¹	30.16 ⁴¹	7.26 ⁹⁹	103.44 ⁷³
	171	160	137	150	73	38	91	131
15.1	53.952	60.13	9.869	98.29	4.491	30.54	6.35	102.13
25.1	53.814 ¹³⁸	58.13 ²⁰⁰	9.766 ¹⁰⁸	96.44 ¹⁸⁵	4.446 ⁴⁵	30.89 ³⁵	5.54 ⁸¹	100.28 ¹⁸⁵
35.1	53.717 ⁹⁷	55.79 ²³⁴	9.701 ⁶⁵	94.27 ²¹⁷	4.433 ¹³	31.19 ³⁰	4.87 ⁶⁷	97.94 ²³⁴
Mean Place	52.493	32.37	7.780	68.51	1.177	44.50	12.344	69.47
Sec δ , Tan δ	1.381	+0.952	1.275	+0.791	1.021	-0.207	4.728	+4.621
$D\psi\alpha$, $D_\omega\alpha$	+0.04	-0.05	+0.05	-0.04	+0.06	+0.01	-0.02	-0.22
$D\psi\delta$, $D_\omega\delta$	+0.3	-0.7	+0.3	-0.7	+0.3	-0.7	+0.3	-0.7

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	3 Piscis Australis. Mag. 5.6			ζ Cygni. Mag. 3.4			τ Cygni. Mag. 3.8			α Equulei. Mag. 4.1		
	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.
	h m	s	° ' "	h m	s	° ' "	h m	s	° ' "	h m	s	° ' "
	21	8	-27 57	21	9	+29 52	21	11	+37 40	21	11	+ 4 53
Jan. 1.1	18.522		52.27	20.925		59.70	25.335		77.83	37.223		59.87
11.1	18.528	6	51.63	20.887	38	57.59	25.276	59	75.54	37.218	5	58.78
21.1	18.570	42	50.82	20.886	1	55.34	25.257	19	73.07	37.244	26	57.67
31.0	18.647	77	49.88	20.922	36	53.04	25.281	24	70.50	37.302	58	56.62
Feb. 10.0	18.760	113	48.80	20.997	75	50.79	25.348	67	67.95	37.390	88	55.67
		146			114			110			120	
20.0	18.906		47.61	21.111		48.69	25.458		65.54	37.510		54.88
29.9	19.085	179	46.28	21.263	152	46.81	25.612	154	63.36	37.660	150	54.31
Mar. 10.9	19.296	211	44.85	21.451	188	45.28	25.808	196	61.50	37.839	179	54.00
20.9	19.536	240	43.33	21.675	224	44.14	26.042	234	60.07	38.047	208	53.98
30.9	19.805	269	41.74	21.932	257	43.45	26.313	271	59.10	38.282	235	54.29
		294			283			303			260	
Apr. 9.8	20.099		40.10	22.215		43.25	26.616		58.67	38.542		54.93
19.8	20.416	317	38.44	22.523	308	43.56	26.942	326	58.77	38.822	280	55.88
29.8	20.748	332	36.80	22.847	324	44.36	27.287	345	59.41	39.119	297	57.14
May 9.8	21.091	343	35.22	23.180	333	45.64	27.643	356	60.57	39.427	308	58.66
19.7	21.442	351	33.74	23.516	336	47.36	28.000	357	62.23	39.739	312	60.42
		348			330			349			310	
29.7	21.790		32.42	23.846		49.46	28.349		64.32	40.049		62.34
June 8.7	22.127	337	31.25	24.162	316	51.87	28.682	333	66.78	40.348	299	64.38
18.6	22.448	321	30.29	24.455	293	54.55	28.990	308	69.55	40.630	282	66.50
28.6	22.742	294	29.57	24.718	263	57.39	29.267	277	72.56	40.888	258	68.60
July 8.6	23.002	260	29.09	24.945	227	60.35	29.503	236	75.72	41.115	227	70.66
		221			187			191			192	
18.6	23.223	174	28.87	25.132	140	63.35	29.694	143	78.95	41.307	151	72.64
28.5	23.397	127	28.89	25.272	91	66.31	29.837	90	82.20	41.458	108	74.49
Aug. 7.5	23.524	75	29.13	25.363	43	69.19	29.927	38	85.38	41.566	61	76.16
17.5	23.599	26	29.58	25.406	4	71.92	29.965	12	88.42	41.629	18	77.64
27.4	23.625	25	30.19	25.402	49	74.43	29.953	61	91.28	41.647	23	78.91
Sept. 6.4	23.600		30.95	25.353		76.71	29.892		93.89	41.624		79.96
16.4	23.533	67	31.78	25.263	90	78.69	29.787	105	96.22	41.564	60	80.78
26.4	23.428	105	32.63	25.139	124	80.35	29.647	140	98.20	41.473	91	81.37
Oct. 6.3	23.293	135	33.46	24.988	151	81.67	29.475	172	99.81	41.355	118	81.75
16.3	23.137	156	34.22	24.816	172	82.62	29.282	193	101.02	41.221	134	81.91
		166			182			206			143	
26.3	22.971		34.89	24.634		83.18	29.076		101.79	41.078		81.87
Nov. 5.3	22.803	168	35.41	24.450	184	83.33	28.865	211	102.12	40.933	145	81.62
15.2	22.645	158	35.76	24.271	179	83.08	28.659	206	102.00	40.795	138	81.20
25.2	22.503	142	35.93	24.106	165	82.42	28.465	194	101.41	40.672	123	80.60
Dec. 5.2	22.385	118	35.92	23.959	147	81.37	28.291	174	100.37	40.566	106	79.85
		87			122			150			81	
15.1	22.298		35.71	23.837		79.98	28.141		98.93	40.485		78.96
25.1	22.242	56	35.34	23.743	94	78.25	28.024	117	97.10	40.430	55	77.96
35.1	22.223	19	34.80	23.683	60	76.26	27.939	85	94.94	40.404	26	76.89
Mean Place	18.644		45.42	21.624		54.35	26.242		70.81	37.506		59.81
Sec δ, Tan δ	1.132		-0.531	1.153		+0.575	1.263		+0.773	1.004		+0.086
D _ψ α, D _ω α	+0.07		+0.03	+0.05		-0.03	+0.05		-0.04	+0.06		0.00
D _ψ δ, D _ω δ	+0.3		-0.7	+0.3		-0.7	+0.3		-0.7	+0.3		-0.7

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	σ Cygni. Mag. 4.3		θ^1 Microscopii. Mag. 4.9		α Cephei. Mag. 2.6		ι Capricorni. Mag. 4.3	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 21 14	° ' +39 2	h m 21 15	° ' -41 9	h m 21 16	° ' +62 13	h m 21 17	° ' -17 11
Jan. 1.1	6.005	39.62	23.321	64.25	32.22	57.19	34.201	39.21
11.1	5.940 ⁶⁵	37.28 ²³⁴	23.307 ¹⁴	62.89 ¹³⁶	32.01 ²¹	54.60 ²⁵⁹	34.199 ²	39.16 ⁵
21.1	5.915 ²⁵	34.77 ²⁵¹	23.337 ³⁰	61.32 ¹⁵⁷	31.87 ¹⁴	51.70 ²⁹⁰	34.231 ³²	39.00 ¹⁶
31.0	5.932 ¹⁷	32.16 ²⁶¹	23.411 ⁷⁴	59.59 ¹⁷³	31.81 ⁶	48.60 ³¹⁰	34.294 ⁶³	38.70 ³⁰
Feb. 10.0	5.994 ⁶²	29.54 ²⁶²	23.525 ¹¹⁴	57.71 ¹⁸⁸	31.83 ²	45.43 ³¹⁷	34.388 ⁹⁴	38.27 ⁴³
20.0	6.100 ¹⁰⁶	27.05 ²⁴⁹	23.680 ¹⁵⁵	55.72 ¹⁹⁹	31.93 ¹⁰	42.32 ³¹¹	34.515 ¹²⁷	37.70 ⁵⁷
29.9	6.251 ¹⁵¹	24.81 ²²⁴	23.875 ¹⁹⁵	53.65 ²⁰⁷	32.12 ¹⁹	39.39 ²⁹³	34.673 ¹⁵⁸	36.95 ⁷⁵
Mar. 10.9	6.445 ¹⁹⁴	22.87 ¹⁹⁴	24.107 ²³²	51.55 ²¹⁰	32.38 ²⁶	36.76 ²⁶³	34.859 ¹⁸⁶	36.04 ⁹¹
20.9	6.680 ²³⁵	21.35 ¹⁵²	24.374 ²⁶⁷	49.44 ²¹¹	32.71 ³⁸	34.55 ²²¹	35.075 ²¹⁶	34.97 ¹⁰⁷
30.9	6.953 ²⁷³	20.32 ¹⁰³	24.675 ³⁰¹	47.35 ²⁰⁹	33.12 ⁴¹	32.83 ¹⁷²	35.318 ²⁴³	33.72 ¹²⁵
Apr. 9.8	7.257 ³⁰⁴	19.80 ⁵²	25.004 ³²⁹	45.34 ²⁰¹	33.58 ⁴⁶	31.68 ¹¹⁵	35.587 ²⁶⁹	32.34 ¹³⁸
19.8	7.587 ³³⁰	19.83 ³	25.359 ³⁵⁵	43.43 ¹⁹¹	34.07 ⁴⁹	31.13 ⁵⁵	35.877 ²⁹⁰	30.84 ¹⁵⁰
29.8	7.937 ³⁵⁰	20.42 ⁵⁹	25.734 ³⁷⁵	41.67 ¹⁷⁶	34.59 ⁵²	31.21 ⁸	36.186 ³⁰⁹	29.25 ¹⁵⁹
May 9.8	8.297 ³⁸⁰	21.53 ¹¹¹	26.124 ³⁹⁰	40.09 ¹⁵⁸	35.13 ⁵⁴	31.90 ⁶⁹	36.507 ³²¹	27.60 ¹⁶⁵
19.7	8.659 ³⁶²	23.15 ¹⁶²	26.520 ³⁹⁶	38.73 ¹³⁶	35.66 ⁵³	33.19 ¹²⁹	36.834 ³²⁷	25.96 ¹⁶⁴
29.7	9.014 ³⁵⁵	25.21 ²⁰⁶	26.916 ³⁹⁶	37.64 ¹⁰⁹	36.18 ⁵²	35.03 ¹⁸⁴	37.161 ³²⁷	24.34 ¹⁶²
June 8.7	9.353 ³³⁹	27.65 ²⁴⁴	27.301 ³⁸⁵	36.84 ⁸⁰	36.66 ⁴⁸	37.37 ²²⁴	37.480 ³¹⁹	22.81 ¹⁵³
18.6	9.667 ³¹⁴	30.41 ²⁷⁶	27.667 ³⁶⁶	36.32 ⁵²	37.10 ⁴⁴	40.14 ²⁷⁷	37.782 ³⁰²	21.40 ¹⁴¹
28.6	9.946 ²⁷⁹	33.41 ³⁰⁰	28.004 ³³⁷	36.14 ¹⁸	37.48 ³⁸	43.26 ³¹²	38.062 ²⁸⁰	20.15 ¹²⁵
July 8.6	10.187 ²⁴¹	36.58 ³¹⁷	28.304 ³⁰⁰	36.27 ¹³	37.80 ³²	46.65 ³³⁹	38.311 ²⁴⁹	19.07 ¹⁰⁸
18.6	10.382 ¹⁹⁵	39.84 ³²⁶	28.559 ²⁵⁵	36.70 ⁴³	38.03 ²³	50.24 ³⁵⁹	38.524 ²¹³	18.21 ⁸⁶
28.5	10.527 ¹⁴⁵	43.11 ³²⁷	28.764 ²⁰⁵	37.42 ⁷²	38.20 ¹⁷	53.94 ³⁷⁰	38.695 ¹⁷¹	17.58 ⁶³
Aug. 7.5	10.620 ⁹³	46.33 ³²²	28.913 ¹⁴⁹	38.38 ⁹⁶	38.28 ⁸	57.66 ³⁷²	38.822 ¹²⁷	17.15 ⁴³
17.5	10.680 ⁴⁰	49.42 ³⁰⁹	29.002 ⁸⁹	39.56 ¹¹⁸	38.28 ⁰	61.33 ³⁶⁷	38.902 ⁸⁰	16.95 ²⁰
27.5	10.648 ¹²	52.33 ²⁹¹	29.034 ³²	40.88 ¹³²	38.21 ⁷	64.87 ³⁶⁴	38.935 ³³	16.95 ⁰
Sept. 6.4	10.588 ⁶⁰	54.99 ²⁸⁶	29.009 ²⁵	42.29 ¹⁴¹	38.05 ¹⁶	68.21 ³³⁴	38.923 ¹²	17.12 ¹⁷
16.4	10.482 ¹⁰⁶	57.37 ²³⁸	28.930 ⁷⁹	43.72 ¹⁴³	37.82 ²³	71.27 ³⁰⁶	38.871 ⁵²	17.43 ³¹
26.4	10.339 ¹⁴³	59.42 ²⁰⁵	28.806 ¹²⁴	45.10 ¹³⁸	37.54 ²⁸	73.99 ²⁷²	38.783 ⁸⁸	17.84 ⁴¹
Oct. 6.3	10.165 ¹⁷⁴	61.09 ¹⁶⁷	28.645 ¹⁶¹	46.38 ¹²⁸	37.21 ³³	76.35 ²³⁶	38.666 ¹¹⁷	18.33 ⁴⁹
16.3	9.968 ¹⁹⁷	62.35 ¹²⁶	28.459 ¹⁸⁴	47.47 ¹⁰⁹	36.84 ³⁷	78.25 ¹⁹⁰	38.530 ¹³⁰	18.85 ⁵²
26.3	9.757 ²¹¹	63.18 ⁸³	28.257 ²⁰²	48.34 ⁸⁷	36.43 ⁴¹	79.64 ¹³⁹	38.383 ¹⁴⁶	19.37 ⁵²
Nov. 5.3	9.542 ²¹⁵	63.55 ³⁷	28.050 ²⁰⁷	48.93 ⁵⁹	36.02 ⁴¹	80.52 ⁸⁸	38.234 ¹⁴⁹	19.87 ⁴⁰
15.2	9.331 ²¹¹	63.45 ¹⁰	27.851 ¹⁹⁹	49.22 ²⁹	35.60 ⁴²	80.84 ³²	38.092 ¹⁴²	20.33 ⁴⁶
25.2	9.130 ²⁰¹	62.89 ⁵⁶	27.667 ²⁰¹	49.20 ²	35.19 ⁴¹	80.58 ²⁶	37.962 ¹³⁰	20.72 ³⁹
Dec. 5.2	8.949 ¹⁸¹	61.87 ¹⁰²	27.512 ¹⁵⁵	48.86 ³⁴	34.80 ³⁹	79.74 ⁸⁴	37.855 ¹⁰⁷	21.02 ³⁰
15.2	8.793 ¹⁵⁶	60.42 ¹⁴⁵	27.390 ¹²²	48.20 ⁶⁶	34.45 ³⁵	78.35 ¹³⁹	37.772 ⁸³	21.22 ²⁰
25.1	8.668 ¹²⁵	58.57 ¹⁸⁵	27.305 ⁸⁵	47.26 ⁹⁴	34.14 ³¹	76.44 ¹⁹¹	37.717 ⁵⁵	21.35 ¹³
35.1	8.577 ⁹¹	56.41 ²¹⁶	27.261 ⁴⁴	46.05 ¹²¹	33.89 ²⁵	74.09 ²³⁵	37.693 ²⁴	21.38 ³
Mean Place	6.946	32.10	23.444	55.14	34.588	45.72	34.307	34.54
Sec δ , Tan δ	1.288	+0.811	1.328	-0.874	2.147	+1.899	1.047	-0.309
D ϕ α , D ω α	+0.05	-0.04	+0.08	+0.04	+0.03	-0.10	+0.07	+0.02
D ϕ δ , D ω δ	+0.3	-0.7	+0.3	-0.7	+0.3	-0.7	+0.3	-0.7

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	1 Pegasi. Mag. 4.2			γ Pavonis. Mag. 4.3			ζ Capricorni. Mag. 3.9			δ Cygni. Mag. 5.3		
	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.
	h m	s	° ' "	h m	s	° ' "	h m	s	° ' "	h m	s	° ' "
	21 18		+19 26	21 19		-65 44	21 21		-22 46	21 26		+46 9
		s			s			s			s	
Jan. 1.1	11.638		44.04	30.31		62.44	52.392		38.66	19.779		81.09
11.1	11.612	26	42.34	30.20	11	59.88	52.386	6	38.32	19.674	105	78.73
21.1	11.617	5	40.56	30.17	3	57.06	52.413	27	37.83	19.614	60	76.11
31.0	11.657	40	38.76	30.23	6	54.04	52.474	61	37.18	19.602	12	73.35
Feb. 10.0	11.730	73	37.02	30.37	14	50.92	52.567	93	36.39	19.639	37	70.55
		108	35.44		24			126			90	
20.0	11.838		35.44	30.61		47.74	52.693		35.46	19.729		67.83
29.9	11.978	140	34.08	30.91	30	44.58	52.851	158	34.38	19.871	142	65.32
Mar. 10.9	12.153	175	33.02	31.27	36	41.51	53.038	187	33.15	20.063	192	63.10
20.9	12.360	207	32.32	31.71	44	38.58	53.258	220	31.79	20.303	240	61.27
30.9	12.596	236	32.01	32.21	50	35.86	53.506	248	30.31	20.587	284	59.92
		265			55			273			323	
Apr. 9.8	12.861		32.13	32.76		33.40	53.779		28.74	20.910		59.10
19.8	13.147	286	32.68	33.35	59	31.24	54.077	298	27.08	21.264	354	58.84
29.8	13.453	306	33.65	33.97	62	29.43	54.392	315	25.39	21.641	377	59.15
May 9.8	13.769	316	35.02	34.62	65	28.00	54.722	330	23.71	22.032	391	60.03
19.7	14.089	320	36.75	35.28	66	26.99	55.059	337	22.09	22.427	395	61.46
		318			65			337			388	
29.7	14.407		38.79	35.93		26.41	55.396		20.55	22.815		63.38
June 8.7	14.714	307	41.06	36.56	63	26.29	55.727	331	19.14	23.187	372	65.73
18.6	15.004	290	43.52	37.15	59	26.61	56.041	314	17.91	23.532	345	68.46
28.6	15.267	263	46.11	37.70	45	27.38	56.333	292	16.86	23.842	310	71.49
July 8.6	15.499	232	48.74	38.19	40	28.54	56.593	260	16.05	24.109	267	74.73
		193			41			224			218	
18.6	15.692		51.36	38.60	32	30.07	56.817	181	15.47	24.327	164	78.11
28.5	15.844	152	53.91	38.92	22	31.92	56.998	135	15.14	24.491	107	81.55
Aug. 7.5	15.951	107	56.34	39.14	12	34.03	57.133	86	15.04	24.598	49	84.99
17.5	16.012	61	58.61	39.26	2	36.31	57.219	38	15.16	24.647	8	88.34
27.5	16.027	15	60.67	39.28	8	38.68	57.257	9	15.48	24.639	61	91.54
		27			8							
Sept. 6.4	16.000		62.50	39.20		41.05	57.248		15.96	24.578		94.52
16.4	15.934	66	64.06	39.03	17	43.34	57.198	50	16.55	24.466	112	97.22
26.4	15.836	98	65.33	38.76	27	45.41	57.108	90	17.23	24.311	155	99.61
Oct. 6.3	15.710	126	66.31	38.43	33	47.22	56.989	119	17.94	24.121	190	101.61
16.3	15.566	144	66.99	38.04	39	48.66	56.849	140	18.63	23.902	219	103.20
		155			43			152			237	
26.3	15.411		67.32	37.61		49.66	56.697		19.28	23.665		104.33
Nov. 5.3	15.253	158	67.35	37.17	44	50.18	56.542	155	19.85	23.419	246	104.98
15.2	15.099	154	67.06	36.74	43	50.18	56.392	150	20.30	23.173	246	105.14
25.2	14.957	142	66.45	36.33	41	49.66	56.256	136	20.63	22.934	239	104.78
Dec. 5.2	14.833	124	65.55	35.96	37	48.63	56.141	115	20.81	22.712	222	103.92
		102			31			91			197	
15.2	14.731		64.36	35.65		47.10	56.050		20.85	22.515		102.58
25.1	14.655	76	62.95	35.42	23	45.14	55.989	61	20.75	22.348	167	100.79
35.1	14.608	47	61.33	35.25	17	42.80	55.960	29	20.48	22.217	131	98.62
Mean Place	12.090		40.38	30.871		50.38	52.463		32.88	20.928		71.31
Sec δ, Tan δ	1.061		+0.353	2.435		-2.220	1.085		-0.420	1.444		+1.042
D _ψ α, D _μ α	+0.05		-0.02	+0.10		+0.11	+0.07		+0.02	+0.04		-0.05
D _ψ δ, D _μ δ	+0.3		-0.6	+0.3		-0.6	+0.3		-0.6	+0.3		-0.6

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	β Aquarii. Mag. 3.1		β Cephei. Mag. 3.3		ξ Aquarii. Mag. 4.8		74 Cygni. Mag. 5.1	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 21 27	° ' - 5 56	h m 21 27	° ' +70 11	h m 21 33	° ' - 8 13	h m 21 33	° ' +40 1
	s "	"	s "	"	s "	"	s "	"
Jan. 1.1	8.153	30.79	31.42	43.89	16.805	55.68	34.018	77.57
11.1	8.141 ¹²	31.32 ⁵³	31.06 ³⁶	41.42 ²⁴⁷	16.789 ¹⁶	56.10 ⁴²	33.931 ⁸⁷	75.36 ²²¹
21.1	8.160 ¹⁹	31.80 ⁴⁸	30.81 ²⁵	38.60 ²⁸²	16.804 ¹⁵	56.43 ³³	33.882 ⁴⁹	72.93 ²⁴³
31.0	8.208 ⁴⁸	32.18 ³⁸	30.65 ¹⁶	35.51 ³⁰⁹	16.847 ⁴³	56.66 ²³	33.875 ⁷	70.36 ²⁵⁷
Feb. 10.0	8.287 ⁷⁹	32.44 ²⁶	30.60 ⁵	32.30 ³²¹	16.921 ⁷⁴	56.77 ¹¹	33.912 ³⁷	67.78 ²⁵⁸
	110	10	8	321	104	6	82	251
20.0	8.397 ¹³⁸	32.54 ⁹	30.68 ²⁰	29.09 ³⁰⁶	17.025 ¹³⁵	56.71 ²⁵	33.994 ¹²⁹	65.27 ²³³
Mar. 1.0	8.535 ¹⁷⁰	32.45 ³¹	30.88 ³⁰	26.03 ²⁸²	17.160 ¹⁶⁵	56.46 ⁴⁵	34.123 ¹⁷⁴	62.94 ²⁰²
10.9	8.705 ¹⁹⁹	32.14 ⁵⁴	31.18 ⁴¹	23.21 ²⁴⁴	17.325 ¹⁹⁴	56.01 ⁶⁸	34.297 ²¹⁷	60.92 ¹⁶⁴
20.9	8.904 ²²⁶	31.60 ⁸⁰	31.59 ⁵¹	20.77 ¹⁹⁸	17.519 ²²⁴	55.33 ⁹⁰	34.514 ²⁵⁹	59.28 ¹¹⁹
30.9	9.130 ²⁵³	30.80 ¹⁰³	32.10 ⁵⁸	18.79 ¹⁴²	17.743 ²⁵¹	54.43 ¹¹³	34.773 ²⁹⁵	58.09 ⁶⁸
Apr. 9.8	9.383 ²⁷⁵	29.77 ¹²⁷	32.68 ⁶⁴	17.37 ⁸⁴	17.994 ²⁷³	53.30 ¹³³	35.068 ³²⁴	57.41 ¹⁵
19.8	9.658 ²⁹⁴	28.50 ¹⁴⁵	33.32 ⁶⁸	16.53 ²²	18.267 ²⁹³	51.97 ¹⁵¹	35.392 ³⁴⁹	57.26 ⁴⁰
29.8	9.952 ³⁰⁹	27.05 ¹⁶³	34.00 ⁷⁰	16.31 ⁴⁰	18.560 ³⁰⁹	50.46 ¹⁶⁶	35.741 ³⁶²	57.66 ⁹⁴
May 9.8	10.261 ³¹⁵	25.42 ¹⁷⁵	34.70 ⁷⁰	16.71 ¹⁰³	18.869 ³¹⁷	48.80 ¹⁷⁵	36.103 ³⁶⁹	58.60 ¹⁴⁵
19.7	10.576 ³¹⁷	23.67 ¹⁸¹	35.40 ⁶⁸	17.74 ¹⁵⁹	19.186 ³¹⁸	47.05 ¹⁸¹	36.472 ³⁶⁶	60.05 ¹⁹⁰
29.7	10.893 ³⁰⁸	21.86 ¹⁸⁵	36.08 ⁶³	19.33 ²¹²	19.504 ³¹³	45.24 ¹⁸¹	36.838 ³⁵²	61.95 ²³¹
June 8.7	11.201 ²⁹⁶	20.01 ¹⁸¹	36.71 ⁵⁸	21.45 ²⁶⁰	19.817 ²⁹⁹	43.43 ¹⁷⁷	37.190 ³³²	64.26 ²⁶⁶
18.7	11.497 ²⁷⁴	18.20 ¹⁷⁵	37.29 ⁵⁰	24.05 ²⁹⁹	20.116 ²⁷⁹	41.66 ¹⁶⁷	37.522 ³⁰⁰	66.92 ²⁹²
28.6	11.771 ²⁴⁴	16.45 ¹⁶²	37.79 ⁴²	27.04 ³²⁹	20.395 ²⁵¹	39.99 ¹⁵⁴	37.822 ²⁶³	69.84 ³¹³
July 8.6	12.015 ²¹⁰	14.83 ¹⁴⁸	38.21 ³²	30.33 ³⁵⁵	20.646 ²¹⁷	38.45 ¹³⁸	38.085 ²¹⁸	72.97 ³²⁴
18.6	12.225 ¹⁷¹	13.35 ¹³⁰	38.53 ²¹	33.88 ³⁷⁰	20.863 ¹⁷⁷	37.07 ¹¹⁹	38.303 ¹⁷⁰	76.21 ³²⁹
28.5	12.396 ¹²⁸	12.05 ¹⁰⁹	38.74 ¹¹	37.58 ³⁷⁷	21.040 ¹³⁶	35.88 ⁹⁹	38.473 ¹¹⁸	79.50 ³²⁶
Aug. 7.5	12.524 ⁸³	10.96 ⁸⁹	38.85 ⁰	41.35 ³⁷⁷	21.176 ⁹⁰	34.89 ⁷⁵	38.591 ⁶⁵	82.76 ³¹⁷
17.5	12.607 ³⁸	10.07 ⁶⁷	38.85 ¹¹	45.12 ³⁶⁸	21.266 ⁴⁶	34.14 ⁵⁵	38.656 ¹²	85.93 ³⁰⁰
27.5	12.645 ³	9.40 ⁴⁷	38.74 ²¹	48.80 ³⁵²	21.312 ²	33.59 ³⁵	38.668 ³⁸	88.93 ²⁸⁰
Sept. 6.4	12.642	8.93 ²⁷	38.53 ³⁰	52.32 ³²⁹	21.314 ³⁷	33.24 ¹⁵	38.630 ⁸⁴	91.73 ²⁵²
16.4	12.598 ⁴⁴	8.66 ¹⁰	38.23 ³⁹	55.61 ²⁹⁹	21.277 ⁷³	33.09 ¹	38.546 ¹²⁵	94.25 ²²¹
26.4	12.520 ¹⁰⁵	8.56 ⁵	37.84 ⁴⁶	58.60 ²⁶²	21.204 ¹⁰⁰	33.10 ¹⁶	38.421 ¹⁵⁹	96.46 ¹⁸⁶
Oct. 6.4	12.415 ¹²⁵	8.61 ¹⁹	37.38 ⁵²	61.22 ²¹⁹	21.104 ¹²²	33.26 ²⁸	38.262 ¹⁸³	98.32 ¹⁴⁶
16.3	12.290 ¹³⁶	8.80 ³⁰	36.86 ⁵⁶	63.41 ¹⁷¹	20.982 ¹³⁴	33.54 ³⁶	38.079 ²⁰²	99.78 ¹⁰³
26.3	12.154 ¹³⁹	9.10 ³⁸	36.30 ⁵⁹	65.12 ¹¹⁹	20.848 ¹³⁸	33.90 ⁴³	37.877 ²¹⁰	100.81 ⁵⁹
Nov. 5.3	12.015 ¹³⁵	9.48 ⁴⁵	35.71 ⁶⁰	66.31 ⁶²	20.710 ¹³⁶	34.33 ⁴⁸	37.667 ²¹⁰	101.40 ¹²
15.2	11.880 ¹²²	9.93 ⁵¹	35.11 ⁶¹	66.93 ²	20.574 ¹²⁴	34.81 ⁵⁰	37.457 ²⁰⁴	101.52 ³⁵
25.2	11.758 ¹⁰⁷	10.44 ⁵⁵	34.50 ⁵⁸	66.95 ⁵⁶	20.450 ¹⁰⁸	35.31 ⁵²	37.253 ¹⁸⁹	101.17 ⁸²
Dec. 5.2	11.651 ⁸⁵	10.99 ⁵⁸	33.92 ⁵⁴	66.39 ¹¹⁴	20.342 ⁸⁸	35.83 ⁵¹	37.064 ¹⁶⁸	100.35 ¹²⁷
15.2	11.566 ⁵⁹	11.57 ⁵⁸	33.38 ⁴⁸	65.25 ¹⁷¹	20.254 ⁶²	36.34 ⁴⁸	36.896 ¹⁴³	99.08 ¹⁶⁷
25.1	11.507 ³¹	12.15 ⁵⁶	32.90 ⁴¹	63.54 ²²⁰	20.192 ³⁵	36.82 ⁴⁶	36.753 ¹⁰⁹	97.41 ²⁰³
35.1	11.476	12.71	32.49	61.34	20.157	37.28	36.644	95.38
Mean Place	8.282	28.85	34.947	30.44	16.894	53.94	34.888	68.40
Sec δ , Tan δ	1.005	-0.104	2.951	+2.777	1.010	-0.145	1.306	+0.840
$D\psi\alpha$, $D_{\alpha}\alpha$	+0.06	+0.01	+0.02	-0.15	+0.06	+0.01	+0.05	-0.04
$D\psi\delta$, $D_{\alpha}\delta$	+0.3	-0.6	+0.3	-0.6	+0.3	-0.6	+0.3	-0.6

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	γ Capricorni. Mag. 3.8			ϵ Pegasi. Mag. 2.5			11 Cephei. Mag. 4.8			δ Capricorni. Mag. 3.0		
	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.
	h m	s	'	h m	s	'	h m	s	'	h m	s	'
	21 35		-17 2	21 40		+ 9 29	21 40		+70 55	21 42		-16 30
Jan. 1.1	26.316	17	36.46	3.388	3	23.89	38.21	40	42.65	24.378	22	36.67
11.1	26.299	15	36.42	3.357	31	22.67	37.81	30	40.34	24.356	7	36.68
21.1	26.314	44	36.26	3.354	27	21.43	37.51	19	37.63	24.363	38	36.56
31.0	26.358	76	35.95	3.381	58	20.20	37.32	9	34.63	24.401	68	36.28
Feb. 10.0	26.434	108	35.50	3.439	88	19.06	37.23	4	31.48	24.469	99	35.87
20.0	26.542	137	34.90	3.527	121	18.05	37.27	16	28.29	24.568	130	35.29
Mar. 1.0	26.679	170	34.12	3.648	153	17.25	37.43	29	25.20	24.698	162	34.52
10.9	26.849	199	33.15	3.801	184	16.70	37.72	39	22.32	24.860	192	33.59
20.9	27.048	229	32.02	3.985	215	16.46	38.11	49	19.78	25.052	224	32.46
30.9	27.277	257	30.72	4.200	243	16.55	38.60	58	17.68	25.276	250	31.17
Apr. 9.9	27.534	280	29.27	4.443	270	16.99	39.18	65	16.10	25.526	276	29.72
19.8	27.814	302	27.69	4.713	289	17.78	39.83	71	15.09	25.802	299	28.12
29.8	28.116	317	26.01	5.002	306	18.92	40.54	72	14.71	26.101	314	26.43
May 9.8	28.433	326	24.29	5.308	313	20.36	41.26	72	14.93	26.415	325	24.68
19.7	28.759	329	22.55	5.621	316	22.08	41.98	70	15.77	26.740	330	22.91
29.7	29.088	323	20.84	5.937	309	24.03	42.68	68	17.20	27.070	324	21.17
June 8.7	29.411	310	19.21	6.246	297	26.15	43.36	62	19.17	27.394	314	19.51
18.7	29.721	291	17.71	6.543	276	28.37	43.98	54	21.62	27.708	294	17.96
28.6	30.012	262	16.36	6.819	246	30.65	44.52	46	24.49	28.002	266	16.56
July 8.6	30.274	227	15.22	7.065	213	32.92	44.98	37	27.70	28.268	233	15.37
18.6	30.501	188	14.28	7.278	175	35.15	45.35	25	31.18	28.501	193	14.38
28.6	30.689	144	13.57	7.453	132	37.25	45.60	15	34.84	28.694	149	13.64
Aug. 7.5	30.833	97	13.10	7.585	89	39.23	45.75	5	38.61	28.843	104	13.12
17.5	30.930	51	12.86	7.674	45	41.02	45.80	7	42.40	28.947	57	12.85
27.5	30.981	5	12.82	7.719	2	42.59	45.73	18	46.14	29.004	12	12.78
Sept. 6.4	30.986	37	12.99	7.721	38	43.96	45.55	28	49.74	29.016	31	12.92
16.4	30.949	73	13.31	7.683	71	45.07	45.27	36	53.14	28.985	67	13.23
26.4	30.876	104	13.75	7.612	90	45.95	44.91	45	56.26	28.918	97	13.67
Oct. 6.4	30.772	125	14.28	7.513	121	46.57	44.46	51	59.03	28.821	122	14.19
16.3	30.647	139	14.85	7.392	133	46.96	43.95	56	61.40	28.699	135	14.78
26.3	30.508	144	15.44	7.259	139	47.10	43.39	60	63.30	28.564	141	15.38
Nov. 5.3	30.364	141	16.00	7.120	137	47.02	42.79	62	64.68	28.423	140	15.97
15.3	30.223	131	16.52	6.983	130	46.70	42.17	62	65.50	28.283	130	16.52
25.2	30.092	114	16.97	6.853	115	46.18	41.55	60	65.74	28.153	114	17.00
Dec. 5.2	29.978	92	17.33	6.738	97	45.45	40.95	57	65.39	28.039	95	17.40
15.2	29.886	65	17.58	6.641	75	44.55	40.38	52	64.43	27.944	70	17.71
25.1	29.821	38	17.74	6.566	50	43.50	39.86	45	62.91	27.874	43	17.90
35.1	29.783		17.79	6.516		42.33	39.41		60.86	27.831		17.99
Mean Place	26.349		32.07	3.607		21.56	41.728		27.95	24.384		32.51
Sec δ , Tan δ	1.046		-0.306	1.014		+0.167	3.060		+2.892	1.043		-0.296
$D\psi\alpha$, $D\omega\alpha$	+0.07		+0.02	+0.06		-0.01	+0.02		-0.16	+0.06		+0.02
$D\psi\delta$, $D\omega\delta$	+0.3		-0.6	+0.3		-0.6	+0.3		-0.6	+0.3		-0.6

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	π^3 Cygni. Mag. 4.3			μ Capricorni. Mag. 5.2			γ Gruis. Mag. 3.2			16 Pegasi. Mag. 5.0		
	Right Ascension.	Declina- tion.		Right Ascension.	Declina- tion.		Right Ascension.	Declina- tion.		Right Ascension.	Declina- tion.	
	h m 21 43	° ' +48 55		h m 21 48	° ' -13 56		h m 21 48	° ' -37 45		h m 21 49	° ' +25 31	
	s "	"		s "	"		s "	"		s "	"	
Jan. 1.1	40.158 135	25.53 226		43.078 28	55.72 11		50.832 47	46.80 107		13.935 61	53.20 173	
11.1	40.023 91	23.27 256		43.050 1	55.83 1		50.785 9	45.73 131		13.874 30	51.47 188	
21.1	39.932 43	20.71 274		43.051 31	55.84 12		50.776 29	44.42 153		13.844 1	49.59 196	
31.0	39.889 9	17.97 283		43.082 59	55.72 27		50.805 66	42.89 173		13.845 36	47.63 196	
Feb. 10.0	39.898 63	15.14 280		43.141 92	55.45 46		50.871 105	41.16 188		13.881 72	45.67 185	
20.0	39.961 119	12.34 264		43.233 121	54.99 63		50.976 142	39.28 202		13.953 109	43.82 167	
Mar. 1.0	40.080 174	9.70 239		43.354 155	54.37 82		51.118 181	37.26 213		14.062 145	42.15 141	
10.9	40.254 230	7.31 201		43.509 184	53.55 102		51.299 218	35.13 218		14.207 183	40.74 106	
20.9	40.484 278	5.30 156		43.693 216	52.53 122		51.517 253	32.95 221		14.390 219	39.68 67	
30.9	40.762 322	3.74 105		43.909 243	51.31 138		51.770 285	30.74 220		14.609 262	39.01 23	
Apr. 9.9	41.084 359	2.69 49		44.152 271	49.93 154		52.056 318	28.54 214		14.861 280	38.78 22	
19.8	41.443 387	2.20 8		44.423 293	48.39 167		52.374 343	26.40 205		15.141 305	39.00 68	
29.8	41.830 407	2.28 66		44.716 308	46.72 175		52.717 363	24.35 192		15.446 320	39.68 112	
May 9.8	42.237 413	2.94 121		45.024 321	44.97 181		53.080 376	22.43 171		15.766 331	40.80 153	
19.7	42.650 411	4.15 173		45.345 326	43.16 182		53.456 382	20.72 150		16.097 333	42.33 189	
29.7	43.061 395	5.88 220		45.671 324	41.34 176		53.838 379	19.22 122		16.430 327	44.22 221	
June 8.7	43.456 373	8.08 260		45.995 310	39.58 164		54.217 365	18.00 93		16.757 311	46.43 245	
18.7	43.829 338	10.68 294		46.305 294	37.94 153		54.583 345	17.07 60		17.068 290	48.88 265	
28.3	44.167 295	13.62 319		46.599 268	36.41 134		54.928 314	16.47 28		17.358 259	51.53 276	
July 8.6	44.462 246	16.81 336		46.867 283	35.07 115		55.242 276	16.19 5		17.617 223	54.29 282	
18.6	44.708 191	20.17 348		47.100 197	33.92 92		55.518 281	16.24 38		17.840 182	57.11 280	
28.6	44.899 133	23.65 350		47.297 153	33.00 68		55.749 180	16.62 67		18.022 138	59.91 274	
Aug. 7.5	45.032 74	27.15 345		47.450 111	32.32 47		55.929 126	17.29 92		18.160 91	62.65 260	
17.5	45.106 14	30.60 333		47.581 59	31.85 20		56.055 70	18.21 115		18.251 45	65.25 243	
27.5	45.120 44	33.93 314		47.620 20	31.65 1		56.125 15	19.36 130		18.296 1	67.68 221	
Sept. 6.4	45.076 97	37.07 290		47.640 24	31.64 13		56.140 37	20.66 139		18.297 42	69.89 197	
16.4	44.979 143	39.97 259		47.616 61	31.77 33		56.103 84	22.05 142		18.255 78	71.86 168	
26.4	44.836 183	42.56 224		47.555 90	32.10 42		56.019 123	23.47 137		18.177 109	73.54 138	
Oct. 6.4	44.653 216	44.80 183		47.465 116	32.52 50		55.896 154	24.84 127		18.068 132	74.92 104	
16.3	44.437 239	46.63 139		47.349 129	33.02 55		55.742 175	26.11 109		17.936 148	75.96 70	
26.3	44.198 252	48.02 91		47.220 137	33.57 57		55.567 185	27.20 87		17.788 157	76.66 34	
Nov. 5.3	43.946 258	48.93 40		47.083 136	34.14 53		55.382 185	28.07 60		17.631 159	77.00 0	
15.3	43.688 255	49.33 12		46.947 129	34.67 50		55.197 177	28.67 31		17.472 153	77.00 38	
25.2	43.433 242	49.21 64		46.818 114	35.17 48		55.020 158	28.98 1		17.319 142	76.62 73	
Dec. 5.2	43.191 222	48.57 114		46.704 95	35.65 37		54.862 135	28.99 30		17.177 125	75.89 106	
15.2	42.969 195	47.43 162		46.609 72	36.02 29		54.727 105	28.69 61		17.052 105	74.83 135	
25.1	42.774 159	45.81 205		46.537 45	36.31 20		54.622 72	28.08 89		16.947 79	73.48 162	
35.1	42.615	43.76		46.492	36.51		54.550	27.19		16.868	71.86	
Mean Place	41.324	13.83		43.068	52.27		50.774	38.01		14.353	46.33	
Sec δ , Tan δ	1.522	+1.147		1.031	-0.248		1.265	-0.774		1.108	+0.478	
$D\phi\alpha$, $D_\alpha\alpha$	+0.04	-0.06		+0.06	+0.01		+0.07	+0.04		+0.05	-0.03	
$D\phi\delta$, $D_\alpha\delta$	+0.3	-0.6		+0.3	-0.5		+0.3	-0.5		+0.3	-0.5	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	79 Draconis. Mag. 6.6		ϵ Indi. Mag. 4.7		20 Pegasi. Mag. 5.7		α Aquarii. Mag. 3.2	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 21 51	° ' " +73 18	h m 21 56	° ' " -57 7	h m 21 56	° ' " +12 42	h m 22 1	° ' " -0 43
	s	"	s	"	s	"	s	"
Jan. 1.1	44.58	32.96	56.473	66.27	59.612	65.26	28.190	41.66
	50	218	109	186	46	126	38	72
11.1	44.08	30.78	56.364	64.41	59.566	64.00	28.152	42.38
	39	261	52	220	19	134	13	69
21.1	43.69	28.17	56.312	62.21	59.547	62.66	28.139	43.07
	27	293	6	246	8	134	14	62
31.1	43.42	25.24	56.318	59.75	59.555	61.32	28.153	43.69
	14	313	64	268	39	128	41	53
Feb. 10.0	43.28	22.11	56.382	57.07	59.594	60.04	28.194	44.21
	0	321	123	282	70	116	71	36
20.0	43.28	18.90	56.505	54.25	59.664	58.88	28.265	44.57
	14	312	180	291	103	97	103	18
Mar. 1.0	43.42	15.78	56.685	51.34	59.767	57.91	28.368	44.73
	27	295	236	294	136	72	133	4
10.9	43.69	12.83	56.921	48.40	59.903	57.19	28.501	44.68
	41	266	291	290	171	43	166	32
20.9	44.10	10.17	57.212	45.50	60.074	56.76	28.667	44.36
	53	223	342	281	203	8	198	38
30.9	44.63	7.94	57.554	42.69	60.277	56.68	28.865	43.77
	63	174	392	264	233	28	227	67
Apr. 9.9	45.26	6.20	57.946	40.05	60.510	56.96	29.092	42.90
	71	117	433	245	261	64	256	112
19.8	45.97	5.03	58.379	37.60	60.771	57.60	29.348	41.78
	78	60	468	219	285	101	279	128
29.8	46.75	4.43	58.847	35.41	61.056	58.61	29.627	40.40
	80	5	498	189	303	134	297	161
May 9.8	47.55	4.48	59.345	33.52	61.359	59.95	29.924	38.79
	82	65	516	154	314	166	312	178
19.8	48.37	5.13	59.861	31.98	61.673	61.61	30.236	37.01
	80	125	525	116	319	190	316	181
29.7	49.17	6.38	60.386	30.82	61.992	63.51	30.552	35.10
	77	179	521	75	316	212	315	200
June 8.7	49.94	8.17	60.907	30.07	62.308	65.63	30.867	33.10
	70	227	507	31	303	226	305	202
18.7	50.64	10.44	61.414	29.76	62.611	67.89	31.172	31.08
	64	276	478	12	286	235	289	206
28.6	51.28	13.20	61.892	29.88	62.897	70.24	31.461	29.08
	53	313	437	54	259	237	264	191
July 8.6	51.81	16.33	62.329	30.42	63.156	72.61	31.725	27.17
	44	340	388	95	227	236	234	180
18.6	52.25	19.73	62.717	31.37	63.383	74.97	31.959	25.37
	31	361	326	134	190	228	197	164
28.6	52.56	23.34	63.043	32.71	63.573	77.25	32.156	23.73
	20	376	257	167	148	214	156	160
Aug. 7.5	52.76	27.10	63.300	34.38	63.721	79.39	32.312	22.27
	7	380	181	193	104	199	113	124
17.5	52.83	30.90	63.481	36.31	63.825	81.38	32.425	21.03
	5	379	103	214	60	179	69	194
27.5	52.78	34.69	63.584	38.45	63.885	83.17	32.494	19.99
	17	367	25	226	17	156	27	60
Sept. 6.5	52.61	38.36	63.609	40.71	63.902	84.73	32.521	19.19
	28	349	52	228	23	133	13	59
16.4	52.33	41.85	63.557	42.99	63.879	86.06	32.508	18.60
	39	327	120	221	58	107	48	37
26.4	51.94	45.12	63.437	45.20	63.821	87.13	32.460	18.23
	48	294	181	206	87	81	80	17
Oct. 6.4	51.46	48.06	63.256	47.26	63.734	87.94	32.380	18.06
	56	255	232	182	111	56	102	1
16.3	50.90	50.61	63.024	49.08	63.623	88.50	32.278	18.05
	63	207	268	148	126	29	119	16
26.3	50.27	52.68	62.756	50.56	63.497	88.79	32.159	18.21
	67	158	289	110	135	5	127	26
Nov. 5.3	49.60	54.26	62.467	51.66	63.362	88.84	32.032	18.51
	71	103	296	67	137	22	128	41
15.3	48.89	55.29	62.171	52.33	63.225	88.62	31.904	18.93
	71	46	289	19	132	45	124	52
25.2	48.18	55.75	61.882	52.52	63.093	88.17	31.780	19.45
	70	16	267	29	120	68	112	61
Dec. 5.2	47.48	55.59	61.615	52.23	62.973	87.49	31.668	20.06
	68	76	236	76	105	89	98	67
15.2	46.80	54.83	61.379	51.47	62.868	86.60	31.570	20.73
	62	136	194	121	87	106	78	73
25.2	46.18	53.47	61.185	50.26	62.781	85.54	31.492	21.46
	54	189	145	162	63	121	57	73
35.1	45.64	51.58	61.040	48.64	62.718	84.33	31.435	22.19
Mean Place	48.529	16.99	56.495	54.26	59.793	61.36	28.213	42.64
Sec δ , Tan δ	3.482	+3.335	1.842	-1.548	1.025	+0.226	1.000	-0.013
$D\phi\alpha$, $D\omega\alpha$	+0.01	-0.19	+0.08	+0.09	+0.06	-0.01	+0.06	0.00
$D\phi\delta$, $D\omega\delta$	+0.3	-0.5	+0.3	-0.5	+0.3	-0.5	+0.3	-0.5

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	♌ Aquarii. Mag. 4.4		♐ Cephei. Mag. 5.4		♋ Grui. Mag. 2.2		♏ Pegasi. Mag. 4.0	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 22 1	° ' -14 16	h m 22 2	° ' +62 22	h m 22 2	° ' -47 21	h m 22 3	° ' +24 55
	s "	"	s "	"	s "	"	s "	"
Jan. 1.1	54.191 ³⁸	43.05 ¹²	25.36 ²⁷	47.18 ²¹⁴	56.788 ⁸⁵	77.39 ¹⁴⁵	5.652 ⁶⁸	71.17 ¹⁶⁴
11.1	54.153 ¹¹	43.17 ⁰	25.09 ²¹	45.04 ²⁵³	56.703 ⁴³	75.94 ¹⁷⁷	5.584 ⁴¹	69.53 ¹⁷⁸
21.1	54.142 ¹⁸	43.17 ¹⁵	24.88 ¹⁵	42.51 ²⁸²	56.660 ¹	74.17 ²⁰⁴	5.543 ¹⁰	67.75 ¹⁸⁷
31.1	54.160 ⁴⁶	43.02 ³²	24.73 ⁶	39.69 ³⁰¹	56.659 ⁴⁶	72.13 ²²⁵	5.533 ²³	65.88 ¹⁸⁸
Feb. 10.0	54.206 ⁷⁶	42.70 ⁴⁸	24.67 ¹	36.68 ³⁰⁷	56.705 ⁹⁰	69.88 ²⁴²	5.556 ⁵⁸	64.00 ¹⁸⁰
20.0	54.282 ¹⁰⁸	42.22 ⁶⁶	24.68 ⁹	33.61 ³⁰⁰	56.795 ¹³⁶	67.46 ²⁵⁶	5.614 ⁹⁴	62.20 ¹⁶²
Mar. 1.0	54.390 ¹³⁹	41.56 ⁸⁷	24.77 ¹⁸	30.61 ²⁸²	56.931 ¹⁸¹	64.90 ²⁶³	5.708 ¹³³	60.58 ¹³⁹
10.9	54.529 ¹⁷²	40.69 ¹⁰⁶	24.95 ²⁶	27.79 ²⁴⁹	57.112 ²²⁶	62.27 ²⁶⁶	5.841 ¹⁷⁰	59.19 ¹⁰⁵
20.9	54.701 ²⁰⁴	39.63 ¹²⁶	25.21 ³³	25.30 ²⁰⁹	57.338 ²⁶⁷	59.61 ²⁶⁴	6.011 ²⁰⁷	58.14 ⁶⁹
30.9	54.905 ²³²	38.37 ¹⁴³	25.54 ⁴⁰	23.21 ¹⁶⁰	57.605 ³⁰³	56.97 ²⁶⁵	6.218 ²⁴⁰	57.45 ²⁶
Apr. 9.9	55.137 ²⁶²	36.94 ¹⁶¹	25.94 ⁴⁶	21.61 ¹⁰⁵	57.913 ³⁴⁴	54.42 ²⁴⁵	6.458 ²⁷²	57.19 ¹⁷
19.8	55.399 ²⁸⁶	35.33 ¹⁷²	26.40 ⁵¹	20.56 ⁴⁵	58.257 ³⁷⁷	51.97 ²²⁷	6.730 ²⁹⁸	57.36 ⁶²
29.8	55.685 ³⁰⁶	33.61 ¹⁸²	26.91 ⁵³	20.11 ¹⁴	58.634 ⁴⁰²	49.70 ²⁰⁵	7.028 ³¹⁷	57.98 ¹⁰⁵
May 9.8	55.991 ³¹⁹	31.79 ¹⁸⁶	27.44 ⁵⁴	20.25 ⁷⁵	59.036 ⁴¹⁹	47.65 ¹⁷⁷	7.345 ³²⁹	59.03 ¹⁴⁵
19.8	56.310 ³²⁶	29.93 ¹⁸⁵	27.98 ⁵⁴	21.00 ¹³²	59.455 ⁴²⁹	45.88 ¹⁴⁸	7.674 ³³³	60.48 ¹⁸³
29.7	56.636 ³²⁵	28.08 ¹⁸¹	28.52 ⁵³	22.32 ¹⁸⁶	59.884 ⁴²⁸	44.40 ¹¹²	8.007 ³³¹	62.31 ²¹⁴
June 8.7	56.961 ³¹⁶	26.27 ¹⁷¹	29.05 ⁵⁰	24.18 ²³⁴	60.312 ⁴¹⁷	43.28 ⁷⁵	8.338 ³¹⁹	64.45 ²³⁹
18.7	57.277 ²⁹⁹	24.56 ¹⁵⁶	29.55 ⁴⁵	26.52 ²⁷⁷	60.729 ³⁹⁵	42.53 ³⁷	8.657 ²⁹⁷	66.84 ²⁵⁹
28.6	57.576 ²⁷⁶	23.00 ¹³⁸	30.00 ⁴⁰	29.29 ³¹¹	61.124 ³⁶⁴	42.16 ²	8.954 ²⁷²	69.43 ²⁷¹
July 8.6	57.852 ²⁴³	21.62 ¹¹⁶	30.40 ³⁴	32.40 ³³⁸	61.488 ³²³	42.18 ⁴²	9.226 ²³⁶	72.14 ²⁷⁸
18.6	58.095 ²⁰⁷	20.46 ⁹⁵	30.74 ²⁶	35.78 ³⁵⁷	61.811 ²⁷²	42.60 ⁷⁹	9.462 ¹⁹⁶	74.92 ²⁷⁷
28.6	58.302 ¹⁶⁵	19.51 ⁷⁰	31.00 ¹⁸	39.35 ³⁶⁹	62.083 ²¹⁷	43.39 ¹¹²	9.658 ¹⁵³	77.69 ²⁷¹
Aug. 7.5	58.467 ¹²⁰	18.81 ⁴⁶	31.18 ¹¹	43.04 ³⁷³	62.300 ¹⁵⁵	44.51 ¹³⁹	9.811 ¹⁰⁸	80.40 ²⁵⁸
17.5	58.587 ⁷⁵	18.35 ²²	31.29 ³	46.77 ³⁶⁹	62.455 ⁹²	45.90 ¹⁶³	9.919 ⁶²	82.98 ²⁴⁴
27.5	58.662 ³⁰	18.13 ⁰	31.32 ⁶	50.46 ³⁵⁶	62.547 ²⁸	47.53 ¹⁷⁸	9.981 ¹⁶	85.42 ²²¹
Sept. 6.5	58.692 ¹²	18.13 ¹⁸	31.26 ¹³	54.02 ³³⁷	62.575 ³³	49.31 ¹⁸⁶	9.997 ²⁵	87.63 ¹⁹⁶
16.4	58.680 ⁴⁹	18.31 ³⁵	31.13 ¹⁹	57.39 ³¹²	62.542 ⁸⁹	51.17 ¹⁸⁶	9.972 ⁶³	89.61 ¹⁷¹
26.4	58.631 ⁸²	18.66 ⁴⁷	30.94 ²⁵	60.51 ²⁸⁰	62.453 ¹³⁹	53.03 ¹⁷⁸	9.909 ⁹³	91.32 ¹⁴¹
Oct. 6.4	58.549 ¹⁰⁶	19.13 ⁵⁵	30.69 ³⁰	63.31 ²⁴⁰	62.314 ¹⁷⁸	54.81 ¹⁶⁰	9.816 ¹³⁸	92.73 ¹⁰⁹
16.3	58.443 ¹²⁶	19.68 ⁶⁰	30.39 ³⁵	65.71 ¹⁹⁷	62.136 ²⁰⁷	56.41 ¹³⁸	9.696 ¹³⁸	93.82 ⁷⁵
26.3	58.318 ¹³³	20.28 ⁶⁰	30.04 ³⁷	67.68 ¹⁴⁷	61.929 ²²³	57.79 ¹⁰⁷	9.558 ¹⁴⁸	94.57 ⁴²
Nov. 5.3	58.185 ¹³⁴	20.88 ⁵⁹	29.67 ³⁹	69.15 ⁹²	61.706 ²²⁹	58.86 ⁷¹	9.410 ¹⁵²	94.99 ⁶
15.3	58.051 ¹²⁹	21.47 ⁵⁵	29.28 ⁴⁰	70.07 ³⁸	61.477 ²²³	59.57 ³³	9.258 ¹⁴⁹	95.05 ²⁹
25.2	57.922 ¹¹⁷	22.02 ⁴⁹	28.88 ³⁷	70.45 ⁷⁹	61.254 ¹⁸³	59.90 ⁴⁶	9.109 ¹²⁷	94.76 ⁹⁵
Dec. 5.2	57.805 ¹⁰¹	22.51 ⁴⁰	28.49 ³⁵	70.25 ¹³⁴	61.048 ¹⁵¹	59.83 ⁸⁷	8.968 ¹⁰⁸	94.13 ¹²⁶
15.2	57.704 ⁷⁹	22.91 ³¹	28.12 ³⁰	69.46 ¹⁸⁵	60.865 ¹¹⁴	59.37 ¹²⁴	8.841 ⁸⁶	93.18 ¹⁵⁰
25.2	57.625 ⁵⁷	23.22 ¹⁹	27.77 ³⁰	68.12 ¹⁸⁵	60.714 ¹¹⁴	58.50 ¹²⁴	8.733 ⁸⁶	91.92 ¹²⁶
35.1	57.568	23.41	27.47	66.27	60.600	57.26	8.647	90.42
Mean Place	54.120	39.78	27.298	31.67	56.683	66.74	5.985	63.68
Sec δ, Tan δ	1.032	-0.254	2.157	+1.911	1.477	-1.086	1.103	+0.465
Dψ α, Dω α	+0.06	+0.01	+0.04	-0.11	+0.08	+0.06	+0.05	-0.03
Dψ δ, Dω δ	+0.3	-0.5	+0.3	-0.5	+0.3	-0.5	+0.3	-0.5

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	θ Pegasi. Mag. 3.7		π Pegasi. Mag. 4.4		ζ Cephei. Mag. 3.6		24 Cephei. Mag. 5.0	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 22 5	° ' " + 5 47	h m 22 6	° ' " +32 45	h m 22 7	° ' " +57 47	h m 22 8	° ' " +71 55
	s	"	s	"	s	"	s	"
Jan. 1.1	57.719	5.56	14.857	65.96	54.797	28.14	8.42	55.15
11.1	57.673 ⁴⁶	4.58 ⁹⁸	14.768 ⁸⁹	64.16 ¹⁸⁰	54.573 ²²⁴	26.06 ²⁰⁸	7.94 ⁴⁸	53.14 ²⁰⁰
21.1	57.653 ²⁰	3.59 ⁹⁹	14.708 ⁶⁰	62.14 ²⁰²	54.398 ¹⁷⁵	23.60 ²⁴⁶	7.55 ³⁹	50.67 ²¹⁷
31.1	57.658 ⁵	2.62 ⁹⁷	14.682 ²⁶	59.96 ²¹⁸	54.279 ¹¹⁹	20.86 ²⁷⁴	7.26 ²⁹	47.87 ²⁸⁰
Feb. 10.0	57.693 ³⁵	1.74 ⁸⁸	14.692 ¹⁰	57.75 ²²¹	54.225 ⁵⁴	17.94 ²⁹²	7.10 ¹⁶	44.82 ³⁰³
	65	74	47	215	12	298	4	214
20.0	57.758	1.00	14.739	55.60	54.237	14.96	7.06	41.66
Mar. 1.0	57.853 ⁹⁵	0.44 ⁵⁶	14.828 ⁸⁹	53.58 ²⁰²	54.323 ⁸⁶	12.06 ²⁹⁰	7.14 ⁸	38.52 ³¹⁴
11.0	57.982 ¹²⁹	0.13 ³¹	14.959 ¹³¹	51.81 ¹⁷⁷	54.479 ¹⁵⁶	9.35 ²⁷¹	7.35 ²¹	35.53 ²⁹⁹
20.9	58.144 ¹⁰²	0.07 ⁶	15.132 ¹⁷³	50.35 ¹⁴⁶	54.706 ²²⁷	6.94 ²⁴¹	7.69 ³⁴	32.81 ²⁷²
30.9	58.337 ¹⁹³	0.33 ²⁶	15.346 ²¹⁴	49.30 ¹⁰⁵	55.001 ²⁹⁵	4.94 ²⁰⁰	8.14 ⁴⁵	30.46 ²⁸³
	226	58	251	61	352	153	56	187
Apr. 9.9	58.563	0.91	15.597	48.69	55.353	3.41	8.70	28.59
19.8	58.817 ²⁵⁴	1.79 ⁸⁸	15.881 ²⁸⁴	48.55 ¹⁴	55.757 ⁴⁰⁴	2.44 ⁹⁷	9.35 ⁶⁵	27.25 ¹³⁴
29.8	59.095 ²⁷⁸	3.00 ¹²¹	16.194 ³¹³	48.91 ³⁶	56.202 ⁴⁴⁵	2.04 ⁴⁰	10.05 ⁷⁰	26.50 ²⁵
May 9.8	59.392 ²⁹⁷	4.47 ¹⁴⁷	16.527 ³³³	49.75 ⁸⁴	56.674 ⁴⁷²	2.23 ¹⁹	10.80 ⁷⁵	26.36 ¹⁴
19.8	59.703 ³¹¹	6.19 ¹⁷²	16.874 ³⁴⁷	51.06 ¹³¹	57.161 ⁴⁸⁷	3.01 ⁷⁸	11.56 ⁷⁶	26.83 ⁴⁷
	318	191	350	173	490	134	76	107
29.7	60.021	8.10	17.224	52.79	57.651	4.35	12.32	27.90
June 8.7	60.337 ³¹⁶	10.16 ²⁰⁶	17.571 ³⁴⁷	54.90 ²¹¹	58.128 ⁴⁷⁷	6.22 ¹⁸⁷	13.06 ⁷⁴	29.53 ¹⁸³
18.7	60.643 ³⁰⁶	12.31 ²¹⁵	17.904 ³³³	57.32 ²⁴²	58.581 ⁴⁵³	8.55 ²³³	13.76 ⁷⁰	31.68 ²¹⁵
28.7	60.933 ²⁹⁰	14.49 ²¹⁸	18.215 ³¹¹	60.01 ²⁶⁹	58.997 ⁴¹⁶	11.30 ²⁷⁵	14.39 ⁶³	34.28 ²⁸⁰
July 8.6	61.198 ²⁶⁵	16.65 ²¹⁶	18.497 ²⁸²	62.87 ²⁸⁶	59.366 ³⁶⁹	14.38 ³⁰⁸	14.94 ⁵⁵	37.28 ³⁰⁰
	235	208	245	298	314	333	46	331
18.6	61.433	18.73	18.742	65.85	59.680	17.71	15.40	40.59
28.6	61.631 ¹⁹⁸	20.69 ¹⁹⁶	18.945 ²⁰³	68.87 ³⁰²	59.932 ²⁵²	21.24 ³⁵³	15.74 ³⁴	44.14 ³⁵⁵
Aug. 7.5	61.790 ¹⁵⁹	22.51 ¹⁸²	19.102 ¹⁵⁷	71.88 ³⁰¹	60.116 ¹⁸⁴	24.86 ³⁶²	15.99 ²⁵	47.86 ³⁷²
17.5	61.906 ¹¹⁶	24.12 ¹⁶¹	19.211 ¹⁰⁹	74.81 ²⁹³	60.231 ¹¹⁵	28.52 ³⁶⁶	16.12 ¹³	51.66 ³⁸⁰
27.5	61.977 ⁷¹	25.54 ¹⁴²	19.272 ⁶¹	77.60 ²⁷⁹	60.274 ⁴³	32.12 ³⁶⁰	16.14 ²	55.46 ³⁸⁸
	30	119	13	259	24	348	9	373
Sept. 6.5	62.007	26.73	19.285	80.19	60.250	35.60	16.05	59.19
16.4	61.996 ¹¹	27.69 ⁹⁶	19.254 ³¹	82.56 ²³⁷	60.161 ⁸⁹	38.89 ³²⁹	15.83 ²²	62.76 ³⁵⁷
26.4	61.951 ⁴⁵	28.42 ⁷³	19.183 ⁷¹	84.64 ²⁰⁸	60.011 ¹⁵⁰	41.92 ³⁰³	15.53 ³⁰	66.12 ³³⁸
Oct. 6.4	61.874 ⁷⁷	28.92 ⁵⁰	19.078 ¹⁰⁵	86.41 ¹⁷⁷	59.809 ²⁰²	44.62 ²⁷⁰	15.14 ³⁹	69.17 ³⁶⁶
16.4	61.775 ⁹⁹	29.19 ²⁷	18.946 ¹³²	87.85 ¹⁴⁴	59.563 ²⁴⁶	46.96 ²³⁴	14.67 ⁴⁷	71.86 ³⁸³
	117	8	152	105	281	190	53	226
26.3	61.658	29.27	18.794	88.90	59.282	48.86	14.14	74.12
Nov. 5.3	61.532 ¹²⁶	29.15 ¹²	18.628 ¹⁶⁶	89.57 ⁶⁷	58.974 ³⁰⁸	50.26 ¹⁴⁰	13.55 ⁵⁹	75.89 ¹⁷⁷
15.3	61.403 ¹²⁹	28.84 ³¹	18.458 ¹⁷⁰	89.83 ²⁶	58.651 ³²³	51.16 ⁹⁰	12.93 ⁶²	77.13 ¹²⁴
25.2	61.280 ¹²³	28.36 ⁴⁸	18.288 ¹⁷⁰	89.68 ¹⁵	58.323 ³²⁸	51.51 ³⁵	12.29 ⁶⁴	77.79 ⁹⁶
Dec. 5.2	61.164 ¹¹⁶	27.73 ⁶³	18.126 ¹⁶²	89.12 ⁵⁶	57.998 ³²⁵	51.29 ²²	11.65 ⁶⁴	77.85 ⁵⁶
	101	77	140	94	309	77	62	56
15.2	61.063	26.96	17.977	88.18	57.689	50.52	11.03	77.29
25.2	60.979 ⁸⁴	26.09 ⁸⁷	17.846 ¹³¹	86.85 ¹³³	57.404 ²⁸⁵	49.20 ¹³²	10.45 ⁵⁸	76.14 ¹¹⁵
35.1	60.918 ⁶¹	25.13 ⁹⁶	17.739 ¹⁰⁷	85.21 ¹⁶⁴	57.152 ²⁵²	47.39 ¹⁸¹	9.93 ⁵²	74.44 ¹⁷⁰
Mean Place	57.779	3.19	15.333	56.25	56.287	12.95	11.728	37.91
Sec δ , Tan δ	1.005	+0.101	1.189	+0.644	1.876	+1.587	3.224	+3.065
$D\psi\alpha$, $D_w\alpha$	+0.06	-0.01	+0.05	-0.04	+0.04	-0.09	+0.02	-0.18
$D\psi\delta$, $D_w\delta$	+0.3	-0.5	+0.3	-0.5	+0.4	-0.5	+0.4	-0.5

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	θ Aquarii. Mag. 4.3		α Tucanæ. Mag. 2.9		γ Aquarii. Mag. 4.0		δ Pegasi. Mag. 4.9	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 22 12	° ' " - 8 11	h m 22 12	° ' " -60 40	h m 22 17	° ' " - 1 48	h m 22 17	° ' " +11 46
	s	"	s	"	s	"	s	"
Jan. 1.1	24.213	68.39	45.40	55.60	19.148	38.75	22.939	57.96
11.1	24.168	68.79	45.23	53.63	19.099	39.40	22.880	56.80
21.1	24.148	69.09	45.12	51.29	19.073	40.02	22.845	55.58
31.1	24.154	69.27	45.07	48.64	19.072	40.56	22.836	54.35
Feb. 10.0	24.188	69.33	45.08	45.75	19.099	40.98	22.856	53.18
20.0	24.252	69.21	45.16	42.68	19.156	41.25	22.905	52.11
Mar. 1.0	24.345	68.90	45.30	39.51	19.242	41.33	22.988	51.21
11.0	24.472	68.38	45.51	36.30	19.361	41.19	23.105	50.55
20.9	24.630	67.63	45.77	33.13	19.512	40.80	23.256	50.17
30.9	24.820	66.66	46.10	30.05	19.696	40.14	23.440	50.10
Apr. 9.9	25.042	65.45	46.50	27.11	19.912	39.23	23.658	50.38
19.8	25.293	64.04	46.93	24.39	20.158	38.05	23.907	51.02
29.8	25.568	62.43	47.41	21.94	20.429	36.63	24.181	52.00
May 9.8	25.866	60.68	47.92	19.80	20.722	34.99	24.477	53.32
19.8	26.178	58.83	48.45	18.04	21.031	33.19	24.789	54.93
29.7	26.497	56.91	49.00	16.68	21.348	31.27	25.107	56.79
June 8.7	26.818	54.98	49.56	15.76	21.666	29.27	25.427	58.87
18.7	27.131	53.10	50.10	15.29	21.977	27.25	25.737	61.10
28.7	27.429	51.29	50.61	15.28	22.273	25.26	26.033	63.40
July 8.6	27.704	49.64	51.09	15.73	22.547	23.35	26.307	65.74
18.6	27.950	48.15	51.52	16.63	22.792	21.56	26.549	68.05
28.6	28.160	46.85	51.87	17.94	23.002	19.94	26.756	70.30
Aug. 7.5	28.330	45.79	52.15	19.62	23.173	18.51	26.923	72.41
17.5	28.458	44.95	52.36	21.58	23.302	17.30	27.047	74.37
27.5	28.541	44.35	52.48	23.78	23.388	16.31	27.129	76.14
Sept. 6.5	28.580	43.98	52.52	26.12	23.431	15.56	27.167	77.68
16.4	28.579	43.82	52.47	28.50	23.434	15.03	27.166	79.00
26.4	28.540	43.85	52.34	30.83	23.399	14.71	27.127	80.07
Oct. 6.4	28.469	44.04	52.14	33.02	23.333	14.58	27.058	80.88
16.4	28.374	44.37	51.88	34.96	23.242	14.62	26.964	81.45
26.3	28.259	44.79	51.57	36.57	23.134	14.83	26.850	81.76
Nov. 5.3	28.135	45.29	51.24	37.79	23.013	15.15	26.725	81.84
15.3	28.008	45.83	50.89	38.54	22.889	15.59	26.596	81.67
25.2	27.884	46.39	50.54	38.80	22.767	16.12	26.469	81.29
Dec. 5.2	27.770	46.95	50.21	38.55	22.654	16.71	26.349	80.69
15.2	27.669	47.49	49.91	37.79	22.553	17.36	26.239	79.88
25.2	27.585	48.00	49.65	36.53	22.467	18.04	26.146	78.92
35.1	27.524	48.45	49.43	34.83	22.403	18.71	26.072	77.82
Mean Place	24.128	66.99	45.362	42.90	19.086	39.31	23.007	53.43
Sec δ , Tan δ	1.010	-0.144	2.042	-1.781	1.000	-0.032	1.022	+0.209
$D\phi a$, $D_{\infty} a$	+0.06	+0.01	+0.08	+0.11	+0.06	0.00	+0.06	-0.01
$D\phi \delta$, $D_{\infty} \delta$	+0.4	-0.5	+0.4	-0.5	+0.4	-0.4	+0.4	-0.4

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	3 Lacertæ. Mag. 4.6		π Aquarii. Mag. 4.6		σ Aquarii. Mag. 4.9		α Lacertæ. Mag. 3.8	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 22 20	° ' " +51 48	h m 22 20	° ' " +0 57	h m 22 26	° ' " -11 6	h m 22 27	° ' " +49 50
	s	"	s	"	s	"	s	"
Jan. 1.2	14.264	43.37	59.280	3.96	12.382	31.16	48.873	76.08
	186	193		76		27	177	186
11.1	14.078	41.44	59.228	3.20	12.327	31.43	48.696	74.23
	146	230		73		16	143	221
21.1	13.932	39.14	59.200	2.47	12.296	31.59	48.553	72.02
	101	259		69		2	100	238
31.1	13.831	36.55	59.195	1.78	12.289	31.61	48.453	69.54
	49	274		55		14	53	267
Feb. 10.0	13.782	33.81	59.218	1.23	12.310	31.47	48.400	66.87
	7	281		43		32	1	273
20.0	13.789	31.00	59.268	0.80	12.359	31.15	48.401	64.15
Mar. 1.0	13.855	28.26	59.351	0.54	12.440	30.65	48.457	61.48
	66	274		26		50	56	267
11.0	13.982	25.69	59.464	0.53	12.553	29.92	48.572	58.98
	127	257		1		73	115	250
20.9	14.171	23.42	59.611	0.76	12.698	28.99	48.745	56.76
	189	227		23		93	173	221
30.9	14.418	21.52	59.792	1.28	12.877	27.83	48.976	54.89
	247	190		52		116	231	187
	301	143		79		135	285	161
Apr. 9.9	14.719	20.09	60.007	2.07	13.089	26.48	49.261	53.48
19.9	15.067	19.19	60.249	3.12	13.331	24.94	49.591	52.58
	348	90		105		154	330	90
29.8	15.454	18.83	60.518	4.46	13.601	23.22	49.961	52.21
	387	36		134		172	370	27
May 9.8	15.870	19.03	60.809	6.03	13.893	21.39	50.362	52.40
	416	20		157		183	401	13
19.8	16.303	19.80	61.117	7.79	14.204	19.47	50.780	53.15
	433	77		176		192	418	21
	439	132		192		195	428	128
29.7	16.742	21.12	61.432	9.71	14.524	17.52	51.208	54.43
June 8.7	17.176	22.93	61.749	11.73	14.847	15.59	51.632	56.20
	434	181		202		193	424	177
18.7	17.593	25.20	62.059	13.80	15.165	13.72	52.042	58.42
	417	227		207		187	410	223
28.7	17.981	27.86	62.355	15.86	15.471	11.96	52.426	61.03
	388	266		206		176	384	261
July 8.6	18.331	30.84	62.629	17.89	15.757	10.37	52.776	63.94
	350	298		203		159	350	261
	305	322		188		141	307	315
18.6	18.636	34.06	62.877	19.77	16.013	8.96	53.083	67.12
28.6	18.887	37.45	63.087	21.52	16.235	7.78	53.340	70.48
	251	339		175		118	257	324
Aug. 7.6	19.081	40.95	63.260	23.09	16.419	6.83	53.542	73.90
	194	350		157		95	202	301
17.5	19.213	44.45	63.391	24.48	16.562	6.14	53.687	77.36
	132	350		139		69	145	248
27.5	19.285	47.93	63.480	25.63	16.659	5.69	53.771	80.79
	72	348		115		45	84	343
	11	335		92		20	27	321
Sept. 6.5	19.296	51.28	63.525	26.55	16.712	5.49	53.798	84.10
16.4	19.250	54.44	63.531	27.25	16.724	5.49	53.770	87.22
	40	316		70		0	28	312
26.4	19.149	57.35	63.500	27.75	16.698	5.69	53.690	90.11
	101	291		50		20	80	289
Oct. 6.4	19.003	59.95	63.437	28.00	16.638	6.04	53.564	92.69
	146	260		25		35	126	258
16.4	18.818	62.19	63.349	28.08	16.550	6.51	53.399	94.93
	185	224		8		47	165	229
	218	182		9		55	196	183
26.3	18.600	64.01	63.242	27.99	16.443	7.06	53.203	96.76
Nov. 5.3	18.359	65.39	63.123	27.73	16.323	7.67	52.982	98.15
	241	138		26		61	221	139
15.3	18.101	66.27	63.001	27.34	16.198	8.29	52.746	99.48
	258	88		39		62	236	92
25.3	17.838	66.63	62.880	26.83	16.072	8.90	52.502	99.07
	263	36		51		61	244	61
Dec. 5.2	17.578	66.46	62.766	26.23	15.955	9.48	52.258	99.37
	260	17		60		58	244	11
	252	70		69		52	236	65
15.2	17.326	65.76	62.664	25.54	15.849	10.00	52.022	98.74
25.2	17.092	64.55	62.575	24.79	15.759	10.44	51.803	97.60
	234	121		75		44	219	114
35.1	16.887	62.86	62.507	24.04	15.689	10.80	51.606	96.01
	205	169		75		36	197	159
Mean Place	15.280	28.38	59.227	2.49	12.213	29.24	49.732	60.97
Sec δ, Tan δ	1.617	+1.271	1.000	+0.017	1.019	-0.196	1.551	+1.186
D _ψ α, D _ω α	+0.05	-0.08	+0.06	0.00	+0.06	+0.01	+0.05	-0.07
D _ψ δ, D _ω δ	+0.4	-0.4	+0.4	-0.4	+0.4	-0.4	+0.4	-0.4

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	♈ Aquarii. Mag. 5.3		♄ B. Cephei. Mag. 5.7		♈ Aquarii. Mag. 4.1		♏ Lacertæ. Mag. 4.9	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 22 30	° ' -21 7	h m 22 30	° ' +75 47	h m 22 31	° ' - 0 32	h m 22 35	° ' +38 36
	s "	"	s "	"	s "	"	s "	"
Jan. 1.2	6.254 61	85.13	44.24 68	55.91 170	2.540 59	61.44 69	28.989 127	58.70 167
11.1	6.193 37	85.00 13	43.56 58	54.21 218	2.481 37	62.13 66	28.862 101	57.03 196
21.1	6.156 11	84.65 53	42.98 46	52.03 261	2.444 13	62.79 59	28.761 68	55.07 219
31.1	6.145 18	84.12 74	42.52 31	49.42 292	2.431 14	63.38 48	28.693 32	52.88 230
Feb. 10.1	6.163 47	83.38 93	42.21 16	46.50 310	2.445 41	63.86 33	28.661 9	50.58 232
20.0	6.210	82.45	42.05	43.40	2.486	64.19	28.670	48.26
Mar. 1.0	6.290 80	81.31 114	42.06 1	40.25 315	2.558 72	64.33 14	28.723 53	46.01 225
11.0	6.404 114	79.99 132	42.23 17	37.16 309	2.663 105	64.25 8	28.822 99	43.95 208
20.9	6.551 147	78.49 150	42.56 33	34.29 287	2.800 137	63.93 32	28.969 147	42.16 179
30.9	6.733 182	76.82 167	43.05 49	31.72 257	2.972 172	63.34 59	29.163 194	40.71 145
	217	181	63	214	205	86	238	101
Apr. 9.9	6.950	75.01	43.68	29.58	3.177	62.48	29.401	39.70
19.9	7.198 248	73.09 192	44.42 74	27.91 167	3.413 236	61.34 114	29.680 279	39.15 55
29.8	7.475 277	71.09 200	45.26 84	26.81 110	3.678 265	59.96 138	29.994 314	39.10 5
May 9.8	7.777 302	69.06 203	46.16 90	26.29 52	3.965 287	58.36 160	30.337 343	39.55 45
19.8	8.097 320	67.04 202	47.10 94	26.36 7	4.270 306	56.57 179	30.698 361	40.52 97
	332	195	95	70	316	193	372	141
29.8	8.429	65.09	48.05	27.06	4.586	54.64	31.070	41.93
June 8.7	8.766 337	63.25 184	48.98 93	28.34 128	4.904 318	52.62 202	31.442 372	43.78 185
18.7	9.098 332	61.57 168	49.87 89	30.14 180	5.219 315	50.57 205	31.805 363	46.01 223
28.7	9.419 321	60.09 148	50.69 82	32.44 230	5.520 301	48.53 204	32.149 344	48.56 255
July 8.6	9.718 299	58.87 122	51.42 73	35.19 275	5.801 281	46.56 197	32.466 317	51.36 280
	271	98	62	313	253	186	283	298
18.6	9.989	57.89	52.04	38.32	6.054	44.70	32.749	54.34
28.6	10.226 237	57.20 69	52.55 51	41.72 340	6.274 220	43.01 169	32.990 241	57.45 311
Aug. 7.6	10.423 197	56.79 41	52.92 37	45.34 362	6.456 182	41.49 152	33.186 196	60.59 314
17.5	10.575 152	56.67 12	53.16 24	49.10 376	6.598 142	40.19 130	33.334 148	63.72 313
27.5	10.681 106	56.82 15	53.26 10	52.93 383	6.695 97	39.12 107	33.430 96	66.76 304
	60	39	4	382	58	85	46	290
Sept. 6.5	10.741 15	57.21 58	53.22 17	56.75 374	6.753 15	38.27 61	33.476 0	69.66 272
16.4	10.756 26	57.79 75	53.05 31	60.49 356	6.768 22	37.66 40	33.476 44	72.38 246
26.4	10.730 62	58.54 85	52.74 42	64.05 330	6.746 54	37.26 18	33.432 83	74.84 217
Oct. 6.4	10.668 91	59.39 92	52.32 53	67.35 298	6.692 80	37.08 1	33.349 117	77.01 184
16.4	10.577 115	60.31 93	51.79 63	70.33 260	6.612 100	37.07 15	33.232 143	78.85 149
26.3	10.462 128	61.24 88	51.16 70	72.93 215	6.512 113	37.22 31	33.089 162	80.34 108
Nov. 5.3	10.334 135	62.12 79	50.46 77	75.08 163	6.399 120	37.53 42	32.927 174	81.42 66
15.3	10.199 135	62.91 67	49.69 80	76.71 109	6.279 121	37.95 52	32.753 180	82.08 22
25.3	10.064 129	63.58 54	48.89 82	77.80 45	6.158 112	38.47 59	32.573 180	82.30 22
Dec. 5.2	9.935 115	64.12 36	48.07 82	78.25 17	6.046 104	39.06 66	32.393 173	82.08 67
15.2	9.820	64.48 18	47.25 78	78.08 77	5.942 91	39.72 70	32.220 160	81.41 109
25.2	9.720 100	64.66 1	46.47 73	77.31 135	5.851 73	40.42 71	32.060 143	80.32 146
35.1	9.642 78	64.65	45.74	75.96	5.778	41.13	31.917	78.86
Mean Place	6.015	80.46	48.168	36.47	2.420	62.80	29.414	45.76
Sec δ, Tan δ	1.072	-0.387	4.076	+3.952	1.000	-0.009	1.280	+0.799
Δφ α, Δω α	+0.06	+0.02	+0.02	-0.24	+0.06	0.00	+0.05	-0.05
Δφ δ, Δω δ	+0.4	-0.4	+0.4	-0.4	+0.4	-0.4	+0.4	-0.4

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	ϵ Piscis Australis. Mag. 4.2		ζ Pegasi. Mag. 3.6		β Gruis. Mag. 2.2		η Pegasi. Mag. 3.1	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 22 36	° ' " -27 28	h m 22 37	° ' " +10 23	h m 22 37	° ' " -47 19	h m 22 39	° ' " +29 46
	s	"	s	"	s	"	s	"
Jan. 1.2	1.017 73	62.52 40	16.385 68	37.85 105	39.771 125	38.55 124	3.546 101	64.05 124
11.1	0.944 49	62.12 40	16.317 49	36.80 110	39.646 91	37.31 159	3.445 78	62.54 173
21.1	0.895 19	61.47 85	16.268 24	35.70 111	39.555 50	35.72 192	3.367 52	60.80 158
31.1	0.876 10	60.59 111	16.244 1	34.59 106	39.505 9	33.80 220	3.315 20	58.92 196
Feb. 10.1	0.886 40	59.48 132	16.245 31	33.53 96	39.496 34	31.60 243	3.295 15	56.96 196
20.0	0.926 75	58.16 152	16.276 63	32.57 79	39.530 79	29.17 262	3.310 54	55.01 183
Mar. 1.0	1.001 110	56.64 171	16.339 95	31.78 59	39.609 125	26.55 274	3.364 92	53.16 162
11.0	1.111 145	54.93 187	16.434 132	31.19 31	39.734 172	23.81 282	3.456 136	51.51 138
20.9	1.256 182	53.06 200	16.566 167	30.88 1	39.906 218	20.99 285	3.592 178	50.13 161
30.9	1.438 218	51.06 211	16.733 202	30.87 31	40.124 263	18.14 281	3.770 219	49.10 54
Apr. 9.9	1.656 252	48.95 217	16.935 235	31.18 66	40.387 305	15.33 274	3.989 256	48.46 25
19.9	1.908 282	46.78 219	17.170 264	31.84 98	40.692 343	12.59 258	4.245 288	48.26 25
29.8	2.190 309	44.59 217	17.434 288	32.82 131	41.035 375	10.01 240	4.533 315	48.51 29
May 9.8	2.499 329	42.42 208	17.722 308	34.13 159	41.410 402	7.61 214	4.848 334	49.21 134
19.8	2.828 342	40.34 198	18.030 317	35.72 183	41.812 418	5.47 185	5.182 346	50.35 124
29.8	3.170 348	38.36 180	18.347 322	37.55 203	42.230 425	3.62 149	5.528 347	51.91 191
June 8.7	3.518 346	36.56 158	18.669 317	39.58 218	42.655 423	2.13 112	5.875 341	53.82 221
18.7	3.864 335	34.98 133	18.986 303	41.76 226	43.078 410	1.01 72	6.216 326	56.05 26
28.7	4.199 313	33.65 102	19.289 284	44.02 228	43.488 385	0.29 29	6.542 301	58.53 26
July 8.6	4.512 286	32.63 73	19.573 256	46.30 227	43.873 350	0.00 13	6.843 271	61.21 26
18.6	4.798 251	31.90 41	19.829 223	48.57 218	44.223 307	0.13 53	7.114 234	64.01 26
28.6	5.049 209	31.49 8	20.052 186	50.75 205	44.530 257	0.66 92	7.348 192	66.86 26
Aug. 7.6	5.258 163	31.41 22	20.238 145	52.80 190	44.787 198	1.58 127	7.540 147	69.72 26
17.5	5.421 116	31.63 49	20.383 101	54.70 170	44.985 137	2.85 156	7.687 101	72.52 26
27.5	5.537 66	32.12 75	20.484 59	56.40 150	45.122 74	4.41 177	7.788 56	75.20 221
Sept. 6.5	5.603 20	32.87 94	20.543 19	57.90 125	45.196 12	6.18 193	7.844 11	77.71 23
16.5	5.623 24	33.81 108	20.562 18	59.15 103	45.208 47	8.11 199	7.855 29	80.02 28
26.4	5.599 64	34.89 117	20.544 50	60.18 77	45.161 99	10.10 198	7.826 65	82.08 177
Oct. 6.4	5.535 94	36.06 119	20.494 78	60.95 54	45.062 143	12.08 186	7.761 94	83.85 18
16.4	5.441 121	37.25 115	20.416 98	61.49 30	44.919 180	13.94 167	7.667 118	85.33 114
26.3	5.320 137	38.40 105	20.318 112	61.79 8	44.739 206	15.61 140	7.549 135	86.47 75
Nov. 5.3	5.183 145	39.45 91	20.206 120	61.87 14	44.533 219	17.01 107	7.414 146	87.25 63
15.3	5.038 148	40.36 72	20.086 122	61.73 36	44.314 222	18.08 69	7.268 151	87.67 7
25.3	4.892 142	41.08 51	19.964 118	61.37 54	44.092 215	18.77 28	7.117 144	87.72 33
Dec. 5.2	4.750 129	41.59 27	19.846 111	60.83 73	43.877 201	19.05 14	6.967 144	87.39 79
15.2	4.621 112	41.86 3	19.735 98	60.10 87	43.676 179	18.91 57	6.823 132	86.69 104
25.2	4.509 92	41.89 24	19.637 83	59.23 99	43.497 149	18.34 97	6.691 116	85.05 125
35.2	4.417	41.65	19.554	58.24	43.348	17.37	6.575	84.30
Mean Place	0.724	56.21	16.334	32.93	39.444	27.71	3.756	53.28
Sec δ , Tan δ	1.127	-0.520	1.017	+0.183	1.475	-1.085	1.152	+0.572
$D_{\phi} a, D_w a$	+0.07	+0.03	+0.06	-0.01	+0.07	+0.07	+0.06	-0.04
$\gamma_{\phi} \delta, D_w \delta$	+0.4	-0.4	+0.4	-0.4	+0.4	-0.4	+0.4	-0.3

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	λ Pegasi. Mag. 4.1		ϵ Gruis. Mag. 3.7		τ Aquarii. Mag. 4.2		μ Pegasi. Mag. 3.7	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 22 42	° ' +23 7	h m 22 43	° ' -51 45	h m 22 45	° ' -14 1	h m 22 45	° ' +24 9
	s	"	s	"	s	"	s	"
Jan. 1.2	28.918	32.88	29.556	43.31	9.059	72.76	56.783	37.31
11.1	28.828 ⁹⁰	31.53 ¹³⁵	29.403 ¹⁵³	41.95 ¹³⁶	8.992 ⁶⁷	72.94 ¹⁸	56.690 ⁹³	35.97 ¹³⁴
21.1	28.760 ⁶⁸	30.00 ¹⁵³	29.288 ¹¹⁵	40.18 ¹⁷⁷	8.944 ⁴⁸	72.97 ³	56.619 ⁷¹	34.44 ¹⁵³
31.1	28.717 ⁴³	28.37 ¹⁶³	29.216 ⁷²	38.07 ²¹¹	8.921 ²³	72.83 ¹⁴	56.571 ⁴⁸	32.78 ¹⁶⁶
Feb. 10.1	28.703 ¹⁴	26.70 ¹⁶⁷	29.189 ²⁷	35.68 ²³⁹	8.923 ²	72.51 ³²	56.553 ¹⁸	31.08 ¹⁷⁰
	17	162	21	265	31	50	14	165
20.0	28.720	25.08	29.210	33.03	8.954	72.01	56.567	29.43
Mar. 1.0	28.773 ⁵³	23.58 ¹⁵⁰	29.280 ⁷⁰	30.21 ²⁸²	9.015 ⁶¹	71.29 ⁷²	56.615 ⁴⁸	27.88 ¹⁵⁵
11.0	28.862 ⁸⁹	22.27 ¹³¹	29.401 ¹²¹	27.26 ²⁹⁵	9.108 ⁹³	70.37 ⁹²	56.702 ⁸⁷	26.53 ¹³⁵
20.9	28.991 ¹²⁹	21.24 ¹⁰³	29.573 ¹⁷²	24.24 ³⁰²	9.235 ¹²⁷	69.23 ¹¹⁴	56.828 ¹²⁶	25.44 ¹⁰⁹
30.9	29.160 ¹⁶⁹	20.54 ⁷⁰	29.796 ²²³	21.21 ³⁰³	9.397 ¹⁶²	67.90 ¹³³	56.994 ¹⁶⁶	24.68 ⁷⁶
	207	33	272	296	197	153	206	40
Apr. 9.9	29.367	20.21	30.068	18.23	9.594	66.37	57.200	24.28
19.9	29.610 ²⁴³	20.28 ⁷	30.387 ³¹⁹	15.37 ²⁸⁶	9.823 ²²⁹	64.66 ¹⁷¹	57.440 ²⁴⁰	24.28 ⁰
29.8	29.864 ³⁷⁴	20.76 ⁴⁸	30.748 ³⁶¹	12.67 ²⁷⁰	10.083 ²⁶⁰	62.82 ¹⁸⁴	57.714 ²⁷⁴	24.71 ⁸⁴
May 9.8	30.185 ²⁰¹	21.66 ⁹⁰	31.145 ³⁹⁷	10.20 ²⁴⁷	10.368 ²⁸⁵	60.87 ¹⁹⁵	58.015 ³⁰¹	25.55 ⁴³
19.8	30.505 ³²⁰	22.95 ¹²⁹	31.571 ⁴²⁶	8.02 ²¹⁸	10.675 ³⁰⁷	58.87 ²⁰⁰	58.335 ³²⁰	26.79 ¹²⁴
	332	164	445	187	319	201	333	160
29.8	30.837	24.59	32.016	6.15	10.994	56.86	58.668	28.39
June 8.7	31.172 ³³⁵	26.54 ¹⁹⁵	32.471 ⁴⁵⁵	4.67 ¹⁴⁸	11.320 ³²⁶	54.88 ¹⁹⁶	59.006 ³³⁸	30.31 ¹⁹²
18.7	31.503 ³³¹	28.75 ²²¹	32.925 ⁴⁵⁴	3.60 ¹⁰⁷	11.645 ³²⁵	52.99 ¹⁸⁹	59.338 ³³²	32.51 ²²⁰
28.7	31.820 ³¹⁷	31.17 ²⁴²	33.364 ⁴³⁹	2.97 ⁶³	11.960 ³¹⁵	51.24 ¹⁷⁵	59.658 ³²⁰	34.91 ²⁴⁰
July 8.6	32.114 ²⁹⁴	33.73 ²⁵⁶	33.780 ⁴¹⁶	2.78 ¹⁹	12.256 ²⁹⁶	49.69 ¹⁵⁵	59.956 ²⁹⁸	37.48 ²⁵⁷
	266	263	380	26	271	135	270	264
18.6	32.380	36.36	34.160	3.04	12.527	48.34	60.226	40.12
28.6	32.613 ²³³	39.00 ²⁶⁴	34.495 ³³⁵	3.73 ⁶⁹	12.767 ²⁴⁰	47.25 ¹⁰⁹	60.462 ²³⁶	42.79 ²⁶⁷
Aug. 7.6	32.804 ¹⁹¹	41.60 ²⁶⁰	34.774 ²⁷⁹	4.83 ¹¹⁰	12.969 ²⁰²	46.41 ⁸⁴	60.658 ¹⁹⁶	45.43 ²⁶⁴
17.5	32.954 ¹⁵⁰	44.11 ²⁵¹	34.993 ²¹⁹	6.27 ¹⁴⁴	13.130 ¹⁶¹	45.84 ⁵⁷	60.812 ¹⁵⁴	47.98 ²⁵⁵
27.5	33.059 ¹⁰⁶	46.48 ²³⁷	35.146 ¹⁵³	8.02 ¹⁷⁵	13.247 ¹¹⁷	45.55 ²⁹	60.922 ¹¹⁰	50.40 ²⁴²
	61	219	83	196	72	6	66	224
Sept. 6.5	33.120	48.67	35.229	10.00	13.319	45.49	60.988	52.64
16.5	33.140 ²⁰	50.64 ¹⁹⁷	35.246 ¹⁷	12.13 ²¹³	13.350 ³¹	45.68 ¹⁹	61.011 ²³	54.67 ²⁰³
26.4	33.120 ⁹⁰	52.37 ¹⁷³	35.197 ⁴⁹	14.31 ²¹⁸	13.340 ¹⁰	46.05 ³⁷	60.994 ¹⁷	56.47 ¹⁸⁰
Oct. 6.4	33.068 ⁵²	53.83 ¹⁴⁶	35.090 ¹⁰⁷	16.45 ²¹⁴	13.296 ⁴⁴	46.58 ⁵³	60.944 ⁵⁰	57.98 ¹⁵¹
16.4	32.985 ⁸³	55.00 ¹¹⁷	34.932 ¹⁵⁸	18.47 ²⁰²	13.222 ⁷⁴	47.22 ⁶⁴	60.864 ⁸⁰	59.21 ¹²³
	105	88	199	181	96	72	103	94
26.3	32.880	55.88	34.733	20.28	13.126	47.94	60.761	60.15
Nov. 5.3	32.758 ¹²²	56.43 ⁵⁵	34.505 ²²⁸	21.78 ¹⁵⁰	13.013 ¹¹³	48.69 ⁷⁵	60.640 ¹²¹	60.75 ⁶⁰
15.3	32.627 ¹³¹	56.67 ²⁴	34.259 ²⁴⁶	22.92 ¹¹⁴	12.891 ¹²²	49.43 ⁷⁴	60.509 ¹³¹	61.03 ²⁸
25.3	32.492 ¹³⁵	56.58 ⁹	34.006 ²⁵³	23.64 ⁷²	12.767 ¹²⁴	50.11 ⁶⁸	60.373 ¹³⁶	61.01 ²
Dec. 5.2	32.357 ¹³⁵	56.19 ³⁹	33.758 ²⁴⁸	23.92 ²⁸	12.647 ¹²⁰	50.73 ⁶²	60.237 ¹³⁶	60.63 ³⁸
	128	70	233	18	111	53	130	68
15.2	32.229	55.49	33.525	23.74	12.536	51.26	60.107	59.95
25.2	32.113 ¹¹⁶	54.51 ⁹⁸	33.315 ²¹⁰	23.09 ⁶⁵	12.437 ⁹⁹	51.67 ⁴¹	59.988 ¹¹⁹	58.99 ⁹⁶
35.2	32.010 ¹⁰³	53.27 ¹²⁴	33.135 ¹⁶⁰	22.00 ¹⁰⁹	12.354 ⁸³	51.95 ²⁸	59.882 ¹⁰⁶	57.76 ¹²³
Mean Place	28.996	23.87	29.198	31.65	8.778	70.37	56.855	27.86
Sec δ , Tan δ	1.088	+0.427	1.615	-1.269	1.031	-0.250	1.096	+0.449
$D\psi a$, $D\omega a$	+0.06	-0.03	+0.07	+0.08	+0.06	+0.02	+0.06	-0.03
$D\psi \delta$, $D\omega \delta$	+0.4	-0.3	+0.4	-0.3	+0.4	-0.3	+0.4	-0.3

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	ϵ Cephei. Mag. 3.7		λ Aquarii. Mag. 3.8		ρ Indi. Mag. 6.1		δ Aquarii. Mag. 3.5	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 22 46	° ' " +65 45	h m 22 48	° ' " - 8 1	h m 22 48	° ' " -70 30	h m 22 50	° ' " -16 15
	s	"	s	"	s	"	s	"
Jan. 1.2	39.46	49.40	14.243	37.30	49.97	96.29	11.942	67.16
11.1	39.09	47.79	14.176	37.71	49.58	94.27	11.869	67.27
21.1	38.77	45.69	14.127	38.02	49.27	91.79	11.816	67.20
31.1	38.52	43.19	14.102	38.19	49.05	88.94	11.788	66.95
Feb. 10.1	38.34	40.40	14.100	38.22	48.92	85.76	11.784	66.51
20.0	38.24	37.43	14.127	38.08	48.87	82.37	11.809	65.86
Mar. 1.0	38.24	34.40	14.183	37.73	48.94	78.81	11.865	65.01
11.0	38.33	31.44	14.270	37.18	49.08	75.19	11.952	63.95
21.0	38.53	28.67	14.393	36.40	49.34	71.58	12.075	62.63
30.9	38.82	26.21	14.550	35.39	49.68	68.06	12.234	61.21
Apr. 9.9	39.19	24.15	14.740	34.13	50.11	64.68	12.426	59.55
19.9	39.64	22.57	14.965	32.67	50.62	61.54	12.653	57.75
29.8	40.15	21.53	15.221	31.02	51.20	58.67	12.912	55.82
May 9.8	40.71	21.07	15.501	29.21	51.85	56.16	13.197	53.80
19.8	41.31	21.20	15.803	27.28	52.56	54.06	13.504	51.74
29.8	41.92	21.91	16.118	25.28	53.28	52.40	13.826	49.69
June 8.7	42.53	23.19	16.440	23.26	54.04	51.24	14.154	47.71
18.7	43.13	24.99	16.760	21.28	54.79	50.57	14.482	45.83
28.7	43.69	27.28	17.070	19.38	55.51	50.43	14.802	44.13
July 8.7	44.20	29.99	17.364	17.60	56.19	50.81	15.103	42.62
18.6	44.65	33.06	17.632	16.01	56.82	51.70	15.380	41.35
28.6	45.02	36.40	17.869	14.62	57.38	53.08	15.625	40.33
Aug. 7.6	45.33	39.95	18.069	13.47	57.84	54.87	15.833	39.60
17.5	45.54	43.64	18.229	12.55	58.20	57.03	15.999	39.14
27.5	45.67	47.37	18.346	11.90	58.43	59.48	16.121	38.97
Sept. 6.5	45.72	51.09	18.420	11.48	58.55	62.13	16.199	39.05
16.5	45.69	54.71	18.453	11.30	58.55	64.87	16.234	39.37
26.4	45.58	58.15	18.448	11.33	58.42	67.60	16.230	39.87
Oct. 6.4	45.39	61.35	18.408	11.55	58.18	70.20	16.188	40.53
16.4	45.12	64.24	18.339	11.91	57.83	72.59	16.116	41.29
26.4	44.81	66.75	18.249	12.39	57.41	74.63	16.022	42.11
Nov. 5.3	44.45	68.82	18.143	12.95	56.92	76.25	15.909	42.94
15.3	44.06	70.39	18.028	13.56	56.39	77.38	15.787	43.74
25.3	43.63	71.42	17.910	14.19	55.83	77.97	15.662	44.47
Dec. 5.2	43.20	71.87	17.795	14.81	55.27	77.97	15.540	45.11
15.2	42.76	71.73	17.686	15.41	54.74	77.39	15.426	45.63
25.2	42.33	71.00	17.589	15.95	54.25	76.23	15.323	46.00
35.2	41.94	69.71	17.507	16.43	53.81	74.53	15.236	46.22
Mean Place	41.181	30.08	13.982	36.81	49.737	82.17	11.621	64.20
Sec δ , Tan δ	2.436	+2.221	1.010	-0.141	2.999	-2.827	1.042	-0.292
$D\psi \alpha$, $D\omega \alpha$	+0.04	-0.14	+0.06	+0.01	+0.08	+0.18	+0.06	+0.02
$D\psi \delta$, $D\omega \delta$	+0.4	-0.3	+0.4	-0.3	+0.4	-0.3	+0.4	-0.3

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	α Piscis Australis. (Fomalhaut.) Mag. 1.3		γ Andromedæ. Mag. 3.6		β Pegasi. Var. 2.2-2.7		α Pegasi. (Markab.) Mag. 2.6	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m	° '	h m	° '	h m	° '	h m	° '
	22 53	-30 3	22 58	+41 52	22 59	+27 37	23 0	+14 45
	s	"	s	"	s	"	s	"
Jan. 1.2	1.123	70.84	2.826	42.45	41.965	47.88	34.651	18.26
11.1	1.033 ⁹⁰	70.42 ⁴²	2.874 ¹⁵²	40.95 ¹⁵⁰	41.858 ¹⁰⁷	46.57 ¹³¹	34.566 ⁸⁵	17.19 ¹⁰⁷
21.1	0.967 ⁶⁶	69.71 ⁷¹	2.545 ¹²⁹	39.10 ¹⁸⁵	41.770 ⁸⁸	45.02 ¹⁵⁵	34.498 ⁶⁸	16.01 ¹¹⁸
31.1	0.927 ⁴⁰	68.74 ⁹⁷	2.444 ¹⁰¹	36.99 ²¹¹	41.706 ⁶⁴	43.32 ¹⁷⁰	34.450 ⁴⁸	14.78 ¹²³
Feb. 10.1	0.916 ¹¹	67.51 ¹²³	2.380 ⁶⁴	34.70 ²²⁹	41.670 ³⁶	41.53 ¹⁷⁹	34.428 ²²	13.56 ¹²²
	21	146	23	236	5	178	5	114
20.0	0.937	66.05	2.357	32.34	41.665	39.75	34.433	12.42
Mar. 1.0	0.992 ⁵⁵	64.37 ¹⁶⁸	2.379 ²²	30.00 ²³⁴	41.697 ³²	38.05 ¹⁷⁰	34.470 ³⁷	11.40 ¹⁰²
11.0	1.082 ⁹⁰	62.50 ¹⁸⁷	2.451 ⁷²	27.78 ²²²	41.769 ⁷²	36.51 ¹⁵⁴	34.542 ⁷²	10.56 ⁸⁴
21.0	1.210 ¹²⁸	60.45 ²⁰⁵	2.573 ¹²²	25.80 ¹⁹⁸	41.882 ¹¹³	35.23 ¹²⁸	34.651 ¹⁰⁹	9.99 ⁶⁷
30.9	1.376 ¹⁶⁶	58.27 ²¹⁸	2.747 ¹⁷⁴	24.14 ¹⁶⁶	42.037 ¹⁵⁵	34.25 ⁹⁸	34.798 ¹⁴⁷	9.71 ²⁸
	205	227	226	128	197	61	184	4
Apr. 9.9	1.581	56.00	2.972	22.86	42.234	33.64	34.982	9.75
19.9	1.821 ²⁴⁰	53.66 ²³⁴	3.242 ²⁷⁰	22.03 ⁸³	42.470 ²³⁶	33.44 ²⁰	35.203 ²²¹	10.15 ⁴⁰
29.8	2.096 ²⁷⁵	51.31 ²³⁵	3.553 ³¹¹	21.69 ³⁴	42.742 ²⁷²	33.66 ²²	35.457 ²⁵⁴	10.91 ⁷⁶
May 9.8	2.401 ³⁰⁵	49.00 ²³¹	3.897 ³⁴⁴	21.85 ¹⁶	43.044 ³⁰²	34.31 ⁶⁵	35.738 ²⁸¹	12.00 ¹⁰⁹
19.8	2.729 ³²⁸	46.78 ²²²	4.266 ³⁶⁹	22.51 ⁶⁶	43.368 ³²⁴	35.38 ¹⁰⁷	36.042 ³⁰⁴	13.41 ¹⁴¹
	345	207	384	116	339	145	818	171
29.8	3.074	44.71	4.650	23.67	43.707	36.83	36.360	15.12
June 8.7	3.429 ³⁵⁵	42.82 ¹⁸⁹	5.039 ³⁸⁹	25.28 ¹⁶¹	44.052 ³⁴⁵	38.65 ¹⁸²	36.686 ³²⁶	17.06 ¹⁹⁴
18.7	3.782 ³⁵³	41.20 ¹⁶²	5.424 ³⁸⁵	27.30 ²⁰²	44.395 ³⁴³	40.77 ²¹²	37.011 ³²⁶	19.20 ²¹⁴
28.7	4.128 ³⁴⁶	39.83 ¹³⁷	5.793 ³⁶⁹	29.67 ²³⁷	44.727 ³³²	43.13 ²³⁶	37.326 ³¹⁵	21.47 ²²⁷
July 8.7	4.457 ³²⁹	38.78 ¹⁰⁶	6.138 ³⁴⁵	32.35 ²⁶⁸	45.038 ³¹¹	45.69 ²⁵⁶	37.623 ²⁹⁷	23.81 ²³⁴
	302	71	312	290	285	268	274	237
18.6	4.759	38.07	6.450	35.25	45.323	48.37	37.897	26.18
28.6	5.027 ²⁶⁸	37.71 ³⁶	6.722 ²⁷²	38.33 ³⁰⁸	45.574 ²⁵¹	51.11 ²⁷⁴	38.138 ²⁴¹	28.51 ²³³
Aug. 7.6	5.255 ²²⁸	37.68 ³	6.950 ²²⁸	41.49 ³¹⁶	45.786 ²¹²	53.85 ²⁷⁴	38.344 ²⁰⁶	30.75 ²²⁴
17.5	5.439 ¹⁸⁴	37.99 ³¹	7.129 ¹⁷⁹	44.68 ³¹⁹	45.955 ¹⁶⁹	56.54 ²⁶⁹	38.511 ¹⁶⁷	32.86 ²¹¹
27.5	5.574 ¹³⁵	38.61 ⁶²	7.257 ¹²⁸	47.83 ³¹⁵	46.080 ¹²⁵	59.12 ²⁵⁸	38.635 ¹²⁴	34.81 ¹⁹⁵
	86	88	78	304	81	243	83	176
Sept. 6.5	5.660	39.49	7.335	50.87	46.161	61.55	38.718	36.57
16.5	5.698 ³⁸	40.58 ¹⁰⁹	7.363 ²⁸	53.77 ²⁹⁰	46.199 ³⁸	63.79 ²²⁴	38.760 ⁴²	38.10 ¹⁵³
26.4	5.690 ⁸	41.84 ¹²⁶	7.345 ¹⁸	56.44 ²⁶⁷	46.197 ²	65.79 ²⁰⁰	38.764 ⁴	39.39 ¹²⁹
Oct. 6.4	5.642 ⁴⁸	43.19 ¹³⁵	7.284 ⁶¹	58.86 ²⁴²	46.158 ³⁹	67.52 ¹⁷³	38.734 ³⁰	40.44 ¹⁰⁶
16.4	5.557 ⁸⁵	44.56 ¹³⁷	7.188 ⁹⁶	60.97 ²¹¹	46.088 ⁷⁰	68.99 ¹⁴⁷	38.676 ⁵⁸	41.23 ⁷⁹
	112	133	129	176	95	114	83	55
26.4	5.445	45.89	7.059	62.73	45.993	70.13	38.593	41.78
Nov. 5.3	5.314 ¹³¹	47.11 ¹²²	6.907 ¹⁵²	64.11 ¹³⁸	45.877 ¹¹⁶	70.94 ⁸¹	38.493 ¹⁰⁰	42.06 ²⁸
15.3	5.170 ¹⁴⁴	48.17 ¹⁰⁶	6.736 ¹⁷¹	65.06 ⁹⁵	45.748 ¹²⁹	71.43 ⁴⁹	38.382 ¹¹¹	42.12 ⁶
25.3	5.021 ¹⁴⁹	49.03 ⁸⁶	6.554 ¹⁸²	65.56 ⁵⁰	45.612 ¹³⁶	71.56 ¹³	38.263 ¹¹⁹	41.92 ²⁰
Dec. 5.2	4.874 ¹⁴⁷	49.64 ⁶¹	6.367 ¹⁸⁷	65.61 ⁵	45.472 ¹⁴⁰	71.34 ²²	38.144 ¹¹⁹	41.49 ⁴³
	139	33	187	41	137	56	114	64
15.2	4.735	49.97	6.180	65.20	45.335	70.78	38.030	40.85
25.2	4.611 ¹²⁴	50.03 ⁶	6.001 ¹⁷⁹	64.34 ⁸⁶	45.205 ¹³⁰	69.91 ⁸⁷	37.921 ¹⁰⁹	40.02 ⁸³
35.2	4.505 ¹⁰⁶	49.81 ²²	5.836 ¹⁶⁵	63.06 ¹²⁸	45.087 ¹¹⁸	68.74 ¹¹⁷	37.824 ⁹⁷	39.02 ¹⁰⁰
Mean Place	0.729	64.01	3.161	27.39	42.002	36.74	34.516	11.08
Sec δ , Tan δ	1.155	-0.579	1.343	+0.897	1.129	+0.524	1.034	+0.263
D ϕ α , D ω α	+0.06	+0.04	+0.05	-0.06	+0.06	-0.03	+0.06	-0.02
D ϕ δ , D ω δ	+0.4	-0.3	+0.4	-0.3	+0.4	-0.3	+0.4	-0.3

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	55 Pegasi. Mag. 4.7		C ² Aquarii. Mag. 3.8		π Cephei. Mag. 4.6		ι Gruis. Mag. 4.1	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 23 2	° ' " + 8 57	h m 23 4	° ' " -21 37	h m 23 5	° ' " +74 55	h m 23 5	° ' " -45 41
Jan. 1.2	46.527 80	24.92 91	58.600 87	47.46 5	10.51 68	81.35 126	37.026 148	77.64 94
11.2	46.447 64	24.01 98	58.513 66	47.41 28	9.83 61	80.09 181	36.878 116	76.70 126
21.1	46.383 45	23.03 97	58.447 45	47.13 50	9.22 52	78.28 229	36.762 85	75.34 170
31.1	46.338 20	22.06 94	58.402 19	46.63 74	8.70 40	75.99 267	36.677 47	73.64 233
Feb. 10.1	46.318 7	21.12 82	58.383 8	45.89 96	8.30 26	73.32 293	36.630 8	71.61 238
20.0	46.325 37	20.30 69	58.391 40	44.93 119	8.04 10	70.39 309	36.622 33	69.31 233
Mar. 1.0	46.362 70	19.61 46	58.431 73	43.74 140	7.94 4	67.30 310	36.655 82	66.78 271
11.0	46.432 105	19.15 25	58.504 108	42.34 160	7.98 21	64.20 298	36.737 122	64.07 284
21.0	46.537 143	18.90 6	58.612 145	40.74 178	8.19 36	61.22 276	36.859 171	61.23 290
30.9	46.680 181	18.96 3	58.757 183	38.96 194	8.55 49	58.46 241	37.030 221	58.33 294
Apr. 9.9	46.861 215	19.32 66	58.940 219	37.02 208	9.04 64	56.05 197	37.251 262	55.42 289
19.9	47.076 247	19.98 99	59.159 253	34.94 215	9.68 73	54.08 148	37.513 306	52.53 298
29.9	47.323 276	20.97 128	59.412 282	32.79 229	10.41 81	52.60 91	37.819 342	49.75 303
May 9.8	47.599 298	22.25 156	59.694 307	30.59 220	11.22 88	51.69 34	38.161 374	47.12 341
19.8	47.897 313	23.81 179	60.001 324	28.39 212	12.10 91	51.35 26	38.535 395	44.71 342
29.8	48.210 321	25.60 198	60.325 334	26.27 203	13.01 91	51.61 84	38.930 410	42.59 381
June 8.7	48.531 320	27.58 213	60.659 337	24.24 187	13.92 89	52.45 141	39.340 414	40.78 385
18.7	48.851 314	29.71 219	60.996 331	22.37 165	14.81 85	53.86 193	39.754 405	39.33 384
28.7	49.165 296	31.90 223	61.327 315	20.72 141	15.66 79	55.79 241	40.159 389	38.29 364
July 8.7	49.461 272	34.13 220	61.642 292	19.31 113	16.45 70	58.20 281	40.548 363	37.65 36
18.6	49.733 241	36.33 212	61.934 262	18.18 82	17.15 59	61.01 317	40.911 324	37.49 28
28.6	49.974 206	38.45 190	62.196 225	17.36 52	17.74 49	64.18 345	41.235 278	37.73 67
Aug. 7.6	50.180 169	40.44 184	62.421 184	16.84 19	18.23 38	67.63 364	41.513 226	38.40 106
17.6	50.349 127	42.28 164	62.605 141	16.65 10	18.61 24	71.27 378	41.739 169	39.46 129
27.5	50.476 86	43.92 142	62.746 95	16.75 39	18.85 11	75.05 383	41.908 110	39.65 167
Sept. 6.5	50.562 45	45.34 120	62.841 50	17.14 61	18.96 2	78.88 380	42.018 51	42.52 188
16.5	50.607 9	46.54 97	62.891 8	17.75 83	18.94 14	82.68 369	42.069 10	44.40 201
26.4	50.616 28	47.51 74	62.899 31	18.58 96	18.80 26	86.37 350	42.059 61	46.41 205
Oct. 6.4	50.588 55	48.25 49	62.868 64	19.54 104	18.54 36	89.87 327	41.998 110	48.46 188
16.4	50.533 78	48.74 27	62.804 89	20.58 109	18.18 48	93.14 291	41.888 145	50.44 187
26.4	50.455 95	49.01 5	62.715 110	21.67 105	17.70 56	96.05 252	41.743 178	52.31 164
Nov. 5.3	50.360 108	49.06 13	62.605 123	22.72 98	17.14 63	98.57 204	41.565 196	53.95 134
15.3	50.252 111	48.93 33	62.482 129	23.70 86	16.51 69	100.61 151	41.369 207	55.29 98
25.3	50.141 115	48.60 49	62.353 129	24.56 70	15.82 73	102.12 93	41.162 209	56.27 60
Dec. 5.3	50.026 110	48.11 64	62.224 123	25.26 52	15.09 75	103.05 32	40.953 202	56.87 18
15.2	49.916 103	47.47 79	62.101 113	25.78 31	14.34 74	103.37 30	40.751 186	57.05 26
25.2	49.813 92	46.68 89	61.988 109	26.09 11	13.60 71	103.07 91	40.565 167	56.79 68
35.2	49.721	45.79	61.888	26.20	12.89	102.16	40.398	56.11
Mean Place	46.322	19.55	58.174	43.16	13.335	59.63	36.516	67.14
Sec δ, Tan δ	1.012	+0.158	1.076	-0.396	3.848	+3.716	1.432	-1.025
Dψ α, Dω α	+0.06	-0.01	+0.06	+0.03	+0.04	-0.24	+0.07	+0.07
Dψ δ, Dω δ	+0.4	-0.2	+0.4	-0.2	+0.4	-0.2	+0.4	-0.2

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	59 Pegasi. Mag. 5.2		5 H ¹ . Cassiop. Mag. 5.6		φ Aquarii. Mag. 4.4		ψ Aquarii. Mag. 4.5	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 23 7	° ' s + 8 15	h m 23 9	° ' s +56 42	h m 23 9	° ' s - 6 29	h m 23 11	° ' s - 9 32
Jan. 1.2	29.931	54.96	13.263	35.23	58.709	66.93	29.912	44.01
11.2	29.849	54.07	13.010	33.85	58.630	67.42	29.834	44.39
21.1	29.781	53.14	12.787	31.99	58.564	67.78	29.769	44.64
31.1	29.734	52.21	12.604	29.76	58.521	68.04	29.725	44.75
Feb. 10.1	29.710	51.32	12.470	27.23	58.498	68.16	29.701	44.68
20.0	29.713	50.54	12.394	24.52	58.504	68.09	29.708	44.44
Mar. 1.0	29.745	49.91	12.382	21.75	58.536	67.84	29.739	44.00
11.0	29.809	49.47	12.441	19.02	58.602	67.36	29.803	43.34
21.0	29.912	49.27	12.571	16.46	58.701	66.67	29.903	42.45
30.9	30.049	49.36	12.775	14.17	58.837	65.72	30.037	41.33
Apr. 9.9	30.225	49.75	13.046	12.25	59.008	64.54	30.209	39.98
19.9	30.436	50.44	13.382	10.77	59.217	63.13	30.417	38.42
29.9	30.673	51.46	13.773	9.80	59.455	61.51	30.655	36.69
May 9.8	30.954	52.75	14.208	9.38	59.723	59.74	30.925	34.80
19.8	31.248	54.32	14.678	9.50	60.016	57.82	31.218	32.81
29.8	31.560	56.12	15.170	10.17	60.325	55.81	31.529	30.75
June 8.7	31.881	58.10	15.667	11.38	60.644	53.76	31.850	28.68
18.7	32.202	60.21	16.157	13.10	60.965	51.73	32.174	26.66
28.7	32.516	62.40	16.632	15.27	61.280	49.75	32.492	24.74
July 8.7	32.814	64.61	17.075	17.84	61.581	47.91	32.796	22.95
18.6	33.089	66.79	17.478	20.76	61.859	46.22	33.079	21.34
28.6	33.335	68.87	17.831	23.93	62.110	44.69	33.333	19.97
Aug. 7.6	33.544	70.83	18.128	27.30	62.325	43.42	33.553	18.82
17.6	33.717	72.63	18.362	30.81	62.504	42.40	33.733	17.96
27.5	33.849	74.24	18.535	34.37	62.643	41.62	33.874	17.35
Sept. 6.5	33.939	75.63	18.642	37.89	62.737	41.11	33.973	17.02
16.5	33.990	76.79	18.684	41.34	62.793	40.83	34.030	16.94
26.4	34.002	77.73	18.665	44.62	62.807	40.78	34.046	17.06
Oct. 6.4	33.979	78.42	18.590	47.69	62.789	40.94	34.029	17.39
16.4	33.929	78.89	18.462	50.45	62.739	41.27	33.980	17.85
26.4	33.855	79.12	18.289	52.88	62.667	41.73	33.907	18.45
Nov. 5.3	33.764	79.14	18.078	54.88	62.573	42.27	33.815	19.12
15.3	33.659	78.99	17.837	56.44	62.469	42.90	33.709	19.83
25.3	33.547	78.67	17.572	57.50	62.359	43.54	33.599	20.54
Dec. 5.3	33.435	78.17	17.293	58.04	62.247	44.20	33.485	21.23
15.2	33.325	77.52	17.008	58.01	62.137	44.85	33.375	21.86
25.2	33.222	76.76	16.727	57.44	62.037	45.47	33.273	22.42
35.2	33.128	75.90	16.460	56.35	61.945	46.02	33.181	22.88
Mean Place	29.692	49.65	14.017	16.13	58.342	67.44	29.521	43.58
Sec δ, Tan δ	1.011	+0.145	1.822	+1.523	1.006	-0.114	1.014	-0.168
D _ψ α, D _ω α	+0.06	-0.01	+0.05	-0.10	+0.06	+0.01	+0.06	+0.01
D _ψ δ, D _ω δ	+0.4	-0.2	+0.4	-0.2	+0.4	-0.2	+0.4	-0.2

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	γ Tucanæ. Mag. 4.1		γ Piscium. Mag. 3.8		γ Sculptoris. Mag. 4.5		α Cephei. Mag. 4.9	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 23 12	° ' " -58 41	h m 23 12	° ' " + 2 49	h m 23 14	° ' " -32 58	h m 23 15	° ' " +67 38
	s	"	s	"	s	"	s	"
Jan. 1.2	32.610	61.29	48.938	26.96	17.966	90.85	8.76	87.76
11.2	32.368 ²⁴²	59.92 ¹³⁷	48.857 ⁸¹	26.22 ⁷⁴	17.855 ¹¹¹	90.44 ⁴¹	8.33 ⁴³	86.51 ¹²⁵
21.1	32.167 ²⁰¹	58.09 ¹⁸³	48.792 ⁶⁵	25.51 ⁷¹	17.764 ⁹¹	89.70 ⁷⁴	7.94 ³⁹	84.76 ¹⁷⁵
31.1	32.011 ¹⁵⁶	55.85 ²²⁴	48.745 ⁴⁷	24.83 ⁶⁸	17.698 ⁶⁶	88.65 ¹⁰⁵	7.61 ³³	82.53 ²²¹
Feb. 10.1	31.906 ¹⁰⁵	53.25 ²⁶⁰	48.721 ²⁴	24.23 ⁶⁰	17.660 ³⁸	87.32 ¹³³	7.35 ²⁶	79.94 ²⁵⁸
	49 ²⁸⁸		1 ¹³⁴	47 ⁴⁷	8 ¹⁶¹		17 ¹⁷	28 ²⁸³
20.1	31.857	50.37	48.722	23.76	17.652	85.71	7.18	77.11
Mar. 1.0	31.866 ⁰	47.25 ³¹²	48.753 ³¹	23.46 ³⁰	17.679 ²⁷	83.87 ¹⁸⁴	7.10 ⁸	74.14 ²⁶⁷
11.0	31.935 ⁶⁹	43.98 ³²⁷	48.815 ⁶²	23.35 ¹¹	17.742 ⁶³	81.81 ²⁰⁶	7.13 ³	71.15 ²⁶⁹
21.0	32.066 ¹³¹	40.63 ³³⁵	48.912 ⁹⁷	23.50 ¹⁵	17.844 ¹⁰²	79.58 ²²³	7.27 ¹⁴	68.28 ²⁶⁷
30.9	32.261 ¹⁹⁵	37.26 ³³⁷	49.046 ¹³⁴	23.90 ⁴⁰	17.986 ¹⁴²	77.21 ²³⁷	7.51 ²⁴	65.64 ²⁶⁴
	255 ³³²		171 ¹⁷¹	68 ⁶⁸	184 ²⁴⁸		34 ³⁴	23 ²³⁰
Apr. 9.9	32.516	33.94	49.217	24.58	18.170	74.73	7.85	63.34
19.9	32.830 ³¹⁴	30.73 ³²¹	49.423 ²⁰⁶	25.53 ⁹⁵	18.392 ²²²	72.20 ²⁵³	8.29 ⁴⁴	61.47 ¹⁶⁷
29.9	33.199 ³⁶⁹	27.71 ³⁰²	49.661 ²³⁸	26.76 ¹²³	18.655 ²⁶³	69.66 ²⁵⁴	8.80 ⁵¹	60.08 ¹³⁹
May 9.8	33.617 ⁴¹⁸	24.92 ²⁷⁹	49.930 ²⁶⁹	28.24 ¹⁴⁸	18.950 ²⁹⁵	67.17 ²⁴⁹	9.37 ⁵⁷	59.23 ⁸²
19.8	34.076 ⁴⁵⁹	22.46 ²⁴⁶	50.222 ²⁹²	29.94 ¹⁷⁰	19.271 ³²¹	64.78 ²³⁹	10.00 ⁶³	58.97 ²⁶
	490 ²¹⁰		310 ³¹⁰	188 ¹⁸⁸	345 ³⁴⁵		65 ⁶⁵	25 ²⁵
29.8	34.566	20.36	50.532	31.82	19.616	62.55	10.65	59.26
June 8.8	35.074 ⁵⁰⁸	18.66 ¹⁷⁰	50.851 ³¹⁹	33.83 ²⁰¹	19.973 ³⁵⁷	60.54 ²⁰¹	11.31 ⁶⁶	60.16 ⁹⁰
18.7	35.590 ⁵¹⁶	17.42 ¹²⁴	51.172 ³²¹	35.92 ²⁰⁹	20.334 ³⁶¹	58.80 ¹⁷⁴	11.96 ⁶⁵	61.57 ¹⁴¹
28.7	36.100 ⁵¹⁰	16.66 ⁷⁶	51.487 ³¹⁵	38.03 ²¹¹	20.690 ³⁵⁶	57.34 ¹⁴⁶	12.59 ⁶³	63.52 ¹⁹⁰
July 8.7	36.590 ⁴⁹⁰	16.39 ²⁷	51.786 ²⁹⁹	40.12 ²⁰⁹	21.033 ³⁴³	56.24 ¹¹⁰	13.18 ⁵⁹	65.93 ²⁴¹
	457 ²³		280 ²⁸⁰	202 ²⁰²	319 ³¹⁹		53 ⁵³	27 ²⁷⁸
18.6	37.047	16.62	52.066	42.14	21.352	55.50	13.71	68.71
28.6	37.459 ⁴¹²	17.34 ⁷²	52.316 ²⁵⁰	44.03 ¹⁸⁹	21.641 ²⁸⁹	55.14 ³⁶	14.18 ⁴⁷	71.85 ³¹⁴
Aug. 7.6	37.815 ³⁵⁶	18.51 ¹¹⁷	52.533 ²¹⁷	45.74 ¹⁷¹	21.892 ²⁵¹	55.15 ¹	14.56 ³¹	75.24 ³³⁸
17.6	38.104 ²⁸⁹	20.10 ¹⁵⁹	52.712 ¹⁷⁹	47.27 ¹⁵³	22.099 ²⁰⁷	55.53 ³⁸	14.87 ³⁸	78.83 ³³⁹
27.5	38.320 ²¹⁶	22.03 ¹⁹³	52.852 ¹⁴⁰	48.59 ¹³²	22.259 ¹⁶⁰	56.25 ⁷²	15.09 ²²	82.52 ²⁶⁰
	137 ²²²		98 ⁹⁸	107 ¹⁰⁷	110 ¹¹⁰		13 ¹³	26 ²⁷⁶
Sept. 6.5	38.457	24.25	52.950	49.66	22.369	57.25	15.22	86.28
16.5	38.515 ⁵⁸	26.66 ²⁴¹	53.007 ⁵⁷	50.51 ⁸⁵	22.429 ⁶⁰	58.51 ¹²⁶	15.26 ⁴	89.98 ³⁷⁰
26.5	38.495 ²⁰	29.16 ²⁵⁰	53.027 ²⁰	51.10 ⁵⁹	22.442 ¹³	59.95 ¹⁴⁴	15.21 ⁵	93.57 ³³⁹
Oct. 6.4	38.401 ⁹⁴	31.65 ²⁴⁹	53.013 ¹⁴	51.49 ³⁹	22.410 ³²	61.49 ¹⁵⁴	15.08 ¹³	96.97 ³⁴⁰
16.4	38.241 ¹⁶⁰	34.03 ²³⁸	52.969 ⁴⁴	51.66 ¹⁷	22.340 ⁷⁰	63.07 ¹⁵⁸	14.88 ²⁰	100.13 ³¹⁸
	217 ²¹⁶		68 ⁶⁸	1 ¹	101 ¹⁰¹		28 ²⁸	281 ²⁸¹
26.4	38.024	36.19	52.901	51.65	22.239	64.62	14.60	102.94
Nov. 5.3	37.761 ²⁶³	38.05 ¹⁸⁶	52.815 ⁸⁶	51.46 ¹⁹	22.113 ¹²⁶	66.06 ¹⁴⁴	14.26 ³⁴	105.35 ²⁴¹
15.3	37.466 ²⁹⁵	39.51 ¹⁴⁶	52.716 ⁹⁹	51.13 ³³	21.970 ¹⁴³	67.31 ¹²⁵	13.88 ³⁸	107.32 ¹⁹⁷
25.3	37.152 ³¹⁴	40.53 ¹⁰²	52.609 ¹⁰⁷	50.66 ⁴⁷	21.818 ¹⁵²	68.34 ¹⁰³	13.45 ⁴³	108.75 ¹⁴³
Dec. 5.3	36.833 ³¹⁹	41.05 ⁵²	52.501 ¹⁰⁸	50.11 ⁵⁵	21.663 ¹⁵⁵	69.10 ⁷⁶	13.00 ⁴⁵	109.64 ⁸⁹
	313 ¹		107 ¹⁰⁷	64 ⁶⁴	150 ¹⁵⁰		47 ⁴⁷	26 ²⁶
15.2	36.520	41.04	52.394	49.47	21.513	69.56	12.53	109.90
25.2	36.225 ²⁹⁵	40.50 ⁵⁴	52.293 ¹⁰¹	48.75 ⁷²	21.372 ¹⁴¹	69.69 ¹³	12.06 ⁴⁷	109.59 ³¹
35.2	35.959 ²⁶⁶	39.46 ¹⁰⁴	52.203 ⁹⁰	48.01 ⁷⁴	21.245 ¹²⁷	69.48 ²¹	11.61 ⁴⁵	108.70 ⁸⁹
Mean Place	32.033	48.44	48.622	23.30	17.440	83.46	10.218	66.39
Sec δ , Tan δ	1.924	-1.645	1.001	+0.049	1.192	-0.649	2.631	+2.433
$D\psi a$, $D\omega a$	+0.07	+0.11	+0.06	0.00	+0.06	+0.04	+0.05	-0.16
$D\psi \delta$, $D\omega \delta$	+0.4	-0.2	+0.4	-0.2	+0.4	-0.2	+0.4	-0.2

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	τ Pegasi. Mag. 4.6		δ^1 Aquarii. Mag. 4.2		4 Cassiopeiae. Mag. 5.2		ν Pegasi. Mag. 4.6	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m	° '	h m	° '	h m	° '	h m	° '
	23 16	+23 16	23 18	-20 33	23 21	+61 49	23 21	+22 56
	s	"	s	"	s	"	s	"
Jan. 1.2	28.756	59.72	34.101	37.46	5.06	38.18	11.246	39.72
11.2	28.650 ¹⁰⁶	58.56 ¹¹⁶	34.009 ⁹²	37.51 ⁵	4.73 ³³	36.96 ¹²²	11.140 ¹⁰⁶	38.60 ¹¹²
21.1	28.560 ⁹⁰	57.22 ¹³⁴	33.932 ⁷⁷	37.33 ¹⁸	4.43 ³⁰	35.23 ¹⁷³	11.048 ⁹²	37.30 ¹³⁰
31.1	28.490 ⁷⁰	55.75 ¹⁴⁷	33.875 ⁵⁷	36.91 ⁴²	4.17 ²⁶	33.07 ²¹⁶	10.976 ⁷²	35.86 ¹⁴⁴
Feb. 10.1	28.443 ⁴⁷	54.21 ¹⁵⁴	33.843 ³²	36.26 ⁶⁵	3.97 ²⁰	30.56 ²⁵¹	10.927 ⁴⁹	34.36 ¹⁵⁰
	16	154	4	88	13	273	20	150
20.1	28.427	52.67	33.839	35.38	3.84	27.83	10.907	32.86
Mar. 1.0	28.444 ¹⁷	51.21 ¹⁴⁶	33.861 ²²	34.26 ¹¹²	3.79 ⁵	24.97 ²⁸⁶	10.920 ¹³	31.44 ¹⁴²
11.0	28.498 ⁵⁴	49.91 ¹³⁰	33.918 ⁵⁷	32.92 ¹³⁴	3.82 ³	22.11 ²⁸⁶	10.969 ⁴⁹	30.18 ¹²⁶
21.0	28.591 ⁹³	48.85 ¹⁰⁸	34.011 ⁹³	31.37 ¹⁵⁵	3.93 ¹¹	19.37 ²⁷⁴	11.058 ⁸⁹	29.12 ¹⁰⁶
30.9	28.726 ¹³⁵	48.07 ⁷⁸	34.140 ¹²⁹	29.61 ¹⁷⁶	4.12 ¹⁹	16.87 ²⁵⁰	11.188 ¹³⁰	28.36 ⁷⁶
	176	46	168	193	28	217	172	44
Apr. 9.9	28.902	47.61	34.308	27.68	4.40	14.70	11.360	27.92
19.9	29.119 ²¹⁷	47.54 ⁷	34.514 ²⁰⁶	25.63 ²⁰⁵	4.75 ³⁵	12.95 ¹⁷⁵	11.573 ²¹³	27.85 ⁷
29.9	29.372 ²⁵³	47.87 ³³	34.753 ²³⁹	23.47 ²¹⁶	5.17 ⁴²	11.69 ¹²⁶	11.822 ²⁴⁹	28.16 ³¹
May 9.8	29.656 ²⁸⁴	48.58 ⁷¹	35.024 ²⁷¹	21.26 ²²¹	5.64 ⁴⁷	10.95 ⁷⁴	12.102 ²⁸⁰	28.86 ⁷⁰
19.8	29.966 ³¹⁰	49.68 ¹¹⁰	35.321 ²⁹⁷	19.05 ²²¹	6.16 ⁵²	10.78 ¹⁷	12.410 ³⁰⁸	29.94 ¹⁰⁸
	327	145	319	220	54	39	325	143
29.8	30.293	51.13	35.640	16.85	6.70	11.17	12.735	31.37
June 8.8	30.630 ³³⁷	52.90 ¹⁷⁷	35.970 ³³⁰	14.76 ²⁰⁰	7.26 ⁵⁶	12.13 ⁹⁶	13.071 ³³⁶	33.12 ¹⁷⁵
18.7	30.968 ³³⁸	54.95 ²⁰⁵	36.305 ³³⁵	12.83 ¹⁹³	7.81 ⁵⁵	13.60 ¹⁴⁷	13.409 ³³⁸	35.15 ²⁰³
28.7	31.298 ³³⁰	57.21 ²²⁶	36.635 ³³⁰	11.08 ¹⁷⁵	8.34 ⁵³	15.57 ¹⁹⁷	13.740 ³³¹	37.39 ²²⁴
July 8.7	31.612 ³¹⁴	59.63 ²⁴²	36.954 ³¹⁹	9.57 ¹⁵¹	8.84 ⁵⁰	17.97 ²⁴⁰	14.056 ³¹⁶	39.77 ²³⁸
	291	252	297	123	46	278	293	250
18.6	31.903	62.15	37.251	8.34	9.30	20.75	14.349	42.27
28.6	32.162 ²⁵⁹	64.72 ²⁵⁷	37.518 ²⁶⁷	7.41 ⁹³	9.71 ⁴¹	23.85 ³¹⁰	14.612 ²⁶³	44.81 ²⁵⁴
Aug. 7.6	32.386 ²²⁴	67.27 ²⁵⁵	37.752 ²³⁴	6.81 ⁶⁰	10.06 ³⁵	27.18 ³³³	14.840 ²²⁸	47.34 ²⁵³
17.6	32.571 ¹⁸⁵	69.75 ²⁴⁸	37.947 ¹⁹⁵	6.50 ³¹	10.33 ²⁷	30.69 ³⁵¹	15.030 ¹⁹⁰	49.80 ²⁴⁶
27.5	32.713 ¹⁴²	72.11 ²³⁶	38.100 ¹⁵³	6.53 ³	10.54 ²¹	34.29 ³⁶⁰	15.178 ¹⁴⁸	52.15 ²³⁵
	100	221	107	31	12	363	105	218
Sept. 6.5	32.813	74.32	38.207	6.84	10.66	37.92	15.283	54.33
16.5	32.871 ⁵⁸	76.33 ²⁰¹	38.271 ⁶⁴	7.40 ⁵⁶	10.72 ⁶	41.49 ³⁵⁷	15.347 ⁶⁴	56.33 ²⁰⁰
26.5	32.889 ¹⁸	78.13 ¹⁸⁰	38.292 ²¹	8.17 ⁷⁷	10.71 ¹	44.95 ³⁴⁶	15.371 ²⁴	58.11 ¹⁷⁸
Oct. 6.4	32.871 ⁴⁸	79.67 ¹⁵⁴	38.276 ¹⁶	9.08 ⁹¹	10.63 ⁸	48.22 ³²⁷	15.359 ¹²	59.64 ¹⁵³
16.4	32.823 ¹⁸	80.94 ¹²⁷	38.225 ⁵¹	10.13 ¹⁰⁵	10.49 ¹⁴	51.22 ³⁰⁰	15.316 ⁴³	60.91 ¹²⁷
	76	100	78	109	20	267	70	100
26.4	32.747	81.94	38.147	11.22	10.29	53.89	15.246	61.91
Nov. 5.3	32.652 ⁹⁵	82.64 ⁷⁰	38.047 ¹⁰⁰	12.31 ¹⁰⁹	10.05 ²⁴	56.18 ²²⁹	15.155 ⁹¹	62.61 ⁷⁰
15.3	32.541 ¹¹¹	83.05 ⁴¹	37.932 ¹¹⁵	13.33 ¹⁰²	9.77 ²⁸	58.01 ¹⁸³	15.048 ¹⁰⁷	63.02 ⁴¹
25.3	32.419 ¹²²	83.14 ⁹	37.809 ¹²³	14.27 ⁹⁴	9.44 ³³	59.35 ¹³⁴	14.929 ¹¹⁹	63.13 ¹¹
Dec. 5.3	32.293 ¹²⁶	82.94 ²⁰	37.684 ¹²⁵	15.05 ⁷⁸	9.10 ³⁴	60.15 ⁸⁰	14.805 ¹²⁴	62.94 ¹⁹
	127	49	123	61	35	23	125	47
15.2	32.166	82.45	37.561	15.66	8.75	60.38	14.680	62.47
25.2	32.043 ¹²³	81.66 ⁷⁹	37.444 ¹¹⁷	16.07 ⁴¹	8.40 ³⁵	60.04 ³⁴	14.557 ¹²³	61.72 ⁷⁵
35.2	31.929 ¹¹⁴	80.63 ¹⁰³	37.339 ¹⁰⁵	16.26 ¹⁹	8.05 ³⁵	59.14 ⁹⁰	14.443 ¹¹⁴	60.72 ¹⁰⁰
Mean Place	28.620	49.19	33.608	33.70	5.941	17.45	11.076	29.14
Sec δ , Tan δ	1.089	+0.430	1.068	-0.375	2.118	+1.867	1.086	+0.423
$D\phi\alpha$, $D\omega\alpha$	+0.06	-0.03	+0.06	+0.02	+0.05	-0.12	+0.06	-0.03
$D\phi\delta$, $D\omega\delta$	+0.4	-0.2	+0.4	-0.2	+0.4	-0.2	+0.4	-0.2

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	κ Piscium. Mag. 4.9			θ Piscium. Mag. 4.4			70 Pegasi. Mag. 4.7			β Sculptoris. Mag. 4.5		
	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.
	h m	s	"	h m	s	"	h m	s	"	h m	s	"
	23 22		+ 0 47	23 23		+ 5 55	23 24		+12 17	23 28		-38 16
Jan. 1.2	37.970		47.66	42.728		8.02	54.611		56.48	28.864		67.85
11.2	37.884	86	46.98	42.637	91	7.22	54.517	94	55.56	28.727	137	67.35
21.1	37.813	71	46.33	42.563	74	6.40	54.437	80	54.55	28.612	115	66.47
31.1	37.758	55	45.75	42.505	58	5.60	54.375	62	53.50	28.521	91	65.24
Feb. 10.1	37.724	34	45.26	42.468	37	4.86	54.333	42	52.47	28.460	61	63.68
		9			11			16			30	
20.1	37.715		44.91	42.457		4.24	54.317		51.50	28.430		61.83
Mar. 1.0	37.735	20	44.73	42.472	15	3.76	54.331	14	50.65	28.434	4	59.71
11.0	37.785	50	44.75	42.522	50	3.48	54.378	47	49.99	28.478	44	57.37
21.0	37.871	86	45.02	42.606	84	3.41	54.462	84	49.55	28.564	86	54.85
30.9	37.994	123	45.53	42.729	123	3.63	54.584	122	49.39	28.693	129	52.19
		161			162			161			174	
Apr. 9.9	38.155		46.31	42.891		4.13	54.745		49.53	28.867		49.45
19.9	38.352	197	47.37	43.087	196	4.93	54.945	200	49.98	29.083	216	46.68
29.9	38.582	230	48.67	43.320	233	5.99	55.180	235	50.77	29.341	258	43.92
May 9.8	38.844	262	50.22	43.580	260	7.35	55.446	266	51.89	29.635	294	41.25
19.8	39.130	286	51.96	43.866	286	8.95	55.738	292	53.29	29.961	326	38.72
		306			307			311			352	
29.8	39.436		53.86	44.173		10.76	56.049		54.96	30.313		36.38
June 8.8	39.753	317	55.88	44.491	318	12.72	56.372	323	56.85	30.682	369	34.30
18.7	40.073	320	57.96	44.811	320	14.81	56.697	325	58.93	31.058	376	32.52
28.7	40.390	317	60.05	45.128	317	16.94	57.017	320	61.11	31.433	375	31.07
July 8.7	40.692	302	62.10	45.432	304	19.10	57.324	307	63.36	31.797	364	30.03
		284			284			286			342	
18.6	40.976		64.05	45.716		21.18	57.610		65.62	32.139		29.38
28.8	41.231	255	65.87	45.970	254	23.19	57.868	258	67.84	32.451	312	29.14
Aug. 7.6	41.453	222	67.50	46.193	223	25.04	58.094	226	69.95	32.726	275	29.32
17.6	41.641	188	68.93	46.379	186	26.72	58.283	189	71.94	32.957	231	29.89
27.5	41.789	148	70.12	46.528	149	28.21	58.432	149	73.77	33.139	182	30.82
		106			106			108			131	
Sept. 6.5	41.895		71.08	46.634		29.47	58.540		75.39	33.270		32.08
16.5	41.962	67	71.79	46.700	66	30.49	58.608	68	76.80	33.347	77	33.60
26.5	41.990	28	72.28	46.731	31	31.27	58.638	30	77.97	33.374	27	35.31
Oct. 6.4	41.984	6	72.54	46.723	8	31.85	58.633	5	78.91	33.353	21	37.13
16.4	41.948	36	72.60	46.689	34	32.19	58.598	35	79.60	33.288	65	38.99
		62			59			61			101	
26.4	41.886		72.48	46.630		32.32	58.537		80.07	33.187		40.79
Nov. 5.3	41.805	81	72.20	46.551	79	32.28	58.457	80	80.30	33.056	131	42.45
15.3	41.711	94	71.80	46.455	96	32.04	58.361	96	80.32	32.904	152	43.91
25.3	41.607	104	71.30	46.351	104	31.67	58.256	105	80.12	32.739	165	45.09
Dec. 5.3	41.500	107	70.71	46.242	109	31.16	58.146	110	79.73	32.567	172	45.95
		108			108			112			170	
15.2	41.392		70.06	46.134		30.52	58.034		79.17	32.397		46.47
25.2	41.289	103	69.37	46.029	105	29.82	57.925	109	78.43	32.235	162	46.60
35.2	41.194	95	68.67	45.933	96	29.06	57.823	102	77.56	32.085	150	46.34
Mean Place	37.584		44.38	42.376		2.99	54.306		49.25	28.231		59.26
Sec δ , Tan δ	1.000		+0.014	1.005		+0.104	1.024		+0.218	1.274		-0.789
D ψ α , D ω α	+0.06		0.00	+0.06		-0.01	+0.06		-0.01	+0.06		+0.05
D ψ δ , D ω δ	+0.4		-0.2	+0.4		-0.2	+0.4		-0.2	+0.4		-0.1

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	72 Pegasi (mean). Mag. 5.2		λ Andromedæ. Mag. 4.0		ι Andromedæ. Mag. 4.3		ι Piscium. Mag. 4.3	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 23 29	° ' " +30 51	h m 23 33	° ' " +46 0	h m 23 34	° ' " +42 48	h m 23 35	° ' " + 5 10
	s 23 29	" +30 51	s 23 33	" +46 0	s 23 34	" +42 48	s 23 35	" + 5 10
Jan. 1.2	47.082	55.39	26.777	28.53	0.686	27.68	38.170	20.40
11.2	46.956 ¹²⁶	54.23 ¹¹⁶	26.589 ¹⁸⁸	27.35 ¹¹⁸	0.514 ¹⁷²	26.51 ¹¹⁷	38.078 ⁹²	19.63 ⁷⁷
21.1	46.844 ¹¹²	52.82 ¹⁴¹	26.419 ¹⁷⁰	25.77 ¹⁵⁸	0.358 ¹⁵⁶	24.97 ¹⁵⁴	37.998 ⁸⁰	18.85 ⁷⁸
31.1	46.750 ⁹⁴	51.20 ¹⁶²	26.272 ¹⁴⁷	23.86 ¹⁹¹	0.224 ¹³⁴	23.12 ¹⁸⁵	37.983 ⁶⁵	18.09 ⁷⁶
Feb. 10.1	46.681 ⁶⁹	49.44 ¹⁷⁶	26.158 ¹¹⁴	21.69 ²¹⁷	0.120 ¹⁰⁴	21.03 ²⁰⁹	37.887 ⁴⁶	17.41 ⁶⁸
20.1	46.643 ³⁸	47.63 ¹⁸¹	26.084 ⁷⁴	19.36 ²³³	0.054 ⁶⁶	18.81 ²²²	37.866 ²¹	16.82 ⁵⁹
Mar. 1.0	46.639 ⁴	45.84 ¹⁷⁹	26.056 ²⁸	16.97 ²³⁹	0.030 ²⁴	16.53 ²²⁸	37.871 ⁵	16.38 ⁴⁴
11.0	46.675 ³⁶	44.17 ¹⁶⁷	26.080 ²⁴	14.62 ²³⁵	0.056 ²⁶	14.31 ²²²	37.909 ³⁸	16.14 ²⁴
21.0	46.758 ⁸³	42.69 ¹⁴⁸	26.160 ⁸⁰	12.42 ²²⁰	0.133 ⁷²	12.25 ²⁰⁶	37.983 ⁷⁴	16.12 ²
31.0	46.884 ¹²⁶	41.48 ¹²¹	26.297 ¹³⁷	10.45 ¹⁹⁷	0.265 ¹³²	10.43 ¹⁸²	38.094 ¹¹¹	16.36 ²⁴
Apr. 9.9	47.055 ¹⁷¹	40.60 ⁸⁸	26.491 ¹⁹⁴	8.82 ¹⁶³	0.452 ¹⁸⁷	8.95 ¹⁴⁸	38.243 ¹⁴⁹	16.87 ⁵¹
19.9	47.270 ²¹⁵	40.09 ⁵¹	26.739 ²⁴⁸	7.58 ¹²⁴	0.690 ²³⁸	7.86 ¹⁰⁰	38.430 ¹⁸⁷	17.67 ⁸⁰
29.9	47.526 ²⁵⁶	40.00 ⁹	27.037 ²⁹⁸	6.79 ⁷⁹	0.975 ²⁸⁵	7.21 ⁶⁵	38.654 ²²⁴	18.76 ¹⁰⁰
May 9.8	47.818 ²⁹²	40.33 ³³	27.377 ³⁴⁰	6.48 ³¹	1.300 ³²⁵	7.04 ¹⁷	38.910 ²⁵⁶	20.11 ¹³⁵
19.8	48.136 ³¹⁸	41.09 ⁷⁶	27.750 ³⁷³	6.67 ¹⁹	1.659 ³⁵⁹	7.35 ³¹	39.192 ²⁸²	21.70 ¹⁵⁹
29.8	48.476 ³⁴⁰	42.26 ¹¹⁷	28.149 ³⁹⁰	7.36 ⁶⁹	2.041 ³⁸²	8.14 ⁷⁹	39.496 ³⁰⁴	23.49 ¹⁷⁹
June 8.8	48.830 ³⁵⁴	43.82 ¹⁵⁶	28.560 ⁴¹¹	8.54 ¹¹⁸	2.436 ³⁹⁵	9.40 ¹²⁶	39.812 ³¹⁶	25.44 ¹⁹⁵
18.7	49.185 ³⁵⁵	45.70 ¹⁸⁸	28.974 ⁴¹⁴	10.16 ¹⁶²	2.834 ³⁹⁸	11.09 ¹⁶⁹	40.135 ³²³	27.50 ²⁰⁶
28.7	49.533 ³⁴⁸	47.88 ²¹⁸	29.379 ⁴⁰⁵	12.19 ²⁰³	3.224 ³⁹⁰	13.16 ²⁰⁷	40.454 ³¹⁹	29.62 ²¹²
July 8.7	49.867 ³³⁴	50.29 ²⁴¹	29.767 ³⁸⁸	14.56 ²³⁷	3.598 ³⁷⁴	15.55 ²³⁹	40.761 ³⁰⁷	31.72 ²¹⁰
18.7	50.177 ³¹⁰	52.88 ²⁵⁹	30.126 ³⁵⁹	17.24 ²⁶⁸	3.944 ³⁴⁶	18.22 ²⁶⁷	41.052 ²⁹¹	33.78 ²⁰⁶
28.6	50.458 ²⁸¹	55.58 ²⁷⁰	30.449 ³²³	20.14 ²⁹⁰	4.259 ³¹⁵	21.09 ²⁸⁷	41.316 ²⁶⁴	35.75 ¹⁹⁷
Aug. 7.6	50.702 ²⁴⁴	58.33 ²⁷⁵	30.732 ²⁸³	23.21 ³⁰⁷	4.529 ²⁷⁰	24.12 ³⁰³	41.550 ²³⁴	37.56 ¹⁸¹
17.6	50.906 ²⁰⁴	61.07 ²⁷⁴	30.966 ²³⁴	26.37 ³¹⁶	4.756 ²²⁷	27.21 ³⁰⁹	41.747 ¹⁹⁷	39.19 ¹⁶³
27.5	51.067 ¹⁶¹	63.75 ²⁶⁸	31.150 ¹⁸⁴	29.56 ³¹⁹	4.935 ¹⁷⁹	30.31 ³¹⁰	41.906 ¹⁵⁹	40.63 ¹⁴⁴
Sept. 6.5	51.184 ¹¹⁷	66.30 ²⁵⁵	31.282 ¹³²	32.72 ³¹⁶	5.065 ¹³⁰	33.36 ³⁰⁵	42.025 ¹¹⁹	41.83 ¹²⁰
16.5	51.257 ⁷³	68.71 ²⁴¹	31.363 ⁸¹	35.78 ³⁰⁶	5.145 ⁸⁰	36.31 ²⁹⁵	42.105 ⁸⁰	42.81 ⁹⁶
26.5	51.289 ³²	70.91 ²²⁰	31.394 ³¹	38.69 ²⁹¹	5.178 ³³	39.10 ²⁷⁹	42.148 ⁴³	43.54 ⁷³
Oct. 6.4	51.284 ⁵	72.89 ¹⁹⁸	31.379 ¹⁵	41.39 ²⁷⁰	5.167 ¹¹	41.66 ²⁵⁶	42.155 ⁷	44.05 ⁵¹
16.4	51.243 ⁴¹	74.59 ¹⁷⁰	31.321 ⁵⁸	43.82 ²⁴³	5.117 ⁵⁰	43.97 ²³¹	42.131 ²⁴	44.33 ²⁸
26.4	51.172 ⁷¹	76.01 ¹⁴²	31.226 ⁹⁵	45.95 ²¹³	5.030 ⁸⁷	45.97 ²⁰⁰	42.082 ⁴⁹	44.43 ¹⁰
Nov. 5.4	51.078 ⁹⁴	77.10 ¹⁰⁹	31.098 ¹²⁸	47.71 ¹⁷⁶	4.913 ¹¹⁷	47.62 ¹⁶⁵	42.011 ⁷¹	44.34 ⁹
15.3	50.963 ¹¹⁵	77.86 ⁷⁶	30.945 ¹⁵³	49.08 ¹³⁷	4.772 ¹⁴¹	48.88 ¹²⁶	41.925 ⁸⁶	44.07 ²⁷
25.3	50.836 ¹²⁷	78.26 ⁴⁰	30.769 ¹⁷⁶	50.03 ⁹⁵	4.610 ¹⁶²	49.72 ⁸⁴	41.828 ⁹⁷	43.67 ⁴⁰
Dec. 5.3	50.699 ¹³⁷	78.31 ⁵	30.578 ¹⁹¹	50.51 ⁴⁸	4.436 ¹⁷⁴	50.13 ¹⁸²	41.724 ¹⁰⁴	43.15 ⁵²
15.2	50.558 ¹⁴¹	78.01 ³⁰	30.380 ¹⁹⁸	50.52 ¹	4.254 ¹⁸²	50.09 ⁴	41.618 ¹⁰⁶	42.53 ⁶²
25.2	50.418 ¹⁴⁰	77.36 ⁶⁵	30.180 ²⁰⁰	50.05 ⁴⁷	4.070 ¹⁸⁴	49.59 ⁵⁰	41.514 ¹⁰⁴	41.81 ⁷²
35.2	50.282 ¹³⁶	76.38 ⁹⁸	29.983 ¹⁹⁷	49.12 ⁹³	3.890 ¹⁸⁰	48.67 ⁹²	41.414 ¹⁰⁰	41.05 ⁷⁶
Mean Place	46.957	42.00	26.900	10.72	0.732	10.65	37.741	15.28
Sec δ , Tan δ	1.165	+0.598	1.440	+1.036	1.363	+0.926	1.004	+0.091
$D_{\psi} \alpha$, $D_{\omega} \alpha$	+0.06	-0.04	+0.06	-0.07	+0.06	-0.06	+0.06	-0.01
$D_{\psi} \delta$, $D_{\omega} \delta$	+0.4	-0.1	+0.4	-0.1	+0.4	-0.1	+0.4	-0.1

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	γ Cephei. Mag. 3.4		κ Andromedæ. Mag. 4.3		ω^2 Aquarii. Mag. 4.6		ι^1 Aquarii. Mag. 5.3	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 23 35	° ' " +77 9	h m 23 36	° ' " +43 52	h m 23 38	° ' " -15 0	h m 23 39	° ' " -18 44
	s 23 35	" +77 9	s 23 36	" +43 52	s 23 38	" -15 0	s 23 39	" -18 44
Jan. 1.2	50.89	72.40	15.939	24.63	22.604	35.31	51.383	38.72
11.2	50.04	85	15.760	179	22.507	27	51.282	101
21.2	49.26	78	15.597	163	22.423	84	51.192	90
31.1	48.57	69	15.457	140	22.355	68	51.118	74
Feb. 10.1	47.99	58	15.348	109	22.306	49	51.067	51
20.1	47.56	43	15.277	71	22.283	23	51.041	26
Mar. 1.0	47.30	26	15.248	29	22.286	3	51.043	2
11.0	47.21	9	15.270	22	22.322	36	51.075	32
21.0	47.32	11	15.344	74	22.392	70	51.145	70
31.0	47.60	28	15.476	132	22.499	107	51.251	106
Apr. 9.9	48.06	46	15.662	186	22.645	146	51.397	146
19.9	48.69	63	15.901	239	22.829	181	51.582	185
29.9	49.46	77	16.188	287	23.049	220	51.804	222
May 9.8	50.34	88	16.516	328	23.303	254	52.056	252
19.8	51.31	97	16.878	362	23.585	282	52.341	285
29.8	52.34	103	17.265	387	23.890	305	52.649	308
June 8.8	53.40	106	17.665	400	24.210	320	52.971	322
18.7	54.46	106	18.068	403	24.537	327	53.301	330
28.7	55.49	103	18.466	398	24.863	326	53.631	330
July 8.7	56.47	98	18.844	378	25.180	317	53.952	321
18.7	57.37	90	19.197	353	25.478	298	54.255	303
28.6	58.16	79	19.515	318	25.753	275	54.534	279
Aug. 7.6	58.84	68	19.794	279	25.996	243	54.781	247
17.6	59.39	55	20.025	231	26.202	206	54.991	210
27.5	59.81	42	20.209	184	26.369	167	55.163	172
Sept. 6.5	60.08	27	20.342	133	26.495	126	55.292	129
16.5	60.20	12	20.428	86	26.578	83	55.378	86
26.5	60.18	2	20.463	35	26.622	44	55.421	43
Oct. 6.4	60.02	16	20.454	9	26.627	5	55.428	7
16.4	59.72	30	20.404	50	26.599	28	55.398	30
26.4	59.28	44	20.318	86	26.544	55	55.341	57
Nov. 5.4	58.73	55	20.202	116	26.465	79	55.260	81
15.3	58.08	65	20.058	144	26.369	96	55.161	99
25.3	57.34	73	19.895	163	26.262	107	55.048	113
Dec. 5.3	56.51	81	19.717	178	26.149	115	54.929	119
15.2	55.66	85	19.532	185	26.034	115	54.809	120
25.2	54.78	88	19.343	189	25.921	113	54.692	117
35.2	53.91	87	19.158	185	25.815	106	54.581	111
Mean Place	53.418	48.73	15.986	7.22	22.031	33.66	50.782	35.88
Sec δ , Tan δ	4.503	+4.391	1.387	+0.961	1.035	-0.268	1.056	-0.339
$D\psi\alpha$, $D\omega\alpha$	+0.05	-0.29	+0.06	-0.06	+0.06	+0.02	+0.06	+0.02
$n = 2$, $D\omega\delta$	+0.4	-0.1	+0.4	-0.1	+0.4	-0.1	+0.4	-0.1

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	ψ Andromedæ. Mag. 5.1		41 H. Cephei. Mag. 5.0		δ Sculptoris. Mag. 4.6		ϕ Pegasi. Mag. 5.2	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 23 41	° ' +45 57	h m 23 43	° ' +67 20	h m 23 44	° ' -28 35	h m 23 48	° ' +18 39
	s "	"	s "	"	s "	"	s "	"
Jan. 1.2	51.962	31.79	52.22	46.68	33.794	48.51	13.127	23.53
11.2	51.771 ¹⁹¹	30.72 ¹⁰⁷	51.78 ⁴⁴	45.81 ⁸⁷	33.675 ¹¹⁹	48.44 ⁷	13.019 ¹⁰⁸	22.61 ⁹²
21.2	51.595 ¹⁷⁶	29.22 ¹⁵⁰	51.36 ⁴²	44.37 ¹⁴⁴	33.570 ¹⁰⁵	48.04 ⁴⁰	12.919 ¹⁰⁰	21.54 ¹⁰⁷
31.1	51.441 ¹⁵⁴	27.40 ¹⁸²	50.99 ³⁷	42.45 ¹⁹²	33.482 ⁸⁸	47.33 ⁷¹	12.834 ⁸⁵	20.35 ¹¹⁹
Feb. 10.1	51.317 ¹²⁴	25.29 ²¹¹	50.69 ³⁰	40.12 ²³³	33.418 ⁶⁴	46.33 ¹⁰⁰	12.768 ⁶⁶	19.12 ¹²³
	84	228	23	265	40	120	43	123
20.1	51.233	23.01	50.46	37.47	33.378	45.04	12.725	17.89
Mar. 1.0	51.193 ⁴⁰	20.65 ²³⁶	50.33 ¹³	34.63 ²⁸⁴	33.370 ⁸	43.49 ¹⁵⁵	12.713 ¹²	16.75 ¹¹⁴
11.0	51.206 ¹³	18.33 ²³²	50.29 ⁴	31.69 ²⁰⁴	33.396 ²⁶	41.70 ¹⁷⁹	12.735 ²²	15.73 ¹⁰²
21.0	51.275 ⁶⁹	16.12 ²²¹	50.35 ⁶	28.80 ²⁸⁹	33.459 ⁶³	39.68 ²⁰²	12.795 ⁶⁰	14.92 ⁸¹
31.0	51.400 ¹²⁵	14.17 ¹⁹⁵	50.53 ¹⁸	26.07 ²⁷³	33.563 ¹⁰⁴	37.48 ²²⁰	12.896 ¹⁰¹	14.35 ⁵⁷
	183	167	27	246	144	235	142	26
Apr. 9.9	51.583	12.50	50.80	23.61	33.707	35.13	13.038	14.09
19.9	51.822 ²³⁹	11.22 ¹²⁸	51.18 ³⁸	21.52 ²⁰⁹	33.892 ¹⁸⁵	32.67 ²⁴⁶	13.222 ¹⁸⁴	14.14 ⁵
29.9	52.112 ²⁹⁰	10.38 ⁸⁴	51.64 ⁴⁶	19.87 ¹⁶⁵	34.118 ²²⁶	30.14 ²⁵³	13.445 ²²³	14.55 ⁴¹
May 9.9	52.444 ³³²	10.01 ³⁷	52.18 ⁵⁴	18.72 ¹¹⁵	34.380 ²⁶²	27.61 ²⁵³	13.704 ²⁵⁹	15.31 ⁷⁶
19.8	52.813 ³⁶⁹	10.14 ¹³	52.77 ⁵⁹	18.12 ⁶⁰	34.673 ²⁹³	25.12 ²⁴⁹	13.991 ²⁸⁷	16.41 ¹¹⁰
	395	63	64	4	318	239	312	140
29.8	53.208	10.77	53.41	18.08	34.991	22.73	14.303	17.81
June 8.8	53.620 ⁴¹²	11.88 ¹¹¹	54.07 ⁶⁶	18.60 ⁵²	35.328 ³³⁷	20.50 ²²³	14.629 ³²⁶	19.51 ¹⁷⁰
18.7	54.036 ⁴¹⁶	13.43 ¹⁵⁵	54.72 ⁶⁵	19.68 ¹⁰⁸	35.674 ³⁴⁶	18.49 ²⁰¹	14.962 ³³³	21.43 ¹⁹²
28.7	54.444 ⁴⁰⁸	15.39 ¹⁹⁶	55.37 ⁶⁵	21.28 ¹⁶⁰	36.022 ³⁴⁸	16.75 ¹⁷⁴	15.293 ³³¹	23.55 ²¹²
July 8.7	54.835 ³⁹¹	17.72 ²³³	55.99 ⁶²	23.35 ²⁰⁷	36.362 ³⁴⁰	15.31 ¹⁴⁴	15.614 ³²¹	25.79 ²²⁴
	368	261	58	251	323	109	303	233
18.7	55.203	20.33	56.57	25.86	36.685	14.22	15.917	28.12
28.6	55.534 ³³¹	23.18 ²⁸⁵	57.09 ⁵²	28.73 ²⁸⁷	36.982 ²⁹⁷	13.49 ⁷³	16.196 ²⁷⁹	30.46 ²³⁴
Aug. 7.6	55.826 ²⁹²	26.20 ³⁰²	57.54 ⁴⁵	31.92 ³¹⁹	37.247 ²⁶⁵	13.14 ³⁵	16.442 ²¹⁶	32.77 ²³¹
17.6	56.070 ²⁴⁴	29.34 ³¹⁴	57.91 ³⁷	35.33 ³⁴¹	37.474 ²²⁷	13.16 ²	16.654 ²¹²	35.01 ²²⁴
27.6	56.265 ¹⁹⁵	32.51 ³¹⁷	58.20 ²⁹	38.92 ³⁵⁹	37.658 ¹⁸⁴	13.55 ³⁹	16.827 ¹⁷³	37.11 ²¹⁰
	145	315	21	366	140	72	133	196
Sept. 6.5	56.410	35.66	58.41	42.58	37.798	14.27	16.960	39.06
16.5	56.504 ⁹⁴	38.72 ³⁰⁶	58.54 ¹³	46.27 ³⁶⁹	37.891 ⁹³	15.26 ⁹⁹	17.054 ⁹⁴	40.82 ¹⁷⁶
26.5	56.548 ⁴⁴	41.66 ²⁹⁴	58.58 ⁴	49.90 ³⁶³	37.938 ⁴⁷	16.51 ¹²⁵	17.108 ⁵⁴	42.36 ¹⁵⁴
Oct. 6.4	56.545 ³	44.38 ²⁷²	58.53 ⁵	53.39 ³⁴⁹	37.943 ⁵	17.91 ¹⁴⁰	17.126 ¹⁸	43.68 ¹³²
16.4	56.500 ⁴⁵	46.87 ²⁴⁹	58.40 ¹³	56.68 ³²⁹	37.909 ³⁴	19.42 ¹⁵¹	17.113 ¹³	44.75 ¹⁰⁷
	85	217	20	300	67	153	41	83
26.4	56.415	49.04	58.20	59.68	37.842	20.95	17.072	45.58
Nov. 5.4	56.298 ¹¹⁷	50.86 ¹⁸²	57.93 ²⁷	62.34 ²⁶⁶	37.749 ⁹³	22.44 ¹⁴⁹	17.007 ⁶⁵	46.15 ⁵⁷
15.3	56.152 ¹⁴⁶	52.31 ¹⁴⁵	57.61 ³²	64.58 ²²⁴	37.634 ¹¹⁵	23.82 ¹³⁸	16.923 ⁸⁴	46.47 ³²
25.3	55.984 ¹⁶⁸	53.34 ¹⁰³	57.24 ³⁷	66.33 ¹⁷⁵	37.506 ¹²⁸	25.03 ¹²¹	16.825 ⁹⁸	46.55 ⁸
Dec. 5.3	55.800 ¹⁸⁴	53.91 ⁵⁷	56.83 ⁴¹	67.56 ¹²³	37.371 ¹³⁵	26.02 ⁹⁹	16.717 ¹⁰⁸	46.37 ¹⁸
	196	10	44	66	141	72	114	41
15.3	55.604	54.01	56.39	68.22	37.230	26.74	16.603	45.96
25.2	55.404 ²⁰⁰	53.64 ³⁷	55.94 ⁴⁵	68.29 ⁷	37.094 ¹³⁶	27.18 ⁴⁴	16.487 ¹¹⁶	45.32 ⁶⁴
35.2	55.207 ¹⁹⁷	52.81 ⁸³	55.49 ⁴⁵	67.75 ⁵⁴	36.964 ¹³⁰	27.31 ¹³	16.373 ¹¹⁴	44.49 ⁸³
Mean Place	52.003	18.62	53.121	23.90	33.113	42.75	12.732	13.42
Sec δ , Tan δ	1.438	+1.034	2.596	+2.395	1.139	-0.545	1.056	+0.338
$D_{\psi} \alpha$, $D_{\omega} \alpha$	+0.06	-0.07	+0.06	-0.16	+0.06	+0.04	+0.06	-0.02
$D_{\psi} \delta$, $D_{\omega} \delta$	+0.4	-0.1	+0.4	-0.1	+0.4	-0.1	+0.4	-0.1

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	ρ Cassiopeiæ. Mag. 4.8		Groombridge 4163. Mag. 6.6		ω Piscium. Mag. 4.0	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m	° '	h m	° '	h m	° '
	23 50	+57 1	23 50	+73 56	23 54	+ 6 23
	s	"	s	"	s	"
Jan. 1.2	10.468	76.56	42.12	58.17	60.353	60.06
11.2	10.189 279	75.64 92	41.45 67	57.50 67	60.254 99	59.31 73
21.2	9.928 261	74.23 141	40.83 62	56.24 126	60.163 91	58.54 77
31.1	9.694 234	72.38 185	40.26 57	54.43 181	60.085 78	57.78 76
Feb. 10.1	9.500 194	70.18 220	39.79 47	52.18 225	60.024 61	57.08 79
	143	246	37	263	40	61
20.1	9.357 85	67.72 263	39.42 24	49.53 286	59.984 13	56.47 65
Mar. 1.0	9.272 18	65.09 267	39.18 10	46.67 301	59.971 18	55.99 30
11.0	9.254 56	62.42 260	39.08 4	43.66 300	59.989 53	55.69 8
21.0	9.310 130	59.82 243	39.12 20	40.66 289	60.042 91	55.60 17
31.0	9.440 203	57.39 214	39.32 34	37.77 267	60.133 131	55.77 43
Apr. 9.9	9.643	55.25 178	39.66 48	35.10 232	60.264 170	56.20 72
19.9	9.919 276	53.47 135	40.14 59	32.78 191	60.434 209	56.92 99
29.9	10.259 340	52.12 86	40.73 71	30.87 141	60.643 243	57.91 128
May 9.9	10.655 441	51.26 35	41.44 78	29.46 86	60.886 273	59.19 151
19.8	11.096 474	50.91 19	42.22 84	28.60 31	61.159 297	60.70 174
29.8	11.570	51.10 72	43.06 87	28.29 26	61.456 313	62.44 190
June 8.8	12.065 495	51.82 123	43.93 88	28.55 81	61.769 321	64.34 202
18.7	12.566 501	53.05 171	44.81 86	29.36 139	62.090 322	66.36 211
28.7	13.061 495	54.76 215	45.67 83	30.75 188	62.412 314	68.47 213
July 8.7	13.537 445	56.91 252	46.50 78	32.63 234	62.726 297	70.59 207
18.7	13.982 405	59.43 283	47.28 70	34.97 275	63.023 276	72.66 206
28.6	14.387 357	62.26 310	47.98 61	37.72 311	63.299 247	74.66 187
Aug. 7.6	14.744 302	65.36 328	48.59 51	40.83 338	63.546 213	76.53 168
17.6	15.046 243	68.64 340	49.10 40	44.21 360	63.759 176	78.22 156
27.6	15.289 180	72.04 345	49.50 29	47.81 371	63.935 139	79.72 128
Sept. 6.5	15.469 118	75.49 343	49.79 17	51.52 378	64.074 99	81.01 106
16.5	15.587 57	78.92 334	49.96 6	55.30 376	64.173 61	82.06 82
26.5	15.644 4	82.26 319	50.02 6	59.06 366	64.234 26	82.88 58
Oct. 6.4	15.640 58	85.45 296	49.96 17	62.72 348	64.260 4	83.46 27
16.4	15.582 110	88.41 268	49.79 28	66.20 325	64.256 33	83.83 13
26.4	15.472 156	91.09 234	49.51 38	69.45 290	64.223 55	83.98 7
Nov. 5.4	15.316 196	93.43 194	49.13 47	72.35 252	64.168 75	83.96 29
15.3	15.120 229	95.37 148	48.66 54	74.87 202	64.093 88	83.76 35
25.3	14.891 257	96.85 99	48.12 60	76.89 149	64.005 97	83.41 67
Dec. 5.3	14.634 274	97.84 46	47.52 65	78.38 91	63.908 103	82.94 58
15.3	14.360 284	98.30 7	46.87 67	79.29 33	63.805 106	82.36 65
25.2	14.076 286	98.23 62	46.20 68	79.62 31	63.699 104	81.68 74
35.2	13.790	97.61	45.52	79.31	63.595	80.94
Mean Place	10.729	55.46	43.583	34.20	59.818	53.99
Sec δ , Tan δ	1.838	+1.542	3.617	+3.475	1.006	+0.112
$D\phi \alpha$, $D\omega \alpha$	+0.06	-0.10	+0.06	-0.23	+0.06	-0.01
$D\phi \delta$, $D\omega \delta$	+0.4	0.0	+0.4	0.0	+0.4	0.0

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	ϵ Tucanae. Mag. 4.7		30 Piscium. Mag. 4.7		2 Ceti. Mag. 4.6	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 23 55	° ' -66 2	h m 23 57	° ' - 6 28	h m 23 59	° ' -17 47
	s	"	s	"	s	"
Jan. 1.2	34.65	52.71	39.768	49.59	26.971	75.41
11.2	34.25 40	51.59 112	39.669 99	50.11 52	26.863 108	75.68 27
21.2	33.88 37	49.94 165	39.579 90	50.51 40	26.764 99	75.73 5
31.1	33.56 32	47.79 215	39.499 80	50.77 28	26.678 86	75.54 19
Feb. 10.1	33.30 26	45.21 258	39.439 60	50.89 12	26.611 67	75.12 42
	19	294	41	7	46	68
20.1	33.11 13	42.27 325	39.398 14	50.82 26	26.565 18	74.44 91
Mar. 1.1	32.98 4	39.02 347	39.384 15	50.56 47	26.547 12	73.53 116
11.0	32.94 3	35.55 359	39.399 50	50.09 70	26.559 46	72.37 140
21.0	32.97 11	31.96 367	39.449 86	49.39 96	26.605 85	70.97 162
31.0	33.08 19	28.29 366	39.535 126	48.44 119	26.690 124	69.35 180
Apr. 9.9	33.27 28	24.63 356	39.661 164	47.25 142	26.814 164	67.55 200
19.9	33.55 35	21.07 341	39.825 203	45.83 163	26.978 203	65.55 214
29.9	33.90 43	17.66 316	40.028 237	44.20 181	27.181 238	63.41 224
May 9.9	34.33 49	14.50 287	40.265 267	42.39 196	27.419 271	61.17 229
19.8	34.82 55	11.63 250	40.532 293	40.44 206	27.690 297	58.88 230
29.8	35.37 58	9.13 207	40.825 309	38.38 211	27.987 315	56.58 224
June 8.8	35.95 60	7.06 160	41.134 320	36.27 212	28.302 326	54.34 212
18.8	36.55 62	5.46 109	41.454 320	34.15 204	28.628 328	52.22 197
28.7	37.17 61	4.37 56	41.774 316	32.11 196	28.956 324	50.25 176
July 8.7	37.78 58	3.81 1	42.090 300	30.15 179	29.280 309	48.49 150
18.7	38.36 55	3.80 54	42.390 278	28.36 159	29.589 289	46.99 121
28.6	38.91 50	4.34 106	42.668 249	26.77 136	29.878 258	45.78 90
Aug. 7.6	39.41 41	5.40 154	42.917 217	25.41 112	30.136 226	44.88 87
17.6	39.82 34	6.94 197	43.134 180	24.29 83	30.362 188	44.31 23
27.6	40.16 25	8.91 233	43.314 141	23.46 55	30.550 147	44.08 7
Sept. 6.5	40.41 16	11.24 260	43.455 102	22.91 30	30.697 104	44.15 38
16.5	40.57 5	13.84 277	43.557 64	22.61 3	30.801 65	44.53 64
26.5	40.62 5	16.61 283	43.621 27	22.58 20	30.866 25	45.17 85
Oct. 6.5	40.57 14	19.44 278	43.648 6	22.78 38	30.891 9	46.02 101
16.4	40.43 22	22.22 260	43.642 34	23.16 53	30.882 40	47.03 110
26.4	40.21 30	24.82 233	43.608 58	23.69 65	30.842 66	48.13 116
Nov. 5.4	39.91 36	27.15 197	43.550 77	24.34 78	30.776 86	49.29 113
15.3	39.55 40	29.12 150	43.473 88	25.07 75	30.690 101	50.42 108
25.3	39.15 43	30.62 98	43.385 100	25.82 77	30.589 111	51.50 97
Dec. 5.3	38.72 44	31.60 41	43.285 106	26.59 78	30.478 118	52.47 81
15.3	38.28 44	32.01 17	43.180 107	27.32 68	30.360 117	53.28 63
25.2	37.84 42	31.84 75	43.073 105	28.00 59	30.243 115	53.91 44
35.2	37.42	31.09	42.968	28.59	30.128	54.35
Mean Place	33.604	39.06	39.136	51.21	26.264	73.25
Sec δ , Tan δ	2.463	-2.250	1.006	-0.114	1.050	-0.321
$D\alpha$, D_{α}	+0.06	+0.15	+0.06	+0.01	+0.06	+0.02
$D\delta$, D_{δ}	+0.4	0.0	+0.4	0.0	+0.4	0.0

FOR WASHINGTON APPARENT NOON.

Date.	Apparent Right Ascension.	Var. per Hour.	Apparent Declination.	Var. per Hour.	Equation of Time. Mean—App.	Var. per Hour.	Semi- diameter.	S. T. of Senn. Pass. Merid.	Sidereal Time of Mean Noon.	
	h m s	s	" ' "	"	m s	s	"	m s	h m s	
Jan	1	18 43 24.52	11.056	-23 4 36.1	+11.47	+ 3 17.16	+1.196	16 17.84	1 11.08	18 40 6.83
	2	18 47 49.72	11.043	22 59 47.1	12.62	3 45.71	1.183	16 17.84	1 11.04	18 44 3.39
	3	18 52 14.59	11.029	22 54 30.5	13.76	4 13.94	1.169	16 17.84	1 10.99	18 47 59.95
	4	18 56 39.11	11.014	22 48 46.5	14.90	4 41.83	1.154	16 17.84	1 10.94	18 51 56.50
	5	19 1 3.24	10.997	22 42 35.2	16.04	5 9.34	1.138	16 17.83	1 10.88	18 55 53.06
	6	19 5 26.95	10.979	-22 35 56.8	+17.16	+ 5 36.42	+1.119	16 17.82	1 10.82	18 59 49.62
	7	19 9 50.21	10.959	22 28 51.6	18.27	6 3.04	1.099	16 17.80	1 10.76	19 3 46.18
	8	19 14 12.98	10.938	22 21 19.8	19.38	6 29.17	1.078	16 17.78	1 10.70	19 7 42.74
	9	19 18 35.22	10.916	22 13 21.6	20.47	6 54.79	1.056	16 17.75	1 10.63	19 11 39.30
	10	19 22 56.92	10.892	22 4 57.3	21.55	7 19.86	1.032	16 17.72	1 10.55	19 15 35.85
	11	19 27 18.04	10.868	-21 56 7.1	+22.62	+ 7 44.35	+1.008	16 17.69	1 10.48	19 19 32.41
	12	19 31 38.56	10.842	21 46 51.4	23.69	8 8.25	0.983	16 17.65	1 10.40	19 23 28.97
	13	19 35 58.46	10.816	21 37 10.3	24.74	8 31.53	0.957	16 17.61	1 10.32	19 27 25.53
	14	19 40 17.73	10.789	21 27 4.2	25.77	8 54.18	0.928	16 17.56	1 10.24	19 31 22.09
	15	19 44 36.34	10.761	21 16 33.3	26.80	9 16.17	0.901	16 17.51	1 10.15	19 35 18.65
	16	19 48 54.27	10.733	-21 5 38.0	+27.81	+ 9 37.48	+0.874	16 17.45	1 10.06	19 39 15.20
	17	19 53 11.51	10.704	20 54 18.6	28.81	9 58.11	0.845	16 17.38	1 9.97	19 43 11.76
	18	19 57 28.04	10.674	20 42 35.3	29.80	10 18.03	0.815	16 17.30	1 9.87	19 47 8.32
	19	20 1 43.85	10.644	20 30 28.4	30.77	10 37.23	0.784	16 17.22	1 9.77	19 51 4.88
	20	20 5 58.93	10.613	20 17 58.4	31.73	10 55.71	0.753	16 17.14	1 9.66	19 55 1.43
	21	20 10 13.27	10.582	-20 5 5.5	+32.68	+11 13.44	+0.722	16 17.05	1 9.56	19 58 57.99
	22	20 14 26.86	10.550	19 51 50.0	33.61	11 30.43	0.691	16 16.95	1 9.46	20 2 54.55
	23	20 18 39.69	10.519	19 38 12.3	34.53	11 46.65	0.660	16 16.85	1 9.35	20 6 51.11
	24	20 22 51.75	10.486	19 24 12.7	35.44	12 2.11	0.628	16 16.74	1 9.24	20 10 47.66
	25	20 27 3.04	10.454	19 9 51.5	36.33	12 16.80	0.595	16 16.62	1 9.13	20 14 44.22
	26	20 31 13.55	10.422	-18 55 9.2	+37.20	+12 30.72	+0.564	16 16.50	1 9.02	20 18 40.78
	27	20 35 23.28	10.389	18 40 6.1	38.06	12 43.85	0.531	16 16.38	1 8.91	20 22 37.33
	28	20 39 32.22	10.356	18 24 42.6	38.90	12 56.20	0.497	16 16.25	1 8.80	20 26 33.89
	29	20 43 40.36	10.323	18 8 59.0	39.73	13 7.75	0.464	16 16.12	1 8.68	20 30 30.45
	30	20 47 47.70	10.289	17 52 55.7	40.54	13 18.51	0.431	16 15.99	1 8.56	20 34 27.00
	Feb.	31	20 51 54.24	10.256	-17 36 33.2	+41.33	+13 28.47	+0.398	16 15.85	1 8.45	20 38 23.56
1		20 55 59.97	10.222	17 19 51.8	42.11	13 37.62	0.364	16 15.71	1 8.33	20 42 20.12
2		21 0 4.89	10.188	17 2 52.1	42.87	13 45.95	0.331	16 15.56	1 8.21	20 46 16.67
3		21 4 8.99	10.154	16 45 34.3	43.61	13 53.48	0.297	16 15.41	1 8.10	20 50 13.23
4		21 8 12.26	10.119	16 27 58.9	44.33	14 0.19	0.262	16 15.25	1 7.99	20 54 9.79
5		21 12 14.71	10.085	-16 10 6.5	+45.03	+14 6.05	+0.228	16 15.10	1 7.88	20 58 6.34
6		21 16 16.33	10.050	15 51 57.5	45.72	14 11.11	0.193	16 14.94	1 7.77	21 2 2.90
7		21 20 17.13	10.016	15 33 32.2	46.39	14 15.35	0.159	16 14.78	1 7.65	21 5 59.46
8		21 24 17.11	9.982	15 14 51.0	47.04	14 18.75	0.125	16 14.61	1 7.54	21 9 56.01
9		21 28 16.27	9.948	14 55 54.5	47.67	14 21.34	0.091	16 14.44	1 7.42	21 13 52.57
10		21 32 14.62	9.914	-14 36 43.1	+48.28	+14 23.14	+0.058	16 14.27	1 7.31	21 17 49.12
11		21 36 12.16	9.881	14 17 17.1	48.88	14 24.13	+0.024	16 14.10	1 7.20	21 21 45.68
12		21 40 8.91	9.848	13 57 37.0	49.46	14 24.31	-0.008	16 13.92	1 7.09	21 25 42.23
13		21 44 4.88	9.816	13 37 43.2	50.02	14 23.73	0.041	16 13.74	1 6.98	21 29 38.79
14		21 48 0.07	9.784	13 17 36.2	50.57	14 22.36	0.073	16 13.55	1 6.87	21 33 35.34
15		21 51 54.50	9.752	-12 57 16.2	+51.09	+14 20.24	-0.104	16 13.36	1 6.76	21 37 31.90
16	21 55 48.18	9.721	12 36 43.8	+51.60	+14 17.38	-0.135	16 13.17	1 6.66	21 41 28.45	

NOTE.—For mean time interval of semidiameter passing meridian, subtract 0°.19 from the sidereal interval.

FOR WASHINGTON APPARENT NOON.

Date.	Apparent Right Ascension.			Var. per Hour.	Apparent Declination.			Var. per Hour.	Equation of Time. Mean—App.		Var. per Hour.	Semi-diameter.		S. T. of Sem. Pass. Merid.		Sidereal Time of Mean Noon.
	h	m	s		°	'	"		m	s		'	"	m	s	
Feb.	16	21 55	48.18	9.721	—12 36	43.8		+51.60	+14 17.38	—0.135	16 13.17	1 6.66		21 41	28.45	
	17	21 59	41.12	9.601	12 15	59.3		52.10	14 13.78	0.165	16 12.97	1 6.56		21 45	25.01	
	18	22 3	33.35	9.662	11 55	3.1		52.58	14 9.47	0.194	16 12.76	1 6.46		21 49	21.56	
	19	22 7	24.88	9.633	11 33	55.6		53.04	14 4.46	0.223	16 12.55	1 6.36		21 53	18.12	
	20	22 11	15.73	9.605	11 12	37.2		53.49	13 58.77	0.251	16 12.33	1 6.26		21 57	14.67	
	21	22 15	5.91	9.577	—10 51	8.2		+33.92	+13 52.41	—0.279	16 12.11	1 6.16		22 1	11.23	
	22	22 18	55.44	9.551	10 29	29.0		54.34	13 45.40	0.305	16 11.88	1 6.06		22 5	7.78	
	23	22 22	44.34	9.525	10 7	40.2		54.73	13 37.77	0.331	16 11.66	1 5.97		22 9	4.34	
	24	22 26	32.64	9.500	9 45	42.0		55.11	13 29.53	0.356	16 11.43	1 5.88		22 13	0.89	
	25	22 30	20.34	9.475	9 23	34.8		55.48	13 20.70	0.380	16 11.20	1 5.79		22 16	57.45	
	26	22 34	7.46	9.452	—9 1	19.0		+55.83	+13 11.29	—0.404	16 10.96	1 5.71		22 20	54.00	
	27	22 37	54.02	9.429	8 38	54.9		56.17	13 1.33	0.427	16 10.73	1 5.63		22 24	50.55	
Mar.	28	22 41	40.04	9.406	8 16	23.1		56.48	12 50.82	0.449	16 10.49	1 5.55		22 28	47.11	
	29	22 45	25.53	9.385	7 53	44.0		56.78	12 39.79	0.470	16 10.25	1 5.47		22 32	43.66	
	1	22 49	10.51	9.364	7 30	57.9		57.06	12 28.25	0.491	16 10.00	1 5.40		22 36	40.21	
	2	22 52	55.00	9.344	—7 8	5.3		+57.32	+12 16.21	—0.512	16 9.76	1 5.33		22 40	36.77	
	3	22 56	39.00	9.324	6 45	6.6		57.57	12 3.69	0.531	16 9.51	1 5.26		22 44	33.32	
	4	23 0	22.54	9.305	6 22	2.3		57.79	11 50.72	0.550	16 9.26	1 5.19		22 48	29.88	
	5	23 4	5.62	9.286	5 58	52.7		58.00	11 37.28	0.569	16 9.01	1 5.13		22 52	26.43	
	6	23 7	48.26	9.268	5 35	38.3		58.20	11 23.40	0.587	16 8.76	1 5.07		22 56	22.98	
	7	23 11	30.49	9.251	—5 12	19.4		+58.37	+11 9.12	—0.604	16 8.51	1 5.01		23 0	19.54	
	8	23 15	12.31	9.234	4 48	56.6		58.53	10 54.43	0.620	16 8.26	1 4.95		23 4	16.09	
	9	23 18	53.74	9.219	4 25	30.2		58.67	10 39.35	0.636	16 8.01	1 4.90		23 8	12.64	
	10	23 22	34.81	9.204	4 2	0.5		58.80	10 23.90	0.651	16 7.75	1 4.85		23 12	9.20	
	11	23 26	15.53	9.190	3 38	28.0		58.91	10 8.11	0.665	16 7.49	1 4.80		23 16	5.75	
	12	23 29	55.92	9.176	—3 14	53.0		+59.00	+9 51.99	—0.678	16 7.23	1 4.75		23 20	2.31	
	13	23 33	36.00	9.164	2 51	15.9		59.08	9 35.56	0.691	16 6.97	1 4.70		23 23	58.86	
	14	23 37	15.79	9.152	2 27	37.0		59.15	9 18.84	0.702	16 6.71	1 4.66		23 27	55.41	
	15	23 40	55.32	9.142	2 3	56.8		59.24	9 1.87	0.712	16 6.45	1 4.62		23 31	51.97	
	16	23 44	34.60	9.132	1 40	15.6		59.23	8 44.65	0.722	16 6.19	1 4.59		23 35	48.52	
	17	23 48	13.66	9.123	—1 16	33.7		+59.23	+8 27.21	—0.731	16 5.92	1 4.57		23 39	45.07	
	18	23 51	52.53	9.116	0 52	51.5		59.26	8 9.57	0.739	16 5.65	1 4.55		23 43	41.63	
	19	23 55	31.22	9.109	0 29	9.3		59.25	7 51.75	0.745	16 5.38	1 4.53		23 47	38.18	
	20	23 59	9.76	9.103	—0 5	27.4		59.23	7 33.79	0.751	16 5.11	1 4.51		23 51	34.73	
	21	0 2	48.18	9.099	+0 18	13.8		59.20	7 15.71	0.756	16 4.83	1 4.49		23 55	31.29	
	22	0 6	28.50	9.095	+0 41	54.0		+59.15	+6 57.52	—0.759	16 4.55	1 4.47		23 59	27.84	
	23	0 10	4.74	9.092	1 5	32.9		59.09	6 39.26	0.762	16 4.27	1 4.46		0 3	24.39	
	24	0 13	42.92	9.091	1 29	10.1		59.01	6 20.94	0.764	16 3.99	1 4.45		0 7	20.94	
	25	0 17	21.08	9.090	1 52	45.2		58.92	6 2.59	0.765	16 3.71	1 4.44		0 11	17.50	
	26	0 20	59.23	9.090	2 16	18.0		58.81	5 44.23	0.765	16 3.43	1 4.44		0 15	14.05	
	27	0 24	37.38	9.091	+2 39	48.1		+58.69	+5 25.88	—0.764	16 3.14	1 4.44		0 19	10.60	
	28	0 28	15.57	9.092	3 3	15.1		58.55	5 7.56	0.762	16 2.85	1 4.44		0 23	7.16	
	29	0 31	53.81	9.095	3 26	38.6		58.40	4 49.30	0.759	16 2.57	1 4.45		0 27	3.71	
	30	0 35	32.12	9.098	3 49	58.2		58.23	4 31.11	0.756	16 2.29	1 4.46		0 31	0.27	
	31	0 39	10.51	9.102	4 13	13.7		58.05	4 13.00	0.752	16 2.01	1 4.47		0 34	56.82	
Apr.	1	0 42	49.01	9.106	+4 36	24.6		+57.86	+3 55.00	—0.748	16 1.73	1 4.48		0 38	53.37	
	2	0 46	27.62	9.111	+4 59	30.6		+57.64	+3 37.10	—0.748	16 1.46	1 4.50		0 42	49.93	

NOTE.—For mean time interval of semidiameter passing meridian, subtract 0°.18 from the sidereal interval.

FOR WASHINGTON APPARENT NOON.

Date.	Apparent Right Ascension.			Var. per Hour.	Apparent Declination.			Var. per Hour.	Equation of Time, Mean—App.	Var. per Hour.	Semi- diameter.	S. T. of Sem. Pass. Merid.	Sidereal Time of Mean Noon
	h	m	s		°	'	"						h	m	s
Apr.	1	0	42 49.01	9.106	+	4 36 24.6	+57.86	+3 55.00	-0.748	16	1.73	1 4.48	0 38 53.37
	2	0	46 27.62	9.111		4 59 30.6	57.64	3 37.10	0.743	16	1.46	1 4.50	0 42 49.93
	3	0	50 6.36	9.117		5 22 31.1	57.41	3 19.33	0.737	16	1.18	1 4.52	0 46 46.48
	4	0	53 45.24	9.123		5 45 25.9	57.16	3 1.71	0.731	16	0.91	1 4.54	0 50 43.03
	5	0	57 24.29	9.130		6 8 14.7	56.90	2 44.26	0.724	16	0.63	1 4.57	0 54 39.59
	6	1	1 3.52	9.138	+	6 30 57.1	+56.63	+2 26.98	-0.716	16	0.36	1 4.60	0 58 36.14
	7	1	4 42.94	9.147		6 53 32.6	56.33	2 9.89	0.708	16	0.09	1 4.64	1 2 32.69
	8	1	8 22.56	9.155		7 16 1.0	56.03	1 53.00	0.699	15	59.82	1 4.67	1 6 29.25
	9	1	12 2.41	9.165		7 38 22.0	55.71	1 36.34	0.689	15	59.55	1 4.71	1 10 25.80
	10	1	15 42.51	9.176		8 0 35.1	55.38	1 19.92	0.679	15	59.28	1 4.75	1 14 22.36
	11	1	19 22.86	9.187	+	8 22 40.0	+55.03	+1 3.77	-0.667	15	59.01	1 4.79	1 18 18.91
	12	1	23 3.49	9.199		8 44 36.5	54.67	0 47.90	0.655	15	58.75	1 4.84	1 22 15.46
	13	1	26 44.41	9.211		9 6 24.2	54.30	0 32.31	0.643	15	58.48	1 4.88	1 26 12.02
	14	1	30 25.64	9.225		9 28 2.7	53.91	0 17.02	0.630	15	58.21	1 4.93	1 30 8.57
	15	1	34 7.20	9.239		9 49 31.7	53.51	+0 2.07	0.616	15	57.95	1 4.98	1 34 5.17
	16	1	37 49.10	9.253	+10	10 10 51.0	+53.10	-0 12.54	-0.601	15	57.69	1 5.04	1 38 1.68
	17	1	41 31.36	9.269		10 32 0.2	52.67	0 26.79	0.586	15	57.42	1 5.09	1 41 58.23
	18	1	45 14.01	9.285		10 52 59.0	52.23	0 40.66	0.569	15	57.16	1 5.15	1 45 54.79
	19	1	48 57.06	9.302		11 13 47.2	51.78	0 54.13	0.552	15	56.89	1 5.21	1 49 51.34
	20	1	52 40.53	9.320		11 34 24.4	51.32	1 7.18	0.535	15	56.63	1 5.27	1 53 47.90
	21	1	56 24.43	9.339	+11	54 50.3	+50.84	-1 19.80	-0.516	15	56.36	1 5.33	1 57 44.45
	22	2	0 8.79	9.358		12 15 4.5	50.35	1 31.96	0.497	15	56.10	1 5.40	2 1 41.01
	23	2	3 53.62	9.378		12 35 6.8	49.84	1 43.65	0.477	15	55.84	1 5.46	2 5 37.56
	24	2	7 38.93	9.398		12 54 56.8	49.32	1 54.86	0.457	15	55.58	1 5.53	2 9 34.12
	25	2	11 24.74	9.419		13 14 34.2	48.79	2 5.58	0.436	15	55.32	1 5.60	2 13 30.67
	26	2	15 11.05	9.440	+13	33 58.7	+48.25	-2 15.79	-0.415	15	55.07	1 5.67	2 17 27.23
	27	2	18 57.88	9.462		13 53 9.9	47.69	2 25.49	0.393	15	54.82	1 5.74	2 21 23.78
	28	2	22 45.23	9.484		14 12 7.5	47.11	2 34.67	0.371	15	54.57	1 5.81	2 25 20.34
	29	2	26 33.12	9.506		14 30 51.1	46.52	2 43.32	0.349	15	54.32	1 5.89	2 29 16.89
	30	2	30 21.54	9.528		14 49 20.4	45.92	2 51.44	0.327	15	54.07	1 5.97	2 33 13.45
May	1	2 34 10.49	9.551	+15	7 35.0	+45.30	-2 59.01	-0.304	15	53.83	1 6.04	2 37 10.00	
	2	2 37 59.99	9.574		15 25 34.7	44.67	3 6.05	0.282	15	53.60	1 6.12	2 41 6.56	
	3	2 41 50.04	9.597		15 43 19.0	44.02	3 12.55	0.259	15	53.36	1 6.20	2 45 3.11	
	4	2 45 40.64	9.620		16 0 47.6	43.36	3 18.50	0.236	15	53.13	1 6.28	2 48 59.67	
	5	2 49 31.78	9.642		16 18 0.2	42.69	3 23.90	0.213	15	52.90	1 6.36	2 52 56.22	
	6	2 53 23.47	9.665	+16	34 56.6	+42.01	-3 28.74	-0.190	15	52.68	1 6.44	2 56 52.78	
	7	2 57 15.72	9.689		16 51 36.5	41.31	3 33.03	0.167	15	52.47	1 6.52	3 0 49.34	
	8	3 1 8.53	9.712		17 7 59.4	40.60	3 36.77	0.144	15	52.26	1 6.61	3 4 45.89	
	9	3 5 1.89	9.735		17 24 5.1	39.87	3 39.96	0.121	15	52.05	1 6.70	3 8 42.45	
	10	3 8 55.81	9.758		17 39 53.3	39.14	3 42.59	0.098	15	51.84	1 6.78	3 12 39.01	
	11	3 12 50.28	9.781	+17	55 23.7	+38.39	-3 44.67	-0.075	15	51.63	1 6.86	3 16 35.56	
	12	3 16 45.31	9.805		18 10 36.1	37.64	3 46.19	0.052	15	51.43	1 6.94	3 20 32.12	
	13	3 20 40.90	9.828		18 25 30.2	36.87	3 47.15	0.028	15	51.22	1 7.02	3 24 28.67	
	14	3 24 37.05	9.851		18 40 5.6	36.08	3 47.55	-0.005	15	51.02	1 7.10	3 28 25.23	
	15	3 28 33.76	9.875		18 54 22.1	35.29	3 47.40	+0.018	15	50.82	1 7.18	3 32 21.79	
	16	3 32 31.03	9.898	+19	8 19.6	+34.49	-3 46.70	+0.041	15	50.62	1 7.26	3 36 18.34	
	17	3 36 28.85	9.921	+19	21 57.7	+33.68	-3 45.44	+0.064	15	50.43	1 7.35	3 40 14.90	

NOTE.—For mean time interval of semidiameter passing meridian, subtract 0^s.18 from the sidereal interval.

FOR WASHINGTON APPARENT NOON.

Date.	Apparent Right Ascension.	Var. per Hour.	Apparent Declination.	Var. per Hour.	Equation of Time. Mean—App.	Var. per Hour.	Semi- diameter.	S. T. of Sem. Pass. Merid.	Sidereal Time of Mean Noon.
	h m s	s	° ' "	"	m s	s	' "	m s	h m s
May 17	3 36 28.85	9.921	+19 21 57.7	+33.68	-3 45.44	+0.064	15 50.43	1 7.35	3 40 14.90
18	3 40 27.24	9.945	19 35 16.1	32.85	3 43.61	0.068	15 50.24	1 7.43	3 44 11.46
19	3 44 26.19	9.968	19 48 14.5	32.01	3 41.22	0.111	15 50.05	1 7.51	3 48 8.02
20	3 48 25.70	9.991	20 0 52.8	31.17	3 38.27	0.134	15 49.87	1 7.59	3 52 4.57
21	3 52 25.76	10.014	20 13 10.8	30.32	3 34.77	0.157	15 49.68	1 7.66	3 56 1.13
22	3 56 26.39	10.038	+20 25 8.2	+29.46	-3 30.72	+0.180	15 49.50	1 7.73	3 59 57.69
23	4 0 27.57	10.060	20 36 44.6	28.58	3 26.12	0.203	15 49.32	1 7.80	4 3 54.24
24	4 4 29.28	10.082	20 47 59.9	27.69	3 20.98	0.225	15 49.14	1 7.87	4 7 50.80
25	4 8 31.52	10.104	20 58 53.8	26.83	3 15.31	0.247	15 48.97	1 7.94	4 11 47.36
26	4 12 34.27	10.125	21 9 26.0	25.89	3 9.13	0.268	15 48.80	1 8.01	4 15 43.92
27	4 16 37.53	10.146	+21 19 36.4	+24.98	-3 2.44	+0.289	15 48.64	1 8.08	4 19 40.47
28	4 20 41.28	10.166	21 29 24.7	24.05	2 55.27	0.309	15 48.48	1 8.14	4 23 37.03
29	4 24 45.50	10.186	21 38 50.7	23.11	2 47.63	0.328	15 48.32	1 8.21	4 27 33.59
30	4 28 50.17	10.204	21 47 54.1	22.17	2 39.54	0.346	15 48.17	1 8.27	4 31 30.14
31	4 32 55.28	10.222	21 56 34.8	21.22	2 31.02	0.364	15 48.03	1 8.33	4 35 26.70
June 1	4 37 0.81	10.239	+22 4 52.6	+20.26	-2 22.07	+0.381	15 47.89	1 8.39	4 39 23.26
2	4 41 6.73	10.255	22 12 47.3	19.29	2 12.73	0.397	15 47.75	1 8.44	4 43 19.82
3	4 45 13.02	10.270	22 20 18.7	18.32	2 3.01	0.412	15 47.62	1 8.49	4 47 16.38
4	4 49 19.67	10.284	22 27 26.6	17.34	1 52.95	0.426	15 47.50	1 8.54	4 51 12.93
5	4 53 26.66	10.298	22 34 11.0	16.35	1 42.55	0.440	15 47.38	1 8.59	4 55 9.49
6	4 57 33.96	10.311	+22 40 31.6	+15.36	-1 31.83	+0.453	15 47.27	1 8.64	4 59 6.05
7	5 1 41.56	10.322	22 46 28.4	14.37	1 20.82	0.464	15 47.16	1 8.68	5 3 2.61
8	5 5 49.42	10.333	22 52 1.2	13.36	1 9.56	0.475	15 47.05	1 8.72	5 6 59.17
9	5 9 57.53	10.343	22 57 9.8	12.36	0 58.03	0.485	15 46.95	1 8.76	5 10 55.72
10	5 14 5.87	10.352	23 1 54.3	11.35	0 46.29	0.494	15 46.85	1 8.79	5 14 52.28
11	5 18 14.41	10.360	+23 6 14.5	+10.33	-0 34.34	+0.502	15 46.75	1 8.82	5 18 48.84
12	5 22 23.14	10.367	23 10 10.3	9.32	0 22.20	0.509	15 46.66	1 8.84	5 22 45.40
13	5 26 32.04	10.374	23 13 41.7	8.30	-0 9.89	0.516	15 46.57	1 8.86	5 26 41.96
14	5 30 41.08	10.380	23 16 48.5	7.27	+0 2.56	0.521	15 46.48	1 8.88	5 30 38.51
15	5 34 50.25	10.385	23 19 30.8	6.25	0 15.13	0.526	15 46.40	1 8.90	5 34 35.07
16	5 38 59.54	10.389	+23 21 48.4	+5.22	+0 27.82	+0.531	15 46.33	1 8.92	5 38 31.63
17	5 43 8.92	10.393	23 23 41.3	4.19	0 40.61	0.535	15 46.26	1 8.93	5 42 28.19
18	5 47 18.38	10.396	23 25 9.5	3.16	0 53.48	0.538	15 46.19	1 8.94	5 46 24.75
19	5 51 27.90	10.398	23 26 12.9	2.12	1 6.41	0.539	15 46.12	1 8.94	5 50 21.30
20	5 55 37.46	10.399	23 26 51.5	1.09	1 19.37	0.540	15 46.05	1 8.94	5 54 17.86
21	5 59 47.03	10.399	+23 27 5.3	+0.06	+1 32.35	+0.541	15 45.99	1 8.94	5 58 14.42
22	6 3 56.60	10.398	23 26 54.3	-0.98	1 45.33	0.540	15 45.93	1 8.94	6 2 10.98
23	6 8 6.14	10.396	23 26 18.4	2.01	1 58.28	0.538	15 45.87	1 8.93	6 6 7.54
24	6 12 15.62	10.394	23 25 17.7	3.04	2 11.17	0.535	15 45.82	1 8.92	6 10 4.10
25	6 16 25.03	10.390	23 23 52.3	4.07	2 23.98	0.532	15 45.77	1 8.91	6 14 0.66
26	6 20 34.33	10.385	+23 22 2.1	-5.11	+2 36.69	+0.527	15 45.73	1 8.89	6 17 57.21
27	6 24 43.50	10.379	23 19 47.2	6.14	2 49.26	0.521	15 45.70	1 8.87	6 21 53.77
28	6 28 52.51	10.372	23 17 7.6	7.16	3 1.68	0.514	15 45.68	1 8.84	6 25 50.33
29	6 33 1.33	10.363	23 14 3.5	8.18	3 13.91	0.506	15 45.66	1 8.81	6 29 46.89
30	6 37 9.94	10.354	23 10 34.9	9.20	3 25.93	0.496	15 45.64	1 8.78	6 33 43.45
July 1	6 41 18.31	10.343	+23 6 42.0	-10.21	+3 37.71	+0.486	15 45.63	1 8.74	6 37 40.00
2	6 45 26.42	10.332	+23 2 24.8	-11.22	+3 49.24	+0.474	15 45.62	1 8.71	6 41 36.56

NOTE.—For mean time interval of semidiameter passing meridian, subtract 0.19 from the sidereal interval.

FOR WASHINGTON APPARENT NOON.

Date.		Apparent Right Ascension.			Var. per Hour.	Apparent Declination.			Var. per Hour.	Equation of Time. Mean—App.		Var. per Hour.	Semi-diameter.			S. T. of Sem. Pass. Merid.	Sidereal Time of Mean Noon.		
		h	m	s	"	°	'	"	"	m	s	s	'	"	m	s	h	m	s
July	1	6	41	18.31	10.343	+23	6	42.0	-10.21	+3	37.71	+0.496	15	45.63	1	8.74	6	37	40.00
	2	6	45	26.42	10.332	23	2	24.8	11.22	3	49.24	0.474	15	45.62	1	8.71	6	41	36.56
	3	6	49	34.25	10.320	22	57	43.5	12.22	4	0.47	0.461	15	45.62	1	8.67	6	45	33.12
	4	6	53	41.76	10.306	22	52	38.2	13.22	4	11.39	0.448	15	45.62	1	8.63	6	49	29.68
	5	6	57	48.94	10.292	22	47	8.9	14.21	4	21.98	0.434	15	45.63	1	8.58	6	53	26.24
	6	7	1	55.76	10.277	+22	41	16.0	-15.20	+4	32.22	+0.419	15	45.65	1	8.53	6	57	22.80
	7	7	6	2.21	10.261	22	34	59.5	16.18	4	42.09	0.403	15	45.67	1	8.48	7	1	19.35
	8	7	10	8.26	10.244	22	28	19.5	17.15	4	51.55	0.386	15	45.70	1	8.43	7	5	15.91
	9	7	14	13.90	10.226	22	21	16.4	18.11	5	0.61	0.368	15	45.73	1	8.37	7	9	12.47
	10	7	18	19.10	10.207	22	13	50.2	19.07	5	9.23	0.350	15	45.76	1	8.31	7	13	9.02
	11	7	22	23.85	10.188	+22	6	1.1	-30.02	+5	17.40	+0.331	15	45.80	1	8.25	7	17	5.58
	12	7	26	28.14	10.169	21	57	49.3	30.96	5	25.11	0.311	15	45.84	1	8.19	7	21	2.14
	13	7	30	31.95	10.149	21	49	15.0	31.89	5	32.34	0.291	15	45.89	1	8.12	7	24	58.70
	14	7	34	35.28	10.128	21	40	18.4	32.82	5	39.09	0.271	15	45.94	1	8.05	7	28	55.36
	15	7	38	38.11	10.108	21	30	59.5	33.75	5	45.35	0.250	15	45.99	1	7.98	7	32	51.81
	16	7	42	40.45	10.087	+21	21	18.7	-24.66	+5	51.11	+0.230	15	46.04	1	7.91	7	36	48.37
	17	7	46	42.28	10.066	21	11	16.1	25.56	5	56.37	0.209	15	46.10	1	7.84	7	40	44.93
	18	7	50	43.59	10.044	21	0	51.9	26.45	6	1.12	0.187	15	46.15	1	7.76	7	44	41.49
	19	7	54	44.38	10.022	20	50	6.4	27.34	6	5.35	0.165	15	46.21	1	7.68	7	48	38.04
	20	7	58	44.65	10.000	20	38	59.8	28.21	6	9.05	0.143	15	46.27	1	7.60	7	52	34.00
	21	8	2	44.38	9.977	+20	27	32.2	-29.08	+6	12.20	+0.120	15	46.34	1	7.52	7	56	31.16
	22	8	6	43.56	9.954	20	15	43.9	29.94	6	14.82	0.098	15	46.42	1	7.44	8	0	27.72
	23	8	10	42.19	9.931	20	3	35.2	30.79	6	16.89	0.074	15	46.50	1	7.36	8	4	24.27
	24	8	14	40.25	9.907	19	51	6.3	31.62	6	18.39	0.060	15	46.59	1	7.28	8	8	20.83
	25	8	18	37.74	9.883	19	38	17.6	32.44	6	19.31	0.027	15	46.68	1	7.19	8	12	17.39
	26	8	22	34.65	9.859	+19	25	9.2	-33.26	+6	19.67	+0.003	15	46.78	1	7.11	8	16	13.94
	27	8	26	30.97	9.834	19	11	41.3	34.06	6	19.43	-0.022	15	46.88	1	7.02	8	20	10.50
	28	8	30	26.69	9.809	18	57	54.4	34.83	6	18.60	0.047	15	46.98	1	6.94	8	24	7.06
	29	8	34	21.82	9.785	18	43	48.7	35.62	6	17.17	0.072	15	47.09	1	6.85	8	28	3.61
	30	8	38	16.35	9.759	18	29	24.5	36.39	6	15.15	0.097	15	47.21	1	6.76	8	32	0.17
Aug.	31	8	42	10.27	9.734	+18	14	42.2	-37.14	+6	12.52	-0.122	15	47.33	1	6.67	8	35	56.72
	1	8	46	3.57	9.708	17	59	41.9	37.88	6	9.28	0.148	15	47.45	1	6.58	8	39	53.28
	2	8	49	56.26	9.682	17	44	24.1	38.60	6	5.42	0.174	15	47.58	1	6.50	8	43	49.84
	3	8	53	48.33	9.657	17	28	49.0	39.32	6	0.94	0.199	15	47.71	1	6.41	8	47	46.39
	4	8	57	39.78	9.631	17	12	56.9	40.02	5	55.85	0.225	15	47.85	1	6.33	8	51	42.95
	5	9	1	30.61	9.605	+16	56	48.2	-40.70	+5	50.14	-0.251	15	47.99	1	6.24	8	55	39.50
	6	9	5	20.82	9.579	16	40	23.2	41.38	5	43.82	0.276	15	48.14	1	6.16	8	59	36.06
	7	9	9	10.42	9.554	16	23	42.1	42.04	5	36.88	0.302	15	48.29	1	6.07	9	3	32.62
	8	9	12	59.42	9.529	16	6	45.4	42.69	5	29.34	0.327	15	48.45	1	5.98	9	7	29.17
	9	9	16	47.81	9.504	15	49	33.2	43.33	5	21.20	0.351	15	48.61	1	5.90	9	11	25.73
	10	9	20	35.60	9.479	+15	32	5.8	-43.95	+5	12.47	-0.376	15	48.77	1	5.82	9	15	22.28
	11	9	24	22.81	9.455	15	14	23.6	44.56	5	3.15	0.400	15	48.94	1	5.74	9	19	18.84
	12	9	28	9.45	9.432	14	56	26.9	45.16	4	53.25	0.424	15	49.11	1	5.66	9	23	15.40
	13	9	31	55.53	9.409	14	38	15.9	45.75	4	42.80	0.447	15	49.28	1	5.58	9	27	11.95
	14	9	35	41.06	9.386	14	19	50.8	46.33	4	31.80	0.469	15	49.45	1	5.50	9	31	8.50
	15	9	39	26.05	9.364	+14	1	12.1	-46.89	+4	20.27	-0.491	15	49.62	1	5.42	9	35	5.06
	16	9	43	10.52	9.342	+13	42	20.0	-47.45	+4	8.22	-0.512	15	49.80	1	5.34	9	39	1.62

NOTE.—For mean time interval of semidiameter passing meridian, subtract 0.18 from the sidereal interval.

FOR WASHINGTON APPARENT NOON.

Date.	Apparent Right Ascension.	Var. per Hour.	Apparent Declination.	Var. per Hour.	Equation of Time. Mean—App.	Var. per Hour.	Semi- diameter.	S. T. of Sem. Pass. Merid.	Sidereal Time of Mean Noon.
	h m s	s	° ' "	"	m s	s	' "	m s	h m s
Aug. 16	9 43 10.52	9.342	+13 42 20.0	-47.45	+ 4 8.22	-0.512	15 49.80	1 5.34	9 39 1.62
17	9 46 54.48	9.321	13 23 14.6	47.99	3 55.67	0.533	15 49.98	1 5.27	9 42 58.17
18	9 50 37.95	9.301	13 3 56.4	48.52	3 42.63	0.553	15 50.16	1 5.20	9 46 54.72
19	9 54 20.95	9.282	12 44 25.6	49.04	3 29.10	0.573	15 50.34	1 5.13	9 50 51.28
20	9 58 3.48	9.262	12 24 42.7	49.54	3 15.11	0.592	15 50.53	1 5.06	9 54 47.83
21	10 1 45.54	9.243	+12 4 47.8	-50.03	+ 3 0.66	-0.611	15 50.72	1 4.99	9 58 44.39
22	10 5 27.16	9.225	11 44 41.3	50.51	2 45.76	0.630	15 50.91	1 4.92	10 2 40.94
23	10 9 8.34	9.207	11 24 23.6	50.97	2 30.43	0.647	15 51.11	1 4.86	10 6 37.50
24	10 12 49.10	9.190	11 3 55.0	51.42	2 14.69	0.664	15 51.31	1 4.79	10 10 34.05
25	10 16 29.46	9.173	10 43 15.7	51.85	1 58.54	0.681	15 51.51	1 4.73	10 14 30.61
26	10 20 9.42	9.157	+10 22 26.2	-52.27	+ 1 41.98	-0.698	15 51.72	1 4.67	10 18 27.16
27	10 23 48.99	9.141	10 1 26.8	52.68	1 25.04	0.714	15 51.94	1 4.61	10 22 23.72
28	10 27 28.19	9.126	9 40 17.7	53.07	1 7.73	0.729	15 52.16	1 4.56	10 26 20.27
29	10 31 7.03	9.111	9 18 59.4	53.45	0 50.07	0.743	15 52.38	1 4.50	10 30 16.82
30	10 34 45.52	9.097	8 57 32.3	53.81	0 32.06	0.757	15 52.60	1 4.45	10 34 13.38
31	10 38 23.67	9.083	+ 8 35 56.7	-54.16	+ 0 13.71	-0.771	15 52.83	1 4.40	10 38 9.93
Sept. 1	10 42 1.51	9.070	8 14 12.8	54.49	- 0 4.96	0.784	15 53.06	1 4.36	10 42 6.49
2	10 45 39.03	9.057	7 52 21.2	54.81	0 23.93	0.797	15 53.29	1 4.32	10 46 3.04
3	10 49 16.26	9.043	7 30 22.0	55.12	0 43.20	0.809	15 53.53	1 4.28	10 49 59.59
4	10 52 53.22	9.034	7 8 15.6	55.41	1 2.75	0.820	15 53.77	1 4.24	10 53 56.15
5	10 56 29.92	9.024	+ 6 46 2.3	-55.69	- 1 22.56	-0.830	15 54.02	1 4.21	10 57 52.70
6	11 0 6.36	9.014	6 23 42.5	55.95	1 42.61	0.840	15 54.27	1 4.18	11 1 49.26
7	11 3 42.58	9.006	6 1 16.6	56.20	2 2.89	0.849	15 54.52	1 4.15	11 5 45.81
8	11 7 18.60	8.997	5 38 44.8	56.44	2 23.37	0.857	15 54.77	1 4.12	11 9 42.36
9	11 10 54.44	8.990	5 16 7.4	56.67	2 44.03	0.864	15 55.02	1 4.10	11 13 38.92
10	11 14 30.11	8.983	+ 4 53 24.6	-56.89	- 3 4.85	-0.870	15 55.27	1 4.08	11 17 35.47
11	11 18 5.65	8.978	4 30 36.9	57.09	3 25.81	0.876	15 55.52	1 4.06	11 21 32.02
12	11 21 41.08	8.974	4 7 44.5	57.28	3 46.88	0.880	15 55.78	1 4.04	11 25 28.58
13	11 25 16.42	8.971	3 44 47.6	57.46	4 8.04	0.883	15 56.03	1 4.03	11 29 25.13
14	11 28 51.69	8.969	3 21 46.6	57.62	4 29.26	0.885	15 56.29	1 4.02	11 33 21.68
15	11 32 26.92	8.967	+ 2 58 41.9	-57.77	- 4 50.53	-0.887	15 56.54	1 4.02	11 37 18.24
16	11 36 2.12	8.966	2 35 33.7	57.91	5 11.82	0.887	15 56.80	1 4.01	11 41 14.79
17	11 39 37.32	8.967	2 12 22.3	58.04	5 33.11	0.886	15 57.05	1 4.01	11 45 11.34
18	11 43 12.55	8.969	1 49 8.0	58.15	5 54.37	0.885	15 57.31	1 4.01	11 49 7.90
19	11 46 47.83	8.971	1 25 51.2	58.25	6 15.60	0.883	15 57.57	1 4.02	11 53 4.45
20	11 50 23.16	8.974	+ 1 2 32.3	-58.33	- 6 36.76	-0.880	15 57.83	1 4.03	11 57 1.00
21	11 53 58.57	8.978	0 39 11.6	58.40	6 57.84	0.876	15 58.10	1 4.04	12 0 57.56
22	11 57 34.09	8.982	+ 0 15 49.4	-58.45	7 18.81	0.871	15 58.36	1 4.05	12 4 54.11
23	12 1 9.73	8.988	- 0 7 33.9	58.49	7 39.66	0.866	15 58.63	1 4.07	12 8 50.66
24	12 4 45.51	8.994	0 30 57.9	58.51	8 0.38	0.860	15 58.90	1 4.09	12 12 47.21
25	12 8 21.45	9.001	- 0 54 22.3	-58.52	- 8 20.95	-0.853	15 59.17	1 4.11	12 16 43.77
26	12 11 57.56	9.008	1 17 46.7	58.51	8 41.34	0.845	15 59.44	1 4.14	12 20 40.32
27	12 15 33.86	9.017	1 41 10.7	58.49	9 1.53	0.837	15 59.71	1 4.17	12 24 36.87
28	12 19 10.37	9.026	2 4 34.0	58.45	9 21.51	0.828	15 59.98	1 4.20	12 28 33.43
29	12 22 47.11	9.036	2 27 56.2	58.40	9 41.26	0.818	16 0.26	1 4.24	12 32 29.98
30	12 26 24.10	9.046	- 2 51 17.0	-58.33	-10 0.77	-0.808	16 0.54	1 4.23	12 36 26.53
Oct. 1	12 30 1.35	9.058	- 3 14 35.9	-58.24	-10 20.03	-0.797	16 0.82	1 4.32	12 40 23.09

NOTE.—For mean time interval of semidiameter passing meridian, subtract 0.18 from the sidereal interval.

FOR WASHINGTON APPARENT NOON.

Date.	Apparent Right Ascension.			Var. per Hour.	Apparent Declination.			Var. per Hour.	Equation of Time. Mean—App.		Var. per Hour.	Semi-diameter.		S. T. of Sem. Pass. Merid.		Sidereal Time of Mean Noon.
	h	m	s		°	'	"		m	s		'	"	m	s	
Oct.	1	12	30	1.35	9.058	— 3	14 35.9	—58.24	—10	20.03	—0.797	16	0.82	1	4.32	12 40 23.09
	2	12	33	38.88	9.070	3	37 52.5	58.14	10	39.01	0.785	16	1.10	1	4.36	12 44 19.64
	3	12	37	16.70	9.082	4	1 6.5	58.03	10	57.69	0.772	16	1.38	1	4.41	12 48 16.19
	4	12	40	54.83	9.096	4	24 17.6	57.90	11	16.06	0.759	16	1.66	1	4.46	12 52 12.75
	5	12	44	33.30	9.110	4	47 25.5	57.75	11	34.10	0.744	16	1.95	1	4.51	12 56 9.30
	6	12	48	12.13	9.125	— 5	10 29.7	—57.59	—11	51.78	—0.729	16	2.24	1	4.57	13 0 5.85
	7	12	51	51.33	9.141	5	33 29.9	57.42	12	9.08	0.713	16	2.52	1	4.63	13 4 2.41
	8	12	55	30.93	9.159	5	56 25.7	57.23	12	25.99	0.696	16	2.80	1	4.69	13 7 58.96
	9	12	59	10.95	9.177	6	19 16.8	57.03	12	42.48	0.678	16	3.08	1	4.76	13 11 55.51
	10	13	2	51.41	9.195	6	42 2.9	56.81	12	58.53	0.659	16	3.36	1	4.83	13 15 52.07
	11	13	6	32.34	9.215	— 7	4 43.7	—56.58	—13	14.11	—0.639	16	3.64	1	4.90	13 19 48.62
	12	13	10	13.76	9.236	7	27 18.8	56.34	13	29.20	0.618	16	3.92	1	4.98	13 23 45.18
	13	13	13	55.70	9.258	7	49 47.8	56.08	13	43.77	0.596	16	4.19	1	5.06	13 27 41.73
	14	13	17	38.17	9.281	8	12 10.4	55.89	13	57.82	0.574	16	4.46	1	5.14	13 31 38.28
	15	13	21	21.20	9.305	8	34 26.3	55.51	14	11.31	0.550	16	4.73	1	5.22	13 35 34.84
	16	13	25	4.81	9.329	— 8	56 35.0	—55.21	—14	24.22	—0.526	16	5.00	1	5.30	13 39 31.39
	17	13	28	49.01	9.354	9	18 36.2	54.89	14	36.53	0.500	16	5.27	1	5.38	13 43 27.94
	18	13	32	33.83	9.380	9	40 29.4	54.55	14	48.23	0.474	16	5.54	1	5.47	13 47 24.50
	19	13	36	19.28	9.407	10	2 14.3	54.19	14	59.30	0.448	16	5.80	1	5.56	13 51 21.05
	20	13	40	5.37	9.434	10	23 50.5	53.82	15	9.73	0.421	16	6.07	1	5.65	13 55 17.61
	21	13	43	52.13	9.462	—10	45 17.6	—53.43	—15	19.50	—0.393	16	6.33	1	5.74	13 59 14.16
	22	13	47	39.57	9.491	11	6 35.1	53.02	15	28.59	0.364	16	6.60	1	5.84	14 3 10.71
	23	13	51	27.71	9.520	11	27 42.7	52.60	15	36.99	0.335	16	6.86	1	5.94	14 7 7.27
	24	13	55	16.55	9.550	11	48 40.0	52.17	15	44.69	0.306	16	7.13	1	6.04	14 11 3.82
	25	13	59	6.11	9.580	12	9 26.5	51.71	15	51.66	0.276	16	7.39	1	6.14	14 15 0.38
	26	14	2	56.40	9.611	—12	30 1.8	—51.23	—15	57.91	—0.245	16	7.65	1	6.24	14 18 56.93
	27	14	6	47.42	9.641	12	50 25.5	50.74	16	3.43	0.214	16	7.91	1	6.35	14 22 53.49
	28	14	10	39.19	9.673	13	10 37.2	50.23	16	8.20	0.183	16	8.17	1	6.46	14 26 50.04
	29	14	14	31.71	9.704	13	30 36.4	49.70	16	12.22	0.152	16	8.43	1	6.57	14 30 46.60
	30	14	18	25.00	9.736	13	50 22.7	49.15	16	15.48	0.120	16	8.68	1	6.68	14 34 43.15
Nov.	31	14	22	19.05	9.768	—14	9 55.7	—48.59	—16	17.97	—0.088	16	8.94	1	6.79	14 38 39.71
	1	14	26	13.88	9.801	14	29 15.1	48.02	16	19.68	0.055	16	9.19	1	6.91	14 42 36.26
	2	14	30	9.50	9.834	14	48 20.4	47.42	16	20.63	—0.023	16	9.45	1	7.03	14 46 32.82
	3	14	34	5.90	9.867	15	7 11.1	46.80	16	20.79	+0.010	16	9.70	1	7.15	14 50 29.37
	4	14	38	3.10	9.900	15	25 46.9	46.17	16	20.15	0.044	16	9.95	1	7.27	14 54 25.93
	5	14	42	1.10	9.934	—15	44 7.3	—45.53	—16	18.70	+0.077	16	10.20	1	7.39	14 58 22.48
	6	14	45	59.92	9.968	16	2 12.1	44.87	16	16.44	0.111	16	10.45	1	7.51	15 2 19.04
	7	14	49	59.57	10.003	16	20 0.8	44.19	16	13.36	0.146	16	10.69	1	7.63	15 6 15.60
	8	14	54	0.05	10.038	16	37 33.1	43.50	16	9.44	0.181	16	10.92	1	7.74	15 10 12.15
	9	14	58	1.37	10.073	16	54 48.6	42.79	16	4.69	0.216	16	11.15	1	7.86	15 14 8.71
	10	15	2	3.54	10.108	—17	11 46.9	—42.06	—15	59.10	+0.251	16	11.38	1	7.98	15 18 5.26
	11	15	6	6.56	10.144	17	28 27.5	41.32	15	52.66	0.286	16	11.61	1	8.10	15 22 1.82
	12	15	10	10.44	10.180	17	44 50.1	40.56	15	45.36	0.322	16	11.83	1	8.22	15 25 58.38
	13	15	14	15.18	10.215	18	0 54.3	39.79	15	37.19	0.358	16	12.04	1	8.34	15 29 54.93
	14	15	18	20.78	10.251	18	16 39.8	39.00	15	28.17	0.394	16	12.25	1	8.46	15 33 51.49
	15	15	22	27.25	10.287	—18	32 6.1	—38.19	—15	18.29	+0.430	16	12.46	1	8.58	15 37 48.05
	16	15	26	34.58	10.323	—18	47 12.7	—37.36	—15	7.54	+0.466	16	12.66	1	8.70	15 41 44.60

NOTE.—For mean time interval of semidiameter passing meridian, subtract 0^m.18 from the sidereal interval.

FOR WASHINGTON APPARENT NOON.

FOR WASHINGTON APPARENT NOON.														Sidereal Time of Mean Noon.	
Date.	Apparent Right Ascension.			Var. per Hour.	Apparent Declination.	Var. per Hour.	Equation of Time. Mean—App.	Var. per Hour.	Semi- diameter.	S. T. of Sem. Pass. Merid.					
	h	m	s	s	°	'	"	m	s	'	m	s	h	m	s
Nov.	16	15	26 34.58	10.323	—18	47	12.7	—37.36	—15	7.54	+0.466	16 12.66	1	8.70	15 41 44.60
	17	15	30 42.77	10.359	19	1	59.4	36.53	14 55.93	0.501	16 12.86	1	8.81	15 45 41.16	
	18	15	34 51.81	10.394	19	16	25.8	35.67	14 43.48	0.536	16 13.06	1	8.92	15 49 37.72	
	19	15	39 1.70	10.430	19	30	31.4	34.80	14 30.18	0.572	16 13.26	1	9.03	15 53 34.27	
	20	15	43 12.44	10.465	19	44	15.9	33.91	14 16.04	0.607	16 13.45	1	9.14	15 57 30.83	
	21	15	47 24.00	10.499	—19	57	38.9	—33.00	—14	1.08	+0.641	16 13.64	1	9.25	16 1 27.39
	22	15	51 36.38	10.533	20	10	40.0	32.08	13 45.30	0.675	16 13.83	1	9.36	16 5 23.94	
	23	15	55 49.57	10.566	20	23	18.8	31.15	13 28.71	0.708	16 14.02	1	9.47	16 9 20.50	
	24	16	0 3.55	10.599	20	35	34.9	30.20	13 11.33	0.740	16 14.20	1	9.58	16 13 17.06	
	25	16	4 18.31	10.631	20	47	28.1	29.24	12 53.19	0.771	16 14.38	1	9.69	16 17 13.61	
Dec.	26	16	8 33.81	10.661	—20	58	58.1	—28.26	—12	34.30	+0.802	16 14.55	1	9.79	16 21 10.17
	27	16	12 50.04	10.691	21	10	4.4	27.26	12 14.67	0.832	16 14.72	1	9.89	16 25 6.73	
	28	16	17 6.99	10.721	21	20	46.6	26.25	11 54.34	0.861	16 14.89	1	9.99	16 29 3.29	
	29	16	21 24.62	10.749	21	31	4.5	25.24	11 33.32	0.890	16 15.05	1	10.08	16 32 59.84	
	30	16	25 42.91	10.776	21	40	57.8	24.20	11 11.64	0.917	16 15.21	1	10.17	16 36 56.40	
	1	16	30 1.85	10.802	—21	50	26.2	—23.16	—10	49.33	+0.943	16 15.37	1	10.26	16 40 52.96
	2	16	34 21.41	10.827	21	59	29.6	22.11	10 26.40	0.968	16 15.53	1	10.35	16 44 49.52	
	3	16	38 41.56	10.852	22	8	7.4	21.04	10 2.87	0.992	16 15.69	1	10.43	16 48 46.08	
	4	16	43 2.29	10.875	22	16	19.5	19.97	9 38.76	1.016	16 15.84	1	10.51	16 52 42.64	
	5	16	47 23.57	10.898	22	24	5.8	18.80	9 14.10	1.039	16 15.98	1	10.58	16 56 39.19	
	6	16	51 45.39	10.920	—22	31	25.9	—17.79	—8	48.90	+1.061	16 16.12	1	10.65	17 0 35.75
	7	16	56 7.72	10.941	22	38	19.6	16.69	8 23.20	1.081	16 16.25	1	10.72	17 4 32.31	
	8	17	0 30.54	10.961	22	44	46.7	15.57	7 57.02	1.101	16 16.38	1	10.79	17 8 28.87	
	9	17	4 53.82	10.979	22	50	47.0	14.45	7 30.37	1.119	16 16.50	1	10.86	17 12 25.43	
	10	17	9 17.54	10.997	22	56	20.3	13.32	7 3.29	1.137	16 16.61	1	10.92	17 16 21.99	
	11	17	13 41.67	11.014	—23	1	26.4	—12.19	—6	35.79	+1.154	16 16.72	1	10.97	17 20 18.54
	12	17	18 6.19	11.029	23	6	5.1	11.04	6 7.90	1.169	16 16.82	1	11.02	17 24 15.10	
	13	17	22 31.06	11.043	23	10	16.3	9.89	5 39.66	1.183	16 16.92	1	11.06	17 28 11.66	
	14	17	26 56.25	11.066	23	13	59.9	8.74	5 11.11	1.196	16 17.01	1	11.10	17 32 8.22	
	15	17	31 21.75	11.089	23	17	15.7	7.58	4 42.25	1.208	16 17.09	1	11.14	17 36 4.78	
	16	17	35 47.53	11.079	—23	20	3.6	—6.41	—4	13.12	+1.219	16 17.17	1	11.17	17 40 1.34
	17	17	40 13.54	11.088	23	22	23.4	5.24	3 43.75	1.228	16 17.24	1	11.19	17 43 57.90	
	18	17	44 39.75	11.096	23	24	15.1	4.07	3 14.18	1.236	16 17.31	1	11.21	17 47 54.45	
	19	17	49 6.13	11.102	23	25	38.6	2.89	2 44.44	1.242	16 17.37	1	11.23	17 51 51.01	
	20	17	53 32.64	11.107	23	26	33.9	1.71	2 14.56	1.247	16 17.43	1	11.24	17 55 47.57	
	21	17	57 59.25	11.110	—23	27	0.8	—0.53	—1	44.59	+1.250	16 17.49	1	11.25	17 59 44.13
	22	18	2 25.93	11.112	23	28	59.3	+0.05	1 14.56	1.252	16 17.55	1	11.25	18 3 40.69	
	23	18	6 52.63	11.113	23	26	29.5	1.83	0 44.50	1.252	16 17.60	1	11.25	18 7 37.25	
	24	18	11 19.32	11.111	23	25	31.4	3.01	—0 14.45	1.251	16 17.65	1	11.25	18 11 33.81	
	25	18	15 45.94	11.107	23	24	5.0	4.19	+0 15.53	1.248	16 17.69	1	11.24	18 15 30.36	
	26	18	20 12.46	11.102	—23	22	10.3	+5.37	+0 45.42	+1.243	16 17.73	1	11.23	18 19 26.92	
	27	18	24 38.85	11.096	23	19	47.4	6.54	1 15.18	1.236	16 17.76	1	11.21	18 23 23.48	
	28	18	29 5.07	11.089	23	16	56.3	7.71	1 44.76	1.228	16 17.79	1	11.18	18 27 20.04	
	29	18	33 31.09	11.079	23	13	37.2	8.88	2 14.13	1.219	16 17.81	1	11.15	18 31 16.60	
	30	18	37 56.86	11.068	23	9	50.3	10.03	2 43.25	1.207	16 17.83	1	11.12	18 35 13.16	
	31	18	42 22.34	11.055	—23	5	35.6	+11.19	+3 12.08	+1.195	16 17.85	1	11.09	18 39 9.71	
	32	18	46 47.50	11.041	—23	0	53.3	+12.34	+3 40.61	+1.182	16 17.87	1	11.05	18 43 6.27	

NOTE.—For mean time interval of semidiameter passing meridian, subtract 0^s.19 from the sidereal interval.

FOR TRANSIT OF MOON'S CENTER OVER THE MERIDIAN OF WASHINGTON.

Date.	Culmination.	Wash. Mean Time.	Var. per Hour of Long.	Right Ascension of Center.	Var. per Hour of Long.	Geocentric Declination of Center.	Var. per Hour of Long.	S. T. of Semi- Passing Meridian.	Geocen- tric Semi-di- ameter.	Equa- torial Horiz- ontal Parallax.	Height Limit.
		h m	m	h m s	s	" ' "	"	s	" ' "	" ' "	
Jan. 0	U	20 19.73	2.454	14 59 14.67	157.51	-22 21 26.6	-606.9	73.91	16 22.3	59 59.2	II S
1	L	8 49.89	2.570	15 31 27.15	164.49	24 11 41.9	492.1	75.56	16 28.7	60 22.5	
1	U	21 21.36	2.673	16 4 59.15	170.66	25 36 56.4	357.0	76.99	16 34.2	60 42.8	II S
2	L	9 53.94	2.751	16 39 37.14	175.38	26 33 24.0	204.9	78.06	16 38.7	60 59.4	
2	U	22 27.26	2.796	17 15 0.18	178.09	-26 58 7.7	-40.9	78.65	16 42.0	61 11.5	II N
3	L	11 0.89	2.802	17 50 41.72	178.43	26 49 27.2	+127.8	78.71	16 43.9	61 18.6	
3	U	23 34.34	2.768	18 26 12.93	176.38	26 7 15.0	293.0	78.23	16 44.4	61 20.3	
4	L	12 7.18	2.699	19 1 6.66	172.26	24 53 0.1	447.0	77.26	16 43.3	61 16.4	
5	U	0 39.02	2.605	19 35 0.91	166.58	-23 9 35.4	+583.7	75.93	16 40.8	61 7.1	
5	L	13 9.63	2.405	20 7 40.89	159.99	21 0 54.6	699.3	74.36	16 36.9	60 52.8	
6	U	1 38.89	2.380	20 38 59.37	153.09	18 31 22.8	792.1	72.69	16 31.7	60 33.8	I S
6	L	14 6.78	2.269	21 8 55.66	146.36	15 45 33.0	892.5	71.04	16 25.5	60 10.9	
7	U	2 33.38	2.166	21 37 34.12	140.16	-12 47 47.2	+911.8	69.49	16 18.4	59 45.0	I S
7	L	14 58.81	2.075	22 5 2.47	134.70	9 42 4.5	942.3	68.11	16 10.7	59 16.8	
8	U	3 23.24	1.999	22 31 30.38	130.10	6 31 55.9	956.5	66.93	16 2.7	58 47.2	I S
8	L	15 46.84	1.937	22 57 8.47	126.40	3 20 23.4	956.7	65.97	15 54.4	58 16.9	
9	U	4 9.79	1.890	23 22 7.56	123.60	-0 10 2.6	+944.9	65.24	15 46.2	57 46.6	I S
9	L	16 32.27	1.858	23 46 38.23	121.67	+2 56 54.2	923.0	64.74	15 38.1	57 17.0	
10	U	4 54.44	1.840	0 10 50.61	120.54	5 58 33.9	892.2	64.45	15 30.4	56 48.6	I S
10	L	17 16.47	1.834	0 34 54.12	120.17	8 53 17.0	883.7	64.37	15 23.1	56 21.8	
11	U	5 38.49	1.839	0 58 57.47	120.49	+11 39 34.8	+808.1	64.46	15 16.3	55 57.0	I S
11	L	18 0.64	1.854	1 23 8.42	121.43	14 16 4.9	755.8	64.73	15 10.1	55 34.3	
12	U	6 23.03	1.879	1 47 33.80	122.88	16 41 29.3	697.2	65.11	15 4.6	55 14.1	I S
12	L	18 45.75	1.910	2 12 19.18	124.75	18 54 31.9	632.2	65.60	14 59.8	54 56.3	
13	U	7 8.88	1.945	2 37 28.84	126.90	+20 53 57.3	+560.9	66.16	14 55.6	54 41.0	I S
13	L	19 32.45	1.984	3 3 5.42	129.20	22 38 31.2	483.6	66.75	14 52.1	54 28.3	
14	U	7 56.49	2.022	3 29 9.73	131.49	24 7 1.3	400.4	67.33	14 49.3	54 18.0	I S
14	L	20 20.97	2.057	3 55 40.63	133.61	25 18 19.7	311.8	67.85	14 47.2	54 10.1	
15	U	8 45.83	2.080	4 22 34.92	135.37	+26 11 25.4	+218.5	68.27	14 45.7	54 4.6	I S
15	L	21 11.00	2.107	4 49 47.49	136.63	26 45 28.5	121.5	68.57	14 44.8	54 1.2	
16	U	9 36.36	2.118	5 17 11.59	137.28	26 59 53.4	+22.4	68.69	14 44.4	53 59.8	I N
16	L	22 1.78	2.117	5 44 39.37	137.24	26 54 22.1	-77.6	68.64	14 44.5	54 0.3	
17	U	10 27.13	2.105	6 12 2.51	136.51	+26 28 56.0	-176.5	68.42	14 45.1	54 2.5	I N
17	L	22 52.26	2.082	6 39 12.99	135.14	25 43 57.2	273.7	68.04	14 46.1	54 6.3	
18	U	11 17.07	2.051	7 6 3.73	133.24	24 40 7.2	364.7	67.52	14 47.6	54 11.6	I N
18	L	23 41.46	2.013	7 32 29.14	130.94	23 18 24.1	451.3	66.90	14 49.3	54 18.1	
19	U	12 5.36	1.971	7 58 25.46	128.41	+21 40 0.7	-531.4	66.22	14 51.4	54 25.8	I, II, N
20	L	0 28.75	1.928	8 23 50.93	125.82	19 46 20.1	604.1	65.53	14 53.8	54 34.6	
20	U	12 51.63	1.886	8 48 45.71	123.33	17 38 52.2	669.2	64.87	14 56.5	54 44.5	II S
21	L	1 14.03	1.848	9 13 11.75	121.06	15 19 11.1	726.3	64.26	14 59.5	54 55.3	
21	U	13 36.01	1.816	9 37 12.53	119.14	+12 48 53.3	-775.3	63.76	15 2.7	55 7.1	II S
22	L	1 57.65	1.792	10 0 52.88	117.66	10 9 35.3	816.4	63.38	15 6.2	55 19.8	
22	U	14 19.05	1.776	10 24 18.73	116.73	7 22 53.5	849.3	63.15	15 9.9	55 33.4	II S
23	L	2 40.32	1.771	10 47 36.88	116.40	4 30 24.6	874.2	63.08	15 13.8	55 48.0	
23	U	15 1.60	1.776	11 10 54.96	116.73	+1 33 45.4	-890.9	63.21	15 18.1	56 3.5	II S

Jan. 16, U Defective Illumination of S. 0'.02.
Jan. 19, U Defective Illumination of II. 0'.01.

Jan. 19, U Defective Illumination of S. 6'.07.

FOR TRANSIT OF MOON'S CENTER OVER THE MERIDIAN OF WASHINGTON.

Date.	Culmination.	Wash. Mean Time.	Var. per Hour of Long.	Right Ascension of Center.	Var. per Hour of Long.	Geocentric Declination of Center.	Var. per Hour of Long.	S. T. of Semid. Passing Meridian.	Geocen- tric Semidi- ameter.	Equa- torial Hori- zontal Parallax.	Bright Limbs.
		h m	m	h m s	s	" ' "	"	s	" "	" "	
Jan. 23	U	15 1.60	1.776	11 10 54.96	116.73	+ 1 33 45.4	-890.9	63.21	15 18.1	56 3.5	II. S.
24	L	3 23.00	1.794	11 34 21.22	117.77	- 1 25 24.2	899.2	63.54	15 22.6	56 20.0	
24	U	15 44.69	1.824	11 58 4.50	119.57	4 25 21.1	898.6	64.07	15 27.4	56 37.6	II. S.
25	L	4 6.82	1.867	12 22 14.09	122.17	7 24 15.1	888.6	64.81	15 32.4	56 56.1	
25	U	16 29.55	1.923	12 46 59.62	125.56	-10 20 6.8	-868.1	65.76	15 37.7	57 15.5	II. S.
26	L	4 53.03	1.993	13 12 30.81	129.77	13 10 44.1	836.1	66.91	15 43.2	57 35.7	
26	U	17 17.43	2.076	13 38 57.15	134.74	15 53 40.0	791.0	68.23	15 48.9	57 56.6	II. S.
27	L	5 42.89	2.170	14 6 27.33	140.39	18 26 10.1	731.5	69.70	15 54.7	58 18.0	
27	U	18 9.53	2.272	14 35 8.41	146.52	-20 45 11.4	-656.0	71.27	16 0.6	58 39.6	II. S.
28	L	6 37.43	2.377	15 5 4.79	152.89	22 47 25.3	563.4	72.85	16 6.4	59 0.9	
28	U	19 6.58	2.480	15 36 17.02	159.10	24 29 23.0	453.3	74.36	16 12.1	59 21.6	II. S.
29	L	7 36.92	2.573	16 8 40.48	164.67	25 47 36.0	326.2	75.68	16 17.4	59 41.2	
29	U	20 8.26	2.647	16 42 4.61	169.12	-26 38 52.6	-184.4	76.70	16 22.2	59 59.0	II. S.
30	L	8 40.34	2.694	17 16 12.87	171.96	27 0 38.0	- 31.8	77.34	16 26.5	60 14.6	
30	U	21 12.80	2.710	17 50 43.94	172.88	26 51 13.8	+126.3	77.52	16 29.9	60 27.1	II. N.
31	L	9 45.24	2.692	18 25 14.03	171.81	26 10 13.9	263.1	77.23	16 32.4	60 36.2	
31	U	22 17.28	2.644	18 59 19.90	168.90	-24 58 30.6	+422.4	76.51	16 33.8	60 41.4	II. N.
Feb. 1	L	10 48.58	2.571	19 32 41.68	164.53	23 18 10.2	568.4	75.45	16 34.0	60 42.2	
1	U	23 18.92	2.483	20 5 4.86	159.22	21 12 18.3	687.1	74.15	16 33.0	60 38.5	
2	L	11 48.13	2.387	20 36 20.98	153.45	18 44 41.4	785.6	72.73	16 30.8	60 30.3	
3	U	0 16.19	2.290	21 6 27.34	147.66	-15 59 26.7	+893.3	71.28	16 27.4	60 17.8	
3	L	12 43.12	2.200	21 35 25.98	142.20	13 0 44.4	920.3	69.90	16 22.8	60 1.2	
4	U	1 9.02	2.118	22 3 22.32	137.30	9 52 35.3	958.0	68.66	16 17.4	59 41.2	
4	L	13 34.01	2.049	22 30 24.10	133.12	6 38 42.8	977.9	67.59	16 11.1	59 18.1	
5	U	1 58.24	1.992	22 56 40.25	129.71	- 3 22 29.1	+981.9	66.71	16 4.2	58 52.8	I. S.
5	L	14 21.87	1.949	23 22 20.27	127.10	- 0 6 53.0	971.8	66.04	15 56.9	58 25.8	
6	U	2 45.06	1.918	23 47 33.65	125.27	+ 3 5 28.5	949.7	65.58	15 49.3	57 58.0	I. S.
6	L	15 7.96	1.901	0 12 29.62	124.18	6 12 18.3	916.9	65.32	15 41.6	57 29.9	
7	U	3 30.71	1.894	0 37 16.83	123.79	+ 9 11 36.6	+874.6	65.25	15 34.1	57 2.2	I. S.
7	L	15 53.45	1.898	1 2 3.22	124.03	12 1 37.4	824.2	65.35	15 26.8	56 35.4	
8	U	4 16.30	1.911	1 26 55.86	124.82	14 40 46.2	766.1	65.59	15 19.9	56 10.0	I. S.
8	L	16 39.35	1.932	1 52 0.84	126.07	17 7 36.7	701.2	65.95	15 13.5	55 46.4	
9	U	5 2.68	1.958	2 17 22.98	127.67	+19 20 49.3	+629.9	66.40	15 7.6	55 25.0	I. S.
9	L	17 26.36	1.988	2 43 5.81	129.49	21 19 9.9	562.5	66.90	15 2.4	55 5.9	
10	U	5 50.41	2.020	3 9 11.19	131.41	23 1 29.1	469.7	67.41	14 57.9	54 49.4	I. S.
10	L	18 14.84	2.051	3 35 39.29	133.26	24 26 43.7	381.9	67.90	14 54.1	54 35.5	
11	U	6 39.62	2.078	4 2 28.53	134.90	+25 33 56.5	+289.6	68.32	14 51.1	54 24.4	I. S.
11	L	19 4.70	2.100	4 29 35.47	136.19	26 22 20.1	193.8	68.64	14 48.8	54 16.1	
12	U	7 29.98	2.113	4 56 55.12	137.00	26 51 17.8	+ 96.5	68.83	14 47.3	54 10.5	I. S.
12	L	19 55.38	2.118	5 24 21.24	137.25	27 0 27.0	- 4.1	68.86	14 46.5	54 7.5	
13	U	8 20.76	2.112	5 51 46.83	136.91	+26 49 41.1	-103.5	68.74	14 46.4	54 7.1	I. N.S.
13	L	20 46.02	2.096	6 19 4.74	135.98	26 19 10.0	201.3	68.46	14 46.9	54 9.1	
14	U	9 11.04	2.072	6 46 8.28	134.52	25 29 19.9	296.4	68.03	14 48.0	54 13.3	I. N.
14	L	21 35.72	2.041	7 12 51.72	132.66	24 20 53.9	387.1	67.50	14 49.7	54 19.5	
15	U	10 0.00	2.005	7 39 10.75	130.48	+22 54 48.7	-472.7	66.89	14 51.9	54 27.5	I. N.

Feb. 13, U Defective Illumination of S. 0".13.

FOR TRANSIT OF MOON'S CENTER OVER THE MERIDIAN OF WASHINGTON.

Date	Culmination	Wash. Mean Time	Var. of Hourly Long.	Right Ascension of Center	Var. of Hourly Long.	Geocentric Declination of Center	Var. of Hourly Long.	S. T. of Transit for Washington	Geocentric Semi-diameter	Equatorial Horizontal Parallax	Bright. Limb.
		<i>h m s</i>	<i>sec</i>	<i>h m s</i>	<i>sec</i>	<i>° ' "</i>	<i>sec</i>	<i>h m s</i>	<i>"</i>	<i>"</i>	
Feb. 15	U	10 0.00	1.885	7 39 18.75	126.69	+22 54 48.7	-472.7	66.89	14 51.9	54 27.5	I. N.
15	L	22 23.83	1.886	8 5 2.73	126.34	21 12 13.0	332.3	66.24	14 54.5	54 37.9	
16	U	10 47.20	1.823	8 30 26.73	125.84	19 14 25.3	426.8	65.59	14 57.5	54 48.2	L. N.
16	L	23 10.11	1.883	8 55 23.50	125.67	17 2 51.2	689.7	64.98	15 0.9	55 0.4	
17	U	11 32.61	1.839	9 19 55.36	125.71	+14 39 1.7	-747.1	64.43	15 4.5	55 13.5	L. N.S.
17	L	23 54.75	1.822	9 44 5.94	126.12	12 4 32.3	796.4	63.98	15 8.2	55 27.3	
18	U	12 16.43	1.814	10 8 0.01	125.87	9 21 1.7	807.3	63.66	15 12.1	55 41.7	I. II. N.S.
19	L	0 38.32	1.862	10 31 42.35	125.35	6 30 11.6	869.4	63.49	15 16.1	55 56.4	
19	U	12 50.94	1.807	10 55 22.47	124.58	+ 3 33 47.1	-890.4	63.48	15 20.2	56 11.4	II. S.
20	L	1 21.61	1.821	11 19 4.50	124.85	+ 0 33 37.0	907.1	63.66	15 24.3	56 26.5	
20	U	13 43.46	1.822	11 42 57.42	124.08	- 2 28 25.1	911.8	64.02	15 28.4	56 41.6	II. S.
21	L	2 5.62	1.864	12 7 9.11	123.50	5 30 20.1	905.3	64.57	15 32.5	56 56.6	
21	U	14 28.24	1.808	12 31 48.10	124.62	- 8 30 1.8	-899.2	65.32	15 36.8	57 11.5	II. S.
22	L	2 51.45	1.863	12 57 2.88	123.96	11 25 14.7	900.9	66.25	15 40.6	57 26.3	
22	U	15 15.39	2.000	13 23 1.76	123.17	14 13 34.0	826.1	67.35	15 44.6	57 40.8	II. S.
23	L	2 49.29	2.106	13 49 52.42	126.38	16 52 23.7	765.8	68.58	15 48.5	57 55.2	
23	U	16 5.97	2.101	14 17 41.37	141.85	-19 18 57.2	-807.3	69.93	15 52.4	58 9.4	II. S.
24	L	4 32.79	2.280	14 46 33.16	147.00	21 30 17.9	813.4	71.31	15 56.2	58 23.3	
24	U	17 0.68	2.289	15 16 29.53	132.38	23 23 23.7	814.5	72.66	15 59.8	58 38.7	II. S.
25	L	5 29.61	2.403	15 47 28.49	137.37	24 55 14.1	601.3	73.91	16 3.3	58 49.7	
25	U	17 50.48	2.323	16 19 23.58	161.45	-26 2 59.4	-274.2	74.95	16 6.7	59 2.1	II. S.
26	L	6 30.09	2.571	16 52 3.62	164.81	26 44 14.1	-126.6	75.71	16 9.8	59 13.5	
26	U	19 1.20	2.604	17 25 13.23	166.33	26 57 10.5	+ 8.0	76.11	16 12.7	59 23.8	II. S.
27	L	7 32.49	2.606	17 58 34.09	186.86	26 40 52.0	155.1	76.12	16 15.1	59 32.7	
27	U	20 3.64	2.582	18 31 46.87	165.21	-25 55 19.3	-290.5	75.74	16 17.0	59 39.8	II. N.
28	L	8 34.37	2.525	19 4 33.63	160.37	24 41 33.6	636.5	75.03	16 18.4	59 44.9	
28	U	21 4.41	2.670	19 36 39.53	138.47	23 1 29.6	561.9	74.04	16 19.1	59 47.6	II. N.
29	L	9 33.60	2.394	20 7 54.16	153.89	20 57 45.8	672.7	72.89	16 19.2	59 47.7	
29	U	22 1.85	2.313	20 38 11.79	169.03	-18 33 31.3	-796.9	71.65	16 18.4	59 44.9	II. N.
Mar. 1	L	10 29.13	2.233	21 7 31.17	144.23	15 52 12.6	843.2	70.41	16 16.8	59 39.1	
1	U	22 55.47	2.139	21 35 54.60	129.75	12 57 22.8	902.0	69.24	16 14.4	59 30.3	II. N.
2	L	11 20.97	2.093	22 3 27.13	135.77	9 52 32.7	943.4	68.20	16 11.2	59 18.5	
2	U	23 45.74	2.007	22 30 15.62	132.43	- 6 41 5.5	-908.4	67.31	16 7.2	59 3.9	
3	L	12 9.91	1.993	22 56 27.95	129.75	3 26 12.8	977.8	66.60	16 2.5	58 46.7	
4	U	0 33.62	1.990	23 22 12.51	127.79	- 0 10 52.9	973.1	66.08	15 57.2	58 27.3	
4	L	12 57.00	1.939	23 47 37.72	126.52	+ 3 2 10.3	955.3	65.75	15 51.5	58 6.2	
5	U	1 20.20	1.929	0 12 51.74	125.92	+ 6 10 27.2	-925.6	65.61	15 45.4	57 43.7	I. S.
5	L	13 43.34	1.929	0 38 2.23	125.93	9 11 40.9	885.0	65.63	15 39.0	57 20.4	
6	U	2 6.54	1.938	1 3 16.12	126.47	12 3 47.3	834.5	65.81	15 32.6	56 56.8	I. S.
6	L	14 29.89	1.955	1 28 39.44	127.49	14 44 53.4	775.1	66.11	15 26.2	56 33.4	
7	U	2 53.49	1.978	1 54 17.12	128.85	+17 13 16.6	-707.5	66.51	15 20.0	56 10.7	I. S.
7	L	15 17.38	2.005	2 20 12.81	130.47	19 27 23.8	632.6	66.98	15 14.2	55 49.1	
8	U	3 41.00	2.033	2 46 28.67	132.19	21 25 51.5	551.0	67.47	15 8.7	55 29.1	I. S.
8	L	16 6.17	2.062	3 13 5.29	133.90	23 7 25.5	463.7	67.94	15 3.7	55 10.9	
9	U	4 31.07	2.087	3 40 1.47	135.42	+24 31 2.0	-371.6	68.38	14 59.4	54 54.9	I. S.

Feb. 17, U Defective Illumination of S. 0°.40.
Feb. 18, U Defective Illumination of I. 0°.00.

Feb. 18, U Defective Illumination of N. 0°.00.

FOR TRANSIT OF MOON'S CENTER OVER THE MERIDIAN OF WASHINGTON.

Date.	Culmination.	Wash. Mean Time.	Var. per Hour of Long.	Right Ascension of Center.	Var. per Hour of Long.	Geocentric Declination of Center.	Var. per Hour of Long.	S. T. of Semid. Pass- ing Mer- idian.	Geocen- tric Semidi- ameter.	Equa- torial Horiz- ontal Parallax.	Bright Limbs.
		h m	m	h m s	s	" ' "	"	s	" "	" "	
Mar. 9	U	4 31.07	2.087	3 40 1.47	135.42	+24 31 2.0	+371.6	68.38	14 59.4	54 54.9	I. S.
9	L	16 56.25	2.108	4 7 14.37	136.66	25 35 49.1	275.6	68.72	14 55.6	54 41.2	
10	U	5 21.63	2.121	4 34 39.59	137.46	26 21 7.7	177.0	68.94	14 52.6	54 30.2	I. S.
10	L	17 47.12	2.126	5 2 11.47	137.76	26 46 33.6	+ 77.1	69.03	14 50.4	54 21.9	
11	U	6 12.61	2.121	5 29 43.60	137.49	+26 51 57.5	- 23.0	63.97	14 48.9	54 16.4	I. S.
11	L	18 38.00	2.108	5 57 9.24	136.69	26 37 26.3	121.9	68.75	14 48.2	54 13.7	
12	U	7 3.17	2.066	6 24 22.03	135.37	26 3 22.1	213.3	68.39	14 48.2	54 13.8	I. N.
12	L	19 28.04	2.057	6 51 16.39	133.63	25 10 21.2	311.1	67.91	14 48.9	54 16.6	
13	U	7 52.53	2.023	7 17 48.05	131.60	+23 59 11.9	-399.5	67.35	14 50.4	54 22.1	I. N.
13	L	20 16.59	1.987	7 43 54.19	129.40	22 30 53.0	482.6	66.73	14 52.6	54 30.1	
14	U	8 40.21	1.950	8 9 33.62	127.18	20 46 31.1	559.9	66.10	14 55.4	54 40.4	I. N.
14	L	21 3.40	1.915	8 34 46.81	125.05	18 47 19.1	630.9	65.49	14 58.8	54 52.8	
15	U	9 26.18	1.883	8 59 35.65	123.13	+16 34 35.0	-695.2	64.94	15 2.7	55 7.1	I. N.
15	L	21 48.61	1.856	9 24 3.43	121.53	14 9 41.3	752.5	64.47	15 7.0	55 22.9	
16	U	10 10.76	1.837	9 48 14.55	120.33	11 34 4.4	802.3	64.11	15 11.6	55 39.9	I. N.
16	L	22 32.73	1.825	10 12 14.37	119.68	8 49 15.6	844.4	63.89	15 16.5	55 57.9	
17	U	10 54.61	1.823	10 36 9.10	119.53	+ 5 56 51.6	-878.2	63.82	15 21.6	56 16.5	I. N.
17	L	23 16.52	1.830	11 0 5.57	119.98	+ 2 58 35.7	903.0	63.92	15 26.7	56 35.3	
18	U	11 38.58	1.848	11 24 11.20	121.07	- 0 34 0.7	918.1	64.21	15 31.8	56 54.1	I. N.S.
19	L	0 9.93	1.877	11 48 33.82	122.81	3 7 57.3	922.7	64.68	15 36.8	57 12.4	
19	U	12 23.69	1.918	12 13 21.50	125.25	- 6 12 3.1	-916.1	65.34	15 41.6	57 30.0	II. S.
20	L	0 47.00	1.970	12 38 42.43	128.36	9 13 35.4	837.1	66.18	15 46.2	57 46.7	
20	U	13 11.00	2.032	13 4 44.58	132.11	12 9 59.4	834.5	67.19	15 50.4	58 2.2	II. S.
21	L	1 35.80	2.104	13 31 35.34	136.44	14 58 27.9	817.7	68.35	15 54.3	58 16.3	
21	U	14 1.52	2.184	13 59 21.01	141.23	-17 36 2.4	-755.5	69.61	15 57.7	58 28.9	II. S.
22	L	2 28.23	2.268	14 28 6.00	146.20	19 59 35.9	677.5	70.92	16 0.7	58 39.9	
22	U	14 55.95	2.352	14 57 52.09	151.37	22 5 57.9	583.5	72.22	16 3.3	58 49.3	II. S.
23	L	3 24.66	2.431	15 28 37.56	156.13	23 52 1.0	474.5	73.43	16 5.4	58 57.2	
23	U	15 54.26	2.439	16 0 16.54	160.22	-25 14 51.8	-351.9	74.46	16 7.1	59 3.6	II. S.
24	L	4 24.57	2.550	16 32 38.63	163.27	26 12 2.4	518.4	75.22	16 8.5	59 8.5	
24	U	16 55.36	2.578	17 5 29.51	164.97	26 41 43.0	- 77.5	75.65	16 9.4	59 11.9	II. S.
25	L	5 26.35	2.581	17 38 31.87	165.16	26 42 52.5	+ 68.0	75.71	16 10.0	59 14.0	
25	U	17 57.22	2.559	18 11 27.36	163.83	-26 15 25.0	+207.8	75.40	16 10.2	59 14.9	II. N.S.
26	L	6 27.68	2.515	18 43 58.62	161.16	25 20 10.0	343.3	74.76	16 10.1	59 14.5	
26	U	18 57.50	2.453	19 15 51.08	157.43	23 58 46.0	468.8	73.84	16 9.6	59 12.8	II. N.
27	L	7 26.50	2.380	19 46 54.24	153.06	22 13 30.8	581.4	72.73	16 8.8	59 9.8	
27	U	19 54.59	2.301	20 17 2.01	148.26	-20 7 9.4	+679.6	71.53	16 7.7	59 5.6	II. N.
28	L	8 21.72	2.222	20 46 12.66	143.53	17 42 41.8	762.4	70.31	16 6.2	59 0.0	
28	U	20 47.93	2.148	21 14 27.98	139.06	15 3 14.3	829.5	69.14	16 4.3	58 53.1	II. N.
29	L	9 13.30	2.082	21 41 52.51	135.10	12 11 52.6	881.6	68.08	16 2.0	58 44.6	
29	U	21 37.93	2.025	22 8 32.69	131.71	- 9 11 36.2	+918.8	67.15	15 59.2	58 34.6	II. N.
30	L	10 1.95	1.980	22 34 36.20	128.99	6 5 18.2	941.9	66.40	15 56.1	58 23.1	
30	U	22 25.50	1.947	23 0 11.28	126.97	- 2 55 43.2	951.7	65.83	15 52.6	58 10.2	II. N.
31	L	10 48.72	1.925	23 25 26.33	125.66	+ 0 14 32.5	948.8	65.45	15 48.7	57 55.8	
31	U	23 11.74	1.914	23 50 29.65	125.01	+ 3 23 0.4	+933.9	65.26	15 44.4	57 40.2	

Mar. 18, U Defective Illumination of N. 0°.17.

Mar. 25, U Defective Illumination of S. 0°.13.

FOR TRANSIT OF MOON'S CENTER OVER THE MERIDIAN OF WASHINGTON.

Date.	Culmination.	Wash. Mean Time.	Var. per Hour of Long.	Right Ascension of Center.	Var. per Hour of Long.	Geocentric Declination of Center.	Var. per Hour of Long.	S. T. of Semid. Pass- ing Mer- idian.	Geocen- tric Semidi- ameter.	Equa- torial Hori- zontal Parallax.	Bright Limbs.
		h m	m	h m s	s	° ' "	"	s	' "	' "	
Mar. 31	U	23 11.74	1.914	23 50 29.65	125.01	+ 3 23 0.4	+933.9	65.26	15 44.4	57 40.2	
Apr. 1	L	11 34.69	1.914	0 15 29.10	125.00	6 27 19.5	907.5	65.25	15 39.9	57 23.5	
1	U	23 57.71	1.923	0 40 31.94	125.57	9 25 15.6	870.1	65.39	15 35.1	57 5.9	
2	L	12 20.88	1.941	1 5 44.65	126.03	12 14 41.5	822.4	65.68	15 30.1	56 47.7	
3	U	0 44.31	1.965	1 31 12.64	128.09	+14 53 36.6	+765.1	66.09	15 25.1	56 29.2	
3	L	13 8.07	1.994	1 57 0.08	129.85	17 20 7.6	698.6	66.57	15 20.0	56 10.6	
4	U	1 32.19	2.026	2 23 9.76	131.77	19 32 29.6	623.7	67.10	15 15.0	55 52.3	I.
4	L	13 56.70	2.058	2 49 42.72	133.70	21 29 7.0	541.4	67.63	15 10.2	55 34.7	S.
5	U	2 21.59	2.088	3 16 38.20	135.49	+23 8 35.5	+452.4	68.14	15 5.7	55 18.2	I.
5	L	14 46.80	2.113	3 43 53.58	137.00	24 29 44.6	358.3	68.56	15 1.6	55 2.9	S.
6	U	3 12.28	2.131	4 11 24.52	138.07	25 31 38.9	260.3	68.88	14 57.9	54 49.3	I.
6	L	15 37.92	2.140	4 39 5.13	138.60	26 13 40.9	159.8	69.04	14 54.6	54 37.5	S.
7	U	4 3.60	2.139	5 6 48.51	138.53	+26 35 31.3	+ 58.6	69.06	14 52.0	54 27.9	I.
7	L	16 29.20	2.127	5 34 27.24	137.83	26 37 10.5	- 41.9	68.92	14 50.1	54 20.7	S.
8	U	4 54.61	2.106	6 1 54.14	136.56	26 18 56.2	140.0	68.61	14 48.8	54 16.0	I.
8	L	17 19.71	2.077	6 29 2.78	134.81	25 41 23.1	234.8	68.17	14 48.2	54 14.0	S.
9	U	5 44.43	2.041	6 55 47.97	132.68	+24 45 19.0	-325.1	67.62	14 48.4	54 14.7	I.
9	L	18 8.69	2.002	7 22 6.15	130.33	23 31 41.7	410.3	67.00	14 49.3	54 18.1	N.
10	U	6 32.48	1.962	7 47 55.53	127.91	22 1 37.0	489.6	66.35	14 51.0	54 24.3	I.
10	L	18 55.79	1.923	8 13 16.12	125.55	20 16 14.8	503.0	65.71	14 53.5	54 33.3	N.
11	U	7 18.64	1.887	8 38 9.51	123.39	+18 16 47.8	-430.4	65.11	14 56.7	54 45.0	I.
11	L	19 41.10	1.857	9 2 38.81	121.55	16 4 29.9	691.6	64.59	15 0.5	54 59.1	N.
12	U	8 3.22	1.833	9 26 48.36	120.12	13 40 36.8	746.3	64.17	15 5.0	55 15.5	I.
12	L	20 25.11	1.817	9 50 43.58	119.17	11 6 25.6	794.5	63.88	15 10.1	55 34.1	N.
13	U	8 46.87	1.810	10 14 30.79	118.70	+ 8 23 16.4	-835.9	63.74	15 15.6	55 54.4	I.
13	L	21 8.61	1.814	10 38 17.01	119.02	5 32 34.4	899.9	63.76	15 21.5	56 16.2	N.
14	U	9 30.46	1.829	11 2 9.90	119.91	+ 2 35 51.2	895.9	63.97	15 27.7	56 39.0	I.
14	L	21 52.56	1.856	11 26 17.64	121.50	- 0 25 11.1	913.0	64.38	15 34.2	57 2.5	N.
15	U	10 15.04	1.894	11 50 48.82	123.82	- 3 28 38.7	-919.9	64.98	15 40.6	57 26.1	I.
15	L	22 38.07	1.945	12 15 52.27	126.88	6 32 22.8	915.4	65.78	15 46.9	57 49.3	N.
16	U	11 1.77	2.008	12 41 36.82	130.67	9 33 57.6	898.1	66.77	15 53.0	58 11.7	I.
16	L	23 26.30	2.082	13 8 11.01	135.14	12 30 38.7	866.2	67.93	15 58.8	58 32.8	N.S.
17	U	11 51.79	2.167	13 35 42.54	140.21	-15 19 23.1	-818.3	69.23	16 4.0	58 52.0	I.//.
17	L	0 18.33	2.258	14 4 17.57	145.09	17 56 50.5	753.3	70.62	16 8.6	59 9.0	S.
18	U	12 45.99	2.352	14 33 59.75	151.35	20 19 27.8	670.0	72.04	16 12.5	59 23.3	II.
19	L	1 14.76	2.443	15 4 49.26	156.83	22 23 37.1	568.6	73.41	16 15.6	59 34.8	S.
19	U	13 44.58	2.525	15 36 41.79	161.77	-24 5 46.9	-450.3	74.63	16 18.0	59 43.3	II.
20	L	2 15.29	2.590	16 9 27.83	165.69	25 22 47.6	317.6	75.59	16 19.4	59 48.7	S.
20	U	14 46.65	2.632	16 42 52.72	168.19	26 12 7.7	174.4	76.22	16 20.1	59 51.0	II.
21	L	3 18.34	2.645	17 16 37.67	169.00	26 32 9.8	- 25.6	76.45	16 19.9	59 50.5	S.
21	U	15 50.02	2.629	17 50 21.65	168.03	-26 22 20.9	+123.3	76.25	16 19.0	59 47.2	II.
22	L	4 21.33	2.586	18 23 43.81	165.41	25 43 15.2	266.4	75.65	16 17.5	59 41.6	S.
22	U	16 51.98	2.520	18 56 26.07	161.44	24 36 28.7	399.4	74.73	16 15.4	59 34.0	II.N.
23	L	5 21.74	2.438	19 28 14.74	156.55	23 4 25.0	518.7	73.56	16 12.8	59 24.5	S.
23	U	17 50.47	2.349	19 59 1.44	151.18	-21 10 0.4	+622.6	72.25	16 9.9	59 13.7	II.N.

Apr. 16, U Defective Illumination of S. 0°.03.

Apr. 17, U Defective Illumination of II. 0°.03.

FOR TRANSIT OF MOON'S CENTER OVER THE MERIDIAN OF WASHINGTON.

Date.	Culmination.	Wash. Mean Time.	Var. per Hour of Long.	Right Ascension of Center.	Var. per Hour of Long.	Geocentric Declination of Center.	Var. per Hour of Long.	S. T. of Semid. Pass- ing Mer- idian.	Geocen- tric Semidi- ameter.	Equa- torial Hori- zontal Parallax.	Bright Limbs.
		h m	m	h m s	s	° ' "	"	s	' "	' "	
Apr. 23	U	17 50.47	2.349	19 59 1.44	151.18	-21 10 0.4	+622.6	72.25	16 9.9	59 13.7	II. N.
24	U	6 18.11	2.259	20 28 42.89	145.74	18 56 27.1	710.2	70.89	16 6.6	59 1.7	
24	L	18 44.69	2.172	20 57 20.24	140.55	16 27 0.9	781.5	69.56	16 3.1	58 48.8	II. N.
25	L	7 10.28	2.094	21 24 58.01	135.84	13 44 52.4	837.4	68.33	15 59.4	58 35.3	
25	U	19 34.99	2.026	21 51 43.02	131.78	-10 53 1.3	+878.8	67.25	15 55.6	58 21.2	II. N.
26	L	7 58.96	1.971	22 17 43.57	128.44	7 54 14.5	906.7	66.33	15 51.7	58 6.8	
26	U	20 22.34	1.928	22 43 8.66	125.87	4 51 6.9	922.4	65.62	15 47.7	57 52.1	II. N.
27	L	8 45.29	1.898	23 8 7.59	124.07	-1 46 2.4	926.4	65.11	15 43.6	57 37.2	
27	U	21 7.96	1.881	23 32 49.50	123.03	+1 18 44.8	+919.6	64.79	15 39.5	57 22.1	II. N.
28	L	9 30.49	1.876	23 57 23.20	122.70	4 21 6.3	902.3	64.66	15 35.3	57 6.9	
28	U	21 53.02	1.881	0 21 56.96	123.03	7 18 59.7	874.9	64.72	15 31.1	56 51.5	II. N.
29	L	10 15.67	1.896	0 46 38.27	123.95	10 10 26.0	837.8	64.95	15 27.0	56 36.2	
29	U	22 38.56	1.920	1 11 33.75	126.37	+12 53 29.5	+791.1	65.31	15 22.8	56 20.8	II. N.
30	L	11 1.78	1.950	1 36 48.85	127.20	15 26 16.6	735.2	65.78	15 18.6	56 5.6	
30	U	23 25.39	1.985	2 2 27.70	129.31	17 46 57.0	670.1	66.32	15 14.5	55 50.6	
May 1	L	11 49.44	2.023	2 28 32.76	131.54	19 53 45.4	596.5	66.91	15 10.5	55 35.9	
2	U	0 13.93	2.059	2 55 4.68	133.75	+21 45 3.1	+515.1	67.50	15 6.7	55 21.7	
2	L	12 38.85	2.092	3 22 2.04	135.75	23 19 21.3	426.8	68.03	15 3.0	55 8.1	
3	U	1 4.13	2.120	3 49 21.38	137.39	24 35 24.2	332.8	68.46	14 59.5	54 55.4	I. S.
3	L	13 29.69	2.138	4 16 57.32	138.50	25 32 12.4	234.6	68.77	14 56.3	54 43.8	
4	U	1 55.40	2.146	4 44 42.81	138.98	+26 9 6.3	+134.0	68.92	14 53.5	54 33.5	I. S.
4	L	14 21.14	2.142	5 12 29.80	138.75	26 25 47.3	+32.8	68.90	14 51.1	54 24.7	
5	U	2 46.77	2.127	5 40 9.89	137.82	26 22 19.2	-67.2	68.70	14 49.2	54 17.5	I. S.
5	L	15 12.15	2.101	6 7 35.02	136.26	25 59 6.1	164.4	68.33	14 47.7	54 12.2	
6	U	3 37.16	2.067	6 34 38.20	134.19	+25 16 51.0	-257.3	67.82	14 46.9	54 9.1	I. N.
6	L	16 1.72	2.026	7 11 4.02	131.74	24 16 31.1	345.0	67.21	14 46.6	54 8.2	
7	U	4 25.77	1.982	7 27 18.99	129.08	22 59 14.1	426.7	66.54	14 47.0	54 9.7	I. N.
7	L	16 49.27	1.937	7 52 51.61	126.37	21 26 14.3	502.1	65.84	14 48.1	54 13.7	
8	U	5 12.25	1.894	8 17 52.32	123.77	+19 38 48.7	-871.0	65.16	14 49.9	54 20.3	I. N.
8	L	17 34.74	1.855	8 42 23.33	121.44	17 38 15.0	633.5	64.54	14 52.5	54 29.6	
9	U	5 56.79	1.822	9 6 28.36	119.47	15 25 49.2	689.7	64.00	14 55.7	54 41.6	I. N.
9	L	18 18.49	1.797	9 30 12.41	117.96	13 2 46.3	739.8	63.58	14 59.7	54 56.2	
10	U	6 39.95	1.781	9 53 41.62	116.99	+10 30 20.0	-783.6	63.31	15 4.4	55 13.3	I. N.
10	L	19 1.27	1.775	10 17 2.67	116.64	7 49 43.7	821.4	63.20	15 9.7	55 32.9	
11	U	7 22.59	1.780	10 40 23.64	116.96	5 2 13.2	832.6	63.27	15 15.7	55 54.7	I. N.
11	L	19 44.04	1.797	11 3 52.44	117.99	+2 9 9.1	876.9	63.54	15 22.2	56 18.5	
12	U	8 5.77	1.827	11 27 38.29	119.79	-0 48 0.2	-893.3	64.01	15 29.1	56 43.9	I. N.
12	L	20 27.94	1.870	11 51 50.44	122.38	3 47 34.9	900.9	64.68	15 36.3	57 10.6	
13	U	8 50.71	1.927	12 16 38.66	125.79	6 47 40.6	898.2	65.58	15 43.8	57 38.0	I. N.
13	L	21 14.25	1.998	12 42 12.82	130.04	9 46 3.3	893.4	66.68	15 51.3	58 5.6	
14	U	9 38.71	2.061	13 8 42.64	135.06	-12 40 7.5	-854.7	67.97	15 58.8	58 32.9	I. N.
14	L	22 4.24	2.176	13 36 17.09	140.79	15 26 53.6	810.0	69.42	16 5.9	58 59.1	
15	U	10 30.97	2.280	14 5 3.62	147.04	18 2 57.9	747.4	70.98	16 12.6	59 23.5	I. N.S.
15	L	22 58.98	2.388	14 35 7.07	153.55	20 24 34.9	665.3	72.58	16 18.6	59 45.6	
16	U	11 28.28	2.494	15 6 28.31	159.94	-22 27 46.6	-563.2	74.12	16 23.8	60 4.6	I. S.

May 15, U Defective Illumination of S. 0'.17.

MOON-CULMINATIONS, 1916.

ANSIT OF MOON'S CENTER OVER THE MERIDIAN OF WASHINGTON.

Wash. Mean Time.	Var. per Hour of Long.	Right Ascension of Center.	Var. per Hour of Long.	Geocentric Declination of Center.	Var. per Hour of Long.	S. T. of Semid. Pass- ing Me- ridian.	Geocen- tric Semidi- ameter.	Equa- torial Horiz- ontal Parallax.	Bright Limbs.
h m	m	h m s	s	° ' "	"	s	"	"	
11 28.28	2.494	15 6 28.31	159.94	-22 27 46.6	-563.2	74.12	16 23.8	60 4.6	I. S
23 58.80	2.590	15 59 2.95	165.70	24 8 34.6	441.7	75.50	16 28.0	60 20.0	
12 30.37	2.667	16 12 40.38	170.30	25 23 19.3	303.2	76.59	16 31.1	60 31.3	II. S
1 2.70	2.716	16 47 3.60	173.25	26 9 2.2	-152.2	77.30	16 33.0	60 38.4	
13 35.42	2.731	17 21 50.37	174.19	-26 23 48.0	+ 5.2	77.53	16 33.7	60 41.0	II. S
2 8.11	2.712	17 56 35.67	173.01	26 6 59.2	162.3	77.28	16 33.2	60 39.3	
14 40.37	2.680	18 30 54.86	169.89	25 19 21.9	312.2	76.58	16 31.6	60 33.4	II. N.S.
3 11.85	2.583	19 4 26.83	165.23	24 2 57.0	449.4	75.51	16 29.0	60 23.8	
15 42.28	2.488	19 36 56.10	159.53	-22 20 42.7	+569.9	74.18	16 25.5	60 10.8	II. N.
4 11.52	2.385	20 8 13.70	153.36	20 16 13.1	671.8	72.70	16 21.2	59 55.1	
16 39.52	2.283	20 38 16.80	147.19	17 53 15.7	734.5	71.19	16 16.3	59 37.3	II. N.
5 6.33	2.186	21 7 7.60	141.37	15 15 36.8	819.0	69.73	16 11.0	59 17.8	
17 32.02	2.099	21 34 51.93	136.14	-12 26 48.8	+866.3	68.40	16 5.4	58 57.2	II. N.
5 56.75	2.025	22 1 38.03	131.08	9 30 5.5	898.5	67.24	15 59.6	58 36.0	
18 20.67	1.964	22 27 35.46	128.04	6 28 21.0	916.8	66.27	15 53.8	58 14.6	II. N.
6 43.95	1.918	22 52 54.34	125.25	3 24 9.6	923.1	65.51	15 48.0	57 53.4	
19 6.76	1.886	23 17 44.88	123.31	- 0 19 49.6	+918.4	64.97	15 42.3	57 32.5	II. N.
7 29.26	1.867	23 42 17.01	122.18	+ 2 42 33.8	903.9	64.64	15 36.8	57 12.3	
19 51.62	1.861	0 6 40.14	121.80	5 41 5.4	879.9	64.52	15 31.5	56 52.8	II. N.
8 13.97	1.866	0 31 3.04	122.12	8 33 56.8	847.2	64.57	15 26.4	56 34.2	
20 36.44	1.882	0 55 33.57	123.06	+11 19 24.0	+805.9	64.80	15 21.6	56 16.6	II. N.
8 59.16	1.906	1 20 18.68	124.54	13 55 45.5	756.2	65.17	15 17.1	55 59.9	
21 22.22	1.938	1 45 24.12	126.43	16 21 21.2	698.3	65.65	15 12.8	55 44.2	II. N.
9 45.68	1.974	2 10 54.14	128.61	18 34 32.6	632.3	66.20	15 8.8	55 29.4	
22 9.60	2.012	2 36 51.32	130.93	+20 33 43.3	+558.3	66.78	15 5.0	55 15.7	II. N.
10 33.98	2.050	3 3 16.31	133.22	22 17 22.0	477.0	67.36	15 1.5	55 2.9	
22 58.79	2.085	3 30 7.64	135.29	23 44 5.1	389.1	67.89	14 58.4	54 51.2	
11 23.99	2.113	3 57 21.66	136.96	24 52 39.5	295.7	68.31	14 55.5	54 40.5	
23 49.46	2.132	4 24 52.64	138.10	+25 42 7.7	+198.4	68.59	14 52.8	54 30.8	
12 15.10	2.139	4 52 33.24	138.55	26 11 51.6	+ 98.6	68.71	14 50.5	54 22.4	
0 40.75	2.135	5 20 14.99	138.28	26 21 33.5	- 1.6	68.64	14 48.5	54 15.1	
13 6.28	2.118	5 47 49.01	137.27	26 11 19.6	100.4	68.40	14 46.9	54 9.2	
1 31.53	2.090	6 15 6.85	135.60	+25 41 36.9	-196.1	67.99	14 45.7	54 4.8	I. S
13 56.40	2.053	6 42 1.22	133.39	24 53 12.6	287.1	67.44	14 44.9	54 1.9	
2 20.78	2.010	7 8 26.47	130.77	23 47 9.2	372.4	66.79	14 44.6	54 0.7	I. N.
14 44.62	1.963	7 34 18.89	127.94	22 24 41.0	451.1	66.07	14 44.8	54 1.3	
3 7.89	1.915	7 59 36.96	125.07	+20 47 8.7	-323.0	65.34	14 45.5	54 3.9	I. N.
15 30.59	1.869	8 24 21.07	122.32	18 55 56.4	587.9	64.62	14 46.7	54 8.6	
3 52.76	1.827	8 48 33.48	119.81	16 52 28.3	645.7	63.96	14 48.6	54 15.5	I. N.
16 14.47	1.792	9 12 17.96	117.68	14 38 6.4	696.8	63.40	14 51.1	54 24.7	
4 35.80	1.764	9 35 39.58	116.01	+12 14 9.5	-741.5	62.97	14 54.3	54 36.3	I. N.
16 56.86	1.746	9 58 44.51	114.90	9 41 54.0	780.0	62.68	14 58.1	54 50.3	
5 17.75	1.738	10 21 39.75	114.41	7 2 34.3	812.3	62.56	15 2.6	55 6.8	I. N.
17 38.61	1.741	10 44 33.06	114.60	4 17 24.0	838.3	62.62	15 7.8	55 25.7	
5 59.58	1.756	11 7 32.89	115.51	+ 1 27 39.2	-838.0	62.88	15 13.6	55 47.0	I. N.

May 19, U Defective Illumination of N. 0°.01.

FOR TRANSIT OF MOON'S CENTER OVER THE MERIDIAN OF WASHINGTON.

Date.	Culmination.	Wash. Mean Time.	Var. per Hour of Long.	Right Ascension of Center.	Var. per Hour of Long.	Geocentric Declination of Center.	Var. per Hour of Long.	S. T. of Semid. Pass- ing Mer- idian.	Geocen- tric Semidi- ameter.	Equa- torial Hori- zontal Parallax.	Bright Limbs.
		h m	m	h m s	s	° ' "	"	s	' "	' "	
June 8	U	5 59.58	1.756	11 7 32.89	115.51	+ 1 27 39.2	-858.0	62.88	15 13.6	55 47.0	I. N.
8	L	18 20.80	1.784	11 30 48.26	117.20	- 1 25 19.8	870.6	63.35	15 20.0	56 10.5	
9	U	6 42.45	1.826	11 54 28.70	119.69	4 20 3.9	875.3	64.03	15 26.9	56 35.9	I. N.
9	L	19 4.68	1.881	12 18 44.27	123.05	7 14 51.9	871.0	64.93	15 34.3	57 3.1	
10	U	7 27.66	1.952	12 43 45.31	127.27	-10 7 46.7	-856.2	66.05	15 42.1	57 31.6	I. N.
10	L	19 51.57	2.036	13 9 42.22	132.35	12 56 31.2	829.0	67.38	15 50.1	58 1.0	
11	U	8 16.58	2.134	13 36 44.98	138.23	15 38 23.6	787.2	68.88	15 58.2	58 30.8	I. N.
11	L	20 42.82	2.242	14 5 2.35	144.76	18 10 16.9	728.7	70.52	16 6.2	59 0.2	
12	U	9 10.42	2.358	14 34 40.99	151.72	-20 28 38.1	-651.5	72.22	16 13.9	59 28.5	I. N.
12	L	21 39.42	2.475	15 5 43.89	158.74	22 29 33.8	554.3	73.91	16 21.1	59 55.0	
13	U	10 9.78	2.584	15 38 8.94	165.32	24 8 59.9	436.7	75.47	16 27.6	60 18.9	I. N.S.
13	L	22 41.37	2.677	16 11 47.63	170.91	25 23 0.4	300.4	76.77	16 33.2	60 39.3	
14	U	11 13.92	2.743	16 46 24.31	174.90	-26 8 9.1	-148.9	77.69	16 37.7	60 55.7	I. S.
14	L	23 47.07	2.775	17 21 36.93	176.83	26 21 57.8	+ 11.9	78.13	16 40.9	61 7.3	
15	U	12 20.37	2.770	17 56 59.23	176.50	26 3 16.6	174.7	78.05	16 42.6	61 13.8	II. S.
16	L	0 53.39	2.728	18 32 4.05	173.96	25 12 26.3	332.1	77.47	16 43.0	61 15.0	
16	U	13 25.72	2.655	19 6 27.10	169.61	-23 51 16.1	+477.0	76.47	16 41.9	61 11.0	II. N.S.
17	L	1 57.04	2.562	19 39 49.62	163.98	22 2 47.8	604.4	75.16	16 39.4	61 1.9	
17	U	14 27.15	2.457	20 11 59.84	157.66	19 50 51.7	711.3	73.66	16 35.7	60 48.3	II. N.
18	L	2 55.99	2.349	20 42 52.95	151.20	17 19 41.9	796.7	72.10	16 30.9	60 30.6	
18	U	15 23.56	2.247	21 12 29.91	145.03	-14 33 34.8	+861.1	70.59	16 25.2	60 9.7	II. N.
19	L	3 49.95	2.154	21 40 56.01	139.44	11 36 33.4	906.1	69.20	16 18.8	59 46.3	
19	U	16 15.30	2.073	22 8 19.41	134.60	8 32 19.4	933.6	67.97	16 11.9	59 21.0	II. N.
20	L	4 39.77	2.007	22 34 49.85	130.62	5 24 9.3	945.7	66.94	16 4.7	58 54.5	
20	U	17 3.53	1.956	23 0 37.81	127.52	- 2 14 54.9	+944.6	66.13	15 57.3	58 27.6	II. N.
21	L	5 26.76	1.919	23 25 53.82	125.29	+ 0 52 54.6	931.8	65.55	15 50.0	58 0.8	
21	U	17 49.63	1.895	23 50 48.18	123.90	3 57 8.0	908.8	65.18	15 42.9	57 34.5	II. N.
22	L	6 12.31	1.885	0 15 30.59	123.29	6 55 49.8	876.7	65.01	15 36.0	57 9.1	
22	U	18 34.93	1.887	0 40 10.01	123.40	+ 9 47 14.8	+896.1	65.03	15 29.4	56 44.9	II. N.
23	L	6 57.64	1.899	1 4 54.51	124.13	12 29 45.7	787.7	65.21	15 23.2	56 22.2	
23	U	19 20.55	1.920	1 29 51.09	125.39	15 150.5	731.8	65.53	15 17.4	56 1.1	II. N.
24	L	7 43.75	1.948	1 55 5.51	127.07	17 22 0.0	668.6	65.96	15 12.1	55 41.6	
24	U	20 7.33	1.961	2 20 42.00	129.04	+19 28 47.8	+598.2	66.46	15 7.3	55 23.9	II. N.
25	L	8 31.31	2.016	2 46 43.19	131.16	21 20 50.9	521.2	66.99	15 3.0	55 8.0	
25	U	20 55.71	2.052	3 13 9.68	133.24	22 56 50.3	437.8	67.50	14 59.1	54 53.8	II. N.
26	L	9 20.51	2.082	3 40 0.01	135.11	24 15 33.7	348.6	67.95	14 55.7	54 41.3	
26	U	21 45.65	2.106	4 7 10.68	136.59	+25 15 59.0	+254.9	68.30	14 52.7	54 30.4	II. N.
27	L	10 11.03	2.122	4 34 36.16	137.55	25 57 18.1	157.8	68.52	14 50.2	54 21.1	
27	U	22 36.54	2.128	5 2 9.32	137.86	26 18 59.7	+ 59.0	68.58	14 48.1	54 13.4	II. S.
28	L	11 2.05	2.121	5 29 42.05	137.47	26 20 52.8	- 40.1	68.45	14 46.3	54 7.1	
28	U	23 27.41	2.103	5 57 5.89	136.38	+26 3 6.7	-137.3	68.16	14 45.0	54 2.3	
29	L	11 52.48	2.074	6 24 12.76	134.66	25 26 12.1	231.1	67.71	14 44.1	53 58.9	
30	U	0 17.16	2.037	6 50 55.73	132.42	24 30 58.2	320.2	67.12	14 43.6	53 57.0	
30	L	12 41.35	1.994	7 17 9.37	129.81	23 18 29.8	403.4	66.44	14 43.5	53 56.5	
July 1	U	1 4.99	1.947	7 42 50.24	126.99	+21 50 3.3	-479.8	65.70	14 43.7	53 57.4	I. N.

June 13, U Defective Illumination of S. 0°.04.

FOR TRANSIT OF MOON'S CENTER OVER THE MERIDIAN OF WASHINGTON.

Date.	Culmination.	Wash. Mean Time.	Var. per Hour of Long.	Right Ascension of Center.	Var. per Hour of Long.	Geocentric Declination of Center.	Var. per Hour of Long.	S. T. of Semi- dian- ing Meri- dian.	Geocen- tric Semi- diameter.	Equa- torial Hor- izontal Parallax.	Bright Limb.
		h m	m	h m s	s	° ' "	"	s	' "	' "	
July 1	U	1 4.99	1.947	7 42 50.24	126.99	+21 50 3.3	-479.8	65.70	14 43.7	53 57.4	I N.
1	L	13 28.07	1.899	8 7 56.78	124.12	20 7 2.5	549.0	64.95	14 44.4	53 59.8	
2	U	1 50.58	1.853	8 32 29.44	121.36	18 10 55.3	610.9	64.23	14 45.5	54 3.8	I N.
2	L	14 12.56	1.811	8 56 30.29	118.84	16 3 10.8	665.3	63.56	14 47.0	54 9.5	
3	U	2 34.07	1.775	9 20 2.94	116.67	+13 45 15.6	-712.6	62.99	14 49.0	54 16.9	I N.
3	L	14 55.20	1.747	9 43 12.23	114.96	11 18 35.1	753.0	62.55	14 51.5	54 26.1	
4	U	3 16.04	1.727	10 6 3.98	113.76	8 44 31.0	786.6	62.25	14 54.6	54 37.3	I N.
4	L	15 36.69	1.717	10 28 44.88	113.15	6 4 23.2	813.6	62.10	14 58.1	54 50.3	
5	U	3 57.29	1.718	10 51 22.33	113.20	+ 3 19 29.7	-834.2	62.14	15 2.2	55 5.4	I N.
5	L	16 17.96	1.730	11 14 4.35	113.93	+ 0 31 9.6	848.0	62.37	15 6.9	55 22.6	
6	U	4 38.85	1.754	11 36 59.52	115.40	- 2 19 15.8	854.9	62.81	15 12.2	55 41.9	I N.
6	L	17 0.11	1.791	12 0 16.96	117.65	5 10 19.4	854.3	63.46	15 18.0	56 3.2	
7	U	5 21.90	1.842	12 24 6.23	120.71	- 8 0 25.9	-845.3	64.31	15 24.3	56 26.4	I N.
7	L	17 44.38	1.907	12 48 37.24	124.60	10 47 47.2	826.6	65.38	15 31.1	56 51.4	
8	U	6 7.73	1.986	13 13 59.97	129.33	13 30 19.7	796.8	66.64	15 38.3	57 17.9	I N.
8	L	18 32.09	2.077	13 40 24.20	134.84	16 5 40.0	754.3	68.09	15 45.9	57 45.7	
9	U	6 57.63	2.180	14 7 58.85	141.04	-18 31 3.1	-697.0	69.68	15 53.7	58 14.3	I N.
9	L	19 24.45	2.292	14 36 51.10	147.74	20 43 20.4	623.0	71.35	16 1.6	58 43.3	
10	U	7 52.64	2.406	15 7 5.21	154.62	22 39 3.4	531.0	73.03	16 9.4	59 12.0	I N.
10	L	20 22.19	2.517	15 38 41.14	161.29	24 14 29.7	420.2	74.63	16 17.0	59 39.7	
11	U	8 53.00	2.616	16 11 33.28	167.23	-25 25 55.8	-291.3	76.02	16 24.1	60 5.7	I N.
11	L	21 24.88	2.693	16 45 29.46	171.88	26 9 57.6	-146.7	77.08	16 30.4	60 29.1	
12	U	9 57.51	2.741	17 20 11.16	174.75	26 23 52.1	+ 9.0	77.72	16 35.9	60 49.2	I N.S.
12	L	22 30.52	2.754	17 55 14.95	175.53	26 6 1.7	169.7	77.88	16 40.3	61 5.1	
13	U	11 3.46	2.731	18 30 15.24	174.18	-25 16 9.9	+328.0	77.54	16 43.3	61 16.3	I S.
13	L	23 35.94	2.677	19 4 47.64	170.93	23 55 27.0	477.0	76.77	16 44.9	61 22.3	
14	U	12 7.62	2.599	19 38 31.93	166.24	22 6 22.1	610.8	75.66	16 45.1	61 22.9	I. II. N.S.
15	L	0 38.26	2.507	20 11 13.99	160.66	19 52 25.2	725.2	74.32	16 43.7	61 17.9	
15	U	13 7.75	2.406	20 42 46.34	154.71	-17 17 44.5	+817.9	72.89	16 41.0	61 7.7	II. N.
16	L	1 36.05	2.310	21 13 7.40	148.85	14 26 44.0	888.5	71.46	16 36.9	60 52.7	
16	U	14 3.23	2.220	21 42 20.45	143.42	11 23 44.6	937.9	70.12	16 31.6	60 33.3	II. N.
17	L	2 29.38	2.140	22 10 32.01	138.63	8 12 52.7	967.6	68.92	16 25.3	60 10.3	
17	U	14 54.65	2.074	22 37 50.71	134.62	- 4 57 52.6	+979.6	67.91	16 18.3	59 44.5	II. N.
18	L	3 19.20	2.021	23 4 26.20	131.43	- 1 42 2.9	976.2	67.10	16 10.7	59 16.7	
18	U	15 43.20	1.982	23 30 28.51	129.09	+ 1 31 42.7	959.3	66.51	16 2.8	58 47.7	II. N.
19	L	4 6.82	1.956	23 56 7.50	127.54	4 40 52.8	930.6	66.12	15 54.7	58 18.1	
19	U	16 30.20	1.943	0 21 32.53	126.75	+ 7 43 16.0	+891.6	65.93	15 46.7	57 48.7	II. N.
20	L	4 53.49	1.941	0 46 52.22	126.64	10 36 57.1	843.7	65.92	15 38.9	57 20.0	
20	U	17 16.82	1.949	1 12 14.33	127.13	13 20 13.0	787.6	66.06	15 31.4	56 52.4	II. N.
21	L	5 40.31	1.966	1 37 45.41	128.12	15 51 30.6	724.1	66.34	15 24.3	56 26.3	
21	U	18 4.03	1.988	2 3 30.80	129.49	+18 9 24.5	+653.8	66.70	15 17.7	56 2.1	II. N.
22	L	6 28.05	2.015	2 29 34.27	131.11	20 12 35.4	577.0	67.12	15 11.6	55 39.9	
22	U	18 52.40	2.044	2 55 57.94	132.83	21 59 49.6	494.4	67.56	15 6.2	55 19.9	II. N.
23	L	7 17.10	2.071	3 22 42.01	134.48	23 30 0.7	406.6	67.97	15 1.4	55 2.2	
23	U	19 42.10	2.095	3 49 44.76	135.92	+24 42 10.5	+314.4	68.32	14 57.1	54 46.7	II. N.

July 12, U Defective Illumination of N. 0° 32.
 July 14, U Defective Illumination of I. 0° 00.

July 14, U Defective Illumination of N. 0° 20.

FOR TRANSIT OF MOON'S CENTER OVER THE MERIDIAN OF WASHINGTON.

Date.	Culmination.	Wash. Mean Time.	Var. per Hour of Long.	Right Ascension of Center.	Var. per Hour of Long.	Geocentric Declination of Center.	Var. per Hour of Long.	S. T. of Semi- Pass- ing Me- ridian.	Geocen- tric Semi-di- ameter.	Equa- torial Horiz- ontal Parallax.	Bright Limbs.
		h m	m	h m s	s	° ' "	"	s	' "	' "	
July 23	U	19 42.10	2.095	3 49 44.76	135.92	+24 42 10.5	+314.4	68.32	14 57.1	54 46.7	II. N.
24	L	8 7.36	2.113	4 17 2.61	136.98	25 35 31.2	218.7	68.56	14 53.5	54 33.5	
24	U	20 32.78	2.122	4 44 30.21	137.53	26 9 28.9	120.7	68.67	14 50.5	54 22.5	II. N.
25	L	8 58.25	2.121	5 12 0.99	137.49	26 23 45.6	+ 22.0	68.62	14 48.1	54 13.7	
25	U	21 23.65	2.110	5 39 27.53	136.83	+26 18 20.4	- 76.0	68.42	14 46.3	54 6.9	II. S.
26	L	9 48.86	2.089	6 6 42.34	135.55	25 53 31.4	171.7	68.05	14 45.0	54 2.1	
26	U	22 13.76	2.059	6 33 38.43	133.72	25 9 54.1	263.8	67.54	14 44.1	53 59.0	II. S.
27	L	10 38.24	2.021	7 0 9.86	131.45	24 8 20.4	350.9	66.92	14 43.8	53 57.7	
27	U	23 2.24	1.979	7 26 12.23	128.90	+22 49 56.1	-432.1	66.22	14 43.9	53 58.1	II. S.
28	L	11 25.72	1.933	7 51 42.77	126.18	21 15 56.8	506.7	65.48	14 44.4	53 59.9	
28	U	23 48.65	1.888	8 16 40.57	123.47	19 27 45.6	574.0	64.74	14 45.3	54 3.1	
29	L	12 11.04	1.845	8 41 6.31	120.86	17 26 49.8	634.0	64.03	14 46.5	54 7.8	
30	U	0 32.94	1.806	9 5 2.26	118.51	+15 14 38.8	-698.5	63.39	14 48.2	54 13.8	
30	L	12 54.41	1.773	9 28 31.93	116.50	12 52 42.3	731.6	62.84	14 50.1	54 21.0	
31	U	1 15.51	1.746	9 51 39.97	114.92	10 22 28.4	799.4	62.42	14 52.5	54 29.6	I. N.
31	L	13 36.35	1.728	10 14 31.89	113.83	7 45 24.8	799.9	62.14	14 55.2	54 39.5	
Aug. 1	U	1 57.02	1.719	10 37 13.98	113.28	+ 5 2 57.4	-823.3	62.01	14 58.2	54 50.7	I. N.
1	L	14 17.65	1.720	10 59 53.12	113.34	+ 2 16 32.0	839.6	62.05	15 1.7	55 3.3	
2	U	2 38.35	1.732	11 22 36.75	114.04	- 0 32 24.5	848.6	62.28	15 5.4	55 17.2	I. N.
2	L	14 59.25	1.755	11 45 32.82	115.42	3 22 23.5	850.0	62.69	15 9.6	55 32.6	
3	U	3 20.50	1.789	12 8 49.62	117.50	- 6 11 51.4	-843.3	63.31	15 14.2	55 49.4	I. N.
3	L	15 42.24	1.836	12 32 35.84	120.33	8 59 8.2	827.9	64.11	15 19.2	56 7.7	
4	U	4 4.62	1.895	12 57 0.37	123.90	11 42 25.1	803.1	65.11	15 24.6	56 27.4	I. N.
4	L	16 27.78	1.967	13 22 12.09	128.18	14 19 40.8	767.6	66.29	15 30.3	56 48.5	
5	U	4 51.87	2.050	13 48 19.51	133.16	-16 48 39.8	-720.1	67.62	15 36.4	57 10.9	I. N.
5	L	17 17.01	2.142	14 15 30.28	138.72	19 6 50.6	659.4	69.08	15 42.8	57 34.3	
6	U	5 43.30	2.241	14 43 50.46	144.69	21 11 25.5	583.9	70.61	15 49.4	57 58.7	I. N.
6	L	18 10.80	2.343	15 13 23.60	150.83	22 59 22.2	492.8	72.15	15 56.2	58 23.6	
7	U	6 39.52	2.442	15 44 9.60	156.78	-24 27 29.8	-385.8	73.61	16 3.1	58 48.6	I. N.
7	L	19 9.37	2.531	16 16 3.82	162.12	25 32 38.5	263.2	74.88	16 9.8	59 13.3	
8	U	7 40.19	2.602	16 48 56.36	166.42	26 11 53.2	-127.3	75.89	16 16.3	59 37.0	I. N.
8	L	20 11.73	2.650	17 22 32.24	169.59	26 22 51.4	+ 18.9	76.53	16 22.3	59 59.1	
9	U	8 43.68	2.669	17 56 32.32	170.44	-26 4 1.2	+170.0	76.77	16 27.7	60 19.0	I. N.S.
9	L	21 15.67	2.659	18 30 35.46	169.80	25 14 54.3	320.6	76.59	16 32.3	60 35.8	
10	U	9 47.37	2.621	19 4 20.98	167.53	23 56 13.0	464.7	76.02	16 35.9	60 49.1	I. S.
10	L	22 18.48	2.561	19 37 31.08	163.96	22 9 48.4	597.0	75.14	16 38.4	60 58.3	
11	U	10 48.79	2.487	20 9 52.55	159.51	-19 58 29.2	+713.2	74.04	16 39.6	61 2.8	I. S.
11	L	23 18.15	2.406	20 41 17.51	154.62	17 25 47.2	810.4	72.84	16 39.5	61 2.4	
12	U	11 46.53	2.324	21 11 43.16	149.69	14 35 39.2	887.4	71.62	16 38.1	60 57.1	I. N.S.
13	L	0 13.95	2.247	21 41 11.08	145.04	11 32 11.8	943.7	70.45	16 35.3	60 46.9	
13	U	12 40.49	2.178	22 9 46.06	140.89	- 8 19 29.6	+980.0	69.40	16 31.3	60 32.2	II. N.
14	L	1 6.26	2.120	22 37 35.06	137.40	5 12 5.6	997.6	68.52	16 26.2	60 13.4	
14	U	13 31.41	2.073	23 4 46.27	134.61	- 1 41 35.3	998.0	67.81	16 20.1	59 51.1	II. N.
15	L	1 56.07	2.089	23 31 28.45	132.55	+ 1 36 45.0	982.9	67.30	16 13.3	59 26.0	
15	U	14 20.40	2.017	23 57 50.42	131.22	+ 4 50 39.8	+954.1	66.98	16 5.9	58 58.9	II. N.

Aug. 9, U Defective Illumination of N. 0°.56.

Aug. 12, U Defective Illumination of N. 0°.01.

FOR TRANSIT OF MOON'S CENTER OVER THE MERIDIAN OF WASHINGTON.

Date.	Culmination.	Wash. Mean Time.	Var. per Hour of Long.	Right Ascension of Center.	Var. per Hour of Long.	Geocentric Declination of Center.	Var. per Hour of Long.	S. T. of Semi- Pass- ing Meridian.	Geocen- tric Semi-di- ameter.	Equa- torial Horiz- ontal Parallax.	Bright Limbs.
		h m	m	h m s	s	° ' "	"	s	' "	' "	
Aug. 15	U	14 20.40	2.017	23 57 50.42	131.22	+ 4 50 39.8	+954.1	66.98	16 5.9	58 58.9	II. N.
16	L	2 44.53	2.005	0 24 0.51	130.57	7 57 33.6	913.0	66.83	15 58.1	58 30.4	
16	U	15 8.59	2.005	0 50 6.49	130.51	10 55 9.1	861.1	66.85	15 50.2	58 1.3	II. N.
17	L	3 32.70	2.013	1 16 15.10	131.00	13 41 25.0	800.0	67.01	15 42.3	57 32.3	
17	U	15 56.94	2.028	1 42 32.02	131.89	+16 14 34.7	+730.4	67.27	15 34.5	57 3.9	II. N.
18	L	4 21.40	2.048	2 9 1.48	133.06	18 33 4.1	653.4	67.60	15 27.1	56 36.6	
18	U	16 46.10	2.070	2 35 46.21	134.40	20 35 30.4	570.0	67.97	15 20.1	56 11.0	II. N.
19	L	5 11.08	2.092	3 2 47.19	135.75	22 20 42.2	481.1	68.34	15 13.7	55 47.3	
19	U	17 36.31	2.113	3 30 3.66	136.96	+23 47 39.3	+387.8	68.66	15 7.8	55 25.8	II. N.
20	L	6 1.76	2.128	3 57 32.96	137.87	24 55 33.9	290.9	68.89	15 2.6	55 6.7	
20	U	18 27.35	2.136	4 25 10.91	138.38	25 43 52.4	191.9	69.01	14 58.0	54 50.0	II. N.
21	L	6 52.99	2.130	4 52 51.94	138.38	26 12 16.0	+ 92.0	68.99	14 54.2	54 36.0	
21	U	19 18.58	2.127	5 20 29.64	137.82	+26 20 41.9	- 7.5	68.83	14 51.1	54 24.6	II. N.
22	L	7 44.00	2.108	5 47 57.24	136.70	26 9 24.0	105.1	68.51	14 48.7	54 15.8	
22	U	20 9.15	2.081	6 15 8.28	135.06	25 38 52.1	199.6	68.06	14 47.0	54 9.5	II. S.
23	L	8 33.92	2.047	6 41 57.04	133.00	24 49 50.8	289.8	67.48	14 45.9	54 5.5	
23	U	20 58.25	2.007	7 8 19.06	130.62	+23 43 17.3	-374.8	66.82	14 45.5	54 3.9	II. S.
24	L	9 22.08	1.965	7 34 11.28	128.06	22 20 18.5	453.9	66.10	14 45.6	54 4.4	
24	U	21 45.40	1.921	7 59 32.26	125.45	20 42 9.3	526.5	65.37	14 46.3	54 6.8	II. S.
25	L	10 8.19	1.879	8 24 22.14	122.90	18 50 9.8	592.2	64.64	14 47.4	54 11.1	
25	U	22 30.50	1.840	8 48 42.47	120.53	+16 45 43.6	-650.9	63.97	14 49.0	54 17.0	II. S.
26	L	10 52.36	1.805	9 12 36.08	118.48	14 30 16.2	702.5	63.38	14 51.0	54 24.3	
26	U	23 13.85	1.777	9 36 6.91	116.75	12 5 14.3	746.7	62.89	14 53.4	54 33.0	
27	L	11 35.03	1.756	9 59 19.73	115.47	9 32 5.5	783.5	62.52	14 56.1	54 42.8	
27	U	23 56.01	1.742	10 22 20.09	114.68	+ 6 52 18.4	-813.1	62.29	14 59.0	54 53.6	
28	L	12 16.88	1.738	10 45 14.16	114.43	4 7 22.5	835.0	62.22	15 2.2	55 5.4	
29	U	0 37.76	1.743	11 8 8.59	114.74	+ 1 18 49.8	849.2	62.32	15 5.7	55 18.0	
29	L	12 58.76	1.759	11 31 10.44	115.67	- 1 31 45.0	855.2	62.59	15 9.3	55 31.3	
30	U	1 20.01	1.785	11 54 27.10	117.22	- 4 22 42.7	-852.8	63.04	15 13.1	55 45.3	I. N.
30	L	13 41.63	1.821	12 18 6.25	119.42	7 12 18.6	841.5	63.67	15 17.1	56 0.0	
31	U	2 3.76	1.868	12 42 15.71	122.27	9 58 40.9	820.5	64.48	15 21.3	56 15.3	I. N.
31	L	14 26.52	1.926	13 7 3.24	125.76	12 39 49.5	789.1	65.45	15 25.6	56 31.1	
Sept. 1	U	2 50.03	1.994	13 32 36.33	129.85	-15 13 34.5	-746.4	66.58	15 30.1	56 47.6	I. N.
1	L	15 14.42	2.071	13 59 1.78	134.48	17 37 35.2	691.6	67.82	15 34.7	57 4.5	
2	U	3 39.77	2.155	14 26 25.21	139.49	19 49 20.6	623.8	69.16	15 39.5	57 22.0	I. N.
2	L	16 6.14	2.242	14 54 50.40	144.73	21 46 10.3	542.2	70.51	15 44.3	57 39.9	
3	U	4 33.57	2.328	15 24 18.51	149.03	-23 25 18.5	-446.8	71.84	15 49.3	57 58.1	I. N.
3	L	17 2.00	2.409	15 54 47.31	154.79	24 43 59.9	337.9	73.06	15 54.3	58 16.6	
4	U	5 31.34	2.478	16 26 10.71	158.96	25 39 38.9	216.7	74.09	15 59.4	58 35.0	I. N.
4	L	18 1.41	2.531	16 58 18.43	162.13	26 10 0.3	- 85.4	74.85	16 4.3	58 53.0	
5	U	6 31.99	2.562	17 30 56.64	164.01	-26 13 22.9	+ 52.6	75.29	16 9.0	59 10.5	I. N.S.
5	L	19 2.81	2.670	18 3 49.02	164.48	25 48 49.0	193.2	75.39	16 13.5	59 27.0	
6	U	7 33.58	2.554	18 36 38.44	163.54	24 56 13.3	332.1	75.14	16 17.6	59 42.0	I. S.
6	L	20 4.03	2.518	19 9 8.86	161.35	23 36 24.5	464.7	74.59	16 21.2	59 55.2	
7	U	8 33.95	2.466	19 41 7.02	158.21	-21 51 2.8	+587.0	73.79	16 24.1	60 6.0	I. S.

Sept. 5, U Defective Illumination of S. 0'.64.

MOON-CULMINATIONS, 1916.

533

FOR TRANSIT OF MOON'S CENTER OVER THE MERIDIAN OF WASHINGTON.

Date.	Culmination.	Wash. Mean Time.	Var. per Hour of Long.	Right Ascension of Center.	Var. per Hour of Long.	Geocentric Declination of Center.	Var. per Hour of Long.	S. T. of Semid. Pass- ing Meri- dian.	Geocen- tric Semidi- ameter.	Equa- torial Horiz- ontal Parallax.	Bright Limbs.
		h m	m	h m s	s	° ' "	"	s	" "	" "	
Sept. 7	U	8 33.95	2.466	19 41 7.02	158.21	-21 51 2.8	+587.0	73.79	16 24.1	60 6.0	I. S.
	L	21 3.17	2.403	20 12 23.41	154.45	19 42 31.0	695.8	72.84	16 26.3	60 14.0	
8	U	9 31.61	2.336	20 42 52.74	150.42	17 13 45.0	789.0	71.81	16 27.6	60 18.8	I. S.
	L	21 59.24	2.270	21 12 33.66	146.43	14 28 3.2	865.0	70.79	16 28.0	60 20.1	
9	U	10 26.11	2.208	21 41 28.21	142.73	-11 28 55.4	+923.2	69.83	16 27.3	60 17.6	I. S.
	L	22 52.28	2.155	22 9 40.95	139.49	8 19 56.2	963.6	68.98	16 25.6	60 11.3	
10	U	11 17.86	2.110	22 37 18.22	136.83	5 4 37.6	986.6	68.27	16 22.8	60 1.2	I. N.S.
	L	23 42.97	2.077	23 4 27.38	134.81	-1 46 24.5	992.8	67.75	16 19.1	59 47.5	
11	U	12 7.74	2.054	23 31 16.30	133.45	+1 31 27.6	+963.3	67.40	16 14.5	59 30.5	I. II. N.
	L	0 32.31	2.042	23 57 52.79	132.74	4 45 55.6	959.0	67.21	16 9.0	59 10.5	
12	U	12 56.80	2.040	0 24 24.31	132.62	7 54 9.5	921.2	67.19	16 2.9	58 48.2	II. N.
	L	1 21.32	2.047	0 50 57.61	133.02	10 53 33.4	870.9	67.32	15 58.3	58 23.9	
13	U	13 45.96	2.061	1 17 38.45	133.85	+13 41 45.6	+809.3	67.57	15 49.4	57 58.5	II. N.
	L	2 10.80	2.080	1 44 31.29	135.00	16 16 39.0	737.9	67.90	15 42.3	57 32.4	
14	U	14 35.89	2.102	2 11 39.17	136.33	18 36 21.2	657.8	68.28	15 35.2	57 6.3	II. N.
	L	3 1.25	2.125	2 39 3.30	137.69	20 39 15.4	570.1	68.66	15 28.2	56 40.7	
15	U	15 26.88	2.145	3 6 43.17	138.92	+22 24 0.6	+476.5	69.01	15 21.5	56 16.2	II. N.
	L	3 52.72	2.161	3 34 36.38	139.88	23 49 32.8	378.2	69.29	15 15.2	55 53.0	
16	U	16 18.72	2.170	4 2 38.81	140.44	24 55 5.9	377.0	69.46	15 9.4	55 31.7	II. N.
	L	4 44.78	2.171	4 30 44.87	140.48	25 40 13.1	174.2	69.49	15 4.2	55 12.6	
17	U	17 10.79	2.162	4 58 48.02	139.95	+26 4 46.8	+71.6	69.37	14 59.6	54 55.8	II. N.
	L	5 36.63	2.144	5 26 41.29	138.84	26 8 58.3	-29.3	69.09	14 55.7	54 41.6	
18	U	18 2.20	2.116	5 54 17.95	137.19	25 53 15.7	127.2	68.66	14 52.6	54 30.1	II. N.
	L	6 27.40	2.081	6 21 31.99	135.09	25 18 23.0	220.8	68.11	14 50.2	54 21.3	
19	U	18 52.14	2.041	6 48 18.62	132.64	+24 25 17.0	-309.3	67.46	14 48.6	54 15.3	II. S.
	L	7 16.36	1.997	7 14 34.55	129.99	23 15 3.2	391.9	66.74	14 47.7	54 12.0	
20	U	19 40.05	1.962	7 40 18.11	127.27	21 48 54.1	468.4	65.98	14 47.5	54 11.4	II. S.
	L	8 3.21	1.907	8 5 29.31	124.61	20 8 6.0	538.5	65.23	14 48.0	54 13.3	
21	U	20 25.84	1.866	8 30 9.58	122.14	+18 13 57.4	-601.9	64.53	14 49.2	54 17.6	II. S.
	L	8 48.01	1.830	8 54 21.67	119.93	16 7 47.4	658.7	63.89	14 51.0	54 24.1	
22	U	21 9.78	1.799	9 18 9.45	118.10	13 50 55.9	708.8	63.35	14 53.3	54 32.7	II. S.
	L	9 31.22	1.776	9 41 37.69	116.69	11 24 43.1	752.2	62.93	14 56.2	54 43.1	
23	U	21 52.43	1.760	10 4 51.87	115.76	+8 50 30.5	-788.8	62.63	14 59.4	54 55.0	II. S.
	L	10 13.50	1.754	10 27 58.09	115.37	6 9 41.4	818.2	62.49	15 3.0	55 8.3	
24	U	22 34.55	1.756	10 51 2.89	115.53	3 23 42.8	840.3	62.52	15 7.0	55 22.7	II. S.
	L	10 55.70	1.769	11 14 13.22	116.29	+0 34 6.4	854.5	62.71	15 11.1	55 37.9	
25	U	23 17.05	1.792	11 37 36.32	117.66	-2 17 30.1	-860.2	63.07	15 15.4	55 53.7	
	L	11 38.74	1.825	12 1 19.65	119.67	5 9 21.3	856.8	63.61	15 19.8	56 9.8	
27	U	0 0.90	1.869	12 25 30.76	122.30	7 59 32.3	843.3	64.33	15 24.2	56 26.0	
	L	12 23.64	1.923	12 50 17.13	125.53	10 45 58.3	819.1	65.21	15 28.6	56 42.1	
28	U	0 47.08	1.986	13 15 45.88	129.35	-13 26 23.9	-783.1	66.24	15 32.9	56 57.9	
	L	13 11.33	2.058	13 42 3.50	133.67	15 58 22.3	734.4	67.39	15 37.1	57 13.4	
29	U	1 36.49	2.136	14 9 15.29	138.36	18 19 16.4	672.3	68.64	15 41.2	57 28.3	I. N.
	L	14 2.61	2.217	14 37 24.79	143.25	20 26 21.8	596.2	69.92	15 45.1	57 42.7	
30	U	2 29.70	2.298	15 6 33.10	148.11	-22 16 50.1	-506.1	71.17	15 48.8	57 56.3	I. N.

Sept. 10, U Defective Illumination of N. O'.06.

Sept. 11, U Defective Illumination of I. O'.07.

FOR TRANSIT OF MOON'S CENTER OVER THE MERIDIAN OF WASHINGTON.

Date.	Culmination.	Wash. Mean Time.	Var. per Hour of Long.	Right Ascension of Center.	Var. per Hour of Long.	Geocentric Declination of Center.	Var. per Hour of Long.	S. T. of Semid. Pass- ing Meri- dian.	Geocen- tric Semidi- ameter.	Equa- torial Horiz- ontal Parallax.	Bright Limbs
		h m	m	h m s	s	' " "	"	s	' "	' "	
Sept. 30	U	2 29.70	2.298	15 6 33.10	148.11	-22 16 50.1	-506.1	71.17	15 48.8	57 56.3	I. N
30	L	14 57.74	2.374	15 36 38.20	152.06	23 47 55.8	402.6	72.33	15 52.3	58 9.3	
Oct. 1	U	3 26.62	2.439	16 7 34.45	156.58	24 57 5.1	287.0	73.33	15 55.7	58 21.5	I. N
1	L	15 56.20	2.488	16 39 12.44	159.57	25 42 5.2	161.6	74.08	15 58.8	58 33.0	
2	U	4 26.27	2.518	17 11 19.41	161.38	-26 1 16.0	-29.4	74.54	16 1.7	58 43.6	I. N
2	L	16 56.56	2.527	17 43 40.24	161.87	25 53 38.4	+105.8	74.68	16 4.4	58 53.5	
3	U	5 26.82	2.513	18 15 58.92	161.04	25 19 1.1	239.9	74.49	16 6.8	59 2.4	I. S
3	L	17 56.79	2.479	18 48 0.33	159.02	24 18 0.3	369.0	74.01	16 9.0	59 10.3	
4	U	6 26.26	2.430	19 19 31.69	156.07	-22 51 57.5	+489.7	73.28	16 10.8	59 17.1	I. S
4	L	18 55.07	2.371	19 50 23.63	152.50	21 2 51.1	599.2	72.40	16 12.3	59 22.6	
5	U	7 23.14	2.307	20 20 30.68	148.65	18 53 7.4	695.7	71.42	16 13.4	59 26.7	I. S
5	L	19 50.44	2.243	20 49 51.09	144.78	16 25 31.7	777.8	70.42	16 14.1	59 29.0	
6	U	8 16.98	2.182	21 18 26.38	141.16	-13 42 59.9	+845.0	69.47	16 14.2	59 29.5	I. S
6	L	20 42.84	2.129	21 46 20.67	137.97	10 48 32.7	897.0	68.62	16 13.8	59 28.0	
7	U	9 8.12	2.086	22 13 39.90	135.33	7 45 11.8	934.0	67.91	16 12.8	59 24.2	I. S
7	L	21 32.94	2.052	22 40 31.20	133.33	4 35 56.8	956.0	67.35	16 11.1	59 18.1	
8	U	9 57.42	2.030	23 7 2.39	131.98	-1 23 43.7	+963.7	66.97	16 8.8	59 9.5	I. S
8	L	22 21.70	2.019	23 33 21.44	131.31	+1 48 35.4	957.1	66.77	16 5.8	58 58.6	
9	U	10 45.91	2.018	23 59 36.14	131.26	4 58 13.3	936.8	66.74	16 2.2	58 45.4	I. N
9	L	23 10.17	2.027	0 25 53.82	131.78	8 2 28.6	903.4	66.86	15 58.0	58 29.9	
10	U	11 34.58	2.044	0 52 20.93	132.80	+10 58 46.5	+857.4	67.12	15 53.3	58 12.6	I. N
10	L	23 59.24	2.067	1 19 2.84	134.22	13 44 39.8	799.5	67.49	15 48.1	57 53.6	
11	U	12 24.21	2.095	1 46 3.48	135.91	16 17 50.2	730.5	67.94	15 42.5	57 33.3	ILN
12	L	0 49.53	2.125	2 13 25.11	137.69	18 36 11.7	651.5	68.42	15 36.8	57 12.1	
12	U	13 15.20	2.153	2 41 7.99	139.42	+20 37 51.7	+563.8	68.88	15 30.9	56 50.6	ILN
13	L	1 41.20	2.178	3 9 10.31	140.91	22 21 14.6	468.9	69.29	15 25.0	56 29.0	
13	U	14 7.45	2.196	3 37 28.19	141.99	23 45 4.7	368.6	69.59	15 19.2	56 7.8	ILN
14	L	2 23.87	2.205	4 5 55.81	142.51	24 48 27.8	264.9	69.76	15 13.7	55 47.6	
14	U	15 0.33	2.203	4 34 25.94	142.39	+25 30 54.2	+159.5	69.77	15 8.5	55 28.6	ILN
15	L	3 26.69	2.189	5 2 50.48	141.58	25 52 18.4	+54.8	69.60	15 3.8	55 11.2	
15	U	15 52.83	2.165	5 31 1.17	140.10	25 52 58.3	-47.6	69.25	14 59.6	54 55.8	ILN
16	L	4 18.61	2.130	5 58 50.40	138.02	25 33 32.4	145.9	68.75	14 56.0	54 42.5	
16	U	16 43.92	2.088	6 26 11.76	135.47	+24 54 56.5	-239.1	68.11	14 53.0	54 31.6	ILAS
17	L	5 8.70	2.040	6 53 0.52	132.61	23 58 19.2	326.1	67.39	14 50.8	54 23.4	
17	U	17 32.88	1.990	7 19 13.84	129.59	22 44 57.3	406.5	66.60	14 49.3	54 17.8	IL S
18	L	5 56.46	1.940	7 44 50.81	126.58	21 16 11.9	480.0	65.80	14 48.5	54 15.0	
18	U	18 19.45	1.892	8 9 52.33	123.71	+19 33 25.2	-546.7	65.02	14 48.5	54 15.1	II S
19	L	6 41.90	1.849	8 34 20.90	121.11	17 37 58.2	606.7	64.30	14 49.3	54 17.9	
19	U	19 3.86	1.812	8 58 20.32	118.87	15 31 9.9	680.2	63.67	14 50.8	54 23.5	II S
20	L	7 25.41	1.782	9 21 55.47	117.07	13 14 16.8	707.5	63.15	14 53.0	54 31.6	
20	U	19 46.66	1.761	9 45 12.09	115.79	+10 48 33.2	-748.7	62.76	14 55.9	54 42.3	II S
21	L	8 7.70	1.748	10 8 16.59	115.06	8 15 13.1	783.6	62.53	14 59.5	54 55.3	
21	U	20 28.66	1.746	10 31 15.88	114.93	5 35 31.7	812.2	62.46	15 3.6	55 10.3	II S
22	L	8 49.66	1.755	10 54 17.37	115.43	2 50 47.1	834.0	62.56	15 8.2	55 27.1	
22	U	21 10.82	1.774	11 17 28.74	116.58	+0 2 23.3	-848.6	62.85	15 13.2	55 45.5	II S

Oct. 9, U Defective Illumination of N. 0° 57.

Oct. 16, U Defective Illumination of N. 0° 53.

FOR TRANSIT OF MOON'S CENTER OVER THE MERIDIAN OF WASHINGTON.

Date.	Culmination.	Wash. Mean Time.	Var. per Hour of Long.	Right Ascension of Center.	Var. per Hour of Long.	Geocentric Declination of Center.	Var. per Hour of Long.	S. T. of Semid. Pass- ing Meridian.	Geocen- tric Semidi- ameter.	Equa- torial Hori- zontal Parallax.	Bright Limbs.
		h m	m	h m s	s	° ' "	"	°	' "	' "	
Oct. 23	L	9 32.28	1.804	11 40 57.99	118.41	- 2 48 8.4	-855.2	63.32	15 18.5	56 5.0	
23	U	21 54.17	1.846	12 4 53.33	120.93	5 39 5.7	852.7	63.98	15 24.0	56 25.2	II. S.
24	L	10 16.63	1.899	12 29 22.94	124.13	8 28 34.0	840.2	64.82	15 29.6	56 45.9	
24	U	22 39.80	1.963	12 54 34.88	127.98	11 14 23.6	816.1	65.83	15 35.2	57 6.5	II. S.
25	L	11 3.79	2.037	13 20 36.70	132.42	-13 54 9.3	-779.2	66.99	15 40.8	57 26.8	
25	U	23 28.72	2.119	13 47 34.95	137.36	16 25 9.9	728.4	68.26	15 46.1	57 46.2	
26	L	11 54.67	2.207	14 15 34.63	142.62	18 44 29.7	662.4	69.60	15 51.0	58 4.4	
27	U	0 21.69	2.296	14 44 38.24	147.97	20 49 3.0	580.6	70.96	15 55.6	58 21.1	
27	L	12 49.75	2.381	15 14 45.14	153.11	-22 35 40.5	-483.1	72.24	15 59.6	58 36.0	
28	U	1 18.79	2.457	15 45 50.65	157.68	24 1 19.7	371.1	73.37	16 3.1	58 48.9	I. N.
28	L	13 48.66	2.517	16 17 45.71	161.31	25 3 17.4	246.6	74.28	16 6.0	58 59.6	
29	U	2 19.13	2.586	16 50 17.00	163.67	25 39 22.9	-113.1	74.88	16 8.4	59 8.2	I. N.
29	L	14 49.92	2.571	17 23 7.89	164.55	-25 48 12.6	+ 25.2	75.12	16 10.1	59 14.6	
30	U	3 20.73	2.560	17 56 0.12	163.90	25 29 17.0	163.7	75.00	16 11.3	59 18.9	I. N.
30	L	15 51.27	2.526	18 28 35.74	161.83	24 43 2.6	297.6	74.54	16 11.9	59 21.2	
31	U	4 21.28	2.472	19 0 39.18	158.59	23 30 50.3	422.8	73.79	16 12.1	59 21.7	I. S.
31	L	16 50.55	2.405	19 31 58.62	154.55	-21 54 43.3	+536.2	72.83	16 11.8	59 20.5	
Nov. 1	U	5 18.97	2.331	20 2 26.67	150.09	19 57 15.3	635.9	71.74	16 11.0	59 17.8	I. S.
1	L	17 46.48	2.256	20 32 0.46	145.56	17 41 18.5	721.0	70.61	16 9.9	59 13.8	
2	U	6 13.11	2.184	21 0 40.92	141.25	15 9 51.7	791.0	69.52	16 8.5	59 8.6	I. S.
2	L	18 38.92	2.119	21 28 32.11	137.38	-12 25 53.7	+846.3	68.52	16 6.8	59 2.4	
3	U	7 4.02	2.065	21 55 40.27	134.10	9 32 18.0	887.3	67.65	16 4.8	58 55.1	I. S.
3	L	19 28.53	2.022	22 22 13.12	131.50	6 31 51.1	914.9	66.95	16 2.6	58 46.8	
4	U	7 52.59	1.991	22 48 19.12	129.63	3 27 11.4	929.5	66.43	16 0.1	58 37.6	I. S.
4	L	20 16.36	1.972	23 14 7.13	128.50	- 0 20 51.1	+931.8	66.10	15 57.3	58 27.4	
5	U	8 39.97	1.965	23 39 45.93	128.09	+ 2 44 43.2	921.9	65.96	15 54.3	58 16.3	I. S.
5	L	21 3.57	1.970	0 5 23.95	128.36	5 47 9.2	900.5	66.00	15 51.0	58 4.3	
6	U	9 27.28	1.985	0 31 8.97	129.25	8 44 7.4	867.4	66.20	15 47.4	57 51.3	I. S.
6	L	21 51.22	2.008	0 57 7.89	130.66	+11 33 20.7	+823.0	66.54	15 43.6	57 37.3	
7	U	10 15.49	2.038	1 23 26.42	132.50	14 12 34.9	767.5	67.00	15 39.6	57 22.5	I. S.
7	L	22 40.16	2.074	1 50 8.73	134.59	16 39 39.9	701.5	67.53	15 35.4	57 7.0	
8	U	11 5.26	2.110	2 17 17.16	136.81	18 52 31.6	635.4	68.09	15 31.0	56 50.8	I. N.S.
8	L	23 30.80	2.146	2 44 51.97	138.95	+20 49 14.4	+540.2	68.63	15 26.4	56 34.2	
9	U	11 56.74	2.177	3 12 51.06	140.83	22 28 7.0	447.3	69.10	15 21.8	56 17.3	II. N.
10	L	0 23.02	2.200	3 41 9.95	142.23	23 47 45.3	348.2	69.47	15 17.2	56 0.4	
10	U	12 49.51	2.213	4 9 42.06	143.00	24 47 6.6	244.8	69.68	15 12.7	55 43.8	II. N.
11	L	1 16.08	2.214	4 38 19.04	143.03	+25 25 33.5	+139.5	69.71	15 8.3	55 27.7	
11	U	13 42.58	2.201	5 6 51.58	142.25	25 42 55.6	+ 34.5	69.55	15 4.2	55 12.5	II. N.
12	L	2 8.85	2.175	5 35 10.23	140.72	25 39 29.3	- 68.2	69.19	15 0.3	54 58.3	
12	U	14 34.74	2.138	6 3 6.16	138.49	25 15 55.5	166.6	68.65	14 56.8	54 45.6	II. N.S.
13	L	3 0.13	2.092	6 30 32.02	135.73	+24 33 14.9	-259.2	67.98	14 53.8	54 34.5	
13	U	15 24.93	2.040	6 57 22.40	132.62	23 32 43.7	344.9	67.20	14 51.3	54 25.4	II. S.
14	L	3 49.08	1.986	7 23 34.08	129.32	22 15 47.4	423.3	66.37	14 49.4	54 18.4	
14	U	16 12.58	1.931	7 49 6.05	126.02	20 43 56.1	494.1	65.52	14 48.1	54 13.7	II. S.
15	L	4 35.43	1.879	8 13 59.32	122.89	+18 58 40.0	-557.4	64.71	14 47.6	54 11.6	

Nov. 8, U Defective Illumination of S. 0'.24.

Nov. 12, U Defective Illumination of S. 0'.09.

FOR TRANSIT OF MOON'S CENTER OVER THE MERIDIAN OF WASHINGTON.

Date.	Culmination.	Wash. Mean Time.	Var. per Hour of Long.	Right Ascension of Center.	Var. per Hour of Long.	Geocentric Declination of Center.	Var. per Hour of Long.	S. T. of Semi- d. Pass- ing Mer- idian.	Geocen- tric Semi-di- ameter.	Equa- torial Hori- zontal Parallax.	Bright Limbs.
		h m	m	h m s	s	° ' "	"	s	' "	' "	
Nov. 15	U	16 57.69	1.832	8 38 16.63	120.06	+17 1 26.9	-613.6	63.96	14 47.7	54 12.0	II. S.
16	L	5 19.42	1.791	9 2 2.19	117.62	14 53 40.4	663.1	63.30	14 48.6	54 15.2	
16	U	17 40.71	1.759	9 25 21.35	115.67	12 36 39.0	706.1	62.77	14 50.2	54 21.1	II. S.
17	L	6 1.66	1.735	9 48 20.37	114.27	10 11 36.5	743.2	62.39	14 52.6	54 29.8	
17	U	18 22.40	1.722	10 11 6.21	113.48	+ 7 39 44.3	-774.5	62.15	14 55.7	54 41.3	II. S.
18	L	6 43.04	1.720	10 33 46.34	113.33	5 2 11.7	799.9	62.09	14 59.5	54 55.4	
18	U	19 3.72	1.729	10 56 28.76	113.86	+ 2 20 9.3	819.4	62.22	15 4.0	55 12.0	II. S.
19	L	7 24.58	1.749	11 19 21.84	115.11	- 0 25 9.2	832.6	62.55	15 9.2	55 31.0	
19	U	19 45.76	1.782	11 42 34.34	117.10	- 3 12 23.2	-838.6	63.08	15 15.0	55 52.1	II. S.
20	L	8 7.41	1.828	12 6 15.24	119.84	6 0 2.1	836.5	63.81	15 21.2	56 15.0	
20	U	20 29.68	1.887	12 30 33.72	123.36	8 46 22.5	825.1	64.73	15 27.8	56 39.3	II. S.
21	L	8 52.73	1.958	12 55 38.92	127.63	11 29 24.2	803.1	65.84	15 34.7	57 4.6	
21	U	21 16.71	2.040	13 21 39.58	132.59	-14 6 48.4	-768.7	67.12	15 41.7	57 30.3	II. S.
22	L	9 41.74	2.133	13 48 43.55	138.16	16 35 55.1	719.9	68.53	15 48.7	57 56.0	
22	U	22 7.92	2.232	14 16 57.05	144.15	18 53 43.9	655.4	70.03	15 55.5	58 21.0	II. S.
23	L	10 35.31	2.334	14 46 23.67	150.29	20 56 57.0	573.8	71.54	16 2.0	58 44.7	
23	U	23 3.92	2.433	15 17 3.37	156.25	-22 42 6.4	-474.8	72.98	16 7.9	59 6.5	
24	L	11 33.67	2.522	15 48 51.31	161.59	24 5 45.5	359.0	74.26	16 13.2	59 25.9	
25	U	0 4.38	2.593	16 21 37.28	165.85	25 4 44.7	228.7	75.28	16 17.7	59 42.3	
25	L	12 35.80	2.639	16 55 5.74	168.61	25 36 31.4	- 87.7	75.94	16 21.2	59 55.4	
26	U	1 7.59	2.655	17 28 56.89	169.60	-25 39 26.4	+ 58.9	76.19	16 23.8	60 4.8	I. N.
26	L	13 39.40	2.641	18 2 48.79	168.74	25 12 58.3	205.1	76.01	16 25.4	60 10.5	
27	U	2 10.86	2.598	18 36 19.99	166.19	24 17 46.7	345.2	75.44	16 25.9	60 12.4	I. S.
27	L	14 41.67	2.533	19 9 12.03	162.29	22 55 36.3	474.2	74.55	16 25.5	60 10.8	
28	U	3 11.61	2.454	19 41 11.32	157.48	-21 9 5.0	+588.3	73.42	16 24.1	60 5.8	I. S.
28	L	15 40.53	2.366	20 12 9.76	152.22	19 1 23.6	685.6	72.17	16 21.9	59 57.8	
29	U	4 8.40	2.278	20 42 4.66	146.95	16 36 0.4	765.3	70.89	16 19.1	59 47.5	I. S.
29	L	16 35.24	2.196	21 10 57.75	141.97	13 56 26.0	827.6	69.66	16 15.7	59 34.8	
30	U	5 1.14	2.122	21 38 54.16	137.54	-11 6 2.8	+873.6	68.54	16 11.8	59 20.6	I. S.
30	L	17 26.22	2.060	22 6 1.36	133.79	8 8 0.3	904.5	67.58	16 7.6	59 5.2	
Dec. 1	U	5 50.63	2.010	22 32 28.17	130.82	5 5 12.4	921.3	66.79	16 3.1	58 48.9	I. S.
1	L	18 14.52	1.974	22 58 24.11	128.65	- 2 0 18.0	925.7	66.23	15 58.6	58 32.1	
2	U	6 38.07	1.952	23 23 58.85	127.29	+ 1 4 17.5	+918.4	65.85	15 53.9	58 15.1	I. S.
2	L	19 1.42	1.942	23 49 21.92	126.69	4 6 19.3	900.2	65.68	15 49.3	57 58.1	
3	U	7 24.72	1.944	0 14 42.33	126.83	7 3 40.8	871.7	65.70	15 44.7	57 41.1	I. S.
3	L	19 48.12	1.957	0 40 8.36	127.62	9 54 20.8	833.3	65.88	15 40.1	57 24.4	
4	U	8 11.73	1.980	1 5 47.35	128.97	+12 36 22.1	+785.3	66.20	15 35.6	57 8.0	I. S.
4	L	20 35.66	2.010	1 31 45.45	130.77	15 7 49.5	727.7	66.64	15 31.2	56 51.9	
5	U	8 59.99	2.045	1 58 7.25	132.90	17 26 51.2	661.0	67.17	15 27.0	56 36.3	I. S.
5	L	21 24.76	2.083	2 24 55.55	135.16	19 31 38.4	585.4	67.72	15 22.8	56 21.0	
6	U	9 49.97	2.120	2 52 11.00	137.39	+21 20 28.7	+501.7	68.27	15 18.8	56 6.1	I. S.
6	L	22 15.61	2.153	3 19 51.91	139.37	22 51 49.1	410.6	68.75	15 14.8	55 51.6	
7	U	10 41.61	2.178	3 47 54.21	140.92	24 4 20.4	313.7	69.12	15 11.0	55 37.6	I. N.S.
7	L	23 7.85	2.194	4 16 11.58	141.86	24 57 1.8	212.6	69.34	15 7.3	55 24.1	
8	U	11 34.21	2.197	4 44 35.83	142.06	+25 29 14.8	+109.3	69.38	15 3.8	55 11.2	I. N.S.

Dec. 8, U Defective Illumination of S, 0°.64.

FOR TRANSIT OF MOON'S CENTER OVER THE MERIDIAN OF WASHINGTON.

Date.	Culmination.	Wash. Mean Time.	Var. per Hour of Long.	Right Ascension of Center.	Var. per Hour of Long.	Geocentric Declination of Center.	Var. per Hour of Long.	S. T. of Semi- d. Pass- ing Meri- dian.	Geocen- tric Semi-di- ameter.	Equa- torial Hori- zontal Parallax.	Bright Limbs.
		h m	m	h m s	s	° ' "	"	s	' "	' "	
Dec. 9	L	0 0.53	2.187	5 12 57.63	141.44	+25 40 46.5	+ 6.1	69.23	15 0.5	54 59.0	
9	U	12 26.65	2.164	5 41 7.32	140.04	25 31 49.8	- 95.0	68.88	14 57.4	54 47.7	II. N. S.
10	L	0 52.42	2.129	6 8 55.74	137.93	25 3 3.0	191.9	68.35	14 54.5	54 37.2	
10	U	13 17.70	2.084	6 36 15.11	135.23	24 15 25.6	283.2	67.67	14 52.0	54 27.9	II. N. S.
11	L	1 42.40	2.032	7 2 59.47	132.12	+23 10 14.3	-367.5	66.89	14 49.8	54 19.9	
11	U	14 6.46	1.977	7 29 5.08	128.79	21 48 57.1	444.1	66.05	14 48.0	54 13.3	II. S.
12	L	2 29.84	1.921	7 54 30.40	125.43	20 13 8.1	512.8	65.19	14 46.7	54 8.3	
12	U	14 52.57	1.867	8 19 16.00	122.20	18 24 23.4	573.4	64.35	14 45.8	54 5.2	II. S.
13	L	3 14.68	1.818	8 43 24.25	119.23	+16 24 16.7	-626.4	63.58	14 45.5	54 4.1	
13	U	15 36.23	1.775	9 6 59.08	116.64	14 14 18.0	672.2	62.90	14 45.8	54 5.1	II. S.
14	L	3 57.31	1.740	9 30 5.59	114.53	11 55 51.3	711.1	62.34	14 46.7	54 8.4	
14	U	16 18.02	1.713	9 52 49.81	112.94	9 30 15.7	743.7	61.93	14 48.3	54 14.2	II. S.
15	L	4 38.47	1.697	10 15 18.58	111.95	+ 6 58 45.5	-770.3	61.67	14 50.5	54 22.5	
15	U	16 58.79	1.691	10 37 39.28	111.60	4 22 31.3	791.1	61.59	14 53.5	54 33.4	II. S.
16	L	5 19.10	1.697	10 59 59.82	111.94	+ 1 42 42.1	806.1	61.70	14 57.2	54 47.0	
16	U	17 39.55	1.714	11 22 28.57	112.98	- 0 59 31.8	815.2	62.00	15 1.6	55 3.2	II. S.
17	L	6 0.29	1.744	11 45 14.30	114.77	- 3 42 56.7	-817.8	62.51	15 6.8	55 22.1	
17	U	18 21.46	1.786	12 8 26.14	117.34	6 26 12.1	813.4	63.22	15 12.6	55 43.3	II. S.
18	L	6 43.21	1.842	12 32 13.53	120.69	9 7 47.3	800.9	64.13	15 19.0	56 6.9	
18	U	19 5.72	1.911	12 56 46.04	124.85	11 45 57.8	779.1	65.24	15 26.0	56 32.6	II. S.
19	L	7 29.14	1.993	13 22 13.13	129.79	-14 18 41.2	-746.2	66.53	15 33.4	56 59.9	
19	U	19 53.61	2.067	13 48 43.72	136.42	16 43 35.5	700.6	67.98	15 41.2	57 28.5	II. S.
20	L	8 19.27	2.190	14 16 25.53	141.63	18 57 56.6	640.3	69.54	15 49.2	57 57.9	
20	U	20 46.20	2.299	14 45 24.12	148.18	20 58 38.1	563.7	71.16	15 57.3	58 27.5	II. S.
21	L	9 14.44	2.408	15 15 41.81	154.74	-22 42 17.1	-469.8	72.75	16 5.2	58 56.5	
21	U	21 43.97	2.511	15 47 16.37	160.91	24 5 21.8	358.1	74.21	16 12.7	59 24.1	II. S.
22	L	10 14.64	2.598	16 20 0.03	166.18	25 4 26.7	230.1	75.44	16 19.7	59 49.7	
22	U	22 46.23	2.663	16 53 39.08	170.06	25 36 31.8	- 88.8	76.33	16 25.9	60 12.4	II. N.
23	L	11 18.43	2.698	17 27 54.34	172.17	-25 39 24.2	+ 61.1	76.80	16 31.1	60 31.5	
23	U	23 50.85	2.700	18 2 23.12	172.26	25 11 57.3	213.3	76.82	16 35.1	60 46.3	
24	L	12 23.10	2.670	18 36 41.80	170.51	24 14 22.0	361.3	76.41	16 37.9	60 56.4	
25	U	0 54.82	2.613	19 10 28.88	167.09	22 48 6.9	499.0	75.62	16 39.3	61 1.5	
25	L	13 25.74	2.537	19 43 27.34	162.50	-20 55 48.4	+621.3	74.55	16 39.3	61 1.5	
26	U	1 55.67	2.449	20 15 26.02	157.22	18 40 51.3	725.0	73.30	16 38.0	60 56.7	I. S.
26	L	14 24.51	2.358	20 46 19.67	151.73	16 7 9.6	808.5	71.99	16 35.4	60 47.2	
27	U	2 52.28	2.270	21 16 8.35	146.44	13 18 46.1	872.0	70.70	16 31.7	60 33.7	I. S.
27	L	15 19.03	2.190	21 44 56.14	141.63	-10 19 38.3	+916.1	69.52	16 27.1	60 16.7	
28	U	3 44.88	2.121	22 12 49.97	137.47	7 13 28.6	942.5	68.49	16 21.7	59 56.9	I. S.
28	L	16 9.98	2.065	22 39 58.51	134.06	4 3 40.0	953.0	67.64	16 15.7	59 34.9	
29	U	4 34.49	2.022	23 6 31.28	131.51	- 0 53 13.9	949.1	66.99	16 9.3	59 11.4	I. S.
29	L	16 58.57	1.993	23 32 38.12	129.76	+ 2 15 8.3	+932.6	66.54	16 2.7	58 47.1	
30	U	5 22.38	1.977	23 58 28.63	128.79	5 19 3.5	904.8	66.30	15 56.0	58 22.5	I. S.
30	L	17 46.06	1.973	0 24 11.91	128.55	8 16 22.6	866.7	66.24	15 49.3	57 58.1	
31	U	6 9.76	1.980	0 49 56.28	128.95	11 5 8.3	819.3	66.34	15 42.8	57 34.3	I. S.
31	L	18 33.61	1.996	1 15 49.05	129.92	+13 43 31.9	+763.1	66.59	15 36.5	57 11.3	

Dec. 9, U Defective Illumination of S. 0°.51.

Dec. 10, U Defective Illumination of N. 0°.00.

FOR TRANSIT AT WASHINGTON.

Date.	Wash. Mean Time.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semi-diam.	S. T. of Sem. Puss. Mer.	Date.	Wash. Mean Time.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semi-diam.	S. T. of Sem. Puss. Mer.
	h m	h m s	° ' "	"	"	s		h m	h m s	° ' "	"	"	s
Jan. 1	0 47	19 26 52.35	-24 7 45.2	6.5	2.5	0.18	Feb. 15	22 51	20 31 56.07	-16 16 45.3	12.1	4.6	0.32
2	0 50	19 33 55.48	23 52 40.5	6.6	2.5	0.18	16	22 47	20 31 54.04	16 29 35.5	11.8	4.5	0.31
3	0 53	19 40 56.74	23 36 1.2	6.6	2.5	0.18	17	22 43	20 32 20.40	16 40 56.9	11.6	4.4	0.31
4	0 56	19 47 55.68	23 17 48.2	6.7	2.5	0.18	18	22 40	20 33 13.53	16 50 47.7	11.4	4.3	0.30
5	0 59	19 54 51.80	22 58 1.8	6.8	2.6	0.19	19	22 38	20 34 31.73	16 59 6.9	11.2	4.2	0.30
6	1 2 20	1 44.48	-22 36 43.5	6.9	2.6	0.19	20	22 35	20 36 13.24	-17 5 53.9	10.9	4.1	0.29
7	1 5 20	8 33.08	-22 15 55.1	7.0	2.6	0.19	21	22 33	20 38 16.40	17 11 8.7	10.7	4.1	0.29
8	1 7 20	15 16.87	21 49 38.7	7.1	2.7	0.19	22	22 32	20 40 39.56	17 14 51.5	10.5	4.0	0.28
9	1 10 20	21 55.01	21 23 57.3	7.2	2.7	0.20	23	22 31	20 43 21.15	17 17 2.4	10.3	3.9	0.27
10	1 13 20	28 26.51	20 56 55.0	7.3	2.8	0.20	24	22 30	20 46 19.72	17 17 42.3	10.2	3.9	0.27
11	1 15 20	34 50.37	-20 28 36.0	7.4	2.8	0.20	25	22 29	20 49 33.88	-17 16 51.8	10.0	3.8	0.26
12	1 17 20	41 5.33	19 59 6.2	7.5	2.9	0.20	26	22 29	20 53 2.34	17 14 31.6	9.8	3.7	0.26
13	1 20 20	47 10.02	19 28 32.9	7.7	2.9	0.20	27	22 28	20 56 43.94	17 10 42.2	9.6	3.7	0.25
14	1 22 20	53 2.89	18 57 4.3	7.8	3.0	0.21	28	22 28	21 0 37.60	17 5 24.8	9.5	3.6	0.25
15	1 23 20	58 42.23	18 24 50.0	8.0	3.0	0.21	29	22 28	21 4 42.30	16 58 39.9	9.3	3.5	0.25
16	1 25 21	4 6.07	-17 52 2.0	8.2	3.1	0.22	Mar. 1	22 29	21 8 57.16	-16 50 28.3	9.2	3.5	0.24
17	1 26 21	9 12.27	17 18 54.0	8.4	3.2	0.22	2	22 29	21 13 21.34	16 40 50.8	9.0	3.4	0.24
18	1 27 21	13 58.46	16 45 41.3	8.6	3.3	0.23	3	22 30	21 17 54.09	16 29 48.2	8.9	3.4	0.23
19	1 27 21	18 22.10	16 12 41.7	8.8	3.3	0.23	4	22 30	21 22 34.72	16 17 21.4	8.8	3.3	0.23
20	1 27 21	22 20.41	15 40 15.4	9.1	3.4	0.24	5	22 31	21 27 22.62	16 3 31.0	8.7	3.3	0.23
21	1 27 21	25 50.52	-15 8 43.7	9.3	3.5	0.24	6	22 32	21 32 17.23	-15 48 17.7	8.5	3.2	0.22
22	1 26 21	28 49.48	14 38 30.3	9.6	3.6	0.25	7	22 33	21 37 18.07	15 31 42.2	8.4	3.2	0.22
23	1 24 21	31 14.37	14 10 0.1	9.9	3.8	0.25	8	22 34	21 42 24.66	15 13 45.3	8.3	3.1	0.22
24	1 22 21	33 2.34	13 43 39.0	10.2	3.9	0.26	9	22 36	21 47 36.59	14 54 27.7	8.2	3.1	0.21
25	1 19 21	34 10.89	13 19 52.7	10.5	4.0	0.27	10	22 37	21 52 53.55	14 33 49.8	8.1	3.1	0.21
26	1 16 21	34 37.93	-12 59 5.8	10.9	4.1	0.28	11	22 38	21 58 15.18	-14 11 52.6	8.0	3.0	0.21
27	1 12 21	34 22.03	12 41 41.3	11.2	4.2	0.29	12	22 40	22 3 41.23	13 48 36.5	7.9	3.0	0.21
28	1 7 21	33 22.62	12 27 58.4	11.5	4.4	0.30	13	22 42	22 9 11.42	13 24 2.2	7.8	3.0	0.20
29	1 1 21	31 40.12	12 18 11.7	11.9	4.5	0.31	14	22 43	22 14 45.56	12 58 10.4	7.7	2.9	0.20
30	0 55 21	29 16.17	12 12 30.3	12.2	4.6	0.31	15	22 45	22 20 23.48	12 31 1.8	7.7	2.9	0.20
31	0 48 21	26 13.78	-12 10 56.4	12.5	4.7	0.32	16	22 47	22 26 5.02	-12 2 36.6	7.6	2.9	0.20
Feb. 1	0 40 21	22 37.23	12 13 24.2	12.8	4.9	0.33	17	22 48	22 31 50.06	11 32 55.9	7.5	2.8	0.19
2	0 32 21	18 32.07	12 19 40.7	13.0	4.9	0.34	18	22 50	22 37 38.49	11 2 0.0	7.4	2.8	0.19
3	0 24 21	14 4.94	12 29 26.2	13.2	5.0	0.34	19	22 52	22 43 30.24	10 29 49.7	7.4	2.8	0.19
4	0 15 21	9 23.21	12 42 14.1	13.4	5.1	0.35	20	22 54	22 49 25.28	9 56 25.6	7.3	2.8	0.19
5	0 6 21	4 34.73	-12 57 34.2	13.5	5.1	0.35	21	22 56	22 55 23.58	-9 21 48.3	7.2	2.7	0.19
5	23 58	20 59 47.24	13 14 53.7	13.5	5.1	0.35	22	22 58	23 1 25.11	8 45 58.4	7.2	2.7	0.18
6	23 49	20 55 8.14	13 33 39.0	13.5	5.1	0.35	23	23 0	23 7 29.91	8 8 56.7	7.1	2.7	0.18
7	23 41	20 50 44.05	13 53 18.3	13.5	5.1	0.35	24	23 3	23 13 38.01	7 30 44.0	7.1	2.7	0.18
8	23 33	20 46 40.59	14 13 21.8	13.4	5.1	0.35	25	23 5	23 19 49.46	6 51 20.8	7.0	2.7	0.18
9	23 25	20 43 2.27	-14 33 23.8	13.3	5.0	0.35	26	23 7	23 26 4.32	-6 10 48.3	7.0	2.6	0.18
10	23 18	20 39 52.43	14 53 1.9	13.1	5.0	0.34	27	23 9	23 32 22.69	5 29 7.3	6.9	2.6	0.18
11	23 12	20 37 13.27	15 11 58.4	12.9	4.9	0.34	28	23 12	23 38 44.67	4 46 18.8	6.9	2.6	0.17
12	23 6	20 35 6.02	15 29 58.6	12.7	4.8	0.33	29	23 14	23 45 10.39	4 2 23.8	6.8	2.6	0.17
13	23 0	20 33 31.03	15 46 51.8	12.5	4.8	0.33	30	23 17	23 51 39.95	3 17 23.8	6.8	2.6	0.17
14	22 55	20 32 28.01	-16 2 29.3	12.3	4.7	0.32	31	23 19	23 58 13.54	-2 31 20.1	6.7	2.6	0.17
15	22 51	20 31 56.07	-16 16 45.3	12.1	4.6	0.32	Apr. 1	23 22	0 451.26	-1 44 14.2	6.7	2.5	0.17

FOR TRANSIT AT WASHINGTON.

Date.	Wash. Mean Time.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semidiam.	S. T. of Sem. Pass. Mer.	Date.	Wash. Mean Time.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semidiam.	S. T. of Sem. Pass. Mer.
	h m	h m s	° ' "	"	"	s		h m	h m s	° ' "	"	"	s
Apr. 1	23 22	0 4 51.26	- 1 44 14.2	6.7	2.5	0.17	May 18	1 21	5 5 44.01	+24 41 15.9	12.2	4.6	0.34
2	23 25	0 11 33.31	0 58 8.0	6.7	2.5	0.17	19	1 19	5 7 49.58	24 34 12.7	12.5	4.8	0.35
3	23 28	0 18 19.84	- 0 7 3.6	6.7	2.5	0.17	20	1 17	5 9 34.37	24 25 41.0	12.8	4.9	0.35
4	23 31	0 25 11.04	+ 0 42 56.9	6.6	2.5	0.17	21	1 15	5 10 58.33	24 15 44.7	13.1	5.0	0.36
5	23 34	0 32 7.06	1 33 50.5	6.6	2.5	0.17	22	1 12	5 12 1.48	24 4 27.4	13.4	5.1	0.37
6	23 37	0 39 8.02	+ 2 25 33.8	6.6	2.5	0.17	23	1 9	5 12 43.99	+23 51 53.7	13.7	5.2	0.38
7	23 40	0 46 14.11	3 18 3.6	6.6	2.5	0.17	24	1 5	5 13 6.13	23 38 7.8	14.0	5.3	0.39
8	23 43	0 53 25.44	4 11 15.4	6.6	2.5	0.17	25	1 1	5 13 8.41	23 23 14.3	14.3	5.4	0.39
9	23 46	1 0 42.09	5 5 4.2	6.6	2.5	0.17	26	0 57	5 12 51.40	23 7 18.4	14.5	5.5	0.40
10	23 50	1 8 4.10	5 59 24.7	6.6	2.5	0.17	27	0 52	5 12 15.91	22 50 25.9	14.8	5.6	0.41
11	23 53	1 15 31.49	+ 6 54 10.4	6.6	2.5	0.17	28	0 48	5 11 22.96	+22 32 43.1	15.0	5.7	0.41
12	23 57	1 23 4.17	7 49 14.0	6.6	2.5	0.17	29	0 43	5 10 13.74	22 14 16.9	15.2	5.8	0.42
14	0 1	1 30 41.97	8 44 27.2	6.6	2.5	0.17	30	0 37	5 8 49.70	21 55 15.0	15.4	5.9	0.42
15	0 4	1 38 24.67	9 39 41.3	6.6	2.5	0.17	31	0 32	5 7 12.44	21 35 46.5	15.6	5.9	0.42
16	0 8	1 46 11.98	10 34 46.3	6.7	2.5	0.17	June 1	0 26	5 5 28.75	21 16 0.6	15.7	6.0	0.43
17	0 12	1 54 3.36	+11 29 30.8	6.7	2.5	0.17	2	0 20	5 3 25.62	+20 56 7.6	15.8	6.0	0.43
18	0 16	2 1 58.30	12 23 43.9	6.7	2.6	0.17	3	0 14	5 1 20.14	20 36 18.2	15.9	6.0	0.43
19	0 20	2 9 56.10	13 17 12.9	6.8	2.6	0.18	4	0 8	4 59 9.53	20 16 43.8	16.0	6.1	0.43
20	0 24	2 17 55.94	14 9 45.2	6.8	2.6	0.18	5	0 2	4 56 56.07	19 57 36.2	16.0	6.1	0.43
21	0 28	2 25 56.88	15 1 7.9	6.9	2.6	0.18	5	23 56	4 54 42.10	19 39 7.0	16.0	6.1	0.43
22	0 32	2 33 57.88	+15 51 8.4	7.0	2.7	0.18	6	23 49	4 52 29.88	+19 21 28.0	15.9	6.0	0.43
23	0 36	2 41 57.84	16 39 34.3	7.1	2.7	0.19	7	23 43	4 50 21.67	19 4 50.1	15.9	6.0	0.42
24	0 40	2 49 55.53	17 26 14.1	7.2	2.7	0.19	8	23 37	4 48 19.59	18 49 24.0	15.8	6.0	0.42
25	0 44	2 57 49.77	18 10 57.1	7.3	2.8	0.19	9	23 32	4 46 25.64	18 35 19.2	15.7	5.9	0.42
26	0 48	3 5 39.31	18 53 33.8	7.4	2.8	0.20	10	23 26	4 44 41.68	18 22 44.3	15.5	5.9	0.41
27	0 52	3 13 22.90	+19 33 56.5	7.5	2.9	0.20	11	23 21	4 43 9.41	+18 11 46.5	15.3	5.8	0.41
28	0 56	3 20 59.34	20 11 58.6	7.7	2.9	0.21	12	23 15	4 41 50.30	18 2 31.5	15.1	5.7	0.40
29	0 59	3 28 27.48	20 47 35.2	7.8	3.0	0.21	13	23 10	4 40 45.63	17 55 3.7	14.8	5.6	0.40
30	1 2	3 35 46.24	21 20 42.8	8.0	3.0	0.21	14	23 6	4 39 56.52	17 49 26.1	14.6	5.5	0.39
May 1	1 6	3 42 54.58	21 51 19.6	8.1	3.1	0.22	15	23 1	4 39 23.90	17 45 40.3	14.3	5.4	0.39
2	1 9	3 49 51.52	+22 19 24.8	8.3	3.1	0.22	16	22 57	4 39 8.52	+17 43 46.7	14.1	5.3	0.38
3	1 11	3 56 36.21	22 44 58.9	8.5	3.2	0.23	17	22 53	4 39 10.97	17 43 44.0	13.8	5.2	0.37
4	1 14	4 3 7.80	23 8 3.4	8.7	3.3	0.24	18	22 49	4 39 31.68	17 45 30.4	13.5	5.1	0.36
5	1 16	4 9 25.55	23 28 40.2	8.9	3.4	0.25	19	22 46	4 40 11.00	17 49 2.4	13.2	5.0	0.35
6	1 18	4 15 28.72	23 46 52.6	9.1	3.5	0.26	20	22 43	4 41 9.16	17 54 16.3	12.9	4.9	0.34
7	1 20	4 21 16.68	+24 2 43.8	9.3	3.5	0.26	21	22 40	4 42 26.28	+18 1 7.0	12.6	4.8	0.34
8	1 22	4 26 48.80	24 16 17.6	9.5	3.6	0.27	22	22 38	4 44 2.46	18 9 29.4	12.3	4.7	0.33
9	1 23	4 32 4.49	24 27 37.9	9.8	3.7	0.27	23	22 36	4 45 57.70	18 19 17.2	12.0	4.6	0.32
10	1 24	4 37 3.23	24 36 49.2	10.0	3.8	0.28	24	22 34	4 48 12.01	18 30 24.0	11.8	4.5	0.31
11	1 25	4 41 44.44	24 43 55.4	10.3	3.9	0.28	25	22 33	4 50 45.34	18 42 43.0	11.5	4.4	0.31
12	1 25	4 46 7.65	+24 49 1.1	10.5	4.0	0.29	26	22 32	4 53 37.64	+18 56 6.6	11.2	4.3	0.30
13	1 26	4 50 12.38	24 52 10.4	10.8	4.1	0.30	27	22 31	4 56 48.86	19 10 27.4	10.9	4.1	0.29
14	1 25	4 53 58.17	24 53 27.5	11.1	4.2	0.31	28	22 31	5 0 18.95	19 25 37.2	10.7	4.0	0.29
15	1 25	4 57 24.58	24 52 56.7	11.4	4.3	0.32	29	22 31	5 4 7.85	19 41 27.8	10.4	4.0	0.28
16	1 24	5 0 31.25	24 50 41.9	11.7	4.4	0.32	30	22 31	5 8 15.52	19 57 50.5	10.1	3.9	0.28
17	1 23	5 3 17.81	+24 46 47.0	12.0	4.5	0.33	July 1	22 31	5 12 41.89	+20 14 36.5	9.9	3.8	0.27
18	1 21	5 5 44.01	+24 41 15.9	12.2	4.6	0.34	2	22 32	5 17 26.96	+20 31 36.2	9.7	3.7	0.27

FOR TRANSIT AT WASHINGTON.

Date.	Wash. Mean Time.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semi-diam.	S. T. of Sem. Pass. Mer.	Date.	Wash. Mean Time.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semi-diam.	S. T. of Sem. Pass. Mer.		
	h m	h m s	" " "	" "	" s			h m	h m s	" " "	" "	" s			
July	1	22 31	5 12 41.89	+20 14 36.5	9.9	3.8	0.27	Aug. 17	1 15	10 58 28.62	+ 7 18 21.0	7.0	2.7	0.18	
	2	22 32	5 17 26.96	20 31 36.2	9.7	3.7	0.27		18	1 17	11 4 17.06	6 34 28.8	7.1	2.7	0.18
	3	22 33	5 22 30.66	20 48 40.0	9.4	3.6	0.26		19	1 19	11 9 58.81	5 50 43.9	7.2	2.7	0.18
	4	22 35	5 27 52.92	21 5 38.0	9.2	3.5	0.25		20	1 21	11 15 34.06	5 7 9.2	7.2	2.7	0.18
	5	22 36	5 33 33.67	21 22 19.6	9.0	3.4	0.25		21	1 22	11 21 3.00	4 23 47.3	7.3	2.8	0.18
	6	22 38	5 39 32.79	+21 38 33.8	8.8	3.3	0.24		22	1 24	11 26 25.73	+ 3 40 40.9	7.4	2.8	0.19
	7	22 41	5 45 50.12	21 54 9.4	8.6	3.3	0.24		23	1 25	11 31 42.38	2 57 52.5	7.4	2.8	0.19
	8	22 43	5 52 25.36	22 8 54.9	8.4	3.2	0.23		24	1 26	11 36 53.05	2 15 24.9	7.5	2.8	0.19
	9	22 46	5 59 18.23	22 22 38.2	8.2	3.1	0.23		25	1 27	11 41 57.85	1 33 20.4	7.6	2.9	0.19
	10	22 50	6 6 28.30	22 35 7.3	8.1	3.1	0.22		26	1 28	11 46 56.78	0 51 41.3	7.7	2.9	0.19
	11	22 53	6 13 54.96	+22 46 9.7	7.9	3.0	0.22		27	1 29	11 51 49.87	+ 0 10 30.5	7.7	2.9	0.20
	12	22 57	6 21 37.52	22 55 33.5	7.7	2.9	0.21		28	1 30	11 56 37.15	- 0 30 9.8	7.8	3.0	0.20
	13	23 1	6 29 35.09	23 3 6.7	7.6	2.9	0.21		29	1 31	12 1 18.58	1 10 17.0	7.9	3.0	0.20
	14	23 5	6 37 46.59	23 8 37.9	7.5	2.8	0.21		30	1 31	12 5 54.09	1 49 48.4	8.0	3.0	0.20
	15	23 10	6 46 10.82	23 11 56.6	7.3	2.8	0.20		31	1 32	12 10 23.59	2 28 41.5	8.1	3.1	0.20
	16	23 14	6 54 46.33	+23 12 53.4	7.2	2.7	0.20	Sept. 1	1 32	12 14 46.94	- 3 6 53.1	8.2	3.1	0.21	
	17	23 19	7 3 31.62	23 11 20.4	7.1	2.7	0.20		2	1 33	12 19 4.00	3 44 20.6	8.3	3.2	0.21
	18	23 24	7 12 24.92	23 7 11.0	7.0	2.7	0.19		3	1 33	12 23 14.54	4 21 0.9	8.3	3.2	0.21
	19	23 29	7 21 24.47	23 0 20.8	6.9	2.6	0.19		4	1 33	12 27 18.32	4 56 50.5	8.6	3.3	0.22
	20	23 34	7 30 28.40	22 50 47.2	6.9	2.6	0.19		5	1 33	12 31 15.05	5 31 46.0	8.7	3.3	0.22
	21	23 39	7 39 34.87	+22 38 29.7	6.8	2.6	0.19		6	1 33	12 35 4.39	- 6 5 43.6	8.8	3.3	0.22
	22	23 44	7 48 42.06	22 23 29.7	6.7	2.6	0.18		7	1 33	12 38 45.93	6 38 39.1	8.9	3.4	0.23
	23	23 50	7 57 48.22	22 5 50.6	6.7	2.5	0.18		8	1 32	12 42 19.25	7 10 28.5	9.1	3.4	0.23
	24	23 55	8 6 51.80	21 45 37.1	6.6	2.5	0.18		9	1 32	12 45 43.79	7 41 6.6	9.2	3.5	0.23
	25	23 59	8 15 51.25	21 22 56.0	6.6	2.5	0.18		10	1 31	12 48 59.01	8 10 28.5	9.4	3.6	0.24
	27	0 5	8 24 45.36	+20 57 54.6	6.6	2.5	0.18		11	1 30	12 52 4.24	- 8 38 28.1	9.5	3.6	0.24
	28	0 9	8 33 32.96	20 30 41.6	6.6	2.5	0.18		12	1 29	12 54 58.77	9 4 59.7	9.7	3.7	0.25
	29	0 14	8 42 13.21	20 1 25.4	6.5	2.5	0.18		13	1 28	12 57 41.81	9 29 56.2	9.9	3.7	0.25
	30	0 19	8 50 45.29	19 30 15.9	6.5	2.5	0.18		14	1 27	13 0 12.44	9 53 9.9	10.0	3.8	0.26
	31	0 23	8 59 8.68	18 57 22.1	6.5	2.5	0.18		15	1 25	13 2 29.75	10 14 32.9	10.2	3.9	0.26
Aug.	1	0 28	9 7 22.93	+18 22 53.2	6.5	2.5	0.17		16	1 23	13 4 32.67	-10 33 55.8	10.4	4.0	0.27
	2	0 32	9 15 27.78	17 46 58.6	6.5	2.5	0.17		17	1 21	13 6 20.08	10 51 8.7	10.6	4.0	0.27
	3	0 36	9 23 23.03	17 9 46.9	6.5	2.5	0.17		18	1 18	13 7 50.80	11 6 0.9	10.8	4.1	0.28
	4	0 39	9 31 8.62	16 31 26.4	6.6	2.5	0.17		19	1 16	13 9 3.57	11 18 20.5	11.0	4.2	0.28
	5	0 43	9 38 44.60	15 52 5.1	6.6	2.5	0.17		20	1 13	13 9 57.08	11 27 54.8	11.2	4.3	0.29
	6	0 47	9 46 11.02	+15 11 50.4	6.6	2.5	0.17		21	1 9	13 10 30.06	-11 34 30.2	11.5	4.4	0.30
	7	0 50	9 53 28.03	14 30 49.2	6.6	2.5	0.17		22	1 6	13 10 41.24	11 37 52.7	11.7	4.4	0.30
	8	0 53	10 0 35.78	13 49 8.1	6.7	2.5	0.17		23	1 1	13 10 29.42	11 37 47.6	11.9	4.5	0.31
	9	0 56	10 7 34.52	13 6 52.9	6.7	2.5	0.17		24	0 57	13 9 53.57	11 34 0.5	12.1	4.6	0.31
	10	0 59	10 14 24.46	12 24 9.4	6.7	2.5	0.17		25	0 52	13 8 52.89	11 26 17.4	12.4	4.7	0.32
	11	1 2	10 21 5.86	+11 41 2.6	6.8	2.6	0.17		26	0 47	13 7 26.89	-11 14 26.0	12.6	4.8	0.32
	12	1 4	10 27 38.94	10 57 37.5	6.8	2.6	0.18		27	0 41	13 5 35.55	10 58 16.4	12.8	4.8	0.33
	13	1 7	10 34 3.97	10 13 58.3	6.8	2.6	0.18		28	0 35	13 3 19.42	10 37 42.2	12.9	4.9	0.33
	14	1 9	10 40 21.21	9 30 9.5	6.9	2.6	0.18		29	0 28	13 0 39.68	10 12 42.8	13.1	5.0	0.34
	15	1 11	10 46 30.92	8 46 14.5	6.9	2.6	0.18		30	0 21	12 57 38.40	9 43 24.2	13.2	5.0	0.34
	16	1 13	10 52 33.31	+ 8 2 17.3	7.0	2.7	0.18	Oct. 1	0 14	12 54 18.45	- 9 10 0.5	13.3	5.1	0.34	
	17	1 15	10 58 28.62	+ 7 18 21.0	7.0	2.7	0.18		2	0 6	12 50 43.64	- 8 32 56.1	13.4	5.1	0.34

FOR TRANSIT AT WASHINGTON.

Date.	Wash. Mean Time.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semi diam.	S. T. of Sem. Pass. Mer.	Date.	Wash. Mean Time.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semi diam.	S. T. of Sem. Pass. Mer.
	h m s	h m s	° ' "	"	"	s		h m s	h m s	° ' "	"	"	s
Oct. 1	0 14	12 54 18.45	- 9 10 0.5	13.3	5.1	0.34	Nov. 15	23 28	15 9 24.78	-17 24 42.1	6.2	2.3	0.16
2	0 6	12 50 43.64	8 32 56.1	13.4	5.1	0.34	16	23 30	15 15 46.37	17 56 48.7	6.2	2.3	0.16
2	23 59	12 46 58.56	7 52 45.0	13.4	5.1	0.34	17	23 33	15 22 9.37	18 28 3.4	6.1	2.3	0.16
3	23 51	12 43 8.73	7 10 11.4	13.4	5.1	0.34	18	23 35	15 28 33.79	18 58 24.2	6.1	2.3	0.16
4	23 43	12 39 20.14	6 26 9.0	13.3	5.0	0.34	19	23 38	15 34 59.69	19 27 49.7	6.1	2.3	0.16
5	23 36	12 35 39.14	- 5 41 37.9	13.2	5.0	0.34	20	23 40	15 41 27.14	-19 56 18.1	6.1	2.3	0.16
6	23 28	12 32 12.09	4 57 42.3	13.0	4.9	0.33	21	23 43	15 47 56.14	20 23 48.1	6.1	2.3	0.16
7	23 21	12 29 5.08	4 15 26.7	12.8	4.9	0.33	22	23 45	15 54 26.74	20 50 17.8	6.1	2.3	0.16
8	23 15	12 26 23.61	3 35 52.9	12.5	4.8	0.32	23	23 48	16 0 58.98	21 15 45.9	6.1	2.3	0.16
9	23 9	12 24 12.31	2 59 55.9	12.2	4.6	0.31	24	23 50	16 7 32.88	21 40 11.0	6.1	2.3	0.16
10	23 3	12 22 34.83	- 2 28 21.7	11.9	4.5	0.30	25	23 53	16 14 8.46	-22 33 15.6	6.1	2.3	0.17
11	22 58	12 21 33.74	2 1 45.9	11.6	4.4	0.29	26	23 56	16 20 45.70	22 25 45.9	6.1	2.3	0.17
12	22 54	12 21 10.43	1 40 33.7	11.3	4.3	0.29	27	23 58	16 27 24.65	22 46 52.8	6.1	2.3	0.17
13	22 50	12 21 25.29	1 24 58.6	10.9	4.1	0.28	29	0 1	16 34 5.29	23 6 50.9	6.1	2.3	0.17
14	22 47	12 22 17.77	1 15 4.8	10.6	4.0	0.27	30	0 4	16 40 47.60	23 25 38.9	6.1	2.3	0.17
15	22 45	12 23 46.53	- 1 10 47.6	10.3	3.9	0.26	Dec. 1	0 7	16 47 31.54	-23 43 15.1	6.1	2.3	0.17
16	22 43	12 25 49.60	1 11 55.3	9.9	3.8	0.25	2	0 10	16 54 17.10	23 59 38.1	6.1	2.3	0.17
17	22 41	12 28 24.58	1 18 10.5	9.6	3.7	0.25	3	0 12	17 1 4.20	24 14 46.6	6.1	2.3	0.17
18	22 40	12 31 28.80	1 29 12.3	9.4	3.6	0.24	4	0 15	17 7 52.81	24 28 39.2	6.2	2.3	0.17
19	22 40	12 34 59.42	1 44 36.6	9.1	3.5	0.23	5	0 18	17 14 42.84	24 41 14.6	6.2	2.3	0.17
20	22 40	12 38 53.59	- 2 3 58.4	8.8	3.4	0.22	6	0 21	17 21 34.19	-24 52 31.3	6.2	2.4	0.17
21	22 40	12 43 8.57	2 26 52.2	8.6	3.3	0.22	7	0 24	17 28 26.78	25 2 27.6	6.2	2.4	0.17
22	22 41	12 47 41.71	2 52 52.6	8.4	3.2	0.21	8	0 27	17 35 20.45	25 11 2.6	6.3	2.4	0.17
23	22 42	12 52 30.57	3 21 35.1	8.2	3.1	0.21	9	0 30	17 42 15.08	25 18 14.8	6.3	2.4	0.18
24	22 43	12 57 32.95	3 52 36.8	8.0	3.0	0.20	10	0 33	17 49 10.47	25 24 2.9	6.3	2.4	0.18
25	22 44	13 2 46.87	- 4 25 36.3	7.8	3.0	0.20	11	0 36	17 56 6.46	-25 28 25.6	6.4	2.4	0.18
26	22 46	13 8 10.55	5 0 13.9	7.7	2.9	0.19	12	0 39	18 3 2.80	25 31 21.8	6.4	2.4	0.18
27	22 47	13 13 42.49	5 36 11.9	7.5	2.9	0.19	13	0 42	18 9 59.27	25 32 50.2	6.5	2.5	0.18
28	22 49	13 19 21.41	6 13 14.0	7.4	2.8	0.19	14	0 45	18 16 55.58	25 32 49.9	6.5	2.5	0.18
29	22 51	13 25 6.13	6 51 5.7	7.2	2.8	0.19	15	0 48	18 23 51.40	25 31 20.0	6.6	2.5	0.18
30	22 53	13 30 55.76	- 7 29 34.5	7.1	2.7	0.18	16	0 51	18 30 46.38	-25 28 19.4	6.6	2.5	0.19
31	22 54	13 36 49.47	8 8 28.7	7.0	2.7	0.18	17	0 54	18 37 40.13	25 23 47.8	6.7	2.5	0.19
Nov. 1	22 56	13 42 46.66	8 47 38.6	6.9	2.6	0.18	18	0 57	18 44 32.17	25 17 44.6	6.8	2.6	0.19
2	22 59	13 48 46.77	9 26 55.1	6.8	2.6	0.18	19	0 59	18 51 22.02	25 10 9.7	6.8	2.6	0.19
3	23 1	13 54 49.38	10 6 10.5	6.8	2.6	0.17	20	1 2	18 58 9.10	25 1 3.0	6.9	2.6	0.19
4	23 3	14 0 54.12	-10 45 17.8	6.7	2.5	0.17	21	1 5	19 4 52.74	-24 50 24.9	7.0	2.7	0.20
5	23 5	14 7 0.74	11 24 11.1	6.6	2.5	0.17	22	1 8	19 11 32.25	24 38 16.1	7.1	2.7	0.20
6	23 7	14 13 9.06	12 2 45.1	6.5	2.5	0.17	23	1 10	19 18 6.76	24 24 38.1	7.2	2.7	0.20
7	23 9	14 19 18.89	12 40 54.9	6.5	2.5	0.17	24	1 13	19 24 35.39	24 9 32.3	7.3	2.8	0.20
8	23 12	14 25 30.13	13 18 36.4	6.4	2.4	0.17	25	1 15	19 30 57.04	23 53 1.3	7.4	2.8	0.21
9	23 14	14 31 42.69	-13 55 45.9	6.4	2.4	0.17	26	1 18	19 37 10.55	-23 35 8.3	7.6	2.9	0.21
10	23 16	14 37 56.54	14 32 20.0	6.3	2.4	0.17	27	1 20	19 43 14.56	23 15 57.2	7.7	2.9	0.21
11	23 18	14 44 11.65	15 8 15.5	6.3	2.4	0.16	28	1 22	19 49 7.55	22 55 33.1	7.9	3.0	0.22
12	23 21	14 50 28.01	15 43 29.9	6.3	2.4	0.16	29	1 23	19 54 47.84	22 34 2.1	8.0	3.0	0.22
13	23 23	14 56 45.64	16 18 0.7	6.2	2.4	0.16	30	1 25	20 0 13.47	22 11 31.7	8.2	3.1	0.22
14	23 25	15 3 4.55	-16 51 45.4	6.2	2.4	0.16	31	1 26	20 5 22.35	-21 48 10.6	8.4	3.2	0.23
15	23 28	15 9 24.78	-17 24 42.1	6.2	2.3	0.16	32	1 27	20 10 12.08	-21 24 9.6	8.6	3.3	0.23

FOR TRANSIT AT WASHINGTON.

Date.	Wash. Mean Time.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semidiam. S. T. of Sem. Pass. Mer.	Date.	Wash. Mean Time.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semidiam. S. T. of Sem. Pass. Mer.
	h m	h m s	" "	" "	s		h m	h m s	" "	" "	s
Jan. 1	2 1	20 41 3.47	-20 5 9.3	6.1	5.9 0.42	Feb. 15	2 33	0 10 39.19	+ 0 27 41.4	7.3	7.1 0.47
2	2 2	20 46 9.85	19 45 59.8	6.1	5.9 0.42	16	2 33	0 14 59.45	0 59 14.3	7.3	7.1 0.48
3	2 3	20 51 14.87	19 26 16.7	6.1	6.0 0.42	17	2 33	0 19 19.41	1 30 46.3	7.4	7.2 0.48
4	2 4	20 56 18.51	19 6 0.6	6.2	6.0 0.42	18	2 34	0 23 39.10	2 2 16.6	7.4	7.2 0.48
5	2 5	21 1 20.76	18 45 12.4	6.2	6.0 0.42	19	2 34	0 27 58.56	2 33 44.5	7.5	7.2 0.48
6	2 6	21 6 21.61	-18 23 52.8	6.2	6.0 0.42	20	2 35	0 32 17.83	+ 3 5 9.4	7.5	7.3 0.49
7	2 7	21 11 21.06	18 2 2.6	6.2	6.0 0.42	21	2 35	0 36 36.94	3 36 30.5	7.5	7.3 0.49
8	2 8	21 16 19.10	17 39 42.5	6.2	6.1 0.42	22	2 35	0 40 55.94	4 7 47.2	7.6	7.4 0.49
9	2 9	21 21 15.73	17 16 53.3	6.3	6.1 0.42	23	2 36	0 45 14.86	4 38 58.7	7.6	7.4 0.50
10	2 10	21 26 10.96	16 53 35.9	6.3	6.1 0.43	24	2 36	0 49 33.73	5 10 4.4	7.7	7.4 0.50
11	2 11	21 31 4.80	-16 29 51.1	6.3	6.1 0.43	25	2 36	0 53 52.59	+ 5 41 3.6	7.7	7.5 0.50
12	2 12	21 35 57.24	16 5 39.6	6.3	6.1 0.43	26	2 37	0 58 11.47	6 11 55.7	7.8	7.5 0.51
13	2 13	21 40 48.29	15 41 2.4	6.3	6.2 0.43	27	2 37	1 2 30.41	6 42 39.9	7.8	7.6 0.51
14	2 14	21 45 37.96	15 16 0.1	6.4	6.2 0.43	28	2 38	1 6 49.45	7 13 15.4	7.8	7.6 0.51
15	2 15	21 50 26.28	14 50 33.5	6.4	6.2 0.43	29	2 38	1 11 8.62	7 43 41.8	7.9	7.7 0.52
16	2 16	21 55 13.25	-14 24 43.5	6.4	6.2 0.43	Mar. 1	2 38	1 15 27.96	+ 8 13 58.3	7.9	7.7 0.52
17	2 16	21 59 58.91	13 58 30.9	6.4	6.2 0.43	2	2 39	1 19 47.47	8 44 4.1	8.0	7.8 0.52
18	2 17	22 4 43.26	13 31 56.4	6.5	6.3 0.43	3	2 39	1 24 7.18	9 13 58.5	8.0	7.8 0.53
19	2 18	22 9 26.33	13 5 0.8	6.5	6.3 0.43	4	2 39	1 28 27.12	9 43 40.7	8.1	7.9 0.53
20	2 19	22 14 8.15	12 37 45.0	6.5	6.3 0.43	5	2 40	1 32 47.32	10 13 10.1	8.1	7.9 0.54
21	2 19	22 18 48.75	-12 10 9.6	6.6	6.4 0.43	6	2 40	1 37 7.79	+10 42 26.1	8.2	8.0 0.54
22	2 20	22 23 28.15	11 42 15.6	6.6	6.4 0.43	7	2 41	1 41 28.54	11 11 27.9	8.2	8.0 0.54
23	2 21	22 28 6.37	11 14 3.5	6.6	6.4 0.43	8	2 41	1 45 49.61	11 40 14.8	8.3	8.1 0.55
24	2 22	22 32 43.45	10 45 34.2	6.6	6.4 0.44	9	2 41	1 50 11.01	12 8 46.1	8.3	8.1 0.55
25	2 22	22 37 19.42	10 16 48.5	6.6	6.5 0.44	10	2 42	1 54 32.75	12 37 1.0	8.4	8.2 0.56
26	2 23	22 41 54.32	-9 47 47.2	6.7	6.5 0.44	11	2 42	1 58 54.84	+13 4 58.9	8.5	8.2 0.56
27	2 23	22 46 28.17	9 18 31.1	6.7	6.5 0.44	12	2 43	2 3 17.30	13 32 39.3	8.5	8.3 0.57
28	2 24	22 51 1.02	8 49 0.8	6.7	6.5 0.44	13	2 43	2 7 40.15	14 0 1.3	8.6	8.3 0.57
29	2 25	22 55 32.90	8 19 17.1	6.8	6.6 0.44	14	2 44	2 12 3.38	14 27 4.2	8.6	8.4 0.58
30	2 25	23 0 3.83	7 49 20.9	6.8	6.6 0.44	15	2 44	2 16 27.00	14 53 47.5	8.7	8.4 0.58
31	2 26	23 4 33.86	-7 19 12.9	6.8	6.6 0.45	16	2 45	2 20 51.03	+15 20 10.6	8.7	8.5 0.59
Feb. 1	2 26	23 9 3.02	6 48 53.8	6.9	6.6 0.45	17	2 45	2 25 15.46	15 46 12.8	8.8	8.5 0.59
2	2 27	23 13 31.35	6 18 24.4	6.9	6.7 0.45	18	2 46	2 29 40.30	16 11 53.3	8.9	8.6 0.60
3	2 27	23 17 58.87	5 47 45.5	6.9	6.7 0.45	19	2 46	2 34 5.56	16 37 11.6	8.9	8.7 0.60
4	2 28	23 22 25.63	5 16 58.0	6.9	6.7 0.45	20	2 46	2 38 31.24	17 2 7.1	9.0	8.7 0.61
5	2 28	23 26 51.66	-4 46 2.6	7.0	6.8 0.45	21	2 47	2 42 57.33	+17 26 39.2	9.1	8.8 0.62
6	2 29	23 31 16.98	4 14 59.9	7.0	6.8 0.46	22	2 47	2 47 23.84	17 50 47.3	9.1	8.9 0.62
7	2 29	23 35 41.64	3 43 50.8	7.0	6.8 0.46	23	2 48	2 51 50.75	18 14 30.8	9.2	8.9 0.63
8	2 30	23 40 5.68	3 12 36.1	7.1	6.9 0.46	24	2 48	2 56 18.07	18 37 49.1	9.3	9.0 0.63
9	2 30	23 44 29.12	2 41 16.5	7.1	6.9 0.46	25	2 49	3 0 45.79	19 0 41.8	9.4	9.1 0.64
10	2 31	23 48 51.99	-2 9 52.8	7.1	6.9 0.46	26	2 49	3 5 13.90	+19 23 8.2	9.4	9.2 0.65
11	2 31	23 53 14.33	1 38 25.8	7.2	7.0 0.46	27	2 50	3 9 42.38	19 45 7.7	9.5	9.2 0.65
12	2 31	23 57 36.18	1 6 56.2	7.2	7.0 0.47	28	2 51	3 14 11.22	20 6 39.8	9.6	9.3 0.66
13	2 32	0 1 57.59	0 35 24.6	7.2	7.0 0.47	29	2 51	3 18 40.39	20 27 43.9	9.7	9.4 0.67
14	2 32	0 6 18.58	-0 3 51.8	7.3	7.1 0.47	30	2 52	3 23 9.87	20 48 19.5	9.7	9.5 0.68
15	2 33	0 10 39.19	+ 0 27 41.4	7.3	7.1 0.47	31	2 52	3 27 39.63	+21 8 26.2	9.8	9.5 0.68
16	2 33	0 14 59.45	+ 0 59 14.3	7.3	7.1 0.48	Apr. 1	2 53	3 32 9.63	+21 28 3.3	9.9	9.6 0.69

FOR TRANSIT AT WASHINGTON.

Date.	Wash. Mean Time.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semidiam. S. T. of Sem. Past. Mer.	Date.	Wash. Mean Time.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semidiam. S. T. of Sem. Past. Mer.			
	h m	h m s	° ' "	"	" s		h m	h m s	° ' "	"	" s			
Apr.	1	2 53	3 32 9.63	+21 28 3.3	9.9	9.6	0.69	May 16	3 3	6 39 18.22	+26 41 57.0	16.4	15.9	1.19
	2	2 53	3 36 39.84	21 47 10.4	10.0	9.7	0.70	17	3 2	6 42 27.99	26 37 4.5	16.7	16.2	1.21
	3	2 54	3 41 10.22	22 5 47.0	10.1	9.8	0.71	18	3 1	6 45 32.84	26 31 48.8	16.9	16.4	1.22
	4	2 54	3 45 40.72	22 23 52.6	10.2	9.9	0.71	19	3 0	6 48 32.61	26 26 10.8	17.2	16.7	1.24
	5	2 55	3 50 11.30	22 41 26.8	10.3	10.0	0.72	20	2 59	6 51 27.11	26 20 11.5	17.4	16.9	1.26
	6	2 56	3 54 41.90	+22 58 29.3	10.3	10.0	0.73	21	2 58	6 54 16.16	+26 13 51.6	17.7	17.2	1.28
	7	2 56	3 59 12.46	23 14 59.5	10.4	10.1	0.74	22	2 57	6 56 59.57	26 7 11.8	18.0	17.4	1.30
	8	2 57	4 3 42.92	23 30 57.1	10.5	10.2	0.75	23	2 55	6 59 37.14	26 0 13.0	18.2	17.7	1.32
	9	2 57	4 8 13.23	23 46 21.8	10.6	10.3	0.75	24	2 54	7 2 8.68	25 52 56.0	18.5	18.0	1.33
	10	2 58	4 12 43.30	24 1 13.3	10.7	10.4	0.76	25	2 52	7 4 33.96	25 45 21.8	18.8	18.2	1.35
	11	2 58	4 17 13.08	+24 15 31.2	10.8	10.5	0.77	26	2 51	7 6 52.78	+25 37 31.1	19.1	18.5	1.37
	12	2 59	4 21 42.50	24 29 15.2	10.9	10.6	0.78	27	2 49	7 9 4.94	25 29 24.9	19.4	18.8	1.39
	13	2 59	4 26 11.48	24 42 25.2	11.1	10.7	0.79	28	2 47	7 11 10.21	25 21 4.1	19.7	19.2	1.42
	14	3 0	4 30 39.94	24 55 0.9	11.2	10.8	0.80	29	2 45	7 13 8.35	25 12 29.5	20.0	19.5	1.44
	15	3 0	4 35 7.80	25 7 2.1	11.3	10.9	0.81	30	2 43	7 14 59.12	25 3 42.0	20.4	19.8	1.46
	16	3 1	4 39 34.98	+25 18 28.8	11.4	11.1	0.82	31	2 41	7 16 42.28	+24 54 42.5	20.7	20.1	1.48
	17	3 1	4 44 1.39	25 29 20.7	11.5	11.2	0.83	June 1	2 39	7 18 17.58	24 45 31.9	21.0	20.4	1.50
	18	3 2	4 48 26.96	25 39 37.8	11.6	11.3	0.84	2	2 36	7 19 44.77	24 36 11.0	21.4	20.7	1.53
	19	3 2	4 52 51.59	25 49 20.0	11.7	11.4	0.84	3	2 33	7 21 3.62	24 26 40.7	21.7	21.1	1.55
	20	3 3	4 57 15.20	25 58 27.3	11.9	11.5	0.85	4	2 31	7 22 13.89	24 17 1.9	22.1	21.4	1.58
	21	3 3	5 1 37.69	+26 6 59.8	12.0	11.6	0.86	5	2 28	7 23 15.34	+24 7 15.3	22.4	21.8	1.60
	22	3 4	5 5 58.96	26 14 57.4	12.1	11.8	0.87	6	2 25	7 24 7.72	23 57 21.6	22.8	22.1	1.62
	23	3 4	5 10 18.93	26 22 20.1	12.2	11.9	0.88	7	2 21	7 24 50.79	23 47 21.6	23.2	22.5	1.65
	24	3 5	5 14 37.49	26 29 8.0	12.4	12.0	0.89	8	2 18	7 25 24.34	23 37 16.1	23.5	22.9	1.67
	25	3 5	5 18 54.54	26 35 21.3	12.5	12.2	0.91	9	2 14	7 25 48.16	23 27 5.7	23.9	23.2	1.69
	26	3 5	5 23 9.96	+26 41 0.1	12.7	12.3	0.92	10	2 11	7 26 2.06	+23 16 50.9	24.3	23.6	1.72
	27	3 5	5 27 23.66	26 46 4.6	12.8	12.4	0.93	11	2 7	7 26 5.89	23 6 32.3	24.7	24.0	1.74
	28	3 6	5 31 35.53	26 50 35.1	13.0	12.6	0.94	12	2 3	7 25 59.49	22 56 10.5	25.1	24.3	1.77
	29	3 6	5 35 45.44	26 54 31.7	13.1	12.7	0.95	13	1 59	7 25 42.77	22 45 46.1	25.4	24.7	1.79
	30	3 6	5 39 53.26	26 57 54.7	13.3	12.9	0.96	14	1 54	7 25 15.65	22 35 19.3	25.8	25.1	1.82
May	1	3 6	5 43 58.86	+27 0 44.5	13.4	13.1	0.98	15	1 50	7 24 38.10	+22 24 50.5	26.2	25.4	1.84
	2	3 6	5 48 2.11	27 3 1.3	13.6	13.2	0.99	16	1 45	7 23 50.15	22 14 20.1	26.5	25.8	1.86
	3	3 6	5 52 2.87	27 4 45.5	13.8	13.4	1.00	17	1 40	7 22 51.89	22 3 48.3	26.9	26.1	1.88
	4	3 6	5 56 0.99	27 5 57.7	14.0	13.6	1.01	18	1 35	7 21 43.44	21 53 15.3	27.3	26.5	1.90
	5	3 6	5 59 56.35	27 6 38.2	14.1	13.7	1.03	19	1 30	7 20 24.99	21 42 41.4	27.6	26.8	1.93
	6	3 6	6 3 48.81	+27 6 47.6	14.3	13.9	1.04	20	1 24	7 18 56.81	+21 32 6.9	27.9	27.1	1.95
	7	3 6	6 7 38.20	27 6 26.3	14.5	14.1	1.05	21	1 19	7 17 19.20	21 21 32.1	28.2	27.4	1.97
	8	3 6	6 11 24.35	27 5 34.9	14.7	14.3	1.07	22	1 13	7 15 32.55	21 10 57.4	28.5	27.6	1.99
	9	3 6	6 15 7.13	27 4 14.0	14.9	14.5	1.08	23	1 7	7 13 37.33	21 0 23.2	28.8	28.0	2.01
	10	3 6	6 18 46.38	27 2 24.3	15.1	14.7	1.10	24	1 1	7 11 34.06	20 49 50.1	29.1	28.3	2.02
	11	3 5	6 22 21.93	+27 0 6.3	15.3	14.9	1.11	25	0 55	7 9 23.32	+20 39 18.6	29.3	28.5	2.03
	12	3 5	6 25 53.60	26 57 20.7	15.5	15.1	1.13	26	0 49	7 7 5.77	20 28 49.6	29.6	28.7	2.05
	13	3 4	6 29 21.23	26 54 8.2	15.7	15.3	1.14	27	0 43	7 4 42.15	20 18 23.9	29.8	28.9	2.06
	14	3 4	6 32 44.65	26 50 29.6	16.0	15.5	1.16	28	0 36	7 2 13.25	20 8 2.6	30.0	29.1	2.07
	15	3 3	6 36 3.71	26 46 25.6	16.2	15.7	1.17	29	0 30	6 59 39.91	19 57 46.8	30.1	29.2	2.07
	16	3 3	6 39 18.22	+26 41 57.0	16.4	15.9	1.19	30	0 23	6 57 3.03	+19 47 37.8	30.2	29.3	2.08
	17	3 2	6 42 27.99	+26 37 4.5	16.7	16.2	1.21	July 1	0 17	6 54 23.54	+19 37 37.2	30.3	29.4	2.08

FOR TRANSIT AT WASHINGTON.

Date.	Wash. Mean Time.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semidiam.	S. T. of Sem. Pass. Mer.	Date.	Wash. Mean Time.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semidiam.	S. T. of Sem. Pass. Mer.
July 1	h m	h m s	" "	" "	" "	" "	Aug. 16	h m	h m s	" "	" "	" "	" "
2	0 17	6 54 23.54	+19 37 37.2	30.3	29.4	2.08	21	7 6 49 16.62	+18 6 28.6	17.4	16.9	1.19	
3	0 10	6 51 42.39	19 27 46.5	30.3	29.5	2.08	17	21 6 6 52 5.42	18 8 10.8	17.1	16.6	1.17	
3	0 3	6 49 0.57	19 18 7.3	30.4	29.5	2.08	18	21 5 6 54 58.84	18 9 40.4	16.9	16.4	1.15	
3	23 57	6 46 19.08	19 8 41.4	30.3	29.5	2.08	19	21 4 6 57 56.69	18 10 56.4	16.7	16.2	1.14	
4	23 50	6 43 38.89	18 59 30.8	30.3	29.4	2.08	20	21 3 7 0 58.80	18 11 57.9	16.4	15.9	1.12	
5	23 44	6 41 0.97	+18 50 37.3	30.2	29.3	2.07	21	21 2 7 4 5.01	+18 12 43.9	16.2	15.7	1.11	
6	23 37	6 38 26.26	18 42 2.7	30.1	29.2	2.06	22	21 1 7 7 15.15	18 13 13.3	16.0	15.5	1.09	
7	23 31	6 35 55.65	18 33 48.6	30.0	29.1	2.05	23	21 0 7 10 29.07	18 13 25.0	15.8	15.3	1.08	
8	23 24	6 33 30.01	18 25 56.8	29.8	28.9	2.04	24	21 0 7 13 46.62	18 13 18.3	15.6	15.1	1.06	
9	23 18	6 31 10.13	18 18 29.0	29.6	28.7	2.02	25	20 59 7 17 7.64	18 12 52.4	15.4	14.9	1.06	
10	23 12	6 28 56.77	+18 11 26.8	29.4	28.5	2.00	26	20 59 7 20 31.99	+18 12 6.6	15.1	14.7	1.03	
11	23 6	6 26 50.61	18 4 51.5	29.1	28.3	1.98	27	20 58 7 23 59.54	18 11 0.1	14.9	14.5	1.02	
12	23 0	6 24 52.24	17 58 44.0	28.9	28.0	1.96	28	20 58 7 27 30.14	18 9 32.2	14.7	14.3	1.01	
12	22 54	6 23 2.19	17 53 5.0	28.6	27.7	1.94	29	20 57 7 31 3.66	18 7 42.2	14.6	14.2	1.00	
14	22 49	6 21 20.93	17 47 55.3	28.3	27.5	1.92	30	20 57 7 34 39.98	18 5 29.4	14.4	14.0	0.98	
15	22 43	6 19 48.86	+17 43 15.3	28.0	27.2	1.90	31	20 57 7 38 18.97	+18 2 53.3	14.2	13.8	0.97	
16	22 38	6 18 26.29	17 39 5.3	27.7	26.9	1.88	Sept. 1	20 56 7 42 0.53	17 59 53.3	14.0	13.6	0.96	
17	22 33	6 17 13.46	17 35 25.2	27.3	26.5	1.86	2	20 56 7 45 44.54	17 56 29.0	13.9	13.5	0.95	
18	22 28	6 16 10.53	17 32 14.7	27.0	26.2	1.84	3	20 56 7 49 30.88	17 52 39.8	13.7	13.3	0.93	
19	22 23	6 15 17.61	17 29 33.3	26.6	25.9	1.81	4	20 56 7 53 19.46	17 48 25.2	13.6	13.2	0.92	
20	22 18	6 14 34.74	+17 27 20.4	26.2	25.5	1.78	5	20 56 7 57 10.17	+17 43 44.8	13.4	13.0	0.91	
21	22 14	6 14 1.92	17 25 35.1	25.9	25.1	1.76	6	20 56 8 1 2.92	17 38 38.2	13.2	12.8	0.90	
22	22 9	6 13 39.11	17 24 16.6	25.5	24.8	1.73	7	20 56 8 4 57.62	17 33 5.0	13.1	12.7	0.88	
23	22 5	6 13 26.20	17 23 23.7	25.1	24.4	1.71	8	20 56 8 8 54.18	17 27 4.8	12.9	12.6	0.88	
24	22 1	6 13 23.08	17 22 55.3	24.8	24.0	1.68	9	20 56 8 12 52.52	17 20 37.3	12.8	12.4	0.87	
25	21 58	6 13 29.58	+17 22 50.0	24.4	23.7	1.66	10	20 56 8 16 52.55	+17 13 42.2	12.6	12.3	0.86	
26	21 54	6 13 45.54	17 23 6.5	24.0	23.3	1.63	11	20 56 8 20 54.19	17 6 19.3	12.5	12.1	0.85	
27	21 50	6 14 10.78	17 23 43.3	23.6	23.0	1.61	12	20 56 8 24 57.34	16 58 28.4	12.4	12.0	0.84	
28	21 47	6 14 45.08	17 24 38.8	23.3	22.6	1.58	13	20 56 8 29 1.94	16 50 9.3	12.2	11.9	0.83	
29	21 44	6 15 28.22	17 25 51.6	22.9	22.3	1.56	14	20 56 8 33 7.91	16 41 21.9	12.1	11.8	0.82	
30	21 41	6 16 19.97	+17 27 20.0	22.6	21.9	1.53	15	20 56 8 37 15.16	+16 32 6.1	12.0	11.6	0.81	
31	21 38	6 17 20.10	17 29 2.5	22.2	21.6	1.51	16	20 57 8 41 23.63	16 22 21.8	11.9	11.5	0.80	
Aug. 1	21 35	6 18 28.37	17 30 57.3	21.9	21.2	1.49	17	20 57 8 45 33.22	16 12 9.0	11.7	11.4	0.79	
2	21 32	6 19 44.55	17 33 2.8	21.5	20.9	1.46	18	20 57 8 49 43.87	16 1 27.7	11.6	11.3	0.78	
3	21 30	6 21 8.40	17 35 17.4	21.2	20.6	1.44	19	20 57 8 53 55.51	15 50 18.0	11.5	11.2	0.77	
4	21 27	6 22 39.69	+17 37 39.6	20.9	20.3	1.42	20	20 58 8 58 8.07	+15 38 40.0	11.4	11.1	0.77	
5	21 25	6 24 18.20	17 40 7.8	20.5	19.9	1.40	21	20 58 9 2 21.49	15 26 33.8	11.3	11.0	0.76	
6	21 23	6 26 3.69	17 42 40.3	20.2	19.6	1.37	22	20 58 9 6 35.70	15 13 59.4	11.2	10.9	0.75	
7	21 21	6 27 55.94	17 45 15.5	19.9	19.3	1.35	23	20 59 9 10 50.65	15 0 57.2	11.1	10.8	0.74	
8	21 19	6 29 54.74	17 47 52.0	19.6	19.0	1.33	24	20 59 9 15 6.26	14 47 27.3	11.0	10.7	0.73	
9	21 17	6 31 59.87	+17 50 28.1	19.3	18.7	1.31	25	20 59 9 19 22.49	+14 33 29.9	10.9	10.6	0.73	
10	21 15	6 34 11.14	17 53 2.3	19.0	18.5	1.29	26	21 0 9 23 39.29	14 19 5.2	10.8	10.5	0.72	
11	21 14	6 36 28.35	17 55 33.1	18.7	18.2	1.27	27	21 0 9 27 56.61	14 4 13.5	10.7	10.4	0.71	
12	21 12	6 38 51.30	17 57 59.2	18.4	17.9	1.26	28	21 0 9 32 14.40	13 48 55.1	10.6	10.3	0.70	
13	21 11	6 41 19.78	18 0 19.2	18.2	17.6	1.24	29	21 1 9 36 32.61	13 33 10.3	10.5	10.2	0.70	
14	21 9	6 43 53.62	+18 2 31.6	17.9	17.4	1.22	30	21 1 9 40 51.21	+13 16 59.4	10.4	10.1	0.69	
15	21 8	6 46 32.63	+18 4 35.1	17.6	17.1	1.20	Oct. 1	21 1 9 45 10.17	+13 0 22.7	10.3	10.0	0.68	

FOR TRANSIT AT WASHINGTON.

Date.	Wash. Mean Time.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semidiam. S. T. of Sem. Pass. Mer.	Date.	Wash. Mean Time.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semidiam. S. T. of Sem. Pass. Mer.
	h m	h m s	° ' "	"	" s		h m	h m s	° ' "	"	" s
Oct. 1	21 1	9 45 10.17	+13 02 27.7	10.3	10.0 0.68	Nov. 16	21 22	13 7 5.08	- 5 6 35.7	7.5	7.3 0.49
2	21 2	9 49 29.45	12 43 20.5	10.2	9.9 0.68	17	21 22	13 11 35.88	5 33 21.3	7.4	7.2 0.48
3	21 2	9 53 49.01	12 25 53.2	10.1	9.8 0.67	18	21 23	13 16 7.34	6 0 3.7	7.4	7.2 0.48
4	21 2	9 58 8.84	12 8 1.2	10.0	9.7 0.66	19	21 24	13 20 39.50	6 26 42.0	7.4	7.2 0.48
5	21 3	10 2 28.90	11 49 44.8	9.9	9.7 0.66	20	21 24	13 25 12.37	6 53 15.5	7.3	7.1 0.48
6	21 3	10 6 49.19	+11 31 4.4	9.9	9.6 0.65	21	21 25	13 29 45.98	- 7 19 43.4	7.3	7.1 0.48
7	21 4	10 11 9.67	11 12 0.4	9.8	9.5 0.65	22	21 25	13 34 20.35	7 46 5.0	7.3	7.1 0.48
8	21 4	10 15 30.34	10 52 33.3	9.7	9.4 0.64	23	21 26	13 38 55.51	8 12 19.4	7.2	7.0 0.47
9	21 4	10 19 51.18	10 32 43.4	9.6	9.3 0.63	24	21 27	13 43 31.48	8 38 25.8	7.2	7.0 0.47
10	21 5	10 24 12.18	10 12 31.2	9.5	9.3 0.63	25	21 27	13 48 8.29	9 4 23.5	7.1	6.9 0.47
11	21 5	10 28 33.32	+ 9 51 57.1	9.5	9.2 0.62	26	21 28	13 52 45.95	- 9 30 11.5	7.1	6.9 0.47
12	21 6	10 32 54.60	9 31 1.7	9.4	9.1 0.62	27	21 29	13 57 24.50	9 55 49.1	7.1	6.9 0.47
13	21 6	10 37 16.02	9 9 45.5	9.3	9.1 0.61	28	21 29	14 2 3.96	10 21 15.6	7.1	6.9 0.46
14	21 6	10 41 37.56	8 48 9.0	9.2	9.0 0.61	29	21 30	14 6 44.35	10 46 30.3	7.0	6.8 0.46
15	21 7	10 45 59.20	8 26 12.8	9.2	8.9 0.60	30	21 31	14 11 25.69	11 11 32.3	7.0	6.8 0.46
16	21 7	10 50 20.94	+ 8 3 57.3	9.1	8.8 0.60	Dec. 1	21 32	14 16 8.02	-11 36 20.8	7.0	6.8 0.46
17	21 8	10 54 42.79	7 41 23.3	9.0	8.8 0.59	2	21 32	14 20 51.35	12 0 55.0	6.9	6.7 0.46
18	21 8	10 59 4.74	7 18 31.3	9.0	8.7 0.59	3	21 33	14 25 35.71	12 25 14.2	6.9	6.7 0.46
19	21 9	11 3 26.79	6 55 21.9	8.9	8.7 0.58	4	21 34	14 30 21.12	12 49 17.5	6.9	6.7 0.46
20	21 9	11 7 48.94	6 31 55.7	8.9	8.6 0.58	5	21 35	14 35 7.59	13 13 4.2	6.8	6.6 0.45
21	21 9	11 12 11.18	+ 6 8 13.4	8.8	8.5 0.57	6	21 36	14 39 55.16	-13 36 33.5	6.8	6.6 0.45
22	21 10	11 16 33.53	5 44 15.5	8.7	8.5 0.57	7	21 37	14 44 43.85	13 59 44.7	6.8	6.6 0.45
23	21 10	11 20 55.98	5 20 2.8	8.7	8.4 0.56	8	21 37	14 49 33.67	14 22 36.8	6.7	6.5 0.45
24	21 11	11 25 18.54	4 55 35.8	8.6	8.4 0.56	9	21 38	14 54 24.65	14 45 9.1	6.7	6.5 0.45
25	21 11	11 29 41.23	4 30 55.2	8.6	8.3 0.56	10	21 39	14 59 16.79	15 7 20.8	6.7	6.5 0.45
26	21 12	11 34 4.04	+ 4 6 1.7	8.5	8.2 0.55	11	21 40	15 4 10.10	-15 29 11.1	6.6	6.5 0.45
27	21 12	11 38 26.99	3 40 56.0	8.4	8.2 0.55	12	21 41	15 9 4.60	15 50 39.2	6.6	6.4 0.45
28	21 12	11 42 50.09	3 15 38.7	8.4	8.1 0.54	13	21 42	15 14 0.29	16 11 44.3	6.6	6.4 0.44
29	21 13	11 47 13.35	2 50 10.5	8.3	8.1 0.54	14	21 43	15 18 57.19	16 32 25.6	6.6	6.4 0.44
30	21 13	11 51 36.79	2 24 32.1	8.3	8.0 0.54	15	21 44	15 23 55.30	16 52 42.4	6.5	6.4 0.44
31	21 14	11 56 0.43	+ 1 58 44.1	8.2	8.0 0.53	16	21 45	15 28 54.61	-17 12 33.8	6.5	6.3 0.44
Nov. 1	21 14	12 0 24.29	1 32 47.0	8.2	7.9 0.53	17	21 46	15 33 55.12	17 31 59.1	6.5	6.3 0.44
2	21 15	12 4 48.38	1 6 41.7	8.1	7.9 0.53	18	21 47	15 38 56.84	17 50 57.4	6.5	6.3 0.44
3	21 15	12 9 12.73	0 40 28.8	8.1	7.8 0.52	19	21 49	15 43 59.76	18 9 28.0	6.4	6.3 0.44
4	21 16	12 13 37.37	+ 0 14 9.1	8.0	7.8 0.52	20	21 50	15 49 3.87	18 27 30.2	6.4	6.2 0.44
5	21 16	12 18 2.32	- 0 12 16.8	8.0	7.7 0.52	21	21 51	15 54 9.16	-18 45 3.2	6.4	6.2 0.44
6	21 17	12 22 27.60	0 38 48.3	7.9	7.7 0.51	22	21 52	15 59 15.62	19 2 6.2	6.4	6.2 0.44
7	21 17	12 26 53.25	1 5 24.8	7.9	7.7 0.51	23	21 53	16 4 23.23	19 18 38.6	6.3	6.2 0.44
8	21 18	12 31 19.30	1 32 5.6	7.8	7.6 0.51	24	21 54	16 9 31.97	19 34 39.7	6.3	6.1 0.44
9	21 18	12 35 45.78	1 58 49.8	7.8	7.6 0.51	25	21 56	16 14 41.81	19 50 8.7	6.3	6.1 0.44
10	21 19	12 40 12.70	- 2 25 36.8	7.7	7.5 0.50	26	21 57	16 19 52.74	-20 5 4.9	6.3	6.1 0.43
11	21 19	12 44 40.08	2 52 25.9	7.7	7.5 0.50	27	21 58	16 25 4.73	20 19 27.7	6.3	6.1 0.43
12	21 20	12 49 7.96	3 19 16.2	7.7	7.4 0.50	28	21 59	16 30 17.76	20 33 16.6	6.2	6.1 0.43
13	21 20	12 53 36.38	3 46 7.1	7.6	7.4 0.49	29	22 1	16 35 31.80	20 46 30.9	6.2	6.0 0.43
14	21 21	12 58 5.35	4 12 57.8	7.6	7.4 0.49	30	22 2	16 40 46.82	20 59 9.9	6.2	6.0 0.43
15	21 21	13 2 34.91	- 4 39 47.6	7.5	7.3 0.49	31	22 3	16 46 2.78	-21 11 13.0	6.2	6.0 0.43
16	21 22	13 7 5.08	- 5 6 35.7	7.5	7.3 0.49	32	22 5	16 51 19.66	-21 22 39.8	6.2	6.0 0.43

FOR TRANSIT AT WASHINGTON.

Date.	Wash. Mean Time.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semidiam.	S. T. of Sem. Pass. Mer.	Date.	Wash. Mean Time.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semidiam.	S. T. of Sem. Pass. Mer.
	h m s	h m s	" " "	" " "	" " "	" " "		h m s	h m s	" " "	" " "	" " "	" " "
Jan. 0	15 34	10 12 47.73	+14 49 57.2	10.6	6.1	0.42	Feb. 15	11 47	9 26 11.58	+19 51 4.0	12.9	7.4	0.53
1	15 30	10 12 48.38	14 52 23.4	10.7	6.2	0.42	16	11 41	9 24 38.64	19 57 26.5	12.9	7.4	0.53
2	15 26	10 12 45.99	14 55 6.0	10.8	6.2	0.43	17	11 36	9 23 6.77	20 3 35.0	12.9	7.4	0.53
3	15 22	10 12 40.54	14 58 5.5	10.9	6.2	0.43	18	11 30	9 21 36.12	20 9 28.9	12.8	7.4	0.52
4	15 18	10 12 32.01	15 1 21.7	11.0	6.3	0.43	19	11 25	9 20 6.87	20 15 7.9	12.8	7.3	0.52
5	15 14	10 12 20.36	+15 4 54.3	11.1	6.4	0.44	20	11 20	9 18 39.18	+20 20 31.5	12.8	7.3	0.52
6	15 10	10 12 5.58	15 8 43.3	11.2	6.4	0.44	21	11 14	9 17 13.18	20 25 39.4	12.7	7.3	0.52
7	15 6	10 11 47.65	15 12 48.6	11.3	6.5	0.44	22	11 9	9 15 49.01	20 30 31.3	12.6	7.2	0.52
8	15 1	10 11 26.55	15 17 10.0	11.4	6.5	0.45	23	11 4	9 14 26.81	20 35 7.0	12.6	7.2	0.52
9	14 57	10 11 2.30	15 21 47.3	11.4	6.6	0.45	24	10 58	9 13 6.73	20 39 26.3	12.5	7.2	0.51
10	14 52	10 10 34.87	+15 26 40.3	11.5	6.6	0.45	25	10 53	9 11 48.88	+20 43 29.2	12.5	7.1	0.51
11	14 48	10 10 4.28	15 31 48.8	11.6	6.6	0.46	26	10 48	9 10 33.36	20 47 15.4	12.4	7.1	0.51
12	14 44	10 9 30.54	15 37 12.3	11.7	6.7	0.46	27	10 43	9 9 20.32	20 50 44.8	12.3	7.1	0.51
13	14 39	10 8 53.64	15 42 50.5	11.8	6.7	0.46	28	10 38	9 8 9.85	20 53 57.5	12.3	7.0	0.51
14	14 34	10 8 13.60	15 48 43.1	11.8	6.8	0.47	29	10 33	9 7 2.05	20 56 53.4	12.2	7.0	0.50
15	14 30	10 7 30.44	+15 54 49.6	11.9	6.8	0.47	Mar. 1	10 28	9 5 57.01	+20 59 32.4	12.1	6.9	0.50
16	14 25	10 6 44.18	16 1 9.4	12.0	6.9	0.47	2	10 23	9 4 54.83	21 1 54.8	12.0	6.9	0.50
17	14 20	10 5 54.84	16 7 42.2	12.1	6.9	0.47	3	10 18	9 3 55.58	21 4 0.4	12.0	6.8	0.49
18	14 16	10 5 2.47	16 14 27.3	12.2	7.0	0.49	4	10 13	9 2 59.34	21 5 49.5	11.9	6.8	0.49
19	14 11	10 4 7.11	16 21 24.3	12.2	7.0	0.49	5	10 8	9 2 6.13	21 7 22.2	11.8	6.8	0.49
20	14 6	10 3 8.77	+16 28 32.5	12.3	7.1	0.49	6	10 3	9 1 16.03	+21 8 38.7	11.7	6.7	0.49
21	14 1	10 2 7.54	16 35 51.2	12.4	7.1	0.50	7	9 58	9 0 29.08	21 9 39.2	11.6	6.7	0.47
22	13 56	10 1 3.47	16 43 19.8	12.4	7.1	0.50	8	9 54	8 59 45.30	21 10 24.1	11.6	6.6	0.47
23	13 51	9 59 56.63	16 50 57.4	12.5	7.2	0.50	9	9 49	8 59 4.71	21 10 53.5	11.5	6.6	0.47
24	13 46	9 58 47.10	16 58 43.3	12.6	7.2	0.51	10	9 45	8 58 27.33	21 11 7.7	11.4	6.5	0.46
25	13 41	9 57 34.93	+17 6 36.7	12.6	7.2	0.51	11	9 40	8 57 53.17	+21 11 7.0	11.3	6.5	0.46
26	13 35	9 56 20.24	17 14 36.6	12.7	7.3	0.51	12	9 36	8 57 22.23	21 10 51.8	11.2	6.4	0.46
27	13 30	9 55 3.12	17 22 42.1	12.7	7.3	0.51	13	9 31	8 56 54.50	21 10 22.4	11.1	6.4	0.45
28	13 25	9 53 43.68	17 30 52.2	12.8	7.3	0.51	14	9 27	8 56 29.96	21 9 38.8	11.0	6.3	0.45
29	13 20	9 52 22.04	17 39 6.1	12.8	7.4	0.52	15	9 23	8 56 8.62	21 8 41.6	10.9	6.3	0.45
30	13 14	9 50 58.33	+17 47 22.5	12.9	7.4	0.52	16	9 18	8 55 50.44	+21 7 31.0	10.8	6.2	0.44
31	13 9	9 49 32.69	17 55 40.4	12.9	7.4	0.52	17	9 14	8 55 35.39	21 6 7.3	10.8	6.2	0.44
Feb. 1	13 4	9 48 5.26	18 3 58.9	12.9	7.4	0.52	18	9 10	8 55 23.46	21 4 30.8	10.7	6.1	0.44
2	12 58	9 46 36.21	18 12 16.7	13.0	7.4	0.52	19	9 6	8 55 14.61	21 2 41.9	10.6	6.1	0.43
3	12 53	9 45 5.71	18 20 32.7	13.0	7.4	0.52	20	9 2	8 55 8.80	21 0 40.8	10.5	6.0	0.43
4	12 47	9 43 33.93	+18 28 45.6	13.0	7.5	0.53	21	8 58	8 55 6.00	+20 58 27.7	10.4	6.0	0.43
5	12 42	9 42 1.02	18 36 54.6	13.0	7.5	0.53	22	8 54	8 55 6.17	20 56 3.0	10.3	5.9	0.42
6	12 36	9 40 27.19	18 44 58.5	13.0	7.5	0.53	23	8 50	8 55 9.28	20 53 26.9	10.2	5.8	0.42
7	12 31	9 38 52.62	18 52 56.3	13.0	7.5	0.53	24	8 46	8 55 15.28	20 50 39.6	10.1	5.8	0.42
8	12 25	9 37 17.49	19 0 46.9	13.0	7.5	0.53	25	8 43	8 55 24.13	20 47 41.1	10.0	5.8	0.41
9	12 20	9 35 41.99	+19 8 29.3	13.0	7.5	0.53	26	8 39	8 55 35.80	+20 44 31.8	10.0	5.7	0.41
10	12 14	9 34 6.30	19 16 2.5	13.0	7.5	0.53	27	8 35	8 55 50.25	20 41 11.8	9.9	5.7	0.41
11	12 9	9 32 30.62	19 23 25.8	13.0	7.5	0.53	28	8 32	8 56 7.43	20 37 41.4	9.8	5.6	0.40
12	12 3	9 30 55.13	19 30 38.3	13.0	7.5	0.53	29	8 28	8 56 27.30	20 34 0.5	9.7	5.6	0.40
13	11 58	9 29 20.00	19 37 39.3	13.0	7.5	0.53	30	8 24	8 56 49.82	20 30 9.4	9.6	5.5	0.40
14	11 52	9 27 45.43	+19 44 28.1	13.0	7.4	0.53	31	8 21	8 57 14.96	+20 26 8.4	9.5	5.5	0.39
15	11 47	9 26 11.58	+19 51 4.0	12.9	7.4	0.53	Apr. 1	8 18	8 57 42.66	+20 21 57.5	9.5	5.4	0.39

Stellar magnitude at opposition, in February, 1916, -1.0.

FOR TRANSIT AT WASHINGTON.

Date.	Wash. Mean Time.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semidiam. S. of Sem. Pass. Mer.	Date.	Wash. Mean Time.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semidiam. S. of Sem. Pass. Mer.
	h m	h m s	° ' "	"	" s		h m	h m s	° ' "	"	" s
Apr. 1	8 18	8 57 42.66	+20 21 57.5	9.5	5.4 0.39	May 17	6 11	9 51 49.76	+14 42 45.5	6.6	3.8 0.26
2	8 14	8 58 12.88	20 17 36.8	9.4	5.4 0.39	18	6 8	9 53 29.13	14 32 36.6	6.6	3.8 0.26
3	8 11	8 58 45.57	20 13 6.5	9.3	5.3 0.38	19	6 6	9 55 9.26	14 22 21.6	6.6	3.8 0.26
4	8 7	8 59 20.67	20 8 26.8	9.2	5.3 0.38	20	6 4	9 56 50.14	14 12 0.4	6.5	3.7 0.26
5	8 4	8 59 58.15	20 3 37.8	9.1	5.2 0.38	21	6 2	9 58 31.73	14 1 33.0	6.5	3.7 0.26
6	8 1	9 0 37.95	+19 58 39.6	9.1	5.2 0.37	22	5 59	10 0 14.05	+13 50 59.5	6.4	3.7 0.25
7	7 58	9 1 20.02	19 53 32.4	9.0	5.2 0.37	23	5 57	10 1 57.08	13 40 19.9	6.4	3.7 0.25
8	7 54	9 2 4.30	19 48 16.3	8.9	5.1 0.37	24	5 55	10 3 40.79	13 29 34.2	6.4	3.6 0.25
9	7 51	9 2 50.75	19 42 51.7	8.8	5.1 0.36	25	5 53	10 5 25.18	13 18 42.4	6.3	3.6 0.25
10	7 48	9 3 39.31	19 37 18.2	8.8	5.0 0.36	26	5 50	10 7 10.22	13 7 44.4	6.3	3.6 0.25
11	7 45	9 4 29.93	+19 31 36.4	8.7	5.0 0.36	27	5 48	10 8 55.92	+12 56 40.5	6.2	3.6 0.25
12	7 42	9 5 22.55	19 25 46.1	8.6	4.9 0.35	28	5 46	10 10 42.26	12 45 30.6	6.2	3.6 0.25
13	7 39	9 6 17.13	19 19 47.7	8.6	4.9 0.35	29	5 44	10 12 29.21	12 34 14.8	6.2	3.5 0.24
14	7 36	9 7 13.61	19 13 41.1	8.5	4.9 0.35	30	5 42	10 14 16.77	12 22 52.9	6.1	3.5 0.24
15	7 33	9 8 11.95	19 7 26.5	8.4	4.8 0.35	31	5 40	10 16 4.93	12 11 25.3	6.1	3.5 0.24
16	7 30	9 9 12.09	+19 1 3.9	8.3	4.8 0.33	June 1	5 38	10 17 53.67	+11 59 52.0	6.1	3.5 0.24
17	7 27	9 10 13.99	18 54 33.6	8.3	4.7 0.33	2	5 36	10 19 42.99	11 48 13.1	6.0	3.5 0.24
18	7 24	9 11 17.60	18 47 55.5	8.2	4.7 0.33	3	5 33	10 21 32.86	11 36 28.3	6.0	3.4 0.24
19	7 21	9 12 22.89	18 41 9.8	8.1	4.7 0.33	4	5 31	10 23 23.27	11 24 37.9	6.0	3.4 0.24
20	7 18	9 13 29.82	18 34 16.5	8.1	4.6 0.32	5	5 29	10 25 14.21	11 12 42.1	5.9	3.4 0.23
21	7 16	9 14 38.33	+18 27 15.5	8.0	4.6 0.32	6	5 27	10 27 5.68	+11 0 40.9	5.9	3.4 0.23
22	7 13	9 15 48.38	18 20 7.0	8.0	4.6 0.32	7	5 25	10 28 57.65	10 48 34.2	5.9	3.4 0.23
23	7 10	9 16 59.95	18 12 51.1	7.9	4.5 0.31	8	5 23	10 30 50.12	10 36 22.3	5.8	3.3 0.23
24	7 8	9 18 13.01	18 5 27.7	7.8	4.5 0.31	9	5 21	10 32 43.06	10 24 5.1	5.8	3.3 0.23
25	7 5	9 19 27.52	17 57 56.9	7.8	4.4 0.31	10	5 19	10 34 36.47	10 11 42.8	5.8	3.3 0.23
26	7 2	9 20 43.44	+17 50 18.6	7.7	4.4 0.31	11	5 17	10 36 30.33	+ 9 59 15.5	5.7	3.3 0.23
27	6 59	9 22 0.74	17 42 33.0	7.6	4.4 0.30	12	5 15	10 38 24.65	9 46 43.1	5.7	3.3 0.23
28	6 57	9 23 19.41	17 34 40.1	7.6	4.4 0.30	13	5 13	10 40 19.41	9 34 5.8	5.7	3.3 0.22
29	6 54	9 24 39.40	17 26 39.9	7.5	4.3 0.30	14	5 11	10 42 14.59	9 21 23.7	5.6	3.2 0.22
30	6 52	9 26 0.67	17 18 32.4	7.5	4.3 0.30	15	5 9	10 44 10.20	9 8 36.6	5.6	3.2 0.22
May 1	6 49	9 27 23.20	+17 10 17.7	7.4	4.3 0.30	16	5 7	10 46 6.23	+ 8 55 44.9	5.6	3.2 0.22
2	6 47	9 28 46.95	17 1 55.9	7.4	4.2 0.29	17	5 5	10 48 2.67	8 42 48.5	5.6	3.2 0.22
3	6 44	9 30 11.89	16 53 26.8	7.3	4.2 0.29	18	5 3	10 49 59.52	8 29 47.4	5.5	3.2 0.22
4	6 42	9 31 38.00	16 44 50.7	7.3	4.2 0.29	19	5 1	10 51 56.75	8 16 41.7	5.5	3.1 0.22
5	6 39	9 33 5.24	16 36 7.6	7.2	4.1 0.29	20	4 59	10 53 54.40	8 3 31.3	5.5	3.1 0.22
6	6 37	9 34 33.59	+16 27 17.6	7.2	4.1 0.28	21	4 57	10 55 52.44	+ 7 50 16.5	5.5	3.1 0.22
7	6 34	9 36 3.00	16 18 20.7	7.1	4.1 0.28	22	4 55	10 57 50.88	7 36 57.1	5.4	3.1 0.21
8	6 32	9 37 33.46	16 9 16.9	7.0	4.0 0.28	23	4 53	10 59 49.72	7 23 33.2	5.4	3.1 0.21
9	6 29	9 39 4.93	16 0 6.4	7.0	4.0 0.28	24	4 51	11 1 48.95	7 10 5.1	5.4	3.1 0.21
10	6 27	9 40 37.38	15 50 49.0	7.0	4.0 0.28	25	4 49	11 3 48.57	6 56 32.7	5.4	3.1 0.21
11	6 24	9 42 10.79	+15 41 25.1	6.9	4.0 0.28	26	4 47	11 5 48.59	+ 6 42 55.8	5.3	3.1 0.21
12	6 22	9 43 45.11	15 31 54.6	6.9	3.9 0.27	27	4 45	11 7 48.97	6 29 14.8	5.3	3.0 0.21
13	6 20	9 45 20.34	15 22 17.6	6.8	3.9 0.27	28	4 43	11 9 49.75	6 15 29.7	5.3	3.0 0.21
14	6 18	9 46 56.45	15 12 34.2	6.8	3.9 0.27	29	4 41	11 11 50.89	6 1 40.6	5.3	3.0 0.21
15	6 15	9 48 33.40	15 2 44.3	6.7	3.8 0.27	30	4 39	11 13 52.42	5 47 47.4	5.2	3.0 0.21
16	6 13	9 50 11.18	+14 52 48.0	6.7	3.8 0.27	July 1	4 38	11 15 54.32	+ 5 33 50.3	5.2	3.0 0.21
17	6 11	9 51 49.76	+14 42 45.5	6.6	3.8 0.26	2	4 36	11 17 56.59	+ 5 19 49.5	5.2	3.0 0.21

Stellar magnitude at opposition, in February, 1916, -1.0.

FOR TRANSIT AT WASHINGTON.

Date.	Wash. Mean Time.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Polar Semidiam.	S. T. of Sem. Pass. Mer.	Date.	Wash. Mean Time.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Polar Semidiam.	S. T. of Sem. Pass. Mer.
	h m	h m s	" "	" "	" "	s		h m	h m s	" "	" "	" "	s
Jan. 1	4 53	23 33 48.83	- 4 11 22.6	1.7	18.2	1.30	Aug. 16	16 32	2 13 55.30	+11 59 28.8	1.9	20.5	1.30
2	4 50	23 34 20.83	4 7 43.0	1.7	18.1	1.29	17	16 28	2 14 1.34	11 59 45.4	1.9	20.8	1.31
3	4 46	23 34 53.34	4 4 0.3	1.7	18.1	1.29	18	16 24	2 14 6.63	11 59 58.1	1.9	20.9	1.31
4	4 43	23 35 26.37	4 0 14.2	1.7	18.0	1.29	19	16 21	2 14 11.16	12 0 7.0	2.0	20.9	1.31
5	4 39	23 35 59.90	3 56 24.9	1.7	18.0	1.28	20	16 17	2 14 14.93	12 0 11.9	2.0	21.0	1.32
6	4 36	23 36 33.92	- 3 52 32.5	1.7	17.9	1.28	21	16 13	2 14 17.95	+12 0 13.0	2.0	21.1	1.32
7	4 33	23 37 8.42	3 48 37.0	1.7	17.9	1.28	22	16 9	2 14 20.20	12 0 10.0	2.0	21.1	1.32
8	4 29	23 37 43.41	3 44 38.5	1.7	17.8	1.27	23	16 5	2 14 21.67	12 0 3.2	2.0	21.2	1.33
9	4 26	23 38 18.86	3 40 37.1	1.7	17.8	1.27	24	16 1	2 14 22.38	11 59 52.4	2.0	21.3	1.34
10	4 23	23 38 54.77	3 36 32.8	1.7	17.8	1.26	25	15 57	2 14 22.31	11 59 37.7	2.0	21.3	1.34
11	4 19	23 39 31.14	- 3 32 25.5	1.7	17.7	1.26	26	15 53	2 14 21.46	+11 59 19.0	2.0	21.4	1.35
12	4 16	23 40 7.94	3 28 15.5	1.6	17.7	1.26	27	15 49	2 14 19.85	11 58 56.6	2.0	21.5	1.35
13	4 13	23 40 45.20	3 24 2.7	1.6	17.6	1.26	28	15 45	2 14 17.46	11 58 30.2	2.0	21.5	1.35
14	4 9	23 41 22.88	3 19 47.2	1.6	17.6	1.25	29	15 41	2 14 14.29	11 57 59.9	2.0	21.6	1.35
15	4 6	23 42 0.97	- 3 15 29.2	1.6	17.5	1.25	30	15 37	2 14 10.34	11 57 25.8	2.0	21.7	1.35
July 16	18 25	2 5 1.36	+11 20 6.8	1.8	18.8	1.36	31	15 33	2 14 5.63	+11 56 47.7	2.0	21.7	1.35
17	18 22	2 5 28.16	11 22 16.2	1.8	18.9	1.36	Sept. 1	15 29	2 14 0.14	11 56 5.8	2.0	21.8	1.35
18	18 18	2 5 54.39	11 24 22.4	1.8	18.9	1.37	2	15 25	2 13 53.90	11 55 20.1	2.0	21.8	1.35
19	18 15	2 6 20.04	11 26 25.2	1.8	19.0	1.37	3	15 21	2 13 46.90	11 54 30.6	2.0	21.9	1.35
20	18 11	2 6 45.12	11 28 24.7	1.8	19.0	1.38	4	15 17	2 13 39.12	11 53 37.3	2.0	22.0	1.36
21	18 8	2 7 9.59	+11 30 20.6	1.8	19.1	1.38	5	15 13	2 13 30.60	+11 52 40.2	2.1	22.0	1.36
22	18 4	2 7 33.46	11 32 13.1	1.8	19.2	1.39	6	15 9	2 13 21.33	11 51 39.4	2.1	22.1	1.36
23	18 1	2 7 56.72	11 34 2.1	1.8	19.2	1.39	7	15 5	2 13 11.32	11 50 34.9	2.1	22.2	1.36
24	17 57	2 8 19.37	11 35 47.8	1.8	19.3	1.40	8	15 1	2 13 0.56	11 49 26.6	2.1	22.2	1.36
25	17 53	2 8 41.40	11 37 29.8	1.8	19.3	1.40	9	14 57	2 12 49.07	11 48 14.7	2.1	22.3	1.36
26	17 50	2 9 2.78	+11 39 8.4	1.8	19.4	1.40	10	14 53	2 12 36.84	+11 46 59.1	2.1	22.3	1.36
27	17 46	2 9 23.54	11 40 43.3	1.8	19.5	1.41	11	14 48	2 12 23.90	11 45 40.0	2.1	22.4	1.36
28	17 43	2 9 43.65	11 42 14.6	1.8	19.5	1.41	12	14 44	2 12 10.25	11 44 17.3	2.1	22.4	1.36
29	17 39	2 10 3.11	11 43 42.4	1.8	19.6	1.42	13	14 40	2 11 55.87	11 42 51.1	2.1	22.5	1.36
30	17 35	2 10 21.90	11 45 6.4	1.8	19.6	1.42	14	14 36	2 11 40.79	11 41 21.3	2.1	22.6	1.36
31	17 32	2 10 40.02	+11 46 26.9	1.8	19.7	1.43	15	14 32	2 11 25.01	+11 39 48.1	2.1	22.6	1.36
Aug. 1	17 28	2 10 57.49	11 47 43.7	1.8	19.8	1.43	16	14 28	2 11 8.55	11 38 11.4	2.1	22.7	1.36
2	17 24	2 11 14.26	11 48 57.0	1.9	19.8	1.44	17	14 23	2 10 51.40	11 36 31.4	2.1	22.7	1.36
3	17 21	2 11 30.35	11 50 6.5	1.9	19.9	1.44	18	14 19	2 10 33.58	11 34 48.1	2.1	22.8	1.36
4	17 17	2 11 45.75	11 51 12.2	1.9	20.0	1.45	19	14 15	2 10 15.09	11 33 1.4	2.1	22.8	1.36
5	17 14	2 12 0.46	+11 52 14.2	1.9	20.0	1.45	20	14 11	2 9 55.96	+11 31 11.4	2.1	22.9	1.36
6	17 10	2 12 14.48	11 53 12.6	1.9	20.1	1.46	21	14 6	2 9 36.18	11 29 18.3	2.1	22.9	1.36
7	17 6	2 12 27.80	11 54 7.2	1.9	20.2	1.46	22	14 2	2 9 15.77	11 27 22.1	2.1	23.0	1.36
8	17 2	2 12 40.42	11 54 58.1	1.9	20.2	1.46	23	13 58	2 8 54.75	11 25 22.7	2.2	23.0	1.36
9	16 59	2 12 52.32	11 55 45.2	1.9	20.3	1.47	24	13 54	2 8 33.12	11 23 20.5	2.2	23.1	1.36
10	16 55	2 13 3.50	+11 56 28.5	1.9	20.3	1.47	25	13 49	2 8 10.91	+11 21 15.4	2.2	23.1	1.36
11	16 51	2 13 13.96	11 57 8.1	1.9	20.4	1.48	26	13 45	2 7 48.12	11 19 7.4	2.2	23.2	1.36
12	16 47	2 13 23.69	11 57 43.8	1.9	20.5	1.48	27	13 41	2 7 24.77	11 16 56.6	2.2	23.2	1.36
13	16 44	2 13 32.71	11 58 15.8	1.9	20.6	1.49	28	13 36	2 7 0.87	11 14 43.1	2.2	23.2	1.36
14	16 40	2 13 40.98	11 58 44.0	1.9	20.6	1.49	29	13 32	2 6 36.46	11 12 27.2	2.2	23.3	1.36
15	16 36	2 13 48.51	+11 59 8.3	1.9	20.7	1.50	30	13 28	2 6 11.54	+11 10 8.7	2.2	23.3	1.36
16	16 32	2 13 55.30	+11 59 28.8	1.9	20.7	1.50	Oct. 1	13 23	2 5 46.13	+11 7 47.8	2.2	23.3	1.36

FOR TRANSIT AT WASHINGTON.

Date.	Wash. Mean Time.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Polar Semidiam.	S. T. of Sem. Past Mer.	Date.	Wash. Mean Time.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Polar Semidiam.	S. T. of Sem. Past Mer.
	h m	h m s	° ' "	"	"	s		h m	h m s	° ' "	"	"	s
Oct. 1	13 23	2 5 46.13	+11 7 47.8	2.2	23.3	1.69	Nov. 16	10 0	1 43 35.92	+9 9 9.9	2.2	23.1	1.67
2	13 19	2 5 20.25	11 5 24.6	2.2	23.4	1.69	17	9 56	1 43 11.88	9 7 7.6	2.2	23.1	1.67
3	13 14	2 4 53.93	11 2 59.3	2.2	23.4	1.69	18	9 52	1 42 48.39	9 5 8.6	2.2	23.1	1.66
4	13 10	2 4 27.17	11 0 31.9	2.2	23.4	1.69	19	9 47	1 42 25.44	9 3 12.8	2.2	23.0	1.66
5	13 6	2 4 0.00	10 58 2.5	2.2	23.5	1.70	20	9 43	1 42 3.06	9 1 20.4	2.1	23.0	1.65
6	13 1	2 3 32.45	+10 55 31.1	2.2	23.5	1.70	21	9 39	1 41 41.26	+8 59 31.7	2.1	22.9	1.65
7	12 57	2 3 4.52	10 52 58.0	2.2	23.5	1.70	22	9 34	1 41 20.05	8 57 46.4	2.1	22.9	1.65
8	12 52	2 2 36.24	10 50 23.1	2.2	23.5	1.70	23	9 30	1 40 59.47	8 56 4.8	2.1	22.8	1.64
9	12 48	2 2 7.63	10 47 46.7	2.2	23.6	1.70	24	9 26	1 40 39.50	8 54 27.0	2.1	22.8	1.64
10	12 44	2 1 38.70	10 45 8.8	2.2	23.6	1.71	25	9 22	1 40 20.17	8 52 53.0	2.1	22.7	1.64
11	12 39	2 1 9.50	+10 42 29.5	2.2	23.6	1.71	26	9 17	1 40 1.50	+8 51 23.0	2.1	22.7	1.63
12	12 35	2 0 40.01	10 39 48.9	2.2	23.6	1.71	27	9 13	1 39 43.51	8 49 56.9	2.1	22.6	1.63
13	12 30	2 0 10.27	10 37 7.3	2.2	23.6	1.71	28	9 9	1 39 26.19	8 48 35.0	2.1	22.6	1.62
14	12 26	1 59 40.30	10 34 24.5	2.2	23.7	1.71	29	9 5	1 39 9.56	8 47 17.1	2.1	22.5	1.62
15	12 22	1 59 10.13	10 31 40.8	2.2	23.7	1.71	30	9 0	1 38 53.63	8 46 3.5	2.1	22.4	1.62
16	12 17	1 58 39.77	+10 28 56.2	2.2	23.7	1.71	Dec. 1	8 56	1 38 38.40	+8 44 54.0	2.1	22.4	1.61
17	12 13	1 58 9.25	10 26 11.1	2.2	23.7	1.71	2	8 52	1 38 23.89	8 43 48.8	2.1	22.3	1.61
18	12 8	1 57 38.59	10 23 25.4	2.2	23.7	1.71	3	8 48	1 38 10.10	8 42 47.8	2.1	22.3	1.60
19	12 4	1 57 7.82	10 20 39.2	2.2	23.7	1.71	4	8 44	1 37 57.05	8 41 51.3	2.1	22.2	1.60
20	11 59	1 56 36.94	10 17 52.6	2.2	23.7	1.71	5	8 40	1 37 44.73	8 40 59.0	2.1	22.1	1.59
21	11 55	1 56 6.00	+10 15 6.0	2.2	23.7	1.71	6	8 36	1 37 33.14	+8 40 11.0	2.1	22.1	1.59
22	11 50	1 55 35.02	10 12 19.3	2.2	23.7	1.71	7	8 31	1 37 22.30	8 39 27.6	2.1	22.0	1.58
23	11 46	1 55 4.02	10 9 32.8	2.2	23.7	1.71	8	8 27	1 37 12.22	8 38 48.6	2.0	21.9	1.57
24	11 42	1 54 33.02	10 6 46.4	2.2	23.7	1.71	9	8 23	1 37 2.90	8 38 14.0	2.0	21.9	1.57
25	11 37	1 54 2.06	10 4 0.4	2.2	23.7	1.71	10	8 19	1 36 54.33	8 37 43.9	2.0	21.8	1.56
26	11 33	1 53 31.14	+10 1 15.1	2.2	23.7	1.71	11	8 15	1 36 46.51	+8 37 18.3	2.0	21.8	1.56
27	11 28	1 53 0.31	9 58 30.2	2.2	23.7	1.71	12	8 11	1 36 39.48	8 36 57.3	2.0	21.7	1.55
28	11 24	1 52 29.58	9 55 46.2	2.2	23.7	1.71	13	8 7	1 36 33.20	8 36 40.6	2.0	21.6	1.55
29	11 19	1 51 58.99	9 53 3.1	2.2	23.7	1.71	14	8 3	1 36 27.71	8 36 28.6	2.0	21.6	1.54
30	11 15	1 51 28.55	9 50 21.1	2.2	23.7	1.71	15	7 59	1 36 23.00	8 36 21.3	2.0	21.5	1.54
31	11 10	1 50 58.28	+9 47 40.3	2.2	23.6	1.70	16	7 55	1 36 19.06	+8 36 18.4	2.0	21.4	1.54
Nov. 1	11 6	1 50 28.21	9 45 0.9	2.2	23.6	1.70	17	7 51	1 36 15.90	8 36 20.1	2.0	21.4	1.53
2	11 2	1 49 58.38	9 42 22.8	2.2	23.6	1.70	18	7 47	1 36 13.51	8 36 26.4	2.0	21.3	1.53
3	10 57	1 49 28.79	9 39 46.5	2.2	23.6	1.70	19	7 43	1 36 11.91	8 36 37.3	2.0	21.2	1.52
4	10 53	1 48 59.46	9 37 11.8	2.2	23.6	1.70	20	7 39	1 36 11.10	8 36 52.7	2.0	21.2	1.52
5	10 48	1 48 30.43	+9 34 39.0	2.2	23.5	1.70	21	7 35	1 36 11.07	+8 37 12.7	2.0	21.1	1.51
6	10 44	1 48 1.71	9 32 8.1	2.2	23.5	1.69	22	7 31	1 36 11.83	8 37 37.2	2.0	21.0	1.51
7	10 40	1 47 33.32	9 29 39.1	2.2	23.5	1.69	23	7 27	1 36 13.38	8 38 6.4	2.0	21.0	1.50
8	10 35	1 47 5.29	9 27 12.4	2.2	23.4	1.69	24	7 24	1 36 15.70	8 38 40.1	2.0	20.9	1.50
9	10 31	1 46 37.62	9 24 48.0	2.2	23.4	1.69	25	7 20	1 36 18.83	8 39 18.4	1.9	20.8	1.49
10	10 26	1 46 10.35	+9 22 25.9	2.2	23.4	1.68	26	7 16	1 36 22.73	+8 40 1.1	1.9	20.7	1.49
11	10 22	1 45 43.48	9 20 6.5	2.2	23.3	1.68	27	7 12	1 36 27.41	8 40 48.5	1.9	20.7	1.48
12	10 18	1 45 17.04	9 17 49.5	2.2	23.3	1.68	28	7 8	1 36 32.86	8 41 40.2	1.9	20.6	1.48
13	10 13	1 44 51.05	9 15 35.3	2.2	23.3	1.68	29	7 4	1 36 39.10	8 42 36.4	1.9	20.5	1.47
14	10 9	1 44 25.52	9 13 23.9	2.2	23.2	1.67	30	7 0	1 36 46.10	8 43 37.0	1.9	20.5	1.47
15	10 5	1 44 0.46	+9 11 15.4	2.2	23.2	1.67	31	6 57	1 36 53.88	+8 44 42.0	1.9	20.4	1.46
16	10 0	1 43 35.92	+9 9 9.9	2.2	23.1	1.67	32	6 53	1 37 2.41	+8 45 51.2	1.9	20.3	1.46

Stellar magnitude at opposition, in October, 1916, —2.5.

FOR TRANSIT AT WASHINGTON.

Date.	Wash. Mean Time.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Polar Semidiam.	S. T. of Sem. Pass. Mer.	Date.	Wash. Mean Time.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Polar Semidiam.	S. T. of Sem. Pass. Mer.
	h m s	h m s	" ' "	"	" "	s		h m s	h m s	" ' "	"	" "	s
Jan. 0	12 19	6 57 39.61	+22 17 53.6	1.1	9.6	0.76	Feb. 15	9 5	6 43 48.33	+22 40 29.7	1.1	9.3	0.74
1	12 15	6 57 18.41	22 18 29.1	1.1	9.6	0.76	16	9 1	6 43 37.23	22 40 49.7	1.1	9.3	0.74
2	12 11	6 56 57.17	22 19 4.5	1.1	9.6	0.76	17	8 56	6 43 26.54	22 41 9.2	1.1	9.3	0.73
3	12 7	6 56 35.92	22 19 39.8	1.1	9.6	0.76	18	8 52	6 43 16.28	22 41 28.2	1.1	9.3	0.73
4	12 2	6 56 14.66	22 20 15.0	1.1	9.6	0.76	19	8 48	6 43 6.45	22 41 46.7	1.1	9.3	0.73
5	11 58	6 55 53.39	+22 20 50.1	1.1	9.6	0.76	20	8 44	6 42 57.06	+22 42 4.7	1.1	9.3	0.73
6	11 54	6 55 32.15	22 21 25.2	1.1	9.6	0.76	21	8 40	6 42 48.10	22 42 22.2	1.0	9.2	0.73
7	11 50	6 55 10.94	22 21 59.9	1.1	9.6	0.76	22	8 36	6 42 39.60	22 42 39.3	1.0	9.2	0.73
8	11 45	6 54 49.77	22 22 34.6	1.1	9.6	0.76	23	8 32	6 42 31.54	22 42 55.9	1.0	9.2	0.73
9	11 41	6 54 28.66	22 23 9.1	1.1	9.6	0.76	24	8 28	6 42 23.94	22 43 12.0	1.0	9.2	0.73
10	11 37	6 54 7.60	+22 23 43.3	1.1	9.6	0.76	25	8 24	6 42 16.80	+22 43 27.6	1.0	9.2	0.73
11	11 32	6 53 46.63	22 24 17.4	1.1	9.6	0.76	26	8 20	6 42 10.11	22 43 42.7	1.0	9.2	0.73
12	11 28	6 53 25.76	22 24 51.2	1.1	9.6	0.76	27	8 16	6 42 3.89	22 43 57.4	1.0	9.1	0.72
13	11 24	6 53 5.00	22 25 24.9	1.1	9.6	0.76	28	8 12	6 41 58.13	22 44 11.6	1.0	9.1	0.72
14	11 20	6 52 44.34	22 25 58.2	1.1	9.6	0.76	29	8 8	6 41 52.84	22 44 25.3	1.0	9.1	0.72
15	11 15	6 52 23.81	+22 26 31.2	1.1	9.6	0.76	Mar. 1	8 4	6 41 48.03	+22 44 38.5	1.0	9.1	0.72
16	11 11	6 52 3.43	22 27 4.0	1.1	9.6	0.76	2	8 0	6 41 43.68	22 44 51.2	1.0	9.1	0.72
17	11 7	6 51 43.20	22 27 36.4	1.1	9.6	0.76	3	7 56	6 41 39.82	22 45 3.5	1.0	9.1	0.72
18	11 2	6 51 23.13	22 28 8.5	1.1	9.6	0.76	4	7 52	6 41 36.44	22 45 15.1	1.0	9.1	0.72
19	10 58	6 51 3.23	22 28 40.3	1.1	9.6	0.76	5	7 48	6 41 33.55	22 45 26.4	1.0	9.0	0.71
20	10 54	6 50 43.51	+22 29 11.8	1.1	9.6	0.76	6	7 44	6 41 31.13	+22 45 37.0	1.0	9.0	0.71
21	10 50	6 50 23.99	22 29 42.9	1.1	9.6	0.76	7	7 40	6 41 29.21	22 45 47.2	1.0	9.0	0.71
22	10 45	6 50 4.67	22 30 13.7	1.1	9.6	0.76	8	7 36	6 41 27.76	22 45 56.9	1.0	9.0	0.71
23	10 41	6 49 45.56	22 30 44.2	1.1	9.6	0.76	9	7 32	6 41 26.81	22 46 6.1	1.0	9.0	0.71
24	10 37	6 49 26.68	22 31 14.3	1.1	9.6	0.75	10	7 28	6 41 26.33	22 46 14.8	1.0	9.0	0.71
25	10 33	6 49 8.03	+22 31 43.9	1.1	9.6	0.75	11	7 24	6 41 26.34	+22 46 23.0	1.0	8.9	0.71
26	10 28	6 48 49.64	22 32 13.3	1.1	9.5	0.75	12	7 20	6 41 26.84	22 46 30.7	1.0	8.9	0.71
27	10 24	6 48 31.50	22 32 42.3	1.1	9.5	0.75	13	7 16	6 41 27.81	22 46 38.0	1.0	8.9	0.70
28	10 20	6 48 13.64	22 33 10.9	1.1	9.5	0.75	14	7 12	6 41 29.27	22 46 44.7	1.0	8.9	0.70
29	10 16	6 47 56.04	22 33 39.0	1.1	9.5	0.75	15	7 8	6 41 31.22	22 46 50.9	1.0	8.9	0.70
30	10 12	6 47 38.73	+22 34 6.7	1.1	9.5	0.75	16	7 5	6 41 33.64	+22 46 56.7	1.0	8.9	0.70
31	10 7	6 47 21.72	22 34 34.0	1.1	9.5	0.75	17	7 1	6 41 36.54	22 47 1.9	1.0	8.8	0.70
Feb. 1	10 3	6 47 5.02	22 35 0.9	1.1	9.5	0.75	18	6 57	6 41 39.92	22 47 6.6	1.0	8.8	0.70
2	9 59	6 46 48.63	22 35 27.4	1.1	9.5	0.75	19	6 53	6 41 43.77	22 47 10.8	1.0	8.8	0.70
3	9 55	6 46 32.57	22 35 53.4	1.1	9.5	0.75	20	6 49	6 41 48.10	22 47 14.5	1.0	8.8	0.70
4	9 50	6 46 16.86	+22 36 19.0	1.1	9.5	0.75	21	6 45	6 41 52.90	+22 47 17.7	1.0	8.8	0.69
5	9 46	6 46 1.48	22 36 44.2	1.1	9.4	0.75	22	6 41	6 41 58.19	22 47 20.4	1.0	8.8	0.69
6	9 42	6 45 46.44	22 37 8.8	1.1	9.4	0.75	23	6 38	6 42 3.93	22 47 22.6	1.0	8.8	0.69
7	9 38	6 45 31.78	22 37 33.0	1.1	9.4	0.74	24	6 34	6 42 10.15	22 47 24.3	1.0	8.7	0.68
8	9 34	6 45 17.49	22 37 56.9	1.1	9.4	0.74	25	6 30	6 42 16.83	22 47 25.5	1.0	8.7	0.68
9	9 30	6 45 3.57	+22 38 20.1	1.1	9.4	0.74	26	6 26	6 42 23.99	+22 47 26.2	1.0	8.7	0.68
10	9 26	6 44 50.04	22 38 42.9	1.1	9.4	0.74	27	6 22	6 42 31.60	22 47 26.3	1.0	8.7	0.68
11	9 21	6 44 36.89	22 39 5.2	1.1	9.4	0.74	28	6 18	6 42 39.68	22 47 26.0	1.0	8.7	0.68
12	9 17	6 44 24.15	22 39 27.0	1.1	9.4	0.74	29	6 15	6 42 48.22	22 47 25.1	1.0	8.7	0.68
13	9 13	6 44 11.79	22 39 48.4	1.1	9.4	0.74	30	6 11	6 42 57.21	22 47 23.6	1.0	8.6	0.68
14	9 9	6 43 59.86	+22 40 9.3	1.1	9.3	0.74	31	6 7	6 43 6.66	+22 47 21.6	1.0	8.6	0.68
15	9 5	6 43 48.33	+22 40 29.7	1.1	9.3	0.74	Apr. 1	6 3	6 43 16.57	+22 47 19.1	1.0	8.6	0.68

FOR TRANSIT AT WASHINGTON.

Date.	Wash. Mean Time.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Polar Semidiam. S. T. of Sem. Pass. Mer.	Date.	Wash. Mean Time.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Polar Semidiam. S. T. of Sem. Pass. Mer.
	h m s	h m s	" " "	"	" s		h m s	h m s	" " "	"	" s
Apr. 1	6 3	6 43 16.57	+22 47 19.1	1.0	8.6 0.68	Nov. 16	16 27	8 11 13.24	+20 7 14.5	1.0	9.0 0.70
2	6 0	6 43 26.92	22 47 16.0	1.0	8.6 0.68	17	16 23	8 11 10.68	20 7 29.2	1.0	9.0 0.70
3	5 56	6 43 37.72	22 47 12.5	1.0	8.6 0.68	18	16 19	8 11 7.65	20 7 45.4	1.0	9.0 0.70
4	5 52	6 43 48.96	22 47 8.4	1.0	8.6 0.68	19	16 15	8 11 4.16	20 8 3.0	1.0	9.0 0.70
5	5 48	6 44 0.66	22 47 3.7	1.0	8.6 0.68	20	16 11	8 11 0.21	20 8 22.2	1.0	9.1 0.70
6	5 45	6 44 12.78	+22 46 58.4	1.0	8.5 0.67	21	16 7	8 10 55.80	+20 8 42.7	1.0	9.1 0.71
7	5 41	6 44 25.33	22 46 52.7	1.0	8.5 0.67	22	16 3	8 10 50.93	20 9 4.7	1.0	9.1 0.71
8	5 37	6 44 38.32	22 46 46.4	1.0	8.5 0.67	23	15 59	8 10 45.59	20 9 28.2	1.0	9.1 0.71
9	5 34	6 44 51.74	22 46 39.5	1.0	8.5 0.67	24	15 55	8 10 39.80	20 9 53.0	1.0	9.1 0.71
10	5 30	6 45 5.56	22 46 32.1	1.0	8.5 0.67	25	15 51	8 10 33.57	20 10 19.2	1.0	9.1 0.71
Oct. 11	18 45	8 7 40.02	+20 14 19.3	1.0	8.4 0.66	26	15 47	8 10 26.88	+20 10 46.8	1.0	9.1 0.71
12	18 41	8 7 53.63	20 13 44.1	1.0	8.4 0.66	27	15 43	8 10 19.76	20 11 15.8	1.0	9.2 0.71
13	18 37	8 8 6.83	20 13 9.9	1.0	8.5 0.66	28	15 38	8 10 12.18	20 11 46.2	1.0	9.2 0.71
14	18 34	8 8 19.61	20 12 37.1	1.0	8.5 0.66	29	15 34	8 10 4.17	20 12 18.0	1.0	9.2 0.71
15	18 30	8 8 31.99	20 12 5.5	1.0	8.5 0.66	30	15 30	8 9 55.72	20 12 51.1	1.0	9.2 0.72
16	18 26	8 8 43.94	+20 11 35.1	1.0	8.5 0.66	Dec. 1	15 26	8 9 46.84	+20 13 25.4	1.0	9.2 0.72
17	18 22	8 8 55.49	20 11 5.9	1.0	8.5 0.66	2	15 22	8 9 37.53	20 14 1.0	1.0	9.2 0.72
18	18 19	8 9 6.60	20 10 38.0	1.0	8.5 0.66	3	15 18	8 9 27.82	20 14 37.9	1.1	9.3 0.72
19	18 15	8 9 17.28	20 10 11.4	1.0	8.6 0.66	4	15 14	8 9 17.68	20 15 16.0	1.1	9.3 0.72
20	18 11	8 9 27.54	20 9 46.1	1.0	8.6 0.67	5	15 10	8 9 7.14	20 15 55.3	1.1	9.3 0.72
21	18 7	8 9 37.35	+20 9 22.1	1.0	8.6 0.67	6	15 6	8 8 56.18	+20 16 35.9	1.1	9.3 0.72
22	18 4	8 9 46.73	20 8 59.5	1.0	8.6 0.67	7	15 2	8 8 44.84	20 17 17.6	1.1	9.3 0.72
23	18 0	8 9 55.66	20 8 38.2	1.0	8.6 0.67	8	14 58	8 8 33.09	20 18 0.5	1.1	9.3 0.73
24	17 56	8 10 4.15	20 8 18.3	1.0	8.6 0.67	9	14 54	8 8 20.96	20 18 44.5	1.1	9.3 0.73
25	17 52	8 10 12.20	20 7 59.7	1.0	8.6 0.67	10	14 49	8 8 8.44	20 19 29.5	1.1	9.3 0.73
26	17 48	8 10 19.81	+20 7 42.5	1.0	8.7 0.67	11	14 45	8 7 55.55	+20 20 15.8	1.1	9.4 0.73
27	17 45	8 10 26.95	20 7 26.7	1.0	8.7 0.67	12	14 41	8 7 42.29	20 21 3.0	1.1	9.4 0.73
28	17 41	8 10 33.64	20 7 12.4	1.0	8.7 0.68	13	14 37	8 7 28.66	20 21 51.3	1.1	9.4 0.73
29	17 37	8 10 39.88	20 6 59.5	1.0	8.7 0.68	14	14 33	8 7 14.67	20 22 40.7	1.1	9.4 0.73
30	17 33	8 10 45.66	20 6 48.1	1.0	8.7 0.68	15	14 28	8 7 0.33	20 23 31.0	1.1	9.4 0.73
31	17 29	8 10 50.98	+20 6 38.0	1.0	8.7 0.68	16	14 24	8 6 45.65	+20 24 22.2	1.1	9.4 0.73
Nov. 1	17 26	8 10 55.84	20 6 29.4	1.0	8.8 0.68	17	14 20	8 6 30.62	20 25 14.4	1.1	9.4 0.73
2	17 22	8 11 0.24	20 6 22.1	1.0	8.8 0.68	18	14 16	8 6 15.27	20 26 7.5	1.1	9.4 0.73
3	17 18	8 11 4.18	20 6 16.4	1.0	8.8 0.68	19	14 12	8 5 59.59	20 27 1.5	1.1	9.4 0.73
4	17 14	8 11 7.66	20 6 12.1	1.0	8.8 0.68	20	14 8	8 5 43.60	20 27 56.3	1.1	9.5 0.74
5	17 10	8 11 10.68	+20 6 9.3	1.0	8.8 0.69	21	14 3	8 5 27.30	+20 28 51.9	1.1	9.5 0.74
6	17 6	8 11 13.25	20 6 7.9	1.0	8.8 0.69	22	13 59	8 5 10.70	20 29 48.3	1.1	9.5 0.74
7	17 2	8 11 15.33	20 6 7.9	1.0	8.9 0.69	23	13 55	8 4 53.82	20 30 45.5	1.1	9.5 0.74
8	16 58	8 11 16.96	20 6 9.5	1.0	8.9 0.69	24	13 51	8 4 36.65	20 31 43.4	1.1	9.5 0.74
9	16 54	8 11 18.13	20 6 12.5	1.0	8.9 0.69	25	13 47	8 4 19.22	20 32 42.0	1.1	9.5 0.74
10	16 50	8 11 18.83	+20 6 17.0	1.0	8.9 0.69	26	13 42	8 4 1.53	+20 33 41.1	1.1	9.5 0.74
11	16 46	8 11 19.06	20 6 22.9	1.0	8.9 0.69	27	13 38	8 3 43.60	20 34 40.9	1.1	9.5 0.74
12	16 43	8 11 18.83	20 6 30.4	1.0	8.9 0.69	28	13 34	8 3 25.43	20 35 41.1	1.1	9.5 0.74
13	16 39	8 11 18.13	20 6 39.1	1.0	9.0 0.70	29	13 30	8 3 7.03	20 36 42.0	1.1	9.5 0.74
14	16 35	8 11 16.96	20 6 49.4	1.0	9.0 0.70	30	13 25	8 2 48.42	20 37 43.3	1.1	9.5 0.74
15	16 31	8 11 15.33	+20 7 1.3	1.0	9.0 0.70	31	13 21	8 2 29.61	+20 38 45.0	1.1	9.5 0.74
16	16 27	8 11 13.24	+20 7 14.5	1.0	9.0 0.70	32	13 17	8 2 10.59	+20 39 47.1	1.1	9.5 0.74

FOR TRANSIT AT WASHINGTON.

Date.	Wash. Mean Time.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semidiam.	S. T. of Sem. Pass. Mer.	Date.	Wash. Mean Time.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semidiam.	S. T. of Sem. Pass. Mer.
	h m s	h m s	" " "	"	"	s		h m s	h m s	" " "	"	"	s
June 1	16 47	21 29 16.81	-15 35 36.3	0.5	1.7	0.12	July 17	13 42	21 25 10.63	-15 56 33.8	0.5	1.8	0.12
2	16 43	21 29 15.14	15 35 46.7	0.5	1.7	0.12	18	13 38	21 25 2.24	15 57 14.6	0.5	1.8	0.12
3	16 39	21 29 13.28	15 35 58.0	0.5	1.7	0.12	19	13 34	21 24 53.76	15 57 55.7	0.5	1.8	0.12
4	16 35	21 29 11.23	15 36 10.1	0.5	1.7	0.12	20	13 30	21 24 45.18	15 58 37.2	0.5	1.8	0.12
5	16 31	21 29 9.00	15 36 23.2	0.5	1.7	0.12	21	13 26	21 24 36.52	15 59 19.0	0.5	1.8	0.12
6	16 27	21 29 6.59	-15 36 37.1	0.5	1.7	0.12	22	13 22	21 24 27.80	-16 0 1.0	0.5	1.8	0.12
7	16 23	21 29 3.98	15 36 51.9	0.5	1.7	0.12	23	13 18	21 24 19.00	16 0 43.4	0.5	1.8	0.12
8	16 19	21 29 1.19	15 37 7.4	0.5	1.7	0.12	24	13 14	21 24 10.13	16 1 25.9	0.5	1.8	0.12
9	16 15	21 28 58.23	15 37 23.8	0.5	1.7	0.12	25	13 10	21 24 1.20	16 2 8.8	0.5	1.8	0.12
10	16 11	21 28 55.09	15 37 41.1	0.5	1.7	0.12	26	13 6	21 23 52.20	16 2 51.8	0.5	1.8	0.12
11	16 7	21 28 51.78	-15 37 59.1	0.5	1.7	0.12	27	13 1	21 23 43.15	-16 3 35.1	0.5	1.8	0.12
12	16 3	21 28 48.29	15 38 18.1	0.5	1.7	0.12	28	12 57	21 23 34.05	16 4 18.5	0.5	1.8	0.12
13	15 59	21 28 44.63	15 38 37.8	0.5	1.7	0.12	29	12 53	21 23 24.89	16 5 2.1	0.5	1.8	0.12
14	15 55	21 28 40.80	15 38 58.4	0.5	1.7	0.12	30	12 49	21 23 15.68	16 5 45.9	0.5	1.8	0.12
15	15 51	21 28 36.80	15 39 19.7	0.5	1.7	0.12	31	12 45	21 23 6.44	16 6 29.7	0.5	1.8	0.12
16	15 47	21 28 32.64	-15 39 41.8	0.5	1.7	0.12	Aug. 1	12 41	21 22 57.16	-16 7 13.7	0.5	1.8	0.12
17	15 43	21 28 28.30	15 40 4.6	0.5	1.7	0.12	2	12 37	21 22 47.84	16 7 57.7	0.5	1.8	0.12
18	15 39	21 28 23.80	15 40 28.2	0.5	1.7	0.12	3	12 33	21 22 38.50	16 8 41.8	0.5	1.8	0.12
19	15 35	21 28 19.12	15 40 52.6	0.5	1.7	0.12	4	12 29	21 22 29.12	16 9 26.1	0.5	1.8	0.12
20	15 31	21 28 14.29	15 41 17.7	0.5	1.7	0.12	5	12 25	21 22 19.72	16 10 10.3	0.5	1.8	0.12
21	15 27	21 28 9.29	-15 41 43.5	0.5	1.7	0.12	6	12 21	21 22 10.30	-16 10 54.5	0.5	1.8	0.12
22	15 23	21 28 4.14	15 42 10.1	0.5	1.7	0.12	7	12 16	21 22 0.87	16 11 38.8	0.5	1.8	0.12
23	15 19	21 27 58.84	15 42 37.4	0.5	1.7	0.12	8	12 12	21 21 51.43	16 12 22.9	0.5	1.8	0.12
24	15 15	21 27 53.38	15 43 5.5	0.5	1.7	0.12	9	12 8	21 21 41.98	16 13 7.0	0.5	1.8	0.12
25	15 11	21 27 47.76	15 43 34.2	0.5	1.7	0.12	10	12 4	21 21 32.53	16 13 51.1	0.5	1.8	0.12
26	15 7	21 27 42.00	-15 44 3.6	0.5	1.7	0.12	11	12 0	21 21 23.07	-16 14 35.2	0.5	1.8	0.12
27	15 3	21 27 36.09	15 44 33.7	0.5	1.7	0.12	12	11 56	21 21 13.62	16 15 19.1	0.5	1.8	0.12
28	14 59	21 27 30.01	15 45 4.4	0.5	1.7	0.12	13	11 52	21 21 4.18	16 16 3.0	0.5	1.8	0.12
29	14 55	21 27 23.82	15 45 35.8	0.5	1.7	0.12	14	11 48	21 20 54.75	16 16 46.6	0.5	1.8	0.12
30	14 51	21 27 17.47	15 46 7.8	0.5	1.8	0.12	15	11 44	21 20 45.34	16 17 30.2	0.5	1.8	0.12
July 1	14 47	21 27 10.98	-15 46 40.3	0.5	1.8	0.12	16	11 40	21 20 35.94	-16 18 13.7	0.5	1.8	0.12
2	14 43	21 27 4.35	15 47 13.5	0.5	1.8	0.12	17	11 36	21 20 26.57	16 18 56.9	0.5	1.8	0.12
3	14 39	21 26 57.59	15 47 47.4	0.5	1.8	0.12	18	11 32	21 20 17.22	16 19 39.9	0.5	1.8	0.12
4	14 35	21 26 50.71	15 48 21.8	0.5	1.8	0.12	19	11 27	21 20 7.90	16 20 22.8	0.5	1.8	0.12
5	14 31	21 26 43.69	15 48 56.7	0.5	1.8	0.12	20	11 23	21 19 58.62	16 21 5.4	0.5	1.8	0.12
6	14 27	21 26 36.55	-15 49 32.2	0.5	1.8	0.12	21	11 19	21 19 49.36	-16 21 47.8	0.5	1.8	0.12
7	14 23	21 26 29.30	15 50 8.2	0.5	1.8	0.12	22	11 15	21 19 40.15	16 22 29.9	0.5	1.8	0.12
8	14 19	21 26 21.91	15 50 44.8	0.5	1.8	0.12	23	11 11	21 19 30.99	16 23 11.6	0.5	1.8	0.12
9	14 15	21 26 14.41	15 51 21.8	0.5	1.8	0.12	24	11 7	21 19 21.88	16 23 53.1	0.5	1.8	0.12
10	14 11	21 26 6.80	15 51 59.3	0.5	1.8	0.12	25	11 3	21 19 12.83	16 24 34.4	0.5	1.8	0.12
11	14 7	21 25 59.08	-15 52 37.3	0.5	1.8	0.12	26	10 59	21 19 3.82	-16 25 15.2	0.5	1.8	0.12
12	14 3	21 25 51.26	15 53 15.7	0.5	1.8	0.12	27	10 55	21 18 54.88	16 25 55.8	0.5	1.8	0.12
13	13 58	21 25 43.32	15 53 54.5	0.5	1.8	0.12	28	10 51	21 18 46.00	16 26 36.0	0.5	1.8	0.12
14	13 54	21 25 35.30	15 54 33.7	0.5	1.8	0.12	29	10 46	21 18 37.19	16 27 15.8	0.5	1.8	0.12
15	13 50	21 25 27.17	15 55 13.3	0.5	1.8	0.12	30	10 42	21 18 28.46	16 27 55.2	0.5	1.8	0.12
16	13 46	21 25 18.95	-15 55 53.4	0.5	1.8	0.12	31	10 38	21 18 19.79	-16 28 34.1	0.5	1.8	0.12
17	13 42	21 25 10.63	-15 56 33.8	0.5	1.8	0.12	Sept. 1	10 34	21 18 11.22	-16 29 12.6	0.5	1.8	0.12

Stellar magnitude at opposition, in August, 1916, 6.0.

FOR TRANSIT AT WASHINGTON.

Date.	Wash. Mean Time.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semi-diam.	S. T. of Sem. Past. Mer.	Date.	Wash. Mean Time.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semi-diam.	S. T. of Sem. Past. Mer.
	h m	h m s	° ' "	"	"	s		h m	h m s	° ' "	"	"	s
Sept. 1	10 34	21 18 11.22	-16 29 12.6	0.5	1.8	0.12	Oct. 17	7 29	21 13 56.93	-16 47 17.4	0.5	1.7	0.12
2	10 30	21 18 2.73	16 29 50.7	0.5	1.8	0.12	18	7 25	21 13 55.37	16 47 22.4	0.5	1.7	0.12
3	10 26	21 17 54.33	16 30 28.3	0.5	1.8	0.12	19	7 21	21 13 54.02	16 47 26.4	0.4	1.7	0.12
4	10 22	21 17 46.02	16 31 5.5	0.5	1.8	0.12	20	7 17	21 13 52.85	16 47 29.7	0.4	1.7	0.12
5	10 18	21 17 37.80	16 31 42.1	0.5	1.8	0.12	21	7 14	21 13 51.88	16 47 32.0	0.4	1.7	0.12
6	10 14	21 17 29.68	-16 32 18.2	0.5	1.8	0.12	22	7 10	21 13 51.11	-16 47 33.4	0.4	1.7	0.12
7	10 10	21 17 21.66	16 32 53.8	0.5	1.8	0.12	23	7 6	21 13 50.55	16 47 33.9	0.4	1.7	0.12
8	10 6	21 17 13.76	16 33 28.8	0.5	1.8	0.12	24	7 2	21 13 50.18	16 47 33.5	0.4	1.7	0.12
9	10 2	21 17 5.95	16 34 3.2	0.5	1.8	0.12	25	6 58	21 13 50.02	16 47 32.3	0.4	1.7	0.12
10	9 58	21 16 58.25	16 34 37.2	0.5	1.8	0.12	26	6 54	21 13 50.06	16 47 30.1	0.4	1.7	0.12
11	9 54	21 16 50.67	-16 35 10.6	0.5	1.8	0.12	27	6 50	21 13 50.30	-16 47 27.0	0.4	1.7	0.12
12	9 50	21 16 43.20	16 35 43.5	0.5	1.8	0.12	28	6 46	21 13 50.74	16 47 22.8	0.4	1.7	0.12
13	9 46	21 16 35.85	16 36 15.7	0.5	1.8	0.12	29	6 42	21 13 51.39	16 47 17.8	0.4	1.7	0.12
14	9 42	21 16 28.63	16 36 47.3	0.5	1.8	0.12	30	6 38	21 13 52.24	16 47 12.0	0.4	1.7	0.12
15	9 37	21 16 21.53	16 37 18.3	0.5	1.8	0.12	31	6 34	21 13 53.29	16 47 5.2	0.4	1.7	0.12
16	9 33	21 16 14.57	-16 37 48.6	0.5	1.8	0.12	Nov. 1	6 30	21 13 54.56	-16 46 57.5	0.4	1.7	0.12
17	9 29	21 16 7.74	16 38 18.3	0.5	1.8	0.12	2	6 26	21 13 56.02	16 46 48.8	0.4	1.7	0.12
18	9 25	21 16 1.04	16 38 47.4	0.5	1.8	0.12	3	6 22	21 13 57.68	16 46 39.3	0.4	1.7	0.12
19	9 21	21 15 54.47	16 39 15.7	0.5	1.8	0.12	4	6 19	21 13 59.56	16 46 28.8	0.4	1.7	0.12
20	9 17	21 15 48.05	16 39 43.4	0.5	1.8	0.12	5	6 15	21 14 1.63	16 46 17.4	0.4	1.7	0.12
21	9 13	21 15 41.77	-16 40 10.3	0.5	1.8	0.12	6	6 11	21 14 3.90	-16 46 5.2	0.4	1.7	0.12
22	9 9	21 15 35.64	16 40 36.6	0.5	1.8	0.12	7	6 7	21 14 6.38	16 45 52.0	0.4	1.7	0.12
23	9 5	21 15 29.66	16 41 2.2	0.5	1.8	0.12	8	6 3	21 14 9.05	16 45 37.9	0.4	1.7	0.12
24	9 1	21 15 23.83	16 41 27.1	0.5	1.8	0.12	9	5 59	21 14 11.93	16 45 22.9	0.4	1.7	0.12
25	8 57	21 15 18.16	16 41 51.2	0.5	1.7	0.12	10	5 55	21 14 15.00	16 45 7.1	0.4	1.7	0.12
26	8 53	21 15 12.64	-16 42 14.5	0.5	1.7	0.12	11	5 51	21 14 18.28	-16 44 50.3	0.4	1.7	0.12
27	8 49	21 15 7.28	16 42 37.1	0.5	1.7	0.12	12	5 48	21 14 21.75	16 44 32.7	0.4	1.7	0.12
28	8 45	21 15 2.08	16 42 58.9	0.5	1.7	0.12	13	5 44	21 14 25.42	16 44 14.2	0.4	1.7	0.12
29	8 41	21 14 57.06	16 43 20.0	0.5	1.7	0.12	14	5 40	21 14 29.29	16 43 54.8	0.4	1.7	0.12
30	8 37	21 14 52.19	16 43 40.3	0.5	1.7	0.12	15	5 36	21 14 33.36	16 43 34.4	0.4	1.7	0.12
Oct. 1	8 33	21 14 47.51	-16 43 59.7	0.5	1.7	0.12	16	5 32	21 14 37.63	-16 43 13.2	0.4	1.7	0.12
2	8 29	21 14 42.99	16 44 18.3	0.5	1.7	0.12	17	5 28	21 14 42.09	16 42 51.2	0.4	1.7	0.12
3	8 25	21 14 38.64	16 44 36.1	0.5	1.7	0.12	18	5 24	21 14 46.74	16 42 28.2	0.4	1.7	0.12
4	8 21	21 14 34.47	16 44 53.1	0.5	1.7	0.12	19	5 20	21 14 51.59	16 42 4.4	0.4	1.7	0.12
5	8 17	21 14 30.48	16 45 9.2	0.5	1.7	0.12	20	5 17	21 14 56.64	16 41 39.7	0.4	1.7	0.12
6	8 13	21 14 26.67	-16 45 24.5	0.5	1.7	0.12	21	5 13	21 15 1.88	-16 41 14.2	0.4	1.7	0.12
7	8 9	21 14 23.04	16 45 39.0	0.5	1.7	0.12	22	5 9	21 15 7.31	16 40 47.8	0.4	1.7	0.12
8	8 5	21 14 19.58	16 45 52.7	0.5	1.7	0.12	23	5 5	21 15 12.92	16 40 20.5	0.4	1.7	0.12
9	8 1	21 14 16.32	16 46 5.6	0.5	1.7	0.12	24	5 1	21 15 18.73	16 39 52.4	0.4	1.7	0.12
10	7 57	21 14 13.24	16 46 17.6	0.5	1.7	0.12	25	4 57	21 15 24.72	16 39 23.3	0.4	1.7	0.12
11	7 53	21 14 10.34	-16 46 28.8	0.5	1.7	0.12	26	4 54	21 15 30.91	-16 38 53.5	0.4	1.7	0.12
12	7 49	21 14 7.63	16 46 39.0	0.5	1.7	0.12	27	4 50	21 15 37.27	16 38 22.9	0.4	1.7	0.12
13	7 45	21 14 5.11	16 46 48.4	0.5	1.7	0.12	28	4 46	21 15 43.82	16 37 51.4	0.4	1.7	0.11
14	7 41	21 14 2.78	16 46 57.0	0.5	1.7	0.12	29	4 42	21 15 50.56	16 37 19.1	0.4	1.7	0.11
15	7 37	21 14 0.64	16 47 4.7	0.5	1.7	0.12	30	4 38	21 15 57.46	16 36 46.0	0.4	1.7	0.11
16	7 33	21 13 58.69	-16 47 11.5	0.5	1.7	0.12	Dec. 1	4 34	21 16 4.55	-16 36 12.1	0.4	1.7	0.11
17	7 29	21 13 56.93	-16 47 17.4	0.5	1.7	0.12	2	4 31	21 16 11.82	-16 35 37.4	0.4	1.6	0.11

Stellar magnitude at opposition, in August, 1916, 6.0.

FOR TRANSIT AT WASHINGTON.

Date.	Wash. Mean Time.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semidiam.	S. T. of Sem. Puss. Mer.	Date.	Wash. Mean Time.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semidiam.	S. T. of Sem. Puss. Mer.
	h m s	h m s	" " "	"	"	s		h m s	h m s	" " "	"	"	s
Jan. 0	13 38	8 16 12.01	+19 27 10.4	0.3	1.3	0.09	Feb. 15	10 32	8 11 2.01	+19 44 7.2	0.3	1.3	0.08
1	13 34	8 16 5.64	19 27 31.4	0.3	1.3	0.09	16	10 28	8 10 55.87	19 44 27.3	0.3	1.3	0.08
2	13 30	8 15 59.22	19 27 52.5	0.3	1.3	0.09	17	10 24	8 10 49.81	19 44 47.1	0.3	1.3	0.09
3	13 26	8 15 52.75	19 28 13.9	0.3	1.3	0.09	18	10 20	8 10 43.81	19 45 6.8	0.3	1.3	0.08
4	13 22	8 15 46.24	19 28 35.4	0.3	1.3	0.09	19	10 16	8 10 37.89	19 45 26.2	0.3	1.3	0.08
5	13 18	8 15 39.67	+19 28 57.2	0.3	1.3	0.09	20	10 12	8 10 32.04	+19 45 45.4	0.3	1.3	0.09
6	13 14	8 15 33.05	19 29 19.0	0.3	1.3	0.09	21	10 8	8 10 26.27	19 46 4.2	0.3	1.3	0.09
7	13 10	8 15 26.39	19 29 40.9	0.3	1.3	0.09	22	10 4	8 10 20.59	19 46 22.9	0.3	1.3	0.08
8	13 6	8 15 19.68	19 30 3.0	0.3	1.3	0.09	23	10 0	8 10 14.98	19 46 41.3	0.3	1.3	0.09
9	13 1	8 15 12.93	19 30 25.2	0.3	1.3	0.09	24	9 56	8 10 9.46	19 46 59.5	0.3	1.3	0.09
10	12 57	8 15 6.15	+19 30 47.5	0.3	1.3	0.09	25	9 52	8 10 4.02	+19 47 17.3	0.3	1.3	0.08
11	12 53	8 14 59.34	19 31 9.9	0.3	1.3	0.09	26	9 47	8 9 58.67	19 47 34.9	0.3	1.3	0.09
12	12 49	8 14 52.50	19 31 32.4	0.3	1.3	0.09	27	9 43	8 9 53.42	19 47 52.3	0.3	1.3	0.09
13	12 45	8 14 45.64	19 31 54.9	0.3	1.3	0.09	28	9 39	8 9 48.25	19 48 9.3	0.3	1.3	0.09
14	12 41	8 14 38.74	19 32 17.6	0.3	1.3	0.09	29	9 35	8 9 43.18	19 48 26.1	0.3	1.3	0.09
15	12 37	8 14 31.83	+19 32 40.3	0.3	1.3	0.09	Mar. 1	9 31	8 9 38.20	+19 48 42.5	0.3	1.3	0.08
16	12 33	8 14 24.90	19 33 3.1	0.3	1.3	0.09	2	9 27	8 9 33.32	19 48 58.6	0.3	1.3	0.08
17	12 29	8 14 17.95	19 33 25.9	0.3	1.3	0.09	3	9 23	8 9 28.55	19 49 14.5	0.3	1.3	0.08
18	12 25	8 14 11.00	19 33 48.7	0.3	1.3	0.09	4	9 19	8 9 23.87	19 49 30.0	0.3	1.3	0.09
19	12 21	8 14 4.02	19 34 11.6	0.3	1.3	0.09	5	9 15	8 9 19.30	19 49 45.1	0.3	1.3	0.08
20	12 17	8 13 57.05	+19 34 34.5	0.3	1.3	0.09	6	9 11	8 9 14.85	+19 49 59.9	0.3	1.3	0.08
21	12 13	8 13 50.05	19 34 57.4	0.3	1.3	0.09	7	9 7	8 9 10.50	19 50 14.5	0.3	1.3	0.08
22	12 9	8 13 43.06	19 35 20.3	0.3	1.3	0.09	8	9 3	8 9 6.25	19 50 28.7	0.3	1.3	0.08
23	12 5	8 13 36.08	19 35 43.2	0.3	1.3	0.09	9	8 59	8 9 2.13	19 50 42.5	0.3	1.3	0.08
24	12 1	8 13 29.10	19 36 6.1	0.3	1.3	0.09	10	8 55	8 8 58.11	19 50 55.9	0.3	1.3	0.08
25	11 57	8 13 22.12	+19 36 28.9	0.3	1.3	0.09	11	8 51	8 8 54.22	+19 51 9.1	0.3	1.3	0.08
26	11 53	8 13 15.15	19 36 51.8	0.3	1.3	0.09	12	8 47	8 8 50.43	19 51 21.9	0.3	1.3	0.08
27	11 49	8 13 8.19	19 37 14.6	0.3	1.3	0.09	13	8 43	8 8 46.77	19 51 34.3	0.3	1.3	0.08
28	11 45	8 13 1.24	19 37 37.3	0.3	1.3	0.09	14	8 39	8 8 43.21	19 51 46.3	0.3	1.3	0.08
29	11 40	8 12 54.33	19 37 59.9	0.3	1.3	0.09	15	8 35	8 8 39.78	19 51 58.0	0.3	1.3	0.08
30	11 36	8 12 47.42	+19 38 22.5	0.3	1.3	0.09	16	8 31	8 8 36.48	+19 52 9.3	0.3	1.3	0.08
31	11 32	8 12 40.54	19 38 45.0	0.3	1.3	0.09	17	8 27	8 8 33.30	19 52 20.2	0.3	1.3	0.08
Feb. 1	11 28	8 12 33.68	19 39 7.4	0.3	1.3	0.09	18	8 23	8 8 30.23	19 52 30.7	0.3	1.3	0.08
2	11 24	8 12 26.85	19 39 29.8	0.3	1.3	0.09	19	8 19	8 8 27.29	19 52 41.0	0.3	1.3	0.08
3	11 20	8 12 20.06	19 39 52.0	0.3	1.3	0.09	20	8 15	8 8 24.49	19 52 50.8	0.3	1.3	0.08
4	11 16	8 12 13.30	+19 40 14.1	0.3	1.3	0.09	21	8 11	8 8 21.79	+19 53 0.2	0.3	1.3	0.09
5	11 12	8 12 6.57	19 40 36.1	0.3	1.3	0.09	22	8 8	8 8 19.23	19 53 9.2	0.3	1.3	0.08
6	11 8	8 11 59.89	19 40 58.0	0.3	1.3	0.09	23	8 4	8 8 16.80	19 53 17.8	0.3	1.3	0.09
7	11 4	8 11 53.25	19 41 19.6	0.3	1.3	0.09	24	8 0	8 8 14.50	19 53 26.0	0.3	1.3	0.08
8	11 0	8 11 46.65	19 41 41.2	0.3	1.3	0.09	25	7 56	8 8 12.32	19 53 33.9	0.3	1.3	0.08
9	10 56	8 11 40.10	+19 42 2.6	0.3	1.3	0.09	26	7 52	8 8 10.29	+19 53 41.4	0.3	1.3	0.08
10	10 52	8 11 33.62	19 42 23.8	0.3	1.3	0.09	27	7 48	8 8 8.38	19 53 48.4	0.3	1.3	0.08
11	10 48	8 11 27.18	19 42 44.9	0.3	1.3	0.09	28	7 44	8 8 6.61	19 53 55.1	0.3	1.3	0.08
12	10 44	8 11 20.79	19 43 5.8	0.3	1.3	0.09	29	7 40	8 8 4.97	19 54 1.3	0.3	1.3	0.09
13	10 40	8 11 14.46	19 43 26.4	0.3	1.3	0.09	30	7 36	8 8 3.47	19 54 7.1	0.3	1.3	0.09
14	10 36	8 11 8.21	+19 43 46.9	0.3	1.3	0.09	31	7 32	8 8 2.09	+19 54 12.5	0.3	1.3	0.09
15	10 32	8 11 2.01	+19 44 7.2	0.3	1.3	0.09	Apr. 1	7 28	8 8 0.86	+19 54 17.5	0.3	1.3	0.08

Stellar magnitude at opposition, in January, 1916, 7.7.

FOR TRANSIT AT WASHINGTON.

Date.	Wash. Mean Time.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semidiam.	S. T. of Sem. Pass. Mer.	Date.	Wash. Mean Time.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semidiam.	S. T. of Sem. Pass. Mer.
	h m	h m s	" ' "	"	" s			h m	h m s	" ' "	"	" s	
Apr. 1	7 28	8 8 0.86	+19 54 17.5	0.3	1.3	0.09	Nov. 16	16 44	8 28 36.44	+18 49 19.9	0.3	1.3	0.09
2	7 24	8 7 59.76	19 54 22.0	0.3	1.3	0.09	17	16 40	8 28 35.00	18 49 25.1	0.3	1.3	0.09
3	7 20	8 7 58.81	19 54 26.2	0.3	1.3	0.09	18	16 36	8 28 33.43	18 49 30.9	0.3	1.3	0.09
4	7 16	8 7 57.99	19 54 30.0	0.3	1.3	0.09	19	16 32	8 28 31.73	18 49 37.0	0.3	1.3	0.09
5	7 12	8 7 57.30	19 54 33.4	0.3	1.3	0.09	20	16 28	8 28 29.89	18 49 43.6	0.3	1.3	0.09
6	7 8	8 7 56.76	+19 54 36.3	0.3	1.3	0.09	21	16 24	8 28 27.91	+18 49 50.8	0.3	1.3	0.09
7	7 4	8 7 56.34	19 54 38.8	0.3	1.3	0.09	22	16 20	8 28 25.80	18 49 58.4	0.3	1.3	0.09
8	7 0	8 7 56.07	19 54 40.8	0.3	1.3	0.09	23	16 16	8 28 23.55	18 50 6.4	0.3	1.3	0.09
9	6 56	8 7 55.94	19 54 42.5	0.3	1.3	0.09	24	16 12	8 28 21.18	18 50 14.9	0.3	1.3	0.09
10	6 52	8 7 55.95	19 54 43.7	0.3	1.3	0.09	25	16 8	8 28 18.67	18 50 24.0	0.3	1.3	0.09
11	6 48	8 7 56.09	+19 54 44.5	0.3	1.3	0.09	26	16 4	8 28 16.03	+18 50 33.5	0.3	1.3	0.09
12	6 45	8 7 56.38	19 54 44.8	0.3	1.3	0.09	27	16 0	8 28 13.27	18 50 43.4	0.3	1.3	0.09
13	6 41	8 7 56.80	19 54 44.9	0.3	1.3	0.09	28	15 56	8 28 10.39	18 50 53.7	0.3	1.3	0.09
14	6 37	8 7 57.36	19 54 44.4	0.3	1.3	0.09	29	15 52	8 28 7.37	18 51 4.5	0.3	1.3	0.09
15	6 33	8 7 58.05	19 54 43.5	0.3	1.3	0.09	30	15 48	8 28 4.23	18 51 15.9	0.3	1.3	0.09
16	6 29	8 7 58.90	+19 54 42.2	0.3	1.3	0.09	Dec. 1	15 44	8 28 0.96	+18 51 27.6	0.3	1.3	0.09
17	6 25	8 7 59.88	19 54 40.4	0.3	1.3	0.09	2	15 40	8 27 57.57	18 51 39.7	0.3	1.3	0.09
18	6 21	8 8 0.98	19 54 38.3	0.3	1.3	0.09	3	15 36	8 27 54.07	18 51 52.2	0.3	1.3	0.09
19	6 17	8 8 2.23	19 54 35.7	0.3	1.3	0.09	4	15 32	8 27 50.44	18 52 5.1	0.3	1.3	0.09
20	6 13	8 8 3.62	19 54 32.7	0.3	1.3	0.09	5	15 28	8 27 46.70	18 52 18.5	0.3	1.3	0.09
Oct. 21	18 26	8 28 25.29	+18 49 55.1	0.3	1.3	0.09	6	15 24	8 27 42.85	+18 52 32.3	0.3	1.3	0.09
22	18 22	8 28 27.46	18 49 47.6	0.3	1.3	0.09	7	15 20	8 27 38.87	18 52 46.5	0.3	1.3	0.09
23	18 18	8 28 29.49	18 49 40.7	0.3	1.3	0.09	8	15 16	8 27 34.78	18 53 1.0	0.3	1.3	0.09
24	18 14	8 28 31.37	18 49 34.2	0.3	1.3	0.09	9	15 12	8 27 30.58	18 53 15.9	0.3	1.3	0.09
25	18 11	8 28 33.12	18 49 28.2	0.3	1.3	0.09	10	15 8	8 27 26.27	18 53 31.2	0.3	1.3	0.09
26	18 7	8 28 34.73	+18 49 22.7	0.3	1.3	0.09	11	15 4	8 27 21.86	+18 53 46.9	0.3	1.3	0.09
27	18 3	8 28 36.20	18 49 17.7	0.3	1.3	0.09	12	15 0	8 27 17.34	18 54 3.0	0.3	1.3	0.09
28	17 59	8 28 37.53	18 49 13.2	0.3	1.3	0.09	13	14 56	8 27 12.73	18 54 19.3	0.3	1.3	0.09
29	17 55	8 28 38.72	18 49 9.2	0.3	1.3	0.09	14	14 52	8 27 8.01	18 54 36.1	0.3	1.3	0.09
30	17 51	8 28 39.79	18 49 5.5	0.3	1.3	0.09	15	14 48	8 27 3.18	18 54 53.3	0.3	1.3	0.09
31	17 47	8 28 40.70	+18 49 2.3	0.3	1.3	0.09	16	14 44	8 26 58.26	+18 55 10.9	0.3	1.3	0.09
Nov. 1	17 43	8 28 41.47	18 48 59.7	0.3	1.3	0.09	17	14 40	8 26 53.23	18 55 28.7	0.3	1.3	0.09
2	17 39	8 28 42.11	18 48 57.6	0.3	1.3	0.09	18	14 36	8 26 48.11	18 55 46.8	0.3	1.3	0.09
3	17 35	8 28 42.61	18 48 56.1	0.3	1.3	0.09	19	14 32	8 26 42.89	18 56 5.4	0.3	1.3	0.09
4	17 31	8 28 42.97	18 48 55.0	0.3	1.3	0.09	20	14 28	8 26 37.59	18 56 24.2	0.3	1.3	0.09
5	17 27	8 28 43.19	+18 48 54.4	0.3	1.3	0.09	21	14 24	8 26 32.19	+18 56 43.2	0.3	1.3	0.09
6	17 24	8 28 43.27	18 48 54.3	0.3	1.3	0.09	22	14 20	8 26 26.70	18 57 2.6	0.3	1.3	0.09
7	17 20	8 28 43.20	18 48 54.7	0.3	1.3	0.09	23	14 16	8 26 21.13	18 57 22.3	0.3	1.3	0.09
8	17 16	8 28 43.00	18 48 55.4	0.3	1.3	0.09	24	14 12	8 26 15.47	18 57 42.4	0.3	1.3	0.09
9	17 12	8 28 42.66	18 48 56.8	0.3	1.3	0.09	25	14 8	8 26 9.75	18 58 2.7	0.3	1.3	0.09
10	17 8	8 28 42.19	+18 48 58.6	0.3	1.3	0.09	26	14 4	8 26 3.93	+18 58 23.2	0.3	1.3	0.09
11	17 4	8 28 41.58	18 49 0.9	0.3	1.3	0.09	27	14 0	8 25 58.04	18 58 44.1	0.3	1.3	0.09
12	17 0	8 28 40.83	18 49 3.8	0.3	1.3	0.09	28	13 56	8 25 52.08	18 59 5.1	0.3	1.3	0.09
13	16 56	8 28 39.94	18 49 7.1	0.3	1.3	0.09	29	13 52	8 25 46.05	18 59 26.4	0.3	1.3	0.09
14	16 52	8 28 38.91	18 49 10.9	0.3	1.3	0.09	30	13 48	8 25 39.96	18 59 47.9	0.3	1.3	0.09
15	16 48	8 28 37.74	+18 49 15.1	0.3	1.3	0.09	31	13 44	8 25 33.79	+19 0 9.6	0.3	1.3	0.09
16	16 44	8 28 36.44	+18 49 19.9	0.3	1.3	0.09	32	13 40	8 25 27.56	+19 0 31.5	0.3	1.3	0.09

Stellar magnitude at opposition, in January, 1917, 7.7.

PART III.

PHENOMENA.

In the year 1916 there will be five eclipses, three of the Sun and two of the Moon.

I.—*A Partial Eclipse of the Moon*, 1916, January 19, visible at Washington; the beginning visible generally in extreme western Europe, the north Atlantic Ocean, North and South America, and the Pacific Ocean; the ending visible generally in North America, the north Atlantic Ocean, northwestern South America, northeast Asia, and the Pacific Ocean.

ELEMENTS OF THE ECLIPSE.

Greenwich mean time of δ in right ascension, January 19				d	h	m	s
				19	20	5	19.1
Sun's right ascension	h	m	s	20	4	20.92	
Moon's right ascension	h	m	s	8	4	20.92	
Sun's declination				-20	22	49.5	
Moon's declination				+21	15	3.7	
Sun's equa. hor. parallax						8.9	
Moon's equa. hor. parallax				54	28.1		
Hourly motion							10.62
Hourly motion							123.78
Hourly motion							+ 0 31.4
Hourly motion							- 8 51.5
Sun's true semidiameter							16 15.3
Moon's true semidiameter							14 49.8

CIRCUMSTANCES OF THE ECLIPSE.

Jan.				d	h	m	
				19	18	4.6	
Moon enters penumbra				19	19	55.0	
Moon enters shadow				19	20	39.5	
Middle of the eclipse				19	21	24.0	
Moon leaves shadow				19	23	14.3	
Moon leaves penumbra				19	23	14.3	
				Greenwich Mean Time.			
Contacts of shadow with Moon's limb.	Angles of position from the north point.			The Moon being in the zenith in longitude from Greenwich, and in latitude.			
First	175 to E.			+116	7	+21	17
Last	140 to W.			+137	41	+21	3

Magnitude of the eclipse = 0.137 (Moon's diameter = 1.0).

II.—*A Total Eclipse of the Sun*, 1916, February 3, visible at Washington as a partial eclipse.

ELEMENTS OF THE ECLIPSE.

Greenwich mean time of δ in right ascension, February 3				d	h	m	s
				3	4	21	39.2
Sun and Moon's R. A.	h	m	s	21	3	58.74	
Sun's declination				-16	46	18.2	
Moon's declination				-16	13	52.3	
Sun's equa. hor. parallax						8.9	
Moon's equa. hor. parallax				60	19.4		
Hourly motions							10.15 and 142.67
Hourly motion							+ 0 43.6
Hourly motion							+13 45.9
Sun's true semidiameter							16 13.5
Moon's true semidiameter							16 25.4

CIRCUMSTANCES OF THE ECLIPSE.

Greenwich Mean Time.				Longitude from Greenwich.				Latitude.			
				d	h	m					
Eclipse begins	Feb.	3	1 26.9	+109	15.5	- 3	17.1				
Central eclipse begins		3	2 29.2	+121	35.6	+ 7	20.8				
Central eclipse at local apparent noon		3	4 21.7	+ 61	56.5	+15	57.2				
Central eclipse ends		3	5 31.0	+ 9	50.2	+49	23.8				
Eclipse ends		3	6 33.3	+ 19	6.1	+39	16.0				

III.—*A Partial Eclipse of the Moon*, 1916, July 14, visible at Washington; the beginning visible generally in Africa, southwestern Europe, the Atlantic Ocean, North America except the more western portions, South America, and the South Pacific Ocean; the ending visible generally in the Atlantic Ocean, North and South America, and the south Pacific Ocean.

ELEMENTS OF THE ECLIPSE.

Greenwich mean time of δ in right ascension, July 14 16 29 34.3

Sun's right ascension	^h 7 ^m 36 ^s 29.27	Hourly motion	^s 10.12
Moon's right ascension	19 36 29.27	Hourly motion	159.64
	" "		" "
Sun's declination	+21 35 58.9	Hourly motion	—0 23.3
Moon's declination	—22 13 50.2	Hourly motion	+9 38.0
Sun's equa. hor. parallax	8.7	Sun's true semidiameter	15 44.1
Moon's equa. hor. parallax	61 23.4	Moon's true semidiameter	16 42.9

CIRCUMSTANCES OF THE ECLIPSE.

	^d ^h ^m	
Moon enters penumbra	July 14 14 18.3	Greenwich Mean Time.
Moon enters shadow	14 15 19.3	
Middle of the eclipse	14 16 45.9	
Moon leaves shadow	14 18 12.5	
Moon leaves penumbra	14 19 13.6	

Contacts of shadow with Moon's limb.	Angles of position from the north point.	The Moon being in the zenith in longitude from Greenwich,		and in latitude.	
First	40 to E.	+49	8	—22	25
Last	70 to W.	+90	38	—21	57

Magnitude of the eclipse=0.800 (Moon's diameter=1.0).

IV.—*An Annular Eclipse of the Sun*, 1916, July 29, invisible at Washington.

ELEMENTS OF THE ECLIPSE.

Greenwich mean time of δ in right ascension, July 29 14 39 30.3

Sun and Moon's R. A.	^h 8 ^m 35 ^s 53.91	Hourly motions	^s 9.77 and ^s 117.77
	" "		" "
Sun's declination	+18 38 11.8	Hourly motion	— 0 35.9
Moon's declination	+17 53 51.1	Hourly motion	—10 3.1
Sun's equa. hor. parallax	8.7	Sun's true semidiameter	15 45.3
Moon's equa. hor. parallax	54 7.0	Moon's true semidiameter	14 44.0

CIRCUMSTANCES OF THE ECLIPSE.

	Greenwich Mean Time.	Longitude from Greenwich.	Latitude.
	^d ^h ^m	[°] ['] [°]	[°] ['] [°]
Eclipse begins	July 29 11 24.9	—103 23.2	— 8 55.8
Central eclipse begins	29 12 50.8	— 89 32.1	—28 44.6
Central eclipse at local apparent noon	29 14 39.5	—141 41.5	—36 53.7
Central eclipse ends	29 15 20.8	—178 36.5	—63 35.6
Eclipse ends	29 16 46.8	—179 5.1	—46 29.6

V.—*A Partial Eclipse of the Sun, 1916, December 24, invisible at Washington.*

ELEMENTS OF THE ECLIPSE.

Greenwich mean time of \odot in right ascension, December 24				d	h	m	s
				8	27	39.5	
Sun and Moon's R. A.	h	m	s	Hourly motions			
	18	11	56.27	11.11 and 164.59			
Sun's declination	-23	25	21.1	Hourly motion			
				+ 0 3.2			
Moon's declination	-24	58	58.2	Hourly motion			
				+ 4 4.1			
Sun's equa. hor. parallax	8.9			Sun's true semidiameter			
				16 15.7			
Moon's equa. hor. parallax	60	50.0		Moon's true semidiameter			
				16 33.8			

CIRCUMSTANCES OF THE ECLIPSE.

	Greenwich Mean Time.			Longitude from Greenwich.		Latitude.	
	d	h	m	"	'	"	'
Eclipse begins	Dec.	24	8	32.4	-47	39.9	-66 31.5
Greatest eclipse		24	8	46.2	-32	10.5	-65 43.2
Eclipse ends		24	9	0.1	-17	42.7	-64 1.7

Magnitude of greatest eclipse=0.011 (Sun's diameter=1.0).

The regions within which the first two eclipses of the Sun are visible are laid down on the accompanying charts, from which, by means of the dotted lines, the Greenwich mean times of beginning and ending at any place may be found with an uncertainty which will vary from three or four minutes for a high Sun to fifteen or twenty minutes when the Sun is near the horizon.

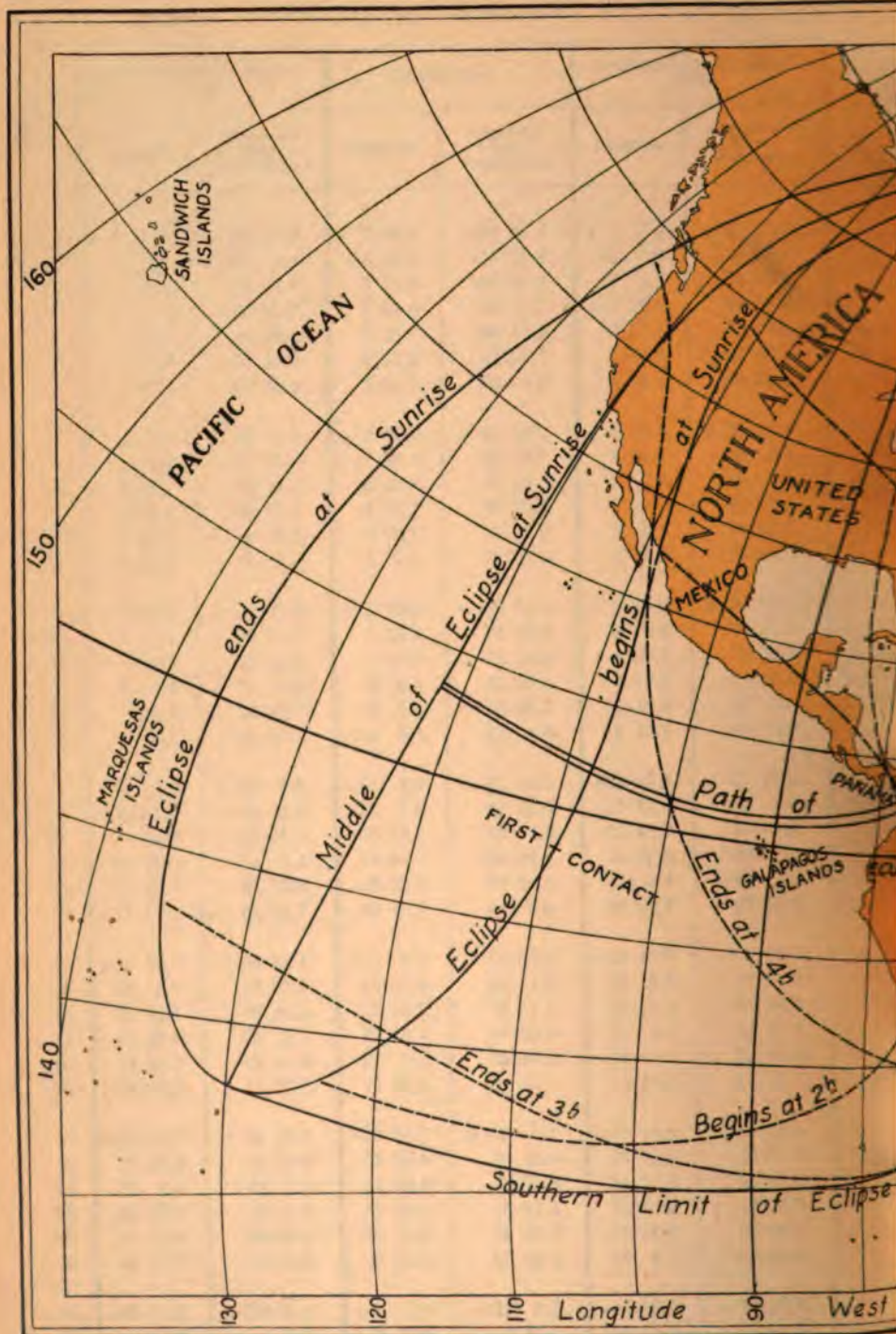
**BESSELIAN ELEMENTS OF THE TOTAL ECLIPSE OF THE SUN,
1916, FEBRUARY 3.**

Greenwich Mean Time.	Coordinates of Center of Shadow on Fundamental Plane.		Direction of Axis of Shadow.			Radius of Penumbra and Shadow on Fundamental Plane.	
	<i>x</i>	<i>y</i>	Log sin <i>d</i>	Log cos <i>d</i>	<i>μ</i>	<i>l</i> ₁	<i>l</i> ₂
h m					° ′		
1 20	-1.60070	-0.11678	-9.46115	+9.98104	16 31.7	+0.54225	-0.00365
30	1.51258	0.08073	9.46110	9.98104	19 1.7	0.54227	0.00362
40	1.42445	0.04467	9.46105	9.98105	21 31.7	0.54230	0.00360
50	1.33633	-0.00861	9.46100	9.98105	24 1.7	0.54232	0.00358
2 0	-1.24821	+0.02746	-9.46095	+9.98106	26 31.7	+0.54234	-0.00356
10	1.16009	0.06354	9.46091	9.98106	29 1.7	0.54236	0.00353
20	1.07196	0.09962	9.46086	9.98106	31 31.7	0.54239	0.00351
30	0.98384	0.13571	9.46081	9.98107	34 1.7	0.54241	0.00349
40	0.89572	0.17180	9.46076	9.98107	36 31.7	0.54243	0.00347
50	0.80760	0.20790	9.46071	9.98108	39 1.7	0.54245	0.00345
3 0	-0.71948	+0.24400	-9.46066	+9.98108	41 31.7	+0.54246	-0.00344
10	0.63138	0.28011	9.46062	9.98109	44 1.7	0.54248	0.00342
20	0.54324	0.31622	9.46057	9.98109	46 31.7	0.54250	0.00340
30	0.45512	0.35234	9.46052	9.98110	49 1.7	0.54252	0.00338
40	0.36701	0.38846	9.46047	9.98110	51 31.7	0.54253	0.00337
50	0.27890	0.42459	9.46042	9.98110	54 1.7	0.54255	0.00335
4 0	-0.19078	+0.46072	-9.46037	+9.98111	56 31.7	+0.54256	-0.00334
10	0.10268	0.49886	9.46032	9.98111	59 1.7	0.54257	0.00333
20	-0.01457	0.53300	9.46028	9.98112	61 31.7	0.54259	0.00331
30	+0.07353	0.56915	9.46023	9.98112	64 1.7	0.54260	0.00330
40	0.16163	0.60530	9.46018	9.98113	66 31.7	0.54261	0.00329
50	0.24973	0.64145	9.46013	9.98113	69 1.7	0.54262	0.00328
5 0	+0.33782	+0.67761	-9.46008	+9.98114	71 31.7	+0.54263	-0.00327
10	0.42591	0.71377	9.46003	9.98114	74 1.7	0.54264	0.00326
20	0 51399	0.74994	9.45999	9.98114	76 31.7	0.54265	0.00325
30	0.60207	0.78611	9.45994	9.98115	79 1.7	0.54266	0.00324
40	0.69015	0.82228	9.45989	9.98115	81 31.7	0.54266	0.00324
50	0.77822	0.85846	9.45984	9.98116	84 1.7	0.54267	0.00323
6 0	+0.86628	+0.89464	-9.45979	+9.98116	86 31.7	+0.54268	-0.00322
10	0.95434	0.93082	9.45974	9.98117	89 1.7	0.54268	0.00322
20	1.04239	0.96701	9.45969	9.98117	91 31.7	0.54269	0.00322
30	1.13044	1.00320	9.45965	9.98118	94 1.7	0.54269	0.00321
40	+1.21848	+1.03939	-9.45960	+9.98118	96 31.7	+0.54269	-0.00321
Greenwich Mean Time.	Log <i>x'</i> for 1 Minute.	Log <i>y'</i> for 1 Minute.	Log <i>μ'</i> for 1 Minute.	Log Tangents of Angles of Conus.			
				Penumbra.		Shadow.	
h m							
1 0	+7.9451	+7.5568	+1.1761	+7.67608		+7.67391	
2 0	7.9451	7.5572	1.1761	7.67608		7.67391	
3 0	7.9451	7.5576	1.1761	7.67608		7.67391	
4 0	7.9450	7.5579	1.1761	7.67608		7.67391	
5 0	7.9449	7.5582	1.1761	7.67607		7.67390	
6 0	7.9448	7.5585	1.1761	7.67607		7.67390	
7 0	+7.9446	+7.5587	+1.1761	+7.67607		+7.67390	

PATH OF THE SHADOW DURING THE TOTAL ECLIPSE OF THE
SUN, 1916, FEBRUARY 3.

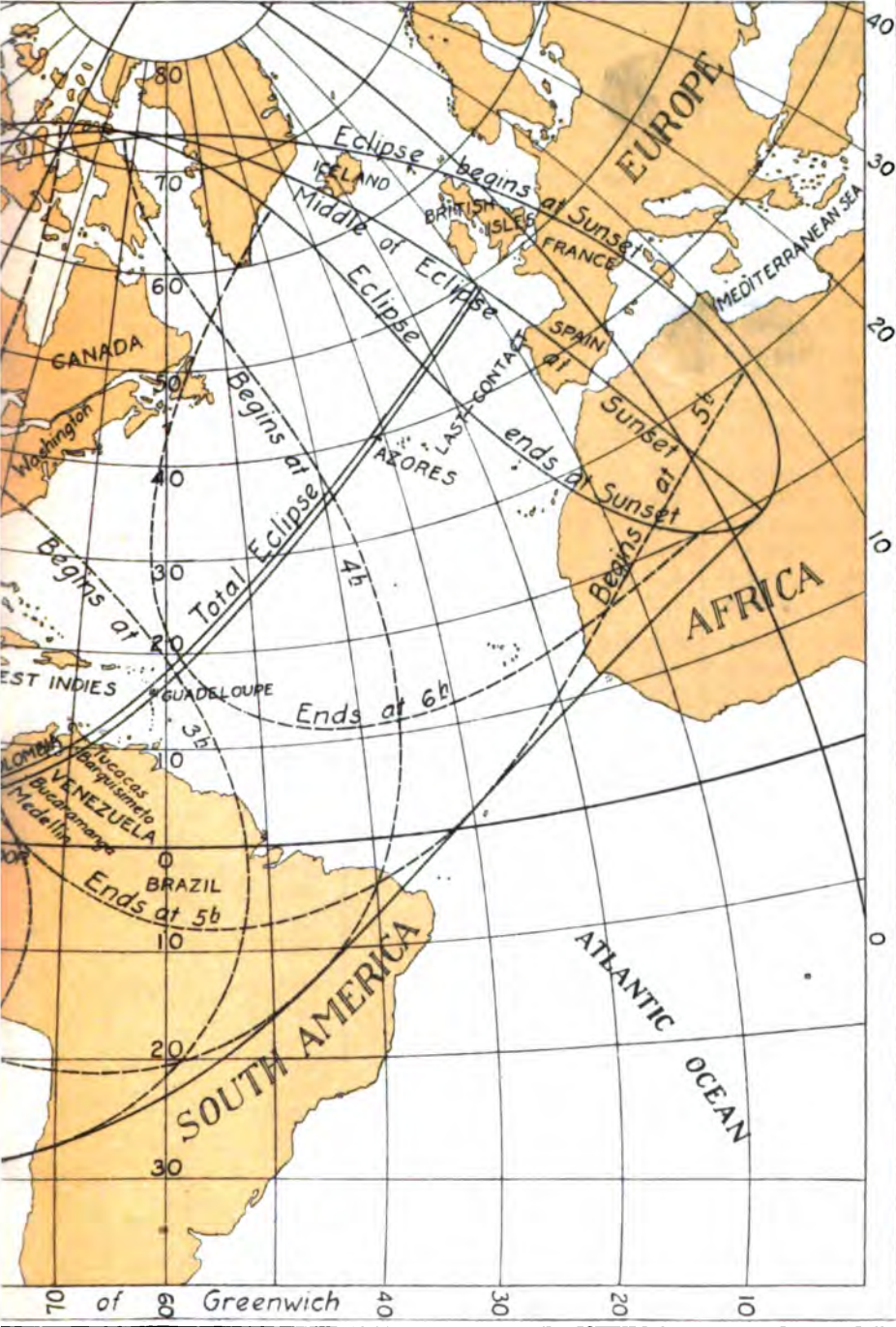
Green- wich Mean Time.	Northern Limit of Shadow Path.		Central Line.		Southern Limit of Shadow Path.		Duration of Totality on Central Line.
	Latitude.	Longitude from Greenwich.	Latitude.	Longitude from Greenwich.	Latitude.	Longitude from Greenwich.	
Limits.	+ 7 34.1	+121 34.0	+ 7 20.8	+121 35.6	+ 7 7.6	+121 37.2	∞
2 ^h 30 ^m	6 1.3	116 4.4	5 33.6	115 19.0	5 7.0	114 38.3	0 57.1
35	3 47.0	105 54.1	3 24.4	105 34.3	3 1.7	105 15.0	1 16.4
40	3 2.2	100 31.8	2 39.3	100 15.2	2 16.2	99 58.9	1 23.7
45	2 44.2	96 30.4	2 20.7	96 14.9	1 57.1	95 59.8	1 33.7
50	2 41.2	93 12.2	2 17.1	92 57.1	1 53.0	92 42.4	1 47.5
55	2 48.4	90 21.8	2 23.9	90 6.9	1 59.4	89 52.2	1 55.1
3 0	+ 3 3.3	+ 87 51.1	+ 2 38.5	+ 87 36.2	+ 2 13.7	+ 87 21.4	2 2.1
5	3 24.4	85 35.2	2 59.4	85 20.1	2 34.3	85 5.2	2 3.3
10	3 50.7	83 30.9	3 25.4	83 15.7	3 0.2	83 0.5	2 13.5
15	4 21.4	81 35.9	3 56.1	81 20.5	3 30.7	81 5.1	2 18.7
20	4 56.2	79 48.5	4 30.8	79 32.9	4 5.4	79 17.2	2 22.9
25	5 34.6	78 7.3	5 9.1	77 51.4	4 43.7	77 35.6	2 26.5
30	+ 6 16.3	+ 76 31.3	+ 5 50.9	+ 76 15.2	+ 5 25.5	+ 75 59.2	2 29.6
35	7 1.2	74 59.5	6 35.8	74 43.3	6 10.6	74 27.1	2 32.4
40	7 49.1	73 31.3	7 23.9	73 14.9	6 58.7	72 58.5	2 33.9
45	8 39.9	72 5.9	8 14.8	71 49.4	7 49.9	71 32.9	2 35.1
50	9 33.6	70 42.7	9 8.7	70 26.1	8 43.9	70 9.6	2 36.4
55	10 30.1	69 21.2	10 5.4	69 4.6	9 40.8	68 48.0	2 38.2
4 0	+11 29.4	+ 68 0.8	+11 4.9	+ 67 44.2	+10 40.5	+ 67 27.6	2 38.9
5	12 31.6	66 41.1	12 7.3	66 24.5	11 43.1	66 7.9	2 35.1
10	13 36.8	65 21.3	13 12.7	65 4.9	12 48.7	64 48.4	2 33.9
15	14 45.0	64 1.1	14 21.1	63 44.8	13 57.3	63 28.4	2 32.1
20	15 56.4	62 39.8	15 32.7	62 23.7	15 9.1	62 7.5	2 29.9
25	17 11.1	61 16.7	16 47.7	61 0.9	16 24.2	60 44.9	2 27.2
30	+18 29.5	+ 59 51.1	+18 6.2	+ 59 35.6	+17 43.0	+ 59 20.0	2 24.0
35	19 51.7	58 22.1	19 28.6	58 7.0	19 5.6	57 51.8	2 20.4
40	21 18.2	56 48.8	20 55.3	56 34.1	20 32.4	56 19.3	2 16.3
45	22 49.5	55 9.7	22 26.7	54 55.6	22 4.0	54 41.4	2 11.7
50	24 26.1	53 23.3	24 3.4	53 10.0	23 40.9	52 56.5	2 6.7
55	26 8.9	51 27.5	25 46.4	51 15.1	25 24.0	51 2.4	2 1.1
5 0	+27 59.1	+ 49 19.5	+27 36.7	+ 49 8.1	+27 14.4	+ 48 56.5	1 55.1
5	29 58.3	46 55.0	29 35.9	46 45.0	29 13.6	46 34.7	1 48.4
10	32 9.0	44 7.8	31 46.6	43 59.6	31 24.3	43 51.0	1 41.1
15	34 35.2	40 47.2	34 12.6	40 41.5	33 50.3	40 35.3	1 32.5
20	37 24.3	36 32.8	37 1.3	36 30.8	36 38.7	36 28.2	1 23.4
25	40 54.3	30 34.0	40 30.4	30 39.0	40 6.7	30 43.2	1 11.9
30	+46 34.6	+ 18 23.6	+46 1.9	+ 19 3.8	+45 30.9	+ 19 38.6	0 54.1
Limits.	+49 35.2	+ 9 56.6	+49 23.8	+ 9 50.2	+49 12.3	+ 9 43.8	∞

TOTAL ECLIPSE OF



Note:- The hours of beginning and ending

FEBRUARY 3RD 1916



are expressed in Greenwich Mean Time.

THE MORRIS PETERS CO., WASHINGTON, D. C.



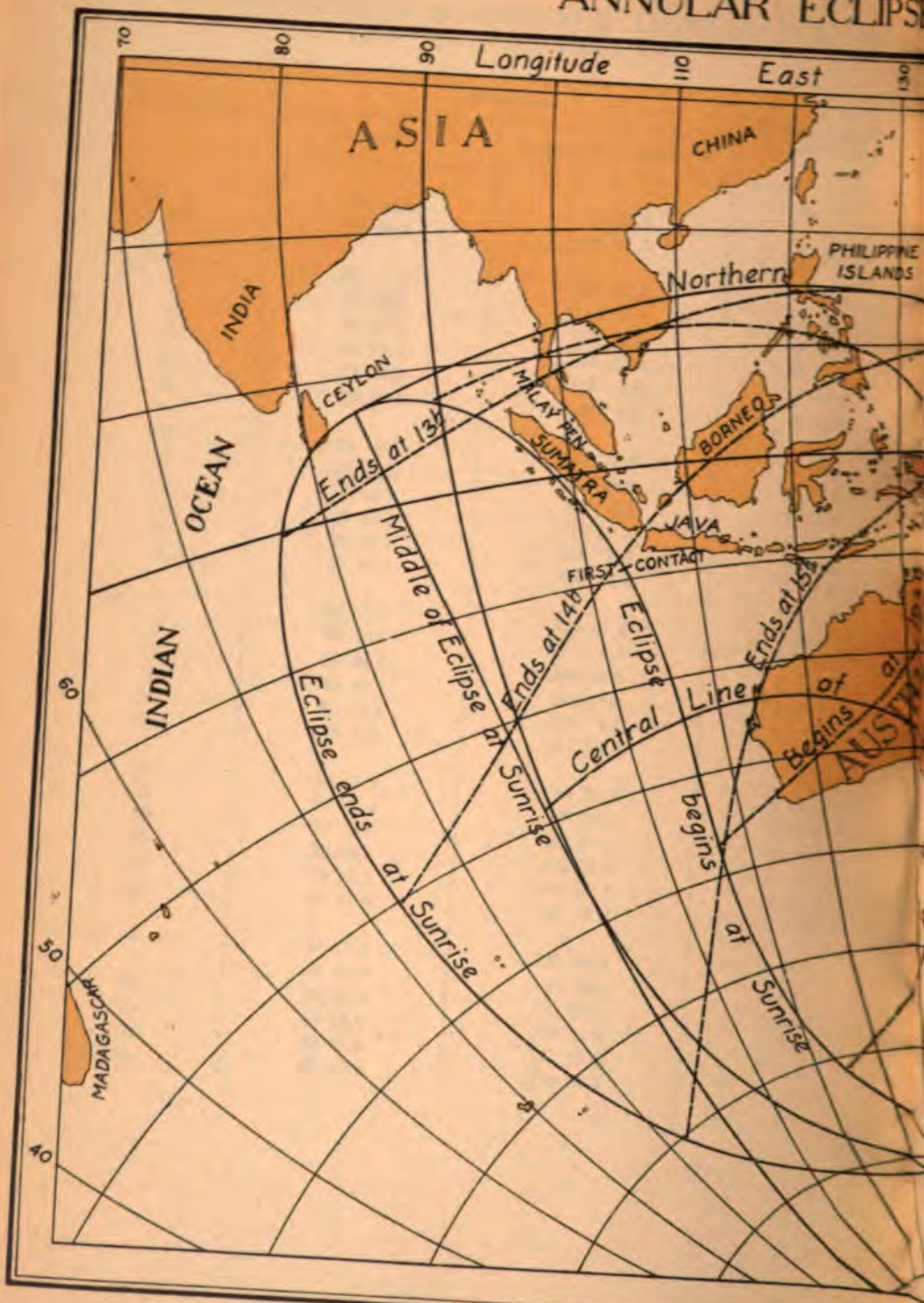
BESSELIAN ELEMENTS OF THE ANNULAR ECLIPSE OF THE SUN, 1916, JULY 29.

Greenwich Mean Time.	Coordinates of Center of Shadow on Fundamental Plane.		Direction of Axis of Shadow.			Radius of Penumbra and Shadow on Fundamental Plane.	
	x	y	Log sin d	Log cos d	μ	h_1	h_2
h m							
11 20	-1.58299	-0.24058	+9.50532	+9.97652	168 25.6	+0.56494	+0.01893
30	1.50365	0.26966	9.50528	9.97653	170 55.6	0.56495	0.01894
40	1.42430	0.29874	9.50525	9.97653	173 25.6	0.56495	0.01894
50	1.34496	0.32783	9.50521	9.97653	175 55.6	0.56495	0.01894
12 0	-1.26561	-0.35692	+9.50517	+9.97654	178 25.6	+0.56495	+0.01894
10	1.18626	0.38602	9.50514	9.97654	180 55.7	0.56495	0.01894
20	1.10691	0.41512	9.50510	9.97655	183 25.7	0.56495	0.01894
30	1.02756	0.44423	9.50507	9.97655	185 55.7	0.56495	0.01894
40	0.94821	0.47335	9.50503	9.97655	188 25.7	0.56495	0.01894
50	0.86887	0.50246	9.50500	9.97656	190 55.7	0.56495	0.01894
13 0	-0.78952	-0.53159	+9.50496	+9.97656	193 25.7	+0.56495	+0.01894
10	0.71017	0.56072	9.50492	9.97657	195 55.7	0.56495	0.01893
20	0.63082	0.58985	9.50489	9.97657	198 25.8	0.56494	0.01893
30	0.55147	0.61899	9.50485	9.97658	200 55.8	0.56494	0.01893
40	0.47213	0.64813	9.50482	9.97658	203 25.8	0.56493	0.01892
50	0.39278	0.67728	9.50478	9.97658	205 55.8	0.56493	0.01892
14 0	-0.31344	-0.70643	+9.50474	+9.97659	208 25.8	+0.56493	+0.01891
10	0.23409	0.73559	9.50471	9.97659	210 55.8	0.56492	0.01891
20	0.15475	0.76475	9.50467	9.97660	213 25.9	0.56491	0.01890
30	-0.07541	0.79392	9.50464	9.97660	215 55.9	0.56491	0.01890
40	+0.00393	0.82309	9.50460	9.97660	218 25.9	0.56490	0.01889
50	0.08327	0.85226	9.50457	9.97661	220 55.9	0.56489	0.01888
15 0	+0.16260	-0.88144	+9.50453	+9.97661	223 25.9	+0.56488	+0.01887
10	0.24194	0.91062	9.50449	9.97662	225 55.9	0.56487	0.01886
20	0.32127	0.93981	9.50446	9.97662	228 25.9	0.56486	0.01885
30	0.40060	0.96900	9.50442	9.97662	230 56.0	0.56485	0.01884
40	0.47993	0.99820	9.50439	9.97663	233 26.0	0.56484	0.01883
50	0.55925	1.02740	9.50435	9.97663	235 56.0	0.56483	0.01882
16 0	+0.63857	-1.05660	+9.50432	+9.97664	238 26.0	+0.56482	+0.01881
10	0.71789	1.08581	9.50428	9.97664	240 56.0	0.56481	0.01880
20	0.79721	1.11502	9.50424	9.97664	243 26.0	0.56480	0.01879
30	0.87652	1.14423	9.50421	9.97665	245 56.1	0.56478	0.01877
40	0.95583	1.17345	9.50417	9.97665	248 26.1	0.56477	0.01876
50	+1.03514	-1.20267	+9.50414	+9.97666	250 56.1	+0.56475	+0.01874
Greenwich Mean Time.	Log x' for 1 Minute.	Log y' for 1 Minute.	Log μ' for 1 Minute.	Log Tangents of Angles of Cones.			
				Penumbra.	Shadow.		
h m							
11 0	+7.8995	-7.4634	+1.1761	+7.66338	+7.66121		
12 0	7.8995	7.4638	1.1761	7.66338	7.66121		
13 0	7.8995	7.4643	1.1761	7.66338	7.66121		
14 0	7.8995	7.4647	1.1761	7.66339	7.66122		
15 0	7.8995	7.4651	1.1761	7.66339	7.66122		
16 0	7.8994	7.4654	1.1761	7.66339	7.66122		
17 0	+7.8993	-7.4658	+1.1761	+7.66339	+7.66122		

PATH OF THE ANNULUS DURING THE ANNULAR ECLIPSE OF
THE SUN, 1916, JULY 29.

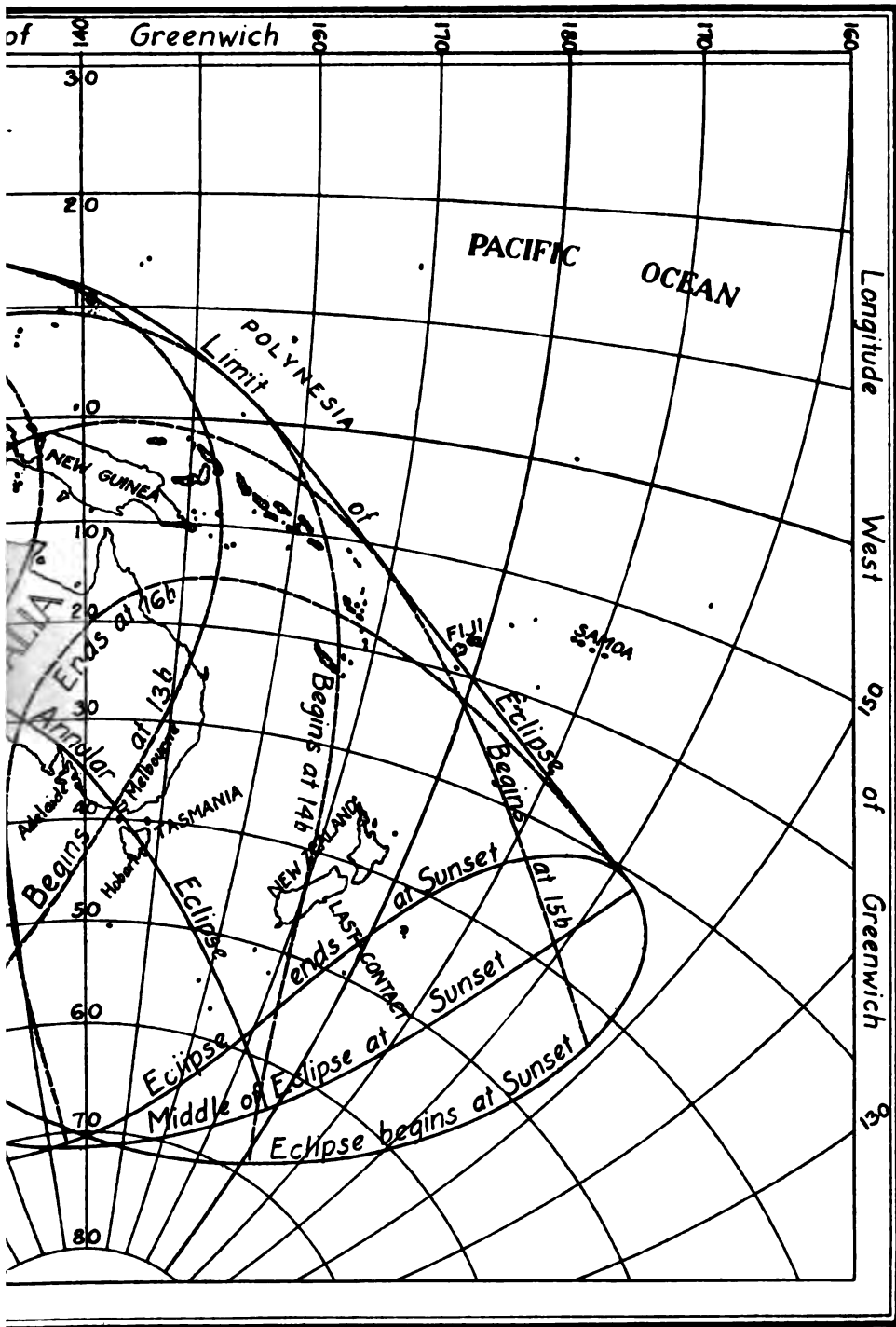
Greenwich Mean Time.	Central Line.		Duration of Annulus Central Line.	
	Latitude.	Longitude from Greenwich.		
Limits.	-28 44.6	- 89 32.1	m	s
12 ^h 55 ^m	25 10.8	101 31.1	5	27.5
13 0	-24 7.3	-106 44.3	5	39.2
5	23 38.3	110 25.7	5	48.2
10	23 27.1	113 23.1	5	55.7
15	23 27.4	115 53.5	6	2.0
20	23 36.5	118 5.6	6	7.4
25	23 52.4	120 4.3	6	12.0
30	-24 14.2	-121 52.9	6	15.9
35	24 41.2	123 33.6	6	19.0
40	25 12.8	125 8.2	6	21.4
45	25 48.7	126 37.8	6	23.2
50	26 28.7	128 3.6	6	24.3
55	27 12.7	129 26.5	6	24.9
14 0	-28 0.7	-130 47.4	6	24.9
5	28 52.6	132 6.9	6	24.3
10	29 48.6	133 25.8	6	23.2
15	30 48.7	134 44.8	6	21.7
20	31 53.2	136 4.7	6	19.7
25	33 2.3	137 26.2	6	17.2
30	-34 16.6	-138 50.3	6	14.3
35	35 36.4	140 18.2	6	11.0
40	37 2.6	141 51.1	6	7.2
45	38 36.1	143 30.9	6	3.1
50	40 18.2	145 19.7	5	58.5
55	42 11.0	147 21.2	5	53.5
15 0	-44 17.3	-149 40.6	5	47.9
5	46 42.2	152 26.4	5	41.7
10	49 35.0	155 56.1	5	34.5
15	53 18.6	160 52.3	5	25.7
20	59 51.0	171 12.8	5	11.7
Limits.	-63 35.6	-178 36.5	.	.

ANNULAR ECLIPSE



Note:- The hours of beginning and ending at

OF JULY 29TH 1916



THE MORRIS PETERS CO., WASHINGTON, D. C.

are expressed in Greenwich Mean Time.

**BESSELIAN ELEMENTS OF THE PARTIAL ECLIPSE OF THE
SUN, 1916, DECEMBER 24.**

Greenwich Mean Time.	Coordinates of Center of Shadow on Fundamental Plane.		Direction of Axis of Shadow.			Radius of Penumbra on Fundamental Plane.
	<i>z</i>	<i>y</i>	Log sin <i>d</i>	Log cos <i>d</i>	<i>a</i>	<i>l</i>
<i>h m</i>						
8 30	+0.02237	-1.54000	-9.59928	+9.96267	127 32.6	+0.54084
40	0.11790	1.52890	9.59928	9.96267	130 2.5	0.54083
50	0.21342	1.51779	9.59927	9.96267	132 32.5	0.54082
9 0	+0.30895	-1.50666	-9.59927	+9.96267	135 2.5	+0.54081
10	+0.40447	-1.49552	-9.59927	+9.96267	137 32.4	+0.54080

Greenwich Mean Time.	Log <i>z'</i> for 1 Minute.	Log <i>y'</i> for 1 Minute.	Log <i>μ'</i> for 1 Minute.	Log Tangent of Angle of Cone.
				Penumbra.
<i>h m</i>				
8 0	+7.9801	+7.0432	+1.1760	+7.67706
9 0	7.9801	7.0467	1.1760	7.67706
10 0	+7.9801	+7.0501	+1.1760	+7.67706

MEAN PLACES FOR 1916.0. (January 1^d.189, Greenwich.)

Name of Star.		Magni- tude.	Right Ascension.			Annual Proper Motion.	Declination.	Annual Proper Motion
			h	m	s	s	" ' "	"
36	Piscium	6.2	0	12	14.982	-0.0027	+ 7 46 26.27	-0.004
<i>d</i>	Piscium	5.4	0	16	16.475	+0.0003	7 43 25.86	+0.016
136 B.	Piscium	6.5	0	36	51.353	-0.0084	8 53 48.53	-0.082
58	Piscium	5.7	0	42	38.423	+0.0033	11 30 57.66	-0.025
75	Piscium	6.3	1	2	8.352	+0.0012	12 30 22.29	+0.042
η	Piscium	3.7	1	26	59.130	+0.0015	+14 54 47.45	-0.003
101	Piscium	6.2	1	31	16.819	+0.0010	14 13 56.68	-0.001
105	Piscium	6.1	1	35	8.712	+0.0053	15 58 48.36	-0.009
3	Arietis	6.4	1	42	1.507	+0.0031	16 59 33.47	+0.013
4	Arietis	5.8	1	43	37.367	+0.0035	16 32 16.22	-0.021
1	Arietis	5.1	1	52	45.506	+0.0021	+17 24 28.35	-0.020
35 B.	Arietis	6.4	1	59	5.979	-0.0008	17 51 0.17	-0.019
47 B.	Arietis	6.5	2	3	8.995	-0.0037	17 37 46.99	-0.067
20 H ¹ .	Arietis	6.4	2	4	46.053	+0.0112	16 49 51.03	-0.179
15	Arietis	5.9	2	5	58.016	+0.0059	19 6 16.06	-0.032
θ	Arietis	5.6	2	13	27.003	-0.0007	+19 30 47.30	-0.005
26	Arietis	6.2	2	25	55.549	+0.0050	19 28 59.27	-0.022
ν	Arietis	5.4	2	34	2.605	+0.0001	21 35 55.63	-0.021
μ	Arietis	5.7	2	37	37.599	+0.0023	19 39 15.43	-0.030
47	Arietis	5.8	2	53	16.532	+0.0160	20 19 57.61	-0.021
ϵ	Arietis (<i>mean</i>) . .	4.6	2	54	24.310	-0.0009	+21 0 18.17	-0.010
64	Arietis	5.8	3	19	20.631	+0.0013	24 25 38.53	-0.046
66	Arietis	6.1	3	23	31.774	+0.0006	22 30 54.87	-0.112
7	Tauri	5.9	3	29	27.958	+0.0013	24 11 0.66	-0.025
11	Tauri	6.1	3	35	45.091	+0.0014	25 3 31.47	-0.008
16	Tauri	5.4	3	39	48.399	+0.0009	+24 1 33.70	-0.040
17	Tauri	3.8	3	39	53.043	+0.0016	23 51 0.22	-0.050
18	Tauri	5.6	3	40	8.777	+0.0004	24 34 35.94	-0.038
γ	Tauri	4.3	3	40	12.231	+0.0010	24 12 17.04	-0.034
20	Tauri	4.1	3	40	49.510	+0.0016	24 6 22.10	-0.044
21	Tauri	5.8	3	40	53.993	+0.0012	+24 17 35.35	-0.046
22	Tauri	6.5	3	41	2.434	+0.0006	24 16 0.10	-0.030
23	Tauri	4.3	3	41	20.240	+0.0017	23 41 14.83	-0.050
η	Tauri	3.0	3	42	29.281	+0.0016	23 50 46.45	-0.050
104 B.	Tauri	5.5	3	43	22.235	+0.0008	23 9 50.38	-0.040
27	Tauri	3.7	3	44	9.852	+0.0013	+23 47 50.75	-0.040
28	Tauri	5.2	3	44	11.139	+0.0009	23 52 51.38	-0.040
14 H.	Tauri	5.3	3	45	15.742	+0.0033	25 19 36.90	-0.103
36	Tauri	5.6	3	59	20.059	+0.0001	23 52 31.76	-0.022
<i>p</i>	Tauri	5.6	4	5	42.728	-0.0024	26 15 45.53	-0.044
χ	Tauri	5.3	4	17	28.108	+0.0028	+25 25 55.07	-0.020
62	Tauri	6.1	4	18	55.749	+0.0008	24 6 22.27	-0.040
17 B.	Aurigæ	6.0	4	47	32.164	+0.0033	27 45 28.44	-0.087
315 B.	Tauri	6.3	4	51	8.552	-0.0001	24 27 31.99	-0.030
<i>k</i>	Tauri	5.6	4	53	0.862	+0.0023	24 55 17.59	-0.040
38 B.	Aurigæ	6.5	4	59	22.687	-0.0001	+27 34 46.58	-0.020
47 B.	Aurigæ	6.0	5	4	28.383	.....	27 55 32.01	.....
354 B.	Tauri	6.4	5	15	42.728	-0.0027	27 52 23.36	-0.040
118	Tauri	5.4	5	24	6.282	+0.0015	25 5 0.28	-0.050
107 B.	Aurigæ	6.5	5	30	39.171	-0.0013	27 36 30.05	-0.070
112 B.	Aurigæ	5.7	5	31	53.972	-0.0004	+26 52 21.75	-0.050
125	Tauri	5.1	5	34	31.834	+0.0018	25 51 3.59	-0.020
132	Tauri	5.0	5	43	51.624	0.0000	+24 32 25.41	-0.020

MEAN PLACES FOR 1916.0. (January 1^d.189, Greenwich.)

Name of Star.		Magni- tude.	Right Ascension.			Annual Proper Motion.	Declination.	Annual Proper Motion.
			h	m	s	s	° ' "	"
406 B.	Tauri	5.6	5	45	40.423	-0.0013	+27 56 37.81	+0.011
136	Tauri	4.6	5	48	2.882	+0.0013	27 35 36.25	-0.020
412 B.	Tauri	5.8	5	51	47.480	.....	24 14 18.19	.....
139	Tauri	4.7	5	52	46.919	0.0000	25 56 40.31	-0.007
415 B.	Tauri	6.1	5	55	43.829	+0.0018	27 34 8.34	-0.001
5	Geminorum	5.9	6	6	23.261	+0.0011	+24 26 23.06	-0.061
8	Geminorum	6.1	6	11	11.120	-0.0009	23 59 53.02	-0.026
52 B.	Geminorum	6.5	6	32	18.294	-0.0021	24 39 41.32	-0.002
e	Geminorum	3.2	6	38	45.897	-0.0001	25 12 55.35	-0.018
87 B.	Geminorum	5.8	6	46	54.133	-0.0006	23 42 7.03	-0.021
37	Geminorum	5.7	6	50	8.794	-0.0028	+25 28 54.40	+0.014
39	Geminorum	6.2	6	53	36.887	-0.0117	26 11 32.63	+0.086
40	Geminorum	6.3	6	54	16.800	-0.0012	26 1 45.03	-0.015
ω	Geminorum	5.2	6	57	17.777	-0.0003	24 20 10.43	0.000
44	Geminorum	5.9	7	0	15.036	0.0000	22 45 51.15	-0.019
48	Geminorum	5.8	7	7	20.252	-0.0009	+24 16 12.72	-0.041
52	Geminorum	6.1	7	9	33.823	+0.0038	25 1 55.16	-0.086
δ	Geminorum	3.5	7	15	6.499	-0.0010	22 8 16.82	-0.015
A	Geminorum	5.1	7	18	21.334	-0.0051	25 12 46.75	-0.014
58	Geminorum	6.0	7	18	25.352	-0.0022	23 6 28.11	-0.064
149 B.	Geminorum	6.4	7	21	52.513	-0.0219	+21 42 16.19	-0.022
63	Geminorum	5.3	7	22	45.321	-0.0035	21 37 5.29	-0.110
	B. D.+23° 1744	6.4	7	27	48.701	-0.0010	23 4 3.43	-0.007
187 B.	Geminorum	6.3	7	35	56.944	+0.0011	23 12 50.57	+0.007
192 B.	Geminorum	6.3	7	38	22.151	-0.0014	22 35 54.46	+0.025
79	Geminorum	6.3	7	40	13.546	-0.0013	+20 31 6.94	-0.012
82	Geminorum	6.3	7	43	32.390	-0.0010	23 20 59.18	-0.001
209 B.	Geminorum	6.2	7	47	3.765	-0.0029	19 32 27.90	-0.030
85	Geminorum	5.2	7	50	45.888	-0.0011	20 6 23.79	-0.043
217 B.	Geminorum	6.3	7	55	54.378	-0.0018	20 2 50.55	-0.007
10 H.	Cancrī	6.1	7	59	54.111	-0.0020	+19 4 48.67	-0.046
μ	Cancrī	5.5	8	2	49.419	+0.0019	21 49 34.62	-0.084
49 B.	Cancrī	6.0	8	15	27.206	+0.0052	21 0 48.18	-0.063
d ¹	Cancrī	5.9	8	18	33.377	-0.0038	18 36 9.73	-0.031
d ²	Cancrī	6.2	8	21	4.740	-0.0132	17 19 26.08	-0.153
θ	Cancrī	5.5	8	26	48.516	-0.0039	+18 22 44.25	-0.068
102 B.	Cancrī	6.5	8	35	32.829	-0.0048	19 58 4.03	-0.010
ε	Cancrī	6.3	8	35	38.170	-0.0007	19 50 33.53	-0.027
δ	Cancrī	4.2	8	39	54.842	-0.0008	18 27 49.59	-0.240
139 B.	Cancrī	6.1	8	45	58.380	-0.0011	19 8 47.57	-0.001
54	Cancrī	6.3	8	46	20.903	-0.0075	+15 39 46.70	+0.076
X	Cancrī (var.)	6.2	8	50	39.162	+0.0009	17 33 6.30	+0.013
o ¹	Cancrī	5.1	8	52	33.976	+0.0041	15 38 44.29	+0.022
o ²	Cancrī	5.7	8	52	53.861	+0.0043	15 54 16.57	+0.023
81	Cancrī	6.4	9	7	41.920	-0.0350	15 20 6.89	+0.244
π	Cancrī	5.6	9	10	35.780	-0.0022	+15 17 26.32	-0.008
227 B.	Cancrī	6.4	9	16	37.334	.....	15 43 42.04	.....
ξ	Leonis	5.1	9	27	25.210	-0.0063	11 40 20.74	-0.084
o	Leonis	3.8	9	36	40.165	-0.0096	10 16 30.54	-0.033
18	Leonis	5.8	9	41	51.961	-0.0006	12 11 50.80	+0.008
19	Leonis	6.4	9	42	55.034	-0.0049	+11 57 26.23	+0.008
R	Leonis (var.)	5-10	9	43	2.528	-0.0005	11 49 8.76	-0.040
83 B.	Leonis	5.9	9	51	58.834	-0.0074	+ 9 19 54.41	+0.017

MEAN PLACES FOR 1916.0. (January 1^d.189, Greenwich.)

Name of Star.	Magni- tude.	Right Ascension.	Annual Proper Motion.	Declination.	Annual Proper Motion.
		h m s	s	" ' "	"
89 B. Leonis	6.2	9 53 40.745	+0.0010	+ 8 42 55.56	-0.029
π Leonis	4.9	9 55 46.547	-0.0029	8 26 51.90	-0.027
λ Leonis	4.6	10 3 26.912	-0.0057	10 24 35.02	-0.067
43 Leonis	6.3	10 18 36.791	-0.0017	6 58 10.48	-0.101
155 B. Leonis	6.5	10 18 52.892	-0.0167	6 7 14.62	-0.071
48 Leonis	5.2	10 30 25.171	-0.0072	+ 7 23 11.29	+0.046
35 Sextantis	6.1	10 38 59.399	+0.0018	5 11 20.05	-0.019
d Leonis	5.0	10 56 13.382	+0.0004	4 4 7.38	-0.022
p^4 Leonis	5.7	11 2 37.184	-0.0253	2 24 42.76	-0.060
p^5 Leonis	5.3	11 9 27.593	-0.0029	0 23 15.75	-0.003
75 Leonis	5.4	11 12 58.050	+0.0027	+ 2 28 21.62	-0.145
76 Leonis	6.0	11 14 36.303	-0.0037	2 6 40.34	-0.053
359 B. Leonis	6.3	11 18 59.899	-0.0024	+ 0 35 35.95	-0.015
388 B. Leonis	6.3	11 23 36.188	-0.0025	- 1 14 14.64	+0.007
e Leonis	5.1	11 26 1.390	+0.0018	2 32 23.02	-0.068
v Leonis	4.5	11 32 38.870	0.0000	- 0 21 35.47	+0.039
431 B. Leonis	6.2	11 34 6.516	-0.0028	1 58 17.15	+0.047
13 B. Virginis	5.9	11 46 44.591	+0.0008	4 51 57.75	+0.006
64 B. Virginis	6.5	12 6 8.595	-0.0004	7 18 25.28	+0.017
78 B. Virginis	6.5	12 9 57.247	-0.0051	5 15 7.71	+0.114
q Virginis	5.3	12 29 26.539	-0.0057	- 8 59 19.31	+0.001
χ Virginis	4.8	12 34 54.542	-0.0056	7 32 0.49	-0.031
370 B. Virginis	6.0	12 49 56.310	-0.0058	11 11 36.06	-0.037
69 Virginis	4.9	13 22 58.182	-0.0086	15 32 17.99	+0.013
75 Virginis	5.6	13 28 22.209	-0.0050	14 55 52.16	+0.004
83 Virginis	5.6	13 39 57.706	+0.0007	-15 45 25.25	-0.011
85 Virginis	6.1	13 41 3.544	-0.0029	15 20 45.03	-0.034
87 Virginis	5.8	13 42 50.974	+0.0025	17 26 23.19	-0.046
89 Virginis	5.1	13 45 18.232	-0.0077	17 42 58.11	-0.040
43 H. Virginis	5.5	14 10 46.165	-0.0031	17 48 33.31	-0.015
231 G. Virginis	6.4	14 12 24.947	-0.0005	-18 11 43.43	+0.106
236 G. Virginis	5.7	14 13 59.390	-0.0039	18 19 37.76	-0.001
9 G. Libræ	6.5	14 30 6.990	+0.0032	20 4 16.41	-0.004
17 G. Libræ	6.4	14 41 24.812	-0.0047	20 49 13.41	-0.121
18 G. Libræ	6.1	14 42 26.881	-0.0032	20 58 23.06	-0.014
43 B. Libræ	5.7	14 52 33.447	+0.0745	-21 2 16.10	-1.763
47 G. Libræ	6.1	15 1 36.199	+0.0065	21 42 20.28	-0.031
64 G. Libræ	5.8	15 11 30.636	-0.0028	22 5 21.06	+0.018
153 B. Libræ	6.3	15 28 10.560	-0.0006	24 12 17.52	-0.042
169 B. Libræ	6.0	15 32 51.556	-0.0017	22 51 48.79	-0.068
177 B. Libræ	6.2	15 34 24.728	-0.0016	-22 52 34.32	-0.034
42 Libræ	5.0	15 35 18.725	-0.0018	23 32 45.12	-0.027
b Scorpii	4.7	15 45 55.379	-0.0023	25 29 48.77	-0.044
λ Scorpii	4.6	15 48 33.918	-0.0017	25 4 37.30	-0.023
31 B. Scorpii	5.4	15 48 52.601	-0.0022	24 17 1.47	-0.037
32 B. Scorpii	5.3	15 48 55.686	-0.0023	-23 43 42.31	-0.016
3 Scorpii	5.9	15 49 36.677	-0.0031	24 59 43.75	-0.029
4 Scorpii	5.7	15 50 25.281	-0.0038	26 1 8.79	-0.028
40 B. Scorpii	5.4	15 53 32.380	-0.0031	24 35 23.09	+0.004
π Scorpii	3.0	15 53 46.018	-0.0010	25 52 23.56	-0.048
48 B. Scorpii	4.9	15 58 15.872	-0.0048	-25 37 55.06	-0.043
50 B. Scorpii	6.4	15 58 51.924	+0.0017	-24 29 43.76	-0.032

MEAN PLACES FOR 1916.0. (January 1^d.189, Greenwich.)

Name of Star.	Magni- tude.	Right Ascension.			Annual Proper Motion.	Declination.	Annual Proper Motion.
		h	m	s	s	° ' "	"
57 B. Scorpii	5.7	16	1	5.617	-0.0011	-23 22 40.33	-0.004
24 G. Scorpii	6.2	16	2	49.247	0.0000	24 14 17.28	-0.068
65 B. Scorpii	5.5	16	3	0.316	+0.0085	26 6 7.64	+0.023
27 G. Scorpii	5.8	16	3	42.678	+0.0032	23 27 42.72	-0.012
41 G. Scorpii	6.3	16	8	42.240	-0.0004	24 12 29.26	-0.034
85 B. Scorpii	6.0	16	9	47.841	-0.0005	-25 15 52.05	+0.012
19 Scorpii	4.9	16	15	34.705	-0.0012	23 58 3.51	-0.013
♄ Scorpii	3.1	16	16	4.779	-0.0011	25 23 32.01	-0.039
α Scorpii	1.2	16	24	15.249	-0.0006	26 14 47.60	-0.028
22 Scorpii	4.8	16	25	6.113	-0.0004	24 55 51.78	-0.016
116 B. Scorpii	6.2	16	26	13.394	-0.0013	-26 21 20.39	-0.087
126 B. Scorpii	6.1	16	36	30.626	-0.0023	24 18 21.25	-0.004
134 B. Scorpii	6.4	16	39	4.635	+0.0012	27 17 57.66	-0.014
88 B. Ophiuchi	6.3	16	54	49.022	+0.0005	24 57 55.82	-0.015
26 Ophiuchi	5.8	16	55	0.647	+0.0036	24 51 42.30	-0.053
118 B. Ophiuchi	6.2	17	1	40.788	-0.0006	-26 24 1.63	-0.046
137 B. Ophiuchi	6.3	17	7	4.248	+0.0058	25 9 8.10	-0.045
95 G. Ophiuchi	6.1	17	7	9.446	+0.0008	27 39 32.92	-0.029
36 Ophiuchi (<i>First Str</i>)	5.4	17	10	10.761	-0.0369	26 28 50.34	-1.166
θ Ophiuchi	3.4	17	16	50.939	-0.0006	24 55 0.35	-0.036
43 Ophiuchi	5.4	17	18	4.293	-0.0002	-28 3 45.04	-0.040
136 G. Ophiuchi	6.3	17	21	43.349	-0.0010	25 52 11.77	-0.003
151 G. Ophiuchi	6.0	17	26	31.425	+0.0012	26 12 22.29	-0.026
163 G. Ophiuchi	6.3	17	38	0.350	+0.0002	27 50 40.43	-0.017
X Sagittarii (<i>var.</i>) . .	4.4	17	42	16.356	+0.0002	27 47 59.34	-0.015
4 G. Sagittarii	6.2	17	43	12.613	-0.0003	-26 56 46.04	-0.030
63 Ophiuchi	6.1	17	49	43.904	-0.0001	24 52 17.05	-0.015
10 G. Sagittarii	5.7	17	51	23.602	+0.0024	28 3 8.53	+0.015
7 Sagittarii	5.5	17	57	42.208	-0.0003	24 16 57.01	-0.007
9 Sagittarii	6.0	17	58	43.358	-0.0006	24 21 48.19	-0.006
66 B. Sagittarii	4.7	18	12	47.708	0.0000	-27 4 25.46	+0.015
67 B. Sagittarii	6.4	18	13	29.657	-0.0044	25 38 14.07	-0.062
70 B. Sagittarii	6.4	18	16	21.147	+0.0013	24 57 14.38	-0.001
68 G. Sagittarii	6.2	18	22	29.563	0.0000	26 41 7.67	-0.046
λ Sagittarii	2.9	18	22	47.209	-0.0033	25 28 9.43	-0.199
69 G. Sagittarii	6.3	18	22	51.810	+0.0018	-26 48 30.14	-0.032
86 B. Sagittarii	6.5	18	23	43.012	-0.0063	26 38 10.42	-0.054
24 Sagittarii	5.7	18	28	45.614	-0.0002	24 5 45.63	-0.020
117 B. Sagittarii	5.8	18	33	24.143	-0.0015	23 34 39.05	-0.020
26 Sagittarii	6.1	18	36	44.258	+0.0021	23 54 45.29	-0.023
126 B. Sagittarii	5.7	18	39	39.759	-0.0008	-25 5 47.06	-0.041
ν ¹ Sagittarii	5.0	18	49	5.945	+0.0001	22 50 57.28	-0.021
ν ² Sagittarii	5.1	18	50	2.487	+0.0069	22 46 37.75	-0.024
♄ Sagittarii	2.1	18	50	3.394	-0.0003	26 24 7.93	-0.076
154 B. Sagittarii	5.9	18	50	55.523	-0.0010	23 16 54.34	-0.021
162 B. Sagittarii	6.4	18	53	11.524	-0.0009	-24 59 23.23	-0.020
127 G. Sagittarii	6.4	18	55	15.555	+0.0023	25 3 35.36	+0.051
168 B. Sagittarii	6.3	18	56	33.980	+0.0005	22 48 52.35	+0.009
172 B. Sagittarii	5.8	18	57	19.375	+0.0002	24 57 48.63	-0.172
189 B. Sagittarii	6.1	19	3	6.704	+0.0012	24 47 21.82	+0.001
191 B. Sagittarii	6.5	19	3	40.007	-0.0011	-23 19 25.38	-0.067
199 B. Sagittarii	6.4	19	7	26.877	-0.0003	-21 47 55.53	-0.040

MEAN PLACES FOR 1916.0. (January 1^d.189, Greenwich.)

Name of Star.		Magni- tude.	Right Ascension.			Annual Proper Motion.	Declination.			Annual Proper Motion.
			h	m	s	s	°	'	"	"
ψ	Sagittarii	4.9	19	10	23.449	+0.0025	-25	24	8.98	-0.035
208 B.	Sagittarii	6.1	19	10	26.217	+0.0072	24	19	23.71	-0.078
222 B.	Sagittarii	5.5	19	15	36.149	-0.0016	22	33	35.04	+0.028
χ	Sagittarii	4.9	19	20	9.885	+0.0033	24	40	21.42	-0.063
49	Sagittarii	5.5	19	20	24.701	-0.0017	24	7	39.82	+0.061
50	Sagittarii	5.5	19	21	18.614	+0.0019	-21	56	37.83	+0.061
253 B.	Sagittarii	6.1	19	25	55.014	+0.0026	21	29	16.07	-0.028
53	Sagittarii	6.3	19	34	46.694	-0.0004	23	37	10.84	-0.037
274 B.	Sagittarii	6.1	19	35	4.274	+0.0018	23	37	20.24	-0.031
f	Sagittarii	5.1	19	41	27.794	-0.0099	19	57	50.06	-0.088
329 B.	Sagittarii	6.1	19	56	24.498	+0.0010	-22	58	8.39	-0.005
336 B.	Sagittarii	6.5	19	58	45.782	-0.0019	22	49	54.44	+0.052
σ	Capricorni	5.5	20	14	32.919	-0.0002	19	22	53.27	-0.006
π	Capricorni	5.2	20	22	30.878	+0.0004	18	29	15.96	-0.002
ρ	Capricorni	5.0	20	24	4.266	-0.0013	18	5	31.78	-0.020
σ	Capricorni	5.6	20	25	5.089	+0.0011	-18	51	43.08	-0.021
47 B.	Capricorni	6.2	20	30	47.156	+0.0055	16	48	54.69	-0.033
ν	Capricorni	5.3	20	35	16.187	-0.0018	18	26	6.01	-0.007
61 B.	Capricorni	5.9	20	35	49.500	-0.0032	16	25	25.19	+0.082
81 B.	Capricorni	6.4	20	44	34.773	-0.0004	18	20	46.93	-0.013
19	Capricorni	5.7	20	50	3.178	-0.0041	-18	14	31.54	-0.013
94 B.	Capricorni	5.7	20	52	58.641	+0.0046	16	21	13.69	+0.030
95 B.	Capricorni	5.9	20	54	2.955	...	14	48	29.12	...
21	Capricorni	6.5	20	56	8.249	-0.0025	17	51	32.41	-0.002
θ	Capricorni	4.2	21	1	13.626	+0.0030	17	34	2.73	-0.036
29	Capricorni	5.5	21	11	6.005	+0.0016	-15	31	16.35	+0.004
53 B.	Aquarii	6.5	21	11	23.640	+0.0004	13	33	3.66	-0.030
18	Aquarii	5.5	21	19	36.160	+0.0054	13	14	21.35	+0.007
72 B.	Aquarii	6.5	21	23	40.869	-0.0045	11	55	57.62	+0.008
137 B.	Capricorni	6.2	21	34	57.287	+0.0001	10	57	19.00	-0.010
c^1	Capricorni	5.3	21	40	31.615	+0.0004	-9	28	7.09	+0.008
c^2	Capricorni	6.3	21	41	47.470	+0.0008	9	39	50.83	+0.001
λ	Capricorni	5.5	21	42	0.892	+0.0015	11	45	13.82	-0.004
151 B.	Capricorni	6.1	21	45	8.758	-0.0009	13	6	53.36	+0.031
96 B.	Aquarii	6.5	21	49	6.632	-0.0001	10	42	27.35	+0.005
θ	Aquarii	4.3	22	12	24.128	+0.0073	-8	12	6.99	-0.019
150 B.	Aquarii	6.0	22	12	26.611	-0.0034	9	27	32.34	-0.005
ρ	Aquarii	5.3	22	15	46.808	+0.0008	8	14	36.57	-0.008
170 B.	Aquarii	6.0	22	19	7.942	+0.0012	7	37	9.73	+0.023
51	Aquarii	5.8	22	19	44.379	+0.0011	5	15	44.82	-0.011
186 B.	Aquarii	6.1	22	26	54.116	+0.0129	-6	59	3.67	-0.129
κ	Aquarii	5.2	22	33	24.424	-0.0049	4	39	41.81	-0.113
207 B.	Aquarii	6.3	22	36	27.219	...	3	59	28.80	...
252 B.	Aquarii	5.8	22	50	49.528	-0.0003	5	26	7.50	+0.009
6 G.	Piscium	6.2	22	53	56.037	+0.0002	2	50	43.37	-0.082
22 B.	Piscium	6.4	23	19	13.388	+0.0043	-0	10	11.38	+0.033
κ	Piscium	4.9	23	22	37.584	+0.0056	+0	47	44.38	-0.093
9	Piscium	6.4	23	22	56.623	+0.0032	0	39	40.03	-0.029
16	Piscium	5.7	23	32	6.082	-0.0074	1	38	9.48	+0.057
λ	Piscium	4.6	23	37	45.599	-0.0092	1	19	3.54	-0.134
19	Piscium	5.4	23	42	5.906	-0.0034	+3	1	14.72	-0.020
22	Piscium	5.8	23	47	39.791	+0.0009	+2	27	48.33	-0.011

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

JANUARY.

THE STAR'S					AT CONJUNCTION IN R. A.					Limiting Par- allels.	
Name.	Mag.	Red'ns from 1916.0.		Apparent Declina- tion.	Greenwich Mean Time.	Hour Angle, H	Y	z	y	N.	S.
		$\Delta\alpha$	$\Delta\delta$								
47 G. Libræ	6.1	-0.04	-2.8	21 42.4	d 1 2 24.0	h 6 2.1	-0.8010	0.5842	-0.1598	-14	-90
64 G. Libræ	5.8	0.08	2.9	22 5.4	6 17.4	+ 9 46.2	-1.0193	0.5882	0.1503	-29	-90
153 B. Libræ	6.3	0.16	2.7	24 12.3	12 43.2	- 8 3.6	+0.1756	0.5946	0.1336	+35	-33
42 Libræ	5.0	0.17	3.0	23 32.8	15 26.0	- 5 27.5	-0.8314	0.5972	0.1262	-19	-90
b Scorpïi	4.7	0.22	2.8	25 29.9	19 25.6	- 1 37.8	+0.6226	0.6007	0.1149	+60	- 8
A Scorpïi	4.6	-0.22	-3.0	-25 4.7	20 24.9	- 0 41.0	+0.0943	0.6016	-0.1121	+29	-38
31 B. Scorpïi	5.4	0.22	3.1	24 17.1	20 31.8	- 0 34.4	-0.7046	0.6017	0.1117	-14	-90
32 B. Scorpïi	5.3	0.22	3.3	23 43.8	20 33.0	- 0 33.2	-1.2569	0.6018	0.1117	-56	-80
3 Scorpïi	5.9	0.23	3.0	24 59.8	20 48.3	- 0 18.6	-0.0299	0.6020	0.1109	+22	-45
4 Scorpïi	5.7	0.24	2.8	26 1.2	21 6.4	- 0 1.2	+0.9506	0.6021	0.1100	+64	+14
40 B. Scorpïi	5.4	-0.24	-3.2	-24 35.4	22 16.0	+ 1 5.5	-0.5905	0.6032	-0.1066	-7	-85
π Scorpïi	3.0	0.24	2.9	25 52.4	22 21.0	+ 1 10.2	+0.6711	0.6033	0.1064	+62	- 5
48 B. Scorpïi	4.9	0.26	3.0	25 38.0	2 0 1.0	+ 2 45.9	+0.2590	0.6047	0.1014	+36	-28
50 B. Scorpïi	6.4	0.25	3.3	24 29.8	0 14.3	+ 2 58.6	-0.8876	0.6048	0.1007	-25	-90
24 G. Scorpïi	6.2	0.26	3.4	24 14.3	1 41.8	+ 4 22.5	-1.2850	0.6060	0.0963	-63	-69
65 B. Scorpïi	5.5	-0.27	-3.0	-26 6.2	1 45.8	+ 4 26.4	+0.5510	0.6060	-0.0961	+54	-12
85 B. Scorpïi	6.0	0.28	3.4	25 15.9	4 15.3	+ 6 49.4	-0.5064	0.6080	0.0884	-4	-77
σ Scorpïi	3.1	0.30	3.5	25 23.6	6 32.8	+ 9 1.0	-0.5741	0.6096	0.0812	-9	-84
α Scorpïi	1.2	0.32	3.5	26 14.9	9 30.6	+11 51.2	+0.0421	0.6116	0.0717	+22	-40
22 Scorpïi	4.8	0.32	3.7	24 55.9	9 49.0	-11 51.3	-1.2761	0.6118	0.0707	-62	-70
116 B. Scorpïi	6.2	-0.33	-3.5	-26 21.4	10 13.3	-11 28.0	+0.0994	0.6121	-0.0694	+25	-37
134 B. Scorpïi	6.4	0.36	3.6	27 18.0	14 50.4	- 7 3.1	+0.7422	0.6147	-0.0542	+63	0
NEW MOON.					6 18 18.4	- 7 46.3	+1.2762	0.5627	+0.2282	+73	+38
URANUS	6.2	...	...	-17 15.4	20 10.5	- 5 58.3	-0.0226	0.5629	+0.2314	+35	-44
29 Capricorni	5.5	-0.14	-4.4	-15 31.3	7 9 40.3	+ 7 2.8	-0.5595	0.5502	0.2475	+10	-78
λ Capricorni	5.5	0.05	3.2	11 45.3	11 4.4	+ 8 24.0	+1.1574	0.5489	0.2488	+77	+25
151 B. Capricorni	6.1	0.03	3.4	13 6.9	12 51.3	-10 7.2	-0.8213	0.5473	0.2504	-4	-90
96 B. Aquarii	6.5	-0.03	-2.8	-10 42.5	23 31.6	- 3 34.0	-0.6427	0.5385	0.2582	+ 8	-85
θ Aquarii	4.3	+0.05	1.7	8 12.1	23 32.8	- 3 32.8	-0.6376	0.5385	+0.2582	+79	-10
150 B. Aquarii	6.0	+0.06	-2.0	-9 27.6	8 1 6.2	- 2 2.5	-0.1934	0.5373	0.2591	+31	-54
ρ Aquarii	5.3	0.06	1.6	8 14.6	2 40.4	- 0 31.4	-0.4204	0.5361	0.2599	+20	-68
170 B. Aquarii	6.0	0.07	1.4	7 37.2	6 20.3	+ 3 1.3	-0.1117	0.5335	0.2616	+36	-49
186 B. Aquarii	6.1	0.10	-1.0	-6 59.1	17 50.1	- 9 50.9	+1.3368	0.5261	0.2647	+83	+40
252 B. Aquarii	5.8	0.20	+ 0.1	5 26.1	19 21.0	- 8 22.7	-0.9239	0.5252	+0.2649	- 7	-90
6 G. Piscium	6.2	+0.20	+ 0.9	-2 50.7	9 7 51.1	+ 3 44.0	-0.3812	0.5191	0.2645	+23	-65
22 B. Piscium	6.4	0.30	2.3	-10 10.2	9 33.2	+ 5 23.0	-0.9341	0.5183	0.2642	- 7	-89
κ Piscium	4.9	0.31	2.7	+ 0 47.8	9 42.8	+ 5 32.3	-0.7524	0.5183	0.2642	+ 4	-89
9 Piscium	6.4	0.32	2.7	0 39.7	14 19.0	+10 0.1	-0.5552	0.5166	0.2631	+14	-77
16 Piscium	5.7	0.36	3.2	1 38.2	17 10.5	-11 13.7	+0.5276	0.5156	+0.2622	+75	-16
λ Piscium	4.6	+0.39	+ 3.3	+ 1 19.1	19 22.4	- 9 5.7	-0.6770	0.5150	0.2614	+ 8	-86
19 Piscium	5.4	0.40	4.0	3 1.3	22 12.1	- 6 21.2	+0.6438	0.5142	0.2603	+85	- 9
22 Piscium	5.8	0.43	3.9	2 27.9	10 12 50.3	+ 7 50.9	-1.1437	0.5115	0.2522	-22	-82
d Piscium	5.4	0.56	6.4	7 43.5	23 25.4	- 5 52.9	+0.2358	0.5110	0.2441	-56	-29
136 B. Piscium	6.5	0.67	7.2	8 53.9	11 12 25.1	+ 6 43.6	-0.5297	0.5118	+0.2319	+15	-69
75 Piscium	6.3	+0.81	+ 9.0	+12 30.5	18 1 6.8	- 4 57.4	-0.2703	0.5140	0.2175	+28	-52
7 Piscium	3.7	0.96	10.1	14 55.0	3 17.8	- 2 50.4	+0.9381	0.5145	0.2148	+90	+13
101 Piscium	6.2	0.99	9.9	14 14.1	5 15.4	- 0 56.3	-0.5351	0.5149	0.2123	+14	-66
106 Piscium	6.1	1.01	10.6	15 59.0	8 44.2	+ 2 26.2	-0.9028	0.5158	0.2077	- 7	-73
3 Arietis	6.4	1.05	11.0	16 59.7	9 32.6	+ 3 13.2	-0.2424	0.5160	+0.2067	+30	-49
4 Arietis	5.8	+1.06	+10.8	+16 32.5	14 8.6	+ 7 40.7	-0.2522	0.5173	0.2003	+29	-49
ι Arietis	5.1	1.12	11.2	17 24.7	17 19.3	+10 45.6	-0.1041	0.5183	0.1958	+37	-40
35 B. Arietis	6.4	1.16	11.3	17 51.2	19 20.8	-11 16.6	+0.5294	0.5190	0.1928	+77	- 7
47 B. Arietis	6.5	1.19	11.3	17 38.0	20 45.1	- 9 54.9	-0.8095	0.5194	0.1907	- 2	-71
15 Arietis	5.9	1.21	11.8	19 6.5	13 0 28.3	- 6 18.5	-0.5578	0.5207	+0.1850	+13	-64
θ Arietis	5.6	+1.26	+11.9	+19 31.0							

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

JANUARY.

THE STAR'S					AT CONJUNCTION IN R. A.							Limiting Position
Name.	Mag.	Red'ns from 1916.0.		Apparent Declination.	Greenwich Mean Time.	Hour Angle, <i>H</i>	<i>Y'</i>	<i>z'</i>	<i>y'</i>	N.	S.	
		$\Delta\alpha$	$\Delta\delta$		d h m	h m						
26 Arietis	6.2	+1.34	+11.8	+19 29.2	13 6 38.1	- 0 20.1	+0.5850	0.5228	+0.1751	+82	- 2	
<i>v</i> Arietis	5.4	1.40	12.5	21 36.1	10 37.0	+ 3 31.2	-1.0495	0.5244	0.1685	-19	- 45	
<i>e</i> Arietis (<i>mean</i>)	4.6	1.53	12.0	21 0.5	20 30.7	-10 53.7	+1.1845	0.5281	0.1510	-90	- 4	
64 Arietis	5.8	1.71	12.7	24 25.9	14 8 26.9	+ 0 39.4	-0.9185	0.5328	0.1282	-11	- 52	
7 Tauri	5.9	1.78	12.4	24 11.2	13 14.2	+ 5 17.4	-0.0586	0.5346	0.1186	+40	- 28	
11 Tauri	6.1	+1.82	+12.4	+25 3.7	16 11.7	+ 8 9.1	-0.6845	0.5357	+0.1125	+ 4	- 44	
16 Tauri	5.4	1.84	12.0	24 1.8	18 5.9	+ 9 59.6	+0.6681	0.5364	0.1085	-96	- 49	
17 Tauri	3.8	1.84	12.0	23 51.2	18 8.0	+10 1.7	+0.8666	0.5364	0.1085	-90	- 41	
18 Tauri	5.6	1.85	12.2	24 34.8	18 15.4	+10 8.7	+0.0762	0.5364	0.1081	-47	- 21	
<i>q</i> Tauri	4.3	1.84	12.1	24 12.5	18 17.0	+10 10.3	+0.4905	0.5365	0.1081	-76	- 1	
20 Tauri	4.1	+1.85	+12.1	+24 6.6	18 34.5	+10 27.2	+0.6311	0.5366	+0.1075	-90	- 4	
21 Tauri	5.8	1.85	12.1	24 17.8	18 36.6	+10 29.3	+0.4279	0.5366	0.1075	-71	- 4	
22 Tauri	6.5	1.85	12.1	24 16.2	18 40.6	+10 33.1	+0.4642	0.5366	0.1073	-73	- 1	
23 Tauri	4.3	1.85	11.9	23 41.4	18 48.9	+10 41.1	+1.1200	0.5366	0.1070	-90	- 40	
<i>η</i> Tauri	3.0	1.86	11.9	23 51.0	19 21.2	+11 12.4	+1.0018	0.5368	0.1059	-90	- 41	
27 Tauri	3.7	+1.86	+11.8	+23 48.0	20 8.2	+11 57.8	+1.1383	0.5371	+0.1042	-90	- 42	
28 Tauri	5.2	1.87	11.9	23 53.1	20 8.8	+11 58.4	+1.0469	0.5371	0.1042	-90	- 34	
14 H. Tauri	5.3	1.89	12.2	25 19.8	20 39.0	-11 32.3	-0.5011	0.5374	0.1032	-13	- 52	
<i>p</i> Tauri	5.6	2.02	11.9	26 16.0	15 6 9.1	- 2 21.1	-0.6557	0.5405	0.0825	+ 5	- 40	
<i>χ</i> Tauri	5.3	2.09	11.1	25 26.1	11 34.2	+ 2 53.1	+0.6799	0.5421	0.0704	-90	- 15	
17 B. Aurigæ	6.0	+2.29	+10.4	+27 45.6	16 1 18.8	- 7 50.2	-1.1516	0.5453	+0.0386	-33	- 42	
38 B. Aurigæ	6.5	2.35	9.7	27 34.9	6 41.5	- 2 38.4	-0.7801	0.5461	0.0259	- 3	- 42	
47 B. Aurigæ	6.0	2.38	9.5	27 55.7	9 0.1	- 0 24.5	-1.1110	0.5464	0.0204	-29	- 42	
354 B. Tauri	6.4	2.43	8.9	27 52.5	14 5.5	+ 4 30.4	-0.9798	0.5469	+0.0082	-17	- 42	
107 B. Aurigæ	6.5	2.50	7.9	27 36.6	20 51.0	+11 2.2	-0.6845	0.5473	-0.0080	+ 3	- 43	
112 B. Aurigæ	5.7	+2.49	+ 7.7	+26 52.5	21 24.9	+11 34.9	+0.1281	0.5473	-0.0093	-50	- 4	
125 Tauri	5.1	2.48	7.4	25 51.2	22 36.3	-11 16.2	+1.2507	0.5473	0.0122	-76	- 41	
406 B. Tauri	5.6	2.57	7.1	27 56.7	17 3 38.8	- 6 23.9	-1.1664	0.5472	0.0243	-35	- 42	
136 Tauri	4.6	2.57	6.9	27 35.7	4 43.3	- 5 21.6	-0.8044	0.5471	0.0268	- 4	- 42	
139 Tauri	4.7	2.55	6.3	25 56.8	6 52.0	- 3 17.3	-0.9644	0.5470	0.0320	-30	- 38	
415 B. Tauri	6.1	+2.60	+ 6.4	+27 34.2	8 12.2	- 1 59.9	-0.8850	0.5469	-0.0351	-10	- 42	
<i>e</i> Geminorum	3.2	2.68	3.2	25 13.0	13 3 49.3	- 7 2.6	-0.5876	0.5437	0.0808	-85	- 4	
37 Geminorum	5.7	2.71	2.4	25 28.9	9 3.8	- 1 58.6	-0.1617	0.5423	0.0925	-34	- 42	
39 Geminorum	6.2	2.73	2.3	26 11.6	10 40.0	- 0 25.6	-1.1002	0.5418	0.0960	-26	- 43	
40 Geminorum	6.3	2.73	2.2	26 1.8	10 58.4	- 0 7.7	-0.9489	0.5417	0.0967	-14	- 43	
<i>ω</i> Geminorum	5.2	+2.70	+ 1.8	+24 20.2	12 22.2	+ 1 13.2	+0.7897	0.5414	-0.0997	+90	- 13	
48 Geminorum	5.8	2.71	1.1	24 16.2	17 2.2	+ 5 44.0	+0.3736	0.5399	0.1098	-66	- 1	
52 Geminorum	6.1	2.73	1.0	25 1.9	18 4.6	+ 6 44.3	-0.5848	0.5396	0.1120	-10	- 38	
<i>A</i> Geminorum	5.1	2.75	0.4	25 12.8	22 11.4	+10 42.9	-1.2628	0.5381	0.1206	-46	- 45	
58 Geminorum	6.0	2.70	+ 0.3	23 6.5	22 13.3	+10 44.7	+1.0622	0.5381	0.1207	-90	- 34	
B. D.+23° 1744	6.4	+2.71	- 0.4	+23 4.0	19 2 38.4	- 8 58.9	+0.5530	0.5365	-0.1297	-81	- 2	
187 B. Geminorum	6.3	2.72	1.0	23 12.8	6 29.5	- 5 15.2	-0.1231	0.5350	0.1373	-36	- 34	
192 B. Geminorum	6.3	2.71	1.2	22 35.9	7 38.5	- 4 8.4	-0.3977	0.5346	0.1395	-68	- 8	
82 Geminorum	6.3	2.73	1.5	23 21.0	10 6.3	- 1 45.4	-0.7813	0.5336	0.1443	- 1	- 67	
<i>μ</i> Cancri	5.5	2.70	2.9	21 49.5	19 22.5	+ 7 13.0	-0.5173	0.5298	0.1614	-14	- 59	
NEPTUNE	7.7	...	...	+19 34.3	20 0 48.2	-11 31.5	+1.0625	0.5288	-0.1711	+90	- 28	
49 B. Cancri	6.0	+2.68	- 3.8	21 0.7	1 31.2	-10 49.9	-0.6457	0.5272	0.1720	+ 8	- 47	
<i>θ</i> Cancri	5.5	2.62	4.5	18 22.7	7 5.8	- 5 25.7	+1.2663	0.5249	0.1811	-86	- 45	
102 B. Cancri	6.5	2.65	5.1	19 58.0	11 25.4	- 1 14.1	-1.2769	0.5231	0.1879	-40	- 70	
<i>ε</i> Cancri	6.3	2.64	5.1	19 50.5	11 28.0	- 1 11.6	-1.1478	0.5231	0.1879	-26	- 70	
<i>δ</i> Cancri	4.2	+2.61	- 5.4	+18 27.7	13 35.7	+ 0 52.1	-0.0374	0.5222	-0.1911	+41	- 36	
<i>X</i> Cancri (<i>var.</i>)	6.2	2.58	6.0	17 33.0	18 58.2	+ 6 4.8	-0.0854	0.5200	0.1989	-38	- 39	
81 Cancri	6.4	2.52	6.9	15 20.0	21 3 35.4	- 9 33.6	+0.5754	0.5166	0.2104	-81	- 7	
<i>π</i> Cancri	5.6	2.51	7.1	15 17.3	5 4.0	- 8 7.7	+0.3121	0.5161	0.2122	-61	- 21	
227 B. Cancri	6.4	2.51	7.5	15 43.6	8 8.7	- 5 8.6	-0.8250	0.5149	0.2159	-2	- 74	
18 Leonis	5.8	+2.40	- 8.6	+12 11.7	21 10.7	+ 7 30.4	+0.1160	0.5107	-0.2300	+49	- 33	

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

JANUARY.

THE STAR'S					AT CONJUNCTION IN R. A.							Limiting Parallels.	
Name.	Mag.	Red'ns from 1916.0.		Apparent Declination.	Greenwich Mean Time.			Hour Angle, H	Y	x'	y'	N.	S.
		$\Delta\alpha$	$\Delta\delta$		d	h	m						
19 Leonis	6.4	+2.39	-8.6	+11 57.3	21	21	43.5	+ 8 2.2	+0.2513	0.5106	-0.2305	+57	-26
R Leonis (var.)	5-10	2.39	8.6	11 49.0	21	47.4	+ 8 6.0	+0.3866	0.5105	0.2306	+66	-19	
A Leonis	4.6	2.32	9.4	10 24.4	22	8 28.1	- 5 31.9	-0.5956	0.5079	0.2398	+12	-75	
43 Leonis	6.3	2.23	9.6	6 58.0	16	27.7	+ 2 13.8	+1.1868	0.5064	0.2456	+90	+27	
48 Leonis	5.2	2.20	10.2	7 23.0	22	42.5	+ 8 17.8	-0.8100	0.5056	0.2493	0	-83	
35 Sextantis	6.1	+2.14	-10.2	+ 5 11.2	23	3 15.1	-11 17.4	+0.4208	0.5052	-0.2516	+67	-20	
d Leonis	5.0	2.07	10.6	4 3.9	12	23.8	- 2 24.5	-0.6927	0.5050	0.2553	+ 7	-86	
p ⁴ Leonis	5.7	2.03	10.4	2 24.5	15	47.3	+ 0 53.2	+0.2174	0.5051	0.2563	+55	-31	
75 Leonis	5.4	2.00	10.8	2 28.2	21	16.0	+ 6 12.5	-1.2542	0.5055	0.2575	-31	-88	
76 Leonis	6.0	1.99	10.8	2 6.5	22	8.0	+ 7 3.0	-1.0902	0.5056	0.2576	-17	-88	
359 B. Leonis	6.3	+1.96	-10.6	+ 0 35.4	24	0 27.3	+ 9 18.4	-0.0654	0.5059	-0.2579	+39	-46	
388 B. Leonis	6.3	1.93	10.2	- 1 14.4	2 53.0	+11	39.9	+1.2622	0.5063	0.2582	+89	+32	
v Leonis	4.5	1.90	10.7	0 21.8	7	38.5	- 7 42.9	-0.9029	0.5072	0.2583	- 5	-90	
431 B. Leonis	6.2	1.88	10.4	1 58.5	8	24.5	- 6 58.2	+0.6157	0.5073	0.2583	+82	-11	
78 B. Virginis	6.5	1.72	10.3	5 15.3	25	3 0.6	+11 5.0	-0.6861	0.5131	0.2549	+ 6	-89	
q Virginis	5.3	+1.62	-9.6	- 8 59.5	12	54.1	- 3 19.4	+0.7629	0.5177	-0.2504	+81	- 3	
370 B. Virginis	6.0	1.52	9.2	11 11.8	23	5.6	+ 6 33.2	+0.5442	0.5235	0.2438	+71	-14	
69 Virginis	4.9	1.36	8.1	15 32.5	26	15 0.0	- 2 3.1	+1.3046	0.5345	0.2289	+74	+40	
75 Virginis	5.6	1.34	8.4	14 56.0	17	31.5	+ 0 23.9	+0.0968	0.5365	0.2259	+42	-38	
83 Virginis	5.6	1.28	8.2	15 45.6	22	54.2	+ 5 35.8	-0.2441	0.5408	0.2193	+24	-57	
85 Virginis	6.1	+1.28	-8.3	-15 20.9	23	24.4	+ 6 4.9	-0.7799	0.5412	-0.2186	- 5	-90	
87 Virginis	5.8	1.27	7.6	17 26.5	27	0 13.7	+ 6 52.6	+1.2074	0.5419	0.2175	+73	+30	
89 Virginis	5.1	1.26	7.5	17 43.1	1	21.0	+ 7 57.7	+1.2492	0.5429	0.2160	+72	+35	
43 H. Virginis	5.5	1.14	7.7	17 48.7	12	45.9	- 5 1.0	-1.0252	0.5529	0.1987	-24	-90	
231 G. Virginis	6.4	1.13	7.6	18 11.8	13	29.3	- 4 19.1	-0.7714	0.5536	0.1974	- 7	-90	
236 G. Virginis	5.7	+1.12	-7.5	-18 19.8	14	10.8	- 3 39.2	-0.7715	0.5542	-0.1963	- 7	-90	
9 G. Libræ	6.5	1.05	7.0	20 4.4	21	9.7	+ 3 4.9	-0.3082	0.5606	0.1837	+16	-61	
17 G. Libræ	6.4	1.00	6.8	20 49.3	23	1 57.5	+ 7 42.1	-0.4000	0.5652	0.1743	+10	-68	
18 G. Libræ	6.1	0.99	6.7	20 58.5	2	23.6	+ 8 7.2	-0.3197	0.5656	0.1734	+14	-62	
43 B. Libræ	5.7	0.95	6.8	21 2.4	6	37.0	-11 48.8	-0.9660	0.5695	0.1645	-23	-90	
47 G. Libræ	6.1	+0.91	-6.5	-21 42.4	10	20.8	- 8 13.4	-0.8827	0.5730	-0.1563	-19	-90	
64 G. Libræ	5.8	0.86	6.4	22 5.5	14	22.8	- 4 20.6	-1.1028	0.5767	0.1469	-35	-90	
153 B. Libræ	6.3	0.79	5.7	24 12.4	21	3.2	+ 2 4.2	+0.1172	0.5828	0.1905	+32	-36	
42 Libræ	5.0	0.76	5.9	23 32.8	23	52.2	+ 4 46.5	-0.9063	0.5852	0.1232	-24	-90	
b Scorpii	4.7	0.71	5.3	25 29.9	29	4 1.0	+ 8 45.5	+0.5764	0.5887	0.1121	+57	-11	
A Scorpii	4.6	+0.70	-5.4	-25 4.7	5	2.6	+ 9 44.5	+0.0392	0.5895	-0.1093	+26	-41	
31 B. Scorpii	5.4	0.70	5.7	24 17.1	5	9.8	+ 9 51.4	-0.7740	0.5897	0.1089	-17	-90	
3 Scorpii	5.9	0.70	5.4	24 59.8	5	26.9	+10 7.9	-0.0871	0.5899	0.1082	+19	-48	
4 Scorpii	5.7	0.70	5.1	26 1.2	5	45.7	+10 25.9	+0.9112	0.5901	0.1073	+64	+10	
40 B. Scorpii	5.4	0.68	5.6	24 35.5	6	57.9	+11 35.1	-0.6567	0.5911	0.1039	-11	-90	
π Scorpii	3.0	+0.68	-5.2	-25 52.5	7	3.2	+11 40.3	+0.6274	0.5912	-0.1037	+60	- 7	
48 B. Scorpii	4.9	0.66	5.3	25 38.0	8	47.0	-10 40.3	+0.2090	0.5925	0.0988	+34	-31	
50 B. Scorpii	6.4	0.66	5.6	24 29.8	9	0.8	-10 26.9	-0.9579	0.5927	0.0982	-30	-90	
65 B. Scorpii	5.5	0.64	5.1	26 6.2	10	35.8	- 8 55.8	+0.5073	0.5939	0.0936	+51	-14	
85 B. Scorpii	6.0	0.62	5.4	25 16.0	13	11.0	- 6 26.9	-0.5673	0.5958	0.0861	- 8	-83	
σ Scorpii	3.1	+0.59	-5.3	-25 23.6	15	33.7	- 4 10.1	-0.6347	0.5974	-0.0790	-12	-90	
α Scorpii	1.2	0.56	5.1	26 14.9	18	38.2	- 1 13.3	-0.0059	0.5995	0.0697	+20	-43	
116 B. Scorpii	6.2	0.55	5.0	26 21.4	19	22.5	- 0 30.8	+0.0528	0.5999	0.0675	+23	-40	
134 B. Scorpii	6.4	0.50	4.8	27 18.0	30	0 10.0	+ 4 4.5	+0.7095	0.6028	0.0526	+62	- 2	
118 B. Ophiuchi	6.2	0.42	5.0	26 24.1	8	30.0	-11 56.7	-0.5161	0.6066	0.0258	-10	-78	
95 G. Ophiuchi	6.1	+0.40	-4.7	-27 39.6	10	30.3	-10 1.6	+0.6938	0.6074	-0.0193	+60	- 3	
36 Ophi. (1st star)	5.4	0.39	5.1	26 28.9	11	36.6	- 8 58.1	-0.5003	0.6078	0.0157	-10	-77	
43 Ophiuchi	5.4	0.37	4.6	28 3.8	14	29.4	- 6 12.7	+1.0438	0.6086	0.0062	+62	+22	
136 G. Ophiuchi	6.3	0.35	5.1	25 52.3	15	49.1	- 4 56.4	-1.1441	0.6089	-0.0018	-52	-90	
151 G. Ophiuchi	6.0	0.34	5.0	26 12.5	17	33.9	- 3 16.1	-0.8071	0.6094	+0.0040	-28	-90	
163 G. Ophiuchi	6.3	+0.30	-4.6	-27 50.8	21	44.1	+ 0 43.3	+0.8675	0.6100	+0.0179	+62	+ 9	

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

JANUARY.

THE STAR'S					AT CONJUNCTION IN R. A.							Long. in R. A.
Name.	Mag.	Red'n's from 1916.0.		Apparent Declina- tion.	Greenwich Mean Time.	Hour Angle, <i>H</i>	<i>Y</i>	<i>x'</i>	<i>y'</i>	<i>N.</i>		
		$\Delta\alpha$	$\Delta\delta$									
		<i>s</i>	<i>"</i>	<i>'</i>	<i>d</i> <i>h</i> <i>m</i>	<i>h</i> <i>m</i>						
<i>X</i> Sagittarii (<i>var.</i>)	4.4	+0.29	-4.6	-27 48.1	30 23 17.0	+2 12.1	+0.8544	0.6101	+0.0231	-62-1		
4 G. Sagittarii	6.2	0.28	4.8	26 56.8	23 37.4	+2 31.8	+0.0146	0.6102	0.0242	-18-4		
10 G. Sagittarii	5.7	0.26	4.6	28 3.2	31 2 35.5	+5 22.0	+1.1989	0.6103	0.0341	-62-0		
66 B. Sagittarii	4.7	0.20	4.7	27 4.5	10 21.7	-11 11.9	+0.5919	0.6097	0.0598	-54-1		
67 B. Sagittarii	6.4	0.20	5.1	25 38.3	10 37.0	-10 57.3	-0.8159	0.6096	0.0606	-24-8		
68 G. Sagittarii	6.2	+0.18	-4.8	-26 41.2	13 53.6	-7 49.1	+0.4384	0.6090	+0.0713	-45-2		
λ Sagittarii	2.9	0.18	5.1	25 28.2	14 0.0	-7 43.0	-0.7581	0.6090	0.0716	-20-4		
69 G. Sagittarii	6.3	0.18	4.8	26 48.6	14 1.7	-7 41.4	+0.5698	0.6090	0.0717	-53-2		
86 B. Sagittarii	6.5	0.18	4.8	26 38.3	14 20.4	-7 23.4	+0.4217	0.6089	0.0727	-44-9		
126 B. Sagittarii	5.7	0.14	5.0	25 5.9	20 10.3	-1 48.6	-0.6234	0.6071	0.0913	-11-8		
σ Sagittarii	2.1	+0.13	-4.8	-26 24.2	23 59.8	+1 51.1	+1.0403	0.6056	+0.1033	-64-2		

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162 B. Sagittarii	6.4	+0.12	-5.0	-24 59.5	1 1 9.2	+2 57.7	-0.2348	0.6051	+0.1068	-11-2
127 G. Sagittarii	6.4	+0.11	-5.0	-25 3.7	1 55.1	+3 41.6	-0.0830	0.6048	+0.1092	-15-8
172 B. Sagittarii	5.8	0.11	5.0	24 57.9	2 40.9	+4 25.5	-0.0940	0.6044	0.1115	-15-6
NEW MOON.										
252 B. Aquarii	5.8	+0.10	-1.0	-5 26.1	5 4 19.4	+2 26.6	+1.3484	0.5335	+0.2686	-83-6
6 G. Piscium	6.2	+0.09	-0.4	-2 50.7	5 48.2	+3 52.6	-0.8899	0.5328	+0.2688	-5-8
22 B. Piscium	6.4	0.15	+0.8	0 10.2	17 59.2	-8 19.7	-0.3506	0.5272	0.2687	-25-0
κ Piscium	4.9	0.15	1.1	0 47.8	19 38.6	-6 43.4	-0.8971	0.5266	0.2685	-5-8
9 Piscium	6.4	0.15	1.1	0 39.7	19 47.9	-6 34.4	-0.7175	0.5266	0.2684	-6-8
16 Piscium	5.7	0.17	1.6	1 38.2	6 0 16.6	-2 14.3	-0.5219	0.5250	0.2674	-16-2
λ Piscium	4.6	+0.20	+1.6	+1 19.1	3 3.4	+0 27.3	+0.5483	0.5241	+0.2665	-77-4
19 Piscium	5.4	0.20	2.2	3 1.3	5 11.6	+2 31.6	-0.6418	0.5235	0.2657	-10-6
22 Piscium	5.8	0.23	2.2	2 27.8	7 56.5	+5 11.3	+0.6631	0.5227	0.2646	-85-1
d Piscium	5.4	0.30	4.4	7 43.5	22 9.5	-5 2.0	-1.1026	0.5201	0.2563	-18-6
136 B. Piscium	6.5	0.39	5.2	8 53.9	7 8 26.4	+4 56.0	+0.2588	0.5193	0.2479	-55-2
75 Piscium	6.3	+0.50	+6.9	+12 30.5	21 4.5	-6 49.0	-0.4990	0.5195	+0.2352	-17-6
η Piscium	3.7	0.62	8.2	14 54.7	8 9 26.5	+5 10.1	-0.2450	0.5209	0.2203	-33-6
101 Piscium	6.2	0.65	8.0	14 14.1	11 34.2	+7 13.9	+0.9491	0.5212	0.2174	-90-0
105 Piscium	6.1	0.66	8.7	15 59.0	13 29.0	+9 5.1	-0.5076	0.5216	0.2149	-16-6
3 Arietis	6.4	0.70	9.1	16 59.7	16 52.9	-11 37.2	-0.8721	0.5222	0.2101	-5-2
4 Arietis	5.8	+0.71	+9.0	+16 32.4	17 40.2	-10 51.4	-0.2191	0.5223	+0.2090	-31-2
ι Arietis	5.1	0.76	9.4	17 24.6	22 9.9	-6 30.2	-0.2298	0.5232	0.2024	-31-6
35 B. Arietis	6.4	0.80	9.6	17 51.2	9 1 16.5	-3 29.4	-0.0840	0.5240	0.1977	-38-2
47 B. Arietis	6.5	0.83	9.6	17 37.9	3 15.4	-1 34.3	+0.5426	0.5245	0.1946	-78-1
15 Arietis	5.9	0.84	10.1	19 6.4	4 38.0	-0 14.2	-0.7829	0.5248	0.1925	-0-1
θ Arietis	5.6	+0.89	+10.3	+19 31.0	8 16.7	+3 17.6	-0.5348	0.5257	+0.1866	-15-6
26 Arietis	6.2	0.97	10.4	19 29.2	14 19.6	+9 9.1	+0.5958	0.5274	0.1764	-84-1
ν Arietis	5.4	1.02	11.1	21 36.1	18 14.4	-11 3.7	-1.0249	0.5285	0.1696	-17-6
ξ Arietis (mean)	4.6	1.16	11.0	21 0.5	10 3 59.0	-1 37.7	+1.1883	0.5314	0.1517	-90-0
64 Arietis	5.8	1.35	11.9	24 25.8	15 46.2	+9 46.4	-0.9017	0.5349	0.1285	-9-6
7 Tauri	5.9	+1.42	+11.7	+24 11.2	20 30.6	-9 38.5	-0.0486	0.5363	+0.1188	-40-8
11 Tauri	6.1	1.47	11.8	25 3.7	23 26.5	-6 48.5	-0.6713	0.5372	0.1126	-5-3
16 Tauri	5.4	1.49	11.4	24 1.8	11 1 19.7	-4 59.0	+0.6728	0.5377	0.1086	-90-0
17 Tauri	3.8	1.49	11.4	23 51.2	1 21.8	-4 57.0	+0.8702	0.5377	0.1085	-90-0
18 Tauri	5.6	1.50	11.6	24 34.8	1 29.2	-4 50.0	+0.0844	0.5378	0.1083	-48-2
q Tauri	4.3	+1.49	+11.5	+24 12.5	1 30.8	-4 48.4	+0.4963	0.5377	+0.1082	-76-1
20 Tauri	4.1	1.50	11.4	24 6.6	1 48.1	-4 31.6	+0.6360	0.5378	0.1076	-90-8
21 Tauri	5.8	1.50	11.5	24 17.8	1 50.2	-4 29.5	+0.4340	0.5378	0.1075	-71-2
22 Tauri	6.5	1.50	11.5	24 16.2	1 54.1	-4 25.8	+0.4701	0.5379	0.1074	-74-0
23 Tauri	4.3	1.50	11.3	23 41.4	2 2.4	-4 17.8	+1.1221	0.5379	0.1071	-90-0
- Tauri	3.0	+1.51	+11.3	+23 51.0	2 34.4	-3 46.8	+1.0045	0.5381	+0.1069	-90-41

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

FEBRUARY.

THE STAR'S					AT CONJUNCTION IN R. A.							Limiting Par- allels.	
Name.	Mag.	Red'ns from 1916.0.		Apparent Declina- tion.	Greenwich Mean Time.			Hour Angle, H	Y	x'	y'	N.	S.
		Δα	Δδ		d	h	m						
		s	"	°	'								
7 Tauri	3.7	+1.52	+11.3	+23 48.0	11	3	21.1	- 3 1.6	+1.1403	0.5383	+0.1043	+90	+42
8 Tauri	5.2	1.52	11.3	23 53.0		3	21.7	- 3 1.0	+1.0494	0.5383	0.1043	+90	+35
4 H. Tauri	5.3	1.54	11.8	25 19.8		3	51.6	- 2 32.2	-0.4902	0.5384	0.1032	+15	-51
p Tauri	5.6	1.69	11.6	26 16.0		13	18.0	+ 6 35.4	-0.6462	0.5408	0.0824	+ 6	-60
χ Tauri	5.3	1.77	11.0	25 26.1		18	41.5	+11 48.0	+0.6825	0.5420	0.0702	+90	+15
7 B. Aurigæ	6.0	+2.00	+10.7	+27 45.7	12	8	23.7	+ 1 2.4	-1.1445	0.5444	+0.0384	-32	-62
8 B. Aurigæ	6.5	2.08	10.1	27 34.9		13	46.1	+ 6 13.9	-0.7752	0.5450	0.0257	- 2	-62
7 B. Aurigæ	6.0	2.12	10.0	27 55.7		16	4.6	+ 8 27.6	-1.1056	0.5451	0.0202	-28	-62
4 B. Tauri	6.4	2.19	9.5	27 52.5		21	10.0	-10 37.3	-0.9757	0.5454	+0.0081	-17	-62
7 B. Aurigæ	6.5	2.28	8.7	27 36.6	13	3	55.7	- 4 5.6	-0.6820	0.5456	-0.0081	+ 3	-58
2 B. Aurigæ	5.7	+2.28	+ 8.4	+26 52.5		4	29.6	- 3 32.8	+0.1287	0.5456	-0.0094	+51	- 8
5 Tauri	5.1	2.28	7.9	25 51.2		5	41.0	- 2 23.8	+1.2488	0.5456	0.0122	+77	+61
6 B. Tauri	5.6	2.38	7.9	27 56.8		10	44.0	+ 2 28.9	-1.1637	0.5454	0.0243	-35	-62
6 Tauri	4.6	2.39	7.7	27 35.7		11	48.5	+ 3 31.1	-0.8026	0.5453	0.0268	- 4	-62
9 Tauri	4.7	2.38	6.9	25 56.8		13	57.4	+ 5 35.7	+0.9626	0.5452	0.0319	+90	+36
5 B. Tauri	6.1	+2.43	+ 7.2	+27 34.3		15	17.7	+ 6 53.2	-0.8832	0.5450	-0.0351	-10	-62
z Geminorum	3.2	2.61	3.9	25 13.0	14	10	56.7	+ 1 52.4	+0.5863	0.5420	0.0805	+85	+ 9
17 Geminorum	5.7	2.66	3.2	25 29.0		16	11.6	+ 6 56.8	-0.1618	0.5408	0.0922	+34	-31
19 Geminorum	6.2	2.70	3.1	26 11.6		17	47.9	+ 8 29.8	-1.0986	0.5404	0.0957	-26	-64
10 Geminorum	6.3	2.70	3.0	26 1.8		18	6.4	+ 8 47.8	-0.9475	0.5403	0.0964	-14	-64
o Geminorum	5.2	+2.67	+ 2.4	+24 20.2		19	30.3	+10 8.9	+0.7880	0.5399	-0.0994	+90	+18
18 Geminorum	5.8	2.71	1.7	24 16.2	15	0	10.5	- 9 20.2	+0.3729	0.5386	0.1095	+66	- 5
12 Geminorum	6.1	2.74	1.7	25 1.9		1	12.8	- 8 19.9	-0.5837	0.5383	0.1117	+10	-58
4 Geminorum	5.1	2.77	1.1	25 12.8		5	19.7	- 4 21.1	-1.2600	0.5371	0.1203	+45	-65
18 Geminorum	6.0	2.73	+ 0.7	23 6.5		5	21.6	- 4 19.3	+1.0604	0.5371	0.1203	+90	+34
B. D. +23° 1744	6.4	+2.76	0.0	+23 4.1		9	46.6	- 0 3.0	+0.5526	0.5357	-0.1294	+81	+ 2
37 B. Geminorum	6.3	2.79	- 0.5	23 12.8		13	37.6	+ 3 40.5	-0.1217	0.5344	0.1370	+36	-34
32 B. Geminorum	6.3	2.78	0.8	22 35.9		14	46.5	+ 4 47.2	+0.3981	0.5340	0.1393	+68	- 7
32 Geminorum	6.3	2.81	1.0	23 21.0		17	14.1	+ 7 10.0	-0.7780	0.5332	0.1440	- 1	-67
μ Cancræ	5.5	2.83	2.8	21 49.5	16	2	29.1	- 7 52.8	-0.5130	0.5299	0.1612	+15	-58
NEPTUNE	7.7	...	...	+19 44.3		6	24.3	- 4 5.0	+1.1326	0.5297	-0.1685	+90	+34
19 B. Cancræ	6.0	+2.84	- 3.8	21 0.7		8	36.5	- 1 57.0	-0.6398	0.5277	0.1720	+ 8	-67
0 Cancræ	5.5	2.81	5.0	18 22.7		14	9.6	+ 3 25.6	+1.2674	0.5258	0.1812	+90	+46
12 B. Cancræ	6.5	2.85	5.4	19 58.0		18	27.8	+ 7 35.8	-1.2663	0.5242	0.1881	-39	-70
e Cancræ	6.3	2.85	5.4	19 50.5		18	30.4	+ 7 38.3	-1.1376	0.5242	0.1881	-25	-70
6 Cancræ	4.2	+2.83	- 5.9	+18 27.7		20	37.4	+ 9 41.4	-0.0306	0.5235	-0.1914	+41	-35
39 B. Cancræ	6.1	2.85	6.2	19 8.7		23	37.8	-11 23.7	-1.3585	0.5224	0.1959	-60	-64
X Cancræ (var.)	6.2	2.83	6.7	17 33.0	17	1	57.7	- 9 8.1	-0.0770	0.5216	0.1993	+39	-39
31 Cancræ	6.4	2.80	8.1	15 20.0		10	30.9	- 0 50.5	+0.5836	0.5189	0.2110	+81	- 7
π Cancræ	5.6	2.80	8.3	15 17.3		11	58.7	+ 0 34.7	+0.3218	0.5184	0.2129	+62	-20
27 B. Cancræ	6.4	+2.81	- 8.6	+15 43.6		15	1.8	+ 3 32.1	-0.8093	0.5175	-0.2167	- 1	-74
18 Leonis	5.8	2.76	10.4	12 11.7	18	3	55.5	- 7 57.3	+0.1321	0.5141	0.2311	+50	-32
19 Leonis	6.4	2.75	10.5	11 57.3		4	27.9	- 7 25.9	+0.2668	0.5140	0.2317	+58	-26
R Leonis (var.)	5-10	2.75	10.5	11 49.0		4	31.8	- 7 22.1	+0.4015	0.5140	0.2317	+67	-19
4 Leonis	4.6	2.72	11.7	10 24.4		15	4.5	+ 2 52.0	-0.5715	0.5118	0.2413	+13	-74
43 Leonis	6.3	+2.66	-12.5	+ 6 58.0		22	57.6	+10 31.2	+1.2047	0.5107	-0.2473	+90	+28
48 Leonis	5.2	2.66	13.1	7 23.0	19	5	7.1	- 7 30.1	-0.7784	0.5102	0.2511	+ 2	-83
35 Sextantis	6.1	2.62	13.4	5 11.1		9	35.8	- 3 9.1	+0.4477	0.5099	0.2535	+69	-19
d Leonis	5.0	2.59	14.1	4 3.9		18	36.2	+ 5 35.4	-0.6554	0.5099	0.2573	+ 9	-84
p ⁴ Leonis	5.7	2.56	14.2	2 24.5		21	56.6	+ 8 50.0	+0.2513	0.5101	0.2583	+57	-30
75 Leonis	5.4	+2.55	-14.6	+ 2 28.1	20	3	20.4	- 9 55.7	-1.2101	0.5106	-0.2596	-27	-88
76 Leonis	6.0	2.54	14.6	2 6.4		4	11.6	- 9 5.9	-1.0465	0.5107	0.2597	-14	-88
59 B. Leonis	6.3	2.52	14.6	+ 0 35.4		6	28.8	- 6 52.8	-0.0259	0.5109	0.2600	+42	-44
38 B. Leonis	6.3	2.50	14.6	- 1 14.5		8	52.3	- 4 33.4	+1.2963	0.5113	0.2602	+89	+35
v Leonis	4.5	2.49	15.0	0 21.8		13	33.7	- 0 0.4	-0.8560	0.5122	0.2604	- 2	-90
31 B. Leonis	6.2	+2.47	-14.8	- 1 58.5		14	19.0	+ 0 43.7	+0.6558	0.5123	-0.2604	+85	- 9

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

FEBRUARY.

THE STAR'S					AT CONJUNCTION IN R. A.							Limit for Calc.
Name.	Mag.	Red'n's from 1916.0.		Apparent Declina- tion.	Greenwich Mean Time.	Hour Angle, H	Y	z'	y'	N. S.		
		Δα	Δδ									
		s	"	°	d	h	m	h	m			
78 B. Virginis	6.5	+2.38	-15.1	- 5 15.4	21	8	40.3	-5 28.0	-0.6322	0.5176	-0.2566	-7.4
q Virginis	5.3	2.31	14.7	8 59.6	18	27.2	+ 4 1.1	+0.8070	0.5217	0.2518	-81	1
χ Virginis	4.8	2.30	15.1	7 32.3	21	10.1	+ 6 39.0	-1.4005	0.5229	0.2502	-56.7	1
370 B. Virginis	6.0	2.25	14.4	11 11.8	23	4 33.4	-10 11.6	+0.6035	0.5267	0.2448	-75.1	1
69 Virginis	4.9	2.16	13.4	15 32.5	20	23.0	+ 5 7.6	+1.3714	0.5363	0.2292	-69.4	1
75 Virginis	5.6	+2.14	-13.6	-14 56.1	22	54.8	+ 7 34.5	+0.1633	0.5380	-0.2262	-46.4	1
83 Virginis	5.6	2.10	13.3	15 45.6	23	4 17.3	-11 13.8	-0.1767	0.5417	0.2193	-27.5	1
85 Virginis	6.1	2.10	13.4	15 21.0	4	47.6	-10 44.5	-0.7137	0.5421	0.2186	-1.4	1
87 Virginis	5.8	2.10	12.8	17 26.6	5	36.9	-9 56.9	+1.2785	0.5427	0.2174	-73.3	1
89 Virginis	5.1	2.09	12.7	17 43.2	6	44.4	-8 51.6	+1.3210	0.5434	0.2159	-72.6	1
43 H. Virginis	5.5	+2.01	-12.5	-17 48.8	18	12.0	+ 2 12.4	-0.9585	0.5520	-0.1981	-15.9	1
231 G. Virginis	6.4	2.00	12.4	18 11.9	18	55.7	+ 2 54.6	-0.7035	0.5526	0.1968	-3.9	1
236 G. Virginis	5.7	2.00	12.3	18 19.8	19	37.4	+ 3 34.8	-0.7036	0.5532	0.1956	-3.3	1
9 G. Libræ	6.5	1.94	11.6	20 4.5	24	2 39.9	+10 22.4	-0.2374	0.5587	0.1828	-19.2	1
17 G. Libræ	6.4	1.90	11.2	20 49.4	7	30.8	-8 57.2	-0.3295	0.5625	0.1732	-14.4	1
18 G. Libræ	6.1	+1.90	-11.1	-20 58.6	7	57.3	-8 31.7	-0.2486	0.5628	-0.1723	-14.5	1
43 B. Libræ	5.7	1.88	11.2	21 2.5	12	13.9	-4 24.5	-0.8994	0.5662	0.1634	-19.9	1
47 G. Libræ	6.1	1.83	10.6	21 42.5	16	1.0	-0 45.8	-0.8159	0.5692	0.1550	-15.4	1
64 G. Libræ	5.8	1.80	10.3	22 5.5	20	7.0	+ 3 11.0	-1.0382	0.5723	0.1456	-30.9	1
153 B. Libræ	6.3	1.74	9.2	24 12.4	25	2 54.8	+9 43.2	+0.1926	0.5773	0.1291	-36.2	1
42 Libræ	5.0	+1.71	-9.3	-23 32.9	5	47.3	-11 30.9	-0.8413	0.5793	-0.1219	-20.4	1
b Scorpïi	4.7	1.68	8.4	25 30.0	10	1.6	-7 26.7	+0.6569	0.5822	0.1108	-62.1	1
A Scorpïi	4.6	1.66	8.5	25 4.8	11	4.5	-6 26.2	+0.1138	0.5830	0.1090	-30.3	1
31 B. Scorpïi	5.4	1.66	8.8	24 17.2	11	11.9	-6 19.1	-0.7084	0.5831	0.1077	-13.9	1
32 B. Scorpïi	5.3	1.65	9.0	23 43.9	11	13.1	-6 18.0	-1.2768	0.5831	0.1077	-58.7	1
3 Scorpïi	5.9	+1.66	-8.5	-24 59.9	11	29.4	-6 2.2	-0.0139	0.5832	-0.1069	-23.4	1
4 Scorpïi	5.7	1.66	8.1	26 1.3	11	48.6	-5 43.8	+0.9955	0.5835	0.1060	-64.1	1
40 B. Scorpïi	5.4	1.64	8.6	24 35.5	13	2.5	-4 32.9	-0.5902	0.5843	0.1027	-7.6	1
π Scorpïi	3.0	1.65	8.1	25 52.5	13	7.9	-4 27.6	+0.7086	0.5843	0.1023	-64.2	1
48 B. Scorpïi	4.9	1.63	8.1	25 38.1	14	54.2	-2 45.6	+0.2853	0.5855	0.0976	-38.2	1
50 B. Scorpïi	6.4	+1.62	-8.5	-24 29.9	15	8.4	-2 31.9	-0.8951	0.5856	-0.0970	-25.4	1
65 B. Scorpïi	5.5	1.61	7.8	26 6.3	16	45.8	-0 58.3	+0.5871	0.5866	0.0924	-56.1	1
85 B. Scorpïi	6.0	1.57	8.0	25 16.0	19	24.9	+1 34.4	-0.5007	0.5882	0.0850	-4.7	1
σ Scorpïi	3.1	1.55	7.8	25 23.7	21	51.4	+3 35.0	-0.5695	0.5895	0.0780	-9.2	1
α Scorpïi	1.2	1.52	7.3	26 14.9	26	1 1.0	+6 57.0	+0.0669	0.5912	0.0688	-24.5	1
116 B. Scorpïi	6.2	+1.51	-7.2	-26 21.5	1	46.5	+7 40.7	+0.1263	0.5915	-0.0666	-26.5	1
134 B. Scorpïi	6.4	1.46	6.6	27 18.1	6	42.2	-11 35.7	+0.7912	0.5938	0.0519	-63.5	1
118 B. Ophiuchi	6.2	1.36	6.4	26 24.1	15	17.6	-3 21.5	-0.4532	0.5969	0.0256	-7.7	1
95 G. Ophiuchi	6.1	1.35	5.8	27 39.6	17	21.8	-1 22.4	+0.7740	0.5974	0.0192	-62.7	1
36 Ophi. (1st star)	5.4	1.32	6.3	26 28.9	18	30.2	-0 16.9	-0.4378	0.5977	0.0156	-7.7	1
43 Ophiuchi	5.4	+1.30	-5.4	-28 3.8	21	28.6	+2 34.1	+1.1286	0.5984	-0.0063	-62.3	1
136 G. Ophiuchi	6.3	1.27	6.0	25 52.3	22	51.0	+3 53.2	-1.0927	0.5986	-0.0020	-47.4	1
151 G. Ophiuchi	6.0	1.25	5.8	26 12.5	20	39.3	+5 36.9	-0.7512	0.5989	-0.0037	-25.4	1
163 G. Ophiuchi	6.3	1.21	5.0	27 50.8	4	58.1	+9 44.9	+0.9480	0.5993	0.0173	-62.1	1
X Sagittarii (var.)	4.4	1.19	4.9	27 48.1	6	34.1	+11 16.9	+0.9343	0.5994	0.0224	-62.1	1
4 G. Sagittarii	6.2	+1.18	-5.2	-26 56.9	6	55.3	+11 37.2	+0.0812	0.5994	+0.0235	-20.3	1
66 B. Sagittarii	4.7	1.06	4.4	27 4.5	18	2.2	-1 43.6	+0.6640	0.5985	0.0583	-59.3	1
67 B. Sagittarii	6.4	1.04	4.9	25 38.3	18	18.0	-1 28.5	-0.7665	0.5985	0.0591	-21.4	1
68 G. Sagittarii	6.2	1.01	4.3	26 41.2	21	41.5	+1 46.6	+0.5066	0.5978	0.0695	-19.1	1
λ Sagittarii	2.9	1.00	4.7	25 28.2	21	48.2	+1 53.0	-0.7092	0.5978	0.0699	-17.4	1
69 G. Sagittarii	6.3	+1.01	-4.3	-26 48.6	21	50.0	+1 54.6	+0.6400	0.5978	+0.0700	-58.7	1
86 B. Sagittarii	6.5	1.00	4.3	26 38.2	22	9.3	+2 13.2	-0.4895	0.5977	0.0709	-48.1	1
126 B. Sagittarii	5.7	0.93	4.4	25 5.9	23	4 11.7	+ 8 0.6	-0.5750	0.5960	0.0892	-8.4	1
σ Sagittarii	2.1	0.90	3.8	26 24.2	8	9.2	+11 48.3	+1.1135	0.5946	0.1009	-64.2	1
162 B. Sagittarii	6.4	0.87	4.1	24 59.5	9	21.2	-11 2.6	-0.1826	0.5941	0.1043	-14.5	1
127 G. Sagittarii	6.4	+0.87	-4.0	-25 3.7	10	8.6	-10 17.1	-0.0287	0.5938	+0.1066	-22.4	1

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

FEBRUARY.

THE STAR'S					AT CONJUNCTION IN R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1916.0.		Apparent Declination.	Greenwich Mean Time.	Hour Angle, <i>H</i>	<i>Y</i>	<i>x'</i>	<i>y'</i>	N.	S.
		$\Delta\alpha$	$\Delta\delta$								
72 B. Sagittarii	5.8	+0.86	-4.0	24 57.9	28 10 56.1	-9 31.5	-0.0402	0.5935	+0.1089	+22	-45
89 B. Sagittarii	6.1	0.83	3.9	24 47.4	13 9.5	-7 23.5	+0.0941	0.5925	0.1153	+26	-41
ψ Sagittarii	4.9	0.81	3.6	25 24.2	15 57.9	-4 42.0	+0.9842	0.5912	0.1231	+65	+16
08 B. Sagittarii	6.1	0.80	3.9	24 19.5	15 59.0	-4 41.0	-0.0971	0.5912	0.1232	+20	-49
χ Sagittarii	4.9	0.77	3.6	24 40.4	19 45.4	-1 3.7	+0.7378	0.5892	0.1335	+65	-1
49 Sagittarii	5.5	+0.76	-3.7	24 7.7	19 51.1	-0 58.1	+0.2037	0.5892	+0.1338	+37	-31
53 Sagittarii	6.3	0.71	3.5	23 37.2	29 1 28.5	+4 25.8	+0.4877	0.5861	0.1486	+54	-16
74 B. Sagittarii	6.1	0.71	3.5	23 37.4	1 35.4	+4 32.5	+0.5075	0.5860	0.1488	+56	-15
29 B. Sagittarii	6.1	0.63	3.1	22 58.2	10 4.0	-11 18.8	+1.2032	0.5808	0.1697	+67	+34
36 B. Sagittarii	6.5	0.62	3.1	22 50.0	11 0.8	-10 24.4	+1.2271	0.5802	0.1719	+67	+37
σ Capricorni	5.5	+0.55	-3.5	-19 22.9	17 24.3	-4 15.5	-1.0897	0.5760	+0.1862	-30	-90
\circ Capricorni	5.6	+0.51	-3.4	-18 51.8	21 43.6	-0 6.0	-0.7865	0.5730	+0.1953	-9	-90

MARCH.

ν Capricorni	5.3	+0.48	-3.2	-18 26.2	1 1 57.0	+3 57.8	-0.3729	0.5701	+0.2036	+14	-65
81 B. Capricorni	6.4	0.46	3.0	-18 20.8	5 51.0	+7 43.2	+0.3465	0.5674	0.2109	+53	-24
19 Capricorni	5.7	0.44	2.8	-18 14.6	8 9.6	+9 56.7	+0.7340	0.5657	0.2150	+72	-3
94 B. Capricorni	5.7	0.42	3.1	-16 21.4	9 24.0	+11 8.3	-0.8941	0.5649	0.2171	-12	-90
21 Capricorni	6.5	0.42	2.8	-17 51.6	10 44.7	-11 33.8	+0.9106	0.5639	0.2194	+72	+8
θ Capricorni	4.2	+0.41	-2.7	-17 34.1	12 55.2	-9 28.1	+1.0989	0.5624	+0.2229	+72	+21
MERCURY	0.3	...	...	-16 54.9	15 17.5	-7 11.0	+0.9775	0.5194	0.2215	+73	+11
NEW MOON.											
136 B. Piscium	6.5	+0.22	+3.5	+8 53.9	5 18 16.9	-7 25.4	+0.1661	0.5251	+0.2497	+52	-32
75 Piscium	6.3	+0.27	+4.9	+12 30.5	6 6 41.7	+4 36.2	-0.5987	0.5259	+0.2373	+11	-74
η Piscium	3.7	0.35	6.1	14 54.9	18 49.6	+7 38.8	-0.3564	0.5276	0.2223	+24	-57
101 Piscium	6.2	0.37	6.0	14 14.0	20 54.8	-5 37.6	+0.8273	0.5281	0.2195	+90	+7
105 Piscium	6.1	0.38	6.6	15 58.9	22 47.3	-3 48.7	-0.6201	0.5283	0.2168	+10	-71
3 Arietis	6.4	0.40	7.0	16 59.7	7 2 7.2	-0 35.0	-0.9841	0.5290	0.2121	-12	-73
4 Arietis	5.8	+0.41	+6.9	+16 32.4	2 53.5	+0 9.9	-0.3367	0.5291	+0.2110	+25	-54
1 Arietis	5.1	0.44	7.3	17 24.6	7 17.9	+4 25.8	-0.3503	0.5301	0.2043	+24	-54
35 B. Arietis	6.4	0.47	7.5	17 51.1	10 20.8	+7 22.9	-0.2076	0.5307	0.1996	+32	-46
47 B. Arietis	6.5	0.49	7.6	17 37.9	12 17.3	+9 15.6	+0.4127	0.5312	0.1964	+63	-13
15 Arietis	5.9	0.50	8.0	19 6.4	13 38.2	+10 33.9	-0.9033	0.5315	0.1943	-8	-71
θ Arietis	5.6	+0.54	+8.2	+19 30.9	17 12.7	-9 58.5	-0.6592	0.5323	+0.1883	+7	-69
26 Arietis	6.2	0.60	8.4	19 29.1	23 8.6	+4 14.0	+0.4592	0.5338	0.1780	+72	-9
ν Arietis	5.4	0.64	9.1	21 36.1	8 2 59.0	-0 31.2	-1.1508	0.5348	0.1710	-28	-68
μ Arietis	5.7	0.66	8.6	19 39.4	4 40.4	+1 7.0	+1.2337	0.5352	0.1679	+89	+44
ϵ Arietis (mean)	4.6	0.75	9.1	21 05.5	12 33.0	+8 44.1	+1.0412	0.5372	0.1529	+90	+29
64 Arietis	5.8	+0.90	+10.3	+24 25.8	9 0 8.6	-4 3.4	-1.0377	0.5400	+0.1294	-20	-66
66 Arietis	6.1	0.93	9.6	22 31.1	2 4.6	+2 11.2	+1.2912	0.5405	0.1253	+74	+58
7 Tauri	5.9	0.97	10.2	24 11.2	4 48.8	+0 27.5	-0.1920	0.5411	0.1195	+32	-36
11 Tauri	6.1	1.01	10.4	25 3.7	7 42.2	+3 15.1	-0.8114	0.5417	0.1133	-4	-65
16 Tauri	5.4	1.04	10.1	24 1.7	9 33.8	+5 3.0	+0.5236	0.5421	0.1092	+79	+2
17 Tauri	3.8	+1.04	+10.0	+23 51.2	9 36.0	+5 5.0	+0.7197	0.5421	+0.1091	+90	+13
18 Tauri	5.6	1.04	10.2	24 34.8	9 43.2	+5 12.0	-0.0611	0.5421	0.1089	+39	-28
q Tauri	4.3	1.04	10.1	24 12.5	9 44.8	+5 13.5	+0.3482	0.5421	0.1088	+64	-7
20 Tauri	4.1	1.04	10.1	24 6.5	10 1.8	+5 30.0	+0.4868	0.5422	0.1082	+75	-0
21 Tauri	5.8	1.04	10.1	24 17.8	10 3.9	+5 32.1	+0.2863	0.5422	0.1081	+60	-10
22 Tauri	6.5	+1.05	+10.1	+24 16.2	10 7.8	+5 35.8	+0.3221	0.5422	+0.1080	+63	-8
23 Tauri	4.3	1.05	9.9	23 41.4	10 15.9	+5 43.6	+0.9699	0.5422	0.1076	+90	+29
η Tauri	3.0	1.05	10.0	23 50.9	10 47.6	+6 14.2	+0.8529	0.5423	0.1065	+90	+21
27 Tauri	3.7	1.06	9.9	23 48.0	11 33.6	+6 58.7	+0.9877	0.5425	0.1048	+90	+31
28 Tauri	5.2	1.06	10.0	23 53.0	11 34.2	+6 59.3	+0.8973	0.5425	0.1048	+90	+24
14 H. Tauri	5.3	+1.08	+10.4	+25 19.8	12 3.8	+7 27.9	-0.6325	0.5426	+0.1037	+7	-61

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

MARCH.

THE STAR'S					AT CONJUNCTION IN R. A.					Limit- ing Par- allels	
Name.	Mag.	Red'n's from 1916.0.		Apparent Declination.	Greenwich Mean Time.	Hour Angle, H	P	α'	γ'	N.	S.
		$\Delta\alpha$	$\Delta\delta$		d h m	h m					
<i>p</i> Tauri	5.6	+1.22	+10.6	+26 15.9	9 21 23.4	7 31.4	-0.7896	0.5442	+0.0627	-3	-64
χ Tauri	5.3	1.30	10.1	25 26.1	10 2 43.7	2 22.1	+0.5313	0.5450	0.0705	+80	+7
38 B. Aurigæ	6.5	1.60	9.8	27 34.9	21 40.0	8 4.5	-0.9203	0.5462	0.0259	-13	-62
47 B. Aurigæ	6.0	1.64	9.8	27 55.7	23 57.9	5 51.4	-1.2495	0.5462	0.0203	-50	-62
354 B. Tauri	6.4	1.72	9.4	27 52.5	11 5 2.0	0 57.6	-1.1200	0.5461	+0.0082	-30	-62
107 B. Aurigæ	6.5	+1.82	+8.7	+27 36.8	11 46.8	5 33.3	-0.8266	0.5456	-0.0078	-6	-62
112 B. Aurigæ	5.7	1.82	8.4	26 52.5	12 20.6	6 6.0	-0.0180	0.5456	0.0092	+42	-16
125 Tauri	5.1	1.83	7.9	25 51.2	13 32.0	7 14.9	+1.0992	0.5456	0.0120	+90	-47
136 Tauri	4.6	1.94	8.0	27 35.7	19 39.2	10 50.4	-0.9458	0.5448	0.0265	-15	-62
139 Tauri	4.7	1.95	7.2	25 56.8	21 48.0	8 45.9	+0.8162	0.5445	0.0316	+90	-25
415 B. Tauri	6.1	+1.99	+7.6	+27 34.3	23 8.4	7 28.3	-1.0255	0.5443	-0.0347	-21	-62
<i>s</i> Geminorum	3.2	2.23	4.6	25 13.0	12 18 49.9	+11 33.4	+0.4483	0.5402	0.0797	+72	+1
37 Geminorum	5.7	2.30	4.0	25 29.0	13 0 6.0	7 21.1	-0.2967	0.5387	0.0913	+26	-39
39 Geminorum	6.2	2.33	4.1	26 11.6	1 42.7	5 47.6	-1.2320	0.5383	0.0948	-42	-64
40 Geminorum	6.3	2.33	4.0	26 1.8	2 1.2	5 29.7	-1.0809	0.5382	0.0954	-25	-64
ω Geminorum	5.2	+2.32	+3.2	+24 20.2	3 25.5	4 8.1	+0.6543	0.5378	-0.0985	+90	-10
48 Geminorum	5.8	2.37	2.6	24 16.3	8 6.9	0 23.9	+0.2418	0.5364	0.1084	+58	-12
52 Geminorum	6.1	2.40	2.7	25 2.0	9 9.6	1 24.5	-0.7137	0.5361	0.1105	+2	-65
58 Geminorum	6.0	2.41	1.5	23 6.5	13 19.5	5 26.3	+0.9323	0.5347	0.1191	+90	-25
B. D.+23° 1744	6.4	2.46	0.9	23 4.1	17 45.9	9 44.0	+0.4275	0.5333	0.1280	+70	-5
187 B. Geminorum	6.3	+2.50	+0.4	+23 12.8	21 38.0	-10 31.3	-0.2440	0.5320	-0.1356	+29	-40
192 B. Geminorum	6.3	2.50	+0.1	22 35.9	22 47.3	9 24.3	+0.2765	0.5316	0.1379	+59	-14
82 Geminorum	6.3	2.54	0.0	23 21.0	1 15.6	7 0.7	-0.8974	0.5308	0.1426	-9	-6
μ Cancri	5.5	2.60	-1.8	21 49.6	10 33.3	1 59.2	-0.6250	0.5277	0.1596	+8	-65
NEPTUNE	7.7	...	...	19 51.8	13 24.0	4 44.6	+1.0690	0.5274	0.1647	+90	-29
49 B. Cancri	6.0	+2.64	-2.9	+21 0.8	16 42.3	7 56.6	-0.7463	0.5256	-0.1703	+2	-69
θ Cancri	5.5	2.63	4.3	18 22.7	22 16.7	-10 39.4	+1.1652	0.5239	0.1795	+90	-35
ϕ Cancri	6.3	2.69	4.6	19 50.5	15 2 38.4	6 25.9	-1.2338	0.5225	0.1864	-35	-7
δ Cancri	4.2	2.68	5.2	18 27.7	4 45.8	4 22.5	-0.1253	0.5218	0.1896	+36	-4
χ Cancri (var.)	6.2	2.70	6.1	17 33.0	10 6.9	0 48.9	-0.1658	0.5202	0.1976	+34	-6
81 Cancri	6.4	+2.71	-7.7	+15 20.0	18 40.7	9 7.1	+0.5039	0.5179	-0.2093	+74	-11
π Cancri	5.6	2.72	8.0	15 17.3	20 8.6	-10 32.3	+0.2443	0.5176	0.2113	+57	-24
227 B. Cancri	6.4	2.75	8.2	15 43.6	23 11.6	-10 30.3	-0.8808	0.5169	0.2151	-6	-74
18 Leonis	5.8	2.75	10.6	12 11.7	16 12 4.1	1 59.2	+0.0762	0.5143	0.2238	+47	-5
19 Leonis	6.4	2.75	10.7	11 57.3	12 36.4	2 30.5	+0.2113	0.5143	0.2304	+55	-2
R Leonis (var.)	5-10	+2.75	-10.8	+11 49.0	12 40.3	2 34.3	+0.3457	0.5143	-0.2304	+63	-21
A Leonis	4.6	2.77	12.2	10 24.4	23 10.1	-11 14.6	-0.6084	0.5130	0.2403	+10	-75
43 Leonis	6.3	2.75	13.5	6 58.0	17 7 0.0	3 38.7	+1.1727	0.5126	0.2466	+90	-24
48 Leonis	5.2	2.77	14.1	7 23.0	13 6.4	2 17.0	-0.7916	0.5125	0.2507	+1	-43
35 Sextantis	6.1	2.76	14.7	5 11.1	17 32.4	6 35.2	+0.4358	0.5126	0.2532	+68	-19
d Leonis	5.0	+2.77	-15.6	+4 3.9	18 2 26.5	8 46.6	-0.6462	0.5134	-0.2573	+9	-45
p^4 Leonis	5.7	2.75	16.0	2 24.4	5 44.3	5 34.7	+0.2609	0.5139	0.2585	+57	-29
75 Leonis	5.4	2.77	16.4	2 28.1	11 3.5	0 24.9	-1.1817	0.5148	0.2599	-25	-44
76 Leonis	6.0	2.76	16.5	2 6.4	11 54.0	0 24.1	-1.0177	0.5150	0.2601	-13	-44
359 B. Leonis	6.3	2.75	16.7	0 35.3	14 9.0	2 35.1	0.0000	0.5154	0.2605	+43	-43
388 B. Leonis	6.3	+2.74	-17.0	-1 14.5	16 30.4	4 52.2	+1.3169	0.5159	-0.2608	+88	-38
v Leonis	4.5	2.75	17.2	0 21.9	21 7.0	9 20.7	-0.8119	0.5171	0.2612	0	-90
431 B. Leonis	6.2	2.74	17.3	1 58.6	21 51.6	-10 3.8	+0.6900	0.5174	0.2612	+88	-5
78 B. Virginis	6.5	2.74	18.1	5 15.4	19 15 52.2	3 31.6	-0.5568	0.5239	0.2580	+13	-77
q Virginis	5.3	2.72	18.2	8 59.6	20 1 27.0	-11 11.6	+0.8857	0.5284	0.2534	+81	-4
χ Virginis	4.8	+2.73	-18.4	-7 32.3	4 6.4	8 37.2	-1.2980	0.5298	-0.2518	+36	-59
370 B. Virginis	6.0	2.72	18.2	11 11.9	11 20.0	1 37.3	+0.6994	0.5338	0.2465	+79	-6
75 Virginis	5.6	2.70	17.6	14 56.2	21 5 17.2	8 15.6	+0.2889	0.5453	0.2278	+53	-27
83 Virginis	5.6	2.69	17.3	15 45.7	10 32.8	3 10.8	-0.0413	0.5490	0.2208	+34	-45
85 Virginis	6.1	2.69	17.4	15 21.0	11 2.4	2 42.1	-0.5731	0.5494	0.2201	+7	-80
43 H. Virginis	5.5	+2.66	-16.4	-17 48.8	22 0 10.6	9 58.4	-0.8013	0.5560	-0.1992	+9	-90

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

MARCH.

THE STAR'S					AT CONJUNCTION IN R. A.							Limit- ing Par- allels.	
Name.	Mag.	Red'ns from 1916.0.		Apparent Declina- tion.	Greenwich Mean Time.	Hour Angle, H	Y	x'	y'	N.	S.		
		Δα	Δδ										
		s	"									s	"
231 G. Virginis	6.4	+2.66	-16.3	-18 12.0	22	0 53.4	+10 39.6	-0.5475	0.5506	-0.1980	+ 5-79		
236 G. Virginis	5.7	2.66	16.2	18 19.9		1 34.3	+11 19.2	-0.5470	0.5600	0.1968	+ 5-79		
9 G. Libræ	6.5	2.65	15.4	20 4.5		8 29.1	- 6 1.1	-0.0777	0.5652	0.1837	+27-47		
17 G. Libræ	6.4	2.64	15.0	20 49.5		13 15.0	- 1 25.6	-0.1648	0.5687	0.1740	+22-52		
18 G. Libræ	6.1	2.64	14.9	20 58.6		13 41.1	- 1 0.6	-0.0841	0.5690	0.1731	+26-47		
43 B. Libræ	5.7	+2.64	-15.0	-21 2.5		17 53.7	+ 3 2.6	-0.7274	0.5720	-0.1640	- 9-90		
47 G. Libræ	6.1	2.61	14.1	21 42.6		21 37.4	+ 6 38.0	-0.6419	0.5747	0.1556	- 5-90		
64 G. Libræ	5.8	2.58	13.6	22 5.6	23	1 40.1	+10 31.4	-0.8606	0.5774	0.1460	-18-90		
153 B. Libræ	6.3	2.57	12.5	24 12.5		8 23.2	+ 7 1.1	+0.3684	0.5818	0.1293	+46-22		
169 B. Libræ	6.0	2.54	12.7	22 52.0		10 15.3	- 5 13.3	-1.2336	0.5830	0.1245	-51-85		
177 B. Libræ	6.2	+2.53	-12.6	-22 52.8		10 52.4	- 4 37.7	-1.2971	0.5833	-0.1229	-62-69		
42 Libræ	5.0	2.54	12.4	23 33.0		11 13.9	- 4 17.1	-0.6597	0.5835	0.1220	- 9-90		
b Scorpïi	4.7	2.54	11.4	25 30.0		15 25.9	- 0 15.0	+0.8352	0.5859	0.1108	+65+ 6		
A Scorpïi	4.6	2.52	11.4	25 4.8		16 28.3	+ 0 45.0	+0.2945	0.5865	0.1080	+39-26		
31 B. Scorpïi	5.4	2.51	11.6	24 17.2		16 35.6	+ 0 52.0	-0.5249	0.5866	0.1076	- 3-79		
32 B. Scorpïi	5.3	+2.50	-11.8	-23 43.9		16 36.8	+ 0 53.2	-1.0916	0.5866	-0.1076	-39-90		
3 Scorpïi	5.9	2.52	11.4	24 59.9		16 53.0	+ 1 8.7	+0.1675	0.5867	0.1068	+32-33		
4 Scorpïi	5.7	2.53	11.0	26 1.3		17 12.1	+ 1 27.0	+1.1739	0.5869	0.1060	+64+34		
40 B. Scorpïi	5.4	2.50	11.3	24 35.6		18 25.5	+ 2 37.5	-0.4063	0.5876	0.1026	+ 2-69		
π Scorpïi	3.0	2.52	11.0	-25 52.6		18 30.8	+ 2 42.6	+0.8888	0.5876	0.1024	+64+10		
48 B. Scorpïi	4.9	+2.50	-10.8	-25 38.1		20 16.4	+ 4 24.0	+0.4677	0.5885	-0.0975	+49-16		
50 B. Scorpïi	6.4	2.48	11.2	24 29.9		20 30.5	+ 4 37.6	-0.7098	0.5886	0.0968	-14-90		
24 G. Scorpïi	6.2	2.47	11.0	24 14.5		22 3.0	+ 6 6.3	-1.1171	0.5893	0.0925	-42-90		
65 B. Scorpïi	5.5	2.50	10.4	26 6.3		22 7.3	+ 6 10.5	+0.7695	0.5893	0.0923	+64+ 2		
85 B. Scorpïi	6.0	2.46	10.4	25 16.0	24	0 45.6	+ 8 42.4	-0.3149	0.5906	0.0848	+ 5-62		
σ Scorpïi	3.1	+2.44	-10.1	-25 23.7		3 11.5	+11 2.4	-0.3827	0.5917	-0.0777	+ 1-67		
α Scorpïi	1.2	2.42	9.4	26 15.0		6 20.5	- 9 56.3	+0.2537	0.5929	0.0685	+34-28		
22 Scorpïi	4.8	2.40	9.8	24 56.0		6 40.1	- 9 37.4	-1.1033	0.5930	0.0676	+43-90		
116 B. Scorpïi	6.2	2.42	9.3	26 21.5		7 6.0	- 9 12.6	+0.3133	0.5931	0.0663	+37-25		
134 B. Scorpïi	6.4	2.39	8.4	27 18.1		12 1.4	- 4 29.2	+0.9798	0.5947	0.0516	+63+17		
118 B. Ophiuchi	6.2	+2.29	- 7.6	-26 24.2		20 37.7	+ 3 45.9	-0.2635	0.5966	-0.0254	+ 3-59		
95 G. Ophiuchi	6.1	2.28	7.0	27 39.7		22 42.4	+ 5 45.4	+0.9660	0.5969	0.0189	+62+16		
36 Ophi. (1st star)	5.4	2.24	7.5	26 29.0		23 51.1	+ 6 51.3	-0.2479	0.5970	0.0154	+ 2-58		
136 G. Ophiuchi	6.3	2.19	6.9	25 52.3	25	4 13.5	+11 2.8	-0.9046	0.5973	-0.0019	-35-90		
151 G. Ophiuchi	6.0	2.18	6.5	26 12.5		6 2.6	-11 12.6	-0.5622	0.5972	+0.0038	-15-83		
163 G. Ophiuchi	6.3	+2.15	- 5.4	-27 50.8		10 23.5	- 7 2.4	+1.1428	0.5970	+0.0172	+62+33		
X Sagittarii (var.)	4.4	2.13	5.2	27 48.1		12 0.5	- 5 29.4	+1.1294	0.5968	0.0223	+62+31		
4 G. Sagittarii	6.2	2.12	5.5	26 56.9		12 21.8	- 5 9.0	+0.2729	0.5968	0.0234	+31-27		
66 B. Sagittarii	4.7	1.98	4.0	27 4.5		23 36.9	+ 5 38.4	+0.8581	0.5945	0.0576	+63+ 8		
67 B. Sagittarii	6.4	1.95	4.5	25 38.3		23 52.9	+ 5 53.7	-0.5811	0.5944	0.0584	-11-85		
70 B. Sagittarii	6.4	+1.93	- 4.6	-24 57.3	26	0 58.5	+ 6 56.7	-1.2073	0.5941	+0.0617	-53-86		
68 G. Sagittarii	6.2	1.93	3.7	26 41.2		3 19.6	+ 9 12.0	+0.6993	0.5933	0.0687	+62- 2		
λ Sagittarii	2.9	1.90	4.1	25 28.2		3 26.4	+ 9 18.6	-0.5244	0.5933	0.0690	- 7-79		
69 G. Sagittarii	6.3	1.93	3.6	26 48.6		3 28.2	+ 9 20.3	+0.8335	0.5933	0.0691	+63+ 6		
86 B. Sagittarii	6.5	1.92	3.6	26 38.2		3 47.8	+ 9 39.1	+0.6821	0.5931	0.0701	+61- 3		
126 B. Sagittarii	5.7	+1.82	- 3.4	-25 5.8		9 56.4	- 8 27.3	-0.3917	0.5907	+0.0880	+ 2-68		
162 B. Sagittarii	6.4	1.75	2.8	24 59.4		15 11.7	- 3 24.6	+0.0016	0.5882	0.1028	+23-42		
127 G. Sagittarii	6.4	1.74	2.7	25 3.6		16 0.1	- 2 38.2	+0.1563	0.5879	0.1050	+32-34		
172 B. Sagittarii	5.8	1.73	2.7	24 57.9		16 48.5	- 1 51.7	+0.1444	0.5874	0.1072	+31-34		
189 B. Sagittarii	6.1	1.70	2.5	24 47.4		19 4.7	+ 0 19.1	+0.2184	0.5863	0.1134	+36-30		
191 B. Sagittarii	6.5	+1.67	- 3.0	-23 19.5		19 17.8	+ 0 31.7	-1.2415	0.5862	+0.1140	-53-83		
φ Sagittarii	4.9	1.67	1.9	25 24.2		21 56.7	+ 3 4.3	+1.1758	0.5847	0.1211	+65+34		
208 B. Sagittarii	6.1	1.66	2.3	24 19.4		21 57.8	+ 3 5.3	+0.0847	0.5847	0.1212	+29-38		
χ Sagittarii	4.9	1.61	1.8	24 40.4	27	1 49.2	+ 6 47.7	+0.9255	0.5824	0.1312	+65+12		
49 Sagittarii	5.5	1.60	1.9	24 7.7		1 55.2	+ 6 53.3	+0.3862	0.5824	0.1315	+47-21		
53 Sagittarii	6.3	+1.52	- 1.5	-23 37.2		7 40.4	-11 34.7	+0.6697	0.5788	+0.1459	+65- 5		

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

MARCH.

THE STAR'S					AT CONJUNCTION IN R. A.					Limit in feet
Name.	Mag.	Red'ns from 1916.0.		Apparent Declina- tion.	Greenwich Mean Time.	Hour Angle, <i>H</i>	<i>Y</i>	<i>x'</i>	<i>y'</i>	
		$\Delta\alpha$	$\Delta\delta$		d h m	h m				
274 B. Sagittarii	6.1	+1.52	-1.5	-23 37.4	27 7 47.5	-11 28.0	+0.6895	0.5788	+0.1462	-0.1
σ Capricorni	5.5	1.27	1.2	19 22.9	28 0 0.8	+4 8.5	-0.9385	0.5679	0.1825	-19.4
π Capricorni	5.2	1.22	1.1	18 29.3	3 22.0	+7 22.3	-1.2233	0.5656	0.1802	-41.4
\circ Capricorni	5.6	1.22	0.9	18 51.7	4 27.2	+8 25.1	-0.6365	0.5648	0.1913	-0.8
ν Capricorni	5.3	1.16	0.6	18 26.1	8 47.6	-11 24.0	-0.2226	0.5619	0.1994	-2.4
81 B. Capricorni	6.4	+1.12	-0.3	-18 20.8	12 48.0	-7 32.1	+0.5008	0.5592	+0.2065	-62.1
19 Capricorni	5.7	1.09	0.1	18 14.5	15 10.6	-5 14.7	+0.8902	0.5576	0.2104	-72.1
94 B. Capricorni	5.7	1.06	-0.6	16 21.3	16 27.1	-4 0.9	-0.7595	0.5567	0.2125	-3.4
21 Capricorni	6.5	1.06	0.0	17 51.5	17 50.0	+2 41.0	+1.0658	0.5558	0.2148	-72.1
θ Capricorni	4.2	1.04	+0.1	17 34.0	20 4.2	-0 31.4	+1.2537	0.5543	0.2162	-73.4
29 Capricorni	5.5	+0.97	-0.2	-15 31.3	29 0 26.5	+3 41.7	+0.1389	0.5515	+0.2246	-44.3
18 Aquarii	5.5	0.91	-0.4	13 14.4	4 14.7	+7 22.0	-1.3228	0.5491	0.2236	-1.4
λ Capricorni	5.5	0.81	0.0	11 45.2	14 25.8	-6 47.6	-0.4366	0.5431	0.2418	-16.4
151 B. Capricorni	6.1	0.81	+0.4	13 6.9	15 52.3	-5 24.1	+1.3034	0.5423	0.2433	-77.3
96 B. Aquarii	6.5	0.77	0.0	10 42.5	17 42.1	-3 37.9	-0.7092	0.5413	0.2451	-2.4
θ Aquarii	4.3	+0.67	+0.2	-8 12.1	4 35.7	+6 54.3	-0.5534	0.5360	+0.2542	-13.1
150 B. Aquarii	6.0	0.68	0.5	9 27.5	4 36.8	+6 55.3	+0.7398	0.5360	0.2542	-61.1
ρ Aquarii	5.3	0.66	0.4	8 14.6	6 11.6	+8 27.0	-0.1038	0.5352	0.2553	-35.4
170 B. Aquarii	6.0	0.64	0.4	7 37.2	7 47.0	+9 59.4	-0.3370	0.5346	0.2563	-24.4
186 B. Aquarii	6.1	0.62	0.5	6 59.1	11 29.1	-10 25.7	-0.0359	0.5331	0.2585	-40.4
252 B. Aquarii	5.8	+0.53	+1.0	-5 26.1	23 0.6	+0 43.8	+1.3822	0.5291	+0.2631	-75.4
6 G. Piscium	6.2	+0.51	+0.7	-2 50.7	31 0 31.2	+2 11.5	-0.8883	0.5287	+0.2635	-3.4

NEW MOON.

APRIL.

26 Arietis	6.2	+0.40	+6.7	+19 29.1	4 7 58.6	+6 23.9	+0.2938	0.5379	+0.1777	-61.1
ν Arietis	5.4	0.42	7.2	21 36.0	11 47.0	+10 4.7	-1.3189	0.5390	0.1708	-62.4
μ Arietis	5.7	0.44	6.9	19 39.4	13 27.6	+11 42.1	+1.0580	0.5395	0.1677	-90.3
ϵ Arietis (mean)	4.6	+0.50	+7.4	+21 0.4	21 15.7	+4 45.3	+0.8543	0.5417	+0.1527	-90.1
64 Arietis	5.8	0.59	8.3	24 25.8	5 8 44.5	+6 20.3	-1.2341	0.5446	0.1292	-41.4
66 Arietis	6.1	0.61	7.9	22 31.0	10 39.4	+8 11.4	+1.0856	0.5450	0.1251	-90.5
7 Tauri	5.9	0.64	8.3	24 11.2	13 21.9	+10 48.4	-0.3963	0.5456	0.1192	-30.1
11 Tauri	6.1	0.67	8.5	25 3.7	16 13.6	-10 25.7	-1.0171	0.5462	0.1130	-19.6
16 Tauri	5.4	+0.69	+8.3	+24 1.7	18 4.2	-8 38.8	+0.3116	0.5466	+0.1089	-62.1
17 Tauri	3.8	0.69	8.3	23 51.1	18 6.2	-8 36.9	+0.5071	0.5466	0.1088	-7.1
18 Tauri	5.6	0.69	8.4	24 34.7	18 13.4	-8 30.0	-0.2714	0.5466	0.1086	-62.3
η Tauri	4.3	0.69	8.4	24 12.4	18 15.0	-8 28.4	+0.1366	0.5466	0.1085	-51.1
20 Tauri	4.1	0.69	8.3	24 6.5	18 31.9	-8 12.1	+0.2745	0.5466	0.1079	-56.1
21 Tauri	5.8	+0.69	+8.4	+24 17.7	18 33.9	-8 10.2	+0.0744	0.5467	+0.1078	-41.1
22 Tauri	6.5	0.69	8.4	24 16.1	18 37.8	-8 6.5	+0.1101	0.5467	0.1077	-40.1
23 Tauri	4.3	0.70	8.2	23 41.4	18 45.8	-7 58.6	+0.7557	0.5467	0.1074	-90.5
η Tauri	3.0	0.70	8.3	23 50.9	19 17.2	-7 28.3	+0.6386	0.5468	0.1062	-90.1
27 Tauri	3.7	0.71	8.2	23 48.0	20 2.8	-6 44.3	+0.7720	0.5469	0.1045	-90.1
28 Tauri	5.2	+0.71	+8.3	+23 53.0	20 3.4	-6 43.8	+0.6821	0.5469	+0.1045	-90.1
14 H. Tauri	5.3	0.72	8.6	25 19.8	20 32.6	-6 15.5	-0.8436	0.5470	0.1034	-6.4
ρ Tauri	5.6	0.82	8.8	26 15.9	5 47.0	+2 40.1	-1.0097	0.5484	0.0823	-19.4
χ Tauri	5.3	0.89	8.6	25 26.1	11 4.5	+7 46.6	+0.3021	0.5490	0.0700	-61.5
38 B. Aurigæ	6.5	1.14	8.6	27 34.9	7 5 52.4	+1 55.8	-1.1605	0.5492	+0.0253	-55.5
107 B. Aurigæ	6.5	+1.34	+8.0	+27 36.6	19 55.3	-8 30.4	-1.0762	0.5477	-0.0083	-26.1
112 B. Aurigæ	5.7	1.34	7.7	26 52.5	20 29.0	-7 57.8	-0.2692	0.5477	0.0097	-27.3
125 Tauri	5.1	1.34	7.3	25 51.2	21 40.1	-6 49.2	+0.8457	0.5474	0.0125	-90.4
136 Tauri	4.6	1.45	7.5	27 35.7	8 3 46.5	-0 55.4	-1.1993	0.5463	0.0269	-40.6
139 Tauri	4.7	1.46	6.8	25 56.8	5 55.1	+1 8.9	+0.5598	0.5458	0.0320	-82.1
52 B. Geminorum	6.5	+1.69	+4.8	+24 39.8	23 58.9	-5 23.9	+1.0279	0.5408	-0.0731	-90.3

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

APRIL.

THE STAR'S					AT CONJUNCTION IN R. A.							Limiting Parallels.	
Name.		Mag.	Red'n's from 1916.0.		Apparent Declination.	Greenwich Mean Time.	Hour Angle, <i>H</i>	<i>Y</i>	<i>x'</i>	<i>y'</i>	<i>N.</i>	<i>S.</i>	
			$\Delta\alpha$	$\Delta\delta$									
ϵ	Geminorum	3.2	+1.74	+4.8	+25 13.0	d h m	h m						
17	Geminorum	5.7	1.81	4.4	25 29.0	9 2 58.0	2 30.7	+0.1871	0.5398	-0.0796	+54	-12	
ω	Geminorum	5.2	1.84	3.6	24 20.2	8 15.2	2 36.0	-0.5588	0.5380	0.0910	+11	-55	
18	Geminorum	5.8	1.90	3.1	24 16.3	11 35.6	5 49.8	+0.3928	0.5368	0.0981	+68	-3	
12	Geminorum	6.1	1.92	3.2	25 2.0	16 18.5	+10 23.4	-0.0198	0.5351	0.1078	+41	-26	
18	Geminorum	6.0	+1.94	+2.1	+23 6.5	17 21.5	+11 24.4	-0.9764	0.5346	0.1100	-16	-65	
	B. D. +23° 1744	6.4	2.00	1.6	23 4.1	21 33.0	8 32.4	+0.6723	0.5330	-0.1184	+90	+9	
57 B.	Geminorum	6.3	2.05	1.2	23 12.9	10 2 1.2	4 12.8	+0.1675	0.5313	0.1272	+52	-18	
32 B.	Geminorum	6.3	2.05	0.9	22 35.9	5 56.1	0 26.4	-0.5043	0.5298	0.1346	+15	-56	
32	Geminorum	6.3	2.09	+0.9	23 21.0	7 4.9	+0.412	+0.0175	0.5294	0.1368	+43	-27	
μ	Cancer	5.5	+2.17	-0.8	+21 49.6	9 34.5	+3 6.0	-1.1581	0.5284	0.1414	-30	-67	
	NEPTUNE	7.7	...	...	19 54.7	18 57.2	-11 49.1	-0.8814	0.5248	-0.1581	-8	-68
49 B.	Cancer	6.0	2.23	1.8	21 0.8	21 26.4	9 24.4	+0.8269	0.5239	0.1623	+90	+13	
θ	Cancer	5.5	2.24	3.4	18 22.7	11 1 9.8	5 47.9	-0.9997	0.5225	0.1685	-15	-69	
δ	Cancer	4.2	2.31	4.1	18 27.8	6 47.8	0 20.5	+0.9209	0.5206	0.1775	+90	+17	
X	Cancer (var.)	6.2	+2.35	-5.0	+17 33.0	13 20.9	+6 0.6	-0.3682	0.5184	0.1874	+23	-54	
α^2	Cancer	5.7	2.33	5.7	15 54.2	18 45.6	+11 15.5	-0.4039	0.5168	-0.1951	+21	-57	
81	Cancer	6.4	2.38	6.7	15 20.0	19 53.7	-11 38.4	+1.1747	0.5164	0.1967	+90	+33	
π	Cancer	5.6	2.40	6.9	15 17.3	12 3 25.0	4 20.7	+0.2768	0.5144	0.2066	+58	-22	
27 B.	Cancer	6.4	2.44	7.1	15 43.6	4 53.8	2 54.6	+0.0182	0.5141	0.2085	+44	-35	
18	Leonis	5.8	+2.49	-9.7	+12 11.7	7 58.9	0 4.9	-1.1067	0.5134	0.2123	-21	-74	
19	Leonis	6.4	2.49	9.8	11 57.3	20 59.2	-11 17.9	-0.1291	0.5112	-0.2268	+36	-46	
R	Leonis (var.)	5-10	2.49	9.8	11 49.0	21 31.9	-10 46.2	+0.0072	0.5111	0.2273	+43	-38	
A	Leonis	4.6	2.55	11.4	10 24.4	21 35.7	-10 42.5	+0.1420	0.5111	0.2274	+50	-31	
43	Leonis	6.3	2.56	13.1	6 58.0	13 8 11.1	0 25.7	-0.7970	0.5102	0.2373	0	-80	
48	Leonis	5.2	+2.61	-13.6	+7 23.0	16 4.5	+7 13.8	+1.0015	0.5102	0.2435	+90	+14	
35	Sextantis	6.1	2.62	14.5	5 11.1	22 13.0	-10 48.5	-0.9533	0.5105	-0.2477	-9	-83	
d	Leonis	5.0	2.66	15.5	4 3.9	14 2 40.2	6 29.0	+0.2842	0.5109	0.2503	+58	-27	
p ⁴	Leonis	5.7	2.66	16.2	2 24.4	11 36.0	+2 10.9	-0.7785	0.5124	0.2546	+2	-86	
p ⁵	Leonis	5.3	2.67	16.8	0 23.0	14 54.2	+5 23.2	+0.1355	0.5130	0.2558	+50	-35	
75	Leonis	5.4	+2.70	-16.6	+2 28.1	18 25.4	+8 48.2	+1.3728	0.5140	0.2570	+81	+46	
76	Leonis	6.0	2.70	16.6	2 6.4	20 13.5	+10 33.1	-1.2932	0.5144	-0.2575	-35	-88	
159 B.	Leonis	6.3	2.70	17.1	+0 35.3	21 3.9	+11 22.0	-1.1274	0.5147	0.2577	-21	-88	
388 B.	Leonis	6.3	2.70	17.6	-1 14.5	23 18.8	-10 27.1	-0.1066	0.5153	0.2581	+37	-48	
v	Leonis	4.5	2.74	17.7	0 21.9	15 1 39.9	8 10.2	+1.2147	0.5161	0.2585	+89	+28	
131 B.	Leonis	6.2	+2.73	-18.0	-1 58.6	6 15.9	3 42.6	-0.8987	0.5177	0.2590	-6	-90	
78 B.	Virginis	6.5	2.82	19.3	5 15.4	7 0.3	2 59.6	+0.6015	0.5180	-0.2591	+81	-11	
q	Virginis	5.3	2.86	20.0	8 59.7	10 53.9	9 38.8	-0.5958	0.5263	0.2566	+11	-80	
r	Virginis	4.8	2.87	19.9	7 32.3	10 22.4	0 28.2	+0.8636	0.5318	0.2525	+81	+4	
370 B.	Virginis	6.0	2.91	20.2	11 11.9	12 59.8	+2 4.1	-1.3000	0.5335	0.2509	-39	-89	
75	Virginis	5.6	+3.00	-20.0	-14 56.2	20 7.3	+8 57.8	+0.7029	0.5383	0.2459	+79	-5	
83	Virginis	5.6	3.03	19.8	15 45.8	17 13 45.2	+2 0.2	+0.3393	0.5516	-0.2279	+55	-24	
85	Virginis	6.1	3.02	19.8	15 21.1	18 54.2	+6 58.4	+0.0247	0.5558	0.2210	+37	-41	
43 H.	Virginis	5.5	3.08	19.0	17 48.9	19 23.2	+7 26.4	-0.5006	0.5562	0.2203	+10	-74	
231 G.	Virginis	6.4	3.09	18.9	18 12.0	18 13.3	+4 11.1	-0.6959	0.5669	0.1997	-3	-90	
236 G.	Virginis	5.7	+3.09	-18.8	-18 19.9	8 55.1	-3 30.8	-0.4433	0.5675	0.1984	+10	-70	
9 G.	Librae	6.5	3.13	18.2	20 4.6	9 35.0	-2 52.3	-0.4413	0.5681	-0.1972	+10	-70	
17 G.	Librae	6.4	3.14	17.7	20 49.5	16 19.4	+3 37.0	+0.0378	0.5736	0.1842	+33	-40	
18 G.	Librae	6.1	3.15	17.6	20 58.7	20 58.1	+8 5.1	-0.0386	0.5774	0.1744	+28	-45	
43 B.	Librae	5.7	3.18	17.7	21 2.6	21 23.4	+8 29.5	+0.0420	0.5777	0.1735	+32	-40	
47 G.	Librae	6.1	+3.17	-16.7	-21 42.6	19 1 29.5	-11 33.9	-0.5853	0.5810	0.1644	-1	-83	
64 G.	Librae	5.8	3.17	16.2	22 5.6	5 7.3	-8 4.6	-0.4935	0.5837	-0.1559	+3	-75	
153 B.	Librae	6.3	3.21	15.0	24 12.5	9 3.5	-4 17.6	-0.7019	0.5866	0.1463	-9	-90	
169 B.	Librae	6.0	3.18	14.9	22 52.1	15 35.8	+1 59.2	+0.5240	0.5912	0.1294	+55	-13	
177 B.	Librae	6.2	3.18	14.8	22 52.8	17 25.0	+3 43.9	-1.0551	0.5923	0.1246	-34	-90	
42	Librae	5.0	+3.19	-14.7	-23 33.0	18 1.0	+4 18.5	-1.1167	0.5927	0.1229	-39	-90	
						18 22.0	+4 38.6	-0.4866	0.5929	-0.1220	0	-75	

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

APRIL.

THE STAR'S					AT CONJUNCTION IN R. A.					Limiting Parallax
Name.	Mag.	Red'ns from 1916.0.		Apparent Declination.	Greenwich Mean Time.	Hour Angle, H	Y	z	y	
		$\Delta\alpha$	$\Delta\delta$		d h m	h m				N. S.
<i>b</i> Scorpii	4.7	+3.22	-13.7	-25 30.0	19 22 27.2	+ 8 34.0	+0.9969	0.5953	-0.1107	+64-18
<i>A</i> Scorpii	4.6	3.21	13.6	25 4.8	23 28.0	+ 9 32.3	+0.4644	0.5959	0.1079	+50-16
31 B. Scorpii	5.4	3.20	13.8	24 17.3	23 35.2	+ 9 39.2	-0.3448	0.5960	0.1075	+ 6-44
32 B. Scorpii	5.3	3.19	13.9	23 43.9	23 36.3	+ 9 40.2	-0.9044	0.5960	0.1075	-25-50
3 Scorpii	5.9	3.21	13.6	25 0.0	23 52.0	+ 9 55.2	+0.3397	0.5961	0.1067	+42-23
40 B. Scorpii	5.4	+3.20	-13.4	-24 35.6	20 1 22.1	+11 21.7	-0.2247	0.5970	-0.1024	+11-56
π Scorpii	3.0	3.22	13.2	25 52.6	1 27.3	+11 26.7	+1.0546	0.5970	0.1022	+64-23
48 B. Scorpii	4.9	3.21	13.0	25 38.1	3 10.1	-10 54.7	+0.6414	0.5978	0.0972	-60- 6
50 B. Scorpii	6.4	3.19	13.2	24 29.9	3 23.8	-10 41.5	-0.5212	0.5979	0.0966	- 4-78
24 G. Scorpii	6.2	3.18	13.0	24 14.5	4 53.9	- 9 15.2	-0.9211	0.5987	0.0922	-28-90
65 B. Scorpii	5.5	+3.22	-12.6	-26 6.3	4 58.1	- 9 11.2	+0.9426	0.5987	-0.0920	+64-13
41 G. Scorpii	6.3	3.17	12.6	24 12.7	7 7.5	- 7 7.1	-1.1492	0.5998	0.0856	-46-90
85 B. Scorpii	6.0	3.19	12.3	25 16.1	7 32.3	- 6 43.4	-0.1247	0.5999	0.0844	+15-50
σ Scorpii	3.1	3.19	11.9	25 23.7	9 54.4	- 4 27.1	-0.1882	0.6009	0.0773	+11-54
α Scorpii	1.2	3.19	11.2	26 15.0	12 58.7	- 1 30.5	+0.4452	0.6020	0.0680	+45-17
22 Scorpii	4.8	+3.16	-11.4	-24 56.1	13 17.7	- 1 12.3	-0.8952	0.6021	-0.0670	-29-90
116 B. Scorpii	6.2	3.19	11.0	26 21.5	13 42.9	- 0 48.1	+0.5052	0.6022	0.0657	+49-14
134 B. Scorpii	6.4	3.19	9.9	27 18.1	18 31.1	+ 3 48.0	+1.1707	0.6035	0.0509	+63-36
118 B. Ophiuchi	6.2	3.12	8.6	26 24.2	21 2 55.2	+11 50.9	-0.0473	0.6049	0.0244	+14-65
95 G. Ophiuchi	6.1	3.13	7.9	27 39.7	4 57.1	-10 12.4	+1.1713	0.6050	0.0179	-62-36
36 Ophi. (1st star)	5.4	+3.08	- 8.4	-26 29.0	6 4.3	- 9 8.0	-0.0281	0.6050	-0.0144	+14-44
136 G. Ophiuchi	6.3	3.06	7.4	25 52.3	10 21.0	- 5 2.2	-0.6731	0.6049	-0.0007	-21-90
151 G. Ophiuchi	6.0	3.04	6.9	26 12.5	12 7.9	- 3 19.8	-0.3323	0.6047	-0.0049	- 3-63
4 G. Sagittarii	6.2	3.00	5.6	26 56.9	18 19.7	+ 2 36.3	+0.5011	0.6037	0.0246	+45-14
66 B. Sagittarii	4.7	2.89	3.4	27 4.5	22 5 23.2	-10 47.9	+1.0925	0.6002	0.0589	+63-27
67 B. Sagittarii	6.4	+2.86	- 3.8	-25 38.3	5 39.0	-10 32.9	-0.3348	0.6000	-0.0597	+ 2-63
70 B. Sagittarii	6.4	2.83	3.8	24 57.3	6 43.5	- 9 31.0	-0.9553	0.5996	0.0630	-33-90
68 G. Sagittarii	6.2	2.84	2.8	26 41.2	9 2.6	- 7 17.6	+0.9384	0.5985	0.0700	+63-14
λ Sagittarii	2.9	2.81	3.2	25 28.2	9 9.2	- 7 11.2	-0.2760	0.5985	0.0703	+ 6-53
69 G. Sagittarii	6.3	2.84	2.8	26 48.5	9 11.0	- 7 9.6	+1.0718	0.5984	0.0704	+63-25
86 B. Sagittarii	6.5	+2.83	- 2.8	-26 38.2	9 30.4	- 6 51.0	+0.9217	0.5983	+0.0713	+63-13
126 B. Sagittarii	5.7	2.73	2.2	25 5.8	15 34.2	- 1 2.1	-0.1398	0.5951	0.0891	+15-51
162 B. Sagittarii	6.4	2.66	1.3	24 59.4	20 46.0	+ 3 57.0	+0.2543	0.5920	0.1038	+37-23
127 G. Sagittarii	6.4	2.65	1.1	25 3.6	21 34.0	+ 4 43.0	+0.4087	0.5915	0.1060	+46-13
172 B. Sagittarii	5.8	2.64	1.0	24 57.8	22 21.9	+ 5 29.0	+0.3974	0.5910	0.1062	+46-30
189 B. Sagittarii	6.1	+2.61	- 0.6	-24 47.4	23 0 36.8	+ 7 38.5	+0.4723	0.5895	+0.1144	+51-16
191 B. Sagittarii	6.5	2.58	1.1	23 19.4	0 49.8	+ 7 51.0	-0.9800	0.5893	0.1149	-30-90
208 B. Sagittarii	6.1	2.56	0.3	24 19.4	3 28.6	+10 23.5	+0.3407	0.5875	0.1220	+43-23
222 B. Sagittarii	5.5	2.50	- 0.6	22 33.6	5 30.3	-11 39.6	-1.1852	0.5861	0.1272	+45-30
χ Sagittarii	4.9	2.52	+ 0.4	24 40.4	7 18.4	- 9 55.8	+1.1799	0.5848	0.1319	+65-34
49 Sagittarii	5.5	+2.50	+ 0.3	-24 7.7	7 24.3	- 9 50.2	+0.6429	0.5847	+0.1321	+63- 6
53 Sagittarii	6.3	2.42	1.0	23 37.2	13 7.8	- 4 20.0	+0.9279	0.5804	0.1462	+66-13
274 B. Sagittarii	6.1	2.42	1.0	23 37.3	13 14.9	- 4 13.2	+0.9478	0.5803	0.1465	+66-13
σ Capricorni	5.5	2.12	2.0	19 22.9	24 5 27.3	+11 22.3	-0.6757	0.5675	0.1819	- 4-90
π Capricorni	5.2	2.06	2.1	18 29.2	8 48.9	- 9 23.5	-0.9614	0.5648	0.1884	-20-90
ρ Capricorni	5.0	+2.05	+ 2.0	-18 5.5	9 28.6	- 8 45.2	-1.2386	0.5642	+0.1896	-43-50
σ Capricorni	5.6	2.05	2.4	18 51.7	9 54.4	- 8 20.4	-0.3748	0.5639	0.1904	+13-63
ν Capricorni	5.3	1.99	2.8	18 26.1	14 15.9	- 4 8.4	+0.0380	0.5604	0.1982	+35-40
81 B. Capricorni	6.4	1.94	3.3	18 20.7	18 17.8	- 0 15.1	+0.7612	0.5572	0.2050	+72- 1
19 Capricorni	5.7	1.90	3.5	18 14.5	20 41.3	+ 2 3.3	+1.1506	0.5554	0.2089	+72-24
94 B. Capricorni	5.7	+1.86	+ 3.0	-16 21.3	21 58.4	+ 3 17.7	-0.5032	0.5544	+0.2108	+ 9-74
21 Capricorni	6.5	1.86	3.7	17 51.5	23 22.0	+ 4 38.3	+1.3257	0.5533	0.2130	+72-47
29 Capricorni	5.5	1.75	3.6	15 31.2	25 6.2	+11 4.7	+0.3925	0.5484	0.2224	+58-23
18 Aquarii	5.5	1.67	3.3	13 14.3	9 52.6	- 9 12.7	-1.0774	0.5457	0.2273	-23-90
λ Capricorni	5.5	1.53	3.8	11 45.2	20 11.3	+ 0 45.3	-0.1980	0.5390	0.2386	+23-53
96 B. Aquarii	6.5	+1.48	+ 3.8	-10 42.4	23 30.4	+ 3 57.9	-0.4760	0.5370	+0.2417	+15-71

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

APRIL.

THE STAR'S					AT CONJUNCTION IN R. A.					Limit- ing Par- allels.	
Name.	Mag.	Red'ns from 1916.0.		Apparent Declina- tion.	Greenwich Mean Time.	Hour Angle, <i>H</i>	<i>Y</i>	<i>x'</i>	<i>y'</i>	N.	S.
		$\Delta\alpha$	$\Delta\delta$		d h m	h m					
6 Aquarii	4.3	+1.34	+4.0	8 12.0	26 10 34.1	-9 20.0	-0.3342	0.5311	+0.2502	+23	-61
150 B. Aquarii	6.0	1.35	4.4	9 27.5	10 35.3	-9 18.9	+0.9674	0.5311	0.2502	+81	+10
ρ Aquarii	5.3	1.32	4.1	8 14.5	12 11.6	-7 45.6	+0.1159	0.5303	0.2512	+47	-36
170 B. Aquarii	6.0	1.30	4.1	7 37.1	13 48.6	-6 11.7	-0.1214	0.5296	0.2522	+34	-49
186 B. Aquarii	6.1	1.26	4.1	6 59.0	17 34.5	-2 32.9	+0.1758	0.5279	0.2542	+51	-33
6 G. Piscium	6.2	+1.09	+3.9	2 50.7	27 6 50.7	+10 18.4	-0.7088	0.5234	+0.2588	+5	-90
22 B. Piscium	6.4	0.96	4.1	0 10.1	19 26.9	-1 28.5	-0.2227	0.5206	0.2598	+31	-55
κ Piscium	4.9	0.95	4.0	+0 47.8	21 9.3	+0 10.8	-0.7874	0.5203	0.2597	+1	-89
9 Piscium	6.4	0.94	4.0	0 39.7	21 18.9	+0 20.0	-0.6057	0.5203	0.2597	+11	-81
16 Piscium	5.7	0.90	4.1	1 38.2	28 1 54.8	+4 47.5	-0.4319	0.5197	0.2591	+20	-68
λ Piscium	4.6	+0.88	+4.3	+1 19.1	4 45.7	+7 33.2	+0.6381	0.5195	+0.2585	+84	-9
19 Piscium	5.4	0.85	4.1	3 1.3	6 56.8	+9 40.3	-0.5811	0.5194	0.2580	+12	-78
22 Piscium	5.8	0.84	4.4	2 27.9	9 45.0	-11 36.6	-0.7254	0.5193	0.2571	+90	-4
d Piscium	5.4	0.72	4.2	7 43.5	29 0 10.3	+2 22.4	-1.1414	0.5199	0.2505	-22	-82
136 B. Piscium	6.5	+0.66	+4.6	+8 53.9	10 30.7	-11 36.1	+0.1719	0.5214	+0.2432	+52	-31
NEW MOON.											

MAY.

χ Tauri	5.3	+0.74	+7.1	+25 26.0	3 18 52.1	-6 38.1	+0.1289	0.5512	+0.0684	+50	-14
112 B. Aurigæ	5.7	1.04	6.5	26 52.5	5 4 12.2	+1 33.1	-0.4974	0.5499	-0.0111	+14	-44
125 Tauri	5.1	1.05	6.3	25 51.2	5 23.2	+2 41.7	+0.6165	0.5496	0.0139	+89	+17
139 Tauri	4.7	1.14	5.9	25 56.8	13 37.5	+10 39.0	+0.3189	0.5478	0.0333	+62	-1
VENUS	4.1	...	...	27 6.8	17 32.8	-9 33.6	-1.1253	0.5088	0.0428	-31	-63
52 B. Geminorum	6.5	+1.32	+4.4	+24 39.8	6 7 41.4	+4 6.4	+0.7653	0.5419	-0.0742	+90	+19
ε Geminorum	3.2	1.36	4.4	25 13.0	10 40.8	+6 59.8	-0.0600	0.5408	0.0807	+38	-26
87 B. Geminorum	5.8	1.38	3.6	23 42.2	14 27.8	+10 39.3	+1.2766	0.5393	0.0888	+74	+60
37 Geminorum	5.7	1.42	4.0	25 29.0	15 58.6	-11 53.0	-0.8329	0.5386	0.0920	-6	-65
ω Geminorum	5.2	1.44	3.4	24 20.2	19 19.6	-8 38.5	+0.1170	0.5372	0.0990	+49	-18
48 Geminorum	5.8	+1.49	+3.0	+24 16.3	7 0 3.5	-4 3.9	-0.3009	0.5352	-0.1086	+25	-41
52 Geminorum	6.1	1.52	3.2	25 2.0	1 6.8	-3 2.6	-1.2608	0.5347	0.1107	-47	-65
58 Geminorum	6.0	1.54	2.2	23 6.5	5 19.4	+1 1.9	+0.3881	0.5328	0.1190	+67	-6
B. D. +23° 1744	6.4	1.59	1.8	23 4.1	9 49.1	+5 22.9	-0.1215	0.5308	0.1276	+35	-33
187 B. Geminorum	6.3	1.63	1.5	23 12.9	13 44.4	+9 10.7	-0.7983	0.5290	0.1349	-3	-67
192 B. Geminorum	6.3	+1.64	+1.2	+22 35.9	14 54.7	+10 18.7	-0.2757	0.5285	-0.1370	+27	-43
217 B. Geminorum	6.3	1.69	-0.4	20 2.8	23 28.1	-5 23.9	+1.3102	0.5247	0.1521	+74	+58
μ Cancri	5.5	1.76	0.2	21 49.6	2 52.6	-2 5.9	-1.1855	0.5231	0.1578	-32	-68
NEPTUNE	7.7	...	...	19 52.5	5 50.7	+0 46.8	+0.4957	0.5212	0.1626	+74	-5
49 B. Cancri	6.0	1.81	1.0	21 0.8	9 8.9	+3 58.8	-1.3074	0.5204	0.1679	-49	-69
δ ¹ Cancri	5.9	+1.79	-2.0	+18 36.1	10 42.0	+5 29.0	+1.0927	0.5198	-0.1703	+90	+30
δ Cancri	5.5	1.83	2.5	18 22.7	14 50.5	+9 30.0	+0.6203	0.5180	0.1766	+85	0
δ Cancri	4.2	1.90	3.1	18 27.8	21 28.4	-8 4.1	-0.6765	0.5155	0.1862	+5	-71
X Cancri (var.)	6.2	1.95	3.9	17 33.0	9 2 57.3	-2 45.0	-0.7128	0.5135	0.1937	+4	-72
α ¹ Cancri	5.1	1.93	4.7	15 38.7	3 56.1	+1 48.0	+1.1927	0.5132	0.1949	+90	+35
α ² Cancri	5.7	+1.94	-4.6	+15 54.2	4 6.3	-1 38.0	+0.8748	0.5131	-0.1952	+90	+12
81 Cancri	6.4	1.99	5.4	15 20.0	11 44.2	+5 46.3	-0.0272	0.5107	0.2048	+41	-37
π Cancri	5.6	2.02	5.7	15 17.3	13 14.3	+7 13.8	-0.2871	0.5103	0.2066	+27	-52
18 Leonis	5.8	2.14	8.4	12 11.7	10 5 35.2	-0 54.0	-0.4283	0.5066	0.2240	+20	-63
19 Leonis	6.4	2.14	8.5	11 57.3	6 8.4	-0 21.8	-0.2907	0.5065	0.2246	+27	-55
R Leonis (var.)	5-10	+2.14	-8.6	+11 49.0	6 12.4	-0 17.9	-0.1549	0.5065	-0.2246	+34	-47
A Leonis	4.6	2.22	10.0	10 24.4	16 58.8	+10 9.9	-1.0920	0.5053	0.2340	+19	-80
43 Leonis	6.3	2.26	12.0	6 58.0	11 1 0.6	-6 2.2	+0.7274	0.5051	0.2399	-90	-3
48 Leonis	5.2	2.32	12.2	7 23.0	7 15.7	+0 2.1	-1.2337	0.5054	0.2439	-30	-83
35 Sextantis	6.1	2.34	13.4	5 11.1	11 47.6	+4 26.2	+0.0186	0.5058	0.2464	+43	-40
d Leonis	5.0	+2.41	-14.4	+4 3.9	20 52.7	-10 44.5	-1.0376	0.5073	-0.2506	-15	-86

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

MAY.

THE STAR'S					AT CONJUNCTION IN R. A.							Long. in P. ab.
Name.	Mag.	Red'n's from 1916.0.		Apparent Declina- tion.	Greenwich Mean Time.	Hour Angle, H	Y	x	y	N. S.		
		$\Delta\alpha$	$\Delta\delta$									
p^4 Leonis	5.7	+2.42	-15.2	+ 2 24.5	12 0 14.1	- 7 28.9	-0.1117	0.5081	-0.2518	+36.4		
p^5 Leonis	5.3	2.45	16.1	0 23.0	3 48.9	- 4 0.3	+1.1398	0.5091	0.2528	+40.2		
76 Leonis	6.0	2.48	15.7	2 6.4	6 29.9	- 1 23.9	-1.3715	0.5099	0.2535	+46.0		
359 B. Leonis	6.3	2.49	16.3	+ 0 35.3	8 46.9	+ 0 49.0	-0.3390	0.5106	0.2540	+52.2		
388 B. Leonis	6.3	2.50	17.0	- 1 14.5	11 10.2	+ 3 8.1	+0.9939	0.5114	0.2544	+59.2		
v Leonis	4.5	+2.55	-17.0	0 21.9	15 50.2	+ 7 39.8	-1.1225	0.5132	-0.2549	-21.9		
431 B. Leonis	6.2	2.55	17.5	1 58.6	16 35.2	+ 8 23.4	+0.3877	0.5136	0.2550	+55.2		
78 B. Virginis	6.5	2.71	19.1	5 15.4	13 10 41.9	+ 1 57.3	-0.7745	0.5229	0.2528	+ 1.4		
q Virginis	5.3	2.79	20.2	8 59.7	20 15.5	+11 12.9	+0.7132	0.5292	0.2489	+81.5		
370 B. Virginis	6.0	2.89	20.8	11 11.9	14 6 3.7	- 3 17.7	+0.5764	0.5366	0.2427	+73.1		
75 Virginis	5.6	+3.08	-21.0	-14 56.2	23 42.9	-10 14.0	+0.2591	0.5518	-0.2253	-51.2		
83 Virginis	5.6	3.13	20.9	15 45.8	4 51.0	- 5 16.6	-0.0411	0.5565	0.2187	+31.4		
85 Virginis	6.1	3.14	20.8	15 21.1	5 20.0	- 4 48.7	-0.5640	0.5571	0.2180	+ 7.7		
43 H. Virginis	5.5	3.28	20.3	17 48.9	18 5.1	+ 7 28.8	-0.7225	0.5693	0.1978	- 5.9		
231 G. Virginis	6.4	3.29	20.2	18 12.1	18 46.6	+ 8 8.7	-0.4690	0.5700	0.1966	+ 9.2		
236 G. Virginis	5.7	+3.29	-20.2	-18 20.0	19 26.1	+ 8 46.8	-0.4652	0.5706	-0.1954	+ 9.1		
9 G. Libræ	6.5	3.38	19.8	20 4.6	16 2 6.3	- 8 48.1	+0.0295	0.5771	0.1826	+33.9		
17 G. Libræ	6.4	3.43	19.3	20 49.6	6 41.5	- 4 23.4	-0.0343	0.5815	0.1730	+25.4		
18 G. Libræ	6.1	3.43	19.2	20 58.7	7 6.5	- 3 59.3	+0.0469	0.5818	0.1721	+32.4		
43 B. Libræ	5.7	3.50	19.4	21 2.6	11 9.0	- 0 6.3	-0.5652	0.5856	0.1630	(0.1)		
47 G. Libræ	6.1	+3.51	-18.3	-21 42.6	14 43.5	+ 3 19.7	-0.4646	0.5888	-0.1546	+ 4.7		
64 G. Libræ	5.8	3.54	17.7	22 5.6	18 35.7	+ 7 2.7	-0.6610	0.5922	0.1450	- 7.9		
153 B. Libræ	6.3	3.62	16.7	24 12.6	17 1 0.7	-10 47.9	+0.5701	0.5975	0.1283	+58.1		
169 B. Libræ	6.0	3.60	16.4	22 52.1	2 47.7	- 9 5.3	-0.9895	0.5988	0.1234	-30.9		
177 B. Libræ	6.2	3.61	16.3	22 52.8	3 23.1	- 8 31.4	-1.0490	0.5993	0.1218	-34.9		
42 Libræ	5.0	+3.63	-16.2	-23 33.0	3 43.6	- 8 11.8	-0.4241	0.5995	-0.1208	+ 3.7		
b Scorpii	4.7	3.69	15.5	25 30.1	7 43.8	- 4 21.5	+1.0540	0.6025	0.1095	+64.2		
A Scorpii	4.6	3.69	15.3	25 4.9	8 43.2	- 3 24.6	+0.5294	0.6031	0.1067	+53.1		
31 B. Scorpii	5.4	3.67	15.3	24 17.3	8 50.2	- 3 17.8	-0.2711	0.6032	0.1063	+ 9.4		
32 B. Scorpii	5.3	3.66	15.3	23 44.0	8 51.4	- 3 16.8	-0.8248	0.6032	0.1063	-21.8		
3 Scorpii	5.9	+3.69	-15.2	-25 0.0	9 6.7	- 3 2.1	+0.4068	0.6034	-0.1055	+46.3		
40 B. Scorpii	5.4	3.69	14.9	24 35.6	10 34.8	- 1 37.7	-0.1480	0.6044	0.1013	+15.4		
π Scorpii	3.0	3.72	14.9	25 52.6	10 39.9	- 1 32.7	+1.1178	0.6044	0.1010	+64.3		
48 B. Scorpii	4.9	3.72	14.6	25 38.2	12 20.4	+ 0 3.5	+0.7128	0.6055	0.0961	+64.1		
50 B. Scorpii	6.4	3.69	14.6	24 30.0	12 33.7	+ 0 16.3	-0.4366	0.6056	0.0954	(0.1)		
24 G. Scorpii	6.2	+3.69	-14.3	-24 14.5	14 1.8	+ 1 40.6	-0.8285	0.6065	-0.0910	-22.8		
65 B. Scorpii	5.5	3.74	14.2	26 6.4	14 5.9	+ 1 44.5	+1.0145	0.6065	0.0908	+64.2		
41 G. Scorpii	6.3	3.70	13.8	24 12.7	16 12.3	+ 3 45.6	-1.0486	0.6077	0.0844	-38.0		
85 B. Scorpii	6.0	3.73	13.7	25 16.1	16 36.5	+ 4 8.7	-0.0350	0.6079	0.0631	+19.4		
σ Scorpii	3.1	3.74	13.2	25 23.8	18 55.1	+ 6 21.5	-0.0923	0.6091	0.0760	+16.5		
α Scorpii	1.2	+3.77	-12.5	-26 15.0	21 54.8	+ 9 13.5	+0.5403	0.6105	-0.0666	+51.1		
22 Scorpii	4.8	3.73	12.5	24 56.1	22 13.4	+ 9 31.2	-0.7832	0.6106	0.0657	-22.0		
116 B. Scorpii	6.2	3.77	12.4	26 21.5	22 38.0	+ 9 54.8	+0.6012	0.6108	0.0643	+55.1		
134 B. Scorpii	6.4	3.81	11.2	27 18.1	13 18.7	- 9 36.8	+1.2684	0.6125	0.0494	+63.5		
88 B. Ophiuchi	6.3	3.74	10.1	24 58.1	9 0.6	- 4 9.5	-1.2696	0.6140	0.0308	-64.7		
118 B. Ophiuchi	6.2	+3.78	- 9.4	-26 24.2	11 29.2	- 1 47.3	-0.0834	0.6144	-0.0226	+20.5		
137 B. Ophiuchi	6.3	3.75	9.1	25 9.3	13 25.8	+ 0 4.3	-1.1888	0.6147	0.0162	+55.8		
36 Ophi. (1st star)	5.4	3.77	9.1	26 29.0	14 33.1	+ 1 8.6	+0.1088	0.6147	-0.0125	-21.8		
136 G. Ophiuchi	6.3	3.76	7.7	25 52.3	18 42.5	+ 5 7.1	-0.5187	0.6148	+0.0013	-13.7		
151 G. Ophiuchi	6.0	3.76	7.2	26 12.5	20 26.3	+ 6 46.4	-0.1792	0.6147	0.0070	+ 6.3		
4 G. Sagittarii	6.2	+3.76	- 5.6	-26 56.9	19 2 27.2	-11 28.3	+0.6543	0.6138	+0.0269	+57.5		
66 B. Sagittarii	4.7	3.70	2.9	27 4.5	13 11.2	- 1 12.2	+1.2572	0.6104	0.0617	+63.5		
67 B. Sagittarii	6.4	3.66	3.1	25 38.3	13 26.5	- 0 57.6	-0.1489	0.6103	0.0624	-12.3		
70 B. Sagittarii	6.4	3.63	3.0	24 57.3	14 29.2	+ 0 2.4	-0.7584	0.6098	0.0668	-20.0		
68 G. Sagittarii	6.2	3.66	2.1	26 41.2	16 44.1	+ 2 11.5	+1.1116	0.6087	0.0728	+63.3		
λ Sagittarii	2.9	+3.63	- 2.4	-25 28.2	16 50.6	+ 2 17.9	-0.0848	0.6086	+0.0731	+16.7		

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

MAY.

THE STAR'S				AT CONJUNCTION IN R. A.						Limit- ing Par- allels.	
Name.	Mag.	Red'ns from 1916.0.		Apparent Declina- tion.	Greenwich Mean Time.	Hour Angle, H	Y	x'	y'	N.	S.
		$\Delta\alpha$	$\Delta\delta$		d h m	h m					
9 G. Sagittarii	6.3	+3.67	-2.0	26 48.5	19 16 52.3	+ 2 19.5	+1.2433	0.6066	+0.0732	+63	+47
6 B. Sagittarii	6.5	3.68	2.0	26 38.2	17 11.1	+ 2 37.4	+1.0960	0.6085	0.0742	+63	+27
4 Sagittarii	5.7	3.57	2.1	24 5.8	19 2.3	+ 4 23.9	-1.2774	0.6075	0.0799	-63	-71
6 Sagittarii	6.1	3.54	1.4	23 54.8	21 59.1	+ 7 13.2	-1.2112	0.6058	0.0889	-52	-87
6 B. Sagittarii	5.7	3.57	-0.9	25 5.8	23 4.1	+ 8 15.5	+0.0601	0.6051	0.0921	+25	-39
12 B. Sagittarii	6.4	+3.52	+0.3	-24 59.4	20 4 6.9	-10 54.5	+0.4570	0.6018	+0.1070	-49	-17
17 G. Sagittarii	6.4	3.51	0.5	25 3.6	4 53.5	-10 9.8	+0.6104	0.6013	0.1092	+59	-8
12 B. Sagittarii	5.8	3.50	0.6	24 57.8	5 40.0	-9 25.3	+0.6005	0.6007	0.1114	+59	-9
19 B. Sagittarii	6.1	3.47	1.1	24 47.3	7 51.1	-7 19.6	+0.6778	0.5991	0.1175	-64	-4
11 B. Sagittarii	6.5	3.43	0.8	23 19.4	8 3.7	-7 7.5	-0.7533	0.5990	0.1181	-15	-90
18 B. Sagittarii	6.1	+3.43	+1.6	-24 19.4	10 37.9	-4 39.7	+0.5525	0.5970	+0.1252	+57	-11
22 B. Sagittarii	5.5	3.35	1.7	22 33.6	12 36.3	-2 46.1	-0.9489	0.5954	0.1305	-26	-90
19 Sagittarii	5.5	3.38	2.4	24 7.6	14 27.0	-0 59.9	+0.8562	0.5939	0.1354	+66	+7
50 Sagittarii	5.5	3.32	1.9	21 56.6	14 47.8	-0 40.0	-1.2699	0.5936	0.1363	-54	-80
53 Sagittarii	6.3	3.31	3.5	23 37.1	20 1.2	+ 4 20.9	+1.1456	0.5893	0.1495	+66	+30
74 B. Sagittarii	6.1	+3.31	+3.5	-23 37.3	20 8.1	+ 4 27.5	+1.1654	0.5892	+0.1498	+66	+32
σ Capricorni	5.5	3.01	5.4	19 22.8	21 11 55.9	-4 21.5	-0.4176	0.5749	0.1850	+10	-68
π Capricorni	5.2	2.95	5.7	18 29.2	15 12.9	-1 12.0	-0.6968	0.5719	0.1914	-4	-90
ρ Capricorni	5.0	2.93	5.7	18 5.4	15 51.6	-0 34.7	-0.9701	0.5713	0.1926	-21	-90
ϕ Capricorni	5.6	2.94	6.0	18 51.6	16 16.9	-0 10.3	-0.1161	0.5709	0.1934	-27	-49
ν Capricorni	5.3	+2.88	+6.6	-18 26.0	20 32.7	+ 3 56.0	+0.2959	0.5670	+0.2011	+49	-26
81 B. Capricorni	6.4	2.83	7.2	18 20.7	22 0 29.6	+ 7 44.2	+1.0146	0.5634	0.2077	+72	+16
94 B. Capricorni	5.7	2.74	7.2	16 21.2	4 5.8	+11 12.6	-0.2338	0.5602	0.2133	-23	-56
29 Capricorni	5.5	2.62	8.0	15 31.1	12 0.9	-5 9.1	+0.6578	0.5533	0.2244	+73	-7
53 B. Aquarii	6.5	2.59	7.4	13 32.9	12 8.7	-5 1.6	-1.3081	0.5532	0.2246	-46	-84
18 Aquarii	5.5	+2.54	+7.8	-13 14.2	15 47.8	-1 30.1	-0.7976	0.5501	+0.2291	-5	-90
λ Capricorni	5.5	2.38	8.6	11 45.1	23 1 57.9	+ 8 19.2	+0.0766	0.5423	0.2398	+43	-38
96 B. Aquarii	6.5	2.33	8.6	10 42.3	5 14.7	+11 29.6	-0.1995	0.5399	0.2427	+29	-53
θ Aquarii	4.3	2.17	8.8	8 12.0	16 12.2	-1 54.4	-0.0607	0.5328	0.2504	+37	-46
150 B. Aquarii	6.0	2.18	9.3	9 27.4	16 13.4	-1 53.3	+1.2344	0.5328	0.2504	+81	+31
ρ Aquarii	5.3	+2.14	+9.0	-8 14.5	17 49.0	-0 20.8	+0.3867	0.5318	+0.2514	+62	-22
70 B. Aquarii	6.0	2.12	9.0	7 37.0	19 25.3	+ 1 12.4	+0.1498	0.5310	0.2522	+49	-34
186 B. Aquarii	6.1	2.07	9.1	6 58.9	23 9.9	+ 4 49.9	+0.4442	0.5289	0.2539	+67	-19
κ Aquarii	5.2	2.00	8.6	4 39.6	24 2 19.3	+ 7 53.3	-1.1473	0.5273	0.2551	-24	-90
6 G. Piscium	6.2	1.87	8.7	2 50.6	12 23.6	-6 21.4	-0.4453	0.5230	0.2576	+19	-69
22 B. Piscium	6.4	+1.72	+8.8	-0 10.0	25 1 0.3	+ 5 52.1	+0.0247	0.5192	+0.2579	+44	-41
κ Piscium	4.9	1.70	8.5	+0 47.9	2 43.0	+ 7 31.5	-0.5422	0.5189	0.2576	+14	-76
9 Piscium	6.4	1.70	8.6	0 39.8	2 52.5	+ 7 40.9	-0.3606	0.5188	0.2576	+23	-63
16 Piscium	5.7	1.64	8.6	1 38.3	7 29.4	-11 50.6	-0.1930	0.5179	0.2568	+32	-53
λ Piscium	4.6	1.61	8.8	1 19.2	10 21.0	-9 4.2	+0.8740	0.5175	0.2561	+90	+5
19 Piscium	5.4	+1.58	+8.4	+3 1.4	12 32.7	-6 56.4	-0.3496	0.5173	+0.2554	+24	-62
22 Piscium	5.8	1.56	8.8	2 28.0	15 21.9	-4 12.4	+0.9544	0.5170	0.2544	+90	+10
δ Piscium	5.4	1.41	7.9	7 43.6	26 53.3	+ 9 52.9	-0.9405	0.5169	0.2472	-9	-82
136 B. Piscium	6.5	1.31	8.0	8 53.9	16 19.2	-4 0.1	+0.3573	0.5180	0.2398	+63	-22
75 Piscium	6.3	1.21	7.5	12 30.5	27 5 3.6	+ 8 21.0	-0.5029	0.5205	0.2281	+16	-67
7 Piscium	3.7	+1.13	+7.3	+14 54.9	17 26.7	-3 38.6	-0.3394	0.5240	+0.2142	+24	-55
101 Piscium	6.2	1.12	7.5	14 14.1	19 34.2	-1 35.1	+0.8436	0.5247	0.2115	+90	+9
105 Piscium	6.1	1.10	7.2	15 58.9	21 28.6	+0 15.7	-0.6324	0.5254	0.2090	+9	-72
3 Arietis	6.4	1.08	7.1	16 59.7	28 0 51.6	+ 3 32.6	-1.0221	0.5265	0.2045	-16	-73
4 Arietis	5.8	1.08	7.2	16 32.4	1 38.7	+ 4 18.2	-0.3730	0.5268	0.2035	+22	-56
1 Arietis	5.1	+1.06	+7.1	+17 24.6	6 6.7	+ 8 37.7	-0.4157	0.5284	+0.1972	+20	-57
35 B. Arietis	6.4	1.04	7.1	17 51.1	9 11.9	+11 37.1	-0.2915	0.5296	0.1926	+26	-50
47 B. Arietis	6.5	1.03	7.2	17 37.9	11 9.7	-10 28.9	+0.3219	0.5303	0.1897	+61	-17
20 H. Arietis	6.4	1.03	7.3	16 50.0	11 56.7	-9 43.3	+1.3329	0.5306	0.1884	+75	+56
15 Arietis	5.9	1.02	6.9	19 8.4	12 31.5	-9 9.6	-1.0140	0.5308	0.1876	-16	-71
θ Arietis	5.6	+1.01	+7.0	+19 30.9	16 8.0	-5 40.0	-0.7903	0.5322	+0.1819	-1	-70

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

MAY.

THE STAR'S					AT CONJUNCTION IN R. A.					Limit- ing Pa- rals.
Name.	Mag.	Red'ns from 1916.0.		Apparent Declina- tion.	Greenwich Mean Time.	Hour Angle, H	Y	α'	γ	
		$\Delta\alpha$	$\Delta\delta$		d h m	h m				N. S.
26 Arietis	6.2	+0.99	+7.0	+19 29.1	28 22 6.6	+0 7.1	+0.2993	0.5345	+0.1720	+60-18
μ Arietis	5.7	+0.97	+7.1	+19 39.4	29 3 40.2	+5 29.9	+1.0442	0.5368	+0.1622	+96-28
NEW					MOON.					

JUNE.

52 B. Geminorum	6.5	+1.22	+3.7	+24 39.8	2 14 34.9	-11 12.5	+0.6123	0.5431	-0.0759	+87-18
ϵ Geminorum	3.2	1.24	3.6	25 13.0	17 34.5	-8 18.9	-0.2396	0.5419	0.0824	+28-35
87 B. Geminorum	5.8	1.26	3.1	23 42.2	21 21.7	-4 39.2	+1.1138	0.5404	0.0905	+90-41
37 Geminorum	5.7	+1.28	+3.3	+25 29.0	22 52.7	-3 11.2	-1.0026	0.5398	-0.0936	+18-46
ω Geminorum	5.2	1.30	2.8	24 20.2	3 2 13.9	+0 3.4	-0.0559	0.5383	0.1006	+39-27
48 Geminorum	5.8	1.33	2.5	24 16.3	6 58.3	+4 38.4	-0.4820	0.5362	0.1102	+15-32
58 Geminorum	6.0	1.36	1.9	23 6.5	12 14.8	+9 44.8	+0.2007	0.5337	0.1205	+54-17
B. D.+23° 1744	6.4	1.39	1.5	23 4.1	16 45.1	-9 53.5	-0.3166	0.5316	0.1290	+25-44
187 B. Geminorum	6.3	+1.42	+1.3	+23 12.9	20 41.1	-6 5.1	-1.0008	0.5296	-0.1363	+17-45
192 B. Geminorum	6.3	1.42	+1.0	+22 35.9	21 51.6	-4 56.8	-0.4783	0.5291	0.1384	+16-35
217 B. Geminorum	6.3	1.46	-0.3	20 2.8	4 6 26.9	+3 22.5	+1.1015	0.5249	0.1532	+90-30
NEPTUNE	7.8	...	...	19 45.4	14 5.4	+10 46.8	+0.2049	0.5200	0.1653	+54-22
d^1 Cancr	5.9	1.54	1.6	18 36.1	17 44.2	-9 41.1	+0.8706	0.5194	0.1712	+90-14
θ Cancr	5.5	+1.57	-2.0	+18 22.7	21 54.3	-5 38.5	+0.3919	0.5175	-0.1773	+66-15
δ Cancr	4.2	1.63	2.6	18 27.8	5 4 35.1	+0 50.3	-0.9176	0.5145	0.1866	-9-22
X Cancr (var.)	6.2	1.66	3.2	17 33.1	10 6.8	+6 12.1	-0.9595	0.5122	0.1939	+12-77
σ^1 Cancr	5.1	1.65	3.9	15 38.7	11 6.2	+7 9.7	+0.9553	0.5118	0.1951	+90-16
σ^2 Cancr	5.7	1.66	3.8	15 54.2	11 16.5	+7 19.8	+0.6356	0.5117	0.1954	+88-1
81 Cancr	6.4	+1.70	-4.6	+15 20.0	18 58.9	-9 11.4	-0.2774	0.5088	-0.2046	+27-51
π Cancr	5.6	1.72	4.8	15 17.4	20 30.0	-7 42.9	-0.5398	0.5083	0.2063	+14-45
18 Leonis	5.8	1.83	7.2	12 11.7	6 13 3.6	+8 22.1	-0.6914	0.5035	0.2229	+7-77
19 Leonis	6.4	1.83	7.3	11 57.3	13 37.3	+8 54.9	-0.5530	0.5034	0.2234	+13-71
R Leonis (var.)	5-10	1.83	7.3	11 49.0	13 41.3	+8 58.7	-0.4162	0.5033	0.2234	+20-42
83 B. Leonis	5.9	+1.84	-8.5	+9 19.8	18 28.4	-10 22.4	+1.2319	0.5024	-0.2275	+90-55
A Leonis	4.6	1.92	8.7	10 24.4	7 0 38.0	-4 23.2	-1.3641	0.5014	0.2323	+48-78
43 Leonis	6.3	1.96	10.5	6 58.0	8 48.4	+3 33.3	+0.4710	0.5006	0.2377	+71-15
155 B. Leonis	6.5	1.94	10.8	6 7.1	8 57.0	+3 41.8	+1.3613	0.5006	0.2378	+81-45
35 Sextantis	6.1	2.05	11.9	5 11.1	19 48.1	-9 45.4	-0.2424	0.5006	0.2437	+30-59
d Leonis	5.0	+2.13	-12.9	+4 3.9	8 5 4.8	-0 44.6	-1.3057	0.5016	-0.2474	+37-54
p^1 Leonis	5.7	2.14	13.7	2 24.5	8 30.7	+2 35.5	-0.3683	0.5022	0.2484	+23-45
p^2 Leonis	5.3	2.17	14.6	0 23.0	-12 10.3	+6 8.9	+0.8987	0.5030	0.2493	+90-6
359 B. Leonis	6.3	2.22	14.8	+0 35.4	17 15.3	+11 5.2	-0.5920	0.5043	0.2502	+11-30
388 B. Leonis	6.3	2.24	15.6	-1 14.5	19 41.9	-10 32.4	+0.7572	0.5050	0.2505	+90-1
v Leonis	4.5	+2.30	-15.5	-0 21.8	9 0 28.6	-5 53.9	-1.3780	0.5067	-0.2509	+47-30
431 B. Leonis	6.2	2.29	16.1	1 58.6	1 14.7	-5 9.1	+0.1495	0.5070	0.2509	+50-34
78 B. Virginis	6.5	2.49	17.9	5 15.4	19 47.8	-11 8.8	-1.0040	0.5159	0.2483	+14-90
q Virginis	5.3	2.59	19.4	8 59.6	10 5 35.1	-1 39.5	+0.5139	0.5222	0.2443	+71-15
370 B. Virginis	6.0	2.72	20.2	11 11.9	15 37.0	+8 3.6	+0.3916	0.5297	0.2382	+61-22
69 Virginis	4.9	+2.94	-21.2	-15 32.7	11 7 10.5	-0 53.3	+1.2790	0.5432	-0.2240	+74-39
75 Virginis	5.6	2.97	20.9	14 56.2	9 38.7	+1 29.9	+0.1033	0.5456	0.2211	+42-35
83 Virginis	5.6	3.06	20.9	15 45.8	14 52.6	+6 32.9	-0.1893	0.5506	0.2146	+26-55
85 Virginis	6.1	3.06	20.8	15 21.1	15 22.0	+7 1.4	-0.7154	0.5511	0.2146	-2-90
87 Virginis	5.8	3.09	21.3	17 26.8	16 9.9	+7 47.7	+1.2579	0.5519	0.2129	+73-35
89 Virginis	5.1	+3.10	-21.3	-17 43.3	17 15.4	+8 50.8	+1.3083	0.5530	-0.2114	+72-45
43 II. Virginis	5.5	3.26	20.5	17 48.9	12 4 19.6	-4 28.6	-0.8477	0.5644	0.1943	+11-90
231 G. Virginis	6.4	3.28	20.5	18 12.1	5 1.7	+3 48.1	-0.5911	0.5651	0.1931	+2-82
236 G. Virginis	5.7	3.29	20.5	18 20.0	5 41.8	-3 9.4	-0.5858	0.5658	0.1919	+2-82
9 G. Libræ	6.5	3.41	20.3	20 4.6	12 27.1	+3 20.8	-0.0740	0.5729	0.1794	+27-46
17 G. Libræ	6.4	+3.48	-19.9	-20 49.6	17 5.3	+7 48.5	-0.1283	0.5778	-0.1700	+23-50

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

JUNE.

THE STAR'S					AT CONJUNCTION IN R. A.					Limiting Parallels.	
Name.	Mag.	Red'n's from 1916.0.		Apparent Declination.	Greenwich Mean Time.	Hour Angle, <i>H</i>	<i>Y</i>	<i>z</i>	<i>y</i>	N.	S.
		$\Delta\alpha$	$\Delta\delta$		d h m	h m					
18 G. Libræ	6.1	+3.49	-19.9	-20 58.7	13 17 30.5	+ 8 12.8	-0.0458	0.5782	-0.1691	+27	-45
43 B. Libræ	5.7	3.58	20.2	21 2.6	21 35.3	-11 51.9	-0.6515	0.5824	0.1602	-5	-90
47 G. Libræ	6.1	3.62	19.0	21 42.7	13 11.4	+ 8 24.2	-0.5427	0.5861	0.1519	0	-79
64 G. Libræ	5.8	3.67	18.4	22 5.7	5 5.1	+ 4 39.8	-0.7310	0.5899	0.1425	-12	-90
153 B. Libræ	6.3	3.80	17.7	24 12.6	11 31.7	+ 1 31.3	+0.5159	0.5961	0.1259	+54	-13
169 B. Libræ	6.0	+3.80	-17.2	-22 52.1	13 19.0	+ 3 14.2	-1.0411	0.5977	-0.1211	-34	-90
177 B. Libræ	6.2	3.80	17.1	22 52.9	13 54.4	+ 3 48.1	-1.0993	0.5982	0.1195	-38	-90
42 Libræ	5.0	3.82	17.1	23 33.0	14 15.0	+ 4 7.8	-0.4734	0.5985	0.1186	0	-73
b Scorpii	4.7	3.92	16.6	25 30.1	18 15.4	+ 7 58.3	+1.0130	0.6020	0.1074	+64	+19
A Scorpii	4.6	3.92	16.4	25 4.9	19 14.8	+ 8 55.3	+0.4906	0.6028	0.1046	+51	-15
31 B. Scorpii	5.4	+3.90	-16.2	-24 17.3	19 21.8	+ 9 2.0	-0.3092	0.6029	-0.1042	+ 8	-61
32 B. Scorpii	5.3	3.88	16.2	23 44.0	19 22.9	+ 9 3.0	-0.8626	0.6029	0.1042	-23	-90
3 Scorpii	5.9	3.92	16.3	25 0.0	19 38.3	+ 9 17.7	+0.3689	0.6031	0.1034	+43	-22
40 B. Scorpii	5.4	3.93	15.9	24 35.6	21 6.3	+10 42.1	-0.1825	0.6043	0.0992	+14	-53
π Scorpii	3.0	3.96	16.1	25 52.7	21 11.4	+10 47.0	+1.0824	0.6044	0.0989	+64	+25
48 B. Scorpii	4.9	+3.97	-15.7	-25 38.2	22 51.7	-11 36.9	+0.6810	0.6057	-0.0940	+62	-3
50 B. Scorpii	6.4	3.95	15.5	24 30.0	23 5.1	-11 24.1	-0.4665	0.6058	0.0934	-2	-73
24 G. Scorpii	6.2	3.96	15.1	24 14.5	10 32.9	-10 0.1	-0.8546	0.6069	0.0890	-24	-90
65 B. Scorpii	5.5	4.01	15.3	26 6.4	0 37.0	+ 9 56.2	+0.9856	0.6069	0.0888	+64	+17
41 G. Scorpii	6.3	3.98	14.6	24 12.7	2 43.0	+ 7 55.6	-1.0694	0.6085	0.0824	-39	-90
85 B. Scorpii	6.0	+4.02	-14.6	-25 16.1	3 7.1	+ 7 32.5	-0.0569	0.6087	-0.0812	+17	-45
σ Scorpii	3.1	4.04	14.2	25 23.8	5 25.3	+ 5 20.1	-0.1094	0.6103	0.0741	+14	-49
α Scorpii	1.2	4.10	13.5	26 15.0	8 24.0	+ 2 29.1	+0.5275	0.6121	0.0647	+50	-12
22 Scorpii	4.8	4.06	13.3	24 56.1	8 42.5	+ 2 11.5	-0.7913	0.6123	0.0638	-22	-90
116 B. Scorpii	6.2	4.10	13.4	26 21.6	9 6.9	+ 1 48.1	+0.5895	0.6125	0.0625	+54	-9
134 B. Scorpii	6.4	+4.18	-12.3	-27 18.2	13 45.7	+ 2 38.7	+1.2629	0.6150	-0.0475	+63	+53
88 B. Ophiuchi	6.3	4.15	10.7	24 58.1	19 24.4	+ 8 2.5	-1.2516	0.6172	0.0289	-61	-90
118 B. Ophiuchi	6.2	4.22	10.0	26 24.2	21 51.4	+10 23.0	+0.0991	0.6180	0.0207	+21	-36
137 B. Ophiuchi	6.3	4.19	9.5	25 9.3	23 46.6	-11 46.8	-1.1614	0.6185	0.0143	-53	-90
36 Ophi. (1st star)	5.4	4.22	9.7	26 29.0	15 05.0	-10 43.4	+0.1304	0.6188	-0.0106	+22	-35
136 G. Ophiuchi	6.3	+4.24	-8.1	-25 52.3	4 59.1	+ 6 48.2	-0.4847	0.6194	+0.0033	-10	-75
151 G. Ophiuchi	6.0	4.26	7.6	26 12.5	6 41.4	+ 5 10.4	-0.1441	0.6195	0.0091	+ 7	-51
4 G. Sagittarii	6.2	4.30	5.9	26 56.9	12 36.6	+ 0 29.1	+0.6940	0.6195	0.0291	+60	-2
63 Ophiuchi	6.1	4.23	5.3	24 52.4	14 55.4	+ 2 41.8	-1.2635	0.6193	0.0369	-62	-90
67 B. Sagittarii	6.4	4.26	2.8	25 38.3	23 23.2	+10 47.1	-0.0814	0.6172	0.0650	+15	-47
70 B. Sagittarii	6.4	+4.24	-2.5	-24 57.3	16 0 24.5	+11 45.9	-0.6826	0.6169	+0.0684	-16	-90
68 G. Sagittarii	6.2	4.30	1.8	26 41.2	2 36.6	-10 7.9	+1.1716	0.6160	0.0755	+63	+35
λ Sagittarii	2.9	4.25	1.9	25 28.2	2 42.9	-10 1.9	-0.0117	0.6160	0.0758	+20	-43
86 B. Sagittarii	6.5	4.29	1.7	26 38.2	3 2.9	+ 9 42.7	+1.1568	0.6158	0.0769	+63	+34
24 Sagittarii	5.7	4.20	1.3	24 5.8	4 51.7	+ 7 58.6	-1.1868	0.6150	0.0827	-50	-90
26 Sagittarii	6.1	+4.19	-0.5	-23 54.8	7 44.3	+ 5 13.5	-1.1157	0.6136	+0.0918	-42	-90
126 B. Sagittarii	5.7	4.23	-0.1	25 5.8	8 47.9	+ 4 12.7	+0.1429	0.6131	0.0951	+30	-34
154 B. Sagittarii	5.9	4.15	+0.9	23 16.9	12 53.5	-0 17.7	-1.2203	0.6107	0.1077	-52	-90
162 B. Sagittarii	6.4	4.21	1.3	24 59.4	13 43.2	+ 0 29.9	+0.5437	0.6102	0.1102	+55	-12
127 G. Sagittarii	6.4	4.21	1.6	25 3.6	14 28.6	+ 1 13.4	+0.6966	0.6097	0.1124	+64	-3
172 B. Sagittarii	5.8	+4.20	-1.7	-24 57.8	15 14.0	+ 1 56.7	+0.6881	0.6092	+0.1147	+64	-3
189 B. Sagittarii	6.1	4.18	2.3	24 47.3	17 21.6	+ 3 59.0	+0.7681	0.6078	0.1209	+65	+2
191 B. Sagittarii	6.5	4.13	2.2	23 19.4	17 33.8	+ 4 10.8	-0.6443	0.6077	0.1215	-9	-90
208 B. Sagittarii	6.1	4.16	3.0	24 19.3	20 4.0	+ 6 34.5	+0.6490	0.6059	0.1287	+63	-6
222 B. Sagittarii	5.5	4.08	3.3	22 33.5	21 59.1	+ 8 24.7	-0.8290	0.6045	0.1341	-18	-90
49 Sagittarii	5.5	+4.12	-4.0	-24 7.6	23 46.8	+10 7.9	+0.9549	0.6031	+0.1391	+66	+14
50 Sagittarii	5.5	4.05	3.8	21 56.6	17 0 7.0	+10 27.2	-1.1419	0.6028	0.1400	-40	-90
53 Sagittarii	6.3	4.07	5.4	23 37.1	5 11.6	+ 8 40.7	+1.2489	0.5987	0.1535	+66	+42
274 B. Sagittarii	6.1	4.07	5.4	23 37.2	5 18.2	+ 8 34.3	+1.2685	0.5986	0.1538	+66	+45
σ Capricorni	5.5	3.81	8.4	19 22.7	20 37.7	+ 6 8.1	-0.2670	0.5848	0.1895	+18	-58
π Capricorni	5.2	+3.76	+8.9	-18 29.1	23 48.6	+ 9 11.5	-0.5371	0.5817	+0.1960	+ 5	-77

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

JUNE.

THE STAR'S					AT CONJUNCTION IN R. A.					Limb in Pre- dic.
Name.	Mag.	Red'ns from 1916.0.		Apparent Declination.	Greenwich Mean Time.	Hour Angle, H	Y	z	y	
		$\Delta\alpha$	$\Delta\delta$		d h m	h m				
ρ Capricorni	5.0	+3.74	+9.0	-18 54.4	18 0 26.1	+9 47.7	-0.8053	0.5812	+0.1972	-10.40
σ Capricorni	5.6	3.76	9.2	18 51.6	0 50.6	+10 11.2	+0.0362	0.5808	0.1980	-35.40
ν Capricorni	5.3	3.70	10.0	18 25.9	4 58.4	-9 50.5	+0.4477	0.5768	0.2057	-59.10
81 B. Capricorni	6.4	3.66	10.8	18 20.6	8 47.8	-6 9.8	+1.1605	0.5782	0.2124	-72.28
94 B. Capricorni	5.7	3.58	11.0	16 21.1	12 17.2	-2 48.2	-0.0639	0.5699	0.2180	-31.48
29 Capricorni	5.5	+3.47	+12.2	-15 31.1	19 57.3	+4 35.0	+0.8233	0.5628	+0.2292	-74.2
53 B. Aquarii	6.5	3.43	11.7	13 32.9	20 4.9	+4 42.3	-1.1121	0.5626	0.2293	-26.40
18 Aquarii	5.5	3.38	12.2	13 14.2	23 37.1	+8 6.9	-0.6056	0.5595	0.2338	-6.28
137 B. Capricorni	6.2	3.26	12.7	10 57.1	19 6 20.4	-9 24.1	-1.2969	0.5537	0.2413	-42.28
λ Capricorni	5.5	3.25	13.4	11 45.0	9 28.6	-6 22.4	-0.2651	0.5511	0.2443	-53.28
96 B. Aquarii	6.5	+3.19	+13.5	-10 42.2	12 39.5	-3 18.1	-0.0042	0.5485	+0.2472	-39.48
θ Aquarii	4.3	3.03	14.1	8 11.9	23 18.1	+6 58.9	+0.1402	0.5406	0.2545	-45.58
ρ Aquarii	5.3	3.01	14.3	8 14.4	20 05.2	+8 30.0	+0.5824	0.5396	0.2553	-76.2
170 B. Aquarii	6.0	2.99	14.3	7 36.9	2 25.9	+10 0.6	-0.3497	0.5386	0.2561	-60.24
186 B. Aquarii	6.1	2.94	14.4	6 58.8	6 4.5	-10 28.0	+0.6420	0.5362	0.2577	-61.1
κ Aquarii	5.2	+2.87	+14.0	-4 39.5	9 8.9	-7 29.6	-0.9273	0.5344	+0.2587	-8.98
207 B. Aquarii	6.3	2.85	14.0	3 59.2	10 35.6	-6 5.7	-1.2364	0.5336	0.2591	-31.98
6 G. Piscium	6.2	2.74	14.3	2 50.5	18 58.4	+2 1.0	-0.2321	0.5292	0.2606	-30.58
22 B. Piscium	6.4	2.59	14.4	0 10.0	21 7 18.8	-10 1.9	+0.2326	0.5242	0.2601	-55.28
κ Piscium	4.9	2.56	14.1	+0 48.0	8 59.4	-8 24.4	-0.3285	0.5236	0.2597	-25.41
9 Piscium	6.4	+2.56	+14.2	+0 39.9	9 8.8	-8 15.3	-0.1489	0.5236	+0.2597	-34.38
16 Piscium	5.7	2.50	14.2	1 38.4	13 40.5	-3 52.0	+0.0160	0.5223	0.2586	-43.41
λ Piscium	4.6	2.48	14.4	1 19.3	16 29.1	-1 8.6	+1.0722	0.5216	0.2577	-90.11
19 Piscium	5.4	2.44	14.0	3 1.5	18 38.6	+0 57.0	-0.1407	0.5211	0.2569	-35.38
22 Piscium	5.8	2.42	14.3	2 28.0	21 25.0	+3 38.2	+1.1509	0.5206	0.2557	-90.2
36 Piscium	6.2	+2.28	+13.0	+7 46.7	22 9 43.5	-8 25.9	-1.2900	0.5192	+0.2490	-57.41
d Piscium	5.4	2.26	13.1	7 43.6	11 44.7	-6 28.4	-0.7371	0.5191	0.2476	-3.28
136 B. Piscium	6.5	2.15	12.9	8 54.0	22 4.6	+3 32.6	+0.5448	0.5193	0.2395	-76.12
75 Piscium	6.3	2.04	12.0	12 30.6	23 10 44.0	-8 11.1	-0.3233	0.5207	0.2272	-25.54
η Piscium	3.7	1.94	11.3	14 55.0	23 4.8	+3 46.9	-0.1742	0.5233	0.2128	-33.48
101 Piscium	6.2	+1.92	+11.5	+14 14.1	24 1 12.1	+5 50.2	+1.0037	0.5239	+0.2100	-40.15
105 Piscium	6.1	1.91	11.0	15 59.0	3 6.4	+7 40.9	-0.4715	0.5245	0.2076	-11.42
3 Arietis	6.4	1.88	10.7	16 59.7	6 29.4	+10 57.6	-0.8648	0.5253	0.2029	-5.3
4 Arietis	5.8	1.88	10.8	16 32.4	7 16.4	+11 43.1	-0.2178	0.5256	0.2018	-30.48
ϵ Arietis	5.1	1.84	10.5	17 24.6	11 44.6	-7 57.1	-0.2661	0.5269	0.1954	-2.45
35 B. Arietis	6.4	+1.82	+10.4	+17 51.2	14 50.0	-4 57.5	-0.1460	0.5279	+0.1908	-34.41
47 B. Arietis	6.5	1.81	10.4	17 38.0	16 48.1	-3 3.1	+0.4643	0.5286	0.1878	-71.18
15 Arietis	5.9	1.80	10.0	19 6.4	18 10.0	-1 43.8	-0.8726	0.5290	0.1857	-7.11
θ Arietis	5.6	1.78	9.8	19 31.0	21 47.1	+1 46.4	-0.6540	0.5303	0.1799	-6.28
26 Arietis	6.2	1.74	9.8	19 29.2	25 3 46.8	+7 34.6	-0.4275	0.5324	0.1700	-68.1
ν Arietis	5.4	+1.72	+9.1	+21 36.1	7 39.4	+11 19.8	-1.2223	0.5338	+0.1633	-57.48
μ Arietis	5.7	1.70	9.6	19 39.4	9 21.7	-11 1.3	+1.1654	0.5343	0.1602	-90.58
ϵ Arietis (mean)	4.6	1.66	9.1	21 0.5	17 17.9	-3 20.5	+0.9130	0.5372	0.1456	-90.21
64 Arietis	5.8	1.61	7.9	24 25.8	4 57.2	+7 55.7	-1.2588	0.5412	0.1227	-45.48
66 Arietis	6.1	1.59	8.3	22 31.1	6 53.6	+9 48.2	+1.0676	0.5418	0.1187	-98.58
7 Tauri	5.9	+1.59	+7.9	+24 11.1	9 38.4	-11 32.4	-0.4409	0.5427	+0.1130	-18.20
11 Tauri	6.1	1.58	7.6	25 3.6	12 32.2	-8 44.4	-1.0822	0.5436	0.1069	-25.65
16 Tauri	5.4	1.56	7.7	24 1.7	14 24.2	-6 56.1	-0.2457	0.5442	0.1029	-57.11
17 Tauri	3.8	1.56	7.8	23 51.1	14 26.3	-6 54.1	+0.4425	0.5442	0.1028	-71.1
18 Tauri	5.6	1.57	7.6	24 34.7	14 33.5	-6 47.2	-0.3423	0.5442	0.1025	-23.43
9 Tauri	4.3	+1.56	+7.7	+24 12.4	14 35.1	-6 45.6	+0.0684	0.5442	+0.1025	-46.21
20 Tauri	4.1	1.56	7.7	24 6.5	14 52.2	-6 29.2	+0.2058	0.5443	0.1018	-55.14
21 Tauri	5.8	1.56	7.6	24 17.7	14 54.3	-6 27.1	+0.0041	0.5443	0.1018	-42.24
22 Tauri	6.5	1.56	7.6	24 16.1	14 58.2	-6 23.3	+0.0397	0.5443	0.1016	-44.22
23 Tauri	4.3	1.56	7.8	23 41.4	15 4.6	-6 15.4	+0.6891	0.5444	0.1013	-90.12
η Tauri	3.0	+1.56	+7.7	+23 50.9	15 38.0	-5 44.8	+0.5682	0.5445	+0.1008	-82.5

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

JUNE.

THE STAR'S					AT CONJUNCTION IN R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1916.0.		Apparent Declination.	Greenwich Mean Time.	Hour Angle, H	Y	x'	y'	N.	S.
		$\Delta\alpha$	$\Delta\delta$								
		s	$"$	$^{\circ}$	$'$	d	h	m			
27 Tauri	3.7	+1.56	+ 7.7	+23 48.0	26 16 24.2	- 5 0.2	+0.6983	0.5448	+0.0985	+90	+14
28 Tauri	5.2	1.56	7.7	23 53.0	16 24.8	- 4 59.6	+0.6076	0.5448	0.0985	+87	+ 8
14 H. Tauri	5.3	1.56	7.3	25 19.7	16 54.4	- 4 31.0	-0.9313	0.5449	0.0975	-13	-65
36 Tauri	5.6	1.53	7.4	23 52.7	23 20.4	+ 1 41.8	+1.2453	0.5466	0.0833	+90	+56
p Tauri	5.6	1.53	6.8	26 15.9	27 2 14.6	+ 4 30.4	-1.1484	0.5472	0.0768	-34	-64
x Tauri	5.3	+1.51	+ 6.8	+25 26.0	7 34.9	+ 9 39.7	+0.1434	0.5483	+0.0647	+51	-12
				NEW	MOON.						

JULY.

d ¹ Cancr	5.9	+1.51	- 1.6	+18 36.1	1 23 56.1	- 1 41.7	+0.7855	0.5204	-0.1725	+90	+10
θ Cancr	5.5	1.53	2.0	18 22.7	2 4 6.3	+ 2 21.0	+0.3017	0.5185	0.1786	+60	-17
δ Cancr	4.2	1.56	2.6	18 27.8	10 47.4	+ 8 50.1	-1.0173	0.5154	0.1879	-16	-72
X ¹ Cancr (var.)	6.2	1.58	3.1	17 33.1	16 19.4	- 9 47.8	-1.0648	0.5130	0.1950	-19	-72
α^1 Cancr	5.1	+1.56	- 3.5	+15 38.7	17 18.9	- 8 50.1	+0.8538	0.5126	-0.1963	+90	+11
α^2 Cancr	5.7	1.56	3.4	15 54.2	17 29.2	- 8 40.0	+0.5331	0.5125	0.1965	+76	- 8
81 Cancr	6.4	1.58	4.1	15 20.0	3 1 12.6	- 1 10.3	-0.3892	0.5094	0.2056	+22	-58
π Cancr	5.6	1.60	4.3	15 17.4	2 43.9	+ 0 18.4	-0.6538	0.5088	0.2073	+ 7	-73
18 Leonis	5.8	1.67	6.3	12 11.7	19 21.3	- 7 32.7	-0.8193	0.5032	0.2234	- 2	-78
19 Leonis	6.4	+1.67	- 6.4	+11 57.3	19 55.1	- 6 59.8	-0.6807	0.5031	-0.2239	+ 6	-78
R Leonis (var.)	5-10	1.67	6.5	11 49.0	19 59.2	- 6 55.9	-0.5434	0.5031	0.2240	+14	-70
43 B. Leonis	5.9	1.67	7.4	9 19.8	4 0 47.9	- 2 15.3	+1.1093	0.5018	0.2279	+90	+22
83 Leonis	6.3	1.76	9.2	6 58.0	15 14.5	+11 47.1	+0.3376	0.4992	0.2375	+62	-23
155 B. Leonis	6.5	1.74	9.4	6 7.1	15 23.3	+11 55.6	+1.2334	0.4992	0.2376	+90	+32
35 Sextantis	6.1	+1.82	-10.4	+ 5 11.2	5 2 21.2	- 1 24.8	-0.3846	0.4985	-0.2429	+22	-64
p ⁴ Leonis	5.7	1.90	12.1	2 24.5	15 14.1	+11 6.5	-0.5150	0.4990	0.2470	+15	-74
p ⁵ Leonis	5.3	1.92	13.0	0 23.0	18 57.2	- 9 16.6	+0.7628	0.4995	0.2477	+90	- 2
359 B. Leonis	6.3	1.98	13.2	+ 0 35.4	6 0 7.3	+ 4 15.2	-0.7420	0.5004	0.2484	+ 3	-89
388 B. Leonis	6.3	1.99	13.9	- 1 14.5	2 36.5	- 1 50.2	+0.6203	0.5009	0.2486	+82	-10
431 B. Leonis	6.2	+2.04	-14.4	- 1 58.5	8 15.5	+ 3 39.3	+0.0070	0.5024	-0.2486	+42	-42
78 B. Virginis	6.5	2.23	16.2	5 15.4	7 3 12.9	+ 1 58.1	-1.1563	0.5098	0.2451	-25	-90
q Virginis	5.3	2.34	17.8	8 59.6	13 14.9	+ 7 48.1	+0.3843	0.5153	0.2408	+62	-22
370 B. Virginis	6.0	2.47	18.8	11 11.9	23 33.1	- 6 12.5	+0.2659	0.5220	0.2344	+54	-28
69 Virginis	4.9	2.70	20.1	15 32.6	8 15 33.5	+ 9 17.5	+1.1764	0.5347	0.2199	+74	+28
75 Virginis	5.6	+2.74	-19.8	-14 56.2	18 6.1	+11 45.1	-0.0140	0.5369	-0.2171	+36	-43
83 Virginis	5.6	2.83	20.0	15 45.8	23 29.5	- 7 2.2	-0.3066	0.5418	0.2106	+19	-60
85 Virginis	6.1	2.83	19.8	15 21.1	23 59.8	- 6 33.0	-0.8397	0.5422	0.2099	-10	-90
87 Virginis	5.8	2.86	20.5	17 26.7	9 0 49.1	- 5 45.3	+1.1621	0.5430	0.2089	+73	+27
89 Virginis	5.1	2.88	20.6	17 43.3	1 56.5	- 4 40.2	+1.2142	0.5441	0.2074	+72	+32
43 H. Virginis	5.5	+3.07	-19.9	-17 48.9	13 20.8	+ 6 20.6	-0.9624	0.5552	-0.1904	-20	-90
231 G. Virginis	6.4	3.08	19.9	18 12.1	14 4.2	+ 7 2.3	-0.7017	0.5559	0.1892	- 4	-90
236 G. Virginis	5.7	3.10	19.9	18 20.0	14 45.5	+ 7 42.3	-0.6956	0.5566	0.1881	+ 4	-90
9 G. Libræ	6.5	3.24	19.9	20 4.6	21 42.8	- 9 35.4	-0.1703	0.5637	0.1757	+22	-52
17 G. Libræ	6.4	3.33	19.7	20 49.6	10 2 29.1	- 4 59.7	-0.2208	0.5686	0.1665	+19	-55
18 G. Libræ	6.1	+3.34	-19.7	-20 58.7	2 55.1	- 4 34.6	-0.1370	0.5690	-0.1656	+22	-50
43 B. Libræ	5.7	3.45	20.1	21 2.6	7 8.9	+ 0 32.2	-0.7465	0.5734	0.1569	-11	-90
47 G. Libræ	6.1	3.49	18.9	21 42.7	10 49.0	+ 3 1.4	-0.6324	0.5772	0.1487	- 5	-88
64 G. Libræ	5.8	3.56	18.4	22 5.7	14 49.1	+ 6 52.3	-0.8189	0.5812	0.1395	-17	-90
153 B. Libræ	6.3	3.72	18.0	24 12.6	21 26.0	-10 46.5	+0.4496	0.5876	0.1233	+50	-17
169 B. Libræ	6.0	+3.73	-17.3	-22 52.1	23 15.9	- 9 0.9	-1.1235	0.5894	-0.1185	-40	-90
177 B. Libræ	6.2	3.74	17.2	22 52.9	23 52.3	- 8 26.0	-1.1816	0.5900	0.1170	-46	-90
42 Libræ	5.0	3.76	17.4	23 63.0	11 0 13.3	- 8 5.9	-0.5482	0.5903	0.1161	- 5	-80
b Scorpii	4.7	3.87	17.1	25 30.1	4 19.5	+ 4 9.6	+0.9585	0.5940	0.1050	+64	+15
A Scorpii	4.6	3.88	16.8	25 4.9	5 20.4	- 3 11.1	-0.4314	0.5949	0.1023	+47	-18
31 B. Scorpii	5.4	+3.86	-16.6	-24 17.3	5 27.5	- 3 4.3	-0.3767	0.5950	-0.1019	+ 4	-66

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

JULY.

THE STAR'S					AT CONJUNCTION IN R. A.					Limiting Pa- rad.
Name.	Mag.	Red'ns from 1916.0.		Apparent Declina- tion.	Greenwich Mean Time.	Hour Angle, H	Y	α'	γ'	
		$\Delta\alpha$	$\Delta\delta$		d h m	h m				N. S.
32 B. Scorpii	5.3	+3.85	-16.4	-23 44.0	11 5 28.7	-3 3.2	-0.9359	0.5950	-0.1019	-28-40
3 Scorpii	5.9	3.88	16.7	25 0.0	5 44.4	-2 48.2	+0.3088	0.5952	0.1012	-30-5
40 B. Scorpii	5.4	3.90	16.3	24 35.7	7 14.5	-1 21.7	-0.2468	0.5965	0.0970	-10-5
π Scorpii	3.0	3.93	16.6	25 52.7	7 19.7	-1 16.7	+1.0311	0.5966	0.0967	-64-2
48 B. Scorpii	4.9	3.96	16.2	25 38.2	9 2.3	+0 21.7	+0.6272	0.5981	0.0919	-59-7
50 B. Scorpii	6.4	+3.93	-15.9	-24 30.0	9 16.0	+0 34.7	-0.5316	0.5983	-0.0913	-5-7
24 G. Scorpii	6.2	3.96	15.5	24 14.5	10 45.7	+2 0.8	-0.9219	0.5994	0.0869	-29-0
65 B. Scorpii	5.5	4.01	15.9	26 6.4	10 49.9	+2 4.8	+0.9366	0.5995	0.0868	-64-4
41 G. Scorpii	6.3	3.99	15.0	24 12.8	12 58.6	+4 8.1	-1.1362	0.6012	0.0805	-45-8
85 B. Scorpii	6.0	4.02	15.2	25 16.1	13 23.3	+4 31.8	-0.1137	0.6015	0.0793	-15-4
σ Scorpii	3.1	+4.06	-14.7	-25 23.8	15 44.2	+6 46.9	-0.1642	0.6033	-0.0723	-12-7
α Scorpii	1.2	4.14	14.2	26 15.0	18 46.5	+9 41.5	+0.4813	0.6055	0.0631	-47-15
22 Scorpii	4.8	4.10	13.8	24 56.1	19 5.3	+9 59.4	-0.8484	0.6057	0.0621	-28-9
116 B. Scorpii	6.2	4.15	14.0	26 21.6	19 30.2	+10 23.3	+0.5445	0.6060	0.0608	-51-10
134 B. Scorpii	6.4	4.26	13.1	27 18.2	19 0 14.0	-9 4.9	+1.2274	0.6089	0.0461	-63-7
118 B. Ophiuchi	6.2	+4.34	-10.7	-26 24.2	8 27.4	-1 12.8	+0.0629	0.6130	-0.0196	-19-3
137 B. Ophiuchi	6.3	4.33	9.9	25 9.3	10 24.2	+0 39.0	-1.2030	0.6138	0.0132	-56-4
36 Ophi. (1st star)	5.4	4.37	10.5	26 29.0	11 31.4	+1 43.2	-0.0974	0.6142	-0.0095	-20-8
136 G. Ophiuchi	6.3	4.42	8.6	25 52.3	15 40.4	+5 41.4	-0.5164	0.6154	+0.0043	-12-7
151 G. Ophiuchi	6.0	4.45	8.2	26 12.5	17 23.8	+7 20.3	-0.1724	0.6158	0.0100	-5-2
4 G. Sagittarii	6.2	+4.53	-6.5	-26 56.9	23 22.2	-10 57.1	+0.6746	0.6167	+0.0300	-58-4
67 B. Sagittarii	6.4	4.57	3.0	25 38.3	10 12.2	-0 35.6	-0.0923	0.6161	0.0659	-15-8
70 B. Sagittarii	6.4	4.56	2.6	24 57.3	11 13.6	+0 23.1	-0.6929	0.6159	0.0693	-16-8
68 G. Sagittarii	6.2	4.63	2.1	26 41.2	13 25.9	+2 29.6	+1.1643	0.6154	0.0764	-63-5
λ Sagittarii	2.9	4.59	2.0	25 28.2	13 32.2	+2 35.6	-0.0192	0.6154	0.0768	-20-5
86 B. Sagittarii	6.5	+4.63	-2.0	-26 38.2	13 52.3	+2 54.9	+1.1499	0.6153	+0.0779	-63-3
24 Sagittarii	5.7	4.55	1.2	24 5.8	15 41.1	+4 39.0	-1.1920	0.6148	0.0637	-50-8
26 Sagittarii	6.1	4.56	-0.2	23 54.8	18 33.7	+7 24.0	-1.1174	0.6139	0.0929	-42-9
126 B. Sagittarii	5.7	4.60	0.0	25 5.8	19 37.1	+8 24.7	+0.1413	0.6135	0.0962	-30-4
154 B. Sagittarii	5.9	4.55	+1.4	23 16.9	23 42.1	-11 40.9	-1.2155	0.6118	0.1089	-51-5
162 B. Sagittarii	6.4	+4.62	+1.5	-24 59.4	14 0 31.6	-10 53.5	+0.5459	0.6114	+0.1114	-55-12
127 G. Sagittarii	6.4	4.62	1.8	25 3.6	1 16.8	-10 10.3	+0.6991	0.6111	0.1137	-64-7
172 B. Sagittarii	5.8	4.62	1.9	24 57.8	2 1.9	-9 27.1	+0.6912	0.6107	0.1159	-64-5
189 B. Sagittarii	6.1	4.61	2.7	24 47.3	4 8.9	-7 25.5	+0.7727	0.6096	0.1223	-65-7
191 B. Sagittarii	6.5	4.56	2.8	23 19.4	4 21.1	-7 13.8	-0.6354	0.6095	0.1228	-8-8
208 B. Sagittarii	6.1	+4.60	+3.5	-24 19.3	6 50.3	-4 51.0	+0.6562	0.6081	+0.1302	-63-6
222 B. Sagittarii	5.5	4.54	4.2	22 33.5	8 44.6	-3 1.6	-0.8146	0.6070	0.1356	-18-0
49 Sagittarii	5.5	4.59	4.6	24 7.6	10 31.4	-1 19.3	+0.9638	0.6059	0.1407	-66-13
50 Sagittarii	5.5	4.52	4.8	21 56.6	10 51.4	-1 0.1	-1.1237	0.6057	0.1416	-39-0
53 Sagittarii	6.3	4.57	6.2	23 37.1	15 52.9	+3 48.7	+1.2604	0.6023	0.1553	-66-11
274 B. Sagittarii	6.1	+4.57	+6.3	-23 37.2	15 59.5	+3 55.1	+1.2801	0.6022	+0.1556	-66-8
σ Capricorni	5.5	4.39	10.4	19 22.7	7 5.8	-5 35.6	-0.2328	0.5904	0.1922	-20-3
π Capricorni	5.2	4.35	11.1	18 29.1	10 13.2	-2 35.7	-0.4976	0.5878	0.1988	-7-1
ρ Capricorni	5.0	4.34	11.2	18 5.3	10 50.0	-2 0.3	-0.7628	0.5872	0.2001	-8-9
ν Capricorni	5.6	4.36	11.3	18 51.5	11 14.1	-1 37.3	+0.0716	0.5869	0.2009	-37-8
ν Capricorni	5.3	+4.32	+12.4	-18 25.9	15 17.0	+2 16.2	+0.4826	0.5834	+0.2089	-60-16
81 B. Capricorni	6.4	4.30	13.2	18 20.6	19 1.5	+5 51.9	+1.1911	0.5801	0.2158	-72-3
94 B. Capricorni	5.7	4.22	13.8	16 21.1	22 26.3	+9 9.0	-0.0181	0.5772	0.2216	-94-5
29 Capricorni	5.5	4.15	15.4	15 31.0	5 55.3	-7 38.9	+0.8647	0.5707	0.2331	-74-5
53 B. Aquarii	6.5	4.10	15.1	13 32.8	6 2.6	-7 31.9	-1.0479	0.5706	0.2333	-21-0
18 Aquarii	5.5	+4.07	+15.7	-13 14.1	9 29.4	+4 12.7	-0.5445	0.5676	+0.2379	-10-7
137 B. Capricorni	6.2	3.97	16.6	10 57.0	16 1.8	+2 5.4	-1.2218	0.5623	0.2457	-83-0
λ Capricorni	5.5	3.96	17.2	11 44.9	19 4.7	+5 1.8	+0.3220	0.5598	0.2488	-56-5
96 B. Aquarii	6.5	3.92	17.6	10 42.2	22 10.1	+8 0.5	+0.0583	0.5574	0.2517	-42-3
θ Aquarii	4.3	3.78	18.6	8 11.8	17 8 29.6	-6 1.5	+0.2068	0.5498	0.2593	-52-31
ρ Aquarii	5.3	+3.77	+18.8	-8 14.3	10 0.8	+4 33.4	+0.6433	0.5488	+0.2602	-80-9

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

JULY.

THE STAR'S					AT CONJUNCTION IN R. A.							Limiting Parallels.	
Name.	Mag.	Red'ns from 1916.0.		Apparent Declination.	Greenwich Mean Time.			Hour Angle, <i>H</i>	<i>Y</i>	<i>x'</i>	<i>y'</i>	<i>N.</i>	<i>S.</i>
		$\Delta\alpha$	$\Delta\delta$		d	h	m						
0 B. Aquarii	6.0	+3.75	+18.9	7 36.8	17	11	31.7	- 3 5.7	+0.4148	0.5478	+0.2609	+65	-20
6 B. Aquarii	6.1	3.71	19.2	6 58.7	15	3.5	+ 0 18.9	+0.7045	0.5455	0.2625	+83	- 5	
κ Aquarii	5.2	3.64	19.0	4 39.4	18	2.1	+ 3 11.5	-0.8405	0.5437	0.2636	- 3	-90	
7 B. Aquarii	6.3	3.62	19.0	3 59.2	19	26.1	+ 4 32.7	-1.1444	0.5428	0.2640	-23	-90	
6 G. Piscium	6.2	3.54	19.6	2 50.4	18	3 33.0	-11 36.6	-0.1517	0.5384	0.2654	+34	-50	
12 B. Piscium	6.4	+3.41	+19.9	- 0 9.9	15	30.0	- 0 3.0	+0.3094	0.5330	+0.2646	+60	-26	
κ Piscium	4.9	3.38	19.6	+ 0 48.1	17	7.5	+ 1 31.4	-0.2430	0.5325	0.2643	+29	-56	
9 Piscium	6.4	3.38	19.7	0 40.0	17	16.6	+ 1 40.2	-0.0661	0.5324	0.2642	+38	-46	
16 Piscium	5.7	3.33	19.8	1 38.5	21	39.9	+ 5 55.1	+0.0973	0.5309	0.2630	+47	-37	
λ Piscium	4.6	3.31	19.9	1 19.4	19	0 23.3	+ 8 33.4	+1.1386	0.5301	0.2620	+90	+22	
19 Piscium	5.4	+3.28	+19.6	+ 3 1.6	2	28.9	+10 34.9	-0.0566	0.5295	+0.2611	+39	-45	
22 Piscium	5.8	3.26	19.9	2 28.1	5	10.4	-10 48.6	+1.2168	0.5288	0.2598	+90	+29	
36 Piscium	6.2	3.13	18.7	7 46.8	17	7.7	+ 0 46.0	-1.1899	0.5266	0.2525	-26	-82	
<i>d</i> Piscium	5.4	3.12	18.8	7 43.7	19	5.6	+ 2 40.2	-0.6447	0.5263	0.2510	+ 8	-80	
36 B. Piscium	6.5	3.02	18.5	8 54.1	20	5 9.3	-11 35.1	+0.6197	0.5257	0.2424	+82	- 8	
75 Piscium	6.3	+2.92	+17.4	+12 30.7	17	30.9	+ 0 23.3	-0.2402	0.5262	+0.2294	+30	-51	
η Piscium	3.7	2.83	16.4	14 55.1	21	5 36.8	-11 53.6	-0.0961	0.5277	0.2143	+37	-42	
31 Piscium	6.2	2.81	16.5	14 14.2	7	41.8	- 9 52.5	+1.0698	0.5280	0.2114	+90	+24	
05 Piscium	6.1	2.80	15.9	15 59.1	9	34.1	- 8 3.8	-0.3918	0.5284	0.2088	+22	-57	
3 Arietis	6.4	2.78	15.6	16 59.8	12	53.7	- 4 50.6	-0.7829	0.5290	0.2040	- 1	-73	
4 Arietis	5.8	+2.77	+15.6	+16 32.5	13	40.0	- 4 5.8	-0.1420	0.5292	+0.2029	+34	-43	
ι Arietis	5.1	2.74	15.1	17 24.7	18	4.0	+ 0 9.9	-0.1914	0.5301	0.1963	+32	-44	
35 B. Arietis	6.4	2.72	14.9	17 51.2	21	6.7	+ 3 6.8	-0.0735	0.5308	0.1915	+38	-38	
47 B. Arietis	6.5	2.70	14.9	17 38.0	23	3.2	+ 4 59.4	+0.5312	0.5313	0.1885	+77	- 6	
15 Arietis	5.9	2.70	14.3	19 6.5	23	0 24.0	+ 6 17.7	-0.7957	0.5316	0.1863	- 2	-71	
0 Arietis	5.6	+2.68	+14.0	+19 31.0	3	58.3	+ 9 45.1	-0.5804	0.5326	+0.1804	+11	-65	
26 Arietis	6.2	2.63	13.8	19 29.2	9	54.0	- 8 30.8	+0.4911	0.5342	0.1702	+74	- 6	
ν Arietis	5.4	2.61	12.8	21 36.1	13	44.3	- 4 47.9	-1.1499	0.5352	0.1633	-29	-68	
μ Arietis	5.7	2.59	13.4	19 39.5	15	25.7	+ 3 9.8	+1.2224	0.5357	0.1602	+90	+44	
ϵ Arietis (mean)	4.6	2.53	12.5	21 0.5	23	18.1	+ 4 27.1	+0.9690	0.5379	0.1454	+90	+25	
64 Arietis	5.8	+2.48	+10.6	+24 25.8	23	10 53.5	- 8 20.5	-1.1980	0.5411	+0.1222	-36	-66	
66 Arietis	6.1	2.45	11.1	22 31.1	12	49.4	- 6 28.4	+1.1182	0.5416	0.1182	+90	+39	
7 Tauri	5.9	2.45	10.4	24 11.2	15	33.6	- 3 49.7	-0.3857	0.5423	0.1124	+21	-46	
11 Tauri	6.1	2.44	9.9	25 3.7	18	27.0	- 1 2.2	-1.0262	0.5431	0.1063	-20	-65	
16 Tauri	5.4	2.41	10.0	24 1.7	20	18.6	+ 0 45.6	+0.2964	0.5435	0.1023	+60	- 9	
17 Tauri	3.8	+2.41	+10.1	+23 51.2	20	20.7	+ 0 47.7	+0.4924	0.5435	+0.1022	+75	+ 2	
18 Tauri	5.6	2.42	9.9	24 34.8	20	27.9	+ 0 54.7	-0.2898	0.5435	0.1020	+26	-40	
<i>q</i> Tauri	4.3	2.41	10.0	24 12.4	20	29.5	+ 0 56.3	+0.1196	0.5435	0.1019	+49	-17	
20 Tauri	4.1	2.41	10.0	24 6.5	20	46.6	+ 1 12.7	+0.2564	0.5436	0.1013	+58	-10	
21 Tauri	5.8	2.41	9.9	24 17.8	20	48.6	+ 1 14.7	+0.0653	0.5436	0.1012	+45	-21	
22 Tauri	6.5	+2.41	+10.0	+24 16.2	20	52.5	+ 1 18.4	+0.0908	0.5436	+0.1011	+47	-19	
23 Tauri	4.3	2.40	10.1	23 41.4	21	0.6	+ 1 26.3	+0.7380	0.5437	0.1008	+90	+15	
η Tauri	3.0	2.40	10.0	23 50.9	21	32.3	+ 1 56.9	+0.6173	0.5438	0.0996	+88	+ 8	
27 Tauri	3.7	2.39	10.0	23 48.0	22	18.3	+ 2 41.4	+0.7467	0.5440	0.0980	+90	+16	
28 Tauri	5.2	2.39	10.0	23 53.0	22	18.9	+ 2 42.0	+0.6563	0.5440	0.0979	+90	+11	
14 H. Tauri	5.3	+2.41	+ 9.4	+25 19.8	22	48.5	+ 3 10.5	-0.8781	0.5441	+0.0969	- 9	-65	
<i>p</i> Tauri	5.6	2.35	8.4	26 15.9	24	8 8.0	-11 49.0	-1.0994	0.5460	0.0761	-27	-64	
χ Tauri	5.3	2.31	8.3	25 26.1	13	28.2	- 6 39.6	+0.1870	0.5469	+0.0640	+53	-10	
112 B. Aurigæ	5.7	2.12	4.8	26 52.4	25	23 7.2	+ 1 50.5	-0.5663	0.5478	-0.0146	+10	-49	
125 Tauri	5.1	2.10	4.9	25 51.1	26	0 18.7	+ 2 59.6	+0.5469	0.5477	0.0174	+81	+13	
139 Tauri	4.7	+2.05	+ 4.1	+25 56.7	8	36.4	+11 0.4	+0.2193	0.5465	-0.0367	+56	- 6	
52 B. Geminorum	6.5	1.95	2.5	24 39.7	27	2 45.8	+ 4 33.3	+0.6061	0.5421	0.0774	+87	+11	
ϵ Geminorum	3.2	1.94	2.1	25 13.0	5	45.8	+ 7 27.2	-0.2516	0.5411	0.0839	+28	-36	
87 B. Geminorum	5.8	1.91	2.0	23 42.2	9	33.6	+11 7.6	+1.0970	0.5399	0.0920	+90	+39	
37 Geminorum	5.7	+1.92	+ 1.6	+25 28.9	11	4.8	-11 24.3	-1.0237	0.5394	-0.0952	-20	-65	

NEW MOON.

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

JULY.

THE STAR'S					AT CONJUNCTION IN R. A.					Limit- ing Pa- ssage.		
Name.	Mag.	Red'ns from 1916.0.		Apparent Declina- tion.	Greenwich Mean Time.			Hour Angle, <i>H</i>	<i>Y</i>	<i>x'</i>	<i>y'</i>	N. S.
		$\Delta\alpha$	$\Delta\delta$		d	h	m					
43 Leonis	6.3	+1.70	- 8.3	+ 6 58.0	31	20	58.4	4 41.7	+0.3362	0.5011	-0.2384	+61.2
155 B. Leonis	6.5	+1.68	- 8.4	+ 6 7.1	21	7.2	4 33.1	+1.2327	0.5011	-0.2385	+90.2	

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35 Sextantis	6.1	+1.73	- 9.4	+ 5 11.2	1 8 3.7	+ 6 5.1	-0.3867	0.5000	-0.2436	+22.4	
p ⁴ Leonis	5.7	1.76	10.8	2 24.5	20 56.2	- 5 24.0	-0.5171	0.4999	0.2474	+15.7	
p ⁶ Leonis	5.3	1.78	11.4	0 23.1	2 0 39.4	- 1 46.9	+0.7647	0.5003	0.2490	+90.1	
359 B. Leonis	6.3	1.81	11.7	+ 0 35.4	5 50.1	+ 3 15.1	-0.7446	0.5009	0.2485	+ 3.6	
388 B. Leonis	6.3	1.82	12.2	- 1 14.4	8 19.8	+ 5 40.6	+0.6229	0.5013	0.2486	+82.9	
431 B. Leonis	6.2	+1.85	-12.8	- 1 58.5	14 0.1	+11 11.3	+0.0078	0.5023	-0.2485	+42.2	
78 B. Virginis	6.5	1.99	14.4	5 15.4	3 9 5.4	+ 5 43.8	-1.1606	0.5082	0.2442	-26.9	
g Virginis	5.3	2.07	15.9	8 59.6	19 14.1	- 8 25.3	+0.3920	0.5128	0.2395	+62.2	
370 B. Virginis	6.0	2.19	16.9	11 11.9	4 5 41.2	+ 1 43.0	+0.2748	0.5185	0.2326	+54.2	
69 Virginis	4.9	2.40	18.3	15 32.6	21 59.5	- 6 29.0	+1.1984	0.5295	0.2176	+74.3	
75 Virginis	5.6	+2.43	-18.1	-14 56.2	5 0 35.4	- 3 58.1	-0.0050	0.5314	-0.2147	-36.4	
83 Virginis	5.6	2.52	18.3	15 45.7	6 6.1	+ 1 21.9	-0.3003	0.5357	0.2081	+20.4	
85 Virginis	6.1	2.53	18.2	15 21.1	6 37.1	+ 1 51.9	-0.8399	0.5361	0.2074	-10.0	
87 Virginis	5.8	2.55	18.8	17 26.7	7 27.6	+ 2 40.7	+1.1867	0.5368	0.2063	+73.3	
89 Virginis	5.1	2.56	18.9	17 43.3	8 36.7	+ 3 47.6	+1.2396	0.5378	0.2048	+73.5	
43 H. Virginis	5.5	+2.75	-18.4	-17 48.9	20 18.8	- 8 53.9	-0.9638	0.5477	-0.1877	-19.8	
231 G. Virginis	6.4	2.77	18.5	18 12.0	21 3.3	- 8 10.9	-0.6993	0.5484	0.1865	-4.9	
236 G. Virginis	5.7	2.78	18.5	18 19.9	21 45.8	- 7 29.8	-0.6933	0.5490	0.1854	-4.9	
9 G. Libræ	6.5	2.92	18.7	20 4.6	6 4 55.2	- 0 35.4	-0.1602	0.5554	0.1730	+23.3	
17 G. Libræ	6.4	3.01	18.6	20 49.5	9 50.1	+ 4 9.0	-0.2110	0.5598	0.1638	+19.5	
18 G. Libræ	6.1	+3.02	-18.6	-20 58.7	10 16.9	+ 4 34.9	-0.1257	0.5602	-0.1630	+23.9	
43 B. Libræ	5.7	3.14	19.2	21 2.6	14 36.5	+ 8 45.1	-0.7439	0.5642	0.1543	-10.8	
47 G. Libræ	6.1	3.18	18.1	21 42.6	18 25.8	-11 34.1	-0.6282	0.5677	0.1463	-5.6	
64 G. Libræ	5.8	3.26	17.7	22 5.6	22 33.7	- 7 35.4	-0.8174	0.5714	0.1371	-17.9	
153 B. Libræ	6.3	3.42	17.6	24 12.6	7 5 23.7	- 1 0.9	+0.4712	0.5775	0.1210	+51.1	
169 B. Libræ	6.0	+3.44	-16.8	-22 52.1	7 17.4	+ 0 48.4	-1.1265	0.5791	-0.1164	-40.8	
177 B. Libræ	6.2	3.45	16.7	22 52.8	7 54.9	+ 1 24.4	-1.1856	0.5797	0.1149	-47.9	
42 Libræ	5.0	3.47	16.9	23 33.0	8 16.7	+ 1 45.4	-0.5421	0.5800	0.1140	-4.3	
b Scorpïi	4.7	3.59	16.9	25 30.1	12 31.3	+ 5 50.1	+0.9884	0.5835	0.1032	+64.1	
A Scorpïi	4.6	3.60	16.6	25 4.9	13 34.2	+ 6 50.5	+0.4531	0.5844	0.1004	+48.1	
31 B. Scorpïi	5.4	+3.59	-16.3	-24 17.3	13 41.6	+ 6 57.6	-0.3678	0.5845	-0.1001	+4.8	
32 B. Scorpïi	5.3	3.58	16.1	23 44.0	13 42.8	+ 6 58.8	-0.9358	0.5845	0.1001	-28.8	
3 Scorpïi	5.9	3.61	16.5	25 0.0	13 59.1	+ 7 14.4	+0.3285	0.5847	0.0993	+41.2	
40 B. Scorpïi	5.4	3.63	16.0	24 35.7	15 32.2	+ 8 43.9	-0.2359	0.5860	0.0952	+10.5	
π Scorpïi	3.0	3.66	16.5	25 52.7	15 37.6	+ 8 49.1	+1.0623	0.5860	0.0950	+64.2	
48 B. Scorpïi	4.9	+3.68	-16.1	-25 38.2	17 23.7	+10 31.0	+0.6521	0.5874	-0.0902	+61.1	
50 B. Scorpïi	6.4	3.67	15.7	24 30.0	17 37.9	+10 44.6	-0.5250	0.5876	0.0896	-5.5	
24 G. Scorpïi	6.2	3.70	15.3	24 14.5	19 10.7	-11 46.4	-0.9215	0.5888	0.0854	-28.2	
65 B. Scorpïi	5.5	3.74	15.9	26 6.4	19 15.1	-11 42.1	+0.9663	0.5888	0.0852	+64.1	
41 G. Scorpïi	6.3	3.74	14.8	24 12.7	21 28.2	- 9 34.4	-1.1392	0.5905	0.0790	-46.9	
85 B. Scorpïi	6.0	+3.77	-15.1	-25 16.1	21 53.7	- 9 9.9	-0.1005	0.5908	-0.0779	+16.5	
σ Scorpïi	3.1	3.82	14.7	25 23.8	2 0 19.5	- 6 49.9	-0.1518	0.5925	0.0710	+13.1	
α Scorpïi	1.2	3.90	14.3	26 15.0	3 28.0	- 3 49.1	+0.5036	0.5947	0.0619	+48.1	
22 Scorpïi	4.8	3.87	13.8	24 56.1	3 47.5	- 3 30.5	-0.8468	0.5949	0.0610	-26.9	
116 B. Scorpïi	6.2	3.92	14.2	26 21.6	4 13.2	- 3 5.8	+0.5679	0.5952	0.0597	+53.1	
134 B. Scorpïi	6.4	+4.03	-13.4	-27 18.2	9 6.7	+ 1 35.7	+1.2611	0.5982	-0.0453	+63.5	
118 B. Ophiuchi	6.2	4.16	11.1	26 24.2	17 36.5	+ 9 44.3	+0.0782	0.6025	0.0193	+20.8	
137 B. Ophiuchi	6.3	4.16	10.2	25 9.3	19 37.1	+11 39.8	-1.2066	0.6034	0.0130	-57.9	
36 Ophi. (1st star)	5.4	4.21	11.0	26 29.0	20 46.5	-11 13.7	+0.1131	0.6038	-0.0094	+21.3	
136 G. Ophiuchi	6.3	4.27	9.0	25 52.3	9 1 3.5	- 7 7.5	-0.5100	0.6053	+0.0041	-11.7	
151 G. Ophiuchi	6.0	+4.31	- 8.6	-26 12.5	2 50.0	- 5 25.5	-0.1612	0.6057	+0.0098	+7.2	

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

AUGUST.

THE STAR'S					AT CONJUNCTION IN R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1916.0.		Apparent Declination.	Greenwich Mean Time.	Hour Angle, H	Y	x'	y'	N.	S.
		$\Delta\alpha$	$\Delta\delta$								
		$^{\circ}$	$''$	$^{\circ}$	$^{\circ}$	$^{\circ}$				$^{\circ}$	$^{\circ}$
4 G. Sagittarii	6.2	+4.44	-7.2	-26 56.9	9 8 59.4	+0 28.2	+0.6968	0.6070	+0.0294	+61	-2
67 B. Sagittarii	6.4	4.54	3.6	25 38.3	20 7.7	+11 8.0	-0.0819	0.6075	0.0649	+15	-47
70 B. Sagittarii	6.4	4.53	3.0	24 57.3	21 10.8	-11 51.5	-0.6900	0.6074	0.0681	-16	-90
68 G. Sagittarii	6.2	4.62	2.8	26 41.2	23 26.5	-9 41.6	+1.1888	0.6072	0.0752	+63	+38
λ Sagittarii	2.9	4.57	2.6	25 28.2	23 33.0	-9 35.4	-0.0085	0.6071	0.0756	+20	-43
86 B. Sagittarii	6.5	+4.62	-2.7	-26 38.2	23 53.6	-9 15.7	+1.1742	0.6071	+0.0766	+63	+36
24 Sagittarii	5.7	4.55	1.5	24 5.8	10 1 45.1	-7 28.9	-1.1948	0.6068	0.0824	-51	-89
26 Sagittarii	6.1	4.57	0.6	23 54.8	4 41.8	-4 39.7	-1.1194	0.6063	0.0915	-43	-90
26 B. Sagittarii	5.7	4.63	-0.5	25 5.8	5 46.8	-3 37.6	+0.1527	0.6060	0.0948	+30	-34
54 B. Sagittarii	5.9	4.61	+1.1	23 16.9	9 57.2	+0 22.3	-1.2186	0.6049	0.1074	-51	-87
62 B. Sagittarii	6.4	+4.67	+1.0	-24 59.4	10 47.8	+1 10.8	+0.5602	0.6046	+0.1099	+56	-11
27 G. Sagittarii	6.4	4.68	1.3	25 3.6	11 34.0	+1 55.1	+0.7145	0.6043	0.1122	+65	-2
72 B. Sagittarii	5.8	4.68	1.4	24 57.8	12 20.1	+2 39.2	+0.7063	0.6041	0.1144	+65	-2
89 B. Sagittarii	6.1	4.70	2.2	24 47.3	14 29.6	+4 43.3	-0.7878	0.6032	0.1207	+65	+3
91 B. Sagittarii	6.5	4.64	2.6	23 19.4	14 42.1	+4 55.3	-0.6333	0.6031	0.1214	-9	-89
88 B. Sagittarii	6.1	+4.70	+3.1	-24 19.3	17 14.1	+7 20.9	+0.6892	0.6022	+0.1287	+64	-5
22 B. Sagittarii	5.5	4.64	4.1	22 33.5	19 10.5	+9 12.4	-0.8145	0.6013	0.1341	-17	-90
49 Sagittarii	5.5	4.72	4.3	24 7.6	20 59.2	+10 56.6	-0.9780	0.6005	0.1392	+66	+16
50 Sagittarii	5.5	4.64	4.8	21 56.6	21 19.5	+11 16.1	-1.1263	0.6002	0.1401	-38	-90
53 Sagittarii	6.3	4.73	6.0	23 37.1	11 2 25.9	-7 50.1	+1.2741	0.5977	0.1539	+66	+47
74 B. Sagittarii	6.1	+4.73	+6.1	-23 37.2	2 32.6	-7 43.7	+1.2939	0.5976	+0.1541	+66	+51
σ Capricorni	5.5	4.64	11.0	19 22.7	17 48.9	+6 55.7	-0.2336	0.5882	0.1911	+20	-56
π Capricorni	5.2	4.61	12.0	18 29.1	20 57.7	+9 57.0	-0.5001	0.5861	0.1979	+6	-74
ρ Capricorni	5.0	4.60	12.1	18 5.3	21 34.7	+10 32.6	-0.7665	0.5857	0.1992	-9	-90
ϕ Capricorni	5.6	4.63	12.1	18 51.5	21 58.9	+10 55.8	+0.0705	0.5854	0.2000	+36	-39
ν Capricorni	5.3	+4.62	+13.3	-18 25.9	12 2 2.9	-9 9.7	+0.4807	0.5826	+0.2082	+60	-16
81 B. Capricorni	6.4	4.62	14.2	18 20.5	5 48.0	-5 33.3	+1.1883	0.5799	0.2153	+72	+30
94 B. Capricorni	5.7	4.56	15.2	16 21.1	9 12.9	-2 16.3	-0.0238	0.5775	0.2214	+34	-44
29 Capricorni	5.5	4.52	16.9	15 31.0	16 41.2	+4 55.1	+0.8551	0.5722	0.2333	+74	+4
53 B. Aquarii	6.5	4.47	17.0	13 32.8	16 48.5	+5 2.2	-1.0560	0.5721	0.2335	-22	-90
18 Aquarii	5.5	+4.46	+17.8	-13 14.1	20 14.4	+8 20.4	-0.5542	0.5697	+0.2383	+9	-78
37 B. Capricorni	6.2	4.39	19.1	10 57.0	13 2 44.2	-9 24.0	-1.2317	0.5652	0.2465	-35	-90
λ Capricorni	5.5	4.40	19.6	11 44.9	5 45.5	-6 29.3	+0.3059	0.5631	0.2499	+55	-26
96 B. Aquarii	6.5	4.36	20.2	10 42.1	8 49.0	-3 32.4	+0.0416	0.5611	0.2529	-42	-40
θ Aquarii	4.3	4.28	21.7	8 11.8	19 0.5	+6 17.5	+0.1840	0.5548	0.2612	+50	-32
ρ Aquarii	5.3	+4.27	+22.0	-8 14.2	20 30.3	+7 44.2	+0.6169	0.5540	+0.2621	+78	-10
70 B. Aquarii	6.0	4.26	22.2	7 36.8	21 59.7	+9 10.5	+0.3889	0.5532	0.2630	+63	-22
86 B. Aquarii	6.1	4.24	22.5	6 58.7	14 1 27.9	-11 28.6	+0.6746	0.5512	0.2648	+82	-7
κ Aquarii	5.2	4.18	22.7	4 39.3	4 23.3	-8 39.2	-0.8604	0.5497	0.2660	-5	-90
207 B. Aquarii	6.3	4.16	22.8	3 59.1	5 45.7	-7 19.6	-1.1625	0.5490	0.2664	-25	-90
6 G. Piscium	6.2	+4.11	+23.6	-2 50.3	13 42.8	+0 21.4	-0.1816	0.5452	+0.2683	+32	-52
22 B. Piscium	6.4	4.02	24.3	-0 9.8	15 1 23.2	+11 38.4	+0.2689	0.5408	0.2680	+57	-28
κ Piscium	4.9	4.01	24.2	+0 48.1	2 58.3	-10 49.6	-0.2785	0.5403	0.2677	+28	-58
9 Piscium	6.4	4.01	24.3	0 40.1	3 7.1	-10 41.1	-0.1034	0.5402	0.2676	+37	-48
16 Piscium	5.7	3.97	24.4	1 38.6	7 23.8	-6 32.9	+0.0560	0.5390	0.2664	+45	-39
λ Piscium	4.6	+3.96	+24.5	+1 19.5	10 3.0	-3 58.9	+1.0842	0.5382	+0.2655	+90	+18
19 Piscium	5.4	3.94	24.4	3 1.7	12 5.2	-2 0.7	-0.0985	0.5377	0.2647	+37	-47
22 Piscium	5.8	3.93	24.7	2 28.2	14 42.4	+0 31.4	+1.1587	0.5371	0.2634	+90	+24
36 Piscium	6.2	3.84	23.9	7 46.8	16 2 19.8	+11 46.1	-1.2243	0.5352	0.2562	-30	-82
d Piscium	5.4	3.83	24.0	7 43.8	4 14.3	-10 23.1	-0.6866	0.5350	0.2547	+6	-82
136 B. Piscium	6.5	+3.77	+23.7	+8 54.2	14 0.8	-0 55.6	+0.5576	0.5344	+0.2460	+77	-11
75 Piscium	6.3	3.71	22.6	12 30.7	17 2 1.4	+10 41.6	-0.2957	0.5345	0.2327	+26	-54
η Piscium	3.7	3.65	21.5	14 55.2	13 47.2	-1 55.4	-0.1573	0.5356	0.2172	+34	-45
101 Piscium	6.2	3.63	21.6	14 14.3	15 48.9	+0 2.3	+0.9933	0.5358	0.2142	+90	+18
105 Piscium	6.1	3.63	21.0	15 59.2	17 38.2	+1 48.0	-0.4504	0.5361	0.2116	+18	-61
3 Arietis	6.4	+3.62	+20.5	+16 59.9	20 52.6	+4 56.0	-0.8375	0.5366	+0.2066	-4	-73

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

AUGUST.

THE STAR'S					AT CONJUNCTION IN R. A.					Long. m s
Name.	Mag.	Red'ns from 1916.0.		Apparent Declina- tion.	Greenwich Mean Time.	Hour Angle, H	Y	z	y	N
		$\Delta\alpha$	$\Delta\delta$							
4 Arietis	5.8	+3.62	+20.6	+16 32.6	d h m 17 21 37.6	h m + 5 39.6	-0.2048	0.5366	+0.2055	-34.4
1 Arietis	5.1	3.59	20.1	17 24.8	18 1 55.0	+ 9 48.6	-0.2548	0.5374	0.1997	-24.4
35 B. Arietis	6.4	3.58	19.8	17 51.3	4 53.2	-11 19.1	-0.1389	0.5379	0.1938	-34.4
47 B. Arietis	6.5	3.56	19.7	17 38.1	6 46.8	- 9 29.2	+0.4583	0.5382	0.1907	-7.3
15 Arietis	5.9	3.57	19.1	19 6.6	8 5.7	- 8 12.9	-0.8533	0.5384	0.1884	-34.4
0 Arietis	5.6	+3.55	+18.7	+19 31.1	11 35.0	- 4 50.5	-0.6413	0.5391	+0.1824	-1.4
26 Arietis	6.2	3.51	18.2	19 29.3	17 22.7	+ 0 45.7	+0.4171	0.5402	0.1719	-6.4
v Arietis	5.4	3.51	17.2	21 36.2	21 8.1	+ 4 23.6	-1.2064	0.5410	0.1649	-34.4
μ Arietis	5.7	3.48	17.7	19 39.6	22 47.4	+ 5 59.5	+1.1402	0.5414	0.1619	-9.4
e Arietis (mean)	4.6	3.44	16.5	21 0.6	19 6 30.6	-10 32.9	+0.8894	0.5429	0.1466	-40.4
64 Arietis	5.8	+3.40	+14.0	+24 25.9	17 54.0	+ 0 27.5	-1.2578	0.5451	+0.1230	-4.4
66 Arietis	6.1	3.36	14.4	22 31.2	19 48.2	+ 2 17.9	+1.0379	0.5454	0.1190	-34.4
7 Tauri	5.9	3.37	13.6	24 11.2	22 29.9	+ 4 54.1	-0.4530	0.5459	0.1132	-11.4
11 Tauri	6.1	3.36	13.0	25 3.7	20 1 20.8	+ 7 39.2	-1.0883	0.5463	0.1069	-2.4
16 Tauri	5.4	3.33	13.1	24 1.8	3 10.9	+ 9 25.5	+0.2236	0.5467	0.1029	-34.4
17 Tauri	3.8	+3.32	+13.1	+23 51.2	3 13.0	+ 9 27.6	+0.4180	0.5467	+0.1028	-1.4
18 Tauri	5.6	3.34	12.9	24 34.8	3 20.2	+ 9 34.5	-0.3580	0.5467	0.1026	-2.4
q Tauri	4.3	3.33	13.0	24 12.5	3 21.7	+ 9 36.0	-0.0482	0.5467	0.1025	-6.4
20 Tauri	4.1	3.33	13.0	24 6.6	3 38.6	+ 9 52.3	+0.1839	0.5467	0.1019	-3.4
21 Tauri	5.8	3.33	12.9	24 17.8	3 40.6	+ 9 54.2	-0.0156	0.5467	0.1018	-6.4
22 Tauri	6.5	+3.33	+12.9	+24 16.2	3 44.4	+ 9 57.9	+0.0196	0.5468	+0.1016	-9.4
23 Tauri	4.3	3.32	13.1	23 41.5	3 52.5	+10 5.7	+0.6616	0.5468	0.1013	-90.4
7 Tauri	3.0	3.32	13.0	23 51.0	4 23.7	+10 35.9	+0.5419	0.5468	0.1002	-90.4
27 Tauri	3.7	3.31	12.9	23 48.1	5 9.1	+11 19.7	+0.6704	0.5470	0.0985	-90.4
28 Tauri	5.2	3.31	12.9	23 53.1	5 9.7	+11 20.3	+0.5808	0.5470	0.0985	-84.4
14 H. Tauri	5.3	+3.33	+12.3	+25 19.8	5 38.9	+11 48.5	-0.9416	0.5470	+0.0974	-14.4
36 Tauri	5.6	3.25	12.1	23 52.7	11 59.7	- 6 3.7	+1.2102	0.5478	0.0831	-5.4
p Tauri	5.6	3.27	10.8	26 15.9	14 52.0	- 3 17.4	-1.1616	0.5481	0.0765	-34.4
χ Tauri	5.3	3.22	10.4	25 26.1	20 9.2	+ 1 49.0	+0.1164	0.5486	+0.0643	-49.4
112 B. Aurigæ	5.7	2.95	5.3	26 52.4	22 5 37.1	+10 7.9	-0.6270	0.5473	-0.0143	-6.4
125 Tauri	5.1	+2.92	+ 5.4	+25 51.2	6 48.5	+11 16.8	+0.4822	0.5472	-0.0171	-75.4
139 Tauri	4.7	2.85	4.3	25 56.7	15 5.3	- 4 43.2	+0.1585	0.5456	0.0363	-52.4
52 B. Geminorum	6.5	2.66	2.1	24 39.7	23 9 14.2	+11 10.8	+0.5514	0.5409	0.0768	-81.4
e Geminorum	3.2	2.65	1.5	25 12.9	12 14.3	- 8 16.7	-0.3028	0.5400	0.0633	-25.4
87 B. Geminorum	5.8	2.59	1.5	23 42.1	16 2.2	- 4 36.3	+1.0445	0.5387	0.0913	-90.4
37 Geminorum	5.7	+2.61	+ 0.7	+25 28.9	17 33.4	- 3 8.1	-1.0709	0.5382	-0.0944	-24.4
ω Geminorum	5.2	2.56	+ 0.6	24 20.2	20 55.0	+ 0 6.9	-0.1289	0.5370	0.1013	-34.4
48 Geminorum	5.8	2.52	- 0.1	24 16.2	21 1 39.8	+ 4 42.4	-0.5594	0.5352	0.1109	-11.4
58 Geminorum	6.0	2.46	0.4	23 6.5	6 56.5	+ 9 48.8	+0.1177	0.5332	0.1213	-49.4
B. D.+23° 1744	6.4	2.42	1.0	23 4.0	11 26.8	- 9 49.4	-0.4031	0.5315	0.1298	-20.4
187 B. Geminorum	6.3	+2.40	- 1.5	+23 12.8	15 22.7	- 6 1.1	-1.0898	0.5300	-0.1370	-24.4
192 B. Geminorum	6.3	2.38	1.5	22 35.9	16 33.1	- 4 52.9	-0.5689	0.5294	0.1392	-10.4
SATURN	0.4	...	...	20 59.8	22 11.3	+ 0 34.6	+0.3942	0.5222	0.1484	-6.4
85 Geminorum	5.2	2.30	1.7	20 6.4	22 35.9	+ 0 58.5	+1.3212	0.5270	0.1498	-66.4
217 B. Geminorum	6.3	2.28	2.0	20 2.8	25 1 7.4	+ 3 25.4	+1.0029	0.5260	0.1541	-90.4
d ¹ Cancri	5.9	+2.18	- 3.1	+18 36.1	12 22.4	+ 9 40.6	+0.7658	0.5215	-0.1723	-90.4
NEPTUNE	7.8	...	...	19 8.2	14 36.9	- 7 30.1	-0.2164	0.5192	0.1753	-30.4
0 Cancri	5.5	2.15	3.6	18 22.7	16 31.3	- 5 39.1	+0.2856	0.5199	0.1785	-59.4
5 Cancri	4.2	2.12	4.5	18 27.8	23 10.0	+ 0 47.6	-1.0254	0.5174	0.1879	-17.4
X Cancri (var.)	6.2	2.08	4.7	+17 33.0	26 4 39.7	+ 6 7.4	-1.0689	0.5154	0.1952	-20.4
NEW MOON.										
78 B. Virginis	6.5	+1.85	-13.1	- 5 15.3	30 14 36.8	-10 57.4	-1.0618	0.5117	-0.2449	-23.4
q Virginis	5.3	1.90	14.2	8 59.6	31 0 41.3	- 1 10.9	+0.4978	0.5158	0.2400	-69.4
370 B. Virginis	6.0	+1.97	-15.0	-11 11.8	11 5.1	+ 8 54.2	+0.3890	0.5210	-0.2329	-61.4

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

SEPTEMBER.

THE STAR'S					AT CONJUNCTION IN R. A.					Limiting Parallels.	
Name.	Mag.	Red'n's from 1916.0.		Apparent Declination.	Greenwich Mean Time.	Hour Angle, H	Y	x'	y'	N.	S.
		$\Delta\alpha$	$\Delta\delta$								
		s	"	° ' "	d h m	h m				° ' "	° ' "
69 Virginis	4.9	+2.12	-16.3	15 32.6	1 3 21.6	+0 40.6	+1.3262	0.5307	-0.2174	+74	+46
75 Virginis	5.6	2.15	16.2	14 56.1	5 57.7	+3 11.6	+0.1215	0.5324	0.2144	+43	-36
83 Virginis	5.6	2.22	16.3	15 45.7	11 29.1	+8 32.3	-0.1719	0.5362	0.2076	+27	-52
85 Virginis	6.1	2.22	16.2	15 21.0	12 0.2	+9 2.4	-0.7131	0.5366	0.2069	-2	-90
87 Virginis	5.8	2.24	16.8	17 26.7	12 50.9	+9 51.4	+1.3209	0.5371	0.2058	+73	+47
43 H. Virginis	5.5	+2.40	-16.6	17 48.8	2 1 46.5	+1 38.8	-0.8334	0.5466	-0.1867	-12	-90
231 G. Virginis	6.4	2.42	16.6	18 12.0	2 31.3	-0 55.6	-0.5675	0.5472	0.1856	+4	-80
236 G. Virginis	5.7	2.43	16.7	18 19.9	3 14.1	-0 14.2	-0.5611	0.5478	0.1844	+4	-79
9 G. Libræ	6.5	2.55	16.9	20 4.6	10 27.8	+6 44.4	-0.0232	0.5533	0.1719	+30	-43
17 G. Libræ	6.4	2.63	17.0	20 49.5	15 26.2	+11 32.4	-0.0734	0.5572	0.1626	+26	-46
18 G. Libræ	6.1	+2.64	-16.9	20 58.7	15 53.4	+11 58.7	+0.0125	0.5575	-0.1618	+30	-42
43 B. Libræ	5.7	2.76	17.8	21 2.6	20 16.6	+7 47.5	-0.6100	0.5609	0.1530	-3	-85
47 G. Libræ	6.1	2.78	16.6	21 42.6	3 0 9.4	+4 3.1	-0.4931	0.5640	0.1450	+2	-75
64 G. Libræ	5.8	2.86	16.2	22 5.6	4 21.5	-0 0.3	-0.6840	0.5671	0.1358	-9	-90
153 B. Libræ	6.3	3.01	16.2	24 12.6	11 19.3	+6 42.1	-0.6168	0.5723	0.1198	+61	-7
169 B. Libræ	6.0	+3.02	-15.6	22 52.1	13 15.4	+8 33.8	-0.9973	0.5737	-0.1152	-31	-90
177 B. Libræ	6.2	3.03	15.5	22 52.8	13 53.7	+9 10.6	-1.0572	0.5742	0.1136	-35	-90
42 Libræ	5.0	3.05	15.7	23 33.0	14 15.9	+9 31.9	-0.4071	0.5744	0.1128	+3	-68
b Scorpïi	4.7	3.16	15.8	25 30.1	18 36.2	-10 17.6	+1.1400	0.5775	0.1020	+64	+31
A Scorpïi	4.6	3.18	15.5	25 4.9	19 40.6	+9 15.7	+0.5986	0.5782	0.0993	+58	-8
31 B. Scorpïi	5.4	+3.17	-15.2	24 17.3	19 48.1	-9 8.4	-0.2316	0.5783	-0.0990	+12	-56
32 B. Scorpïi	5.3	3.16	15.0	23 44.0	19 49.4	-9 7.2	-0.8060	0.5783	0.0989	-20	-90
3 Scorpïi	5.9	3.18	15.4	25 0.0	20 6.0	-8 51.3	+0.4726	0.5785	0.0982	+50	-16
40 B. Scorpïi	5.4	3.21	15.0	24 35.6	21 41.3	-7 19.5	-0.0984	0.5795	0.0941	+17	-48
π Scorpïi	3.0	3.23	15.5	25 52.7	21 46.8	-7 14.3	+1.2147	0.5796	0.0940	+64	+41
48 B. Scorpïi	4.9	+3.26	-15.2	25 38.2	23 35.5	+5 29.8	+0.7996	0.5807	-0.0892	+64	+4
50 B. Scorpïi	6.4	3.25	14.7	24 30.0	23 50.0	+5 15.9	-0.3913	0.5809	0.0886	+2	-67
24 G. Scorpïi	6.2	3.27	14.4	24 14.5	4 1 25.2	-3 44.4	-0.7930	0.5819	0.0844	-21	-90
65 B. Scorpïi	5.5	3.31	15.0	26 6.4	1 29.6	-3 40.2	+1.1175	0.5820	0.0842	+64	+29
41 G. Scorpïi	6.3	3.31	14.0	24 12.7	3 46.1	-1 29.0	-1.0139	0.5834	0.0781	-35	-90
85 B. Scorpïi	6.0	+3.34	-14.3	25 16.1	4 12.3	-1 3.8	+0.0375	0.5836	-0.0770	+23	-40
σ Scorpïi	3.1	3.39	14.0	25 23.8	6 41.9	+1 20.0	-0.0150	0.5850	0.0702	+20	-43
α Scorpïi	1.2	3.47	13.7	26 15.0	9 55.6	+4 25.9	+0.6482	0.5868	0.0613	+59	-5
22 Scorpïi	4.8	3.45	13.2	24 56.1	10 15.6	+4 45.2	-0.7198	0.5870	0.0603	-18	-90
116 B. Scorpïi	6.2	3.49	13.6	26 21.6	10 42.0	+5 10.6	+0.7131	0.5872	0.0591	+63	-1
88 B. Ophiuchi	6.3	+3.67	-11.0	24 58.1	21 50.3	-8 7.9	-1.1882	0.5923	-0.0271	-54	-89
118 B. Ophiuchi	6.2	3.76	10.9	26 24.2	5 0 29.1	-5 35.5	+0.2129	0.5933	0.0193	+27	-30
137 B. Ophiuchi	6.3	3.76	10.5	25 9.3	2 33.5	-3 36.2	-1.0912	0.5939	0.0131	+77	-90
36 Ophi. (1st star)	5.4	3.79	11.0	26 29.0	3 45.2	-2 27.4	+0.2471	0.5943	-0.0096	+28	-28
136 G. Ophiuchi	6.3	3.89	9.0	25 52.3	8 10.5	+1 47.0	-0.3871	0.5954	+0.0036	-5	-67
151 G. Ophiuchi	6.0	+3.93	-8.7	26 12.5	10 0.5	+3 32.5	-0.0340	0.5958	+0.0092	+13	-44
4 G. Sagittarii	6.2	4.06	7.5	26 56.9	16 22.2	+9 38.6	+0.8339	0.5968	0.0284	+63	+7
63 Ophiuchi	6.1	4.04	6.1	24 52.4	18 51.1	-11 58.6	-1.1854	0.5970	0.0359	-54	-89
67 B. Sagittarii	6.4	4.21	4.1	25 38.3	6 3 53.6	-3 18.4	+0.0365	0.5969	0.0631	+22	-40
70 B. Sagittarii	6.4	4.20	3.5	24 57.3	4 58.9	-2 15.7	-0.5817	0.5968	0.0663	-10	-84
λ Sagittarii	2.9	+4.26	-3.2	25 28.2	7 26.1	+0 5.4	+0.1088	0.5965	+0.0735	+26	-36
24 Sagittarii	5.7	4.24	2.0	24 5.8	9 42.8	+2 16.6	-1.0980	0.5962	0.0802	-42	-90
26 Sagittarii	6.1	4.28	1.1	23 54.8	12 45.7	+5 12.0	-1.0235	0.5956	0.0891	-35	-90
126 B. Sagittarii	5.7	4.34	-1.2	25 5.8	13 52.9	+6 16.5	+0.2678	0.5953	0.0923	+36	-27
154 B. Sagittarii	5.9	4.33	+0.6	23 16.9	18 12.1	+10 25.1	-1.1284	0.5943	0.1047	-42	-90
162 B. Sagittarii	6.4	+4.40	+0.3	24 59.4	19 4.4	+11 15.2	+0.6776	0.5940	+0.1071	+63	-4
127 G. Sagittarii	6.4	4.42	0.5	25 3.6	19 52.2	-11 58.8	+0.8337	0.5938	0.1093	+65	+6
172 B. Sagittarii	5.8	4.42	0.6	24 57.8	20 39.9	-11 13.1	+0.8247	0.5935	0.1116	+66	+6
189 B. Sagittarii	6.1	4.44	1.4	24 47.3	22 53.9	-9 4.5	+0.9055	0.5928	0.1177	+65	+11
191 B. Sagittarii	6.5	4.40	1.9	23 19.4	23 6.7	-8 52.2	-0.5379	0.5927	0.1183	-3	-79
208 B. Sagittarii	6.1	+4.47	+2.3	24 19.4	7 1 44.0	-6 21.3	+0.7826	0.5918	+0.1254	+66	+2

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

SEPTEMBER.

THE STAR'S					AT CONJUNCTION IN R. A.							Limit mag. in alt.
Name.	Mag.	Red'ns from 1916.0.		Apparent Declination.	Greenwich Mean Time.	Hour Angle, H	Y	x'	y'	N.S.	Limit mag. in alt.	
		$\Delta\alpha$	$\Delta\delta$									
		s	"	'	d	h	m					
222 B. Sagittarii	5.5	+4.42	+3.5	-22 33.5	7	3	44.3	4 25.9	-0.7259	0.5911	+0.1309	-12.4
49 Sagittarii	5.5	4.50	3.5	24 7.6		5	36.7	2 38.0	+1.0923	0.5903	0.1358	-68.2
50 Sagittarii	5.5	4.43	4.3	21 56.6		5	57.7	2 17.8	-1.0445	0.5901	0.1367	-32.8
253 B. Sagittarii	6.1	4.43	4.9	21 29.2		7	45.6	0 34.2	-1.2500	0.5894	0.1414	-51.4
σ Capricorni	5.5	4.54	10.6	19 22.7	8	3	5.6	5 59.6	-0.1606	0.5798	0.1871	-23.4
π Capricorni	5.2	+4.53	+11.7	-18 29.1		6	19.7	2 53.0	-0.4347	0.5780	+0.1938	-10.4
ρ Capricorni	5.0	4.52	11.9	18 5.3		6	57.8	2 16.3	-0.7052	0.5776	0.1951	-5.8
ν Capricorni	5.6	4.55	11.8	18 51.5		7	22.6	1 52.5	+0.1421	0.5773	0.1969	-40.4
υ Capricorni	5.3	4.56	13.0	18 25.9		11	33.2	2 8.7	+0.5521	0.5750	0.2041	-64.2
81 B. Capricorni	6.4	4.58	13.9	18 20.6		15	24.1	5 50.8	+1.2628	0.5727	0.2112	-72.8
94 B. Capricorni	5.7	+4.54	+15.2	-16 21.1		18	54.0	9 12.9	+0.0311	0.5708	+0.2173	-37.4
29 Capricorni	5.5	4.55	17.0	15 31.0	9	2	32.2	7 25.8	+0.9078	0.5664	0.2294	-74.1
53 B. Aquarii	6.5	4.50	17.4	13 32.8		2	39.6	7 18.7	-1.0230	0.5663	0.2296	-20.8
18 Aquarii	5.5	4.51	18.2	13 14.1		6	9.7	3 56.2	-0.5210	0.5644	0.2345	-10.5
137 B. Capricorni	6.2	4.47	19.9	10 57.0		12	46.4	2 26.3	-1.2143	0.5608	0.2430	-33.8
λ Capricorni	5.5	+4.50	+20.4	-11 44.9		15	50.6	5 23.9	+0.3314	0.5592	+0.2464	-57.5
96 B. Aquarii	6.5	4.48	21.1	10 42.1		18	56.8	8 23.5	+0.0598	0.5576	0.2497	-42.3
θ Aquarii	4.3	4.45	23.1	8 11.7	10	5	15.3	5 39.6	+0.1852	0.5528	0.2585	-51.2
ρ Aquarii	5.3	4.45	23.3	8 14.2		6	45.9	4 12.2	+0.6178	0.5521	0.2595	-78.9
170 B. Aquarii	6.0	4.44	23.6	7 36.8		8	16.0	2 45.1	+0.3859	0.5516	0.2605	-63.2
186 B. Aquarii	6.1	+4.44	+24.1	-6 58.7		11	45.7	0 37.3	+0.6664	0.5501	+0.2625	-82.1
κ Aquarii	5.2	4.40	24.6	4 39.3		14	42.1	3 27.7	-0.8801	0.5490	0.2639	-6.8
207 B. Aquarii	6.3	4.39	25.0	3 59.1		16	5.0	4 47.7	-1.1855	0.5485	0.2645	-27.8
6 G. Piscium	6.2	4.38	25.9	2 50.3	11	0	3.2	-11 30.1	-0.2150	0.5459	0.2669	-32.4
22 B. Piscium	6.4	4.35	27.1	0 9.7		11	42.5	0 14.2	+0.2150	0.5429	0.2673	-54.1
κ Piscium	4.9	+4.34	+27.1	+0 48.2		13	17.1	1 17.3	-0.3351	0.5426	+0.2671	-25.5
9 Piscium	6.4	4.34	27.2	0 40.1		13	26.0	1 25.9	-0.1604	0.5426	0.2671	-34.5
16 Piscium	5.7	4.33	27.5	1 38.6		17	41.2	5 32.6	-0.0086	0.5418	0.2661	-42.4
λ Piscium	4.6	4.33	27.5	1 19.5		20	19.2	8 5.4	+1.0131	0.5414	0.2654	-90.4
19 Piscium	5.4	4.32	27.6	3 1.7		22	20.5	+10 2.7	-0.1709	0.5412	0.2647	-33.5
22 Piscium	5.8	+4.32	+27.8	+2 28.3	12	0	56.3	-11 26.6	+1.0788	0.5408	+0.2636	-90.1
36 Piscium	6.2	4.30	27.7	7 46.9		12	25.8	0 19.9	-1.3152	0.5401	0.2569	-40.4
d Piscium	5.4	4.30	27.8	7 43.9		14	18.8	1 29.4	-0.7827	0.5401	0.2555	-1.5
136 B. Piscium	6.5	4.28	27.6	8 54.3		23	56.4	+10 48.0	+0.4402	0.5403	0.2472	-68.7
75 Piscium	6.3	4.28	26.9	12 30.8	13	11	44.1	-1 47.6	-0.4245	0.5412	0.2342	-30.4
η Piscium	3.7	+4.28	+25.8	+14 55.2		23	15.8	9 21.1	-0.3016	0.5428	+0.2188	-26.5
101 Piscium	6.2	4.27	25.8	14 14.4	14	1	14.9	+11 16.2	+0.8370	0.5431	0.2159	-90.1
105 Piscium	6.1	4.28	25.4	15 59.2		3	1.9	-11 0.3	-0.5966	0.5434	0.2133	-10.7
3 Arietis	6.4	4.29	24.9	17 0.0		6	12.1	-7 56.5	-0.9838	0.5440	0.2084	-14.7
4 Arietis	5.8	4.28	25.0	16 32.7		6	56.2	-7 13.9	-0.3574	0.5441	0.2072	-23.5
ϵ Arietis	5.1	+4.28	+24.4	+17 24.9		11	8.0	3 10.5	-0.4112	0.5448	+0.2004	-30.5
35 B. Arietis	6.4	4.27	24.0	17 51.4		14	2.2	0 22.1	-0.2994	0.5454	0.1955	-26.5
47 B. Arietis	6.5	4.26	23.9	17 38.2		15	53.4	1 25.3	+0.2905	0.5458	0.1923	-58.3
20 H ¹ . Arietis	6.4	4.26	23.9	16 50.2		16	37.7	2 8.1	+1.2701	0.5459	0.1910	-87.8
15 Arietis	5.9	4.28	23.4	19 6.7		17	10.6	+2 39.8	-1.0101	0.5460	0.1901	-15.7
θ Arietis	5.6	+4.28	+23.0	+19 31.2		20	35.2	+5 57.6	-0.8032	0.5466	+0.1839	-2.7
26 Arietis	6.2	4.26	22.3	19 29.4	15	2	15.2	+11 28.1	+0.2403	0.5478	0.1734	-56.3
μ Arietis	5.7	4.24	21.6	19 39.6		7	32.8	-7 27.3	+0.9523	0.5487	0.1631	-90.2
ϵ Arietis (mean)	4.6	4.23	20.2	21 0.6		15	5.9	0 9.6	+0.6986	0.5501	0.1478	-90.3
66 Arietis	6.1	4.20	17.7	22 31.2	16	4	7.2	-11 35.3	+0.8387	0.5520	0.1198	-90.1
7 Tauri	5.9	+4.22	+16.9	+24 11.3		6	45.7	9 2.3	-0.6397	0.5523	+0.1140	-6.5
11 Tauri	6.1	4.23	16.1	25 3.8		9	33.4	6 20.4	-1.2705	0.5526	0.1076	-50.4
16 Tauri	5.4	4.19	16.1	24 1.8		11	21.4	4 36.2	+0.0288	0.5528	0.1036	-44.2
17 Tauri	3.8	4.19	16.2	23 51.3		11	23.5	4 34.2	+0.2214	0.5528	0.1033	-55.1
18 Tauri	5.6	4.20	15.9	24 34.9		11	30.5	4 27.4	-0.5476	0.5528	0.1032	-11.5
γ Tauri	4.3	+4.20	+16.0	+24 12.6		11	32.0	4 26.0	-0.1451	0.5528	+0.1032	-34.5

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

SEPTEMBER.

THE STAR'S					AT CONJUNCTION IN R. A.					Limiting Par- allels.	
Name.	Mag.	Red'ns from 1916.0.		Apparent Declina- tion.	Greenwich Mean Time.	Hour Angle, <i>H</i>	<i>Y</i>	<i>x'</i>	<i>y'</i>	N.	S.
		$\Delta\alpha$	$\Delta\delta$								
		<i>s</i>	<i>"</i>	<i>'</i>	<i>d h m</i>	<i>h m</i>				<i>'</i>	<i>"</i>
0 Tauri	4.1	+4.19	+16.0	+24 6.6	16 11 48.6	-4 10.0	-0.0108	0.5528	+0.1025	+41	-24
1 Tauri	5.8	4.20	16.0	24 17.9	11 50.6	-4 8.2	-0.2084	0.5528	0.1025	+30	-35
2 Tauri	6.5	4.19	16.0	24 16.3	11 54.3	-4 4.5	-0.1736	0.5528	0.1023	+32	-33
3 Tauri	4.3	4.18	16.1	23 41.5	12 2.2	-3 56.9	+0.4627	0.5528	0.1020	+73	0
7 Tauri	3.0	4.18	16.0	23 51.0	12 32.8	-3 27.3	+0.3438	0.5529	0.1009	+63	-6
4 B. Tauri	5.5	+4.16	+16.1	+23 10.1	12 56.3	-3 4.6	+1.1172	0.5529	+0.1000	+90	+41
7 Tauri	3.7	4.18	15.9	23 48.1	13 17.4	-2 44.2	+0.4709	0.5529	0.0992	+73	0
8 Tauri	5.2	4.18	15.8	23 53.1	13 18.0	-2 43.7	+0.3820	0.5529	0.0991	+66	-4
4 H. Tauri	5.3	4.21	15.2	25 19.9	13 46.7	-2 15.9	-1.1270	0.5530	0.0980	-30	-65
6 Tauri	5.6	4.13	14.7	23 52.8	20 0.8	+3 45.1	+1.0040	0.5533	0.0836	+90	+34
χ Tauri	5.3	+4.12	+12.7	+25 26.1	17 4 2.3	+11 29.8	-0.0824	0.5535	+0.0647	+37	-25
ϵ Tauri	5.6	3.97	9.8	24 55.5	19 46.7	+2 41.1	+1.1999	0.5525	+0.0271	+87	+55
18 Tauri	5.4	3.85	7.1	25 5.1	18 9 37.3	+7 57.0	+1.1752	0.5502	-0.0060	+90	+54
12 B. Aurigæ	5.7	3.86	5.8	26 52.5	13 6.7	-4 34.9	-0.8227	0.5495	0.0142	-6	-63
25 Tauri	5.1	3.82	6.0	25 51.2	14 17.5	-3 26.5	+0.2807	0.5492	0.0170	+59	-1
39 Tauri	4.7	+3.74	+4.3	+25 56.7	22 31.0	+4 30.2	-0.0396	0.5470	-0.0361	+40	-20
52 B. Geminorum	6.5	3.51	1.4	24 39.7	19 16 35.3	-2 2.2	+0.3580	0.5410	0.0763	+65	-3
ϵ Geminorum	3.2	3.50	0.6	25 12.9	19 35.0	+0 51.6	-0.4918	0.5399	0.0827	+14	-50
87 B. Geminorum	5.8	3.41	+0.4	23 42.1	23 22.5	+4 31.5	+0.8531	0.5384	0.0906	+90	+23
37 Geminorum	5.7	3.44	-0.4	25 28.9	20 0 53.6	+5 59.7	-1.2549	0.5378	0.0937	-47	-65
ω Geminorum	5.2	+3.38	-0.6	+24 20.2	4 15.0	+9 14.5	-0.3140	0.5365	-0.1005	+24	-41
44 Geminorum	5.9	3.32	0.3	22 45.8	5 38.5	+10 35.3	+1.2834	0.5360	0.1034	+74	+60
48 Geminorum	5.8	3.32	1.4	24 16.2	8 59.6	-10 10.1	-0.7406	0.5346	0.1100	0	-66
δ Geminorum	3.5	3.23	1.3	22 8.3	12 41.4	-6 35.5	+1.1997	0.5330	0.1172	+90	+47
58 Geminorum	6.0	3.23	2.0	23 6.4	14 16.4	-5 3.6	-0.0616	0.5324	0.1202	+37	-29
49 B. Geminorum	6.4	+3.17	-1.7	+21 42.2	15 55.6	-3 27.5	+1.2906	0.5317	-0.1234	+75	+59
B. D.+23° 1744	6.4	3.18	2.6	23 4.0	18 46.9	-0 41.7	-0.5780	0.5305	0.1286	+10	-60
87 B. Geminorum	6.3	3.15	3.3	23 12.8	22 42.9	+3 6.8	-1.2603	0.5288	0.1358	-44	-67
92 B. Geminorum	6.3	3.12	3.3	23 35.9	23 53.4	+4 15.1	-0.7395	0.5283	0.1379	0	-67
85 Geminorum	5.2	3.00	3.5	20 6.3	21 5 56.7	+10 7.0	+1.1522	0.5258	0.1485	+90	+38
17 B. Geminorum	6.3	+2.97	-3.9	+20 2.8	8 28.4	-11 26.1	+0.8370	0.5248	-0.1527	+90	+15
SATURN	0.5	...	...	20 30.3	11 15.5	-8 44.2	-0.1027	0.5199	0.1566	+36	-36
α^1 NEPTUNE	5.9	2.82	5.1	18 36.1	19 44.4	-0 30.8	+0.6121	0.5203	0.1706	+85	0
θ CANCRI	7.8	...	...	18 57.1	23 38.2	+3 15.9	-0.4510	0.5177	0.1761	+18	-58
δ CANCRI	5.5	2.78	5.6	18 22.6	23 53.8	+3 30.9	+0.1376	0.5186	0.1768	+50	-25
δ CANCRI	4.2	+2.72	-6.7	+18 27.7	22 6 33.0	+9 58.2	-1.1632	0.5163	-0.1861	-28	-72
54 CANCRI	6.3	2.63	6.1	15 39.7	9 50.5	-10 50.2	+1.3090	0.5150	0.1905	+82	+50
χ CANCRI (var.)	6.2	2.65	7.0	17 33.0	12 3.1	-8 41.5	-1.1994	0.5144	0.1934	-31	-72
α^1 CANCRI	5.1	2.61	6.6	15 38.6	13 2.1	-7 44.3	+0.7123	0.5141	0.1947	+90	+2
α^2 CANCRI	5.7	2.61	6.7	15 54.2	13 12.4	-7 34.2	+0.3934	0.5140	0.1949	+66	-15
VENUS	-3.9	...	...	+15 17.4	19 40.8	-1 17.4	-0.2198	0.4666	-0.1937	+31	-48
81 CANCRI	6.4	+2.51	-7.3	+15 20.0	20 52.0	-0 8.2	-0.5077	0.5117	0.2042	+15	-65
π CANCRI	5.6	2.52	7.7	15 17.3	22 22.5	+1 19.7	-0.7676	0.5113	0.2059	0	-75
ξ LEONIS	5.1	2.39	7.9	11 40.2	23 7 10.9	+9 52.6	+1.3555	0.5091	0.2154	+77	+53
18 LEONIS	5.8	2.35	8.8	12 11.7	14 48.3	-6 43.2	-0.8912	0.5075	0.2227	-6	-78
19 LEONIS	6.4	+2.34	-8.8	+11 57.3	15 21.7	-6 10.8	-0.7519	0.5075	-0.2232	+2	-78
R LEONIS (var.)	5-10	2.34	8.8	11 49.0	15 25.6	-6 6.9	-0.6151	0.5074	0.2232	+9	-75
83 B. LEONIS	5.9	2.27	8.7	9 19.8	20 10.2	-1 30.5	+1.0412	0.5067	0.2273	+90	+18
43 LEONIS	6.3	2.16	9.8	6 58.0	24 10 22.6	-11 42.4	+0.3145	0.5054	0.2374	+60	-24
155 B. LEONIS	6.5	2.13	9.6	+6 7.1	10 31.2	-11 34.1	+1.2056	0.5053	0.2375	+90	+30
NEW MOON.											
43 H. VIRGINIS	5.5	+2.18	-14.8	-17 48.8	29 7 26.5	+5 48.6	-0.6607	0.5522	-0.1871	-2	-90
231 G. VIRGINIS	6.4	2.19	14.8	18 12.0	8 10.8	+6 31.3	-0.3951	0.5527	0.1859	+12	-66
236 G. VIRGINIS	5.7	+2.19	-14.9	-18 19.9	8 53.0	+7 12.2	-0.3879	0.5532	-0.1847	+13	-66

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

SEPTEMBER.

THE STAR'S					AT CONJUNCTION IN R. A.					Limit- ing Pa- rallels	
Name.	Mag.	Red'ns from 1916.0.		Apparent Declina- tion.	Greenwich Mean Time.	Hour Angle, H	Y	τ	γ	N. S.	
		$\Delta\alpha$	$\Delta\delta$								
		s	"								
9 G. Libræ	6.5	+2.28	-15.0	-20 4.5	29 16 0.9	9 55.0	+0.1567	0.5585	-0.1720	+39-33	
17 G. Libræ	6.4	2.34	15.0	20 49.5	20 55.9	5 10.5	+0.1127	0.5620	0.1626	-36-35	
18 G. Libræ	6.1	2.34	15.0	20 58.6	21 22.7	4 44.6	+0.1988	0.5623	0.1617	-40-31	
43 B. Libræ	5.7	2.46	16.1	21 2.6	30 1 43.2	0 33.5	-0.4168	0.5654	0.1529	+ 7-6	
47 G. Libræ	6.1	2.46	14.7	21 42.6	5 33.8	3 8.7	-0.2965	0.5681	0.1448	-13-60	
64 G. Libræ	5.8	+2.51	-14.4	-22 5.6	9 43.8	+ 7 9.4	-0.4831	0.5710	-0.1355	+ 2-74	
153 B. Libræ	6.3	2.63	14.4	24 12.5	16 38.9	-10 11.0	+0.8214	0.5755	0.1194	+66+ 5	
169 B. Libræ	6.0	2.64	13.9	22 52.0	18 34.3	- 8 19.9	-0.7889	0.5767	0.1147	-17-90	
177 B. Libræ	6.2	2.65	13.9	22 52.8	19 12.5	- 7 43.2	-0.8482	0.5771	0.1132	-21-90	
42 Libræ	5.0	+2.67	-14.0	-23 33.0	19 34.6	- 7 22.0	-0.1986	0.5773	-0.1123	+14-54	

OCTOBER.

A Scorpïi	4.6	+2.77	-13.8	-25 4.9	1 0 58.0	- 2 10.9	+0.8105	0.5804	-0.0988	+65- 5
31 B. Scorpïi	5.4	+2.76	-13.6	-24 17.3	1 5.6	- 2 3.6	-0.0193	0.5805	-0.0984	-22-40
32 B. Scorpïi	5.3	2.75	13.4	23 43.9	1 6.8	- 2 2.4	-0.5935	0.5805	0.0984	- 8-8
3 Scorpïi	5.9	2.77	13.8	25 0.0	1 23.4	1 46.6	+0.6849	0.5807	0.0977	-63- 7
40 B. Scorpïi	5.4	2.79	13.5	24 35.6	2 58.5	0 15.1	+0.1152	0.5816	0.0936	-29-35
48 B. Scorpïi	4.9	2.84	13.6	25 38.1	4 52.6	+ 1 34.5	+1.0146	0.5826	0.0886	-64-30
50 B. Scorpïi	6.4	+2.83	-13.2	-24 30.0	5 7.0	+ 1 48.4	-0.1764	0.5827	-0.0880	+13-55
24 G. Scorpïi	6.2	2.85	13.0	24 14.5	6 42.1	+ 3 19.8	-0.5772	0.5835	0.0638	- 8-8
41 G. Scorpïi	6.3	2.88	12.6	24 12.7	9 3.1	+ 5 35.3	-0.7972	0.5846	0.0775	-21-90
85 B. Scorpïi	6.0	2.91	12.8	25 16.1	9 29.2	+ 6 0.5	-0.2553	0.5849	0.0763	-35- 7
19 Scorpïi	4.9	2.92	12.2	23 58.3	11 47.0	+ 8 12.8	-1.2454	0.5859	0.0701	-58-81
σ Scorpïi	3.1	+2.95	-12.6	-25 23.7	11 59.0	+ 8 24.4	+0.2042	0.5860	-0.0696	+31- 3
α Scorpïi	1.2	3.02	12.4	26 15.0	15 13.0	+11 30.7	+0.8703	0.5873	0.0606	-64-10
22 Scorpïi	4.8	3.00	11.9	24 56.1	15 33.1	+11 50.0	-0.5000	0.5875	0.0597	- 7-7
116 B. Scorpïi	6.2	3.04	12.3	26 21.5	15 59.6	-11 44.6	+0.9359	0.5877	0.0585	-64-14
88 B. Ophiuchi	6.3	3.20	10.1	24 58.1	2 3 11.3	- 0 59.6	-0.9665	0.5912	0.0266	-37-40
26 Ophiuchi	5.8	+3.20	-10.0	-24 51.9	3 15.8	- 0 55.3	-1.0746	0.5912	-0.0264	-45-90
118 B. Ophiuchi	6.2	3.28	10.1	26 24.2	5 51.4	+ 1 34.2	+0.4408	0.5918	0.0189	-41-17
137 B. Ophiuchi	6.3	3.29	9.3	25 9.3	7 56.9	+ 3 34.6	-0.8684	0.5922	0.0128	-32-90
36 Ophi. (1st star)	5.4	3.31	10.4	26 29.0	9 9.2	+ 4 44.0	+0.4761	0.5924	0.0093	-43-15
θ Ophiuchi	3.4	3.34	8.5	24 55.1	11 44.2	+ 7 12.7	-1.1357	0.5928	-0.0017	-51-90
136 G. Ophiuchi	6.3	+3.40	- 8.4	-25 52.3	13 37.3	+ 9 1.2	-0.1603	0.5929	+0.0039	+ 6-55
151 G. Ophiuchi	6.0	3.44	8.2	26 12.5	15 28.7	+10 48.1	+0.1951	0.5931	0.0093	-26-31
4 G. Sagittarii	6.2	3.56	7.1	26 56.9	21 55.5	- 7 0.7	+1.0696	0.5932	0.0283	-63-25
63 Ophiuchi	6.1	3.55	5.9	24 52.4	3 0 26.7	- 4 35.6	-0.9636	0.5931	0.0357	-36-9
67 B. Sagittarii	6.4	3.72	4.1	25 38.3	9 38.6	+ 4 14.0	+0.2668	0.5918	0.0623	-34- 7
70 B. Sagittarii	6.4	+3.72	- 3.6	-24 57.3	10 45.2	+ 5 18.0	-0.3569	0.5916	+0.0655	+ 1-65
λ Sagittarii	2.9	3.77	3.4	25 28.2	13 15.2	+ 7 42.0	+0.3393	0.5910	0.0726	-39-23
24 Sagittarii	5.7	3.77	2.2	24 5.8	15 34.7	+ 9 55.9	-0.8791	0.5904	0.0791	-26-90
117 B. Sagittarii	5.8	3.78	1.6	23 34.7	17 23.4	+11 40.2	-1.2574	0.5899	0.0842	-58-75
26 Sagittarii	6.1	3.81	1.4	23 54.8	18 41.6	-11 4.7	-0.8050	0.5895	0.0878	-21-90
126 B. Sagittarii	5.7	+3.86	- 1.6	-25 5.8	19 50.3	- 9 58.7	+0.4985	0.5891	+0.0910	+51-14
154 B. Sagittarii	5.9	3.87	+ 0.2	23 16.9	4 0 15.5	- 5 44.1	-0.9134	0.5876	0.1030	-26-90
162 B. Sagittarii	6.4	3.94	- 0.2	24 59.4	1 9.0	- 4 52.7	+0.9112	0.5873	0.1054	-65-12
127 G. Sagittarii	6.4	3.96	0.0	25 3.6	1 57.9	- 4 5.7	+1.0687	0.5870	0.1076	-65-24
168 B. Sagittarii	6.3	3.89	+ 0.9	22 48.9	2 28.8	- 3 36.0	-1.1513	0.5867	0.1089	-44-90
172 B. Sagittarii	5.8	+3.96	0.0	-24 57.8	2 46.8	- 3 18.7	+1.0594	0.5866	+0.1097	-65-23
189 B. Sagittarii	6.1	3.99	+ 0.8	24 47.4	5 4.1	- 1 6.9	+1.1405	0.5857	0.1157	-65-31
191 B. Sagittarii	6.5	3.94	1.3	23 19.4	5 17.3	- 0 54.1	-0.3190	0.5856	0.1163	- 8-62
208 B. Sagittarii	6.1	4.02	1.6	24 19.4	7 58.6	+ 1 40.8	+1.0150	0.5845	0.1232	-66-19
222 B. Sagittarii	5.5	3.98	2.8	22 33.5	10 2.0	+ 3 39.3	-0.5119	0.5835	0.1285	- 1-76
50 Sagittarii	5.5	+4.00	+ 3.6	-21 56.6	12 18.9	+ 5 50.9	-0.8355	0.5824	+0.1342	-18-90

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

OCTOBER.

THE STAR'S					AT CONJUNCTION IN R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1916.0.		Apparent Declination.	Greenwich Mean Time.	Hour Angle, H	Y	x'	y'	N.	S.
		$\Delta\alpha$	$\Delta\delta$								
53 B. Sagittarii	6.1	+4.01	+4.2	-21 29.2	d 14 9.8	+7 37.5	-1.0448	0.5816	+0.1387	-32	-90
σ Capricorni	5.5	4.18	9.6	19 22.7	5 10 3.6	+2 46.0	+0.0412	0.5710	0.1830	+34	-40
π Capricorni	5.2	4.18	10.7	18 29.1	13 23.6	+5 58.5	-0.2402	0.5691	0.1895	+20	-56
ρ Capricorni	5.0	4.18	11.0	18 5.3	14 2.8	+6 36.3	-0.5152	0.5688	0.1907	+6	-75
\circ Capricorni	5.6	4.21	10.8	18 51.5	14 28.4	+7 0.9	+0.3433	0.5685	0.1916	+51	-23
47 B. Capricorni	6.2	+4.18	+12.0	-16 48.7	16 52.7	+9 19.9	-1.2563	0.5672	+0.1960	-45	-89
ν Capricorni	5.3	4.24	11.9	18 25.9	18 46.7	+11 9.8	+0.7540	0.5661	0.1995	+72	-1
61 B. Capricorni	5.9	4.18	12.7	16 25.2	19 0.9	+11 23.4	-1.2286	0.5659	0.1999	-41	-90
94 B. Capricorni	5.7	4.25	14.3	16 21.1	6 2 21.3	-5 32.0	+0.2157	0.5618	0.2123	+46	-30
95 B. Capricorni	5.9	4.21	14.8	14 48.2	2 49.0	-5 5.3	-1.2466	0.5616	0.2130	-41	-90
29 Capricorni	5.5	+4.29	+16.1	-15 31.0	10 13.7	+2 3.5	+1.0932	0.5577	+0.2241	+74	+21
53 B. Aquarii	6.5	4.24	16.7	13 32.8	10 21.4	+2 10.9	-0.8652	0.5576	0.2243	-10	-90
18 Aquarii	5.5	4.27	17.6	13 14.1	13 57.9	+5 39.8	-0.3619	0.5558	0.2291	+18	-63
72 B. Aquarii	6.5	4.24	18.3	11 55.7	15 46.0	+7 24.0	-1.2651	0.5549	0.2314	-40	-90
137 B. Capricorni	6.2	4.26	19.4	10 57.0	20 46.6	-11 45.7	-1.0766	0.5525	0.2374	-22	-90
λ Capricorni	5.5	+4.31	+19.8	-11 44.9	23 56.2	-8 42.7	-0.4846	0.5510	+0.2408	+66	16
96 B. Aquarii	6.5	4.30	20.6	10 42.1	7 3 7.9	-5 37.6	+0.2032	0.5497	0.2440	+50	-31
θ Aquarii	4.3	4.33	22.9	8 11.7	13 43.6	+4 36.6	+0.3085	0.5456	0.2529	+58	-26
ρ Aquarii	5.3	4.34	23.1	8 14.2	15 16.6	+6 6.4	+0.7434	0.5450	0.2539	+82	-3
170 B. Aquarii	6.0	4.34	23.5	7 36.8	16 49.1	+7 35.9	+0.5050	0.5445	0.2549	+71	-16
186 B. Aquarii	6.1	+4.35	+24.0	-6 58.7	20 24.2	+11 3.8	+0.7809	0.5434	+0.2570	+83	0
κ Aquarii	5.2	4.32	24.9	4 39.3	23 24.9	-10 1.6	-0.7914	0.5426	0.2585	-1	-90
207 B. Aquarii	6.3	4.32	25.4	3 59.1	8 0 49.8	-8 39.5	-1.1037	0.5422	0.2591	-21	-90
6 G. Piscium	6.2	4.36	26.4	2 50.3	8 58.9	-0 46.5	-0.1409	0.5403	0.2617	+34	-50
22 B. Piscium	6.4	4.39	28.0	0 9.7	20 51.8	+10 43.0	+0.2639	0.5386	0.2626	+57	-28
κ Piscium	4.9	+4.39	+28.2	0 48.2	22 28.1	-11 43.8	-0.2955	0.5385	+0.2625	+26	-58
9 Piscium	6.4	4.39	28.2	0 48.2	22 37.1	-11 35.1	-0.1195	0.5385	0.2625	+36	-48
16 Piscium	5.7	4.40	28.7	1 38.6	9 2 56.4	-7 24.2	+0.0226	0.5382	0.2618	+43	-40
λ Piscium	4.6	4.41	28.7	1 19.5	5 36.8	-4 49.0	+1.0459	0.5381	0.2612	+90	+16
19 Piscium	5.4	4.42	29.1	3 1.7	7 39.9	-2 49.9	-0.1533	0.5381	0.2605	+34	-50
22 Piscium	5.8	+4.44	+29.2	+2 28.3	10 17.7	-0 17.2	+1.0992	0.5381	+0.2596	+90	+20
36 Piscium	6.2	4.47	30.0	7 46.9	21 54.6	+10 57.0	-1.3412	0.5387	0.2536	-44	-81
d Piscium	5.4	4.48	30.0	7 43.9	23 48.5	-11 12.8	-0.8103	0.5389	0.2523	-2	-82
136 B. Piscium	6.5	4.52	29.9	8 54.3	10 9 29.6	-1 50.7	+0.3937	0.5402	0.2446	+65	-19
75 Piscium	6.3	4.59	29.7	12 30.9	21 18.9	+9 35.2	-0.5033	0.5425	0.2323	+15	-67
7 Piscium	3.7	+4.66	+28.8	+14 55.3	11 8 49.5	-3 17.2	-0.4071	0.5452	+0.2174	+20	-59
101 Piscium	6.2	4.66	28.7	14 14.4	10 48.1	-1 22.5	+0.7274	0.5457	0.2146	+90	+2
105 Piscium	6.1	4.69	28.4	15 59.3	12 34.7	+0 20.6	-0.7105	0.5462	0.2120	+4	-74
3 Arietis	6.4	4.71	28.1	17 0.0	15 44.0	+3 23.5	-1.1045	0.5470	0.2072	-23	-73
4 Arietis	5.8	4.71	28.0	16 32.7	16 27.8	+4 5.8	-0.4798	0.5472	0.2061	+16	-62
ϵ Arietis	5.1	+4.73	+27.5	+17 24.9	20 38.0	+8 7.6	-0.5426	0.5483	+0.1994	-12	-65
35 B. Arietis	6.4	4.74	27.1	17 51.5	23 31.1	+10 54.8	-0.4369	0.5491	0.1946	+18	-58
47 B. Arietis	6.5	4.74	27.0	17 38.2	1 21.3	-11 18.8	+0.1482	0.5496	0.1915	+50	-25
20 H. Arietis	6.4	4.74	26.8	16 50.3	2 5.3	-10 36.3	+1.1246	0.5498	0.1902	+90	+31
15 Arietis	5.9	4.78	26.6	19 6.7	2 37.9	-10 4.8	-1.1528	0.5500	0.1893	-28	-71
θ Arietis	5.6	+4.79	+26.2	+19 31.2	6 0.8	-6 48.8	-0.9529	0.5508	+0.1832	-13	-70
26 Arietis	6.2	4.80	25.4	19 29.4	11 37.6	-1 23.6	+0.0772	0.5523	0.1728	+46	-27
μ Arietis	5.7	4.82	24.5	19 39.7	16 51.8	+3 39.8	+0.7768	0.5536	0.1626	+90	+11
47 Arietis	5.8	4.84	23.3	20 20.3	23 49.6	+10 23.0	+1.1476	0.5552	0.1484	+90	+39
ϵ Arietis (mean)	4.6	4.85	23.1	21 0.7	13 0 19.7	+10 52.2	+0.5102	0.5553	0.1474	+76	-2
66 Arietis	6.1	+4.88	+20.4	+22 31.3	13 10.9	-0 43.6	+0.6280	0.5576	+0.1194	+88	+7
7 Tauri	5.9	4.93	19.6	24 11.3	15 47.4	+1 47.3	-0.8473	0.5580	0.1136	-7	-66
16 Tauri	5.4	4.92	18.6	24 1.9	20 19.3	+6 9.6	-0.1888	0.5585	0.1031	+31	-34
17 Tauri	3.8	4.91	18.7	23 51.3	20 21.3	+6 11.5	+0.0029	0.5585	0.1030	+42	-24
18 Tauri	5.6	4.93	18.5	24 34.9	20 28.2	+6 18.3	-0.7623	0.5585	0.1028	-2	-65
q Tauri	4.3	+4.92	+18.6	+24 12.6	20 29.7	+6 19.7	-0.3620	0.5585	+0.1027	-22	-44

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS. OCTOBER.

THE STAR'S					AT CONJUNCTION IN R. A.						
Name.	Mag.	Red'ns from 1916.0.		Apparent Declination.	Greenwich Mean Time.	Hour Angle, <i>H</i>	<i>Y</i>	<i>z'</i>	<i>g'</i>	<i>g</i>	
		$\Delta\alpha$	$\Delta\delta$								
		<i>s</i>	<i>"</i>	<i>s</i>	<i>d</i>	<i>h</i>	<i>m</i>	<i>h</i>	<i>m</i>		
20 Tauri	4.1	+4.92	+18.6	+24 6.7	13	20	46.0	+ 6 35.4	-0.2287	0.5585	+0.1021
21 Tauri	5.8	4.93	18.5	24 17.9	20	48.0	+ 6 37.3	-0.4254	0.5585	0.1020	
22 Tauri	6.5	4.92	18.5	24 16.3	20	51.7	+ 6 40.9	-0.3909	0.5585	0.1019	
23 Tauri	4.3	4.91	18.6	23 41.6	20	59.5	+ 6 48.4	+0.2420	0.5585	0.1019	
7 Tauri	3.0	4.91	18.4	23 51.1	21	29.7	+ 7 17.5	+0.1231	0.5586	0.1004	
104 B. Tauri	5.5	+4.89	+18.5	+23 10.1	21	52.9	+ 7 39.9	+0.8919	0.5586	+0.0995	
27 Tauri	3.7	4.91	18.3	23 48.2	22	13.7	+ 8 0.1	+0.2484	0.5587	0.0987	
28 Tauri	5.2	4.91	18.2	23 53.2	22	14.3	+ 8 0.6	+0.1600	0.5587	0.0987	
36 Tauri	5.6	4.89	16.8	23 52.8	14	4 51.5	- 9 36.3	+0.7696	0.5591	0.0831	
χ Tauri	5.3	4.92	14.6	25 26.2	12	46.4	- 1 58.3	-0.3208	0.5590	0.0641	
62 Tauri	6.1	+4.87	+14.8	+24 6.6	13	24.6	- 1 21.4	+1.1489	0.5590	+0.0626	
λ Tauri	5.6	4.82	11.0	24 55.5	15	4 18.4	-10 59.3	+0.9377	0.5576	+0.0264	
118 Tauri	5.4	4.73	7.6	25 5.1	17	59.4	+ 2 12.9	+0.9012	0.5546	-0.0667	
112 B. Aurigæ	5.7	4.76	6.2	26 52.5	21	26.6	+ 5 32.8	-1.0894	0.5535	0.0150	
125 Tauri	5.1	4.72	6.2	25 51.2	22	36.7	+ 6 40.5	+0.0077	0.5532	0.0177	
139 Tauri	4.7	+4.65	+ 4.2	+25 56.7	16	6 45.6	- 9 27.5	-0.3167	0.5505	-0.0368	
5 Geminorum	5.9	4.54	3.2	24 26.4	12	53.2	- 3 32.5	+1.0666	0.5482	0.0606	
52 B. Geminorum	6.5	4.42	+ 0.3	24 39.7	17	0 42.6	+ 7 52.9	+0.0705	0.5431	0.0767	
ε Geminorum	3.2	4.41	- 0.6	25 12.9	3	41.4	+10 45.8	-0.7777	0.5418	0.0830	
87 B. Geminorum	5.8	4.31	0.9	23 42.1	7	28.0	- 9 35.2	+0.5620	0.5400	0.0909	
ω Geminorum	5.2	+4.28	- 2.2	+24 20.1	12	19.5	- 4 53.3	-0.6029	0.5377	-0.1008	
44 Geminorum	5.9	4.21	2.0	22 45.8	13	42.8	- 3 32.6	+0.9902	0.5370	0.1035	
48 Geminorum	5.8	4.22	3.2	24 16.2	17	3.6	- 0 18.4	-1.0293	0.5354	0.1100	
δ Geminorum	3.5	4.11	3.3	22 8.2	20	45.0	+ 3 15.8	+0.9065	0.5336	0.1171	
58 Geminorum	6.0	4.12	4.0	23 6.4	22	19.9	+ 4 47.7	-0.3524	0.5328	0.1201	
149 B. Geminorum	6.4	+4.04	- 3.8	+21 42.2	23	59.1	+ 6 23.7	+0.9974	0.5320	-0.1232	
63 Geminorum	5.3	4.05	3.9	21 37.0	18	0 24.4	+ 6 48.3	+1.0408	0.5318	0.1240	
B. D. +23° 1744	6.4	4.06	4.9	23 4.0	2	50.3	+ 9 9.5	-0.8679	0.5306	0.1284	
192 B. Geminorum	6.3	3.99	5.7	22 35.8	7	57.0	- 9 53.5	-1.0289	0.5281	0.1375	
79 Geminorum	6.3	3.91	5.2	20 31.0	8	51.2	- 9 1.0	+1.1460	0.5277	0.1390	
85 Geminorum	5.2	+3.84	- 6.0	+20 6.3	14	0.8	- 4 1.1	+0.8621	0.5251	-0.1477	
217 B. Geminorum	6.3	3.81	6.5	20 2.7	16	32.9	- 1 33.8	+0.5479	0.5239	0.1519	
10 H. Cancri	6.1	3.76	6.6	19 4.7	18	31.6	+ 0 21.2	+1.3141	0.5230	0.1551	
SATURN	0.4	...	...	20 10.6	23	4.8	+ 4 46.1	-0.6241	0.5191	0.1619
d^1 Cancri	5.9	3.63	8.0	18 36.0	19	3 51.2	+ 9 23.7	+0.3282	0.5188	0.1694	
θ Cancri	5.5	+3.58	- 8.7	+18 22.6	8	1.6	-10 33.5	-0.1438	0.5170	-0.1754	
NEPTUNE	7.7	...	...	18 50.3	8	45.8	- 9 50.6	-0.7834	0.5163	0.1763
54 Cancri	6.3	3.39	9.3	15 39.6	18	1.4	- 0 51.5	+1.0352	0.5131	0.1888	
α^1 Cancri	5.1	3.37	9.8	15 38.6	21	14.1	+ 2 15.5	+0.4412	0.5120	0.1928	
α^2 Cancri	5.7	3.37	10.0	15 54.1	21	24.4	+ 2 25.4	+0.1223	0.5119	0.1930	
81 Cancri	6.4	+3.24	-10.7	+15 19.9	20	5 6.8	+ 9 54.2	-0.7718	0.5095	-0.2021	
π Cancri	5.6	3.25	11.1	15 17.3	6	37.8	+11 22.7	-1.0302	0.5090	0.2037	
ξ Leonis	5.1	3.08	11.2	11 40.2	15	29.6	- 4 1.0	+1.1051	0.5067	0.2130	
18 Leonis	5.8	3.01	12.2	12 11.6	23	9.8	+ 3 26.1	-1.1328	0.5052	0.2201	
19 Leonis	6.4	3.00	12.2	11 57.2	23	43.4	+ 3 58.8	-0.9925	0.5051	0.2206	
R Leonis (var.)	5-10	+3.00	-12.2	+11 48.9	23	47.4	+ 4 2.6	-0.8555	0.5051	-0.2206	
83 B. Leonis	5.9	2.90	12.0	9 19.7	21	4 33.7	+ 8 40.8	+0.8092	0.5044	0.2246	
89 B. Leonis	6.2	2.89	11.9	8 42.7	5	28.2	+ 9 33.8	+1.2798	0.5043	0.2253	
π Leonis	4.9	2.87	12.0	8 26.7	6	35.5	+10 39.2	+1.3192	0.5042	0.2262	
43 Leonis	6.3	2.74	13.0	6 58.0	18	50.5	- 1 26.7	+0.1067	0.5035	0.2346	
155 B. Leonis	6.5	+2.72	-12.7	+ 6 7.0	18	59.1	- 1 18.3	+0.9983	0.5035	-0.2347	
35 Sextantis	6.1	2.63	13.4	5 11.1	22	5 47.3	+ 9 11.6	-0.5563	0.5039	0.2404	
p^4 Leonis	5.7	2.48	13.8	2 24.5	18	26.3	- 2 31.1	-0.6179	0.5058	0.2449	
p^5 Leonis	5.3	2.45	13.5	0 23.0	22	4.9	+ 1 1.3	+0.6723	0.5066	0.2457	
359 B. Leonis	6.3	2.42	14.0	+ 0 35.4	23	3 8.6	+ 5 56.4	-0.7948	0.5080	0.2463	
388 B. Leonis	6.3	+2.39	-13.7	- 1 14.5	5	34.7	+ 8 18.3	+0.5730	0.5086	-0.2467	

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

OCTOBER.

THE STAR'S					AT CONJUNCTION IN R. A.							Limiting Parallels.	
Name.	Mag.	Red'ns from 1916.0.		Apparent Declination.	Greenwich Mean Time.	Hour Angle, <i>H</i>	<i>Y</i>	<i>x'</i>	<i>y'</i>	N.	S.		
		$\Delta\alpha$	$\Delta\delta$										
		α	δ	α	d h m	h m						α	δ
431 B. Leonis	6.2	+2.35	-13.9	1 58.5	23 11 6.5	-10 19.5	-0.0049	0.5105	-0.2469	+41	-42		
78 B. Virginis	6.5	2.24	14.2	5 15.4	24 5 38.6	+7 39.7	-1.0548	0.5186	0.2435	-18	-90		
NEW MOON.													
40 B. Scorpis	5.4	+2.59	-11.8	24 35.6	28 9 30.4	+8 4.4	+0.2856	0.5898	-0.0929	+38	-26		
48 B. Scorpis	4.9	2.63	11.8	25 38.1	11 21.9	+9 51.5	+1.1795	0.5908	0.0879	+64	+37		
50 B. Scorpis	6.4	2.62	11.6	24 29.9	11 36.0	+10 5.0	+0.0008	0.5909	0.0873	+22	-42		
57 B. Scorpis	5.7	2.61	11.3	23 22.9	12 28.4	+10 55.3	-1.2128	0.5913	0.0849	-53	-87		
24 G. Scorpis	6.2	2.63	11.4	24 14.5	13 9.0	+11 34.3	-0.3932	0.5917	0.0831	+1	-67		
27 G. Scorpis	5.8	+2.62	-11.2	23 27.9	13 29.8	+11 54.2	-1.2125	0.5919	-0.0821	-53	-87		
41 G. Scorpis	6.3	2.65	11.1	24 12.7	15 26.8	-10 13.4	-0.6071	0.5928	0.0767	-11	-86		
85 B. Scorpis	6.0	2.67	11.2	25 16.1	15 52.3	-9 48.9	+0.4357	0.5930	0.0755	+46	-17		
19 Scorpis	4.9	2.68	10.7	23 58.2	18 7.2	-7 39.4	-1.0465	0.5940	0.0692	-39	-90		
6 Scorpis	3.1	2.70	11.0	25 23.7	18 18.8	-7 28.3	+0.3893	0.5940	0.0687	+42	-20		
α Scorpis	1.2	+2.76	-10.7	26 15.0	21 28.7	-4 26.1	+1.0544	0.5953	-0.0597	+64	+24		
22 Scorpis	4.8	2.74	10.4	24 56.0	21 48.3	-4 7.2	-0.3023	0.5954	0.0587	+4	-60		
116 B. Scorpis	6.2	2.76	10.7	26 21.5	22 14.3	-3 42.3	+1.1206	0.5956	0.0575	+64	+30		
126 B. Scorpis	6.1	2.78	9.7	24 18.5	29 2 11.9	+0 5.6	-1.1671	0.5969	0.0460	-51	-90		
88 B. Ophiuchi	6.3	2.88	8.8	24 58.1	9 12.4	+6 48.9	-0.7472	0.5985	0.0254	-23	-90		
26 Ophiuchi	5.8	+2.88	-8.8	24 51.9	9 16.8	+6 53.1	-0.8543	0.5986	-0.0252	-30	-90		
118 B. Ophiuchi	6.2	2.94	8.7	26 24.2	11 49.4	+9 19.6	+0.6517	0.5989	0.0176	+57	-4		
137 B. Ophiuchi	6.3	2.95	8.1	25 9.3	13 52.7	+11 17.8	-0.6436	0.5992	0.0115	-18	-90		
36 Ophi. (1st star)	5.4	2.96	9.2	26 29.0	15 3.7	-11 34.1	+0.6915	0.5993	0.0079	+60	-2		
0 Ophiuchi	3.4	2.98	7.4	24 55.1	17 36.0	-9 8.1	-0.9039	0.5994	-0.0003	-35	-90		
136 G. Ophiuchi	6.3	+3.03	-7.3	25 52.3	19 27.2	-7 21.5	+0.0662	0.5995	+0.0052	+18	-38		
151 G. Ophiuchi	6.0	3.06	7.1	26 12.5	21 16.7	-5 38.5	+0.4212	0.5994	0.0107	+39	-18		
63 Ophiuchi	6.1	3.15	5.1	24 52.4	30 6 6.7	+251.8	-0.7187	0.5985	0.0371	-21	-90		
7 Sagittarii	5.5	3.18	4.4	24 17.0	9 9.2	+5 46.8	-1.1879	0.5979	0.0461	-53	-89		
9 Sagittarii	6.0	3.19	4.3	24 21.9	9 32.5	+6 9.2	-1.0880	0.5978	0.0472	-44	-90		
67 B. Sagittarii	6.4	+3.29	-3.6	25 38.3	15 11.9	+11 34.8	+0.5140	0.5962	+0.0637	+50	-12		
70 B. Sagittarii	6.4	3.29	3.1	24 57.3	16 17.8	-11 22.0	-0.1053	0.5959	0.0668	+15	-48		
λ Sagittarii	2.9	3.33	2.9	25 28.2	18 46.3	-8 59.5	+0.5899	0.5950	0.0739	+56	-8		
24 Sagittarii	5.7	3.33	1.9	24 5.8	21 4.6	-6 46.8	-0.6208	0.5941	0.0804	-11	-88		
117 B. Sagittarii	5.8	3.34	1.3	23 34.7	22 52.4	-5 3.4	-0.9961	0.5934	0.0854	-34	-90		
26 Sagittarii	6.1	+3.37	-1.2	23 54.8	31 0 10.0	-3 49.0	-0.5446	0.5928	+0.0890	-6	-80		
126 B. Sagittarii	5.7	3.41	-1.3	25 5.8	1 18.2	-2 43.5	+0.7550	0.5923	0.0921	+65	+2		
ν^1 Sagittarii	5.0	3.40	+0.2	22 51.0	4 58.8	+0 48.2	-1.1596	0.5905	0.1021	-46	-90		
ν^2 Sagittarii	5.1	3.41	0.3	22 46.6	5 21.0	+1 9.6	-1.1946	0.5904	0.1031	-49	-90		
154 B. Sagittarii	5.9	3.42	+0.2	23 16.9	5 41.7	+1 29.4	-0.6487	0.5902	0.1040	-10	-90		
162 B. Sagittarii	6.4	+3.48	-0.2	24 59.4	6 35.0	+2 20.7	+1.1711	0.5897	+0.1064	+65	+35		
168 B. Sagittarii	6.3	3.44	+0.9	22 48.9	7 54.4	+3 36.9	-0.8846	0.5890	0.1098	-24	-90		
191 B. Sagittarii	6.5	3.49	1.2	23 19.4	10 42.2	+6 18.1	-0.0526	0.5875	0.1171	-22	-45		
208 B. Sagittarii	6.1	3.56	1.5	24 19.4	13 23.0	+8 52.5	+1.2807	0.5860	0.1239	+66	+52		
222 B. Sagittarii	5.5	3.53	2.6	22 33.5	15 26.2	+10 50.8	-0.2424	0.5848	0.1291	+13	-56		
50 Sagittarii	5.5	+3.55	+3.2	21 56.6	17 43.0	-10 57.7	-0.5646	0.5834	+0.1347	-3	-81		
253 B. Sagittarii	6.1	+3.56	+3.8	21 29.2	19 33.8	-9 11.2	-0.7730	0.5823	+0.1391	-14	-90		

NOVEMBER.

ϕ Capricorni	5.5	+3.73	+8.8	-19 22.8	1 15 32.2	+10 2.0	+0.3183	0.5691	+0.1821	+49	-24
π Capricorni	5.2	3.75	9.8	18 29.1	18 53.9	-10 43.8	+0.0360	0.5668	0.1884	+34	-40
ρ Capricorni	5.0	3.74	10.0	18 5.4	19 33.5	-10 5.6	-0.2399	0.5664	0.1896	+20	-56
σ Capricorni	5.6	3.77	9.8	18 51.6	19 59.3	-9 40.7	-0.6215	0.5661	0.1904	+68	-8
47 B. Capricorni	6.2	3.75	11.0	16 48.7	22 25.0	-7 20.3	-0.9844	0.5645	0.1947	-21	-90
ν Capricorni	5.3	+3.80	+10.9	-18 25.9	2 0 20.2	-5 29.3	+1.0336	0.5632	+0.1979	+72	+18

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

NOVEMBER.

THE STAR'S					AT CONJUNCTION IN R. A.							Limiting Pa- ra- heli.	
Name.	Mag.	Red'ns from 1916.0.		Apparent Declina- tion.	Greenwich Mean Time.	Hour Angle, H	Y	x'	y'	N.	S.		
		$\Delta\alpha$	$\Delta\delta$										
		s	"	'	d	h	m	h	m				
61 B. Capricorni	5.9	+3.76	+11.7	-16 25.2	2	0	34.5	-5 15.6	-0.9573	0.5630	+0.1983	-19 -90	
94 B. Capricorni	5.7	3.84	13.1	16 21.1	8	0	3.1	+1 54.3	+0.4914	0.5581	0.2102	+63 -15	
95 B. Capricorni	5.9	3.80	13.8	14 48.3	8	28.4	+2 21.4	-0.9791	0.5578	0.2109	-19 -90		
53 B. Aquarii	6.5	3.86	15.6	13 32.8	16	7.6	+9 44.3	-0.6004	0.5531	0.2215	+5 -82		
18 Aquarii	5.5	3.89	16.4	13 14.1	19	47.6	-10 43.0	-0.0964	0.5509	0.2261	+32 -47		
72 B. Aquarii	6.5	+3.87	+17.1	-11 55.7	21	37.5	-8 56.9	-1.0077	0.5499	+0.2283	-18 -90		
137 B. Capricorni	6.2	3.90	18.3	10 57.0	3	2 43.6	-4 1.4	-0.8228	0.5471	0.2339	-7 -90		
λ Capricorni	5.5	3.95	18.5	11 44.9	5	56.9	-0 54.6	+0.7481	0.5454	0.2371	+78 -9		
96 B. Aquarii	6.5	3.96	19.4	10 42.1	9	12.4	+2 14.3	+0.4610	0.5438	0.2401	+65 -17		
θ Aquarii	4.3	4.02	21.8	8 11.8	20	1.8	-11 17.9	+0.5540	0.5392	0.2483	+74 -13		
ρ Aquarii	5.3	+4.04	+22.0	-8 14.2	21	36.8	-9 45.8	+0.9910	0.5386	+0.2493	+82 -13		
170 B. Aquarii	6.0	4.04	22.4	7 36.8	23	11.4	-8 14.4	+0.7480	0.5380	0.2502	+82 -9		
186 B. Aquarii	6.1	4.07	23.0	6 58.7	4	2 51.4	-4 41.4	+1.0212	0.5368	0.2521	+83 -15		
κ Aquarii	5.2	4.05	24.1	4 39.3	5	56.4	-1 42.5	-0.5724	0.5359	0.2535	+11 -75		
207 B. Aquarii	6.3	4.06	24.6	3 59.1	7	23.3	-0 18.4	-0.8905	0.5354	0.2540	-7 -90		
6 G. Piscium	6.2	+4.13	+25.7	-2 50.3	15	44.1	+7 46.3	+0.0674	0.5334	+0.2564	+45 -38		
22 B. Piscium	6.4	4.21	27.6	-0 9.7	5	3 54.4	-4 26.8	+0.4519	0.5318	0.2571	+69 -18		
κ Piscium	4.9	4.22	27.8	+0 48.2	5	33.0	-2 51.3	-0.1175	0.5317	0.2569	+35 -48		
9 Piscium	6.4	4.22	27.9	0 40.1	5	42.2	-2 42.4	+0.0602	0.5317	0.2569	+45 -38		
16 Piscium	5.7	4.25	28.5	1 38.6	10	7.8	+1 34.8	+0.1939	0.5315	0.2562	+52 -31		
λ Piscium	4.6	+4.27	+28.3	+1 19.5	12	52.1	+4 13.9	+1.2226	0.5315	+0.2556	+90 -30		
19 Piscium	5.4	4.29	29.0	3 1.7	14	58.0	+6 15.8	+0.0049	0.5315	0.2550	+42 -41		
22 Piscium	5.8	4.32	29.0	2 28.3	17	39.6	+8 52.3	+1.2649	0.5316	0.2541	+90 -35		
36 Piscium	6.2	4.41	30.5	7 46.9	6	5 32.3	-3 37.6	-1.2317	0.5327	0.2483	-31 -8		
d Piscium	5.4	4.44	30.5	7 43.9	7	28.7	-1 44.9	-0.7000	0.5330	0.2470	+5 -82		
136 B. Piscium	6.5	+4.52	+30.6	+8 54.3	17	21.8	+7 49.3	+0.4908	0.5349	+0.2396	+72 -14		
75 Piscium	6.3	4.66	30.8	12 30.9	7	5 24.1	-4 31.8	-0.4471	0.5381	0.2277	-18 -65		
η Piscium	3.7	4.80	30.3	14 55.3	17	5.5	+6 46.6	-0.3810	0.5418	0.2134	-21 -5		
101 Piscium	6.2	4.81	30.0	14 14.4	19	5.8	+8 42.9	+0.7568	0.5425	0.2107	+90 -5		
105 Piscium	6.1	4.85	30.0	15 59.3	20	53.8	+10 27.4	-0.6968	0.5431	0.2081	+4 -74		
3 Arietis	6.4	+4.90	+29.8	+17 0.1	8	0 5.5	-10 27.2	-1.1018	0.5442	+0.2035	-23 -73		
4 Arietis	5.8	4.90	29.7	16 32.8	0	49.9	-9 44.3	-0.4747	0.5445	0.2024	+16 -6		
ι Arietis	5.1	4.95	29.3	17 25.0	5	3.0	+5 39.6	-0.5488	0.5460	0.1959	+12 -6		
35 B. Arietis	6.4	4.98	28.9	17 51.5	7	57.8	-2 50.7	-0.4499	0.5470	0.1912	-17 -59		
47 B. Arietis	6.5	4.99	28.7	17 38.3	9	49.2	-1 3.0	+0.1341	0.5477	0.1882	+49 -3		
20 H ¹ . Arietis	6.4	+4.99	+28.4	+16 50.3	10	33.6	-0 20.2	+1.1144	0.5480	+0.1870	+90 -31		
15 Arietis	5.9	5.03	28.6	19 6.7	11	6.5	+0 11.6	-1.1781	0.5482	0.1860	-31 -71		
θ Arietis	5.6	5.06	28.2	19 31.3	14	31.2	+3 29.5	-0.9854	0.5494	0.1802	-15 -79		
26 Arietis	6.2	5.12	27.2	19 29.4	20	10.6	+8 57.3	+0.0360	0.5514	0.1700	+44 -9		
μ Arietis	5.7	5.16	26.3	19 39.7	9	1 26.8	-9 57.5	+0.7254	0.5532	0.1600	+90 -3		
47 Arietis	5.8	+5.24	+25.1	+20 20.4	8	26.6	-3 12.1	+1.0797	0.5553	+0.1460	+90 -33		
σ Arietis (mean)	4.6	5.24	25.0	21 0.7	8	56.8	-2 42.9	+0.4388	0.5555	0.1450	+70 -5		
66 Arietis	6.1	5.36	22.2	22 31.3	21	49.7	+9 43.0	+0.5260	0.5589	0.1174	+77 -2		
7 Tauri	5.9	5.43	21.6	24 11.4	10	0 26.2	-11 46.2	-0.9581	0.5594	0.1115	-15 -6		
16 Tauri	5.4	5.44	20.4	24 1.9	4	58.0	-7 23.9	-0.3084	0.5603	0.1012	+24 -40		
17 Tauri	3.8	+5.44	+20.4	+23 51.3	5	0.0	-7 22.0	-0.1165	0.5603	+0.1012	-35 -30		
18 Tauri	5.6	5.46	20.4	24 34.9	5	6.9	+7 15.3	-0.8831	0.5603	0.1009	-10 -65		
η Tauri	4.3	5.45	20.4	24 12.6	5	8.4	+7 13.9	-0.4822	0.5603	0.1008	-14 -51		
20 Tauri	4.1	5.45	20.3	24 6.7	5	24.7	+6 58.1	-0.3493	0.5603	0.1002	+22 -63		
21 Tauri	5.8	5.46	20.3	24 17.9	5	26.7	+6 56.2	-0.5463	0.5603	0.1001	+11 -53		
22 Tauri	6.5	+5.45	+20.3	+24 16.3	5	30.4	+6 52.6	-0.5119	0.5603	+0.1000	-13 -53		
23 Tauri	4.3	5.44	20.3	23 41.6	5	38.2	+6 45.1	+0.1216	0.5604	0.0997	+49 -17		
η Tauri	3.0	5.44	20.2	23 51.1	6	8.3	+6 16.1	+0.0014	0.5604	0.0985	+42 -34		
104 B. Tauri	5.5	5.42	20.1	23 10.2	6	31.5	+5 53.7	+0.7704	0.5605	0.0976	+90 -18		
27 Tauri	3.7	5.44	20.0	23 48.2	6	52.3	+5 33.7	+0.1253	0.5606	0.0968	+49 -17		
Tauri	5.2	+5.44	+20.0	+23 53.2	6	52.9	+5 33.1	+0.0367	0.5606	+0.0968	+44 -21		

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

NOVEMBER.

THE STAR'S					AT CONJUNCTION IN R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1916.0.		Apparent Declination.	Greenwich Mean Time.	Hour Angle, H	Y	x'	y'	N.	S.
		$\Delta\alpha$	$\Delta\delta$		d h m	h m					
36 Tauri	5.6	+5.47	+18.3	+23 52.8	10 13 29.4	+ 0 49.4	+0.6327	0.5614	+0.0813	+89	+12
χ Tauri	5.3	5.55	16.1	25 26.2	21 22.9	+ 8 26.0	-0.4746	0.5618	0.0624	+15	-47
62 Tauri	6.1	5.50	16.0	24 6.6	22 1.0	+ 9 2.8	+0.9940	0.5618	0.0609	+90	+36
315 B. Tauri	6.3	5.52	12.1	24 27.7	11 12 1.7	- 1 26.3	+1.2337	0.5610	0.0266	+82	+59
k Tauri	5.6	5.54	11.8	24 55.5	12 50.7	- 0 39.1	+0.7533	0.5608	+0.0246	+90	+24
118 Tauri	5.4	+5.51	+ 7.8	+25 5.1	12 2 26.9	-11 31.8	+0.6925	0.5581	-0.0084	+90	+22
125 Tauri	5.1	5.52	6.3	25 51.2	7 2.6	- 7 5.7	-0.2076	0.5568	0.0194	+30	-27
132 Tauri	5.0	5.44	5.4	24 32.5	11 10.4	- 3 6.7	+1.1243	0.5554	0.0292	+90	+48
139 Tauri	4.7	5.48	3.9	25 56.7	15 8.5	+ 0 43.2	-0.5445	0.5540	0.0384	+11	-50
5 Geminorum	5.9	5.38	2.5	24 26.4	21 13.9	+ 6 36.0	+0.8275	0.5515	0.0524	+90	+25
8 Geminorum	6.1	+5.34	+ 2.0	+23 59.9	23 23.6	+ 8 41.2	+1.1941	0.5506	-0.0573	+89	+53
52 B. Geminorum	6.5	5.30	- 0.9	24 39.7	13 8 59.5	- 6 2.3	-0.1836	0.5461	0.0783	+31	-32
ϵ Geminorum	3.2	5.30	1.9	25 12.9	11 57.5	- 3 10.3	-1.0347	0.5446	0.0846	-22	-65
87 B. Geminorum	5.8	5.20	2.6	23 42.1	15 43.0	+ 0 27.7	+0.2987	0.5426	0.0924	+60	- 8
ω Geminorum	5.2	5.18	4.0	24 20.1	20 33.4	+ 5 8.6	-0.8710	0.5401	0.1021	- 9	-66
44 Geminorum	5.9	+5.10	- 4.0	+22 45.8	21 56.4	+ 6 28.9	+0.7191	0.5394	-0.1049	+90	+14
δ Geminorum	3.5	5.01	5.6	22 8.2	14 4 57.4	-10 44.0	+0.6279	0.5355	0.1184	+88	+ 7
58 Geminorum	6.0	5.03	6.3	23 6.4	6 32.1	- 9 12.3	-0.6320	0.5347	0.1213	+ 6	-63
149 B. Geminorum	6.4	4.94	6.3	21 42.2	8 11.1	- 7 36.6	+0.7156	0.5337	0.1243	+90	+11
63 Geminorum	5.3	4.95	6.5	21 37.0	8 36.4	- 7 12.0	+0.7585	0.5335	0.1251	+90	+14
B. D. +23° 1744	6.4	+4.98	- 7.4	+23 3.9	11 2.0	+ 45.1	-1.1520	0.5322	-0.1295	-31	-67
79 Geminorum	6.3	4.82	8.1	20 31.0	17 2.6	+ 0 58.1	+0.8563	0.5288	0.1399	+90	+18
85 Geminorum	5.2	4.75	9.2	20 6.2	22 12.3	+ 5 58.1	+0.5684	0.5260	0.1485	+80	- 0
217 B. Geminorum	6.3	4.72	9.7	20 2.7	15 0 44.5	+ 8 25.6	+0.2522	0.5246	0.1526	-56	-17
10 H. Cancri	6.1	4.66	9.9	19 4.6	2 43.3	+10 20.7	+1.0176	0.5235	0.1557	+90	+26
SATURN	0.3	...	...	+20 6.9	8 21.7	- 8 11.2	-1.0337	0.5210	-0.1644	-19	-70
α^1 Cancri	5.9	+4.54	-11.7	18 36.0	12 4.3	+ 4 35.3	+0.0254	0.5186	0.1696	+43	-31
α^2 Cancri	6.2	4.48	11.6	17 19.2	13 20.9	- 3 21.1	+1.2236	0.5180	0.1714	+90	+42
θ Cancri	5.5	4.48	12.5	18 22.5	16 15.7	- 0 31.5	-0.4494	0.5166	0.1754	+17	-58
NEPTUNE	7.7	...	...	18 49.2	17 9.2	+ 0 20.4	-1.0994	0.5164	0.1767	-24	-71
54 Cancri	6.3	+4.28	-13.4	+15 39.6	16 2 18.5	+ 9 13.4	+0.7290	0.5119	-0.1883	+90	+ 4
α^1 Cancri	5.1	4.25	14.0	15 38.5	5 32.5	-11 38.3	+0.1330	0.5105	0.1922	+49	-28
α^2 Cancri	5.7	4.26	14.1	15 54.0	5 42.9	-11 28.3	-0.1868	0.5105	0.1924	+31	-45
81 Cancri	6.4	4.11	15.1	15 19.9	13 28.7	- 3 56.0	-1.0842	0.5074	0.2010	-21	-75
π Cancri	5.6	4.12	15.6	15 17.2	15 0.6	- 2 26.7	-1.3435	0.5069	0.2027	-51	-72
ξ Leonis	5.1	+3.93	-15.7	+11 40.1	23 57.2	+ 6 14.5	+0.8005	0.5041	-0.2115	+90	+ 5
σ Leonis	3.8	3.84	15.9	10 16.2	4 54.7	+11 3.6	+1.2819	0.5028	0.2158	+90	+41
19 Leonis	6.4	3.85	17.0	11 57.2	8 16.4	- 9 40.4	-1.3023	0.5020	0.2186	+41	-78
R Leonis (var.)	5-10	3.85	17.0	11 48.9	8 20.5	- 9 36.4	-1.1648	0.5020	0.2187	-27	-78
83 B. Leonis	5.9	3.74	16.7	9 19.6	13 10.1	- 4 54.9	+0.5097	0.5011	0.2224	+73	-12
89 B. Leonis	6.2	+3.72	-16.6	+ 8 42.6	14 5.2	- 4 1.4	+0.9828	0.5009	-0.2231	+90	+15
π Leonis	4.9	3.70	16.6	8 26.6	15 13.3	- 2 55.2	+1.0232	0.5007	0.2239	+90	+17
43 Leonis	6.3	3.54	17.7	6 57.9	8 16.4	- 9 40.4	-1.3023	0.5020	0.2186	+41	-78
155 B. Leonis	6.5	3.52	17.4	6 7.0	8 20.5	- 9 36.4	-1.1648	0.5020	0.2187	-27	-78
35 Sextantis	6.1	3.41	18.2	5 11.0	13 10.1	- 4 54.9	+0.5097	0.5011	0.2224	+73	-12
p^4 Leonis	5.7	+3.23	-18.4	+ 2 24.4	14 5.2	- 4 1.4	+0.9828	0.5009	-0.2231	+90	+15
p^5 Leonis	5.3	3.19	17.9	0 23.0	15 13.3	- 2 55.2	+1.0232	0.5007	0.2239	+90	+17
359 B. Leonis	6.3	3.15	18.4	+ 0 35.3	8 16.4	- 9 40.4	-1.3023	0.5020	0.2186	+41	-78
388 B. Leonis	6.3	3.11	17.9	-1 14.5	12 22.8	- 7 1.7	-1.0481	0.5036	0.2428	-16	-89
431 B. Leonis	6.2	3.06	18.0	1 58.6	14 50.8	- 4 37.8	+0.3304	0.5044	0.2430	+60	-24
13 B. Virginis	5.9	+2.99	-17.5	- 4 52.3	20 26.8	+ 0 48.7	-0.2401	0.5063	0.2432	+29	-55
78 B. Virginis	6.5	2.89	17.8	5 15.4	3 3 7.4	+ 7 17.8	+1.2460	0.5090	-0.2427	+85	+33
q Virginis	5.3	2.81	17.2	8 59.6	15 11.5	- 4 59.3	-1.2555	0.5152	0.2399	-35	-90
370 B. Virginis	6.0	2.75	16.8	11 11.9	21 1 5.6	+ 4 36.9	+0.3605	0.5212	0.2356	+60	-23
69 Virginis	4.9	2.68	15.8	15 32.6	11 15.4	- 9 32.2	+0.3229	0.5284	0.2292	+57	-25
75 Virginis	5.6	+2.67	-16.0	-14 56.1	22 3 3.0	+ 5 45.1	+1.3546	0.5412	0.2147	+70	+54
					5 33.7	+ 8 10.8	+0.1847	0.5434	-0.2119	+46	-32

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

NOVEMBER.

THE STAR'S					AT CONJUNCTION IN R. A.					Limit- ing Pa- rallels.
Name.	Mag.	Red'ns from 1916.0.		Apparent Declina- tion.	Greenwich Mean Time.	Hour Angle, H	Y	z'	y'	
		$\Delta\alpha$	$\Delta\delta$		d h m	h m				N. S.
83 Virginis	5.6	+2.66	-15.7	-15 45.7	22 10 53.2	-10 40.4	-0.0682	0.5481	-0.2053	-31-46
85 Virginis	6.1	2.66	15.8	15 21.0	11 23.2	-10 11.4	-0.5972	0.5486	-0.2047	-4-42
NEW MOON.										
67 B. Sagittarii	6.4	3.12	2.6	25 38.2	26 22 47.1	-3 2.4	+0.6618	0.6063	+0.0665	+60-4
70 B. Sagittarii	6.4	+3.12	-2.2	-24 57.3	23 51.1	-2 1.1	+0.0632	0.6060	+0.0697	+23-39
λ Sagittarii	2.9	3.14	2.0	25 28.2	27 2 15.3	+0 17.2	+0.7429	0.6051	0.0768	+65-1
24 Sagittarii	5.7	3.14	1.2	24 5.8	4 29.5	+2 25.7	-0.4467	0.6042	0.0834	-2-7
117 B. Sagittarii	5.8	3.14	0.7	23 34.7	6 14.1	+4 6.0	-0.8137	0.6034	0.0885	-22-30
26 Sagittarii	6.1	3.16	0.6	23 54.8	7 29.5	+5 18.2	-0.3664	0.6028	0.0921	+3-45
126 B. Sagittarii	5.7	+3.19	-0.6	-25 5.8	8 35.6	+6 21.7	+0.9167	0.6022	+0.0952	+65-13
ν^1 Sagittarii	5.0	3.17	+0.6	22 50.9	12 10.0	+9 47.0	-0.9648	0.6004	0.1053	-30-30
ν^2 Sagittarii	5.1	3.18	0.7	22 46.6	12 31.4	+10 7.7	-0.9989	0.6002	0.1063	-32-30
154 B. Sagittarii	5.9	3.19	0.6	23 16.9	12 51.6	+10 27.0	-0.4600	0.6000	0.1073	0-72
168 B. Sagittarii	6.3	3.20	1.2	22 48.9	15 0.5	-11 29.3	-0.6892	0.5988	0.1131	-12-30
191 B. Sagittarii	6.5	+3.23	+1.6	-23 19.4	17 43.5	+8 53.0	+0.1356	0.5971	+0.1204	-32-34
199 B. Sagittarii	6.4	3.21	2.2	21 47.9	19 10.7	-7 29.3	-1.2071	0.5962	0.1243	-46-30
222 B. Sagittarii	5.5	3.26	2.8	22 33.5	22 19.6	-4 28.1	-0.0444	0.5942	0.1325	-24-41
50 Sagittarii	5.5	3.26	3.4	21 56.6	28 0 32.6	-2 20.5	-0.3590	0.5926	0.1380	+8-64
253 B. Sagittarii	6.1	3.27	3.8	21 29.2	2 20.4	-0 37.0	-0.5620	0.5913	0.1425	-2-40
f Sagittarii	5.1	+3.28	+5.4	-19 57.7	8 27.7	+5 15.8	-1.1665	0.5869	+0.1570	-41-30
σ Capricorni	5.5	3.40	8.3	19 22.8	21 48.9	+5 53.9	+0.5409	0.5764	0.1853	+62-12
π Capricorni	5.2	3.41	9.2	18 29.1	29 1 6.2	-2 44.0	+0.2655	0.5738	0.1914	-47-25
ρ Capricorni	5.0	3.40	9.4	18 5.4	1 44.9	-2 6.7	-0.0068	0.5733	0.1926	-32-4
σ Capricorni	5.6	3.43	9.2	18 51.6	2 10.2	-1 42.3	+0.8458	0.5730	0.1934	-71-6
47 B. Capricorni	6.2	+3.41	+10.3	-16 48.7	4 32.8	+0 34.9	-0.7406	0.5711	+0.1976	-6-30
ν Capricorni	5.3	3.45	10.2	18 25.9	6 25.7	+2 23.7	+1.2583	0.5696	0.2008	-72-40
61 B. Capricorni	5.9	3.41	10.9	16 25.2	6 39.7	+2 37.1	-0.7120	0.5694	0.2012	-4-39
94 B. Capricorni	5.7	3.49	12.2	16 21.1	13 57.1	+9 38.6	+0.7286	0.5636	0.2127	-74-2
95 B. Capricorni	5.9	3.45	12.8	14 48.3	14 24.7	+10 5.2	-0.7280	0.5633	0.2134	-3-30
53 B. Aquarii	6.5	+3.50	+14.4	-13 32.8	21 56.4	-6 39.3	-0.3483	0.5576	+0.2226	+18-42
18 Aquarii	5.5	3.53	15.1	13 14.1	31 33.3	-3 10.0	+0.1535	0.5550	0.2280	+45-33
72 B. Aquarii	6.5	3.52	15.9	11 55.7	3 21.8	-1 25.2	-0.7505	0.5537	0.2300	-2-30
137 B. Capricorni	6.2	3.55	17.0	10 57.0	8 24.2	+3 26.7	-0.5656	0.5503	0.2353	+9-73
c^2 Capricorni	6.3	3.56	17.8	9 39.6	11 29.4	+6 25.5	-1.1413	0.5483	0.2382	-27-40
λ Capricorni	5.5	+3.60	+17.2	-11 44.9	11 35.5	+6 31.4	+0.9969	0.5482	+0.2383	-78-14
96 B. Aquarii	6.5	+3.61	+18.0	-10 42.2	14 49.2	+9 38.5	+0.7123	0.5462	+0.2410	-79-4

DECEMBER.

θ Aquarii	4.3	+3.69	+20.2	-8 11.8	1 1 34.3	-3 57.9	+0.8061	0.5402	+0.2484	+82-1
ρ Aquarii	5.3	3.70	20.4	8 14.3	3 9.0	-2 26.3	+1.2417	0.5394	0.2493	+82-53
170 B. Aquarii	6.0	3.70	20.9	7 36.8	4 43.2	-0 55.2	+0.9993	0.5386	0.2500	+82-14
51 Aquarii	5.8	3.67	21.7	5 15.4	5 0.3	-0 38.7	-1.3286	0.5385	0.2502	-44-36
186 B. Aquarii	6.1	3.74	21.4	6 58.7	8 22.6	+2 37.0	+1.2715	0.5370	0.2517	+83-36
κ Aquarii	5.2	+3.73	+22.6	-4 39.3	11 27.3	+5 35.7	-0.3204	0.5357	+0.2528	-24-30
207 B. Aquarii	6.3	3.74	23.0	3 59.1	12 54.2	+6 59.7	-0.6388	0.5350	0.2532	+8-44
6 G. Piscium	6.2	3.82	24.2	2 50.3	21 15.6	-8 54.9	+0.3134	0.5322	0.2550	+59-25
22 B. Piscium	6.4	3.93	26.2	0 9.8	9 29.4	+2 55.7	+0.6890	0.5293	0.2548	+89-3
κ Piscium	4.9	3.95	26.4	+0 48.2	11 8.7	+4 31.8	+0.1169	0.5290	0.2546	+45-35
9 Piscium	6.4	+3.95	+26.5	+0 40.1	11 18.0	+4 40.9	+0.2948	0.5290	+0.2546	+58-25
16 Piscium	5.7	3.98	27.2	1 38.6	15 45.7	+9 0.1	+0.4242	0.5285	0.2536	+67-19
19 Piscium	5.4	4.04	27.8	3 1.7	20 38.5	+10 16.3	+0.2290	0.5281	0.2521	+54-29
36 Piscium	6.2	4.20	29.7	7 46.9	3 11 23.1	+4 0.6	-1.0341	0.5283	0.2447	-16-32
d Piscium	5.4	4.23	29.7	7 43.9	13 21.0	+5 54.9	-0.5028	0.5285	0.2434	+15-70
136 B. Piscium	6.5	+4.36	+29.9	+8 54.3	23 22.8	-8 22.4	+0.6788	0.5299	+0.2357	+89-4

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

DECEMBER.

THE STAR'S					AT CONJUNCTION IN R. A.							Limiting Parallels.	
Name.		Mag.	Red'ns from 1916.0.		Apparent Declination.	Greenwich Mean Time.	Hour Angle, H	Y	x'	y'	N.	S.	
			$\Delta\alpha$	$\Delta\delta$									
			s	$''$	$^{\circ}$	d	h	m	h	m	$^{\circ}$	$^{\circ}$	
75	Piscium	6.3	+4.55	+30.6	+12 30.9	4	11	36.8	+ 3 28.5	-0.2868	0.5327	+0.2237	+26 -53
η	Piscium	3.7	4.73	30.4	14 55.3		23	30.2	- 9 1.1	-0.2429	0.5363	0.2093	+28 -49
101	Piscium	6.2	4.75	30.0	14 14.4	5	1	32.6	- 7 2.7	+0.8997	0.5370	0.2066	+90 +13
105	Piscium	6.1	4.81	30.3	15 59.3		3	22.5	- 5 16.3	-0.5687	0.5376	0.2042	+11 -68
3	Arietis	6.4	4.86	30.3	17 0.1		6	37.5	- 2 7.7	-0.9832	0.5387	0.1995	-14 -73
4	Arietis	5.8	+4.87	+30.0	+16 32.8		7	22.6	- 1 24.1	-0.3527	0.5390	+0.1984	+22 -54
ϵ	Arietis	5.1	4.94	29.7	17 25.0		11	40.1	- 2 45.0	-0.4360	0.5406	0.1920	-18 -58
35 B.	Arietis	6.4	4.99	29.5	17 51.5		14	38.0	+ 5 37.0	-0.3423	0.5417	0.1874	+23 -52
47 B.	Arietis	6.5	5.01	29.2	17 38.3		16	31.2	+ 7 26.5	+0.2423	0.5424	0.1844	+56 -20
20 H ¹ .	Arietis	6.4	5.01	28.7	16 50.3		17	16.4	+ 8 10.1	+1.2287	0.5426	0.1832	+90 +42
15	Arietis	5.9	+5.06	+29.3	+19 6.8		17	49.9	+ 8 42.5	-1.0826	0.5429	+0.1823	-23 -71
θ	Arietis	5.6	5.11	28.9	19 31.3		21	18.0	-11 56.2	-0.8954	0.5442	0.1765	- 9 -70
26	Arietis	6.2	5.19	28.0	19 29.5	6	3	3.0	- 6 22.8	+0.1221	0.5464	0.1665	+48 -24
μ	Arietis	5.7	5.27	27.0	19 39.7		8	24.1	- 1 12.4	+0.8057	0.5484	0.1566	+90 +13
47	Arietis	5.8	5.38	25.8	20 20.4		15	30.3	+ 5 39.2	+1.1479	0.5510	0.1429	+90 +39
ϵ	Arietis (mean)	4.6	+5.39	+25.9	+21 0.7		16	0.9	+ 6 8.8	+0.5014	0.5511	+0.1419	+75 - 2
66	Arietis	6.1	5.60	23.1	22 31.3	7	5	4.3	- 5 14.8	+0.5626	0.5554	0.1147	+81 + 4
7	Tauri	5.9	5.68	22.8	24 11.4		7	42.8	- 2 41.9	-0.9361	0.5561	0.1089	-14 -66
16	Tauri	5.4	5.73	21.6	24 1.9		12	17.8	+ 1 43.6	-0.2912	0.5572	0.0987	+25 -39
17	Tauri	3.8	5.73	21.5	23 51.4		12	19.8	+ 1 45.5	-0.0983	0.5572	0.0986	+36 -29
18	Tauri	5.6	+5.75	+21.6	+24 35.0		12	26.8	+ 1 52.3	-0.8696	0.5572	+0.0984	- 9 -65
q	Tauri	4.3	5.74	21.6	24 12.6		12	28.3	+ 1 53.7	-0.4664	0.5572	0.0983	+15 -50
20	Tauri	4.1	5.74	21.5	24 6.7		12	44.8	+ 2 9.7	-0.3333	0.5573	0.0977	+23 -42
21	Tauri	5.8	5.75	21.5	24 17.9		12	46.8	+ 2 11.6	-0.5316	0.5573	0.0976	+12 -54
22	Tauri	6.5	5.75	21.5	24 16.4		12	50.5	+ 2 15.2	-0.4970	0.5573	0.0975	+14 -52
23	Tauri	4.3	+5.73	+21.4	+23 41.6		12	58.4	+ 2 22.8	+0.1400	0.5574	+0.0972	+50 -16
η	Tauri	3.0	5.74	21.2	23 51.1		13	28.9	+ 2 52.2	+0.0181	0.5575	0.0960	+42 -22
104 B.	Tauri	5.5	5.72	21.1	23 10.2		13	52.3	+ 3 14.8	+0.7907	0.5576	0.0952	+90 +19
27	Tauri	3.7	5.74	21.1	23 48.2		14	13.4	+ 3 35.1	+0.1412	0.5576	0.0944	+50 -16
28	Tauri	5.2	5.75	21.1	23 53.2		14	13.9	+ 3 35.6	+0.0521	0.5576	0.0943	+45 -20
36	Tauri	5.6	+5.81	+19.3	+23 52.8		20	54.6	+10 2.3	+0.6382	0.5589	+0.0790	+90 +12
χ	Tauri	5.3	5.94	17.1	25 26.2	8	4	52.3	- 6 16.9	-0.4899	0.5600	0.0603	+14 -48
62	Tauri	6.1	5.89	16.9	24 6.7		5	30.7	- 5 39.8	+0.9845	0.5600	0.0588	+90 +35
315 B.	Tauri	6.3	5.99	12.6	24 27.7		19	37.1	+ 7 56.7	+1.1980	0.5602	0.0248	+88 +56
k	Tauri	5.6	6.02	12.3	24 55.5		20	26.3	+ 8 44.2	+0.7143	0.5602	+0.0228	+90 +22
118	Tauri	5.4	+6.07	+ 8.0	+25 5.1	9	10	5.9	- 2 5.0	+0.6284	0.5583	-0.0101	+89 +18
125	Tauri	5.1	6.12	6.4	25 51.2		14	42.3	+ 2 21.7	-0.2822	0.5572	0.0211	+25 -32
132	Tauri	5.0	6.06	5.2	24 32.5		18	50.6	+ 6 21.3	+1.0459	0.5561	0.0308	+90 +42
412 B.	Tauri	5.8	6.04	4.1	24 14.4		22	22.5	+ 9 45.9	+1.2548	0.5550	0.0391	+77 +62
139	Tauri	4.7	6.13	3.8	25 56.7		22	49.0	+10 11.4	-0.6334	0.5549	0.0401	+ 5 -57
5	Geminorum	5.9	+6.05	+ 1.9	+24 26.4	10	4	54.8	- 7 55.4	+0.7313	0.5527	-0.0541	+90 +20
8	Geminorum	6.1	6.02	+ 1.3	23 59.9		7	4.4	- 5 50.2	+1.0950	0.5519	0.0590	+90 +43
52 B.	Geminorum	6.5	6.03	- 1.9	24 39.7		16	40.2	+ 3 26.0	-0.3003	0.5477	0.0800	+24 -38
ϵ	Geminorum	3.2	6.04	2.9	25 12.9		19	38.0	+ 6 17.8	-1.1572	0.5464	0.0863	-34 -65
87 B.	Geminorum	5.8	5.96	3.9	23 42.1		23	23.4	+ 9 55.6	+0.1724	0.5445	0.0941	+52 -14
ω	Geminorum	5.2	+5.96	- 5.4	+24 20.1	11	4	13.4	- 9 23.8	-1.0060	0.5420	-0.1039	-19 -66
44	Geminorum	5.9	5.88	5.7	22 45.8		5	36.3	- 8 3.6	+0.5841	0.5413	0.1066	+83 + 6
δ	Geminorum	3.5	5.81	7.6	22 8.2		12	36.7	- 1 16.9	+0.4827	0.5374	0.1200	+73 - 1
58	Geminorum	6.0	5.84	8.3	23 6.3		14	11.2	+ 0 14.5	-0.7809	0.5366	0.1230	- 3 -67
149 B.	Geminorum	6.4	5.75	8.5	21 42.1		15	50.0	+ 1 50.1	+0.5661	0.5356	0.1260	+81 + 3
63	Geminorum	5.3	+5.76	- 8.7	+21 36.9		16	15.3	+ 2 14.6	+0.6085	0.5354	-0.1268	+85 + 5
B. D. +23° 1744		6.4	5.80	9.5	23 3.9		18	40.8	+ 4 35.5	-1.3077	0.5340	0.1311	-59 -65
79	Geminorum	6.3	5.65	10.8	20 30.9	12	0	40.9	+10 24.1	+0.6953	0.5306	0.1416	+90 + 8
209 B.	Geminorum	6.2	5.58	11.5	19 32.3		4	1.2	-10 21.9	+1.2968	0.5287	0.1471	+78 +56
85	Geminorum	5.2	5.60	12.1	20 6.2		5	50.2	- 8 36.3	+0.4006	0.5277	0.1501	+67 - 9
217 B.	Geminorum	6.3	+5.57	-12.7	+20 2.6		8	22.3	- 6 8.9	+0.0809	0.5262	-0.1541	+46 -26

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

DECEMBER.

THE STAR'S					AT CONJUNCTION IN R. A.					Limiting Parallax.
Name.	Mag.	Red'ns from 1916.0.		Apparent Declination.	Greenwich Mean Time.	Hour Angle, <i>H</i>	<i>Y</i>	<i>x'</i>	<i>y'</i>	
		$\Delta\alpha$	$\Delta\delta$		d h m	h m				N. S.
10 H. Cancr	6.1	+5.51	-13.0	+19 4.6	13 10 21.1	4 13.8	+0.8450	0.5251	-0.1572	+90-15
SATURN	0.1	...	...	20 20.9	14 13.2	0 28.8	-1.1845	0.5256	0.1637	+33-70
d ¹ Cancr	5.9	5.41	15.2	18 35.9	19 42.0+	4 50.0	-0.1592	0.5200	0.1709	+33-41
d ² Cancr	6.2	5.34	15.3	17 19.2	20 58.6+	6 4.2	+1.0400	0.5193	0.1727	+90-25
θ Cancr	5.5	5.36	16.2	18 22.5	23 53.5+	8 53.9	-0.6395	0.5177	0.1767	+7-29
NEPTUNE	7.7	...	...	+18 54.1	13 0 5.1+	9 5.2	-1.2586	0.5184	-0.1771	+40-7
54 Cancr	6.3	+5.17	-17.5	15 39.5	9 57.4	5 20.1	+0.5321	0.5126	0.1893	+76-7
o ¹ Cancr	5.1	5.15	18.3	15 38.4	13 11.9	2 11.2	-0.0683	0.5110	0.1930	+38-39
o ² Cancr	5.7	5.16	18.4	15 54.0	13 22.3	2 1.1	-0.3892	0.5109	0.1932	+21-5
81 Cancr	6.4	5.02	19.6	15 19.8	21 9.8+	5 32.9	-1.2959	0.5074	0.2016	+42-5
ξ Leonis	5.1	+4.84	-20.7	+11 40.0	14 7 41.8	8 13.1	+0.5891	0.5033	-0.2116	+60-7
o Leonis	3.8	4.75	21.1	10 16.2	12 41.3	3 22.0	+1.0704	0.5017	0.2157	+90-22
83 B. Leonis	5.9	4.65	22.0	9 19.5	21 1.0+	4 43.6	+0.2914	0.4993	0.2219	+58-24
89 B. Leonis	6.2	4.63	22.0	8 42.6	21 56.6+	5 37.8	+0.7669	0.4991	0.2225	+90-1
π Leonis	4.9	4.61	22.1	8 26.5	23 5.4+	6 44.6	+0.8072	0.4988	0.2233	+90-4
43 Leonis	6.3	+4.46	-23.3	+6 57.8	15 11 38.5	5 3.1	-0.4105	0.4966	-0.2306	+20-44
155 B. Leonis	6.5	4.43	23.0	6 6.9	11 47.3	4 54.6	+0.4916	0.4966	0.2306	+72-15
35 Sextantis	6.1	4.32	23.8	5 10.9	22 53.7+	5 53.6	-1.0702	0.4959	0.2353	+15-55
p ¹ Leonis	5.7	4.13	24.1	2 24.3	16 11 56.3	5 25.2	-1.1129	0.4968	0.2388	+21-38
p ² Leonis	5.3	4.09	23.6	0 22.9	15 42.1-	1 45.6	+0.2022	0.4973	0.2394	+53-31
359 B. Leonis	6.3	+4.05	-24.1	+0 35.2	20 55.9+	3 19.4	-1.2745	0.4983	-0.2399	+36-39
388 B. Leonis	6.3	4.01	23.6	1 14.6	23 26.9+	5 46.3	+0.1180	0.4989	0.2399	+48-35
e Leonis	5.1	3.99	23.2	2 32.8	17 0 46.1+	7 3.2	+1.2192	0.4992	0.2400	+87-36
431 B. Leonis	6.2	3.95	23.6	1 58.7	5 9.9+	11 19.6	-0.4544	0.5005	0.2398	+18-59
13 B. Virginis	5.9	3.88	23.0	4 52.3	11 59.2-	6 2.5	+1.0512	0.5029	0.2391	+85-17
64 B. Virginis	6.5	+3.78	-22.5	7 18.8	22 19.2+	3 59.8	+1.2225	0.5074	-0.2367	+83-31
q Virginis	5.3	3.68	22.2	8 59.7	18 10 27.7	8 13.0	+0.1787	0.5142	0.2316	+49-2
370 B. Virginis	6.0	3.60	21.5	11 12.0	20 51.6+	1 52.1	+0.1531	0.5212	0.2251	+47-3
69 Virginis	4.9	3.50	19.6	15 32.6	19 13 0.6	6 29.3	+1.2154	0.5342	0.2108	+74-35
75 Virginis	5.6	3.49	19.8	14 56.2	15 34.5-	4 0.3	+0.0387	0.5364	0.2080	+38-0
83 Virginis	5.6	+3.46	-19.3	-15 45.7	21 0.7+	1 15.2	-0.2083	0.5414	-0.2015	+24-54
85 Virginis	6.1	3.46	19.4	15 21.1	21 31.2+	1 44.6	-0.7409	0.5418	0.2009	+5-90
87 Virginis	5.8	3.47	18.7	17 26.7	22 21.0+	2 32.8	+1.2830	0.5426	0.1998	+73-2
89 Virginis	5.1	3.45	18.6	17 43.3	23 29.0+	3 38.5	+1.3452	0.5437	0.1984	+68-55
43 H. Virginis	5.5	3.40	17.8	17 48.9	20 10 59.4	9 14.7	-0.7499	0.5549	0.1817	+8-99
231 G. Virginis	6.4	+3.40	-17.6	-18 12.0	11 43.1-	8 32.6	-0.4813	0.5556	-0.1805	+7-72
236 G. Virginis	5.7	3.39	17.6	18 19.9	12 24.7-	7 52.4	-0.4695	0.5563	0.1794	+8-71
9 G. Libræ	6.5	3.38	16.5	20 4.5	19 26.0-	1 6.2	+0.1161	0.5634	0.1672	+36-35
17 G. Libræ	6.4	3.36	16.0	20 49.5	21 0 15.0+	3 32.4	+0.1030	0.5682	0.1581	+35-34
18 G. Libræ	6.1	3.36	15.8	20 58.6	0 41.2+	3 57.7	+0.1908	0.5686	0.1572	+39-31
43 B. Libræ	5.7	+3.42	-17.1	-21 2.6	4 55.5+	8 2.6	-0.3904	0.5729	-0.1487	+8-65
47 G. Libræ	6.1	3.35	14.8	21 42.6	8 39.9+	11 38.5	-0.2481	0.5766	0.1406	+15-54
64 G. Libræ	5.8	3.33	14.2	22 5.6	12 42.5	8 28.1	-0.4066	0.5805	0.1316	+5-6
153 B. Libræ	6.3	3.45	13.0	24 12.5	19 23.6-	2 2.5	+0.9163	0.5868	0.1156	+66-12
169 B. Libræ	6.0	3.32	13.0	22 52.0	21 14.9-	0 15.6	-0.6542	0.5885	0.1110	+10-99
177 B. Libræ	6.2	+3.32	-12.9	-22 52.8	21 51.6+	0 19.6	-0.7087	0.5890	-0.1095	+13-90
42 Libræ	5.0	3.33	12.7	23 33.0	22 12.9+	0 40.0	-0.0689	0.5894	0.1066	+20-66
A Scorpii	4.6	3.34	11.7	25 4.8	3 23.6+	5 38.4	+0.9505	0.5938	0.0950	+65-15
31 B. Scorpii	5.4	3.32	11.8	24 17.2	3 30.9+	5 45.4	+0.1380	0.5939	0.0947	+30-34
32 B. Scorpii	5.3	3.31	11.9	23 43.9	3 32.1+	5 46.5	-0.4245	0.5939	0.0947	+1-69
3 Scorpii	5.9	+3.34	-11.7	-24 59.9	3 48.0+	6 1.7	+0.8296	0.5942	-0.0940	+65-7
40 B. Scorpii	5.4	3.32	11.5	24 35.6	5 19.1+	7 29.2	+0.2800	0.5954	0.0899	+37-26
48 B. Scorpii	4.9	3.34	11.1	25 38.1	7 8.3+	9 14.0	+1.1707	0.5969	0.0849	+64-36
50 B. Scorpii	6.4	3.32	11.2	24 29.9	7 22.1+	9 27.2	+0.0062	0.5970	0.0843	+22-41
57 B. Scorpii	5.7	+3.30	-11.2	-23 22.9	8 13.3+	10 16.4	-1.1900	0.5977	-0.0819	+50-99

NEW MOON.

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

DECEMBER.

THE STAR'S					AT CONJUNCTION IN R. A.							Limiting Parallels.	
Name.	Mag.	Red'ms from 1916.0.		Apparent Declination.	Greenwich Mean Time.	Hour Angle, H	Y	x'	y'	N.	S.	N.	S.
		$\Delta\alpha$	$\Delta\delta$										
		s	"	'	d h m	h m				'	'		
π Capricorni	5.2	+3.30	+ 9.0	-18 29.1	26 9 54.6	+ 7 52.2	+0.3575	0.5847	+0.1961	+52	-22		
ρ Capricorni	5.0	3.29	9.2	18 5.4	10 32.1	+ 8 28.3	+0.0904	0.5842	0.1973	+37	-36		
ϕ Capricorni	5.6	3.31	9.1	18 51.6	10 56.5	+ 8 51.8	+0.9293	0.5838	0.1981	+71	+11		
47 B. Capricorni	6.2	3.28	9.9	16 48.7	13 14.2	+11 4.2	-0.6280	0.5820	0.2024	0	-85		
ν Capricorni	5.3	3.32	10.0	18 25.9	15 3.1	-11 11.1	+1.3393	0.5805	0.2056	+69	+55		
61 B. Capricorni	5.9	+3.28	+10.5	-16 25.2	15 16.6	-10 58.1	-0.5977	0.5803	+0.2060	+ 2	-82		
94 B. Capricorni	5.7	3.32	11.7	16 21.1	22 18.7	- 4 12.0	+0.8261	0.5746	0.2177	+74	+ 4		
95 B. Capricorni	5.9	3.29	12.1	14 48.3	22 45.4	- 3 46.4	-0.6054	0.5742	0.2184	+ 4	-82		
53 B. Aquarii	6.5	3.31	13.6	13 32.8	27 6 1.2	+ 3 13.3	-0.2252	0.5684	0.2287	+25	-54		
18 Aquarii	5.5	3.33	14.2	13 14.1	9 30.5	+ 6 34.9	+0.2714	0.5657	0.2331	+62	-27		
72 B. Aquarii	6.5	+3.31	+14.8	-11 55.7	11 15.2	+ 8 15.8	-0.6159	0.5643	+0.2351	+ 5	-83		
137 B. Capricorni	6.2	3.33	15.8	10 57.1	16 7.2	-11 2.7	-0.4303	0.5606	0.2403	+16	-67		
ϵ^1 Capricorni	5.3	3.33	16.6	9 27.8	18 32.9	- 8 42.2	-1.3229	0.5589	0.2427	-46	-84		
ϵ^2 Capricorni	6.3	3.34	16.6	9 39.6	19 6.0	- 8 10.2	-0.9944	0.5585	0.2432	-16	-90		
λ Capricorni	5.5	3.37	16.1	11 45.0	19 11.9	- 8 4.5	+1.1086	0.5584	0.2433	+78	+22		
96 B. Aquarii	6.5	+3.38	+16.8	-10 42.2	22 19.0	- 5 4.0	+0.8310	0.5562	+0.2460	+79	+ 3		
θ Aquarii	4.3	3.43	18.8	8 11.8	23 8 43.0	+ 4 58.4	+0.9302	0.5494	0.2530	+82	+ 9		
ρ Aquarii	5.3	3.44	19.0	8 14.3	10 14.7	+ 6 27.1	+1.3599	0.5485	0.2538	+78	+48		
170 B. Aquarii	6.0	3.44	19.4	7 36.8	11 46.0	+ 7 55.2	+1.1221	0.5476	0.2545	+82	+22		
51 Aquarii	5.8	3.41	20.1	5 15.4	12 2.6	+ 8 11.3	-1.1702	0.5475	0.2547	-27	-90		
186 B. Aquarii	6.1	+3.48	+19.9	- 6 58.7	15 18.7	+11 20.7	+1.3922	0.5456	+0.2560	+72	+55		
κ Aquarii	5.2	3.46	20.9	4 39.3	18 17.9	- 9 46.1	-0.1750	0.5440	0.2570	+32	-51		
207 B. Aquarii	6.3	3.47	21.4	3 59.1	19 42.2	- 8 24.6	-0.4884	0.5434	0.2573	+16	-71		
6 G. Piscium	6.2	3.54	22.4	2 50.3	23 3 49.7	- 0 33.3	+0.4527	0.5396	0.2586	+68	-18		
22 B. Piscium	6.4	3.65	24.4	0 9.8	15 45.2	+10 58.9	+0.8256	0.5353	0.2577	+90	+ 2		
κ Piscium	4.9	+3.66	+24.6	0 48.1	17 22.3	-11 27.1	+0.2602	0.5349	+0.2573	+56	-28		
9 Piscium	6.4	3.66	24.7	0 40.1	17 31.3	-11 18.4	+0.4360	0.5348	0.2573	+67	-19		
16 Piscium	5.7	3.69	25.4	1 38.6	21 53.3	- 7 4.9	+0.5640	0.5337	0.2560	+77	-12		
19 Piscium	5.4	3.75	26.0	3 1.7	30 2 40.4	- 2 27.0	+0.3705	0.5328	0.2541	+63	-22		
36 Piscium	6.2	3.92	28.1	7 46.9	17 10.6	+11 35.5	-0.8863	0.5312	0.2457	- 6	-82		
d Piscium	5.4	+3.95	+28.1	+ 7 43.9	19 7.0	-10 31.8	-0.3598	0.5312	+0.2443	+23	-61		
136 B. Piscium	6.5	4.09	28.4	8 54.3	31 5 2.3	- 0 55.5	+0.8098	0.5314	0.2359	+90	+ 4		
58 Piscium	5.7	4.15	29.3	11 31.4	7 49.4	+ 1 46.3	-1.2600	0.5316	0.2332	-36	-78		
75 Piscium	6.3	+4.29	+29.4	+12 30.9	17 11.4	+10 50.3	-0.1579	0.5328	+0.2231	+33	-46		

OCCULTATIONS VISIBLE AT WASHINGTON.

Date.	THE STAR'S		IMMERSION.				EMERSION.				Duration of Occultation.
			Washington.		Angle from—		Washington.		Angle from—		
	Name.	Mag.	Sidereal Time.	Mean Time.	North Point.	Ver- tex.	Sidereal Time.	Mean Time.	North Point.	Ver- tex.	
Jan. 14	<i>q</i> Tauri	4.3	h m 9 40	h m 14 6	° 95	° 41	h m 10 38	h m 15 4	° 260	° 210	h m 0 58
14	16 Tauri	5.4	9 41	14 8	145	91	10 13	14 39	210	158	0 32
14	21 Tauri	5.8	10 0	14 26	76	24	10 55	15 22	279	231	0 55
14	20 Tauri	4.1	10 1	14 28	121	69	10 48	15 14	234	185	0 47
14	22 Tauri	6.5	10 3	14 30	83	30	10 59	15 26	273	225	0 56
15	<i>x</i> Tauri	5.3	0 26	4 50	132	192	1 3	5 27	191	251	0 37
18	48 Geminorum	5.8	7 26	11 37	126	111	8 52	13 3	276	224	1 26

NOTE.—The angles of position are counted from the north point and vertex of the Moon's limb toward the east.

OCCULTATIONS VISIBLE AT WASHINGTON.

Date.	THE STAR'S		IMMERSION.				EMERSION.				Duration of Occultation.	
			Washington.		Angle from—		Washington.		Angle from—			
	Name.	Mag.	Sidereal Time.	Mean Time.	North Point.	Ver- tex.	Sidereal Time.	Mean Time.	North Point.	Ver- tex.		
Jan. 18	58 Geminorum	†	6.0	h m	h m	°	°	h m	h m	°	°	h m
23	p ⁴ Leonis	†	5.7	4 45	8 36	114	166	5 44	9 36	299	350	0 59
26	87 Virginis		5.8	16 12	19 50	165	134	17 1	20 39	245	206	0 49
29	134 B. Scorpil		6.4	14 27	17 53	71	98	15 32	18 59	313	328	1 6
30	X Sagitt. (var.)	†	4.4	13 11	16 34	118	164	14 10	17 33	256	295	0 59
31	σ Sagittarii	†	2.1	14 3	17 21	143	191	14 38	17 57	213	257	0 36
Feb. 14	ε Geminorum		3.2	1 47	4 13	154	213	2 17	4 42	205	264	0 30
14	ω Geminorum		5.2	12 58	15 22	116	62	13 53	16 17	280	231	0 55
15	B. D.+23° 1744		6.4	0 25	2 47	119	168	1 18	3 39	251	304	0 52
15	192 B. Geminorum		6.3	6 34	8 54	141	179	7 53	10 14	260	251	1 19
17	π Cancri		5.6	2 38	4 52	114	165	3 37	5 51	280	333	0 59
21	γ Virginis		5.3	10 37	12 34	175	202	11 29	13 26	261	277	0 52
27	69 G. Sagittarii	†	6.3	13 30	15 2	60	109	14 24	15 56	303	346	0 54
Mar. 7	47 B. Arietis		6.5	7 7	8 5	103	48	8 2	9 0	328	275	0 55
11	112 B. Aurigæ		5.7	6 41	7 24	28	342	7 14	7 57	346	292	0 33
16	18 Leonis		5.8	4 31	4 54	83	136	5 30	5 53	324	17	0 59
16	19 Leonis		6.4	5 10	5 33	112	165	6 22	6 45	299	349	1 12
16	R Leonis (var.)		5-10	5 25	5 48	138	190	6 32	6 55	273	323	1 7
18	359 B. Leonis		6.3	6 54	7 9	60	109	7 26	7 40	5	52	0 31
23	π Scorpil		3.0	12 14	12 9	162	202	12 56	12 50	240	274	0 42
23	65 B. Scorpil		5.5	17 0	16 54	64	51	18 7	18 1	312	287	1 7
24	95 G. Ophiuchi		6.1	17 23	17 13	101	98	18 44	18 33	258	238	1 30
25	66 B. Sagittarii		4.7	18 19	18 5	73	71	19 40	19 26	266	247	1 21
26	φ Sagittarii		4.9	15 53	15 36	154	191	16 16	15 59	191	224	0 23
Apr. 6	χ Tauri		5.3	7 31	6 31	91	30	8 45	7 46	270	211	1 14
9	ω Geminorum		5.2	7 26	6 14	128	106	8 52	7 40	271	218	1 25
13	43 Leonis		6.3	13 14	11 46	154	110	14 17	12 48	276	225	1 2
16	370 B. Virginis		6.0	17 46	16 6	35	346	17 59	16 19	10	320	0 13
17	75 Virginis		5.6	8 30	6 47	111	160	9 30	7 46	309	353	0 59
19	153 B. Libræ	†	6.3	10 36	8 45	107	156	11 36	9 44	297	339	1 0
19	b Scorpil	†	4.7	20 4	18 11	135	90	20 50	18 57	232	182	0 46
24	19 Capricorni		5.7	15 56	13 44	113	162	16 46	14 34	211	255	0 58
May 8	θ Cancri		5.5	13 50	10 43	66	11	14 28	11 21	345	292	0 37
19	86 B. Sagittarii		6.5	14 39	10 49	158	199	15 4	11 14	202	239	0 25
20	53 Sagittarii		6.3	17 48	13 53	121	144	18 40	14 45	204	216	0 52
20	274 B. Sagittarii		6.1	18 1	14 6	129	149	18 44	14 49	195	206	0 43
June 8	p ⁵ Leonis		5.3	12 22	7 14	148	126	13 38	8 30	288	251	1 16
11	87 Virginis		5.8	17 38	12 18	187	144	17 54	12 34	213	168	0 16
13	b Scorpil		4.7	19 17	13 48	129	90	20 11	14 42	238	192	0 54
16	172 B. Sagittarii		5.8	14 11	8 31	53	101	15 3	9 23	299	341	0 52
16	189 B. Sagittarii	†	6.1	16 54	11 13	44	70	17 56	12 15	294	309	1 2
16	208 B. Sagittarii		6.1	20 50	15 8	47	26	21 55	16 14	269	237	1 6
18	29 Capricorni		5.5	19 45	13 56	50	69	21 1	15 12	249	251	1 16
21	22 Piscium		5.8	20 51	14 50	132	174	21 6	15 5	155	196	0 15
22	136 B. Piscium		6.5	21 52	15 47	18	62	22 52	16 47	270	305	1 0
July 16	96 B. Aquarii		6.5	2 8	18 29	339	292	2 20	18 40	318	270	0 11
23	17 Tauri		3.8	21 40	13 34	25	79	22 21	14 14	297	353	0 40
23	23 Tauri		4.3	22 3	13 56	90	145	23 1	14 54	230	289	0 58
23	γ Tauri		3.0	22 38	14 30	76	133	23 43	15 36	243	302	1 5
23	28 Tauri		5.2	23 30	15 23	101	160	0 31	16 23	216	275	1 1
23	27 Tauri		3.7	23 36	15 29	126	184	0 16	16 8	192	250	0 39
Aug. 7	b Scorpil		4.7	16 11	7 7	115	109	17 32	8 27	268	246	1 20
10	127 G. Sagittarii	†	6.4	14 4	4 48	61	109	15 0	5 44	292	334	0 56

NOTE.—The angles of position are counted from the north point and vertex of the Moon's limb toward the east.
† Immersion below the horizon of Washington. ‡ Emersion below the horizon of Washington.

OCCULTATIONS VISIBLE AT WASHINGTON.

Date.	THE STAR'S		IMMERSION.				EMERSON.				Duration of Occultation.
			Washington.		Angle from—		Washington.		Angle from—		
	Name.	Mag.	Sidereal Time.	Mean Time.	North Point.	Ver- tex.	Sidereal Time.	Mean Time.	North Point.	Ver- tex.	
			h m	h m	°	°	h m	h m	°	°	h m
Aug. 10	172 B. Sagittarii	5.8	15 2	5 46	44	86	15 54	6 38	305	340	0 52
10	189 B. Sagittarii	6.1	17 55	8 38	48	63	19 6	9 49	282	281	1 10
10	208 B. Sagittarii	6.1	21 48	12 30	69	38	22 53	13 35	246	205	1 5
12	29 Capricorni	5.5	20 12	10 47	61	75	21 27	12 2	235	231	1 15
13	ρ Aquarii	5.3	1 27	15 57	106	66	2 8	16 38	188	143	0 40
13	170 B. Aquarii	† 6.0	3 14	17 44	84	34	4 5	18 34	218	167	0 50
15	22 Piscium	† 5.8	17 13	7 37	93	144	18 0	8 24	213	265	0 47
17	101 Piscium	† 6.2	18 31	8 46	75	124	19 22	9 38	235	287	0 51
24	SATURN	0.4	1 16	15 3	104	155	2 18	16 5	272	327	1 1
Sept. 4	116 B. Scorpii	6.2	15 55	5 1	54	60	16 55	6 0	323	317	1 0
9	96 B. Aquarii	6.5	2 25	15 9	356	309	2 51	15 35	302	253	0 26
15	ε Arietis (mean)	4.6	19 55	8 16	40	90	20 40	9 2	298	331	0 46
18	139 Tauri	4.7	4 37	16 45	19	66	5 5	17 13	344	20	0 28
21	α ¹ Cancri	† 5.9	0 57	12 54	146	193	1 36	13 33	236	286	0 39
Oct. 5	o Capricorni	5.6	23 10	10 12	5	332	23 48	10 50	296	257	0 39
6	29 Capricorni	5.5	16 15	3 15	94	143	17 15	4 14	225	269	0 59
7	ρ Aquarii	5.3	23 2	9 56	82	70	0 6	11 1	204	178	1 4
7	170 B. Aquarii	6.0	1 19	12 13	79	40	2 19	13 13	214	169	1 0
12	μ Arietis	5.7	23 48	10 23	127	181	0 20	10 54	177	227	0 32
13	66 Arietis	† 6.1	19 59	6 30	28	75	20 35	7 6	297	347	0 36
13	17 Tauri	3.8	4 58	15 28	27	343	5 50	16 20	312	258	0 52
13	23 Tauri	4.3	5 32	16 2	84	32	6 54	17 23	262	203	1 22
13	η Tauri	3.0	6 22	16 52	56	358	7 30	17 59	294	235	1 7
13	27 Tauri	3.7	7 15	17 45	76	17	8 25	18 54	278	220	1 9
13	28 Tauri	5.2	7 21	17 50	56	357	8 22	18 51	297	239	1 1
19	α ² Cancri	5.7	4 11	14 17	85	140	5 19	15 25	314	7	1 8
19	α ¹ Cancri	5.1	4 19	14 26	152	206	5 13	15 19	246	299	0 54
Nov. 4	6 G. Piscium	6.2	2 44	11 48	4	318	3 23	12 26	292	244	0 38
6	136 B. Piscium	6.5	3 58	12 54	115	66	4 41	13 37	193	142	0 43
8	20 H ¹ . Arietis	† 6.4	18 47	3 37	112	160	19 24	4 13	204	254	0 36
8	26 Arietis	6.2	7 34	16 22	7	312	7 54	16 41	330	276	0 20
9	66 Arietis	6.1	8 55	17 38	111	55	9 48	18 31	241	189	0 53
10	36 Tauri	5.6	21 49	6 30	68	121	22 47	7 27	258	315	0 57
11	κ Tauri	† 5.6	21 19	5 56	92	138	22 10	6 47	248	299	0 51
13	87 B. Geminorum	5.8	0 15	8 44	58	109	1 5	9 33	304	359	0 50
14	85 Geminorum	5.2	8 46	17 9	148	118	10 0	18 24	266	216	1 15
16	ξ Leonis	5.1	10 57	19 12	158	125	12 7	20 22	274	227	1 10
Dec. 2	22 B. Piscium	6.4	19 49	3 4	13	58	20 39	3 53	282	321	0 50
2	16 Piscium	5.7	4 18	11 32	98	47	5 7	12 20	209	158	0 49
5	47 B. Arietis	6.5	4 52	11 53	72	20	6 7	13 8	252	196	1 15
6	ε Arietis (mean)	4.6	3 58	10 55	136	101	4 37	11 34	190	144	0 39
7	27 Tauri	3.7	1 15	8 9	10	66	1 54	8 48	310	2	0 39
7	36 Tauri	5.6	9 54	16 46	124	70	10 41	17 34	236	186	0 47
8	κ Tauri	5.6	9 46	16 35	174	117	10 0	16 49	199	142	0 14
11	149 B. Geminorum	6.4	2 33	9 12	166	223	2 58	9 36	207	264	0 24
11	79 Geminorum	6.3	13 54	20 31	80	28	14 41	21 17	320	271	0 47
14	83 B. Leonis	5.9	8 17	14 42	102	134	9 38	16 3	330	336	1 21
14	89 B. Leonis	6.2	10 26	16 51	161	149	11 38	18 3	274	239	1 12
14	π Leonis	4.9	11 58	18 22	136	98	13 15	19 39	295	247	1 17
16	ε Leonis	5.1	14 37	20 54	191	150	15 6	21 22	235	190	0 29
18	370 B. Virginis	6.0	7 33	13 43	82	132	8 23	14 32	338	25	0 49
26	π Capricorni	5.2	23 55	5 35	34	354	0 49	6 28	270	224	0 54
27	18 Aquarii	5.5	23 43	5 19	343	312	0 3	5 39	310	276	0 26

NOTE.—The angles of position are counted from the north point and vertex of the Moon's limb toward the east.
† Immersion below the horizon of Washington. ‡ Emerision below the horizon of Washington.

EPHEMERIS FOR PHYSICAL OBSERVATIONS OF THE SUN.
FOR GREENWICH MEAN NOON.

Date.	P	B_0	L_0	Date.	P	B_0	L_0
	°	°	°		°	°	°
Jan. 1	+ 2.37	-3.08	313.50	July 4	- 1.22	+3.35	31.75
6	- 0.07	3.65	247.65	9	+ 1.05	3.87	325.58
11	2.49	4.19	181.81	14	3.31	4.36	259.41
16	4.87	4.70	115.97	19	5.52	4.83	193.25
21	7.19	5.17	50.13	24	7.68	5.26	127.10
26	- 9.43	-5.60	344.30	29	+ 9.77	+5.66	60.96
31	11.57	5.98	278.47	Aug. 3	11.77	6.02	354.84
Feb. 5	13.60	6.32	212.64	8	13.68	6.34	288.72
10	15.51	6.61	146.80	13	15.49	6.61	222.62
15	17.28	6.85	80.96	18	17.18	6.84	156.53
20	-18.92	-7.03	15.12	23	+18.75	+7.02	90.46
25	20.41	7.16	309.27	28	20.20	7.14	24.40
Mar. 1	21.74	7.23	243.41	Sept. 2	21.51	7.22	318.35
6	22.92	7.25	177.54	7	22.68	7.25	252.32
11	23.93	7.21	111.65	12	23.70	7.22	186.30
16	-24.78	-7.12	45.75	17	+24.57	+7.15	120.28
21	25.45	6.97	339.83	22	25.28	7.02	54.29
26	25.95	6.77	273.89	27	25.82	6.84	343.30
31	26.28	6.52	207.94	Oct. 2	26.20	6.60	282.32
Apr. 5	26.42	6.22	141.97	7	26.40	6.32	216.36
10	-26.39	-5.88	75.98	12	+26.42	+5.99	150.39
15	26.16	5.50	9.96	17	26.25	5.61	84.44
20	25.76	5.08	303.93	22	25.89	5.20	18.50
25	25.17	4.62	237.87	27	25.33	4.74	312.56
30	24.40	4.13	171.80	Nov. 1	24.58	4.24	246.63
May 5	-23.44	-3.61	105.71	6	+23.63	+3.71	180.70
10	22.31	3.07	39.60	11	22.49	3.15	114.78
15	21.01	2.51	333.47	16	21.15	2.57	48.86
20	19.54	1.93	267.33	21	19.62	1.96	342.96
25	17.92	1.34	201.18	26	17.92	1.34	277.06
30	-16.16	-0.74	135.02	Dec. 1	+16.06	+0.71	211.17
June 4	14.27	-0.14	68.84	6	14.04	+0.07	145.28
9	12.27	+0.47	2.67	11	11.90	-0.57	79.39
14	10.17	1.06	296.48	16	9.65	1.21	13.52
19	8.00	1.66	230.30	21	7.31	1.84	307.65
24	- 5.77	+2.24	164.11	26	+ 4.91	-2.45	241.79
29	- 3.50	+2.80	97.93	31	+ 2.48	-3.06	175.94

In the above table, P is the position-angle of the axis of rotation measured eastward from the north point of the disk, while L_0 and B_0 are the heliographic longitudes and latitudes, respectively, of the center of the disk. The longitudes are reckoned from the Solar Meridian which passed through the ascending node of the Sun's equator on the ecliptic, on Jan. 1, 1854, Greenwich Mean Noon.

MEAN EQUATOR, ORBIT, AND MEAN LONGITUDE.

FOR GREENWICH MEAN NOON.

Date.	Mean Equator.			Orbit.		Mean Longitude. C	Mean Solar Days.	Motion in Mean Longitude.
	δ	Δ	Ω'	Γ'	Ω			
	° ' "	° ' "	° ' "	° ' "	° ' "	° ' "		° ' "
Jan. 1	22 30.0	126 52.8	3 5.2	265 22.3	309 43.0	233 18.6	0.1	1 19.06
11	22 30.7	126 19.8	3 6.5	266 29.2	309 11.3	5 4.4	0.2	2 38.12
21	22 31.4	125 46.8	3 7.8	267 36.0	308 39.5	136 50.3	0.3	3 57.18
31	22 32.1	125 13.9	3 9.1	268 42.8	308 7.7	268 36.1	0.4	5 16.23
Feb. 10	22 32.8	124 41.0	3 10.4	269 49.7	307 36.0	40 22.0	0.5	6 35.29
							0.6	7 54.35
20	22 33.5	124 8.0	3 11.6	270 56.5	307 4.2	172 7.8	0.7	9 13.41
Mar. 1	22 34.2	123 35.1	3 12.9	272 3.4	306 32.4	303 53.6	0.8	10 32.47
11	22 34.9	123 2.2	3 14.1	273 10.2	306 0.6	75 39.5	0.9	11 51.53
21	22 35.6	122 29.4	3 15.3	274 17.0	305 28.9	207 25.3	1.0	13 10.58
31	22 36.3	121 56.5	3 16.5	275 23.9	304 57.1	339 11.1	2.0	26 21.17
							3.0	39 31.75
Apr. 10	22 37.0	121 23.7	3 17.6	276 30.8	304 25.3	110 57.0	4.0	52 42.33
20	22 37.8	120 50.8	3 18.8	277 37.6	303 53.5	242 42.8	5.0	65 52.92
30	22 38.5	120 18.0	3 19.9	278 44.4	303 21.7	14 28.7	6.0	79 3.50
May 10	22 39.2	119 45.3	3 21.0	279 51.3	302 50.0	146 14.5	7.0	92 14.09
20	22 40.0	119 12.5	3 22.1	280 58.1	302 18.2	278 0.3	8.0	105 24.67
							9.0	118 35.25
30	22 40.7	118 39.8	3 23.2	282 4.9	301 46.5	49 46.2	10.0	131 45.84
June 9	22 41.5	118 7.0	3 24.2	283 11.8	301 14.7	181 32.0	Hours.	° ' "
19	22 42.2	117 34.3	3 25.2	284 18.6	300 42.9	313 17.8	1	0 32.94
29	22 43.0	117 1.6	3 26.2	285 25.5	300 11.1	85 3.7	2	1 5.88
July 9	22 43.7	116 29.0	3 27.2	286 32.3	299 39.4	216 49.5	3	1 38.82
							4	2 11.76
19	22 44.5	115 56.3	3 28.2	287 39.2	299 7.6	348 35.4	5	2 44.70
29	22 45.2	115 23.7	3 29.2	288 46.0	298 35.8	120 21.2	6	3 17.65
Aug. 8	22 46.0	114 51.1	3 30.1	289 52.8	298 4.1	252 7.0	7	3 50.59
18	22 46.8	114 18.5	3 31.0	290 59.7	297 32.3	23 52.9	8	4 23.53
28	22 47.6	113 45.9	3 31.9	292 6.5	297 0.5	155 38.7	9	4 56.47
							10	5 29.41
Sept. 7	22 48.4	113 13.3	3 32.8	293 13.3	296 28.7	287 24.5	11	6 2.35
17	22 49.1	112 40.7	3 33.6	294 20.2	295 57.0	59 10.4	12	6 35.29
27	22 49.9	112 8.2	3 34.5	295 27.1	295 25.2	190 56.2	13	7 8.23
Oct. 7	22 50.7	111 35.7	3 35.3	296 33.9	294 53.4	322 42.1	14	7 41.17
17	22 51.5	111 3.2	3 36.1	297 40.7	294 21.6	94 27.9	15	8 14.11
							16	8 47.06
27	22 52.3	110 30.7	3 36.9	298 47.6	293 49.9	226 13.7	17	9 20.00
Nov. 6	22 53.1	109 58.2	3 37.6	299 54.4	293 18.1	357 59.6	18	9 52.94
16	22 53.9	109 25.8	3 38.4	301 1.2	292 46.3	129 45.4	19	10 25.88
26	22 54.7	108 53.4	3 39.1	302 8.1	292 14.5	261 31.3	20	10 58.82
Dec. 6	22 55.5	108 21.0	3 39.8	303 15.0	291 42.8	33 17.1	21	11 31.76
							22	12 4.70
16	22 56.3	107 48.6	3 40.5	304 21.8	291 11.0	165 2.9	23	12 37.64
26	22 57.1	107 16.3	3 41.1	305 28.6	290 39.2	296 48.8		
36	22 57.9	106 43.9	3 41.8	306 35.5	290 7.5	68 34.6		

Daily motion of Γ' +6'.684Daily motion of Ω -3'.177

EPHEMERIS FOR PHYSICAL OBSERVATIONS OF THE MOON.
FOR GREENWICH MEAN MIDNIGHT.

Date.		The Earth's Selenographic—		Physical Libration.		The Sun's Selenographic—		c
		Long.	Lat.	Long.	Lat.	Colong.	Lat.	
Jan.	1	-4.63	+6.45	0.00	-0.03	229.52	-0.73	14.78
	2	2.86	5.74	0.00	0.03	241.71	0.70	9.45
	3	-0.88	4.62	0.00	0.03	253.90	0.67	3.19
	4	+1.15	3.16	0.00	0.03	266.09	0.65	356.71
	5	3.08	+1.48	0.00	0.03	278.28	0.62	350.76
	6	+4.74	-0.28	+0.01	-0.03	290.47	-0.60	345.79
	7	6.05	1.97	0.01	0.03	302.65	0.57	342.03
	8	6.92	3.50	0.01	0.03	314.84	0.55	339.37
	9	7.36	4.78	0.01	0.03	327.01	0.53	337.84
	10	7.37	5.77	0.01	0.03	339.18	0.51	337.35
	11	+7.00	-6.43	+0.01	-0.03	351.35	-0.49	337.86
	12	6.31	6.78	0.01	0.03	350.00	0.47	339.36
	13	5.37	6.81	+0.01	0.03	350.00	0.45	341.83
	14	4.23	6.54	0.00	0.03	349.00	0.43	345.22
	15	2.97	5.99	0.00	0.03	348.00	0.41	349.40
	16	+1.64	-5.18	0.00	-0.03	347.00	-0.38	354.15
	17	+0.28	4.16	0.00	0.03	346.00	0.36	359.19
	18	-1.05	2.96	0.00	0.03	345.00	0.33	4.19
	19	2.32	1.62	0.00	0.03	344.00	0.30	8.87
	20	3.49	-0.20	0.00	0.03	343.00	0.27	13.02
	21	-4.53	+1.25	0.00	-0.03	342.00	-0.24	16.51
	22	5.40	2.66	0.00	0.03	341.00	0.20	19.27
	23	6.07	3.96	0.00	0.03	340.00	0.17	21.24
	24	6.50	5.09	-0.01	0.03	339.00	0.14	22.39
	25	6.67	5.97	0.01	0.03	338.00	0.10	22.00
	26	-6.53	+6.56	-0.01	-0.03	337.00	-0.07	21.75
	27	6.07	6.80	0.01	0.02	336.00	0.04	19.00
	28	5.28	6.65	0.01	0.02	335.00	-0.01	16.30
	29	4.18	6.09	0.01	0.02	334.00	+0.03	11.59
	30	2.81	5.13	-0.01	0.02	333.00	0.06	5.82
	31	-1.24	+3.82	0.00	-0.02	332.00	+0.09	359.53
Feb.	1	+0.42	2.24	0.00	0.02	331.00	0.12	353.39
	2	2.08	+0.51	0.00	0.02	330.00	0.15	347.97
	3	3.59	-1.25	0.00	0.02	329.00	0.18	343.61
	4	4.87	2.89	0.00	0.02	328.00	0.21	340.40
	5	+5.81	-4.32	0.00	-0.02	327.00	+0.24	336.35
	6	6.37	5.46	0.00	0.02	326.00	0.26	337.39
	7	6.53	6.26	0.00	0.03	325.00	0.29	337.52
	8	6.28	6.72	0.00	0.03	324.00	0.31	336.69
	9	5.69	6.84	0.00	0.03	323.00	0.33	340.89
	10	+4.79	-6.65	0.00	-0.03	322.00	+0.36	344.05
	11	3.66	6.17	0.00	0.03	321.00	0.38	348.04
	12	2.38	5.42	0.00	0.03	320.00	0.40	352.67
	13	+1.02	4.45	0.00	0.03	319.00	0.42	357.66
	14	-0.34	3.30	0.00	0.03	318.00	0.45	2.71
	15	-1.64	-1.99	-0.01	-0.03	317.00	+0.47	7.51
	16	-2.81	-0.58	-0.01	-0.02	316.00	+0.50	11.86

EPHEMERIS FOR PHYSICAL OBSERVATIONS OF THE MOON.

FOR GREENWICH MEAN MIDNIGHT.

Date.	The Earth's Selenographic—		Physical Libration.		The Sun's Selenographic—		C
	Long.	Lat.	Long.	Lat.	Colong.	Lat.	
	°	°	°	°	°	°	°
Feb. 16	-2.81	-0.58	-0.01	-0.02	69.09	+0.50	11.86
17	3.81	+0.87	0.01	0.02	81.23	0.53	15.58
18	4.60	2.30	0.01	0.02	93.37	0.55	18.59
19	5.15	3.64	0.01	0.02	105.51	0.58	20.82
20	5.46	4.82	0.01	0.02	117.65	0.61	22.21
21	-5.52	+5.77	-0.01	-0.02	129.80	+0.64	22.67
22	5.35	6.42	0.01	0.02	141.95	0.67	22.07
23	4.95	6.73	0.01	0.02	154.09	0.70	20.30
24	4.36	6.65	0.01	0.02	166.24	0.72	17.25
25	3.59	6.19	0.01	0.02	178.41	0.75	12.93
26	-2.66	+5.35	-0.01	-0.02	190.58	+0.78	7.54
27	1.61	4.17	0.01	0.02	202.76	0.80	1.53
28	-0.47	2.72	0.01	0.02	214.95	0.83	355.47
29	+0.73	+1.10	0.01	0.02	227.15	0.86	349.91
Mar. 1	1.92	-0.60	0.01	0.02	239.34	0.88	345.23
2	+3.05	-2.25	-0.01	-0.02	251.55	+0.91	341.60
3	4.03	3.74	0.01	0.02	263.75	0.93	339.07
4	4.78	4.99	0.01	0.02	275.96	0.96	337.64
5	5.26	5.91	0.01	0.02	288.17	0.98	337.31
6	5.40	6.49	0.01	0.02	300.37	1.00	338.07
7	+5.18	-6.72	-0.01	-0.02	312.57	+1.02	339.91
8	4.63	6.62	0.01	0.02	324.77	1.04	342.78
9	3.77	6.21	0.01	0.02	336.96	1.06	346.56
10	2.66	5.54	0.01	0.02	349.15	1.07	351.06
11	1.38	4.63	0.01	0.02	1.33	1.09	355.98
12	+0.02	-3.53	-0.01	-0.02	13.50	+1.10	1.04
13	-1.34	2.28	0.01	0.02	25.68	1.12	5.95
14	2.62	-0.92	0.01	0.02	37.84	1.14	10.45
15	3.72	+0.49	0.01	0.02	50.00	1.16	14.39
16	4.58	1.91	0.02	0.02	62.16	1.17	17.67
17	-5.15	+3.26	-0.02	-0.02	74.32	+1.19	20.19
18	5.39	4.48	0.02	0.02	86.47	1.21	21.89
19	5.31	5.48	0.02	0.02	98.62	1.22	22.66
20	4.93	6.19	0.02	0.02	110.77	1.24	22.38
21	4.30	6.56	0.02	0.02	122.93	1.26	20.91
22	-3.49	+6.55	-0.02	-0.02	135.09	+1.27	18.13
23	2.56	6.14	0.02	0.02	147.25	1.29	14.04
24	1.59	5.36	0.01	0.02	159.42	1.30	8.83
25	-0.62	4.25	0.01	0.02	171.60	1.31	2.94
26	+0.32	2.88	0.01	0.02	183.78	1.33	356.92
27	+1.21	+1.33	-0.01	-0.02	195.97	+1.34	351.30
28	2.04	-0.29	0.01	0.02	208.17	1.36	346.47
29	2.81	1.89	0.01	0.02	220.38	1.38	342.61
30	3.49	3.36	0.01	0.02	232.59	1.39	339.78
31	4.05	4.62	0.01	0.02	244.81	1.40	338.00
Apr. 1	+4.45	-5.60	-0.01	-0.02	257.03	+1.42	337.27
2	+4.64	-6.25	-0.01	-0.02	269.25	+1.43	337.62

EPHEMERIS FOR PHYSICAL OBSERVATIONS OF THE MOON.

FOR GREENWICH MEAN MIDNIGHT.

Date.	The Earth's Selenographic—		Physical Libration.		The Sun's Selenographic—		C
	Long.	Lat.	Long.	Lat.	Colong.	Lat.	
Apr. 1	+4.45	−5.60	−0.01	−0.02	257.03	+1.42	337.27
2	4.64	6.25	0.01	0.02	269.25	1.43	337.62
3	4.57	6.56	0.01	0.02	281.47	1.45	339.07
4	4.23	6.54	0.01	0.02	293.69	1.46	341.58
5	3.59	6.20	0.01	0.02	305.91	1.47	345.09
6	+2.69	−5.57	−0.01	−0.02	318.12	+1.47	349.40
7	1.56	4.71	0.01	0.02	330.34	1.48	354.24
8	+0.26	3.66	0.01	0.02	342.54	1.49	359.31
9	−1.12	2.45	0.01	0.02	354.74	1.50	4.30
10	2.50	−1.13	0.01	0.02	6.94	1.50	8.94
11	−3.77	+0.24	−0.01	−0.02	19.13	+1.51	13.06
12	4.85	1.63	0.01	0.02	31.31	1.51	16.56
13	5.64	2.96	0.01	0.02	43.49	1.51	19.35
14	6.08	4.18	0.02	0.02	55.67	1.52	21.37
15	6.12	5.22	0.02	0.02	67.84	1.52	22.52
16	−5.75	+6.00	−0.02	−0.02	80.01	+1.52	22.65
17	5.00	6.44	0.02	0.02	92.18	1.52	21.61
18	3.93	6.50	0.02	0.02	104.34	1.52	19.23
19	2.66	6.15	0.02	0.02	116.51	1.52	15.45
20	−1.31	5.41	0.02	0.02	128.68	1.52	10.40
21	+0.02	+4.31	−0.01	−0.02	140.86	+1.52	4.45
22	1.24	2.94	0.01	0.02	153.05	1.52	358.34
23	2.29	+1.40	0.01	0.02	165.24	1.51	352.53
24	3.16	−0.21	0.01	0.02	177.43	1.51	347.49
25	3.84	1.79	0.01	0.02	189.64	1.51	343.42
26	+4.35	−3.24	−0.01	−0.02	201.85	+1.51	340.37
27	4.70	4.49	0.01	0.02	214.07	1.52	338.34
28	4.88	5.48	0.01	0.02	226.30	1.52	337.33
29	4.89	6.16	0.01	0.02	238.52	1.52	337.36
30	4.72	6.51	0.01	0.02	250.76	1.52	338.45
May 1	+4.35	−6.52	−0.01	−0.02	262.99	+1.52	340.62
2	3.75	6.22	0.01	0.02	275.23	1.52	343.81
3	2.94	5.64	0.01	0.02	287.47	1.52	347.89
4	1.90	4.80	0.01	0.02	299.70	1.52	352.61
5	+0.69	3.76	0.01	0.02	311.93	1.52	357.66
6	−0.66	−2.57	−0.01	−0.02	324.16	+1.51	2.70
7	2.07	−1.27	0.01	0.02	336.38	1.51	7.46
8	3.47	+0.09	0.01	0.02	348.60	1.50	11.74
9	4.76	1.46	0.01	0.02	0.82	1.49	15.43
10	5.85	2.78	0.01	0.02	13.03	1.49	18.44
11	−6.64	+4.00	−0.01	−0.02	25.23	+1.48	20.72
12	7.06	5.06	0.01	0.01	37.43	1.47	22.21
13	7.04	5.89	0.01	0.01	49.62	1.45	22.77
14	6.53	6.41	0.01	0.01	61.81	1.44	22.24
15	5.58	6.57	0.01	0.01	73.99	1.43	20.43
16	−4.25	+6.32	−0.01	−0.01	86.17	+1.41	17.17
17	−2.64	+5.64	−0.01	−0.01	98.35	+1.40	12.49

EPHEMERIS FOR PHYSICAL OBSERVATIONS OF THE MOON.

FOR GREENWICH MEAN MIDNIGHT.

Date.	The Earth's Selenographic—		Physical Libration.		The Sun's Selenographic—		C
	Long.	Lat.	Long.	Lat.	Colong.	Lat.	
May	.	.	.	.	.	.	.
17	-2.64	+5.64	-0.01	-0.01	98.35	+1.40	12.49
18	-0.91	4.58	0.01	0.01	110.53	1.38	6.68
19	+0.80	3.20	0.01	0.01	122.71	1.36	0.35
20	2.36	+1.62	0.01	0.01	134.90	1.34	354.20
21	3.68	-0.05	-0.01	0.01	147.10	1.32	348.76
22	+4.72	-1.69	0.00	-0.01	159.30	+1.31	344.32
23	5.47	3.19	0.00	0.01	171.50	1.29	340.97
24	5.92	4.48	0.00	0.01	183.72	1.28	338.68
25	6.11	5.50	0.00	0.01	195.94	1.27	337.44
26	6.06	6.20	0.00	0.01	208.17	1.26	337.21
27	+5.78	-6.58	0.00	-0.01	220.41	+1.25	338.03
28	5.30	6.63	0.00	0.02	232.65	1.24	339.91
29	4.62	6.36	0.00	0.02	244.89	1.23	342.81
30	3.76	5.80	0.00	0.02	257.14	1.22	346.64
31	2.72	4.98	0.00	0.02	269.38	1.21	351.19
June	.	.	.	.	.	.	.
1	+1.52	-3.95	0.00	-0.02	281.63	+1.20	356.18
2	+0.20	2.75	0.00	0.02	293.88	1.18	1.25
3	-1.20	1.44	0.00	0.01	306.12	1.17	6.12
4	2.64	-0.07	-0.01	0.01	318.36	1.16	10.55
5	4.04	+1.31	0.01	0.01	330.60	1.14	14.40
6	-5.32	+2.64	-0.01	-0.01	342.83	+1.12	17.59
7	6.41	3.88	0.01	0.01	355.06	1.10	20.08
8	7.22	4.96	0.01	0.01	7.28	1.08	21.82
9	7.66	5.84	0.01	0.01	19.50	1.06	22.72
10	7.67	6.44	0.01	0.01	31.70	1.04	22.64
11	-7.20	+6.70	-0.01	-0.01	43.91	+1.02	21.39
12	6.26	6.57	0.01	0.01	56.10	0.99	18.80
13	4.88	6.03	0.01	0.01	68.30	0.96	14.74
14	3.17	5.07	-0.01	0.01	80.49	0.94	9.35
15	-1.26	3.74	0.00	0.01	92.68	0.91	3.07
16	+0.71	+2.15	0.00	-0.01	104.86	+0.88	356.62
17	2.56	+0.41	0.00	0.01	117.06	0.85	350.68
18	4.19	-1.34	0.00	0.01	129.25	0.82	345.71
19	5.49	2.96	0.00	0.01	141.45	0.79	341.88
20	6.44	4.36	0.00	0.01	153.66	0.76	339.19
21	+7.00	-5.47	0.00	-0.01	165.87	+0.74	337.62
22	7.20	6.25	0.00	0.01	178.09	0.72	337.13
23	7.07	6.68	+0.01	0.01	190.32	0.70	337.70
24	6.64	6.77	+0.01	0.01	202.55	0.68	339.33
25	5.95	6.54	0.00	0.01	214.79	0.66	341.99
26	+5.05	-6.01	0.00	-0.01	227.03	+0.64	345.60
27	3.97	5.22	0.00	0.01	239.28	0.62	349.98
28	2.74	4.21	0.00	0.01	251.53	0.61	354.86
29	1.41	3.02	0.00	0.01	263.78	0.59	359.94
30	+0.01	1.71	0.00	0.01	276.03	0.57	4.89
July	.	.	.	.	.	.	.
1	-1.42	-0.32	0.00	-0.01	288.28	+0.55	9.46
2	-2.82	+1.08	0.00	-0.01	300.53	+0.53	13.47

EPHEMERIS FOR PHYSICAL OBSERVATIONS OF THE MOON.
FOR GREENWICH MEAN MIDNIGHT.

Date.	The Earth's Selenographic—		Physical Libration.		The Sun's Selenographic—		C
	Long.	Lat.	Long.	Lat.	Colong.	Lat.	
July							
1	-1.42	-0.32	0.00	-0.01	288.28	+0.55	9.46
2	2.82	+1.08	0.00	0.01	300.53	0.53	13.47
3	4.16	2.44	0.00	0.01	312.78	0.51	16.84
4	5.38	3.71	0.00	0.01	325.02	0.49	19.51
5	6.40	4.83	0.00	0.01	337.26	0.46	21.45
6	-7.16	+5.75	0.00	-0.01	349.50	+0.44	22.59
7	7.61	6.42	0.00	0.01	1.72	0.41	22.82
8	7.67	6.77	0.00	0.01	13.94	0.39	22.01
9	7.32	6.76	0.00	0.01	26.16	0.36	19.98
10	6.52	6.37	0.00	0.01	38.37	0.33	16.59
11	-5.30	+5.56	0.00	-0.01	50.57	+0.29	11.82
12	3.71	4.38	0.00	0.01	62.76	0.26	5.96
13	-1.87	2.87	0.00	0.01	74.96	0.22	359.52
14	+0.11	+1.14	0.00	0.01	87.14	0.19	353.25
15	2.08	-0.67	+0.01	0.01	99.33	0.15	347.72
16	+3.88	-2.41	+0.01	-0.01	111.52	+0.12	343.29
17	5.41	3.96	0.01	0.01	123.72	0.08	340.06
18	6.57	5.22	0.01	0.01	135.92	0.05	338.01
19	7.31	6.12	0.01	0.01	148.12	+0.02	337.13
20	7.63	6.66	0.01	0.01	160.33	-0.01	337.39
21	+7.53	-6.84	+0.01	-0.01	172.55	-0.03	338.75
22	7.07	6.67	0.01	0.01	184.77	0.06	341.18
23	6.30	6.20	0.01	0.01	197.00	0.08	344.59
24	5.27	5.45	0.01	0.01	209.23	0.10	348.81
25	4.06	4.47	0.01	0.01	221.47	0.12	353.60
26	+2.72	-3.31	+0.01	-0.01	233.72	-0.14	358.66
27	+1.31	2.02	0.01	0.01	245.96	0.16	3.66
28	-0.11	-0.64	0.01	0.01	258.21	0.18	8.35
29	1.50	+0.77	0.01	0.01	270.46	0.20	12.54
30	2.82	2.16	+0.01	0.01	282.71	0.22	16.09
31	-4.02	+3.46	0.00	-0.01	294.96	-0.24	18.96
Aug.							
1	5.06	4.62	0.00	0.01	307.20	0.26	21.08
2	5.91	5.58	0.00	0.01	319.45	0.29	22.42
3	6.53	6.30	0.00	0.01	331.68	0.31	22.89
4	6.88	6.72	0.00	0.01	343.91	0.34	22.37
5	-6.92	+6.80	0.00	-0.01	356.14	-0.36	20.72
6	6.64	6.52	+0.01	0.01	8.36	0.39	17.82
7	6.01	5.85	0.01	0.01	20.57	0.42	13.62
8	5.02	4.83	0.01	0.01	32.78	0.45	8.27
9	3.72	3.47	0.01	0.01	44.97	0.48	2.16
10	-2.15	+1.86	+0.01	-0.01	57.16	-0.51	355.88
11	-0.40	+0.10	0.01	0.01	69.35	0.55	350.06
12	+1.43	-1.67	0.01	0.01	81.53	0.58	345.12
13	3.19	3.32	0.01	0.01	93.72	0.62	341.31
14	4.76	4.72	0.02	-0.01	105.90	0.65	338.71
15	+6.03	-5.79	+0.02	0.00	118.08	-0.68	337.32
16	+6.90	-6.47	+0.02	0.00	130.27	-0.71	337.13

EPHEMERIS FOR PHYSICAL OBSERVATIONS OF THE MOON.

FOR GREENWICH MEAN MIDNIGHT.

Date.	The Earth's Selenographic—		Physical Libration.		The Sun's Selenographic—		C
	Long.	Lat.	Long.	Lat.	Colong.	Lat.	
	°	°	°	°	°	°	°
Aug. 16	+6.90	—6.47	+0.02	0.00	130.27	—0.71	337.13
17	7.32	6.76	0.02	0.00	142.47	0.74	338.12
18	7.31	6.69	0.02	0.00	154.67	0.76	340.26
19	6.89	6.29	0.02	0.00	166.87	0.78	343.45
20	6.10	5.60	0.02	0.00	179.08	0.80	347.52
21	+5.04	—4.67	+0.02	0.00	191.30	—0.82	352.23
22	3.77	3.55	0.02	0.00	203.53	0.84	357.27
23	2.39	2.29	0.02	0.00	215.75	0.86	2.32
24	+0.96	—0.94	0.02	0.00	227.98	0.88	7.13
25	—0.43	+0.46	0.01	0.00	240.22	0.89	11.47
26	—1.74	+1.84	+0.01	0.00	252.46	—0.91	15.22
27	2.91	3.15	0.01	0.00	264.70	0.92	18.30
28	3.90	4.34	0.01	0.00	276.94	0.94	20.65
29	4.68	5.34	0.01	0.00	289.18	0.96	22.21
30	5.24	6.09	0.01	0.00	301.41	0.97	22.90
31	—5.58	+6.56	+0.01	0.00	313.65	—0.99	22.61
Sept. 1	5.70	6.69	0.01	0.00	325.88	1.00	21.23
2	5.59	6.48	0.01	0.00	338.10	1.02	18.64
3	5.25	5.90	0.01	0.00	350.32	1.04	14.81
4	4.68	4.98	0.01	0.00	2.53	1.06	9.85
5	—3.89	+3.75	+0.01	0.00	14.73	—1.08	4.07
6	2.87	2.28	0.01	0.00	26.92	1.11	357.98
7	1.65	+0.63	0.02	0.00	39.11	1.13	352.12
8	—0.26	—1.08	0.02	0.00	51.29	1.16	346.95
9	+1.22	2.72	0.02	0.00	63.47	1.18	342.74
10	+2.71	—4.17	+0.02	0.00	75.64	—1.21	339.65
11	4.09	5.34	0.02	0.00	87.81	1.23	337.74
12	5.24	6.15	0.02	0.00	99.98	1.26	337.03
13	6.08	6.58	0.02	0.00	112.15	1.28	337.55
14	6.51	6.61	0.02	0.00	124.32	1.30	339.28
15	+6.52	—6.29	+0.02	0.00	136.50	—1.32	342.16
16	6.13	5.66	0.02	0.00	148.69	1.33	346.09
17	5.36	4.78	0.02	0.00	160.88	1.34	350.63
18	4.30	3.70	0.02	0.00	173.07	1.35	355.66
19	3.02	2.47	0.02	0.00	185.27	1.36	0.78
20	+1.63	—1.16	+0.02	0.00	197.48	—1.37	5.69
21	+0.21	+0.21	0.02	0.00	209.69	1.38	10.20
22	—1.14	1.57	0.01	0.00	221.90	1.39	14.14
23	2.35	2.88	0.01	0.00	234.12	1.40	17.45
24	3.36	4.07	0.01	0.00	246.34	1.40	20.04
25	—4.11	+5.09	+0.01	0.00	258.57	—1.41	21.86
26	4.60	5.88	0.01	0.00	270.79	1.41	22.83
27	4.81	6.39	0.01	0.00	283.02	1.42	22.82
28	4.78	6.57	0.01	0.00	295.24	1.42	21.71
29	4.52	6.40	0.01	0.00	307.46	1.43	19.39
30	—4.10	+5.86	+0.01	0.00	319.68	—1.43	15.80
Oct. 1	—3.53	+4.98	+0.01	0.00	331.89	—1.44	11.05

EPHEMERIS FOR PHYSICAL OBSERVATIONS OF THE MOON.

FOR GREENWICH MEAN MIDNIGHT.

Date.	The Earth's Selenographic—		Physical Libration.		The Sun's Selenographic—		c
	Long.	Lat.	Long.	Lat.	Colong.	Lat.	
	°	°	°	°	°	°	°
Oct. 1	−3.53	+4.98	+0.01	0.00	331.89	−1.44	11.06
2	2.85	3.81	0.01	0.00	344.09	1.45	5.45
3	2.08	2.39	0.01	0.00	356.29	1.46	359.46
4	1.22	+0.82	0.02	0.00	8.48	1.47	353.62
5	−0.26	−0.81	0.02	0.00	20.66	1.48	348.36
6	+0.76	−2.39	+0.02	0.00	32.83	−1.49	343.97
7	1.84	3.83	0.02	0.00	45.00	1.50	340.56
8	2.92	5.03	0.02	0.00	57.16	1.51	338.28
9	3.92	5.90	0.02	0.00	69.32	1.52	337.12
10	4.76	6.41	0.02	0.00	81.47	1.53	337.16
11	+5.35	−6.54	+0.02	0.00	93.63	−1.54	338.42
12	5.62	6.30	0.02	0.00	105.78	1.55	340.88
13	5.53	5.72	0.02	0.00	117.94	1.55	344.43
14	5.08	4.88	0.02	0.00	130.10	1.56	348.66
15	4.28	3.82	0.02	0.00	142.27	1.56	353.84
16	+3.21	−2.61	+0.02	0.00	154.44	−1.56	359.02
17	1.93	−1.30	0.02	0.00	166.61	1.56	4.07
18	+0.54	+0.05	0.02	0.00	178.79	1.55	8.74
19	−0.87	1.40	0.01	0.00	190.97	1.55	12.86
20	2.20	2.70	0.01	0.00	203.16	1.54	16.40
21	−3.35	+3.89	+0.01	0.00	215.36	−1.54	19.24
22	4.25	4.93	0.01	0.00	227.56	1.53	21.34
23	4.85	5.76	0.01	0.00	239.76	1.53	22.63
24	5.09	6.31	0.01	0.00	251.97	1.52	22.88
25	4.99	6.54	0.01	0.00	264.18	1.51	22.25
26	−4.58	+6.42	+0.01	0.00	276.39	−1.51	20.30
27	3.90	5.92	0.01	0.00	288.60	1.50	17.01
28	3.05	5.06	0.01	0.00	300.80	1.49	12.46
29	2.10	3.89	0.01	0.00	313.01	1.48	6.92
30	1.11	2.46	0.01	0.00	325.20	1.47	0.88
31	−0.14	+0.89	+0.01	0.00	337.40	−1.46	354.91
Nov. 1	+0.80	−0.74	0.01	0.00	349.58	1.46	349.49
2	1.68	2.32	0.01	0.00	1.76	1.45	344.91
3	2.51	3.75	0.02	0.00	13.92	1.45	341.32
4	3.28	4.95	0.02	0.00	26.09	1.44	338.73
5	+3.96	−5.84	+0.02	0.00	38.24	−1.44	337.31
6	4.52	6.39	0.02	0.00	50.39	1.43	336.97
7	4.93	6.57	0.02	0.00	62.53	1.42	337.81
8	5.14	6.39	0.02	0.00	74.67	1.42	339.84
9	5.08	5.87	0.02	0.00	86.81	1.41	343.01
10	+4.75	−5.06	+0.02	+0.01	98.95	−1.40	347.16
11	4.13	4.02	0.02	0.01	111.09	1.39	352.01
12	3.23	2.81	0.02	0.01	123.24	1.38	357.19
13	2.10	1.49	0.01	0.01	135.39	1.36	2.35
14	+0.79	−0.12	0.01	0.01	147.54	1.35	7.20
15	−0.61	+1.25	+0.01	+0.01	159.70	−1.33	11.54
16	−2.03	+2.57	+0.01	+0.01	171.86	−1.32	15.27

EPHEMERIS FOR PHYSICAL OBSERVATIONS OF THE MOON.

FOR GREENWICH MEAN MIDNIGHT.

Date.	The Earth's Selenographic—		Physical Libration.		The Sun's Selenographic—		C
	Long.	Lat.	Long.	Lat.	Colong.	Lat.	
Nov. 16	• -2.03	• +2.57	• +0.01	• +0.01	• 171.86	• -1.32	• 15.27
17	3.36	3.78	0.01	0.01	184.02	1.30	18.33
18	4.51	4.84	+0.01	0.01	196.19	1.28	20.69
19	5.40	5.71	0.00	0.01	208.37	1.27	22.28
20	5.95	6.32	0.00	0.01	220.56	1.25	23.00
21	-6.10	+6.63	0.00	+0.01	232.74	-1.23	22.73
22	5.84	6.59	0.00	0.01	244.94	1.21	21.29
23	5.19	6.18	0.00	0.01	257.13	1.19	18.51
24	4.19	5.38	0.00	0.01	269.83	1.17	14.36
25	2.94	4.23	0.00	0.01	281.52	1.15	9.01
26	-1.55	+2.79	+0.01	+0.01	293.72	-1.13	2.91
27	-0.13	+1.15	0.01	0.01	305.91	1.11	356.67
28	+1.24	-0.55	0.01	0.01	318.10	1.09	350.88
29	2.47	2.20	0.01	0.01	330.28	1.07	345.95
30	3.53	3.70	0.01	0.01	342.45	1.05	342.05
Dec. 1	+4.40	-4.95	+0.01	+0.01	354.62	-1.03	339.23
2	5.05	5.89	0.01	0.01	6.78	1.01	337.51
3	5.50	6.48	0.01	0.01	18.94	0.99	336.90
4	5.73	6.70	0.01	0.01	31.08	0.97	337.43
5	5.74	6.57	0.01	0.01	43.22	0.95	339.12
6	+5.53	-6.10	+0.01	+0.01	55.36	-0.92	341.94
7	5.10	5.33	0.01	0.01	67.49	0.90	345.77
8	4.44	4.32	0.01	0.01	79.62	0.88	350.41
9	3.57	3.11	0.01	0.01	91.76	0.86	355.51
10	2.50	1.78	0.01	0.01	103.89	0.83	0.71
11	+1.27	-0.38	+0.01	+0.01	116.02	-0.81	5.70
12	-0.09	+1.02	0.00	0.01	128.16	0.78	10.24
13	1.50	2.37	0.00	0.01	140.30	0.76	14.17
14	2.91	3.62	0.00	0.01	152.44	0.73	17.44
15	4.25	4.73	0.00	0.01	164.59	0.71	20.02
16	-5.42	+5.64	0.00	+0.01	176.74	-0.68	21.85
17	6.34	6.32	0.00	0.01	188.90	0.66	22.89
18	6.94	6.72	0.00	0.01	201.07	0.64	23.02
19	7.16	6.79	0.00	0.01	213.24	0.61	22.08
20	6.95	6.50	0.00	0.01	225.42	0.59	19.92
21	-6.29	+5.84	0.00	+0.01	237.60	-0.56	16.41
22	5.22	4.80	0.00	0.01	249.78	0.53	11.58
23	3.78	3.42	0.00	0.01	261.97	0.50	5.69
24	2.10	1.79	0.00	0.01	274.16	0.48	359.31
25	-0.30	+0.02	0.00	0.01	286.35	0.45	353.10
26	+1.50	-1.75	0.00	+0.01	298.54	-0.42	347.62
27	3.15	3.38	0.00	0.01	310.73	0.39	343.19
28	4.58	4.77	0.00	0.01	322.91	0.36	339.92
29	5.69	5.82	0.00	0.01	335.08	0.33	337.82
30	6.47	6.50	0.00	0.01	347.24	0.30	336.91
31	+6.90	-6.80	0.00	+0.01	359.40	-0.27	337.16
32	+6.98	-6.72	0.00	+0.01	11.56	-0.24	338.58

620 ILLUMINATED DISK OF MERCURY, 1916.

FOR GREENWICH MEAN NOON.

Date.	k	i	θ	L	Stellar Mag.	Date.	k	i	θ	L	Stellar Mag.
		°	°					°	°		
Jan. 1	0.958	24	4	33.4	-0.8	July 4	0.476	93	170	45.2	+0.2
6	0.917	34	358	40.3	0.8	9	0.621	76	175	54.9	-0.3
11	0.842	47	352	49.8	0.7	14	0.774	57	182	63.9	0.8
16	0.719	64	347	60.7	0.6	19	0.904	36	191	68.3	1.3
21	0.524	87	342	65.1	-0.3	24	0.982	16	208	64.8	1.6
26	0.294	114	337	51.9	+0.4	29	0.998	6	320	56.1	-1.6
31	0.085	146	327	19.1	1.6	Aug. 3	0.971	20	3	46.7	1.2
Feb. 5	0.009	169	248	2.0	2.7	8	0.927	31	12	39.4	0.8
10	0.080	147	182	15.4	1.7	13	0.877	41	18	34.5	0.4
15	0.220	124	174	31.4	1.1	18	0.827	49	21	31.4	-0.2
20	0.359	106	170	37.0	+0.7	23	0.775	56	23	29.8	0.0
25	0.474	93	166	36.5	0.5	28	0.723	64	25	29.5	+0.2
Mar. 1	0.566	82	163	34.2	0.4	Sept. 2	0.665	71	26	30.3	0.3
-6	0.641	74	160	32.1	0.3	7	0.596	79	28	31.7	0.4
11	0.704	66	157	30.7	0.2	12	0.516	88	29	33.7	0.5
16	0.754	59	154	30.0	+0.1	17	0.415	100	30	35.1	+0.6
21	0.806	52	152	30.5	-0.1	22	0.283	116	32	32.4	0.9
26	0.852	45	150	32.4	0.3	27	0.148	135	36	23.2	1.4
31	0.900	37	148	35.9	0.6	Oct. 2	0.029	160	48	6.0	2.4
Apr. 5	0.946	27	146	41.5	0.9	7	0.015	166	185	3.3	2.6
10	0.985	14	142	49.6	-1.4	12	0.153	134	204	30.7	+1.1
15	0.999	3	19	59.4	1.8	17	0.387	103	208	58.8	+0.1
20	0.966	21	338	67.6	1.6	22	0.615	77	209	65.1	-0.4
25	0.870	42	338	69.1	1.1	27	0.783	56	209	57.0	0.7
30	0.726	63	340	63.0	0.7	Nov. 1	0.886	40	209	46.3	0.8
May 5	0.571	82	343	53.3	-0.2	6	0.944	27	207	37.6	-0.8
10	0.427	98	345	43.3	+0.4	11	0.977	18	205	31.6	0.8
15	0.299	114	348	33.8	0.9	16	0.993	10	200	27.7	0.8
20	0.190	128	351	24.3	1.4	21	0.999	3	183	25.4	0.8
25	0.100	143	354	14.5	1.9	26	0.999	3	41	24.4	0.8
30	0.035	158	1	5.6	+2.5	Dec. 1	0.994	9	24	24.5	-0.7
June 4	0.004	173	39	0.7	3.3	6	0.982	15	18	25.8	0.6
9	0.014	166	139	2.4	3.0	11	0.963	22	12	28.2	0.6
14	0.063	151	153	9.6	2.2	16	0.933	30	7	32.3	0.6
19	0.139	136	158	18.8	1.7	21	0.885	40	2	38.5	0.6
24	0.235	122	162	27.7	+1.2	26	0.806	52	357	47.2	-0.6
29	0.348	108	166	36.4	+0.7	31	0.682	69	352	57.3	-0.5

NOTATION.

k = the ratio of the area of the illuminated portion of the apparent disk to the area of the entire apparent disk regarded as circular.

i = the angle between the Sun and Earth, as seen from the planet.

θ = the angle which the line joining the cusps, or extremities of the illuminated portion, makes with the meridian.

L = the brilliancy of the disk. The unit of L is the amount of light received by an eye from a circular disk with the same albedo as the planet, subtending an angular radius of one second of arc, situated at distance unity from the Sun, and illuminated by the latter as the mean disk of the planet is illuminated.

FOR GREENWICH MEAN NOON.

Date.	k	i	θ	L	Stellar Mag.	Date.	k	i	θ	L	Stellar Mag.
		°	°					°	°		
Jan. 1	0.892	38.4	348.5	59.1	-3.4	July 4	0.002	174.5	110.1	3.8	-2.8
6	0.882	40.1	346.5	60.4	3.4	9	0.015	165.9	155.3	23.8	3.2
11	0.872	41.8	344.6	61.9	3.4	14	0.043	156.0	164.2	63.4	3.6
16	0.862	43.6	343.0	63.5	3.4	19	0.063	146.6	167.8	107.1	3.8
21	0.851	45.4	341.5	65.2	3.4	24	0.128	138.1	170.2	144.0	4.0
26	0.839	47.3	340.2	67.0	-3.4	29	0.174	130.6	172.1	168.9	-4.1
31	0.827	49.1	339.2	69.0	3.4	Aug. 3	0.220	124.0	174.0	182.1	4.2
Feb. 5	0.815	50.9	338.4	71.1	3.5	8	0.264	118.1	176.0	186.9	4.2
10	0.801	53.0	337.8	73.4	3.5	13	0.306	112.8	178.0	185.8	4.2
15	0.787	55.0	337.4	75.9	3.5	18	0.345	108.1	180.0	180.8	4.2
20	0.772	57.0	337.3	78.6	-3.5	23	0.380	103.8	182.2	173.8	-4.1
25	0.757	59.1	337.3	81.4	3.6	28	0.414	99.9	184.4	165.9	4.1
Mar. 1	0.741	61.2	337.6	84.6	3.6	Sept. 2	0.446	96.2	186.6	157.5	4.1
6	0.724	63.4	338.0	88.0	3.6	7	0.475	92.8	188.8	149.5	4.0
11	0.706	65.7	338.7	91.6	3.6	12	0.503	89.6	191.0	141.8	4.0
16	0.687	68.0	339.6	95.6	-3.7	17	0.530	86.6	193.1	134.2	-3.9
21	0.668	70.4	340.7	99.9	3.7	22	0.555	83.7	195.1	127.7	3.9
26	0.648	72.9	341.9	104.7	3.7	27	0.579	81.0	197.0	121.4	3.9
31	0.626	75.4	343.4	109.7	3.8	Oct. 2	0.601	78.4	198.8	115.7	3.8
Apr. 5	0.603	78.1	345.0	115.1	3.8	7	0.623	75.8	200.4	110.2	3.8
10	0.579	80.8	346.7	121.3	-3.9	12	0.644	73.2	201.8	105.3	-3.7
15	0.554	83.7	348.6	127.7	3.9	17	0.664	70.8	203.0	100.7	3.7
20	0.528	86.7	350.5	134.7	3.9	22	0.683	68.5	203.9	96.4	3.7
25	0.501	89.9	352.4	142.3	4.0	27	0.702	66.2	204.6	92.6	3.7
30	0.471	93.3	354.3	150.2	4.0	Nov. 1	0.720	63.9	205.1	89.1	3.6
May 5	0.441	96.9	356.2	158.6	-4.1	6	0.737	61.7	205.3	85.8	-3.6
10	0.408	100.7	358.0	167.1	4.1	11	0.753	59.6	205.3	82.6	3.6
15	0.372	104.9	359.7	174.4	4.2	16	0.769	57.5	205.0	79.8	3.5
20	0.334	109.4	1.3	181.0	4.2	21	0.784	55.4	204.4	77.1	3.5
25	0.294	114.4	2.7	185.1	4.2	26	0.799	53.3	203.5	74.6	3.5
30	0.250	120.0	3.8	184.3	-4.2	Dec. 1	0.813	51.3	202.4	72.3	-3.5
June 4	0.204	126.3	4.9	176.5	4.2	6	0.826	49.3	201.0	70.1	3.5
9	0.157	133.3	5.9	159.3	4.2	11	0.838	47.4	199.3	68.1	3.4
14	0.110	141.2	7.1	130.3	4.0	16	0.850	45.5	197.3	66.2	3.4
19	0.067	150.1	9.0	90.1	3.8	21	0.862	43.6	195.1	64.4	3.4
24	0.031	159.8	13.1	46.3	-3.5	26	0.873	41.8	192.7	62.7	-3.4
29	0.008	169.8	27.7	12.8	-3.0	31	0.884	39.9	190.1	61.2	-3.4

NOTATION.

k = the ratio of the area of the illuminated portion of the apparent disk to the area of the entire apparent disk regarded as circular.

i = the angle between the Sun and Earth, as seen from the planet.

θ = the angle which the line joining the cusps, or extremities of the illuminated portion, makes with the meridian.

L = the brilliancy of the disk. The unit of L is the amount of light received by an eye from a circular disk with the same albedo as the planet, subtending an angular radius of one second of arc, situated at distance unity from the Sun, and illuminated by the latter as the mean disk of the planet is illuminated.

EPHEMERIS FOR PHYSICAL OBSERVATIONS OF MARS.

FOR GREENWICH MEAN NOON.

Date.	Light-Time.	Stellar Magnitude.	P	$A_{\oplus}+180^{\circ}$	D_{\oplus}	$A_{\odot}-A_{\oplus}$	D_{\odot}	\odot_{ϵ}
	m		.	.	.	.	.	.
Jan. 1	6.86	-0.2	9.54	240.18	+19.36	-27.91	+13.36	34.65
3	6.75	0.3	9.52	240.16	19.28	27.02	13.67	35.55
5	6.64	0.3	9.48	240.08	19.18	26.07	13.97	36.45
7	6.54	0.4	9.41	239.94	19.08	25.06	14.27	37.34
9	6.44	0.4	9.30	239.75	18.96	23.99	14.57	38.24
11	6.34	-0.5	9.16	239.50	+18.84	-22.87	+14.86	39.13
13	6.25	0.5	8.99	239.19	18.70	21.69	15.15	40.03
15	6.16	0.6	8.79	238.83	18.56	20.46	15.44	40.92
17	6.08	0.6	8.55	238.42	18.41	19.17	15.72	41.81
19	6.01	0.7	8.28	237.96	18.25	17.82	16.00	42.70
21	5.94	-0.7	7.99	237.44	+18.08	-16.43	+16.27	43.58
23	5.87	0.7	7.66	236.88	17.90	14.99	16.54	44.47
25	5.81	0.8	7.31	236.27	17.72	13.50	16.81	45.36
27	5.76	0.8	6.93	235.62	17.52	11.96	17.07	46.24
29	5.72	0.9	6.53	234.93	17.33	10.39	17.33	47.13
31	5.68	-0.9	6.10	234.21	+17.13	- 8.78	+17.58	48.01
Feb. 2	5.65	0.9	5.66	233.46	16.92	7.14	17.83	48.89
4	5.63	1.0	5.20	232.69	16.71	5.48	18.08	49.77
6	5.62	1.0	4.73	231.90	16.50	3.80	18.32	50.65
8	5.61	1.0	4.25	231.10	16.30	2.11	18.56	51.53
10	5.61	-1.0	3.76	230.30	+16.09	- 0.41	+18.79	52.41
12	5.62	1.0	3.28	229.50	15.89	+ 1.29	19.02	53.29
14	5.63	1.0	2.80	228.71	15.69	2.98	19.24	54.17
16	5.65	0.9	2.32	227.93	15.50	4.65	19.46	55.04
18	5.68	0.9	1.86	227.17	15.32	6.31	19.67	55.92
20	5.72	-0.9	1.41	226.44	+15.15	+ 7.95	+19.88	56.80
22	5.77	0.8	0.97	225.73	14.99	9.56	20.09	57.67
24	5.82	0.8	0.56	225.06	14.85	11.14	20.29	58.55
26	5.88	0.8	0.16	224.43	14.72	12.68	20.48	59.42
28	5.94	0.7	359.80	223.83	14.60	14.19	20.67	60.30
Mar. 1	6.01	-0.7	359.45	223.28	+14.49	+15.65	+20.86	61.17
3	6.09	0.6	359.14	222.78	14.41	17.07	21.04	62.04
5	6.17	0.6	358.86	222.32	14.34	18.44	21.21	62.92
7	6.26	0.5	358.60	221.92	14.28	19.77	21.38	63.79
9	6.35	0.5	358.38	221.56	14.25	21.04	21.55	64.66
11	6.45	-0.4	358.20	221.26	+14.23	+22.27	+21.71	65.54
13	6.55	0.4	358.04	221.01	14.23	23.45	21.87	66.41
15	6.66	0.3	357.92	220.81	14.25	24.58	22.02	67.28
17	6.77	0.3	357.82	220.66	14.28	25.66	22.16	68.16
19	6.88	0.2	357.76	220.56	14.33	26.69	22.30	69.03
21	7.00	-0.2	357.73	220.50	+14.39	+27.67	+22.44	69.90
23	7.12	0.1	357.73	220.50	14.47	28.61	22.57	70.78
25	7.24	-0.1	357.76	220.54	14.57	29.51	22.69	71.65
27	7.37	0.0	357.81	220.63	14.68	30.36	22.81	72.52
29	7.50	0.0	357.90	220.76	14.80	31.16	22.92	73.40
31	7.63	+0.1	358.01	220.94	+14.93	+31.93	+23.03	74.27
Apr. 2	7.76	+0.1	358.14	221.16	+15.08	+32.66	+23.13	75.15

EPHEMERIS FOR PHYSICAL OBSERVATIONS OF MARS.

FOR GREENWICH MEAN NOON.

FOR GREENWICH MEAN NOON.							Mean Time of Transit of Zero Meridian.			
Date.	<i>k</i>	Diameter.	<i>i</i>	<i>q</i>	<i>Q</i>	Central Meridian.	Of Date.	Of Intermediate Date.		
		"	"	"	"	"	h m	h m		
Jan.	1	0.944	12.23	27.41	0.69	287.90	331.50	1 56.9	2 34.2	
	3	0.947	12.43	26.48	0.65	287.61	313.34	3 11.5	3 48.6	
	5	0.951	12.63	25.49	0.61	287.28	295.23	4 25.7	5 2.8	
	7	0.955	12.84	24.46	0.57	286.91	277.18	5 39.8	6 16.7	
	9	0.959	13.04	23.37	0.53	286.49	259.18	6 53.6	7 30.4	
	11	0.963	13.24	22.23	0.49	286.00	241.24	8 7.2	8 43.9	
	13	0.967	13.43	21.04	0.45	285.42	223.35	9 20.5	9 57.1	
	15	0.970	13.62	19.80	0.40	284.76	205.51	10 33.6	11 10.1	
	17	0.974	13.80	18.51	0.36	284.00	187.73	11 46.5	12 22.9	
	19	0.978	13.97	17.17	0.31	283.11	170.00	12 59.2	13 35.4	
	21	0.981	14.14	15.79	0.27	282.07	152.31	14 11.6	14 47.8	
	23	0.984	14.29	14.37	0.22	280.83	134.68	15 23.9	15 59.9	
	25	0.987	14.43	12.92	0.18	279.32	117.08	16 36.0	17 11.9	
	27	0.990	14.56	11.43	0.14	277.42	99.53	17 47.9	18 23.8	
	29	0.993	14.67	9.92	0.11	274.98	82.01	18 59.6	19 35.5	
	31	0.995	14.77	8.39	0.08	271.69	64.53	20 11.3	20 47.0	
	Feb.	2	0.997	14.84	6.88	0.05	266.99	47.07	21 22.8	21 58.5
		4	0.998	14.90	5.41	0.04	259.77	29.63	22 34.2	23 10.0
		6	0.999	14.94	4.05	0.02	247.60	12.20	23 45.7	...
		8	0.999	14.96	3.02	0.01	225.64	354.79	0 21.4	0 57.0
10		0.999	14.96	2.72	0.01	191.96	337.38	1 32.7	2 8.4	
12		0.999	14.94	3.36	0.01	162.04	319.96	2 44.1	3 19.8	
14		0.998	14.90	4.54	0.02	144.56	302.53	3 55.6	4 31.3	
16		0.997	14.84	5.94	0.04	134.69	285.09	5 7.1	5 42.9	
18		0.996	14.76	7.42	0.06	128.60	267.62	6 18.7	6 54.6	
20		0.994	14.67	8.93	0.09	124.49	250.13	7 30.4	8 6.4	
	22	0.992	14.55	10.44	0.12	121.53	232.61	8 42.3	9 18.3	
	24	0.989	14.43	11.93	0.16	119.27	215.05	9 54.3	10 30.4	
	26	0.986	14.28	13.39	0.19	117.49	197.45	11 6.5	11 42.7	
	28	0.983	14.13	14.81	0.24	116.03	179.82	12 18.9	12 55.1	
	Mar.	1	0.980	13.96	16.20	0.28	114.82	162.13	13 31.4	14 7.8
		3	0.977	13.79	17.54	0.32	113.79	144.40	14 44.2	15 20.7
		5	0.973	13.60	18.84	0.36	112.91	126.62	15 57.2	16 33.8
		7	0.970	13.41	20.09	0.41	112.14	108.79	17 10.4	17 47.1
		9	0.966	13.22	21.29	0.45	111.47	90.91	18 23.8	19 0.6
		11	0.962	13.02	22.44	0.49	110.90	72.97	19 37.5	20 14.4
13		0.958	12.81	23.53	0.53	110.39	54.98	20 51.4	21 28.4	
15		0.955	12.61	24.58	0.57	109.93	36.94	22 5.5	22 42.7	
17		0.951	12.40	25.57	0.61	109.54	18.85	23 19.9	23 57.1	
19		0.947	12.20	26.51	0.64	109.19	0.70	...	0 34.4	
	21	0.944	11.99	27.41	0.67	108.89	342.51	1 11.8	1 49.2	
	23	0.940	11.79	28.26	0.70	108.64	324.27	2 26.6	3 4.2	
	25	0.937	11.59	29.06	0.73	108.42	305.98	3 41.7	4 19.3	
	27	0.934	11.39	29.81	0.75	108.24	287.65	4 57.0	5 34.7	
	29	0.931	11.19	30.52	0.78	108.08	269.27	6 12.5	6 50.3	
	31	0.928	11.00	31.19	0.80	107.96	250.84	7 28.1	8 6.0	
	Apr.	2	0.925	10.81	31.81	0.81	107.86	232.38	8 44.0	9 21.9

EPHEMERIS FOR PHYSICAL OBSERVATIONS OF MARS.
FOR GREENWICH MEAN NOON.

Date.	Light-Time.	Stellar Magnitude.	P	$A_{\oplus}+180^{\circ}$	D_{\oplus}	$A_{\odot}-A_{\oplus}$	D_{\odot}	\odot_{δ}
	m		.	.	.	.	.	.
Mar. 31	7.63	+0.1	358.01	220.94	+14.93	+31.93	+23.03	74.27
Apr. 2	7.76	0.1	358.14	221.16	15.08	32.66	23.13	75.15
4	7.90	0.2	358.30	221.42	15.24	33.35	23.23	76.02
6	8.03	0.2	358.49	221.72	15.41	34.00	23.32	76.90
8	8.17	0.3	358.70	222.05	15.58	34.61	23.40	77.78
10	8.31	+0.3	358.93	222.43	+15.77	+35.18	+23.48	78.65
12	8.45	0.4	359.19	222.84	15.97	35.73	23.56	79.53
14	8.59	0.4	359.46	223.28	16.17	36.24	23.62	80.41
16	8.74	0.4	359.75	223.76	16.38	36.72	23.69	81.29
18	8.88	0.5	0.07	224.27	16.60	37.17	23.74	82.17
20	9.02	+0.5	0.40	224.81	+16.83	+37.59	+23.79	83.05
22	9.17	0.6	0.74	225.38	17.06	37.98	23.84	83.93
24	9.31	0.6	1.11	225.98	17.29	38.35	23.88	84.81
26	9.46	0.6	1.49	226.60	17.53	38.68	23.91	85.69
28	9.60	0.7	1.88	227.25	17.77	39.00	23.93	86.57
30	9.75	+0.7	2.29	227.93	+18.01	+39.29	+23.96	87.46
May 2	9.90	0.7	2.72	228.64	18.26	39.55	23.97	88.34
4	10.04	0.8	3.15	229.36	18.51	39.79	23.98	89.23
6	10.19	0.8	3.60	230.12	18.76	40.01	23.98	90.12
8	10.33	0.8	4.06	230.89	19.01	40.21	23.98	91.01
10	10.48	+0.9	4.54	231.69	+19.26	+40.38	+23.96	91.90
12	10.62	0.9	5.02	232.51	19.51	40.54	23.95	92.79
14	10.77	0.9	5.52	233.35	19.76	40.67	23.93	93.68
16	10.91	0.9	6.02	234.22	20.00	40.78	23.90	94.57
18	11.05	1.0	6.53	235.10	20.25	40.88	23.86	95.47
20	11.20	+1.0	7.05	236.00	+20.49	+40.96	+23.82	96.36
22	11.34	1.0	7.58	236.92	20.74	41.02	23.78	97.26
24	11.48	1.0	8.12	237.86	20.97	41.06	23.72	98.16
26	11.62	1.1	8.67	238.81	21.21	41.09	23.66	99.06
28	11.76	1.1	9.22	239.78	21.44	41.10	23.60	99.96
30	11.90	+1.1	9.78	240.78	+21.67	+41.09	+23.52	100.86
June 1	12.03	1.1	10.35	241.78	21.89	41.06	23.44	101.77
3	12.17	1.2	10.92	242.80	22.11	41.02	23.36	102.65
5	12.31	1.2	11.50	243.84	22.32	40.97	23.27	103.53
7	12.44	1.2	12.08	244.90	22.53	40.90	23.17	104.50
9	12.58	+1.2	12.66	245.97	+22.73	+40.81	+23.07	105.41
11	12.71	1.2	13.25	247.06	22.92	40.71	22.96	106.32
13	12.84	1.3	13.85	248.16	23.11	40.60	22.84	107.24
15	12.97	1.3	14.44	249.27	23.29	40.47	22.72	108.16
17	13.10	1.3	15.04	250.40	23.46	40.33	22.59	109.06
19	13.23	+1.3	15.64	251.54	+23.62	+40.18	+22.45	110.00
21	13.35	1.3	16.25	252.69	23.78	40.02	22.31	110.92
23	13.48	1.3	16.85	253.85	23.93	39.84	22.16	111.85
25	13.60	1.4	17.45	255.03	24.07	39.65	22.01	112.77
27	13.73	1.4	18.06	256.22	24.20	39.44	21.85	113.70
29	13.85	+1.4	18.66	257.42	+24.32	+39.23	+21.68	114.64
July 1	13.97	+1.4	19.27	258.65	+24.43	+39.00	+21.51	115.57

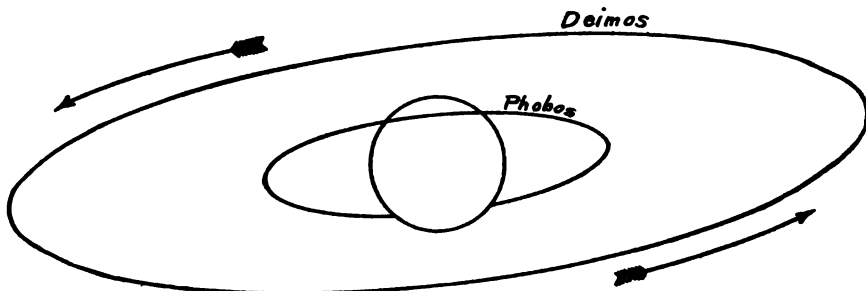
EPHEMERIS FOR PHYSICAL OBSERVATIONS OF MARS.

FOR GREENWICH MEAN NOON.

							Mean Time of Transit of Zero Meridian.	
Date.	<i>k</i>	Diameter.	<i>i</i>	<i>q</i>	<i>Q</i>	Central Meridian.	Of Date.	Of Intermedi- ate Date.
		"	"	"	"	"	h m	h m
Mar. 31	0.928	11.00	31.19	0.80	107.96	250.84	7 28.1	8 6.0
Apr. 2	0.925	10.81	31.81	0.81	107.86	232.38	8 44.0	9 21.9
4	0.922	10.63	32.40	0.83	107.79	213.87	10 0.0	10 38.0
6	0.919	10.45	32.95	0.84	107.75	195.32	11 16.2	11 54.3
8	0.917	10.27	33.46	0.85	107.72	176.73	12 32.5	13 10.8
10	0.915	10.10	33.93	0.86	107.71	158.11	13 49.0	14 27.4
12	0.913	9.93	34.37	0.87	107.72	139.45	15 5.7	15 44.1
14	0.911	9.77	34.78	0.87	107.75	120.75	16 22.5	17 1.0
16	0.909	9.61	35.16	0.88	107.80	102.03	17 39.5	18 18.0
18	0.907	9.45	35.50	0.88	107.85	83.27	18 56.6	19 35.2
20	0.905	9.30	35.82	0.88	107.92	64.48	20 13.8	20 52.5
22	0.904	9.15	36.12	0.88	108.01	45.66	21 31.2	22 9.9
24	0.902	9.01	36.38	0.88	108.10	26.81	22 48.6	23 27.4
26	0.901	8.87	36.63	0.88	108.20	7.93	...	0 6.2
28	0.900	8.74	36.84	0.87	108.31	349.02	0 45.1	1 24.0
30	0.899	8.61	37.04	0.87	108.42	330.10	2 2.8	2 41.8
May 2	0.898	8.48	37.22	0.86	108.55	311.14	3 20.7	3 59.7
4	0.897	8.36	37.37	0.86	108.69	292.16	4 38.7	5 17.8
6	0.897	8.24	37.50	0.85	108.82	273.15	5 56.8	6 35.9
8	0.896	8.12	37.62	0.84	108.96	254.13	7 15.0	7 54.1
10	0.896	8.01	37.71	0.84	109.11	235.08	8 33.3	9 12.5
12	0.895	7.90	37.79	0.83	109.26	216.00	9 51.7	10 30.9
14	0.895	7.80	37.85	0.82	109.41	196.91	11 10.1	11 49.4
16	0.894	7.69	37.90	0.81	109.56	177.80	12 28.7	13 8.0
18	0.894	7.59	37.93	0.80	109.72	158.67	13 47.3	14 26.7
20	0.894	7.50	37.95	0.79	109.88	139.52	15 6.0	15 45.4
22	0.894	7.40	37.96	0.78	110.03	120.35	16 24.9	17 4.3
24	0.894	7.31	37.95	0.77	110.19	101.16	17 43.7	18 23.2
26	0.894	7.22	37.93	0.76	110.35	81.95	19 2.7	19 42.2
28	0.894	7.14	37.90	0.75	110.50	62.73	20 21.7	21 1.3
30	0.895	7.06	37.85	0.74	110.66	43.49	21 40.8	22 20.4
June 1	0.895	6.97	37.80	0.73	110.81	24.23	23 0.0	23 39.6
3	0.895	6.90	37.73	0.72	110.96	4.96	...	0 19.3
5	0.896	6.82	37.66	0.71	111.11	345.67	0 58.9	1 38.6
7	0.896	6.75	37.57	0.70	111.25	326.37	2 18.2	2 57.9
9	0.897	6.67	37.47	0.69	111.40	307.05	3 37.6	4 17.4
11	0.897	6.60	37.37	0.68	111.53	287.71	4 57.1	5 36.9
13	0.898	6.54	37.26	0.67	111.67	268.37	6 16.7	6 56.4
15	0.899	6.47	37.14	0.66	111.80	249.00	7 36.3	8 16.1
17	0.899	6.41	37.01	0.65	111.93	229.63	8 55.9	9 35.8
19	0.900	6.34	36.87	0.64	112.05	210.24	10 15.6	10 55.5
21	0.901	6.28	36.73	0.62	112.17	190.84	11 35.4	12 15.3
23	0.901	6.23	36.58	0.61	112.28	171.43	12 55.2	13 35.1
25	0.902	6.17	36.43	0.60	112.38	152.01	14 15.0	14 55.0
27	0.903	6.11	36.26	0.59	112.49	132.57	15 35.0	16 14.9
29	0.904	6.06	36.09	0.58	112.58	113.13	16 54.9	17 34.9
July 1	0.905	6.01	35.92	0.57	112.67	93.67	18 14.9	18 55.0

APPARENT ORBITS OF THE SATELLITES OF MARS, AT DATE OF OPPOSITION,
FEBRUARY 9, 1916, AS SEEN IN AN INVERTING TELESCOPE.

South



North

Phobos.			Deimos.		
Date.	Position Angle of Apsis.	Apparent Distance at Apsis.	Date.	Position Angle of Apsis.	Apparent Distance at Apsis.
Jan. 11	280.6	17.0	Jan. 11	281.7	42.4
Feb. 10	274.8	19.2	Feb. 10	276.3	48.0
Mar. 11	268.9	16.7	Mar. 11	270.6	41.7

GREENWICH MEAN TIME OF GREATEST ELONGATION.

Phobos.					Deimos.																			
	d	h				d	h				d	h												
Jan.	17	19.6	E.		Feb.	3	13.3	W.		Feb.	20	7.0	E.		Jan.	15	20.1	E.		Feb.	13	5.0	W.	
	18	22.4	W.			4	16.1	E.			21	9.8	W.			17	17.5	W.			15	2.3	E.	
	20	1.2	E.			5	18.9	W.			22	12.5	E.			19	14.9	E.			16	23.7	W.	
	21	3.9	W.			6	21.6	E.			23	15.3	W.			21	12.3	W.			18	21.1	E.	
	22	6.7	E.			8	0.4	W.			24	18.1	E.			23	9.7	E.			20	18.5	W.	
	23	9.5	W.			9	3.2	E.			25	20.9	W.			25	7.1	W.			22	15.9	E.	
	24	12.3	E.			10	6.0	W.			26	23.7	E.			27	4.5	E.			24	13.3	W.	
	25	15.1	W.			11	8.7	E.			28	2.5	W.			29	1.9	W.			26	10.7	E.	
	26	17.8	E.			12	11.5	W.			29	5.2	E.			30	23.3	E.			28	8.1	W.	
	27	20.6	W.			13	14.3	E.	Mar.	1	8.0	W.		Feb.	1	20.7	W.		Mar.	1	5.5	E.		
	28	23.4	E.			14	17.1	W.			2	10.8	E.			3	18.0	E.			3	2.9	W.	
	30	2.2	W.			15	19.9	E.			3	13.6	W.			5	15.4	W.			5	0.3	E.	
	31	5.0	E.			16	22.7	W.			4	16.4	E.			7	12.8	E.			6	21.7	W.	
Feb.	1	7.7	W.			18	1.4	E.			5	19.1	W.			9	10.2	W.			8	19.2	E.	
	2	10.5	E.			19	4.2	W.			6	21.9	E.			11	7.6	E.			10	16.6	W.	

For Phobos every seventh eastern and western elongation is given, and for Deimos every third; the intermediate ones may be found by adding multiples of the period of the satellite.

Sidereal period of Phobos, $7^h 39^m 13^s.85$. Sidereal period of Deimos, $30^h 17^m 54^s.87$

EPHEMERIS FOR PHYSICAL OBSERVATIONS OF JUPITER.

FOR GREENWICH MEAN NOON.

Date.	Light-Time.	Stellar Magnitude.	P	$\Delta_{\oplus+180^\circ}$	D_{\oplus}	$\Delta_{\odot+180^\circ}$	D_{\odot}
	m		.	.	.	.	.
Jan. 1	42.89	-1.9	334.63	216.55	+1.83	227.45	+2.26
8	43.76	1.8	334.60	217.62	1.84	228.09	2.28
15	44.58	1.8	334.57	218.79	1.86	228.73	2.31
22	45.36	1.8	334.55	220.06	1.89	229.37	2.33
29	46.09	1.7	334.54	221.41	1.92	230.02	2.35
Feb. 5	46.76	-1.7	334.55	222.83	+1.95	230.66	+2.37
12	47.36	1.7	334.57	224.32	1.99	231.30	2.40
19	47.89	1.6	334.60	225.86	2.03	231.94	2.42
26	48.35	1.6	334.66	227.45	2.06	232.58	2.44
Mar. 4	48.73	1.6	334.73	229.07	2.12	233.22	2.46
May 1	48.79	-1.6	336.10	242.93	+2.54	238.54	+2.62
8	48.43	1.6	336.35	244.54	2.59	239.18	2.64
15	48.00	1.6	336.61	246.12	2.64	239.82	2.65
22	47.49	1.7	336.87	247.64	2.69	240.46	2.67
29	46.92	1.7	337.14	249.12	2.74	241.10	2.69
June 5	46.30	-1.7	337.42	250.54	+2.79	241.74	+2.70
12	45.61	1.8	337.69	251.89	2.84	242.38	2.72
19	44.88	1.8	337.96	253.16	2.89	243.03	2.74
26	44.10	1.8	338.22	254.35	2.93	243.67	2.75
July 3	43.28	1.9	338.47	255.44	2.98	244.31	2.77
10	42.43	-1.9	338.70	256.43	+3.02	244.95	+2.78
17	41.56	2.0	338.91	257.31	3.06	245.59	2.80
24	40.68	2.0	339.10	258.06	3.10	246.23	2.81
31	39.79	2.0	339.25	258.68	3.14	246.87	2.82
Aug. 7	38.91	2.1	339.38	259.16	3.18	247.51	2.84
14	38.05	-2.2	339.46	259.49	+3.21	248.15	+2.85
21	37.21	2.2	339.51	259.66	3.24	248.80	2.86
28	36.42	2.3	339.51	259.67	3.27	249.44	2.87
Sept. 4	35.63	2.3	339.47	259.51	3.29	250.08	2.89
11	35.00	2.3	339.39	259.20	3.31	250.72	2.90
18	34.41	-2.4	339.28	258.72	+3.32	251.36	+2.91
25	33.90	2.4	339.13	258.11	3.32	252.00	2.92
Oct. 2	33.50	2.4	338.95	257.37	3.32	252.64	2.93
9	33.20	2.4	338.75	256.54	3.31	253.28	2.94
16	33.03	2.5	338.53	255.63	3.29	253.92	2.95
23	32.98	-2.5	338.32	254.69	+3.27	254.56	+2.96
30	33.05	2.5	338.11	253.74	3.24	255.20	2.97
Nov. 6	33.25	2.4	337.91	252.83	3.20	255.83	2.98
13	33.57	2.4	337.73	251.99	3.16	256.47	2.98
20	34.01	2.4	337.58	251.25	3.12	257.11	2.99
27	34.55	-2.4	337.45	250.63	+3.07	257.75	+3.00
Dec. 4	35.18	2.3	337.36	250.16	3.03	258.39	3.01
11	35.90	2.3	337.29	249.84	2.99	259.02	3.01
18	36.69	2.2	337.26	249.70	2.95	259.66	3.02
25	37.54	2.2	337.27	249.72	2.91	260.30	3.03
32	38.42	-2.1	337.30	249.92	+2.88	260.94	+3.03

EPHEMERIS FOR PHYSICAL OBSERVATIONS OF JUPITER.

FOR GREENWICH MEAN NOON.

Date.		Equatorial Diameter.	Excess of Equat. Diameter over Polar.	i	q	Q	Central Meridian.		Correction for Phase.
							System I.	System II.	
		"	"	"	"	"	"	"	"
Jan.	1	38.82	2.35	10.90	0.35	67.09	215.88	288.39	-0.52
	8	38.06	2.31	10.48	0.32	67.20	239.58	258.68	0.43
	15	37.35	2.26	9.95	0.28	67.30	263.20	228.90	0.43
	22	36.71	2.22	9.32	0.24	67.43	286.76	199.06	0.28
	29	36.13	2.19	8.62	0.21	67.58	310.27	169.16	0.22
Feb.	5	35.62	2.16	7.83	0.17	67.77	333.74	139.22	-0.27
	12	35.16	2.13	6.98	0.13	68.01	357.18	109.26	0.21
	19	34.77	2.11	6.08	0.09	68.35	20.62	79.28	0.16
	26	34.44	2.09	5.14	0.07	68.80	44.05	49.31	0.12
Mar.	4	34.17	2.07	4.16	0.04	69.47	67.49	19.34	-0.08
May	1	34.13	2.07	4.39	0.05	245.00	211.80	81.11	+0.09
	8	34.38	2.08	5.36	0.08	245.77	235.70	51.60	0.12
	15	34.70	2.10	6.29	0.10	246.37	259.69	22.18	0.17
	22	35.06	2.12	7.17	0.14	246.89	283.77	352.85	0.22
	29	35.49	2.15	8.01	0.17	247.36	307.94	323.60	0.28
June	5	35.97	2.18	8.79	0.21	247.78	332.21	294.46	+0.34
	12	36.51	2.21	9.49	0.25	248.18	356.58	265.42	0.39
	19	37.11	2.24	10.12	0.29	248.57	21.05	236.47	0.44
	26	37.76	2.28	10.67	0.33	248.93	45.64	207.65	0.50
July	3	38.48	2.33	11.12	0.36	249.28	70.34	178.94	0.54
	10	39.24	2.37	11.47	0.39	249.61	95.17	150.35	+0.57
	17	40.06	2.42	11.71	0.42	249.92	120.12	121.89	0.60
	24	40.93	2.48	11.82	0.43	250.22	145.21	93.56	0.61
	31	41.85	2.53	11.80	0.44	250.49	170.43	65.36	0.60
Aug.	7	42.79	2.59	11.64	0.44	250.74	195.79	37.31	0.58
	14	43.76	2.65	11.32	0.42	250.99	221.29	9.39	+0.53
	21	44.75	2.71	10.86	0.40	251.22	246.92	341.62	0.51
	28	45.72	2.76	10.22	0.37	251.44	272.70	313.98	0.45
Sept.	4	46.67	2.82	9.43	0.32	251.67	298.61	286.47	0.38
	11	47.57	2.88	8.47	0.26	251.93	324.64	259.09	0.31
	18	48.40	2.93	7.36	0.20	252.26	350.77	231.81	+0.24
	25	49.12	2.97	6.12	0.14	252.74	16.99	204.62	0.18
Oct.	2	49.72	3.00	4.75	0.08	253.54	43.28	177.49	0.10
	9	50.15	3.03	3.28	0.04	255.15	69.59	150.39	0.05
	16	50.42	3.05	1.75	0.01	259.86	95.90	123.29	+0.01
	23	50.50	3.05	0.34	0.00	315.12	122.18	96.16	0.00
	30	50.38	3.05	1.48	0.01	57.61	148.38	68.95	-0.05
Nov.	6	50.08	3.03	3.01	0.03	63.70	174.47	41.63	0.04
	13	49.60	3.00	4.48	0.07	65.60	200.42	14.17	0.09
	20	48.97	2.96	5.86	0.13	66.51	226.19	346.54	0.15
	27	48.20	2.92	7.11	0.18	67.05	251.78	318.72	-0.22
Dec.	4	47.33	2.86	8.22	0.25	67.42	277.17	290.70	0.30
	11	46.38	2.80	9.17	0.30	67.70	302.34	262.46	0.37
	18	45.39	2.74	9.95	0.34	67.94	327.31	234.02	0.43
	25	44.36	2.68	10.56	0.38	68.16	352.06	205.38	0.49
	32	43.34	2.62	11.00	0.40	68.38	16.63	176.53	-0.53

EPHEMERIS FOR PHYSICAL OBSERVATIONS OF JUPITER,
SYSTEM I.

GREENWICH MEAN TIME.

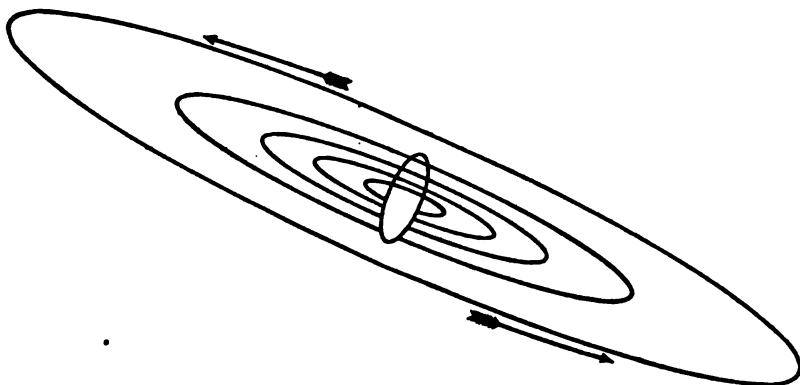
Transit of Zero Meridian.				Interval between Successive Transits.		Transit of Zero Meridian.				Interval between Successive Transits.		Transit of Zero Meridian.				Interval between Successive Transits.	
Jan.	d	h	m	h	m	June	d	h	m	h	m	Sept.	d	h	m	h	m
	1	3	57.31	9	50.65		4	5	3.86	9	50.59		18	19	55.59	9	50.42
	3	5	10.55				6	6	16.80				20	21	7.69		
	5	6	23.79				8	7	29.72				22	22	19.78		
	7	7	37.05				10	8	42.64				24	23	31.86		
	9	8	50.32				12	9	55.55				27	0	43.93		
	11	10	3.60	9	50.66		14	11	8.44	9	50.57		29	1	55.99	9	50.41
	13	11	16.88				16	12	21.31			Oct.	1	3	8.04		
	15	12	30.18				18	13	34.16				3	4	20.09		
	17	13	43.49				20	14	47.00				5	5	32.13		
	19	14	56.80				22	15	59.83				7	6	44.16		
	21	16	10.12	9	50.67		24	17	12.64	9	50.56		9	7	56.20	9	50.41
	23	17	23.45				26	18	25.43				11	9	8.23		
	25	18	36.78				28	19	38.21				13	10	20.26		
	27	19	50.12				30	20	50.98				15	11	32.29		
	29	21	3.46			July	2	22	3.73				17	12	44.32		
	31	22	16.80	9	50.67		4	23	16.46	9	50.54		19	13	56.35	9	50.41
Feb.	2	23	30.16				7	0	29.17				21	15	8.39		
	5	0	43.53				9	1	41.87				23	16	20.44		
	7	1	56.89				11	2	54.56				25	17	32.50		
	9	3	10.26				13	4	7.22				27	18	44.57		
	11	4	23.63	9	50.67		15	5	19.87	9	50.52		29	19	56.66	9	50.42
	13	5	36.99				17	6	32.50				31	21	8.77		
	15	6	50.37				19	7	45.12			Nov.	2	22	20.89		
	17	8	3.74				21	8	57.72				4	23	33.04		
	19	9	17.12				23	10	10.30				7	0	45.22		
	21	10	30.49	9	50.67		25	11	22.87	9	50.51		9	1	57.41	9	50.45
	23	11	43.86				27	12	35.42				11	3	9.63		
	25	12	57.24				29	13	47.95				13	4	21.88		
	27	14	10.61				31	15	0.46				15	5	34.15		
	29	15	23.99			Aug.	2	16	12.95				17	6	46.45		
Mar.	2	16	37.36	9	50.67		4	17	25.43	9	50.49		19	7	58.77	9	50.48
	4	17	50.73				6	18	37.89				21	9	11.12		
							8	19	50.33				23	10	23.51		
							10	21	2.76				25	11	35.93		
Apr.	28	7	8.57	9	50.63		12	22	15.17				27	12	48.36		
	30	8	21.75	9	50.63		14	23	27.56	9	50.47		29	14	0.82	9	50.50
May	2	9	34.91				17	0	39.93			Dec.	1	15	13.32		
	4	10	48.07				19	1	52.29				3	16	25.84		
	6	12	1.21				21	3	4.62				5	17	38.40		
	8	13	14.34				23	4	16.94				7	18	50.98		
	10	14	27.46	9	50.62		25	5	29.25	9	50.45		9	20	3.60	9	50.53
	12	15	40.57				27	6	41.53				11	21	16.24		
	14	16	53.66				29	7	53.79				13	22	28.91		
	16	18	6.74				31	9	6.04				15	23	41.61		
	18	19	19.81			Sept.	2	10	18.28				18	0	54.34		
	20	20	32.86	9	50.61		4	11	30.50	9	50.44		20	2	7.09	9	50.56
	22	21	45.90				6	12	42.70				22	3	19.87		
	24	22	58.93				8	13	54.88				24	4	32.68		
	27	0	11.94				10	15	7.05				26	5	45.52		
	29	1	24.94				12	16	19.21				28	6	58.38		
	31	2	37.93	9	50.59		14	17	31.34	9	50.42		30	8	11.26	9	50.59
June	2	3	50.90				16	18	43.46				32	9	24.17		

EPHEMERIS FOR PHYSICAL OBSERVATIONS OF JUPITER,
SYSTEM II.

GREENWICH MEAN TIME.

Transit of Zero Meridian.				Interval between Successive Transits.		Transit of Zero Meridian.				Interval between Successive Transits.		Transit of Zero Meridian.				Interval between Successive Transits.	
Jan.	d	h	m	h	m	June	d	h	m	h	m	Sept.	d	h	m	h	m
	1	1	59.38	9	55.83		2	14	13.29	9	55.77		18	3	31.69	9	55.39
	3	3	38.52				4	15	52.14				20	5	9.68		
	5	5	17.66				6	17	30.98				22	6	47.66		
	7	6	56.81				8	19	9.80				24	8	25.62		
	9	8	35.97				10	20	48.60				26	10	3.57		
	11	10	15.15	9	55.84		12	22	27.39	9	55.75		28	11	41.51	9	55.38
	13	11	54.33				15	0	6.17				30	13	19.44		
	15	13	33.52				17	1	44.94			Oct.	2	14	57.37		
	17	15	12.73				19	3	23.68				4	16	35.28		
	19	16	51.95				21	5	2.41				6	18	13.20		
	21	18	31.17	9	55.85		23	6	41.12	9	55.74		8	19	51.11	9	55.38
	23	20	10.39				25	8	19.82				10	21	29.02		
	25	21	49.62				27	9	58.50				12	23	6.93		
	27	23	28.86				29	11	37.17				15	0	44.84		
	30	1	8.11			July	1	13	15.82				17	2	22.75		
Feb.	1	2	47.36	9	55.85		3	14	54.46	9	55.72		19	4	0.66	9	55.38
	3	4	26.61				5	16	33.08				21	5	38.57		
	5	6	5.87				7	18	11.68				23	7	16.50		
	7	7	45.13				9	19	50.27				25	8	54.43		
	9	9	24.40				11	21	28.83				27	10	32.38		
	11	11	3.66	9	55.85		13	23	7.38	9	55.70		29	12	10.35	9	55.38
	13	12	42.93				16	0	45.92				31	13	48.33		
	15	14	22.21				18	2	24.43			Nov.	2	15	26.34		
	17	16	1.48				20	4	2.93				4	17	4.36		
	19	17	40.75				22	5	41.41				6	18	42.41		
	21	19	20.03	9	55.85		24	7	19.88	9	55.69		8	20	20.49	9	55.38
	23	20	59.30				26	8	58.32				10	21	58.58		
	25	22	38.58				28	10	36.76				12	23	36.70		
	28	0	17.85				30	12	15.18				15	1	14.85		
Mar.	1	1	57.13			Aug.	1	13	53.56				17	2	53.03		
	3	3	36.40	9	55.85		3	15	31.93	9	55.67		19	4	31.23	9	55.38
	5	5	15.67				5	17	10.29				21	6	9.46		
							7	18	48.62				23	7	47.72		
							9	20	26.95				25	9	26.01		
Apr.	26	8	31.65	9	55.81		11	22	5.26				27	11	4.34		
	28	10	10.74	9	55.81		13	23	43.54	9	55.65		29	12	42.69	9	55.38
	30	11	49.82				16	1	21.80			Dec.	1	14	21.07		
May	2	13	28.87				18	3	0.06				3	15	59.48		
	4	15	7.93				20	4	38.29				5	17	37.92		
	6	16	46.97				22	6	16.50				7	19	16.39		
	8	18	25.99	9	55.80		24	7	54.69	9	55.63		9	20	54.89	9	55.38
	10	20	5.01				26	9	32.86				11	22	33.42		
	12	21	44.02				28	11	11.02				14	0	11.98		
	14	23	23.01				30	12	49.18				16	1	50.56		
	17	1	1.98			Sept.	1	14	27.29				18	3	29.18		
	19	2	40.94	9	55.79		3	16	5.40	9	55.61		20	5	7.82	9	55.38
	21	4	19.90				5	17	43.48				22	6	46.49		
	23	5	58.83				7	19	21.56				24	8	25.18		
	25	7	37.75				9	20	59.62				26	10	3.91		
	27	9	16.66				11	22	37.66				28	11	42.67		
	29	10	55.55	9	55.77		14	0	15.68	9	55.60		30	13	21.44	9	55.38
	31	12	34.43				16	1	53.70				32	15	0.25		

South



North

APPARENT ORBITS OF THE SATELLITES OF JUPITER AT DATE OF OPPOSITION, OCTOBER 23, 1916, AS SEEN IN AN INVERTING TELESCOPE, AND ELONGATED IN THE RATIO OF THREE TO ONE IN THE DIRECTION OF THEIR MINOR AXES.

In the above diagram the central ellipse represents the disk of Jupiter, and the inner orbit is that of Satellite V.

In the diagrams of the configurations of Jupiter's four brighter satellites, pages 637-655, Jupiter is represented by a light disk, \bigcirc , in the center of the page, and the relative positions of the satellites at the Greenwich time stated above the diagrams are indicated by dots. The designation of each satellite is shown by a numeral placed to the right or left of the dot, according as the motion of the satellite at the instant in question is toward the east or toward the west, the motion being always toward the numeral. In constructing the diagrams the latitudes of the satellites are always considered zero, except where two or more of them chance to be at nearly the same distance from the planet, when they are placed one above the other, according to their apparent latitudes. If, at the epoch of any configuration, one or more satellites are projected on the disk of the planet, that phenomenon is indicated by a light disk, \bigcirc , at the left-hand side of the page; and if any satellites are invisible on account of being occulted behind the disk of the planet, or eclipsed by its shadow, that circumstance is indicated by a dark disk, \bullet , at the right-hand side of the page. In both cases the annexed numerals serve to point out which satellites are thus rendered invisible.

MEAN SYNODIC PERIODS OF THE SATELLITES.

	d	h	m	s	=	d		d	h	m	s	=	d	
I.	1	18	28	35.946	=	1.769	860	49	V.	0	11	57	27.635	= 0.498 236 52
II.	3	13	17	53.736	=	3.554	094	17	VI.					=266.00
III.	7	3	59	35.856	=	7.166	387	22	VII.					=276.67
IV.	16	18	5	6.916	=	16.753	552	27						

SATELLITE V.

GREENWICH MEAN TIME OF EVERY TWENTIETH GREATEST ELONGATION.

July	d	h	E.	Oct.	d	h	E.	July	d	h	W.	Oct.	d	h	W.
	15	1.4	E.		12	17.4	E.		15	7.4	W.		12	23.4	W.
	25	0.6	E.		22	16.5	E.		25	6.5	W.		22	22.4	W.
Aug.	3	23.7	E.	Nov.	1	15.5	E.	Aug.	4	5.7	W.	Nov.	1	21.5	W.
	13	22.8	E.		11	14.6	E.		14	4.8	W.		11	20.6	W.
	23	21.9	E.		21	13.7	E.		24	3.9	W.		21	19.7	W.
Sept.	2	21.0	E.	Dec.	1	12.9	E.	Sept.	3	3.0	W.	Dec.	1	18.8	W.
	12	20.1	E.		11	12.0	E.		13	2.1	W.		11	18.0	W.
	22	19.2	E.		21	11.1	E.		23	1.2	W.		21	17.1	W.
Oct.	2	18.3	E.		31	10.3	E.	Oct.	3	0.3	W.		31	16.3	W.

GREENWICH MEAN TIME OF SUPERIOR GEOCENTRIC CONJUNCTION.

SATELLITE I.

Jan.	d	h	m	s	May	d	h	m	s	Aug.	d	h	m	s	Oct.	d	h	m	s
	1	12	33	40		18	15	56	36		4	13	27	11		21	9	7	21
	3	7	3	17		20	10	26	41		6	7	55	20		23	3	33	14
	5	1	32	54		22	4	56	48		8	2	23	29		24	21	59	13
	6	20	2	35		23	23	26	51		9	20	51	28		26	16	25	5
	8	14	32	17		25	17	56	56		11	15	19	31		28	10	51	5
	10	9	2	5		27	12	26	56		13	9	47	23		30	5	17	1
	12	3	31	52		29	6	56	57		15	4	15	17		31	23	43	4
	13	22	1	43		31	1	26	53		16	22	42	59	Nov.	2	18	9	2
	15	16	31	35	June	1	19	56	51		18	17	10	46		4	12	35	8
	17	11	1	32		3	14	26	44		20	11	38	21		6	7	1	11
	19	5	31	26		5	8	56	38		22	6	5	58		8	1	27	22
	21	0	1	29		7	3	26	25		24	0	33	24		9	19	53	28
	22	18	31	29		8	21	56	17		25	19	0	53		11	14	19	45
	24	13	1	34		10	16	26	2		27	13	28	12		13	8	45	58
	26	7	31	38		12	10	55	48		29	7	55	32		15	3	12	21
	28	2	1	45		14	5	25	28		31	2	22	41		16	21	38	38
	29	20	31	52		15	23	55	11	Sept.	1	20	49	53		18	16	5	4
	31	15	2	4		17	18	24	47		3	15	16	55		20	10	31	35
Feb.	2	9	32	16		19	12	54	24		5	9	43	58		22	4	58	17
	4	4	2	29		21	7	23	55		7	4	10	50		23	23	24	45
	5	22	32	43		23	1	53	29		8	22	37	46		25	17	51	30
	7	17	3	0		24	20	22	55		10	17	4	31		27	12	18	13
	9	11	33	18		26	14	52	23		12	11	31	19		29	6	45	7
	11	6	3	36		28	9	21	43		14	5	57	55	Dec.	1	1	11	58
	13	0	33	55		30	3	51	7		16	0	24	35		2	19	39	0
	14	19	4	17	July	1	22	20	21		17	18	51	5		4	14	6	1
	16	13	34	39		3	16	49	41		19	13	17	39		6	8	33	13
	18	8	5	1		5	11	18	50		21	7	44	0		8	3	0	22
	20	2	35	24		7	5	48	3		23	2	10	27		9	21	27	43
	21	21	5	50		9	0	17	7		24	20	36	44		11	15	58	3
	23	15	36	15		10	18	46	13		26	15	3	4		13	10	22	34
	25	10	6	41		12	13	15	10		28	9	29	13		15	4	50	2
	27	4	37	7		14	7	44	11		30	3	55	27		16	23	17	41
	28	23	7	35		16	2	13	3	Oct.	1	22	21	33		18	17	45	21
	...	...	...	...		17	20	41	56		3	16	47	42		20	12	13	11
May	2	17	24	30		19	15	10	40		5	11	13	42		22	6	40	58
	4	11	54	50		21	9	39	28		7	5	39	47		24	1	8	56
	6	6	25	6		23	4	8	6		9	0	5	45		25	19	36	55
	8	0	55	23		24	22	36	46		10	18	31	48		27	14	5	4
	9	19	25	37		26	17	5	15		12	12	57	41		29	8	33	5
	11	13	55	53		28	11	33	49		14	7	23	41		31	3	1	28
	13	8	26	4		30	6	2	13		16	1	49	34					
	15	2	56	14	Aug.	1	0	30	40		17	20	15	34					
	16	21	26	24		2	18	58	54		19	14	41	23					

GREENWICH MEAN TIME OF SUPERIOR GEOCENTRIC CONJUNCTION.

SATELLITE II.

	d	h m s		d	h m s		d	h m s		d	h m s
Jan.	1	4 54 42	May	11	21 42 24	Aug.	1	16 54 52	Oct.	22	7 52 54
	4	18 17 3		15	11 7 12		5	6 11 0		25	20 59 14
	8	7 39 14		19	0 32 16		8	19 26 37		29	10 5 44
	11	21 2 29		22	13 56 36		12	8 41 37	Nov.	1	23 12 20
	15	10 25 26		26	3 21 8		15	21 56 7		5	12 19 12
	18	23 49 23		29	16 45 0		19	11 9 54		9	1 26 17
	22	13 13 8	June	2	6 8 56		23	0 23 11		12	14 33 45
	26	2 37 52		5	19 32 13		26	13 35 51		16	3 41 35
	29	16 2 7		9	8 55 31		30	2 47 57		19	16 49 53
Feb.	2	5 27 28		12	22 18 11	Sept.	2	15 59 30		23	5 58 38
	5	18 52 16		16	11 40 45		6	5 10 27		26	19 7 55
	9	8 18 9		20	1 2 45		9	18 20 51		30	8 17 45
	12	21 43 24		23	14 24 35		13	7 30 43	Dec.	3	21 28 14
	16	11 9 41		27	3 45 51		16	20 40 3		7	10 39 17
	20	0 35 18		30	17 6 50		20	9 48 54		10	23 50 59
	23	14 1 57	July	4	6 27 19		23	22 57 15		14	13 3 17
	27	3 27 51		7	19 47 27		27	12 5 12		18	2 16 17
				11	9 7 5	Oct.	1	1 12 45		21	15 29 55
				14	22 26 17		4	14 19 58		25	4 44 13
				18	11 44 59		8	3 26 53		28	17 59 10
May	1	5 25 40		22	1 3 14		11	16 33 35		32	7 14 45
	4	18 51 41		25	14 20 59		15	5 40 7			
	8	8 16 51		29	3 38 12		18	18 46 31			

SATELLITE III.

	d	h m s		d	h m s		d	h m s		d	h m s
Jan.	5	23 21 2	May	14	7 46 25	Aug.	1	6 32 17	Oct.	18	21 34 59
	13	3 37 45		21	12 13 24		8	10 26 55		26	0 50 29
	20	7 57 4		28	16 39 9		15	14 17 18	Nov.	2	4 5 49
	27	12 19 1	June	4	21 2 20		22	18 3 38		9	7 22 43
Feb.	3	16 43 39		12	1 23 20		29	21 44 39		16	10 42 15
	10	21 10 0		19	5 42 3	Sept.	6	1 21 8		23	14 5 27
	18	1 38 24		26	9 58 26		13	4 52 17		30	17 33 21
	25	6 7 25	July	3	14 12 35		20	8 18 58	Dec.	7	21 5 33
				10	18 23 7		27	11 41 45		15	0 43 4
				17	22 30 30	Oct.	4	15 1 26		22	4 24 57
May	7	3 17 43		25	2 33 27		11	18 19 15		29	8 11 55

SATELLITE IV.

	d	h m s		d	h m s		d	h m s		d	h m s
Jan.	3	14 57 47	May	17	12 16 23	Aug.	9	12 52 16	Oct.	31	17 0 58
	20	10 39 33	June	3	8 43 28		26	5 47 58	Nov.	17	7 20 50
Feb.	6	6 53 58		20	4 45 28	Sept.	11	21 42 23		3	22 23 25
	23	3 32 30	July	7	0 12 43		28	12 40 53	Dec.	20	14 26 0
				23	18 57 46	Oct.	15	2 58 4			

DIFFERENTIAL COORDINATES OF SATELLITE VI.

Greenwich Mean Noon.	$\alpha_{VI}-\alpha_{Jup.}$	$\delta_{VI}-\delta_{Jup.}$	Greenwich Mean Noon.	$\alpha_{VI}-\alpha_{Jup.}$	$\delta_{VI}-\delta_{Jup.}$	Greenwich Mean Noon.	$\alpha_{VI}-\alpha_{Jup.}$	$\delta_{VI}-\delta_{Jup.}$
	m s	'		m s	'		m s	'
Jan. 1	-2 3	+1.9	June 8	+2 41	+ 9.0	Sept. 20	-3 21	-10.1
3	1 55	1.5	10	2 36	9.6	22	3 15	11.3
5	1 47	1.1	12	2 30	10.2	24	3 9	12.4
7	1 38	0.7	14	2 24	10.7	26	3 1	13.4
9	1 30	+0.3	16	2 18	11.3	28	2 53	14.4
11	-1 21	-0.1	18	+2 12	+11.8	Oct. 30	-2 44	-15.3
13	1 12	0.6	20	2 5	12.4	2	2 35	16.2
15	1 3	1.0	22	1 58	12.9	4	2 24	17.0
17	0 54	1.4	24	1 50	13.4	6	2 13	17.8
19	0 45	1.8	26	1 42	13.9	8	2 2	18.4
21	-0 36	-2.2	28	+1 34	+14.3	10	-1 50	-19.0
23	0 27	2.6	30	1 26	14.8	12	1 38	19.6
25	0 18	3.1	July 2	1 17	15.2	14	1 25	20.1
27	0 10	3.4	4	1 7	15.5	16	1 12	20.5
29	-0 1	3.8	6	0 58	15.9	18	0 58	20.8
31	+0 8	-4.2	8	+0 48	+16.2	20	-0 45	-21.1
Feb. 2	0 16	4.6	10	0 38	16.4	22	0 31	21.4
4	0 24	4.9	12	0 28	16.6	24	0 17	21.5
6	0 33	5.2	14	0 17	16.8	26	-0 4	21.7
8	0 41	5.5	16	+0 6	16.9	28	+0 10	21.7
10	+0 49	-5.8	18	-0 5	+17.0	Nov. 30	+0 24	-21.7
12	0 56	6.1	20	0 16	16.9	1	0 38	21.7
14	1 4	6.4	22	0 28	16.8	3	0 52	21.6
16	1 12	6.6	24	0 39	16.7	5	1 5	21.4
18	1 19	6.8	26	0 50	16.5	7	1 18	21.2
20	+1 26	-7.0	28	-1 2	+16.2	9	+1 31	-21.0
22	1 32	7.2	30	1 13	15.9	11	1 43	20.7
24	1 38	7.4	Aug. 1	1 25	15.5	13	1 55	20.3
26	1 44	7.6	3	1 36	15.1	15	2 7	19.9
28	1 50	7.7	5	1 47	14.6	17	2 18	19.5
Mar. 1	+1 55	-7.8	7	-1 58	+14.0	19	+2 29	-19.0
. . .	. . .	. . .	9	2 8	13.4	21	2 40	18.6
. . .	. . .	. . .	11	2 19	12.6	23	2 50	18.0
. . .	. . .	. . .	13	2 28	11.9	25	2 59	17.5
May 3	+3 27	-1.0	15	2 38	11.0	27	3 8	16.9
5	+3 26	-0.5	17	-2 47	+10.1	Dec. 29	+3 17	-16.3
7	3 25	0.0	19	2 55	9.1	1	3 25	15.7
9	3 24	+0.5	21	3 3	8.1	3	3 32	15.1
11	3 23	1.0	23	3 10	7.0	5	3 39	14.4
13	3 22	1.6	25	3 16	5.9	7	3 45	13.7
15	+3 20	+2.1	27	-3 22	+ 4.8	9	+3 51	-13.0
17	3 19	2.6	29	3 27	3.6	11	3 56	12.4
19	3 17	3.2	31	3 31	2.3	13	4 1	11.6
21	3 14	3.8	Sept. 2	3 34	+ 1.1	15	4 5	10.9
23	3 12	4.3	4	3 36	- 0.1	17	4 9	10.1
25	+3 9	+4.9	6	-3 38	- 1.5	19	+4 12	- 9.5
27	3 6	5.5	8	3 38	2.8	21	4 15	8.7
29	3 2	6.0	10	3 38	4.0	23	4 17	8.0
31	2 59	6.6	12	3 36	5.3	25	4 19	7.3
June 2	2 55	7.2	14	3 34	6.5	27	4 20	6.5
4	+2 50	+7.8	16	-3 30	- 7.8	29	+4 21	- 5.7
6	+2 46	+8.4	18	-3 26	- 9.0	31	+4 21	- 5.0

DIFFERENTIAL COORDINATES OF SATELLITE VII.

Greenwich Mean Noon.	$\alpha_{VII}-\alpha_{Jup.}$	$\delta_{VII}-\delta_{Jup.}$	Greenwich Mean Noon.	$\alpha_{VII}-\alpha_{Jup.}$	$\delta_{VII}-\delta_{Jup.}$	Greenwich Mean Noon.	$\alpha_{VII}-\alpha_{Jup.}$	$\delta_{VII}-\delta_{Jup.}$
Jan. 1	m s +0 23	-14.9	June 8	m s -1 40	+9.5	Sept. 20	m s +2 19	-8.3
3	+0 12	15.2	10	1 34	9.3	22	2 8	8.3
5	0 0	15.5	12	1 27	9.2	24	1 56	8.2
7	-0 11	15.7	14	1 21	9.0	26	1 43	8.2
9	0 22	15.8	16	1 14	8.9	28	1 30	8.1
11	-0 33	-15.8	18	-1 7	+8.7	Oct. 30	+1 16	-8.0
13	0 43	15.8	20	1 0	8.5	2	1 2	7.8
15	0 54	15.7	22	0 53	8.2	4	0 47	7.7
17	1 4	15.6	24	0 46	8.0	6	0 32	7.5
19	1 14	15.4	26	0 38	7.7	8	0 17	7.3
21	-1 23	-15.2	28	-0 30	+7.5	10	+0 1	-7.1
23	1 32	14.9	30	0 23	7.2	12	-0 14	6.9
25	1 41	14.6	July 2	0 15	6.9	14	0 30	6.6
27	1 50	14.2	4	-0 7	6.5	16	0 46	6.4
29	1 58	13.8	6	+0 2	6.2	18	1 2	6.1
31	-2 5	-13.3	8	+0 10	+5.8	20	-1 17	-5.8
Feb. 2	2 13	12.8	10	0 19	5.4	22	1 32	5.5
4	2 20	12.3	12	0 28	5.0	24	1 47	5.2
6	2 26	11.8	14	0 37	4.6	26	2 2	4.8
8	2 32	11.2	16	0 46	4.2	28	2 16	4.5
10	-2 38	-10.6	18	+0 55	+3.7	Nov. 30	-2 29	-4.1
12	2 44	10.1	20	1 4	3.2	1	2 43	3.8
14	2 49	9.5	22	1 13	2.7	3	2 55	3.4
16	2 53	8.9	24	1 23	2.2	5	3 7	3.0
18	2 58	8.3	26	1 32	1.7	7	3 19	2.6
20	-3 2	-7.6	28	+1 41	+1.2	9	-3 30	-2.2
22	3 5	7.0	30	1 50	0.6	11	3 40	1.8
24	3 9	6.4	Aug. 1	1 59	+0.1	13	3 50	1.4
26	3 12	5.8	3	2 8	-0.4	15	3 59	1.0
28	3 15	5.3	5	2 17	1.0	17	4 7	0.6
Mar. 1	-3 18	-4.7	7	+2 25	-1.5	19	-4 14	-0.2
...	...	...	9	2 33	2.1	21	4 21	+0.2
...	...	...	11	2 40	2.6	23	4 27	0.6
...	...	...	13	2 47	3.1	25	4 33	1.0
May 3	-3 4	+8.7	15	2 54	3.6	27	4 38	1.5
5	-3 1	+8.9	17	+2 59	-4.1	Dec. 29	-4 42	+1.9
7	2 57	9.1	19	3 4	4.6	1	4 46	2.3
9	2 54	9.3	21	3 9	5.0	3	4 49	2.7
11	2 50	9.4	23	3 12	5.5	5	4 51	3.1
13	2 46	9.6	25	3 15	5.9	7	4 53	3.5
15	-2 42	+9.7	27	+3 16	-6.2	9	-4 54	+3.9
17	2 38	9.8	29	3 17	6.6	11	4 55	4.3
19	2 33	9.8	31	3 17	6.9	13	4 56	4.7
21	2 29	9.9	Sept. 2	3 16	7.2	15	4 55	5.1
23	2 24	9.9	4	3 13	7.4	17	4 55	5.5
25	-2 19	+9.9	6	+3 10	-7.6	19	-4 54	+5.9
27	2 14	9.9	8	3 6	7.8	21	4 52	6.2
29	2 9	9.8	10	3 0	8.0	23	4 50	6.6
31	2 3	9.8	12	2 54	8.1	25	4 48	6.9
June 2	1 58	9.7	14	2 46	8.2	27	4 46	7.2
4	-1 52	+9.6	16	+2 38	-8.3	29	-4 43	+7.5
6	-1 46	+9.6	18	+2 29	-8.3	31	-4 39	+7.8

GREENWICH MEAN TIME.

JANUARY.

d h m s		d h m s		d h m s		d h m s	
1 330 0	II. Oc. D.	9 11 48 38	I.*Sh. I.	16 23 43 31	III. Sh. E.	24 11 54 19	I.*Oc. D.
8 53 52	II. Ec. R.	11 53 56	III.*Tr. I.			15 11 59	I. Ec. R.
11 26 11	I.*Oc. D.	12 49 29	I.*Tr. E.	17 4 7 3	II. Tr. I.		
14 57 9	I.*Ec. R.	14 1 27	I.*Sh. E.	6 24 52	II. Sh. I.	25 9 5 24	I. Tr. I.
		14 55 27	III. Tr. E.	6 53 6	II. Tr. E.	10 9 21	I. Sh. I.
		17 2 25	III. Sh. I.	9 6 44	II. Sh. E.	11 19 54	I.*Tr. E.
2 7 38 14	III. Tr. I.	19 41 39	III. Sh. E.	9 54 13	I. Oc. D.	12 22 19	E.*Sh. E.
8 36 9	I. Tr. I.			13 16 43	I.*Ec. R.		
9 52 41	I. Sh. I.	10 1 22 34	II. Tr. I.			26 1 13 12	II. Oc. D.
10 40 15	III.*Tr. E.	3 48 26	II. Sh. I.	18 7 4 52	I. Tr. I.	6 9 4	II. Ec. R.
10 50 24	I.*Tr. E.	4 8 44	II. Tr. E.	8 13 29	I. Sh. I.	6 24 24	I. Oc. D.
12 5 28	I.*Sh. E.	6 30 29	II. Sh. E.	9 19 18	I. Tr. E.	9 40 47	I. Ec. R.
12 59 18	III.*Sh. I.	7 54 41	I. Oc. D.	10 26 21	I. Sh. E.		
15 39 47	III. Sh. E.	11 21 25	I.*Ec. R.	22 24 45	II. Oc. D.	27 3 35 42	I. Tr. I.
22 39 17	II. Tr. I.					4 38 23	I. Sh. I.
		11 5 4 57	I. Tr. I.	19 3 30 29	II. Ec. R.	5 50 13	I. Tr. E.
3 1 11 52	II. Sh. I.	6 17 32	I. Sh. I.	4 24 10	I. Oc. D.	6 51 22	I. Sh. E.
1 25 35	II. Tr. E.	7 19 19	I. Tr. E.	7 45 33	I. Ec. R.	10 48 46	III. Oc. D.
3 54 7	II. Sh. E.	8 30 23	I. Sh. E.			13 49 16	III.*Oc. R.
5 55 50	I. Oc. D.	19 37 45	II. Oc. D.	20 1 35 1	I. Tr. I.	15 10 21	III. Ec. D.
9 26 2	I. Ec. R.			2 42 30	I. Sh. I.	17 48 18	III. Ec. R.
13 20 26	IV.*Oc. D.	12 0 49 29	IV. Tr. I.	3 49 28	I. Tr. E.	20 15 47	II. Tr. I.
16 35 9	IV. Oc. R.	0 51 56	II. Ec. R.	4 55 25	I. Sh. E.	22 19 14	II. Sh. I.
		2 24 29	I. Oc. D.	6 26 11	III. Oc. D.	23 1 38	II. Tr. E.
4 2 13 42	IV. Ec. D.	3 56 42	IV. Tr. E.	9 6 6	IV. Oc. D.		
3 5 46	I. Tr. I.	5 50 14	I. Ec. R.	9 27 57	III. Oc. R.	28 0 54 32	I. Oc. D.
3 34 21	IV. Ec. R.	13 22 38	IV.*Sh. I.	11 7 59	III.*Ec. D.	1 0 50	II. Sh. E.
4 21 36	I. Sh. I.	14 13 48	IV.*Sh. E.	12 12 59	IV.*Oc. R.	4 9 35	I. Ec. R.
5 20 2	I. Tr. E.	23 34 56	I. Tr. I.	13 47 17	III.*Ec. R.	20 56 28	IV. Tr. I.
6 34 24	I. Sh. E.			17 29 42	II. Tr. I.	22 5 55	I. Tr. I.
16 52 20	II. Oc. D.	13 0 46 35	I. Sh. I.	19 43 2	II. Sh. I.	23 7 19	I. Sh. I.
22 13 26	II. Ec. R.	1 49 19	I. Tr. E.	20 15 41	II. Tr. E.	23 53 4	IV. Tr. E.
		2 6 21	III. Oc. D.	20 48 11	IV. Ec. D.		
5 0 25 27	I. Oc. D.	2 59 26	I. Sh. E.	21 32 26	IV. Ec. R.	29 0 20 27	I. Tr. E.
3 54 53	I. Ec. R.	5 9 10	III. Oc. R.	22 24 47	II. Sh. E.	1 20 19	I. Sh. E.
21 35 33	I. Tr. I.	7 5 43	III. Ec. D.	22 54 11	I. Oc. D.	14 37 29	II. Oc. D.
21 49 13	III. Oc. D.	9 46 22	III. Ec. R.			19 24 41	I. Oc. D.
22 50 39	I. Sh. I.	14 44 42	II. Tr. I.	21 2 14 22	I. Ec. R.	19 27 55	II. Ec. R.
23 49 51	I. Tr. E.	17 6 40	II. Sh. I.	20 5 6	I. Tr. I.	22 38 22	I. Ec. R.
		17 30 46	II. Tr. E.	21 11 26	I. Sh. I.		
6 0 52 52	III. Oc. R.	19 48 38	II. Sh. E.	22 19 33	I. Tr. E.	30 16 36 15	I. Tr. I.
1 3 27	I. Sh. E.	20 54 21	I. Oc. D.	23 24 22	I. Sh. E.	17 36 21	I. Sh. I.
3 3 14	III. Ec. D.					18 50 48	I. Tr. E.
5 45 14	III. Ec. R.	14 0 19 5	I. Ec. R.	23 11 48 27	II.*Oc. D.	19 49 20	I. Sh. E.
12 0 48	II.*Tr. I.	18 4 51	I. Tr. I.	16 49 21	II. Ec. R.		
14 30 9	II.*Sh. I.	19 15 31	I. Sh. I.	17 24 10	I. Oc. D.	31 1 0 0	III. Tr. I.
14 47 1	II.*Tr. E.	20 19 16	I. Tr. E.	20 43 10	I. Ec. R.	3 58 33	III. Tr. E.
17 12 18	II. Sh. E.	21 28 23	I. Sh. E.			5 12 22	III. Sh. I.
18 55 9	I. Oc. D.			23 14 35 17	I. Tr. I.	7 47 56	III. Sh. E.
22 23 44	I. Ec. R.	15 9 0 43	II. Oc. D.	15 40 27	I. Sh. I.	9 39 13	II. Tr. I.
		14 10 47	II.*Ec. R.	16 49 47	I. Tr. E.	11 37 19	II.*Sh. I.
7 16 5 17	I. Tr. I.	15 24 14	I. Oc. D.	17 53 24	I. Sh. E.	12 24 58	II.*Tr. E.
17 19 36	I. Sh. I.	18 47 53	I. Ec. R.	20 35 30	III. Tr. I.	13 54 54	I. Oc. D.
18 19 36	I. Tr. E.			23 35 15	III. Tr. E.	14 18 51	II. Sh. E.
19 32 24	I. Sh. E.	16 12 34 54	I.*Tr. I.			17 7 10	I. Ec. R.
		13 44 33	I.*Sh. I.	24 1 9 15	III. Sh. I.		
8 6 14 32	II. Oc. D.	14 49 19	I. Tr. E.	3 46 2	III. Sh. E.		
11 32 19	II.*Ec. R.	15 57 26	I. Sh. E.	6 52 37	II. Tr. I.		
13 24 52	I.*Oc. D.	16 12 55	III. Tr. I.	9 1 10	II. Sh. I.		
16 52 33	I. Ec. R.	19 13 40	III. Tr. E.	9 38 32	II. Tr. E.		
		21 5 30	III. Sh. I.	11 42 49	II.*Sh. E.		

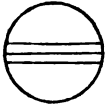
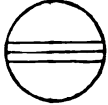
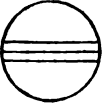
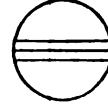
NOTE.—I. denotes ingress; E., egress; D., disappearance; R., reappearance; Ec., eclipse; Oc., occultation.
Tr., transit of the satellite; Sh., transit of the shadow.

*Visible at Washington.

GREENWICH MEAN TIME.

JANUARY.

Phases of the Eclipses of the Satellites for an Inverting Telescope.

I.		* r	III.		* d * r
II.		* r	IV.		** dr

Configurations at 11^h 55^m for an Inverting Telescope.

Day.	West.	East.
1	·4	○ ·2 3· ·1 ●
2	·4	¹ / ₂ ○ 2·
3	3· 2·	· ○ 4 ·1
4	·3 1··2	○ ·4
5	·3	○ ·1 ·2 ·4
6	·1 2 ○ ·	·3 ·4
7	·2	○ 1· ·3 ·4
8		·1 ○ ·2 3· 4·
9	○ 1·	3 ○ · 2· 4·
10	3· 2·	○ ·1 4·
11	·3	¹ / ₂ ○ 4·
12	·3 4·	○ ·1 ·2
13	4· ·1	○ 2· ·3
14	4· 2·	○ 1· ·3
15	4·	·1 ○ 3· ·2 ●
16	·4	1 ○ ·3 2·
17	·4	3· 2· ○ ·1 ●
18	·4 3·	·2 1· ○
19	³ / ₄	○ ·1 ·2
20	1·	○ 2· ·3 ● ·4 ●
21	2·	○ 1· ·4 ·3
22	·1	○ 3· ·4 ·2 ●
23		○ 1· 3· 2· ·4
24	3· 2· ·1	○ 4·
25	3· ·2 1·	○ 4·
26	·3	○ ·1 ·2 4·
27	1·	○ 2· 4· ·3 ●
28	2·	○ 4· ·1 ·3
29	⁴ / ₁ ·2	○ 3·
30	4·	○ 1· 3· ·2
31	○ 2· 4·	3· ·1 ○

GREENWICH MEAN TIME.

FEBRUARY.

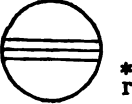
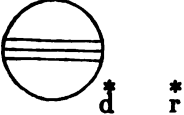

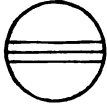
d h m s		d h m s		d h m s		d h m s	
11 6 30	I.* Tr. I.	8 15 22 40	I. Tr. E.	18 9 45 19	II. Oc. D.	23 16 43 17	II. Ec. R.
12 5 13	I.* Sh. I.	16 14 7	I. Sh. E.	12 27 40	I.* Oc. D.	17 21 1	I. Ec. R.
13 21 4	I.* Tr. E.			14 4 46	II. Ec. R.		
14 18 14	I. Sh. E.	9 6 53 39	II. Oc. D.	15 26 4	I. Ec. R.	24 11 43 0	I.* Tr. I.
		10 26 14	I. Oc. D.			12 21 29	I.* Sh. I.
2 4 252	II. Oc. D.	11 26 14	II.* Ec. R.	17 9 40 39	I. Tr. I.	13 57 35	I. Tr. E.
8 25 7	I. Oc. D.	13 31 3	I. Ec. R.	10 25 48	I. Sh. I.	14 34 39	I. Sh. E.
8 47 38	II. Ec. R.			11 55 15	I.* Tr. E.		
11 35 58	I.* Ec. R.	10 7 38 36	I. Tr. I.	12 38 56	I.* Sh. E.	25 4 40 48	III. Oc. D.
		8 30 3	I. Sh. I.			7 28 3	II. Tr. I.
3 5 36 57	I. Tr. I.	9 53 12	I. Tr. E.	18 0 10 43	III. Oc. D.	8 42 41	II. Sh. I.
6 34 15	I. Sh. I.	10 43 8	I. Sh. E.	3 6 4	III. Oc. R.	8 59 49	I. Oc. D.
7 51 30	I. Tr. E.	19 41 21	III. Oc. D.	3 18 35	III. Ec. D.	9 53 6	III. Ec. R.
8 47 17	I. Sh. E.	22 38 38	III. Oc. R.	4 39 2	II. Tr. I.	10 13 2	II. Tr. E.
15 14 8	III. Oc. D.	23 15 42	III. Ec. D.	5 52 25	III. Ec. R.	11 23 46	II. Sh. E.
18 13 9	III. Oc. R.			6 7 0	II. Sh. I.	11 49 44	I.* Ec. R.
19 13 11	III. Ec. D.	11 1 50 35	II. Tr. I.	6 58 3	I. Oc. D.		
21 49 46	III. Ec. R.	1 50 54	III. Ec. R.	7 24 17	II. Tr. E.	26 6 13 36	I. Tr. I.
23 2 49	II. Tr. I.	3 31 11	II. Sh. I.	8 48 13	II. Sh. E.	6 50 21	I. Sh. I.
		4 36 4	II. Tr. E.	9 54 48	I. Ec. R.	8 28 9	I. Tr. E.
4 0 55 17	II. Sh. I.	4 56 33	I. Oc. D.			9 3 31	I. Sh. E.
1 48 29	II. Tr. E.	6 12 30	II. Sh. E.	19 4 11 10	I. Tr. I.		
2 55 21	I. Oc. D.	7 59 48	I. Ec. R.	4 54 43	I. Sh. I.	27 2 3 45	II. Oc. D.
3 36 45	II. Sh. E.			6 25 46	I. Tr. E.	3 30 15	I. Oc. D.
6 4 44	I. Ec. R.	12 2 9 2	I. Tr. I.	7 7 49	I. Sh. E.	6 2 3	II. Ec. R.
		2 58 59	I. Sh. I.	23 11 1	II. Oc. D.	6 18 25	I. Ec. R.
5 0 7 15	I. Tr. I.	4 23 38	I. Tr. E.				
1 3 9	I. Sh. I.	5 12 4	I. Sh. E.	20 1 28 27	I. Oc. D.	28 0 44 18	I. Tr. I.
2 21 50	I. Tr. E.	20 18 58	II. Oc. D.	3 23 34	II. Ec. R.	1 19 19	I. Sh. I.
3 16 12	I. Sh. E.	23 26 53	I. Oc. D.	4 23 31	I. Ec. R.	2 58 50	I. Tr. E.
17 27 44	II. Oc. D.			22 41 48	I. Tr. I.	3 32 29	I. Sh. E.
21 25 36	I. Oc. D.	13 0 45 4	II. Ec. R.	23 23 39	I. Sh. I.	18 55 58	III. Tr. I.
22 6 30	II. Ec. R.	2 28 32	I. Ec. R.			20 52 41	II. Tr. I.
		20 39 35	I. Tr. I.	21 0 56 24	I. Tr. E.	21 23 6	III. Sh. I.
6 0 33 30	I. Ec. R.	21 27 56	I. Sh. I.	1 36 49	I. Sh. E.	21 47 22	III. Tr. E.
5 27 27	IV. Oc. D.	22 54 12	I. Tr. E.	14 24 28	III. Tr. I.	22 0 28	II. Sh. I.
8 20 28	IV. Oc. R.	23 41 3	I. Sh. E.	17 17 59	III. Tr. E.	22 0 45	I. Oc. D.
18 37 42	I. Tr. I.			17 20 14	III. Sh. I.	23 37 31	II. Tr. E.
19 32 9	I. Sh. I.	14 9 54 48	III. Tr. I.	18 3 28	II. Tr. I.	23 53 38	III. Sh. E.
20 52 18	I. Tr. E.	12 50 13	III.* Tr. E.	19 24 51	II. Sh. I.		
21 45 13	I. Sh. E.	13 17 49	III. Sh. I.	19 52 3	III. Sh. E.	29 0 41 28	II. Sh. E.
		15 14 45	II. Tr. I.	19 58 55	I. Oc. D.	0 47 8	I. Ec. R.
7 5 26 42	III. Tr. I.	15 50 54	III. Sh. E.	20 48 35	II. Tr. E.	19 14 54	I. Tr. I.
8 23 46	III. Tr. E.	16 49 7	II. Sh. I.	22 6 1	II. Sh. E.	19 48 8	I. Sh. I.
9 15 19	III. Sh. I.	17 35 41	IV. Tr. I.	22 52 16	I. Ec. R.	21 29 24	I. Tr. E.
11 49 39	III.* Sh. E.	17 57 16	I. Oc. D.			22 1 19	I. Sh. E.
12 26 37	II.* Tr. I.	18 0 7	II. Tr. E.	23 17 12 20	I. Tr. I.		
14 13 15	II. Sh. I.	19 30 24	II. Sh. E.	17 52 30	I. Sh. I.		
15 12 11	II. Tr. E.	20 14 57	IV. Tr. E.	19 26 55	I. Tr. E.		
15 55 55	I. Oc. D.	20 57 19	I. Ec. R.	20 5 40	I. Sh. E.		
16 54 38	II. Sh. E.						
19 2 17	I. Ec. R.	15 15 10 2	I. Tr. I.	23 2 16 30	IV. Oc. D.		
		15 56 48	I. Sh. I.	4 48 29	IV. Oc. R.		
8 13 8 5	I.* Tr. I.	17 24 39	I. Tr. E.	12 37 45	II.* Oc. D.		
14 1 2	I. Sh. I.	18 9 56	I. Sh. E.	14 29 22	I. Oc. D.		

By reason of the proximity of JUPITER to the SUN the phenomena of the satellites are not given for March and April.

GREENWICH MEAN TIME.

FEBRUARY.

Phases of the Eclipses of the Satellites for an Inverting Telescope.

I.		III.	
II.		IV. No Eclipse.	

Configurations at 11^h 40^m for an Inverting Telescope.

Day.	West.					East.				
1	○ 1.	4.	3.	2.	○					
2		4.	3.		○ 1.	2.				
3		4.		1. 3.	○	2.				
4			4.	2.	○	1.	3.			
5				4. 1.	2.	○		3.		
6					○ 4.	1.	3.			
7				3.	2.	○ 1.		4.		
8			3.	2.	○ 1.		4.			
9			3.		○ 2.		4.		1.	●
10				3.	1.	○	2.	4.		
11				2.	○	1.	3.	4.		
12				1.	4.	○		3.	4.	
13					○	1.	2.	3.	4.	
14	○ 3.			1.	○ 4.					
15			3.	2.	4.	○ 1.				
16			4.	3.	○ 1.				2.	●
17	○ 1.	4.		3.	○	2.				
18		4.		2.	○	1.	3.			
19		4.		2.	1.	○		3.		
20		4.			○	1.	2.	3.		
21			4.	1.	○ 3.	2.				
22			3.	2.	4.	○ 1.				
23			3.		1.	○ 2.	4.			
24			3.	1.	○		2.	4.		
25				2.	○	3.		4.		1.
26				2.	1.	○	3.	4.		
27					○	1.	3.	4.		
28				1.	○	3.	2.	4.		
1				1.	○	1.		4.		

GREENWICH MEAN TIME.

MAY.

d h m s		d h m s		d h m s		d h m s	
1 0 025	I. Oc. R.	9 23 54 6	II. Sh. I.	17 20 3 53	III. Sh. E.	26 14 12 31	I. Tr. I.
3 1 114	II. Ec. D.			21 0 15	III.* Tr. I.	15 29 21	I. Sh. E.
6 46 53	II. Oc. R.	10 1 12 55	II. Tr. I.	23 15 12	III. Tr. E.	16 23 31	I. Tr. E.
18 36 31	I. Sh. I.	2 33 7	II. Sh. E.				
19 8 19	I. Tr. I.	3 52 32	II. Tr. E.	18 14 3 0	I. Ec. D.	27 10 25 41	I. Ec. D.
20 48 44	I. Sh. E.	13 47 14	III. Sh. I.	17 2 35	I. Oc. R.	13 32 47	I. Oc. R.
21 20 46	I. Tr. E.	14 59 58	I. Sh. I.	21 34 32	II. Ec. D.	18 28 4	II. Sh. I.
		15 40 21	I. Tr. I.			20 14 11	II. Tr. I.
2 15 45 56	I. Ec. D.	16 3 36	III. Sh. E.	19 1 52 23	II. Oc. R.	21 1 24	II.* Sh. E.
18 30 42	I. Oc. R.	16 30 19	III. Tr. I.	11 23 23	I. Sh. I.	22 51 55	II. Tr. E.
21 18 41	II. Sh. I.	17 11 54	I. Sh. E.	12 11 51	I. Tr. I.		
22 30 40	II. Tr. I.	17 52 18	I. Tr. E.	13 35 1	I. Sh. E.	28 7 46 35	I. Sh. I.
23 57 57	II. Sh. E.	18 49 25	III. Tr. E.	14 23 17	I. Tr. E.	8 42 34	I. Tr. I.
						9 57 53	I. Sh. E.
3 1 3 48	II. Tr. E.	11 12 8 47	I. Ec. D.	20 8 31 32	I. Ec. D.	10 53 27	I. Tr. E.
9 45 23	III. Sh. I.	15 1 58	I. Oc. R.	11 32 39	I. Oc. R.	11 43 43	III. Ec. D.
11 58 55	III. Tr. I.	18 57 30	II. Ec. D.	15 47 25	II. Sh. I.	13 58 19	III. Ec. R.
12 3 14	III. Sh. E.	23 2 57	II. Oc. R.	17 26 6	II. Tr. I.	15 33 58	III. Oc. D.
13 5 9	I. Sh. I.			18 26 2	II. Sh. E.	17 44 20	III. Oc. R.
13 38 42	I. Tr. I.	12 9 28 42	I. Sh. I.	20 4 35	II. Tr. E.		
14 22 2	III. Tr. E.	10 10 44	I. Tr. I.			29 4 54 14	I. Ec. D.
15 17 20	I. Sh. E.	11 40 34	I. Sh. E.	21 5 52 0	I. Sh. I.	8 2 46	I. Oc. E.
15 51 3	I. Tr. E.	12 22 35	I. Tr. E.	6 42 2	I. Tr. I.	13 29 29	II. Ec. E.
				7 41 52	III. Ec. D.	18 4 26	II. Oc. R.
4 10 14 32	I. Ec. D.	13 6 37 20	I. Ec. D.	8 3 34	I. Sh. E.		
13 1 1	I. Oc. R.	9 32 7	I. Oc. R.	8 53 21	I. Tr. E.	30 2 15 16	I. Sh. I.
16 20 18	II. Ec. D.	13 11 54	II. Sh. I.	9 57 50	III. Ec. R.	3 12 40	I. Tr. I.
20 12 40	II. Oc. R.	14 37 28	II. Tr. I.	11 6 8	III. Oc. D.	4 26 30	I. Sh. I.
		15 50 47	II. Sh. E.	13 20 39	III. Oc. R.	5 23 27	I. Tr. E.
5 7 33 55	I. Sh. I.	17 16 41	II. Tr. E.			23 22 45	I. Ec. D.
8 9 11	I. Tr. I.			22 3 0 5	I. Ec. D.		
9 46 1	I. Sh. E.	14 3 40 21	III. Ec. D.	6 2 44	I. Oc. R.	31 2 32 41	I. Oc. R.
10 21 26	I. Tr. E.	3 57 21	I. Sh. I.	10 52 42	II. Ec. D.	7 41 1	II. Sh. I.
		4 41 1	I. Tr. I.	15 16 31	II. Oc. R.	9 38 7	II. Tr. I.
6 4 43 5	I. Ec. D.	5 57 41	III. Ec. R.			10 19 12	II. Sh. I.
7 31 15	I. Oc. R.	6 9 9	I. Sh. E.	23 0 20 43	I. Sh. I.	12 15 27	II. Tr. I.
10 36 24	II. Sh. I.	6 37 9	III. Oc. D.	1 12 16	I. Tr. I.	20 43 50	I.* Sh. I.
11 48 15	II. Tr. I.	6 52 45	I. Tr. E.	2 32 13	I. Sh. E.	21 42 38	I. Tr. I.
13 15 33	II. Sh. E.	8 55 41	III. Oc. R.	3 23 29	I. Tr. E.	22 55 1	I. Sh. E.
14 28 12	II. Tr. E.			21 28 37	I. Ec. D.	23 53 19	I. Tr. E.
23 38 28	III. Ec. D.	15 1 5 53	I. Ec. D.				
		4 2 16	I. Oc. R.	24 0 32 45	I. Oc. R.		
7 1 57 10	III. Ec. R.	8 15 45	II. Ec. D.	5 5 18	II. Sh. I.		
2 2 34	I. Sh. I.	12 27 33	II. Oc. R.	6 50 19	II. Tr. I.		
2 6 30	III. Oc. D.	22 26 5	I. Sh. I.	7 43 46	II. Sh. E.		
2 39 34	I. Tr. I.	23 11 21	I. Tr. I.	9 28 26	II. Tr. E.		
4 14 38	I. Sh. E.			18 49 18	I. Sh. I.		
4 28 56	III. Oc. R.	16 0 37 50	I. Sh. E.	19 42 22	I. Tr. I.		
4 51 43	I. Tr. E.	1 23 0	I. Tr. E.	21 0 45	I.* Sh. E.		
23 11 39	I. Ec. D.	19 34 25	I. Ec. D.	21 50 24	III. Sh. I.		
		22 32 25	I. Oc. R.	21 53 28	I. Tr. E.		
8 2 1 31	I. Oc. R.	17 2 29 41	II. Sh. I.	25 0 3 45	III. Sh. E.		
5 38 36	II. Ec. D.	4 1 54	II. Tr. I.	1 28 29	III. Tr. I.		
9 37 38	II. Oc. R.	5 8 26	II. Sh. E.	3 39 9	III. Tr. E.		
20 31 21	I. Sh. I.	6 40 46	II. Tr. E.	15 57 11	I. Ec. D.		
21 10 2	I. Tr. I.	16 54 41	I. Sh. I.	19 2 49	I. Oc. R.		
22 43 20	I. Sh. E.	17 41 35	I. Tr. I.				
23 22 5	I. Tr. E.	17 49 1	III. Sh. I.	26 0 11 21	II. Ec. D.		
		19 6 23	I. Sh. E.	4 40 48	II. Oc. R.		
9 17 40 12	I. Ec. D.	19 53 7	I. Tr. E.	13 17 59	I. Sh. I.		
20 31 43	I. Oc. R.						

NOTE.—I. denotes ingress; E., egress; D., disappearance; R., reappearance; Ec., eclipse; Oc., occultation.
Tr., transit of the satellite; Sh., transit of the shadow.

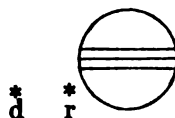
*Visible at Washington.

GREENWICH MEAN TIME.

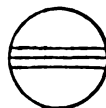
MAY.

Phases of the Eclipses of the Satellites for an Inverting Telescope.

III.



IV. No Eclipse.

*Configurations at 20^h 40^m for an Inverting Telescope.*

Day.	West.	East.
1	○ 1.	○ .2 .4 3.
2		○ 2. 1 3. .4
3	2. 1.	○ .4
4	3.	○ .2 .1 .4
5	.3 .1	○ 2. 4.
6	2. 3	○ 1. 4.
7	.2 .1	○ .3 4.
8		1 ○ .4 .2 .3
9	4.	○ 12. 3.
10	4. 2. 1. 3.	○
11	4. 3.	○ .1 .2 ●
12	4. .3 1.	○ 2.
13	.4 .32.	○ 1.
14	.4 .2 .1	○ .3
15	.4	○ 1. .2 .3
16	.4	○ 2. 3. .1 ●
17	2. 1. 3.	○ .4
18	3. .2	○ .1 .4
19	.3 1.	○ .2 .4
20	.3 2.	○ .1 .4
21	.2 .1	○ .3 4.
22		○ 1. 2 .3 4.
23		.1 ○ 2. 3. 4.
24	2.	○ 3. 4.
25	3. .24	○ .1
26	3. 4. 1.	○ .2
27	○ 2. 4. .3	○ .1
28	4. .2 .1	○ .3 .
29	4.	○ .21. .3
30	.4 .1	○ 2. 3.
31	.4 2.	○ 1. 3.

GREENWICH MEAN TIME.

JUNE.

d h m s		d h m s		d h m s		d h m s	
1 151 42	III. Sh. I.	9 18 12	I. Tr. I.	18 7 9 1	II. Tr. E.	26 12 30 36	I. Ec. D.
4 3 33	III. Sh. E.	19 17 45	I. Sh. E.	13 29 47	I. Sh. I.	15 57 49	I. Oc. R.
5 55 2	III. Tr. I.	20 22 20	I.*Tr. E.	14 40 43	I. Tr. I.	23 54 18	II. Ec. D.
8 1 17	III. Tr. E.			15 40 16	I. Sh. E.		
17 51 19	I. Ec. D.	10 14 13 55	I. Ec. D.	16 50 19	I. Tr. E.	27 5 3 27	II. Oc. R.
21 2 38	I.*Oc. R.	17 31 41	I. Oc. R.	23 46 36	III. Ec. D.	9 52 36	I. Sh. I.
		23 34 36	II. Sh. I.			11 8 13	I. Tr. I.
2 2 47 57	II. Ec. D.			19 1 57 13	III. Ec. R.	12 2 46	I. Sh. E.
7 28 9	II. Oc. R.	11 1 48 7	II. Tr. I.	4 43 28	III. Oc. D.	13 17 18	I. Tr. E.
15 12 29	I. Sh. I.	2 12 23	II. Sh. E.	6 40 38	III. Oc. R.		
16 12 39	I. Tr. I.	4 24 15	II. Tr. E.	10 36 32	I. Ec. D.	28 6 59 5	I. Ec. D.
17 23 36	I. Sh. E.	11 35 28	I. Sh. I.	13 59 56	I. Oc. R.	10 27 7	I. Oc. R.
18 23 12	I. Tr. E.	12 41 57	I. Tr. I.	21 18 23	II. Ec. D.	18 4 49	II. Sh. I.
		13 46 14	I. Sh. E.			20 40 19	II.*Tr. I.
3 12 19 49	I. Ec. D.	14 51 59	I. Tr. E.	20 2 20 49	II. Oc. R.	20 41 56	II.*Sh. E.
15 32 29	I. Oc. R.	19 45 44	III.*Ec. D.	7 58 24	I. Sh. I.	23 14 21	II. Tr. E.
20 58 45	II.*Sh. I.	21 57 40	III. Ec. R.	9 10 21	I. Tr. I.		
23 1 34	II. Tr. I.			10 8 49	I. Sh. E.	29 4 21 5	I. Sh. I.
23 36 49	II. Sh. E.	12 0 22 28	III. Oc. D.	11 19 50	I. Tr. E.	5 37 32	I. Tr. I.
		2 24 12	III. Oc. R.			6 31 12	I. Sh. E.
4 1 38 30	II. Tr. E.	8 42 28	I. Ec. D.	21 5 5 1	I. Ec. D.	7 46 31	I. Tr. E.
9 41 3	I. Sh. I.	12 1 25	I. Oc. R.	8 29 25	I. Oc. R.	17 58 30	III. Sh. I.
10 42 34	I. Tr. I.	18 42 16	II. Ec. D.	15 28 41	II. Sh. I.	20 4 31	III.*Sh. E.
11 52 6	I. Sh. E.	23 36 42	II. Oc. R.	17 56 20	II. Tr. I.	23 21 31	III. Tr. I.
12 53 1	I. Tr. E.			18 6 4	II. Sh. E.		
15 44 47	III. Ec. D.	13 6 4 7	I. Sh. I.	20 31 12	II.*Tr. E.	30 1 9 0	III. Tr. E.
17 58 3	III. Ec. R.	7 11 46	I. Tr. I.			1 27 38	I. Ec. D.
19 59 16	III.*Oc. D.	8 14 48	I. Sh. E.	22 2 26 54	I. Sh. I.	4 56 30	I. Oc. R.
22 5 23	III. Oc. R.	9 21 41	I. Tr. E.	3 39 53	I. Tr. I.	13 12 17	II. Ec. D.
				4 37 16	I. Sh. E.	18 24 13	II.*Oc. R.
5 6 48 22	I. Ec. D.	14 3 10 56	I. Ec. D.	5 49 14	I. Tr. E.	22 49 37	I. Sh. I.
10 2 21	I. Oc. R.	6 31 4	I. Oc. R.	13 57 6	III. Sh. I.		
16 5 58	II. Ec. D.	12 52 42	II. Sh. I.	16 4 33	III. Sh. E.		
20 51 12	II.*Oc. R.	15 11 14	II. Tr. I.	19 3 57	III.*Tr. I.		
		15 30 20	II. Sh. E.	20 56 16	III.*Tr. E.		
6 4 9 44	I. Sh. I.	17 46 56	II. Tr. E.	23 33 35	I. Ec. D.		
5 12 32	I. Tr. I.						
6 20 42	I. Sh. E.	15 0 32 38	I. Sh. I.	23 2 58 57	I. Oc. R.		
7 22 52	I. Tr. E.	1 41 26	I. Tr. I.	10 36 31	II. Ec. D.		
		2 43 16	I. Sh. E.	15 42 25	II. Oc. R.		
7 1 16 51	I. Ec. D.	3 51 14	I. Tr. E.	20 55 29	I.*Sh. I.		
4 32 8	I. Oc. R.	9 55 0	III. Sh. I.	22 9 23	I. Tr. I.		
10 16 46	II. Sh. I.	12 3 54	III. Sh. E.	23 5 47	I. Sh. E.		
12 25 6	II. Tr. I.	14 43 2	III. Tr. I.				
12 54 42	II. Sh. E.	16 40 6	III. Tr. E.	24 0 18 39	I. Tr. E.		
15 1 39	II. Tr. E.	21 39 30	I. Ec. D.	18 2 4	I. Ec. D.		
22 38 17	I. Sh. I.			21 28 22	I. Oc. R.		
23 42 21	I. Tr. I.	16 1 0 46	I. Oc. R.				
		8 0 31	II. Ec. D.	25 4 46 35	II. Sh. I.		
8 0 49 11	I. Sh. E.	12 59 2	II. Oc. R.	7 18 16	II. Tr. I.		
1 52 35	I. Tr. E.	19 1 14	I. Sh. I.	7 23 50	II. Sh. E.		
5 53 28	III. Sh. I.	20 11 7	I.*Tr. I.	9 52 43	II. Tr. E.		
8 3 49	III. Sh. E.	21 11 48	I.*Sh. E.	15 24 1	I. Sh. I.		
10 20 15	III. Tr. I.	22 20 49	I. Tr. E.	16 38 47	I. Tr. I.		
12 21 57	III. Tr. E.			17 34 14	I. Sh. E.		
19 45 25	I.*Ec. D.	17 16 8 0	I. Ec. D.	18 47 57	I.*Tr. E.		
23 1 58	I. Oc. R.	19 30 20	I.*Oc. R.				
9 5 24 21	II. Ec. D.	18 2 10 33	II. Sh. I.	26 3 47 39	III. Ec. D.		
10 14 16	II. Oc. R.	4 33 44	II. Tr. I.	5 56 56	III. Ec. R.		
17 6 55	I. Sh. I.	4 48 3	II. Sh. E.	9 2 12	III. Oc. D.		
				10 54 41	III. Oc. R.		

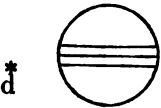
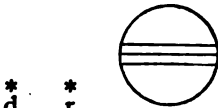
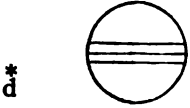
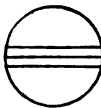
NOTE.—I. denotes ingress; E., egress; D., disappearance; R., reappearance; Ec., eclipse; Oc., occultation; Tr., transit of the satellite; Sh., transit of the shadow.

*Visible at Washington.

GREENWICH MEAN TIME.

JUNE.

Phases of the Eclipses of the Satellites for an Inverting Telescope.

I.		III.	
II.		IV. No Eclipse.	

Configurations at 19^h 55^m for an Inverting Telescope.

Day.	West.				East.			
1		•4	3••2	○				•1●
2		3•	•4 1•	○	•2			
3		•3		○ 2• ⁴				
4		2•	1•	•○3	•4			
5				○	1•	•3	•4	•2●
6			•1	○	2•	3•	•4	
7			2•	○	1•	3•	4•	
8			•2 3•	○			4•	•1●
9	○ 1•	3•		○	•2	4•		
10		•3		○	•12•	4•		
11			2•	1•	○			•3●
12			4•		○	•1	•3	•2●
13		4•		•1	○	2•	•3	
14		4•		2•	○	1•	3•	
15	4•		•2	• ⁸ 1•	○			
16	•4	3•		1○	•2			
17	•4	•3		○	•1	2•		
18		•4	2•	•1	○			
19				• ⁴ 1•	○	•1	•3	
20			1•	○	•4	•2	•3	
21	○ 2•			○	1•	3•	•4	
22	○ 3•		•2	•1	○			•4
23		3•		○	1••2		•4	
24		•3		○	2•		4•	•1●
25			• ³ 1•	○			4•	
26			•2	○	•1•3		4•	
27			1•	○	4••2	•3		
28				• ⁴ 1•	○	•1	3•	
29		4•	•2	•1	○	3•		
30		4•	3•	○	•21•			

GREENWICH MEAN TIME.

JULY.

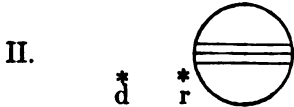
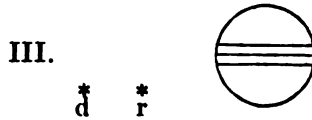
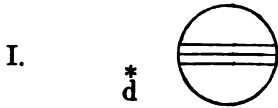
d h m s		d h m s		d h m s		d h m s	
1 0 651	I. Tr. I.	9 9 58 56	II. Sh. I.	16 23 15 44	I. Sh. E.	24 23 41 45	I. Oc. R.
0 59 42	I. Sh. E.	12 35 43	II. Sh. E.				
2 15 44	I. Tr. E.	12 43 28	II. Tr. I.	17 0 36 15	I. Tr. E.	25 1 47 12	III. Oc. R.
19 56 7	I.* Ec. D.	15 16 19	II. Tr. E.	15 52 3	III. Ec. D.	3 19 42	III. Oc. R.
23 25 44	I. Oc. R.	19 12 9	I.* Sh. I.	17 57 27	III.* Ec. R.	10 16 7	II. Ec. R.
		20 32 36	I.* Tr. I.	18 12 48	I.* Ec. D.	12 53 17	II. Ec. R.
2 7 22 43	II. Sh. I.	21 21 58	I. Sh. E.	21 41 40	III. Oc. D.	13 5 6	II. Oc. R.
9 59 43	II. Sh. E.	22 41 1	I. Tr. E.	21 47 2	I. Oc. R.	15 36 51	II. Oc. R.
10 1 34	II. Tr. I.			23 19 19	III. Oc. R.	17 28 28	I.* Sh. I.
12 35 12	II. Tr. E.	10 11 50 29	III. Ec. D.			18 51 22	I.* Tr. I.
17 18 7	I. Sh. I.	13 57 9	III. Ec. R.	18 7 40 54	II. Ec. D.	19 37 55	I.* Sh. E.
18 36 4	I.* Tr. I.	16 18 44	I. Ec. D.	10 18 23	II. Ec. R.	20 59 6	I.* Tr. E.
19 28 8	I.* Sh. E.	17 31 46	III. Oc. D.	10 28 41	II. Oc. D.		
20 44 52	I.* Tr. E.	19 14 27	III.* Oc. R.	13 1 16	II. Oc. R.	26 14 35 22	I. Ec. D.
		19 51 26	I.* Oc. R.	15 34 37	I. Sh. I.	18 10 13	I.* Oc. R.
3 7 49 15	III. Ec. D.			16 56 59	I. Tr. I.		
9 57 13	III. Ec. R.	11 5 53 4	II. Ec. D.	17 44 12	I.* Sh. E.	27 4 30 21	II. Sh. I.
13 18 45	III. Oc. D.	7 43 23	II. Ec. R.	19 4 57	I.* Tr. E.	7 6 42	II. Sh. E.
14 24 40	I. Ec. D.	7 50 22	II. Oc. D.			7 21 35	II. Tr. I.
15 6 24	III. Oc. R.	10 23 48	II. Oc. R.	19 12 41 16	I. Ec. D.	9 52 34	II. Tr. E.
17 55 0	I. Oc. R.	13 40 41	I. Sh. I.	16 15 44	I. Oc. R.	11 56 54	I. Sh. I.
		15 1 35	I. Tr. I.			13 19 48	I. Tr. I.
4 2 30 1	II. Ec. D.	15 50 27	I. Sh. E.	20 1 53 50	II. Sh. I.	14 6 19	I. Sh. E.
5 8 12	II. Ec. R.	17 9 55	I. Tr. E.	4 30 19	II. Sh. E.	15 27 28	I. Tr. E.
5 10 9	II. Oc. D.			4 43 46	II. Tr. I.		
7 44 29	II. Oc. R.	12 10 47 12	I. Ec. D.	7 15 29	II. Tr. E.	28 9 3 58	I. Ec. D.
11 46 40	I. Sh. I.	14 20 21	I. Oc. R.	10 3 3	I. Sh. I.	10 2 22	III. Sh. I.
13 5 19	I. Tr. I.	23 17 22	II. Sh. I.	11 25 37	I. Tr. I.	12 3 5	III. Sh. E.
13 56 39	I. Sh. E.			12 12 37	I. Sh. E.	12 38 46	I. Oc. R.
15 14 1	I. Tr. E.	13 1 54 3	II. Sh. E.	13 33 34	I. Tr. E.	15 58 21	III. Tr. I.
		2 4 10	II. Tr. I.			17 25 7	III.* Tr. E.
5 8 53 8	I. Ec. D.	4 36 39	II. Tr. E.	21 6 1 8	III. Sh. I.	23 33 43	II. Ec. D.
12 24 7	I. Oc. R.	8 9 9	I. Sh. I.	7 9 51	I. Ec. D.		
20 41 3	II.* Sh. I.	9 30 29	I. Tr. I.	8 3 7	III. Sh. E.	29 2 10 41	II. Ec. R.
23 17 56	II. Sh. E.	10 18 52	I. Sh. E.	10 44 30	I. Oc. R.	2 22 32	II. Oc. D.
23 23 0	II. Tr. I.	11 38 44	I. Tr. E.	11 54 11	III. Tr. I.	4 53 52	II. Oc. R.
				13 26 19	III. Tr. E.	6 25 21	I. Sh. I.
6 1 56 14	II. Tr. E.	14 2 0 25	III. Sh. I.	20 58 35	II.* Ec. D.	7 48 11	I. Tr. I.
6 15 9	I. Sh. I.	4 3 43	III. Sh. E.	23 35 53	II. Ec. R.	8 34 45	I. Sh. E.
7 34 26	I. Tr. I.	5 15 46	I. Ec. D.	23 47 10	II. Oc. D.	9 55 48	I. Tr. E.
8 25 4	I. Sh. E.	7 46 48	III. Tr. I.				
9 43 2	I. Tr. E.	8 49 20	I. Oc. R.	22 2 19 19	II. Oc. R.	30 3 32 27	I. Ec. D.
21 59 38	III. Sh. I.	9 24 9	III. Tr. E.	4 31 32	I. Sh. I.	7 7 8	I. Oc. R.
		18 23 19	II.* Ec. D.	5 54 16	I. Tr. I.	17 48 22	II.* Sh. I.
7 0 4 17	III. Sh. E.	21 0 57	II.* Ec. R.	6 41 3	I. Sh. E.	20 24 40	II.* Sh. E.
3 21 42	I. Ec. D.	21 9 47	II.* Oc. D.	8 2 8	I. Tr. E.	20 39 26	II.* Tr. I.
3 35 54	III. Tr. I.	23 42 48	II. Oc. R.			23 10 5	II. Tr. E.
5 18 22	III. Tr. E.			23 1 38 20	I. Ec. D.		
6 53 19	I. Oc. R.	15 2 37 38	I. Sh. I.	5 13 7	I. Oc. R.	31 0 53 46	I. Sh. I.
15 47 53	II. Ec. D.	3 59 22	I. Tr. I.	15 11 48	II. Sh. I.	2 16 32	I. Tr. I.
18 25 53	II. Ec. R.	4 47 19	I. Sh. E.	17 48 12	II.* Sh. E.	3 3 9	I. Sh. E.
18 30 29	II.* Oc. D.	6 7 32	I. Tr. E.	18 2 34	II.* Tr. I.	4 24 6	I. Tr. E.
21 4 23	II.* Oc. R.	23 44 15	I. Ec. D.	20 33 54	II.* Tr. E.	22 1 2	I. Ec. D.
				22 59 58	I. Sh. I.	23 53 40	III. Ec. D.
8 0 43 40	I. Sh. I.	16 3 18 10	I. Oc. R.				
2 3 32	I. Tr. I.	12 35 19	II. Sh. I.	24 0 22 49	I. Tr. I.		
2 53 32	I. Sh. E.	15 11 54	II. Sh. E.	1 9 38	I. Sh. E.		
4 12 3	I. Tr. E.	15 23 51	II. Tr. I.	2 30 37	I. Tr. E.		
21 50 11	I. Ec. D.	17 55 57	II.* Tr. E.	19 52 54	III.* Ec. D.		
		21 6 6	I.* Sh. I.	20 6 55	I.* Ec. D.		
9 1 22 21	I. Oc. R.	22 28 9	I. Tr. I.	21 57 2	III. Ec. R.		

NOTE.—I. denotes ingress; E., egress; D., disappearance; R., reappearance; Ec., eclipse; Oc., occultation.
Tr., transit of the satellite; Sh., transit of the shadow.
*Visible at Washington.

GREENWICH MEAN TIME.

JULY.

Phases of the Eclipses of the Satellites for an Inverting Telescope.



Configurations at 19^h 10^m for an Inverting Telescope.

Day.	West.	East.
1	4. 3. .1	2. ○
2	○ 1. 4. .3 2.	○
3	.4 .2	○ .1 3.
4	.4 1. ○	.2 .3
5	.4 ○ 2. .1	3.
6	2. 1. .4	○ 3.
7	3. ○ 1. .4	.2 ●
8	3. .1 ○	2. .4
9	.3 2. ○ 1.	.4
10	.2 ○	.4 .1 ● .3 ●
11	1. ○ .2 .3	4.
12	○ .1 3. 4.	
13	2. 1. ○ 3. 4.	
14	3. ○ .1 .4	.2 ●
15	3. .4 .1 ○	.2
16	.4 .3 2. ○ 1.	
17	4. .2 .1 ○	.1 ●
18	4. 1. ○ .2 .3	
19	.4 ○ .1 2. 3.	
20	.4 2. 1. ○ 3.	
21	.4 .3 ○ .1	
22	3. .4 .1 ○	.2
23	○ 2. .3 ○ 1.	
24	.2 .1 ○ .4	
25	○ 1. ○ .2 .3 .4	
26	○ .1 2. .3 .4	
27	2. 1. ○ 3. .4	
28	.2 3. ○ .1 4.	
29	3. 1. ○ .2 4.	
30	.3 ○ 2. 1. 4.	
31	2. .3 .1 ○ 4.	

GREENWICH MEAN TIME.

AUGUST.

d h m s		d h m s		d h m s		d h m s	
1 135 34	I. Oc. R.	8 18 11 30	II.*Oc. D.	16 2 35 32	I. Tr. E.	24 20 1 23	II.*Tr. E.
1 56 34	III. Ec. R.	20 41 44	II.*Oc. R.	20 17 52	I.*Ec. D.	20 45 47	I.*Tr. I.
5 48 39	III. Oc. D.	21 15 59	I.*Sh. I.	23 47 40	I. Oc. R.	21 41 0	I.*Sh. E.
7 15 55	III. Oc. R.	22 37 6	I. Tr. I.			22 52 53	I. Tr. E.
12 51 12	II. Ec. D.	23 25 15	I. Sh. E.	17 12 20 42	II. Sh. I.		
15 28 1	II. Ec. R.			14 56 48	II. Sh. E.	25 16 40 47	I.*Ec. D.
15 39 24	II. Oc. D.	9 0 44 25	I. Tr. E.	15 2 59	II. Tr. I.	20 5 27	I.*Oc. R.
18 10 23	II.*Oc. R.	18 23 39	I.*Ec. D.	17 32 14	II.*Tr. E.		
19 22 15	I.*Sh. I.	21 56 14	I. Oc. R.	17 38 4	I.*Sh. I.	26 2 6 33	III. Sh. I.
20 44 48	I.*Tr. I.			18 55 59	I.*Tr. I.	4 2 47	III. Sh. E.
21 31 36	I.*Sh. E.	10 9 43 50	II. Sh. I.	19 47 20	I.*Sh. E.	7 29 40	III. Tr. I.
22 52 18	I. Tr. E.	12 19 58	II. Sh. E.	21 3 8	I.*Tr. E.	8 35 24	III. Tr. E.
		12 31 20	II. Tr. I.			9 53 6	II. Ec. D.
2 16 29 30	I.*Ec. D.	15 1 5	II. Tr. E.	18 14 46 30	I. Ec. D.	14 0 8	I. Sh. I.
20 3 47	I.*Oc. R.	15 44 24	I. Sh. I.	18 15 25	I.*Oc. R.	14 50 11	II. Oc. R.
		17 5 1	I.*Tr. I.	22 5 51	III. Sh. I.	15 13 3	I.*Tr. I.
3 7 7 3	II. Sh. I.	17 53 40	I.*Sh. E.			16 9 25	I.*Sh. E.
9 43 16	II. Sh. E.	19 12 17	I.*Tr. E.	19 0 3 6	III. Sh. E.	17 20 9	I.*Tr. E.
9 57 30	II. Tr. I.			3 44 17	III. Tr. I.		
12 27 50	II. Tr. E.	11 12 52 16	I. Ec. D.	4 54 59	III. Tr. E.	27 11 9 19	I. Ec. D.
13 50 41	I. Sh. I.	16 24 16	I.*Oc. R.	7 18 22	II. Ec. D.	14 32 45	I. Oc. R.
15 12 57	I. Tr. I.	18 4 56	III.*Sh. I.	9 54 24	II. Ec. R.		
16 0 1	I. Sh. E.	20 3 18	III.*Sh. E.	9 55 21	II. Oc. D.	28 4 15 50	II. Sh. I.
17 20 24	I.*Tr. E.	23 53 47	III. Tr. I.	12 6 29	I. Sh. I.	6 45 51	II. Tr. I.
				12 24 34	II. Oc. R.	6 51 56	II. Sh. E.
4 10 58 6	I. Ec. D.	12 1 9 49	III. Tr. E.	13 23 32	I. Tr. I.	8 28 34	I. Sh. I.
14 3 23	III. Sh. I.	4 43 35	II. Ec. D.	14 15 45	I. Sh. E.	9 14 33	II. Tr. E.
14 32 2	I. Oc. R.	7 19 55	II. Ec. R.	15 30 41	I.*Tr. E.	9 40 15	I. Tr. I.
16 2 53	III. Sh. E.	7 26 41	II. Oc. D.			10 37 50	I. Sh. E.
19 58 2	III.*Tr. I.	9 56 34	II. Oc. R.	20 9 15 1	I. Ec. D.	11 47 20	I. Tr. E.
21 19 24	III.*Tr. E.	10 12 49	I. Sh. I.	12 42 59	I. Oc. R.		
		11 32 52	I. Tr. I.			29 5 37 57	I. Ec. D.
5 2 8 41	II. Ec. D.	12 22 5	I. Sh. E.	21 1 38 48	II. Sh. I.	9 0 3	I. Oc. R.
4 45 20	II. Ec. R.	13 40 6	I. Tr. E.	4 14 54	II. Sh. E.	15 58 30	III.*Ec. D.
4 55 43	II. Oc. D.			4 17 33	II. Tr. I.	17 56 33	III.*Ec. R.
7 26 17	II. Oc. R.	13 7 20 46	I. Ec. D.	6 34 53	I. Sh. I.	21 11 22	III.*Oc. D.
8 19 6	I. Sh. I.	10 52 7	I. Oc. R.	6 46 36	II. Tr. E.	22 17 56	III. Oc. R.
9 41 4	I. Tr. I.	23 1 53	II. Sh. I.	7 51 0	I. Tr. I.	23 10 29	II. Ec. D.
10 28 25	I. Sh. E.			8 44 8	I. Sh. E.		
11 48 28	I. Tr. E.	14 1 37 59	II. Sh. E.	9 58 8	I. Tr. E.	30 2 56 59	I. Sh. I.
		1 46 59	II. Tr. I.			4 2 12	II. Oc. R.
6 5 26 36	I. Ec. D.	4 16 28	II. Tr. E.	22 3 43 38	I. Ec. D.	4 7 23	I. Tr. I.
9 0 9	I. Oc. R.	4 41 13	I. Sh. I.	7 10 35	I. Oc. R.	5 6 17	I. Sh. E.
20 25 5	II.*Sh. I.	6 0 37	I. Tr. I.	11 57 10	III. Ec. D.	6 14 29	I. Tr. E.
23 1 16	II. Sh. E.	6 50 29	I. Sh. E.	13 56 24	III. Ec. R.		
23 14 19	II. Tr. I.	8 7 50	I. Tr. E.	17 27 55	III.*Oc. D.	31 0 6 28	I. Ec. D.
				18 39 20	III.*Oc. R.	3 27 11	I. Oc. R.
7 1 44 21	II. Tr. E.	15 1 49 22	I. Ec. D.	20 35 45	II.*Ec. D.	17 34 49	II.*Sh. I.
2 47 31	I. Sh. I.	5 19 59	I. Oc. R.			19 59 29	II.*Tr. I.
4 9 6	I. Tr. I.	7 55 29	III. Ec. D.	23 1 3 19	I. Sh. I.	20 10 56	II.*Sh. E.
4 56 49	I. Sh. E.	9 55 56	III. Ec. R.	1 37 39	II. Oc. R.	21 25 23	I.*Sh. I.
6 16 27	I. Tr. E.	13 38 59	III. Oc. D.	2 18 27	I. Tr. I.	22 28 4	II. Tr. E.
23 55 11	I. Ec. D.	14 55 36	III. Oc. R.	3 12 35	I. Sh. E.	22 34 27	I. Tr. I.
		18 1 0	II.*Ec. D.	4 25 33	I. Tr. E.	23 34 43	I. Sh. E.
8 3 28 18	I. Oc. R.	20 37 12	II.*Ec. R.	22 12 8	I. Ec. D.		
3 54 27	III. Ec. D.	20 41 21	II.*Oc. D.			24 1 37 59	I. Oc. R.
5 56 7	III. Ec. R.	23 9 40	I. Sh. I.	14 57 39	II. Sh. I.	17 32 30	II.*Tr. I.
9 45 57	III. Oc. D.	23 10 53	II. Oc. R.	17 32 30	II.*Tr. I.	17 33 50	II.*Sh. E.
11 7 53	III. Oc. R.			17 33 50	II.*Sh. E.	19 31 43	I.*Sh. I.
15 26 9	II. Ec. D.	16 0 28 21	I. Tr. I.				
18 2 39	II.*Ec. R.	1 18 55	I. Sh. E.				

NOTE.—I. denotes ingress; E., egress; D., disappearance; R., reappearance; Ec., eclipse; Oc., occultation; Tr., transit of the satellite; Sh., transit of the shadow.

*Visible at Washington.

GREENWICH MEAN TIME.

AUGUST.

Phases of the Eclipses of the Satellites for an Inverting Telescope.



Configurations at 18^h 25^m for an Inverting Telescope.

Day.	West.	East.
1	4. ○ ₄ ¹ .3	
2	4. ○ 2. .3 .	.1 ●
3	4. 2. 1. ○ 3.	
4	4. .2 3 ○ . 1	
5	.4 3. 1. ○ .2	
6	.4 .3 ○ 2. .1	
7	.4 2.3 .1 ○	
8	.4 ○ 1. ₂	.2 ●
9	.1 ○ .4 2. .3	
10	○ 1. 2. ○ .43.	
11	.2 ○ ₁ ³ .4	
12	3. 1. ○ .2 .4	
13	3. ○ ₁ ³ .4	
14	.32. .1 ○ 4.	
15	○ .31. 4. .2 ●	
16	.1 ○ .24. .3	
17	₄ ³ ○ . 3.	
18	₂ ⁴ ○ .1 3.	
19	4. 3. 1. ○ .2	
20	4. 3. ○ .12.	
21	4. .3 2.1. ○	
22	.4 .2 ○ 1. .3 ●	
23	.4 .1 ○ .2 .3	
24	○ 2. .4 1. 3.	
25	.2 .4 ○ 3. .1 ●	
26	3. 1. ○ .2 .4	
27	3. ○ .1 2. .4	
28	.3 ₂ ¹ ○ .4	
29	.2 .3 .1 .4	
30	.1 ○ .2 .3 4.	
31	○ 2.1. 3. 4.	

GREENWICH MEAN TIME.

SEPTEMBER.

d h m s		d h m s		d h m s		d h m s	
1 041 32	I. Tr. E.	9 19 34 45	II.*Oc. R.	18 15 1 15	I.*Tr. I.	27 10 31 59	I. Sh. I.
18 35 8	I.*Ec. D.	19 56 55	I.*Sh. E.	16 19 12	I.*Sh. E.	11 12 21	I. Tr. I.
21 54 22	I.*Oc. R.	20 55 51	I.*Tr. E.	16 24 46	II.*Tr. E.	11 13 35	III. Oc. D.
				17 8 32	I.*Tr. E.	12 9 56	III. Oc. R.
2 6 7 2	III. Sh. I.	10 14 58 8	I.*Ec. D.	19 11 21 23	I. Ec. D.	12 41 40	I. Sh. E.
8 2 13	III. Sh. E.	18 8 56	I.*Oc. R.	14 21 59	I.*Oc. R.	13 18 57	II.*Oc. R.
11 9 54	III. Tr. I.					13 19 50	I.*Tr. E.
12 10 52	III. Tr. E.	11 9 30 20	II. Sh. I.	20 4 2 22	III. Ec. D.	28 7 44 40	I. Ec. D.
12 27 48	II. Ec. D.	11 35 10	II. Tr. I.	5 57 8	III. Ec. R.	10 33 32	I. Oc. R.
15 53 47	I.*Sh. I.	12 6 30	II. Sh. E.	6 54 36	II. Ec. D.		
17 1 25	I.*Tr. I.	12 15 53	I. Sh. I.	7 50 27	III. Oc. D.	29 4 4 48	II. Sh. I.
17 13 36	II.*Oc. R.	13 15 18	I. Tr. I.	8 38 6	I. Sh. I.	5 0 28	I. Sh. I.
18 3 8	I.*Sh. E.	14 3 31	II.*Tr. E.	8 47 28	III. Oc. R.	5 25 1	II. Tr. I.
19 8 31	I.*Tr. E.	14 25 20	I.*Sh. E.	9 27 35	I. Tr. I.	5 38 26	I. Tr. I.
		15 22 28	I.*Tr. E.	10 47 42	I. Sh. E.	6 40 57	II. Sh. E.
3 13 3 41	I. Ec. D.			11 2 39	II. Oc. R.	7 10 11	I. Sh. E.
16 21 23	I.*Oc. R.	12 9 26 47	I. Ec. D.	11 34 54	I. Tr. E.	7 45 58	I. Tr. E.
		12 35 43	I. Oc. R.			7 53 35	II. Tr. E.
4 6 53 1	II. Sh. I.	13 0 1 18	III. Ec. D.	21 5 49 58	I. Ec. D.		
9 11 40	II. Tr. I.	1 57 7	III. Ec. R.	8 48 21	I. Oc. R.	30 2 13 26	I. Ec. D.
9 29 9	II. Sh. E.	4 19 53	II. Ec. D.			4 59 46	I. Oc. R.
10 22 11	I. Sh. I.	4 22 44	III. Oc. D.	22 1 27 6	II. Sh. I.	22 11 30	III.*Sh. I.
11 28 19	I. Tr. I.	5 21 49	III. Oc. R.	3 6 34	I. Sh. I.	22 46 48	II. Ec. D.
11 40 8	II. Tr.*E.	6 44 20	I. Sh. I.	3 6 45	II. Tr. I.	23 28 57	I. Sh. I.
12 31 34	I. Sh. E.	7 41 54	I. Tr. I.	3 53 52	I. Tr. I.		
13 35 26	I. Tr. E.	8 44 34	II. Oc. R.	4 3 16	II. Sh. E.		
		8 53 49	I. Sh. E.	5 16 11	I. Sh. E.		
5 7 32 20	I. Ec. D.	9 49 6	I. Tr. E.	5 35 8	II. Tr. E.		
10 48 26	I. Oc. R.			6 1 13	I. Tr. E.		
20 0 13	III.*Ec. D.	14 3 55 23	I. Ec. D.				
21 57 9	III.*Ec. R.	7 2 18	I. Oc. R.	23 0 18 42	I. Ec. D.		
		22 49 29	II. Sh. I.	3 14 47	I. Oc. R.		
6 0 49 56	III. Oc. D.			18 9 47	III.*Sh. I.		
1 45 10	II. Ec. D.	15 0 46 30	II. Tr. I.	20 2 3	III.*Sh. E.		
1 52 21	III. Oc. R.	1 12 46	I. Sh. I.	20 11 58	II.*Ec. D.		
4 50 38	I. Sh. I.	1 25 40	II. Sh. E.	21 35 1	I.*Sh. I.		
5 55 11	I. Tr. I.	2 8 25	I. Tr. I.	21 41 2	III.*Tr. I.		
6 24 27	II. Oc. R.	3 14 50	II. Tr. E.	22 20 4	I.*Tr. I.		
7 0 1	I. Sh. E.	3 22 17	I. Sh. E.	22 33 28	III. Tr. E.		
8 2 19	I. Tr. E.	4 15 38	I. Tr. E.	23 44 40	I. Sh. E.		
		22 24 5	I. Ec. D.				
7 2 0 52	I. Ec. D.			24 0 11 0	II. Oc. R.		
5 15 17	I. Oc. R.	16 1 28 57	I. Oc. R.	0 27 28	I. Tr. E.		
20 12 6	II.*Sh. I.	14 8 45	III.*Sh. I.	18 47 20	I.*Ec. D.		
22 24 9	II. Tr. I.	16 1 57	III.*Sh. E.	21 41 3	I.*Oc. R.		
22 48 15	II. Sh. E.	17 37 14	II.*Ec. D.				
23 19 3	I. Sh. I.	18 15 39	III.*Tr. I.	25 14 45 28	II.*Sh. I.		
		19 9 35	III.*Tr. E.	16 3 29	I.*Sh. I.		
8 0 21 57	I. Tr. I.	19 41 12	I.*Sh. I.	16 15 40	II.*Tr. I.		
0 52 33	II. Tr. E.	20 34 52	I.*Tr. I.	16 46 13	I.*Tr. I.		
1 28 28	I. Sh. E.	21 50 45	I.*Sh. E.	17 21 38	II.*Sh. E.		
2 29 7	I. Tr. E.	21 53 51	II.*Oc. R.	18 13 8	I.*Sh. E.		
20 29 34	I.*Ec. D.	22 42 7	I. Tr. E.	18 44 8	II.*Tr. E.		
23 42 12	I. Oc. R.			18 53 39	I.*Tr. E.		
9 10 7 34	III. Sh. I.	17 16 52 41	I.*Ec. D.	26 13 16 3	I.*Ec. D.		
12 1 45	III. Sh. E.	19 55 27	I.*Oc. R.	16 7 23	I.*Oc. R.		
14 45 0	III.*Tr. I.						
15 2 30	II.*Ec. D.	18 12 7 48	II. Sh. I.	27 8 3 34	III. Ec. D.		
15 41 56	III.*Tr. E.	13 56 26	II.*Tr. I.	9 29 24	II. Ec. D.		
17 47 28	I.*Sh. I.	14 9 38	I.*Sh. I.	9 57 14	III. Ec. R.		
18 48 40	I.*Tr. I.	14 43 59	II.*Sh. E.				

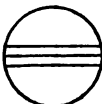
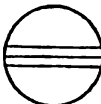

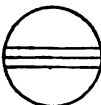
NOTE.—I. denotes ingress; E., egress; D., disappearance; R., reappearance; Ec., eclipse; Oc., occultation; Tr., transit of the satellite; Sh., transit of the shadow.

*Visible at Washington.

GREENWICH MEAN TIME.

SEPTEMBER.

Phases of the Eclipses of the Satellites for an Inverting Telescope.

I.	[*] _d 	III.	
II.	[*] _d 	IV.	No Eclipse. 

Configurations at 17^h 40^m for an Inverting Telescope.

Day.	West.	East.
1	2. .1 ○	3. 4.
2	○ 1.	3. ○ 2 4.
3	3. 4. ○ .1 2.	
4	.3 4. ^{1.} _{1.} ○	
5	4. .2 .3 ○ .1	
6	4. 1. ○ ^{2.} _{3.}	
7	4. ○ ^{2.} _{1.} .3	
8	.4 2. .1 ○ 3.	
9	.4 3. ○ 1.	.2 ●
10	3. .4 ○ 2.	.1 ●
11	.3 ^{1.} _{2.} ○ 4	
12	.2 .3 ○ .1 .4	
13	1. ○ ^{2.} _{3.} .4	
14	○ ^{2.} _{1.} .3 .4	
15	2. .1 ○ 3. .4	
16	3 ○ 1.	4. .2 ●
17	3. ○ .2 4. .1 ●	
18	.3 ^{1.} _{2.} ○ 4.	
19	^{2.} _{3.} ○ .1 4.	
20	^{4.} _{1.} ○ ^{2.} _{3.}	
21	4. ○ ^{2.} _{1.} .3	
22	4. 2. .1 ○ 3.	
23	4. .2 ○ 3 .1.	
24	.4 3. .1 ○ .2	
25	○ 2. ○ 1. .4 .3 ○	
26	.4 ^{2.} _{3.} ○ .1	
27	.4 1. ○ ^{2.} _{3.}	
28	○ .4 .12. .3	
29	2. .1 ○ .4 3.	
30	.2 ○ 3 .1. .4	

GREENWICH MEAN TIME.

OCTOBER.

d h m s		d h m s		d h m s		d h m s	
1 0 251	III. Sh. E.	9 20 113	II.*Sh. I.	18 17 1421	II.*Ec. D.	27 14 37 19	II.*Sh. I.
0 427	I. Tr. I.	20 14 2	I.*Tr. I.	18 24 14	I.*Sh. E.	14 40 15	I.*Tr. E.
1 2 23	III. Tr. I.	20 49 8	II.*Tr. I.	18 31 5	I.*Tr. E.	14 47 19	I.*Sh. E.
138 41	I. Sh. E.	22 122	I.*Sh. E.	20 0 41	II.*Oc. R.	16 57 10	II.*Tr. E.
155 5	III. Tr. E.	22 21 50	I.*Tr. E.	20 9 16	III.*Ec. D.	17 12 54	II.*Sh. E.
212 0	I. Tr. E.	22 37 16	II.*Sh. E.	22 7 6	III.*Oc. R.		
226 31	II. Oc. R.	23 18 15	II. Tr. E.			28 9 46 19	I. Oc. D.
20 42 5	I.*Ec. D.			19 13 29 29	I.*Ec. D.	12 4 23	I.*Ec. R.
23 25 52	I. Oc. R.	10 17 5 45	I.*Ec. D.	15 45 50	I.*Oc. R.		
		19 36 10	I.*Oc. R.			29 6 57 48	I. Tr. I.
2 17 23 14	II.*Sh. I.			20 10 43 1	I. Sh. I.	7 6 10	I. Sh. I.
17 57 26	I.*Sh. I.	11 14 20 6	I.*Sh. I.	10 48 51	I. Tr. I.	8 51 9	II. Oc. D.
18 30 26	I.*Tr. I.	14 39 14	II.*Ec. D.	11 58 56	II.*Sh. I.	9 6 6	I. Tr. E.
18 33 5	II.*Tr. I.	14 39 53	I.*Tr. I.	12 12 3	II.*Tr. I.	9 15 56	I. Sh. E.
19 59 22	II.*Sh. E.	16 7 20	III.*Ec. D.	12 52 51	I.*Sh. E.	11 41 7	II.*Ec. R.
20 7 11	I.*Sh. E.	16 29 55	I.*Sh. E.	12 56 55	I.*Tr. E.	13 56 25	III.*Tr. I.
20 38 2	I.*Tr. E.	16 47 43	I.*Tr. E.	14 34 45	II.*Sh. E.	14 16 22	III.*Sh. I.
21 1 48	II.*Tr. E.	17 47 32	II.*Oc. R.	14 41 53	II.*Tr. E.	15 5 53	III.*Tr. E.
		18 49 16	III.*Oc. R.			16 3 57	III.*Sh. E.
3 15 10 51	I.*Ec. D.			21 7 58 19	I. Ec. D.		
17 52 2	I.*Oc. R.	12 11 34 25	I. Ec. D.	10 11 48	I. Oc. R.	30 4 12 12	I. Oc. D.
		14 2 4	I.*Oc. R.			6 33 8	I. Ec. R.
4 12 4 16	II. Ec. D.			22 5 11 37	I. Sh. I.		
12 5 5	III. Ec. D.	13 8 48 40	I. Sh. I.	5 14 36	I. Tr. I.	31 1 23 38	I. Tr. I.
12 25 59	I.*Sh. I.	9 5 42	I. Tr. I.	6 31 59	II. Ec. D.	134 49	I. Sh. I.
12 56 24	I.*Tr. I.	9 20 43	II. Sh. I.	7 21 27	I. Sh. E.	331 58	I. Tr. E.
13 57 43	III.*Ec. R.	9 57 14	II. Tr. I.	7 22 44	I. Tr. E.	333 44	II. Tr. I.
14 32 45	III.*Oc. D.	10 58 30	I. Sh. E.	9 7 11	II. Oc. R.	344 35	I. Sh. E.
14 35 44	I.*Sh. E.	11 13 36	I. Tr. E.	10 15 3	III. Sh. I.	356 6	II. Sh. I.
15 4 3	I.*Tr. E.	11 56 42	II.*Sh. E.	10 44 57	III. Tr. I.	6 4 29	II. Tr. E.
15 30 8	III.*Oc. R.	12 26 34	II.*Tr. E.	11 48 35	III.*Tr. E.	6 31 32	II. Sh. E.
15 33 47	II.*Oc. R.			12 3 36	III.*Sh. E.	22 38 14	I. Oc. D.
		14 6 3 14	I. Ec. D.				
5 9 39 29	I. Ec. D.	8 28 4	I. Oc. R.	23 2 27 4	I. Ec. D.		
12 18 2	I.*Oc. R.			4 37 42	I. Oc. R.		
		15 3 17 14	I. Sh. I.	23 40 14	I. Sh. I.		
6 6 42 41	II. Sh. I.	3 31 29	I. Tr. I.	23 40 22	I. Tr. I.		
6 54 29	I. Sh. I.	3 56 47	II. Ec. D.				
7 22 19	I. Tr. I.	5 27 4	I. Sh. E.	24 1 17 40	II. Sh. I.		
7 41 42	II. Tr. I.	5 39 26	I. Tr. E.	1 18 57	II. Tr. I.		
9 4 17	I. Sh. E.	6 13 54	III. Sh. I.	1 48 32	I. Tr. E.		
9 18 48	II. Sh. E.	6 54 10	II. Oc. R.	1 50 3	I. Sh. E.		
9 30 1	I. Tr. E.	7 33 1	III. Tr. I.	3 49 2	II. Tr. E.		
10 10 37	II. Tr. E.	8 3 25	III. Sh. E.	3 53 23	II. Sh. E.		
		8 31 42	III. Tr. E.	20 54 29	I.*Oc. D.		
7 4 8 16	I. Ec. D.			23 6 49	I. Ec. R.		
6 44 8	I. Oc. R.	16 0 31 57	I. Ec. D.				
		2 53 58	I. Oc. R.	25 18 6 10	I.*Tr. I.		
8 1 21 44	II. Ec. D.	21 45 48	I.*Sh. I.	18 8 53	I.*Sh. I.		
1 23 1	I. Sh. I.	21 57 16	I.*Tr. I.	19 44 48	II.*Oc. D.		
1 48 11	I. Tr. I.	22 39 20	II.*Sh. I.	20 14 22	I.*Tr. E.		
2 12 44	III. Sh. I.	23 4 14	II. Tr. I.	20 18 40	I.*Sh. E.		
3 32 49	I. Sh. E.	23 55 38	I. Sh. E.	22 23 28	II.*Ec. R.		
3 55 56	I. Tr. E.						
4 3 10	III. Sh. E.	17 0 5 15	I. Tr. E.	26 0 11 35	III. Ec. D.		
4 19 13	III. Tr. I.	1 15 15	II. Sh. E.	2 1 17	III. Ec. R.		
4 40 46	II. Oc. R.	1 33 49	II. Tr. E.	15 20 20	I.*Oc. D.		
5 14 7	III. Tr. E.	19 0 47	I.*Ec. D.	17 35 32	I.*Ec. R.		
22 36 57	I.*Ec. D.	21 19 59	I.*Oc. R.				
				27 12 31 59	I.*Tr. I.		
9 1 110 6	I. Oc. R.	18 16 14 24	I.*Sh. I.	12 37 32	I.*Sh. I.		
19 51 32	I.*Sh. I.	16 23 3	I.*Tr. I.	14 26 43	II.*Tr. I.		

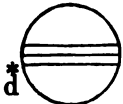

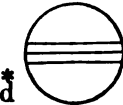
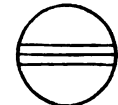
NOTE.—I. denotes ingress; E., egress; D., disappearance; R., reappearance; Ec., eclipse; Oc., occultation; Tr., transit of the satellite; Sh., transit of the shadow.

*Visible at Washington.

GREENWICH MEAN TIME.

OCTOBER.

Phases of the Eclipses of the Satellites for an Inverting Telescope.

I.		III.	
II.		IV. No Eclipse.	

Configurations at 16^h 40^m for an Inverting Telescope.

Day.	West.				East.			
1		3.	•1	○	•2		•4	
2		3.		○ ¹ ₁			•4	
3		•32.		○		4.		•1●
4			1.	○	•2		4.	
5				○	•1	2.	4.	•3
6			¹ ₁	○	4.		3.	
7			4.	•2	○	¹ ₁		
8		4.		3.	•1	○	•2	
9		4.	3.		○	¹ ₁		
10	4.		•32.	•	○	1		
11	○1.	•4		○				•2●•3●
12		•4		○	•1	2.	•3	
13		•4	¹ ₁	○		3.		
14			•2	•4	○	•13.		
15			¹ ₁	○		•4.	2	
16		3.		○	¹ ₁		•4	
17		•3	2.	•1	○		•4	
18	○1.			•3.	○	2		•4
19				○	•1	¹ ₁		4.
20				1.	2.	○	3.	4.
21			•2	○	•1	3.	4.	
22			1.	3.	○	•24.		
23		3.		4.	○	¹ ₁		
24		•34.	2.	•1	○			
25		4.		•3.	2	○	1.	
26		4.		○		•3.	2	•1●
27	○2.	•4		1.	○		•3	
28		•4		•2	○	•1	3.	
29		•4		1.	3.	○	•2	
30			3.	•4	○	1.	2.	
31			•3	2.	•1	○		

GREENWICH MEAN TIME.

NOVEMBER.

d h m s		d h m s		d h m s		d h m s	
1 1 2 1	I. Ec. R.	9 18 48 31	I.*Oc. D.	18 1 7 19	II. Sh. E.	27 3 4 49	III. Tr. I.
19 49 31	I.*Tr. I.	21 26 6	I.*Ec. R.	15 0 3	I.*Oc. D.	4 39 8	III. Tr. E.
20 3 30	I.*Sh. I.			17 50 27	I.*Ec. R.	6 25 0	III. Sh. I.
21 57 34	II.*Oc. D.	10 15 59 29	I.*Tr. I.			8 8 46	III. Sh. E.
21 57 54	I.*Tr. E.	16 26 59	I.*Sh. I.	19 12 10 40	I.*Tr. I.	11 13 0	I.*Oc. D.
22 13 13	I.*Sh. E.	18 8 3	I.*Tr. E.	12 50 38	I.*Sh. I.	14 14 52	I.*Ec. R.
		18 36 35	I.*Sh. E.	14 19 23	I.*Tr. E.		
2 0 58 46	II. Ec. R.	18 57 53	II.*Tr. I.	15 0 2	I.*Sh. E.	28 8 23 28	I. Tr. I.
3 28 5	III. Oc. D.	19 54 17	II.*Sh. I.	15 34 8	II.*Oc. D.	9 14 30	I. Sh. I.
6 2 6	III. Ec. R.	21 29 35	II.*Tr. E.	19 27 50	II.*Ec. R.	10 32 18	I.*Tr. E.
17 410	I.*Oc. D.	22 29 13	II. Sh. E.	23 42 50	III. Tr. I.	11 23 42	I.*Sh. E.
19 30 46	I.*Ec. R.					12 44 51	II.*Tr. I.
		11 13 14 45	I.*Oc. D.	20 1 11 13	III. Tr. E.	14 30 20	II.*Sh. I.
3 14 15 27	I.*Tr. I.	15 55 0	I.*Ec. R.	2 22 55	III. Sh. I.	15 18 1	II.*Tr. E.
14 32 11	I.*Sh. I.			4 7 36	III. Sh. E.	17 4 8	II.*Sh. I.
16 23 52	I.*Tr. E.	12 10 25 36	I. Tr. I.	9 26 28	I. Oc. D.		
16 41 48	II.*Tr. I.	10 55 41	I.*Sh. I.	12 19 18	I.*Ec. R.	29 5 39 52	I. Oc. R.
16 41 54	I.*Sh. E.	12 34 12	I.*Tr. E.			8 43 50	I. Ec. R.
17 15 45	II.*Sh. I.	13 5 14	I.*Sh. E.	21 6 37 5	I. Tr. I.		
19 12 52	II.*Tr. E.	13 18 25	II.*Oc. D.	7 19 24	I. Sh. I.	30 2 50 14	I. Tr. I.
19 51 2	II.*Sh. E.	16 52 3	II.*Ec. R.	8 45 50	I. Tr. E.	3 43 17	I. Sh. I.
		20 24 17	III.*Tr. I.	9 28 46	I. Sh. E.	4 59 6	I. Tr. E.
4 11 30 15	I.*Oc. D.	21 46 22	III. Tr. E.	10 24 26	II.*Tr. I.	5 52 27	I. Sh. E.
13 59 38	I.*Ec. R.	22 20 20	III. Sh. I.	11 51 43	II.*Sh. I.	7 1 24	II. Oc. R.
				12 57 2	II.*Tr. E.	11 24 53	II.*Ec. R.
5 8 41 23	I. Tr. I.	13 0 5 58	III. Sh. E.	14 25 59	II.*Sh. E.	16 43 35	III.*Oc. D.
9 0 51	I. Sh. I.	7 40 57	I. Oc. D.			18 23 8	III.*Oc. R.
10 49 50	I.*Tr. E.	10 23 49	I. Ec. R.	22 3 53 3	I. Oc. D.	20 21 59	III. Ec. I.
11 4 15	II.*Oc. D.			6 48 14	I. Ec. R.	22 7 30	III. Ec. E.
11 10 32	I.*Sh. E.	14 4 51 47	I. Tr. I.				
14 16 30	II.*Ec. R.	5 24 24	I. Sh. I.	23 1 3 34	I. Tr. I.		
17 9 25	III.*Tr. I.	7 0 24	I. Tr. E.	1 48 9	I. Sh. I.		
18 18 25	III.*Sh. I.	7 33 56	I. Sh. E.	3 12 21	I. Tr. E.		
18 25 8	III.*Tr. E.	8 6 3	II. Tr. I.	3 57 29	I. Sh. E.		
20 5 0	III.*Sh. E.	9 13 9	II. Sh. I.	4 42 41	II. Oc. D.		
		10 38 3	II.*Tr. E.	8 45 48	II. Ec. R.		
6 5 56 16	I. Oc. D.	11 47 52	II.*Sh. E.	13 18 29	III.*Oc. D.		
8 28 26	I. Ec. R.			14 52 25	III.*Oc. R.		
		15 2 7 19	I. Oc. D.	16 19 5	III.*Ec. D.		
7 3 7 22	I. Tr. I.	4 52 44	I. Ec. R.	18 5 24	III.*Ec. R.		
3 29 33	I. Sh. I.	23 18 1	I. Tr. I.	22 19 35	I. Oc. D.		
5 15 51	I. Tr. E.	23 53 8	I. Sh. I.				
5 39 12	I. Sh. E.			24 1 17 4	I. Ec. R.		
5 49 17	II. Tr. I.	16 1 26 40	I. Tr. E.	19 30 9	I.*Tr. I.		
6 34 35	II. Sh. I.	2 2 37	I. Sh. E.	20 16 57	I.*Sh. I.		
8 20 40	II. Tr. E.	2 26 3	II. Oc. D.	21 38 57	I. Tr. E.		
9 9 42	II. Sh. E.	6 9 54	II. Ec. R.	22 26 14	I. Sh. E.		
		9 58 17	III. Oc. D.	23 34 46	II. Tr. I.		
8 0 22 26	I. Oc. D.	11 26 13	III.*Oc. R.				
2 57 20	I. Ec. R.	12 16 54	III.*Ec. D.	25 1 11 25	II. Sh. I.		
21 33 23	I.*Tr. I.	14 4 0	III.*Ec. R.	2 7 40	II. Tr. E.		
21 58 14	I. Sh. I.	20 33 35	I.*Oc. D.	3 45 27	II. Sh. E.		
23 41 55	I. Tr. E.	23 21 33	I. Ec. R.	16 46 18	I.*Oc. D.		
				19 46 0	I.*Ec. R.		
9 0 7 53	I. Sh. E.	17 17 44 20	I.*Tr. I.				
0 11 9	II. Oc. D.	18 21 54	I.*Sh. I.	26 13 56 46	I.*Tr. I.		
3 34 14	II. Ec. R.	19 53 1	I.*Tr. E.	14 45 43	I.*Sh. I.		
6 41 52	III. Oc. D.	20 31 21	I.*Sh. E.	16 5 35	I.*Tr. E.		
8 3 35	III. Oc. R.	21 15 25	II. Tr. I.	16 54 57	I.*Sh. E.		
8 15 1	III. Ec. D.	22 32 50	II. Sh. I.	17 51 46	II.*Oc. D.		
10 2 58	III. Ec. R.	23 47 44	II. Tr. E.	22 3 49	II. Ec. R.		

NOTE.—I. denotes ingress; E., egress; D., disappearance; R., reappearance; Ec., eclipse; Oc., occultation; Tr., transit of the satellite; Sh., transit of the shadow.

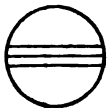
*Visible at Washington.

GREENWICH MEAN TIME.

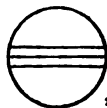
NOVEMBER.

Phases of the Eclipses of the Satellites for an Inverting Telescope.

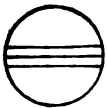
I.



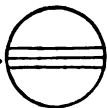
III.



II.



IV. No Eclipse.

*Configurations at 15^h 25^m for an Inverting Telescope.*

Day.	West.	East.
1		•3•2 ○ 1• •4
2		•1○ •3 •2 •4
3	○ 1•	2○• •3 •4
4		•2 ○ •1 3• •4
5		1• 3○ •2 4•
6	3•	○ •12• 4•
7	•3	•1 ○ 4•
8		•3•2 ○ 4•1•
9		4• •1 ○ •3 •2
10	4•	○ 1•2• •3
11	4• 2•	○ 3• •1●
12	4• 1•	○ 3• •2●
13	•4 3•	○ •1 2•
14	•4 3•	1•2• ○
15	•4 •3•2	○ 1•
16		•4•1 ○ •3 •2
17		○ 1•2• •3
18	2•	○ •43• •1●
19		1••○2 3• •4
20	3•	○ •1 2• •4
21	3•	1• 2• ○ 4•
22	•3 •2	○ •1 4•
23		•1 ○ •2 4•
24		○ 1•2• 4• •3
25	2•	•1○ 3•
26	○ 1•	4• •2○ 3•
27	4• 3•	○ •1 •2
28	4• 3•	1• 2• ○
29	4• •3 •2	○ •1
30	•4	•1 •○3 •2

GREENWICH MEAN TIME.

DECEMBER.

d h m s		d h m s		d h m s		d h m s	
1 0 641	I. Oc. D.	9 9 135	II. Sh. E.	18 5 52 59	II. Ec. R.	26 17 50 34	I.*Tr. E.
3 12 40	I. Ec. R.	20 22 18	I. Oc. D.	13 39 46	III.*Tr. I.	19 4 37	I. Sh. E.
21 17 7	I. Tr. I.	23 37 19	I. Ec. R.	15 28 38	III.*Tr. E.	22 30 28	II. Tr. I.
22 12 7	I. Sh. I.			16 39 51	I.*Oc. D.		
23 26 0	I. Tr. E.	10 17 32 31	I.*Tr. I.	18 30 53	III.*Sh. I.	27 1 41 2	II. Sh. I.
		18 36 13	I.*Sh. I.	20 1 55	I. Ec. R.	1 5 22	II. Tr. E.
2 0 21 14	I. Sh. E.	19 41 31	I.*Tr. E.	20 12 5	III. Sh. E.	3 36 13	II. Sh. E.
1 56 17	II. Tr. I.	20 45 8	I. Sh. E.			12 59 31	I.*Oc. D.
3 49 59	II. Sh. I.	22 34 3	II. Oc. D.	19 13 49 57	I.*Tr. I.	16 26 41	I.*Ec. R.
4 29 43	II. Tr. E.			15 0 29	I.*Sh. I.		
6 23 33	II. Sh. E.	11 3 16 24	II. Ec. R.	15 59 4	I.*Tr. E.	28 10 9 24	I. Tr. I.
18 33 42	I.*Oc. D.	10 3 3	III. Tr. I.	17 9 13	I.*Sh. E.	11 24 51	I.*Sh. I.
21 41 37	I. Ec. R.	11 47 39	III.*Tr. E.	20 0 21	II. Tr. I.	12 18 37	I.*Tr. E.
		14 28 53	III.*Sh. I.	22 25 51	II. Sh. I.	13 33 28	I.*Sh. E.
3 15 44 2	I.*Tr. I.	14 49 37	I.*Oc. D.	22 34 55	II. Tr. E.	16 41 26	II.*Oc. D.
16 40 55	I.*Sh. I.	16 10 54	III.*Sh. E.			21 48 18	II. Ec. R.
17 52 56	I.*Tr. E.	18 6 12	I.*Ec. R.	20 0 58 18	II. Sh. E.		
18 49 59	I.*Sh. E.			11 7 40	I.*Oc. D.	29 7 13 28	III. Oc. D.
20 11 40	II. Oc. D.	12 11 59 50	I.*Tr. I.	14 30 56	I.*Ec. R.	7 27 34	I. Oc. D.
		13 5 3	I.*Sh. I.			9 10 23	III. Oc. R.
4 0 40 0	II. Ec. R.	14 8 52	I.*Tr. E.	21 8 17 40	I. Tr. I.	10 55 33	I.*Ec. R.
6 31 24	III. Tr. I.	15 13 56	I.*Sh. E.	9 29 20	I. Sh. I.	12 31 20	III.*Ec. R.
8 11 8	III. Tr. E.	17 32 42	II.*Tr. I.	10 26 48	I.*Tr. E.	14 14 20	III.*Ec. R.
10 26 58	III.*Sh. I.	19 47 24	II. Sh. I.	11 38 2	I.*Sh. E.		
12 9 52	III.*Sh. E.	20 6 52	II. Tr. E.	14 12 28	II.*Oc. D.	30 4 37 32	I. Tr. I.
13 0 41	I.*Oc. D.	22 20 17	II. Sh. E.	19 11 24	II. Ec. R.	5 53 46	I. Sh. I.
16 10 30	I.*Ec. R.					6 46 48	I. Tr. E.
		13 9 17 7	I. Oc. D.	22 3 28 14	III. Oc. D.	8 2 23	I. Sh. E.
5 10 11 2	I. Tr. I.	12 35 11	I.*Ec. R.	5 21 40	III. Oc. R.	11 46 35	II.*Tr. I.
11 9 44	I.*Sh. I.			5 35 27	I. Oc. D.	14 21 37	II.*Tr. E.
12 19 58	I.*Tr. E.	14 6 27 14	I. Tr. I.	8 29 20	III. Ec. D.	14 23 35	II.*Sh. I.
13 18 45	I.*Sh. E.	7 33 53	I. Sh. I.	8 59 48	I. Ec. R.	16 55 24	II.*Sh. E.
15 7 32	II.*Tr. I.	8 36 17	I. Tr. E.	10 12 53	III. Ec. R.		
17 8 52	II.*Sh. I.	9 42 44	I. Sh. E.			31 1 55 53	I. Oc. D.
17 41 13	II.*Tr. E.	11 46 11	II.*Oc. D.	23 2 45 31	I. Tr. I.	5 24 32	I. Ec. R.
19 42 13	II.*Sh. E.	16 34 41	II.*Ec. R.	3 58 14	I. Sh. I.	23 5 43	I. Tr. I.
		23 48 22	III. Oc. D.	4 54 40	I. Tr. E.		
6 7 27 52	I. Oc. D.			6 6 55	I. Sh. E.		
10 39 29	I.*Ec. R.	15 1 37 45	III. Oc. R.	9 15 26	II. Tr. I.		
		3 44 34	I. Oc. D.	11 45 18	II.*Sh. I.		
7 4 38 6	I. Tr. I.	4 27 15	III. Ec. D.	11 50 9	II.*Tr. E.		
5 38 33	I. Sh. I.	6 11 24	III. Ec. R.	14 17 32	II.*Sh. E.		
6 47 3	I. Tr. E.	7 4 3	I. Ec. R.				
7 47 31	I. Sh. E.			24 0 3 25	I. Oc. D.		
9 22 32	II. Oc. D.	16 0 54 45	I. Tr. I.	3 28 47	I. Ec. R.		
13 58 12	II.*Ec. R.	2 2 47	I. Sh. I.	21 13 23	I. Tr. I.		
20 13 11	III. Oc. D.	3 3 50	I. Tr. E.	22 27 5	I. Sh. I.		
21 57 55	III. Oc. R.	4 11 35	I. Sh. E.	23 22 33	I. Tr. E.		
		6 46 33	II. Tr. I.				
8 0 24 28	III. Ec. D.	9 6 58	II. Sh. I.	25 0 35 45	I. Sh. E.		
1 54 59	I. Oc. D.	9 20 56	II. Tr. E.	3 26 37	II. Oc. D.		
2 9 16	III. Ec. R.	11 39 37	II.*Sh. E.	8 29 47	II. Ec. R.		
5 8 20	I. Ec. R.	22 12 13	I. Oc. D.	17 22 44	III.*Tr. I.		
23 5 18	I. Tr. I.			18 31 22	I. Oc. D.		
		17 1 33 1	I. Ec. R.	19 15 13	III. Tr. E.		
9 0 7 24	I. Sh. I.	19 22 16	I. Tr. I.	21 57 40	I. Ec. R.		
1 14 16	I. Tr. E.	20 31 37	I. Sh. I.	22 33 34	III. Sh. I.		
2 16 21	I. Sh. E.	21 31 24	I. Tr. E.				
4 20 12	II. Tr. I.	22 40 22	I. Sh. E.	26 0 14 0	III. Sh. E.		
6 28 29	II. Sh. I.			15 41 21	I.*Tr. I.		
6 54 9	II. Tr. E.	18 0 59 0	II. Oc. D.	16 55 59	I.*Sh. I.		

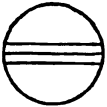
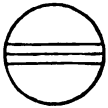
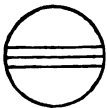
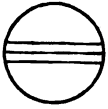
NOTE.—I. denotes ingress; E., egress; D., disappearance; R., reappearance; Ec., eclipse; Oc., occultation.
Tr., transit of the satellite; Sh., transit of the shadow.

*Visible at Washington.

GREENWICH MEAN TIME.

DECEMBER.

Phases of the Eclipses of the Satellites for an Inverting Telescope.

I.		* r	III.		* d * r
II.		* r	IV. No Eclipse.		

Configurations at 14^h 10^m for an Inverting Telescope.

Day.	West.			East.		
1		•4	○	1• 2•	•3	
2		•4	2• 1•	○	3•	
3			•2•4	○ 1•	3•	
4			3•	○	•4 2	•1●
5		3•	1•2○		•4	
6		•3 2	○	•1		•4
7			1• 3	○ 2		•4
8			○	1• 2• 3		4•
9			2• 1	○	•3	4•
10			•2	○ 1•	3•	4•
11			3• 1	○ 1	4• 2	
12	○ 1•		3•	4•	○ 2•	
13			•3• 2•	○	•1	
14		4•	1• 3	○		•2●
15		4•		○	•1•32•	
16		•4		•12•	○	•3
17		•4		•2	○ 1•	3•
18	○ 3•		•4	•1	○	2
19	○ 1•		3• 4		○	2•
20			•3 2•		○	4
21				•3 1•	•○ 2	•4
22				○	1• 2•	•4
23				1• 2•	○	•3 4
24				•2	○ 1•	3• 4
25				•1	○ 3•	•2 4•
26			3•		○ 1• 2•	4•
27			•3 2•		○	4•
28			•3	1• 3	○ 4•	
29				4•	○	•1 2
30	○ 2•		4•	1•	○	•3
31		4•		•2	○ 1•	3•

656 MAGNITUDE AND RINGS OF SATURN, 1916.

ELEMENTS FOR DETERMINING THE GEOCENTRIC POSITION, APPEAR-
ANCE, AND MAGNITUDE OF SATURN'S RINGS.

Greenwich Mean Noon.	a Outer Major Axis.	b Outer Minor Axis.	p Inclination of Northern Semi-minor Axis to Circle of Declination from North to East.	l The Eleva- tion of the Earth above the Plane of the Rings.	l' The Eleva- tion of the Sun above the Plane of the Rings.	u u' Earth's Longitude from Saturn counted on Plane of Rings from the Rings' Ascending Node on—		Stellar Mag.
						Equator.	Ecliptic.	
	"	"	"	"	"	"	"	
Jan. 1	46.67	-19.57	-6 58.3	-24 47.6	-24 55.7	160 7.2	117 42.1	-0.2
11	46.63	19.70	6 56.2	24 59.3	24 51.8	159 14.2	116 49.2	0.2
21	46.42	19.75	6 54.0	25 10.4	24 47.8	158 23.0	115 58.1	0.1
31	46.03	19.70	6 52.0	25 20.4	24 43.7	157 36.9	115 12.0	-0.1
Feb. 10	45.50	19.57	6 50.3	25 28.7	24 39.5	156 58.2	114 33.4	0.0
20	44.86	-19.37	-6 49.1	-25 35.4	-24 35.3	156 29.4	114 4.6	0.0
Mar. 1	44.13	19.11	6 48.2	25 40.0	24 31.0	156 11.4	113 46.6	+0.1
11	43.36	18.81	6 48.0	25 42.4	24 26.7	156 5.5	113 40.8	0.2
21	42.57	18.47	6 48.4	25 42.6	24 22.3	156 11.8	113 47.1	0.2
31	41.79	18.11	6 49.3	25 40.7	24 17.9	156 30.0	114 5.4	0.3
Apr. 10	41.03	-17.74	-6 50.7	-25 36.8	-24 13.4	156 59.5	114 35.0	+0.3
20	40.32	17.37	6 52.6	25 30.7	24 8.8	157 39.6	115 15.1	0.3
30	39.66	17.00	6 54.8	25 22.5	24 4.2	158 29.4	116 4.9	0.3
May 10	39.08	16.65	6 57.3	25 12.4	23 59.5	159 27.1	117 2.7	0.4
20	38.58	16.31	7 0.0	25 0.4	23 54.8	160 32.1	118 7.7	0.4
30	38.16	-15.99	-7 2.8	-24 46.5	-23 50.0	161 42.8	119 18.5	+0.4
June 9	37.83	15.70	7 5.3	24 30.9	23 45.1	162 58.2	120 33.9	0.4
19	37.58	15.42	7 7.8	24 13.9	23 40.2	164 16.9	121 52.7	0.3
29	37.41	15.16	7 10.0	23 55.4	23 35.2	165 37.6	123 13.4	0.3
July 9	37.33	14.94	7 12.0	23 35.9	23 30.2	166 59.7	124 35.6	0.3
19	37.34	-14.74	-7 13.8	-23 15.6	-23 25.1	168 21.5	125 57.4	+0.3
29	37.44	14.57	7 15.3	22 54.6	23 19.9	169 42.3	127 18.2	0.4
Aug. 8	37.63	14.44	7 16.4	22 33.6	23 14.7	171 0.8	128 36.8	0.4
18	37.91	14.33	7 17.2	22 12.9	23 9.4	172 15.7	129 51.8	0.4
28	38.27	14.26	7 17.7	21 52.7	23 4.1	173 26.7	131 2.8	0.4
Sept. 7	38.72	-14.23	-7 18.0	-21 33.6	-22 58.7	174 32.2	132 8.3	+0.5
17	39.24	14.24	7 18.1	21 16.2	22 53.2	175 31.0	133 7.2	0.5
27	39.84	14.29	7 18.2	21 0.6	22 47.6	176 22.5	133 58.7	0.5
Oct. 7	40.50	14.38	7 18.1	20 47.6	22 42.0	177 5.5	134 41.8	0.4
17	41.23	14.53	7 18.0	20 37.5	22 36.4	177 38.9	135 15.2	0.4
27	41.99	-14.72	-7 17.9	-20 31.0	-22 30.7	178 2.2	135 38.6	+0.4
Nov. 6	42.78	14.96	7 17.9	20 28.0	22 25.0	178 14.4	135 50.8	0.3
16	43.56	15.24	7 17.9	20 28.8	22 19.2	178 15.4	135 51.9	0.3
26	44.30	15.56	7 18.0	20 33.3	22 13.4	178 5.0	135 41.5	0.2
Dec. 6	44.98	15.90	7 18.2	20 41.6	22 7.5	177 44.1	135 20.6	0.1
16	45.56	-16.24	-7 18.4	-20 52.9	-22 1.6	177 13.3	134 49.9	+0.1
26	46.03	16.58	7 18.5	21 6.9	21 55.6	176 34.1	134 10.7	0.0
31	46.20	-16.74	-7 18.5	-21 14.8	-21 52.5	176 12.0	133 48.6	0.0

The factor to be multiplied by *a* and *b* to obtain the axes of—

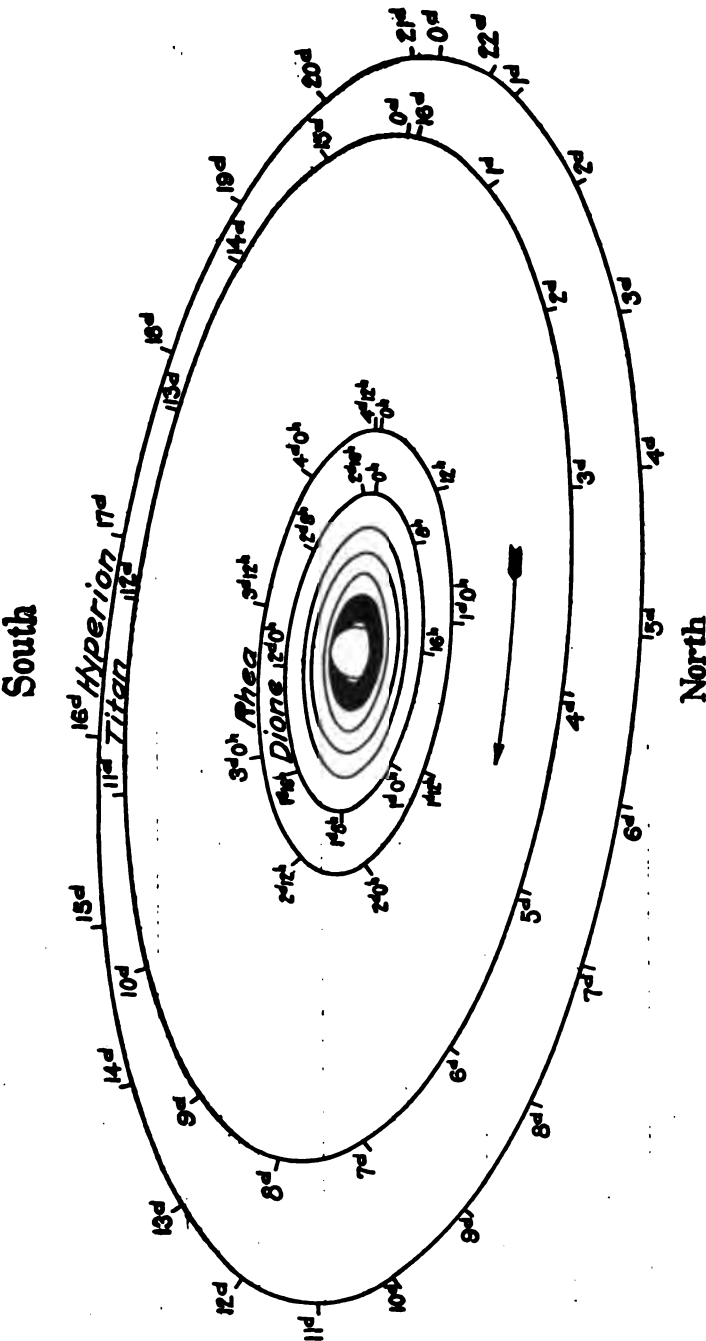
The inner ellipse of the outer ring=0.8801, log factor=9.9445

The outer ellipse of the inner ring=0.8599, log factor=9.9344

The inner ellipse of the inner ring=0.6650, log factor=9.8228

The inner ellipse of the dusky ring=0.5486, log factor=9.7392

NOTE.—The negative sign of *l* indicates that the visible surface of the rings is the southern one.



MEAN SYNODIC PERIODS.

	d	h
I.	0	22.6
II.	1	8.9
III.	1	21.3
IV.	2	17.7
V.	4	12.5
VI.	15	23.3
VII.	21	7.6
VIII.	79	22.1
IX.	523	15.6

APPARENT ORBITS OF THE SEVEN INNER SATELLITES OF SATURN,
AT DATE OF OPPOSITION, JANUARY 4, 1916,
AS SEEN IN AN INVERTING TELESCOPE.

NAMES OF THE SATELLITES.

I.	Mimas.
II.	Enceladus.
III.	Tethys.
IV.	Dione.
V.	Rhea.
VI.	Titan.
VII.	Hyperion.
VIII.	Iapetus.
IX.	Phoebe.

GREENWICH MEAN TIME OF GREATEST ELONGATION, ETC.

In the diagram on the preceding page, the points of the orbits marked "0" are those of the eastern elongation, as seen in an inverting telescope. The times of these elongations may be found from the following tables, and the apparent position of a satellite at any other time may be marked on the diagram by setting off on the proper orbit the elapsed interval in days and hours since the last eastern elongation. The orbits of the five inner satellites are regarded as circular and the time of any elongation not given in the tables may be readily found from those given by adding or subtracting the proper multiple of the mean synodic period. For Titan, Hyperion and Iapetus the eccentricity is taken into account, and for Iapetus the times both of the elongations and of the conjunctions are given. The following abbreviations are used in the tables:

E., East Elongation.
W., West Elongation.

I., Inferior Conjunction (north of planet).
S., Superior Conjunction (south of planet).

MIMAS.

Greatest Elongations Visible in the United States.

Jan.	d h	Jan.	d h	Feb.	d h	Apr.	d h	Oct.	d h	Dec.	d h
1 14.9 W.		28 0.0 W.		28 13.7 E.		14 18.3 E.		25 0.1 E.		1 16.8 E.	
2 13.5 W.		28 11.3 E.		29 12.3 E.		15 16.9 E.		25 22.7 E.		2 15.4 E.	
3 0.8 E.		28 22.6 W.		Mar. 2 20.8 W.		16 15.5 E.		26 21.3 E.		3 14.0 E.	
3 12.1 W.		29 21.2 W.		3 19.5 W.		17 14.2 E.		27 19.9 E.		4 1.3 W.	
3 23.4 E.		30 19.9 W.		4 18.1 W.		18 12.8 E.		28 18.6 E.		4 23.9 W.	
4 10.7 W.		31 18.5 W.		5 16.7 W.		22 18.5 W.		29 17.2 E.		5 22.5 W.	
4 22.0 E.		Feb. 1 17.1 W.		6 15.3 W.		23 17.1 W.		Nov. 2 0.3 W.		6 21.1 W.	
5 20.6 E.		2 15.7 W.		7 13.9 W.		24 15.7 W.		2 22.9 W.		7 19.8 W.	
6 19.3 E.		3 14.3 W.		8 12.5 W.		25 14.3 W.		3 21.5 W.		8 18.4 W.	
7 17.9 E.		4 12.9 W.		10 21.1 E.		26 13.0 W.		4 20.2 W.		9 17.0 W.	
8 16.5 E.		5 11.5 W.		11 19.7 E.		May 1 17.4 E.		5 18.8 W.		10 15.6 W.	
9 15.1 E.		5 22.9 E.		12 18.3 E.		2 16.0 E.		6 17.4 W.		11 14.2 W.	
10 13.7 E.		6 21.5 E.		13 16.9 E.		3 14.6 E.		7 16.0 W.		12 1.5 E.	
11 1.0 W.		7 20.1 E.		14 15.6 E.		.....		10 0.6 E.		13 0.1 E.	
11 12.3 E.		8 18.7 E.		15 14.2 E.		.....		10 23.2 E.		13 22.7 E.	
11 23.6 W.		9 17.3 E.		16 12.8 E.		Sept. 22 23.0 E.		11 21.8 E.		14 21.3 E.	
12 10.9 W.		10 15.9 E.		19 20.0 W.		23 21.6 E.		12 20.4 E.		15 20.0 E.	
12 22.2 W.		11 14.5 E.		20 18.6 W.		24 20.2 E.		13 19.0 E.		16 18.6 E.	
13 20.8 W.		12 13.1 E.		21 17.2 W.		25 18.9 E.		14 17.6 E.		17 17.2 E.	
14 19.5 W.		13 11.7 E.		22 15.8 W.		30 23.3 W.		15 16.3 E.		18 15.8 E.	
15 18.1 W.		13 23.0 W.		23 14.4 W.		Oct. 1 21.9 W.		16 14.9 E.		19 14.4 E.	
16 16.7 W.		14 21.6 W.		24 13.1 W.		2 20.6 W.		18 0.8 W.		20 13.0 E.	
17 15.3 W.		15 20.2 W.		27 20.3 E.		3 19.2 W.		18 23.4 W.		21 0.3 W.	
18 13.9 W.		16 18.9 W.		28 18.9 E.		4 17.8 W.		19 22.0 W.		21 22.9 W.	
19 12.5 W.		17 17.5 W.		29 17.5 E.		8 23.6 E.		20 20.7 W.		22 21.5 W.	
19 23.8 E.		18 16.1 W.		30 16.2 E.		9 22.2 E.		21 19.3 W.		23 20.2 W.	
20 11.1 W.		19 14.8 W.		31 14.8 E.		10 20.9 E.		22 17.9 W.		24 18.8 W.	
20 22.4 E.		20 13.4 W.		Apr. 1 13.4 E.		11 19.5 E.		23 16.5 W.		25 17.4 W.	
21 21.0 E.		21 12.0 W.		2 12.1 E.		12 18.1 E.		24 15.1 W.		26 16.0 W.	
22 19.7 E.		22 22.0 E.		5 19.3 W.		16 23.9 W.		26 1.1 E.		27 14.6 W.	
23 18.3 E.		23 20.6 E.		6 17.9 W.		17 22.5 W.		26 23.7 E.		28 13.2 W.	
24 16.9 E.		24 19.2 E.		7 16.5 W.		18 21.1 W.		27 22.3 E.		29 0.5 E.	
25 15.5 E.		25 17.8 E.		8 15.2 W.		19 19.7 W.		28 20.9 E.		29 23.1 E.	
26 14.1 E.		26 16.4 E.		9 13.9 W.		20 18.4 W.		29 19.5 E.		30 21.7 E.	
27 12.7 E.		27 15.1 E.		10 12.5 W.		21 17.0 W.		30 18.1 E.		31 20.4 E.	

SATELLITES OF SATURN, 1916.

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GREENWICH MEAN TIME OF GREATEST ELONGATION.

ENCELADUS.

Jan.	d h	Feb.	d h	Mar.	d h	Apr.	d h	Oct.	d h	Nov.	d h
	1 1.4 E.		9 18.7 E.		20 12.4 E.		29 6.4 E.		18 23.7 E.		27 17.4 E.
	2 10.2 E.		11 3.6 E.		21 21.3 E.		30 15.3 E.		20 8.6 E.		29 2.3 E.
	3 19.1 E.		12 12.5 E.		23 6.2 E.	May	2 0.2 E.		21 17.4 E.		30 11.2 E.
	5 4.0 E.		13 21.4 E.		24 15.1 E.		3 9.1 E.		23 2.3 E.	Dec.	1 20.1 E.
	6 12.8 E.		15 6.3 E.		26 0.0 E.		...		24 11.2 E.		3 5.0 E.
	7 21.7 E.		16 15.1 E.		27 8.9 E.		...		25 20.1 E.		4 13.9 E.
	9 6.6 E.		18 0.0 E.		28 17.8 E.	Sept.	17 11.1 E.		27 5.0 E.		5 22.7 E.
	10 15.5 E.		19 8.9 E.		30 2.7 E.		18 20.0 E.		28 13.9 E.		7 7.6 E.
	12 0.3 E.		20 17.8 E.		31 11.5 E.		20 4.9 E.		29 22.7 E.		8 16.4 E.
	13 9.2 E.		22 2.7 E.	Apr.	1 20.4 E.		21 13.8 E.		31 7.6 E.		10 1.3 E.
	14 18.1 E.		23 11.6 E.		3 5.3 E.		22 22.7 E.	Nov.	1 16.5 E.		11 10.2 E.
	16 3.0 E.		24 20.4 E.		4 14.2 E.		24 7.6 E.		3 1.4 E.		12 19.1 E.
	17 11.8 E.		26 5.3 E.		5 23.1 E.		25 16.5 E.		4 10.3 E.		14 4.0 E.
	18 20.7 E.		27 14.2 E.		7 8.0 E.		27 1.4 E.		5 19.1 E.		15 12.8 E.
	20 5.6 E.		28 23.1 E.		8 16.9 E.		28 10.3 E.		7 4.0 E.		16 21.7 E.
	21 14.4 E.	Mar.	1 8.0 E.		10 1.8 E.		29 19.2 E.		8 12.9 E.		18 6.5 E.
	22 23.3 E.		2 16.9 E.		11 10.7 E.	Oct.	1 4.1 E.		9 21.8 E.		19 15.3 E.
	24 8.2 E.		4 1.7 E.		12 19.6 E.		2 13.0 E.		11 6.7 E.		21 0.2 E.
	25 17.1 E.		5 10.6 E.		14 4.5 E.		3 21.9 E.		12 15.6 E.		22 9.0 E.
	27 1.9 E.		6 19.5 E.		15 13.4 E.		5 6.8 E.		14 0.4 E.		23 17.9 E.
	28 10.8 E.		8 4.4 E.		16 22.3 E.		6 15.7 E.		15 9.3 E.		25 2.8 E.
	29 19.7 E.		9 13.3 E.		18 7.2 E.		8 0.7 E.		16 18.2 E.		26 11.7 E.
Feb.	31 4.6 E.		10 22.2 E.		19 16.1 E.		9 9.5 E.		18 3.1 E.		27 20.5 E.
	1 113.4 E.		12 7.1 E.		21 1.0 E.		10 18.4 E.		19 12.0 E.		29 5.4 E.
	2 22.3 E.		13 16.0 E.		22 9.9 E.		12 3.3 E.		20 20.9 E.		30 14.3 E.
	4 7.2 E.		15 0.8 E.		23 18.8 E.		13 12.2 E.		22 5.8 E.		31 23.2 E.
	5 16.1 E.		16 9.7 E.		25 3.7 E.		14 21.1 E.		23 14.7 E.		
	7 1.0 E.		17 18.6 E.		26 12.6 E.		16 5.9 E.		24 23.6 E.		
	8 9.8 E.		19 3.5 E.		27 21.5 E.		17 14.8 E.		26 8.5 E.		

TETHYS.

Jan.	d h	Feb.	d h	Mar.	d h	Apr.	d h	Oct.	d h	Nov.	d h
	2 17.8 E.		11 9.0 E.		22 0.4 E.		30 16.2 E.		19 13.5 E.		28 5.0 E.
	4 15.1 E.		13 6.3 E.		23 21.7 E.	May	2 13.5 E.		21 10.8 E.		30 2.3 E.
	6 12.4 E.		15 3.6 E.		25 19.0 E.		...		23 8.1 E.	Dec.	1 23.6 E.
	8 9.7 E.		17 0.9 E.		27 16.4 E.		...		25 5.5 E.		3 20.9 E.
	10 7.0 E.		18 22.2 E.		29 13.7 E.	Sept.	17 11.1 E.		27 2.8 E.		5 18.2 E.
	12 4.2 E.		20 19.5 E.		31 11.0 E.		19 8.4 E.		29 0.1 E.		7 15.5 E.
	14 1.5 E.		22 16.8 E.	Apr.	2 8.3 E.		21 5.7 E.		30 21.4 E.		9 12.8 E.
	15 22.8 E.		24 14.1 E.		4 5.7 E.		23 3.1 E.	Nov.	1 18.7 E.		11 10.1 E.
	17 20.1 E.		26 11.4 E.		6 3.0 E.		25 0.4 E.		3 16.0 E.		13 7.3 E.
	19 17.4 E.		28 8.7 E.		8 0.3 E.		26 21.7 E.		5 13.3 E.		15 4.6 E.
	21 14.7 E.	Mar.	1 6.0 E.		9 21.6 E.		28 19.1 E.		7 10.6 E.		17 1.9 E.
	23 12.0 E.		3 3.3 E.		11 19.0 E.		30 16.4 E.		9 8.0 E.		18 23.2 E.
	25 9.3 E.		5 0.6 E.		13 16.3 E.	Oct.	2 13.7 E.		11 5.3 E.		20 20.5 E.
	27 6.5 E.		6 21.9 E.		15 13.6 E.		4 11.0 E.		13 2.6 E.		22 17.8 E.
	29 3.8 E.		8 19.2 E.		17 10.9 E.		6 8.3 E.		14 23.9 E.		24 15.1 E.
	31 1.1 E.		10 16.5 E.		19 8.3 E.		8 5.6 E.		16 21.2 E.		26 12.4 E.
Feb.	1 22.4 E.		12 13.8 E.		21 5.6 E.		10 3.0 E.		18 18.5 E.		28 9.6 E.
	3 19.7 E.		14 11.2 E.		23 2.9 E.		12 0.3 E.		20 15.8 E.		30 6.9 E.
	5 17.0 E.		16 8.5 E.		25 0.2 E.		13 21.6 E.		22 13.1 E.		
	7 14.3 E.		18 5.8 E.		26 21.5 E.		15 18.9 E.		24 10.4 E.		
	9 11.6 E.		20 3.1 E.		28 18.9 E.		17 16.2 E.		26 7.7 E.		

GREENWICH MEAN TIME OF GREATEST ELONGATION.

DIONE.

Jan.	d h	Feb.	d h	Mar.	d h	Apr.	d h	Oct.	d h	Nov.	d h
3	3.3 E.	10	10.2 E.	19	17.7 E.	27	1.7 E.	16	15.5 E.	23	23.1 E.
	5 20.9 E.	13	3.9 E.		22 11.4 E.		29 19.5 E.	19	9.2 E.		26 16.8 E.
	8 14.5 E.		15 21.5 E.		25 5.1 E.	May	2 13.2 E.		22 2.9 E.		29 10.5 E.
	11 8.1 E.		18 15.2 E.		27 22.8 E.		.....		24 20.6 E.	Dec.	2 4.1 E.
	14 1.8 E.		21 8.9 E.		30 16.5 E.		.....		27 14.3 E.		4 21.8 E.
				Apr.	2 10.3 E.	Sept.	22 0.0 E.		30 8.1 E.		7 15.4 E.
	16 19.4 E.		24 2.6 E.		5 4.0 E.		24 17.8 E.	Nov.	2 1.7 E.		10 9.1 E.
	19 13.0 E.		26 20.2 E.		7 21.7 E.		27 11.5 E.		4 19.4 E.		13 2.7 E.
	22 6.6 E.		29 13.9 E.		10 15.4 E.		30 5.2 E.		7 13.1 E.		15 20.4 E.
	25 0.3 E.	Mar.	3 7.6 E.		13 9.1 E.	Oct.	2 22.9 E.		10 6.7 E.		18 14.0 E.
	27 17.9 E.		6 1.3 E.								
	30 11.6 E.		8 19.0 E.		16 2.8 E.		5 16.6 E.		13 0.4 E.		21 7.7 E.
Feb.	2 5.2 E.		11 12.7 E.		18 20.6 E.		8 10.3 E.		15 18.1 E.		24 1.3 E.
	4 22.9 E.		14 6.3 E.		21 14.3 E.		11 4.1 E.		18 11.8 E.		26 19.0 E.
	7 16.6 E.		17 0.0 E.		24 8.0 E.		13 21.8 E.		21 5.5 E.		29 12.6 E.

RHEA.

Jan.	d h	Feb.	d h	Mar.	d h	Sept.	d h	Oct.	d h	Nov.	d h
3	21.1 E.	13	11.9 E.	25	3.5 E.		.....	19	5.4 E.	28	21.2 E.
	8 9.4 E.		18 0.3 E.		29 16.1 E.		.....		23 17.8 E.	Dec.	3 9.6 E.
	12 21.7 E.		22 12.7 E.	Apr.	3 4.6 E.	Sept.	17 13.8 E.		28 6.2 E.		7 21.9 E.
	17 10.0 E.		27 1.1 E.		7 17.1 E.		22 2.4 E.	Nov.	1 18.6 E.		12 10.3 E.
	21 22.3 E.	Mar.	2 13.5 E.		12 5.6 E.		26 14.9 E.		6 7.1 E.		16 22.6 E.
	26 10.6 E.		7 1.9 E.		16 18.1 E.	Oct.	1 3.5 E.		10 19.5 E.		21 11.0 E.
	30 22.9 E.		11 14.3 E.		21 6.6 E.		5 16.0 E.		15 8.0 E.		25 23.3 E.
Feb.	4 11.2 E.		16 2.7 E.		25 19.1 E.		10 4.4 E.		19 20.5 E.		30 11.6 E.
	8 23.6 E.		20 15.1 E.		30 7.7 E.		14 16.9 E.		24 8.9 E.		

TITAN.

Jan.	d h	Feb.	d h	Apr.	d h	Sept.	d h	Nov.	d h	Dec.	d h
5	18.9 E.	22	11.7 E.	10	8.5 E.	17	15.0 E.	4	13.8 E.	22	8.3 E.
	13 10.6 W.	Mar.	1 3.8 W.		18 1.4 W.		25 8.3 W.		12 6.4 W.		30 0.3 W.
	21 16.2 E.		9 10.0 E.		26 8.4 E.	Oct.	3 15.0 E.		20 12.5 E.		
	29 8.0 W.		17 2.5 W.	May	4 1.5 W.		11 8.1 W.		28 4.8 W.		
Feb.	6 13.7 E.		25 8.9 E.		.....		19 14.7 E.	Dec.	6 10.6 E.		
	14 5.7 W.	Apr.	2 1.7 W.		.....		27 7.5 W.		14 2.8 W.		

HYPERION.

Jan.	d h	Feb.	d h	Apr.	d h	Sept.	d h	Nov.	d h	Dec.	d h
8	10.0 E.	19	23.9 E.	2	18.7 E.	21	12.3 E.	3	2.6 E.	15	10.3 E.
	20 1.0 W.	Mar.	2 16.3 W.		14 13.3 W.	Oct.	3 6.3 W.		14 18.0 W.		26 23.8 W.
	29 16.5 E.		12 8.6 E.		24 5.6 E.		12 20.4 E.		24 7.3 E.		
Feb.	10 8.0 W.		24 1.9 W.		.....		24 13.1 W.	Dec.	5 21.6 W.		

IAPETUS.

Jan.	d h	Feb.	d h	Apr.	d h	Oct.	d h	Nov.	d h	Dec.	d h
15	10.0 W.	23	22.5 E.	3	8.2 W.		.....	23	14.1 E.	1	11.3 W.
Feb.	3 10.3 S.	Mar.	15 6.3 I.		22 21.0 S.	Oct.	2 11.9 S.		12 16.8 I.		20 20.6 S.

DIFFERENTIAL COORDINATES OF PHOEBE.

Greenwich Mean Noon.	$a_{Ph.} - a_{Sat.}$	$\delta_{Ph.} - \delta_{Sat.}$	Greenwich Mean Noon.	$a_{Ph.} - a_{Sat.}$	$\delta_{Ph.} - \delta_{Sat.}$	Greenwich Mean Noon.	$a_{Ph.} - a_{Sat.}$	$\delta_{Ph.} - \delta_{Sat.}$
	m s	' "		m s	' "		m s	' "
Jan. 1	+0 46.2	+2 53	Apr. 14	-1 27.2	+2 31	Sept. 20	-0 41.1	-0 37
3	0 43.7	2 56	16	1 29.3	2 30	22	0 37.5	0 47
5	0 41.2	2 58	18	1 31.3	2 29	24	0 33.9	0 56
7	0 38.7	3 1	20	1 33.4	2 29	26	0 30.3	1 6
9	0 36.1	3 3	22	1 35.3	2 28	28	0 26.6	1 15
11	+0 33.6	+3 5	24	-1 37.3	+2 28	30	-0 22.9	-1 25
13	0 31.0	3 7	26	1 39.1	2 27	Oct. 2	0 19.1	1 35
15	0 28.4	3 8	28	1 41.0	2 27	4	0 15.4	1 45
17	0 25.8	3 10	30	1 42.8	2 27	6	0 11.6	1 55
19	0 23.2	3 11	May 2	1 44.5	2 27	8	0 7.7	2 5
21	+0 20.5	+3 12	4	-1 46.1	+2 26	10	-0 3.9	-2 15
23	0 17.9	3 13	6	1 47.7	2 26	12	0 0.0	2 25
25	0 15.2	3 14	8	1 49.3	2 26	14	+0 3.8	2 36
27	0 12.6	3 14	10	1 50.8	2 26	16	0 7.7	2 46
29	0 9.9	3 14	12	1 52.2	2 26	18	0 11.6	2 56
31	+0 7.2	+3 15	14	-1 53.6	+2 26	20	+0 15.5	-3 6
Feb. 2	0 4.5	3 14	16	1 54.9	2 26	22	0 19.4	3 15
4	+0 1.8	3 14	18	1 56.2	2 27	24	0 23.2	3 25
6	-0 0.9	3 14	20	1 57.4	2 27	26	0 27.1	3 35
8	0 3.6	3 14	22	1 58.5	2 27	28	0 30.9	3 45
10	-0 6.3	+3 13	24	-1 59.6	+2 28	30	+0 34.8	-3 54
12	0 9.0	3 13	26	2 0.6	2 28	Nov. 1	0 38.6	4 3
14	0 11.7	3 12	28	2 1.5	2 29	3	0 42.4	4 12
16	0 14.4	3 11	30	2 2.4	2 29	5	0 46.2	4 21
18	0 17.1	3 10	June 1	2 3.2	2 30	7	0 50.0	4 30
20	-0 19.8	+3 9	3	-2 3.9	+2 30	9	+0 53.7	-4 38
22	0 22.5	3 7	5	2 4.5	2 31	11	0 57.4	4 46
24	0 25.2	3 6	7	2 5.1	2 31	13	1 1.0	4 54
26	0 27.9	3 5	9	2 5.6	2 32	15	1 4.6	5 2
28	0 30.6	3 3	11	-2 6.0	+2 32	17	1 8.2	5 9
Mar. 1	-0 33.2	+3 2		. . . .	. . .	19	+1 11.7	-5 16
3	0 35.9	3 0		. . . .	. . .	21	1 15.1	5 22
5	0 38.6	2 58	Aug. 11	-1 39.5	+1 44	23	1 18.5	5 29
7	0 41.2	2 57	13	1 37.2	1 39	25	1 21.9	5 35
9	0 43.8	2 55	15	1 34.9	1 35	27	1 25.2	5 40
11	-0 46.4	+2 54	17	-1 32.6	+1 29	29	+1 28.4	-5 45
13	0 49.0	2 52	19	1 30.1	1 24	Dec. 1	1 31.5	5 50
15	0 51.6	2 50	21	1 27.6	1 18	3	1 34.6	5 55
17	0 54.2	2 49	23	1 25.0	1 12	5	1 37.6	5 59
19	0 56.7	2 47	25	1 22.3	1 6	7	1 40.6	6 2
21	-0 59.2	+2 46	27	-1 19.5	+1 0	9	+1 43.5	-6 5
23	1 1.7	2 44	29	1 16.7	0 53	11	1 46.3	6 8
25	1 4.2	2 43	31	1 13.8	0 46	13	1 49.0	6 11
27	1 6.6	2 42	Sept. 2	1 10.8	0 39	15	1 51.6	6 13
29	1 9.0	2 40	4	1 7.7	0 31	17	1 54.2	6 14
31	-1 11.4	+2 39	6	-1 4.6	+0 23	19	+1 56.7	-6 16
Apr. 2	1 13.8	2 37	8	1 1.4	0 15	21	1 59.1	6 17
4	1 16.1	2 36	10	0 58.1	+0 7	23	2 1.4	6 17
6	1 18.4	2 35	12	0 54.8	-0 2	25	2 3.6	6 17
8	1 20.6	2 34	14	0 51.5	0 10	27	2 5.7	6 17
10	-1 22.8	+2 33	16	-0 48.1	-0 19	29	+2 7.8	-6 16
12	-1 25.0	+2 32	18	-0 44.6	-0 28	31	+2 9.7	-6 15

Time from Eastern Elongation.	Mimas.		Time from Eastern Elongation.	Enceladus.		Tethys.		Time from Eastern Elongation.	Dione.	
	p^1	F		p^1	F	p^1	F		p^1	F
h	°		d h	°		°		d h	°	
0.0	83.3	1.000	0 0	83.3	1.000	83.3	1.000	0 0	83.3	1.000
0.5	80.2	0.992	0 1	78.7	0.985	80.1	0.992	0 2	78.7	0.985
1.0	76.9	0.968	0 2	73.7	0.941	76.7	0.968	0 4	73.7	0.941
1.5	73.4	0.928	0 3	68.2	0.871	73.1	0.929	0 6	68.1	0.871
2.0	69.6	0.875	0 4	61.4	0.778	69.2	0.877	0 8	61.3	0.778
2.5	65.1	0.809	0 5	52.6	0.672	64.6	0.812	0 10	52.5	0.671
3.0	59.8	0.733	0 6	40.4	0.562	59.2	0.738	0 12	40.2	0.562
3.5	53.2	0.651	0 7	22.8	0.470	52.5	0.657	0 14	22.6	0.470
4.0	44.7	0.568	0 8	359.1	0.422	44.0	0.576	0 16	358.8	0.423
4.5	33.4	0.490	0 9	333.7	0.442	32.7	0.500	0 18	333.5	0.443
5.0	18.3	0.429	0 10	313.3	0.518	17.8	0.441	0 20	313.1	0.520
5.5	359.5	0.397	0 11	299.0	0.623	359.7	0.410	0 22	298.9	0.624
6.0	339.6	0.405	0 12	288.9	0.723	340.4	0.417	1 0	288.8	0.734
6.5	322.2	0.449	0 13	281.3	0.832	323.3	0.459	1 2	281.2	0.834
7.0	308.6	0.517	0 14	275.3	0.913	309.7	0.525	1 4	275.2	0.914
7.5	298.4	0.599	0 15	270.1	0.969	299.5	0.604	1 6	270.0	0.970
8.0	290.7	0.683	0 16	265.4	0.997	291.7	0.686	1 8	265.3	0.997
8.5	284.7	0.763	0 17	260.8	0.995	285.5	0.764	1 10	260.7	0.995
9.0	279.8	0.835	0 18	256.0	0.964	280.4	0.836	1 12	255.9	0.963
9.5	275.6	0.897	0 19	250.7	0.905	276.1	0.896	1 14	250.6	0.903
10.0	271.9	0.945	0 20	244.6	0.822	272.3	0.945	1 16	244.4	0.819
10.5	268.5	0.979	0 21	236.8	0.720	268.8	0.978	1 18	236.5	0.717
11.0	265.3	0.997	0 22	226.3	0.610	265.5	0.997	1 20	225.9	0.607
11.5	262.1	0.999	0 23	211.4	0.507	262.2	0.999	1 22	210.8	0.505
12.0	258.9	0.984	1 0	190.2	0.436	258.9	0.986	2 0	189.4	0.435
12.5	255.6	0.955	1 1	164.6	0.425	255.5	0.957	2 2	163.9	0.426
13.0	252.0	0.910	1 2	141.6	0.480	251.8	0.913	2 4	140.9	0.482
13.5	247.9	0.851	1 3	124.7	0.575	247.7	0.856	2 6	124.2	0.579
14.0	243.2	0.781	1 4	112.9	0.684	242.8	0.787	2 8	112.6	0.688
14.5	237.5	0.701	1 5	104.4	0.790	237.1	0.710	2 10	104.2	0.794
15.0	230.3	0.619	1 6	97.8	0.880	229.8	0.628	2 12	97.6	0.883
15.5	220.8	0.536	1 7	92.3	0.948	220.4	0.549	2 14	92.1	0.950
16.0	208.1	0.464	1 8	87.5	0.988	207.9	0.477	2 16	87.3	0.980
16.5	191.5	0.413	1 9	82.8	1.000	191.9	0.426	2 18	82.6	1.000
17.0	171.9	0.396	1 10			172.9	0.410			
17.5	152.5	0.418	1 11			154.1	0.428			
18.0	136.5	0.474	1 12			138.2	0.480			
18.5	124.4	0.549	1 13			125.9	0.552			
19.0	115.2	0.631	1 14			116.5	0.632			
19.5	108.3	0.714	1 15			109.4	0.713			
20.0	102.7	0.792	1 16			103.6	0.790			
20.5	98.1	0.860	1 17			98.9	0.858			
21.0	94.1	0.917	1 18			94.7	0.915			
21.5	90.6	0.960	1 19			91.0	0.958			
22.0	87.3	0.988	1 20			87.6	0.986			
22.5	84.1	1.000	1 21			84.3	0.999			
23.0	80.9	0.995	1 22			81.1	0.996			

Position angle of satellite $p = p^1 + (P - P_0)$.Apparent distance of satellite $s = F \frac{\alpha(p)}{p}$.

Time from Eastern Elongation.	Rhea.		Time from Eastern Elongation.	Titan.		Hyperion.		Time from Eastern Elongation.	Iapetus.	
	p^1	F		p^1	F	p^1	F		p^1	F
d h	.		d h	.		.		d	.	
0 0	83.3	1.000	0 0	83.3	1.001	83.9	0.950	0	81.2	1.027
0 3	79.1	0.988	0 10	79.4	0.985	80.6	0.953	2	79.5	1.015
0 6	74.6	0.951	0 20	75.2	0.948	77.3	0.942	4	77.8	0.979
0 9	69.7	0.892	1 6	70.6	0.889	73.9	0.919	6	76.0	0.922
0 12	63.9	0.815	1 16	65.2	0.813	70.3	0.885	8	73.8	0.843
0 15	56.7	0.722	2 2	58.6	0.722	66.4	0.842	10	71.2	0.747
0 18	47.4	0.622	2 12	49.9	0.623	61.9	0.789	12	67.6	0.634
0 21	34.4	0.527	2 22	38.0	0.526	56.8	0.731	14	62.5	0.511
1 0	16.6	0.453	3 8	21.1	0.447	50.8	0.669	16	53.8	0.381
1 3	354.2	0.423	3 18	359.1	0.405	43.5	0.608	18	36.6	0.259
1 6	331.5	0.449	4 4	335.6	0.420	34.7	0.550	20	359.1	0.186
1 9	313.3	0.521	4 14	316.0	0.484	23.9	0.501	22	314.8	0.225
1 12	300.1	0.615	5 0	302.0	0.575	11.3	0.466	24	292.2	0.338
1 15	290.5	0.715	5 10	291.9	0.674	357.1	0.452	26	281.5	0.467
1 18	283.2	0.808	5 20	284.4	0.770	342.9	0.461	28	275.4	0.593
1 21	277.4	0.887	6 6	278.4	0.853	329.7	0.490	30	271.4	0.707
2 0	272.4	0.948	6 16	273.5	0.920	318.5	0.537	32	268.4	0.805
2 3	267.9	0.986	7 2	269.1	0.967	309.2	0.594	34	266.1	0.882
2 6	263.6	1.000	7 12	265.0	0.993	301.6	0.657	36	264.1	0.936
2 9	259.4	0.989	7 22	261.1	0.996	295.4	0.722	38	262.3	0.967
2 12	255.0	0.955	8 8	257.1	0.977	290.2	0.785	40	260.5	0.972
2 15	250.0	0.897	8 18	252.9	0.937	285.7	0.844	42	258.7	0.950
2 18	244.3	0.820	9 4	248.1	0.879	281.9	0.899	44	256.7	0.905
2 21	237.3	0.728	9 14	242.6	0.804	278.4	0.946	46	254.5	0.837
3 0	228.1	0.629	10 0	235.9	0.718	275.2	0.985	48	251.8	0.748
3 3	215.5	0.533	10 10	227.2	0.627	272.3	1.014	50	248.3	0.641
3 6	198.0	0.457	10 20	215.6	0.539	269.5	1.033	52	243.2	0.520
3 9	175.8	0.423	11 6	200.0	0.468	266.8	1.042	54	235.0	0.393
3 12	153.0	0.446	11 16	180.2	0.430	264.0	1.039	56	219.3	0.272
3 15	134.4	0.515	12 2	159.2	0.439	261.3	1.025	58	185.5	0.192
3 18	120.9	0.608	12 12	140.7	0.490	258.4	0.999	60	140.8	0.216
3 21	111.1	0.708	12 22	126.6	0.569	255.3	0.961	62	115.7	0.320
4 0	103.7	0.802	13 8	116.2	0.660	252.0	0.913	64	103.9	0.447
4 3	97.8	0.882	13 18	108.4	0.750	248.2	0.855	66	97.3	0.573
4 6	92.7	0.944	14 4	102.1	0.834	243.8	0.787	68	93.0	0.691
4 9	88.2	0.984	14 14	96.9	0.904	238.6	0.712	70	89.9	0.794
4 12	83.9	1.000	15 0	92.4	0.956	232.1	0.633	72	87.6	0.882
4 15	79.7	0.991	15 10	88.8	0.989	223.6	0.554	74	85.6	0.950
			15 20	84.4	1.002	212.5	0.481	76	83.8	0.998
			16 6	80.5	0.992	197.9	0.423	78	82.2	1.023
			16 16			179.8	0.392	80	80.6	1.027
			17 2			160.6	0.397			
			17 12			143.3	0.435			
			17 22			129.6	0.498			
			18 8			119.2	0.572			
			18 18			111.3	0.650			
			19 4			105.0	0.724			
			19 14			99.9	0.791			
			20 0			95.5	0.849			
			20 10			91.6	0.895			
			20 20			88.1	0.928			
			21 6			84.7	0.948			
			21 16			81.5	0.954			

Position angle of satellite $p = p^1 + (P - P_0)$.

Apparent distance of satellite $s = \frac{F^2(p)}{p}$.

Date.	Mimas.		Enceladus.		Tethys.		Dione.	
	$P-P_0$	$\frac{a(p)}{p}$	$P-P_0$	$\frac{a(p)}{p}$	$P-P_0$	$\frac{a(p)}{p}$	$P-P_0$	$\frac{a(p)}{p}$
	°	"	°	"	°	"	°	"
Jan. 1	0.0	31.8	-0.3	40.8	+0.5	50.5	-0.3	64.7
6	+0.2	31.8	0.3	40.8	0.5	50.5	0.3	64.7
11	0.3	31.8	0.3	40.8	0.6	50.5	0.3	64.6
16	0.5	31.7	0.2	40.7	0.6	50.4	0.3	64.5
21	0.6	31.6	0.2	40.6	0.6	50.2	0.3	64.3
26	+0.8	31.5	-0.2	40.4	+0.6	50.0	-0.3	64.1
31	0.9	31.4	0.2	40.2	0.7	49.8	0.2	63.8
Feb. 5	1.0	31.2	0.2	40.0	0.7	49.5	0.2	63.5
10	1.1	31.0	0.2	39.8	0.7	49.2	0.2	63.1
15	1.2	30.8	0.2	39.5	0.7	48.9	0.2	62.7
20	+1.3	30.6	-0.2	39.2	+0.8	48.6	-0.2	62.2
25	1.4	30.4	0.2	38.9	0.8	48.2	0.2	61.7
Mar. 1	1.5	30.1	0.2	38.6	0.8	47.8	0.2	61.2
6	1.5	29.8	0.2	38.3	0.8	47.4	0.2	60.7
11	1.6	29.5	0.1	37.9	0.8	46.9	0.2	60.1
16	+1.6	29.3	-0.2	37.6	+0.8	46.5	-0.2	59.6
21	1.6	29.0	0.2	37.2	0.8	46.1	0.2	59.0
26	1.6	28.7	0.2	36.9	0.8	45.7	0.2	58.4
31	1.6	28.5	0.2	36.5	0.8	45.2	0.2	57.9
Apr. 5	1.6	28.3	0.2	36.2	0.8	44.8	0.2	57.4
10	+1.5	28.0	-0.2	35.9	+0.9	44.4	-0.2	56.9
15	1.5	27.7	0.2	35.6	0.8	44.0	0.3	56.4
20	1.4	27.5	0.2	35.2	0.8	43.6	0.3	55.9
25	1.3	27.3	0.2	34.9	0.8	43.3	0.3	55.4
30	+1.2	27.0	-0.3	34.7	+0.8	42.9	-0.3	55.0
Sept. 27	-2.2	27.1	-0.7	34.9	+0.4	43.1	-0.7	55.2
Oct. 2	2.1	27.4	0.7	35.1	0.4	43.5	0.7	55.7
7	2.0	27.6	0.7	35.4	0.4	43.8	0.7	56.1
12	1.9	27.8	0.7	35.7	0.4	44.2	0.7	56.6
17	1.8	28.1	0.7	36.0	0.4	44.6	0.7	57.1
22	-1.7	28.4	-0.7	36.4	+0.4	45.0	-0.7	57.7
27	1.5	28.7	0.7	36.7	0.3	45.4	0.7	58.2
Nov. 1	1.4	28.9	0.7	37.1	0.3	45.9	0.7	58.7
6	1.2	29.2	0.7	37.4	0.3	46.3	0.7	59.2
11	1.1	29.4	0.7	37.7	0.3	46.7	0.7	59.8
16	-1.0	29.7	-0.7	38.0	+0.3	47.1	-0.7	60.4
21	0.8	29.9	0.7	38.4	0.3	47.5	0.7	60.9
26	0.7	30.2	0.6	38.7	0.3	47.9	0.7	61.4
Dec. 1	0.5	30.4	0.6	39.0	0.3	48.3	0.7	61.9
6	0.4	30.7	0.6	39.3	0.2	48.7	0.7	62.4
11	-0.3	30.9	-0.6	39.6	+0.2	49.0	-0.7	62.8
16	-0.1	31.1	0.6	39.9	0.2	49.3	0.7	63.2
21	0.0	31.2	0.6	40.1	0.2	49.6	0.7	63.5
26	+0.1	31.4	0.6	40.3	0.2	49.8	0.7	63.8
31	+0.3	31.5	-0.6	40.4	+0.2	50.0	-0.7	64.0

Date.	Rhea.		Titan.		Hyperion.		Iapetus.	
	$P-P_0$	$\frac{a(\rho)}{\rho}$	$P-P_0$	$\frac{a(\rho)}{\rho}$	$P-P_0$	$\frac{a(\rho)}{\rho}$	$P-P_0$	$\frac{a(\rho)}{\rho}$
	•	"	•	"	•	"	•	"
Jan. 1	0.0	90.3	0.0	209	0.0	254	0.0	610
6	+0.1	90.3	0.0	209	0.0	254	-0.1	610
11	0.1	90.3	0.0	209	0.0	253	0.1	610
16	0.1	90.2	0.0	209	0.0	253	0.2	609
21	0.1	89.9	+0.1	208	+0.1	252	0.3	607
26	+0.1	89.5	+0.1	207	+0.1	251	-0.4	606
31	0.1	89.1	0.1	206	0.1	250	0.5	602
Feb. 5	0.2	88.6	0.1	205	0.1	249	0.5	599
10	0.2	88.1	0.1	204	0.1	247	0.6	596
15	0.2	87.5	0.1	203	0.1	246	0.7	591
20	+0.2	86.8	+0.1	201	+0.2	244	-0.7	587
25	0.2	86.1	0.1	200	0.2	242	0.7	582
Mar. 1	0.2	85.4	0.1	198	0.2	240	0.8	577
6	0.2	84.7	0.1	196	0.2	238	0.8	572
11	0.2	83.9	0.1	194	0.2	236	0.8	567
16	+0.2	83.2	+0.1	193	+0.2	234	-0.8	562
21	0.2	82.4	0.1	191	0.2	231	0.7	557
26	0.2	81.7	0.1	189	0.2	229	0.7	551
31	0.2	80.9	0.1	187	0.1	227	0.7	546
Apr. 5	0.2	80.2	0.1	186	0.1	225	0.6	541
10	+0.2	79.4	+0.1	184	+0.1	223	-0.6	536
15	0.1	78.7	0.1	182	0.1	221	0.5	532
20	0.1	78.0	0.1	181	0.1	219	0.4	527
25	0.1	77.4	+0.1	179	+0.1	217	0.4	523
30	+0.1	76.8	0.0	178	0.0	216	-0.3	519
Sept. 27	-0.5	77.1	-0.3	179	-0.4	217	+3.8	521
Oct. 2	0.5	77.8	0.3	180	0.4	218	3.9	525
7	0.5	78.5	0.3	182	0.4	220	4.0	530
12	0.5	79.1	0.3	183	0.4	222	4.0	534
17	0.5	79.8	0.3	185	0.4	224	4.1	539
22	-0.5	80.5	-0.3	187	-0.4	226	+4.1	544
27	0.5	81.2	0.3	188	0.4	228	4.2	549
Nov. 1	0.5	82.0	0.3	190	0.4	230	4.2	554
6	0.5	82.8	0.3	192	0.4	232	4.2	559
11	0.5	83.6	0.3	194	0.4	235	4.2	564
16	-0.5	84.3	-0.3	195	-0.4	237	+4.2	569
21	0.5	85.0	0.3	197	0.4	239	4.2	574
26	0.5	85.7	0.3	199	0.4	241	4.2	579
Dec. 1	0.5	86.4	0.3	200	0.5	243	4.1	584
6	0.5	87.1	0.3	202	0.5	244	4.1	588
11	-0.5	87.7	-0.3	203	-0.5	246	+4.0	592
16	0.5	88.2	0.3	204	0.5	248	4.0	596
21	0.5	88.7	0.3	206	0.5	249	3.9	599
26	0.5	89.1	0.3	207	0.4	250	3.8	603
31	-0.5	89.4	-0.3	207	-0.4	251	+3.7	604

APPARENT ORBITS OF THE SATELLITES OF URANUS AT DATE OF OPPOSITION,
AUGUST 10, 1916, AS SEEN IN AN INVERTING TELESCOPE.

South



Apparent Apisides.

Date.	Position Angle.	App. Distances. Ariel. Umbriel.
May 4,	350.9	13.2 18.4
Aug. 12,	351.6	14.0 19.5
Nov. 20,	352.2	13.1 18.3

Apparent Apisides.

Date.	Position Angle.	App. Distances. Titania. Oberon.
May 4,	350.9	30.2 40.4
Aug. 12,	351.6	31.9 42.7
Nov. 20,	352.2	30.0 40.1

North

GREENWICH MEAN TIME OF GREATEST ELONGATION.

ARIEL.		UMBRIEL.		TITANIA.		OBERON.
North.	South.	North.	South.	North.	South.	North and South.
d h	d h	d h	d h	d h	d h	d h
May 10 21.6	May 14 16.3	May 4 8.9	May 6 10.6	Apr. 29 2.8	May 3 11.2	May 23 18.48
18 11.0	22 5.8	12 15.8	14 17.5	May 7 19.7	12 4.2	30 11.9X
26 0.5	29 19.2	20 22.7	23 0.4	16 12.6	20 21.1	June 6 5.58
June 2 13.9	June 6 8.6	29 5.6	31 7.3	25 5.5	29 14.0	12 23.0X
10 3.4	13 22.1	June 6 12.5	June 8 14.2	June 2 22.5	June 7 6.9	19 16.65
17 16.8	21 11.6	14 19.4	16 21.2	11 15.4	15 23.9	26 10.2X
25 6.3	29 1.0	23 2.3	25 4.1	20 8.4	24 16.8	July 3 5.58
July 2 19.8	July 6 14.5	July 1 9.3	July 3 11.0	29 1.3	July 3 9.8	9 21.4X
10 9.2	14 4.0	9 16.2	11 17.9	July 7 18.2	12 2.7	16 14.38
17 22.7	21 17.4	17 23.1	20 0.8	16 11.2	20 19.7	23 8.5X
25 12.2	29 6.9	26 6.0	28 7.8	25 4.2	29 12.7	30 2.18
Aug. 2 1.6	Aug. 5 20.4	Aug. 3 13.0	Aug. 5 14.7	Aug. 2 21.2	Aug. 7 5.6	Aug. 5 19.7X
9 15.1	13 9.8	11 19.9	13 21.6	11 14.1	15 22.6	12 13.35
17 4.6	20 23.3	20 2.8	22 4.6	20 7.1	24 15.6	19 6.9X
24 18.1	28 12.8	28 9.8	30 11.5	29 0.1	Sept. 2 8.6	26 0.58
Sept. 1 7.6	Sept. 5 2.3	Sept. 5 16.7	Sept. 7 18.5	Sept. 6 17.1	11 1.6	Sept. 1 18.1X
8 21.0	12 15.8	13 23.7	16 1.4	15 10.1	19 18.6	8 11.58
16 10.5	20 5.3	22 6.6	24 8.4	24 3.0	28 11.5	15 5.4X
24 0.0	27 18.7	30 13.6	Oct. 2 15.3	Oct. 2 20.0	Oct. 7 4.5	21 23.08
Oct. 1 13.5	Oct. 5 8.2	Oct. 8 20.5	10 22.2	11 13.0	15 21.5	28 16.6X
9 3.0	12 21.7	17 3.4	19 5.2	20 6.0	24 14.4	Oct. 5 10.18
16 16.5	20 11.2	25 10.4	27 12.1	28 22.9	Nov. 2 7.4	12 3.7X
24 6.0	28 0.7	Nov. 2 17.3	Nov. 4 19.1	Nov. 6 15.9	11 0.3	18 21.38
31 19.4	Nov. 4 14.2	11 0.3	13 2.0	15 8.8	19 17.3	25 14.9X
Nov. 8 8.9	12 3.6	19 7.2	21 8.9	24 1.8	28 10.2	Nov. 1 8.58

For Ariel every third elongation is given, and for Umbriel every alternate one; the intermediate ones may be found by adding multiples of the period of the satellite.

Sidereal period of Ariel, $2^d 12^h.489$; of Umbriel, $4^d 3^h.460$; of Titania, $8^d 16^h.941$; of Oberon, $13^d 11^h.118$.

Fractions of the Period of Revolution.

Fraction of a Revolution.	Ariel.	Umbriel.	Titania.	Oberon.	Fraction of a Revolution.	p^1	F
	d h	d h	d h	d h			
0.00	0 0.0	0 0.0	0 0.0	0 0.0	0.00	351.6	1.000
0.02	0 1.2	0 2.0	0 4.2	0 6.5	0.02	355.0	0.994
0.04	0 2.4	0 4.0	0 8.4	0 12.9	0.04	358.6	0.976
0.06	0 3.6	0 6.0	0 12.5	0 19.4	0.06	2.3	0.946
0.08	0 4.8	0 8.0	0 16.7	1 1.8	0.08	6.3	0.906
0.10	0 6.0	0 10.0	0 20.9	1 8.3	0.10	10.7	0.856
0.12	0 7.3	0 11.9	1 1.1	1 14.8	0.12	15.7	0.799
0.14	0 8.5	0 13.9	1 5.3	1 21.2	0.14	21.6	0.736
0.16	0 9.7	0 15.9	1 9.4	2 3.7	0.16	28.5	0.670
0.18	0 10.9	0 17.9	1 13.6	2 10.2	0.18	37.0	0.606
0.20	0 12.1	0 19.9	1 17.8	2 16.6	0.20	47.3	0.549
0.22	0 13.3	0 21.9	1 22.0	2 23.1	0.22	59.8	0.505
0.24	0 14.5	0 23.9	2 2.1	3 5.5	0.24	74.1	0.480
0.26	0 15.7	1 1.9	2 6.3	3 12.0	0.26	89.1	0.480
0.28	0 16.9	1 3.8	2 10.5	3 18.5	0.28	103.4	0.505
0.30	0 18.1	1 5.8	2 14.7	4 0.9	0.30	115.8	0.549
0.32	0 19.4	1 7.8	2 18.9	4 7.4	0.32	126.2	0.606
0.34	0 20.6	1 9.8	2 23.0	4 13.9	0.34	134.6	0.670
0.36	0 21.8	1 11.8	3 3.2	4 20.3	0.36	141.6	0.736
0.38	0 23.0	1 13.8	3 7.4	5 2.8	0.38	147.4	0.799
0.40	1 0.2	1 15.8	3 11.6	5 9.2	0.40	152.5	0.856
0.42	1 1.4	1 17.8	3 15.8	5 15.7	0.42	156.9	0.906
0.44	1 2.6	1 19.8	3 19.9	5 22.2	0.44	160.9	0.946
0.46	1 3.8	1 21.8	4 0.1	6 4.6	0.46	164.6	0.976
0.48	1 5.0	1 23.7	4 4.3	6 11.1	0.48	168.1	0.994
0.50	1 6.2	2 1.7	4 8.5	6 17.6	0.50	171.6	1.000
0.52	1 7.5	2 3.7	4 12.6	7 0.0	0.52	175.0	0.994
0.54	1 8.7	2 5.7	4 16.8	7 6.5	0.54	178.6	0.976
0.56	1 9.9	2 7.7	4 21.0	7 12.9	0.56	182.3	0.946
0.58	1 11.1	2 9.7	5 1.2	7 19.4	0.58	186.3	0.906
0.60	1 12.3	2 11.7	5 5.4	8 1.9	0.60	190.7	0.856
0.62	1 13.5	2 13.7	5 9.5	8 8.3	0.62	195.7	0.799
0.64	1 14.7	2 15.7	5 13.7	8 14.8	0.64	201.6	0.736
0.66	1 15.9	2 17.6	5 17.9	8 21.3	0.66	208.5	0.670
0.68	1 17.1	2 19.6	5 22.1	9 3.7	0.68	217.0	0.606
0.70	1 18.3	2 21.6	6 2.3	9 10.2	0.70	227.3	0.549
0.72	1 19.6	2 23.6	6 6.4	9 16.6	0.72	239.8	0.505
0.74	1 20.8	3 1.6	6 10.6	9 23.1	0.74	254.1	0.480
0.76	1 22.0	3 3.6	6 14.8	10 5.6	0.76	269.1	0.480
0.78	1 23.2	3 5.6	6 19.0	10 12.0	0.78	283.4	0.505
0.80	2 0.4	3 7.6	6 23.2	10 18.5	0.80	295.8	0.549
0.82	2 1.6	3 9.6	7 3.3	11 1.0	0.82	306.2	0.606
0.84	2 2.8	3 11.5	7 7.5	11 7.4	0.84	314.6	0.670
0.86	2 4.0	3 13.5	7 11.7	11 13.9	0.86	321.6	0.736
0.88	2 5.2	3 15.5	7 15.9	11 20.3	0.88	327.4	0.799
0.90	2 6.4	3 17.5	7 20.0	12 2.8	0.90	332.5	0.856
0.92	2 7.7	3 19.5	8 0.2	12 9.3	0.92	336.9	0.906
0.94	2 8.9	3 21.5	8 4.4	12 15.7	0.94	340.9	0.946
0.96	2 10.1	3 23.5	8 8.6	12 22.2	0.96	344.6	0.976
0.98	2 11.3	4 1.5	8 12.8	13 4.7	0.98	348.1	0.994
1.00	2 12.5	4 3.5	8 16.9	13 11.1	1.00	351.6	1.000

The fraction of a revolution is reckoned from the Northern Elongation.

Position angle of satellite $p = p^1 + (P - P_s)$.Apparent distance of satellite $s = F \frac{a(\rho)}{\rho}$.

Date.	$P-P_0$	$\frac{a(\rho)}{\rho}$				Date.	$P-P_0$	$\frac{a(\rho)}{\rho}$			
		Ariel.	Umbriel.	Titania.	Oberon.			Ariel.	Umbriel.	Titania.	Oberon.
Apr. 15	-0.5	13.0	18.1	29.7	39.8	Aug. 13	0.0	14.0	19.5	31.9	42.7
20	0.6	13.1	18.2	29.8	39.9	18	+0.1	14.0	19.4	31.9	42.7
25	0.6	13.1	18.3	30.0	40.1	23	0.2	13.9	19.4	31.9	42.6
30	0.6	13.2	18.3	30.1	40.2	28	0.3	13.9	19.4	31.8	42.6
May 5	0.7	13.2	18.4	30.2	40.4	Sept 2	0.3	13.9	19.4	31.8	42.5
10	-0.7	13.3	18.5	30.3	40.6	7	+0.4	13.9	19.3	31.7	42.4
15	0.7	13.3	18.6	30.5	40.8	12	0.5	13.8	19.3	31.6	42.3
20	0.7	13.4	18.7	30.6	40.9	17	0.5	13.8	19.2	31.6	42.2
25	0.7	13.4	18.7	30.7	41.1	22	0.6	13.8	19.2	31.5	42.1
30	0.7	13.5	18.8	30.9	41.3	27	0.6	13.7	19.1	31.4	42.0
June 4	-0.7	13.6	18.9	31.0	41.4	Oct. 2	+0.6	13.7	19.1	31.3	41.8
9	0.7	13.6	19.0	31.1	41.6	7	0.7	13.6	19.0	31.1	41.7
14	0.6	13.6	19.0	31.2	41.7	12	0.7	13.6	18.9	31.0	41.5
19	0.6	13.7	19.1	31.3	41.9	17	0.7	13.5	18.8	30.9	41.3
24	0.6	13.7	19.2	31.4	42.0	22	0.7	13.5	18.8	30.8	41.2
29	-0.5	13.8	19.2	31.5	42.2	27	+0.7	13.4	18.7	30.6	41.0
July 4	0.5	13.8	19.3	31.6	42.3	Nov. 1	0.7	13.4	18.6	30.5	40.8
9	0.4	13.9	19.3	31.7	42.4	6	0.7	13.3	18.5	30.4	40.6
14	0.4	13.9	19.4	31.8	42.5	11	0.7	13.2	18.4	30.2	40.5
19	0.3	13.9	19.4	31.8	42.5	16	0.6	13.2	18.4	30.1	40.3
24	-0.2	13.9	19.4	31.9	42.6	21	+0.6	13.1	18.3	30.0	40.1
29	0.2	14.0	19.4	31.9	42.7	26	0.5	13.1	18.2	29.9	39.9
Aug. 3	-0.1	14.0	19.4	31.9	42.7	Dec. 1	0.5	13.0	18.2	29.8	39.8
8	0.0	14.0	19.5	31.9	42.7	6	+0.4	13.0	18.1	29.6	39.6

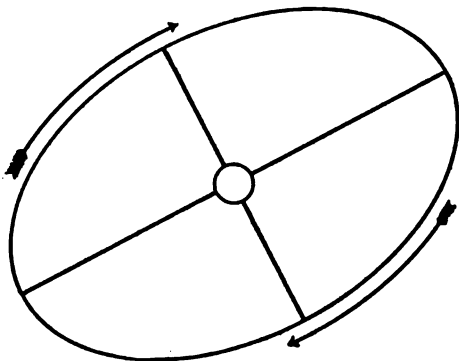
SATELLITE OF NEPTUNE, 1916.

Time from Eastern Elongation.		p^1	F	Time from Eastern Elongation.		p^1	F	Date.	$P-P_0$	$\frac{a(\rho)}{\rho}$	Date.	$P-P_0$	$\frac{a(\rho)}{\rho}$
d h	m			d h	m								
0 0	117.7	1.000		3 0	295.3	0.999		Jan. 1	+0.6	16.8	Apr. 30	-1.6	16.2
0 3	112.8	0.995		3 3	290.4	0.988		6	0.5	16.8	May 5	1.5	16.1
0 6	107.8	0.979		3 6	285.3	0.968		11	0.3	16.8	10	1.4	16.1
0 9	102.6	0.954		3 9	279.9	0.940		16	+0.2	16.8	15	1.3	16.0
0 12	97.0	0.920		3 12	274.1	0.901		21	0.0	16.8	20	-1.2	16.0
0 15	90.9	0.879		3 15	267.8	0.857		26	-0.2	16.8	Oct. 2	+3.6	16.0
0 18	84.3	0.833		3 18	260.7	0.810		31	0.3	16.8	7	3.7	16.1
0 21	76.8	0.786		3 21	252.8	0.762		Feb. 5	0.5	16.8	12	3.8	16.1
1 0	68.3	0.738		4 0	243.8	0.716		10	0.6	16.8	17	3.8	16.1
1 3	58.8	0.696		4 3	233.7	0.679		15	0.8	16.8	22	3.9	16.1
1 6	48.2	0.664		4 6	222.7	0.652		20	-0.9	16.7	27	+3.9	16.2
1 9	36.7	0.644		4 9	210.9	0.640		25	1.1	16.7	Nov. 1	4.0	16.2
1 12	24.8	0.640		4 12	198.9	0.643		Mar. 1	1.2	16.7	6	4.0	16.2
1 15	13.0	0.652		4 15	187.4	0.663		6	1.3	16.6	11	4.0	16.4
1 18	1.9	0.678		4 18	176.8	0.696		11	1.4	16.6	16	3.9	16.4
1 21	351.8	0.716		4 21	167.2	0.738		16	-1.5	16.6	21	+3.9	16.5
2 0	342.8	0.761		5 0	158.8	0.785		21	1.6	16.5	26	3.8	16.5
2 3	334.9	0.809		5 3	151.3	0.833		26	1.6	16.5	Dec. 1	3.7	16.6
2 6	327.8	0.856		5 6	144.6	0.878		31	1.7	16.4	6	3.6	16.6
2 9	321.4	0.900		5 9	138.6	0.919		Apr. 5	1.7	16.4	11	3.5	16.6
2 12	315.6	0.938		5 12	133.0	0.953		10	-1.7	16.4	16	+3.4	16.7
2 15	310.3	0.967		5 15	127.7	0.978		15	1.7	16.3	21	3.3	16.7
2 18	305.2	0.988		5 18	122.7	0.995		20	1.7	16.3	26	3.2	16.7
2 21	300.2	0.999		5 21	117.8	1.000		25	-1.6	16.2	31	+3.1	16.8

Position angle of satellite $p = p^1 + (P - P_0)$.Apparent distance of satellite $s = \frac{a(\rho)}{\rho}$.

APPARENT ORBIT OF THE SATELLITE OF NEPTUNE AT DATE OF OPPOSITION,
JANUARY 22, 1916, AS SEEN IN AN INVERTING TELESCOPE.

South



North

Date.	Position Angle of Apsis.	Apparent Distance at Apsis.
Jan. 21	117.7	16.8
Apr. 30	116.1	16.2
Oct. 11	121.5	16.1
Dec. 30	120.9	16.7

GREENWICH MEAN TIME OF GREATEST ELONGATION.

East.		West.		East.		West.		East.		West.	
Jan.	d h	Jan.	d h	Mar.	d h	Mar.	d h	Oct.	d h	Oct.	d h
	3 16.6		6 15.1		26 0.2		28 22.7		11 17.5		14 16.0
	9 13.7		12 12.2		31 21.2		3 19.8		17 14.5		20 13.0
	15 10.8		18 9.4	Apr.	6 18.3		9 16.9		23 11.5		26 10.0
	21 7.9		24 6.5		12 15.4		15 13.9		29 8.5	Nov.	1 7.0
	27 5.1		30 3.6		18 12.4		21 11.0	Nov.	4 5.5		7 4.0
Feb.	2 2.2	Feb.	5 0.7		24 9.5		27 8.0		10 2.5		13 1.1
	7 23.3		10 21.9		30 6.5	May	3 5.0		15 23.6		18 22.1
	13 20.4		16 19.0	May	6 3.5		9 2.0		21 20.6		24 19.1
	19 17.5		22 16.1		12 0.5		14 23.0		27 17.7		30 16.2
	25 14.7		28 13.2		17 21.5		20 20.0	Dec.	3 14.8	Dec.	6 13.3
Mar.	2 11.8	Mar.	5 10.3		23 18.5		26 17.0		9 11.8		12 10.3
	8 8.9		11 7.4		...		...		15 8.9		18 7.4
	14 6.0		17 4.5	Sept.	29 23.5	Oct.	2 22.0		21 6.0		24 4.6
	20 3.1		23 1.6	Oct.	5 20.5		8 19.0		27 3.1		30 1.7

The above times are the instants of each passage of the satellite through the
apsis of its apparent orbit. The position of the satellite at any other time
may be found by measuring around the orbit from the apsis last passed through,
bearing in mind that the radius vector of the satellite describes equal areas
in equal times.

The sidereal period of the satellite of Neptune is 5^d 21^h.044.

NOTE.—In the preceding diagrams the central circle represents the planet and is on the same scale as the orbits.

GREENWICH MEAN TIME.

PLANETARY CONFIGURATIONS.

Jan.	d h m		Mar.	d h m	
	1 8 -	♀ Greatest Hel. Lat. S.		22 1 -	♂ Stationary.
	1 14 -	♂ Stationary.		29 6 25	♂ ☾ ☾ ☾ - 1 53
	2 1 -	⊕ in Perihelion.		30 7 -	♂ ☾ ☾ ☾ Greatest Hel. Lat. S.
	2 8 -	♂ ☾ ☾ ☾ Greatest Hel. Lat. S.		30 10 -	☐ ☾ ☾ ☾
	4 5 -	♂ ☾ ☾ ☾ in Perihelion.		31 4 -	♀ in Perihelion.
	5 13 48	♂ ☾ ☾ ☾ ☾ - 1 1	Apr.	1 2 -	♂ ☾ ☾ ☾
	6 8 -	♂ ☾ ☾ ☾ ♀ - 1 7		1 8 45	♂ ☾ ☾ ☾ ☾ - 6 52
	6 18 18	♂ ☾ ☾ ☾ ☾ - 1 17		2 7 23	♂ ☾ ☾ ☾ ☾ - 6 17
	6 19 13	♂ ☾ ☾ ☾ ♀ - 2 27		6 0 8	♂ ☾ ☾ ☾ ♀ - 2 0
	9 17 33	♂ ☾ ☾ ☾ ☾ - 5 34		8 21 -	♂ ☾ ☾ ☾ ☾ - 0 24
	17 6 -	♂ ☾ ☾ ☾ ☾ - 0 15		9 5 46	♂ ☾ ☾ ☾ ☾ - 2 24
	18 9 39	♂ ☾ ☾ ☾ ♀ - 2 49		9 23 -	♂ ☾ ☾ ☾ Stationary.
	19 - -	♂ ☾ ☾ ☾ Par. ecl. vis. at Wash.		10 21 27	♂ ☾ ☾ ☾ ☾ - 0 45
	20 0 48	♂ ☾ ☾ ☾ ☾ - 0 58		12 2 0	♂ ☾ ☾ ☾ ☾ + 3 37
	20 6 -	♂ ☾ ☾ ☾ Great. elong. E. 18 40		14 9 -	♂ ☾ ☾ ☾ Superior.
	21 8 -	♂ ☾ ☾ ☾ in ☾		17 13 -	♂ ☾ ☾ ☾ in Perihelion.
	22 3 -	♂ ☾ ☾ ☾ ☾ + 6 35		18 8 -	♂ ☾ ☾ ☾ in ☾
	22 7 28	♂ ☾ ☾ ☾ ☾ + 6 35		19 19 -	☐ ☾ ☾ ☾
	25 23 -	♂ ☾ ☾ ☾ in Perihelion.		22 3 -	♀ Greatest Hel. Lat. N.
	26 10 -	♂ ☾ ☾ ☾ Stationary.		22 22 -	♂ ☾ ☾ ☾ in Perihelion.
Feb.	3 - -	☐ Tot. ecl. vis. at Wash.		23 22 -	♀ Greatest elong. E. 45 39
	3 8 8	♂ ☾ ☾ ☾ ☾ - 1 27		25 13 43	♂ ☾ ☾ ☾ ☾ - 2 13
	3 8 24	♂ ☾ ☾ ☾ ☾ + 2 47		30 2 54	♂ ☾ ☾ ☾ ☾ - 6 29
	3 12 -	♂ ☾ ☾ ☾ ☾ + 4 15	May	3 5 -	♂ ☾ ☾ ☾ Greatest Hel. Lat. N.
	4 20 -	♂ ☾ ☾ ☾ Inferior.		3 9 56	♂ ☾ ☾ ☾ ☾ - 2 0
	5 6 -	♂ ☾ ☾ ☾ Greatest Hel. Lat. N.		5 17 33	♂ ☾ ☾ ☾ ♀ + 1 1
	5 7 -	♂ ☾ ☾ ☾ ♀ - 5 16		6 17 31	♂ ☾ ☾ ☾ ♀ - 1 56
	5 23 6	♂ ☾ ☾ ☾ ☾ - 5 52		8 5 51	♂ ☾ ☾ ☾ ☾ - 0 27
	6 12 55	♂ ☾ ☾ ☾ ☾ - 5 52		10 3 -	☐ ☾ ☾ ☾
	7 0 -	♂ ☾ ☾ ☾ Greatest Hel. Lat. N.		10 4 41	♂ ☾ ☾ ☾ ☾ + 3 54
	8 23 -	♂ ☾ ☾ ☾ Nearest ⊕		12 4 -	♂ ☾ ☾ ☾ Greatest elong. E. 21 41
	9 14 -	♂ ☾ ☾ ☾ ♀ + 0 27		14 12 -	☐ ☾ ☾ ☾
	13 15 -	♂ ☾ ☾ ☾ ♀ + 0 27		22 20 11	♂ ☾ ☾ ☾ ☾ - 2 33
	14 13 20	♂ ☾ ☾ ☾ ♀ - 2 54		23 20 -	♂ ☾ ☾ ☾ ♀ + 3 25
	16 6 24	♂ ☾ ☾ ☾ ☾ - 1 2		24 15 -	♂ ☾ ☾ ☾ Stationary.
	16 18 -	♂ ☾ ☾ ☾ Stationary.		24 21 -	♂ ☾ ☾ ☾ Stationary.
	17 18 16	♂ ☾ ☾ ☾ ☾ + 5 44		26 16 -	♂ ☾ ☾ ☾ in ☾
	26 15 -	♂ ☾ ☾ ☾ in ☾		27 2 -	♂ ☾ ☾ ☾ Greatest brilliancy.
	28 17 -	♂ ☾ ☾ ☾ in ☾		27 20 20	♂ ☾ ☾ ☾ ☾ - 6 41
Mar.	1 12 -	♂ ☾ ☾ ☾ Greatest elong. W. 27 6		31 23 22	♂ ☾ ☾ ☾ ☾ - 4 56
	1 15 17	♂ ☾ ☾ ☾ ☾ - 0 58	June	3 6 18	♂ ☾ ☾ ☾ ♀ - 1 29
	1 20 40	♂ ☾ ☾ ☾ ☾ - 1 37		3 13 38	♂ ☾ ☾ ☾ ♀ + 1 16
	4 13 -	♂ ☾ ☾ ☾ ☾ - 0 8		4 14 5	♂ ☾ ☾ ☾ ☾ - 0 39
	5 10 16	♂ ☾ ☾ ☾ ☾ - 6 5		5 13 -	♂ ☾ ☾ ☾ Inferior.
	7 1 17	♂ ☾ ☾ ☾ ♀ - 4 50		5 22 -	♂ ☾ ☾ ☾ in Aphelion.
	9 23 -	♂ ☾ ☾ ☾ in Aphelion.		7 14 32	♂ ☾ ☾ ☾ ☾ + 4 23
	11 0 -	♂ ☾ ☾ ☾ Stationary.		11 4 -	♀ Stationary.
	11 0 -	♂ ☾ ☾ ☾ Greatest Hel. Lat. S.		17 4 -	♀ in ☾
	12 20 3	♂ ☾ ☾ ☾ ♀ - 2 45		17 13 -	♂ ☾ ☾ ☾ Stationary.
	13 15 -	♂ ☾ ☾ ☾ in Aphelion.		19 3 25	♂ ☾ ☾ ☾ ☾ - 2 44
	14 13 24	♂ ☾ ☾ ☾ ☾ - 0 58		21 6 24	☐ enters ♄, Summer com.
	15 12 51	♂ ☾ ☾ ☾ ☾ + 4 15		22 3 -	♂ ☾ ☾ ☾ ♀ - 0 57
	20 10 47	☐ enters ♑, Spring com.		24 11 42	♂ ☾ ☾ ☾ ☾ - 6 52

GREENWICH MEAN TIME.

PLANETARY CONFIGURATIONS.

June			d	h	m			
26	7	-	♂	♂	♂	Greatest Hel. Lat. S.	♂	♂
28	1	11	♂	♂	♂	♂ - 7 7	♂	♂
29	18	-	♂	♂	♂	Great. elong. W.	♂	21 52
30	8	10	♂	♂	♂	♂ - 4 30	♂	♂
30	19	28	♂	♂	♂	♂ - 1 6	♂	♂
July			d	h	m			
1	22	5	♂	♂	♂	♂ + 0 6	♂	♂
2	18	-	♂	♂	♂	in Aphelion.	♂	♂
3	8	-	♂	♂	♂	Inferior.	♂	♂
6	3	41	♂	♂	♂	♂ + 5 22	♂	♂
12	8	-	♂	♂	♂	♂	♂	♂
13	12	-	♂	♂	♂	♂ + 5 1	♂	♂
14	-	-	♂	♂	♂	Par. ecl. vis. at Wash.	♂	♂
15	7	-	♂	♂	♂	in ♄	♂	♂
16	11	54	♂	♂	♂	♂ - 2 44	♂	♂
19	22	-	♂	♂	♂	in Perihelion.	♂	♂
21	9	-	♂	♂	♂	♂ + 1 9	♂	♂
21	16	-	♂	♂	♂	in Aphelion.	♂	♂
22	0	57	♂	♂	♂	♂ - 6 57	♂	♂
24	23	-	♂	♂	♂	Stationary.	♂	♂
25	5	-	♂	♂	♂	♂	♂	♂
26	12	-	♂	♂	♂	♂ + 1 53	♂	♂
26	18	8	♂	♂	♂	♂ - 8 21	♂	♂
26	23	-	♂	♂	♂	♂	♂	♂
27	22	-	♂	♂	♂	Superior.	♂	♂
28	8	47	♂	♂	♂	♂ - 0 44	♂	♂
29	-	-	♂	♂	♂	Ann. ecl. invis. at Wash.	♂	♂
29	6	8	♂	♂	♂	♂ + 0 5	♂	♂
29	20	41	♂	♂	♂	♂ + 2 50	♂	♂
30	4	-	♂	♂	♂	Greatest Hel. Lat. N.	♂	♂
Aug.	3	18	♂	♂	♂	♂ + 5 42	♂	♂
9	3	-	♂	♂	♂	Greatest brilliancy.	♂	♂
10	5	-	♂	♂	♂	♂	♂	♂
12	20	53	♂	♂	♂	♂ - 2 37	♂	♂
13	1	-	♂	♂	♂	Greatest Hel. Lat. S.	♂	♂
18	11	51	♂	♂	♂	♂ - 6 58	♂	♂
22	15	-	♂	♂	♂	in ♄	♂	♂
22	15	-	♂	♂	♂	in ♄	♂	♂
24	3	12	♂	♂	♂	♂ - 5 23	♂	♂
24	2	11	♂	♂	♂	♂ - 0 21	♂	♂
25	7	-	♂	♂	♂	Stationary.	♂	♂
25	14	37	♂	♂	♂	♂ + 0 12	♂	♂
30	13	7	♂	♂	♂	♂ + 3 54	♂	♂
Sept.	1	8	♂	♂	♂	♂ + 5 25	♂	♂
1	21	-	♂	♂	♂	in Aphelion.	♂	♂
5	14	-	♂	♂	♂	♂ - 3 0	♂	♂
9	5	5	♂	♂	♂	♂ - 2 33	♂	♂
9	5	-	♂	♂	♂	Great. elong. E.	♂	26 54
12	2	-	♂	♂	♂	Great. elong. W.	♂	46 1
13	5	-	♂	♂	♂	♂ - 2 3	♂	♂
14	19	45	♂	♂	♂	♂ - 6 55	♂	♂
21	11	15	♂	♂	♂	♂ + 0 6	♂	♂
21	23	38	♂	♂	♂	♂ + 0 25	♂	♂
22	6	-	♂	♂	♂	Greatest Hel. Lat. S.	♂	♂
Sept.			d	h	m			
22	6	-	♂	♂	♂	Stationary.	♂	♂
22	19	41	♂	♂	♂	♂ + 0 12	♂	♂
22	21	14	♂	♂	♂	enters ♄, Autumn com.	♂	♂
27	4	-	♂	♂	♂	in ♄	♂	♂
28	0	11	♂	♂	♂	♂ + 1 30	♂	♂
30	0	1	♂	♂	♂	♂ + 4 30	♂	♂
Oct.	4	23	♂	♂	♂	Inferior.	♂	♂
6	11	40	♂	♂	♂	♂ - 2 39	♂	♂
8	8	-	♂	♂	♂	in ♄	♂	♂
11	6	-	♂	♂	♂	in ♄	♂	♂
12	0	21	♂	♂	♂	♂ - 6 54	♂	♂
13	7	-	♂	♂	♂	Stationary.	♂	♂
15	21	-	♂	♂	♂	in Perihelion.	♂	♂
18	23	5	♂	♂	♂	♂ + 0 34	♂	♂
19	8	46	♂	♂	♂	♂ + 0 42	♂	♂
20	10	-	♂	♂	♂	Great. elong. W.	♂	18 17
23	1	47	♂	♂	♂	♂ + 5 35	♂	♂
23	13	-	♂	♂	♂	♂	♂	♂
23	14	-	♂	♂	♂	♂	♂	♂
25	5	24	♂	♂	♂	♂ + 7 40	♂	♂
25	20	-	♂	♂	♂	Stationary.	♂	♂
26	3	-	♂	♂	♂	Greatest Hel. Lat. N.	♂	♂
28	3	-	♂	♂	♂	♂	♂	♂
28	16	46	♂	♂	♂	♂ + 3 3	♂	♂
Nov.	2	17	♂	♂	♂	♂ - 2 53	♂	♂
7	0	-	♂	♂	♂	Stationary.	♂	♂
8	2	-	♂	♂	♂	♂	♂	♂
8	2	31	♂	♂	♂	♂ - 6 56	♂	♂
11	2	-	♂	♂	♂	in Perihelion.	♂	♂
11	22	-	♂	♂	♂	Stationary.	♂	♂
15	8	22	♂	♂	♂	♂ + 0 56	♂	♂
15	17	9	♂	♂	♂	♂ + 1 0	♂	♂
18	15	-	♂	♂	♂	in ♄	♂	♂
22	6	32	♂	♂	♂	♂ + 7 33	♂	♂
23	14	-	♂	♂	♂	Superior.	♂	♂
24	23	17	♂	♂	♂	♂ + 3 5	♂	♂
26	11	57	♂	♂	♂	♂ + 1 12	♂	♂
28	20	-	♂	♂	♂	in Aphelion.	♂	♂
29	23	54	♂	♂	♂	♂ - 3 10	♂	♂
Dec.	2	20	♂	♂	♂	Greatest Hel. Lat. N.	♂	♂
5	4	36	♂	♂	♂	♂ - 7 0	♂	♂
12	14	13	♂	♂	♂	♂ + 1 4	♂	♂
13	0	5	♂	♂	♂	♂ + 1 8	♂	♂
19	5	-	♂	♂	♂	Greatest Hel. Lat. S.	♂	♂
21	1	-	♂	♂	♂	Stationary.	♂	♂
21	15	59	♂	♂	♂	enters ♄, Winter com.	♂	♂
21	23	-	♂	♂	♂	♂ - 1 10	♂	♂
22	5	46	♂	♂	♂	♂ + 5 34	♂	♂
24	-	-	♂	♂	♂	Par. ecl. invis. at Wash.	♂	♂
25	10	4	♂	♂	♂	♂ - 0 57	♂	♂
25	14	36	♂	♂	♂	♂ - 9 13	♂	♂
27	9	42	♂	♂	♂	♂ - 3 22	♂	♂

No.	Place.	Latitude.	Reduction to Geocentric Latitude.	Altitude (Meters).	Log ρ (Including altitude).	Longitude from Greenwich.	Reduction from Greenwich to Local S.T.M.N.
		° ' "	' "			h m s	s
1	Abbadia, France . . .	+43 22 52.2	-11 34.4	69	9.999317	+ 0 7 0.1	+ 1.15
2	Adelaide, S. Australia . .	-34 55 38.0 <i>a</i>	+10 52.4	41 <i>b</i>	9.999526	- 9 14 20.07 <i>a</i>	- 91.06
3	Adelaide, S. Australia . .	-34 55 37.4 <i>c</i>	+10 52.4	...	9.999523	- 9 14 20.17 <i>c</i>	- 91.06
4	Albany, N. Y. . . .	+42 39 12.7 <i>a</i>	-11 33.1	70 <i>a</i>	9.999336	+ 4 55 7.12 <i>a</i>	+ 48.48
5	Albany, N. Y. . . .	+42 39 49.5 <i>a</i>	-11 33.1	52	9.999335	+ 4 54 59.97 <i>a</i>	+ 48.46
6	Algiers, Algeria . . .	+36 47 50	-11 6.7	342	9.999501	- 0 12 8.38	- 1.99
7	Allegheny, Pa. . . .	+40 28 58.1 <i>d</i>	-11 26.7	370 <i>d</i>	9.999411	+ 5 20 5.39 <i>d</i>	+ 52.58
8	Allegheny, Pa. . . .	+40 27 41.6	-11 26.6	...	9.999387	+ 5 20 2.93	+ 52.58
9	Amherst, Mass. . . .	+42 21 56.5 <i>e</i>	-11 32.5	110 <i>e</i>	9.999346	+ 4 50 5.93 <i>e</i>	+ 47.66
10	Amherst, Mass. . . .	+42 22 17.1 <i>f</i>	-11 32.5	...	9.999338	+ 4 50 4.67 <i>f</i>	+ 47.65
11	Ann Arbor, Mich. . . .	+42 16 48.7 <i>a</i>	-11 32.3	282 <i>a</i>	9.999360	+ 5 34 55.27 <i>a</i>	+ 55.02
12	Appleton, Wis. . . .	+44 15 39.2 <i>g</i>	-11 35.4	242	9.999307	+ 5 53 35.92 <i>g</i>	+ 58.09
13	Arcetri, Italy	+43 45 14.4	-11 34.9	184	9.999316	- 0 45 1.30	- 7.40
14	Arequipa, Peru	-16 22 28.0 <i>h</i>	+ 6 15.2	2451 <i>h</i>	0.000052	+ 4 46 11.73 <i>h</i>	+ 47.02
15	Armagh, Ireland	+54 21 12.7 <i>c</i>	-10 59.6	61 <i>c</i>	9.999040	+ 0 26 35.4 <i>c</i>	+ 4.37
16	Athens, Greece	+37 58 19.7 <i>i</i>	-11 14.3	107 <i>i</i>	9.999456	- 1 34 53 <i>i</i>	- 15.59
17	Baltimore, Md. . . .	+39 17 52.0 <i>j</i>	-11 21.5	36 <i>j</i>	9.999418	+ 5 6 29.1 <i>j</i>	+ 50.55
18	Bamberg, Bavaria	+49 53 6.0 <i>c</i>	-11 26.0	299 <i>c</i>	9.999167	- 0 43 33.57 <i>c</i>	- 7.16
19	Barcelona, Spain	+41 25 18	-11 30.0	420	9.999391	- 0 8 28.0	- 1.39
20	Beloit, Wis.	+42 30 8.4	-11 32.8	...	9.999335	+ 5 56 7.4	+ 58.59
21	Bergedorf, Germany	+53 28 46.2	-11 6.1	35	9.999060	- 0 40 57.74	- 6.73
22	Berkeley, Cal.	+37 52 23.6	-11 13.7	97	9.999458	+ 8 9 2.72	+ 80.34
23	Berlin, Prussia	+52 30 16.7 <i>k</i>	-11 12.5	47 <i>k</i>	9.999085	- 0 53 34.80 <i>k</i>	- 8.80
24	Berlin, Prussia	+52 31 13.1	-11 12.4	...	9.999081	- 0 53 34.41	- 8.80
25	Berlin, Prussia	+52 31 30.7	-11 12.4	...	9.999081	- 0 53 27.40	- 8.78
26	Berlin, Prussia	+52 29 7	-11 12.6	38	9.999084	- 0 53 54.2	- 8.86
27	Berne, Switzerland	+46 57 8.7	-11 34.2	573	9.999260	- 0 29 45.70 <i>a</i>	- 4.89
28	Besançon, France	+47 14 59.0	-11 33.7	312	9.999235	- 0 23 57.13	- 3.92
29	Birr Castle, Ireland	+53 5 47	-11 8.7	56	9.999071	+ 0 31 40.9	+ 5.29
30	Bloomington, Ind. . . .	+39 9 56 <i>d</i>	-11 20.8	238 <i>d</i>	9.999435	+ 5 46 5 <i>d</i>	+ 56.53
31	Bogota, Colombia	+ 4 35 55.2 <i>c</i>	- 1 50.8	2634	0.000170	+ 4 56 23.5	+ 43.69
32	Bombay (Colaba), India . .	+18 53 36.2 <i>c</i>	- 7 5.1	14 <i>c</i>	9.999849	- 4 51 15.72 <i>c</i>	- 47.85
33	Bonn, Prussia	+50 43 45.0 <i>k</i>	-11 22.3	62 <i>l</i>	9.999130	- 0 28 23.17 <i>k</i>	- 4.66
34	Bordeaux (Florac), France .	+44 50 7.2 <i>a</i>	-11 35.6	73	9.999281	+ 0 2 5.51 <i>a</i>	+ 0.34
35	Boston, Mass	+42 20 58 <i>m</i>	-11 32.5	31 <i>m</i>	9.999341	+ 4 44 19.1 <i>m</i>	+ 46.71
36	Boston, Mass	+42 21 32.5	-11 32.5	48	9.999342	+ 4 44 15.0	+ 46.79
37	Bothkamp, Prussia	+54 12 9.3 <i>n</i>	-11 0.8	32 <i>n</i>	9.999042	- 0 40 31.02 <i>n</i>	- 6.08
38	Bremen, Germany	+53 4 36	-11 8.8	...	9.999067	- 0 35 15	- 3.79
39	Breslau, Prussia	+51 6 55.8 <i>k</i>	-11 20.4	147 <i>k</i>	9.999126	- 1 8 8.72 <i>k</i>	- 11.29
40	Brisbane, Queensland	-27 28 0.0	+ 9 28.3	...	9.999691	-10 12 6.17	-100.53
41	Brussels (Uccle), Belgium .	+50 47 55.5 <i>a</i>	-11 21.9	105 <i>a</i>	9.999131	- 0 17 26.05 <i>a</i>	- 2.88
42	Brussels, Belgium	+50 51 10.6 <i>c</i>	-11 21.7	...	9.999123	- 0 17 28.02 <i>c</i>	- 2.87
43	Budapest, Hungary	+47 29 34.7 <i>c</i>	-11 33.2	131 <i>c</i>	9.999217	- 1 16 15.3 <i>c</i>	- 12.53
44	Cambridge, England	+52 12 51.6	-11 14.3	28	9.999091	- 0 0 22.75	- 0.08
45	Cambridge, Mass. . . .	+42 22 47.6 <i>o</i>	-11 32.6	24	9.999340	+ 4 44 31.05 <i>o</i>	+ 46.74
46	Cape of Good Hope	-33 56 3.5 <i>p</i>	+10 43.6	13 <i>p</i>	9.999548	- 1 13 54.76 <i>p</i>	- 12.14
47	Caloforte, Sardinia	+39 8 8.9 <i>q</i>	-11 20.7	18 <i>q</i>	9.999421	- 0 33 14.9 <i>q</i>	- 5.40
48	Canania, Sicily	+37 30 13.2 <i>c</i>	-11 11.4	49 <i>c</i>	9.999464	- 1 0 20.70 <i>c</i>	- 9.81
49	Charkow, Russia	+50 0 9.9 <i>a</i>	-11 25.5	178 <i>r</i>	9.999153	- 2 24 55.75 <i>a</i>	- 21.81
50	Charlottesville, Va. . . .	+38 2 1.2 <i>e</i>	-11 14.6	259 <i>e</i>	9.999465	+ 5 14 5.33 <i>e</i>	+ 51.08

a Meridian circle.*b* Standard barometer.*c* Transit instrument.*d* Transit instrument pier.*e* Center of large dome.*f* Center of dome tower.*g* Center of dome.*h* Transit pier.*i* Circle Syngros.*j* Center of instrument house.*k* Center of observatory.*l* Floor of meridian room.*m* Foot of pillar of 7-in. equatorial.*n* Cube of equatorial.*o* Dome of 15-in. equatorial.*p* 8-in. meridian circle.*q* Zenith telescope.*r* Barometer in meridian room.

No.	Authority for—		Description.
	Latitude.	Longitude.	
1	<i>Les Obs. Astron.</i> , Bruxelles, 1907.	<i>Les Obs. Astron.</i> , Bruxelles, 1907.	Obs. Paris Acad. of Sci., Houdaye.
2	Letter from Govt. Astronomer, 1913.	Letter from Govt. Astronomer, 1913.	Govt. Obs., since 1884.
3	Letter from Govt. Astronomer, 1913.	Letter from Govt. Astronomer, 1913.	Govt. Obs., before 1884.
4	Letter from Director, 1913.	Letter from Director, 1913.	Dudley Obs., since 1893.
5	Letter from Director, 1913.	Letter from Director, 1913.	Dudley Obs., before 1893.
6	<i>Les Obs. Astron.</i> , Bruxelles, 1907.	<i>Astron. Nach.</i> , Nr. 3993, 1905.	At Bouzaréah. Old Obs. 3° 38', 8° E.
7	<i>Publications of Obs.</i> , 1909.	<i>Publications of Obs.</i> , 1909.	Obs. Western Univ. of Pa., since 1905.
8	Letter from Director, 1897.	Letter from Director, 1897.	Obs. Western Univ. of Pa., before 1905.
9	Letter from Director, 1913.	Letter from Director, 1913.	Amherst College Obs., since 1903.
10	Letter from Director, 1913.	Letter from Director, 1913.	Lawrence Obs., before 1903.
11	Letter from Director, 1913.	Letter from Director, 1913.	Detroit Obs., Univ. of Mich.
12	See footnote (b).	See footnote (b).	Underwood Obs., Lawrence College.
13	<i>Pubbl. dell'Osserv.</i> , 1900.	<i>Astron. Nach.</i> , Nr. 3993, 1905.	Royal Observatory.
14	<i>Harvard Annals</i> , 1903.	<i>Harvard Annals</i> , 1903.	Branch of Harvard Coll. Obs.
15	<i>Armagh Catalogue of Stars</i> , 1840.	<i>Armagh Catalogue of Stars</i> , 1840.	Armagh Observatory.
16	<i>Annales de l'Obs.</i> , 1910.	Letter from Director, 1913.	c National Observatory.
17	Letter from Director, 1913.	Letter from Director, 1913.	Johns Hopkins Univ. Obs.
18	Letter from Director, 1913.	<i>Astron. Nach.</i> , Nr. 3993, 1905.	Remeis Observatory.
19	<i>Les Obs. Astron.</i> , Bruxelles, 1907.	<i>Les Obs. Astron.</i> , Bruxelles, 1907.	Fabra Obs., Acad. of Sci. and Arts.
20	Letter from Director, 1897.	Letter from Director, 1897.	Smith Obs., Beloit College.
21	Letter from Director, 1913.	<i>Astron. Nach.</i> , Nr. 3993, 1905.	Hamburg Obs., since 1909.
22	Letter from Director, 1897.	Letter from Director, 1897.	Students' Obs., Univ. of Cal.
23	<i>Astron. Nach.</i> , Nr. 3545, 1898.	<i>Astron. Nach.</i> , Nr. 3993, 1905.	Royal Obs., since 1835.
24	Letter from Director, 1913.	Letter from Director, 1913.	Royal Obs., before 1835.
25	<i>Astron. Nach.</i> , Nr. 3170, 1893.	<i>Astron. Nach.</i> , Nr. 3170, 1893.	Urania Observatory.
26	<i>Les Obs. Astron.</i> , Bruxelles, 1907.	<i>Les Obs. Astron.</i> , Bruxelles, 1907.	Treptow Observatory.
27	<i>Berliner Jahrbuch</i> .	<i>Astron. Nach.</i> , Nr. 3202, 1893.	Observatory, Cantonal Univ.
28	<i>Astron. Nach.</i> , Nr. 2805, 1887.	<i>Astron. Nach.</i> , Nr. 2805, 1887.	National Observatory.
29	<i>British Nautical Almanac</i> .	<i>British Nautical Almanac</i> .	Private Obs. of Earl of Rosse.
30	Letter from Director, 1913.	Letter from Director, 1913.	Kirkwood Obs., Univ. of Ind.
31	Letter from Director, 1913.	Letter from Director, 1913.	National Observatory.
32	Letter from Director, 1913.	Letter from Director, 1913.	Government Observatory.
33	Letter from Director, 1913.	<i>Astron. Nach.</i> , Nr. 3993, 1905.	Royal Observatory.
34	Letter from Director, 1897.	<i>Annales de l'Obs.</i> , 1885.	Obs., Univ. of Bordeaux.
35	Letter from Director, 1909.	Letter from Director, 1909.	Boston Univ. Obs., since 1908.
36	Letter from Director, 1895.	Letter from Director, 1895.	Boston Univ. Obs., before 1908.
37	<i>Beob. zu Bothkamp</i> , 1872.	Letter from Director, 1913.	Obs. of Herr von Bülow.
38	<i>Astron. Nach.</i> , Nr. 15, 1822.	<i>Astron. Nach.</i> , Nr. 15, 1822.	Formerly Olber's Obs.
39	Letter from Director, 1897.	<i>Astron. Nach.</i> , Nr. 3993, 1905.	Royal University Obs.
40	<i>British Nautical Almanac</i> .	c <i>British Nautical Almanac</i> .	Brisbane Observatory.
41	Letter from Director, 1913.	Letter from Director, 1913.	Royal Obs., since 1891.
42	<i>Annales de l'Obs.</i> , 1857.	Letter from Director, 1913.	Royal Obs., before 1891.
43	<i>Astron. Nach.</i> , Nr. 2752, 1886.	<i>Astron. Nach.</i> , Nr. 2752, 1886.	University Observatory.
44	Letter from Director, 1879.	Letter from Director, 1879.	University Observatory.
45	<i>Harvard Annals</i> , 1887.	<i>U. S. C. and G. S. Report</i> , 1897.	Harvard College Obs.
46	<i>Cape Gen. Catalogue of Stars</i> , 1885.	<i>Monthly Notices, R. A. S.</i> , Nov. 1908.	Royal Observatory.
47	See footnote (d).	Letter from Director, 1913.	International Lat. Obs.
48	Letter from Director, 1913.	Letter from Director, 1913.	Royal Obs. of Catania and Etna.
49	<i>Annales de l'Obs.</i> , 1904.	<i>Annales de l'Obs.</i> , 1904.	University Observatory.
50	Letter from Director, 1913.	Letter from Director, 1913.	Leander McCormick Obs., Univ. Va.

a Name of Western Univ. of Pa. changed in 1908; now the Univ. of Pittsburgh.

b *Professional Papers, Corps of Engineers, U. S. A.*, 1882.

c Old meridian circle 0' 48", 0.1 W. of Circle Synge.

d *Resultate des Internationalen Breitendienstes*, 1900-1908.

e With the new value of the longitude of Sydney.

No.	Place.	Latitude.	Reduction to Geocen- tric Latitude.	Altitude (Meters).	Log p (Including altitude).	Longitude from Greenwich.	Reduction from Green- wich to Local S. T. M. N.
		" "	" "			" "	" "
51	Chicago, Ill.	+41 50 1.0	-11 31.2	25	9.999352	+5 50 26.84	+57.57
52	Christiania, Norway . . .	+59 54 44.0 ^a	-10 4.8	25 ^a	9.998908	-0 42 53.50 ^a	- 7.06
53	Cincinnati, Ohio	+39 8 19.8 ^b	-11 20.7	247 ^b	9.999437	+5 37 41.40 ^b	+55.48
54	Cincinnati, Ohio	+39 6 26.5	-11 20.5	247	9.999421	+5 37 59.00	+55.52
55	Cleveland, Ohio	+41 30 14.5 ^c	-11 30.2	215 ^c	9.999375	+5 26 25.86 ^c	+53.62
56	Clinton, N. Y.	+43 3 17.0	-11 33.9	276	9.999340	+5 1 37.45	+49.55
57	Coimbra, Portugal	+40 12 24.5	-11 25.6	99	9.999400	+0 33 43.1	+ 5.54
58	Columbia, Mo.	+38 56 51.7 ^d	-11 19.7	225 ^e	9.999440	+6 9 18.33 ^d	+60.67
59	Columbus, Ohio	+39 59 50.4 ^d	-11 24.7	233 ^d	9.999414	+5 32 2.60 ^d	+54.55
60	Copenhagen, Denmark . .	+55 41 12.6	-10 48.6	14	9.999005	-0 50 18.69 ^f	- 8.26
61	Cordova, Arg. Rep. . . .	-31 25 15.5 ^g	+10 18.0	434 ^g	9.999634	+4 16 48.22 ^g	+42.19
62	Cracow, Austria	+50 3 52 0 ^a	-11 25.2	221 ^a	9.999157	-1 19 50.27 ^a	-13.12
63	Danzig, Prussia	+54 21 18.0	-10 59.6	3	9.999036	-1 14 39.6	-12.26
64	Dehra Dun, India	+30 18 51.8 ^h	-10 5.3	681 ^h	9.999676	-5 12 11.76 ^h	-51.29
65	Denver, Colo.	+39 40 36.4 ^a	-11 23.3	1644 ⁱ	9.999518	+6 59 47.72 ^a	+68.96
66	Des Moines, Iowa	+41 36 0	-11 30.5	296	9.999378	+6 14 30.56	+61.32
67	Dorpat (Jurjew), Russia .	+58 22 47.2 ^a	-10 22.1	67 ^a	9.998945	-1 46 53.22 ^a	-17.56
68	Dresden, Saxony	+51 2 16.8	-11 20.8	121	9.999126	-0 54 54.74	- 9.02
69	Dublin, Ireland	+53 23 13.1 ^a	-11 6.7	86 ^a	9.999066	+0 25 21.1 ^a	+ 4.16
70	Dun Echt, Scotland . . .	+57 9 36	-10 34.8	141	9.998979	+0 9 40.0	+ 1.59
71	Durham, England	+54 46 6.2 ^j	-10 56.4	107 ^k	9.999033	+0 6 19.75 ^j	+ 1.04
72	Dusseldorf, Prussia . . .	+51 12 25.0 ^l	-11 19.9	46 ^l	9.999117	-0 27 2.69 ^l	- 4.44
73	Edinburgh, Scotland . . .	+55 55 30.0 ^a	-10 46.5	134 ^m	9.999007	+0 12 44.22 ^a	+ 2.09
74	Edinburgh, Scotland . . .	+55 57 23.2 ⁿ	-10 46.2	106 ^o	9.998995	+0 12 43.05 ⁿ	+ 2.09
75	Elmira, N. Y.	+42 6 25	-11 31.9	100	9.999345	+5 7 13.90	+50.47
76	Evanston, Ill.	+42 3 33.4	-11 31.8	175	9.999358	+5 50 42.3	+57.61
77	Flagstaff, Ariz.	+35 12 30.5	-10 54.7	2210	9.999667	+7 26 44.58	+73.23
78	Gaithersburg, Md.	+39 8 13.2 ^r	-11 20.7	165	9.999431	+5 8 47.73	+50.73
79	Geneva, N. Y.	+42 52 46.2	-11 33.6	152	9.999336	+5 8 1.00	+50.60
80	Geneva, Switzerland . . .	+46 11 59.3 ^a	-11 35.2	407 ^a	9.999268	-0 24 36.61 ^a	- 4.04
81	Genoa, Italy	+44 25 9.3 ^a	-11 35.5	105	9.999293	-0 35 41.28 ^a	- 5.86
82	Georgetown, D. C.	+38 54 26.7 ^b	-11 19.5	47	9.999429	+5 8 18.26 ^b	+50.65
83	Glasgow, Mo.	+39 13 45.6	-11 21.1	227	9.999433	+6 11 18.08	+61.00
84	Glasgow, Scotland	+55 52 42.8 ^a	-10 46.9	55 ^p	9.999003	+0 17 10.55 ^a	+ 2.82
85	Gotha, Germany	+50 56 37.9 ^l	-11 21.2	322 ^a	9.999142	-0 42 50.51 ^l	- 7.04
86	Gotha, Germany	+50 56 4.4 ^j	-11 21.2	360 ^j	9.999145	-0 42 55.09 ^j	- 7.05
87	Göttingen, Prussia	+51 31 48.1 ^q	-11 18.2	161 ^q	9.999116	-0 39 46.22 ^q	- 6.13
88	Greencastle, Ind.	+39 38 46.6 ^a	-11 23.1	262 ^a	9.999425	+5 47 24.36 ^a	+57.07
89	Greenwich, England . . .	+51 28 38.2 ^a	-11 18.5	49 ^a	9.999110	0 0 0.00 ^a	0.00
90	Hamburg, Germany	+53 33 6.0	-11 5.6	25	9.999057	-0 39 53.60 ^a	- 6.55
91	Hamburg, Germany	+53 32 51.3 ^d	-11 5.6	30 ^d	9.999058	-0 39 53.46 ^d	- 6.55
92	Hanover, N. H.	+43 42 15.3	-11 34.8	183	9.999317	+4 49 8.02	+47.50
93	Haverford, Pa.	+40 0 40.1 ^r	-11 24.8	133	9.999398	+5 1 12.70 ^r	+49.45
94	Heidelberg, Baden	+49 23 55.2 ^s	-11 27.8	567 ^s	9.999198	-0 34 53.13 ^s	- 5.73
95	Heidelberg, Baden	+49 23 55.7 ^t	-11 27.8	570 ^t	9.999198	-0 34 52.96 ^t	- 5.73
96	Heidelberg, Baden	+49 24 34.3 ^l	-11 27.8	126 ^l	9.999168	-0 34 46.80 ^l	- 5.71
97	Helsingfors, Finland . . .	+60 9 42.3 ^a	-10 1.5	33 ^a	9.998903	-1 39 49.10 ^a	-16.40
98	Herény, Hungary	+47 15 47.4	-11 33.7	229	9.999229	-1 6 24.7	-10.31
99	Hong Kong, China	+22 18 13.2 ^j	- 8 7.4	33 ^j	9.999793	-7 36 41.86 ^j	-75.32
100	Iowa City, Iowa	+41 40 0	-11 30.7	183	9.999369	+6 6 1.6	+60.14

^a Meridian circle.^b Center of dome.^c Zenith telescope pier.^d Transit pier.^e Observatory bench mark.^f Center of observatory.^g Old meridian circle.^h Floor-level of zenith sector pillar.ⁱ Main floor.^j Transit instrument.^k Barometer in transit room.^l Equatorial.^m Standard barometer.ⁿ Point midway between transit instrument and mural circle.^o Floor of main building.^p Floor of meridian circle room.^q Position of meridian circle before 1888.^r Zenith telescope.^s Repsold meridian circle.^t Bruce telescope.

No.	Authority for—		Description.
	Latitude.	Longitude.	
51	U. S. Lake Survey, 1864.	Smithsonian Report, 1886.	^a Dearborn Observatory.
52	<i>Astron. Nach.</i> , Nr. 3193, 1893.	<i>Astron. Nach.</i> , Nr. 3993, 1905.	University Observatory.
53	<i>Publications of the Obs.</i> , 1908.	<i>Astronomical Journal</i> , 1897.	Cincinnati Obs., since 1873.
54	Letter from Director, 1897.	<i>Astronomical Journal</i> , 1854.	Cincinnati Obs. before 1873.
55	Letter from Director, 1913.	Letter from Director, 1913.	Case Obs., Case School of Appl'd Sci.
56	<i>Astron. Nach.</i> , Nr. 2553, 1883.	<i>Astron. Nach.</i> , Nr. 2553, 1883.	Litchfield Obs., Hamilton College.
57	<i>Eph. Astron. de Coimbra</i> , 1889.	<i>Eph. Astron. de Coimbra</i> , 1889.	University Observatory.
58	<i>Trans. Acad. of Sci. of St. Louis</i> , 1894.	<i>Trans. Acad. of Sci. of St. Louis</i> , 1894.	Laws Obs., Univ. of Mo.
59	Letter from Director, 1913.	Letter from Director, 1899.	McMillin Obs., State Univ.
60	British Nautical Almanac.	<i>Astron. Nach.</i> , Nr. 3993, 1905.	University Observatory.
61	<i>Resultados del Obs.</i> , 1887.	<i>Resultados del Obs.</i> , 1887.	National Observatory.
62	Letter from Director, 1913.	Letter from Director, 1913.	Imperial and Royal Obs.
63	Letter from Director, 1897.	Letter from Director, 1897.	Obs. of the School of Navigation.
64	<i>Great Trig. Survey of India</i> , 1906.	Letter from Supt. of Survey, 1913.	Halg Obs., Trig. Survey of India.
65	Letter from Director, 1913.	Letter from Director, 1913.	Chamberlin Obs., Univ. of Denver.
66	<i>Les Obs. Astron.</i> , Bruxelles, 1907.	<i>Les Obs. Astron.</i> , Bruxelles, 1907.	Drake Univ. Obs.
67	<i>Publikationen der Sternw.</i> , 1911.	<i>Astron. Nach.</i> , Nr. 3993, 1905.	Imperial University Obs.
68	<i>Berliner Jahrbuch.</i>	<i>Berliner Jahrbuch.</i>	^b Baron Engelhardt's Obs.
69	<i>Trans. Royal Dublin Soc.</i> , 1880.	<i>Trans. Royal Irish Acad.</i> , 1838.	Dunsink Obs., Trinity College.
70	Letter from Royal Astronomer, 1897.	Letter from Royal Astronomer, 1897.	^c Lord Crawford's Obs.
71	Letter from Director, 1913.	Letter from Director, 1913.	University Observatory.
72	<i>Astron. Nach.</i> , Nr. 643, 1848.	Letter from Director, 1913.	Municipal Obs., Bilk.
73	<i>Monthly Notices, R. A. S.</i> , 1907.	Letter from Director, 1913.	Royal Obs. since 1895; Blackford Hill.
74	<i>Monthly Notices, R. A. S.</i> , 1836.	<i>Edinburgh Observations</i> , 1858.	^d Royal Obs. before 1895; Calton Hill.
75	Letter from Director, 1912.	Letter from Director, 1912.	Elmira College Obs.
76	Letter from Director, 1893.	Letter from Director, 1893.	Dearborn Obs., North Western Univ.
77	British Nautical Almanac.	British Nautical Almanac.	Lowell Observatory.
78	See footnote (^f).	See footnote (^k).	International Lat. Obs.
79	<i>Les Obs. Astron.</i> , Bruxelles, 1907.	<i>Les Obs. Astron.</i> , Bruxelles, 1907.	Smith Observatory.
80	<i>Memoire par J. Pidoux</i> , 1900.	<i>Astron. Nach.</i> , Nr. 3993, 1905.	Municipal Observatory.
81	Letter from Director, 1897.	<i>Astron. Nach.</i> , Nr. 3993, 1905.	Hydrographic Institute.
82	See footnote (^e).	See footnote (^e).	Georgetown College Obs.
83	<i>Astron. Nach.</i> , Nr. 2625, 1884.	<i>Washington Observations</i> , 1877.	Morrison Observatory.
84	<i>First Glasgow Catalogue</i> , 1870.	<i>Monthly Notices, R. A. S.</i> , 1865.	University Observatory.
85	Letter from Director, 1913.	Letter from Director, 1913.	Ducal Obs. since 1857.
86	Letter, Director new Obs., 1913.	Letter, Director new Obs., 1913.	Ducal Obs. before 1857.
87	<i>Astron. Nach.</i> , Nr. 4428, 1910.	<i>Astron. Nach.</i> , Nr. 3993, 1905.	Royal University Obs.
88	Letter from Director, 1912.	Letter from Director, 1912.	McKim Obs., De Pauw Univ.
89	<i>Greenwich Observations</i> , 1910.	<i>Greenwich Observations</i> , 1910.	^f Royal Observatory.
90	Letter, Director new Obs., 1913.	<i>Astron. Nach.</i> , Nr. 3993, 1905.	^g Hamburg Observatory before 1900.
91	Letter from Director, 1913.	Letter from Director, 1913.	^h Imperial Marine Obs.
92	Letter from Director, 1894.	Letter from Director, 1894.	Shattuck Obs., Dartmouth College.
93	<i>Proc. Amer. Ph. Soc.</i> , 1883.	<i>Proc. Amer. Ph. Soc.</i> , 1883.	Haverford College Obs.
94	Letter from Director, 1913.	Letter from Director, 1913.	Astron. Institute, Königstuhl Obs.
95	<i>Publik. des Obs.</i> , Königstuhl, 1902.	<i>Publik. des Obs.</i> , Königstuhl, 1902.	Astrophys. Inst., Königstuhl Obs.
96	<i>Publik. des Obs.</i> , Königstuhl, 1902.	<i>Publik. des Obs.</i> , Königstuhl, 1902.	ⁱ Dr. Wolf's Obs. before 1898.
97	Letter from Director, 1913.	<i>Astron. Nach.</i> , Nr. 3993, 1905.	Imperial Univ. Obs.
98	<i>Astron. Nach.</i> , Nr. 2633, 1884.	British Nautical Almanac.	Astrophysical Observatory.
99	<i>Hong Kong Observations</i> , 1897.	Letter from Director, 1897.	Colonial Observatory.
100	<i>Les Obs. Astron.</i> , Bruxelles, 1907.	<i>Les Obs. Astron.</i> , Bruxelles, 1907.	Obs., Univ. of Iowa.

^a Transferred to Evanston, Ill., in 1887.^b Instruments transferred to Univ. of Kasan in 1897.^c Instruments transferred to Royal Obs. at Edinburgh in 1896.^d City Obs. since 1896.^e Based upon data from the U. S. C. and G. Survey.^f Point of reference before 1861, 7½ ft. N., 19 ft. W.^g At Bergedorf since 1909.^h Transit instrument before 1908, 0° 5' N., 0° 04' W.ⁱ Instruments transferred to the Astrophysical Institute of the Königstuhl Obs. in 1896.^j *Resultate des Internationalen Breitendienstes*, 1900-1908.^k *Resultate des Internationalen Breitendienstes*, Band I, 1908.

No.	Place.	Latitude.	Reduction to Geocen- tric Latitude.	Altitude (Meters).	Log ρ (Including altitude).	Longitude from Greenwich.	Reduction from Greenwich to Local S.T.M.N.
		$^{\circ}$ $'$ $''$	$''$			$^{\circ}$ $'$ $''$	$''$
101	Ithaca, N. Y.	+42 26 47.3 <i>a</i>	-11 32.6	256 <i>a</i>	9.999354	+5 5 55.99 <i>a</i>	+50.24
102	Ithaca, N. Y.	+42 26 51.4	-11 32.6		9.999337	+5 5 56.47	+50.36
103	Jamaica, West Indies	+18 24 51 <i>b</i>	-6 55.9	540 <i>b</i>	9.999892	+5 11 29.48 <i>b</i>	+51.17
104	Jena, Saxe-Weimar	+50 55 34.9 <i>c</i>	-11 21.3	165 <i>c</i>	9.999132	-0 46 20.22 <i>c</i>	-7.61
105	Jena, Saxe-Weimar	+50 55 35.8	-11 21.3	155	9.999131	-0 46 20.31	-7.61
106	Jena, Saxe-Weimar	+50 56 11.0	-11 21.3	174	9.999132	-0 46 20.73	-7.61
107	Johannesburg, Transvaal	-26 10 54.6 <i>d</i>	+9 9.8	1804 <i>d</i>	9.999840	-1 52 18.0 <i>d</i>	-18.45
108	Kalocsa, Hungary	+46 31 41.7 <i>b</i>	-11 34.8	117 <i>e</i>	9.999240	-1 15 54.12 <i>b</i>	-12.47
109	Kasan, Russia	+55 50 20.0 <i>f</i>	-10 47.3	98 <i>f</i>	9.999007	-3 15 15.61 <i>f</i>	-32.08
110	Kasan, Russia	+55 47 23.9 <i>g</i>	-10 47.7	79 <i>g</i>	9.999007	-3 16 29.00 <i>g</i>	-32.28
111	Kew, England	+51 28 6	-11 18.5	10	9.999108	+0 1 15.1	+0.21
112	Kief, Russia	+50 27 10.0 <i>w</i>	-11 23.5	179 <i>f</i>	9.999145	-2 2 0.56 <i>f</i>	-20.04
113	Kiel, Prussia	+54 20 27.6 <i>f</i>	-10 59.7	52 <i>f</i>	9.999040	-0 40 35.45 <i>f</i>	-6.67
114	Kis-Kartal, Hungary	+47 41 54.8	-11 32.8		9.999202	-1 18 11.7	-12.85
115	Königsberg, Prussia	+54 42 50.5 <i>f</i>	-10 56.8	24 <i>f</i>	9.999029	-1 21 58.97 <i>f</i>	-13.47
116	Kremsmunster, Austria	+48 3 23.1 <i>f</i>	-11 32.0	384 <i>f</i>	9.999220	-0 56 31.58 <i>f</i>	-9.29
117	La Plata, Arg. Rep.	-34 54 31.8 <i>h</i>	+10 52.2	18 <i>h</i>	9.999525	+3 51 44.8 <i>h</i>	+38.97
118	Leiden, Netherlands	+52 9 19.8 <i>f</i>	-11 14.6	6 <i>f</i>	9.999090	-0 17 56.15 <i>f</i>	-2.95
119	Leipzig, Saxony	+51 20 5.9 <i>i</i>	-11 19.2	119 <i>i</i>	9.999118	-0 49 33.92 <i>i</i>	-8.14
120	Leipzig, Saxony	+51 20 20.1	-11 19.2		9.999110	-0 49 29.92	-8.13
121	Liege, Belgium	+50 37 6	-11 22.8	127	9.999137	-0 22 15.44	-3.46
122	Lisbon (Tapada), Portugal	+38 42 30.5 <i>f</i>	-11 18.5	95 <i>f</i>	9.999437	+0 36 44.68 <i>f</i>	+6.04
123	Liverpool, England	+53 24 4.8	-11 6.6	61	9.999064	+0 12 17.33	+2.02
124	Liverpool, England	+53 24 47.8	-11 6.5		9.999059	+0 12 0.11	+1.97
125	Lund, Sweden	+55 41 51.6 <i>i</i>	-10 48.5	38	9.999006	-0 52 44.97 <i>i</i>	-8.67
126	Lund, Sweden	+55 52 12.0	-10 47.0		9.999000	-0 52 47.50	-8.67
127	Lussinpiccolo, Austria	+44 32 11.0	-11 35.5	42	9.999286	-0 57 52.41	-9.51
128	Lyons, France	+45 41 41.0	-11 35.5	299	9.999274	-0 19 8.52 <i>h</i>	-3.14
129	Madison, Wis.	+43 4 36.8 <i>f</i>	-11 33.9	292 <i>i</i>	9.999340	+5 57 37.90 <i>f</i>	+68.75
130	Madras, India	+13 4 8.0 <i>f</i>	-5 5.5	7	9.999926	-5 20 59.14	-52.71
131	Madrid, Spain	+40 24 30.0 <i>m</i>	-11 26.4	655 <i>m</i>	9.999433	+0 14 45.09 <i>m</i>	+2.42
132	Manila, P. I.	+14 34 41	-5 38.2	3	9.999908	-8 3 54.2	-79.48
133	Mare Island, Cal.	+38 5 55.8 <i>n</i>	-11 15.0	18 <i>n</i>	9.999447	+8 9 5.63 <i>n</i>	+80.38
134	Markree, Ireland	+54 10 31.8	-11 1.0	45	9.999044	+0 33 48.4	+5.55
135	Marseilles, France	+43 18 19 <i>f</i>	-11 34.3	75 <i>o</i>	9.999320	-0 21 34.55 <i>f</i>	-3.54
136	Marseilles, France	+43 17 52	-11 34.3	27	9.999317	-0 21 28.1	-3.53
137	Mauritius (Port Louis)	-20 5 39	+7 27.7	54	9.999832	-3 50 12.6	-37.82
138	Melbourne, Victoria	-37 49 53.2 <i>p</i>	+11 13.4	28 <i>q</i>	9.999454	-9 39 53.92 <i>p</i>	-95.26
139	Meudon, France	+48 48 18	-11 29.8	162	9.999185	-0 8 55.6	-1.67
140	Middletown, Conn.	+41 33 16.0	-11 30.4		9.999359	+4 50 37.18	+47.74
141	Milan, Italy	+45 27 59.2	-11 35.6	120	9.999268	-0 36 45.88 <i>o</i>	-6.04
142	Minneapolis, Minn.	+44 58 40.0 <i>r</i>	-11 35.7	260 <i>r</i>	9.999290	+6 12 56.84 <i>r</i>	+61.57
143	Mizusawa, Japan	+39 8 3.6 <i>x</i>	-11 20.7	62	9.999424	-9 24 30.75	-92.74
144	Modena, Italy	+44 38 51.4	-11 35.6	64	9.999285	-0 43 43.40	-7.18
145	Montreal, Canada	+45 30 20 <i>s</i>	-11 35.6	57 <i>s</i>	9.999262	+4 54 18.63 <i>s</i>	+48.35
146	Moscow (Presnia), Russia	+55 45 19.5	-10 48.0	150 <i>f</i>	9.999012	-2 30 17.03 <i>f</i>	-24.69
147	Mount Hamilton, Cal.	+37 20 25.6 <i>r</i>	-11 10.4	1284 <i>r</i>	9.999552	+8 6 34.89 <i>r</i>	+79.93
148	Mount Wilson, Cal.	+34 12 59.5 <i>t</i>	-10 46.2	1799 <i>t</i>	9.999663	+7 52 14.33 <i>t</i>	+77.58
149	Mount Wilson, Cal.	+34 12 55	-10 46.1	1727 <i>u</i>	9.999658	+7 52 14.3	+77.58
150	Munich, Bavaria	+48 8 45.5 <i>v</i>	-11 31.7	529 <i>v</i>	9.999227	-0 46 26.02 <i>v</i>	-7.63

a Top of east pier in transit room.*b* Transit instrument pier.*c* Bamberg equatorial.*d* International latitude hut.*e* Seven-inch equatorial.*f* Meridian circle.*g* Center of great dome.*h* Gautier meridian circle.*i* Center of observatory.*j* Center of dome.*k* Pier of small meridian circle.*l* Main floor.*m* Center of rotunda.*n* East transit instrument.*o* Barometer.*p* Old meridian circle.*q* Floor of meridian room.*r* Transit instrument.*s* East transit pier.*t* Snow telescope pier.*u* Floor.*v* West dome.*w* Photographic equatorial, 41 feet south of prime vertical transit.*x* Zenith telescope.

No.	Authority for—		Description.
	Latitude.	Longitude.	
101	Letter from the Dean, 1913.	Letter from the Dean, 1913.	^a Fuertes Obs., Cornell Univ.
102	Letter from the Dean, 1913.	Letter from the Dean, 1913.	^b Fuertes Obs., Cornell Univ.
103	<i>Memoirs, R. A. S.</i> , 1879.	See footnote (^c).	Mr. Hall's Obs., Montego Bay.
104	Letter from Director, 1913.	Letter from Director, 1913.	Univ. Obs., since 1888.
105	Letter, Director new Obs., 1913.	Letter, Director new Obs., 1913.	Univ. Obs., before 1888.
106	<i>V. J. S. Astron. Gesell.</i> , 1910.	<i>V. J. S. Astron. Gesell.</i> , 1910.	The late Dr. Winkler's Obs.
107	Transvaal Obs. <i>Circular</i> , 1910.	Transvaal Obs. <i>Circular</i> , 1910.	Union Obs., formerly Transvaal Obs.
108	Letter from Director, 1913.	Letter from Director, 1913.	Archiepiscopal Haynald Obs.
109	Letter from Director, 1913.	Publications of the Obs., 1911.	Engelhardt Obs., Univ. of Kasan.
110	Publications of the Obs., 1911.	Letter from Director, 1913.	University Observatory.
111	Letter from Director, 1897.	Letter from Director, 1897.	Meteorological Obs., London.
112	<i>Annales de l'Obs.</i> , Vol. IV, 1893.	<i>Astron. Nach.</i> , Nr. 3993, 1905.	Imperial Univ. Obs.
113	<i>Les Obs. Astron.</i> , Bruxelles, 1907.	<i>Astron. Nach.</i> , Nr. 3993, 1905.	^d Royal University Obs.
114	<i>Les Obs. Astron.</i> , Bruxelles, 1907.	<i>Les Obs. Astron.</i> , Bruxelles, 1907.	Near Aszöd, Hungary.
115	Letter from Director, 1913.	<i>Astron. Nach.</i> , Nr. 3993, 1905.	Royal University Obs.
116	Letter from Director, 1897.	<i>Astron. Nach.</i> , Nr. 3993, 1905.	Obs. of the Benedictines.
117	Letter from Director, 1913.	Letter from Director, 1913.	National Univ. Obs.
118	Letter from Director, 1913.	<i>Astron. Nach.</i> , Nr. 3993, 1905.	University Observatory.
119	Letter from Director, 1913.	<i>Astron. Nach.</i> , Nr. 3993, 1905.	University Obs., since 1861.
120	Letter, Director new Obs., 1913.	Letter, Director new Obs., 1913.	University Obs., before 1861.
121	<i>Les Obs. Astron.</i> , Bruxelles, 1907.	<i>Les Obs. Astron.</i> , Bruxelles, 1907.	University Obs., Cointe.
122	Letter from Director, 1913.	<i>Astron. Nach.</i> , Nr. 3202, 1893.	Obs. of Lisbon.
123	<i>Monthly Notices, R. A. S.</i> , 1894.	<i>Monthly Notices, R. A. S.</i> , 1894.	Bldston, Birkenhead, since 1867.
124	<i>British Nautical Almanac</i> , 1872.	<i>British Nautical Almanac</i> , 1872.	Liverpool Obs., before 1867.
125	Letter from Director, 1913.	<i>Astron. Nach.</i> , Nr. 3993, 1905.	Royal Univ. Obs., since 1867.
126	Letter, Director new Obs., 1913.	Letter, Director new Obs., 1913.	Royal Univ. Obs., before 1867.
127	Letter from Director, 1897.	Letter from Director, 1897.	Manora Observatory.
128	Letter from Director, 1897.	<i>Astron. Nach.</i> , Nr. 3202, 1893.	Obs. of the Univ., St. Genis Laval.
129	<i>Publications of the Obs.</i> , 1892.	Letter from Director, 1912.	Washburn Obs., Univ. of Wis.
130	<i>Great Trig. Survey of India</i> , 1906.	<i>Great Trig. Survey of India</i> , 1901.	Obs. founded by East India Co.
131	<i>Annuario del Obs.</i> , 1912.	<i>Astron. Nach.</i> , Nr. 3993, 1905.	Astron. and Meteorolog. Obs.
132	<i>Les Obs. Astron.</i> , Bruxelles, 1907.	<i>Les Obs. Astron.</i> , Bruxelles, 1907.	Meteorological Observatory.
133	Letter from Director, 1913.	<i>Lick Obs. Bulletin</i> , 1908.	Chronom. and Time Sta., Navy Yd.
134	<i>Astron. Nach.</i> Nr. 768, 1851.	<i>British Nautical Almanac</i> , 1901.	Col. Cooper's Observatory.
135	Letter from Director, 1913.	<i>Astron. Nach.</i> Nr. 3993, 1905.	See footnote (^e).
136	Letter, Director new Obs., 1913.	Letter, Director new Obs., 1913.	See footnote (^f).
137	<i>Mag. and Meteor. Results</i> , 1908.	<i>Mag. and Meteor. Results</i> , 1908.	Royal Alfred Obs.
138	<i>Astron. Results</i> , 1881–84.	^g <i>Astron. Results</i> , 1881–84.	^g Government Observatory.
139	<i>Les Obs. Astron.</i> , Bruxelles, 1907.	<i>Les Obs. Astron.</i> , Bruxelles, 1907.	Seine-et-Oise, near Paris.
140	Letter from Director, 1894.	Letter from Director, 1894.	Wesleyan University Obs.
141	<i>British Nautical Almanac</i> .	<i>Astron. Nach.</i> , Nr. 3993, 1905.	Royal Observatory, Brera.
142	Letter from Director, 1913.	Letter from Director, 1913.	Obs. Univ. of Minn.
143	See footnote (^h).	<i>Les Obs. Astron.</i> , Bruxelles, 1907.	International Lat. Obs.
144	Letter from Director, 1913.	Letter from Director, 1913.	Royal Univ. Geophysical Obs.
145	Letter from Director, 1912.	<i>U. S. C. and G. S. Report</i> , 1897.	McGill University Obs.
146	<i>Les Obs. Astron.</i> , Bruxelles, 1907.	<i>Astron. Nach.</i> , Nr. 3993, 1905.	Obs. of the Imperial Univ.
147	<i>Publications of the Obs.</i> , 1900.	<i>U. S. C. and G. S. Report</i> , 1897.	Lick Obs., Univ. of Cal.
148	<i>Astrophysical Journal</i> , 1906.	<i>Astrophysical Journal</i> , 1906.	Solar Obs., Carnegie Inst.
149	Letter from C. G. Abbot, 1912.	Letter from C. G. Abbot, 1912.	Branch of Smithsonian Astrophys. Obs.
150	Letter from Director, 1897.	<i>Astron. Nach.</i> , Nr. 3993, 1905.	Royal Observatory.

^a Since 1902.^b Before 1902.^c *British Report on Transit of Venus*, 1882.^d Old position of meridian circle, 0° 9' N., 0° 12' E.^e National Obs., Univ. of Aix-Marseille, since 1864–66.^f National Obs., at Accoules, before 1864–66.^g Transferred from Williamstown in 1861.^h *Resultate des Internationalen Breitendienstes*, 1900–1908.ⁱ With the new values of the longitudes of Adelaide and Sydney.

No.	Place.	Latitude.	Reduction to Geocen- tric Latitude.	Altitude (Meters).	Log <i>p</i> (Including altitude).	Longitude from Greenwich.	Reduction from Green- wich to Local S.T.M.N.
		" ' "	" "			h m s	"
151	Naples, Italy	+40 51 46.3	-11 28.1	164	9.999388	-0 57 1.70 <i>a</i>	- 9.37
152	Nashville, Tenn.	+36 8 54.4 <i>b</i>	-11 2.0	172 <i>c</i>	9.999505	+5 47 12.2	+57.04
153	Neuchâtel, Switzerland	+46 59 50.6	-11 34.1	488	9.999254	-0 27 49.90 <i>d</i>	- 4.57
154	New Brunswick, N. J. . .	+40 30 1.4 <i>b</i>	-11 26.7	21 <i>b</i>	9.999387	+4 57 47.45 <i>b</i>	+48.92
155	New Haven, Conn.	+41 19 22.3	-11 29.6	40	9.999368	+4 51 40.58	+47.92
156	New Haven, Conn.	+41 18 36.5	-11 29.6	. . .	9.999365	+4 51 42.16	+47.92
157	New York, N. Y.	+40 48 34.6	-11 27.9	25	9.999380	+4 55 50	+48.60
158	New York, N. Y.	+40 45 23.1	-11 27.7	. . .	9.999379	+4 55 53.64	+48.61
159	Nice, France	+43 43 16.9 <i>e</i>	-11 34.9	378	9.999330	-0 29 12.15 <i>e</i>	- 4.80
160	Nikolaieff, Russia	+46 58 22.1	-11 34.2	55	9.999225	-2 7 53.78 <i>a</i>	-21.01
161	Northampton, Mass. . . .	+42 19 1.9 <i>b</i>	-11 32.4	70 <i>b</i>	9.999345	+4 50 33.10 <i>b</i>	+47.73
162	Northfield, Minn.	+44 27 41.6 <i>f</i>	-11 35.5	290 <i>f</i>	9.999305	+6 12 35.92 <i>f</i>	+61.21
163	Oakland, Cal.	+37 48 5 <i>d</i>	-11 13.2	11 <i>d</i>	9.999454	+8 9 6.55 <i>d</i>	+80.35
164	Odessa, Russia	+46 28 37.5	-11 34.9	. . .	9.999234	-2 3 2.18 <i>b</i>	-20.21
165	Odessa, Russia	+46 28 36.7 <i>d</i>	-11 34.9	55 <i>d</i>	9.999237	-2 3 2.04 <i>d</i>	-20.21
166	O-Gyalla, Hungary	+47 52 27.3	-11 32.4	113	9.999206	-1 12 45.49	-11.96
167	Omaha, Nebr.	+41 16 5.6 <i>b</i>	-11 29.5	344 <i>b</i>	9.999390	+6 23 46.96 <i>b</i>	+63.06
168	Orono, Me.	+44 54 0	-11 35.6	38	9.999277	+4 34 40.3	+45.12
169	Ottawa, Canada	+45 23 39.1 <i>d</i>	-11 35.6	85 <i>g</i>	9.999267	+5 2 51.98 <i>d</i>	+49.75
170	Oxford, Miss.	+34 22 12.6	-10 47.5	. . .	9.999536	+5 58 7.18	+58.88
171	Oxford, England	+51 45 35.6 <i>d</i>	-11 16.9	65 <i>h</i>	9.999104	+0 5 2.6	+ 0.83
172	Oxford, England	+51 45 34.2	-11 16.9	64	9.999104	+0 5 0.40	+ 0.82
173	Padua, Italy	+45 24 1.0 <i>i</i>	-11 35.6	31 <i>j</i>	9.999263	-0 47 29.13 <i>i</i>	- 7.80
174	Palermo, Sicily	+38 6 44.0 <i>k</i>	-11 15.1	76 <i>d</i>	9.999451	-0 53 25.87	- 8.78
175	Paris, France	+48 50 11.2 <i>l</i>	-11 29.8	67 <i>m</i>	9.999178	-0 9 20.93 <i>n</i>	- 1.53
176	Perth, West Australia . . .	-31 57 8.9 <i>d</i>	+10 23.8	60	9.999597	-7 43 21.51 <i>d</i>	-76.12
177	Philadelphia, Pa.	+39 58 2.1 <i>o</i>	-11 24.6	74 <i>o</i>	9.999404	+5 1 6.81 <i>o</i>	+49.46
178	Pola, Austria	+44 51 48.6 <i>d</i>	-11 35.6	32 <i>d</i>	9.999277	-0 55 23.07 <i>d</i>	- 9.10
179	Potsdam, Prussia	+52 22 56.0 <i>p</i>	-11 13.3	97 <i>p</i>	9.999091	-0 52 15.86 <i>p</i>	- 8.59
180	Poughkeepsie, N. Y. . . .	+41 41 18	-11 30.8	61	9.999360	+4 55 33.6 <i>b</i>	+48.55
181	Prague, Bohemia	+50 5 16.0 <i>o</i>	-11 25.1	197 <i>o</i>	9.999155	-0 57 40.28 <i>o</i>	- 9.47
182	Princeton, N. J.	+40 20 55.8	-11 26.1	75	9.999395	+4 58 39.44	+49.06
183	Princeton, N. J.	+40 20 57.8 <i>d</i>	-11 26.1	65 <i>d</i>	9.999394	+4 58 37.61 <i>d</i>	+49.06
184	Providence, R. I.	+41 50 21	-11 31.2	64	9.999356	+4 45 35.95	+46.92
185	Providence, R. I.	+41 49 46.4	-11 31.2	. . .	9.999352	+4 45 37.64	+46.92
186	Pulkowa, Russia	+59 46 18.7 <i>a</i>	-10 6.2	75 <i>q</i>	9.998914	-2 1 18.57 <i>a</i>	-19.93
187	Quebec, Canada	+46 47 59.2	-11 34.4	90	9.999231	+4 44 52.71 <i>b</i>	+46.88
188	Quito, Ecuador	- 0 14 0	+ 0 5.6	2908	0.000198	+5 14 6.66	+51.60
189	Riga, Russia	+56 57 9.3	-10 36.9	. . .	9.998974	-1 36 28.10 <i>r</i>	-15.93
190	Rio de Janeiro, Brazil . .	-22 54 23.8 <i>o</i>	+ 8 17.7	62 <i>o</i>	9.999784	+2 52 41.4 <i>o</i>	+28.37
191	Rome, Italy	+41 53 53.6 <i>d</i>	-11 31.3	51 <i>j</i>	9.999354	-0 49 55.12 <i>d</i>	- 8.18
192	Rome, Italy	+41 53 33.6 <i>d</i>	-11 31.3	65 <i>q</i>	9.999355	-0 49 56.34 <i>d</i>	- 8.18
193	Rome, Italy	+41 54 12.4 <i>d</i>	-11 31.4	100 <i>d</i>	9.999357	-0 49 48.02 <i>d</i>	- 8.18
194	Rome, Italy	+41 54 16.7	-11 31.4	75 <i>j</i>	9.999355	-0 49 49.28 <i>d</i>	- 8.18
195	San Fernando, Spain	+36 27 42.0 <i>s</i>	-11 4.3	30 <i>s</i>	9.999488	+0 24 49.32 <i>s</i>	+ 4.08
196	San Fernando, Spain	+36 31 7	-11 4.7	. . .	9.999485	+0 25 10.82	+ 4.14
197	San Francisco, Cal.	+37 47 27.9	-11 13.2	. . .	9.999454	+8 9 42.86 <i>t</i>	+80.45
198	San Luis, Arg. Rep.	-33 17 45.7	+10 37.6	800	9.999616	+4 25 22	+43.60
199	Santiago, Chile	-33 26 42 <i>d</i>	+10 39.0	520 <i>d</i>	9.999594	+4 42 46.0 <i>d</i>	+46.45
200	Santiago, Chile	-33 26 25	+10 38.9	619	9.999600	+4 42 36.5	+46.42
201	Santiago, Chile	-33 33 46 <i>b</i>	+10 40.1	580 <i>b</i>	9.999595	+4 42 46 <i>b</i>	+46.45

a Center of observatory.*b* Transit instrument.*c* Bench mark on obs. steps.*d* Meridian circle.*e* Small meridian circle.*f* Meridian circle pier.*g* Bench mark in east wall.*h* Barometer basin.*i* Axis of tower.*j* Barometer.*k* Center of south dome.*l* South facade of observatory.*m* Level of obs. terrace.*n* Cassini's Meridian.*o* Center of dome.*p* Center of middle dome.*q* Main floor.*r* Tower of school.*s* Center of building, ground floor.*t* West transit pier.

No.	Authority for—		Description.
	Latitude.	Longitude.	
151	Letter from Director, 1897.	<i>Astron. Nach.</i> , Nr. 3202, 1893.	Royal Obs., Capo di Monte.
152	Letter from the Dean, 1913.	Letter from Director, 1893.	Obs. of Vanderbilt Univ.
153	Swiss Triangulation, 1890.	<i>Astron. Nach.</i> , Nr. 3202, 1893.	Cantonal Observatory.
154	Letter from Director, 1913.	Letter from Director, 1913.	Schanck Obs., Rutgers College.
155	Letter from Director, 1893.	See footnote (h).	Yale Univ. Obs., since 1882.
156	Letter, Director new Obs., 1893.	Letter, Director new Obs., 1893.	Yale Univ. Obs., before 1882.
157	<i>Contributions from the Obs.</i> , 1906.	<i>Contributions from the Obs.</i> , 1906.	Columbia Univ. Obs., since 1897.
158	Letter from Director, 1879.	<i>British Nautical Almanac.</i>	Columbia Univ. Obs., before 1897.
159	<i>Annales de l'Obs.</i> , Tome II, 1887.	<i>Astron. Nach.</i> , Nr. 3993, 1905.	Mt. Gros, near Nice.
160	<i>Les Obs. Astron.</i> , Bruxelles, 1907.	<i>Astron. Nach.</i> , Nr. 3202, 1893.	Naval Observatory.
161	Letter from Director, 1913.	Harvard <i>Annals</i> , 1893.	Smith College Obs.
162	Letter from Director, 1912.	<i>Publications of Obs.</i> , 1901.	Goodsell Obs., Carleton College.
163	Letter from Director, 1912.	Letter from Director, 1912.	Chabot Observatory.
164	Pulkowa <i>Mitteilungen</i> , No. 56, 1913.	<i>Astron. Nach.</i> , Nr. 3993, 1905.	Branch of Pulkowa Obs.
165	Letter from Director, 1897.	<i>Astron. Nach.</i> , Nr. 3993, 1905.	University Observatory.
166	Letter from Director, 1897.	Letter from Director, 1897.	Royal Astrophysical Obs.
167	Letter from Director, 1912.	Letter from Director, 1912.	Creighton University Obs.
168	Letter from Director, 1912.	Letter from Director, 1912.	Obs. Univ. of Maine.
169	Letter from Chief Astronomer, 1913.	Letter from Chief Astronomer, 1913.	Dominion Astronomical Obs.
170	Smithsonian Report, 1880.	Smithsonian Report, 1880.	Obs. Univ. of Mississippi.
171	<i>Radcliffe Catalogue of Stars</i> , 1900.	<i>Radcliffe Observations</i> , 1842.	Radcliffe Observatory.
172	<i>Oxford Astron. Observations</i> , 1878.	<i>Oxford Astron. Observations</i> , 1878.	University Observatory.
173	Letter from Director, 1913.	<i>Astron. Nach.</i> , Nr. 3993, 1905.	Royal University Obs.
174	Letter from Director, 1913.	<i>Astron. Nach.</i> , Nr. 3202, 1893.	Royal Observatory.
175	Letter from Director, 1913.	<i>Astron. Nach.</i> , Nr. 3993, 1905.	Observatory of Paris.
176	<i>Meridian Observations</i> , Vol. 2, 1908.	<i>Meridian Observations</i> , Vol. 2, 1908.	Government Observatory.
177	Letter from Director, 1913.	Letter from Director, 1913.	Flower Obs., Univ. of Pa.
178	Letter from Director, 1913.	Letter from Director, 1913.	See footnote (b).
179	<i>Veröff. K. Preuss. Geod. Inst.</i> , 1906.	<i>Astron. Nach.</i> , Nr. 3993, 1905.	Royal Astrophysical Obs.
180	Smithsonian Report, 1880.	Smithsonian Report, 1880.	Vassar College Obs.
181	Prague <i>Observations</i> , 1907.	<i>Astron. Nach.</i> , Nr. 3993, 1905.	Imperial and Royal Obs.
182	Letter from Director, 1913.	Letter from Director, 1913.	Halsted Obs., Princeton Univ.
183	Letter from Director, 1913.	<i>Washington Observations</i> , 1878.	Obs. of Instruction, Princeton Univ.
184	Letter from Director, 1893.	Letter from Director, 1893.	Ladd Obs., Brown Univ.
185	<i>Astron. Nach.</i> , Nr. 2254, 1879.	<i>Astron. Nach.</i> , Nr. 2254, 1879.	Mr. Seagrave's Observatory.
186	<i>Description de l'Obs.</i> , 1845.	<i>Astron. Nach.</i> , Nr. 3993, 1905.	Obs. Central Nicolas.
187	Letter from Director, 1912.	Letter from Director, 1912.	Quebec Obs., Plains of Abraham.
188	Letter from Director, 1897.	Letter from Director, 1897.	National Observatory.
189	Letter from Director, 1897.	<i>Astron. Nach.</i> , Nr. 3993, 1905.	Polytechnic School Obs.
190	See footnote (c).	See footnote (c).	National Observatory.
191	<i>Memorie del R. Osserv.</i> , 1904.	Letter from Director, 1913.	Royal Obs. at Roman College.
192	Letter from Director, 1913.	<i>Astron. Nach.</i> , Nr. 3993, 1905.	Royal Univ. Obs. at Capitol.
193	Letter from Director, 1913.	Letter from Director, 1913.	Vatican Obs., since 1906-7.
194	<i>Pubbli. della Specola Vaticana</i> , 1905.	<i>Astron. Nach.</i> , Nr. 3993, 1905.	^d Vatican Obs., before 1906-7.
195	<i>Annales del Obs.</i> , 1892.	Letter from Director, 1913.	Naval Obs., since 1797.
196	Letter, Director new Obs., 1913.	Letter, Director new Obs., 1913.	^e Naval Obs., before 1797.
197	Letter from Director, 1897.	<i>U. S. C. and G. S. Report</i> , 1897.	Davidson Observatory.
198	Letter from Director, 1911.	Letter from Director, 1911.	Southern Obs. of Carnegie Inst.
199	Letter from Director, 1913.	Letter from Director, 1913.	^f National Obs., since 1862.
200	Letter, Director new Obs., 1913.	Letter, Director new Obs., 1913.	^g National Obs., before 1862.
201	Letter from Director, 1913.	Letter from Director, 1913.	National Obs., Espejo.

^a Old observatory, 1877-1886, 415 feet W.

^b Observatory of Imperial and Royal Hydrographic Office.

^c Green and Davis, *Telegraphic Determinations of Longitudes on the East Coast of South America*, 1880.

^d In the Gregorian tower.

^e In Cadix.

^f In Quinta Normal.

^g On the hill Santa Lucia, in Santiago.

^h Based upon data from the U. S. C. and G. Survey.

ⁱ With the new value of the longitude of Sydney.

No.	Place.	Latitude.	Reduction to Geocen- tric Latitude.	Alti- tude (Meters).	Log <i>p</i> (Including altitude).	Longitude from Greenwich.	Refine- ment from Green- wich to Local S.T.M.N.
		" ' "	" "			h m s	"
202	South Bethlehem, Pa.	+40 36 23.2 ^a	-11 27.2	110	9.999391	+ 5 1 31.96 ^a	+ 49.33
203	South Hadley, Mass.	+42 15 18.2 ^b	-11 32.2	76 ^b	9.999346	+ 4 50 20.40 ^b	+ 47.70
204	St. Louis, Mo.	+38 38 3.0	-11 18.1		9.999432	+ 6 0 49.26	+ 59.27
205	St. Petersburg, Russia	+59 56 32.0	-10 4.2	4	9.998906	- 2 1 11.4	- 19.91
206	Stockholm, Sweden	+59 20 32.6 ^c	-10 11.3	44 ^c	9.998922	- 1 12 13.97 ^c	- 11.87
207	Stonyhurst, England	+53 50 40	-11 3.4	117 ^c	9.999056	+ 0 9 52.68	+ 1.62
208	Strassburg, Alsace	+48 35 0.3 ^c	-11 30.5	144 ^c	9.999190	- 0 31 4.52 ^c	- 5.11
209	Swarthmore, Pa.	+39 54 23.3	-11 24.3		9.999401	+ 5 1 24.89	+ 49.32
210	Sydney, N. S. W.	-33 51 41.1	+10 42.9	44	9.999552	-10 4 49.31	- 97.36
211	Syracuse, N. Y.	+43 2 13.1	-11 33.9	160	9.999332	+ 5 4 33.36	+ 50.03
212	Tacubaya, Mexico	+19 24 17.5 ^e	- 7 14.8	2285 ^e	9.999995	+ 6 36 46.67 ^e	+ 65.15
213	Tashkent, Turkestan	+41 19 31.3	-11 29.6	457	9.999396	- 4 37 10.80	- 45.33
214	Taunton, Mass.	+41 54 0	-11 31.3	8	9.999351	+ 4 44 20	+ 46.71
215	Teramo, Italy	+42 39 27 ^d	-11 33.1	398	9.999358	- 0 54 56	- 9.02
216	Tokyo, Japan	+35 39 17.0 ^c	-10 58.3	25	9.999507	- 9 18 58.22 ^e	- 91.82
217	Toronto, Canada	+43 39 46.0 ^f	-11 34.8	110 ^g	9.999313	+ 5 17 34.70 ^g	+ 52.17
218	Toronto, Canada	+43 40 0.8 ^g	-11 34.8	116 ^g	9.999313	+ 5 17 35.60 ^g	+ 52.17
219	Toulouse, France	+43 36 44.0	-11 34.7	194	9.999320	- 0 5 51.23	- 0.96
220	Triest, Austria	+45 38 35.5 ^h	-11 35.5	68 ⁱ	9.999260	- 0 55 5.23 ^h	- 9.05
221	Triest, Austria	+45 38 45.4 ^j	-11 35.5	26 ⁱ	9.999257	- 0 55 3.0	- 9.04
222	Tschardjui, Turkestan	+39 8 11.0 ^d	-11 20.7	188 ^d	9.999433	- 4 14 17.2 ^d	- 41.77
223	Tschardjui, Turkestan	+39 8 10.7 ^d	-11 20.7	167	9.999431	- 4 13 57.3	- 41.72
224	Tulse Hill, England	+51 26 47	-11 18.6	48	9.999111	+ 0 0 27.7	+ 0.08
225	Turin, Italy	+45 2 16.2 ^k	-11 35.7	618 ^k	9.999313	- 0 31 3	- 5.19
226	Turin, Italy	+45 4 8.3 ^c	-11 35.7	276 ⁱ	9.999288	- 0 30 47.15 ^c	- 5.06
227	Tuscaloosa, Ala.	+33 12 36.8 ^e	-10 36.7	69	9.999568	+ 5 50 11.74 ^e	+ 57.33
228	Ukiah, Cal.	+39 8 12.1 ^d	-11 20.7	220 ^d	9.999435	+ 8 12 50.3 ^d	+ 80.96
229	Upsala, Sweden	+59 51 29.4 ^b	-10 5.2	21 ^b	9.998909	- 1 10 30.12 ^b	- 11.38
230	Urbana, Ill.	+40 6 20.2 ^l	-11 25.2	236 ^l	9.999412	+ 5 52 53.90 ^l	+ 57.97
231	Utrecht, Netherlands	+52 5 9.7 ^m	-11 15.0	12 ^m	9.999093	- 0 20 31.0	- 1.37
232	Utrecht, Netherlands	+52 5 13	-11 15.0	23	9.999093	- 0 20 28.9	- 1.36
233	Venice, Italy	+45 26 10.5 ^e	-11 35.6	15 ^e	9.999261	- 0 49 22.12 ^e	- 8.11
234	Vienna, Austria	+48 13 55.1 ⁿ	-11 31.5	240 ⁱ	9.999205	- 1 5 21.35 ⁿ	- 10.74
235	Vienna, Austria	+48 12 35.5	-11 31.6	186 ⁱ	9.999202	- 1 5 31.61	- 10.78
236	Vienna, Austria	+48 12 53.8	-11 31.6	214	9.999204	- 1 5 25.17	- 10.75
237	Vienna, Austria	+48 12 46.7 ^c	-11 31.6	285	9.999209	- 1 5 10.96	- 10.71
238	Warsaw, Russia	+52 13 4.6 ^c	-11 14.3	121 ^c	9.999097	- 1 24 7.25 ^c	- 11.82
239	Washington, D. C.	+38 55 14.0 ^o	-11 19.6	82 ^p	9.999431	+ 5 8 15.78 ^o	+ 50.44
240	Washington, D. C.	+38 53 38.7 ^q	-11 19.4	31 ^r	9.999428	+ 5 8 12.15 ^q	+ 50.43
241	Washington, D. C.	+38 53 17.3 ^s	-11 19.4	10 ^s	9.999427	+ 5 8 6.24 ^s	+ 50.41
242	Washington, D. C.	+38 56 14.8 ^a	-11 19.7		9.999425	+ 5 8 0.0	+ 50.00
243	Wellesley, Mass.	+42 17 34.8	-11 32.3	61	9.999344	+ 4 45 12.7	+ 45.85
244	Wellington, N. Z.	-41 17 3.8 ^b	+11 29.5	127 ^b	9.999375	-11 39 4.27 ^b	- 114.88
245	West Point, N. Y.	+41 23 22.1	-11 29.9	170	9.999375	+ 4 55 50.55	+ 48.90
246	Wilhelmshaven, Germany	+53 31 52.1 ^c	-11 5.7	9 ^c	9.999057	- 0 32 35.06 ^c	- 5.35
247	Williams Bay, Wis.	+42 34 12.6 ^t	-11 33.0	320 ^t	9.999355	+ 5 54 13.24 ^t	+ 53.19
248	Williamstown, Mass.	+42 42 30	-11 33.2	213	9.999344	+ 4 52 50	+ 48.10
249	Winchester, Mass.	+42 27 11	-11 32.7	30	9.999338	+ 4 44 32.4	+ 46.74
250	Windsor, N. S. W.	-33 36 30.8 ^b	+10 40.6	16 ^r	9.999556	-10 3 19.9	- 90.11
251	Zō-Sō, China	+31 5 48.0 ^c	-10 14.4	100 ^c	9.999619	- 8 4 44.82 ^c	- 79.60
252	Zurich, Switzerland	+47 22 38.3 ^c	-11 33.5	469 ^c	9.999243	- 0 34 12.26 ^c	- 5.62

^a Center of dome.^b Transit instrument.^c Meridian circle.^d Zenith telescope.^e Great transit instrument.^f Main dome.^g Transit pier.^h Equatorial pier.ⁱ Barometer cistern.^j Stone pier in terrace wall.^k Prime vertical instrument.^l 12-inch equatorial.^m Altazimuth pier.ⁿ Central dome.^o Center of the clock room.^p Ground floor of main building.^q Small dome.^r Barometer.^s Siderostat pier.^t 40-inch equatorial.

No.	Authority for—		Description.
	Latitude.	Longitude.	
202	Letter from Director, 1913.	<i>Washington Observations</i> , 1875.	Sayre Obs., Lehigh Univ.
203	<i>Amer. Jour. of Sci.</i> , 1883.	Letter from Director, 1913.	Williston Obs., Mt. Holyoke Coll.
204	Letter from Director, 1897.	<i>U. S. C. and G. S. Report</i> , 1897.	^a Washington University Obs.
205	<i>Astron. Nach.</i> , Nr. 2582, 1884.	<i>Astron. Nach.</i> , Nr. 2582, 1884.	Imperial University Obs.
206	Letter from Director, 1913.	<i>Astron. Nach.</i> , Nr. 3993, 1905.	Obs. of Acad. of Sci.
207	Letter from Director, 1913.	<i>Monthly Notices</i> , R. A. S., 1851.	Stonyhurst College Obs.
208	<i>Annalen der Sternw.</i> , 1896.	<i>Astron. Nach.</i> , Nr. 3993, 1905.	Imperial Univ. Obs.
209	Letter from Director, 1912.	Letter from Director, 1912.	Sproul Obs., Swarthmore College.
210	<i>Astron. Results</i> , 1879–81.	See footnote (b).	Government Observatory.
211	Letter from Director, 1891.	Letter from Director, 1891.	Syracuse Univ. Obs.
212	<i>Annuario del Obs.</i> , 1902.	<i>Annuario del Obs.</i> , 1902.	National Observatory.
213	Letter from Director, 1897.	Letter from Director, 1897.	Tashkent Observatory.
214	<i>Les Obs. Astron.</i> , Bruxelles, 1907.	<i>Les Obs. Astron.</i> , Bruxelles, 1907.	Mr. Metcalf's Obs., before 1911.
215	<i>Pubbl. dell'Osserv.</i> , 1900.	Letter from Director, 1913.	Collurania Observatory.
216	<i>Annales de l'Obs.</i> , 1894.	<i>Annales de l'Obs.</i> , 1894.	University Observatory.
217	Letter from Director, 1913.	Letter from Director, 1913.	University Observatory.
218	Letter from Director, 1912.	Letter from Director, 1912.	Meteorological Observatory.
219	<i>Annales de l'Obs.</i> , 1912.	<i>British Nautical Almanac</i> .	University Observatory.
220	Letter from Director, 1913.	Letter from Director, 1913.	^e Imperial and Royal Maritime Obs.
221	Letter, Director new Obs., 1913.	Letter, Director new Obs., 1913.	^d Imperial and Royal Maritime Obs.
222	<i>Astron. Nach.</i> , Nr. 4588, 1912.	Letter from Director, 1913.	International Lat. Obs., since 1909.
223	See footnote (e).	See footnote (f).	International Lat. Obs., before 1909.
224	<i>British Nautical Almanac</i> .	<i>British Nautical Almanac</i> .	Obs. of Sir W. Huggins, London.
225	Letter from Director, 1913.	Letter from Director, 1913.	^f Royal Obs. of the Univ., since 1913.
226	Letter from Director, 1913.	<i>Astron. Nach.</i> , Nr. 3993, 1905.	^g Royal Obs. of the Univ., before 1913.
227	Letter from Director, 1897.	Letter from Director, 1897.	Obs. Univ. of Ala.
228	See footnote (e).	Letter from Director, 1912.	International Lat. Obs.
229	Letter from Director, 1913.	<i>Astron. Nach.</i> , Nr. 3993, 1905.	University Observatory.
230	Letter from Director, 1913.	Letter from Director, 1913.	Obs., Univ. of Ill.
231	Letter from Director, 1913.	Letter from Director, 1913.	University Obs., since 1855.
232	Letter, Director New Obs., 1913.	Letter, Director new Obs., 1913.	University Obs., before 1855.
233	Letter from Director, 1913.	Letter from Director, 1913.	Obs. of the Nautical Institute.
234	See footnote (h).	<i>Astron. Nach.</i> , Nr. 3993, 1905.	ⁱ Imperial and Royal Univ. Obs.
235	Letter, Director new Obs., 1913.	Letter, Director new Obs., 1913.	^j Imperial and Royal Univ. Obs.
236	<i>Berliner Jahrbuch</i> .	<i>Berliner Jahrbuch</i> .	Oppolzer Obs., Josephstadt.
237	<i>Publik. der Sternw.</i> , 1892.	<i>Astron. Nach.</i> , Nr. 3993, 1905.	Kuffner Obs., Ottakring.
238	<i>Astron. Nach.</i> , Nr. 4666, 1913.	<i>Astron. Nach.</i> , Nr. 3993, 1905.	Imperial University Obs.
239	<i>U. S. Naval Obs. Publications</i> , 1900.	<i>U. S. C. and G. S. Report</i> , 1897.	U. S. N. Obs., Georgetown Heights.
240	See footnote (m).	<i>U. S. C. and G. S. Report</i> , 1897.	U. S. Naval Obs., 1842–1893.
241	Letter from Director, 1912.	Letter from Director, 1912.	Smithsonian Astrophysical Obs.
242	<i>Astronomical Journal</i> , 1897.	<i>Astronomical Journal</i> , 1897.	Catholic Univ. Obs., Brookland.
243	Letter from Director, 1912.	<i>Les Obs. Astron.</i> , Bruxelles, 1907.	Whitin Obs., Wellesley College.
244	<i>New Zealand Gazette</i> , Feb. 29, 1912.	<i>New Zealand Gazette</i> , Feb. 29, 1912.	Hector Observatory.
245	Letter from Director, 1891.	Letter from Director, 1891.	^k U. S. Military Academy.
246	Letter from Director, 1913.	<i>Astron. Nach.</i> , Nr. 3993, 1905.	Imperial Naval Obs.
247	<i>Astrophysical Journal</i> , 1901.	<i>Astrophysical Journal</i> , 1901.	Yerkes Obs., Univ. of Chicago.
248	Letter from Director, 1893.	Letter from Director, 1893.	Field Memorial Obs., Williams Coll.
249	Letter from Director, 1913.	Letter from Director, 1913.	Mr. Metcalf's Obs., since 1911.
250	<i>Monthly Notices</i> , R. A. S., 1884.	ⁿ <i>Monthly Notices</i> , R. A. S., 1888.	Mr. John Tebbutt's Obs.
251	<i>Annales de l'Obs.</i> , 1907.	<i>Annales de l'Obs.</i> , 1907.	Obs. of the Jesuits near Shanghai.
252	Letter from Director, 1913.	<i>Astron. Nach.</i> , Nr. 3202, 1893.	Obs. of Swiss Polytechnic School.

^a Old observatory No. 128 E.^b Letter from Government Astronomer at Adelaide, 1913.^c Since 1898.^d Before 1898.^e *Resultate des Internationalen Breitendienstes*, 1900–1908.^f At Pino Torinese.^g At Palazzo Madama.^h *Astron. Arbeiten des K. K. Gradmessungs-Bureau*, 1896.ⁱ Since 1879.^j Before 1879.^k Old observatory 9° N., 1° 2 E.^l *Resultate des Internationalen Breitendienstes*, Band I, 1903.^m *Washington Observations* for 1902, Appendix I, pp. XXI and XXII.ⁿ And the new value of the longitude of Sydney.

THE COMPUTATION OF LUNAR DISTANCES.

The tables of lunar distances formerly given on pages XIII to XVIII, inclusive, for each month of the Greenwich Ephemeris, are omitted, as it has been decided by the authorities of the Navy Department that they are now of little practical use to navigators. However, in case it is desired to use this method, the angular distance between the Moon and any heavenly body may be calculated by solving the spherical triangle of which the known parts are the polar distances of the Moon and the other body and the difference of their right ascensions, or, in other words, the angle at the pole between their hour-circles. Then, the Greenwich mean time of the observation being approximately known, and the lunar distances for the star or other body calculated for the even hour before and after, the required lunar distance may be interpolated and the longitude derived by the methods given in books on navigation.

EXAMPLE 1.

Find the lunar distance of Aldebaran, May 9, 1916, at 6 P. M. Greenwich Mean Time.

Let α and δ = Right Ascension and Declination of the star
 " α' and δ' = " " " " " " Moon
 " D = Lunar Distance

Also let $\tan M = \tan \delta' \sec (\alpha - \alpha')$

Then $\cos D = \sin \delta' \cos (M - \delta) \operatorname{cosec} M$

$\alpha =$	$4^h 31^m 6^s.7$	$M =$	$36^\circ 13' 35''$
$\alpha' =$	$8^h 56^m 37^s.1$	$\delta = +$	$16^\circ 20' 35''$
$\alpha - \alpha' =$	$19^h 34^m 29^s.6$	$M - \delta =$	$19^\circ 53' 0''$
$\alpha - \alpha' =$	$293^\circ 37' 24''$	$\sin \delta' =$	9.449758
$\delta' = +$	$16^\circ 21' 38''$	$\cos (M - \delta) =$	9.973307
$\tan \delta' =$	9.467709	$\operatorname{cosec} M =$	0.228429
$\sec (\alpha - \alpha') =$	0.397157	$\cos D =$	9.651494
$\tan M =$	9.864866	$D =$	$63^\circ 22' 12''$

EXAMPLE 2.

Find the lunar distance of Jupiter, March 6, 1916, at noon, Greenwich Mean Time. In this case the distance is smaller and the following method is more accurate:

Let α and δ = Right Ascension and Declination of the planet
 " α' and δ' = " " " " " " Moon

" D = Lunar Distance

Also let $\tan N = \tan \frac{1}{2} (\alpha - \alpha') \cos \frac{1}{2} (\delta + \delta') \operatorname{cosec} \frac{1}{2} (\delta - \delta')$

Then $\sin \frac{1}{2} D = \sin \frac{1}{2} (\alpha - \alpha') \cos \frac{1}{2} (\delta + \delta') \operatorname{cosec} N$

$\sin N$ and $\sin \frac{1}{2} (\alpha - \alpha')$ have the same algebraic sign.

$\alpha =$	$0^h 21^m 4^s.8$	$\tan \frac{1}{2} (\alpha - \alpha') =$	$8.777268 n$
$\alpha' =$	$0^h 48^m 29^s.7$	$\cos \frac{1}{2} (\delta + \delta') =$	9.997815
$\alpha - \alpha' =$	$23^h 32^m 35^s.1$	$\operatorname{cosec} \frac{1}{2} (\delta - \delta') =$	$1.089983 n$
$\alpha - \alpha' =$	$353^\circ 8' 46''$	$\tan N =$	9.865066
$\delta = +$	$1^\circ 4' 49''$	$N =$	$36^\circ 14' 20''$
$\delta' = +$	$10^\circ 24' 19''$	$\sin \frac{1}{2} (\alpha - \alpha') =$	8.776490
$\delta + \delta' = +$	$11^\circ 29' 8''$	$\cos \frac{1}{2} (\delta + \delta') =$	9.997815
$\delta - \delta' = -$	$9^\circ 19' 30''$	$\operatorname{cosec} N =$	0.228300
$\frac{1}{2} (\alpha - \alpha') =$	$176^\circ 34' 23''$	$\sin \frac{1}{2} D =$	9.002605
$\frac{1}{2} (\delta + \delta') = +$	$5^\circ 44' 34''$	$\frac{1}{2} D =$	$5^\circ 46' 26''$
$\frac{1}{2} (\delta - \delta') = -$	$4^\circ 39' 45''$	$D =$	$11^\circ 32' 52''$

FOR FINDING THE LATITUDE BY AN OBSERVED ALTITUDE OF POLARIS, 1916.

Reduce the observed altitude of Polaris to the true altitude.

Reduce the recorded time of observation to the local sidereal time.

Take out the App. R. A. and App. Decl. of Polaris for the time of observation.

Subtract the App. R. A. from the local sidereal time of observation and the remainder is the hour-angle of Polaris.

With this hour-angle as the vertical argument, and the App. Decl. of Polaris as the horizontal argument, take out the correction from Table I and add it to or subtract it from the true altitude, according to its sign.

For other altitudes than 45° , corrections taken from the supplementary table at the bottom of Table I (Table Ia) may be applied when necessary for the degree of accuracy required.

Example.—1916, August 5, at $10^h 40^m 30^s$ P. M. local mean solar time, in longitude 59° west of Greenwich, suppose the true altitude of Polaris to be $33^\circ 20' 0''$, required the latitude of the place.

Local astronomical mean time	h	m	s
Reduction from Table III for $10^h 40^m 30^s$	10	40	30
Greenwich sidereal time of mean noon, August 5, page 10		+ 1	45
Reduction from Table III, for longitude ($=3^h 56^m$ west, or plus)	8	54	49
		+ 0	39

Sum (having regard to signs) is equal to local sidereal time	h	m	s
R. A. of Polaris (page 281) for time of observation	19	37	43
	1	30	18

Remainder is equal to hour-angle of Polaris	h	m	s
Decl. of Polaris (page 281) for time of observation $88^\circ 51' 25''$	18	7	25

True altitude	+33	20	0
Correction from Table I		-1	32
Correction from Table Ia			-14

Latitude of the place	+33	18	14
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Observations of Polaris for latitude should be made when practicable near the times of upper or of lower culminations (hour-angle 0^h or 12^h). However, at sea, if made near elongation (hour-angle 6^h or 18^h), the hour-angle, and hence the local time, should be known within one minute.

Decl. H. A.	88° 51' 20''	88° 51' 30''	88° 51' 40''	88° 51' 50''	88° 52' 0''	88° 52' 10''	Decl. H. A.
h m	' "	' "	' "	' "	' "	' "	h m
0 0	-68 40 0	-68 30 0	-68 20 0	-68 10 0	-68 0 0	-67 50 0	24 0
3	68 40 1	68 30 1	68 20 1	68 10 1	68 0 1	67 50 1	23 57
6	68 39 2	68 29 2	68 19 2	68 9 2	67 59 2	67 49 2	54
9	68 37 3	68 27 3	68 17 3	68 7 3	67 57 3	67 47 3	51
12	68 34 3	68 24 3	68 14 3	68 4 3	67 54 3	67 44 3	48
0 15	-68 31 4	-68 21 4	-68 11 4	-68 1 4	-67 51 4	-67 41 4	23 45
18	68 27 5	68 17 5	68 7 5	67 57 5	67 47 4	67 37 4	42
21	68 22 5	68 12 5	68 2 5	67 52 5	67 43 4	67 33 4	39
24	68 17 6	68 7 6	67 57 6	67 47 6	67 37 6	67 27 6	36
27	68 11 7	68 1 7	67 51 7	67 41 7	67 31 7	67 21 7	33
0 30	-68 4 8	-67 54 7	-67 44 7	-67 34 7	-67 24 7	-67 14 7	23 30
33	67 56 8	67 47 8	67 37 8	67 27 8	67 17 8	67 7 8	27
36	67 48 8	67 39 8	67 29 8	67 19 8	67 9 8	66 59 8	24
39	67 39 9	67 30 9	67 20 9	67 10 9	67 0 9	66 50 9	21
42	67 30 11	67 20 10	67 10 10	67 0 10	66 50 10	66 41 11	18
0 45	-67 19 11	-67 10 11	-67 0 11	-66 50 11	-66 40 11	-66 30 11	23 15
48	67 8 12	66 59 12	66 49 12	66 39 12	66 29 12	66 19 12	12
51	66 56 12	66 47 12	66 37 12	66 27 12	66 17 12	66 8 13	9
54	66 44 13	66 34 13	66 24 13	66 15 13	66 5 13	65 55 13	6
0 57	66 31 14	66 21 14	66 11 13	66 2 14	65 52 14	65 42 13	3
1 0	-66 17 15	-66 7 14	-65 58 15	-65 48 14	-65 38 14	-65 29 15	23 0
3	66 2 15	65 53 15	65 43 15	65 34 15	65 24 15	65 14 15	22 57
6	65 47 16	65 38 16	65 28 16	65 18 16	65 9 16	64 59 16	54
9	65 31 17	65 22 16	65 12 16	65 2 16	64 53 16	64 43 16	51
1 12	-65 14	-65 5	-64 56	-64 46	-64 36	-64 27	22 48

FOR FINDING THE LATITUDE BY AN OBSERVED ALTITUDE OF POLARIS, 1916.

Decl. H. A.		88° 51' 20''	88° 51' 30''	88° 51' 40''	88° 51' 50''	88° 52' 0''	88° 52' 10''	Decl. H. A.
h m		' "	' "	' "	' "	' "	' "	h m
1	12	-65 14	-65 5	-64 56	-64 46	-64 36	-64 27	22 4
	15	64 57	64 48	64 38	64 29	64 19	64 10	45
	18	64 39	64 30	64 20	64 11	64 2	63 52	42
	21	64 20	64 11	64 2	63 52	63 43	63 34	39
	24	64 1	63 52	63 42	63 33	63 24	63 15	36
1	27	-63 41	-63 32	-63 22	-63 13	-63 4	-62 55	22 33
	30	63 20	63 11	63 2	62 53	62 44	62 34	30
	33	62 59	62 50	62 41	62 32	62 23	62 13	27
	36	62 37	62 28	62 19	62 10	62 1	61 52	24
	39	62 14	62 5	61 56	61 47	61 38	61 29	21
1	42	-61 51	-61 42	-61 33	-61 24	-61 15	-61 6	22 18
	45	61 27	61 18	61 9	61 0	60 51	60 42	15
	48	61 2	60 54	60 45	60 35	60 27	60 18	12
	51	60 37	60 29	60 20	60 10	60 2	59 53	9
	54	60 11	60 3	59 54	59 45	59 37	59 28	6
1	57	-59 45	-59 36	-59 28	-59 19	-59 10	-59 2	22 3
2	0	59 18	59 9	59 1	58 52	58 43	58 35	22 0
	3	58 50	58 41	58 33	58 24	58 16	58 7	21 57
	6	58 22	58 13	58 5	57 56	57 48	57 39	54
	9	57 53	57 44	57 36	57 28	57 19	57 11	51
2	12	-57 23	-57 15	-57 7	-56 58	-56 50	-56 42	21 48
	15	56 53	56 45	56 37	56 28	56 20	56 12	45
	18	56 22	56 14	56 6	55 58	55 50	55 41	42
	21	55 51	55 43	55 35	55 27	55 19	55 10	39
	24	55 19	55 11	55 3	54 55	54 47	54 39	36
2	27	-54 46	-54 39	-54 31	-54 23	-54 15	-54 7	21 33
	30	54 13	54 6	53 58	53 50	53 42	53 34	30
	33	53 40	53 32	53 24	53 16	53 9	53 1	27
	36	53 6	52 58	52 50	52 42	52 35	52 27	24
	39	52 31	52 23	52 16	52 8	52 1	51 53	21
2	42	-51 56	-51 48	-51 41	-51 33	-51 26	-51 18	21 18
	45	51 20	51 12	51 5	50 58	50 50	50 43	15
	48	50 43	50 36	50 29	50 22	50 14	50 7	12
	51	50 6	49 59	49 52	49 45	49 38	49 30	9
	54	49 29	49 22	49 15	49 8	49 1	48 53	6
2	57	-48 51	-48 44	-48 37	-48 30	-48 23	-48 16	21 3
3	0	48 13	48 6	47 59	47 52	47 45	47 38	21 0
	3	47 34	47 27	47 20	47 13	47 6	47 0	20 57
	6	46 55	46 48	46 41	46 34	46 27	46 21	54
	9	46 15	46 8	46 1	45 55	45 48	45 41	51
3	12	-45 34	-45 28	-45 21	-45 15	-45 8	-45 1	20 48
	15	44 53	44 47	44 40	44 34	44 28	44 21	45
	18	44 12	44 6	43 59	43 53	43 47	43 40	42
	21	43 30	43 24	43 18	43 12	43 5	42 59	39
	24	42 48	42 42	42 36	42 30	42 23	42 17	36
3	27	-42 5	-41 59	-41 53	-41 47	-41 41	-41 35	30 33
	30	41 22	41 16	41 10	41 4	40 59	40 53	30
	33	40 39	40 33	40 27	40 21	40 16	40 10	27
	36	39 55	39 49	39 44	39 38	39 32	39 26	24
	39	39 11	39 5	39 00	38 54	38 48	38 42	21
3	42	-38 26	-38 20	-38 15	-38 9	-38 4	-37 58	20 18
	45	37 41	37 35	37 30	37 24	37 19	37 14	15
	48	36 55	36 50	36 45	36 39	36 34	36 29	12
	51	36 9	36 4	35 59	35 54	35 48	35 43	9
	54	35 23	35 18	35 13	35 8	35 3	34 58	6
3	57	-34 36	-34 31	-34 27	-34 22	-34 17	-34 12	20 1
4	0	33 49	33 44	33 40	33 35	33 30	33 25	20 0
	3	33 2	32 57	32 53	32 48	32 43	32 38	19 57
	6	32 14	32 10	32 5	32 0	31 56	31 51	54
	9	-31 26	-31 22	-31 17	-31 13	-31 8	-31 4	19 51

FOR FINDING THE LATITUDE BY AN OBSERVED ALTITUDE OF POLARIS, 1916.

Decl.		88° 51' 20''		88° 51' 30''		88° 51' 40''		88° 51' 50''		88° 52' 0''		88° 52' 10'		Decl.		
H. A.														H. A.		
h m		' "		' "		' "		' "		' "		' "		h m		
4	9	-31	26	48	-31	22	48	-31	17	48	-31	8	48	-31	4	19 51
	12	30	38	49	30	34	49	30	29	48	30	20	48	30	16	48
	15	29	49	49	29	45	49	29	41	49	29	32	49	29	28	48
	18	29	0	49	28	56	49	28	52	49	28	43	49	28	40	48
	21	28	11	49	28	7	49	28	3	49	27	55	49	27	51	49
4	24	-27	22	50	-27	18	50	-27	14	50	-27	6	49	-27	2	49
	27	26	32	50	26	28	50	26	24	50	26	17	50	26	13	49
	30	25	42	50	25	38	50	25	34	50	25	27	50	25	24	49
	33	24	51	51	24	48	51	24	44	50	24	37	50	24	34	50
	36	24	1	51	23	57	50	23	54	51	23	47	50	23	44	50
4	39	-23	10	51	-23	7	51	-23	3	51	-23	0	51	-22	54	51
	42	22	19	52	22	16	51	22	12	51	22	6	51	22	3	51
	45	21	27	52	21	25	52	21	21	51	21	15	51	21	13	50
	48	20	36	52	20	33	51	20	30	51	20	24	51	20	22	51
	51	19	44	52	19	42	52	19	39	52	19	33	51	19	31	51
4	54	-18	52	52	-18	50	52	-18	47	52	-18	42	52	-18	39	51
4	57	18	0	52	17	58	52	17	55	52	17	50	52	17	48	52
5	0	17	8	52	17	6	53	17	3	52	16	58	51	16	56	52
	3	16	16	53	16	13	52	16	11	52	16	7	52	16	4	52
	6	15	23	53	15	21	53	15	19	52	15	15	53	15	12	52
5	9	-14	30	53	-14	28	52	-14	27	53	-14	22	52	-14	20	52
	12	13	37	53	13	36	53	13	34	53	13	30	53	13	28	52
	15	12	44	53	12	43	53	12	41	53	12	37	53	12	36	52
	18	11	51	53	11	50	54	11	48	53	11	45	53	11	43	53
	21	10	58	54	10	56	53	10	55	53	10	52	53	10	50	52
5	24	-10	4	53	-10	3	53	-10	2	53	-9	59	53	-9	58	53
	27	9	11	54	9	10	54	9	9	53	9	6	53	9	5	53
	30	8	17	53	8	16	53	8	16	53	8	13	53	8	12	53
	33	7	24	54	7	23	54	7	22	54	7	20	53	7	19	53
	36	6	30	54	6	29	54	6	28	54	6	27	54	6	26	53
5	39	-5	36	54	-5	35	53	-5	35	54	-5	33	53	-5	33	53
	42	4	42	54	4	42	54	4	41	53	4	40	53	4	40	54
	45	3	48	53	3	48	54	3	48	54	3	47	54	3	46	54
	48	2	55	54	2	54	53	2	54	54	2	53	53	2	53	53
	51	2	1	54	2	1	54	2	0	53	2	0	54	2	0	54
5	54	-1	7	54	-1	7	54	-1	7	54	-1	6	53	-1	6	53
5	57	-0	13	54	-0	13	54	-0	13	54	-0	13	53	-0	13	53
6	0	+0	41	54	+0	41	54	+0	41	53	+0	40	54	+0	40	53
	3	1	35	54	1	35	53	1	34	54	1	34	53	1	33	53
	6	2	29	54	2	28	54	2	28	54	2	27	53	2	27	54
6	9	+3	23	54	+3	22	54	+3	22	53	+3	20	54	+3	20	53
	12	4	17	53	4	16	53	4	15	54	4	14	53	4	13	53
	15	5	10	54	5	9	53	5	9	53	5	7	53	5	6	53
	18	6	4	54	6	3	53	6	2	54	6	0	53	6	0	53
	21	6	58	53	6	56	54	6	56	53	6	53	53	6	52	53
6	24	+7	51	54	+7	50	53	+7	49	53	+7	46	53	+7	45	53
	27	8	45	53	8	43	54	8	42	53	8	39	53	8	38	53
	30	9	38	53	9	37	54	9	35	53	9	32	53	9	31	53
	33	10	32	54	10	30	53	10	28	53	10	25	53	10	23	52
	36	11	25	53	11	23	53	11	21	53	11	18	52	11	16	52
6	39	+12	18	52	+12	16	52	+12	14	53	+12	10	53	+12	8	53
	42	13	10	53	13	8	53	13	7	52	13	3	52	13	1	52
	45	14	3	53	14	1	53	13	59	53	13	55	52	13	53	52
	48	14	56	52	14	54	52	14	52	52	14	47	52	14	45	52
	51	15	48	53	15	46	52	15	44	52	15	39	52	15	37	51
6	54	+16	41	52	+16	38	52	+16	36	52	+16	31	51	+16	28	52
6	57	17	33	52	17	30	52	17	28	51	17	22	52	17	20	51
7	0	18	25	51	18	22	52	18	19	52	18	14	51	18	11	51
	3	19	16	52	19	14	51	19	11	51	19	5	51	19	2	51
7	6	+20	8		+20	5		+20	2		+19	59	51	+19	53	51

FOR FINDING THE LATITUDE BY AN OBSERVED ALTITUDE OF POLARIS, 1886.

Decl. H. A.	88° 51' 20''	88° 51' 30''	88° 51' 40''	88° 51' 50''	88° 52' 0''	88° 52' 10''	Decl. H. A.
h m	" "	" "	" "	" "	" "	" "	h m
7 6	+20 8 51	+20 5 51	+20 2 51	+19 59 51	+19 56 51	+19 53 51	16 34
7 9	20 59 51	20 56 51	20 53 51	20 50 51	20 47 50	20 44 50	51
12	21 50 51	21 47 51	21 44 51	21 41 50	21 37 51	21 34 50	45
15	22 41 51	22 38 50	22 35 50	22 31 50	22 28 50	22 24 50	45
18	23 32 50	23 28 51	23 25 50	23 21 50	23 18 50	23 14 50	45
7 21	+24 22 50	+24 19 50	+24 15 50	+24 11 50	+24 8 49	+24 4 50	16 39
24	25 12 50	25 9 49	25 5 50	25 1 50	24 57 50	24 54 49	38
27	26 2 50	25 58 50	25 55 49	25 51 49	25 47 49	25 43 49	31
30	26 52 49	26 48 49	26 44 49	26 40 50	26 36 49	26 32 49	30
33	27 41 49	27 37 49	27 33 49	27 30 48	27 25 48	27 21 48	27
7 36	+28 30 49	+28 26 48	+28 22 48	+28 18 48	+28 13 49	+28 9 48	16 24
39	29 19 48	29 14 49	29 10 48	29 6 48	29 2 48	28 57 48	21
42	30 7 48	30 3 49	29 58 48	29 54 48	29 50 48	29 45 48	18
45	30 55 48	30 51 48	30 46 48	30 42 48	30 37 47	30 33 47	15
48	31 43 48	31 38 48	31 34 47	31 29 47	31 24 47	31 20 47	12
7 51	+32 31 47	+32 26 47	+32 21 47	+32 16 47	+32 11 47	+32 7 46	16 9
54	33 18 47	33 13 46	33 8 47	33 3 47	32 58 46	32 53 46	6
7 57	34 5 46	33 59 47	33 55 46	33 50 46	33 44 46	33 39 46	3
8 0	34 51 46	34 46 47	34 41 46	34 36 46	34 30 46	34 25 46	16 9
3	35 37 46	35 32 45	35 27 45	35 21 46	35 16 45	35 11 45	15 57
8 6	+36 23 45	+36 17 45	+36 12 45	+36 7 45	+36 1 45	+35 56 45	15 54
9	37 8 45	37 2 45	36 57 45	36 52 44	36 46 45	36 41 44	51
12	37 53 44	37 47 45	37 42 44	37 36 44	37 31 44	37 25 44	45
15	38 37 44	38 32 44	38 26 44	38 20 44	38 15 43	38 9 44	45
18	39 22 43	39 16 43	39 10 44	39 4 44	38 58 44	38 53 43	42
8 21	+40 5 44	+39 59 44	+39 54 43	+39 48 43	+39 42 43	+39 36 43	15 39
24	40 49 43	40 43 43	40 37 43	40 31 42	40 25 42	40 19 42	36
27	41 32 42	41 26 42	41 20 42	41 13 42	41 7 42	41 1 42	33
30	42 14 42	42 8 42	42 2 42	41 55 42	41 49 42	41 43 42	30
33	42 56 42	42 50 41	42 44 41	42 37 42	42 31 41	42 25 41	27
8 36	+43 38 41	+43 31 41	+43 25 41	+43 19 41	+43 12 41	+43 6 41	15 24
39	44 19 41	44 12 41	44 6 40	44 0 40	43 53 40	43 47 40	23
42	45 0 40	44 53 41	44 46 40	44 40 40	44 33 40	44 27 40	19
45	45 40 40	45 33 40	45 26 40	45 20 39	45 13 39	45 7 39	15
48	46 20 39	46 13 39	46 6 39	45 59 39	45 52 39	45 46 39	12
8 51	+46 59 39	+46 52 39	+46 45 39	+46 38 39	+46 31 39	+46 25 38	15 9
54	47 38 38	47 31 38	47 24 38	47 17 38	47 10 38	47 3 38	5
8 57	48 16 38	48 9 38	48 2 38	47 55 38	47 48 37	47 41 37	3
9 0	48 54 37	48 47 37	48 40 37	48 33 37	48 25 37	48 18 37	15 9
3	49 31 37	49 24 37	49 17 37	49 10 36	49 2 37	48 55 36	14 57
9 6	+50 8 36	+50 1 36	+49 54 36	+49 46 36	+49 39 36	+49 31 36	14 54
9	50 44 36	50 37 36	50 30 35	50 22 36	50 15 35	50 7 36	51
12	51 20 35	51 13 35	51 5 35	50 58 35	50 50 35	50 43 35	48
15	51 55 35	51 48 35	51 40 35	51 33 34	51 25 35	51 18 34	45
18	52 30 34	52 23 34	52 15 34	52 7 34	52 0 34	51 52 34	42
9 21	+53 4 34	+52 57 33	+52 49 34	+52 41 34	+52 34 33	+52 26 33	14 39
24	53 38 33	53 30 33	53 23 33	53 15 33	53 7 33	52 59 33	35
27	54 11 33	54 3 33	53 56 32	53 48 32	53 40 32	53 32 32	32
30	54 44 32	54 36 32	54 28 32	54 20 32	54 12 32	54 4 32	27
33	55 16 31	55 8 31	55 0 31	54 52 31	54 44 31	54 36 31	27
9 36	+55 47 31	+55 39 31	+55 31 31	+55 23 31	+55 15 30	+55 7 30	14 29
39	56 18 31	56 10 30	56 2 30	55 54 30	55 45 30	55 37 30	25
42	56 49 30	56 40 30	56 32 30	56 24 29	56 15 30	56 7 30	22
45	57 19 29	57 10 29	57 2 29	56 53 29	56 45 29	56 37 29	19
48	57 48 28	57 39 29	57 31 28	57 22 29	57 14 28	57 6 28	15
9 51	+58 16 28	+58 8 28	+57 59 28	+57 51 28	+57 42 28	+57 34 27	14 9
54	58 44 28	58 36 27	58 27 27	58 19 27	58 10 27	58 1 27	6
9 57	59 12 27	59 3 27	58 54 27	58 46 26	58 37 27	58 28 27	3
10 0	59 39 26	59 30 26	59 21 26	59 12 26	59 4 26	58 55 26	14 0
10 3	+60 5 26	+59 56 26	+59 47 26	+59 38 26	+59 30 26	+59 21 26	13 57

FOR FINDING THE LATITUDE BY AN OBSERVED ALTITUDE OF POLARIS, 1916.

Decl. H. A.		88° 51' 20''	88° 51' 30''	88° 51' 40''	88° 51' 50''	88° 52' 0''	88° 52' 10''	Decl. H. A.	
h	m	' "	' "	' "	' "	' "	' "	h	m
10	3	+60 5	+59 56	+59 47	+59 38	+59 30	+59 21	13	57
	6	60 30	60 21	60 13	60 4	59 55	59 46		54
	9	60 55	60 46	60 37	60 28	60 20	60 11		51
	12	61 19	61 10	61 2	60 53	60 44	60 35		48
	15	61 43	61 34	61 25	61 16	61 7	60 58		45
		23	23	23	23	23	23		
10	18	+62 6	+61 57	+61 48	+61 39	+61 30	+61 21	13	42
	21	62 29	62 19	62 11	62 2	61 52	61 43		39
	24	62 51	62 41	62 32	62 23	62 14	62 5		36
	27	63 12	63 2	62 53	62 44	62 35	62 26		33
	30	63 33	63 23	63 14	63 5	62 55	62 46		30
		20	20	20	19	20	20		
10	33	+63 53	+63 43	+63 34	+63 24	+63 15	+63 6	13	27
	36	64 12	64 2	63 53	63 44	63 34	63 25		24
	39	64 30	64 21	64 12	64 2	63 53	63 43		21
	42	64 48	64 39	64 29	64 20	64 11	64 1		18
	45	65 5	64 56	64 47	64 37	64 28	64 18		15
		17	17	16	17	16	17		
10	48	+65 22	+65 13	+65 3	+64 54	+64 44	+64 35	13	12
	51	65 38	65 29	65 19	65 10	65 0	64 51		9
	54	65 53	65 44	65 34	65 25	65 15	65 6		6
10	57	66 8	65 59	65 49	65 40	65 30	65 20		3
	11	0	66 22	66 13	65 54	65 44	65 34	13	0
			13	13	13	13	13		
11	3	+66 35	+66 26	+66 16	+66 7	+65 57	+65 47	12	57
	6	66 48	66 39	66 29	66 19	66 9	66 0		54
	9	67 0	66 51	66 41	66 31	66 21	66 12		51
	12	67 12	67 2	66 52	66 42	66 33	66 23		48
	15	67 23	67 13	67 3	66 53	66 43	66 33		45
		10	10	10	10	10	10		
11	18	+67 33	+67 23	+67 13	+67 3	+66 53	+66 43	12	42
	21	67 42	67 32	67 22	67 12	67 2	66 52		39
	24	67 50	67 40	67 30	67 20	67 11	67 1		36
	27	67 58	67 48	67 38	67 28	67 19	67 9		33
	30	68 5	67 55	67 46	67 36	67 26	67 16		30
		7	7	6	6	6	6		
11	33	+68 12	+68 2	+67 52	+67 42	+67 32	+67 22	12	27
	36	68 18	68 8	67 58	67 48	67 38	67 28		24
	39	68 23	68 13	68 3	67 53	67 43	67 33		21
	42	68 28	68 17	68 8	67 58	67 48	67 38		18
	45	68 32	68 21	68 11	68 1	67 51	67 41		15
		3	3	3	3	3	3		
11	48	+68 35	+68 24	+68 14	+68 4	+67 54	+67 44	12	12
	51	68 37	68 27	68 17	68 7	67 57	67 47		9
	54	68 39	68 29	68 19	68 9	67 59	67 49		6
11	57	68 40	68 30	68 20	68 10	68 0	67 50		3
	12	0	+68 40	+68 30	+68 20	+68 10	+67 50	12	0

TABLE Ia.

Table I has been computed for an altitude of 45°. For other altitudes, corrections taken from the following table may be applied when the desired degree of accuracy requires it.

Altitude. H. A.		10°	20°	30°	40°	50°	60°	70°	Altitude. H. A.	
h	h	"	"	"	"	"	"	"	h	h
0	12	0	0	0	0	0	0	0	12	24
1	11	- 2	- 2	- 1	0	0	+ 2	+ 5	13	23
2	10	8	7	4	-2	+2	8	18	14	22
3	9	17	13	9	3	4	15	36	15	21
4	8	25	20	13	5	6	23	54	16	20
5	7	32	24	16	6	7	28	67	17	19
6	6	-34	-26	-17	-7	+8	+30	+72	18	18

SIDEREAL INTO MEAN SOLAR TIME.

TO BE SUBTRACTED FROM A SIDEREAL TIME INTERVAL.

Side- real.	0 ^h	1 ^h	2 ^h	3 ^h	4 ^h	5 ^h	6 ^h	7 ^h	For Seconds.
m	m s	m s	m s	m s	m s	m s	m s	m s	s s
0	0 0.000	0 9.830	0 19.659	0 29.489	0 39.318	0 49.148	0 58.977	1 8.807	0 0.000
1	0 0.164	0 9.993	0 19.823	0 29.653	0 39.482	0 49.312	0 59.141	1 8.971	1 0.006
2	0 0.328	0 10.157	0 19.987	0 29.816	0 39.646	0 49.475	0 59.305	1 9.135	2 0.005
3	0 0.491	0 10.321	0 20.151	0 29.980	0 39.810	0 49.639	0 59.469	1 9.298	3 0.006
4	0 0.655	0 10.485	0 20.314	0 30.144	0 39.974	0 49.803	0 59.633	1 9.462	4 0.011
5	0 0.819	0 10.649	0 20.478	0 30.308	0 40.137	0 49.967	0 59.796	1 9.626	5 0.014
6	0 0.983	0 10.813	0 20.642	0 30.472	0 40.301	0 50.131	0 59.960	1 9.790	6 0.016
7	0 1.147	0 10.976	0 20.806	0 30.635	0 40.465	0 50.295	1 0.124	1 9.954	7 0.019
8	0 1.311	0 11.140	0 20.970	0 30.799	0 40.629	0 50.458	1 0.288	1 10.118	8 0.022
9	0 1.474	0 11.304	0 21.134	0 30.963	0 40.793	0 50.622	1 0.452	1 10.281	9 0.025
10	0 1.638	0 11.468	0 21.297	0 31.127	0 40.956	0 50.786	1 0.616	1 10.445	10 0.027
11	0 1.802	0 11.632	0 21.461	0 31.291	0 41.120	0 50.950	1 0.779	1 10.609	11 0.030
12	0 1.966	0 11.795	0 21.625	0 31.455	0 41.284	0 51.114	1 0.943	1 10.773	12 0.033
13	0 2.130	0 11.959	0 21.789	0 31.618	0 41.448	0 51.278	1 1.107	1 10.937	13 0.035
14	0 2.294	0 12.123	0 21.953	0 31.782	0 41.612	0 51.441	1 1.271	1 11.100	14 0.038
15	0 2.457	0 12.287	0 22.117	0 31.946	0 41.776	0 51.605	1 1.435	1 11.264	15 0.041
16	0 2.621	0 12.451	0 22.280	0 32.110	0 41.939	0 51.769	1 1.599	1 11.428	16 0.044
17	0 2.785	0 12.615	0 22.444	0 32.274	0 42.103	0 51.933	1 1.762	1 11.592	17 0.046
18	0 2.949	0 12.778	0 22.608	0 32.438	0 42.267	0 52.097	1 1.926	1 11.756	18 0.049
19	0 3.113	0 12.942	0 22.772	0 32.601	0 42.431	0 52.260	1 2.090	1 11.920	19 0.052
20	0 3.277	0 13.106	0 22.936	0 32.765	0 42.595	0 52.424	1 2.254	1 12.083	20 0.055
21	0 3.440	0 13.270	0 23.099	0 32.929	0 42.759	0 52.588	1 2.418	1 12.247	21 0.057
22	0 3.604	0 13.434	0 23.263	0 33.093	0 42.922	0 52.752	1 2.582	1 12.411	22 0.059
23	0 3.768	0 13.598	0 23.427	0 33.257	0 43.086	0 52.916	1 2.745	1 12.575	23 0.062
24	0 3.932	0 13.761	0 23.591	0 33.420	0 43.250	0 53.080	1 2.909	1 12.739	24 0.064
25	0 4.096	0 13.925	0 23.755	0 33.584	0 43.414	0 53.243	1 3.073	1 12.903	25 0.066
26	0 4.259	0 14.089	0 23.919	0 33.748	0 43.578	0 53.407	1 3.237	1 13.066	26 0.068
27	0 4.423	0 14.253	0 24.082	0 33.912	0 43.742	0 53.571	1 3.401	1 13.230	27 0.070
28	0 4.587	0 14.417	0 24.246	0 34.076	0 43.905	0 53.735	1 3.564	1 13.394	28 0.072
29	0 4.751	0 14.581	0 24.410	0 34.240	0 44.069	0 53.899	1 3.728	1 13.558	29 0.074
30	0 4.915	0 14.744	0 24.574	0 34.403	0 44.233	0 54.063	1 3.892	1 13.722	30 0.076
31	0 5.079	0 14.908	0 24.738	0 34.567	0 44.397	0 54.226	1 4.056	1 13.886	31 0.078
32	0 5.242	0 15.072	0 24.902	0 34.731	0 44.561	0 54.390	1 4.220	1 14.049	32 0.080
33	0 5.406	0 15.236	0 25.065	0 34.895	0 44.724	0 54.554	1 4.384	1 14.213	33 0.082
34	0 5.570	0 15.400	0 25.229	0 35.059	0 44.888	0 54.718	1 4.547	1 14.377	34 0.084
35	0 5.734	0 15.563	0 25.393	0 35.223	0 45.052	0 54.882	1 4.711	1 14.541	35 0.086
36	0 5.898	0 15.727	0 25.557	0 35.386	0 45.216	0 55.046	1 4.875	1 14.705	36 0.088
37	0 6.062	0 15.891	0 25.721	0 35.550	0 45.380	0 55.209	1 5.039	1 14.868	37 0.090
38	0 6.225	0 16.055	0 25.885	0 35.714	0 45.544	0 55.373	1 5.203	1 15.032	38 0.092
39	0 6.389	0 16.219	0 26.048	0 35.878	0 45.707	0 55.537	1 5.367	1 15.196	39 0.094
40	0 6.553	0 16.383	0 26.212	0 36.042	0 45.871	0 55.701	1 5.530	1 15.360	40 0.096
41	0 6.717	0 16.546	0 26.376	0 36.206	0 46.035	0 55.865	1 5.694	1 15.524	41 0.098
42	0 6.881	0 16.710	0 26.540	0 36.369	0 46.199	0 56.028	1 5.858	1 15.688	42 0.100
43	0 7.045	0 16.874	0 26.704	0 36.533	0 46.363	0 56.192	1 6.022	1 15.851	43 0.102
44	0 7.208	0 17.038	0 26.867	0 36.697	0 46.527	0 56.356	1 6.186	1 16.015	44 0.104
45	0 7.372	0 17.202	0 27.031	0 36.861	0 46.690	0 56.520	1 6.350	1 16.179	45 0.106
46	0 7.536	0 17.366	0 27.195	0 37.025	0 46.854	0 56.684	1 6.513	1 16.343	46 0.108
47	0 7.700	0 17.529	0 27.359	0 37.188	0 47.018	0 56.848	1 6.677	1 16.507	47 0.110
48	0 7.864	0 17.693	0 27.523	0 37.352	0 47.182	0 57.011	1 6.841	1 16.671	48 0.112
49	0 8.027	0 17.857	0 27.687	0 37.516	0 47.346	0 57.175	1 7.005	1 16.834	49 0.114
50	0 8.191	0 18.021	0 27.850	0 37.680	0 47.510	0 57.339	1 7.169	1 16.998	50 0.116
51	0 8.355	0 18.185	0 28.014	0 37.844	0 47.673	0 57.503	1 7.332	1 17.162	51 0.118
52	0 8.519	0 18.349	0 28.178	0 38.008	0 47.837	0 57.667	1 7.496	1 17.326	52 0.120
53	0 8.683	0 18.512	0 28.342	0 38.171	0 48.001	0 57.831	1 7.660	1 17.490	53 0.122
54	0 8.847	0 18.676	0 28.506	0 38.335	0 48.165	0 57.994	1 7.824	1 17.654	54 0.124
55	0 9.010	0 18.840	0 28.670	0 38.499	0 48.329	0 58.158	1 7.988	1 17.817	55 0.126
56	0 9.174	0 19.004	0 28.833	0 38.663	0 48.492	0 58.322	1 8.152	1 17.981	56 0.128
57	0 9.338	0 19.168	0 28.997	0 38.827	0 48.656	0 58.486	1 8.315	1 18.145	57 0.130
58	0 9.502	0 19.331	0 29.161	0 38.991	0 48.820	0 58.650	1 8.479	1 18.309	58 0.132
59	0 9.666	0 19.495	0 29.325	0 39.154	0 48.984	0 58.814	1 8.643	1 18.473	59 0.134

SIDEREAL INTO MEAN SOLAR TIME.

TO BE SUBTRACTED FROM A SIDEREAL TIME INTERVAL.

Sidereal.	8 ^h	9 ^h	10 ^h	11 ^h	12 ^h	13 ^h	14 ^h	15 ^h	For Seconds.	
m	m s	m s	m s	m s	m s	m s	m s	m s	s	s
0	1 18.636	1 28.466	1 38.296	1 48.125	1 57.955	2 7.784	2 17.614	2 27.443	0	0.000
1	1 18.800	1 28.630	1 38.459	1 48.289	1 58.119	2 7.948	2 17.778	2 27.607	1	0.003
2	1 18.964	1 28.794	1 38.623	1 48.453	1 58.282	2 8.112	2 17.941	2 27.771	2	0.005
3	1 19.128	1 28.958	1 38.787	1 48.617	1 58.446	2 8.276	2 18.105	2 27.935	3	0.008
4	1 19.292	1 29.121	1 38.951	1 48.780	1 58.610	2 8.440	2 18.269	2 28.099	4	0.011
5	1 19.456	1 29.285	1 39.115	1 48.944	1 58.774	2 8.603	2 18.433	2 28.263	5	0.014
6	1 19.619	1 29.449	1 39.279	1 49.108	1 58.938	2 8.767	2 18.597	2 28.426	6	0.016
7	1 19.783	1 29.613	1 39.442	1 49.272	1 59.101	2 8.931	2 18.761	2 28.590	7	0.019
8	1 19.947	1 29.777	1 39.606	1 49.436	1 59.265	2 9.095	2 18.924	2 28.754	8	0.022
9	1 20.111	1 29.940	1 39.770	1 49.600	1 59.429	2 9.259	2 19.088	2 28.918	9	0.025
10	1 20.275	1 30.104	1 39.934	1 49.763	1 59.593	2 9.423	2 19.252	2 29.082	10	0.027
11	1 20.439	1 30.268	1 40.098	1 49.927	1 59.757	2 9.586	2 19.416	2 29.245	11	0.030
12	1 20.602	1 30.432	1 40.261	1 50.091	1 59.921	2 9.750	2 19.580	2 29.409	12	0.033
13	1 20.766	1 30.596	1 40.425	1 50.255	2 0.084	2 9.914	2 19.744	2 29.573	13	0.035
14	1 20.930	1 30.760	1 40.589	1 50.419	2 0.248	2 10.078	2 19.907	2 29.737	14	0.038
15	1 21.094	1 30.923	1 40.753	1 50.583	2 0.412	2 10.242	2 20.071	2 29.901	15	0.041
16	1 21.258	1 31.087	1 40.917	1 50.746	2 0.576	2 10.405	2 20.235	2 30.065	16	0.044
17	1 21.422	1 31.251	1 41.081	1 50.910	2 0.740	2 10.569	2 20.399	2 30.228	17	0.046
18	1 21.585	1 31.415	1 41.244	1 51.074	2 0.904	2 10.733	2 20.563	2 30.392	18	0.049
19	1 21.749	1 31.579	1 41.408	1 51.238	2 1.067	2 10.897	2 20.727	2 30.556	19	0.052
20	1 21.913	1 31.743	1 41.572	1 51.402	2 1.231	2 11.061	2 20.890	2 30.720	20	0.055
21	1 22.077	1 31.906	1 41.736	1 51.565	2 1.395	2 11.225	2 21.054	2 30.884	21	0.057
22	1 22.241	1 32.070	1 41.900	1 51.729	2 1.559	2 11.388	2 21.218	2 31.048	22	0.060
23	1 22.404	1 32.234	1 42.064	1 51.893	2 1.723	2 11.552	2 21.382	2 31.211	23	0.063
24	1 22.568	1 32.398	1 42.227	1 52.057	2 1.887	2 11.716	2 21.546	2 31.375	24	0.066
25	1 22.732	1 32.562	1 42.391	1 52.221	2 2.050	2 11.880	2 21.709	2 31.539	25	0.068
26	1 22.896	1 32.726	1 42.555	1 52.385	2 2.214	2 12.044	2 21.873	2 31.703	26	0.071
27	1 23.060	1 32.889	1 42.719	1 52.548	2 2.378	2 12.208	2 22.037	2 31.867	27	0.074
28	1 23.224	1 33.053	1 42.883	1 52.712	2 2.542	2 12.371	2 22.201	2 32.031	28	0.076
29	1 23.387	1 33.217	1 43.047	1 52.876	2 2.706	2 12.535	2 22.365	2 32.194	29	0.079
30	1 23.551	1 33.381	1 43.210	1 53.040	2 2.869	2 12.699	2 22.529	2 32.358	30	0.082
31	1 23.715	1 33.545	1 43.374	1 53.204	2 3.033	2 12.863	2 22.692	2 32.522	31	0.085
32	1 23.879	1 33.708	1 43.538	1 53.368	2 3.197	2 13.027	2 22.856	2 32.686	32	0.087
33	1 24.043	1 33.872	1 43.702	1 53.531	2 3.361	2 13.191	2 23.020	2 32.850	33	0.090
34	1 24.207	1 34.036	1 43.866	1 53.695	2 3.525	2 13.354	2 23.184	2 33.013	34	0.093
35	1 24.370	1 34.200	1 44.029	1 53.859	2 3.689	2 13.518	2 23.348	2 33.177	35	0.096
36	1 24.534	1 34.364	1 44.193	1 54.023	2 3.852	2 13.682	2 23.512	2 33.341	36	0.098
37	1 24.698	1 34.528	1 44.357	1 54.187	2 4.016	2 13.846	2 23.675	2 33.505	37	0.101
38	1 24.862	1 34.691	1 44.521	1 54.351	2 4.180	2 14.010	2 23.839	2 33.669	38	0.104
39	1 25.026	1 34.855	1 44.685	1 54.514	2 4.344	2 14.173	2 24.003	2 33.833	39	0.106
40	1 25.190	1 35.019	1 44.849	1 54.678	2 4.508	2 14.337	2 24.167	2 33.996	40	0.109
41	1 25.353	1 35.183	1 45.012	1 54.842	2 4.672	2 14.501	2 24.331	2 34.160	41	0.112
42	1 25.517	1 35.347	1 45.176	1 55.006	2 4.835	2 14.665	2 24.495	2 34.324	42	0.115
43	1 25.681	1 35.511	1 45.340	1 55.170	2 4.999	2 14.829	2 24.658	2 34.488	43	0.117
44	1 25.845	1 35.674	1 45.504	1 55.333	2 5.163	2 14.993	2 24.822	2 34.652	44	0.120
45	1 26.009	1 35.838	1 45.668	1 55.497	2 5.327	2 15.156	2 24.986	2 34.816	45	0.123
46	1 26.172	1 36.002	1 45.832	1 55.661	2 5.491	2 15.320	2 25.150	2 34.979	46	0.126
47	1 26.336	1 36.166	1 45.995	1 55.825	2 5.655	2 15.484	2 25.314	2 35.143	47	0.128
48	1 26.500	1 36.330	1 46.159	1 55.989	2 5.818	2 15.648	2 25.477	2 35.307	48	0.131
49	1 26.664	1 36.493	1 46.323	1 56.153	2 5.982	2 15.812	2 25.641	2 35.471	49	0.134
50	1 26.828	1 36.657	1 46.487	1 56.316	2 6.146	2 15.976	2 25.805	2 35.635	50	0.137
51	1 26.992	1 36.821	1 46.651	1 56.480	2 6.310	2 16.139	2 25.969	2 35.798	51	0.139
52	1 27.155	1 36.985	1 46.815	1 56.644	2 6.474	2 16.303	2 26.133	2 35.962	52	0.142
53	1 27.319	1 37.149	1 46.978	1 56.808	2 6.637	2 16.467	2 26.297	2 36.126	53	0.145
54	1 27.483	1 37.313	1 47.142	1 56.972	2 6.801	2 16.631	2 26.460	2 36.290	54	0.147
55	1 27.647	1 37.476	1 47.306	1 57.136	2 6.965	2 16.795	2 26.624	2 36.454	55	0.150
56	1 27.811	1 37.640	1 47.470	1 57.299	2 7.129	2 16.959	2 26.788	2 36.618	56	0.153
57	1 27.975	1 37.804	1 47.634	1 57.463	2 7.293	2 17.122	2 26.952	2 36.781	57	0.156
58	1 28.138	1 37.968	1 47.797	1 57.627	2 7.457	2 17.286	2 27.116	2 36.945	58	0.158
59	1 28.302	1 38.132	1 47.961	1 57.791	2 7.620	2 17.450	2 27.280	2 37.109	59	0.161

SIDEREAL INTO MEAN SOLAR TIME.

TO BE SUBTRACTED FROM A SIDEREAL TIME INTERVAL.

Side- real.	16 ^h	17 ^h	18 ^h	19 ^h	20 ^h	21 ^h	22 ^h	23 ^h	For Seconds.	
m	m s	m s	m s	m s	m s	m s	m s	m s	s	s
0	2 37.273	2 47.102	2 56.932	3 6.762	3 16.591	3 26.421	3 36.250	3 46.080	0	0.000
1	2 37.437	2 47.266	2 57.096	3 6.925	3 16.755	3 26.585	3 36.414	3 46.244	1	0.003
2	2 37.601	2 47.430	2 57.260	3 7.089	3 16.919	3 26.748	3 36.578	3 46.407	2	0.005
3	2 37.764	2 47.594	2 57.424	3 7.253	3 17.083	3 26.912	3 36.742	3 46.571	3	0.006
4	2 37.928	2 47.758	2 57.587	3 7.417	3 17.246	3 27.076	3 36.906	3 46.735	4	0.011
5	2 38.092	2 47.922	2 57.751	3 7.581	3 17.410	3 27.240	3 37.069	3 46.899	5	0.014
6	2 38.256	2 48.085	2 57.915	3 7.745	3 17.574	3 27.404	3 37.233	3 47.063	6	0.016
7	2 38.420	2 48.249	2 58.079	3 7.908	3 17.738	3 27.568	3 37.397	3 47.227	7	0.019
8	2 38.584	2 48.413	2 58.243	3 8.072	3 17.902	3 27.731	3 37.561	3 47.390	8	0.022
9	2 38.747	2 48.577	2 58.406	3 8.236	3 18.066	3 27.895	3 37.725	3 47.554	9	0.025
10	2 38.911	2 48.741	2 58.570	3 8.400	3 18.229	3 28.059	3 37.889	3 47.718	10	0.027
11	2 39.075	2 48.905	2 58.734	3 8.564	3 18.393	3 28.223	3 38.052	3 47.882	11	0.030
12	2 39.239	2 49.068	2 58.898	3 8.728	3 18.557	3 28.387	3 38.216	3 48.046	12	0.033
13	2 39.403	2 49.232	2 59.062	3 8.891	3 18.721	3 28.550	3 38.380	3 48.210	13	0.035
14	2 39.566	2 49.396	2 59.226	3 9.055	3 18.885	3 28.714	3 38.544	3 48.373	14	0.038
15	2 39.730	2 49.560	2 59.389	3 9.219	3 19.049	3 28.878	3 38.708	3 48.537	15	0.041
16	2 39.894	2 49.724	2 59.553	3 9.383	3 19.212	3 29.042	3 38.871	3 48.701	16	0.044
17	2 40.058	2 49.888	2 59.717	3 9.547	3 19.376	3 29.206	3 39.035	3 48.865	17	0.046
18	2 40.222	2 50.051	2 59.881	3 9.710	3 19.540	3 29.370	3 39.199	3 49.029	18	0.049
19	2 40.386	2 50.215	3 0.045	3 9.874	3 19.704	3 29.533	3 39.363	3 49.193	19	0.052
20	2 40.549	2 50.379	3 0.209	3 10.038	3 19.868	3 29.697	3 39.527	3 49.356	20	0.055
21	2 40.713	2 50.543	3 0.372	3 10.202	3 20.032	3 29.861	3 39.691	3 49.520	21	0.057
22	2 40.877	2 50.707	3 0.536	3 10.366	3 20.195	3 30.025	3 39.854	3 49.684	22	0.060
23	2 41.041	2 50.870	3 0.700	3 10.530	3 20.359	3 30.189	3 40.018	3 49.848	23	0.063
24	2 41.205	2 51.034	3 0.864	3 10.693	3 20.523	3 30.353	3 40.182	3 50.012	24	0.066
25	2 41.369	2 51.198	3 1.028	3 10.857	3 20.687	3 30.516	3 40.346	3 50.175	25	0.068
26	2 41.532	2 51.362	3 1.192	3 11.021	3 20.851	3 30.680	3 40.510	3 50.339	26	0.071
27	2 41.696	2 51.526	3 1.355	3 11.185	3 21.014	3 30.844	3 40.674	3 50.503	27	0.074
28	2 41.860	2 51.690	3 1.519	3 11.349	3 21.178	3 31.008	3 40.837	3 50.667	28	0.077
29	2 42.024	2 51.853	3 1.683	3 11.513	3 21.342	3 31.172	3 41.001	3 50.831	29	0.079
30	2 42.188	2 52.017	3 1.847	3 11.676	3 21.506	3 31.336	3 41.165	3 50.995	30	0.082
31	2 42.352	2 52.181	3 2.011	3 11.840	3 21.670	3 31.499	3 41.329	3 51.158	31	0.085
32	2 42.515	2 52.345	3 2.174	3 12.004	3 21.834	3 31.663	3 41.493	3 51.322	32	0.087
33	2 42.679	2 52.509	3 2.338	3 12.168	3 21.997	3 31.827	3 41.657	3 51.486	33	0.090
34	2 42.843	2 52.673	3 2.502	3 12.332	3 22.161	3 31.991	3 41.820	3 51.650	34	0.093
35	2 43.007	2 52.836	3 2.666	3 12.496	3 22.325	3 32.155	3 41.984	3 51.814	35	0.096
36	2 43.171	2 53.000	3 2.830	3 12.659	3 22.489	3 32.318	3 42.148	3 51.978	36	0.098
37	2 43.334	2 53.164	3 2.994	3 12.823	3 22.653	3 32.482	3 42.312	3 52.141	37	0.101
38	2 43.498	2 53.328	3 3.157	3 12.987	3 22.817	3 32.646	3 42.476	3 52.305	38	0.104
39	2 43.662	2 53.492	3 3.321	3 13.151	3 22.980	3 32.810	3 42.639	3 52.469	39	0.106
40	2 43.826	2 53.656	3 3.485	3 13.315	3 23.144	3 32.974	3 42.803	3 52.633	40	0.109
41	2 43.990	2 53.819	3 3.649	3 13.478	3 23.308	3 33.138	3 42.967	3 52.797	41	0.112
42	2 44.154	2 53.983	3 3.813	3 13.642	3 23.472	3 33.301	3 43.131	3 52.961	42	0.115
43	2 44.317	2 54.147	3 3.977	3 13.806	3 23.636	3 33.465	3 43.295	3 53.124	43	0.117
44	2 44.481	2 54.311	3 4.140	3 13.970	3 23.800	3 33.629	3 43.459	3 53.288	44	0.120
45	2 44.645	2 54.475	3 4.304	3 14.134	3 23.963	3 33.793	3 43.622	3 53.452	45	0.123
46	2 44.809	2 54.638	3 4.468	3 14.298	3 24.127	3 33.957	3 43.786	3 53.616	46	0.126
47	2 44.973	2 54.802	3 4.632	3 14.461	3 24.291	3 34.121	3 43.950	3 53.780	47	0.128
48	2 45.137	2 54.966	3 4.796	3 14.625	3 24.455	3 34.284	3 44.114	3 53.943	48	0.131
49	2 45.300	2 55.130	3 4.960	3 14.789	3 24.619	3 34.448	3 44.278	3 54.107	49	0.134
50	2 45.464	2 55.294	3 5.123	3 14.953	3 24.782	3 34.612	3 44.442	3 54.271	50	0.137
51	2 45.628	2 55.458	3 5.287	3 15.117	3 24.946	3 34.776	3 44.605	3 54.435	51	0.139
52	2 45.792	2 55.621	3 5.451	3 15.281	3 25.110	3 34.940	3 44.769	3 54.599	52	0.142
53	2 45.956	2 55.785	3 5.615	3 15.444	3 25.274	3 35.104	3 44.933	3 54.763	53	0.145
54	2 46.120	2 55.949	3 5.779	3 15.608	3 25.438	3 35.267	3 45.097	3 54.926	54	0.147
55	2 46.283	2 56.113	3 5.942	3 15.772	3 25.602	3 35.431	3 45.261	3 55.090	55	0.150
56	2 46.447	2 56.277	3 6.106	3 15.936	3 25.765	3 35.595	3 45.425	3 55.254	56	0.153
57	2 46.611	2 56.441	3 6.270	3 16.100	3 25.929	3 35.759	3 45.588	3 55.418	57	0.156
58	2 46.775	2 56.604	3 6.434	3 16.264	3 26.093	3 35.923	3 45.752	3 55.582	58	0.158
59	2 46.939	2 56.768	3 6.598	3 16.427	3 26.257	3 36.086	3 45.916	3 55.746	59	0.161

MEAN SOLAR INTO SIDEREAL TIME.

TO BE ADDED TO A MEAN TIME INTERVAL.

Mean Solar.	0 ^h	1 ^h	2 ^h	3 ^h	4 ^h	5 ^h	6 ^h	7 ^h	For Seconds.
m s	m s	m s	m s	m s	m s	m s	m s	m s	s s
0	0 0.000	0 9.856	0 19.713	0 29.569	0 39.426	0 49.282	0 59.139	1 8.995	0 0.000
1	0 0.164	0 10.021	0 19.877	0 29.734	0 39.590	0 49.447	0 59.303	1 9.160	1 0.003
2	0 0.329	0 10.185	0 20.041	0 29.898	0 39.754	0 49.611	0 59.467	1 9.324	2 0.005
3	0 0.493	0 10.349	0 20.206	0 30.062	0 39.919	0 49.775	0 59.632	1 9.488	3 0.008
4	0 0.657	0 10.514	0 20.370	0 30.227	0 40.083	0 49.939	0 59.796	1 9.652	4 0.011
5	0 0.821	0 10.678	0 20.534	0 30.391	0 40.247	0 50.104	0 59.960	1 9.817	5 0.014
6	0 0.986	0 10.842	0 20.699	0 30.555	0 40.412	0 50.268	1 0.124	1 9.981	6 0.016
7	0 1.150	0 11.006	0 20.863	0 30.719	0 40.576	0 50.432	1 0.289	1 10.145	7 0.019
8	0 1.314	0 11.171	0 21.027	0 30.884	0 40.740	0 50.597	1 0.453	1 10.310	8 0.022
9	0 1.478	0 11.335	0 21.191	0 31.048	0 40.904	0 50.761	1 0.617	1 10.474	9 0.025
10	0 1.643	0 11.499	0 21.356	0 31.212	0 41.069	0 50.925	1 0.782	1 10.638	10 0.027
11	0 1.807	0 11.663	0 21.520	0 31.376	0 41.233	0 51.089	1 0.946	1 10.802	11 0.030
12	0 1.971	0 11.828	0 21.684	0 31.541	0 41.397	0 51.254	1 1.110	1 10.967	12 0.033
13	0 2.136	0 11.992	0 21.849	0 31.705	0 41.561	0 51.418	1 1.274	1 11.131	13 0.036
14	0 2.300	0 12.156	0 22.013	0 31.869	0 41.726	0 51.582	1 1.439	1 11.295	14 0.038
15	0 2.464	0 12.321	0 22.177	0 32.034	0 41.890	0 51.746	1 1.603	1 11.459	15 0.041
16	0 2.628	0 12.485	0 22.341	0 32.198	0 42.054	0 51.911	1 1.767	1 11.624	16 0.044
17	0 2.793	0 12.649	0 22.506	0 32.362	0 42.219	0 52.075	1 1.932	1 11.788	17 0.047
18	0 2.957	0 12.813	0 22.670	0 32.526	0 42.383	0 52.239	1 2.096	1 11.952	18 0.049
19	0 3.121	0 12.978	0 22.834	0 32.691	0 42.547	0 52.404	1 2.260	1 12.117	19 0.052
20	0 3.285	0 13.142	0 22.998	0 32.855	0 42.711	0 52.568	1 2.424	1 12.281	20 0.055
21	0 3.450	0 13.306	0 23.163	0 33.019	0 42.876	0 52.732	1 2.589	1 12.445	21 0.057
22	0 3.614	0 13.471	0 23.327	0 33.183	0 43.040	0 52.896	1 2.753	1 12.609	22 0.060
23	0 3.778	0 13.635	0 23.491	0 33.348	0 43.204	0 53.061	1 2.917	1 12.774	23 0.063
24	0 3.943	0 13.799	0 23.656	0 33.512	0 43.368	0 53.225	1 3.081	1 12.938	24 0.066
25	0 4.107	0 13.963	0 23.820	0 33.676	0 43.533	0 53.389	1 3.246	1 13.102	25 0.068
26	0 4.271	0 14.128	0 23.984	0 33.841	0 43.697	0 53.554	1 3.410	1 13.266	26 0.071
27	0 4.435	0 14.292	0 24.148	0 34.005	0 43.861	0 53.718	1 3.574	1 13.431	27 0.074
28	0 4.600	0 14.456	0 24.313	0 34.169	0 44.026	0 53.882	1 3.739	1 13.595	28 0.077
29	0 4.764	0 14.620	0 24.477	0 34.333	0 44.190	0 54.046	1 3.903	1 13.759	29 0.079
30	0 4.928	0 14.785	0 24.641	0 34.498	0 44.354	0 54.211	1 4.067	1 13.924	30 0.082
31	0 5.093	0 14.949	0 24.805	0 34.662	0 44.518	0 54.375	1 4.231	1 14.088	31 0.085
32	0 5.257	0 15.113	0 24.970	0 34.826	0 44.683	0 54.539	1 4.396	1 14.252	32 0.088
33	0 5.421	0 15.278	0 25.134	0 34.990	0 44.847	0 54.703	1 4.560	1 14.416	33 0.090
34	0 5.585	0 15.442	0 25.298	0 35.155	0 45.011	0 54.868	1 4.724	1 14.581	34 0.093
35	0 5.750	0 15.606	0 25.463	0 35.319	0 45.176	0 55.032	1 4.888	1 14.745	35 0.096
36	0 5.914	0 15.770	0 25.627	0 35.483	0 45.340	0 55.196	1 5.053	1 14.909	36 0.099
37	0 6.078	0 15.935	0 25.791	0 35.648	0 45.504	0 55.361	1 5.217	1 15.073	37 0.101
38	0 6.242	0 16.099	0 25.955	0 35.812	0 45.668	0 55.525	1 5.381	1 15.238	38 0.104
39	0 6.407	0 16.263	0 26.120	0 35.976	0 45.833	0 55.689	1 5.546	1 15.402	39 0.107
40	0 6.571	0 16.427	0 26.284	0 36.140	0 45.997	0 55.853	1 5.710	1 15.566	40 0.110
41	0 6.735	0 16.592	0 26.448	0 36.305	0 46.161	0 56.018	1 5.874	1 15.731	41 0.112
42	0 6.900	0 16.756	0 26.612	0 36.469	0 46.325	0 56.182	1 6.038	1 15.895	42 0.115
43	0 7.064	0 16.920	0 26.777	0 36.633	0 46.490	0 56.346	1 6.203	1 16.059	43 0.118
44	0 7.228	0 17.085	0 26.941	0 36.798	0 46.654	0 56.510	1 6.367	1 16.223	44 0.120
45	0 7.392	0 17.249	0 27.105	0 36.962	0 46.818	0 56.675	1 6.531	1 16.388	45 0.123
46	0 7.557	0 17.413	0 27.270	0 37.126	0 46.983	0 56.839	1 6.695	1 16.552	46 0.126
47	0 7.721	0 17.577	0 27.434	0 37.290	0 47.147	0 57.003	1 6.860	1 16.716	47 0.129
48	0 7.885	0 17.742	0 27.598	0 37.455	0 47.311	0 57.168	1 7.024	1 16.881	48 0.131
49	0 8.049	0 17.906	0 27.762	0 37.619	0 47.475	0 57.332	1 7.188	1 17.045	49 0.134
50	0 8.214	0 18.070	0 27.927	0 37.783	0 47.640	0 57.496	1 7.353	1 17.209	50 0.137
51	0 8.378	0 18.234	0 28.091	0 37.947	0 47.804	0 57.660	1 7.517	1 17.373	51 0.140
52	0 8.542	0 18.399	0 28.255	0 38.112	0 47.968	0 57.825	1 7.681	1 17.538	52 0.142
53	0 8.707	0 18.563	0 28.420	0 38.276	0 48.132	0 57.989	1 7.845	1 17.702	53 0.145
54	0 8.871	0 18.727	0 28.584	0 38.440	0 48.297	0 58.153	1 8.010	1 17.866	54 0.148
55	0 9.035	0 18.892	0 28.748	0 38.605	0 48.461	0 58.317	1 8.174	1 18.030	55 0.151
56	0 9.199	0 19.056	0 28.912	0 38.769	0 48.625	0 58.482	1 8.338	1 18.195	56 0.153
57	0 9.364	0 19.220	0 29.077	0 38.933	0 48.790	0 58.646	1 8.502	1 18.359	57 0.156
58	0 9.528	0 19.384	0 29.241	0 39.097	0 48.954	0 58.810	1 8.667	1 18.523	58 0.159
59	0 9.692	0 19.549	0 29.405	0 39.262	0 49.118	0 58.975	1 8.831	1 18.688	59 0.162

MEAN SOLAR INTO SIDEREAL TIME.

TO BE ADDED TO A MEAN TIME INTERVAL.

Mean Solar.	8 ^h	9 ^h	10 ^h	11 ^h	12 ^h	13 ^h	14 ^h	15 ^h	For Seconds.	
m	m s	m s	m s	m s	m s	m s	m s	m s	s	s
0	1 18.852	1 28.708	1 38.565	1 48.421	1 58.278	2 8.134	2 17.991	2 27.847	0	0.008
1	1 19.016	1 28.873	1 38.729	1 48.585	1 58.442	2 8.298	2 18.155	2 28.011	1	0.008
2	1 19.180	1 29.037	1 38.893	1 48.750	1 58.606	2 8.463	2 18.319	2 28.176	2	0.008
3	1 19.345	1 29.201	1 39.058	1 48.914	1 58.771	2 8.627	2 18.483	2 28.340	3	0.008
4	1 19.509	1 29.365	1 39.222	1 49.078	1 58.935	2 8.791	2 18.648	2 28.504	4	0.011
5	1 19.673	1 29.530	1 39.386	1 49.243	1 59.099	2 8.956	2 18.812	2 28.668	5	0.014
6	1 19.837	1 29.694	1 39.550	1 49.407	1 59.263	2 9.120	2 18.976	2 28.833	6	0.016
7	1 20.002	1 29.858	1 39.715	1 49.571	1 59.428	2 9.284	2 19.141	2 28.997	7	0.019
8	1 20.166	1 30.022	1 39.879	1 49.735	1 59.592	2 9.448	2 19.305	2 29.161	8	0.022
9	1 20.330	1 30.187	1 40.043	1 49.900	1 59.756	2 9.613	2 19.469	2 29.326	9	0.025
10	1 20.495	1 30.351	1 40.207	1 50.064	1 59.920	2 9.777	2 19.633	2 29.490	10	0.027
11	1 20.659	1 30.515	1 40.372	1 50.228	2 0.085	2 9.941	2 19.798	2 29.654	11	0.030
12	1 20.823	1 30.680	1 40.536	1 50.393	2 0.249	2 10.105	2 19.962	2 29.818	12	0.033
13	1 20.987	1 30.844	1 40.700	1 50.557	2 0.413	2 10.270	2 20.126	2 29.983	13	0.036
14	1 21.152	1 31.008	1 40.865	1 50.721	2 0.578	2 10.434	2 20.290	2 30.147	14	0.038
15	1 21.316	1 31.172	1 41.029	1 50.885	2 0.742	2 10.598	2 20.455	2 30.311	15	0.041
16	1 21.480	1 31.337	1 41.193	1 51.050	2 0.906	2 10.763	2 20.619	2 30.476	16	0.044
17	1 21.644	1 31.501	1 41.357	1 51.214	2 1.070	2 10.927	2 20.783	2 30.640	17	0.047
18	1 21.809	1 31.665	1 41.522	1 51.378	2 1.235	2 11.091	2 20.948	2 30.804	18	0.049
19	1 21.973	1 31.829	1 41.686	1 51.542	2 1.399	2 11.255	2 21.112	2 30.968	19	0.052
20	1 22.137	1 31.994	1 41.850	1 51.707	2 1.563	2 11.420	2 21.276	2 31.133	20	0.055
21	1 22.302	1 32.158	1 42.015	1 51.871	2 1.727	2 11.584	2 21.440	2 31.297	21	0.057
22	1 22.466	1 32.322	1 42.179	1 52.035	2 1.892	2 11.748	2 21.605	2 31.461	22	0.060
23	1 22.630	1 32.487	1 42.343	1 52.200	2 2.056	2 11.912	2 21.769	2 31.625	23	0.063
24	1 22.794	1 32.651	1 42.507	1 52.364	2 2.220	2 12.077	2 21.933	2 31.790	24	0.066
25	1 22.959	1 32.815	1 42.672	1 52.528	2 2.385	2 12.241	2 22.098	2 31.954	25	0.068
26	1 23.123	1 32.979	1 42.836	1 52.692	2 2.549	2 12.405	2 22.262	2 32.118	26	0.071
27	1 23.287	1 33.144	1 43.000	1 52.857	2 2.713	2 12.570	2 22.426	2 32.283	27	0.074
28	1 23.451	1 33.308	1 43.164	1 53.021	2 2.877	2 12.734	2 22.590	2 32.447	28	0.077
29	1 23.616	1 33.472	1 43.329	1 53.185	2 3.042	2 12.898	2 22.755	2 32.611	29	0.079
30	1 23.780	1 33.637	1 43.493	1 53.349	2 3.206	2 13.062	2 22.919	2 32.775	30	0.082
31	1 23.944	1 33.801	1 43.657	1 53.514	2 3.370	2 13.227	2 23.083	2 32.940	31	0.085
32	1 24.109	1 33.965	1 43.822	1 53.678	2 3.534	2 13.391	2 23.247	2 33.104	32	0.088
33	1 24.273	1 34.129	1 43.986	1 53.842	2 3.699	2 13.555	2 23.412	2 33.268	33	0.090
34	1 24.437	1 34.294	1 44.150	1 54.007	2 3.863	2 13.720	2 23.576	2 33.432	34	0.093
35	1 24.601	1 34.458	1 44.314	1 54.171	2 4.027	2 13.884	2 23.740	2 33.597	35	0.096
36	1 24.766	1 34.622	1 44.479	1 54.335	2 4.192	2 14.048	2 23.905	2 33.761	36	0.099
37	1 24.930	1 34.786	1 44.643	1 54.499	2 4.356	2 14.212	2 24.069	2 33.925	37	0.101
38	1 25.094	1 34.951	1 44.807	1 54.664	2 4.520	2 14.377	2 24.233	2 34.090	38	0.104
39	1 25.259	1 35.115	1 44.971	1 54.828	2 4.684	2 14.541	2 24.397	2 34.254	39	0.106
40	1 25.423	1 35.279	1 45.136	1 54.992	2 4.849	2 14.705	2 24.562	2 34.418	40	0.109
41	1 25.587	1 35.444	1 45.300	1 55.156	2 5.013	2 14.869	2 24.726	2 34.582	41	0.111
42	1 25.751	1 35.608	1 45.464	1 55.321	2 5.177	2 15.034	2 24.890	2 34.747	42	0.113
43	1 25.916	1 35.772	1 45.629	1 55.485	2 5.342	2 15.198	2 25.054	2 34.911	43	0.115
44	1 26.080	1 35.936	1 45.793	1 55.649	2 5.506	2 15.362	2 25.219	2 35.075	44	0.118
45	1 26.244	1 36.101	1 45.957	1 55.814	2 5.670	2 15.527	2 25.383	2 35.239	45	0.120
46	1 26.408	1 36.265	1 46.121	1 55.978	2 5.834	2 15.691	2 25.547	2 35.404	46	0.122
47	1 26.573	1 36.429	1 46.286	1 56.142	2 5.999	2 15.855	2 25.712	2 35.568	47	0.125
48	1 26.737	1 36.593	1 46.450	1 56.306	2 6.163	2 16.019	2 25.876	2 35.732	48	0.127
49	1 26.901	1 36.758	1 46.614	1 56.471	2 6.327	2 16.184	2 26.040	2 35.897	49	0.130
50	1 27.066	1 36.922	1 46.778	1 56.635	2 6.491	2 16.348	2 26.204	2 36.061	50	0.132
51	1 27.230	1 37.086	1 46.943	1 56.799	2 6.656	2 16.512	2 26.369	2 36.225	51	0.135
52	1 27.394	1 37.251	1 47.107	1 56.964	2 6.820	2 16.676	2 26.533	2 36.389	52	0.137
53	1 27.558	1 37.415	1 47.271	1 57.128	2 6.984	2 16.841	2 26.697	2 36.554	53	0.140
54	1 27.723	1 37.579	1 47.436	1 57.292	2 7.149	2 17.005	2 26.861	2 36.718	54	0.142
55	1 27.887	1 37.743	1 47.600	1 57.456	2 7.313	2 17.169	2 27.026	2 36.882	55	0.145
56	1 28.051	1 37.908	1 47.764	1 57.621	2 7.477	2 17.334	2 27.190	2 37.047	56	0.147
57	1 28.215	1 38.072	1 47.928	1 57.785	2 7.641	2 17.498	2 27.354	2 37.211	57	0.150
58	1 28.380	1 38.236	1 48.093	1 57.949	2 7.806	2 17.662	2 27.519	2 37.375	58	0.152
59	1 28.544	1 38.400	1 48.257	1 58.113	2 7.970	2 17.826	2 27.683	2 37.539	59	0.155

MEAN SOLAR INTO SIDEREAL TIME.

TO BE ADDED TO A MEAN TIME INTERVAL.

Mean Solar.	16 ^h	17 ^h	18 ^h	19 ^h	20 ^h	21 ^h	22 ^h	23 ^h	For Seconds.	
m	m s	m s	m s	m s	m s	m s	m s	m s	s	s
0	2 37.704	2 47.560	2 57.417	3 7.273	3 17.129	3 26.986	3 36.842	3 46.699	0	0.000
1	2 37.868	2 47.724	2 57.581	3 7.437	3 17.294	3 27.150	3 37.007	3 46.863	1	0.003
2	2 38.032	2 47.889	2 57.745	3 7.602	3 17.458	3 27.315	3 37.171	3 47.027	2	0.005
3	2 38.196	2 48.053	2 57.909	3 7.766	3 17.622	3 27.479	3 37.335	3 47.192	3	0.008
4	2 38.361	2 48.217	2 58.074	3 7.930	3 17.787	3 27.643	3 37.500	3 47.356	4	0.011
5	2 38.525	2 48.381	2 58.238	3 8.094	3 17.951	3 27.807	3 37.664	3 47.520	5	0.014
6	2 38.689	2 48.546	2 58.402	3 8.259	3 18.115	3 27.972	3 37.828	3 47.685	6	0.016
7	2 38.854	2 48.710	2 58.566	3 8.423	3 18.279	3 28.136	3 37.992	3 47.849	7	0.019
8	2 39.018	2 48.874	2 58.731	3 8.587	3 18.444	3 28.300	3 38.157	3 48.013	8	0.022
9	2 39.182	2 49.039	2 58.895	3 8.751	3 18.608	3 28.464	3 38.321	3 48.177	9	0.025
10	2 39.346	2 49.203	2 59.059	3 8.916	3 18.772	3 28.629	3 38.485	3 48.342	10	0.027
11	2 39.511	2 49.367	2 59.224	3 9.080	3 18.937	3 28.793	3 38.649	3 48.506	11	0.030
12	2 39.675	2 49.531	2 59.388	3 9.244	3 19.101	3 28.957	3 38.814	3 48.670	12	0.033
13	2 39.839	2 49.696	2 59.552	3 9.409	3 19.265	3 29.122	3 38.978	3 48.834	13	0.036
14	2 40.003	2 49.860	2 59.716	3 9.573	3 19.429	3 29.286	3 39.142	3 48.999	14	0.038
15	2 40.168	2 50.024	2 59.881	3 9.737	3 19.594	3 29.450	3 39.307	3 49.163	15	0.041
16	2 40.332	2 50.188	3 0.045	3 9.901	3 19.758	3 29.614	3 39.471	3 49.327	16	0.044
17	2 40.496	2 50.353	3 0.209	3 10.066	3 19.922	3 29.779	3 39.635	3 49.492	17	0.047
18	2 40.661	2 50.517	3 0.373	3 10.230	3 20.086	3 29.943	3 39.799	3 49.656	18	0.049
19	2 40.825	2 50.681	3 0.538	3 10.394	3 20.251	3 30.107	3 39.964	3 49.820	19	0.052
20	2 40.989	2 50.846	3 0.702	3 10.559	3 20.415	3 30.271	3 40.128	3 49.984	20	0.055
21	2 41.153	2 51.010	3 0.866	3 10.723	3 20.579	3 30.436	3 40.292	3 50.149	21	0.057
22	2 41.318	2 51.174	3 1.031	3 10.887	3 20.744	3 30.600	3 40.456	3 50.313	22	0.060
23	2 41.482	2 51.338	3 1.195	3 11.051	3 20.908	3 30.764	3 40.621	3 50.477	23	0.063
24	2 41.646	2 51.503	3 1.359	3 11.216	3 21.072	3 30.929	3 40.785	3 50.642	24	0.066
25	2 41.810	2 51.667	3 1.523	3 11.380	3 21.236	3 31.093	3 40.949	3 50.806	25	0.068
26	2 41.975	2 51.831	3 1.688	3 11.544	3 21.401	3 31.257	3 41.114	3 50.970	26	0.071
27	2 42.139	2 51.995	3 1.852	3 11.708	3 21.565	3 31.421	3 41.278	3 51.134	27	0.074
28	2 42.303	2 52.160	3 2.016	3 11.873	3 21.729	3 31.586	3 41.442	3 51.299	28	0.077
29	2 42.468	2 52.324	3 2.181	3 12.037	3 21.893	3 31.750	3 41.606	3 51.463	29	0.079
30	2 42.632	2 52.488	3 2.345	3 12.201	3 22.058	3 31.914	3 41.771	3 51.627	30	0.082
31	2 42.796	2 52.653	3 2.509	3 12.366	3 22.222	3 32.078	3 41.935	3 51.791	31	0.085
32	2 42.960	2 52.817	3 2.673	3 12.530	3 22.386	3 32.243	3 42.099	3 51.956	32	0.088
33	2 43.125	2 52.981	3 2.838	3 12.694	3 22.551	3 32.407	3 42.264	3 52.120	33	0.090
34	2 43.289	2 53.145	3 3.002	3 12.858	3 22.715	3 32.571	3 42.428	3 52.284	34	0.093
35	2 43.453	2 53.310	3 3.166	3 13.023	3 22.879	3 32.736	3 42.592	3 52.449	35	0.096
36	2 43.617	2 53.474	3 3.330	3 13.187	3 23.043	3 32.900	3 42.756	3 52.613	36	0.099
37	2 43.782	2 53.638	3 3.495	3 13.351	3 23.208	3 33.064	3 42.921	3 52.777	37	0.101
38	2 43.946	2 53.803	3 3.659	3 13.515	3 23.372	3 33.228	3 43.085	3 52.941	38	0.104
39	2 44.110	2 53.967	3 3.823	3 13.680	3 23.536	3 33.393	3 43.249	3 53.106	39	0.107
40	2 44.275	2 54.131	3 3.988	3 13.844	3 23.700	3 33.557	3 43.413	3 53.270	40	0.110
41	2 44.439	2 54.295	3 4.152	3 14.008	3 23.865	3 33.721	3 43.578	3 53.434	41	0.112
42	2 44.603	2 54.460	3 4.316	3 14.173	3 24.029	3 33.886	3 43.742	3 53.598	42	0.115
43	2 44.767	2 54.624	3 4.480	3 14.337	3 24.193	3 34.050	3 43.906	3 53.763	43	0.118
44	2 44.932	2 54.788	3 4.645	3 14.501	3 24.358	3 34.214	3 44.071	3 53.927	44	0.120
45	2 45.096	2 54.952	3 4.809	3 14.665	3 24.522	3 34.378	3 44.235	3 54.091	45	0.123
46	2 45.260	2 55.117	3 4.973	3 14.830	3 24.686	3 34.543	3 44.399	3 54.256	46	0.126
47	2 45.425	2 55.281	3 5.137	3 14.994	3 24.850	3 34.707	3 44.563	3 54.420	47	0.129
48	2 45.589	2 55.445	3 5.302	3 15.158	3 25.015	3 34.871	3 44.728	3 54.584	48	0.131
49	2 45.753	2 55.610	3 5.466	3 15.322	3 25.179	3 35.035	3 44.892	3 54.748	49	0.134
50	2 45.917	2 55.774	3 5.630	3 15.487	3 25.343	3 35.200	3 45.056	3 54.913	50	0.137
51	2 46.082	2 55.938	3 5.795	3 15.651	3 25.508	3 35.364	3 45.220	3 55.077	51	0.140
52	2 46.246	2 56.102	3 5.959	3 15.815	3 25.672	3 35.528	3 45.385	3 55.241	52	0.142
53	2 46.410	2 56.267	3 6.123	3 15.980	3 25.836	3 35.693	3 45.549	3 55.405	53	0.145
54	2 46.574	2 56.431	3 6.287	3 16.144	3 26.000	3 35.857	3 45.713	3 55.570	54	0.148
55	2 46.739	2 56.595	3 6.452	3 16.308	3 26.165	3 36.021	3 45.878	3 55.734	55	0.151
56	2 46.903	2 56.759	3 6.616	3 16.472	3 26.329	3 36.185	3 46.042	3 55.898	56	0.153
57	2 47.067	2 56.924	3 6.780	3 16.637	3 26.493	3 36.350	3 46.206	3 56.063	57	0.156
58	2 47.232	2 57.088	3 6.944	3 16.801	3 26.657	3 36.514	3 46.370	3 56.227	58	0.159
59	2 47.396	2 57.252	3 7.109	3 16.965	3 26.822	3 36.678	3 46.535	3 56.391	59	0.162

AZIMUTH OF POLARIS AT ALL HOUR ANGLES, 1916.

[For hour angles 0^h to 12^h the star is west of north, and for hour angles 12^h to 24^h it is east of north.]

Lat. H.A.		10°	15°	20°	22°	24°	26°	28°	30°	32°	Lat. H.A.
h m		°	°	°	°	°	°	°	°	°	h m
0 0		0 0.0	0 0.0	0 0.0	0 0.0	0 0.0	0 0.0	0 0.0	0 0.0	0 0.0	24 0
10		0 3.0	0 3.1	0 3.2	0 3.2	0 3.3	0 3.4	0 3.4	0 3.5	0 3.6	23 50
20		0 6.1	0 6.2	0 6.4	0 6.5	0 6.6	0 6.7	0 6.8	0 7.0	0 7.1	40
0 30		0 9.1	0 9.3	0 9.6	0 9.7	0 9.8	0 10.0	0 10.2	0 10.4	0 10.6	23 30
40		0 12.1	0 12.3	0 12.7	0 12.9	0 13.1	0 13.3	0 13.6	0 13.8	0 14.1	20
50		0 15.1	0 15.4	0 15.8	0 16.1	0 16.3	0 16.6	0 16.9	0 17.2	0 17.6	10
1 0		0 18.0	0 18.4	0 18.9	0 19.2	0 19.5	0 19.8	0 20.2	0 20.6	0 21.1	23 0
10		0 20.9	0 21.4	0 22.0	0 22.3	0 22.7	0 23.0	0 23.5	0 24.0	0 24.5	22 50
20		0 23.8	0 24.3	0 25.0	0 25.4	0 25.8	0 26.2	0 26.7	0 27.3	0 27.9	40
1 30		0 26.6	0 27.2	0 28.0	0 28.4	0 28.8	0 29.3	0 29.9	0 30.5	0 31.2	22 30
40		0 29.4	0 30.0	0 30.9	0 31.3	0 31.8	0 32.4	0 33.0	0 33.7	0 34.4	20
50		0 32.1	0 32.8	0 33.7	0 34.2	0 34.8	0 35.4	0 36.0	0 36.8	0 37.6	10
2 0		0 34.8	0 35.5	0 36.5	0 37.1	0 37.6	0 38.3	0 39.0	0 39.8	0 40.7	22 0
10		0 37.4	0 38.1	0 39.3	0 39.8	0 40.4	0 41.1	0 41.9	0 42.8	0 43.7	21 50
20		0 39.9	0 40.7	0 41.9	0 42.5	0 43.2	0 43.9	0 44.7	0 45.6	0 46.6	40
2 30		0 42.3	0 43.2	0 44.5	0 45.1	0 45.8	0 46.6	0 47.4	0 48.4	0 49.5	21 30
40		0 44.7	0 45.6	0 46.9	0 47.6	0 48.3	0 49.2	0 50.1	0 51.1	0 52.2	20
50		0 46.9	0 47.9	0 49.3	0 50.0	0 50.8	0 51.7	0 52.6	0 53.7	0 54.9	10
3 0		0 49.1	0 50.2	0 51.6	0 52.3	0 53.2	0 54.1	0 55.1	0 56.2	0 57.4	21 0
10		0 51.2	0 52.3	0 53.8	0 54.6	0 55.4	0 56.4	0 57.4	0 58.5	0 59.8	20 50
20		0 53.2	0 54.3	0 55.9	0 56.7	0 57.6	0 58.5	0 59.6	1 0.8	1 2.1	40
3 30		0 55.1	0 56.2	0 57.9	0 58.7	0 59.6	1 0.6	1 1.7	1 3.0	1 4.3	20 30
40		0 56.9	0 58.1	0 59.7	1 0.6	1 1.5	1 2.6	1 3.7	1 5.0	1 6.4	20
50		0 58.6	0 59.8	1 1.5	1 2.4	1 3.3	1 4.4	1 5.6	1 6.9	1 8.3	10
4 0		1 0.1	1 1.4	1 3.1	1 4.0	1 5.0	1 6.1	1 7.3	1 8.6	1 10.1	20 0
10		1 1.6	1 2.8	1 4.6	1 5.5	1 6.5	1 7.7	1 8.9	1 10.3	1 11.8	19 50
20		1 2.9	1 4.2	1 6.0	1 6.9	1 8.0	1 9.1	1 10.4	1 11.8	1 13.3	40
4 30		1 4.1	1 5.4	1 7.3	1 8.2	1 9.3	1 10.4	1 11.7	1 13.1	1 14.7	19 30
40		1 5.2	1 6.5	1 8.4	1 9.4	1 10.4	1 11.6	1 12.9	1 14.3	1 15.9	20
50		1 6.2	1 7.5	1 9.4	1 10.4	1 11.4	1 12.6	1 14.0	1 15.4	1 17.0	10
5 0		1 7.0	1 8.3	1 10.3	1 11.3	1 12.3	1 13.5	1 14.9	1 16.3	1 18.0	19 0
10		1 7.7	1 9.1	1 11.0	1 12.0	1 13.1	1 14.3	1 15.6	1 17.1	1 18.8	18 50
20		1 8.3	1 9.7	1 11.6	1 12.6	1 13.7	1 14.9	1 16.3	1 17.8	1 19.4	40
5 30		1 8.7	1 10.1	1 12.1	1 13.1	1 14.2	1 15.4	1 16.7	1 18.3	1 19.9	18 30
40		1 9.1	1 10.4	1 12.4	1 13.4	1 14.5	1 15.7	1 17.1	1 18.6	1 20.3	20
50		1 9.3	1 10.6	1 12.6	1 13.6	1 14.7	1 15.9	1 17.3	1 18.8	1 20.5	10
6 0		1 9.3	1 10.7	1 12.6	1 13.6	1 14.7	1 15.9	1 17.3	1 18.8	1 20.5	18 0
10		1 9.2	1 10.6	1 12.5	1 13.5	1 14.6	1 15.8	1 17.2	1 18.7	1 20.4	17 50
20		1 9.0	1 10.4	1 12.3	1 13.3	1 14.4	1 15.6	1 16.9	1 18.4	1 20.1	40
6 30		1 8.7	1 10.0	1 11.9	1 12.9	1 14.0	1 15.2	1 16.5	1 18.0	1 19.7	17 30
40		1 8.2	1 9.5	1 11.4	1 12.4	1 13.5	1 14.7	1 16.0	1 17.5	1 19.1	20
50		1 7.6	1 8.9	1 10.8	1 11.7	1 12.8	1 14.0	1 15.3	1 16.8	1 18.4	10
7 0		1 6.9	1 8.2	1 10.0	1 10.9	1 12.0	1 13.2	1 14.5	1 15.9	1 17.5	17 0
10		1 6.0	1 7.3	1 9.1	1 10.0	1 11.1	1 12.2	1 13.5	1 14.9	1 16.5	16 50
20		1 5.0	1 6.3	1 8.1	1 9.0	1 10.0	1 11.1	1 12.4	1 13.8	1 15.3	40
7 30		1 3.9	1 5.2	1 6.9	1 7.8	1 8.8	1 9.9	1 11.1	1 12.5	1 14.0	16 30
40		1 2.7	1 3.9	1 5.6	1 6.5	1 7.5	1 8.5	1 9.7	1 11.1	1 12.6	20
50		1 1.4	1 2.5	1 4.2	1 5.1	1 6.0	1 7.0	1 8.2	1 9.5	1 11.0	10
8 0		0 59.9	1 1.0	1 2.7	1 3.5	1 4.4	1 5.4	1 6.6	1 7.9	1 9.3	16 0
10		0 58.3	0 59.4	1 1.0	1 1.8	1 2.7	1 3.7	1 4.8	1 6.1	1 7.4	15 50
20		0 56.7	0 57.7	0 59.2	1 0.0	1 0.9	1 1.9	1 2.9	1 4.1	1 5.5	40
8 30		0 54.9	0 55.9	0 57.4	0 58.1	0 59.0	0 59.9	1 0.9	1 2.1	1 3.4	15 30
40		0 53.0	0 53.9	0 55.4	0 56.1	0 56.9	0 57.8	0 58.8	0 59.9	1 1.2	20
50		0 51.0	0 51.9	0 53.3	0 54.0	0 54.7	0 55.6	0 56.6	0 57.7	0 58.8	10
9 0		0 48.9	0 49.8	0 51.1	0 51.8	0 52.5	0 53.3	0 54.2	0 55.3	0 56.4	15 0

AZIMUTH OF POLARIS AT ALL HOUR ANGLES, 1916.

[For hour angles 0^h to 12^h the star is west of north, and for hour angles 12^h to 24^h it is east of north.]

Lat. H. A.		10°	15°	20°	22°	24°	26°	28°	30°	32°	Lat. H. A.		
h	m	°	′	°	′	°	′	°	′	°	′	h	m
9	0	0 48.9	0 49.8	0 51.1	0 51.8	0 52.5	0 53.3	0 54.2	0 55.3	0 56.4		15	0
	10	0 46.7	0 47.5	0 48.8	0 49.4	0 50.1	0 50.9	0 51.8	0 52.8	0 53.9		14	50
	20	0 44.4	0 45.2	0 46.4	0 47.0	0 47.7	0 48.4	0 49.3	0 50.2	0 51.2			40
9	30	0 42.1	0 42.8	0 44.0	0 44.5	0 45.2	0 45.9	0 46.7	0 47.5	0 48.5		14	30
	40	0 39.6	0 40.3	0 41.4	0 41.9	0 42.5	0 43.2	0 44.0	0 44.8	0 45.7			20
	50	0 37.1	0 37.8	0 38.8	0 39.3	0 39.8	0 40.5	0 41.2	0 41.9	0 42.8			10
10	0	0 34.5	0 35.2	0 36.1	0 36.5	0 37.1	0 37.7	0 38.3	0 39.0	0 39.8		14	0
	10	0 31.9	0 32.5	0 33.3	0 33.7	0 34.2	0 34.8	0 35.4	0 36.0	0 36.8		13	50
	20	0 29.2	0 29.7	0 30.5	0 30.9	0 31.3	0 31.8	0 32.4	0 33.0	0 33.6			40
10	30	0 26.4	0 26.9	0 27.6	0 28.0	0 28.4	0 28.8	0 29.3	0 29.9	0 30.4		13	30
	40	0 23.6	0 24.0	0 24.7	0 25.0	0 25.3	0 25.7	0 26.2	0 26.7	0 27.2			20
	50	0 20.8	0 21.1	0 21.7	0 22.0	0 22.3	0 22.6	0 23.0	0 23.5	0 23.9			10
11	0	0 17.9	0 18.2	0 18.7	0 18.9	0 19.2	0 19.5	0 19.8	0 20.2	0 20.6		13	0
	10	0 15.0	0 15.2	0 15.6	0 15.8	0 16.0	0 16.3	0 16.6	0 16.9	0 17.2		12	50
	20	0 12.0	0 12.2	0 12.5	0 12.7	0 12.9	0 13.1	0 13.3	0 13.5	0 13.8			40
11	30	0 9.0	0 9.2	0 9.4	0 9.5	0 9.7	0 9.8	0 10.0	0 10.2	0 10.4		12	30
	40	0 6.0	0 6.1	0 6.3	0 6.4	0 6.5	0 6.6	0 6.7	0 6.8	0 6.9			20
	50	0 3.0	0 3.1	0 3.1	0 3.2	0 3.2	0 3.3	0 3.3	0 3.4	0 3.5			10
12	0	0 0.0	0 0.0	0 0.0	0 0.0	0 0.0	0 0.0	0 0.0	0 0.0	0 0.0		12	0

Lat.											Lat.		
H. A.		32°	34°	36°	38°	40°	42°	44°	46°	48°		H. A.	
h	m	°	′	°	′	°	′	°	′	°	′	h	m
0	0	0 0.0	0 0.0	0 0.0	0 0.0	0 0.0	0 0.0	0 0.0	0 0.0	0 0.0		24	0
	10	0 3.6	0 3.6	0 3.7	0 3.8	0 3.9	0 4.1	0 4.2	0 4.4	0 4.6		23	50
	20	0 7.1	0 7.3	0 7.5	0 7.7	0 7.9	0 8.2	0 8.4	0 8.8	0 9.1			40
0	30	0 10.6	0 10.9	0 11.2	0 11.5	0 11.8	0 12.2	0 12.6	0 13.1	0 13.6		23	30
	40	0 14.1	0 14.5	0 14.9	0 15.3	0 15.7	0 16.2	0 16.8	0 17.4	0 18.1			20
	50	0 17.6	0 18.1	0 18.5	0 19.0	0 19.6	0 20.2	0 20.9	0 21.7	0 22.6			10
1	0	0 21.1	0 21.6	0 22.1	0 22.7	0 23.4	0 24.2	0 25.0	0 25.9	0 27.0		23	0
	10	0 24.5	0 25.1	0 25.7	0 26.4	0 27.2	0 28.1	0 29.0	0 30.1	0 31.3		22	50
	20	0 27.9	0 28.5	0 29.2	0 30.0	0 30.9	0 31.9	0 33.0	0 34.2	0 35.6			40
1	30	0 31.2	0 31.9	0 32.7	0 33.6	0 34.6	0 35.7	0 36.9	0 38.3	0 39.8		22	30
	40	0 34.4	0 35.2	0 36.1	0 37.1	0 38.2	0 39.4	0 40.8	0 42.3	0 44.0			20
	50	0 37.6	0 38.5	0 39.5	0 40.5	0 41.7	0 43.1	0 44.6	0 46.2	0 48.0			10
2	0	0 40.7	0 41.6	0 42.7	0 43.9	0 45.2	0 46.6	0 48.2	0 50.0	0 52.0		22	0
	10	0 43.7	0 44.7	0 45.9	0 47.1	0 48.5	0 50.1	0 51.8	0 53.7	0 55.8		21	50
	20	0 46.6	0 47.7	0 49.0	0 50.3	0 51.8	0 53.4	0 55.3	0 57.3	0 59.6			40
2	30	0 49.5	0 50.6	0 51.9	0 53.4	0 55.0	0 56.7	0 58.6	1 0.8	1 3.2		21	30
	40	0 52.2	0 53.5	0 54.8	0 56.3	0 58.0	0 59.8	1 1.9	1 4.2	1 6.7			20
	50	0 54.9	0 56.2	0 57.6	0 59.2	1 0.9	1 2.9	1 5.0	1 7.4	1 10.0			10
3	0	0 57.4	0 58.8	1 0.3	1 1.9	1 3.7	1 5.8	1 8.0	1 10.5	1 13.2		21	0
	10	0 59.8	1 1.2	1 2.8	1 4.5	1 6.4	1 8.5	1 10.9	1 13.5	1 16.3		20	50
	20	1 2.1	1 3.6	1 5.2	1 7.0	1 9.0	1 11.1	1 13.6	1 16.3	1 19.2			40
3	30	1 4.3	1 5.8	1 7.5	1 9.4	1 11.4	1 13.6	1 16.2	1 18.9	1 22.0		20	30
	40	1 6.4	1 7.9	1 9.7	1 11.6	1 13.7	1 16.0	1 18.6	1 21.4	1 24.6			20
	50	1 8.3	1 9.9	1 11.7	1 13.7	1 15.8	1 18.2	1 20.9	1 23.8	1 27.0			10
4	0	1 10.1	1 11.8	1 13.6	1 15.6	1 17.8	1 20.2	1 23.0	1 26.0	1 29.3		20	0
	10	1 11.8	1 13.5	1 15.3	1 17.4	1 19.6	1 22.1	1 24.9	1 28.0	1 31.4		19	50
	20	1 13.3	1 15.0	1 16.9	1 19.0	1 21.3	1 23.9	1 26.7	1 29.8	1 33.3			40
4	30	1 14.7	1 16.4	1 18.4	1 20.5	1 22.8	1 25.4	1 28.3	1 31.5	1 35.0		19	30
	40	1 15.9	1 17.7	1 19.7	1 21.8	1 24.2	1 26.8	1 29.7	1 33.0	1 36.6			20
	50	1 17.0	1 18.8	1 20.8	1 23.0	1 25.4	1 28.1	1 31.0	1 34.3	1 37.9			10
5	0	1 18.0	1 19.8	1 21.8	1 24.0	1 26.4	1 29.1	1 32.1	1 35.4	1 39.1		19	0

AZIMUTH OF POLARIS AT ALL HOUR ANGLES, 1916.

[For hour angles 0^h to 12^h the star is west of north, and for hour angles 12^h to 24^h it is east of north.]

Lat. H. A.		32°	34°	36°	38°	40°	42°	44°	46°	48°	Lat. H. A.	
h m		° ' "	° ' "	° ' "	° ' "	° ' "	° ' "	° ' "	° ' "	° ' "	h m	
		1 18.0	1 19.8	1 21.8	1 24.0	1 26.4	1 29.1	1 32.1	1 35.4	1 39.1		
		1 18.8	1 20.6	1 22.6	1 24.8	1 27.3	1 30.0	1 33.0	1 36.3	1 40.1		
5 0	10	1 19.4	1 21.3	1 23.3	1 25.5	1 28.0	1 30.7	1 33.7	1 37.1	1 40.8	18 50	40
5 30	40	1 19.9	1 21.8	1 23.8	1 26.0	1 28.5	1 31.3	1 34.3	1 37.7	1 41.4	18 30	20
40	50	1 20.3	1 22.1	1 24.1	1 26.4	1 28.9	1 31.6	1 34.7	1 38.1	1 41.8	18 10	10
50	6 0	1 20.5	1 22.3	1 24.3	1 26.6	1 29.1	1 31.8	1 34.9	1 38.2	1 42.0	18 0	0
6 0	10	1 20.5	1 22.3	1 24.4	1 26.6	1 29.1	1 31.8	1 34.9	1 38.2	1 42.0	17 50	40
10	20	1 20.4	1 22.2	1 24.2	1 26.5	1 28.9	1 31.7	1 34.7	1 38.1	1 41.8	17 30	20
20	30	1 20.1	1 21.9	1 23.9	1 26.2	1 28.6	1 31.4	1 34.4	1 37.7	1 41.4	17 10	10
30	40	1 19.7	1 21.5	1 23.5	1 25.7	1 28.1	1 30.9	1 33.8	1 37.1	1 40.8	17 0	0
40	50	1 19.1	1 20.9	1 22.9	1 25.1	1 27.5	1 30.2	1 33.1	1 36.4	1 40.1	16 50	40
50	7 0	1 18.4	1 20.1	1 22.1	1 24.3	1 26.7	1 29.3	1 32.2	1 35.5	1 39.1	16 30	20
7 0	10	1 17.5	1 19.2	1 21.2	1 23.3	1 25.7	1 28.3	1 31.2	1 34.4	1 38.0	16 10	10
10	20	1 16.5	1 18.2	1 20.1	1 22.2	1 24.5	1 27.1	1 30.0	1 33.1	1 36.6	16 0	0
20	30	1 15.3	1 17.0	1 18.9	1 20.9	1 23.2	1 25.8	1 28.6	1 31.7	1 35.1	15 50	40
30	40	1 14.0	1 15.7	1 17.5	1 19.5	1 21.8	1 24.3	1 27.0	1 30.1	1 33.4	15 30	20
40	50	1 12.6	1 14.2	1 16.0	1 18.0	1 20.2	1 22.6	1 25.3	1 28.3	1 31.6	15 10	10
50	8 0	1 11.0	1 12.6	1 14.3	1 16.3	1 18.4	1 20.8	1 23.4	1 26.3	1 29.6	15 0	0
8 0	10	1 9.3	1 10.8	1 12.5	1 14.4	1 16.5	1 18.8	1 21.4	1 24.2	1 27.4	14 50	40
10	20	1 7.4	1 8.9	1 10.6	1 12.4	1 14.5	1 16.7	1 19.2	1 21.9	1 25.0	14 30	20
20	30	1 5.5	1 6.9	1 8.5	1 10.3	1 12.3	1 14.5	1 16.9	1 19.5	1 22.5	14 10	10
30	40	1 3.4	1 4.8	1 6.3	1 8.1	1 10.0	1 12.1	1 14.4	1 17.0	1 19.8	14 0	0
40	50	1 1.2	1 2.5	1 4.0	1 5.7	1 7.5	1 9.6	1 11.8	1 14.3	1 17.0	13 50	40
50	9 0	0 58.8	1 0.1	1 1.6	1 3.2	1 5.0	1 6.9	1 9.1	1 11.4	1 14.1	13 30	20
9 0	10	0 56.4	0 57.7	0 59.0	1 0.6	1 2.3	1 4.1	1 6.2	1 8.5	1 11.0	13 10	10
10	20	0 53.9	0 55.1	0 56.4	0 57.8	0 59.4	1 1.2	1 3.2	1 5.4	1 7.8	13 0	0
20	30	0 51.2	0 52.4	0 53.6	0 55.0	0 56.5	0 58.2	1 0.1	1 2.2	1 4.4	12 50	40
30	40	0 48.5	0 49.6	0 50.8	0 52.1	0 53.5	0 55.1	0 56.9	0 58.8	1 1.0	12 30	20
40	50	0 45.7	0 46.7	0 47.8	0 49.0	0 50.4	0 51.9	0 53.6	0 55.4	0 57.4	12 10	10
50	10 0	0 42.8	0 43.7	0 44.8	0 45.9	0 47.2	0 48.6	0 50.2	0 51.9	0 53.8	12 0	0
10 0	10	0 39.8	0 40.7	0 41.7	0 42.7	0 43.9	0 45.2	0 46.7	0 48.2	0 50.0	11 50	40
10	20	0 36.8	0 37.6	0 38.5	0 39.4	0 40.5	0 41.7	0 43.1	0 44.5	0 46.2	11 30	20
20	30	0 33.6	0 34.4	0 35.2	0 36.1	0 37.1	0 38.2	0 39.4	0 40.7	0 42.2	11 10	10
30	40	0 30.4	0 31.1	0 31.9	0 32.7	0 33.6	0 34.6	0 35.7	0 36.9	0 38.2	11 0	0
40	50	0 27.2	0 27.8	0 28.5	0 29.2	0 30.0	0 30.9	0 31.9	0 33.0	0 34.2	10 50	40
50	11 0	0 23.9	0 24.4	0 25.0	0 25.7	0 26.4	0 27.2	0 28.0	0 29.0	0 30.0	10 30	20
11 0	10	0 20.6	0 21.0	0 21.5	0 22.1	0 22.7	0 23.4	0 24.1	0 24.9	0 25.8	10 10	10
10	20	0 17.2	0 17.6	0 18.0	0 18.5	0 19.0	0 19.5	0 20.2	0 20.8	0 21.6	10 0	0
20	30	0 13.8	0 14.1	0 14.4	0 14.8	0 15.2	0 15.7	0 16.2	0 16.7	0 17.3	9 50	40
30	40	0 10.4	0 10.6	0 10.8	0 11.1	0 11.4	0 11.8	0 12.2	0 12.6	0 13.0	9 30	20
40	50	0 6.9	0 7.1	0 7.2	0 7.4	0 7.6	0 7.8	0 8.1	0 8.4	0 8.7	9 10	10
50	12 0	0 3.5	0 3.5	0 3.6	0 3.7	0 3.8	0 3.9	0 4.1	0 4.2	0 4.3	9 0	0
12 0	0 0.0	0 0.0	0 0.0	0 0.0	0 0.0	0 0.0	0 0.0	0 0.0	0 0.0	0 0.0	8 50	40

Lat. H. A.		48°	50°	52°	54°	56°	58°	60°	61°	62°	Lat. H. A.	
h m		° ' "	° ' "	° ' "	° ' "	° ' "	° ' "	° ' "	° ' "	° ' "	h m	
		0 0.0	0 0.0	0 0.0	0 0.0	0 0.0	0 0.0	0 0.0	0 0.0	0 0.0		
		0 4.6	0 4.7	0 5.0	0 5.2	0 5.5	0 5.8	0 6.2	0 6.4	0 6.6		
0 10	20	0 9.1	0 9.5	0 9.9	0 10.4	0 10.9	0 11.6	0 12.3	0 12.7	0 13.2	23 50	40
0 30	40	0 13.6	0 14.2	0 14.8	0 15.6	0 16.4	0 17.3	0 18.4	0 19.1	0 19.7	23 30	20
40	50	0 18.1	0 18.9	0 19.7	0 20.7	0 21.8	0 23.0	0 24.5	0 25.3	0 26.2	23 10	10
50	1 0	0 22.6	0 23.5	0 24.6	0 25.8	0 27.2	0 28.7	0 30.5	0 31.6	0 32.7	23 0	0
1 0	0 27.0	0 28.1	0 29.4	0 30.8	0 32.5	0 34.4	0 36.5	0 37.7	0 39.0			

TABLE IV.

AZIMUTH OF POLARIS AT ALL HOUR ANGLES, 1916.

[For hour angles 0^h to 12^h the star is west of north, and for hour angles 12^h to 24^h it is east of north.]

H. A.	Lat.		48°	50°	52°	54°	56°	58°	60°	61°	62°	Lat.	H. A.
h m	°	'	°	'	°	'	°	'	°	'	°	'	h m
1 0	0 27.0	0 28.1	0 29.4	0 30.8	0 32.5	0 34.4	0 36.5	0 37.7	0 39.0	0 39.0	23 0		
10	0 31.3	0 32.6	0 34.1	0 35.8	0 37.7	0 39.9	0 42.4	0 43.8	0 45.3	0 45.3	22 50		
20	0 35.6	0 37.1	0 38.8	0 40.7	0 42.9	0 45.4	0 48.2	0 49.8	0 51.5	0 51.5	40		
1 30	0 39.8	0 41.5	0 43.4	0 45.6	0 48.0	0 50.7	0 53.9	0 55.7	0 57.6	0 57.6	22 30		
40	0 44.0	0 45.8	0 47.9	0 50.3	0 53.0	0 56.0	0 59.5	1 1.5	1 3.6	1 3.6	20		
50	0 48.0	0 50.1	0 52.3	0 54.9	0 57.8	1 1.2	1 5.0	1 7.1	1 9.4	1 9.4	10		
2 0	0 52.0	0 54.2	0 56.6	0 59.4	1 2.6	1 6.2	1 10.3	1 12.6	1 15.1	1 15.1	22 0		
10	0 55.8	0 58.2	1 0.8	1 3.8	1 7.2	1 11.1	1 15.5	1 18.0	1 20.6	1 20.6	21 50		
20	0 59.6	1 2.1	1 4.9	1 8.1	1 11.7	1 15.8	1 20.5	1 23.2	1 26.0	1 26.0	40		
2 30	1 3.2	1 5.9	1 8.8	1 12.2	1 16.0	1 20.4	1 25.4	1 28.2	1 31.2	1 31.2	21 30		
40	1 6.7	1 9.5	1 12.6	1 16.2	1 20.2	1 24.8	1 30.1	1 33.0	1 36.2	1 36.2	20		
50	1 10.0	1 13.0	1 16.3	1 20.0	1 24.2	1 29.0	1 34.6	1 37.7	1 41.0	1 41.0	10		
3 0	1 13.2	1 16.3	1 19.8	1 23.7	1 28.1	1 33.1	1 38.9	1 42.1	1 45.6	1 45.6	21 0		
10	1 16.3	1 19.5	1 23.1	1 27.2	1 31.8	1 37.0	1 43.0	1 46.3	1 50.0	1 50.0	20 50		
20	1 19.2	1 22.6	1 26.3	1 30.5	1 35.3	1 40.7	1 46.9	1 50.3	1 54.1	1 54.1	40		
3 30	1 22.0	1 25.5	1 29.3	1 33.6	1 38.6	1 44.2	1 50.6	1 54.1	1 58.0	1 58.0	20 30		
40	1 24.6	1 28.2	1 32.1	1 36.6	1 41.7	1 47.4	1 54.0	1 57.7	2 1.7	2 1.7	20		
50	1 27.0	1 30.7	1 34.8	1 39.4	1 44.6	1 50.5	1 57.3	2 1.0	2 5.1	2 5.1	10		
4 0	1 29.3	1 33.0	1 37.2	1 41.9	1 47.3	1 53.3	2 0.2	2 4.1	2 8.3	2 8.3	20 0		
10	1 31.4	1 35.2	1 39.5	1 44.3	1 49.7	1 55.9	2 3.0	2 6.9	2 11.2	2 11.2	19 50		
20	1 33.3	1 37.2	1 41.6	1 46.5	1 52.0	1 58.3	2 5.5	2 9.5	2 13.8	2 13.8	40		
4 30	1 35.0	1 39.0	1 43.4	1 48.4	1 54.0	2 0.4	2 7.8	2 11.8	2 16.2	2 16.2	19 30		
40	1 36.6	1 40.6	1 45.1	1 50.1	1 55.8	2 2.3	2 9.8	2 13.9	2 18.3	2 18.3	20		
50	1 37.9	1 42.0	1 46.5	1 51.6	1 57.4	2 4.0	2 11.5	2 15.7	2 20.2	2 20.2	10		
5 0	1 39.1	1 43.2	1 47.8	1 52.9	1 58.8	2 5.4	2 13.0	2 17.2	2 21.7	2 21.7	19 0		
10	1 40.1	1 44.2	1 48.8	1 54.0	1 59.9	2 6.6	2 14.2	2 18.5	2 23.0	2 23.0	18 50		
20	1 40.8	1 45.0	1 49.6	1 54.9	2 0.8	2 7.5	2 15.2	2 19.5	2 24.0	2 24.0	40		
5 30	1 41.4	1 45.6	1 50.3	1 55.5	2 1.5	2 8.2	2 15.9	2 20.2	2 24.8	2 24.8	18 30		
40	1 41.8	1 46.0	1 50.7	1 55.9	2 1.9	2 8.6	2 16.4	2 20.6	2 25.2	2 25.2	20		
50	1 42.0	1 46.2	1 50.9	1 56.1	2 2.1	2 8.8	2 16.6	2 20.8	2 25.4	2 25.4	10		
6 0	1 42.0	1 46.2	1 50.9	1 56.1	2 2.1	2 8.8	2 16.5	2 20.7	2 25.3	2 25.3	18 0		
10	1 41.8	1 46.0	1 50.6	1 55.9	2 1.8	2 8.5	2 16.1	2 20.4	2 24.9	2 24.9	17 50		
20	1 41.4	1 45.6	1 50.2	1 55.4	2 1.3	2 8.0	2 15.5	2 19.8	2 24.3	2 24.3	40		
6 30	1 40.8	1 44.9	1 49.6	1 54.7	2 0.6	2 7.2	2 14.7	2 18.9	2 23.4	2 23.4	17 30		
40	1 40.1	1 44.1	1 48.7	1 53.8	1 59.6	2 6.2	2 13.6	2 17.7	2 22.2	2 22.2	20		
50	1 39.1	1 43.1	1 47.6	1 52.7	1 58.4	2 4.9	2 12.3	2 16.3	2 20.7	2 20.7	10		
7 0	1 38.0	1 41.9	1 46.4	1 51.4	1 57.0	2 3.4	2 10.7	2 14.7	2 19.0	2 19.0	17 0		
10	1 36.6	1 40.5	1 44.9	1 49.8	1 55.4	2 1.6	2 8.8	2 12.8	2 17.0	2 17.0	16 50		
20	1 35.1	1 39.0	1 43.3	1 48.1	1 53.5	1 59.7	2 6.7	2 10.7	2 14.8	2 14.8	40		
7 30	1 33.4	1 37.2	1 41.4	1 46.2	1 51.5	1 57.5	2 4.4	2 8.3	2 12.4	2 12.4	16 30		
40	1 31.6	1 35.3	1 39.4	1 44.0	1 49.2	1 55.2	2 1.9	2 5.6	2 9.7	2 9.7	20		
50	1 29.6	1 33.2	1 37.2	1 41.7	1 46.8	1 52.6	1 59.2	2 2.8	2 6.7	2 6.7	10		
8 0	1 27.4	1 30.9	1 34.8	1 39.2	1 44.1	1 49.8	1 56.2	1 59.7	2 3.5	2 3.5	16 0		
10	1 25.0	1 28.4	1 32.2	1 36.5	1 41.3	1 46.8	1 53.0	1 56.5	2 0.1	2 0.1	15 50		
20	1 22.5	1 25.8	1 29.5	1 33.6	1 38.3	1 43.6	1 49.6	1 53.0	1 56.5	1 56.5	40		
8 30	1 19.8	1 23.0	1 26.6	1 30.6	1 35.1	1 40.2	1 46.0	1 49.3	1 52.7	1 52.7	15 30		
40	1 17.0	1 20.1	1 23.5	1 27.4	1 31.7	1 36.6	1 42.3	1 45.4	1 48.7	1 48.7	20		
50	1 14.1	1 17.0	1 20.3	1 24.0	1 28.2	1 32.9	1 38.3	1 41.3	1 44.5	1 44.5	10		
9 0	1 11.0	1 13.8	1 17.0	1 20.5	1 24.5	1 29.0	1 34.2	1 37.1	1 40.1	1 40.1	15 0		
10	1 7.8	1 10.5	1 13.5	1 16.9	1 20.7	1 25.0	1 29.9	1 32.7	1 35.6	1 35.6	14 50		
20	1 4.4	1 7.0	1 9.9	1 13.1	1 16.7	1 20.8	1 25.5	1 28.1	1 30.8	1 30.8	40		
9 30	1 1.0	1 3.4	1 6.1	1 9.2	1 12.6	1 16.4	1 20.9	1 23.3	1 25.9	1 25.9	14 30		
40	0 57.4	0 59.7	1 2.3	1 5.1	1 8.3	1 11.9	1 16.1	1 18.4	1 20.9	1 20.9	20		
50	0 53.8	0 55.9	0 58.3	1 1.0	1 3.9	1 7.3	1 11.2	1 13.4	1 15.7	1 15.7	10		
10 0	0 50.0	0 52.0	0 54.2	0 56.7	0 59.5	1 2.6	1 6.2	1 8.3	1 10.4	1 10.4	14 0		

AZIMUTH OF POLARIS AT ALL HOUR ANGLES, 1916.

[For hour angles 0^h to 12^h the star is west of north, and for hour angles 12^h to 24^h it is east of north.]

Lat. H.A.	48°	50°	52°	54°	56°	58°	60°	61°	62°	Lat. H.A.
h m	° ' "	° ' "	° ' "	° ' "	° ' "	° ' "	° ' "	° ' "	° ' "	h m
10 0	0 50.0	0 52.0	0 54.2	0 56.7	0 59.5	1 2.6	1 6.2	1 8.3	1 10.4	14 0
10 10	0 46.2	0 48.0	0 50.0	0 52.3	0 54.9	0 57.8	1 1.1	1 3.0	1 5.0	13 50
10 20	0 42.2	0 43.9	0 45.8	0 47.8	0 50.2	0 52.9	0 55.9	0 57.6	0 59.4	40
10 30	0 38.2	0 39.7	0 41.4	0 43.3	0 45.4	0 47.8	0 50.6	0 52.2	0 53.8	13 30
10 40	0 34.2	0 35.5	0 37.0	0 38.7	0 40.6	0 42.7	0 45.2	0 46.6	0 48.0	20
10 50	0 30.0	0 31.2	0 32.5	0 34.0	0 35.7	0 37.5	0 39.7	0 40.9	0 42.2	10
11 0	0 25.8	0 26.8	0 28.0	0 29.3	0 30.7	0 32.3	0 34.2	0 35.2	0 36.3	13 0
11 10	0 21.6	0 22.4	0 23.4	0 24.5	0 25.7	0 27.0	0 28.6	0 29.4	0 30.4	12 50
11 20	0 17.3	0 18.0	0 18.8	0 19.6	0 20.6	0 21.7	0 22.9	0 23.6	0 24.4	40
11 30	0 13.0	0 13.5	0 14.1	0 14.7	0 15.5	0 16.3	0 17.2	0 17.8	0 18.3	12 30
11 40	0 8.7	0 9.0	0 9.4	0 9.8	0 10.3	0 10.9	0 11.5	0 11.9	0 12.2	20
11 50	0 4.3	0 4.5	0 4.7	0 4.9	0 5.2	0 5.4	0 5.8	0 6.0	0 6.1	10
12 0	0 0.0	0 0.0	0 0.0	0 0.0	0 0.0	0 0.0	0 0.0	0 0.0	0 0.0	12 0

Lat. H.A.	62°	63°	64°	65°	66°	67°	68°	69°	70°	Lat. H.A.
h m	° ' "	° ' "	° ' "	° ' "	° ' "	° ' "	° ' "	° ' "	° ' "	h m
0 0	0 0.0	0 0.0	0 0.0	0 0.0	0 0.0	0 0.0	0 0.0	0 0.0	0 0.0	24 0
0 10	0 6.8	0 6.8	0 7.1	0 7.4	0 7.7	0 8.0	0 8.4	0 8.8	0 9.2	23 50
0 20	0 13.2	0 13.6	0 14.2	0 14.7	0 15.3	0 16.0	0 16.7	0 17.5	0 18.4	40
0 30	0 19.7	0 20.4	0 21.2	0 22.0	0 22.9	0 23.9	0 25.0	0 26.2	0 27.5	23 30
0 40	0 26.2	0 27.1	0 28.2	0 29.3	0 30.5	0 31.8	0 33.2	0 34.8	0 36.6	20
0 50	0 32.7	0 33.8	0 35.1	0 36.5	0 38.0	0 39.6	0 41.4	0 43.4	0 45.6	10
1 0	0 39.0	0 40.4	0 41.9	0 43.6	0 45.4	0 47.3	0 49.5	0 51.9	0 54.5	23 0
1 10	0 45.3	0 47.0	0 48.7	0 50.6	0 52.7	0 55.0	0 57.5	1 0.3	1 3.3	22 50
1 20	0 51.5	0 53.4	0 55.4	0 57.5	0 59.9	1 2.5	1 5.3	1 8.5	1 11.9	40
1 30	0 57.6	0 59.7	1 1.9	1 4.3	1 7.0	1 9.9	1 13.0	1 16.5	1 20.4	22 30
1 40	1 3.6	1 5.9	1 8.3	1 11.0	1 13.9	1 17.1	1 20.6	1 24.4	1 28.7	20
1 50	1 9.4	1 11.9	1 14.6	1 17.5	1 20.7	1 24.1	1 28.0	1 32.1	1 36.8	10
2 0	1 15.1	1 17.8	1 20.7	1 23.8	1 27.3	1 31.0	1 35.1	1 39.7	1 44.7	22 0
2 10	1 20.6	1 23.5	1 26.6	1 30.0	1 33.7	1 37.7	1 42.1	1 47.0	1 52.4	21 50
2 20	1 26.0	1 29.1	1 32.4	1 36.0	1 39.9	1 44.2	1 48.9	1 54.1	1 59.8	40
2 30	1 31.2	1 34.4	1 37.9	1 41.7	1 45.9	1 50.4	1 55.4	2 0.9	2 6.9	21 30
2 40	1 36.2	1 39.6	1 43.3	1 47.3	1 51.7	1 56.4	2 1.7	2 7.4	2 13.8	20
2 50	1 41.0	1 44.6	1 48.4	1 52.6	1 57.2	2 2.2	2 7.7	2 13.7	2 20.4	10
3 0	1 45.6	1 49.3	1 53.3	1 57.7	2 2.5	2 7.7	2 13.4	2 19.7	2 26.7	21 0
3 10	1 50.0	1 53.8	1 58.0	2 2.6	2 7.5	2 12.9	2 18.9	2 25.4	2 32.7	20 50
3 20	1 54.1	1 58.1	2 2.4	2 7.2	2 12.3	2 17.9	2 24.1	2 30.8	2 38.3	40
3 30	1 58.0	2 2.1	2 6.6	2 11.5	2 16.8	2 22.6	2 28.9	2 35.9	2 43.6	20 30
3 40	2 1.7	2 5.9	2 10.5	2 15.6	2 21.0	2 27.0	2 33.5	2 40.7	2 48.6	20
3 50	2 5.1	2 9.5	2 14.2	2 19.3	2 24.9	2 31.0	2 37.7	2 45.1	2 53.3	10
4 0	2 8.3	2 12.7	2 17.6	2 22.8	2 28.6	2 34.8	2 41.7	2 49.2	2 57.5	20 0
4 10	2 11.2	2 15.7	2 20.7	2 26.1	2 31.9	2 38.3	2 45.3	2 52.9	3 1.4	19 50
4 20	2 13.8	2 18.5	2 23.5	2 29.0	2 34.9	2 41.4	2 48.5	2 56.3	3 5.0	40
4 30	2 16.2	2 20.9	2 26.0	2 31.6	2 37.6	2 44.2	2 51.4	2 59.4	3 8.1	19 30
4 40	2 18.3	2 23.1	2 28.3	2 33.9	2 40.0	2 46.7	2 54.0	3 2.1	3 10.9	20
4 50	2 20.2	2 25.0	2 30.2	2 35.9	2 42.1	2 48.9	2 56.2	3 4.4	3 13.3	10
5 0	2 21.7	2 26.6	2 31.9	2 37.6	2 43.9	2 50.7	2 58.1	3 6.3	3 15.3	19 0
5 10	2 23.0	2 28.0	2 33.3	2 39.0	2 45.3	2 52.2	2 59.6	3 7.9	3 17.0	18 50
5 20	2 24.0	2 29.0	2 34.3	2 40.1	2 46.4	2 53.3	3 0.8	3 9.1	3 18.2	40
5 30	2 24.8	2 29.7	2 35.1	2 40.9	2 47.2	2 54.1	3 1.6	3 9.9	3 19.1	18 30
5 40	2 25.2	2 30.2	2 35.6	2 41.4	2 47.7	2 54.6	3 2.1	3 10.4	3 19.5	20
5 50	2 25.4	2 30.4	2 35.7	2 41.6	2 47.9	2 54.7	3 2.2	3 10.5	3 19.6	10
6 0	2 25.3	2 30.3	2 35.6	2 41.4	2 47.7	2 54.5	3 2.0	3 10.3	3 19.4	18 0

AZIMUTH OF POLARIS AT ALL HOUR ANGLES, 1916.

[For hour angles 0° to 12° the star is west of north, and for hour angles 12° to 24° it is east of north.]

Lat. H. A.		62°	63°	64°	65°	66°	67°	68°	69°	70°	Lat. H. A.	
h m		° '	° '	° '	° '	° '	° '	° '	° '	° '	h m	
6	0	2 25.3	2 30.3	2 35.6	2 41.4	2 47.7	2 54.5	3 2.0	3 10.3	3 19.4	18	0
	10	2 24.9	2 29.9	2 35.2	2 41.0	2 47.2	2 54.0	3 1.5	3 9.7	3 18.7		50
	20	2 24.3	2 29.2	2 34.5	2 40.2	2 46.4	2 53.2	3 0.6	3 8.7	3 17.7		40
6	30	2 23.4	2 28.2	2 33.5	2 39.1	2 45.3	2 52.0	2 59.4	3 7.4	3 16.3	17	30
	40	2 22.2	2 27.0	2 32.2	2 37.8	2 43.9	2 50.5	2 57.8	3 5.7	3 14.5		20
	50	2 20.7	2 25.5	2 30.6	2 36.1	2 42.2	2 48.7	2 55.9	3 3.7	3 12.4		10
7	0	2 19.0	2 23.7	2 28.7	2 34.2	2 40.1	2 46.6	2 53.6	3 1.4	3 9.9	17	0
	10	2 17.0	2 21.7	2 26.6	2 32.0	2 37.8	2 44.2	2 51.1	2 58.7	3 7.1		50
	20	2 14.8	2 19.4	2 24.2	2 29.5	2 35.2	2 41.4	2 48.3	2 55.7	3 3.9		40
7	30	2 12.4	2 16.8	2 21.6	2 26.7	2 32.3	2 38.4	2 45.1	2 52.4	3 0.4	16	30
	40	2 9.7	2 14.0	2 18.7	2 23.7	2 29.2	2 35.1	2 41.6	2 48.8	2 56.6		20
	50	2 6.7	2 11.0	2 15.5	2 20.4	2 25.8	2 31.6	2 37.9	2 44.9	2 52.5		10
8	0	2 3.5	2 7.7	2 12.1	2 16.9	2 22.1	2 27.7	2 33.9	2 40.7	2 48.1	16	0
	10	2 0.1	2 4.2	2 8.5	2 13.1	2 18.2	2 23.6	2 29.6	2 36.2	2 43.4		50
	20	1 56.5	2 0.4	2 4.6	2 9.1	2 14.0	2 19.3	2 25.1	2 31.4	2 38.4		40
8	30	1 52.7	1 56.5	2 0.5	2 4.9	2 9.6	2 14.7	2 20.3	2 26.4	2 33.1	15	30
	40	1 48.7	1 52.3	1 56.2	2 0.4	2 4.9	2 9.9	2 15.2	2 21.1	2 27.6		20
	50	1 44.5	1 48.0	1 51.7	1 55.7	2 0.1	2 4.8	2 10.0	2 15.6	2 21.8		10
9	0	1 40.1	1 43.4	1 47.0	1 50.8	1 55.0	1 59.5	2 4.5	2 9.9	2 15.8	15	0
	10	1 35.6	1 38.7	1 42.1	1 45.8	1 49.7	1 54.0	1 58.7	2 3.9	2 9.6		50
	20	1 30.8	1 33.8	1 37.0	1 40.5	1 44.3	1 48.4	1 52.8	1 57.7	2 3.1		40
9	30	1 25.9	1 28.8	1 31.8	1 35.1	1 38.7	1 42.5	1 46.7	1 51.3	1 56.4	14	30
	40	1 20.9	1 23.6	1 26.4	1 29.5	1 32.9	1 36.5	1 40.4	1 44.8	1 49.5		20
	50	1 15.7	1 18.2	1 20.9	1 23.8	1 26.9	1 30.3	1 34.0	1 38.0	1 42.5		10
10	0	1 10.4	1 12.7	1 15.2	1 17.9	1 20.8	1 23.9	1 27.4	1 31.1	1 35.3	14	0
	10	1 5.0	1 7.1	1 9.4	1 11.9	1 14.5	1 17.4	1 20.6	1 24.1	1 27.9		50
	20	0 59.4	1 1.4	1 3.5	1 5.7	1 8.2	1 10.8	1 13.7	1 16.9	1 20.4		40
10	30	0 53.8	0 55.5	0 57.4	0 59.5	1 1.7	1 4.1	1 6.7	1 9.6	1 12.7	13	30
	40	0 48.0	0 49.6	0 51.3	0 53.1	0 55.1	0 57.2	0 59.6	1 2.1	1 4.9		20
	50	0 42.2	0 43.6	0 45.1	0 46.7	0 48.4	0 50.3	0 52.3	0 54.6	0 57.1		10
11	0	0 36.3	0 37.5	0 38.8	0 40.2	0 41.6	0 43.3	0 45.0	0 47.0	0 49.1	13	0
	10	0 30.4	0 31.3	0 32.4	0 33.6	0 34.8	0 36.2	0 37.6	0 39.2	0 41.0		50
	20	0 24.4	0 25.1	0 26.0	0 26.9	0 27.9	0 29.0	0 30.2	0 31.5	0 32.9		40
11	30	0 18.3	0 18.9	0 19.5	0 20.2	0 21.0	0 21.8	0 22.7	0 23.7	0 24.7	12	30
	40	0 12.2	0 12.6	0 13.0	0 13.5	0 14.0	0 14.5	0 15.2	0 15.8	0 16.5		20
	50	0 6.1	0 6.3	0 6.5	0 6.8	0 7.0	0 7.3	0 7.6	0 7.9	0 8.3		10
12	0	0 0.0	0 0.0	0 0.0	0 0.0	0 0.0	0 0.0	0 0.0	0 0.0	0 0.0	12	0

TABLE IVa.

Table IV has been computed for a declination of 88° 51' 45". For other declinations of Polaris the correction given below should be applied to the Azimuth taken from Table IV.

Azimuth. Decl.		0'	20'	40'	60'	80'	100'	120'	140'	160'	180'	200'	Azimuth. Decl.	
° ' "		° '	° '	° '	° '	° '	° '	° '	° '	° '	° '	° '	° ' "	
88 51 20	0.0	+0.1	+0.2	+0.4	+0.5	+0.6	+0.7	+0.8	+1.0	+1.1	+1.2		88 51 20	
	0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0			
	0.0	+0.1	0.1	0.2	0.3	0.4	0.4	0.5	0.6	0.7	0.7			
	0.0	0.0	+0.1	0.1	0.2	0.2	0.3	0.3	0.4	0.4	0.5			
88 51 30	0.0	0.0	0.0	+0.1	+0.1	+0.1	+0.1	+0.2	+0.2	+0.2	+0.2		88 51 30	
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
	0.0	0.0	0.0	-0.1	-0.1	-0.1	-0.1	-0.2	-0.2	-0.2	-0.2			
88 51 40	0.0	0.0	0.0	-0.1	-0.2	-0.2	-0.3	-0.3	-0.4	-0.4	-0.5		88 51 40	
	0.0	-0.1	0.1	0.2	0.3	0.4	0.4	0.5	0.6	0.7	0.7			
	0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0			
	0.0	-0.1	-0.2	-0.4	-0.5	-0.6	-0.7	-0.8	-1.0	-1.1	-1.2			

AZIMUTH OF POLARIS AT ELONGATION, 1916.

Decl. Lat.	88° 51' 20"			88° 51' 30"			88° 51' 40"			88° 51' 50"			88° 52' 0"			88° 52' 10"			Variation for—	
																1' of Lat.	1" of δ .			
° ' "	° ' "	° ' "	° ' "	° ' "	° ' "	° ' "	° ' "	° ' "	° ' "	° ' "	° ' "	° ' "	° ' "	° ' "	° ' "	° ' "	° ' "	° ' "	° ' "	
10 0	1 9 43.6	1 9 33.4	1 9 23.3	1 9 13.1	1 9 2.9	1 8 52.8	+0.21	—1.02												
10 20	1 9 47.9	1 9 37.8	1 9 27.6	1 9 17.4	1 9 7.3	1 8 57.1	0.22	1.02												
10 40	1 9 52.4	1 9 42.3	1 9 32.1	1 9 21.9	1 9 11.8	1 9 1.6	0.23	1.02												
11 0	1 9 57.1	1 9 46.9	1 9 36.8	1 9 26.6	1 9 16.4	1 9 6.2	0.24	1.02												
11 20	1 10 1.9	1 9 51.7	1 9 41.6	1 9 31.4	1 9 21.2	1 9 11.0	0.24	1.02												
11 40	1 10 6.9	1 9 56.7	1 9 46.5	1 9 36.3	1 9 26.1	1 9 15.9	+0.25	—1.02												
12 0	1 10 12.1	1 10 1.8	1 9 51.6	1 9 41.4	1 9 31.2	1 9 20.9	0.26	1.02												
12 20	1 10 17.3	1 10 7.1	1 9 56.9	1 9 46.6	1 9 36.4	1 9 26.2	0.27	1.02												
12 40	1 10 22.8	1 10 12.5	1 10 2.3	1 9 52.0	1 9 41.8	1 9 31.5	0.28	1.03												
13 0	1 10 28.4	1 10 18.1	1 10 7.9	1 9 57.6	1 9 47.3	1 9 37.1	0.28	1.03												
13 20	1 10 34.2	1 10 23.9	1 10 13.6	1 10 3.3	1 9 53.0	1 9 42.8	+0.29	—1.03												
13 40	1 10 40.1	1 10 29.8	1 10 19.5	1 10 9.2	1 9 58.9	1 9 48.6	0.30	1.03												
14 0	1 10 46.2	1 10 35.8	1 10 25.5	1 10 15.2	1 10 4.9	1 9 54.6	0.30	1.03												
14 20	1 10 52.4	1 10 42.1	1 10 31.7	1 10 21.4	1 10 11.1	1 10 0.8	0.31	1.03												
14 40	1 10 58.8	1 10 48.4	1 10 38.1	1 10 27.8	1 10 17.4	1 10 7.1	0.32	1.03												
15 0	1 11 5.4	1 10 55.0	1 10 44.6	1 10 34.3	1 10 23.9	1 10 13.6	+0.33	—1.04												
15 20	1 11 12.1	1 11 1.7	1 10 51.4	1 10 41.0	1 10 30.6	1 10 20.2	0.34	1.04												
15 40	1 11 19.0	1 11 8.6	1 10 58.2	1 10 47.8	1 10 37.4	1 10 27.1	0.34	1.04												
16 0	1 11 26.1	1 11 15.7	1 11 5.2	1 10 54.8	1 10 44.4	1 10 34.0	0.35	1.04												
16 20	1 11 33.3	1 11 22.9	1 11 12.4	1 11 2.0	1 10 51.6	1 10 41.2	0.36	1.04												
16 40	1 11 40.7	1 11 30.3	1 11 19.8	1 11 9.4	1 10 58.9	1 10 48.5	+0.37	—1.04												
17 0	1 11 48.3	1 11 37.8	1 11 27.4	1 11 16.9	1 11 6.4	1 10 56.0	0.38	1.05												
17 20	1 11 56.0	1 11 45.5	1 11 35.1	1 11 24.6	1 11 14.1	1 11 3.6	0.39	1.05												
17 40	1 12 4.0	1 11 53.5	1 11 43.0	1 11 32.5	1 11 22.0	1 11 11.5	0.40	1.05												
18 0	1 12 12.1	1 12 1.5	1 11 51.0	1 11 40.5	1 11 30.0	1 11 19.5	0.41	1.05												
18 20	1 12 20.3	1 12 9.8	1 11 59.3	1 11 48.7	1 11 38.2	1 11 27.7	+0.42	—1.05												
18 40	1 12 28.8	1 12 18.2	1 12 7.7	1 11 57.1	1 11 46.6	1 11 36.0	0.42	1.05												
19 0	1 12 37.4	1 12 26.9	1 12 16.3	1 12 5.7	1 11 55.1	1 11 44.5	0.43	1.05												
19 20	1 12 46.2	1 12 35.6	1 12 25.1	1 12 14.5	1 12 3.9	1 11 53.3	0.44	1.05												
19 40	1 12 55.3	1 12 44.6	1 12 34.0	1 12 23.4	1 12 12.8	1 12 2.2	0.45	1.05												
20 0	1 13 4.4	1 12 53.8	1 12 43.2	1 12 32.5	1 12 21.9	1 12 11.2	+0.46	—1.06												
20 20	1 13 13.8	1 13 3.2	1 12 52.5	1 12 41.8	1 12 31.2	1 12 20.5	0.47	1.07												
20 40	1 13 23.4	1 13 12.7	1 13 2.0	1 12 51.3	1 12 40.7	1 12 30.0	0.48	1.07												
21 0	1 13 33.2	1 13 22.5	1 13 11.7	1 13 1.0	1 12 50.3	1 12 39.6	0.49	1.07												
21 20	1 13 43.1	1 13 32.4	1 13 21.6	1 13 10.9	1 13 0.2	1 12 49.4	0.50	1.07												
21 40	1 13 53.3	1 13 42.5	1 13 31.7	1 13 21.0	1 13 10.2	1 12 59.5	+0.51	—1.06												
22 0	1 14 3.6	1 13 52.8	1 13 42.0	1 13 31.2	1 13 20.5	1 13 9.7	0.52	1.06												
22 20	1 14 14.2	1 14 3.4	1 13 52.5	1 13 41.7	1 13 30.9	1 13 20.1	0.53	1.06												
22 40	1 14 24.9	1 14 14.1	1 14 3.2	1 13 52.4	1 13 41.6	1 13 30.7	0.54	1.06												
23 0	1 14 35.9	1 14 25.0	1 14 14.1	1 14 3.3	1 13 52.4	1 13 41.5	0.55	1.06												
23 20	1 14 47.0	1 14 36.1	1 14 25.2	1 14 14.3	1 14 3.4	1 13 52.6	+0.56	—1.09												
23 40	1 14 58.4	1 14 47.5	1 14 36.5	1 14 25.6	1 14 14.7	1 14 3.8	0.57	1.09												
24 0	1 15 10.0	1 14 59.0	1 14 48.1	1 14 37.1	1 14 26.2	1 14 15.2	0.58	1.10												
24 20	1 15 21.8	1 15 10.8	1 14 59.8	1 14 48.8	1 14 37.9	1 14 26.9	0.59	1.10												
24 40	1 15 33.8	1 15 22.8	1 15 11.8	1 15 0.8	1 14 49.7	1 14 38.7	0.60	1.10												
25 0	1 15 46.0	1 15 34.9	1 15 23.9	1 15 12.9	1 15 1.8	1 14 50.8	+0.61	—1.10												
25 20	1 15 58.4	1 15 47.4	1 15 36.3	1 15 25.2	1 15 14.2	1 15 3.1	0.62	1.11												
25 40	1 16 11.1	1 16 0.0	1 15 48.9	1 15 37.8	1 15 26.7	1 15 15.6	0.64	1.11												
26 0	1 16 24.0	1 16 12.9	1 16 1.7	1 15 50.6	1 15 39.5	1 15 28.4	0.65	1.11												
26 20	1 16 37.1	1 16 26.0	1 16 14.8	1 16 3.6	1 15 52.5	1 15 41.3	0.66	1.12												
26 40	1 16 50.5	1 16 39.3	1 16 28.1	1 16 16.9	1 16 5.7	1 15 54.5	+0.67	—1.12												
27 0	1 17 4.1	1 16 52.8	1 16 41.6	1 16 30.4	1 16 19.2	1 16 7.9	0.68	1.12												
27 20	1 17 17.9	1 17 6.6	1 16 55.4	1 16 44.1	1 16 32.9	1 16 21.6	0.69	1.13												
27 40	1 17 32.0	1 17 20.7	1 17 9.4	1 16 58.1	1 16 46.8	1 16 35.5	0.70	1.13												
28 0	1 17 46.3	1 17 34.9	1 17 23.6	1 17 12.3	1 17 1.0	1 16 49.6	0.72	1.13												
28 20	1 18 0.8	1 17 49.5	1 17 38.1	1 17 26.8	1 17 15.4	1 17 4.0	+0.73	—1.14												
28 40	1 18 15.6	1 18 4.3	1 17 52.8	1 17 41.5	1 17 30.1	1 17 18.7	0.74	1.14												
29 0	1 18 30.7	1 18 19.3	1 18 7.8	1 17 56.4	1 17 45.0	1 17 33.5	0.76	1.14												
29 20	1 18 46.0	1 18 34.6	1 18 23.1	1 18 11.6	1 18 0.2	1 17 48.7	0.77	1.15												
29 40	1 19 1.6	1 18 50.1	1 18 38.6	1 18 27.1	1 18 15.6	1 18 4.1	0.78	1.15												
30 0	1 19 17.5	1 19 5.9	1 18 54.4	1 18 42.8	1 18 31.3	1 18 19.7	+0.79	—1.16												

AZIMUTH OF POLARIS AT ELONGATION, 1916.

Decl. r.	88° 51' 20"	88° 51' 30"	88° 51' 40"	88° 51' 50"	88° 52' 0"	88° 52' 10"	Variation for—	
							1' of Lat.	1" of s.
° ' "	° ' "	° ' "	° ' "	° ' "	° ' "	° ' "	"	"
30 0	1 19 17.5	1 19 5.9	1 18 54.4	1 18 42.8	1 18 31.3	1 18 19.7	+0.79	-1.16
30 10	1 19 25.5	1 19 13.9	1 19 2.4	1 18 50.8	1 18 39.2	1 18 27.7	0.80	1.16
30 20	1 19 33.6	1 19 22.0	1 19 10.4	1 18 58.8	1 18 47.2	1 18 35.7	0.81	1.16
30 30	1 19 41.8	1 19 30.1	1 19 18.5	1 19 6.9	1 18 55.3	1 18 43.7	0.82	1.16
30 40	1 19 50.0	1 19 38.4	1 19 26.7	1 19 15.1	1 19 3.5	1 18 51.8	0.82	1.16
30 50	1 19 58.3	1 19 46.6	1 19 35.0	1 19 23.3	1 19 11.7	1 19 0.0	+0.83	-1.17
31 0	1 20 6.6	1 19 55.0	1 19 43.3	1 19 31.6	1 19 20.0	1 19 8.3	0.84	1.17
31 10	1 20 15.1	1 20 3.4	1 19 51.7	1 19 40.0	1 19 28.3	1 19 16.6	0.84	1.17
31 20	1 20 23.6	1 20 11.9	1 20 0.2	1 19 48.5	1 19 36.8	1 19 25.0	0.85	1.17
31 30	1 20 32.2	1 20 20.4	1 20 8.7	1 19 57.0	1 19 45.3	1 19 33.5	0.86	1.17
31 40	1 20 40.8	1 20 29.1	1 20 17.3	1 20 5.6	1 19 53.8	1 19 42.1	+0.86	-1.17
31 50	1 20 49.5	1 20 37.8	1 20 26.0	1 20 14.2	1 20 2.5	1 19 50.7	0.87	1.18
32 0	1 20 58.3	1 20 46.5	1 20 34.8	1 20 23.0	1 20 11.2	1 19 59.4	0.88	1.18
32 10	1 21 7.2	1 20 55.4	1 20 43.6	1 20 31.8	1 20 19.9	1 20 8.1	0.88	1.18
32 20	1 21 16.2	1 21 4.3	1 20 52.5	1 20 40.6	1 20 28.8	1 20 17.0	0.89	1.18
32 30	1 21 25.2	1 21 13.3	1 21 1.5	1 20 49.6	1 20 37.7	1 20 25.9	+0.90	-1.19
32 40	1 21 34.3	1 21 22.4	1 21 10.5	1 20 58.6	1 20 46.7	1 20 34.9	0.91	1.19
32 50	1 21 43.4	1 21 31.5	1 21 19.6	1 21 7.7	1 20 55.8	1 20 43.9	0.92	1.19
33 0	1 21 52.7	1 21 40.7	1 21 28.8	1 21 16.9	1 21 5.0	1 20 53.1	0.92	1.19
33 10	1 22 2.0	1 21 50.0	1 21 38.1	1 21 26.2	1 21 14.2	1 21 2.3	0.93	1.19
33 20	1 22 11.4	1 21 59.4	1 21 47.4	1 21 35.5	1 21 23.5	1 21 11.5	+0.94	-1.20
33 30	1 22 20.9	1 22 8.9	1 21 56.9	1 21 44.9	1 21 32.9	1 21 20.9	0.95	1.20
33 40	1 22 30.4	1 22 18.4	1 22 6.4	1 21 54.4	1 21 42.4	1 21 30.3	0.95	1.20
33 50	1 22 40.1	1 22 28.0	1 22 16.0	1 22 3.9	1 21 51.9	1 21 39.9	0.96	1.20
34 0	1 22 49.8	1 22 37.7	1 22 25.6	1 22 13.6	1 22 1.5	1 21 49.5	0.97	1.21
34 10	1 22 59.6	1 22 47.5	1 22 35.4	1 22 23.3	1 22 11.2	1 21 59.1	+0.98	-1.21
34 20	1 23 9.4	1 22 57.3	1 22 45.2	1 22 33.1	1 22 21.0	1 22 8.9	0.98	1.21
34 30	1 23 19.4	1 23 7.3	1 22 55.1	1 22 43.0	1 22 30.9	1 22 18.7	0.99	1.21
34 40	1 23 29.4	1 23 17.3	1 23 5.1	1 22 53.0	1 22 40.8	1 22 28.6	1.00	1.22
34 50	1 23 39.6	1 23 27.4	1 23 15.2	1 23 3.0	1 22 50.8	1 22 38.6	1.01	1.22
35 0	1 23 49.8	1 23 37.5	1 23 25.3	1 23 13.1	1 23 0.9	1 22 48.7	+1.02	-1.22
35 10	1 24 0.0	1 23 47.8	1 23 35.6	1 23 23.4	1 23 11.1	1 22 58.9	1.03	1.22
35 20	1 24 10.4	1 23 58.2	1 23 45.9	1 23 33.6	1 23 21.4	1 23 9.1	1.03	1.23
35 30	1 24 20.9	1 24 8.6	1 23 56.3	1 23 44.0	1 23 31.7	1 23 19.5	1.04	1.23
35 40	1 24 31.4	1 24 19.1	1 24 6.8	1 23 54.5	1 23 42.2	1 23 29.9	1.05	1.23
35 50	1 24 42.1	1 24 29.7	1 24 17.4	1 24 5.0	1 23 52.7	1 23 40.4	+1.06	-1.23
36 0	1 24 52.8	1 24 40.4	1 24 28.0	1 24 15.7	1 24 3.3	1 23 51.0	1.07	1.24
36 10	1 25 3.6	1 24 51.2	1 24 38.8	1 24 26.4	1 24 14.0	1 24 1.6	1.08	1.24
36 20	1 25 14.5	1 25 2.1	1 24 49.6	1 24 37.2	1 24 24.8	1 24 12.4	1.09	1.24
36 30	1 25 25.5	1 25 13.0	1 25 0.6	1 24 48.2	1 24 35.7	1 24 23.3	1.10	1.24
36 40	1 25 36.6	1 25 24.1	1 25 11.6	1 24 59.2	1 24 46.7	1 24 34.2	+1.10	-1.25
36 50	1 25 47.7	1 25 35.2	1 25 22.7	1 25 10.2	1 24 57.7	1 24 45.2	1.11	1.25
37 0	1 25 59.0	1 25 46.5	1 25 34.0	1 25 21.4	1 25 8.9	1 24 56.4	1.12	1.25
37 10	1 26 10.3	1 25 57.8	1 25 45.2	1 25 32.7	1 25 20.1	1 25 7.6	1.13	1.25
37 20	1 26 21.8	1 26 9.2	1 25 56.6	1 25 44.1	1 25 31.5	1 25 18.9	1.14	1.26
37 30	1 26 33.3	1 26 20.7	1 26 8.1	1 25 55.5	1 25 42.9	1 25 30.3	+1.15	-1.26
37 40	1 26 45.0	1 26 32.4	1 26 19.7	1 26 7.1	1 25 54.5	1 25 41.8	1.16	1.26
37 50	1 26 56.7	1 26 44.1	1 26 31.4	1 26 18.7	1 26 6.1	1 25 53.4	1.17	1.27
38 0	1 27 8.6	1 26 55.9	1 26 43.2	1 26 30.5	1 26 17.8	1 26 5.1	1.18	1.27
38 10	1 27 20.5	1 27 7.8	1 26 55.1	1 26 42.3	1 26 29.6	1 26 16.9	1.19	1.27
38 20	1 27 32.5	1 27 19.8	1 27 7.0	1 26 54.3	1 26 41.5	1 26 28.8	+1.20	-1.27
38 30	1 27 44.7	1 27 31.9	1 27 19.1	1 27 6.3	1 26 53.5	1 26 40.8	1.21	1.28
38 40	1 27 56.9	1 27 44.1	1 27 31.3	1 27 18.5	1 27 5.7	1 26 52.9	1.22	1.28
38 50	1 28 9.2	1 27 56.4	1 27 43.6	1 27 30.7	1 27 17.9	1 27 5.0	1.23	1.28
39 0	1 28 21.7	1 28 8.8	1 27 55.9	1 27 43.1	1 27 30.2	1 27 17.3	1.24	1.29
39 10	1 28 34.2	1 28 21.3	1 28 8.4	1 27 55.5	1 27 42.6	1 27 29.7	+1.25	-1.29
39 20	1 28 46.9	1 28 33.9	1 28 21.0	1 28 8.1	1 27 55.1	1 27 42.2	1.26	1.29
39 30	1 28 59.6	1 28 46.7	1 28 33.7	1 28 20.7	1 28 7.8	1 27 54.8	1.27	1.30
39 40	1 29 12.5	1 28 59.5	1 28 46.5	1 28 33.5	1 28 20.5	1 28 7.5	1.28	1.30
39 50	1 29 25.4	1 29 12.4	1 28 59.4	1 28 46.4	1 28 33.4	1 28 20.3	1.29	1.30
40 0	1 29 38.5	1 29 25.5	1 29 12.4	1 28 59.4	1 28 46.3	1 28 33.2	+1.30	-1.31

AZIMUTH OF POLARIS AT ELONGATION, 1916.

Decl. Lat.	88° 51' 20"	88° 51' 30"	88° 51' 40"	88° 51' 50"	88° 52' 0"	88° 52' 10"	Variation in—	
							1" of Lat.	1" of L.
40 0	1 29 38.5	1 29 25.5	1 29 12.4	1 28 59.4	1 28 46.3	1 28 33.2	+1.30	-1.31
40 10	1 29 51.7	1 29 38.6	1 29 25.5	1 29 12.4	1 28 59.4	1 28 46.3	1.32	1.31
40 20	1 30 5.0	1 29 51.9	1 29 38.8	1 29 25.7	1 29 12.5	1 28 59.4	1.33	1.31
40 30	1 30 18.4	1 30 5.3	1 29 52.1	1 29 39.0	1 29 25.8	1 29 12.7	1.34	1.31
40 40	1 30 31.9	1 30 18.8	1 30 5.6	1 29 52.4	1 29 39.2	1 29 26.0	1.35	1.32
40 50	1 30 45.6	1 30 32.4	1 30 19.1	1 30 5.9	1 29 52.7	1 29 39.5	+1.36	-1.32
41 0	1 30 59.3	1 30 46.1	1 30 32.8	1 30 19.6	1 30 6.3	1 29 53.1	1.37	1.32
41 10	1 31 13.2	1 30 59.9	1 30 46.6	1 30 33.3	1 30 20.1	1 30 6.8	1.38	1.33
41 20	1 31 27.2	1 31 13.9	1 31 0.5	1 30 47.2	1 30 33.9	1 30 20.6	1.40	1.33
41 30	1 31 41.3	1 31 27.9	1 31 14.6	1 31 1.2	1 30 47.9	1 30 34.5	1.41	1.34
41 40	1 31 55.5	1 31 42.1	1 31 28.7	1 31 15.3	1 31 2.0	1 30 48.6	+1.42	-1.34
41 50	1 32 9.8	1 31 56.4	1 31 43.0	1 31 29.6	1 31 16.2	1 31 2.7	1.43	1.34
42 0	1 32 24.3	1 32 10.8	1 31 57.4	1 31 43.9	1 31 30.5	1 31 17.0	1.44	1.35
42 10	1 32 38.9	1 32 25.4	1 32 11.9	1 31 58.4	1 31 44.9	1 31 31.4	1.46	1.35
42 20	1 32 53.6	1 32 40.1	1 32 26.5	1 32 13.0	1 31 59.5	1 31 46.0	1.47	1.35
42 30	1 33 8.4	1 32 54.9	1 32 41.3	1 32 27.7	1 32 14.2	1 32 0.6	+1.48	-1.36
42 40	1 33 23.4	1 33 9.8	1 32 56.2	1 32 42.6	1 32 29.0	1 32 15.4	1.50	1.36
42 50	1 33 38.5	1 33 24.9	1 33 11.2	1 32 57.6	1 32 43.9	1 32 30.3	1.51	1.36
43 0	1 33 53.7	1 33 40.0	1 33 26.4	1 33 12.7	1 32 59.0	1 32 45.3	1.52	1.37
43 10	1 34 9.1	1 33 55.4	1 33 41.6	1 33 27.9	1 33 14.2	1 33 0.5	1.53	1.37
43 20	1 34 24.6	1 34 10.8	1 33 57.0	1 33 43.3	1 33 29.5	1 33 15.8	+1.55	-1.38
43 30	1 34 40.2	1 34 26.4	1 34 12.6	1 33 58.8	1 33 45.0	1 33 31.2	1.56	1.38
43 40	1 34 55.9	1 34 42.1	1 34 28.3	1 34 14.4	1 34 0.6	1 33 46.8	1.57	1.38
43 50	1 35 11.8	1 34 57.9	1 34 44.1	1 34 30.2	1 34 16.3	1 34 2.5	1.58	1.39
44 0	1 35 27.8	1 35 13.9	1 35 0.0	1 34 46.1	1 34 32.2	1 34 18.3	1.60	1.39
44 10	1 35 44.0	1 35 30.0	1 35 16.1	1 35 2.2	1 34 48.2	1 34 34.3	+1.61	-1.39
44 20	1 36 0.3	1 35 46.3	1 35 32.3	1 35 18.4	1 35 4.4	1 34 50.4	1.63	1.40
44 30	1 36 16.7	1 36 2.7	1 35 48.7	1 35 34.7	1 35 20.7	1 35 6.6	1.64	1.40
44 40	1 36 33.3	1 36 19.3	1 36 5.2	1 35 51.2	1 35 37.1	1 35 23.0	1.66	1.41
44 50	1 36 50.1	1 36 36.0	1 36 21.9	1 36 7.8	1 35 53.6	1 35 39.5	1.67	1.41
45 0	1 37 6.9	1 36 52.8	1 36 38.7	1 36 24.5	1 36 10.4	1 35 56.2	+1.68	-1.41
45 10	1 37 24.0	1 37 9.8	1 36 55.6	1 36 41.4	1 36 27.2	1 36 13.0	1.70	1.42
45 20	1 37 41.2	1 37 26.9	1 37 12.7	1 36 58.5	1 36 44.2	1 36 30.0	1.71	1.42
45 30	1 37 58.5	1 37 44.2	1 37 29.9	1 37 15.7	1 37 1.4	1 36 47.1	1.73	1.43
45 40	1 38 16.0	1 38 1.7	1 37 47.3	1 37 33.0	1 37 18.7	1 37 4.4	1.75	1.43
45 50	1 38 33.6	1 38 19.3	1 38 4.9	1 37 50.5	1 37 36.2	1 37 21.8	+1.76	-1.44
46 0	1 38 51.4	1 38 37.0	1 38 22.6	1 38 8.2	1 37 53.8	1 37 39.4	1.78	1.44
46 10	1 39 9.3	1 38 54.9	1 38 40.5	1 38 26.0	1 38 11.6	1 37 57.1	1.79	1.44
46 20	1 39 27.5	1 39 13.0	1 38 58.5	1 38 44.0	1 38 29.5	1 38 15.0	1.81	1.45
46 30	1 39 45.7	1 39 31.2	1 39 16.7	1 39 2.1	1 38 47.6	1 38 33.1	1.82	1.45
46 40	1 40 4.2	1 39 49.6	1 39 35.0	1 39 20.4	1 39 5.9	1 38 51.3	+1.84	-1.46
46 50	1 40 22.8	1 40 8.1	1 39 53.5	1 39 38.9	1 39 24.3	1 39 9.7	1.86	1.46
47 0	1 40 41.5	1 40 26.9	1 40 12.2	1 39 57.5	1 39 42.9	1 39 28.2	1.87	1.47
47 10	1 41 0.5	1 40 45.8	1 40 31.0	1 40 16.3	1 40 1.6	1 39 46.9	1.89	1.47
47 20	1 41 19.6	1 41 4.8	1 40 50.1	1 40 35.3	1 40 20.5	1 40 5.8	1.91	1.48
47 30	1 41 38.8	1 41 24.0	1 41 9.2	1 40 54.4	1 40 39.6	1 40 24.8	+1.92	-1.48
47 40	1 41 58.3	1 41 43.5	1 41 28.6	1 41 13.8	1 40 58.9	1 40 44.0	1.94	1.49
47 50	1 42 17.9	1 42 3.0	1 41 48.1	1 41 33.2	1 41 18.3	1 41 3.4	1.96	1.49
48 0	1 42 37.7	1 42 22.8	1 42 7.8	1 41 52.9	1 41 38.0	1 41 23.0	1.98	1.49
48 10	1 42 57.7	1 42 42.7	1 42 27.7	1 42 12.8	1 41 57.8	1 41 42.8	2.00	1.50
48 20	1 43 17.9	1 43 2.9	1 42 47.8	1 42 32.8	1 42 17.7	1 42 2.7	+2.02	-1.50
48 30	1 43 38.3	1 43 23.2	1 43 8.1	1 42 53.0	1 42 37.9	1 42 22.8	2.03	1.51
48 40	1 43 58.8	1 43 43.7	1 43 28.5	1 43 13.4	1 42 58.2	1 42 43.1	2.06	1.51
48 50	1 44 19.5	1 44 4.3	1 43 49.2	1 43 34.0	1 43 18.8	1 43 3.6	2.07	1.52
49 0	1 44 40.5	1 44 25.2	1 44 10.0	1 43 54.7	1 43 39.5	1 43 24.2	2.09	1.53
49 10	1 45 1.6	1 44 46.3	1 44 31.0	1 44 15.7	1 44 0.4	1 43 45.1	+2.11	-1.53
49 20	1 45 22.9	1 45 7.6	1 44 52.2	1 44 36.9	1 44 21.5	1 44 6.2	2.13	1.53
49 30	1 45 44.4	1 45 29.0	1 45 13.6	1 44 58.2	1 44 42.8	1 44 27.4	2.15	1.54
49 40	1 46 6.1	1 45 50.7	1 45 35.2	1 45 19.8	1 45 4.3	1 44 48.9	2.17	1.54
49 50	1 46 28.1	1 46 12.6	1 45 57.0	1 45 41.5	1 45 26.0	1 45 10.5	2.19	1.55
50 0	1 46 50.2	1 46 34.6	1 46 19.1	1 46 3.5	1 45 47.9	1 45 32.4	+2.21	-1.56

AZIMUTH OF POLARIS AT ELONGATION, 1916.

Decl. at.	88° 51' 20"	88° 51' 30"	88° 51' 40"	88° 51' 50"	88° 52' 0"	88° 52' 10"	Variation for—	
							1' of Lat.	1" of S.
• /	• / "	• / "	• / "	• / "	• / "	• / "	"	"
50 0	1 46 50.2	1 46 34.6	1 46 19.1	1 46 3.5	1 45 47.9	1 45 32.4	+2.21	-1.56
50 10	1 47 12.5	1 46 56.9	1 46 41.3	1 46 25.7	1 46 10.1	1 45 54.4	2.23	1.56
50 20	1 47 35.1	1 47 19.4	1 47 3.7	1 46 48.1	1 46 32.4	1 46 16.7	2.25	1.57
50 30	1 47 57.8	1 47 42.1	1 47 26.4	1 47 10.6	1 46 54.9	1 46 39.2	2.27	1.57
50 40	1 48 20.8	1 48 5.0	1 47 49.2	1 47 33.5	1 47 17.7	1 47 1.9	2.30	1.58
50 50	1 48 44.0	1 48 28.2	1 48 12.3	1 47 56.5	1 47 40.6	1 47 24.8	+2.32	-1.58
51 0	1 49 7.4	1 48 51.5	1 48 35.6	1 48 19.7	1 48 3.8	1 47 47.9	2.34	1.59
51 10	1 49 31.1	1 49 15.1	1 48 59.1	1 48 43.2	1 48 27.2	1 48 11.3	2.36	1.60
51 20	1 49 54.9	1 49 38.9	1 49 22.9	1 49 6.9	1 48 50.9	1 48 34.9	2.38	1.60
51 30	1 50 19.0	1 50 2.9	1 49 46.9	1 49 30.8	1 49 14.7	1 48 58.7	2.41	1.61
51 40	1 50 43.4	1 50 27.2	1 50 11.1	1 49 55.0	1 49 38.8	1 49 22.7	+2.43	-1.61
51 50	1 51 7.9	1 50 51.7	1 50 35.5	1 50 19.4	1 50 3.2	1 49 47.0	2.45	1.62
52 0	1 51 32.7	1 51 16.5	1 51 0.2	1 50 44.0	1 50 27.7	1 50 11.5	2.48	1.62
52 10	1 51 57.8	1 51 41.5	1 51 25.1	1 51 8.8	1 50 52.5	1 50 36.2	2.50	1.63
52 20	1 52 23.1	1 52 6.7	1 51 50.3	1 51 34.0	1 51 17.6	1 51 1.2	2.53	1.64
52 30	1 52 48.6	1 52 32.2	1 52 15.7	1 51 59.3	1 51 42.9	1 51 26.4	+2.55	-1.64
52 40	1 53 14.4	1 52 57.9	1 52 41.4	1 52 24.9	1 52 8.4	1 51 51.9	2.58	1.65
52 50	1 53 40.4	1 53 23.9	1 53 7.3	1 52 50.8	1 52 34.2	1 52 17.7	2.60	1.65
53 0	1 54 6.8	1 53 50.1	1 53 33.5	1 53 16.9	1 53 0.3	1 52 43.6	2.63	1.66
53 10	1 54 33.3	1 54 16.6	1 54 0.0	1 53 43.3	1 53 26.6	1 53 9.9	2.65	1.67
53 20	1 55 0.2	1 54 43.4	1 54 26.7	1 54 9.9	1 53 53.2	1 53 36.4	+2.68	-1.68
53 30	1 55 27.3	1 55 10.5	1 54 53.6	1 54 36.8	1 54 20.0	1 54 3.2	2.71	1.68
53 40	1 55 54.7	1 55 37.8	1 55 20.9	1 55 4.0	1 54 47.1	1 54 30.2	2.74	1.69
53 50	1 56 22.3	1 56 5.4	1 55 48.4	1 55 31.5	1 55 14.5	1 54 57.6	2.76	1.69
54 0	1 56 50.2	1 56 33.2	1 56 16.2	1 55 59.2	1 55 42.2	1 55 25.1	2.79	1.70
54 10	1 57 18.5	1 57 1.4	1 56 44.3	1 56 27.2	1 56 10.1	1 55 53.0	+2.82	-1.71
54 20	1 57 47.0	1 57 29.8	1 57 12.7	1 56 55.5	1 56 38.3	1 56 21.2	2.85	1.72
54 30	1 58 15.8	1 57 58.6	1 57 41.3	1 57 24.1	1 57 6.9	1 56 49.6	2.88	1.72
54 40	1 58 44.9	1 58 27.6	1 58 10.3	1 57 53.0	1 57 35.7	1 57 18.4	2.91	1.73
54 50	1 59 14.3	1 58 56.9	1 58 39.5	1 58 22.2	1 58 4.8	1 57 47.4	2.94	1.74
55 0	1 59 44.0	1 59 26.5	1 59 9.1	1 58 51.6	1 58 34.2	1 58 16.8	+2.97	-1.74
55 10	2 0 14.0	1 59 56.5	1 59 39.0	1 59 21.4	1 59 3.9	1 58 46.4	3.00	1.75
55 20	2 0 44.3	2 0 26.7	2 0 9.1	1 59 51.6	1 59 34.0	1 59 16.4	3.03	1.76
55 30	2 1 15.0	2 0 57.3	2 0 39.6	2 0 22.0	2 0 4.3	1 59 46.6	3.06	1.77
55 40	2 1 45.9	2 1 28.2	2 1 10.4	2 0 52.7	2 0 35.0	2 0 17.2	3.10	1.77
55 50	2 2 17.2	2 1 59.4	2 1 41.6	2 1 23.8	2 1 6.0	2 0 48.1	+3.13	-1.78
56 0	2 2 48.8	2 2 30.9	2 2 13.1	2 1 55.2	2 1 37.3	2 1 19.4	3.16	1.79
56 10	2 3 20.8	2 3 2.8	2 2 44.9	2 2 26.9	2 2 8.9	2 1 51.0	3.19	1.80
56 20	2 3 53.1	2 3 35.1	2 3 17.0	2 2 59.0	2 2 40.9	2 2 22.9	3.23	1.80
56 30	2 4 25.8	2 4 7.6	2 3 49.5	2 3 31.4	2 3 13.2	2 2 55.1	3.26	1.81
56 40	2 4 58.8	2 4 40.6	2 4 22.3	2 4 4.1	2 3 45.9	2 3 27.7	+3.30	-1.82
56 50	2 5 32.1	2 5 13.8	2 4 55.5	2 4 37.2	2 4 19.0	2 4 0.7	3.33	1.83
57 0	2 6 5.8	2 5 47.5	2 5 29.1	2 5 10.7	2 4 52.4	2 4 34.0	3.37	1.84
57 10	2 6 39.9	2 6 21.5	2 6 3.0	2 5 44.6	2 5 26.1	2 5 7.7	3.41	1.84
57 20	2 7 14.4	2 6 55.9	2 6 37.3	2 6 18.8	2 6 0.2	2 5 41.7	3.44	1.85
57 30	2 7 49.2	2 7 30.6	2 7 12.0	2 6 53.4	2 6 34.7	2 6 16.1	+3.48	-1.86
57 40	2 8 24.5	2 8 5.8	2 7 47.0	2 7 28.3	2 7 9.6	2 6 50.9	3.52	1.87
57 50	2 9 0.1	2 8 41.3	2 8 22.5	2 8 3.7	2 7 44.0	2 7 26.1	3.56	1.88
58 0	2 9 36.1	2 9 17.2	2 8 58.3	2 8 39.4	2 8 20.6	2 8 1.7	3.60	1.89
58 10	2 10 12.5	2 9 53.5	2 9 34.6	2 9 15.6	2 8 56.6	2 8 37.7	3.64	1.90
58 20	2 10 49.3	2 10 30.3	2 10 11.2	2 9 52.2	2 9 33.1	2 9 14.0	+3.68	-1.91
58 30	2 11 26.6	2 11 7.4	2 10 48.3	2 10 29.1	2 10 10.0	2 9 50.8	3.72	1.92
58 40	2 12 4.3	2 11 45.0	2 11 25.8	2 11 6.5	2 10 47.3	2 10 28.1	3.77	1.92
58 50	2 12 42.3	2 12 23.0	2 12 3.7	2 11 44.4	2 11 25.0	2 11 5.7	3.81	1.93
59 0	2 13 20.9	2 13 1.5	2 12 42.0	2 12 22.6	2 12 3.2	2 11 43.8	3.85	1.94
59 10	2 13 59.9	2 13 40.3	2 13 20.8	2 13 1.3	2 12 41.8	2 12 22.3	+3.90	-1.95
59 20	2 14 39.3	2 14 19.7	2 14 0.0	2 13 40.4	2 13 20.8	2 13 1.2	3.94	1.96
59 30	2 15 19.2	2 14 59.5	2 14 39.7	2 14 20.0	2 14 0.3	2 13 40.6	3.99	1.97
59 40	2 15 59.5	2 15 39.7	2 15 19.9	2 15 0.1	2 14 40.3	2 14 20.5	4.04	1.98
59 50	2 16 40.3	2 16 20.4	2 16 0.5	2 15 40.6	2 15 20.7	2 15 0.8	4.08	1.99
60 0	2 17 21.6	2 17 1.6	2 16 41.6	2 16 21.6	2 16 1.6	2 15 41.6	+4.13	-2.00

AZIMUTH OF POLARIS AT ELONGATION, 1916.

Decl. Lat.							Variation for—	
	88° 51' 20"	88° 51' 30"	88° 51' 40"	88° 51' 50"	88° 52' 0"	88° 52' 10"	1" of Lat.	1" of L.
• "	• "	• "	• "	• "	• "	• "	"	"
60 0	2 17 21.6	2 17 1.6	2 16 41.6	2 16 21.6	2 16 1.6	2 15 41.6	+4.13	-2.00
60 10	2 18 3.4	2 17 43.3	2 17 23.2	2 17 3.1	2 16 43.0	2 16 22.9	4.18	2.01
60 20	2 18 45.7	2 18 25.5	2 18 5.3	2 17 45.1	2 17 24.9	2 17 4.6	4.23	2.02
60 30	2 19 28.5	2 19 8.2	2 18 47.9	2 18 27.6	2 18 7.2	2 17 46.9	4.28	2.03
60 40	2 20 11.8	2 19 51.4	2 19 31.0	2 19 10.6	2 18 50.1	2 18 29.7	4.33	2.04
60 50	2 20 55.7	2 20 35.1	2 20 14.6	2 19 54.1	2 19 33.5	2 19 13.0	+4.38	-2.05
61 0	2 21 40.0	2 21 19.4	2 20 58.7	2 20 38.1	2 20 17.5	2 19 56.8	4.44	2.07
61 10	2 22 24.9	2 22 4.2	2 21 43.4	2 21 22.7	2 21 1.9	2 20 41.2	4.49	2.08
61 20	2 23 10.4	2 22 49.5	2 22 28.6	2 22 7.8	2 21 46.9	2 21 26.1	4.54	2.09
61 30	2 23 56.4	2 23 35.4	2 23 14.4	2 22 53.5	2 22 32.5	2 22 11.5	4.60	2.10
61 40	2 24 43.0	2 24 21.9	2 24 0.8	2 23 39.7	2 23 18.6	2 22 57.5	+4.66	-2.11
61 50	2 25 30.1	2 25 8.9	2 24 47.7	2 24 26.5	2 24 5.3	2 23 44.1	4.72	2.12
62 0	2 26 17.9	2 25 56.6	2 25 35.3	2 25 13.9	2 24 52.6	2 24 31.3	4.78	2.13
62 10	2 27 6.2	2 26 44.8	2 26 23.4	2 26 1.9	2 25 40.5	2 25 19.1	4.84	2.14
62 20	2 27 55.2	2 27 33.7	2 27 12.1	2 26 50.6	2 26 29.0	2 26 7.4	4.90	2.16
62 30	2 28 44.8	2 28 23.1	2 28 1.4	2 27 39.8	2 27 18.1	2 26 56.4	+4.96	-2.17
62 40	2 29 35.0	2 29 13.2	2 28 51.4	2 28 29.6	2 28 7.8	2 27 46.0	5.02	2.18
62 50	2 30 25.9	2 30 4.0	2 29 42.0	2 29 20.1	2 28 58.2	2 28 36.3	5.09	2.19
63 0	2 31 17.4	2 30 55.4	2 30 33.3	2 30 11.3	2 29 49.2	2 29 27.2	5.16	2.20
63 10	2 32 9.6	2 31 47.4	2 31 25.3	2 31 3.1	2 30 40.9	2 30 18.8	5.22	2.22
63 20	2 33 2.5	2 32 40.2	2 32 17.9	2 31 55.6	2 31 33.3	2 31 11.0	+5.29	-2.23
63 30	2 33 56.0	2 33 33.6	2 33 11.2	2 32 48.8	2 32 26.3	2 32 3.9	5.36	2.24
63 40	2 34 50.3	2 34 27.8	2 34 5.2	2 33 42.6	2 33 20.1	2 32 57.5	5.43	2.26
63 50	2 35 45.3	2 35 22.6	2 34 59.9	2 34 37.2	2 34 14.5	2 33 51.8	5.50	2.27
64 0	2 36 41.1	2 36 18.2	2 35 55.4	2 35 32.6	2 35 9.7	2 34 46.9	5.58	2.28
64 10	2 37 37.5	2 37 14.6	2 36 51.6	2 36 28.6	2 36 5.7	2 35 42.7	+5.65	-2.30
64 20	2 38 34.8	2 38 11.7	2 37 48.6	2 37 25.5	2 37 2.4	2 36 39.3	5.73	2.31
64 30	2 39 32.8	2 39 9.6	2 38 46.3	2 38 23.1	2 37 59.8	2 37 36.6	5.81	2.32
64 40	2 40 31.6	2 40 8.2	2 39 44.9	2 39 21.5	2 38 58.1	2 38 34.7	5.89	2.34
64 50	2 41 31.3	2 41 7.7	2 40 44.2	2 40 20.7	2 39 57.1	2 39 33.6	5.97	2.35
65 0	2 42 31.7	2 42 8.0	2 41 44.4	2 41 20.7	2 40 57.0	2 40 33.3	+6.05	-2.37
65 10	2 43 33.0	2 43 9.2	2 42 45.4	2 42 21.5	2 41 57.7	2 41 33.9	6.13	2.38
65 20	2 44 35.2	2 44 11.2	2 43 47.2	2 43 23.2	2 42 59.3	2 42 35.3	6.22	2.40
65 30	2 45 38.2	2 45 14.1	2 44 50.0	2 44 25.8	2 44 1.7	2 43 37.6	6.31	2.41
65 40	2 46 42.2	2 46 17.9	2 45 53.6	2 45 29.3	2 45 5.0	2 44 40.7	6.40	2.43
65 50	2 47 47.0	2 47 22.6	2 46 58.1	2 46 33.7	2 46 9.2	2 45 44.8	+6.49	-2.44
66 0	2 48 52.8	2 48 28.2	2 48 3.6	2 47 39.0	2 47 14.4	2 46 49.8	6.58	2.46
66 10	2 49 59.5	2 49 34.8	2 49 10.0	2 48 45.2	2 48 20.5	2 47 55.7	6.68	2.48
66 20	2 51 7.2	2 50 42.3	2 50 17.4	2 49 52.4	2 49 27.5	2 49 2.6	6.78	2.49
66 30	2 52 15.9	2 51 50.8	2 51 25.7	2 51 0.6	2 50 35.5	2 50 10.4	6.88	2.51
66 40	2 53 25.7	2 53 0.4	2 52 35.1	2 52 9.8	2 51 44.6	2 51 19.3	+6.96	-2.53
66 50	2 54 36.4	2 54 11.0	2 53 45.5	2 53 20.1	2 52 54.6	2 52 29.2	7.09	2.54
67 0	2 55 48.2	2 55 22.6	2 54 57.0	2 54 31.4	2 54 5.7	2 53 40.1	7.19	2.56
67 10	2 57 1.1	2 56 35.3	2 56 9.5	2 55 43.7	2 55 17.9	2 54 52.1	7.30	2.58
67 20	2 58 15.1	2 57 49.1	2 57 23.2	2 56 57.2	2 56 31.2	2 56 5.2	7.41	2.60
67 30	2 59 30.3	2 59 4.1	2 58 37.9	2 58 11.8	2 57 45.6	2 57 19.4	+7.52	-2.62
67 40	3 0 46.5	3 0 20.2	2 59 53.8	2 59 27.5	2 59 1.2	2 58 34.8	7.64	2.63
67 50	3 2 4.0	3 1 37.5	3 1 10.9	3 0 44.4	3 0 17.9	2 59 51.3	7.76	2.65
68 0	3 3 22.7	3 2 56.0	3 2 29.2	3 2 2.5	3 1 35.8	3 1 9.0	7.88	2.67
68 10	3 4 42.6	3 4 15.7	3 3 48.8	3 3 21.8	3 2 54.9	3 2 28.0	8.01	2.69
68 20	3 6 3.8	3 5 36.7	3 5 9.6	3 4 42.4	3 4 15.3	3 3 48.2	+8.13	-2.71
68 30	3 7 26.3	3 6 58.9	3 6 31.6	3 6 4.3	3 5 37.0	3 5 9.7	8.26	2.73
68 40	3 8 50.1	3 8 22.5	3 7 55.0	3 7 27.5	3 7 0.0	3 6 32.4	8.40	2.75
68 50	3 10 15.2	3 9 47.5	3 9 19.8	3 8 52.0	3 8 24.3	3 7 56.6	8.53	2.77
69 0	3 11 41.8	3 11 13.8	3 10 45.9	3 10 17.9	3 9 50.0	3 9 22.1	8.67	2.79
69 10	3 13 9.7	3 12 41.6	3 12 13.4	3 11 45.3	3 11 17.1	3 10 49.0	+8.81	-2.81
69 20	3 14 39.1	3 14 10.8	3 13 42.4	3 13 14.0	3 12 45.7	3 12 17.3	8.96	2.84
69 30	3 16 10.1	3 15 41.5	3 15 12.9	3 14 44.3	3 14 15.7	3 13 47.1	9.11	2.86
69 40	3 17 42.5	3 17 13.7	3 16 44.9	3 16 16.0	3 15 47.2	3 15 18.4	9.26	2.88
69 50	3 19 16.5	3 18 47.5	3 18 18.4	3 17 49.4	3 17 20.3	3 16 51.3	9.42	2.90
70 0	3 20 52.1	3 20 22.8	3 19 53.6	3 19 24.3	3 18 55.0	3 18 25.7	+9.58	-2.93

FOR REDUCING TO ELONGATION OBSERVATIONS MADE NEAR ELONGATION.

<div>Azimuth at Elong.</div> *Time.	1° 0'	1° 10'	1° 20'	1° 30'	1° 40'	1° 50'	2° 0'	2° 10'	<div>Azimuth at Elong.</div> Time.*
m	"	"	"	"	"	"	"	"	m
0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
1	0.0	0.0	0.0	+ 0.1	+ 0.1	+ 0.1	+ 0.1	+ 0.1	1
2	+ 0.1	+ 0.2	+ 0.2	0.2	0.2	0.3	0.3	0.3	2
3	0.3	0.4	0.4	0.5	0.5	0.6	0.6	0.7	3
4	0.5	0.6	0.7	0.8	0.9	1.0	1.1	1.2	4
5	+ 0.9	+ 1.0	+ 1.1	+ 1.3	+ 1.4	+ 1.6	+ 1.7	+ 1.9	5
6	1.2	1.4	1.6	1.8	2.1	2.3	2.5	2.7	6
7	1.7	2.0	2.2	2.5	2.8	3.1	3.4	3.7	7
8	2.2	2.6	2.9	3.3	3.7	4.0	4.4	4.8	8
9	2.8	3.2	3.7	4.2	4.6	5.1	5.6	6.0	9
10	+ 3.4	+ 4.0	+ 4.6	+ 5.1	+ 5.7	+ 6.3	+ 6.9	+ 7.4	10
11	4.1	4.8	5.5	6.2	6.9	7.6	8.3	9.0	11
12	4.9	5.8	6.6	7.4	8.2	9.0	9.9	10.7	12
13	5.8	6.8	7.7	8.7	9.7	10.6	11.6	12.6	13
14	6.7	7.8	9.0	10.1	11.2	12.3	13.4	14.6	14
15	+ 7.7	+ 9.0	+10.3	+11.6	+12.8	+14.1	+15.4	+16.7	15
16	8.8	10.2	11.7	13.2	14.6	16.1	17.5	19.0	16
17	9.9	11.5	13.2	14.9	16.5	18.2	19.8	21.5	17
18	11.1	12.9	14.8	16.7	18.5	20.4	22.2	24.1	18
19	12.4	14.4	16.5	18.6	20.6	22.7	24.7	26.8	19
20	+13.7	+16.0	+18.3	+20.6	+22.8	+25.1	+27.4	+29.7	20
21	15.1	17.6	20.1	22.7	25.2	27.7	30.2	32.7	21
22	16.6	19.3	22.1	24.9	27.6	30.4	33.2	35.9	22
23	18.1	21.1	24.2	27.2	30.2	33.2	36.2	39.3	23
24	19.7	23.0	26.3	29.6	32.9	36.2	39.5	42.8	24
25	+21.4	+25.0	+28.5	+32.1	+35.7	+39.2	+42.8	+46.4	25

<div>Azimuth at Elong.</div> *Time.	2° 10'	2° 20'	2° 30'	2° 40'	2° 50'	3° 0'	3° 10'	3° 20'	<div>Azimuth at Elong.</div> Time.*
m	"	"	"	"	"	"	"	"	m
0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
1	+ 0.1	+ 0.1	+ 0.1	+ 0.1	+ 0.1	+ 0.1	+ 0.1	+ 0.1	1
2	0.3	0.3	0.4	0.4	0.4	0.4	0.4	0.5	2
3	0.7	0.7	0.8	0.8	0.9	0.9	1.0	1.0	3
4	1.2	1.3	1.4	1.5	1.6	1.6	1.7	1.8	4
5	+ 1.9	+ 2.0	+ 2.1	+ 2.3	+ 2.4	+ 2.6	+ 2.7	+ 2.9	5
6	2.7	2.9	3.1	3.3	3.5	3.7	3.9	4.1	6
7	3.7	3.9	4.2	4.5	4.8	5.0	5.3	5.6	7
8	4.8	5.1	5.5	5.9	6.2	6.6	7.0	7.3	8
9	6.0	6.5	7.0	7.4	7.9	8.3	8.8	9.3	9
10	+ 7.4	+ 8.0	+ 8.6	+ 9.2	+ 9.7	+10.3	+10.9	+11.4	10
11	9.0	9.7	10.4	11.1	11.8	12.4	13.1	13.8	11
12	10.7	11.5	12.3	13.2	14.0	14.8	15.6	16.5	12
13	12.6	13.5	14.5	15.4	16.4	17.4	18.4	19.3	13
14	14.6	15.7	16.8	17.9	19.0	20.2	21.3	22.4	14
15	+16.7	+18.0	+19.3	+20.6	+21.9	+23.1	+24.4	+25.7	15
16	19.0	20.5	21.9	23.4	24.9	26.3	27.8	29.3	16
17	21.5	23.1	24.8	26.4	28.1	29.7	31.4	33.0	17
18	24.1	25.9	27.8	29.6	31.5	33.3	35.2	37.0	18
19	26.8	28.9	30.9	33.0	35.1	37.1	39.2	41.3	19
20	+29.7	+32.0	+34.3	+36.6	+38.8	+41.1	+43.4	+45.7	20
21	32.7	35.3	37.8	40.3	42.8	45.3	47.9	50.4	21
22	35.9	38.7	41.5	44.2	47.0	49.8	52.5	55.3	22
23	39.3	42.3	45.3	48.3	51.4	54.4	57.4	60.4	23
24	42.8	46.0	49.3	52.6	55.9	59.2	62.5	65.8	24
25	+46.4	+49.9	+53.5	+57.1	+60.7	+64.2	+67.8	+71.4	25

* Sidereal time from elongation.

79790°—1916—45

FOR FINDING THE TIMES OF UPPER AND LOWER CULMINATION OF POLARIS, 1916, FROM THE OBSERVED TIMES WHEN THE STAR IS ON THE SAME VERTICAL CIRCLE WITH THE STARS ζ URSAE MAJORIS (MIZAR) *SUB POLO* AND δ CASSIOPEIAE *SUB POLO*, RESPECTIVELY.

Except at high latitudes, the pole star at either upper or lower culmination furnishes a simple and convenient method for laying down a meridian line on the earth's surface at points in the northern hemisphere. When the local time is unknown and accurate astronomical instruments are not available, the time of culmination of Polaris may be found by observing the instant when Polaris is vertically above (has the same azimuth as) ζ Ursæ Majoris (Mizar) below the pole, or δ Cassiopeia below the pole. In the former case, for the year 1916, Polaris is approaching upper culmination and in the latter case it is approaching lower culmination. The mean time interval which elapses between the observed times above mentioned and upper or lower culmination, as the case may be, are given for ζ Ursæ Majoris and δ Cassiopeia for ten-day intervals in the following table. This method can not be used at places south of 30° north latitude.

ζ URSAE MAJORIS (MIZAR). (Upper culmination of Polaris.)						δ CASSIOPEIAE. (Lower culmination of Polaris.)							
Date.	Lat.	40°	45°	50°	55°	60°	Date.	Lat.	35°	40°	45°	50°	55°
		m s	m s	m s	m s	m s			m s	m s	m s	m s	m s
Jan.	1	8 51	8 50	8 48	8 45	8 42	Jan.	1	9 58	9 59	10 1	10 3	10 6
	11	8 41	8 39	8 37	8 35	8 31		11	9 47	9 48	9 50	9 52	9 55
	21	8 30	8 29	8 27	8 24	8 21		21	9 36	9 38	9 40	9 42	9 44
	31	8 20	8 19	8 17	8 14	8 11		31	9 26	9 28	9 29	9 31	9 34
Feb.	10	8 10	8 8	8 7	8 4	8 1	Feb.	10	9 16	9 17	9 19	9 21	9 23
	20	8 1	7 59	7 57	7 55	7 52		20	9 6	9 7	9 9	9 11	9 13
Mar.	1	7 53	7 52	7 50	7 48	7 45	Mar.	2	8 57	8 59	9 1	9 3	9 5
	12	8 51	8 53	8 55	8 57	8 59		12	8 51	8 53	8 55	8 57	8 59
June	30	8 37	8 35	8 33	8 31	8 28		22	8 47	8 48	8 50	8 52	8 54
July	10	8 48	8 46	8 44	8 42	8 38	Apr.	1	8 45	8 46	8 48	8 50	8 52
	20	8 59	8 57	8 55	8 52	8 49		11	8 45	8 46	8 48	8 50	8 52
	30	9 10	9 8	9 6	9 3	9 0		21	8 47	8 48	8 50	8 52	8 54
Aug.	9	9 21	9 19	9 17	9 14	9 10	May	1	8 50	8 52	8 53	8 55	8 58
	19	9 30	9 28	9 26	9 23	9 20		11	8 56	8 57	8 59	9 1	9 3
	29	9 38	9 37	9 34	9 31	9 28		21	9 4	9 5	9 7	9 9	9 11
Sept.	8	9 46	9 45	9 42	9 39	9 36		31	9 12	9 14	9 15	9 17	9 20
	18	9 53	9 51	9 49	9 46	9 42	June	10	9 21	9 23	9 24	9 26	9 29
	28	9 58	9 56	9 53	9 51	9 47		20	9 32	9 33	9 35	9 37	9 40
Oct.	8	10 1	9 59	9 57	9 54	9 50		30	9 43	9 45	9 47	9 49	9 52
	18	10 4	10 2	9 59	9 56	9 53	July	10	9 54	9 56	9 58	10 0	10 3
	28	10 4	10 2	9 59	9 57	9 53		20	10 5	10 7	10 9	10 11	10 14
Nov.	7	10 2	10 0	9 58	9 55	9 51		30	10 17	10 18	10 20	10 23	10 26
	17	9 59	9 57	9 55	9 52	9 48	Nov.	27	11 2	11 4	11 6	11 9	11 12
	27	9 54	9 52	9 50	9 47	9 44	Dec.	7	10 55	10 57	10 59	11 2	11 5
Dec.	7	9 48	9 46	9 43	9 41	9 37		17	10 47	10 49	10 51	10 53	10 56
	17	9 39	9 37	9 35	9 32	9 29		27	10 38	10 40	10 42	10 44	10 47
	27	9 31	9 29	9 27	9 24	9 20		31	10 34	10 35	10 37	10 40	10 43
	31	9 27	9 25	9 23	9 20	9 17							

APPARENT PLACE, TIME OF UPPER CULMINATION, AND TIME INTERVAL BETWEEN UPPER CULMINATION AND ELONGATION EAST OR WEST, OF POLARIS, 1916.

The local mean time of culmination on any meridian for a given date is found by taking from the following table the *Mean Time* of the nearest Greenwich culmination, and applying to it the product of the *Var. per Day* by the integral number of intervening days, this product being numerically additive for an earlier date and subtractive for a later date than that given in the table; and by applying also the product of the *Var. per Hour* by the longitude from Greenwich expressed in hours and fractions of an hour, this product being numerically additive for East longitudes and subtractive for West longitudes.

The time interval between upper and lower culmination is 12^h diminished by one-half the numerical value of the *Var. per Day*.

The last column below applies to all meridians.

Date.	Upper Culmination, Meridian of Greenwich.					Latitude.	Mean Time Interval, Elongation <i>minus</i> Upper Culm.
	Apparent Right Ascension.	Apparent Declination.	Mean Time.	Var. per Day.	Var. per Hour.		
	h m l 28	° ' " +88 51	h m s	m s	W. E.	°	W. E.
Jan. 1	111	51.8	6 49 28	-3 57.0	-9.88+	10	+5 58.2-
11	100	52.9	6 9 58	3 57.0	9.87	12	5 58.1
21	90	53.4	5 30 28	3 56.9	9.87	14	5 57.9
31	80	53.0	4 50 59	3 56.9	9.87	16	5 57.7
Feb. 10	70	52.0	4 11 30	3 56.9	9.87	18	5 57.5
20	60	50.6	3 32 1	-3 56.8	-9.87+	20	+5 57.4-
Mar. 1	53	48.6	2 52 35	3 56.6	9.86	22	5 57.2
11	46	46.0	2 13 10	3 56.5	9.85	24	5 57.0
21	41	43.2	1 33 45	3 56.3	9.84	26	5 56.8
31	39	40.3	0 54 24	3 56.0	9.83	28	5 56.6
Apr. 10	39	37.1	0 15 5	-3 55.8	-9.83+	30	+5 56.4-
19	40	34.0	23 35 47	3 55.7	9.82	32	5 56.2
29	43	31.1	22 56 31	3 55.5	9.81	34	5 56.0
May 9	49	28.6	22 17 18	3 55.3	9.80	36	5 55.7
19	56	26.2	21 38 6	3 55.1	9.80	38	5 55.5
29	64	24.2	20 58 55	-3 55.0	-9.79+	40	+5 55.2-
June 8	74	22.9	20 19 45	3 54.9	9.79	42	5 54.9
18	85	22.1	19 40 37	3 54.8	9.78	44	5 54.6
28	96	21.6	19 1 29	3 54.8	9.78	46	5 54.3
July 8	107	21.7	18 22 20	3 54.8	9.78	48	5 54.0
18	118	22.6	17 43 12	-3 54.8	-9.78+	50	+5 53.6-
28	130	23.8	17 4 5	3 54.8	9.78	52	5 53.2
Aug. 7	140	25.4	16 24 56	3 54.9	9.79	54	5 52.8
17	150	27.7	15 45 47	3 55.0	9.79	56	5 52.3
27	159	30.4	15 6 37	3 55.0	9.79	58	5 51.8
Sept. 6	168	33.3	14 27 27	-3 55.1	-9.80+	60	+5 51.2-
16	174	36.5	13 48 14	3 55.3	9.80	62	5 50.5
26	179	40.1	13 9 0	3 55.4	9.81	64	5 49.7
Oct. 6	184	43.9	12 29 46	3 55.6	9.82	66	5 48.8
16	187	47.6	11 50 29	3 55.8	9.82	68	5 47.8
26	187	51.4	11 11 10	-3 56.0	-9.83+	70	+5 46.5-
Nov. 5	186	55.2	10 31 50	3 56.1	9.84		
15	183	58.8	9 52 29	3 56.3	9.84		
25	179	62.0	9 13 5	3 56.5	9.85		
Dec. 5	172	65.0	8 33 39	3 56.6	9.86		
15	165	67.6	7 54 13	-3 56.7	-9.86+		
25	156	69.6	7 14 45	-3 56.8	-9.87+		

ON THE ARRANGEMENT AND USE OF THE AMERICAN EPHEMERIS AND NAUTICAL ALMANAC.

There are in general use three different kinds of time, True Solar Time—also called Apparent Solar Time—Mean Solar Time, and Sidereal Time.

True or Apparent Solar Time is measured by the diurnal motion of the Sun, the length of the day being the interval between two successive transits of the Sun over the same meridian, and the time of day being the hour-angle of the Sun westward from the meridian. Owing to the obliquity of the ecliptic and to the lack of uniformity of the motion of the Earth in its orbit, the rate of motion of the Sun in hour-angle and the length of the apparent solar day are not constant. Therefore clocks and chronometers can not be regulated to apparent solar time, which may, however, be determined by observations of the Sun when visible.

Mean Solar Time is measured by the motion of a fictitious body called the mean Sun, which is supposed to move uniformly in the celestial equator, completing the circuit in one tropical year. Since mean solar time is uniform and regular in its passage, clocks and watches may be regulated to it, and those in ordinary use are usually so regulated.

Mean solar time can not, of course, be determined by direct observation, but may be determined indirectly by correcting observations of the Sun for the equation of time, or by converting to mean time sidereal time determined by observations of fixed stars.

The Equation of Time is the difference in hour-angle between the true Sun and the mean Sun. The true Sun is sometimes before and sometimes behind the mean Sun by an amount which varies from zero to about 16 minutes. The equation of time is given for Greenwich mean noon on pages 2-16 and for Washington apparent noon on pages 514-521.

The Mean Solar Day is the unit of mean solar time, and is equal in length to the mean or average of all the true or apparent solar days of the year. It may be otherwise defined as the interval of time elapsing between two successive transits of the mean Sun across the meridian of any place.

Sidereal Time or star time, in general terms, is measured by the diurnal motion of the fixed stars, or, speaking more precisely, by the diurnal motion of that point on the celestial equator called the vernal equinox, from which the right ascensions of the heavenly bodies are measured. Astronomical clocks regulated to sidereal time are called sidereal clocks. Sidereal time may be determined from observations of stars whose right ascensions are known.

A Sidereal Day is very nearly the length of time in which the Earth rotates on its axis and is accurately defined as the time interval between two suc-

cessive transits of the vernal equinox over the same meridian. The sidereal day is shorter than the mean solar day by $3^m 56^s.555$ sidereal time or $3^m 55^s.909$ mean solar time, the tropical year of 365.2422 mean solar days containing 366.2422 sidereal days. Sidereal time and the length of the sidereal day are subject to slight irregularities on account of small differences between the positions of the true and mean equinoxes.

The mean solar and sidereal days are each divided into 24 hours. About March 23 (civil date) of each year, about two days after the vernal equinox, there is an instant when the face of a sidereal clock shows the same time as a mean time clock, and the former gains on the latter $3^m 56^s.555$ sidereal time per mean solar day, so that at the end of a year it will have gained one sidereal day and will again agree with the mean time clock.

The Civil Day begins at midnight and comprises 24 hours, the hours being counted from 0 to 12 in two series; the first, marked A. M., running from midnight to noon, and the second, marked P. M., running from noon to midnight.

The Astronomical Day begins at noon on the civil day of the same date, the 24 hours being counted from 0 to 24, running from noon of one day to noon of the next following day. Astronomical time as well as civil time may be either apparent or mean.

The civil day begins twelve hours before the astronomical day; therefore the first half of the civil day coincides with the last half of the preceding astronomical day, and the last half of the civil day coincides with the first half of the astronomical day of the same date. Hence we have the following rules:

To convert Civil Time into Astronomical Time.—If the civil time is marked A. M., take one from the day and add twelve to the hours; if the civil time is marked P. M., take away the designation P. M. Thus, January 9, 2 o'clock, A. M., civil time, is January 8, 14^h , astronomical time; and January 9, 2 o'clock, P. M., civil time, is January 9, 2^h , astronomical time.

To convert Astronomical Time into Civil Time.—If the astronomical time is less than twelve hours, write P. M. after it; if greater than twelve hours, subtract twelve hours from it, mark the result A. M., and add one to the day.

To convert Solar or Sidereal Time of any meridian B to that of another meridian A, add the difference of longitude expressed in time when A is east of B, and subtract the difference of longitude when A is west of B.

Greenwich mean time, which at any fixed observatory is obtained by applying the longitude to the local mean time, on board ship is usually taken from the mean time chronometer set to Greenwich time.

Greenwich mean noon of any date means the noon at the beginning of the astronomical day.

PART I.—THE EPHEMERIS FOR THE MERIDIAN OF GREENWICH.

Pages 2-17 contain for Greenwich mean noon of each day the *Sun's Apparent Right Ascension, Apparent Declination, Semidiameter, Horizontal Parallax, True Longitude, and Latitude*. They also contain the *Logarithm of the Radius Vector of the Earth, the Precession in Longitude, the Nutation in Longitude, the Aberration, the True Obliquity, the Equation of Time, the Sidereal Time or Right Ascension of Mean Sun, and the Mean Time of Sidereal Noon*. Adjoining columns contain, for each Greenwich mean noon, the *Variation per*

Hour for those of the quantities for which it seemed advisable to give a rate of motion. By multiplying any one of those variations by the hours and parts of an hour from Greenwich mean noon and adding the product algebraically to the corresponding quantity at noon, we obtain an approximate value of the quantity in question for any given Greenwich mean time. If great exactness is desired, the value of the hourly variation is found for the time halfway between Greenwich mean noon and the given Greenwich mean time before multiplying by the hours and parts of an hour from Greenwich mean noon.

It is to be noted that here, as elsewhere throughout the volume, the positive sign used with declinations or latitudes indicates north and the negative sign south.

The Sun's *Apparent Right Ascension* and *Declination* are affected both by aberration and by nutation, and therefore denote the *apparent* position of the *true* Sun. The Sun's *True Longitude* is the true geometric longitude not corrected for aberration; it is referred to the true equinox.

The Sun's *Latitude* is referred to the ecliptic of the date.

The Sun's *Declination* is required whenever that body is observed for the purpose of finding latitude, local time, or azimuth.

The Sun's *Semidiameter* is used in reducing the altitude of the upper or lower limb of the Sun to the altitude of the center; and in reducing the angular distance between the limb of the Sun and any other object to the distance from the center of the Sun.

The *Horizontal Parallax* is the angle subtended by the equatorial radius of the Earth, as seen from the center of the Sun.

The *Precession in Longitude* is the quantity to be applied to the longitude of the Sun referred to the mean equinox of the beginning of the Besselian fictitious year, i. e., the instant when the Sun's mean longitude is 280° , in order to refer it to the mean equinox of date.

The *Nutation in Longitude* is the quantity to be applied to the longitude of a body referred to the mean equinox of date in order to refer it to the true equinox, short-period terms being neglected.

The *Aberration* is the quantity to be subtracted from the true longitude of the Sun in order to obtain its apparent longitude.

The *True Obliquity* is the inclination of the Earth's equator to the ecliptic, short-period terms being neglected.

The corrections to the values of the nutation and the obliquity here given, to take account of the short-period terms, may be found on pages 215-216.

The *Equation of Time* is the apparent time of Greenwich mean noon, or the hour angle of the true Sun at that instant. When interpolated to any given Greenwich mean time, it is the correction to be applied to mean time in order to obtain apparent time.

The *Sidereal Time of Mean Noon* is the right ascension of the mean Sun at Greenwich mean noon. It may be reduced for the longitude or to any Greenwich mean time by using the hourly variation, $+9^s.8565$; or by Table III, page 691 of this volume, for reducing intervals of mean time to sidereal time. It is useful in converting mean time to sidereal time. We first find the Greenwich mean time, then the right ascension of the mean Sun for that time,

and this being added to the local astronomical mean time, i. e., the hour angle of the mean Sun, will give the hour angle of the vernal equinox, or the sidereal time required.

The sidereal time of mean noon, reduced for the longitude of the place, is also used in converting sidereal time to mean time. Subtracting the reduced value from the given sidereal time gives the interval of sidereal time past noon, and that is converted into the required mean time by subtracting from it the corresponding reduction of a sidereal interval to a mean-time interval, taken from Table II, page 688 of this volume. If the sidereal interval is less than $3^m 56^s.555$, there are two mean times corresponding to the given sidereal time, one a few minutes after the preceding noon, and the other a few minutes before the following noon, the mean time interval between these two mean times being $23^h 56^m 4^s.09$. The mean time, approximately known, will always show which one is to be taken. Instead of using Table II, the reduction of a sidereal to a mean time interval may be found by multiplying $-9^s.8296$ by the hours and parts of an hour of the sidereal interval.

The *Mean Time of Sidereal Noon* is the number of hours, minutes, and seconds after Greenwich mean noon when the vernal equinox passes the meridian of Greenwich; it may be reduced to any other meridian by using the hourly variation, $-9^s.8296$, to effect the necessary interpolation, or the reduction may be taken directly from Table II. In the same way the reduction may be made to any Greenwich sidereal time, and the result will then represent $24^h -$ Right Ascension of the Mean Sun. This column may be conveniently used for converting sidereal to mean time, or—which is the same problem—for finding the time of meridian passage of a star whose right ascension is known, by adding to the mean time of the *preceding* local sidereal noon, the mean time equivalent of the given sidereal time.

As examples of the use of pages 2-17:

1. Let the Sun's declination be required for 1916, April 14, $2^h 5^m 20^s$, P. M., at a place whose longitude is $58^\circ 20'$, or $3^h 53^m 20^s$ west from Greenwich:

Local mean time	April 14,	$2^h 5^m 20^s$
Longitude from Greenwich (additive)		$3^h 53^m 20^s$
Greenwich mean time	April 14,	$5^h 58^m 40^s$

Reducing the minutes and seconds to decimals of an hour, we find that this moment is $5^h.978$ after Greenwich mean noon on April 14, or $18^h.022$ before Greenwich mean noon on April 15.

On page 6 of the Ephemeris we find that the variation of declination per hour is:

At Greenwich mean noon, April 14	$+54.00$
At Greenwich mean noon, April 15	$+53.60$
Difference for one day	$- 0.40$

If great exactness is desired, we find the amount of this hourly variation for the time halfway between Greenwich noon and the time of observation; that is, for 3 hours after Greenwich noon of the 14th, this being half of 6 hours. Three hours is 0.125 of a day; so the calculation is as follows:

Variation at Greenwich mean noon, April 14 . . .	+54.00
Change for 0.125 of a day, or $-0''.40 \times 0.125$. . .	- 0.05
Variation at 3 hours after noon	+53.95
$+53''.95 \times 5.978 = +322''.5 = +5' 22''.5$	
Declination at Greenwich noon, April 14 . . .	+9 23 25.2
Variation in 5.978 hours	+ 5 22.5
Sun's declination at time of observation . . .	+9 28 47.7

With equal facility the computation might have been made backward from the succeeding noon. Thus in the example just given the time is 18^h.022 before Greenwich noon of April 15; half this interval is about 0.375 of a day, and the hourly motion for the middle of the interval is +53''.75. Then we find:

Declination at Greenwich noon, April 15 . . .	+9 44 56.5
Product of $+53''.75 \times -18.022 = -968''.7$. . .	- 16 8.7
Sun's declination at time of observation . . .	+9 28 47.8

It will always be well to make the calculation in both ways, as a check; but if the results differ slightly the one derived from the nearest noon should be regarded as the more accurate.

2. Let the Sun's right ascension and the equation of time be required for 1916, July 13, 10^h 3^m 30^s, A. M., mean time, at a place whose longitude is 85° 15', or 5^h 41^m west from Greenwich.

Local astronomical mean time	July 12, 22 3 30
Longitude from Greenwich (additive)	5 41 0
Greenwich mean time	July 13, 3 44 30 = 3.7417
<i>Sun's Right Ascension.</i>	
Greenwich noon, July 13 ^{h m s} 7 29 38.86	Greenwich noon, July 13 ^{m s} -5 30.80
H. V. $10^s.150 \times 3.7417$ + 37.98	H. V. $-0^s.294 \times 3.7417$ - 1.10
7 30 16.84	-5 31.90

In this case the hourly variations interpolated to half the interval, or 1^h.87 after noon, have been used.

3. If the sidereal time is required for the same time and place, we have:

Sidereal time at Greenwich mean noon, July 13	^{h m s} 7 24 8.06
Reduction for 3 ^h 44 ^m 30 ^s from Table III, or $9^s.8565 \times 3.7417$. . .	+ 36.88
Add the local astronomical mean time	22 3 30.00
The required sidereal time (rejecting 24 ^h)	5 28 14.94

4. On 1916, July 13, A. M., at a place whose longitude is 85° 15' W., suppose the sidereal time to be 5^h 28^m 14^s.94 and that the corresponding mean time is required.

The astronomical day is July 12; the longitude in time, $+5^h 41^m 0^s$, or $+5^h.6833$.

First solution.

Sidereal time at Greenwich mean noon, July 12	$h \quad m \quad s$ 7 20 11.50
Reduction for $5^h 41^m 0^s$ from Table III, or $9^s.8565 \times 5.6833$	+56.02
The sidereal time at local mean noon, July 12	7 21 7.52
The given sidereal time ($+24^h$, if necessary for the following subtraction)	29 28 14.94
Subtracting the first from the second gives the sidereal interval from noon	$22 \quad 7 \quad 7.42 = 22.1157$
Reduction for $22^h 7^m 7^s.42$ from Table II, or $-9^s.8296 \times 22.1187$	-3 37.42
The required astronomical mean time July 12,	22 3 30.00

Second solution.

Mean time at Greenwich sidereal noon July 12,	$h \quad m \quad s$ 16 37 4.70
Reduction for longitude from Table II, or $-9^s.8296 \times 5.6833$	- 55.86
Mean time of <i>preceding</i> local sidereal noon July 12,	16 36 8.84
Add the given sidereal time	5 28 14.94
Reduction for $5^h 28^m 14^s.94$ from Table II, or $-9^s.8296 \times 5.4708$	- 53.78
The required astronomical mean time July 12,	22 3 30.00

If there is any doubt about the mean time of the *preceding* local sidereal noon, the first solution is to be preferred.

Pages 18-25 contain the rectangular coordinates of the Sun, referred to the center of the Earth as the origin, and to the true equator and equinox as the plane and point of reference. Each coordinate is given for every Greenwich mean noon and midnight. The columns *Reduc. to Mean Eq'x of 1916.0* give the corrections to be applied to the coordinates for noon in order to obtain the corresponding coordinates referred to the mean equator and equinox of the beginning of the Besselian fictitious year.

Pages 26-117 contain *The Moon's Right Ascension and Declination* for each day and hour of Greenwich mean time, referred to the true equator and equinox. They are accompanied by columns of *Variations per Minute*, by means of which, interpolation may be conveniently made to any moment of Greenwich mean time. The right ascension or declination is taken out for the given day and hour of Greenwich mean time; the *Var. per Min.* is multiplied by the minutes and parts of a minute of the Greenwich time, and the product is added numerically in case of the right ascension and algebraically in case of the declination.

Thus, suppose the Moon's right ascension and declination are required for 1916, January 25, $10^h 10^m 30^s$, astronomical mean time at Greenwich:

<i>Right Ascension.</i>	<i>Declination.</i>
$h \quad m \quad s$	$^{\circ} \quad ' \quad ''$
January 25, 10^h 12 23 42.84	-7 34 59.9
Var. $1^s.9777 \times 10.5$ 20.77	$-14''.346 \times 10.5$ -2 30.6
January 25, $10^h 10^m 30^s$ 12 24 3.61	-7 37 30.5

For the sake of precision, the differences here employed have been interpolated for $5^m.2 = 0^h.09$.

Page 117 contains also the *Phases of the Moon* and the dates of the *Moon's Apogee and Perigee*, or greatest and least distances from the Earth.

Pages 118–133 contain for every Greenwich mean noon and midnight the *Moon's Longitude* and *Latitude* referred to the true equinox and the ecliptic, its *Semidiameter*, and its *Equatorial Horizontal Parallax*. The column adjoining that of the horizontal parallax gives the variation of that quantity per hour, by means of which it can be reduced to any other Greenwich mean time in the manner shown in the preceding examples. When allowing for change in the variation itself, note must be taken of the fact that the tabular interval is here 12 hours instead of 24. The quantity thus obtained is the equatorial horizontal parallax; to obtain the horizontal parallax at any given place, the correction for the latitude of the place must be applied. The reduction of the Moon's semidiameter may be readily found by multiplying the reduction of the horizontal parallax by 0.2725 (see page xiii), or by simply computing the proportional part.

If, for example, the semidiameter of the Moon is to be taken out for 1916, March 10, 7^h, P. M., Greenwich mean time, we see that the difference of the semidiameters at noon and midnight of March 10 is 2''.9; then,

$$12^h : 7^h = 2''.9 : 1''.7$$

which is the correction to be subtracted from the semidiameter at noon, because the semidiameter is decreasing. The Moon's semidiameter for March 10, 7^h, is therefore 14' 53''.5.

The Moon's semidiameter and horizontal parallax are required for all observations of the Moon.

Pages 118–133 contain also: The *Moon's Age*, or the time elapsed since the preceding new Moon, given to tenths of a day; the mean time of the *Moon's Transit*, *Upper* and *Lower*, at Greenwich, given to tenths of a minute; and the *Variation per Hour* of the latter quantity, that is, the variation for one hour of longitude, by means of which the local time of an upper or lower transit of the Moon may be computed for any place whose longitude is known.

Pages 134–198 contain for each of the seven major planets the geocentric ephemeris followed immediately by the heliocentric ephemeris.

The geocentric ephemeris gives the planet's *Apparent Right Ascension* and *Apparent Declination* with the respective *Variations per Hour* or *per Day*. The positions thus given are referred to the true equator and equinox, and are corrected for aberration. The geocentric ephemeris gives also the *Logarithm of Distance from Earth* with the *Variation per Hour* or *per Day*, the planet's *Semidiameter* and *Horizontal Parallax*, and, to tenths of a minute, the time of *Transit*, *Meridian of Greenwich*. All the data, except the last named, are given for Greenwich mean noon.

The right ascension and declination of a planet are required whenever it is observed for time, latitude, or azimuth. The mode of reducing the ephemeris positions of planets to other instants of Greenwich mean time is the same as that already given for the Sun. The local mean time of meridian transit of any planet at any place can be found by dividing the proper daily difference of the ephemeris times by 24, multiplying the quotient by the longitude of the place expressed in hours and fractions, and applying the product with its proper sign to the time of Greenwich transit.

The heliocentric ephemeris gives the *Heliocentric Longitude*, *Mean Equinox of Date*; the *Heliocentric Latitude*; and the *Logarithm of Radius Vector*; with

their respective *Variations per Day*. The heliocentric longitude may be referred to the true equinox by applying nutation. The variations are given for the instant of Greenwich mean noon. The column *Reduction to Orbit* contains the correction to be applied to the heliocentric longitude in order to obtain the longitude measured along the orbit of the planet. This orbit longitude is equal to the distance from the mean equinox to the node, plus the distance from the node to the planet. The heliocentric latitude is referred to the ecliptic of the date. The *Logarithm of Radius Vector* is the logarithm of the distance of the center of the planet from that of the Sun.

PART II.—THE EPHEMERIS FOR THE MERIDIAN OF WASHINGTON.

Pages 200–201 contain formulæ for reducing mean positions of stars to apparent positions, including expressions for the Besselian star-numbers and star-constants, and for the independent star-numbers; the whole based upon the constants of the Paris Conference of May, 1896, and expressed in the notation of BESSEL.

Pages 202–205 contain the logarithms of the *Besselian Star-Numbers*, *A*, *B*, *C*, *D*, for each Washington mean midnight, with the values of *E* appended at the bottoms of the pages. The terms of short period have been included. These numbers serve to reduce the mean place of a star at the beginning of the Besselian fictitious year to its apparent place at any of the dates for which the numbers are given, and in ordinary cases four-figure logarithms suffice; but where extreme accuracy is desired the logarithms of *A*, *C*, and *D* are sometimes needed to five places of decimals. Along with the solar day, the first column contains the sidereal hour of Washington mean midnight for certain dates, and by interpolation among them it is easy to find the sidereal time for which any set of quantities is given.

The following is an example of the reduction of a star to apparent place by the Besselian star-numbers:

Computation of the apparent place of α Aquilæ, July 2, 1916, for the upper transit at Washington.

$\log a$	0.5165	$\log b$	7.2441 <i>n</i>	$\log c$	8.0434	$\log d$	8.8236 <i>n</i>
$\log A$	9.9072	$\log B$	0.6185 <i>n</i>	$\log C$	0.5513	$\log D$	1.3032 <i>n</i>
$\log a'$	0.5159	$\log b'$	9.9941	$\log c'$	9.4341	$\log d'$	8.4146 <i>n</i>
$\log Aa$	0.4237	$\log Bb$	7.8626	$\log Ce$	8.5947	$\log Dd$	0.1268
$\log Aa'$	0.4231	$\log Bb'$	0.6126 <i>n</i>	$\log Cc'$	9.9854	$\log Dd'$	9.7178
<i>Mean Place, 1916.0</i>				$\alpha_0 =$	^h 18 ^m 37 ^s 40.531	$\delta_0 =$	[°] -9 ['] 8 ["] 1.93
				<i>Aa</i> =	+2.653	<i>Aa'</i> =	+2.65
				<i>Bb</i> =	+0.007	<i>Bb'</i> =	-4.10
				<i>Cc</i> =	+0.039	<i>Cc'</i> =	+0.97
				<i>Dd</i> =	+1.339	<i>Dd'</i> =	+0.52
				<i>E</i> =	+0.003	$\tau\mu'$ =	0.00
				$\tau\mu$ =	+0.001		
<i>Apparent Place, July 2,</i>				$\alpha =$	^h 18 ^m 37 ^s 44.573	$\delta =$	[°] -9 ['] 8 ["] 1.89

Pages 206–213 contain the *Independent Star-Numbers*, which can frequently be advantageously used instead of the *Besselian Star-Numbers*. The terms of short period have been included. These quantities are connected with those of Bessel by the relations given on page 200, which also contains the formulæ and precepts for the application of both systems of numbers. In order to use

the Besselian numbers, it is necessary to have the values of the star-constants, α , b , c , d , α' , b' , c' , d' , while the independent star-numbers render it possible to determine the apparent place of a star without computing these star-constants. Four-figure logarithms usually suffice, but where extreme accuracy is desired the logarithms of g and h are needed to five places of decimals, and G and H are needed to one-tenth of a minute of arc. The column τ gives the fraction of a year, counted from the beginning of the Besselian fictitious year to each date.

The following is an example of the reduction of a star to apparent place by the independent star-numbers:

Computation of the apparent place of α Aquilæ, July 2, 1916, for the upper transit at Washington.

$G = 23$	$\overset{h}{m}$ 2.4			$\delta_o = -9$	$\overset{\circ}{'}$ 8.0
$\alpha_o = 18$	37.7			$G + \alpha_o =$	$17^h 40^m.1$
$H = 11$	19.8			$H + \alpha_o =$	$5 \quad 57.5$
$\log \gamma$	8.8239	$\log \gamma$	8.8239	$\alpha_o =$	$\overset{h}{m}{\overset{s}{}}$ 18 37 40.531
$\log g$	1.2231	$\log h$	1.3099	$f + f' =$	+2.485
$\sin (G + \alpha_o)$	9.9984 <i>n</i>	$\sin (H + \alpha_o)$	0.0000	$(g) =$	+0.178
$\tan \delta_o$	9.2062 <i>n</i>	$\sec \delta_o$	0.0055	$(h) =$	+1.378
$\log (g)$	9.2516	$\log (h)$	0.1393	$\tau \mu =$	+0.001
				$\alpha =$	18 37 44.573
$\log g$	1.2231	$\log h$	1.3099	$\delta_o = -9$	$\overset{\circ}{'}{''}$ 8 1.93
$\cos (G + \alpha_o)$	8.9381 <i>n</i>	$\cos (H + \alpha_o)$	8.0377	$(g') =$	-1.45
		$\sin \delta_o$	9.2007 <i>n</i>	$(h') =$	-0.04
$\log (g')$	0.1612 <i>n</i>	$\log (h')$	8.5483 <i>n</i>	$(i) =$	+1.52
				$\tau \mu' =$	0.00
				$\delta = -9$	8 1.90
$\log i$	0.1885				
$\cos \delta_o$	9.9945				
$\log (i)$	0.1830				

Page 214 contains for every tenth sidereal day the *Besselian* and *Independent Star-Numbers*, exclusive of all short-period terms. They are useful in computing ephemerides of stars, similar to those on pages 316–513, for which data containing short-period terms should not be employed.

Pages 215–216 contain for Washington mean midnight of each day the short-period terms of the nutation in longitude and obliquity, for use in connection with the formulæ on page 201, and the coefficients mentioned later, which are given for each star on pages 316–513.

Pages 217–230 contain the *Mean Places of Ten-day Stars* for the beginning of the Besselian fictitious year. These pages give also the magnitude, spectral type, annual variations, and proper motions for each star. The annual variations are to be considered as the differential coefficients of each coordinate with respect to the time at the beginning of the year.

Page 231 contains, for the *Circumpolar Stars*, the same data as the immediately preceding pages do for the ten-day stars.

Pages 232–315 contain for every upper transit at Washington the apparent positions of seventeen northern and eighteen southern circumpolar stars arranged in the order of their right ascensions. The mean solar time of transit is given in the column *Washington Mean Time*, in order that each transit above

and below the pole may be readily identified. Suppose, for example, that the transit of Polaris below the pole on January 26 is to be found, and we wish to know whether it precedes or follows the upper transit of the same date. On page 232 we find that the upper transit occurs January 26.2; the lower transit, therefore, occurs January 26.7. But the lower transit of July 1 precedes the upper one, which occurs July 1.8. A transit occurring very nearly at noon may also be identified without a computation to ascertain the actual mean date, by simply noting the tenth of a day in the column *Washington Mean Time*.

The secant and tangent of the apparent declination for the 15th of each month and the mean place in right ascension and declination for the beginning of the year are given for each star at the foot of the page.

Pages 316-513 contain, for every tenth upper transit at Washington, the apparent places of 790 stars, being all those given in the list of mean places of ten-day stars. The *Washington Mean Time* in the left-hand column of each page gives the day and tenth of the transit, so that intermediate transits may be readily identified; and to facilitate interpolation, the differences of each coordinate are given for every ten days.

In connection with the ephemeris of each ten-day star there are given at the foot of the page (1) the seconds of the mean place in both right ascension and declination for the beginning of the year, (2) the secant and the tangent of the mean of the star's greatest and least apparent declinations during the year, and (3) the coefficients of the short-period terms of the nutation, the use of which is explained on page 201.

Pages 514-521 contain, for Washington apparent noon, the *Apparent Right Ascension* and *Declination* of the Sun, the *Equation of Time*, and the *Variation per Hour* of these quantities; the *Semidiameter* of the Sun, and the *Sidereal Time of Semidiameter Passing Meridian*. The last column on each page contains the *Sidereal Time of Mean Noon*.

The *Equation of Time, Mean-App.* is the correction to be applied to apparent time in order to obtain mean time. Each number as given is the mean time of transit of the Sun's center over the meridian of Washington counted from the nearest noon.

Pages 522-537 contain the *Right Ascension of Center*, the *Geocentric Declination of Center*, the *Sidereal Time of Semidiameter Passing Meridian*, the *Geocentric Semidiameter*, and the *Equatorial Horizontal Parallax* of the Moon, and the *Washington Mean Time* at the moment of each upper and lower transit over the meridian of Washington.

The *Variation per Hour of Longitude* is the correction to be applied in each case to the quantity in the preceding column to obtain its value for the time of transit over the meridian one hour west of Washington, supposing the rate of change to be uniform and equal to what it is at the instant of transit over the meridian of Washington. The quantities in the third column, when corrected for another longitude by the hourly variations, give the local mean time of transit for that longitude. By means of the variations per hour of longitude any one of the quantities under consideration can be computed with great exactness for the moment of transit over any meridian not more than one hour distant from Washington. To obtain the same accuracy for more distant

meridians, we may proceed as follows: Let F represent either the *Washington Mean Time*, the *Right Ascension of Center*, or the *Geocentric Declination of Center*, and let V represent the corresponding *Variation per Hour of Longitude*. Write down three successive values of F , together with the corresponding values of V , and difference the latter as in the following scheme, where the middle values, F_0 and V_0 , belong to the culmination from which is to be derived the value of F for the culmination on the meridian whose longitude is λ :—

Function.	Var. per Hour of Longitude.	Δ'	Δ''
F_{-1}	V_{-1}	a'	b
F_0	V_0	a''	
F_{+1}	V_{+1}		

Then, for the culmination at the meridian λ

$$F_\lambda = F_0 + \lambda V_0 + \frac{\lambda^2}{48}(a' + a'') + \frac{\lambda^3 b}{864}$$

where λ must be expressed in hours and decimals of an hour, and reckoned from Washington or from 180° from Washington according as the upper or lower culmination is used for the middle value (F_0). Adding twelve hours to the Washington time of lower transit at Washington gives the local time of upper transit at places whose longitude is 180° from Washington.

The column *Bright Limbs* is given to indicate to the observer which limbs are illuminated. When one limb is full and the terminator is within $1''$ of the opposite limb, both can be well observed, and in such cases both are indicated, the defective limb being indicated by an italic letter or numeral, and the correction for defective illumination (as seen from Washington) being given in a footnote.

Pages 538–555 contain for each of the seven major planets, the geocentric *Apparent Right Ascension* and *Declination*, the *Horizontal Parallax*, *Semidiameter*, *Sidereal Time of Semidiameter Passing Meridian*, and the *Washington Mean Time*, for the moments of all transits which it is usually desirable to observe over the meridian of Washington. The stellar magnitude at opposition for Mars, Jupiter, Saturn, Uranus, and Neptune, respectively, is given at the bottom of the page containing the ephemeris of the planet.

PART III.—PHENOMENA.

This part gives the dates of the principal astronomical phenomena of the year, expressed in Greenwich mean time, except in the case of the occultations visible at Washington, where Washington time is used.

Pages 558–565 contain all necessary data respecting the solar and lunar eclipses which occur during the year.

The eclipse elements are given for the moment of conjunction of the Sun and Moon in right ascension, but the subsequent tables and results are computed from the exact positions of these bodies at the several instants referred to. The times and angles designated as the circumstances of a lunar eclipse remain the same throughout all parts of the Earth, and require no explanation beyond a mere statement of the fact that in computing them the geometrical

diameter of the Earth's shadow has been augmented in the proportion of 51 : 50. The principal circumstances of each total and annular eclipse of the Sun are stated in five lines, as follows:—

The line entitled "Eclipse begins" gives the Greenwich mean time at which the Moon's penumbra first touches the Earth, together with the latitude and longitude of the point of contact.

The line entitled "Central eclipse begins" gives the time when the axis of the Moon's shadow first touches the Earth, and the latitude and longitude of the point of contact follow.

The line entitled "Central eclipse at local apparent noon" gives the time when the axes of the Earth and of the shadow cone lie in the same plane. The latitude and longitude of the point where the axis of the shadow cone then cuts the Earth's surface follow, and there the eclipse will be central and the Sun will be exactly on the meridian.

The lines entitled "Central eclipse ends" and "Eclipse ends" give, respectively, the times when and the localities where these events occur, the phenomena being the converse of those denoted by the similar phrases for the beginning.

In the case of partial solar eclipses the axis of the Moon's shadow does not come into contact with the Earth, and the three lines entitled, respectively, "Central eclipse begins," "Central eclipse at local apparent noon," and "Central eclipse ends," are replaced by a single line entitled "Greatest eclipse," whereon are given the time when and the latitude and longitude where the eclipse attains its greatest magnitude. The latter phenomenon necessarily occurs with the Sun in the horizon.

Maps of the Eclipses.—The regions in which each eclipse is visible are shown upon the map relating to it, from which may be taken approximately, for any place, both the times of the beginning and ending of the eclipse and its magnitude. The dotted curves show the outline of the shadow for each hour of Greenwich mean time, and therefore pass through all places where the eclipse begins or ends at the hour indicated. To find the instant of beginning at any place, we determine by inspection between what pair of these curved lines the place is situated. The eclipse will then begin between the corresponding hours of Greenwich mean time; and the fraction of the hour may be determined by dividing the hour in the same proportion as the space representing it on the map is divided by the place in question. This division may be made a little more exact by allowing for the changes in the spaces as indicated by their varying width. The Greenwich mean time thus found must be reduced to local mean time by applying the longitude.

As an example, suppose we wish to find the times at which the eclipse of 1916, February 3, begins and ends at a point near Washington, latitude $+38^{\circ} 54'$, longitude $+77^{\circ} 3'$.

For the beginning we compare the distance of the place from the curves of 3^h and 4^h , and find it to correspond to about 10 minutes from the former, thus giving for the approximate time of beginning $3^h 10^m$; for the end we compare the distance of the place from the curves of 5^h and 6^h , and find it to be about 20 minutes from the former, thus giving for the approximate time of ending $5^h 20^m$, and both of these results are probably correct to within 3 or 4 minutes.

Changing to local mean time, we shall have—

			Beginning.			Ending.		
			d	h	m	d	h	m
Greenwich mean time	.	February	3	3	10	3	5	20
Longitude west	.			5	8		5	8
Local mean time	.	February	2	22	2	3	0	12

In the case of total and annular eclipses, a fair estimate of the magnitude of the eclipse at any place may be obtained from the position thereof relatively to the central line and to the limit. On the central line the eclipse is annular or total, while between the central line and the limit the maximum magnitude of the eclipse is given by the quotient of the distance of the place from the limit divided by the distance of the central line from the limit; the measurements being made upon a line drawn through the place perpendicularly to the central line.

More Accurate Computations.—A more accurate determination of the phases, as visible at any point of the Earth's surface, may be obtained from the Besselian elements which are given for every 10 minutes of Greenwich mean time. Their geometric signification is as follows:—

Let us imagine a plane passing through the center of the Earth, perpendicular to the right line joining the centers of the Sun and Moon. This latter line is the axis of the Moon's shadow, and the plane is called the *fundamental plane* or plane of *xy*. We take the intersection of this plane with that of the Earth's equator as the axis of *x*, and the center of the Earth as the origin of coordinates. The axis of *y* is perpendicular to that of *x*, and directed toward the north; *x* and *y* are then the coordinates of the point in which the axis of the shadow intersects the fundamental plane, and they are here expressed in terms of the Earth's equatorial radius as unity. The angle *d*, of which the sine and cosine are both given, is the declination of that point of the celestial sphere toward which the axis of the shadow is directed; or, in other words, it is the declination of the center of the Sun as seen from the center of the Moon. The angle μ is the Greenwich hour-angle of this same point of the celestial sphere.

The quantities l_1 and l_2 are the radii of the shadow cones upon the fundamental plane, l_1 corresponding to the penumbra, and l_2 to the umbra, or annulus. The notation is that of CHAUVENET'S *Spherical and Practical Astronomy*, in which l_2 is regarded as positive for an annular and negative for a total eclipse.

The angles f_1 and f_2 , the tangents of which are given, are the angles which the elements of the respective shadow cones make with the axis of the shadow; or, they are the semiangles of the two cones.

In order to facilitate interpolation to any required moment, the logarithms of x' , y' , and μ' , which are the changes of *x*, *y*, and μ , in one minute of time, are given at the bottom of the table.

The method of computing an eclipse from its Besselian elements is based on the fact that at the moments of beginning and ending the distance of the observer from the axis of the shadow or penumbra is equal to the radius of the latter at the point of observation. To find this distance and radius we proceed as follows:

(1) The coordinates of the observer, ξ , η , and ζ , together with their variations in one minute, are computed for some assumed moment of Greenwich mean time, as near as practicable to the true time of the required phase.

(2) The coordinates x and y of the axis of the shadow, together with their variations in one minute, are taken for the same moment from the tables of elements.

(3) From (1) and (2) the position and motion of the observer relative to the axis of the shadow are found.

(4) The radius of the penumbra or umbra at a distance from the fundamental plane equal to that of the observer is also computed.

(5) Then, assuming the motions to be uniform, we determine the time required for the observer to be brought to a distance from the axis of the shadow equal to this radius.

The formulæ and directions for the several steps in the computation are as follows:—

(1) Find $\rho \cos \varphi'$ and $\rho \sin \varphi'$, which are the geocentric coordinates of the station referred to the Earth's equator, ρ being the distance from the center of the Earth and φ' the geocentric latitude. These coordinates may be computed from the following table based on the compression of the Earth adopted at the Paris Conference of 1911, 1/297, by the formulæ—

$$\rho \cos \varphi' = F \cos \varphi$$

$$\rho \sin \varphi' = \frac{\sin \varphi}{G}$$

φ being, as usual, the geographic latitude.

Table for Computing the Geocentric Coordinates of a Place.

φ	Log F.	Log G.
0°	0.00000	0.00293
5	0.00001 1	0.00292 1
10	0.00004 3	0.00289 3
15	0.00010 6	0.00283 6
20	0.00017 7	0.00276 7
25	0.00026 9	0.00267 9
30	0.00037 11	0.00256 11
35	0.00048 11	0.00245 11
40	0.00060 12	0.00232 12
45	0.00073 13	0.00220 13
50	0.00086 12	0.00207 12
55	0.00098 12	0.00195 12
60	0.00110 12	0.00183 12
65	0.00120 10	0.00173 10
70	0.00129 9	0.00164 9
75	0.00137 8	0.00156 8
80	0.00142 5	0.00151 5
85	0.00145 3	0.00148 3
90	0.00146 1	0.00146 2

For the assumed Greenwich mean time of computation, take from the table of elements the values of $\sin d$, $\cos d$, and μ . Then, with λ for the longitude west from Greenwich, the coordinates of the observer will be—

$$\xi = \rho \cos \varphi' \sin (\mu - \lambda)$$

$$\eta = \rho \sin \varphi' \cos d - \rho \cos \varphi' \sin d \cos (\mu - \lambda) = \eta_1 - \eta_2$$

$$\zeta = \rho \sin \varphi' \sin d + \rho \cos \varphi' \cos d \cos (\mu - \lambda) = \zeta_1 + \zeta_2$$

and their variations in one minute of mean time will be—

$$\begin{aligned}\xi' &= [7.63992] \rho \cos \varphi' \cos (\mu - \lambda) \\ \eta' &= [7.63992] \rho \cos \varphi' \sin d \sin (\mu - \lambda) = [7.63992] \xi \sin d \\ \zeta' &\text{ is not needed.}\end{aligned}$$

(2) For the same assumed moment of Greenwich mean time, take from the tables of elements the coordinates x and y of the axis of the shadow, together with their variations for one minute, which are equal to one-tenth of the differences of two consecutive numbers. These variations are represented by x' and y' , and their logarithms are given beneath the tables of x and y .

(3) The distance m and position-angle M of the axis of the shadow relatively to the observer, and the relative motions, n and N , are computed by the formulæ—

$$\begin{aligned}m \sin M &= x - \xi \\ m \cos M &= y - \eta \\ n \sin N &= x' - \xi' \\ n \cos N &= y' - \eta'\end{aligned}$$

(4) Both for the shadow and for the penumbra, the radius L at the distance ζ from the fundamental plane is computed by the formula—

$$L = l - \zeta \tan f$$

l and f being found from the table of elements, and ζ computed in (1).

(5) If the time chosen for computation is exactly that of the beginning or ending of the eclipse, we shall have—

$$m = L$$

But, as this condition will rarely be fulfilled on a first trial, a correction τ to the assumed time is computed thus: Find the angle ψ from the equation,

$$\sin \psi = \frac{m \sin (M - N)}{L}$$

There will be two values for this angle, of which one will be in the first and the other in the second quadrant when $\sin \psi$ is positive, and one in the third and the other in the fourth quadrant when $\sin \psi$ is negative; but simplicity will be gained by taking only that value of ψ for which $\cos \psi$ is positive. This value lies between the limits $+90^\circ$ and -90° . The correction τ to the assumed time of beginning or ending of the eclipse will then be found, in minutes, from—

$$\tau = -\frac{m \cos (M - N)}{n} \mp \frac{L \cos \psi}{n}$$

where the double sign is to be taken negative for the beginning and positive for the ending.

However, one such pair of values of τ can not give the times of both beginning and ending with accuracy. To attain that, we must commence the computation by assuming two times, one near the beginning and the other near the ending of the eclipse, both of which may be derived from the chart with sufficient exactness. The computation for the first assumed time will

give a small value of τ which, when applied to the assumed time, will give the beginning of the eclipse nearly correctly, and a large value which will give an inaccurate time of ending. Similarly, the computation for the second assumed time will give a small and nearly correct value of τ for finding the time of ending, and a large and inaccurate negative value for finding the time of beginning. We shall thus deduce two times of each phase, only one of which is to be regarded as approximately correct.

The more accurate times of beginning and ending may now be taken in place of those originally assumed, and the whole computation may be repeated, thus leading to a pair of values of τ , which should be very small and accurate. Such a repetition of the computation will in general be advisable, to guard against accidental numerical errors, but a second approximation may be obtained without it, by finding a corrected value of τ in accordance with the formulæ—

$$\delta\tau = \mp \frac{\tau(l' + [5.3100]\xi \cos d)}{n \cos \phi} - \frac{[4.9788]\tau^2}{n \cos \phi} [\xi \sin (N \mp \phi) - \eta_2 \cos (N \mp \phi)]$$

$$\tau_0 = \tau + \delta\tau$$

where the double signs are to be taken negative for the beginning of the eclipse and positive for the ending. l' is the variation of l for one minute of time, and its numerical value can be taken by inspection from the table of Besselian elements.

If the resulting values of τ_0 are not greater than fifteen minutes, the corrected times of contact thus obtained will be theoretically exact within less than a second, but the uncertainties of the solar and lunar tables are such that an unavoidable error of several seconds may exist in the prediction. To guard against numerical mistakes it is better, after making this final correction, to repeat the computations so far as to obtain new values of m and L for the corrected times. If these two quantities agree within a unit of the fourth place of decimals, the times employed are generally correct within a second of time. If they differ too widely, the computer must use his own judgment as to making further corrections and computations.

Position-angle of Point of Contact.—The position-angle P , of the point of contact, reckoned from the north point of the Sun's limb toward the east, is found by the formulæ—

$$P = N - \psi \pm 180^\circ \text{ for the beginning,}$$

$$\text{or } P = N + \psi \quad \text{for the ending,}$$

it being assumed that, in each case, the value of ψ is taken between the limits $\pm 90^\circ$.

Computation of the Solar Eclipse of 1916, February 3, for Washington.

The position of the point chosen is—

	°	'	"
Latitude, $\phi =$	+38	54	0
Longitude, $\lambda =$	+77	3	0

Its geocentric coordinates are—

$$\rho \sin \phi' = 9.79558$$

$$\rho \cos \phi' = 9.89169$$

From the Eclipse Chart we find the approximate times of the phases to be—

Beginning February	^d 3	^h 3	^m 10	} Greenwich Mean Time.
Ending	3	5	20	
Greenwich Mean Time, T , February 3,				
	Beginning. 3 ^h 10 ^m			Ending. 5 ^h 20 ^m
μ	44	1	42	76 31 42
λ	+77	3	0	+77 3 0
$\mu - \lambda$	-33	1	18	- 0 31 18
$\rho \cos \varphi'$	9.89169			9.89169
$\sin (\mu - \lambda)$	9.73636 n			7.95926 n
$\log \xi$	9.62805 n			7.85095 n
ξ	-0.42467			-0.00710
$\rho \sin \varphi'$	9.79558			9.79558
$\cos d$	9.98109			9.98114
$\log \eta_1$	9.77667			9.77672
η_1	+0.59796			+0.59803
$\rho \cos \varphi'$	9.89169			9.89169
$\sin d$	9.46062 n			9.45999 n
$\cos (\mu - \lambda)$	9.92349			9.99998
$\log \eta_2$	9.27580 n			9.35166 n
η_2	-0.18871			-0.22473
$\eta = \eta_1 - \eta_2$	+0.78667			+0.82276
$\rho \sin \varphi' \sin d$	9.25620 n			9.25557 n
ζ_1	-0.18038			-0.18012
$\rho \cos \varphi' \cos d \cos (\mu - \lambda)$	9.79627			9.87281
ζ_2	+0.62556			+0.74612
$\zeta = \zeta_1 + \zeta_2$	+0.44518			+0.56600
const. log	7.63992			7.63992
$\rho \cos \varphi' \cos (\mu - \lambda)$	9.81518			9.89167
$\log \xi'$	7.45510			7.53159
ξ'	+0.002852			+0.003401
const. log	7.63992			7.63992
$\xi \sin d$	9.08867			7.31094
$\log \eta'$	6.72859			4.95086
η'	+0.000535			+0.000009
$x - \xi$	-0.20669			+0.52109
$y - \eta$	-0.50656			-0.07282
$x' - \xi'$	+0.005961			+0.005407
$y' - \eta'$	+0.003076			+0.003608
$m \sin M$	9.31532 n			9.71691
$m \cos M$	9.70463 n			3.86225 n
$\tan M$	9.61069			0.85466 n

	Beginning.	Ending.
M	202° 11' 48''	97° 57' 19''
$\sin M$	9.57725 n	9.99580
$\log m$	9.73807	9.72111
$n \sin N$	7.77532	7.73296
$n \cos N$	7.48799	7.55727
$\tan N$	0.28733	0.17569
N	62° 42' 19''	56° 17' 9''
$\sin N$	9.94873	9.92003
$\log n$	7.82659	7.81293
$\tan f$	7.67608	7.67607
$\log \zeta$	9.64854	9.75282
	7.32462	7.42889
$\zeta \tan f$	+0.00211	+0.00268
l	+0.54248	+0.54265
L	+0.54037	+0.53997
$M - N$	139° 29' 29''	41° 40' 10''
$\sin (M - N)$	9.81262	9.82271
$\log m$	9.73807	9.72111
$\csc L$	0.26731	0.26763
$\sin \psi$	9.81800	9.81145
ψ	+41° 7' 17''	+40° 22' 36''
$\log \frac{m}{n}$	1.91148	1.90818
$\cos (M - N)$	9.88099 n	9.87332
	1.79247 n	1.78150
$-\frac{m}{n} \cos (M - N)$	+62.011	-60.464
$\log L$	9.73269	9.73237
$\cos \psi$	9.87698	9.88184
$\csc n$	2.17341	2.18707
	1.78308	1.80128
$\mp \frac{L \cos \psi}{n}$	-60.684	+63.281
τ	+ 1.327	+ 2.817
$T + \tau$	d h m 3 3 11.327	d h m 3 5 22.817

Although neither value of τ is large, we compute the correction $\delta\tau$ for the ending as follows:

	Ending.
const. \log	5.3100
$\log \xi$	7.8510 n
$\cos d$	9.9811
	3.1421 n

	Ending.
number	-0.0000001
l'	+0.0000008
sum	+0.0000007

	Ending.		Ending.
$\log (\text{sum})$	3.8451	$\xi \sin (N+\psi)$	-0.0070
$\log \tau$	0.4498	$\eta_2 \cos (N+\psi)$	+0.0261
$\text{colog } n$	2.1871	diff.	-0.0331
$\sec \psi$	0.1182		
	6.6002	$\log (\text{diff.})$	8.5198 n
(1)	+0.0004	const. \log	4.9788 n
$N+\psi$	96° 40'	$\log \tau^2$	0.8996
$\sin (N+\psi)$	9.9971	$\text{colog } (n \cos \psi)$	2.3052
$\log \xi$	7.8510 n		6.7034
$\log \xi \sin (N+\psi)$	7.8481 n	(2)	+0.0005
$\cos (N+\psi)$	9.0648 n		
$\log \eta_2$	9.3517 n	(1) + (2) = $\delta \tau$	+0.001 ^m
$\log \eta_2 \cos (N+\psi)$	8.4165	τ	+2.817
		τ_0	+2.818

The corrected time of ending is, therefore,

$$T_0 = \text{February } 3^{\text{d}} 5^{\text{h}} 22^{\text{m}}.818$$

Whence we find—

			Beginning.			Ending.		
Greenwich Mean Time, February			d	h	m	d	h	m
λ			3	3	11.327	3	5	22.818
			+	5	8.200	+	5	8.200
Local Mean Time, February			2	22	3.127	3	0	14.618

Therefore we have—

Beginning of the Eclipse, February	d	h	m	s	} Local Mean Time.
End of the Eclipse, February	2	22	3	7.6	
	3	0	14	37.1	

	Beginning.	Ending.
$N \mp \psi$	21 35.0	96 39.8
constant	180 0.0	0 0.0
Angle of position, P	201 35.0	96 39.8

from the north point of the Sun's disk toward the east for direct image.

Pages 566–570 contain the adopted mean places and annual proper motions of such stars, as bright as magnitude 6.5, as will be occulted during the year by the Moon.

Pages 571–607 contain the elements for the prediction of the times of occultations of stars and planets by the Moon during the current year. The system of coordinates employed is similar to that already described for eclipses, the fundamental plane passing through the center of the Earth, and being taken perpendicular to the line joining the star and the center of the Moon, but the cone circumscribing the Moon and star is regarded as a cylinder which intercepts the fundamental plane in a circle having the same linear diameter as the Moon.

In the columns referring to the star, those headed *Red'ns from 1916.0* give the quantities necessary to reduce the mean place of the star at the beginning of 1916 to its apparent place at the time of occultation. These reductions are sufficiently accurate to be definitive.

Under the general head, *At Conjunction in R. A.*, are five columns giving certain quantities for the moment of geocentric conjunction of the Moon and star in right ascension, as follows:

The *Greenwich Mean Time* is the moment, T , at which the two bodies are in geocentric conjunction in right ascension. At that moment the coordinate x of the axis of the cylinder on the fundamental plane has the value zero. The column *Hour Angle, H*, gives the common geocentric hour-angle of the Moon and star at the same moment, expressed in sidereal time and counted from the meridian of Greenwich—positive toward the west and negative toward the east. Column Y gives the coordinate y of the axis of the cylinder upon the fundamental plane at the same moment. Columns x' and y' give the variations of x and y in one hour of mean time. The linear unit in these columns is the Earth's equatorial radius. The limiting parallels, north and south, show the extreme limits of latitude within which the occultation will be visible.

By the aid of these elements, the time of immersion and emersion of a star relatively to the limb of the Moon may be computed for any part of the Earth by a method nearly the same as that already explained for computing eclipses, but somewhat more simple.

Prediction of Occultations for a given Place.—When it is desired to predict the circumstances of one or more occultations at any place, the first step will be to select them from the general list given in the Ephemeris. The conditions of visibility are:—

1. The limiting parallels in the last columns must include the latitude of the place.

2. The quantity $H - \lambda$, taken without regard to sign, must be less than the semidiurnal arc of the star by at least one hour. On very rare occasions an emersion might be seen in the east, or an immersion in the west, when this difference is a few minutes less than an hour.

3. The Sun must not be much more than an hour above the horizon at the local mean time $T - \lambda$, unless the star is bright enough to be seen in the daytime.

When many occultations are to be selected, the most convenient course will be to write the value of $-\lambda$ on the bottom of a slip of paper, and in passing through the list of occultations to pause over each one for which condition (1) is fulfilled, and examine by means of the slip whether conditions (2) and (3) are also fulfilled. If either fails, the computer passes on. Sometimes it will be difficult to determine whether $H - \lambda$ or $T - \lambda$ falls within the limits; and in such cases the computer may mark the occultation for trial and leave the decision for the subsequent operations. The whole list can be gone over in less than a day, and it will probably be found that about one-tenth of the occultations are marked for trial.

The next step will be to compute the local times of immersion and emersion from the elements, and to that end let—

T = the instant of geocentric conjunction of Moon and star in right ascension, expressed in Greenwich mean time;

H = the Greenwich west hour-angle of the two bodies at that moment;

λ = the longitude west of Greenwich;

$h_0 = H - \lambda$ = the local hour-angle of the star at the instant T ;

δ = the star's declination.

The procedure for each occultation will then be as follows:—

(1) The geocentric coordinates of the place, $\rho \sin \varphi'$ and $\rho \cos \varphi'$, are to be computed by the formulæ and table given in connection with eclipses on page 722.

The next step will be to find the approximate instant of apparent conjunction of the Moon and star as seen from the place, and that may be deduced from the time of geocentric conjunction by the application of an approximate correction taken from DOWNES's table, printed in the volumes of the American Ephemeris for 1882 to 1899. This correction must be reckoned in mean solar hours, and will be designated by the symbol t . It will have the same sign as h_0 .

When DOWNES's table is not available, the correction may be computed from the formulæ,

$$\xi_0 = \rho \cos \varphi' \sin h_0$$

$$\xi' = [9.4192] \rho \cos \varphi' \cos \frac{4}{3} h_0$$

$$t = \frac{\xi_0}{x' - \xi'}$$

By applying t to the Greenwich mean time of geocentric conjunction, as given with the elements, we shall have the Greenwich mean time of local conjunction within a few minutes.

(2) Compute for the instant $T + t$ the following quantities, in which t_0 is the sidereal equivalent of the mean time interval t :

$$\xi = \rho \cos \varphi' \sin (h_0 + t_0)$$

$$\eta = \rho \sin \varphi' \cos \delta - \rho \cos \varphi' \sin \delta \cos (h_0 + t_0) = \eta_1 - \eta_2$$

$$\xi' = [9.4192] \rho \cos \varphi' \cos (h_0 + t_0)$$

$$\eta' = [9.4192] \rho \cos \varphi' \sin \delta \sin (h_0 + t_0) = [9.4192] \xi \sin \delta$$

$$x = x't$$

$$y = Y + y't$$

Compute also m , M , n , N , and ψ from the equations,

$$m \sin M = x - \xi$$

$$m \cos M = y - \eta$$

$$n \sin N = x' - \xi'$$

$$n \cos N = y' - \eta'$$

$$\sin \psi = [0.5646] m \sin (M - N)$$

ψ being taken between the limits $\pm 90^\circ$. Finally compute,

$$\tau = -\frac{[1.7782]m}{n} \cos (M - N) \mp \frac{[1.2135]}{n} \cos \psi$$

$$\delta\tau = \frac{[6.7591]\tau^2}{n \cos \psi} [\eta_2 \cos (N \mp \psi) - \xi \sin (N \mp \psi)]$$

where the double signs are to be taken negative for an immersion and positive for an emersion. Both τ and $\delta\tau$ thus have two values, which are expressed in minutes of time, and in order to distinguish them let those pertaining to immersion be designated respectively τ' and $\delta\tau'$, while those pertaining to emersion are designated τ'' and $\delta\tau''$. We then have for the Greenwich mean times of the phases,

$$\text{Instant of immersion} = T + t + \tau' + \delta\tau'$$

$$\text{Instant of emersion} = T + t + \tau'' + \delta\tau''$$

These expressions are practically exact, as the corrections $\delta\tau$ seldom amount to so much as 1.5 minutes, and whenever an inaccuracy of that magnitude is permissible they may be omitted. As a check upon the results it will be advisable to compute ξ , η , x , and y for the times of immersion and emersion finally obtained. If these times are correct, the quantities in question will fulfill the condition,

$$\sqrt{(x - \xi)^2 + (y - \eta)^2} = 0.2725$$

If $\log m \sin (M - N) > 9.4354$, $\sin \psi$ will be numerically greater than unity, and no occultation is to be expected at the given place; but a very brief one may occur if the excess of the computed distance over the Moon's semi-diameter happens to be within the errors of the ephemerides of the Moon and star.

The position-angle of the line from the Moon's center to the star, at the time of contact, is reckoned from the north point toward the east, and designated by the symbol P . It is computed from the formulæ,

$$\begin{aligned} P &= N - \psi + \delta P && \text{for immersion,} \\ \text{or } P &= N + \psi + \delta P \pm 180^\circ && \text{for emersion,} \end{aligned}$$

where the angles $N - \psi$ and $N + \psi$ are taken directly from the computation of $\delta\tau$, and δP is found in degrees of arc from the expression,

$$\delta P = \mp \frac{[7.3038]\tau^2}{\cos \psi} [\eta_2 \sin N + \xi \cos N]$$

In the latter formula the double sign is to be taken negative for an immersion and positive for an emersion.

The angle from the vertex, V , is also reckoned in the direction from the north toward the east, and is found from the formula,

$$V = P - C$$

where C is computed from the expression,

$$\tan C = \frac{\xi + [8.2218]\tau\xi' - [4.9810]\tau^2\xi}{\eta + [8.2218]\tau\eta' + [4.9810]\tau^2\eta_2}$$

C being taken less or greater than 180° , according as the numerator is positive or negative.

The value of τ employed in the latter formula must be so taken as to correspond with the phase for which C is required.

In the volumes of the American Ephemeris for the years 1882 to 1901 instructions are given for constructing three special tables which greatly diminish the labor of computing occultations, but as these tables should contain from 4700 to 6300 quantities, and as they would apply only to the place for which they were computed, it will rarely be worth while to undertake the labor of forming them. Those who desire further information on the subject may consult any one of the volumes in question.

As an example of an isolated occultation, we will compute that of 112 B. Aurigæ on March 11, 1916, for Miami, Fla., whose position is—

$$\begin{aligned}\varphi &= +25^{\circ} 46' 28''.0 \\ \lambda &= + 5^{\text{h}} 20^{\text{m}} 45^{\text{s}}.8\end{aligned}$$

and whose geocentric coordinates are—

$$\begin{aligned}\rho \sin \varphi' &= 9.6357 \\ \rho \cos \varphi' &= 9.9548\end{aligned}$$

From the elements on page 578 we have,

$$\begin{aligned}T &= 12^{\text{h}} 20.6^{\text{m}} \\ H &= + 6 6.0 \\ \text{and} \quad h_0 &= H - \lambda = + 0 45.2\end{aligned}$$

From the formulæ on page 729, we find the correction, t , to the Greenwich mean time of geocentric conjunction, T , to be about $+0^{\text{h}} 33^{\text{m}}.4$; therefore the Greenwich mean time of apparent conjunction is—

$$T+t = \text{March } 11^{\text{d}} 12^{\text{h}} 54^{\text{m}}.0$$

112 B. Aurigæ.	Apparent Declination.	G. M. T. of ϕ	Hour Angle.	Y	z'	y'
	+26 52.5	$\begin{smallmatrix} \text{d} & \text{h} & \text{m} \\ \text{Mar. } 11 & 12 & 20.6 \end{smallmatrix}$	$\begin{smallmatrix} \text{h} & \text{m} \\ + 6 & 6.0 \end{smallmatrix}$	-0.0180	0.5456	-0.0092
$T+t$ Mar. 11 ^d 12 ^h 54 ^m .0				η'		+0.0360
h_0	+ 0 45.2			$\log x'$		9.7369
t_0	+ 0 33.5			$\log t$		9.7455
h_0+t_0	+ 1 18.7			$\log x$		9.4824
$\rho \cos \varphi'$	9.9548			x		+0.3037
$\sin (h_0+t_0)$	9.5272			$\log y'$		7.9638 n
$\log \xi$	9.4820			$\log y't$		7.7093 n
ξ	+0.3034			$y't$		-0.0051
$\rho \sin \varphi'$	9.6357			Y		-0.0180
$\cos \delta$	9.9504			y		-0.0231
$\log \eta_1$	9.5861			$x-\xi$		+0.0003
η_1	+0.3856			$y-\eta$		-0.0251
$\rho \cos \varphi'$	9.9548			$x'-\xi'$		+0.3228
$\sin \delta$	9.6552			$y'-\eta'$		-0.0452
$\cos (h_0+t_0)$	9.9739			$m \sin M$		6.4771
$\log \eta_2$	9.5839			$m \cos M$		8.3997 n
η_2	+0.3836			$\tan M$		8.0774 n
$\eta_1-\eta_2=\eta$	+0.0020			M		179° 19'
const. log	9.4192			$\cos M$		0.0000 n
$\rho \cos \varphi' \cos (h_0+t_0)$	9.9287			$\log m$		8.3997
$\log \xi'$	9.3479			$n \sin N$		9.5089
ξ'	+0.2228			$n \cos N$		8.6551 n
const. log	9.4192			$\tan N$		0.8538 n
$\xi \sin \delta$	9.1372			N		97° 58'
$\log \eta'$	8.5564			$\sin N$		9.9958
				$\log n$		9.5121

const. log	0.5646	$-\frac{[1.7782]m}{n} \cos(M-N)$	-0.70
log m	8.3997		
$\sin(M-N)$	9.9950	const. log	1.2135
$\sin \psi$	8.9593	colog n	0.4869
ψ	+ 5° 13'	cos ψ	9.9982
const. log	1.7782		1.6986
log $\frac{m}{n}$	8.8866	$\mp \frac{[1.2135] \cos \psi}{n}$	∓ 49.96
$\cos(M-N)$	9.1772	τ for immersion	- 50.66
	9.8420	τ for emersion	+ 49.26

The computation of $\delta\tau$ for the two contacts is as follows:

	Immersion.	Emersion.
$N \mp \psi$	92° 45'	103° 11'
$\cos(N \mp \psi)$	8.6810 n	9.3581 n
log η_2	9.5839	9.5839
log (1)	8.2649 n	8.9420 n
(1)	-0.0184	-0.0875
$\sin(N \mp \psi)$	9.9995	9.9884
log ξ	9.4820	9.4820
log (2)	9.4815	9.4704
(2)	+0.3031	+0.2954
(1) - (2)	-0.3215	-0.3829
log [(1) - (2)]	9.5072 n	9.5831 n
const. log	6.7591	6.7591
log τ^2	3.4094	3.3850
colog ($n \cos \psi$)	0.4887	0.4887
log $\delta\tau$	0.1644 n	0.2159 n
$\delta\tau$	- 1.46	- 1.64
$\tau + \delta\tau$	- 52.12	+ 47.62
$T+t$	d h m	h m
Greenwich Mean Time of Phase,	Mar. 11 12 54.0	12 54.0
"	11 12 1.9	13 41.6
λ	+5 20.8	+ 5 20.8
Miami Mean Time,	Mar. 11 6 41.1	8 20.8

To find δP and P :

log η_2	9.5839	log ξ	9.4820	(3)	+0.3799
$\sin N$	9.9958	cos N	9.1420 n	(4)	-0.0421
log (3)	9.5797	log (4)	8.6240 n	(3) + (4)	+0.3378
log [(3) + (4)]		Immersion.	9.5287	Emersion.	9.5287
const. log			7.3038 n		7.3038
log τ^2			3.4094		3.3850
colog $\cos \psi$			0.0018		0.0018
log δP			0.2437 n		0.2193

	Summa	Summa
δP	- 1.8	- 1.7
$N = \phi$	92.8	92.8
constant	0.0	190.1
Angle of position P	91.0	284.4

from the north point of the Moon's limb toward the east, for direct image.

Pages 607-609 contain in detail all the data necessary for observing every occultation of the general list which is visible at Washington during the current year.

Page 610 contains the *Ephemeris for Physical Observations of the Sun*.

Page 611 contains certain elements referring to the Moon, its equator, and its orbit.

i is the inclination of the Moon's mean equator to the Earth's true equator.

A is the distance on the Moon's mean equator from its ascending node on the Earth's true equator to its ascending node on the ecliptic of date.

Q' is the distance along the Earth's true equator from the true equinox to the ascending node of the Moon's mean equator.

P is the longitude of the perigee of the Moon's orbit, referred to the mean equinox of date.

Q is the longitude of the ascending node of the Moon's orbit on the ecliptic, referred to the mean equinox of date.

C is the Moon's mean longitude, referred to the mean equinox of date.

Pages 612-619 contain the *Ephemeris for Physical Observations of the Moon*. The selenographic longitudes are measured in the plane of the Moon's equator, the axis of reference being the radius of the Moon which passes through the mean center of the visible disk, positive toward the west—i. e., toward Mare Crisium—and the latitudes are measured from the Moon's equator, positive toward the north—i. e., in the hemisphere containing Mare Serenitatis.

The optical and physical librations in longitude and latitude have been computed with elements and formulæ given on page xiii, and their sums are given in the second and third columns, respectively, the physical libration being given separately in the fourth and fifth columns. The Sun's selenographic colongitude (90° —longitude) and latitude and the position-angle of the Moon's axis, C , in the sixth, seventh, and eighth columns, respectively, have all been corrected for the effect of physical libration.

When the libration in longitude is positive, the mean center of the disk is displaced toward the east—that is, the region thus exposed to view is on the west limb—and when the libration in latitude is positive the mean center of the disk is displaced toward the south—that is, the region thus exposed to view is on the north limb.

The altitude of the Sun, A , at any given time above the horizon of any point on the Moon whose selenographic longitude and latitude, λ and β , are known, may be computed from the following formula, the Sun's selenographic longitude and latitude being denoted by l_\odot and b_\odot , respectively:

$$\sin A = \sin b_\odot \sin \beta + \cos b_\odot \cos \beta \cos (l_\odot - \lambda)$$

Pages 620-621 contain the data with reference to the illuminated disks of Mercury and Venus. The angle θ is the angle which the arc of the great circle

from the planet to the Sun makes with the arc from the planet toward the west, measured in the direction west, north, east, south. It is measured from 0° to 360° . We may also regard θ as expressing the angle which the line of cusps makes with the meridian, the positive direction of the meridian being toward the north, and the positive direction of the line of cusps that in which a person following this line would have the illuminated portion of the disk on his right.

Pages 622–625 contain the *Ephemeris for Physical Observations of Mars*. The quantities here given have been corrected for aberration, so that in using them they should be interpolated to the actual time of observation.

P is the position-angle of the axis of rotation measured eastward from the north point of the disk.

A_\oplus and A_\odot are the planetocentric right ascensions of the Earth and Sun, respectively, measured in the plane of the planet's equator from its vernal equinox.

D_\oplus and D_\odot are the planetocentric declinations of the Earth and Sun, respectively, referred to the planet's equator.

$\odot \sigma$ is the planetocentric longitude of the Sun measured in the plane of the planet's orbit from its vernal equinox.

k is the ratio of the area of the illuminated portion of the apparent disk to the area of the entire apparent disk regarded as circular.

i is the angle between the Sun and the Earth as seen from the planet.

q is the angular value of the greatest defect of illumination as seen from the Earth.

Q is the position-angle of the radius of the disk which passes through the point of greatest defect of illumination—that is, of the radius perpendicular to the line joining the cusps. It is measured eastward from the north point of the disk.

The column headed *Central Meridian* contains the longitude of the meridian which bisects the disk, measured from the adopted zero meridian.

The columns headed *Mean Time of Transit of Zero Meridian* contain the Greenwich Mean Time of every transit of the zero meridian across the actual center of the disk.

Page 626 contains, for the *Satellites of Mars*, the diagram of their orbits and the times of their elongations.

Pages 627–630 contain the *Ephemeris for Physical Observations of Jupiter*.

The columns headed *Central Meridian* contain the longitudes of the meridian which bisects the disk, measured from the adopted zero meridian of System I and System II, respectively.

The column headed *Correction for Phase* contains the corrections to be applied to the longitudes of the central meridian to obtain the longitudes of the meridian bisecting the illuminated disk.

The column headed *Transit of Zero Meridian* contains the Greenwich Mean Time of every fifth transit of the zero meridian across the center of the illuminated disk.

The quantities in the remaining columns on pages 627–628 are the same as those defined under the *Ephemeris for the Physical Observations of Mars*.

Pages 631–655 contain, concerning the *Satellites of Jupiter*, the diagram of the orbits of Satellites I–V, the times of conjunction of Satellites I–IV.

the times of elongation of Satellite V, the differences in right ascension and declination between Jupiter and Satellites VI and VII, and the phenomena of the Satellites I-IV together with their configurations.

Page 656 contains the *Magnitude of Saturn* and the *Elements of the Rings*.

Pages 657-665 contain, concerning the *Satellites of Saturn*, the diagram of the orbits of the seven inner satellites, the times of elongation for the first eight satellites, the differences in right ascension and declination between Saturn and Phœbe, the ninth satellite, and tables for predicting the position-angles and distances from the center of the planet of the first eight satellites.

Page 666 contains the diagram of the orbits of the satellites of Uranus, together with the times of their elongations.

Pages 667-668 contain tables for predicting the position-angles and distances from the center of the planet of the satellites of Uranus and Neptune.

Page 669 contains the diagram of the orbit of the satellite of Neptune, together with the times of its elongations.

Pages 670-671 contain the *Phenomena*, or the configurations of the Sun, Moon, and planets, expressed in the symbols of page xx. The predicted times of the conjunctions, quadratures, and oppositions of the planets with respect to the Sun are, respectively, the instants when the longitude of each planet differs from that of the Sun by 0° , $\pm 90^\circ$, or 180° . For the conjunction of the planets with the Moon and with each other, the predicted times are the instants when the two bodies have the same right ascension. In the case of conjunction the degrees and minutes to the right indicate the difference of declination. Thus, $\delta \text{ } \text{C} \dots \text{ } \text{C} - 4^\circ 22'$ would be read "Conjunction of Mars with the Moon, Mars $4^\circ 22'$ to the South."

These pages contain also the beginning of the seasons; the perihelia and aphelia of the planets, including the Earth; the passage of the planets through the nodes of their orbits upon the ecliptic; the time of Mars' nearest approach to the Earth; the time of the greatest brilliancy of Venus; and the date of lunar and solar eclipses, with their aspect as seen from Washington.

Pages 672-681 contain the *Positions of Observatories*, together with a list of the authorities from which the positions are obtained. The tabular arrangement is self-explanatory.

Page 682 contains two examples in the computation of lunar distances, which are inserted because lunar distance tables are no longer published.

Pages 683-707 contain a series of tables numbered from I to VII.

Table I—For Finding the Latitude by an Observed Altitude of Polaris.

Table II—For converting Sidereal into Mean Solar Time.

Table III—For converting Mean Solar into Sidereal Time.

Table IV—For Finding the Azimuth of Polaris at All Hour Angles.

Table V—For Finding the Azimuth of Polaris at Elongation.

Table VI—For Finding the Times of Upper and Lower Culmination of Polaris.

Table VII—For finding the Apparent Place, Time of Upper Culmination, and Time Interval between Upper Culmination and Elongation, of Polaris.

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Andromedæ.		Aquarii.		Argus.		Boëtis.		Can. Maj.		Cassiop.		Ceti.	
α	316	b^1	507	ψ	395	f	429	ξ^2	372	36 H.	336	θ	320
β	324	c^2	504			11	426	o^2	378	38	327	ι	317
γ	332	i^1	510	Arietis.		33	431			40	327	μ	326
δ	320							Can. Min.		50	332	ν	336
ϵ	320	Aquilæ.		α	332	Bradley.		α	381	55	333	ξ^1	321
ζ	321			β	331			β	380			ξ^2	322
ι	509	α	476	δ	343	1147	385			Centauri.		θ	335
κ	510	β	477	ϵ	340	1672	235					π	338
λ	509	γ	475	ζ	344	2777	487	Can. Ven.		α^2	431	σ	339
μ	323	δ	472	ν	337			β	426	γ	418	τ	326
o	503	ϵ	469	σ	339	Camelop.		α	420	δ	413	ν	331
π	319	ζ	469	τ	344			2	415	ϵ	424	2	311
σ	317	η	476	41	339	β	358	8	416	ζ	425	12	319
v	327	θ	478			4	356	17 H.	423	η	431	13	319
ψ	511	κ	474	Aurigæ.		9	357	20	421	θ	427	20	322
22	317	λ	470	α	360	17	362			θ	427	67	324
		μ	473	β	367	43	374	Capricorni.		ι	422		
Antliæ.		τ	478	δ	367	2 H.	346	α^2	479	λ	410	Chamaeleon.	
		ω	472	ϵ	358	5 H.	348	β	479	π	409		
α	401	1	465	ζ	358	9 H.	349	γ	492	n	419	β	413
θ	396	2	466	η	359	19 H.	360	δ	492			δ^2	404
ι	405	6	467	θ	368	22 H.	369	ζ	490	Cephei.		ζ	234
				ι	357	23 H.	372	θ	486	α	489	9	381
Apodis.		Aræ.		λ	361	25 H.	233	ι	489	β	491	π	411
α	432	α	455	μ	360	30 H.	234	μ	493	γ	510		
γ	447	β	454	ν	366	32 H.	235	π	480	ζ	496	Cori.	
δ^1	444	δ	455	o	365			ρ	480	η	484	α	380
θ	425	ϵ^1	451	χ	363	Cancr.		v	482	θ	481		
59 G.	236	θ	461	ψ^1	370	α	391	ψ	483	ι	502	Columbæ.	
				ψ^2	374	β	386			κ	479		
Aquarii.		Argus.		51	372	γ	389	Carinæ.		o	506	α	365
α	494	α	371	63	377	δ	389	b^1	391	π	504	o	361
β	491	β	393			ζ	385			11	492		
γ	497	γ	385	Boëtis.		η	388			20	495	Comæ.	
δ	502	δ	390	α	428	ι	389	Cassiop.		24	496		
ϵ	484	ϵ	386	β	435	κ	392	α	320	39 H.	238	20	416
η	499	η	403	γ	430	σ^2	390	β	316	41 H.	511	24	417
θ	497	θ	403	δ	437	ω	383	γ	323	43 H.	232	31	419
ι	495	ι	393	ϵ	432	d^1	386	δ	326	47 H.	341	43	421
λ	502	λ	392	η	425	83	393	ϵ	330	48 H.	343		
μ	485	μ	404	θ	429			ζ	319	51 H.	233	Cor. Austr.	
ν	487	ν	373	λ	428	Can. Maj.		η	322	226 B.	499	α	430
ξ	491	ξ	382	μ	437	α	374	ι	335				
π	498	π	378	ν^1	439	β	370	μ	324	Ceti.		Cor. Bor.	
σ	498	ρ	384	ρ	430	γ	377	o	321	α	341		
τ	501	σ	380	σ	431	δ	377	ρ	512	β	321	α	430
v	499	τ	375	τ	424	ϵ	376	ω	328	γ	338	β	433
φ	505	v	396	ψ	435	ζ	369	4	507	δ	337	ϵ	443
ψ	505	φ	398	c	435	η	379	5 H ¹ .	505	ζ	330	ζ	440
ω^2	510	χ	383	d	427	θ	376	21	321	η	324	σ	445

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β 417	α 355	ν 354	1446 388	α 352	s 396	β 434
γ 414	δ 366	ν^1 352	1450 387	μ 342	ζ 400	γ 439
δ 416		τ^2 340	1586 397	38 G. 344	η 398	ζ 436
s 413	Draconis.	τ^3 341	1706 405		θ 406	
		τ^4 347	1830 412	Hydræ.	ι 409	Lyncis.
		τ^5 348	2001 423		μ 397	
Crateris.	α 427	ν^6 353	2164 433	α 394	ξ 395	2 369
	β 456	φ 334	2283 236	γ 422	o 396	8 371
α 406	γ 460	s 345	2320 444	δ 388	π 398	15 375
β 407	δ 471	g 348	2377 450	s 390	ρ 402	24 381
δ 408	s 476	12 343	2533 463	ζ 390	σ 409	26 383
ζ 411	ζ 453	53 355	3241 481	θ 392	τ 409	27 384
	η 447		4163 512	λ 399	ν 410	31 386
Crucis.	θ 443	Fornacis.		μ 401	χ 407	40 393
	ι 438			ν 404	d 406	
α^1 415	κ 417		Gruis.	ξ 410	l 404	Lyræ.
β 419	λ 410	β 339		π 426	p^4 407	
γ 416	ξ 459	κ 335	α 495	σ 388	54 405	α 466
δ 414	o 468	μ 334	β 500			β 467
	τ 472		γ 463	Hydri.	Leo. Min.	γ 469
Cygni.	χ 464	Geminor.	s 501			θ 471
	ψ 458		ι 504	α 332	10 395	ι 470
α 483	ω 457	α^2 380		β 318	19 398	R 468
β 473	A 448	β 382	Herculis.	γ 349	31 401	
γ 480	1 H. 234	γ 372		δ 335	41 403	Mensæ.
δ 475	3 411	δ 378	α 453	s 337	42 403	
s 484	4 H. 414	s 373	β 448	θ 342	46 405	δ 353
ζ 488	9 H. 402	ζ 376	γ 446	ι 345		ζ 233
θ 474	12 H. 441	η 369	δ 453	λ 322	Leporis.	31 G. 233
ι 473	35 459	θ 375	s 452	μ 337		
κ 472	36 463	ι 379	ζ 450		α 363	
ν 486	50 467	κ 381	η 450	Indi.	β 362	Microscop.
ξ 487	76 237	λ 378	θ 460		δ 366	
o 478	79 494	μ 370	ι 457	α 482	s 359	γ 486
π^2 493	220 H ¹ . 485	ν 371	κ 444	β 485	ζ 365	θ^1 489
σ 489		ξ 373	λ 456	s 494	η 367	
τ 488	Equulei.	ρ 380	μ 458	ρ 502	μ 360	Monocer.
g 490		φ 382	ξ 460			
15 475	α 488	χ 384	o 462	Lacertæ.	Libræ.	8 373
41 481		1 368	π 454		α 433	8 370
61 487	Eridani.	51 377	σ 449	α 498	β 437	10 371
74 491			τ 446	3 498	γ 439	18 374
	α 328	Groombr.	φ 444	10 499	δ 434	25 381
Delphini.	β 359		ω 447		ι 436	30 387
	γ 350	750 232	d 452	Leonis.	λ 442	
α 482	δ 347	848 355	w 454		ξ^2 434	Muscæ.
β 482	s 346	944 232	49 451	α 399	2 429	
γ 484	ζ 344	966 363	89 459	β 412	8 433	α 417
δ 483	η 340	1119 234	109 464	γ 400	32 438	δ 420
s 481	θ 341	1308 379	110 466	δ 408		
	μ 356	1374 383				

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γ^2 445	π^s 357	ρ 342	1 G. 368	τ 449	α 464	α 232
	τ 361	τ 340	4 382	24 449		β 433
Octantis.	φ^1 364	v 328	20 385		Trianguli.	γ 437
α 486	11 359	φ 329		Sculptoris.		δ 237
β 238	Pavonis.	c 351	Pyxidis.	α 323	α 330	ϵ 236
γ^1 238		m 354	α 389	β 508	β 333	ζ 441
δ 236	α 480	6 333	θ 394	γ 506	γ 334	η 447
ζ 234	β 483	Phœnicis.	Reticuli.	δ 511	Tri. Austr.	λ 237
η 235	γ 490	α 318	α 352	ϵ 330	α 450	4 428
ι 235	ϵ 477	β 324	δ 350	Serpentis.	β 442	5 439
κ 235	ζ 465	γ 326		α 440	γ 436	19 445
λ 238	η 457	ϵ 316	Sagittæ.	β 440		Velorum.
ρ 236	λ 467	μ 320	β 474	γ 442	Tucanæ.	q 389
σ 237	Pegasi.	ψ 331	γ 477	ϵ 441	α 497	Virginis.
v 238	α 503	Piazz.	δ 476	η 463	γ 506	α 422
χ 237	β 503	221 434	Sagittarii.	θ 468	ϵ 513	β 412
4 G. 232	γ 317	Pictoris.	γ 461	κ 440	ζ 318	γ 413
7 G. 233	ϵ 492	α 375	δ 463	μ 441	κ 325	δ 429
Ophiuchi.	ζ 500	Pisc. Austr.	ϵ 464	ξ 457	Urs. Maj.	ϵ 471
α 456	η 500	α 503	ζ 469	τ^1 438	α 406	ζ 423
β 458	θ 496	ϵ 500	η 462	c 465	β 406	η 415
γ 459	ι 495	3 488	ι 477	3 436	γ 412	θ 421
δ 445	λ 501	Piscium.	λ 465	Sextantis.	δ 414	ι 428
ϵ 446	μ 501	γ 506	μ 462	6 397	ϵ 420	κ 427
ζ 449	π 496	δ 322	π 470	33 402	ζ^1 422	λ 429
η 452	τ 507	ϵ 323	σ 468	Tauri.	η 424	μ 432
θ 454	v 507	ζ 325	φ 466	α 354	θ 395	ν 413
κ 451	φ 511	η 327	ψ 471	β 362	ι 391	ρ 418
λ 448	1 490	θ 508	c 478	γ 353	κ 391	τ 426
ν 460	16 493	ι 509	d 471	δ 353	λ 400	φ 430
σ 455	20 494	κ 508	f 475	ϵ 354	μ 400	χ 418
30 452	31 497	ν 329	h 473	ζ 364	ν 408	m 424
67 461	55 504	ξ 331	54 474	η 348	ω 387	70 423
70 461	59 505	\circ 329	Scorpii.	ι 358	σ^2 392	89 425
72 462	70 508	π 328	α 448	λ 350	v 397	109 432
	72 509	τ 325	β 443	μ 352	ψ 407	Volantis.
Orionis.	Persei.	ξ 323	γ 435	ν 351	χ 411	γ^2 373
α 367	α 345	ζ 325	δ 443	ξ 346	d 394	δ 379
β 361	β 343	ω 512	ϵ 451	\circ 345	h 394	
γ 362	γ 342	f 325	η 453	τ 355	3 H. 384	
δ 363	δ 347	30 513	ι^1 458	A 351	30 H. 401	Vulpeculæ.
ϵ 364	ϵ 349	33 316	λ 456	f 346	32 399	24 479
ζ 365	ζ 349	44 318	π 442	i 357	36 402	32 485
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