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FOR THE YEAR

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

October, 1914.

PREFACE.

This volume of the *American Ephemeris and Nautical Almanac* is prepared under the immediate supervision of Professor W. S. CHELBERGER, U. S. N., the Director. The character of the matter herein contained and its arrangement are the same as in the preceding volume.

This is the second 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volumes of the office: *Provided further*, That section four hundred and thirty-five, Revised Statutes, is hereby repealed.

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

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

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

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

The Greenwich ephemerides of the Sun, Moon, Venus, Ma Jupiter, Saturn, Uranus, and Neptune were furnished by the off of the British *Nautical Almanac*.

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

The conjunctions, phenomena, and configurations of Jupite satellites I–IV and the apparent places for Greenwich transit of circumpolar stars were furnished by the office of the *Connaissance Temps*.

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

The apparent places for Greenwich transit of 137 ten-day st were furnished by the office of the *Annuario Astronomico di Tori*

In accordance with the recommendations of the *Congrès Inter tional des Éphémérides Astronomiques*, most of the material furnish from abroad is based upon tables prepared in the American Nauti Almanac Office. In the Introduction are mentioned the vari tables upon which the different ephemerides are based.

The following computations were made by the American Na tical Almanac Office:

In Part I, all the hourly and daily variations for the quantit furnished from abroad except in the case of the right ascension a declination of the Moon.

In Part II, the quantities used in computing the apparent pla of the stars from their mean places; the mean place list; the int polation of the apparent places of 814 stars from transit at Greenw

to transit at Washington; the apparent places of 11 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 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.

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.

J. A. HOOGEWERFF,
Captain, U. S. Navy,
Superintendent Naval Observatory.

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

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744	Parallax, Horizontal, of Jupiter, Page	*for*	134, 538	*read*	174,

INTRODUCTION.

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:

$$X = R \cos \lambda$$
$$Y = R \sin \lambda \cos \omega - 19.3\, R \beta$$
$$Z = R \sin \lambda \sin \omega + 44.5\, R \beta$$

The reductions to mean equinox are computed by the formulæ—

$$\Delta X = + Y \sec \omega \, \Delta\lambda \sin 1''$$
$$\Delta Y = - X \cos \omega \, \Delta\lambda \sin 1'' + Z \Delta\omega \sin 1'' + 9.1\, \tau R \sin (\lambda + 6^\circ)$$
$$\Delta Z = - X \sin \omega \, \Delta\lambda \sin 1'' - Y \Delta\omega \sin 1'' - 21.0\, \tau R \sin (\lambda + 6^\circ)$$

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 NEWCO tables of these planets, *Astronomical Papers of the American Ephemeris*, VII, parts 3 and 4.

The nutation used in computing the ephemerides of the Sun, Moon, planets has been taken from Tables XXXII and XXXIII of NEWCO *Tables of the Sun, Astronomical Papers of the American Ephemeris*, Vol. part 1. The formulæ from which this nutation is computed are as follows time interval T being expressed in units of 100 years, reckoned from 1 See *Tables of the Sun*, page 26.

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

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

Terms of Long Period.	Terms of Short Period.
$\delta\psi = -(17''.234+0''.017\,T)\sin\Omega$	$-0''.204\sin 2\mathbb{C}$
$+0''.209\sin 2\Omega$	$+0''.011\sin(\mathbb{C}+\Gamma')$
$-1''.272\sin 2L$	$+0''.068\sin(\mathbb{C}-\Gamma')$
$+0''.126\sin(L-\Gamma)$	$-0''.034\sin(2\mathbb{C}-\Omega)$
$-0''.050\sin(3L-\Gamma)$	$-0''.026\sin(3\mathbb{C}-\Gamma')$
$+0''.021\sin(L+\Gamma)$	$+0''.015\sin(\mathbb{C}-2L+\Gamma')$
$+0''.012\sin(2L-\Omega)$	$+0''.006\sin 2(\mathbb{C}-L)$
$\delta\epsilon = +(9''.210+0''.0009\,T)\cos\Omega$	$+0''.088\cos 2\mathbb{C}$
$-0''.090\cos 2\Omega$	$+0''.018\cos(2\mathbb{C}-\Omega)$
$+0''.551\cos 2L$	$+0''.011\cos(3\mathbb{C}-\Gamma')$
$+0''.022\cos(3L-\Gamma)$	$-0''.005\cos(\mathbb{C}+\Gamma')$
$-0''.009\cos(L+\Gamma)$	
$-0''.007\cos(2L-\Omega)$	

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

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

In general, the names of the stars are the same as in NEWCOMB'S gested List of Fundamental Stars, except that the FLAMSTEED number been omitted in all cases where Greek or italic letters are available. In s cases the constellation and number of the uranometries of HEIS or Gc have been used. In all such cases, H^1 or the letter G precedes the const tion name, as, for example, 5 H^1. Cassiopeiæ and 38 G. Horologii.

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

The spectral classification has been furnished by the Harvard Co Observatory. The notation is that of *Annals of Harvard College Observa*

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 $\alpha-\alpha_0$

$$\left.\begin{aligned} &+0^s.000\,003\,\tau^2 \sin\alpha \\ &-0.000\,149\,\tau^2 \cos\alpha \end{aligned}\right\} \tan\delta$$

$$\left.\begin{aligned} &-0.000\,0650\,\tau^2 \sin 2\alpha \\ &+0.000\,0103 \sin 2\,\Omega \cos 2\alpha \\ &-0.000\,0107 \cos 2\,\Omega \sin 2\alpha \end{aligned}\right\} \tan^2\delta$$

$$\left.\begin{aligned} &+0.000\,0620 \sin 2\,\odot \cos 2\alpha \\ &-0.000\,0622 \cos 2\,\odot \sin 2\alpha \end{aligned}\right\} \sec^2\delta$$

$$\left.\begin{aligned} &+0.000\,0513 \sin(\odot+\Omega) \cos 2\alpha \\ &-0.000\,0507 \cos(\odot+\Omega) \sin 2\alpha \\ &+0.000\,0097 \sin(\odot-\Omega) \cos 2\alpha \\ &-0.000\,0053 \cos(\odot-\Omega) \sin 2\alpha \end{aligned}\right\} \tan\delta \sec\delta$$

To $\delta-\delta_0$

$$\left.\begin{aligned} &+0''.000\,975\,\tau^2 \sin^2\alpha \\ &-0.000\,023 \cos 2\,\Omega \\ &-0.000\,080 \cos 2\,\Omega \cos 2\alpha \\ &-0.000\,077 \sin 2\,\Omega \sin 2\alpha \\ &+0.000\,040 \cos 2\,\odot \\ &-0.000\,467 \cos 2\,\odot \cos 2\alpha \\ &-0.000\,465 \sin 2\,\odot \sin 2\alpha \end{aligned}\right\} \tan\delta$$

$$\left.\begin{aligned} &-0.000\,039 \cos(\odot+\Omega) \\ &-0.000\,380 \cos(\odot+\Omega) \cos 2\alpha \\ &-0.000\,385 \sin(\odot+\Omega) \sin 2\alpha \\ &-0.000\,380 \cos(\odot-\Omega) \\ &-0.000\,040 \cos(\odot-\Omega) \cos 2\alpha \\ &-0.000\,072 \sin(\odot-\Omega) \sin 2\alpha \end{aligned}\right\} \sin\delta \tan\delta$$

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 Cent
The values of these corrections are given on pages 98 and 99 of *Veroeffent
ungen des Koeniglichen Astronomischen Rechen-Instituts zu Berlin*, 1907, No
but those for Sirius and Procyon need an additional correction to refer the
the center of the orbit before they are applicable to the mean places taken f
Newcomb's Fundamental Catalogue. These additional corrections for Si
and Procyon were omitted in the *Star List of the American Ephemeris* [*Sup
ment to the American Ephemeris and Nautical Almanac*] for 1910 and 1911,
in the *American Ephemeris and Nautical Almanac* for 1912 and 1913.
values of the corrections for the three stars are—

	Sirius.		Procyon.		α^2 Centauri.	
	1917.0	1918.0	1917.0	1918.0	1917.0	1918.0
$\Delta\alpha$	$-0^s.143$	$-0^s.143$	$-0^s.062$	$-0^s.061$	$+0^s.647$	$+0^s.634$
$\Delta\delta$	$-0''.59$	$-0''.72$	$+0''.05$	$+0''.18$	$+5''.98$	$+5''.70$

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

The stars occulted by the Moon have been selected from the *Catalog
Zodiacal Stars* contained in Vol. VIII, part 3, *Astronomical Papers of
American Ephemeris*, and the mean places for 1917.0 have been derived f
the same catalogue.

In Part III the elements of eclipses of the Sun and occultations of s
by the Moon are given in accordance with Bessel's method, the special fo
employed being a modification of those developed in Chauvenet's *Sphe
and Practical Astronomy*.

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

G. M. T. 1917		δv	δb	$\delta\pi$
		"	"	"
Jan. 7^d	20^h	+8.4	+1.3	+0.40
Jan. 22	20	+7.6	0.0	+0.50
June 19	1	+6.3	+1.3	+0.43
July 4	10	+7.0	0.0	+0.48
July 18	15	+6.6	+1.6	+0.41
Dec. 13	21	+7.5	−0.1	+0.46
Dec. 27	22	+7.8	+1.4	+0.44

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

The conjunctions and phenomena of Jupiter's four brighter satellites
derived from Sampson's tables. The configurations are derived from a
tinuation of Damoiseau's tables by M. Pottier.

The elongations of the Vth satellite of Jupiter are derived from unp
lished elements deduced from the observations of Barnard.

The differential coordinates of Jupiter's VIth and VIIth satellites
derived from elements and tables given in *Lick Observatory Bulletin*, 1
Vol. IV, No. 112, and in *Astronomische Nachrichten*, 1907, Vol. 174, page
respectively.

The positions of the rings and the elongations and conjunctions of the satellites 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 *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° 15′
Longitude of the ascending node of the Sun's equator on the ecliptic	73° 40′+50″.25 (t−1850)
Sidereal period of rotation (mean solar days)	25^d.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° 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,

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

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

$\mathbb{C}$=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 nod the ecliptic,

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

δb, δl=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 longitud

δC=the physical libration of C,

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

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

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

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

$$b=B-\beta,$$

$$l=\lambda'-\mathbb{C},$$

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

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

$$\delta l=+12'' \sin g-59'' \sin g'-18'' \sin 2\omega,$$
$$-[108'' \cos(\omega+l)-37'' \cos(\omega-l)+11'' \cos(g+\omega-l)] \tan b,$$

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

$$C=C'+\delta C.$$

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

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

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

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

ve been replaced by those of System II. of MARTH. This change has been de in view of the following facts: The Paris Conference of October, 1911, signed to the office of the American Ephemeris and Nautical Almanac the eparation of the ephemerides for the physical observations of the planets; a neral desire exists that the use of System II. of MARTH should not be dis-ntinued; and the position of the Great Red Spot during the opposition of 12 was about 70° from the place predicted from the elements adopted in the *nerican Ephemeris and Nautical Almanac* for 1913.

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

In the list of observatories the authority for the various positions is given each case. The latitudes given are in most cases astronomical. In some stances they have been determined by geodetic triangulation from other oints. The reductions from geographic to geocentric latitude, $\varphi' - \varphi$, and the istance from the center of the earth, ρ, are computed from the formulæ on age xviii, using the flattening $\frac{1}{297}$ obtained by JOHN F. HAYFORD in *Supple-ientary Investigation in 1909 of the Figure of the Earth and Isostasy*, U. S. Coast nd Geodetic Survey, 1910, and adopted by the *Paris Conference*, October, 1911.

ANNIVERSARIES AND FESTIVALS, 1917.

New Year's Day	Monday,	Jan.
Epiphany	Saturday,	Jan.
Septuagesima Sunday	Sunday,	Feb
Lincoln's Birthday	Monday,	Feb
Quinquagesima (Shrove Sunday)	Sunday,	Feb
Ash Wednesday	Wednesday,	Feb
Washington's Birthday	Thursday,	Feb
Palm Sunday	Sunday,	Apr
Good Friday	Friday,	Apr
First Day of Passover	Saturday,	Apr
Easter Sunday	Sunday,	Apr
Rogation Sunday	Sunday,	May
Ascension Day (Holy Thursday)	Thursday,	May
Hebrew Pentecost (Shebuoth)	Sunday,	May
Pentecost (Whit Sunday)	Sunday,	May
Memorial Day	Wednesday,	May
Trinity Sunday	Sunday,	Jun
Corpus Christi	Thursday,	Jun
Independence Day	Wednesday,	July
Labor Day (except in certain States)	Monday,	Sept
Hebrew New Year (Rosh Hashanah)	Monday,	Sept
Day of Atonement (Yom Kippur)	Wednesday,	Sept
First Day of Tabernacle (Sucoth)	Monday,	Oct.
Election Day (in certain States)	Tuesday,	Nov
Thanksgiving Day	Thursday,	Nov
First Sunday in Advent	Sunday,	Dec
Christmas Day	Tuesday,	Dec

CHRONOLOGICAL ERAS AND CYCLES.

CHRONOLOGICAL ERAS.

E YEAR 1917, WHICH COMPRISES THE LATTER PART OF THE 141ST AND THE BEGINNING OF THE 142D-YEAR OF THE INDEPENDENCE OF THE UNITED STATES OF AMERICA, CORRESPONDS TO—

The year 6630 of the Julian period;

" 7425–7426 of the Byzantine era, the year 7426 commencing on September 1;

" 5677–5678 of the Jewish era, the year 5678 commencing on September 17, or, more exactly, at sunset on September 16;

" 2670 since the foundation of Rome, according to VARRO;

" 2664 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;

" 2693 of the Olympiads, or the first year of the 674th Olympiad, commencing in July, 1917, if we fix the era of the Olympiads at 775½ years before CHRIST, or near the beginning of July of the year 3938 of the Julian period;

" 2229 of the Grecian era, or the era of the SELEUCIDÆ, which began near the vernal equinox of the year, −311 = B. C. 312, = 4402 of the Julian period;

" 1633 of the era of DIOCLETIAN;

" 2577 of the Japanese era and to the 6th year of the period entitled Taisho.

The year 1336 of the Mohammedan era, or the era of the Hegira, begins n the 17th day of October, 1917.

The first day of January of the year 1917 is the 2,421,230th day since the ommencement of the Julian Period.

CHRONOLOGICAL CYCLES.

ominical Letter	G	Solar Cycle	22
pact	6	Roman Indiction	15
unar Cycle or Golden Number	18	Julian Period	6630

ASTRONOMICAL CONSTANTS.

Solar Parallax	8.80″	Paris Confere
Constant of Nutation	9.21	
Constant of Aberration	20.47	
General Precession	50″.2564+0″.000 222(t−1900)	Newco
Obliquity of the Ecliptic	23° 27′ 8″.26−0″.4684(t−1900)	
Equatorial Horizontal Parallax of the Moon	57′ 2″.63*	(Newco

Mean distance Earth to Moon 384 411 kilometers=238 862 miles, or 60.2678 radii.

Mean distance Earth to Sun 149 504 201 kilometers=92 897 416 statute miles.

Velocity of light 299 860 kilometers=186 324 statute miles per second (Newcomb and Michels

Light travels unit distance in 498ˢ.580.

Gaussian Gravitation Constant, †k=0.017 202 099=3 548″.187 61.

Acceleration in one second due to gravity, $g=\overset{m}{9.8060}-\overset{m}{0.0260}\cos 2\varphi-\frac{2h}{R}g$.‡

Length of seconds pendulum, $l=\overset{m}{0.993\ 549}-\overset{m}{0.002\ 631}\cos 2\varphi-\frac{2h}{R}l$.‡ } Helmert.

Length of the year:

Tropical (ordinary)	$\overset{d}{365.242\ 198\ 79}-\overset{d}{0.000\ 000\ 0614}\ (t-1900)$	Newco
Sidereal	$365.256\ 360\ 42+0.000\ 000\ 0011\ (t-1900)$	
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)	29.530 588=29 12 44 2.8	Han
Tropical	27.321 582=27 7 43 4.7	
Sidereal	27.321 661=27 7 43 11.5	
Anomalistic	27.554 550=27 13 18 33.1	
Nodical	27.212 219=27 5 5 35.7	

Length of the day:

Sidereal	23 h 56 m 4.091 s of mean solar tin
Mean Solar	24 3 56.555 of sidereal time.

Dimensions of the Earth (Hayford's Spheroid of 1909):

Equatorial Radius, a=6378.388 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 $\frac{\sqrt{a^2-b^2}}{a}=\log e=8.913\ 804$

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

Reduction from geographic latitude φ to geocentric latitude φ',

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

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

1 statute mile=0.868 362 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 conta 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 als 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=6.80416.

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

ASTRONOMICAL CONSTANTS.

SEMIDIAMETERS 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 1917—January 0^d G. M. T.

Name.	Mean Distance.	Sidereal Period in Tropical Years.	Sidereal Mean Daily Motion.	Synodic Period in Tropical Years.	Eccentricity.
			″		
☿ Mercury	0.387 099	0.240 85	14 732.420	0.317 26	0.205 6177
♀ Venus	0.723 331	0.615 21	5 767.670	1.598 72	0.006 8126
⊕ Earth	1.000 000	1.000 04	3 548.193	. . .	0.016 7480
♂ Mars	1.523 688	1.880 89	1 886.519	2.135 39	0.093 3244
♃ Jupiter	5.202 803	11.862 23	299.128	1.092 11	0.048 3653
♄ Saturn	9.538 843	29.457 72	120.455	1.035 18	0.055 8310
♅ Uranus	19.190 978	84.015 29	42.23	1.012 09	0.047 0922
♆ Neptune	30.070 672	164.788 29	21.53	1.006 14	0.008 5441

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 11.5	47 20 50.7	76 9 50.9	27 44 52.89	3.221 8487−10
♀ Venus	3 23 37.7	75 55 57.5	130 24 11.4	210 37 57.16	4.389 3398−10
⊕ Earth	. . . . .	. . . .	101 30 47.1	99 34 51.57	4.482 2896−10
♂ Mars	1 51 0.9	48 55 1.4	334 31 53.0	307 42 19.72	3.509 5499−10
♃ Jupiter	1 18 28.1	99 36 35.2	12 59 7.6	34 12 1.58	6.979 9082−10
♄ Saturn	2 29 29.8	112 55 54.7	91 25 18.3	114 33 12.34	6.455 7335−10
♅ Uranus	0 46 22.0	73 34 32.6	169 19 14.1	316 26 34.40	5.640 7528−10
♆ Neptune	1 46 39.4	130 51 56.8	43 54 15.2	122 24 2.19	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 1917 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.	♐	Sagittar
Summer Signs.	4.	♋	Cancer.	Winter Signs.	10.	♑	Capricor
	5.	♌	Leo.		11.	♒	Aquariu
	6.	♍	Virgo.		12.	♓	Pisces.

ASPECTS.

☌	Conjunction, or having the same Longitude or Right Ascension.
□	Quadrature, or differing ±90° 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.

xx

PART I.

ASTRONOMICAL EPHEMERIS FOR THE MERIDIAN OF GREENWICH.

39398°—1917——1

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.	Sider or Rig sion
		h m s	s	° ′ ″	″	′ ″	″	m s	s	h
Jan. 1	Mo	18 45 50.11	11.041	−23 1 56.7	+12.09	16 17.87	8.95	− 3 34.47	−1.184	18 4
2	Tu	18 50 14.92	11.026	22 56 52.8	13.23	16 17.88	8.95	4 2.72	1.170	18 4
3	We	18 54 39.37	11.011	22 51 21.6	14.37	16 17.88	8.95	4 30.61	1.154	18 5
4	Th	18 59 3.42	10.994	22 45 23.2	15.50	16 17.88	8.95	4 58.11	1.137	18 5
5	Fr	19 3 27.06	10.976	22 38 57.7	16.62	16 17.87	8.95	5 25.19	1.119	18 5
6	Sa	19 7 50.25	10.957	−22 32 5.4	+17.74	16 17.85	8.95	− 5 51.83	−1.100	19
7	Su	19 12 12.98	10.937	22 24 46.4	18.84	16 17.83	8.95	6 17.99	1.080	19
8	Mo	19 16 35.22	10.916	22 17 1.0	19.94	16 17.80	8.95	6 43.67	1.059	19
9	Tu	19 20 56.94	10.894	22 8 49.3	21.03	16 17.77	8.95	7 8.83	1.037	19 1
10	We	19 25 18.12	10.871	22 0 11.6	22.11	16 17.73	8.95	7 33.46	1.015	19 1
11	Th	19 29 38.75	10.848	−21 51 8.2	+23.18	16 17.68	8.95	− 7 57.53	−0.991	19 2
12	Fr	19 33 58.80	10.823	21 41 39.2	24.24	16 17.63	8.95	8 21.02	0.967	19 2
13	Sa	19 38 18.25	10.798	21 31 44.9	25.28	16 17.57	8.95	8 43.92	0.941	19 2
14	Su	19 42 37.09	10.772	21 21 25.7	26.32	16 17.51	8.95	9 6.20	0.915	19 3
15	Mo	19 46 55.30	10.745	21 10 41.7	27.34	16 17.44	8.95	9 27.85	0.888	19 3
16	Tu	19 51 12.85	10.717	−20 59 33.3	+28.35	16 17.36	8.95	− 9 48.84	−0.861	19 4
17	We	19 55 29.73	10.689	20 48 0.8	29.35	16 17.28	8.94	10 9.17	0.833	19 4
18	Th	19 59 45.93	10.660	20 36 4.4	30.34	16 17.20	8.94	10 28.81	0.804	19 4
19	Fr	20 4 1.42	10.631	20 23 44.6	31.31	16 17.11	8.94	10 47.75	0.774	19 5
20	Sa	20 8 16.20	10.601	20 11 1.7	32.27	16 17.02	8.94	11 5.97	0.744	19 5
21	Su	20 12 30.25	10.570	−19 57 55.9	+33.21	16 16.92	8.94	−11 23.45	−0.713	20
22	Mo	20 16 43.54	10.538	19 44 27.8	34.13	16 16.82	8.94	11 40.19	0.681	20
23	Tu	20 20 56.06	10.506	19 30 37.7	35.04	16 16.72	8.94	11 56.15	0.649	20
24	We	20 25 7.80	10.473	19 16 25.9	35.94	16 16.61	8.94	12 11.33	0.616	20 1
25	Th	20 29 18.74	10.439	19 1 52.9	36.81	16 16.51	8.94	12 25.72	0.583	20 1
26	Fr	20 33 28.87	10.405	−18 46 59.0	+37.67	16 16.39	8.94	−12 39.29	−0.549	20 2
27	Sa	20 37 38.18	10.371	18 31 44.7	38.51	16 16.28	8.94	12 52.05	0.514	20 2
28	Su	20 41 46.66	10.336	18 16 10.4	39.34	16 16.16	8.93	13 3.97	0.479	20 2
29	Mo	20 45 54.31	10.302	18 0 16.4	40.15	16 16.03	8.93	13 15.06	0.445	20 3
30	Tu	20 50 1.13	10.267	17 44 3.2	40.95	16 15.91	8.93	13 25.32	0.410	20 3
31	We	20 54 7.10	10.231	−17 27 31.1	+41.72	16 15.77	8.93	−13 34.74	−0.375	20 4
Feb. 1	Th	20 58 12.23	10.196	17 10 40.7	42.48	16 15.64	8.93	13 43.32	0.340	20 4
2	Fr	21 2 16.53	10.162	16 53 32.2	43.23	16 15.49	8.93	13 51.06	0.306	20 4
3	Sa	21 6 20.00	10.127	16 36 6.0	43.95	16 15.35	8.93	13 57.97	0.271	20 5
4	Su	21 10 22.63	10.092	16 18 22.6	44.66	16 15.19	8.93	14 4.05	0.236	20 5
5	Mo	21 14 24.44	10.058	−16 0 22.3	+45.36	16 15.03	8.92	−14 9.31	−0.202	21
6	Tu	21 18 25.44	10.025	15 42 5.6	46.03	16 14.87	8.92	14 13.75	0.168	21
7	We	21 22 25.63	9.991	15 23 32.8	46.70	16 14.70	8.92	14 17.38	0.135	21
8	Th	21 26 25.02	9.958	15 4 44.3	47.34	16 14.53	8.92	14 20.21	0.101	21 1
9	Fr	21 30 23.61	9.925	14 45 40.5	47.97	16 14.35	8.92	14 22.25	0.069	21 1
10	Sa	21 34 21.43	9.893	−14 26 21.8	+48.58	16 14.16	8.92	−14 23.51	−0.036	21 1
11	Su	21 38 18.48	9.861	14 6 48.7	49.18	16 13.98	8.91	14 24.00	−0.004	21 2
12	Mo	21 42 14.76	9.829	13 47 1.5	49.76	16 13.79	8.91	14 23.73	+0.027	21 2
13	Tu	21 46 10.30	9.799	13 27 0.5	50.32	16 13.59	8.91	14 22.72	0.058	21 3
14	We	21 50 5.11	9.769	13 6 46.3	50.86	16 13.39	8.91	14 20.97	0.088	21 3
15	Th	21 53 59.20	9.739	−12 46 19.2	+51.39	16 13.18	8.91	−14 18.50	+0.118	21 3
16	Fr	21 57 52.57	9.709	−12 25 39.6	+51.90	16 12.97	8.90	−14 15.32	+0.147	21 4

FOR GREENWICH MEAN NOON.

ate.	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.	Aberration.	True Obliquity.	Mean Time of Sidereal Noon.
		° ′ ″	″	″			″	″	″	23° 27′ ″	h m s
1. 1	1	280 32 24.7	152.89	+0.63	9.992 6701	− 2.0	0.08	+16.48	20.81	3.04	5 16 52.31
2	2	281 33 34.0	152.88	0.62	9.992 6664	− 1.0	0.22	16.53	20.81	3.04	5 12 56.40
3	3	282 34 43.0	152.87	0.57	9.992 6652	0.0	0.36	16.58	20.81	3.03	5 9 0.48
4	4	283 35 51.7	152.86	0.50	9.992 6666	+ 1.1	0.49	16.63	20.81	3.03	5 5 4.57
5	5	284 37 0.2	152.85	0.41	9.992 6707	2.3	0.63	16.68	20.81	3.04	5 1 8.66
6	6	285 38 8.4	152.84	+0.30	9.992 6776	+ 3.5	0.77	+16.72	20.81	3.04	4 57 12.75
7	7	286 39 16.3	152.83	0.18	9.992 6873	4.6	0.90	16.77	20.81	3.04	4 53 16.84
8	8	287 40 24.1	152.82	+0.05	9.992 6997	5.7	1.04	16.82	20.81	3.04	4 49 20.92
9	9	288 41 31.6	152.81	−0.07	9.992 7149	6.9	1.18	16.86	20.81	3.04	4 45 25.01
10	10	289 42 38.9	152.80	0.20	9.992 7329	8.1	1.32	16.91	20.81	3.04	4 41 29.10
11	11	290 43 45.9	152.79	−0.31	9.992 7536	+ 9.2	1.45	+16.95	20.81	3.05	4 37 33.19
12	12	291 44 52.8	152.78	0.41	9.992 7770	10.3	1.59	16.99	20.81	3.05	4 33 37.28
13	13	292 45 59.5	152.78	0.48	9.992 8030	11.4	1.73	17.03	20.81	3.05	4 29 41.36
14	14	293 47 6.0	152.77	0.52	9.992 8315	12.4	1.87	17.07	20.80	3.06	4 25 45.45
15	15	294 48 12.3	152.76	0.54	9.992 8624	13.4	2.00	17.11	20.80	3.07	4 21 49.54
16	16	295 49 18.3	152.75	−0.53	9.992 8957	+14.3	2.14	+17.15	20.80	3.07	4 17 53.63
17	17	296 50 24.1	152.74	0.49	9.992 9311	15.2	2.28	17.18	20.80	3.08	4 13 57.72
18	18	297 51 29.7	152.72	0.42	9.992 9686	16.0	2.42	17.22	20.80	3.09	4 10 1.81
19	19	298 52 34.9	152.71	0.32	9.993 0080	16.8	2.55	17.25	20.80	3.09	4 6 5.89
20	20	299 53 39.7	152.69	0.20	9.993 0492	17.5	2.69	17.28	20.79	3.10	4 2 9.98
21	21	300 54 44.0	152.67	−0.07	9.993 0919	+18.1	2.83	+17.31	20.79	3.11	3 58 14.07
22	22	301 55 47.8	152.64	+0.06	9.993 1362	18.7	2.97	17.34	20.79	3.12	3 54 18.16
23	23	302 56 50.9	152.61	0.20	9.993 1818	19.3	3.10	17.37	20.79	3.12	3 50 22.25
24	24	303 57 53.2	152.58	0.33	9.993 2288	19.9	3.24	17.40	20.79	3.13	3 46 26.34
25	25	304 58 54.5	152.53	0.44	9.993 2772	20.5	3.38	17.42	20.78	3.14	3 42 30.43
26	26	305 59 54.8	152.49	+0.54	9.993 3271	+21.1	3.52	+17.44	20.78	3.15	3 38 34.52
27	27	307 0 54.1	152.44	0.60	9.993 3786	21.8	3.66	17.46	20.78	3.16	3 34 38.60
28	28	308 1 52.1	152.39	0.63	9.993 4318	22.5	3.79	17.48	20.78	3.17	3 30 42.69
29	29	309 2 48.9	152.34	0.63	9.993 4867	23.3	3.93	17.50	20.77	3.18	3 26 46.78
30	30	310 3 44.4	152.28	0.61	9.993 5435	24.1	4.07	17.52	20.77	3.19	3 22 50.87
31	31	311 4 38.6	152.23	+0.55	9.993 6024	+25.0	4.21	+17.53	20.77	3.20	3 18 54.96
Feb. 1	32	312 5 31.4	152.18	0.46	9.993 6634	25.9	4.34	17.55	20.77	3.21	3 14 59.05
2	33	313 6 23.0	152.12	0.35	9.993 7266	26.8	4.48	17.56	20.76	3.22	3 11 3.14
3	34	314 7 13.2	152.06	0.24	9.993 7920	27.7	4.62	17.57	20.76	3.23	3 7 7.23
4	35	315 8 2.0	152.01	+0.11	9.993 8598	28.7	4.76	17.58	20.76	3.24	3 3 11.32
5	36	316 8 49.6	151.95	−0.02	9.993 9298	+29.7	4.89	+17.58	20.75	3.25	2 59 15.41
6	37	317 9 35.9	151.90	0.14	9.994 0022	30.7	5.03	17.59	20.75	3.26	2 55 19.50
7	38	318 10 20.9	151.85	0.26	9.994 0770	31.6	5.17	17.59	20.75	3.28	2 51 23.59
8	39	319 11 4.6	151.80	0.36	9.994 1540	32.6	5.31	17.59	20.74	3.29	2 47 27.68
9	40	320 11 47.1	151.75	0.44	9.994 2334	33.5	5.44	17.59	20.74	3.30	2 43 31.77
10	41	321 12 28.4	151.70	−0.50	9.994 3149	+34.4	5.58	+17.59	20.73	3.30	2 39 35.86
11	42	322 13 8.5	151.65	0.53	9.994 3986	35.3	5.72	17.59	20.73	3.31	2 35 39.95
12	43	323 13 47.4	151.60	0.53	9.994 4844	36.1	5.86	17.58	20.73	3.32	2 31 44.05
13	44	324 14 25.2	151.55	0.50	9.994 5721	36.9	5.99	17.58	20.72	3.33	2 27 48.14
14	45	325 15 1.8	151.50	0.44	9.994 6617	37.7	6.13	17.57	20.72	3.34	2 23 52.23
15	46	326 15 37.2	151.45	−0.34	9.994 7529	+38.3	6.27	+17.56	20.71	3.35	2 19 56.32
16	47	*327 16 11.4*	*151.40*	*−0.23*	*9.994 8457*	+38.9	6.41	+17.55	20.71	3.36	2 16 0.41

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 the Sun
		h m s	s	° ′ ″	″	′ ″	″	m s	s	h m
Feb. 16	Fr	21 57 52.57	9.709	−12 25 39.6	+51.90	16 12.97	8.90	−14 15.32	+0.147	21 4
17	Sa	22 1 45.24	9.690	12 4 48.0	52.40	16 12.76	8.90	14 11.44	0.176	21 4
18	Su	22 5 37.23	9.652	11 43 44.7	52.87	16 12.55	8.90	14 6.87	0.204	21 5
19	Mo	22 9 28.54	9.624	11 22 30.3	53.33	16 12.34	8.90	14 1.63	0.232	21 5
20	Tu	22 13 19.19	9.596	11 1 5.1	53.77	16 12.12	8.90	13 55.72	0.260	21 5
21	We	22 17 9.17	9.569	−10 39 29.7	+54.19	16 11.90	8.90	−13 49.15	+0.287	22
22	Th	22 20 58.51	9.543	10 17 44.3	54.59	16 11.68	8.89	13 41.94	0.314	22
23	Fr	22 24 47.22	9.516	9 55 49.5	54.97	16 11.46	8.89	13 34.09	0.340	22 1
24	Sa	22 28 35.29	9.490	9 33 45.8	55.33	16 11.24	8.89	13 25.61	0.366	22 1
25	Su	22 32 22.76	9.465	9 11 33.6	55.68	16 11.01	8.89	13 16.53	0.391	22 1
26	Mo	22 36 9.63	9.440	− 8 49 13.2	+56.01	16 10.78	8.88	−13 6.84	+0.416	22 2
27	Tu	22 39 55.91	9.416	8 26 45.1	56.33	16 10.55	8.88	12 56.57	0.440	22 2
28	We	22 43 41.63	9.393	8 4 9.6	56.62	16 10.32	8.88	12 45.73	0.463	22 3
Mar. 1	Th	22 47 26.80	9.371	7 41 27.3	56.90	16 10.09	8.88	12 34.34	0.485	22 3
2	Fr	22 51 11.43	9.349	7 18 38.4	57.17	16 9.85	8.88	12 22.43	0.507	22 3
3	Sa	22 54 55.56	9.328	− 6 55 43.4	+57.41	16 9.61	8.87	−12 10.00	+0.528	22 4
4	Su	22 58 39.19	9.308	6 32 42.7	57.64	16 9.37	8.87	11 57.08	0.548	22 4
5	Mo	23 2 22.36	9.289	6 9 36.6	57.86	16 9.13	8.87	11 43.69	0.567	22 5
6	Tu	23 6 5.07	9.271	5 46 25.4	58.06	16 8.88	8.87	11 29.86	0.586	22 5
7	We	23 9 47.36	9.254	5 23 9.6	58.25	16 8.63	8.87	11 15.59	0.603	22 5
8	Th	23 13 29.25	9.237	− 4 59 49.5	+58.42	16 8.38	8.86	−11 0.92	+0.619	23
9	Fr	23 17 10.75	9.221	4 36 25.5	58.58	16 8.12	8.86	10 45.87	0.635	23
10	Sa	23 20 51.89	9.207	4 12 58.0	58.73	16 7.86	8.86	10 30.45	0.650	23 1
11	Su	23 24 32.69	9.193	3 49 27.2	58.85	16 7.59	8.86	10 14.70	0.663	23 1
12	Mo	23 28 13.18	9.181	3 25 53.5	58.96	16 7.33	8.85	9 58.64	0.675	23 1
13	Tu	23 31 53.38	9.169	− 3 2 17.4	+59.05	16 7.06	8.85	− 9 42.29	+0.687	23 2
14	We	23 35 33.31	9.159	2 38 39.1	59.13	16 6.79	8.85	9 25.67	0.698	23 2
15	Th	23 39 13.00	9.149	2 14 59.1	59.20	16 6.52	8.85	9 8.80	0.708	23 3
16	Fr	23 42 52.46	9.140	1 51 17.7	59.25	16 6.24	8.84	8 51.71	0.716	23 3
17	Sa	23 46 31.73	9.132	1 27 35.2	59.29	16 5.97	8.84	8 34.42	0.724	23 3
18	Su	23 50 10.81	9.125	− 1 3 52.0	+59.31	16 5.69	8.84	− 8 16.95	+0.731	23 4
19	Mo	23 53 49.73	9.119	0 40 8.6	59.31	16 5.42	8.84	7 59.32	0.736	23 4
20	Tu	23 57 28.51	9.113	− 0 16 25.2	59.30	16 5.14	8.83	7 41.55	0.743	23 4
21	We	0 1 7.17	9.108	+ 0 7 17.6	59.27	16 4.86	8.83	7 23.65	0.748	23 5
22	Th	0 4 45.71	9.104	0 30 59.5	59.22	16 4.59	8.83	7 5.64	0.752	23 5
23	Fr	0 8 24.16	9.101	+ 0 54 40.2	+59.16	16 4.31	8.83	− 6 47.54	+0.756	0
24	Sa	0 12 2.54	9.098	1 18 19.2	59.09	16 4.04	8.82	6 29.36	0.759	0
25	Su	0 15 40.85	9.095	1 41 56.2	58.99	16 3.77	8.82	6 11.12	0.761	0
26	Mo	0 19 19.12	9.094	2 5 30.6	58.88	16 3.49	8.82	5 52.84	0.762	0 1
27	Tu	0 22 57.36	9.093	2 29 2.3	58.76	16 3.22	8.82	5 34.53	0.763	0 1
28	We	0 26 35.59	9.093	+ 2 52 30.8	+58.62	16 2.95	8.81	− 5 16.20	+0.763	0 2
29	Th	0 30 13.83	9.094	3 15 55.8	58.46	16 2.68	8.81	4 57.89	0.763	0 2
30	Fr	0 33 52.10	9.095	3 39 16.9	58.29	16 2.41	8.81	4 39.60	0.761	0 2
31	Sa	0 37 30.41	9.098	4 2 33.8	58.11	16 2.14	8.81	4 21.36	0.759	0 3
Apr. 1	Su	0 41 8.79	9.101	4 25 46.1	57.91	16 1.87	8.80	4 3.19	0.755	0 3
2	Mo	0 44 47.26	9.105	+ 4 48 53.5	+57.70	16 1.60	8.80	− 3 45.11	+0.751	0 4
3	Tu	0 48 25.83	9.110	+ 5 11 55.7	+57.48	16 1.32	8.80	− 3 27.13	+0.747	0 4

FOR GREENWICH MEAN NOON.

Date.	Day of the Year.	True Longitude.	Var. per Hour.	Lati-tude.	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
eb. 16	47	327 16 11.4	151.40	−0.23	9.994 8457	+38.9	6.41	+17.55	20.71	3.36	2 16 0.41
17	48	328 16 44.4	151.35	−0.10	9.994 9397	39.4	6.55	17.54	20.70	3.37	2 12 4.50
18	49	329 17 16.2	151.29	+0.04	9.995 0349	39.9	6.68	17.52	20.70	3.38	2 8 8.59
19	50	330 17 46.6	151.24	0.18	9.995 1311	40.3	6.82	17.51	20.70	3.39	2 4 12.68
20	51	331 18 15.5	151.18	0.31	9.995 2281	40.6	6.96	17.49	20.69	3.39	2 0 16.78
21	52	332 18 43.0	151.11	+0.42	9.995 3259	+40.9	7.10	+17.47	20.69	3.40	1 56 20.87
22	53	333 19 8.9	151.04	0.52	9.995 4244	41.2	7.23	17.45	20.68	3.41	1 52 24.96
23	54	334 19 33.0	150.97	0.59	9.995 5235	41.5	7.37	17.43	20.68	3.41	1 48 29.05
24	55	335 19 55.3	150.89	0.63	9.995 6234	41.8	7.51	17.41	20.67	3.42	1 44 33.14
25	56	336 20 15.8	150.81	0.63	9.995 7239	42.1	7.65	17.39	20.67	3.43	1 40 37.23
26	57	337 20 34.2	150.72	+0.60	9.995 8254	+42.5	7.78	+17 36	20.66	3.43	1 36 41.33
27	58	338 20 50.6	150.64	0.55	9.995 9278	42.9	7.92	17.34	20.66	3.44	1 32 45.42
28	59	339 21 5.0	150.56	0.47	9.996 0312	43.3	8.06	17.31	20.65	3.44	1 28 49.51
lar. 1	60	340 21 17.4	150.47	0.36	9.996 1358	43.8	8.20	17.29	20.65	3.44	1 24 53.60
2	61	341 21 27.6	150.39	0.26	9.996 2415	44.3	8.33	17.26	20.64	3.44	1 20 57.69
3	62	342 21 35.9	150.30	+0.15	9.996 3486	+44.9	8.47	+17.23	20.64	3.45	1 17 1.79
4	63	343 21 42.0	150.21	+0.02	9.996 4569	45.4	8.61	17.20	20.63	3.45	1 13 5.88
5	64	344 21 46.2	150.13	−0.11	9.996 5667	46.0	8.75	17.17	20.63	3.45	1 9 9.97
6	65	345 21 48.3	150.05	0.22	9.996 6779	46.6	8.88	17.13	20.62	3.45	1 5 14.06
7	66	346 21 48.4	149.96	0.32	9.996 7904	47.2	9.02	17.10	20.62	3.45	1 1 18.16
8	67	347 21 46.5	149.88	−0.40	9.996 9044	+47.8	9.16	+17.07	20.61	3.45	0 57 22.25
9	68	348 21 42.7	149.80	0.46	9.997 0198	48.4	9.30	17.03	20.61	3.45	0 53 26.34
10	69	349 21 37.1	149.73	0.49	9.997 1365	48.9	9.43	17.00	20.60	3.45	0 49 30.44
11	70	350 21 29.6	149.65	0.49	9.997 2546	49.5	9.57	16.96	20.59	3.45	0 45 34.53
12	71	351 21 20.2	149.58	0.46	9.997 3740	50.0	9.71	16.92	20.59	3.44	0 41 38.62
13	72	352 21 9.2	149.50	−0.41	9.997 4946	+50.5	9.85	+16.89	20.58	3.44	0 37 42.71
14	73	353 20 56.3	149.43	0.33	9.997 6162	50.8	9.99	16.85	20.58	3.43	0 33 46.81
15	74	354 20 41.8	149.36	0.23	9.997 7386	51.2	10.12	16.81	20.57	3.43	0 29 50.90
16	75	355 20 25.6	149.29	−0.11	9.997 8619	51.5	10.26	16.77	20.57	3.42	0 25 54.99
17	76	356 20 7.8	149.22	+0.03	9.997 9857	51.7	10.40	16.74	20.56	3.42	0 21 59.09
18	77	357 19 48.2	149.15	+0.16	9.998 1099	+51.8	10.54	+16.70	20.55	3.41	0 18 3.18
19	78	358 19 26.9	149.08	0.29	9.998 2343	51.9	10.67	16.66	20.55	3.40	0 14 7.27
20	79	359 19 3.8	149.00	0.42	9.998 3588	51.8	10.81	16.62	20.54	3.39	0 10 11.36
21	80	0 18 39.0	148.92	0.52	9.998 4831	51.8	10.95	16.58	20.54	3.38	0 6 15.45
22	81	1 18 12.2	148.84	0.59	9.998 6072	51.7	11.09	16.54	20.53	3.37	{ 0 23 2 58 19.55 23.64
23	82	2 17 43.4	148.76	+0.63	9.998 7310	+51.5	11.22	+16.50	20.52	3.36	23 54 27.73
24	83	3 17 12.6	148.67	0.64	9.998 8544	51.3	11.36	16.46	20.52	3.35	23 50 31.83
25	84	4 16 39.7	148.58	0.62	9.998 9774	51.2	11.50	16.43	20.51	3.34	23 46 35.92
26	85	5 16 4.6	148.49	0.57	9.999 1001	51.1	11.64	16.39	20.51	3.33	23 42 40.01
27	86	6 15 27.2	148.39	0.50	9.999 2226	51.0	11.77	16.35	20.50	3.32	23 38 44.11
28	87	7 14 47.5	148.31	+0.41	9.999 3450	+51.0	11.91	+16.31	20.50	3.30	23 34 48.20
29	88	8 14 5.5	148.21	0.30	9.999 4672	50.9	12.05	16.27	20.49	3.29	23 30 52.29
30	89	9 13 21.2	148.11	0.18	9.999 5894	51.0	12.19	16.24	20.48	3.27	23 26 56.38
31	90	10 12 34.6	148.01	+0.06	9.999 7118	51.0	12.32	16.20	20.48	3.26	23 23 0.48
pr. 1	91	11 11 45.7	147.91	−0.06	9.999 8342	51.0	12.46	16.16	20.47	3.24	23 19 4.57
2	92	12 10 54.5	147.82	−0.17	9.999 9568	+51.1	12.60	+16.13	20.47	3.23	23 15 8.66
3	93	13 10 1.0	147.73	−0.27	0.000 0797	+51.2	12.74	+16.09	20.46	3.21	23 11 12.75

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.
		h m s	s	° ′ ″	″	′ ″	″	m s	s	h m
Apr. 1	Su	0 41 8.79	9.101	+ 4 25 46.1	+57.91	16 1.87	8.80	−4 3.19	+0.755	0 3
2	Mo	0 44 47.26	9.105	4 48 53.5	57.70	16 1.60	8.80	3 45.11	0.751	0 4
3	Tu	0 48 25.83	9.110	5 11 55.7	57.48	16 1.32	8.80	3 27.13	0.747	0 4
4	We	0 52 4.54	9.116	5 34 52.4	57.24	16 1.05	8.80	3 9.28	0.741	0 4
5	Th	0 55 43.39	9.122	5 57 43.1	56.99	16 0.78	8.79	2 51.58	0.734	0 5
6	Fr	0 59 22.41	9.130	+ 6 20 27.7	+56.72	16 0.50	8.79	−2 34.05	+0.727	0 5
7	Sa	1 3 1.63	9.138	6 43 5.7	56.44	16 0.23	8.79	2 16.71	0.718	1
8	Su	1 6 41.05	9.147	7 5 36.9	56.15	15 59.96	8.79	1 59.58	0.709	1
9	Mo	1 10 20.71	9.158	7 28 0.9	55.85	15 59.68	8.78	1 42.69	0.698	1
10	Tu	1 14 0.63	9.169	7 50 17.4	55.53	15 59.40	8.78	1 26.06	0.686	1 1
11	We	1 17 40.83	9.181	+ 8 12 26.1	+55.20	15 59.13	8.78	−1 9.69	+0.676	1 1
12	Th	1 21 21.32	9.193	8 34 26.7	54.85	15 58.85	8.78	0 53.63	0.663	1 2
13	Fr	1 25 2.12	9.207	8 56 18.8	54.49	15 58.57	8.77	0 37.88	0.649	1 2
14	Sa	1 28 43.26	9.222	9 18 2.1	54.12	15 58.30	8.77	0 22.47	0.635	1 2
15	Su	1 32 24.76	9.237	9 39 36.3	53.73	15 58.02	8.77	−0 7.41	0.620	1 3
16	Mo	1 36 6.62	9.252	+10 1 1.0	+53.33	15 57.75	8.77	+0 7.28	+0.604	1 3
17	Tu	1 39 48.87	9.268	10 22 16.9	52.91	15 57.48	8.76	0 21.59	0.588	1 4
18	We	1 43 31.51	9.285	10 43 20.6	52.48	15 57.21	8.76	0 35.50	0.571	1 4
19	Th	1 47 14.55	9.302	11 4 14.7	52.03	15 56.95	8.76	0 49.01	0.554	1 4
20	Fr	1 50 58.02	9.320	11 24 57.9	51.57	15 56.68	8.76	1 2.10	0.537	1 5
21	Sa	1 54 41.91	9.338	+11 45 29.9	+51.09	15 56.43	8.75	+1 14.76	+0.519	1 5
22	Su	1 58 26.23	9.356	12 5 50.3	50.60	15 56.17	8.75	1 26.99	0.500	1 5
23	Mo	2 2 11.00	9.375	12 25 58.6	50.09	15 55.91	8.75	1 38.78	0.482	2
24	Tu	2 5 56.22	9.394	12 45 54.7	49.57	15 55.66	8.75	1 50.12	0.463	2
25	We	2 9 41.90	9.413	13 5 38.1	49.04	15 55.41	8.74	2 0.99	0.443	2 1
26	Th	2 13 28.04	9.432	+13 25 8.5	+48.49	15 55.17	8.74	+2 11.40	+0.424	2 1
27	Fr	2 17 14.66	9.453	13 44 25.6	47.93	15 54.93	8.74	2 21.33	0.404	2 1
28	Sa	2 21 1.77	9.473	14 3 29.1	47.36	15 54.69	8.74	2 30.78	0.384	2 2
29	Su	2 24 49.37	9.494	14 22 18.7	46.77	15 54.45	8.74	2 39.74	0.363	2 2
30	Mo	2 28 37.47	9.515	14 40 53.9	46.17	15 54.21	8.73	2 48.19	0.342	2 3
May 1	Tu	2 32 26.09	9.536	+14 59 14.6	+45.56	15 53.98	8.73	+2 56.13	+0.320	2 3
2	We	2 36 15.22	9.558	15 17 20.5	44.93	15 53.75	8.73	3 3.55	0.298	2 3
3	Th	2 40 4.88	9.580	15 35 11.2	44.29	15 53.51	8.73	3 10.45	0.276	2 4
4	Fr	2 43 55.08	9.603	15 52 46.3	43.64	15 53.29	8.73	3 16.81	0.254	2 4
5	Sa	2 47 45.82	9.626	16 10 5.8	42.97	15 53.06	8.72	3 22.62	0.231	2 5
6	Su	2 51 37.11	9.649	+16 27 9.1	+42.30	15 52.83	8.72	+3 27.89	+0.208	2 5
7	Mo	2 55 28.96	9.672	16 43 56.1	41.61	15 52.61	8.72	3 32.59	0.184	2 5
8	Tu	2 59 21.38	9.696	17 0 26.4	40.91	15 52.39	8.72	3 36.73	0.160	3
9	We	3 3 14.38	9.720	17 16 39.8	40.20	15 52.16	8.72	3 40.29	0.136	3
10	Th	3 7 7.95	9.744	17 32 36.0	39.48	15 51.94	8.71	3 43.26	0.112	3 1
11	Fr	3 11 2.12	9.769	+17 48 14.7	+38.74	15 51.73	8.71	+3 45.65	+0.087	3 1
12	Sa	3 14 56.88	9.794	18 3 35.6	37.99	15 51.51	8.71	3 47.45	0.063	3 1
13	Su	3 18 52.23	9.819	18 18 38.3	37.23	15 51.30	8.71	3 48.65	0.038	3 2
14	Mo	3 22 48.18	9.844	18 33 22.7	36.46	15 51.09	8.71	3 49.26	+0.013	3 2
15	Tu	3 26 44.72	9.868	18 47 48.4	35.68	15 50.88	8.70	3 49.27	−0.012	3 3
16	We	3 30 41.85	9.893	+19 1 55.2	+34.88	15 50.68	8.70	+3 48.70	−0.036	3 3
17	Th	3 34 39.57	9.917	+19 15 42.6	+34.07	15 50.48	8.70	+3 47.54	−0.060	3 3

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.	Aberration.	True Obliquity. 23° 27′	Mean Time of Sidereal Noon.
		° ′ ″	″	″			″	″	″	″	h m s
Apr. 1	91	11 11 45.7	147.91	−0.06	9.999 8342	+51.0	12.46	+16.16	20.47	3.24	23 19 4.57
2	92	12 10 54.5	147.82	0.17	9.999 9568	51.1	12.60	16.13	20.47	3.23	23 15 8.66
3	93	13 10 1.0	147.73	0.27	0.000 0797	51.2	12.74	16.09	20.46	3.21	23 11 12.75
4	94	14 9 5.3	147.63	0.35	0.000 2028	51.3	12.88	16.06	20.45	3.19	23 7 16.85
5	95	15 8 7.4	147.54	0.41	0.000 3262	51.5	13.01	16.02	20.45	3.17	23 3 20.94
6	96	16 7 7.4	147.46	−0.45	0.000 4500	+51.7	13.15	+15.99	20.44	3.15	22 59 25.03
7	97	17 6 5.3	147.37	0.46	0.000 5741	51.8	13.29	15.96	20.44	3.13	22 55 29.13
8	98	18 5 1.2	147.29	0.44	0.000 6985	51.9	13.43	15.93	20.43	3.11	22 51 33.22
9	99	19 3 55.1	147.21	0.39	0.000 8232	52.0	13.56	15.90	20.43	3.09	22 47 37.31
10	100	20 2 47.1	147.13	0.32	0.000 9482	52.1	13.70	15.87	20.42	3.07	22 43 41.40
11	101	21 1 37.3	147.06	−0.22	0.001 0734	+52.2	13.84	+15.84	20.41	3.05	22 39 45.50
12	102	22 0 25.6	146.98	−0.10	0.001 1985	52.1	13.98	15.81	20.41	3.03	22 35 49.59
13	103	22 59 12.3	146.91	+0.03	0.001 3235	52.0	14.11	15.78	20.40	3.00	22 31 53.68
14	104	23 57 57.3	146.84	0.16	0.001 4483	51.9	14.25	15.76	20.40	2.98	22 27 57.77
15	105	24 56 40.6	146.77	0.29	0.001 5727	51.7	14.39	15.73	20.39	2.96	22 24 1.86
16	106	25 55 22.3	146.70	+0.41	0.001 6963	+51.4	14.53	+15.71	20.38	2.93	22 20 5.96
17	107	26 54 2.3	146.63	0.51	0.001 8192	51.0	14.66	15.69	20.38	2.91	22 16 10.05
18	108	27 52 40.6	146.56	0.59	0.001 9412	50.6	14.80	15.67	20.37	2.89	22 12 14.14
19	109	28 51 17.2	146.49	0.63	0.002 0620	50.1	14.94	15.65	20.37	2.86	22 8 18.23
20	110	29 49 52.1	146.41	0.64	0.002 1815	49.5	15.08	15.63	20.37	2.83	22 4 22.32
21	111	30 48 25.1	146.34	+0.63	0.002 2997	+49.0	15.21	+15.61	20.36	2.81	22 0 26.42
22	112	31 46 56.2	146.26	0.59	0.002 4166	48.4	15.35	15.59	20.36	2.79	21 56 30.51
23	113	32 45 25.3	146.17	0.52	0.002 5320	47.8	15.49	15.58	20.35	2.76	21 52 34.60
24	114	33 43 52.5	146.09	0.42	0.002 6461	47.3	15.63	15.56	20.35	2.73	21 48 38.69
25	115	34 42 17.6	146.01	0.30	0.002 7590	46.7	15.76	15.55	20.34	2.71	21 44 42.78
26	116	35 40 40.7	145.92	+0.18	0.002 8705	+46.2	15.90	+15.54	20.33	2.68	21 40 46.87
27	117	36 39 1.8	145.83	+0.05	0.002 9809	45.8	16.04	15.53	20.33	2.65	21 36 50.96
28	118	37 37 20.7	145.75	−0.07	0.003 0903	45.4	16.18	15.52	20.32	2.62	21 32 55.05
29	119	38 35 37.6	145.66	0.19	0.003 1986	44.9	16.32	15.52	20.32	2.60	21 28 59.14
30	120	39 33 52.5	145.58	0.30	0.003 3059	44.5	16.45	15.51	20.31	2.57	21 25 3.24
May 1	121	40 32 5.4	145.49	−0.38	0.003 4124	+44.2	16.59	+15.50	20.31	2.54	21 21 7.33
2	122	41 30 16.2	145.41	0.44	0.003 5180	43.8	16.73	15.50	20.30	2.51	21 17 11.42
3	123	42 28 25.2	145.33	0.48	0.003 6229	43.5	16.87	15.50	20.30	2.49	21 13 15.51
4	124	43 26 32.2	145.25	0.49	0.003 7270	43.3	17.00	15.50	20.29	2.46	21 9 19.60
5	125	44 24 37.4	145.18	0.47	0.003 8306	43.0	17.14	15.50	20.29	2.43	21 5 23.69
6	126	45 22 40.9	145.11	−0.43	0.003 9335	+42.7	17.28	+15.50	20.28	2.40	21 1 27.78
7	127	46 20 42.6	145.04	0.36	0.004 0358	42.5	17.42	15.51	20.28	2.38	20 57 31.87
8	128	47 18 42.8	144.98	0.25	0.004 1375	42.3	17.55	15.51	20.27	2.35	20 53 35.96
9	129	48 16 41.4	144.91	0.14	0.004 2386	42.0	17.69	15.52	20.27	2.32	20 49 40.05
10	130	49 14 38.6	144.86	−0.01	0.004 3390	41.7	17.83	15.53	20.26	2.29	20 45 44.14
11	131	50 12 34.5	144.80	+0.12	0.004 4385	+41.3	17.97	+15.54	20.26	2.26	20 41 48.23
12	132	51 10 29.0	144.75	0.26	0.004 5371	40.8	18.10	15.55	20.25	2.24	20 37 52.32
13	133	52 8 22.4	144.69	0.37	0.004 6345	40.3	18.24	15.56	20.25	2.21	20 33 56.41
14	134	53 6 14.5	144.65	0.48	0.004 7306	39.8	18.38	15.57	20.24	2.18	20 30 0.50
15	135	54 4 5.5	144.60	0.57	0.004 8253	39.1	18.52	15.59	20.24	2.16	20 26 4.59
16	136	55 1 55.3	144.55	+0.62	0.004 9183	+38.4	18.65	+15.60	20.23	2.13	20 22 8.68
17	137	55 59 43.9	144.50	+0.63	0.005 0096	+37.6	18.79	+15.62	20.23	2.10	20 18 12.77

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 or Right Ascension of Sun
		h m s	s	° ′ ″	″	′ ″	″	m s	s	h m
July 1	Su	6 39 23.88	10.341	+23 8 28.4	− 9.73	15 45.71	8.66	−3 31.68	−0.484	6 35
2	Mo	6 43 31.93	10.330	23 4 22.9	10.73	15 45.71	8.66	3 43.17	0.473	6 39
3	Tu	6 47 39.69	10.317	22 59 53.2	11.74	15 45.70	8.66	3 54.37	0.461	6 43
4	We	6 51 47.16	10.305	22 54 59.4	12.74	15 45.70	8.66	4 5.28	0.448	6 47
5	Th	6 55 54.32	10.292	22 49 41.7	13.73	15 45.71	8.66	4 15.88	0.435	6 51
6	Fr	7 0 1.15	10.278	+22 44 0.2	−14.72	15 45.71	8.66	−4 26.16	−0.421	6 55
7	Sa	7 4 7.64	10.263	22 37 55.1	15.71	15 45.72	8.66	4 36.09	0.407	6 59
8	Su	7 8 13.78	10.248	22 31 26.3	16.69	15 45.74	8.66	4 45.67	0.392	7 3
9	Mo	7 12 19.55	10.233	22 24 34.2	17.66	15 45.75	8.66	4 54.89	0.376	7 7
10	Tu	7 16 24.94	10.216	22 17 18.8	18.63	15 45.77	8.66	5 3.72	0.360	7 11
11	We	7 20 29.92	10.199	+22 9 40.2	−19.59	15 45.80	8.66	−5 12.15	−0.343	7 15
12	Th	7 24 34.49	10.182	22 1 38.7	20.54	15 45.83	8.66	5 20.16	0.325	7 19
13	Fr	7 28 38.63	10.163	21 53 14.5	21.48	15 45.86	8.66	5 27.74	0.306	7 23
14	Sa	7 32 42.32	10.144	21 44 27.7	22.42	15 45.90	8.66	5 34.87	0.287	7 27
15	Su	7 36 45.54	10.124	21 35 18.6	23.34	15 45.94	8.66	5 41.53	0.268	7 31
16	Mo	7 40 48.28	10.104	+21 25 47.3	−24.26	15 45.99	8.66	−5 47.71	−0.247	7 35
17	Tu	7 44 50.52	10.083	21 15 54.1	25.17	15 46.04	8.66	5 53.39	0.226	7 38
18	We	7 48 52.24	10.061	21 5 39.2	26.07	15 46.11	8.66	5 58.56	0.204	7 42
19	Th	7 52 53.43	10.038	20 55 2.9	26.96	15 46.17	8.66	6 3.19	0.182	7 46
20	Fr	7 56 54.07	10.015	20 44 5.4	27.83	15 46.24	8.66	6 7.28	0.159	7 50
21	Sa	8 0 54.16	9.992	+20 32 47.0	−28.70	15 46.32	8.66	−6 10.81	−0.136	7 54
22	Su	8 4 53.68	9.968	20 21 7.8	29.56	15 46.40	8.66	6 13.78	0.112	7 58
23	Mo	8 8 52.62	9.944	20 9 8.3	30.40	15 46.49	8.66	6 16.16	0.087	8 2
24	Tu	8 12 50.97	9.919	19 56 48.5	31.24	15 46.58	8.66	6 17.95	0.062	8 6
25	We	8 16 48.73	9.894	19 44 8.9	32.06	15 46.68	8.66	6 19.15	0.037	8 10
26	Th	8 20 45.88	9.868	+19 31 9.7	−32.87	15 46.78	8.66	−6 19.74	−0.012	8 14
27	Fr	8 24 42.41	9.843	19 17 51.2	33.67	15 46.88	8.67	6 19.72	+0.014	8 18
28	Sa	8 28 38.33	9.817	19 4 13.5	34.46	15 46.99	8.67	6 19.08	0.039	8 22
29	Su	8 32 33.63	9.791	18 50 17.1	35.24	15 47.11	8.67	6 17.83	0.065	8 26
30	Mo	8 36 28.31	9.765	18 36 2.2	36.00	15 47.22	8.67	6 15.95	0.091	8 30
31	Tu	8 40 22.37	9.740	+18 21 29.0	−36.76	15 47.34	8.67	−6 13.45	+0.117	8 34
Aug. 1	We	8 44 15.81	9.714	18 6 37.8	37.50	15 47.47	8.67	6 10.34	0.143	8 38
2	Th	8 48 8.64	9.689	17 51 28.9	38.24	15 47.59	8.67	6 6.61	0.168	8 42
3	Fr	8 52 0.86	9.663	17 36 2.5	38.96	15 47.72	8.67	6 2.27	0.193	8 45
4	Sa	8 55 52.47	9.638	17 20 19.0	39.67	15 47.85	8.68	5 57.33	0.218	8 49
5	Su	8 59 43.49	9.614	+17 4 18.5	−40.37	15 47.99	8.68	−5 51.80	+0.242	8 53
6	Mo	9 3 33.93	9.589	16 48 1.4	41.06	15 48.12	8.68	5 45.68	0.267	8 57
7	Tu	9 7 23.78	9.565	16 31 27.9	41.73	15 48.26	8.68	5 38.98	0.291	9 1
8	We	9 11 13.06	9.542	16 14 38.3	42.40	15 48.41	8.68	5 31.70	0.315	9 5
9	Th	9 15 1.78	9.518	15 57 32.9	43.05	15 48.55	8.68	5 23.86	0.338	9 9
10	Fr	9 18 49.93	9.495	+15 40 12.0	−43.69	15 48.70	8.68	−5 15.46	+0.362	9 13
11	Sa	9 22 37.53	9.472	15 22 35.9	44.32	15 48.85	8.68	5 6.50	0.385	9 17
12	Su	9 26 24.58	9.449	15 4 44.9	44.93	15 49.01	8.68	4 56.99	0.408	9 21
13	Mo	9 30 11.08	9.426	14 46 39.4	45.53	15 49.17	8.69	4 46.94	0.430	9 25
14	Tu	9 33 57.04	9.404	14 28 19.7	46.11	15 49.34	8.69	4 36.35	0.453	9 29
15	We	9 37 42.47	9.382	+14 9 46.1	−46.68	15 49.51	8.69	−4 25.22	+0.475	9 33
16	Th	9 41 27.37	9.360	+13 50 58.9	−47.24	15 49.68	8.69	−4 13.57	+0.496	9 37

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.	Aberration.	True Obliquity.	Mean Time of Sidereal Noon.
		° ′ ″	″	″			″	″	″	23° 27′ ″	h m s
July 1	182	99 3 20.3	142.96	−0.39	0.007 1930	+ 1.4	24.98	+17.24	20.13	1.35	17 21 16.74
2	183	100 0 31.3	142.95	0.28	0.007 1956	0.8	25.12	17.28	20.13	1.35	17 17 20.83
3	184	100 57 42.0	142.95	0.15	0.007 1968	+ 0.2	25.26	17.32	20.13	1.35	17 13 24.92
4	185	101 54 52.6	142.94	−0.02	0.007 1965	− 0.4	25.40	17.36	20.13	1.34	17 9 29.01
5	186	102 52 3.2	142.94	+0.12	0.007 1949	1.0	25.53	17.40	20.13	1.34	17 5 33.09
6	187	103 49 13.9	142.96	+0.26	0.007 1919	− 1.6	25.67	+17.43	20.13	1.34	17 1 37.18
7	188	104 46 24.8	142.96	0.38	0.007 1874	2.2	25.81	17.47	20.13	1.34	16 57 41.27
8	189	105 43 36.0	142.97	0.48	0.007 1814	2.8	25.95	17.51	20.13	1.34	16 53 45.36
9	190	106 40 47.6	142.99	0.55	0.007 1739	3.5	26.09	17.54	20.13	1.34	16 49 49.45
10	191	107 37 59.6	143.01	0.59	0.007 1646	4.3	26.22	17.58	20.13	1.34	16 45 53.54
11	192	108 35 12.2	143.03	+0.60	0.007 1534	− 5.1	26.36	+17.62	20.13	1.34	16 41 57.63
12	193	109 32 25.3	143.06	0.57	0.007 1402	5.9	26.50	17.65	20.13	1.34	16 38 1.71
13	194	110 29 38.9	143.03	0.52	0.007 1248	6.9	26.64	17.68	20.13	1.34	16 34 5.80
14	195	111 26 53.1	143.10	0.43	0.007 1071	7.9	26.77	17.71	20.13	1.34	16 30 9.89
15	196	112 24 7.9	143.13	0.33	0.007 0871	8.9	26.91	17.75	20.13	1.34	16 26 13.98
16	197	113 21 23.2	143.15	+0.20	0.007 0646	− 9.9	27.05	+17.78	20.13	1.35	16 22 18.07
17	198	114 18 39.1	143.17	+0.06	0.007 0396	10.9	27.19	17.80	20.14	1.35	16 18 22.16
18	199	115 15 55.4	143.19	−0.07	0.007 0121	12.0	27.32	17.83	20.14	1.36	16 14 26.25
19	200	116 13 12.3	143.21	0.20	0.006 9820	13.0	27.46	17.86	20.14	1.36	16 10 30.34
20	201	117 10 29.6	143.23	0.32	0.006 9495	14.1	27.60	17.89	20.14	1.37	16 6 34.42
21	202	118 7 47.4	143.25	−0.42	0.006 9144	−15.1	27.74	+17.91	20.14	1.37	16 2 38.51
22	203	119 5 5.6	143.27	0.50	0.006 8769	16.1	27.87	17.94	20.14	1.37	15 58 42.60
23	204	120 2 24.2	143.29	0.56	0.006 8370	17.1	28.01	17.96	20.14	1.38	15 54 46.69
24	205	120 59 43.3	143.30	0.61	0.006 7948	18.0	28.15	17.98	20.15	1.39	15 50 50.78
25	206	121 57 2.8	143.32	0.62	0.006 7504	18.9	28.29	18.00	20.15	1.39	15 46 54.87
26	207	122 54 22.7	143.34	−0.61	0.006 7039	−19.8	28.42	+18.02	20.15	1.40	15 42 58.96
27	208	123 51 43.1	143.36	0.55	0.006 6554	20.6	28.56	18.04	20.15	1.41	15 39 3.05
28	209	124 49 3.9	143.38	0.48	0.006 6049	21.4	28.70	18.05	20.16	1.41	15 35 7.14
29	210	125 46 25.3	143.40	0.37	0.006 5527	22.1	28.84	18.07	20.16	1.42	15 31 11.23
30	211	126 43 47.1	143.42	0.25	0.006 4989	22.7	28.98	18.08	20.16	1.43	15 27 15.32
31	212	127 41 9.6	143.45	−0.13	0.006 4436	−23.3	29.11	+18.10	20.16	1.44	15 23 19.41
Aug. 1	213	128 38 32.7	143.48	+0.01	0.006 3870	23.8	29.25	18.11	20.17	1.44	15 19 23.50
2	214	129 35 56.5	143.51	0.15	0.006 3292	24.3	29.39	18.12	20.17	1.45	15 15 27.59
3	215	130 33 21.3	143.55	0.26	0.006 2702	24.8	29.53	18.12	20.17	1.46	15 11 31.68
4	216	131 30 47.0	143.59	0.36	0.006 2101	25.3	29.66	18.13	20.17	1.47	15 7 35.77
5	217	132 28 13.7	143.64	+0.44	0.006 1488	−25.8	29.80	+18.14	20.18	1.48	15 3 39.86
6	218	133 25 41.7	143.69	0.49	0.006 0864	26.3	29.94	18.14	20.18	1.48	14 59 43.95
7	219	134 23 10.9	143.75	0.51	0.006 0227	26.9	30.08	18.15	20.18	1.49	14 55 48.04
8	220	135 20 41.5	143.80	0.49	0.005 9575	27.5	30.21	18.15	20.19	1.50	14 51 52.13
9	221	136 18 13.4	143.86	0.44	0.005 8908	28.1	30.35	18.15	20.19	1.51	14 47 56.22
10	222	137 15 46.8	143.92	+0.36	0.005 8224	−28.8	30.49	+18.15	20.19	1.52	14 44 0.31
11	223	138 13 21.6	143.98	0.26	0.005 7523	29.6	30.63	18.15	20.20	1.53	14 40 4.40
12	224	139 10 57.8	144.04	0.14	0.005 6802	30.4	30.76	18.14	20.20	1.53	14 36 8.49
13	225	140 8 35.5	144.10	+0.01	0.005 6062	31.2	30.90	18.14	20.20	1.54	14 32 12.58
14	226	141 6 14.6	144.16	−0.11	0.005 5302	32.1	31.04	18.13	20.21	1.55	14 28 16.67
15	227	142 3 55.1	144.21	−0.23	0.005 4522	−33.0	31.18	+18.12	20.21	1.56	14 24 20.76
16	228	*143 1 37.0*	*144.27*	*−0.35*	*0.005 3720*	−33.9	31.31	+18.11	20.21	1.57	14 20 24.85

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
Aug. 16	Th	9 41 27.37	9.369	+13 50 58.9	−47.26	15 49.68	8.69	− 4 13.57	+0.496	9 37
17	Fr	9 45 11.76	9.339	13 31 58.5	47.79	15 49.86	8.69	4 1.40	0.513	9 41
18	Sa	9 48 55.63	9.317	13 12 45.2	48.32	15 50.05	8.70	3 48.72	0.539	9 45
19	Su	9 52 38.99	9.296	12 53 19.4	48.83	15 50.24	8.70	3 35.53	0.560	9 49
20	Mo	9 56 21.86	9.276	12 33 41.3	49.34	15 50.43	8.70	3 21.84	0.580	9 53
21	Tu	10 0 4.24	9.256	+12 13 51.3	−49.83	15 50.63	8.70	− 3 7.67	+0.600	9 56
22	We	10 3 46.15	9.236	11 53 49.8	50.30	15 50.83	8.70	2 53.02	0.620	10 0
23	Th	10 7 27.59	9.217	11 33 37.0	50.76	15 51.04	8.70	2 37.90	0.639	10 4
24	Fr	10 11 8.57	9.198	11 13 13.4	51.20	15 51.24	8.70	2 22.33	0.658	10 8
25	Sa	10 14 49.11	9.180	10 52 39.3	51.64	15 51.46	8.71	2 6.32	0.676	10 12
26	Su	10 18 29.22	9.162	+10 31 54.8	−52.06	15 51.67	8.71	− 1 49.87	+0.694	10 16
27	Mo	10 22 8.91	9.145	10 11 0.5	52.47	15 51.89	8.71	1 33.01	0.711	10 20
28	Tu	10 25 48.20	9.129	9 49 56.5	52.86	15 52.11	8.71	1 15.75	0.727	10 24
29	We	10 29 27.11	9.114	9 28 43.3	53.24	15 52.34	8.72	0 58.11	0.743	10 28
30	Th	10 33 5.66	9.099	9 7 21.1	53.61	15 52.58	8.72	0 40.10	0.758	10 32
31	Fr	10 36 43.86	9.085	+ 8 45 50.2	−53.97	15 52.79	8.72	− 0 21.74	+0.772	10 36
Sept. 1	Sa	10 40 21.73	9.072	8 24 10.8	54.31	15 53.01	8.72	− 0 3.06	0.785	10 40
2	Su	10 43 59.30	9.059	8 2 23.3	54.64	15 53.24	8.73	+ 0 15.92	0.797	10 44
3	Mo	10 47 36.59	9.048	7 40 28.0	54.96	15 53.47	8.73	0 35.19	0.808	10 48
4	Tu	10 51 13.62	9.038	7 18 25.2	55.27	15 53.70	8.73	0 54.71	0.818	10 52
5	We	10 54 50.41	9.028	+ 6 56 15.1	−55.57	15 53.94	8.73	+ 1 14.47	+0.828	10 56
6	Th	10 58 26.98	9.020	6 33 58.1	55.85	15 54.17	8.73	1 34.45	0.837	11 0
7	Fr	11 2 3.36	9.012	6 11 34.4	56.12	15 54.41	8.74	1 54.63	0.845	11 4
8	Sa	11 5 39.56	9.005	5 49 4.5	56.37	15 54.64	8.74	2 14.98	0.852	11 8
9	Su	11 9 15.60	8.998	5 26 28.7	56.61	15 54.88	8.74	2 35.50	0.858	11 12
10	Mo	11 12 51.49	8.993	+ 5 3 47.2	−56.84	15 55.13	8.74	+ 2 56.16	+0.863	11 16
11	Tu	11 16 27.26	8.988	4 41 0.4	57.05	15 55.37	8.74	3 16.94	0.868	11 19
12	We	11 20 2.92	8.984	4 18 8.7	57.25	15 55.62	8.75	3 37.83	0.873	11 23
13	Th	11 23 38.49	8.981	3 55 12.5	57.43	15 55.87	8.75	3 58.82	0.876	11 27
14	Fr	11 27 13.99	8.978	3 32 12.0	57.60	15 56.12	8.75	4 19.87	0.879	11 31
15	Sa	11 30 49.43	8.976	+ 3 9 7.7	−57.76	15 56.38	8.75	+ 4 40.99	+0.881	11 35
16	Su	11 34 24.83	8.974	2 45 59.8	57.90	15 56.63	8.76	5 2.14	0.883	11 39
17	Mo	11 38 0.20	8.974	2 22 48.7	58.02	15 56.90	8.76	5 23.32	0.883	11 43
18	Tu	11 41 35.57	8.974	1 59 34.8	58.13	15 57.16	8.76	5 44.50	0.882	11 47
19	We	11 45 10.96	8.975	1 36 18.5	58.23	15 57.43	8.76	6 5.67	0.881	11 51
20	Th	11 48 46.37	8.976	+ 1 13 0.0	−58.31	15 57.70	8.77	+ 6 26.80	+0.880	11 55
21	Fr	11 52 21.83	8.979	0 49 39.8	58.37	15 57.97	8.77	6 47.90	0.878	11 59
22	Sa	11 55 57.35	8.982	0 26 18.3	58.42	15 58.24	8.77	7 8.93	0.875	12 3
23	Su	11 59 32.96	8.986	+ 0 2 55.6	−58.46	15 58.52	8.77	7 29.88	0.871	12 7
24	Mo	12 3 8.67	8.990	− 0 20 27.8	58.48	15 58.80	8.78	7 50.72	0.866	12 11
25	Tu	12 6 44.50	8.996	− 0 43 51.5	−58.49	15 59.07	8.78	+ 8 11.45	+0.861	12 15
26	We	12 10 20.47	9.002	1 7 15.3	58.49	15 59.35	8.78	8 32.08	0.854	12 19
27	Th	12 13 56.60	9.009	1 30 38.7	58.47	15 59.63	8.78	8 52.45	0.847	12 23
28	Fr	12 17 32.91	9.017	1 54 1.6	58.44	15 59.91	8.79	9 12.69	0.839	12 27
29	Sa	12 21 9.44	9.027	2 17 23.5	58.39	16 0.18	8.79	9 32.71	0.830	12 31
30	Su	12 24 46.20	9.037	− 2 40 44.1	−58.33	16 0.46	8.79	+ 9 52.50	+0.820	12 35
Oct. 1	Mo	12 28 23.22	9.048	− 3 4 3.2	−58.26	16 0.74	8.79	+10 12.04	+0.809	12 39

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.	Aberration.	True Obliquity.	Mean Time of Sidereal Noon.
		° ′ ″	″	″			″	″	″	23° 27′ ″	h m s
Aug. 16	228	143 1 37.0	144.27	−0.35	0.005 3720	−33.9	31.31	+18.11	20.21	1.57	14 20 24.85
17	229	143 59 20.2	144.33	0.46	0.005 2897	34.7	31.45	18.10	20.22	1.58	14 16 28.94
18	230	144 57 4.8	144.39	0.55	0.005 2054	35.6	31.59	18.09	20.22	1.58	14 12 33.03
19	231	145 54 50.7	144.44	0.62	0.005 1190	36.4	31.73	18.08	20.22	1.59	14 8 37.13
20	232	146 52 37.9	144.49	0.66	0.005 0307	37.2	31.86	18.06	20.23	1.60	14 4 41.22
21	233	147 50 26.4	144.55	−0.67	0.004 9404	−38.0	32.00	+18.05	20.23	1.61	14 0 45.31
22	234	148 48 16.1	144.60	0.66	0.004 8482	38.8	32.14	18.03	20.24	1.61	13 56 49.40
23	235	149 46 7.1	144.65	0.62	0.004 7543	39.5	32.28	18.01	20.24	1.62	13 52 53.49
24	236	150 43 59.3	144.70	0.56	0.004 6586	40.2	32.42	17.99	20.25	1.63	13 48 57.58
25	237	151 41 52.7	144.75	0.46	0.004 5615	40.8	32.55	17.97	20.25	1.63	13 45 1.68
26	238	152 39 47.4	144.80	−0.35	0.004 4629	−41.3	32.69	+17.95	20.26	1.64	13 41 5.77
27	239	153 37 43.3	144.86	0.22	0.004 3631	41.8	32.83	17.92	20.26	1.64	13 37 9.86
28	240	154 35 40.5	144.91	−0.10	0.004 2622	42.2	32.97	17.90	20.26	1.65	13 33 13.95
29	241	155 33 39.0	144.97	+0.04	0.004 1604	42.6	33.10	17.87	20.27	1.65	13 29 18.04
30	242	156 31 38.9	145.03	0.16	0.004 0579	42.9	33.24	17.85	20.27	1.66	13 25 22.14
31	243	157 29 40.3	145.09	+0.27	0.003 9547	−43.1	33.38	+17.82	20.28	1.66	13 21 26.23
Sept. 1	244	158 27 43.2	145.16	0.35	0.003 8509	43.3	33.52	17.79	20.28	1.66	13 17 30.32
2	245	159 25 47.8	145.23	0.40	0.003 7467	43.5	33.65	17.76	20.29	1.67	13 13 34.41
3	246	160 23 54.2	145.30	0.42	0.003 6421	43.7	33.79	17.73	20.29	1.67	13 9 38.51
4	247	161 22 2.5	145.36	0.42	0.003 5369	44.0	33.93	17.70	20.30	1.67	13 5 42.60
5	248	162 20 12.6	145.47	+0.37	0.003 4311	−44.2	34.07	+17.66	20.30	1.67	13 1 46.69
6	249	163 18 24.8	145.55	0.30	0.003 3247	44.5	34.20	17.63	20.31	1.67	12 57 50.78
7	250	164 16 39.0	145.63	0.20	0.003 2175	44.9	34.34	17.60	20.31	1.67	12 53 54.88
8	251	165 14 55.3	145.72	+0.09	0.003 1093	45.3	34.48	17.56	20.32	1.67	12 49 58.97
9	252	166 13 13.6	145.81	−0.03	0.003 0002	45.7	34.62	17.52	20.32	1.67	12 46 3.06
10	253	167 11 34.1	145.89	−0.16	0.002 8900	−46.1	34.75	+17.49	20.33	1.67	12 42 7.16
11	254	168 9 56.6	145.98	0.28	0.002 7787	46.6	34.89	17.45	20.33	1.67	12 38 11.25
12	255	169 8 21.1	146.07	0.41	0.002 6662	47.1	35.03	17.41	20.34	1.67	12 34 15.34
13	256	170 6 47.7	146.15	0.51	0.002 5524	47.7	35.17	17.37	20.34	1.67	12 30 19.44
14	257	171 5 16.3	146.23	0.60	0.002 4374	48.2	35.30	17.33	20.35	1.66	12 26 23.53
15	258	172 3 46.9	146.31	−0.66	0.002 3211	−48.7	35.44	+17.30	20.36	1.66	12 22 27.62
16	259	173 2 19.4	146.39	0.70	0.002 2035	49.3	35.58	17.26	20.36	1.65	12 18 31.71
17	260	174 0 53.8	146.47	0.73	0.002 0847	49.8	35.72	17.22	20.37	1.65	12 14 35.81
18	261	174 59 30.1	146.55	0.73	0.001 9647	50.3	35.86	17.17	20.37	1.64	12 10 39.90
19	262	175 58 8.3	146.63	0.70	0.001 8435	50.7	35.99	17.13	20.38	1.63	12 6 43.99
20	263	176 56 48.2	146.70	−0.63	0.001 7213	−51.1	36.13	+17.09	20.38	1.63	12 2 48.09
21	264	177 55 29.9	146.77	0.54	0.001 5982	51.5	36.27	17.05	20.39	1.62	11 58 52.18
22	265	178 54 13.3	146.84	0.44	0.001 4741	51.8	36.41	17.01	20.39	1.61	11 54 56.27
23	266	179 52 58.4	146.91	0.32	0.001 3494	52.1	36.54	16.97	20.40	1.60	11 51 0.37
24	267	180 51 45.3	146.99	0.18	0.001 2241	52.3	36.68	16.93	20.41	1.59	11 47 4.46
25	268	181 50 33.8	147.06	−0.05	0.001 0984	−52.4	36.82	+16.88	20.41	1.58	11 43 8.55
26	269	182 49 24.0	147.13	+0.07	0.000 9724	52.5	36.96	16.84	20.42	1.57	11 39 12.64
27	270	183 48 16.0	147.20	0.18	0.000 8465	52.5	37.09	16.80	20.42	1.56	11 35 16.74
28	271	184 47 9.7	147.28	0.26	0.000 7206	52.4	37.23	16.76	20.43	1.55	11 31 20.83
29	272	185 46 5.2	147.35	0.31	0.000 5951	52.2	37.37	16.72	20.44	1.54	11 27 24.92
30	273	186 45 2.7	147.44	+0.34	0.000 4700	−52.1	37.51	+16.68	20.44	1.52	11 23 29.02
Oct. 1	274	187 44 2.2	147.52	+0.33	0.000 3453	−51.9	37.64	+16.64	20.45	1.51	11 19 33.11

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 or Right Ascension
		h m s	s	° ′ ″	″	′ ″	″	m s	s	h
Oct. 1	Mo	12 28 23.22	9.048	− 3 4 3.2	−58.26	16 0.74	8.79	+10 12.04	+0.808	12
2	Tu	12 32 0.53	9.061	3 27 20.4	58.17	16 1.01	8.80	10 31.28	0.796	12
3	We	12 35 38.14	9.074	3 50 35.3	58.07	16 1.29	8.80	10 50.22	0.782	12
4	Th	12 39 16.09	9.089	4 13 47.7	57.96	16 1.56	8.80	11 8.82	0.768	12
5	Fr	12 42 54.40	9.104	4 36 57.2	57.83	16 1.83	8.80	11 27.07	0.753	12
6	Sa	12 46 33.09	9.120	− 5 0 3.5	−57.69	16 2.10	8.81	+11 44.94	+0.736	12
7	Su	12 50 12.17	9.137	5 23 6.1	57.53	16 2.37	8.81	12 2.40	0.719	13
8	Mo	12 53 51.68	9.155	5 46 4.7	57.35	16 2.64	8.81	12 19.45	0.701	13
9	Tu	12 57 31.63	9.174	6 8 58.9	57.16	16 2.92	8.81	12 36.06	0.682	13
10	We	13 1 12.03	9.193	6 31 48.3	56.96	16 3.19	8.82	12 52.20	0.663	13
11	Th	13 4 52.91	9.214	− 6 54 32.7	−56.74	16 3.46	8.82	+13 7.87	+0.643	13
12	Fr	13 8 34.29	9.235	7 17 11.5	56.49	16 3.73	8.82	13 23.05	0.622	13
13	Sa	13 12 16.18	9.256	7 39 44.3	56.24	16 4.00	8.82	13 37.72	0.600	13
14	Su	13 15 58.59	9.278	8 2 10.9	55.97	16 4.28	8.83	13 51.86	0.578	13
15	Mo	13 19 41.54	9.301	8 24 30.7	55.68	16 4.55	8.83	14 5.46	0.555	13
16	Tu	13 23 25.06	9.325	− 8 46 43.5	−55.38	16 4.82	8.83	+14 18.50	+0.531	13
17	We	13 27 9.15	9.349	9 8 48.7	55.06	16 5.10	8.83	14 30.96	0.507	13
18	Th	13 30 53.82	9.374	9 30 46.0	54.72	16 5.37	8.84	14 42.85	0.483	13
19	Fr	13 34 39.09	9.399	9 52 34.9	54.36	16 5.65	8.84	14 54.13	0.457	13
20	Sa	13 38 24.97	9.425	10 14 15.1	53.99	16 5.92	8.84	15 4.80	0.432	13
21	Su	13 42 11.48	9.451	−10 35 46.3	−53.60	16 6.20	8.84	+15 14.84	+0.405	13
22	Mo	13 45 58.63	9.478	10 57 7.9	53.19	16 6.47	8.85	15 24.25	0.379	14
23	Tu	13 49 46.43	9.505	11 18 19.5	52.77	16 6.75	8.85	15 33.01	0.351	14
24	We	13 53 34.89	9.533	11 39 20.8	52.33	16 7.02	8.85	15 41.09	0.323	14
25	Th	13 57 24.04	9.562	12 0 11.5	51.88	16 7.29	8.85	15 48.50	0.295	14
26	Fr	14 1 13.88	9.591	−12 20 51.1	−51.41	16 7.56	8.86	+15 55.22	+0.265	14
27	Sa	14 5 4.43	9.621	12 41 19.2	50.93	16 7.82	8.86	16 1.22	0.235	14
28	Su	14 8 55.71	9.652	13 1 35.4	50.43	16 8.09	8.86	16 6.49	0.204	14
29	Mo	14 12 47.73	9.683	13 21 39.5	49.91	16 8.35	8.86	16 11.03	0.173	14
30	Tu	14 16 40.51	9.715	13 41 30.9	49.37	16 8.60	8.87	16 14.80	0.141	14
31	We	14 20 34.07	9.748	−14 1 9.3	−48.82	16 8.86	8.87	+16 17.80	+0.108	14
Nov. 1	Th	14 24 28.42	9.781	14 20 34.4	48.26	16 9.11	8.87	16 20.00	0.075	14
2	Fr	14 28 23.57	9.815	14 39 45.7	47.68	16 9.35	8.87	16 21.40	0.042	14
3	Sa	14 32 19.54	9.849	14 58 42.9	47.08	16 9.59	8.87	16 21.99	+0.007	14
4	Su	14 36 16.34	9.884	15 17 25.4	46.46	16 9.83	8.88	16 21.75	−0.028	14
5	Mo	14 40 13.98	9.919	−15 35 53.0	−45.83	16 10.07	8.88	+16 20.66	−0.063	14
6	Tu	14 44 12.47	9.955	15 54 5.2	45.18	16 10.30	8.88	16 18.73	0.098	15
7	We	14 48 11.80	9.990	16 12 1.6	44.51	16 10.54	8.88	16 15.95	0.133	15
8	Th	14 52 11.99	10.026	16 29 41.8	43.83	16 10.77	8.88	16 12.32	0.169	15
9	Fr	14 56 13.04	10.062	16 47 5.3	43.13	16 10.99	8.89	16 7.82	0.205	15
10	Sa	15 0 14.96	10.098	−17 4 11.7	−42.41	16 11.22	8.89	+16 2.46	−0.241	15
11	Su	15 4 17.73	10.134	17 21 0.7	41.67	16 11.44	8.89	15 56.25	0.277	15
12	Mo	15 8 21.37	10.169	17 37 31.8	40.92	16 11.66	8.89	15 49.17	0.313	15
13	Tu	15 12 25.86	10.205	17 53 44.7	40.15	16 11.88	8.90	15 41.23	0.349	15
14	We	15 16 31.21	10.241	18 9 38.8	39.36	16 12.10	8.90	15 32.43	0.384	15
15	Th	15 20 37.41	10.276	−18 25 13.8	−38.55	16 12.31	8.90	+15 22.79	−0.419	15
16	Fr	15 24 44.46	10.311	−18 40 29.3	−37.73	16 12.53	8.90	+15 12.30	−0.454	15

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.	Aberration.	True Obliquity.	Mean Time of Sidereal Noon.
		° ′ ″	″	″			″	″	″	23° 27′ ″	h m s
Oct. 1	274	187 44 2.2	147.52	+0.33	0.000 3453	−51.9	37.64	+16.64	20.45	1.51	11 19 33.11
2	275	188 43 3.7	147.61	0.30	0.000 2211	51.7	37.78	16.60	20.45	1.49	11 15 37.20
3	276	189 42 7.4	147.70	0.23	0.000 0974	51.5	37.92	16.56	20.46	1.48	11 11 41.30
4	277	190 41 13.4	147.80	0.13	9.999 9741	51.3	38.06	16.52	20.47	1.46	11 7 45.39
5	278	191 40 21.6	147.89	+0.02	9.999 8512	51.2	38.19	16.48	20.47	1.45	11 3 49.48
6	279	192 39 32.1	147.99	−0.10	9.999 7285	−51.1	38.33	+16.44	20.48	1.43	10 59 53.57
7	280	193 38 45.0	148.09	0.23	9.999 6060	51.0	38.47	16.40	20.48	1.41	10 55 57.67
8	281	194 38 0.2	148.18	0.35	9.999 4836	51.0	38.61	16.37	20.49	1.39	10 52 1.76
9	282	195 37 17.7	148.28	0.47	9.999 3612	51.0	38.75	16.33	20.49	1.37	10 48 5.85
10	283	196 36 37.5	148.37	0.58	9.999 2388	51.0	38.88	16.30	20.50	1.35	10 44 9.95
11	284	197 35 59.6	148.47	−0.67	9.999 1163	−51.1	39.02	+16.26	20.51	1.33	10 40 14.04
12	285	198 35 24.0	148.56	0.74	9.998 9936	51.2	39.16	16.23	20.51	1.31	10 36 18.13
13	286	199 34 50.6	148.65	0.79	9.998 8707	51.2	39.30	16.20	20.52	1.29	10 32 22.22
14	287	200 34 19.3	148.74	0.80	9.998 7476	51.3	39.43	16.16	20.52	1.27	10 28 26.31
15	288	201 33 50.1	148.83	0.79	9.998 6243	51.4	39.57	16.13	20.53	1.25	10 24 30.41
16	289	202 33 23.1	148.91	−0.76	9.998 5008	−51.5	39.71	+16.10	20.54	1.22	10 20 34.50
17	290	203 32 58.0	149.00	0.70	9.998 3772	51.5	39.85	16.07	20.54	1.20	10 16 38.59
18	291	204 32 34.9	149.08	0.62	9.998 2534	51.6	39.98	16.05	20.55	1.18	10 12 42.68
19	292	205 32 13.7	149.16	0.50	9.998 1295	51.6	40.12	16.02	20.55	1.15	10 8 46.78
20	293	206 31 54.3	149.23	0.38	9.998 0057	51.6	40.26	16.00	20.56	1.13	10 4 50.87
21	294	207 31 36.7	149.30	−0.25	9.997 8820	−51.5	40.40	+15.97	20.56	1.10	10 0 54.96
22	295	208 31 20.8	149.37	−0.13	9.997 7587	51.3	40.53	15.95	20.57	1.08	9 56 59.05
23	296	209 31 6.6	149.44	0.00	9.997 6357	51.1	40.67	15.93	20.58	1.05	9 53 3.14
24	297	210 30 54.1	149.51	+0.11	9.997 5135	50.8	40.81	15.91	20.58	1.02	9 49 7.24
25	298	211 30 43.2	149.58	0.20	9.997 3920	50.4	40.95	15.89	20.59	1.00	9 45 11.33
26	299	212 30 34.0	149.65	+0.26	9.997 2716	−49.9	41.08	+15.87	20.59	0.97	9 41 15.42
27	300	213 30 26.5	149.72	0.29	9.997 1523	49.5	41.22	15.85	20.60	0.94	9 37 19.51
28	301	214 30 20.7	149.80	0.29	9.997 0343	48.9	41.36	15.84	20.60	0.91	9 33 23.60
29	302	215 30 16.8	149.87	0.26	9.996 9178	48.2	41.50	15.83	20.61	0.89	9 29 27.69
30	303	216 30 14.6	149.95	0.19	9.996 8028	47.6	41.63	15.82	20.62	0.86	9 25 31.79
31	304	217 30 14.4	150.03	+0.09	9.996 6893	−46.9	41.77	+15.80	20.62	0.83	9 21 35.88
Nov. 1	305	218 30 16.2	150.11	−0.02	9.996 5775	46.3	41.91	15.80	20.63	0.80	9 17 39.97
2	306	219 30 19.9	150.20	0.15	9.996 4671	45.7	42.05	15.79	20.63	0.77	9 13 44.06
3	307	220 30 25.7	150.28	0.28	9.996 3582	45.1	42.19	15.78	20.64	0.74	9 9 48.15
4	308	221 30 33.6	150.37	0.40	9.996 2508	44.5	42.32	15.78	20.64	0.72	9 5 52.24
5	309	222 30 43.5	150.46	−0.53	9.996 1446	−44.0	42.46	+15.78	20.65	0.69	9 1 56.33
6	310	223 30 55.6	150.55	0.64	9.996 0397	43.5	42.60	15.78	20.65	0.66	8 58 0.42
7	311	224 31 9.7	150.63	0.73	9.995 9359	43.0	42.74	15.78	20.66	0.63	8 54 4.51
8	312	225 31 25.8	150.71	0.80	9.995 8333	42.6	42.87	15.78	20.66	0.60	8 50 8.60
9	313	226 31 43.9	150.79	0.84	9.995 7316	42.1	43.01	15.78	20.67	0.57	8 46 12.69
10	314	227 32 3.9	150.87	−0.86	9.995 6310	−41.7	43.15	+15.79	20.67	0.54	8 42 16.78
11	315	228 32 25.9	150.95	0.85	9.995 5313	41.3	43.29	15.80	20.68	0.51	8 38 20.87
12	316	229 32 49.7	151.03	0.81	9.995 4325	41.0	43.42	15.80	20.68	0.48	8 34 24.96
13	317	230 33 15.3	151.10	0.76	9.995 3345	40.7	43.56	15.81	20.69	0.45	8 30 29.05
14	318	231 33 42.6	151.17	0.68	9.995 2373	40.3	43.70	15.83	20.69	0.42	8 26 33.14
15	319	232 34 11.5	151.24	−0.56	9.995 1410	−40.0	43.84	+15.84	20.69	0.39	8 22 37.23
16	320	233 34 42.0	151.30	−0.44	9.995 0455	−39.6	43.97	+15.86	20.70	0.37	8 18 41.32

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.
		h m s	s	° ′ ″	″	′ ″	″	m s	s	h
Nov. 16	Fr	15 24 44.46	10.311	−18 40 29.3	−37.73	16 12.53	8.90	+15 12.30	−0.454	15
17	Sa	15 28 52.34	10.345	18 55 24.9	36.90	16 12.74	8.90	15 0.98	0.489	15
18	Su	15 33 1.04	10.380	19 10 0.2	36.05	16 12.95	8.90	14 48.83	0.522	15
19	Mo	15 37 10.56	10.413	19 24 14.9	35.18	16 13.16	8.91	14 35.87	0.557	15
20	Tu	15 41 20.88	10.447	19 38 8.5	34.29	16 13.36	8.91	14 22.10	0.590	15
21	We	15 45 32.00	10.480	−19 51 40.6	−33.39	16 13.56	8.91	+14 7.54	−0.623	15
22	Th	15 49 43.90	10.512	20 4 51.0	32.46	16 13.76	8.91	13 52.19	0.655	16
23	Fr	15 53 56.58	10.544	20 17 39.3	31.54	16 13.96	8.91	13 36.08	0.687	16
24	Sa	15 58 10.02	10.576	20 30 5.0	30.60	16 14.14	8.92	13 19.20	0.719	16
25	Su	16 2 24.21	10.607	20 42 8.0	29.65	16 14.33	8.92	13 1.56	0.750	16
26	Mo	16 6 39.14	10.637	−20 53 47.9	−28.68	16 14.51	8.92	+12 43.19	−0.781	16
27	Tu	16 10 54.80	10.668	21 5 4.3	27.69	16 14.69	8.92	12 24.09	0.811	16
28	We	16 15 11.18	10.697	21 15 57.0	26.70	16 14.86	8.92	12 4.26	0.841	16
29	Th	16 19 28.26	10.726	21 26 25.6	25.69	16 15.02	8.92	11 43.73	0.870	16
30	Fr	16 23 46.04	10.755	21 36 29.8	24.66	16 15.18	8.93	11 22.51	0.898	16
Dec. 1	Sa	16 28 4.50	10.783	−21 46 9.4	−23.63	16 15.34	8.93	+11 0.61	−0.926	16
2	Su	16 32 23.62	10.810	21 55 24.0	22.58	16 15.49	8.93	10 38.05	0.953	16
3	Mo	16 36 43.38	10.836	22 4 13.3	21.52	16 15.63	8.93	10 14.85	0.980	16
4	Tu	16 41 3.76	10.862	22 12 37.1	20.46	16 15.77	8.93	9 51.02	1.005	16
5	We	16 45 24.75	10.887	22 20 35.1	19.38	16 15.90	8.93	9 26.60	1.030	16
6	Th	16 49 46.31	10.910	−22 28 7.1	−18.29	16 16.03	8.93	+ 9 1.59	−1.054	16
7	Fr	16 54 8.42	10.932	22 35 12.8	17.19	16 16.15	8.93	8 36.04	1.076	17
8	Sa	16 58 31.05	10.954	22 41 52.0	16.08	16 16.27	8.94	8 9.96	1.097	17
9	Su	17 2 54.18	10.974	22 48 4.4	14.96	16 16.39	8.94	7 43.39	1.117	17
10	Mo	17 7 17.78	10.993	22 53 49.9	13.83	16 16.50	8.94	7 16.35	1.136	17
11	Tu	17 11 41.82	11.010	−22 59 8.3	−12.70	16 16.61	8.94	+ 6 48.87	−1.153	17
12	We	17 16 6.25	11.026	23 3 59.3	11.56	16 16.71	8.94	6 21.00	1.169	17
13	Th	17 20 31.05	11.041	23 8 22.9	10.41	16 16.82	8.94	5 52.75	1.184	17
14	Fr	17 24 56.19	11.054	23 12 18.8	9.25	16 16.91	8.94	5 24.18	1.197	17
15	Sa	17 29 21.62	11.065	23 15 47.0	8.09	16 17.01	8.94	4 55.30	1.209	17
16	Su	17 33 47.31	11.075	−23 18 47.3	− 6.93	16 17.10	8.94	+ 4 26.17	−1.219	17
17	Mo	17 38 13.22	11.084	23 21 19.6	5.76	16 17.18	8.94	3 56.82	1.227	17
18	Tu	17 42 39.32	11.091	23 23 23.8	4.59	16 17.27	8.94	3 27.28	1.234	17
19	We	17 47 5.56	11.096	23 24 59.9	3.42	16 17.35	8.95	2 57.60	1.239	17
20	Th	17 51 31.91	11.100	23 26 7.9	2.24	16 17.42	8.95	2 27.81	1.243	17
21	Fr	17 55 58.33	11.102	−23 26 47.6	− 1.07	16 17.49	8.95	+ 1 57.94	−1.245	17
22	Sa	18 0 24.79	11.103	23 26 59.1	+ 0.11	16 17.56	8.95	1 28.04	1.246	18
23	Su	18 4 51.26	11.103	23 26 42.4	1.29	16 17.61	8.95	0 58.13	1.246	18
24	Mo	18 9 17.70	11.101	23 25 57.4	2.46	16 17.67	8.95	+ 0 28.24	1.244	18
25	Tu	18 13 44.09	11.098	23 24 44.2	3.64	16 17.72	8.95	− 0 1.58	1.241	18
26	We	18 18 10.38	11.093	−23 23 2.8	+ 4.81	16 17.76	8.95	− 0 31.32	−1.237	18
27	Th	18 22 36.56	11.088	23 20 53.3	5.98	16 17.80	8.95	1 0.94	1.231	18
28	Fr	18 27 2.59	11.081	23 18 15.6	7.15	16 17.83	8.95	1 30.41	1.225	18
29	Sa	18 31 28.45	11.073	23 15 9.9	8.32	16 17.85	8.95	1 59.71	1.217	18
30	Su	18 35 54.10	11.064	23 11 36.2	9.48	16 17.87	8.95	2 28.80	1.208	18
31	Mo	18 40 19.51	11.053	−23 7 34.7	+10.64	16 17.88	8.95	− 2 57.66	−1.197	18
32	Tu	18 44 44.66	11.042	−23 3 5.4	+11.80	16 17.88	8.95	− 3 26.25	−1.185	18

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.	Aberration.	True Obliquity.	Mean Time of Sidereal Noon.
		° ′ ″	″	″			″	″	″	23° 26′ ″	h m s
v. 16	320	233 34 42.0	151.30	−0.44	9.995 0455	−39.6	43.97	+15.86	20.70	60.37	8 18 41.32
17	321	234 35 14.0	151.36	0.31	9.994 9510	39.2	44.11	15.87	20.70	60.34	8 14 45.41
18	322	235 35 47.4	151.42	0.17	9.994 8574	38.8	44.25	15.89	20.71	60.31	8 10 49.50
19	323	236 36 22.0	151.47	−0.04	9.994 7649	38.3	44.39	15.91	20.71	60.28	8 6 53.59
20	324	237 36 57.9	151.52	+0.08	9.994 6736	37.8	44.52	15.93	20.72	60.25	8 2 57.68
21	325	238 37 35.0	151.57	+0.17	9.994 5837	−37.1	44.66	+15.95	20.72	60.23	7 59 1.77
22	326	239 38 13.2	151.61	0.24	9.994 4955	36.4	44.80	15.98	20.73	60.20	7 55 5.86
23	327	240 38 52.5	151.66	0.28	9.994 4089	35.7	44.94	16.00	20.73	60.17	7 51 9.95
24	328	241 39 32.9	151.71	0.29	9.994 3243	34.8	45.08	16.03	20.73	60.14	7 47 14.04
25	329	242 40 14.4	151.75	0.27	9.994 2417	34.0	45.21	16.06	20.74	60.12	7 43 18.13
26	330	243 40 57.0	151.80	+0.21	9.994 1613	−33.0	45.35	+16.09	20.74	60.09	7 39 22.21
27	331	244 41 40.7	151.85	0.12	9.994 0832	32.0	45.49	16.12	20.75	60.07	7 35 26.30
28	332	245 42 25.7	151.90	+0.02	9.994 0076	31.0	45.63	16.15	20.75	60.04	7 31 30.39
29	333	246 43 11.8	151.95	−0.10	9.993 9344	30.0	45.76	16.19	20.75	60.02	7 27 34.48
30	334	247 43 59.2	152.00	0.23	9.993 8636	29.0	45.90	16.22	20.76	59.99	7 23 38.57
ec. 1	335	248 44 47.9	152.06	−0.36	9.993 7953	−28.0	46.04	+16.25	20.76	59.97	7 19 42.66
2	336	249 45 38.0	152.11	0.49	9.993 7294	27.0	46.18	16.29	20.76	59.95	7 15 46.74
3	337	250 46 29.3	152.17	0.60	9.993 6658	26.0	46.31	16.33	20.76	59.92	7 11 50.83
4	338	251 47 22.0	152.22	0.71	9.993 6044	25.1	46.45	16.37	20.77	59.90	7 7 54.92
5	339	252 48 16.0	152.28	0.78	9.993 5451	24.2	46.59	16.41	20.77	59.88	7 3 59.01
6	340	253 49 11.2	152.33	−0.84	9.993 4880	−23.4	46.73	+16.45	20.77	59.86	7 0 3.10
7	341	254 50 7.8	152.38	0.85	9.993 4328	22.6	46.86	16.49	20.78	59.84	6 56 7.18
8	342	255 51 5.5	152.43	0.85	9.993 3796	21.8	47.00	16.53	20.78	59.82	6 52 11.27
9	343	256 52 4.4	152.48	0.82	9.993 3282	21.1	47.14	16.58	20.78	59.80	6 48 15.36
10	344	257 53 4.4	152.52	0.76	9.993 2785	20.3	47.28	16.62	20.78	59.78	6 44 19.45
11	345	258 54 5.5	152.57	−0.68	9.993 2306	−19.6	47.41	+16.67	20.79	59.77	6 40 23.54
12	346	259 55 7.6	152.60	0.58	9.993 1842	19.0	47.55	16.71	20.79	59.75	6 36 27.62
13	347	260 56 10.6	152.64	0.46	9.993 1394	18.4	47.69	16.76	20.79	59.73	6 32 31.71
14	348	261 57 14.4	152.67	0.31	9.993 0960	17.8	47.83	16.81	20.79	59.72	6 28 35.80
15	349	262 58 18.9	152.70	0.17	9.993 0542	17.1	47.96	16.85	20.79	59.70	6 24 39.89
16	350	263 59 24.0	152.72	−0.04	9.993 0139	−16.5	48.10	+16.90	20.80	59.69	6 20 43.98
17	351	265 0 29.6	152.74	+0.09	9.992 9751	15.8	48.24	16.95	20.80	59.67	6 16 48.06
18	352	266 1 35.6	152.76	0.21	9.992 9380	15.1	48.38	17.00	20.80	59.66	6 12 52.15
19	353	267 2 41.9	152.77	0.29	9.992 9027	14.3	48.52	17.04	20.80	59.65	6 8 56.24
20	354	268 3 48.4	152.78	0.35	9.992 8693	13.5	48.65	17.09	20.80	59.63	6 5 0.33
21	355	269 4 55.1	152.78	+0.37	9.992 8381	−12.6	48.79	+17.14	20.80	59.62	6 1 4.41
22	356	270 6 2.0	152.79	0.35	9.992 8090	11.6	48.93	17.19	20.81	59.61	5 57 8.50
23	357	271 7 9.0	152.79	0.31	9.992 7824	10.6	49.07	17.24	20.81	59.60	5 53 12.59
24	358	272 8 16.1	152.80	0.23	9.992 7583	9.5	49.20	17.29	20.81	59.59	5 49 16.67
25	359	273 9 23.4	152.81	0.14	9.992 7368	8.4	49.34	17.34	20.81	59.59	5 45 20.76
26	360	274 10 30.7	152.81	+0.02	9.992 7181	− 7.2	49.48	+17.39	20.81	59.58	5 41 24.85
27	361	275 11 38.2	152.82	−0.12	9.992 7022	6.0	49.62	17.43	20.81	59.57	5 37 28.94
28	362	276 12 45.9	152.82	0.24	9.992 6891	4.8	49.75	17.48	20.81	59.57	5 33 33.03
29	363	277 13 53.8	152.83	0.37	9.992 6790	3.6	49.89	17.53	20.81	59.56	5 29 37.11
30	364	278 15 1.9	152.84	0.50	9.992 6716	2.5	50.03	17.58	20.81	59.56	5 25 41.20
31	365	279 16 10.2	152.85	−0.61	9.992 6670	− 1.4	50.17	+17.62	20.81	59.55	5 21 45.29
32	366	280 17 18.8	152.86	*−0.69*	*9.992 6651*	− 0.2	50.30	+17.67	20.81	59.55	5 17 49.38

GREENWICH MEAN TIME.

Date.	X True Equinox.		Reduc. to Mean Eq'x of 1917.0.	Y True Equinox.		Reduc. to Mean Eq'x of 1917.0.	Z True Equinox.		Red to Me Eq' 191
	Noon.	*Midnight.*	*Noon.*	*Noon.*	*Midnight.*	*Noon.*	*Noon.*	*Midnight.*	*Noo*
Jan. 1	+0.179 8639	+0.188 4540	−776	−0.886 8288	−0.885 3217	−184	−0.384 6965	−0.384 0428	+
2	0.197 0291	0.205 5885	782	0.883 7459	0.882 1013	198	0.383 3592	0.382 6459	
3	0.214 1317	0.222 6579	788	0.880 3884	0.878 6071	212	0.381 9030	0.381 1305	
4	0.231 1666	0.239 6571	793	0.876 7579	0.874 8408	226	0.380 3284	0.379 4971	
5	0.248 1287	0.256 5809	798	0.872 8560	0.870 8035	241	0.378 6364	0.377 7463	
6	+0.265 0131	+0.273 4247	−803	−0.868 6836	−0.866 4962	−256	−0.376 8270	−0.375 8785	+
7	0.281 8150	0.290 1834	807	0.864 2419	0.861 9207	271	0.374 9009	0.373 8943	
8	0.298 5293	0.306 8522	811	0.859 5328	0.857 0782	286	0.372 8588	0.371 7943	
9	0.315 1513	0.323 4261	814	0.854 5572	0.851 9699	302	0.370 7010	0.369 5790	+
10	0.331 6759	0.339 9002	817	0.849 3167	0.846 5978	318	0.368 4284	0.367 2493	−
11	+0.348 0983	+0.356 2696	−820	−0.843 8133	−0.840 9634	−334	−0.366 0417	−0.364 8057	−
12	0.364 4135	0.372 5295	822	0.838 0482	0.835 0679	350	0.363 5413	0.362 2487	
13	0.380 6169	0.388 6751	824	0.832 0228	0.828 9130	366	0.360 9279	0.359 5790	
14	0.396 7034	0.404 7011	826	0.825 7388	0.822 5005	382	0.358 2022	0.356 7975	
15	0.412 6678	0.420 6029	827	0.819 1982	0.815 8322	399	0.355 3651	0.353 9050	
16	+0.428 5056	+0.436 3754	−827	−0.812 4027	−0.808 9098	−415	−0.352 4172	−0.350 9019	−
17	0.444 2116	0.452 0137	827	0.805 3539	0.801 7353	432	0.349 3593	0.347 7894	
18	0.459 7809	0.467 5127	827	0.798 0542	0.794 3107	448	0.346 1924	0.344 5683	
19	0.475 2084	0.482 8674	827	0.790 5052	0.786 6379	465	0.342 9172	0.341 2394	
20	0.490 4890	0.498 0726	826	0.782 7092	0.778 7194	482	0.339 5349	0.337 8038	
21	+0.505 6175	+0.513 1232	−824	−0.774 6688	−0.770 5576	−499	−0.336 0463	−0.334 2626	−
22	0.520 5889	0.528 0140	822	0.766 3862	0.762 1548	516	0.332 4527	0.330 6168	
23	0.535 3980	0.542 7402	820	0.757 8639	0.753 5140	533	0.328 7551	0.326 8678	1
24	0.550 0400	0.557 2968	817	0.749 1053	0.744 6382	550	0.324 9552	0.323 0172	1
25	0.564 5100	0.571 6790	813	0.740 1132	0.735 5308	567	0.321 0539	0.319 0657	1
26	+0.578 8032	+0.585 8821	−809	−0.730 8912	−0.726 1949	−584	−0.317 0528	−0.315 0154	−1
27	0.592 9153	0.599 9021	805	0.721 4423	0.716 6338	601	0.312 9537	0.310 8678	1
28	0.606 8421	0.613 7347	800	0.711 7699	0.706 8510	618	0.308 7578	0.306 6240	1
29	0.620 5793	0.627 3755	795	0.701 8775	0.696 8500	635	0.304 4665	0.302 2856	1
30	0.634 1229	0.640 8210	789	0.691 7687	0.686 6340	652	0.300 0815	0.297 8543	1
31	+0.647 4693	+0.654 0673	−783	−0.681 4466	−0.676 2068	−668	−0.295 6043	−0.293 3316	−1
Feb. 1	0.660 6145	0.667 1105	776	0.670 9150	0.665 5718	685	0.291 0363	0.288 7187	1
2	0.673 5549	0.679 9472	769	0.660 1774	0.654 7323	701	0.286 3790	0.284 0172	1
3	0.686 2870	0.692 5738	761	0.649 2370	0.643 6920	718	0.281 6336	0.279 2285	2
4	0.698 8071	0.704 9866	753	0.638 0976	0.632 4542	734	0.276 8021	0.274 3544	2
5	+0.711 1118	+0.717 1824	−744	−0.626 7622	−0.621 0222	−750	−0.271 8857	−0.269 3961	−2
6	0.723 1980	0.729 1580	735	0.615 2346	0.609 3999	766	0.266 8858	0.264 3550	2
7	0.735 0620	0.740 9096	726	0.603 5184	0.597 5906	782	0.261 8040	0.259 2329	2
8	0.746 7004	0.752 4341	716	0.591 6171	0.585 5981	798	0.256 6419	0.254 0311	2
9	0.758 1102	0.763 7282	706	0.579 5342	0.573 4257	814	0.251 4007	0.248 7511	2
10	+0.769 2877	+0.774 7886	−695	−0.567 2731	−0.561 0768	−830	−0.246 0823	−0.243 3945	−2
11	0.780 2304	0.785 6124	684	0.554 8374	0.548 5553	845	0.240 6880	0.237 9629	2
12	0.790 9344	0.796 1960	672	0.542 2310	0.535 8648	860	0.235 2194	0.232 4578	2
13	0.801 3967	0.806 5363	660	0.529 4572	0.523 0089	875	0.229 6781	0.226 8807	2
14	0.811 6142	0.816 6300	647	0.516 5203	0.509 9916	890	0.224 0658	0.221 2335	2
15	+0.821 5833	+0.826 4739	−634	−0.503 4235	−0.496 8164	−904	−0.218 3841	−0.215 5177	−2
16	+0.831 3013	+0.836 0651	−621	−0.490 1709	−0.483 4874	−918	−0.212 6346	−0.209 7350	−2

GREENWICH MEAN TIME.

Date.	X True Equinox.		Reduc. to Mean Eq'x of 1917.0.	Y True Equinox.		Reduc. to Mean Eq'x of 1917.0.	Z True Equinox.		Reduc. to Mean Eq'x of 1917.0.
	Noon.	*Midnight.*	*Noon.*	*Noon.*	*Midnight.*	*Noon.*	*Noon.*	*Midnight.*	*Noon.*
Feb.16	+0.831 3013	+0.836 0651	−621	−0.490 1709	−0.483 4874	− 918	−0.212 6346	−0.209 7350	−310
17	0.840 7648	0.845 4001	607	0.476 7665	0.470 0086	932	0.206 8192	0.203 8873	319
18	0.849 9706	0 854 4760	593	0.463 2144	0.456 3842	946	0.200 9396	0.197 9764	327
19	0.858 9158	0.863 2896	578	0.449 5187	0.442 6185	959	0.194 9979	0.192 0043	335
20	0.867 5970	0.871 8377	563	0.435 6841	0.428 7161	972	0.188 9958	0.185 9728	343
21	+0.876 0114	+0.880 1179	−548	−0.421 7150	−0.414 6814	− 985	−0.182 9355	−0.179 8841	−351
22	0.884 1567	0.888 1276	532	0.407 6160	0.400 5192	998	0.176 8189	0.173 7402	359
23	0.892 0302	0.895 8643	516	0.393 3918	0.386 2345	1010	0.170 6482	0.167 5433	367
24	0.899 6296	0.903 3259	499	0.379 0477	0.371 8320	1022	0.164 4256	0.161 2954	374
25	0.906 9529	0.910 5105	482	0.364 5880	0.357 3165	1034	0.158 1531	0.154 9989	381
26	+0.913 9983	+0.917 4162	−465	−0.350 0181	−0.342 6933	−1046	−0.151 8330	−0.148 6557	−389
27	0.920 7640	0.924 0414	448	0.335 3427	0.327 9668	1057	0.145 4671	0.142 2676	397
28	0.927 2483	0.930 3845	430	0.320 5663	0.313 1416	1068	0.139 0575	0.135 8370	404
Mar. 1	0.933 4499	0.936 4444	412	0.305 6935	0.298 2226	1079	0.132 6064	0.129 3658	412
2	0.939 3677	0.942 2197	393	0.290 7293	0.283 2143	1089	0.126 1156	0.122 8559	419
3	+0.945 0003	+0.947 7092	−374	−0.275 6781	−0.268 1213	−1099	−0.119 5870	−0.116 3092	−426
4	0.950 3464	0.952 9117	355	0.260 5444	0.252 9482	1109	0.113 0228	0.109 7279	433
5	0.955 4050	0.957 8262	336	0.245 3332	0.237 6998	1118	0.106 4249	0.103 1139	440
6	0.960 1750	0.962 4513	316	0.230 0487	0.222 3804	1127	0.099 7952	0.096 4690	446
7	0.964 6551	0.966 7864	296	0.214 6954	0.206 9944	1136	0.093 1355	0.089 7951	453
8	+0.968 8450	+0.970 8306	−276	−0.199 2779	−0.191 5464	−1144	−0.086 4479	−0.083 0942	−459
9	0.972 7432	0.974 5826	256	0.183 8006	0.176 0409	1152	0.079 7342	0.076 3682	466
10	0.976 3489	0.978 0420	235	0.168 2680	0.160 4823	1159	0.072 9964	0.069 6190	472
11	0.979 6616	0.981 2078	214	0.152 6844	0.144 8749	1166	0.066 2363	0.062 8485	478
12	0.982 6804	0.984 0793	193	0.137 0543	0.129 2232	1173	0.059 4558	0.056 0586	484
13	+0.985 4044	+0.986 6556	−172	−0.121 3822	−0.113 5318	−1180	−0.052 6571	−0.049 2515	−490
14	0.987 8329	0.988 9360	150	0.105 6726	0.097 8051	1186	0.045 8420	0.042 4288	495
15	0.989 9650	0.990 9198	128	0.089 9299	0.082 0476	1192	0.039 0123	0.035 5927	501
16	0.991 8002	0.992 6062	106	0.074 1588	0.066 2640	1197	0.032 1703	0.028 7452	506
17	0.993 3377	0.993 9944	84	0.058 3638	0.050 4588	1203	0.025 3178	0.021 8883	511
18	+0.994 5765	+0.995 0839	− 62	−0.042 5496	−0.034 6369	−1208	−0.018 4570	−0.015 0241	−516
19	0.995 5166	0.995 8745	39	0.026 7213	0.018 8033	1212	0.011 5900	0.008 1549	521
20	0.996 1575	0.996 3655	− 16	−0.010 8836	−0.002 9628	1216	−0.004 7190	−0.001 2827	526
21	0.996 4986	0.996 5568	+ 7	+0.004 9584	+0.012 8795	1219	+0.002 1537	+0.005 5900	531
22	0.996 5402	0.996 4487	30	0.020 7997	0.028 7184	1222	0.009 0259	0.012 4612	535
23	+0.996 2823	+0.996 0411	+ 53	+0.036 6350	+0.044 5489	−1225	+0.015 8954	+0.019 3284	−539
24	0.995 7250	0.995 3343	77	0.052 4593	0.060 3657	1228	0.022 7599	0.026 1896	543
25	0.994 8691	0.994 3294	100	0.068 2674	0.076 1638	1230	0.029 6173	0.033 0426	547
26	0.993 7151	0.993 0266	124	0.084 0542	0.091 9381	1232	0.036 4652	0.039 8850	550
27	0.992 2642	0.991 4278	148	0.099 8149	0.107 6840	1234	0.043 3018	0.046 7151	554
28	+0.990 5176	+0.989 5335	+172	+0.115 5448	+0.123 3966	−1235	+0.050 1248	+0.053 5306	−557
29	0.988 4758	0.987 3448	196	0.131 2388	0.139 0710	1236	0.056 9322	0.060 3294	560
30	0.986 1405	0.984 8632	220	0.146 8925	0.154 7028	1237	0.063 7220	0.067 1098	563
31	0.983 5129	0.982 0898	244	0.162 5012	0.170 2873	1237	0.070 4924	0.073 8696	566
Apr. 1	0.980 5941	0.979 0260	269	0.178 0604	0.185 8201	1237	0.077 2412	0.080 6070	568
2	+0.977 3858	+0.975 6734	+294	+0.193 5659	+0.201 2970	−1236	+0.083 9667	+0.087 3202	−570
3	+0.973 8891	+0.972 0331	+318	+0.209 0130	+0.216 7134	−1235	+0.090 6671	+0.094 0072	-

GREENWICH MEAN TIME.

Date.	X True Equinox.		Reduc. to Mean Eq'x of 1917.0.	Y True Equinox.		Reduc. to Mean Eq'x of 1917.0.	Z True Equinox.		Reduc. to Mean Eq'x of 1917.0.
	Noon.	*Midnight.*	*Noon.*	*Noon.*	*Midnight.*	*Noon.*	*Noon.*	*Midnight.*	*Noon.*
July 1	−0.160 0222	−0.168 3677	+2055	+0.921 1012	+0.919 8514	+ 325	+0.399 5559	+0.399 0141	+
2	0.176 7011	0.185 0219	2058	0.918 5373	0.917 1589	358	0.398 4443	0.397 8467	
3	0.193 3296	0.201 6237	2060	0.915 7164	0.914 2098	391	0.397 2214	0.396 5682	
4	0.209 9035	0.218 1686	2062	0.912 6392	0.911 0049	424	0.395 8871	0.395 1784	
5	0.226 4184	0.234 6525	2063	0.909 3069	0.907 5451	457	0.394 4422	0.393 6784	
6	−0.242 8703	−0.251 0713	+2063	+0.905 7197	+0.903 8309	+ 490	+0.392 8871	+0.392 0681	
7	0.259 2549	0.267 4206	2062	0.901 8789	0.899 8637	523	0.391 2216	0.390 3477	
8	0.275 5678	0.283 6961	2061	0.897 7854	0.895 6440	557	0.389 4464	0.388 5178	
9	0.291 8049	0.299 8936	2059	0.893 4397	0.891 1727	590	0.387 5618	0.386 5785	
10	0.307 9616	0.316 0083	2057	0.888 8429	0.886 4504	624	0.385 5680	0.384 5302	
11	−0.324 0332	−0.332 0357	+2054	+0.883 9955	+0.881 4783	+ 657	+0.383 4653	+0.382 3733	
12	0.340 0151	0.347 9709	2050	0.878 8989	0.876 2575	691	0.381 2543	0.380 1084	
13	0.355 9026	0.363 8096	2045	0.873 5541	0.870 7888	725	0.378 9355	0.377 7357	
14	0.371 6912	0.379 5469	2040	0.867 9618	0.865 0734	759	0.376 5091	0.375 2559	
15	0.387 3759	0.395 1778	2034	0.862 1238	0.859 1130	793	0.373 9762	0.372 6700	
16	−0.402 9519	−0.410 6977	+2027	+0.856 0414	+0.852 9092	+ 827	+0.371 3373	+0.369 9782	
17	0.418 4145	0.426 1018	2020	0.849 7166	0.846 4637	861	0.368 5929	0.367 1815	
18	0.433 7589	0.441 3853	2012	0.843 1509	0.839 7782	894	0.365 7441	0.364 2807	
19	0.448 9805	0.456 5439	2003	0.836 3459	0.832 8545	928	0.362 7915	0.361 2767	
20	0.464 0749	0.471 5729	1993	0.829 3041	0.825 6949	962	0.359 7363	0.358 1704	
21	−0.479 0373	−0.486 4676	+1983	+0.822 0272	+0.818 3014	+ 996	+0.356 5792	+0.354 9628	
22	0.493 8633	0.501 2238	1972	0.814 5177	0.810 6763	1029	0.353 3213	0.351 6548	
23	0.508 5487	0.515 8374	1960	0.806 7776	0.802 8219	1063	0.349 9635	0.348 2474	
24	0.523 0892	0.530 3036	1947	0.798 8095	0.794 7406	1096	0.346 5068	0.344 7418	
25	0.537 4802	0.544 6186	1934	0.790 6158	0.786 4353	1129	0.342 9525	0.341 1390	
26	−0.551 7181	−0.558 7783	+1920	+0.782 1994	+0.777 9082	+1162	+0.339 3016	+0.337 4403	
27	0.565 7987	0.572 7787	1905	0.773 5622	0.769 1616	1195	0.335 5553	0.333 6466	
28	0.579 7179	0.586 6159	1889	0.764 7069	0.760 1985	1227	0.331 7144	0.329 7590	
29	0.593 4723	0.600 2865	1873	0.755 6367	0.751 0218	1260	0.327 7805	0.325 7790	
30	0.607 0580	0.613 7864	1856	0.746 3541	0.741 6341	1292	0.323 7546	0.321 7075	
31	−0.620 4714	−0.627 1126	+1838	+0.736 8620	+0.732 0381	+1324	+0.319 6378	+0.317 5457	
Aug. 1	0.633 7094	0.640 2615	1820	0.727 1628	0.722 2365	1356	0.315 4312	0.313 2946	
2	0.646 7684	0.653 2297	1801	0.717 2594	0.712 2318	1388	0.311 1360	0.308 9555	
3	0.659 6450	0.666 0140	1781	0.707 1542	0.702 0269	1419	0.306 7533	0.304 5294	
4	0.672 3361	0.678 6110	1760	0.696 8501	0.691 6240	1450	0.302 2840	0.300 0173	
5	−0.684 8381	−0.691 0171	+1739	+0.686 3491	+0.681 0257	+1481	+0.297 7294	+0.295 4204	
6	0.697 1476	0.703 2291	1717	0.675 6542	0.670 2347	1512	0.293 0904	0.290 7396	
7	0.709 2611	0.715 2433	1694	0.664 7676	0.659 2533	1542	0.288 3681	0.285 9760	
8	0.721 1752	0.727 0561	1671	0.653 6920	0.648 0841	1572	0.283 5636	0.281 1309	
9	0.732 8858	0.738 6638	1647	0.642 4300	0.636 7300	1601	0.278 6781	0.276 2053	
10	−0.744 3897	−0.750 0628	+1622	+0.630 9844	+0.625 1938	+1630	+0.273 7127	+0.271 2006	
11	0.755 6828	0.761 2491	1597	0.619 3584	0.613 4785	1659	0.268 6691	0.266 1182	
12	0.766 7614	0.772 2192	1571	0.607 5547	0.601 5873	1687	0.263 5482	0.260 9593	
13	0.777 6221	0.782 9697	1544	0.595 5768	0.589 5237	1715	0.258 3517	0.255 7256	
14	0.788 2615	0.793 4970	1516	0.583 4282	0.577 2907	1743	0.253 0812	0.250 4186	
15	−0.798 6759	−0.803 7976	+1488	+0.571 1118	+0.564 8919	+1770	+0.247 7381	+0.245 0397	
	8619	−0.813 8684	+1459	+0.558 6315	+0.552 3309	+1797	+0.242 3236	+0.239 5902	

GREENWICH MEAN TIME.

Date.	X True Equinox.		Reduc. to Mean Eq'x of 1917.0.	Y True Equinox.		Reduc. to Mean Eq'x of 1917.0.	Z True Equinox.		Reduc. to Mean Eq'x of 1917.0.
	Noon.	*Midnight.*	*Noon.*	*Noon.*	*Midnight.*	*Noon.*	*Noon.*	*Midnight.*	*Noon.*
Aug. 16	−0.808 8619	−0.813 8684	+1459	+0.558 6315	+0.552 3309	+1797	+0.242 3236	+0.239 5902	+ 730
17	0.818 8164	0.823 7057	1430	0.545 9908	0.539 6115	1823	0.236 8397	0.234 0722	742
18	0.828 5360	0.833 3069	1400	0.533 1936	0.526 7374	1849	0.231 2880	0.228 4872	754
19	0.838 0179	0.842 6686	1369	0.520 2434	0.513 7123	1874	0.225 6700	0.222 8368	766
20	0.847 2588	0.851 7882	1338	0.507 1444	0.500 5401	1899	0.219 9878	0.217 1230	778
21	−0.856 2563	−0.860 6628	+1306	+0.493 9001	+0.487 2248	+1923	+0.214 2425	+0.211 3468	+ 789
22	0.865 0074	0.869 2898	1274	0.480 5147	0.473 7704	1946	0.208 4362	0.205 5108	801
23	0.873 5096	0.877 6665	1241	0.466 9923	0.460 1810	1969	0.202 5707	0.199 6162	812
24	0.881 7602	0.885 7905	1208	0.453 3369	0.446 4606	1991	0.196 6475	0.193 6649	823
25	0.889 7571	0.893 6597	1174	0.439 5526	0.432 6133	2013	0.190 6686	0.187 6587	833
26	−0.897 4980	−0.901 2717	+1139	+0.425 6434	+0.418 6433	+2035	+0.184 6356	+0.181 5994	+ 844
27	0.904 9806	0.908 6246	1104	0.411 6136	0.404 5547	2056	0.178 5504	0.175 4888	854
28	0.912 2034	0.915 7168	1068	0.397 4672	0.390 3515	2077	0.172 4147	0.169 3284	864
29	0.919 1645	0.922 5462	1032	0.383 2082	0.376 0377	2097	0.166 2300	0.163 1199	874
30	0.925 8619	0.929 1113	996	0.368 8406	0.361 6173	2116	0.159 9982	0.156 8651	884
31	−0.932 2940	−0.935 4099	+ 959	+0.354 3682	+0.347 0938	+2135	+0.153 7209	+0.150 5657	+ 893
Sept. 1	0.938 4589	0.941 4408	921	0.339 7947	0.332 4713	2153	0.147 3996	0.144 2230	902
2	0.944 3554	0.947 2024	883	0.325 1241	0.317 7536	2171	0.141 0360	0.137 8388	911
3	0.949 9815	0.952 6924	845	0.310 3601	0.302 9441	2188	0.134 6317	0.131 4148	920
4	0.955 3350	0.957 9091	806	0.295 5062	0.288 0468	2204	0.128 1883	0.124 9524	929
5	−0.960 4144	−0.962 8508	+ 767	+0.280 5665	+0.273 0656	+2219	+0.121 7074	+0.118 4535	+ 937
6	0.965 2180	0.967 5156	727	0.265 5447	0.258 0044	2234	0.115 1908	0.111 9196	945
7	0.969 7433	0.971 9010	687	0.250 4451	0.242 8673	2248	0.108 6403	0.105 3529	953
8	0.973 9884	0.976 0054	647	0.235 2715	0.227 6584	2262	0.102 0577	0.098 7550	960
9	0.977 9518	0.979 8274	606	0.220 0285	0.212 3822	2275	0.095 4449	0.092 1276	967
10	−0.981 6320	−0.983 3653	+ 565	+0.204 7201	+0.197 0428	+2287	+0.088 8036	+0.085 4730	+ 974
11	0.985 0271	0.986 6173	524	0.189 3510	0.181 6452	2299	0.082 1361	0.078 7931	981
12	0.988 1357	0.989 5820	482	0.173 9259	0.166 1936	2310	0.075 4442	0.072 0898	987
13	0.990 9561	0.992 2579	440	0.158 4489	0.150 6925	2320	0.068 7300	0.065 3651	993
14	0.993 4873	0.994 6441	398	0.142 9250	0.135 1469	2330	0.061 9954	0.058 6212	999
15	−0.995 7281	−0.996 7392	+ 355	+0.127 3587	+0.119 5612	+2339	+0.055 2427	+0.051 8602	+1004
16	0.997 6774	0.998 5426	312	0.111 7550	0.103 9405	2348	0.048 4739	0.045 0840	1009
17	0.999 3347	1.000 0534	269	0.096 1184	0.088 2894	2355	0.041 6908	0.038 2947	1014
18	1.000 6988	1.001 2709	226	0.080 4540	0.072 6128	2362	0.034 8958	0.031 4944	1019
19	1.001 7695	1.002 1945	182	0.064 7664	0.056 9153	2368	0.028 0909	0.024 6854	1023
20	−1.002 5460	−1.002 8240	+ 138	+0.049 0603	+0.041 2020	+2374	+0.021 2783	+0.017 8698	+1027
21	1.003 0285	1.003 1593	94	0.033 3410	0.025 4779	2379	0.014 4600	0.011 0492	1031
22	1.003 2164	1.003 1999	50	0.017 6132	+0.009 7475	2383	0.007 6379	+0.004 2262	1034
23	1.003 1099	1.002 9463	+ 6	+0.001 8814	−0.005 9845	2387	+0.000 8144	−0.002 5973	1037
24	1.002 7090	1.002 3982	− 39	−0.013 8495	0.021 7130	2390	−0.006 0086	0.009 4194	1040
25	−1.002 0138	−1.001 5560	− 84	−0.029 5746	−0.037 4337	+2392	−0.012 8293	−0.016 2381	+1042
26	1.001 0249	1.000 4205	129	0.045 2896	0.053 1418	2393	0.019 6456	0.023 0515	1044
27	0.999 7430	0.998 9922	174	0.060 9898	0.068 8331	2394	0.026 4555	0.029 8575	1046
28	0.998 1681	0.997 2710	219	0.076 6710	0.084 5030	2394	0.033 2572	0.036 6545	1047
29	0.996 3011	0.995 2582	264	0.092 3287	0.100 1475	2393	0.040 0490	0.043 4406	1049
30	−0.994 1423	−0.992 9534	− 309	−0.107 9588	−0.115 7621	+2392	−0.046 8290	−0.050 2139	+1050
Oct. 1	*−0.991 6918*	*−0.990 3575*	*− 354*	*−0.123 5569*	−0.131 3427	+2390	−0.053 5952	−0.056 9797	+1050

GREENWICH MEAN TIME.

Date.	X True Equinox.		Reduc. to Mean Eq'x of 1917.0.	Y True Equinox.		Reduc. to Mean Eq'x of 1917.0.	Z True Equinox.		Red to Mean Eq'x 191
	Noon.	*Midnight.*	*Noon.*	*Noon.*	*Midnight.*	*Noon.*	*Noon.*	*Midnight.*	*Noon.*
Oct. 1	−0.991 6918	−0.990 3575	− 354	−0.123 5569	−0.131 3427	+2390	−0.053 5952	−0.056 9727	+1
2	0.988 9505	0.987 4707	400	0.139 1189	0.146 8850	2387	0.060 3460	0.063 7150	1
3	0.985 9184	0.984 2935	445	0.154 6406	0.162 3851	2383	0.067 0794	0.070 4390	1
4	0.982 5960	0.980 8261	491	0.170 1178	0.177 8383	2379	0.073 7936	0.077 1429	1
5	0.978 9839	0.977 0692	537	0.185 5459	0.193 2402	2374	0.080 4866	0.083 8245	1
6	−0.975 0822	−0.973 0228	− 582	−0.200 9206	−0.208 5865	+2368	−0.087 1565	−0.090 4822	+1
7	0.970 8913	0.968 6878	628	0.216 2372	0.223 8722	2362	0.093 8012	0.097 1135	1
8	0.966 4124	0.964 0650	673	0.231 4909	0.239 0928	2355	0.100 4188	0.103 7167	1
9	0.961 6458	0.959 1550	718	0.246 6773	0.254 2438	2347	0.107 0069	0.110 2894	1
10	0.956 5926	0.953 9587	763	0.261 7916	0.269 3202	2339	0.113 5638	0.116 8298	1
11	−0.951 2536	−0.948 4774	− 808	−0.276 8290	−0.284 3174	+2330	−0.120 0872	−0.123 3358	+1
12	0.945 6302	0.942 7121	854	0.291 7848	0.299 2305	2320	0.126 5751	0.129 8050	1
13	0.939 7235	0.936 6644	899	0.306 6540	0.314 0548	2309	0.133 0253	0.136 2357	1
14	0.933 5352	0.930 3359	944	0.321 4322	0.328 7855	2298	0.139 4359	0.142 6256	1
15	0.927 0668	0.923 7280	989	0.336 1143	0.343 4180	2286	0.145 8046	0.148 9728	1
16	−0.920 3198	−0.916 8426	−1034	−0.350 6959	−0.357 9475	+2274	−0.152 1297	−0.155 2751	+1
17	0.913 2965	0.909 6817	1079	0.365 1721	0.372 3691	2261	0.158 4087	0.161 5304	1
18	0.905 9985	0.902 2473	1124	0.379 5380	0.386 6782	2247	0.164 6399	0.167 7370	1
19	0.898 4283	0.894 5417	1169	0.393 7891	0.400 8702	2232	0.170 8212	0.173 8925	
20	0.890 5880	0.886 5673	1213	0.407 9209	0.414 9407	2217	0.176 9506	0.179 9952	
21	−0.882 4800	−0.878 3265	−1257	−0.421 9289	−0.428 8851	+2201	−0.183 0262	−0.186 0434	+
22	0.874 1072	0.869 8223	1301	0.435 8087	0.442 6991	2185	0.189 0464	0.192 0350	
23	0.865 4722	0.861 0573	1345	0.449 5559	0.456 3785	2168	0.195 0089	0.197 9681	
24	0.856 5778	0.852 0340	1389	0.463 1665	0.469 9194	2150	0.200 9122	0.203 8412	
25	0.847 4265	0.842 7556	1432	0.476 6366	0.483 3177	2131	0.206 7548	0.209 6527	
26	−0.838 0215	−0.833 2246	−1475	−0.489 9621	−0.496 5695	+2111	−0.212 5348	−0.215 4007	+
27	0.828 3654	0.823 4441	1518	0.503 1392	0.509 6709	2091	0.218 2504	0.221 0837	
28	0.818 4610	0.813 4166	1561	0.516 1642	0.522 6186	2070	0.223 9003	0.226 7002	
29	0.808 3113	0.803 1452	1603	0.529 0337	0.535 4090	2049	0.229 4830	0.232 2486	
30	0.797 9187	0.792 6322	1645	0.541 7439	0.548 0380	2027	0.234 9967	0.237 7271	
31	−0.787 2862	−0.781 8809	−1687	−0.554 2909	−0.560 5023	+2004	−0.240 4397	−0.243 1344	+
Nov. 1	0.776 4166	0.770 8935	1728	0.566 6716	0.572 7983	1981	0.245 8108	0.248 4688	
2	0.765 3121	0.759 6728	1769	0.578 8820	0.584 9221	1957	0.251 1080	0.253 7283	
3	0.753 9760	0.748 2219	1810	0.590 9182	0.596 8699	1933	0.256 3295	0.258 9115	
4	0.742 4109	0.736 5433	1851	0.602 7767	0.608 6380	1908	0.261 4741	0.264 0169	
5	−0.730 6198	−0.724 6407	−1891	−0.614 4535	−0.620 2226	+1882	−0.266 5398	−0.269 0426	+
6	0.718 6061	0.712 5166	1931	0.625 9449	0.631 6199	1855	0.271 5251	0.273 9869	
7	0.706 3726	0.700 1746	1971	0.637 2470	0.642 8259	1828	0.276 4280	0.278 8482	
8	0.693 9229	0.687 6180	2010	0.648 3560	0.653 8369	1800	0.281 2471	0.283 6246	
9	0.681 2606	0.674 8509	2049	0.659 2681	0.664 6493	1772	0.285 9806	0.288 3149	
10	−0.668 3894	−0.661 8764	−2087	−0.669 9798	−0.675 2592	+1743	−0.290 6271	−0.292 9172	+
11	0.655 3126	0.648 6984	2125	0.680 4871	0.685 6631	1713	0.295 1848	0.297 4299	
12	0.642 0344	0.635 3210	2162	0.690 7866	0.695 8572	1682	0.299 6522	0.301 8515	
13	0.628 5587	0.621 7479	2199	0.700 8745	0.705 8380	1651	0.304 0277	0.306 1805	
14	0.614 8894	0.607 9836	2236	0.710 7473	0.715 6021	1619	0.308 3097	0.310 4153	
15	−0.601 0311	−0.594 0324	−2272	−0.720 4020	−0.725 1464	+1587	−0.312 4971	−0.314 5547	+
16	−0.586 9882	−0.579 8989	−2308	−0.729 8350	−0.734 4673	+1554	−0.316 5880	−0.318 5970	+

GREENWICH MEAN TIME.

Date.	X True Equinox.		Reduc. to Mean Eq'x of 1917.0.	Y True Equinox.		Reduc. to Mean Eq'x of 1917.0.	Z True Equinox.		Reduc. to Mean Eq'x of 1917.0.
	Noon.	*Midnight.*	*Noon.*	*Noon.*	*Midnight.*	*Noon.*	*Noon.*	*Midnight.*	*Noon.*
Nov.16	−0.586 9882	−0.579 8989	−2308	−0.729 8350	−0.734 4673	+1554	−0.316 5880	−0.318 5970	+696
17	0.572 7652	0.565 5875	2343	0.739 0429	0.743 5615	1521	0.320 5814	0.322 5410	680
18	0.558 3665	0.551 1028	2378	0.748 0226	0.752 4261	1487	0.324 4758	0.326 3856	664
19	0.543 7969	0.536 4495	2412	0.756 7717	0.761 0588	1452	0.328 2702	0.330 1294	648
20	0.529 0611	0.521 6325	2445	0.765 2871	0.769 4563	1416	0.331 9631	0.333 7713	632
21	−0.514 1641	−0.506 6566	−2478	−0.773 5662	−0.777 6165	+1380	−0.335 5538	−0.337 3105	+615
22	0.499 1105	0.491 5265	2510	0.781 6068	0.785 5369	1343	0.339 0412	0.340 7458	598
23	0.483 9051	0.476 2469	2542	0.789 4065	0.793 2153	1306	0.342 4242	0.344 0762	581
24	0.468 5526	0.460 8226	2573	0.796 9631	0.800 6495	1268	0.345 7018	0.347 3009	564
25	0.453 0575	0.445 2580	2604	0.804 2742	0.807 8372	1230	0.348 8733	0.350 4189	546
26	−0.437 4246	−0.429 5578	−2634	−0.811 3382	−0.814 7769	+1191	−0.351 9376	−0.353 4294	+528
27	0.421 6583	0.413 7267	2664	0.818 1530	0.821 4664	1152	0.354 8941	0.356 3316	510
28	0.405 7635	0.397 7692	2693	0.824 7169	0.827 9042	1112	0.357 7418	0.359 1245	491
29	0.389 7442	0.381 6892	2721	0.831 0279	0.834 0878	1071	0.360 4797	0.361 8074	472
30	0.373 6049	0.365 4918	2748	0.837 0836	0.840 0153	1030	0.363 1073	0.364 3793	453
Dec. 1	−0.357 3505	−0.349 1816	−2775	−0.842 8826	−0.845 6851	+ 983	−0.365 6233	−0.366 8392	+434
2	0.340 9854	0.332 7626	2801	0.848 4226	0.851 0949	946	0.368 0269	0.369 1863	415
3	0.324 5140	0.316 2402	2826	0.853 7018	0.856 2430	903	0.370 3173	0.371 4199	395
4	0.307 9416	0.299 6188	2851	0.858 7183	0.861 1273	860	0.372 4938	0.373 5389	375
5	0.291 2725	0.282 9034	2875	0.863 4699	0.865 7460	816	0.374 5552	0.375 5426	355
6	−0.274 5122	−0.266 0994	−2898	−0.867 9552	−0.870 0974	+ 771	−0.376 5010	−0.377 4302	+335
7	0.257 6656	0.249 2114	2921	0.872 1723	0.874 1796	726	0.378 3302	0.379 2009	315
8	0.240 7376	0.232 2448	2942	0.876 1193	0.877 9911	681	0.380 0422	0.380 8541	294
9	0.223 7336	0.215 2047	2963	0.879 7949	0.881 5305	635	0.381 6364	0.382 3890	273
10	0.206 6588	0.198 0965	2983	0.883 1976	0.884 7961	589	0.383 1119	0.383 8051	252
11	−0.189 5186	−0.180 9257	−3002	−0.886 3258	−0.887 7864	+ 542	−0.384 4684	−0.385 1017	+231
12	0.172 3185	0.163 6977	3020	0.889 1779	0.890 5002	495	0.385 7050	0.386 2783	210
13	0.155 0640	0.146 4181	3037	0.891 7531	0.892 9365	447	0.386 8214	0.387 3343	188
14	0.137 7608	0.129 0928	3053	0.894 0503	0.895 0944	399	0.387 8170	0.388 2694	166
15	0.120 4148	0.111 7274	3069	0.896 0687	0.896 9729	350	0.388 6915	0.389 0233	144
16	−0.103 0314	−0.094 3277	−3084	−0.897 8070	−0.898 5710	+ 301	−0.389 4448	−0.389 7758	+122
17	0.085 6168	0.076 8995	3098	0.899 2648	0.899 8884	252	0.390 0764	0.390 3467	100
18	0.068 1766	0.059 4488	3111	0.900 4419	0.900 9252	202	0.390 5865	0.390 7958	78
19	0.050 7167	0.041 9810	3123	0.901 3383	0.901 6811	152	0.390 9747	0.391 1232	55
20	0.033 2425	0.024 5018	3134	0.901 9536	0.902 1560	101	0.391 2413	0.391 3290	33
21	−0.015 7597	−0.007 0168	−3144	−0.902 2882	−0.902 3504	+ 50	−0.391 3863	−0.391 4133	+ 10
22	+0.001 7263	+0.010 4688	3153	0.902 3424	0.902 2643	− 1	0.391 4099	0.391 3761	− 12
23	0.019 2101	0.027 9495	3161	0.902 1162	0.901 8983	52	0.391 3119	0.391 2175	35
24	0.036 6864	0.045 4202	3168	0.901 6104	0.901 2525	104	0.391 0928	0.390 9378	58
25	0.054 1501	0.062 8756	3174	0.900 8249	0.900 3274	156	0.390 7525	0.390 5370	81
26	+0.071 5960	+0.080 3106	−3179	−0.899 7602	−0.899 1234	− 208	−0.390 2913	−0.390 0154	−104
27	0.089 0189	0.097 7203	3183	0.898 4170	0.897 6410	260	0.389 7093	0.389 3730	127
28	0.106 4141	0.115 0997	3186	0.896 7956	0.895 8809	313	0.389 0065	0.388 6100	150
29	0.123 7764	0.132 4436	3188	0.894 8969	0.893 8434	366	0.388 1835	0.387 7269	173
30	0.141 1006	0.149 7469	3190	0.892 7205	0.891 5286	419	0.387 2403	0.386 7236	196
31	+0.158 3817	+0.167 0045	−3189	−0.890 2678	−0.888 9379	− 472	−0.386 1769	−0.385 6002	−220
32	*+0.175 6146*	*+0.184 2114*	*−3188*	*−0.887 5389*	*−0.886 0710*	− 526	−0.384 9935	−0.384 3570	−?

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	JANUARY 1.			
	h m s	s	° ′ ″	″
0	1 16 27.05	2.0961	+13 47 14.9	+12.285
1	1 18 32.87	2.0978	13 59 29.7	12.207
2	1 20 38.78	2.0993	14 11 39.7	12.126
3	1 22 44.79	2.1010	14 23 44.8	12.045
4	1 24 50.90	2.1027	14 35 45.1	11.963
5	1 26 57.11	2.1043	14 47 40.3	11.879
6	1 29 3.42	2.1062	14 59 30.6	11.796
7	1 31 9.85	2.1080	15 11 15.8	11.712
8	1 33 16.38	2.1098	15 22 56.0	11.626
9	1 35 23.03	2.1118	15 34 30.9	11.539
10	1 37 29.79	2.1136	15 46 0.7	11.453
11	1 39 36.66	2.1155	15 57 25.2	11.364
12	1 41 43.65	2.1175	16 8 44.4	11.275
13	1 43 50.76	2.1196	16 19 58.2	11.186
14	1 45 58.00	2.1216	16 31 6.7	11.096
15	1 48 5.35	2.1236	16 42 9.7	11.004
16	1 50 12.83	2.1258	16 53 7.2	10.913
17	1 52 20.44	2.1279	17 3 59.2	10.819
18	1 54 28.18	2.1301	17 14 45.5	10.725
19	1 56 36.05	2.1322	17 25 26.2	10.632
20	1 58 44.04	2.1343	17 36 1.3	10.537
21	2 0 52.17	2.1367	17 46 30.6	10.441
22	2 3 0.44	2.1388	17 56 54.2	10.344
23	2 5 8.83	2.1411	+18 7 11.9	+10.246
	JANUARY 2.			
0	2 7 17.37	2.1434	+18 17 23.7	+10.148
1	2 9 26.04	2.1457	18 27 29.6	10.049
2	2 11 34.85	2.1480	18 37 29.6	9.949
3	2 13 43.80	2.1503	18 47 23.5	9.848
4	2 15 52.89	2.1527	18 57 11.4	9.748
5	2 18 2.12	2.1549	19 6 53.2	9.646
6	2 20 11.48	2.1573	19 16 28.9	9.543
7	2 22 20.99	2.1597	19 25 58.4	9.439
8	2 24 30.64	2.1620	19 35 21.6	9.335
9	2 26 40.43	2.1643	19 44 38.6	9.230
10	2 28 50.36	2.1667	19 53 49.2	9.125
11	2 31 0.43	2.1691	20 2 53.6	9.018
12	2 33 10.65	2.1715	20 11 51.4	8.911
13	2 35 21.01	2.1738	20 20 42.9	8.803
14	2 37 31.51	2.1762	20 29 27.8	8.695
15	2 39 42.15	2.1786	20 38 6.3	8.587
16	2 41 52.94	2.1809	20 46 38.2	8.477
17	2 44 3.86	2.1832	20 55 3.5	8.366
18	2 46 14.92	2.1856	21 3 22.1	8.255
19	2 48 26.13	2.1879	21 11 34.1	8.144
20	2 50 37.47	2.1902	21 19 39.4	8.032
21	2 52 48.95	2.1925	21 27 37.9	7.918
22	2 55 0.57	2.1948	21 35 29.6	7.804
23	2 57 12.32	2.1970	21 43 14.4	7.690
	2 59 24.21	*2.1993*	*+21 50 52.4*	+ 7.576

Hour.	Right Ascension.	Var. per Min.	Declination.
	JANUARY 3.		
	h m s	s	° ′ ″
0	2 59 24.21	2.1993	+21 50 52.4
1	3 1 36.24	2.2015	21 58 23.5
2	3 3 48.39	2.2037	22 5 47.6
3	3 6 0.68	2.2059	22 13 4.8
4	3 8 13.10	2.2081	22 20 15.0
5	3 10 25.65	2.2103	22 27 18.1
6	3 12 38.33	2.2123	22 34 14.2
7	3 14 51.13	2.2144	22 41 3.1
8	3 17 4.06	2.2165	22 47 44.9
9	3 19 17.11	2.2185	22 54 19.5
10	3 21 30.28	2.2205	23 0 46.9
11	3 23 43.57	2.2224	23 7 7.1
12	3 25 56.97	2.2243	23 13 20.0
13	3 28 10.49	2.2263	23 19 25.6
14	3 30 24.12	2.2281	23 25 23.9
15	3 32 37.86	2.2299	23 31 14.9
16	3 34 51.71	2.2317	23 36 58.5
17	3 37 5.66	2.2334	23 42 34.7
18	3 39 19.72	2.2351	23 48 3.4
19	3 41 33.87	2.2367	23 53 24.7
20	3 43 48.12	2.2383	23 58 38.5
21	3 46 2.46	2.2398	24 3 44.8
22	3 48 16.89	2.2413	24 8 43.5
23	3 50 31.41	2.2428	+24 13 34.8
	JANUARY 4.		
0	3 52 46.02	2.2442	+24 18 18.4
1	3 55 0.71	2.2455	24 22 54.5
2	3 57 15.48	2.2468	24 27 22.9
3	3 59 30.32	2.2479	24 31 43.7
4	4 1 45.23	2.2492	24 35 56.9
5	4 4 0.22	2.2503	24 40 2.3
6	4 6 15.26	2.2513	24 44 0.1
7	4 8 30.37	2.2523	24 47 50.2
8	4 10 45.54	2.2533	24 51 32.6
9	4 13 0.76	2.2541	24 55 7.2
10	4 15 16.03	2.2549	24 58 34.1
11	4 17 31.35	2.2556	25 1 53.3
12	4 19 46.70	2.2563	25 5 4.6
13	4 22 2.10	2.2569	25 8 8.2
14	4 24 17.53	2.2575	25 11 3.9
15	4 26 33.00	2.2581	25 13 51.9
16	4 28 48.50	2.2584	25 16 32.0
17	4 31 4.01	2.2588	25 19 4.3
18	4 33 19.55	2.2591	25 21 28.8
19	4 35 35.10	2.2593	25 23 45.5
20	4 37 50.67	2.2595	25 25 54.3
21	4 40 6.24	2.2595	25 27 55.3
22	4 42 21.81	2.2596	25 29 48.5
23	4 44 37.39	2.2595	25 31 33.8
	4 46 52.95	2.2593	+25 33 11.2

GREENWICH MEAN TIME.

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	° ′ ″	″
4 46 52.95	2.2593	+25 33 11.2	+1.558	0	6 33 49.86	2.1715	+24 20 31.0	−4.453
4 49 8.51	2.2592	25 34 40.8	1.428	1	6 36 0.05	2.1682	24 16 0.4	4.568
4 51 24.05	2.2588	25 36 2.5	1.297	2	6 38 10.04	2.1649	24 11 22.9	4.681
4 53 39.57	2.2586	25 37 16.4	1.166	3	6 40 19.84	2.1615	24 6 38.7	4.793
4 55 55.08	2.2582	25 38 22.4	1.035	4	6 42 29.42	2.1581	24 1 47.7	4.906
4 58 10.55	2.2576	25 39 20.6	0.905	5	6 44 38.81	2.1547	23 56 50.0	5.018
5 0 25.99	2.2571	25 40 11.0	0.774	6	6 46 47.98	2.1511	23 51 45.6	5.128
5 2 41.40	2.2564	25 40 53.5	0.643	7	6 48 56.94	2.1476	23 46 34.6	5.238
5 4 56.76	2.2557	25 41 28.2	0.513	8	6 51 5.69	2.1440	23 41 17.0	5.348
5 7 12.08	2.2549	25 41 55.1	0.383	9	6 53 14.22	2.1404	23 35 52.8	5.457
5 9 27.35	2.2541	25 42 14.1	0.253	10	6 55 22.54	2.1368	23 30 22.2	5.564
5 11 42.57	2.2532	25 42 25.4	+0.123	11	6 57 30.64	2.1331	23 24 45.1	5.672
5 13 57.73	2.2522	25 42 28.8	−0.008	12	6 59 38.51	2.1294	23 19 1.6	5.778
5 16 12.83	2.2511	25 42 24.5	0.138	13	7 1 46.17	2.1258	23 13 11.7	5.884
5 18 27.86	2.2498	25 42 12.3	0.267	14	7 3 53.60	2.1219	23 7 15.5	5.989
5 20 42.81	2.2487	25 41 52.5	0.396	15	7 6 0.80	2.1182	23 1 13.0	6.093
5 22 57.70	2.2474	25 41 24.8	0.525	16	7 8 7.78	2.1144	22 55 4.3	6.198
5 25 12.50	2.2460	25 40 49.5	0.653	17	7 10 14.53	2.1105	22 48 49.3	6.301
5 27 27.22	2.2446	25 40 6.4	0.783	18	7 12 21.04	2.1067	22 42 28.2	6.402
5 29 41.85	2.2431	25 39 15.6	0.911	19	7 14 27.33	2.1028	22 36 1.1	6.503
5 31 56.39	2.2415	25 38 17.1	1.038	20	7 16 33.38	2.0989	22 29 27.8	6.604
5 34 10.83	2.2398	25 37 11.0	1.166	21	7 18 39.20	2.0951	22 22 48.6	6.704
5 36 25.17	2.2382	25 35 57.2	1.293	22	7 20 44.79	2.0912	22 16 3.3	6.803
5 38 39.41	2.2364	+25 34 35.8	−1.421	23	7 22 50.14	2.0872	+22 9 12.2	−6.901
JANUARY 6.					**JANUARY 8.**			
5 40 53.54	2.2345	+25 33 6.7	−1.548	0	7 24 55.25	2.0833	+22 2 15.2	−6.998
5 43 7.55	2.2326	25 31 30.1	1.674	1	7 27 0.13	2.0793	21 55 12.4	7.095
5 45 21.45	2.2307	25 29 45.8	1.800	2	7 29 4.76	2.0753	21 48 3.8	7.192
5 47 35.23	2.2286	25 27 54.1	1.926	3	7 31 9.16	2.0713	21 40 49.4	7.287
5 49 48.88	2.2264	25 25 54.7	2.052	4	7 33 13.31	2.0673	21 33 29.4	7.380
5 52 2.40	2.2243	25 23 47.9	2.175	5	7 35 17.23	2.0633	21 26 3.8	7.473
5 54 15.79	2.2220	25 21 33.7	2.300	6	7 37 20.91	2.0593	21 18 32.6	7.567
5 56 29.04	2.2197	25 19 11.9	2.424	7	7 39 24.34	2.0553	21 10 55.8	7.658
5 58 42.15	2.2173	25 16 42.8	2.548	8	7 41 27.54	2.0513	21 3 13.6	7.749
6 0 55.11	2.2148	25 14 6.2	2.671	9	7 43 30.49	2.0473	20 55 25.9	7.840
6 3 7.93	2.2124	25 11 22.3	2.793	10	7 45 33.21	2.0433	20 47 32.8	7.929
6 5 20.60	2.2098	25 8 31.0	2.916	11	7 47 35.68	2.0392	20 39 34.4	8.017
6 7 33.10	2.2071	25 5 32.4	3.037	12	7 49 37.91	2.0352	20 31 30.8	8.104
6 9 45.45	2.2045	25 2 26.6	3.158	13	7 51 39.90	2.0312	20 23 21.9	8.192
6 11 57.64	2.2018	24 59 13.5	3.279	14	7 53 41.65	2.0272	20 15 7.8	8.278
6 14 9.66	2.1989	24 55 53.1	3.399	15	7 55 43.16	2.0231	20 6 48.5	8.364
6 16 21.51	2.1961	24 52 25.6	3.518	16	7 57 44.42	2.0191	19 58 24.1	8.448
6 18 33.19	2.1932	24 48 51.0	3.637	17	7 59 45.45	2.0152	19 49 54.7	8.532
6 20 44.69	2.1903	24 45 9.2	3.755	18	8 1 46.24	2.0112	19 41 20.3	8.614
6 22 56.02	2.1873	24 41 20.4	3.873	19	8 3 46.79	2.0072	19 32 41.0	8.697
6 25 7.16	2.1842	24 37 24.5	3.991	20	8 5 47.10	2.0032	19 23 56.7	8.778
6 27 18.12	2.1811	24 33 21.5	4.108	21	8 7 47.17	1.9993	19 15 7.7	8.858
6 29 28.89	2.1779	24 29 11.6	4.223	22	8 9 47.01	1.9953	19 6 13.8	8.938
6 31 39.47	2.1748	24 24 54.7	4.338	23	8 11 46.61	1.9914	18 57 15.2	9.016
6 33 49.86	2.1715	+24 20 31.0	−4.453	24	8 13 45.98	1.9875	+18 48 11.9	−9.0[illegible]

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	JANUARY 9.			
	h m s	s	° ′ ″	″
0	8 13 45.98	1.9875	+18 48 11.9	− 9.084
1	8 15 45.11	1.9837	18 39 3.9	9.171
2	8 17 44.02	1.9798	18 29 51.4	9.247
3	8 19 42.69	1.9759	18 20 34.3	9.323
4	8 21 41.13	1.9721	18 11 12.7	9.397
5	8 23 39.34	1.9683	18 1 46.7	9.471
6	8 25 37.32	1.9644	17 52 16.2	9.544
7	8 27 35.07	1.9607	17 42 41.4	9.616
8	8 29 32.60	1.9570	17 33 2.3	9.687
9	8 31 29.91	1.9533	17 23 19.0	9.758
10	8 33 26.99	1.9495	17 13 31.4	9.828
11	8 35 23.85	1.9458	17 3 39.7	9.895
12	8 37 20.49	1.9422	16 53 44.0	9.963
13	8 39 16.91	1.9386	16 43 44.1	10.031
14	8 41 13.12	1.9350	16 33 40.3	10.098
15	8 43 9.11	1.9314	16 23 32.4	10.163
16	8 45 4.89	1.9279	16 13 20.7	10.228
17	8 47 0.46	1.9244	16 3 5.1	10.293
18	8 48 55.82	1.9210	15 52 45.6	10.355
19	8 50 50.98	1.9176	15 42 22.5	10.417
20	8 52 45.93	1.9142	15 31 55.6	10.479
21	8 54 40.68	1.9108	15 21 25.0	10.540
22	8 56 35.23	1.9075	15 10 50.8	10.600
23	8 58 29.58	1.9042	+15 0 13.0	−10.658
	JANUARY 10.			
0	9 0 23.73	1.9009	+14 49 31.8	−10.717
1	9 2 17.69	1.8978	14 38 47.0	10.775
2	9 4 11.46	1.8946	14 27 58.8	10.832
3	9 6 5.04	1.8915	14 17 7.2	10.888
4	9 7 58.44	1.8884	14 6 12.3	10.943
5	9 9 51.65	1.8853	13 55 14.0	10.998
6	9 11 44.68	1.8823	13 44 12.6	11.051
7	9 13 37.53	1.8793	13 33 7.9	11.105
8	9 15 30.20	1.8764	13 22 0.0	11.157
9	9 17 22.70	1.8736	13 10 49.1	11.208
10	9 19 15.03	1.8708	12 59 35.1	11.258
11	9 21 7.19	1.8680	12 48 18.1	11.308
12	9 22 59.19	1.8653	12 36 58.1	11.358
13	9 24 51.02	1.8626	12 25 35.2	11.406
14	9 26 42.70	1.8599	12 14 9.4	11.454
15	9 28 34.21	1.8573	12 2 40.7	11.501
16	9 30 25.57	1.8548	11 51 9.3	11.547
17	9 32 16.78	1.8523	11 39 35.1	11.593
18	9 34 7.84	1.8498	11 27 58.2	11.637
19	9 35 58.75	1.8473	11 16 18.7	11.681
20	9 37 49.52	1.8450	11 4 36.5	11.724
21	9 39 40.15	1.8427	10 52 51.8	11.767
22	9 41 30.64	1.8404	10 41 4.5	11.808
23	9 43 21.00	1.8383	10 29 14.8	11.849
24	9 45 11.23	1.8361	+10 17 22.6	−11.890

Hour.	Right Ascension.	Var. per Min.	Declination.
	JANUARY 11.		
	h m s	s	° ′ ″
0	9 45 11.23	1.8361	+10 17 22.6
1	9 47 1.33	1.8340	10 5 28.0
2	9 48 51.31	1.8320	9 53 31.1
3	9 50 41.17	1.8300	9 41 31.9
4	9 52 30.91	1.8280	9 29 30.4
5	9 54 20.53	1.8261	9 17 26.6
6	9 56 10.04	1.8243	9 5 20.7
7	9 57 59.45	1.8226	8 53 12.7
8	9 59 48.75	1.8208	8 41 2.5
9	10 1 37.95	1.8192	8 28 50.3
10	10 3 27.05	1.8176	8 16 36.0
11	10 5 16.06	1.8161	8 4 19.8
12	10 7 4.98	1.8146	7 52 1.7
13	10 8 53.81	1.8131	7 39 41.7
14	10 10 42.55	1.8118	7 27 19.8
15	10 12 31.22	1.8104	7 14 56.1
16	10 14 19.80	1.8092	7 2 30.7
17	10 16 8.32	1.8080	6 50 3.5
18	10 17 56.76	1.8068	6 37 34.7
19	10 19 45.14	1.8058	6 25 4.2
20	10 21 33.45	1.8047	6 12 32.1
21	10 23 21.70	1.8038	5 59 58.4
22	10 25 9.90	1.8029	5 47 23.3
23	10 26 58.05	1.8021	+ 5 34 46.6
	JANUARY 12.		
0	10 28 46.15	1.8013	+ 5 22 8.5
1	10 30 34.21	1.8006	5 9 29.0
2	10 32 22.22	1.7999	4 56 48.1
3	10 34 10.20	1.7993	4 44 6.0
4	10 35 58.14	1.7988	4 31 22.5
5	10 37 46.06	1.7984	4 18 37.8
6	10 39 33.95	1.7979	4 5 51.9
7	10 41 21.81	1.7976	3 53 4.9
8	10 43 9.66	1.7974	3 40 16.7
9	10 44 57.50	1.7972	3 27 27.5
10	10 46 45.32	1.7970	3 14 37.2
11	10 48 33.14	1.7969	3 1 45.9
12	10 50 20.95	1.7969	2 48 53.7
13	10 52 8.77	1.7970	2 36 0.6
14	10 53 56.59	1.7971	2 23 6.5
15	10 55 44.42	1.7973	2 10 11.7
16	10 57 32.27	1.7976	1 57 16.0
17	10 59 20.13	1.7979	1 44 19.6
18	11 1 8.02	1.7983	1 31 22.5
19	11 2 55.93	1.7988	1 18 24.7
20	11 4 43.87	1.7993	1 5 26.2
21	11 6 31.84	1.7999	0 52 27.2
22	11 8 19.86	1.8006	0 39 27.6
23	11 10 7.91	1.8013	0 26 27.5
24	11 11 56.01	1.8021	+ 0 13 26.9

GREENWICH MEAN TIME.

Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
JANUARY 13.					**JANUARY 15.**			
m s	s	° ′ ″	″		h m s	s	° ′ ″	″
1 56.01	1.8021	+ 0 13 26.9	−13.014	0	12 40 43.09	1.9257	−10 6 24.1	−12.520
3 44.16	1.8030	+ 0 0 25.8	13.021	1	12 42 38.76	1.9301	10 18 54.4	12.490
5 32.37	1.8039	− 0 12 35.6	13.027	2	12 44 34.70	1.9346	10 31 22.9	12.458
7 20.63	1.8049	0 25 37.4	13.033	3	12 46 30.91	1.9392	10 43 49.4	12.426
9 8.96	1.8060	0 38 39.5	13.037	4	12 48 27.40	1.9438	10 56 14.0	12.393
0 57.35	1.8072	0 51 41.8	13.041	5	12 50 24.16	1.9484	11 8 36.6	12.359
2 45.82	1.8083	1 4 44.4	13.045	6	12 52 21.21	1.9533	11 20 57.1	12.324
4 34.35	1.8096	1 17 47.2	13.048	7	12 54 18.55	1.9582	11 33 15.5	12.288
6 22.97	1.8110	1 30 50.1	13.049	8	12 56 16.19	1.9631	11 45 31.7	12.252
8 11.67	1.8124	1 43 53.1	13.051	9	12 58 14.12	1.9680	11 57 45.7	12.214
0 0.46	1.8140	1 56 56.2	13.052	10	13 0 12.35	1.9732	12 9 57.4	12.174
1 49.35	1.8155	2 9 59.3	13.051	11	13 2 10.90	1.9783	12 22 6.6	12.133
3 38.32	1.8171	2 23 2.3	13.050	12	13 4 9.75	1.9835	12 34 13.4	12.093
5 27.40	1.8188	2 36 5.3	13.049	13	13 6 8.92	1.9888	12 46 17.8	12.051
7 16.58	1.8207	2 49 8.2	13.048	14	13 8 8.41	1.9943	12 58 19.5	12.008
9 5.88	1.8226	3 2 11.0	13.045	15	13 10 8.23	1.9997	13 10 18.7	11.964
0 55.29	1.8244	3 15 13.6	13.041	16	13 12 8.37	2.0052	13 22 15.2	11.918
2 44.81	1.8264	3 28 15.9	13.037	17	13 14 8.85	2.0108	13 34 8.9	11.872
4 34.46	1.8286	3 41 18.0	13.032	18	13 16 9.67	2.0164	13 45 59.8	11.824
6 24.24	1.8308	3 54 19.7	13.026	19	13 18 10.82	2.0222	13 57 47.8	11.776
8 14.15	1.8329	4 7 21.1	13.019	20	13 20 12.33	2.0280	14 9 32.9	11.727
0 4.19	1.8353	4 20 22.0	13.012	21	13 22 14.18	2.0338	14 21 15.0	11.676
1 54.38	1.8376	4 33 22.5	13.004	22	13 24 16.39	2.0398	14 32 54.0	11.623
3 44.70	1.8400	− 4 46 22.5	−12.996	23	13 26 18.95	2.0458	−14 44 29.8	−11.570
JANUARY 14.					**JANUARY 16.**			
5 35.18	1.8426	− 4 59 22.0	−12.987	0	13 28 21.88	2.0519	−14 56 2.4	−11.516
7 25.81	1.8452	5 12 20.9	12.976	1	13 30 25.18	2.0581	15 7 31.7	11.461
9 16.60	1.8478	5 25 19.1	12.965	2	13 32 28.85	2.0643	15 18 57.7	11.404
1 7.55	1.8506	5 38 16.7	12.953	3	13 34 32.89	2.0705	15 30 20.2	11.346
2 58.67	1.8534	5 51 13.5	12.941	4	13 36 37.31	2.0769	15 41 39.2	11.287
4 49.96	1.8563	6 4 9.6	12.928	5	13 38 42.12	2.0833	15 52 54.6	11.227
6 41.42	1.8593	6 17 4.9	12.914	6	13 40 47.31	2.0898	16 4 6.4	11.165
8 33.07	1.8623	6 29 59.3	12.898	7	13 42 52.89	2.0963	16 15 14.4	11.103
10 24.90	1.8655	6 42 52.7	12.883	8	13 44 58.87	2.1030	16 26 18.7	11.039
12 16.93	1.8687	6 55 45.3	12.868	9	13 47 5.25	2.1096	16 37 19.1	10.973
14 9.14	1.8719	7 8 36.8	12.849	10	13 49 12.02	2.1163	16 48 15.5	10.907
16 1.56	1.8753	7 21 27.2	12.832	11	13 51 19.20	2.1231	16 59 7.9	10.839
17 54.18	1.8788	7 34 16.6	12.813	12	13 53 26.79	2.1299	17 9 56.2	10.770
19 47.01	1.8822	7 47 4.8	12.793	13	13 55 34.79	2.1368	17 20 40.3	10.699
21 40.04	1.8858	7 59 51.8	12.773	14	13 57 43.21	2.1438	17 31 20.1	10.628
23 33.30	1.8894	8 12 37.5	12.752	15	13 59 52.04	2.1508	17 41 55.6	10.554
25 26.77	1.8932	8 25 22.0	12.729	16	14 2 1.30	2.1578	17 52 26.6	10.479
27 20.48	1.8970	8 38 5.0	12.706	17	14 4 10.98	2.1649	18 2 53.1	10.403
29 14.41	1.9008	8 50 46.7	12.683	18	14 6 21.09	2.1721	18 13 15.0	10.327
31 8.57	1.9048	9 3 26.9	12.658	19	14 8 31.63	2.1793	18 23 32.3	10.248
33 2.98	1.9088	9 16 5.6	12.632	20	14 10 42.61	2.1866	18 33 44.7	10.168
34 57.63	1.9129	9 28 42.7	12.605	21	14 12 54.02	2.1938	18 43 52.4	10.087
36 52.53	1.9171	9 41 18.2	12.578	22	14 15 5.87	2.2012	18 53 55.1	10.003
38 47.68	1.9213	*9 53 52.0*	*12.549*	23	14 17 18.16	2.2086	19 3 52.8	9.919
40 43.09	*1.9257*	*−10 6 24.1*	*−12.520*	24	14 19 30.90	2.2160	−19 13 45.4	− 9.833

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	JANUARY 17.			
	h m s	s	° ′ ″	″
0	14 19 30.90	2.2160	−19 13 45.4	−9.833
1	14 21 44.08	2.2235	19 23 32.8	9.746
2	14 23 57.72	2.2310	19 33 14.9	9.658
3	14 26 11.80	2.2385	19 42 51.7	9.568
4	14 28 26.34	2.2461	19 52 23.0	9.475
5	14 30 41.33	2.2538	20 1 48.7	9.382
6	14 32 56.79	2.2614	20 11 8.8	9.288
7	14 35 12.70	2.2690	20 20 23.2	9.192
8	14 37 29.07	2.2767	20 29 31.8	9.093
9	14 39 45.90	2.2844	20 38 34.4	8.994
10	14 42 3.20	2.2922	20 47 31.1	8.894
11	14 44 20.96	2.2998	20 56 21.7	8.792
12	14 46 39.18	2.3076	21 5 6.1	8.688
13	14 48 57.87	2.3154	21 13 44.2	8.583
14	14 51 17.03	2.3233	21 22 16.0	8.476
15	14 53 36.66	2.3311	21 30 41.3	8.367
16	14 55 56.76	2.3389	21 39 0.0	8.257
17	14 58 17.33	2.3468	21 47 12.1	8.145
18	15 0 38.37	2.3545	21 55 17.4	8.032
19	15 2 59.87	2.3623	22 3 15.9	7.917
20	15 5 21.85	2.3702	22 11 7.4	7.800
21	15 7 44.29	2.3779	22 18 51.9	7.683
22	15 10 7.20	2.3858	22 26 29.3	7.563
23	15 12 30.58	2.3936	−22 33 59.4	−7.441
	JANUARY 18.			
0	15 14 54.43	2.4013	−22 41 22.2	−7.318
1	15 17 18.74	2.4091	22 48 37.6	7.194
2	15 19 43.52	2.4168	22 55 45.5	7.068
3	15 22 8.76	2.4246	23 2 45.8	6.941
4	15 24 34.47	2.4323	23 9 38.4	6.811
5	15 27 0.63	2.4398	23 16 23.1	6.680
6	15 29 27.25	2.4474	23 23 0.0	6.548
7	15 31 54.32	2.4550	23 29 28.9	6.413
8	15 34 21.85	2.4626	23 35 49.6	6.278
9	15 36 49.83	2.4701	23 42 2.2	6.142
10	15 39 18.26	2.4776	23 48 6.6	6.003
11	15 41 47.14	2.4849	23 54 2.5	5.862
12	15 44 16.45	2.4923	23 59 50.0	5.720
13	15 46 46.21	2.4996	24 5 28.9	5.577
14	15 49 16.40	2.5068	24 10 59.2	5.432
15	15 51 47.02	2.5140	24 16 20.7	5.285
16	15 54 18.08	2.5211	24 21 33.4	5.137
17	15 56 49.55	2.5281	24 26 37.1	4.987
18	15 59 21.45	2.5350	24 31 31.8	4.836
19	16 1 53.75	2.5418	24 36 17.4	4.684
20	16 4 26.47	2.5488	24 40 53.9	4.530
21	16 6 59.60	2.5554	24 45 21.0	4.374
22	16 9 33.12	2.5620	24 49 38.8	4.218
23	16 12 7.04	2.5685	24 53 47.1	4.058
24	*16 14 41.34*	*2.5749*	*−24 57 45.8*	*−3.899*

Hour.	Right Ascension.	Var. per Min.	Declination.
	JANUARY 19.		
	h m s	s	° ′ ″
0	16 14 41.34	2.5749	−24 57 45.8
1	16 17 16.03	2.5813	25 1 35.0
2	16 19 51.10	2.5876	25 5 14.4
3	16 22 26.54	2.5937	25 8 44.0
4	16 25 2.34	2.5997	25 12 3.8
5	16 27 38.50	2.6056	25 15 13.6
6	16 30 15.01	2.6113	25 18 13.4
7	16 32 51.86	2.6170	25 21 3.1
8	16 35 29.05	2.6226	25 23 42.6
9	16 38 6.57	2.6280	25 26 11.9
10	16 40 44.41	2.6333	25 28 30.9
11	16 43 22.57	2.6385	25 30 39.5
12	16 46 1.03	2.6435	25 32 37.6
13	16 48 39.79	2.6484	25 34 25.2
14	16 51 18.84	2.6533	25 36 2.2
15	16 53 58.18	2.6578	25 37 28.6
16	16 56 37.78	2.6623	25 38 44.3
17	16 59 17.65	2.6666	25 39 49.2
18	17 1 57.77	2.6708	25 40 43.3
19	17 4 38.14	2.6748	25 41 26.6
20	17 7 18.74	2.6787	25 41 58.9
21	17 9 59.58	2.6824	25 42 20.2
22	17 12 40.63	2.6858	25 42 30.5
23	17 15 21.88	2.6893	−25 42 29.8
	JANUARY 20.		
0	17 18 3.34	2.6926	−25 42 17.9
1	17 20 44.99	2.6957	25 41 54.9
2	17 23 26.82	2.6985	25 41 20.7
3	17 26 8.81	2.7013	25 40 35.3
4	17 28 50.97	2.7038	25 39 38.6
5	17 31 33.27	2.7063	25 38 30.7
6	17 34 15.72	2.7085	25 37 11.5
7	17 36 58.29	2.7105	25 35 40.9
8	17 39 40.98	2.7123	25 33 59.0
9	17 42 23.77	2.7141	25 32 5.7
10	17 45 6.67	2.7157	25 30 1.0
11	17 47 49.65	2.7169	25 27 45.0
12	17 50 32.70	2.7181	25 25 17.5
13	17 53 15.82	2.7192	25 22 38.6
14	17 55 59.00	2.7201	25 19 48.3
15	17 58 42.23	2.7208	25 16 46.6
16	18 1 25.49	2.7212	25 13 33.5
17	18 4 8.77	2.7215	25 10 8.9
18	18 6 52.07	2.7217	25 6 33.0
19	18 9 35.37	2.7216	25 2 45.6
20	18 12 18.66	2.7214	24 58 46.9
21	18 15 1.94	2.7211	24 54 36.8
22	18 17 45.19	2.7205	24 50 15.3
23	18 20 28.40	2.7198	24 45 42.5
24	18 23 11.56	2.7189	−24 40 58.4

GREENWICH MEAN TIME.

	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	JANUARY 21.			
	h m s	s	° ′ ″	″
	18 23 11.56	2.7189	−24 40 58.4	+ 4.829
	18 25 54.67	2.7178	24 36 3.0	5.017
	18 28 37.70	2.7166	24 30 56.4	5.204
	18 31 20.66	2.7153	24 25 38.5	5.392
	18 34 3.54	2.7138	24 20 9.4	5.578
	18 36 46.31	2.7120	24 14 29.2	5.763
	18 39 28.98	2.7102	24 8 37.9	5.947
	18 42 11.53	2.7082	24 2 35.6	6.131
	18 44 53.96	2.7060	23 56 22.2	6.314
	18 47 36.25	2.7037	23 49 57.9	6.496
	18 50 18.40	2.7013	23 43 22.7	6.678
	18 53 0.40	2.6987	23 36 36.6	6.858
	18 55 42.24	2.6959	23 29 39.7	7.038
	18 58 23.91	2.6929	23 22 32.1	7.216
	19 1 5.39	2.6899	23 15 13.8	7.394
	19 3 46.70	2.6868	23 7 44.8	7.570
	19 6 27.80	2.6834	23 0 5.4	7.745
	19 9 8.71	2.6800	22 52 15.4	7.919
	19 11 49.40	2.6764	22 44 15.1	8.091
	19 14 29.88	2.6728	22 36 4.5	8.263
	19 17 10.14	2.6690	22 27 43.6	8.433
	19 19 50.16	2.6651	22 19 12.5	8.602
	19 22 29.95	2.6611	22 10 31.4	8.769
	19 25 9.49	2.6568	−22 1 40.2	+ 8.935
	JANUARY 22.			
	19 27 48.77	2.6526	−21 52 39.2	+ 9.099
	19 30 27.80	2.6483	21 43 28.3	9.262
	19 33 6.56	2.6438	21 34 7.8	9.423
	19 35 45.05	2.6393	21 24 37.5	9.583
	19 38 23.27	2.6346	21 14 57.8	9.741
	19 41 1.20	2.6298	21 5 8.6	9.898
	19 43 38.85	2.6251	20 55 10.0	10.053
	19 46 16.21	2.6202	20 45 2.2	10.206
	19 48 53.27	2.6152	20 34 45.3	10.358
	19 51 30.03	2.6101	20 24 19.3	10.508
	19 54 6.48	2.6049	20 13 44.3	10.657
	19 56 42.62	2.5998	20 3 0.5	10.803
	19 59 18.45	2.5945	19 52 8.0	10.947
	20 1 53.96	2.5892	19 41 6.9	11.089
	20 4 29.15	2.5838	19 29 57.3	11.230
	20 7 4.01	2.5783	19 18 39.3	11.369
	20 9 38.54	2.5728	19 7 13.0	11.506
	20 12 12.74	2.5673	18 55 38.6	11.641
	20 14 46.61	2.5617	18 43 56.1	11.773
	20 17 20.14	2.5560	18 32 5.8	11.904
	20 19 53.33	2.5503	18 20 7.6	12.034
	20 22 26.18	2.5447	18 8 1.7	12.162
	20 24 58.69	2.5389	17 55 48.2	12.287
	20 27 30.85	2.5332	17 43 27.3	12.409
	20 30 2.67	*2.5274*	*−17 30 59.1*	*+12.530*

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	JANUARY 23.			
	h m s	s	° ′ ″	″
0	20 30 2.67	2.5274	−17 30 59.1	+12.530
1	20 32 34.14	2.5215	17 18 23.7	12.649
2	20 35 5.25	2.5157	17 5 41.2	12.766
3	20 37 36.02	2.5098	16 52 51.8	12.880
4	20 40 6.43	2.5039	16 39 55.6	12.993
5	20 42 36.49	2.4981	16 26 52.7	13.103
6	20 45 6.20	2.4923	16 13 43.2	13.212
7	20 47 35.56	2.4863	16 0 27.3	13.318
8	20 50 4.56	2.4804	15 47 5.1	13.422
9	20 52 33.21	2.4746	15 33 36.7	13.524
10	20 55 1.51	2.4688	15 20 2.2	13.624
11	20 57 29.46	2.4628	15 6 21.8	13.722
12	20 59 57.05	2.4569	14 52 35.6	13.818
13	21 2 24.29	2.4511	14 38 43.7	13.911
14	21 4 51.18	2.4453	14 24 46.3	14.002
15	21 7 17.73	2.4395	14 10 43.5	14.091
16	21 9 43.92	2.4337	13 56 35.4	14.178
17	21 12 9.77	2.4279	13 42 22.1	14.263
18	21 14 35.27	2.4222	13 28 3.8	14.345
19	21 17 0.43	2.4164	13 13 40.7	14.426
20	21 19 25.24	2.4107	12 59 12.7	14.504
21	21 21 49.71	2.4051	12 44 40.2	14.580
22	21 24 13.85	2.3994	12 30 3.1	14.654
23	21 26 37.64	2.3938	−12 15 21.7	+14.726
	JANUARY 24.			
0	21 29 1.10	2.3883	−12 0 36.0	+14.796
1	21 31 24.23	2.3828	11 45 46.2	14.863
2	21 33 47.03	2.3773	11 30 52.4	14.928
3	21 36 9.50	2.3718	11 15 54.8	14.991
4	21 38 31.65	2.3664	11 0 53.5	15.053
5	21 40 53.47	2.3610	10 45 48.5	15.112
6	21 43 14.97	2.3558	10 30 40.1	15.168
7	21 45 36.16	2.3505	10 15 28.3	15.223
8	21 47 57.03	2.3453	10 0 13.3	15.277
9	21 50 17.59	2.3401	9 44 55.1	15.327
10	21 52 37.84	2.3350	9 29 34.1	15.375
11	21 54 57.79	2.3299	9 14 10.1	15.422
12	21 57 17.43	2.3249	8 58 43.5	15.466
13	21 59 36.78	2.3200	8 43 14.2	15.509
14	22 1 55.83	2.3151	8 27 42.4	15.549
15	22 4 14.59	2.3103	8 12 8.3	15.587
16	22 6 33.07	2.3056	7 56 32.0	15.623
17	22 8 51.26	2.3008	7 40 53.5	15.658
18	22 11 9.17	2.2962	7 25 13.0	15.690
19	22 13 26.80	2.2916	7 9 30.7	15.720
20	22 15 44.16	2.2871	6 53 46.6	15.748
21	22 18 1.25	2.2827	6 38 0.9	15.774
22	22 20 18.08	2.2783	6 22 13.7	15.798
23	22 22 34.64	2.2739	6 6 25.1	15.821
24	22 24 50.95	2.2698	− 5 50 35.2	+15.842

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	JANUARY 25.			
	h m s	s	° ′ ″	″
0	22 24 50.95	2.2698	−5 50 35.2	+15.842
1	22 27 7.01	2.2656	5 34 44.1	15.860
2	22 29 22.82	2.2614	5 18 52.0	15.877
3	22 31 38.38	2.2574	5 2 58.9	15.892
4	22 33 53.71	2.2534	4 47 5.0	15.905
5	22 36 8.79	2.2495	4 31 10.3	15.917
6	22 38 23.65	2.2458	4 15 15.0	15.925
7	22 40 38.28	2.2419	3 59 19.3	15.933
8	22 42 52.68	2.2383	3 43 23.1	15.938
9	22 45 6.87	2.2347	3 27 26.7	15.942
10	22 47 20.84	2.2310	3 11 30.1	15.944
11	22 49 34.59	2.2276	2 55 33.4	15.945
12	22 51 48.15	2.2243	2 39 36.7	15.943
13	22 54 1.50	2.2209	2 23 40.2	15.940
14	22 56 14.66	2.2177	2 7 43.9	15.935
15	22 58 27.62	2.2144	1 51 48.0	15.928
16	23 0 40.39	2.2113	1 35 52.6	15.920
17	23 2 52.98	2.2083	1 19 57.6	15.910
18	23 5 5.39	2.2054	1 4 3.4	15.898
19	23 7 17.63	2.2025	0 48 9.8	15.886
20	23 9 29.69	2.1997	0 32 17.1	15.870
21	23 11 41.59	2.1969	0 16 25.4	15.853
22	23 13 53.32	2.1943	−0 0 34.7	15.836
23	23 16 4.90	2.1917	+0 15 14.9	+15.816
	JANUARY 26.			
0	23 18 16.32	2.1891	+0 31 3.2	+15.794
1	23 20 27.59	2.1867	0 46 50.2	15.772
2	23 22 38.72	2.1844	1 2 35.8	15.747
3	23 24 49.72	2.1821	1 18 19.8	15.721
4	23 27 0.57	2.1798	1 34 2.3	15.693
5	23 29 11.29	2.1777	1 49 43.0	15.664
6	23 31 21.89	2.1757	2 5 22.0	15.634
7	23 33 32.37	2.1737	2 20 59.1	15.603
8	23 35 42.73	2.1718	2 36 34.3	15.569
9	23 37 52.98	2.1698	2 52 7.4	15.534
10	23 40 3.11	2.1680	3 7 38.4	15.498
11	23 42 13.14	2.1663	3 23 7.1	15.459
12	23 44 23.07	2.1648	3 38 33.5	15.421
13	23 46 32.91	2.1632	3 53 57.6	15.380
14	23 48 42.65	2.1617	4 9 19.1	15.338
15	23 50 52.31	2.1603	4 24 38.2	15.296
16	23 53 1.88	2.1588	4 39 54.6	15.251
17	23 55 11.37	2.1576	4 55 8.3	15.205
18	23 57 20.79	2.1564	5 10 19.2	15.158
19	23 59 30.14	2.1553	5 25 27.2	15.109
20	0 1 39.42	2.1542	5 40 32.3	15.059
21	0 3 48.64	2.1532	5 55 34.3	15.008
22	0 5 57.80	2.1523	6 10 33.3	14.957
23	0 8 6.91	2.1513	6 25 29.1	14.903
24	0 10 15.96	2.1505	+6 40 21.6	+14.848

Hour.	Right Ascension.	Var. per Min.	Declination.
	JANUARY 27.		
	h m s	s	° ′ ″
0	0 10 15.96	2.1505	+ 6 40 21.6
1	0 12 24.97	2.1498	6 55 10.8
2	0 14 33.93	2.1491	7 9 56.6
3	0 16 42.86	2.1485	7 24 39.0
4	0 18 51.75	2.1479	7 39 17.8
5	0 21 0.61	2.1474	7 53 53.0
6	0 23 9.44	2.1470	8 8 24.5
7	0 25 18.25	2.1467	8 22 52.3
8	0 27 27.04	2.1463	8 37 16.2
9	0 29 35.81	2.1460	8 51 36.3
10	0 31 44.56	2.1458	9 5 52.4
11	0 33 53.31	2.1458	9 20 4.4
12	0 36 2.05	2.1457	9 34 12.4
13	0 38 10.79	2.1458	9 48 16.2
14	0 40 19.54	2.1458	10 2 15.8
15	0 42 28.28	2.1458	10 16 11.1
16	0 44 37.04	2.1461	10 30 2.1
17	0 46 45.81	2.1463	10 43 48.7
18	0 48 54.59	2.1465	10 57 30.8
19	0 51 3.39	2.1468	11 11 8.3
20	0 53 12.21	2.1472	11 24 41.3
21	0 55 21.05	2.1476	11 38 9.6
22	0 57 29.92	2.1481	11 51 33.3
23	0 59 38.82	2.1486	+12 4 52.1
	JANUARY 28.		
0	1 1 47.75	2.1492	+12 18 6.2
1	1 3 56.72	2.1498	12 31 15.3
2	1 6 5.72	2.1504	12 44 19.5
3	1 8 14.77	2.1512	12 57 18.7
4	1 10 23.86	2.1519	13 10 12.9
5	1 12 33.00	2.1528	13 23 1.9
6	1 14 42.19	2.1535	13 35 45.8
7	1 16 51.42	2.1544	13 48 24.5
8	1 19 0.72	2.1554	14 0 57.9
9	1 21 10.07	2.1563	14 13 25.9
10	1 23 19.48	2.1573	14 25 48.6
11	1 25 28.94	2.1583	14 38 5.9
12	1 27 38.48	2.1595	14 50 17.7
13	1 29 48.08	2.1606	15 2 23.9
14	1 31 57.75	2.1617	15 14 24.6
15	1 34 7.48	2.1628	15 26 19.6
16	1 36 17.29	2.1642	15 38 9.0
17	1 38 27.18	2.1653	15 49 52.6
18	1 40 37.13	2.1666	16 1 30.5
19	1 42 47.17	2.1680	16 13 2.5
20	1 44 57.29	2.1693	16 24 28.6
21	1 47 7.48	2.1706	16 35 48.8
22	1 49 17.76	2.1720	16 47 3.1
23	1 51 28.12	2.1733	16 58 11.3
24	1 53 38.56	2.1748	+17 9 13.5

GREENWICH MEAN TIME.

ight nsion.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
JANUARY 29.					**JANUARY 31.**			
s	s	° ′ ″	″		h m s	s	° ′ ″	″
38.56	2.1748	+17 9 13.5	+10.986	0	3 39 48.31	2.2450	+23 47 43.0	+5.415
49.09	2.1763	17 20 9.6	10.883	1	3 42 3.04	2.2460	23 53 4.1	5.288
59.71	2.1778	17 30 59.5	10.781	2	3 44 17.83	2.2469	23 58 17.6	5.161
10.42	2.1793	17 41 43.3	10.678	3	3 46 32.67	2.2478	24 3 23.4	5.033
21.22	2.1808	17 52 20.8	10.573	4	3 48 47.57	2.2487	24 8 21.6	4.906
32.11	2.1823	18 2 52.1	10.468	5	3 51 2.51	2.2495	24 13 12.1	4.778
43.10	2.1838	18 13 17.0	10.363	6	3 53 17.51	2.2503	24 17 54.9	4.649
54.17	2.1853	18 23 35.6	10.257	7	3 55 32.54	2.2509	24 22 30.0	4.521
5.34	2.1869	18 33 47.8	10.150	8	3 57 47.62	2.2516	24 26 57.4	4.392
16.60	2.1885	18 43 53.6	10.042	9	4 0 2.73	2.2522	24 31 17.0	4.263
27.96	2.1901	18 53 52.8	9.933	10	4 2 17.88	2.2528	24 35 29.0	4.134
39.41	2.1916	19 3 45.6	9.825	11	4 4 33.06	2.2533	24 39 33.1	4.005
50.95	2.1933	19 13 31.8	9.715	12	4 6 48.27	2.2538	24 43 29.6	3.877
2.60	2.1949	19 23 11.4	9.605	13	4 9 3.51	2.2542	24 47 18.3	3.746
14.34	2.1965	19 32 44.4	9.494	14	4 11 18.77	2.2545	24 50 59.1	3.616
26.18	2.1982	19 42 10.7	9.383	15	4 13 34.05	2.2548	24 54 32.2	3.487
38.12	2.1998	19 51 30.3	9.271	16	4 15 49.35	2.2551	24 57 57.5	3.357
50.15	2.2013	20 0 43.2	9.158	17	4 18 4.66	2.2553	25 1 15.0	3.227
2.28	2.2030	20 9 49.3	9.044	18	4 20 19.99	2.2555	25 4 24.7	3.097
14.51	2.2046	20 18 48.5	8.930	19	4 22 35.32	2.2556	25 7 26.6	2.966
26.83	2.2063	20 27 40.9	8.817	20	4 24 50.66	2.2557	25 10 20.6	2.836
39.26	2.2078	20 36 26.5	8.702	21	4 27 6.00	2.2556	25 13 6.9	2.706
51.77	2.2094	20 45 5.1	8.585	22	4 29 21.33	2.2555	25 15 45.3	2.576
4.39	2.2110	+20 53 36.7	+ 8.468	23	4 31 36.66	2.2554	+25 18 16.0	+2.446
JANUARY 30.					**FEBRUARY 1.**			
17.09	2.2126	+21 2 1.3	+ 8.353	0	4 33 51.98	2.2553	+25 20 38.8	+2.315
29.90	2.2143	21 10 19.0	8.236	1	4 36 7.29	2.2550	25 22 53.8	2.184
42.80	2.2158	21 18 29.6	8.118	2	4 38 22.58	2.2547	25 25 0.9	2.054
55.79	2.2173	21 26 33.1	7.999	3	4 40 37.85	2.2543	25 27 0.3	1.924
8.87	2.2188	21 34 29.5	7.881	4	4 42 53.10	2.2539	25 28 51.8	1.793
22.05	2.2204	21 42 18.8	7.762	5	4 45 8.32	2.2533	25 30 35.5	1.663
35.32	2.2219	21 50 0.9	7.642	6	4 47 23.51	2.2528	25 32 11.4	1.533
48.68	2.2234	21 57 35.8	7.522	7	4 49 38.66	2.2523	25 33 39.4	1.403
2.13	2.2249	22 5 3.5	7.401	8	4 51 53.78	2.2517	25 34 59.7	1.273
15.67	2.2263	22 12 23.9	7.280	9	4 54 8.86	2.2509	25 36 12.2	1.143
29.29	2.2278	22 19 37.1	7.158	10	4 56 23.89	2.2501	25 37 16.8	1.013
43.00	2.2293	22 26 42.9	7.036	11	4 58 38.87	2.2493	25 38 13.7	0.883
56.80	2.2307	22 33 41.4	6.914	12	5 0 53.80	2.2483	25 39 2.8	0.753
10.68	2.2320	22 40 32.6	6.791	13	5 3 8.67	2.2474	25 39 44.1	0.624
24.64	2.2333	22 47 16.3	6.668	14	5 5 23.49	2.2464	25 40 17.7	0.496
38.68	2.2347	22 53 52.7	6.544	15	5 7 38.24	2.2453	25 40 43.6	0.367
52.80	2.2359	23 0 21.6	6.420	16	5 9 52.92	2.2441	25 41 1.7	0.237
6.99	2.2372	23 6 43.1	6.296	17	5 12 7.53	2.2429	25 41 12.0	+0.108
21.26	2.2384	23 12 57.1	6.172	18	5 14 22.07	2.2417	25 41 14.7	−0.020
35.60	2.2396	23 19 3.7	6.046	19	5 16 36.53	2.2403	25 41 9.6	0.148
50.01	2.2407	23 25 2.6	5.920	20	5 18 50.90	2.2388	25 40 56.9	0.276
4.48	2.2418	23 30 54.1	5.795	21	5 21 5.19	2.2374	25 40 36.5	0.404
19.03	2.2430	23 36 38.0	5.668	22	5 23 19.39	2.2359	25 40 8.4	0.532
33.64	2.2440	*23 42 14.3*	*5.542*	23	5 25 33.50	2.2343	25 39 32.7	0.658
48.31	*2.2450*	*+23 47 43.0*	*+ 5.415*	24	5 27 47.51	2.2327	+25 38 49.4	−0.785

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	FEBRUARY 2.			
	h m s	s	° ′ ″	″
0	5 27 47.51	2.2327	+25 38 49.4	−0.785
1	5 30 1.42	2.2310	25 37 58.5	0.913
2	5 32 15.23	2.2293	25 36 59.9	1.039
3	5 34 28.93	2.2274	25 35 53.8	1.164
4	5 36 42.52	2.2256	25 34 40.2	1.290
5	5 38 56.00	2.2237	25 33 19.0	1.416
6	5 41 9.36	2.2217	25 31 50.3	1.541
7	5 43 22.60	2.2196	25 30 14.1	1.665
8	5 45 35.71	2.2175	25 28 30.5	1.789
9	5 47 48.70	2.2154	25 26 39.4	1.913
10	5 50 1.56	2.2132	25 24 40.9	2.037
11	5 52 14.28	2.2108	25 22 35.0	2.159
12	5 54 26.86	2.2085	25 20 21.8	2.282
13	5 56 39.30	2.2062	25 18 1.2	2.404
14	5 58 51.60	2.2038	25 15 33.3	2.525
15	6 1 3.76	2.2013	25 12 58.2	2.647
16	6 3 15.76	2.1988	25 10 15.7	2.768
17	6 5 27.61	2.1963	25 7 26.0	2.888
18	6 7 39.31	2.1937	25 4 29.2	3.008
19	6 9 50.85	2.1909	25 1 25.1	3.128
20	6 12 2.22	2.1882	24 58 13.9	3.246
21	6 14 13.43	2.1855	24 54 55.6	3.364
22	6 16 24.48	2.1827	24 51 30.2	3.482
23	6 18 35.35	2.1798	+24 47 57.8	−3.599
	FEBRUARY 3.			
0	6 20 46.06	2.1770	+24 44 18.3	−3.716
1	6 22 56.59	2.1740	24 40 31.9	3.833
2	6 25 6.94	2.1710	24 36 38.4	3.948
3	6 27 17.11	2.1680	24 32 38.1	4.063
4	6 29 27.10	2.1650	24 28 30.9	4.178
5	6 31 36.91	2.1618	24 24 16.8	4.292
6	6 33 46.52	2.1587	24 19 55.9	4.404
7	6 35 55.95	2.1556	24 15 28.3	4.517
8	6 38 5.19	2.1523	24 10 53.9	4.629
9	6 40 14.23	2.1490	24 6 12.8	4.741
10	6 42 23.07	2.1458	24 1 25.0	4.853
11	6 44 31.72	2.1425	23 56 30.5	4.963
12	6 46 40.17	2.1392	23 51 29.5	5.072
13	6 48 48.42	2.1358	23 46 21.9	5.180
14	6 50 56.47	2.1324	23 41 7.9	5.288
15	6 53 4.31	2.1289	23 35 47.3	5.397
16	6 55 11.94	2.1255	23 30 20.3	5.503
17	6 57 19.37	2.1221	23 24 46.9	5.610
18	6 59 26.59	2.1186	23 19 7.1	5.716
19	7 1 33.60	2.1150	23 13 21.0	5.820
20	7 3 40.39	2.1114	23 7 28.7	5.924
21	7 5 46.97	2.1079	23 1 30.1	6.028
22	7 7 53.34	2.1043	22 55 25.3	6.132
23	7 9 59.49	2.1008	22 49 14.3	6.233
24	7 12 5.43	2.0972	+22 42 57.3	−6.334

Hour.	Right Ascension.	Var. per Min.	Declination.	V. M.
	FEBRUARY 4.			
	h m s	s	° ′ ″	
0	7 12 5.43	2.0972	+22 42 57.3	−
1	7 14 11.15	2.0934	22 36 34.2	
2	7 16 16.64	2.0898	22 30 5.0	
3	7 18 21.92	2.0862	22 23 29.9	
4	7 20 26.98	2.0824	22 16 48.8	
5	7 22 31.81	2.0788	22 10 1.9	
6	7 24 36.43	2.0751	22 3 9.1	
7	7 26 40.82	2.0713	21 56 10.4	
8	7 28 44.98	2.0676	21 49 6.1	
9	7 30 48.93	2.0639	21 41 55.9	
10	7 32 52.65	2.0601	21 34 40.2	
11	7 34 56.14	2.0563	21 27 18.7	
12	7 36 59.41	2.0527	21 19 51.7	
13	7 39 2.46	2.0489	21 12 19.2	
14	7 41 5.28	2.0451	21 4 41.1	
15	7 43 7.87	2.0413	20 56 57.7	
16	7 45 10.24	2.0376	20 49 8.8	
17	7 47 12.38	2.0338	20 41 14.5	
18	7 49 14.30	2.0302	20 33 15.0	
19	7 51 16.00	2.0264	20 25 10.2	
20	7 53 17.47	2.0227	20 17 0.1	
21	7 55 18.72	2.0189	20 8 44.9	
22	7 57 19.74	2.0152	20 0 24.6	
23	7 59 20.54	2.0115	+19 51 59.2	−
	FEBRUARY 5.			
0	8 1 21.12	2.0078	+19 43 28.8	−
1	8 3 21.47	2.0041	19 34 53.4	
2	8 5 21.61	2.0004	19 26 13.0	
3	8 7 21.52	1.9967	19 17 27.8	
4	8 9 21.21	1.9930	19 8 37.7	
5	8 11 20.68	1.9893	18 59 42.8	
6	8 13 19.93	1.9858	18 50 43.2	
7	8 15 18.97	1.9821	18 41 38.9	
8	8 17 17.78	1.9785	18 32 29.9	
9	8 19 16.39	1.9749	18 23 16.3	
10	8 21 14.77	1.9713	18 13 58.2	
11	8 23 12.95	1.9678	18 4 35.5	
12	8 25 10.91	1.9643	17 55 8.4	
13	8 27 8.66	1.9608	17 45 36.9	
14	8 29 6.20	1.9573	17 36 1.0	
15	8 31 3.53	1.9538	17 26 20.8	
16	8 33 0.65	1.9503	17 16 36.3	
17	8 34 57.57	1.9469	17 6 47.6	
18	8 36 54.28	1.9435	16 56 54.7	
19	8 38 50.79	1.9402	16 46 57.7	
20	8 40 47.10	1.9368	16 36 56.5	1
21	8 42 43.21	1.9335	16 26 51.4	1
22	8 44 39.12	1.9303	16 16 42.2	1
23	8 46 34.84	1.9270	16 6 29.1	1
24	8 48 30.36	1.9238	+15 56 12.1	−1

GREENWICH MEAN TIME.

Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
FEBRUARY 6.					**FEBRUARY 8.**			
h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
3 48 30.36	1.9238	+15 56 12.1	−10.315	0	10 17 50.13	1.8152	+6 41 26.2	−12.508
3 50 25.69	1.9206	15 45 51.3	10.379	1	10 19 39.01	1.8141	6 28 54.9	12.534
3 52 20.83	1.9174	15 35 26.6	10.443	2	10 21 27.82	1.8130	6 16 22.1	12.561
3 54 15.78	1.9143	15 24 58.2	10.504	3	10 23 16.57	1.8121	6 3 47.6	12.588
3 56 10.54	1.9111	15 14 26.1	10.565	4	10 25 5.27	1.8112	5 51 11.6	12.612
3 58 5.11	1.9081	15 3 50.4	10.626	5	10 26 53.91	1.8102	5 38 34.2	12.636
3 59 59.51	1.9051	14 53 11.0	10.687	6	10 28 42.49	1.8093	5 25 55.3	12.660
9 1 53.72	1.9020	14 42 28.0	10.746	7	10 30 31.03	1.8087	5 13 15.0	12.683
9 3 47.75	1.8991	14 31 41.5	10.803	8	10 32 19.53	1.8079	5 0 33.4	12.705
9 5 41.61	1.8962	14 20 51.6	10.861	9	10 34 7.98	1.8073	4 47 50.4	12.727
9 7 35.29	1.8932	14 9 58.2	10.918	10	10 35 56.40	1.8067	4 35 6.2	12.747
9 9 28.79	1.8903	13 59 1.4	10.974	11	10 37 44.78	1.8061	4 22 20.8	12.767
9 11 22.13	1.8876	13 48 1.3	11.029	12	10 39 33.13	1.8056	4 9 34.2	12.786
9 13 15.30	1.8848	13 36 57.9	11.083	13	10 41 21.45	1.8052	3 56 46.5	12.804
9 15 8.30	1.8820	13 25 51.3	11.137	14	10 43 9.75	1.8048	3 43 57.7	12.823
9 17 1.14	1.8793	13 14 41.5	11.189	15	10 44 58.03	1.8044	3 31 7.8	12.839
9 18 53.81	1.8766	13 3 28.6	11.242	16	10 46 46.28	1.8042	3 18 17.0	12.855
9 20 46.33	1.8740	12 52 12.5	11.293	17	10 48 34.53	1.8040	3 5 25.2	12.871
9 22 38.69	1.8714	12 40 53.4	11.343	18	10 50 22.76	1.8038	2 52 32.5	12.886
9 24 30.90	1.8689	12 29 31.3	11.393	19	10 52 10.99	1.8038	2 39 38.9	12.900
9 26 22.96	1.8664	12 18 6.2	11.443	20	10 53 59.22	1.8038	2 26 44.5	12.913
9 28 14.87	1.8639	12 6 38.2	11.491	21	10 55 47.44	1.8038	2 13 49.4	12.925
9 30 6.63	1.8615	11 55 7.3	11.538	22	10 57 35.67	1.8039	2 0 53.5	12.938
9 31 58.25	1.8592	+11 43 33.7	−11.584	23	10 59 23.91	1.8041	+1 47 56.9	−12.949
FEBRUARY 7.					**FEBRUARY 9.**			
9 33 49.73	1.8568	+11 31 57.2	−11.631	0	11 1 12.16	1.8043	+1 34 59.6	−12.959
9 35 41.07	1.8545	11 20 18.0	11.676	1	11 3 0.42	1.8045	1 22 1.8	12.969
9 37 32.27	1.8523	11 8 36.1	11.720	2	11 4 48.70	1.8049	1 9 3.3	12.978
9 39 23.34	1.8501	10 56 51.6	11.763	3	11 6 37.01	1.8053	0 56 4.4	12.986
9 41 14.28	1.8479	10 45 4.5	11.807	4	11 8 25.34	1.8057	0 43 5.0	12.993
9 43 5.09	1.8458	10 33 14.8	11.848	5	11 10 13.69	1.8062	0 30 5.2	13.001
9 44 55.78	1.8438	10 21 22.7	11.890	6	11 12 2.08	1.8068	0 17 4.9	13.007
9 46 46.34	1.8418	10 9 28.0	11.931	7	11 13 50.51	1.8074	+0 4 4.4	13.012
9 48 36.79	1.8398	9 57 31.0	11.970	8	11 15 38.97	1.8081	−0 8 56.5	13.017
9 50 27.12	1.8379	9 45 31.6	12.010	9	11 17 27.48	1.8089	0 21 57.6	13.020
9 52 17.34	1.8360	9 33 29.8	12.048	10	11 19 16.04	1.8097	0 34 58.9	13.023
9 54 7.44	1.8342	9 21 25.8	12.086	11	11 21 4.64	1.8105	0 48 0.3	13.025
9 55 57.44	1.8325	9 9 19.5	12.123	12	11 22 53.30	1.8115	1 1 1.9	13.027
9 57 47.34	1.8308	8 57 11.0	12.159	13	11 24 42.02	1.8125	1 14 3.5	13.028
9 59 37.13	1.8290	8 45 0.4	12.194	14	11 26 30.80	1.8136	1 27 5.2	13.028
0 1 26.82	1.8274	8 32 47.7	12.228	15	11 28 19.65	1.8147	1 40 6.9	13.028
0 3 16.42	1.8259	8 20 33.0	12.263	16	11 30 8.56	1.8158	1 53 8.5	13.026
0 5 5.93	1.8244	8 8 16.2	12.296	17	11 31 57.55	1.8172	2 6 10.0	13.023
0 6 55.35	1.8229	7 55 57.5	12.328	18	11 33 46.62	1.8185	2 19 11.3	13.020
0 8 44.68	1.8214	7 43 36.8	12.361	19	11 35 35.77	1.8198	2 32 12.4	13.017
0 10 33.92	1.8201	7 31 14.2	12.391	20	11 37 25.00	1.8213	2 45 13.3	13.013
0 12 23.09	1.8188	7 18 49.9	12.421	21	11 39 14.32	1.8228	2 58 14.0	13.008
0 14 12.18	1.8175	7 6 23.7	12.451	22	11 41 3.73	1.8243	3 11 14.2	13.001
0 16 1.19	1.8163	6 53 55.8	12.479	23	11 42 53.24	1.8261	3 24 14.1	12.994
0 17 50.13	*1.8152*	*+ 6 41 26.2*	*−12.508*	24	11 44 42.86	1.8278	−3 37 13.5	−12.983

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	FEBRUARY 10.			
	h m s	s	° ′ ″	″
0	11 44 42.86	1.8278	− 3 37 13.5	−12.987
1	11 46 32.58	1.8295	3 50 12.5	12.978
2	11 48 22.40	1.8313	4 3 10.9	12.969
3	11 50 12.33	1.8332	4 16 8.8	12.960
4	11 52 2.38	1.8352	4 29 6.1	12.949
5	11 53 52.55	1.8373	4 42 2.7	12.938
6	11 55 42.85	1.8393	4 54 58.6	12.926
7	11 57 33.26	1.8413	5 7 53.8	12.913
8	11 59 23.81	1.8437	5 20 48.1	12.898
9	12 1 14.50	1.8459	5 33 41.6	12.884
10	12 3 5.32	1.8483	5 46 34.2	12.869
11	12 4 56.29	1.8507	5 59 25.9	12.853
12	12 6 47.40	1.8531	6 12 16.5	12.835
13	12 8 38.66	1.8557	6 25 6.1	12.818
14	12 10 30.08	1.8583	6 37 54.6	12.799
15	12 12 21.66	1.8610	6 50 42.0	12.780
16	12 14 13.40	1.8637	7 3 28.2	12.759
17	12 16 5.30	1.8664	7 16 13.1	12.738
18	12 17 57.37	1.8693	7 28 56.8	12.717
19	12 19 49.62	1.8723	7 41 39.1	12.693
20	12 21 42.05	1.8753	7 54 20.0	12.670
21	12 23 34.66	1.8783	8 6 59.5	12.645
22	12 25 27.45	1.8815	8 19 37.4	12.620
23	12 27 20.44	1.8848	− 8 32 13.9	−12.594
	FEBRUARY 11.			
0	12 29 13.62	1.8880	− 8 44 48.7	−12.567
1	12 31 7.00	1.8913	8 57 21.9	12.539
2	12 33 0.58	1.8947	9 9 53.4	12.510
3	12 34 54.36	1.8982	9 22 23.1	12.480
4	12 36 48.36	1.9017	9 34 51.0	12.450
5	12 38 42.56	1.9053	9 47 17.1	12.418
6	12 40 36.99	1.9089	9 59 41.2	12.386
7	12 42 31.63	1.9126	10 12 3.4	12.353
8	12 44 26.50	1.9164	10 24 23.6	12.319
9	12 46 21.60	1.9203	10 36 41.7	12.283
10	12 48 16.93	1.9242	10 48 57.6	12.248
11	12 50 12.50	1.9282	11 1 11.4	12.212
12	12 52 8.31	1.9322	11 13 23.0	12.174
13	12 54 4.36	1.9363	11 25 32.3	12.134
14	12 56 0.67	1.9405	11 37 39.1	12.094
15	12 57 57.22	1.9447	11 49 43.6	12.054
16	12 59 54.03	1.9491	12 1 45.6	12.013
17	13 1 51.11	1.9534	12 13 45.1	11.971
18	13 3 48.44	1.9578	12 25 42.1	11.928
19	13 5 46.04	1.9623	12 37 36.4	11.882
20	13 7 43.92	1.9668	12 49 27.9	11.837
21	13 9 42.06	1.9714	13 1 16.8	11.791
22	13 11 40.49	1.9762	13 13 2.8	11.743
23	13 13 39.20	1.9808	13 24 45.9	11.694
24	13 15 38.19	1.9856	−13 36 26.1	−11.645

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	FEBRUARY 12.			
	h m s	s	° ′ ″	″
0	13 15 38.19	1.9856	−13 36 26.1	−1
1	13 17 37.47	1.9905	13 48 3.3	1
2	13 19 37.05	1.9954	13 59 37.4	1
3	13 21 36.92	2.0004	14 11 8.5	1
4	13 23 37.10	2.0054	14 22 36.3	1
5	13 25 37.57	2.0105	14 34 0.9	1
6	13 27 38.36	2.0157	14 45 22.2	1
7	13 29 39.45	2.0208	14 56 40.1	1
8	13 31 40.86	2.0262	15 7 54.6	1
9	13 33 42.59	2.0315	15 19 5.5	1
10	13 35 44.64	2.0368	15 30 13.0	1
11	13 37 47.01	2.0423	15 41 16.7	1
12	13 39 49.71	2.0478	15 52 16.8	1
13	13 41 52.74	2.0533	16 3 13.1	1
14	13 43 56.11	2.0589	16 14 5.6	1
15	13 45 59.81	2.0645	16 24 54.2	1
16	13 48 3.85	2.0703	16 35 38.9	1
17	13 50 8.24	2.0760	16 46 19.5	1
18	13 52 12.97	2.0818	16 56 56.0	1
19	13 54 18.06	2.0878	17 7 28.4	1
20	13 56 23.50	2.0936	17 17 56.5	1
21	13 58 29.29	2.0995	17 28 20.3	1
22	14 0 35.44	2.1055	17 38 39.8	1
23	14 2 41.95	2.1115	−17 48 54.8	−1
	FEBRUARY 13.			
0	14 4 48.82	2.1176	−17 59 5.2	−1
1	14 6 56.06	2.1238	18 9 11.1	1
2	14 9 3.67	2.1299	18 19 12.3	
3	14 11 11.65	2.1361	18 29 8.8	
4	14 13 20.00	2.1423	18 39 0.5	
5	14 15 28.73	2.1486	18 48 47.3	
6	14 17 37.83	2.1549	18 58 29.1	
7	14 19 47.32	2.1613	19 8 5.9	
8	14 21 57.19	2.1677	19 17 37.7	
9	14 24 7.44	2.1741	19 27 4.2	
10	14 26 18.08	2.1806	19 36 25.5	
11	14 28 29.11	2.1870	19 45 41.5	
12	14 30 40.52	2.1935	19 54 52.1	
13	14 32 52.33	2.2001	20 3 57.2	
14	14 35 4.53	2.2066	20 12 56.7	
15	14 37 17.12	2.2133	20 21 50.6	
16	14 39 30.12	2.2199	20 30 38.8	
17	14 41 43.51	2.2264	20 39 21.2	
18	14 43 57.29	2.2331	20 47 57.8	
19	14 46 11.48	2.2398	20 56 28.4	
20	14 48 26.07	2.2465	21 4 52.9	
21	14 50 41.06	2.2532	21 13 11.4	
22	14 52 56.45	2.2599	21 21 23.7	
23	14 55 12.25	2.2667	21 29 29.7	
24	14 57 28.45	2.2733	−21 37 29.4	−

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	FEBRUARY 14.			
	h m s	s	° ′ ″	″
0	14 57 28.45	2.2733	−21 37 29.4	−7.942
1	14 59 45.05	2.2801	21 45 22.7	7.834
2	15 2 2.06	2.2868	21 53 9.5	7.725
3	15 4 19.47	2.2935	22 0 49.7	7.614
4	15 6 37.28	2.3003	22 8 23.2	7.503
5	15 8 55.50	2.3070	22 15 50.0	7.390
6	15 11 14.12	2.3137	22 23 10.0	7.276
7	15 13 33.14	2.3203	22 30 23.1	7.160
8	15 15 52.56	2.3271	22 37 29.2	7.043
9	15 18 12.39	2.3338	22 44 28.3	6.925
10	15 20 32.62	2.3405	22 51 20.2	6.805
11	15 22 53.25	2.3472	22 58 4.9	6.684
12	15 25 14.28	2.3538	23 4 42.3	6.562
13	15 27 35.71	2.3605	23 11 12.3	6.438
14	15 29 57.54	2.3671	23 17 34.9	6.314
15	15 32 19.76	2.3737	23 23 50.0	6.188
16	15 34 42.38	2.3802	23 29 57.4	6.059
17	15 37 5.38	2.3867	23 35 57.1	5.930
18	15 39 28.78	2.3933	23 41 49.0	5.801
19	15 41 52.57	2.3997	23 47 33.2	5.669
20	15 44 16.74	2.4061	23 53 9.3	5.536
21	15 46 41.30	2.4124	23 58 37.5	5.403
22	15 49 6.23	2.4188	24 3 57.6	5.268
23	15 51 31.55	2.4251	−24 9 9.6	−5.130
	FEBRUARY 15.			
0	15 53 57.24	2.4313	−24 14 13.2	−4.992
1	15 56 23.30	2.4375	24 19 8.6	4.853
2	15 58 49.74	2.4437	24 23 55.6	4.713
3	16 1 16.54	2.4497	24 28 34.1	4.570
4	16 3 43.70	2.4557	24 33 4.0	4.428
5	16 6 11.22	2.4616	24 37 25.4	4.284
6	16 8 39.09	2.4675	24 41 38.1	4.138
7	16 11 7.32	2.4734	24 45 42.0	3.992
8	16 13 35.90	2.4791	24 49 37.1	3.844
9	16 16 4.81	2.4848	24 53 23.3	3.695
10	16 18 34.07	2.4904	24 57 0.5	3.545
11	16 21 3.66	2.4959	25 0 28.7	3.393
12	16 23 33.58	2.5014	25 3 47.7	3.241
13	16 26 3.83	2.5068	25 6 57.6	3.088
14	16 28 34.39	2.5120	25 9 58.3	2.933
15	16 31 5.27	2.5172	25 12 49.6	2.778
16	16 33 36.45	2.5223	25 15 31.6	2.622
17	16 36 7.95	2.5273	25 18 4.2	2.463
18	16 38 39.73	2.5322	25 20 27.2	2.304
19	16 41 11.81	2.5371	25 22 40.7	2.145
20	16 43 44.18	2.5418	25 24 44.6	1.984
21	16 46 16.82	2.5463	25 26 38.8	1.823
22	16 48 49.74	2.5509	25 28 23.3	1.659
23	16 51 22.93	2.5553	25 29 57.9	1.495
24	*16 53 56.38*	*2.5597*	*−25 31 22.7*	*−1.331*

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	FEBRUARY 16.			
	h m s	s	° ′ ″	″
0	16 53 56.38	2.5597	−25 31 22.7	−1.331
1	16 56 30.09	2.5638	25 32 37.6	1.166
2	16 59 4.04	2.5679	25 33 42.6	1.000
3	17 1 38.24	2.5718	25 34 37.6	0.833
4	17 4 12.66	2.5757	25 35 22.6	0.665
5	17 6 47.32	2.5795	25 35 57.4	0.497
6	17 9 22.20	2.5831	25 36 22.2	0.328
7	17 11 57.29	2.5865	25 36 36.7	−0.157
8	17 14 32.58	2.5899	25 36 41.0	+0.013
9	17 17 8.08	2.5932	25 36 35.1	0.184
10	17 19 43.76	2.5963	25 36 18.9	0.357
11	17 22 19.63	2.5993	25 35 52.3	0.530
12	17 24 55.68	2.6023	25 35 15.3	0.703
13	17 27 31.90	2.6049	25 34 27.9	0.876
14	17 30 8.27	2.6075	25 33 30.2	1.050
15	17 32 44.80	2.6100	25 32 21.9	1.226
16	17 35 21.47	2.6123	25 31 3.1	1.400
17	17 37 58.28	2.6146	25 29 33.9	1.575
18	17 40 35.22	2.6166	25 27 54.1	1.752
19	17 43 12.27	2.6185	25 26 3.7	1.928
20	17 45 49.44	2.6203	25 24 2.8	2.104
21	17 48 26.71	2.6221	25 21 51.2	2.281
22	17 51 4.09	2.6236	25 19 29.1	2.457
23	17 53 41.54	2.6249	−25 16 56.4	+2.634
	FEBRUARY 17.			
0	17 56 19.08	2.6263	−25 14 13.0	+2.812
1	17 58 56.69	2.6274	25 11 19.0	2.989
2	18 1 34.37	2.6283	25 8 14.3	3.168
3	18 4 12.09	2.6292	25 4 58.9	3.345
4	18 6 49.87	2.6300	25 1 32.9	3.522
5	18 9 27.69	2.6305	24 57 56.3	3.699
6	18 12 5.53	2.6309	24 54 9.0	3.878
7	18 14 43.40	2.6313	24 50 11.0	4.055
8	18 17 21.29	2.6315	24 46 2.4	4.232
9	18 19 59.18	2.6315	24 41 43.2	4.409
10	18 22 37.07	2.6314	24 37 13.3	4.586
11	18 25 14.95	2.6313	24 32 32.9	4.763
12	18 27 52.82	2.6309	24 27 41.8	4.939
13	18 30 30.66	2.6304	24 22 40.2	5.115
14	18 33 8.47	2.6298	24 17 28.0	5.292
15	18 35 46.23	2.6290	24 12 5.2	5.467
16	18 38 23.95	2.6283	24 6 32.0	5.641
17	18 41 1.62	2.6273	24 0 48.3	5.816
18	18 43 39.22	2.6260	23 54 54.1	5.989
19	18 46 16.74	2.6248	23 48 49.6	6.163
20	18 48 54.20	2.6235	23 42 34.6	6.336
21	18 51 31.56	2.6220	23 36 9.3	6.508
22	18 54 8.84	2.6204	23 29 33.7	6.678
23	18 56 46.01	2.6187	23 22 47.9	6.849
24	18 59 23.08	2.6168	−23 15 51.8	+7.020

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	FEBRUARY 18.			
	h m s	s	° ′ ″	″
0	18 59 23.08	2.6168	−23 15 51.8	+ 7.020
1	19 2 0.03	2.6149	23 8 45.5	7.189
2	19 4 36.87	2.6129	23 1 29.1	7.358
3	19 7 13.58	2.6107	22 54 2.6	7.525
4	19 9 50.15	2.6084	22 46 26.1	7.692
5	19 12 26.59	2.6061	22 38 39.6	7.858
6	19 15 2.88	2.6036	22 30 43.2	8.023
7	19 17 39.02	2.6011	22 22 36.9	8.187
8	19 20 15.01	2.5984	22 14 20.8	8.350
9	19 22 50.83	2.5956	22 5 54.9	8.513
10	19 25 26.48	2.5928	21 57 19.3	8.673
11	19 28 1.96	2.5898	21 48 34.2	8.832
12	19 30 37.26	2.5868	21 39 39.5	8.991
13	19 33 12.38	2.5837	21 30 35.3	9.148
14	19 35 47.30	2.5804	21 21 21.7	9.304
15	19 38 22.03	2.5773	21 11 58.8	9.459
16	19 40 56.57	2.5739	21 2 26.6	9.613
17	19 43 30.90	2.5704	20 52 45.2	9.766
18	19 46 5.02	2.5670	20 42 54.7	9.917
19	19 48 38.94	2.5634	20 32 55.2	10.066
20	19 51 12.63	2.5598	20 22 46.8	10.215
21	19 53 46.11	2.5561	20 12 29.4	10.362
22	19 56 19.36	2.5523	20 2 3.4	10.507
23	19 58 52.39	2.5485	−19 51 28.6	+10.651
	FEBRUARY 19.			
0	20 1 25.18	2.5446	−19 40 45.3	+10.793
1	20 3 57.74	2.5408	19 29 53.4	10.934
2	20 6 30.07	2.5368	19 18 53.2	11.073
3	20 9 2.15	2.5328	19 7 44.6	11.212
4	20 11 34.00	2.5287	18 56 27.8	11.348
5	20 14 5.59	2.5245	18 45 2.8	11.483
6	20 16 36.94	2.5204	18 33 29.8	11.616
7	20 19 8.04	2.5163	18 21 48.9	11.748
8	20 21 38.89	2.5121	18 10 0.1	11.878
9	20 24 9.49	2.5078	17 58 3.6	12.005
10	20 26 39.82	2.5034	17 45 59.5	12.132
11	20 29 9.90	2.4993	17 33 47.8	12.257
12	20 31 39.73	2.4949	17 21 28.7	12.379
13	20 34 9.29	2.4905	17 9 2.3	12.501
14	20 36 38.59	2.4862	16 56 28.6	12.620
15	20 39 7.63	2.4818	16 43 47.9	12.738
16	20 41 36.41	2.4774	16 31 0.1	12.853
17	20 44 4.92	2.4729	16 18 5.5	12.967
18	20 46 33.16	2.4685	16 5 4.1	13.079
19	20 49 1.14	2.4642	15 51 56.0	13.189
20	20 51 28.86	2.4597	15 38 41.4	13.298
21	20 53 56.30	2.4553	15 25 20.3	13.404
22	20 56 23.49	2.4508	15 11 52.9	13.508
23	20 58 50.40	2.4463	14 58 19.3	13.612
24	21 1 17.05	2.4419	−14 44 39.5	+13.713

Hour.	Right Ascension.	Var. per Min.	Declination.
	FEBRUARY 20.		
	h m s	s	° ′ ″
0	21 1 17.05	2.4419	−14 44 39.5
1	21 3 43.43	2.4375	14 30 53.8
2	21 6 9.55	2.4332	14 17 2.2
3	21 8 35.41	2.4288	14 3 4.9
4	21 11 1.00	2.4243	13 49 2.0
5	21 13 26.33	2.4200	13 34 53.5
6	21 15 51.40	2.4156	13 20 39.7
7	21 18 16.20	2.4113	13 6 20.6
8	21 20 40.75	2.4070	12 51 56.3
9	21 23 5.04	2.4027	12 37 27.1
10	21 25 29.07	2.3984	12 22 52.9
11	21 27 52.85	2.3942	12 8 13.9
12	21 30 16.37	2.3899	11 53 30.3
13	21 32 39.64	2.3858	11 38 42.1
14	21 35 2.66	2.3816	11 23 49.5
15	21 37 25.43	2.3774	11 8 52.5
16	21 39 47.95	2.3734	10 53 51.4
17	21 42 10.24	2.3693	10 38 46.2
18	21 44 32.27	2.3653	10 23 37.1
19	21 46 54.07	2.3614	10 8 24.2
20	21 49 15.64	2.3574	9 53 7.6
21	21 51 36.96	2.3535	9 37 47.4
22	21 53 58.06	2.3497	9 22 23.8
23	21 56 18.92	2.3458	− 9 6 56.8
	FEBRUARY 21.		
0	21 58 39.56	2.3421	− 8 51 26.7
1	22 0 59.97	2.3383	8 35 53.5
2	22 3 20.16	2.3347	8 20 17.3
3	22 5 40.13	2.3311	8 4 38.3
4	22 7 59.89	2.3275	7 48 56.6
5	22 10 19.43	2.3239	7 33 12.3
6	22 12 38.76	2.3204	7 17 25.5
7	22 14 57.88	2.3170	7 1 36.5
8	22 17 16.80	2.3137	6 45 45.1
9	22 19 35.52	2.3104	6 29 51.7
10	22 21 54.05	2.3071	6 13 56.3
11	22 24 12.37	2.3038	5 57 59.1
12	22 26 30.50	2.3007	5 42 0.1
13	22 28 48.45	2.2976	5 25 59.5
14	22 31 6.21	2.2945	5 9 57.4
15	22 33 23.79	2.2915	4 53 53.9
16	22 35 41.19	2.2886	4 37 49.2
17	22 37 58.42	2.2858	4 21 43.3
18	22 40 15.48	2.2830	4 5 36.4
19	22 42 32.38	2.2803	3 49 28.6
20	22 44 49.11	2.2775	3 33 20.0
21	22 47 5.68	2.2748	3 17 10.7
22	22 49 22.09	2.2723	3 1 0.9
23	22 51 38.35	2.2698	2 44 50.6
24	22 53 54.46	2.2673	− 2 28 40.0

GREENWICH MEAN TIME.

Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
FEBRUARY 22.					**FEBRUARY 24.**			
m s	s	° ′ ″	″		h m s	s	° ′ ″	″
53 54.46	2.2673	−2 28 40.0	+16.178	0	0 41 4.80	2.2205	+ 9 59 12.8	+14.359
56 10.43	2.2650	2 12 29.2	16.181	1	0 43 18.04	2.2209	10 13 32.1	14.283
58 26.26	2.2626	1 56 18.3	16.182	2	0 45 31.31	2.2213	10 27 46.8	14.207
0 41.94	2.2603	1 40 7.4	16.180	3	0 47 44.60	2.2218	10 41 56.9	14.129
2 57.50	2.2582	1 23 56.7	16.177	4	0 49 57.92	2.2223	10 56 2.3	14.051
5 12.92	2.2560	1 7 46.2	16.173	5	0 52 11.27	2.2228	11 10 3.0	13.971
7 28.22	2.2539	0 51 36.0	16.166	6	0 54 24.65	2.2233	11 23 58.8	13.888
9 43.39	2.2519	0 35 26.3	16.157	7	0 56 38.07	2.2239	11 37 49.6	13.806
11 58.45	2.2500	0 19 17.2	16.146	8	0 58 51.52	2.2245	11 51 35.5	13.723
14 13.39	2.2480	−0 3 8.8	16.133	9	1 1 5.01	2.2253	12 5 16.4	13.638
16 28.21	2.2462	+0 12 58.8	16.120	10	1 3 18.55	2.2259	12 18 52.1	13.552
18 42.93	2.2444	0 29 5.6	16.103	11	1 5 32.12	2.2266	12 32 22.6	13.464
20 57.54	2.2428	0 45 11.2	16.085	12	1 7 45.74	2,2274	12 45 47.8	13.376
23 12.06	2.2411	1 1 15.8	16.066	13	1 9 59.41	2.2283	12 59 7.7	13.286
25 26.47	2.2395	1 17 19.1	16.044	14	1 12 13.14	2.2292	13 12 22.1	13.195
27 40.80	2.2381	1 33 21.1	16.022	15	1 14 26.91	2.2300	13 25 31.1	13.104
29 55.04	2.2366	1 49 21.7	15.998	16	1 16 40.74	2.2309	13 38 34.6	13.011
32 9.19	2.2352	2 5 20.8	15.970	17	1 18 54.62	2.2318	13 51 32.4	12.916
34 23.26	2.2338	2 21 18.1	15.942	18	1 21 8.56	2.2328	14 4 24.5	12.822
36 37.25	2.2325	2 37 13.8	15.913	19	1 23 22.55	2.2338	14 17 11.0	12.726
38 51.16	2.2313	2 53 7.6	15.881	20	1 25 36.61	2.2348	14 29 51.6	12.628
41 5.01	2.2303	3 8 59.5	15.848	21	1 27 50.73	2.2359	14 42 26.4	12.531
43 18.79	2.2291	3 24 49.3	15.812	22	1 30 4.92	2.2369	14 54 55.3	12.432
45 32.50	2.2280	+3 40 36.9	+15.775	23	1 32 19.16	2.2379	+15 7 18.2	+12.331
FEBRUARY 23.					**FEBRUARY 25.**			
47 46.15	2.2271	+3 56 22.3	+15.738	0	1 34 33.47	2.2391	+15 19 35.0	+12.229
49 59.75	2.2263	4 12 5.4	15.698	1	1 36 47.85	2.2403	15 31 45.7	12.128
52 13.30	2.2253	4 27 46.0	15.655	2	1 39 2.30	2.2414	15 43 50.3	12.025
54 26.79	2.2245	4 43 24.0	15.612	3	1 41 16.82	2.2426	15 55 48.7	11.921
56 40.24	2.2238	4 58 59.4	15.568	4	1 43 31.41	2.2438	16 7 40.8	11.815
58 53.65	2.2232	5 14 32.1	15.522	5	1 45 46.07	2.2449	16 19 26.5	11.709
1 7.02	2.2226	5 30 2.0	15.473	6	1 48 0.80	2.2461	16 31 5.9	11.603
3 20.36	2.2220	5 45 28.9	15.423	7	1 50 15.60	2.2473	16 42 38.9	11.496
5 33.66	2.2215	6 0 52.8	15.373	8	1 52 30.48	2.2486	16 54 5.4	11.387
7 46.94	2.2211	6 16 13.6	15.320	9	1 54 45.43	2.2498	17 5 25.3	11.277
10 0.19	2.2206	6 31 31.2	15.266	10	1 57 0.46	2.2511	17 16 38.6	11.167
12 13.41	2.2203	6 46 45.5	15.210	11	1 59 15.56	2.2523	17 27 45.3	11.057
14 26.62	2.2200	7 1 56.4	15.153	12	2 1 30.73	2.2535	17 38 45.4	10.945
16 39.81	2.2198	7 17 3.9	15.095	13	2 3 45.98	2.2548	17 49 38.7	10.832
18 53.00	2.2197	7 32 7.8	15.035	14	2 6 1.31	2.2562	18 0 25.2	10.718
21 6.17	2.2195	7 47 8.1	14.973	15	2 8 16.72	2.2574	18 11 4.9	10.604
23 19.34	2.2194	8 2 4.6	14.911	16	2 10 32.20	2.2587	18 21 37.7	10.489
25 32.50	2.2193	8 16 57.4	14.847	17	2 12 47.76	2.2600	18 32 3.6	10.373
27 45.66	2.2194	8 31 46.2	14.780	18	2 15 3.40	2.2613	18 42 22.5	10.257
29 58.83	2.2195	8 46 31.0	14.713	19	2 17 19.11	2.2624	18 52 34.4	10.140
32 12.00	2.2196	9 1 11.8	14.646	20	2 19 34.89	2.2638	19 2 39.3	10.023
34 25.18	2.2198	9 15 48.5	14.576	21	2 21 50.76	2.2651	19 12 37.1	9.903
36 38.37	2.2200	9 30 20.9	14.504	22	2 24 6.70	2.2663	19 22 27.7	9.784
38 51.58	2.2203	9 44 49.0	14.433	23	2 26 22.71	2.2675	19 32 11.2	9.665
41 4.80	2.2205	+9 59 12.8	+14.359	24	2 28 38.80	2.2688	+19 41 47.5	+ 9.544

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	FEBRUARY 26.			
	h m s	s	° ′ ″	″
0	2 28 38.80	2.2688	+19 41 47.5	+9.544
1	2 30 54.96	2.2700	19 51 16.5	9.423
2	2 33 11.20	2.2713	20 0 38.2	9.301
3	2 35 27.51	2.2724	20 9 52.6	9.179
4	2 37 43.89	2.2736	20 18 59.7	9.056
5	2 40 0.34	2.2748	20 27 59.3	8.932
6	2 42 16.86	2.2759	20 36 51.5	8.808
7	2 44 33.45	2.2771	20 45 36.3	8.683
8	2 46 50.11	2.2782	20 54 13.5	8.558
9	2 49 6.83	2.2793	21 2 43.3	8.433
10	2 51 23.62	2.2803	21 11 5.4	8.306
11	2 53 40.47	2.2813	21 19 20.0	8.179
12	2 55 57.38	2.2824	21 27 26.9	8.052
13	2 58 14.36	2.2834	21 35 26.2	7.924
14	3 0 31.39	2.2843	21 43 17.8	7.797
15	3 2 48.48	2.2853	21 51 1.8	7.668
16	3 5 5.63	2.2863	21 58 37.9	7.538
17	3 7 22.83	2.2871	22 6 6.4	7.409
18	3 9 40.08	2.2879	22 13 27.0	7.279
19	3 11 57.38	2.2888	22 20 39.9	7.149
20	3 14 14.73	2.2896	22 27 44.9	7.018
21	3 16 32.13	2.2903	22 34 42.1	6.888
22	3 18 49.57	2.2910	22 41 31.4	6.756
23	3 21 7.05	2.2918	+22 48 12.8	+6.625
	FEBRUARY 27.			
0	3 23 24.58	2.2924	+22 54 46.4	+6.493
1	3 25 42.14	2.2930	23 1 12.0	6.361
2	3 27 59.74	2.2935	23 7 29.7	6.228
3	3 30 17.36	2.2940	23 13 39.4	6.096
4	3 32 35.02	2.2945	23 19 41.2	5.963
5	3 34 52.70	2.2949	23 25 34.9	5.829
6	3 37 10.41	2.2953	23 31 20.7	5.696
7	3 39 28.14	2.2957	23 36 58.4	5.563
8	3 41 45.89	2.2960	23 42 28.2	5.428
9	3 44 3.66	2.2963	23 47 49.8	5.294
10	3 46 21.44	2.2964	23 53 3.5	5.161
11	3 48 39.23	2.2965	23 58 9.1	5.025
12	3 50 57.02	2.2966	24 3 6.5	4.890
13	3 53 14.82	2.2968	24 7 55.9	4.757
14	3 55 32.63	2.2968	24 12 37.3	4.623
15	3 57 50.43	2.2968	24 17 10.6	4.487
16	4 0 8.24	2.2967	24 21 35.7	4.352
17	4 2 26.03	2.2964	24 25 52.8	4.218
18	4 4 43.81	2.2963	24 30 1.8	4.083
19	4 7 1.58	2.2960	24 34 2.7	3.948
20	4 9 19.33	2.2956	24 37 55.5	3.812
21	4 11 37.05	2.2953	24 41 40.1	3.677
22	4 13 54.76	2.2949	24 45 16.7	3.542
23	4 16 12.44	2.2944	24 48 45.1	3.406
24	4 18 30.09	2.2939	+24 52 5.4	+3.271

Hour.	Right Ascension.	Var. per Min.	Declination.
	FEBRUARY 28.		
	h m s	s	° ′ ″
0	4 18 30.09	2.2939	+24 52 5.4
1	4 20 47.71	2.2933	24 55 17.6
2	4 23 5.28	2.2926	24 58 21.7
3	4 25 22.82	2.2919	25 1 17.7
4	4 27 40.31	2.2912	25 4 5.6
5	4 29 57.76	2.2903	25 6 45.4
6	4 32 15.15	2.2894	25 9 17.2
7	4 34 32.49	2.2885	25 11 40.8
8	4 36 49.77	2.2875	25 13 56.4
9	4 39 6.99	2.2865	25 16 3.9
10	4 41 24.15	2.2853	25 18 3.4
11	4 43 41.23	2.2841	25 19 54.8
12	4 45 58.24	2.2829	25 21 38.2
13	4 48 15.18	2.2817	25 23 13.6
14	4 50 32.04	2.2803	25 24 40.9
15	4 52 48.81	2.2788	25 26 0.3
16	4 55 5.50	2.2774	25 27 11.7
17	4 57 22.10	2.2759	25 28 15.1
18	4 59 38.61	2.2743	25 29 10.6
19	5 1 55.02	2.2727	25 29 58.2
20	5 4 11.33	2.2709	25 30 37.8
21	5 6 27.53	2.2693	25 31 9.5
22	5 8 43.64	2.2675	25 31 33.4
23	5 10 59.63	2.2655	+25 31 49.3
	MARCH 1.		
0	5 13 15.50	2.2636	+25 31 57.5
1	5 15 31.26	2.2617	25 31 57.8
2	5 17 46.90	2.2596	25 31 50.3
3	5 20 2.41	2.2575	25 31 35.0
4	5 22 17.80	2.2554	25 31 11.9
5	5 24 33.06	2.2532	25 30 41.2
6	5 26 48.18	2.2509	25 30 2.6
7	5 29 3.17	2.2487	25 29 16.4
8	5 31 18.02	2.2463	25 28 22.6
9	5 33 32.72	2.2438	25 27 21.1
10	5 35 47.28	2.2414	25 26 11.9
11	5 38 1.69	2.2389	25 24 55.2
12	5 40 15.95	2.2363	25 23 30.9
13	5 42 30.05	2.2338	25 21 59.1
14	5 44 44.00	2.2311	25 20 19.8
15	5 46 57.78	2.2283	25 18 33.0
16	5 49 11.40	2.2256	25 16 38.7
17	5 51 24.85	2.2228	25 14 37.1
18	5 53 38.13	2.2199	25 12 28.0
19	5 55 51.24	2.2171	25 10 11.6
20	5 58 4.18	2.2142	25 7 47.8
21	6 0 16.94	2.2112	25 5 16.8
22	6 2 29.52	2.2082	25 2 38.5
23	6 4 41.92	2.2051	24 59 52.9
24	6 6 54.13	2.2020	+24 57 0.2

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	MARCH 2.			
	h m s	s	° ′ ″	″
0	6 6 54.13	2.2020	+24 57 0.2	−2.938
1	6 9 6.16	2.1989	24 54 0.3	3.058
2	6 11 18.00	2.1957	24 50 53.3	3.177
3	6 13 29.64	2.1925	24 47 39.1	3.295
4	6 15 41.10	2.1893	24 44 17.9	3.412
5	6 17 52.35	2.1859	24 40 49.7	3.528
6	6 20 3.41	2.1827	24 37 14.5	3.645
7	6 22 14.27	2.1793	24 33 32.3	3.761
8	6 24 24.93	2.1760	24 29 43.2	3.876
9	6 26 35.39	2.1726	24 25 47.2	3.990
10	6 28 45.64	2.1691	24 21 44.4	4.104
11	6 30 55.68	2.1656	24 17 34.7	4.218
12	6 33 5.51	2.1622	24 13 18.3	4.329
13	6 35 15.14	2.1587	24 8 55.2	4.442
14	6 37 24.55	2.1551	24 4 25.3	4.553
15	6 39 33.75	2.1515	23 59 48.8	4.663
16	6 41 42.73	2.1479	23 55 5.8	4.773
17	6 43 51.50	2.1443	23 50 16.1	4.883
18	6 46 0.05	2.1407	23 45 19.9	4.991
19	6 48 8.38	2.1370	23 40 17.2	5.099
20	6 50 16.49	2.1334	23 35 8.0	5.207
21	6 52 24.39	2.1298	23 29 52.4	5.313
22	6 54 32.06	2.1259	23 24 30.5	5.418
23	6 56 39.50	2.1223	+23 19 2.2	−5.524
	MARCH 3.			
0	6 58 46.73	2.1186	+23 13 27.6	−5.628
1	7 0 53.73	2.1148	23 7 46.8	5.733
2	7 3 0.50	2.1110	23 1 59.7	5.836
3	7 5 7.05	2.1073	22 56 6.5	5.938
4	7 7 13.37	2.1034	22 50 7.1	6.040
5	7 9 19.46	2.0997	22 44 1.7	6.141
6	7 11 25.33	2.0958	22 37 50.2	6.241
7	7 13 30.96	2.0920	22 31 32.8	6.341
8	7 15 36.37	2.0883	22 25 9.3	6.441
9	7 17 41.55	2.0845	22 18 39.9	6.538
10	7 19 46.51	2.0807	22 12 4.7	6.636
11	7 21 51.23	2.0768	22 5 23.6	6.733
12	7 23 55.72	2.0729	21 58 36.8	6.828
13	7 25 59.98	2.0692	21 51 44.2	6.924
14	7 28 4.02	2.0653	21 44 45.9	7.018
15	7 30 7.82	2.0615	21 37 42.0	7.113
16	7 32 11.40	2.0577	21 30 32.4	7.206
17	7 34 14.74	2.0538	21 23 17.3	7.298
18	7 36 17.86	2.0501	21 15 56.7	7.389
19	7 38 20.75	2.0463	21 8 30.6	7.481
20	7 40 23.41	2.0424	21 0 59.0	7.571
21	7 42 25.84	2.0386	20 53 22.1	7.660
22	7 44 28.04	2.0348	20 45 39.8	7.749
23	7 46 30.02	2.0312	20 37 52.2	7.838
24	*7 48 31.78*	*2.0274*	*+20 29 59.3*	*−7.925*

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	MARCH 4.			
	h m s	s	° ′ ″	″
0	7 48 31.78	2.0274	+20 29 59.3	− 7.925
1	7 50 33.31	2.0236	20 22 1.2	8.012
2	7 52 34.61	2.0198	20 13 57.9	8.098
3	7 54 35.69	2.0162	20 5 49.5	8.183
4	7 56 36.55	2.0124	19 57 36.0	8.267
5	7 58 37.18	2.0087	19 49 17.5	8.350
6	8 0 37.59	2.0051	19 40 54.0	8.433
7	8 2 37.79	2.0014	19 32 25.5	8.516
8	8 4 37.76	1.9978	19 23 52.1	8.597
9	8 6 37.52	1.9942	19 15 13.9	8.678
10	8 8 37.06	1.9905	19 6 30.8	8.758
11	8 10 36.38	1.9869	18 57 43.0	8.836
12	8 12 35.49	1.9833	18 48 50.5	8.914
13	8 14 34.38	1.9798	18 39 53.3	8.993
14	8 16 33.07	1.9763	18 30 51.4	9.070
15	8 18 31.54	1.9728	18 21 44.9	9.146
16	8 20 29.80	1.9693	18 12 33.9	9.221
17	8 22 27.85	1.9658	18 3 18.4	9.296
18	8 24 25.70	1.9624	17 53 58.4	9.370
19	8 26 23.34	1.9591	17 44 34.0	9.443
20	8 28 20.79	1.9557	17 35 5.3	9.515
21	8 30 18.02	1.9523	17 25 32.2	9.588
22	8 32 15.06	1.9490	17 15 54.8	9.658
23	8 34 11.90	1.9458	+17 6 13.2	− 9.728
	MARCH 5.			
0	8 36 8.55	1.9425	+16 56 27.4	− 9.798
1	8 38 5.00	1.9393	16 46 37.5	9.867
2	8 40 1.26	1.9361	16 36 43.4	9.935
3	8 41 57.33	1.9328	16 26 45.3	10.003
4	8 43 53.20	1.9297	16 16 43.1	10.069
5	8 45 48.89	1.9267	16 6 37.0	10.134
6	8 47 44.40	1.9237	15 56 27.0	10.199
7	8 49 39.73	1.9206	15 46 13.1	10.264
8	8 51 34.87	1.9176	15 35 55.3	10.328
9	8 53 29.84	1.9146	15 25 33.7	10.391
10	8 55 24.62	1.9117	15 15 8.4	10.453
11	8 57 19.24	1.9088	15 4 39.4	10.514
12	8 59 13.68	1.9059	14 54 6.7	10.575
13	9 1 7.95	1.9032	14 43 30.4	10.635
14	9 3 2.06	1.9003	14 32 50.5	10.694
15	9 4 55.99	1.8976	14 22 7.1	10.753
16	9 6 49.77	1.8950	14 11 20.2	10.811
17	9 8 43.39	1.8923	14 0 29.8	10.868
18	9 10 36.84	1.8896	13 49 36.1	10.923
19	9 12 30.14	1.8871	13 38 39.0	10.979
20	9 14 23.29	1.8846	13 27 38.6	11.034
21	9 16 16.29	1.8820	13 16 34.9	11.088
22	9 18 9.13	1.8796	13 5 28.0	11.141
23	9 20 1.84	1.8772	12 54 18.0	11.193
24	9 21 54.39	1.8748	+12 43 4.8	−11.245

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	MARCH 6.			
	h m s	s	° ′ ″	″
0	9 21 54.39	1.8748	+12 43 4.8	−11.246
1	9 23 46.81	1.8725	12 31 48.5	11.298
2	9 25 39.09	1.8702	12 20 29.1	11.348
3	9 27 31.23	1.8679	12 9 6.8	11.397
4	9 29 23.24	1.8658	11 57 41.5	11.447
5	9 31 15.12	1.8636	11 46 13.2	11.495
6	9 33 6.87	1.8614	11 34 42.1	11.542
7	9 34 58.49	1.8594	11 23 8.2	11.588
8	9 36 50.00	1.8574	11 11 31.5	11.635
9	9 38 41.38	1.8554	10 59 52.0	11.680
10	9 40 32.65	1.8535	10 48 9.9	11.724
11	9 42 23.80	1.8516	10 36 25.1	11.768
12	9 44 14.84	1.8498	10 24 37.7	11.812
13	9 46 5.78	1.8481	10 12 47.7	11.854
14	9 47 56.61	1.8463	10 0 55.2	11.896
15	9 49 47.33	1.8446	9 49 0.2	11.938
16	9 51 37.96	1.8430	9 37 2.7	11.978
17	9 53 28.49	1.8414	9 25 2.9	12.017
18	9 55 18.93	1.8399	9 13 0.7	12.055
19	9 57 9.28	1.8383	9 0 56.3	12.093
20	9 58 59.53	1.8369	8 48 49.5	12.131
21	10 0 49.71	1.8356	8 36 40.6	12.167
22	10 2 39.80	1.8342	8 24 29.5	12.203
23	10 4 29.81	1.8329	+ 8 12 16.2	−12.238
	MARCH 7.			
0	10 6 19.75	1.8317	+ 8 0 0.9	−12.273
1	10 8 9.61	1.8305	7 47 43.5	12.307
2	10 9 59.41	1.8293	7 35 24.1	12.340
3	10 11 49.13	1.8283	7 23 2.7	12.372
4	10 13 38.80	1.8273	7 10 39.5	12.403
5	10 15 28.40	1.8263	6 58 14.3	12.434
6	10 17 17.95	1.8253	6 45 47.4	12.463
7	10 19 7.44	1.8244	6 33 18.7	12.493
8	10 20 56.88	1.8237	6 20 48.2	12.522
9	10 22 46.28	1.8229	6 8 16.1	12.549
10	10 24 35.63	1.8222	5 55 42.3	12.577
11	10 26 24.94	1.8215	5 43 6.9	12.603
12	10 28 14.21	1.8208	5 30 30.0	12.628
13	10 30 3.44	1.8203	5 17 51.5	12.653
14	10 31 52.65	1.8198	5 5 11.6	12.677
15	10 33 41.82	1.8193	4 52 30.3	12.701
16	10 35 30.97	1.8190	4 39 47.5	12.724
17	10 37 20.10	1.8187	4 27 3.4	12.745
18	10 39 9.21	1.8183	4 14 18.1	12.766
19	10 40 58.30	1.8182	4 1 31.5	12.787
20	10 42 47.39	1.8180	3 48 43.7	12.807
21	10 44 36.46	1.8178	3 35 54.7	12.825
22	10 46 25.53	1.8178	3 23 4.7	12.843
23	10 48 14.60	1.8178	3 10 13.6	12.860
24	10 50 3.67	1.8178	+ 2 57 21.5	−12.877

Hour.	Right Ascension.	Var. per Min.	Declination.
	MARCH 8.		
	h m s	s	° ′ ″
0	10 50 3.67	1.8178	+2 57 21.5
1	10 51 52.74	1.8179	2 44 28.4
2	10 53 41.82	1.8181	2 31 34.4
3	10 55 30.91	1.8183	2 18 39.5
4	10 57 20.02	1.8186	2 5 43.7
5	10 59 9.14	1.8189	1 52 47.2
6	11 0 58.29	1.8193	1 39 49.9
7	11 2 47.46	1.8197	1 26 51.9
8	11 4 36.65	1.8202	1 13 53.3
9	11 6 25.88	1.8208	1 0 54.1
10	11 8 15.15	1.8214	0 47 54.3
11	11 10 4.45	1.8220	0 34 53.9
12	11 11 53.79	1.8228	0 21 53.2
13	11 13 43.18	1.8236	+0 8 52.0
14	11 15 32.62	1.8244	−0 4 9.6
15	11 17 22.11	1.8253	0 17 11.4
16	11 19 11.66	1.8263	0 30 13.6
17	11 21 1.26	1.8273	0 43 16.0
18	11 22 50.93	1.8284	0 56 18.6
19	11 24 40.67	1.8295	1 9 21.3
20	11 26 30.47	1.8307	1 22 24.1
21	11 28 20.35	1.8319	1 35 26.9
22	11 30 10.30	1.8333	1 48 29.7
23	11 32 0.34	1.8346	−2 1 32.5
	MARCH 9.		
0	11 33 50.45	1.8360	−2 14 35.1
1	11 35 40.66	1.8375	2 27 37.6
2	11 37 30.95	1.8390	2 40 39.9
3	11 39 21.34	1.8407	2 53 41.9
4	11 41 11.83	1.8423	3 6 43.6
5	11 43 2.42	1.8440	3 19 44.9
6	11 44 53.11	1.8458	3 32 45.9
7	11 46 43.91	1.8477	3 45 46.4
8	11 48 34.83	1.8496	3 58 46.3
9	11 50 25.86	1.8515	4 11 45.7
10	11 52 17.01	1.8535	4 24 44.6
11	11 54 8.28	1.8555	4 37 42.7
12	11 55 59.67	1.8576	4 50 40.1
13	11 57 51.19	1.8598	5 3 36.8
14	11 59 42.85	1.8621	5 16 32.6
15	12 1 34.64	1.8644	5 29 27.6
16	12 3 26.58	1.8668	5 42 21.7
17	12 5 18.65	1.8692	5 55 14.8
18	12 7 10.88	1.8717	6 8 6.9
19	12 9 3.25	1.8742	6 20 57.9
20	12 10 55.78	1.8768	6 33 47.8
21	12 12 48.47	1.8794	6 46 36.5
22	12 14 41.31	1.8822	6 59 24.0
23	12 16 34.33	1.8850	7 12 10.2
24	12 18 27.51	1.8878	−7 24 55.0

GREENWICH MEAN TIME.

	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	MARCH 10.			
	h m s	s	° ′ ″	″
	12 18 27.51	1.8878	− 7 24 55.0	−12.735
	12 20 20.86	1.8907	7 37 38.4	12.712
	12 22 14.39	1.8936	7 50 20.4	12.688
	12 24 8.09	1.8966	8 3 0.9	12.663
	12 26 1.98	1.8997	8 15 39.9	12.636
	12 27 56.05	1.9028	8 28 17.2	12.608
	12 29 50.31	1.9059	8 40 52.8	12.579
	12 31 44.76	1.9092	8 53 26.7	12.551
	12 33 39.41	1.9125	9 5 58.9	12.521
	12 35 34.26	1.9158	9 18 29.2	12.488
)	12 37 29.30	1.9192	9 30 57.5	12.457
.	12 39 24.56	1.9227	9 43 24.0	12.424
2	12 41 20.02	1.9262	9 55 48.4	12.389
3	12 43 15.70	1.9298	10 8 10.7	12.355
4	12 45 11.59	1.9333	10 20 31.0	12.319
5	12 47 7.70	1.9370	10 32 49.0	12.282
6	12 49 4.03	1.9408	10 45 4.8	12.243
7	12 51 0.59	1.9446	10 57 18.2	12.204
8	12 52 57.38	1.9484	11 9 29.3	12.165
9	12 54 54.40	1.9523	11 21 38.0	12.124
0	12 56 51.66	1.9563	11 33 44.2	12.082
1	12 58 49.15	1.9603	11 45 47.8	12.039
2	13 0 46.89	1.9643	11 57 48.9	11.996
3	13 2 44.87	1.9684	−12 9 47.3	−11.950
	MARCH 11.			
)	13 4 43.10	1.9726	−12 21 42.9	−11.904
1	13 6 41.58	1.9768	12 33 35.8	11.858
2	13 8 40.32	1.9811	12 45 25.8	11.809
3	13 10 39.31	1.9854	12 57 12.9	11.760
4	13 12 38.57	1.9898	13 8 57.0	11.710
5	13 14 38.08	1.9942	13 20 38.1	11.659
6	13 16 37.87	1.9987	13 32 16.1	11.608
7	13 18 37.92	2.0032	13 43 51.0	11.554
8	13 20 38.25	2.0078	13 55 22.6	11.500
9	13 22 38.85	2.0123	14 6 51.0	11.445
0	13 24 39.73	2.0170	14 18 16.0	11.388
1	13 26 40.89	2.0218	14 29 37.6	11.331
2	13 28 42.34	2.0265	14 40 55.7	11.273
3	13 30 44.07	2.0313	14 52 10.3	11.213
4	13 32 46.09	2.0361	15 3 21.2	11.152
5	13 34 48.40	2.0410	15 14 28.5	11.090
6	13 36 51.01	2.0460	15 25 32.0	11.028
7	13 38 53.92	2.0509	15 36 31.8	10.963
8	13 40 57.12	2.0559	15 47 27.6	10.898
9	13 43 0.63	2.0610	15 58 19.6	10.833
0	13 45 4.44	2.0661	16 9 7.5	10.764
1	13 47 8.56	2.0712	16 19 51.3	10.696
2	13 49 12.98	2.0763	16 30 31.0	10.627
3	13 51 17.72	2.0816	16 41 6.5	10.556
4	*13 53 22.77*	*2.0868*	*−16 51 37.7*	−10.484

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	MARCH 12.			
	h m s	s	° ′ ″	″
0	13 53 22.77	2.0868	−16 51 37.7	−10.484
1	13 55 28.14	2.0922	17 2 4.6	10.411
2	13 57 33.83	2.0974	17 12 27.0	10.337
3	13 59 39.83	2.1028	17 22 45.0	10.263
4	14 1 46.16	2.1082	17 32 58.5	10.186
5	14 3 52.81	2.1136	17 43 7.3	10.108
6	14 5 59.79	2.1191	17 53 11.4	10.029
7	14 8 7.10	2.1245	18 3 10.8	9.949
8	14 10 14.73	2.1300	18 13 5.3	9.868
9	14 12 22.70	2.1355	18 22 55.0	9.787
10	14 14 30.99	2.1410	18 32 39.7	9.703
11	14 16 39.62	2.1467	18 42 19.3	9.618
12	14 18 48.59	2.1523	18 51 53.9	9.533
13	14 20 57.89	2.1579	19 1 23.3	9.446
14	14 23 7.54	2.1636	19 10 47.4	9.358
15	14 25 17.52	2.1692	19 20 6.2	9.268
16	14 27 27.84	2.1748	19 29 19.6	9.178
17	14 29 38.50	2.1805	19 38 27.6	9.087
18	14 31 49.50	2.1863	19 47 30.0	8.993
19	14 34 0.85	2.1920	19 56 26.8	8.899
20	14 36 12.54	2.1978	20 5 17.9	8.804
21	14 38 24.58	2.2035	20 14 3.3	8.708
22	14 40 36.96	2.2092	20 22 42.9	8.611
23	14 42 49.68	2.2149	−20 31 16.6	− 8.512
	MARCH 13.			
0	14 45 2.75	2.2208	−20 39 44.3	− 8.412
1	14 47 16.17	2.2265	20 48 6.0	8.311
2	14 49 29.93	2.2323	20 56 21.6	8.208
3	14 51 44.04	2.2381	21 4 31.0	8.105
4	14 53 58.50	2.2438	21 12 34.2	8.001
5	14 56 13.30	2.2496	21 20 31.1	7.894
6	14 58 28.45	2.2554	21 28 21.5	7.788
7	15 0 43.95	2.2612	21 36 5.6	7.680
8	15 2 59.79	2.2669	21 43 43.1	7.570
9	15 5 15.98	2.2727	21 51 14.0	7.459
10	15 7 32.51	2.2783	21 58 38.2	7.348
11	15 9 49.38	2.2841	22 5 55.7	7.235
12	15 12 6.60	2.2898	22 13 6.4	7.121
13	15 14 24.16	2.2955	22 20 10.2	7.006
14	15 16 42.06	2.3012	22 27 7.1	6.889
15	15 19 0.30	2.3068	22 33 56.9	6.771
16	15 21 18.88	2.3124	22 40 39.6	6.653
17	15 23 37.79	2.3180	22 47 15.2	6.533
18	15 25 57.04	2.3236	22 53 43.5	6.412
19	15 28 16.62	2.3291	23 0 4.6	6.289
20	15 30 36.53	2.3347	23 6 18.2	6.166
21	15 32 56.78	2.3402	23 12 24.5	6.042
22	15 35 17.35	2.3455	23 18 23.2	5.916
23	15 37 38.24	2.3509	23 24 14.4	5.790
24	15 39 59.46	2.3563	−23 29 58.0	− 5.66

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	MARCH 14.			
	h m s	s	° ′ ″	″
0	15 39 59.46	2.3563	−23 29 58.0	−5.663
1	15 42 21.00	2.3617	23 35 33.9	5.533
2	15 44 42.86	2.3670	23 41 1.9	5.403
3	15 47 5.04	2.3723	23 46 22.2	5.272
4	15 49 27.53	2.3774	23 51 34.5	5.139
5	15 51 50.33	2.3825	23 56 38.9	5.007
6	15 54 13.43	2.3876	24 1 35.3	4.873
7	15 56 36.84	2.3927	24 6 23.6	4.737
8	15 59 0.55	2.3977	24 11 3.7	4.600
9	16 1 24.56	2.4026	24 15 35.6	4.463
10	16 3 48.86	2.4074	24 19 59.3	4.325
11	16 6 13.45	2.4123	24 24 14.6	4.186
12	16 8 38.33	2.4170	24 28 21.6	4.046
13	16 11 3.49	2.4217	24 32 20.1	3.904
14	16 13 28.93	2.4263	24 36 10.1	3.762
15	16 15 54.65	2.4308	24 39 51.5	3.619
16	16 18 20.63	2.4353	24 43 24.4	3.475
17	16 20 46.88	2.4397	24 46 48.5	3.329
18	16 23 13.39	2.4440	24 50 3.9	3.184
19	16 25 40.16	2.4483	24 53 10.6	3.038
20	16 28 7.19	2.4524	24 56 8.4	2.890
21	16 30 34.45	2.4565	24 58 57.4	2.742
22	16 33 1.97	2.4606	25 1 37.4	2.592
23	16 35 29.72	2.4644	−25 4 8.4	−2.442
	MARCH 15.			
0	16 37 57.70	2.4683	−25 6 30.4	−2.291
1	16 40 25.91	2.4721	25 8 43.3	2.139
2	16 42 54.35	2.4758	25 10 47.1	1.988
3	16 45 23.00	2.4793	25 12 41.8	1.834
4	16 47 51.86	2.4828	25 14 27.2	1.680
5	16 50 20.93	2.4862	25 16 3.4	1.526
6	16 52 50.20	2.4894	25 17 30.3	1.371
7	16 55 19.66	2.4927	25 18 47.9	1.215
8	16 57 49.32	2.4958	25 19 56.1	1.058
9	17 0 19.16	2.4988	25 20 54.9	0.902
10	17 2 49.17	2.5017	25 21 44.3	0.745
11	17 5 19.36	2.5045	25 22 24.3	0.587
12	17 7 49.71	2.5072	25 22 54.7	0.428
13	17 10 20.22	2.5098	25 23 15.6	0.268
14	17 12 50.89	2.5123	25 23 26.9	−0.108
15	17 15 21.70	2.5147	25 23 28.6	+0.052
16	17 17 52.65	2.5170	25 23 20.7	0.212
17	17 20 23.74	2.5192	25 23 3.2	0.373
18	17 22 54.95	2.5213	25 22 35.9	0.535
19	17 25 26.29	2.5233	25 21 59.0	0.696
20	17 27 57.74	2.5251	25 21 12.4	0.858
21	17 30 29.30	2.5268	25 20 16.0	1.022
22	17 33 0.96	2.5285	25 19 9.8	1.184
23	17 35 32.72	2.5301	25 17 53.9	1.348
24	17 38 4.57	2.5315	−25 16 28.1	+1.511

Hour.	Right Ascension.	Var. per Min.	Declination.	
	MARCH 16.			
	h m s	s	° ′ ″	
0	17 38 4.57	2.5315	−25 16 28.1	+
1	17 40 36.50	2.5328	25 14 52.6	
2	17 43 8.51	2.5340	25 13 7.2	
3	17 45 40.58	2.5351	25 11 12.0	
4	17 48 12.72	2.5362	25 9 7.0	
5	17 50 44.92	2.5370	25 6 52.1	
6	17 53 17.16	2.5378	25 4 27.4	
7	17 55 49.45	2.5385	25 1 52.9	
8	17 58 21.78	2.5390	24 59 8.5	
9	18 0 54.13	2.5394	24 56 14.2	
10	18 3 26.51	2.5398	24 53 10.1	
11	18 5 58.91	2.5401	24 49 56.2	
12	18 8 31.32	2.5402	24 46 32.4	
13	18 11 3.73	2.5402	24 42 58.8	
14	18 13 36.14	2.5401	24 39 15.3	
15	18 16 8.54	2.5398	24 35 22.0	
16	18 18 40.92	2.5396	24 31 18.9	
17	18 21 13.29	2.5392	24 27 6.0	
18	18 23 45.62	2.5387	24 22 43.3	
19	18 26 17.93	2.5381	24 18 10.9	
20	18 28 50.19	2.5373	24 13 28.7	
21	18 31 22.41	2.5366	24 8 36.8	
22	18 33 54.58	2.5357	24 3 35.2	
23	18 36 26.69	2.5347	−23 58 23.8	+
	MARCH 17.			
0	18 38 58.74	2.5336	−23 53 2.8	+
1	18 41 30.72	2.5323	23 47 32.2	
2	18 44 2.62	2.5311	23 41 52.0	
3	18 46 34.45	2.5298	23 36 2.1	
4	18 49 6.19	2.5283	23 30 2.8	
5	18 51 37.84	2.5267	23 23 53.9	
6	18 54 9.39	2.5250	23 17 35.6	
7	18 56 40.84	2.5233	23 11 7.8	
8	18 59 12.19	2.5216	23 4 30.6	
9	19 1 43.43	2.5197	22 57 44.0	
10	19 4 14.55	2.5177	22 50 48.1	
11	19 6 45.55	2.5157	22 43 43.0	
12	19 9 16.43	2.5136	22 36 28.6	
13	19 11 47.18	2.5113	22 29 5.0	
14	19 14 17.79	2.5090	22 21 32.2	
15	19 16 48.26	2.5067	22 13 50.4	
16	19 19 18.59	2.5043	22 5 59.5	
17	19 21 48.78	2.5018	21 57 59.6	
18	19 24 18.81	2.4993	21 49 50.7	
19	19 26 48.69	2.4967	21 41 33.0	
20	19 29 18.41	2.4940	21 33 6.4	
21	19 31 47.97	2.4913	21 24 31.0	
22	19 34 17.37	2.4885	21 15 46.9	
23	19 36 46.59	2.4857	21 6 54.2	
24	19 39 15.65	2.4828	−20 57 52.8	

GREENWICH MEAN TIME.

Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
MARCH 18.					**MARCH 20.**			
h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
19 39 15.65	2.4828	−20 57 52.8	+ 9.094	0	21 34 37.41	2.3233	−11 20 43.1	+14.395
19 41 44.53	2.4799	20 48 42.9	9.236	1	21 36 56.72	2.3203	11 6 17.2	14.468
19 44 13.24	2.4769	20 39 24.5	9.377	2	21 39 15.85	2.3173	10 51 47.0	14.539
19 46 41.76	2.4738	20 29 57.7	9.516	3	21 41 34.80	2.3144	10 37 12.5	14.608
19 49 10.10	2.4708	20 20 22.6	9.655	4	21 43 53.58	2.3116	10 22 34.1	14.674
19 51 38.25	2.4677	20 10 39.1	9.793	5	21 46 12.19	2.3088	10 7 51.6	14.741
19 54 6.22	2.4646	20 0 47.5	9.928	6	21 48 30.63	2.3058	9 53 5.2	14.804
19 56 34.00	2.4613	19 50 47.7	10.064	7	21 50 48.89	2.3031	9 38 15.1	14.865
19 59 1.58	2.4581	19 40 39.8	10.198	8	21 53 7.00	2.3004	9 23 21.4	14.925
20 1 28.97	2.4548	19 30 24.0	10.330	9	21 55 24.94	2.2977	9 8 24.1	14.984
20 3 56.16	2.4516	19 20 0.2	10.462	10	21 57 42.72	2.2951	8 53 23.3	15.041
20 6 23.16	2.4483	19 9 28.6	10.593	11	22 0 0.35	2.2925	8 38 19.2	15.095
20 8 49.95	2.4448	18 58 49.1	10.722	12	22 2 17.82	2.2899	8 23 11.9	15.148
20 11 16.54	2.4416	18 48 2.0	10.849	13	22 4 35.14	2.2875	8 8 1.4	15.200
20 13 42.94	2.4382	18 37 7.2	10.976	14	22 6 52.32	2.2851	7 52 47.9	15.249
20 16 9.12	2.4347	18 26 4.9	11.100	15	22 9 9.35	2.2827	7 37 31.5	15.297
20 18 35.10	2.4313	18 14 55.2	11.224	16	22 11 26.24	2.2803	7 22 12.3	15.343
20 21 0.88	2.4279	18 3 38.0	11.347	17	22 13 42.99	2.2780	7 6 50.4	15.387
20 23 26.45	2.4244	17 52 13.6	11.468	18	22 15 59.60	2.2758	6 51 25.9	15.429
20 25 51.81	2.4209	17 40 41.9	11.588	19	22 18 16.08	2.2737	6 35 58.9	15.470
20 28 16.96	2.4174	17 29 3.1	11.705	20	22 20 32.44	2.2715	6 20 29.5	15.509
20 30 41.90	2.4139	17 17 17.3	11.823	21	22 22 48.66	2.2694	6 4 57.8	15.546
20 33 6.63	2.4104	17 5 24.4	11.938	22	22 25 4.77	2.2674	5 49 24.0	15.581
20 35 31.15	2.4070	−16 53 24.7	+12.052	23	22 27 20.75	2.2653	− 5 33 48.1	+15.614
MARCH 19.					**MARCH 21.**			
20 37 55.47	2.4035	−16 41 18.2	+12.164	0	22 29 36.61	2.2634	− 5 18 10.3	+15.645
20 40 19.57	2.3999	16 29 5.0	12.275	1	22 31 52.36	2.2617	5 2 30.7	15.675
20 42 43.46	2.3965	16 16 45.2	12.385	2	22 34 8.01	2.2599	4 46 49.3	15.703
20 45 7.15	2.3930	16 4 18.8	12.493	3	22 36 23.55	2.2581	4 31 6.3	15.729
20 47 30.62	2.3895	15 51 46.0	12.600	4	22 38 38.98	2.2564	4 15 21.8	15.753
20 49 53.89	2.3860	15 39 6.8	12.705	5	22 40 54.32	2.2548	3 59 35.9	15.776
20 52 16.94	2.3825	15 26 21.4	12.808	6	22 43 9.56	2.2533	3 43 48.7	15.797
20 54 39.79	2.3791	15 13 29.8	12.910	7	22 45 24.71	2.2517	3 28 0.3	15.815
20 57 2.43	2.3757	15 0 32.2	13.010	8	22 47 39.76	2.2503	3 12 10.9	15.833
20 59 24.87	2.3722	14 47 28.6	13.109	9	22 49 54.74	2.2489	2 56 20.4	15.848
21 1 47.09	2.3688	14 34 19.1	13.208	10	22 52 9.63	2.2475	2 40 29.2	15.861
21 4 9.12	2.3654	14 21 3.7	13.303	11	22 54 24.44	2.2462	2 24 37.1	15.873
21 6 30.94	2.3620	14 7 42.8	13.396	12	22 56 39.17	2.2450	2 8 44.4	15.883
21 8 52.56	2.3587	13 54 16.2	13.488	13	22 58 53.84	2.2438	1 52 51.2	15.890
21 11 13.98	2.3553	13 40 44.2	13.579	14	23 1 8.43	2.2428	1 36 57.6	15.897
21 13 35.19	2.3519	13 27 6.7	13.668	15	23 3 22.97	2.2418	1 21 3.6	15.902
21 15 56.21	2.3487	13 13 24.0	13.756	16	23 5 37.44	2.2407	1 5 9.4	15.903
21 18 17.03	2.3454	12 59 36.0	13.843	17	23 7 51.85	2.2398	0 49 15.2	15.904
21 20 37.66	2.3422	12 45 42.9	13.926	18	23 10 6.21	2.2389	0 33 20.9	15.904
21 22 58.09	2.3389	12 31 44.9	14.008	19	23 12 20.52	2.2382	0 17 26.7	15.901
21 25 18.33	2.3358	12 17 41.9	14.089	20	23 14 34.79	2.2374	− 0 1 32.8	15.897
21 27 38.38	2.3327	12 3 34.2	14.168	21	23 16 49.01	2.2366	+ 0 14 20.9	15.891
21 29 58.25	2.3295	11 49 21.7	14.247	22	23 19 3.18	2.2360	0 30 14.1	15.882
21 32 17.92	2.3263	11 35 4.6	14.322	23	23 21 17.33	2.2355	0 46 6.7	15.872
21 34 37.41	2.3233	−11 20 43.1	+14.395	24	23 23 31.44	2.2349	+ 1 1 58.7	+15.860

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	MARCH 22.			
	h m s	s	° ′ ″	″
0	23 23 31.44	2.2349	+ 1 1 58.7	+15.861
1	23 25 45.52	2.2345	1 17 50.0	15.847
2	23 27 59.58	2.2341	1 33 40.3	15.832
3	23 30 13.61	2.2338	1 49 29.8	15.815
4	23 32 27.63	2.2334	2 5 18.1	15.796
5	23 34 41.62	2.2332	2 21 5.3	15.776
6	23 36 55.61	2.2331	2 36 51.2	15.754
7	23 39 9.59	2.2329	2 52 35.8	15.731
8	23 41 23.56	2.2328	3 8 18.9	15.705
9	23 43 37.53	2.2328	3 24 0.4	15.678
10	23 45 51.50	2.2329	3 39 40.2	15.648
11	23 48 5.48	2.2330	3 55 18.2	15.618
12	23 50 19.46	2.2331	4 10 54.3	15.585
13	23 52 33.45	2.2333	4 26 28.4	15.551
14	23 54 47.46	2.2337	4 42 0.4	15.515
15	23 57 1.49	2.2339	4 57 30.2	15.478
16	23 59 15.53	2.2343	5 12 57.7	15.438
17	0 1 29.60	2.2348	5 28 22.8	15.398
18	0 3 43.70	2.2353	5 43 45.4	15.355
19	0 5 57.83	2.2358	5 59 5.4	15.311
20	0 8 11.99	2.2363	6 14 22.7	15.266
21	0 10 26.18	2.2369	6 29 37.3	15.218
22	0 12 40.42	2.2377	6 44 48.9	15.168
23	0 14 54.70	2.2383	+ 6 59 57.5	+15.118
	MARCH 23.			
0	0 17 9.01	2.2390	+ 7 15 3.1	+15.067
1	0 19 23.38	2.2398	7 30 5.5	15.012
2	0 21 37.79	2.2407	7 45 4.5	14.956
3	0 23 52.26	2.2416	8 0 0.2	14.899
4	0 26 6.78	2.2425	8 14 52.4	14.841
5	0 28 21.36	2.2436	8 29 41.1	14.781
6	0 30 36.01	2.2446	8 44 26.1	14.718
7	0 32 50.71	2.2456	8 59 7.3	14.654
8	0 35 5.48	2.2467	9 13 44.6	14.590
9	0 37 20.31	2.2478	9 28 18.1	14.524
10	0 39 35.22	2.2491	9 42 47.5	14.456
11	0 41 50.20	2.2503	9 57 12.8	14.387
12	0 44 5.25	2.2515	10 11 33.9	14.316
13	0 46 20.38	2.2528	10 25 50.7	14.243
14	0 48 35.59	2.2542	10 40 3.1	14.170
15	0 50 50.88	2.2555	10 54 11.1	14.095
16	0 53 6.25	2.2569	11 8 14.5	14.018
17	0 55 21.71	2.2583	11 22 13.2	13.939
18	0 57 37.25	2.2598	11 36 7.2	13.860
19	0 59 52.88	2.2613	11 49 56.4	13.779
20	1 2 8.60	2.2628	12 3 40.7	13.697
21	1 4 24.41	2.2643	12 17 20.0	13.613
22	1 6 40.32	2.2658	12 30 54.2	13.528
23	1 8 56.31	2.2673	12 44 23.3	13.441
24	1 11 12.40	2.2690	+12 57 47.1	+13.353

Hour.	Right Ascension.	Var. per Min.	Declinati
	MARCH 24.		
	h m s	s	° ′
0	1 11 12.40	2.2690	+12 57 4
1	1 13 28.59	2.2707	13 11
2	1 15 44.88	2.2723	13 24 1
3	1 18 1.27	2.2740	13 37 2
4	1 20 17.76	2.2757	13 50 2
5	1 22 34.35	2.2773	14 3 2
6	1 24 51.04	2.2790	14 16 1
7	1 27 7.83	2.2808	14 29
8	1 29 24.73	2.2826	14 41 4
9	1 31 41.74	2.2843	14 54 1
10	1 33 58.85	2.2860	15 6 4
11	1 36 16.06	2.2878	15 19
12	1 38 33.38	2.2896	15 31 1
13	1 40 50.81	2.2914	15 43 2
14	1 43 8.35	2.2932	15 55 2
15	1 45 25.99	2.2949	16 7 2
16	1 47 43.74	2.2968	16 19 1
17	1 50 1.60	2.2986	16 30 5
18	1 52 19.57	2.3003	16 42 3
19	1 54 37.64	2.3021	16 54
20	1 56 55.82	2.3039	17 5 2
21	1 59 14.11	2.3057	17 16 4
22	2 1 32.50	2.3074	17 27 5
23	2 3 51.00	2.3093	+17 38 5
	MARCH 25.		
0	2 6 9.61	2.3110	+17 49 5
1	2 8 28.32	2.3127	18 0 4
2	2 10 47.13	2.3144	18 11 2
3	2 13 6.05	2.3162	18 22
4	2 15 25.07	2.3178	18 32 2
5	2 17 44.18	2.3194	18 42 4
6	2 20 3.40	2.3212	18 53
7	2 22 22.72	2.3228	19 3
8	2 24 42.13	2.3243	19 13
9	2 27 1.64	2.3260	19 23
10	2 29 21.25	2.3276	19 32 4
11	2 31 40.95	2.3291	19 42 2
12	2 34 0.74	2.3306	19 51 4
13	2 36 20.62	2.3321	20 1 1
14	2 38 40.59	2.3335	20 10 2
15	2 41 0.64	2.3349	20 19 3
16	2 43 20.78	2.3363	20 28 2
17	2 45 41.00	2.3377	20 37 1
18	2 48 1.30	2.3390	20 46
19	2 50 21.68	2.3403	20 54 3
20	2 52 42.13	2.3414	21 3
21	2 55 2.65	2.3427	21 11 2
22	2 57 23.25	2.3438	21 19 3
23	2 59 43.91	2.3449	21 27 3
24	3 2 4.64	2.3460	+21 35 3

GREENWICH MEAN TIME.

Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
MARCH 26.					**MARCH 28.**			
h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
3 2 4.64	2.3460	+21 35 32.7	+7.851	0	4 54 49.22	2.3265	+25 12 9.9	+1.146
3 4 25.43	2.3470	21 43 19.7	7.717	1	4 57 8.75	2.3244	25 13 14.5	1.008
3 6 46.28	2.3480	21 50 58.7	7.582	2	4 59 28.15	2.3223	25 14 10.9	0.872
3 9 7.19	2.3489	21 58 29.5	7.446	3	5 1 47.42	2.3201	25 14 59.1	0.734
3 11 28.15	2.3498	22 5 52.2	7.309	4	5 4 6.56	2.3178	25 15 39.0	0.597
3 13 49.16	2.3506	22 13 6.6	7.173	5	5 6 25.56	2.3155	25 16 10.7	0.461
3 16 10.22	2.3514	22 20 12.9	7.037	6	5 8 44.42	2.3131	25 16 34.3	0.325
3 18 31.33	2.3521	22 27 11.0	6.899	7	5 11 3.13	2.3107	25 16 49.7	0.189
3 20 52.47	2.3528	22 34 0.8	6.762	8	5 13 21.70	2.3082	25 16 57.0	+0.054
3 23 13.66	2.3533	22 40 42.4	6.623	9	5 15 40.11	2.3055	25 16 56.2	−0.080
3 25 34.87	2.3538	22 47 15.6	6.484	10	5 17 58.36	2.3029	25 16 47.4	0.214
3 27 56.12	2.3544	22 53 40.5	6.346	11	5 20 16.46	2.3002	25 16 30.5	0.348
3 30 17.40	2.3548	22 59 57.1	6.207	12	5 22 34.38	2.2973	25 16 5.6	0.482
3 32 38.70	2.3552	23 6 5.3	6.068	13	5 24 52.14	2.2946	25 15 32.7	0.614
3 35 0.02	2.3555	23 12 5.2	5.928	14	5 27 9.73	2.2917	25 14 51.9	0.746
3 37 21.36	2.3558	23 17 56.6	5.788	15	5 29 27.14	2.2887	25 14 3.2	0.878
3 39 42.71	2.3560	23 23 39.7	5.648	16	5 31 44.37	2.2857	25 13 6.6	1.009
3 42 4.08	2.3561	23 29 14.4	5.508	17	5 34 1.42	2.2827	25 12 2.1	1.140
3 44 25.44	2.3561	23 34 40.6	5.367	18	5 36 18.29	2.2796	25 10 49.8	1.270
3 46 46.81	2.3562	23 39 58.4	5.226	19	5 38 34.97	2.2763	25 9 29.7	1.399
3 49 8.18	2.3561	23 45 7.7	5.085	20	5 40 51.45	2.2731	25 8 1.9	1.528
3 51 29.54	2.3560	23 50 8.6	4.944	21	5 43 7.74	2.2699	25 6 26.3	1.657
3 53 50.90	2.3558	23 55 1.0	4.803	22	5 45 23.84	2.2666	25 4 43.1	1.784
3 56 12.24	2.3555	+23 59 44.9	+4.662	23	5 47 39.73	2.2632	+25 2 52.2	−1.912
MARCH 27.					**MARCH 29.**			
3 58 33.56	2.3552	+24 4 20.4	+4.521	0	5 49 55.42	2.2598	+25 0 53.7	−2.038
4 0 54.86	2.3548	24 8 47.4	4.378	1	5 52 10.90	2.2563	24 58 47.7	2.163
4 3 16.14	2.3543	24 13 5.8	4.237	2	5 54 26.18	2.2528	24 56 34.1	2.289
4 5 37.38	2.3538	24 17 15.8	4.095	3	5 56 41.24	2.2492	24 54 13.0	2.413
4 7 58.59	2.3533	24 21 17.2	3.953	4	5 58 56.08	2.2456	24 51 44.5	2.538
4 10 19.77	2.3526	24 25 10.2	3.813	5	6 1 10.71	2.2420	24 49 8.5	2.661
4 12 40.90	2.3518	24 28 54.7	3.671	6	6 3 25.12	2.2383	24 46 25.2	2.783
4 15 1.99	2.3510	24 32 30.7	3.528	7	6 5 39.31	2.2346	24 43 34.6	2.905
4 17 23.02	2.3501	24 35 58.1	3.387	8	6 7 53.27	2.2308	24 40 36.6	3.027
4 19 44.00	2.3492	24 39 17.1	3.247	9	6 10 7.00	2.2270	24 37 31.4	3.147
4 22 4.92	2.3482	24 42 27.7	3.105	10	6 12 20.51	2.2232	24 34 19.0	3.267
4 24 25.78	2.3470	24 45 29.7	2.963	11	6 14 33.78	2.2193	24 30 59.4	3.387
4 26 46.56	2.3458	24 48 23.3	2.823	12	6 16 46.83	2.2155	24 27 32.6	3.505
4 29 7.28	2.3447	24 51 8.4	2.682	13	6 18 59.64	2.2115	24 23 58.8	3.623
4 31 27.92	2.3433	24 53 45.1	2.541	14	6 21 12.21	2.2075	24 20 17.9	3.740
4 33 48.48	2.3420	24 56 13.3	2.400	15	6 23 24.54	2.2036	24 16 30.0	3.857
4 36 8.96	2.3405	24 58 33.1	2.260	16	6 25 36.64	2.1996	24 12 35.1	3.972
4 38 29.34	2.3390	25 0 44.5	2.120	17	6 27 48.49	2.1954	24 8 33.4	4.087
4 40 49.64	2.3375	25 2 47.5	1.980	18	6 30 0.09	2.1914	24 4 24.7	4.201
4 43 9.84	2.3358	25 4 42.1	1.840	19	6 32 11.46	2.1873	24 0 9.3	4.314
4 45 29.93	2.3340	25 6 28.3	1.701	20	6 34 22.57	2.1832	23 55 47.0	4.427
4 47 49.92	2.3323	25 8 6.2	1.563	21	6 36 33.44	2.1790	23 51 18.1	4.538
4 50 9.80	2.3304	25 9 35.8	1.423	22	6 38 44.05	2.1748	23 46 42.4	4.651
4 52 29.57	2.3285	25 10 57.0	1.284	23	6 40 54.42	2.1708	23 42 0.0	4.761
4 54 49.22	*2.3265*	*+25 12 9.9*	*+1.146*	24	6 43 4.54	2.1665	+23 37 11.1	−4.870

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	MARCH 30.			
	h m s	s	° ′ ″	″
0	6 43 4.54	2.1665	+23 37 11.1	−4.870
1	6 45 14.40	2.1623	23 32 15.6	4.979
2	6 47 24.01	2.1581	23 27 13.6	5.088
3	6 49 33.37	2.1538	23 22 5.1	5.195
4	6 51 42.47	2.1496	23 16 50.2	5.302
5	6 53 51.32	2.1453	23 11 28.9	5.408
6	6 55 59.90	2.1409	23 6 1.2	5.513
7	6 58 8.23	2.1368	23 0 27.3	5.617
8	7 0 16.31	2.1324	22 54 47.2	5.721
9	7 2 24.12	2.1281	22 49 0.8	5.824
10	7 4 31.68	2.1238	22 43 8.3	5.926
11	7 6 38.98	2.1195	22 37 9.7	6.027
12	7 8 46.02	2.1152	22 31 5.1	6.127
13	7 10 52.80	2.1109	22 24 54.5	6.228
14	7 12 59.33	2.1066	22 18 37.8	6.327
15	7 15 5.59	2.1023	22 12 15.3	6.424
16	7 17 11.60	2.0979	22 5 46.9	6.522
17	7 19 17.34	2.0936	21 59 12.7	6.618
18	7 21 22.83	2.0894	21 52 32.7	6.714
19	7 23 28.07	2.0851	21 45 47.0	6.809
20	7 25 33.04	2.0808	21 38 55.6	6.903
21	7 27 37.76	2.0765	21 31 58.6	6.997
22	7 29 42.22	2.0722	21 24 56.0	7.090
23	7 31 46.42	2.0679	+21 17 47.8	−7.182
	MARCH 31.			
0	7 33 50.37	2.0638	+21 10 34.2	−7.273
1	7 35 54.07	2.0595	21 3 15.1	7.363
2	7 37 57.51	2.0553	20 55 50.6	7.453
3	7 40 0.70	2.0511	20 48 20.8	7.542
4	7 42 3.64	2.0469	20 40 45.6	7.630
5	7 44 6.33	2.0428	20 33 5.2	7.718
6	7 46 8.77	2.0386	20 25 19.5	7.804
7	7 48 10.96	2.0344	20 17 28.7	7.889
8	7 50 12.90	2.0303	20 9 32.8	7.974
9	7 52 14.59	2.0262	20 1 31.8	8.058
10	7 54 16.04	2.0222	19 53 25.8	8.142
11	7 56 17.25	2.0181	19 45 14.8	8.224
12	7 58 18.21	2.0140	19 36 58.9	8.306
13	8 0 18.93	2.0101	19 28 38.1	8.388
14	8 2 19.42	2.0062	19 20 12.4	8.468
15	8 4 19.67	2.0022	19 11 41.9	8.548
16	8 6 19.68	1.9982	19 3 6.7	8.627
17	8 8 19.45	1.9943	18 54 26.7	8.705
18	8 10 19.00	1.9905	18 45 42.1	8.783
19	8 12 18.31	1.9866	18 36 52.8	8.859
20	8 14 17.39	1.9828	18 27 59.0	8.935
21	8 16 16.25	1.9791	18 19 0.6	9.011
22	8 18 14.88	1.9753	18 9 57.7	9.085
23	8 20 13.29	1.9716	18 0 50.4	9.158
24	8 22 11.47	1.9678	+17 51 38.7	−9.232

Hour.	Right Ascension.	Var. per Min.	Declination
	APRIL 1.		
	h m s	s	° ′ ″
0	8 22 11.47	1.9678	+17 51 38
1	8 24 9.43	1.9643	17 42 22
2	8 26 7.18	1.9607	17 33 2
3	8 28 4.71	1.9571	17 23 37
4	8 30 2.03	1.9536	17 14 8
5	8 31 59.14	1.9500	17 4 35
6	8 33 56.03	1.9466	16 54 58
7	8 35 52.73	1.9432	16 45 17
8	8 37 49.21	1.9398	16 35 31
9	8 39 45.50	1.9364	16 25 42
10	8 41 41.58	1.9331	16 15 49
11	8 43 37.47	1.9298	16 5 51
12	8 45 33.16	1.9266	15 55 50
13	8 47 28.66	1.9234	15 45 45
14	8 49 23.97	1.9203	15 35 37
15	8 51 19.10	1.9173	15 25 24
16	8 53 14.04	1.9141	15 15 8
17	8 55 8.79	1.9111	15 4 48
18	8 57 3.37	1.9082	14 54 25
19	8 58 57.77	1.9053	14 43 57
20	9 0 52.00	1.9024	14 33 27
21	9 2 46.06	1.8996	14 22 53
22	9 4 39.95	1.8968	14 12 15
23	9 6 33.67	1.8939	+14 1 34
	APRIL 2.		
0	9 8 27.22	1.8913	+13 50 50
1	9 10 20.62	1.8887	13 40 2
2	9 12 13.86	1.8861	13 29 11
3	9 14 6.95	1.8835	13 18 17
4	9 15 59.88	1.8810	13 7 19
5	9 17 52.67	1.8786	12 56 19
6	9 19 45.31	1.8762	12 45 15
7	9 21 37.81	1.8738	12 34 8
8	9 23 30.16	1.8714	12 22 58
9	9 25 22.38	1.8693	12 11 45
10	9 27 14.47	1.8670	12 0 30
11	9 29 6.42	1.8648	11 49 11
12	9 30 58.25	1.8628	11 37 49
13	9 32 49.95	1.8608	11 26 25
14	9 34 41.54	1.8588	11 14 57
15	9 36 33.00	1.8568	11 3 27
16	9 38 24.35	1.8548	10 51 55
17	9 40 15.58	1.8530	10 40 19
18	9 42 6.71	1.8513	10 28 41
19	9 43 57.73	1.8495	10 17 0
20	9 45 48.65	1.8478	10 5 17
21	9 47 39.47	1.8462	9 53 31
22	9 49 30.19	1.8446	9 41 43
23	9 51 20.82	1.8431	9 29 53
24	9 53 11.36	1.8416	+ 9 17 59

GREENWICH MEAN TIME.

ight nsion.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
APRIL 3.					**APRIL 5.**			
s	s	° ′ ″	″		h m s	s	° ′ ″	″
11.36	1.8416	+9 17 59.9	−11.904	0	11 20 58.82	1.8388	− 0 45 57.0	−12.980
1.81	1.8403	9 6 4.5	11.943	1	11 22 49.19	1.8403	0 58 56.3	12.991
52.19	1.8389	8 54 6.7	11.982	2	11 24 39.65	1.8418	1 11 55.9	12.995
42.48	1.8375	8 42 6.7	12.019	3	11 26 30.20	1.8432	1 24 55.7	12.998
32.69	1.8363	8 30 4.4	12.056	4	11 28 20.83	1.8448	1 37 55.6	13.000
22.84	1.8352	8 18 0.0	12.092	5	11 30 11.57	1.8464	1 50 55.7	13.002
12.91	1.8340	8 5 53.4	12.128	6	11 32 2.40	1.8481	2 3 55.8	13.001
2.92	1.8329	7 53 44.7	12.163	7	11 33 53.34	1.8499	2 16 55.8	13.001
52.86	1.8319	7 41 33.9	12.198	8	11 35 44.39	1.8518	2 29 55.9	13.000
42.75	1.8309	7 29 21.0	12.231	9	11 37 35.55	1.8536	2 42 55.8	12.998
32.57	1.8300	7 17 6.2	12.263	10	11 39 26.82	1.8555	2 55 55.7	12.996
22.35	1.8292	7 4 49.5	12.295	11	11 41 18.21	1.8575	3 8 55.3	12.991
12.07	1.8283	6 52 30.8	12.327	12	11 43 9.72	1.8596	3 21 54.6	12.987
1.75	1.8277	6 40 10.3	12.358	13	11 45 1.36	1.8617	3 34 53.7	12.982
51.39	1.8270	6 27 47.9	12.388	14	11 46 53.12	1.8638	3 47 52.4	12.976
40.99	1.8263	6 15 23.7	12.418	15	11 48 45.02	1.8662	4 0 50.8	12.969
30.55	1.8258	6 2 57.8	12.446	16	11 50 37.06	1.8684	4 13 48.7	12.961
20.08	1.8253	5 50 30.2	12.473	17	11 52 29.23	1.8708	4 26 46.1	12.952
9.58	1.8248	5 38 1.0	12.501	18	11 54 21.55	1.8733	4 39 42.9	12.943
59.06	1.8245	5 25 30.1	12.528	19	11 56 14.02	1.8757	4 52 39.2	12.932
48.52	1.8241	5 12 57.7	12.553	20	11 58 6.63	1.8782	5 5 34.7	12.920
37.95	1.8238	5 0 23.7	12.579	21	11 59 59.40	1.8808	5 18 29.6	12.908
27.37	1.8236	4 47 48.2	12.603	22	12 1 52.33	1.8835	5 31 23.7	12.895
16.78	1.8235	+4 35 11.3	−12.627	23	12 3 45.42	1.8863	− 5 44 17.0	−12.881
APRIL 4.					**APRIL 6.**			
6.19	1.8234	+4 22 33.0	−12.650	0	12 5 38.68	1.8890	− 5 57 9.4	−12.866
55.59	1.8233	4 9 53.3	12.673	1	12 7 32.10	1.8918	6 10 0.9	12.850
44.99	1.8233	3 57 12.3	12.694	2	12 9 25.70	1.8948	6 22 51.4	12.833
34.39	1.8234	3 44 30.0	12.716	3	12 11 19.47	1.8977	6 35 40.8	12.815
23.80	1.8236	3 31 46.4	12.736	4	12 13 13.42	1.9008	6 48 29.2	12.797
13.22	1.8238	3 19 1.7	12.755	5	12 15 7.56	1.9038	7 1 16.4	12.777
2.65	1.8240	3 6 15.8	12.774	6	12 17 1.88	1.9068	7 14 2.4	12.756
52.10	1.8244	2 53 28.8	12.793	7	12 18 56.38	1.9101	7 26 47.1	12.734
41.58	1.8248	2 40 40.7	12.810	8	12 20 51.09	1.9134	7 39 30.5	12.712
31.07	1.8251	2 27 51.6	12.826	9	12 22 45.99	1.9166	7 52 12.5	12.688
20.59	1.8256	2 15 1.6	12.842	10	12 24 41.08	1.9200	8 4 53.1	12.664
10.14	1.8262	2 2 10.6	12.858	11	12 26 36.39	1.9235	8 17 32.2	12.639
59.73	1.8268	1 49 18.7	12.872	12	12 28 31.90	1.9269	8 30 9.8	12.613
49.36	1.8275	1 36 26.0	12.886	13	12 30 27.62	1.9304	8 42 45.7	12.584
39.03	1.8282	1 23 32.4	12.899	14	12 32 23.55	1.9340	8 55 19.9	12.556
28.74	1.8289	1 10 38.1	12.911	15	12 34 19.70	1.9377	9 7 52.4	12.527
18.50	1.8298	0 57 43.1	12.922	16	12 36 16.07	1.9414	9 20 23.1	12.497
8.32	1.8308	0 44 47.5	12.933	17	12 38 12.67	1.9452	9 32 52.0	12.465
58.19	1.8318	0 31 51.2	12.943	18	12 40 9.49	1.9489	9 45 18.9	12.433
48.13	1.8328	0 18 54.3	12.953	19	12 42 6.54	1.9528	9 57 43.9	12.399
38.13	1.8338	+0 5 56.9	12.961	20	12 44 3.82	1.9568	10 10 6.8	12.364
28.19	1.8350	−0 7 1.0	12.968	21	12 46 1.35	1.9608	10 22 27.6	12.328
18.33	1.8363	0 19 59.3	12.975	22	12 47 59.11	1.9647	10 34 46.2	12.292
8.54	1.8374	*0 32 58.0*	*12.981*	23	12 49 57.11	1.9688	10 47 2.6	12.255
58.82	*1.8388*	*−0 45 57.0*	*−12.986*	24	12 51 55.36	1.9729	−10 59 16.8	−12.217

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	APRIL 7.			
	h m s	s	° ′ ″	″
0	12 51 55.36	1.9729	−10 59 16.8	−12.217
1	12 53 53.86	1.9771	11 11 28.6	12.176
2	12 55 52.61	1.9813	11 23 37.9	12.135
3	12 57 51.61	1.9856	11 35 44.8	12.093
4	12 59 50.88	1.9899	11 47 49.1	12.050
5	13 1 50.40	1.9943	11 59 50.8	12.006
6	13 3 50.19	1.9988	12 11 49.8	11.960
7	13 5 50.25	2.0033	12 23 46.0	11.914
8	13 7 50.58	2.0078	12 35 39.5	11.867
9	13 9 51.18	2.0123	12 47 30.0	11.818
10	13 11 52.06	2.0169	12 59 17.6	11.768
11	13 13 53.21	2.0216	13 11 2.2	11.718
12	13 15 54.65	2.0263	13 22 43.7	11.666
13	13 17 56.37	2.0311	13 34 22.1	11.613
14	13 19 58.38	2.0359	13 45 57.2	11.558
15	13 22 0.68	2.0407	13 57 29.0	11.503
16	13 24 3.26	2.0456	14 8 57.5	11.446
17	13 26 6.15	2.0506	14 20 22.5	11.388
18	13 28 9.33	2.0555	14 31 44.1	11.329
19	13 30 12.81	2.0605	14 43 2.0	11.269
20	13 32 16.59	2.0655	14 54 16.4	11.208
21	13 34 20.67	2.0706	15 5 27.0	11.145
22	13 36 25.06	2.0758	15 16 33.8	11.082
23	13 38 29.76	2.0809	−15 27 36.8	−11.018
	APRIL 8.			
0	13 40 34.77	2.0861	−15 38 35.9	−10.952
1	13 42 40.09	2.0913	15 49 31.0	10.884
2	13 44 45.73	2.0966	16 0 22.0	10.815
3	13 46 51.68	2.1018	16 11 8.8	10.746
4	13 48 57.95	2.1072	16 21 51.5	10.675
5	13 51 4.54	2.1125	16 32 29.8	10.603
6	13 53 11.45	2.1179	16 43 3.8	10.529
7	13 55 18.69	2.1233	16 53 33.3	10.455
8	13 57 26.25	2.1288	17 3 58.4	10.379
9	13 59 34.14	2.1342	17 14 18.8	10.303
10	14 1 42.35	2.1396	17 24 34.7	10.224
11	14 3 50.89	2.1452	17 34 45.7	10.144
12	14 5 59.77	2.1507	17 44 52.0	10.064
13	14 8 8.97	2.1562	17 54 53.4	9.982
14	14 10 18.51	2.1618	18 4 49.8	9.898
15	14 12 28.38	2.1673	18 14 41.2	9.814
16	14 14 38.59	2.1729	18 24 27.5	9.728
17	14 16 49.13	2.1784	18 34 8.6	9.641
18	14 19 0.00	2.1841	18 43 44.4	9.553
19	14 21 11.22	2.1898	18 53 15.0	9.464
20	14 23 22.77	2.1953	19 2 40.1	9.373
21	14 25 34.66	2.2010	19 11 59.7	9.281
22	14 27 46.89	2.2067	19 21 13.8	9.188
23	14 29 59.46	2.2123	19 30 22.2	9.093
24	14 32 12.37	2.2180	−19 39 25.0	− 8.998

Hour.	Right Ascension.	Var. per Min.	Declination.
	APRIL 9.		
	h m s	s	° ′ ″
0	14 32 12.37	2.2180	−19 39 25.0
1	14 34 25.62	2.2237	19 48 22.0
2	14 36 39.21	2.2293	19 57 13.1
3	14 38 53.13	2.2348	20 5 58.3
4	14 41 7.39	2.2406	20 14 37.8
5	14 43 22.00	2.2463	20 23 10.6
6	14 45 36.94	2.2518	20 31 37.8
7	14 47 52.22	2.2575	20 39 58.3
8	14 50 7.84	2.2631	20 48 12.7
9	14 52 23.79	2.2687	20 56 20.7
10	14 54 40.08	2.2743	21 4 22.3
11	14 56 56.70	2.2798	21 12 17.4
12	14 59 13.65	2.2853	21 20 5.9
13	15 1 30.94	2.2909	21 27 47.7
14	15 3 48.56	2.2964	21 35 22.8
15	15 6 6.51	2.3018	21 42 51.1
16	15 8 24.78	2.3073	21 50 12.5
17	15 10 43.38	2.3128	21 57 26.9
18	15 13 2.31	2.3182	22 4 34.3
19	15 15 21.56	2.3234	22 11 34.6
20	15 17 41.12	2.3288	22 18 27.7
21	15 20 1.01	2.3341	22 25 13.6
22	15 22 21.21	2.3393	22 31 52.2
23	15 24 41.72	2.3444	−22 38 23.4
	APRIL 10.		
0	15 27 2.54	2.3496	−22 44 47.1
1	15 29 23.67	2.3548	22 51 3.4
2	15 31 45.11	2.3598	22 57 12.0
3	15 34 6.85	2.3648	23 3 13.1
4	15 36 28.89	2.3698	23 9 6.4
5	15 38 51.22	2.3747	23 14 52.0
6	15 41 13.85	2.3796	23 20 29.7
7	15 43 36.77	2.3843	23 25 59.5
8	15 45 59.97	2.3891	23 31 21.4
9	15 48 23.46	2.3938	23 36 35.2
10	15 50 47.23	2.3984	23 41 40.9
11	15 53 11.27	2.4029	23 46 38.6
12	15 55 35.58	2.4074	23 51 28.0
13	15 58 0.16	2.4118	23 56 9.1
14	16 0 25.00	2.4162	24 0 42.0
15	16 2 50.10	2.4204	24 5 6.4
16	16 5 15.45	2.4246	24 9 22.4
17	16 7 41.05	2.4288	24 13 30.0
18	16 10 6.90	2.4328	24 17 29.0
19	16 12 32.99	2.4368	24 21 19.4
20	16 14 59.31	2.4406	24 25 1.1
21	16 17 25.86	2.4443	24 28 34.2
22	16 19 52.63	2.4481	24 31 58.5
23	16 22 19.63	2.4518	24 35 14.1
24	16 24 46.84	2.4553	−24 38 20.9

GREENWICH MEAN TIME.

Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
APRIL 11.					**APRIL 13.**			
h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
16 24 46.84	2.4553	−24 38 20.8	−3.038	0	18 24 45.67	2.5029	−24 5 12.5	+ 4.480
16 27 14.26	2.4587	24 41 18.6	2.889	1	18 27 15.80	2.5014	24 0 39.1	4.635
16 29 41.88	2.4620	24 44 7.5	2.741	2	18 29 45.84	2.4998	23 55 56.3	4.790
16 32 9.70	2.4653	24 46 47.5	2.591	3	18 32 15.77	2.4980	23 51 4.3	4.943
16 34 37.71	2.4684	24 49 18.4	2.440	4	18 34 45.60	2.4963	23 46 3.1	5.097
16 37 5.91	2.4715	24 51 40.3	2.289	5	18 37 15.32	2.4943	23 40 52.7	5.251
16 39 34.29	2.4744	24 53 53.1	2.138	6	18 39 44.92	2.4923	23 35 33.0	5.403
16 42 2.84	2.4773	24 55 56.8	1.985	7	18 42 14.39	2.4902	23 30 4.3	5.554
16 44 31.56	2.4801	24 57 51.3	1.833	8	18 44 43.74	2.4881	23 24 26.5	5.706
16 47 0.45	2.4828	24 59 36.7	1.679	9	18 47 12.96	2.4858	23 18 39.6	5.857
16 49 29.49	2.4853	25 1 12.8	1.524	10	18 49 42.04	2.4835	23 12 43.7	6.007
16 51 58.68	2.4878	25 2 39.6	1.370	11	18 52 10.98	2.4811	23 6 38.8	6.156
16 54 28.02	2.4902	25 3 57.2	1.215	12	18 54 39.77	2.4786	23 0 25.0	6.304
16 56 57.50	2.4924	25 5 5.4	1.059	13	18 57 8.41	2.4761	22 54 2.3	6.453
16 59 27.11	2.4945	25 6 4.3	0.904	14	18 59 36.90	2.4735	22 47 30.7	6.600
17 1 56.84	2.4965	25 6 53.9	0.748	15	19 2 5.23	2.4708	22 40 50.3	6.746
17 4 26.69	2.4985	25 7 34.0	0.590	16	19 4 33.40	2.4681	22 34 1.2	6.891
17 6 56.66	2.5003	25 8 4.7	0.433	17	19 7 1.40	2.4653	22 27 3.4	7.036
17 9 26.73	2.5020	25 8 26.0	0.276	18	19 9 29.23	2.4624	22 19 56.9	7.180
17 11 56.90	2.5036	25 8 37.8	−0.118	19	19 11 56.89	2.4595	22 12 41.8	7.323
17 14 27.16	2.5052	25 8 40.1	+0.040	20	19 14 24.37	2.4565	22 5 18.2	7.464
17 16 57.52	2.5066	25 8 33.0	0.198	21	19 16 51.67	2.4534	21 57 46.1	7.606
17 19 27.95	2.5078	25 8 16.3	0.358	22	19 19 18.78	2.4503	21 50 5.5	7.747
17 21 58.45	2.5089	−25 7 50.1	+0.516	23	19 21 45.71	2.4473	−21 42 16.5	+ 7.886
APRIL 12.					**APRIL 14.**			
17 24 29.02	2.5100	−25 7 14.4	+0.675	0	19 24 12.45	2.4440	−21 34 19.2	+ 8.024
17 26 59.65	2.5109	25 6 29.1	0.833	1	19 26 38.99	2.4408	21 26 13.6	8.163
17 29 30.33	2.5118	25 5 34.4	0.993	2	19 29 5.34	2.4375	21 17 59.8	8.298
17 32 1.06	2.5125	25 4 30.0	1.153	3	19 31 31.49	2.4342	21 9 37.9	8.433
17 34 31.83	2.5131	25 3 16.1	1.312	4	19 33 57.44	2.4308	21 1 7.9	8.568
17 37 2.63	2.5136	25 1 52.6	1.472	5	19 36 23.19	2.4274	20 52 29.8	8.701
17 39 33.46	2.5140	25 0 19.5	1.632	6	19 38 48.73	2.4239	20 43 43.8	8.833
17 42 4.31	2.5143	24 58 36.8	1.791	7	19 41 14.06	2.4204	20 34 49.8	8.965
17 44 35.18	2.5145	24 56 44.6	1.951	8	19 43 39.18	2.4169	20 25 48.0	9.095
17 47 6.05	2.5145	24 54 42.7	2.111	9	19 46 4.09	2.4134	20 16 38.4	9.225
17 49 36.92	2.5145	24 52 31.3	2.270	10	19 48 28.79	2.4099	20 7 21.0	9.353
17 52 7.79	2.5144	24 50 10.3	2.430	11	19 50 53.28	2.4063	19 57 56.0	9.480
17 54 38.65	2.5142	24 47 39.7	2.589	12	19 53 17.55	2.4027	19 48 23.4	9.606
17 57 9 49	2.5138	24 44 59.6	2.748	13	19 55 41.60	2.3990	19 38 43.3	9.730
17 59 40.30	2.5133	24 42 10.0	2.906	14	19 58 5.43	2.3954	19 28 55.8	9.854
18 2 11.08	2.5127	24 39 10.9	3.065	15	20 0 29.05	2.3918	19 19 0.8	9.977
18 4 41.82	2.5120	24 36 2.2	3.223	16	20 2 52.44	2.3880	19 8 58.6	10.098
18 7 12.52	2.5113	24 32 44.1	3.382	17	20 5 15.61	2.3843	18 58 49.1	10.218
18 9 43.17	2.5103	24 29 16.4	3.540	18	20 7 38.55	2.3806	18 48 32.5	10.336
18 12 13.76	2.5093	24 25 39.3	3.697	19	20 10 1.28	2.3769	18 38 8.8	10.453
18 14 44.29	2.5083	24 21 52.8	3.854	20	20 12 23.78	2.3731	18 27 38.1	10.570
18 17 14.75	2.5071	24 17 56.8	4.012	21	20 14 46.05	2.3694	18 17 0.4	10.686
18 19 45.14	2.5058	24 13 51.4	4.168	22	20 17 8.11	2.3658	18 6 15.8	10.799
18 22 15.45	2.5044	24 9 36.7	4.324	23	20 19 29.94	2.3619	17 55 24.5	10.912
18 24 45.67	*2.5029*	*−24 5 12.5*	*+4.480*	24	20 21 51.54	2.3582	−17 44 26.4	+11.022

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	APRIL 15.			
	h m s	s	° ′ ″	″
0	20 21 51.54	2.3582	−17 44 26.4	+11.023
1	20 24 12.92	2.3545	17 33 21.7	11.133
2	20 26 34.08	2.3508	17 22 10.4	11.242
3	20 28 55.02	2.3471	17 10 52.7	11.349
4	20 31 15.73	2.3433	16 59 28.5	11.456
5	20 33 36.22	2.3397	16 47 58.0	11.561
6	20 35 56.49	2.3360	16 36 21.2	11.664
7	20 38 16.54	2.3323	16 24 38.3	11.767
8	20 40 36.36	2.3286	16 12 49.2	11.868
9	20 42 55.97	2.3251	16 0 54.2	11.967
10	20 45 15.37	2.3214	15 48 53.2	12.066
11	20 47 34.54	2.3177	15 36 46.3	12.163
12	20 49 53.49	2.3142	15 24 33.7	12.258
13	20 52 12.24	2.3107	15 12 15.4	12.352
14	20 54 30.77	2.3071	14 59 51.5	12.444
15	20 56 49.09	2.3036	14 47 22.1	12.536
16	20 59 7.20	2.3002	14 34 47.2	12.627
17	21 1 25.11	2.2968	14 22 6.9	12.715
18	21 3 42.81	2.2933	14 9 21.4	12.802
19	21 6 0.31	2.2899	13 56 30.7	12.888
20	21 8 17.60	2.2865	13 43 34.9	12.973
21	21 10 34.69	2.2833	13 30 34.0	13.056
22	21 12 51.59	2.2800	13 17 28.2	13.137
23	21 15 8.29	2.2767	−13 4 17.6	+13.218
	APRIL 16.			
0	21 17 24.79	2.2735	−12 51 2.1	+13.297
1	21 19 41.11	2.2703	12 37 42.0	13.373
2	21 21 57.23	2.2672	12 24 17.3	13.449
3	21 24 13.17	2.2642	12 10 48.1	13.523
4	21 26 28.93	2.2612	11 57 14.5	13.597
5	21 28 44.51	2.2582	11 43 36.5	13.668
6	21 30 59.91	2.2553	11 29 54.3	13.738
7	21 33 15.14	2.2523	11 16 7.9	13.807
8	21 35 30.19	2.2494	11 2 17.5	13.874
9	21 37 45.07	2.2467	10 48 23.0	13.940
10	21 39 59.79	2.2439	10 34 24.7	14.004
11	21 42 14.34	2.2413	10 20 22.5	14.068
12	21 44 28.74	2.2386	10 6 16.6	14.128
13	21 46 42.97	2.2359	9 52 7.1	14.188
14	21 48 57.05	2.2334	9 37 54.1	14.246
15	21 51 10.98	2.2310	9 23 37.6	14.303
16	21 53 24.77	2.2285	9 9 17.7	14.358
17	21 55 38.40	2.2261	8 54 54.6	14.413
18	21 57 51.90	2.2238	8 40 28.2	14.465
19	22 0 5.26	2.2215	8 25 58.8	14.515
20	22 2 18.48	2.2193	8 11 26.4	14.565
21	22 4 31.57	2.2172	7 56 51.0	14.613
22	22 6 44.54	2.2151	7 42 12.8	14.659
23	22 8 57.38	2.2130	7 27 31.9	14.704
24	22 11 10.10	2.2111	− 7 12 48.3	+14.748

Hour.	Right Ascension.	Var. per Min.	Declinatio
	APRIL 17.		
	h m s	s	° ′
0	22 11 10.10	2.2111	−7 12 48
1	22 13 22.71	2.2092	6 58 2
2	22 15 35.20	2.2073	6 43 13
3	22 17 47.58	2.2055	6 28 22
4	22 19 59.86	2.2038	6 13 29
5	22 22 12.03	2.2021	5 58 34
6	22 24 24.11	2.2005	5 43 36
7	22 26 36.09	2.1989	5 28 36
8	22 28 47.98	2.1974	5 13 35
9	22 30 59.78	2.1959	4 58 32
10	22 33 11.49	2.1946	4 43 27
11	22 35 23.13	2.1933	4 28 20
12	22 37 34.69	2.1921	4 13 12
13	22 39 46.18	2.1910	3 58 2
14	22 41 57.61	2.1898	3 42 51
15	22 44 8.96	2.1888	3 27 39
16	22 46 20.26	2.1878	3 12 25
17	22 48 31.50	2.1869	2 57 11
18	22 50 42.69	2.1861	2 41 55
19	22 52 53.83	2.1853	2 26 39
20	22 55 4.92	2.1846	2 11 21
21	22 57 15.98	2.1839	1 56 3
22	22 59 26.99	2.1833	1 40 45
23	23 1 37.97	2.1828	−1 25 25
	APRIL 18.		
0	23 3 48.93	2.1824	−1 10 6
1	23 5 59.86	2.1819	0 54 46
2	23 8 10.76	2.1816	0 39 26
3	23 10 21.65	2.1814	0 24 5
4	23 12 32.53	2.1812	−0 8 45
5	23 14 43.39	2.1810	+0 6 35
6	23 16 54.25	2.1810	0 21 55
7	23 19 5.11	2.1809	0 37 15
8	23 21 15.96	2.1810	0 52 35
9	23 23 26.83	2.1812	1 7 54
10	23 25 37.70	2.1813	1 23 13
11	23 27 48.58	2.1815	1 38 31
12	23 29 59.48	2.1818	1 53 49
13	23 32 10.40	2.1823	2 9
14	23 34 21.35	2.1827	2 24 2
15	23 36 32.32	2.1831	2 39 3
16	23 38 43.32	2.1837	2 54 5
17	23 40 54.36	2.1843	3 10
18	23 43 5.44	2.1850	3 25 1
19	23 45 16.56	2.1858	3 40 2
20	23 47 27.73	2.1865	3 55 3
21	23 49 38.94	2.1873	4 10 4
22	23 51 50.21	2.1883	4 25 4
23	23 54 1.54	2.1893	4 40 5
24	23 56 12.92	2.1903	+4 55 5

GREENWICH MEAN TIME.

ght sion.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
APRIL 19.				**APRIL 21.**				
s	s	° ′ ″	″		h m s	s	° ′ ″	″
12.92	2.1903	+ 4 55 54.3	+15.023	0	1 43 24.59	2.2891	+15 53 0.9	+11.803
24.37	2.1913	5 10 54.7	14.989	1	1 45 42.02	2.2918	16 4 46.1	11.703
35.88	2.1924	5 25 53.0	14.955	2	1 47 59.60	2.2943	16 16 25.2	11.600
47.46	2.1937	5 40 49.3	14.920	3	1 50 17.34	2.2969	16 27 58.1	11.497
59.12	2.1949	5 55 43.4	14.883	4	1 52 35.23	2.2996	16 39 24.8	11.393
10.85	2.1962	6 10 35.3	14.846	5	1 54 53.29	2.3023	16 50 45.2	11.287
22.66	2.1976	6 25 24.9	14.805	6	1 57 11.50	2.3048	17 1 59.2	11.180
34.56	2.1990	6 40 11.9	14.763	7	1 59 29.86	2.3073	17 13 6.8	11.072
46.54	2.2003	6 54 56.5	14.721	8	2 1 48.38	2.3100	17 24 7.8	10.963
58.60	2.2018	7 9 38.4	14.677	9	2 4 7.06	2.3126	17 35 2.3	10.853
10.76	2.2035	7 24 17.7	14.631	10	2 6 25.89	2.3151	17 45 50.1	10.741
23.02	2.2051	7 38 54.1	14.583	11	2 8 44.87	2.3176	17 56 31.2	10.628
35.37	2.2067	7 53 27.6	14.533	12	2 11 4.00	2.3201	18 7 5.5	10.514
47.82	2.2084	8 7 58.1	14.483	13	2 13 23.28	2.3227	18 17 32.9	10.400
0.38	2.2102	8 22 25.6	14.432	14	2 15 42.72	2.3252	18 27 53.5	10.284
13.04	2.2119	8 36 49.9	14.378	15	2 18 2.30	2.3276	18 38 7.0	10.167
25.81	2.2138	8 51 10.9	14.323	16	2 20 22.03	2.3300	18 48 13.5	10.049
38.69	2.2157	9 5 28.6	14.267	17	2 22 41.90	2.3323	18 58 12.9	9.930
51.69	2.2176	9 19 42.9	14.208	18	2 25 1.91	2.3348	19 8 5.1	9.810
4.80	2.2195	9 33 53.6	14.148	19	2 27 22.07	2.3372	19 17 50.1	9.689
18.03	2.2216	9 48 0.7	14.088	20	2 29 42.37	2.3395	19 27 27.8	9.568
31.39	2.2236	10 2 4.1	14.025	21	2 32 2.81	2.3418	19 36 58.2	9.445
44.86	2.2257	10 16 3.7	13.961	22	2 34 23.38	2.3439	19 46 21.2	9.321
58.47	2.2278	+10 29 59.4	+13.895	23	2 36 44.08	2.3462	+19 55 36.7	+ 9.196
APRIL 20.				**APRIL 22.**				
12.20	2.2299	+10 43 51.1	+13.828	0	2 39 4.92	2.3484	+20 4 44.7	+ 9.070
26.06	2.2321	10 57 38.8	13.760	1	2 41 25.89	2.3505	20 13 45.1	8.944
40.05	2.2343	11 11 22.3	13.690	2	2 43 46.98	2.3526	20 22 38.0	8.817
54.18	2.2367	11 25 1.6	13.619	3	2 46 8.20	2.3547	20 31 23.1	8.688
8.45	2.2389	11 38 36.6	13.547	4	2 48 29.54	2.3567	20 40 0.6	8.560
22.85	2.2412	11 52 7.2	13.473	5	2 50 51.00	2.3587	20 48 30.3	8.430
37.39	2.2436	12 5 33.3	13.398	6	2 53 12.58	2.3605	20 56 52.2	8.299
52.08	2.2459	12 18 54.9	13.320	7	2 55 34.26	2.3623	21 5 6.2	8.168
6.90	2.2483	12 32 11.7	13.242	8	2 57 56.06	2.3642	21 13 12.3	8.036
21.87	2.2508	12 45 23.9	13.163	9	3 0 17.96	2.3659	21 21 10.5	7.903
36.99	2.2533	12 58 31.2	13.081	10	3 2 39.97	2.3676	21 29 0.7	7.770
52.26	2.2557	13 11 33.6	12.998	11	3 5 2.07	2.3692	21 36 42.9	7.636
7.67	2.2582	13 24 31.0	12.914	12	3 7 24.27	2.3708	21 44 17.0	7.501
23.24	2.2607	13 37 23.3	12.829	13	3 9 46.57	2.3724	21 51 43.0	7.366
38.95	2.2632	13 50 10.5	12.743	14	3 12 8.96	2.3738	21 59 0.9	7.229
54.82	2.2658	14 2 52.4	12.654	15	3 14 31.43	2.3753	22 6 10.5	7.093
10.84	2.2683	14 15 29.0	12.565	16	3 16 53.99	2.3766	22 13 12.0	6.956
27.02	2.2709	14 28 0.2	12.475	17	3 19 16.62	2.3778	22 20 5.2	6.818
43.35	2.2734	14 40 26.0	12.383	18	3 21 39.33	2.3791	22 26 50.1	6.679
59.83	2.2760	14 52 46.1	12.289	19	3 24 2.11	2.3802	22 33 26.7	6.541
16.47	2.2787	15 5 0.7	12.195	20	3 26 24.95	2.3813	22 39 55.0	6.402
33.27	2.2813	15 17 9.5	12.098	21	3 28 47.86	2.3823	22 46 14.9	6.262
50.22	2.2838	15 29 12.5	12.002	22	3 31 10.82	2.3832	22 52 26.4	6.121
7.33	2.2864	15 41 9.7	11.903	23	3 33 33.84	2.3840	22 58 29.A	5.981
24.59	*2.2891*	*+15 53 0.9*	*+11.803*	24	3 35 56.90	2.3848	+23 4 24.1	+ 5.840

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	APRIL 23.			
	h m s	s	° ′ ″	″
0	3 35 56.90	2.3848	+23 4 24.1	+5.840
1	3 38 20.01	2.3855	23 10 10.2	5.698
2	3 40 43.16	2.3862	23 15 47.9	5.557
3	3 43 6.35	2.3868	23 21 17.0	5.414
4	3 45 29.57	2.3872	23 26 37.6	5.272
5	3 47 52.81	2.3875	23 31 49.6	5.129
6	3 50 16.07	2.3878	23 36 53.1	4.987
7	3 52 39.35	2.3882	23 41 48.0	4.843
8	3 55 2.65	2.3883	23 46 34.2	4.699
9	3 57 25.95	2.3883	23 51 11.9	4.556
10	3 59 49.25	2.3883	23 55 40.9	4.412
11	4 2 12.55	2.3883	24 0 1.3	4.268
12	4 4 35.84	2.3881	24 4 13.1	4.124
13	4 6 59.12	2.3878	24 8 16.2	3.980
14	4 9 22.38	2.3875	24 12 10.7	3.835
15	4 11 45.62	2.3871	24 15 56.4	3.691
16	4 14 8.83	2.3865	24 19 33.6	3.547
17	4 16 32.00	2.3859	24 23 2.0	3.402
18	4 18 55.14	2.3853	24 26 21.8	3.258
19	4 21 18.23	2.3845	24 29 32.9	3.113
20	4 23 41.28	2.3837	24 32 35.4	2.969
21	4 26 4.27	2.3827	24 35 29.2	2.825
22	4 28 27.20	2.3817	24 38 14.4	2.681
23	4 30 50.07	2.3806	+24 40 50.9	+2.537
	APRIL 24.			
0	4 33 12.87	2.3793	+24 43 18.8	+2.393
1	4 35 35.59	2.3781	24 45 38.0	2.248
2	4 37 58.24	2.3768	24 47 48.6	2.105
3	4 40 20.80	2.3752	24 49 50.6	1.962
4	4 42 43.26	2.3737	24 51 44.0	1.819
5	4 45 5.64	2.3721	24 53 28.9	1.676
6	4 47 27.91	2.3703	24 55 5.1	1.533
7	4 49 50.08	2.3685	24 56 32.8	1.391
8	4 52 12.13	2.3666	24 57 52.0	1.248
9	4 54 34.07	2.3647	24 59 2.6	1.106
10	4 56 55.89	2.3627	25 0 4.7	0.965
11	4 59 17.59	2.3605	25 0 58.4	0.823
12	5 1 39.15	2.3583	25 1 43.5	0.682
13	5 4 0.58	2.3560	25 2 20.2	0.542
14	5 6 21.87	2.3536	25 2 48.5	0.403
15	5 8 43.01	2.3512	25 3 8.5	0.263
16	5 11 4.01	2.3487	25 3 20.0	+0.123
17	5 13 24.85	2.3460	25 3 23.2	−0.015
18	5 15 45.53	2.3433	25 3 18.2	0.153
19	5 18 6.05	2.3406	25 3 4.8	0.292
20	5 20 26.40	2.3378	25 2 43.2	0.429
21	5 22 46.58	2.3348	25 2 13.3	0.566
22	5 25 6.58	2.3318	25 1 35.3	0.702
23	5 27 26.40	2.3288	25 0 49.1	0.838
24	5 29 46.03	2.3256	+24 59 54.8	−0.973

Hour.	Right Ascension.	Var. per Min.	Declinatio
	APRIL 25.		
	h m s	s	° ′
0	5 29 46.03	2.3256	+24 59 5
1	5 32 5.47	2.3224	24 58 5
2	5 34 24.72	2.3192	24 57 4
3	5 36 43.77	2.3158	24 56 2
4	5 39 2.62	2.3124	24 54 5
5	5 41 21.26	2.3090	24 53 2
6	5 43 39.70	2.3055	24 51 4
7	5 45 57.92	2.3018	24 49 5
8	5 48 15.92	2.2982	24 47 5
9	5 50 33.70	2.2945	24 45 4
10	5 52 51.26	2.2908	24 43 3
11	5 55 8.60	2.2870	24 41 1
12	5 57 25.70	2.2831	24 38 4
13	5 59 42.57	2.2792	24 36 6
14	6 1 59.20	2.2752	24 33 2
15	6 4 15.59	2.2712	24 30 3
16	6 6 31.74	2.2671	24 27 3
17	6 8 47.64	2.2629	24 24 2
18	6 11 3.29	2.2588	24 21 1
19	6 13 18.69	2.2546	24 17 5
20	6 15 33.84	2.2503	24 14 2
21	6 17 48.73	2.2461	24 10 4
22	6 20 3.37	2.2418	24 7 2
23	6 22 17.74	2.2373	+24 3 1
	APRIL 26.		
0	6 24 31.85	2.2329	+23 59 1
1	6 26 45.69	2.2285	23 55 1
2	6 28 59.27	2.2241	23 50 5
3	6 31 12.58	2.2195	23 46 4
4	6 33 25.61	2.2150	23 42 1
5	6 35 38.38	2.2105	23 37 4
6	6 37 50.87	2.2058	23 33 5
7	6 40 3.08	2.2013	23 28 1
8	6 42 15.02	2.1966	23 23 2
9	6 44 26.67	2.1919	23 18 2
10	6 46 38.05	2.1873	23 13 2
11	6 48 49.15	2.1826	23 8 1
12	6 50 59.96	2.1778	23 2 5
13	6 53 10.49	2.1732	22 57 2
14	6 55 20.74	2.1685	22 51 5
15	6 57 30.71	2.1638	22 46 1
16	6 59 40.39	2.1589	22 40 3
17	7 1 49.78	2.1542	22 34 4
18	7 3 58.89	2.1494	22 28 4
19	7 6 7.71	2.1447	22 22 4
20	7 8 16.25	2.1399	22 16 3
21	7 10 24.50	2.1351	22 10 1
22	7 12 32.46	2.1303	22 3 5
23	7 14 40.14	2.1255	21 57 3
24	7 16 47.52	2.1207	+21 50 5

GREENWICH MEAN TIME.

Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
APRIL 27.				APRIL 29.				
h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
7 16 47.52	2.1207	+21 50 59.7	− 6.593	0	8 53 24.53	1.9168	+14 58 14.8	−10.295
7 18 54.62	2.1159	21 44 21.2	6.689	1	8 55 19.43	1.9133	14 47 55.3	10.353
7 21 1.43	2.1112	21 37 37.0	6.785	2	8 57 14.13	1.9101	14 37 32.4	10.410
7 23 7.96	2.1064	21 30 47.0	6.880	3	8 59 8.64	1.9069	14 27 6.1	10.467
7 25 14.20	2.1017	21 23 51.4	6.973	4	9 1 2.96	1.9037	14 16 36.4	10.523
7 27 20.16	2.0969	21 16 50.2	7.068	5	9 2 57.08	1.9005	14 6 3.3	10.579
7 29 25.83	2.0921	21 9 43.3	7.160	6	9 4 51.02	1.8975	13 55 26.9	10.633
7 31 31.21	2.0874	21 2 31.0	7.251	7	9 6 44.78	1.8945	13 44 47.3	10.687
7 33 36.32	2.0827	20 55 13.2	7.342	8	9 8 38.36	1.8915	13 34 4.5	10.740
7 35 41.14	2.0779	20 47 50.0	7.432	9	9 10 31.76	1.8886	13 23 18.5	10.793
7 37 45.67	2.0733	20 40 21.4	7.521	10	9 12 24.99	1.8857	13 12 29.4	10.845
7 39 49.93	2.0687	20 32 47.5	7.608	11	9 14 18.04	1.8828	13 1 37.1	10.896
7 41 53.91	2.0640	20 25 8.4	7.695	12	9 16 10.93	1.8802	12 50 41.9	10.946
7 43 57.61	2.0593	20 17 24.1	7.782	13	9 18 3.66	1.8775	12 39 43.6	10.996
7 46 1.03	2.0548	20 9 34.6	7.868	14	9 19 56.23	1.8748	12 28 42.4	11.044
7 48 4.18	2.0502	20 1 40.0	7.952	15	9 21 48.64	1.8722	12 17 38.3	11.093
7 50 7.05	2.0455	19 53 40.4	8.036	16	9 23 40.89	1.8697	12 6 31.2	11.141
7 52 9.64	2.0410	19 45 35.7	8.119	17	9 25 33.00	1.8673	11 55 21.4	11.188
7 54 11.97	2.0365	19 37 26.1	8.201	18	9 27 24.96	1.8648	11 44 8.7	11.235
7 56 14.02	2.0319	19 29 11.6	8.283	19	9 29 16.77	1.8624	11 32 53.2	11.280
7 58 15.80	2.0275	19 20 52.2	8.363	20	9 31 8.45	1.8602	11 21 35.1	11.325
8 0 17.32	2.0231	19 12 28.1	8.443	21	9 32 59.99	1.8579	11 10 14.2	11.370
8 2 18.57	2.0186	19 3 59.1	8.522	22	9 34 51.40	1.8557	10 58 50.7	11.413
8 4 19.55	2.0142	+18 55 25.5	− 8.598	23	9 36 42.67	1.8535	+10 47 24.6	−11.457
APRIL 28.				APRIL 30.				
8 6 20.27	2.0098	+18 46 47.3	− 8.676	0	9 38 33.82	1.8515	+10 35 55.9	−11.499
8 8 20.73	2.0056	18 38 4.4	8.753	1	9 40 24.85	1.8495	10 24 24.7	11.541
8 10 20.94	2.0013	18 29 16.9	8.828	2	9 42 15.76	1.8475	10 12 51.0	11.583
8 12 20.88	1.9970	18 20 25.0	8.903	3	9 44 6.55	1.8456	10 1 14.8	11.623
8 14 20.58	1.9928	18 11 28.5	8.978	4	9 45 57.23	1.8438	9 49 36.3	11.663
8 16 20.02	1.9886	18 2 27.7	9.050	5	9 47 47.80	1.8420	9 37 55.3	11.703
8 18 19.21	1.9844	17 53 22.5	9.123	6	9 49 38.27	1.8403	9 26 12.0	11.741
8 20 18.15	1.9803	17 44 12.9	9.195	7	9 51 28.64	1.8387	9 14 26.4	11.778
8 22 16.84	1.9763	17 34 59.1	9.265	8	9 53 18.91	1.8370	9 2 38.6	11.816
8 24 15.30	1.9723	17 25 41.1	9.335	9	9 55 9.08	1.8355	8 50 48.5	11.853
8 26 13.51	1.9682	17 16 18.9	9.405	10	9 56 59.17	1.8341	8 38 56.2	11.889
8 28 11.48	1.9642	17 6 52.5	9.473	11	9 58 49.17	1.8326	8 27 1.8	11.924
8 30 9.21	1.9603	16 57 22.1	9.541	12	10 0 39.08	1.8313	8 15 5.3	11.959
8 32 6.71	1.9564	16 47 47.6	9.608	13	10 2 28.92	1.8300	8 3 6.7	11.993
8 34 3.98	1.9526	16 38 9.2	9.673	14	10 4 18.68	1.8288	7 51 6.1	12.027
8 36 1.02	1.9488	16 28 26.8	9.740	15	10 6 8.37	1.8277	7 39 3.5	12.059
8 37 57.84	1.9451	16 18 40.4	9.804	16	10 7 58.00	1.8266	7 26 59.0	12.092
8 39 54.43	1.9413	16 8 50.3	9.868	17	10 9 47.56	1.8255	7 14 52.5	12.124
8 41 50.80	1.9377	15 58 56.3	9.932	18	10 11 37.06	1.8245	7 2 44.1	12.155
8 43 46.95	1.9340	15 48 58.5	9.994	19	10 13 26.50	1.8236	6 50 33.9	12.185
8 45 42.88	1.9305	15 38 57.0	10.055	20	10 15 15.89	1.8228	6 38 21.9	12.215
8 47 38.61	1.9270	15 28 51.9	10.116	21	10 17 5.24	1.8220	6 26 8.1	12.244
8 49 34.12	1.9234	15 18 43.1	10.177	22	10 18 54.53	1.8213	6 13 52.6	12.272
8 51 29.42	1.9201	15 8 30.7	10.236	23	10 20 43.79	1.8207	6 1 35.5	12.299
8 53 24.53	1.9168	+14 58 14.8	−10.295	24	10 22 33.01	1.8201	+ 5 49 16.7	−12.326

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	MAY 1.			
	h m s	s	° ′ ″	″
0	10 22 33.01	1.8201	+5 49 16.7	−12.327
1	10 24 22.20	1.8195	5 36 56.3	12.354
2	10 26 11.35	1.8190	5 24 34.2	12.380
3	10 28 0.48	1.8187	5 12 10.7	12.405
4	10 29 49.59	1.8183	4 59 45.6	12.430
5	10 31 38.68	1.8180	4 47 19.1	12.454
6	10 33 27.75	1.8178	4 34 51.1	12.478
7	10 35 16.81	1.8177	4 22 21.8	12.500
8	10 37 5.87	1.8176	4 9 51.1	12.523
9	10 38 54.92	1.8175	3 57 19.1	12.543
10	10 40 43.97	1.8176	3 44 45.9	12.564
11	10 42 33.03	1.8178	3 32 11.4	12.585
12	10 44 22.10	1.8179	3 19 35.7	12.604
13	10 46 11.18	1.8182	3 6 58.9	12.623
14	10 48 0.28	1.8186	2 54 20.9	12.642
15	10 49 49.41	1.8189	2 41 41.9	12.658
16	10 51 38.55	1.8193	2 29 1.9	12.676
17	10 53 27.73	1.8198	2 16 20.8	12.693
18	10 55 16.93	1.8204	2 3 38.8	12.708
19	10 57 6.18	1.8211	1 50 55.9	12.723
20	10 58 55.46	1.8218	1 38 12.1	12.737
21	11 0 44.79	1.8226	1 25 27.5	12.750
22	11 2 34.17	1.8234	1 12 42.1	12.763
23	11 4 23.60	1.8243	+0 59 55.9	−12.775
	MAY 2.			
0	11 6 13.08	1.8253	+0 47 9.1	−12.786
1	11 8 2.63	1.8263	0 34 21.6	12.798
2	11 9 52.24	1.8274	0 21 33.4	12.808
3	11 11 41.92	1.8286	+0 8 44.7	12.817
4	11 13 31.67	1.8298	−0 4 4.6	12.826
5	11 15 21.50	1.8312	0 16 54.4	12.834
6	11 17 11.41	1.8326	0 29 44.7	12.841
7	11 19 1.41	1.8340	0 42 35.3	12.847
8	11 20 51.49	1.8354	0 55 26.3	12.853
9	11 22 41.66	1.8371	1 8 17.7	12.858
10	11 24 31.94	1.8388	1 21 9.3	12.863
11	11 26 22.31	1.8404	1 34 1.2	12.866
12	11 28 12.79	1.8423	1 46 53.2	12.868
13	11 30 3.38	1.8440	1 59 45.4	12.870
14	11 31 54.07	1.8459	2 12 37.6	12.872
15	11 33 44.89	1.8480	2 25 30.0	12.873
16	11 35 35.83	1.8500	2 38 22.3	12.872
17	11 37 26.89	1.8521	2 51 14.6	12.872
18	11 39 18.08	1.8543	3 4 6.9	12.869
19	11 41 9.40	1.8565	3 16 58.9	12.866
20	11 43 0.86	1.8588	3 29 50.8	12.863
21	11 44 52.45	1.8612	3 42 42.5	12.860
22	11 46 44.20	1.8637	3 55 34.0	12.855
23	11 48 36.09	1.8661	4 8 25.1	12.848
24	11 50 28.13	1.8687	−4 21 15.8	−12.842

Hour.	Right Ascension.	Var. per Min.	Declination.
	MAY 3.		
	h m s	s	° ′ ″
0	11 50 28.13	1.8687	− 4 21 15
1	11 52 20.33	1.8713	4 34 6
2	11 54 12.69	1.8741	4 46 55
3	11 56 5.22	1.8769	4 59 45
4	11 57 57.92	1.8797	5 12 34
5	11 59 50.78	1.8826	5 25 22
6	12 1 43.83	1.8856	5 38 9
7	12 3 37.05	1.8886	5 50 56
8	12 5 30.46	1.8918	6 3 42
9	12 7 24.06	1.8949	6 16 27
10	12 9 17.85	1.8981	6 29 11
11	12 11 11.83	1.9014	6 41 54
12	12 13 6.02	1.9048	6 54 37
13	12 15 0.41	1.9083	7 7 18
14	12 16 55.01	1.9118	7 19 58
15	12 18 49.82	1.9153	7 32 37
16	12 20 44.84	1.9189	7 45 15
17	12 22 40.09	1.9227	7 57 52
18	12 24 35.56	1.9263	8 10 27
19	12 26 31.25	1.9302	8 23 1
20	12 28 27.18	1.9340	8 35 33
21	12 30 23.33	1.9379	8 48 4
22	12 32 19.73	1.9420	9 0 33
23	12 34 16.37	1.9460	− 9 13 1
	MAY 4.		
0	12 36 13.25	1.9501	− 9 25 27
1	12 38 10.38	1.9543	9 37 51
2	12 40 7.77	1.9587	9 50 14
3	12 42 5.42	1.9629	10 2 35
4	12 44 3.32	1.9673	10 14 53
5	12 46 1.49	1.9717	10 27 10
6	12 47 59.92	1.9762	10 39 25
7	12 49 58.63	1.9808	10 51 37
8	12 51 57.61	1.9853	11 3 48
9	12 53 56.86	1.9899	11 15 56
10	12 55 56.40	1.9947	11 28 1
11	12 57 56.22	1.9994	11 40 5
12	12 59 56.33	2.0043	11 52 6
13	13 1 56.73	2.0092	12 4 4
14	13 3 57.43	2.0141	12 16 0
15	13 5 58.42	2.0190	12 27 54
16	13 7 59.71	2.0241	12 39 44
17	13 10 1.31	2.0292	12 51 32
18	13 12 3.21	2.0343	13 3 17
19	13 14 5.43	2.0396	13 14 59
20	13 16 7.96	2.0448	13 26 38
21	13 18 10.80	2.0501	13 38 14
22	13 20 13.97	2.0554	13 49 46
23	13 22 17.45	2.0608	14 1 16
24	13 24 21.26	2.0663	−14 12 42

GREENWICH MEAN TIME.

Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
MAY 5.					**MAY 7.**			
h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
13 24 21.26	2.0663	−14 12 42.7	−11.410	0	15 10 21.76	2.3547	−21 51 59.5	−7.209
13 26 25.40	2.0717	14 24 5.6	11.353	1	15 12 43.22	2.3606	21 59 8.5	7.089
13 28 29.86	2.0772	14 35 25.1	11.296	2	15 15 5.03	2.3664	22 6 10.2	6.967
13 30 34.66	2.0828	14 46 41.1	11.237	3	15 17 27.19	2.3722	22 13 4.5	6.843
13 32 39.80	2.0884	14 57 53.5	11.177	4	15 19 49.69	2.3778	22 19 51.4	6.719
13 34 45.27	2.0940	15 9 2.3	11.115	5	15 22 12.53	2.3836	22 26 30.8	6.593
13 36 51.08	2.0998	15 20 7.3	11.052	6	15 24 35.72	2.3892	22 33 2.6	6.466
13 38 57.24	2.1055	15 31 8.5	10.988	7	15 26 59.23	2.3948	22 39 26.7	6.338
13 41 3.74	2.1112	15 42 5.8	10.923	8	15 29 23.09	2.4003	22 45 43.1	6.208
13 43 10.58	2.1170	15 52 59.2	10.857	9	15 31 47.27	2.4057	22 51 51.7	6.078
13 45 17.78	2.1229	16 3 48.6	10.788	10	15 34 11.77	2.4111	22 57 52.4	5.946
13 47 25.33	2.1287	16 14 33.8	10.718	11	15 36 36.60	2.4164	23 3 45.2	5.813
13 49 33.22	2.1346	16 25 14.8	10.648	12	15 39 1.74	2.4217	23 9 29.9	5.678
13 51 41.48	2.1406	16 35 51.6	10.577	13	15 41 27.20	2.4269	23 15 6.5	5.543
13 53 50.09	2.1465	16 46 24.0	10.503	14	15 43 52.97	2.4321	23 20 35.0	5.407
13 55 59.06	2.1525	16 56 52.0	10.429	15	15 46 19.05	2.4372	23 25 55.3	5.268
13 58 8.39	2.1586	17 7 15.5	10.353	16	15 48 45.43	2.4421	23 31 7.2	5.129
14 0 18.09	2.1646	17 17 34.4	10.277	17	15 51 12.10	2.4470	23 36 10.8	4.989
14 2 28.14	2.1707	17 27 48.7	10.198	18	15 53 39.07	2.4518	23 41 5.9	4.848
14 4 38.57	2.1768	17 37 58.2	10.118	19	15 56 6.32	2.4565	23 45 52.6	4.707
14 6 49.35	2.1828	17 48 2.8	10.037	20	15 58 33.85	2.4612	23 50 30.7	4.563
14 9 0.51	2.1890	17 58 2.6	9.954	21	16 1 1.66	2.4658	23 55 0.1	4.418
14 11 12.03	2.1951	18 7 57.3	9.870	22	16 3 29.74	2.4702	23 59 20.9	4.273
14 13 23.92	2.2013	−18 17 47.0	−9.785	23	16 5 58.08	2.4745	−24 3 32.9	−4.128
MAY 6.					**MAY 8.**			
14 15 36.18	2.2074	−18 27 31.5	−9.698	0	16 8 26.68	2.4788	−24 7 36.2	−3.981
14 17 48.81	2.2137	18 37 10.8	9.611	1	16 10 55.54	2.4831	24 11 30.6	3.832
14 20 1.82	2.2198	18 46 44.8	9.521	2	16 13 24.65	2.4872	24 15 16.0	3.683
14 22 15.19	2.2260	18 56 13.3	9.430	3	16 15 54.00	2.4912	24 18 52.5	3.533
14 24 28.94	2.2323	19 5 36.4	9.338	4	16 18 23.59	2.4950	24 22 19.9	3.382
14 26 43.07	2.2385	19 14 53.9	9.245	5	16 20 53.40	2.4988	24 25 38.3	3.230
14 28 57.56	2.2447	19 24 5.8	9.150	6	16 23 23.44	2.5025	24 28 47.5	3.078
14 31 12.43	2.2509	19 33 11.9	9.053	7	16 25 53.70	2.5061	24 31 47.6	2.924
14 33 27.67	2.2571	19 42 12.2	8.956	8	16 28 24.17	2.5095	24 34 38.4	2.769
14 35 43.28	2.2633	19 51 6.6	8.857	9	16 30 54.84	2.5129	24 37 19.9	2.615
14 37 59.27	2.2695	19 59 55.0	8.757	10	16 33 25.72	2.5162	24 39 52.2	2.460
14 40 15.62	2.2757	20 8 37.4	8.655	11	16 35 56.78	2.5193	24 42 15.1	2.303
14 42 32.35	2.2819	20 17 13.6	8.552	12	16 38 28.03	2.5223	24 44 28.5	2.146
14 44 49.45	2.2882	20 25 43.6	8.448	13	16 40 59.46	2.5252	24 46 32.6	1.988
14 47 6.93	2.2943	20 34 7.3	8.342	14	16 43 31.05	2.5279	24 48 27.1	1.830
14 49 24.77	2.3004	20 42 24.6	8.235	15	16 46 2.81	2.5306	24 50 12.2	1.672
14 51 42.98	2.3066	20 50 35.5	8.127	16	16 48 34.72	2.5331	24 51 47.7	1.512
14 54 1.56	2.3128	20 58 39.8	8.016	17	16 51 6.78	2.5355	24 53 13.6	1.353
14 56 20.51	2.3188	21 6 37.4	7.905	18	16 53 38.98	2.5378	24 54 30.0	1.192
14 58 39.82	2.3248	21 14 28.4	7.793	19	16 56 11.31	2.5399	24 55 36.6	1.031
15 0 59.49	2.3308	21 22 12.5	7.678	20	16 58 43.77	2.5419	24 56 33.7	0.870
15 3 19.52	2.3368	21 29 49.8	7.563	21	17 1 16.34	2.5438	24 57 21.0	0.708
15 5 39.91	2.3428	21 37 20.1	7.447	22	17 3 49.03	2.5457	24 57 58.6	0.545
15 8 0.66	2.3488	21 44 43.4	7.328	23	17 6 21.82	2.5473	24 58 26.4	0.383
15 10 21.76	*2.3547*	*−21 51 59.5*	*−7.209*	24	17 8 54.70	2.5488	−24 58 44.5	−0.220

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	MAY 9.			
	h m s	s	° ′ ″	″
0	17 8 54.70	2.5488	−24 58 44.5	−0.220
1	17 11 27.67	2.5503	24 58 52.8	−0.057
2	17 14 0.73	2.5515	24 58 51.3	+0.107
3	17 16 33.85	2.5526	24 58 40.0	0.270
4	17 19 7.04	2.5536	24 58 18.9	0.433
5	17 21 40.28	2.5545	24 57 48.0	0.598
6	17 24 13.58	2.5553	24 57 7.2	0.762
7	17 26 46.91	2.5558	24 56 16.6	0.926
8	17 29 20.28	2.5563	24 55 16.1	1.090
9	17 31 53.67	2.5567	24 54 5.8	1.254
10	17 34 27.08	2.5569	24 52 45.6	1.418
11	17 37 0.50	2.5570	24 51 15.6	1.583
12	17 39 33.92	2.5569	24 49 35.7	1.747
13	17 42 7.33	2.5568	24 47 46.0	1.911
14	17 44 40.74	2.5565	24 45 46.4	2.075
15	17 47 14.11	2.5561	24 43 37.0	2.239
16	17 49 47.47	2.5556	24 41 17.7	2.403
17	17 52 20.78	2.5548	24 38 48.7	2.565
18	17 54 54.05	2.5541	24 36 9.9	2.729
19	17 57 27.27	2.5532	24 33 21.2	2.892
20	18 0 0.43	2.5521	24 30 22.9	3.054
21	18 2 33.52	2.5510	24 27 14.7	3.217
22	18 5 6.55	2.5498	24 23 56.9	3.378
23	18 7 39.49	2.5483	−24 20 29.4	+3.540
	MAY 10.			
0	18 10 12.35	2.5468	−24 16 52.1	+3.701
1	18 12 45.11	2.5452	24 13 5.3	3.861
2	18 15 17.77	2.5434	24 9 8.8	4.021
3	18 17 50.32	2.5416	24 5 2.8	4.180
4	18 20 22.76	2.5397	24 0 47.2	4.339
5	18 22 55.08	2.5376	23 56 22.1	4.498
6	18 25 27.27	2.5354	23 51 47.5	4.655
7	18 27 59.33	2.5331	23 47 3.5	4.812
8	18 30 31.24	2.5308	23 42 10.1	4.968
9	18 33 3.02	2.5283	23 37 7.3	5.124
10	18 35 34.64	2.5257	23 31 55.2	5.279
11	18 38 6.10	2.5229	23 26 33.8	5.434
12	18 40 37.39	2.5202	23 21 3.1	5.588
13	18 43 8.52	2.5173	23 15 23.3	5.740
14	18 45 39.47	2.5143	23 9 34.3	5.892
15	18 48 10.24	2.5113	23 3 36.3	6.043
16	18 50 40.82	2.5082	22 57 29.2	6.193
17	18 53 11.22	2.5050	22 51 13.2	6.342
18	18 55 41.42	2.5017	22 44 48.2	6.490
19	18 58 11.42	2.4983	22 38 14.4	6.638
20	19 0 41.22	2.4948	22 31 31.7	6.784
21	19 3 10.80	2.4913	22 24 40.3	6.930
22	19 5 40.18	2.4878	22 17 40.1	7.074
23	19 8 9.33	2.4840	22 10 31.4	7.218
24	19 10 38.26	2.4803	−22 3 14.0	+7.361

Hour.	Right Ascension.	Var. per Min.	Declination.
	MAY 11.		
	h m s	s	° ′ ″
0	19 10 38.26	2.4803	−22 3 14.(
1	19 13 6.97	2.4765	21 55 48.1
2	19 15 35.44	2.4727	21 48 13.5
3	19 18 3.69	2.4688	21 40 31.1
4	19 20 31.69	2.4648	21 32 40.1
5	19 22 59.46	2.4608	21 24 40.1
6	19 25 26.98	2.4567	21 16 33.4
7	19 27 54.26	2.4526	21 8 17.1
8	19 30 21.29	2.4483	20 59 54.2
9	19 32 48.06	2.4441	20 51 22.(
10	19 35 14.58	2.4399	20 42 43.1
11	19 37 40.85	2.4356	20 33 55.1
12	19 40 6.85	2.4313	20 25 0.(
13	19 42 32.60	2.4269	20 15 57.1
14	19 44 58.08	2.4225	20 6 47.4
15	19 47 23.30	2.4181	19 57 29.1
16	19 49 48.25	2.4137	19 48 4.1
17	19 52 12.94	2.4092	19 38 31.4
18	19 54 37.35	2.4047	19 28 51.1
19	19 57 1.50	2.4003	19 19 4.(
20	19 59 25.38	2.3957	19 9 9.(
21	20 1 48.98	2.3911	18 59 8.1
22	20 4 12.31	2.3865	18 48 59.1
23	20 6 35.36	2.3819	−18 38 44.1
	MAY 12.		
0	20 8 58.14	2.3774	−18 28 22.(
1	20 11 20.65	2.3728	18 17 53.
2	20 13 42.88	2.3683	18 7 17.
3	20 16 4.84	2.3637	17 56 35.
4	20 18 26.52	2.3591	17 45 46.
5	20 20 47.93	2.3546	17 34 51.
6	20 23 9.07	2.3500	17 23 50.
7	20 25 29.93	2.3454	17 12 42.
8	20 27 50.52	2.3409	17 1 28.
9	20 30 10.84	2.3363	16 50 8.
10	20 32 30.88	2.3318	16 38 42.
11	20 34 50.65	2.3273	16 27 10.
12	20 37 10.16	2.3229	16 15 33.
13	20 39 29.40	2.3184	16 3 49.
14	20 41 48.37	2.3139	15 52 0.
15	20 44 7.07	2.3095	15 40 6.
16	20 46 25.51	2.3052	15 28 6.
17	20 48 43.69	2.3008	15 16 0.
18	20 51 1.60	2.2964	15 3 49.
19	20 53 19.26	2.2922	14 51 33.
20	20 55 36.66	2.2878	14 39 12.
21	20 57 53.80	2.2836	14 26 46.
22	21 0 10.69	2.2794	14 14 15.
23	21 2 27.33	2.2753	14 1 39.
24	21 4 43.72	2.2712	−13 48 58.

GREENWICH MEAN TIME.

Hr.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	MAY 13.			
	h m s	s	° ′ ″	″
0	21 4 43.72	2.2712	−13 48 58.3	+12.721
1	21 6 59.87	2.2671	13 36 12.7	12.798
2	21 9 15.77	2.2630	13 23 22.5	12.874
3	21 11 31.43	2.2590	13 10 27.8	12.949
4	21 13 46.85	2.2550	12 57 28.6	13.023
5	21 16 2.03	2.2512	12 44 25.1	13.094
6	21 18 16.99	2.2473	12 31 17.3	13.165
7	21 20 31.71	2.2434	12 18 5.3	13.234
8	21 22 46.20	2.2397	12 4 49.2	13.303
9	21 25 0.47	2.2360	11 51 29.0	13.369
10	21 27 14.52	2.2323	11 38 4.9	13.433
11	21 29 28.35	2.2287	11 24 37.0	13.497
12	21 31 41.96	2.2251	11 11 5.3	13.559
13	21 33 55.36	2.2216	10 57 29.9	13.619
14	21 36 8.55	2.2182	10 43 51.0	13.678
15	21 38 21.54	2.2148	10 30 8.5	13.737
16	21 40 34.32	2.2114	10 16 22.6	13.793
17	21 42 46.91	2.2082	10 2 33.4	13.847
18	21 44 59.30	2.2049	9 48 41.0	13.901
19	21 47 11.50	2.2018	9 34 45.3	13.953
20	21 49 23.51	2.1987	9 20 46.6	14.003
21	21 51 35.34	2.1957	9 6 44.9	14.053
22	21 53 46.99	2.1927	8 52 40.3	14.100
23	21 55 58.46	2.1898	− 8 38 32.9	+14.147
	MAY 14.			
0	21 58 9.76	2.1869	− 8 24 22.7	+14.192
1	22 0 20.89	2.1841	8 10 9.9	14.235
2	22 2 31.85	2.1814	7 55 54.5	14.278
3	22 4 42.66	2.1788	7 41 36.6	14.318
4	22 6 53.30	2.1761	7 27 16.3	14.358
5	22 9 3.79	2.1736	7 12 53.7	14.396
6	22 11 14.13	2.1712	6 58 28.8	14.433
7	22 13 24.33	2.1688	6 44 1.8	14.468
8	22 15 34.39	2.1665	6 29 32.7	14.501
9	22 17 44.31	2.1642	6 15 1.7	14.533
10	22 19 54.09	2.1620	6 0 28.7	14.565
11	22 22 3.75	2.1599	5 45 53.9	14.594
12	22 24 13.28	2.1578	5 31 17.4	14.623
13	22 26 22.69	2.1559	5 16 39.2	14.649
14	22 28 31.99	2.1540	5 1 59.5	14.674
15	22 30 41.17	2.1521	4 47 18.3	14.698
16	22 32 50.24	2.1503	4 32 35.7	14.721
17	22 34 59.21	2.1487	4 17 51.8	14.743
18	22 37 8.08	2.1471	4 3 6.6	14.763
19	22 39 16.86	2.1456	3 48 20.3	14.781
20	22 41 25.55	2.1441	3 33 32.9	14.798
21	22 43 34.15	2.1426	3 18 44.5	14.814
22	22 45 42.66	2.1413	3 3 55.2	14.828
23	22 47 51.10	2.1401	2 49 5.1	14.842
24	*22 49 59.47*	*2.1389*	*− 2 34 14.2*	*+14.853*

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	MAY 15.			
	h m s	s	° ′ ″	″
0	22 49 59.47	2.1389	−2 34 14.2	+14.853
1	22 52 7.77	2.1378	2 19 22.7	14.863
2	22 54 16.00	2.1367	2 4 30.6	14.873
3	22 56 24.17	2.1358	1 49 38.0	14.881
4	22 58 32.29	2.1348	1 34 44.9	14.887
5	23 0 40.35	2.1339	1 19 51.6	14.891
6	23 2 48.36	2.1333	1 4 58.0	14.895
7	23 4 56.34	2.1326	0 50 4.2	14.898
8	23 7 4.27	2.1319	0 35 10.3	14.898
9	23 9 12.17	2.1313	0 20 16.4	14.898
10	23 11 20.03	2.1308	−0 5 22.6	14.895
11	23 13 27.87	2.1305	+0 9 31.0	14.892
12	23 15 35.69	2.1302	0 24 24.4	14.888
13	23 17 43.49	2.1299	0 39 17.5	14.883
14	23 19 51.28	2.1297	0 54 10.3	14.875
15	23 21 59.05	2.1296	1 9 2.5	14.866
16	23 24 6.83	2.1296	1 23 54.2	14.856
17	23 26 14.60	2.1295	1 38 45.2	14.845
18	23 28 22.37	2.1297	1 53 35.6	14.833
19	23 30 30.16	2.1298	2 8 25.1	14.818
20	23 32 37.95	2.1300	2 23 13.7	14.803
21	23 34 45.76	2.1303	2 38 1.4	14.787
22	23 36 53.59	2.1308	2 52 48.1	14.768
23	23 39 1.45	2.1313	+3 7 33.6	+14.748
	MAY 16.			
0	23 41 9.34	2.1318	+3 22 17.9	+14.728
1	23 43 17.26	2.1323	3 37 0.9	14.706
2	23 45 25.21	2.1329	3 51 42.6	14.683
3	23 47 33.21	2.1337	4 6 22.8	14.658
4	23 49 41.25	2.1343	4 21 1.5	14.632
5	23 51 49.33	2.1352	4 35 38.6	14.605
6	23 53 57.47	2.1362	4 50 14.1	14.576
7	23 56 5.67	2.1371	5 4 47.7	14.545
8	23 58 13.92	2.1381	5 19 19.5	14.514
9	0 0 22.24	2.1392	5 33 49.4	14.482
10	0 2 30.62	2.1403	5 48 17.3	14.448
11	0 4 39.08	2.1416	6 2 43.2	14.413
12	0 6 47.61	2.1428	6 17 6.8	14.375
13	0 8 56.22	2.1442	6 31 28.2	14.338
14	0 11 4.91	2.1456	6 45 47.3	14.298
15	0 13 13.69	2.1471	7 0 4.0	14.258
16	0 15 22.56	2.1486	7 14 18.2	14.216
17	0 17 31.52	2.1501	7 28 29.9	14.173
18	0 19 40.57	2.1518	7 42 38.9	14.128
19	0 21 49.73	2.1535	7 56 45.2	14.082
20	0 23 58.99	2.1553	8 10 48.7	14.034
21	0 26 8.36	2.1570	8 24 49.3	13.986
22	0 28 17.83	2.1588	8 38 47.0	13.936
23	0 30 27.42	2.1608	8 52 41.6	13.883
24	0 32 37.13	2.1628	+9 6 33.0	+13.831

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	MAY 17.			
	h m s	s	° ′ ″	″
0	0 32 37.13	2.1628	+ 9 6 33.0	+13.831
1	0 34 46.96	2.1648	9 20 21.3	13.778
2	0 36 56.90	2.1668	9 34 6.3	13.723
3	0 39 6.97	2.1689	9 47 48.0	13.666
4	0 41 17.17	2.1711	10 1 26.2	13.608
5	0 43 27.50	2.1733	10 15 0.9	13.548
6	0 45 37.97	2.1756	10 28 32.0	13.488
7	0 47 48.57	2.1778	10 41 59.5	13.427
8	0 49 59.30	2.1802	10 55 23.2	13.363
9	0 52 10.19	2.1826	11 8 43.0	13.298
10	0 54 21.21	2.1849	11 21 59.0	13.233
11	0 56 32.38	2.1874	11 35 11.0	13.167
12	0 58 43.70	2.1899	11 48 19.0	13.098
13	1 0 55.17	2.1925	12 1 22.8	13.028
14	1 3 6.80	2.1951	12 14 22.4	12.958
15	1 5 18.58	2.1977	12 27 17.7	12.886
16	1 7 30.52	2.2003	12 40 8.7	12.813
17	1 9 42.62	2.2030	12 52 55.2	12.737
18	1 11 54.88	2.2058	13 5 37.1	12.661
19	1 14 7.31	2.2085	13 18 14.5	12.585
20	1 16 19.90	2.2113	13 30 47.3	12.506
21	1 18 32.66	2.2140	13 43 15.2	12.426
22	1 20 45.58	2.2168	13 55 38.4	12.346
23	1 22 58.68	2.2197	+14 7 56.7	+12.263
	MAY 18.			
0	1 25 11.94	2.2225	+14 20 10.0	+12.180
1	1 27 25.38	2.2255	14 32 18.3	12.095
2	1 29 39.00	2.2284	14 44 21.4	12.008
3	1 31 52.79	2.2313	14 56 19.3	11.922
4	1 34 6.76	2.2343	15 8 12.0	11.833
5	1 36 20.90	2.2373	15 19 59.3	11.743
6	1 38 35.23	2.2403	15 31 41.2	11.653
7	1 40 49.73	2.2432	15 43 17.6	11.561
8	1 43 4.41	2.2463	15 54 48.5	11.468
9	1 45 19.28	2.2493	16 6 13.7	11.373
10	1 47 34.32	2.2523	16 17 33.3	11.278
11	1 49 49.55	2.2553	16 28 47.1	11.181
12	1 52 4.96	2.2583	16 39 55.0	11.083
13	1 54 20.55	2.2614	16 50 57.0	10.984
14	1 56 36.33	2.2644	17 1 53.1	10.884
15	1 58 52.28	2.2674	17 12 43.1	10.783
16	2 1 8.42	2.2705	17 23 27.0	10.680
17	2 3 24.74	2.2736	17 34 4.7	10.577
18	2 5 41.25	2.2766	17 44 36.2	10.472
19	2 7 57.93	2.2796	17 55 1.3	10.366
20	2 10 14.80	2.2826	18 5 20.1	10.259
21	2 12 31.84	2.2856	18 15 32.4	10.151
22	2 14 49.07	2.2886	18 25 38.2	10.042
23	2 17 6.47	2.2916	18 35 37.4	9.932
24	2 19 24.06	2.2946	+18 45 30.0	+ 9.821

Hour.	Right Ascension.	Var. per Min.	Declination.
	MAY 19.		
	h m s	s	° ′ ″
0	2 19 24.06	2.2946	+18 45 30.0
1	2 21 41.82	2.2975	18 55 15.9
2	2 23 59.76	2.3004	19 4 55.0
3	2 26 17.87	2.3033	19 14 27.3
4	2 28 36.15	2.3061	19 23 52.7
5	2 30 54.60	2.3090	19 33 11.2
6	2 33 13.23	2.3118	19 42 22.7
7	2 35 32.02	2.3145	19 51 27.1
8	2 37 50.97	2.3173	20 0 24.3
9	2 40 10.10	2.3201	20 9 14.4
10	2 42 29.38	2.3227	20 17 57.3
11	2 44 48.82	2.3253	20 26 32.9
12	2 47 8.42	2.3280	20 35 1.1
13	2 49 28.18	2.3306	20 43 22.0
14	2 51 48.09	2.3331	20 51 35.4
15	2 54 8.15	2.3356	20 59 41.3
16	2 56 28.36	2.3380	21 7 39.7
17	2 58 48.71	2.3403	21 15 30.6
18	3 1 9.20	2.3428	21 23 13.7
19	3 3 29.84	2.3451	21 30 49.2
20	3 5 50.61	2.3473	21 38 17.0
21	3 8 11.51	2.3494	21 45 36.9
22	3 10 32.54	2.3515	21 52 49.1
23	3 12 53.69	2.3536	+21 59 53.4
	MAY 20.		
0	3 15 14.97	2.3557	+22 6 49.8
1	3 17 36.37	2.3576	22 13 38.3
2	3 19 57.88	2.3594	22 20 18.7
3	3 22 19.50	2.3613	22 26 51.2
4	3 24 41.23	2.3630	22 33 15.6
5	3 27 3.06	2.3647	22 39 31.9
6	3 29 24.99	2.3663	22 45 40.0
7	3 31 47.01	2.3678	22 51 40.1
8	3 34 9.13	2.3693	22 57 31.9
9	3 36 31.33	2.3707	23 3 15.5
10	3 38 53.61	2.3720	23 8 50.8
11	3 41 15.97	2.3733	23 14 17.9
12	3 43 38.40	2.3744	23 19 36.6
13	3 46 0.90	2.3755	23 24 47.0
14	3 48 23.46	2.3765	23 29 49.1
15	3 50 46.08	2.3775	23 34 42.8
16	3 53 8.76	2.3783	23 39 28.0
17	3 55 31.48	2.3790	23 44 4.9
18	3 57 54.24	2.3798	23 48 33.3
19	4 0 17.05	2.3803	23 52 53.2
20	4 2 39.88	2.3808	23 57 4.7
21	4 5 2.75	2.3813	24 1 7.7
22	4 7 25.64	2.3816	24 5 2.2
23	4 9 48.54	2.3818	24 8 48.1
24	4 12 11.45	2.3819	+24 12 25.5

GREENWICH MEAN TIME.

Hr.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	MAY 21.			
	h m s	s	° ′ ″	″
0	4 12 11.45	2.3819	+24 12 25.5	+3.553
1	4 14 34.37	2.3821	24 15 54.4	3.410
2	4 16 57.30	2.3821	24 19 14.7	3.268
3	4 19 20.22	2.3819	24 22 26.5	3.125
4	4 21 43.13	2.3817	24 25 29.7	2.983
5	4 24 6.02	2.3813	24 28 24.4	2.840
6	4 26 28.89	2.3810	24 31 10.5	2.697
7	4 28 51.74	2.3805	24 33 48.0	2.553
8	4 31 14.55	2.3799	24 36 16.9	2.411
9	4 33 37.33	2.3793	24 38 37.3	2.268
10	4 36 0.06	2.3785	24 40 49.1	2.126
11	4 38 22.75	2.3777	24 42 52.4	1.983
12	4 40 45.38	2.3767	24 44 47.0	1.839
13	4 43 7.95	2.3757	24 46 33.1	1.698
14	4 45 30.46	2.3746	24 48 10.7	1.555
15	4 47 52.90	2.3733	24 49 39.7	1.413
16	4 50 15.26	2.3720	24 51 0.3	1.272
17	4 52 37.54	2.3706	24 52 12.3	1.129
18	4 54 59.73	2.3691	24 53 15.8	0.988
19	4 57 21.83	2.3676	24 54 10.8	0.847
20	4 59 43.84	2.3658	24 54 57.4	0.706
21	5 2 5.73	2.3640	24 55 35.5	0.565
22	5 4 27.52	2.3622	24 56 5.2	0.424
23	5 6 49.19	2.3602	+24 56 26.4	+0.284
	MAY 22.			
0	5 9 10.74	2.3582	+24 56 39.3	+0.145
1	5 11 32.17	2.3560	24 56 43.8	+0.005
2	5 13 53.46	2.3538	24 56 39.9	−0.134
3	5 16 14.62	2.3515	24 56 27.7	0.272
4	5 18 35.64	2.3491	24 56 7.3	0.410
5	5 20 56.51	2.3467	24 55 38.5	0.548
6	5 23 17.24	2.3441	24 55 1.5	0.685
7	5 25 37.80	2.3414	24 54 16.3	0.823
8	5 27 58.21	2.3387	24 53 22.8	0.959
9	5 30 18.44	2.3358	24 52 21.2	1.094
10	5 32 38.51	2.3330	24 51 11.5	1.229
11	5 34 58.40	2.3301	24 49 53.7	1.364
12	5 37 18.12	2.3271	24 48 27.8	1.498
13	5 39 37.65	2.3238	24 46 53.9	1.633
14	5 41 56.98	2.3207	24 45 11.9	1.766
15	5 44 16.13	2.3174	24 43 22.0	1.898
16	5 46 35.07	2.3140	24 41 24.2	2.029
17	5 48 53.81	2.3107	24 39 18.5	2.160
18	5 51 12.35	2.3073	24 37 5.0	2.291
19	5 53 30.68	2.3037	24 34 43.6	2.421
20	5 55 48.79	2.3000	24 32 14.5	2.549
21	5 58 6.68	2.2963	24 29 37.7	2.678
22	6 0 24.35	2.2927	24 26 53.1	2.807
23	6 2 41.80	2.2888	24 24 0.9	2.933
24	6 4 59.01	2.2849	+24 21 1.2	−3.058

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	MAY 23.			
	h m s	s	° ′ ″	″
0	6 4 59.01	2.2849	+24 21 1.2	−3.058
1	6 7 15.99	2.2810	24 17 53.9	3.184
2	6 9 32.73	2.2770	24 14 39.1	3.309
3	6 11 49.23	2.2730	24 11 16.8	3.433
4	6 14 5.49	2.2689	24 7 47.1	3.557
5	6 16 21.50	2.2648	24 4 10.0	3.679
6	6 18 37.26	2.2606	24 0 25.6	3.801
7	6 20 52.77	2.2563	23 56 33.9	3.922
8	6 23 8.02	2.2520	23 52 35.0	4.042
9	6 25 23.01	2.2477	23 48 28.9	4.161
10	6 27 37.74	2.2433	23 44 15.7	4.278
11	6 29 52.21	2.2388	23 39 55.5	4.396
12	6 32 6.40	2.2343	23 35 28.2	4.513
13	6 34 20.33	2.2299	23 30 53.9	4.628
14	6 36 33.99	2.2253	23 26 12.8	4.743
15	6 38 47.37	2.2208	23 21 24.7	4.858
16	6 41 0.48	2.2162	23 16 29.8	4.971
17	6 43 13.31	2.2115	23 11 28.2	5.083
18	6 45 25.86	2.2068	23 6 19.9	5.194
19	6 47 38.13	2.2022	23 1 4.9	5.305
20	6 49 50.12	2.1974	22 55 43.3	5.415
21	6 52 1.82	2.1927	22 50 15.1	5.523
22	6 54 13.24	2.1879	22 44 40.5	5.631
23	6 56 24.37	2.1831	+22 38 59.4	−5.738
	MAY 24.			
0	6 58 35.21	2.1783	+22 33 11.9	−5.844
1	7 0 45.76	2.1734	22 27 18.1	5.949
2	7 2 56.02	2.1686	22 21 18.0	6.053
3	7 5 5.99	2.1638	22 15 11.7	6.156
4	7 7 15.67	2.1589	22 8 59.3	6.258
5	7 9 25.06	2.1540	22 2 40.7	6.360
6	7 11 34.15	2.1490	21 56 16.1	6.460
7	7 13 42.94	2.1442	21 49 45.5	6.560
8	7 15 51.45	2.1393	21 43 8.9	6.659
9	7 17 59.65	2.1343	21 36 26.4	6.757
10	7 20 7.57	2.1294	21 29 38.1	6.853
11	7 22 15.18	2.1244	21 22 44.1	6.948
12	7 24 22.50	2.1195	21 15 44.3	7.044
13	7 26 29.52	2.1146	21 8 38.8	7.138
14	7 28 36.25	2.1098	21 1 27.7	7.231
15	7 30 42.69	2.1048	20 54 11.1	7.323
16	7 32 48.83	2.0998	20 46 49.0	7.414
17	7 34 54.67	2.0949	20 39 21.4	7.505
18	7 37 0.22	2.0901	20 31 48.4	7.594
19	7 39 5.48	2.0852	20 24 10.1	7.683
20	7 41 10.44	2.0803	20 16 26.5	7.770
21	7 43 15.11	2.0754	20 8 37.7	7.856
22	7 45 19.49	2.0706	20 0 43.8	7.942
23	7 47 23.58	2.0658	19 52 44.7	8.027
24	7 49 27.38	2.0609	+19 44 40.6	−8.110

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	MAY 25.			
	h m s	s	° ′ ″	″
0	7 49 27.38	2.0609	+19 44 40.6	− 8.110
1	7 51 30.89	2.0562	19 36 31.5	8.193
2	7 53 34.12	2.0514	19 28 17.4	8.275
3	7 55 37.06	2.0466	19 19 58.5	8.356
4	7 57 39.71	2.0418	19 11 34.7	8.437
5	7 59 42.08	2.0372	19 3 6.1	8.516
6	8 1 44.17	2.0325	18 54 32.8	8.595
7	8 3 45.98	2.0278	18 45 54.7	8.673
8	8 5 47.51	2.0232	18 37 12.1	8.748
9	8 7 48.76	2.0185	18 28 24.9	8.824
10	8 9 49.73	2.0139	18 19 33.2	8.900
11	8 11 50.43	2.0094	18 10 36.9	8.974
12	8 13 50.86	2.0049	18 1 36.3	9.047
13	8 15 51.02	2.0004	17 52 31.3	9.119
14	8 17 50.91	1.9959	17 43 22.0	9.190
15	8 19 50.53	1.9915	17 34 8.5	9.261
16	8 21 49.89	1.9872	17 24 50.7	9.332
17	8 23 48.99	1.9828	17 15 28.7	9.400
18	8 25 47.83	1.9785	17 6 2.7	9.468
19	8 27 46.41	1.9743	16 56 32.6	9.535
20	8 29 44.74	1.9701	16 46 58.5	9.602
21	8 31 42.82	1.9658	16 37 20.4	9.668
22	8 33 40.64	1.9616	16 27 38.4	9.732
23	8 35 38.21	1.9575	+16 17 52.6	− 9.796
	MAY 26.			
0	8 37 35.54	1.9535	+16 8 2.9	− 9.859
1	8 39 32.63	1.9494	15 58 9.5	9.921
2	8 41 29.47	1.9454	15 48 12.4	9.983
3	8 43 26.08	1.9415	15 38 11.6	10.044
4	8 45 22.45	1.9376	15 28 7.1	10.104
5	8 47 18.59	1.9338	15 17 59.1	10.163
6	8 49 14.50	1.9299	15 7 47.6	10.221
7	8 51 10.18	1.9262	14 57 32.6	10.278
8	8 53 5.64	1.9225	14 47 14.2	10.335
9	8 55 0.88	1.9188	14 36 52.4	10.392
10	8 56 55.90	1.9152	14 26 27.2	10.447
11	8 58 50.70	1.9117	14 15 58.8	10.501
12	9 0 45.30	1.9082	14 5 27.1	10.555
13	9 2 39.68	1.9047	13 54 52.2	10.608
14	9 4 33.86	1.9013	13 44 14.2	10.660
15	9 6 27.83	1.8979	13 33 33.0	10.712
16	9 8 21.61	1.8947	13 22 48.8	10.763
17	9 10 15.19	1.8913	13 12 1.5	10.813
18	9 12 8.57	1.8881	13 1 11.3	10.862
19	9 14 1.76	1.8850	12 50 18.1	10.911
20	9 15 54.77	1.8820	12 39 22.0	10.958
21	9 17 47.60	1.8789	12 28 23.1	11.005
22	9 19 40.24	1.8759	12 17 21.4	11.052
23	9 21 32.71	1.8730	12 6 16.9	11.098
24	9 23 25.00	1.8701	+11 55 9.7	−11.143

Hour.	Right Ascension.	Var. per Min.	Declination.
	MAY 27.		
	h m s	s	° ′ ″
0	9 23 25.00	1.8701	+11 55 9.7
1	9 25 17.12	1.8673	11 43 59.8
2	9 27 9.08	1.8646	11 32 47.3
3	9 29 0.87	1.8619	11 21 32.2
4	9 30 52.51	1.8593	11 10 14.5
5	9 32 43.99	1.8567	10 58 54.3
6	9 34 35.31	1.8542	10 47 31.6
7	9 36 26.49	1.8518	10 36 6.5
8	9 38 17.52	1.8493	10 24 39.0
9	9 40 8.41	1.8470	10 13 9.1
10	9 41 59.16	1.8448	10 1 36.9
11	9 43 49.78	1.8426	9 50 2.5
12	9 45 40.27	1.8404	9 38 25.8
13	9 47 30.63	1.8383	9 26 46.9
14	9 49 20.87	1.8363	9 15 5.9
15	9 51 10.99	1.8343	9 3 22.7
16	9 53 0.99	1.8323	8 51 37.4
17	9 54 50.87	1.8305	8 39 50.1
18	9 56 40.65	1.8288	8 28 0.8
19	9 58 30.33	1.8270	8 16 9.5
20	10 0 19.89	1.8253	8 4 16.3
21	10 2 9.37	1.8238	7 52 21.2
22	10 3 58.75	1.8223	7 40 24.2
23	10 5 48.05	1.8209	+ 7 28 25.4
	MAY 28.		
0	10 7 37.26	1.8195	+ 7 16 24.9
1	10 9 26.39	1.8182	7 4 22.6
2	10 11 15.44	1.8168	6 52 18.7
3	10 13 4.41	1.8157	6 40 13.0
4	10 14 53.32	1.8146	6 28 5.8
5	10 16 42.16	1.8135	6 15 56.9
6	10 18 30.94	1.8125	6 3 46.5
7	10 20 19.66	1.8116	5 51 34.6
8	10 22 8.33	1.8108	5 39 21.1
9	10 23 56.95	1.8099	5 27 6.3
10	10 25 45.52	1.8092	5 14 50.0
11	10 27 34.05	1.8085	5 2 32.4
12	10 29 22.54	1.8079	4 50 13.4
13	10 31 11.00	1.8073	4 37 53.2
14	10 32 59.42	1.8069	4 25 31.6
15	10 34 47.83	1.8066	4 13 8.9
16	10 36 36.21	1.8062	4 0 45.0
17	10 38 24.57	1.8059	3 48 19.9
18	10 40 12.92	1.8058	3 35 53.7
19	10 42 1.26	1.8056	3 23 26.4
20	10 43 49.59	1.8055	3 10 58.1
21	10 45 37.92	1.8056	2 58 28.8
22	10 47 26.26	1.8057	2 45 58.5
23	10 49 14.60	1.8058	2 33 27.3
24	10 51 2.96	1.8061	+ 2 20 55.2

GREENWICH MEAN TIME.

r.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	MAY 29.			
	h m s	s	° ′ ″	″
	10 51 2.96	1.8061	+2 20 55.2	−12.542
	10 52 51.33	1.8063	2 8 22.3	12.556
	10 54 39.72	1.8067	1 55 48.5	12.570
	10 56 28.13	1.8071	1 43 13.9	12.583
	10 58 16.57	1.8076	1 30 38.6	12.594
	11 0 5.04	1.8082	1 18 2.6	12.605
	11 1 53.55	1.8088	1 5 26.0	12.616
	11 3 42.10	1.8095	0 52 48.7	12.627
	11 5 30.69	1.8103	0 40 10.8	12.637
	11 7 19.34	1.8112	0 27 32.3	12.645
	11 9 8.03	1.8120	0 14 53.4	12.653
	11 10 56.78	1.8131	+0 2 13.9	12.661
	11 12 45.60	1.8142	−0 10 25.9	12.668
	11 14 34.48	1.8153	0 23 6.2	12.674
	11 16 23.43	1.8165	0 35 46.8	12.680
	11 18 12.46	1.8178	0 48 27.8	12.685
	11 20 1.56	1.8191	1 1 9.0	12.689
	11 21 50.75	1.8206	1 13 50.5	12.693
	11 23 40.03	1.8220	1 26 32.2	12.697
	11 25 29.39	1.8235	1 39 14.1	12.698
	11 27 18.85	1.8252	1 51 56.0	12.700
	11 29 8.41	1.8269	2 4 38.1	12.702
	11 30 58.08	1.8287	2 17 20.2	12.702
	11 32 47.85	1.8305	−2 30 2.3	−12.701
	MAY 30.			
	11 34 37.74	1.8325	−2 42 44.3	−12.700
	11 36 27.75	1.8344	2 55 26.3	12.698
	11 38 17.87	1.8365	3 8 8.1	12.696
	11 40 8.13	1.8387	3 20 49.8	12.693
	11 41 58.51	1.8408	3 33 31.2	12.689
	11 43 49.03	1.8431	3 46 12.5	12.685
	11 45 39.68	1.8454	3 58 53.4	12.678
	11 47 30.48	1.8479	4 11 33.9	12.673
	11 49 21.43	1.8503	4 24 14.1	12.667
	11 51 12.52	1.8528	4 36 53.9	12.659
	11 53 3.77	1.8556	4 49 33.2	12.651
	11 54 55.19	1.8583	5 2 12.0	12.642
	11 56 46.76	1.8610	5 14 50.2	12.632
	11 58 38.51	1.8639	5 27 27.8	12.621
	12 0 30.43	1.8668	5 40 4.7	12.610
	12 2 22.53	1.8698	5 52 41.0	12.598
	12 4 14.80	1.8728	6 5 16.5	12.585
	12 6 7.27	1.8760	6 17 51.2	12.571
	12 7 59.92	1.8792	6 30 25.0	12.557
	12 9 52.77	1.8825	6 42 58.0	12.542
	12 11 45.82	1.8858	6 55 30.0	12.525
	12 13 39.07	1.8893	7 8 1.0	12.508
	12 15 32.53	1.8928	7 20 31.0	12.491
	12 17 26.20	1.8963	7 32 59.9	12.472
	12 19 20.08	*1.8999*	*−7 45 27.6*	*−12.452*

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	MAY 31.			
	h m s	s	° ′ ″	″
0	12 19 20.08	1.8999	− 7 45 27.6	−12.452
1	12 21 14.19	1.9037	7 57 54.1	12.432
2	12 23 8.52	1.9074	8 10 19.4	12.411
3	12 25 3.08	1.9113	8 22 43.4	12.389
4	12 26 57.87	1.9152	8 35 6.1	12.366
5	12 28 52.90	1.9192	8 47 27.3	12.341
6	12 30 48.17	1.9233	8 59 47.0	12.317
7	12 32 43.69	1.9273	9 12 5.3	12.292
8	12 34 39.45	1.9316	9 24 22.0	12.264
9	12 36 35.48	1.9358	9 36 37.0	12.236
10	12 38 31.75	1.9402	9 48 50.3	12.208
11	12 40 28.30	1.9446	10 1 1.9	12.178
12	12 42 25.10	1.9490	10 13 11.7	12.148
13	12 44 22.18	1.9536	10 25 19.7	12.117
14	12 46 19.53	1.9582	10 37 25.7	12.084
15	12 48 17.16	1.9628	10 49 29.8	12.051
16	12 50 15.07	1.9676	11 1 31.8	12.016
17	12 52 13.27	1.9723	11 13 31.7	11.981
18	12 54 11.75	1.9773	11 25 29.5	11.944
19	12 56 10.54	1.9822	11 37 25.0	11.907
20	12 58 9.61	1.9871	11 49 18.3	11.868
21	13 0 8.99	1.9923	12 1 9.2	11.828
22	13 2 8.68	1.9974	12 12 57.7	11.788
23	13 4 8.68	2.0026	−12 24 43.8	−11.746
	JUNE 1.			
0	13 6 8.99	2.0078	−12 36 27.2	−11.703
1	13 8 9.62	2.0131	12 48 8.1	11.659
2	13 10 10.56	2.0185	12 59 46.3	11.613
3	13 12 11.84	2.0240	13 11 21.7	11.568
4	13 14 13.44	2.0294	13 22 54.4	11.521
5	13 16 15.37	2.0349	13 34 24.2	11.472
6	13 18 17.63	2.0406	13 45 51.0	11.423
7	13 20 20.24	2.0463	13 57 14.9	11.372
8	13 22 23.18	2.0519	14 8 35.6	11.320
9	13 24 26.47	2.0578	14 19 53.3	11.267
10	13 26 30.11	2.0636	14 31 7.6	11.212
11	13 28 34.10	2.0694	14 42 18.7	11.158
12	13 30 38.44	2.0753	14 53 26.5	11.101
13	13 32 43.14	2.0814	15 4 30.8	11.043
14	13 34 48.21	2.0874	15 15 31.6	10.983
15	13 36 53.63	2.0934	15 26 28.7	10.923
16	13 38 59.42	2.0997	15 37 22.3	10.862
17	13 41 5.59	2.1058	15 48 12.1	10.798
18	13 43 12.12	2.1121	15 58 58.0	10.733
19	13 45 19.04	2.1183	16 9 40.1	10.668
20	13 47 26.32	2.1247	16 20 18.2	10.602
21	13 49 34.00	2.1311	16 30 52.3	10.534
22	13 51 42.05	2.1374	16 41 22.3	10.464
23	13 53 50.49	2.1439	16 51 48.0	10.393
24	13 55 59.32	2.1504	−17 2 9.5	−10.322

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	JUNE 2.			
	h m s	s	° ′ ″	″
0	13 55 59.32	2.1504	−17 2 9.5	−10.322
1	13 58 8.54	2.1569	17 12 26.6	10.248
2	14 0 18.15	2.1634	17 22 39.2	10.173
3	14 2 28.15	2.1700	17 32 47.3	10.097
4	14 4 38.55	2.1767	17 42 50.8	10.019
5	14 6 49.35	2.1833	17 52 49.6	9.940
6	14 9 0.55	2.1900	18 2 43.6	9.860
7	14 11 12.15	2.1968	18 12 32.8	9.779
8	14 13 24.16	2.2034	18 22 17.1	9.696
9	14 15 36.56	2.2102	18 31 56.3	9.611
10	14 17 49.38	2.2170	18 41 30.4	9.525
11	14 20 2.60	2.2238	18 50 59.3	9.438
12	14 22 16.23	2.2306	19 0 23.0	9.350
13	14 24 30.27	2.2374	19 9 41.3	9.259
14	14 26 44.72	2.2443	19 18 54.1	9.168
15	14 28 59.58	2.2511	19 28 1.4	9.075
16	14 31 14.85	2.2580	19 37 3.1	8.980
17	14 33 30.54	2.2649	19 45 59.0	8.884
18	14 35 46.64	2.2718	19 54 49.2	8.788
19	14 38 3.15	2.2786	20 3 33.5	8.688
20	14 40 20.07	2.2855	20 12 11.8	8.588
21	14 42 37.41	2.2924	20 20 44.1	8.487
22	14 44 55.16	2.2993	20 29 10.2	8.384
23	14 47 13.32	2.3062	−20 37 30.2	− 8.279
	JUNE 3.			
0	14 49 31.90	2.3131	−20 45 43.7	− 8.173
1	14 51 50.89	2.3199	20 53 50.9	8.066
2	14 54 10.29	2.3267	21 1 51.6	7.957
3	14 56 30.09	2.3335	21 9 45.7	7.847
4	14 58 50.31	2.3403	21 17 33.2	7.735
5	15 1 10.93	2.3472	21 25 13.9	7.621
6	15 3 31.97	2.3539	21 32 47.7	7.507
7	15 5 53.40	2.3606	21 40 14.7	7.391
8	15 8 15.24	2.3673	21 47 34.6	7.273
9	15 10 37.48	2.3740	21 54 47.4	7.153
10	15 13 0.12	2.3807	22 1 53.0	7.033
11	15 15 23.16	2.3873	22 8 51.3	6.910
12	15 17 46.59	2.3938	22 15 42.2	6.787
13	15 20 10.41	2.4003	22 22 25.7	6.663
14	15 22 34.63	2.4068	22 29 1.7	6.537
15	15 24 59.23	2.4133	22 35 30.1	6.409
16	15 27 24.22	2.4196	22 41 50.8	6.280
17	15 29 49.58	2.4259	22 48 3.7	6.149
18	15 32 15.33	2.4323	22 54 8.7	6.017
19	15 34 41.45	2.4383	23 0 5.7	5.884
20	15 37 7.93	2.4445	23 5 54.8	5.750
21	15 39 34.79	2.4506	23 11 35.7	5.614
22	15 42 2.00	2.4566	23 17 8.5	5.477
23	15 44 29.58	2.4626	23 22 32.9	5.338
24	15 46 57.51	2.4684	−23 27 49.0	− 5.198

Hour.	Right Ascension.	Var. per Min.	Declination.
	JUNE 4.		
	h m s	s	° ′ ″
0	15 46 57.51	2.4684	−23 27 49.0
1	15 49 25.79	2.4742	23 32 56.7
2	15 51 54.41	2.4799	23 37 55.9
3	15 54 23.38	2.4856	23 42 46.5
4	15 56 52.68	2.4910	23 47 28.5
5	15 59 22.30	2.4964	23 52 1.7
6	16 1 52.25	2.5018	23 56 26.2
7	16 4 22.52	2.5071	24 0 41.7
8	16 6 53.10	2.5123	24 4 48.4
9	16 9 23.99	2.5173	24 8 46.0
10	16 11 55.18	2.5223	24 12 34.6
11	16 14 26.66	2.5271	24 16 14.0
12	16 16 58.43	2.5319	24 19 44.2
13	16 19 30.49	2.5365	24 23 5.1
14	16 22 2.81	2.5410	24 26 16.7
15	16 24 35.41	2.5455	24 29 19.0
16	16 27 8.27	2.5498	24 32 11.7
17	16 29 41.39	2.5540	24 34 55.0
18	16 32 14.75	2.5580	24 37 28.7
19	16 34 48.35	2.5619	24 39 52.8
20	16 37 22.18	2.5658	24 42 7.2
21	16 39 56.24	2.5694	24 44 12.0
22	16 42 30.51	2.5730	24 46 6.9
23	16 45 5.00	2.5764	−24 47 52.1
	JUNE 5.		
0	16 47 39.68	2.5797	−24 49 27.4
1	16 50 14.56	2.5828	24 50 52.8
2	16 52 49.62	2.5859	24 52 8.3
3	16 55 24.87	2.5888	24 53 13.8
4	16 58 0.27	2.5914	24 54 9.3
5	17 0 35.84	2.5941	24 54 54.8
6	17 3 11.56	2.5966	24 55 30.2
7	17 5 47.43	2.5988	24 55 55.4
8	17 8 23.42	2.6010	24 56 10.6
9	17 10 59.55	2.6031	24 56 15.6
10	17 13 35.79	2.6049	24 56 10.3
11	17 16 12.14	2.6066	24 55 54.9
12	17 18 48.58	2.6082	24 55 29.3
13	17 21 25.12	2.6097	24 54 53.4
14	17 24 1.74	2.6110	24 54 7.3
15	17 26 38.44	2.6121	24 53 10.9
16	17 29 15.19	2.6130	24 52 4.2
17	17 31 52.00	2.6139	24 50 47.2
18	17 34 28.86	2.6147	24 49 19.9
19	17 37 5.76	2.6152	24 47 42.3
20	17 39 42.68	2.6155	24 45 54.5
21	17 42 19.62	2.6158	24 43 56.3
22	17 44 56.57	2.6159	24 41 47.8
23	17 47 33.53	2.6158	24 39 29.1
24	17 50 10.47	2.6156	−24 37 0.0

GREENWICH MEAN TIME.

Right cension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
JUNE 6.					JUNE 8.			
m s	s	° ′ ″	″		h m s	s	° ′ ″	″
50 10.47	2.6156	−24 37 0.0	+2.570	0	19 53 3.94	2.4663	−19 27 33.9	+ 9.947
52 47.40	2.6153	24 34 20.7	2.741	1	19 55 31.77	2.4613	19 17 33.3	10.072
55 24.30	2.6148	24 31 31.1	2.913	2	19 57 59.30	2.4563	19 7 25.3	10.194
58 1.17	2.6142	24 28 31.2	3.083	3	20 0 26.52	2.4512	18 57 10.0	10.316
0 38.00	2.6133	24 25 21.1	3.253	4	20 2 53.44	2.4461	18 46 47.4	10.437
3 14.77	2.6124	24 22 0.9	3.423	5	20 5 20.05	2.4409	18 36 17.6	10.555
5 51.49	2.6113	24 18 30.4	3.593	6	20 7 46.35	2.4358	18 25 40.8	10.672
8 28.13	2.6102	24 14 49.7	3.763	7	20 10 12.35	2.4307	18 14 57.0	10.787
11 4.71	2.6088	24 10 58.9	3.931	8	20 12 38.03	2.4254	18 4 6.4	10.901
13 41.19	2.6073	24 6 58.0	4.099	9	20 15 3.40	2.4203	17 53 8.9	11.013
16 17.59	2.6058	24 2 47.0	4.267	10	20 17 28.46	2.4151	17 42 4.8	11.123
18 53.88	2.6040	23 58 26.0	4.434	11	20 19 53.21	2.4099	17 30 54.1	11.233
21 30.07	2.6022	23 53 54.9	4.601	12	20 22 17.65	2.4047	17 19 36.9	11.340
24 6.14	2.6001	23 49 13.9	4.767	13	20 24 41.77	2.3994	17 8 13.3	11.446
26 42.08	2.5979	23 44 22.9	4.933	14	20 27 5.58	2.3943	16 56 43.5	11.549
29 17.89	2.5957	23 39 22.0	5.097	15	20 29 29.08	2.3891	16 45 7.4	11.653
31 53.56	2.5933	23 34 11.3	5.261	16	20 31 52.27	2.3839	16 33 25.2	11.753
34 29.08	2.5908	23 28 50.7	5.424	17	20 34 15.15	2.3787	16 21 37.0	11.853
37 4.45	2.5882	23 23 20.4	5.586	18	20 36 37.71	2.3735	16 9 42.9	11.949
39 39.66	2.5854	23 17 40.4	5.748	19	20 38 59.97	2.3683	15 57 43.1	12.045
42 14.70	2.5825	23 11 50.7	5.908	20	20 41 21.91	2.3632	15 45 37.5	12.140
44 49.56	2.5795	23 5 51.4	6.068	21	20 43 43.55	2.3581	15 33 26.3	12.233
47 24.24	2.5765	22 59 42.5	6.227	22	20 46 4.88	2.3529	15 21 9.5	12.324
49 58.74	2.5733	−22 53 24.2	+6.384	23	20 48 25.90	2.3478	−15 8 47.4	+12.413
JUNE 7.					JUNE 9.			
52 33.04	2.5700	−22 46 56.4	+6.542	0	20 50 46.61	2.3427	−14 56 20.0	+12.500
55 7.14	2.5666	22 40 19.2	6.698	1	20 53 7.02	2.3377	14 43 47.4	12.586
57 41.03	2.5630	22 33 32.6	6.853	2	20 55 27.13	2.3327	14 31 9.7	12.670
0 14.70	2.5594	22 26 36.8	7.007	3	20 57 46.94	2.3278	14 18 27.0	12.753
2 48.16	2.5558	22 19 31.8	7.159	4	21 0 6.46	2.3228	14 5 39.3	12.834
5 21.39	2.5520	22 12 17.7	7.311	5	21 2 25.67	2.3178	13 52 46.9	12.913
7 54.40	2.5482	22 4 54.5	7.462	6	21 4 44.59	2.3129	13 39 49.7	12.992
10 27.17	2.5441	21 57 22.3	7.611	7	21 7 3.22	2.3081	13 26 47.9	13.068
12 59.69	2.5401	21 49 41.2	7.759	8	21 9 21.56	2.3033	13 13 41.6	13.143
15 31.98	2.5360	21 41 51.2	7.906	9	21 11 39.61	2.2985	13 0 30.8	13.216
18 4.01	2.5318	21 33 52.5	8.051	10	21 13 57.38	2.2938	12 47 15.7	13.287
20 35.79	2.5274	21 25 45.1	8.195	11	21 16 14.86	2.2891	12 33 56.4	13.356
23 7.30	2.5230	21 17 29.1	8.338	12	21 18 32.07	2.2845	12 20 33.0	13.423
25 38.55	2.5187	21 9 4.5	8.480	13	21 20 49.00	2.2798	12 7 5.6	13.490
28 9.54	2.5142	21 0 31.5	8.621	14	21 23 5.65	2.2752	11 53 34.2	13.555
30 40.25	2.5096	20 51 50.0	8.760	15	21 25 22.02	2.2707	11 39 59.0	13.618
33 10.69	2.5050	20 43 0.3	8.897	16	21 27 38.13	2.2663	11 26 20.0	13.680
35 40.85	2.5004	20 34 2.4	9.033	17	21 29 53.98	2.2619	11 12 37.4	13.739
38 10.74	2.4957	20 24 56.3	9.168	18	21 32 9.56	2.2575	10 58 51.3	13.798
40 40.33	2.4908	20 15 42.2	9.302	19	21 34 24.88	2.2532	10 45 1.6	13.855
43 9.64	2.4860	20 6 20.1	9.434	20	21 36 39.94	2.2490	10 31 8.7	13.909
45 38.65	2.4812	19 56 50.1	9.564	21	21 38 54.76	2.2448	10 17 12.5	13.963
48 7.38	2.4763	19 47 12.4	9.693	22	21 41 9.32	2.2406	10 3 13.1	14.016
50 35.81	2.4713	*19 37 26.9*	*9.821*	23	21 43 23.63	2.2366	9 49 10.6	14.068
53 3.94	*2.4663*	*−19 27 33.9*	*+9.947*	24	21 45 37.71	2.2327	− 9 35 5.2	+14.118

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	JUNE 10.			
	h m s	s	° ′ ″	″
0	21 45 37.71	2.2327	−9 35 5.2	+14.114
1	21 47 51.55	2.2287	9 20 56.9	14.162
2	21 50 5.15	2.2248	9 6 45.8	14.208
3	21 52 18.52	2.2209	8 52 32.0	14.252
4	21 54 31.66	2.2172	8 38 15.6	14.294
5	21 56 44.58	2.2135	8 23 56.7	14.336
6	21 58 57.28	2.2098	8 9 35.3	14.376
7	22 1 9.76	2.2063	7 55 11.6	14.413
8	22 3 22.03	2.2028	7 40 45.7	14.449
9	22 5 34.09	2.1993	7 26 17.7	14.484
10	22 7 45.95	2.1959	7 11 47.6	14.518
11	22 9 57.60	2.1926	6 57 15.5	14.550
12	22 12 9.06	2.1894	6 42 41.6	14.580
13	22 14 20.33	2.1863	6 28 5.9	14.609
14	22 16 31.42	2.1833	6 13 28.5	14.637
15	22 18 42.32	2.1802	5 58 49.5	14.663
16	22 20 53.04	2.1772	5 44 8.9	14.688
17	22 23 3.58	2.1743	5 29 26.9	14.711
18	22 25 13.96	2.1716	5 14 43.6	14.732
19	22 27 24.17	2.1688	4 59 59.1	14.753
20	22 29 34.22	2.1661	4 45 13.3	14.772
21	22 31 44.10	2.1635	4 30 26.5	14.788
22	22 33 53.84	2.1611	4 15 38.7	14.805
23	22 36 3.43	2.1585	−4 0 49.9	+14.819
	JUNE 11.			
0	22 38 12.86	2.1561	−3 46 0.4	+14.832
1	22 40 22.16	2.1539	3 31 10.1	14.843
2	22 42 31.33	2.1518	3 16 19.2	14.853
3	22 44 40.37	2.1496	3 1 27.7	14.863
4	22 46 49.28	2.1475	2 46 35.7	14.871
5	22 48 58.07	2.1455	2 31 43.2	14.877
6	22 51 6.74	2.1436	2 16 50.5	14.881
7	22 53 15.30	2.1418	2 1 57.5	14.885
8	22 55 23.75	2.1399	1 47 4.3	14.887
9	22 57 32.09	2.1383	1 32 11.1	14.887
10	22 59 40.34	2.1367	1 17 17.9	14.887
11	23 1 48.49	2.1351	1 2 24.7	14.885
12	23 3 56.55	2.1337	0 47 31.7	14.881
13	23 6 4.53	2.1323	0 32 39.0	14.877
14	23 8 12.42	2.1309	0 17 46.5	14.871
15	23 10 20.24	2.1297	−0 2 54.5	14.863
16	23 12 27.98	2.1285	+0 11 57.0	14.854
17	23 14 35.66	2.1274	0 26 48.0	14.844
18	23 16 43.27	2.1264	0 41 38.3	14.833
19	23 18 50.83	2.1254	0 56 28.0	14.821
20	23 20 58.32	2.1245	1 11 16.8	14.806
21	23 23 5.77	2.1238	1 26 4.7	14.791
22	23 25 13.18	2.1231	1 40 51.7	14.775
23	23 27 20.54	2.1224	1 55 37.7	14.758
24	*23 29 27.87*	*2.1219*	*+2 10 22.6*	+14.738

Hour.	Right Ascension.	Var. per Min.	Declination.
	JUNE 12.		
	h m s	s	° ′ ″
0	23 29 27.87	2.1219	+ 2 10 22.6
1	23 31 35.17	2.1213	2 25 6.3
2	23 33 42.43	2.1209	2 39 48.7
3	23 35 49.68	2.1206	2 54 29.8
4	23 37 56.90	2.1203	3 9 9.4
5	23 40 4.11	2.1201	3 23 47.6
6	23 42 11.31	2.1199	3 38 24.2
7	23 44 18.50	2.1198	3 52 59.2
8	23 46 25.69	2.1199	4 7 32.5
9	23 48 32.89	2.1200	4 22 4.0
10	23 50 40.09	2.1201	4 36 33.6
11	23 52 47.30	2.1203	4 51 1.4
12	23 54 54.52	2.1206	5 5 27.0
13	23 57 1.77	2.1210	5 19 50.6
14	23 59 9.04	2.1213	5 34 12.1
15	0 1 16.33	2.1218	5 48 31.3
16	0 3 23.66	2.1225	6 2 48.2
17	0 5 31.03	2.1231	6 17 2.8
18	0 7 38.43	2.1237	6 31 14.9
19	0 9 45.87	2.1245	6 45 24.5
20	0 11 53.37	2.1253	6 59 31.6
21	0 14 0.91	2.1263	7 13 35.9
22	0 16 8.51	2.1272	7 27 37.6
23	0 18 16.16	2.1281	+ 7 41 36.5
	JUNE 13.		
0	0 20 23.88	2.1293	+ 7 55 32.4
1	0 22 31.67	2.1303	8 9 25.5
2	0 24 39.52	2.1315	8 23 15.5
3	0 26 47.45	2.1328	8 37 2.4
4	0 28 55.45	2.1341	8 50 46.2
5	0 31 3.54	2.1355	9 4 26.8
6	0 33 11.71	2.1368	9 18 4.1
7	0 35 19.96	2.1383	9 31 38.0
8	0 37 28.31	2.1399	9 45 8.4
9	0 39 36.75	2.1415	9 58 35.4
10	0 41 45.29	2.1431	10 11 58.8
11	0 43 53.92	2.1448	10 25 18.6
12	0 46 2.66	2.1466	10 38 34.6
13	0 48 11.51	2.1484	10 51 46.9
14	0 50 20.47	2.1502	11 4 55.3
15	0 52 29.53	2.1521	11 17 59.8
16	0 54 38.72	2.1541	11 31 0.3
17	0 56 48.02	2.1561	11 43 56.8
18	0 58 57.45	2.1582	11 56 49.1
19	1 1 7.00	2.1603	12 9 37.3
20	1 3 16.68	2.1623	12 22 21.2
21	1 5 26.48	2.1645	12 35 0.7
22	1 7 36.42	2.1668	12 47 35.9
23	1 9 46.49	2.1690	13 0 6.6
24	1 11 56.70	2.1713	+13 12 32.5

GREENWICH MEAN TIME.

Hr.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	JUNE 14.			
	h m s	s	° ′ ″	″
0	1 11 56.70	2.1713	+13 12 32.9	+12.399
1	1 14 7.05	2.1737	13 24 54.5	12.322
2	1 16 17.54	2.1760	13 37 11.5	12.244
3	1 18 28.17	2.1784	13 49 23.8	12.164
4	1 20 38.95	2.1808	14 1 31.2	12.083
5	1 22 49.87	2.1833	14 13 33.8	12.003
6	1 25 0.95	2.1859	14 25 31.5	11.920
7	1 27 12.18	2.1884	14 37 24.2	11.837
8	1 29 23.56	2.1910	14 49 11.9	11.752
9	1 31 35.10	2.1936	15 0 54.4	11.666
10	1 33 46.79	2.1962	15 12 31.8	11.579
11	1 35 58.64	2.1988	15 24 3.9	11.491
12	1 38 10.65	2.2015	15 35 30.7	11.403
13	1 40 22.82	2.2043	15 46 52.2	11.313
14	1 42 35.16	2.2070	15 58 8.2	11.222
15	1 44 47.66	2.2097	16 9 18.8	11.130
16	1 47 0.32	2.2124	16 20 23.8	11.036
17	1 49 13.15	2.2153	16 31 23.1	10.943
18	1 51 26.15	2.2180	16 42 16.9	10.848
19	1 53 39.31	2.2208	16 53 4.8	10.751
20	1 55 52.64	2.2236	17 3 47.0	10.654
21	1 58 6.14	2.2263	17 14 23.3	10.556
22	2 0 19.81	2.2292	17 24 53.7	10.457
23	2 2 33.65	2.2320	+17 35 18.1	+10.357
	JUNE 15.			
0	2 4 47.65	2.2348	+17 45 36.5	+10.256
1	2 7 1.83	2.2378	17 55 48.8	10.153
2	2 9 16.18	2.2406	18 5 54.9	10.050
3	2 11 30.70	2.2434	18 15 54.8	9.946
4	2 13 45.39	2.2463	18 25 48.4	9.842
5	2 16 0.25	2.2492	18 35 35.8	9.736
6	2 18 15.29	2.2520	18 45 16.7	9.628
7	2 20 30.49	2.2548	18 54 51.2	9.521
8	2 22 45.86	2.2576	19 4 19.2	9.412
9	2 25 1.40	2.2604	19 13 40.6	9.302
10	2 27 17.11	2.2633	19 22 55.4	9.192
11	2 29 32.99	2.2661	19 32 3.6	9.081
12	2 31 49.04	2.2688	19 41 5.1	8.968
13	2 34 5.25	2.2716	19 49 59.8	8.855
14	2 36 21.63	2.2743	19 58 47.7	8.741
15	2 38 38.17	2.2770	20 7 28.7	8.626
16	2 40 54.87	2.2798	20 16 2.8	8.510
17	2 43 11.74	2.2824	20 24 29.9	8.393
18	2 45 28.76	2.2850	20 32 50.0	8.277
19	2 47 45.94	2.2877	20 41 3.1	8.158
20	2 50 3.28	2.2903	20 49 9.0	8.039
21	2 52 20.77	2.2928	20 57 7.8	7.919
22	2 54 38.41	2.2953	21 4 59.3	7.798
23	2 56 56.20	2.2978	21 12 43.6	7.678
24	*2 59 14.14*	*2.3003*	*+21 20 20.6*	*+7.555*

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	JUNE 16.			
	h m s	s	° ′ ″	″
0	2 59 14.14	2.3003	+21 20 20.6	+7.555
1	3 1 32.23	2.3027	21 27 50.2	7.433
2	3 3 50.46	2.3050	21 35 12.5	7.309
3	3 6 8.83	2.3074	21 42 27.3	7.184
4	3 8 27.35	2.3097	21 49 34.6	7.059
5	3 10 45.99	2.3119	21 56 34.4	6.933
6	3 13 4.78	2.3142	22 3 26.6	6.808
7	3 15 23.69	2.3163	22 10 11.3	6.681
8	3 17 42.73	2.3183	22 16 48.3	6.553
9	3 20 1.89	2.3204	22 23 17.7	6.426
10	3 22 21.18	2.3224	22 29 39.4	6.297
11	3 24 40.58	2.3243	22 35 53.3	6.167
12	3 27 0.10	2.3263	22 41 59.4	6.037
13	3 29 19.73	2.3281	22 47 57.7	5.907
14	3 31 39.47	2.3299	22 53 48.2	5.775
15	3 33 59.32	2.3316	22 59 30.7	5.643
16	3 36 19.26	2.3332	23 5 5.4	5.512
17	3 38 39.30	2.3348	23 10 32.1	5.379
18	3 40 59.44	2.3363	23 15 50.9	5.246
19	3 43 19.66	2.3378	23 21 1.6	5.112
20	3 45 39.97	2.3392	23 26 4.3	4.978
21	3 48 0.36	2.3405	23 30 59.0	4.844
22	3 50 20.83	2.3418	23 35 45.6	4.709
23	3 52 41.37	2.3429	+23 40 24.1	+4.574
	JUNE 17.			
0	3 55 1.98	2.3440	+23 44 54.5	+4.438
1	3 57 22.65	2.3451	23 49 16.7	4.303
2	3 59 43.39	2.3461	23 53 30.8	4.167
3	4 2 4.18	2.3468	23 57 36.7	4.030
4	4 4 25.01	2.3477	24 1 34.4	3.893
5	4 6 45.90	2.3484	24 5 23.9	3.757
6	4 9 6.82	2.3490	24 9 5.2	3.619
7	4 11 27.78	2.3497	24 12 38.2	3.481
8	4 13 48.78	2.3502	24 16 2.9	3.343
9	4 16 9.80	2.3505	24 19 19.4	3.206
10	4 18 30.84	2.3508	24 22 27.6	3.068
11	4 20 51.89	2.3510	24 25 27.5	2.929
12	4 23 12.96	2.3512	24 28 19.1	2.791
13	4 25 34.03	2.3513	24 31 2.4	2.653
14	4 27 55.11	2.3513	24 33 37.4	2.513
15	4 30 16.18	2.3512	24 36 4.0	2.374
16	4 32 37.25	2.3510	24 38 22.3	2.236
17	4 34 58.30	2.3507	24 40 32.3	2.098
18	4 37 19.33	2.3503	24 42 34.0	1.959
19	4 39 40.34	2.3499	24 44 27.4	1.820
20	4 42 1.32	2.3493	24 46 12.4	1.681
21	4 44 22.26	2.3487	24 47 49.1	1.543
22	4 46 43.16	2.3480	24 49 17.6	1.405
23	4 49 4.02	2.3473	24 50 37.7	1.266
24	4 51 24.83	2.3463	+24 51 49.5	+1.128

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	JUNE 18.			
	h m s	s	° ′ ″	″
0	4 51 24.83	2.3463	+24 51 49.5	+1.128
1	4 53 45.58	2.3453	24 52 53.0	0.988
2	4 56 6.27	2.3443	24 53 48.1	0.850
3	4 58 26.89	2.3432	24 54 35.0	0.713
4	5 0 47.45	2.3419	24 55 13.7	0.575
5	5 3 7.92	2.3405	24 55 44.0	0.437
6	5 5 28.31	2.3392	24 56 6.1	0.300
7	5 7 48.62	2.3377	24 56 20.0	0.163
8	5 10 8.83	2.3361	24 56 25.7	+0.026
9	5 12 28.95	2.3344	24 56 23.1	−0.111
10	5 14 48.96	2.3327	24 56 12.4	0.247
11	5 17 8.87	2.3308	24 55 53.5	0.383
12	5 19 28.66	2.3288	24 55 26.5	0.518
13	5 21 48.33	2.3268	24 54 51.3	0.653
14	5 24 7.88	2.3248	24 54 8.1	0.788
15	5 26 27.30	2.3226	24 53 16.7	0.923
16	5 28 46.59	2.3203	24 52 17.3	1.057
17	5 31 5.74	2.3180	24 51 9.9	1.190
18	5 33 24.75	2.3156	24 49 54.5	1.323
19	5 35 43.61	2.3131	24 48 31.1	1.457
20	5 38 2.32	2.3105	24 46 59.7	1.588
21	5 40 20.87	2.3078	24 45 20.5	1.720
22	5 42 39.26	2.3051	24 43 33.3	1.852
23	5 44 57.48	2.3023	+24 41 38.3	−1.982
	JUNE 19.			
0	5 47 15.54	2.2995	+24 39 35.5	−2.112
1	5 49 33.42	2.2965	24 37 24.9	2.242
2	5 51 51.12	2.2935	24 35 6.5	2.372
3	5 54 8.64	2.2904	24 32 40.3	2.500
4	5 56 25.97	2.2872	24 30 6.5	2.627
5	5 58 43.10	2.2839	24 27 25.1	2.754
6	6 1 0.04	2.2807	24 24 36.0	2.881
7	6 3 16.78	2.2773	24 21 39.4	3.007
8	6 5 33.32	2.2739	24 18 35.2	3.132
9	6 7 49.65	2.2704	24 15 23.6	3.256
10	6 10 5.77	2.2668	24 12 4.5	3.380
11	6 12 21.67	2.2632	24 8 38.0	3.503
12	6 14 37.35	2.2595	24 5 4.1	3.626
13	6 16 52.81	2.2558	24 1 22.9	3.748
14	6 19 8.05	2.2521	23 57 34.4	3.868
15	6 21 23.06	2.2483	23 53 38.7	3.988
16	6 23 37.84	2.2443	23 49 35.8	4.108
17	6 25 52.38	2.2403	23 45 25.8	4.226
18	6 28 6.68	2.2364	23 41 8.7	4.344
19	6 30 20.75	2.2324	23 36 44.5	4.462
20	6 32 34.57	2.2283	23 32 13.3	4.578
21	6 34 48.14	2.2241	23 27 35.1	4.694
22	6 37 1.46	2.2199	23 22 50.0	4.808
23	6 39 14.53	2.2157	23 17 58.1	4.922
24	6 41 27.34	2.2114	+23 12 59.4	−5.035

Hour.	Right Ascension.	Var. per Min.	Declinatic
	JUNE 20.		
	h m s	s	° ′
0	6 41 27.34	2.2114	+23 12 5
1	6 43 39.90	2.2072	23 7 5
2	6 45 52.20	2.2028	23 2 4
3	6 48 4.24	2.1985	22 57 2
4	6 50 16.02	2.1941	22 51 5
5	6 52 27.53	2.1897	22 46 2
6	6 54 38.78	2.1852	22 40 4
7	6 56 49.75	2.1807	22 35 1
8	6 59 0.46	2.1763	22 29 1
9	7 1 10.90	2.1717	22 23 1
10	7 3 21.06	2.1670	22 17 8
11	7 5 30.94	2.1624	22 10 5
12	7 7 40.55	2.1578	22 4 4
13	7 9 49.88	2.1533	21 58 1
14	7 11 58.94	2.1486	21 51 5
15	7 14 7.71	2.1439	21 45 1
16	7 16 16.21	2.1393	21 38 3
17	7 18 24.42	2.1345	21 31 4
18	7 20 32.35	2.1298	21 24 5
19	7 22 40.00	2.1252	21 17 5
20	7 24 47.37	2.1204	21 10 5
21	7 26 54.45	2.1157	21 3 4
22	7 29 1.25	2.1110	20 56 2
23	7 31 7.77	2.1063	+20 49 8
	JUNE 21.		
0	7 33 14.00	2.1015	+20 41 4
1	7 35 19.95	2.0968	20 34 1
2	7 37 25.61	2.0920	20 26 3
3	7 39 30.99	2.0873	20 18 5
4	7 41 36.08	2.0826	20 11 2
5	7 43 40.90	2.0778	20 3 9
6	7 45 45.42	2.0731	19 55 1
7	7 47 49.67	2.0684	19 47 8
8	7 49 53.63	2.0637	19 38 5
9	7 51 57.31	2.0590	19 30 4
10	7 54 0.71	2.0543	19 22 2
11	7 56 3.83	2.0496	19 14 4
12	7 58 6.66	2.0449	19 5 3
13	8 0 9.22	2.0403	18 57 3
14	8 2 11.50	2.0357	18 48 2
15	8 4 13.50	2.0311	18 39 4
16	8 6 15.23	2.0265	18 30 5
17	8 8 16.68	2.0220	18 22 4
18	8 10 17.87	2.0174	18 13 7
19	8 12 18.77	2.0128	18 4 7
20	8 14 19.41	2.0084	17 55 2
21	8 16 19.78	2.0040	17 45 5
22	8 18 19.89	1.9995	17 36 3
23	8 20 19.72	1.9951	17 27 2
24	8 22 19.30	1.9908	+17 17 5

GREENWICH MEAN TIME.

ht sion.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	JUNE 22.				JUNE 24.			
s	s	° ′ ″	″		h m s	s	° ′ ″	″
19.30	1.9908	+17 17 58.8	− 9.403	0	9 53 33.71	1.8293	+8 42 23.7	−11.778
18.61	1.9863	17 8 32.5	9.473	1	9 55 23.40	1.8272	8 30 36.1	11.809
17.66	1.9820	16 59 2.1	9.541	2	9 57 12.97	1.8251	8 18 46.6	11.840
16.45	1.9778	16 49 27.6	9.608	3	9 59 2.41	1.8231	8 6 55.3	11.869
14.99	1.9734	16 39 49.2	9.673	4	10 0 51.74	1.8213	7 55 2.3	11.898
13.26	1.9692	16 30 6.8	9.738	5	10 2 40.96	1.8193	7 43 7.5	11.928
11.29	1.9651	16 20 20.6	9.803	6	10 4 30.06	1.8176	7 31 11.0	11.955
9.07	1.9609	16 10 30.5	9.867	7	10 6 19.07	1.8159	7 19 12.9	11.983
6.60	1.9568	16 0 36.6	9.929	8	10 8 7.97	1.8142	7 7 13.1	12.009
3.88	1.9526	15 50 39.0	9.991	9	10 9 56.77	1.8126	6 55 11.8	12.034
0.91	1.9486	15 40 37.7	10.052	10	10 11 45.48	1.8111	6 43 9.0	12.060
57.71	1.9447	15 30 32.8	10.112	11	10 13 34.10	1.8096	6 31 4.6	12.085
54.27	1.9407	15 20 24.3	10.171	12	10 15 22.63	1.8082	6 18 58.8	12.108
50.59	1.9367	15 10 12.3	10.229	13	10 17 11.08	1.8068	6 6 51.6	12.132
46.67	1.9328	14 59 56.8	10.287	14	10 18 59.45	1.8055	5 54 43.0	12.154
42.52	1.9289	14 49 37.9	10.343	15	10 20 47.74	1.8043	5 42 33.1	12.176
38.14	1.9251	14 39 15.7	10.398	16	10 22 35.97	1.8032	5 30 21.9	12.198
33.53	1.9213	14 28 50.1	10.454	17	10 24 24.12	1.8020	5 18 9.4	12.218
28.70	1.9177	14 18 21.2	10.508	18	10 26 12.21	1.8011	5 5 55.7	12.238
23.65	1.9140	14 7 49.1	10.562	19	10 28 0.25	1.8001	4 53 40.8	12.258
18.38	1.9103	13 57 13.8	10.614	20	10 29 48.22	1.7991	4 41 24.7	12.277
12.89	1.9067	13 46 35.4	10.666	21	10 31 36.14	1.7983	4 29 7.6	12.295
7.18	1.9032	13 35 53.9	10.718	22	10 33 24.02	1.7975	4 16 49.3	12.313
1.27	1.8998	+13 25 9.3	−10.767	23	10 35 11.84	1.7968	+4 4 30.0	−12.329
	JUNE 23.				JUNE 25.			
55.15	1.8963	+13 14 21.9	−10.815	0	10 36 59.63	1.7962	+3 52 9.8	−12.345
48.82	1.8928	13 3 31.5	10.865	1	10 38 47.38	1.7956	3 39 48.6	12.362
42.29	1.8895	12 52 38.1	10.913	2	10 40 35.10	1.7951	3 27 26.4	12.377
35.56	1.8863	12 41 41.9	10.959	3	10 42 22.79	1.7947	3 15 3.4	12.391
28.64	1.8830	12 30 43.0	11.006	4	10 44 10.46	1.7943	3 2 39.5	12.406
21.52	1.8798	12 19 41.2	11.052	5	10 45 58.11	1.7940	2 50 14.7	12.419
14.21	1.8766	12 8 36.8	11.097	6	10 47 45.74	1.7937	2 37 49.2	12.431
6.71	1.8735	11 57 29.6	11.141	7	10 49 33.35	1.7935	2 25 23.0	12.443
59.03	1.8705	11 46 19.9	11.183	8	10 51 20.96	1.7934	2 12 56.0	12.455
51.17	1.8675	11 35 7.6	11.226	9	10 53 8.56	1.7934	2 0 28.4	12.466
43.13	1.8645	11 23 52.8	11.268	10	10 54 56.17	1.7934	1 48 0.1	12.476
34.91	1.8616	11 12 35.5	11.309	11	10 56 43.77	1.7935	1 35 31.3	12.486
26.52	1.8588	11 1 15.7	11.350	12	10 58 31.39	1.7938	1 23 1.8	12.495
17.97	1.8561	10 49 53.5	11.389	13	11 0 19.02	1.7939	1 10 31.9	12.503
9.25	1.8533	10 38 29.0	11.428	14	11 2 6.66	1.7942	0 58 1.5	12.511
0.36	1.8506	10 27 2.2	11.466	15	11 3 54.32	1.7945	0 45 30.6	12.518
51.32	1.8481	10 15 33.1	11.503	16	11 5 42.00	1.7950	0 32 59.4	12.524
42.13	1.8455	10 4 1.8	11.540	17	11 7 29.72	1.7955	0 20 27.7	12.530
32.78	1.8430	9 52 28.3	11.577	18	11 9 17.46	1.7961	+0 7 55.8	12.535
23.29	1.8406	9 40 52.6	11.613	19	11 11 5.25	1.7968	−0 4 36.5	12.540
13.65	1.8382	9 29 14.8	11.647	20	11 12 53.07	1.7974	0 17 9.0	12.543
3.87	1.8358	9 17 35.0	11.680	21	11 14 40.94	1.7982	0 29 41.7	12.547
53.95	1.8335	9 5 53.2	11.713	22	11 16 28.85	1.7991	0 42 14.6	12.550
43.89	1.8313	8 54 9.4	11.746	23	11 18 16.83	1.8000	0 54 47.7	12.552
33.71	1.8293	+ 8 42 23.7	−11.778	24	11 20 4.85	1.8009	−1 7 20.8	−12.553

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	JUNE 26.			
	h m s	s	° ′ ″	″
0	11 20 4.85	1.8009	− 1 7 20.8	−12.553
1	11 21 52.94	1.8020	1 19 54.0	12.554
2	11 23 41.09	1.8032	1 32 27.3	12.554
3	11 25 29.32	1.8043	1 45 0.5	12.553
4	11 27 17.61	1.8056	1 57 33.7	12.553
5	11 29 5.99	1.8070	2 10 6.9	12.552
6	11 30 54.45	1.8083	2 22 39.9	12.549
7	11 32 42.99	1.8098	2 35 12.8	12.547
8	11 34 31.63	1.8114	2 47 45.5	12.543
9	11 36 20.36	1.8129	3 0 17.9	12.538
10	11 38 9.18	1.8147	3 12 50.1	12.534
11	11 39 58.12	1.8165	3 25 22.0	12.528
12	11 41 47.16	1.8183	3 37 53.5	12.522
13	11 43 36.31	1.8203	3 50 24.6	12.515
14	11 45 25.59	1.8223	4 2 55.3	12.508
15	11 47 14.98	1.8242	4 15 25.5	12.499
16	11 49 4.49	1.8263	4 27 55.2	12.490
17	11 50 54.14	1.8286	4 40 24.3	12.480
18	11 52 43.92	1.8308	4 52 52.8	12.470
19	11 54 33.84	1.8332	5 5 20.7	12.459
20	11 56 23.90	1.8355	5 17 47.9	12.448
21	11 58 14.10	1.8380	5 30 14.4	12.435
22	12 0 4.46	1.8407	5 42 40.1	12.422
23	12 1 54.98	1.8433	− 5 55 5.0	−12.408
	JUNE 27.			
0	12 3 45.65	1.8459	− 6 7 29.0	−12.393
1	12 5 36.49	1.8487	6 19 52.2	12.378
2	12 7 27.49	1.8515	6 32 14.4	12.363
3	12 9 18.67	1.8545	6 44 35.7	12.346
4	12 11 10.03	1.8574	6 56 55.9	12.328
5	12 13 1.56	1.8605	7 9 15.1	12.310
6	12 14 53.29	1.8637	7 21 33.1	12.291
7	12 16 45.20	1.8668	7 33 50.0	12.272
8	12 18 37.31	1.8702	7 46 5.7	12.252
9	12 20 29.61	1.8735	7 58 20.2	12.230
10	12 22 22.12	1.8769	8 10 33.3	12.208
11	12 24 14.84	1.8804	8 22 45.1	12.184
12	12 26 7.77	1.8840	8 34 55.4	12.160
13	12 28 0.92	1.8876	8 47 4.3	12.137
14	12 29 54.28	1.8913	8 59 11.8	12.112
15	12 31 47.87	1.8951	9 11 17.7	12.085
16	12 33 41.69	1.8989	9 23 22.0	12.058
17	12 35 35.74	1.9028	9 35 24.7	12.030
18	12 37 30.03	1.9068	9 47 25.6	12.002
19	12 39 24.56	1.9108	9 59 24.9	11.973
20	12 41 19.33	1.9149	10 11 22.3	11.942
21	12 43 14.35	1.9192	10 23 17.9	11.912
22	12 45 9.63	1.9235	10 35 11.7	11.879
23	12 47 5.17	1.9278	10 47 3.4	11.846
24	*12 49 0.97*	*1.9323*	*−10 58 53.2*	*−11.813*

Hour.	Right Ascension.	Var. per Min.	Declination.
	JUNE 28.		
	h m s	s	° ′ ″
0	12 49 0.97	1.9323	−10 58 53.
1	12 50 57.04	1.9368	11 10 40.
2	12 52 53.38	1.9413	11 22 26.
3	12 54 49.99	1.9458	11 34 10.
4	12 56 46.88	1.9506	11 45 51.
5	12 58 44.06	1.9554	11 57 30.
6	13 0 41.53	1.9602	12 9 6.
7	13 2 39.28	1.9650	12 20 41.
8	13 4 37.33	1.9700	12 32 12.
9	13 6 35.68	1.9751	12 43 42.
10	13 8 34.34	1.9802	12 55 8.
11	13 10 33.30	1.9853	13 6 32.
12	13 12 32.58	1.9906	13 17 54.
13	13 14 32.17	1.9958	13 29 12.
14	13 16 32.08	2.0013	13 40 28.
15	13 18 32.32	2.0067	13 51 41.
16	13 20 32.88	2.0121	14 2 51.
17	13 22 33.77	2.0177	14 13 58.
18	13 24 35.00	2.0233	14 25 2.
19	13 26 36.57	2.0289	14 36 3.
20	13 28 38.47	2.0347	14 47 1.
21	13 30 40.73	2.0405	14 57 55.
22	13 32 43.33	2.0463	15 8 46.
23	13 34 46.29	2.0523	−15 19 34.
	JUNE 29.		
0	13 36 49.60	2.0582	−15 30 18.
1	13 38 53.27	2.0642	15 40 59.
2	13 40 57.30	2.0703	15 51 36.
3	13 43 1.70	2.0764	16 2 10.
4	13 45 6.47	2.0827	16 12 39.
5	13 47 11.62	2.0889	16 23 5.
6	13 49 17.14	2.0952	16 33 27.
7	13 51 23.04	2.1015	16 43 45.
8	13 53 29.32	2.1078	16 53 59.
9	13 55 35.98	2.1143	17 4 9.
10	13 57 43.04	2.1208	17 14 15.
11	13 59 50.48	2.1273	17 24 17.
12	14 1 58.32	2.1339	17 34 14.
13	14 4 6.55	2.1405	17 44 7.
14	14 6 15.18	2.1473	17 53 55.
15	14 8 24.22	2.1539	18 3 39.
16	14 10 33.65	2.1607	18 13 18.
17	14 12 43.50	2.1675	18 22 53.
18	14 14 53.75	2.1743	18 32 23.
19	14 17 4.41	2.1811	18 41 47.
20	14 19 15.48	2.1879	18 51 7.
21	14 21 26.96	2.1949	19 0 22.
22	14 23 38.87	2.2019	19 9 32.
23	14 25 51.19	2.2088	19 18 37.
24	14 28 3.92	2.2158	−19 27 38

GREENWICH MEAN TIME.

Hr.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	JUNE 30.			
	h m s	s	° ′ ″	″
0	14 28 3.92	2.2158	−19 27 36.6	−8.945
1	14 30 17.08	2.2228	19 36 30.6	8.855
2	14 32 30.66	2.2296	19 45 19.2	8.764
3	14 34 44.66	2.2360	19 54 2.3	8.672
4	14 36 59.09	2.2440	20 2 39.8	8.578
5	14 39 13.94	2.2511	20 11 11.6	8.483
6	14 41 29.22	2.2583	20 19 37.7	8.386
7	14 43 44.93	2.2654	20 27 57.9	8.288
8	14 46 1.07	2.2725	20 36 12.2	8.188
9	14 48 17.63	2.2796	20 44 20.4	8.087
10	14 50 34.62	2.2868	20 52 22.6	7.984
11	14 52 52.04	2.2939	21 0 18.5	7.880
12	14 55 9.89	2.3011	21 8 8.2	7.775
13	14 57 28.17	2.3083	21 15 51.5	7.668
14	14 59 46.88	2.3153	21 23 28.4	7.561
15	15 2 6.01	2.3225	21 30 58.8	7.451
16	15 4 25.58	2.3297	21 38 22.5	7.339
17	15 6 45.57	2.3368	21 45 39.5	7.227
18	15 9 5.99	2.3438	21 52 49.7	7.113
19	15 11 26.83	2.3509	21 59 53.1	6.998
20	15 13 48.10	2.3580	22 6 49.4	6.881
21	15 16 9.79	2.3650	22 13 38.8	6.763
22	15 18 31.90	2.3721	22 20 20.9	6.643
23	15 20 54.44	2.3790	−22 26 55.9	−6.523
	JULY 1.			
0	15 23 17.38	2.3859	−22 33 23.6	−6.400
1	15 25 40.75	2.3930	22 39 43.9	6.276
2	15 28 4.54	2.3998	22 45 56.7	6.150
3	15 30 28.73	2.4067	22 52 1.9	6.023
4	15 32 53.34	2.4135	22 57 59.4	5.894
5	15 35 18.35	2.4203	23 3 49.2	5.765
6	15 37 43.77	2.4270	23 9 31.2	5.634
7	15 40 9.59	2.4337	23 15 5.3	5.502
8	15 42 35.81	2.4403	23 20 31.4	5.368
9	15 45 2.42	2.4468	23 25 49.4	5.233
10	15 47 29.43	2.4533	23 30 59.3	5.096
11	15 49 56.82	2.4596	23 36 0.9	4.958
12	15 52 24.60	2.4662	23 40 54.3	4.819
13	15 54 52.76	2.4725	23 45 39.2	4.678
14	15 57 21.30	2.4787	23 50 15.7	4.537
15	15 59 50.20	2.4848	23 54 43.6	4.393
16	16 2 19.48	2.4910	23 59 2.9	4.248
17	16 4 49.12	2.4969	24 3 13.4	4.103
18	16 7 19.11	2.5028	24 7 15.2	3.956
19	16 9 49.46	2.5087	24 11 8.1	3.808
20	16 12 20.15	2.5144	24 14 52.1	3.658
21	16 14 51.19	2.5201	24 18 27.1	3.508
22	16 17 22.56	2.5256	24 21 53.0	3.355
23	16 19 54.26	2.5310	24 25 9.7	3.202
24	16 22 26.28	2.5364	−24 28 17.2	−3.048

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	JULY 2.			
	h m s	s	° ′ ″	″
0	16 22 26.28	2.5364	−24 28 17.2	−3.048
1	16 24 58.63	2.5417	24 31 15.4	2.893
2	16 27 31.28	2.5468	24 34 4.3	2.736
3	16 30 4.25	2.5519	24 36 43.7	2.578
4	16 32 37.51	2.5568	24 39 13.7	2.420
5	16 35 11.07	2.5617	24 41 34.1	2.259
6	16 37 44.91	2.5663	24 43 44.8	2.098
7	16 40 19.03	2.5709	24 45 45.9	1.938
8	16 42 53.42	2.5754	24 47 37.3	1.775
9	16 45 28.08	2.5798	24 49 18.9	1.612
10	16 48 2.99	2.5840	24 50 50.7	1.448
11	16 50 38.16	2.5881	24 52 12.6	1.282
12	16 53 13.56	2.5920	24 53 24.5	1.115
13	16 55 49.20	2.5959	24 54 26.4	0.948
14	16 58 25.07	2.5996	24 55 18.3	0.781
15	17 1 1.15	2.6031	24 56 0.1	0.613
16	17 3 37.44	2.6066	24 56 31.8	0.443
17	17 6 13.94	2.6098	24 56 53.3	0.273
18	17 8 50.62	2.6129	24 57 4.6	−0.103
19	17 11 27.49	2.6160	24 57 5.6	+0.068
20	17 14 4.54	2.6188	24 56 56.4	0.240
21	17 16 41.75	2.6216	24 56 36.8	0.413
22	17 19 19.13	2.6242	24 56 6.9	0.585
23	17 21 56.65	2.6265	−24 55 26.6	+0.758
	JULY 3.			
0	17 24 34.31	2.6288	−24 54 35.9	+0.932
1	17 27 12.11	2.6309	24 53 31.8	1.106
2	17 29 50.02	2.6328	24 52 23.2	1.280
3	17 32 28.05	2.6348	24 51 1.2	1.454
4	17 35 6.19	2.6364	24 49 28.7	1.629
5	17 37 44.42	2.6379	24 47 45.7	1.805
6	17 40 22.74	2.6393	24 45 52.1	1.980
7	17 43 1.13	2.6405	24 43 48.1	2.155
8	17 45 39.60	2.6416	24 41 33.5	2.331
9	17 48 18.12	2.6424	24 39 8.4	2.507
10	17 50 56.69	2.6433	24 36 32.7	2.683
11	17 53 35.31	2.6439	24 33 46.5	2.858
12	17 56 13.96	2.6443	24 30 49.7	3.034
13	17 58 52.63	2.6446	24 27 42.4	3.209
14	18 1 31.31	2.6448	24 24 24.6	3.385
15	18 4 10.00	2.6448	24 20 56.2	3.560
16	18 6 48.68	2.6446	24 17 17.4	3.735
17	18 9 27.35	2.6443	24 13 28.0	3.910
18	18 12 6.00	2.6438	24 9 28.2	4.084
19	18 14 44.61	2.6433	24 5 17.9	4.258
20	18 17 23.19	2.6425	24 0 57.2	4.433
21	18 20 1.71	2.6416	23 56 26.0	4.606
22	18 22 40.18	2.6406	23 51 44.5	4.779
23	18 25 18.58	2.6394	23 46 52.5	4.952
24	18 27 56.91	2.6381	−23 41 50.3	+5.123

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	JULY 4.			
	h m s	s	° ′ ″	″
0	18 27 56.91	2.6381	−23 41 50.3	+ 5.123
1	18 30 35.15	2.6367	23 36 37.8	5.294
2	18 33 13.31	2.6351	23 31 15.0	5.466
3	18 35 51.36	2.6333	23 25 41.9	5.636
4	18 38 29.30	2.6314	23 19 58.7	5.804
5	18 41 7.13	2.6295	23 14 5.4	5.973
6	18 43 44.84	2.6273	23 8 1.9	6.142
7	18 46 22.41	2.6251	23 1 48.4	6.308
8	18 48 59.85	2.6228	22 55 24.9	6.474
9	18 51 37.14	2.6202	22 48 51.5	6.639
10	18 54 14.27	2.6176	22 42 8.2	6.804
11	18 56 51.25	2.6149	22 35 15.0	6.968
12	18 59 28.06	2.6120	22 28 12.1	7.130
13	19 2 4.69	2.6091	22 20 59.4	7.292
14	19 4 41.15	2.6060	22 13 37.1	7.452
15	19 7 17.41	2.6028	22 6 5.2	7.611
16	19 9 53.48	2.5995	21 58 23.8	7.769
17	19 12 29.35	2.5961	21 50 32.9	7.927
18	19 15 5.01	2.5926	21 42 32.6	8.083
19	19 17 40.46	2.5890	21 34 23.0	8.238
20	19 20 15.69	2.5853	21 26 4.1	8.391
21	19 22 50.70	2.5815	21 17 36.1	8.543
22	19 25 25.47	2.5777	21 8 59.0	8.693
23	19 28 0.02	2.5738	−21 0 12.9	+ 8.843
	JULY 5.			
0	19 30 34.32	2.5697	−20 51 17.8	+ 8.992
1	19 33 8.38	2.5656	20 42 13.9	9.138
2	19 35 42.19	2.5613	20 33 1.3	9.283
3	19 38 15.74	2.5571	20 23 39.9	9.428
4	19 40 49.04	2.5528	20 14 10.0	9.569
5	19 43 22.08	2.5484	20 4 31.6	9.710
6	19 45 54.85	2.5439	19 54 44.8	9.849
7	19 48 27.35	2.5394	19 44 49.7	9.988
8	19 50 59.58	2.5348	19 34 46.3	10.124
9	19 53 31.53	2.5302	19 24 34.8	10.258
10	19 56 3.20	2.5254	19 14 15.3	10.392
11	19 58 34.58	2.5207	19 3 47.8	10.523
12	20 1 5.68	2.5159	18 53 12.6	10.652
13	20 3 36.49	2.5111	18 42 29.6	10.781
14	20 6 7.01	2.5062	18 31 38.9	10.908
15	20 8 37.23	2.5013	18 20 40.7	11.033
16	20 11 7.16	2.4964	18 9 35.0	11.156
17	20 13 36.80	2.4914	17 58 22.0	11.278
18	20 16 6.13	2.4863	17 47 1.7	11.398
19	20 18 35.16	2.4813	17 35 34.3	11.515
20	20 21 3.89	2.4763	17 23 59.9	11.631
21	20 23 32.31	2.4713	17 12 18.6	11.746
22	20 26 0.44	2.4662	17 0 30.4	11.859
23	20 28 28.25	2.4610	16 48 35.5	11.970
24	20 30 55.76	2.4559	−16 36 34.0	+12.078

Hour.	Right Ascension.	Var. per Min.	Declination.
	JULY 6.		
	h m s	s	° ′ ″
0	20 30 55.76	2.4559	−16 36 34.0
1	20 33 22.96	2.4508	16 24 26.1
2	20 35 49.85	2.4456	16 12 11.7
3	20 38 16.43	2.4405	15 59 51.1
4	20 40 42.71	2.4353	15 47 24.3
5	20 43 8.67	2.4302	15 34 51.5
6	20 45 34.33	2.4251	15 22 12.7
7	20 47 59.68	2.4199	15 9 28.1
8	20 50 24.72	2.4148	14 56 37.7
9	20 52 49.46	2.4097	14 43 41.8
10	20 55 13.88	2.4047	14 30 40.3
11	20 57 38.00	2.3995	14 17 33.5
12	21 0 1.82	2.3944	14 4 21.4
13	21 2 25.33	2.3893	13 51 4.1
14	21 4 48.54	2.3843	13 37 41.8
15	21 7 11.45	2.3793	13 24 14.6
16	21 9 34.06	2.3743	13 10 42.5
17	21 11 56.37	2.3693	12 57 5.7
18	21 14 18.38	2.3644	12 43 24.4
19	21 16 40.10	2.3596	12 29 38.5
20	21 19 1.53	2.3548	12 15 48.2
21	21 21 22.67	2.3498	12 1 53.7
22	21 23 43.51	2.3450	11 47 55.0
23	21 26 4.07	2.3403	−11 33 52.3
	JULY 7.		
0	21 28 24.35	2.3357	−11 19 45.6
1	21 30 44.35	2.3309	11 5 35.1
2	21 33 4.06	2.3263	10 51 21.0
3	21 35 23.50	2.3218	10 37 3.2
4	21 37 42.67	2.3173	10 22 41.9
5	21 40 1.57	2.3128	10 8 17.3
6	21 42 20.20	2.3083	9 53 49.4
7	21 44 38.56	2.3038	9 39 18.3
8	21 46 56.66	2.2995	9 24 44.2
9	21 49 14.50	2.2953	9 10 7.1
10	21 51 32.09	2.2910	8 55 27.3
11	21 53 49.42	2.2868	8 40 44.7
12	21 56 6.50	2.2827	8 25 59.4
13	21 58 23.34	2.2787	8 11 11.7
14	22 0 39.94	2.2747	7 56 21.6
15	22 2 56.30	2.2707	7 41 29.2
16	22 5 12.42	2.2668	7 26 34.6
17	22 7 28.31	2.2629	7 11 37.9
18	22 9 43.97	2.2592	6 56 39.3
19	22 11 59.41	2.2555	6 41 38.8
20	22 14 14.63	2.2518	6 26 36.5
21	22 16 29.63	2.2483	6 11 32.6
22	22 18 44.42	2.2447	5 56 27.1
23	22 20 58.99	2.2412	5 41 20.1
24	22 23 13.36	2.2378	− 5 26 11.8

GREENWICH MEAN TIME.

	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	JULY 8.			
	h m s	s	° ′ ″	″
	22 23 13.36	2.2378	−5 26 11.8	+15.149
	22 25 27.53	2.2346	5 11 2.2	15.169
	22 27 41.51	2.2313	4 55 51.5	15.188
	22 29 55.29	2.2281	4 40 39.7	15.204
	22 32 8.88	2.2250	4 25 27.0	15.220
	22 34 22.29	2.2220	4 10 13.3	15.233
	22 36 35.52	2.2191	3 54 59.0	15.244
	22 38 48.58	2.2162	3 39 44.0	15.255
	22 41 1.46	2.2133	3 24 28.4	15.264
	22 43 14.17	2.2105	3 9 12.3	15.271
	22 45 26.72	2.2078	2 53 55.9	15.276
	22 47 39.11	2.2052	2 38 39.2	15.279
	22 49 51.34	2.2027	2 23 22.4	15.281
	22 52 3.43	2.2002	2 8 5.5	15.283
	22 54 15.36	2.1978	1 52 48.5	15.282
	22 56 27.16	2.1955	1 37 31.7	15.279
	22 58 38.82	2.1932	1 22 15.0	15.275
	23 0 50.34	2.1909	1 6 58.7	15.269
	23 3 1.73	2.1888	0 51 42.7	15.263
	23 5 13.00	2.1868	0 36 27.2	15.254
	23 7 24.15	2.1848	0 21 12.2	15.244
	23 9 35.18	2.1829	−0 5 57.9	15.232
	23 11 46.10	2.1811	+0 9 15.6	15.219
	23 13 56.91	2.1793	+0 24 28.4	+15.205
	JULY 9.			
	23 16 7.61	2.1776	+0 39 40.2	+15.188
	23 18 18.22	2.1761	0 54 51.0	15.172
	23 20 28.74	2.1745	1 10 0.8	15.153
	23 22 39.16	2.1730	1 25 9.3	15.132
	23 24 49.50	2.1716	1 40 16.6	15.111
	23 26 59.75	2.1703	1 55 22.6	15.088
	23 29 9.93	2.1691	2 10 27.1	15.063
	23 31 20.04	2.1678	2 25 30.2	15.038
	23 33 30.07	2.1668	2 40 31.6	15.010
	23 35 40.05	2.1658	2 55 31.4	14.982
	23 37 49.96	2.1647	3 10 29.4	14.952
	23 39 59.81	2.1638	3 25 25.6	14.920
	23 42 9.61	2.1630	3 40 19.8	14.888
	23 44 19.37	2.1623	3 55 12.1	14.853
	23 46 29.08	2.1615	4 10 2.2	14.818
	23 48 38.75	2.1609	4 24 50.2	14.782
	23 50 48.39	2.1604	4 39 36.0	14.744
	23 52 58.00	2.1599	4 54 19.5	14.705
	23 55 7.58	2.1594	5 9 0.6	14.664
	23 57 17.13	2.1591	5 23 39.2	14.622
	23 59 26.67	2.1588	5 38 15.2	14.579
	0 1 36.19	2.1587	5 52 48.7	14.535
	0 3 45.71	2.1585	6 7 19.4	14.489
	0 5 55.21	2.1583	6 21 47.4	14.443
	0 8 4.71	*2.1584*	*+6 36 12.5*	*+14.394*

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	JULY 10.			
	h m s	s	° ′ ″	″
0	0 8 4.71	2.1584	+ 6 36 12.5	+14.394
1	0 10 14.22	2.1584	6 50 34.7	14.344
2	0 12 23.72	2.1585	7 4 53.8	14.293
3	0 14 33.24	2.1588	7 19 9.9	14.243
4	0 16 42.77	2.1589	7 33 22.9	14.189
5	0 18 52.31	2.1593	7 47 32.6	14.135
6	0 21 1.88	2.1597	8 1 39.1	14.080
7	0 23 11.47	2.1600	8 15 42.2	14.023
8	0 25 21.08	2.1605	8 29 41.8	13.965
9	0 27 30.73	2.1610	8 43 38.0	13.907
10	0 29 40.40	2.1616	8 57 30.6	13.847
11	0 31 50.12	2.1623	9 11 19.6	13.785
12	0 33 59.87	2.1629	9 25 4.9	13.723
13	0 36 9.67	2.1638	9 38 46.4	13.659
14	0 38 19.52	2.1646	9 52 24.0	13.595
15	0 40 29.42	2.1655	10 5 57.8	13.530
16	0 42 39.38	2.1664	10 19 27.6	13.463
17	0 44 49.39	2.1673	10 32 53.3	13.394
18	0 46 59.46	2.1684	10 46 14.9	13.326
19	0 49 9.60	2.1695	10 59 32.4	13.256
20	0 51 19.80	2.1706	11 12 45.6	13.183
21	0 53 30.07	2.1718	11 25 54.4	13.112
22	0 55 40.42	2.1731	11 38 59.0	13.039
23	0 57 50.84	2.1743	+11 51 59.1	+12.963
	JULY 11.			
0	1 0 1.33	2.1756	+12 4 54.6	+12.888
1	1 2 11.91	2.1770	12 17 45.6	12.812
2	1 4 22.57	2.1785	12 30 32.0	12.734
3	1 6 33.33	2.1800	12 43 13.7	12.655
4	1 8 44.17	2.1814	12 55 50.6	12.575
5	1 10 55.10	2.1829	13 8 22.7	12.495
6	1 13 6.12	2.1845	13 20 50.0	12.413
7	1 15 17.24	2.1863	13 33 12.2	12.329
8	1 17 28.47	2.1879	13 45 29.5	12.247
9	1 19 39.79	2.1895	13 57 41.8	12.162
10	1 21 51.21	2.1913	14 9 48.9	12.076
11	1 24 2.74	2.1930	14 21 50.9	11.989
12	1 26 14.37	2.1948	14 33 47.6	11.901
13	1 28 26.11	2.1967	14 45 39.0	11.813
14	1 30 37.97	2.1986	14 57 25.1	11.723
15	1 32 49.94	2.2004	15 9 5.7	11.632
16	1 35 2.02	2.2023	15 20 40.9	11.541
17	1 37 14.22	2.2043	15 32 10.6	11.448
18	1 39 26.54	2.2063	15 43 34.7	11.354
19	1 41 38.98	2.2083	15 54 53.1	11.259
20	1 43 51.53	2.2103	16 6 5.8	11.164
21	1 46 4.21	2.2124	16 17 12.8	11.068
22	1 48 17.02	2.2144	16 28 14.0	10.971
23	1 50 29.94	2.2164	16 39 9.3	10.873
24	1 52 42.99	2.2185	+16 49 58.6	+10.774

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	JULY 12.			
	h m s	s	° ′ ″	″
0	1 52 42.99	2.2186	+16 49 58.6	+10.773
1	1 54 56.17	2.2208	17 0 42.0	10.673
2	1 57 9.48	2.2228	17 11 19.4	10.573
3	1 59 22.91	2.2250	17 21 50.8	10.472
4	2 1 36.48	2.2272	17 32 16.0	10.368
5	2 3 50.17	2.2293	17 42 35.0	10.265
6	2 6 4.00	2.2315	17 52 47.8	10.161
7	2 8 17.95	2.2337	18 2 54.3	10.056
8	2 10 32.04	2.2359	18 12 54.5	9.951
9	2 12 46.26	2.2381	18 22 48.4	9.844
10	2 15 0.61	2.2403	18 32 35.8	9.736
11	2 17 15.09	2.2425	18 42 16.7	9.627
12	2 19 29.71	2.2448	18 51 51.0	9.518
13	2 21 44.46	2.2469	19 1 18.8	9.408
14	2 23 59.34	2.2492	19 10 40.0	9.298
15	2 26 14.36	2.2513	19 19 54.6	9.187
16	2 28 29.50	2.2535	19 29 2.4	9.074
17	2 30 44.78	2.2558	19 38 3.5	8.962
18	2 33 0.19	2.2578	19 46 57.8	8.848
19	2 35 15.72	2.2600	19 55 45.2	8.733
20	2 37 31.39	2.2623	20 4 25.7	8.618
21	2 39 47.19	2.2643	20 12 59.3	8.503
22	2 42 3.11	2.2664	20 21 26.0	8.386
23	2 44 19.16	2.2686	+20 29 45.6	+ 8.268
	JULY 13.			
0	2 46 35.34	2.2707	+20 37 58.1	+ 8.149
1	2 48 51.64	2.2728	20 46 3.5	8.031
2	2 51 8.07	2.2748	20 54 1.8	7.913
3	2 53 24.62	2.2768	21 1 53.0	7.793
4	2 55 41.28	2.2788	21 9 36.9	7.671
5	2 57 58.07	2.2808	21 17 13.5	7.549
6	3 0 14.97	2.2827	21 24 42.8	7.428
7	3 2 31.99	2.2847	21 32 4.9	7.306
8	3 4 49.13	2.2865	21 39 19.5	7.183
9	3 7 6.37	2.2883	21 46 26.8	7.059
10	3 9 23.73	2.2902	21 53 26.6	6.934
11	3 11 41.19	2.2919	22 0 18.9	6.810
12	3 13 58.76	2.2938	22 7 3.8	6.685
13	3 16 16.44	2.2954	22 13 41.1	6.559
14	3 18 34.21	2.2971	22 20 10.9	6.433
15	3 20 52.09	2.2988	22 26 33.0	6.306
16	3 23 10.06	2.3003	22 32 47.6	6.178
17	3 25 28.12	2.3018	22 38 54.4	6.050
18	3 27 46.28	2.3033	22 44 53.6	5.923
19	3 30 4.52	2.3048	22 50 45.1	5.793
20	3 32 22.86	2.3063	22 56 28.8	5.664
21	3 34 41.27	2.3075	23 2 4.8	5.534
22	3 36 59.76	2.3088	23 7 32.9	5.404
23	3 39 18.33	2.3101	23 12 53.3	5.273
24	3 41 36.97	2.3113	+23 18 5.7	+ 5.143

Hour.	Right Ascension.	Var. per Min.	Declination.
	JULY 14.		
	h m s	s	° ′ ″
0	3 41 36.97	2.3113	+23 18 5.
1	3 43 55.68	2.3124	23 23 10.
2	3 46 14.46	2.3135	23 28 7.
3	3 48 33.30	2.3146	23 32 56.
4	3 50 52.21	2.3156	23 37 36.
5	3 53 11.17	2.3164	23 42 9.
6	3 55 30.18	2.3173	23 46 35.
7	3 57 49.24	2.3181	23 50 52.
8	4 0 8.35	2.3188	23 55 1.
9	4 2 27.50	2.3194	23 59 2.
10	4 4 46.68	2.3201	24 2 55.
11	4 7 5.91	2.3207	24 6 40.
12	4 9 25.16	2.3211	24 10 17.
13	4 11 44.44	2.3215	24 13 46.
14	4 14 3.74	2.3218	24 17 7.
15	4 16 23.05	2.3221	24 20 19.
16	4 18 42.39	2.3223	24 23 24.
17	4 21 1.73	2.3223	24 26 21.
18	4 23 21.07	2.3224	24 29 9.
19	4 25 40.42	2.3225	24 31 49.
20	4 27 59.77	2.3223	24 34 22.
21	4 30 19.10	2.3222	24 36 46.
22	4 32 38.43	2.3220	24 39 2.
23	4 34 57.74	2.3217	+24 41 10.
	JULY 15.		
0	4 37 17.03	2.3213	+24 43 10.
1	4 39 36.29	2.3208	24 45 2.
2	4 41 55.53	2.3203	24 46 45.
3	4 44 14.73	2.3197	24 48 21.
4	4 46 33.89	2.3190	24 49 48.
5	4 48 53.01	2.3183	24 51 7.
6	4 51 12.08	2.3174	24 52 19.
7	4 53 31.10	2.3165	24 53 22.
8	4 55 50.06	2.3155	24 54 17.
9	4 58 8.96	2.3144	24 55 4.
10	5 0 27.79	2.3133	24 55 43.
11	5 2 46.56	2.3121	24 56 14.
12	5 5 5.24	2.3108	24 56 36.
13	5 7 23.85	2.3095	24 56 51.
14	5 9 42.38	2.3081	24 56 58.
15	5 12 0.82	2.3065	24 56 57.
16	5 14 19.16	2.3049	24 56 47.
17	5 16 37.41	2.3033	24 56 30.
18	5 18 55.56	2.3016	24 56 5.
19	5 21 13.60	2.2997	24 55 32.
20	5 23 31.52	2.2978	24 54 51.
21	5 25 49.34	2.2959	24 54 2.
22	5 28 7.03	2.2938	24 53 5.
23	5 30 24.60	2.2918	24 52 1.
24	5 32 42.04	2.2896	+24 50 48.

GREENWICH MEAN TIME.

Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
JULY 16.					**JULY 18.**			
h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
5 32 42.04	2.2896	+24 50 48.9	−1.272	0	7 18 58.42	2.1212	+21 30 32.0	− 6.807
5 34 59.35	2.2873	24 49 28.7	1.401	1	7 21 5.56	2.1168	21 23 40.7	6.903
5 37 16.52	2.2851	24 48 0.8	1.530	2	7 23 12.44	2.1124	21 16 43.6	6.999
5 39 33.56	2.2828	24 46 25.1	1.659	3	7 25 19.05	2.1080	21 9 40.8	7.093
5 41 50.45	2.2802	24 44 41.7	1.788	4	7 27 25.40	2.1037	21 2 32.4	7.188
5 44 7.18	2.2777	24 42 50.6	1.916	5	7 29 31.49	2.0993	20 55 18.3	7.281
5 46 23.77	2.2752	24 40 51.8	2.043	6	7 31 37.32	2.0950	20 47 58.7	7.373
5 48 40.20	2.2725	24 38 45.4	2.170	7	7 33 42.89	2.0906	20 40 33.5	7.465
5 50 56.47	2.2698	24 36 31.4	2.297	8	7 35 48.19	2.0861	20 33 2.9	7.555
5 53 12.57	2.2670	24 34 9.8	2.423	9	7 37 53.22	2.0818	20 25 26.9	7.644
5 55 28.51	2.2642	24 31 40.7	2.548	10	7 39 58.00	2.0774	20 17 45.6	7.733
5 57 44.27	2.2612	24 29 4.1	2.673	11	7 42 2.51	2.0729	20 9 58.9	7.821
5 59 59.85	2.2583	24 26 19.9	2.798	12	7 44 6.75	2.0685	20 2 7.1	7.907
6 2 15.26	2.2553	24 23 28.4	2.921	13	7 46 10.73	2.0642	19 54 10.1	7.993
6 4 30.48	2.2522	24 20 29.4	3.044	14	7 48 14.45	2.0598	19 46 7.9	8.079
6 6 45.52	2.2491	24 17 23.1	3.166	15	7 50 17.90	2.0553	19 38 0.6	8.163
6 9 0.37	2.2458	24 14 9.5	3.288	16	7 52 21.09	2.0509	19 29 48.3	8.247
6 11 15.02	2.2426	24 10 48.5	3.410	17	7 54 24.01	2.0466	19 21 31.0	8.329
6 13 29.48	2.2393	24 7 20.3	3.530	18	7 56 26.68	2.0423	19 13 8.8	8.410
6 15 43.73	2.2359	24 3 44.9	3.650	19	7 58 29.08	2.0378	19 4 41.8	8.491
6 17 57.79	2.2325	24 0 2.3	3.769	20	8 0 31.22	2.0335	18 56 9.9	8.571
6 20 11.63	2.2290	23 56 12.6	3.888	21	8 2 33.10	2.0292	18 47 33.3	8.650
6 22 25.27	2.2256	23 52 15.7	4.006	22	8 4 34.72	2.0248	18 38 51.9	8.728
6 24 38.70	2.2220	+23 48 11.9	−4.123	23	8 6 36.08	2.0206	+18 30 5.9	− 8.804
JULY 17.					**JULY 19.**			
6 26 51.91	2.2183	+23 44 1.0	−4.240	0	8 8 37.19	2.0163	+18 21 15.4	− 8.880
6 29 4.90	2.2148	23 39 43.1	4.356	1	8 10 38.04	2.0120	18 12 20.3	8.956
6 31 17.68	2.2111	23 35 18.3	4.471	2	8 12 38.63	2.0078	18 3 20.7	9.031
6 33 30.23	2.2073	23 30 46.6	4.586	3	8 14 38.97	2.0036	17 54 16.6	9.105
6 35 42.55	2.2035	23 26 8.0	4.699	4	8 16 39.06	1.9993	17 45 8.1	9.178
6 37 54.65	2.1997	23 21 22.7	4.812	5	8 18 38.89	1.9951	17 35 55.3	9.248
6 40 6.51	2.1958	23 16 30.6	4.924	6	8 20 38.47	1.9910	17 26 38.3	9.319
6 42 18.14	2.1919	23 11 31.8	5.036	7	8 22 37.81	1.9868	17 17 17.0	9.390
6 44 29.54	2.1880	23 6 26.3	5.147	8	8 24 36.89	1.9827	17 7 51.5	9.459
6 46 40.70	2.1840	23 1 14.2	5.257	9	8 26 35.73	1.9786	16 58 21.0	9.528
6 48 51.62	2.1800	22 55 55.5	5.366	10	8 28 34.32	1.9745	16 48 48.2	9.595
6 51 2.30	2.1760	22 50 30.3	5.473	11	8 30 32.67	1.9704	16 39 10.5	9.661
6 53 12.74	2.1719	22 44 58.7	5.581	12	8 32 30.77	1.9663	16 29 28.9	9.726
6 55 22.93	2.1678	22 39 20.6	5.688	13	8 34 28.63	1.9624	16 19 43.4	9.792
6 57 32.87	2.1637	22 33 36.2	5.793	14	8 36 26.26	1.9585	16 9 53.9	9.856
6 59 42.57	2.1596	22 27 45.4	5.898	15	8 38 23.65	1.9545	16 0 0.7	9.918
7 1 52.02	2.1553	22 21 48.4	6.003	16	8 40 20.80	1.9506	15 50 3.7	9.980
7 4 1.21	2.1511	22 15 45.1	6.106	17	8 42 17.72	1.9467	15 40 3.1	10.042
7 6 10.15	2.1469	22 9 35.7	6.208	18	8 44 14.40	1.9428	15 29 58.7	10.103
7 8 18.84	2.1427	22 3 20.1	6.311	19	8 46 10.86	1.9391	15 19 50.8	10.162
7 10 27.27	2.1384	21 56 58.4	6.411	20	8 48 7.09	1.9353	15 9 39.3	10.221
7 12 35.45	2.1342	21 50 30.8	6.511	21	8 50 3.09	1.9315	14 59 24.3	10.279
7 14 43.37	2.1298	21 43 57.1	6.611	22	8 51 58.87	1.9278	14 49 5.8	10.337
7 16 51.02	2.1254	21 37 17.5	6.709	23	8 53 54.43	1.9242	14 38 43.9	10.392
7 18 58.42	*2.1212*	*+21 30 32.0*	*−6.807*	24	8 55 49.77	1.9205	+14 28 18.8	−10.447

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	JULY 20.			
	h m s	s	° ′ ″	″
0	8 55 49.77	1.9205	+14 28 18.8	−10.447
1	8 57 44.89	1.9169	14 17 50.3	10.502
2	8 59 39.80	1.9134	14 7 18.6	10.556
3	9 1 34.50	1.9098	13 56 43.6	10.609
4	9 3 28.98	1.9063	13 46 5.5	10.661
5	9 5 23.26	1.9029	13 35 24.3	10.713
6	9 7 17.33	1.8995	13 24 40.0	10.763
7	9 9 11.20	1.8962	13 13 52.8	10.813
8	9 11 4.87	1.8929	13 3 2.5	10.862
9	9 12 58.35	1.8896	12 52 9.4	10.909
10	9 14 51.62	1.8863	12 41 13.4	10.957
11	9 16 44.71	1.8833	12 30 14.6	11.003
12	9 18 37.61	1.8801	12 19 13.0	11.049
13	9 20 30.32	1.8769	12 8 8.7	11.093
14	9 22 22.84	1.8739	11 57 1.8	11.138
15	9 24 15.19	1.8709	11 45 52.2	11.181
16	9 26 7.35	1.8679	11 34 40.1	11.223
17	9 27 59.34	1.8651	11 23 25.4	11.265
18	9 29 51.16	1.8622	11 12 8.3	11.306
19	9 31 42.80	1.8593	11 0 48.7	11.347
20	9 33 34.28	1.8566	10 49 26.7	11.386
21	9 35 25.59	1.8538	10 38 2.4	11.424
22	9 37 16.74	1.8512	10 26 35.8	11.462
23	9 39 7.73	1.8485	+10 15 7.0	−11.499
	JULY 21.			
0	9 40 58.56	1.8459	+10 3 35.9	−11.536
1	9 42 49.24	1.8434	9 52 2.7	11.572
2	9 44 39.77	1.8410	9 40 27.3	11.607
3	9 46 30.16	1.8386	9 28 49.9	11.640
4	9 48 20.40	1.8362	9 17 10.5	11.674
5	9 50 10.50	1.8339	9 5 29.0	11.707
6	9 52 0.47	1.8317	8 53 45.7	11.738
7	9 53 50.30	1.8294	8 42 0.4	11.770
8	9 55 40.00	1.8273	8 30 13.3	11.801
9	9 57 29.57	1.8252	8 18 24.3	11.831
10	9 59 19.02	1.8231	8 6 33.6	11.860
11	10 1 8.34	1.8211	7 54 41.1	11.888
12	10 2 57.55	1.8192	7 42 47.0	11.916
13	10 4 46.64	1.8173	7 30 51.2	11.943
14	10 6 35.62	1.8155	7 18 53.9	11.969
15	10 8 24.50	1.8137	7 6 54.9	11.995
16	10 10 13.26	1.8119	6 54 54.5	12.019
17	10 12 1.93	1.8103	6 42 52.6	12.043
18	10 13 50.50	1.8087	6 30 49.3	12.068
19	10 15 38.97	1.8071	6 18 44.5	12.090
20	10 17 27.35	1.8056	6 6 38.5	12.112
21	10 19 15.64	1.8042	5 54 31.1	12.134
22	10 21 3.85	1.8028	5 42 22.4	12.154
23	10 22 51.98	1.8015	5 30 12.6	12.173
24	10 24 40.03	1.8003	+ 5 18 1.6	−12.193

Hour.	Right Ascension.	Var. per Min.	Declination.
	JULY 22.		
	h m s	s	° ′ ″
0	10 24 40.03	1.8003	+5 18 1.6
1	10 26 28.01	1.7990	5 5 49.4
2	10 28 15.91	1.7978	4 53 36.2
3	10 30 3.75	1.7968	4 41 21.8
4	10 31 51.53	1.7958	4 29 6.4
5	10 33 39.24	1.7948	4 16 50.1
6	10 35 26.90	1.7939	4 4 32.8
7	10 37 14.51	1.7930	3 52 14.6
8	10 39 2.06	1.7922	3 39 55.6
9	10 40 49.57	1.7915	3 27 35.7
10	10 42 37.04	1.7908	3 15 15.0
11	10 44 24.47	1.7903	3 2 53.6
12	10 46 11.87	1.7897	2 50 31.5
13	10 47 59.23	1.7892	2 38 8.7
14	10 49 46.57	1.7888	2 25 45.3
15	10 51 33.88	1.7883	2 13 21.3
16	10 53 21.17	1.7881	2 0 56.8
17	10 55 8.45	1.7878	1 48 31.7
18	10 56 55.71	1.7876	1 36 6.2
19	10 58 42.96	1.7875	1 23 40.3
20	11 0 30.21	1.7874	1 11 13.9
21	11 2 17.45	1.7874	0 58 47.2
22	11 4 4.70	1.7875	0 46 20.2
23	11 5 51.95	1.7877	+0 33 53.0
	JULY 23.		
0	11 7 39.22	1.7879	+0 21 25.5
1	11 9 26.50	1.7881	+0 8 57.8
2	11 11 13.79	1.7884	−0 3 30.0
3	11 13 1.11	1.7888	0 15 58.0
4	11 14 48.44	1.7892	0 28 26.0
5	11 16 35.81	1.7898	0 40 54.1
6	11 18 23.21	1.7903	0 53 22.2
7	11 20 10.65	1.7909	1 5 50.3
8	11 21 58.12	1.7916	1 18 18.3
9	11 23 45.64	1.7924	1 30 46.1
10	11 25 33.21	1.7932	1 43 13.9
11	11 27 20.82	1.7941	1 55 41.4
12	11 29 8.50	1.7951	2 8 8.7
13	11 30 56.23	1.7961	2 20 35.8
14	11 32 44.03	1.7972	2 33 2.5
15	11 34 31.89	1.7983	2 45 28.9
16	11 36 19.83	1.7996	2 57 54.9
17	11 38 7.84	1.8008	3 10 20.5
18	11 39 55.92	1.8022	3 22 45.6
19	11 41 44.10	1.8036	3 35 10.3
20	11 43 32.35	1.8050	3 47 34.4
21	11 45 20.70	1.8067	3 59 57.9
22	11 47 9.15	1.8083	4 12 20.8
23	11 48 57.69	1.8098	4 24 43.0
24	11 50 46.33	1.8116	−4 37 4.5

GREENWICH MEAN TIME.

Hr.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	JULY 24.			
	h m s	s	° ′ ″	″
0	11 50 46.33	1.8116	− 4 37 4.5	−12.353
1	11 52 35.08	1.8135	4 49 25.3	12.340
2	11 54 23.95	1.8153	5 1 45.3	12.326
3	11 56 12.92	1.8173	5 14 4.4	12.312
4	11 58 2.02	1.8193	5 26 22.7	12.298
5	11 59 51.23	1.8213	5 38 40.1	12.283
6	12 1 40.58	1.8235	5 50 56.6	12.266
7	12 3 30.05	1.8257	6 3 12.0	12.249
8	12 5 19.66	1.8280	6 15 26.5	12.232
9	12 7 9.41	1.8303	6 27 39.8	12.213
10	12 8 59.30	1.8327	6 39 52.1	12.194
11	12 10 49.33	1.8351	6 52 3.1	12.174
12	12 12 39.51	1.8377	7 4 13.0	12.154
13	12 14 29.85	1.8403	7 16 21.6	12.133
14	12 16 20.35	1.8430	7 28 29.0	12.112
15	12 18 11.01	1.8458	7 40 35.0	12.088
16	12 20 1.84	1.8485	7 52 39.6	12.065
17	12 21 52.83	1.8514	8 4 42.8	12.042
18	12 23 44.01	1.8544	8 16 44.6	12.017
19	12 25 35.36	1.8573	8 28 44.8	11.991
20	12 27 26.89	1.8603	8 40 43.5	11.965
21	12 29 18.60	1.8635	8 52 40.6	11.938
22	12 31 10.51	1.8668	9 4 36.1	11.910
23	12 33 2.61	1.8700	− 9 16 29.8	−11.881
	JULY 25.			
0	12 34 54.91	1.8734	− 9 28 21.8	−11.852
1	12 36 47.42	1.8768	9 40 12.0	11.823
2	12 38 40.13	1.8803	9 52 0.5	11.792
3	12 40 33.05	1.8838	10 3 47.0	11.760
4	12 42 26.18	1.8874	10 15 31.7	11.728
5	12 44 19.54	1.8911	10 27 14.3	11.694
6	12 46 13.11	1.8948	10 38 55.0	11.661
7	12 48 6.91	1.8987	10 50 33.6	11.625
8	12 50 0.95	1.9025	11 2 10.0	11.590
9	12 51 55.21	1.9064	11 13 44.4	11.554
0	12 53 49.72	1.9104	11 25 16.5	11.516
1	12 55 44.46	1.9145	11 36 46.3	11.478
2	12 57 39.46	1.9187	11 48 13.9	11.440
3	12 59 34.70	1.9228	11 59 39.1	11.399
4	13 1 30.20	1.9271	12 11 1.8	11.358
5	13 3 25.95	1.9314	12 22 22.1	11.318
6	13 5 21.97	1.9358	12 33 39.9	11.275
7	13 7 18.25	1.9403	12 44 55.1	11.232
8	13 9 14.80	1.9448	12 56 7.7	11.188
9	13 11 11.62	1.9493	13 7 17.6	11.143
0	13 13 8.72	1.9540	13 18 24.8	11.097
1	13 15 6.10	1.9587	13 29 29.2	11.049
2	13 17 3.76	1.9634	13 40 30.7	11.002
3	13 19 1.71	1.9683	13 51 29.4	10.953
24	13 20 59.95	1.9732	−14 2 25.1	−10.903

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	JULY 26.			
	h m s	s	° ′ ″	″
0	13 20 59.95	1.9732	−14 2 25.1	−10.903
1	13 22 58.49	1.9781	14 13 17.8	10.853
2	13 24 57.32	1.9831	14 24 7.4	10.802
3	13 26 56.46	1.9882	14 34 54.0	10.749
4	13 28 55.90	1.9933	14 45 37.3	10.695
5	13 30 55.66	1.9985	14 56 17.4	10.641
6	13 32 55.72	2.0038	15 6 54.2	10.586
7	13 34 56.11	2.0091	15 17 27.7	10.529
8	13 36 56.81	2.0143	15 27 57.7	10.472
9	13 38 57.83	2.0198	15 38 24.3	10.413
10	13 40 59.18	2.0253	15 48 47.3	10.353
11	13 43 0.86	2.0308	15 59 6.7	10.293
12	13 45 2.87	2.0363	16 9 22.5	10.232
13	13 47 5.22	2.0420	16 19 34.5	10.169
14	13 49 7.91	2.0477	16 29 42.8	10.106
15	13 51 10.94	2.0534	16 39 47.2	10.040
16	13 53 14.32	2.0593	16 49 47.6	9.974
17	13 55 18.05	2.0650	16 59 44.1	9.908
18	13 57 22.12	2.0709	17 9 36.6	9.841
19	13 59 26.56	2.0769	17 19 25.0	9.771
20	14 1 31.35	2.0828	17 29 9.1	9.701
21	14 3 36.50	2.0888	17 38 49.1	9.630
22	14 5 42.01	2.0949	17 48 24.7	9.558
23	14 7 47.89	2.1011	−17 57 56.0	− 9.485
	JULY 27.			
0	14 9 54.14	2.1073	−18 7 22.9	− 9.410
1	14 12 0.76	2.1134	18 16 45.2	9.334
2	14 14 7.75	2.1197	18 26 3.0	9.257
3	14 16 15.12	2.1259	18 35 16.0	9.178
4	14 18 22.86	2.1322	18 44 24.4	9.100
5	14 20 30.98	2.1386	18 53 28.0	9.019
6	14 22 39.49	2.1450	19 2 26.7	8.938
7	14 24 48.38	2.1514	19 11 20.5	8.855
8	14 26 57.66	2.1579	19 20 9.3	8.771
9	14 29 7.33	2.1643	19 28 53.0	8.686
10	14 31 17.38	2.1708	19 37 31.6	8.600
11	14 33 27.83	2.1774	19 46 5.0	8.513
12	14 35 38.67	2.1840	19 54 33.1	8.423
13	14 37 49.91	2.1906	20 2 55.8	8.333
14	14 40 1.54	2.1973	20 11 13.1	8.242
15	14 42 13.58	2.2039	20 19 24.8	8.148
16	14 44 26.01	2.2106	20 27 30.9	8.055
17	14 46 38.85	2.2173	20 35 31.4	7.961
18	14 48 52.08	2.2239	20 43 26.2	7.864
19	14 51 5.72	2.2308	20 51 15.1	7.766
20	14 53 19.77	2.2374	20 58 58.1	7.667
21	14 55 34.21	2.2441	21 6 35.1	7.567
22	14 57 49.06	2.2509	21 14 6.1	7.466
23	15 0 4.32	2.2577	21 21 31.0	7.363
24	15 2 19.98	2.2644	−21 28 49.7	− 7.259

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	JULY 28.			
	h m s	s	° ′ ″	″
0	15 2 19.98	2.2644	−21 28 49.7	−7.259
1	15 4 36.05	2.2713	21 36 2.1	7.153
2	15 6 52.53	2.2780	21 43 8.1	7.047
3	15 9 9.41	2.2848	21 50 7.7	6.939
4	15 11 26.70	2.2915	21 57 0.8	6.830
5	15 13 44.39	2.2983	22 3 47.3	6.719
6	15 16 2.49	2.3051	22 10 27.1	6.608
7	15 18 21.00	2.3118	22 17 0.2	6.494
8	15 20 39.90	2.3185	22 23 26.4	6.380
9	15 22 59.22	2.3253	22 29 45.8	6.264
10	15 25 18.93	2.3319	22 35 58.1	6.147
11	15 27 39.05	2.3386	22 42 3.4	6.029
12	15 29 59.56	2.3453	22 48 1.6	5.910
13	15 32 20.48	2.3519	22 53 52.6	5.788
14	15 34 41.79	2.3585	22 59 36.2	5.666
15	15 37 3.50	2.3652	23 5 12.5	5.543
16	15 39 25.61	2.3718	23 10 41.3	5.417
17	15 41 48.11	2.3783	23 16 2.5	5.291
18	15 44 11.00	2.3847	23 21 16.2	5.164
19	15 46 34.27	2.3912	23 26 22.2	5.035
20	15 48 57.94	2.3976	23 31 20.4	4.905
21	15 51 21.98	2.4039	23 36 10.8	4.774
22	15 53 46.41	2.4103	23 40 53.3	4.642
23	15 56 11.22	2.4166	−23 45 27.8	−4.508
	JULY 29.			
0	15 58 36.40	2.4228	−23 49 54.3	−4.373
1	16 1 1.95	2.4290	23 54 12.6	4.237
2	16 3 27.88	2.4351	23 58 22.7	4.099
3	16 5 54.16	2.4411	24 2 24.5	3.960
4	16 8 20.81	2.4472	24 6 17.9	3.820
5	16 10 47.82	2.4531	24 10 2.9	3.679
6	16 13 15.18	2.4589	24 13 39.4	3.538
7	16 15 42.89	2.4647	24 17 7.4	3.394
8	16 18 10.94	2.4704	24 20 26.7	3.248
9	16 20 39.34	2.4761	24 23 37.2	3.103
10	16 23 8.07	2.4816	24 26 39.1	2.957
11	16 25 37.13	2.4871	24 29 32.0	2.808
12	16 28 6.52	2.4925	24 32 16.1	2.660
13	16 30 36.23	2.4979	24 34 51.2	2.509
14	16 33 6.27	2.5032	24 37 17.2	2.358
15	16 35 36.61	2.5083	24 39 34.1	2.205
16	16 38 7.26	2.5133	24 41 41.8	2.053
17	16 40 38.20	2.5183	24 43 40.4	1.898
18	16 43 9.45	2.5232	24 45 29.6	1.743
19	16 45 40.98	2.5279	24 47 9.5	1.586
20	16 48 12.80	2.5326	24 48 39.9	1.428
21	16 50 44.89	2.5372	24 50 0.9	1.271
22	16 53 17.26	2.5416	24 51 12.4	1.112
23	16 55 49.88	2.5459	24 52 14.3	0.952
24	*16 58 22.77*	*2.5503*	*−24 53 6.6*	*−0.791*

Hour.	Right Ascension.	Var. per Min.	Declination
	JULY 30.		
	h m s	s	° ′ ′
0	16 58 22.77	2.5503	−24 53 6
1	17 0 55.91	2.5543	24 53 49
2	17 3 29.29	2.5583	24 54 22
3	17 6 2.91	2.5623	24 54 45
4	17 8 36.76	2.5661	24 54 58
5	17 11 10.84	2.5698	24 55 2
6	17 13 45.13	2.5733	24 54 55
7	17 16 19.63	2.5766	24 54 39
8	17 18 54.34	2.5800	24 54 12
9	17 21 29.23	2.5832	24 53 36
10	17 24 4.32	2.5863	24 52 49
11	17 26 39.59	2.5893	24 51 53
12	17 29 15.03	2.5920	24 50 46
13	17 31 50.63	2.5947	24 49 29
14	17 34 26.39	2.5973	24 48 2
15	17 37 2.30	2.5997	24 46 25
16	17 39 38.35	2.6019	24 44 38
17	17 42 14.53	2.6041	24 42 40
18	17 44 50.84	2.6062	24 40 32
19	17 47 27.27	2.6080	24 38 14
20	17 50 3.80	2.6098	24 35 45
21	17 52 40.44	2.6113	24 33 7
22	17 55 17.16	2.6128	24 30 17
23	17 57 53.98	2.6143	−24 27 18
	JULY 31.		
0	18 0 30.87	2.6154	−24 24 8
1	18 3 7.83	2.6165	24 20 48
2	18 5 44.85	2.6174	24 17 17
3	18 8 21.92	2.6182	24 13 36
4	18 10 59.03	2.6188	24 9 45
5	18 13 36.18	2.6194	24 5 44
6	18 16 13.36	2.6198	24 1 32
7	18 18 50.56	2.6201	23 57 9
8	18 21 27.77	2.6203	23 52 37
9	18 24 4.99	2.6203	23 47 54
10	18 26 42.20	2.6201	23 43 1
11	18 29 19.40	2.6198	23 37 57
12	18 31 56.58	2.6194	23 32 44
13	18 34 33.73	2.6189	23 27 20
14	18 37 10.85	2.6183	23 21 45
15	18 39 47.93	2.6175	23 16 1
16	18 42 24.95	2.6166	23 10 7
17	18 45 1.92	2.6157	23 4 2
18	18 47 38.83	2.6145	22 57 47
19	18 50 15.66	2.6132	22 51 23
20	18 52 52.41	2.6118	22 44 48
21	18 55 29.08	2.6104	22 38 3
22	18 58 5.66	2.6088	22 31 8
23	19 0 42.14	2.6070	22 24 4
24	19 3 18.50	2.6051	−22 16 50

GREENWICH MEAN TIME.

Hr.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	AUGUST 1.			
	h m s	s	° ′ ″	″
0	19 3 18.50	2.6051	−22 16 50.0	+ 7.322
1	19 5 54.75	2.6033	22 9 25.8	7.484
2	19 8 30.89	2.6013	22 1 51.9	7.646
3	19 11 6.90	2.5991	21 54 8.3	7.807
4	19 13 42.78	2.5968	21 46 15.1	7.966
5	19 16 18.52	2.5945	21 38 12.4	8.125
6	19 18 54.12	2.5920	21 30 0.1	8.284
7	19 21 29.56	2.5895	21 21 38.3	8.441
8	19 24 4.86	2.5869	21 13 7.2	8.596
9	19 26 39.99	2.5841	21 4 26.8	8.751
10	19 29 14.95	2.5813	20 55 37.1	8.905
11	19 31 49.75	2.5784	20 46 38.2	9.058
12	19 34 24.36	2.5753	20 37 30.2	9.208
13	19 36 58.79	2.5723	20 28 13.2	9.358
14	19 39 33.04	2.5693	20 18 47.2	9.508
15	19 42 7.10	2.5660	20 9 12.3	9.654
16	19 44 40.96	2.5627	19 59 28.7	9.800
17	19 47 14.62	2.5593	19 49 36.3	9.946
18	19 49 48.08	2.5559	19 39 35.2	10.089
19	19 52 21.33	2.5524	19 29 25.6	10.231
20	19 54 54.37	2.5488	19 19 7.5	10.371
21	19 57 27.19	2.5452	19 8 41.1	10.510
22	19 59 59.79	2.5415	18 58 6.3	10.648
23	20 2 32.17	2.5378	−18 47 23.3	+10.784
	AUGUST 2.			
0	20 5 4.33	2.5341	−18 36 32.2	+10.918
1	20 7 36.26	2.5302	18 25 33.1	11.052
2	20 10 7.95	2.5263	18 14 26.0	11.183
3	20 12 39.41	2.5223	18 3 11.1	11.313
4	20 15 10.63	2.5184	17 51 48.5	11.441
5	20 17 41.62	2.5143	17 40 18.2	11.568
6	20 20 12.36	2.5103	17 28 40.3	11.693
7	20 22 42.86	2.5063	17 16 55.1	11.816
8	20 25 13.11	2.5022	17 5 2.4	11.938
9	20 27 43.12	2.4980	16 53 2.6	12.057
10	20 30 12.87	2.4938	16 40 55.6	12.175
11	20 32 42.38	2.4897	16 28 41.6	12.292
12	20 35 11.63	2.4854	16 16 20.6	12.407
13	20 37 40.63	2.4813	16 3 52.8	12.518
14	20 40 9.38	2.4770	15 51 18.4	12.629
15	20 42 37.87	2.4727	15 38 37.3	12.738
16	20 45 6.10	2.4684	15 25 49.8	12.846
17	20 47 34.08	2.4642	15 12 55.8	12.952
18	20 50 1.80	2.4599	14 59 55.6	13.055
19	20 52 29.27	2.4557	14 46 49.2	13.157
20	20 54 56.48	2.4513	14 33 36.8	13.256
21	20 57 23.43	2.4471	14 20 18.5	13.354
22	20 59 50.13	2.4428	14 6 54.3	13.451
23	21 2 16.56	2.4385	13 53 24.4	13.544
0	21 4 42.75	2.4343	−13 39 49.0	+13.636

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	AUGUST 3.			
	h m s	s	° ′ ″	″
0	21 4 42.75	2.4343	−13 39 49.0	+13.636
1	21 7 8.67	2.4299	13 26 8.1	13.726
2	21 9 34.34	2.4258	13 12 21.9	13.814
3	21 11 59.76	2.4215	12 58 30.4	13.901
4	21 14 24.92	2.4173	12 44 33.8	13.985
5	21 16 49.83	2.4130	12 30 32.2	14.068
6	21 19 14.48	2.4088	12 16 25.7	14.148
7	21 21 38.89	2.4048	12 2 14.4	14.227
8	21 24 3.05	2.4005	11 47 58.5	14.303
9	21 26 26.95	2.3964	11 33 38.1	14.378
10	21 28 50.62	2.3923	11 19 13.2	14.450
11	21 31 14.03	2.3883	11 4 44.1	14.521
12	21 33 37.21	2.3843	10 50 10.7	14.590
13	21 36 0.14	2.3803	10 35 33.3	14.656
14	21 38 22.84	2.3763	10 20 52.0	14.720
15	21 40 45.29	2.3723	10 6 6.9	14.783
16	21 43 7.52	2.3684	9 51 18.1	14.843
17	21 45 29.50	2.3645	9 36 25.7	14.903
18	21 47 51.26	2.3608	9 21 29.8	14.959
19	21 50 12.79	2.3569	9 6 30.6	15.013
20	21 52 34.09	2.3532	8 51 28.2	15.066
21	21 54 55.17	2.3495	8 36 22.7	15.116
22	21 57 16.03	2.3458	8 21 14.3	15.164
23	21 59 36.66	2.3422	− 8 6 3.0	+15.212
	AUGUST 4.			
0	22 1 57.09	2.3387	− 7 50 48.9	+15.257
1	22 4 17.30	2.3351	7 35 32.2	15.299
2	22 6 37.30	2.3317	7 20 13.0	15.339
3	22 8 57.10	2.3283	7 4 51.5	15.378
4	22 11 16.69	2.3248	6 49 27.6	15.415
5	22 13 36.07	2.3214	6 34 1.7	15.449
6	22 15 55.26	2.3183	6 18 33.7	15.483
7	22 18 14.26	2.3150	6 3 3.7	15.514
8	22 20 33.06	2.3118	5 47 32.0	15.543
9	22 22 51.68	2.3088	5 31 58.6	15.570
10	22 25 10.11	2.3057	5 16 23.6	15.596
11	22 27 28.36	2.3026	5 0 47.1	15.618
12	22 29 46.42	2.2997	4 45 9.4	15.639
13	22 32 4.32	2.2968	4 29 30.4	15.658
14	22 34 22.04	2.2940	4 13 50.4	15.676
15	22 36 39.60	2.2913	3 58 9.3	15.693
16	22 38 56.99	2.2885	3 42 27.3	15.706
17	22 41 14.22	2.2858	3 26 44.6	15.717
18	22 43 31.29	2.2833	3 11 1.3	15.728
19	22 45 48.21	2.2808	2 55 17.3	15.736
20	22 48 4.98	2.2783	2 39 33.0	15.742
21	22 50 21.60	2.2758	2 23 48.3	15.747
22	22 52 38.08	2.2735	2 8 3.4	15.749
23	22 54 54.42	2.2712	1 52 18.4	15.750
24	22 57 10.62	2.2690	− 1 36 33.4	+15.748

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	AUGUST 5.			
	h m s	s	° ′ ″	″
0	22 57 10.62	2.2689	− 1 36 33.4	+15.748
1	22 59 26.69	2.2668	1 20 48.6	15.746
2	23 1 42.64	2.2648	1 5 3.9	15.742
3	23 3 58.46	2.2627	0 49 19.6	15.734
4	23 6 14.16	2.2607	0 33 35.8	15.727
5	23 8 29.74	2.2588	0 17 52.4	15.717
6	23 10 45.21	2.2569	− 0 2 9.8	15.704
7	23 13 0.57	2.2552	+ 0 13 32.1	15.692
8	23 15 15.83	2.2534	0 29 13.2	15.677
9	23 17 30.98	2.2518	0 44 53.3	15.659
10	23 19 46.04	2.2502	1 0 32.3	15.641
11	23 22 1.00	2.2486	1 16 10.2	15.621
12	23 24 15.87	2.2472	1 31 46.8	15.598
13	23 26 30.66	2.2458	1 47 22.0	15.575
14	23 28 45.36	2.2444	2 2 55.8	15.550
15	23 30 59.99	2.2432	2 18 28.0	15.523
16	23 33 14.54	2.2419	2 33 58.5	15.494
17	23 35 29.02	2.2408	2 49 27.3	15.464
18	23 37 43.43	2.2397	3 4 54.2	15.433
19	23 39 57.78	2.2387	3 20 19.2	15.399
20	23 42 12.07	2.2377	3 35 42.1	15.364
21	23 44 26.30	2.2368	3 51 2.9	15.328
22	23 46 40.48	2.2359	4 6 21.4	15.289
23	23 48 54.61	2.2351	+ 4 21 37.6	+15.250
	AUGUST 6.			
0	23 51 8.69	2.2343	+ 4 36 51.4	+15.208
1	23 53 22.73	2.2338	4 52 2.6	15.166
2	23 55 36.74	2.2332	5 7 11.3	15.122
3	23 57 50.71	2.2326	5 22 17.2	15.076
4	0 0 4.65	2.2322	5 37 20.4	15.028
5	0 2 18.57	2.2318	5 52 20.6	14.979
6	0 4 32.46	2.2313	6 7 17.9	14.930
7	0 6 46.32	2.2310	6 22 12.2	14.878
8	0 9 0.18	2.2308	6 37 3.3	14.825
9	0 11 14.01	2.2305	6 51 51.2	14.770
10	0 13 27.84	2.2304	7 6 35.7	14.714
11	0 15 41.66	2.2303	7 21 16.9	14.658
12	0 17 55.47	2.2303	7 35 54.6	14.598
13	0 20 9.29	2.2303	7 50 28.7	14.538
14	0 22 23.11	2.2303	8 4 59.2	14.477
15	0 24 36.93	2.2305	8 19 25.9	14.414
16	0 26 50.77	2.2308	8 33 48.9	14.350
17	0 29 4.62	2.2309	8 48 7.9	14.284
18	0 31 18.48	2.2312	9 2 23.0	14.218
19	0 33 32.36	2.2315	9 16 34.0	14.149
20	0 35 46.26	2.2319	9 30 40.9	14.081
21	0 38 0.19	2.2323	9 44 43.7	14.010
22	0 40 14.14	2.2328	9 58 42.1	13.938
23	0 42 28.13	2.2334	10 12 36.2	13.864
24	0 44 42.15	2.2339	+10 26 25.8	+13.790

Hour.	Right Ascension.	Var. per Min.	Declination
	AUGUST 7.		
	h m s	s	° ′ ″
0	0 44 42.15	2.2339	+10 26 25.
1	0 46 56.20	2.2346	10 40 11.
2	0 49 10.30	2.2353	10 53 51.
3	0 51 24.43	2.2359	11 7 27.
4	0 53 38.61	2.2367	11 20 58.
5	0 55 52.83	2.2374	11 34 25.
6	0 58 7.10	2.2383	11 47 46.
7	1 0 21.42	2.2392	12 1 3.
8	1 2 35.80	2.2400	12 14 14.
9	1 4 50.22	2.2409	12 27 21.
10	1 7 4.71	2.2419	12 40 22.
11	1 9 19.25	2.2429	12 53 18.
12	1 11 33.86	2.2440	13 6 9.
13	1 13 48.53	2.2451	13 18 55.
14	1 16 3.27	2.2462	13 31 35.
15	1 18 18.07	2.2473	13 44 10.
16	1 20 32.95	2.2485	13 56 39.
17	1 22 47.89	2.2497	14 9 2.
18	1 25 2.91	2.2509	14 21 20.
19	1 27 18.00	2.2522	14 33 32.
20	1 29 33.17	2.2535	14 45 39.
21	1 31 48.42	2.2548	14 57 39.
22	1 34 3.74	2.2560	15 9 34.
23	1 36 19.14	2.2574	+15 21 22.
	AUGUST 8.		
0	1 38 34.63	2.2588	+15 33 5.
1	1 40 50.20	2.2602	15 44 42.
2	1 43 5.85	2.2615	15 56 12.
3	1 45 21.58	2.2630	16 7 36.
4	1 47 37.41	2.2644	16 18 54.
5	1 49 53.31	2.2658	16 30 6.
6	1 52 9.31	2.2673	16 41 11.
7	1 54 25.39	2.2688	16 52 10.
8	1 56 41.57	2.2703	17 3 3.
9	1 58 57.83	2.2718	17 13 49.
10	2 1 14.18	2.2733	17 24 28.
11	2 3 30.62	2.2748	17 35 1.
12	2 5 47.16	2.2763	17 45 27.
13	2 8 3.78	2.2778	17 55 47.
14	2 10 20.50	2.2793	18 6 0.
15	2 12 37.30	2.2808	18 16 5.
16	2 14 54.19	2.2823	18 26 5.
17	2 17 11.18	2.2838	18 35 57.
18	2 19 28.25	2.2853	18 45 42.
19	2 21 45.42	2.2869	18 55 20.
20	2 24 2.68	2.2883	19 4 52.
21	2 26 20.02	2.2898	19 14 16.
22	2 28 37.46	2.2914	19 23 33.
23	2 30 54.99	2.2928	19 32 43.
24	2 33 12.60	2.2943	+19 41 45.

GREENWICH MEAN TIME.

Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
AUGUST 9.					**AUGUST 11.**			
m s	s	° ′ ″	″		h m s	s	° ′ ″	″
2 33 12.60	2.2943	+19 41 45.9	+8.985	0	4 24 27.59	2.3244	+24 25 16.2	+2.704
2 35 30.30	2.2957	19 50 41.4	8.865	1	4 26 47.04	2.3238	24 27 54.4	2.569
2 37 48.08	2.2971	19 59 29.7	8.743	2	4 29 6.44	2.3231	24 30 24.5	2.434
2 40 5.95	2.2986	20 8 10.6	8.621	3	4 31 25.81	2.3223	24 32 46.5	2.298
2 42 23.91	2.3000	20 16 44.2	8.498	4	4 33 45.12	2.3215	24 35 0.3	2.163
2 44 41.95	2.3013	20 25 10.4	8.375	5	4 36 4.39	2.3206	24 37 6.0	2.028
2 47 0.06	2.3026	20 33 29.2	8.252	6	4 38 23.59	2.3196	24 39 3.6	1.892
2 49 18.26	2.3040	20 41 40.6	8.128	7	4 40 42.74	2.3187	24 40 53.0	1.757
2 51 36.54	2.3053	20 49 44.5	8.002	8	4 43 1.83	2.3176	24 42 34.4	1.623
2 53 54.90	2.3066	20 57 40.8	7.876	9	4 45 20.85	2.3164	24 44 7.7	1.488
2 56 13.33	2.3078	21 5 29.6	7.751	10	4 47 39.80	2.3152	24 45 32.9	1.353
2 58 31.83	2.3090	21 13 10.9	7.624	11	4 49 58.67	2.3139	24 46 50.0	1.218
3 0 50.41	2.3103	21 20 44.5	7.497	12	4 52 17.47	2.3126	24 47 59.0	1.083
3 3 9.06	2.3114	21 28 10.5	7.369	13	4 54 36.18	2.3112	24 49 0.0	0.950
3 5 27.78	2.3126	21 35 28.8	7.241	14	4 56 54.81	2.3097	24 49 53.0	0.817
3 7 46.57	2.3137	21 42 39.4	7.113	15	4 59 13.34	2.3081	24 50 38.0	0.683
3 10 5.42	2.3148	21 49 42.3	6.984	16	5 1 31.78	2.3065	24 51 15.0	0.549
3 12 24.34	2.3158	21 56 37.5	6.855	17	5 3 50.12	2.3048	24 51 43.9	0.416
3 14 43.32	2.3168	22 3 24.9	6.724	18	5 6 8.36	2.3031	24 52 4.9	0.284
3 17 2.35	2.3178	22 10 4.4	6.593	19	5 8 26.49	2.3013	24 52 18.0	0.152
3 19 21.45	2.3187	22 16 36.1	6.463	20	5 10 44.52	2.2995	24 52 23.1	+0.019
3 21 40.59	2.3195	22 23 0.0	6.333	21	5 13 2.43	2.2975	24 52 20.3	−0.113
3 23 59.79	2.3204	22 29 16.0	6.201	22	5 15 20.22	2.2955	24 52 9.6	0.243
3 26 19.04	2.3212	+22 35 24.1	+6.069	23	5 17 37.89	2.2934	+24 51 51.1	−0.375
AUGUST 10.					**AUGUST 12.**			
3 28 38.33	2.3219	+22 41 24.3	+5.938	0	5 19 55.43	2.2913	+24 51 24.6	−0.506
3 30 57.67	2.3227	22 47 16.6	5.805	1	5 22 12.84	2.2892	24 50 50.4	0.636
3 33 17.05	2.3233	22 53 0.9	5.672	2	5 24 30.13	2.2869	24 50 8.3	0.767
3 35 36.46	2.3239	22 58 37.2	5.538	3	5 26 47.27	2.2846	24 49 18.4	0.896
3 37 55.92	2.3245	23 4 5.5	5.406	4	5 29 4.28	2.2823	24 48 20.8	1.024
3 40 15.40	2.3250	23 9 25.9	5.273	5	5 31 21.14	2.2798	24 47 15.5	1.153
3 42 34.92	2.3255	23 14 38.2	5.138	6	5 33 37.86	2.2773	24 46 2.5	1.282
3 44 54.46	2.3259	23 19 42.5	5.004	7	5 35 54.42	2.2748	24 44 41.7	1.409
3 47 14.03	2.3263	23 24 38.7	4.869	8	5 38 10.83	2.2723	24 43 13.4	1.536
3 49 33.61	2.3266	23 29 26.8	4.735	9	5 40 27.09	2.2696	24 41 37.4	1.663
3 51 53.22	2.3269	23 34 6.9	4.601	10	5 42 43.18	2.2668	24 39 53.8	1.790
3 54 12.84	2.3271	23 38 38.9	4.466	11	5 44 59.11	2.2641	24 38 2.6	1.915
3 56 32.47	2.3273	23 43 2.8	4.331	12	5 47 14.87	2.2613	24 36 4.0	2.040
3 58 52.11	2.3273	23 47 18.6	4.196	13	5 49 30.46	2.2584	24 33 57.8	2.166
4 1 11.75	2.3273	23 51 26.3	4.061	14	5 51 45.88	2.2554	24 31 44.1	2.290
4 3 31.39	2.3273	23 55 25.9	3.926	15	5 54 1.11	2.2524	24 29 23.0	2.413
4 5 51.03	2.3273	23 59 17.4	3.791	16	5 56 16.17	2.2495	24 26 54.5	2.536
4 8 10.66	2.3271	24 3 0.8	3.655	17	5 58 31.05	2.2463	24 24 18.7	2.658
4 10 30.28	2.3269	24 6 36.0	3.518	18	6 0 45.73	2.2432	24 21 35.5	2.782
4 12 49.89	2.3267	24 10 3.0	3.383	19	6 3 0.23	2.2401	24 18 44.9	2.903
4 15 9.48	2.3263	24 13 22.0	3.248	20	6 5 14.54	2.2368	24 15 47.2	3.023
4 17 29.05	2.3259	24 16 32.7	3.112	21	6 7 28.65	2.2335	24 12 42.2	3.143
4 19 48.59	2.3255	24 19 35.4	2.977	22	6 9 42.56	2.2302	24 9 30.0	3.263
4 22 8.11	2.3250	24 22 29.9	2.840	23	6 11 56.27	2.2268	24 6 10.6	3.382
4 24 27.59	2.3244	+24 25 16.2	+2.704	24	6 14 9.78	2.2234	+24 2 44.2	−3.500

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	AUGUST 13.			
	h m s	s	° ′ ″	″
0	6 14 9.78	2.2234	+24 2 44.2	−3.499
1	6 16 23.08	2.2200	23 59 10.7	3.618
2	6 18 36.18	2.2166	23 55 30.1	3.735
3	6 20 49.07	2.2130	23 51 42.5	3.851
4	6 23 1.74	2.2093	23 47 48.0	3.967
5	6 25 14.19	2.2058	23 43 46.5	4.082
6	6 27 26.43	2.2022	23 39 38.2	4.196
7	6 29 38.45	2.1985	23 35 23.0	4.310
8	6 31 50.25	2.1948	23 31 1.0	4.423
9	6 34 1.82	2.1910	23 26 32.3	4.535
10	6 36 13.17	2.1872	23 21 56.8	4.647
11	6 38 24.28	2.1833	23 17 14.7	4.757
12	6 40 35.17	2.1796	23 12 26.0	4.867
13	6 42 45.83	2.1757	23 7 30.7	4.977
14	6 44 56.25	2.1718	23 2 28.8	5.085
15	6 47 6.44	2.1679	22 57 20.5	5.193
16	6 49 16.40	2.1639	22 52 5.7	5.300
17	6 51 26.11	2.1599	22 46 44.5	5.406
18	6 53 35.59	2.1560	22 41 17.0	5.512
19	6 55 44.83	2.1519	22 35 43.1	5.617
20	6 57 53.82	2.1478	22 30 3.0	5.721
21	7 0 2.57	2.1438	22 24 16.6	5.824
22	7 2 11.08	2.1398	22 18 24.1	5.926
23	7 4 19.35	2.1357	+22 12 25.5	−6.028
	AUGUST 14.			
0	7 6 27.36	2.1315	+22 6 20.8	−6.128
1	7 8 35.13	2.1274	22 0 10.1	6.228
2	7 10 42.65	2.1233	21 53 53.4	6.328
3	7 12 49.93	2.1192	21 47 30.7	6.427
4	7 14 56.95	2.1150	21 41 2.2	6.524
5	7 17 3.73	2.1108	21 34 27.8	6.621
6	7 19 10.25	2.1067	21 27 47.7	6.717
7	7 21 16.53	2.1025	21 21 1.8	6.813
8	7 23 22.55	2.0983	21 14 10.2	6.907
9	7 25 28.32	2.0941	21 7 13.0	7.000
10	7 27 33.84	2.0899	21 0 10.2	7.093
11	7 29 39.11	2.0858	20 53 1.8	7.186
12	7 31 44.13	2.0816	20 45 47.9	7.277
13	7 33 48.90	2.0773	20 38 28.6	7.367
14	7 35 53.41	2.0731	20 31 3.9	7.457
15	7 37 57.67	2.0689	20 23 33.8	7.545
16	7 40 1.68	2.0648	20 15 58.5	7.633
17	7 42 5.44	2.0606	20 8 17.9	7.720
18	7 44 8.95	2.0563	20 0 32.1	7.806
19	7 46 12.21	2.0522	19 52 41.2	7.891
20	7 48 15.21	2.0480	19 44 45.2	7.976
21	7 50 17.97	2.0438	19 36 44.1	8.059
22	7 52 20.47	2.0397	19 28 38.1	8.142
23	7 54 22.73	2.0355	19 20 27.1	8.224
24	7 56 24.73	2.0313	+19 12 11.2	−8.305

Hour.	Right Ascension.	Var. per Min.	Declination.
	AUGUST 15.		
	h m s	s	° ′ ″
0	7 56 24.73	2.0313	+19 12 11.
1	7 58 26.49	2.0273	19 3 50.
2	8 0 28.00	2.0232	18 55 24.
3	8 2 29.27	2.0191	18 46 54.
4	8 4 30.29	2.0150	18 38 19.
5	8 6 31.07	2.0110	18 29 40.
6	8 8 31.61	2.0069	18 20 56.
7	8 10 31.90	2.0028	18 12 7.
8	8 12 31.95	1.9988	18 3 14.
9	8 14 31.76	1.9948	17 54 16.
10	8 16 31.33	1.9909	17 45 14.
11	8 18 30.67	1.9870	17 36 8.
12	8 20 29.77	1.9830	17 26 57.
13	8 22 28.63	1.9791	17 17 42.
14	8 24 27.26	1.9753	17 8 23.
15	8 26 25.66	1.9714	16 59 0.
16	8 28 23.83	1.9675	16 49 32.
17	8 30 21.76	1.9637	16 40 1.
18	8 32 19.47	1.9600	16 30 26.
19	8 34 16.96	1.9563	16 20 46.
20	8 36 14.22	1.9525	16 11 3.
21	8 38 11.26	1.9488	16 1 16.
22	8 40 8.08	1.9452	15 51 25.
23	8 42 4.68	1.9415	+15 41 31.
	AUGUST 16.		
0	8 44 1.06	1.9379	+15 31 33.
1	8 45 57.23	1.9343	15 21 31.
2	8 47 53.18	1.9308	15 11 25.
3	8 49 48.93	1.9273	15 1 16.
4	8 51 44.46	1.9238	14 51 4.
5	8 53 39.79	1.9204	14 40 48.
6	8 55 34.91	1.9170	14 30 28.
7	8 57 29.83	1.9137	14 20 5.
8	8 59 24.55	1.9103	14 9 39.
9	9 1 19.07	1.9070	13 59 10.
10	9 3 13.39	1.9038	13 48 38.
11	9 5 7.52	1.9005	13 38 2.
12	9 7 1.45	1.8973	13 27 23.
13	9 8 55.20	1.8943	13 16 41.
14	9 10 48.76	1.8911	13 5 56.
15	9 12 42.13	1.8880	12 55 9.
16	9 14 35.32	1.8850	12 44 18.
17	9 16 28.33	1.8820	12 33 24.
18	9 18 21.16	1.8791	12 22 28.
19	9 20 13.82	1.8763	12 11 29.
20	9 22 6.31	1.8734	12 0 27.
21	9 23 58.63	1.8705	11 49 22.
22	9 25 50.77	1.8678	11 38 15.
23	9 27 42.76	1.8650	11 27 5.
24	9 29 34.57	1.8623	+11 15 52.

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	AUGUST 17.			
	h m s	s	° ′ ″	″
0	9 29 34.57	1.8623	+11 15 52.9	−11.228
1	9 31 26.23	1.8597	11 4 38.0	11.269
2	9 33 17.73	1.8571	10 53 20.6	11.310
3	9 35 9.08	1.8546	10 42 0.8	11.350
4	9 37 0.28	1.8521	10 30 38.6	11.389
5	9 38 51.33	1.8497	10 19 14.1	11.428
6	9 40 42.24	1.8473	10 7 47.3	11.465
7	9 42 33.00	1.8448	9 56 18.3	11.502
8	9 44 23.62	1.8425	9 44 47.1	11.538
9	9 46 14.10	1.8403	9 33 13.8	11.573
10	9 48 4.45	1.8380	9 21 38.4	11.607
11	9 49 54.66	1.8358	9 10 1.0	11.641
12	9 51 44.75	1.8338	8 58 21.5	11.674
13	9 53 34.71	1.8316	8 46 40.1	11.707
14	9 55 24.54	1.8296	8 34 56.7	11.738
15	9 57 14.26	1.8276	8 23 11.5	11.769
16	9 59 3.85	1.8257	8 11 24.4	11.799
17	10 0 53.34	1.8238	7 59 35.6	11.828
18	10 2 42.71	1.8219	7 47 45.0	11.857
19	10 4 31.97	1.8202	7 35 52.8	11.884
20	10 6 21.13	1.8185	7 23 58.9	11.912
21	10 8 10.19	1.8168	7 12 3.4	11.938
22	10 9 59.14	1.8151	7 0 6.3	11.964
23	10 11 48.00	1.8136	+ 6 48 7.7	−11.989
	AUGUST 18.			
0	10 13 36.77	1.8121	+ 6 36 7.6	−12.013
1	10 15 25.45	1.8105	6 24 6.1	12.037
2	10 17 14.03	1.8091	6 12 3.2	12.060
3	10 19 2.54	1.8078	5 59 58.9	12.082
4	10 20 50.96	1.8064	5 47 53.4	12.103
5	10 22 39.31	1.8052	5 35 46.5	12.124
6	10 24 27.58	1.8038	5 23 38.5	12.144
7	10 26 15.77	1.8027	5 11 29.2	12.163
8	10 28 3.90	1.8017	4 59 18.9	12.182
9	10 29 51.97	1.8007	4 47 7.4	12.200
10	10 31 39.98	1.7996	4 34 54.9	12.218
11	10 33 27.92	1.7986	4 22 41.3	12.234
12	10 35 15.81	1.7978	4 10 26.8	12.249
13	10 37 3.65	1.7968	3 58 11.4	12.264
14	10 38 51.43	1.7960	3 45 55.1	12.279
15	10 40 39.17	1.7953	3 33 37.9	12.293
16	10 42 26.87	1.7947	3 21 19.9	12.306
17	10 44 14.53	1.7940	3 9 1.2	12.318
18	10 46 2.15	1.7935	2 56 41.8	12.329
19	10 47 49.75	1.7930	2 44 21.7	12.341
20	10 49 37.31	1.7924	2 32 0.9	12.351
21	10 51 24.84	1.7921	2 19 39.6	12.360
22	10 53 12.36	1.7918	2 7 17.7	12.369
23	10 54 59.85	1.7914	1 54 55.3	12.378
24	10 56 47.33	1.7912	+ 1 42 32.4	−12.385

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	AUGUST 19.			
	h m s	s	° ′ ″	″
0	10 56 47.33	1.7912	+1 42 32.4	−12.385
1	10 58 34.79	1.7910	1 30 9.1	12.391
2	11 0 22.25	1.7909	1 17 45.5	12.397
3	11 2 9.70	1.7908	1 5 21.5	12.403
4	11 3 57.14	1.7908	0 52 57.2	12.408
5	11 5 44.59	1.7908	0 40 32.6	12.412
6	11 7 32.04	1.7909	0 28 7.8	12.415
7	11 9 19.50	1.7911	0 15 42.8	12.418
8	11 11 6.97	1.7913	+0 3 17.7	12.419
9	11 12 54.45	1.7915	−0 9 7.5	12.421
10	11 14 41.95	1.7919	0 21 32.8	12.421
11	11 16 29.48	1.7923	0 33 58.0	12.421
12	11 18 17.02	1.7926	0 46 23.3	12.421
13	11 20 4.59	1.7932	0 58 48.5	12.418
14	11 21 52.20	1.7938	1 11 13.5	12.417
15	11 23 39.84	1.7943	1 23 38.5	12.414
16	11 25 27.52	1.7949	1 36 3.2	12.410
17	11 27 15.23	1.7957	1 48 27.7	12.406
18	11 29 3.00	1.7965	2 0 51.9	12.400
19	11 30 50.81	1.7973	2 13 15.7	12.395
20	11 32 38.68	1.7983	2 25 39.3	12.389
21	11 34 26.60	1.7992	2 38 2.4	12.381
22	11 36 14.58	1.8002	2 50 25.0	12.373
23	11 38 2.62	1.8013	−3 2 47.2	−12.366
	AUGUST 20.			
0	11 39 50.73	1.8024	−3 15 8.9	−12.357
1	11 41 38.91	1.8035	3 27 30.0	12.347
2	11 43 27.15	1.8048	3 39 50.5	12.336
3	11 45 15.48	1.8061	3 52 10.3	12.325
4	11 47 3.88	1.8074	4 4 29.5	12.313
5	11 48 52.37	1.8089	4 16 47.9	12.300
6	11 50 40.95	1.8103	4 29 5.5	12.287
7	11 52 29.61	1.8119	4 41 22.3	12.273
8	11 54 18.38	1.8135	4 53 38.2	12.258
9	11 56 7.23	1.8151	5 5 53.2	12.243
10	11 57 56.19	1.8169	5 18 7.3	12.227
11	11 59 45.26	1.8187	5 30 20.4	12.209
12	12 1 34.43	1.8204	5 42 32.4	12.192
13	12 3 23.71	1.8223	5 54 43.4	12.173
14	12 5 13.11	1.8243	6 6 53.2	12.154
15	12 7 2.62	1.8263	6 19 1.9	12.134
16	12 8 52.26	1.8283	6 31 9.3	12.113
17	12 10 42.02	1.8305	6 43 15.5	12.093
18	12 12 31.92	1.8327	6 55 20.4	12.071
19	12 14 21.94	1.8348	7 7 24.0	12.048
20	12 16 12.10	1.8372	7 19 26.2	12.024
21	12 18 2.40	1.8395	7 31 26.9	12.000
22	12 19 52.84	1.8419	7 43 26.2	11.975
23	12 21 43.43	1.8444	7 55 23.9	11.949
24	12 23 34.17	1.8469	−8 7 20.1	−11.923

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	AUGUST 21.			
	h m s	s	° ′ ″	″
0	12 23 34.17	1.8469	− 8 7 20.1	−11.923
1	12 25 25.06	1.8495	8 19 14.7	11.896
2	12 27 16.11	1.8522	8 31 7.6	11.868
3	12 29 7.32	1.8548	8 42 58.8	11.839
4	12 30 58.69	1.8576	8 54 48.3	11.810
5	12 32 50.23	1.8605	9 6 36.0	11.780
6	12 34 41.95	1.8633	9 18 21.9	11.749
7	12 36 33.83	1.8662	9 30 5.9	11.717
8	12 38 25.89	1.8693	9 41 47.9	11.684
9	12 40 18.14	1.8723	9 53 28.0	11.652
10	12 42 10.57	1.8754	10 5 6.1	11.618
11	12 44 3.19	1.8786	10 16 42.1	11.582
12	12 45 56.00	1.8818	10 28 15.9	11.546
13	12 47 49.00	1.8851	10 39 47.6	11.511
14	12 49 42.21	1.8884	10 51 17.2	11.473
15	12 51 35.61	1.8918	11 2 44.4	11.435
16	12 53 29.22	1.8953	11 14 9.4	11.397
17	12 55 23.04	1.8988	11 25 32.0	11.357
18	12 57 17.07	1.9023	11 36 52.2	11.316
19	12 59 11.32	1.9059	11 48 9.9	11.275
20	13 1 5.78	1.9096	11 59 25.2	11.233
21	13 3 0.47	1.9133	12 10 37.9	11.189
22	13 4 55.38	1.9171	12 21 47.9	11.145
23	13 6 50.52	1.9210	−12 32 55.3	−11.101
	AUGUST 22.			
0	13 8 45.90	1.9249	−12 44 0.0	−11.056
1	13 10 41.51	1.9288	12 55 2.0	11.009
2	13 12 37.35	1.9328	13 6 1.1	10.962
3	13 14 33.44	1.9368	13 16 57.4	10.914
4	13 16 29.77	1.9410	13 27 50.8	10.865
5	13 18 26.36	1.9452	13 38 41.2	10.815
6	13 20 23.19	1.9493	13 49 28.6	10.764
7	13 22 20.27	1.9536	14 0 12.9	10.713
8	13 24 17.62	1.9579	14 10 54.1	10.661
9	13 26 15.22	1.9623	14 21 32.2	10.608
10	13 28 13.09	1.9667	14 32 7.0	10.553
11	13 30 11.22	1.9712	14 42 38.6	10.498
12	13 32 9.63	1.9758	14 53 6.7	10.441
13	13 34 8.31	1.9803	15 3 31.5	10.385
14	13 36 7.26	1.9848	15 13 52.9	10.328
15	13 38 6.49	1.9895	15 24 10.8	10.268
16	13 40 6.00	1.9943	15 34 25.1	10.208
17	13 42 5.80	1.9990	15 44 35.8	10.148
18	13 44 5.88	2.0038	15 54 42.9	10.087
19	13 46 6.25	2.0087	16 4 46.2	10.023
20	13 48 6.92	2.0136	16 14 45.7	9.960
21	13 50 7.88	2.0185	16 24 41.4	9.896
22	13 52 9.14	2.0235	16 34 33.2	9.831
23	13 54 10.70	2.0284	16 44 21.1	9.764
24	*13 56 12.55*	*2.0335*	*−16 54 4.9*	− 9.697

Hour.	Right Ascension.	Var. per Min.	Declination
	AUGUST 23.		
	h m s	s	° ′ ″
0	13 56 12.55	2.0335	−16 54 4.
1	13 58 14.72	2.0387	17 3 44.
2	14 0 17.19	2.0438	17 13 20.
3	14 2 19.97	2.0490	17 22 51.
4	14 4 23.07	2.0543	17 32 19.
5	14 6 26.48	2.0595	17 41 42.
6	14 8 30.21	2.0648	17 51 0.
7	14 10 34.26	2.0702	18 0 14.
8	14 12 38.63	2.0755	18 9 24.
9	14 14 43.32	2.0809	18 18 29.
10	14 16 48.34	2.0864	18 27 29.
11	14 18 53.69	2.0919	18 36 25.
12	14 20 59.37	2.0974	18 45 16.
13	14 23 5.38	2.1029	18 54 3.
14	14 25 11.72	2.1085	19 2 44.
15	14 27 18.40	2.1141	19 11 20.
16	14 29 25.41	2.1197	19 19 52.
17	14 31 32.76	2.1254	19 28 18.
18	14 33 40.46	2.1311	19 36 40.
19	14 35 48.49	2.1367	19 44 56.
20	14 37 56.86	2.1424	19 53 7.
21	14 40 5.58	2.1483	20 1 13.
22	14 42 14.65	2.1540	20 9 13.
23	14 44 24.06	2.1597	−20 17 8.
	AUGUST 24.		
0	14 46 33.81	2.1655	−20 24 57.
1	14 48 43.92	2.1713	20 32 41.
2	14 50 54.37	2.1772	20 40 19.
3	14 53 5.18	2.1830	20 47 52.
4	14 55 16.33	2.1888	20 55 18.
5	14 57 27.84	2.1948	21 2 39.
6	14 59 39.70	2.2007	21 9 54.
7	15 1 51.92	2.2065	21 17 3.
8	15 4 4.48	2.2123	21 24 6.
9	15 6 17.40	2.2183	21 31 3.
10	15 8 30.67	2.2241	21 37 54.
11	15 10 44.29	2.2300	21 44 39.
12	15 12 58.27	2.2359	21 51 17.
13	15 15 12.60	2.2418	21 57 49.
14	15 17 27.29	2.2477	22 4 14.
15	15 19 42.32	2.2535	22 10 33.
16	15 21 57.71	2.2594	22 16 46.
17	15 24 13.45	2.2653	22 22 52.
18	15 26 29.55	2.2712	22 28 51.
19	15 28 45.99	2.2769	22 34 43.
20	15 31 2.78	2.2828	22 40 29.
21	15 33 19.93	2.2886	22 46 8.
22	15 35 37.41	2.2943	22 51 39.
23	15 37 55.25	2.3003	22 57 4.
24	*15 40 13.44*	*2.3060*	*−23 2 22*

GREENWICH MEAN TIME.

t ion.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
AUGUST 25.					**AUGUST 27.**			
s	s	° ′ ″	″		h m s	s	° ′ ″	″
3.44	2.3060	−23 2 22.2	−5.235	0	17 36 37.36	2.5174	−24 38 0.4	+1.578
1.97	2.3116	23 7 32.7	5.116	1	17 39 8.48	2.5198	24 36 21.0	1.738
0.83	2.3173	23 12 36.1	4.995	2	17 41 39.74	2.5222	24 34 31.9	1.898
0.04	2.3229	23 17 32.1	4.873	3	17 44 11.14	2.5243	24 32 33.3	2.057
9.58	2.3286	23 22 20.8	4.750	4	17 46 42.66	2.5263	24 30 25.1	2.218
9.47	2.3342	23 27 2.1	4.626	5	17 49 14.30	2.5283	24 28 7.2	2.378
9.68	2.3397	23 31 35.9	4.501	6	17 51 46.06	2.5303	24 25 39.7	2.539
0.23	2.3453	23 36 2.2	4.375	7	17 54 17.93	2.5320	24 23 2.5	2.701
1.11	2.3508	23 40 20.9	4.248	8	17 56 49.90	2.5337	24 20 15.6	2.863
2.32	2.3562	23 44 31.9	4.119	9	17 59 21.97	2.5353	24 17 19.0	3.023
3.85	2.3615	23 48 35.2	3.990	10	18 1 54.13	2.5367	24 14 12.8	3.185
5.70	2.3669	23 52 30.7	3.859	11	18 4 26.37	2.5380	24 10 56.8	3.348
7.88	2.3723	23 56 18.3	3.728	12	18 6 58.69	2.5393	24 7 31.0	3.511
0.37	2.3775	23 59 58.1	3.597	13	18 9 31.08	2.5404	24 3 55.5	3.672
3.18	2.3828	24 3 29.9	3.463	14	18 12 3.54	2.5415	24 0 10.4	3.833
6.30	2.3879	24 6 53.6	3.328	15	18 14 36.06	2.5423	23 56 15.5	3.997
9.73	2.3930	24 10 9.2	3.193	16	18 17 8.62	2.5432	23 52 10.8	4.158
3.46	2.3981	24 13 16.7	3.057	17	18 19 41.24	2.5439	23 47 56.5	4.320
7.50	2.4031	24 16 16.0	2.919	18	18 22 13.89	2.5445	23 43 32.4	4.483
1.83	2.4080	24 19 7.0	2.781	19	18 24 46.58	2.5451	23 38 58.5	4.645
6.46	2.4128	24 21 49.7	2.642	20	18 27 19.30	2.5454	23 34 15.0	4.806
1.37	2.4176	24 24 24.0	2.502	21	18 29 52.03	2.5458	23 29 21.8	4.968
6.57	2.4224	24 26 49.9	2.361	22	18 32 24.79	2.5460	23 24 18.9	5.129
2.06	2.4271	−24 29 7.3	−2.218	23	18 34 57.55	2.5460	−23 19 6.3	+5.291
AUGUST 26.					**AUGUST 28.**			
7.82	2.4317	−24 31 16.0	−2.074	0	18 37 30.31	2.5460	−23 13 44.0	+5.452
3.86	2.4363	24 33 16.2	1.932	1	18 40 3.07	2.5459	23 8 12.1	5.613
0.17	2.4407	24 35 7.8	1.787	2	18 42 35.82	2.5458	23 2 30.5	5.773
6.74	2.4451	24 36 50.6	1.642	3	18 45 8.56	2.5455	22 56 39.3	5.933
3.58	2.4494	24 38 24.8	1.496	4	18 47 41.28	2.5451	22 50 38.5	6.093
0.67	2.4537	24 39 50.1	1.348	5	18 50 13.97	2.5446	22 44 28.2	6.252
8.02	2.4578	24 41 6.5	1.200	6	18 52 46.63	2.5440	22 38 8.3	6.412
5.61	2.4618	24 42 14.1	1.052	7	18 55 19.25	2.5433	22 31 38.8	6.570
3.44	2.4658	24 43 12.7	0.902	8	18 57 51.83	2.5426	22 24 59.9	6.727
1.51	2.4698	24 44 2.3	0.752	9	19 0 24.36	2.5417	22 18 11.6	6.884
9.81	2.4736	24 44 42.9	0.601	10	19 2 56.83	2.5408	22 11 13.8	7.042
8.34	2.4773	24 45 14.4	0.449	11	19 5 29.25	2.5398	22 4 6.6	7.198
7.09	2.4810	24 45 36.8	0.297	12	19 8 1.60	2.5387	21 56 50.1	7.353
6.06	2.4846	24 45 50.0	−0.144	13	19 10 33.89	2.5375	21 49 24.3	7.508
5.24	2.4880	24 45 54.1	+0.010	14	19 13 6.10	2.5362	21 41 49.1	7.663
4.62	2.4913	24 45 48.8	0.164	15	19 15 38.23	2.5348	21 34 4.8	7.816
4.20	2.4946	24 45 34.4	0.319	16	19 18 10.27	2.5333	21 26 11.2	7.969
3.97	2.4978	24 45 10.5	0.475	17	19 20 42.23	2.5319	21 18 8.5	8.121
3.94	2.5010	24 44 37.4	0.630	18	19 23 14.10	2.5303	21 9 56.7	8.272
4.09	2.5039	24 43 54.9	0.788	19	19 25 45.87	2.5286	21 1 35.9	8.423
4.41	2.5068	24 43 2.9	0.945	20	19 28 17.53	2.5268	20 53 6.0	8.573
4.91	2.5097	24 42 1.5	1.103	21	19 30 49.09	2.5250	20 44 27.2	8.721
5.57	2.5123	24 40 50.6	1.260	22	19 33 20.53	2.5232	20 35 39.5	8.869
6.39	2.5149	24 39 30.3	1.418	23	19 35 51.87	2.5212	20 26 42.9	9.016
37.36	2.5174	−24 38 0.4	+1.578	24	19 38 23.07	2.5191	−20 17 37.6	+9.162

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	AUGUST 29.			
	h m s	s	° ′ ″	″
0	19 38 23.07	2.5191	−20 17 37.6	+ 9.162
1	19 40 54.16	2.5171	20 8 23.5	9.307
2	19 43 25.12	2.5150	19 59 0.8	9.451
3	19 45 55.96	2.5128	19 49 29.4	9.593
4	19 48 26.66	2.5105	19 39 49.6	9.735
5	19 50 57.22	2.5082	19 30 1.2	9.877
6	19 53 27.64	2.5058	19 20 4.4	10.016
7	19 55 57.92	2.5034	19 9 59.3	10.153
8	19 58 28.05	2.5010	18 59 46.0	10.291
9	20 0 58.04	2.4985	18 49 24.4	10.428
10	20 3 27.87	2.4959	18 38 54.6	10.563
11	20 5 57.55	2.4933	18 28 16.9	10.696
12	20 8 27.07	2.4907	18 17 31.1	10.828
13	20 10 56.43	2.4880	18 6 37.5	10.959
14	20 13 25.63	2.4853	17 55 36.0	11.089
15	20 15 54.67	2.4826	17 44 26.8	11.218
16	20 18 23.54	2.4798	17 33 9.9	11.344
17	20 20 52.24	2.4770	17 21 45.5	11.470
18	20 23 20.78	2.4742	17 10 13.5	11.594
19	20 25 49.14	2.4713	16 58 34.2	11.717
20	20 28 17.33	2.4684	16 46 47.5	11.838
21	20 30 45.35	2.4655	16 34 53.6	11.958
22	20 33 13.19	2.4626	16 22 52.6	12.076
23	20 35 40.86	2.4597	−16 10 44.5	+12.193
	AUGUST 30.			
0	20 38 8.35	2.4567	−15 58 29.4	+12.308
1	20 40 35.66	2.4537	15 46 7.5	12.422
2	20 43 2.79	2.4507	15 33 38.8	12.534
3	20 45 29.74	2.4478	15 21 3.4	12.645
4	20 47 56.52	2.4448	15 8 21.4	12.753
5	20 50 23.11	2.4417	14 55 33.0	12.861
6	20 52 49.52	2.4387	14 42 38.1	12.967
7	20 55 15.75	2.4356	14 29 37.0	13.070
8	20 57 41.79	2.4326	14 16 29.7	13.173
9	21 0 7.66	2.4297	14 3 16.2	13.274
10	21 2 33.35	2.4267	13 49 56.8	13.373
11	21 4 58.86	2.4236	13 36 31.5	13.470
12	21 7 24.18	2.4205	13 23 0.4	13.566
13	21 9 49.32	2.4176	13 9 23.6	13.659
14	21 12 14.29	2.4147	12 55 41.3	13.751
15	21 14 39.08	2.4117	12 41 53.5	13.842
16	21 17 3.69	2.4087	12 28 0.3	13.930
17	21 19 28.12	2.4057	12 14 1.9	14.016
18	21 21 52.37	2.4028	11 59 58.4	14.101
19	21 24 16.45	2.3999	11 45 49.8	14.185
20	21 26 40.36	2.3970	11 31 36.2	14.266
21	21 29 4.09	2.3941	11 17 17.9	14.344
22	21 31 27.65	2.3913	11 2 54.9	14.422
23	21 33 51.05	2.3885	10 48 27.3	14.498
24	21 36 14.27	2.3856	−10 33 55.2	+14.571

Hour.	Right Ascension.	Var. per Min.	Declination.
	AUGUST 31.		
	h m s	s	° ′ ″
0	21 36 14.27	2.3856	−10 33 55.2
1	21 38 37.32	2.3828	10 19 18.8
2	21 41 0.21	2.3802	10 4 38.1
3	21 43 22.94	2.3774	9 49 53.2
4	21 45 45.50	2.3747	9 35 4.4
5	21 48 7.90	2.3720	9 20 11.6
6	21 50 30.14	2.3694	9 5 15.0
7	21 52 52.23	2.3668	8 50 14.8
8	21 55 14.16	2.3643	8 35 11.0
9	21 57 35.94	2.3618	8 20 3.7
10	21 59 57.58	2.3593	8 4 53.1
11	22 2 19.06	2.3568	7 49 39.3
12	22 4 40.40	2.3545	7 34 22.4
13	22 7 1.60	2.3521	7 19 2.5
14	22 9 22.65	2.3498	7 3 39.8
15	22 11 43.57	2.3475	6 48 14.3
16	22 14 4.35	2.3453	6 32 46.2
17	22 16 25.00	2.3431	6 17 15.6
18	22 18 45.52	2.3409	6 1 42.6
19	22 21 5.91	2.3388	5 46 7.4
20	22 23 26.18	2.3368	5 30 30.0
21	22 25 46.32	2.3348	5 14 50.5
22	22 28 6.35	2.3328	4 59 9.2
23	22 30 26.26	2.3308	− 4 43 26.1
	SEPTEMBER 1.		
0	22 32 46.05	2.3289	− 4 27 41.3
1	22 35 5.73	2.3272	4 11 54.9
2	22 37 25.31	2.3254	3 56 7.1
3	22 39 44.78	2.3238	3 40 18.0
4	22 42 4.16	2.3221	3 24 27.7
5	22 44 23.43	2.3203	3 8 36.3
6	22 46 42.60	2.3188	2 52 44.0
7	22 49 1.69	2.3173	2 36 50.8
8	22 51 20.68	2.3158	2 20 56.8
9	22 53 39.59	2.3145	2 5 2.3
10	22 55 58.42	2.3131	1 49 7.3
11	22 58 17.16	2.3117	1 33 12.0
12	23 0 35.82	2.3105	1 17 16.4
13	23 2 54.42	2.3093	1 1 20.6
14	23 5 12.94	2.3082	0 45 24.8
15	23 7 31.40	2.3071	0 29 29.1
16	23 9 49.79	2.3061	− 0 13 33.6
17	23 12 8.13	2.3051	+ 0 2 21.8
18	23 14 26.40	2.3042	0 18 16.3
19	23 16 44.63	2.3033	0 34 10.4
20	23 19 2.80	2.3024	0 50 3.9
21	23 21 20.92	2.3017	1 5 56.6
22	23 23 39.00	2.3010	1 21 48.4
23	23 25 57.04	2.3003	1 37 39.3
24	23 28 15.03	2.2996	+ 1 53 28.5

GREENWICH MEAN TIME.

Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
SEPTEMBER 2.					**SEPTEMBER 4.**			
h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
3 28 15.03	2.2996	+ 1 53 28.8	+15.817	0	1 18 50.72	2.3238	+13 36 41.9	+12.867
3 30 32.99	2.2992	2 9 17.2	15.796	1	1 21 10.18	2.3251	13 49 31.0	12.769
3 32 50.93	2.2987	2 25 4.3	15.773	2	1 23 29.73	2.3264	14 2 14.2	12.669
3 35 8.83	2.2982	2 40 49.9	15.747	3	1 25 49.35	2.3277	14 14 51.3	12.569
3 37 26.71	2.2978	2 56 33.9	15.719	4	1 28 9.05	2.3290	14 27 22.5	12.468
3 39 44.57	2.2974	3 12 16.2	15.691	5	1 30 28.83	2.3303	14 39 47.4	12.364
3 42 2.40	2.2971	3 27 56.8	15.660	6	1 32 48.69	2.3318	14 52 6.2	12.261
3 44 20.22	2.2969	3 43 35.4	15.627	7	1 35 8.64	2.3331	15 4 18.7	12.156
3 46 38.03	2.2968	3 59 12.0	15.593	8	1 37 28.66	2.3344	15 16 24.9	12.049
3 48 55.83	2.2966	4 14 46.6	15.558	9	1 39 48.77	2.3359	15 28 24.6	11.942
3 51 13.62	2.2964	4 30 18.9	15.518	10	1 42 8.97	2.3373	15 40 17.9	11.833
3 53 31.40	2.2963	4 45 48.8	15.478	11	1 44 29.24	2.3386	15 52 4.6	11.724
3 55 49.18	2.2964	5 1 16.3	15.438	12	1 46 49.60	2.3400	16 3 44.8	11.614
3 58 6.97	2.2965	5 16 41.3	15.394	13	1 49 10.04	2.3414	16 15 18.3	11.502
0 0 24.76	2.2966	5 32 3.6	15.349	14	1 51 30.57	2.3428	16 26 45.0	11.388
0 2 42.56	2.2968	5 47 23.2	15.303	15	1 53 51.18	2.3442	16 38 4.9	11.274
0 5 0.37	2.2969	6 2 39.9	15.253	16	1 56 11.87	2.3455	16 49 17.9	11.159
0 7 18.19	2.2972	6 17 53.6	15.203	17	1 58 32.64	2.3469	17 0 24.0	11.044
0 9 36.03	2.2975	6 33 4.3	15.152	18	2 0 53.50	2.3483	17 11 23.2	10.927
0 11 53.89	2.2978	6 48 11.8	15.098	19	2 3 14.44	2.3497	17 22 15.2	10.808
0 14 11.77	2.2982	7 3 16.0	15.043	20	2 5 35.46	2.3510	17 33 0.2	10.691
0 16 29.67	2.2987	7 18 16.9	14.986	21	2 7 56.56	2.3523	17 43 38.1	10.571
0 18 47.61	2.2992	7 33 14.3	14.928	22	2 10 17.74	2.3537	17 54 8.7	10.450
0 21 5.57	2.2996	+ 7 48 8.2	+14.867	23	2 12 39.00	2.3550	+18 4 32.1	+10.329
SEPTEMBER 3.					**SEPTEMBER 5.**			
0 23 23.56	2.3002	+ 8 2 58.3	+14.804	0	2 15 0.34	2.3563	+18 14 48.2	+10.207
0 25 41.59	2.3008	8 17 44.7	14.742	1	2 17 21.76	2.3576	18 24 56.9	10.083
0 27 59.65	2.3014	8 32 27.3	14.676	2	2 19 43.25	2.3588	18 34 58.2	9.960
0 30 17.76	2.3021	8 47 5.8	14.609	3	2 22 4.82	2.3601	18 44 52.1	9.835
0 32 35.90	2.3028	9 1 40.4	14.542	4	2 24 26.46	2.3613	18 54 38.4	9.709
0 34 54.09	2.3036	9 16 10.8	14.471	5	2 26 48.18	2.3625	19 4 17.2	9.583
0 37 12.33	2.3044	9 30 36.9	14.399	6	2 29 9.96	2.3637	19 13 48.4	9.456
0 39 30.62	2.3052	9 44 58.7	14.327	7	2 31 31.82	2.3649	19 23 11.9	9.328
0 41 48.95	2.3060	9 59 16.1	14.253	8	2 33 53.75	2.3660	19 32 27.7	9.199
0 44 7.34	2.3069	10 13 29.0	14.177	9	2 36 15.74	2.3671	19 41 35.8	9.071
0 46 25.78	2.3078	10 27 37.3	14.099	10	2 38 37.80	2.3682	19 50 36.2	8.941
0 48 44.28	2.3088	10 41 40.9	14.020	11	2 40 59.92	2.3692	19 59 28.7	8.810
0 51 2.84	2.3098	10 55 39.7	13.939	12	2 43 22.10	2.3702	20 8 13.4	8.679
0 53 21.46	2.3108	11 9 33.6	13.858	13	2 45 44.34	2.3712	20 16 50.2	8.548
0 55 40.14	2.3119	11 23 22.6	13.775	14	2 48 6.64	2.3721	20 25 19.1	8.415
0 57 58.89	2.3130	11 37 6.6	13.690	15	2 50 28.99	2.3730	20 33 40.0	8.282
1 0 17.70	2.3140	11 50 45.4	13.603	16	2 52 51.40	2.3738	20 41 52.9	8.148
1 2 36.57	2.3152	12 4 19.0	13.517	17	2 55 13.85	2.3747	20 49 57.7	8.013
1 4 55.52	2.3164	12 17 47.4	13.428	18	2 57 36.36	2.3755	20 57 54.5	7.880
1 7 14.54	2.3176	12 31 10.4	13.338	19	2 59 58.91	2.3762	21 5 43.3	7.745
1 9 33.63	2.3188	12 44 27.9	13.246	20	3 2 21.50	2.3768	21 13 23.9	7.608
1 11 52.79	2.3199	12 57 39.9	13.153	21	3 4 44.13	2.3776	21 20 56.3	7.473
1 14 12.02	2.3212	13 10 46.3	13.059	22	3 7 6.81	2.3783	21 28 20.6	7.336
1 16 31.33	2.3225	13 23 47.0	12.963	23	3 9 29.52	2.3788	21 35 36.6	7.199
1 18 50.72	*2.3238*	*+13 36 41.9*	*+12.867*	24	3 11 52.26	2.3793	+21 42 44.5	+ 7.063

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	SEPTEMBER 6.			
	h m s	s	° ′ ″	″
0	3 11 52.26	2.3793	+21 42 44.5	+7.063
1	3 14 15.03	2.3798	21 49 44.1	6.924
2	3 16 37.85	2.3802	21 56 35.4	6.786
3	3 19 0.65	2.3806	22 3 18.4	6.647
4	3 21 23.50	2.3809	22 9 53.0	6.508
5	3 23 46.36	2.3812	22 16 19.4	6.370
6	3 26 9.24	2.3813	22 22 37.4	6.230
7	3 28 32.12	2.3815	22 28 47.0	6.090
8	3 30 55.02	2.3817	22 34 48.2	5.950
9	3 33 17.92	2.3817	22 40 41.0	5.809
10	3 35 40.82	2.3816	22 46 25.3	5.669
11	3 38 3.71	2.3816	22 52 1.3	5.529
12	3 40 26.61	2.3815	22 57 28.8	5.388
13	3 42 49.49	2.3813	23 2 47.8	5.247
14	3 45 12.36	2.3811	23 7 58.4	5.106
15	3 47 35.22	2.3808	23 13 0.5	4.964
16	3 49 58.05	2.3803	23 17 54.1	4.823
17	3 52 20.86	2.3799	23 22 39.3	4.682
18	3 54 43.64	2.3794	23 27 15.9	4.540
19	3 57 6.39	2.3789	23 31 44.1	4.398
20	3 59 29.11	2.3783	23 36 3.7	4.257
21	4 1 51.78	2.3776	23 40 14.9	4.115
22	4 4 14.42	2.3768	23 44 17.5	3.973
23	4 6 37.00	2.3759	+23 48 11.6	+3.832
	SEPTEMBER 7.			
0	4 8 59.53	2.3751	+23 51 57.3	+3.691
1	4 11 22.01	2.3742	23 55 34.5	3.548
2	4 13 44.43	2.3732	23 59 3.1	3.407
3	4 16 6.79	2.3721	24 2 23.3	3.266
4	4 18 29.08	2.3709	24 5 35.0	3.124
5	4 20 51.30	2.3698	24 8 38.2	2.983
6	4 23 13.45	2.3685	24 11 32.9	2.842
7	4 25 35.52	2.3671	24 14 19.2	2.702
8	4 27 57.50	2.3657	24 16 57.1	2.561
9	4 30 19.40	2.3642	24 19 26.5	2.419
10	4 32 41.20	2.3626	24 21 47.4	2.279
11	4 35 2.91	2.3611	24 24 0.0	2.139
12	4 37 24.53	2.3594	24 26 4.1	1.999
13	4 39 46.04	2.3576	24 27 59.9	1.860
14	4 42 7.44	2.3558	24 29 47.3	1.720
15	4 44 28.73	2.3539	24 31 26.3	1.582
16	4 46 49.91	2.3519	24 32 57.1	1.443
17	4 49 10.96	2.3499	24 34 19.5	1.304
18	4 51 31.90	2.3478	24 35 33.6	1.166
19	4 53 52.70	2.3457	24 36 39.4	1.028
20	4 56 13.38	2.3435	24 37 37.0	0.891
21	4 58 33.92	2.3413	24 38 26.3	0.753
22	5 0 54.33	2.3389	24 39 7.4	0.618
23	5 3 14.59	2.3365	24 39 40.4	0.481
24	5 5 34.71	2.3340	+24 40 5.1	+0.344

Hour.	Right Ascension.	Var. per Min.	Declination.
	SEPTEMBER 8.		
	h m s	s	° ′ ″
0	5 5 34.71	2.3340	+24 40 5.1
1	5 7 54.67	2.3314	24 40 21.7
2	5 10 14.48	2.3289	24 40 30.2
3	5 12 34.14	2.3263	24 40 30.7
4	5 14 53.63	2.3235	24 40 23.0
5	5 17 12.96	2.3208	24 40 7.4
6	5 19 32.12	2.3178	24 39 43.7
7	5 21 51.10	2.3150	24 39 12.1
8	5 24 9.92	2.3121	24 38 32.6
9	5 26 28.55	2.3090	24 37 45.2
10	5 28 47.00	2.3060	24 36 49.8
11	5 31 5.27	2.3029	24 35 46.7
12	5 33 23.35	2.2998	24 34 35.7
13	5 35 41.24	2.2965	24 33 17.0
14	5 37 58.93	2.2932	24 31 50.5
15	5 40 16.42	2.2898	24 30 16.3
16	5 42 33.71	2.2864	24 28 34.5
17	5 44 50.79	2.2830	24 26 45.0
18	5 47 7.67	2.2796	24 24 48.0
19	5 49 24.34	2.2761	24 22 43.4
20	5 51 40.80	2.2725	24 20 31.3
21	5 53 57.04	2.2688	24 18 11.7
22	5 56 13.06	2.2653	24 15 44.6
23	5 58 28.87	2.2616	+24 13 10.2
	SEPTEMBER 9.		
0	6 0 44.45	2.2578	+24 10 28.4
1	6 2 59.81	2.2540	24 7 39.3
2	6 5 14.93	2.2502	24 4 42.9
3	6 7 29.83	2.2463	24 1 39.3
4	6 9 44.49	2.2424	23 58 28.4
5	6 11 58.92	2.2385	23 55 10.5
6	6 14 13.11	2.2345	23 51 45.4
7	6 16 27.06	2.2305	23 48 13.3
8	6 18 40.77	2.2265	23 44 34.1
9	6 20 54.24	2.2224	23 40 48.0
10	6 23 7.46	2.2183	23 36 54.9
11	6 25 20.44	2.2143	23 32 55.0
12	6 27 33.17	2.2101	23 28 48.2
13	6 29 45.65	2.2059	23 24 34.6
14	6 31 57.88	2.2017	23 20 14.3
15	6 34 9.85	2.1974	23 15 47.2
16	6 36 21.57	2.1933	23 11 13.6
17	6 38 33.04	2.1889	23 6 33.2
18	6 40 44.24	2.1847	23 1 46.4
19	6 42 55.20	2.1804	22 56 53.0
20	6 45 5.89	2.1760	22 51 53.2
21	6 47 16.32	2.1717	22 46 46.9
22	6 49 26.49	2.1673	22 41 34.3
23	6 51 36.40	2.1630	22 36 15.3
24	6 53 46.05	2.1586	+22 30 50.1

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	SEPTEMBER 10.			
	h m s	s	° ′ ″	″
0	6 53 46.05	2.1586	+22 30 50.1	−5.472
1	6 55 55.43	2.1542	22 25 18.7	5.576
2	6 58 4.55	2.1498	22 19 41.0	5.678
3	7 0 13.41	2.1454	22 13 57.3	5.779
4	7 2 22.00	2.1410	22 8 7.5	5.881
5	7 4 30.33	2.1366	22 2 11.6	5.982
6	7 6 38.39	2.1321	21 56 9.7	6.080
7	7 8 46.18	2.1277	21 50 2.0	6.178
8	7 10 53.71	2.1233	21 43 48.3	6.277
9	7 13 0.97	2.1188	21 37 28.8	6.373
10	7 15 7.97	2.1144	21 31 3.5	6.470
11	7 17 14.70	2.1100	21 24 32.4	6.565
12	7 19 21.17	2.1056	21 17 55.7	6.659
13	7 21 27.37	2.1012	21 11 13.3	6.753
14	7 23 33.31	2.0967	21 4 25.4	6.845
15	7 25 38.97	2.0923	20 57 31.9	6.938
16	7 27 44.38	2.0878	20 50 32.9	7.028
17	7 29 49.51	2.0834	20 43 28.5	7.118
18	7 31 54.39	2.0791	20 36 18.7	7.208
19	7 33 59.00	2.0746	20 29 3.5	7.298
20	7 36 3.34	2.0703	20 21 43.0	7.385
21	7 38 7.43	2.0659	20 14 17.3	7.472
22	7 40 11.25	2.0615	20 6 46.4	7.558
23	7 42 14.81	2.0571	+19 59 10.3	−7.644
	SEPTEMBER 11.			
0	7 44 18.10	2.0528	+19 51 29.1	−7.728
1	7 46 21.14	2.0485	19 43 42.9	7.812
2	7 48 23.92	2.0442	19 35 51.7	7.894
3	7 50 26.44	2.0399	19 27 55.6	7.977
4	7 52 28.71	2.0357	19 19 54.5	8.059
5	7 54 30.72	2.0314	19 11 48.6	8.138
6	7 56 32.48	2.0272	19 3 37.9	8.218
7	7 58 33.98	2.0230	18 55 22.5	8.297
8	8 0 35.24	2.0188	18 47 2.3	8.375
9	8 2 36.24	2.0146	18 38 37.5	8.453
10	8 4 36.99	2.0104	18 30 8.0	8.528
11	8 6 37.49	2.0063	18 21 34.1	8.603
12	8 8 37.75	2.0023	18 12 55.6	8.678
13	8 10 37.76	1.9982	18 4 12.7	8.753
14	8 12 37.53	1.9942	17 55 25.3	8.826
15	8 14 37.06	1.9902	17 46 33.6	8.898
16	8 16 36.35	1.9862	17 37 37.5	8.970
17	8 18 35.40	1.9822	17 28 37.2	9.040
18	8 20 34.21	1.9783	17 19 32.7	9.110
19	8 22 32.79	1.9744	17 10 24.0	9.179
20	8 24 31.14	1.9705	17 1 11.2	9.248
21	8 26 29.25	1.9667	16 51 54.3	9.315
22	8 28 27.14	1.9628	16 42 33.4	9.382
23	8 30 24.79	1.9590	16 33 8.5	9.448
24	8 32 22.22	1.9553	+16 23 39.6	−9.513
	SEPTEMBER 12.			
0	8 32 22.22	1.9553	+16 23 39.6	− 9.513
1	8 34 19.43	1.9517	16 14 6.9	9.578
2	8 36 16.42	1.9480	16 4 30.3	9.641
3	8 38 13.19	1.9443	15 54 50.0	9.703
4	8 40 9.74	1.9407	15 45 5.9	9.766
5	8 42 6.07	1.9371	15 35 18.1	9.828
6	8 44 2.19	1.9337	15 25 26.6	9.888
7	8 45 58.11	1.9302	15 15 31.5	9.948
8	8 47 53.81	1.9267	15 5 32.9	10.007
9	8 49 49.31	1.9233	14 55 30.7	10.065
10	8 51 44.61	1.9199	14 45 25.1	10.122
11	8 53 39.70	1.9165	14 35 16.1	10.179
12	8 55 34.59	1.9133	14 25 3.6	10.235
13	8 57 29.29	1.9100	14 14 47.9	10.290
14	8 59 23.79	1.9068	14 4 28.8	10.345
15	9 1 18.10	1.9036	13 54 6.5	10.398
16	9 3 12.22	1.9004	13 43 41.0	10.451
17	9 5 6.15	1.8973	13 33 12.4	10.503
18	9 6 59.90	1.8943	13 22 40.7	10.554
19	9 8 53.47	1.8913	13 12 5.9	10.605
20	9 10 46.86	1.8883	13 1 28.1	10.655
21	9 12 40.07	1.8853	12 50 47.3	10.704
22	9 14 33.10	1.8825	12 40 3.6	10.753
23	9 16 25.97	1.8797	+12 29 17.0	−10.800
	SEPTEMBER 13.			
0	9 18 18.66	1.8768	+12 18 27.6	−10.847
1	9 20 11.19	1.8742	12 7 35.4	10.893
2	9 22 3.56	1.8714	11 56 40.4	10.939
3	9 23 55.76	1.8688	11 45 42.7	10.983
4	9 25 47.81	1.8662	11 34 42.4	11.028
5	9 27 39.70	1.8636	11 23 39.4	11.071
6	9 29 31.44	1.8611	11 12 33.9	11.113
7	9 31 23.03	1.8587	11 1 25.9	11.155
8	9 33 14.48	1.8563	10 50 15.3	11.197
9	9 35 5.78	1.8538	10 39 2.3	11.236
10	9 36 56.93	1.8514	10 27 47.0	11.276
11	9 38 47.95	1.8492	10 16 29.2	11.315
12	9 40 38.83	1.8469	10 5 9.2	11.353
13	9 42 29.58	1.8448	9 53 46.9	11.390
14	9 44 20.20	1.8427	9 42 22.4	11.427
15	9 46 10.70	1.8406	9 30 55.7	11.463
16	9 48 1.07	1.8385	9 19 26.8	11.498
17	9 49 51.32	1.8365	9 7 55.9	11.533
18	9 51 41.45	1.8345	8 56 22.9	11.567
19	9 53 31.46	1.8326	8 44 47.9	11.600
20	9 55 21.36	1.8308	8 33 10.9	11.633
21	9 57 11.16	1.8291	8 21 32.0	11.664
22	9 59 0.85	1.8273	8 9 51.2	11.695
23	10 0 50.43	1.8255	7 58 8.6	11.726
24	10 2 39.91	1.8239	+ 7 46 24.1	−11.756

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.
	SEPTEMBER 14.					SEPTEMBER 16.		
	h m s	s	° ′ ″	″		h m s	s	° ′ ″
0	10 2 39.91	1.8239	+7 46 24.1	−11.756	0	11 29 18.52	1.8066	− 1 58 39.3
1	10 4 29.30	1.8223	7 34 37.9	11.781	1	11 31 6.95	1.8076	2 11 0.3
2	10 6 18.59	1.8208	7 22 50.0	11.812	2	11 32 55.43	1.8086	2 23 20.9
3	10 8 7.80	1.8193	7 11 0.5	11.840	3	11 34 43.98	1.8097	2 35 41.2
4	10 9 56.91	1.8178	6 59 9.2	11.868	4	11 36 32.59	1.8108	2 48 1.1
5	10 11 45.94	1.8165	6 47 16.4	11.893	5	11 38 21.27	1.8119	3 0 20.5
6	10 13 34.89	1.8152	6 35 22.1	11.918	6	11 40 10.02	1.8132	3 12 39.4
7	10 15 23.76	1.8138	6 23 26.3	11.943	7	11 41 58.85	1.8144	3 24 57.8
8	10 17 12.55	1.8127	6 11 28.9	11.968	8	11 43 47.75	1.8158	3 37 15.6
9	10 19 1.28	1.8115	5 59 30.2	11.990	9	11 45 36.74	1.8172	3 49 32.8
10	10 20 49.93	1.8103	5 47 30.1	12.013	10	11 47 25.81	1.8186	4 1 49.3
11	10 22 38.51	1.8092	5 35 28.6	12.035	11	11 49 14.97	1.8200	4 14 5.1
12	10 24 27.03	1.8082	5 23 25.9	12.056	12	11 51 4.21	1.8215	4 26 20.1
13	10 26 15.49	1.8073	5 11 21.9	12.077	13	11 52 53.55	1.8233	4 38 34.3
14	10 28 3.90	1.8063	4 59 16.7	12.096	14	11 54 43.00	1.8249	4 50 47.7
15	10 29 52.25	1.8054	4 47 10.4	12.115	15	11 56 32.54	1.8265	5 3 0.2
16	10 31 40.55	1.8046	4 35 2.9	12.134	16	11 58 22.18	1.8283	5 15 11.7
17	10 33 28.80	1.8038	4 22 54.3	12.152	17	12 0 11.94	1.8302	5 27 22.3
18	10 35 17.01	1.8031	4 10 44.7	12.169	18	12 2 1.80	1.8320	5 39 31.8
19	10 37 5.17	1.8024	3 58 34.0	12.185	19	12 3 51.78	1.8339	5 51 40.2
20	10 38 53.30	1.8019	3 46 22.5	12.200	20	12 5 41.87	1.8358	6 3 47.6
21	10 40 41.40	1.8013	3 34 10.0	12.216	21	12 7 32.08	1.8379	6 15 53.7
22	10 42 29.46	1.8008	3 21 56.6	12.230	22	12 9 22.42	1.8400	6 27 58.6
23	10 44 17.50	1.8003	+3 9 42.4	−12.243	23	12 11 12.88	1.8421	− 6 40 2.3
	SEPTEMBER 15.					SEPTEMBER 17.		
0	10 46 5.50	1.7999	+2 57 27.4	−12.256	0	12 13 3.47	1.8443	− 6 52 4.6
1	10 47 53.49	1.7996	2 45 11.7	12.268	1	12 14 54.20	1.8466	7 4 5.6
2	10 49 41.45	1.7993	2 32 55.3	12.279	2	12 16 45.06	1.8488	7 16 5.2
3	10 51 29.40	1.7991	2 20 38.2	12.291	3	12 18 36.06	1.8512	7 28 3.3
4	10 53 17.34	1.7989	2 8 20.4	12.301	4	12 20 27.20	1.8535	7 39 59.9
5	10 55 5.27	1.7988	1 56 2.1	12.309	5	12 22 18.48	1.8560	7 51 55.0
6	10 56 53.20	1.7988	1 43 43.3	12.318	6	12 24 9.92	1.8585	8 3 48.5
7	10 58 41.12	1.7988	1 31 24.0	12.326	7	12 26 1.50	1.8610	8 15 40.3
8	11 0 29.05	1.7988	1 19 4.2	12.333	8	12 27 53.24	1.8637	8 27 30.5
9	11 2 16.97	1.7988	1 6 44.0	12.340	9	12 29 45.14	1.8663	8 39 18.9
10	11 4 4.91	1.7990	0 54 23.4	12.346	10	12 31 37.20	1.8689	8 51 5.5
11	11 5 52.85	1.7992	0 42 2.5	12.350	11	12 33 29.41	1.8717	9 2 50.2
12	11 7 40.81	1.7994	0 29 41.4	12.354	12	12 35 21.80	1.8746	9 14 33.1
13	11 9 28.78	1.7998	0 17 20.0	12.358	13	12 37 14.36	1.8774	9 26 14.1
14	11 11 16.78	1.8002	+0 4 58.4	12.362	14	12 39 7.09	1.8803	9 37 53.1
15	11 13 4.80	1.8005	−0 7 23.4	12.364	15	12 40 59.99	1.8833	9 49 30.0
16	11 14 52.84	1.8009	0 19 45.3	12.366	16	12 42 53.08	1.8863	10 1 4.9
17	11 16 40.91	1.8015	0 32 7.3	12.367	17	12 44 46.34	1.8893	10 12 37.6
18	11 18 29.02	1.8021	0 44 29.3	12.366	18	12 46 39.79	1.8924	10 24 8.2
19	11 20 17.16	1.8027	0 56 51.2	12.365	19	12 48 33.43	1.8956	10 35 36.5
20	11 22 5.34	1.8034	1 9 13.1	12.364	20	12 50 27.26	1.8988	10 47 2.5
21	11 23 53.57	1.8042	1 21 34.9	12.363	21	12 52 21.29	1.9021	10 58 26.3
22	11 25 41.84	1.8049	1 33 56.6	12.359	22	12 54 15.51	1.9053	11 9 47.6
23	11 27 30.16	1.8057	1 46 18.0	12.356	23	12 56 9.92	1.9086	11 21 6.5
24	11 29 18.52	1.8066	−1 58 39.3	−12.353	24	12 58 4.54	1.9121	−11 32 22.8

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	SEPTEMBER 18.			
	h m s	s	° ′ ″	″
0	12 58 4.54	1.9121	−11 32 22.8	−11.252
1	12 59 59.37	1.9155	11 43 36.7	11.209
2	13 1 54.40	1.9189	11 54 47.9	11.165
3	13 3 49.64	1.9225	12 5 56.5	11.122
4	13 5 45.10	1.9261	12 17 2.5	11.077
5	13 7 40.77	1.9298	12 28 5.7	11.030
6	13 9 36.67	1.9334	12 39 6.1	10.983
7	13 11 32.78	1.9371	12 50 3.6	10.935
8	13 13 29.12	1.9408	13 0 58.3	10.886
9	13 15 25.68	1.9447	13 11 49.9	10.836
10	13 17 22.48	1.9485	13 22 38.6	10.786
11	13 19 19.50	1.9523	13 33 24.2	10.734
12	13 21 16.76	1.9563	13 44 6.7	10.682
13	13 23 14.26	1.9603	13 54 46.0	10.628
14	13 25 11.99	1.9643	14 5 22.1	10.575
15	13 27 9.97	1.9683	14 15 55.0	10.520
16	13 29 8.19	1.9724	14 26 24.5	10.463
17	13 31 6.66	1.9766	14 36 50.6	10.406
18	13 33 5.38	1.9808	14 47 13.2	10.348
19	13 35 4.35	1.9849	14 57 32.4	10.290
20	13 37 3.57	1.9892	15 7 48.0	10.230
21	13 39 3.05	1.9935	15 18 0.0	10.169
22	13 41 2.79	1.9978	15 28 8.3	10.108
23	13 43 2.79	2.0022	−15 38 12.9	−10.045
	SEPTEMBER 19.			
0	13 45 3.05	2.0066	−15 48 13.7	− 9.982
1	13 47 3.58	2.0110	15 58 10.7	9.918
2	13 49 4.37	2.0154	16 8 3.8	9.852
3	13 51 5.43	2.0199	16 17 52.9	9.786
4	13 53 6.76	2.0245	16 27 38.1	9.718
5	13 55 8.37	2.0290	16 37 19.1	9.650
6	13 57 10.24	2.0336	16 46 56.1	9.582
7	13 59 12.40	2.0383	16 56 28.9	9.511
8	14 1 14.83	2.0429	17 5 57.4	9.440
9	14 3 17.55	2.0476	17 15 21.7	9.368
10	14 5 20.54	2.0523	17 24 41.6	9.295
11	14 7 23.82	2.0570	17 33 57.1	9.222
12	14 9 27.38	2.0618	17 43 8.2	9.147
13	14 11 31.23	2.0666	17 52 14.7	9.071
14	14 13 35.37	2.0714	18 1 16.7	8.993
15	14 15 39.80	2.0762	18 10 13.9	8.915
16	14 17 44.51	2.0810	18 19 6.5	8.838
17	14 19 49.52	2.0860	18 27 54.4	8.758
18	14 21 54.83	2.0908	18 36 37.4	8.676
19	14 24 0.42	2.0958	18 45 15.5	8.594
20	14 26 6.32	2.1007	18 53 48.7	8.512
21	14 28 12.50	2.1056	19 2 16.9	8.428
22	14 30 18.99	2.1106	19 10 40.1	8.343
23	14 32 25.77	2.1155	19 18 58.1	8.258
24	*14 34 32.85*	*2.1205*	*−19 27 11.0*	− 8.171

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	SEPTEMBER 20.			
	h m s	s	° ′ ″	″
0	14 34 32.85	2.1205	−19 27 11.0	−8.171
1	14 36 40.23	2.1255	19 35 18.6	8.083
2	14 38 47.91	2.1306	19 43 21.0	7.995
3	14 40 55.90	2.1356	19 51 18.0	7.905
4	14 43 4.18	2.1406	19 59 9.6	7.814
5	14 45 12.77	2.1457	20 6 55.7	7.723
6	14 47 21.66	2.1508	20 14 36.3	7.629
7	14 49 30.86	2.1558	20 22 11.2	7.536
8	14 51 40.35	2.1608	20 29 40.6	7.442
9	14 53 50.15	2.1659	20 37 4.2	7.345
10	14 56 0.26	2.1709	20 44 22.0	7.248
11	14 58 10.66	2.1759	20 51 34.0	7.152
12	15 0 21.37	2.1810	20 58 40.2	7.053
13	15 2 32.38	2.1861	21 5 40.4	6.953
14	15 4 43.70	2.1912	21 12 34.6	6.853
15	15 6 55.32	2.1962	21 19 22.7	6.751
16	15 9 7.24	2.2012	21 26 4.7	6.648
17	15 11 19.46	2.2062	21 32 40.5	6.545
18	15 13 31.98	2.2112	21 39 10.1	6.441
19	15 15 44.80	2.2163	21 45 33.4	6.335
20	15 17 57.93	2.2213	21 51 50.3	6.228
21	15 20 11.35	2.2262	21 58 0.8	6.121
22	15 22 25.07	2.2311	22 4 4.8	6.013
23	15 24 39.08	2.2361	−22 10 2.3	−5.903
	SEPTEMBER 21.			
0	15 26 53.40	2.2411	−22 15 53.2	−5.793
1	15 29 8.01	2.2459	22 21 37.5	5.682
2	15 31 22.91	2.2508	22 27 15.0	5.569
3	15 33 38.11	2.2557	22 32 45.8	5.457
4	15 35 53.59	2.2605	22 38 9.8	5.343
5	15 38 9.37	2.2653	22 43 26.9	5.227
6	15 40 25.43	2.2701	22 48 37.0	5.111
7	15 42 41.78	2.2749	22 53 40.2	4.994
8	15 44 58.42	2.2796	22 58 36.3	4.877
9	15 47 15.33	2.2843	23 3 25.4	4.758
10	15 49 32.53	2.2889	23 8 7.3	4.638
11	15 51 50.00	2.2935	23 12 41.9	4.518
12	15 54 7.75	2.2981	23 17 9.4	4.397
13	15 56 25.77	2.3027	23 21 29.5	4.274
14	15 58 44.07	2.3072	23 25 42.3	4.151
15	16 1 2.63	2.3116	23 29 47.6	4.027
16	16 3 21.46	2.3161	23 33 45.5	3.903
17	16 5 40.56	2.3204	23 37 35.9	3.777
18	16 7 59.91	2.3247	23 41 18.7	3.650
19	16 10 19.52	2.3290	23 44 53.9	3.523
20	16 12 39.39	2.3333	23 48 21.4	3.394
21	16 14 59.51	2.3374	23 51 41.2	3.265
22	16 17 19.88	2.3415	23 54 53.2	3.135
23	16 19 40.49	2.3456	23 57 57.4	3.005
24	16 22 1.35	2.3497	−24 0 53.8	−2.874

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	SEPTEMBER 22.			
	h m s	s	° ′ ″	″
0	16 22 1.35	2.3497	−24 0 53.8	−2.874
1	16 24 22.45	2.3536	24 3 42.3	2.742
2	16 26 43.78	2.3574	24 6 22.8	2.608
3	16 29 5.34	2.3613	24 8 55.3	2.475
4	16 31 27.14	2.3651	24 11 19.8	2.341
5	16 33 49.15	2.3688	24 13 36.2	2.205
6	16 36 11.39	2.3725	24 15 44.4	2.069
7	16 38 33.85	2.3761	24 17 44.5	1.933
8	16 40 56.52	2.3796	24 19 36.4	1.797
9	16 43 19.40	2.3831	24 21 20.1	1.658
10	16 45 42.49	2.3865	24 22 55.4	1.519
11	16 48 5.78	2.3898	24 24 22.4	1.381
12	16 50 29.26	2.3930	24 25 41.1	1.242
13	16 52 52.94	2.3963	24 26 51.4	1.101
14	16 55 16.81	2.3993	24 27 53.2	0.960
15	16 57 40.86	2.4023	24 28 46.6	0.819
16	17 0 5.09	2.4053	24 29 31.5	0.677
17	17 2 29.50	2.4083	24 30 7.8	0.533
18	17 4 54.08	2.4111	24 30 35.5	0.391
19	17 7 18.83	2.4138	24 30 54.7	0.248
20	17 9 43.73	2.4164	24 31 5.2	−0.103
21	17 12 8.80	2.4191	24 31 7.1	+0.041
22	17 14 34.02	2.4215	24 31 0.3	0.187
23	17 16 59.38	2.4239	−24 30 44.7	+0.332
	SEPTEMBER 23.			
0	17 19 24.89	2.4263	−24 30 20.5	+0.477
1	17 21 50.54	2.4286	24 29 47.5	0.623
2	17 24 16.32	2.4308	24 29 5.7	0.770
3	17 26 42.23	2.4328	24 28 15.1	0.917
4	17 29 8.26	2.4348	24 27 15.7	1.064
5	17 31 34.41	2.4368	24 26 7.4	1.212
6	17 34 0.68	2.4387	24 24 50.3	1.359
7	17 36 27.05	2.4404	24 23 24.3	1.508
8	17 38 53.53	2.4422	24 21 49.4	1.657
9	17 41 20.11	2.4438	24 20 5.5	1.805
10	17 43 46.78	2.4453	24 18 12.8	1.953
11	17 46 13.54	2.4467	24 16 11.1	2.103
12	17 48 40.38	2.4480	24 14 0.5	2.252
13	17 51 7.30	2.4493	24 11 40.9	2.402
14	17 53 34.30	2.4505	24 9 12.3	2.551
15	17 56 1.36	2.4516	24 6 34.8	2.701
16	17 58 28.49	2.4526	24 3 48.2	2.851
17	18 0 55.67	2.4535	24 0 52.7	3.001
18	18 3 22.91	2.4544	23 57 48.1	3.151
19	18 5 50.20	2.4552	23 54 34.6	3.300
20	18 8 17.53	2.4558	23 51 12.1	3.450
21	18 10 44.90	2.4564	23 47 40.6	3.600
22	18 13 12.30	2.4570	23 44 0.1	3.750
23	18 15 39.74	2.4574	23 40 10.6	3.900
24	18 18 7.19	2.4578	−23 36 12.1	+4.050

Hour.	Right Ascension.	Var. per Min.	Declination.
	SEPTEMBER 24.		
	h m s	s	° ′ ″
0	18 18 7.19	2.4578	−23 36 12.1
1	18 20 34.67	2.4581	23 32 4.(
2	18 23 2.16	2.4582	23 27 48.2
3	18 25 29.65	2.4583	23 23 22.8
4	18 27 57.16	2.4584	23 18 48.4
5	18 30 24.66	2.4583	23 14 5.(
6	18 32 52.16	2.4583	23 9 12.8
7	18 35 19.66	2.4581	23 4 11.(
8	18 37 47.13	2.4578	22 59 1.8
9	18 40 14.59	2.4575	22 53 42.2
10	18 42 42.03	2.4571	22 48 14.(
11	18 45 9.44	2.4566	22 42 37.8
12	18 47 36.82	2.4560	22 36 52.2
13	18 50 4.16	2.4554	22 30 57.8
14	18 52 31.47	2.4548	22 24 54.2
15	18 54 58.73	2.4540	22 18 42.8
16	18 57 25.95	2.4532	22 12 22.2
17	18 59 53.11	2.4523	22 5 52.2
18	19 2 20.22	2.4513	21 59 14.(
19	19 4 47.27	2.4503	21 52 28.(
20	19 7 14.26	2.4493	21 45 32.(
21	19 9 41.18	2.4482	21 38 28.
22	19 12 8.04	2.4470	21 31 16.
23	19 14 34.82	2.4457	−21 23 55.
	SEPTEMBER 25.		
0	19 17 1.52	2.4443	−21 16 25.
1	19 19 28.14	2.4430	21 8 47.
2	19 21 54.68	2.4417	21 1 1.
3	19 24 21.14	2.4403	20 53 6.
4	19 26 47.51	2.4387	20 45 3.
5	19 29 13.78	2.4371	20 36 51.
6	19 31 39.96	2.4356	20 28 32.
7	19 34 6.05	2.4339	20 20 4.
8	19 36 32.03	2.4322	20 11 28.
9	19 38 57.91	2.4305	20 2 43.
10	19 41 23.69	2.4288	19 53 51.
11	19 43 49.36	2.4269	19 44 51.
12	19 46 14.92	2.4251	19 35 43.
13	19 48 40.37	2.4232	19 26 27.
14	19 51 5.70	2.4213	19 17 2.
15	19 53 30.92	2.4194	19 7 31.
16	19 55 56.03	2.4174	18 57 51.
17	19 58 21.01	2.4154	18 48 4.
18	20 0 45.88	2.4134	18 38 9.
19	20 3 10.62	2.4113	18 28 6.
20	20 5 35.24	2.4093	18 17 56.
21	20 7 59.73	2.4072	18 7 39.
22	20 10 24.10	2.4052	17 57 14.
23	20 12 48.35	2.4030	17 46 42.
24	20 15 12.46	2.4008	−17 36 2

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	SEPTEMBER 26.			
	h m s	s	° ′ ″	″
0	20 15 12.46	2.4008	−17 36 2.7	+10.718
1	20 17 36.44	2.3987	17 25 16.0	10.838
2	20 20 0.30	2.3965	17 14 22.2	10.957
3	20 22 24.02	2.3943	17 3 21.2	11.074
4	20 24 47.61	2.3922	16 52 13.3	11.189
5	20 27 11.08	2.3899	16 40 58.5	11.304
6	20 29 34.40	2.3877	16 29 36.8	11.418
7	20 31 57.60	2.3856	16 18 8.3	11.531
8	20 34 20.67	2.3833	16 6 33.1	11.643
9	20 36 43.60	2.3811	15 54 51.2	11.753
10	20 39 6.40	2.3789	15 43 2.8	11.862
11	20 41 29.07	2.3768	15 31 7.8	11.969
12	20 43 51.61	2.3745	15 19 6.5	12.075
13	20 46 14.01	2.3723	15 6 58.8	12.181
14	20 48 36.29	2.3702	14 54 44.8	12.285
15	20 50 58.43	2.3679	14 42 24.6	12.388
16	20 53 20.44	2.3658	14 29 58.3	12.488
17	20 55 42.32	2.3636	14 17 26.0	12.588
18	20 58 4.07	2.3614	14 4 47.8	12.686
19	21 0 25.69	2.3593	13 52 3.7	12.783
20	21 2 47.18	2.3572	13 39 13.8	12.879
21	21 5 8.55	2.3551	13 26 18.2	12.973
22	21 7 29.79	2.3530	13 13 17.0	13.067
23	21 9 50.91	2.3508	−13 0 10.2	+13.158
	SEPTEMBER 27.			
0	21 12 11.89	2.3488	−12 46 58.0	+13.248
1	21 14 32.76	2.3468	12 33 40.5	13.336
2	21 16 53.51	2.3448	12 20 17.7	13.423
3	21 19 14.13	2.3428	12 6 49.7	13.509
4	21 21 34.64	2.3408	11 53 16.6	13.593
5	21 23 55.03	2.3389	11 39 38.6	13.675
6	21 26 15.31	2.3370	11 25 55.6	13.757
7	21 28 35.47	2.3352	11 12 7.8	13.836
8	21 30 55.53	2.3333	10 58 15.3	13.913
9	21 33 15.47	2.3314	10 44 18.2	13.989
10	21 35 35.30	2.3297	10 30 16.6	14.065
11	21 37 55.03	2.3279	10 16 10.4	14.138
12	21 40 14.65	2.3262	10 2 0.0	14.209
13	21 42 34.17	2.3245	9 47 45.3	14.279
14	21 44 53.59	2.3229	9 33 26.5	14.348
15	21 47 12.92	2.3213	9 19 3.6	14.415
16	21 49 32.14	2.3197	9 4 36.7	14.480
17	21 51 51.28	2.3183	8 50 6.0	14.543
18	21 54 10.33	2.3167	8 35 31.6	14.604
19	21 56 29.28	2.3152	8 20 53.5	14.665
20	21 58 48.15	2.3138	8 6 11.8	14.723
21	22 1 6.94	2.3125	7 51 26.7	14.780
22	22 3 25.65	2.3112	7 36 38.2	14.836
23	22 5 44.28	2.3098	7 21 46.4	14.889
24	22 8 2.83	2.3086	− 7 6 51.5	+14.940

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	SEPTEMBER 28.			
	h m s	s	° ′ ″	″
0	22 8 2.83	2.3086	−7 6 51.5	+14.940
1	22 10 21.31	2.3074	6 51 53.6	14.990
2	22 12 39.72	2.3063	6 36 52.7	15.038
3	22 14 58.06	2.3052	6 21 49.0	15.085
4	22 17 16.34	2.3042	6 6 42.5	15.130
5	22 19 34.56	2.3031	5 51 33.4	15.173
6	22 21 52.71	2.3021	5 36 21.8	15.213
7	22 24 10.81	2.3013	5 21 7.8	15.253
8	22 26 28.86	2.3004	5 5 51.4	15.291
9	22 28 46.86	2.2996	4 50 32.9	15.327
10	22 31 4.81	2.2988	4 35 12.2	15.362
11	22 33 22.72	2.2982	4 19 49.5	15.393
12	22 35 40.59	2.2975	4 4 25.0	15.423
13	22 37 58.42	2.2968	3 48 58.7	15.453
14	22 40 16.21	2.2963	3 33 30.7	15.479
15	22 42 33.97	2.2958	3 18 1.2	15.504
16	22 44 51.70	2.2953	3 2 30.2	15.528
17	22 47 9.41	2.2949	2 46 57.8	15.549
18	22 49 27.09	2.2946	2 31 24.3	15.568
19	22 51 44.76	2.2943	2 15 49.6	15.587
20	22 54 2.41	2.2940	2 0 13.9	15.603
21	22 56 20.04	2.2938	1 44 37.3	15.617
22	22 58 37.66	2.2937	1 28 59.9	15.629
23	23 0 55.28	2.2936	−1 13 21.8	+15.639
	SEPTEMBER 29.			
0	23 3 12.89	2.2935	−0 57 43.2	+15.648
1	23 5 30.50	2.2936	0 42 4.1	15.654
2	23 7 48.12	2.2937	0 26 24.7	15.659
3	23 10 5.74	2.2938	−0 10 45.0	15.663
4	23 12 23.37	2.2939	+0 4 54.8	15.663
5	23 14 41.01	2.2941	0 20 34.6	15.663
6	23 16 58.66	2.2944	0 36 14.3	15.660
7	23 19 16.34	2.2948	0 51 53.8	15.656
8	23 21 34.03	2.2951	1 7 33.0	15.650
9	23 23 51.75	2.2956	1 23 11.8	15.641
10	23 26 9.50	2.2961	1 38 49.9	15.631
11	23 28 27.28	2.2966	1 54 27.5	15.620
12	23 30 45.09	2.2972	2 10 4.3	15.606
13	23 33 2.94	2.2978	2 25 40.2	15.589
14	23 35 20.83	2.2985	2 41 15.0	15.572
15	23 37 38.76	2.2993	2 56 48.8	15.553
16	23 39 56.74	2.3001	3 12 21.3	15.531
17	23 42 14.77	2.3009	3 27 52.5	15.508
18	23 44 32.85	2.3018	3 43 22.3	15.483
19	23 46 50.98	2.3027	3 58 50.5	15.456
20	23 49 9.17	2.3037	4 14 17.0	15.428
21	23 51 27.42	2.3047	4 29 41.8	15.398
22	23 53 45.73	2.3058	4 45 4.7	15.365
23	23 56 4.11	2.3069	5 0 25.6	15.330
24	23 58 22.56	2.3081	+5 15 44.3	+15.293

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	SEPTEMBER 30.			
	h m s	s	° ′ ″	″
0	23 58 22.56	2.3081	+ 5 15 44.3	+15.293
1	0 0 41.08	2.3093	5 31 0.8	15.257
2	0 2 59.68	2.3106	5 46 15.1	15.217
3	0 5 18.35	2.3118	6 1 26.8	15.175
4	0 7 37.10	2.3132	6 16 36.1	15.132
5	0 9 55.93	2.3146	6 31 42.6	15.086
6	0 12 14.85	2.3160	6 46 46.4	15.040
7	0 14 33.85	2.3174	7 1 47.4	14.991
8	0 16 52.94	2.3190	7 16 45.3	14.940
9	0 19 12.13	2.3205	7 31 40.2	14.888
10	0 21 31.40	2.3221	7 46 31.8	14.833
11	0 23 50.78	2.3237	8 1 20.2	14.778
12	0 26 10.24	2.3253	8 16 5.2	14.720
13	0 28 29.81	2.3270	8 30 46.6	14.661
14	0 30 49.48	2.3288	8 45 24.5	14.599
15	0 33 9.26	2.3305	8 59 58.5	14.536
16	0 35 29.14	2.3323	9 14 28.8	14.472
17	0 37 49.13	2.3341	9 28 55.1	14.405
18	0 40 9.23	2.3360	9 43 17.4	14.337
19	0 42 29.45	2.3378	9 57 35.5	14.267
20	0 44 49.77	2.3397	10 11 49.4	14.196
21	0 47 10.21	2.3417	10 25 59.0	14.123
22	0 49 30.77	2.3436	10 40 4.1	14.048
23	0 51 51.44	2.3456	+10 54 4.7	+13.971
	OCTOBER 1.			
0	0 54 12.24	2.3476	+11 8 0.6	+13.893
1	0 56 33.15	2.3496	11 21 51.8	13.813
2	0 58 54.19	2.3516	11 35 38.1	13.731
3	1 1 15.34	2.3536	11 49 19.5	13.648
4	1 3 36.62	2.3558	12 2 55.8	13.563
5	1 5 58.03	2.3578	12 16 27.0	13.477
6	1 8 19.56	2.3599	12 29 53.0	13.389
7	1 10 41.22	2.3620	12 43 13.7	13.299
8	1 13 3.00	2.3641	12 56 28.9	13.208
9	1 15 24.91	2.3663	13 9 38.7	13.116
10	1 17 46.95	2.3683	13 22 42.8	13.022
11	1 20 9.11	2.3705	13 35 41.3	12.927
12	1 22 31.41	2.3728	13 48 34.0	12.829
13	1 24 53.84	2.3748	14 1 20.8	12.731
14	1 27 16.39	2.3770	14 14 1.7	12.631
15	1 29 39.08	2.3792	14 26 36.5	12.529
16	1 32 1.89	2.3813	14 39 5.2	12.427
17	1 34 24.83	2.3835	14 51 27.7	12.323
18	1 36 47.91	2.3857	15 3 43.9	12.217
19	1 39 11.11	2.3878	15 15 53.7	12.110
20	1 41 34.44	2.3898	15 27 57.1	12.002
21	1 43 57.89	2.3920	15 39 53.9	11.892
22	1 46 21.48	2.3942	15 51 44.1	11.781
23	1 48 45.19	2.3962	16 3 27.6	11.668
	1 51 9.02	2.3983	+16 15 4.3	+11.555

Hour.	Right Ascension.	Var. per Min.	Declination.
	OCTOBER 2.		
	h m s	s	° ′ ″
0	1 51 9.02	2.3983	+16 15 4.3
1	1 53 32.98	2.4004	16 26 34.2
2	1 55 57.07	2.4024	16 37 57.1
3	1 58 21.27	2.4044	16 49 13.0
4	2 0 45.60	2.4065	17 0 21.9
5	2 3 10.05	2.4085	17 11 23.6
6	2 5 34.62	2.4104	17 22 18.1
7	2 7 59.30	2.4123	17 33 5.4
8	2 10 24.10	2.4143	17 43 45.2
9	2 12 49.02	2.4162	17 54 17.7
10	2 15 14.04	2.4180	18 4 42.6
11	2 17 39.18	2.4198	18 15 0.1
12	2 20 4.42	2.4216	18 25 9.9
13	2 22 29.77	2.4234	18 35 12.0
14	2 24 55.23	2.4251	18 45 6.4
15	2 27 20.78	2.4267	18 54 53.0
16	2 29 46.43	2.4283	19 4 31.8
17	2 32 12.18	2.4300	19 14 2.6
18	2 34 38.03	2.4315	19 23 25.5
19	2 37 3.96	2.4329	19 32 40.4
20	2 39 29.98	2.4343	19 41 47.2
21	2 41 56.08	2.4358	19 50 46.0
22	2 44 22.27	2.4372	19 59 36.5
23	2 46 48.54	2.4384	+20 8 18.8
	OCTOBER 3.		
0	2 49 14.88	2.4397	+20 16 52.9
1	2 51 41.30	2.4408	20 25 18.7
2	2 54 7.78	2.4419	20 33 36.1
3	2 56 34.33	2.4431	20 41 45.1
4	2 59 0.95	2.4441	20 49 45.7
5	3 1 27.62	2.4450	20 57 37.9
6	3 3 54.35	2.4458	21 5 21.5
7	3 6 21.12	2.4467	21 12 56.6
8	3 8 47.95	2.4475	21 20 23.2
9	3 11 14.82	2.4482	21 27 41.1
10	3 13 41.73	2.4488	21 34 50.4
11	3 16 8.67	2.4493	21 41 51.1
12	3 18 35.64	2.4498	21 48 43.0
13	3 21 2.64	2.4502	21 55 26.2
14	3 23 29.66	2.4505	22 2 0.7
15	3 25 56.70	2.4508	22 8 26.4
16	3 28 23.76	2.4510	22 14 43.3
17	3 30 50.82	2.4511	22 20 51.4
18	3 33 17.89	2.4511	22 26 50.7
19	3 35 44.95	2.4511	22 32 41.1
20	3 38 12.02	2.4510	22 38 22.6
21	3 40 39.07	2.4508	22 43 55.3
22	3 43 6.11	2.4505	22 49 19.0
23	3 45 33.13	2.4502	22 54 33.9
24	3 48 0.13	2.4498	+22 59 39.8

GREENWICH MEAN TIME.

Hr.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	OCTOBER 4.			
	h m s	s	° ′ ″	″
0	3 48 0.13	2.4498	+22 59 39.8	+5.024
1	3 50 27.10	2.4492	23 4 36.8	4.876
2	3 52 54.03	2.4486	23 9 24.9	4.727
3	3 55 20.93	2.4479	23 14 4.0	4.578
4	3 57 47.78	2.4472	23 18 34.2	4.428
5	4 0 14.59	2.4463	23 22 55.4	4.279
6	4 2 41.34	2.4453	23 27 7.7	4.131
7	4 5 8.03	2.4443	23 31 11.1	3.982
8	4 7 34.66	2.4433	23 35 5.5	3.833
9	4 10 1.22	2.4421	23 38 51.0	3.683
10	4 12 27.71	2.4408	23 42 27.5	3.534
11	4 14 54.12	2.4394	23 45 55.1	3.386
12	4 17 20.44	2.4380	23 49 13.8	3.237
13	4 19 46.68	2.4365	23 52 23.5	3.088
14	4 22 12.82	2.4348	23 55 24.4	2.940
15	4 24 38.86	2.4332	23 58 16.3	2.792
16	4 27 4.80	2.4313	24 0 59.4	2.644
17	4 29 30.62	2.4295	24 3 33.6	2.496
18	4 31 56.34	2.4277	24 5 58.9	2.348
19	4 34 21.94	2.4256	24 8 15.4	2.202
20	4 36 47.41	2.4234	24 10 23.1	2.054
21	4 39 12.75	2.4213	24 12 21.9	1.908
22	4 41 37.96	2.4190	24 14 12.0	1.762
23	4 44 3.03	2.4167	+24 15 53.3	+1.615
	OCTOBER 5.			
0	4 46 27.96	2.4143	+24 17 25.8	+1.469
1	4 48 52.74	2.4117	24 18 49.6	1.325
2	4 51 17.36	2.4091	24 20 4.8	1.180
3	4 53 41.83	2.4065	24 21 11.2	1.036
4	4 56 6.14	2.4038	24 22 9.1	0.893
5	4 58 30.28	2.4008	24 22 58.3	0.748
6	5 0 54.24	2.3979	24 23 38.9	0.606
7	5 3 18.03	2.3950	24 24 11.0	0.463
8	5 5 41.64	2.3919	24 24 34.5	0.322
9	5 8 5.06	2.3888	24 24 49.6	0.181
10	5 10 28.29	2.3856	24 24 56.2	+0.039
11	5 12 51.33	2.3823	24 24 54.3	−0.101
12	5 15 14.17	2.3790	24 24 44.1	0.240
13	5 17 36.81	2.3756	24 24 25.5	0.378
14	5 19 59.24	2.3720	24 23 58.7	0.517
15	5 22 21.45	2.3685	24 23 23.5	0.655
16	5 24 43.46	2.3649	24 22 40.1	0.792
17	5 27 5.24	2.3613	24 21 48.5	0.928
18	5 29 26.81	2.3575	24 20 48.7	1.064
19	5 31 48.14	2.3537	24 19 40.8	1.199
20	5 34 9.25	2.3499	24 18 24.8	1.334
21	5 36 30.13	2.3459	24 17 0.7	1.468
22	5 38 50.76	2.3419	24 15 28.7	1.600
23	5 41 11.16	2.3379	*24 13 48.7*	*1.733*
24	*5 43 31.31*	*2.3338*	*+24 12 0.8*	*−1.863*

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	OCTOBER 6.			
	h m s	s	° ′ ″	″
0	5 43 31.31	2.3338	+24 12 0.8	−1.863
1	5 45 51.21	2.3297	24 10 5.1	1.994
2	5 48 10.87	2.3255	24 8 1.5	2.125
3	5 50 30.27	2.3212	24 5 50.1	2.253
4	5 52 49.41	2.3169	24 3 31.1	2.382
5	5 55 8.30	2.3126	24 1 4.3	2.509
6	5 57 26.92	2.3081	23 58 30.0	2.636
7	5 59 45.27	2.3037	23 55 48.0	2.763
8	6 2 3.36	2.2993	23 52 58.5	2.887
9	6 4 21.18	2.2948	23 50 1.6	3.011
10	6 6 38.73	2.2902	23 46 57.2	3.135
11	6 8 56.00	2.2855	23 43 45.4	3.258
12	6 11 12.99	2.2808	23 40 26.3	3.379
13	6 13 29.70	2.2762	23 36 59.9	3.500
14	6 15 46.13	2.2715	23 33 26.3	3.619
15	6 18 2.28	2.2668	23 29 45.6	3.738
16	6 20 18.14	2.2620	23 25 57.7	3.858
17	6 22 33.72	2.2572	23 22 2.7	3.975
18	6 24 49.00	2.2523	23 18 0.7	4.092
19	6 27 3.99	2.2474	23 13 51.7	4.207
20	6 29 18.69	2.2426	23 9 35.9	4.322
21	6 31 33.10	2.2377	23 5 13.1	4.436
22	6 33 47.21	2.2328	23 0 43.6	4.548
23	6 36 1.03	2.2278	+22 56 7.3	−4.661
	OCTOBER 7.			
0	6 38 14.55	2.2228	+22 51 24.3	−4.772
1	6 40 27.77	2.2178	22 46 34.7	4.882
2	6 42 40.69	2.2129	22 41 38.5	4.992
3	6 44 53.32	2.2079	22 36 35.7	5.100
4	6 47 5.64	2.2028	22 31 26.5	5.208
5	6 49 17.65	2.1978	22 26 10.8	5.314
6	6 51 29.37	2.1928	22 20 48.8	5.419
7	6 53 40.78	2.1879	22 15 20.5	5.524
8	6 55 51.89	2.1827	22 9 45.9	5.628
9	6 58 2.70	2.1776	22 4 5.1	5.731
10	7 0 13.20	2.1725	21 58 18.2	5.833
11	7 2 23.40	2.1674	21 52 25.2	5.934
12	7 4 33.29	2.1623	21 46 26.1	6.034
13	7 6 42.88	2.1573	21 40 21.1	6.133
14	7 8 52.16	2.1522	21 34 10.1	6.233
15	7 11 1.14	2.1471	21 27 53.2	6.329
16	7 13 9.81	2.1421	21 21 30.6	6.425
17	7 15 18.19	2.1370	21 15 2.2	6.522
18	7 17 26.25	2.1319	21 8 28.0	6.617
19	7 19 34.02	2.1269	21 1 48.2	6.710
20	7 21 41.48	2.1219	20 55 2.8	6.803
21	7 23 48.65	2.1169	20 48 11.9	6.894
22	7 25 55.51	2.1118	20 41 15.5	6.986
23	7 28 2.07	2.1068	20 34 13.6	7.076
24	7 30 8.33	2.1018	+20 27 6.4	−7.165

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	OCTOBER 8.			
	h m s	s	° ′ ″	″
0	7 30 8.33	2.1018	+20 27 6.4	− 7.165
1	7 32 14.29	2.0969	20 19 53.8	7.253
2	7 34 19.96	2.0920	20 12 36.0	7.341
3	7 36 25.33	2.0870	20 5 12.9	7.428
4	7 38 30.40	2.0822	19 57 44.7	7.513
5	7 40 35.19	2.0773	19 50 11.4	7.598
6	7 42 39.67	2.0723	19 42 33.0	7.683
7	7 44 43.87	2.0676	19 34 49.5	7.765
8	7 46 47.78	2.0627	19 27 1.2	7.847
9	7 48 51.39	2.0578	19 19 7.9	7.928
10	7 50 54.72	2.0532	19 11 9.8	8.008
11	7 52 57.77	2.0484	19 3 6.9	8.088
12	7 55 0.53	2.0437	18 54 59.2	8.167
13	7 57 3.01	2.0390	18 46 46.9	8.245
14	7 59 5.21	2.0343	18 38 29.8	8.323
15	8 1 7.13	2.0297	18 30 8.2	8.398
16	8 3 8.77	2.0250	18 21 42.1	8.473
17	8 5 10.13	2.0205	18 13 11.5	8.548
18	8 7 11.23	2.0160	18 4 36.4	8.622
19	8 9 12.05	2.0115	17 55 56.9	8.693
20	8 11 12.61	2.0071	17 47 13.2	8.765
21	8 13 12.90	2.0026	17 38 25.1	8.838
22	8 15 12.92	1.9982	17 29 32.7	8.908
23	8 17 12.68	1.9938	+17 20 36.2	− 8.976
	OCTOBER 9.			
0	8 19 12.18	1.9895	+17 11 35.6	− 9.044
1	8 21 11.42	1.9853	17 2 30.9	9.113
2	8 23 10.41	1.9810	16 53 22.1	9.180
3	8 25 9.14	1.9768	16 44 9.3	9.246
4	8 27 7.62	1.9726	16 34 52.6	9.311
5	8 29 5.85	1.9685	16 25 32.0	9.376
6	8 31 3.84	1.9644	16 16 7.5	9.439
7	8 33 1.58	1.9603	16 6 39.3	9.502
8	8 34 59.08	1.9564	15 57 7.3	9.565
9	8 36 56.35	1.9524	15 47 31.5	9.626
10	8 38 53.37	1.9485	15 37 52.2	9.686
11	8 40 50.17	1.9447	15 28 9.2	9.747
12	8 42 46.73	1.9408	15 18 22.6	9.806
13	8 44 43.06	1.9370	15 8 32.5	9.863
14	8 46 39.17	1.9333	14 58 39.0	9.921
15	8 48 35.06	1.9297	14 48 42.0	9.978
16	8 50 30.73	1.9260	14 38 41.6	10.034
17	8 52 26.18	1.9223	14 28 37.9	10.089
18	8 54 21.41	1.9188	14 18 30.9	10.143
19	8 56 16.44	1.9153	14 8 20.7	10.198
20	8 58 11.25	1.9119	13 58 7.2	10.251
21	9 0 5.87	1.9085	13 47 50.6	10.303
22	9 2 0.27	1.9051	13 37 30.8	10.355
23	9 3 54.48	1.9018	13 27 8.0	10.405
24	9 5 48.49	1.8986	+13 16 42.2	−10.455

Hour.	Right Ascension.	Var. per Min.	Declination.
	OCTOBER 10.		
	h m s	s	° ′ ″
0	9 5 48.49	1.8986	+13 16 42.2
1	9 7 42.31	1.8954	13 6 13.4
2	9 9 35.94	1.8923	12 55 41.7
3	9 11 29.38	1.8891	12 45 7.0
4	9 13 22.63	1.8860	12 34 29.5
5	9 15 15.70	1.8831	12 23 49.2
6	9 17 8.60	1.8802	12 13 6.1
7	9 19 1.32	1.8773	12 2 20.3
8	9 20 53.87	1.8744	11 51 31.8
9	9 22 46.25	1.8716	11 40 40.6
10	9 24 38.46	1.8688	11 29 46.9
11	9 26 30.51	1.8662	11 18 50.5
12	9 28 22.40	1.8635	11 7 51.7
13	9 30 14.13	1.8609	10 56 50.4
14	9 32 5.71	1.8584	10 45 46.7
15	9 33 57.14	1.8560	10 34 40.6
16	9 35 48.43	1.8536	10 23 32.1
17	9 37 39.57	1.8512	10 12 21.3
18	9 39 30.57	1.8489	10 1 8.3
19	9 41 21.44	1.8467	9 49 53.0
20	9 43 12.17	1.8444	9 38 35.5
21	9 45 2.77	1.8423	9 27 15.8
22	9 46 53.25	1.8403	9 15 54.1
23	9 48 43.60	1.8382	+ 9 4 30.3
	OCTOBER 11.		
0	9 50 33.83	1.8363	+ 8 53 4.4
1	9 52 23.95	1.8343	8 41 36.6
2	9 54 13.95	1.8324	8 30 6.8
3	9 56 3.84	1.8306	8 18 35.1
4	9 57 53.62	1.8288	8 7 1.5
5	9 59 43.30	1.8272	7 55 26.1
6	10 1 32.88	1.8256	7 43 49.0
7	10 3 22.37	1.8240	7 32 10.0
8	10 5 11.76	1.8224	7 20 29.2
9	10 7 1.06	1.8210	7 8 47.6
10	10 8 50.28	1.8196	6 57 3.9
11	10 10 39.41	1.8182	6 45 17.4
12	10 12 28.46	1.8169	6 33 30.0
13	10 14 17.44	1.8157	6 21 41.7
14	10 16 6.34	1.8145	6 9 51.5
15	10 17 55.18	1.8133	5 58 0.5
16	10 19 43.94	1.8123	5 46 7.6
17	10 21 32.65	1.8113	5 34 13.8
18	10 23 21.30	1.8103	5 22 17.9
19	10 25 9.89	1.8094	5 10 20.9
20	10 26 58.43	1.8085	4 58 22.9
21	10 28 46.91	1.8078	4 46 23.8
22	10 30 35.36	1.8071	4 34 22.8
23	10 32 23.76	1.8063	4 22 21.8
24	10 34 12.12	1.8058	+ 4 10 18.8

GREENWICH MEAN TIME.

Hr.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	OCTOBER 12.			
	h m s	s	° ′ ″	″
0	10 34 12.12	1.8058	+4 10 18.7	−12.053
1	10 36 0.45	1.8053	3 58 15.0	12.070
2	10 37 48.75	1.8047	3 46 10.3	12.086
3	10 39 37.01	1.8043	3 34 4.7	12.102
4	10 41 25.26	1.8039	3 21 58.1	12.118
5	10 43 13.48	1.8035	3 9 50.6	12.132
6	10 45 1.68	1.8033	2 57 42.3	12.145
7	10 46 49.87	1.8031	2 45 33.2	12.158
8	10 48 38.05	1.8029	2 33 23.3	12.171
9	10 50 26.22	1.8028	2 21 12.7	12.183
10	10 52 14.39	1.8028	2 9 1.4	12.194
11	10 54 2.56	1.8028	1 56 49.4	12.204
12	10 55 50.73	1.8029	1 44 36.9	12.213
13	10 57 38.91	1.8030	1 32 23.8	12.223
14	10 59 27.09	1.8032	1 20 10.2	12.232
15	11 1 15.29	1.8035	1 7 56.0	12.239
16	11 3 3.51	1.8038	0 55 41.5	12.246
17	11 4 51.75	1.8042	0 43 26.5	12.253
18	11 6 40.01	1.8045	0 31 11.2	12.258
19	11 8 28.29	1.8050	0 18 55.5	12.263
20	11 10 16.61	1.8056	+0 6 39.6	12.268
21	11 12 4.96	1.8062	−0 5 36.6	12.271
22	11 13 53.35	1.8068	0 17 52.9	12.274
23	11 15 41.78	1.8075	−0 30 9.5	−12.277
	OCTOBER 13.			
0	11 17 30.25	1.8083	−0 42 26.1	−12.278
1	11 19 18.77	1.8091	0 54 42.8	12.278
2	11 21 7.34	1.8100	1 6 59.5	12.278
3	11 22 55.97	1.8109	1 19 16.2	12.278
4	11 24 44.65	1.8118	1 31 32.9	12.277
5	11 26 33.39	1.8129	1 43 49.4	12.275
6	11 28 22.20	1.8141	1 56 5.9	12.273
7	11 30 11.08	1.8153	2 8 22.1	12.269
8	11 32 0.03	1.8164	2 20 38.2	12.265
9	11 33 49.05	1.8177	2 32 53.9	12.260
10	11 35 38.15	1.8190	2 45 9.4	12.255
11	11 37 27.33	1.8204	2 57 24.5	12.248
12	11 39 16.60	1.8219	3 9 39.2	12.242
13	11 41 5.96	1.8233	3 21 53.5	12.233
14	11 42 55.40	1.8248	3 34 7.2	12.225
15	11 44 44.94	1.8265	3 46 20.5	12.217
16	11 46 34.58	1.8283	3 58 33.2	12.206
17	11 48 24.33	1.8299	4 10 45.2	12.195
18	11 50 14.17	1.8317	4 22 56.6	12.184
19	11 52 4.13	1.8335	4 35 7.3	12.173
20	11 53 54.19	1.8354	4 47 17.3	12.159
21	11 55 44.38	1.8373	4 59 26.4	12.145
22	11 57 34.67	1.8393	5 11 34.7	12.131
23	11 59 25.10	1.8414	5 23 42.1	12.116
4	*12 1 15.64*	*1.8434*	*−5 35 48.6*	−12.100

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	OCTOBER 14.			
	h m s	s	° ′ ″	″
0	12 1 15.64	1.8434	− 5 35 48.6	−12.100
1	12 3 6.31	1.8457	5 47 54.1	12.083
2	12 4 57.12	1.8479	5 59 58.6	12.065
3	12 6 48.06	1.8501	6 12 1.9	12.047
4	12 8 39.13	1.8524	6 24 4.2	12.028
5	12 10 30.35	1.8548	6 36 5.3	12.008
6	12 12 21.71	1.8573	6 48 5.2	11.987
7	12 14 13.22	1.8598	7 0 3.7	11.965
8	12 16 4.88	1.8623	7 12 1.0	11.943
9	12 17 56.69	1.8648	7 23 56.9	11.920
10	12 19 48.66	1.8675	7 35 51.4	11.896
11	12 21 40.79	1.8702	7 47 44.4	11.871
12	12 23 33.08	1.8729	7 59 35.9	11.845
13	12 25 25.54	1.8758	8 11 25.8	11.819
14	12 27 18.17	1.8786	8 23 14.2	11.792
15	12 29 10.97	1.8814	8 35 0.8	11.763
16	12 31 3.94	1.8843	8 46 45.8	11.735
17	12 32 57.09	1.8874	8 58 29.0	11.704
18	12 34 50.43	1.8904	9 10 10.3	11.673
19	12 36 43.94	1.8935	9 21 49.8	11.643
20	12 38 37.65	1.8968	9 33 27.4	11.610
21	12 40 31.55	1.8998	9 45 3.0	11.577
22	12 42 25.63	1.9031	9 56 36.6	11.543
23	12 44 19.92	1.9064	−10 8 8.1	−11.508
	OCTOBER 15.			
0	12 46 14.40	1.9098	−10 19 37.5	−11.472
1	12 48 9.09	1.9132	10 31 4.7	11.435
2	12 50 3.98	1.9165	10 42 29.7	11.398
3	12 51 59.07	1.9200	10 53 52.4	11.359
4	12 53 54.38	1.9236	11 5 12.8	11.319
5	12 55 49.90	1.9271	11 16 30.7	11.278
6	12 57 45.63	1.9307	11 27 46.2	11.238
7	12 59 41.58	1.9344	11 38 59.2	11.196
8	13 1 37.76	1.9381	11 50 9.7	11.153
9	13 3 34.15	1.9418	12 1 17.5	11.108
10	13 5 30.78	1.9457	12 12 22.7	11.063
11	13 7 27.63	1.9494	12 23 25.1	11.017
12	13 9 24.71	1.9533	12 34 24.7	10.970
13	13 11 22.02	1.9572	12 45 21.5	10.923
14	13 13 19.57	1.9612	12 56 15.4	10.874
15	13 15 17.36	1.9653	13 7 6.4	10.824
16	13 17 15.40	1.9693	13 17 54.3	10.773
17	13 19 13.67	1.9733	13 28 39.2	10.723
18	13 21 12.19	1.9774	13 39 21.0	10.670
19	13 23 10.96	1.9815	13 49 59.6	10.617
20	13 25 9.97	1.9858	14 0 35.0	10.562
21	13 27 9.25	1.9900	14 11 7.0	10.506
22	13 29 8.77	1.9942	14 21 35.7	10.450
23	13 31 8.55	1.9985	14 32 1.0	10.393
24	13 33 8.59	2.0028	−14 42 22.8	−10.334

GREENWICH MEAN TIME.

Hour.	Right Ascension	Var. per Min.	Declination.	Var. per Min.
	OCTOBER 16.			
	h m s	s	° ′ ″	″
0	13 33 8.59	2.0028	−14 42 22.8	−10.334
1	13 35 8.89	2.0072	14 52 41.1	10.275
2	13 37 9.45	2.0116	15 2 55.8	10.215
3	13 39 10.28	2.0160	15 13 6.9	10.153
4	13 41 11.37	2.0205	15 23 14.2	10.091
5	13 43 12.74	2.0250	15 33 17.8	10.028
6	13 45 14.37	2.0294	15 43 17.5	9.963
7	13 47 16.27	2.0340	15 53 13.4	9.898
8	13 49 18.45	2.0386	16 3 5.3	9.832
9	13 51 20.90	2.0432	16 12 53.2	9.764
10	13 53 23.63	2.0478	16 22 37.0	9.696
11	13 55 26.64	2.0524	16 32 16.7	9.627
12	13 57 29.92	2.0571	16 41 52.2	9.557
13	13 59 33.49	2.0618	16 51 23.5	9.485
14	14 1 37.34	2.0665	17 0 50.4	9.413
15	14 3 41.47	2.0712	17 10 13.0	9.339
16	14 5 45.88	2.0760	17 19 31.1	9.265
17	14 7 50.59	2.0808	17 28 44.8	9.189
18	14 9 55.58	2.0855	17 37 53.8	9.113
19	14 12 0.85	2.0903	17 46 58.3	9.035
20	14 14 6.42	2.0952	17 55 58.0	8.956
21	14 16 12.27	2.1000	18 4 53.0	8.877
22	14 18 18.42	2.1048	18 13 43.2	8.797
23	14 20 24.85	2.1097	−18 22 28.6	− 8.715
	OCTOBER 17.			
0	14 22 31.58	2.1146	−18 31 9.0	− 8.632
1	14 24 38.60	2.1194	18 39 44.4	8.548
2	14 26 45.91	2.1243	18 48 14.8	8.463
3	14 28 53.51	2.1292	18 56 40.0	8.378
4	14 31 1.41	2.1341	19 5 0.1	8.291
5	14 33 9.60	2.1389	19 13 14.9	8.203
6	14 35 18.08	2.1438	19 21 24.4	8.114
7	14 37 26.86	2.1488	19 29 28.6	8.024
8	14 39 35.93	2.1537	19 37 27.3	7.933
9	14 41 45.30	2.1586	19 45 20.5	7.841
10	14 43 54.96	2.1634	19 53 8.2	7.748
11	14 46 4.91	2.1683	20 0 50.3	7.654
12	14 48 15.16	2.1733	20 8 26.7	7.559
13	14 50 25.70	2.1781	20 15 57.4	7.463
14	14 52 36.53	2.1829	20 23 22.3	7.366
15	14 54 47.65	2.1878	20 30 41.3	7.268
16	14 56 59.07	2.1927	20 37 54.4	7.168
17	14 59 10.77	2.1974	20 45 1.5	7.068
18	15 1 22.76	2.2023	20 52 2.6	6.968
19	15 3 35.05	2.2071	20 58 57.6	6.865
20	15 5 47.61	2.2118	21 5 46.4	6.762
21	15 8 0.47	2.2167	21 12 29.0	6.658
22	15 10 13.61	2.2213	21 19 5.4	6.553
23	15 12 27.03	2.2260	21 25 35.4	6.447
24	15 14 40.73	2.2308	−21 31 59.0	− 6.340

Hour.	Right Ascension.	Var. per Min.	Declination.
	OCTOBER 18.		
	h m s	s	° ′ ″
0	15 14 40.73	2.2308	−21 31 59.0
1	15 16 54.72	2.2354	21 38 16.2
2	15 19 8.98	2.2401	21 44 26.8
3	15 21 23.53	2.2448	21 50 30.9
4	15 23 38.35	2.2493	21 56 28.3
5	15 25 53.44	2.2538	22 2 19.1
6	15 28 8.81	2.2583	22 8 3.2
7	15 30 24.44	2.2628	22 13 40.4
8	15 32 40.34	2.2673	22 19 10.8
9	15 34 56.51	2.2718	22 24 34.3
10	15 37 12.95	2.2761	22 29 50.8
11	15 39 29.64	2.2803	22 35 0.4
12	15 41 46.59	2.2847	22 40 2.8
13	15 44 3.80	2.2889	22 44 58.1
14	15 46 21.26	2.2932	22 49 46.3
15	15 48 38.98	2.2973	22 54 27.3
16	15 50 56.94	2.3013	22 59 1.0
17	15 53 15.14	2.3054	23 3 27.4
18	15 55 33.59	2.3095	23 7 46.4
19	15 57 52.28	2.3134	23 11 58.0
20	16 0 11.20	2.3173	23 16 2.1
21	16 2 30.35	2.3211	23 19 58.7
22	16 4 49.73	2.3249	23 23 47.8
23	16 7 9.34	2.3287	−23 27 29.5
	OCTOBER 19.		
0	16 9 29.17	2.3323	−23 31 3.0
1	16 11 49.22	2.3359	23 34 29.1
2	16 14 9.48	2.3394	23 37 47.5
3	16 16 29.95	2.3428	23 40 58.1
4	16 18 50.62	2.3463	23 44 0.8
5	16 21 11.51	2.3497	23 46 55.7
6	16 23 32.58	2.3529	23 49 42.7
7	16 25 53.86	2.3563	23 52 21.8
8	16 28 15.33	2.3593	23 54 52.9
9	16 30 36.98	2.3623	23 57 15.9
10	16 32 58.81	2.3654	23 59 30.9
11	16 35 20.83	2.3683	24 1 37.8
12	16 37 43.01	2.3712	24 3 36.6
13	16 40 5.37	2.3740	24 5 27.3
14	16 42 27.89	2.3766	24 7 9.7
15	16 44 50.56	2.3793	24 8 43.9
16	16 47 13.40	2.3818	24 10 9.8
17	16 49 36.38	2.3843	24 11 27.5
18	16 51 59.51	2.3867	24 12 36.9
19	16 54 22.78	2.3890	24 13 37.9
20	16 56 46.19	2.3913	24 14 30.5
21	16 59 9.73	2.3934	24 15 14.8
22	17 1 33.40	2.3955	24 15 50.7
23	17 3 57.19	2.3974	24 16 18.3
24	17 6 21.09	2.3993	−24 16 37.6

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	OCTOBER 20.			
	h m s	s	° ′ ″	″
0	17 6 21.09	2.3993	−24 16 37.0	−0.245
1	17 8 45.11	2.4012	24 16 47.5	−0.104
2	17 11 9.23	2.4028	24 16 49.5	+0.038
3	17 13 33.45	2.4045	24 16 42.9	0.180
4	17 15 57.77	2.4062	24 16 27.9	0.323
5	17 18 22.19	2.4076	24 16 4.2	0.465
6	17 20 46.68	2.4089	24 15 32.1	0.608
7	17 23 11.26	2.4103	24 14 51.3	0.751
8	17 25 35.92	2.4115	24 14 2.0	0.894
9	17 28 0.64	2.4127	24 13 4.0	1.038
10	17 30 25.44	2.4138	24 11 57.5	1.181
11	17 32 50.29	2.4147	24 10 42.3	1.325
12	17 35 15.20	2.4156	24 9 18.5	1.468
13	17 37 40.16	2.4164	24 7 46.1	1.613
14	17 40 5.17	2.4172	24 6 5.0	1.758
15	17 42 30.22	2.4178	24 4 15.2	1.901
16	17 44 55.30	2.4183	24 2 16.9	2.044
17	17 47 20.41	2.4188	24 0 9.9	2.189
18	17 49 45.55	2.4192	23 57 54.2	2.333
19	17 52 10.71	2.4194	23 55 29.9	2.478
20	17 54 35.88	2.4197	23 52 56.9	2.622
21	17 57 1.07	2.4198	23 50 15.3	2.765
22	17 59 26.26	2.4198	23 47 25.1	2.909
23	18 1 51.45	2.4198	−23 44 26.2	+3.053
	OCTOBER 21.			
0	18 4 16.64	2.4198	−23 41 18.7	+3.197
1	18 6 41.82	2.4196	23 38 2.6	3.340
2	18 9 6.99	2.4193	23 34 37.9	3.483
3	18 11 32.14	2.4190	23 31 4.6	3.627
4	18 13 57.27	2.4185	23 27 22.7	3.770
5	18 16 22.36	2.4180	23 23 32.2	3.913
6	18 18 47.43	2.4175	23 19 33.2	4.055
7	18 21 12.46	2.4168	23 15 25.6	4.198
8	18 23 37.45	2.4162	23 11 9.5	4.339
9	18 26 2.40	2.4153	23 6 44.9	4.480
10	18 28 27.29	2.4144	23 2 11.9	4.622
11	18 30 52.13	2.4136	22 57 30.3	4.763
12	18 33 16.92	2.4126	22 52 40.3	4.903
13	18 35 41.64	2.4115	22 47 41.9	5.043
14	18 38 6.30	2.4104	22 42 35.1	5.183
15	18 40 30.89	2.4092	22 37 19.9	5.323
16	18 42 55.40	2.4079	22 31 56.3	5.463
17	18 45 19.84	2.4067	22 26 24.4	5.600
18	18 47 44.20	2.4053	22 20 44.3	5.738
19	18 50 8.47	2.4038	22 14 55.8	5.877
20	18 52 32.65	2.4023	22 8 59.1	6.013
21	18 54 56.75	2.4008	22 2 54.3	6.149
22	18 57 20.74	2.3991	21 56 41.2	6.286
23	18 59 44.64	2.3975	21 50 20.0	6.421
24	19 2 8.44	2.3958	−21 43 50.7	+6.556

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	OCTOBER 22.			
	h m s	s	° ′ ″	″
0	19 2 8.44	2.3958	−21 43 50.7	+ 6.556
1	19 4 32.13	2.3940	21 37 13.3	6.690
2	19 6 55.72	2.3923	21 30 27.9	6.823
3	19 9 19.20	2.3903	21 23 34.5	6.957
4	19 11 42.56	2.3884	21 16 33.1	7.089
5	19 14 5.81	2.3865	21 9 23.8	7.220
6	19 16 28.94	2.3845	21 2 6.7	7.351
7	19 18 51.95	2.3825	20 54 41.7	7.483
8	19 21 14.84	2.3805	20 47 8.8	7.612
9	19 23 37.61	2.3783	20 39 28.3	7.740
10	19 26 0.24	2.3762	20 31 40.0	7.868
11	19 28 22.75	2.3740	20 23 44.1	7.996
12	19 30 45.12	2.3718	20 15 40.5	8.123
13	19 33 7.36	2.3696	20 7 29.4	8.248
14	19 35 29.47	2.3673	19 59 10.7	8.373
15	19 37 51.44	2.3650	19 50 44.6	8.498
16	19 40 13.27	2.3628	19 42 11.0	8.621
17	19 42 34.97	2.3604	19 33 30.1	8.743
18	19 44 56.52	2.3580	19 24 41.8	8.866
19	19 47 17.93	2.3556	19 15 46.2	8.986
20	19 49 39.19	2.3533	19 6 43.5	9.106
21	19 52 0.32	2.3508	18 57 33.5	9.226
22	19 54 21.29	2.3483	18 48 16.4	9.343
23	19 56 42.12	2.3459	−18 38 52.3	+ 9.461
	OCTOBER 23.			
0	19 59 2.80	2.3434	−18 29 21.1	+ 9.578
1	20 1 23.33	2.3410	18 19 43.0	9.693
2	20 3 43.72	2.3386	18 9 58.0	9.807
3	20 6 3.96	2.3360	18 0 6.2	9.921
4	20 8 24.04	2.3335	17 50 7.5	10.033
5	20 10 43.98	2.3310	17 40 2.2	10.144
6	20 13 3.76	2.3285	17 29 50.2	10.255
7	20 15 23.40	2.3260	17 19 31.6	10.365
8	20 17 42.88	2.3234	17 9 6.4	10.473
9	20 20 2.21	2.3210	16 58 34.8	10.580
10	20 22 21.40	2.3185	16 47 56.8	10.687
11	20 24 40.43	2.3159	16 37 12.4	10.793
12	20 26 59.31	2.3135	16 26 21.7	10.897
13	20 29 18.05	2.3110	16 15 24.8	11.000
14	20 31 36.63	2.3086	16 4 21.7	11.102
15	20 33 55.08	2.3062	15 53 12.6	11.203
16	20 36 13.37	2.3037	15 41 57.4	11.303
17	20 38 31.52	2.3013	15 30 36.3	11.401
18	20 40 49.52	2.2988	15 19 9.3	11.499
19	20 43 7.38	2.2965	15 7 36.4	11.596
20	20 45 25.10	2.2942	14 55 57.8	11.691
21	20 47 42.68	2.2918	14 44 13.5	11.785
22	20 50 0.11	2.2894	14 32 23.6	11.878
23	20 52 17.41	2.2872	14 20 28.1	11.971
24	20 54 34.57	2.2848	−14 8 27.1	+12.062

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	OCTOBER 24.			
	h m s	s	° ′ ″	″
0	20 54 34.57	2.2848	−14 8 27.1	+12.062
1	20 56 51.59	2.2826	13 56 20.7	12.151
2	20 59 8.48	2.2804	13 44 9.0	12.239
3	21 1 25.24	2.2783	13 31 52.0	12.327
4	21 3 41.87	2.2760	13 19 29.8	12.413
5	21 5 58.36	2.2738	13 7 2.4	12.498
6	21 8 14.73	2.2718	12 54 30.1	12.581
7	21 10 30.98	2.2698	12 41 52.7	12.664
8	21 12 47.10	2.2677	12 29 10.4	12.745
9	21 15 3.10	2.2657	12 16 23.3	12.824
10	21 17 18.98	2.2637	12 3 31.5	12.903
11	21 19 34.74	2.2618	11 50 34.9	12.981
12	21 21 50.39	2.2599	11 37 33.8	13.057
13	21 24 5.93	2.2580	11 24 28.1	13.132
14	21 26 21.35	2.2562	11 11 18.0	13.205
15	21 28 36.67	2.2544	10 58 3.5	13.277
16	21 30 51.88	2.2527	10 44 44.8	13.348
17	21 33 6.99	2.2511	10 31 21.8	13.418
18	21 35 22.01	2.2494	10 17 54.7	13.486
19	21 37 36.92	2.2478	10 4 23.5	13.553
20	21 39 51.74	2.2463	9 50 48.4	13.618
21	21 42 6.47	2.2448	9 37 9.4	13.683
22	21 44 21.11	2.2433	9 23 26.5	13.746
23	21 46 35.66	2.2418	− 9 9 39.9	+13.807
	OCTOBER 25.			
0	21 48 50.13	2.2405	− 8 55 49.7	+13.867
1	21 51 4.52	2.2392	8 41 55.9	13.926
2	21 53 18.83	2.2379	8 27 58.6	13.983
3	21 55 33.07	2.2368	8 13 57.9	14.039
4	21 57 47.24	2.2356	7 59 53.9	14.093
5	22 0 1.34	2.2344	7 45 46.7	14.147
6	22 2 15.37	2.2333	7 31 36.3	14.199
7	22 4 29.34	2.2324	7 17 22.8	14.250
8	22 6 43.26	2.2315	7 3 6.3	14.298
9	22 8 57.12	2.2306	6 48 47.0	14.346
10	22 11 10.93	2.2298	6 34 24.8	14.393
11	22 13 24.69	2.2289	6 19 59.9	14.438
12	22 15 38.40	2.2282	6 5 32.3	14.481
13	22 17 52.07	2.2276	5 51 2.2	14.523
14	22 20 5.71	2.2270	5 36 29.6	14.563
15	22 22 19.31	2.2264	5 21 54.7	14.601
16	22 24 32.88	2.2259	5 7 17.5	14.639
17	22 26 46.42	2.2255	4 52 38.0	14.675
18	22 28 59.94	2.2251	4 37 56.5	14.709
19	22 31 13.43	2.2248	4 23 12.9	14.743
20	22 33 26.91	2.2246	4 8 27.4	14.774
21	22 35 40.38	2.2243	3 53 40.0	14.804
22	22 37 53.83	2.2242	3 38 50.9	14.833
23	22 40 7.28	2.2242	3 24 0.1	14.860
24	22 42 20.73	2.2242	− 3 9 7.7	+14.885

Hour.	Right Ascension.	Var. per Min.	Declination.
	OCTOBER 26.		
	h m s	s	° ′ ″
0	22 42 20.73	2.2242	−3 9 7.7
1	22 44 34.18	2.2242	2 54 13.9
2	22 46 47.63	2.2243	2 39 18.7
3	22 49 1.09	2.2244	2 24 22.1
4	22 51 14.56	2.2246	2 9 24.4
5	22 53 28.04	2.2249	1 54 25.6
6	22 55 41.55	2.2253	1 39 25.7
7	22 57 55.08	2.2257	1 24 24.9
8	23 0 8.63	2.2261	1 9 23.3
9	23 2 22.21	2.2267	0 54 21.0
10	23 4 35.83	2.2273	0 39 18.0
11	23 6 49.48	2.2279	0 24 14.5
12	23 9 3.18	2.2287	−0 9 10.5
13	23 11 16.92	2.2294	+0 5 53.8
14	23 13 30.71	2.2303	0 20 58.4
15	23 15 44.55	2.2312	0 36 3.1
16	23 17 58.45	2.2321	0 51 7.9
17	23 20 12.40	2.2331	1 6 12.7
18	23 22 26.42	2.2343	1 21 17.3
19	23 24 40.51	2.2353	1 36 21.8
20	23 26 54.66	2.2365	1 51 25.9
21	23 29 8.89	2.2378	2 6 29.5
22	23 31 23.20	2.2391	2 21 32.7
23	23 33 37.58	2.2404	+2 36 35.3
	OCTOBER 27.		
0	23 35 52.05	2.2419	+2 51 37.1
1	23 38 6.61	2.2433	3 6 38.1
2	23 40 21.25	2.2448	3 21 38.2
3	23 42 35.99	2.2465	3 36 37.3
4	23 44 50.83	2.2482	3 51 35.3
5	23 47 5.77	2.2498	4 6 32.1
6	23 49 20.81	2.2516	4 21 27.6
7	23 51 35.96	2.2533	4 36 21.6
8	23 53 51.21	2.2553	4 51 14.1
9	23 56 6.59	2.2573	5 6 5.1
10	23 58 22.08	2.2592	5 20 54.3
11	0 0 37.69	2.2612	5 35 41.7
12	0 2 53.42	2.2633	5 50 27.2
13	0 5 9.28	2.2654	6 5 10.7
14	0 7 25.27	2.2676	6 19 52.0
15	0 9 41.39	2.2698	6 34 31.1
16	0 11 57.64	2.2720	6 49 8.0
17	0 14 14.03	2.2743	7 3 42.3
18	0 16 30.56	2.2768	7 18 14.2
19	0 18 47.24	2.2792	7 32 43.8
20	0 21 4.06	2.2816	7 47 10.0
21	0 23 21.03	2.2842	8 1 33.8
22	0 25 38.16	2.2867	8 15 54.6
23	0 27 55.43	2.2892	8 30 12.4
24	0 30 12.86	2.2918	+8 44 27.8

GREENWICH MEAN TIME.

Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
OCTOBER 28.					**OCTOBER 30.**			
h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
) 30 12.86	2.2918	+ 8 44 27.0	+14.217	0	2 23 39.49	2.4358	+18 35 7.4	+9.812
) 32 30.45	2.2945	8 58 38.4	14.163	1	2 26 5.72	2.4384	18 44 52.3	9.686
) 34 48.20	2.2972	9 12 46.5	14.107	2	2 28 32.10	2.4410	18 54 29.7	9.558
) 37 6.11	2.2999	9 26 51.2	14.049	3	2 30 58.64	2.4437	19 3 59.3	9.430
) 39 24.19	2.3027	9 40 52.4	13.989	4	2 33 25.34	2.4462	19 13 21.3	9.300
) 41 42.43	2.3054	9 54 49.9	13.928	5	2 35 52.18	2.4486	19 22 35.3	9.169
) 44 0.84	2.3083	10 8 43.7	13.864	6	2 38 19.17	2.4511	19 31 41.6	9.038
) 46 19.42	2.3112	10 22 33.6	13.800	7	2 40 46.31	2.4534	19 40 39.8	8.904
) 48 38.18	2.3141	10 36 19.7	13.734	8	2 43 13.58	2.4557	19 49 30.1	8.771
) 50 57.11	2.3170	10 50 1.7	13.666	9	2 45 40.99	2.4579	19 58 12.3	8.637
) 53 16.22	2.3199	11 3 39.6	13.597	10	2 48 8.53	2.4601	20 6 46.5	8.501
) 55 35.50	2.3228	11 17 13.3	13.525	11	2 50 36.20	2.4623	20 15 12.4	8.363
) 57 54.96	2.3258	11 30 42.6	13.452	12	2 53 4.00	2.4643	20 23 30.1	8.226
1 0 14.60	2.3289	11 44 7.5	13.378	13	2 55 31.92	2.4663	20 31 39.5	8.088
1 2 34.43	2.3320	11 57 27.9	13.301	14	2 57 59.95	2.4682	20 39 40.6	7.948
1 4 54.44	2.3350	12 10 43.6	13.223	15	3 0 28.10	2.4700	20 47 33.2	7.808
1 7 14.63	2.3381	12 23 54.7	13.144	16	3 2 56.35	2.4718	20 55 17.5	7.667
1 9 35.01	2.3413	12 37 0.9	13.063	17	3 5 24.71	2.4735	21 2 53.2	7.524
1 11 55.58	2.3443	12 50 2.2	12.981	18	3 7 53.17	2.4751	21 10 20.4	7.383
1 14 16.33	2.3474	13 2 58.6	12.897	19	3 10 21.72	2.4767	21 17 39.1	7.239
1 16 37.27	2.3505	13 15 49.8	12.811	20	3 12 50.37	2.4782	21 24 49.1	7.094
1 18 58.39	2.3537	13 28 35.9	12.723	21	3 15 19.10	2.4794	21 31 50.4	6.950
1 21 19.71	2.3568	13 41 16.6	12.634	22	3 17 47.90	2.4808	21 38 43.1	6.805
1 23 41.21	2.3599	+13 53 52.0	+12.544	23	3 20 16.79	2.4820	+21 45 27.0	+6.658
OCTOBER 29.					**OCTOBER 31.**			
1 26 2.90	2.3632	+14 6 21.9	+12.453	0	3 22 45.74	2.4831	+21 52 2.1	+6.512
1 28 24.79	2.3663	14 18 46.3	12.358	1	3 25 14.76	2.4842	21 58 28.4	6.365
1 30 46.86	2.3695	14 31 4.9	12.263	2	3 27 43.84	2.4851	22 4 45.9	6.218
1 33 9.13	2.3727	14 43 17.9	12.167	3	3 30 12.97	2.4859	22 10 54.5	6.068
1 35 31.58	2.3758	14 55 25.0	12.068	4	3 32 42.15	2.4868	22 16 54.1	5.919
1 37 54.22	2.3790	15 7 26.1	11.968	5	3 35 11.38	2.4874	22 22 44.8	5.771
1 40 17.06	2.3822	15 19 21.2	11.868	6	3 37 40.64	2.4880	22 28 26.6	5.621
1 42 40.08	2.3853	15 31 10.3	11.766	7	3 40 9.94	2.4885	22 33 59.3	5.471
1 45 3.30	2.3885	15 42 53.1	11.661	8	3 42 39.26	2.4888	22 39 23.1	5.321
1 47 26.70	2.3916	15 54 29.6	11.556	9	3 45 8.60	2.4892	22 44 37.8	5.170
1 49 50.29	2.3947	16 5 59.8	11.449	10	3 47 37.96	2.4894	22 49 43.5	5.018
1 52 14.06	2.3978	16 17 23.5	11.341	11	3 50 7.33	2.4895	22 54 40.0	4.867
1 54 38.02	2.4009	16 28 40.7	11.232	12	3 52 36.70	2.4895	22 59 27.5	4.716
1 57 2.17	2.4039	16 39 51.3	11.120	13	3 55 6.07	2.4894	23 4 5.9	4.563
1 59 26.49	2.4069	16 50 55.1	11.008	14	3 57 35.43	2.4892	23 8 35.1	4.411
2 1 51.00	2.4100	17 1 52.2	10.894	15	4 0 4.77	2.4889	23 12 55.2	4.259
2 4 15.69	2.4130	17 12 42.4	10.778	16	4 2 34.10	2.4886	23 17 6.2	4.107
2 6 40.56	2.4160	17 23 25.6	10.662	17	4 5 3.40	2.4880	23 21 8.0	3.954
2 9 5.61	2.4189	17 34 1.8	10.544	18	4 7 32.66	2.4873	23 25 0.7	3.802
2 11 30.83	2.4218	17 44 30.9	10.426	19	4 10 1.88	2.4867	23 28 44.2	3.649
2 13 56.22	2.4247	17 54 52.9	10.306	20	4 12 31.06	2.4858	23 32 18.6	3.496
2 16 21.79	2.4275	18 5 7.6	10.183	21	4 15 0.18	2.4849	23 35 43.7	3.343
2 18 47.52	2.4303	18 15 14.9	10.061	22	4 17 29.25	2.4840	23 38 59.8	3.191
2 21 13.42	2.4331	*18 25 14.9*	*9.938*	23	4 19 58.26	2.4828	23 42 6.6	3.038
? 23 39.49	*2.4358*	*+18 35 7.4*	*+ 9.812*	24	4 22 27.19	2.4816	+23 45 4.3	+2.885

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	NOVEMBER 1.			
	h m s	s	° ′ ″	″
0	4 22 27.19	2.4816	+23 45 4.3	+2.885
1	4 24 56.05	2.4803	23 47 52.8	2.733
2	4 27 24.82	2.4788	23 50 32.2	2.581
3	4 29 53.50	2.4773	23 53 2.5	2.428
4	4 32 22.09	2.4757	23 55 23.6	2.276
5	4 34 50.58	2.4739	23 57 35.6	2.124
6	4 37 18.96	2.4720	23 59 38.5	1.973
7	4 39 47.22	2.4701	24 1 32.3	1.822
8	4 42 15.37	2.4681	24 3 17.1	1.671
9	4 44 43.39	2.4658	24 4 52.8	1.520
10	4 47 11.27	2.4636	24 6 19.5	1.369
11	4 49 39.02	2.4613	24 7 37.1	1.219
12	4 52 6.63	2.4588	24 8 45.8	1.070
13	4 54 34.08	2.4563	24 9 45.5	0.921
14	4 57 1.38	2.4537	24 10 36.3	0.772
15	4 59 28.52	2.4509	24 11 18.1	0.623
16	5 1 55.49	2.4480	24 11 51.1	0.476
17	5 4 22.28	2.4451	24 12 15.2	0.328
18	5 6 48.90	2.4421	24 12 30.5	0.182
19	5 9 15.33	2.4389	24 12 37.0	+0.036
20	5 11 41.57	2.4357	24 12 34.8	−0.110
21	5 14 7.61	2.4324	24 12 23.8	0.256
22	5 16 33.46	2.4290	24 12 4.1	0.400
23	5 18 59.09	2.4255	+24 11 35.8	−0.543
	NOVEMBER 2.			
0	5 21 24.52	2.4220	+24 10 58.9	−0.687
1	5 23 49.73	2.4183	24 10 13.4	0.829
2	5 26 14.72	2.4146	24 9 19.4	0.971
3	5 28 39.48	2.4108	24 8 16.9	1.113
4	5 31 4.01	2.4069	24 7 5.9	1.253
5	5 33 28.31	2.4029	24 5 46.5	1.393
6	5 35 52.36	2.3988	24 4 18.8	1.531
7	5 38 16.17	2.3948	24 2 42.8	1.669
8	5 40 39.73	2.3905	24 0 58.5	1.808
9	5 43 3.03	2.3862	23 59 5.9	1.944
10	5 45 26.07	2.3818	23 57 5.2	2.079
11	5 47 48.85	2.3775	23 54 56.4	2.214
12	5 50 11.37	2.3731	23 52 39.5	2.348
13	5 52 33.62	2.3685	23 50 14.6	2.482
14	5 54 55.59	2.3638	23 47 41.7	2.613
15	5 57 17.28	2.3592	23 45 1.0	2.745
16	5 59 38.69	2.3545	23 42 12.3	2.876
17	6 1 59.82	2.3497	23 39 15.9	3.005
18	6 4 20.65	2.3448	23 36 11.7	3.134
19	6 6 41.20	2.3400	23 32 59.8	3.262
20	6 9 1.45	2.3350	23 29 40.3	3.388
21	6 11 21.40	2.3300	23 26 13.2	3.515
22	6 13 41.05	2.3249	23 22 38.5	3.640
23	6 16 0.39	2.3198	23 18 56.4	3.763
24	*6 18 19.43*	*2.3148*	*+23 15 6.9*	*−3.887*

Hour.	Right Ascension.	Var. per Min.	Declination.
	NOVEMBER 3.		
	h m s	s	° ′ ″
0	6 18 19.43	2.3148	+23 15 6.9
1	6 20 38.16	2.3096	23 11 10.0
2	6 22 56.58	2.3043	23 7 5.9
3	6 25 14.68	2.2991	23 2 54.5
4	6 27 32.47	2.2938	22 58 35.9
5	6 29 49.94	2.2884	22 54 10.2
6	6 32 7.08	2.2831	22 49 37.5
7	6 34 23.91	2.2778	22 44 57.7
8	6 36 40.41	2.2723	22 40 11.1
9	6 38 56.59	2.2669	22 35 17.5
10	6 41 12.44	2.2614	22 30 17.1
11	6 43 27.96	2.2559	22 25 10.0
12	6 45 43.15	2.2504	22 19 56.2
13	6 47 58.01	2.2449	22 14 35.8
14	6 50 12.54	2.2393	22 9 8.8
15	6 52 26.73	2.2338	22 3 35.3
16	6 54 40.59	2.2283	21 57 55.4
17	6 56 54.12	2.2227	21 52 9.1
18	6 59 7.31	2.2171	21 46 16.4
19	7 1 20.17	2.2114	21 40 17.6
20	7 3 32.68	2.2058	21 34 12.5
21	7 5 44.87	2.2003	21 28 1.3
22	7 7 56.71	2.1946	21 21 44.1
23	7 10 8.22	2.1890	+21 15 20.8
	NOVEMBER 4.		
0	7 12 19.39	2.1833	+21 8 51.6
1	7 14 30.22	2.1778	21 2 16.5
2	7 16 40.72	2.1722	20 55 35.7
3	7 18 50.88	2.1666	20 48 49.0
4	7 21 0.71	2.1610	20 41 56.7
5	7 23 10.20	2.1553	20 34 58.7
6	7 25 19.35	2.1498	20 27 55.2
7	7 27 28.17	2.1443	20 20 46.2
8	7 29 36.66	2.1387	20 13 31.8
9	7 31 44.81	2.1331	20 6 11.9
10	7 33 52.63	2.1276	19 58 46.8
11	7 36 0.12	2.1221	19 51 16.3
12	7 38 7.28	2.1166	19 43 40.7
13	7 40 14.11	2.1111	19 35 59.9
14	7 42 20.61	2.1057	19 28 14.1
15	7 44 26.79	2.1003	19 20 23.2
16	7 46 32.64	2.0948	19 12 27.4
17	7 48 38.17	2.0895	19 4 26.6
18	7 50 43.38	2.0841	18 56 21.0
19	7 52 48.26	2.0788	18 48 10.6
20	7 54 52.83	2.0735	18 39 55.5
21	7 56 57.08	2.0683	18 31 35.8
22	7 59 1.02	2.0631	18 23 11.4
23	8 1 4.65	2.0578	18 14 42.4
24	8 3 7.96	2.0527	+18 6 9.0

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	NOVEMBER 5.			
	h m s	s	° ′ ″	″
0	8 3 7.96	2.0527	+18 6 9.0	− 8.594
1	8 5 10.97	2.0475	17 57 31.1	8.668
2	8 7 13.66	2.0424	17 48 48.9	8.740
3	8 9 16.06	2.0374	17 40 2.3	8.813
4	8 11 18.15	2.0323	17 31 11.4	8.883
5	8 13 19.94	2.0274	17 22 16.3	8.953
6	8 15 21.44	2.0224	17 13 17.1	9.022
7	8 17 22.63	2.0175	17 4 13.7	9.090
8	8 19 23.54	2.0127	16 55 6.3	9.157
9	8 21 24.15	2.0078	16 45 54.9	9.223
10	8 23 24.48	2.0031	16 36 39.5	9.288
11	8 25 24.52	1.9983	16 27 20.3	9.353
12	8 27 24.28	1.9937	16 17 57.2	9.417
13	8 29 23.76	1.9890	16 8 30.3	9.479
14	8 31 22.96	1.9844	15 58 59.7	9.542
15	8 33 21.89	1.9798	15 49 25.3	9.603
16	8 35 20.54	1.9753	15 39 47.4	9.663
17	8 37 18.93	1.9709	15 30 5.8	9.723
18	8 39 17.05	1.9665	15 20 20.7	9.780
19	8 41 14.91	1.9621	15 10 32.2	9.838
20	8 43 12.50	1.9578	15 0 40.2	9.895
21	8 45 9.84	1.9536	14 50 44.8	9.952
22	8 47 6.93	1.9493	14 40 46.0	10.007
23	8 49 3.76	1.9452	+14 30 44.0	−10.060
	NOVEMBER 6.			
0	8 51 0.35	1.9411	+14 20 38.8	−10.113
1	8 52 56.69	1.9370	14 10 30.4	10.167
2	8 54 52.79	1.9331	14 0 18.8	10.219
3	8 56 48.66	1.9292	13 50 4.1	10.270
4	8 58 44.29	1.9252	13 39 46.4	10.320
5	9 0 39.68	1.9213	13 29 25.7	10.370
6	9 2 34.85	1.9177	13 19 2.0	10.419
7	9 4 29.80	1.9139	13 8 35.4	10.468
8	9 6 24.52	1.9102	12 58 5.9	10.515
9	9 8 19.02	1.9066	12 47 33.6	10.561
0	9 10 13.31	1.9030	12 36 58.6	10.607
1	9 12 7.38	1.8995	12 26 20.8	10.653
2	9 14 1.25	1.8961	12 15 40.3	10.697
3	9 15 54.91	1.8927	12 4 57.2	10.740
4	9 17 48.37	1.8894	11 54 11.5	10.783
5	9 19 41.64	1.8861	11 43 23.3	10.825
6	9 21 34.70	1.8828	11 32 32.5	10.867
7	9 23 27.58	1.8798	11 21 39.3	10.908
8	9 25 20.27	1.8767	11 10 43.6	10.948
9	9 27 12.78	1.8736	10 59 45.6	10.987
0	9 29 5.10	1.8706	10 48 45.2	11.026
1	9 30 57.25	1.8678	10 37 42.5	11.063
2	9 32 49.23	1.8649	10 26 37.6	11.101
3	9 34 41.04	1.8621	*10 15 30.4*	*11.138*
4	*9 36 32.68*	*1.8593*	*+10 4 21.1*	*−11.173*

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	NOVEMBER 7.			
	h m s	s	° ′ ″	″
0	9 36 32.68	1.8593	+10 4 21.1	−11.173
1	9 38 24.16	1.8567	9 53 9.6	11.208
2	9 40 15.48	1.8541	9 41 56.1	11.243
3	9 42 6.65	1.8516	9 30 40.5	11.277
4	9 43 57.67	1.8491	9 19 22.9	11.310
5	9 45 48.54	1.8466	9 8 3.3	11.343
6	9 47 39.26	1.8443	8 56 41.7	11.375
7	9 49 29.85	1.8420	8 45 18.3	11.406
8	9 51 20.30	1.8398	8 33 53.0	11.437
9	9 53 10.62	1.8375	8 22 25.9	11.467
10	9 55 0.80	1.8354	8 10 57.0	11.497
11	9 56 50.87	1.8334	7 59 26.3	11.525
12	9 58 40.81	1.8314	7 47 54.0	11.553
13	10 0 30.64	1.8295	7 36 20.0	11.580
14	10 2 20.35	1.8276	7 24 44.4	11.607
15	10 4 9.95	1.8258	7 13 7.2	11.633
16	10 5 59.45	1.8241	7 1 28.5	11.658
17	10 7 48.84	1.8224	6 49 48.2	11.684
18	10 9 38.14	1.8208	6 38 6.4	11.708
19	10 11 27.34	1.8193	6 26 23.3	11.731
20	10 13 16.45	1.8178	6 14 38.7	11.755
21	10 15 5.47	1.8163	6 2 52.7	11.777
22	10 16 54.41	1.8150	5 51 5.5	11.798
23	10 18 43.27	1.8138	+ 5 39 16.9	−11.820
	NOVEMBER 8.			
0	10 20 32.06	1.8126	+ 5 27 27.1	−11.840
1	10 22 20.78	1.8113	5 15 36.1	11.860
2	10 24 9.42	1.8102	5 3 43.9	11.879
3	10 25 58.00	1.8093	4 51 50.6	11.898
4	10 27 46.53	1.8083	4 39 56.2	11.916
5	10 29 34.99	1.8073	4 28 0.7	11.933
6	10 31 23.40	1.8065	4 16 4.2	11.950
7	10 33 11.77	1.8058	4 4 6.7	11.966
8	10 35 0.09	1.8049	3 52 8.3	11.982
9	10 36 48.36	1.8043	3 40 8.9	11.998
10	10 38 36.60	1.8038	3 28 8.6	12.012
11	10 40 24.81	1.8033	3 16 7.5	12.025
12	10 42 12.99	1.8028	3 4 5.6	12.038
13	10 44 1.15	1.8024	2 52 2.9	12.051
14	10 45 49.28	1.8020	2 39 59.5	12.063
15	10 47 37.39	1.8018	2 27 55.4	12.074
16	10 49 25.49	1.8016	2 15 50.6	12.085
17	10 51 13.58	1.8014	2 3 45.2	12.095
18	10 53 1.66	1.8014	1 51 39.2	12.105
19	10 54 49.75	1.8014	1 39 32.6	12.114
20	10 56 37.83	1.8013	1 27 25.5	12.122
21	10 58 25.91	1.8015	1 15 18.0	12.129
22	11 0 14.01	1.8017	1 3 10.0	12.137
23	11 2 2.11	1.8019	0 51 1.6	12.143
24	11 3 50.24	1.8023	+ 0 38 52.8	−12.149

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	NOVEMBER 9.			
	h m s	s	° ′ ″	″
0	11 3 50.24	1.8023	+0 38 52.8	−12.149
1	11 5 38.39	1.8027	0 26 43.7	12.154
2	11 7 26.56	1.8031	0 14 34.3	12.158
3	11 9 14.76	1.8036	+0 2 24.7	12.163
4	11 11 2.99	1.8042	−0 9 45.2	12.166
5	11 12 51.26	1.8048	0 21 55.2	12.168
6	11 14 39.56	1.8054	0 34 5.4	12.171
7	11 16 27.91	1.8063	0 46 15.7	12.172
8	11 18 16.31	1.8071	0 58 26.0	12.173
9	11 20 4.76	1.8079	1 10 36.4	12.173
10	11 21 53.26	1.8088	1 22 46.8	12.173
11	11 23 41.82	1.8099	1 34 57.1	12.171
12	11 25 30.45	1.8110	1 47 7.3	12.169
13	11 27 19.14	1.8121	1 59 17.4	12.167
14	11 29 7.90	1.8133	2 11 27.3	12.163
15	11 30 56.74	1.8146	2 23 37.0	12.160
16	11 32 45.65	1.8159	2 35 46.5	12.155
17	11 34 34.65	1.8173	2 47 55.6	12.150
18	11 36 23.73	1.8187	3 0 4.5	12.145
19	11 38 12.89	1.8202	3 12 13.0	12.138
20	11 40 2.15	1.8218	3 24 21.0	12.131
21	11 41 51.51	1.8235	3 36 28.7	12.123
22	11 43 40.97	1.8252	3 48 35.8	12.114
23	11 45 30.53	1.8269	−4 0 42.4	−12.105
	NOVEMBER 10.			
0	11 47 20.20	1.8288	−4 12 48.4	−12.095
1	11 49 9.98	1.8307	4 24 53.8	12.085
2	11 50 59.88	1.8326	4 36 58.6	12.073
3	11 52 49.89	1.8346	4 49 2.6	12.061
4	11 54 40.03	1.8368	5 1 5.9	12.048
5	11 56 30.30	1.8388	5 13 8.4	12.035
6	11 58 20.69	1.8410	5 25 10.1	12.021
7	12 0 11.22	1.8433	5 37 10.9	12.006
8	12 2 1.88	1.8456	5 49 10.8	11.990
9	12 3 52.69	1.8479	6 1 9.7	11.973
10	12 5 43.63	1.8503	6 13 7.6	11.957
11	12 7 34.73	1.8529	6 25 4.5	11.938
12	12 9 25.98	1.8555	6 37 0.2	11.919
13	12 11 17.39	1.8581	6 48 54.8	11.901
14	12 13 8.95	1.8607	7 0 48.3	11.881
15	12 15 0.67	1.8635	7 12 40.5	11.859
16	12 16 52.57	1.8663	7 24 31.4	11.838
17	12 18 44.63	1.8691	7 36 21.0	11.816
18	12 20 36.86	1.8720	7 48 9.3	11.793
19	12 22 29.27	1.8750	7 59 56.1	11.768
20	12 24 21.86	1.8780	8 11 41.4	11.743
21	12 26 14.63	1.8811	8 23 25.2	11.717
22	12 28 7.59	1.8843	8 35 7.4	11.691
23	12 30 0.74	1.8875	8 46 48.1	11.663
24	12 31 54.09	1.8908	−8 58 27.0	−11.635

Hour.	Right Ascension.	Var. per Min.	Declination.
	NOVEMBER 11.		
	h m s	s	° ′ ″
0	12 31 54.09	1.8908	− 8 58 27.0
1	12 33 47.63	1.8940	9 10 4.3
2	12 35 41.37	1.8974	9 21 39.7
3	12 37 35.32	1.9008	9 33 13.4
4	12 39 29.47	1.9043	9 44 45.2
5	12 41 23.84	1.9079	9 56 15.1
6	12 43 18.42	1.9114	10 7 43.0
7	12 45 13.21	1.9150	10 19 8.9
8	12 47 8.22	1.9188	10 30 32.8
9	12 49 3.46	1.9225	10 41 54.5
10	12 50 58.92	1.9263	10 53 14.0
11	12 52 54.62	1.9302	11 4 31.3
12	12 54 50.54	1.9340	11 15 46.3
13	12 56 46.70	1.9380	11 26 59.0
14	12 58 43.10	1.9420	11 38 9.3
15	13 0 39.74	1.9460	11 49 17.1
16	13 2 36.62	1.9502	12 0 22.4
17	13 4 33.76	1.9543	12 11 25.1
18	13 6 31.14	1.9585	12 22 25.3
19	13 8 28.78	1.9628	12 33 22.8
20	13 10 26.67	1.9670	12 44 17.8
21	13 12 24.82	1.9714	12 55 9.8
22	13 14 23.24	1.9758	13 5 58.6
23	13 16 21.92	1.9802	−13 16 44.8
	NOVEMBER 12.		
0	13 18 20.86	1.9846	−13 27 28.6
1	13 20 20.07	1.9892	13 38 8.2
2	13 22 19.56	1.9938	13 48 45.3
3	13 24 19.32	1.9983	13 59 19.3
4	13 26 19.36	2.0029	14 9 50.1
5	13 28 19.67	2.0076	14 20 17.6
6	13 30 20.27	2.0124	14 30 41.8
7	13 32 21.16	2.0172	14 41 2.6
8	13 34 22.33	2.0219	14 51 20.0
9	13 36 23.79	2.0267	15 1 33.8
10	13 38 25.53	2.0315	15 11 44.1
11	13 40 27.57	2.0365	15 21 50.7
12	13 42 29.91	2.0414	15 31 53.7
13	13 44 32.54	2.0464	15 41 52.9
14	13 46 35.48	2.0514	15 51 48.5
15	13 48 38.71	2.0564	16 1 39.8
16	13 50 42.25	2.0615	16 11 27.3
17	13 52 46.09	2.0665	16 21 10.8
18	13 54 50.23	2.0717	16 30 50.5
19	13 56 54.69	2.0768	16 40 25.6
20	13 58 59.45	2.0819	16 49 56.7
21	14 1 4.52	2.0871	16 59 23.8
22	14 3 9.90	2.0923	17 8 46.6
23	14 5 15.60	2.0976	17 18 4.7
24	14 7 21.61	2.1028	−17 27 17.7

GREENWICH MEAN TIME.

Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
NOVEMBER 13.					**NOVEMBER 15.**			
h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
14 7 21.61	2.1028	−17 27 17.7	−9.189	0	15 54 20.73	2.3470	−23 0 46.1	−4.290
14 9 27.94	2.1081	17 36 26.8	9.113	1	15 56 41.68	2.3512	23 4 59.7	4.163
14 11 34.58	2.1133	17 45 31.2	9.035	2	15 59 2.87	2.3553	23 9 5.7	4.035
14 13 41.54	2.1187	17 54 31.0	8.958	3	16 1 24.32	2.3594	23 13 3.9	3.906
14 15 48.82	2.1240	18 3 26.1	8.878	4	16 3 46.00	2.3634	23 16 54.4	3.777
14 17 56.42	2.1293	18 12 16.3	8.797	5	16 6 7.93	2.3674	23 20 37.1	3.646
14 20 4.34	2.1347	18 21 1.7	8.715	6	16 8 30.09	2.3712	23 24 11.9	3.513
14 22 12.58	2.1400	18 29 42.1	8.633	7	16 10 52.47	2.3749	23 27 38.7	3.382
14 24 21.14	2.1453	18 38 17.6	8.548	8	16 13 15.08	2.3788	23 30 57.7	3.249
14 26 30.02	2.1507	18 46 47.9	8.463	9	16 15 37.92	2.3823	23 34 8.6	3.114
14 28 39.22	2.1560	18 55 13.1	8.378	10	16 18 0.96	2.3858	23 37 11.4	2.980
14 30 48.74	2.1614	19 3 33.2	8.290	11	16 20 24.22	2.3893	23 40 6.2	2.845
14 32 58.59	2.1668	19 11 47.9	8.201	12	16 22 47.68	2.3928	23 42 52.8	2.709
14 35 8.76	2.1722	19 19 57.3	8.112	13	16 25 11.35	2.3961	23 45 31.3	2.573
14 37 19.25	2.1775	19 28 1.3	8.022	14	16 27 35.21	2.3993	23 48 1.5	2.434
14 39 30.06	2.1829	19 35 59.9	7.929	15	16 29 59.26	2.4023	23 50 23.4	2.297
14 41 41.20	2.1883	19 43 52.8	7.836	16	16 32 23.49	2.4054	23 52 37.1	2.158
14 43 52.65	2.1936	19 51 40.2	7.743	17	16 34 47.91	2.4084	23 54 42.4	2.019
14 46 4.43	2.1990	19 59 21.9	7.647	18	16 37 12.50	2.4113	23 56 39.4	1.879
14 48 16.53	2.2043	20 6 57.8	7.550	19	16 39 37.27	2.4141	23 58 27.9	1.738
14 50 28.95	2.2096	20 14 27.9	7.453	20	16 42 2.19	2.4168	24 0 8.0	1.598
14 52 41.68	2.2149	20 21 52.2	7.355	21	16 44 27.28	2.4194	24 1 39.6	1.456
14 54 54.74	2.2203	20 29 10.5	7.254	22	16 46 52.52	2.4218	24 3 2.7	1.314
14 57 8.11	2.2255	−20 36 22.7	−7.153	23	16 49 17.90	2.4243	−24 4 17.3	−1.172
NOVEMBER 14.					**NOVEMBER 16.**			
14 59 21.80	2.2308	−20 43 28.9	−7.052	0	16 51 43.43	2.4266	−24 5 23.3	−1.028
15 1 35.81	2.2360	20 50 28.9	6.949	1	16 54 9.09	2.4288	24 6 20.7	0.885
15 3 50.12	2.2413	20 57 22.8	6.845	2	16 56 34.88	2.4309	24 7 9.5	0.742
15 6 4.76	2.2465	21 4 10.3	6.739	3	16 59 0.80	2.4330	24 7 49.7	0.597
15 8 19.70	2.2516	21 10 51.5	6.633	4	17 1 26.84	2.4348	24 8 21.1	0.452
15 10 34.95	2.2568	21 17 26.3	6.527	5	17 3 52.98	2.4367	24 8 43.9	0.308
15 12 50.51	2.2619	21 23 54.7	6.418	6	17 6 19.24	2.4384	24 8 58.0	0.163
15 15 6.38	2.2670	21 30 16.4	6.308	7	17 8 45.59	2.4400	24 9 3.4	−0.017
15 17 22.55	2.2721	21 36 31.6	6.198	8	17 11 12.04	2.4415	24 9 0.0	+0.130
15 19 39.03	2.2772	21 42 40.2	6.087	9	17 13 38.57	2.4429	24 8 47.8	0.276
15 21 55.81	2.2821	21 48 42.0	5.973	10	17 16 5.19	2.4443	24 8 26.9	0.422
15 24 12.88	2.2870	21 54 36.9	5.859	11	17 18 31.88	2.4454	24 7 57.2	0.568
15 26 30.25	2.2919	22 0 25.1	5.745	12	17 20 58.64	2.4466	24 7 18.7	0.715
15 28 47.91	2.2968	22 6 6.3	5.629	13	17 23 25.47	2.4476	24 6 31.4	0.862
15 31 5.87	2.3017	22 11 40.6	5.513	14	17 25 52.35	2.4484	24 5 35.3	1.009
15 33 24.11	2.3064	22 17 7.8	5.394	15	17 28 19.28	2.4493	24 4 30.3	1.157
15 35 42.64	2.3112	22 22 27.9	5.275	16	17 30 46.26	2.4500	24 3 16.5	1.303
15 38 1.45	2.3158	22 27 40.8	5.155	17	17 33 13.28	2.4506	24 1 53.9	1.451
15 40 20.54	2.3204	22 32 46.5	5.035	18	17 35 40.33	2.4511	24 0 22.4	1.598
15 42 39.90	2.3249	22 37 45.0	4.913	19	17 38 7.41	2.4515	23 58 42.1	1.745
15 44 59.53	2.3295	22 42 36.1	4.790	20	17 40 34.51	2.4518	23 56 53.0	1.893
15 47 19.44	2.3340	22 47 19.8	4.667	21	17 43 1.62	2.4519	23 54 55.0	2.040
15 49 39.61	2.3383	22 51 56.1	4.543	22	17 45 28.74	2.4521	23 52 48.2	2.188
15 52 0.04	2.3427	*22 56 24.9*	4.417	23	17 47 55.87	2.4521	23 50 32.5	2.335
15 54 20.73	*2.3470*	*−23 0 46.1*	*−4.290*	24	17 50 22.99	2.4519	−23 48 8.0	+2.482

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	NOVEMBER 17.			
	h m s	s	° ′ ″	″
0	17 50 22.99	2.4519	−23 48 8.0	+2.482
1	17 52 50.10	2.4518	23 45 34.7	2.628
2	17 55 17.20	2.4515	23 42 52.6	2.775
3	17 57 44.28	2.4510	23 40 1.7	2.922
4	18 0 11.32	2.4505	23 37 2.0	3.068
5	18 2 38.34	2.4500	23 33 53.5	3.214
6	18 5 5.32	2.4493	23 30 36.3	3.359
7	18 7 32.25	2.4485	23 27 10.4	3.505
8	18 9 59.14	2.4477	23 23 35.7	3.651
9	18 12 25.97	2.4467	23 19 52.3	3.796
10	18 14 52.74	2.4456	23 16 0.2	3.940
11	18 17 19.44	2.4444	23 11 59.5	4.084
12	18 19 46.07	2.4433	23 7 50.1	4.228
13	18 22 12.63	2.4419	23 3 32.1	4.372
14	18 24 39.10	2.4405	22 59 5.5	4.515
15	18 27 5.49	2.4391	22 54 30.3	4.658
16	18 29 31.79	2.4375	22 49 46.6	4.799
17	18 31 57.99	2.4358	22 44 54.4	4.941
18	18 34 24.09	2.4341	22 39 53.7	5.082
19	18 36 50.08	2.4323	22 34 44.6	5.222
20	18 39 15.96	2.4304	22 29 27.1	5.363
21	18 41 41.73	2.4285	22 24 1.1	5.502
22	18 44 7.38	2.4264	22 18 26.9	5.639
23	18 46 32.90	2.4243	−22 12 44.4	+5.778
	NOVEMBER 18.			
0	18 48 58.30	2.4222	−22 6 53.6	+5.915
1	18 51 23.56	2.4199	22 0 54.6	6.052
2	18 53 48.69	2.4177	21 54 47.4	6.188
3	18 56 13.68	2.4153	21 48 32.1	6.323
4	18 58 38.53	2.4129	21 42 8.6	6.458
5	19 1 3.23	2.4103	21 35 37.1	6.591
6	19 3 27.77	2.4078	21 28 57.7	6.724
7	19 5 52.16	2.4053	21 22 10.2	6.858
8	19 8 16.40	2.4026	21 15 14.8	6.988
9	19 10 40.47	2.3998	21 8 11.6	7.119
10	19 13 4.38	2.3972	21 1 0.5	7.249
11	19 15 28.13	2.3943	20 53 41.7	7.378
12	19 17 51.70	2.3914	20 46 15.2	7.506
13	19 20 15.10	2.3886	20 38 41.0	7.633
14	19 22 38.33	2.3857	20 30 59.2	7.759
15	19 25 1.38	2.3826	20 23 9.9	7.885
16	19 27 24.24	2.3796	20 15 13.0	8.010
17	19 29 46.93	2.3766	20 7 8.7	8.133
18	19 32 9.43	2.3735	19 58 57.0	8.256
19	19 34 31.75	2.3703	19 50 38.0	8.378
20	19 36 53.87	2.3672	19 42 11.7	8.498
21	19 39 15.81	2.3641	19 33 38.2	8.618
22	19 41 37.56	2.3608	19 24 57.6	8.737
23	19 43 59.11	2.3576	19 16 9.8	8.855
24	*19 46 20.47*	*2.3543*	*−19 7 15.0*	*+8.972*

Hour.	Right Ascension.	Var. per Min.	Declinatio
	NOVEMBER 19.		
	h m s	s	° ′
0	19 46 20.47	2.3543	−19 7 15
1	19 48 41.63	2.3511	18 58 13
2	19 51 2.60	2.3478	18 49 4
3	19 53 23.36	2.3444	18 39 49
4	19 55 43.93	2.3412	18 30 26
5	19 58 4.30	2.3378	18 20 57
6	20 0 24.46	2.3344	18 11 22
7	20 2 44.43	2.3311	18 1 39
8	20 5 4.19	2.3277	17 51 50
9	20 7 23.75	2.3243	17 41 55
10	20 9 43.11	2.3210	17 31 54
11	20 12 2.27	2.3176	17 21 46
12	20 14 21.22	2.3142	17 11 31
13	20 16 39.97	2.3108	17 1 11
14	20 18 58.52	2.3074	16 50 44
15	20 21 16.86	2.3041	16 40 12
16	20 23 35.01	2.3008	16 29 33
17	20 25 52.95	2.2973	16 18 49
18	20 28 10.69	2.2941	16 7 58
19	20 30 28.24	2.2908	15 57
20	20 32 45.58	2.2874	15 46
21	20 35 2.73	2.2841	15 34 5
22	20 37 19.67	2.2808	15 23 4
23	20 39 36.43	2.2776	−15 12 2
	NOVEMBER 20.		
0	20 41 52.98	2.2743	−15 0 5
1	20 44 9.34	2.2712	14 49 2
2	20 46 25.52	2.2680	14 37 5
3	20 48 41.50	2.2648	14 26 1
4	20 50 57.29	2.2617	14 14 2
5	20 53 12.90	2.2586	14 2 4
6	20 55 28.32	2.2555	13 50 4
7	20 57 43.56	2.2524	13 38 4
8	20 59 58.61	2.2494	13 26 4
9	21 2 13.49	2.2464	13 14 3
10	21 4 28.18	2.2434	13 2 1
11	21 6 42.70	2.2406	12 49 5
12	21 8 57.05	2.2378	12 37 3
13	21 11 11.23	2.2348	12 25
14	21 13 25.23	2.2321	12 12 3
15	21 15 39.08	2.2293	11 59 5
16	21 17 52.75	2.2266	11 47 1
17	21 20 6.27	2.2239	11 34 3
18	21 22 19.62	2.2213	11 21 4
19	21 24 32.83	2.2188	11 8 5
20	21 26 45.87	2.2162	10 55 5
21	21 28 58.77	2.2138	10 42 5
22	21 31 11.52	2.2113	10 29 5
23	21 33 24.13	2.2089	10 16 4
24	21 35 36.59	2.2066	−10 3 3

GREENWICH MEAN TIME.

ht sion.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
NOVEMBER 21.					**NOVEMBER 23.**			
s	s	° ′ ″	″		h m s	s	° ′ ″	″
36.59	2.2066	−10 3 32.3	+13.223	0	23 19 57.57	2.1663	+ 1 15 13.6	+14.551
48.92	2.2043	9 50 17.2	13.281	1	23 22 7.57	2.1670	1 29 46.5	14.546
1.11	2.2020	9 36 58.6	13.338	2	23 24 17.61	2.1678	1 44 19.1	14.540
13.16	2.1998	9 23 36.6	13.394	3	23 26 27.71	2.1688	1 58 51.3	14.532
25.09	2.1978	9 10 11.3	13.449	4	23 28 37.87	2.1698	2 13 22.9	14.523
36.89	2.1957	8 56 42.7	13.503	5	23 30 48.08	2.1708	2 27 54.0	14.513
48.57	2.1938	8 43 11.0	13.554	6	23 32 58.37	2.1720	2 42 24.4	14.499
0.14	2.1918	8 29 36.2	13.605	7	23 35 8.72	2.1732	2 56 53.9	14.486
11.58	2.1898	8 15 58.4	13.654	8	23 37 19.15	2.1744	3 11 22.7	14.472
22.91	2.1880	8 2 17.7	13.702	9	23 39 29.65	2.1757	3 25 50.5	14.455
34.14	2.1862	7 48 34.2	13.749	10	23 41 40.23	2.1771	3 40 17.3	14.438
45.25	2.1844	7 34 47.8	13.795	11	23 43 50.90	2.1786	3 54 43.1	14.419
56.27	2.1828	7 20 58.8	13.838	12	23 46 1.66	2.1801	4 9 7.6	14.398
7.19	2.1812	7 7 7.2	13.882	13	23 48 12.51	2.1817	4 23 30.9	14.377
18.01	2.1797	6 53 13.0	13.923	14	23 50 23.46	2.1833	4 37 52.8	14.353
28.75	2.1782	6 39 16.4	13.963	15	23 52 34.51	2.1851	4 52 13.2	14.328
39.39	2.1767	6 25 17.4	14.003	16	23 54 45.67	2.1868	5 6 32.2	14.303
49.95	2.1754	6 11 16.1	14.040	17	23 56 56.93	2.1887	5 20 49.6	14.275
0.44	2.1741	5 57 12.6	14.077	18	23 59 8.31	2.1906	5 35 5.2	14.246
10.84	2.1728	5 43 6.9	14.112	19	0 1 19.80	2.1925	5 49 19.1	14.216
21.18	2.1716	5 28 59.2	14.146	20	0 3 31.41	2.1945	6 3 31.1	14.184
31.45	2.1706	5 14 49.4	14.178	21	0 5 43.14	2.1966	6 17 41.2	14.151
41.65	2.1695	5 0 37.8	14.209	22	0 7 55.00	2.1988	6 31 49.2	14.117
51.79	2.1686	− 4 46 24.3	+14.239	23	0 10 6.99	2.2009	+ 6 45 55.2	+14.081
NOVEMBER 22.					**NOVEMBER 24.**			
1.88	2.1678	− 4 32 9.1	+14.268	0	0 12 19.11	2.2032	+ 6 59 58.9	+14.043
11.92	2.1668	4 17 52.2	14.294	1	0 14 31.37	2.2054	7 14 0.3	14.004
21.90	2.1661	4 3 33.8	14.320	2	0 16 43.76	2.2078	7 27 59.4	13.964
31.85	2.1654	3 49 13.8	14.345	3	0 18 56.31	2.2103	7 41 56.0	13.923
41.75	2.1648	3 34 52.4	14.368	4	0 21 8.99	2.2127	7 55 50.1	13.879
51.62	2.1642	3 20 29.6	14.390	5	0 23 21.83	2.2153	8 9 41.5	13.834
1.45	2.1637	3 6 5.6	14.410	6	0 25 34.82	2.2178	8 23 30.2	13.788
11.26	2.1633	2 51 40.4	14.430	7	0 27 47.97	2.2205	8 37 16.1	13.741
21.04	2.1628	2 37 14.0	14.448	8	0 30 1.28	2.2232	8 50 59.1	13.692
30.80	2.1625	2 22 46.7	14.464	9	0 32 14.75	2.2258	9 4 39.1	13.642
40.54	2.1623	2 8 18.3	14.480	10	0 34 28.38	2.2286	9 18 16.1	13.589
50.28	2.1622	1 53 49.1	14.493	11	0 36 42.18	2.2314	9 31 49.8	13.536
0.00	2.1620	1 39 19.1	14.506	12	0 38 56.15	2.2343	9 45 20.4	13.482
9.72	2.1620	1 24 48.4	14.518	13	0 41 10.29	2.2373	9 58 47.6	13.425
19.44	2.1621	1 10 17.0	14.528	14	0 43 24.62	2.2403	10 12 11.4	13.368
29.17	2.1622	0 55 45.1	14.536	15	0 45 39.12	2.2432	10 25 31.8	13.309
38.90	2.1623	0 41 12.7	14.543	16	0 47 53.80	2.2462	10 38 48.5	13.248
48.65	2.1626	0 26 40.0	14.548	17	0 50 8.66	2.2493	10 52 1.5	13.186
58.41	2.1628	− 0 12 6.9	14.554	18	0 52 23.72	2.2525	11 5 10.8	13.123
8.19	2.1633	+ 0 2 26.5	14.557	19	0 54 38.96	2.2556	11 18 16.2	13.058
18.00	2.1638	0 16 59.9	14.558	20	0 56 54.39	2.2588	11 31 17.7	12.992
27.84	2.1643	0 31 33.4	14.559	21	0 59 10.02	2.2621	11 44 15.2	12.924
37.71	2.1648	0 46 7.0	14.558	22	1 1 25.84	2.2653	11 57 8.6	12.854
47.62	*2.1655*	*1 0 40.4*	*14.555*	23	1 3 41.85	2.2686	12 9 57.7	12.783
57.57	*2.1663*	*+ 1 15 13.6*	*+14.551*	24	1 5 58.07	2.2720	+12 22 42.6	+12.712

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	NOVEMBER 25.			
	h m s	s	° ′ ″	″
0	1 5 58.07	2.2720	+12 22 42.6	+12.712
1	1 8 14.49	2.2755	12 35 23.1	12.638
2	1 10 31.11	2.2788	12 47 59.2	12.563
3	1 12 47.94	2.2822	13 0 30.7	12.487
4	1 15 4.97	2.2856	13 12 57.6	12.409
5	1 17 22.21	2.2891	13 25 19.8	12.330
6	1 19 39.66	2.2925	13 37 37.2	12.249
7	1 21 57.31	2.2960	13 49 49.7	12.167
8	1 24 15.18	2.2996	14 1 57.2	12.083
9	1 26 33.26	2.3032	14 13 59.6	11.998
10	1 28 51.56	2.3068	14 25 57.0	11.913
11	1 31 10.07	2.3103	14 37 49.1	11.824
12	1 33 28.79	2.3138	14 49 35.9	11.735
13	1 35 47.73	2.3175	15 1 17.3	11.645
14	1 38 6.89	2.3211	15 12 53.3	11.553
15	1 40 26.26	2.3247	15 24 23.7	11.459
16	1 42 45.85	2.3283	15 35 48.4	11.365
17	1 45 5.66	2.3320	15 47 7.5	11.269
18	1 47 25.69	2.3356	15 58 20.7	11.171
19	1 49 45.93	2.3392	16 9 28.0	11.073
20	1 52 6.39	2.3428	16 20 29.4	10.973
21	1 54 27.07	2.3464	16 31 24.7	10.871
22	1 56 47.96	2.3500	16 42 13.9	10.768
23	1 59 9.07	2.3536	+16 52 56.9	+10.664
	NOVEMBER 26.			
0	2 1 30.39	2.3572	+17 3 33.6	+10.558
1	2 3 51.93	2.3608	17 14 3.9	10.452
2	2 6 13.69	2.3644	17 24 27.8	10.344
3	2 8 35.66	2.3679	17 34 45.2	10.235
4	2 10 57.84	2.3714	17 44 56.0	10.124
5	2 13 20.23	2.3749	17 55 0.1	10.013
6	2 15 42.83	2.3784	18 4 57.5	9.899
7	2 18 5.64	2.3819	18 14 48.0	9.785
8	2 20 28.66	2.3854	18 24 31.7	9.670
9	2 22 51.89	2.3888	18 34 8.4	9.553
10	2 25 15.31	2.3921	18 43 38.0	9.435
11	2 27 38.94	2.3955	18 53 0.6	9.317
12	2 30 2.77	2.3988	19 2 16.0	9.196
13	2 32 26.80	2.4021	19 11 24.1	9.075
14	2 34 51.02	2.4053	19 20 25.0	8.953
15	2 37 15.43	2.4084	19 29 18.4	8.828
16	2 39 40.03	2.4115	19 38 4.4	8.704
17	2 42 4.81	2.4147	19 46 42.9	8.578
18	2 44 29.79	2.4178	19 55 13.8	8.452
19	2 46 54.94	2.4207	20 3 37.1	8.324
20	2 49 20.27	2.4236	20 11 52.7	8.195
21	2 51 45.77	2.4265	20 20 0.5	8.065
22	2 54 11.45	2.4293	20 28 0.5	7.935
23	2 56 37.29	2.4321	20 35 52.7	7.803
24	2 59 3.30	2.4348	+20 43 36.9	+ 7.670

Hour.	Right Ascension.	Var. per Min.	Declination.
	NOVEMBER 27.		
	h m s	s	° ′ ″
0	2 59 3.30	2.4348	+20 43 36.9
1	3 1 29.47	2.4374	20 51 13.1
2	3 3 55.79	2.4400	20 58 41.3
3	3 6 22.27	2.4426	21 6 1.3
4	3 8 48.90	2.4450	21 13 13.2
5	3 11 15.67	2.4473	21 20 16.9
6	3 13 42.57	2.4496	21 27 12.4
7	3 16 9.62	2.4518	21 33 59.5
8	3 18 36.79	2.4539	21 40 38.3
9	3 21 4.09	2.4560	21 47 8.7
10	3 23 31.51	2.4579	21 53 30.7
11	3 25 59.04	2.4598	21 59 44.1
12	3 28 26.69	2.4618	22 5 49.1
13	3 30 54.45	2.4634	22 11 45.5
14	3 33 22.30	2.4651	22 17 33.3
15	3 35 50.26	2.4667	22 23 12.4
16	3 38 18.30	2.4680	22 28 42.9
17	3 40 46.42	2.4694	22 34 4.7
18	3 43 14.63	2.4708	22 39 17.8
19	3 45 42.91	2.4718	22 44 22.0
20	3 48 11.25	2.4729	22 49 17.5
21	3 50 39.66	2.4739	22 54 4.2
22	3 53 8.12	2.4748	22 58 42.0
23	3 55 36.63	2.4756	+23 3 11.0
	NOVEMBER 28.		
0	3 58 5.19	2.4763	+23 7 31.0
1	4 0 33.79	2.4768	23 11 42.1
2	4 3 2.41	2.4773	23 15 44.3
3	4 5 31.07	2.4778	23 19 37.6
4	4 7 59.74	2.4779	23 23 21.9
5	4 10 28.42	2.4781	23 26 57.2
6	4 12 57.11	2.4782	23 30 23.5
7	4 15 25.80	2.4782	23 33 40.8
8	4 17 54.49	2.4780	23 36 49.1
9	4 20 23.16	2.4777	23 39 48.3
10	4 22 51.81	2.4773	23 42 38.6
11	4 25 20.44	2.4768	23 45 19.8
12	4 27 49.03	2.4763	23 47 51.9
13	4 30 17.59	2.4756	23 50 15.0
14	4 32 46.10	2.4747	23 52 29.1
15	4 35 14.55	2.4738	23 54 34.2
16	4 37 42.95	2.4728	23 56 30.2
17	4 40 11.28	2.4716	23 58 17.3
18	4 42 39.54	2.4703	23 59 55.3
19	4 45 7.72	2.4690	24 1 24.3
20	4 47 35.82	2.4675	24 2 44.3
21	4 50 3.82	2.4659	24 3 55.3
22	4 52 31.73	2.4643	24 4 57.4
23	4 54 59.53	2.4624	24 5 50.5
24	4 57 27.22	2.4605	+24 6 34.7

GREENWICH MEAN TIME.

Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
NOVEMBER 29.					**DECEMBER 1.**			
h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
4 57 27.22	2.4605	+24 6 34.7	+0.663	0	6 51 34.65	2.2661	+21 58 5.6	−5.705
4 59 54.79	2.4585	24 7 10.0	0.513	1	6 53 50.45	2.2606	21 52 20.0	5.814
5 2 22.24	2.4564	24 7 36.3	0.365	2	6 56 5.92	2.2551	21 46 27.9	5.923
5 4 49.56	2.4542	24 7 53.8	0.218	3	6 58 21.06	2.2496	21 40 29.2	6.032
5 7 16.74	2.4518	24 8 2.4	+0.071	4	7 0 35.87	2.2440	21 34 24.1	6.138
5 9 43.77	2.4493	24 8 2.3	−0.076	5	7 2 50.34	2.2384	21 28 12.6	6.244
5 12 10.66	2.4468	24 7 53.3	0.223	6	7 5 4.48	2.2328	21 21 54.8	6.348
5 14 37.39	2.4442	24 7 35.5	0.369	7	7 7 18.27	2.2272	21 15 30.8	6.452
5 17 3.96	2.4415	24 7 9.0	0.514	8	7 9 31.74	2.2216	21 9 0.6	6.555
5 19 30.37	2.4386	24 6 33.8	0.658	9	7 11 44.86	2.2158	21 2 24.2	6.656
5 21 56.59	2.4357	24 5 50.0	0.803	10	7 13 57.64	2.2103	20 55 41.9	6.756
5 24 22.65	2.4327	24 4 57.4	0.948	11	7 16 10.09	2.2046	20 48 53.5	6.856
5 26 48.51	2.4294	24 3 56.3	1.090	12	7 18 22.19	2.1989	20 41 59.2	6.953
5 29 14.18	2.4263	24 2 46.6	1.233	13	7 20 33.96	2.1933	20 34 59.1	7.050
5 31 39.66	2.4229	24 1 28.3	1.375	14	7 22 45.38	2.1875	20 27 53.2	7.146
5 34 4.93	2.4194	24 0 1.6	1.516	15	7 24 56.46	2.1818	20 20 41.6	7.241
5 36 29.99	2.4159	23 58 26.4	1.657	16	7 27 7.20	2.1762	20 13 24.3	7.335
5 38 54.84	2.4124	23 56 42.8	1.797	17	7 29 17.60	2.1706	20 6 1.4	7.427
5 41 19.48	2.4087	23 54 50.8	1.937	18	7 31 27.67	2.1649	19 58 33.1	7.518
5 43 43.88	2.4048	23 52 50.4	2.075	19	7 33 37.39	2.1592	19 50 59.2	7.609
5 46 8.06	2.4011	23 50 41.8	2.212	20	7 35 46.77	2.1535	19 43 20.0	7.698
5 48 32.01	2.3971	23 48 25.0	2.349	21	7 37 55.81	2.1478	19 35 35.4	7.787
5 50 55.71	2.3931	23 45 59.9	2.486	22	7 40 4.51	2.1423	19 27 45.6	7.873
5 53 19.18	2.3890	+23 43 26.7	−2.621	23	7 42 12.88	2.1367	+19 19 50.6	−7.959
NOVEMBER 30.					**DECEMBER 2.**			
5 55 42.39	2.3848	+23 40 45.4	−2.756	0	7 44 20.91	2.1310	+19 11 50.5	−8.044
5 58 5.35	2.3805	23 37 56.0	2.890	1	7 46 28.60	2.1254	19 3 45.3	8.128
6 0 28.05	2.3762	23 34 58.6	3.023	2	7 48 35.96	2.1198	18 55 35.2	8.211
6 2 50.49	2.3718	23 31 53.3	3.154	3	7 50 42.98	2.1143	18 47 20.0	8.293
6 5 12.66	2.3673	23 28 40.1	3.286	4	7 52 49.67	2.1088	18 39 0.1	8.373
6 7 34.56	2.3628	23 25 19.0	3.416	5	7 54 56.03	2.1033	18 30 35.3	8.453
6 9 56.19	2.3582	23 21 50.2	3.545	6	7 57 2.06	2.0978	18 22 5.7	8.532
6 12 17.54	2.3535	23 18 13.6	3.673	7	7 59 7.76	2.0923	18 13 31.5	8.608
6 14 38.61	2.3488	23 14 29.4	3.801	8	8 1 13.13	2.0868	18 4 52.7	8.685
6 16 59.40	2.3440	23 10 37.5	3.928	9	8 3 18.17	2.0813	17 56 9.3	8.761
6 19 19.89	2.3391	23 6 38.1	4.053	10	8 5 22.89	2.0760	17 47 21.4	8.836
6 21 40.09	2.3342	23 2 31.2	4.178	11	8 7 27.29	2.0706	17 38 29.0	8.909
6 23 59.99	2.3292	22 58 16.8	4.301	12	8 9 31.36	2.0653	17 29 32.3	8.981
6 26 19.59	2.3242	22 53 55.1	4.423	13	8 11 35.12	2.0599	17 20 31.3	9.053
6 28 38.89	2.3192	22 49 26.0	4.546	14	8 13 38.55	2.0547	17 11 26.0	9.123
6 30 57.89	2.3141	22 44 49.6	4.666	15	8 15 41.68	2.0495	17 2 16.6	9.192
6 33 16.58	2.3088	22 40 6.1	4.785	16	8 17 44.49	2.0443	16 53 3.0	9.260
6 35 34.95	2.3036	22 35 15.4	4.904	17	8 19 46.99	2.0391	16 43 45.4	9.328
6 37 53.01	2.2983	22 30 17.6	5.022	18	8 21 49.18	2.0339	16 34 23.7	9.394
6 40 10.75	2.2931	22 25 12.8	5.138	19	8 23 51.06	2.0288	16 24 58.1	9.458
6 42 28.18	2.2878	22 20 1.0	5.253	20	8 25 52.64	2.0238	16 15 28.7	9.523
6 44 45.28	2.2824	22 14 42.4	5.368	21	8 27 53.92	2.0188	16 5 55.3	9.587
6 47 2.07	2.2770	22 9 16.9	5.482	22	8 29 54.90	2.0138	15 56 18.2	9.648
6 49 18.52	2.2715	22 3 44.6	5.594	23	8 31 55.58	2.0088	15 46 37.5	9.710
6 51 34.65	*2.2661*	*+21 58 5.6*	*−5.705*	24	8 33 55.96	2.0039	+15 36 53.0	−9.771

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	DECEMBER 3.			
	h m s	s	° ′ ″	″
0	8 33 55.96	2.0039	+15 36 53.0	− 9.771
1	8 35 56.05	1.9992	15 27 5.0	9.830
2	8 37 55.86	1.9943	15 17 13.4	9.889
3	8 39 55.37	1.9896	15 7 18.3	9.948
4	8 41 54.61	1.9849	14 57 19.7	10.004
5	8 43 53.56	1.9802	14 47 17.8	10.059
6	8 45 52.23	1.9756	14 37 12.6	10.114
7	8 47 50.63	1.9710	14 27 4.1	10.168
8	8 49 48.75	1.9664	14 16 52.4	10.222
9	8 51 46.60	1.9620	14 6 37.5	10.274
10	8 53 44.19	1.9577	13 56 19.5	10.325
11	8 55 41.52	1.9533	13 45 58.5	10.376
12	8 57 38.58	1.9489	13 35 34.4	10.426
13	8 59 35.39	1.9447	13 25 7.4	10.474
14	9 1 31.94	1.9404	13 14 37.5	10.523
15	9 3 28.24	1.9363	13 4 4.7	10.570
16	9 5 24.29	1.9322	12 53 29.1	10.616
17	9 7 20.10	1.9282	12 42 50.8	10.661
18	9 9 15.67	1.9242	12 32 9.8	10.706
19	9 11 11.00	1.9203	12 21 26.1	10.750
20	9 13 6.10	1.9163	12 10 39.8	10.793
21	9 15 0.96	1.9125	11 59 51.0	10.835
22	9 16 55.60	1.9088	11 48 59.6	10.877
23	9 18 50.02	1.9051	+11 38 5.8	−10.917
	DECEMBER 4.			
0	9 20 44.21	1.9014	+11 27 9.6	−10.957
1	9 22 38.19	1.8978	11 16 11.0	10.995
2	9 24 31.95	1.8943	11 5 10.2	11.033
3	9 26 25.50	1.8908	10 54 7.0	11.072
4	9 28 18.85	1.8874	10 43 1.6	11.108
5	9 30 11.99	1.8841	10 31 54.1	11.143
6	9 32 4.94	1.8808	10 20 44.4	11.179
7	9 33 57.69	1.8776	10 9 32.6	11.214
8	9 35 50.25	1.8744	9 58 18.7	11.248
9	9 37 42.62	1.8713	9 47 2.9	11.280
10	9 39 34.80	1.8682	9 35 45.1	11.313
11	9 41 26.80	1.8653	9 24 25.4	11.344
12	9 43 18.63	1.8623	9 13 3.8	11.375
13	9 45 10.28	1.8595	9 1 40.4	11.405
14	9 47 1.77	1.8568	8 50 15.2	11.435
15	9 48 53.09	1.8539	8 38 48.2	11.464
16	9 50 44.24	1.8513	8 27 19.5	11.492
17	9 52 35.24	1.8487	8 15 49.2	11.519
18	9 54 26.08	1.8462	8 4 17.2	11.546
19	9 56 16.78	1.8437	7 52 43.7	11.572
20	9 58 7.32	1.8412	7 41 8.6	11.598
21	9 59 57.72	1.8389	7 29 32.0	11.622
22	10 1 47.99	1.8366	7 17 54.0	11.646
23	10 3 38.11	1.8343	7 6 14.5	11.669
24	10 5 28.11	1.8323	+ 6 54 33.7	−11.692

Hour.	Right Ascension.	Var. per Min.	Declination.
	DECEMBER 5.		
	h m s	s	° ′ ″
0	10 5 28.11	1.8323	+6 54 33.7
1	10 7 17.98	1.8302	6 42 51.5
2	10 9 7.73	1.8281	6 31 8.0
3	10 10 57.35	1.8262	6 19 23.3
4	10 12 46.87	1.8243	6 7 37.3
5	10 14 36.27	1.8224	5 55 50.1
6	10 16 25.56	1.8206	5 44 1.8
7	10 18 14.74	1.8189	5 32 12.4
8	10 20 3.83	1.8173	5 20 21.9
9	10 21 52.82	1.8158	5 8 30.3
10	10 23 41.72	1.8143	4 56 37.8
11	10 25 30.53	1.8128	4 44 44.3
12	10 27 19.26	1.8115	4 32 49.9
13	10 29 7.91	1.8102	4 20 54.6
14	10 30 56.48	1.8089	4 8 58.4
15	10 32 44.98	1.8078	3 57 1.5
16	10 34 33.42	1.8067	3 45 3.7
17	10 36 21.78	1.8056	3 33 5.2
18	10 38 10.09	1.8048	3 21 6.0
19	10 39 58.35	1.8038	3 9 6.1
20	10 41 46.55	1.8029	2 57 5.6
21	10 43 34.70	1.8022	2 45 4.5
22	10 45 22.81	1.8015	2 33 2.8
23	10 47 10.88	1.8009	+2 21 0.6
	DECEMBER 6.		
0	10 48 58.92	1.8004	+2 8 57.9
1	10 50 46.93	1.7998	1 56 54.8
2	10 52 34.90	1.7994	1 44 51.2
3	10 54 22.86	1.7991	1 32 47.3
4	10 56 10.79	1.7988	1 20 43.0
5	10 57 58.71	1.7986	1 8 38.4
6	10 59 46.62	1.7984	0 56 33.5
7	11 1 34.52	1.7983	0 44 28.4
8	11 3 22.41	1.7983	0 32 23.0
9	11 5 10.31	1.7983	0 20 17.5
10	11 6 58.21	1.7984	+0 8 11.9
11	11 8 46.12	1.7987	−0 3 53.9
12	11 10 34.05	1.7989	0 15 59.7
13	11 12 21.99	1.7992	0 28 5.6
14	11 14 9.95	1.7996	0 40 11.4
15	11 15 57.94	1.8001	0 52 17.2
16	11 17 45.96	1.8006	1 4 23.0
17	11 19 34.01	1.8011	1 16 28.6
18	11 21 22.09	1.8018	1 28 34.1
19	11 23 10.22	1.8025	1 40 39.4
20	11 24 58.39	1.8033	1 52 44.5
21	11 26 46.62	1.8042	2 4 49.3
22	11 28 34.89	1.8051	2 16 53.9
23	11 30 23.23	1.8061	2 28 58.1
24	11 32 11.62	1.8071	−2 41 1.9

GREENWICH MEAN TIME.

	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
		DECEMBER 7.				DECEMBER 9.		
	s	° ′ ″	″		h m s	s	° ′ ″	″
.62	1.8071	− 2 41 1.9	−12.060	0	13 1 25.48	1.9356	−12 0 10.4	−10.963
.08	1.8083	2 53 5.3	12.053	1	13 3 21.74	1.9398	12 11 6.9	10.921
.61	1.8095	3 5 8.3	12.046	2	13 5 18.26	1.9441	12 22 0.9	10.879
.22	1.8108	3 17 10.8	12.038	3	13 7 15.03	1.9483	12 32 52.4	10.836
.90	1.8121	3 29 12.8	12.029	4	13 9 12.06	1.9528	12 43 41.2	10.791
.67	1.8135	3 41 14.3	12.020	5	13 11 9.36	1.9573	12 54 27.3	10.746
.52	1.8149	3 53 15.2	12.009	6	13 13 6.93	1.9618	13 5 10.7	10.700
.46	1.8164	4 5 15.4	11.998	7	13 15 4.77	1.9663	13 15 51.3	10.653
.49	1.8181	4 17 15.0	11.988	8	13 17 2.88	1.9708	13 26 29.1	10.605
.63	1.8198	4 29 13.9	11.976	9	13 19 1.27	1.9755	13 37 3.9	10.556
.86	1.8215	4 41 12.1	11.963	10	13 20 59.94	1.9802	13 47 35.8	10.507
.21	1.8233	4 53 9.4	11.949	11	13 22 58.89	1.9849	13 58 4.7	10.456
.66	1.8252	5 5 6.0	11.936	12	13 24 58.13	1.9898	14 8 30.5	10.404
.23	1.8271	5 17 1.7	11.921	13	13 26 57.66	1.9946	14 18 53.2	10.352
.91	1.8291	5 28 56.5	11.906	14	13 28 57.48	1.9995	14 29 12.7	10.298
.72	1.8312	5 40 50.4	11.890	15	13 30 57.60	2.0044	14 39 29.0	10.243
.65	1.8333	5 52 43.3	11.873	16	13 32 58.01	2.0094	14 49 41.9	10.188
.71	1.8355	6 4 35.2	11.857	17	13 34 58.73	2.0144	14 59 51.5	10.132
.91	1.8378	6 16 26.1	11.839	18	13 36 59.74	2.0195	15 9 57.7	10.074
.24	1.8401	6 28 15.9	11.820	19	13 39 1.07	2.0248	15 20 0.4	10.015
.72	1.8425	6 40 4.5	11.801	20	13 41 2.71	2.0298	15 29 59.5	9.956
.34	1.8450	6 51 52.0	11.781	21	13 43 4.65	2.0350	15 39 55.1	9.896
.12	1.8475	7 3 38.2	11.760	22	13 45 6.91	2.0403	15 49 47.0	9.833
.04	1.8501	− 7 15 23.2	−11.739	23	13 47 9.49	2.0457	−15 59 35.1	− 9.771
		DECEMBER 8.				DECEMBER 10.		
.13	1.8528	− 7 27 6.9	−11.718	0	13 49 12.39	2.0509	−16 9 19.5	− 9.708
.38	1.8555	7 38 49.3	11.694	1	13 51 15.61	2.0563	16 19 0.0	9.643
.79	1.8583	7 50 30.2	11.671	2	13 53 19.15	2.0618	16 28 36.7	9.578
.38	1.8612	8 2 9.8	11.648	3	13 55 23.02	2.0673	16 38 9.3	9.510
.13	1.8640	8 13 47.9	11.623	4	13 57 27.22	2.0728	16 47 37.9	9.443
.06	1.8671	8 25 24.5	11.597	5	13 59 31.75	2.0783	16 57 2.4	9.373
.18	1.8702	8 36 59.5	11.570	6	14 1 36.61	2.0838	17 6 22.7	9.303
.48	1.8732	8 48 32.9	11.543	7	14 3 41.80	2.0893	17 15 38.8	9.233
.96	1.8764	9 0 4.6	11.515	8	14 5 47.33	2.0950	17 24 50.6	9.160
.65	1.8797	9 11 34.7	11.487	9	14 7 53.20	2.1007	17 33 58.0	9.087
.52	1.8829	9 23 3.0	11.457	10	14 9 59.41	2.1064	17 43 1.0	9.013
.60	1.8863	9 34 29.5	11.427	11	14 12 5.97	2.1121	17 51 59.5	8.937
.88	1.8898	9 45 54.2	11.396	12	14 14 12.86	2.1178	18 0 53.4	8.860
.37	1.8933	9 57 17.0	11.364	13	14 16 20.10	2.1235	18 9 42.7	8.783
.07	1.8968	10 8 37.9	11.332	14	14 18 27.68	2.1293	18 18 27.3	8.703
.98	1.9003	10 19 56.8	11.298	15	14 20 35.62	2.1352	18 27 7.1	8.623
.11	1.9041	10 31 13.7	11.265	16	14 22 43.90	2.1409	18 35 42.0	8.542
.47	1.9078	10 42 28.6	11.230	17	14 24 52.53	2.1468	18 44 12.1	8.460
.05	1.9116	10 53 41.3	11.194	18	14 27 1.51	2.1526	18 52 37.2	8.376
.86	1.9154	11 4 51.9	11.158	19	14 29 10.84	2.1585	19 0 57.2	8.291
.90	1.9194	11 16 0.2	11.120	20	14 31 20.53	2.1644	19 9 12.1	8.206
.19	1.9234	11 27 6.3	11.082	21	14 33 30.57	2.1703	19 17 21.9	8.119
.71	1.9273	11 38 10.0	11.043	22	14 35 40.96	2.1762	19 25 26.4	8.030
.47	1.9314	11 49 11.4	11.003	23	14 37 51.71	2.1821	19 33 25.5	7.941
.48	1.9356	−12 0 10.4	−10.963	24	14 40 2.81	2.1880	−19 41 19.3	− 7.851

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	DECEMBER 11.			
	h m s	s	° ′ ″	″
0	14 40 2.81	2.1880	−19 41 19.3	−7.851
1	14 42 14.27	2.1939	19 49 7.6	7.759
2	14 44 26.08	2.1998	19 56 50.4	7.667
3	14 46 38.25	2.2058	20 4 27.6	7.573
4	14 48 50.77	2.2117	20 11 59.1	7.477
5	14 51 3.65	2.2177	20 19 24.8	7.380
6	14 53 16.89	2.2236	20 26 44.7	7.283
7	14 55 30.48	2.2294	20 33 58.8	7.185
8	14 57 44.42	2.2353	20 41 6.9	7.084
9	14 59 58.72	2.2413	20 48 8.9	6.983
10	15 2 13.37	2.2472	20 55 4.9	6.882
11	15 4 28.38	2.2530	21 1 54.7	6.778
12	15 6 43.73	2.2588	21 8 38.2	6.673
13	15 8 59.44	2.2647	21 15 15.5	6.568
14	15 11 15.49	2.2705	21 21 46.3	6.460
15	15 13 31.90	2.2763	21 28 10.7	6.353
16	15 15 48.65	2.2821	21 34 28.6	6.243
17	15 18 5.75	2.2878	21 40 39.8	6.132
18	15 20 23.19	2.2935	21 46 44.4	6.021
19	15 22 40.97	2.2992	21 52 42.3	5.908
20	15 24 59.09	2.3048	21 58 33.4	5.794
21	15 27 17.55	2.3104	22 4 17.6	5.679
22	15 29 36.34	2.3159	22 9 54.9	5.563
23	15 31 55.46	2.3215	−22 15 25.1	−5.445
	DECEMBER 12.			
0	15 34 14.92	2.3271	−22 20 48.3	−5.327
1	15 36 34.71	2.3325	22 26 4.3	5.208
2	15 38 54.82	2.3378	22 31 13.2	5.088
3	15 41 15.25	2.3432	22 36 14.8	4.965
4	15 43 36.00	2.3485	22 41 9.0	4.842
5	15 45 57.07	2.3538	22 45 55.8	4.718
6	15 48 18.45	2.3590	22 50 35.2	4.593
7	15 50 40.15	2.3642	22 55 7.0	4.467
8	15 53 2.15	2.3692	22 59 31.2	4.340
9	15 55 24.45	2.3742	23 3 47.8	4.213
10	15 57 47.05	2.3791	23 7 56.7	4.083
11	16 0 9.94	2.3840	23 11 57.8	3.953
12	16 2 33.13	2.3889	23 15 51.1	3.823
13	16 4 56.61	2.3936	23 19 36.5	3.690
14	16 7 20.36	2.3983	23 23 13.9	3.556
15	16 9 44.40	2.4029	23 26 43.2	3.423
16	16 12 8.71	2.4073	23 30 4.6	3.288
17	16 14 33.28	2.4118	23 33 17.8	3.152
18	16 16 58.12	2.4163	23 36 22.8	3.014
19	16 19 23.23	2.4205	23 39 19.5	2.877
20	16 21 48.58	2.4247	23 42 8.0	2.739
21	16 24 14.19	2.4288	23 44 48.2	2.600
22	16 26 40.03	2.4328	23 47 20.0	2.459
23	16 29 6.12	2.4368	23 49 43.3	2.318
24	16 31 32.44	2.4406	−23 51 58.2	−2.177

Hour.	Right Ascension.	Var. per Min.	Declinatio
	DECEMBER 13.		
	h m s	s	° ′
0	16 31 32.44	2.4406	−23 51 58
1	16 33 58.99	2.4443	23 54 4
2	16 36 25.76	2.4480	23 56 2
3	16 38 52.75	2.4515	23 57 51
4	16 41 19.94	2.4549	23 59 31
5	16 43 47.34	2.4583	24 1 3
6	16 46 14.94	2.4616	24 2 26
7	16 48 42.73	2.4648	24 3 41
8	16 51 10.71	2.4678	24 4 46
9	16 53 38.86	2.4707	24 5 43
10	16 56 7.19	2.4735	24 6 30
11	16 58 35.68	2.4763	24 7 9
12	17 1 4.34	2.4789	24 7 39
13	17 3 33.15	2.4814	24 8 (
14	17 6 2.11	2.4838	24 8 11
15	17 8 31.20	2.4860	24 8 14
16	17 11 0.43	2.4883	24 8 8
17	17 13 29.79	2.4903	24 7 5
18	17 15 59.27	2.4923	24 7 2
19	17 18 28.86	2.4940	24 6 5
20	17 20 58.55	2.4957	24 6 1
21	17 23 28.34	2.4973	24 5 2
22	17 25 58.23	2.4989	24 4 1
23	17 28 28.21	2.5003	−24 3
	DECEMBER 14.		
0	17 30 58.26	2.5014	−24 1 4
1	17 33 28.38	2.5026	24 0 2
2	17 35 58.57	2.5036	23 58 4
3	17 38 28.81	2.5044	23 56 5
4	17 40 59.10	2.5053	23 54 5
5	17 43 29.44	2.5059	23 52 5
6	17 45 59.81	2.5064	23 50 3
7	17 48 30.21	2.5068	23 48 1
8	17 51 0.63	2.5072	23 45 4
9	17 53 31.07	2.5073	23 42 5
10	17 56 1.51	2.5074	23 40 (
11	17 58 31.96	2.5074	23 37
12	18 1 2.40	2.5073	23 33 5
13	18 3 32.83	2.5069	23 30 3
14	18 6 3.23	2.5065	23 27 (
15	18 8 33.61	2.5060	23 23 2
16	18 11 3.95	2.5054	23 19 4
17	18 13 34.26	2.5048	23 15 4
18	18 16 4.52	2.5038	23 11 4
19	18 18 34.72	2.5029	23 7 2
20	18 21 4.87	2.5019	23 3
21	18 23 34.95	2.5008	22 58 3
22	18 26 4.96	2.4995	22 53 4
23	18 28 34.89	2.4982	22 48 5
24	18 31 4.74	2.4967	−22 44

GREENWICH MEAN TIME.

DECEMBER 15.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	h m s	s	° ′ ″	″
0	18 31 4.74	2.4967	−22 44 0.0	+ 5.063
1	18 33 34.49	2.4951	22 38 51.8	5.211
2	18 36 4.15	2.4935	22 33 34.7	5.359
3	18 38 33.71	2.4917	22 28 8.7	5.507
4	18 41 3.15	2.4898	22 22 33.9	5.653
5	18 43 32.49	2.4879	22 16 50.4	5.798
6	18 46 1.70	2.4858	22 10 58.1	5.944
7	18 48 30.79	2.4838	22 4 57.1	6.088
8	18 50 59.75	2.4816	21 58 47.5	6.232
9	18 53 28.58	2.4793	21 52 29.3	6.375
10	18 55 57.26	2.4768	21 46 2.5	6.518
11	18 58 25.80	2.4744	21 39 27.2	6.659
12	19 0 54.19	2.4718	21 32 43.4	6.800
13	19 3 22.42	2.4692	21 25 51.2	6.939
14	19 5 50.49	2.4665	21 18 50.7	7.078
15	19 8 18.40	2.4638	21 11 41.9	7.216
16	19 10 46.14	2.4608	21 4 24.8	7.353
17	19 13 13.70	2.4579	20 56 59.5	7.489
18	19 15 41.09	2.4550	20 49 26.1	7.624
19	19 18 8.30	2.4520	20 41 44.6	7.758
20	19 20 35.33	2.4488	20 33 55.1	7.892
21	19 23 2.16	2.4457	20 25 57.6	8.024
22	19 25 28.81	2.4425	20 17 52.2	8.155
23	19 27 55.26	2.4392	−20 9 39.0	+ 8.284

DECEMBER 16.

0	19 30 21.51	2.4358	−20 1 18.1	+ 8.413
1	19 32 47.56	2.4324	19 52 49.4	8.542
2	19 35 13.40	2.4290	19 44 13.1	8.668
3	19 37 39.04	2.4255	19 35 29.3	8.793
4	19 40 4.46	2.4219	19 26 37.9	8.918
5	19 42 29.67	2.4184	19 17 39.1	9.041
6	19 44 54.67	2.4148	19 8 33.0	9.163
7	19 47 19.44	2.4111	18 59 19.5	9.284
8	19 49 44.00	2.4074	18 49 58.9	9.403
9	19 52 8.33	2.4037	18 40 31.1	9.523
10	19 54 32.44	2.3999	18 30 56.2	9.639
11	19 56 56.32	2.3962	18 21 14.4	9.755
12	19 59 19.98	2.3924	18 11 25.6	9.870
13	20 1 43.41	2.3885	18 1 30.0	9.983
14	20 4 6.60	2.3846	17 51 27.7	10.095
15	20 6 29.56	2.3808	17 41 18.6	10.206
16	20 8 52.29	2.3769	17 31 3.0	10.315
17	20 11 14.79	2.3730	17 20 40.8	10.423
18	20 13 37.05	2.3690	17 10 12.2	10.530
19	20 15 59.07	2.3651	16 59 37.2	10.636
20	20 18 20.86	2.3612	16 48 55.9	10.740
21	20 20 42.41	2.3573	16 38 8.4	10.843
22	20 23 3.73	2.3533	16 27 14.7	10.945
23	20 25 24.80	2.3493	16 16 15.0	11.044
24	20 27 45.64	2.3453	−16 5 9.4	+11.143

DECEMBER 17.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	h m s	s	° ′ ″	″
0	20 27 45.64	2.3453	−16 5 9.4	+11.143
1	20 30 6.24	2.3414	15 53 57.9	11.240
2	20 32 26.61	2.3374	15 42 40.6	11.335
3	20 34 46.73	2.3335	15 31 17.7	11.430
4	20 37 6.63	2.3296	15 19 49.0	11.523
5	20 39 26.28	2.3256	15 8 14.9	11.614
6	20 41 45.70	2.3218	14 56 35.3	11.705
7	20 44 4.89	2.3178	14 44 50.3	11.793
8	20 46 23.84	2.3138	14 33 0.1	11.881
9	20 48 42.55	2.3100	14 21 4.6	11.968
10	20 51 1.04	2.3063	14 9 4.0	12.052
11	20 53 19.30	2.3023	13 56 58.4	12.134
12	20 55 37.32	2.2985	13 44 47.9	12.216
13	20 57 55.12	2.2948	13 32 32.5	12.296
14	21 0 12.69	2.2909	13 20 12.4	12.374
15	21 2 30.03	2.2872	13 7 47.6	12.452
16	21 4 47.15	2.2835	12 55 18.2	12.528
17	21 7 4.05	2.2798	12 42 44.2	12.603
18	21 9 20.73	2.2763	12 30 5.9	12.675
19	21 11 37.20	2.2726	12 17 23.2	12.747
20	21 13 53.44	2.2689	12 4 36.3	12.817
21	21 16 9.47	2.2654	11 51 45.2	12.885
22	21 18 25.29	2.2620	11 38 50.1	12.953
23	21 20 40.91	2.2585	−11 25 50.9	+13.018

DECEMBER 18.

0	21 22 56.31	2.2550	−11 12 47.9	+13.082
1	21 25 11.51	2.2517	10 59 41.1	13.145
2	21 27 26.51	2.2483	10 46 30.5	13.207
3	21 29 41.31	2.2450	10 33 16.3	13.266
4	21 31 55.91	2.2418	10 19 58.6	13.324
5	21 34 10.32	2.2385	10 6 37.4	13.382
6	21 36 24.53	2.2353	9 53 12.8	13.438
7	21 38 38.56	2.2323	9 39 44.9	13.491
8	21 40 52.40	2.2292	9 26 13.9	13.543
9	21 43 6.06	2.2262	9 12 39.7	13.595
10	21 45 19.54	2.2232	8 59 2.5	13.644
11	21 47 32.84	2.2203	8 45 22.4	13.693
12	21 49 45.97	2.2174	8 31 39.4	13.739
13	21 51 58.93	2.2146	8 17 53.7	13.785
14	21 54 11.72	2.2118	8 4 5.2	13.829
15	21 56 24.35	2.2092	7 50 14.2	13.871
16	21 58 36.82	2.2065	7 36 20.7	13.913
17	22 0 49.13	2.2039	7 22 24.7	13.953
18	22 3 1.29	2.2014	7 8 26.4	13.990
19	22 5 13.30	2.1989	6 54 25.9	14.027
20	22 7 25.16	2.1965	6 40 23.2	14.063
21	22 9 36.88	2.1943	6 26 18.4	14.097
22	22 11 48.47	2.1919	6 12 11.6	14.129
23	22 13 59.91	2.1897	5 58 2.9	14.16
24	22 16 11.23	2.1876	− 5 43 52.3	+14.1

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	DECEMBER 19.			
	h m s	s	° ′ ″	″
0	22 16 11.23	2.1876	−5 43 52.3	+14.191
1	22 18 22.42	2.1854	5 29 40.0	14.218
2	22 20 33.48	2.1833	5 15 26.1	14.246
3	22 22 44.42	2.1814	5 1 10.5	14.272
4	22 24 55.25	2.1796	4 46 53.5	14.295
5	22 27 5.97	2.1777	4 32 35.1	14.318
6	22 29 16.57	2.1759	4 18 15.3	14.340
7	22 31 27.08	2.1743	4 3 54.3	14.359
8	22 33 37.48	2.1725	3 49 32.2	14.378
9	22 35 47.78	2.1710	3 35 8.9	14.396
10	22 37 58.00	2.1695	3 20 44.7	14.412
11	22 40 8.12	2.1680	3 6 19.5	14.427
12	22 42 18.16	2.1667	2 51 53.5	14.439
13	22 44 28.12	2.1654	2 37 26.8	14.452
14	22 46 38.01	2.1642	2 22 59.3	14.462
15	22 48 47.82	2.1629	2 8 31.4	14.470
16	22 50 57.56	2.1618	1 54 2.9	14.479
17	22 53 7.24	2.1610	1 39 33.9	14.485
18	22 55 16.86	2.1601	1 25 4.7	14.490
19	22 57 26.43	2.1590	1 10 35.1	14.494
20	22 59 35.94	2.1582	0 56 5.4	14.496
21	23 1 45.41	2.1574	0 41 35.6	14.497
22	23 3 54.83	2.1567	0 27 5.8	14.497
23	23 6 4.21	2.1561	−0 12 36.0	+14.495
	DECEMBER 20.			
0	23 8 13.56	2.1556	+0 1 53.6	+14.492
1	23 10 22.88	2.1551	0 16 23.0	14.488
2	23 12 32.17	2.1547	0 30 52.1	14.482
3	23 14 41.44	2.1543	0 45 20.8	14.475
4	23 16 50.69	2.1541	0 59 49.1	14.467
5	23 18 59.93	2.1539	1 14 16.8	14.458
6	23 21 9.16	2.1538	1 28 44.0	14.447
7	23 23 18.38	2.1537	1 43 10.4	14.433
8	23 25 27.60	2.1538	1 57 36.0	14.420
9	23 27 36.83	2.1538	2 12 0.8	14.406
10	23 29 46.06	2.1539	2 26 24.7	14.390
11	23 31 55.30	2.1542	2 40 47.6	14.373
12	23 34 4.56	2.1545	2 55 9.4	14.353
13	23 36 13.84	2.1548	3 9 30.0	14.333
14	23 38 23.14	2.1552	3 23 49.4	14.312
15	23 40 32.46	2.1557	3 38 7.4	14.289
16	23 42 41.82	2.1563	3 52 24.1	14.266
17	23 44 51.22	2.1569	4 6 39.3	14.240
18	23 47 0.65	2.1576	4 20 52.9	14.213
19	23 49 10.13	2.1583	4 35 4.9	14.186
20	23 51 19.65	2.1592	4 49 15.2	14.157
21	23 53 29.23	2.1601	5 3 23.7	14.126
22	23 55 38.86	2.1610	5 17 30.3	14.094
23	23 57 48.55	2.1621	5 31 35.0	14.062
24	23 59 58.31	2.1632	+5 45 37.7	+14.028

Hour.	Right Ascension.	Var. per Min.	Declination.
	DECEMBER 21.		
	h m s	s	° ′ ″
0	23 59 58.31	2.1632	+ 5 45 37.7
1	0 2 8.13	2.1643	5 59 38.3
2	0 4 18.03	2.1656	6 13 36.7
3	0 6 28.00	2.1668	6 27 32.9
4	0 8 38.05	2.1682	6 41 26.7
5	0 10 48.18	2.1695	6 55 18.2
6	0 12 58.39	2.1710	7 9 7.2
7	0 15 8.70	2.1726	7 22 53.6
8	0 17 19.10	2.1742	7 36 37.4
9	0 19 29.60	2.1758	7 50 18.5
10	0 21 40.20	2.1775	8 3 56.8
11	0 23 50.90	2.1793	8 17 32.3
12	0 26 1.71	2.1811	8 31 4.9
13	0 28 12.63	2.1830	8 44 34.4
14	0 30 23.67	2.1849	8 58 0.9
15	0 32 34.82	2.1868	9 11 24.2
16	0 34 46.09	2.1889	9 24 44.3
17	0 36 57.49	2.1911	9 38 1.0
18	0 39 9.02	2.1932	9 51 14.4
19	0 41 20.67	2.1953	10 4 24.3
20	0 43 32.46	2.1976	10 17 30.7
21	0 45 44.38	2.1999	10 30 33.5
22	0 47 56.45	2.2023	10 43 32.7
23	0 50 8.65	2.2046	+10 56 28.0
	DECEMBER 22.		
0	0 52 21.00	2.2071	+11 9 19.6
1	0 54 33.50	2.2096	11 22 7.2
2	0 56 46.15	2.2121	11 34 50.9
3	0 58 58.95	2.2147	11 47 30.5
4	1 1 11.91	2.2173	12 0 6.0
5	1 3 25.03	2.2200	12 12 37.2
6	1 5 38.31	2.2227	12 25 4.2
7	1 7 51.75	2.2254	12 37 26.9
8	1 10 5.36	2.2283	12 49 45.1
9	1 12 19.14	2.2310	13 1 58.9
10	1 14 33.08	2.2338	13 14 8.0
11	1 16 47.20	2.2368	13 26 12.6
12	1 19 1.49	2.2397	13 38 12.4
13	1 21 15.96	2.2426	13 50 7.4
14	1 23 30.60	2.2456	14 1 57.6
15	1 25 45.43	2.2486	14 13 42.9
16	1 28 0.43	2.2516	14 25 23.1
17	1 30 15.62	2.2547	14 36 58.3
18	1 32 30.99	2.2578	14 48 28.3
19	1 34 46.55	2.2608	14 59 53.2
20	1 37 2.29	2.2640	15 11 12.7
21	1 39 18.23	2.2672	15 22 26.8
22	1 41 34.35	2.2703	15 33 35.6
23	1 43 50.66	2.2734	15 44 38.8
24	1 46 7.16	2.2767	+15 55 36.5

GREENWICH MEAN TIME.

	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	DECEMBER 23.			
	h m s	s	° ′ ″	″
1	1 46 7.16	2.2767	+15 55 36.5	+10.914
	1 48 23.86	2.2798	16 6 28.5	10.820
	1 50 40.74	2.2831	16 17 14.9	10.724
	1 52 57.83	2.2863	16 27 55.4	10.627
	1 55 15.10	2.2895	16 38 30.1	10.529
	1 57 32.57	2.2928	16 48 58.9	10.431
	1 59 50.24	2.2961	16 59 21.8	10.330
	2 2 8.10	2.2993	17 9 38.5	10.228
	2 4 26.16	2.3026	17 19 49.2	10.127
	2 6 44.41	2.3058	17 29 53.7	10.023
	2 9 2.85	2.3090	17 39 51.9	9.918
1	2 11 21.49	2.3123	17 49 43.8	9.813
2	2 13 40.33	2.3156	17 59 29.4	9.706
13	2 15 59.36	2.3188	18 9 8.5	9.598
14	2 18 18.59	2.3221	18 18 41.1	9.489
15	2 20 38.01	2.3253	18 28 7.2	9.379
16	2 22 57.62	2.3284	18 37 26.6	9.268
17	2 25 17.42	2.3316	18 46 39.3	9.156
18	2 27 37.41	2.3348	18 55 45.3	9.043
19	2 29 57.59	2.3379	19 4 44.5	8.928
20	2 32 17.96	2.3411	19 13 36.7	8.813
21	2 34 38.52	2.3442	19 22 22.1	8.698
22	2 36 59.26	2.3472	19 31 0.5	8.581
23	2 39 20.18	2.3503	+19 39 31.8	+ 8.463
	DECEMBER 24.			
0	2 41 41.29	2.3533	+19 47 56.0	+ 8.343
1	2 44 2.58	2.3563	19 56 13.0	8.223
2	2 46 24.05	2.3593	20 4 22.8	8.103
3	2 48 45.69	2.3622	20 12 25.4	7.982
4	2 51 7.51	2.3651	20 20 20.6	7.858
5	2 53 29.50	2.3678	20 28 8.4	7.735
6	2 55 51.65	2.3707	20 35 48.8	7.611
7	2 58 13.98	2.3735	20 43 21.7	7.485
8	3 0 36.47	2.3762	20 50 47.0	7.359
9	3 2 59.12	2.3788	20 58 4.8	7.233
10	3 5 21.93	2.3815	21 5 14.9	7.104
11	3 7 44.90	2.3841	21 12 17.3	6.976
12	3 10 8.02	2.3866	21 19 12.0	6.847
13	3 12 31.29	2.3891	21 25 58.9	6.717
14	3 14 54.71	2.3915	21 32 38.0	6.586
15	3 17 18.27	2.3938	21 39 9.2	6.453
16	3 19 41.97	2.3962	21 45 32.4	6.322
17	3 22 5.81	2.3983	21 51 47.8	6.189
18	3 24 29.77	2.4005	21 57 55.1	6.055
19	3 26 53.87	2.4027	22 3 54.4	5.921
20	3 29 18.09	2.4048	22 9 45.6	5.785
21	3 31 42.44	2.4067	22 15 28.6	5.649
22	3 34 6.89	2.4085	22 21 3.5	5.514
23	3 36 31.46	2.4104	22 26 30.3	5.378
24	*3 38 56.14*	*2.4122*	*+22 31 48.8*	*+ 5.239*

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	DECEMBER 25.			
	h m s	s	° ′ ″	″
0	3 38 56.14	2.4122	+22 31 48.8	+5.239
1	3 41 20.92	2.4138	22 36 59.0	5.102
2	3 43 45.80	2.4154	22 42 1.0	4.963
3	3 46 10.77	2.4170	22 46 54.6	4.824
4	3 48 35.84	2.4184	22 51 39.9	4.685
5	3 51 0.98	2.4198	22 56 16.8	4.545
6	3 53 26.21	2.4211	23 0 45.3	4.404
7	3 55 51.51	2.4223	23 5 5.3	4.263
8	3 58 16.89	2.4234	23 9 16.9	4.123
9	4 0 42.32	2.4244	23 13 20.0	3.981
10	4 3 7.82	2.4254	23 17 14.6	3.839
11	4 5 33.37	2.4263	23 21 0.7	3.697
12	4 7 58.97	2.4271	23 24 38.2	3.554
13	4 10 24.62	2.4278	23 28 7.2	3.412
14	4 12 50.30	2.4283	23 31 27.6	3.268
15	4 15 16.02	2.4288	23 34 39.4	3.125
16	4 17 41.76	2.4292	23 37 42.6	2.982
17	4 20 7.52	2.4295	23 40 37.2	2.838
18	4 22 33.30	2.4298	23 43 23.2	2.694
19	4 24 59.09	2.4299	23 46 0.5	2.550
20	4 27 24.89	2.4299	23 48 29.2	2.407
21	4 29 50.68	2.4298	23 50 49.3	2.262
22	4 32 16.46	2.4297	23 53 0.6	2.117
23	4 34 42.24	2.4294	+23 55 3.3	+1.973
	DECEMBER 26.			
0	4 37 7.99	2.4290	+23 56 57.4	+1.829
1	4 39 33.72	2.4286	23 58 42.8	1.684
2	4 41 59.42	2.4281	24 0 19.5	1.540
3	4 44 25.09	2.4274	24 1 47.6	1.396
4	4 46 50.71	2.4266	24 3 7.0	1.251
5	4 49 16.28	2.4258	24 4 17.7	1.107
6	4 51 41.80	2.4248	24 5 19.8	0.963
7	4 54 7.25	2.4238	24 6 13.3	0.819
8	4 56 32.65	2.4227	24 6 58.1	0.675
9	4 58 57.97	2.4213	24 7 34.3	0.532
10	5 1 23.21	2.4199	24 8 1.9	0.388
11	5 3 48.36	2.4185	24 8 20.9	0.245
12	5 6 13.43	2.4170	24 8 31.3	+0.103
13	5 8 38.40	2.4153	24 8 33.2	−0.040
14	5 11 3.27	2.4137	24 8 26.5	0.183
15	5 13 28.04	2.4118	24 8 11.2	0.325
16	5 15 52.69	2.4098	24 7 47.5	0.466
17	5 18 17.22	2.4078	24 7 15.3	0.607
18	5 20 41.63	2.4057	24 6 34.7	0.748
19	5 23 5.90	2.4034	24 5 45.5	0.889
20	5 25 30.04	2.4012	24 4 48.0	1.028
21	5 27 54.04	2.3988	24 3 42.1	1.168
22	5 30 17.89	2.3963	24 2 27.8	1.308
23	5 32 41.59	2.3937	24 1 5.2	1.446
24	5 35 5.13	2.3910	+23 59 34.3	−1.584

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
	DECEMBER 27.			
	h m s	s	° ′ ″	″
0	5 35 5.13	2.3910	+23 59 34.3	−1.584
1	5 37 28.51	2.3883	23 57 55.1	1.722
2	5 39 51.72	2.3853	23 56 7.7	1.858
3	5 42 14.75	2.3824	23 54 12.1	1.995
4	5 44 37.61	2.3794	23 52 8.3	2.131
5	5 47 0.28	2.3763	23 49 56.4	2.266
6	5 49 22.77	2.3732	23 47 36.4	2.401
7	5 51 45.06	2.3698	23 45 8.3	2.535
8	5 54 7.15	2.3665	23 42 32.2	2.668
9	5 56 29.04	2.3631	23 39 48.1	2.801
10	5 58 50.72	2.3595	23 36 56.1	2.933
11	6 1 12.18	2.3559	23 33 56.2	3.063
12	6 3 33.43	2.3523	23 30 48.5	3.193
13	6 5 54.45	2.3485	23 27 33.0	3.323
14	6 8 15.25	2.3448	23 24 9.7	3.453
15	6 10 35.82	2.3408	23 20 38.7	3.580
16	6 12 56.15	2.3369	23 17 0.1	3.708
17	6 15 16.25	2.3329	23 13 13.8	3.834
18	6 17 36.10	2.3288	23 9 20.0	3.960
19	6 19 55.70	2.3247	23 5 18.6	4.085
20	6 22 15.06	2.3205	23 1 9.8	4.208
21	6 24 34.16	2.3163	22 56 53.6	4.331
22	6 26 53.01	2.3119	22 52 30.1	4.453
23	6 29 11.59	2.3075	+22 47 59.2	−4.575
	DECEMBER 28.			
0	6 31 29.91	2.3031	+22 43 21.1	−4.695
1	6 33 47.96	2.2986	22 38 35.8	4.815
2	6 36 5.74	2.2941	22 33 43.3	4.933
3	6 38 23.25	2.2895	22 28 43.8	5.050
4	6 40 40.48	2.2848	22 23 37.3	5.168
5	6 42 57.43	2.2802	22 18 23.7	5.283
6	6 45 14.10	2.2754	22 13 3.3	5.398
7	6 47 30.48	2.2707	22 7 36.0	5.512
8	6 49 46.58	2.2658	22 2 1.9	5.624
9	6 52 2.38	2.2610	21 56 21.1	5.737
10	6 54 17.90	2.2562	21 50 33.5	5.848
11	6 56 33.12	2.2512	21 44 39.4	5.957
12	6 58 48.04	2.2463	21 38 38.7	6.066
13	7 1 2.67	2.2413	21 32 31.5	6.173
14	7 3 16.99	2.2362	21 26 17.9	6.280
15	7 5 31.01	2.2313	21 19 57.9	6.386
16	7 7 44.74	2.2262	21 13 31.6	6.490
17	7 9 58.15	2.2210	21 6 59.1	6.594
18	7 12 11.26	2.2160	21 0 20.3	6.697
19	7 14 24.07	2.2108	20 53 35.5	6.798
20	7 16 36.56	2.2057	20 46 44.6	6.899
21	7 18 48.75	2.2005	20 39 47.6	6.998
22	7 21 0.62	2.1953	20 32 44.8	7.097
23	7 23 12.19	2.1902	20 25 36.0	7.194
24	7 25 23.44	2.1849	+20 18 21.5	−7.289

Hour.	Right Ascension.	Var. per Min.	Declination.
	DECEMBER 29.		
	h m s	s	° ′ ″
0	7 25 23.44	2.1849	+20 18 21.5
1	7 27 34.38	2.1798	20 11 1.3
2	7 29 45.01	2.1745	20 3 35.3
3	7 31 55.32	2.1693	19 56 3.8
4	7 34 5.32	2.1640	19 48 26.7
5	7 36 15.00	2.1588	19 40 44.1
6	7 38 24.37	2.1536	19 32 56.2
7	7 40 33.43	2.1483	19 25 2.8
8	7 42 42.16	2.1430	19 17 4.1
9	7 44 50.59	2.1378	19 9 0.3
10	7 46 58.70	2.1325	19 0 51.2
11	7 49 6.49	2.1273	18 52 37.1
12	7 51 13.97	2.1221	18 44 17.9
13	7 53 21.14	2.1169	18 35 53.8
14	7 55 28.00	2.1117	18 27 24.7
15	7 57 34.54	2.1064	18 18 50.8
16	7 59 40.77	2.1013	18 10 12.2
17	8 1 46.70	2.0962	18 1 28.8
18	8 3 52.31	2.0909	17 52 40.7
19	8 5 57.61	2.0858	17 43 48.1
20	8 8 2.61	2.0808	17 34 50.9
21	8 10 7.30	2.0757	17 25 49.3
22	8 12 11.69	2.0706	17 16 43.3
23	8 14 15.77	2.0655	+17 7 32.9
	DECEMBER 30.		
0	8 16 19.55	2.0605	+16 58 18.2
1	8 18 23.03	2.0555	16 48 59.4
2	8 20 26.21	2.0505	16 39 36.4
3	8 22 29.09	2.0456	16 30 9.3
4	8 24 31.68	2.0407	16 20 38.2
5	8 26 33.97	2.0358	16 11 3.1
6	8 28 35.97	2.0309	16 1 24.1
7	8 30 37.68	2.0261	15 51 41.3
8	8 32 39.10	2.0213	15 41 54.7
9	8 34 40.23	2.0165	15 32 4.3
10	8 36 41.08	2.0118	15 22 10.3
11	8 38 41.64	2.0070	15 12 12.7
12	8 40 41.92	2.0024	15 2 11.5
13	8 42 41.93	1.9978	14 52 6.8
14	8 44 41.65	1.9932	14 41 58.8
15	8 46 41.11	1.9887	14 31 47.3
16	8 48 40.29	1.9842	14 21 32.5
17	8 50 39.21	1.9797	14 11 14.5
18	8 52 37.85	1.9752	14 0 53.3
19	8 54 36.23	1.9709	13 50 28.9
20	8 56 34.36	1.9666	13 40 1.4
21	8 58 32.22	1.9622	13 29 30.9
22	9 0 29.82	1.9579	13 18 57.4
23	9 2 27.17	1.9538	13 8 21.0
24	9 4 24.27	1.9496	+12 57 41.7

GREENWICH MEAN TIME.

Right ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
DECEMBER 31.				DECEMBER 31.				
m s	s	° ′ ″	″		h m s	s	° ′ ″	″
4 24.27	1.9496	+12 57 41.7	−10.678	12	9 27 30.92	1.9034	+10 46 25.8	−11.178
6 21.12	1.9455	12 46 59.6	10.725	13	9 29 25.02	1.8999	10 35 14.0	11.214
8 17.73	1.9414	12 36 14.7	10.770	14	9 31 18.91	1.8964	10 24 0.1	11.249
10 14.09	1.9373	12 25 27.2	10.815	15	9 33 12.59	1.8931	10 12 44.1	11.283
12 10.21	1.9334	12 14 36.9	10.859	16	9 35 6.08	1.8898	10 1 26.1	11.318
14 6.10	1.9295	12 3 44.1	10.902	17	9 36 59.36	1.8863	9 50 6.0	11.351
16 1.75	1.9256	11 52 48.7	10.943	18	9 38 52.44	1.8832	9 38 44.0	11.383
17 57.17	1.9218	11 41 50.9	10.985	19	9 40 45.34	1.8800	9 27 20.1	11.414
19 52.36	1.9180	11 30 50.5	11.026	20	9 42 38.04	1.8768	9 15 54.3	11.444
21 47.33	1.9143	11 19 47.8	11.065	21	9 44 30.56	1.8738	9 4 26.8	11.474
23 42.08	1.9107	11 8 42.7	11.103	22	9 46 22.89	1.8707	8 52 57.4	11.503
25 36.61	1.9070	10 57 35.4	11.141	23	9 48 15.04	1.8678	8 41 26.4	11.531
27 30.92	1.9034	+10 46 25.8	−11.178	24	9 50 7.02	1.8648	+ 8 29 53.7	−11.558

PHASES OF THE MOON.

		d	h	m		d	h	m		d	h	m		d	h	m
loon	Jan.	7	19	42.0	Apr.	7	1	48.8	July	4	9	40.5	Sept.	30	8	31.1
uarter		15	23	42.1		14	8	12.0		11	0	11.9	Oct.	7	10	14.3
loon		22	19	40.0		21	2	1.3		18	15	0.1		15	14	41.0
uarter		29	13	1.5		28	17	22.0		26	18	40.4		23	2	37.7
loon	Feb.	6	15	28.4	May	6	14	43.3	Aug.	2	17	10.9		29	18	19.2
uarter		14	13	53.2		13	13	47.9		9	7	56.4	Nov.	6	5	3.5
loon		21	6	9.0		20	12	46.8		17	6	21.0		14	6	28.5
uarter		28	4	43.7		28	11	33.5		25	7	8.2		21	10	28.8
loon	Mar.	8	9	58.0	June	5	1	6.7	Sept.	1	0	28.5		28	6	41.3
uarter		16	0	33.1		11	18	38.5		7	19	5.2	Dec.	6	2	13.8
loon		22	16	5.0		19	1	2.2		15	22	27.5		13	21	17.3
uarter		29	22	36.4		27	4	8.4		23	17	41.4		20	18	7.3
loon	Apr.	7	1	48.8	July	4	9	40.5		30	8	31.1		27	21	51.6
uarter		14	8	12.0		11	0	11.9	Oct.	7	10	14.3				

APOGEE.

d	h		d	h
9	20.4	July	21	17.6
5	20.7	August	18	0.5
5	2.9	September	14	2.7
1	19.2	October	11	12.5
29	14.2	November	8	5.4
27	9.4	December	6	2.3
24	3.1			

PERIGEE.

d	h		d	h
January	23	0.6	August	3	9.9
February	20	13.3	August	31	19.9
March	20	21.2	September	29	6.1
April	17	15.2	October	27	10.8
May	13	6.6	November	23	18.5
June	8	8.2	December	18	10.2
July	6	3.6			

GREENWICH MEAN TIME.

G. M. T.	Longitude.	Latitude.	Semi-diameter.	Horizontal Parallax.	Var. per Hour.	Age.	Transit, Meridian of Gree	
	° ′ ″	° ′ ″	′ ″	′ ″	″	d		
Jan. 1.0	22 50 37.6	+5 17 1.2	15 36.4	57 10.73	−1.810	7.6	Jan. 1	U
1.5	29 24 53.3	5 13 6.2	15 30.6	56 49.55	1.718	8.1	1	L
2.0	35 54 31.8	5 5 12.4	15 25.2	56 29.55	1.615	8.6	2	U
2.5	42 19 50.8	4 53 33.4	15 20.1	56 10.81	1.508	9.1	2	L
3.0	48 41 8.7	4 38 24.2	15 15.3	55 53.38	1.396	9.6	3	U
3.5	54 58 43.7	+4 20 1.2	15 10.9	55 37.30	−1.286	10.1	3	L
4.0	61 12 54.5	3 58 42.0	15 6.9	55 22.51	1.175	10.6	4	U
4.5	67 23 58.6	3 34 44.9	15 3.2	55 9.01	1.070	11.1	4	L
5.0	73 32 13.1	3 8 29.1	14 59.9	54 56.80	0.969	11.6	5	U
5.5	79 37 54.2	2 40 14.4	14 56.9	54 45.73	0.872	12.1	5	L
6.0	85 41 17.2	+2 10 21.1	14 54.2	54 35.85	−0.774	12.6	6	U
6.5	91 42 37.4	1 39 9.7	14 51.8	54 27.12	0.682	13.1	6	L
7.0	97 42 9.2	1 7 1.4	14 49.7	54 19.49	0.589	13.6	7	U
7.5	103 40 7.1	0 34 16.8	14 48.0	54 12.98	0.495	14.1		
8.0	109 36 45.5	+0 1 16.6	14 46.5	54 7.61	0.400	14.6	8	L
8.5	115 32 19.0	−0 31 38.6	14 45.3	54 3.41	−0.300	15.1	8	U
9.0	121 27 3.0	1 4 8.8	14 44.5	54 0.44	0.195	15.6	9	L
9.5	127 21 13.5	1 35 54.5	14 44.1	53 58.76	−0.083	16.1	9	U
10.0	133 15 7.7	2 6 37.0	14 44.0	53 58.47	+0.037	16.6	10	L
10.5	139 9 4.0	2 35 58.1	14 44.3	53 59.67	0.165	17.1	10	U
11.0	145 3 22.0	−3 3 40.7	14 45.1	54 2.47	+0.303	17.6	11	L
11.5	150 58 23.3	3 29 28.1	14 46.3	54 6.98	0.450	18.1	11	U
12.0	156 54 30.9	3 53 4.7	14 48.0	54 13.31	0.606	18.6	12	L
12.5	162 52 9.5	4 14 15.6	14 50.3	54 21.58	0.774	19.1	12	U
13.0	168 51 45.4	4 32 46.6	14 53.1	54 31.90	0.947	19.6	13	L
13.5	174 53 46.8	−4 48 24.2	14 56.5	54 44.34	+1.127	20.1	13	U
14.0	180 58 42.6	5 0 55.3	15 0.5	54 58.97	1.311	20.6	14	L
14.5	187 7 3.4	5 10 7.9	15 5.1	55 15.81	1.496	21.1	14	U
15.0	193 19 19.9	5 15 50.5	15 10.3	55 34.86	1.678	21.6	15	L
15.5	199 36 2.7	5 17 52.4	15 16.0	55 56.05	1.853	22.1	15	U
16.0	205 57 42.2	−5 16 3.7	15 22.4	56 19.29	+2.017	22.6	16	L
16.5	212 24 47.2	5 10 16.4	15 29.2	56 44.39	2.162	23.1	16	U
17.0	218 57 43.9	5 0 23.8	15 36.5	57 11.09	2.284	23.6	17	L
17.5	225 36 55.1	4 46 21.9	15 44.1	57 39.09	2.377	24.1	17	U
18.0	232 22 39.2	4 28 9.7	15 52.0	58 7.96	2.428	24.6	18	L
18.5	239 15 8.1	−4 5 49.9	16 0.0	58 37.18	+2.434	25.1	18	U
19.0	246 14 26.5	3 39 30.2	16 7.8	59 6.17	2.388	25.6	19	L
19.5	253 20 30.6	3 9 24.1	16 15.5	59 34.26	2.283	26.1	19	U
20.0	260 33 6.7	2 35 51.1	16 22.7	60 0.73	2.117	26.6	20	L
20.5	267 51 50.2	1 59 17.5	16 29.3	60 24.82	1.889	27.1	20	U
21.0	275 16 5.8	−1 20 17.0	16 35.0	60 45.82	+1.600	27.6	21	L
21.5	282 45 7.2	−0 39 29.3	16 39.7	61 3.01	1.256	28.1	21	U
22.0	290 17 57.7	+0 2 19.8	16 43.2	61 15.80	0.869	28.6		
22.5	297 53 32.6	0 44 20.4	16 45.3	61 23.74	0.451	29.1	22	L
23.0	305 30 40.0	1 25 40.9	16 46.1	61 26.56	+0.018	0.2	23	U
23.5	313 8 4.4	+2 5 29.7	16 45.4	61 24.17	−0.415	0.7	23	L
24.0	320 44 29.8	+2 42 57.9	16 43.4	61 16.68	−0.828	1.2	24	U

GREENWICH MEAN TIME.

M. T.	Longitude.	Latitude.	Semi-diameter.	Horizontal Parallax.	Var. per Hour.	Age.	Transit, Meridian of Greenwich.			Var. per Hour.
	° ′ ″	° ′ ″	′ ″	′ ″	″	d			h m	m
h. 24.0	320 44 29.8	+2 42 57.9	16 43.4	61 16.68	−0.828	1.2	Jan. 24	U	1 19.0	2.30
24.5	328 18 41.4	3 17 21.3	16 40.1	61 4.41	1.210	1.7	24	L	13 46.2	2.23
25.0	335 49 29.8	3 48 2.9	16 35.5	60 47.80	1.548	2.2	25	U	2 12.6	2.17
25.5	343 15 53.5	4 14 32.7	16 30.0	60 27.48	1.830	2.7	25	L	14 38.4	2.12
26.0	350 37 0.2	4 36 29.7	16 23.6	60 4.12	2.052	3.2	26	U	3 3.6	2.09
26.5	357 52 8.4	+4 53 41.0	16 16.7	59 38.47	−2.213	3.7	26	L	15 28.5	2.06
27.0	5 0 48.5	5 6 1.1	16 9.2	59 11.25	2.314	4.2	27	U	3 53.2	2.05
27.5	12 2 41.9	5 13 31.7	16 1.6	58 43.14	2.360	4.7	27	L	16 17.8	2.05
28.0	18 57 40.9	5 16 19.7	15 53.9	58 14.80	2.355	5.2	28	U	4 42.4	2.06
28.5	25 45 47.1	5 14 36.6	15 46.2	57 46.80	2.306	5.7	28	L	17 7.2	2.07
29.0	32 27 10.6	+5 8 37.0	15 38.8	57 19.59	−2.224	6.2	29	U	5 32.1	2.09
29.5	39 2 8.7	4 58 37.9	15 31.7	56 53.54	2.113	6.7	29	L	17 57.3	2.11
30.0	45 31 3.6	4 44 57.8	15 25.0	56 28.98	1.978	7.2	30	U	6 22.8	2.13
30.5	51 54 21.6	4 27 56.1	15 18.8	56 6.14	1.828	7.7	30	L	18 48.5	2.15
31.0	58 12 32.0	4 7 52.4	15 13.1	55 45.15	1.669	8.2	31	U	7 14.4	2.16
31.5	64 26 5.7	+3 45 6.7	15 7.9	55 26.10	−1.504	8.7	31	L	19 40.3	2.17
h. 1.0	70 35 34.2	3 19 59.0	15 3.2	55 9.05	1.338	9.2	Feb. 1	U	8 6.3	2.16
1.5	76 41 29.3	2 52 49.0	14 59.1	54 53.98	1.172	9.7	1	L	20 32.2	2.14
2.0	82 44 21.7	2 23 56.3	14 55.6	54 40.89	1.011	10.2	2	U	8 57.8	2.12
2.5	88 44 41.4	1 53 40.4	14 52.5	54 29.69	0.857	10.7	2	L	21 23.1	2.09
3.0	94 42 56.4	+1 22 21.0	14 49.9	54 20.30	−0.709	11.2	3	U	9 48.0	2.05
3.5	100 39 33.6	0 50 17.5	14 47.9	54 12.64	0.568	11.7	3	L	22 12.3	2.00
4.0	106 34 57.2	+0 17 49.3	14 46.2	54 6.64	0.435	12.2	4	U	10 36.1	1.95
4.5	112 29 30.1	−0 14 44.3	14 45.0	54 2.18	0.309	12.7	4	L	22 59.2	1.91
5.0	118 23 32.8	0 47 3.9	14 44.2	53 59.19	0.191	13.2	5	U	11 21.8	1.86
5.5	124 17 24.4	−1 18 50.2	14 43.8	53 57.57	−0.079	13.7	5	L	23 43.8	1.81
6.0	130 11 22.4	1 49 44.3	14 43.7	53 57.28	+0.030	14.2	6	U	12 5.4	1.77
6.5	136 5 42.6	2 19 27.5	14 43.9	53 58.27	0.135	14.7			. . . . .	. . .
7.0	142 0 39.9	2 47 41.7	14 44.6	54 0.51	0.238	15.2	7	L	0 26.4	1.74
7.5	147 56 28.4	3 14 9.3	14 45.5	54 3.99	0.342	15.7	7	U	12 47.2	1.71
8.0	153 53 21.4	−3 38 33.3	14 46.8	54 8.73	+0.448	16.2	8	L	1 7.6	1.69
8.5	159 51 32.3	4 0 37.8	14 48.4	54 14.74	0.555	16.7	8	U	13 27.9	1.69
9.0	165 51 14.5	4 20 7.8	14 50.4	54 22.07	0.667	17.2	9	L	1 48.1	1.69
9.5	171 52 41.9	4 36 49.3	14 52.8	54 30.78	0.785	17.7	9	U	14 8.4	1.70
10.0	177 56 9.1	4 50 29.6	14 55.6	54 40.94	0.908	18.2	10	L	2 28.9	1.71
10.5	184 1 51.8	−5 0 57.2	14 58.8	54 52.59	+1.035	18.7	10	U	14 49.6	1.74
11.0	190 10 7.0	5 8 2.0	15 2.4	55 5.81	1.168	19.2	11	L	3 10.8	1.78
11.5	196 21 13.0	5 11 35.2	15 6.4	55 20.65	1.305	19.7	11	U	15 32.5	1.84
12.0	202 35 29.4	5 11 29.5	15 10.9	55 37.14	1.444	20.2	12	L	3 55.0	1.90
12.5	208 53 17.0	5 7 39.3	15 15.8	55 55.31	1.583	20.7	12	U	16 18.2	1.97
13.0	215 14 57.6	−5 0 0.6	15 21.2	56 15.13	+1.719	21.2	13	L	4 42.3	2.05
13.5	221 40 53.9	4 48 31.7	15 27.1	56 36.53	1.847	21.7	13	U	17 7.4	2.14
14.0	228 11 28.3	4 33 12.6	15 33.3	56 59.40	1.963	22.2	14	L	5 33.6	2.23
14.5	234 47 2.7	4 14 6.1	15 39.9	57 23.57	2.062	22.7	14	U	18 0.8	2.31
15.0	241 27 57.7	3 51 18.0	15 46.8	57 48.78	2.137	23.2	15	L	6 29.1	2.40
15.5	248 14 31.4	−3 24 57.6	15 53.8	58 14.73	+2.183	23.7	15	U	18 58.3	2.47
16.0	255 6 58.1	−2 55 18.3	16 1.0	58 41.02	+2.191	24.2	16	L	7 28.3	2.53

GREENWICH MEAN TIME.

G. M. T.	Longitude.	Latitude.	Semi-diameter.	Horizontal Parallax.	Var. per Hour.	Age.	Transit Meridian of Gr	
	° ′ ″	° ′ ″	′ ″	′ ″	″	d		
Feb. 16.0	255 6 58.1	−2 55 18.3	16 1.0	58 41.02	+2.191	24.2	Feb. 16	L
16.5	262 5 27.0	2 22 37.8	16 8.1	59 7.15	2.156	24.7	16	U
17.0	269 10 1.0	1 47 19.2	16 15.1	59 32.56	2.071	25.2	17	L
17.5	276 20 35.1	1 9 50.7	16 21.6	59 56.64	1.932	25.7	17	U
18.0	283 36 54.9	−0 30 45.9	16 27.6	60 18.72	1.738	26.2	18	L
18.5	290 58 35.7	+0 9 16.3	16 32.9	60 38.13	+1.483	26.7	18	U
19.0	298 25 1.8	0 49 32.6	16 37.3	60 54.20	1.183	27.2	19	L
19.5	305 55 26.6	1 29 16.1	16 40.6	61 6.33	0.833	27.7	19	U
20.0	313 28 52.7	2 7 39.0	16 42.7	61 14.04	0.448	28.2	20	L
20.5	321 4 13.7	2 43 53.3	16 43.5	61 16.98	+0.039	28.7	20	U
21.0	328 40 16.6	+3 17 13.7	16 43.0	61 14.96	−0.375	29.2		
21.5	336 15 44.4	3 46 59.4	16 41.0	61 8.00	0.782	0.2	21	L
22.0	343 49 19.1	4 12 36.5	16 37.9	60 56.28	1.166	0.7	22	U
22.5	351 19 45.3	4 33 39.0	16 33.5	60 40.17	1.512	1.2	22	L
23.0	358 45 53.7	4 49 49.5	16 28.0	60 20.19	1.809	1.7	23	U
23.5	6 6 43.6	+5 0 59.1	16 21.7	59 56.97	−2.051	2.2	23	L
24.0	13 21 25.6	5 7 7.8	16 14.7	59 31.20	2.234	2.7	24	U
24.5	20 29 21.8	5 8 22.4	16 7.1	59 3.59	2.357	3.2	24	L
25.0	27 30 7.5	5 4 55.9	15 59.3	58 34.87	2.420	3.7	25	U
25.5	34 23 30.3	4 57 5.6	15 51.4	58 5.73	2.428	4.2	25	L
26.0	41 9 29.3	+4 45 12.4	15 43.5	57 36.78	−2.389	4.7	26	U
26.5	47 48 14.0	4 29 39.0	15 35.8	57 8.57	2.307	5.2	26	L
27.0	54 20 2.5	4 10 48.9	15 28.4	56 41.56	2.191	5.7	27	U
27.5	60 45 20.1	3 49 6.0	15 21.5	56 16.11	2.047	6.2	27	L
28.0	67 4 37.6	3 24 53.6	15 15.1	55 52.54	1.881	6.7	28	U
28.5	73 18 29.6	+2 58 34.4	15 9 2	55 31.05	−1.699	7.2	28	L
Mar. 1.0	79 27 33.6	2 30 30.4	15 4.0	55 11.81	1.506	7.7	Mar. 1	U
1.5	85 32 28.7	2 1 2.4	14 59.4	54 54.92	1.309	8.2	1	L
2.0	91 33 54.1	1 30 30.5	14 55.4	54 40.40	1.112	8.7	2	U
2.5	97 32 28.8	0 59 13.9	14 52.1	54 28.24	0.915	9.2	2	L
3.0	103 28 51.1	+0 27 31.5	14 49.4	54 18.42	−0.722	9.7	3	U
3.5	109 23 37.4	−0 4 18.6	14 47.4	54 10.88	0.536	10.2	3	L
4.0	115 17 22.1	0 35 58.4	14 45.9	54 5.50	0.360	10.7	4	U
4.5	121 10 37.5	1 7 10.2	14 45.0	54 2.18	0.194	11.2	4	L
5.0	127 3 53.0	1 37 36.3	14 44.6	54 0.80	−0.038	11.7	5	U
5.5	132 57 35.1	−2 6 59.2	14 44.7	54 1.22	+0.106	12.2	5	L
6.0	138 52 7.7	2 35 1.5	14 45.3	54 3.30	0.239	12.7	6	U
6.5	144 47 51.5	3 1 25.9	14 46.3	54 6.90	0.360	13.2	6	L
7.0	150 45 4.5	3 25 55.4	14 47.7	54 11.90	0.472	13.7	7	U
7.5	156 44 1.7	3 48 13.7	14 49.4	54 18.19	0.575	14.2	7	L
8.0	162 44 55.6	−4 8 4.8	14 51.4	54 25.64	+0.666	14.7	8	U
8.5	168 47 56.5	4 25 13.7	14 53.7	54 34.16	0.753	15.2		
9.0	174 53 12.5	4 39 26.5	14 56.3	54 43.69	0.833	15.7	9	L
9.5	181 0 50.3	4 50 30.7	14 59.2	54 54.14	0.908	16.2	9	U
10.0	187 10 55.3	4 58 15.3	15 2.3	55 5.49	0.982	16.7	10	L
10.5	193 23 32.5	−5 2 31.4	15 5.6	55 17.70	+1.053	17.2	10	U
11.0	199 38 46.4	−5 3 11.7	15 9.1	55 30.76	+1.124	17.7	11	L

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	187 10 55.3	−4 58 15.3	15 2.3	55 5.49	+0.982	16.7	Mar. 10	L	1 10.1	1.78
10.5	193 23 32.5	5 2 31.4	15 5.6	55 17.70	1.053	17.2	10	U	13 31.7	1.82
11.0	199 38 46.4	5 3 11.7	15 9.1	55 30.76	1.124	17.7	11	L	1 53.9	1.87
11.5	205 56 42.1	5 0 11.4	15 12.9	55 44.67	1.195	18.2	11	U	14 16.7	1.93
12.0	212 17 25.3	4 53 28.0	15 17.0	55 59.43	1.266	18.7	12	L	2 40.3	2.00
12.5	218 41 3.4	−4 43 1.4	15 21.2	56 15.05	+1.338	19.2	12	U	15 4.7	2.07
13.0	225 7 44.6	4 28 53.9	15 25.7	56 31.53	1.409	19.7	13	L	3 30.1	2.15
13.5	231 37 38.7	4 11 11.0	15 30.4	56 48.85	1.478	20.2	13	U	15 56.4	2.23
14.0	238 10 57.0	3 50 0.4	15 35.4	57 6.97	1.541	20.7	14	L	4 23.6	2.30
14.5	244 47 52.3	3 25 32.9	15 40.5	57 25.80	1.597	21.2	14	U	16 51.5	2.36
15.0	251 28 37.8	−2 58 2.4	15 45.8	57 45.25	+1.643	21.7	15	L	5 20.2	2.41
15.5	258 13 26.9	2 27 46.0	15 51.2	58 5.16	1.673	22.2	15	U	17 49.5	2.45
16.0	265 2 32.4	1 55 4.2	15 56.7	58 25.32	1.682	22.7	16	L	6 19.0	2.47
16.5	271 56 5.4	1 20 20.5	16 2.2	58 45.44	1.667	23.2	16	U	18 48.7	2.47
17.0	278 54 14.0	0 44 2.4	16 7.6	59 5.20	1.622	23.7	17	L	7 18.3	2.46
17.5	285 57 2.1	−0 6 40.7	16 12.8	59 24.23	+1.544	24.2	17	U	19 47.6	2.43
18.0	293 4 27.8	+0 31 10.3	16 17.6	59 42.09	1.426	24.7	18	L	8 16.4	2.38
18.5	300 16 22.3	1 8 53.5	16 22.0	59 58.28	1.267	25.2	18	U	20 44.8	2.33
19.0	307 32 28.4	1 45 49.4	16 25.9	60 12.32	1.067	25.7	19	L	9 12.6	2.29
19.5	314 52 20.0	2 21 17.2	16 29.0	60 23.72	0.827	26.2	19	U	21 39.8	2.25
20.0	322 15 21.1	+2 54 35.7	16 31.2	60 32.03	+0.553	26.7	20	L	10 6.5	2.21
20.5	329 40 46.1	3 25 5.3	16 32.6	60 36.85	+0.248	27.2	20	U	22 32.8	2.18
21.0	337 7 41.0	3 52 9.0	16 32.8	60 37.88	−0.079	27.7	21	L	10 58.8	2.16
21.5	344 35 4.9	4 15 14.7	16 32.0	60 34.91	0.416	28.2	21	U	23 24.6	2.14
22.0	352 1 51.7	4 33 56.0	16 30.1	60 27.91	0.751	28.7			. . . . .	. . .
22.5	359 26 53.6	+4 47 54.0	16 27.1	60 16.98	−1.070	29.2	22	L	11 50.4	2.14
23.0	6 49 3.4	4 56 57.5	16 23.2	60 2.32	1.367	0.3	23	U	0 16.1	2.15
23.5	14 7 18.3	5 1 3.0	16 18.2	59 44.31	1.628	0.8	23	L	12 42.0	2.16
24.0	21 20 42.0	5 0 15.1	16 12.6	59 23.42	1.848	1.3	24	U	1 8.0	2.18
24.5	28 28 27.2	4 54 45.0	16 6.2	59 0.16	2.020	1.8	24	L	13 34.4	2.21
25.0	35 29 57.1	+4 44 49.8	15 59.4	58 35.15	−2.139	2.3	25	U	2 1.0	2.24
25.5	42 24 46.3	4 30 50.8	15 52.3	58 9.01	2.208	2.8	25	L	14 27.9	2.26
26.0	49 12 40.9	4 13 12.5	15 45.0	57 42.33	2.231	3.3	26	U	2 55.0	2.27
26.5	55 53 38.1	3 52 20.7	15 37.7	57 15.67	2.205	3.8	26	L	15 22.3	2.27
27.0	62 27 45.1	3 28 42.6	15 30.6	56 49.59	2.136	4.3	27	U	3 49.6	2.27
27.5	68 55 18.1	+3 2 44.5	15 23.8	56 24.54	−2.033	4.8	27	L	16 16.7	2.26
28.0	75 16 40.8	2 34 52.3	15 17.4	56 0.92	1.899	5.3	28	U	4 43.7	2.23
28.5	81 32 23.0	2 5 30.5	15 11.4	55 39.07	1.739	5.8	28	L	17 10.3	2.20
29.0	87 42 59.3	1 35 2.3	15 6.0	55 19.26	1.560	6.3	29	U	5 36.3	2.15
29.5	93 49 7.5	1 3 49.5	15 1.2	55 1.70	1.365	6.8	29	L	18 1.8	2.10
30.0	99 51 27.9	+0 32 12.4	14 57.1	54 46.55	−1.160	7.3	30	U	6 26.7	2.04
30.5	105 50 41.9	+0 0 29.9	14 53.6	54 33.89	0.949	7.8	30	L	18 50.8	1.98
31.0	111 47 31.5	−0 30 59.8	14 50.9	54 23.78	0.736	8.3	31	U	7 14.3	1.93
31.5	117 42 38.0	1 1 59.5	14 48.8	54 16.22	0.524	8.8	31	L	19 37.2	1.88
Apr. 1.0	123 36 41.9	1 32 12.4	14 47.5	54 11.18	0.316	9.3	Apr. 1	U	7 59.4	1.83
1.5	129 30 22.1	−2 1 22.6	14 46.8	54 8.61	−0.114	9.8	1	L	20 21.1	1.79
2.0	135 24 15.4	−2 29 13.9	14 46.7	54 8.39	+0.076	10.3	2	U	8 42.4	1.76

GREENWICH MEAN TIME.

G. M. T.	Longitude.	Latitude.	Semi-diameter.	Horizontal Parallax.	Var. per Hour.	Age.	Transit, Meridian of Green	
	° ′ ″	° ′ ″	′ ″	′ ″	″	d		
Apr. 1.0	123 36 41.9	−1 32 12.4	14 47.5	54 11.18	−0.316	9.3	Apr. 1	U
1.5	129 30 22.1	2 1 22.6	14 46.8	54 8.61	−0.114	9.8	1	L
2.0	135 24 15.4	2 29 13.9	14 46.7	54 8.39	+0.076	10.3	2	U
2.5	141 18 56.0	2 55 30.6	14 47.2	54 10.39	0.256	10.8	2	L
3.0	147 14 55.0	3 19 57.1	14 48.4	54 14.49	0.424	11.3	3	U
3.5	153 12 40.5	−3 42 17.7	14 50.0	54 20.51	+0.578	11.8	3	L
4.0	159 12 36.9	4 2 17.2	14 52.1	54 28.28	0.715	12.3	4	U
4.5	165 15 4.9	4 19 40.5	14 54.7	54 37.60	0.837	12.8	4	L
5.0	171 20 21.0	4 34 13.5	14 57.6	54 48.29	0.942	13.3	5	U
5.5	177 28 38.1	4 45 42.3	15 0.8	55 0.13	1.030	13.8	5	L
6.0	183 40 5.0	−4 53 54.9	15 4.3	55 12.94	+1.101	14.3	6	U
6.5	189 54 47.0	4 58 40.4	15 8.0	55 26.50	1.156	14.8	6	L
7.0	196 12 46.0	4 59 50.0	15 11.8	55 40.64	1.198	15.3	7	U
7.5	202 34 0.6	4 57 17.4	15 15.8	55 55.20	1.226	15.8		
8.0	208 58 27.4	4 50 58.7	15 19.9	56 10.01	1.242	16.3	8	L
8.5	215 26 1.0	−4 40 53.2	15 23.9	56 24.95	+1.247	16.8	8	U
9.0	221 56 35.0	4 27 3.3	15 28.0	56 39.91	1.244	17.3	9	L
9.5	228 30 2.8	4 9 34.9	15 32.0	56 54.79	1.236	17.8	9	U
10.0	235 6 17.9	3 48 37.4	15 36.1	57 9.54	1.222	18.3	10	L
10.5	241 45 14.7	3 24 23.6	15 40.0	57 24.10	1.205	18.8	10	U
11.0	248 26 49.3	−2 57 9.7	15 44.0	57 38.43	+1.184	19.3	11	L
11.5	255 10 59.0	2 27 15.2	15 47.8	57 52.49	1.159	19.8	11	U
12.0	261 57 43.3	1 55 2.5	15 51.5	58 6.23	1.131	20.3	12	L
12.5	268 47 2.9	1 20 57.0	15 55.2	58 19.62	1.099	20.8	12	U
13.0	275 38 59.8	0 45 26.5	15 58.7	58 32.59	1.062	21.3	13	L
13.5	282 33 36.7	−0 9 1.0	16 2.1	58 45.07	+1.015	21.8	13	U
14.0	289 30 56.1	+0 27 47.6	16 5.3	58 56.90	0.956	22.3	14	L
14.5	296 30 59.3	1 4 25.5	16 8.3	59 7.95	0.885	22.8	14	U
15.0	303 33 44.9	1 40 18.5	16 11.1	59 18.06	0.796	23.3	15	L
15.5	310 39 8.7	2 14 51.2	16 13.5	59 26.99	0.688	23.8	15	U
16.0	317 47 1.9	+2 47 28.6	16 15.6	59 34.50	+0.559	24.3	16	L
16.5	324 57 10.1	3 17 36.8	16 17.2	59 40.34	0.410	24.8	16	U
17.0	332 9 12.8	3 44 43.2	16 18.2	59 44.26	0.239	25.3	17	L
17.5	339 22 43.2	4 8 18.2	16 18.7	59 46.01	+0.048	25.8	17	U
18.0	346 37 7.9	4 27 55.9	16 18.5	59 45.35	−0.160	26.3	18	L
18.5	353 51 47.6	+4 43 14.9	16 17.7	59 42.13	−0.379	26.8	18	U
19.0	1 5 58.3	4 53 59.7	16 16.0	59 36.22	0.606	27.3	19	L
19.5	8 18 52.6	5 0 0.6	16 13.7	59 27.59	0.832	27.8	19	U
20.0	15 29 41.8	5 1 14.5	16 10.6	59 16.28	1.051	28.3	20	L
20.5	22 37 37.8	4 57 45.1	16 6.8	59 2.42	1.255	28.8	20	U
21.0	29 41 55.2	+4 49 42.0	16 2.4	58 46.24	−1.438	29.3		
21.5	36 41 53.0	4 37 20.4	15 57.5	58 28.01	1.594	0.4	21	L
22.0	43 36 56.8	4 21 0.6	15 52.0	58 8.10	1.719	0.9	22	U
22.5	50 26 39.7	4 1 6.1	15 46.2	57 46.91	1.807	1.4	22	L
23.0	57 10 42.9	3 38 2.9	15 40.2	57 24.87	1.859	1.9	23	U
23.5	63 48 56.4	+3 12 18.8	15 34.1	57 2.44	−1.873	2.4	23	L
24.0	70 21 18.3	+2 44 21.7	15 28.0	56 40.06	−1.850	2.9	24	U

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	70 21 18.3	+2 44 21.7	15 28.0	56 40.06	−1.850	2.9	Apr. 24	U	2 31.0	2.29
24.5	76 47 55.2	2 14 39.5	15 22.1	56 18.17	1.792	3.4	24	L	14 58.4	2.27
25.0	83 9 1.0	1 43 38.7	15 16.4	55 57.17	1.703	3.9	25	U	3 25.4	2.23
25.5	89 24 55.8	1 11 45.0	15 11.0	55 37.42	1.584	4.4	25	L	15 51.9	2.18
26.0	95 36 5.8	0 39 22.0	15 6.0	55 19.26	1.439	4.9	26	U	4 17.7	2.12
26.5	101 43 1.4	+0 6 51.8	15 1.6	55 2.96	−1.274	5.4	26	L	16 42.8	2.06
27.0	107 46 16.8	−0 25 25.2	14 57.7	54 48.75	1.091	5.9	27	U	5 7.1	2.00
27.5	113 46 29.0	0 57 10.1	14 54.4	54 36.82	0.894	6.4	27	L	17 30.7	1.94
28.0	119 44 16.8	1 28 5.3	14 51.9	54 27.33	0.686	6.9	28	U	5 53.6	1.88
28.5	125 40 20.3	1 57 54.6	14 50.0	54 20.37	0.474	7.4	28	L	18 15.8	1.83
29.0	131 35 20.3	−2 26 22.2	14 48.8	54 15.99	−0.257	7.9	29	U	6 37.5	1.78
29.5	137 29 56.9	2 53 13.4	14 48.3	54 14.21	−0.039	8.4	29	L	18 58.6	1.75
30.0	143 24 50.0	3 18 13.7	14 48.5	54 15.03	+0.174	8.9	30	U	7 19.4	1.72
30.5	149 20 37.7	3 41 9.1	14 49.4	54 18.37	0.380	9.4	30	L	19 40.0	1.71
May 1.0	155 17 56.8	4 1 45.4	14 51.0	54 24.13	0.579	9.9	May 1	U	8 0.4	1.70
1.5	161 17 21.5	−4 19 49.2	14 53.2	54 32.22	+0.766	10.4	1	L	20 20.8	1.70
2.0	167 19 22.6	4 35 6.9	14 56.0	54 42.45	0.937	10.9	2	U	8 41.4	1.72
2.5	173 24 28.1	4 47 25.3	14 59.3	54 54.63	1.091	11.4	2	L	21 2.2	1.75
3.0	179 33 1.7	4 56 32.0	15 3.1	55 8.55	1.226	11.9	3	U	9 23.3	1.78
3.5	185 45 23.0	5 2 15.1	15 7.3	55 23.95	1.337	12.4	3	L	21 45.0	1.83
4.0	192 1 46.8	−5 4 24.3	15 11.8	55 40.55	+1.426	12.9	4	U	10 7.3	1.89
4.5	198 22 23.0	5 2 50.8	15 16.6	55 58.08	1.489	13.4	4	L	22 30.4	1.96
5.0	204 47 16.4	4 57 28.1	15 21.5	56 16.20	1.527	13.9	5	U	10 54.3	2.03
5.5	211 16 26.8	4 48 12.4	15 26.6	56 34.62	1.538	14.4	5	L	23 19.1	2.11
6.0	217 49 49.5	4 35 3.4	15 31.6	56 53.02	1.524	14.9	6	U	11 45.0	2.19
6.5	224 27 15.1	−4 18 4.0	15 36.5	57 11.09	+1.484	15.4			. . . . .	. . .
7.0	231 8 30.3	3 57 21.8	15 41.2	57 28.55	1.422	15.9	7	L	0 11.8	2.27
7.5	237 53 19.1	3 33 8.4	15 45.8	57 45.15	1.341	16.4	7	U	12 39.5	2.35
8.0	244 41 23.1	3 5 40.0	15 50.0	58 0.66	1.242	16.9	8	L	1 8.1	2.41
8.5	251 32 22.6	2 35 17.0	15 53.9	58 14.91	1.131	17.4	8	U	13 37.4	2.46
9.0	258 25 57.0	−2 2 24.1	15 57.4	58 27.76	+1.010	17.9	9	L	2 7.1	2.49
9.5	265 21 46.9	1 27 29.4	16 0.5	58 39.13	0.884	18.4	9	U	14 36.9	2.49
10.0	272 19 33.2	0 51 4.0	16 3.2	58 48.98	0.757	18.9	10	L	3 6.8	2.47
10.5	279 18 58.8	−0 13 41.6	16 5.4	58 57.29	0.628	19.4	10	U	15 36.3	2.44
11.0	286 19 48.0	+0 24 2.7	16 7.3	59 4.08	0.504	19.9	11	L	4 5.3	2.39
11.5	293 21 47.0	+1 1 33.0	16 8.7	59 9.42	+0.385	20.4	11	U	16 33.7	2.33
12.0	300 24 44.0	1 38 13.2	16 9.8	59 13.35	0.271	20.9	12	L	5 1.3	2.27
12.5	307 28 28.0	2 13 27.9	16 10.5	59 15.95	0.162	21.4	12	U	17 28.2	2.21
13.0	314 32 49.0	2 46 43.3	16 10.9	59 17.26	+0.056	21.9	13	L	5 54.4	2.16
13.5	321 37 36.6	3 17 27.1	16 10.9	59 17.32	−0.046	22.4	13	U	18 20.0	2.11
14.0	328 42 40.4	+3 45 10.0	16 10.6	59 16.16	−0.148	22.9	14	L	6 45.1	2.07
14.5	335 47 48.4	4 9 25.6	16 9.9	59 13.78	0.249	23.4	14	U	19 9.9	2.05
15.0	342 52 46.8	4 29 51.2	16 8.9	59 10.19	0.350	23.9	15	L	7 34.3	2.04
15.5	349 57 19.4	4 46 7.8	16 7.6	59 5.35	0.456	24.4	15	U	19 58.7	2.03
16.0	357 1 7.8	4 58 1.4	16 6.0	58 59.21	0.565	24.9	16	L	8 23.2	2 04
16.5	4 3 51.1	+5 5 22.2	16 3.9	58 51.76	−0.677	25.4	16	U	20 47.8	2 06
17.0	11 5 5.8	+5 8 5.9	16 1.5	58 42.95	−0.792	25.9	17	L	9 12.7	2 08

GREENWICH MEAN TIME.

G. M. T.		Longitude.	Latitude.	Semi-diameter.	Horizontal Parallax.	Var. per Hour.	Age.	Transit, Meridian of Greenwich		
		° ′ ″	° ′ ″	′ ″	′ ″	″	d			h
May	17.0	11 5 5.8	+5 8 5.9	16 1.5	58 42.95	−0.792	25.9	May 17	L	9 1
	17.5	18 4 27.3	5 6 13.0	15 58.8	58 32.76	0.905	26.4	17	U	21 3
	18.0	25 1 29.8	4 59 49.0	15 55.6	58 21.22	1.019	26.9	18	L	10
	18.5	31 55 47.1	4 49 4.5	15 52.1	58 8.34	1.126	27.4	18	U	22 2
	19.0	38 46 54.4	4 34 14.4	15 48.2	57 54.21	1.227	27.9	19	L	10 5
	19.5	45 34 28.1	+4 15 37.5	15 44.1	57 38.94	−1.315	28.4	19	U	23 2
	20.0	52 18 8.3	3 53 36.1	15 39.7	57 22.69	1.390	28.9			...
	20.5	58 57 37.8	3 28 34.8	15 35.0	57 5.65	1.447	29.4	20	L	11 5
	21.0	65 32 44.4	3 1 0.2	15 30.2	56 48.06	1.482	0.5	21	U	0 1
	21.5	72 3 20.5	2 31 19.5	15 25.4	56 30.19	1.494	1.0	21	L	12 4
	22.0	78 29 23.5	+2 0 0.7	15 20.5	56 12.31	−1.482	1.5	22	U	1 1
	22.5	84 50 56.3	1 27 31.1	15 15.7	55 54.71	1.446	2.0	22	L	13 4
	23.0	91 8 6.7	0 54 16.9	15 11.0	55 37.71	1.384	2.5	23	U	2
	23.5	97 21 7.6	+0 20 43.2	15 6.6	55 21.59	1.299	3.0	23	L	14 3
	24.0	103 30 16.3	−0 12 46.4	15 2.6	55 6.63	1.192	3.5	24	U	2 5
	24.5	109 35 54.6	−0 45 49.9	14 58.9	54 53.09	−1.061	4.0	24	L	15 2
	25.0	115 38 27.7	1 18 7.4	14 55.6	54 41.24	0.912	4.5	25	U	3 4
	25.5	121 38 24.4	1 49 20.1	14 52.9	54 31.28	0.745	5.0	25	L	16
	26.0	127 36 15.8	2 19 11.1	14 50.8	54 23.44	0.562	5.5	26	U	4 3
	26.5	133 32 35.9	2 47 24.7	14 49.3	54 17.86	0.367	6.0	26	L	16 5
	27.0	139 27 59.8	−3 13 46.3	14 48.4	54 14.67	−0.163	6.5	27	U	5 1
	27.5	145 23 4.2	3 38 2.0	14 48.2	54 13.96	+0.047	7.0	27	L	17 3
	28.0	151 18 26.5	3 59 59.1	14 48.7	54 15.83	0.264	7.5	28	U	5 5
	28.5	157 14 44.2	4 19 24.9	14 50.0	54 20.29	0.480	8.0	28	L	18 1
	29.0	163 12 34.5	4 36 7.3	14 51.9	54 27.32	0.692	8.5	29	U	6 3
	29.5	169 12 34.1	−4 49 54.7	14 54.5	54 36.87	+0.900	9.0	29	L	18 5
	30.0	175 15 17.8	5 0 35.6	14 57.7	54 48.88	1.099	9.5	30	U	7 1
	30.5	181 21 19.0	5 7 59.1	15 1.6	55 3.19	1.285	10.0	30	L	19 2
	31.0	187 31 7.8	5 11 54.9	15 6.1	55 19.64	1.452	10.5	31	U	7 5
	31.5	193 45 11.3	5 12 13.6	15 11.1	55 37.97	1.600	11.0	31	L	20 2
June	1.0	200 3 52.9	−5 8 46.8	15 16.6	55 57.95	+1.725	11.5	June 1	U	8 4
	1.5	206 27 30.9	5 1 28.1	15 22.4	56 19.24	1.818	12.0	1	L	21
	2.0	212 56 18.8	4 50 13.6	15 28.4	56 41.47	1.882	12.5	2	U	9 3
	2.5	219 30 23.8	4 35 1.8	15 34.6	57 4.26	1.910	13.0	2	L	21 5
	3.0	226 9 47.6	4 15 55.2	15 40.9	57 27.16	1.900	13.5	3	U	10 2
	3.5	232 54 25.0	−3 53 0.7	15 47.0	57 49.71	+1.851	14.0	3	L	22 5
	4.0	239 44 5.0	3 26 29.4	15 52.9	58 11.44	1.765	14.5	4	U	11 2
	4.5	246 38 29.8	2 56 38.0	15 58.5	58 31.93	1.643	15.0	4	L	23 5
	5.0	253 37 16.5	2 23 48.2	16 3.6	58 50.72	1.484	15.5	5	U	12 2
	5.5	260 39 57.1	1 48 27.2	16 8.2	59 7.44	1.298	16.0			...
	6.0	267 45 59.4	−1 11 6.9	16 12.1	59 21.77	+1.088	16.5	6	L	0 5
	6.5	274 54 48.5	−0 32 23.3	16 15.3	59 33.48	0.862	17.0	6	U	13 2
	7.0	282 5 47.5	+0 7 4.4	16 17.7	59 42.40	0.623	17.5	7	L	1 5
	7.5	289 18 19.2	0 46 35.4	16 19.4	59 48.46	0.387	18.0	7	U	14 2
	8.0	296 31 46.2	1 25 27.6	16 20.3	59 51.70	+0.154	18.5	8	L	2 5
	8.5	303 45 33.2	+2 3 0.1	16 20.4	59 52.20	−0.067	19.0	8	U	15 2
	9.0	310 59 6.9	+2 38 33.9	16 19.8	59 50.17	−0.270	19.5	9	L	3 5

GREENWICH MEAN TIME.

I. T.	Longitude.	Latitude.	Semi-diameter.	Horizontal Parallax.	Var. per Hour.	Age.	Transit, Meridian of Greenwich.			Var. per Hour.
	° ′ ″	° ′ ″	′ ″	′ ″	″	d			h m	m
9.0	310 59 6.9	+2 38 33.9	16 19.8	59 50.17	−0.270	19.5	June 9	L	3 50.0	2.24
9.5	318 11 56.6	3 11 32.4	16 18.6	59 45.79	0.455	20.0	9	U	16 16.5	2.18
10.0	325 23 35.2	3 41 23.6	16 16.9	59 39.35	0.615	20.5	10	L	4 42.2	2.13
10.5	332 33 38.6	4 7 39.7	16 14.6	59 31.12	0.753	21.0	10	U	17 7.4	2.08
11.0	339 41 46.1	4 29 57.8	16 12.0	59 21.38	0.868	21.5	11	L	5 32.2	2.05
11.5	346 47 39.9	+4 48 0.2	16 9.0	59 10.38	−0.961	22.0	11	U	17 56.6	2.03
12.0	353 51 5.3	5 1 34.3	16 5.7	58 58.38	1.037	22.5	12	L	6 20.9	2.02
12.5	0 51 49.8	5 10 32.6	16 2.2	58 45.57	1.096	23.0	12	U	18 45.2	2.03
13.0	7 49 42.8	5 14 52.4	15 58.6	58 32.15	1.140	23.5	13	L	7 9.6	2.04
13.5	14 44 35.7	5 14 35.8	15 54.8	58 18.26	1.173	24.0	13	U	19 34.2	2.07
14.0	21 36 21.0	+5 9 48.9	15 50.9	58 4.02	−1.199	24.5	14	L	7 59.2	2.10
14.5	28 24 52.3	5 0 41.5	15 47.0	57 49.50	1.220	25.0	14	U	20 24.6	2.13
15.0	35 10 4.5	4 47 27.3	15 43.0	57 34.77	1.236	25.5	15	L	8 50.4	2.17
15.5	41 51 52.7	4 30 23.1	15 38.9	57 19.87	1.247	26.0	15	U	21 16.7	2.21
16.0	48 30 13.4	4 9 48.3	15 34.8	57 4.86	1.254	26.5	16	L	9 43.4	2.24
16.5	55 5 3.5	+3 46 4.5	15 30.7	56 49.80	−1.257	27.0	16	U	22 10.4	2.26
17.0	61 36 21.4	3 19 35.1	15 26.6	56 34.72	1.257	27.5	17	L	10 37.6	2.27
17.5	68 4 6.1	2 50 45.1	15 22.5	56 19.66	1.250	28.0	17	U	23 4.8	2.27
18.0	74 28 18.6	2 20 0.0	15 18.4	56 4.75	1.234	28.5	18	L	11 31.9	2.25
18.5	80 49 0.9	1 47 46.1	15 14.4	55 50.06	1.211	29.0	18	U	23 58.7	2.22
19.0	87 6 17.3	+1 14 29.3	15 10.5	55 35.73	−1.176	29.5			. . . . .	. . .
19.5	93 20 14.1	0 40 35.2	15 6.7	55 21.88	1.129	0.5	19	L	12 25.0	2.17
20.0	99 30 59.5	+0 6 28.7	15 3.1	55 8.68	1.069	1.0	20	U	0 50.7	2.11
20.5	105 38 44.4	−0 27 26.8	14 59.8	54 56.28	0.995	1.5	20	L	13 15.7	2.06
21.0	111 43 41.8	1 0 48.7	14 56.6	54 44.87	0.905	2.0	21	U	1 40.0	2.00
21.5	117 46 7.4	−1 33 16.2	14 53.9	54 34.63	−0.799	2.5	21	L	14 3.6	1.93
22.0	123 46 19.0	2 4 29.9	14 51.4	54 25.76	0.676	3.0	22	U	2 26.4	1.87
22.5	129 44 37.4	2 34 12.1	14 49.4	54 18.45	0.540	3.5	22	L	14 48.5	1.82
23.0	135 41 25.5	3 2 6.4	14 47.9	54 12.86	0.388	4.0	23	U	3 10.1	1.77
23.5	141 37 8.5	3 27 57.9	14 46.9	54 9.18	0.223	4.5	23	L	15 31.1	1.73
24.0	147 32 13.4	−3 51 33.0	14 46.5	54 7.56	−0.046	5.0	24	U	3 51.7	1.71
24.5	153 27 9.6	4 12 39.2	14 46.6	54 8.13	+0.144	5.5	24	L	16 12,0	1.69
25.0	159 22 27.8	4 31 4.8	14 47.4	54 11.03	0.341	6.0	25	U	4 32.2	1.68
25.5	165 18 40.6	4 46 39.1	14 48.9	54 16.33	0.544	6.5	25	L	16 52.3	1.68
26.0	171 16 21.1	4 59 12.0	14 51.0	54 24.12	0.755	7.0	26	U	5 12.5	1.69
26.5	177 16 3.2	−5 8 34.1	14 53.8	54 34.44	+0.966	7.5	26	L	17 32.9	1.71
27.0	183 18 21.5	5 14 36.5	14 57.3	54 47.27	1.171	8.0	27	U	5 53.6	1.75
27.5	189 23 50.2	5 17 11.0	15 1.4	55 2.53	1.373	8.5	27	L	18 14.9	1.79
28.0	195 33 2.4	5 16 10.0	15 6.3	55 20.18	1.566	9.0	28	U	6 36.8	1.85
28.5	201 46 30.0	5 11 27.2	15 11.7	55 40.05	1.743	9.5	28	L	18 59.4	1.93
29.0	208 4 43.0	−5 2 57.2	15 17.6	56 1.95	+1.902	10.0	29	U	7 23.0	2.01
29.5	214 28 8.2	4 50 36.6	15 24.1	56 25.61	2.035	10.5	29	L	19 47.6	2.09
30.0	220 57 8.4	4 34 24.2	15 30.9	56 50.67	2.138	11.0	30	U	8 13.2	2.18
30.5	227 32 2.1	4 14 21.7	15 38.0	57 16.78	2.207	11.5	30	L	20 40.1	2.27
1.0	234 13 1.9	3 50 34.3	15 45.3	57 43.47	2.234	12.0	July 1	U	9 8.0	2.37
1.5	241 0 13.6	−3 23 11.4	15 52.6	58 10.21	+2.215	12.5	1	L	21 37.0	2.46
2.0	247 53 36.3	−2 52 27.7	15 59.7	58 36.44	+2.148	13.0	2	U	10 6.9	2.52

GREENWICH MEAN TIME.

G. M. T.	Longitude.	Latitude.	Semi-diameter.	Horizontal Parallax.	Var. per Hour.	Age.	Transit, Meridian of Greenwi		
	° ′ ″	° ′ ″	′ ″	′ ″	″	d			h
July 1.0	234 13 1.9	−3 50 34.3	15 45.3	57 43.47	+2.234	12.0	July 1	U	9
1.5	241 0 13.6	3 23 11.4	15 52.6	58 10.21	2.215	12.5	1	L	21
2.0	247 53 36.3	2 52 27.7	15 59.7	58 36.44	2.148	13.0	2	U	10
2.5	254 53 0.5	2 18 42.9	16 6.6	59 1.56	2.030	13.5	2	L	22
3.0	261 58 8.7	1 42 22.6	16 13.0	59 24.97	1.863	14.0	3	U	11
3.5	269 8 34.5	−1 3 58.5	16 18.7	59 46.07	+1.646	14.5	3	L	23
4.0	276 23 44.0	−0 24 7.2	16 23.7	60 4.31	1.388	15.0	4	U	12
4.5	283 42 55.3	+0 16 29.9	16 27.8	60 19.24	1.094	15.5			...
5.0	291 5 19.9	0 57 8.1	16 30.8	60 30.46	0.773	16.0	5	L	0
5.5	298 30 4.6	1 37 0.8	16 32.8	60 37.75	0.440	16.5	5	U	13
6.0	305 56 12.9	+2 15 21.6	16 33.7	60 40.99	+0.101	17.0	6	L	1
6.5	313 22 46.9	2 51 25.9	16 33.5	60 40.20	−0.229	17.5	6	U	14
7.0	320 48 49.2	3 24 32.5	16 32.2	60 35.56	0.539	18.0	7	L	2
7.5	328 13 25.2	3 54 5.8	16 30.0	60 27.38	0.820	18.5	7	U	15
8.0	335 35 44.5	4 19 35.9	16 26.9	60 16.02	1.068	19.0	8	L	3
8.5	342 55 2.7	+4 40 40.0	16 23.1	60 1.92	−1.275	19.5	8	U	15
9.0	350 10 41.8	4 57 2.4	16 18.6	59 45.59	1.442	20.0	9	L	4
9.5	357 22 11.3	5 8 34.4	16 13.7	59 27.49	1.568	20.5	9	U	16
10.0	4 29 8.3	5 15 13.6	16 8.4	59 8.12	1.654	21.0	10	L	5
10.5	11 31 17.0	5 17 3.1	16 2.9	58 47.95	1.705	21.5	10	U	17
11.0	18 28 28.5	+5 14 11.5	15 57.3	58 27.33	−1.726	22.0	11	L	5
11.5	25 20 40.0	5 6 51.0	15 51.6	58 6.64	1.720	22.5	11	U	18
12.0	32 7 53.5	4 55 17.3	15 46.1	57 46.15	1.692	23.0	12	L	6
12.5	38 50 15.6	4 39 48.6	15 40.6	57 26.10	1.647	23.5	12	U	19
13.0	45 27 56.4	4 20 45.3	15 35.3	57 6.67	1.591	24.0	13	L	7
13.5	52 1 7.9	+3 58 29.2	15 30.2	56 47.97	−1.524	24.5	13	U	20
14.0	58 30 4.3	3 33 23.1	15 25.3	56 30.11	1.454	25.0	14	L	8
14.5	64 55 0.8	3 5 50.5	15 20.7	56 13.11	1.379	25.5	14	U	20
15.0	71 16 12.8	2 36 15.6	15 16.3	55 57.02	1.303	26.0	15	L	9
15.5	77 33 56.1	2 5 2.6	15 12.2	55 41.85	1.226	26.5	15	U	21
16.0	83 48 26.2	+1 32 35.5	15 8.3	55 27.59	−1.150	27.0	16	L	10
16.5	89 59 58.0	0 59 18.5	15 4.6	55 14.26	1.071	27.5	16	U	22
17.0	96 8 46.2	+0 25 35.3	15 1.3	55 1.88	0.993	28.0	17	L	11
17.5	102 15 5.1	−0 8 11.3	14 58.2	54 50.43	0.913	28.5	17	U	23
18.0	108 19 8.4	0 41 38.8	14 55.3	54 39.99	0.829	29.0			..
18.5	114 21 9.8	−1 14 26.1	14 52.7	54 30.56	−0.742	29.5	18	L	11
19.0	120 21 23.1	1 46 12.6	14 50.5	54 22.20	0.649	0.4	19	U	0
19.5	126 20 2.5	2 16 39.4	14 48.5	54 15.00	0.549	0.9	19	L	12
20.0	132 17 22.5	2 45 28.6	14 46.9	54 9.05	0.441	1.4	20	U	1
20.5	138 13 38.5	3 12 23.8	14 45.6	54 4.44	0.325	1.9	20	L	13
21.0	144 9 6.8	−3 37 9.7	14 44.8	54 1.29	−0.199	2.4	21	U	1
21.5	150 4 5.1	3 59 32.7	14 44.3	53 59.71	−0.063	2.9	21	L	14
22.0	155 58 52.5	4 19 20.5	14 44.4	53 59.83	+0.084	3.4	22	U	2
22.5	161 53 49.6	4 36 21.8	14 44.9	54 1.78	0.243	3.9	22	L	14
23.0	167 49 19.0	4 50 26.8	14 46.0	54 5.70	0.411	4.4	23	U	3
23.5	173 45 44.6	−5 1 26.4	14 47.6	54 11.67	+0.587	4.9	23	L	15
24.0	179 43 32.4	−5 9 13.3	14 49.8	54 19.81	+0.771	5.4	24	U	3

GREENWICH MEAN TIME.

	Longitude.	Latitude.	Semi-diameter.	Horizontal Parallax.	Var. per Hour.	Age.	Transit, Meridian of Greenwich.			Var. per Hour.
	° ′ ″	° ′ ″	′ ″	′ ″	″	d			h m	m
.0	179 43 32.4	−5 9 13.3	14 49.8	54 19.81	+0.771	5.4	July 24	U	3 50.6	1.70
.5	185 43 10.0	5 13 40.6	14 52.6	54 30.20	0.961	5.9	24	L	16 11.2	1.73
.0	191 45 6.4	5 14 42.2	14 56.1	54 42.89	1.155	6.4	25	U	4 32.2	1.78
.5	197 49 52.0	5 12 13.3	15 0.2	54 57.92	1.351	6.9	25	L	16 53.8	1.83
.0	203 57 57.8	5 6 10.3	15 4.9	55 15.28	1.542	7.4	26	U	5 16.2	1.89
.5	210 9 55.9	−4 56 30.5	15 10.3	55 34.91	+1.728	7.9	26	L	17 39.3	1.96
.0	216 26 17.6	4 43 12.6	15 16.2	55 56.71	1.903	8.4	27	U	6 3.4	2.05
.5	222 47 33.9	4 26 17.3	15 22.7	56 20.52	2.062	8.9	27	L	18 28.5	2.14
.0	229 14 13.9	4 5 47.2	15 29.7	56 46.10	2.198	9.4	28	U	6 54.7	2.23
.5	235 46 44.4	3 41 47.9	15 37.1	57 13.15	2.306	9.9	28	L	19 21.9	2.31
.0	242 25 28.4	−3 14 28.0	15 44.7	57 41.30	+2.379	10.4	29	U	7 50.2	2.40
.5	249 10 44.2	2 44 0.3	15 52.6	58 10.07	2.408	10.9	29	L	20 19.4	2.47
.0	256 2 43.6	2 10 41.8	16 0.4	58 38.91	2.391	11.4	30	U	8 49.4	2.52
.5	263 1 30.8	1 34 54.9	16 8.1	59 7.23	2.320	11.9	30	L	21 19.8	2.55
.0	270 7 1.8	0 57 7.3	16 15.5	59 34.36	2.191	12.4	31	U	9 50.5	2.56
.5	277 19 1.8	−0 17 52.3	16 22.4	59 59.58	+2.002	12.9	31	L	22 21.2	2.55
.0	284 37 5.7	+0 22 11.6	16 28.6	60 22.19	1.758	13.4	Aug. 1	U	10 51.6	2.52
.5	292 0 37.1	1 2 21.2	16 33.8	60 41.55	1.460	13.9	1	L	23 21.5	2.47
.0	299 28 48.5	1 41 49.9	16 38.1	60 57.04	1.116	14.4	2	U	11 50.8	2.41
.5	307 0 42.6	2 19 49.7	16 41.1	61 8.18	0.735	14.9			. . . . .	. . .
.0	314 35 13.5	+2 55 32.9	16 42.9	61 14.62	+0.336	15.4	3	L	0 19.5	2.36
.5	322 11 8.7	3 28 14.2	16 43.3	61 16.21	−0.071	15.9	3	U	12 47.4	2.30
.0	329 47 12.7	3 57 13.2	16 42.4	61 12.94	0.472	16.4	4	L	1 14.7	2.25
.5	337 22 9.4	4 21 55.8	16 40.2	61 4.98	0.849	16.9	4	U	13 41.5	2.21
.0	344 54 45.4	4 41 56.0	16 36.9	60 52.72	1.189	17.4	5	L	2 7.8	2.18
.5	352 23 53.6	+4 56 56.2	16 32.5	60 36.62	−1.486	17.9	5	U	14 33.8	2.15
.0	359 48 34.8	5 6 47.8	16 27.2	60 17.26	1.732	18.4	6	L	2 59.5	2.14
.5	7 8 0.1	5 11 30.3	16 21.2	59 55.27	1.922	18.9	6	U	15 25.2	2.14
.0	14 21 32.1	5 11 10.4	16 14.7	59 31.34	2.058	19.4	7	L	3 50.9	2.15
.5	21 28 44.8	5 6 1.2	16 7.8	59 6.06	2.145	19.9	7	U	16 16.8	2.16
.0	28 29 23.3	+4 56 20.4	16 0.7	58 40.06	−2.181	20.4	8	L	4 42.8	2.18
.5	35 23 23.2	4 42 29.2	15 53.6	58 13.89	2.174	20.9	8	U	17 9.0	2.20
.0	42 10 49.4	4 24 51.3	15 46.6	57 48.03	2.132	21.4	9	L	5 35.5	2.22
.5	48 51 54.0	4 3 51.8	15 39.7	57 22.85	2.061	21.9	9	U	18 2.2	2.23
.0	55 26 55.3	3 39 56.3	15 33.1	56 58.66	1.966	22.4	10	L	6 29.1	2.24
.5	61 56 16.3	+3 13 30.3	15 26.9	56 35.74	−1.853	22.9	10	U	18 56.0	2.24
.0	68 20 23.2	2 44 59.1	15 21.0	56 14.24	1.729	23.4	11	L	7 22.9	2.23
.5	74 39 43.9	2 14 47.4	15 15.6	55 54.28	1.596	23.9	11	U	19 49.6	2.21
.0	80 54 47.7	1 43 19.3	15 10.6	55 35.95	1.459	24.4	12	L	8 16.0	2.18
.5	87 6 3.6	1 10 58.0	15 6.0	55 19.27	1.322	24.9	12	U	20 41.9	2.14
.0	93 14 0.0	+0 38 5.8	15 1.9	55 4.23	−1.187	25.4	13	L	9 7.4	2.10
.5	99 19 4.4	+0 5 4.4	14 58.2	54 50.78	1.053	25.9	13	U	21 32.3	2.04
.0	105 21 42.5	−0 27 45.4	14 55.0	54 38.94	0.922	26.4	14	L	9 56.5	1.99
.5	111 22 18.1	1 0 3.4	14 52.2	54 28.62	0.798	26.9	14	U	22 20.0	1.93
.0	117 21 13.2	1 31 30.2	14 49.8	54 19.77	0.678	27.4	15	L	10 42.9	1.88
.5	123 18 48.0	−2 1 47.2	14 47.8	54 12.33	−0.562	27.9	15	U	23 5.2	1.83
.0	129 15 20.7	−2 30 36.8	*14 46.1*	*54 6.27*	−0.449	28.4	16	L	11 26.9	1.79

GREENWICH MEAN TIME.

G. M. T.	Longitude.	Latitude.	Semi-diameter.	Horizontal Parallax.	Var. per Hour.	Age.	Transit, Meridian of Greenwi		
	° ′ ″	° ′ ″	′ ″	′ ″	″	d			h
Aug. 16.0	129 15 20.7	−2 30 36.8	14 46.1	54 6.27	−0.449	28.4	Aug. 16	L	11
16.5	135 11 7.8	2 57 42.4	14 44.8	54 1.55	0.338	28.9	16	U	23
17.0	141 6 24.7	3 22 47.9	14 43.9	53 58.15	0.227	29.4			...
17.5	147 1 25.4	3 45 39.1	14 43.4	53 56.11	0.115	0.2	17	L	12
18.0	152 56 23.4	4 6 2.5	14 43.2	53 55.38	−0.004	0.7	18	U	0
18.5	158 51 31.8	−4 23 45.9	14 43.3	53 56.02	+0.112	1.2	18	L	12
19.0	164 47 3.6	4 38 38.7	14 43.9	53 58.10	0.234	1.7	19	U	1
19.5	170 43 12.4	4 50 31.5	14 44.9	54 1.65	0.359	2.2	19	L	13
20.0	176 40 12.4	4 59 16.3	14 46.2	54 6.75	0.492	2.7	20	U	14
20.5	182 38 19.0	5 4 46.7	14 48.1	54 13.48	0.631	3.2	20	L	14
21.0	188 37 49.3	−5 6 57.5	14 50.4	54 21.92	+0.777	3.7	21	U	2
21.5	194 39 1.8	5 5 45.1	14 53.2	54 32.15	0.929	4.2	21	L	14
22.0	200 42 17.0	5 1 7.3	14 56.5	54 44.25	1.087	4.7	22	U	3
22.5	206 47 57.4	4 53 3.1	15 0.3	54 58.27	1.249	5.2	22	L	15
23.0	212 56 27.4	4 41 33.2	15 4.6	55 14.25	1.415	5.7	23	U	3
23.5	219 8 13.2	−4 26 39.7	15 9.5	55 32.22	+1.580	6.2	23	L	16
24.0	225 23 42.3	4 8 26.5	15 15.0	55 52.15	1.740	6.7	24	U	4
24.5	231 43 23.4	3 46 59.3	15 20.9	56 13.96	1.893	7.2	24	L	17
25.0	238 7 45.6	3 22 26.0	15 27.4	56 37.54	2.034	7.7	25	U	5
25.5	244 37 17.9	2 54 57.1	15 34.2	57 2.70	2.157	8.2	25	L	18
26.0	251 12 27.6	−2 24 45.8	15 41.4	57 29.20	+2.255	8.7	26	U	6
26.5	257 53 39.9	1 52 8.8	15 48.9	57 56.71	2.322	9.2	26	L	19
27.0	264 41 16.0	1 17 26.7	15 56.6	58 24.79	2.351	9.7	27	U	7
27.5	271 35 32.0	0 41 4.1	16 4.3	58 52.96	2.335	10.2	27	L	20
28.0	278 36 36.6	−0 3 30.1	16 11.8	59 20.64	2.269	10.7	28	U	8
28.5	285 44 29.9	+0 34 41.6	16 19.0	59 47.19	+2.146	11.2	28	L	21
29.0	292 59 1.7	1 12 53.0	16 25.8	60 11.91	1.965	11.7	29	U	9
29.5	300 19 49.7	1 50 22.6	16 31.8	60 34.10	1.724	12.2	29	L	22
30.0	307 46 19.1	2 26 26.0	16 37.0	60 53.06	1.426	12.7	30	U	10
30.5	315 17 42.2	3 0 17.9	16 41.1	61 8.14	1.078	13.2	30	L	22
31.0	322 52 58.9	+3 31 13.9	16 44.0	61 18.79	+0.691	13.7	31	U	11
31.5	330 30 58.1	3 58 32.5	16 45.6	61 24.63	+0.278	14.2	31	L	23
Sept. 1.0	338 10 20.6	4 21 37.2	16 45.8	61 25.42	−0.149	14.7	Sept. 1	U	12
1.5	345 49 41.8	4 39 58.5	16 44.6	61 21.09	0.571	15.2			...
2.0	353 27 36.2	4 53 15.5	16 42.1	61 11.79	0.974	15.7	2	L	0
2.5	1 2 40.9	+5 1 16.6	16 38.3	60 57.85	−1.342	16.2	2	U	13
3.0	8 33 39.7	5 3 59.8	16 33.4	60 39.77	1.663	16.7	3	L	1
3.5	15 59 25.9	5 1 31.6	16 27.5	60 18.15	1.931	17.2	3	U	14
4.0	23 19 5.1	4 54 6.5	16 20.8	59 53.66	2.140	17.7	4	L	2
4.5	30 31 56.3	4 42 5.2	16 13.5	59 27.02	2.289	18.2	4	U	14
5.0	37 37 32.7	+4 25 52.9	16 5.9	58 58.97	−2.377	18.7	5	L	3
5.5	44 35 40.5	4 5 57.9	15 58.0	58 30.19	2.410	19.2	5	U	15
6.0	51 26 18.4	3 42 49.8	15 50.2	58 1.32	2.394	19.7	6	L	4
6.5	58 9 35.9	3 16 58.8	15 42.4	57 32.90	2.336	20.2	6	U	16
7.0	64 45 51.2	2 48 54.4	15 35.0	57 5.41	2.242	20.7	7	L	5
7.5	71 15 29.9	+2 19 4.9	15 27.8	56 39.22	−2.119	21.2	7	U	17
8.0	77 39 2.4	+1 47 57.3	15 21.1	56 14.64	−1.974	21.7	8	L	6

GREENWICH MEAN TIME.

ude.	Latitude.	Semi-diameter.	Horizontal Parallax.	Var. per Hour.	Age.	Transit, Meridian of Greenwich.			Var. per Hour.
"	° ′ ″	′ ″	′ ″	″	d			h m	m
2.4	+1 47 57.3	15 21.1	56 14.64	−1.974	21.7	Sept. 8	L	6 11.0	2.23
3.1	1 15 56.8	15 14.9	55 51.91	1.813	22.2	8	U	18 37.6	2.19
8.4	0 43 27.1	15 9.3	55 31.18	1.641	22.7	9	L	7 3.6	2.14
55.7	+0 10 49.9	15 4.2	55 12.55	1.463	23.2	9	U	19 28.9	2.08
2.4	−0 21 34.2	14 59.7	54 56.07	1.283	23.7	10	L	7 53.6	2.02
5.1	−0 53 25.7	14 55.8	54 41.75	−1.103	24.2	10	U	20 17.5	1.96
38.9	1 24 26.6	14 52.5	54 29.57	0.928	24.7	11	L	8 40.8	1.91
16.8	1 54 19.6	14 49.7	54 19.46	0.760	25.2	11	U	21 3.4	1.86
29.3	2 22 48.4	14 47.5	54 11.33	0.597	25.7	12	L	9 25.4	1.81
44.4	2 49 37.4	14 45.8	54 5.10	0.443	26.2	12	U	21 46.9	1.77
27.3	−3 14 31.6	14 44.6	54 0.68	−0.297	26.7	13	L	10 7.9	1.74
0.3	3 37 17.1	14 43.9	53 57.96	0.159	27.2	13	U	22 28.6	1.71
43.1	3 57 40.5	14 43.6	53 56.84	−0.030	27.7	14	L	10 49.0	1.69
52.5	4 15 29.5	14 43.7	53 57.21	+0.091	28.2	14	U	23 9.2	1.68
43.1	4 30 33.0	14 44.2	53 59.00	0.206	28.7	15	L	11 29.4	1.68
27.6	−4 42 40.7	14 45.0	54 2.13	+0.316	29.2	15	U	23 49.6	1.69
16.7	4 51 44.1	14 46.2	54 6.55	0.421	0.1			.....	...
20.1	4 57 35.8	14 47.8	54 12.22	0.523	0.6	16	L	12 9.9	1.70
46.7	5 0 10.3	14 49.6	54 19.11	0.625	1.1	17	U	0 30.5	1.73
45.0	4 59 23.6	14 51.8	54 27.22	0.726	1.6	17	L	12 51.5	1.76
23.7	−4 55 13.6	14 54.4	54 36.54	+0.828	2.1	18	U	1 12.9	1.80
52.6	4 47 40.0	14 57.2	54 47.10	0.933	2.6	18	L	13 34.8	1.85
22.4	4 36 44.8	15 0.5	54 58.93	1.039	3.1	19	U	1 57.4	1.91
5.3	4 22 31.5	15 4.0	55 12.06	1.150	3.6	19	L	14 20.7	1.97
15.7	4 5 5.7	15 8.0	55 26.53	1.263	4.1	20	U	2 44.7	2.04
9.7	−3 44 35.2	15 12.3	55 42.36	+1.376	4.6	20	L	15 9.6	2.10
5.9	3 21 9.6	15 17.0	55 59.55	1.489	5.1	21	U	3 35.2	2.17
24.8	2 55 0.8	15 22.0	56 18.10	1.603	5.6	21	L	16 1.6	2.23
28.5	2 26 22.8	15 27.5	56 37.99	1.711	6.1	22	U	4 28.7	2.29
40.4	1 55 32.0	15 33.2	56 59.12	1.809	6.6	22	L	16 56.5	2.33
24.2	−1 22 47.3	15 39.3	57 21.35	+1.894	7.1	23	U	5 24.6	2.36
3.7	0 48 30.3	15 45.6	57 44.51	1.962	7.6	23	L	17 53.1	2.38
1.1	−0 13 5.5	15 52.1	58 8.35	2.006	8.1	24	U	6 21.7	2.38
35.7	+0 22 59.8	15 58.7	58 32.54	2.021	8.6	24	L	18 50.3	2.38
2.4	0 59 14.9	16 5.2	58 56.70	1.999	9.1	25	U	7 18.7	2.36
30.1	+1 35 6.5	16 11.7	59 20.35	+1.936	9.6	25	L	19 46.9	2.33
0.1	2 9 58.6	16 17.9	59 42.97	1.826	10.1	26	U	8 14.7	2.30
23.9	2 43 13.1	16 23.6	60 3.98	1.667	10.6	26	L	20 42.2	2.27
22.3	3 14 10.8	16 28.7	60 22.78	1.458	11.1	27	U	9 9.3	2.25
24.1	3 42 12.7	16 33.1	60 38.77	1.200	11.6	27	L	21 36.1	2.23
45.9	+4 6 41.6	16 36.5	60 51.39	+0.896	12.1	28	U	10 2.8	2.21
32.1	4 27 3.6	16 38.9	61 0.12	0.554	12.6	28	L	22 29.3	2.21
36.6	4 42 50.0	16 40.1	61 4.56	+0.183	13.1	29	U	10 55.8	2.21
45.0	4 53 39.1	16 40.1	61 4.46	−0.202	13.6	29	L	23 22.4	2.22
37.7	4 59 17.0	16 38.8	60 59.72	0.588	14.1	30	U	11 49.2	2.24
53.6	+4 59 39.1	16 36.3	60 50.40	−0.961	14.6			.....	...
13.7	+4 54 49.6	16 32.5	60 36.75	−1.309	15.1	Oct. 1	L	0 16.2	2.27

GREENWICH MEAN TIME.

G. M. T.	Longitude.	Latitude.	Semi-diameter.	Horizontal Parallax.	Var. per Hour.	Age.	Transit, Meridian of Greenwich		
	° ′ ″	° ′ ″	′ ″	′ ″	″	d			h
Oct. 1.0	16 47 13.7	+4 54 49.6	16 32.5	60 36.75	−1.309	15.1	Oct. 1	L	0 16
1.5	24 13 25.1	4 45 1.1	16 27.7	60 19.14	1.619	15.6	1	U	12 43
2.0	31 34 23.9	4 30 33.9	16 22.0	59 58.09	1.881	16.1	2	L	1 11
2.5	38 49 17.7	4 11 54.1	16 15.5	59 34.21	2.089	16.6	2	U	13 39
3.0	45 57 26.9	3 49 32.0	16 8.4	59 8.16	2.243	17.1	3	L	2 7
3.5	52 58 25.4	+3 24 0.3	16 0.9	58 40.63	−2.337	17.6	3	U	14 36
4.0	59 52 0.2	2 55 52.9	15 53.2	58 12.30	2.376	18.1	4	L	3 4
4.5	66 38 10.3	2 25 43.3	15 45.4	57 43.80	2.366	18.6	4	U	15 33
5.0	73 17 5.4	1 54 3.7	15 37.7	57 15.70	2.311	19.1	5	L	4 1
5.5	79 49 4.5	1 21 24.2	15 30.3	56 48.51	2.214	19.6	5	U	16 28
6.0	86 14 33.7	+0 48 12.8	15 23.3	56 22.68	−2.086	20.1	6	L	4 55
6.5	92 34 4.8	+0 14 54.9	15 16.7	55 58.54	1.932	20.6	6	U	17 22
7.0	98 48 13.8	−0 18 6.5	15 10.7	55 36.38	1.758	21.1	7	L	5 47
7.5	104 57 39.3	0 50 30.5	15 5.2	55 16.41	1.569	21.6	7	U	18 12
8.0	111 3 1.2	1 21 58.2	15 0.4	54 58.78	1.370	22.1	8	L	6 36
8.5	117 5 0.0	−1 52 12.6	14 56.3	54 43.56	−1.165	22.6	8	U	18 59
9.0	123 4 15.9	2 20 58.0	14 52.8	54 30.81	0.960	23.1	9	L	7 22
9.5	129 1 28.0	2 47 59.8	14 50.0	54 20.52	0.755	23.6	9	U	19 44
10.0	134 57 13.3	3 13 4.4	14 47.9	54 12.66	0.556	24.1	10	L	8 5
10.5	140 52 6.8	3 35 59.2	14 46.4	54 7.15	0.363	24.6	10	U	20 26
11.0	146 46 41.2	−3 56 32.1	14 45.5	54 3.90	−0.180	25.1	11	L	8 47
11.5	152 41 26.0	4 14 31.8	14 45.2	54 2.78	−0.008	25.6	11	U	21 7
12.0	158 36 47.7	4 29 47.5	14 45.4	54 3.65	+0.152	26.1	12	L	9 27
12.5	164 33 9.4	4 42 9.5	14 46.2	54 6.38	0.301	26.6	12	U	21 48
13.0	170 30 51.4	4 51 28.7	14 47.4	54 10.82	0.435	27.1	13	L	10 8
13.5	176 30 10.0	−4 57 37.2	14 49.0	54 16.78	+0.556	27.6	13	U	22 28
14.0	182 31 19.0	5 0 28.6	14 51.0	54 24.13	0.666	28.1	14	L	10 49
14.5	188 34 29.2	4 59 57.9	14 53.3	54 32.71	0.762	28.6	14	U	23 11
15.0	194 39 48.8	4 56 1.7	14 56.0	54 42.38	0.848	29.1	15	L	11 32
15.5	200 47 23.7	4 48 38.9	14 58.9	54 53.02	0.922	29.6	15	U	23 55
16.0	206 57 18.2	−4 37 50.4	15 2.0	55 4.48	+0.988	0.4			. . .
16.5	213 9 36.0	4 23 39.5	15 5.3	55 16.71	1.047	0.9	16	L	12 18
17.0	219 24 19.8	4 6 12.2	15 8.8	55 29.58	1.099	1.4	17	U	0 42
17.5	225 41 32.1	3 45 37.0	15 12.5	55 43.05	1.147	1.9	17	L	13 6
18.0	232 1 16.3	3 22 4.9	15 16.3	55 57.08	1.191	2.4	18	U	1 32
18.5	238 23 36.7	−2 55 49.5	15 20.3	56 11.64	+1.234	2.9	18	L	13 58
19.0	244 48 39.2	2 27 6.9	15 24.4	56 26.70	1.275	3.4	19	U	2 25
19.5	251 16 31.2	1 56 15.8	15 28.6	56 42.24	1.314	3.9	19	L	14 52
20.0	257 47 22.1	1 23 37.0	15 33.0	56 58.23	1.351	4.4	20	U	3 20
20.5	264 21 22.6	0 49 33.6	15 37.5	57 14.66	1.387	4.9	20	L	15 48
21.0	270 58 45.2	−0 14 30.7	15 42.0	57 31.49	+1.417	5.4	21	U	4 16
21.5	277 39 43.2	+0 21 4.7	15 46.7	57 48.65	1.440	5.9	21	L	16 44
22.0	284 24 29.8	0 56 43.9	15 51.5	58 6.01	1.452	6.4	22	U	5 12
22.5	291 13 17.7	1 31 56.6	15 56.2	58 23.45	1.452	6.9	22	L	17 39
23.0	298 6 17.9	2 6 11.2	16 0.9	58 40.78	1.433	7.4	23	U	6 7
23.5	305 3 37.5	+2 38 55.2	16 5.6	58 57.74	+1.391	7.9	23	L	18 33
24.0	312 5 19.6	+3 9 35.3	16 10.0	59 14.06	+1.324	8.4	24	U	7 0

GREENWICH MEAN TIME.

M. T.	Longitude.	Latitude.	Semi-diameter.	Horizontal Parallax.	Var. per Hour.	Age.	Transit, Meridian of Greenwich.			Var. per Hour.
	° ′ ″	° ′ ″	′ ″	′ ″	″	d			h m	m
24.0	312 5 19.6	+3 9 35.3	16 10.0	59 14.06	+1.324	8.4	Oct. 24	U	7 0.1	2.18
24.5	319 11 21.9	3 37 38.6	16 14.2	59 29.40	1.227	8.9	24	L	19 26.1	2.16
25.0	326 21 34.6	4 2 32.9	16 18.0	59 43.39	1.098	9.4	25	U	7 51.9	2.14
25.5	333 35 39.6	4 23 47.7	16 21.3	59 55.61	0.934	9.9	25	L	20 17.6	2.13
26.0	340 53 10.1	4 40 55.7	16 24.1	60 5.67	0.735	10.4	26	U	8 43.2	2.13
26.5	348 13 30.4	+4 53 33.4	16 26.1	60 13.14	+0.504	10.9	26	L	21 8.9	2.15
27.0	355 35 56.0	5 1 22.4	16 27.3	60 17.67	+0.248	11.4	27	U	9 34.7	2.17
27.5	2 59 34.4	5 4 11.1	16 27.7	60 18.99	−0.031	11.9	27	L	22 1.0	2.20
28.0	10 23 27.9	5 1 54.6	16 27.1	60 16.86	0.325	12.4	28	U	10 27.6	2.24
28.5	17 46 34.5	4 54 35.9	16 25.6	60 11.16	0.628	12.9	28	L	22 54.6	2.28
29.0	25 7 51.0	+4 42 25.3	16 23.0	60 1.87	−0.919	13.4	29	U	11 22.3	2.32
29.5	32 26 16.2	4 25 40.5	16 19.6	59 49.18	1.194	13.9	29	L	23 50.4	2.36
30.0	39 40 53.3	4 4 45.4	16 15.2	59 33.30	1.447	14.4	30	U	12 18.9	2.39
30.5	46 50 51.5	3 40 9.1	16 10.1	59 14.57	1.667	14.9			. . . . .	. . .
31.0	53 55 28.8	3 12 24.2	16 4.4	58 53.44	1.847	15.4	31	L	0 47.7	2.41
31.5	60 54 12.9	+2 42 5.6	15 58.1	58 30.42	−1.983	15.9	31	U	13 16.8	2.42
Nov. 1.0	67 46 41.8	2 9 48.6	15 51.5	58 6.05	2.072	16.4	Nov. 1	L	1 45.7	2.41
1.5	74 32 43.5	1 36 8.0	15 44.6	57 40.89	2.116	16.9	1	U	14 14.5	2.38
2.0	81 12 16.1	1 1 37.3	15 37.7	57 15.46	2.114	17.4	2	L	2 42.8	2.33
2.5	87 45 26.4	+0 26 47.5	15 30.8	56 50.33	2.069	17.9	2	U	15 10.5	2.27
3.0	94 12 29.4	−0 7 52.9	15 24.2	56 25.95	−1.988	18.4	3	L	3 37.4	2.21
3.5	100 33 47.0	0 41 58.6	15 17.9	56 2.77	1.872	18.9	3	U	16 3.5	2.14
4.0	106 49 46.5	1 15 6.9	15 12.0	55 41.14	1.728	19.4	4	L	4 28.7	2.06
4.5	113 0 59.3	1 46 57.7	15 6.6	55 21.39	1.561	19.9	4	U	16 53.0	1.99
5.0	119 8 0.5	2 17 13.6	15 1.8	55 3.75	1.376	20.4	5	L	5 16.4	1.92
5.5	125 11 27.5	−2 45 39.1	14 57.6	54 48.44	−1.175	20.9	5	U	17 39.1	1.86
6.0	131 11 58.7	3 12 0.8	14 54.1	54 35.60	0.963	21.4	6	L	6 1.1	1.81
6.5	137 10 13.5	3 36 6.3	14 51.3	54 25.34	0.747	21.9	6	U	18 22.5	1.76
7.0	143 6 50.9	3 57 44.5	14 49.2	54 17.67	0.530	22.4	7	L	6 43.4	1.73
7.5	149 2 29.3	4 16 45.5	14 47.9	54 12.63	0.310	22.9	7	U	19 4.0	1.70
8.0	154 57 46.2	−4 33 0.0	14 47.2	54 10.20	−0.097	23.4	8	L	7 24.3	1.69
8.5	160 53 16.6	4 46 19.1	14 47.2	54 10.27	+0.107	23.9	8	U	19 44.5	1.68
9.0	166 49 34.2	4 56 35.0	14 47.9	54 12.75	0.304	24.4	9	L	8 4.7	1.69
9.5	172 47 9.7	5 3 40.3	14 49.2	54 17.52	0.488	24.9	9	U	20 25.1	1.71
10.0	178 46 30.8	5 7 28.5	14 51.1	54 24.41	0.659	25.4	10	L	8 45.8	1.73
10.5	184 48 2.1	−5 7 53.9	14 53.5	54 33.25	+0.813	25.9	10	U	21 6.7	1.77
11.0	190 52 4.7	5 4 52.2	14 56.4	54 43.84	0.947	26.4	11	L	9 28.1	1.81
11.5	196 58 56.4	4 58 20.4	14 59.6	54 55.91	1.062	26.9	11	U	21 50.2	1.87
12.0	203 8 50.9	4 48 17.5	15 3.3	55 9.26	1.159	27.4	12	L	10 13.0	1.93
12.5	209 21 58.4	4 34 44.7	15 7.2	55 23.64	1.233	27.9	12	U	22 36.6	2.00
13.0	215 38 25.6	−4 17 45.6	15 11.3	55 38.78	+1.286	28.4	13	L	11 0.9	2.07
13.5	221 58 15.8	3 57 26.6	15 15.6	55 54.44	1.321	28.9	13	U	23 26.1	2.14
14.0	228 21 29.3	3 33 57.4	15 20.0	56 10.41	1.336	29.4			. . . . .	. . .
14.5	234 48 3.9	3 7 30.8	15 24.3	56 26.42	1.331	0.2	14	L	11 52.2	2.21
15.0	241 17 55.4	2 38 22.8	15 28.6	56 42.29	1.311	0.7	15	U	0 19.0	2.27
15.5	247 50 57.8	−2 6 53.1	15 32.9	56 57.84	+1.278	1.2	15	L	12 46.6	2.32
16.0	254 27 4.4	−1 33 24.3	15 37.0	57 12.92	+1.233	1.7	16	U	1 14.6	2.35

GREENWICH MEAN TIME.

G. M. T.	Longitude.	Latitude.	Semi-diameter.	Horizontal Parallax.	Var. per Hour.	Age.	Transit, Meridian of Greenwich.		
	° ′ ″	° ′ ″	′ ″	′ ″	″	d			h m
Nov. 16.0	254 27 4.4	−1 33 24.3	15 37.0	57 12.92	+1.233	1.7	Nov. 16	U	1 14.
16.5	261 6 7.9	0 58 21.8	15 40.9	57 27.41	1.181	2.2	16	L	13 43.
17.0	267 48 1.3	−0 22 13.8	15 44.7	57 41.25	1.124	2.7	17	U	2 11.
17.5	274 32 37.9	+0 14 29.6	15 48.3	57 54.35	1.060	3.2	17	L	14 40.
18.0	281 19 51.9	0 51 16.9	15 51.6	58 6.68	0.996	3.7	18	U	3 8.
18.5	288 9 38.0	+1 27 35.4	15 54.8	58 18.25	+0.932	4.2	18	L	15 36.
19.0	295 1 51.8	2 2 52.1	15 57.7	58 29.05	0.867	4.7	19	U	4 3.
19.5	301 56 29.3	2 36 34.2	16 0.5	58 39.06	0.802	5.2	19	L	16 30.
20.0	308 53 26.5	3 8 9.5	16 3.0	58 48.29	0.736	5.7	20	U	4 56.
20.5	315 52 38.9	3 37 7.1	16 5.3	58 56.70	0.666	6.2	20	L	17 22.
21.0	322 54 0.7	+4 2 57.9	16 7.3	59 4.25	+0.591	6.7	21	U	5 47.
21.5	329 57 24.3	4 25 15.5	16 9.1	59 10.87	0.509	7.2	21	L	18 12.
22.0	337 2 39.5	4 43 36.1	16 10.6	59 16.44	0.419	7.7	22	U	6 37.
22.5	344 9 32.7	4 57 39.3	16 11.8	59 20.87	0.317	8.2	22	L	19 2.
23.0	351 17 46.8	5 7 9.4	16 12.7	59 23.99	0.200	8.7	23	U	7 27.
23.5	358 27 0.5	+5 11 54.7	16 13.2	59 25.62	+0.069	9.2	23	L	19 52.
24.0	5 36 48.6	5 11 48.9	16 13.1	59 25.60	−0.076	9.7	24	U	8 17.
24.5	12 46 41.7	5 6 51.3	16 12.6	59 23.75	0.235	10.2	24	L	20 43.
25.0	19 56 7.5	4 57 6.9	16 11.6	59 19.90	0.406	10.7	25	U	9 10.
25.5	27 4 31.0	4 42 46.5	16 10.0	59 13.98	0.583	11.2	25	L	21 36.
26.0	34 11 15.6	+4 24 6.6	16 7.8	59 5.89	−0.765	11.7	26	U	10 4.
26.5	41 15 44.5	4 1 28.6	16 5.0	58 55.61	0.946	12.2	26	L	22 32.
27.0	48 17 22.2	3 35 18.7	16 1.6	58 43.20	1.121	12.7	27	U	11 0.
27.5	55 15 35.1	3 6 6.7	15 57.7	58 28.76	1.281	13.2	27	L	23 29.
28.0	62 9 53.7	2 34 24.9	15 53.2	58 12.53	1.423	13.7	28	U	11 58.
28.5	68 59 52.5	+2 0 47.2	15 48.3	57 54.71	−1.543	14.2			. . . .
29.0	75 45 11.7	1 25 48.0	15 43.2	57 35.62	1.634	14.7	29	L	0 27.
29.5	82 25 37.3	0 50 1.0	15 37.7	57 15.62	1.696	15.2	29	U	12 55.
30.0	89 1 1.3	+0 13 58.5	15 32.1	56 55.05	1.725	15.7	30	L	1 23.
30.5	95 31 21.8	−0 21 49.2	15 26.5	56 34.34	1.721	16.2	30	U	13 50.
Dec. 1.0	101 56 43.5	−0 56 54.4	15 20.9	56 13.87	−1.685	16.7	Dec. 1	L	2 17.
1.5	108 17 16.0	1 30 51.9	15 15.5	55 54.02	1.617	17.2	1	U	14 42.
2.0	114 33 14.6	2 3 19.9	15 10.4	55 35.18	1.519	17.7	2	L	3 7.
2.5	120 44 59.3	2 33 59.2	15 5.6	55 17.67	1.396	18.2	2	U	15 31.
3.0	126 52 53.9	3 2 33.2	15 1.2	55 1.78	1.248	18.7	3	L	3 54.
3.5	132 57 26.1	−3 28 47.6	14 57.4	54 47.80	−1.079	19.2	3	U	16 16.
4.0	138 59 6.3	3 52 30.4	14 54.2	54 35.95	0.893	19.7	4	L	4 37.
4.5	144 58 27.1	4 13 31.1	14 51.6	54 26.42	0.693	20.2	4	U	16 58.
5.0	150 56 3.0	4 31 40.9	14 49.7	54 19.36	0.482	20.7	5	L	5 19.
5.5	156 52 29.6	4 46 52.1	14 48.5	54 14.88	0.264	21.2	5	U	17 39.
6.0	162 48 23.5	−4 58 58.0	14 48.0	54 13.05	−0.042	21.7	6	L	6 0.
6.5	168 44 21.3	5 7 52.4	14 48.2	54 13.88	+0.180	22.2	6	U	18 20.
7.0	174 40 59.3	5 13 30.3	14 49.2	54 17.38	0.401	22.7	7	L	6 40.
7.5	180 38 52.9	5 15 46.8	14 50.8	54 23.48	0.614	23.2	7	U	19 1.
8.0	186 38 36.5	5 14 38.2	14 53.2	54 32.09	0.819	23.7	8	L	7 21.
8.5	192 40 42.8	−5 10 1.2	14 56.2	54 43.09	+1.012	24.2	8	U	19 43.
9.0	*198 45 41.9*	*−5 1 53.8*	14 59.8	54 56.31	+1.188	24.7	9	L	8 5

GREENWICH MEAN TIME.

Longitude.	Latitude.	Semi-diameter.	Horizontal Parallax.	Var. per Hour.	Age.	Transit, Meridian of Greenwich.			Var. per Hour.
° ′ ″	° ′ ″	′ ″	′ ″	″	d			h m	m
198 45 41.9	−5 1 53.8	14 59.8	54 56.31	+1.188	24.7	Dec. 9	L	8 5.3	1.86
204 54 1.3	4 50 15.4	15 3.9	55 11.53	1.344	25.2	9	U	20 28.0	1.93
211 6 5.2	4 35 6.9	15 8.5	55 28.48	1.477	25.7	10	L	8 51.6	2.00
217 22 14.2	4 16 31.5	15 13.5	55 46.87	1.585	26.2	10	U	21 16.0	2.08
223 42 44.7	3 54 34.8	15 18.9	56 6.40	1.664	26.7	11	L	9 41.4	2.16
230 7 48.2	−3 29 25.5	15 24.4	56 26.69	+1.710	27.2	11	U	22 7.8	2.23
236 37 31.8	3 1 15.7	15 30.0	56 47.33	1.725	27.7	12	L	10 35.0	2.30
243 11 57.2	2 30 21.3	15 35.6	57 7.98	1.709	28.2	12	U	23 3.0	2.36
249 51 1.2	1 57 2.2	15 41.2	57 28.22	1.658	28.7			. . . . .	. . .
256 34 35.5	1 21 42.5	15 46.5	57 47.66	1.577	29.2	13	L	11 31.6	2.41
263 22 26.9	−0 44 50.0	15 51.4	58 5.95	+1.466	0.1	14	U	0 0.7	2.43
270 14 17.9	−0 6 56.1	15 56.0	58 22.75	1.330	0.6	14	L	12 29.9	2.44
277 9 47.3	+0 31 24.6	16 0.1	58 37.79	1.175	1.1	15	U	0 59.1	2.42
284 8 30.7	1 9 35.4	16 3.7	58 50.89	1.006	1.6	15	L	13 28.0	2.40
291 10 1.2	1 46 58.5	16 6.7	59 1.88	0.824	2.1	16	U	1 56.5	2.35
298 13 50.8	+2 22 55.8	16 9.1	59 10.67	+0.641	2.6	16	L	14 24.5	2.30
305 19 30.5	2 56 50.2	16 10.9	59 17.30	0.463	3.1	17	U	2 51.8	2.25
312 26 31.2	3 28 6.5	16 12.1	59 21.80	0.289	3.6	17	L	15 18.5	2.20
319 34 24.9	3 56 12.6	16 12.8	59 24.29	+0.128	4.1	18	U	3 44.6	2.15
326 42 44.9	4 20 40.1	16 13.0	59 24.91	−0.021	4.6	18	L	16 10.2	2.11
333 51 6.0	+4 41 4.9	16 12.7	59 23.83	−0.155	5.1	19	U	4 35.4	2.08
340 59 5.3	4 57 7.8	16 12.0	59 21.23	0.276	5.6	19	L	17 0.3	2.06
348 6 21.7	5 8 34.7	16 10.9	59 17.26	0.382	6.1	20	U	5 25.0	2.06
355 12 36.6	5 15 16.7	16 9.5	59 12.11	0.475	6.6	20	L	17 49.7	2.06
2 17 32.9	5 17 9.9	16 7.8	59 5.92	0.556	7.1	21	U	6 14.5	2.08
9 20 55.4	+5 14 15.4	16 5.8	58 58.79	−0.632	7.6	21	L	18 39.6	2.10
16 22 30.3	5 6 39.3	16 3.7	58 50.78	0.702	8.1	22	U	7 5.0	2.13
23 22 5.1	4 54 32.1	16 1.3	58 41.97	0.767	8.6	22	L	19 30.9	2.17
30 19 27.8	4 38 8.5	15 58.6	58 32.36	0.832	9.1	23	U	7 57.2	2.22
37 14 27.3	4 17 46.9	15 55.8	58 22.00	0.896	9.6	23	L	20 24.1	2.26
44 6 53.1	+3 53 49.3	15 52.8	58 10.85	−0.961	10.1	24	U	8 51.4	2.30
50 56 34.7	3 26 40.6	15 49.5	57 58.94	1.025	10.6	24	L	21 19.2	2.33
57 43 22.6	2 56 48.1	15 46.1	57 46.25	1.090	11.1	25	U	9 47.3	2.35
64 27 7.1	2 24 40.9	15 42.4	57 32.80	1.150	11.6	25	L	22 15.5	2.35
71 7 39.8	1 50 49.4	15 38.6	57 18.67	1.206	12.1	26	U	10 43.7	2.34
77 44 52.8	+1 15 44.6	15 34.5	57 3.89	−1.256	12.6	26	L	23 11.7	2.31
84 18 39.7	0 39 57.4	15 30.4	56 48.58	1.295	13.1	27	U	11 39.2	2.26
90 48 55.6	+0 3 58.0	15 26.1	56 32.86	1.323	13.6			. . . . .	. . .
97 15 37.1	−0 31 44.5	15 21.7	56 16.90	1.334	14.1	28	L	0 6.2	2.22
103 38 43.6	1 6 42.7	15 17.4	56 0.91	1.327	14.6	28	U	12 32.4	2.15
109 58 16.5	−1 40 31.4	15 13.1	55 45.13	−1.302	15.1	29	L	0 57.9	2.09
116 14 20.2	2 12 47.6	15 8.9	55 29.73	1.259	15.6	29	U	13 22.5	2.02
122 27 1.8	2 43 11.0	15 4.8	55 15.00	1.194	16.1	30	L	1 46.3	1.95
128 36 31.4	3 11 23.5	15 1.1	55 1.17	1.108	16.6	30	U	14 9.3	1.89
134 43 2.1	3 37 9.8	14 57.6	54 48.50	1.000	17.1	31	L	2 31.5	1.83
140 46 50.4	*−4 0 17.1*	*14 54.6*	*54 37.25*	−0.873	17.6	31	U	14 53.2	1.78
146 48 15.4	*−4 20 34.5*	*14 51.9*	*54 27.63*	−0.726	18.1	32	L	3 14.3	1.74

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 of Mercury at Greenwich.
		Noon.	Noon.	Noon.	Noon.	Noon.	Noon.	Noon.	Noon.	
		h m s	s	° ′ ″	″			″	″	h m
Jan.	1	20 8 54.66	+11.874	−21 30 48.2	−60.35	0.013 0168	−4399.8	3.24	8.54	1 26
	2	20 13 28.72	10.945	21 6 26.3	61.39	0.002 1984	4614.9	3.32	8.76	1 27
	3	20 17 39.05	9.895	20 41 46.3	61.84	9.990 8704	4823.6	3.42	8.99	1 27
	4	20 21 22.61	8.713	20 17 3.3	61.62	9.979 0547	5020.1	3.50	9.23	1 27
	5	20 24 36.17	7.394	19 52 34.5	60.64	9.966 7889	5197.6	3.60	9.50	1 26
	6	20 27 16.37	+ 5.933	−19 28 38.9	+58.85	9.954 1282	−5347.5	3.71	9.78	1 25
	7	20 29 19.82	4.331	19 5 36.6	56.19	9.941 1515	5459.2	3.82	10.08	1 23
	8	20 30 43.18	2.595	18 43 48.9	52.63	9.927 9630	5522.0	3.95	10.39	1 20
	9	20 31 23.42	+ 0.741	18 23 37.3	48.19	9.914 6949	5523.4	4.07	10.71	1 17
	10	20 31 18.02	− 1.204	18 5 22.8	42.89	9.901 5099	5450.6	4.19	11.04	1 13
	11	20 30 25.18	− 3.204	−17 49 24.8	+36.83	9.888 6007	−5291.9	4.32	11.37	1 8
	12	20 28 44.22	5.205	17 35 59.7	30.17	9.876 1852	5037.7	4.44	11.70	1 2
	13	20 26 15.80	7.147	17 25 20.1	23.07	9.864 5017	4681.2	4.56	12.02	0 56
	14	20 23 2.20	8.957	17 17 33.7	15.78	9.853 7984	4221.3	4.68	12.32	0 49
	15	20 19 7.50	10.560	17 12 42.3	8.53	9.844 3184	3663.0	4.78	12.59	0 41
	16	20 14 37.56	−11.882	−17 10 41.6	+ 1.59	9.836 2854	−3018.2	4.87	12.83	0 33
	17	20 9 39.92	12.860	17 11 22.0	− 4.85	9.829 8848	2306.3	4.94	13.02	0 25
	18	20 4 23.41	13.449	17 14 28.8	10.59	9.825 2497	1551.6	4.99	13.16	0 15
	19	19 58 57.65	13.629	17 19 44.0	15.54	9.822 4495	781.6	5.03	13.24	0 5
	20	19 53 32.43	13.407	17 26 47.8	19.63	9.821 4873	− 24.8	5.04	13.27	23 47
	21	19 48 17.09	−12.813	−17 35 19.7	−22.89	9.822 2990	+ 693.0	5.03	13.25	23 38
	22	19 43 19.99	11.896	17 45 0.4	25.37	9.824 7659	1351.3	5.00	13.17	23 30
	23	19 38 48.13	10.720	17 55 31.7	27.15	9.828 7258	1935.4	4.95	13.05	23 22
	24	19 34 46.90	9.355	18 6 37.7	28.27	9.833 9895	2436.8	4.90	12.90	23 14
	25	19 31 20.11	7.863	18 18 4.3	28.86	9.840 3545	2853.2	4.82	12.71	23 7
	26	19 28 30.01	- 6.305	−18 29 39.5	−29.00	9.847 6194	+3187.5	4.74	12.50	23 1
	27	19 26 17.62	4.729	18 41 13.0	28.73	9.855 5930	3444.9	4.66	12.27	22 56
	28	19 24 42.83	3.176	18 52 35.6	28.10	9.864 0995	3633.2	4.56	12.03	22 51
	29	19 23 44.76	1.674	19 3 39.5	27.17	9.872 9844	3761.7	4.48	11.79	22 47
	30	19 23 21.92	− 0.242	19 14 17.8	25.98	9.882 1147	3839.0	4.38	11.54	22 43
	31	19 23 32.45	+ 1.105	−19 24 24.4	−24.53	9.891 3776	+3873.9	4.29	11.30	22 39
Feb.	1	19 24 14.25	2.303	19 33 53.7	22.88	9.900 6817	3874.3	4.19	11.06	22 37
	2	19 25 25.14	3.529	19 42 40.9	21.02	9.909 9518	3846.7	4.11	10.83	22 34
	3	19 27 2.92	4.604	19 50 41.4	19.00	9.919 1287	3797.5	4.02	10.60	22 32
	4	19 29 5.44	5.592	19 57 51.5	16.82	9.928 1665	3731.5	3.94	10.38	22 31
	5	19 31 30.64	+ 6.495	−20 4 7.7	−14.50	9.937 0296	+3652.7	3.86	10.17	22 30
	6	19 34 16.58	7.321	20 9 26.7	12.06	9.945 6924	3565.0	3.79	9.97	22 29
	7	19 37 21.46	8.074	20 13 45.8	9.51	9.954 1365	3470.7	3.71	9.78	22 28
	8	19 40 43.60	8.761	20 17 2.4	6.86	9.962 3487	3372.3	3.64	9.60	22 28
	9	19 44 21.48	9.386	20 19 14.4	4.13	9.970 3216	3271.4	3.58	9.42	22 28
	10	19 48 13.70	+ 9.956	−20 20 20.0	− 1.32	9.978 0505	+3169.4	3.51	9.26	22 28
	11	19 52 18.98	10.475	20 20 17.2	+ 1.56	9.985 5349	3067.5	3.46	9.10	22 28
	12	19 56 36.14	10.948	20 19 4.6	4.49	9.992 7753	2966.3	3.40	8.95	22 29
	13	20 1 4.16	11.380	20 16 41.1	7.48	9.999 7745	2866.7	3.34	8.80	22 29
	14	20 5 42.05	11.772	20 13 5.3	10.51	0.006 5370	2768.9	3.29	8.67	22 30
	15	20 10 28.96	+12.131	−20 8 16.5	+13.57	0.013 0671	+2673.2	3.24	8.54	22 31
	16	20 15 24.11	+12.459	−20 2 13.6	+16.67	0.019 3706	+2580.1	3.20	8.42	22 32

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
Feb. 16	20 15 24.11	+12.459	−20 2 13.6	+ 16.67	0.019 3706	+2580.1	3.20	8.42	22 32.8
17	20 20 26.77	12.758	19 54 56.1	19.79	0.025 4536	2489.5	3.15	8.30	22 34.0
18	20 25 36.31	13.033	19 46 23.3	22.94	0.031 3224	2401.6	3.11	8.19	22 35.3
19	20 30 52.15	13.283	19 36 34.7	26.11	0.036 9832	2316.2	3.06	8.08	22 36.8
20	20 36 13.74	13.513	19 25 30.0	29.29	0.042 4425	2233.6	3.03	7.98	22 38.3
21	20 41 40.62	+13.724	−19 13 8.8	+ 32.48	0.047 7065	+2153.6	2.99	7.88	22 39.8
22	20 47 12.35	13.918	18 59 30.9	35.69	0.052 7817	2076.1	2.96	7.79	22 41.5
23	20 52 48.57	14.097	18 44 35.9	38.90	0.057 6736	2001.0	2.92	7.71	22 43.2
24	20 58 28.90	14.262	18 28 23.9	42.11	0.062 3883	1928.2	2.89	7.62	22 45.0
25	21 4 13.06	14.415	18 10 54.7	45.32	0.066 9309	1857.7	2.86	7.54	22 46.9
26	21 10 0.75	+14.557	−17 52 8.3	+ 48.55	0.071 3068	+1789.2	2.84	7.47	22 48.8
27	21 15 51.74	14.690	17 32 4.4	51.77	0.075 5206	1722.5	2.81	7.39	22 50.7
28	21 21 45.81	14.815	17 10 43.3	54.99	0.079 5762	1657.5	2.78	7.33	22 52.7
Mar. 1	21 27 42.78	14.932	16 48 4.9	58.21	0.083 4781	1594.2	2.76	7.26	22 54.8
2	21 33 42.49	15.043	16 24 9.3	61.43	0.087 2294	1532.1	2.74	7.20	22 56.9
3	21 39 44.80	+15.149	−15 58 56.4	+ 64.64	0.090 8333	+1471.2	2.72	7.14	22 59.0
4	21 45 49.59	15.250	15 32 26.5	67.85	0.094 2922	1411.4	2.69	7.08	23 1.2
5	21 51 56.77	15.348	15 4 39.6	71.05	0.097 6085	1352.2	2.67	7.03	23 3.4
6	21 58 6.26	15.443	14 35 36.0	74.25	0.100 7831	1293.4	2.65	6.98	23 5.7
7	22 4 18.01	15.536	14 5 15.7	77.44	0.103 8174	1235.2	2.63	6.93	23 8.0
8	22 10 31.98	+15.628	−13 33 38.9	+ 80.62	0.106 7123	+1177.1	2.61	6.88	23 10.3
9	22 16 48.16	15.720	13 0 46.0	83.79	0.109 4673	1118.7	2.60	6.84	23 12.7
10	22 23 6.52	15.811	12 26 37.1	86.95	0.112 0817	1059.9	2.58	6.80	23 15.1
11	22 29 27.11	15.904	11 51 12.5	90.10	0.114 5543	1000.5	2.56	6.76	23 17.5
12	22 35 49.94	15.998	11 14 32.5	93.23	0.116 8833	940.1	2.55	6.72	23 20.0
13	22 42 15.04	+16.094	−10 36 37.7	+ 96.34	0.119 0658	+ 878.4	2.54	6.69	23 22.5
14	22 48 42.48	16.193	9 57 28.3	99.44	0.121 0981	815.0	2.52	6.66	23 25.1
15	22 55 12.33	16.295	9 17 5.0	102.50	0.122 9763	749.7	2.51	6.63	23 27.7
16	23 1 44.65	16.400	8 35 28.4	105.55	0.124 6949	682.0	2.50	6.60	23 30.3
17	23 8 19.54	16.509	7 52 39.0	108.56	0.126 2479	611.6	2.49	6.58	23 33.0
18	23 14 57.09	+16.621	− 7 8 38.0	+111.52	0.127 6280	+ 537.9	2.49	6.56	23 35.7
19	23 21 37.41	16.739	6 23 26.2	114.45	0.128 8270	460.6	2.49	6.55	23 38.5
20	23 28 20.60	16.861	5 37 4.8	117.32	0.129 8357	379.0	2.48	6.53	23 41.3
21	23 35 6.76	16.986	4 49 35.3	120.15	0.130 6432	293.0	2.47	6.51	23 44.2
22	23 41 55.99	17.117	4 0 59.3	122.86	0.131 2380	201.7	2.47	6.50	23 47.2
23	23 48 48.41	+17.252	− 3 11 18.9	+125.50	0.131 6067	+ 104.5	2.47	6.50	23 50.2
24	23 55 44.10	17.389	2 20 36.3	128.03	0.131 7347	+ 1.0	2.47	6.50	23 53.2
25	0 2 43.12	17.530	1 28 54.3	130.44	0.131 6060	− 109.5	2.47	6.50	23 56.3
26	0 9 45.54	17.672	− 0 36 16.2	132.71	0.131 2031	227.6	2.47	6.50	23 59.5
27	0 16 51.37	17.814	+ 0 17 14.2	134.80	0.130 5072	353.7	2.47	6.51	. . . . .
28	0 24 0.61	+17.955	+ 1 11 32.6	+136.69	0.129 4981	− 488.7	2.48	6.53	0 2.7
29	0 31 13.19	18.092	2 6 33.6	138.35	0.128 1539	632.9	2.49	6.55	0 6.0
30	0 38 28.99	18.223	3 2 11.4	139.75	0.126 4526	786.6	2.49	6.58	0 9.3
31	0 45 47.83	18.345	3 58 19.2	140.84	0.124 3705	950.1	2.50	6.61	0 12.7
1	0 53 9.44	18.454	4 54 49.1	141.59	0.121 8842	1123.5	2.52	6.65	0 16.1
2	1 0 33.46	+18.545	+ 5 51 32.5	+141.96	0.118 9700	−1306.6	2.54	6.69	0 19.6
3	1 7 59.43	+18.615	+ 6 48 19.6	+141.90	0.115 6050	−1499.0	2.56	6.74	0 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.	Horizontal Parallax.
		Noon.	*Noon.*	*Noon.*	*Noon.*	*Noon.*	*Noon.*	*Noon.*	*Noon.*
		h m s	s	° ′ ″	″			″	″
Apr.	1	0 53 9.44	+18.454	+ 4 54 49.1	+141.59	0.121 8842	−1123.5	2.52	6.65
	2	1 0 33.46	18.545	5 51 32.5	141.96	0.118 9700	1306.6	2.54	6.69
	3	1 7 59.43	18.615	6 48 19.6	141.90	0.115 6050	1499.0	2.56	6.74
	4	1 15 26.78	18.659	7 44 59.8	141.37	0.111 7679	1700.0	2.58	6.80
	5	1 22 54.82	18.672	8 41 21.5	140.35	0.107 4392	1908.4	2.61	6.87
	6	1 30 22.76	+18.650	+ 9 37 12.4	+138.80	0.102 6027	−2122.9	2.64	6.95
	7	1 37 49.68	18.586	10 32 19.7	136.71	0.097 2457	2341.9	2.67	7.03
	8	1 45 14.55	18.479	11 26 30.2	134.07	0.091 3598	2563.3	2.71	7.13
	9	1 52 36.28	18.324	12 19 30.5	130.87	0.084 9417	2785.0	2.75	7.24
	10	1 59 53.67	18.117	13 11 7.6	127.14	0.077 9935	3004.6	2.79	7.35
	11	2 7 5.48	+17.858	+14 1 8.9	+122.89	0.070 5228	−3220.1	2.84	7.48
	12	2 14 10.45	17.547	14 49 22.7	118.18	0.062 5424	3429.0	2.89	7.62
	13	2 21 7.30	17.182	15 35 38.2	113.05	0.054 0706	3629.3	2.95	7.77
	14	2 27 54.78	16.766	16 19 46.0	107.54	0.045 1301	3819.1	3.01	7.93
	15	2 34 31.66	16.299	17 1 37.7	101.72	0.035 7480	3997.2	3.07	8.10
	16	2 40 56.76	+15.785	+17 41 6.6	+ 95.65	0.025 9540	−4162.1	3.15	8.29
	17	2 47 8.97	15.225	18 18 7.3	89.38	0.015 7815	4312.7	3.23	8.49
	18	2 53 7.24	14.624	18 52 35.5	82.95	0.005 2649	4448.6	3.30	8.69
	19	2 58 50.60	13.983	19 24 28.3	76.43	9.994 4403	4569.3	3.38	8.91
	20	3 4 18.11	13.304	19 53 43.8	69.85	9.983 3448	4674.3	3.47	9.14
	21	3 9 28.92	+12.592	+20 20 21.0	+ 63.24	9.972 0163	−4763.5	3.57	9.39
	22	3 14 22.26	11.848	20 44 19.5	56.63	9.960 4928	4836.8	3.66	9.64
	23	3 18 57.38	11.074	21 5 39.5	50.04	9.948 8128	4893.8	3.76	9.90
	24	3 23 13.60	10.274	21 24 21.7	43.48	9.937 0159	4934.3	3.86	10.17
	25	3 27 10.31	9.448	21 40 27.0	36.97	9.925 1414	4958.2	3.97	10.46
	26	3 30 46.94	+ 8.601	+21 53 56.6	+ 30.51	9.913 2301	−4965.0	4.08	10.75
	27	3 34 2.98	7.733	22 4 51.9	24.11	9.901 3236	4954.1	4.19	11.04
	28	3 36 57.99	6.849	22 13 14.3	17.76	9.889 4651	4925.0	4.31	11.35
	29	3 39 31.61	5.951	22 19 5.1	11.49	9.877 6990	4876.8	4.42	11.66
	30	3 41 43.55	5.043	22 22 26.1	+ 5.27	9.866 0723	4808.8	4.54	11.98
May	1	3 43 33.64	+ 4.131	+22 23 18.7	− 0.89	9.854 6334	−4720.0	4.67	12.30
	2	3 45 1.82	3.218	22 21 44.8	6.93	9.843 4337	4609.5	4.79	12.62
	3	3 46 8.14	2.311	22 17 46.7	12.90	9.832 5260	4476.4	4.91	12.94
	4	3 46 52.83	1.416	22 11 26.7	18.75	9.821 9659	4319.7	5.03	13.26
	5	3 47 16.28	+ 0.542	22 2 48.1	24.45	9.811 8108	4138.9	5.15	13.57
	6	3 47 19.10	− 0.302	+21 51 54.5	− 29.98	9.802 1191	−3933.3	5.27	13.88
	7	3 47 2.08	1.110	21 38 50.8	35.29	9.792 9509	3702.8	5.38	14.17
	8	3 46 26.22	1.870	21 23 42.9	40.32	9.784 3653	3447.6	5.49	14.46
	9	3 45 32.77	2.574	21 6 37.9	45.03	9.776 4216	3168.2	5.59	14.72
	10	3 44 23.19	3.212	20 47 44.6	49.35	9.769 1760	2866.1	5.68	14.97
	11	3 42 59.19	− 3.775	+20 27 12.9	− 53.20	9.762 6814	−2542.7	5.77	15.20
	12	3 41 22.64	4.256	20 5 15.0	56.53	9.756 9863	2200.2	5.84	15.40
	13	3 39 35.62	4.647	19 42 4.0	59.27	9.752 1333	1841.7	5.90	15.57
	14	3 37 40.33	4.944	19 17 55.1	61.36	9.748 1561	1470.6	5.96	15.72
	15	3 35 39.08	5.143	18 53 4.5	62.74	9.745 0818	1090.3	6.00	15.83
	16	*3 33 34.26*	− 5.242	+18 27 49.3	− 63.39	9.742 9268	− 706.0	6.03	15.91
	17	*3 31 28.25*	− 5.242	+18 2 27.7	− 63.28	9.741 6986	− 318.8	6.05	15.95

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
17	3 31 28.25	− 5.242	+18 2 27.7	−63.28	9.741 6986	− 318.8	6.05	15.95	23 47.0
18	3 29 23.38	5.148	17 37 17.8	62.41	9.741 3937	+ 63.9	6.05	15.96	23 41.1
19	3 27 21.90	4.960	17 12 37.9	60.80	9.741 9996	439.4	6.04	15.94	23 35.3
20	3 25 25.98	4.687	16 48 45.3	58.46	9.743 4938	803.8	6.02	15.88	23 29.5
21	3 23 37.56	4.355	16 25 56.9	55.47	9.745 8462	1153.8	5.99	15.80	23 23.9
22	3 21 58.45	− 3.913	+16 4 27.7	−51.87	9.749 0184	+1486.7	5.95	15.68	23 18.5
23	3 20 30.23	3.429	15 44 31.5	47.73	9.752 9668	1800.2	5.90	15.54	23 13.4
24	3 19 14.28	2.892	15 26 20.1	43.15	9.757 6426	2092.7	5.83	15.38	23 8.4
25	3 18 11.76	2.311	15 10 3.4	38.19	9.762 9943	2363.2	5.76	15.19	23 3.6
26	3 17 23.64	1.694	14 55 49.5	32.93	9.768 9679	2611.0	5.68	14.98	22 59.1
27	3 16 50.67	− 1.049	+14 43 44.3	−27.47	9.775 5087	+2836.0	5.60	14.76	22 54.9
28	3 16 33.44	− 0.384	14 33 52.0	21.87	9.782 5625	3038.3	5.50	14.52	22 51.0
29	3 16 32.35	+ 0.296	14 26 15.0	16.21	9.790 0763	3219.4	5.41	14.27	22 47.3
30	3 16 47.70	0.984	14 20 54.2	10.53	9.797 9992	3379.6	5.31	14.01	22 43.9
31	3 17 19.63	1.677	14 17 49.1	− 4.91	9.806 2825	3519.9	5.22	13.75	22 40.7
1	3 18 8.21	+ 2.371	+14 16 57.9	+ 0.62	9.814 8801	+3641.9	5.11	13.48	22 37.8
2	3 19 13.40	3.062	14 18 17.9	6.02	9.823 7498	3746.7	5.01	13.20	22 35.3
3	3 20 35.14	3.749	14 21 45.4	11.24	9.832 8515	3835.5	4.90	12.93	22 32.9
4	3 22 13.28	4.429	14 27 16.1	16.28	9.842 1487	3909.9	4.80	12.66	22 30.9
5	3 24 7.65	5.101	14 34 45.1	21.10	9.851 6080	3970.7	4.70	12.38	22 29.1
6	3 26 18.09	+ 5.767	+14 44 6.9	+25.68	9.861 1983	+4019.4	4.59	12.11	22 27.6
7	3 28 44.42	6.425	14 55 15.9	30.02	9.870 8920	4056.9	4.50	11.85	22 26.3
8	3 31 26.44	7.075	15 8 6.0	34.11	9.880 6629	4084.0	4.39	11.58	22 25.3
9	3 34 23.97	7.718	15 22 30.9	37.93	9.890 4875	4101.7	4.30	11.32	22 24.6
10	3 37 36.86	8.356	15 38 24.2	41.47	9.900 3444	4111.0	4.20	11.07	22 24.1
11	3 41 4.98	+ 8.987	+15 55 39.3	+44.74	9.910 2139	+4112.1	4.10	10.82	22 23.9
12	3 44 48.18	9.613	16 14 9.5	47.73	9.920 0765	4105.7	4.01	10.58	22 23.9
13	3 48 46.40	10.238	16 33 47.9	50.42	9.929 9156	4092.3	3.93	10.34	22 24.1
14	3 52 59.57	10.859	16 54 27.5	52.83	9.939 7143	4072.2	3.85	10.11	22 24.6
15	3 57 27.64	11.481	17 16 1.4	54.94	9.949 4571	4045.6	3.76	9.89	22 25.4
16	4 2 10.64	+12.102	+17 38 22.2	+56.74	9.959 1281	+4012.5	3.67	9.67	22 26.4
17	4 7 8.56	12.725	18 1 22.4	58.22	9.968 7121	3973.1	3.59	9.46	22 27.7
18	4 12 21.46	13.350	18 24 54.4	59.39	9.978 1936	3927.1	3.51	9.25	22 29.2
19	4 17 49.40	13.979	18 48 50.2	60.21	9.987 5568	3874.4	3.44	9.06	22 30.9
20	4 23 32.46	14.611	19 13 1.7	60.69	9.996 7852	3814.7	3.37	8.87	22 32.9
21	4 29 30.73	+15.245	+19 37 20.1	+60.79	0.005 8618	+3747.9	3.29	8.68	22 35.2
22	4 35 44.26	15.883	20 1 36.5	60.51	0.014 7688	3673.3	3.23	8.51	22 37.7
23	4 42 13.14	16.524	20 25 41.5	59.83	0.023 4870	3590.5	3.17	8.34	22 40.5
24	4 48 57.39	17.164	20 49 25.1	58.73	0.031 9963	3499.1	3.10	8.17	22 43.6
25	4 55 57.00	17.803	21 12 37.0	57.19	0.040 2752	3398.4	3.04	8.02	22 46.9
26	5 3 11.88	+18.436	+21 35 6.4	+55.18	0.048 3009	+3288.1	2.98	7.87	22 50.4
27	5 10 41.87	19.061	21 56 41.8	52.69	0.056 0501	3167.8	2.93	7.73	22 54.2
28	5 18 26.71	19.672	22 17 11.8	49.72	0.063 4981	3037.1	2.88	7.60	22 58.3
29	5 26 25.99	20.264	22 36 24.3	46.24	0.070 6195	2895.7	2.84	7.48	23 2.5
30	5 34 39.19	20.831	22 54 7.1	42.25	0.077 3889	2743.7	2.79	7.36	23 7.1
1	5 43 5.60	+21.364	+23 10 8.2	+37.76	0.083 7811	+2581.4	2.76	7.26	23 11.8
2	5 51 44.35	+21.857	+23 24 15.9	+32.80	0.089 7719	+2409.3	2.72	7.16	23 16.5

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.	T... M... G... V...
	Noon.	*Noon.*	*Noon.*	*Noon.*	*Noon.*	*Noon.*	*Noon.*	*Noon.*	
	h m s	s	° ′ ″	″			″	″	h
July 1	5 43 5.60	+21.304	+23 10 8.2	+ 37.76	0.083 7811	+2581.4	2.76	7.26	23 [illegible]
2	5 51 44.35	21.857	23 24 15.9	32.80	0.089 7719	2409.3	2.72	7.16	23 [illegible]
3	6 0 34.37	22.303	23 36 18.8	27.37	0.095 3386	2228.1	2.68	7.07	23 [illegible]
4	6 9 34.45	22.694	23 46 6.4	21.53	0.100 4606	2039.0	2.65	6.99	23 [illegible]
5	6 18 43.18	23.023	23 53 29.3	15.32	0.105 1207	1843.4	2.62	6.91	23 [illegible]
6	6 27 59.02	+23.285	+23 58 19.6	+ 8.82	0.109 3053	+1643.1	2.60	6.84	23 [illegible]
7	6 37 20.31	23.477	24 0 30.7	+ 2.07	0.113 0050	1439.6	2.57	6.78	23 [illegible]
8	6 46 45.33	23.596	23 59 58.0	− 4.81	0.116 2146	1235.2	2.55	6.73	23 [illegible]
9	6 56 12.31	23.641	23 56 39.1	11.77	0.118 9349	1032.0	2.53	6.69	23 [illegible]
10	7 5 39.51	23.614	23 50 33.0	18.72	0.121 1702	831.4	2.52	6.66	23 [illegible]
11	7 15 5.24	+23.519	+23 41 41.1	− 25.58	0.122 9292	+ 635.6	2.51	6.63	. . . [illegible]
12	7 24 27.89	23.359	23 30 6.3	32.29	0.124 2259	446.1	2.50	6.61	0 [illegible]
13	7 33 46.03	23.143	23 15 53.1	38.77	0.125 0761	263.8	2.50	6.60	0 [illegible]
14	7 42 58.33	22.875	22 59 7.4	44.99	0.125 4989	+ 90.1	2.49	6.59	0 [illegible]
15	7 52 3.66	22.563	22 39 56.2	50.89	0.125 5156	− 74.7	2.50	6.60	0 [illegible]
16	8 1 1.04	+22.213	+22 18 27.2	− 56.46	0.125 1479	− 230.0	2.50	6.60	0 [illegible]
17	8 9 49.68	21.835	21 54 48.9	61.67	0.124 4192	375.7	2.50	6.61	0 [illegible]
18	8 18 28.93	21.433	21 29 9.8	66.52	0.123 3518	512.1	2.51	6.62	0 [illegible]
19	8 26 58.32	21.014	21 1 38.8	71.00	0.121 9682	639.4	2.52	6.64	0 [illegible]
20	8 35 17.49	20.582	20 32 24.9	75.11	0.120 2897	757.9	2.53	6.67	0 [illegible]
21	8 43 26.22	+20.144	+20 1 36.5	− 78.86	0.118 3368	− 868.2	2.54	6.70	0 [illegible]
22	8 51 24.37	19.702	19 29 22.2	82.27	0.116 1286	970.8	2.55	6.73	0 [illegible]
23	8 59 11.91	19.260	18 55 50.1	85.35	0.113 6826	1066.4	2.56	6.77	0 [illegible]
24	9 6 48.87	18.821	18 21 8.0	88.11	0.111 0152	1155.6	2.58	6.81	1 0.4
25	9 14 15.33	18.385	17 45 23.2	90.57	0.108 1406	1238.8	2.60	6.86	1 3.9
26	9 21 31.41	+17.957	+17 8 42.8	− 92.75	0.105 0730	−1316.8	2.62	6.91	1 7.2
27	9 28 37.31	17.536	16 31 13.3	94.67	0.101 8235	1390.3	2.64	6.97	1 10.4
28	9 35 33.20	17.123	15 53 0.8	96.33	0.098 4028	1459.6	2.66	7.02	1 13.4
29	9 42 19.28	16.719	15 14 11.4	97.75	0.094 8201	1525.4	2.68	7.07	1 16.2
30	9 48 55.78	16.324	14 34 50.4	98.96	0.091 0836	1588.0	2.71	7.13	1 18.9
31	9 55 22.91	+15.939	+13 55 3.1	− 99.95	0.087 2001	−1647.9	2.74	7.20	1 21.4
Aug. 1	10 1 40.90	15.562	13 14 54.2	100.75	0.083 1757	1705.5	2.76	7.27	1 23.7
2	10 7 49.94	15.194	12 34 28.4	101.37	0.079 0151	1761.4	2.78	7.33	1 25.9
3	10 13 50.27	14.835	11 53 50.0	101.81	0.074 7223	1815.7	2.81	7.41	1 28.0
4	10 19 42.06	14.482	11 13 3.0	102.08	0.070 3009	1868.7	2.84	7.48	1 29.9
5	10 25 25.49	+14.138	+10 32 11.5	−102.19	0.065 7530	−1920.9	2.87	7.56	1 31.7
6	10 31 0.73	13.800	9 51 19.2	102.15	0.061 0806	1972.6	2.90	7.65	1 33.3
7	10 36 27.92	13.467	9 10 29.7	101.96	0.056 2845	2024.0	2.93	7.73	1 34.8
8	10 41 47.18	13.139	8 29 46.4	101.62	0.051 3654	2075.2	2.96	7.82	1 36.2
9	10 46 58.62	12.815	7 49 12.9	101.15	0.046 3232	2126.6	3.00	7.91	1 37.4
10	10 52 2.31	+12.493	+ 7 8 52.5	−100.53	0.041 1574	−2178.3	3.04	8.00	1 38.5
11	10 56 58.30	12.173	6 28 48.6	99.77	0.035 8670	2230.4	3.07	8.10	1 39.5
12	11 1 46.60	11.853	5 49 4.4	98.88	0.030 4508	2283.1	3.11	8.20	1 40.4
13	11 6 27.23	11.532	5 9 43.3	97.85	0.024 9073	2336.6	3.15	8.31	1 41.1
14	11 11 0.12	11.209	4 30 48.6	96.68	0.019 2346	2390.7	3.19	8.42	1 41.7
15	11 15 25.23	+10.882	+ 3 52 23.9	− 95.36	0.013 4312	−2445.7	3.24	8.53	1 42.2
16	11 19 42.44	+10.551	+ 3 14 32.6	− 93.89	0.007 4945	−2501.6	3.28	8.65	1 42.5

GREENWICH MEAN TIME.

	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
. 16	11 19 42.44	+10.551	+3 14 32.6	− 93.89	0.007 4945	−2501.6	3.28	8.65	1 42.5
17	11 23 51.61	10.212	2 37 18.2	92.27	0.001 4228	2558.2	3.32	8.77	1 42.7
18	11 27 52.56	9.866	2 0 44.7	90.49	9.995 2141	2615.8	3.38	8.90	1 42.8
19	11 31 45.08	9.509	1 24 56.0	88.54	9.988 8665	2674.0	3.43	9.03	1 42.7
20	11 35 28.90	9.140	0 49 56.3	86.41	9.982 3785	2732.7	3.47	9.16	1 42.5
21	11 39 3.72	+ 8.758	+0 15 50.0	− 84.09	9.975 7491	−2791.8	3.53	9.31	1 42.1
22	11 42 29.17	8.360	−0 17 18.2	81.57	9.968 9778	2850.9	3.59	9.45	1 41.6
23	11 45 44.85	7.946	0 49 23.4	78.82	9.962 0648	2909.9	3.64	9.60	1 40.9
24	11 48 50.30	7.507	1 20 19.9	75.85	9.955 0110	2968.1	3.70	9.76	1 40.0
25	11 51 45.00	7.047	1 50 2.0	72.62	9.947 8192	3024.9	3.76	9.92	1 39.0
26	11 54 28.38	+ 6.563	−2 18 23.6	− 69.12	9.940 4931	−3079.9	3.83	10.09	1 37.7
27	11 56 59.80	6.050	2 45 17.6	65.33	9.933 0383	3131.8	3.89	10.27	1 36.3
28	11 59 18.56	5.508	3 10 36.8	61.21	9.925 4635	3179.8	3.96	10.45	1 34.7
29	12 1 23.92	4.933	3 34 13.1	56.75	9.917 7793	3222.8	4.03	10.63	1 32.8
30	12 3 15.06	4.323	3 55 57.9	51.92	9.909 9995	3259.1	4.11	10.83	1 30.7
31	12 4 51.13	+ 3.677	−4 15 41.9	− 46.68	9.902 1424	−3287.0	4.18	11.02	1 28.3
pt. 1	12 6 11.24	2.992	4 33 15.2	41.01	9.894 2304	3304.3	4.26	11.23	1 25.7
2	12 7 14.44	2.268	4 48 26.9	34.88	9.886 2921	3308.7	4.34	11.43	1 22.8
3	12 7 59.78	1.504	5 1 5.7	28.26	9.878 3611	3297.6	4.42	11.64	1 19.6
4	12 8 26.33	+ 0.702	5 10 59.6	21.14	9.870 4789	3267.6	4.50	11.86	1 16.1
5	12 8 33.18	− 0.137	−5 17 56.3	− 13.49	9.862 6949	−3215.0	4.58	12.07	1 12.3
6	12 8 19.51	1.007	5 21 42.9	− 5.31	9.855 0681	3136.1	4.67	12.29	1 8.1
7	12 7 44.61	1.905	5 22 7.2	+ 3.38	9.847 6663	3026.5	4.74	12.50	1 3.6
8	12 6 47.95	2.819	5 18 56.8	12.56	9.840 5690	2881.7	4.82	12.70	0 58.7
9	12 5 29.28	3.737	5 12 1.2	22.14	9.833 8662	2696.9	4.90	12.90	0 53.4
10	12 3 48.64	− 4.646	−5 1 11.3	+ 32.06	9.827 6596	−2467.7	4.97	13.09	0 47.8
11	12 1 46.49	5.526	4 46 20.9	42.16	9.822 0598	2190.4	5.03	13.26	0 41.9
12	11 59 23.80	6.354	4 27 27.4	52.28	9.817 1868	1861.7	5.09	13.41	0 35.6
13	11 56 42.11	7.105	4 4 33.3	62.17	9.813 1660	1480.1	5.13	13.53	0 28.9
14	11 53 43.60	7.751	3 37 47.1	71.58	9.810 1247	1045.7	5.17	13.63	0 22.1
15	11 50 31.12	− 8.264	−3 7 23.9	+ 80.20	9.808 1868	− 561.1	5.20	13.69	0 14.9
16	11 47 8.20	8.617	2 33 46.4	87.71	9.807 4673	− 31.6	5.20	13.71	0 7.7
17	11 43 39.01	8.783	1 57 25.3	93.79	9.808 0648	+ 534.9	5.20	13.69	{ 0 0.3 / 23 52.8
18	11 40 8.25	8.745	1 18 58.1	98.16	9.810 0558	1127.5	5.17	13.63	23 45.5
19	11 36 41.03	8.488	−0 39 9.2	100.56	9.813 4872	1733.0	5.13	13.52	23 38.3
20	11 33 22.69	− 8.005	+0 1 12.2	+100.86	9.818 3729	+2337.0	5.08	13.37	23 31.3
21	11 30 18.52	7.306	0 41 14.6	98.97	9.824 6911	2924.0	5.00	13.18	23 24.6
22	11 27 33.64	6.401	1 20 5.4	94.92	9.832 3827	3479.2	4.92	12.95	23 18.3
23	11 25 12.72	5.314	1 56 54.5	88.85	9.841 3553	3989.5	4.82	12.68	23 12.5
24	11 23 19.82	4.071	2 30 55.3	80.94	9.851 4868	4443.3	4.71	12.39	23 7.2
25	11 21 58.26	− 2.708	+3 1 27.1	+ 71.47	9.862 6313	+4832.5	4.58	12.07	23 2.5
26	11 21 10.53	− 1.259	3 27 56.0	60.75	9.874 6266	5151.7	4.46	11.74	22 58.3
27	11 20 58.24	+ 0.240	3 49 55.6	49.08	9.887 3014	5398.4	4.33	11.41	22 54.8
28	11 21 22.16	1.753	4 7 6.8	36.78	9.900 4812	5573.0	4.20	11.07	22 51.8
29	11 22 22.26	3.250	4 19 18.3	24.14	9.913 9963	5678.2	4.07	10.73	22 49.4
30	11 23 57.80	+ 4.702	+4 26 25.1	+ 11.44	9.927 6845	+5718.2	3.95	10.39	22 47.6
1	*11 26 7.39*	*+ 6.085*	*+4 28 28.6*	− 1.10	9.941 3965	+5699.2	3.82	10.07	22 46.3

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.
	Noon.	*Noon.*	*Noon.*	*Noon.*	*Noon.*	*Noon.*	*Noon.*
	h m s	s	° ′ ″	″			″
Oct. 1	11 26 7.39	+ 6.085	+ 4 28 28.6	− 1.10	9.941 3965	+5699.2	3.82
2	11 28 49.18	7.382	4 25 35.4	13.26	9.954 9986	5627.8	3.70
3	11 32 0.93	8.579	4 17 56.6	24.88	9.968 3740	5511.4	3.59
4	11 35 40.12	9.668	4 5 46.5	35.84	9.981 4232	5357.4	3.48
5	11 39 44.09	10.644	3 49 22.5	46.02	9.994 0658	5173.6	3.39
6	11 44 10.12	+11.507	+ 3 29 3.9	− 55.39	0.006 2379	+4966.5	3.29
7	11 48 55.53	12.259	3 5 10.9	63.88	0.017 8917	4742.9	3.21
8	11 53 57.72	12.907	2 38 4.8	71.49	0.028 9951	4508.6	3.12
9	11 59 14.28	13.457	2 8 6.3	78.24	0.039 5283	4268.5	3.05
10	12 4 42.96	13.919	1 35 36.2	84.14	0.049 4825	4026.7	2.98
11	12 10 21.75	+14.301	+ 1 0 54.1	− 89.24	0.058 8582	+3787.1	2.91
12	12 16 8.83	14.610	+ 0 24 18.8	93.58	0.067 6638	3552.0	2.86
13	12 22 2.63	14.862	− 0 13 52.3	97.23	0.075 9128	3323.4	2.81
14	12 28 1.81	15.061	0 53 23.2	100.24	0.083 6227	3103.1	2.76
15	12 34 5.18	15.214	1 33 59.2	102.66	0.090 8150	2892.0	2.72
16	12 40 11.79	+15.331	− 2 15 26.9	−104.56	0.097 5119	+2690.3	2.67
17	12 46 20.83	15.417	2 57 34.5	105.99	0.103 7366	2498.8	2.63
18	12 52 31.63	15.479	3 40 11.2	107.00	0.109 5141	2317.2	2.60
19	12 58 43.66	15.521	4 23 7.5	107.64	0.114 8671	2145.2	2.56
20	13 4 56.51	15.547	5 6 15.0	107.94	0.119 8189	1982.8	2.53
21	13 11 9.84	+15.562	− 5 49 26.1	−107.94	0.124 3916	+1829.3	2.50
22	13 17 23.42	15.568	6 32 34.3	107.69	0.128 6062	1684.2	2.48
23	13 23 37.07	15.568	7 15 33.6	107.21	0.132 4820	1547.1	2.46
24	13 29 50.67	15.565	7 58 18.9	106.53	0.136 0384	1417.6	2.44
25	13 36 4.15	15.559	8 40 45.7	105.67	0.139 2919	1294.8	2.43
26	13 42 17.49	+15.552	− 9 22 49.8	−104.65	0.142 2585	+1178.4	2.41
27	13 48 30.66	15.546	10 4 27.6	103.48	0.144 9528	1067.8	2.39
28	13 54 43.72	15.542	10 45 36.0	102.19	0.147 3883	962.6	2.38
29	14 0 56.69	15.540	11 26 12.0	100.79	0.149 5771	862.2	2.37
30	14 7 9.65	15.541	12 6 13.0	99.28	0.151 5302	766.1	2.35
31	14 13 22.67	+15.545	−12 45 36.7	− 97.68	0.153 2575	+ 674.0	2.34
Nov. 1	14 19 35.83	15.553	13 24 20.9	95.99	0.154 7682	585.4	2.34
2	14 25 49.23	15.564	14 2 23.5	94.22	0.156 0700	500.0	2.33
3	14 32 2.95	15.580	14 39 42.7	92.37	0.157 1702	417.2	2.33
4	14 38 17.10	15.600	15 16 16.9	90.46	0.158 0748	337.1	2.32
5	14 44 31.76	+15.623	−15 52 4.3	− 88.48	0.158 7899	+ 259.1	2.32
6	14 50 47.04	15.651	16 27 3.4	86.44	0.159 3197	182.7	2.32
7	14 57 3.03	15.682	17 1 12.7	84.33	0.159 6683	108.0	2.32
8	15 3 19.81	15.717	17 34 30.8	82.17	0.159 8394	+ 34.8	2.32
9	15 9 37.47	15.755	18 6 56.2	79.94	0.159 8359	− 37.7	2.32
10	15 15 56.07	+15.796	−18 38 27.6	− 77.67	0.159 6593	− 109.3	2.32
11	15 22 15.71	15.841	19 9 3.7	75.33	0.159 3118	180.3	2.32
12	15 28 36.44	15.887	19 38 42.9	72.93	0.158 7942	250.9	2.32
13	15 34 58.32	15.936	20 7 24.1	70.49	0.158 1074	321.5	2.32
14	15 41 21.38	15.986	20 35 6.0	67.99	0.157 2508	392.3	2.33
15	15 47 45.67	+16.038	−21 1 47.0	− 65.42	0.156 2242	− 463.3	2.34
16	15 54 11.21	+16.090	−21 27 25.8	− 62.80	0.155 0265	− 534.9	2.34

GREENWICH MEAN TIME.

	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
Nov. 16	15 54 11.21	+16.090	−21 27 25.8	−62.80	0.155 0265	534.9	2.34	6.16	0 14.3
17	16 0 38.01	16.143	21 52 1.2	60.14	0.153 6561	607.3	2.35	6.18	0 16.8
18	16 7 6.08	16.195	22 15 31.9	57.41	0.152 1107	680.7	2.35	6.20	0 19.3
19	16 13 35.38	16.246	22 37 56.2	54.61	0.150 3880	755.1	2.36	6.22	0 21.9
20	16 20 5.90	16.296	22 59 12.9	51.77	0.148 4848	831.2	2.37	6.25	0 24.4
21	16 26 37.59	+16.344	−23 19 20.7	−48.86	0.146 3970	− 908.8	2.38	6.28	0 27.0
22	16 33 10.37	16.388	23 38 17.9	45.89	0.144 1209	988.3	2.39	6.31	0 29.6
23	16 39 44.17	16.428	23 56 3.2	42.87	0.141 6515	1069.9	2.41	6.35	0 32.3
24	16 46 18.87	16.463	24 12 35.3	39.79	0.138 9834	1154.0	2.43	6.39	0 34.9
25	16 52 54.35	16.492	24 27 52.8	36.65	0.136 1100	1240.8	2.44	6.43	0 37.6
26	16 59 30.45	+16.515	−24 41 54.0	−33.44	0.133 0253	−1330.4	2.46	6.48	0 40.2
27	17 6 6.99	16.529	24 54 37.7	30.19	0.129 7214	1423.4	2.48	6.53	0 42.9
28	17 12 43.74	16.532	25 6 2.6	26.87	0.126 1902	1520.0	2.49	6.58	0 45.6
29	17 19 20.45	16.525	25 16 7.1	23.50	0.122 4225	1620.4	2.52	6.64	0 48.2
30	17 25 56.84	16.505	25 24 50.3	20.08	0.118 4087	1725.1	2.54	6.70	0 50.9
Dec. 1	17 32 32.57	+16.470	−25 32 10.6	−16.60	0.114 1381	−1834.5	2.57	6.77	0 53.6
2	17 39 7.24	16.417	25 38 7.0	13.09	0.109 5991	1948.9	2.60	6.84	0 56.2
3	17 45 40.43	16.345	25 42 38.5	9.53	0.104 7794	2068.5	2.62	6.91	0 58.8
4	17 52 11.61	16.250	25 45 44.1	5.94	0.099 6659	2193.9	2.66	6.99	1 1.4
5	17 58 40.24	16.130	25 47 23.2	− 2.32	0.094 2438	2325.4	2.69	7.08	1 3.9
6	18 5 5.63	+15.981	−25 47 35.1	+ 1.32	0.088 4990	−2463.2	2.73	7.18	1 6.4
7	18 11 27.07	15.799	25 46 19.6	4.97	0.082 4150	2607.9	2.77	7.28	1 8.8
8	18 17 43.70	15.580	25 43 36.6	8.61	0.075 9754	2759.6	2.81	7.39	1 11.2
9	18 23 54.57	15.319	25 39 26.5	12.23	0.069 1633	2918.5	2.85	7.50	1 13.4
10	18 29 58.60	15.009	25 33 50.0	15.81	0.061 9610	3084.6	2.89	7.63	1 15.5
11	18 35 54.55	+14.645	−25 26 48.3	+19.32	0.054 3512	−3258.1	2.94	7.76	1 17.5
12	18 41 41.05	14.219	25 18 23.2	22.75	0.046 3164	3438.6	3.00	7.91	1 19.3
13	18 47 16.52	13.724	25 8 37.2	26.07	0.037 8408	3625.5	3.06	8.06	1 21.0
14	18 52 39.19	13.151	24 57 33.2	29.24	0.028 9096	3817.9	3.12	8.23	1 22.4
15	18 57 47.05	12.489	24 45 15.3	32.21	0.019 5114	4014.6	3.19	8.41	1 23.6
16	19 2 37.88	+11.729	−24 31 48.7	+34.96	0.009 6378	−4213.6	3.26	8.61	1 24.4
17	19 7 9.17	10.859	24 17 19.2	37.44	9.999 2866	4412.0	3.34	8.81	1 25.0
18	19 11 18.16	9.869	24 1 54.1	39.60	9.988 4635	4606.1	3.43	9.04	1 25.2
19	19 15 1.82	8.747	23 45 41.5	41.38	9.977 1843	4791.2	3.52	9.27	1 24.9
20	19 18 16.86	7.482	23 28 51.2	42.74	9.965 4778	4961.0	3.62	9.53	1 24.2
21	19 20 59.78	+ 6.069	−23 11 33.8	+43.62	9.953 3897	−5107.9	3.72	9.80	1 22.9
22	19 23 6.94	4.502	22 54 1.3	44.00	9.940 9859	5222.4	3.82	10.08	1 21.1
23	19 24 34.68	2.784	22 36 26.1	43.84	9.928 3572	5293.3	3.94	10.38	1 18.6
24	19 25 19.44	+ 0.924	22 19 1.4	43.12	9.915 6228	5308.2	4.06	10.69	1 15.4
25	19 25 18.07	− 1.057	22 2 0.6	41.86	9.902 9333	5253.6	4.17	11.00	1 11.4
26	19 24 28.02	− 3.125	−21 45 36.2	+40.07	9.890 4724	−5115.5	4.30	11.32	1 6.6
27	19 22 47.77	5.231	21 30 0.1	37.86	9.878 4563	4880.9	4.42	11.64	1 0.9
28	19 20 17.14	7.310	21 15 22.0	35.25	9.867 1291	4540.2	4.54	11.95	0 54.5
29	19 16 57.72	9.283	21 1 50.3	32.35	9.856 7527	4088.1	4.65	12.24	0 47.2
30	19 12 53.11	11.063	20 49 31.0	29.24	9.847 5942	3526.1	4.74	12.50	0 39.2
31	19 8 9.10	−12.551	−20 38 28.0	+25.99	9.839 9078	−2863.9	4.83	12.72	0 30.6
32	*19 2 53.57*	....	*−20 28 44.2*	...	9.833 9126	....	4.90	12.90	0 21.4

FOR GREENWICH MEAN NOON.

Date.		Heliocentric Longitude, Mean Equinox of Date.	Var. per Day.	Reduction to Orbit.	Heliocentric Latitude.	Var. per Day.	Log Radi
		° ′ ″	° ′ ″	′ ″	° ′ ″	′ ″	
an.	1	12 18 53.7	5 10 27.6	−12 6.9	−4 2 0.9	+31 4.4	9.5
	2	17 33 55.3	5 19 35.2	11 7.2	3 29 29.8	33 56.8	9.5
	3	22 58 1.9	5 28 36.3	9 42.2	2 54 10.3	36 40.4	9.5
	4	28 31 3.1	5 37 23.0	7 53.3	2 16 13.8	39 9.8	9.5
	5	34 12 40.0	5 45 46.0	5 43.0	1 35 57.1	41 19.8	9.5
	6	40 2 23.9	5 53 35.4	− 3 15.5	−0 53 42.6	+43 4.4	9.5
	7	45 59 36.3	6 0 41.0	− 0 36.6	−0 9 58.8	44 17.6	9.4
	8	52 3 27.8	6 6 51.9	+ 2 6.9	+0 34 40.5	44 54.5	9.4
	9	58 12 58.4	6 11 57.7	4 47.0	1 19 36.7	44 51.0	9.4
	10	64 26 58.4	6 15 49.2	7 15.5	2 4 7.9	44 4.1	9.4
	11	70 44 9.3	6 18 18.4	+ 9 24.2	+2 47 30.1	+42 33.1	9.4
	12	77 3 5.9	6 19 19.9	11 6.1	3 28 59.8	40 19.4	9.4
	13	83 22 18.8	6 18 50.7	12 15.6	4 7 55.9	37 26.6	9.4
	14	89 40 17.0	6 16 50.6	12 49.2	4 43 41.6	33 59.6	9.4
	15	95 55 30.8	6 13 22.8	12 45.9	5 15 46.1	30 5.4	9.4
	16	102 6 35.2	6 8 33.0	+12 7.0	+5 43 45.9	+25 51.6	9.4
	17	108 12 12.0	6 2 29.1	10 55.7	6 7 25.5	21 26.3	9.4
	18	114 11 12.1	5 55 21.4	9 17.1	6 26 37.3	16 57.2	9.5
	19	120 2 37.2	5 47 21.0	7 17.3	6 41 21.0	12 31.2	9.5
	20	125 45 40.2	5 38 39.2	5 2.8	6 51 42.7	8 14.2	9.5
	21	131 19 45.7	5 29 27.8	+ 2 40.5	+6 57 53.9	+ 4 10.8	9.5
	22	136 44 29.5	5 19 57.5	+ 0 16.3	7 0 10.1	+ 0 24.6	9.5
	23	141 59 37.7	5 10 18.0	− 2 4.2	6 58 49.5	− 3 2.5	9.5
	24	147 5 5.4	5 0 38.0	4 16.6	6 54 11.9	6 9.4	9.5
	25	152 0 55.8	4 51 4.4	6 17.1	6 46 37.7	8 55.6	9.5
	26	156 47 18.5	4 41 43.4	− 8 3.4	+6 36 27.3	−11 22.0	9.5
	27	161 24 28.4	4 32 39.5	9 33.6	6 24 0.2	13 29.2	9.5
	28	165 52 44.4	4 23 56.1	10 46.8	6 9 35.0	15 18.4	9.5
	29	170 12 28.2	4 15 35.4	11 42.9	5 53 28.8	16 51.3	9.5
	30	174 24 3.6	4 7 39.6	12 22.0	5 35 57.3	18 9.4	9.5
	31	178 27 55.9	4 0 9.2	−12 44.8	+5 17 14.4	−19 14.2	9.5
eb.	1	182 24 30.7	3 53 4.8	12 52.3	4 57 33.0	20 6.9	9.5
	2	186 14 14.0	3 46 26.2	12 45.6	4 37 4.1	20 49.3	9.6
	3	189 57 31.5	3 40 13.0	12 26.0	4 15 57.5	21 22.4	9.6
	4	193 34 48.3	3 34 24.8	11 54.7	3 54 21.9	21 47.6	9.6
	5	197 6 29.2	3 29 0.8	−11 13.3	+3 32 24.7	−22 5.8	9.6
	6	200 32 57.8	3 24 0.2	10 23.0	3 10 12.3	22 18.0	9.6
	7	203 54 37.0	3 19 21.8	9 25.1	2 47 50.4	22 25.0	9.6
	8	207 11 48.6	3 15 5.0	8 21.0	2 25 23.9	22 27.4	9.6
	9	210 24 53.8	3 11 8.7	7 11.7	2 2 56.9	22 26.0	9.6
	10	213 34 12.5	3 7 31.9	− 5 58.5	+1 40 33.0	−22 21.2	9.6
	11	216 40 3.8	3 4 13.8	4 42.3	1 18 15.4	22 13.6	9.6
	12	219 42 46.1	3 1 13.7	3 24.2	0 56 6.6	22 3.6	9.6
	13	222 42 36.9	2 58 30.6	2 5.0	0 34 9.0	21 51.2	9.6
	14	225 39 52.8	2 56 3.9	− 0 45.5	+0 12 24.7	21 37.1	9.6
	15	228 34 49.9	2 53 52.8	+ 0 33.3	−0 9 4.6	−21 21.2	9.6
	16	231 27 43.4	2 51 56.8	+ 1 50.9	−0 30 17.3	−21 4.0	9.6

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.
	° ′ ″	° ′ ″	′ ″	° ′ ″	′ ″		
16	231 27 43.4	2 51 56.8	+ 1 50.9	−0 30 17.3	−21 4.0	9.658 8892	+23098
17	234 18 48.3	2 50 15.4	3 6.6	0 51 12.1	20 45.4	9.661 0663	20446
18	237 8 18.8	2 48 48.0	4 19.7	1 11 47.6	20 25.4	9.662 9788	17805
19	239 56 28.8	2 47 34.2	5 29.8	1 32 2.6	20 4.5	9.664 6276	15173
20	242 43 31.6	2 46 33.6	6 36.2	1 51 56.2	19 42.4	9.666 0137	12550
21	245 29 40.4	2 45 46.0	+ 7 38.5	−2 11 27.1	−19 19.2	9.667 1379	+ 9935
22	248 15 7.9	2 45 11.0	8 36.3	2 30 34.4	18 55.2	9.668 0009	7326
23	251 0 6.7	2 44 48.6	9 29.1	2 49 17.1	18 30.0	9.668 6033	4722
24	253 44 49.3	2 44 38.6	10 16.5	3 7 34.1	18 3.8	9.668 9454	+ 2120
25	256 29 27.9	2 44 40.6	10 58.3	3 25 24.2	17 36.3	9.669 0274	− 480
26	259 14 14.7	2 44 55.0	+11 34.0	−3 42 46.3	−17 7.7	9.668 8495	− 3080
27	261 59 22.0	2 45 21.6	12 3.3	3 59 39.2	16 37.8	9.668 4114	5684
28	264 45 1.9	2 46 0.4	12 26.0	4 16 1.5	16 6.6	9.667 7127	8289
1	267 31 26.9	2 46 51.6	12 41.9	4 31 51.9	15 33.8	9.666 7534	10900
2	270 18 49.2	2 47 55.2	12 50.6	4 47 8.6	14 59.4	9.665 5325	13518
3	273 7 21.7	2 49 11.8	+12 52.0	−5 1 50.0	−14 23.2	9.664 0494	−16145
4	275 57 17.2	2 50 41.4	12 45.8	5 15 54.2	13 44.8	9.662 3032	18780
5	278 48 48.8	2 52 24.2	12 32.1	5 29 19.0	13 4.4	9.660 2931	21425
6	281 42 10.1	2 54 20.7	12 10.6	5 42 2.2	12 21.5	9.658 0179	24080
7	284 37 34.9	2 56 31.3	11 41.4	5 54 1.1	11 35.9	9.655 4767	26746
8	287 35 17.6	2 58 56.6	+11 4.3	−6 5 13.0	−10 47.3	9.652 6684	−29420
9	290 35 33.0	3 1 36.8	10 19.6	6 15 34.6	9 55.4	9.649 5925	32102
10	293 38 36.4	3 4 32.7	9 27.2	6 25 2.7	9 0.0	9.646 2479	34790
11	296 44 43.8	3 7 44.8	8 27.4	6 33 33.4	8 0.6	9.642 6345	37478
12	299 54 11.7	3 11 13.8	7 20.4	6 41 2.5	6 56.8	9.638 7525	40162
13	303 7 17.3	3 15 0.3	+ 6 6.8	−6 47 25.5	− 5 48.3	9.634 6025	−42838
14	306 24 18.4	3 19 5.1	4 46.9	6 52 37.4	4 34.6	9.630 1855	45498
15	309 45 33.8	3 23 28.8	3 21.5	6 56 32.8	3 15.2	9.625 5038	48130
16	313 11 22.6	3 28 12.2	1 51.3	6 59 5.8	1 49.6	9.620 5608	50722
17	316 42 4.9	3 33 15.8	+ 0 17.4	7 0 9.9	− 0 17.5	9.615 3612	53260
18	320 18 1.3	3 38 40.6	− 1 19.1	−6 59 38.4	+ 1 21.8	9.609 9111	−55727
19	323 59 33.3	3 44 27.0	2 56.8	6 57 23.9	3 8.5	9.604 2190	58098
20	327 47 2.6	3 50 35.3	4 34.2	6 53 18.7	5 3.4	9.598 2956	60348
21	331 40 51.4	3 57 6.2	6 9.2	6 47 14.4	7 6.5	9.592 1544	62447
22	335 41 22.4	4 3 59.6	7 39.9	6 39 2.8	9 18.4	9.585 8125	64358
23	339 48 58.0	4 11 15.4	− 9 4.0	−6 28 35.0	+11 38.7	9.579 2905	−66041
24	344 4 0.5	4 18 53.1	10 18.9	6 15 42.6	14 7.6	9.572 6137	67444
25	348 26 51.2	4 26 51.8	11 21.9	6 0 17.1	16 44.8	9.565 8129	68514
26	352 57 50.7	4 35 10.1	12 10.4	5 42 10.6	19 29.4	9.558 9239	69197
27	357 37 17.3	4 43 45.8	12 41.4	5 21 16.3	22 20.2	9.551 9888	69422
28	2 25 27.2	4 52 36.2	−12 52.3	−4 57 28.7	+25 15.5	9.545 0572	−69118
29	7 22 33.2	5 1 37.3	12 41.0	4 30 44.5	28 13.0	9.538 1854	68212
30	12 28 43.8	5 10 44.4	12 5.5	4 1 2.8	31 9.8	9.531 4373	66634
31	17 44 2.2	5 19 51.9	11 4.9	3 28 26.4	34 2.0	9.524 8834	64314
1	23 8 25.4	5 28 52.8	9 39.2	2 53 1.8	36 45.2	9.518 6012	61194
2	28 41 42.7	5 37 38.6	− 7 49.5	−2 15 0.7	+39 14.2	9.512 6731	−57222
3	34 23 34.8	5 46 0.8	− 5 38.7	−1 34 40.0	+41 23.4	9.507 1862	−52570

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
		° ′ ″	° ′ ″	′ ″	° ′ ″	′ ″	
Apr.	1	23 8 25.4	5 28 52.8	− 9 39.2	−2 53 1.8	+36 45.2	9.518 6012
	2	28 41 42.7	5 37 38.6	7 49.5	2 15 0.7	39 14.2	9.512 6731
	3	34 23 34.8	5 46 0.8	5 38.7	1 34 40.0	41 23.4	9.507 1862
	4	40 13 33.0	5 53 49.1	3 10.8	0 52 22.4	43 7.1	9.502 2282
	5	46 10 58.2	6 0 53.0	− 0 31.6	−0 8 36.3	44 19.4	9.497 8854
	6	52 15 0.8	6 7 2.0	+ 2 11.9	+0 36 4.1	+44 55.0	9.494 2393
	7	58 24 40.4	6 12 5.6	4 51.8	1 21 0.1	44 50.0	9.491 3624
	8	64 38 47.1	6 15 54.6	7 19.8	2 5 29.7	44 1.8	9.489 3156
	9	70 56 2.1	6 18 21.2	9 27.8	2 48 49.0	42 29.6	9.488 1429
	10	77 15 0.1	6 19 20.0	11 8.7	3 30 14.6	40 14.8	9.487 8708
	11	83 34 11.7	6 18 48.0	+12 17.1	+4 9 5.3	+37 20.6	9.488 5052
	12	89 52 5.7	6 16 45.0	12 49.7	4 44 44.5	33 52.8	9.490 0321
	13	96 7 12.6	6 13 14.6	12 45.3	5 16 41.7	29 57.8	9.492 4174
	14	102 18 7.6	6 8 22.3	12 5.2	5 44 33.7	25 43.6	9.495 6101
	15	108 23 32.7	6 2 16.5	10 53.1	6 8 5.1	21 18.0	9.499 5443
	16	114 22 19.3	5 55 7.0	+ 9 13.7	+6 27 8.6	+16 48.9	9.504 1433
	17	120 13 29.1	5 47 5.0	7 13.3	6 41 44.0	12 23.0	9.509 3235
	18	125 56 15.7	5 38 22.3	4 58.6	6 51 57.8	8 6.4	9.514 9974
	19	131 30 3.9	5 29 10.2	2 36.0	6 58 1.5	4 3.6	9.521 0773
	20	136 54 29.9	5 19 39.6	+ 0 11.9	7 0 10.8	+ 0 17.9	9.527 4780
	21	142 9 20.0	5 9 59.9	− 2 8.4	+6 58 43.8	− 3 8.6	9.534 1185
	22	147 14 29.6	5 0 20.0	4 20.4	6 54 0.5	6 14.7	9.540 9243
	23	152 10 2.2	4 50 46.8	6 20.6	6 46 21.2	9 0.4	9.547 8272
	24	156 56 7.5	4 41 26.3	8 6.4	6 36 6.3	11 26.2	9.554 7663
	25	161 33 0.6	4 32 23.0	9 36.1	6 23 35.3	13 32.7	9.561 6883
	26	166 1 0.4	4 23 40.2	−10 48.8	+6 9 6.8	−15 21.5	9.568 5468
	27	170 20 28.7	4 15 20.5	11 44.4	5 52 57.7	16 54.0	9.575 3020
	28	174 31 49.6	4 7 25.4	12 23.0	5 35 23.8	18 11.6	9.581 9206
	29	178 35 28.0	3 59 55.8	12 45.3	5 16 39.0	19 15.9	9.588 3727
	30	182 31 49.7	3 52 52.1	12 52.3	4 56 56.0	20 8.4	9.594 6364
May	1	186 21 20.8	3 46 14.3	−12 45.2	+4 36 25.8	−20 50.4	9.600 6923
	2	190 4 26.8	3 40 2.0	12 25.2	4 15 18.2	21 23.4	9.606 5246
	3	193 41 33.0	3 34 14.6	11 53.6	3 53 41.8	21 48.2	9.612 1210
	4	197 13 3.9	3 28 51.2	11 11.9	3 31 44.0	22 6.2	9.617 4716
	5	200 39 23.3	3 23 51.4	10 21.3	3 9 31.3	22 18.2	9.622 5692
	6	204 0 54.0	3 19 13.8	− 9 23.2	+2 47 9.2	−22 25.1	9.627 4080
	7	207 17 57.9	3 14 57.6	8 18.9	2 24 42.6	22 27.4	9.631 9836
	8	210 30 55.9	3 11 1.8	7 9.5	2 2 15.6	22 25.9	9.636 2944
	9	213 40 8.0	3 7 25.6	5 56.2	1 39 51.9	22 21.0	9.640 3375
	10	216 45 53.3	3 4 8.1	4 39.9	1 17 34.4	22 13.4	9.644 1117
	11	219 48 30.2	3 1 8.5	− 3 21.7	+0 55 25.9	−22 3.2	9.647 6173
	12	222 48 16.0	2 58 26.0	2 2.5	0 33 28.7	21 50.8	9.650 8544
	13	225 45 27.5	2 55 59.7	− 0 43.1	+0 11 44.9	21 36.6	9.653 8230
	14	228 40 20.6	2 53 49.1	+ 0 35.7	−0 9 44.0	21 20.8	9.656 5244
	15	231 33 10.7	2 51 53.6	1 53.3	0 30 56.2	21 3.4	9.658 9591
	16	234 24 12.6	2 50 12.6	+ 3 8.9	−0 51 50.3	−20 44.7	9.661 1283
	17	237 13 40.5	2 48 45.4	+ 4 21.9	−1 12 25.2	−20 24.9	9.663 0328

FOR GREENWICH MEAN NOON

te.	Heliocentric Longitude, Mean Equinox of Date.	Var. per Day.	Reduction to Orbit.	Heliocentric Latitude.	Var. per Day.	Logarithm of Radius Vector.	Var. per Day.
	° ′ ″	° ′ ″	′ ″	° ′ ″	′ ″		
17	237 13 40.5	2 48 45.4	+ 4 21.9	−1 12 25.2	−20 24.9	9.663 0328	+17725
18	240 1 48.2	2 47 32.1	5 31.9	1 32 39.7	20 3.8	9.664 6736	15094
19	242 48 49.3	2 46 32.0	6 38.2	1 52 32.5	19 41.7	9.666 0518	12472
20	245 34 56.6	2 45 44.8	7 40.4	2 12 2.8	19 18.6	9.667 1681	9856
21	248 20 23.1	2 45 10.2	8 38.0	2 31 9.4	18 54.4	9.668 0231	7246
22	251 5 21.3	2 44 48.2	+ 9 30.6	−2 49 51.3	−18 29.2	9.668 6176	+ 4642
23	253 50 3.6	2 44 38.5	10 17.9	3 8 7.4	18 2.9	9.668 9517	+ 2040
24	256 34 42.4	2 44 41.0	10 59.5	3 25 56.7	17 35.4	9.669 0257	− 559
25	259 19 29.7	2 44 55.6	11 35.0	3 43 17.9	17 6.8	9.668 8399	3159
26	262 4 37.8	2 45 22.6	12 4.1	4 0 9.9	16 37.0	9.668 3938	5762
27	264 50 19.0	2 46 1.8	+12 26.6	−4 16 31.3	−16 5.6	9.667 6874	− 8367
28	267 36 45.5	2 46 53.4	12 42.2	4 32 20.6	15 32.8	9.666 7202	10979
29	270 24 9.9	2 47 57.4	12 50.7	4 47 36.3	14 58.3	9.665 4914	13598
30	273 12 44.7	2 49 14.3	12 51.9	5 2 16.6	14 22.0	9.664 0005	16223
31	276 2 42.9	2 50 44.3	12 45.5	5 16 19.6	13 43.7	9.662 2465	18860
1	278 54 17.7	2 52 27.5	+12 31.6	−5 29 43.2	−13 3.1	9.660 2283	−21505
2	281 47 42.5	2 54 24.4	12 9.8	5 42 25.0	12 20.1	9.657 9452	24160
3	284 43 11.3	2 56 35.6	11 40.4	5 54 22.5	11 34.4	9.655 3960	26826
4	287 40 58.4	2 59 1.2	11 3.1	6 5 32.9	10 45.8	9.652 5797	29500
5	290 41 18.6	3 1 41.9	10 18.1	6 15 53.0	9 53.8	9.649 4957	32181
6	293 44 27.4	3 4 38.3	+ 9 25.4	−6 25 19.3	− 8 58.2	9.646 1433	−34870
7	296 50 40.6	3 7 50.9	8 25.4	6 33 48.1	7 58.6	9.642 5218	37558
8	300 0 14.8	3 11 20.4	7 18.3	6 41 15.2	6 54.8	9.638 6318	40243
9	303 13 27.2	3 15 7.4	6 4.4	6 47 36.1	5 46.2	9.634 4735	42918
10	306 30 35.7	3 19 12.6	4 44.4	6 52 45.8	4 32.2	9.630 0487	45576
11	309 51 59.0	3 23 37.1	+ 3 18.8	−6 56 38.7	− 3 12.6	9.625 3591	−48208
12	313 17 56.4	3 28 21.0	1 48.5	6 59 9.1	1 47.0	9.620 4084	50799
13	316 48 47.8	3 33 25.4	+ 0 14.5	7 0 10.4	− 0 14.6	9.615 2011	53336
14	320 24 54.1	3 38 50.7	− 1 22.1	6 59 35.9	+ 1 24.9	9.609 7437	55799
15	324 6 36.4	3 44 37.6	2 59.8	6 57 18.1	3 12.0	9.604 0445	58168
16	327 54 16.7	3 50 46.7	− 4 37.1	−6 53 9.3	+ 5 7.0	9.598 1143	−60414
17	331 48 17.3	3 57 18.2	6 12.1	6 47 1.3	7 10.4	9.591 9668	62508
18	335 49 0.7	4 4 12.3	7 42.6	6 38 45.6	9 22.4	9.585 6191	64412
19	339 56 49.4	4 11 28.8	9 6.5	6 28 13.6	11 43.1	9.579 0920	66086
20	344 12 5.6	4 19 7.2	10 21.0	6 15 16.6	14 12.3	9.572 4111	67482
21	348 35 10.7	4 27 6.4	−11 23.7	−5 59 46.3	+16 40.7	9.565 6068	−68542
22	353 6 25.0	4 35 25.4	12 11.6	5 41 34.8	19 34.5	9.558 7157	69210
23	357 46 7.2	4 44 1.6	12 42.0	5 20 35.3	22 25.5	9.551 7800	69420
24	2 34 33.0	4 52 52.2	12 52.3	4 56 42.4	25 20.8	9.544 8493	69100
25	7 31 55.3	5 1 53.6	12 40.2	4 29 52.8	28 18.5	9.537 9802	68176
26	12 38 22.3	5 11 0.9	−12 4.0	−4 0 5.8	+31 15.1	9.531 2366	−66576
27	17 53 57.2	5 20 8.3	11 2.6	3 27 24.1	34 7.2	9.524 6896	64235
28	23 18 36.6	5 29 8.7	9 36.1	2 51 54.6	36 50.0	9.518 4165	61087
29	28 52 9.7	5 37 54.2	7 45.8	2 13 49.0	39 18.4	9.512 5006	57088
30	34 34 17.0	5 46 15.6	5 34.4	1 33 24.4	41 27.0	9.507 0281	52213
1	40 24 29.4	5 54 2.6	− 3 6.1	−0 51 3.6	+43 9.8	9.502 0873	−46461
2	46 22 7.4	6 1 5.0	− 0 26.6	−0 7 15.4	+44 21.0	9.497 7941	−39886

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.
		° ′ ″	° ′ ″	′ ″	° ′ ″	′ ″	
July	1	40 24 29.4	5 54 2.6	− 3 6.1	−0 51 3.6	+43 9.8	9.502 0873
	2	46 22 7.4	6 1 5.0	− 0 26.6	−0 7 15.4	44 21.0	9.497 7641
	3	52 26 21.1	6 7 12.2	+ 2 16.9	+0 37 26.0	44 55.4	9.494 1399
	4	58 36 10.0	6 12 13.8	4 56.6	1 22 21.9	44 49.3	9.491 2872
	5	64 50 23.7	6 16 0.4	7 24.0	2 6 50.1	43 59.8	9.489 2658
	6	71 7 43.2	6 18 24.4	+ 9 31.3	+2 50 6.6	+42 26.0	9.488 1201
	7	77 26 43.2	6 19 20.5	11 11.3	3 31 28.0	40 9.9	9.487 8751
	8	83 45 53.9	6 18 45.6	12 18.7	4 10 13.4	37 14.8	9.488 5365
	9	90 3 44.3	6 16 40.2	12 50.1	4 45 46.3	33 46.0	9.490 0899
	10	96 18 45.1	6 13 7.2	12 44.6	5 17 36.4	29 50.4	9.492 5004
	11	102 29 31.4	6 8 12.4	+12 3.5	+5 45 20.6	+25 35.6	9.495 7165
	12	108 34 45.6	6 2 4.5	10 50.4	6 8 43.9	21 9.8	9.499 6719
	13	114 33 19.3	5 54 53.3	9 10.3	6 27 39.2	16 40.8	9.504 2897
	14	120 24 14.8	5 46 50.0	7 9.4	6 42 6.6	12 15.2	9.509 4861
	15	126 6 45.7	5 38 6.2	4 54.3	6 52 12.6	7 58.8	9.515 1736
	16	131 40 17.5	5 28 53.4	+ 2 31.6	+6 58 8.9	+ 3 56.4	9.521 2645
	17	137 4 26.4	5 19 22.2	+ 0 7.5	7 0 11.2	+ 0 11.3	9.527 6737
	18	142 18 59.1	5 9 42.5	− 2 12.6	6 58 38.0	− 3 14.6	9.534 3203
	19	147 23 51.4	5 0 2.6	4 24.3	6 53 48.9	6 20.2	9.541 1300
	20	152 19 6.7	4 50 29.8	6 24.1	6 46 4.6	9 5.2	9.548 0348
	21	157 4 55.2	4 41 9.8	− 8 9.4	+6 35 45.2	−11 30.2	9.554 9745
	22	161 41 32.0	4 32 7.0	9 38.6	6 23 10.4	13 36.3	9.561 8954
	23	166 9 16.1	4 23 24.8	10 50.8	6 8 38.5	15 24.6	9.568 7515
	24	170 28 29.4	4 15 5.8	11 45.8	5 52 26.6	16 56.6	9.575 5032
	25	174 39 35.9	4 7 11.4	12 23.9	5 34 50.3	18 13.8	9.582 1167
	26	178 43 0.8	3 59 42.6	−12 45.7	+5 16 3.5	−19 17.7	9.588 5641
	27	182 39 9.8	3 52 39.7	12 52.3	4 56 18.8	20 9.8	9.594 8221
	28	186 28 28.8	3 46 2.6	12 44.8	4 35 47.3	20 51.6	9.600 8716
	29	190 11 23.6	3 39 51.2	12 24.4	4 14 38.7	21 24.2	9.606 6970
	30	193 48 19.4	3 34 4.4	11 52.5	3 53 1.5	21 49.0	9.612 2863
	31	197 19 40.5	3 28 41.8	−11 10.4	+3 31 3.1	−22 6.8	9.617 6296
Aug.	1	200 45 50.9	3 23 42.6	10 19.6	3 8 50.0	22 18.6	9.622 7196
	2	204 7 13.1	3 19 5.6	9 21.4	2 46 27.7	22 25.2	9.627 5506
	3	207 24 9.2	3 14 50.0	8 16.8	2 24 1.0	22 27.4	9.632 1188
	4	210 37 0.0	3 10 54.9	7 7.3	2 1 34.1	22 25.8	9.636 4213
	5	213 46 5.5	3 7 19.4	− 5 53.9	+1 39 10.5	−22 21.0	9.640 4561
	6	216 51 44.9	3 4 2.4	4 37.5	1 16 53.2	22 13.1	9.644 2226
	7	219 54 16.3	3 1 3.2	3 19.3	0 54 45.1	22 2.8	9.647 7203
	8	222 53 57.1	2 58 21.2	2 0.1	0 32 48.3	21 50.4	9.650 9492
	9	225 51 4.1	2 55 55.4	− 0 40.6	+0 11 4.8	21 36.2	9.653 9101
	10	228 45 53.1	2 53 45.3	+ 0 38.1	−0 10 23.5	−21 20.2	9.656 6035
	11	231 38 39.7	2 51 50.2	1 55.7	0 31 35.2	21 2.8	9.659 0303
	12	234 29 38.4	2 50 9.6	3 11.2	0 52 28.8	20 44.2	9.661 1913
	13	237 19 3.5	2 48 43.0	4 24.1	1 13 3.1	20 24.2	9.663 0879
	14	240 7 9.0	2 47 30.1	5 34.0	1 33 16.8	20 3.2	9.664 7209
	15	242 54 8.1	2 46 30.3	+ 6 40.2	−1 53 9.0	−19 41.0	9.666 0912
	16	245 40 13.9	2 45 43.4	+ 7 42.2	−2 12 38.5	−19 17.9	9.667 1996

FOR GREENWICH MEAN NOON.

te.	Heliocentric Longitude, Mean Equinox of Date.	Var. per Day.	Reduction to Orbit.	Heliocentric Latitude.	Var. per Day.	Logarithm of Radius Vector.	Var. per Day.
	° ′ ″	″	′ ″	° ′ ″	″		
16	245 40 13.9	2 45 43.4	+ 7 42.2	−2 12 38.5	−19 17.9	9.667 1996	+ 9777
17	248 25 39.2	2 45 9.2	8 39.7	2 31 44.4	18 53.7	9.668 0468	7168
18	251 10 36.6	2 44 47.6	9 32.2	2 50 25.5	18 28.4	9.668 6333	4564
19	253 55 18.5	2 44 38.2	10 19.3	3 8 40.8	18 2.0	9.668 9596	+ 1962
20	256 39 57.2	2 44 41.1	11 0.6	3 26 29.2	17 34.6	9.669 0258	− 638
21	259 24 44.8	2 44 56.2	+11 36.0	−3 43 49.6	−17 5.9	9.668 8321	− 3237
22	262 9 53.6	2 45 23.4	12 4.9	4 0 40.6	16 35.9	9.668 3783	5839
23	264 55 35.8	2 46 3.0	12 27.2	4 17 1.0	16 4.6	9.667 6641	8446
24	267 42 3.8	2 46 55.0	12 42.6	4 32 49.3	15 31.8	9.666 6889	11059
25	270 29 30.0	2 47 59.4	12 50.9	4 48 3.9	14 57.2	9.665 4521	13677
26	273 18 7.0	2 49 16.7	+12 51.8	−5 2 43.1	−14 20.8	9.663 9532	−16304
27	276 8 7.8	2 50 47.1	12 45.2	5 16 44.9	13 42.4	9.662 1911	18940
28	278 59 45.6	2 52 30.7	12 31.0	5 30 7.2	13 1.8	9.660 1649	21586
29	281 53 13.8	2 54 28.1	12 9.1	5 42 47.7	12 18.8	9.657 8735	24242
30	284 48 46.5	2 56 39.6	11 39.3	5 54 43.8	11 33.0	9.655 3161	26908
31	287 46 37.9	2 59 5.7	+11 1.8	−6 5 52.6	−10 44.2	9.652 4915	−29583
1	290 47 2.9	3 1 46.9	10 16.6	6 16 11.1	9 52.2	9.649 3993	32264
2	293 50 16.9	3 4 43.8	9 23.7	6 25 35.7	8 56.4	9.646 0385	34950
3	296 56 35.8	3 7 56.8	8 23.4	6 34 2.7	7 56.8	9.642 4091	37640
4	300 6 16.2	3 11 26.8	7 16.1	6 41 27.9	6 52.8	9.638 5107	40325
5	303 19 35.4	3 15 14.5	+ 6 2.0	−6 47 46.7	− 5 44.0	9.634 3444	−43001
6	306 36 51.3	3 19 20.4	4 41.8	6 52 54.1	4 29.9	9.629 9111	45660
7	309 58 22.6	3 23 45.3	3 16.1	6 56 44.6	3 10.1	9.625 2134	48290
8	313 24 28.5	3 28 29.8	1 45.7	6 59 12.3	1 44.2	9.620 2545	50880
9	316 55 29.1	3 33 34.8	+ 0 11.6	7 0 10.8	− 0 11.7	9.615 0393	53415
10	320 31 45.1	3 39 0.8	− 1 25.1	−6 59 33.3	+ 1 28.0	9.609 5740	−55876
11	324 13 38.0	3 44 48.6	3 2.8	6 57 12.2	3 15.4	9.603 8674	58240
12	328 1 29.5	3 50 58.2	4 40.1	6 52 59.9	5 10.6	9.597 9300	60484
13	331 55 42.0	3 57 30.5	6 14.9	6 46 48.1	7 14.4	9.591 7759	62572
14	335 56 38.0	4 4 25.3	7 45.3	6 38 28.4	9 26.6	9.585 4220	64471
15	340 4 40.0	4 11 42.4	− 9 8.9	−6 27 52.1	+11 47.5	9.578 8895	−66138
16	344 20 10.2	4 19 21.5	10 23.1	6 14 50.6	14 17.0	9.572 2039	67520
17	348 43 30.0	4 27 21.6	11 25.4	5 59 15.4	16 54.6	9.565 3964	68573
18	353 14 59.7	4 35 41.0	12 12.8	5 40 58.9	19 39.6	9.558 5025	69231
19	357 54 57.7	4 44 17.8	12 42.6	5 19 54.2	22 30.8	9.551 5657	69423
20	2 43 39.9	4 53 8.8	−12 52.3	−4 55 55.9	+25 26.4	9.544 6356	−69084
21	7 41 18.8	5 2 10.4	12 39.5	4 29 0.9	28 23.8	9.537 7689	68142
22	12 48 2.8	5 11 18.0	12 2.5	3 59 8.5	31 20.5	9.531 0297	66522
23	18 3 54.7	5 20 25.3	11 0.4	3 26 21.5	34 12.4	9.524 4894	64155
24	23 28 51.0	5 29 25.4	9 33.1	2 50 47.0	36 54.8	9.518 2256	60982
25	29 2 40.5	5 38 10.3	− 7 42.1	−2 12 36.8	+39 22.8	9.512 3214	−56958
26	34 45 3.5	5 46 30.8	5 30.1	1 32 8.2	41 30.6	9.506 8634	52056
27	40 35 30.6	5 54 16.8	3 1.3	0 49 44.2	43 12.4	9.501 9395	46276
28	46 33 22.1	6 1 17.8	− 0 21.6	−0 5 53.8	44 22.6	9.497 6363	39654
29	52 37 47.6	6 7 23.1	+ 2 21.9	+0 38 48.8	44 56.0	9.494 0344	32202
30	58 47 46.3	6 12 22.5	+ 5 1.3	+1 23 44.5	+44 48.4	9.491 2061	−24205
1	65 2 7.5	6 16 6.6	+ 7 28.3	+2 8 11.2	+43 57.6	9.489 2108	−15828

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
		° ′ ″	″	″	° ′ ″	″	
Oct.	1	65 2 7.5	6 16 6.6	+ 7 28.3	+2 8 11.2	+43 57.6	9.489 2108
	2	71 19 32.0	6 18 28.1	9 34.8	2 51 24.9	42 22.6	9.488 0920
	3	77 38 34.3	6 19 21.4	11 13.9	3 32 42.2	40 5.1	9.487 8748
	4	83 57 44.5	6 18 43.8	12 20.2	4 11 22.2	37 8.8	9.488 5641
	5	90 15 31.7	6 16 35.6	12 50.4	4 46 48.7	33 39.2	9.490 1443
	6	96 30 26.5	6 13 0.0	+12 43.8	+5 18 31.6	+29 42.8	9.492 5805
	7	102 41 4.4	6 8 2.9	12 1.7	5 46 8.0	25 27.6	9.495 8206
	8	108 46 7.9	6 1 52.8	10 47.7	6 9 23.1	21 1.6	9.499 7978
	9	114 44 28.9	5 54 39.6	9 6.8	6 28 10.1	16 32.4	9.504 4352
	10	120 35 10.0	5 46 34.9	7 5.4	6 42 29.2	12 7.0	9.509 6484
	11	126 17 25.3	5 37 50.0	+ 4 50.0	+6 52 27.3	+ 7 51.1	9.515 3501
	12	131 50 40.4	5 28 36.3	2 27.1	6 58 16.1	3 49.2	9.521 4524
	13	137 14 32.0	5 19 4.8	+ 0 3.1	7 0 11.5	+ 0 4.6	9.527 8706
	14	142 28 47.2	5 9 24.8	− 2 16.9	6 58 31.8	− 3 20.6	9.534 5238
	15	147 33 21.8	4 59 45.1	4 28.2	6 53 37.0	6 25.6	9.541 3379
	16	152 28 19.8	4 50 12.6	− 6 27.6	+6 45 47.5	− 9 10.0	9.548 2453
	17	157 13 51.2	4 40 52.9	8 12.4	6 35 23.6	11 34.5	9.555 1855
	18	161 50 11.4	4 31 50.6	9 41.1	6 22 44.8	13 40.0	9.562 1055
	19	166 17 39.4	4 23 9.1	10 52.8	6 8 9.6	15 27.7	9.568 9593
	20	170 36 37.4	4 14 50.9	11 47.2	5 51 54.8	16 59.2	9.575 7076
	21	174 47 29.4	4 6 57.2	−12 24.8	+5 34 16.1	−18 16.0	9.582 3169
	22	178 50 40.4	3 59 29.2	12 46.2	5 15 27.3	19 19.5	9.588 7591
	23	182 46 36.4	3 52 27.0	12 52.3	4 55 41.0	20 11.4	9.595 0112
	24	186 35 43.1	3 45 50.8	12 44.3	4 35 8.1	20 52.8	9.601 0541
	25	190 18 26.4	3 39 40.0	12 23.5	4 13 58.5	21 25.1	9.606 8727
	26	193 55 11.4	3 33 54.1	−11 51.3	+3 52 20.5	−21 49.6	9.612 4548
	27	197 26 22.6	3 28 32.2	11 9.0	3 30 21.6	22 7.2	9.617 7906
	28	200 52 23.6	3 23 33.6	10 17.9	3 8 8.1	22 18.8	9.622 8729
	29	204 13 37.3	3 18 57.4	9 19.4	2 45 45.6	22 25.4	9.627 6960
	30	207 30 25.4	3 14 42.4	8 14.7	2 23 18.8	22 27.5	9.632 2561
	31	210 43 8.9	3 10 47.9	− 7 5.1	+2 0 51.9	−22 25.7	9.636 5504
Nov.	1	213 52 7.7	3 7 12.9	5 51.5	1 38 28.5	22 20.6	9.640 5772
	2	216 57 40.9	3 3 56.4	4 35.1	1 16 11.5	22 12.8	9.644 3354
	3	220 0 6.6	3 0 57.9	3 16.8	0 54 3.6	22 2.5	9.647 8250
	4	222 59 42.4	2 58 16.4	1 57.6	0 32 7.2	21 50.0	9.651 0457
	5	225 56 44.8	2 55 51.1	− 0 38.2	+0 10 24.2	−21 35.6	9.653 9982
	6	228 51 29.8	2 53 41.4	+ 0 40.6	−0 11 3.6	21 19.7	9.656 6835
	7	231 44 12.6	2 51 46.8	1 58.1	0 32 14.7	21 2.2	9.659 1020
	8	234 35 8.2	2 50 6.7	3 13.5	0 53 7.7	20 43.6	9.661 2549
	9	237 24 30.6	2 48 40.4	4 26.4	1 13 41.4	20 23.6	9.663 1435
	10	240 12 33.7	2 47 28.0	+ 5 36.1	−1 33 54.5	−20 2.4	9.664 7683
	11	242 59 30.9	2 46 28.6	6 42.2	1 53 45.9	19 40.2	9.666 1304
	12	245 45 35.2	2 45 42.2	7 44.1	2 13 14.7	19 17.2	9.667 2308
	13	248 30 59.5	2 45 8.4	8 41.4	2 32 19.8	18 52.9	9.668 0698
	14	251 15 56.2	2 44 47.0	9 33.7	2 51 0.1	18 27.6	9.668 6484
	15	254 0 37.7	2 44 38.0	+10 20.7	−3 9 14.6	−18 1.2	9.668 9665
	16	256 45 16.4	2 44 41.4	+11 1.8	−3 27 2.2	−17 33.7	9.669 0249

FOR GREENWICH MEAN NOON.

	Heliocentric Longitude, Mean Equinox of Date.	Var. per Day.	Reduction to Orbit.	Heliocentric Latitude.	Var. per Day.	Logarithm of Radius Vector.	Var. per Day.
	° ′ ″	° ′ ″	′ ″	° ′ ″	′ ″		
16	256 45 16.4	2 44 41.4	+11 1.8	−3 27 2.2	−17 33.7	9.669 0249	− 717
17	259 30 4.5	2 44 56.8	11 37.0	3 44 21.6	17 5.0	9.668 8231	3318
18	262 15 14.1	2 45 24.4	12 5.7	4 1 11.7	16 35.0	9.668 3613	5921
19	265 0 57.5	2 46 4.4	12 27.8	4 17 31.2	16 3.6	9.667 6388	8528
20	267 47 27.0	2 46 56.8	12 43.0	4 33 18.4	15 30.6	9.666 6556	11140
21	270 34 55.2	2 48 1.6	+12 51.0	−4 48 31.9	−14 56.1	9.665 4107	−13759
22	273 23 34.5	2 49 19.2	12 51.7	5 3 10.0	14 19.7	9.663 9036	16386
23	276 13 38.1	2 50 50.0	12 44.9	5 17 10.6	13 41.2	9.662 1333	19022
24	279 5 19.0	2 52 34.1	12 30.4	5 30 31.6	13 0.5	9.660 0988	21668
25	281 58 50.9	2 54 31.9	12 8.2	5 43 10.8	12 17.4	9.657 7993	24324
26	284 54 27.5	2 56 43.8	+11 38.3	−5 55 5.4	−11 31.4	9.655 2337	−26991
27	287 52 23.4	2 59 10.4	11 0.5	6 6 12.7	10 42.6	9.652 4008	29666
28	290 52 53.4	3 1 52.1	10 15.0	6 16 29.6	9 50.5	9.649 3003	32348
29	293 56 12.8	3 4 49.4	9 21.9	6 25 52.5	8 54.6	9.645 9311	35036
30	297 2 37.6	3 8 3.0	8 21.4	6 34 17.6	7 54.9	9.642 2932	37724
1	300 12 24.5	3 11 33.7	+ 7 13.9	−6 41 40.8	− 6 50.7	9.638 3864	−40410
2	303 25 50.8	3 15 21.8	5 59.6	6 47 57.4	5 41.7	9.634 2117	43084
3	306 43 14.3	3 19 28.3	4 39.2	6 53 2.5	4 27.5	9.629 7702	45742
4	310 4 53.7	3 23 53.7	3 13.4	6 56 50.5	3 7.6	9.625 0643	48371
5	313 31 8.3	3 28 39.0	1 42.8	6 59 15.6	1 41.4	9.620 0974	50960
6	317 2 18.4	3 33 44.6	+ 0 8.6	−7 0 11.2	− 0 8.6	9.614 8742	−53494
7	320 38 44.5	3 39 11.2	− 1 28.1	6 59 30.5	+ 1 31.3	9.609 4012	55952
8	324 20 48.1	3 44 59.6	3 5.9	6 57 6.1	3 18.8	9.603 6871	58312
9	328 8 51.1	3 51 10.0	4 43.0	6 52 50.2	5 14.4	9.597 7428	60551
10	332 3 15.7	3 57 43.0	6 17.8	6 46 34.6	7 18.2	9.591 5821	62634
11	336 4 24.6	4 4 38.5	− 7 48.0	−6 38 10.8	+ 9 30.8	9.585 2223	−64527
12	340 12 40.1	4 11 56.3	9 11.4	6 27 30.1	11 52.0	9.578 6845	66186
13	344 28 24.5	4 19 36.1	10 25.3	6 14 23.9	14 21.8	9.571 9945	67562
14	348 51 59.2	4 27 36.8	11 27.1	5 58 43.8	16 59.6	9.565 1834	68600
15	353 23 44.4	4 35 56.7	12 14.0	5 40 22.2	19 44.8	9.558 2876	69244
16	358 3 58.4	4 44 34.0	−12 43.2	−5 19 12.1	+22 36.2	9.551 3500	−69422
17	2 52 57.1	4 53 25.5	12 52.2	4 55 8.4	25 31.8	9.544 4209	69066
18	7 50 52.9	5 2 27.4	12 38.7	4 28 7.9	28 29.4	9.537 5570	68106
19	12 57 53.9	5 11 35.0	12 1.0	3 58 9.9	31 26.0	9.530 8225	66464
20	18 14 2.8	5 20 42.2	10 58.0	3 25 17.6	34 17.4	9.524 2893	64072
21	23 39 15.9	5 29 42.0	− 9 30.0	−2 49 38.1	+36 59.6	9.518 0350	−60875
22	29 13 21.8	5 38 26.4	7 38.3	2 11 23.3	39 27.1	9.512 1429	56821
23	34 56 0.5	5 46 46.0	5 25.7	1 30 50.7	41 34.2	9.506 7001	51890
24	40 46 42.2	5 54 30.8	2 56.5	0 48 23.6	43 15.2	9.501 7941	46084
25	46 44 46.9	6 1 30.2	− 0 16.6	−0 4 31.0	44 24.2	9.497 5113	39438
26	52 49 23.9	6 7 33.6	+ 2 27.0	+0 40 12.6	+44 56.4	9.493 9323	−32022
27	58 59 32.0	6 12 30.8	5 6.1	1 25 8.2	44 47.6	9.491 1289	23947
28	65 14 0.4	6 16 12.6	7 32.6	2 9 33.3	43 55.2	9.489 1601	15357
29	71 31 29.5	6 18 31.4	9 38.4	2 52 44.0	42 19.0	9.488 0689	− 6426
30	77 50 33.7	6 19 22.0	11 16.5	3 33 57.0	40 0.3	9.487 8798	+ 2650
31	84 9 43.0	6 18 41.4	+12 21.7	+4 12 31.6	+37 2.8	9.488 5971	+11668
32	90 27 26.4	. . . . .	*+12 50.8*	+4 47 51.6	. . . . .	9.490 2046	. . . .

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.
		Noon.	*Noon.*	*Noon.*	*Noon.*	*Noon.*	*Noon.*	*Noon.*	*Noon.*
		h m s	s	° ′ ″	″			″	″
an.	1	16 45 20.74	+13.167	−21 9 39.0	−29.55	0.154 0588	+610.2	5.99	6.17
	2	16 50 37.21	13.205	21 21 10.1	28.03	0.155 5154	603.7	5.98	6.15
	3	16 55 54.57	13.241	21 32 4.4	26.49	0.156 9568	597.4	5.96	6.13
	4	17 1 12.77	13.275	21 42 21.3	24.92	0.158 3831	591.2	5.94	6.11
	5	17 6 31.78	13.308	21 52 0.5	23.34	0.159 7944	585.0	5.92	6.09
	6	17 11 51.56	+13.340	−22 1 1.4	−21.73	0.161 1909	+578.8	5.90	6.07
	7	17 17 12.07	13.369	22 9 23.6	20.11	0.162 5726	572.7	5.88	6.05
	8	17 22 33.27	13.397	22 17 6.6	18.47	0.163 9398	566.6	5.86	6.03
	9	17 27 55.10	13.422	22 24 10.0	16.81	0.165 2925	560.6	5.84	6.01
	10	17 33 17.53	13.446	22 30 33.5	15.14	0.166 6308	554.6	5.82	5.99
	11	17 38 40.49	+13.467	−22 36 16.7	−13.46	0.167 9548	+548.7	5.81	5.98
	12	17 44 3.94	13.487	22 41 19.4	11.76	0.169 2645	542.7	5.79	5.96
	13	17 49 27.83	13.504	22 45 41.1	10.05	0.170 5600	536.8	5.77	5.94
	14	17 54 52.10	13.518	22 49 21.8	8.34	0.171 8413	530.9	5.75	5.92
	15	18 0 16.69	13.531	22 52 21.1	6.61	0.173 1085	525.0	5.74	5.91
	16	18 5 41.55	+13.541	−22 54 38.8	− 4.87	0.174 3615	+519.1	5.73	5.89
	17	18 11 6.62	13.548	22 56 14.7	3.13	0.175 6004	513.3	5.71	5.87
	18	18 16 31.84	13.553	22 57 8.8	− 1.38	0.176 8253	507.4	5.70	5.86
	19	18 21 57.14	13.555	22 57 21.0	+ 0.37	0.178 0361	501.6	5.68	5.84
	20	18 27 22.47	13.555	22 56 51.1	2.12	0.179 2330	495.8	5.66	5.82
	21	18 32 47.77	+13.553	−22 55 39.3	+ 3.87	0.180 4160	+490.0	5.65	5.81
	22	18 38 12.97	13.547	22 53 45.5	5.62	0.181 5851	484.3	5.63	5.79
	23	18 43 38.01	13.539	22 51 9.7	7.36	0.182 7406	478.6	5.62	5.78
	24	18 49 2.82	13.528	22 47 52.1	9.10	0.183 8824	472.9	5.60	5.76
	25	18 54 27.35	13.515	22 43 52.7	10.84	0.185 0108	467.4	5.59	5.75
	26	18 59 51.54	+13.500	−22 39 11.7	+12.57	0.186 1259	+461.9	5.57	5.73
	27	19 5 15.34	13.482	22 33 49.3	14.30	0.187 2279	456.4	5.56	5.72
	28	19 10 38.68	13.462	22 27 45.7	16.01	0.188 3169	451.1	5.54	5.70
	29	19 16 1.51	13.440	22 21 1.1	17.71	0.189 3932	445.8	5.53	5.69
	30	19 21 23.78	13.416	22 13 35.8	19.40	0.190 4569	440.6	5.52	5.68
	31	19 26 45.44	+13.389	−22 5 30.1	+21.07	0.191 5081	+435.4	5.50	5.66
'eb.	1	19 32 6.45	13.361	21 56 44.3	22.74	0.192 5470	430.3	5.49	5.65
	2	19 37 26.76	13.331	21 47 18.7	24.39	0.193 5737	425.2	5.47	5.63
	3	19 42 46.33	13.299	21 37 13.7	26.02	0.194 5882	420.2	5.46	5.62
	4	19 48 5.11	13.266	21 26 29.8	27.64	0.195 5907	415.2	5.45	5.61
	5	19 53 23.08	+13.231	−21 15 7.2	+29.24	0.196 5813	+410.2	5.44	5.60
	6	19 58 40.19	13.195	21 3 6.4	30.82	0.197 5599	405.3	5.42	5.58
	7	20 3 56.41	13.157	20 50 28.0	32.38	0.198 5267	400.4	5.41	5.57
	8	20 9 11.70	13.117	20 37 12.3	33.92	0.199 4818	395.5	5.40	5.56
	9	20 14 26.03	13.077	20 23 20.0	35.44	0.200 4250	390.6	5.39	5.55
	10	20 19 39.38	+13.035	−20 8 51.5	+36.93	0.201 3565	+385.7	5.38	5.53
	11	20 24 51.72	12.993	19 53 47.4	38.41	0.202 2762	380.8	5.37	5.52
	12	20 30 3.03	12.949	19 38 8.2	39.86	0.203 1842	375.9	5.36	5.51
	13	20 35 13.28	12.905	19 21 54.5	41.28	0.204 0804	371.0	5.35	5.50
	14	20 40 22.46	12.860	19 5 7.0	42.68	0.204 9648	366.1	5.34	5.49
	15	20 45 30.55	+12.814	−18 47 46.2	+44.05	0.205 8375	+361.2	5.33	5.48
	16	20 50 37.53	+12.768	−18 29 52.7	+45.40	0.206 6983	+356.2	5.32	5.47

GREENWICH MEAN TIME.

ate.	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
16	20 50 37.53	+12.768	−18 29 52.7	+45.40	0.206 6983	+356.2	5.32	5.47	23 8.1
17	20 55 43.40	12.721	18 11 27.2	46.72	0.207 5472	351.2	5.31	5.46	23 9.3
18	21 0 48.13	12.674	17 52 30.4	48.01	0.208 3841	346.2	5.30	5.45	23 10.4
19	21 5 51.73	12.626	17 33 3.0	49.27	0.209 2091	341.3	5.28	5.43	23 11.5
20	21 10 54.18	12.578	17 13 5.7	50.50	0.210 0222	336.3	5.27	5.42	23 12.6
21	21 15 55.48	+12.530	−16 52 39.1	+51.71	0.210 8233	+331.3	5.26	5.41	23 13.6
22	21 20 55.62	12.482	16 31 44.0	52.88	0.211 6126	326.4	5.25	5.40	23 14.7
23	21 25 54.60	12.434	16 10 21.1	54.02	0.212 3900	321.5	5.25	5.40	23 15.7
24	21 30 52.44	12.386	15 48 31.1	55.14	0.213 1558	316.6	5.24	5.39	23 16.7
25	21 35 49.12	12.338	15 26 14.8	56.22	0.213 9099	311.8	5.23	5.38	23 17.7
26	21 40 44.66	+12.291	−15 3 32.9	+57.27	0.214 6524	+307.0	5.22	5.37	23 18.6
27	21 45 39.07	12.244	14 40 26.1	58.29	0.215 3835	302.3	5.21	5.36	23 19.6
28	21 50 32.36	12.197	14 16 55.1	59.28	0.216 1033	297.6	5.20	5.35	23 20.5
r. 1	21 55 24.54	12.152	13 53 0.7	60.24	0.216 8118	292.9	5.19	5.34	23 21.4
2	22 0 15.64	12.107	13 28 43.7	61.17	0.217 5091	288.2	5.18	5.33	23 22.3
3	22 5 5.67	+12.063	−13 4 4.6	+62.08	0.218 1953	+283.6	5.17	5.32	23 23.2
4	22 9 54.65	12.019	12 39 4.3	62.94	0.218 8704	279.0	5.17	5.32	23 24.0
5	22 14 42.60	11.977	12 13 43.5	63.78	0.219 5344	274.4	5.16	5.31	23 24.9
6	22 19 29.56	11.936	11 48 2.9	64.59	0.220 1874	269.8	5.15	5.30	23 25.7
7	22 24 15.54	11.896	11 22 3.2	65.37	0.220 8294	265.2	5.14	5.29	23 26.5
8	22 29 0.57	+11.857	−10 55 45.3	+66.12	0.221 4604	+260.6	5.13	5.28	23 27.3
9	22 33 44.68	11.819	10 29 9.7	66.84	0.222 0804	256.0	5.13	5.28	23 28.1
10	22 38 27.90	11.783	10 2 17.3	67.53	0.222 6894	251.5	5.12	5.27	23 28.8
11	22 43 10.26	11.748	9 35 8.7	68.18	0.223 2874	246.9	5.11	5.26	23 29.6
12	22 47 51.80	11.714	9 7 44.8	68.81	0.223 8744	242.2	5.11	5.26	23 30.3
13	22 52 32.53	+11.681	− 8 40 6.2	+69.41	0.224 4501	+237.6	5.10	5.25	23 31.1
14	22 57 12.51	11.650	8 12 13.6	69.97	0.225 0147	232.9	5.09	5.24	23 31.8
15	23 1 51.76	11.621	7 44 7.8	70.50	0.225 5680	228.2	5.08	5.23	23 32.5
16	23 6 30.32	11.593	7 15 49.6	71.01	0.226 1099	223.4	5.08	5.23	23 33.2
17	23 11 8.23	11.566	6 47 19.6	71.48	0.226 6403	218.6	5.07	5.22	23 33.9
18	23 15 45.51	+11.541	− 6 18 38.6	+71.93	0.227 1592	+213.8	5.07	5.22	23 34.5
19	23 20 22.21	11.517	5 49 47.3	72.34	0.227 6665	208.9	5.06	5.21	23 35.2
20	23 24 58.36	11.495	5 20 46.5	72.72	0.228 1621	204.0	5.05	5.20	23 35.8
21	23 29 33.99	11.475	4 51 37.0	73.07	0.228 6458	199.1	5.05	5.20	23 36.5
22	23 34 9.15	11.456	4 22 19.4	73.39	0.229 1176	194.1	5.04	5.19	23 37.1
23	23 38 43.87	+11.438	− 3 52 54.5	+73.68	0.229 5774	+189.1	5.04	5.19	23 37.7
24	23 43 18.18	11.421	3 23 23.1	73.93	0.230 0253	184.1	5.03	5.18	23 38.4
25	23 47 52.12	11.407	2 53 45.9	74.16	0.230 4613	179.2	5.03	5.18	23 39.0
26	23 52 25.74	11.395	2 24 3.6	74.36	0.230 8854	174.2	5.03	5.17	23 39.6
27	23 56 59.07	11.383	1 54 17.0	74.52	0.231 2977	169.3	5.02	5.17	23 40.2
28	0 1 32.14	+11.373	− 1 24 26.7	+74.66	0.231 6981	+164.4	5.02	5.16	23 40.8
29	0 6 5.01	11.366	0 54 33.6	74.76	0.232 0867	159.5	5.02	5.16	23 41.4
30	0 10 37.71	11.360	− 0 24 38.3	74.84	0.232 4635	154.6	5.01	5.15	23 42.0
31	0 15 10.28	11.355	+ 0 5 18.5	74.89	0.232 8286	149.7	5.01	5.15	23 42.6
r. 1	0 19 42.77	11.353	0 35 16.1	74.91	0.233 1819	144.7	5.00	5.14	23 43.2
2	0 24 15.22	+11.352	+ 1 5 13.8	+74.89	0.233 5234	+139.9	5.00	5.14	23 43.8
3	*0 28 47.66*	*+11.352*	*+ 1 35 10.8*	*+74.85*	0.233 8532	+135.0	5.00	5.14	23 44.4

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. Paral-lax.
		Noon.	Noon.	Noon.	Noon.	Noon.	Noon.	Noon.	Noon.
		h m s	s	° ′ ″	″			″	″
Apr.	1	0 19 42.77	+11.353	+ 0 35 16.1	+74.91	0.233 1819	+144.7	5.00	5.14
	2	0 24 15.22	11.352	1 5 13.8	74.89	0.233 5234	139.9	5.00	5.14
	3	0 28 47.66	11.352	1 35 10.8	74.85	0.233 8532	135.0	5.00	5.14
	4	0 33 20.15	11.355	2 5 6.5	74.78	0.234 1712	130.1	4.99	5.13
	5	0 37 52.73	11.360	2 35 0.2	74.68	0.234 4775	125.1	4.99	5.13
	6	0 42 25.44	+11.366	+ 3 4 51.1	+74.55	0.234 7719	+120.2	4.98	5.12
	7	0 46 58.31	11.374	3 34 38.5	74.39	0.235 0545	115.3	4.98	5.12
	8	0 51 31.40	11.384	4 4 21.8	74.21	0.235 3253	110.4	4.98	5.12
	9	0 56 4.75	11.395	4 34 0.3	73.99	0.235 5842	105.4	4.98	5.12
	10	1 0 38.39	11.409	5 3 33.2	73.74	0.235 8311	100.4	4.97	5.11
	11	1 5 12.38	+11.424	+ 5 32 59.7	+73.46	0.236 0659	+ 95.3	4.97	5.11
	12	1 9 46.76	11.441	6 2 19.3	73.16	0.236 2885	90.2	4.97	5.11
	13	1 14 21.56	11.459	6 31 31.2	72.82	0.236 4989	85.1	4.96	5.10
	14	1 18 56.82	11.479	7 0 34.6	72.45	0.236 6968	79.8	4.96	5.10
	15	1 23 32.59	11.501	7 29 28.8	72.06	0.236 8821	74.6	4.96	5.10
	16	1 28 8.90	+11.525	+ 7 58 13.1	+71.63	0.237 0547	+ 69.2	4.96	5.10
	17	1 32 45.79	11.550	8 26 46.8	71.17	0.237 2144	63.9	4.96	5.10
	18	1 37 23.30	11.576	8 55 9.1	70.68	0.237 3612	58.5	4.95	5.09
	19	1 42 1.45	11.604	9 23 19.3	70.16	0.237 4950	53.0	4.95	5.09
	20	1 46 40.29	11.633	9 51 16.6	69.61	0.237 6156	47.5	4.95	5.09
	21	1 51 19.84	+11.663	+10 19 0.3	+69.03	0.237 7229	+ 41.9	4.95	5.09
	22	1 56 0.14	11.695	10 46 29.6	68.41	0.237 8169	36.4	4.95	5.09
	23	2 0 41.22	11.728	11 13 43.8	67.77	0.237 8975	30.8	4.95	5.09
	24	2 5 23.10	11.762	11 40 42.1	67.09	0.237 9647	25.2	4.95	5.09
	25	2 10 5.82	11.797	12 7 23.8	66.38	0.238 0184	19.6	4.95	5.09
	26	2 14 49.39	+11.834	+12 33 48.1	+65.64	0.238 0586	+ 14.0	4.95	5.09
	27	2 19 33.86	11.872	12 59 54.3	64.87	0.238 0854	8.4	4.95	5.09
	28	2 24 19.24	11.910	13 25 41.7	64.07	0.238 0988	+ 2.8	4.95	5.09
	29	2 29 5.56	11.950	13 51 9.5	63.24	0.238 0987	− 2.9	4.95	5.09
	30	2 33 52.85	11.991	14 16 17.0	62.38	0.238 0851	8.5	4.95	5.09
May	1	2 38 41.12	+12.032	+14 41 3.4	+61.48	0.238 0580	− 14.1	4.95	5.09
	2	2 43 30.40	12.075	15 5 28.0	60.56	0.238 0175	19.7	4.95	5.09
	3	2 48 20.72	12.118	15 29 30.1	59.61	0.237 9634	25.4	4.95	5.09
	4	2 53 12.08	12.162	15 53 8.9	58.62	0.237 8958	31.0	4.95	5.09
	5	2 58 4.50	12.207	16 16 23.7	57.61	0.237 8146	36.6	4.95	5.09
	6	3 2 58.01	+12.252	+16 39 13.8	+56.56	0.237 7199	− 42.3	4.95	5.09
	7	3 7 52.60	12.298	17 1 38.5	55.49	0.237 6115	48.0	4.95	5.09
	8	3 12 48.31	12.344	17 23 37.0	54.38	0.237 4894	53.7	4.95	5.09
	9	3 17 45.13	12.391	17 45 8.6	53.25	0.237 3536	59.4	4.95	5.09
	10	3 22 43.08	12.438	18 6 12.6	52.08	0.237 2040	65.2	4.96	5.10
	11	3 27 42.17	+12.486	+18 26 48.3	+50.89	0.237 0404	− 71.1	4.96	5.10
	12	3 32 42.39	12.533	18 46 54.9	49.66	0.236 8628	76.9	4.96	5.10
	13	3 37 43.74	12.580	19 6 31.8	48.41	0.236 6710	82.9	4.96	5.10
	14	3 42 46.23	12.627	19 25 38.2	47.12	0.236 4649	88.9	4.96	5.10
	15	3 47 49.85	12.674	19 44 13.5	45.81	0.236 2444	94.9	4.97	5.11
	16	3 52 54.59	+12.721	+20 2 17.0	+44.47	0.236 0092	−101.1	4.97	5.11
	17	3 58 0.44	+12.767	+20 19 48.0	+43.10	0.235 7593	−107.2	4.97	5.11

GREENWICH MEAN TIME.

ate.	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
17	3 58 0.44	+12.767	+20 19 48.0	+43.10	0.235 7593	−107.2	4.97	5.11	0 19.6
18	4 3 7.39	12.812	20 36 45.8	41.71	0.235 4945	113.4	4.98	5.12	0 20.8
19	4 8 15.42	12.857	20 53 9.9	40.29	0.235 2148	119.7	4.98	5.12	0 22.0
20	4 13 24.50	12.900	21 8 59.5	38.84	0.234 9200	126.0	4.98	5.12	0 23.2
21	4 18 34.62	12.943	21 24 14.0	37.37	0.234 6100	132.3	4.99	5.13	0 24.4
22	4 23 45.75	+12.984	+21 38 52.9	+35.87	0.234 2848	−138.7	4.99	5.13	0 25.6
23	4 28 57.86	13.024	21 52 55.5	34.34	0.233 9443	145.1	4.99	5.13	0 26.9
24	4 34 10.91	13.063	22 6 21.2	32.80	0.233 5885	151.4	5.00	5.14	0 28.1
25	4 39 24.89	13.101	22 19 9.6	31.23	0.233 2174	157.8	5.00	5.14	0 29.4
26	4 44 39.75	13.137	22 31 20.1	29.64	0.232 8310	164.2	5.01	5.15	0 30.7
27	4 49 55.46	+13.171	+22 42 52.1	+28.03	0.232 4292	−170.6	5.01	5.15	0 32.1
28	4 55 11.96	13.204	22 53 45.3	26.40	0.232 0120	177.0	5.02	5.16	0 33.4
29	5 0 29.23	13.235	23 3 59.1	24.75	0.231 5794	183.5	5.02	5.16	0 34.8
30	5 5 47.23	13.264	23 13 33.1	23.08	0.231 1314	189.9	5.03	5.17	0 36.1
31	5 11 5.90	13.291	23 22 27.0	21.40	0.230 6681	196.2	5.03	5.17	0 37.5
e 1	5 16 25.20	+13.317	+23 30 40.2	+19.70	0.230 1894	−202.6	5.03	5.18	0 38.9
2	5 21 45.08	13.340	23 38 12.4	17.99	0.229 6954	209.0	5.04	5.19	0 40.3
3	5 27 5.49	13.361	23 45 3.4	16.26	0.229 1861	215.4	5.04	5.19	0 41.7
4	5 32 26.37	13.380	23 51 12.7	14.52	0.228 6614	221.8	5.05	5.20	0 43.1
5	5 37 47.69	13.396	23 56 40.2	12.77	0.228 1215	228.2	5.05	5.20	0 44.5
6	5 43 9.38	+13.411	+24 1 25.5	+11.01	0.227 5662	−234.6	5.06	5.21	0 45.9
7	5 48 31.39	13.423	24 5 28.5	9.24	0.226 9956	241.0	5.07	5.22	0 47.3
8	5 53 53.67	13.433	24 8 48.9	7.46	0.226 4095	247.5	5.07	5.22	0 48.8
9	5 59 16.15	13.440	24 11 26.5	5.68	0.225 8078	253.9	5.08	5.23	0 50.2
10	6 4 38.79	13.446	24 13 21.3	3.89	0.225 1906	260.4	5.09	5.24	0 51.6
11	6 10 1.52	+13.448	+24 14 33.1	+ 2.09	0.224 5576	−267.0	5.10	5.25	0 53.1
12	6 15 24.29	13.449	24 15 1.8	+ 0.30	0.223 9088	273.6	5.10	5.25	0 54.5
13	6 20 47.03	13.446	24 14 47.4	− 1.50	0.223 2441	280.3	5.11	5.26	0 55.9
14	6 26 9.68	13.441	24 13 49.9	3.29	0.222 5633	287.0	5.12	5.27	0 57.4
15	6 31 32.18	13.433	24 12 9.3	5.09	0.221 8664	293.8	5.13	5.28	0 58.8
16	6 36 54.46	+13.423	+24 9 45.7	− 6.88	0.221 1531	−300.6	5.14	5.29	1 0.2
17	6 42 16.47	13.410	24 6 39.1	8.67	0.220 4235	307.4	5.15	5.30	1 1.7
18	6 47 38.14	13.395	24 2 49.7	10.45	0.219 6775	314.3	5.16	5.31	1 3.1
19	6 52 59.42	13.378	23 58 17.6	12.22	0.218 9148	321.2	5.16	5.31	1 4.5
20	6 58 20.25	13.357	23 53 3.1	13.99	0.218 1355	328.2	5.17	5.32	1 5.9
21	7 3 40.56	+13.335	+23 47 6.2	−15.75	0.217 3395	−335.1	5.18	5.33	1 7.3
22	7 9 0.30	13.310	23 40 27.4	17.49	0.216 5268	342.1	5.19	5.34	1 8.7
23	7 14 19.40	13.282	23 33 6.8	19.22	0.215 6975	349.0	5.21	5.36	1 10.1
24	7 19 37.81	13.252	23 25 4.8	20.94	0.214 8515	356.0	5.22	5.37	1 11.4
25	7 24 55.49	13.220	23 16 21.7	22.64	0.213 9888	362.9	5.23	5.38	1 12.8
26	7 30 12.37	+13.186	+23 6 58.0	−24.33	0.213 1094	−369.9	5.24	5.39	1 14.1
27	7 35 28.42	13.151	22 56 53.9	26.01	0.212 2132	376.9	5.25	5.40	1 15.5
28	7 40 43.58	13.113	22 46 9.9	27.66	0.211 3003	383.8	5.26	5.41	1 16.8
29	7 45 57.82	13.073	22 34 46.5	29.29	0.210 3709	390.7	5.27	5.42	1 18.1
30	7 51 11.08	13.032	22 22 44.0	30.91	0.209 4248	397.6	5.28	5.43	1 19.3
ly 1	7 56 23.34	+12.989	+22 10 3.0	−32.51	0.208 4622	−404.5	5.29	5.44	1 20.6
2	8 1 34.55	+12.945	+21 56 43.9	−34.08	0.207 4831	−411.4	5.31	5.46	1 21.8

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.
		Noon.	*Noon.*	*Noon.*	*Noon.*	*Noon.*	*Noon.*	*Noon.*	*Noon.*
		h m s	s	° ′ ″	″			″	″
July	1	7 56 23.34	+12.989	+22 10 3.0	−32.51	0.208 4622	−404.5	5.29	5.44
	2	8 1 34.55	12.945	21 56 43.9	34.08	0.207 4831	411.4	5.31	5.46
	3	8 6 44.69	12.900	21 42 47.3	35.63	0.206 4876	418.2	5.32	5.47
	4	8 11 53.73	12.853	21 28 13.7	37.16	0.205 4756	425.1	5.33	5.48
	5	8 17 1.64	12.806	21 13 3.7	38.67	0.204 4473	431.9	5.35	5.50
	6	8 22 8.40	+12.757	+20 57 17.7	−40.16	0.203 4027	−438.7	5.36	5.51
	7	8 27 13.99	12.708	20 40 56.4	41.61	0.202 3416	445.5	5.37	5.52
	8	8 32 18.38	12.658	20 24 0.4	43.05	0.201 2641	452.4	5.38	5.54
	9	8 37 21.56	12.607	20 6 30.2	44.46	0.200 1701	459.3	5.39	5.55
	10	8 42 23.53	12.556	19 48 26.6	45.84	0.199 0595	466.2	5.40	5.56
	11	8 47 24.26	+12.504	+19 29 50.0	−47.20	0.197 9323	−473.2	5.42	5.58
	12	8 52 23.74	12.453	19 10 41.3	48.53	0.196 7883	480.2	5.43	5.59
	13	8 57 21.98	12.401	18 51 1.0	49.83	0.195 6275	487.2	5.45	5.61
	14	9 2 18.96	12.348	18 30 49.8	51.10	0.194 4497	494.3	5.46	5.62
	15	9 7 14.67	12.295	18 10 8.4	52.34	0.193 2548	501.4	5.48	5.64
	16	9 12 9.13	+12.243	+17 48 57.5	−53.56	0.192 0428	−508.6	5.49	5.65
	17	9 17 2.32	12.190	17 27 17.8	54.74	0.190 8135	515.8	5.51	5.67
	18	9 21 54.25	12.137	17 5 10.0	55.90	0.189 5669	523.0	5.53	5.69
	19	9 26 44.92	12.085	16 42 34.8	57.03	0.188 3029	530.3	5.54	5.70
	20	9 31 34.33	12.033	16 19 33.0	58.12	0.187 0215	537.5	5.56	5.72
	21	9 36 22.50	+11.981	+15 56 5.3	−59.19	0.185 7227	−544.8	5.58	5.74
	22	9 41 9.44	11.930	15 32 12.3	60.22	0.184 4064	552.1	5.59	5.75
	23	9 45 55.15	11.879	15 7 54.9	61.22	0.183 0726	559.4	5.61	5.77
	24	9 50 39.66	11.830	14 43 13.8	62.20	0.181 7213	566.7	5.63	5.79
	25	9 55 22.97	11.780	14 18 9.7	63.14	0.180 3525	574.0	5.65	5.81
	26	10 0 5.09	+11.731	+13 52 43.4	−64.05	0.178 9662	−581.3	5.67	5.83
	27	10 4 46.06	11.683	13 26 55.6	64.93	0.177 5624	588.5	5.69	5.85
	28	10 9 25.89	11.636	13 0 47.0	65.78	0.176 1412	595.8	5.71	5.87
	29	10 14 4.60	11.590	12 34 18.4	66.60	0.174 7025	603.1	5.72	5.88
	30	10 18 42.22	11.545	12 7 30.4	67.39	0.173 2464	610.3	5.73	5.90
	31	10 23 18.77	+11.501	+11 40 23.9	−68.15	0.171 7730	−617.5	5.75	5.92
Aug.	1	10 27 54.28	11.458	11 12 59.5	68.88	0.170 2825	624.6	5.78	5.95
	2	10 32 28.78	11.417	10 45 17.9	69.58	0.168 7748	631.8	5.80	5.97
	3	10 37 2.30	11.377	10 17 19.9	70.25	0.167 2500	638.9	5.82	5.99
	4	10 41 34.87	11.338	9 49 6.2	70.89	0.165 7081	646.0	5.84	6.01
	5	10 46 6.54	+11.301	+ 9 20 37.4	−71.51	0.164 1491	−653.1	5.86	6.03
	6	10 50 37.33	11.265	8 51 54.2	72.09	0.162 5730	660.3	5.88	6.05
	7	10 55 7.29	11.231	8 22 57.3	72.64	0.160 9798	667.5	5.90	6.07
	8	10 59 36.44	11.198	7 53 47.5	73.17	0.159 3692	674.7	5.93	6.10
	9	11 4 4.83	11.167	7 24 25.4	73.67	0.157 7413	682.0	5.95	6.12
	10	11 8 32.49	+11.138	+ 6 54 51.7	−74.14	0.156 0958	−689.3	5.97	6.14
	11	11 12 59.46	11.110	6 25 7.1	74.57	0.154 4326	696.7	6.00	6.17
	12	11 17 25.78	11.083	5 55 12.4	74.98	0.152 7517	704.1	6.02	6.19
	13	11 21 51.48	11.059	5 25 8.2	75.36	0.151 0530	711.5	6.04	6.21
	14	11 26 16.61	11.036	4 54 55.2	75.72	0.149 3363	719.0	6.07	6.24
	15	11 30 41.20	+11.014	+ 4 24 34.1	−76.03	0.147 6015	−726.6	6.08	6.26
	16	11 35 5.28	+10.993	+ 3 54 5.8	−76.32	0.145 8484	−734.2	6.11	6.29

GREENWICH MEAN TIME.

	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
16	11 35 5.28	+10.993	+ 3 54 5.8	−76.32	0.145 8484	− 734.2	6.11	6.29	1 57.9
17	11 39 28.90	10.975	3 23 30.8	76.59	0.144 0771	741.9	6.14	6.32	1 58.4
18	11 43 52.09	10.958	2 52 49.9	76.82	0.142 2874	749.6	6.16	6.34	1 58.8
19	11 48 14.90	10.943	2 22 3.8	77.02	0.140 4791	757.3	6.19	6.37	1 59.2
20	11 52 37.36	10.929	1 51 13.2	77.19	0.138 6522	765.1	6.21	6.39	1 59.7
21	11 56 59.51	+10.917	+ 1 20 18.8	−77.34	0.136 8066	− 772.9	6.24	6.42	2 0.1
22	12 1 21.38	10.906	0 49 21.3	77.45	0.134 9422	780.8	6.27	6.45	2 0.5
23	12 5 43.02	10.897	+ 0 18 21.3	77.54	0.133 0589	788.6	6.30	6.48	2 0.9
24	12 10 4.47	10.890	− 0 12 40.4	77.59	0.131 1568	796.5	6.33	6.51	2 1.3
25	12 14 25.76	10.884	0 43 43.0	77.62	0.129 2357	804.4	6.35	6.53	2 1.8
26	12 18 46.93	+10.880	− 1 14 46.0	−77.62	0.127 2957	− 812.2	6.38	6.56	2 2.2
27	12 23 8.03	10.878	1 45 48.6	77.59	0.125 3369	820.1	6.41	6.59	2 2.6
28	12 27 29.08	10.877	2 16 50.1	77.53	0.123 3591	828.0	6.43	6.62	2 3.0
29	12 31 50.13	10.878	2 47 49.8	77.44	0.121 3625	835.9	6.46	6.65	2 3.4
30	12 36 11.22	10.880	3 18 47.1	77.33	0.119 3469	843.7	6.49	6.68	2 3.8
31	12 40 32.39	+10.884	− 3 49 41.3	−77.18	0.117 3125	− 851.6	6.53	6.72	2 4.2
1	12 44 53.68	10.890	4 20 31.7	77.01	0.115 2591	859.5	6.56	6.75	2 4.6
2	12 49 15.14	10.898	4 51 17.6	76.81	0.113 1869	867.4	6.59	6.78	2 5.0
3	12 53 36.81	10.908	5 21 58.4	76.58	0.111 0957	875.3	6.62	6.81	2 5.5
4	12 57 58.72	10.919	5 52 33.4	76.33	0.108 9856	883.2	6.66	6.85	2 5.9
5	13 2 20.93	+10.932	− 6 23 2.0	−76.05	0.106 8562	− 891.2	6.69	6.88	2 6.3
6	13 6 43.46	10.946	6 53 23.5	75.74	0.104 7077	899.2	6.72	6.91	2 6.7
7	13 11 6.37	10.963	7 23 37.2	75.40	0.102 5398	907.4	6.76	6.95	2 7.2
8	13 15 29.70	10.981	7 53 42.3	75.03	0.100 3522	915.6	6.78	6.98	2 7.6
9	13 19 53.47	11.000	8 23 38.2	74.63	0.098 1448	923.9	6.82	7.02	2 8.1
10	13 24 17.73	+11.022	− 8 53 24.2	−74.20	0.095 9174	− 932.3	6.85	7.05	2 8.6
11	13 28 42.52	11.044	9 22 59.6	73.74	0.093 6697	940.8	6.89	7.09	2 9.0
12	13 33 7.87	11.068	9 52 23.7	73.26	0.091 4016	949.4	6.93	7.13	2 9.5
13	13 37 33.81	11.093	10 21 35.7	72.74	0.089 1129	958.0	6.97	7.17	2 10.0
14	13 42 0.37	11.120	10 50 34.9	72.19	0.086 8032	966.7	7.00	7.20	2 10.5
15	13 46 27.60	+11.149	−11 19 20.7	−71.62	0.084 4725	− 975.6	7.04	7.24	2 11.0
16	13 50 55.52	11.178	11 47 52.4	71.01	0.082 1204	984.5	7.08	7.28	2 11.5
17	13 55 24.15	11.208	12 16 9.1	70.37	0.079 7468	993.5	7.12	7.32	2 12.1
18	13 59 53.52	11.240	12 44 10.1	69.71	0.077 3514	1002.7	7.15	7.36	2 12.6
19	14 4 23.66	11.272	13 11 54.8	69.01	0.074 9339	1011.9	7.19	7.40	2 13.2
20	14 8 54.59	+11.306	−13 39 22.3	−68.28	0.072 4943	−1021.2	7.24	7.45	2 13.7
21	14 13 26.34	11.340	14 6 31.9	67.52	0.070 0322	1030.6	7.28	7.49	2 14.3
22	14 17 58.92	11.375	14 33 23.0	66.73	0.067 5476	1040.0	7.32	7.53	2 14.9
23	14 22 32.36	11.411	14 59 54.8	65.91	0.065 0403	1049.4	7.37	7.58	2 15.6
24	14 27 6.67	11.448	15 26 6.6	65.06	0.062 5102	1059.0	7.41	7.62	2 16.2
25	14 31 41.87	+11.485	−15 51 57.6	−64.18	0.059 9570	−1068.7	7.45	7.67	2 16.8
26	14 36 17.97	11.523	16 17 27.1	63.27	0.057 3806	1078.4	7.49	7.71	2 17.5
27	14 40 54.99	11.562	16 42 34.4	62.33	0.054 7809	1088.1	7.54	7.76	2 18.2
28	14 45 32.95	11.601	17 7 18.8	61.36	0.052 1579	1097.8	7.58	7.80	2 18.9
29	14 50 11.84	11.640	17 31 39.5	60.36	0.049 5116	1107.5	7.63	7.85	2 19.6
30	14 54 51.69	+11.680	−17 55 35.9	−59.33	0.046 8417	−1117.3	7.68	7.90	2 20.3
31	*14 59 32.50*	*+11.721*	*−18 19 7.3*	−58.28	0.044 1483	−1127.2	7.73	7.95	2 21.0

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.
	Noon.	*Noon.*	*Noon.*	*Noon.*	*Noon.*	*Noon.*	*Noon.*	*Noon.*
	h m s	s	° ′ ″	″			″	″
Oct. 1	14 59 32.50	+11.721	−18 19 7.3	−58.28	0.044 1483	−1127.2	7.73	7.95
2	15 4 14.29	11.761	18 42 13.0	57.19	0.041 4312	1137.1	7.78	8.00
3	15 8 57.05	11.802	19 4 52.2	56.08	0.038 6900	1147.2	7.82	8.05
4	15 13 40.80	11.844	19 27 4.4	54.93	0.035 9247	1157.3	7.87	8.10
5	15 18 25.54	11.885	19 48 48.8	53.76	0.033 1349	1167.5	7.92	8.15
6	15 23 11.26	+11.926	−20 10 4.8	−52.56	0.030 3204	−1177.9	7.98	8.21
7	15 27 57.97	11.967	20 30 51.5	51.33	0.027 4808	1188.4	8.03	8.26
8	15 32 45.66	12.007	20 51 8.5	50.08	0.024 6158	1199.1	8.08	8.31
9	15 37 34.32	12.048	21 10 55.0	48.80	0.021 7251	1209.9	8.14	8.37
10	15 42 23.94	12.087	21 30 10.5	47.49	0.018 8082	1220.9	8.19	8.43
11	15 47 14.51	+12.126	−21 48 54.1	−46.15	0.015 8648	−1232.0	8.24	8.48
12	15 52 5.99	12.164	22 7 5.3	44.79	0.012 8944	1243.3	8.30	8.54
13	15 56 58.37	12.201	22 24 43.5	43.40	0.009 8966	1254.8	8.36	8.60
14	16 1 51.62	12.237	22 41 48.1	41.98	0.006 8710	1266.5	8.42	8.66
15	16 6 45.72	12.271	22 58 18.3	40.54	0.003 8171	1278.4	8.48	8.72
16	16 11 40.62	+12.304	−23 14 13.8	−39.08	0.000 7347	−1290.3	8.53	8.78
17	16 16 36.31	12.336	23 29 33.9	37.59	9.997 6233	1302.5	8.60	8.85
18	16 21 32.72	12.365	23 44 18.0	36.08	9.994 4824	1314.9	8.66	8.91
19	16 26 29.83	12.393	23 58 25.6	34.55	9.991 3116	1327.5	8.73	8.98
20	16 31 27.57	12.418	24 11 56.2	33.00	9.988 1104	1340.2	8.79	9.04
21	16 36 25.90	+12.442	−24 24 49.4	−31.43	9.984 8785	−1353.1	8.85	9.11
22	16 41 24.76	12.463	24 37 4.7	29.84	9.981 6155	1366.1	8.92	9.18
23	16 46 24.09	12.481	24 48 41.7	28.24	9.978 3210	1379.3	8.99	9.25
24	16 51 23.83	12.497	24 59 39.9	26.61	9.974 9948	1392.6	9.06	9.32
25	16 56 23.93	12.511	25 9 59.0	24.97	9.971 6364	1406.1	9.13	9.39
26	17 1 24.33	+12.522	−25 19 38.6	−23.32	9.968 2456	−1419.6	9.20	9.47
27	17 6 24.95	12.530	25 28 38.5	21.66	9.964 8221	1433.3	9.27	9.54
28	17 11 25.73	12.535	25 36 58.3	19.99	9.961 3658	1447.0	9.35	9.62
29	17 16 26.60	12.537	25 44 37.8	18.30	9.957 8763	1460.9	9.43	9.70
30	17 21 27.49	12.537	25 51 36.7	16.61	9.954 3532	1475.0	9.51	9.78
31	17 26 28.34	+12.533	−25 57 54.9	−14.91	9.950 7963	−1489.2	9.58	9.86
Nov. 1	17 31 29.06	12.527	26 3 32.1	13.20	9.947 2051	1503.5	9.66	9.94
2	17 36 29.60	12.517	26 8 28.3	11.48	9.943 5793	1518.0	9.74	10.02
3	17 41 29.87	12.505	26 12 43.3	9.76	9.939 9183	1532.8	9.83	10.11
4	17 46 29.80	12.489	26 16 17.0	8.04	9.936 2217	1547.7	9.90	10.19
5	17 51 29.31	+12.470	−26 19 9.3	− 6.32	9.932 4890	−1562.9	9.99	10.28
6	17 56 28.33	12.448	26 21 20.4	4.60	9.928 7195	1578.4	10.08	10.37
7	18 1 26.78	12.422	26 22 50.2	2.88	9.924 9127	1594.0	10.17	10.46
8	18 6 24.58	12.393	26 23 38.7	− 1.16	9.921 0680	1609.9	10.25	10.55
9	18 11 21.63	12.361	26 23 46.1	+ 0.55	9.917 1847	1626.2	10.35	10.65
10	18 16 17.86	+12.325	−26 23 12.5	+ 2.25	9.913 2622	−1642.7	10.45	10.75
11	18 21 13.18	12.285	26 21 58.1	3.95	9.909 2997	1659.5	10.54	10.84
12	18 26 7.50	12.241	26 20 3.0	5.64	9.905 2965	1676.6	10.63	10.94
13	18 31 0.74	12.195	26 17 27.5	7.32	9.901 2520	1693.9	10.74	11.05
14	18 35 52.81	12.144	26 14 11.9	8.98	9.897 1655	1711.5	10.84	11.15
15	18 40 43.61	+12.089	−26 10 16.4	+10.63	9.893 0363	−1729.6	10.94	11.26
16	18 45 33.07	+12.031	−26 5 41.6	+12.27	9.888 8634	−1747.9	11.05	11.37

GREENWICH MEAN TIME.

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
18 45 33.07	+12.031	−26 5 41.6	+12.27	9.888 8634	−1747.9	11.05	11.37	3 5.7
18 50 21.07	11.969	26 0 27.6	13.89	9.884 6463	1766.5	11.16	11.48	3 6.6
18 55 7.54	11.903	25 54 35.0	15.49	9.880 3841	1785.4	11.27	11.59	3 7.4
18 59 52.39	11.833	25 48 4.3	17.07	9.876 0762	1804.6	11.38	11.71	3 8.2
19 4 35.51	11.760	25 40 55.9	18.63	9.871 7219	1824.0	11.49	11.82	3 9.0
19 9 16.82	+11.682	−25 33 10.4	+20.16	9.867 3207	−1843.7	11.61	11.94	3 9.7
19 13 56.23	11.601	25 24 48.3	21.67	9.862 8718	1863.7	11.73	12.07	3 10.4
19 18 33.64	11.516	25 15 50.3	23.16	9.858 3748	1883.8	11.85	12.19	3 11.1
19 23 8.97	11.428	25 6 16.9	24.62	9.853 8292	1904.2	11.98	12.32	3 11.7
19 27 42.14	11.336	24 56 8.8	26.05	9.849 2344	1924.8	12.10	12.45	3 12.3
19 32 13.06	+11.240	−24 45 26.6	+27.46	9.844 5900	−1945.6	12.24	12.59	3 12.9
19 36 41.64	11.141	24 34 11.0	28.84	9.839 8955	1966.5	12.36	12.72	3 13.4
19 41 7.82	11.040	24 22 22.7	30.18	9.835 1504	1987.7	12.50	12.86	3 13.9
19 45 31.52	10.935	24 10 2.5	31.50	9.830 3542	2009.1	12.65	13.01	3 14.4
19 49 52.65	10.826	23 57 11.0	32.79	9.825 5064	2030.7	12.78	13.15	3 14.8
19 54 11.15	+10.715	−23 43 49.1	+34.04	9.820 6064	−2052.6	12.93	13.30	3 15.1
19 58 26.94	10.601	23 29 57.5	35.26	9.815 6536	2074.7	13.07	13.45	3 15.4
20 2 39.95	10.483	23 15 37.0	36.44	9.810 6474	2097.1	13.23	13.61	3 15.7
20 6 50.11	10.363	23 0 48.5	37.60	9.805 5871	2119.8	13.38	13.77	3 16.0
20 10 57.34	10.239	22 45 32.7	38.71	9.800 4721	2142.8	13.54	13.93	3 16.1
20 15 1.57	+10.113	−22 29 50.7	+39.79	9.795 3015	−2166.1	13.71	14.10	3 16.2
20 19 2.72	9.983	22 13 43.2	40.83	9.790 0748	2189.6	13.87	14.27	3 16.3
20 23 0.72	9.850	21 57 11.1	41.84	9.784 7912	2213.4	14.04	14.44	3 16.3
20 26 55.50	9.714	21 40 15.4	42.80	9.779 4500	2237.6	14.21	14.62	3 16.3
20 30 46.96	9.574	21 22 57.0	43.73	9.774 0504	2262.1	14.40	14.81	3 16.2
20 34 35.03	+ 9.431	−21 5 16.9	+44.61	9.768 5918	−2286.8	14.57	14.99	3 16.0
20 38 19.63	9.285	20 47 16.1	45.45	9.763 0735	2311.8	14.75	15.18	3 15.8
20 42 0.68	9.135	20 28 55.6	46.25	9.757 4948	2337.2	14.95	15.38	3 15.6
20 45 38.08	8.981	20 10 16.5	47.00	9.751 8549	2362.8	15.14	15.58	3 15.3
20 49 11.73	8.823	19 51 19.8	47.71	9.746 1534	2388.6	15.35	15.79	3 14.9
20 52 41.55	+ 8.661	−19 32 6.6	+48.37	9.740 3896	−2414.6	15.55	16.00	3 14.4
20 56 7.42	8.495	19 12 38.2	48.99	9.734 5632	2440.8	15.77	16.22	3 13.9
20 59 29.25	8.324	18 52 55.6	49.55	9.728 6738	2467.0	15.98	16.44	3 13.3
21 2 46.91	8.148	18 33 0.0	50.07	9.722 7214	2493.3	16.19	16.66	3 12.6
21 6 0.30	7.967	18 12 52.7	50.53	9.716 7059	2519.6	16.43	16.90	3 11.9
21 9 9.29	+ 7.781	−17 52 34.8	+50.95	9.710 6274	−2545.7	16.65	17.13	3 11.1
21 12 13.76	7.591	17 32 7.6	51.31	9.704 4865	2571.7	16.89	17.38	3 10.2
21 15 13.60	7.395	17 11 32.3	51.62	9.698 2835	2597.4	17.14	17.63	3 9.3
21 18 8.67	7.193	16 50 50.2	51.88	9.692 0193	2622.7	17.38	17.88	3 8.2
21 20 58.83	6.986	16 30 2.7	52.08	9.685 6947	2647.7	17.64	18.15	3 7.1
21 23 43.97	+ 6.774	−16 9 10.9	+52.23	9.679 3109	−2672.1	17.90	18.42	3 5.9
21 26 23.93	6.555	15 48 16.2	52.32	9.672 8692	2695.9	18.17	18.69	3 4.6
21 28 58.58	6.331	15 27 20.0	52.36	9.666 3713	2719.0	18.44	18.97	3 3.3
21 31 27.77	6.100	15 6 23.6	52.34	9.659 8186	2741.4	18.72	19.26	3 1.8
21 33 51.35	5.864	14 45 28.3	52.26	9.653 2132	2762.9	19.01	19.56	3 0.2
21 36 9.17	+ 5.620	−14 24 35.7	+52.12	9.646 5573	−2783.5	19.30	19.86	2 58.6
21 38 21.07	*+ 5.370*	*−14 3 47.1*	+51.92	9.639 8535	−2802.8	19.61	20.17	2 56.8

FOR GREENWICH MEAN NOON.

Date.		Heliocentric Longitude, Mean Equinox of Date.	Var. per Day.	Reduction to Orbit.	Heliocentric Latitude.	Var. per Day.	L Ra
		° ′ ″	° ′ ″	′ ″	° ′ ″	′ ″	
n.	1	213 3 29.8	1 36 18.1	−3 0.5	+2 18 38.2	−4 10.7	9
	3	216 16 0.5	1 36 12.6	2 57.9	2 10 4.2	4 23.1	9
	5	219 28 20.1	1 36 7.0	2 53.1	2 1 6.2	4 34.7	9
	7	222 40 28.7	1 36 1.6	2 46.1	1 51 45.9	4 45.4	9
	9	225 52 26.6	1 35 56.2	2 37.0	1 42 5.2	4 55.2	9
	11	229 4 13.7	1 35 50.9	−2 26.0	+1 32 5.8	−5 4.0	9
	13	232 15 50.4	1 35 45.8	2 13.2	1 21 49.8	5 11.9	9
	15	235 27 16.9	1 35 40.7	1 58.7	1 11 18.9	5 18.8	9
	17	238 38 33.3	1 35 35.8	1 42.8	1 0 35.3	5 24.7	9
	19	241 49 40.2	1 35 31.1	1 25.6	0 49 40.9	5 29.6	9
	21	245 0 38.0	1 35 26.6	−1 7.4	+0 38 37.7	−5 33.4	9
	23	248 11 26.9	1 35 22.4	0 48.4	0 27 27.9	5 36.2	9
	25	251 22 7.6	1 35 18.3	0 28.8	0 16 13.5	5 38.0	9
	27	254 32 40.4	1 35 14.5	−0 8.8	+0 4 56.5	5 38.8	9
	29	257 43 5.8	1 35 11.0	+0 11.3	−0 6 20.9	5 38.5	9
	31	260 53 24.5	1 35 7.8	+0 31.2	−0 17 36.8	−5 37.2	9
eb.	2	264 3 37.0	1 35 4.8	0 50.7	0 28 49.1	5 34.9	9
	4	267 13 43.7	1 35 2.1	1 9.6	0 39 55.7	5 31.5	9
	6	270 23 45.4	1 34 59.7	1 27.6	0 50 54.6	5 27.2	9
	8	273 33 42.5	1 34 57.5	1 44.6	1 1 43.8	5 21.9	9
	10	276 43 35.7	1 34 55.7	+2 0.2	−1 12 21.5	−5 15.6	9
	12	279 53 25.6	1 34 54.2	2 14.4	1 22 45.7	5 8.4	9
	14	283 3 12.6	1 34 52.9	2 27.0	1 32 54.6	5 0.3	9
	16	286 12 57.4	1 34 52.0	2 37.7	1 42 46.2	4 51.2	9
	18	289 22 40.6	1 34 51.3	2 46.6	1 52 18.9	4 41.3	9
	20	292 32 22.6	1 34 50.8	+2 53.4	−2 1 30.9	−4 30.6	9
	22	295 42 4.1	1 34 50.7	2 58.1	2 10 20.7	4 19.0	9
	24	298 51 45.5	1 34 50.8	3 0.6	2 18 46.5	4 6.7	9
	26	302 1 27.4	1 34 51.1	3 0.9	2 26 47.0	3 53.6	9
	28	305 11 10.1	1 34 51.7	2 59.0	2 34 20.6	3 39.9	9
ar.	2	308 20 54.2	1 34 52.5	+2 55.0	−2 41 26.0	−3 25.5	9
	4	311 30 40.1	1 34 53.4	2 48.8	2 48 2.0	3 10.4	9
	6	314 40 28.1	1 34 54.6	2 40.5	2 54 7.3	2 54.8	9
	8	317 50 18.7	1 34 56.0	2 30.3	2 59 40.8	2 38.7	9
	10	321 0 12.3	1 34 57.5	2 18.3	3 4 41.6	2 22.0	9
	12	324 10 9.0	1 34 59.2	+2 4.6	−3 9 8.6	−2 4.9	9
	14	327 20 9.3	1 35 1.1	1 49.4	3 13 1.1	1 47.5	9
	16	330 30 13.4	1 35 3.1	1 32.8	3 16 18.3	1 29.7	9
	18	333 40 21.6	1 35 5.2	1 15.1	3 18 59.7	1 11.6	9
	20	336 50 34.1	1 35 7.4	0 56.4	3 21 4.6	0 53.3	9
	22	340 0 51.1	1 35 9.6	+0 37.1	−3 22 32.8	−0 34.8	9
	24	343 11 12.7	1 35 12.0	+0 17.3	3 23 23.8	−0 16.2	9
	26	346 21 39.2	1 35 14.5	−0 2.7	3 23 37.5	+0 2.5	9
	28	349 32 10.8	1 35 17.1	0 22.7	3 23 13.8	0 21.2	9
	30	352 42 47.5	1 35 19.7	0 42.4	3 22 12.7	0 39.9	9
pr.	1	355 53 29.5	1 35 22.4	−1 1.6	−3 20 34.3	+0 58.5	9
	3	359 4 17.0	1 35 25.1	−1 20.1	−3 18 18.9	+1 16.9	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.
	° ′ ″	° ′ ″	′ ″	° ′ ″	′ ″		
1	355 53 29.5	1 35 22.4	−1 1.6	−3 20 34.3	+0 58.5	9.861 4090	−584
3	359 4 17.0	1 35 25.1	1 20.1	3 18 18.9	1 16.9	9.861 2889	616
5	2 15 9.9	1 35 27.9	1 37.6	3 15 26.9	1 35.1	9.861 1627	646
7	5 26 8.5	1 35 30.7	1 53.8	3 11 58.6	1 53.1	9.861 0307	674
9	8 37 12.7	1 35 33.5	2 8.7	3 7 54.6	2 10.8	9.860 8934	699
11	11 48 22.7	1 35 36.5	−2 22.1	−3 3 15.8	+2 28.0	9.860 7513	−722
13	14 59 38.6	1 35 39.4	2 33.7	2 58 2.9	2 44.9	9.860 6046	744
15	18 11 0.5	1 35 42.5	2 43.3	2 52 16.7	3 1.2	9.860 4540	763
17	21 22 28.5	1 35 45.5	2 51.0	2 45 58.3	3 17.1	9.860 2997	779
19	24 34 2.5	1 35 48.6	2 56.5	2 39 8.7	3 32.4	9.860 1424	794
21	27 45 42.8	1 35 51.7	−2 59.9	−2 31 49.2	+3 47.0	9.859 9824	−806
23	30 57 29.4	1 35 54.9	3 1.0	2 24 1.0	4 1.0	9.859 8203	815
25	34 9 22.4	1 35 58.1	2 59.9	2 15 45.7	4 14.2	9.859 6566	822
27	37 21 21.8	1 36 1.3	2 56.5	2 7 4.6	4 26.7	9.859 4918	826
29	40 33 27.8	1 36 4.7	2 51.0	1 57 59.4	4 38.4	9.859 3265	827
1	43 45 40.5	1 36 8.0	−2 43.3	−1 48 31.6	+4 49.3	9.859 1611	−826
3	46 57 59.9	1 36 11.4	2 33.5	1 38 43.0	4 59.2	9.858 9961	823
5	50 10 26.1	1 36 14.8	2 21.8	1 28 35.5	5 8.2	9.858 8320	817
7	53 22 59.1	1 36 18.3	2 8.3	1 18 10.8	5 16.3	9.858 6694	808
9	56 35 39.2	1 36 21.8	1 53.2	1 7 31.0	5 23.4	9.858 5089	797
11	59 48 26.4	1 36 25.4	−1 36.7	−0 56 37.9	+5 29.5	9.858 3508	−783
13	63 1 20.7	1 36 28.9	1 18.9	0 45 33.7	5 34.6	9.858 1957	767
15	66 14 22.2	1 36 32.5	1 0.1	0 34 20.4	5 38.6	9.858 0441	748
17	69 27 30.8	1 36 36.1	0 40.6	0 23 0.1	5 41.5	9.857 8965	727
19	72 40 46.8	1 36 39.8	0 20.5	0 11 35.0	5 43.4	9.857 7534	704
21	75 54 10.0	1 36 43.4	−0 0.2	−0 0 7.3	+5 44.1	9.857 6152	−678
23	79 7 40.5	1 36 47.0	+0 20.2	+0 11 20.8	5 43.8	9.857 4824	650
25	82 21 18.1	1 36 50.6	0 40.3	0 22 47.3	5 42.4	9.857 3553	620
27	85 35 2.9	1 36 54.2	0 59.9	0 34 9.8	5 39.9	9.857 2344	588
29	88 48 54.8	1 36 57.7	1 18.7	0 45 26.1	5 36.3	9.857 1202	554
31	92 2 53.6	1 37 1.1	+1 36.6	+0 56 34.1	+5 31.5	9.857 0129	−519
2	95 16 59.1	1 37 4.4	1 53.3	1 7 31.5	5 25.7	9.856 9128	481
4	98 31 11.3	1 37 7.7	2 8.5	1 18 16.4	5 18.9	9.856 8205	442
6	101 45 29.8	1 37 10.8	2 22.0	1 28 46.6	5 11.0	9.856 7360	402
8	104 59 54.5	1 37 13.8	2 33.8	1 39 0.0	5 2.1	9.856 6599	360
10	108 14 25.0	1 37 16.7	+2 43.6	+1 48 54.5	+4 52.3	9.856 5922	−317
12	111 29 1.0	1 37 19.3	2 51.3	1 58 28.4	4 41.4	9.856 5332	273
14	114 43 42.1	1 37 21.8	2 56.8	2 7 39.6	4 29.6	9.856 4831	228
16	117 58 28.0	1 37 24.0	3 0.1	2 16 26.4	4 17.0	9.856 4420	183
18	121 13 18.1	1 37 26.0	3 1.0	2 24 47.0	4 3.5	9.856 4101	136
20	124 28 12.0	1 37 27.8	+2 59.6	+2 32 39.8	+3 49.2	9.856 3875	− 90
22	127 43 9.2	1 37 29.3	2 55.9	2 40 3.2	3 34.1	9.856 3743	− 42
24	130 58 9.1	1 37 30.6	2 50.0	2 46 55.9	3 18.4	9.856 3706	+ 5
26	134 13 11.2	1 37 31.5	2 41.9	2 53 16.3	3 2.0	9.856 3762	52
28	137 28 14.7	1 37 32.1	2 31.6	2 59 3.4	2 45.0	9.856 3912	99
30	140 43 19.2	1 37 32.3	+2 19.5	+3 4 15.9	+2 27.4	9.856 4156	+145
2	143 58 23.8	1 37 32.2	+2 5.5	+3 8 52.8	+2 9.4	9.856 4493	+192

FOR GREENWICH MEAN NOON.

Date.	Heliocentric Longitude, Mean Equinox of Date.	Var. per Day.	Reduction to Orbit.	Heliocentric Latitude.	Var. per Day.	I R
	° ′ ″	° ′ ″	′ ″	° ′ ″	′ ″	
ıly 2	143 58 23.8	1 37 32.2	+2 5.5	+3 8 52.8	+2 9.4	♀
4	147 13 28.0	1 37 31.9	1 49.9	3 12 53.3	1 51.0	♀
6	150 28 31.1	1 37 31.1	1 33.0	3 16 16.6	1 32.2	♀
8	153 43 32.3	1 37 30.0	1 14.8	3 19 2.0	1 13.1	♀
10	156 58 31.0	1 37 28.6	0 55.7	3 21 9.0	0 53.8	♀
12	160 13 26.5	1 37 26.8	+0 35.8	+3 22 37.3	+0 34.4	♀
14	163 28 18.0	1 37 24.7	+0 15.6	3 23 26.6	+0 14.9	♀
16	166 43 4.9	1 37 22.2	−0 4.9	3 23 36.8	−0 4.7	♀
18	169 57 46.4	1 37 19.3	0 25.3	3 23 7.9	0 24.2	♀
20	173 12 22.0	1 37 16.2	0 45.4	3 22 0.0	0 43.6	♀
22	176 26 51.0	1 37 12.8	−1 4.9	+3 20 13.4	−1 2.9	♀
24	179 41 12.8	1 37 9.0	1 23.5	3 17 48.6	1 21.9	♀
26	182 55 26.8	1 37 5.0	1 41.1	3 14 46.1	1 40.6	♀
28	186 9 32.5	1 37 0.7	1 57.4	3 11 6.5	1 59.0	♀
30	189 23 29.4	1 36 56.2	2 12.1	3 6 50.6	2 16.9	♀
ug. 1	192 37 17.0	1 36 51.4	−2 25.2	+3 1 59.4	−2 34.3	♀
3	195 50 55.0	1 36 46.5	2 36.4	2 56 33.8	2 51.2	♀
5	199 4 22.9	1 36 41.4	2 45.7	2 50 34.9	3 7.6	♀
7	202 17 40.5	1 36 36.2	2 52.8	2 44 3.9	3 23.3	♀
9	205 30 47.6	1 36 30.9	2 57.8	2 37 2.2	3 38.3	♀
11	208 43 43.9	1 36 25.5	−3 0.5	+2 29 31.1	−3 52.7	♀
13	211 56 29.4	1 36 20.0	3 0.9	2 21 32.1	4 6.2	♀
15	215 9 3.8	1 36 14.5	2 59.1	2 13 6.9	4 18.9	♀
17	218 21 27.3	1 36 9.0	2 55.0	2 4 17.1	4 30.8	♀
19	221 33 39.9	1 36 3.5	2 48.8	1 55 4.4	4 41.8	♀
21	224 45 41.5	1 35 58.1	−2 40.4	+1 45 30.7	−4 51.9	♀
23	227 57 32.4	1 35 52.8	2 30.1	1 35 37.6	5 1.0	♀
25	231 9 12.7	1 35 47.6	2 17.9	1 25 27.2	5 9.2	♀
27	234 20 42.8	1 35 42.5	2 4.0	1 15 1.3	5 16.5	♀
29	237 32 2.8	1 35 37.5	1 48.5	1 4 21.9	5 22.7	♀
31	240 43 13.1	1 35 32.8	−1 31.8	+0 53 31.1	−5 27.9	♀
·pt. 2	243 54 14.1	1 35 28.2	1 13.9	0 42 30.8	5 32.2	♀
4	247 5 6.2	1 35 23.9	0 55.1	0 31 23.1	5 35.4	♀
6	250 15 49.9	1 35 19.8	0 35.7	0 20 10.0	5 37.6	♀
8	253 26 25.5	1 35 15.9	−0 15.8	+0 8 53.6	5 38.6	♀
10	256 36 53.7	1 35 12.3	+0 4.3	−0 2 23.9	−5 38.7	♀
12	259 47 15.0	1 35 9.0	0 24.3	0 13 40.6	5 37.8	♀
14	262 57 29.7	1 35 5.9	0 44.0	0 24 54.4	5 35.8	♀
16	266 7 38.7	1 35 3.1	1 3.1	0 36 3.2	5 32.8	♀
18	269 17 42.2	1 35 0.6	1 21.4	0 47 5.1	5 28.9	♀
20	272 27 41.1	1 34 58.4	+1 38.8	−0 57 58.0	−5 23.9	♀
22	275 37 35.8	1 34 56.4	1 54.9	1 8 39.9	5 17.9	♀
24	278 47 27.0	1 34 54.8	2 9.6	1 19 9.1	5 11.0	♀
26	281 57 15.2	1 34 53.5	2 22.8	1 29 23.5	5 3.2	♀
28	285 7 1.1	1 34 52.4	2 34.2	1 39 21.4	4 54.5	♀
30	**288 16 45.0**	1 34 51.6	+2 43.7	−1 49 1.0	−4 44.9	♀
2	**291 26 27.6**	1 34 51.1	+2 51.2	−1 58 20.4	−4 34.4	♀

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.
	° ′ ″	° ′ ″	′ ″	° ′ ″	′ ″		
2	291 26 27.6	1 34 51.1	+2 51.2	−1 58 20.4	−4 34.4	9.862 1155	+271
4	294 36 9.6	1 34 50.8	2 56.6	2 7 18.2	4 23.2	9.862 1654	228
6	297 45 51.2	1 34 50.8	2 59.9	2 15 52.6	4 11.1	9.862 2066	184
8	300 55 33.1	1 34 51.1	3 1.0	2 24 2.1	3 58.3	9.862 2389	139
10	304 5 15.8	1 34 51.6	2 59.9	2 31 45.2	3 44.8	9.862 2622	94
12	307 14 59.6	1 34 52.3	+2 56.6	−2 39 0.6	−3 30.6	9.862 2766	+ 49
14	310 24 45.2	1 34 53.3	2 51.2	2 45 47.0	3 15.7	9.862 2819	+ 4
16	313 34 32.8	1 34 54.3	2 43.6	2 52 3.2	3 0.3	9.862 2781	− 41
18	316 44 22.7	1 34 55.6	2 34.1	2 57 48.0	2 44.4	9.862 2653	87
20	319 54 15.5	1 34 57.1	2 22.7	3 3 0.3	2 27.9	9.862 2434	132
22	323 4 11.3	1 34 58.8	+2 9.6	−3 7 39.2	−2 11.0	9.862 2126	−176
24	326 14 10.6	1 35 0.6	1 54.8	3 11 43.9	1 53.6	9.862 1730	220
26	329 24 13.6	1 35 2.5	1 38.7	3 15 13.5	1 35.9	9.862 1245	264
28	332 34 20.6	1 35 4.5	1 21.4	3 18 7.5	1 18.0	9.862 0675	306
30	335 44 31.8	1 35 6.7	1 3.0	3 20 25.2	0 59.7	9.862 0020	348
1	338 54 47.4	1 35 8.9	+0 43.9	−3 22 6.3	−0 41.3	9.861 9283	−389
3	342 5 7.6	1 35 11.3	0 24.3	3 23 10.3	0 22.7	9.861 8466	428
5	345 15 32.6	1 35 13.8	+0 4.3	3 23 37.1	−0 4.0	9.861 7571	467
7	348 26 2.7	1 35 16.3	−0 15.7	3 23 26.4	+0 14.7	9.861 6600	504
9	351 36 37.8	1 35 18.9	0 35.6	3 22 38.4	0 33.4	9.861 5557	539
11	354 47 18.2	1 35 21.5	−0 55.0	−3 21 13.0	+0 52.0	9.861 4444	−573
13	357 58 4.0	1 35 24.2	1 13.7	3 19 10.5	1 10.5	9.861 3266	605
15	1 8 55.2	1 35 27.0	1 31.6	3 16 31.2	1 28.8	9.861 2025	635
17	4 19 51.9	1 35 29.8	1 48.3	3 13 15.5	1 46.9	9.861 0726	663
19	7 30 54.3	1 35 32.7	2 3.7	3 9 23.9	2 4.6	9.860 9373	690
21	10 42 2.6	1 35 35.6	−2 17.6	−3 4 57.2	+2 22.0	9.860 7968	−714
23	13 53 16.6	1 35 38.5	2 29.8	2 59 56.1	2 39.0	9.860 6517	736
25	17 4 36.6	1 35 41.5	2 40.2	2 54 21.4	2 55.6	9.860 5025	756
27	20 16 2.6	1 35 44.5	2 48.6	2 48 14.1	3 11.7	9.860 3495	774
29	23 27 34.7	1 35 47.6	2 54.9	2 41 35.2	3 27.1	9.860 1932	789
1	26 39 13.0	1 35 50.7	−2 59.0	−2 34 26.0	+3 42.0	9.860 0342	−801
3	29 50 57.6	1 35 53.9	3 0.9	2 26 47.7	3 56.2	9.859 8729	812
5	33 2 48.5	1 35 57.1	3 0.6	2 18 41.7	4 9.7	9.859 7097	820
7	36 14 45.9	1 36 0.3	2 58.0	2 10 9.4	4 22.5	9.859 5453	824
9	39 26 49.8	1 36 3.6	2 53.2	2 1 12.4	4 34.4	9.859 3802	827
11	42 39 0.3	1 36 6.9	−2 46.2	−1 51 52.2	+4 45.6	9.859 2148	−827
13	45 51 17.5	1 36 10.3	2 37.1	1 42 10.7	4 55.8	9.859 0496	824
15	49 3 41.6	1 36 13.7	2 26.1	1 32 9.5	5 5.2	9.858 8852	819
17	52 16 12.4	1 36 17.2	2 13.2	1 21 50.6	5 13.6	9.858 7221	811
19	55 28 50.3	1 36 20.7	1 58.7	1 11 15.9	5 21.0	9.858 5608	801
21	58 41 35.2	1 36 24.2	−1 42.6	−1 0 27.2	+5 27.5	9.858 4019	−788
23	61 54 27.3	1 36 27.8	1 25.3	0 49 26.6	5 32.9	9.858 2458	773
25	65 7 26.4	1 36 31.4	1 6.8	0 38 16.2	5 37.3	9.858 0930	755
27	68 20 32.8	1 36 35.0	0 47.5	0 26 58.1	5 40.6	9.857 9441	734
29	71 33 46.5	1 36 38.7	0 27.6	0 15 34.4	5 42.9	9.857 7995	712
31	74 47 7.4	1 36 42.3	−0 7.3	−0 4 7.4	+5 44.0	9.857 6596	−687
33	78 0 35.5	1 36 45.9	+0 13.1	+0 7 20.9	+5 44.0	9.857 5250	−660

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.
	Noon.	*Noon.*	*Noon.*	*Noon.*	*Noon.*	*Noon.*	*Noon.*	*Noon.*
	h m s	s	° ′ ″	″			″	″
Jan. 1	19 43 7.78	+8.316	−22 25 0.4	+19.91	0.368 8986	+68.1	2.16	3.76
2	19 46 27.23	8.305	22 16 55.0	20.54	0.369 0607	67.0	2.16	3.76
3	19 49 46.41	8.293	22 8 34.4	21.17	0.369 2203	66.0	2.16	3.76
4	19 53 5.31	8.282	21 59 58.7	21.80	0.369 3776	65.0	2.16	3.76
5	19 56 23.93	8.270	21 51 8.0	22.42	0.369 5325	64.1	2.16	3.76
6	19 59 42.26	+8.257	−21 42 2.5	+23.04	0.369 6851	+63.1	2.16	3.76
7	20 3 0.28	8.244	21 32 42.3	23.65	0.369 8356	62.2	2.15	3.75
8	20 6 17.98	8.231	21 23 7.5	24.25	0.369 9839	61.4	2.15	3.75
9	20 9 35.36	8.218	21 13 18.2	24.85	0.370 1303	60.6	2.15	3.75
10	20 12 52.42	8.204	21 3 14.6	25.45	0.370 2746	59.7	2.15	3.75
11	20 16 9.13	+8.189	−20 52 56.8	+26.04	0.370 4169	+58.9	2.15	3.75
12	20 19 25.50	8.175	20 42 24.8	26.62	0.370 5573	58.1	2.15	3.75
13	20 22 41.51	8.160	20 31 39.0	27.19	0.370 6958	57.3	2.15	3.75
14	20 25 57.17	8.145	20 20 39.4	27.77	0.370 8323	56.5	2.15	3.75
15	20 29 12.46	8.129	20 9 26.3	28.33	0.370 9668	55.7	2.15	3.75
16	20 32 27.38	+8.114	−19 57 59.6	+28.89	0.371 0995	+54.9	2.15	3.74
17	20 35 41.91	8.098	19 46 19.7	29.44	0.371 2302	54.0	2.15	3.74
18	20 38 56.06	8.082	19 34 26.6	29.98	0.371 3589	53.2	2.15	3.74
19	20 42 9.82	8.065	19 22 20.6	30.52	0.371 4857	52.4	2.15	3.74
20	20 45 23.18	8.048	19 10 1.8	31.05	0.371 6105	51.6	2.15	3.74
21	20 48 36.14	+8.032	−18 57 30.3	+31.57	0.371 7334	+50.8	2.15	3.74
22	20 51 48.70	8.015	18 44 46.4	32.08	0.371 8541	49.9	2.15	3.74
23	20 55 0.84	7.997	18 31 50.3	32.59	0.371 9728	49.0	2.15	3.74
24	20 58 12.55	7.979	18 18 42.2	33.09	0.372 0894	48.2	2.15	3.74
25	21 1 23.84	7.961	18 5 22.2	33.58	0.372 2041	47.3	2.14	3.73
26	21 4 34.70	+7.943	−17 51 50.6	+34.06	0.372 3166	+46.5	2.14	3.73
27	21 7 45.11	7.925	17 38 7.5	34.53	0.372 4274	45.8	2.14	3.73
28	21 10 55.09	7.907	17 24 13.3	34.99	0.372 5363	45.0	2.14	3.73
29	21 14 4.62	7.888	17 10 8.0	35.45	0.372 6436	44.3	2.14	3.73
30	21 17 13.71	7.869	16 55 51.8	35.90	0.372 7492	43.7	2.14	3.73
31	21 20 22.35	+7.851	−16 41 25.0	+36.34	0.372 8534	+43.1	2.14	3.73
Feb. 1	21 23 30.54	7.832	16 26 47.8	36.77	0.372 9561	42.5	2.14	3.73
2	21 26 38.29	7.814	16 12 0.3	37.19	0.373 0574	41.9	2.14	3.73
3	21 29 45.59	7.795	15 57 2.8	37.60	0.373 1572	41.3	2.14	3.73
4	21 32 52.45	7.777	15 41 55.4	38.01	0.373 2557	40.8	2.14	3.73
5	21 35 58.87	+7.758	−15 26 38.3	+38.41	0.373 3529	+40.3	2.14	3.72
6	21 39 4.84	7.740	15 11 11.8	38.80	0.373 4490	39.8	2.14	3.72
7	21 42 10.38	7.722	14 55 36.0	39.18	0.373 5439	39.3	2.14	3.72
8	21 45 15.49	7.704	14 39 51.1	39.55	0.373 6377	38.8	2.14	3.72
9	21 48 20.16	7.686	14 23 57.3	39.92	0.373 7303	38.4	2.14	3.72
10	21 51 24.40	+7.668	−14 7 54.9	+40.28	0.373 8218	+37.9	2.14	3.72
11	21 54 28.22	7.650	13 51 44.0	40.63	0.373 9121	37.4	2.14	3.72
12	21 57 31.62	7.633	13 35 24.8	40.97	0.374 0013	36.9	2.14	3.72
13	22 0 34.60	7.616	13 18 57.5	41.30	0.374 0894	36.4	2.14	3.72
14	22 3 37.18	7.599	13 2 22.4	41.62	0.374 1762	35.9	2.14	3.72
15	22 6 39.35	+7.582	−12 45 39.6	+41.94	0.374 2618	+35.4	2.14	3.72
16	22 9 41.12	+7.565	−12 28 49.3	+42.25	0.374 3462	+34.9	2.14	3.72

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	22 9 41.12	+7.565	−12 28 49.3	+42.25	0.374 3462	+34.9	2.14	3.72	0 26.1
17	22 12 42.49	7.549	12 11 51.7	42.55	0.374 4292	34.3	2.14	3.72	0 25.1
18	22 15 43.46	7.533	11 54 47.1	42.84	0.374 5107	33.7	2.13	3.71	0 24.2
19	22 18 44.05	7.516	11 37 35.7	43.11	0.374 5908	33.0	2.13	3.71	0 23.3
20	22 21 44.24	7.500	11 20 17.8	43.38	0.374 6693	32.4	2.13	3.71	0 22.3
21	22 24 44.05	+7.484	−11 2 53.5	+43.64	0.374 7463	+31.7	2.13	3.71	0 21.4
22	22 27 43.48	7.468	10 45 23.1	43.89	0.374 8217	31.1	2.13	3.71	0 20.4
23	22 30 42.53	7.453	10 27 46.8	44.13	0.374 8956	30.5	2.13	3.71	0 19.5
24	22 33 41.21	7.437	10 10 4.7	44.37	0.374 9680	29.9	2.13	3.71	0 18.5
25	22 36 39.52	7.422	9 52 17.2	44.59	0.375 0389	29.2	2.13	3.71	0 17.6
26	22 39 37.46	+7.407	− 9 34 24.4	+44.80	0.375 1083	+28.6	2.13	3.71	0 16.6
27	22 42 35.04	7.392	9 16 26.6	45.00	0.375 1764	28.1	2.13	3.71	0 15.6
28	22 45 32.27	7.377	8 58 24.0	45.20	0.375 2431	27.5	2.13	3.71	0 14.6
Mar. 1	22 48 29.15	7.363	8 40 16.8	45.39	0.375 3086	27.0	2.13	3.71	0 13.6
2	22 51 25.69	7.349	8 22 5.1	45.58	0.375 3728	26.5	2.13	3.71	0 12.6
3	22 54 21.90	+7.335	− 8 3 49.2	+45.75	0.375 4359	+26.0	2.13	3.71	0 11.6
4	22 57 17.78	7.322	7 45 29.3	45.91	0.375 4978	25.6	2.13	3.71	0 10.6
5	23 0 13.35	7.309	7 27 5.6	46.06	0.375 5586	25.1	2.13	3.71	0 9.6
6	23 3 8.60	7.296	7 8 38.3	46.21	0.375 6182	24.6	2.12	3.70	0 8.6
7	23 6 3.55	7.284	6 50 7.6	46.35	0.375 6768	24.2	2.12	3.70	0 7.5
8	23 8 58.21	+7.272	− 6 31 33.7	+46.48	0.375 7343	+23.7	2.12	3.70	0 6.5
9	23 11 52.59	7.260	6 12 56.7	46.60	0.375 7906	23.2	2.12	3.70	0 5.5
10	23 14 46.69	7.249	5 54 16.9	46.71	0.375 8458	22.8	2.12	3.70	0 4.4
11	23 17 40.53	7.238	5 35 34.4	46.82	0.375 8999	22.3	2.12	3.70	0 3.4
12	23 20 34.11	7.227	5 16 49.5	46.92	0.375 9528	21.8	2.12	3.70	0 2.3
13	23 23 27.44	+7.217	− 4 58 2.3	+47.01	0.376 0046	+21.3	2.12	3.70	0 1.3
14	23 26 20.53	7.207	4 39 13.1	47.09	0.376 0550	20.7	2.12	3.70	0 0.2 23 59.1
15	23 29 13.39	7.198	4 20 22.0	47.17	0.376 1041	20.1	2.12	3.70	23 58.1
16	23 32 6.04	7.189	4 1 29.2	47.23	0.376 1517	19.5	2.12	3.70	23 57.0
17	23 34 58.47	7.180	3 42 35.0	47.29	0.376 1979	18.9	2.12	3.70	23 55.9
18	23 37 50.69	+7.172	− 3 23 39.5	+47.34	0.376 2426	+18.3	2.12	3.70	23 54.9
19	23 40 42.72	7.164	3 4 42.9	47.37	0.376 2857	17.6	2.12	3.70	23 53.8
20	23 43 34.56	7.156	2 45 45.4	47.40	0.376 3270	16.8	2.12	3.70	23 52.7
21	23 46 26.21	7.149	2 26 47.3	47.43	0.376 3665	16.1	2.12	3.70	23 51.6
22	23 49 17.69	7.141	2 7 48.7	47.44	0.376 4042	15.3	2.12	3.70	23 50.6
23	23 52 8.99	+7.134	− 1 48 49.9	+47.45	0.376 4399	+14.5	2.12	3.70	23 49.5
24	23 55 0.13	7.128	1 29 51.0	47.45	0.376 4736	13.6	2.12	3.70	23 48.3
25	23 57 51.11	7.121	1 10 52.4	47.44	0.376 5053	12.8	2.12	3.70	23 47.2
26	0 0 41.94	7.115	0 51 54.1	47.42	0.376 5351	12.0	2.12	3.70	23 46.1
27	0 3 32.62	7.109	0 32 56.3	47.39	0.376 5630	11.2	2.12	3.70	23 45.0
28	0 6 23.17	+7.104	− 0 13 59.3	+47.36	0.376 5890	+10.4	2.12	3.70	23 44.0
29	0 9 13.59	7.098	+ 0 4 56.8	47.31	0.376 6131	9.7	2.12	3.70	23 42.9
30	0 12 3.88	7.093	0 23 51.7	47.26	0.376 6354	8.9	2.12	3.70	23 41.8
31	0 14 54.06	7.089	0 42 45.3	47.20	0.376 6560	8.2	2.12	3.70	23 40.7
Apr. 1	0 17 44.14	7.085	1 1 37.5	47.14	0.376 6748	7.4	2.12	3.70	23 39.6
2	0 20 34.12	+7.081	+ 1 20 28.0	+47.07	0.376 6917	+ 6.7	2.12	3.70	23 38.4
3	0 23 24.01	*+7.077*	*+ 1 39 16.6*	+46.99	0.376 7068	+ 5.9	2.12	3.70	23 37.3

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.
	Noon.	*Noon.*	*Noon.*	*Noon.*	*Noon.*	*Noon.*	*Noon.*	*Noon.*
	h m s	s	° ′ ″	″			″	″
Apr. 1	0 17 44.14	+7.085	+ 1 1 37.5	+47.14	0.376 6748	+ 7.4	2.12	3.70
2	0 20 34.12	7.081	1 20 28.0	47.07	0.376 6917	6.7	2.12	3.70
3	0 23 24.01	7.077	1 39 16.6	46.99	0.376 7068	5.9	2.12	3.70
4	0 26 13.82	7.074	1 58 3.3	46.90	0.376 7200	5.1	2.12	3.70
5	0 29 3.56	7.071	2 16 47.8	46.80	0.376 7314	4.4	2.12	3.70
6	0 31 53.24	+7.069	+ 2 35 29.9	+46.70	0.376 7409	+ 3.6	2.12	3.70
7	0 34 42.86	7.067	2 54 9.5	46.59	0.376 7486	2.8	2.12	3.70
8	0 37 32.45	7.065	3 12 46.5	46.48	0.376 7545	2.1	2.12	3.70
9	0 40 22.00	7.064	3 31 20.6	46.36	0.376 7585	1.2	2.12	3.70
10	0 43 11.53	7.063	3 49 51.6	46.23	0.376 7604	+ 0.4	2.12	3.70
11	0 46 1.04	+7.063	+ 4 8 19.5	+46.09	0.376 7603	− 0.5	2.12	3.70
12	0 48 50.54	7.063	4 26 44.1	45.95	0.376 7579	1.5	2.12	3.70
13	0 51 40.05	7.063	4 45 5.1	45.80	0.376 7532	2.4	2.12	3.70
14	0 54 29.56	7.063	5 3 22.4	45.64	0.376 7461	3.5	2.12	3.70
15	0 57 19.09	7.064	5 21 35.9	45.48	0.376 7364	4.6	2.12	3.70
16	1 0 8.64	+7.065	+ 5 39 45.3	+45.31	0.376 7242	− 5.7	2.12	3.70
17	1 2 58.23	7.067	5 57 50.5	45.13	0.376 7092	6.8	2.12	3.70
18	1 5 47.85	7.068	6 15 51.3	44.94	0.376 6915	8.0	2.12	3.70
19	1 8 37.51	7.070	6 33 47.6	44.75	0.376 6709	9.2	2.12	3.70
20	1 11 27.22	7.072	6 51 39.1	44.55	0.376 6473	10.5	2.12	3.70
21	1 14 16.98	+7.074	+ 7 9 25.8	+44.34	0.376 6207	−11.7	2.12	3.70
22	1 17 6.79	7.077	7 27 7.3	44.12	0.376 5911	13.0	2.12	3.70
23	1 19 56.67	7.080	7 44 43.6	43.90	0.376 5584	14.3	2.12	3.70
24	1 22 46.61	7.082	8 2 14.4	43.67	0.376 5226	15.6	2.12	3.70
25	1 25 36.62	7.085	8 19 39.7	43.43	0.376 4836	16.9	2.12	3.70
26	1 28 26.70	+7.088	+ 8 36 59.1	+43.19	0.376 4415	−18.2	2.12	3.70
27	1 31 16.86	7.092	8 54 12.7	42.94	0.376 3962	19.5	2.12	3.70
28	1 34 7.11	7.095	9 11 20.2	42.68	0.376 3479	20.8	2.12	3.70
29	1 36 57.44	7.099	9 28 21.5	42.42	0.376 2963	22.1	2.12	3.70
30	1 39 47.87	7.104	9 45 16.4	42.15	0.376 2417	23.4	2.12	3.70
May 1	1 42 38.41	+7.108	+10 2 4.8	+41.88	0.376 1838	−24.8	2.12	3.70
2	1 45 29.05	7.112	10 18 46.6	41.60	0.376 1227	26.1	2.12	3.70
3	1 48 19.80	7.117	10 35 21.5	41.31	0.376 0583	27.5	2.12	3.70
4	1 51 10.67	7.122	10 51 49.6	41.02	0.375 9907	28.8	2.12	3.70
5	1 54 1.67	7.128	11 8 10.5	40.72	0.375 9199	30.2	2.12	3.70
6	1 56 52.79	+7.133	+11 24 24.2	+40.42	0.375 8458	−31.6	2.12	3.70
7	1 59 44.05	7.139	11 40 30.6	40.11	0.375 7684	33.0	2.12	3.70
8	2 2 35.46	7.145	11 56 29.5	39.79	0.375 6875	34.4	2.12	3.70
9	2 5 27.01	7.151	12 12 20.7	39.47	0.375 6031	35.9	2.12	3.70
10	2 8 18.71	7.158	12 28 4.2	39.15	0.375 5151	37.4	2.13	3.71
11	2 11 10.57	+7.164	+12 43 39.9	+38.82	0.375 4235	−39.0	2.13	3.71
12	2 14 2.60	7.171	12 59 7.5	38.48	0.375 3279	40.6	2.13	3.71
13	2 16 54.79	7.178	13 14 26.9	38.14	0.375 2284	42.3	2.13	3.71
14	2 19 47.15	7.186	13 29 38.0	37.79	0.375 1247	44.1	2.13	3.71
15	2 22 39.69	7.193	13 44 40.7	37.43	0.375 0168	45.9	2.13	3.71
	2 25 32.39	+7.200	+13 59 34.8	+37.07	0.374 9045	−47.7	2.13	3.71
	2 28 25.27	+7.207	+14 14 20.2	+36.71	0.374 7877	−49.6	2.13	3.71

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 17	2 28 25.27	+7.207	+14 14 20.2	+36.71	0.374 7877	− 49.6	2.13	3.71	22 49.0
18	2 31 18.32	7.214	14 28 56.7	36.34	0.374 6664	51.5	2.13	3.71	22 47.9
19	2 34 11.54	7.221	14 43 24.2	35.96	0.374 5404	53.5	2.13	3.71	22 46.9
20	2 37 4.94	7.229	14 57 42.6	35.57	0.374 4097	55.4	2.14	3.72	22 45.8
21	2 39 58.51	7.236	15 11 51.6	35.18	0.374 2743	57.4	2.14	3.72	22 44.8
22	2 42 52.26	+7.243	+15 25 51.3	+34.79	0.374 1341	− 59.4	2.14	3.72	22 43.7
23	2 45 46.18	7.250	15 39 41.4	34.39	0.373 9890	61.5	2.14	3.72	22 42.7
24	2 48 40.26	7.257	15 53 21.9	33.98	0.373 8391	63.5	2.14	3.72	22 41.6
25	2 51 34.52	7.264	16 6 52.6	33.58	0.373 6841	65.6	2.14	3.72	22 40.6
26	2 54 28.95	7.272	16 20 13.5	33.16	0.373 5242	67.7	2.14	3.72	22 39.6
27	2 57 23.55	+7.279	+16 33 24.4	+32.74	0.373 3593	− 69.7	2.14	3.72	22 38.5
28	3 0 18.31	7.286	16 46 25.1	32.32	0.373 1895	71.8	2.14	3.73	22 37.5
29	3 3 13.25	7.293	16 59 15.7	31.88	0.373 0146	73.9	2.14	3.73	22 36.5
30	3 6 8.35	7.300	17 11 55.9	31.46	0.372 8348	76.0	2.14	3.73	22 35.5
31	3 9 3.62	7.307	17 24 25.7	31.02	0.372 6499	78.1	2.14	3.73	22 34.4
Aug. 1	3 11 59.06	+7.314	+17 36 45.0	+30.58	0.372 4599	− 80.2	2.14	3.73	22 33.4
2	3 14 54.67	7.321	17 48 53.7	30.14	0.372 2648	82.3	2.14	3.73	22 32.4
3	3 17 50.44	7.327	18 0 51.7	29.69	0.372 0646	84.5	2.15	3.74	22 31.4
4	3 20 46.38	7.334	18 12 38.8	29.24	0.371 8591	86.7	2.15	3.74	22 30.4
5	3 23 42.49	7.341	18 24 15.0	28.78	0.371 6483	89.0	2.15	3.74	22 29.4
6	3 26 38.77	+7.348	+18 35 40.3	+28.32	0.371 4321	− 91.2	2.15	3.74	22 28.4
7	3 29 35.21	7.355	18 46 54.5	27.86	0.371 2105	93.5	2.15	3.74	22 27.4
8	3 32 31.82	7.362	18 57 57.6	27.39	0.370 9832	95.9	2.15	3.75	22 26.4
9	3 35 28.59	7.369	19 8 49.4	26.92	0.370 7503	98.3	2.15	3.75	22 25.4
10	3 38 25.53	7.376	19 19 29.8	26.45	0.370 5115	100.8	2.15	3.75	22 24.4
11	3 41 22.62	+7.382	+19 29 58.8	+25.97	0.370 2666	−103.3	2.15	3.75	22 23.4
12	3 44 19.87	7.389	19 40 16.4	25.49	0.370 0156	105.9	2.15	3.75	22 22.5
13	3 47 17.27	7.395	19 50 22.3	25.00	0.369 7583	108.5	2.16	3.76	22 21.5
14	3 50 14.81	7.401	20 0 16.5	24.51	0.369 4946	111.2	2.16	3.76	22 20.5
15	3 53 12.49	7.406	20 9 59.0	24.02	0.369 2244	114.0	2.16	3.76	22 19.5
16	3 56 10.29	+7.411	+20 19 29.6	+23.53	0.368 9476	−116.7	2.16	3.76	22 18.5
17	3 59 8.23	7.416	20 28 48.3	23.03	0.368 6641	119.5	2.16	3.77	22 17.5
18	4 2 6.28	7.421	20 37 55.0	22.53	0.368 3738	122.4	2.16	3.77	22 16.6
19	4 5 4.44	7.426	20 46 49.7	22.03	0.368 0766	125.3	2.16	3.77	22 15.6
20	4 8 2.71	7.429	20 55 32.2	21.52	0.367 7724	128.2	2.16	3.77	22 14.6
21	4 11 1.06	+7.433	+21 4 2.6	+21.01	0.367 4613	−131.1	2.17	3.78	22 13.6
22	4 13 59.50	7.437	21 12 20.7	20.50	0.367 1431	134.0	2.17	3.78	22 12.7
23	4 16 58.03	7.440	21 20 26.6	19.99	0.366 8179	137.0	2.17	3.78	22 11.7
24	4 19 56.62	7.443	21 28 20.1	19.47	0.366 4856	140.0	2.17	3.78	22 10.8
25	4 22 55.28	7.445	21 36 1.2	18.95	0.366 1461	143.0	2.18	3.79	22 9.8
26	4 25 54.00	+7.448	+21 43 29.9	+18.44	0.365 7994	−146.0	2.18	3.79	22 8.8
27	4 28 52.77	7.450	21 50 46.1	17.92	0.365 4455	149.0	2.18	3.79	22 7.9
28	4 31 51.58	7.452	21 57 49.9	17.40	0.365 0843	152.0	2.18	3.80	22 6.9
29	4 34 50.44	7.453	22 4 41.1	16.87	0.364 7158	155.0	2.18	3.80	22 5.9
30	4 37 49.32	7.454	22 11 19.7	16.35	0.364 3401	158.1	2.18	3.80	22 5.0
July 1	4 40 48.23	+7.455	+22 17 45.8	+15.82	0.363 9571	−161.1	2.19	3.81	22 4.0
2	*4 43 47.15*	*+7.455*	*+22 23 59.2*	+15.29	0.363 5668	−164.2	2.19	3.81	22 3.1

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.
		Noon.	Noon.	Noon.	Noon.	Noon.	Noon.	Noon.	Noon.
		h m s	s	° ′ ″	″			″	″
July	1	4 40 48.23	−7.455	−22 17 45.8	−15.82	0.363 9571	−161.1	2.19	3.81
	2	4 43 47.15	7.455	22 23 59.2	15.29	0.363 5668	164.2	2.19	3.81
	3	4 46 46.08	7.456	22 29 59.9	14.77	0.363 1690	167.3	2.19	3.81
	4	4 49 45.02	7.456	22 35 48.0	14.24	0.362 7636	170.5	2.19	3.82
	5	4 52 43.96	7.456	22 41 23.4	13.71	0.362 3506	173.7	2.19	3.82
	6	4 55 42.90	−7.455	−22 46 46.1	−13.18	0.361 9297	−177.0	2.19	3.82
	7	4 58 41.81	7.454	22 51 56.0	12.65	0.361 5010	180.3	2.20	3.83
	8	5 1 40.71	7.453	22 56 53.2	12.12	0.361 0642	183.7	2.20	3.83
	9	5 4 39.58	7.452	23 1 37.7	11.59	0.360 6193	187.1	2.20	3.84
	10	5 7 38.41	7.450	23 6 9.5	11.06	0.360 1661	190.6	2.20	3.84
	11	5 10 37.20	+7.448	−23 10 28.5	−10.53	0.359 7043	−194.2	2.20	3.84
	12	5 13 35.93	7.446	23 14 34.7	9.99	0.359 2339	197.8	2.21	3.85
	13	5 16 34.59	7.443	23 18 28.1	9.46	0.358 7547	201.5	2.21	3.85
	14	5 19 33.17	7.439	23 22 8.8	8.93	0.358 2666	205.3	2.22	3.86
	15	5 22 31.65	7.435	23 25 36.7	8.40	0.357 7694	209.1	2.22	3.86
	16	5 25 30.04	+7.431	−23 28 51.9	−7.87	0.357 2631	−212.9	2.22	3.87
	17	5 28 28.31	7.426	23 31 54.4	7.34	0.356 7476	216.7	2.22	3.87
	18	5 31 26.46	7.420	23 34 44.1	6.81	0.356 2228	220.6	2.22	3.87
	19	5 34 24.47	7.413	23 37 21.2	6.28	0.355 6886	224.5	2.23	3.88
	20	5 37 22.33	7.407	23 39 45.7	5.76	0.355 1450	228.5	2.23	3.88
	21	5 40 20.03	+7.401	+23 41 57.5	−5.23	0.354 5920	−232.4	2.23	3.89
	22	5 43 17.57	7.394	23 43 56.7	4.71	0.354 0294	236.4	2.23	3.89
	23	5 46 14.92	7.386	23 45 43.4	4.19	0.353 4572	240.4	2.24	3.90
	24	5 49 12.07	7.377	23 47 17.6	3.67	0.352 8755	244.4	2.24	3.90
	25	5 52 9.03	7.369	23 48 39.3	3.15	0.352 2841	248.4	2.24	3.91
	26	5 55 5.78	+7.360	+23 49 48.6	−2.63	0.351 6830	−252.5	2.25	3.92
	27	5 58 2.30	7.351	23 50 45.5	2.12	0.351 0721	256.6	2.25	3.92
	28	6 0 58.60	7.341	23 51 30.1	1.60	0.350 4515	260.6	2.26	3.93
	29	6 3 54.66	7.331	23 52 2.5	1.09	0.349 8211	264.7	2.26	3.93
	30	6 6 50.48	7.321	23 52 22.6	0.58	0.349 1808	268.9	2.26	3.94
	31	6 9 46.05	−7.310	−23 52 30.5	−0.08	0.348 5305	−273.0	2.26	3.94
Aug.	1	6 12 41.35	7.299	23 52 26.3	−0.43	0.347 8702	277.2	2.27	3.95
	2	6 15 36.39	7.288	23 52 10.0	0.93	0.347 1998	281.5	2.27	3.96
	3	6 18 31.15	7.276	23 51 41.8	1.43	0.346 5192	285.7	2.27	3.96
	4	6 21 25.64	7.264	23 51 1.5	1.93	0.345 8283	290.1	2.28	3.97
	5	6 24 19.83	+7.252	+23 50 9.4	−2.42	0.345 1268	−294.5	2.28	3.97
	6	6 27 13.74	7.240	23 49 5.5	2.91	0.344 4147	298.9	2.28	3.98
	7	6 30 7.34	7.227	23 47 49.8	3.40	0.343 6918	303.5	2.29	3.99
	8	6 33 0.63	7.214	23 46 22.5	3.88	0.342 9578	308.2	2.29	3.99
	9	6 35 53.60	7.200	23 44 43.6	4.36	0.342 2126	312.8	2.30	4.00
	10	6 38 46.23	+7.186	+23 42 53.2	−4.84	0.341 4561	−317.6	2.30	4.01
	11	6 41 38.52	7.172	23 40 51.4	5.31	0.340 6881	322.4	2.31	4.02
	12	6 44 30.46	7.157	23 38 38.3	5.78	0.339 9085	327.3	2.31	4.02
	13	6 47 22.04	7.141	23 36 13.9	6.25	0.339 1170	332.2	2.31	4.03
	14	6 50 13.24	7.126	23 33 38.4	6.71	0.338 3137	337.2	2.32	4.04
	15	6 53 4.07	+7.110	+23 30 51.8	−7.17	0.337 4984	−342.2	2.32	4.05
	16	6 55 54.50	+7.093	+23 27 54.3	−7.62	0.336 6710	−347.3	2.32	4.05

GREENWICH MEAN TIME.

	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
16	6 55 54.50	+7.093	+23 27 54.3	− 7.62	0.336 6710	−347.3	2.32	4.05	21 17.7
17	6 58 44.53	7.076	23 24 45.9	8.07	0.335 8315	352.3	2.33	4.06	21 16.6
18	7 1 34.15	7.059	23 21 26.8	8.52	0.334 9798	357.4	2.34	4.07	21 15.4
19	7 4 23.36	7.042	23 17 57.0	8.96	0.334 1159	362.5	2.34	4.08	21 14.3
20	7 7 12.14	7.024	23 14 16.6	9.40	0.333 2396	367.7	2.34	4.08	21 13.2
21	7 10 0.48	+7.005	+23 10 25.9	− 9.83	0.332 3509	−372.9	2.35	4.09	21 12.0
22	7 12 48.38	6.987	23 6 24.9	10.26	0.331 4497	378.1	2.35	4.10	21 10.9
23	7 15 35.84	6.968	23 2 13.6	10.68	0.330 5361	383.3	2.36	4.11	21 9.7
24	7 18 22.83	6.949	22 57 52.3	11.10	0.329 6099	388.5	2.36	4.12	21 8.6
25	7 21 9.37	6.929	22 53 21.0	11.51	0.328 6712	393.8	2.37	4.13	21 7.4
26	7 23 55.44	+6.910	+22 48 39.8	−11.92	0.327 7198	−399.1	2.38	4.14	21 6.2
27	7 26 41.04	6.890	22 43 48.8	12.33	0.326 7557	404.3	2.38	4.15	21 5.0
28	7 29 26.17	6.870	22 38 48.1	12.73	0.325 7789	409.7	2.39	4.16	21 3.8
29	7 32 10.81	6.850	22 33 37.9	13.12	0.324 7892	415.1	2.39	4.17	21 2.6
30	7 34 54.98	6.830	22 28 18.2	13.51	0.323 7866	420.5	2.40	4.18	21 1.4
31	7 37 38.66	+6.810	+22 22 49.2	−13.90	0.322 7709	−426.0	2.40	4.18	21 0.2
1	7 40 21.85	6.789	22 17 11.0	14.28	0.321 7419	431.5	2.41	4.19	20 59.0
2	7 43 4.55	6.769	22 11 23.6	14.66	0.320 6996	437.1	2.41	4.20	20 57.7
3	7 45 46.76	6.749	22 5 27.2	15.03	0.319 6438	442.8	2.42	4.21	20 56.4
4	7 48 28.48	6.728	21 59 22.0	15.40	0.318 5742	448.5	2.43	4.23	20 55.2
5	7 51 9.69	+6.707	+21 53 8.0	−15.76	0.317 4907	−454.4	2.43	4.24	20 54.0
6	7 53 50.40	6.686	21 46 45.4	16.12	0.316 3930	460.3	2.44	4.25	20 52.7
7	7 56 30.60	6.664	21 40 14.3	16.47	0.315 2811	466.3	2.45	4.26	20 51.4
8	7 59 10.29	6.643	21 33 34.8	16.82	0.314 1547	472.4	2.45	4.27	20 50.1
9	8 1 49.45	6.621	21 26 47.0	17.16	0.313 0137	478.5	2.46	4.28	20 48.8
10	8 4 28.08	+6.599	+21 19 51.2	−17.49	0.311 8579	−484.7	2.46	4.29	20 47.5
11	8 7 6.18	6.576	21 12 47.4	17.82	0.310 6871	491.0	2.47	4.30	20 46.2
12	8 9 43.74	6.554	21 5 35.8	18.14	0.309 5013	497.2	2.47	4.31	20 44.9
13	8 12 20.76	6.531	20 58 16.5	18.46	0.308 3004	503.6	2.49	4.33	20 43.6
14	8 14 57.23	6.508	20 50 49.7	18.77	0.307 0842	510.0	2.49	4.34	20 42.2
15	8 17 33.14	+6.485	+20 43 15.5	−19.08	0.305 8526	−516.4	2.50	4.35	20 40.9
16	8 20 8.50	6.461	20 35 34.0	19.38	0.304 6056	522.8	2.50	4.36	20 39.5
17	8 22 43.30	6.438	20 27 45.4	19.67	0.303 3430	529.3	2.51	4.38	20 38.1
18	8 25 17.53	6.415	20 19 49.8	19.96	0.302 0648	535.9	2.52	4.39	20 36.8
19	8 27 51.21	6.391	20 11 47.4	20.24	0.300 7708	542.5	2.53	4.40	20 35.4
20	8 30 24.29	+6.367	+20 3 38.3	−20.52	0.299 4610	−549.0	2.54	4.42	20 34.0
21	8 32 56.80	6.343	19 55 22.6	20.79	0.298 1354	555.6	2.54	4.43	20 32.6
22	8 35 28.74	6.319	19 47 0.6	21.05	0.296 7940	562.2	2.55	4.44	20 31.2
23	8 38 0.10	6.294	19 38 32.3	21.31	0.295 4367	568.9	2.56	4.46	20 29.7
24	8 40 30.87	6.270	19 29 57.8	21.57	0.294 0634	575.6	2.57	4.47	20 28.3
25	8 43 1.07	+6.246	+19 21 17.2	−21.81	0.292 6740	−582.3	2.58	4.49	20 26.9
26	8 45 30.68	6.222	19 12 30.8	22.05	0.291 2685	589.0	2.58	4.50	20 25.4
27	8 47 59.72	6.198	19 3 38.6	22.29	0.289 8467	595.8	2.59	4.51	20 23.9
28	8 50 28.18	6.174	18 54 40.8	22.53	0.288 4085	602.7	2.60	4.53	20 22.5
29	8 52 56.07	6.150	18 45 37.4	22.76	0.286 9537	609.6	2.61	4.54	20 21.0
30	8 55 23.37	+6.126	+18 36 28.6	−22.98	0.285 4823	−616.6	2.62	4.56	20 19.5
1	*8 57 50.10*	*+6.102*	*+18 27 14.6*	−23.19	0.283 9940	−623.6	2.63	4.58	20 18.0

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.
	Noon.	*Noon.*	*Noon.*	*Noon.*	*Noon.*	*Noon.*	*Noon.*	*Noon.*
	h m s	s	° ′ ″	″			″	″
Oct. 1	8 57 50.10	+6.102	+18 27 14.6	−23.19	0.283 9940	−623.6	2.63	4.58
2	9 0 16.25	6.078	18 17 55.4	23.40	0.282 4887	630.8	2.63	4.59
3	9 2 41.82	6.054	18 8 31.2	23.61	0.280 9660	638.1	2.65	4.61
4	9 5 6.82	6.030	17 59 2.2	23.81	0.279 4257	645.5	2.65	4.62
5	9 7 31.24	6.006	17 49 28.5	24.00	0.277 8677	652.9	2.66	4.64
6	9 9 55.08	+5.981	+17 39 50.2	−24.19	0.276 2917	− 660.4	2.67	4.66
7	9 12 18.33	5.957	17 30 7.6	24.37	0.274 6975	668.1	2.69	4.68
8	9 14 40.99	5.932	17 20 20.7	24.54	0.273 0850	675.7	2.69	4.69
9	9 17 3.06	5.907	17 10 29.7	24.71	0.271 4540	683.5	2.70	4.71
10	9 19 24.54	5.882	17 0 34.8	24.87	0.269 8043	691.3	2.72	4.73
11	9 21 45.42	+5.857	+16 50 36.0	−25.02	0.268 1358	− 699.1	2.73	4.75
12	9 24 5.69	5.832	16 40 33.7	25.17	0.266 4484	707.0	2.73	4.76
13	9 26 25.37	5.807	16 30 27.8	25.32	0.264 7420	715.0	2.74	4.78
14	9 28 44.44	5.782	16 20 18.6	25.45	0.263 0164	723.0	2.76	4.80
15	9 31 2.90	5.756	16 10 6.2	25.58	0.261 2715	731.1	2.77	4.82
16	9 33 20.74	+5.731	+15 59 50.8	−25.70	0.259 5072	− 739.2	2.78	4.84
17	9 35 37.97	5.705	15 49 32.6	25.82	0.257 7233	747.4	2.79	4.86
18	9 37 54.57	5.679	15 39 11.6	25.93	0.255 9199	755.5	2.80	4.88
19	9 40 10.55	5.653	15 28 48.1	26.03	0.254 0969	763.7	2.81	4.90
20	9 42 25.91	5.627	15 18 22.2	26.13	0.252 2541	771.9	2.82	4.92
21	9 44 40.65	+5.601	+15 7 54.0	−26.22	0.250 3916	− 780.2	2.84	4.94
22	9 46 54.76	5.575	14 57 23.6	26.31	0.248 5093	788.5	2.85	4.96
23	9 49 8.26	5.549	14 46 51.2	26.39	0.246 6070	796.8	2.86	4.99
24	9 51 21.13	5.523	14 36 16.8	26.47	0.244 6848	805.1	2.88	5.01
25	9 53 33.37	5.497	14 25 40.7	26.54	0.242 7426	813.5	2.89	5.03
26	9 55 44.99	+5.471	+14 15 2.9	−26.61	0.240 7801	− 822.0	2.90	5.05
27	9 57 55.99	5.445	14 4 23.6	26.67	0.238 7972	830.5	2.92	5.08
28	10 0 6.36	5.419	13 53 43.0	26.72	0.236 7937	839.1	2.93	5.10
29	10 2 16.11	5.393	13 43 1.1	26.77	0.234 7695	847.8	2.94	5.12
30	10 4 25.24	5.367	13 32 18.2	26.81	0.232 7243	856.6	2.96	5.15
31	10 6 33.74	+5.341	+13 21 34.2	−26.85	0.230 6578	− 865.5	2.97	5.17
Nov. 1	10 8 41.62	5.315	13 10 49.4	26.88	0.228 5699	874.5	2.98	5.20
2	10 10 48.87	5.289	13 0 4.0	26.90	0.226 4602	883.6	3.00	5.22
3	10 12 55.49	5.263	12 49 18.0	26.92	0.224 3286	892.8	3.01	5.25
4	10 15 1.47	5.236	12 38 31.7	26.94	0.222 1749	902.0	3.03	5.28
5	10 17 6.80	+5.209	+12 27 45.1	−26.94	0.219 9988	− 911.4	3.04	5.30
6	10 19 11.49	5.182	12 16 58.5	26.94	0.217 8002	920.8	3.06	5.33
7	10 21 15.53	5.154	12 6 12.0	26.93	0.215 5789	930.3	3.08	5.36
8	10 23 18.90	5.127	11 55 25.9	26.91	0.213 3347	939.9	3.09	5.38
9	10 25 21.61	5.099	11 44 40.2	26.89	0.211 0674	949.6	3.11	5.41
10	10 27 23.65	+5.071	+11 33 55.2	−26.86	0.208 7768	− 959.3	3.12	5.44
11	10 29 25.01	5.043	11 23 10.9	26.83	0.206 4629	969.0	3.14	5.47
12	10 31 25.69	5.014	11 12 27.5	26.78	0.204 1255	978.8	3.16	5.50
13	10 33 25.66	4.984	11 1 45.3	26.73	0.201 7645	988.7	3.17	5.53
14	10 35 24.94	4.955	10 51 4.3	26.68	0.199 3798	998.5	3.19	5.56
15	10 37 23.51	+4.925	+10 40 24.8	−26.62	0.196 9715	−1008.4	3.21	5.59
16	10 39 21.36	+4.895	+10 29 46.9	−26.55	0.194 5394	−1018.3	3.23	5.62

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
Sept. 16	10 39 21.36	+4.895	+10 29 46.9	−26.55	0.194 5394	−1018.3	3.23	5.62	18 57.8
17	10 41 18.49	4.865	10 19 10.7	26.47	0.192 0835	1028.2	3.24	5.65	18 55.8
18	10 43 14.90	4.835	10 8 36.4	26.39	0.189 6038	1038.2	3.27	5.69	18 53.8
19	10 45 10.59	4.805	9 58 4.1	26.30	0.187 1002	1048.2	3.28	5.72	18 51.8
20	10 47 5.53	4.774	9 47 33.9	26.21	0.184 5726	1058.1	3.30	5.75	18 49.8
21	10 48 59.73	+4.743	+ 9 37 6.1	−26.11	0.182 0211	−1068.1	3.32	5.79	18 47.7
22	10 50 53.18	4.712	9 26 40.7	26.00	0.179 4455	1078.2	3.34	5.82	18 45.7
23	10 52 45.87	4.680	9 16 18.0	25.89	0.176 8457	1088.3	3.36	5.86	18 43.6
24	10 54 37.81	4.648	9 5 57.9	25.78	0.174 2215	1098.5	3.38	5.89	18 41.5
25	10 56 28.98	4.616	8 55 40.7	25.66	0.171 5729	1108.7	3.40	5.93	18 39.4
26	10 58 19.39	+4.584	+ 8 45 26.5	−25.52	0.168 8996	−1119.1	3.42	5.96	18 37.3
27	11 0 9.02	4.552	8 35 15.6	25.39	0.166 2013	1129.5	3.44	6.00	18 35.2
28	11 1 57.86	4.519	8 25 7.9	25.25	0.163 4781	1139.9	3.47	6.04	18 33.0
29	11 3 45.91	4.486	8 15 3.7	25.10	0.160 7296	1150.5	3.49	6.08	18 30.9
30	11 5 33.16	4.452	8 5 3.1	24.95	0.157 9557	1161.1	3.51	6.12	18 28.7
Oct. 1	11 7 19.59	+4.418	+ 7 55 6.3	−24.79	0.155 1561	−1171.9	3.54	6.16	18 26.5
2	11 9 5.20	4.383	7 45 13.4	24.62	0.152 3307	1182.6	3.56	6.20	18 24.4
3	11 10 49.96	4.348	7 35 24.8	24.44	0.149 4793	1193.5	3.58	6.24	18 22.2
4	11 12 33.88	4.312	7 25 40.5	24.25	0.146 6016	1204.5	3.60	6.28	18 19.9
5	11 14 16.92	4.275	7 16 0.8	24.06	0.143 6975	1215.6	3.63	6.32	18 17.7
6	11 15 59.09	+4.238	+ 7 6 25.8	−23.86	0.140 7669	−1226.6	3.65	6.36	18 15.5
7	11 17 40.35	4.200	6 56 55.8	23.64	0.137 8097	1237.7	3.68	6.41	18 13.2
8	11 19 20.70	4.162	6 47 30.9	23.42	0.134 8259	1248.8	3.70	6.45	18 10.9
9	11 21 0.11	4.123	6 38 11.3	23.20	0.131 8153	1260.0	3.73	6.50	18 8.6
10	11 22 38.58	4.083	6 28 57.3	22.97	0.128 7781	1271.1	3.75	6.54	18 6.3
11	11 24 16.07	+4.042	+ 6 19 48.9	−22.73	0.125 7142	−1282.2	3.78	6.59	18 4.0
12	11 25 52.58	4.000	6 10 46.4	22.48	0.122 6236	1293.3	3.81	6.63	18 1.7
13	11 27 28.08	3.958	6 1 49.9	22.22	0.119 5064	1304.4	3.83	6.68	17 59.3
14	11 29 2.55	3.915	5 52 59.7	21.96	0.116 3626	1315.4	3.86	6.73	17 56.9
15	11 30 35.98	3.871	5 44 16.0	21.68	0.113 1924	1326.4	3.89	6.78	17 54.5
16	11 32 8.34	+3.826	+ 5 35 38.9	−21.40	0.109 9959	−1337.3	3.92	6.83	17 52.1
17	11 33 39.63	3.781	5 27 8.6	21.12	0.106 7732	1348.2	3.95	6.88	17 49.7
18	11 35 9.81	3.734	5 18 45.3	20.82	0.103 5244	1359.1	3.98	6.93	17 47.2
19	11 36 38.88	3.688	5 10 29.1	20.52	0.100 2497	1369.8	4.01	6.99	17 44.8
20	11 38 6.81	3.640	5 2 20.2	20.21	0.096 9493	1380.5	4.04	7.04	17 42.3
21	11 39 33.60	+3.592	+ 4 54 18.9	−19.90	0.093 6232	−1391.2	4.07	7.09	17 39.8
22	11 40 59.21	3.542	4 46 25.1	19.58	0.090 2715	1401.9	4.10	7.15	17 37.2
23	11 42 23.63	3.492	4 38 39.2	19.25	0.086 8943	1412.5	4.13	7.20	17 34.7
24	11 43 46.84	3.442	4 31 1.2	18.91	0.083 4917	1423.0	4.17	7.26	17 32.1
25	11 45 8.82	3.390	4 23 31.4	18.57	0.080 0638	1433.6	4.20	7.32	17 29.5
26	11 46 29.55	+3.337	+ 4 16 9.9	−18.22	0.076 6105	−1444.2	4.24	7.38	17 26.9
27	11 47 48.99	3.283	4 8 57.1	17.85	0.073 1319	1454.7	4.27	7.44	17 24.3
28	11 49 7.14	3.228	4 1 53.0	17.48	0.069 6282	1465.1	4.30	7.50	17 21.7
29	11 50 23.95	3.172	3 54 57.9	17.10	0.066 0993	1475.6	4.34	7.56	17 19.0
30	11 51 39.41	3.115	3 48 12.1	16.71	0.062 5455	1485.9	4.37	7.62	17 16.3
31	11 52 53.47	+3.056	+ 3 41 35.7	−16.31	0.058 9668	−1496.3	4.41	7.68	17 13.6
32	11 *54 6.11*	. . .	*+ 3 35 9.1*	. . .	0.055 3635	. . . .	4.45	7.75	17 10.8

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 D
		° ′ ″	′ ″	″	° ′ ″	″		
Jan.	1	302 56 43.4	37 8.1	+28.5	−1 46 44.3	−19.8	0.145 9131	−1
	3	304 11 4.0	37 12.4	26.5	1 47 22.4	18.3	0.145 4963	1
	5	305 25 33.1	37 16.6	24.4	1 47 57.5	16.8	0.145 0942	1
	7	306 40 10.3	37 20.6	22.3	1 48 29.7	15.3	0.144 7071	1
	9	307 54 55.3	37 24.5	20.1	1 48 58.9	13.8	0.144 3353	1
	11	309 9 48.0	37 28.2	+17.9	−1 49 25.0	−12.3	0.143 9789	−1
	13	310 24 47.9	37 31.7	15.7	1 49 48.0	10.8	0.143 6383	1
	15	311 39 54.7	37 35.1	13.5	1 50 8.0	9.2	0.143 3136	1
	17	312 55 8.1	37 38.3	11.2	1 50 24.8	7.6	0.143 0051	1
	19	314 10 27.8	37 41.4	8.9	1 50 38.5	6.0	0.142 7129	1
	21	315 25 53.4	37 44.3	+ 6.5	−1 50 48.9	− 4.4	0.142 4374	−1
	23	316 41 24.7	37 47.0	4.2	1 50 56.2	2.9	0.142 1786	1
	25	317 57 1.1	37 49.5	+ 1.8	1 51 0.3	− 1.3	0.141 9367	1
	27	319 12 42.5	37 51.8	− 0.5	1 51 1.2	+ 0.4	0.141 7119	1
	29	320 28 28.3	37 54.0	2.9	1 50 58.8	2.0	0.141 5043	
	31	321 44 18.3	37 56.0	− 5.3	−1 50 53.2	+ 3.6	0.141 3141	−
Feb.	2	323 0 12.1	37 57.8	7.6	1 50 44.4	5.2	0.141 1414	
	4	324 16 9.3	37 59.4	10.0	1 50 32.3	6.9	0.140 9863	
	6	325 32 9.6	38 0.8	12.3	1 50 16.9	8.5	0.140 8490	
	8	326 48 12.5	38 2.1	14.6	1 49 58.4	10.1	0.140 7296	
	10	328 4 17.8	38 3.1	−16.9	−1 49 36.6	+11.7	0.140 6280	−
	12	329 20 24.9	38 4.0	19.1	1 49 11.6	13.3	0.140 5445	
	14	330 36 33.6	38 4.7	21.3	1 48 43.3	14.9	0.140 4790	
	16	331 52 43.5	38 5.2	23.5	1 48 11.8	16.5	0.140 4316	
	18	333 8 54.1	38 5.4	25.6	1 47 37.1	18.1	0.140 4023	
	20	334 25 5.1	38 5.5	−27.7	−1 46 59.3	+19.7	0.140 3912	−
	22	335 41 16.0	38 5.4	29.7	1 46 18.3	21.3	0.140 3982	+
	24	336 57 26.6	38 5.1	31.7	1 45 34.2	22.8	0.140 4235	
	26	338 13 36.4	38 4.6	33.6	1 44 46.9	24.4	0.140 4668	
	28	339 29 45.0	38 4.0	35.4	1 43 56.6	25.9	0.140 5282	
Mar.	2	340 45 52.1	38 3.1	−37.1	−1 43 3.3	+27.4	0.140 6077	+
	4	342 1 57.3	38 2.0	38.8	1 42 6.9	28.9	0.140 7052	
	6	343 18 0.1	38 0.8	40.4	1 41 7.6	30.4	0.140 8206	
	8	344 34 0.3	37 59.3	42.0	1 40 5.4	31.8	0.140 9540	
	10	345 49 57.3	37 57.7	43.4	1 39 0.3	33.3	0.141 1051	
	12	347 5 51.0	37 55.9	−44.8	−1 37 52.3	+34.7	0.141 2738	+
	14	348 21 40.8	37 53.9	46.0	1 36 41.5	36.1	0.141 4600	
	16	349 37 26.5	37 51.8	47.2	1 35 28.0	37.4	0.141 6637	
	18	350 53 7.7	37 49.4	48.3	1 34 11.8	38.8	0.141 8847	
	20	352 8 43.9	37 46.8	49.3	1 32 52.9	40.1	0.142 1228	
	22	353 24 14.9	37 44.1	−50.2	−1 31 31.4	+41.4	0.142 3779	+
	24	354 39 40.3	37 41.2	51.0	1 30 7.4	42.6	0.142 6497	
	26	355 54 59.8	37 38.2	51.7	1 28 40.9	43.9	0.142 9382	
	28	357 10 13.1	37 35.0	52.3	1 27 11.9	45.1	0.143 2431	
	30	358 25 19.7	37 31.6	52.8	1 25 40.6	46.3	0.143 5642	
Apr.	1	359 40 19.4	37 28.0	−53.2	−1 24 6.9	+47.4	0.143 9014	+
	3	0 55 11.8	37 24.3	−53.5	−1 22 31.1	+48.4	0.144 2543	+

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.
	° ′ ″	′ ″	″	° ′ ″	″		
1	359 40 19.4	37 28.0	−53.2	−1 24 6.9	+47.4	0.143 9014	+1725
3	0 55 11.8	37 24.3	53.5	1 22 31.1	48.4	0.144 2543	1804
5	2 9 56.7	37 20.5	53.7	1 20 53.1	49.5	0.144 6228	1881
7	3 24 33.8	37 16.5	53.8	1 19 12.9	50.6	0.145 0066	1957
9	4 39 2.7	37 12.4	53.8	1 17 30.7	51.6	0.145 4054	2031
11	5 53 23.2	37 8.1	−53.6	−1 15 46.6	+52.6	0.145 8191	+2105
13	7 7 34.9	37 3.6	53.4	1 14 0.4	53.6	0.146 2473	2177
15	8 21 37.6	36 59.0	53.1	1 12 12.4	54.5	0.146 6897	2247
17	9 35 31.0	36 54.3	52.7	1 10 22.6	55.3	0.147 1462	2317
19	10 49 14.9	36 49.5	52.2	1 8 31.2	56.1	0.147 6164	2385
21	12 2 49.0	36 44.5	−51.6	−1 6 38.1	+57.0	0.148 1000	+2451
23	13 16 13.0	36 39.5	51.0	1 4 43.4	57.7	0.148 5967	2516
25	14 29 26.8	36 34.3	50.2	1 2 47.2	58.5	0.149 1062	2579
27	15 42 30.1	36 29.0	49.3	1 0 49.6	59.1	0.149 6283	2641
29	16 55 22.7	36 23.6	48.3	0 58 50.7	59.8	0.150 1625	2701
1	18 8 4.3	36 18.0	−47.3	−0 56 50.5	+60.4	0.150 7086	+2760
3	19 20 34.7	36 12.4	46.2	0 54 49.1	61.0	0.151 2663	2817
5	20 32 53.8	36 6.7	45.0	0 52 46.5	61.6	0.151 8353	2872
7	21 45 1.3	36 0.8	43.7	0 50 42.8	62.1	0.152 4151	2926
9	22 56 57.0	35 54.9	42.4	0 48 38.1	62.6	0.153 0056	2979
11	24 8 41.0	35 49.0	−40.9	−0 46 32.5	+63.0	0.153 6064	+3029
13	25 20 12.9	35 42.9	39.4	0 44 26.1	63.4	0.154 2170	3077
15	26 31 32.5	35 36.7	37.9	0 42 18.8	63.8	0.154 8372	3124
17	27 42 39.8	35 30.6	36.3	0 40 10.8	64.2	0.155 4667	3170
19	28 53 34.7	35 24.3	34.6	0 38 2.2	64.5	0.156 1051	3214
21	30 4 16.8	35 17.9	−32.9	−0 35 53.0	+64.7	0.156 7520	+3256
23	31 14 46.3	35 11.5	31.1	0 33 43.3	65.0	0.157 4072	3296
25	32 25 2.9	35 5.1	29.3	0 31 33.1	65.2	0.158 0703	3335
27	33 35 6.5	34 58.5	27.4	0 29 22.5	65.4	0.158 7409	3372
29	34 44 57.0	34 52.0	25.5	0 27 11.6	65.5	0.159 4188	3407
31	35 54 34.4	34 45.4	−23.6	−0 25 0.4	+65.6	0.160 1035	+3440
2	37 3 58.4	34 38.7	21.6	0 22 49.1	65.7	0.160 7947	3472
4	38 13 9.2	34 32.1	19.6	0 20 37.6	65.8	0.161 4922	3502
6	39 22 6.6	34 25.3	17.6	0 18 26.1	65.8	0.162 1955	3531
8	40 30 50.5	34 18.6	15.6	0 16 14.5	65.8	0.162 9044	3558
10	41 39 21.0	34 11.8	−13.5	−0 14 2.9	+65.8	0.163 6184	+3583
12	42 47 37.8	34 5.0	11.4	0 11 51.5	65.7	0.164 3373	3606
14	43 55 41.0	33 58.2	9.3	0 9 40.2	65.6	0.165 0607	3628
16	45 3 30.7	33 51.4	7.2	0 7 29.1	65.5	0.165 7883	3648
18	46 11 6.6	33 44.5	5.1	0 5 18.3	65.3	0.166 5198	3667
20	47 18 28.9	33 37.7	− 3.0	−0 3 7.8	+65.2	0.167 2549	+3684
22	48 25 37.5	33 30.9	− 0.9	−0 0 57.7	64.9	0.167 9932	3699
24	49 32 32.4	33 24.0	+ 1.1	+0 1 11.9	64.7	0.168 7345	3713
26	50 39 13.6	33 17.2	3.2	0 3 21.2	64.5	0.169 4783	3725
28	51 45 41.1	33 10.3	5.3	0 5 29.9	64.2	0.170 2245	3736
30	52 51 54.8	33 3.5	+ 7.4	+0 7 38.0	+63.9	0.170 9728	+3746
2	53 57 55.0	*32 56.6*	*+ 9.4*	+0 9 45.6	+63.6	0.171 7227	+3753

FOR GREENWICH MEAN NOON.

Date.		Heliocentric Longitude, Mean Equinox of Date.	Var. per Day.	Reduction to Orbit.	Heliocentric Latitude.	Var. per Day.	I R
		° ′ ″	′ ″	″	° ′ ″	″	
July	2	53 57 55.0	32 56.6	+ 9.4	+0 9 45.6	+63.6	(
	4	55 3 41.4	32 49.8	11.4	0 11 52.4	63.2	(
	6	56 9 14.3	32 43.0	13.4	0 13 58.6	62.9	(
	8	57 14 33.5	32 36.2	15.4	0 16 4.0	62.5	(
	10	58 19 39.2	32 29.5	17.3	0 18 8.7	62.1	(
	12	59 24 31.4	32 22.7	+19.2	+0 20 12.5	+61.7	(
	14	60 29 10.2	32 16.0	21.1	0 22 15.5	61.2	(
	16	61 33 35.5	32 9.3	23.0	0 24 17.5	60.8	(
	18	62 37 47.5	32 2.6	24.8	0 26 18.7	60.3	(
	20	63 41 46.1	31 56.0	26.5	0 28 18.9	59.9	(
	22	64 45 31.4	31 49.4	+28.2	+0 30 18.1	+59.3	(
	24	65 49 3.7	31 42.8	29.9	0 32 16.2	58.8	(
	26	66 52 22.8	31 36.3	31.5	0 34 13.3	58.3	(
	28	67 55 29.0	31 29.8	33.1	0 36 9.3	57.7	(
	30	68 58 22.2	31 23.4	34.6	0 38 4.1	57.1	(
Aug.	1	70 1 2.6	31 17.0	+36.1	+0 39 57.8	+56.6	(
	3	71 3 30.2	31 10.6	37.6	0 41 50.3	56.0	(
	5	72 5 45.1	31 4.3	38.9	0 43 41.6	55.4	(
	7	73 7 47.4	30 58.0	40.2	0 45 31.7	54.8	(
	9	74 9 37.3	30 51.8	41.5	0 47 20.6	54.1	(
	11	75 11 14.7	30 45.7	+42.7	+0 49 8.2	+53.5	(
	13	76 12 40.0	30 39.6	43.8	0 50 54.5	52.8	(
	15	77 13 53.0	30 33.5	44.9	0 52 39.4	52.1	(
	17	78 14 53.9	30 27.5	45.9	0 54 23.0	51.5	(
	19	79 15 42.9	30 21.6	46.9	0 56 5.2	50.8	(
	21	80 16 20.1	30 15.6	+47.8	+0 57 46.0	+50.1	(
	23	81 16 45.4	30 9.8	48.6	0 59 25.5	49.4	(
	25	82 16 59.3	30 4.0	49.4	1 1 3.5	48.7	(
	27	83 17 1.6	29 58.3	50.1	1 2 40.1	48.0	(
	29	84 16 52.5	29 52.6	50.8	1 4 15.3	47.2	(
	31	85 16 32.2	29 47.1	+51.4	+1 5 49.0	+46.5	(
Sept.	2	86 16 0.8	29 41.5	51.9	1 7 21.2	45.7	(
	4	87 15 18.4	29 36.1	52.3	1 8 51.9	45.0	(
	6	88 14 25.1	29 30.7	52.7	1 10 21.1	44.2	(
	8	89 13 21.1	29 25.3	53.1	1 11 48.8	43.5	(
	10	90 12 6.4	29 20.0	+53.3	+1 13 15.0	+42.7	(
	12	91 10 41.3	29 14.9	53.5	1 14 39.7	41.9	(
	14	92 9 5.9	29 9.7	53.7	1 16 2.7	41.2	(
	16	93 7 20.2	29 4.6	53.8	1 17 24.3	40.4	(
	18	94 5 24.5	28 59.6	53.8	1 18 44.3	39.6	(
	20	95 3 18.8	28 54.7	+53.7	+1 20 2.7	+38.8	(
	22	96 1 3.3	28 49.8	53.6	1 21 19.6	38.0	(
	24	96 58 38.2	28 45.1	53.5	1 22 34.8	37.2	(
	26	97 56 3.6	28 40.3	53.3	1 23 48.5	36.4	(
	28	98 53 19.6	28 35.7	53.0	1 25 0.5	35.6	(
	30	99 50 26.3	28 31.1	+52.6	+1 26 10.9	+34.8	(
	2	100 47 24.0	28 26.6	+52.2	+1 27 19.8	+34.0	(

FOR GREENWICH MEAN NOON.

Heliocentric Longitude, Mean Equinox of Date.	Var. per Day.	Reduction to Orbit.	Heliocentric Latitude.	Var. per Day.	Logarithm of Radius Vector.	Var. per Day.
° ′ ″	′ ″	″	° ′ ″	″		
100 47 24.0	28 26.6	+52.2	+1 27 19.8	+34.0	0.203 7563	+2863
101 44 12.8	28 22.2	51.8	1 28 27.1	33.2	0.204 3251	2824
102 40 52.7	28 17.8	51.3	1 29 32.7	32.4	0.204 8859	2785
103 37 24.0	28 13.5	50.7	1 30 36.7	31.6	0.205 4389	2745
104 33 46.8	28 9.3	50.1	1 31 39.0	30.8	0.205 9839	2705
105 30 1.2	28 5.1	+49.4	+1 32 39.7	+29.9	0.206 5207	+2664
106 26 7.4	28 1.1	48.7	1 33 38.7	29.1	0.207 0494	2623
107 22 5.5	27 57.1	48.0	1 34 36.2	28.3	0.207 5697	2581
108 17 55.7	27 53.1	47.2	1 35 32.0	27.5	0.208 0817	2539
109 13 38.1	27 49.3	46.3	1 36 26.2	26.7	0.208 5851	2496
110 9 12.9	27 45.5	+45.4	+1 37 18.8	+25.9	0.209 0801	+2453
111 4 40.1	27 41.8	44.4	1 38 9.8	25.1	0.209 5663	2409
112 0 0.1	27 38.2	43.4	1 38 59.1	24.2	0.210 0438	2365
112 55 12.9	27 34.6	42.4	1 39 46.7	23.4	0.210 5125	2322
113 50 18.7	27 31.2	41.3	1 40 32.7	22.6	0.210 9724	2277
114 45 17.6	27 27.7	+40.2	+1 41 17.1	+21.8	0.211 4233	+2232
115 40 9.7	27 24.4	39.0	1 41 59.9	21.0	0.211 8651	2187
116 34 55.3	27 21.2	37.8	1 42 40.9	20.1	0.212 2979	2141
117 29 34.4	27 18.0	36.6	1 43 20.4	19.3	0.212 7215	2096
118 24 7.2	27 14.9	35.3	1 43 58.2	18.5	0.213 1359	2049
119 18 33.9	27 11.9	+34.0	+1 44 34.4	+17.7	0.213 5410	+2002
120 12 54.7	27 8.9	32.7	1 45 9.0	16.9	0.213 9368	1955
121 7 9.5	27 6.0	31.3	1 45 41.9	16.0	0.214 3232	1908
122 1 18.7	27 3.2	29.9	1 46 13.1	15.2	0.214 7001	1861
122 55 22.4	27 0.5	28.5	1 46 42.7	14.4	0.215 0675	1813
123 49 20.7	26 57.8	+27.0	+1 47 10.7	+13.6	0.215 4254	+1765
124 43 13.7	26 55.2	25.6	1 47 37.1	12.8	0.215 7737	1717
125 37 1.7	26 52.7	24.1	1 48 1.8	12.0	0.216 1123	1669
126 30 44.6	26 50.2	22.6	1 48 25.0	11.2	0.216 4412	1620
127 24 22.8	26 48.0	21.1	1 48 46.6	10.4	0.216 7602	1571
128 17 56.5	26 45.7	+19.5	+1 49 6.4	+ 9.5	0.217 0696	+1522
129 11 25.6	26 43.5	17.9	1 49 24.7	8.8	0.217 3691	1473
130 4 50.4	26 41.3	16.3	1 49 41.4	8.0	0.217 6587	1423
130 58 11.0	26 39.3	14.7	1 49 56.5	7.2	0.217 9384	1374
131 51 27.6	26 37.3	13.1	1 50 10.0	6.4	0.218 2082	1324
132 44 40.2	26 35.4	+11.5	+1 50 21.9	+ 5.6	0.218 4681	+1274
133 37 49.1	26 33.6	9.9	1 50 32.2	4.8	0.218 7178	1224
134 30 54.5	26 31.8	8.2	1 50 40.9	4.0	0.218 9576	1174
135 23 56.4	26 30.1	6.6	1 50 48.0	3.2	0.219 1873	1123
136 16 55.0	26 28.5	5.0	1 50 53.5	2.4	0.219 4069	1073
137 9 50.5	26 27.0	+ 3.3	+1 50 57.5	+ 1.6	0.219 6164	+1022
138 2 43.0	26 25.5	+ 1.6	1 50 59.9	+ 0.8	0.219 8157	971
138 55 32.7	26 24.2	0.0	1 51 0.7	0.0	0.220 0048	920
139 48 19.7	26 22.9	− 1.6	1 50 59.8	− 0.8	0.220 1838	869
140 41 4.2	26 21.6	3.3	1 50 57.5	1.6	0.220 3525	818
141 33 46.3	26 20.5	− 4.9	+1 50 53.5	− 2.4	0.220 5110	+ 767
142 26 26.1	26 19.4	− 6.6	+1 50 48.1	− 3.1	0.220 6592	+ 715

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. Paral-lax.
	Noon.	*Noon.*	*Noon.*	*Noon.*	*Noon.*	*Noon.*	*Noon.*	*Noon.*
	h m s	s	° ′ ″	″			″	″
Jan. 1	1 36 58.03	+0.356	+ 8 45 15.9	+2.89	0.665 0022	+607.4	20.36	1.90
2	1 37 6.97	0.388	8 46 27.5	3.07	0.666 4607	607.9	20.29	1.90
3	1 37 16.67	0.420	8 47 43.4	3.25	0.667 9203	608.3	20.22	1.89
4	1 37 27.12	0.451	8 49 3.5	3.43	0.669 3806	608.6	20.15	1.88
5	1 37 38.32	0.482	8 50 27.8	3.60	0.670 8412	608.6	20.08	1.88
6	1 37 50.26	+0.513	+ 8 51 56.4	+3.78	0.672 3015	+608.4	20.02	1.87
7	1 38 2.94	0.544	8 53 29.1	3.96	0.673 7612	608.0	19.95	1.87
8	1 38 16.35	0.574	8 55 5.9	4.12	0.675 2199	607.5	19.88	1.86
9	1 38 30.49	0.604	8 56 46.7	4.28	0.676 6772	606.9	19.82	1.85
10	1 38 45.36	0.634	8 58 31.6	4.45	0.678 1327	606.1	19.75	1.85
11	1 39 0.94	+0.664	+ 9 0 20.5	+4.62	0.679 5862	+605.1	19.68	1.84
12	1 39 17.24	0.694	9 2 13.3	4.78	0.681 0371	604.0	19.62	1.83
13	1 39 34.24	0.723	9 4 9.9	4.94	0.682 4852	602.7	19.55	1.83
14	1 39 51.94	0.752	9 6 10.5	5.10	0.683 9301	601.3	19.49	1.82
15	1 40 10.34	0.781	9 8 14.8	5.26	0.685 3713	599.7	19.42	1.82
16	1 40 29.43	+0.810	+ 9 10 23.0	+5.42	0.686 8087	+598.0	19.36	1.81
17	1 40 49.21	0.838	9 12 34.7	5.57	0.688 2418	596.2	19.29	1.80
18	1 41 9.67	0.866	9 14 50.2	5.72	0.689 6703	594.2	19.23	1.80
19	1 41 30.80	0 894	9 17 9.3	5.87	0.691 0939	592.1	19.17	1.79
20	1 41 52.60	0.922	9 19 32.1	6.02	0.692 5122	589.8	19.11	1.79
21	1 42 15.06	+0.950	+ 9 21 58.3	+6.17	0.693 9249	+587.4	19.04	1.78
22	1 42 38.18	0.977	9 24 28.1	6.32	0.695 3317	584.9	18.98	1.77
23	1 43 1.96	1.004	9 27 1.4	6.46	0.696 7322	582.2	18.92	1.77
24	1 43 26.38	1.031	9 29 38.0	6.59	0.698 1260	579.3	18.86	1.76
25	1 43 51.44	1.057	9 32 17.9	6.73	0.699 5129	576.4	18.80	1.76
26	1 44 17.13	+1.084	+ 9 35 1.1	+6.87	0.700 8926	+573.3	18.74	1.75
27	1 44 43.45	1.109	9 37 47.5	7.00	0.702 2647	570.1	18.68	1.75
28	1 45 10.38	1.135	9 40 37.1	7.13	0.703 6290	566.8	18.62	1.74
29	1 45 37.91	1.160	9 43 29.7	7.26	0.704 9853	563.4	18.56	1.74
30	1 46 6.04	1.184	9 46 25.4	7.38	0.706 3333	559.9	18.51	1.73
31	1 46 34.77	+1.209	+ 9 49 24.1	+7.51	0.707 6728	+556.3	18.45	1.72
Feb. 1	1 47 4.07	1.233	9 52 25.7	7.62	0.709 0035	552.6	18.39	1.72
2	1 47 33.95	1.257	9 55 30.1	7.74	0.710 3252	548.8	18.34	1.71
3	1 48 4.41	1.281	9 58 37.3	7.86	0.711 6377	544.9	18.28	1.71
4	1 48 35.42	1.304	10 1 47.3	7.97	0.712 9408	541.0	18.23	1.70
5	1 49 6.99	+1.327	+ 10 4 59.9	+8.08	0.714 2343	+536.9	18.17	1.70
6	1 49 39.11	1.350	10 8 15.2	8.19	0.715 5181	532.9	18.12	1.69
7	1 50 11.77	1.372	10 11 33.1	8.30	0.716 7921	528.8	18.07	1.69
8	1 50 44.96	1.394	10 14 53.5	8.40	0.718 0561	524.5	18.01	1.68
9	1 51 18.67	1.416	10 18 16.4	8.50	0.719 3098	520.2	17.96	1.68
10	1 51 52.91	+1.437	+ 10 21 41.7	+8.60	0.720 5531	+515.9	17.91	1.67
11	1 52 27.66	1.459	10 25 9.4	8.70	0.721 7859	511.4	17.86	1.67
12	1 53 2.92	1.480	10 28 39.4	8.80	0.723 0079	506.9	17.81	1.66
13	1 53 38.68	1.500	10 32 11.8	8.89	0.724 2192	502.4	17.76	1.66
14	1 54 14.94	1.521	10 35 46.3	8.98	0.725 4195	497.8	17.71	1.66
15	1 54 51.69	+1.541	+ 10 39 23.0	+9.07	0.726 6087	+493.1	17.66	1.65
16	1 55 28.92	+1.561	+ 10 43 1.9	+9.16	0.727 7866	+488.4	17.62	1.65

GREENWICH MEAN TIME.

	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
16	1 55 28.92	+1.561	+10 43 1.9	+ 9.16	0.727 7866	+488.4	17.62	1.65	4 11.3
17	1 56 6.62	1.581	10 46 42.8	9.25	0.728 9530	483.6	17.57	1.64	4 8.0
18	1 56 44.79	1.600	10 50 25.8	9.33	0.730 1079	478.8	17.52	1.64	4 4.7
19	1 57 23.44	1.620	10 54 10.8	9.41	0.731 2510	473.8	17.48	1.63	4 1.4
20	1 58 2.55	1.639	10 57 57.7	9.49	0.732 3821	468.8	17.43	1.63	3 58.1
21	1 58 42.10	+1.657	+11 1 46.4	+ 9.57	0.733 5011	+463.7	17.38	1.63	3 54.8
22	1 59 22.10	1.676	11 5 36.9	9.64	0.734 6078	458.5	17.34	1.62	3 51.6
23	2 0 2.54	1.694	11 9 29.2	9.71	0.735 7021	453.3	17.30	1.62	3 48.3
24	2 0 43.40	1.711	11 13 23.2	9.78	0.736 7839	448.1	17.25	1.61	3 45.1
25	2 1 24.69	1.729	11 17 18.8	9.85	0.737 8530	442.8	17.21	1.61	3 41.8
26	2 2 6.40	+1.746	+11 21 16.0	+ 9.91	0.738 9094	+437.5	17.17	1.60	3 38.6
27	2 2 48.52	1.763	11 25 14.7	9.98	0.739 9530	432.1	17.13	1.60	3 35.3
28	2 3 31.04	1.780	11 29 15.0	10.04	0.740 9836	426.7	17.09	1.60	3 32.1
r. 1	2 4 13.96	1.796	11 33 16.7	10.10	0.742 0013	421.3	17.05	1.59	3 28.9
2	2 4 57.26	1.812	11 37 19.7	10.15	0.743 0059	415.8	17.01	1.59	3 25.7
3	2 5 40.94	+1.828	+11 41 24.1	+10.21	0.743 9972	+410.3	16.97	1.59	3 22.5
4	2 6 25.00	1.843	11 45 29.7	10.26	0.744 9754	404.8	16.93	1.58	3 19.3
5	2 7 9.42	1.858	11 49 36.5	10.31	0.745 9403	399.3	16.89	1.58	3 16.1
6	2 7 54.20	1.873	11 53 44.5	10.36	0.746 8920	393.8	16.86	1.58	3 12.9
7	2 8 39.34	1.888	11 57 53.7	10.40	0.747 8305	388.2	16.82	1.57	3 9.7
8	2 9 24.84	+1.903	+12 2 3.9	+10.45	0.748 7556	+382.7	16.79	1.57	3 6.5
9	2 10 10.68	1.917	12 6 15.2	10.49	0.749 6673	377.1	16.75	1.57	3 3.4
10	2 10 56.85	1.931	12 10 27.4	10.53	0.750 5655	371.4	16.72	1.56	3 0.2
11	2 11 43.36	1.944	12 14 40.6	10.57	0.751 4501	365.8	16.68	1.56	2 57.0
12	2 12 30.19	1.958	12 18 54.7	10.61	0.752 3211	360.1	16.65	1.56	2 53.9
13	2 13 17.35	+1.972	+12 23 9.7	+10.64	0.753 1784	+354.4	16.62	1.55	2 50.7
14	2 14 4.83	1.985	12 27 25.4	10.67	0.754 0220	348.7	16.58	1.55	2 47.6
15	2 14 52.62	1.998	12 31 42.0	10.71	0.754 8519	342.9	16.55	1.55	2 44.4
16	2 15 40.72	2.010	12 35 59.3	10.74	0.755 6680	337.2	16.52	1.54	2 41.3
17	2 16 29.12	2.023	12 40 17.3	10.76	0.756 4703	331.4	16.49	1.54	2 38.2
18	2 17 17.82	+2.035	+12 44 36.0	+10.79	0.757 2586	+325.6	16.46	1.54	2 35.1
19	2 18 6.82	2.047	12 48 55.3	10.82	0.758 0330	319.8	16.43	1.54	2 32.0
20	2 18 56.10	2.059	12 53 15.1	10.84	0.758 7934	313.9	16.40	1.53	2 28.8
21	2 19 45.67	2.071	12 57 35.4	10.86	0.759 5396	308.0	16.37	1.53	2 25.7
22	2 20 35.51	2.082	13 1 56.2	10.88	0.760 2717	302.1	16.35	1.53	2 22.6
23	2 21 25.62	+2.093	+13 6 17.5	+10.89	0.760 9895	+296.1	16.32	1.53	2 19.5
24	2 22 16.00	2.104	13 10 39.1	10.91	0.761 6929	290.1	16.29	1.52	2 16.4
25	2 23 6.64	2.115	13 15 1.1	10.92	0.762 3821	284.1	16.27	1.52	2 13.3
26	2 23 57.52	2.125	13 19 23.3	10.93	0.763 0568	278.1	16.24	1.52	2 10.2
27	2 24 48.65	2.135	13 23 45.8	10.94	0.763 7171	272.1	16.22	1.52	2 7.2
28	2 25 40.02	+2.145	+13 28 8.4	+10.95	0.764 3631	+266.1	16.19	1.51	2 4.1
29	2 26 31.63	2.155	13 32 31.2	10.95	0.764 9946	260.1	16.17	1.51	2 1.0
30	2 27 23.45	2.164	13 36 54.2	10.96	0.765 6117	254.1	16.15	1.51	1 57.9
31	2 28 15.50	2.173	13 41 17.2	10.96	0.766 2144	248.1	16.12	1.51	1 54.9
pr. 1	2 29 7.77	2.182	13 45 40.3	10.96	0.766 8028	242.2	16.10	1.51	1 51.8
2	2 30 0.25	+2.191	+13 50 3.4	+10.96	0.767 3768	+236.2	16.08	1.50	1 48.7
3	2 30 52.94	+2.200	+13 54 26.5	+10.96	0.767 9363	+230.1	16.06	1.50	1 45.7

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. Paral-lax.
	Noon.	Noon.	Noon.	Noon.	Noon.	Noon.	Noon.	Noon.
	h m s	s	° ′ ″	″			″	″
Apr. 1	2 29 7.77	+2.182	+13 45 40.3	+10.96	0.766 8028	+242.2	16.10	1.51
2	2 30 0.25	2.191	13 50 3.4	10.96	0.767 3768	236.2	16.08	1.50
3	2 30 52.94	2.200	13 54 26.5	10.96	0.767 9363	230.1	16.06	1.50
4	2 31 45.83	2.208	13 58 49.5	10.96	0.768 4814	224.1	16.04	1.50
5	2 32 38.92	2.216	14 3 12.4	10.95	0.769 0121	218.1	16.02	1.50
6	2 33 32.20	+2.224	+14 7 35.1	+10.94	0.769 5284	+212.1	16.00	1.50
7	2 34 25.66	2.231	14 11 57.7	10.94	0.770 0303	206.1	15.98	1.49
8	2 35 19.31	2.239	14 16 20.1	10.93	0.770 5179	200.2	15.96	1.49
9	2 36 13.14	2.247	14 20 42.2	10.92	0.770 9911	194.2	15.95	1.49
10	2 37 7.15	2.254	14 25 4.1	10.91	0.771 4500	188.2	15.93	1.49
11	2 38 1.32	+2.261	+14 29 25.7	+10.89	0.771 8944	+182.2	15.91	1.49
12	2 38 55.66	2.268	14 33 46.9	10.88	0.772 3244	176.2	15.90	1.49
13	2 39 50.15	2.274	14 38 7.8	10.86	0.772 7400	170.1	15.88	1.48
14	2 40 44.81	2.281	14 42 28.3	10.84	0.773 1411	164.1	15.87	1.48
15	2 41 39.62	2.287	14 46 48.3	10.82	0.773 5277	158.1	15.85	1.48
16	2 42 34.58	+2.293	+14 51 7.9	+10.81	0.773 8999	+152.1	15.84	1.48
17	2 43 29.69	2.299	14 55 27.0	10.79	0.774 2576	146.0	15.83	1.48
18	2 44 24.94	2.305	14 59 45.6	10.76	0.774 6007	139.9	15.82	1.48
19	2 45 20.32	2.311	15 4 3.7	10.74	0.774 9292	133.8	15.80	1.48
20	2 46 15.84	2.316	15 8 21.1	10.71	0.775 2431	127.8	15.79	1.48
21	2 47 11.48	+2.321	+15 12 37.9	+10.69	0.775 5424	+121.7	15.78	1.48
22	2 48 7.23	2.325	15 16 54.1	10.66	0.775 8270	115.5	15.77	1.47
23	2 49 3.10	2.330	15 21 9.5	10.63	0.776 0970	109.5	15.76	1.47
24	2 49 59.07	2.334	15 25 24.2	10.60	0.776 3524	103.4	15.75	1.47
25	2 50 55.15	2.338	15 29 38.1	10.56	0.776 5932	97.3	15.74	1.47
26	2 51 51.32	+2.342	+15 33 51.2	+10.53	0.776 8195	+ 91.2	15.73	1.47
27	2 52 47.59	2.346	15 38 3.5	10.50	0.777 0311	85.1	15.73	1.47
28	2 53 43.94	2.350	15 42 15.0	10.46	0.777 2282	79.1	15.72	1.47
29	2 54 40.38	2.353	15 46 25.6	10.42	0.777 4108	73.1	15.71	1.47
30	2 55 36.89	2.356	15 50 35.3	10.39	0.777 5789	67.0	15.71	1.47
May 1	2 56 33.47	+2.359	+15 54 44.1	+10.35	0.777 7325	+ 61.0	15.70	1.47
2	2 57 30.12	2.362	15 58 52.0	10.31	0.777 8716	55.0	15.70	1.47
3	2 58 26.83	2.364	16 2 58.8	10.26	0.777 9963	49.0	15.69	1.47
4	2 59 23.60	2.367	16 7 4.7	10.22	0.778 1067	42.9	15.69	1.47
5	3 0 20.43	2.369	16 11 9.5	10.18	0.778 2027	37.0	15.68	1.47
6	3 1 17.31	+2.371	+16 15 13.3	+10.14	0.778 2845	+ 31.1	15.68	1.47
7	3 2 14.24	2.373	16 19 16.0	10.09	0.778 3519	25.1	15.68	1.47
8	3 3 11.22	2.375	16 23 17.6	10.04	0.778 4051	19.2	15.68	1.47
9	3 4 8.23	2.376	16 27 18.1	10.00	0.778 4439	13.2	15.68	1.47
10	3 5 5.27	2.378	16 31 17.5	9.95	0.778 4684	7.3	15.68	1.47
11	3 6 2.35	+2.379	+16 35 15.7	+ 9.90	0.778 4787	+ 1.3	15.67	1.47
12	3 6 59.45	2.380	16 39 12.8	9.85	0.778 4746	− 4.7	15.67	1.47
13	3 7 56.57	2.381	16 43 8.7	9.80	0.778 4562	10.6	15.68	1.47
14	3 8 53.72	2.381	16 47 3.3	9.75	0.778 4235	16.6	15.68	1.47
15	3 9 50.88	2.382	16 50 56.7	9.70	0.778 3764	22.6	15.68	1.47
16	3 10 48.05	+2.382	+16 54 48.9	+ 9.65	0.778 3150	− 28.6	15.68	1.47
17	3 11 45.23	+2.382	+16 58 39.8	+ 9.59	0.778 2392	− 34.6	15.68	1.47

GREENWICH MEAN TIME.

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
3 11 45.23	+2.382	+16 58 39.8	+9.59	0.778 2392	− 34.6	15.68	1.47	23 30.3
3 12 42.40	2.382	17 2 29.4	9.54	0.778 1491	40.5	15.69	1.47	23 27.4
3 13 39.57	2.382	17 6 17.6	9.48	0.778 0446	46.5	15.69	1.47	23 24.4
3 14 36.72	2.381	17 10 4.5	9.42	0.777 9257	52.5	15.69	1.47	23 21.4
3 15 33.86	2.380	17 13 50.0	9.37	0.777 7925	58.5	15.70	1.47	23 18.4
3 16 30.98	+2.379	+17 17 34.1	+9.31	0.777 6449	− 64.5	15.70	1.47	23 15.5
3 17 28.07	2.378	17 21 16.8	9.25	0.777 4829	70.5	15.71	1.47	23 12.5
3 18 25.12	2.376	17 24 58.1	9.19	0.777 3067	76.4	15.72	1.47	23 9.5
3 19 22.13	2.375	17 28 37.9	9.13	0.777 1162	82.3	15.72	1.47	23 6.5
3 20 19.10	2.373	17 32 16.3	9.07	0.776 9116	88.2	15.73	1.47	23 3.5
3 21 16.01	+2.370	+17 35 53.1	+9.00	0.776 6927	− 94.1	15.74	1.47	23 0.5
3 22 12.88	2.368	17 39 28.5	8.94	0.776 4598	100.0	15.75	1.47	22 57.5
3 23 9.68	2.365	17 43 2.3	8.88	0.776 2128	105.9	15.76	1.47	22 54.5
3 24 6.42	2.363	17 46 34.6	8.81	0.775 9517	111.7	15.77	1.47	22 51.5
3 25 3.09	2.360	17 50 5.3	8.75	0.775 6766	117.6	15.78	1.47	22 48.5
3 25 59.69	+2.357	+17 53 34.5	+8.68	0.775 3875	−123.4	15.79	1.48	22 45.5
3 26 56.21	2.353	17 57 2.1	8.62	0.775 0844	129.2	15.80	1.48	22 42.5
3 27 52.64	2.350	18 0 28.1	8.55	0.774 7675	134.9	15.81	1.48	22 39.5
3 28 48.99	2.346	18 3 52.5	8.48	0.774 4366	140.7	15.82	1.48	22 36.5
3 29 45.24	2.342	18 7 15.3	8.42	0.774 0920	146.5	15.83	1.48	22 33.5
3 30 41.40	+2.338	+18 10 36.5	+8.35	0.773 7334	−152.3	15.85	1.48	22 30.6
3 31 37.46	2.334	18 13 56.1	8.28	0.773 3610	158.1	15.86	1.48	22 27.6
3 32 33.42	2.329	18 17 14.0	8.21	0.772 9748	163.8	15.87	1.48	22 24.6
3 33 29.27	2.325	18 20 30.2	8.14	0.772 5748	169.5	15.89	1.49	22 21.5
3 34 25.01	2.320	18 23 44.8	8.07	0.772 1610	175.3	15.90	1.49	22 18.5
3 35 20.63	+2.315	+18 26 57.7	+8.00	0.771 7335	−181.0	15.92	1.49	22 15.5
3 36 16.13	2.310	18 30 9.0	7.93	0.771 2921	186.8	15.94	1.49	22 12.5
3 37 11.49	2.304	18 33 18.5	7.86	0.770 8369	192.6	15.95	1.49	22 9.5
3 38 6.72	2.298	18 36 26.3	7.79	0.770 3678	198.4	15.97	1.49	22 6.5
3 39 1.81	2.293	18 39 32.4	7.72	0.769 8848	204.1	15.99	1.49	22 3.5
3 39 56.76	+2.286	+18 42 36.7	+7.64	0.769 3880	−209.9	16.01	1.50	22 0.4
3 40 51.54	2.279	18 45 39.3	7.57	0.768 8775	215.6	16.03	1.50	21 57.4
3 41 46.17	2.273	18 48 40.0	7.50	0.768 3531	221.3	16.04	1.50	21 54.4
3 42 40.63	2.266	18 51 39.1	7.42	0.767 8151	227.0	16.06	1.50	21 51.3
3 43 34.92	2.258	18 54 36.3	7.35	0.767 2634	232.7	16.08	1.50	21 48.3
3 44 29.02	+2.250	+18 57 31.8	+7.27	0.766 6981	−238.4	16.10	1.51	21 45.3
3 45 22.94	2.243	19 0 25.4	7.20	0.766 1193	244.0	16.13	1.51	21 42.2
3 46 16.67	2.235	19 3 17.2	7.12	0.765 5270	249.6	16.15	1.51	21 39.2
3 47 10.21	2.227	19 6 7.2	7.05	0.764 9211	255.2	16.17	1.51	21 36.1
3 48 3.54	2.218	19 8 55.4	6.97	0.764 3019	260.7	16.19	1.51	21 33.0
3 48 56.66	+2.209	+19 11 41.8	+6.89	0.763 6692	−266.4	16.22	1.52	21 30.0
3 49 49.56	2.200	19 14 26.3	6.82	0.763 0232	271.9	16.24	1.52	21 27.0
3 50 42.25	2.190	19 17 9.1	6.74	0.762 3640	277.4	16.27	1.52	21 23.9
3 51 34.70	2.181	19 19 49.9	6.66	0.761 6917	282.9	16.29	1.52	21 20.8
3 52 26.93	2.171	19 22 29.0	6.59	0.761 0062	288.3	16.32	1.53	21 17.8
3 53 18.92	+2.161	+19 25 6.2	+6.51	0.760 3077	−293.8	16.34	1.53	21 14.7
3 54 10.67	+2.151	+19 27 41.5	+6.43	0.759 5962	−299.2	16.37		11.8

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 Par lax
	Noon.	*Noon.*	*Noon.*	*Noon.*	*Noon.*	*Noon.*	*Noon.*	*Noo*
	h m s	s	° ′ ″	″			″	″
July 1	3 53 18.92	+2.161	+19 25 6.2	+6.51	0.760 3077	−293.8	16.34	1.5
2	3 54 10.67	2.151	19 27 41.5	6.43	0.759 5962	299.2	16.37	1.5
3	3 55 2.17	2.140	19 30 14.9	6.35	0.758 8717	304.5	16.40	1.5
4	3 55 53.41	2.130	19 32 46.5	6.28	0.758 1344	309.9	16.43	1.5
5	3 56 44.40	2.119	19 35 16.2	6.20	0.757 3842	315.3	16.45	1.5
6	3 57 35.12	+2.108	+19 37 44.1	+6.12	0.756 6210	−320.6	16.48	1.5
7	3 58 25.58	2.096	19 40 10.2	6.05	0.755 8451	326.0	16.51	1.5
8	3 59 15.75	2.085	19 42 34.3	5.97	0.755 0564	331.3	16.54	1.5
9	4 0 5.65	2.073	19 44 56.6	5.89	0.754 2549	336.6	16.57	1.5
10	4 0 55.27	2.061	19 47 17.0	5.81	0.753 4407	341.9	16.60	1.5
11	4 1 44.59	+2.049	+19 49 35.6	+5.74	0.752 6138	−347.2	16.64	1.5
12	4 2 33.60	2.036	19 51 52.3	5.66	0.751 7742	352.5	16.67	1.5
13	4 3 22.31	2.023	19 54 7.1	5.58	0.750 9220	357.7	16.70	1.5
14	4 4 10.69	2.009	19 56 19.9	5.50	0.750 0571	363.0	16.73	1.5
15	4 4 58.75	1.995	19 58 30.9	5.42	0.749 1796	368.3	16.77	1.5
16	4 5 46.47	+1.981	+20 0 40.0	+5.34	0.748 2895	−373.4	16.80	1.5
17	4 6 33.86	1.967	20 2 47.2	5.26	0.747 3872	378.5	16.84	1.5
18	4 7 20.90	1.952	20 4 52.6	5.18	0.746 4727	383.6	16.87	1.5
19	4 8 7.58	1.938	20 6 56.0	5.10	0.745 5459	388.7	16.91	1.5
20	4 8 53.90	1.922	20 8 57.6	5.03	0.744 6071	393.7	16.95	1.5
21	4 9 39.84	+1.906	+20 10 57.3	+4.95	0.743 6562	−398.7	16.98	1.5
22	4 10 25.41	1.891	20 12 55.0	4.87	0.742 6935	403.6	17.02	1.5
'23	4 11 10.59	1.874	20 14 50.9	4.79	0.741 7189	408.5	17.06	1.5
24	4 11 55.38	1.858	20 16 44.9	4.71	0.740 7326	413.4	17.10	1.6
25	4 12 39.77	1.841	20 18 37.0	4.63	0.739 7348	418.1	17.14	1.6
26	4 13 23.75	+1.824	+20 20 27.3	+4.55	0.738 7255	−422.9	17.18	1.6
27	4 14 7.32	1.807	20 22 15.6	4.48	0.737 7049	427.6	17.22	1.6
28	4 14 50.47	1.789	20 24 2.1	4.40	0.736 6731	432.2	17.26	1.6
29	4 15 33.20	1.771	20 25 46.8	4.32	0.735 6302	436.8	17.30	1.6
30	4 16 15.49	1.753	20 27 29.6	4.25	0.734 5764	441.4	17.34	1.6
31	4 16 57.34	+1.734	+20 29 10.6	+4.17	0.733 5116	−445.9	17.39	1.6
Aug. 1	4 17 38.74	1.716	20 30 49.7	4.09	0.732 4361	450.4	17.43	1.6
2	4 18 19.69	1.697	20 32 27.0	4.01	0.731 3499	454.8	17.47	1.6
3	4 19 0.18	1.677	20 34 2.4	3.94	0.730 2531	459.2	17.52	1.6
4	4 19 40.20	1.658	20 35 36.0	3.86	0.729 1458	463.5	17.56	1.6
5	4 20 19.74	+1.638	+20 37 7.7	+3.78	0.728 0281	−467.8	17.61	1.6
6	4 20 58.80	1.617	20 38 37.6	3.71	0.726 9001	472.1	17.65	1.6
7	4 21 37.37	1.597	20 40 5.7	3.63	0.725 7619	476.4	17.70	1.6
8	4 22 15.44	1.576	20 41 32.0	3.56	0.724 6136	480.5	17.74	1.6
9	4 22 53.00	1.554	20 42 56.4	3.48	0.723 4554	484.6	17.79	1.6
10	4 23 30.05	+1.533	+20 44 19.1	+3.41	0.722 2874	−488.7	17.84	1.6
11	4 24 6.58	1.511	20 45 39.9	3.33	0.721 1096	492.7	17.89	1.6
12	4 24 42.57	1.488	20 46 58.9	3.25	0.719 9223	496.7	17.94	1.6
13	4 25 18.02	1.465	20 48 16.1	3.18	0.718 7257	500.5	17.99	1.6
14	4 25 52.91	1.442	20 49 31.5	3.11	0.717 5199	504.3	18.04	1.6
15	4 26 27.24	+1.419	+20 50 45.2	+3.03	0.716 3051	−508.0	18.09	1.6
16	4 27 1.01	+1.395	+20 51 57.1	+2.96	0.715 0815	−511.6	18.14	1.7

GREENWICH MEAN TIME.

	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
	4 27 1.01	+1.395	+20 51 57.1	+2.96	0.715 0815	−511.6	18.14	1.70	18 47.1
	4 27 34.19	1.370	20 53 7.1	2.88	0.713 8494	515.1	18.19	1.70	18 43.7
	4 28 6.79	1.346	20 54 15.4	2.81	0.712 6089	518.6	18.24	1.71	18 40.3
	4 28 38.79	1.321	20 55 22.0	2.74	0.711 3603	521.9	18.29	1.71	18 36.9
	4 29 10.19	1.295	20 56 26.7	2.66	0.710 1037	525.2	18.35	1.72	18 33.5
	4 29 40.97	+1.270	+20 57 29.7	+2.59	0.708 8394	−528.4	18.40	1.72	18 30.1
	4 30 11.14	1.244	20 58 31.0	2.52	0.707 5676	531.4	18.45	1.73	18 26.6
	4 30 40.68	1.218	20 59 30.5	2.44	0.706 2886	534.4	18.51	1.73	18 23.2
	4 31 9.58	1.191	21 0 28.3	2.37	0.705 0026	537.2	18.56	1.74	18 19.7
	4 31 37.84	1.164	21 1 24.4	2.30	0.703 7098	540.0	18.62	1.74	18 16.2
5	4 32 5.46	+1.137	+21 2 18.8	+2.23	0.702 4106	−542.6	18.68	1.75	18 12.8
7	4 32 32.42	1.110	21 3 11.4	2.16	0.701 1051	545.2	18.73	1.75	18 9.3
8	4 32 58.72	1.082	21 4 2.4	2.09	0.699 7937	547.6	18.79	1.76	18 5.8
29	4 33 24.34	1.054	21 4 51.6	2.02	0.698 4765	550.0	18.85	1.76	18 2.3
30	4 33 49.29	1.025	21 5 39.2	1.95	0.697 1538	552.2	18.90	1.77	17 58.7
31	4 34 13.56	+0.997	+21 6 25.0	+1.88	0.695 8258	−554.4	18.96	1.77	17 55.2
. 1	4 34 37.14	0.968	21 7 9.2	1.81	0.694 4928	556.4	19.02	1.78	17 51.6
2	4 35 0.01	0.939	21 7 51.7	1.74	0.693 1551	558.3	19.08	1.78	17 48.1
3	4 35 22.19	0.909	21 8 32.6	1.67	0.691 8129	560.2	19.14	1.79	17 44.5
4	4 35 43.65	0.879	21 9 11.8	1.60	0.690 4664	561.9	19.20	1.79	17 40.9
5	4 36 4.39	+0.849	+21 9 49.3	+1.53	0.689 1159	−563.5	19.26	1.80	17 37.3
6	4 36 24.40	0.818	21 10 25.1	1.46	0.687 7618	564.9	19.32	1.81	17 33.7
7	4 36 43.67	0.788	21 10 59.3	1.39	0.686 4043	566.3	19.38	1.81	17 30.1
8	4 37 2.20	0.756	21 11 31.9	1.32	0.685 0437	567.5	19.44	1.82	17 26.5
9	4 37 19.97	0.725	21 12 2.8	1.25	0.683 6803	568.6	19.50	1.82	17 22.8
10	4 37 36.98	+0.693	+21 12 32.1	+1.19	0.682 3146	−569.5	19.56	1.83	17 19.2
11	4 37 53.22	0.660	21 12 59.8	1.12	0.680 9470	570.2	19.62	1.83	17 15.5
12	4 38 8.68	0.628	21 13 25.8	1.05	0.679 5777	570.8	19.68	1.84	17 11.8
13	4 38 23.36	0.595	21 13 50.2	0.98	0.678 2072	571.2	19.75	1.85	17 8.1
14	4 38 37.24	0.562	21 14 13.0	0.92	0.676 8359	571.5	19.81	1.85	17 4.4
15	4 38 50.33	+0.529	+21 14 34.2	+0.85	0.675 4642	−571.6	19.87	1.86	17 0.7
16	4 39 2.61	0.495	21 14 53.7	0.78	0.674 0925	571.5	19.93	1.86	16 57.0
17	4 39 14.08	0.461	21 15 11.7	0.71	0.672 7212	571.2	20.00	1.87	16 53.2
18	4 39 24.74	0.427	21 15 28.0	0.65	0.671 3509	570.7	20.06	1.88	16 49.4
19	4 39 34.58	0.393	21 15 42.8	0.58	0.669 9820	570.0	20.12	1.88	16 45.7
20	4 39 43.59	+0.358	+21 15 55.9	+0.51	0.668 6148	−569.2	20.19	1.89	16 41.9
21	4 39 51.78	0.324	21 16 7.5	0.45	0.667 2499	568.2	20.25	1.89	16 38.1
22	4 39 59.14	0.289	21 16 17.4	0.38	0.665 8877	567.0	20.31	1.90	16 34.2
23	4 40 5.67	0.254	21 16 25.8	0.32	0.664 5287	565.5	20.38	1.90	16 30.4
24	4 40 11.35	0.219	21 16 32.6	0.25	0.663 1733	563.9	20.44	1.91	16 26.6
25	4 40 16.20	+0.184	+21 16 37.9	+0.19	0.661 8220	−562.1	20.50	1.92	16 22.7
26	4 40 20.20	0.149	21 16 41.5	0.12	0.660 4753	560.1	20.57	1.92	16 18.8
27	4 40 23.36	0.114	21 16 43.6	+0.05	0.659 1337	557.9	20.63	1.93	16 14.9
28	4 40 25.67	0.078	21 16 44.1	−0.01	0.657 7976	555.5	20.70	1.94	16 11.0
29	4 40 27.13	0.043	21 16 43.1	0.08	0.656 4675	552.9	20.76	1.94	16 7.1
30	4 40 27.74	+0.008	+21 16 40.4	−0.14	0.655 1439	−550.1	20.82	1.95	16 3.2
t. 1	4 40 27.50	−0.028	+21 16 36.2	−0.21	0.653 8271	−547.2	20.89	1.95	15 59.2

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.
	Noon.	*Noon.*	*Noon.*	*Noon.*	*Noon.*	*Noon.*	*Noon.*	*Noon.*
	h m s	s	° ′ ″	″			″	″
Oct. 1	4 40 27.50	−0.028	+21 16 36.2	−0.21	0.653 8271	−547.2	20.89	1.95
2	4 40 26.41	0.063	21 16 30.5	0.27	0.652 5178	543.9	20.95	1.96
3	4 40 24.46	0.099	21 16 23.2	0.34	0.651 2163	540.6	21.01	1.96
4	4 40 21.66	0.135	21 16 14.3	0.40	0.649 9232	537.0	21.07	1.97
5	4 40 18.00	0.170	21 16 3.9	0.47	0.648 6390	533.1	21.14	1.98
6	4 40 13.48	−0.206	+21 15 51.8	−0.53	0.647 3644	−529.0	21.20	1.98
7	4 40 8.11	0.242	21 15 38.2	0.60	0.646 0998	524.7	21.26	1.99
8	4 40 1.87	0.278	21 15 23.1	0.66	0.644 8459	520.2	21.32	1.99
9	4 39 54.77	0.314	21 15 6.4	0.73	0.643 6032	515.4	21.38	2.00
10	4 39 46.82	0.349	21 14 48.1	0.79	0.642 3724	510.3	21.44	2.00
11	4 39 38.01	−0.385	+21 14 28.3	−0.86	0.641 1540	−505.1	21.50	2.01
12	4 39 28.35	0.420	21 14 6.9	0.92	0.639 9487	499.4	21.56	2.02
13	4 39 17.85	0.455	21 13 44.0	0.99	0.638 7570	493.6	21.62	2.02
14	4 39 6.50	0.490	21 13 19.5	1.05	0.637 5796	487.5	21.68	2.03
15	4 38 54.32	0.525	21 12 53.5	1.12	0.636 4172	481.1	21.74	2.03
16	4 38 41.31	−0.559	+21 12 25.9	−1.18	0.635 2703	−474.5	21.80	2.04
17	4 38 27.47	0.594	21 11 56.8	1.24	0.634 1396	467.7	21.85	2.04
18	4 38 12.82	0.628	21 11 26.3	1.31	0.633 0256	460.6	21.91	2.05
19	4 37 57.35	0.661	21 10 54.1	1.37	0.631 9291	453.2	21.96	2.05
20	4 37 41.09	0.694	21 10 20.5	1.43	0.630 8506	445.5	22.02	2.06
21	4 37 24.04	−0.726	+21 9 45.3	−1.50	0.629 7907	−437.7	22.07	2.06
22	4 37 6.22	0.759	21 9 8.7	1.56	0.628 7501	429.5	22.13	2.07
23	4 36 47.62	0.791	21 8 30.5	1.62	0.627 7292	421.2	22.18	2.07
24	4 36 28.27	0.822	21 7 50.9	1.68	0.626 7287	412.6	22.23	2.08
25	4 36 8.18	0.852	21 7 9.9	1.74	0.625 7491	403.7	22.28	2.08
26	4 35 47.36	−0.882	+21 6 27.4	−1.80	0.624 7910	−394.7	22.33	2.09
27	4 35 25.82	0.912	21 5 43.5	1.86	0.623 8548	385.4	22.38	2.09
28	4 35 3.58	0.941	21 4 58.1	1.92	0.622 9413	375.9	22.43	2.10
29	4 34 40.65	0.970	21 4 11.2	1.98	0.622 0508	366.2	22.47	2.10
30	4 34 17.04	0.998	21 3 23.0	2.04	0.621 1839	356.2	22.52	2.11
31	4 33 52.76	−1.025	+21 2 33.4	−2.10	0.620 3411	−346.1	22.56	2.11
Nov. 1	4 33 27.84	1.052	21 1 42.4	2.15	0.619 5230	335.8	22.60	2.11
2	4 33 2.28	1.078	21 0 50.1	2.21	0.618 7301	325.0	22.64	2.12
3	4 32 36.10	1.104	20 59 56.5	2.26	0.617 9630	314.2	22.68	2.12
4	4 32 9.32	1.128	20 59 1.6	2.31	0.617 2221	303.2	22.72	2.12
5	4 31 41.96	−1.152	+20 58 5.4	−2.37	0.616 5080	−291.9	22.76	2.13
6	4 31 14.03	1.175	20 57 7.9	2.42	0.615 8212	280.4	22.80	2.13
7	4 30 45.55	1.198	20 56 9.1	2.47	0.615 1622	268.7	22.83	2.13
8	4 30 16.54	1.219	20 55 9.1	2.52	0.614 5315	256.8	22.86	2.14
9	4 29 47.03	1.240	20 54 7.9	2.57	0.613 9296	244.7	22.90	2.14
10	4 29 17.03	−1.260	+20 53 5.5	−2.62	0.613 3570	−232.4	22.93	2.14
11	4 28 46.56	1.279	20 52 1.9	2.67	0.612 8141	219.9	22.95	2.15
12	4 28 15.65	1.297	20 50 57.3	2.71	0.612 3014	207.3	22.98	2.15
13	4 27 44.33	1.313	20 49 51.7	2.75	0.611 8192	194.5	23.01	2.15
14	4 27 12.61	1.329	20 48 45.1	2.79	0.611 3680	181.5	23.03	2.15
15	4 26 40.52	−1.344	+20 47 37.6	−2.83	0.610 9481	−168.4	23.05	2.16
16	4 26 8.08	−1.358	+20 46 29.1	−2.87	0.610 5600	−155.1	23.07	2.16

GREENWICH MEAN TIME.

	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
Dec. 16	4 26 8.08	−1.358	+20 46 29.1	−2.87	0.610 5600	−155.1	23.07	2.16	12 43.8
17	4 25 35.32	1.371	20 45 19.8	2.91	0.610 2038	141.7	23.09	2.16	12 39.3
18	4 25 2.27	1.382	20 44 9.6	2.94	0.609 8800	128.1	23.11	2.16	12 34.9
19	4 24 28.96	1.393	20 42 58.7	2.97	0.609 5887	114.6	23.13	2.16	12 30.4
20	4 23 55.40	1.403	20 41 47.0	3.00	0.609 3301	100.9	23.14	2.16	12 25.9
21	4 23 21.64	−1.411	+20 40 34.6	−3.03	0.609 1044	− 87.1	23.15	2.16	12 21.4
22	4 22 47.69	1.418	20 39 21.6	3.05	0.608 9118	73.4	23.16	2.17	12 16.9
23	4 22 13.57	1.424	20 38 8.1	3.08	0.608 7523	59.5	23.17	2.17	12 12.4
24	4 21 39.33	1.429	20 36 54.0	3.10	0.608 6262	45.6	23.18	2.17	12 7.9
25	4 21 4.97	1.433	20 35 39.5	3.11	0.608 5334	31.7	23.18	2.17	12 3.4
26	4 20 30.54	−1.436	+20 34 24.5	−3.13	0.608 4741	− 17.7	23.18	2.17	11 58.9
27	4 19 56.05	1.438	20 33 9.2	3.14	0.608 4483	− 3.8	23.19	2.17	11 54.4
28	4 19 21.53	1.439	20 31 53.7	3.15	0.608 4561	+ 10.2	23.19	2.17	11 49.9
29	4 18 47.00	1.438	20 30 37.9	3.16	0.608 4975	24.2	23.18	2.17	11 45.4
30	4 18 12.49	1.437	20 29 22.0	3.17	0.608 5725	38.2	23.18	2.17	11 40.9
Jan. 1	4 17 38.03	−1.434	+20 28 5.9	−3.17	0.608 6810	+ 52.2	23.18	2.17	11 36.4
2	4 17 3.65	1.431	20 26 49.9	3.17	0.608 8231	66.2	23.18	2.17	11 31.9
3	4 16 29.36	1.426	20 25 33.9	3.17	0.608 9987	80.1	23.16	2.17	11 27.4
4	4 15 55.20	1.421	20 24 17.9	3.16	0.609 2077	94.0	23.15	2.16	11 22.9
5	4 15 21.18	1.414	20 23 2.2	3.15	0.609 4501	107.9	23.13	2.16	11 18.4
6	4 14 47.34	−1.406	+20 21 46.6	−3.14	0.609 7257	+121.7	23.12	2.16	11 13.9
7	4 14 13.71	1.397	20 20 31.4	3.13	0.610 0344	135.5	23.10	2.16	11 9.4
8	4 13 40.30	1.387	20 19 16.5	3.11	0.610 3761	149.2	23.08	2.16	11 4.9
9	4 13 7.14	1.376	20 18 2.2	3.09	0.610 7505	162.8	23.06	2.16	11 0.4
10	4 12 34.27	1.363	20 16 48.3	3.06	0.611 1576	176.3	23.04	2.15	10 56.0
11	4 12 1.70	−1.350	+20 15 35.1	−3.04	0.611 5969	+189.8	23.02	2.15	10 51.5
12	4 11 29.46	1.336	20 14 22.5	3.01	0.612 0684	203.1	22.99	2.15	10 47.0
13	4 10 57.58	1.320	20 13 10.6	2.98	0.612 5717	216.3	22.97	2.15	10 42.6
14	4 10 26.08	1.304	20 11 59.6	2.94	0.613 1064	229.3	22.94	2.14	10 38.1
15	4 9 54.99	1.286	20 10 49.5	2.90	0.613 6722	242.2	22.91	2.14	10 33.7
16	4 9 24.33	−1.268	+20 9 40.4	−2.86	0.614 2687	+254.9	22.88	2.14	10 29.2
17	4 8 54.12	1.249	20 8 32.3	2.82	0.614 8955	267.4	22.85	2.14	10 24.8
18	4 8 24.39	1.228	20 7 25.2	2.77	0.615 5522	279.8	22.81	2.13	10 20.4
19	4 7 55.16	1.207	20 6 19.4	2.72	0.616 2383	291.9	22.77	2.13	10 16.0
20	4 7 26.45	1.185	20 5 14.8	2.66	0.616 9533	303.8	22.74	2.13	10 11.6
21	4 6 58.28	−1.162	+20 4 11.5	−2.61	0.617 6968	+315.6	22.70	2.12	10 7.2
22	4 6 30.67	1.138	20 3 9.6	2.55	0.618 4681	327.1	22.66	2.12	10 2.8
23	4 6 3.64	1.114	20 2 9.1	2.49	0.619 2668	338.4	22.62	2.11	9 58.4
24	4 5 37.20	1.089	20 1 10.1	2.43	0.620 0924	349.5	22.57	2.11	9 54.1
25	4 5 11.37	1.063	20 0 12.6	2.36	0.620 9443	360.3	22.53	2.11	9 49.7
26	4 4 46.16	−1.037	+19 59 16.7	−2.29	0.621 8220	+371.0	22.48	2.10	9 45.4
27	4 4 21.59	1.010	19 58 22.5	2.22	0.622 7250	381.4	22.44	2.10	9 41.0
28	4 3 57.68	0.982	19 57 30.0	2.15	0.623 6526	391.6	22.39	2.09	9 36.7
29	4 3 34.44	0.954	19 56 39.3	2.08	0.624 6045	401.6	22.34	2.09	9 32.4
30	4 3 11.89	0.925	19 55 50.4	2.00	0.625 5800	411.3	22.29	2.08	9 28.1
31	4 2 50.04	−0.896	+19 55 3.4	−1.92	0.626 5786	+420.8	22.24	2.08	9 23.8
32	*4 2 28.89*	. . .	*+19 54 18.3*	. . .	0.627 6000	. . .	22.19	2.07	9 19.5

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.
		° ′ ″	′ ″	″	° ′ ″	″	
Jan.	1	36 39 41.0	5 27.38	−21.8	−1 9 54.8	+3.40	0.696 5008
	5	37 1 30.4	5 27.30	22.0	1 9 41.1	3.44	0.696 5518
	9	37 23 19.4	5 27.22	22.2	1 9 27.3	3.48	0.696 6035
	13	37 45 8.1	5 27.14	22.3	1 9 13.3	3.52	0.696 6560
	17	38 6 56.5	5 27.06	22.5	1 8 59.1	3.57	0.696 7092
	21	38 28 44.6	5 26.98	−22.7	−1 8 44.7	+3.61	0.696 7631
	25	38 50 32.3	5 26.89	22.9	1 8 30.2	3.65	0.696 8178
	29	39 12 19.7	5 26.81	23.1	1 8 15.5	3.69	0.696 8731
Feb.	2	39 34 6.8	5 26.72	23.2	1 8 0.7	3.73	0.696 9292
	6	39 55 53.5	5 26.64	23.4	1 7 45.7	3.77	0.696 9860
	10	40 17 39.9	5 26.55	−23.6	−1 7 30.5	+3.81	0.697 0435
	14	40 39 25.9	5 26.46	23.7	1 7 15.2	3.84	0.697 1016
	18	41 1 11.6	5 26.38	23.9	1 6 59.8	3.88	0.697 1605
	22	41 22 56.9	5 26.29	24.0	1 6 44.2	3.93	0.697 2201
	26	41 44 41.9	5 26.20	24.2	1 6 28.4	3.97	0.697 2804
Mar.	2	42 6 26.5	5 26.10	−24.4	−1 6 12.4	+4.01	0.697 3414
	6	42 28 10.7	5 26.00	24.5	1 5 56.3	4.04	0.697 4030
	10	42 49 54.5	5 25.91	24.6	1 5 40.1	4.08	0.697 4654
	14	43 11 38.0	5 25.81	24.8	1 5 23.7	4.12	0.697 5284
	18	43 33 21.0	5 25.71	24.9	1 5 7.1	4.16	0.697 5921
	22	43 55 3.7	5 25.62	−25.0	−1 4 50.4	+4.19	0.697 6565
	26	44 16 46.0	5 25.52	25.1	1 4 33.6	4.22	0.697 7216
	30	44 38 27.9	5 25.42	25.3	1 4 16.6	4.26	0.697 7873
Apr.	3	45 0 9.4	5 25.32	25.4	1 3 59.5	4.30	0.697 8537
	7	45 21 50.5	5 25.22	25.5	1 3 42.2	4.35	0.697 9208
	11	45 43 31.2	5 25.11	−25.6	−1 3 24.7	+4.39	0.697 9885
	15	46 5 11.4	5 25.01	25.7	1 3 7.1	4.41	0.698 0568
	19	46 26 51.3	5 24.91	25.8	1 2 49.4	4.45	0.698 1259
	23	46 48 30.7	5 24.81	25.9	1 2 31.5	4.49	0.698 1955
	27	47 10 9.8	5 24.70	26.0	1 2 13.5	4.52	0.698 2659
May	1	47 31 48.3	5 24.59	−26.0	−1 1 55.3	+4.56	0.698 3369
	5	47 53 26.5	5 24.49	26.1	1 1 37.0	4.59	0.698 4085
	9	48 15 4.2	5 24.38	26.2	1 1 18.6	4.62	0.698 4807
	13	48 36 41.5	5 24.28	26.3	1 1 0.0	4.66	0.698 5536
	17	48 58 18.4	5 24.16	26.4	1 0 41.3	4.70	0.698 6271
	21	49 19 54.8	5 24.04	−26.4	−1 0 22.4	+4.74	0.698 7013
	25	49 41 30.7	5 23.93	26.5	1 0 3.4	4.76	0.698 7761
	29	50 3 6.2	5 23.82	26.5	0 59 44.3	4.80	0.698 8515
June	2	50 24 41.3	5 23.71	26.6	0 59 25.0	4.84	0.698 9275
	6	50 46 15.9	5 23.59	26.6	0 59 5.6	4.86	0.699 0041
	10	51 7 50.0	5 23.46	−26.7	−0 58 46.1	+4.89	0.699 0813
	14	51 29 23.6	5 23.35	26.7	0 58 26.5	4.92	0.699 1592
	18	51 50 56.8	5 23.24	26.8	0 58 6.7	4.96	0.699 2376
	22	52 12 29.5	5 23.12	26.8	0 57 46.8	5.00	0.699 3166
	26	52 34 1.8	5 23.00	26.8	0 57 26.7	5.04	0.699 3963
	30	52 55 33.5	5 22.88	−26.8	−0 57 6.5	+5.06	0.699 4765
July	4	53 17 4.8	5 22.76	−26.8	−0 56 46.2	+5.09	0.699 5573

FOR GREENWICH MEAN NOON.

ate.	Heliocentric Longitude, Mean Equinox of Date.	Var. per Day.	Reduction to Orbit.	Heliocentric Latitude.	Var. per Day.	Logarithm of Radius Vector.	Var. per Day.
	° ′ ″	′ ″	″	° ′ ″	″		
4	53 17 4.8	5 22.76	−26.8	−0 56 46.2	+5.09	0.699 5573	+202.7
8	53 38 35.6	5 22.64	26.8	0 56 25.8	5.12	0.699 6387	204.2
12	54 0 5.9	5 22.51	26.8	0 56 5.2	5.16	0.699 7207	205.6
16	54 21 35.7	5 22.39	26.9	0 55 44.5	5.19	0.699 8032	207.0
20	54 43 5.0	5 22.26	26.9	0 55 23.7	5.21	0.699 8863	208.5
24	55 4 33.8	5 22.14	−26.9	−0 55 2.8	+5.24	0.699 9700	+210.0
28	55 26 2.1	5 22.01	26.8	0 54 41.8	5.27	0.700 0543	211.5
1	55 47 29.9	5 21.89	26.8	0 54 20.6	5.30	0.700 1392	212.9
5	56 8 57.2	5 21.76	26.8	0 53 59.4	5.33	0.700 2246	214.1
9	56 30 24.0	5 21.64	26.8	0 53 38.0	5.37	0.700 3105	215.5
13	56 51 50.3	5 21.50	−26.8	−0 53 16.4	+5.40	0.700 3970	+217.0
17	57 13 16.0	5 21.36	26.8	0 52 54.8	5.42	0.700 4841	218.4
21	57 34 41.2	5 21.24	26.7	0 52 33.1	5.45	0.700 5717	219.7
25	57 56 6.0	5 21.11	26.7	0 52 11.2	5.48	0.700 6599	221.0
29	58 17 30.1	5 20.98	26.6	0 51 49.2	5.50	0.700 7485	222.4
2	58 38 53.8	5 20.85	−26.6	−0 51 27.2	+5.53	0.700 8378	+223.7
6	59 0 16.9	5 20.71	26.6	0 51 5.0	5.56	0.700 9275	225.0
10	59 21 39.5	5 20.58	26.5	0 50 42.7	5.59	0.701 0178	226.4
14	59 43 1.5	5 20.45	26.4	0 50 20.3	5.62	0.701 1086	227.6
18	60 4 23.1	5 20.31	26.4	0 49 57.7	5.65	0.701 1999	228.9
22	60 25 44.0	5 20.17	−26.3	−0 49 35.1	+5.67	0.701 2917	+230.1
26	60 47 4.4	5 20.04	26.2	0 49 12.4	5.70	0.701 3840	231.5
30	61 8 24.3	5 19.90	26.2	0 48 49.5	5.72	0.701 4769	232.7
4	61 29 43.6	5 19.76	26.1	0 48 26.6	5.75	0.701 5702	233.9
8	61 51 2.4	5 19.62	26.0	0 48 3.5	5.77	0.701 6640	235.0
12	62 12 20.6	5 19.48	−25.9	−0 47 40.4	+5.79	0.701 7582	+236.2
16	62 33 38.2	5 19.34	25.8	0 47 17.2	5.81	0.701 8530	237.6
20	62 54 55.3	5 19.20	25.8	0 46 53.9	5.85	0.701 9483	238.8
24	63 16 11.8	5 19.06	25.7	0 46 30.4	5.87	0.702 0440	239.9
28	63 37 27.8	5 18.92	25.6	0 46 6.9	5.89	0.702 1402	241.0
1	63 58 43.2	5 18.78	−25.4	−0 45 43.3	+5.92	0.702 2368	+242.2
5	64 19 58.0	5 18.63	25.3	0 45 19.5	5.94	0.702 3340	243.4
9	64 41 12.2	5 18.49	25.2	0 44 55.7	5.96	0.702 4315	244.5
13	65 2 25.9	5 18.35	25.1	0 44 31.8	5.99	0.702 5296	245.7
17	65 23 39.0	5 18.20	25.0	0 44 7.8	6.01	0.702 6281	246.8
21	65 44 51.5	5 18.05	−24.9	−0 43 43.7	+6.03	0.702 7270	+247.9
25	66 6 3.4	5 17.90	24.7	0 43 19.6	6.05	0.702 8264	249.0
29	66 27 14.7	5 17.76	24.6	0 42 55.3	6.07	0.702 9262	250.1
3	66 48 25.5	5 17.61	24.5	0 42 31.0	6.09	0.703 0265	251.2
7	67 9 35.6	5 17.46	24.3	0 42 6.6	6.12	0.703 1272	252.3
11	67 30 45.2	5 17.32	−24.2	−0 41 42.0	+6.15	0.703 2283	+253.3
15	67 51 54.2	5 17.17	24.0	0 41 17.4	6.17	0.703 3298	254.3
19	68 13 2.6	5 17.01	23.9	0 40 52.7	6.19	0.703 4317	255.4
23	68 34 10.3	5 16.86	23.7	0 40 27.9	6.20	0.703 5341	256.5
27	68 55 17.5	5 16.72	23.6	0 40 3.1	6.22	0.703 6369	257.4
31	69 16 24.1	5 16.56	−23.4	−0 39 38.2	+6.24	0.703 7400	+258.4
35	69 37 30.0	5 16.41	−23.3	−0 39 13.2	+6.26	0.703 8436	+259.5

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-diameter.	Hor. Parallax.	Tr[illegible]
		Noon.	Noon.	Noon.	Noon.	Noon.	Noon.	Noon.	Noon.	G[illegible]
		h m s	s	° ′ ″	″			″	″	h
Jan.	1	8 2 25.24	−0.792	+20 38 59.3	+2.59	0.909 5168	−112.3	9.54	1.09	13
	2	8 2 6.13	0.800	20 40 1.7	2.61	0.909 2552	105.6	9.55	1.09	13
	3	8 1 46.84	0.808	20 41 4.5	2.62	0.909 0098	98.9	9.55	1.09	13
	4	8 1 27.37	0.814	20 42 7.6	2.64	0.908 7806	92.1	9.56	1.09	13
	5	8 1 7.75	0.821	20 43 11.0	2.65	0.908 5677	85.3	9.56	1.09	13
	6	8 0 47.98	−0.827	+20 44 14.6	+2.66	0.908 3713	− 78.4	9.57	1.09	12
	7	8 0 28.06	0.833	20 45 18.5	2.67	0.908 1915	71.5	9.57	1.09	12
	8	8 0 8.02	0.837	20 46 22.6	2.67	0.908 0283	64.5	9.57	1.09	12
	9	7 59 47.87	0.842	20 47 26.8	2.68	0.907 8819	57.5	9.58	1.09	12
	10	7 59 27.61	0.846	20 48 31.1	2.68	0.907 7521	50.6	9.58	1.09	12
	11	7 59 7.26	−0.850	+20 49 35.5	+2.69	0.907 6392	− 43.5	9.58	1.09	12
	12	7 58 46.82	0.853	20 50 40.0	2.69	0.907 5431	36.5	9.58	1.09	12
	13	7 58 26.31	0.856	20 51 44.5	2.69	0.907 4640	29.4	9.59	1.09	12
	14	7 58 5.74	0.858	20 52 49.0	2.69	0.907 4018	22.4	9.59	1.09	12
	15	7 57 45.12	0.860	20 53 53.4	2.68	0.907 3566	15.2	9.59	1.09	12
	16	7 57 24.47	−0.861	+20 54 57.7	+2.68	0.907 3286	− 8.1	9.59	1.09	12
	17	7 57 3.80	0.862	20 56 1.9	2.67	0.907 3178	− 0.9	9.59	1.09	12
	18	7 56 43.11	0.862	20 57 5.9	2.67	0.907 3242	+ 6.3	9.59	1.09	12
	19	7 56 22.43	0.862	20 58 9.7	2.65	0.907 3479	13.5	9.59	1.09	12
	20	7 56 1.75	0.861	20 59 13.3	2.64	0.907 3888	20.6	9.59	1.09	11
	21	7 55 41.11	−0.859	+21 0 16.7	+2.63	0.907 4468	+ 27.7	9.59	1.09	11
	22	7 55 20.50	0.858	21 1 19.7	2.62	0.907 5219	34.8	9.58	1.09	11
	23	7 54 59.94	0.856	21 2 22.4	2.61	0.907 6141	42.0	9.58	1.09	11
	24	7 54 39.44	0.853	21 3 24.8	2.59	0.907 7234	49.1	9.58	1.09	11
	25	7 54 19.02	0.849	21 4 26.7	2.57	0.907 8496	56.1	9.58	1.09	11
	26	7 53 58.69	−0.845	+21 5 28.2	+2.55	0.907 9928	+ 63.2	9.57	1.09	11 31
	27	7 53 38.46	0.840	21 6 29.2	2.53	0.908 1528	70.2	9.57	1.09	11 26
	28	7 53 18.35	0.836	21 7 29.7	2.51	0.908 3296	77.1	9.57	1.09	11 22
	29	7 52 58.36	0.830	21 8 29.6	2.48	0.908 5229	84.0	9.56	1.09	11 18
	30	7 52 38.51	0.824	21 9 28.9	2.46	0.908 7328	90.9	9.56	1.09	11 14
	31	7 52 18.81	−0.818	+21 10 27.7	+2.44	0.908 9590	+ 97.6	9.55	1.09	11 9
Feb.	1	7 51 59.26	0.811	21 11 25.9	2.41	0.909 2014	104.3	9.55	1.08	11 5
	2	7 51 39.89	0.803	21 12 23.4	2.38	0.909 4598	111.0	9.54	1.08	11 1
	3	7 51 20.70	0.796	21 13 20.3	2.36	0.909 7340	117.5	9.54	1.08	10 57
	4	7 51 1.70	0.788	21 14 16.5	2.33	0.910 0240	124.1	9.53	1.08	10 52
	5	7 50 42.90	−0.779	+21 15 12.0	+2.30	0.910 3296	+130.6	9.52	1.08	10 48
	6	7 50 24.31	0.770	21 16 6.7	2.26	0.910 6507	137.0	9.52	1.08	10 44
	7	7 50 5.94	0.760	21 17 0.7	2.23	0.910 9872	143.3	9.51	1.08	10 40
	8	7 49 47.81	0.750	21 17 53.8	2.20	0.911 3387	149.6	9.50	1.08	10 35
	9	7 49 29.92	0.740	21 18 46.2	2.17	0.911 7053	155.8	9.49	1.08	10 31
	10	7 49 12.27	−0.730	+21 19 37.8	+2.13	0.912 0866	+161.9	9.48	1.08	10 27
	11	7 48 54.89	0.719	21 20 28.6	2.10	0.912 4825	167.9	9.48	1.08	10 23
	12	7 48 37.77	0.707	21 21 18.5	2.06	0.912 8927	173.9	9.47	1.08	10 19
	13	7 48 20.94	0.695	21 22 7.5	2.02	0.913 3172	179.8	9.46	1.07	10 14
	14	7 48 4.39	0.683	21 22 55.7	1.99	0.913 7557	185.6	9.45	1.07	10 10
	15	7 47 48.14	−0.671	+21 23 42.9	+1.95	0.914 2081	+191.3	9.44	1.07	10 6
	16	7 47 32.20	−0.658	+21 24 29.2	+1.91	0.914 6740	+196.9	9.43	1.07	10 2

GREENWICH MEAN TIME.

	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
16	7 47 32.20	−0.658	+21 24 29.2	+1.91	0.914 6740	+196.9	9.43	1.07	10 2.2
17	7 47 16.57	0.644	21 25 14.6	1.87	0.915 1534	202.5	9.42	1.07	9 58.0
18	7 47 1.27	0.631	21 25 59.0	1.83	0.915 6459	207.9	9.41	1.07	9 53.8
19	7 46 46.30	0.617	21 26 42.4	1.79	0.916 1514	213.3	9.40	1.07	9 49.6
20	7 46 31.68	0.602	21 27 24.8	1.75	0.916 6697	218.5	9.38	1.07	9 45.4
21	7 46 17.40	−0.588	+21 28 6.2	+1.70	0.917 2004	+223.7	9.37	1.06	9 41.3
22	7 46 3.48	0.572	21 28 46.6	1.66	0.917 7433	228.7	9.36	1.06	9 37.1
23	7 45 49.93	0.557	21 29 26.0	1.62	0.918 2981	233.6	9.35	1.06	9 33.0
24	7 45 36.75	0.541	21 30 4.3	1.57	0.918 8646	238.4	9.34	1.06	9 28.8
25	7 45 23.95	0.525	21 30 41.5	1.53	0.919 4425	243.1	9.32	1.06	9 24.7
26	7 45 11.54	−0.509	+21 31 17.7	+1.48	0.920 0315	+247.6	9.31	1.06	9 20.5
27	7 44 59.52	0.492	21 31 52.7	1.44	0.920 6312	252.1	9.30	1.06	9 16.4
28	7 44 47.91	0.476	21 32 26.7	1.39	0.921 2415	256.4	9.29	1.05	9 12.3
r. 1	7 44 36.69	0.459	21 32 59.5	1.34	0.921 8619	260.6	9.27	1.05	9 8.2
2	7 44 25.88	0.442	21 33 31.2	1.30	0.922 4923	264.7	9.26	1.05	9 4.1
3	7 44 15.49	−0.424	+21 34 1.8	+1.25	0.923 1324	+268.7	9.25	1.05	9 0.0
4	7 44 5.51	0.407	21 34 31.3	1.21	0.923 7820	272.5	9.23	1.05	8 55.9
5	7 43 55.96	0.389	21 34 59.7	1.16	0.924 4406	276.3	9.22	1.05	8 51.8
6	7 43 46.84	0.371	21 35 27.0	1.11	0.925 1081	279.9	9.20	1.05	8 47.7
7	7 43 38.15	0.353	21 35 53.1	1.06	0.925 7841	283.4	9.19	1.04	8 43.6
8	7 43 29.89	−0.335	+21 36 18.1	+1.02	0.926 4683	+286.8	9.18	1.04	8 39.6
9	7 43 22.07	0.317	21 36 42.0	0.97	0.927 1605	290.0	9.16	1.04	8 35.5
10	7 43 14.69	0.298	21 37 4.8	0.92	0.927 8605	293.2	9.15	1.04	8 31.4
11	7 43 7.75	0.280	21 37 26.4	0.88	0.928 5680	296.3	9.13	1.04	8 27.4
12	7 43 1.26	0.261	21 37 46.8	0.83	0.929 2826	299.2	9.12	1.04	8 23.4
13	7 42 55.22	−0.242	+21 38 6.1	+0.78	0.930 0043	+302.1	9.10	1.03	8 19.3
14	7 42 49.64	0.223	21 38 24.3	0.73	0.930 7326	304.8	9.09	1.03	8 15.3
15	7 42 44.51	0.204	21 38 41.3	0.68	0.931 4673	307.4	9.07	1.03	8 11.3
16	7 42 39.83	0.185	21 38 57.1	0.64	0.932 2081	309.9	9.05	1.03	8 7.3
17	7 42 35.62	0.166	21 39 11.8	0.59	0.932 9549	312.3	9.04	1.03	8 3.3
18	7 42 31.87	−0.147	+21 39 25.3	+0.54	0.933 7072	+314.6	9.02	1.03	7 59.3
19	7 42 28.58	0.128	21 39 37.6	0.49	0.934 4649	316.8	9.01	1.02	7 55.3
20	7 42 25.76	0.108	21 39 48.8	0.44	0.935 2276	318.8	8.99	1.02	7 51.4
21	7 42 23.41	0.088	21 39 58.8	0.39	0.935 9951	320.7	8.98	1.02	7 47.4
22	7 42 21.53	0.068	21 40 7.6	0.34	0.936 7671	322.5	8.96	1.02	7 43.4
23	7 42 20.13	−0.049	+21 40 15.2	+0.29	0.937 5433	+324.2	8.94	1.02	7 39.5
24	7 42 19.19	0.029	21 40 21.7	0.24	0.938 3234	325.8	8.93	1.01	7 35.5
25	7 42 18.73	−0.010	21 40 26.9	0.19	0.939 1071	327.2	8.91	1.01	7 31.6
26	7 42 18.74	+0.010	21 40 31.0	0.15	0.939 8941	328.6	8.90	1.01	7 27.6
27	7 42 19.22	0.030	21 40 33.9	0.10	0.940 6842	329.8	8.88	1.01	7 23.7
28	7 42 20.18	+0.049	+21 40 35.6	+0.05	0.941 4770	+330.8	8.86	1.01	7 19.8
29	7 42 21.60	0.069	21 40 36.1	0.00	0.942 2723	331.8	8.85	1.01	7 15.9
30	7 42 23.50	0.089	21 40 35.5	−0.05	0.943 0697	332.7	8.83	1.00	7 12.0
31	7 42 25.87	0.109	21 40 33.7	0.10	0.943 8691	333.4	8.82	1.00	7 8.1
r. 1	7 42 28.70	0.128	21 40 30.7	0.15	0.944 6702	334.1	8.80	1.00	7 4.3
2	7 42 32.00	+0.147	+21 40 26.6	−0.20	0.945 4727	+334.6	8.78	1.00	7 0.4
3	*7 42 35.77*	*+0.167*	*+21 40 21.3*	*−0.24*	0.946 2764	+335.1	8.77	1.00	6 56.5

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-diameter.	Hor Para lax.
	Noon.	*Noon.*	*Noon.*	*Noon.*	*Noon.*	*Noon.*	*Noon.*	*Noon*
	h m s	s	° ′ ″	″			″	″
Apr. 1	7 42 28.70	+0.128	+21 40 30.7	−0.15	0.944 6702	+334.1	8.80	1.0
2	7 42 32.00	0.147	21 40 26.6	0.20	0.945 4727	334.6	8.78	1.0
3	7 42 35.77	0.167	21 40 21.3	0.24	0.946 2764	335.1	8.77	1.0
4	7 42 40.00	0.186	21 40 14.9	0.29	0.947 0811	335.4	8.75	0.9
5	7 42 44.69	0.205	21 40 7.3	0.34	0.947 8866	335.7	8.73	0.9
6	7 42 49.84	+0.224	+21 39 58.5	−0.39	0.948 6925	+335.8	8.72	0.9
7	7 42 55.44	0.243	21 39 48.6	0.44	0.949 4987	335.9	8.70	0.9
8	7 43 1.50	0.262	21 39 37.6	0.48	0.950 3050	335.9	8.68	0.9
9	7 43 8.01	0.281	21 39 25.4	0.53	0.951 1111	335.8	8.67	0.9
10	7 43 14.97	0.299	21 39 12.1	0.58	0.951 9169	335.6	8.65	0.9
11	7 43 22.38	+0.318	+21 38 57.6	−0.62	0.952 7221	+335.4	8.64	0.9
12	7 43 30.23	0.337	21 38 42.1	0.67	0.953 5266	335.0	8.62	0.9
13	7 43 38.53	0.355	21 38 25.4	0.72	0.954 3301	334.6	8.60	0.9
14	7 43 47.28	0.374	21 38 7.6	0.76	0.955 1325	334.0	8.59	0.9
15	7 43 56.46	0.392	21 37 48.7	0.81	0.955 9334	333.4	8.57	0.9
16	7 44 6.09	+0.410	+21 37 28.6	−0.86	0.956 7328	+332.7	8.56	0.9
17	7 44 16.15	0.428	21 37 7.4	0.91	0.957 5303	331.9	8.54	0.9
18	7 44 26.64	0.446	21 36 45.0	0.96	0.958 3257	331.0	8.53	0.9
19	7 44 37.56	0.464	21 36 21.5	1.00	0.959 1189	330.0	8.51	0.9
20	7 44 48.91	0.482	21 35 56.9	1.05	0.959 9096	328.9	8.49	0.9
21	7 45 0.68	+0.499	+21 35 31.1	−1.10	0.960 6977	+327.8	8.48	0.9
22	7 45 12.88	0.517	21 35 4.3	1.14	0.961 4829	326.5	8.47	0.9
23	7 45 25.49	0.534	21 34 36.3	1.19	0.962 2649	325.2	8.45	0.9
24	7 45 38.52	0.551	21 34 7.2	1.23	0.963 0437	323.8	8.43	0.9
25	7 45 51.96	0.568	21 33 37.1	1.28	0.963 8190	322.3	8.42	0.9
26	7 46 5.80	+0.585	+21 33 5.8	−1.33	0.964 5906	+320.7	8.40	0.9
27	7 46 20.04	0.602	21 32 33.4	1.37	0.965 3583	319.0	8.39	0.9
28	7 46 34.68	0.618	21 31 59.9	1.42	0.966 1220	317.4	8.37	0.9
29	7 46 49.72	0.635	21 31 25.3	1.46	0.966 8816	315.6	8.36	0.9
30	7 47 5.14	0.650	21 30 49.7	1.51	0.967 6368	313.7	8.35	0.9
May 1	7 47 20.94	+0.667	+21 30 13.0	−1.55	0.968 3875	+311.8	8.33	0.9
2	7 47 37.13	0.682	21 29 35.2	1.60	0.969 1335	309.8	8.32	0.9
3	7 47 53.69	0.698	21 28 56.4	1.64	0.969 8747	307.8	8.30	0.9
4	7 48 10.62	0.713	21 28 16.5	1.68	0.970 6109	305.7	8.29	0.9
5	7 48 27.91	0.728	21 27 35.6	1.73	0.971 3421	303.6	8.27	0.9
6	7 48 45.57	+0.743	+21 26 53.6	−1.77	0.972 0681	+301.4	8.26	0.9
7	7 49 3.59	0.758	21 26 10.6	1.81	0.972 7888	299.1	8.25	0.9
8	7 49 21.96	0.773	21 25 26.5	1.86	0.973 5039	296.8	8.23	0.9
9	7 49 40.67	0.787	21 24 41.4	1.90	0.974 2134	294.4	8.22	0.9
10	7 49 59.74	0.802	21 23 55.3	1.94	0.974 9172	292.0	8.21	0.9
11	7 50 19.14	+0.816	+21 23 8.1	−1.99	0.975 6151	+289.6	8.19	0.9
12	7 50 38.89	0.830	21 22 19.9	2.03	0.976 3071	287.0	8.18	0.9
13	7 50 58.96	0.843	21 21 30.6	2.07	0.976 9929	284.5	8.17	0.9
14	7 51 19.37	0.857	21 20 40.3	2.12	0.977 6726	281.9	8.16	0.9
15	7 51 40.10	0.871	21 19 49.0	2.16	0.978 3459	279.2	8.14	0.9
16	7 52 1.16	+0.884	+21 18 56.7	−2.20	0.979 0128	+276.5	8.13	0.9
17	7 52 22.53	+0.897	+21 18 3.4	−2.24	0.979 6730	+273.7	8.12	0.9

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	7 52 22.53	+0.897	+21 18 3.4	−2.24	0.979 6730	+273.7	8.12	0.92	4 13.3
18	7 52 44.22	0.910	21 17 9.1	2.28	0.980 3264	270.8	8.10	0.92	4 9.7
19	7 53 6.21	0.923	21 16 13.7	2.33	0.980 9730	267.9	8.09	0.92	4 6.1
20	7 53 28.51	0.935	21 15 17.4	2.37	0.981 6125	265.0	8.08	0.92	4 2.6
21	7 53 51.11	0.948	21 14 20.0	2.41	0.982 2448	262.0	8.07	0.92	3 59.0
22	7 54 14.01	+0.960	+21 13 21.6	−2.45	0.982 8699	+258.9	8.06	0.92	3 55.5
23	7 54 37.19	0.972	21 12 22.3	2.49	0.983 4877	255.9	8.05	0.91	3 52.0
24	7 55 0.66	0.984	21 11 22.0	2.53	0.984 0981	252.7	8.04	0.91	3 48.4
25	7 55 24.41	0.995	21 10 20.7	2.57	0.984 7008	249.5	8.02	0.91	3 44.9
26	7 55 48.43	1.007	21 9 18.5	2.61	0.985 2959	246.4	8.01	0.91	3 41.3
27	7 56 12.72	+1.018	+21 8 15.3	−2.65	0.985 8833	+243.1	8.00	0.91	3 37.8
28	7 56 37.28	1.029	21 7 11.2	2.69	0.986 4629	239.8	7.99	0.91	3 34.3
29	7 57 2.09	1.039	21 6 6.1	2.73	0.987 0345	236.5	7.98	0.91	3 30.8
30	7 57 27.16	1.050	21 5 0.1	2.77	0.987 5980	233.1	7.97	0.91	3 27.2
31	7 57 52.48	1.060	21 3 53.1	2.81	0.988 1534	229.7	7.96	0.90	3 23.7
June 1	7 58 18.04	+1.070	+21 2 45.3	−2.84	0.988 7006	+226.3	7.95	0.90	3 20.2
2	7 58 43.84	1.080	21 1 36.6	2.88	0.989 2396	222.9	7.94	0.90	3 16.7
3	7 59 9.88	1.090	21 0 27.0	2.92	0.989 7703	219.4	7.93	0.90	3 13.2
4	7 59 36.14	1.099	20 59 16.4	2.96	0.990 2926	215.9	7.92	0.90	3 9.7
5	8 0 2.63	1.108	20 58 5.0	2.99	0.990 8066	212.4	7.91	0.90	3 6.2
6	8 0 29.34	+1.117	+20 56 52.7	−3.03	0.991 3122	+208.9	7.90	0.90	3 2.7
7	8 0 56.27	1.126	20 55 39.5	3.07	0.991 8093	205.3	7.89	0.90	2 59.3
8	8 1 23.41	1.135	20 54 25.5	3.10	0.992 2978	201.8	7.89	0.90	2 55.8
9	8 1 50.77	1.144	20 53 10.5	3.14	0.992 7777	198.1	7.88	0.89	2 52.3
10	8 2 18.32	1.152	20 51 54.7	3.18	0.993 2489	194.5	7 87	0.89	2 48.8
11	8 2 46.08	+1.161	+20 50 38.0	−3.21	0.993 7112	+190.8	7.86	0.89	2 45.4
12	8 3 14.03	1.169	20 49 20.5	3.25	0.994 1647	187.1	7.85	0.89	2 41.9
13	8 3 42.17	1.177	20 48 2.1	3.28	0.994 6093	183.4	7.84	0.89	2 38.4
14	8 4 10.50	1.184	20 46 42.9	3.32	0.995 0448	179.6	7.83	0.89	2 35.0
15	8 4 39.02	1.192	20 45 22.8	3.35	0.995 4713	175.8	7.83	0.89	2 31.5
16	8 5 7.71	+1.199	+20 44 2.0	−3.38	0.995 8887	+172.0	7.82	0.89	2 28.0
17	8 5 36.58	1.207	20 42 40.3	3.42	0.996 2968	168.1	7.81	0.89	2 24.6
18	8 6 5.62	1.213	20 41 17.8	3.45	0.996 6955	164.2	7.80	0.89	2 21.1
19	8 6 34.82	1.220	20 39 54.5	3.49	0.997 0849	160.3	7.80	0.89	2 17.7
20	8 7 4.18	1.227	20 38 30.4	3.52	0.997 4649	156.4	7.79	0.89	2 14.3
21	8 7 33.70	+1.233	+20 37 5.5	−3.55	0.997 8355	+152.4	7.78	0.88	2 10.8
22	8 8 3.37	1.239	20 35 39.9	3.58	0.998 1965	148.5	7.78	0.88	2 7.4
23	8 8 33.18	1.245	20 34 13.5	3.61	0.998 5481	144.5	7.77	0.88	2 3.9
24	8 9 3.13	1.251	20 32 46.4	3.65	0.998 8901	140.5	7.77	0.88	2 0.5
25	8 9 33.22	1.256	20 31 18.5	3.68	0.999 2224	136.5	7.76	0.88	1 57.1
26	8 10 3.43	+1.261	+20 29 50.0	−3.70	0.999 5451	+132.4	7.75	0.88	1 53.6
27	8 10 33.77	1.267	20 28 20.7	3.74	0.999 8580	128.4	7.75	0.88	1 50.2
28	8 11 4.23	1.272	20 26 50.7	3. 3	1.000 1612	124.3	7.74	0.88	1 46.8
29	8 11 34.80	1.276	20 25 20.1	3.79	1.000 4547	120.3	7.74	0.88	1 43.4
30	8 12 5.48	1.281	20 23 48.8	3.82	1.000 7384	116.2	7.73	0.88	1 39.9
July 1	8 12 36.27	+1.285	+20 22 16.8	−3.85	1.001 0123	+112.1	7.73	0.88	1 36.5
2	*8 13 7.17*	*+1.289*	*+20 20 44.1*	*−3.88*	1.001 2764	+108.0	7.72	0.88	1 33.1

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-diameter.	Hor. Parallax.
	Noon.	*Noon.*	*Noon.*	*Noon.*	*Noon.*	*Noon.*	*Noon.*	*Noon.*
	h m s	s	° ′ ″	″			″	″
July 1	8 12 36.27	+1.285	+20 22 16.8	−3.85	1.001 0123	+112.1	7.73	0.88
2	8 13 7.17	1.289	20 20 44.1	3.88	1.001 2764	108.0	7.72	0.88
3	8 13 38.16	1.293	20 19 10.8	3.90	1.001 5307	103.9	7.72	0.88
4	8 14 9.24	1.297	20 17 36.9	3.92	1.001 7752	99.8	7.71	0.88
5	8 14 40.42	1.301	20 16 2.4	3.95	1.002 0099	95.7	7.71	0.87
6	8 15 11.68	+1.304	+20 14 27.2	−3.98	1.002 2346	+ 91.6	7.71	0.87
7	8 15 43.02	1.307	20 12 51.5	4.00	1.002 4495	87.5	7.70	0.87
8	8 16 14.43	1.310	20 11 15.1	4.03	1.002 6544	83.3	7.70	0.87
9	8 16 45.92	1.314	20 9 38.1	4.05	1.002 8493	79.1	7.70	0.87
10	8 17 17.49	1.317	20 8 0.6	4.08	1.003 0342	75.0	7.69	0.87
11	8 17 49.12	+1.319	+20 6 22.5	−4.10	1.003 2091	+ 70.8	7.69	0.87
12	8 18 20.80	1.321	20 4 43.8	4.12	1.003 3739	66.6	7.69	0.87
13	8 18 52.55	1.324	20 3 4.6	4.14	1.003 5286	62.4	7.68	0.87
14	8 19 24.35	1.326	20 1 24.9	4.17	1.003 6732	58.1	7.68	0.87
15	8 19 56.21	1.328	19 59 44.6	4.19	1.003 8077	53.9	7.68	0.87
16	8 20 28.10	+1.330	+19 58 3.9	−4.21	1.003 9319	+ 49.6	7.68	0.87
17	8 21 0.04	1.331	19 56 22.7	4.23	1.004 0459	45.4	7.67	0.87
18	8 21 32.01	1.333	19 54 41.0	4.25	1.004 1496	41.1	7.67	0.87
19	8 22 4.01	1.334	19 52 58.9	4.26	1.004 2431	36.8	7.67	0.87
20	8 22 36.03	1.335	19 51 16.3	4.28	1.004 3262	32.5	7.67	0.87
21	8 23 8.07	+1.335	+19 49 33.3	−4.30	1.004 3989	+ 28.2	7.67	0.87
22	8 23 40.13	1.336	19 47 49.9	4.32	1.004 4613	23.9	7.67	0.87
23	8 24 12.21	1.336	19 46 6.1	4.33	1.004 5134	19.6	7.67	0.87
24	8 24 44.28	1.336	19 44 22.0	4.35	1.004 5552	15.3	7.67	0.87
25	8 25 16.36	1.336	19 42 37.5	4.36	1.004 5868	11.0	7.67	0.87
26	8 25 48.43	+1.336	+19 40 52.6	−4.38	1.004 6082	+ 6.8	7.66	0.87
27	8 26 20.50	1.336	19 39 7.5	4.39	1.004 6194	+ 2.5	7.66	0.87
28	8 26 52.55	1.335	19 37 22.0	4.40	1.004 6203	− 1.8	7.66	0.87
29	8 27 24.59	1.335	19 35 36.2	4.41	1.004 6109	6.1	7.66	0.87
30	8 27 56.61	1.334	19 33 50.1	4.43	1.004 5912	10.3	7.67	0.87
31	8 28 28.61	+1.333	+19 32 3.8	−4.44	1.004 5613	− 14.6	7.67	0.87
Aug. 1	8 29 0.58	1.331	19 30 17.2	4.45	1.004 5211	18.9	7.67	0.87
2	8 29 32.51	1.330	19 28 30.4	4.46	1.004 4707	23.1	7.67	0.87
3	8 30 4.41	1.328	19 26 43.3	4.46	1.004 4102	27.4	7.67	0.87
4	8 30 36.27	1.327	19 24 56.1	4.47	1.004 3394	31.6	7.67	0.87
5	8 31 8.09	+1.325	+19 23 8.7	−4.48	1.004 2584	− 35.9	7.67	0.87
6	8 31 39.86	1.323	19 21 21.1	4.49	1.004 1672	40.1	7.67	0.87
7	8 32 11.59	1.321	19 19 33.4	4.49	1.004 0658	44.4	7.67	0.87
8	8 32 43.25	1.318	19 17 45.5	4.50	1.003 9542	48.6	7.68	0.87
9	8 33 14.86	1.316	19 15 57.5	4.50	1.003 8324	52.9	7.68	0.87
10	8 33 46.41	+1.313	+19 14 9.4	−4.51	1.003 7003	− 57.2	7.68	0.87
11	8 34 17.89	1.310	19 12 21.2	4.51	1.003 5579	61.4	7.68	0.87
12	8 34 49.29	1.307	19 10 32.9	4.51	1.003 4054	65.7	7.68	0.87
13	8 35 20.62	1.304	19 8 44.6	4.51	1.003 2427	69.9	7.69	0.87
14	8 35 51.87	1.300	19 6 56.2	4.51	1.003 0698	74.2	7.69	0.87
15	8 36 23.03	+1.297	+19 5 7.9	−4.51	1.002 8867	− 78.4	7.70	0.87
16	8 36 54.10	+1.293	+19 3 19.5	−4.51	1.002 6935	− 82.6	7.70	0.87

GREENWICH MEAN TIME.

	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
g. 16	8 36 54.10	+1.293	+19 3 19.5	−4.51	1.002 6935	− 82.6	7.70	0.87	22 56.4
17	8 37 25.07	1.289	19 1 31.3	4.51	1.002 4900	86.9	7.70	0.87	22 53.0
18	8 37 55.95	1.284	18 59 43.1	4.51	1.002 2762	91.2	7.71	0.87	22 49.6
19	8 38 26.72	1.280	18 57 55.0	4.50	1.002 0523	95.4	7.71	0.87	22 46.1
20	8 38 57.38	1.275	18 56 7.0	4.50	1.001 8183	99.6	7.71	0.88	22 42.7
21	8 39 27.93	+1.270	+18 54 19.1	−4.49	1.001 5742	−103.8	7.72	0.88	22 39.3
22	8 39 58.36	1.265	18 52 31.4	4.49	1.001 3202	107.9	7.72	0.88	22 35.8
23	8 40 28.67	1.260	18 50 43.8	4.48	1.001 0562	112.1	7.73	0.88	22 32.4
24	8 40 58.86	1.255	18 48 56.4	4.47	1.000 7823	116.2	7.73	0.88	22 29.0
25	8 41 28.91	1.249	18 47 9.2	4.46	1.000 4985	120.3	7.74	0.88	22 25.5
26	8 41 58.82	+1.243	+18 45 22.3	−4.45	1.000 2048	−124.4	7.74	0.88	22 22.1
27	8 42 28.59	1.238	18 43 35.6	4.44	0.999 9013	128.5	7.75	0.88	22 18.6
28	8 42 58.22	1.231	18 41 49.1	4.43	0.999 5881	132.5	7.75	0.88	22 15.2
29	8 43 27.70	1.225	18 40 3.0	4.41	0.999 2651	136.6	7.76	0.88	22 11.8
30	8 43 57.03	1.219	18 38 17.2	4.40	0.998 9325	140.6	7.76	0.88	22 8.3
31	8 44 26.21	+1.212	+18 36 31.7	−4.39	0.998 5903	−144.6	7.77	0.88	22 4.9
pt. 1	8 44 55.22	1.205	18 34 46.6	4.37	0.998 2386	148.6	7.78	0.88	22 1.4
2	8 45 24.07	1.199	18 33 1.8	4.36	0.997 8772	152.6	7.78	0.88	21 58.0
3	8 45 52.76	1.192	18 31 17.4	4.34	0.997 5063	156.5	7.79	0.88	21 54.5
4	8 46 21.27	1.184	18 29 33.5	4.32	0.997 1259	160.5	7.80	0.88	21 51.0
5	8 46 49.61	+1.177	+18 27 50.0	−4.30	0.996 7360	−164.4	7.80	0.89	21 47.6
6	8 47 17.77	1.170	18 26 6.9	4.29	0.996 3368	168.3	7.81	0.89	21 44.1
7	8 47 45.75	1.162	18 24 24.3	4.26	0.995 9282	172.2	7.82	0.89	21 40.6
8	8 48 13.53	1.154	18 22 42.2	4.24	0.995 5102	176.1	7.83	0.89	21 37.2
9	8 48 41.13	1.146	18 21 0.6	4.22	0.995 0829	180.0	7.83	0.89	21 33.7
10	8 49 8.52	+1.137	+18 19 19.6	−4.20	0.994 6464	−183.8	7.84	0.89	21 30.2
11	8 49 35.72	1.129	18 17 39.2	4.17	0.994 2007	187.6	7.85	0.89	21 26.7
12	8 50 2.71	1.120	18 15 59.3	4.15	0.993 7459	191.4	7.86	0.89	21 23.2
13	8 50 29.49	1.111	18 14 20.2	4.12	0.993 2820	195.2	7.87	0.89	21 19.8
14	8 50 56.05	1.102	18 12 41.7	4.09	0.992 8091	198.9	7.87	0.90	21 16.3
15	8 51 22.39	+1.093	+18 11 3.9	−4.06	0.992 3272	−202.6	7.88	0.90	21 12.8
16	8 51 48.50	1.083	18 9 26.8	4.03	0.991 8364	206.3	7.89	0.90	21 9.3
17	8 52 14.39	1.074	18 7 50.4	4.00	0.991 3368	210.0	7.90	0.90	21 5.8
18	8 52 40.03	1.064	18 6 14.8	3.97	0.990 8284	213.6	7.91	0.90	21 2.2
19	8 53 5.44	1.054	18 4 40.0	3.94	0.990 3113	217.2	7.92	0.90	20 58.7
20	8 53 30.61	+1.044	+18 3 5.9	−3.90	0.989 7857	−220.8	7.93	0.90	20 55.2
21	8 53 55.53	1.033	18 1 32.8	3.86	0.989 2517	224.3	7.94	0.90	20 51.7
22	8 54 20.19	1.022	18 0 0.5	3.83	0.988 7093	227.7	7.95	0.90	20 48.2
23	8 54 44.59	1.011	17 58 29.1	3.79	0.988 1587	231.1	7.96	0.90	20 44.6
24	8 55 8.73	1.000	17 56 58.6	3.75	0.987 5999	234.5	7.97	0.91	20 41.1
25	8 55 32.61	+0.989	+17 55 29.0	−3.71	0.987 0331	−237.8	7.98	0.91	20 37.6
26	8 55 56.22	0.978	17 54 0.4	3.67	0.986 4583	241.1	7.99	0.91	20 34.0
27	8 56 19.56	0.967	17 52 32.7	3.63	0.985 8757	244.4	8.00	0.91	20 30.5
28	8 56 42.62	0.955	17 51 6.0	3.59	0.985 2853	247.6	8.01	0.91	20 26.9
29	8 57 5.40	0.943	17 49 40.4	3.54	0.984 6872	250.8	8.02	0.91	20 23.4
30	8 57 27.89	+0.931	+17 48 15.9	−3.50	0.984 0816	−253.9	8.04	0.91	20 19.8
t. 1	8 57 50.09	*+0.919*	*+17 46 52.4*	*−3.46*	0.983 4685	−257.0	8.05	0.91	20 16.2

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.
	Noon.	*Noon.*	*Noon.*	*Noon.*	*Noon.*	*Noon.*	*Noon.*	*Noon.*
	h m s	s	° ′ ″	″			″	″
Oct. 1	8 57 50.09	+0.919	+17 46 52.4	−3.46	0.983 4685	−257.0	8.05	0.91
2	8 58 12.01	0.907	17 45 29.9	3.41	0.982 8479	260.1	8.06	0.92
3	8 58 33.62	0.894	17 44 8.6	3.36	0.982 2201	263.1	8.07	0.92
4	8 58 54.94	0.882	17 42 48.5	3.32	0.981 5851	266.1	8.08	0.92
5	8 59 15.95	0.869	17 41 29.5	3.27	0.980 9430	269.0	8.09	0.92
6	8 59 36.66	+0.856	+17 40 11.7	−3.22	0.980 2938	−271.9	8.11	0.92
7	8 59 57.05	0.843	17 38 55.1	3.17	0.979 6378	274.8	8.12	0.92
8	9 0 17.13	0.830	17 37 39.7	3.11	0.978 9750	277.6	8.13	0.92
9	9 0 36.88	0.816	17 36 25.6	3.06	0.978 3055	280.3	8.14	0.93
10	9 0 56.31	0.802	17 35 12.8	3.01	0.977 6294	283.0	8.16	0.93
11	9 1 15.40	+0.788	+17 34 1.3	−2.95	0.976 9469	−285.7	8.17	0.93
12	9 1 34.15	0.774	17 32 51.2	2.89	0.976 2581	288.3	8.18	0.93
13	9 1 52.57	0.760	17 31 42.4	2.84	0.975 5632	290.8	8.19	0.93
14	9 2 10.64	0.746	17 30 35.0	2.78	0.974 8624	293.2	8.21	0.93
15	9 2 28.36	0.731	17 29 29.0	2.72	0.974 1557	295.6	8.22	0.93
16	9 2 45.72	+0.716	+17 28 24.5	−2.66	0.973 4433	−298.0	8.23	0.94
17	9 3 2.73	0.701	17 27 21.5	2.59	0.972 7254	300.3	8.25	0.94
18	9 3 19.38	0.686	17 26 20.0	2.53	0.972 0021	302.5	8.26	0.94
19	9 3 35.67	0.671	17 25 20.0	2.47	0.971 2735	304.6	8.28	0.94
20	9 3 51.58	0.655	17 24 21.6	2.40	0.970 5400	306.6	8.29	0.94
21	9 4 7.12	+0.640	+17 23 24.7	−2.34	0.969 8017	−308.6	8.30	0.94
22	9 4 22.28	0.624	17 22 29.4	2.27	0.969 0587	310.5	8.32	0.94
23	9 4 37.07	0.608	17 21 35.6	2.21	0.968 3113	312.3	8.33	0.95
24	9 4 51.47	0.592	17 20 43.5	2.14	0.967 5595	314.1	8.35	0.95
25	9 5 5.49	0.576	17 19 53.0	2.07	0.966 8036	315.8	8.36	0.95
26	9 5 19.12	+0.560	+17 19 4.2	−2.00	0.966 0438	−317.4	8.38	0.95
27	9 5 32.36	0.543	17 18 17.0	1.93	0.965 2802	318.9	8.39	0.95
28	9 5 45.20	0.527	17 17 31.5	1.86	0.964 5131	320.3	8.40	0.95
29	9 5 57.65	0.510	17 16 47.7	1.79	0.963 7426	321.7	8.42	0.96
30	9 6 9.70	0.494	17 16 5.6	1.72	0.962 9689	323.0	8.44	0.96
31	9 6 21.34	+0.476	+17 15 25.3	−1.64	0.962 1921	−324.3	8.45	0.96
Nov. 1	9 6 32.57	0.460	17 14 46.7	1.57	0.961 4125	325.4	8.47	0.96
2	9 6 43.40	0.443	17 14 9.9	1.50	0.960 6301	326.5	8.48	0.96
3	9 6 53.82	0.425	17 13 34.8	1.42	0.959 8453	327.5	8.50	0.97
4	9 7 3.82	0.408	17 13 1.6	1.35	0.959 0581	328.4	8.51	0.97
5	9 7 13.40	+0.390	+17 12 30.2	−1.27	0.958 2689	−329.3	8.53	0.97
6	9 7 22.56	0.373	17 12 0.6	1.19	0.957 4777	330.0	8.54	0.97
7	9 7 31.29	0.355	17 11 32.9	1.11	0.956 6848	330.7	8.56	0.97
8	9 7 39.60	0.337	17 11 7.1	1.04	0.955 8905	331.2	8.57	0.97
9	9 7 47.47	0.319	17 10 43.2	0.96	0.955 0949	331.7	8.59	0.98
10	9 7 54.91	+0.301	+17 10 21.2	−0.88	0.954 2984	−332.0	8.61	0.98
11	9 8 1.91	0.283	17 10 1.1	0.80	0.953 5012	332.3	8.62	0.98
12	9 8 8.48	0.265	17 9 42.9	0.72	0.952 7034	332.5	8.64	0.98
13	9 8 14.61	0.246	17 9 26.7	0.63	0.951 9053	332.6	8.65	0.98
14	9 8 20.29	0.228	17 9 12.5	0.55	0.951 1072	332.5	8.67	0.98
15	9 8 25.53	+0.209	+17 9 0.2	−0.47	0.950 3093	−332.4	8.68	0.99
16	9 8 30.33	+0.191	+17 8 49.8	−0.39	0.949 5119	−332.1	8.70	0.99

GREENWICH MEAN TIME.

	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
.16	9 8 30.33	+0.191	+17 8 49.8	−0.39	0.949 5119	−332.1	8.70	0.99	17 25.7
17	9 8 34.68	0.172	17 8 41.4	0.31	0.948 7153	331.7	8.72	0.99	17 21.9
18	9 8 38.58	0.153	17 8 35.0	0.23	0.947 9199	331.1	8.73	0.99	17 18.0
19	9 8 42.02	0.134	17 8 30.6	0.14	0.947 1259	330.5	8.75	0.99	17 14.1
20	9 8 45.02	0.116	17 8 28.1	−0.06	0.946 3334	329.8	8.76	1.00	17 10.2
21	9 8 47.57	+0.097	+17 8 27.7	+0.02	0.945 5428	−329.0	8.78	1.00	17 6.3
22	9 8 49.67	0.078	17 8 29.2	0.11	0.944 7543	328.1	8.80	1.00	17 2.4
23	9 8 51.32	0.059	17 8 32.8	0.19	0.943 9681	327.0	8.81	1.00	16 58.5
24	9 8 52.52	0.041	17 8 38.3	0.27	0.943 1846	325.9	8.83	1.00	16 54.6
25	9 8 53.27	0.022	17 8 45.8	0.35	0.942 4040	324.6	8.84	1.00	16 50.7
26	9 8 53.57	+0.003	+17 8 55.3	+0.44	0.941 6266	−323.2	8.86	1.01	16 46.8
27	9 8 53.42	−0.015	17 9 6.7	0.52	0.940 8526	321.7	8.88	1.01	16 42.8
28	9 8 52.82	0.034	17 9 20.1	0.60	0.940 0823	320.2	8.89	1.01	16 38.9
29	9 8 51.77	0.053	17 9 35.4	0.68	0.939 3158	318.5	8.91	1.01	16 34.9
30	9 8 50.27	0.072	17 9 52.7	0.76	0.938 5535	316.7	8.92	1.01	16 31.0
c. 1	9 8 48.33	−0.090	+17 10 12.0	+0.85	0.937 7956	−314.8	8.94	1.02	16 27.0
2	9 8 45.94	0.109	17 10 33.3	0.93	0.937 0424	312.8	8.95	1.02	16 23.0
3	9 8 43.10	0.128	17 10 56.5	1.01	0.936 2942	310.6	8.97	1.02	16 19.0
4	9 8 39.81	0.146	17 11 21.6	1.09	0.935 5514	308.4	8.99	1.02	16 15.0
5	9 8 36.08	0.165	17 11 48.7	1.17	0.934 8141	306.0	9.00	1.02	16 11.0
6	9 8 31.91	−0.183	+17 12 17.7	+1.25	0.934 0827	−303.5	9.02	1.02	16 7.0
7	9 8 27.29	0.202	17 12 48.6	1.33	0.933 3574	300.9	9.03	1.03	16 3.0
8	9 8 22.23	0.220	17 13 21.5	1.41	0.932 6385	298.1	9.05	1.03	15 59.0
9	9 8 16.73	0.238	17 13 56.2	1.49	0.931 9264	295.2	9.06	1.03	15 55.0
10	9 8 10.79	0.256	17 14 32.8	1.56	0.931 2213	292.2	9.07	1.03	15 50.9
11	9 8 4.43	−0.274	+17 15 11.3	+1.64	0.930 5236	−289.2	9.09	1.03	15 46.9
12	9 7 57.63	0.292	17 15 51.7	1.72	0.929 8335	285.9	9.10	1.03	15 42.8
13	9 7 50.40	0.310	17 16 33.8	1.79	0.929 1514	282.5	9.12	1.04	15 38.8
14	9 7 42.75	0.328	17 17 17.8	1.87	0.928 4776	279.0	9.13	1.04	15 34.7
15	9 7 34.67	0.345	17 18 3.5	1.94	0.927 8123	275.4	9.15	1.04	15 30.7
16	9 7 26.18	−0.362	+17 18 51.0	+2.01	0.927 1559	−271.6	9.16	1.04	15 26.6
17	9 7 17.27	0.380	17 19 40.2	2.09	0.926 5086	267.8	9.17	1.04	15 22.5
18	9 7 7.96	0.396	17 20 31.1	2.15	0.925 8708	263.7	9.19	1.04	15 18.4
19	9 6 58.25	0.413	17 21 23.6	2.22	0.925 2427	259.6	9.20	1.05	15 14.3
20	9 6 48.14	0.429	17 22 17.8	2.30	0.924 6246	255.4	9.21	1.05	15 10.2
21	9 6 37.64	−0.446	+17 23 13.7	+2.36	0.924 0167	−251.1	9.23	1.05	15 6.1
22	9 6 26.75	0.461	17 24 11.1	2.42	0.923 4194	246.6	9.24	1.05	15 2.0
23	9 6 15.49	0.477	17 25 10.0	2.49	0.922 8328	242.1	9.25	1.05	14 57.9
24	9 6 3.85	0.493	17 26 10.5	2.55	0.922 2573	237.4	9.26	1.05	14 53.7
25	9 5 51.84	0.508	17 27 12.4	2.61	0.921 6931	232.7	9.28	1.05	14 49.6
26	9 5 39.48	−0.522	+17 28 15.7	+2.67	0.921 1403	−227.9	9.29	1.06	14 45.4
27	9 5 26.76	0.537	17 29 20.5	2.73	0.920 5993	222.9	9.30	1.06	14 41.3
28	9 5 13.69	0.552	17 30 26.6	2.78	0.920 0702	217.9	9.31	1.06	14 37.2
29	9 5 0.27	0.566	17 31 34.1	2.84	0.919 5533	212.8	9.32	1.06	14 33.0
30	9 4 46.52	0.580	17 32 42.9	2.89	0.919 0489	207.5	9.33	1.06	14 28.8
31	9 4 32.44	−0.594	+17 33 53.0	+2.95	0.918 5573	−202.1	9.34	1.06	14 24.7
32	*9. 4 18.03*	. . .	*+17 35 4.4*	. . .	0.918 0786	. . .	9.35	1.06	14 20.5

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
		° ′ ″	′ ″	″	° ′ ″	″	
Jan.	1	116 31 51.0	2 13.49	+12.2	+0 9 16.3	+5.79	0.957 1250
	9	116 49 38.8	2 13.46	13.2	0 10 2.6	5.79	0.957 1767
	17	117 7 26.4	2 13.43	14.2	0 10 48.9	5.78	0.957 2290
	25	117 25 13.7	2 13.40	15.2	0 11 35.1	5.78	0.957 2818
Feb.	2	117 43 0.8	2 13.37	16.2	0 12 21.3	5.78	0.957 3352
	10	118 0 47.6	2 13.34	+17.2	+0 13 7.5	+5.77	0.957 3891
	18	118 18 34.2	2 13.31	18.2	0 13 53.7	5.77	0.957 4436
	26	118 36 20.5	2 13.28	19.2	0 14 39.8	5.76	0.957 4986
Mar.	6	118 54 6.6	2 13.24	20.2	0 15 25.9	5.76	0.957 5542
	14	119 11 52.4	2 13.21	21.2	0 16 12.0	5.76	0.957 6103
	22	119 29 37.9	2 13.17	+22.1	+0 16 58.0	+5.75	0.957 6669
	30	119 47 23.2	2 13.13	23.1	0 17 44.0	5.74	0.957 7241
Apr.	7	120 5 8.2	2 13.09	24.1	0 18 29.9	5.74	0.957 7819
	15	120 22 52.9	2 13.06	25.1	0 19 15.8	5.74	0.957 8401
	23	120 40 37.4	2 13.04	26.0	0 20 1.7	5.73	0.957 8990
May	1	120 58 21.6	2 13.01	+27.0	+0 20 47.5	+5.72	0.957 9584
	9	121 16 5.5	2 12.97	28.0	0 21 33.2	5.71	0.958 0183
	17	121 33 49.1	2 12.94	28.9	0 22 18.9	5.71	0.958 0787
	25	121 51 32.5	2 12.91	29.9	0 23 4.6	5.71	0.958 1397
June	2	122 9 15.6	2 12.87	30.8	0 23 50.2	5.70	0.958 2012
	10	122 26 58.4	2 12.83	+31.8	+0 24 35.8	+5.69	0.958 2632
	18	122 44 40.9	2 12.79	32.7	0 25 21.3	5.69	0.958 3258
	26	123 2 23.1	2 12.76	33.7	0 26 6.8	5.68	0.958 3888
July	4	123 20 5.0	2 12.72	34.6	0 26 52.2	5.67	0.958 4523
	12	123 37 46.6	2 12.69	35.6	0 27 37.5	5.67	0.958 5163
	20	123 55 28.0	2 12.65	+36.5	+0 28 22.9	+5.66	0.958 5809
	28	124 13 9.0	2 12.61	37.4	0 29 8.1	5.65	0.958 6459
Aug.	5	124 30 49.7	2 12.57	38.4	0 29 53.3	5.64	0.958 7115
	13	124 48 30.1	2 12.54	39.3	0 30 38.4	5.63	0.958 7775
	21	125 6 10.3	2 12.50	40.2	0 31 23.4	5.62	0.958 8441
	29	125 23 50.1	2 12.46	+41.1	+0 32 8.4	+5.62	0.958 9112
Sept.	6	125 41 29.6	2 12.42	42.0	0 32 53.3	5.61	0.958 9787
	14	125 59 8.8	2 12.38	42.9	0 33 38.2	5.60	0.959 0467
	22	126 16 47.6	2 12.34	43.8	0 34 23.0	5.59	0.959 1152
	30	126 34 26.2	2 12.30	44.7	0 35 7.7	5.59	0.959 1842
Oct.	8	126 52 4.4	2 12.26	+45.6	+0 35 52.4	+5.58	0.959 2536
	16	127 9 42.3	2 12.22	46.5	0 36 37.0	5.57	0.959 3236
	24	127 27 19.9	2 12.18	47.4	0 37 21.5	5.56	0.959 3941
Nov.	1	127 44 57.1	2 12.13	48.2	0 38 6.0	5.55	0.959 4650
	9	128 2 34.0	2 12.09	49.1	0 38 50.3	5.54	0.959 5365
	17	128 20 10.6	2 12.06	+49.9	+0 39 34.6	+5.53	0.959 6084
	25	128 37 46.9	2 12.01	50.8	0 40 18.8	5.52	0.959 6809
Dec.	3	128 55 22.8	2 11.97	51.7	0 41 2.9	5.51	0.959 7538
	11	129 12 58.4	2 11.92	52.5	0 41 47.0	5.50	0.959 8272
	19	129 30 33.6	2 11.88	53.3	0 42 31.0	5.49	0.959 9011
	27	129 48 8.5	2 11.84	+54.2	+0 43 14.9	+5.48	0.959 9754
	35	130 5 43.1	2 11.80	+55.0	+0 43 58.7	+5.47	0.960 0501

GREENWICH MEAN TIME.

	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
	21 21 21.53	+11.851	−16 11 12.3	+55.96	1.317 1981	+2099.8	1.62	0.43	2 30.8
	21 22 9.72	12.239	16 7 24.6	57.83	1.317 9972	1895.1	1.61	0.42	2 15.9
	21 22 59.38	12.584	16 3 29.9	59.52	1.318 7134	1684.8	1.61	0.42	2 1.0
	21 23 50.33	12.886	15 59 28.7	61.03	1.319 3442	1468.1	1.61	0.42	1 46.1
	21 24 42.41	13.147	15 55 21.9	62.34	1.319 8871	1245.5	1.60	0.42	1 31.2
	21 25 35.44	+13.358	−15 51 10.2	+63.47	1.320 3399	+1017.5	1.60	0.42	1 16.4
	21 26 29.21	13.519	15 46 54.5	64.33	1.320 7006	785.6	1.60	0.42	1 1.6
	21 27 23.53	13.632	15 42 35.9	64.95	1.320 9682	552.6	1.60	0.42	0 46.7
	21 28 18.20	13.698	15 38 15.2	65.37	1.321 1426	319.1	1.60	0.42	0 31.9
	21 29 13.05	13.718	15 33 53.2	65.60	1.321 2234	+ 85.0	1.60	0.42	0 17.0
	21 30 7.89	+13.696	−15 29 30.7	+65.61	1.321 2106	− 148.9	1.60	0.42	{ 0 2.1 / 23 58.4
	21 31 2.56	13.630	15 25 8.6	65.39	1.321 1044	381.9	1.60	0.42	23 43.7
	21 31 56.87	13.518	15 20 47.9	64.96	1.320 9052	614.3	1.60	0.42	23 28.9
	21 32 50.64	13.357	15 16 29.3	64.27	1.320 6133	844.3	1.60	0.42	23 14.1
	21 33 43.66	13.145	15 12 14.1	63.33	1.320 2304	1069.3	1.60	0.42	22 59.2
	21 34 35.75	+12.895	−15 8 2.9	+62.21	1.319 7586	−1288.8	1.61	0.42	22 44.4
	21 35 26.77	12.607	15 3 56.7	60.86	1.319 2001	1502.7	1.61	0.42	22 29.5
	21 36 16.55	12.278	14 59 56.3	59.33	1.318 5572	1710.7	1.61	0.42	22 14.6
	21 37 4.94	11.909	14 56 2.4	57.57	1.317 8323	1913.0	1.61	0.42	21 59.6
	21 37 51.77	11.502	14 52 16.0	55.61	1.317 0277	2108.8	1.62	0.42	21 44.7
	21 38 36.90	+11.054	−14 48 37.8	+53.42	1.316 1464	−2296.1	1.62	0.42	21 29.7
	21 39 20.15	10.565	14 45 8.9	51.03	1.315 1922	2473.1	1.62	0.43	21 14.7
	21 40 1.38	10.046	14 41 49.8	48.46	1.314 1694	2638.7	1.63	0.43	20 59.6
	21 40 40.48	9.496	14 38 41.4	45.73	1.313 0826	2794.1	1.63	0.43	20 44.5
	21 41 17.31	8.917	14 35 44.1	42.86	1.311 9355	2939.3	1.63	0.43	20 29.4
	21 41 51.79	+ 8.314	−14 32 58.7	+39.81	1.310 7327	−3072.7	1.64	0.43	20 14.3
	21 42 23.78	7.678	14 30 25.8	36.61	1.309 4789	3194.6	1.64	0.43	19 59.1
	21 42 53.18	7.017	14 28 6.0	33.25	1.308 1787	3304.0	1.65	0.43	19 43.8
	21 43 19.88	6.329	14 26 0.0	29.75	1.306 8377	3398.1	1.65	0.43	19 28.5
	21 43 43.79	5.624	14 24 8.1	26.18	1.305 4622	3477.2	1.66	0.43	19 13.2
	21 44 4.85	+ 4.903	−14 22 30.7	+22.51	1.304 0579	−3541.5	1.66	0.44	18 57.8
	21 44 23.00	4.172	14 21 8.1	18.79	1.302 6310	3590.7	1.67	0.44	18 42.3
	21 44 38.21	3.430	14 20 0.5	14.98	1.301 1873	3625.5	1.68	0.44	18 26.9
	21 44 50.42	2.674	14 19 8.3	11.12	1.299 7326	3645.7	1.68	0.44	18 11.3
	21 44 59.59	1.908	14 18 31.6	7.23	1.298 2730	3648.8	1.69	0.44	17 55.7
	21 45 5.68	+ 1.138	−14 18 10.5	+ 3.30	1.296 8159	−3634.0	1.69	0.44	17 40.1
	21 45 8.70	+ 0.373	14 18 5.2	− 0.61	1.295 3681	3601.9	1.70	0.45	17 24.4
	21 45 8.67	− 0.386	14 18 15.3	4.45	1.293 9367	3552.1	1.70	0.45	17 8.7
	21 45 5.62	1.137	14 18 40.7	8.24	1.292 5285	3487.1	1.71	0.45	16 52.9
	21 44 59.59	1.876	14 19 21.1	11.95	1.291 1492	3405.9	1.71	0.45	16 37.0
	21 44 50.63	− 2.602	−14 20 16.2	−15.60	1.289 8060	−3308.2	1.72	0.45	16 21.1
	21 44 38.79	3.316	14 21 25.8	19.16	1.288 5049	3194.0	1.72	0.45	16 5.2
	21 44 24.13	4.007	14 22 49.3	22.59	1.287 2532	3061.2	1.73	0.45	15 49.2
	21 44 6.77	4.670	14 24 26.3	25.86	1.286 0581	2912.4	1.73	0.45	15 33.2
	21 43 46.81	5.301	14 26 15.9	28.91	1.284 9253	2748.2	1.74	0.46	15 17.2
	21 43 24.41	− 5.894	−14 28 17.3	−31.77	1.283 8614	−2570.0	1.74	0.46	15 1.1
	21 42 59.70	− 6.455	*−14 30 29.8*	*−34.43*	1.282 8710	−2379.2	1.75	0.46	14 44.9

GREENWICH MEAN TIME.

Date.	Apparent Right Ascension.	Var. per Day.	Apparent Declination.	Var. per Day.	Logarithm of Distance from Earth.	Var. per Day.	Semi-diameter.	Hor. Paral-lax.
	Noon.	*Noon.*	*Noon.*	*Noon.*	*Noon.*	*Noon.*	*Noon.*	*Noon.*
	h m s	s	° ′ ″	″			″	″
July 2	21 43 24.41	−5.894	−14 28 17.3	−31.77	1.283 8614	−2570.0	1.74	0.46
6	21 42 59.70	6.455	14 30 29.8	34.43	1.282 8710	2379.2	1.75	0.46
10	21 42 32.82	6.977	14 32 52.5	36.89	1.281 9598	2175.1	1.75	0.46
14	21 42 3.94	7.458	14 35 24.6	39.12	1.281 1326	1958.6	1.75	0.46
18	21 41 33.22	7.892	14 38 5.1	41.08	1.280 3946	1729.3	1.76	0.46
22	21 41 0.87	− 8.274	−14 40 52.9	−42.76	1.279 7506	−1489.0	1.76	0.46
26	21 40 27.10	8.599	14 43 46.8	44.15	1.279 2046	1239.9	1.76	0.46
30	21 39 52.15	8.868	14 46 45.7	45.22	1.278 7596	984.0	1.76	0.46
Aug. 3	21 39 16.23	9.080	14 49 48.2	46.01	1.278 4180	723.8	1.77	0.46
7	21 38 39.58	9.238	14 52 53.4	46.51	1.278 1812	458.4	1.77	0.46
11	21 38 2.40	− 9.339	−14 56 0.0	−46.72	1.278 0518	− 188.8	1.77	0.46
15	21 37 24.95	9.377	14 59 6.8	46.63	1.278 0305	+ 83.7	1.77	0.46
19	21 36 47.47	9.351	15 2 12.6	46.20	1.278 1188	356.5	1.77	0.46
23	21 36 10.23	9.259	15 5 16.0	45.45	1.278 3155	627.5	1.77	0.46
27	21 35 33.48	9.104	15 8 15.8	44.40	1.278 6204	895.7	1.76	0.46
31	21 34 57.48	− 8.888	−15 11 10.8	−43.05	1.279 0313	+1157.4	1.76	0.46
Sept. 4	21 34 22.45	8.618	15 13 59.9	41.48	1.279 5455	1412.7	1.76	0.46
8	21 33 48.61	8.293	15 16 42.3	39.65	1.280 1606	1661.9	1.76	0.46
12	21 33 16.18	7.910	15 19 16.7	37.50	1.280 8740	1903.9	1.76	0.46
16	21 32 45.41	7.468	15 21 42.0	35.13	1.281 6824	2135.9	1.75	0.46
20	21 32 16.51	− 6.972	−15 23 57.4	−32.51	1.282 5810	+2354.7	1.75	0.46
24	21 31 49.70	6.428	15 26 1.8	29.68	1.283 5644	2560.6	1.74	0.46
28	21 31 25.14	5.844	15 27 54.6	26.68	1.284 6275	2751.5	1.74	0.46
Oct. 2	21 31 3.00	5.220	15 29 35.0	23.52	1.285 7636	2927.5	1.74	0.46
6	21 30 43.43	4.561	15 31 2.5	20.20	1.286 9676	3089.6	1.73	0.45
10	21 30 26.56	− 3.867	−15 32 16.4	−16.75	1.288 2332	+3236.3	1.73	0.45
14	21 30 12.54	3.139	15 33 16.3	13.16	1.289 5544	3366.2	1.72	0.45
18	21 30 1.48	2.387	15 34 1.5	9.44	1.290 9237	3477.4	1.72	0.45
22	21 29 53.47	1.616	15 34 31.7	5.64	1.292 3338	3569.9	1.71	0.45
26	21 29 48.59	0.828	15 34 46.6	− 1.83	1.293 7771	3643.3	1.70	0.45
30	21 29 46.86	− 0.034	−15 34 46.3	+ 1.99	1.295 2461	+3699.3	1.70	0.45
Nov. 3	21 29 48.33	+ 0.768	15 34 30.6	5.86	1.296 7342	3737.8	1.69	0.44
7	21 29 53.01	1.572	15 33 59.4	9.75	1.298 2340	3758.6	1.69	0.44
11	21 30 0.91	2.379	15 33 12.6	13.64	1.299 7387	3761.8	1.68	0.44
15	21 30 12.04	3.186	15 32 10.3	17.51	1.301 2410	3746.7	1.67	0.44
19	21 30 26.38	+ 3.981	−15 30 52.6	+21.33	1.302 7335	+3712.3	1.67	0.44
23	21 30 43.86	4.756	15 29 19.8	25.04	1.304 2085	3660.3	1.66	0.44
27	21 31 4.40	5.512	15 27 32.4	28.67	1.305 6596	3592.3	1.66	0.43
Dec. 1	21 31 27.93	6.250	15 25 30.5	32.24	1.307 0804	3510.1	1.65	0.43
5	21 31 54.37	6.966	15 23 14.6	35.69	1.308 4656	3412.3	1.65	0.43
9	21 32 23.63	+ 7.660	−15 20 45.1	+39.04	1.309 8082	+3299.0	1.64	0.43
13	21 32 55.61	8.326	15 18 2.4	42.29	1.311 1030	3172.4	1.64	0.43
17	21 33 30.19	8.958	15 15 7.0	45.38	1.312 3442	3030.8	1.63	0.43
21	21 34 7.22	9.551	15 11 59.6	48.29	1.313 5259	2876.1	1.63	0.43
25	21 34 46.55	10.109	15 8 40.9	51.04	1.314 6437	2711.5	1.62	0.43
29	21 35 28.04	+10.629	−15 5 11.5	+53.62	1.315 6938	+2537.2	1.62	0.43
33	21 36 11.52	....	−15 1 32.3	...	1.316 6720	....	1.62	0.42

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.
	° ′ ″	″	″	° ′ ″	″		
1. 5	319 19 28.8	39.13	+7.0	−0 42 15.4	−0.22	1.300 2137	+18.8
15	319 26 0.1	39.13	7.0	0 42 17.6	0.22	1.300 2325	18.8
25	319 32 31.4	39.12	7.0	0 42 19.8	0.21	1.300 2513	18.8
b. 4	319 39 2.6	39.12	+7.0	−0 42 21.9	−0.21	1.300 2700	+18.7
14	319 45 33.7	39.11	6.9	0 42 24.0	0.21	1.300 2886	18.6
24	319 52 4.8	39.11	6.9	0 42 26.1	0.21	1.300 3071	18.6
r. 6	319 58 35.9	39.10	+6.9	−0 42 28.2	−0.21	1.300 3257	+18.5
16	320 5 6.9	39.10	6.9	0 42 30.3	0.21	1.300 3441	18.4
26	320 11 37.9	39.10	6.8	0 42 32.4	0.21	1.300 3624	18.3
e. 5	320 18 8.8	39.09	+6.8	−0 42 34.5	−0.21	1.300 3806	+18.2
15	320 24 39.7	39.09	6.8	0 42 36.6	0.21	1.300 3989	18.2
25	320 31 10.5	39.08	6.8	0 42 38.6	0.20	1.300 4171	18.1
y 5	320 37 41.3	39.08	+6.7	−0 42 40.7	−0.20	1.300 4352	+18.0
15	320 44 12.0	39.07	6.7	0 42 42.7	0.20	1.300 4531	17.9
25	320 50 42.7	39.07	6.7	0 42 44.8	0.20	1.300 4710	17.9
ne. 4	320 57 13.4	39.06	+6.7	−0 42 46.8	−0.20	1.300 4889	+17.8
14	321 3 44.0	39.06	6.6	0 42 48.8	0.20	1.300 5067	17.8
24	321 10 14.6	39.06	6.6	0 42 50.8	0.20	1.300 5244	17.7
ly 4	321 16 45.1	39.05	+6.6	−0 42 52.8	−0.20	1.300 5421	+17.7
14	321 23 15.6	39.05	6.6	0 42 54.8	0.20	1.300 5597	17.6
24	321 29 46.1	39.04	6.5	0 42 56.8	0.20	1.300 5772	17.5
g. 3	321 36 16.5	39.04	+6.5	−0 42 58.8	−0.20	1.300 5947	+17.5
13	321 42 46.8	39.03	6.5	0 43 0.8	0.19	1.300 6121	17.4
23	321 49 17.1	39.03	6.4	0 43 2.7	0.19	1.300 6295	17.3
pt. 2	321 55 47.4	39.02	+6.4	−0 43 4.6	−0.19	1.300 6468	+17.3
12	322 2 17.6	39.02	6.4	0 43 6.5	0.19	1.300 6640	17.2
22	322 8 47.8	39.02	6.4	0 43 8.5	0.19	1.300 6811	17.1
t. 2	322 15 18.0	39.01	+6.4	−0 43 10.4	−0.19	1.300 6982	+17.1
12	322 21 48.1	39.01	6.3	0 43 12.3	0.19	1.300 7152	17.0
22	322 28 18.1	39.00	6.3	0 43 14.2	0.19	1.300 7322	16.9
v. 1	322 34 48.1	39.00	+6.3	−0 43 16.1	−0.19	1.300 7491	+16.8
11	322 41 18.1	39.00	6.2	0 43 17.9	0.18	1.300 7658	16.7
21	322 47 48.1	38.99	6.2	0 43 19.8	0.18	1.300 7826	16.7
c. 1	322 54 18.0	38.99	+6.2	−0 43 21.6	−0.18	1.300 7993	+16.6
11	323 0 47.8	38.98	6.2	0 43 23.5	0.18	1.300 8159	16.6
21	323 7 17.6	38.98	6.1	0 43 25.3	0.18	1.300 8324	16.5
31	323 13 47.4	38.97	+6.1	−0 43 27.2	−0.18	1.300 8489	+16.5
41	323 20 17.1	38.97	+6.1	−0 43 29.0	−0.18	1.300 8654	+16.4

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.
	Noon.	*Noon.*	*Noon.*	*Noon.*	*Noon.*	*Noon.*	*Noon.*	*Noon.*
	h m s	s	° ′ ″	″			″	″
Jan. 3	8 25 19.89	−6.346	+19 0 58.6	+22.35	1.463 9859	− 944.7	1.33	0.30
7	8 24 54.08	6.554	19 2 29.4	23.04	1.463 6430	770.4	1.33	0.30
11	8 24 27.51	6.722	19 4 2.7	23.57	1.463 3701	592.4	1.33	0.30
15	8 24 0.36	6.849	19 5 37.8	23.97	1.463 1697	409.3	1.33	0.30
19	8 23 32.78	6.930	19 7 14.3	24.24	1.463 0430	223.7	1.33	0.30
23	8 23 4.98	−6.964	+19 8 51.5	+24.31	1.462 9910	− 36.1	1.33	0.30
27	8 22 37.13	6.950	19 10 28.6	24.22	1.463 0141	+ 151.1	1.33	0.30
31	8 22 9.44	6.888	19 12 5.1	23.99	1.463 1116	336.2	1.33	0.30
Feb. 4	8 21 42.08	6.783	19 13 40.3	23.60	1.463 2827	519.0	1.33	0.30
8	8 21 15.23	6.637	19 15 13.7	23.07	1.463 5263	697.9	1.33	0.30
12	8 20 49.04	−6.448	+19 16 44.7	+22.39	1.463 8404	+ 871.9	1.33	0.30
16	8 20 23.70	6.218	19 18 12.7	21.61	1.464 2233	1042.5	1.33	0.30
20	8 19 59.35	5.948	19 19 37.4	20.68	1.464 6736	1207.0	1.33	0.30
24	8 19 36.17	5.636	19 20 58.0	19.62	1.465 1879	1363.9	1.32	0.30
28	8 19 14.31	5.288	19 22 14.2	18.46	1.465 7635	1511.8	1.32	0.30
Mar. 4	8 18 53.91	−4.907	+19 23 25.5	+17.18	1.466 3960	+1649.7	1.32	0.30
8	8 18 35.09	4.498	19 24 31.5	15.83	1.467 0820	1778.5	1.32	0.30
12	8 18 17.96	4.063	19 25 32.0	14.39	1.467 8175	1897.7	1.32	0.30
16	8 18 2.62	3.604	19 26 26.5	12.87	1.468 5988	2007.1	1.31	0.30
20	8 17 49.16	3.123	19 27 14.9	11.28	1.469 4217	2105.2	1.31	0.30
24	8 17 37.67	−2.616	+19 27 56.7	+ 9.63	1.470 2815	+2192.5	1.31	0.30
28	8 17 28.25	2.094	19 28 31.9	7.92	1.471 1740	2267.1	1.31	0.30
Apr. 1	8 17 20.93	1.564	19 29 0.2	6.19	1.472 0935	2328.9	1.30	0.30
5	8 17 15.75	1.023	19 29 21.4	4.44	1.473 0356	2379.6	1.30	0.30
9	8 17 12.75	−0.478	19 29 35.7	2.70	1.473 9956	2418.1	1.30	0.30
13	8 17 11.93	+0.070	+19 29 42.9	+ 0.89	1.474 9686	+2445.7	1.29	0.29
17	8 17 13.32	0.625	19 29 42.8	− 0.93	1.475 9507	2462.5	1.29	0.29
21	8 17 16.93	1.179	19 29 35.4	2.74	1.476 9370	2467.2	1.29	0.29
25	8 17 22.75	1.730	19 29 20.9	4.52	1.477 9228	2459.5	1.29	0.29
29	8 17 30.76	2.272	19 28 59.2	6.32	1.478 9030	2439.8	1.28	0.29
May 3	8 17 40.91	+2.802	+19 28 30.4	− 8.07	1.479 8732	+2409.2	1.28	0.29
7	8 17 53.16	3.321	19 27 54.7	9.78	1.480 8291	2369.3	1.28	0.29
11	8 18 7.46	3.826	19 27 12.2	11.47	1.481 7674	2320.6	1.27	0.29
15	8 18 23.75	4.318	19 26 23.0	13.13	1.482 6842	2261.5	1.27	0.29
19	8 18 41.99	4.798	19 25 27.2	14.75	1.483 5753	2192.5	1.27	0.29
23	8 19 2.11	+5.258	+19 24 25.1	−16.31	1.484 4370	+2114.5	1.27	0.29
27	8 19 24.03	5.698	19 23 16.8	17.82	1.485 2657	2027.6	1.26	0.29
31	8 19 47.66	6.111	19 22 2.6	19.26	1.486 0580	1932.7	1.26	0.29
June 4	8 20 12.89	6.501	19 20 42.8	20.63	1.486 8110	1830.7	1.26	0.29
8	8 20 39.64	6.870	19 19 17.6	21.95	1.487 5217	1722.5	1.26	0.29
12	8 21 7.82	+7.217	+19 17 47.3	−23.20	1.488 1882	+1608.9	1.26	0.29
16	8 21 37.34	7.537	19 16 12.1	24.39	1.488 8079	1487.9	1.25	0.29
20	8 22 8.08	7.830	19 14 32.3	25.49	1.489 3777	1360.7	1.25	0.28
24	8 22 39.94	8.095	19 12 48.3	26.49	1.489 8958	1228.5	1.25	0.28
28	8 23 12.80	8.331	19 11 0.5	27.40	1.490 3599	1091.5	1.25	0.28
July 2	8 23 46.55	+8.536	+19 9 9.2	−28.23	1.490 7686	+ 951.4	1.25	0.28
6	8 24 21.05	+8.710	+19 7 14.8	−28.96	1.491 1207	+ 809.2	1.25	0.28

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
ly 2	8 23 46.55	+8.536	+19 9 9.2	−28.23	1.490 7686	+ 951.4	1.25	0.28	1 43.7
6	8 24 21.05	8.710	19 7 14.8	28.96	1.491 1207	809.2	1.25	0.28	1 28.6
10	8 24 56.20	8.861	19 5 17.6	29.63	1.491 4155	663.5	1.25	0.28	1 13.4
14	8 25 31.90	8.983	19 3 17.9	30.19	1.491 6511	514.7	1.25	0.28	0 58.3
18	8 26 8.02	9.073	19 1 16.2	30.66	1.491 8269	363.3	1.25	0.28	0 43.1
22	8 26 44.44	+9.129	+18 59 12.8	−30.99	1.491 9415	+ 210.2	1.25	0.28	0 28.0
26	8 27 21.02	9.153	18 57 8.4	31.22	1.491 9950	+ 56.8	1.25	0.28	0 12.9
30	8 27 57.62	9.145	18 55 3.2	31.34	1.491 9869	− 97.0	1.25	0.28	23 54.0
ug. 3	8 28 34.13	9.108	18 52 57.8	31.37	1.491 9176	248.8	1.25	0.28	23 38.9
7	8 29 10.45	9.047	18 50 52.4	31.29	1.491 7879	400.6	1.25	0.28	23 23.7
11	8 29 46.46	+8.952	+18 48 47.6	−31.11	1.491 5971	− 552.9	1.25	0.28	23 8.6
15	8 30 22.02	8.824	18 46 43.7	30.79	1.491 3458	703.3	1.25	0.28	22 53.4
19	8 30 57.01	8.665	18 44 41.4	30.37	1.491 0348	851.4	1.25	0.28	22 38.3
23	8 31 31.30	8.475	18 42 40.9	29.83	1.490 6651	996.1	1.25	0.28	22 23.1
27	8 32 4.77	8.255	18 40 42.9	29.15	1.490 2384	1137.1	1.25	0.28	22 7.9
31	8 32 37.30	+8.007	+18 38 47.8	−28.38	1.489 7560	−1273.9	1.25	0.28	21 52.8
pt. 4	8 33 8.79	7.733	18 36 56.0	27.52	1.489 2199	1406.0	1.25	0.28	21 37.6
8	8 33 39.13	7.433	18 35 7.8	26.55	1.488 6318	1533.7	1.25	0.29	21 22.3
12	8 34 8.22	7.105	18 33 23.8	25.43	1.487 9936	1656.8	1.26	0.29	21 7.1
16	8 34 35.93	6.746	18 31 44.5	24.22	1.487 3072	1773.8	1.26	0.29	20 51.8
20	8 35 2.15	+6.360	+18 30 10.2	−22.91	1.486 5756	−1883.1	1.26	0.29	20 36.5
24	8 35 26.78	5.952	18 28 41.4	21.46	1.485 8018	1984.4	1.26	0.29	20 21.2
28	8 35 49.74	5.523	18 27 18.6	19.95	1.484 9892	2077.5	1.27	0.29	20 5.9
ct. 2	8 36 10.94	5.074	18 26 1.9	18.36	1.484 1409	2162.6	1.27	0.29	19 50.5
6	8 36 30.31	4.607	18 24 51.8	16.69	1.483 2602	2239.9	1.27	0.29	19 35.1
10	8 36 47.77	+4.119	+18 23 48.5	−14.93	1.482 3502	−2308.0	1.27	0.29	19 19.6
14	8 37 3.24	3.613	18 22 52.5	13.07	1.481 4152	2365.8	1.28	0.29	19 4.1
18	8 37 16.65	3.089	18 22 4.0	11.16	1.480 4590	2413.1	1.28	0.29	18 48.6
22	8 37 27.94	2.555	18 21 23.3	9.19	1.479 4863	2448.5	1.28	0.29	18 33.1
26	8 37 37.08	2.014	18 20 50.5	7.19	1.478 5017	2472.5	1.28	0.29	18 17.5
30	8 37 44.04	+1.465	+18 20 25.8	− 5.15	1.477 5098	−2485.4	1.29	0.29	18 1.9
ov. 3	8 37 48.79	0.911	18 20 9.3	3.10	1.476 5148	2487.8	1.29	0.29	17 46.2
7	8 37 51.32	+0.353	18 20 1.0	− 1.03	1.475 5212	2477.7	1.29	0.29	17 30.5
11	8 37 51.61	−0.206	18 20 1.1	+ 1.08	1.474 5343	2455.1	1.30	0.29	17 14.8
15	8 37 49.67	0.765	18 20 9.6	3.17	1.473 5588	2420.0	1.30	0.30	16 59.0
19	8 37 45.50	−1.316	+18 20 26.4	+ 5.22	1.472 6001	−2371.4	1.30	0.30	16 43.2
23	8 37 39.16	1.855	18 20 51.3	7.23	1.471 6634	2310.1	1.30	0.30	16 27.4
27	8 37 30.68	2.381	18 21 24.2	9.20	1.470 7536	2237.3	1.31	0.30	16 11.5
ec. 1	8 37 20.13	2.891	18 22 4.8	11.09	1.469 8751	2153.2	1.31	0.30	15 55.6
5	8 37 7.57	3.387	18 22 52.8	12.92	1.469 0326	2057.7	1.31	0.30	15 39.7
9	8 36 53.06	−3.861	+18 23 48.1	+14.69	1.468 2305	−1950.4	1.32	0.30	15 23.7
13	8 36 36.71	4.312	18 24 50.2	16.36	1.467 4739	1830.8	1.32	0.30	15 7.7
17	8 36 18.60	4.735	18 25 58.8	17.91	1.466 7673	1700.8	1.32	0.30	14 51.7
21	8 35 58.87	5.126	18 27 13.3	19.33	1,466 1146	1560.7	1.32	0.30	14 35.6
25	8 35 37.64	5.481	18 28 33.3	20.62	1.465 5199	1412.1	1.32	0.30	14 19.5
29	8 35 15.07	−5.794	+18 29 58.1	+21.77	1.464 9859	−1256.6	1.33	0.30	14 3.4
33	8 34 51.29	....	*+18 31 27.3*	....	1.464 5158	....	1.33	0.30	13 47.3

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. Day.
		° ′ ″	″	″	° ′ ″	″		
Jan.	5	123 22 54.7	21.74	−12.8	−0 13 53.4	+0.67	1.477 4598	+4.8
	15	123 26 32.1	21.74	12.7	0 13 46.7	0.67	1.477 4647	4.8
	25	123 30 9.5	21.74	12.6	0 13 40.0	0.67	1.477 4695	4.8
Feb.	4	123 33 47.0	21.74	−12.5	−0 13 33.3	+0.67	1.477 4743	+4.8
	14	123 37 24.4	21.74	12.4	0 13 26.7	0.67	1.477 4792	4.8
	24	123 41 1.8	21.74	12.3	0 13 20.0	0.67	1.477 4840	4.8
Mar.	6	123 44 39.2	21.74	−12.2	−0 13 13.4	+0.67	1.477 4889	+4.8
	16	123 48 16.7	21.74	12.1	0 13 6.7	0.67	1.477 4937	4.8
	26	123 51 54.1	21.74	12.0	0 13 0.1	0.67	1.477 4986	4.8
Apr.	5	123 55 31.6	21.74	−11.9	−0 12 53.4	+0.67	1.477 5034	+4.8
	15	123 59 9.0	21.74	11.8	0 12 46.7	0.67	1.477 5082	4.8
	25	124 2 46.5	21.74	11.7	0 12 40.0	0.67	1.477 5130	4.8
May	5	124 6 23.9	21.74	−11.6	−0 12 33.4	+0.67	1.477 5178	+4.8
	15	124 10 1.4	21.74	11.5	0 12 26.7	0.67	1.477 5226	4.8
	25	124 13 38.8	21.74	11.4	0 12 20.0	0.67	1.477 5274	4.8
June	4	124 17 16.3	21.74	−11.3	−0 12 13.3	+0.67	1.477 5322	+4.8
	14	124 20 53.7	21.75	11.2	0 12 6.7	0.67	1.477 5370	4.8
	24	124 24 31.2	21.75	11.1	0 12 0.0	0.67	1.477 5418	4.8
July	4	124 28 8.6	21.75	−11.0	−0 11 53.3	+0.67	1.477 5466	+4.8
	14	124 31 46.1	21.75	10.9	0 11 46.6	0.67	1.477 5513	4.8
	24	124 35 23.5	21.75	10.8	0 11 39.9	0.67	1.477 5561	4.8
Aug.	3	124 39 1.0	21.75	−10.7	−0 11 33.2	+0.67	1.477 5609	+4.8
	13	124 42 38.5	21.75	10.6	0 11 26.5	0.67	1.477 5657	4.8
	23	124 46 16.0	21.75	10.5	0 11 19.8	0.67	1.477 5704	4.8
Sept.	2	124 49 53.4	21.75	−10.4	−0 11 13.2	+0.67	1.477 5752	+4.7
	12	124 53 30.9	21.75	10.3	0 11 6.5	0.67	1.477 5799	4.7
	22	124 57 8.4	21.75	10.2	0 10 59.8	0.67	1.477 5847	4.7
Oct.	2	125 0 45.9	21.75	−10.1	−0 10 53.1	+0.67	1.477 5894	+4.7
	12	125 4 23.3	21.75	10.0	0 10 46.4	0.67	1.477 5941	4.7
	22	125 8 0.8	21.75	9.9	0 10 39.7	0.67	1.477 5988	4.7
Nov.	1	125 11 38.3	21.75	− 9.8	−0 10 33.0	+0.67	1.477 6035	+4.7
	11	125 15 15.8	21.75	9.7	0 10 26.3	0.67	1.477 6082	4.7
	21	125 18 53.3	21.75	9.6	0 10 19.7	0.67	1.477 6129	4.7
Dec.	1	125 22 30.8	21.75	− 9.5	−0 10 13.0	+0.67	1.477 6176	+4.7
	11	125 26 8.3	21.75	9.4	0 10 6.3	0.67	1.477 6223	4.7
	21	125 29 45.8	21.75	9.3	0 9 59.6	0.67	1.477 6269	4.7
	31	125 33 23.3	21.75	− 9.2	−0 9 52.9	+0.67	1.477 6316	+4.7
	41	125 37 0.8	21.75	− 9.1	−0 9 46.2	+0.67	1.477 6362	+4.6

PART II.

ASTRONOMICAL EPHEMERIS FOR THE MERIDIAN OF WASHINGTON.

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

BESSELIAN STAR-NUMBERS.

Terms of Long Period.	*Terms of Short Period.*
$A=\tau-$ 0.342 20 sin ☊	$-0.004\ 05 \sin 2\ \mathbb{C}$
$+$ 0.004 15 sin 2 ☊	$+0.000\ 23 \sin (\mathbb{C}+\Gamma')$
$-$ 0.025 26 sin 2 L	$+0.001\ 34 \sin (\mathbb{C}-\Gamma')$
$+$ 0.002 51 sin (L$-\Gamma$)	$-0.000\ 68 \sin (2\ \mathbb{C}-$☊$)$
$-$ 0.000 99 sin (3 L$-\Gamma$)	$-0.000\ 52 \sin (3\ \mathbb{C}-\Gamma')$
$+$ 0.000 42 sin (L$+\Gamma$)	$+0.000\ 30 \sin (\mathbb{C}-2\ \mathrm{L}+\Gamma')$
$+$ 0.000 25 sin (2 L$-$☊)	$+0.000\ 12 \sin 2\ (\mathbb{C}-\mathrm{L})$
$B=-$ 9.210 cos ☊	$-0.088 \cos 2\ \mathbb{C}$
$+$ 0.090 cos 2 ☊	$-0.018 \cos (2\ \mathbb{C}-$☊$)$
$-$ 0.552 cos 2 L	$-0.011 \cos (3\ \mathbb{C}-\Gamma')$
$-$ 0.022 cos (3 L$-\Gamma$)	$+0.005 \cos (\mathbb{C}+\Gamma')$
$+$ 0.009 cos (L$+\Gamma$)	
$+$ 0.007 cos (2 L$-$☊)	

$C=-20.4700 \cos \omega \cos \odot$

$D=-20.4700 \sin \odot$

$E=-0.0416 \sin$ ☊$+0''.0005 \sin 2$ ☊$-0''.0031 \sin 2\ \mathrm{L}$

BESSEL'S *Star-Constants.*

$a=3^s.072\ 65+1^s.336\ 36 \sin \alpha_0 \tan \delta_0$	$a'=20''.0454 \cos \alpha_0$
$b=\frac{1}{15} \cos \alpha_0 \tan \delta_0$	$b'=-\sin \alpha_0$
$c=\frac{1}{15} \cos \alpha_0 \sec \delta_0$	$c'=\tan \omega \cos \delta_0-\sin \alpha_0 \sin \delta_0$
$d=\frac{1}{15} \sin \alpha_0 \sec \delta_0$	$d'=\cos \alpha_0 \sin \delta_0$

Formulæ for reduction to Apparent Position.

$$\alpha=\alpha_0+\tau\mu+Aa+Bb+Cc+Dd+\tfrac{1}{15}E \quad \text{(in time)}$$
$$\delta=\delta_0+\tau\mu'+Aa'+Bb'+Cc'+Dd' \quad \text{(in arc)}$$

INDEPENDENT STAR-NUMBERS.

$f+f'=+46''.0898\ A+E$ (in arc)
$=+3^s.07265\ A+\frac{1}{15}E$ (in time)

$f'=-0^s.0124 \sin 2\ \mathbb{C}+0^s.0041 \sin (\mathbb{C}-\Gamma')+0^s.0007 \sin (\mathbb{C}+\Gamma')$
$-0^s.0021 \sin (2\ \mathbb{C}-$☊$)-0^s.0016 \sin (3\ \mathbb{C}-\Gamma')$
$+0^s.0009 \sin (\mathbb{C}-2\ \mathrm{L}+\Gamma')+0^s.0004 \sin 2\ (\mathbb{C}-\mathrm{L})$

$g \sin G=B$ $\quad h \sin H=C$ $\quad i=C \tan \omega$
$g \cos G=20''.0454\ A$ $\quad h \cos H=D$

Formulæ for Reduction to Apparent Position.

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

In the above formulæ,

τ denotes the time reckoned in units of one year, from the beginning of Besselian fictitious year (1917, January $0^d.217$, Washington m time),

α_0, δ_0, the star's mean R. A. and Decl. at the beginning of the fictitious y

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,
☊, the longitude of the Moon's *ascending node*,

ω, the obliquity of the eclipti
Γ, the long. of the Sun's peri
Γ', the long. of the Moon's per
$\mathbb{C}$, the Moon's mean longitud

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

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

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

n the computation of the independent star-numbers, pages 206–213, the -period terms have been included in the two columns headed G and Log g. uantities f and f' give separately the effect of the long period and short-d terms. f' differs but slightly from the quantity $-0''.1866 \sin 2 (\mathbb{C} + 22 \sin (\mathbb{C} - \Gamma'')$ given on page 37 of the *Procès-Verbaux* of the Paris Con-ce of 1896, which quantity that conference decided should be omitted in eduction of stars from mean to apparent place.

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

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

$$\Delta\alpha = D_\psi\alpha \; \delta''\psi + D_\omega\alpha \; \delta''\omega$$
$$\Delta\delta = D_\psi\delta \; \delta''\psi + D_\omega\delta \; \delta''\omega$$

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

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

hich A_2 and B_2 are the sums of the short-period terms given in the expres-s 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 ages 316–513, and have been computed by means of the following formulæ:

$$D_\psi\alpha = {}^s.015 \; (\cos\omega + \sin\alpha \tan\delta \sin\omega) \qquad D_\omega\alpha = -{}^s.015 \cos\alpha \tan\delta$$
$$D_\psi\delta = \cos\alpha \sin\omega \qquad D_\omega\delta = \sin\alpha$$

In the *Star List of the American Ephemeris* for the years 1910 and 1911 l in the *American Ephemeris and Nautical Almanac* for the years 1912 to 5, inclusive, the value used for the derivative of the right ascension with rence to ψ was

$$D'_\psi\alpha = {}^s.015 \sin\alpha \tan\delta \sin\omega$$

l the addition of the term ${}^s.015 \cos\omega$ is made in accordance with the above-ntioned decision *of the Congrès International des Éphémérides* Astronomiques *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*.
Jan.	0	+9.51342	−0.4500	−0.52391	+1.30413	Feb.	15	+9.67399	−0.4817	−1.19718
	1	9.51677	0.4437	0.56460	1.30267		16	9.67843	0.4821	1.20206
	2	9.52128	0.4364	0.60168	1.30105		17	9.68278	0.4858	1.20674
	3	9.52686	0.4297	0.63570	1.29930	h	18	9.68668	0.4922	1.21124
h	4	9.53322	0.4252	0.66713	1.29740	(10.0)	19	9.68965	0.5001	1.21557
(7.0)	5	+9.53988	−0.4235	−0.69630	+1.29535		20	+9.69167	−0.5077	−1.21971
	6	9.54637	0.4248	0.72351	1.29316		21	9.69277	0.5136	1.22368
	7	9.55236	0.4288	0.74898	1.29082		22	9.69326	0.5167	1.22748
	8	9.55758	0.4346	0.77290	1.28832		23	9.69364	0.5164	1.23111
	9	9.56190	0.4411	0.79545	1.28568		24	9.69433	0.5133	1.23458
	10	+9.56540	−0.4474	−0.81675	+1.28288		25	+9.69562	−0.5084	−1.23788
	11	9.56812	0.4528	0.83692	1.27992		26	9.69774	0.5029	1.24103
	12	9.57019	0.4565	0.85607	1.27681		27	9.70049	0.4983	1.24402
	13	9.57201	0.4579	0.87427	1.27354		28	9.70370	0.4958	1.24685
	14	9.57388	0.4568	0.89161	1.27010	Mar.	1	9.70697	0.4957	1.24954
	15	+9.57616	−0.4534	−0.90815	+1.26650		2	+9.71005	−0.4980	−1.25207
	16	9.57933	0.4483	0.92395	1.26272		3	9.71271	0.5022	1.25445
	17	9.58354	0.4427	0.93906	1.25878		4	9.71483	0.5073	1.25669
	18	9.58883	0.4382	0.95353	1.25466		5	9.71635	0.5126	1.25878
	19	9.59493	0.4362	0.96740	1.25037		6	9.71730	0.5172	1.26073
h						h				
(8.0)	20	+9.60133	−0.4378	−0.98070	+1.24590	(11.0)	7	+9.71780	−0.5206	−1.26254
	21	9.60746	0.4430	0.99348	1.24124		8	9.71798	0.5222	1.26421
	22	9.61271	0.4510	1.00575	1.23639		9	9.71806	0.5217	1.26574
	23	9.61682	0.4601	1.01756	1.23135		10	9.71829	0.5190	1.26713
	24	9.61966	0.4683	1.02891	1.22611		11	9.71893	0.5144	1.26838
	25	+9.62150	−0.4743	−1.03983	+1.22067		12	+9.72021	−0.5085	−1.26950
	26	9.62280	0.4769	1.05036	1.21503		13	9.72228	0.5025	1.27049
	27	9.62410	0.4761	1.06049	1.20918		14	9.72507	0.4976	1.27134
	28	9.62586	0.4726	1.07026	1.20311		15	9.72839	0.4951	1.27206
	29	9.62843	0.4675	1.07968	1.19682		16	9.73182	0.4956	1.27265
	30	+9.63190	−0.4626	−1.08876	+1.19030		17	+9.73500	−0.4990	−1.27310
	31	9.63603	0.4592	1.09752	1.18354		18	9.73753	0.5043	1.27342
Feb.	1	9.64053	0.4583	1.10597	1.17654		19	9.73924	0.5100	1.27362
	2	9.64504	0.4601	1.11412	1.16929		20	9.74009	0.5145	1.27368
h	3	9.64921	0.4645	1.12198	1.16178	h	21	9.74037	0.5164	1.27361
(9.0)	4	+9.65284	−0.4706	−1.12957	+1.15400	(12.0)	22	+9.74039	−0.5151	−1.27341
	5	9.65577	0.4776	1.13689	1.14595		23	9.74066	0.5106	1.27308
	6	9.65798	0.4846	1.14395	1.13761		24	9.74145	0.5038	1.27262
	7	9.65959	0.4907	1.15077	1.12897		25	9.74290	0.4960	1.27203
	8	9.66068	0.4954	1.15734	1.12002		26	9.74509	0.4884	1.27131
	9	+9.66142	−0.4980	−1.16368	+1.11075		27	+9.74775	−0.4826	−1.27046
	10	9.66211	0.4984	1.16980	1.10114		28	9.75064	0.4792	1.26948
	11	9.66303	0.4965	1.17569	1.09117		29	9.75344	0.4784	1.26837
	12	9.66452	0.4928	1.18137	1.08084		30	9.75588	0.4797	1.26713
	13	9.66683	0.4883	1.18684	1.07012		31	9.75791	0.4824	1.26575
	14	+9.67004	−0.4841	−1.19211	+1.05900	Apr.	1	+9.75937	−0.4855	−1.26424
	15	+9.67399	−0.4817	−1.19718	+1.04745		2	+9.76035	−0.4882	−1.26260

E=+0″.04=+0ˢ.003

FOR WASHINGTON MEAN MIDNIGHT.

	Log *A*.	Log *B*.	Log *C*.	Log *D*.	Solar Day. (Sid. Hr.)		Log *A*.	Log *B*.	Log *C*.	Log *D*.
	+9.75937	−0.4855	−1.26424	−0.62542	May	17	+9.83469	−0.3062	−1.01346	−1.23314
	9.76035	0.4882	1.26260	0.65942		18	9.83619	0.2912	1.00215	1.23785
	9.76090	0.4898	1.26083	0.69082		19	9.83834	0.2752	0.99041	1.24239
	9.76116	0.4897	1.25892	0.71997		20	9.84100	0.2605	0.97823	1.24675
	9.76130	0.4874	1.25687	0.74714	h	21	9.84402	0.2492	0.96558	1.25096
	+9.76153	−0.4827	−1.25469	−0.77258	(16.0)	22	+9.84716	−0.2424	−0.95242	−1.25499
	9.76205	0.4758	1.25237	0.79647		23	9.85012	0.2402	0.93873	1.25887
	9.76313	0.4672	1.24991	0.81899		24	9.85277	0.2415	0.92448	1.26259
	9.76490	0.4580	1.24731	0.84026		25	9.85502	0.2448	0.90962	1.26616
	9.76736	0.4494	1.24456	0.86041		26	9.85681	0.2484	0.89412	1.26957
	+9.77036	−0.4430	−1.24167	−0.87953		27	+9.85820	−0.2510	−0.87792	−1.27284
	9.77363	0.4397	1.23864	0.89772		28	9.85931	0.2513	0.86098	1.27596
	9.77674	0.4401	1.23546	0.91505		29	9.86020	0.2486	0.84322	1.27894
	9.77938	0.4430	1.23213	0.93158		30	9.86111	0.2422	0.82459	1.28177
	9.78132	0.4471	1.22865	0.94737		31	9.86218	0.2320	0.80500	1.28446
	+9.78252	−0.4505	−1.22501	−0.96248	June	1	+9.86355	−0.2185	−0.78438	−1.28702
	9.78309	0.4515	1.22122	0.97696		2	9.86541	0.2025	0.76260	1.28944
	9.78335	0.4490	1.21727	0.99083		3	9.86781	0.1863	0.73955	1.29172
	9.78373	0.4427	1.21315	1.00415		4	9.87073	0.1723	0.71509	1.29387
	9.78453	0.4332	1.20887	1.01695		5	9.87400	0.1631	0.68905	1.29589
	+9.78596	−0.4218	−1.20443	−1.02925	h (17.0)	6	+9.87736	−0.1604	−0.66122	−1.29778
	9.78809	0.4102	1.19981	1.04108		7	9.88052	0.1642	0.63137	1.29954
	9.79074	0.4001	1.19502	1.05247		8	9.88321	0.1723	0.59918	1.30117
	9.79369	0.3928	1.19006	1.06344		9	9.88528	0.1817	0.56430	1.30268
	9.79665	0.3887	1.18491	1.07401		10	9.88672	0.1889	0.52624	1.30406
	+9.79938	−0.3875	−1.17957	−1.08420		11	+9.88774	−0.1912	−0.48439	−1.30531
	9.80174	0.3884	1.17405	1.09403		12	9.88856	0.1871	0.43795	1.30644
	9.80362	0.3903	1.16833	1.10351		13	9.88955	0.1764	0.38580	1.30745
	9.80502	0.3921	1.16241	1.11266		14	9.89091	0.1607	0.32641	1.30833
	9.80602	0.3928	1.15629	1.12150		15	9.89281	0.1426	0.25744	1.30909
	+9.80675	−0.3916	−1.14996	−1.13004		16	+9.89522	−0.1255	−0.17532	−1.30973
	9.80729	0.3879	1.14341	1.13828		17	9.89802	0.1125	0.07374	1.31025
	9.80790	0.3814	1.13664	1.14624		18	9.90096	0.1057	9.94082	1.31065
	9.80874	0.3720	1.12963	1.15394		19	9.90384	0.1054	9.74814	1.31093
	9.81000	0.3602	1.12239	1.16137		20	9.90644	0.1107	−9.39300	1.31108
	+9.81188	−0.3471	−1.11491	−1.16855	h (18.0)	21	+9.90871	−0.1193	+8.81701	−1.31112
	9.81438	0.3343	1.10718	1.17550		22	9.91054	0.1289	9.57789	1.31103
	9.81741	0.3235	1.09918	1.18221		23	9.91202	0.1375	9.83943	1.31082
	9.82077	0.3167	1.09090	1.18869		24	9.91318	0.1435	0.00142	1.31050
	9.82412	0.3145	1.08235	1.19495		25	9.91414	0.1458	0.11901	1.31005
	+9.82713	−0.3164	−1.07350	−1.20100		26	+9.91501	−0.1436	+0.21136	−1.30948
	9.82963	0.3208	1.06434	1.20684		27	9.91595	0.1371	0.28735	1.30879
	9.83128	0.3252	1.05486	1.21248		28	9.91712	0.1264	0.35190	1.30798
	9.83237	0.3272	1.04505	1.21793		29	9.91868	0.1125	0.40796	1.30705
	9.83307	0.3251	1.03489	1.22318		30	9.92068	0.0975	0.45750	1.30600
	+9.83374	−0.3179	−1.02437	−1.22825	July	1	+9.92315	−0.0845	+0.50185	−1.30482
	+9.83469	−0.3062	−1.01346	−1.23314		2	+9.92600	−0.0766	+0.54198	−1.30352

E=+0″.04=+0ˢ.003

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.
July 1	+9.92315	−0.0845	+0.50185	−1.30482	Aug. 16	+9.99504	−0.2033	+1.18005
2	9.92600	0.0766	0.54198	1.30352	17	9.99566	0.2141	1.18531
3	9.92898	0.0764	0.57860	1.30209	18	9.99605	0.2219	1.19089
4	9.93190	0.0840	0.61226	1.30054	19	9.99630	0.2261	1.19529
5	9.93448	0.0978	0.64338	1.29886	20	9.99654	0.2266	1.20002
h					h			
(19.0) 6	+9.93652	−0.1140	+0.67231	−1.29706	(23.0) 21	+9.99685	−0.2233	+1.20458
7	9.93800	0.1287	0.69932	1.29512	22	9.99738	0.2169	1.20897
8	9.93902	0.1384	0.72464	1.29306	23	9.99822	0.2085	1.21319
9	9.93976	0.1412	0.74846	1.29087	24	9.99944	0.2002	1.21726
10	9.94053	0.1365	0.77092	1.28854	25	0.00102	0.1942	1.22116
11	+9.94154	−0.1259	+0.79217	−1.28608	26	+0.00283	−0.1925	+1.22491
12	9.94298	0.1116	0.81231	1.28349	27	0.00473	0.1965	1.22851
13	9.94487	0.0974	0.83146	1.28076	28	0.00652	0.2059	1.23196
14	9.94714	0.0870	0.84967	1.27789	29	0.00799	0.2187	1.23525
15	9.94962	0.0830	0.86705	1.27487	30	0.00904	0.2324	1.23840
16	+9.95209	−0.0857	+0.88364	−1.27172	31	+0.00963	−0.2436	+1.24141
17	9.95436	0.0947	0.89951	1.26842	Sept. 1	0.00992	0.2502	1.24428
18	9.95633	0.1077	0.91470	1.26497	2	0.01004	0.2510	1.24700
19	9.95792	0.1220	0.92926	1.26138	3	0.01026	0.2461	1.24958
20	9.95917	0.1357	0.94324	1.25763	4	0.01075	0.2367	1.25203
h					h			
h 21	+9.96011	−0.1467	+0.95667	−1.25372	(23.0) 5	+0.01162	−0.2253	+1.25434
(20.0) 22	9.96083	0.1542	0.96958	1.24966	6	0.01287	0.2149	1.25652
23	9.96142	0.1575	0.98200	1.24544	7	0.01438	0.2077	1.25857
24	9.96203	0.1563	0.99396	1.24106	8	0.01600	0.2055	1.26048
25	9.96278	0.1510	1.00548	1.23650	9	0.01755	0.2084	1.26225
26	+9.96382	−0.1425	+1.01658	−1.23178	10	+0.01888	−0.2154	+1.26390
27	9.96522	0.1324	1.02730	1.22688	11	0.01992	0.2245	1.26542
28	9.96704	0.1234	1.03764	1.22180	12	0.02064	0.2338	1.26681
29	9.96922	0.1181	1.04762	1.21654	13	0.02107	0.2417	1.26807
30	9.97165	0.1190	1.05726	1.21109	14	0.02128	0.2471	1.26920
31	+9.97406	−0.1270	+1.06658	−1.20545	15	+0.02133	−0.2492	+1.27020
Aug. 1	9.97625	0.1409	1.07558	1.19961	16	0.02135	0.2475	1.27108
2	9.97802	0.1580	1.08428	1.19357	17	0.02142	0.2424	1.27183
3	9.97932	0.1745	1.09270	1.18731	18	0.02167	0.2338	1.27245
4	9.98013	0.1873	1.10084	1.18085	19	0.02219	0.2228	1.27294
h					h			
h 5	+9.98064	−0.1943	+1.10872	−1.17415	(0.0) 20	+0.02304	−0.2110	+1.27331
(21.0) 6	9.98105	0.1946	1.11633	1.16723	21	0.02423	0.2004	1.27356
7	9.98162	0.1889	1.12370	1.16007	22	0.02571	0.1932	1.27367
8	9.98253	0.1791	1.13083	1.15266	23	0.02733	0.1912	1.27366
9	9.98386	0.1685	1.13773	1.14499	24	0.02890	0.1949	1.27352
10	+9.98555	−0.1600	+1.14440	−1.13706	25	+0.03025	−0.2028	+1.27325
11	9.98747	0.1562	1.15085	1.12886	26	0.03124	0.2126	1.27286
12	9.98944	0.1583	1.15710	1.12037	27	0.03181	0.2212	1.27234
13	9.99128	0.1659	1.16313	1.11158	28	0.03204	0.2258	1.27169
14	9.99286	0.1774	1.16897	1.10249	29	0.03209	0.2246	1.27091
15	+9.99412	−0.1905	+1.17461	−1.09307	30	+0.03218	−0.2170	+1.27000
16	+9.99504	−0.2033	+1.18005	−1.08331	Oct. 1	+0.03250	−0.2039	+1.26896

E=+0″.04=+0ˢ.003

FOR WASHINGTON MEAN MIDNIGHT.

Log A.	Log B.	Log C.	Log D.	Solar Day. (Sid. Hr.)		Log A.	Log B.	Log C.	Log D.
03250	−0.2039	+1.26896	+0.47758	Nov.	16	+0.07578	−9.5670	+1.03976	+1.22071
03316	0.1873	1.26778	0.52511		17	0.07765	9.5439	1.02892	1.22611
03423	0.1702	1.26648	0.56786		18	0.07941	9.5444	1.01765	1.23131
03560	0.1556	1.26504	0.60668	h	19	0.08095	9.5629	1.00594	1.23631
03715	0.1460	1.26347	0.64222	(4.0)	20	0.08211	9.5860	0.99377	1.24113
03868	−0.1423	+1.26176	+0.67497		21	+0.08293	−9.6005	+0.98110	+1.24576
04005	0.1438	1.25991	0.70533		22	0.08349	9.5969	0.96790	1.25021
04115	0.1488	1.25793	0.73359		23	0.08395	9.5679	0.95415	1.25448
04196	0.1547	1.25580	0.76002		24	0.08451	9.5068	0.93981	1.25858
04248	0.1598	1.25354	0.78483		25	0.08534	9.4094	0.92483	1.26250
04278	−0.1622	+1.25112	+0.80819		26	+0.08652	−9.2688	+0.90917	+1.26626
04292	0.1610	1.24857	0.83025		27	0.08806	9.0785	0.89278	1.26986
04301	0.1552	1.24586	0.85113		28	0.08986	8.8357	0.87559	1.27329
04313	0.1448	1.24301	0.87094		29	0.09178	8.5705	0.85755	1.27656
04340	0.1300	1.24000	0.88977		30	0.09364	8.4200	0.83859	1.27967
04392	−0.1113	+1.23685	+0.90770	Dec.	1	+0.09532	−8.5079	+0.81860	+1.28262
04474	0.0904	1.23353	0.92481		2	0.09672	8.6739	0.79750	1.28542
04588	0.0695	1.23006	0.94115		3	0.09786	8.8089	0.77517	1.28807
04734	0.0519	1.22642	0.95678		4	0.09875	8.8837	0.75148	1.29057
04897	0.0404	1.22262	0.97175	h	5	0.09947	8.8998	0.72627	1.29292
05063	−0.0367	+1.21865	+0.98610	(5.0)	6	+0.10007	−8.8451	+0.69935	+1.29512
05212	0.0402	1.21451	0.99987		7	0.10066	8.6712	0.67049	1.29718
05330	0.0479	1.21020	1.01309		8	0.10132	−8.0334	0.63942	1.29909
05410	0.0558	1.20571	1.02581		9	0.10214	+8.5515	0.60580	1.30086
05457	0.0592	1.20103	1.03804		10	0.10321	8.9455	0.56919	1.30248
05481	−0.0552	+1.19617	+1.04981		11	+0.10455	+9.1495	+0.52905	+1.30396
05503	0.0416	1.19112	1.06114		12	0.10615	9.2725	0.48466	1.30530
05542	0.0187	1.18588	1.07207		13	0.10799	9.3408	0.43504	1.30650
05614	9.9884	1.18043	1.08260		14	0.10994	9.3653	0.37884	1.30756
05725	9.9543	1.17478	1.09277		15	0.11183	9.3506	0.31410	1.30849
05871	−9.9216	+1.16891	+1.10257		16	+0.11353	+9.2997	+0.23782	+1.30927
06038	9.8952	1.16283	1.11203		17	0.11491	9.2196	0.14504	1.30991
06213	9.8786	1.15652	1.12117		18	0.11597	9.1291	0.02671	1.31042
06376	9.8725	1.14999	1.13000		19	0.11672	9.0660	9.86332	1.31079
06516	9.8743	1.14321	1.13852	h	20	0.11730	9.0734	9.59804	1.31102
06629	−9.8798	+1.13619	+1.14675	(6.0)	21	+0.11789	+9.1569	+8.79619	+1.31112
06712	9.8849	1.12891	1.15470		22	0.11869	9.2728	−9.43348	1.31107
06772	9.8861	1.12136	1.16239		23	0.11977	9.3820	9.78184	1.31089
06817	9.8810	1.11355	1.16981		24	0.12118	9.4669	9.97253	1.31058
06853	9.8681	1.10545	1.17698		25	0.12286	9.5224	0.10450	1.31012
06892	−9.8460	+1.09705	+1.18391		26	+0.12469	+9.5483	−0.20546	+1.30953
06942	9.8142	1.08835	1.19060		27	0.12653	9.5479	0.28721	1.30880
07013	9.7722	1.07933	1.19706		28	0.12821	9.5240	0.35587	1.30792
07111	9.7215	1.06998	1.20329		29	0.12966	9.4817	0.41503	1.30691
07240	9.6654	1.06028	1.20931		30	0.13086	9.4278	0.46696	1.30576
07398	−9.6108	+1.05021	+1.21511		31	+0.13179	+9.3707	−0.51322	+1.30447
07578	−9.5670	+1.03976	+1.22071		32	+0.13252	+9.3232	−0.55491	+1.30304

E = +0″.04 = +0ˢ.003

FOR WASHINGTON MEAN MIDNIGHT.

Solar Day. (Sidereal Hour.)		r	f	f'	G		H		Log g.	Log h.	t
			In Time.	In Time.	In Arc.	In Time.	In Arc.	In Time.			
		y	s	s	° ′	h m	° ′	h m			″
Jan.	0	0.0008	+1.009	−0.005	336 40.8	22 26.7	350 34.9	23 22.3	0.85244	1.31003	−1.45
	1	0.0035	1.021	0.008	337 9.0	22 28.6	349 38.5	23 18.6	0.85427	1.30980	1.59
	2	0.0063	1.032	0.009	337 41.4	22 30.8	348 42.0	23 14.8	0.85704	1.30955	1.73
	3	0.0090	1.044	0.008	338 15.2	22 33.0	347 45.5	23 11.0	0.86093	1.30929	1.88
h	4	0.0117	1.055	−0.004	338 44.7	22 35.0	346 48.9	23 7.3	0.86583	1.30900	2.02
(7.0)	5	0.0145	+1.067	+0.001	339 6.9	22 36.5	345 52.2	23 3.5	0.87140	1.30869	−2.16
	6	0.0172	1.078	0.006	339 20 3	22 37.4	344 55.4	22 59.7	0.87725	1.30837	2.30
	7	0.0199	1.089	0.010	339 25.6	22 37.7	343 58.6	22 55.9	0.88299	1.30803	2.43
	8	0.0227	1.100	0.012	339 24.2	22 37.6	343 1.7	22 52.1	0.88828	1.30766	2.57
	9	0.0254	1.111	0.012	339 18.5	22 37.2	342 4.7	22 48.3	0.89286	1.30728	2.71
	10	0.0282	+1.122	+0.010	339 11.0	22 36.7	341 7.5	22 44.5	0.89673	1.30688	−2.85
	11	0.0309	1.133	+0.006	339 4.0	22 36.3	340 10.3	22 40.7	0.89978	1.30646	2.98
	12	0.0336	1.144	0.000	338 59.7	22 36.0	339 13.0	22 36.9	0.90206	1.30603	3.11
	13	0.0364	1.155	−0.006	339 0.9	22 36.1	338 15.5	22 33.0	0.90382	1.30558	3.25
	14	0.0391	1.166	0.011	339 8.7	22 36.6	337 18.0	22 29.2	0.90532	1.30512	3.38
	15	0.0419	+1.177	−0.016	339 23.6	22 37.6	336 20.3	22 25.4	0.90689	1.30464	−3.51
	16	0.0446	1.187	0.018	339 44.5	22 39.0	335 22.4	22 21.5	0.90907	1.30414	3.64
	17	0.0473	1.198	0.017	340 9.9	22 40.7	334 24.5	22 17.6	0.91211	1.30362	3.77
	18	0.0501	1.208	0.013	340 34.4	22 42.3	333 26.4	22 13.8	0.91629	1.30310	3.90
h	19	0.0528	1.219	−0.007	340 54.4	22 43.6	332 28.2	22 9.9	0.92151	1.30256	4.02
(8.0)	20	0.0555	+1.229	+0.001	341 6.1	22 44.4	331 29.9	22 6.0	0.92741	1.30201	−4.15
	21	0.0583	1.239	0.008	341 8.3	22 44.6	330 31.4	22 2.1	0.93344	1.30144	4.27
	22	0.0610	1.249	0.013	341 1.8	22 44.1	329 32.7	21 58.2	0.93897	1.30087	4.40
	23	0.0638	1.259	0.015	340 49.6	22 43.3	328 33.9	21 54.3	0.94362	1.30028	4.52
	24	0.0665	1.269	0.013	340 36.1	22 42.4	327 35.0	21 50.3	0.94705	1.29968	4.64
	25	0.0692	+1.279	+0.009	340 26.0	22 41.7	326 35.9	21 46.4	0.94934	1.29907	−4.75
	26	0.0720	1.289	+0.003	340 22.8	22 41.5	325 36.7	21 42.5	0.95079	1.29846	4.87
	27	0.0747	1.299	−0.003	340 27.9	22 41.9	324 37.3	21 38.5	0.95186	1.29783	4.99
	28	0.0774	1.303	0.007	340 41.1	22 42.7	323 37.8	21 34.5	0.95303	1.29721	5.10
	29	0.0802	1.318	0.009	340 59.5	22 44.0	322 38.1	21 30.5	0.95479	1.29657	5.21
	30	0.0829	+1.327	−0.003	341 20.0	22 45.3	321 38.3	21 26.6	0.95738	1.29592	−5.32
	31	0.0856	1.336	−0.004	341 38.0	22 46.5	320 38.2	21 22.6	0.96075	1.29528	5.43
Feb.	1	0.0884	1.345	0.000	341 50.7	22 47.4	319 38.0	21 18.5	0.96472	1.29463	5.54
	2	0.0911	1.354	+0.005	341 57.0	22 47.8	318 37.8	21 14.5	0.96897	1.29396	5.64
h	3	0.0939	1.363	0.009	341 56.4	22 47.8	317 37.3	21 10.5	0.97313	1.29331	5.74
(9.0)	4	0.0966	+1.372	+0.012	341 50.7	22 47.4	316 36.6	21 6.4	0.97702	1.29265	−5.84
	5	0.0993	1.381	0.013	341 41.1	22 46.7	315 35.9	21 2.4	0.98036	1.29198	5.94
	6	0.1021	1.390	0.011	341 29.8	22 46.0	314 34.9	20 58.3	0.98304	1.29132	6.04
	7	0.1048	1.398	0.003	341 19.0	22 45.3	313 33.8	20 54.3	0.98511	1.29067	6.14
	8	0.1076	1.407	+0.003	341 10.5	22 44.7	312 32.5	20 50.2	0.98656	1.29000	6.23
	9	0.1103	+1.415	−0.003	341 5.9	22 44.4	311 31.0	20 46.1	0.98750	1.28934	−6.32
	10	0.1130	1.423	0.009	341 6.6	22 44.4	310 29.4	20 42.0	0.98817	1.28869	6.41
	11	0.1158	1.431	0.014	341 13.3	22 44.9	309 27.6	20 37.8	0.98879	1.28804	6.50
	12	0.1185	1.439	0.017	341 25.7	22 45.7	308 25.6	20 33.7	0.98975	1.28738	6.59
	13	0.1212	1.447	0.018	341 42.1	22 46.8	307 23.5	20 29.6	0.99138	1.28674	6.67
	14	0.1240	+1.455	−0.015	341 59.4	22 48.0	306 21.2	20 25.4	0.99386	1.28611	−6.75
	15	0.1267	+1.463	−0.010	342 14.1	22 48.9	305 18.8	20 21.3	0.99722	1.28549	−6.83

FOR WASHINGTON MEAN MIDNIGHT.

Day. (real r.)	τ	f In Time.	f' In Time.	G In Arc.	G In Time.	H In Arc.	H In Time.	Log g.	Log h.	i	Log i.
	y	s	s	° ′	h m	° ′	h m			″	
15	0.1267	+1.463	−0.010	342 14.1	22 48.9	305 18.8	20 21.3	0.99722	1.28549	−6.83	−0.8344
16	0.1295	1.471	−0.008	342 23.3	22 49.6	304 16.1	20 17.1	1.00129	1.28487	6.91	0.8393
17	0.1322	1.478	+0.005	342 24.9	22 49.7	303 13.4	20 12.9	1.00557	1.28425	6.98	0.8440
18	0.1349	1.486	0.010	342 19.2	22 49.3	302 10.5	20 8.7	1.00970	1.28365	7.06	0.8485
19	0.1377	1.493	0.013	342 7.8	22 48.5	301 7.4	20 4.5	1.01314	1.28307	7.13	0.8528
20	0.1404	+1.501	+0.013	341 54.7	22 47.6	300 4.2	20 0.3	1.01569	1.28249	−7.20	−0.8570
21	0.1432	1.508	0.009	341 43.5	22 46.9	299 0.9	19 56.1	1.01726	1.28192	7.26	0.8610
22	0.1459	1.515	+0.004	341 37.4	22 46.5	297 57.4	19 51.8	1.01800	1.28137	7.32	0.8648
23	0.1486	1.522	−0.002	341 39.0	22 46.6	296 53.8	19 47.6	1.01831	1.28083	7.39	0.8684
24	0.1514	1.529	0.006	341 47.8	22 47.2	295 50.1	19 43.3	1.01864	1.28031	7.44	0.8718
25	0.1541	+1.536	−0.009	342 2.4	22 48.2	294 46.2	19 39.1	1.01932	1.27980	−7.50	−0.8751
26	0.1568	1.543	0.008	342 20.0	22 49.3	293 42.3	19 34.9	1.02073	1.27931	7.56	0.8783
27	0.1596	1.550	0.005	342 36.5	22 50.4	292 38.2	19 30.6	1.02282	1.27883	7.61	0.8813
28	0.1623	1.557	−0.001	342 49.5	22 51.3	291 34.1	19 26.3	1.02552	1.27837	7.66	0.8841
1	0.1650	1.563	+0.004	342 56.9	22 51.8	290 29.8	19 22.0	1.02850	1.27794	7.71	0.8868
2	0.1678	+1.570	+0.009	342 58.6	22 51.9	289 25.4	19 17.7	1.03152	1.27752	−7.75	−0.8893
3	0.1705	1.576	0.012	342 55.3	22 51.7	288 21.0	19 13.4	1.03431	1.27711	7.79	0.8917
4	0.1733	1.583	0.013	342 48.7	22 51.2	287 16.5	19 9.1	1.03668	1.27674	7.83	0.8940
5	0.1760	1.589	0.012	342 40.2	22 50.7	286 11.9	19 4.8	1.03853	1.27638	7.87	0.8961
6	0.1787	1.596	0.010	342 31.9	22 50.1	285 7.2	19 0.5	1.03981	1.27603	7.91	0.8980
7	0.1815	+1.602	+0.005	342 25.3	22 49.7	284 2.5	18 56.2	1.04058	1.27572	−7.94	−0.8998
8	0.1842	1.608	−0.001	342 22.0	22 49.5	282 57.7	18 51.8	1.04089	1.27542	7.97	0.9015
9	0.1870	1.615	0.007	342 23.4	22 49.6	281 52.9	18 47.5	1.04091	1.27515	8.00	0.9030
10	0.1897	1.621	0.012	342 30.0	22 50.0	280 48.0	18 43.2	1.04088	1.27489	8.02	0.9044
11	0.1924	1.627	0.016	342 41.9	22 50.8	279 43.1	18 38.9	1.04105	1.27466	8.05	0.9057
12	0.1952	+1.633	−0.017	342 57.9	22 51.9	278 38.2	18 34.5	1.04170	1.27445	−8.07	−0.9068
13	0.1979	1.639	0.016	343 15.7	22 53.0	277 33.2	18 30.2	1.04309	1.27427	8.09	0.9078
14	0.2006	1.645	0.011	343 32.3	22 54.2	276 28.2	18 25.9	1.04526	1.27411	8.10	0.9086
15	0.2034	1.652	−0.005	343 44.7	22 55.0	275 23.2	18 21.5	1.04812	1.27398	8.12	0.9093
16	0.2061	1.658	+0.002	343 51.0	22 55.4	274 18.2	18 17.2	1.05132	1.27387	8.13	0.9099
17	0.2089	+1.664	+0.008	343 50.5	22 55.4	273 13.2	18 12.9	1.05451	1.27378	−8.14	−0.9104
18	0.2116	1.670	0.012	343 44.7	22 55.0	272 8.2	18 8.5	1.05726	1.27372	8.14	0.9107
19	0.2143	1.676	0.012	343 36.1	22 54.4	271 3.2	18 4.2	1.05929	1.27369	8.15	0.9109
20	0.2171	1.682	0.010	343 28.3	22 53.9	269 58.2	17 59.9	1.06043	1.27368	8.15	0.9110
21	0.2198	1.688	+0.005	343 24.8	22 53.7	268 53.2	17 55.5	1.06084	1.27369	8.14	0.9109
22	0.2226	+1.694	−0.001	343 27.7	22 53.8	267 48.4	17 51.2	1.06075	1.27373	−8.14	−0.9107
23	0.2253	1.700	0.006	343 37.8	22 54.5	266 43.6	17 46.9	1.06064	1.27379	8.14	0.9104
24	0.2280	1.706	0.009	343 54.0	22 55.6	265 38.8	17 42.6	1.06084	1.27387	8.13	0.9099
25	0.2308	1.712	0.009	344 13.5	22 56.9	264 34.1	17 38.3	1.06159	1.27399	8.12	0.9093
26	0.2335	1.718	0.007	344 33.3	22 58.2	263 29.5	17 34.0	1.06307	1.27412	8.10	0.9086
27	0.2362	+1.724	−0.003	344 50.4	22 59.4	262 25.0	17 29.7	1.06514	1.27428	−8.09	−0.9077
28	0.2390	1.730	+0.003	345 2.9	23 0.2	261 20.5	17 25.4	1.06760	1.27446	8.07	0.9067
29	0.2417	1.736	0.008	345 10.1	23 0.7	260 16.2	17 21.1	1.07017	1.27467	8.05	0.9056
30	0.2444	1.742	0.011	345 12.3	23 0.8	259 11.9	17 16.8	1.07253	1.27489	8.02	0.9044
31	0.2472	1.749	0.013	345 11.0	23 0.7	258 7.8	17 12.5	1.07461	1.27514	8.00	0.9030
Apr. 1	0.2499	+1.755	+0.013	345 7.7	23 0.5	257 3.8	17 8.3	1.07618	1.27541	−7.97	−0.9015
2	*0.2527*	*+1.761*	*+0.011*	*345 4.3*	*23 0.3*	255 59.9	17 4.0	1.07727	1.27570	−7.94	−0.8999

FOR WASHINGTON MEAN MIDNIGHT.

Solar Day. (Sidereal Hour.)		τ	f	f'	G		H		Log g.	Log k.	i
			In Time.	In Time.	In Arc.	In Time.	In Arc.	In Time.			
		y	s	s	° ′	h m	° ′	h m			″
Apr.	1	0.2499	+1.755	+0.013	345 7.7	23 0.5	257 3.8	17 8.3	1.07618	1.27541	−7.97
	2	0.2527	1.761	0.011	345 4.3	23 0.3	255 59.9	17 4.0	1.07727	1.27570	7.94
	3	0.2554	1.768	0.007	345 2.3	23 0.2	254 56.2	16 59.7	1.07789	1.27601	7.91
	4	0.2581	1.774	+0.002	345 3.0	23 0.2	253 52.5	16 55.5	1.07812	1.27635	7.87
	5	0.2609	1.780	−0.004	345 7.8	23 0.5	252 49.0	16 51.3	1.07811	1.27670	7.84
h (13.0)	6	0.2636	+1.787	−0.010	345 17.4	23 1.2	251 45.7	16 47.0	1.07801	1.27707	−7.80
	7	0.2664	1.793	0.014	345 31.8	23 2.1	250 42.5	16 42.8	1.07806	1.27747	7.76
	8	0.2691	1.800	0.016	345 50.1	23 3.3	249 39.5	16 38.6	1.07855	1.27788	7.71
	9	0.2718	1.806	0.015	346 10.5	23 4.7	248 36.6	16 34.4	1.07967	1.27830	7.67
	10	0.2746	1.813	0.012	346 30.5	23 6.0	247 33.8	16 30.3	1.08152	1.27875	7.62
	11	0.2773	+1.820	−0.006	346 47.2	23 7.1	246 31.3	16 26.1	1.08402	1.27920	−7.57
	12	0.2801	1.826	+0.001	346 58.5	23 7.9	245 28.9	16 21.9	1.08696	1.27968	7.51
	13	0.2828	1.833	0.007	347 3.5	23 8.2	244 26.7	16 17.8	1.08992	1.28017	7.46
	14	0.2855	1.840	0.011	347 3.0	23 8.2	243 24.6	16 13.6	1.09258	1.28068	7.40
	15	0.2883	1.847	0.013	346 59.3	23 8.0	242 22.7	16 9.5	1.09463	1.28120	7.34
	16	0.2910	+1.854	+0.011	346 55.4	23 7.7	241 21.0	16 5.4	1.09594	1.28173	−7.28
	17	0.2937	1.861	+0.006	346 54.7	23 7.6	240 19.5	16 1.3	1.09653	1.28228	7.22
	18	0.2965	1.868	0.000	346 59.5	23 8.0	239 18.2	15 57.2	1.09665	1.28283	7.15
	19	0.2992	1.875	−0.005	347 11.1	23 8.7	238 17.0	15 53.1	1.09670	1.28339	7.09
	20	0.3020	1.883	0.009	347 28.5	23 9.9	237 16.0	15 49.1	1.09700	1.28397	7.02
h (14.0)	21	0.3047	+1.890	−0.011	347 49.8	23 11.3	236 15.2	15 45.0	1.09784	1.28456	−6.95
	22	0.3074	1.898	0.009	348 11.8	23 12.8	235 14.7	15 41.0	1.09938	1.28515	6.87
	23	0.3102	1.905	−0.005	348 31.7	23 14.1	234 14.3	15 37.0	1.10152	1.28575	6.80
	24	0.3129	1.913	0.000	348 47.4	23 15.2	233 14.2	15 32.9	1.10407	1.28636	6.72
	25	0.3156	1.920	+0.006	348 58.0	23 15.9	232 14.2	15 28.9	1.10676	1.28698	6.64
	26	0.3184	+1.928	+0.010	349 3.8	23 16.3	231 14.4	15 25.0	1.10935	1.28760	−6.56
	27	0.3211	1.936	0.013	349 5.9	23 16.4	230 14.9	15 21.0	1.11166	1.28822	6.48
	28	0.3239	1.944	0.013	349 5.9	23 16.4	229 15.6	15 17.0	1.11354	1.28884	6.39
	29	0.3266	1.952	0.012	349 5.3	23 16.4	228 16.5	15 13.1	1.11495	1.28947	6.30
	30	0.3293	1.960	0.008	349 5.7	23 16.4	227 17.6	15 9.2	1.11595	1.29010	6.22
May	1	0.3321	+1.968	+0.003	349 8.6	23 16.6	226 18.8	15 5.3	1.11660	1.29074	−6.13
	2	0.3348	1.977	−0.003	349 14.7	23 17.0	225 20.3	15 1.4	1.11700	1.29137	6.04
	3	0.3375	1.985	0.008	349 25.0	23 17.7	224 22.0	14 57.5	1.11736	1.29201	5.94
	4	0.3403	1.994	0.013	349 39.4	23 18.6	223 23.8	14 53.6	1.11786	1.29264	5.85
	5	0.3430	2.002	0.016	349 57.4	23 19.8	222 25.9	14 49.7	1.11872	1.29327	5.75
h	6	0.3458	+2.011	−0.016	350 17.5	23 21.2	221 28.2	14 45.9	1.12016	1.29389	−5.65
(15.0)	7	0.3485	2.019	0.013	350 37.3	23 22.5	220 30.7	14 42.0	1.12223	1.29453	5.55
	8	0.3512	2.028	0.008	350 54.6	23 23.6	219 33.4	14 38.2	1.12491	1.29516	5.45
	9	0.3540	2.037	−0.001	351 7.0	23 24.5	218 36.2	14 34.4	1.12802	1.29577	5.35
	10	0.3567	2.046	+0.006	351 13.7	23 24.9	217 39.3	14 30.6	1.13124	1.29639	5.24
	11	0.3595	+2.055	+0.011	351 15.0	23 25.0	216 42.5	14 26.8	1.13422	1.29699	−5.14
	12	0.3622	2.064	0.013	351 12.6	23 24.8	215 45.9	14 23.1	1.13667	1.29759	5.03
	13	0.3649	2.073	0.013	351 9.5	23 24.6	214 49.4	14 19.3	1.13848	1.29818	4.92
	14	0.3677	2.083	0.009	351 8.4	23 24.6	213 53.1	14 15.5	1.13959	1.29877	4.81
	15	0.3704	2.092	+0.003	351 11.7	23 24.8	212 57.1	14 11.8	1.14023	1.29935	4.70
	16	0.3731	+2.101	−0.004	351 21.1	23 25.4	212 1.2	14 8.1	1.14072	1.29992	−4.59
	17	0.3759	+2.111	−0.009	351 35.7	23 26.4	211 5.4	14 4.4	1.14139	1.30048	−4.47

FOR WASHINGTON MEAN MIDNIGHT.

	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	° ′	h m	° ′	h m			″	
59	+2.111	−0.009	351 35.7	23 26.4	211 5.4	14 4.4	1.14139	1.30048	−4.47	−0.6507
86	2.121	0.011	351 54.0	23 27.6	210 9.8	14 0.7	1.14256	1.30104	4.36	0.6394
14	2.130	0.010	352 14.0	23 28.9	209 14.4	13 57.0	1.14435	1.30158	4.24	0.6277
41	2.140	0.007	352 32.0	23 30.1	208 19.1	13 53.3	1.14671	1.30211	4.13	0.6155
68	2.150	−0.002	352 46.4	23 31.0	207 24.0	13 49.6	1.14949	1.30264	4.01	0.6029
96	+2.160	+0.004	352 56.1	23 31.7	206 29.0	13 45.9	1.15248	1.30314	−3.89	−0.5897
23	2.170	0.009	353 1.1	23 32.1	205 34.2	13 42.3	1.15536	1.30363	3.77	0.5760
50	2.180	0.012	353 2.3	23 32.2	204 39.5	13 38.6	1.15799	1.30412	3.65	0.5618
78	2.190	0.013	353 1.3	23 32.1	203 45.0	13 35.0	1.16026	1.30459	3.52	0.5469
05	2.200	0.012	352 59.6	23 32.0	202 50.6	13 31.4	1.16207	1.30504	3.40	0.5314
33	+2.210	+0.009	352 58.5	23 31.9	201 56.4	13 27.8	1.16348	1.30549	−3.28	−0.5152
60	2.220	+0.004	352 59.2	23 32.0	201 2.2	13 24.1	1.16458	1.30592	3.15	0.4983
87	2.231	−0.001	353 2.6	23 32.2	200 8.2	13 20.5	1.16541	1.30633	3.02	0.4805
.15	2.241	0.007	353 9.5	23 32.6	199 14.3	13 17.0	1.16622	1.30673	2.90	0.4619
.42	2.252	0.012	353 19.9	23 33.3	198 20.5	13 13.4	1.16714	1.30710	2.77	0.4423
.69	+2.262	−0.015	353 33.3	23 34.2	197 26.9	13 9.8	1.16831	1.30748	−2.64	−0.4217
97	2.273	0.016	353 48.8	23 35.3	196 33.4	13 6.2	1.16995	1.30783	2.51	0.3999
224	2.283	0.015	354 4.2	23 36.3	195 39.9	13 2.7	1.17215	1.30816	2.38	0.3768
252	2.294	0.010	354 17.7	23 37.2	194 46.6	12 59.1	1.17490	1.30848	2.25	0.3524
279	2.305	−0.003	354 27.3	23 37.7	193 53.3	12 55.5	1.17805	1.30879	2.12	0.3263
306	+2.316	+0.004	354 32.0	23 38.1	193 0.1	12 52.0	1.18135	1.30906	−1.99	−0.2984
334	2.326	0.010	354 31.5	23 38.0	192 7.0	12 48.5	1.18451	1.30932	1.86	0.2686
361	2.337	0.014	354 27.4	23 37.8	191 14.0	12 44.9	1.18726	1.30957	1.72	0.2365
388	2.348	0.014	354 21.7	23 37.4	190 21.1	12 41.4	1.18940	1.30980	1.59	0.2016
416	2.359	0.011	354 17.2	23 37.1	189 28.2	12 37.9	1.19090	1.31002	1.46	0.1635
443	+2.370	+0.006	354 16.2	23 37.1	188 35.3	12 34.4	1.19193	1.31021	−1.32	−0.1217
471	2.381	−0.001	354 20.1	23 37.3	187 42.5	12 30.8	1.19270	1.31038	1.19	0.0752
498	2.392	0.006	354 29.0	23 37.9	186 49.8	12 27.3	1.19358	1.31055	1.06	0.0231
525	2.403	0.010	354 41.7	23 38.8	185 57.1	12 23.8	1.19478	1.31068	0.92	9.9637
553	2.414	0.010	354 56.0	23 39.7	185 4.4	12 20.3	1.19652	1.31079	0.78	9.8947
580	+2.425	−0.008	355 9.3	23 40.6	184 11.8	12 16.8	1.19879	1.31090	−0.65	−9.8126
608	2.436	−0.003	355 19.6	23 41.3	183 19.2	12 13.3	1.20147	1.31098	0.51	9.7110
635	2.447	+0.002	355 25.8	23 41.7	182 26.6	12 9.8	1.20435	1.31105	0.38	9.5781
662	2.458	0.007	355 27.8	23 41.9	181 34.1	12 6.3	1.20721	1.31109	0.24	9.3854
690	2.469	0.011	355 25.9	23 41.7	180 41.5	12 2.8	1.20983	1.31111	−0.11	−9.0303
717	+2.480	+0.013	355 22.1	23 41.5	179 49.0	11 59.3	1.21214	1.31112	+0.03	+8.4543
744	2.491	0.013	355 17.1	23 41.1	178 56.5	11 55.8	1.21402	1.31111	0.16	9.2152
772	2.502	0.010	355 12.5	23 40.8	178 3.9	11 52.3	1.21556	1.31107	0.30	9.4767
799	2.513	+0.006	355 9.2	23 40.6	177 11.4	11 48.8	1.21675	1.31102	0.44	9.6387
827	2.524	0.000	355 8.4	23 40.6	176 18.9	11 45.3	1.21772	1.31096	0.57	9.7563
854	+2.535	−0.006	355 10.4	23 40.7	175 26.3	11 41.8	1.21857	1.31086	+0.71	+9.8486
881	2.546	0.011	355 15.3	23 41.0	174 33.8	11 38.3	1.21945	1.31075	0.84	9.9246
909	2.557	0.015	355 22.9	23 41.5	173 41.2	11 34.7	1.22054	1.31062	0.98	9.9892
936	2.568	0.017	355 32.6	23 42.2	172 48.6	11 31.2	1.22200	1.31048	1.11	0.0452
963	2.579	0.016	355 42.8	23 42.9	171 55.9	11 27.7	1.22390	1.31032	1.24	0.0948
991	+2.590	−0.012	355 51.7	23 43.4	171 3.3	11 24.2	1.22629	1.31013	+1.38	+0.1391
018	*+2.600*	*−0.006*	*355 57.8*	*23 43.9*	170 10.6	11 20.7	1.22909	1.30994	+1.51	+0.1793

FOR WASHINGTON MEAN MIDNIGHT.

Solar Day (Sidereal Hour.)		τ	f	f'	G		H		Log g.	Log h.	i
			In Time.	In Time.	In Arc.	In Time.	In Arc.	In Time.			
		y	s	s	° ′	h m	° ′	h m			″
July	1	0.4991	+2.590	−0.012	355 51.7	23 43.4	171 3.3	11 24.2	1.22629	1.31013	+1.38
	2	0.5018	2.600	−0.006	355 57.8	23 43.9	170 10.6	11 20.7	1.22909	1.30994	1.51
	3	0.5046	2.611	+0.001	355 59.6	23 44.0	169 17.8	11 17.2	1.23205	1.30971	1.64
	4	0.5073	2.622	0.007	355 57.0	23 43.8	168 24.9	11 13.7	1.23500	1.30948	1.78
	5	0.5100	2.633	0.012	355 50.6	23 43.4	167 32.0	11 10.1	1.23763	1.30922	1.91
h (19.0)	6	0.5128	+2.644	+0.014	355 42.4	23 42.8	166 39.1	11 6.6	1.23975	1.30896	+2.04
	7	0.5155	2.654	0.012	355 34.5	23 42.3	165 46.1	11 3.1	1.24131	1.30866	2.17
	8	0.5182	2.665	0.008	355 29.1	23 41.9	164 53.0	10 59.6	1.24238	1.30835	2.30
	9	0.5210	2.676	+0.002	355 27.9	23 41.9	163 59.8	10 56.0	1.24313	1.30804	2.43
	10	0.5237	2.686	−0.004	355 31.2	23 42.1	163 6.5	10 52.4	1.24387	1.30769	2.56
	11	0.5265	+2.697	−0.008	355 38.3	23 42.6	162 13.2	10 48.9	1.24481	1.30733	+2.69
	12	0.5292	2.707	0.010	355 47.6	23 43.2	161 19.7	10 45.3	1.24616	1.30697	2.82
	13	0.5319	2.717	0.008	355 56.7	23 43.8	160 26.1	10 41.7	1.24797	1.30659	2.94
	14	0.5347	2.728	−0.004	356 3.7	23 44.2	159 32.5	10 38.2	1.25017	1.30619	3.07
	15	0.5374	2.738	+0.001	356 7.3	23 44.5	158 38.7	10 34.6	1.25263	1.30577	3.19
	16	0.5402	+2.748	+0.006	356 7.1	23 44.5	157 44.8	10 31.0	1.25510	1.30533	+3.32
	17	0.5429	2.758	0.011	356 3.5	23 44.2	156 50.8	10 27.4	1.25740	1.30489	3.44
	18	0.5456	2.769	0.013	355 57.4	23 43.8	155 56.6	10 23.8	1.25943	1.30443	3.56
	19	0.5484	2.779	0.013	355 50.2	23 43.3	155 2.4	10 20.2	1.26108	1.30397	3.68
	20	0.5511	2.789	0.011	355 43.0	23 42.9	154 8.0	10 16.5	1.26239	1.30348	3.81
h (20.0)	21	0.5538	+2.798	+0.007	355 37.0	23 42.5	153 13.5	10 12.9	1.26339	1.30298	+3.93
	22	0.5566	2.808	+0.002	355 32.9	23 42.2	152 18.8	10 9.3	1.26415	1.30247	4.05
	23	0.5593	2.818	−0.004	355 31.2	23 42.1	151 24.0	10 5.6	1.26476	1.30195	4.16
	24	0.5621	2.828	0.009	355 32.3	23 42.2	150 29.1	10 1.9	1.26536	1.30142	4.28
	25	0.5648	2.837	0.014	355 36.0	23 42.4	149 34.0	9 58.3	1.26607	1.30088	4.39
	26	0.5675	+2.847	−0.017	355 41.7	23 42.8	148 38.8	9 54.6	1.26705	1.30034	+4.51
	27	0.5703	2.856	0.017	355 48.5	23 43.2	147 43.5	9 50.9	1.26840	1.29977	4.62
	28	0.5730	2.866	0.015	355 54.6	23 43.6	146 48.0	9 47.2	1.27015	1.29920	4.73
	29	0.5757	2.875	0.010	355 58.8	23 43.9	145 52.3	9 43.5	1.27230	1.29862	4.84
	30	0.5785	2.884	−0.003	355 59.6	23 44.0	144 56.5	9 39.8	1.27472	1.29803	4.95
	31	0.5812	+2.893	+0.004	355 56.5	23 43.8	144 0.5	9 36.0	1.27716	1.29745	+5.06
Aug.	1	0.5840	2.902	0.010	355 49.9	23 43.3	143 4.3	9 32.3	1.27942	1.29685	5.16
	2	0.5867	2.911	0.013	355 40.9	23 42.7	142 8.1	9 28.5	1.28126	1.29624	5.27
	3	0.5894	2.920	0.013	355 31.7	23 42.1	141 11.5	9 24.8	1.28265	1.29563	5.37
	4	0.5922	2.929	0.009	355 24.2	23 41.6	140 14.9	9 21.0	1.28354	1.29502	5.47
h (21.0)	5	0.5949	+2.938	+0.004	355 20.1	23 41.3	139 18.0	9 17.2	1.28409	1.29440	+5.57
	6	0.5976	2.946	−0.002	355 20.2	23 41.3	138 21.0	9 13.4	1.28450	1.29378	5.67
	7	0.6004	2.955	0.007	355 24.2	23 41.6	137 23.8	9 9.6	1.28503	1.29315	5.77
	8	0.6031	2.963	0.009	355 30.9	23 42.1	136 26.4	9 5.8	1.28588	1.29253	5.86
	9	0.6059	2.972	0.008	355 38.1	23 42.5	135 28.7	9 1.9	1.28713	1.29191	5.96
	10	0.6086	+2.980	−0.005	355 44.2	23 42.9	134 31.0	8 58.1	1.28877	1.29128	+6.05
	11	0.6113	2.988	0.000	355 47.5	23 43.2	133 33.0	8 54.2	1.29066	1.29065	6.14
	12	0.6141	2.996	+0.005	355 47.5	23 43.2	132 34.8	8 50.3	1.29263	1.29003	6.23
	13	0.6168	3.004	0.010	355 44.1	23 42.9	131 36.4	8 46.4	1.29450	1.28940	6.32
	14	0.6196	3.012	0.013	355 38.2	23 42.5	130 37.9	8 42.5	1.29613	1.28878	6.40
	15	0.6223	+3.020	+0.014	355 31.0	23 42.1	129 39.1	8 38.6	1.29746	1.28815	+6.48
	16	0.6250	+3.028	+0.013	355 23.6	23 41.6	128 40.2	8 34.7	1.29845	1.28753	+6.57

FOR WASHINGTON MEAN MIDNIGHT.

Day-real r.)	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			″	
16	0.6250	+3.028	+0.013	355 23.6	23 41.6	128 40.2	8 34.7	1.29845	1.28753	+6.57	+0.8173
17	0.6278	3.036	0.009	355 17.1	23 41.1	127 41.1	8 30.7	1.29914	1.28692	6.65	0.8226
18	0.6305	3.043	+0.005	355 12.2	23 40.8	126 41.8	8 26.8	1.29959	1.28632	6.72	0.8277
19	0.6332	3.051	−0.001	355 9.6	23 40.6	125 42.3	8 22.8	1.29986	1.28572	6.80	0.8326
20	0.6360	3.058	0.007	355 9.4	23 40.6	124 42.6	8 18.8	1.30011	1.28512	6.88	0.8373
)21	0.6387	+3.066	−0.012	355 11.8	23 40.8	123 42.7	8 14.8	1.30039	1.28454	-6.95	+0.8419
22	0.6414	3.073	0.016	355 16.4	23 41.1	122 42.6	8 10.8	1.30087	1.28396	7.02	0.8462
23	0.6442	3.080	0.017	355 22.3	23 41.5	121 42.4	8 6.8	1.30165	1.28339	7.09	0.8505
24	0.6469	3.087	0.016	355 28.3	23 41.9	120 42.0	8 2.8	1.30281	1.28283	7.15	0.8545
25	0.6497	3.094	0.012	355 33.0	23 42.2	119 41.4	7 58.8	1.30433	1.28228	7.22	0.8584
26	0.6524	+3.101	−0.006	355 35.1	23 42.3	118 40.7	7 54.7	1.30613	1.28175	-7.28	+0.8622
27	0.6551	3.108	+0.001	355 33.8	23 42.2	117 39.7	7 50.6	1.30804	1.28122	7.34	0.8658
28	0.6579	3.115	0.007	355 29.2	23 41.9	116 38.6	7 46.6	1.30988	1.28071	7.40	0.8692
29	0.6606	3.122	0.011	355 22.0	23 41.5	115 37.3	7 42.5	1.31142	1.28020	7.46	0.8725
30	0.6634	3.129	0.012	355 13.9	23 40.9	114 35.9	7 38.4	1.31255	1.27972	7.51	0.8757
31	0.6661	+3.135	+0.009	355 6.8	23 40.5	113 34.3	7 34.3	1.31322	1.27925	+7.56	+0.8787
1	0.6688	3.142	+0.005	355 2.6	23 40.2	112 32.5	7 30.2	1.31355	1.27879	7.61	0.8816
2	0.6716	3.148	−0.001	355 2.1	23 40.1	111 30.6	7 26.0	1.31368	1.27835	7.66	0.8843
3	0.6743	3.155	0.006	355 5.6	23 40.4	110 28.6	7 21.9	1.31386	1.27793	7.71	0.8869
4	0.6770	3.161	0.009	355 12.1	23 40.8	109 26.4	7 17.8	1.31429	1.27752	7.75	0.8893
D) 5	0.6798	+3.168	−0.009	355 20.1	23 41.3	108 24.0	7 13.6	1.31507	1.27713	+7.79	+0.8916
6	0.6825	3.174	0.006	355 27.5	23 41.8	107 21.4	7 9.4	1.31624	1.27676	7.83	0.8938
7	0.6853	3.180	−0.001	355 32.9	23 42.2	106 18.8	7 5.3	1.31770	1.27641	7.87	0.8958
8	0.6880	3.186	+0.004	355 35.1	23 42.3	105 16.0	7 1.1	1.31930	1.27608	7.90	0.8978
9	0.6907	3.193	0.010	355 34.4	23 42.3	104 13.1	6 56.9	1.32086	1.27576	7.94	0.8995
10	0.6935	+3.199	+0.013	355 30.9	23 42.1	103 10.0	6 52.7	1.32222	1.27547	+7.97	+0.9012
11	0.6962	3.205	0.015	355 25.9	23 41.9	102 6.8	6 48.5	1.32331	1.27520	7.99	0.9027
12	0.6990	3.211	0.014	355 20.4	23 41.4	101 3.5	6 44.2	1.32409	1.27495	8.02	0.9041
13	0.7017	3.217	0.011	355 15.6	23 41.0	100 0.1	6 40.0	1.32456	1.27472	8.04	0.9053
14	0.7044	3.223	0.007	355 12.2	23 40.8	98 56.6	6 35.8	1.32482	1.27451	8.06	0.9065
15	0.7072	+3.229	+0.001	355 10.9	23 40.7	97 53.1	6 31.5	1.32488	1.27432	+8.08	+0.9075
16	0.7099	3.235	−0.005	355 12.0	23 40.8	96 49.4	6 27.3	1.32489	1.27417	8.10	0.9084
17	0.7126	3.241	0.010	355 15.4	23 41.0	95 45.6	6 23.0	1.32492	1.27403	8.11	0.9091
18	0.7154	3.247	0.014	355 21.1	23 41.4	94 41.8	6 18.8	1.32511	1.27391	8.12	0.9097
h 19	0.7181	3.252	0.016	355 28.4	23 41.9	93 37.9	6 14.5	1.32556	1.27381	8.13	0.9102
0.0) 20	0.7208	+3.258	−0.016	355 36.2	23 42.4	92 34.0	6 10.3	1.32633	1.27375	+8.14	+0.9106
21	0.7236	3.264	0.013	355 43.2	23 42.9	91 30.0	6 6.0	1.32745	1.27371	8.14	0.9108
22	0.7263	3.270	0.007	355 48.2	23 43.2	90 26.0	6 1.7	1.32889	1.27368	8.14	0.9109
23	0.7291	3.276	−0.001	355 50.3	23 43.4	89 22.0	5 57.5	1.33049	1.27369	8.14	0.9109
24	0.7318	3.282	+0.005	355 49.1	23 43.3	88 17.8	5 53.2	1.33207	1.27371	8.14	0.9108
25	0.7345	+3.288	+0.009	355 45.3	23 43.0	87 13.7	5 48.9	1.33346	1.27376	-8.14	+0.9105
26	0.7373	3.294	0.011	355 40.1	23 42.7	86 9.6	5 44.6	1.33449	1.27383	8.13	0.9101
27	0.7400	3.300	0.009	355 35.3	23 42.4	85 5.4	5 40.4	1.33511	1.27394	8.12	0.9096
28	0.7428	3.305	+0.005	355 32.6	23 42.2	84 1.3	5 36.1	1.33536	1.27406	8.11	0.9090
29	0.7455	3.311	0.000	355 33.4	23 42.2	82 57.2	5 31.8	1.33541	1.27421	8.10	0.9082
30	0.7482	+3.317	−0.006	355 38.0	23 42.5	81 53.1	5 27.5	1.33545	1.27437	-8.08	+0.9073
ct. 1	*0.7510*	*+3.323*	*−0.009*	*355 46.0*	*23 43.1*	80 49.0	5 23.3	1.33570	1.27456	+8.06	+0.9062

FOR WASHINGTON MEAN MIDNIGHT.

Solar Day. (Sidereal Hour.)		r	f	f′	G		H		Log g.	Log h.	i
			In Time.	In Time.	In Arc.	In Time.	In Arc.	In Time.			
		y	s	s	° ′	h m	° ′	h m			″
Oct.	1	0.7510	+3.323	−0.009	355 46.0	23 43.1	80 49.0	5 23.3	1.33570	1.27456	+8.06
	2	0.7537	3.329	0.010	355 55.8	23 43.7	79 44.9	5 19.0	1.33626	1.27477	8.04
	3	0.7564	3.335	0.008	356 5.8	23 44.4	78 40.9	5 14.7	1.33725	1.27501	8.01
	4	0.7592	3.341	−0.004	356 14.2	23 44.9	77 36.9	5 10.5	1.33855	1.27527	7.99
	5	0.7619	3.347	+0.002	356 20.0	23 45.3	76 32.9	5 6.2	1.34005	1.27556	7.96
h (1.0)	6	0.7647	+3.353	+0.008	356 22.7	23 45.5	75 28.9	5 1.9	1.34156	1.27585	+7.93
	7	0.7674	3.360	0.013	356 22.5	23 45.5	74 25.0	4 57.7	1.34293	1.27618	7.89
	8	0.7701	3.366	0.015	356 20.6	23 45.4	73 21.2	4 53.4	1.34404	1.27652	7.86
	9	0.7729	3.372	0.015	356 18.0	23 45.2	72 17.5	4 49.2	1.34488	1.27688	7.82
	10	0.7756	3.378	0.013	356 15.6	23 45.0	71 13.8	4 44.9	1.34541	1.27727	7.78
	11	0.7784	+3.385	+0.009	356 14.6	23 45.0	70 10.1	4 40.7	1.34572	1.27768	+7.73
	12	0.7811	3.391	+0.003	356 15.3	23 45.0	69 6.6	4 36.4	1.34586	1.27810	7.69
	13	0.7838	3.397	−0.002	356 18.3	23 45.2	68 3.1	4 32.2	1.34593	1.27853	7.64
	14	0.7866	3.404	0.008	356 23.5	23 45.6	66 59.8	4 28.0	1.34600	1.27899	7.59
	15	0.7893	3.410	0.012	356 30.9	23 46.1	65 56.5	4 23.8	1.34621	1.27947	7.54
	16	0.7920	+3.417	−0.015	356 39.9	23 46.7	64 53.4	4 19.6	1.34667	1.27997	+7.48
	17	0.7948	3.424	0.015	356 49.7	23 47.3	63 50.3	4 15.4	1.34741	1.28047	7.43
	18	0.7975	3.431	0.013	356 59.1	23 47.9	62 47.4	4 11.2	1.34849	1.28099	7.37
	19	0.8003	3.438	0.008	357 6.9	23 48.5	61 44.6	4 7.0	1.34989	1.28153	7.31
	20	0.8030	3.444	−0.002	357 12.0	23 48.8	60 41.9	4 2.8	1.35150	1.28208	7.24
h (2.0)	21	0.8057	+3.451	+0.004	357 14.0	23 48.9	59 39.3	3 58.6	1.35315	1.28264	+7.18
	22	0.8085	3.458	0.009	357 13.3	23 48.9	58 36.9	3 54.5	1.35464	1.28321	7.11
	23	0.8112	3.466	0.011	357 10.7	23 48.7	57 34.7	3 50.3	1.35583	1.28379	7.04
	24	0.8139	3.473	0.010	357 8.0	23 48.5	56 32.5	3 46.2	1.35665	1.28439	6.97
	25	0.8167	3.480	0.006	357 6.8	23 48.5	55 30.4	3 42.0	1.35713	1.28500	6.89
	26	0.8194	+3.487	+0.001	357 8.5	23 48.6	54 28.6	3 37.9	1.35736	1.28561	+6.81
	27	0.8222	3.495	−0.005	357 13.9	23 48.9	53 26.9	3 33.8	1.35755	1.28623	6.74
	28	0.8249	3.503	0.009	357 22.5	23 49.5	52 25.4	3 29.7	1.35788	1.28686	6.66
	29	0.8276	3.510	0.011	357 33.4	23 50.2	51 24.0	3 25.6	1.35855	1.28749	6.57
	30	0.8304	3.518	0.010	357 44.8	23 51.0	50 22.7	3 21.5	1.35959	1.28813	6.49
	31	0.8331	+3.526	−0.006	357 55.0	23 51.7	49 21.5	3 17.4	1.36101	1.28878	+6.40
Nov.	1	0.8358	3.534	0.000	358 2.8	23 52.2	48 20.6	3 13.4	1.36264	1.28942	6.31
	2	0.8386	3.542	+0.006	358 7.7	23 52.5	47 19.8	3 9.3	1.36437	1.29007	6.22
	3	0.8413	3.550	0.011	358 9.6	23 52.6	46 19.1	3 5.3	1.36599	1.29074	6.13
h	4	0.8441	3.558	0.014	358 9.5	23 52.6	45 18.6	3 1.2	1.36739	1.29139	6.03
(3.0)	5	0.8468	+3.567	+0.015	358 8.4	23 52.6	44 18.2	2 57.2	1.36853	1.29205	+5.94
	6	0.8495	3.575	0.014	358 7.3	23 52.5	43 18.0	2 53.2	1.36936	1.29270	5.84
	7	0.8523	3.584	0.010	358 7.2	23 52.5	42 17.9	2 49.2	1.36996	1.29336	5.74
	8	0.8550	3.592	+0.005	358 8.6	23 52.6	41 18.0	2 45.2	1.37041	1.29402	5.63
	9	0.8577	3.601	−0.001	358 11.9	23 52.8	40 18.2	2 41.2	1.37075	1.29466	5.53
	10	0.8605	+3.610	−0.006	358 17.4	23 53.2	39 18.5	2 37.2	1.37112	1.29531	+5.42
	11	0.8632	3.619	0.011	358 24.7	23 53.6	38 19.0	2 33.3	1.37160	1.29595	5.32
	12	0.8660	3.628	0.014	358 33.7	23 54.2	37 19.7	2 29.3	1.37228	1.29659	5.21
	13	0.8687	3.637	0.015	358 43.3	23 54.9	36 20.5	2 25.4	1.37323	1.29722	5.10
	14	0.8714	3.646	0.013	358 52.8	23 55.5	35 21.4	2 21.4	1.37449	1.29785	4.98
	15	0.8742	+3.655	−0.009	359 1.0	23 56.1	34 22.5	2 17.5	1.37605	1.29846	+4.87
	16	0.8769	+3.665	−0.004	359 6.9	23 56.5	33 23.7	2 13.6	1.37784	1.29908	+4.75

FOR WASHINGTON MEAN MIDNIGHT.

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			″	
0.8769	+3.665	−0.004	359 6.9	23 56.5	33 23.7	2 13.6	1.37784	1.29908	+4.75	+0.6770
0.8797	3.674	+0.003	359 9.8	23 56.7	32 25.1	2 9.7	1.37972	1.29969	4.64	0.6662
0.8824	3.684	0.008	359 10.0	23 56.7	31 26.6	2 5.8	1.38147	1.30028	4.52	0.6549
0.8851	3.693	0.011	359 8.0	23 56.5	30 28.2	2 1.9	1.38301	1.30086	4.40	0.6432
0.8879	3.703	0.011	359 5.3	23 56.4	29 30.0	1 58.0	1.38418	1.30143	4.28	0.6310
0.8906	+3.713	+0.008	359 3.5	23 56.2	28 31.9	1 54.1	1.38500	1.30199	+4.15	+0.6184
0.8933	3.723	+0.003	359 4.1	23 56.3	27 33.9	1 50.3	1.38556	1.30254	4.03	0.6052
0.8961	3.733	−0.003	359 7.7	23 56.5	26 36.1	1 46.4	1.38601	1.30308	3.90	0.5914
0.8988	3.743	0.008	359 14.7	23 57.0	25 38.4	1 42.6	1.38656	1.30360	3.78	0.5771
0.9016	3.753	0.011	359 23.8	23 57.6	24 40.9	1 38.7	1.38737	1.30410	3.65	0.5621
0.9043	+3.764	−0.011	359 33.9	23 58.3	23 43.4	1 34.9	1.38854	1.30460	+3.52	+0.5464
0.9070	3.774	0.008	359 43.2	23 58.9	22 46.0	1 31.1	1.39008	1.30509	3.39	0.5300
0.9098	3.785	−0.003	359 50.4	23 59.4	21 48.7	1 27.2	1.39187	1.30555	3.26	0.5129
0.9125	3.795	+0.003	359 54.8	23 59.7	20 51.6	1 23.4	1.39379	1.30600	3.13	0.4948
0.9152	3.806	0.009	359 56.4	23 59.8	19 54.6	1 19.6	1.39565	1.30643	2.99	0.4759
0.9180	+3.816	+0.013	359 55.6	23 59.7	18 57.6	1 15.8	1.39733	1.30684	+2.86	+0.4559
0.9207	3.827	0.015	359 53.5	23 59.6	18 0.7	1 12.0	1.39873	1.30724	2.72	0.4348
0.9235	3.838	0.014	359 51.2	23 59.4	17 3.9	1 8.3	1.39987	1.30763	2.59	0.4124
0.9262	3.849	0.011	359 49.5	23 59.3	16 7.2	1 4.5	1.40076	1.30799	2.45	0.3888
0.9289	3.860	0.007	359 49.2	23 59.3	15 10.5	1 0.7	1.40148	1.30834	2.31	0.3635
0.9317	+3.871	+0.001	359 50.5	23 59.4	14 14.0	0 56.9	1.40208	1.30866	+2.17	+0.3366
0.9344	3.882	−0.005	359 53.5	23 59.6	13 17.5	0 53.2	1.40267	1.30897	2.03	0.3078
0.9371	3.893	0.010	359 58.5	23 59.9	12 21.0	0 49.4	1.40333	1.30926	1.89	0.2767
0.9399	3.904	0.014	0 4.8	0 0.3	11 24.6	0 45.6	1.40415	1.30953	1.75	0.2431
0.9426	3.915	0.015	0 11.9	0 0.8	10 28.2	0 41.9	1.40522	1.30977	1.61	0.2065
0.9454	+3.926	−0.014	0 19.0	0 1.3	9 31.9	0 38.1	1.40657	1.31000	+1.47	+0.1663
0.9481	3.937	0.011	0 25.2	0 1.7	8 35.7	0 34.4	1.40817	1.31020	1.32	0.1219
0.9508	3.948	−0.006	0 29.3	0 2.0	7 39.4	0 30.6	1.41002	1.31039	1.18	0.0723
0.9536	3.960	+0.001	0 30.9	0 2.1	6 43.2	0 26.9	1.41197	1.31055	1.04	0.0161
0.9563	3.971	0.007	0 29.7	0 2.0	5 47.1	0 23.1	1.41386	1.31070	0.89	9.9514
0.9591	+3.982	+0.011	0 26.3	0 1.8	4 50.9	0 19.4	1.41555	1.31083	+0.75	+9.8751
0.9618	3 994	0 012	0 21.8	0 1.5	3 54.8	0 15.7	1.41693	1.31093	0.61	9.7823
0.9645	4.005	0.011	0 17.7	0 1.2	2 58.7	0 11.9	1.41799	1.31101	0.46	9.6640
0.9673	4.016	+0.006	0 15.3	0 1.0	2 2.6	0 8.2	1.41873	1.31107	0.32	9.5006
0.9700	4.028	0.000	0 15.5	0 1.0	1 6.6	0 4.4	1.41931	1.31110	0.17	9.2353
0.9727	+4.039	−0.006	0 18.8	0 1.3	0 10.5	0 0.7	1.41991	1.31112	+0.03	+8.4335
0.9755	4.051	0.010	0 24.5	0 1.6	359 14.4	23 57.0	1.42071	1.31111	−0.12	−9.0708
0.9782	4.062	0.011	0 31.4	0 2.1	358 18.4	23 53.2	1.42180	1.31108	0.26	9.4191
0.9810	4.073	0.009	0 38.0	0 2.5	357 22.3	23 49.5	1.42322	1.31104	0.41	9.6098
0.9837	4.085	−0.005	0 43.0	0 2.9	356 26.2	23 45.7	1.42490	1.31096	0.55	9.7418
0.9864	+4.096	+0.001	0 45.5	0 3.0	355 30.0	23 42.0	1.42673	1.31087	−0.70	−9.8427
0.9892	4.108	0.007	0 45.3	0 3.0	354 33.9	23 38.3	1.42857	1.31076	0.84	9.9245
0.9919	4.119	0.012	0 42.7	0 2.8	353 37.7	23 34.5	1.43025	1.31061	0.98	9.9931
0.9946	4.130	0.014	0 38.6	0 2.6	352 41.4	23 30.8	1.43170	1.31045	1.13	0.0523
0.9974	4.142	0.014	0 34.0	0 2.3	351 45.2	23 27.0	1.43289	1.31027	1.27	0.1042
1.0001	+4.153	+0.012	0 29.7	0 2.0	350 48.8	23 23.3	1.43382	1.31007	−1.41	−0.1505
1.0029	*+4.164*	*+0.008*	*0 26.6*	*0 1.8*	349 52.4	23 19.5	1.43454	1.30985	−1.56	−0.1999

FOR WASHINGTON SIDEREAL TWELVE HOURS.

Mean Solar Date.		Log A_1.	Log B_1.	Log C.	Log D.	f	G_1	H	Log ρ_1.	Log k.
						s	° ′	° ′		
Jan.	0.72	+9.5166	−0.4382	−0.5332	+1.3038	+1.012	337 23	350 22	0.8534	1.3100
	10.69	9.5625	0.4415	0.8208	1.2823	1.125	339 19	340 56	0.8934	1.3068
	20.67	9.6017	0.4529	0.9828	1.2451	1.231	340 30	331 20	0.9294	1.3019
	30.64	9.6348	0.4689	1.0900	1.1894	1.328	341 12	321 30	0.9606	1.2958
Feb.	9.61	9.6627	0.4856	1.1644	1.1097	1.416	341 39	311 24	0.9874	1.2893
	19.58	+9.6860	−0.4998	−1.2159	+0.9953	+1.494	342 0	301 2	1.0098	1.2830
Mar.	1.56	9.7059	0.5086	1.2497	0.8209	1.564	342 26	290 26	1.0286	1.2779
	11.53	9.7232	0.5101	1.2684	+0.5006	1.627	343 1	279 41	1.0446	1.2746
	21.50	9.7391	0.5031	1.2736	−9.5615	1.688	343 50	268 53	1.0586	1.2737
	31.48	9.7545	0.4867	1.2658	0.5874	1.749	344 56	258 9	1.0717	1.2751
Apr.	10.45	+9.7702	−0.4609	−1.2447	−0.8594	+1.812	346 15	247 37	1.0848	1.2787
	20.42	9.7866	0.4257	1.2092	1.0160	1.882	347 44	237 21	1.0986	1.2839
	30.39	9.8040	0.3822	1.1570	1.1206	1.959	349 18	227 24	1.1136	1.2900
May	10.37	9.8226	0.3317	1.0835	1.1941	2.045	350 51	217 47	1.1302	1.2963
	20.34	9.8421	0.2771	0.9802	1.2460	2.138	352 16	208 28	1.1481	1.3020
	30.31	+9.8621	−0.2223	−0.8282	−1.2813	+2.239	353 29	199 25	1.1669	1.3067
June	9.28	9.8823	0.1727	0.5722	1.3024	2.346	354 26	190 33	1.1864	1.3097
	19.26	9.9021	0.1343	−9.8035	1.3109	2.455	355 8	181 47	1.2057	1.3111
	29.23	9.9211	0.1123	+0.3936	1.3073	2.565	355 34	173 3	1.2244	1.3105
July	9.20	9.9389	0.1087	0.7416	1.2915	2.672	355 47	164 16	1.2421	1.3081
	19.17	+9.9554	−0.1213	+0.9246	−1.2626	+2.775	355 49	155 20	1.2586	1.3041
	29.15	9.9702	0.1451	1.0442	1.2184	2.872	355 44	146 12	1.2734	1.2988
Aug.	8.12	9.9834	0.1734	1.1282	1.1555	2.959	355 35	136 48	1.2867	1.2928
	18.09	9.9950	0.2000	1.1884	1.0671	3.040	355 26	127 6	1.2984	1.2866
	28.07	0.0051	0.2202	1.2304	0.9393	3.112	355 19	117 6	1.3086	1.2809
Sept.	7.04	+0.0142	−0.2300	+1.2577	−0.7374	+3.177	355 19	106 48	1.3177	1.2766
	17.01	0.0224	0.2264	1.2714	−0.3131	3.238	355 26	96 17	1.3258	1.2741
	26.98	0.0302	0.2065	1.2726	+0.1547	3.297	355 43	85 39	1.3334	1.2739
Oct.	6.96	0.0380	0.1671	1.2609	0.6891	3.357	356 9	75 0	1.3410	1.2760
	16.93	0.0462	0.1044	1.2355	0.9152	3.421	356 44	64 26	1.3489	1.2802
	26.90	+0.0551	−0.0117	+1.1942	+1.0544	+3.491	357 25	54 4	1.3575	1.2859
Nov.	5.87	0.0648	9.8779	1.1335	1.1498	3.570	358 9	43 56	1.3670	1.2923
	15.85	0.0755	9.6790	1.0466	1.2171	3.658	358 51	34 2	1.3776	1.2987
	25.82	0.0870	−9.3388	0.9199	1.2637	3.757	359 29	24 22	1.3890	1.3043
Dec.	5.79	0.0991	+6.7782	0.7187	1.2936	3.863	0 0	14 54	1.4011	1.3084
	15.77	+0.1114	+9.2087	+0.2951	+1.3087	+3.974	0 21	5 32	1.4134	1.3107
	25.74	0.1237	9.4072	−0.1308	1.3100	4.088	0 33	356 13	1.4257	1.3109
	35.71	+0.1354	+9.4473	−0.6660	+1.2975	+4.200	0 35	346 51	1.4374	1.3090

E = +0ˢ.003

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

FOR WASHINGTON MEAN MIDNIGHT.

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

FOR WASHINGTON MEAN MIDNIGHT.

Date.	$\delta''\psi$	$\delta''\omega$	Date.	$\delta''\psi$	$\delta''\omega$	Date.	$\delta''\psi$	$\delta''\omega$	Date.	δ'
	"	"		"	"		"	"		'
July 1	−0.20	−0.07	Aug. 16	+0.21	+0.03	Oct. 1	−0.15	+0.05	Nov. 16	−0
2	−0.11	0.09	17	0.15	0.06	2	0.17	0.00	17	+0
3	+0.01	0.09	18	+0.08	0.08	3	0.13	−0.04	18	0
4	0.12	0.07	19	−0.02	0.09	4	−0.06	0.08	19	0
5	0.20	−0.03	20	0.12	0.08	5	+0.04	0.09	20	0
6	+0.23	+0.02	21	−0.20	+0.06	6	+0.13	−0.09	21	+0
7	0.20	0.06	22	0.26	+0.03	7	0.21	0.07	22	+0
8	0.13	0.09	23	0.28	−0.01	8	0.24	−0.03	23	−0
9	+0.03	0.10	24	0.26	0.05	9	0.24	0.00	24	0
10	−0.06	0.08	25	0.19	0.08	10	0.21	+0.04	25	0
11	−0.13	+0.05	26	−0.09	−0.09	11	+0.14	+0.07	26	−0
12	0.16	0.00	27	+0.02	0.08	12	+0.06	0.08	27	0
13	0.13	−0.04	28	0.11	0.06	13	−0.04	0.08	28	−0
14	−0.07	0.08	29	0.18	−0.01	14	0.13	0.07	29	+0
15	+0.01	0.09	30	0.19	+0.03	15	0.20	0.05	30	0
16	+0.10	−0.09	31	+0.15	+0.07	16	−0.25	+0.01	Dec. 1	+0
17	0.17	0.07	Sept. 1	+0.08	0.10	17	0.25	−0.03	2	0
18	0.21	−0.04	2	−0.02	0.10	18	0.21	0.06	3	0
19	0.22	0.00	3	0.10	0.07	19	0.14	0.09	4	0
20	0.19	+0.04	4	0.14	+0.03	20	−0.04	0.09	5	0
21	+0.12	+0.06	5	−0.14	−0.02	21	+0.06	−0.08	6	+0
22	+0.04	0.08	6	0.10	0.06	22	0.14	−0.04	7	−0
23	−0.06	0.09	7	−0.02	0.09	23	0.18	0.00	8	0
24	0.15	0.07	8	+0.07	0.09	24	0.16	+0.05	9	0
25	0.23	0.05	9	0.16	0.08	25	0.11	0.08	10	0
26	−0.28	+0.01	10	+0.22	−0.06	26	+0.01	+0.10	11	−0
27	0.28	−0.03	11	0.24	−0.02	27	−0.08	0.09	12	0
28	0.24	0.06	12	0.23	+0.02	28	0.15	0.06	13	−0
29	0.16	0.09	13	0.18	0.05	29	0.18	+0.02	14	+0
30	−0.05	0.09	14	0.11	0.07	30	0.16	−0.03	15	0
31	+0.07	−0.08	15	+0.02	+0.08	31	−0.10	−0.07	16	+0
Aug. 1	0.16	−0.04	16	−0.08	0.08	Nov. 1	−0.01	0.09	17	0
2	0.21	0.00	17	0.16	0.07	2	+0.09	0.09	18	0
3	0.21	+0.05	18	0.23	+0.04	3	0.18	0.08	19	+0
4	0.15	0.08	19	0.26	0.00	4	0.23	0.04	20	0
5	+0.06	+0.10	20	−0.26	−0.04	5	+0.25	−0.01	21	−0
6	−0.03	0.09	21	0.21	0.07	6	0.22	+0.03	22	0
7	0.11	0.06	22	0.12	0.09	7	0.17	0.06	23	0
8	0.15	+0.02	23	−0.02	0.09	8	+0.08	0.08	24	0
9	0.13	−0.03	24	+0.08	0.07	9	−0.01	0.08	25	−0
10	−0.08	−0.07	25	+0.15	−0.03	10	−0.10	+0.08	26	+0
11	0.00	0.09	26	0.18	+0.02	11	0.18	0.05	27	0
12	+0.09	0.09	27	0.15	0.06	12	0.23	+0.02	28	0
13	0.17	0.08	28	+0.08	0.09	13	0.25	−0.02	29	0
14	0.22	0.05	29	−0.01	0.10	14	0.22	0.05	30	0
15	+0.23	−0.01	30	−0.09	+0.08	15	−0.16	−0.08	31	+0
16	+0.21	+0.03	Oct. 1	−0.15	+0.05	16	−0.06	−0.09	32	+0

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ame of Star.	Magni-tude.	Spec-trum.	Right Ascension.	Annual Varia-tion.	Annual P. M.	Declination.	Annual Varia-tion.	Annual P. M.
			h m s	s	s	° ′ ″	″	″
m . . .	4.7	K0	0 1 5.255	+3.0714	−.0006	− 6 10 18.77	+20.136	+0.091
medæ (*Alpheratz*)	2.2	A0p	0 4 5.642	3.0964	+.0107	+28 37 55.99	19.880	−0.163
peiæ . .	2.4	F5	0 4 44.428	3.1861	+.0680	+58 41 31.28	19.861	−0.180
icis . .	3.9	K0	0 5 12.088	3.0506	+.0096	−46 12 19.72	19.848	−0.193
medæ . .	5.1	F0	0 6 0.119	3.1105	+.0021	+45 36 37.45	20.034	−0.004
i . . .	2.9	B2	0 8 57.593	+3.0867	+.0003	+14 43 19.85	+20.020	−0.010
medæ . .	4.5	A2	0 13 59.251	3.1281	−.0044	+36 19 30.33	19.961	−0.047
. . . .	3.8	K0	0 15 11.958	3.0569	−.0013	− 9 17 2.18	19.972	−0.030
iæ . . .	4.3	F8	0 15 45.483	3.1464	+.2739	−65 21 43.94	21.170	+1.172
im . . .	6.0	G5	0 21 8.836	3.0744	−.0014	+ 1 28 48.19	19.937	−0.023
i . . .	2.9	G0	0 21 24.623	+3.1971	+.6972	−77 43 18.09	+20.276	+0.318
nicis . . .	2.4	K0	0 22 11.117	2.9720	+.0188	−42 45 24.20	19.548	−0.403
. . . .	6.0	K5	0 25 48.196	3.0622	+.0011	− 4 24 56.65	19.918	0.000
. . . .†	5.2	G0	0 30 58.516	3.0872	+.0273	− 4 2 58.34	19.846	−0.017
peiæ . .	3.7	B2	0 32 20.390	3.3298	+.0036	+53 26 25.07	19.839	−0.007
omedæ . .	4.4	B3	0 32 26.620	+3.1982	+.0019	+33 15 45.46	+19.845	0.000
omedæ . .	4.5	G5	0 34 9.953	3.1649	−.0172	+28 51 40.54	19.569	−0.254
omedæ . .	3.5	K0	0 34 53.148	3.2026	+.0110	+30 24 24.57	19.717	−0.097
peiæ (*Schedir*) .†	*var.*	K0	0 35 47.272	3.3880	+.0063	+56 4 56.41	19.770	−0.032
nicis . .	4.6	K0	0 37 24.283	2.8389	−.0046	−46 32 27.18	19.747	−0.032
. . . .	2.2	K0	0 39 25.444	+3.0124	+.0160	−18 26 30.85	+19.791	+0.041
peiæ . .	4.7	B2	0 40 5.617	3.3322	+.0028	+47 49 49.29	19.733	−0.006
peiæ . .	5.6	A2	0 40 8.510	3.9093	−.0050	+74 32 4.64	19.712	−0.026
omedæ . .	4.3	K0	0 42 56.147	3.1752	−.0073	+23 48 57.14	19.616	−0.078
peiæ . .†	3.6	F8	0 44 4.191	3.6149	+.1432	+57 22 35.55	19.200	−0.476
um . . .	4.6	K5	0 44 22.471	+3.1103	+.0055	+ 7 8 0.98	+19.627	−0.044
ri . . .	5.0	K5	0 45 43.258	2.1003	+.0425	−75 22 29.58	19.647	−0.001
. . . .	4.9	K0	0 48 45.876	3.0643	−.0005	− 1 35 40.46	19.590	−0.003
peiæ . .	2.2	B0p	0 51 41.231	3.5994	+.0036	+60 16 3.24	19.533	−0.005
omedæ . .	3.9	A2	0 52 8.460	3.3217	+.0132	+38 2 57.80	19.559	+0.030
ptoris . .	4.4	B5	0 54 36.370	+2.8902	−.0018	−29 48 21.70	+19.466	−0.013
um . . .	4.4	K0	0 58 38.030	3.1114	−.0054	+ 7 26 36.74	19.419	+0.026
nicis . . .†	3.4	K0	1 2 22.806	2.6795	−.0057	−47 9 48.05	19.284	−0.024
peiæ . .	5.3	G5	1 2 44.206	3.9711	+.3918	+54 30 49.74	17.744	−1.555
. . . .	3.6	K0	1 4 24.862	3.0175	+.0143	−10 37 18.66	19.134	−0.125
romedæ . .	2.4	Ma	1 5 4.762	+3.3514	+.0148	+35 10 50.85	+19.126	−0.117
ium . . .	4.7	K0	1 7 5.091	3.2977	+.0056	+29 38 57.55	19.164	−0.029
ium . . .†	5.6	A5	1 9 23.597	3.1321	+.0096	+ 7 8 12.37	19.081	−0.052
næ . . .†	5.0	F8	1 12 57.309	2.0392	+.0744	−69 19 1.27	19.127	+0.089
ium . . .	5.3	A2	1 13 30.988	3.0927	−.0033	+ 3 10 39.65	18.997	−0.024
ium . . .	4.7	A2	1 14 54.019	+3.2913	+.0016	+26 49 41.37	+18.976	−0.008
. . . .	3.8	K0	1 19 52.444	2.9978	−.0057	− 8 36 40.68	18.626	−0.215
iopeiæ . .	2.8	A5	1 20 22.443	3.9022	+.0407	+59 48 16.27	18.788	−0.037
nicis . . .	3.4	K5	1 24 45.714	2.6074	−.0029	−43 44 36.23	18.465	−0.225
iopeiæ . .	6.0	F5	1 25 1.814	4.4185	+.0263	+69 50 16.94	18.609	−0.072
ium . . .	3.7	G5	1 27 2.336	+3.2061	+.0015	+14 55 6.06	+18.614	−0.003
iopeiæ . .	5.5	K0	1 31 51.309	4.7370	−.0011	+72 37 3.69	18.455	−0.002
romedæ . .	4.2	G0	1 31 55.147	3.5107	−.0153	+40 59 26.87	18.078	−0.377
ium . . .	5.6	F0	1 32 41.751	3.1768	−.0049	+11 43 2.35	18.462	+0.034
ei . . .	3.8	K0	1 32 53.356	3.6686	+.0064	+48 12 29.27	18.302	−0.119
ani (*Achernar*) .	0.6	B5	1 34 37.452	+2.2361	+.0103	−57 39 29.67	+18.320	−0.041
iopeiæ . .	5.5	A0p	1 36 10.410	4.4041	+.0088	+67 37 25.81	18.304	−0.002
ium . . .	4.7	K0	1 37 6.617	3.1199	−.0015	+ 5 4 4.95	18.276	+0.003
ei . . .	4.2	B0p	1 38 26.963	3.7454	+.0031	+50 16 16.10	18.208	−0.015
. . . .	3.6	K0	1 40 12.695	2.7866	−.1198	−16 22 26.83	19.018	+0.859
ium . . .	4.5	K0	1 41 0.516	+3.1652	+.0049	+ 8 44 25.46	+18.175	+0.045
ptoris . . .†	5.4	F0	1 41 45.290	+2.8044	+.0052	−25 28 0.82	+18.051	−0.051

up. 5m.5, 6m.2, 0″.3
p., var. irreg. 2m.2, 2m.8
p. comp. 7m.6, 4″ s. pr.

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

α Tucanæ, comp. 7m, 6″ n.
ε Sculptoris, comp. 6m, 5″ n. f.

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Name of Star.	Magnitude.	Spectrum.	Right Ascension.	Annual Variation.	Annual P. M.	Declination.	Annual Variation.
			h m s	s	s	° ′ ″	″
ζ Ceti	3.9	K0	1 47 21.784	+2.9601	+.0020	−10 44 40.43	+17.8
α Trianguli	3.6	F5	1 48 20.746	3.4138	+.0015	+29 10 30.12	17.6
ε Cassiopeiæ	3.4	B3	1 48 24.487	4.2864	+.0053	+63 15 43.20	17.8
ξ Piscium	4.8	K0	1 49 15.422	3.1039	+.0015	+ 2 46 41.75	17.8
β Arietis	2.7	A5	1 50 3.057	3.3087	+.0064	+20 24 10.04	17.6
ψ Phœnicis	4.4	Mb	1 50 19.001	+2.4035	−.0124	−46 42 32.87	+17.6
υ Ceti	4.2	K5	1 56 5.618	2.8257	+.0082	−21 28 46.13	17.5
α Hydri	3.0	F0	1 56 8.844	1.8818	+.0277	−61 58 24.38	17.5
50 Cassiopeiæ	4.1	A0	1 56 19.026	5.0648	−.0092	+72 1 13.50	17.5
γ Andromedæ *pr.*	2.3	K0	1 58 47.863	3.6720	+.0046	+41 55 55.46	17.3
γ Andromedæ *seq.*	5.1	A	Δα +0.842	....	...	Δδ + 4.58	...
α Arietis	2.2	K2	2 2 29.429	+3.3765	+.0139	+23 4 13.99	+17.1
β Trianguli	3.1	A5	2 4 35.965	3.5621	+.0126	+34 35 42.98	17.1
55 Cassiopeiæ	6.2	F5	2 7 56.952	4.6709	−.0020	+66 8 10.27	16.9
6 Persei	5.4	K0	2 8 4.556	3.9746	+.0368	+50 40 51.26	16.8
ξ¹ Ceti	4.5	G5	2 8 35.910	+3.1772	−.0012	+ 8 27 28.09	+16.9
μ Fornacis	5.2	A0	2 9 14.907	2.6378	−.0037	−31 6 47.04	16.9
γ Trianguli	4.1	A0	2 12 22.490	3.5590	+.0040	+33 27 50.23	16.7
67 Ceti	5.7	G5	2 12 50.533	2.9907	+.0054	− 6 48 15.03	16.6
φ Eridani	3.8	B8	2 13 32.555	2.1411	+.0062	−51 53 45.88	16.7
o Ceti (*Mira*) †	*var.*	Md	2 15 9.150	+3.0292	+.0002	− 3 21 13.83	+16.4
κ Fornacis	5.4	F5	2 18 44.646	2.7448	+.0138	−24 11 35.30	16.4
δ Hydri	4.3	A2	2 20 16.017	1.0589	−.0097	−69 2 12.48	16.4
ι Cassiopeiæ †	4.6	A5p	2 22 12.509	4.9056	−.0003	+67 1 48.50	16.3
ξ² Ceti	4.3	A0	2 23 44.617	3.1867	+.0025	+ 8 5 19.19	16.2
σ Ceti	4.8	F5	2 28 9.116	+2.8415	−.0063	−15 36 29.45	+15.8
36 H. Cassiopeiæ	5.3	K0	2 30 6.628	5.6424	−.0052	+72 27 22.70	15.9
ν Ceti	5.0	G5	2 31 30.967	+3.1453	−.0025	+ 5 13 54.36	15.8
μ Hydri	5.3	K0	2 33 23.719	−1.3462	+.0426	−79 28 18.11	15.6
ν Arietis	5.4	A2	2 34 6.008	+3.4024	+.0001	+21 36 11.29	15.6
δ Ceti	4.0	B2	2 35 13.607	+3.0733	+.0011	− 0 1 43.75	+15.6
ε Hydri	4.3	B9	2 38 18.462	0.9145	+.0169	−68 37 20.74	15.4
θ Persei	4.2	G0	2 38 31.361	4.0843	+.0353	+48 52 41.76	15.3
γ Ceti *seq.* †	3.7	A0	2 38 59.876	3.1061	−.0096	+ 2 53 11.96	15.2
π Ceti	4.4	B5	2 40 10.269	2.8538	−.0012	−14 12 34.51	15.3
μ Ceti	4.4	A5	2 40 27.153	+3.2396	+.0188	+ 9 45 52.09	+15.3
η Persei †	3.9	K0	2 44 37.944	4.3589	+.0041	+55 33 7.10	15.0
41 Arietis	3.7	B8	2 45 5.632	3.5253	+.0050	+26 55 9.16	14.9
β Fornacis	4.5	K0	2 45 37.016	2.5121	+.0080	−32 45 14.56	15.1
σ Arietis	5.5	B5	2 46 54.428	3.3083	+.0016	+14 44 26.31	14.9
τ² Eridani	4.8	K0	2 47 16.333	+2.7200	−.0044	−21 20 43.61	+14.9
τ Persei	4.1	G0p	2 48 21.811	4.2376	+.0008	+52 25 25.44	14.8
η Eridani	4.0	K0	2 52 22.329	2.9304	+.0060	− 9 13 40.10	14.4
ε Arietis (*mean*) †	4.6	A2	2 54 27.735	3.4258	−.0009	+21 0 32.67	14.5
47 H. Cephei	5.7	Ma	2 54 59.610	7.8578	−.0102	+79 5 32.52	14.4
θ Eridani †	3.4	A2	2 55 6.964	+2.2767	−.0025	−40 38 12.34	+14.4
α Ceti	2.8	Ma	2 57 56.323	3.1334	−.0009	+ 3 45 53.30	14.2
τ³ Eridani	4.2	A3	2 58 43.945	2.6449	−.0104	−23 56 56.75	14.2
γ Persei	3.1	G0p	2 58 46.536	4.3292	+.0010	+53 10 56.74	14.2
ρ Persei †	*var.*	Mb	2 59 51.117	3.8359	+.0116	+38 31 9.94	14.0
μ Horologii	5.2	F0	3 1 39.177	+1.4079	−.0123	−60 3 32.87	+14.0
θ Hydri	5.5	B8	3 2 4.324	0.1016	+.0034	−72 13 35.69	14.0
β Persei (*Algol*) †	*var.*	B8	3 2 45.724	3.8941	+.0008	+40 38 12.42	14.0
δ Arietis	4.5	K0	3 6 52.788	3.4265	+.0110	+19 24 49.19	13.7
12 Eridani †	4.0	F8	3 8 32.655	2.5468	+.0241	−29 18 49.45	14.2
48 H. Cephei	5.5	F0	3 9 44.362	+7.5077	+.0204	+77 25 53.42	+13.5
ζ Arietis	5.0	A0	3 10 7.630	+3.4440	−.0019	+20 44 15.26	+13.4

o Ceti, var., 331d.1 m.7–9m.6, star 9m f.8s
ι Cassiop., triple, 7m, 8m, 2″, 8″
γ Ceti, comp. 6m.2, 2″.7 pr.

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

ρ Persei, var. irreg., 3m.4–
β Persei, var. 2d.87, 2m.1–
12 Eridani, comp. 7m, 1″.4

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Name of Star.	Magnitude.	Spectrum.	Right Ascension.	Annual Variation.	Annual P. M.	Declination.	Annual Variation.	Annual P. M.
			h m s	s	s	° ′ ″	″	″
rologii . . †	5.7	N	3 10 26.793	+1.5150	−.0005	−57 37 55.60	+13.508	−0.006
ni . . .	4.9	A3	3 11 48.028	2.9125	−.0008	− 9 7 38.13	13.479	+0.053
s . . .	5.2	B3	3 16 25.929	3.4597	+.0023	+20 50 54.99	13.089	−0.033
ni . . .	4.3	G5	3 16 36.756	+2.3980	+.2808	−43 23 11.60	13.867	+0.757
i . . .	5.5	F2	3 18 0.035	−1.5497	+.0352	−77 41 31.67	13.058	+0.040
i . . .	1.9	F5	3 18 23.335	+4.2700	+.0030	+49 34 0.45	+12.964	−0.028
. . .	3.8	G5	3 20 20.663	3.2256	−.0046	+ 8 44 15.33	12.788	−0.074
melopardalis .	4.4	A0	3 22 20.239	4.8387	+.0027	+59 39 8.13	12.729	+0.001
. . .	3.8	B8	3 22 40.128	3.2486	+.0040	+ 9 26 38.30	12.659	−0.046
. . .	4.3	K0	3 26 17.304	3.3093	+.0016	+12 39 11.11	12.461	+0.002
ni . . . †	3.8	K0p	3 29 1.141	+2.8253	−.0660	− 9 44 18.21	+12.297	+0.027
ni . . .	4.3	B8	3 30 7.202	2.6484	+.0023	−21 54 38.44	12.155	−0.039
i . . .	3.1	B5	3 37 0.504	4.2608	+.0035	+47 31 23.67	11.674	−0.036
ni . . .	3.7	K0	3 39 16.294	2.8731	−.0061	−10 2 37.56	12.280	+0.731
i . . .	3.9	F5	3 39 32.977	4.0675	−.0004	+42 19 2.94	11.530	0.000
melopardalis .	4.7	A0	3 41 34.461	+6.2872	+.0059	+71 4 40.54	+11.328	−0.057
(*Alcyone*) . †	3.0	B5	3 42 32.843	3.5619	+.0016	+23 50 57.71	11.265	−0.050
ni . . .	4.3	F8	3 43 16.595	2.5807	−.0115	−23 29 36.69	10.780	−0.481
ni . . .	4.2	K0	3 46 20.924	+2.2452	−.0036	−36 27 2.88	11.010	−0.028
i . . .	3.2	Ma	3 48 30.514	−0.9631	+.0096	−74 29 36.94	10.997	+0.117
i . . .	2.9	B1	3 48 54.636	+3.7660	+.0010	+31 38 17.23	+10.836	−0.014
melopardalis . †	5.2	K0p	3 50 2.934	5.0954	+.0003	+60 52 1.14	10.750	−0.017
i . . . †	3.0	B0	3 52 16.786	4.0198	+.0031	+39 46 16.22	10.575	−0.027
i . . .	4.0	Oe5	3 53 34.530	3.8873	+.0012	+35 33 11.66	10.488	−0.017
ni . . .	3.2	K5	3 54 9.390	2.7985	+.0047	−13 44 37.92	10.352	−0.111
. . . †	*var.*	B3	3 56 4.802	+3.3218	+.0002	+12 15 24.18	+10.307	−0.011
uli . . .	4.4	Ma	3 57 25.568	0.9412	−.0020	−61 38 2.37	10.215	−0.002
. . .	3.9	A0	3 58 44.381	3.1898	+.0008	+ 5 45 35.51	10.113	−0.005
. . . †	4.5	K0	3 59 47.139	3.5436	+.0069	+21 51 21.96	9.981	−0.058
i . . .	4.0	B3p	4 2 37.844	4.3478	+.0042	+47 29 31.39	9.791	−0.032
. . .	5.6	F0	4 5 46.378	+3.6495	−.0024	+26 15 55.08	+ 9.540	−0.042
ni . . .	4.1	F5	4 7 48.789	2.9274	+.0007	− 7 3 11.25	9.511	+0.086
. . .	4.3	B3	4 11 1.544	3.2558	+.0016	+ 8 41 7.40	9.152	−0.024
logii . . .	3.8	K0	4 11 15.072	1.9874	+.0040	−42 29 55.70	8.928	−0.230
uli . . .	3.4	G5	4 13 21.071	0.7654	+.0048	−62 40 53.00	9.039	+0.044
. . .	3.9	K0	4 15 4.077	+3.4118	+.0083	+15 25 41.32	+ 8.834	−0.026
. . .	3.9	K0	4 18 8.755	3.4571	+.0075	+17 20 55.71	8.588	−0.030
ni . . .	4.1	K5	4 20 55.139	+2.2529	+.0052	−34 12 32.57	8.441	+0.042
e . . .	5.6	K0	4 23 32.981	−4.1420	+.0042	−80 24 33.81	8.261	+0.072
. . .	3.6	K0	4 23 46.086	+3.5009	+.0082	+18 59 50.43	8.137	−0.034
i . . . †	6.1	F0	4 27 34.256	+4.2156	+.0012	+42 53 15.99	+ 7.871	+0.004
(*Aldebaran*) .	1.1	K5	4 31 9.358	3.4402	+.0047	+16 20 36.31	7.388	−0.189
ni . . .	4.1	B2	4 32 10.231	2.9939	−.0005	− 3 31 16.42	7.495	0.000
lus . . .	3.5	A0p	4 32 12.109	1.2949	+.0067	−55 12 58.87	7.482	−0.011
ni . . .	4.0	K0	4 34 22.647	2.7456	−.0061	−14 27 55.42	7.162	−0.154
. . .	4.3	B5	4 37 15.692	+3.5988	+.0007	+22 47 55.34	+ 7.061	−0.020
nbridge 848 .	6.0	F0	4 37 38.363	8.0232	+.0095	+75 47 32.16	6.906	−0.144
. . .	4.5	F2	4 37 53.125	1.9300	−.0149	−42 1 19.29	6.923	−0.106
lopardalis .	5.4	A2	4 41 5.010	4.9874	+.0062	+56 36 40.34	6.618	−0.148
ni . . .	4.2	B5	4 41 21.091	2.9989	+.0011	− 3 24 21.10	6.736	−0.009
is . . .	3.3	F8	4 45 19.982	+3.2552	+.0312	+ 6 49 2.75	+ 6.439	+0.023
lopardalis .	4.4	B0	4 45 47.437	5.9495	+.0038	+66 12 12.27	6.383	+0.005
. . .	5.1	F0	4 46 31.010	3.5078	+.0059	+18 41 58.61	6.283	−0.035
is . . .	3.9	B3	4 49 55.628	3.1241	+.0002	+ 2 18 20.81	6.039	+0.005
ae . . .	2.9	K2	4 51 35.156	3.9041	+.0009	+33 2 8.90	5.874	−0.021
ae . . . †	*var.*	F5p	4 56 0.620	+4.3016	+.0012	+43 42 6.11	+ 5.511	−0.013
lopardalis .	4.2	G0	4 56 1.676	+5.3265	−.0004	+60 19 21.09	+ 5.512	−0.011

ii, remarkable purplish red

, comp. 9m, s. 7″

η Tauri, quad., comps. 6m.3, 7m.6, 8m.2, 117″, 181″, 190″

9 H. Camelop., comp. 8m, 1″.9 n. f.

ε *Persei, comp.* 8m, 8″.6 n. f.

λ Tauri, var., 3d.95, 3m.3–4m.2

A Tauri, star 6m.5 f. 38s, 270″ s.

m Persei, star 6m, 115″ s. pr.

ε Aurigæ, var. irreg., 3m.0–4m.5

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Name of Star.	Magnitude.	Spectrum.	Right Ascension.	Annual Variation.	Annual P. M.	Declination.	Annual Variation
			h m s	s	s	° ′ ″	″
ζ Aurigæ	3.9	K0p	4 56 40.402	+4.1899	+.0013	+40 57 21.44	+5.4
1 Tauri	4.7	A5	4 58 8.007	3.5849	+.0056	+21 28 20.43	5.2
11 Orionis	4.6	B9	4 59 49.503	3.4268	+.0013	+15 17 22.30	5.1
η Aurigæ	3.3	B3	5 0 41.525	4.2044	+.0039	+41 7 24.32	5.0
ε Leporis	3.3	K5	5 1 56.812	2.5385	+.0012	−22 28 54.23	4.9
β Eridani	2.9	A2	5 3 46.147	+2.9493	−.0056	− 5 11 34.02	+4.7
μ Aurigæ	4.8	A3	5 7 44.741	4.1019	−.0020	+38 23 14.50	4.4
19 H. Camelopardalis	5.2	F8	5 8 51.183	9.8373	−.0275	+79 8 19.22	4.5
μ Leporis	3.3	A0p	5 9 12.161	2.6940	+.0027	−16 18 10.46	4.3
β Orionis (*Rigel*) †	0.3	B8p	5 10 32.891	2.8823	.0000	− 8 17 47.84	4.2
α Aurigæ (*Capella*)	0.2	G0	5 10 33.306	+4.4290	+.0086	+45 54 53.67	+3.8
λ Aurigæ	4.8	G0	5 13 18.021	4.2179	+.0461	+40 1 35.62	3.3
τ Orionis	3.7	B5	5 13 34.551	2.9126	−.0009	− 6 55 59.47	4.0
o Columbæ	4.9	K0	5 14 29.293	2.1588	+.0027	−34 58 33.35	3.6
γ Orionis (*Bellatrix*)	1.7	B2	5 20 40.711	3.2170	−.0004	+ 6 16 31.57	3.4
β Tauri	1.8	B8	5 21 2.635	+3.7914	+.0025	+28 32 18.52	+3.2
17 Camelopardalis	5.8	K5	5 22 19.643	5.6603	+.0003	+62 59 58.21	3.2
β Leporis	3.0	G0	5 24 41.340	2.5703	.0000	−20 49 29.19	2.9
χ Aurigæ	4.9	B1	5 27 19.471	3.9041	+.0006	+32 7 54.32	2.8
δ Orionis †	2.5	B0	5 27 45.937	3.0643	.0000	− 0 21 34.69	2.8
Groombridge 966	6.4	K5	5 28 37.064	+8.0101	−.0002	+74 59 28.43	+2.7
α Leporis	2.7	F0	5 29 4.156	2.6457	+.0003	−17 52 51.25	2.6
ϕ^1 Orionis	4.5	B0	5 30 15.778	3.2927	−.0002	+ 9 26 3.34	2.5
1 Orionis †	2.9	Oe5	5 31 22.359	2.9343	+.0001	− 5 57 48.67	2.4
ε Orionis	1.8	B0	5 32 0.075	3.0436	.0000	− 1 15 14.21	2.4
ζ Tauri	3.0	B3	5 32 41.020	+3.5850	+.0006	+21 5 34.40	+2.3
ζ Orionis †	2.0	B0	5 36 34.227	3.0270	+.0005	− 1 59 8.47	2.0
α Columbæ	2.8	B5p	5 36 38.609	2.1725	+.0006	−34 7 4.00	2.0
o Aurigæ	5.5	A0	5 39 28.107	4.6454	−.0018	+49 47 28.40	1.7
ζ Leporis	3.7	A2	5 43 11.644	2.7179	−.0013	−14 51 7.32	1.4
κ Orionis	2.2	B0	5 43 49.186	+2.8449	+.0001	− 9 41 53.66	+1.4
δ Doradus	4.5	A5	5 44 37.312	0.1023	−.0081	−65 46 0.00	1.3
ν Aurigæ	4.2	K0	5 45 44.198	4.1574	−.0001	+39 7 31.68	1.2
δ Leporis	3.9	K0	5 47 45.084	2.5796	+.0162	−20 53 7.11	0.4
α Orionis (*Betelgeux*) †	*var.*	Ma	5 50 40.683	3.2479	+.0020	+ 7 23 33.32	0.8
η Leporis	3.8	F5	5 52 37.461	+2.7323	−.0028	−14 10 55.27	+0.7
δ Aurigæ	3.9	K0	5 52 41.636	4.9419	+.0118	+54 16 47.67	0.5
β Aurigæ	2.1	A0p	5 53 26.464	4.4019	−.0038	+44 56 25.22	0.5
θ Aurigæ †	2.7	A0p	5 54 3.685	4.0917	+.0047	+37 12 28.56	+0.4
1 Geminorum	4.3	G5	5 59 4.505	3.6475	+.0002	+23 16 7.83	−0.0
1 G. Puppis †	6.2	F8	6 2 5.082	+1.7258	−.0088	−45 2 9.80	+0.0
ν Orionis	4.4	B2	6 2 50.011	3.4264	+.0012	+14 46 45.79	−0.2
22 H. Camelopardalis	4.7	A0	6 9 42.225	6.6182	+.0026	+69 21 3.47	0.9
η Geminorum †	*var.*	Ma	6 9 52.098	3.6227	−.0039	+22 31 54.92	0.8
2 Lyncis	4.4	A0	6 12 18.204	5.2984	+.0012	+59 2 33.52	1.0
ζ Canis Majoris	3.1	B3	6 17 7.529	+2.3019	−.0006	−30 1 34.03	−1.5
μ Geminorum	3.2	Ma	6 17 56.386	3.6307	+.0046	+22 33 26.30	1.6
ψ^1 Aurigæ	5.1	K2	6 18 30.538	4.6259	+.0029	+49 19 54.02	1.6
β Canis Majoris	2.0	B1	6 19 2.655	2.6416	−.0006	−17 54 49.68	1.6
8 Monocerotis †	4.5	A5	6 19 22.225	3.1802	−.0004	+ 4 38 9.54	1.6
α Argus (*Canopus*)	−0.9	F0	6 22 6.565	+1.3319	+.0022	−52 39 0.04	−1.9
10 Monocerotis	5.0	B3	6 23 51.718	2.9641	+.0010	− 4 42 35.53	2.0
ν Geminorum	4.1	B5	6 24 2.105	3.5629	−.0005	+20 15 56.75	2.1
8 Lyncis	6.0	G0	6 30 6.605	5.4917	−.0267	+61 33 20.84	2.9
ξ^2 Canis Majoris	4.5	A0	6 31 34.686	2.5158	+.0022	−22 53 51.86	2.7
23 H. Camelopardalis	5.6	F8	6 32 5.571	+10.2957	−.0278	+79 39 25.93	−3.4
51 Aurigæ	5.7	K0	6 32 54.535	+ 4.1596	−.0020	+39 27 54.79	−2.9

β Orionis, comp. $8^m.0$, 9″.5 s. pr.
δ Orionis, star $6^m.9$, 52″.6 n.
ι Orionis, comp. $7^m.3$, 11″.5 s. f.

ζ Orionis, comp. $4^m.2$, 2″.4 s. f.
α Orionis red star, var. irreg. $1^m.0$–$1^m.4$
θ Aurigæ, comp. $7^m.5$, 2″.5 n. pr.

1 Puppis, star $5^m.8$, 150″
η Gem., var. $23^d.4$, $3^m.2$–4 $8^m.8$, 1″.2 n. pr.
8 Monoc., star $6^m.5$, 13″.

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Name of Star.	Magnitude.	Spectrum.	Right Ascension.	Annual Variation.	Annual P. M.	Declination.	Annual Variation.	Annual P. M.
			h m s	s	s	° ′ ″	″	″
inorum . .	1.9	A0	6 32 55.063	+3.4670	+.0033	+16 28 16.07	− 2.917	−0.048
is . . .	3.2	B8	6 35 13.382	1.8367	+.0008	−43 7 21.57	3.088	−0.019
ocerotis . . †	4.7	Oe5	6 36 24.445	3.3047	.0000	+ 9 58 24.51	3.179	−0.008
inorum . .	3.2	G5	6 38 49.590	3.6928	−.0001	+25 12 51.95	3.398	−0.018
inorum . .	3.4	F5	6 40 37.896	3.3684	−.0076	+12 59 10.03	3.728	−0.193
gæ . . .	5.3	G0	6 40 45.621	+4.3296	+.0018	+43 39 40.70	− 3.386	+0.160
s Majoris (*Sirius*) †	−1.6	A0	6 41 29.433	2.6434	−.0373	−16 36 5.39	4.816	−1.206
ocerotis . .	4.7	K0	6 43 31.963	3.1281	−.0020	+ 2 30 14.20	3.801	−0.016
elopardalis .	5.1	B5	6 44 45.850	6.4874	+.0021	+68 59 12.22	3.878	+0.012
inorum . .	3.6	A2	6 47 19.245	3.9580	+.0010	+34 3 45.02	4.160	−0.050
ris . . .	3.3	A5	6 47 20.476	+0.6175	−.0104	−61 51 7.91	− 3.873	+0.238
s . . .	2.8	K0	6 47 52.585	1.4883	+.0025	−50 30 56.32	4.264	−0.107
ris . . †	4.5	K0	6 50 5.803	5.2064	+.0021	+58 31 59.14	4.477	−0.130
s Majoris . .	4.2	K2	6 50 20.048	2.7879	−.0091	−11 56 1.24	4.374	−0.007
s Majoris . . †	1.6	B1	6 55 21.817	2.3575	−.0001	−28 51 30.10	4.793	+0.003
inorum . . †	*var.*	G0	6 59 11.248	+3.5605	−.0002	+20 41 35.05	− 5.127	−0.007
s Majoris . .	3.1	B5p	6 59 33.520	2.5049	−.0006	−23 42 40.29	5.146	+0.005
s Majoris . .	4.1	B5	7 0 0.220	2.7148	+.0003	−15 30 35.28	5.198	−0.010
s Majoris . .	2.0	F8	7 5 0.931	2.4382	−.0015	−26 15 38.37	5.607	+0.003
gæ . . .	5.1	K2	7 5 56.990	4.1326	+.0052	+39 27 25.69	5.692	−0.003
inorum . .	5.3	Mb	7 8 36.417	+3.4479	+.0019	+16 18 2.98	− 5.953	−0.042
ntis . . . †	3.9	K0	7 9 27.280	−0.5019	+.0004	−70 21 51.69	5.905	+0.078
inorum . .	3.6	A2	7 13 19.471	+3.4501	−.0029	+16 41 27.81	6.349	−0.045
is . . .	2.7	K5	7 14 12.680	2.1189	−.0008	−36 56 52.95	6.388	−0.010
inorum . . †	3.5	F0	7 15 10.085	+3.5863	−.0010	+22 8 10.35	6.472	−0.015
ntis . . .	4.0	F5	7 16 52.958	−0.0199	+.0004	−67 48 19.34	− 6.605	−0.006
inorum . .	3.9	K0	7 20 34.438	+3.7302	−.0086	+27 57 50.80	6.991	−0.087
s Majoris . .	2.4	B5p	7 20 48.770	2.3738	+.0003	−29 8 25.61	6.916	+0.007
mbridge 1308 .	5.8	K0	7 22 15.511	6.2732	+.0018	+68 38 12.89	7.086	−0.045
s Minoris . .	3.1	B8	7 22 39.049	3.2554	−.0032	+ 8 27 26.92	7.120	−0.047
inorum . .	4.2	F0	7 23 46.515	+3.8628	+.0118	+31 57 2.93	− 6.982	+0.183
is . . . †	3.3	K5	7 26 35.800	1.9018	−.0072	−43 7 58.09	7.215	+0.180
inorum (*Castor*)	2.0	A0	7 29 18.402	3.8329	−.0144	+32 4 19.07	7.697	−0.082
inorum . .	2.8	A0	$\Delta\alpha$ − 0.255	. . . .	. .	$\Delta\delta$ − 4.13	. . . .	. . .
ocerotis . .	5.2	F5	7 33 9.064	2.9819	−.0066	− 3 55 28.96	7.903	+0.022
Min. (*Procyon*) †	0.5	F5	7 34 57.476	+3.1420	−.0471	+ 5 26 18.37	− 9.107	−1.037
ris . . .	5.0	A2	7 35 59.578	5.0927	−.0042	+58 54 21.49	8.209	−0.056
inorum . . †	3.7	G5	7 39 26.375	3.6263	−.0014	+24 35 52.70	8.487	−0.060
inorum (*Pollux*)	1.2	K0	7 40 14.369	3.6755	−.0470	+28 13 39.63	8.545	−0.055
pis . . .	5.1	F2	7 42 7.563	2.7636	−.0003	−14 21 40.59	8.642	−0.002
is . . .	3.5	G0	7 45 48.212	+2.5232	−.0004	−24 39 2.57	− 8.929	0.000
inorum . .	5.0	A2	7 48 25.235	3.6763	−.0020	+26 58 54.15	9.160	−0.027
ris . . .	5.7	K0	7 48 40.533	4.3807	−.0022	+47 46 51.38	9.158	−0.006
mbridge 1374 .	5.6	K0	7 50 17.290	7.2404	−.0023	+74 8 29.49	9.315	−0.037
is . . .	3.6	B3	7 54 40.144	1.5258	−.0043	−52 45 33.92	9.611	+0.006
ri . . .	5.9	K0	7 55 54.675	+3.6336	+.0003	+25 37 15.44	− 9.715	−0.004
inorum . .	5.0	K0	7 58 25.439	3.6900	−.0012	+28 1 40.62	9.956	−0.053
ris . . .	4.9	A2	8 2 13.397	4.5291	−.0032	+51 44 49.80	10.193	−0.003
is . . .	2.9	F5	8 4 0.537	2.5546	−.0065	−24 3 51.19	10.273	+0.052
rsæ Majoris .	5.5	G5	8 4 34.242	6.0095	+.0002	+68 43 11.87	10.362	+0.005
is . . . †	2.2	Oap	8 6 58.547	+1.8498	−.0003	−47 5 29.77	−10.557	−0.011
ri (*mean*) . . †	4.7	G0	8 7 27.241	3.4443	+.0051	+17 53 56.75	10.710	−0.129
ley 1147 . .	5.7	G5	8 9 9.080	7.6155	+.0077	+76 0 43.16	10.715	−0.008
pis . . .	5.0	G5	8 9 31.072	2.7580	−.0009	−15 32 14.58	10.733	+0.001
ri . . .	3.8	K2	8 12 0.915	3.2555	−.0035	+ 9 26 31.93	10.971	−0.052
ris . . .	4.4	K5	8 17 9.656	+4.1202	+.0015	+43 27 19.70	−11.393	−0.100
ri . . .	5.9	F0	8 18 36.816	+3.4388	−.0038	+18 35 58.31	−11.429	−0.031

, comp. 8m.8, 2″.9 s. pr.
, dup., 4m.9, 6m.2, 0″.7
aj., comp. 9m., 7″.8 s. f.
rar., 10d.15, 3m.7–4m.3

γ^2 Volantis, comp. 5m.8, 12″.9 n. pr.
δ Gem., comp. 8m., 7″.0 s. pr.
σ Argus, star 8m., 22″.4 n. f.
κ Gem., comp. 8m.5, 6″.6 s. pr.

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

ons given for Sirius and Procyon are those of the centers of their orbits. Corrections given on page xii rem*ed to reduce to the positions of the stars.*

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Name of Star.	Magnitude.	Spectrum.	Right Ascension.	Annual Variation.	Annual P. M.	Declination.	Annual Variation.
			h m s	s	s	° ′ ″	″
ε Argus	1.7	K0p	8 20 48.714	+1.2336	−.0042	−59 14 31.56	−11.548
30 Monocerotis	4.0	A0	8 21 30.868	+2.9995	−.0039	− 3 38 5.42	11.625
θ Chamæleontis	4.3	K0	8 23 9.121	−1.7505	−.0451	−77 13 2.21	11.705
o Ursæ Majoris	3.5	G0	8 23 22.930	+5.0107	−.0160	+60 59 48.78	11.851
Groombridge 1450	6.0	K0	8 27 31.536	3.9087	−.0082	+38 18 7.19	12.209
η Cancri	5.5	B5p	8 27 54.709	+3.4741	−.0025	+20 43 26.13	−12.112
Groombridge 1446	6.3	K0	8 30 30.691	6.7404	−.0043	+73 55 16.50	12.358
δ Hydræ	4.2	A0	8 33 15.820	3.1780	−.0048	+ 5 59 38.31	12.442
σ Hydræ	4.5	K0	8 34 25.244	3.1382	−.0008	+ 3 38 1.20	12.520
γ Cancri	4.7	A0	8 38 29.155	3.4766	−.0071	+21 46 4.17	12.826
δ Cancri	4.2	K0	8 39 58.256	+3.4136	−.0009	+18 27 36.47	−13.123
α Pyxidis	3.7	B2	8 40 15.384	2.4111	−.0003	−32 53 11.68	12.891
ι Cancri †[a]	4.2	G5	8 41 40.736	3.6375	−.0006	+29 3 51.60	13.048
ε Hydræ †[a]	3.5	F8	8 42 22.940	3.1796	−.0127	+ 6 43 26.95	13.092
δ Argus †[b]	2.0	A0	8 42 24.502	1.6517	−.0035	−54 24 14.47	13.145
σ^2 Cancri (*mean*) †[c]	5.5	K0	8 49 11.090	+3.6675	+.0034	+30 53 40.50	−13.511
ζ Hydræ	3.3	K0	8 51 0.503	3.1743	−.0060	+ 6 15 43.81	13.600
ι Ursæ Majoris	3.1	A5	8 53 31.958	4.1218	−.0435	+48 22 6.23	14.017
α Cancri	4.3	A3	8 53 56.993	3.2844	+.0024	+12 10 46.93	13.837
b^1 Carinæ †[d]	5.1	B3	8 54 56.499	1.4680	−.0034	−58 54 31.66	13.877
κ Ursæ Majoris	3.7	A0	8 57 57.998	+4.1098	−.0027	+47 29 8.31	−14.115
σ^2 Ursæ Majoris †[c]	4.9	F8	9 3 6.642	5.3194	−.0003	+67 28 21.53	14.432
κ Cancri	5.1	B8	9 3 15.224	3.2525	−.0012	+11 0 10.48	14.387
λ Argus	2.2	K5	9 4 56.550	2.2063	−.0015	−43 5 49.80	14.483
θ Hydræ	3.8	A0	9 10 2.860	3.1235	+.0088	+ 2 39 54.55	15.094
β Argus	1.8	A0	9 12 17.664	+0.6692	−.0310	−69 22 30.83	−14.820
83 Cancri	6.6	F5	9 14 21.132	3.3533	−.0076	+18 3 28.33	15.170
ι Argus	2.2	F0	9 14 51.990	1.6040	−.0055	−58 55 35.56	15.057
40 Lyncis	3.3	K5	9 16 0.205	3.6630	−.0178	+34 44 39.40	15.116
θ Pyxidis	4.9	Ma	9 17 48.883	2.6514	−.0048	−25 36 43.41	15.264
α Hydræ	2.2	K2	9 23 30.551	+2.9486	−.0010	− 8 17 53.44	−15.518
h Ursæ Majoris	3.8	F0	9 25 0.187	4.7632	+.0183	+63 25 32.34	15.609
d Ursæ Majoris	4.6	G0	9 27 10.177	5.3569	−.0112	+70 11 46.05	15.680
θ Ursæ Majoris	3.3	F8	9 27 18.915	4.0293	−.1026	+52 3 23.10	16.302
ψ Argus †[e]	3.6	F5	9 27 25.682	2.3595	−.0181	−40 6 11.48	15.727
ξ Leonis	5.1	G5	9 27 28.447	+3.2367	−.0063	+11 40 4.89	−15.851
10 Leonis Minoris	4.6	G5	9 29 8.652	3.6845	+.0011	+36 46 0.55	15.878
o Leonis	3.8	F5p	9 36 43.370	3.2048	−.0096	+10 16 14.25	16.287
θ Antliæ	5.0	F5	9 40 30.080	2.6732	−.0036	−27 23 20.26	16.416
ε Leonis	3.1	G0p	9 41 8.593	3.4106	−.0034	+24 9 25.02	16.499
υ Argus †[e]	3.2	F0	9 45 1.689	+1.5007	−.0025	−64 41 12.71	−16.684
υ Ursæ Majoris	3.9	F0	9 45 6.034	4.2905	−.0382	+59 25 47.52	16.830
6 Sextantis	6.0	A3	9 47 3.136	3.0244	+.0011	− 3 51 13.59	16.795
μ Leonis	4.1	K0	9 48 2.755	3.4167	−.0171	+26 23 54.51	16.868
Groombridge 1586	6.0	K0	9 50 59.596	5.4262	−.0197	+73 16 29.75	17.012
19 Leonis Minoris	5.2	F5	9 52 36.398	+3.6843	−.0111	+41 27 5.64	−17.050
ϕ Argus	3.7	B5	9 53 56.760	2.1018	−.0033	−54 10 21.11	17.109
π Leonis	4.9	Ma	9 55 49.720	3.1721	−.0029	+ 8 26 34.70	17.201
η Leonis	3.6	A0p	10 2 48.496	3.2725	−.0022	+17 10 4.54	17.486
α Leonis (*Regulus*)	1.3	B8	10 3 57.221	3.1980	−.0169	+12 22 23.99	17.532
λ Hydræ	3.8	K0	10 6 32.504	+2.9247	−.0137	−11 56 35.89	−17.726
q Velorum	4.1	A2	10 11 14.886	2.5131	−.0153	−41 42 37.28	17.798
32 Ursæ Majoris	5.7	A3	10 12 1.438	4.3911	−.0140	+65 31 22.84	17.874
ζ Leonis	3.6	F0	10 12 4.638	3.3419	+.0014	+23 49 53.14	17.872
λ Ursæ Majoris	3.5	A0	10 12 5.897	3.6303	−.0142	+43 19 45.96	17.903
γ Leonis *pr.* †[f]	2.6	K0	10 15 23.938	+3.3113	+.0212	+20 15 42.71	−18.143
μ Ursæ Majoris	3.2	K5	10 17 23.446	+3.5852	−.0068	+41 55 2.74	−18.043

[a] Cancri, star 6^m.6, 30″.6 n. pr.
[b] Hydræ, triple; binary 3^m.5, 6^m.8, 0″.2, with comp. 7^m.8, 3″.3
[c] Argus, comp. 5^m, 2″ s.
[d] σ^2 Cancri, dup. 5^m.9, 6^m.4, 1″.4
[e] Carinæ, comp. 7^m.2, 5^s f.
[f] σ^2 Urs. Maj., binary 4^m.0, 8^m, 1″.3
[g] Argus, dup. 3^m.8, 6^m.0, 0″
[h] Argue, comp. 6^m.0, 4″.9 s
[i] Leonis, comp. 3^m.8, 3″.7 1

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Name of Star.	Magnitude.	Spectrum.	Right Ascension.	Annual Variation.	Annual P. M.	Declination.	Annual Variation.	Annual P. M.
			h m s	s	s	° ′ ″	″	″
rsæ Majoris	4.9	A0	10 18 10.162	+4.3597	−.0024	+65 59 12.23	−18.117	−0.018
æ	4.1	K5	10 22 4.536	2.9006	−.0089	−16 24 43.67	18.322	−0.079
s Minoris	4.4	K0	10 23 5.378	3.4785	−.0094	+37 7 58.41	18.392	−0.112
æ	4.4	K5	10 23 21.115	2.7426	−.0060	−30 38 42.55	18.312	−0.023
Majoris	4.8	F5	10 25 19.572	3.8595	−.0208	+56 24 23.75	18.398	−0.039
raconis	5.0	G5	10 28 4.749	+5.1792	−.0084	+76 8 28.04	−18.464	−0.009
s	3.8	B0p	10 28 26.559	3.1614	−.0004	+ 9 44 2.93	18.470	−0.003
ntis	6.4	K0	10 37 10.837	3.0519	−.0100	− 1 18 16.79	18.861	−0.110
s Minoris	5.0	A2	10 38 54.375	3.2668	−.0084	+23 37 23.92	18.794	+0.009
	3.0	B0	10 39 59.488	2.1328	−.0043	−63 57 35.70	18.864	−0.027
is Minoris	5.4	B9	10 41 15.213	+3.3421	−.0024	+31 7 11.33	−18.915	−0.041
	var.	Pec.	10 41 50.234	2.3212	−.0002	−59 14 52.58	18.900	−0.009
	2.8	G5	10 43 11.758	2.5740	+.0066	−48 58 53.94	19.011	−0.081
is	5.3	A0	10 44 53.786	3.1563	+.0001	+10 59 4.66	19.012	−0.033
æleontis	4.6	B3	10 45 1.016	0.5921	−.0192	−80 6 8.64	18.986	−0.004
æ	3.3	Ma	10 45 31.690	+2.9583	+.0061	−15 45 31.67	−18.786	+0.211
is Minoris	3.9	K0	10 48 40.473	3.3630	+.0074	+34 39 45.71	19.365	−0.283
is	4.5	A0	10 51 7.318	3.2527	−.0060	+25 11 33.92	19.165	−0.018
æ	4.7	K0	10 52 51.107	2.7963	+.0112	−36 41 28.88	19.329	−0.138
mbridge 1706	6.3	G5	10 53 21.248	4.8827	−.0264	+78 12 54.54	19.239	−0.035
ris	4.2	K0	10 55 43.737	+2.9208	−.0327	−17 51 24.26	−19.155	+0.108
is	5.0	K0	10 56 16.480	3.0991	+.0004	+ 4 3 48.08	19.298	−0.022
Majoris	2.4	A0	10 56 50.595	3.6394	+.0105	+56 49 39.35	19.263	+0.026
Majoris	2.0	K0	10 58 37.132	3.7270	−.0164	+62 11 57.70	19.402	−0.071
is	4.7	F0	11 0 44.205	3.0960	−.0234	+ 7 47 6.38	19.420	−0.041
is	5.7	K0	11 2 40.246	+3.0612	−.0253	+ 2 24 23.26	−19.502	−0.080
Majoris	3.2	K0	11 5 0.238	3.3844	−.0053	+44 56 56.81	19.504	−0.033
ris	4.5	A2	11 7 34.425	2.9478	.0000	−22 22 21.40	19.630	−0.106
is	2.6	A2	11 9 41.824	3.1950	+.0108	+20 58 43.01	19.705	−0.141
is	3.4	A0	11 9 53.160	3.1503	−.0049	+15 53 0.32	19.653	−0.085
Majoris	3.7	K0	11 13 59.997	+3.2475	−.0018	+33 32 50.74	−19.617	+0.026
ris	3.8	K0	11 15 11.376	2.9975	−.0088	−14 19 45.19	19.468	+0.195
is	4.1	A0	11 16 51.460	3.0949	−.0062	+ 6 29 4.09	19.704	−0.013
auri	4.3	B5	11 17 12.999	2.7267	−.0041	−54 2 9.66	19.710	−0.013
is	4.0	F5	11 19 35.891	3.1285	+.0103	+10 59 11.67	19.818	−0.083
is	5.2	K0	11 23 40.156	+3.0857	+.0008	+ 3 18 48.67	−19.811	−0.016
onis	4.1	Ma	11 26 29.629	3.5942	−.0072	+69 47 21.55	19.852	−0.021
ræ	3.7	G5	11 28 55.004	2.9466	−.0158	−31 23 54.02	19.916	−0.055
auri	3.3	B9	11 31 56.642	2.7511	−.0073	−62 33 37.87	19.922	−0.027
is	4.5	K0	11 32 41.941	3.0716	.0000	− 0 21 55.34	19.864	+0.039
æleontis	5.7	F0	11 33 49.733	+2.4542	−.0323	−75 26 13.46	−19.937	−0.023
onis	5.5	K0	11 37 51.393	3.3714	−.0080	+67 12 15.59	19.917	+0.035
eris	4.9	G5	11 40 33.229	3.0379	+.0018	−17 53 21.29	20.014	−0.041
Majoris	3.8	K0	11 41 40.449	3.1794	−.0128	+48 14 22.74	19.961	+0.029
is (*Denebola*)	2.2	A2	11 44 49.653	3.0623	−.0341	+15 2 9.92	20.126	−0.118
inis	3.8	F8	11 46 22.311	+3.1252	+.0494	+ 2 13 57.16	−20.284	−0.275
mbridge 1830	6.5	G5	11 48 12.010	3.4671	+.3401	+38 18 52.10	25.802	−5.784
Majoris	2.5	A0	11 49 28.353	3.1691	+.0115	+54 9 22.47	20.020	+0.004
inis	4.6	A3	11 56 37.180	3.0742	−.0009	+ 7 4 37.72	20.075	−0.032
inis	4.2	G5	12 0 58.908	3.0570	−.0148	+ 9 11 37.95	20.013	+0.032
auri	2.9	B3p	12 4 2.987	+3.0960	−.0050	−50 15 37.19	−20.072	−0.030
i	3.2	K0	12 5 51.206	3.0815	−.0051	−22 9 29.59	20.036	+0.003
raconis	5.1	A5	12 8 19.650	2.8453	+.0026	+78 4 38.71	20.013	+0.019
is	3.1	B3	12 10 44.064	3.1760	+.0021	−58 17 15.32	20.062	−0.038
Majoris	3.4	A2	12 11 19.618	2.9840	+.0150	+57 29 37.50	20.016	+0.005
i	2.8	B8	12 11 32.104	+3.0819	−.0114	−17 4 51.83	−20.003	+0.017
m Venaticorum †	5.8	K5	12 11 58.355	+3.0156	+.0038	+41 7 19.27	−20.064	−0.046

var., irreg., $1^m.6$–$6^m.6$
Comp. 7^m, 2″.2 n. f.

δ^3 Cham., star $5^m.5$ pr. 32ˢ, 256″ n.
54 Leonis, comp. $6^m.3$, 6″.4 s. f.

ι Leonis, comp. $6^m.8$, 2″.6 n. f.
2 Can. Ven., star 8^m, 11″.6 s. pr.

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Name of Star.	Magnitude.	Spectrum.	Right Ascension.	Annual Variation.	Annual P. M.	Declination.	Ann Var tio
			h m s	s	s	° ′ ″	″
β Chamæleontis	4.4	B5	12 13 26.825	+3.4515	−.0188	−78 51 4.93	−19.
η Virginis	4.0	A0	12 15 39.568	3.0694	−.0036	− 0 12 20.31	20.
α^1 Crucis	1.6	B1	12 21 58.181	3.3134	−.0064	−62 38 21.43	19.
α^2 Crucis	2.1		Δα + 0.628	....	...	Δδ − 1.87	..
20 Comæ	5.7	A2	12 25 33.217	3.0181	+.0036	+21 21 20.18	19.
δ Corvi †	3.1	A0	12 25 34.065	+3.1014	− 0140	−16 3 12.48	−20.
γ Crucis †	1.6	Mb	12 26 33.028	3.3046	−.0028	−56 38 54.24	20.
8 Canum Venaticorum	4.3	G0	12 29 48.338	2.8560	−.0617	+41 48 29.82	19.
κ Draconis	3.9	B5p	12 29 56.924	2.5766	−.0112	+70 14 44.25	19.
β Corvi	2.8	G5	12 30 1.405	3.1458	−.0008	−22 56 16.40	19.
24 Comæ *seq.* †	5.2	K0	12 30 58.031	+3.0106	−.0007	+18 50 1.51	−19.
α Muscæ	2.9	B3	12 32 13.073	3.5436	−.0088	−68 40 42.18	19.
χ Virginis	4.8	K0	12 34 57.636	3.0939	−.0056	− 7 32 20.34	19.
γ Centauri †	2.4	A0	12 36 55.952	3.2955	−.0196	−48 30 15.08	19.
γ Virginis (*mean*) †	2.9	F0	12 37 27.290	3.0399	−.0365	− 0 59 39.62	19.
ρ Virginis	5.0	A0	12 37 41.049	+3.0372	+.0058	+10 41 33.89	−19.
76 Ursæ Majoris	5.9	A0	12 37 56.652	2.6307	−.0065	+63 10 6.88	19.
β Crucis	1.5	B1	12 42 51.646	3.4836	−.0064	−59 14 7.14	19.
31 Comæ	5.1	G0	12 47 39.407	2.9238	−.0022	+27 59 31.52	19.
n Centauri	4.3	A5	12 48 50.062	3.3135	+.0060	−39 43 39.77	19.
ε Ursæ Majoris (*Alioth*)	1.7	A0p	12 50 22.936	+2.6477	+.0138	+56 24 36.46	−19.
δ Virginis	3.7	Ma	12 51 25.308	3.0209	−.0318	+ 3 50 53.79	19.
α Canum Venat. *seq.* †	2.9	A0p	12 52 8.856	2.8103	−.0203	+38 45 58.99	19.
δ Muscæ	3.6	K2	12 56 32.256	4.0755	+.0496	−71 6 5.16	19.
ε Virginis	3.0	K0	12 58 2.714	2.9865	−.0186	+11 24 17.96	19.
θ Virginis †	4.4	A0	13 5 39.035	+3.1034	−.0029	− 5 5 46.26	−19.
43 Comæ	4.3	G0	13 8 0.119	2.8024	−.0599	+28 17 55.05	18.
20 Canum Venaticorum	4.7	F0	13 13 49.448	2.6954	−.0094	+41 0 33.61	18.
γ Hydræ	3.3	G5	13 14 24.338	3.2559	+.0046	−22 44 2.20	19.
ι Centauri	2.9	A2	13 15 55.465	3.3623	−.0294	−36 16 29.40	19.
ζ^1 Ursæ Maj. (*Mizar*) †	2.4	A0p	13 20 35.249	+2.4218	+.0153	+55 21 30.68	−18.
ζ^2 Ursæ Majoris	4.0	A0	Δα + 0.916	....	...	Δδ −12.40	..
α Virginis (*Spica*)	1.2	B2	13 20 49.090	3.1573	−.0028	−10 43 42.19	18.
Groombridge 2001	6.1	K5	13 24 0.915	1.5244	+.0012	+72 49 19.90	18.
70 Virginis	5.2	G5	13 24 22.227	2.9340	−.0168	+14 13 18.23	19.
ζ Virginis	3.4	A2	13 30 27.735	+3.0546	−.0195	− 0 10 18.77	−18.
17 H. Canum Venaticorum	5.0	F0	13 31 5.572	2.6815	+.0073	+37 36 26.55	18.
ε Centauri	2.6	B1	13 34 37.129	3.7814	−.0039	−53 2 41.91	18.
m Virginis	5.2	Ma	13 37 15.201	3.1454	−.0073	− 8 17 4.56	18.
τ Boötis	4.5	F5	13 43 19.071	2.8508	−.0341	+17 52 11.79	18.
η Ursæ Majoris (*Alkaid*)	1.9	B3	13 44 16.341	+2.3678	−.0118	+49 43 37.57	−18.
89 Virginis	5.1	K0	13 45 21.487	3.2544	−.0077	−17 43 16.12	18.
ζ Centauri	3.1	B2p	13 50 21.223	3.7266	−.0070	−46 52 49.39	17.
η Boötis	2.8	G0	13 50 43.968	2.8567	−.0044	+18 48 47.97	18.
θ Apodis †	*var.*	Mb	13 57 11.699	5.7459	−.0293	−76 23 48.82	17.
11 Boötis	6.1	A3	13 57 24.729	+2.7215	−.0060	+27 47 13.03	−17.
τ Virginis	4.3	A2	13 57 25.268	3.0514	+.0010	+ 1 56 44.56	17.
β Centauri	0.9	B1	13 57 57.232	4.2075	−.0033	−59 58 23.52	17.
π Hydræ	3.5	K0	14 1 38.444	3.4099	+.0031	−26 16 59.18	17.
θ Centauri	2.3	K0	14 1 47.518	3.5203	−.0437	−35 57 43.84	17.
α Draconis	3.6	A0	14 2 8.553	+1.6245	−.0071	+64 46 20.01	−17.
d Boötis	4.8	F5	14 6 36.864	2.7370	−.0014	+25 29 3.30	17.
κ Virginis	4.3	K0	14 8 27.955	+3.1971	+.0006	− 9 53 16.58	16.
4 Ursæ Minoris	5.0	K0	14 9 9.051	−0.2786	−.0108	+77 56 14.88	16.
ι Virginis	4.2	F5	14 11 39.592	+3.1426	−.0013	− 5 36 17.81	17.
α Boötis (*Arcturus*)	0.2	K0	14 11 52.501	+2.7356	−.0779	+19 36 50.39	−18.
λ Boötis	4.3	A0	14 13 13.805	+2.2830	−.0172	+46 28 8.27	−16.

δ Corvi, star 8m, 24″.4 s. pr.
γ Crucis, star 6m.0, 85″ n. f.
24 Comæ, star 6m.7, 20″.6 pr.
γ Cent., dup., 3m1, 3m.1, 1″.7

γ Virginis, binary, 3m.7, 3m.7, 6″.2, P=328°
α Can. Ven., star 5m, 19″.8 s. pr.
θ Virginis, comp. 9m, 7″.1 n. pr.

ζ^1 Urs. Maj., star Alcor 4′ 222″ n.
θ Apodis, var. irreg., 5m.

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Name of Star.	Magnitude.	Spectrum.	Right Ascension.	Annual Variation.	Annual P. M.	Declination.	Annual Variation.	Annual P. M.
			h m s	s	s	° ′ ″	″	″
inis	4.6	A2	14 14 36.912	+3.2411	−.0024	−12 59 22.71	−16.665	+0.021
e	6.3	K0	14 18 57.478	3.2240	−.0014	−11 20 7.90	16.539	−0.067
is	4.1	F8	14 22 22.329	2.0433	−.0254	+52 14 2.20	16.706	−0.406
is	5.4	A5	14 22 35.703	2.7901	−.0052	+19 35 58.11	16.274	+0.015
inis †	5.0	K0	14 23 55.458	+3.0891	−.0090	− 1 51 23.14	16.225	−0.004
Minoris	4.4	K2	14 27 40.979	−0.1604	+.0022	+76 3 54.14	−16.004	+0.021
is	3.8	K0	14 28 15.208	+2.5865	−.0073	+30 44 6.73	15.882	+0.113
is	3.0	F0	14 28 44.200	2.4171	−.0091	+38 40 14.90	15.825	+0.145
auri	2.6	B3p	14 30 13.824	3.7977	−.0032	−41 47 37.92	15.922	−0.082
is	4.5	F0	14 31 4.036	2.6131	+.0150	+30 6 18.60	15.721	+0.125
auri †	0.1	G0	14 33 57.052	+4.0561	−.4861	−60 29 36.71	−14.967	+0.723
is	5.4	A0	14 35 44.969	2.2341	−.0056	+44 45 43.53	15.635	−0.043
lis	3.8	K5	14 37 28.968	7.3038	−.0088	−78 41 37.47	15.520	−0.024
inis	4.0	F5	14 38 41.050	3.1588	+.0071	− 5 17 52.80	15.751	−0.322
is †	2.7	K0p	14 41 21.734	2.6203	−.0035	+27 25 24.57	15.269	+0.009
inis	3.8	A0	14 42 3.086	+3.0313	−.0074	+ 2 14 31.17	−15.274	−0.035
æ	5.3	F5	14 46 5.561	3.3136	−.0073	−15 39 10.04	15.081	−0.074
æ	2.9	A2	14 46 17.008	3.3141	−.0078	−15 41 51.20	15.073	−0.077
mbridge 2164	5.7	K2	14 49 19.924	+1.5204	−.0165	+59 37 51.22	14.701	+0.118
e Minoris	2.2	K5	14 50 56.060	−0.2026	−.0065	+74 29 40.81	14.721	+0.003
æ	5.6	K0	14 52 15.680	+3.2507	−.0006	−11 4 31.52	−14.646	−0.001
xi 221	5.8	A0	14 52 18.093	2.8298	−.0021	+14 46 51.83	14.653	−0.011
i	2.8	B2p	14 53 5.179	3.9139	−.0070	−42 48 2.05	14.658	−0.062
æ †	*var.*	A0	14 56 32.093	3.2015	−.0051	− 8 11 25.13	14.402	−0.015
tis	3.6	G5	14 58 49.182	2.2600	−.0036	+40 43 2.45	14.287	−0.040
pii	3.4	Ma	14 59 12.512	+3.5052	−.0056	−24 57 23.19	−14.271	−0.048
tis	4.7	K0	15 0 53.334	2.5704	−.0133	+27 16 14.23	14.133	−0.014
tis	5.0	F0	15 3 39.326	2.6347	+.0136	+25 11 30.10	14.131	−0.184
i	3.5	K0	15 6 18.818	4.2928	−.0126	−51 47 2.64	13.844	−0.066
æ	4.7	A0p	15 7 29.193	3.4145	−.0031	−19 28 42.58	13.757	−0.053
pentis	5.4	K0	15 11 3.707	+2.9801	−.0017	+ 5 14 48.40	−13.478	−0.005
nguli Australis	3.1	A0	15 11 8.361	5.5554	−.0137	−68 22 27.17	13.510	−0.042
tis	3.5	K0	15 12 9.406	2.4193	+.0075	+33 37 25.59	13.528	−0.126
æ	2.7	B8	15 12 32.293	+3.2251	−.0066	− 9 4 38.73	13.402	−0.024
e Minoris	3.1	A2	15 20 51.060	−0.1143	−.0020	+72 7 45.49	12.815	+0.013
tis *pr.* †	4.5	F0	15 21 21.295	+2.2664	−.0121	+37 40 3.51	−12.713	+0.081
pentis	5.5	Ma	15 21 56.323	2.7801	−.0024	+15 43 8.76	12.778	−0.024
conis	3.5	K0	15 23 4.993	1.3336	+.0014	+59 15 22.97	12.668	+0.010
æ	5.9	K0	15 23 34.354	3.3790	+.0006	−16 25 40.70	12.687	−0.043
næ Borealis	3.7	Fp	15 24 24.423	2.4738	−.0130	+29 23 28.09	12.509	+0.078
tis	5.2	K5	15 27 56.882	+2.1552	+.0016	+41 6 55.34	−12.359	−0.014
i (*mean*) †	3.0	B3	15 29 36.230	3.9875	−.0020	−40 53 20.03	12.279	−0.049
æ	4.0	K0	15 30 52.856	3.3526	+.0047	−14 30 48.31	12.135	+0.006
næ Borealis	2.3	A0	15 31 10.392	2.5395	+.0090	+26 59 35.81	12.221	−0.100
næ Borealis *seq.* †	5.1	B8	15 36 15.152	2.2596	−.0005	+36 54 16.73	11.776	−0.012
pentis	2.8	K0	15 40 10.702	+2.9532	+.0089	+ 6 41 9.49	−11.442	+0.042
pentis	3.7	A2	15 42 21.414	2.7686	+.0054	+15 40 50.67	11.383	−0.055
pentis	4.3	K5	15 45 0.164	2.6996	−.0035	+18 23 49.35	11.236	−0.099
pentis	3.6	A0	15 45 17.206	3.1286	−.0058	− 3 10 37.38	11.144	−0.028
Draconis	5.1	A2	15 45 23.868	0.9076	+.0047	+62 51 20.66	11.176	−0.068
pentis	3.8	A0	15 46 40.625	+2.9885	+.0081	+ 4 43 36.86	−10.945	+0.070
e Minoris	4.3	A2	15 46 59.691	−2.1997	+.0082	+78 3 1.37	10.995	−0.004
nguli Australis	3.0	F0	15 47 49.006	+5.2589	−.0290	−63 10 32.92	11.339	−0.408
æ	5.1	B3	15 48 30.751	3.4777	−.0017	−19 55 12.01	10.926	−0.046
pentis	3.9	F8	15 52 37.106	2.7698	+.0212	+15 55 54.25	11.865	−1.289
pii	3.0	B2p	15 53 49.642	+3.6241	−.0010	−25 52 34.10	−10.535	−0.048
næ Borealis	4.2	K0	15 54 9.009	+2.4824	−.0065	+27 7 2.90	−10.530	−0.067

s, comp. 9^m, 4″.5 s. f.
comp. 5^m.1, 2″.8 n. pr.

δ Libræ, var., 2^d.33, 4^m.8–6^m.2
μ Boötis, star 6^m.7, 108″ s.

γ Lupi, binary 3^m.7, 3^m.9, 0″.4
ζ Cor. Bor., comp. 6^m.0, 6″.2 n. pr.

auri, dup., 0^m.3, 1^m.7; companion s. pr. The position given is that of the center of gravity of the system.
s given on *pages xii remain to be applied to* reduce to the position of α^2 Centauri.

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Name of Star.	Magnitude.	Spectrum.	Right Ascension.	Annual Variation.	Annual P. M.	Declination.	Annual Variation.
			h m s	s	s	° ′ ″	″
δ Scorpii	2.5	B1p	15 55 25.331	+3.5426	−.0011	−22 23 11.19	−10.402
θ Draconis	4.1	F8	16 0 19.978	1.1219	−.0391	+58 47 11.79	9.659
β Scorpii †	2.9	B1	16 0 36.440	3.4838	−.0011	−19 34 45.00	10.005
κ Herculis †	5.3	G5	16 4 19.637	2.7052	−.0039	+17 16 1.45	9.719
Groombridge 2320	5.4	A0	16 6 5.472	0.1536	−.0074	+68 1 43.00	9.506
φ Herculis	4.3	A0	16 6 9.264	+1.8898	−.0017	+45 9 7.12	−9.517
δ^1 Apodis	4.8	Mb	16 7 53.722	8.8602	−.0050	−78 29 20.42	9.474
δ Ophiuchi	3.0	Ma	16 9 59.656	3.1416	−.0031	− 3 28 53.21	9.401
σ Coronæ Bor. *seq.* †	5.8	G0	16 11 34.188	+2.2459	−.0223	+34 4 6.39	9.206
19 Ursæ Minoris	5.5	B8	16 13 10.417	−1.7458	+.0007	+76 5 13.09	9.091
γ^2 Normæ	4.1	K0	16 13 37.194	+4.4728	−.0216	−49 57 11.27	−9.038
ε Ophiuchi	3.3	K0	16 13 55.670	3.1720	+.0054	− 4 29 27.83	8.913
σ Scorpii †	3.1	B1	16 16 8.421	3.6419	−.0011	−25 23 40.82	8.815
τ Herculis	3.9	B5	16 17 14.756	1.8032	+.0001	+46 30 37.45	8.660
γ Herculis	3.8	F0	16 18 15.476	+2.6455	−.0034	+19 20 49.87	8.573
η Ursæ Minoris	5.0	F0	16 19 54.741	−1.7882	−.0231	+75 56 49.54	−8.226
γ Apodis	3.9	K0	16 20 40.624	+9.1087	−.0409	−78 42 47.43	8.503
ω Herculis	4.5	Ap	16 21 34.845	2.7619	−.0028	+14 13 24.78	8.405
η Draconis †	2.9	G5	16 22 51.890	0.8082	−.0020	+61 42 6.46	8.188
α Scorpii (*Antares*) †	1.2	Map	16 24 18.923	3.6744	−.0006	−26 14 55.76	8.156
β Herculis	2.8	K0	16 26 39.031	+2.5775	−.0076	+21 40 10.50	−7.966
λ Ophiuchi †	3.8	A0	16 26 43.554	+3.0240	−.0022	+ 2 9 52.94	8.014
A Draconis	5.0	B8p	16 28 8.325	−0.1289	−.0049	+68 56 51.84	7.785
τ Scorpii	2.9	B0	16 30 42.742	+3.7299	−.0013	−28 2 41.64	7.648
σ Herculis	4.2	A0	16 31 25.615	1.9336	−.0006	+42 36 26.80	7.530
ζ Ophiuchi	2.7	B0	16 32 35.194	+3.3010	+.0007	−10 23 59.67	−7.439
24 Scorpii	5.0	K0	16 36 46.219	3.4668	−.0017	−17 34 56.80	7.125
ζ Herculis †	3.0	G0	16 38 9.418	2.2614	−.0364	+31 45 8.88	6.617
α Trianguli Australis	1.9	K2	16 39 51.756	6.3253	+.0028	−68 52 37.47	6.917
η Herculis	3.6	K0	16 40 2.984	2.0558	+.0031	+39 4 45.77	6.945
Groombridge 2377	4.9	F0	16 43 43.346	+1.1375	+.0046	+56 55 47.51	−6.487
ε Scorpii	2.4	K0	16 44 47.028	3.8801	−.0505	−34 8 37.71	6.725
49 Herculis	6.4	A0	16 48 18.083	2.7303	+.0010	+15 6 45.09	6.183
ε^1 Aræ	4.2	K2	16 52 57.748	4.7718	−.0011	−53 2 3.96	5.797
κ Ophiuchi	3.4	K0	16 53 44.315	2.8383	−.0199	+ 9 30 11.40	5.726
30 Ophiuchi	5.0	K0	16 56 40.999	+3.1630	−.0018	− 4 5 56.57	−5.543
ε Herculis	3.9	A0	16 57 6.805	2.2947	−.0036	+31 2 52.31	5.408
d Herculis	5.3	A2	16 58 32.416	2.2121	−.0016	+33 41 15.49	5.320
η Ophiuchi †	2.6	A0	17 5 36.950	3.4376	+.0017	−15 37 23.24	4.621
η Scorpii	3.4	F2	17 6 12.319	4.2926	+.0023	−43 7 52.14	4.968
ζ Draconis	3.2	B5	17 8 32.643	+0.1693	−.0021	+65 49 0.27	−4.445
α Herculis †	*var.*	Mb	17 10 51.730	2.7345	−.0008	+14 29 2.46	4.235
δ Herculis †	3.2	A0	17 11 37.296	2.4632	−.0019	+24 56 10.61	4.358
π Herculis	3.4	K2	17 12 9.316	2.0885	−.0025	+36 54 7.14	4.155
θ Ophiuchi	3.4	B3	17 16 54.620	3.6819	−.0006	−24 55 4.13	3.782
w Herculis	5.4	G0	17 17 33.166	+2.2430	+.0096	+32 34 25.28	−4.738
β Aræ	2.8	K2	17 18 23.824	4.9813	−.0004	−55 27 9.79	3.646
b Ophiuchi	4.3	F0	17 21 17.948	3.6610	−.0009	−24 6 0.68	3.506
σ Ophiuchi	4.4	K0	17 22 23.753	2.9757	+.0002	+ 4 12 41.90	3.266
δ Aræ	3.8	B8	17 23 36.038	5.4063	−.0098	−60 36 59.05	3.290
α Aræ	3.0	B3p	17 25 25.373	+4.6332	−.0036	−49 48 42.21	−3.096
λ Herculis	4.5	K0	17 27 23.022	2.4241	+.0016	+26 10 20.76	2.825
λ Scorpii	1.7	B2	17 27 58.232	4.0711	−.0004	−37 2 39.60	2.820
β Draconis	3.0	G0	17 28 33.393	1.3543	−.0017	+52 21 44.46	2.733
α Ophiuchi	2.1	A5	17 31 4.857	2.7838	+.0080	+12 37 10.14	2.758
ξ Serpentis	3.6	A5	17 32 49.942	+3.4330	−.0038	−15 20 50.00	−2.431
ι Herculis	3.8	B3	17 37 7.326	+1.6936	+.0003	+46 2 59.82	−1.995

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

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

α Herculis, var. irreg., 3^m.1-3
comp. 6^m, 4″.6 s. f.
δ Herculis, binary, comp
s. pr.

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me of Star.	Magnitude.	Spectrum.	Right Ascension.	Annual Variation.	Annual P. M.	Declination.	Annual Variation.	Annual P. M.
			h m s	s	s	° ′ ″	″	″
nis . . .	4.9	F5	17 37 26.140	−0.3540	+.0014	+68 47 47.02	−1.652	+0.318
is . . .	3.6	K0	17 37 34.919	+5.8816	-.0028	−64 41 9.06	2.038	−0.080
chi . .	2.9	K0	17 39 22.313	2.9629	−.0026	+ 4 36 3.81	1.614	+0.158
ii . . .	3.1	F5p	17 41 46.752	4.1948	+.0006	−40 5 45.73	1.600	−0.008
lis . . .	3.5	G5	17 43 12.573	+2.3471	−.0238	+27 46 6.42	2.216	−0.749
nis . . .†	4.9	F5	17 43 24.658	−1.0738	+.0024	+72 11 23.68	−1.718	−0.268
chi . .	3.7	A0	17 43 43.813	+3.0073	−.0016	+ 2 44 15.38	1.495	−0.073
lis . . .	5.5	F2	17 52 4.310	2.4207	+.0013	+26 3 44.75	0.688	+0.006
nis . . .	3.9	K0	17 52 5.684	+1.0381	+.0131	+56 53 7.24	0.615	+0.077
nis . . .	5.0	F5	17 53 9.799	−2.6900	+.0116	+76 58 28.71	0.355	+0.243
lis . . .	4.0	K0	17 53 24.377	+2.0571	+.0006	+37 15 38.91	−0.572	+0.004
chi . .	3.5	K0	17 54 27.394	3.3019	−.0006	− 9 45 51.93	0.604	−0.120
lis . . .	3.8	K0	17 54 32.377	2.3315	+.0072	+29 15 21.90	0.495	−0.018
nis . . .	2.4	K5	17 54 40.717	1.3926	−.0006	+51 29 53.36	0.489	−0.024
chi . .	3.9	B5p	17 56 29.302	3.0049	+.0008	+ 2 56 4.66	0.320	−0.013
. . .	3.9	B1	18 0 10.166	+4.6699	−.0010	−50 5 54.79	−0.036	−0.050
arii . . .	3.1	K0	18 0 28.482	3.8520	−.0055	−30 25 34.56	0.156	−0.198
chi . . .†	4.1	K0	18 1 15.559	3.0317	+.0178	+ 2 31 3.87	−1.012	−1.122
chi . .	3.7	A2	18 3 24.848	2.8433	−.0045	+ 9 33 4.42	+0.386	+0.087
lis . . .	3.8	A0	18 4 18.259	2.3395	−.0002	+28 45 0.95	0.378	+0.003
arii . . .	4.0	B8p	18 8 47.943	+3.5870	−.0004	−21 4 53.84	+0.768	−0.002
arii . . .	3.2	Mb	18 12 0.696	4.0597	−.0109	−36 47 15.14	0.898	−0.152
ubridge 2533 .	5.4	B5	18 13 3.849	1.8652	−.0006	+42 7 49.53	1.141	−0.001
nis . . .	5.0	F5	18 13 25.151	0.3456	+.0535	+64 22 8.30	1.199	+0.026
arii . . .	2.8	K0	18 15 40.823	3.8405	+.0023	−29 51 52.34	1.337	−0.034
ntis . .	3.4	K0	18 17 0.847	+3.1028	−.0378	− 2 55 16.45	+0.795	−0.692
arii . . .	2.0	A0	18 18 39.755	3.9814	−.0041	−34 25 29.56	1.508	−0.122
lis . . .	3.9	K0	18 20 9.641	2.5560	+.0139	+21 43 51.57	1.500	−0.261
copii . .	3.8	B3	18 20 49.165	+4.4499	−.0017	−46 0 55.68	1.750	−0.068
nis . . .	3.7	F8	18 22 33.352	−1.0787	+.1177	+72 41 49.41	1.598	−0.372
arii . . .	2.9	K0	18 22 50.911	+3.7027	−.0033	−25 28 7.64	+1.796	−0.199
ntis . . .	5.4	G5	18 25 21.795	3.1215	+.0015	− 2 2 23.78	2.179	−0.035
æ . . .	4.1	K0	18 30 41.420	3.2646	−.0013	− 8 18 11.05	2.361	−0.315
nis . . .	4.1	K0	18 33 20.434	7.0190	−.0057	−71 30 4.20	2.741	−0.165
(*Vega*) . .	0.1	A0	18 34 7.695	2.0314	+.0178	+38 42 20.61	3.254	+0.280
æ . . .	4.7	F0	18 37 43.817	+3.2866	+.0020	− 9 7 58.66	+3.279	−0.006
arii . . .	3.3	B8	18 40 28.264	3.7486	+.0034	−27 4 37.80	3.515	−0.006
ulis . . .	4.3	F5	18 42 5.321	2.5804	−.0019	+20 27 57.52	3.317	−0.344
æ . . .	4.5	G0	18 42 46.231	3.1829	−.0009	− 4 50 15.57	3.696	−0.023
nis . . .	4.4	B2	18 44 31.787	5.5655	−.0030	−62 17 3.04	3.848	−0.022
. . . .†	*var.*	B2p	18 47 0.919	+2.2148	+.0004	+33 15 56.11	+4.078	−0.005
nis . . .	5.4	A0	18 49 3.584	−1.9211	−.0031	+75 20 11.11	4.309	+0.051
nis . . .†	4.8	K0	18 49 58.730	+0.8880	+.0116	+59 17 11.75	4.360	+0.023
arii . . .	2.1	B3	18 50 7.114	3.7200	−.0003	−26 24 3.66	4.274	−0.075
ntis *pr.* . .†	4.5	A5	18 52 5.582	2.9822	+.0027	+ 4 5 40.76	4.545	+0.028
. . . .†	*var.*	Mb	18 52 48.588	+1.8260	+.0026	+43 50 10.20	+4.656	+0.078
. . .	3.3	A0	18 55 50.298	2.2435	−.0006	+32 34 29.74	4.830	−0.006
æ . . .	4.2	K0	18 55 51.301	2.7221	−.0042	+14 57 16.73	4.756	−0.081
arii . . .†	2.7	A2	18 57 19.884	3.8178	−.0024	−30 0 0.26	4.943	−0.019
æ . . .	3.0	A0	19 1 35.698	2.7569	−.0008	+13 44 21.13	5.224	−0.099
æ . . .	3.6	A0	19 1 50.651	+3.1835	−.0020	− 5 0 28.20	+5.261	−0.083
æ Australis .	4.1	A2	19 3 49.557	4.0829	+.0051	−38 2 6.34	5.393	−0.118
. . .	5.1	B5	19 4 20.420	2.1413	+.0005	+35 58 9.57	5.548	−0.006
arii . . .	3.0	F2	19 4 49.713	3.5688	−.0005	−21 9 23.62	5.559	−0.036
arii . . .	4.9	F5	19 10 27.129	3.6800	+.0025	−25 24 2.96	6.030	−0.035
nis . . .	3.2	K0	19 12 32.414	+0.0218	+.0175	+67 30 55.85	+6.327	+0.088
arii . . .	5.0	K0	19 12 46.758	+3.5108	−.0015	−19 6 5.88	+6.243	−0.017

star 6m.1, 30″.4 n. f.
, comp. 6m, 2″.1 s.

β Lyræ, var., 12d.9, 3m.4–4m.1, star 7m, 46″ s. f.
ε Draco, star 7m.6, 32″.1 n. pr.

θ Serpentis, star 5m.4, 22″.2 s. f.
R Lyræ, var., 46d.4, 4m.0–4m.7.
ζ Sag., binary, 3m.4, 3m.6, 0″.5.

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Name of Star.	Magnitude.	Spectrum.	Right Ascension.	Annual Variation.	Annual P. M.	Declination.	Annual Variation
			h m s	s	s	° ′ ″	′
θ Lyræ	4.5	K0	19 13 29.188	+2.0808	−.0015	+37 59 7.19	+ 6.
ω Aquilæ	5.1	A5	19 13 55.236	2.8158	−.0002	+11 26 41.49	6.
κ Cygni	4.0	K0	19 15 11.130	+1.3878	+.0071	+53 12 53.51	6.
τ Draconis	4.6	K0	19 17 9.537	−1.1368	−.0312	+73 12 6.36	6.
δ Aquilæ	3.4	F0	19 21 18.819	+3.0249	+.0168	+ 2 56 54.21	7.
β Cygni †	3.2	K0p	19 27 22.426	+2.4189	−.0002	+27 47 4.40	+ 7.
ι Cygni	3.9	A2	19 27 36.836	1.5132	+.0023	+51 33 8.92	7.
μ Aquilæ	4.6	K0	19 30 2.113	2.9312	+.0145	+ 7 12 7.10	7.
h Sagittarii	4.7	B9	19 31 39.459	3.6528	+.0045	−25 4 4.19	7.
κ Aquilæ	5.0	B0	19 32 25.638	3.2287	+.0005	− 7 12 46.14	7.
θ Cygni	4.6	F5	19 34 12.963	+1.6089	−.0024	+50 1 42.06	+ 8.
54 Sagittarii	5.4	K0	19 35 58.167	3.4386	+.0046	−16 29 4.31	8.
β Sagittæ	4.4	K0	19 37 19.243	2.6939	+.0001	+17 16 58.67	8.
15 Cygni	5.0	K0	19 41 17.033	2.1640	+.0068	+37 9 12.00	8.
f Sagittarii	5.1	K0	19 41 31.295	3.5013	−.0099	−19 57 41.56	8.
γ Aquilæ	2.8	K2	19 42 18.817	+2.8519	+.0007	+10 24 36.48	+ 8.
δ Cygni †	3.0	A0	19 42 22.897	1.8760	+.0055	+44 55 39.24	8.
δ Sagittæ	3.8	Map	19 43 41.215	2.6749	+.0004	+18 19 43.62	8.
α Aquilæ (*Altair*)	0.9	A5	19 46 44.024	2.9271	+.0360	+ 8 38 53.59	9.
η Aquilæ †	*var.*	G0	19 48 14.719	+3.0567	+.0005	+ 0 47 30.35	9.
ε Draconis †	4.0	K0	19 48 27.750	−0.1885	+.0170	+70 3 23.40	+ 9.
ι Sagittarii	4.2	K0	19 49 32.212	+4.1427	−.0017	−42 5 14.69	9.
ε Pavonis	4.1	A0	19 51 0.707	6.9839	+.0112	−73 7 51.67	9.
β Aquilæ	3.9	K0	19 51 14.175	2.9468	+.0025	+ 6 11 55.08	8.
γ Sagittæ	3.7	K5	19 55 3.931	2.6673	+.0041	+19 15 57.45	9.
c Sagittarii	4.6	Mb	19 57 33.406	+3.6926	+.0023	−27 56 29.64	+ 9.
τ Aquilæ	5.6	K0	20 0 5.136	2.9307	+.0010	+ 7 2 35.37	10.
θ Aquilæ	3.4	A0	20 7 1.371	3.0959	+.0020	− 1 4 6.48	10.
o Cygni *seq.* †	4.0	K0p	20 11 1.132	+1.8901	+.0014	+46 29 20.71	10.
κ Cephei †	4.4	B9	20 11 42.531	−1.9687	+.0025	+77 27 43.18	10.
24 Vulpeculæ	5.4	K0	20 13 14.008	+2.5674	+.0017	+24 24 53.00	+10.
α^2 Capricorni †	3.8	K0	20 13 27.046	3.3303	+.0040	−12 48 10.54	11.
β Capricorni †	3.2	G0p	20 16 21.000	3.3732	+.0030	−15 2 39.49	11.
α Pavonis	2.1	B3	20 19 5.338	4.7631	.0000	−57 0 7.87	11.
γ Cygni	2.3	F8p	20 19 14.948	2.1527	+.0004	+39 59 25.47	11.
π Capricorni †	5.2	B8	20 22 34.314	+3.4361	+.0004	−18 29 4.29	+11.
ρ Capricorni †	5.0	F0	20 24 7.690	3.4244	−.0013	−18 5 20.02	11.
41 Cygni	4.1	F5	20 26 0.298	2.4516	+.0014	+30 5 27.48	11.
θ Cephei	4.3	A5	20 28 11.516	1.0114	+.0066	+62 42 53.24	12.
ε Dephini	4.0	B5	20 29 14.877	+2.8664	+.0007	+11 1 13.40	12.
Groombridge 3241	6.4	K2	20 30 22.523	−0.2401	−.0047	+72 15 2.00	+12.
α Indi	3.2	K0	20 31 43.960	+4.2290	+.0027	−47 34 55.24	12.
β Delphini †	3.7	F5	20 33 39.453	2.8138	+.0082	+14 18 20.44	12.
υ Capricorni	5.3	Ma	20 35 19.605	3.4178	−.0018	−18 25 53.45	12.
α Delphini	3.9	B8	20 35 46.988	2.7868	+.0047	+15 37 7.61	12.
β Pavonis	3.6	A5	20 37 29.681	+5.4409	−.0079	−66 30 9.90	+12.
α Cygni (*Deneb*)	1.3	A2p	20 38 36.119	2.0448	+.0004	+44 58 59.39	12.
δ Delphini	4.5	A2	20 39 35.044	2.8008	−.0014	+14 46 33.59	12.
ψ Capricorni	4.3	F8	20 41 11.051	3.5563	−.0041	−25 34 11.19	12.
γ Delphini *seq.* †	4.5	G5	20 42 48.447	2.7832	−.0023	+15 49 28.19	12.
ε Cygni	2.6	K0	20 42 51.169	+2.4275	+.0294	+33 39 31.48	+13.
ε Aquarii	3.8	A0	20 43 11.054	3.2491	+.0017	− 9 48 1.17	13.
η Cephei	3.6	K0	20 43 36.226	1.2243	+.0132	+61 30 58.03	13.
μ Aquarii	4.8	A3	20 48 10.706	3.2376	+.0025	− 9 17 44.18	13.
β Indi	3.7	K0	20 48 19.977	4.7101	+.0018	−58 46 4.98	13.
32 Vulpeculæ	5.2	K2	20 51 1.338	+2.5563	−.0003	+27 44 28.91	+13.

β Cygni, star 5m.4, 34″.7 n. f.
δ Cygni, comp. 8m, 1″.6 n. pr.
η Aquilæ, var., 74.18, 3m.7–4m.4
ε Draconis, comp. 7m.6, 3″.1 n.

o Cygni, star 5m.0 pr. 19°, 270″ n., star 7m.8 f. 1°, 96″ s.
κ Cephei, comp. 8m, 7″.5 s. f.
α^2 Capricor., α^1 Capricor. 4m.6 pr. 24°, 137″ n.

β Capricor., star 6m.2 pr.
π Capricor., comp. 9m, 3
ρ Capricor., comp. 7m.6,
β Delphini, binary 4m.1,
γ Delphini, comp. 5m.5,

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Name of Star.	Magnitude.	Spectrum.	Right Ascension.	Annual Variation.	Annual P. M.	Declination.	Annual Variation.	Annual P. M.
			h m s	s	s	° ′ ″	″	″
H¹. Draconis	5.6	K0	20 51 23.721	−2.6348	−.0105	+80 14 30.34	+13.607	−0.025
Cygni	4.0	A0	20 54 4.689	+2.2256	+.0008	+40 50 49.17	13.786	−0.018
Octantis	5.2	F2	20 54 42.416	7.3755	−.0007	−77 20 31.45	13.454	−0.389
Microscopii	4.7	G5	20 56 12.259	3.6861	−.0004	−32 34 58.56	13.933	−0.004
Capricorni	4.2	A0	21 1 17.001	3.3751	+.0051	−17 33 48.54	14.187	−0.066
Cygni	3.9	K5	21 1 54.674	+2.1814	+.0009	+43 35 46.67	+14.300	+0.008
Cygni *pr.*	5.6	K5	21 3 10.466	2.6853	+.3496	+38 20 26.13	17.618	+3.249
Cygni *seq.*	6.3	K5	$\Delta\alpha$ + 1.499	....	...	$\Delta\delta$ −15.64	....	...
Aquarii	4.5	K0	21 5 4.447	+3.2098	+.0057	−11 42 30.02	14.479	−0.006
Bradley 2777	5.9	A	21 7 11.200	−1.1450	+.0102	+77 47 24.11	14.641	+0.029
Piscis Australis	5.6	K5	21 8 22.207	+3.5630	+.0075	−27 57 30.84	+14.576	−0.106
Cygni	3.4	K0	21 9 24.176	2.5522	−.0002	+29 53 9.03	14.683	−0.061
Cygni †	3.8	F0	21 11 28.636	2.3941	+.0141	+37 41 26.11	15.300	+0.434
Equulei	4.1	F8p	21 11 40.506	2.9992	+.0034	+ 4 54 14.60	14.792	−0.085
Cygni	4.3	A0p	21 14 9.301	2.3549	−.0001	+39 2 47.12	15.025	+0.003
Microscopii	4.9	A2p	21 15 27.288	+3.8440	+.0028	−41 9 40.04	+15.102	+0.005
Cephei	2.6	A5	21 16 36.023	1.4348	+.0224	+62 14 0.93	15.212	+0.050
Capricorni	4 3	K0	21 17 37.651	3.3438	+.0022	−17 11 19.32	15.225	+0.004
Pegasi	4.2	K0	21 18 14.864	2.7741	+.0075	+19 26 55.70	15.321	+0.064
Pavonis	4.3	F8	21 19 35.870	4.9983	+.0154	−65 44 34.26	16.117	+0.784
Capricorni	3.9	G5p	21 21 55.893	+3.4300	+.0004	−22 46 17.40	+15.484	+0.020
Cygni †	5.3	K0	21 26 23.141	2.2128	+.0050	+46 10 27.13	15.814	+0.105
Aquarii	3.1	G0	21 27 11.442	3.1598	+.0012	− 5 56 13.11	15.742	−0.011
Cephei †	3.3	B1	21 27 35.732	0.7853	+.0026	+70 11 46.22	15.760	+0.005
Aquarii	4.8	A5	21 33 20.090	3.1955	+.0075	− 8 13 37.29	16.056	−0.023
54 Cygni	5.1	A5	21 33 37.291	+2.4035	+.0003	+40 2 24.51	+16.103	+0.009
57 Capricorni	3.8	F0p	21 35 29.676	3.3270	+.0129	−17 2 15.90	16.174	−0.017
Pegasi	2.5	K0	21 40 6.553	2.9461	+.0016	+ 9 29 37.98	16.425	0.000
21 Cephei	4.8	K0	21 40 42.615	0.8874	+.0221	+70 55 44.50	16.549	+0.093
Capricorni	3.0	A5	21 42 27.698	3.3139	+.0176	−16 30 16.26	16.246	−0.297
58 Cygni	4.3	B3	21 43 43.539	+2.2147	+.0009	+48 55 30.44	+16.604	−0.001
Capricorni	5.2	F0	21 48 46.341	3.2728	+.0204	−13 56 35.42	16.849	+0.001
Gruis	3.2	B8	21 48 54.415	3.6406	+.0077	−37 45 21.18	16.534	−0.021
16 Pegasi	5.0	B3	21 49 17.082	2.7285	+.0005	+25 32 3.21	16.878	+0.006
70 Draconis	6.6	A0	21 51 49.247	0.7179	+.0100	+73 18 33.99	17.007	+0.016
Indi	4.7	K5	21 57 1.104	+4.6081	+.4783	−57 7 39.60	+14.655	−2.572
20 Pegasi	5.7	F2	21 57 2.716	2.9222	+.0038	+12 43 18.54	17.176	−0.054
Aquarii	3.2	G0	22 1 31.295	3.0820	+.0010	− 0 43 24.62	17.424	−0.002
Aquarii	4.4	B8	22 1 57.362	3.2423	+.0022	−14 16 22.40	17.383	−0.062
20 Cephei	5.4	K5	22 2 29.121	1.8229	+.0032	+62 22 49.19	17.519	+0.051
Gruis	2.2	B5	22 3 0.476	+3.7928	+.0110	−47 21 49.43	+17.315	−0.174
Pegasi	4.0	F5	22 3 8.777	2.7916	+.0222	+24 56 21.20	17.516	+0.020
Pegasi	3.7	A0	22 6 0.805	3.0267	+.0187	+ 5 47 20.84	17.652	+0.036
Pegasi	4.4	F5	22 6 17.996	2.6628	−.0003	+32 46 13.86	17.610	−0.018
Cephei	3.6	K0	22 7 58.365	2.0783	+.0018	+57 47 30.65	17.708	+0.010
24 Cephei	5.0	G5	22 8 12.885	+1.1573	+.0044	+71 55 55.62	+17.711	+0.004
Aquarii	4.3	K0	22 12 27.295	3.1671	+.0074	− 8 11 49.13	17.860	−0.019
Tucanæ	2.9	K2	22 12 49.495	4.1332	−.0118	−60 40 25.05	17.859	−0.035
Aquarii	4.0	A0	22 17 22.185	3.0990	+.0081	− 1 48 21.22	18.084	+0.015
Pegasi	1.9	B3p	22 17 25.960	2.9530	+.0010	+11 47 11.51	18.078	+0.007
Lacertæ	4.6	K0	22 20 17.636	+2.3559	−.0007	+51 48 46.37	+17.900	−0.188
Aquarii	4.6	B1	22 21 2.291	3.0637	+.0004	+ 0 57 20.70	18.204	−0.001
Aquarii	4.9	A0	22 26 15.390	3.1769	.0000	−11 6 10.87	18.366	−0.026
Lacertæ	3.8	A0	22 27 52.200	2.4684	+.0157	+49 51 19.43	18.461	+0.014
Aquarii	5.3	F5	22 30 9.299	3.2848	+.0148	−21 8 2.09	18.370	−0.154
B. Cephei	5.7	A0	22 30 49.232	+1.0041	−.0052	+75 47 55.01	+18.547	0.000

Cygni, comp. 7m, 0″.8 | *g* Cygni, star 6m.7 f. 10s, 420″ s. | *β* Cephei, star 8m, 13″.3 s. pr.

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Name of Star.	Magnitude.	Spectrum.	Right Ascension.	Annual Variation.	Annual P. M.	Declination.	Annual Variation
			h m s	s	s	° ′ ″	″
η Aquarii	4.1	B8	22 31 5.504	+3.0831	+.0057	− 0 32 44.30	+18.1
10 Lacertæ	4.9	Oe5	22 35 32.103	2.6892	+.0011	+38 37 4.45	18.1
ϵ Piscis Australis	4.2	B8	22 36 4.046	3.3223	+.0008	−27 28 37.50	18.1
ζ Pegasi	3.6	B8	22 37 19.326	2.9915	+.0054	+10 23 51.67	18.1
β Gruis	2.2	Mb	22 37 43.040	3.5951	+.0133	−47 19 8.97	18.1
η Pegasi	3.1	G0	22 39 6.566	+2.8094	+.0011	+29 47 12.05	+18.1
λ Pegasi	4.1	K0	22 42 31.883	2.8871	+.0037	+23 7 42.77	18.1
ϵ Gruis	3.7	A2	22 43 32.835	3.6371	+.0093	−51 45 12.77	18.1
τ Aquarii	4.2	K5	22 45 11.957	3.1789	−.0008	−14 1 51.42	18.1
μ Pegasi	3.7	K0	22 45 59.749	2.8934	+.0110	+24 9 46.83	18.1
ι Cephei	3.7	K0	22 46 43.309	+2.1285	−.0111	+65 45 48.98	+18.1
λ Aquarii	3.8	Ma	22 48 17.113	3.1308	+.0002	− 8 1 17.70	19.1
ρ Indi	6.1	G5	22 48 53.950	4.2126	−.0133	−70 31 3.03	19.1
δ Aquarii	3.5	A2	22 50 14.807	3.1861	−.0034	−16 15 45.11	19.1
α Pisc. Aust. (*Fomalhaut*)	1.3	A3	22 53 4.049	3.3205	+.0252	−30 3 44.98	19.1
o Andromedæ	3.6	B5p	22 58 5.916	+2.7549	+.0020	+41 52 46.70	+19.1
β Pegasi †	*var.*	Ma	22 59 44.908	2.9054	+.0146	+27 37 56.23	19.1
α Pegasi (*Markab*)	2.6	A0	23 0 37.503	2.9865	+.0040	+14 45 30.41	19.1
55 Pegasi	4.7	Ma	23 2 49.342	3.0209	+.0003	+ 8 57 38.97	19.1
e^2 Aquarii	3.8	K0	23 5 1.376	3.2017	+.0032	−21 37 23.65	19.1
π Cephei †	4.6	G5	23 5 15.234	+1.8999	+.0023	+74 56 19.07	+19.1
ι Gruis	4.1	K0	23 5 39.922	3.4064	+.0121	−45 41 47.69	19.1
59 Pegasi	5.2	A3	23 7 32.720	3.0279	−.0007	+ 8 16 9.18	19.1
5 H^1. Cassiopeiæ	5.6	K2	23 9 16.897	2.8795	+.2536	+56 42 35.99	19.1
ϕ Aquarii	4.4	Ma	23 10 1.450	3.1071	+.0015	− 6 29 48.06	19.1
ψ Aquarii †	4.5	K0	23 11 32.666	+3.1447	+.0250	− 9 32 23.99	+19.1
γ Tucanæ	4.1	F2	23 12 35.551	3.5182	−.0057	−58 41 28.76	19.1
γ Piscium	3.8	K0	23 12 51.731	3.1094	+.0502	+ 2 49 42.94	19.1
γ Sculptoris	4.5	K0	23 14 20.684	3.2444	+.0002	−32 59 3.88	19.1
o Cephei †	4.9	G5	23 15 12.670	2.4526	+.0113	+67 39 26.07	19.1
τ Pegasi	4.6	A5	23 16 31.586	+2.9060	+.0018	+23 17 8.86	+19.1
b^1 Aquarii	4.2	K0	23 18 36.761	3.1528	−.0099	−20 33 14.07	19.1
4 Cassiopeiæ	5.2	K5	23 21 8.592	2.6512	−.0004	+61 49 37.20	19.1
υ Pegasi	4.6	G0	23 21 14.067	2.9908	+.0134	+22 56 48.93	19.1
κ Piscium	4.9	A2p	23 22 40.659	3.0752	+.0056	+ 0 48 4.07	19.1
θ Piscium	4.4	G5	23 23 45.418	+3.0421	−.0088	+ 5 55 22.75	+19.1
70 Pegasi	4.7	K0	23 24 57.338	3.0322	+.0040	+12 18 9.10	19.1
β Sculptoris	4.5	B9	23 28 31.456	3.2242	+.0071	−38 16 39.40	19.1
72 Pegasi (*mean*) †	5.2	K2	23 29 49.929	2.9713	+.0035	+30 52 1.86	19.1
λ Andromedæ	4.0	K0	23 33 29.829	2.9287	+.0158	+46 0 30.22	19.1
ι Andromedæ	4.3	B8	23 34 3.667	+2.9353	+.0025	+42 48 30.57	+19.1
ι Piscium	4.3	G0	23 35 40.825	3.0845	+.0246	+ 5 10 34.77	19.1
γ Cephei	3.4	K0	23 35 55.858	2.4403	−.0173	+77 10 8.83	20.0
κ Andromedæ	4.3	A0	23 36 18.934	2.9479	+.0078	+43 52 27.14	19.1
ω^2 Aquarii	4.6	A0	23 38 25.143	3.1126	+.0063	−15 0 13.76	19.1
i^1 Aquarii	5.3	B8	23 39 53.896	+3.1143	+.0019	−18 44 15.92	+19.1
ψ Andromedæ	5.1	K0	23 41 54.967	2.9643	+.0005	+45 57 33.59	19.1
41 H. Cephei	5.0	A0	23 43 55.971	2.8507	+.0024	+67 20 43.89	19.1
δ Sculptoris	4.6	A0	23 44 36.240	3.1274	+.0059	−28 35 22.88	19.1
ϕ Pegasi	5.2	Ma	23 48 15.780	3.0482	−.0013	+18 39 33.40	19.1
ρ Cassiopeiæ	4.8	F8p	23 50 13.711	+2.9826	−.0022	+57 2 15.48	+20.0
Groombridge 4163	6.6	B9	23 50 46.464	2.8818	−.0040	+73 56 54.22	20.0
ω Piscium	4.0	F5	23 55 2.897	3.0796	+.0102	+ 6 24 13.92	19.1
ϵ Tucanæ	4.7	B9	23 55 36.742	3.1378	+.0076	−66 2 19.02	20.0
30 Piscium	4.7	Mb	23 57 42.213	3.0771	+.0030	− 6 28 31.21	20.0
2 Ceti	4.6	A0	23 59 29.339	+3.0751	+.0015	−17 47 53.22	+20.0

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

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

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

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ıme of Star.	Magnitude.	Spectrum.	Right Ascension.	Annual Variation.	Annual P. M.	Declination.	Annual Variation.	Annual P. M.
			h m s	s	s	° ′ ″	″	″
ıhei . . .	4.5	K0	0 57 9.300	+ 7.6506	+.0730	+85 48 45.30	+19.421	−0.004
lin.(*Polaris*) . †	2.1	F8	1 30 13.156	+29.0262	+.1472	+88 51 43.55	+18.514	+0.002
antis . .	5.6	K0	1 42 2.339	− 3.7571	+.0086	−85 11 21.46	+18.119	+0.028
bridge 750 .	6.7	F8	4 10 2.561	+17.6173	+.0128	+85 20 10.34	+ 9.295	+0.042
bridge 944 .	6.4	K0	5 35 12.782	+18.7703	+.0130	+85 9 30.24	+ 2.160	−0.004
ıssæ . . .	6.2	A0	5 46 14.756	−11.6820	−.0123	−84 49 46.89	+ 1.289	+0.087
. . .	5.6	A2	6 46 58.546	− 4.9448	−.0036	−80 43 38.16	− 3.998	+0.082
ıhei . .	5.3	Ma	7 2 4.048	+29.1731	−.0578	+87 10 54.74	− 5.397	−0.035
nelopardalis .	5.1	Mb	7 13 42.294	+12.8146	+.0132	+82 34 30.13	− 6.383	−0.047
antis . .	6.4	F5	7 16 20.292	−20.2749	−.0146	−86 54 6.70	− 6.548	+0.005
bridge 1119 .	7.0	A0	8 15 48.380	+59.9071	−.0404	+88 53 0.29	−11.178	+0.017
is . . .	5.4	A3	9 8 57.938	− 8.1549	−.1147	−85 19 57.45	−14.675	+0.043
conis . .	4.6	K0	9 25 21.719	+ 8.7856	−.0059	+81 41 41.50	−15.680	−0.027
leontis . .	5.2	B3	9 36 22.347	− 1.6575	−.0121	−80 34 6.83	−16.217	+0.019
nelopardalis .	5.3	F5	10 21 4.831	+ 7.5676	−.0462	+82 58 54.07	−18.198	+0.009
is . . .	6.3	A0	10 59 55.280	− 0.3633	−.0574	−84 8 50.60	−19.365	−0.005
y 1672 . .	6.3	F0	12 14 28.425	+ 0.3756	−.0716	+88 9 36.08	−19.947	+0.058
is . . .	5.4	K0	12 46 7.152	+ 5.9739	+.0366	−84 40 22.34	−19.617	+0.024
nelop. *seq.* . †	5.3	A2	12 48 30.418	+ 0.4429	−.0184	+83 51 50.47	−19.582	+0.016
is . . .	5.6	A2	13 27 14.624	+ 9.1162	−.0764	−85 21 42.23	−18.634	−0.024
is . . .	4.1	K2	14 13 27.793	+ 9.2680	−.0511	−83 17 21.03	−16.756	−0.014
bridge 2283 .	7.2	K0	15 3 41.175	−19.3982	−.0066	+87 33 10.52	−13.914	+0.031
is . . .	5.7	A2	15 23 56.594	+13.3645	+.0842	−84 11 30.39	−12.539	+0.080
finoris . .	4.4	G5	16 54 25.488	− 6.2513	+.0057	+82 10 32.75	− 5.658	−0.001
ndis . . .	5.9	Mb	17 15 54.896	+11.1669	+.0086	−80 47 6.56	− 3.871	−0.039
finoris . .	4.4	A0	17 59 1.307	−19.4978	+.0175	+86 36 51.17	− 0.038	+0.048
is . . .	5.2	K0	18 6 11.893	+35.7286	−.0967	−87 39 51.82	+ 0.416	−0.127
finoris . .	6.6	Mb	19 2 39.624	−72.0496	−.1103	+89 1 2.17	+ 5.418	+0.006
is . . .	5.5	F0	19 27 42.218	+94.7793	+.1084	−89 13 28.57	+ 7.485	−0.001
is . . .	5.7	A0	20 48 40.494	− 4.1683	+.0131	+82 13 29.86	+13.482	+0.025
is . . . †	5.4	G0p	21 38 19.542	+ 9.5134	+.0389	−83 6 6.99	+16.323	−0.012
is . . .	5.7	K0	22 16 8.656	+12.3084	−.0400	−86 23 27.13	+18.097	+0.074
is . . .	4.3	F0	22 37 39.016	+ 6.3104	−.0302	−81 49 2.34	+18.767	+0.002
ıhei . .	5.6	F0	23 27 44.125	− 0.2705	+.0639	+86 50 58.89	+19.867	+0.020
is . . .	5.1	G5	23 47 16.424	+ 3.6100	−.0247	−82 28 48.42	+20.003	−0.012

, star 9m, 18″ s. pr. | 32 H. Camelop., star 5m, 19″.8 s. pr. | λ Octantis, binary, 5m.5, 8m.0, 3″.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 Mag. 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.
	h m s	° ′ ″		h m s	° ′ ″		h m s	° ′ ″		h m s	° ′ ″		h m s
Jan.	0 57	+85 49	Jan.	1 29	+88 52	Jan.	1 41	−85 11	Jan.	4 10	+85 20	Jan.	5 35
0.3	10.94	12.49	0.3	89.73	10.50	0.3	67.69	34.01	0.4	20.66	27.91	0.5	34.29
1.3	10.68	12.55	1.3	88.81	10.59	1.3	67.40	34.06	1.4	20.55	28.15	1.5	34.17
2.3	10.44	12.60	2.3	87.93	10.69	2.3	67.09	34.11	2.4	20.45	28.38	2.4	34.16
3.3	10.21	12.66	3.3	87.07	10.80	3.3	66.77	34.16	3.4	20.36	28.62	3.4	34.15
4.3	9.97	12.75	4.3	86.20	10.92	4.3	66.49	34.15	4.4	20.27	28.88	4.4	34.15
5.3	9.71	12.81	5.3	85.28	11.03	5.3	66.19	34.12	5.4	20.17	29.15	5.4	34.15
6.2	9.44	12.88	6.3	84.28	11.16	6.3	65.91	34.08	6.4	20.07	29.44	6.4	34.15
7.2	9.16	12.95	7.3	83.23	11.29	7.3	65.63	34.03	7.4	19.95	29.74	7.4	34.12
8.2	8.85	13.01	8.3	82.12	11.40	8.3	65.38	33.99	8.4	19.81	30.03	8.4	34.08
9.2	8.53	13.06	9.3	80.97	11.51	9.3	65.13	33.94	9.4	19.66	30.31	9.4	34.06
10.2	8.20	13.08	10.3	79.80	11.57	10.3	64.88	33.91	10.4	19.49	30.59	10.4	33.97
11.2	7.90	13.09	11.3	78.62	11.63	11.3	64.63	33.88	11.4	19.31	30.84	11.4	33.88
12.2	7.59	13.06	12.3	77.45	11.68	12.3	64.37	33.85	12.4	19.12	31.08	12.4	33.78
13.2	7.28	13.02	13.2	76.31	11.69	13.3	64.11	33.84	13.4	18.92	31.29	13.4	33.67
14.2	6.99	12.97	14.2	75.22	11.70	14.3	63.83	33.84	14.4	18.73	31.49	14.4	33.56
15.2	6.72	12.92	15.2	74.19	11.69	15.3	63.54	33.83	15.4	18.54	31.68	15.4	33.45
16.2	6.47	12.88	16.2	73.22	11.69	16.2	63.25	33.79	16.4	18.38	31.86	16.4	33.36
17.2	6.23	12.85	17.2	72.29	11.70	17.2	62.93	33.72	17.3	18.23	32.03	17.4	33.27
18.2	5.99	12.83	18.2	71.39	11.73	18.2	62.63	33.64	18.3	18.08	32.21	18.4	33.20
19.2	5.75	12.83	19.2	70.46	11.78	19.2	62.32	33.53	19.3	17.94	32.43	19.4	33.14
20.2	5.49	12.82	20.2	69.49	11.83	20.2	62.03	33.38	20.3	17.80	32.65	20.4	33.09
21.2	5.22	12.83	21.2	68.44	11.89	21.2	61.76	33.23	21.3	17.63	32.88	21.4	33.01
22.2	4.94	12.81	22.2	67.31	11.94	22.2	61.52	33.09	22.3	17.46	33.11	22.4	32.93
23.2	4.61	12.77	23.2	66.12	11.96	23.2	61.27	32.94	23.3	17.27	33.35	23.4	32.83
24.2	4.29	12.72	24.2	64.91	11.94	24.2	61.03	32.81	24.3	17.04	33.56	24.4	32.69
25.2	3.97	12.62	25.2	63.71	11.90	25.2	60.80	32.69	25.3	16.81	33.75	25.4	32.54
26.2	3.68	12.50	26.2	62.55	11.84	26.2	60.54	32.59	26.3	16.57	33.91	26.4	32.36
27.2	3.40	12.36	27.2	61.47	11.75	27.2	60.27	32.50	27.3	16.33	34.05	27.4	32.18
28.2	3.15	12.23	28.2	60.46	11.67	28.2	59.99	32.39	28.3	16.10	34.16	28.4	32.03
29.2	2.91	12.10	29.2	59.52	11.58	29.2	59.69	32.26	29.3	15.89	34.27	29.4	31.88
30.2	2.69	11.99	30.2	58.64	11.53	30.2	59.40	32.14	30.3	15.70	34.38	30.4	31.73
31.2	2.48	11.89	31.2	57.76	11.47	31.2	59.10	32.00	31.3	15.51	34.50	31.4	31.60
13.72	+13.68		50.70	+50.69		11.93	−11.89		12.31	+12.27		11.86	+
$0^h\ 57^m\ 9^s.300$			$1^h\ 30^m\ 13^s.156$			$1^h\ 42^m\ 2^s.339$			$4^h\ 10^m\ 2^s.561$			$5^h\ 35^m$	
+85° 48′ 45″.30			+88° 51′ 43″.55			−85° 11′ 21″.46			+85° 20′ 10″.34			+85° 9′	

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

Mensæ. g. 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		
ight scen-ion.	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.
m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	° ′
46	−84 49	Jan.	6 47	−80 43	Jan.	7 2	+87 10	Jan.	7 13	+82 34	Jan.	7 16	−86 54
s	″		s	″		s	″		s	″		s	″
5.81	48.31	0.5	5.15	36.15	0.5	42.13	53.42	0.5	57.32	27.41	0.5	37.37	2.82
5.72	48.68	1.5	5.15	36.56	1.5	42.22	53.69	1.5	57.36	27.66	1.5	37.39	3.23
5.62	49.05	2.5	5.13	36.97	2.5	42.33	53.97	2.5	57.42	27.90	2.5	37.39	3.64
5.48	49.43	3.5	5.10	37.38	3.5	42.46	54.23	3.5	57.49	28.14	3.5	37.36	4.05
5.35	49.78	4.5	5.06	37.78	4.5	42.59	54.51	4.5	57.56	28.38	4.5	37.30	4.45
5.20	50.12	5.5	5.03	38.16	5.5	42.74	54.80	5.5	57.63	28.64	5.5	37.22	4.83
5.05	50.44	6.5	4.99	38.53	6.5	42.88	55.10	6.5	57.70	28.93	6.5	37.13	5.20
4.90	50.72	7.5	4.95	38.87	7.5	43.01	55.42	7.5	57.77	29.24	7.5	37.02	5.56
4.75	51.00	8.5	4.91	39.20	8.5	43.12	55.76	8.5	57.83	29.56	8.5	36.91	5.90
4.61	51.28	9.5	4.86	39.53	9.5	43.21	56.11	9.5	57.88	29.90	9.5	36.81	6.23
4.48	51.55	10.5	4.82	39.85	10.5	43.26	56.46	10.5	57.92	30.23	10.5	36.72	6.54
4.35	51.83	11.5	4.78	40.18	11.5	43.28	56.81	11.5	57.93	30.56	11.5	36.63	6.86
4.21	52.11	12.5	4.74	40.51	12.5	43.29	57.15	12.5	57.94	30.89	12.5	36.55	7.20
4.07	52.40	13.5	4.70	40.86	13.5	43.25	57.48	13.5	57.95	31.22	13.5	36.48	7.55
3.93	52.71	14.5	4.66	41.22	14.5	43.21	57.78	14.5	57.95	31.51	14.5	36.41	7.91
3.79	53.04	15.5	4.62	41.60	15.5	43.17	58.07	15.5	57.95	31.78	15.5	36.32	8.28
3.62	53.37	16.5	4.57	41.98	16.5	43.14	58.34	16.5	57.95	32.05	16.5	36.21	8.67
3.45	53.70	17.5	4.51	42.38	17.5	43.13	58.61	17.5	57.95	32.31	17.5	36.08	9.07
3.25	54.02	18.5	4.45	42.76	18.5	43.14	58.88	18.5	57.98	32.56	18.5	35.91	9.48
3.05	54.30	19.5	4.37	43.13	19.5	43.17	59.17	19.5	58.01	32.82	19.5	35.73	9.86
2.82	54.58	20.4	4.29	43.47	20.5	43.21	59.47	20.5	58.04	33.10	20.5	35.50	10.23
2.60	54.82	21.4	4.21	43.79	21.5	43.25	59.78	21.5	58.07	33.42	21.5	35.27	10.57
2.40	55.04	22.4	4.13	44.09	22.5	43.27	60.12	22.5	58.09	33.74	22.5	35.04	10.90
2.20	55.24	23.4	4.05	44.38	23.5	43.24	60.47	23.5	58.10	34.08	23.5	34.82	11.19
2.01	55.45	24.4	3.97	44.66	24.4	43.18	60.81	24.5	58.10	34.42	24.5	34.62	11.48
1.82	55.69	25.4	3.90	44.96	25.4	43.08	61.14	25.5	58.06	34.76	25.5	34.43	11.78
1.64	55.93	26.4	3.82	45.27	26.4	42.94	61.46	26.5	58.02	35.07	26.5	34.25	12.10
1.45	56.19	27.4	3.74	45.59	27.4	42.79	61.76	27.4	57.97	35.36	27.5	34.08	12.44
1.26	56.46	28.4	3.67	45.93	28.4	42.63	62.05	28.4	57.93	35.63	28.4	33.91	12.80
1.05	56.75	29.4	3.59	46.30	29.4	42.48	62.31	29.4	57.88	35.87	29.4	33.71	13.18
0.82	57.03	30.4	3.51	46.65	30.4	42.35	62.56	30.4	57.84	36.10	30.4	33.48	13.55
0.59	57.30	31.4	3.41	46.99	31.4	42.24	62.81	31.4	57.81	36.35	31.4	33.22	13.93
−11.05		6.21		−6.12	20.35		+20.32	7.74		+7.67	18.50		−18.48
6m 14s.756		6h 46m 58s.546			7h 2m 4s.048			7h 13m 42s.294			7h 16m 20s.292		
9′ 46″.89		−80° 43′ 38″.16			+87° 10′ 54″.74			+82° 34′ 30″.13			−86° 54′ 6″.70		

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. Cam Mag. 5.	
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 Ascen- sion.
	h m s	° ′ ″		h m s	° ′ ″		h m s	° ′ ″		h m s	° ′ ″		h m s
Jan.	8 17	+88 52	Jan.	9 9	−85 19	Jan.	9 25	+81 41	Jan.	9 36	−80 33	Jan.	10 21
0.6	16.68	50.38	0.6	6.86	47.99	0.6	32.61	24.46	0.6	26.82	56.57	0.7	14.97
1.6	17.19	50.64	1.6	7.03	48.34	1.6	32.71	24.64	1.6	26.91	56.91	1.6	15.11
2.6	17.73	50.89	2.6	7.18	48.72	2.6	32.82	24.80	2.6	27.01	57.27	2.6	15.26
3.6	18.30	51.12	3.6	7.32	49.11	3.6	32.95	24.95	3.6	27.11	57.65	3.6	15.42
4.6	18.93	51.36	4.6	7.45	49.49	4.6	33.08	25.10	4.6	27.20	58.02	4.6	15.59
5.6	19.57	51.59	5.6	7.55	49.86	5.6	33.21	25.26	5.6	27.27	58.40	5.6	15.76
6.6	20.24	51.87	6.6	7.63	50.23	6.6	33.34	25.43	6.6	27.34	58.78	6.6	15.94
7.5	20.89	52.15	7.6	7.71	50.59	7.6	33.48	25.63	7.6	27.40	59.11	7.6	16.13
8.5	21.52	52.45	8.6	7.78	50.93	8.6	33.61	25.85	8.6	27.46	59.45	8.6	16.31
9.5	22.09	52.78	9.6	7.84	51.27	9.6	33.73	26.09	9.6	27.51	59.79	9.6	16.49
10.5	22.59	53.11	10.6	7.92	51.60	10.6	33.84	26.34	10.6	27.57	60.12	10.6	16.65
11.5	23.02	53.43	11.6	8.00	51.93	11.6	33.94	26.60	11.6	27.62	60.44	11.6	16.81
12.5	23.39	53.75	12.6	8.08	52.26	12.6	34.05	26.86	12.6	27.68	60.77	12.6	16.96
13.5	23.69	54.08	13.6	8.17	52.59	13.6	34.14	27.13	13.6	27.74	61.11	13.6	17.09
14.5	23.93	54.40	14.6	8.26	52.94	14.6	34.22	27.37	14.6	27.81	61.46	14.6	17.21
15.5	24.15	54.70	15.6	8.35	53.32	15.6	34.29	27.61	15.6	27.88	61.82	15.6	17.34
16.5	24.38	54.97	16.6	8.44	53.72	16.6	34.37	27.84	16.6	27.95	62.19	16.6	17.45
17.5	24.64	55.24	17.6	8.53	54.13	17.6	34.45	28.04	17.6	28.01	62.60	17.6	17.57
18.5	24.94	55.47	18.6	8.58	54.55	18.6	34.53	28.24	18.6	28.07	63.02	18.6	17.70
19.5	25.31	55.73	19.6	8.62	54.97	19.6	34.63	28.46	19.6	28.12	63.45	19.6	17.83
20.5	25.72	56.00	20.5	8.63	55.41	20.6	34.73	28.68	20.6	28.16	63.88	20.6	17.98
21.5	26.14	56.31	21.5	8.64	55.82	21.6	34.84	28.90	21.6	28.19	64.29	21.6	18.14
22.5	26.54	56.65	22.5	8.63	56.19	22.6	34.95	29.16	22.6	28.21	64.66	22.6	18.30
23.5	26.85	56.99	23.5	8.61	56.54	23.6	35.06	29.45	23.6	28.23	65.04	23.6	18.45
24.5	27.09	57.34	24.5	8.61	56.88	24.6	35.14	29.76	24.6	28.25	65.38	24.6	18.59
25.5	27.21	57.71	25.5	8.62	57.23	25.5	35.20	30.09	25.6	28.27	65.72	25.6	18.71
26.5	27.22	58.04	26.5	8.64	57.58	26.5	35.26	30.38	26.6	28.30	66.08	26.6	18.81
27.5	27.18	58.36	27.5	8.67	57.95	27.5	35.30	30.67	27.5	28.33	66.45	27.6	18.90
28.5	27.10	58.66	28.5	8.70	58.34	28.5	35.33	30.95	28.5	28.37	66.84	28.6	18.98
29.5	27.04	58.94	29.5	8.73	58.75	29.5	35.37	31.21	29.5	28.41	67.25	29.6	19.05
30.5	27.00	59.21	30.5	8.74	59.17	30.5	35.42	31.45	30.5	28.45	67.67	30.6	19.13
31.5	27.01	59.48	31.5	8.74	59.61	31.5	35.46	31.70	31.5	28.47	68.11	31.6	19.22
51.25	+51.24		12.29	−12.25		6.92	+6.85		6.10	−6.02		8.18	
$8^h\ 15^m\ 48^s.380$			$9^h\ 8^m\ 57^s.938$			$9^h\ 25^m\ 21^s.719$			$9^h\ 36^m\ 22^s.347$			$10^h\ 21^m$	
+88° 53′ 0″.29			−85° 19′ 57″.45			+81° 41′ 41″.50			−80° 34′ 6″.83			+82° 58′	

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

tantis. g. 6.3		Bradley 1672. Mag. 6.3			ι Octantis. Mag. 5.4			32 H. Camelop. *seq.* Mag. 5.3			κ Octantis. Mag. 5.6		
ght ension.	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.
m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	° ′
59	−84 8	Jan.	12 14	+88 9	Jan.	12 46	−84 40	Jan.	12 48	+83 51	Jan.	13 27	+85 21
s	″		s	″		s	″		s	″		s	″
.98	37.88	0.7	38.79	9.03	0.8	6.64	9.16	0.8	31.72	23.04	0.8	11.96	29.57
.20	38.10	1.7	39.39	9.04	1.8	6.93	9.21	1.8	31.91	22.99	1.8	12.29	29.57
.42	38.34	2.7	39.98	9.03	2.7	7.23	9.30	2.7	32.09	22.90	2.8	12.62	29.59
.62	38.62	3.7	40.58	8.99	3.7	7.52	9.38	3.7	32.28	22.82	3.8	12.97	29.63
.83	38.91	4.7	41.21	8.96	4.7	7.81	9.51	4.7	32.47	22.74	4.8	13.31	29.69
.02	39.20	5.7	41.86	8.92	5.7	8.09	9.66	5.7	32.67	22.64	5.8	13.64	29.77
.21	39.49	6.7	42.57	8.88	6.7	8.34	9.80	6.7	32.90	22.54	6.8	13.96	29.85
.37	39.77	7.7	43.30	8.87	7.7	8.60	9.96	7.7	33.13	22.48	7.8	14.25	29.95
.51	40.05	8.7	44.05	8.87	8.7	8.84	10.11	8.7	33.36	22.42	8.8	14.53	30.04
.67	40.33	9.7	44.80	8.88	9.7	9.06	10.27	9.7	33.59	22.37	9.8	14.81	30.12
.82	40.59	10.7	45.54	8.92	10.7	9.29	10.41	10.7	33.82	22.34	10.8	15.08	30.19
.97	40.84	11.7	46.26	8.99	11.7	9.51	10.52	11.7	34.05	22.35	11.8	15.35	30.25
.13	41.09	12.7	46.97	9.07	12.7	9.75	10.64	12.7	34.27	22.36	12.7	15.63	30.31
.29	41.35	13.7	47.64	9.15	13.7	9.99	10.77	13.7	34.47	22.39	13.7	15.92	30.36
.47	41.61	14.7	48.26	9.24	14.7	10.24	10.90	14.7	34.67	22.43	14.7	16.22	30.42
.65	41.90	15.7	48.86	9.32	15.7	10.50	11.04	15.7	34.87	22.46	15.7	16.53	30.50
.82	42.21	16.7	49.42	9.40	16.7	10.78	11.21	16.7	35.05	22.49	16.7	16.86	30.59
.01	42.53	17.7	49.98	9.47	17.7	11.06	11.39	17.7	35.23	22.51	17.7	17.21	30.71
.19	42.89	18.7	50.55	9.53	18.7	11.34	11.61	18.7	35.42	22.51	18.7	17.55	30.85
.33	43.25	19.7	51.16	9.58	19.7	11.61	11.83	19.7	35.61	22.51	19.7	17.88	31.02
.48	43.61	20.7	51.81	9.61	20.7	11.87	12.07	20.7	35.83	22.50	20.7	18.20	31.20
.61	43.99	21.7	52.50	9.66	21.7	12.10	12.34	21.7	36.06	22.49	21.7	18.50	31.41
.71	44.36	22.7	53.21	9.74	22.7	12.31	12.59	22.7	36.28	22.51	22.7	18.77	31.61
.81	44.69	23.7	53.93	9.83	23.7	12.51	12.82	23.7	36.51	22.55	23.7	19.04	31.79
.91	45.01	24.7	54.65	9.97	24.7	12.71	13.04	24.7	36.74	22.60	24.7	19.28	31.94
.02	45.30	25.7	55.31	10.11	25.7	12.91	13.24	25.7	36.95	22.70	25.7	19.55	32.09
.15	45.61	26.7	55.92	10.29	26.7	13.13	13.43	26.7	37.15	22.80	26.7	19.82	32.23
.28	45.93	27.7	56.48	10.47	27.7	13.36	13.62	27.7	37.34	22.93	27.7	20.10	32.37
.43	46.27	28.7	56.99	10.64	28.7	13.61	13.83	28.7	37.52	23.06	28.7	20.41	32.52
.57	46.62	29.7	57.47	10.79	29.7	13.86	14.06	29.7	37.68	23.17	29.7	20.73	32.69
.71	46.99	30.6	57.97	10.93	30.7	14.11	14.32	30.7	37.85	23.28	30.7	21.05	32.88
.84	47.38	31.6	58.47	11.07	31.7	14.36	14.59	31.7	38.02	23.37	31.7	21.37	33.09
	−9.75		31.02	+31.00		10.76	−10.72		9.34	+9.29		12.36	−12.32
m	55ˢ.280		12ʰ 14ᵐ	28ˢ.425		12ʰ 46ᵐ	7ˢ.152		12ʰ 48ᵐ	30ˢ.418		13ʰ 27ᵐ	14ˢ.624
′	50″.60		+88° 9′	36″.08		−84° 40′	22″.34		+83° 51′	50″.47		−85° 21′	42″.23

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. Aps Mag. 5	
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.
	h m s	° ′ ″		h m s	° ′ ″		h m s	° ′ ″		h m s	° ′ ″		h m s
Jan.	14 13	−83 17	Jan.	15 3	+87 32	Jan.	15 23	−84 11	Jan.	16 54	+82 10	Jan.	17 15
0.8	24.85	9.66	0.9	19.12	47.42	0.9	50.93	21.57	0.9	14.86	19.09	0.9	50.30
1.8	25.07	9.57	1.8	19.46	47.20	1.9	51.15	21.38	1.9	14.92	18.78	1.9	50.47
2.8	25.30	9.51	2.8	19.78	46.99	2.9	51.39	21.19	2.9	14.97	18.49	2.9	50.59
3.8	25.54	9.47	3.8	20.09	46.76	3.9	51.64	21.03	3.9	15.02	18.18	3.9	50.69
4.8	25.78	9.44	4.8	20.42	46.54	4.9	51.89	20.89	4.9	15.06	17.88	4.9	50.82
5.8	26.02	9.45	5.8	20.76	46.30	5.8	52.15	20.78	5.9	15.12	17.56	5.9	50.95
6.8	26.25	9.48	6.8	21.13	46.06	6.8	52.39	20.70	6.9	15.18	17.22	6.9	51.07
7.8	26.46	9.51	7.8	21.54	45.80	7.8	52.64	20.62	7.9	15.26	16.87	7.9	51.19
8.8	26.66	9.52	8.8	21.98	45.56	8.8	52.86	20.55	8.9	15.34	16.53	8.9	51.30
9.8	26.87	9.54	9.8	22.43	45.35	9.8	53.09	20.46	9.9	15.43	16.20	9.9	51.40
10.8	27.06	9.56	10.8	22.90	45.15	10.8	53.29	20.37	10.9	15.52	15.87	10.9	51.51
11.8	27.25	9.57	11.8	23.38	44.96	11.8	53.50	20.28	11.9	15.61	15.55	11.9	51.60
12.8	27.45	9.57	12.8	23.86	44.79	12.8	53.72	20.19	12.9	15.69	15.25	12.9	51.70
13.8	27.65	9.57	13.8	24.33	44.65	13.8	53.95	20.07	13.9	15.81	14.96	13.9	51.80
14.8	27.87	9.56	14.8	24.77	44.51	14.8	54.17	19.95	14.9	15.91	14.70	14.9	51.91
15.8	28.09	9.57	15.8	25.20	44.38	15.8	54.41	19.83	15.9	16.01	14.46	15.9	52.02
16.8	28.32	9.57	16.8	25.62	44.26	16.8	54.68	19.73	16.9	16.10	14.22	16.9	52.15
17.8	28.57	9.61	17.8	26.00	44.13	17.8	54.95	19.64	17.9	16.19	13.98	17.9	52.29
18.8	28.82	9.68	18.8	26.39	43.99	18.8	55.23	19.58	18.9	16.28	13.72	18.9	52.44
19.8	29.07	9.77	19.8	26.79	43.81	19.8	55.52	19.54	19.9	16.37	13.44	19.9	52.60
20.8	29.31	9.88	20.8	27.21	43.63	20.8	55.81	19.53	20.9	16.45	13.16	20.9	52.76
21.8	29.54	10.02	21.8	27.66	43.46	21.8	56.09	19.54	21.9	16.55	12.86	21.9	52.93
22.8	29.75	10.16	22.8	28.16	43.28	22.8	56.34	19.56	22.9	16.66	12.55	22.9	53.07
23.8	29.95	10.28	23.8	28.67	43.13	23.8	56.58	19.57	23.9	16.78	12.26	23.9	53.21
24.7	30.14	10.38	24.8	29.21	43.00	24.8	56.81	19.58	24.9	16.91	11.97	24.9	53.34
25.7	30.33	10.46	25.8	29.74	42.90	25.8	57.04	19.55	25.9	17.04	11.72	25.9	53.46
26.7	30.53	10.55	26.8	30.26	42.84	26.8	57.27	19.52	26.9	17.17	11.49	26.9	53.58
27.7	30.75	10.62	27.8	30.76	42.78	27.8	57.51	19.47	27.9	17.31	11.29	27.9	53.71
28.7	30.97	10.69	28.8	31.23	42.74	28.8	57.77	19.43	28.8	17.43	11.11	28.9	53.84
29.7	31.20	10.77	29.8	31.68	42.70	29.8	58.04	19.39	29.8	17.56	10.93	29.9	53.98
30.7	31.45	10.88	30.8	32.10	42.65	30.8	58.32	19.38	30.8	17.67	10.75	30.9	54.16
31.7	31.69	11.01	31.8	32.53	42.60	31.8	58.62	19.39	31.8	17.79	10.57	31.9	54.32
8.55		−8.49	23.35		+23.33	9.88		−9.83	7.34		+7.27	6.24	
14h 13m 27s.793			15h 3m 41s.175			15h 23m 56s.594			16h 54m 25s.488			17h 15m	
−83° 17′ 21″.03			+87° 33′ 10″.52			−84° 11′ 30″.39			+82° 10′ 32″.75			−80° 47′	

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

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		
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	° ′
17 58	+86 36	Jan.	18 5	−87 39	Jan.	19 0	+89 0	Jan.	19 26	−89 13	Jan.	20 48	+82 13
s	″		s	″		s	″		s	″		s	″
32.24	44.64	0.9	50.69	51.56	1.0	54.17	63.20	1.0	39.88	32.96	1.1	29.69	42.76
32.28	44.34	1.9	50.91	51.18	2.0	53.94	62.90	2.0	39.81	32.57	2.1	29.61	42.52
32.30	44.06	2.9	51.16	50.79	3.0	53.66	62.61	3.0	39.86	32.16	3.1	29.53	42.30
32.30	43.77	3.9	51.44	50.43	4.0	53.34	62.34	4.0	40.03	31.76	4.1	29.45	42.07
32.31	43.45	4.9	51.75	50.09	5.0	52.99	62.04	5.0	40.33	31.38	5.1	29.36	41.83
32.32	43.13	5.9	52.09	49.77	5.9	52.64	61.72	6.0	40.69	31.01	6.1	29.27	41.59
32.33	42.79	6.9	52.43	49.47	6.9	52.31	61.41	7.0	41.09	30.65	7.1	29.18	41.31
32.37	42.45	7.9	52.76	49.19	7.9	52.03	61.07	8.0	41.50	30.31	8.1	29.07	41.03
32.42	42.08	8.9	53.06	48.91	8.9	51.81	60.71	9.0	41.90	29.99	9.1	28.98	40.72
32.51	41.71	9.9	53.38	48.65	9.9	51.65	60.35	10.0	42.28	29.68	10.1	28.90	40.41
32.59	41.36	10.9	53.67	48.37	10.9	51.58	59.99	11.0	42.61	29.35	11.1	28.81	40.09
32.70	41.01	11.9	53.95	48.09	11.9	51.59	59.64	12.0	42.89	29.02	12.1	28.75	39.76
32.83	40.68	12.9	54.23	47.81	12.9	51.66	59.29	12.9	43.15	28.68	13.1	28.68	39.42
32.96	40.35	13.9	54.50	47.50	13.9	51.77	58.95	13.9	43.41	28.34	14.1	28.63	39.09
33.10	40.07	14.9	54.79	47.19	14.9	51.93	58.65	14.9	43.68	27.98	15.0	28.58	38.79
33.24	39.79	15.9	55.11	46.87	15.9	52.07	58.36	15.9	44.01	27.60	16.0	28.54	38.51
33.37	39.52	16.9	55.47	46.54	16.9	52.18	58.08	16.9	44.44	27.22	17.0	28.50	38.24
33.47	39.26	17.9	55.88	46.20	17.9	52.25	57.80	17.9	45.00	26.81	18.0	28.46	38.00
33.57	38.98	18.9	56.33	45.89	18.9	52.27	57.52	18.9	45.70	26.42	19.0	28.42	37.73
33.67	38.68	19.9	56.81	45.60	19.9	52.24	57.24	19.9	46.53	26.04	20.0	28.36	37.46
33.76	38.37	20.9	57.32	45.32	20.9	52.18	56.92	20.9	47.46	25.70	21.0	28.30	37.16
33.86	38.04	21.9	57.81	45.08	21.9	52.17	56.58	21.9	48.40	25.36	22.0	28.24	36.84
34.00	37.70	22.9	58.28	44.85	22.9	52.25	56.21	22.9	49.33	25.04	23.0	28.18	36.50
34.16	37.36	23.9	58.72	44.63	23.9	52.40	55.85	23.9	50.17	24.75	24.0	28.13	36.15
34.35	37.02	24.9	59.14	44.42	24.9	52.66	55.49	24.9	50.93	24.46	25.0	28.09	35.79
34.57	36.72	25.9	59.52	44.18	25.9	53.04	55.15	25.9	51.59	24.14	26.0	28.06	35.44
34.79	36.43	26.9	59.90	43.90	26.9	53.49	54.83	26.9	52.21	23.81	27.0	28.04	35.09
35.01	36.19	27.9	60.30	43.62	27.9	53.97	54.54	27.9	52.84	23.45	28.0	28.04	34.75
35.24	35.95	28.9	60.72	43.33	28.9	54.45	54.26	28.9	53.54	23.09	29.0	28.04	34.45
35.44	35.72	29.9	61.19	43.04	29.9	54.88	54.01	29.9	54.33	22.72	30.0	28.04	34.17
35.64	35.49	30.9	61.69	42.76	30.9	55.27	53.77	30.9	55.24	22.35	31.0	28.04	33.91
35.82	35.26	31.9	62.23	42.49	31.9	55.64	53.50	31.9	56.28	21.99	32.0	28.03	33.63
6.92	+16.89		24.52	−24.50		58.24	+58.23		73.87	−73.86		7.39	+7.33
7h 59m 1s.307			18h 6m 11s.893			19h 2m 39s.624			19h 27m 42s.218			20h 48m 40s.494	
6° 36′ 51″.17			−87° 39′ 51″.82			+89° 1′ 2″.17			−89° 13′ 28″.57			+82° 13′ 29″.86	

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

λ Octantis. Mag. 5.4			υ Octantis. Mag. 5.7			β Octantis. Mag. 4.3			39 H. Cephei. Mag. 5.6			γ¹ Oct Mag.
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.
	h m s	° ′ ″		h m s	° ′ ″		h m s	° ′ ″		h m s	° ′ ″	
Jan.	21 38	−83 6	Jan.	22 15	−86 23	Jan.	22 37	−81 49	Jan.	23 27	+86 51	Jan.
	s	″		s	″		s	″		s	″	
1.1	15.83	17.67	1.1	62.64	39.06	1.2	37.43	14.78	1.2	32.94	24.28	1.2
2.1	15.72	17.36	2.1	62.36	38.78	2.2	37.30	14.53	2.2	32.61	24.23	2.2
3.1	15.61	17.03	3.1	62.09	38.46	3.2	37.18	14.27	3.2	32.29	24.19	3.2
4.1	15.52	16.69	4.1	61.86	38.15	4.2	37.08	14.00	4.2	31.95	24.15	4.2
5.1	15.45	16.36	5.1	61.64	37.83	5.2	36.97	13.72	5.2	31.59	24.11	5.2
6.1	15.39	16.02	6.1	61.44	37.52	6.1	36.87	13.44	6.2	31.22	24.06	6.2
7.1	15.33	15.70	7.1	61.26	37.22	7.1	36.79	13.17	7.2	30.83	24.01	7.2
8.1	15.28	15.40	8.1	61.10	36.93	8.1	36.72	12.91	8.2	30.42	23.94	8.2
9.1	15.23	15.11	9.1	60.94	36.65	9.1	36.64	12.65	9.2	30.01	23.85	9.2
10.1	15.17	14.82	10.1	60.77	36.37	10.1	36.56	12.41	10.2	29.60	23.73	10.2
11.1	15.11	14.53	11.1	60.60	36.10	11.1	36.48	12.17	11.2	29.20	23.60	11.2
12.1	15.05	14.24	12.1	60.43	35.83	12.1	36.39	11.93	12.2	28.82	23.45	12.2
13.1	14.97	13.95	13.1	60.24	35.55	13.1	36.30	11.69	13.2	28.45	23.28	13.2
14.1	14.90	13.64	14.1	60.03	35.26	14.1	36.19	11.42	14.2	28.12	23.11	14.2
15.1	14.82	13.33	15.1	59.82	34.95	15.1	36.09	11.16	15.2	27.79	22.96	15.2
16.1	14.74	13.00	16.1	59.61	34.64	16.1	35.99	10.87	16.2	27.51	22.81	16.2
17.1	14.68	12.63	17.1	59.40	34.31	17.1	35.88	10.56	17.2	27.22	22.67	17.2
18.1	14.62	12.26	18.1	59.22	33.94	18.1	35.79	10.24	18.2	26.93	22.57	18.2
19.1	14.59	11.87	19.1	59.07	33.56	19.1	35.73	9.90	19.1	26.63	22.46	19.2
20.1	14.57	11.47	20.1	58.95	33.19	20.1	35.66	9.53	20.1	26.31	22.33	20.2
21.1	14.56	11.09	21.1	58.86	32.80	21.1	35.61	9.16	21.1	25.98	22.21	21.2
22.1	14.57	10.73	22.1	58.78	32.42	22.1	35.58	8.82	22.1	25.61	22.08	22.2
23.1	14.57	10.39	23.1	58.73	32.09	23.1	35.54	8.48	23.1	25.23	21.91	23.2
24.1	14.57	10.05	24.1	58.65	31.77	24.1	35.50	8.17	24.1	24.86	21.72	24.1
25.1	14.56	9.73	25.1	58.56	31.45	25.1	35.45	7.89	25.1	24.51	21.49	25.1
26.1	14.53	9.42	26.1	58.43	31.13	26.1	35.39	7.60	26.1	24.19	21.26	26.1
27.1	14.49	9.09	27.1	58.31	30.81	27.1	35.31	7.31	27.1	23.90	21.02	27.1
28.0	14.45	8.73	28.1	58.16	30.46	28.1	35.23	7.00	28.1	23.65	20.79	28.1
29.0	14.41	8.37	29.1	58.01	30.10	29.1	35.15	6.67	29.1	23.41	20.57	29.1
30.0	14.38	7.99	30.1	57.87	29.73	30.1	35.08	6.30	30.1	23.19	20.36	30.1
31.0	14.37	7.57	31.1	57.77	29.33	31.1	35.03	5.94	31.1	22.96	20.17	31.1
32.0	14.37	7.15	32.1	57.70	28.93	32.1	34.98	5.55	32.1	22.72	19.98	32.1
8.33		−8.27	15.89		−15.86	7.03		−6.96	18.24		+18.21	7.64
21h 38m 19s.542			22h 16m 8s.656			22h 37m 39s.016			23h 27m 44s.125			23h 47m
−83° 6′ 6″.99			−86° 23′ 27″.13			−81° 49′ 2″.34			+86° 50′ 58″.89			−82° 28′

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

Cephei. g. 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		
ight scen-ion.	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	° ′
0 56	+85 49	Feb.	1 29	+88 52	Feb.	1 41	−85 11	Feb.	4 10	+85 20	Feb.	5 35	+85 9
s	″		s	″		s	″		s	″		s	″
2.48	11.89	0.2	57.76	11.47	0.2	59.10	32.00	0.3	15.51	34.50	0.4	31.60	47.57
2.24	11.79	1.2	56.84	11.41	1.2	58.81	31.81	1.3	15.32	34.64	1.4	31.47	47.79
2.00	11.69	2.2	55.88	11.36	2.2	58.54	31.61	2.3	15.12	34.78	2.4	31.34	48.02
1.75	11.59	3.2	54.86	11.31	3.2	58.29	31.41	3.3	14.93	34.91	3.4	31.21	48.26
1.47	11.46	4.2	53.79	11.24	4.2	58.04	31.21	4.3	14.70	35.05	4.4	31.05	48.50
1.20	11.34	5.2	52.68	11.18	5.2	57.81	31.00	5.3	14.46	35.20	5.4	30.88	48 74
0.91	11.20	6.2	51.56	11.09	6.2	57.58	30.80	6.3	14.20	35.35	6.4	30.70	48.99
0.63	11.04	7.2	50.43	10.97	7.2	57.36	30.61	7.3	13.93	35.49	7.3	30.50	49.22
0.35	10.86	8.2	49.32	10.84	8.2	57.12	30.43	8.3	13.67	35.58	8.3	30.29	49.42
0.09	10.66	9.2	48.24	10.67	9.2	56.89	30.25	9.3	13.39	35.66	9.3	30.07	49.62
9.85	10.44	10.2	47.23	10.50	10.2	56.66	30.09	10.3	13.12	35.72	10.3	29.84	49.77
9.61	10.22	11.2	46.28	10.32	11.2	56.41	29.92	11.3	12.85	35.76	11.3	29.62	49.93
9.40	10.01	12.2	45.41	10.15	12.2	56.14	29.74	12.3	12.60	35.77	12.3	29.40	50.08
9.20	9.82	13.2	44.59	9.97	13.2	55.87	29.55	13.3	12.37	35.79	13.3	29.20	50.22
9.03	9.62	14.2	43.80	9.82	14.2	55.60	29.31	14.3	12.15	35.81	14.3	29.01	50.33
8.85	9.44	15.2	43.04	9.69	15.2	55.33	29.09	15.3	11.95	35.85	15.3	28.83	50.46
8.66	9.28	16.2	42.23	9.56	16.2	55.09	28.82	16.3	11.74	35.90	16.3	28.69	50.61
8.47	9.13	17.2	41.38	9.45	17.2	54.84	28.53	17.3	11.54	35.98	17.3	28.51	50.78
8.24	8.97	18.2	40.48	9.33	18.2	54.63	28.22	18.3	11.31	36.07	18.3	28.34	50.95
8.00	8.79	19.1	39.50	9.19	19.2	54.44	27.91	19.3	11.07	36.15	19.3	28.15	51.14
7.76	8.57	20.1	38.49	9.03	20.2	54.24	27.63	20.3	10.80	36.22	20.3	27.92	51.32
7.52	8.34	21.1	37.49	8.85	21.2	54.06	27.38	21.3	10.52	36.27	21.3	27.68	51.47
7.29	8.07	22.1	36.53	8.61	22.1	53.86	27.14	22.3	10.22	36.28	22.3	27.43	51.61
7.09	7.79	23.1	35.66	8.38	23.1	53.64	26.91	23.2	9.94	36.25	23.3	27.17	51.71
6.91	7.51	24.1	34.88	8.13	24.1	53.42	26.68	24.2	9.67	36.19	24.3	26.92	51.79
6.77	7.24	25.1	34.19	7.89	25.1	53.19	26.44	25.2	9.42	36.13	25.3	26.68	51.84
6.63	7.00	26.1	33.56	7.64	26.1	52.95	26.17	26.2	9.18	36.08	26.3	26.45	51.89
6.50	6.75	27.1	32.94	7.44	27.1	52.71	25.91	27.2	8.96	36.04	27.3	26.24	51.94
6.37	6.52	28.1	32.33	7.24	28.1	52.48	25.59	28.2	8.74	36.00	28.3	26.04	52.00
6.24	6.29	29.1	31.69	7.02	29.1	52.27	25.26	29.2	8.53	35.98	29.3	25.83	52.08
6.09	6.05	30.1	31.00	6.82	30.1	52.07	24.93	30.2	8.30	35.95	30.3	25.63	52.16
5.92	5.80	31.1	30.27	6.61	31.1	51.88	24.60	31.2	8.07	35.94	31.3	25.40	52.26
+13.68		50.68	+50.67		11.93	−11.89		12.32	+12.28		11.86	+11.82	
57m 9s.300		1h 30m 13s.156			1h 42m 2s.339			4h 10m 2s.561			5h 35m 12s.782		
48′ 45″.30		+88° 51′ 43″.55			−85° 11′ 21″.46			+85° 20′ 10″.34			+85° 9′ 30″.24		

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. Octan Mag. 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 Ascen sion.
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m
Feb.	5 46	−84 49	Feb.	6 46	−80 43	Feb.	7 2	+87 11	Feb.	7 13	+82 34	Feb.	7 16
	s	″		s	″		s	″		s	″		s
0.4	20.59	57.30	0.4	63.41	46.99	0.4	42.24	2.81	0.4	57.81	36.35	0.4	33.22
1.4	20.34	57.54	1.4	63.32	47.32	1.4	42.15	3.08	1.4	57.78	36.62	1.4	32.95
2.4	20.10	57.75	2.4	63.22	47.63	2.4	42.04	3.36	2.4	57.77	36.90	2.4	32.67
3.4	19.85	57.95	3.4	63.11	47.92	3.4	41.94	3.65	3.4	57.74	37.18	3.4	32.37
4.4	19.60	58.13	4.4	63.01	48.18	4.4	41.82	3.96	4.4	57.71	37.49	4.4	32.07
5.4	19.37	58.30	5.4	62.90	48.43	5.4	41.67	4.28	5.4	57.67	37.80	5.4	31.78
6.4	19.13	58.47	6.4	62.80	48.67	6.4	41.49	4.61	6.4	57.62	38.12	6.4	31.49
7.4	18.91	58.64	7.4	62.69	48.92	7.4	41.29	4.92	7.4	57.55	38.43	7.4	31.21
8.4	18.68	58.80	8.4	62.59	49.17	8.4	41.06	5.23	8.4	57.47	38.72	8.4	30.94
9.4	18.47	58.98	9.4	62.49	49.43	9.4	40.80	5.52	9.4	57.38	39.01	9.4	30.68
10.3	18.24	59.16	10.4	62.39	49.70	10.4	40.53	5.79	10.4	57.29	39.28	10.4	30.42
11.3	18.01	59.37	11.4	62.28	49.97	11.4	40.25	6.03	11.4	57.20	39.53	11.4	30.16
12.3	17.77	59.58	12.4	62.18	50.27	12.4	39.98	6.26	12.4	57.10	39.76	12.4	29.89
13.3	17.52	59.79	13.4	62.07	50.57	13.4	39.73	6.48	13.4	57.02	39.99	13.4	29.58
14.3	17.25	60.00	14.4	61.95	50.87	14.4	39.50	6.69	14.4	56.94	40.20	14.4	29.26
15.3	16.97	60.19	15.4	61.83	51.16	15.4	39.30	6.90	15.4	56.87	40.41	15.4	28.90
16.3	16.69	60.34	16.4	61.70	51.41	16.4	39.10	7.12	16.4	56.81	40.64	16.4	28.53
17.3	16.40	60.49	17.4	61.56	51.64	17.4	38.91	7.36	17.4	56.75	40.88	17.4	28.13
18.3	16.11	60.60	18.4	61.42	51.85	18.4	38.71	7.62	18.4	56.70	41.14	18.4	27.73
19.3	15.83	60.69	19.4	61.29	52.05	19.4	38.49	7.89	19.4	56.62	41.40	19.4	27.34
20.3	15.56	60.77	20.4	61.16	52.24	20.4	38.22	8.17	20.4	56.54	41.69	20.4	26.97
21.3	15.31	60.86	21.4	61.03	52.42	21.4	37.92	8.44	21.4	56.43	41.97	21.4	26.62
22.3	15.06	60.96	22.4	60.90	52.61	22.4	37.58	8.68	22.4	56.30	42.22	22.4	26.28
23.3	14.81	61.09	23.4	60.78	52.81	23.4	37.22	8.89	23.4	56.18	42.44	23.4	25.95
24.3	14.55	61.22	24.4	60.66	53.04	24.4	36.85	9.09	24.4	56.04	42.64	24.4	25.61
25.3	14.28	61.36	25.4	60.53	53.29	25.4	36.50	9.27	25.4	55.91	42.83	25.4	25.26
26.3	14.01	61.51	26.3	60.41	53.54	26.4	36.17	9.42	26.4	55.80	42.98	26.4	24.90
27.3	13.72	61.65	27.3	60.27	53.79	27.4	35.85	9.57	27.4	55.70	43.13	27.4	24.52
28.3	13.43	61.76	28.3	60.13	54.00	28.4	35.56	9.73	28.4	55.60	43.28	28.4	24.11
29.3	13.14	61.87	29.3	59.98	54.20	29.4	35.27	9.90	29.4	55.49	43.45	29.4	23.68
30.3	12.84	61.93	30.3	59.83	54.39	30.3	34.98	10.08	30.4	55.40	43.64	30.4	23.24
31.3	12.54	61.99	31.3	59.69	54.54	31.3	34.67	10.26	31.4	55.29	43.84	31.4	22.81
11.10	−11.06		6.21	−6.13		20.36	+20.34		7.74	+7.68		18.52	−1
5^h	46^m	$14^s.756$	6^h	46^m	$58^s.546$	7^h	2^m	$4^s.048$	7^h	13^m	$42^s.294$	7^h	16^m 2
−84°	49′	46″.89	−80°	43′	38″.16	+87°	10′	54″.74	+82°	34′	30″.13	−86°	54′

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

ridge 1119. ag. 7.0		ζ Octantis. Mag. 5.4			1 H. Draconis. Mag. 4.6			ζ Chamæleontis. Mag. 5.2			30 H. Camelop. Mag. 5.3		
Right scen-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	° ′
8 17	+88 52	Feb.	9 9	−85 19	Feb.	9 25	+81 41	Feb.	9 36	−80 34	Feb.	10 21	+82 58
s	″		s	″		s	″		s	″		s	″
7.01	59.48	0.5	8.74	59.61	0.5	35.46	31.70	0.5	28.47	8.11	0.6	19.22	38.21
7.05	59.75	1.5	8.72	60.04	1.5	35.51	31.94	1.5	28.48	8.55	1.6	19.32	38.43
7.11	60.06	2.5	8.69	60.45	2.5	35.57	32.21	2.5	28.49	8.98	2.6	19.42	38.66
7.16	60.37	3.5	8.64	60.85	3.5	35.64	32.49	3.5	28.49	9.39	3.6	19.53	38.91
7.19	60.70	4.5	8.58	61.22	4.5	35.69	32.79	4.5	28.49	9.77	4.6	19.63	39.17
7.18	61.03	5.5	8.52	61.58	5.5	35.74	33.10	5.5	28.49	10.16	5.6	19.73	39.44
7.10	61.40	6.5	8.46	61.94	6.5	35.79	33.41	6.5	28.48	10.52	6.6	19.83	39.75
6.94	61.74	7.5	8.40	62.29	7.5	35.82	33.74	7.5	28.47	10.88	7.5	19.92	40.06
6.71	62.08	8.5	8.35	62.64	8.5	35.84	34.08	8.5	28.46	11.23	8.5	19.98	40.38
6.42	62.42	9.5	8.30	63.00	9.5	35.85	34.41	9.5	28.45	11.60	9.5	20.03	40.70
6.07	62.74	10.5	8.26	63.36	10.5	35.85	34.73	10.5	28.46	11.96	10.5	20.08	41.02
5.70	63.04	11.5	8.23	63.74	11.5	35.84	35.05	11.5	28.46	12.34	11.5	20.12	41.32
5.30	63.33	12.5	8.19	64.11	12.5	35.83	35.34	12.5	28.46	12.75	12.5	20.15	41.61
4.92	63.60	13.5	8.15	64.53	13.5	35.82	35.62	13.5	28.46	13.15	13.5	20.18	41.89
4.59	63.85	14.5	8.09	64.94	14.5	35.82	35.88	14.5	28.45	13.58	14.5	20.21	42.16
4.31	64.11	15.5	8.00	65.37	15.5	35.84	36.14	15.5	28.44	14.02	15.5	20.26	42.41
4.09	64.38	16.5	7.90	65.79	16.5	35.86	36.40	16.5	28.41	14.46	16.5	20.31	42.65
3.90	64.65	17.5	7.78	66.19	17.5	35.89	36.67	17.5	28.38	14.88	17.5	20.38	42.91
3.68	64.96	18.5	7.64	66.57	18.5	35.91	36.94	18.5	28.34	15.27	18.5	20.45	43.20
3.43	65.27	19.5	7.50	66.93	19.5	35.92	37.26	19.5	28.30	15.64	19.5	20.51	43.50
3.09	65.58	20.5	7.37	67.26	20.5	35.93	37.59	20.5	28.25	16.00	20.5	20.56	43.82
2.66	65.90	21.5	7.25	67.59	21.5	35.93	37.93	21.5	28.21	16.35	21.5	20.60	44.15
2.12	66.23	22.5	7.15	67.92	22.5	35.90	38.26	22.5	28.16	16.71	22.5	20.60	44.49
1.51	66.52	23.5	7.05	68.27	23.5	35.86	38.59	23.5	28.13	17.07	23.5	20.61	44.83
0.84	66.78	24.5	6.95	68.63	24.5	35.82	38.89	24.5	28.11	17.45	24.5	20.60	45.15
0.18	67.02	25.5	6.85	69.01	25.5	35.77	39.17	25.5	28.08	17.84	25.5	20.58	45.45
19.55	67.26	26.4	6.75	69.40	26.5	35.72	39.43	26.5	28.05	18.25	26.5	20.57	45.73
18.97	67.48	27.4	6.63	69.81	27.5	35.68	39.68	27.5	28.02	18.67	27.5	20.55	46.02
18.41	67.70	28.4	6.50	70.20	28.5	35.65	39.94	28.5	27.98	19.08	28.5	20.55	46.29
17.89	67.94	29.4	6.35	70.58	29.5	35.62	40.19	29.5	27.94	19.48	29.5	20.55	46.56
17.38	68.21	30.4	6.18	70.95	30.5	35.60	40.47	30.5	27.88	19.86	30.5	20.57	46.84
16.87	68.46	31.4	6.01	71.29	31.4	35.58	40.75	31.5	27.82	20.24	31.5	20.58	47.15
	+51.36		12.30	−12.25		6.92	+6.85		6.10	−6.02		8.18	+8.12
	15m 48s.380		9h	8m 57s.938		9h 25m	21s.719		9h 36m	22s.347		10h 21m	4s.831
	53′ 0″.29		−85°	19′ 57″.45		+81°	41′ 41″.50		−80°	34′ 6″.83		+82°	58′ 5A″.07

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. *seq.* Mag. 5.3			κ Octa Mag.
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.
	h m s	° ′ ″		h m s	° ′ ″		h m s	° ′ ″		h m s	° ′ ″		h m s
Feb.	11 0	−84 8	Feb.	12 14	+88 9	Feb.	12 46	−84 40	Feb.	12 48	+83 51	Feb.	13 27
0.6	3.84	47.38	0.6	58.47	11.07	0.7	14.36	14.59	0.7	38.02	23.37	0.7	21.37
1.6	3.95	47.78	1.6	59.01	11.22	1.7	14.61	14.87	1.7	38.20	23.46	1.7	21.68
2.6	4.05	48.17	2.6	59.57	11.36	2.7	14.84	15.17	2.7	38.38	23.55	2.7	21.97
3.6	4.14	48.56	3.6	60.16	11.49	3.7	15.03	15.47	3.7	38.58	23.64	3.7	22.24
4.6	4.22	48.95	4.6	60.76	11.66	4.7	15.22	15.76	4.7	38.79	23.75	4.7	22.49
5.6	4.28	49.32	5.6	61.37	11.85	5.7	15.40	16.06	5.7	38.99	23.88	5.7	22.73
6.6	4.34	49.68	6.6	61.96	12.05	6.7	15.59	16.34	6.7	39.20	24.03	6.7	22.97
7.6	4.40	50.03	7.6	62.54	12.26	7.7	15.76	16.62	7.7	39.40	24.19	7.7	23.21
8.6	4.49	50.36	8.6	63.09	12.49	8.6	15.93	16.87	8.6	39.58	24.37	8.7	23.44
9.6	4.56	50.70	9.6	63.59	12.73	9.6	16.11	17.12	9.6	39.75	24.57	9.7	23.67
10.6	4.64	51.05	10.6	64.06	12.98	10.6	16.29	17.37	10.6	39.91	24.78	10.7	23.92
11.6	4.72	51.41	11.6	64.48	13.24	11.6	16.49	17.64	11.6	40.06	25.00	11.7	24.19
12.6	4.81	51.78	12.6	64.87	13.49	12.6	16.70	17.93	12.6	40.21	25.22	12.7	24.46
13.6	4.91	52.16	13.6	65.24	13.72	13.6	16.92	18.23	13.6	40.34	25.42	13.7	24.75
14.6	5.00	52.58	14.6	65.60	13.93	14.6	17.14	18.55	14.6	40.48	25.60	14.7	25.04
15.6	5.06	53.01	15.6	65.98	14.14	15.6	17.34	18.89	15.6	40.62	25.77	15.7	25.32
16.6	5.12	53.44	16.6	66.40	14.34	16.6	17.54	19.26	16.6	40.78	25.92	16.7	25.59
17.5	5.16	53.89	17.6	66.86	14.54	17.6	17.72	19.63	17.6	40.94	26.07	17.7	25.84
18.5	5.17	54.31	18.6	67.34	14.73	18.6	17.87	20.00	18.6	41.11	26.24	18.6	26.06
19.5	5.19	54.70	19.6	67.84	14.96	19.6	18.01	20.35	19.6	41.29	26.42	19.6	26.26
20.5	5.20	55.08	20.6	68.33	15.20	20.6	18.14	20.69	20.6	41.47	26.61	20.6	26.45
21.5	5.22	55.44	21.6	68.77	15.48	21.6	18.26	21.02	21.6	41.62	26.84	21.6	26.64
22.5	5.25	55.80	22.6	69.16	15.77	22.6	18.40	21.32	22.6	41.77	27.11	22.6	26.85
23.5	5.28	56.17	23.6	69.49	16.07	23.6	18.54	21.63	23.6	41.90	27.38	23.6	27.06
24.5	5.33	56.53	24.6	69.77	16.37	24.6	18.72	21.93	24.6	42.00	27.66	24.6	27.29
25.5	5.37	56.92	25.6	70.00	16.66	25.6	18.90	22.24	25.6	42.10	27.93	25.6	27.54
26.5	5.42	57.31	26.6	70.22	16.94	26.6	19.07	22.58	26.6	42.19	28.17	26.6	27.79
27.5	5.46	57.75	27.6	70.44	17.18	27.6	19.24	22.95	27.6	42.29	28.40	27.6	28.04
28.5	5.49	58.18	28.6	70.68	17.45	28.6	19.40	23.32	28.6	42.40	28.62	28.6	28.27
29.5	5.50	58.61	29.6	70.96	17.71	29.6	19.55	23.70	29.6	42.51	28.84	29.6	28.50
30.5	5.49	59.04	30.6	71.27	17.97	30.6	19.69	24.09	30.6	42.64	29.07	30.6	28.70
31.5	5.48	59.46	31.6	71.58	18.23	31.6	19.79	24.49	31.6	42.77	29.31	31.6	28.88
9.81		−9.76	31.04		+31.02	10.77		−10.72	9.35		+9.29	12.36	−
10^h	59^m	55ˢ.280	12^h	14^m	28ˢ.425	12^h	46^m	7ˢ.152	12^h	48^m	30ˢ.418	13^h	27^m
−84°	8′	50″.60	+88°	9′	36″.08	−84°	40′	22″.34	+83°	51′	50″.47	−85°	21′

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

...antis. ...4.1		Groombridge 2283. Mag. 7.2			ρ Octantis. Mag. 5.7			ϵ Ursæ Minoris. Mag. 4.4			59 G. Apodis. Mag. 5.9		
ght ...sen- ...n.	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.
m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	° ′
13	−83 17	Feb.	15 3	+87 32	Feb.	15 23	−84 11	Feb.	16 54	+82 10	Feb.	17 15	−80 46
s	″		s	″		s	″		s	″		s	″
.69	11.01	0.8	32.53	42.60	0.8	58.62	19.39	0.8	17.79	10.57	0.9	54.32	56.84
.93	11.18	1.8	32.98	42.52	1.8	58.91	19.42	1.8	17.90	10.37	1.9	54.49	56.69
.15	11.36	2.8	33.45	42.45	2.8	59.19	19.48	2.8	18.03	10.14	2.8	54.66	56.56
.37	11.54	3.8	33.95	42.37	3.8	59.46	19.54	3.8	18.16	9.93	3.8	54.83	56.44
.57	11.72	4.8	34.47	42.29	4.8	59.71	19.60	4.8	18.30	9.71	4.8	54.99	56.34
.76	11.90	5.8	35.01	42.23	5.8	59.96	19.68	5.8	18.44	9.50	5.8	55.14	56.25
.95	12.07	6.7	35.56	42.18	6.8	60.20	19.76	6.8	18.59	9.29	6.8	55.29	56.15
.13	12.25	7.7	36.11	42.15	7.8	60.43	19.81	7.8	18.74	9.09	7.8	55.42	56.06
.32	12.39	8.7	36.66	42.14	8.8	60.67	19.87	8.8	18.91	8.91	8.8	55.56	55.96
.51	12.53	9.7	37.21	42.17	9.8	60.90	19.91	9.8	19.06	8.77	9.8	55.70	55.82
.69	12.68	10.7	37.73	42.20	10.8	61.14	19.95	10.8	19.21	8.63	10.8	55.84	55.69
.91	12.83	11.7	38.22	42.25	11.7	61.40	19.98	11.8	19.37	8.53	11.8	55.98	55.55
.13	13.00	12.7	38.69	42.31	12.7	61.66	20.01	12.8	19.52	8.43	12.8	56.15	55.42
.35	13.17	13.7	39.15	42.36	13.7	61.93	20.07	13.8	19.66	8.32	13.8	56.32	55.28
.57	13.36	14.7	39.58	42.41	14.7	62.22	20.15	14.8	19.80	8.23	14.8	56.49	55.15
.80	13.60	15.7	40.00	42.43	15.7	62.51	20.23	15.8	19.94	8.13	15.8	56.68	55.05
.02	13.86	16.7	40.46	42.43	16.7	62.80	20.37	16.8	20.07	8.00	16.8	56.87	54.99
.22	14.12	17.7	40.92	42.43	17.7	63.08	20.53	17.8	20.22	7.87	17.8	57.06	54.93
.42	14.38	18.7	41.43	42.43	18.7	63.35	20.70	18.8	20.36	7.72	18.8	57.25	54.90
.60	14.64	19.7	41.95	42.43	19.7	63.59	20.86	19.8	20.53	7.56	19.8	57.42	54.89
.77	14.88	20.7	42.49	42.47	20.7	63.83	21.01	20.8	20.69	7.42	20.8	57.58	54.86
.93	15.12	21.7	43.04	42.54	21.7	64.05	21.14	21.8	20.86	7.32	21.8	57.73	54.83
.09	15.32	22.7	43.56	42.64	22.7	64.27	21.26	22.8	21.04	7.25	22.8	57.88	54.78
.27	15.52	23.7	44.06	42.77	23.7	64.51	21.37	23.8	21.20	7.20	23.8	58.02	54.71
.46	15.72	24.7	44.53	42.90	24.7	64.75	21.47	24.8	21.36	7.16	24.8	58.17	54.62
.65	15.94	25.7	44.96	43.03	25.7	65.01	21.55	25.8	21.51	7.16	25.8	58.34	54.54
.86	16.16	26.7	45.38	43.16	26.7	65.28	21.67	26.8	21.66	7.16	26.8	58.52	54.45
.06	16.41	27.7	45.78	43.28	27.7	65.55	21.80	27.8	21.81	7.12	27.8	58.71	54.40
.27	16.69	28.7	46.19	43.38	28.7	65.83	21.97	28.8	21.96	7.09	28.8	58.90	54.37
.46	16.98	29.7	46.60	43.48	29.7	66.10	22.16	29.8	22.11	7.06	29.8	59.08	54.36
.64	17.29	30.7	47.05	43.58	30.7	66.36	22.35	30.8	22.27	7.02	30.8	59.27	54.37
.81	17.59	31.7	47.51	43.69	31.7	66.60	22.56	31.8	22.44	6.97	31.8	59.45	54.38
	−8.50		23.35	+23.32		9.88	−9.83		7.34	+7.27		6.24	−6.16
^{m}	$27^s.793$		15^h 3^m	$41^s.175$		15^h 23^m	$56^s.594$		16^h 54^m	$25^s.488$		17^h 15^m	$54^s.896$
′	″.03		+87° 33′	10″.52		−84° 11′	30″.39		+82° 10′	32″.75		−80° 47′	6″.56

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 Drac Mag.	
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 Ascen sion.
	h m s	° ′ ″		h m s	° ′ ″		h m s	° ′ ″		h m s	° ′ ″		h m s
Feb.	17 58	+86 36	Feb.	18 6	−87 39	Feb.	19 0	+89 0	Feb.	19 26	−89 13	Feb.	20 4
	s	″		s	″		s	″		s	″		s
0.9	35.82	35.26	0.9	2.23	42.49	0.9	55.64	53.50	0.9	56.28	21.99	1.0	28.0
1.9	36.01	35.01	1.9	2.79	42.25	1.9	55.97	53.22	1.9	57.39	21.64	1.9	28.0
2.9	36.20	34.74	2.9	3.35	42.03	2.9	56.32	52.93	2.9	58.56	21.30	2.9	28.0
3.9	36.42	34.46	3.9	3.90	41.83	3.9	56.71	52.61	3.9	59.74	20.98	3.9	27.9
4.9	36.64	34.18	4.9	4.42	41.63	4.9	57.14	52.28	4.9	60.91	20.70	4.9	27.9
5.9	36.88	33.91	5.9	4.95	41.44	5.9	57.63	51.95	5.9	62.05	20.42	5.9	27.9
6.9	37.15	33.64	6.9	5.46	41.27	6.9	58.21	51.63	6.9	63.14	20.14	6.9	27.9
7.9	37.42	33.39	7.9	5.94	41.09	7.9	58.85	51.33	7.9	64.19	19.86	7.9	27.9
8.9	37.72	33.14	8.9	6.42	40.90	8.9	59.57	51.03	8.9	65.20	19.58	8.9	28.0
9.9	38.02	32.91	9.9	6.89	40.71	9.9	60.34	50.75	9.9	66.18	19.30	9.9	28.0
10.9	38.32	32.71	10.9	7.37	40.48	10.9	61.15	50.48	10.9	67.17	18.99	10.9	28.0
11.9	38.62	32.52	11.9	7.87	40.26	11.9	61.95	50.24	11.9	68.19	18.67	11.9	28.1
12.9	38.92	32.34	12.9	8.40	40.04	12.9	62.74	50.00	12.9	69.28	18.34	12.9	28.1
13.8	39.20	32.19	13.9	8.97	39.82	13.9	63.47	49.79	13.9	70.48	18.00	13.9	28.2
14.8	39.47	32.05	14.9	9.58	39.59	14.9	64.16	49.58	14.9	71.81	17.67	14.9	28.2
15.8	39.72	31.86	15.8	10.23	39.39	15.9	64.78	49.35	15.9	73.26	17.35	15.9	28.2
16.8	39.96	31.68	16.8	10.88	39.21	16.9	65.38	49.11	16.9	74.82	17.07	16.9	28.3
17.8	40.22	31.48	17.8	11.55	39.07	17.9	65.97	48.86	17.9	76.42	16.79	17.9	28.3
18.8	40.49	31.25	18.8	12.21	38.94	18.9	66.62	48.59	18.9	78.01	16.54	18.9	28.3
19.8	40.79	31.02	19.8	12.82	38.84	19.9	67.35	48.32	19.9	79.53	16.31	19.9	28.3
20.8	41.11	30.82	20.8	13.40	38.73	20.9	68.19	48.04	20.9	80.97	16.09	20.9	28.4
21.8	41.45	30.62	21.8	13.96	38.60	21.9	69.13	47.79	21.9	82.30	15.86	21.9	28.4
22.8	41.81	30.47	22.8	14.48	38.47	22.9	70.14	47.54	22.9	83.57	15.61	22.9	28.5
23.8	42.17	30.33	23.8	15.03	38.33	23.9	71.17	47.33	23.9	84.82	15.34	23.9	28.6
24.8	42.51	30.23	24.8	15.58	38.15	24.9	72.22	47.14	24.9	86.10	15.07	24.9	28.6
25.8	42.86	30.14	25.8	16.18	37.97	25.9	73.24	46.97	25.9	87.45	14.77	25.9	28.7
26.8	43.18	30.05	26.8	16.80	37.80	26.9	74.20	46.81	26.9	88.91	14.48	26.9	28.8
27.8	43.49	29.96	27.8	17.46	37.65	27.9	75.11	46.64	27.9	90.49	14.20	27.9	28.9
28.8	43.80	29.86	28.8	18.14	37.50	28.9	76.00	46.48	28.9	92.15	13.92	28.9	29.0
29.8	44.11	29.76	29.8	18.83	37.39	29.8	76.87	46.31	29.9	93.86	13.68	29.9	29.0
30.8	44.42	29.62	30.8	19.50	37.31	30.8	77.75	46.12	30.9	95.59	13.46	30.9	29.1
31.8	44.74	29.49	31.8	20.16	37.25	31.8	78.67	45.92	31.9	97.30	13.26	31.9	29.2
16.91		+16.88	24.50		−24.48	58.10		+58.09	73.60		−73.59	7.39	
17h	59m	1s.307	18h	6m	11s.893	19h	2m	39s.624	19h	27m	42s.218	20h	48m
+86°	36′	51″.17	−87°	39′	51″.82	+89°	1′	2″.17	−89°	13′	28″.57	+82°	13′

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

ctantis. g. 5.4		υ Octantis. Mag. 5.7			β Octantis. Mag. 4.3			39 H. Cephei. Mag. 5.6			γ^1 Octantis. Mag. 5.1		
ight scen-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	° ′
1 38	−83 5	Feb.	22 15	−86 23	Feb.	22 37	−81 48	Feb.	23 27	+86 51	Feb.	23 47	−82 28
s	″		s	″		s	″		s	″		s	″
4.37	67.15	1.1	57.70	28.93	1.1	34.98	65.55	1.1	22.72	19.98	1.1	12.58	54.81
4.38	66.76	2.1	57.64	28.52	2.1	34.94	65.17	2.1	22.46	19.78	2.1	12.48	54.48
4.41	66.37	3.1	57.60	28.14	3.1	34.92	64.78	3.1	22.19	19.59	3.1	12.39	54.16
4.44	66.00	4.1	57.58	27.76	4.1	34.90	64.42	4.1	21.91	19.36	4.1	12.31	53.84
4.47	65.64	5.1	57.57	27.38	5.1	34.88	64.05	5.1	21.62	19.12	5.1	12.24	53.52
4.50	65.30	6.0	57.56	27.02	6.1	34.87	63.73	6.1	21.33	18.88	6.1	12.17	53.21
4.53	64.96	7.0	57.53	26.68	7.1	34.84	63.40	7.1	21.05	18.60	7.1	12.09	52.92
4.54	64.63	8.0	57.50	26.34	8.1	34.81	63.08	8.1	20.78	18.33	8.1	12.01	52.63
4.55	64.31	9.0	57.47	26.01	9.1	34.79	62.76	9.1	20.55	18.04	9.1	11.94	52.34
4.56	63.97	10.0	57.42	25.67	10.1	34.75	62.44	10.1	20.34	17.73	10.1	11.84	52.04
4.57	63.63	11.0	57.36	25.31	11.1	34.71	62.09	11.1	20.15	17.41	11.1	11.74	51.75
4.57	63.26	12.0	57.30	24.93	12.0	34.67	61.73	12.1	19.98	17.13	12.1	11.65	51.43
4.58	62.86	13.0	57.24	24.53	13.0	34.62	61.36	13.1	19.84	16.86	13.1	11.55	51.12
4.61	62.46	14.0	57.20	24.12	14.0	34.61	60.96	14.1	19.70	16.61	14.1	11.46	50.76
4.64	62.04	15.0	57.19	23.70	15.0	34.59	60.55	15.1	19.57	16.36	15.1	11.37	50.38
4.69	61.63	16.0	57.20	23.27	16.0	34.58	60.14	16.1	19.40	16.12	16.1	11.31	49.99
4.77	61.22	17.0	57.26	22.84	17.0	34.59	59.72	17.1	19.23	15.89	17.1	11.25	49.59
4.85	60.81	18.0	57.35	22.42	18.0	34.62	59.30	18.1	19.04	15.66	18.1	11.20	49.20
4.94	60.44	19.0	57.43	22.05	19.0	34.65	58.93	19.1	18.81	15.39	19.1	11.17	48.83
5.03	60.09	20.0	57.52	21.66	20.0	34.67	58.54	20.1	18.61	15.11	20.1	11.14	48.45
5.10	59.75	21.0	57.58	21.30	21.0	34.68	58.20	21.1	18.42	14.79	21.1	11.11	48.11
5.16	59.42	22.0	57.63	20.96	22.0	34.69	57.86	22.1	18.24	14.45	22.1	11.06	47.78
5.20	59.08	23.0	57.65	20.62	23.0	34.69	57.51	23.1	18.11	14.11	23.1	11.00	47.44
5.24	58.71	23.9	57.66	20.25	24.0	34.68	57.15	24.0	18.03	13.79	24.1	10.94	47.10
5.28	58.35	24.9	57.67	19.87	25.0	34.67	56.79	25.0	17.97	13.47	25.1	10.86	46.77
5.34	57.97	25.9	57.70	19.47	26.0	34.67	56.38	26.0	17.92	13.15	26.1	10.78	46.40
5.39	57.57	26.9	57.73	19.06	27.0	34.66	55.98	27.0	17.87	12.88	27.1	10.73	46.01
5.47	57.16	27.9	57.78	18.65	28.0	34.67	55.57	28.0	17.82	12.60	28.1	10.68	45.60
5.56	56.76	28.9	57.87	18.22	29.0	34.70	55.15	29.0	17.75	12.33	29.0	10.64	45.19
5.65	56.38	29.9	57.99	17.79	29.9	34.73	54.74	30.0	17.67	12.05	30.0	10.61	44.78
5.75	56.02	30.9	58.12	17.39	30.9	34.78	54.34	31.0	17.58	11.77	31.0	10.60	44.37
5.87	55.65	31.9	58.25	17.01	31.9	34.83	53.95	32.0	17.48	11.46	32.0	10.59	43.99
	−8.26		15.88	−15.85		7.03	−6.95		18.22	+18.20		7.64	−7.58
8m	19s.542		22h	16m 8s.656		22h	37m 39s.016		23h	27m 44s.125		23h	47m 16s.424
6′	6″.99		−86°	23′ 27″.13		−81°	49′ 2″.34		+86°	50′ 58″.89		−82°	28′ 48″.42

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 Mag. 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.
	h m s	° ′ ″		h m s	° ′ ″		h m s	° ′ ″		h m s	° ′ ″		h m s
Mar.	0 56	+85 48	Mar.	1 29	+88 51	Mar.	1 41	−85 11	Mar.	4 10	+85 20	Mar.	5 35
	s	″		s	″		s	″		s	″		s
0.1	56.37	66.52	0.1	32.33	67.24	0.1	52.48	25.59	0.2	8.74	36.00	0.3	26.04
1.1	56.24	66.29	1.1	31.69	67.02	1.1	52.27	25.26	1.2	8.53	35.98	1.3	25.83
2.1	56.09	66.05	2.1	31.00	66.82	2.1	52.07	24.93	2.2	8.30	35.95	2.3	25.63
3.1	55.92	65.80	3.1	30.27	66.61	3.1	51.88	24.60	3.2	8.07	35.94	3.3	25.40
4.1	55.75	65.56	4.1	29.51	66.39	4.1	51.71	24.26	4.2	7.82	35.93	4.3	25.18
5.1	55.58	65.29	5.1	28.72	66.16	5.1	51.55	23.94	5.2	7.55	35.89	5.3	24.94
6.1	55.40	65.03	6.1	27.93	65.92	6.1	51.40	23.64	6.2	7.27	35.85	6.3	24.67
7.1	55.22	64.74	7.1	27.18	65.65	7.1	51.25	23.34	7.2	7.00	35.79	7.3	24.41
8.1	55.07	64.42	8.1	26.45	65.36	8.1	51.08	23.06	8.2	6.71	35.71	8.3	24.14
9.1	54.93	64.11	9.1	25.79	65.07	9.1	50.91	22.76	9.2	6.44	35.62	9.3	23.86
10.1	54.82	63.78	10.1	25.19	64.78	10.1	50.74	22.47	10.2	6.17	35.49	10.3	23.59
11.1	54.72	63.44	11.1	24.69	64.46	11.1	50.55	22.18	11.2	5.92	35.35	11.3	23.32
12.1	54.63	63.13	12.1	24.25	64.17	12.1	50.37	21.90	12.2	5.68	35.20	12.3	23.06
13.1	54.58	62.83	13.1	23.86	63.89	13.1	50.18	21.60	13.2	5.46	35.06	13.3	22.83
14.1	54.53	62.54	14.1	23.50	63.61	14.1	49.99	21.25	14.2	5.27	34.92	14.3	22.62
15.1	54.48	62.27	15.1	23.14	63.36	15.1	49.80	20.90	15.2	5.07	34.81	15.3	22.42
16.1	54.40	62.03	16.1	22.75	63.11	16.1	49.65	20.52	16.2	4.88	34.70	16.2	22.21
17.1	54.32	61.77	17.1	22.30	62.89	17.1	49.51	20.13	17.2	4.68	34.60	17.2	22.01
18.1	54.22	61.52	18.1	21.78	62.66	18.1	49.40	19.73	18.2	4.45	34.51	18.2	21.79
19.0	54.12	61.26	19.1	21.23	62.40	19.1	49.29	19.36	19.2	4.23	34.42	19.2	21.55
20.0	54.01	60.96	20.1	20.69	62.13	20.1	49.18	19.00	20.2	3.98	34.32	20.2	21.29
21.0	53.91	60.63	21.1	20.18	61.82	21.1	49.07	18.64	21.2	3.73	34.19	21.2	21.01
22.0	53.85	60.29	22.1	19.73	61.48	22.1	48.96	18.33	22.2	3.47	34.01	22.2	20.74
23.0	53.79	59.92	23.1	19.40	61.14	23.1	48.83	18.00	23.2	3.22	33.78	23.2	20.47
24.0	53.78	59.58	24.1	19.15	60.79	24.1	48.68	17.69	24.2	3.01	33.57	24.2	20.23
25.0	53.77	59.25	25.1	19.00	60.45	25.1	48.54	17.38	25.2	2.81	33.35	25.2	19.98
26.0	53.78	58.93	26.1	18.89	60.13	26.1	48.39	17.04	26.2	2.63	33.15	26.2	19.75
27.0	53.79	58.65	27.1	18.79	59.85	27.1	48.24	16.66	27.2	2.46	32.94	27.2	19.56
28.0	53.82	58.37	28.0	18.67	59.58	28.1	48.10	16.27	28.2	2.29	32.76	28.2	19.35
29.0	53.83	58.09	29.0	18.51	59.30	29.1	48.01	15.88	29.2	2.13	32.58	29.2	19.15
30.0	53.82	57.81	30.0	18.31	59.03	30.0	47.91	15.47	30.2	1.96	32.43	30.2	18.95
31.0	53.79	57.53	31.0	18.08	58.77	31.0	47.85	15.07	31.2	1.77	32.26	31.2	18.72
13.71	+13.67		50.60	+50.59		11.92	−11.88		12.32	+12.28		11.86	+1
0^h 57^m	$9^s.300$		1^h 30^m	$13^s.156$		1^h 42^m	$2^s.339$		4^h 10^m	$2^s.561$		5^h 35^m	1
+85° 48′	45″.30		+88° 51′	43″.55		−85° 11′	21″.46		+85° 20′	10″.34		+85° 9′	3

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

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		
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	° ′
5 46	−84 50	Mar.	6 46	−80 43	Mar.	7 2	+87 11	Mar.	7 13	+82 34	Mar.	7 16	−86 54
s	″		s	″		s	″		s	″		s	″
13.43	1.76	0.3	60.13	54.00	0.4	35.56	9.73	0.4	55.60	43.28	0.4	24.11	21.82
13.14	1.87	1.3	59.98	54.20	1.4	35.27	9.90	1.4	55.49	43.45	1.4	23.68	22.06
12.84	1.93	2.3	59.83	54.39	2.3	34.98	10.08	2.4	55.40	43.64	2.4	23.24	22.30
12.54	1.99	3.3	59.69	54.54	3.3	34.67	10.26	3.4	55.29	43.84	3.4	22.81	22.49
12.26	2.02	4.3	59.54	54.69	4.3	34.35	10.46	4.4	55.17	44.05	4.4	22.39	22.68
11.97	2.05	5.3	59.40	54.83	5.3	34.01	10.66	5.3	55.05	44.25	5.3	21.96	22.85
11.70	2.08	6.3	59.26	54.95	6.3	33.64	10.86	6.3	54.92	44.45	6.3	21.55	23.01
11.44	2.11	7.3	59.11	55.08	7.3	33.23	11.06	7.3	54.78	44.66	7.3	21.15	23.18
11.17	2.14	8.3	58.98	55.20	8.3	32.82	11.24	8.3	54.63	44.85	8.3	20.76	23.35
10.91	2.18	9.3	58.84	55.33	9.3	32.39	11.39	9.3	54.47	45.01	9.3	20.38	23.53
10.64	2.23	10.3	58.70	55.49	10.3	31.96	11.53	10.3	54.31	45.16	10.3	20.01	23.72
10.38	2.32	11.3	58.56	55.64	11.3	31.53	11.65	11.3	54.15	45.31	11.3	19.62	23.92
10.10	2.38	12.3	58.43	55.80	12.3	31.11	11.75	12.3	53.99	45.41	12.3	19.21	24.13
9.81	2.45	13.3	58.28	55.96	13.3	30.72	11.82	13.3	53.85	45.50	13.3	18.79	24.34
9.51	2.50	14.3	58.13	56.12	14.3	30.35	11.89	14.3	53.72	45.59	14.3	18.35	24.55
9.20	2.52	15.3	57.97	56.27	15.3	30.01	11.97	15.3	53.59	45.68	15.3	17.88	24.75
8.88	2.53	16.3	57.81	56.38	16.3	29.68	12.07	16.3	53.48	45.79	16.3	17.39	24.91
8.57	2.51	17.3	57.65	56.47	17.3	29.35	12.18	17.3	53.36	45.91	17.3	16.89	25.05
8.28	2.47	18.3	57.49	56.53	18.3	29.00	12.30	18.3	53.24	46.04	18.3	16.40	25.18
7.99	2.41	19.3	57.33	56.59	19.3	28.64	12.43	19.3	53.11	46.18	19.3	15.93	25.28
7.71	2.35	20.3	57.17	56.63	20.3	28.22	12.56	20.3	52.96	46.32	20.3	15.47	25.37
7.45	2.31	21.3	57.02	56.68	21.3	27.77	12.67	21.3	52.79	46.44	21.3	15.04	25.47
7.18	2.28	22.3	56.88	56.74	22.3	27.31	12.75	22.3	52.62	46.54	22.3	14.63	25.58
6.92	2.27	23.3	56.74	56.83	23.3	26.84	12.81	23.3	52.44	46.60	23.3	14.22	25.71
6.64	2.28	24.3	56.59	56.94	24.3	26.37	12.84	24.3	52.27	46.65	24.3	13.80	25.85
6.37	2.28	25.3	56.45	57.04	25.3	25.94	12.85	25.3	52.11	46.68	25.3	13.37	26.01
6.08	2.29	26.3	56.30	57.15	26.3	25.52	12.83	26.3	51.96	46.71	26.3	12.92	26.16
5.79	2.28	27.3	56.13	57.24	27.3	25.13	12.82	27.3	51.81	46.72	27.3	12.45	26.30
5.47	2.24	28.3	55.97	57.30	28.3	24.76	12.84	28.3	51.68	46.75	28.3	11.96	26.43
5.18	2.19	29.3	55.81	57.35	29.3	24.39	12.87	29.3	51.54	46.78	29.3	11.46	26.53
4.89	2.11	30.3	55.64	57.37	30.3	24.02	12.90	30.3	51.41	46.82	30.3	10.97	26.61
4.60	2.01	31.3	55.48	57.38	31.3	23.63	12.94	31.3	51.27	46.88	31.3	10.47	26.67
11	−11.06		6.21	−6.13		20.37	+20.35		7.74	+7.68		18.53	−18.51
46m	14s.756		6h	46m 58s.546		7h	2m 4s.048		7h	13m 42s.294		7h	16m 20s.292
49′	46″.89		−80°	43′ 38″.16		+87°	10′ 54″.74		+82°	34′ 30″.13		−86°	54′ 6″.70

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. Ca Mag.	
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.	Righ Ascen sion.
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h n
Mar.	8 16	+88 53	Mar.	9 9	−85 20	Mar.	9 25	+81 41	Mar.	9 36	−80 34	Mar.	10 2
	s	″		s	″		s	″		s	″		s
0.4	78.41	7.70	0.4	6.50	10.20	0.5	35.65	39.94	0.5	27.98	19.08	0.5	20.5
1.4	77.89	7.94	1.4	6.35	10.58	1.5	35.62	40.19	1.5	27.94	19.48	1.5	20.5
2.4	77.38	8.21	2.4	6.18	10.95	2.5	35.60	40.47	2.5	27.88	19.86	2.5	20.5
3.4	76.87	8.46	3.4	6.01	11.29	3.4	35.58	40.75	3.5	27.82	20.24	3.5	20.5
4.4	76.30	8.73	4.4	5.82	11.62	4.4	35.56	41.06	4.5	27.75	20.60	4.5	20.5
5.4	75.68	9.02	5.4	5.65	11.93	5.4	35.52	41.37	5.4	27.68	20.93	5.5	20.5
6.4	75.01	9.30	6.4	5.48	12.23	6.4	35.48	41.69	6.4	27.61	21.26	6.5	20.5
7.4	74.28	9.57	7.4	5.30	12.52	7.4	35.42	42.00	7.4	27.54	21.59	7.5	20.5
8.4	73.47	9.82	8.4	5.15	12.81	8.4	35.35	42.31	8.4	27.48	21.90	8.5	20.5
9.4	72.60	10.07	9.4	5.00	13.12	9.4	35.27	42.60	9.4	27.41	22.21	9.5	20.4
10.4	71.71	10.30	10.4	4.84	13.44	10.4	35.19	42.89	10.4	27.35	22.54	10.5	20.4
11.4	70.79	10.49	11.4	4.69	13.77	11.4	35.10	43.17	11.4	27.30	22.91	11.5	20.3
12.4	69.88	10.68	12.4	4.54	14.12	12.4	35.01	43.42	12.4	27.25	23.28	12.5	20.2
13.4	69.02	10.85	13.4	4.38	14.48	13.4	34.93	43.65	13.4	27.18	23.65	13.5	20.2
14.4	68.22	10.99	14.4	4.20	14.84	14.4	34.86	43.86	14.4	27.11	24.04	14.5	20.1
15.4	67.46	11.16	15.4	4.01	15.18	15.4	34.80	44.09	15.4	27.03	24.42	15.5	20.1
16.4	66.79	11.34	16.4	3.79	15.52	16.4	34.75	44.32	16.4	26.96	24.79	16.4	20.0
17.4	66.11	11.53	17.4	3.56	15.84	17.4	34.69	44.55	17.4	26.87	25.13	17.4	20.0
18.4	65.41	11.73	18.4	3.32	16.12	18.4	34.64	44.81	18.4	26.77	25.45	18.4	20.0
19.4	64.64	11.95	19.4	3.09	16.39	19.4	34.57	45.09	19.4	26.67	25.74	19.4	19.9
20.4	63.79	12.17	20.4	2.85	16.65	20.4	34.49	45.36	20.4	26.57	26.02	20.4	19.9
21.3	62.83	12.40	21.4	2.64	16.90	21.4	34.40	45.61	21.4	26.48	26.29	21.4	19.8
22.3	61.82	12.58	22.4	2.44	17.16	22.4	34.30	45.89	22.4	26.40	26.58	22.4	19.7
23.3	60.74	12.74	23.4	2.25	17.42	23.4	34.18	46.13	23.4	26.32	26.86	23.4	19.6
24.3	59.66	12.88	24.4	2.07	17.73	24.4	34.05	46.35	24.4	26.24	27.18	24.4	19.5
25.3	58.61	12.97	25.4	1.88	18.04	25.4	33.95	46.55	25.4	26.17	27.51	25.4	19.4
26.3	57.61	13.07	26.4	1.69	18.35	26.4	33.84	46.73	26.4	26.09	27.85	26.4	19.3
27.3	56.66	13.16	27.4	1.47	18.65	27.4	33.74	46.90	27.4	26.00	28.18	27.4	19.2
28.3	55.76	13.26	28.4	1.23	18.94	28.4	33.65	47.06	28.4	25.91	28.51	28.4	19.1
29.3	54.88	13.38	29.4	0.99	19.22	29.4	33.55	47.24	29.4	25.81	28.81	29.4	19.0
30.3	54.01	13.50	30.4	0.72	19.49	30.4	33.47	47.43	30.4	25.70	29.10	30.4	19.0
31.3	53.12	13.62	31.4	0.46	19.72	31.4	33.38	47.63	31.4	25.59	29.37	31.4	18.9
51.46		+51.45	12.30		−12.26	6.92		+6.85	6.11		−6.02	8.18	
8^h	15^m	$48^s.380$	9^h	8^m	$57^s.938$	9^h	25^m	$21^s.719$	9^h	36^m	$22^s.347$	10^h	21^m
+88°	53′	0″.29	−85°	19′	57″.45	+81°	41′	41″.50	−80°	34′	6″.83	+82°	58′

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

s.	Bradley 1672. Mag. 6.3			ι Octantis. Mag. 5.4			32 H. Camelop. *seq.* Mag. 5.3			κ Octantis. Mag. 5.6		
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	° ′
-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	″
58.18	0.6	10.68	17.45	0.6	19.40	23.32	0.6	42.40	28.62	0.6	28.27	40.47
58.61	1.6	10.96	17.71	1.6	19.55	23.70	1.6	42.51	28.84	1.6	28.50	40.79
59.04	2.6	11.27	17.97	2.6	19.69	24.09	2.6	42.64	29.07	2.6	28.70	41.16
59.46	3.6	11.58	18.23	3.6	19.79	24.49	3.6	42.77	29.31	3.6	28.88	41.50
59.85	4.6	11.89	18.50	4.6	19.90	24.86	4.6	42.89	29.57	4.6	29.06	41.85
60.23	5.6	12.21	18.80	5.6	20.00	25.22	5.6	43.01	29.84	5.6	29.21	42.19
60.61	6.6	12.49	19.11	6.6	20.08	25.57	6.6	43.12	30.12	6.6	29.35	42.53
60.97	7.6	12.74	19.43	7.6	20.17	25.91	7.6	43.23	30.43	7.6	29.51	42.84
61.32	8.5	12.95	19.76	8.6	20.26	26.25	8.6	43.32	30.75	8.6	29.66	43.14
61.69	9.5	13.13	20.10	9.6	20.36	26.58	9.6	43.40	31.08	9.6	29.81	43.44
62.05	10.5	13.25	20.46	10.6	20.47	26.91	10.6	43.47	31.40	10.6	29.98	43.73
62.42	11.5	13.35	20.79	11.6	20.60	27.27	11.6	43.53	31.72	11.6	30.18	44.04
62.83	12.5	13.39	21.11	12.6	20.72	27.63	12.6	43.58	32.02	12.6	30.37	44.36
63.24	13.5	13.44	21.41	13.6	20.84	28.00	13.6	43.63	32.31	13.6	30.57	44.72
63.66	14.5	13.48	21.69	14.6	20.96	28.39	14.6	43.68	32.60	14.6	30.77	45.08
64.08	15.5	13.57	21.97	15.6	21.07	28.81	15.6	43.73	32.84	15.6	30.95	45.47
64.51	16.5	13.67	22.25	16.5	21.17	29.23	16.5	43.79	33.10	16.6	31.10	45.86
64.94	17.5	13.81	22.51	17.5	21.23	29.66	17.5	43.88	33.35	17.6	31.24	46.26
65.34	18.5	13.98	22.79	18.5	21.29	30.05	18.5	43.96	33.62	18.6	31.36	46.65
65.72	19.5	14.14	23.11	19.5	21.33	30.44	19.5	44.03	33.91	19.6	31.47	47.03
66.06	20.5	14.26	23.43	20.5	21.36	30.82	20.5	44.09	34.23	20.6	31.56	47.39
66.41	21.5	14.33	23.77	21.5	21.40	31.18	21.5	44.15	34.56	21.6	31.65	47.73
66.75	22.5	14.34	24.11	22.5	21.45	31.52	22.5	44.19	34.91	22.6	31.76	48.07
67.11	23.5	14.29	24.48	23.5	21.51	31.87	23.5	44.20	35.26	23.6	31.89	48.40
67.47	24.5	14.19	24.82	24.5	21.60	32.23	24.5	44.21	35.60	24.6	32.03	48.73
67.83	25.5	14.06	25.14	25.5	21.68	32.61	25.5	44.21	35.93	25.6	32.18	49.08
68.22	26.5	13.94	25.43	26.5	21.77	33.00	26.5	44.20	36.23	26.5	32.33	49.44
68.62	27.5	13.83	25.72	27.5	21.84	33.41	27.5	44.20	36.52	27.5	32.48	49.83
69.01	28.5	13.74	26.01	28.5	21.90	33.82	28.5	44.20	36.81	28.5	32.61	50.22
69.41	29.5	13.68	26.29	29.5	21.95	34.23	29.5	44.22	37.10	29.5	32.71	50.63
69.80	30.5	13.63	26.56	30.5	21.96	34.65	30.5	44.24	37.37	30.5	32.81	51.04
70.16	31.5	13.59	26.87	31.5	21.97	35.04	31.5	44.26	37.66	31.5	32.87	51.43
9.76	31.08		+31.06	10.77		-10.73	9.35		+9.29	12.37		-12.33
5ˢ.280	12ʰ	14ᵐ	28ˢ.425	12ʰ	46ᵐ	7ˢ.152	12ʰ	48ᵐ	30ˢ.418	13ʰ	27ᵐ	14ˢ.624
0″.60	+88°	9′	36″.08	-84°	40′	22″.34	+83°	51′	50″.47	-85°	21′	42″.23

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			50 G. Ma	
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.	R A s
	h m s	° ′ ″		h m s	° ′ ″		h m s	° ′ ″		h m s	° ′ ″		
Mar.	14 13	−83 17	Mar.	15 3	+87 32	Mar.	15 24	−84 11	Mar.	16 54	+82 10	Mar.	1
0.7	37.27	16.69	0.7	46.19	43.38	0.7	5.83	21.97	0.8	21.96	7.09	0.8	5
1.6	37.46	16.98	1.7	46.60	43.48	1.7	6.10	22.16	1.8	22.11	7.06	1.8	5
2.6	37.64	17.29	2.7	47.05	43.58	2.7	6.36	22.35	2.8	22.27	7.02	2.8	5
3.6	37.81	17.59	3.7	47.51	43.69	3.7	6.60	22.56	3.8	22.44	6.97	3.8	5
4.6	37.96	17.88	4.7	47.98	43.81	4.7	6.83	22.77	4.8	22.60	6.93	4.8	5
5.6	38.10	18.19	5.7	48.48	43.94	5.7	7.05	22.97	5.8	22.77	6.88	5.8	5
6.6	38.25	18.47	6.7	48.96	44.09	6.7	7.25	23.18	6.7	22.94	6.87	6.8	5
7.6	38.38	18.75	7.7	49.45	44.25	7.7	7.46	23.37	7.7	23.11	6.86	7.8	6
8.6	38.53	19.02	8.7	49.93	44.43	8.7	7.67	23.55	8.7	23.28	6.87	8.8	6
9.6	38.67	19.27	9.7	50.38	44.62	9.7	7.88	23.71	9.7	23.45	6.91	9.8	6
10.6	38.81	19.52	10.7	50.81	44.84	10.7	8.09	23.87	10.7	23.62	6.97	10.8	6
11.6	38.99	19.78	11.7	51.20	45.06	11.7	8.32	24.04	11.7	23.77	7.05	11.7	6
12.6	39.15	20.05	12.7	51.56	45.28	12.7	8.56	24.21	12.7	23.92	7.13	12.7	6
13.6	39.32	20.33	13.7	51.90	45.49	13.7	8.81	24.40	13.7	24.07	7.22	13.7	6
14.6	39.50	20.65	14.6	52.22	45.69	14.7	9.07	24.62	14.7	24.22	7.30	14.7	6
15.6	39.68	20.98	15.6	52.56	45.87	15.7	9.33	24.85	15.7	24.37	7.35	15.7	6
16.6	39.83	21.34	16.6	52.90	46.02	16.7	9.57	25.12	16.7	24.50	7.40	16.7	6
17.6	39.97	21.70	17.6	53.27	46.18	17.7	9.80	25.40	17.7	24.66	7.43	17.7	6
18.6	40.11	22.06	18.6	53.68	46.35	18.7	10.00	25.68	18.7	24.80	7.46	18.7	6
19.6	40.21	22.40	19.6	54.09	46.52	19.7	10.20	25.94	19.7	24.98	7.50	19.7	6
20.6	40.32	22.74	20.6	54.50	46.73	20.6	10.38	26.20	20.7	25.14	7.56	20.7	6
21.6	40.42	23.04	21.6	54.89	46.96	21.6	10.56	26.44	21.7	25.30	7.65	21.7	6
22.6	40.53	23.34	22.6	55.27	47.24	22.6	10.75	26.66	22.7	25.47	7.77	22.7	6
23.6	40.66	23.62	23.6	55.60	47.52	23.6	10.93	26.85	23.7	25.61	7.91	23.7	6
24.6	40.80	23.92	24.6	55.89	47.80	24.6	11.16	27.06	24.7	25.76	8.09	24.7	6
25.6	40.94	24.23	25.6	56.16	48.07	25.6	11.37	27.29	25.7	25.91	8.26	25.7	6
26.6	41.09	24.54	26.6	56.40	48.34	26.6	11.60	27.53	26.7	26.05	8.43	26.7	6
27.6	41.24	24.89	27.6	56.64	48.59	27.6	11.82	27.79	27.7	26.17	8.57	27.7	6
28.6	41.37	25.25	28.6	56.90	48.82	28.6	12.05	28.06	28.7	26.31	8.72	28.7	6
29.6	41.50	25.62	29.6	57.17	49.06	29.6	12.25	28.35	29.7	26.44	8.84	29.7	6
30.6	41.60	25.99	30.6	57.43	49.28	30.6	12.45	28.65	30.7	26.58	8.96	30.7	6
31.6	41.70	26.36	31.6	57.73	49.51	31.6	12.62	28.96	31.7	26.72	9.09	31.7	6
8.56		−8.50	23.36		+23.33	9.88		−9.83	7.34		+7.27	6.24	
14h	13m	27s.793	15h	3m	41s.175	15h	23m	56s.594	16h	54m	25s.488	17h	1
−83°	17′	21″.03	+87°	33′	10″.52	−84°	11′	30″.39	+82°	10′	32″.75	−80°	4

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

noris. .4	χ Octantis. Mag. 5.2			λ Ursæ Minoris. Mag. 6.6			σ Octantis. Mag. 5.5			76 Draconis. Mag. 5.7		
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	° ′
+86 36	Mar.	18 6	−87 39	Mar.	19 1	+89 0	Mar.	19 27	−89 13	Mar.	20 48	+82 13
″		s	″		s	″		s	″		s	″
29.86	0.8	18.14	37.50	0.9	16.00	46.48	0.9	32.15	13.92	0.9	29.01	24.88
29.76	1.8	18.83	37.39	1.8	16.87	46.31	1.9	33.86	13.68	1.9	29.07	24.61
29.62	2.8	19.50	37.31	2.8	17.75	46.12	2.9	35.59	13.46	2.9	29.14	24.34
29.49	3.8	20.16	37.25	3.8	18.67	45.92	3.9	37.30	13.26	3.9	29.21	24.05
29.39	4.8	20.80	37.18	4.8	19.65	45.71	4.9	38.99	13.07	4.9	29.29	23.75
29.26	5.8	21.41	37.13	5.8	20.70	45.52	5.9	40.62	12.88	5.9	29.37	23.44
29.14	6.8	22.01	37.08	6.8	21.80	45.33	6.9	42.20	12.70	6.9	29.45	23.13
29.04	7.8	22.59	37.02	7.8	22.96	45.14	7.9	43.72	12.53	7.9	29.54	22.83
28.97	8.8	23.16	36.95	8.8	24.17	44.98	8.8	45.19	12.33	8.9	29.64	22.55
28.92	9.8	23.73	36.87	9.8	25.42	44.83	9.8	46.65	12.13	9.9	29.75	22.29
28.88	10.8	24.32	36.78	10.8	26.67	44.72	10.8	48.13	11.90	10.9	29.87	22.03
28.87	11.8	24.91	36.67	11.8	27.90	44.61	11.8	49.65	11.68	11.9	29.99	21.79
28.86	12.8	25.55	36.57	12.8	29.08	44.52	12.8	51.26	11.46	12.9	30.12	21.59
28.86	13.8	26.23	36.48	13.8	30.20	44.45	13.8	52.96	11.23	13.9	30.22	21.39
28.87	14.8	26.92	36.41	14.8	31.25	44.39	14.8	54.79	11.02	14.9	30.33	21.21
28.86	15.8	27.63	36.35	15.8	32.25	44.30	15.8	56.72	10.82	15.9	30.45	21.01
28.82	16.8	28.37	36.33	16.8	33.22	44.19	16.8	58.70	10.64	16.9	30.54	20.80
28.77	17.8	29.09	36.33	17.8	34.22	44.06	17.8	60.68	10.50	17.9	30.64	20.58
28.72	18.8	29.76	36.35	18.8	35.28	43.93	18.8	62.61	10.37	18.9	30.74	20.34
28.67	19.8	30.42	36.36	19.8	36.42	43.80	19.8	64.46	10.25	19.9	30.85	20.10
28.63	20.8	31.03	36.39	20.8	37.64	43.68	20.8	66.18	10.13	20.9	30.97	19.85
28.63	21.8	31.61	36.40	21.8	38.94	43.58	21.8	67.83	10.01	21.9	31.10	19.61
28.67	22.8	32.18	36.38	22.8	40.28	43.52	22.8	69.43	9.88	22.9	31.23	19.40
28.71	23.8	32.78	36.34	23.8	41.63	43.48	23.8	71.01	9.72	23.9	31.38	19.21
28.80	24.7	33.38	36.30	24.8	42.94	43.47	24.8	72.67	9.55	24.9	31.52	19.06
28.88	25.7	34.04	36.26	25.8	44.18	43.46	25.8	74.41	9.38	25.9	31.68	18.90
28.97	26.7	34.72	36.22	26.8	45.36	43.46	26.8	76.24	9.21	26.9	31.82	18.76
29.03	27.7	35.42	36.21	27.8	46.48	43.45	27.8	78.17	9.06	27.9	31.96	18.63
29.10	28.7	36.12	36.22	28.8	47.57	43.44	28.8	80.14	8.92	28.9	32.10	18.51
29.16	29.7	36.82	36.26	29.8	48.67	43.42	29.8	82.15	8.82	29.8	32.22	18.37
29.20	30.7	37.49	36.32	30.8	49.78	43.38	30.8	84.14	8.73	30.8	32.34	18.22
29.25	31.7	38.16	36.38	31.8	50.93	43.34	31.8	86.08	8.64	31.8	32.48	18.05
16.87	24.49		−24.47	58.01		+58.00	73.43		−73.42	7.39		+7.32
1ˢ.307	18ʰ	6ᵐ	11ˢ.893	19ʰ	2ᵐ	39ˢ.624	19ʰ	27ᵐ	42ˢ.218	20ʰ	48ᵐ	40ˢ.494
51″.17	−87°	39′	51″.82	+89°	1′	2″.17	−89°	13′	28″.57	+82°	13′	29″.86

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

λ Octantis. Mag. 5.4			υ Octantis. Mag. 5.7			β Octantis. Mag. 4.3			39 H. Cephei. Mag. 5.6			γ¹ Octa Mag. (	
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 Ascen sion.
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m
Mar.	21 38	−83 5	Mar.	22 15	−86 23	Mar.	22 37	−81 48	Mar.	23 27	+86 51	Mar.	23 47
	s	″		s	″		s	″		s	″		s
0.9	15.56	56.76	0.9	57.87	18.22	1.0	34.70	55.15	1.0	17.75	12.33	1.0	10.64
1.9	15.65	56.38	1.9	57.99	17.79	1.9	34.73	54.74	2.0	17.67	12.05	2.0	10.61
2.9	15.75	56.02	2.9	58.12	17.39	2.9	34.78	54.34	3.0	17.58	11.77	3.0	10.60
3.9	15.87	55.65	3.9	58.25	17.01	3.9	34.83	53.95	4.0	17.48	11.46	4.0	10.59
4.9	15.98	55.32	4.9	58.38	16.65	4.9	34.87	53.57	5.0	17.39	11.15	5.0	10.58
5.9	16.08	54.99	5.9	58.52	16.29	5.9	34.92	53.21	6.0	17.29	10.81	6.0	10.57
6.9	16.18	54.67	6.9	58.65	15.96	6.9	34.96	52.87	7.0	17.22	10.47	7.0	10.56
7.9	16.28	54.36	7.9	58.75	15.62	7.9	35.01	52.53	8.0	17.17	10.13	8.0	10.54
8.9	16.37	54.05	8.9	58.86	15.28	8.9	35.04	52.18	9.0	17.14	9.77	9.0	10.53
9.9	16.45	53.73	9.9	58.96	14.93	9.9	35.07	51.82	10.0	17.14	9.42	10.0	10.49
10.9	16.53	53.39	10.9	59.05	14.57	10.9	35.09	51.46	11.0	17.17	9.08	11.0	10.46
11.9	16.61	53.05	11.9	59.14	14.21	11.9	35.11	51.10	12.0	17.22	8.75	12.0	10.43
12.9	16.70	52.68	12.9	59.23	13.81	12.9	35.14	50.72	13.0	17.28	8.45	13.0	10.40
13.9	16.80	52.32	13.9	59.36	13.41	13.9	35.18	50.30	13.9	17.35	8.14	14.0	10.37
14.9	16.92	51.94	14.9	59.50	13.00	14.9	35.23	49.88	14.9	17.40	7.86	15.0	10.37
15.9	17.05	51.56	15.9	59.68	12.60	15.9	35.31	49.47	15.9	17.44	7.60	16.0	10.38
16.9	17.20	51.19	16.9	59.89	12.19	16.9	35.39	49.07	16.9	17.45	7.32	17.0	10.40
17.9	17.36	50.85	17.9	60.13	11.81	17.9	35.48	48.67	17.9	17.45	7.03	18.0	10.43
18.9	17.51	50.53	18.9	60.35	11.47	18.9	35.56	48.29	18.9	17.45	6.72	19.0	10.47
19.9	17.66	50.25	19.9	60.56	11.13	19.9	35.65	47.95	19.9	17.45	6.41	19.9	10.50
20.9	17.79	49.97	20.9	60.76	10.80	20.9	35.72	47.62	20.9	17.49	6.08	20.9	10.53
21.9	17.92	49.69	21.9	60.94	10.48	21.9	35.78	47.30	21.9	17.55	5.73	21.9	10.55
22.9	18.02	49.40	22.9	61.09	10.16	22.9	35.84	46.96	22.9	17.64	5.39	22.9	10.58
23.9	18.13	49.08	23.9	61.24	9.82	23.9	35.90	46.62	23.9	17.78	5.05	23.9	10.58
24.9	18.24	48.75	24.9	61.39	9.46	24.9	35.96	46.26	24.9	17.93	4.73	24.9	10.58
25.9	18.36	48.40	25.9	61.55	9.09	25.9	36.00	45.88	25.9	18.09	4.45	25.9	10.58
26.9	18.49	48.06	26.9	61.73	8.72	26.9	36.08	45.49	26.9	18.24	4.17	26.9	10.56
27.9	18.64	47.73	27.9	61.95	8.35	27.9	36.16	45.10	27.9	18.39	3.90	27.9	10.58
28.9	18.81	47.40	28.9	62.19	7.97	28.9	36.24	44.72	28.9	18.53	3.64	28.9	10.62
29.9	18.98	47.08	29.9	62.43	7.62	29.9	36.34	44.34	29.9	18.66	3.38	29.9	10.67
30.9	19.15	46.78	30.9	62.69	7.29	30.9	36.45	43.99	30.9	18.76	3.10	30.9	10.73
31.9	19.32	46.51	31.9	62.96	6.95	31.9	36.56	43.65	31.9	18.87	2.81	31.9	10.79
8.32	−8.26		15.87	−15.84		7.02	−6.95		18.21	+18.18		7.64	
21h	38m	19s.542	22h	16m	8s.656	22h	37m	39s.016	23h	27m	44s.125	23h	47m
−83°	6′	6″.99	−86°	23′	27″.13	−81°	49′	2″.34	+86°	50′	58″.89	−82°	28′

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

phei. .5		α Ursæ Minoris. (*Polaris.*) Mag. 2.1			4 G. Octantis. Mag. 5.6			Groombridge 750. Mag. 6.7			Groombridge 944. Mag. 6.4		
	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	° ′
	+85 48	Apr.	1 29	+88 51	Apr.	1 41	−85 11	Apr.	4 9	+85 20	Apr.	5 35	+85 9
	″		s	″		s	″		s	″		s	″
	57.53	0.0	18.08	58.77	0.0	47.85	15.07	0.2	61.77	32.26	0.2	18.72	51.69
	57.21	1.0	17.83	58.48	1.0	47.78	14.68	1.1	61.57	32.08	1.2	18.50	51.62
	56.90	2.0	17.57	58.15	2.0	47.72	14.30	2.1	61.37	31.89	2.2	18.26	51.54
	56.58	3.0	17.33	57.84	3.0	47.65	13.93	3.1	61.16	31.70	3.2	18.02	51.45
	56.25	4.0	17.14	57.52	4.0	47.60	13.58	4.1	60.95	31.48	4.2	17.77	51.35
	55.90	5.0	16.99	57.15	5.0	47.54	13.25	5.1	60.74	31.25	5.2	17.51	51.22
	55.55	6.0	16.91	56.80	6.0	47.46	12.92	6.1	60.54	31.01	6.2	17.26	51.07
	55.22	7.0	16.92	56.45	7.0	47.38	12.59	7.1	60.35	30.75	7.2	17.02	50.89
	54.88	8.0	16.99	56.11	8.0	47.29	12.24	8.1	60.19	30.47	8.2	16.78	50.72
	54.56	9.0	17.15	55.78	9.0	47.20	11.87	9.1	60.04	30.20	9.2	16.58	50.53
	54.25	10.0	17.34	55.46	10.0	47.11	11.51	10.1	59.93	29.94	10.2	16.40	50.33
	53.97	11.0	17.54	55.16	11.0	47.03	11.11	11.1	59.82	29.69	11.2	16.22	50.15
	53.71	12.0	17.71	54.89	12.0	46.97	10.70	12.1	59.72	29.44	12.2	16.07	49.96
	53.46	13.0	17.84	54.62	13.0	46.92	10.29	13.1	59.61	29.22	13.2	15.90	49.81
	53.20	14.0	17.92	54.36	14.0	46.91	9.86	14.1	59.48	29.01	14.2	15.73	49.69
	52.93	14.9	17.94	54.08	15.0	46.91	9.45	15.1	59.35	28.81	15.2	15.56	49.56
	52.65	15.9	17.95	53.80	16.0	46.90	9.04	16.1	59.21	28.58	16.2	15.36	49.43
	52.36	16.9	17.98	53.49	17.0	46.90	8.66	17.1	59.05	28.35	17.2	15.14	49.27
	52.04	17.9	18.06	53.16	17.9	46.91	8.33	18.1	58.89	28.09	18.2	14.92	49.08
	51.71	18.9	18.24	52.82	18.9	46.88	7.98	19.1	58.74	27.79	19.2	14.72	48.88
	51.38	19.9	18.53	52.46	19.9	46.85	7.64	20.1	58.61	27.47	20.2	14.51	48.64
	51.06	20.9	18.89	52.13	20.9	46.82	7.29	21.1	58.51	27.14	21.2	14.31	48.37
	50.78	21.9	19.35	51.82	21.9	46.78	6.92	22.1	58.44	26.82	22.1	14.16	48.12
	50.50	22.9	19.81	51.52	22.9	46.74	6.55	23.1	58.38	26.50	23.1	14.01	47.88
	50.25	23.9	20.27	51.25	23.9	46.72	6.17	24.1	58.33	26.22	24.1	13.88	47.63
	50.02	24.9	20.69	50.98	24.9	46.71	5.77	25.1	58.27	25.94	25.1	13.76	47.41
	49.78	25.9	21.07	50.71	25.9	46.72	5.36	26.1	58.22	25.67	26.1	13.63	47.21
	49.54	26.9	21.41	50.45	26.9	46.75	4.96	27.1	58.15	25.43	27.1	13.50	47.01
	49.31	27.9	21.71	50.19	27.9	46.78	4.57	28.1	58.07	25.19	28.1	13.35	46.81
	49.06	28.9	22.00	49.93	28.9	46.83	4.18	29.1	57.98	24.93	29.1	13.20	46.60
	48.79	29.9	22.31	49.65	29.9	46.88	3.80	30.1	57.88	24.66	30.1	13.03	46.41
	48.51	30.9	22.64	49.34	30.9	46.93	3.44	31.1	57.79	24.38	31.1	12.86	46.18
	+13.67	50.48		+50.47	11.92		−11.87	12.31		+12.27	11.86		+11.82
	9ˢ.300	1ʰ	30ᵐ	13ˢ.156	1ʰ	42ᵐ	2ˢ.339	4ʰ	10ᵐ	2ˢ.561	5ʰ	35ᵐ	12ˢ.782
	45″.30	+88°	51′	43″.55	−85°	11′	21″.46	+85°	20′	10″.34	+85°	9′	30″.24

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. Oc Mag.	
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.	Rig Asce sio
	h m s	° ′ ″		h m s	° ′ ″		h m s	° ′ ″		h m s	° ′ ″		h s
Apr.	5 45	−84 49	Apr.	6 46	−80 43	Apr.	7 2	+87 11	Apr.	7 13	+82 34	Apr.	7 1
	s	″		s	″		s	″		s	″		s
0.2	64.60	62.01	0.3	55.48	57.38	0.3	23.63	12.94	0.3	51.27	46.88	0.3	70.4
1.2	64.32	61.91	1.3	55.33	57.38	1.3	23.22	12.98	1.3	51.12	46.94	1.3	69.9
2.2	64.06	61.78	2.3	55.18	57.36	2.3	22.78	13.02	2.3	50.96	47.00	2.3	69.5
3.2	63.80	61.67	3.3	55.03	57.34	3.3	22.34	13.05	3.3	50.79	47.05	3.3	69.0
4.2	63.55	61.56	4.2	54.88	57.32	4.3	21.89	13.08	4.3	50.62	47.10	4.3	68.6
5.2	63.30	61.46	5.2	54.74	57.32	5.3	21.42	13.08	5.3	50.45	47.11	5.3	68.2
6.2	63.05	61.36	6.2	54.60	57.32	6.3	20.94	13.05	6.3	50.27	47.10	6.3	67.7
7.2	62.80	61.31	7.2	54.45	57.33	7.3	20.47	13.01	7.3	50.09	47.07	7.3	67.3
8.2	62.53	61.24	8.2	54.30	57.37	8.2	20.01	12.94	8.3	49.91	47.03	8.3	66.9
9.2	62.27	61.17	9.2	54.16	57.40	9.2	19.58	12.85	9.3	49.75	46.98	9.3	66.4
10.2	62.00	61.09	10.2	54.01	57.42	10.2	19.19	12.76	10.3	49.60	46.90	10.3	66.0
11.2	61.71	60.99	11.2	53.86	57.43	11.2	18.81	12.68	11.2	49.47	46.83	11.2	65.5
12.2	61.43	60.86	12.2	53.70	57.42	12.2	18.46	12.61	12.2	49.33	46.77	12.2	65.0
13.2	61.14	60.72	13.2	53.55	57.38	13.2	18.12	12.55	13.2	49.21	46.73	13.2	64.5
14.2	60.87	60.53	14.2	53.39	57.30	14.2	17.77	12.50	14.2	49.09	46.71	14.2	64.0
15.2	60.60	60.35	15.2	53.23	57.21	15.2	17.41	12.47	15.2	48.95	46.70	15.2	63.5
16.2	60.36	60.16	16.2	53.08	57.11	16.2	17.01	12.43	16.2	48.80	46.69	16.2	63.0
17.2	60.13	59.98	17.2	52.93	57.01	17.2	16.59	12.38	17.2	48.64	46.66	17.2	62.6
18.2	59.90	59.81	18.2	52.79	56.94	18.2	16.14	12.31	18.2	48.47	46.62	18.2	62.1
19.2	59.68	59.66	19.2	52.65	56.88	19.2	15.68	12.23	19.2	48.31	46.54	19.2	61.7
20.2	59.44	59.52	20.2	52.51	56.84	20.2	15.23	12.10	20.2	48.13	46.42	20.2	61.3
21.2	59.21	59.39	21.2	52.36	56.81	21.2	14.81	11.93	21.2	47.97	46.29	21.2	60.9
22.2	58.97	59.27	22.2	52.23	56.77	22.2	14.42	11.75	22.2	47.82	46.16	22.2	60.4
23.2	58.72	59.14	23.2	52.08	56.72	23.2	14.06	11.60	23.2	47.68	46.01	23.2	60.0
24.2	58.45	59.00	24.2	51.93	56.66	24.2	13.72	11.46	24.2	47.56	45.86	24.2	59.5
25.1	58.20	58.81	25.2	51.78	56.57	25.2	13.39	11.32	25.2	47.44	45.75	25.2	59.0
26.1	57.96	58.62	26.2	51.63	56.46	26.2	13.07	11.19	26.2	47.32	45.64	26.2	58.5
27.1	57.71	58.39	27.2	51.49	56.33	27.2	12.74	11.08	27.2	47.20	45.54	27.2	58.1
28.1	57.48	58.16	28.2	51.34	56.18	28.2	12.41	10.97	28.2	47.07	45.44	28.2	57.6
29.1	57.26	57.92	29.2	51.20	56.03	29.2	12.05	10.86	29.2	46.94	45.35	29.2	57.2
30.1	57.06	57.69	30.2	51.07	55.89	30.2	11.67	10.74	30.2	46.80	45.26	30.2	56.7
31.1	56.86	57.46	31.2	50.93	55.74	31.2	11.29	10.61	31.2	46.66	45.14	31.2	56.3
11.10	−11.06		6.21	−6.13		20.37	+20.35		7.74	+7.68		18.54	
5^h	46^m	14″.756	6^h	46^m	58″.546	7^h	2^m	4″.048	7^h	13^m	42″.294	7^h	16^m
−84°	49′	46″.89	−80°	43′	38″.16	+87°	10′	54″.74	+82°	34′	30″.13	−86°	54′

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

119.	ζ Octantis. Mag. 5.4			1 H. Draconis. Mag. 4.6			ζ Chamæleontis. Mag. 5.2			30 H. Camelop. Mag. 5.3		
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	° ′
88 53	Apr.	9 8	−85 20	Apr.	9 25	+81 41	Apr.	9 36	−80 34	Apr.	10 21	+82 58
″		s	″		s	″		s	″		s	″
3.62	0.4	60.46	19.72	0.4	33.38	47.63	0.4	25.59	29.37	0.4	18.94	55.08
3.76	1.4	60.21	19.94	1.4	33.29	47.84	1.4	25.47	29.63	1.4	18.86	55.34
3.89	2.4	59.96	20.15	2.4	33.19	48.06	2.4	25.36	29.87	2.4	18.77	55.60
4.02	3.3	59.71	20.35	3.4	33.07	48.29	3.4	25.25	30.10	3.4	18.67	55.89
4.17	4.3	59.46	20.55	4.4	32.94	48.52	4.4	25.14	30.32	4.4	18.56	56.17
4.27	5.3	59.23	20.75	5.4	32.82	48.72	5.4	25.04	30.56	5.4	18.43	56.44
4.36	6.3	59.00	20.95	6.4	32.68	48.89	6.4	24.94	30.80	6.4	18.30	56.68
4.43	7.3	58.78	21.17	7.4	32.53	49.05	7.4	24.84	31.03	7.4	18.15	56.91
4.49	8.3	58.56	21.40	8.3	32.39	49.20	8.4	24.74	31.28	8.4	18.01	57.13
4.50	9.3	58.34	21.65	9.3	32.26	49.32	9.4	24.65	31.55	9.4	17.87	57.32
4.51	10.3	58.09	21.90	10.3	32.13	49.43	10.3	24.55	31.83	10.4	17.72	57.50
4.53	11.3	57.84	22.14	11.3	32.01	49.53	11.3	24.44	32.11	11.4	17.60	57.67
4.54	12.3	57.56	22.39	12.3	31.91	49.62	12.3	24.31	32.37	12.4	17.50	57.82
4.57	13.3	57.28	22.59	13.3	31.80	49.74	13.3	24.19	32.61	13.4	17.39	57.99
4.60	14.3	56.98	22.78	14.3	31.71	49.87	14.3	24.06	32.84	14.4	17.29	58.16
4.65	15.3	56.69	22.93	15.3	31.61	50.01	15.3	23.93	33.03	15.4	17.19	58.35
4.71	16.3	56.39	23.08	16.3	31.48	50.13	16.3	23.80	33.21	16.4	17.07	58.56
4.76	17.3	56.12	23.23	17.3	31.35	50.29	17.3	23.67	33.37	17.4	16.94	58.79
4.80	18.3	55.85	23.36	18.3	31.21	50.43	18.3	23.55	33.53	18.4	16.80	59.00
4.82	19.3	55.61	23.49	19.3	31.06	50.56	19.3	23.44	33.69	19.4	16.63	59.20
4.80	20.3	55.38	23.66	20.3	30.91	50.66	20.3	23.33	33.87	20.4	16.46	59.35
4.76	21.3	55.14	23.83	21.3	30.75	50.74	21.3	23.23	34.05	21.3	16.29	59.50
4.69	22.3	54.90	24.01	22.3	30.60	50.79	22.3	23.12	34.28	22.3	16.13	59.63
4.62	23.3	54.64	24.19	23.3	30.47	50.82	23.3	23.00	34.50	23.3	15.98	59.73
4.55	24.3	54.37	24.38	24.3	30.33	50.85	24.3	22.88	34.71	24.3	15.83	59.82
4.48	25.3	54.08	24.54	25.3	30.22	50.89	25.3	22.76	34.91	25.3	15.69	59.92
4.43	26.3	53.79	24.68	26.3	30.10	50.93	26.3	22.63	35.09	26.3	15.56	60.04
4.40	27.3	53.49	24.79	27.3	29.98	50.99	27.3	22.49	35.24	27.3	15.43	60.17
4.37	28.3	53.19	24.89	28.3	29.87	51.07	28.3	22.36	35.37	28.3	15.30	60.29
4.35	29.3	52.90	24.96	29.3	29.74	51.15	29.3	22.22	35.48	29.3	15.17	60.42
4.33	30.3	52.60	25.04	30.3	29.61	51.22	30.3	22.08	35.58	30.3	15.02	60.56
4.29	31.3	52.32	25.10	31.3	29.47	51.29	31.3	21.95	35.67	31.3	14.86	60.69
1.49	12.31		−12.27	6.92		+6.85	6.11		−6.03	8.19		+8.12
3ˢ.380	9ʰ	8ᵐ	57ˢ.938	9ʰ	25ᵐ	21ˢ.719	9ʰ	36ᵐ	22ˢ.347	10ʰ	21ᵐ	4ˢ.831
0″.29	−85°	19′	57″.45	+81°	41′	41″.50	−80°	34′	6″.83	+82°	58′	54″.07

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. *seq.* Mag. 5.3			κ Oc Mag
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.	Ri As sio
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h
Apr.	11 0	−84 9	Apr.	12 15	+88 9	Apr.	12 46	−84 40	Apr.	12 48	+83 51	Apr.	13
	s	″		s	″		s	″		s	″		
0.4	4.19	10.16	0.5	13.59	26.87	0.5	21.97	35.04	0.5	44.26	37.66	0.5	32
1.4	4.08	10.50	1.5	13.57	27.18	1.5	21.98	35.43	1.5	44.28	37.97	1.5	32
2.4	3.97	10.83	2.5	13.51	27.51	2.5	21.98	35.80	2.5	44.30	38.30	2.5	32
3.4	3.85	11.16	3.5	13.44	27.84	3.5	21.97	36.16	3.5	44.31	38.63	3.5	33
4.4	3.74	11.48	4.5	13.31	28.17	4.5	21.97	36.52	4.5	44.31	38.97	4.5	33
5.4	3.64	11.79	5.5	13.14	28.51	5.5	21.96	36.87	5.5	44.29	39.32	5.5	33
6.4	3.54	12.10	6.5	12.94	28.85	6.5	21.97	37.21	6.5	44.26	39.67	6.5	33
7.4	3.46	12.40	7.5	12.69	29.18	7.5	21.99	37.54	7.5	44.22	40.02	7.5	33
8.4	3.37	12.73	8.5	12.41	29.49	8.5	22.02	37.90	8.5	44.17	40.36	8.5	33
9.4	3.29	13.09	9.5	12.11	29.78	9.5	22.05	38.28	9.5	44.11	40.68	9.5	33
10.4	3.20	13.45	10.5	11.81	30.05	10.5	22.08	38.68	10.5	44.05	40.96	10.5	33
11.4	3.10	13.81	11.5	11.53	30.32	11.5	22.09	39.09	11.5	43.99	41.24	11.5	33
12.4	2.97	14.17	12.5	11.28	30.56	12.5	22.10	39.50	12.5	43.95	41.51	12.5	33
13.4	2.84	14.54	13.5	11.07	30.80	13.5	22.09	39.92	13.5	43.92	41.77	13.5	33
14.4	2.70	14.88	14.4	10.87	31.05	14.5	22.05	40.32	14.5	43.91	42.03	14.5	33
15.4	2.55	15.18	15.4	10.69	31.33	15.5	22.00	40.70	15.5	43.88	42.31	15.5	33
16.4	2.39	15.47	16.4	10.50	31.62	16.5	21.93	41.07	16.5	43.84	42.62	16.5	33
17.4	2.24	15.74	17.4	10.26	31.91	17.5	21.87	41.42	17.5	43.80	42.94	17.5	33
18.4	2.10	16.00	18.4	9.96	32.22	18.5	21.82	41.74	18.5	43.74	43.28	18.5	33
19.4	1.96	16.27	19.4	9.59	32.53	19.5	21.79	42.06	19.5	43.66	43.62	19.5	33
20.4	1.85	16.55	20.4	9.18	32.84	20.5	21.77	42.38	20.5	43.58	43.95	20.5	33
21.4	1.74	16.83	21.4	8.75	33.12	21.5	21.76	42.72	21.5	43.47	44.27	21.5	33
22.4	1.63	17.14	22.4	8.29	33.36	22.4	21.75	43.09	22.4	43.36	44.55	22.5	33
23.4	1.50	17.46	23.4	7.85	33.59	23.4	21.73	43.46	23.4	43.25	44.80	23.5	33
24.4	1.37	17.78	24.4	7.42	33.81	24.4	21.70	43.85	24.4	43.16	45.05	24.5	33
25.4	1.23	18.07	25.4	7.04	34.03	25.4	21.66	44.23	25.4	43.08	45.30	25.5	33
26.4	1.06	18.37	26.4	6.66	34.24	26.4	21.60	44.61	26.4	42.99	45.54	26.5	33
27.4	0.89	18.64	27.4	6.32	34.46	27.4	21.52	44.98	27.4	42.92	45.79	27.5	33
28.4	0.71	18.89	28.4	5.99	34.69	28.4	21.44	45.34	28.4	42.84	46.05	28.5	33
29.4	0.53	19.13	29.4	5.64	34.93	29.4	21.34	45.68	29.4	42.77	46.32	29.5	33
30.4	0.35	19.36	30.4	5.27	35.18	30.4	21.24	46.00	30.4	42.69	46.60	30.5	33
31.3	0.18	19.56	31.4	4.86	35.44	31.4	21.14	46.30	31.4	42.59	46.88	31.5	33
9.82		−9.77	31.12		+31.11	10.78		−10.73	9.35		+9.30	12.38	
10^h	59^m	$55^s.280$	12^h	14^m	$28^s.425$	12^h	46^m	$7^s.152$	12^h	48^m	$30^s.418$	13^h	27
−84°	8′	50″.60	+88°	9′	36″.08	−84°	40′	22″.34	+83°	51′	50″.47	−85°	21

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

Octantis. fag. 4.1		**Groombridge 2283.** Mag. 7.2			**ρ Octantis.** Mag. 5.7			**ε Ursæ Minoris.** Mag. 4.4			**59 G. Apodis.** Mag. 5.9		
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	° ′
14 13	−83 17	Apr.	15 3	+87 32	Apr.	15 24	−84 11	Apr.	16 54	+82 10	Apr.	17 16	−80 46
s	″		s	″		s	″		s	″		s	″
41.70	26.36	0.6	57.73	49.51	0.6	12.62	28.96	0.7	26.72	9.09	0.7	4.14	55.89
41.78	26.73	1.6	58.04	49.75	1.6	12.79	29.26	1.7	26.86	9.22	1.7	4.29	56.06
41.86	27.09	2.6	58.35	50.02	2.6	12.93	29.57	2.7	27.01	9.37	2.7	4.44	56.21
41.93	27.43	3.6	58.65	50.29	3.6	13.08	29.85	3.7	27.15	9.52	3.7	4.57	56.35
42.01	27.77	4.6	58.93	50.59	4.6	13.23	30.14	4.7	27.31	9.69	4.7	4.71	56.49
42.08	28.07	5.6	59.20	50.90	5.6	13.38	30.40	5.7	27.45	9.88	5.7	4.85	56.64
42.16	28.38	6.6	59.43	51.21	6.6	13.53	30.64	6.7	27.59	10.11	6.7	4.98	56.74
42.24	28.70	7.6	59.63	51.54	7.6	13.70	30.90	7.7	27.72	10.35	7.7	5.12	56.84
42.35	29.01	8.6	59.80	51.86	8.6	13.88	31.16	8.7	27.85	10.59	8.7	5.27	56.95
42.45	29.33	9.6	59.93	52.17	9.6	14.05	31.43	9.7	27.97	10.82	9.7	5.43	57.07
42.55	29.69	10.6	60.06	52.47	10.6	14.24	31.71	10.7	28.07	11.06	10.7	5.60	57.19
42.66	30.06	11.6	60.18	52.75	11.6	14.43	32.02	11.6	28.17	11.29	11.7	5.77	57.32
42.75	30.45	12.6	60.31	53.02	12.6	14.62	32.34	12.6	28.28	11.49	12.7	5.95	57.49
42.84	30.85	13.6	60.44	53.28	13.6	14.79	32.68	13.6	28.39	11.68	13.7	6.12	57.68
42.89	31.26	14.6	60.61	53.54	14.6	14.93	33.03	14.6	28.49	11.87	14.7	6.26	57.88
42.94	31.65	15.6	60.79	53.80	15.6	15.06	33.38	15.6	28.62	12.05	15.7	6.41	58.09
42.98	32.01	16.6	60.98	54.08	16.6	15.17	33.71	16.6	28.74	12.25	16.7	6.55	58.30
43.01	32.35	17.6	61.17	54.39	17.6	15.27	34.03	17.6	28.86	12.47	17.6	6.68	58.51
43.05	32.69	18.6	61.32	54.71	18.6	15.38	34.32	18.6	28.97	12.73	18.6	6.78	58.70
43.09	33.00	19.6	61.44	55.06	19.6	15.50	34.59	19.6	29.09	13.00	19.6	6.90	58.85
43.15	33.31	20.5	61.52	55.41	20.6	15.63	34.87	20.6	29.19	13.30	20.6	7.03	59.00
43.22	33.64	21.5	61.56	55.76	21.6	15.77	35.15	21.6	29.28	13.61	21.6	7.17	59.14
43.30	33.97	22.5	61.56	56.10	22.6	15.92	35.43	22.6	29.37	13.92	22.6	7.32	59.30
43.36	34.34	23.5	61.57	56.41	23.6	16.08	35.75	23.6	29.45	14.21	23.6	7.47	59.46
43.42	34.71	24.5	61.58	56.73	24.6	16.22	36.08	24.6	29.53	14.50	24.6	7.62	59.65
43.48	35.10	25.5	61.58	57.01	25.5	16.36	36.42	25.6	29.61	14.76	25.6	7.78	59.87
43.53	35.48	26.5	61.61	57.30	26.5	16.48	36.79	26.6	29.69	15.02	26.6	7.92	60.09
43.54	35.86	27.5	61.66	57.57	27.5	16.58	37.14	27.6	29.77	15.26	27.6	8.06	60.33
43.56	36.24	28.5	61.71	57.86	28.5	16.68	37.49	28.6	29.85	15.50	28.6	8.18	60.58
43.57	36.61	29.5	61.77	58.17	29.5	16.76	37.84	29.6	29.94	15.76	29.6	8.29	60.81
43.56	36.95	30.5	61.83	58.48	30.5	16.82	38.18	30.6	30.03	16.02	30.6	8.40	61.05
43.55	37.28	31.5	61.86	58.80	31.5	16.88	38.51	31.6	30.11	16.30	31.6	8.50	61.29
8.56	−8.50		23.37	+23.35		9.88	−9.83		7.34	+7.27		6.24	−6.16
14h 13m	27s.793		15h 3m	41s.175		15h 23m	56s.594		16h 54m	25s.488		17h 15m	54s.896
83° 17′	21″.03		+87° 33′	10″.52		−84° 11′	30″.39		+82° 10′	32″.75		−80° 47′	6″.56

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.	
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.
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m
Apr.	17 58	+86 36	Apr.	18 6	−87 39	Apr.	19 1	+89 0	Apr.	19 28	−89 13	Apr.	20 49
	s	″		s	″		s	″		s	″		s
0.7	54.71	29.25	0.7	38.16	36.38	0.8	50.93	43.34	0.8	26.08	8.64	0.8	32.45
1.7	55.05	29.29	1.7	38.79	36.47	1.8	52.13	43.29	1.8	27.96	8.58	1.8	32.61
2.7	55.42	29.34	2.7	39.39	36.54	2.8	53.38	43.27	2.8	29.78	8.52	2.8	32.74
3.7	55.80	29.42	3.7	39.96	36.60	3.8	54.67	43.26	3.8	31.54	8.46	3.8	32.89
4.7	56.17	29.51	4.7	40.53	36.66	4.8	56.01	43.26	4.8	33.24	8.40	4.8	33.04
5.7	56.55	29.60	5.7	41.09	36.72	5.8	57.36	43.27	5.8	34.91	8.32	5.8	33.20
6.7	56.91	29.74	6.7	41.66	36.77	6.8	58.73	43.31	6.8	36.56	8.24	6.8	33.37
7.7	57.28	29.89	7.7	42.23	36.79	7.7	60.06	43.37	7.8	38.23	8.15	7.8	33.54
8.7	57.61	30.06	8.7	42.83	36.81	8.7	61.35	43.45	8.8	39.97	8.05	8.8	33.68
9.7	57.94	30.23	9.7	43.47	36.85	9.7	62.56	43.54	9.8	41.79	7.95	9.8	33.86
10.7	58.24	30.40	10.7	44.12	36.90	10.7	63.70	43.63	10.8	43.71	7.85	10.8	34.02
11.7	58.52	30.55	11.7	44.81	36.98	11.7	64.77	43.71	11.8	45.72	7.77	11.8	34.17
12.7	58.80	30.71	12.7	45.50	37.06	12.7	65.80	43.79	12.8	47.80	7.72	12.8	34.32
13.7	59.08	30.83	13.7	46.18	37.19	13.7	66.82	43.85	13.8	49.90	7.71	13.8	34.45
14.7	59.37	30.94	14.7	46.83	37.33	14.7	67.86	43.89	14.7	51.94	7.69	14.8	34.59
15.7	59.68	31.05	15.7	47.44	37.48	15.7	68.97	43.92	15.7	53.90	7.69	15.8	34.73
16.7	60.00	31.18	16.7	48.01	37.63	16.7	70.16	43.97	16.7	55.75	7.72	16.8	34.88
17.7	60.33	31.33	17.7	48.54	37.76	17.7	71.41	44.03	17.7	57.48	7.74	17.8	35.05
18.7	60.67	31.51	18.7	49.06	37.89	18.7	72.71	44.11	18.7	59.13	7.74	18.8	35.22
19.7	61.00	31.71	19.7	49.58	37.99	19.7	74.01	44.22	19.7	60.76	7.72	19.8	35.39
20.7	61.32	31.94	20.7	50.12	38.07	20.7	75.27	44.36	20.7	62.43	7.68	20.8	35.57
21.7	61.61	32.19	21.7	50.69	38.15	21.7	76.46	44.53	21.7	64.16	7.63	21.8	35.74
22.7	61.88	32.43	22.7	51.28	38.24	22.7	77.59	44.71	22.7	65.97	7.59	22.8	35.92
23.7	62.12	32.66	23.7	51.90	38.35	23.7	78.63	44.89	23.7	67.87	7.57	23.8	36.07
24.7	62.37	32.89	24.7	52.53	38.47	24.7	79.61	45.03	24.7	69.83	7.56	24.8	36.23
25.7	62.60	33.11	25.7	53.15	38.61	25.7	80.58	45.17	25.7	71.81	7.57	25.8	36.38
26.7	62.83	33.31	26.7	53.77	38.78	26.7	81.55	45.31	26.7	73.79	7.61	26.8	36.54
27.7	63.08	33.49	27.7	54.34	38.96	27.7	82.52	45.42	27.7	75.72	7.67	27.8	36.69
28.6	63.33	33.69	28.7	54.90	39.15	28.7	83.54	45.53	28.7	77.58	7.73	28.8	36.83
29.6	63.60	33.88	29.7	55.41	39.34	29.7	84.61	45.66	29.7	79.37	7.80	29.8	36.96
30.6	63.88	34.10	30.6	55.90	39.54	30.7	85.71	45.79	30.7	81.07	7.87	30.8	37.15
31.6	64.15	34.32	31.6	56.37	39.73	31.7	86.83	45.93	31.7	82.71	7.94	31.8	37.31
16.90	+16.87		24.50	−24.48		58.01	+58.00		73.35	−73.34		7.39	
17h 59m	1s.307		18h 6m	11s.893		19h 2m	39s.624		19h 27m	42s.218		20h 48m	
+86° 36′	51″.17		−87° 39′	51″.82		+89° 1′	2″.17		−89° 13′	28″.57		+82° 13′	

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

antis. 5.4		υ Octantis. Mag. 5.7			β Octantis. Mag. 4.3			39 H. Cephei. Mag. 5.6			γ¹ Octantis. Mag. 5.1		
ht on.	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.
m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	° ′
38	−83 5	Apr.	22 16	−86 22	Apr.	22 37	−81 48	Apr.	23 27	+86 50	Apr.	23 47	−82 28
	″		s	″		s	″		s	″		s	″
32	46.51	0.9	2.96	66.95	0.9	36.56	43.65	0.9	18.87	62.81	0.9	10.79	33.14
48	46.26	1.9	3.23	66.66	1.9	36.66	43.33	1.9	18.97	62.52	1.9	10.85	32.77
64	46.01	2.9	3.49	66.36	2.9	36.76	43.00	2.9	19.10	62.21	2.9	10.91	32.41
79	45.77	3.9	3.73	66.07	3.9	36.87	42.70	3.9	19.24	61.90	3.9	10.97	32.05
94	45.53	4.9	3.96	65.79	4.9	36.96	42.40	4.9	19.41	61.59	4.9	11.02	31.72
08	45.27	5.9	4.18	65.53	5 9	37.05	42.10	5.9	19.60	61.27	5.9	11.06	31.39
22	45.02	6.9	4.39	65.26	6.9	37.13	41.80	6.9	19.82	60.98	6.9	11.09	31.05
35	44.76	7.9	4.59	64.95	7.9	37.21	41.48	7.9	20.05	60.69	7.9	11.12	30.69
49	44.49	8.9	4.81	64.64	8.9	37.28	41.15	8.9	20.30	60.43	8.9	11.17	30.33
65	44.20	9.9	5.03	64.32	9.9	37.38	40.81	9.9	20.57	60.19	9.9	11.21	29.93
82	43.91	10.9	5.30	63.98	10.9	37.47	40.45	10.9	20.82	59.96	10.9	11.27	29.53
99	43.62	11.9	5.57	63.65	11.9	37.60	40.09	11.9	21.06	59.74	11.9	11.33	29.14
18	43.34	12.9	5.88	63.33	12.9	37.73	39.73	12.9	21.28	59.54	12.9	11.42	28.73
39	43.09	13.9	6.21	63.03	13.9	37.87	39.40	13.9	21.47	59.32	13.9	11.51	28.34
59	42.85	14.9	6.54	62.75	14.9	38.02	39.09	14.9	21.66	59.10	14.9	11.61	27.96
79	42.65	15.9	6.88	62.50	15.9	38.15	38.81	15.9	21.83	58.85	15.9	11.71	27.59
98	42.46	16.9	7.20	62.26	16.9	38.28	38.55	16.9	22.04	58.58	16.9	11.81	27.27
16	42.28	17.9	7.49	62.03	17.9	38.39	38.29	17.9	22.27	58.32	17.9	11.90	26.95
30	42.08	18.9	7.75	61.79	18.9	38.50	38.02	18.9	22.54	58.07	18.9	11.97	26.63
47	41.88	19.9	8.00	61.56	19.9	38.60	37.75	19.9	22.84	57.82	19.9	12.03	26.32
63	41.67	20.8	8.24	61.29	20.9	38.71	37.48	20.9	23.16	57.58	20.9	12.09	25.99
79	41.44	21.8	8.50	61.02	21.9	38.81	37.18	21.9	23.50	57.38	21.9	12.15	25.65
95	41.20	22.8	8.78	60.75	22.9	38.93	36.87	22.9	23.83	57.19	22.9	12.23	25.28
13	40.96	23.8	9.07	60.47	23.9	39.06	36.55	23.9	24.16	57.02	23.9	12.31	24.91
3.33	40.72	24.8	9.39	60.18	24.9	39.19	36.24	24.9	24.47	56.85	24.9	12.41	24.53
3.53	40.52	25.8	9.73	59.93	25.8	39.33	35.95	25.9	24.75	56.68	25.9	12.52	24.17
3.74	40.32	26.8	10.09	59.70	26.8	39.48	35.67	26.9	25.03	56.52	26.9	12.65	23.83
3.95	40.14	27.8	10.44	59.46	27.8	39.64	35.42	27.9	25.29	56.34	27.9	12.77	23.50
4.15	39.98	28.8	10.79	59.25	28.8	39.79	35.18	28.9	25.56	56.16	28.9	12.89	23.16
4.36	39.83	29.8	11.14	59.06	29.8	39.94	34.95	29.9	25.83	55.96	29.9	13.01	22.87
4.55	39.70	30.8	11.48	58.87	30.8	40.09	34.74	30.9	26.12	55.75	30.9	13.12	22.57
4.74	39.60	31.8	11.79	58.69	31.8	40.22	34.54	31.9	26.42	55.55	31.9	13.23	22.28
	−8.26		15.86	−15.82		7.02	−6.95		18.20	+18.17		7.64	−7.57
	38m 19s.542		22h 16m	8s.656		22h 37m	39s.016		23h 27m	44s.125		23h 47m	16s.424
	6′ 6″.99		−86° 23′	27″.13		−81° 49′	2″.34		+86° 50′	58″.89		−82° 28′	48″.42

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			Groombri Mag.		
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 Ascen sion.	
	h m s	° ′ ″		h m s	° ′ ″		h m s	° ′ ″		h m s	° ′ ″		h m s	
May	0 56	+85 48	May	1 29	+88 51	May	1 41	−85 10	May	4 9	+85 20	May	5 3	
0.9	56.39	48.51	0.9	22.64	49.34	0.9	46.93	63.44	1.1	57.79	24.38	1.1	12.8	
1.9	56.53	48.22	1.9	23.03	49.02	1.9	46.98	63.10	2.1	57.70	24.09	2.1	12.7	
2.9	56.70	47.94	2.9	23.47	48.70	2.9	47.03	62.76	3.1	57.62	23.77	3.1	12.5	
3.9	56.87	47.65	3.9	23.97	48.39	3.9	47.07	62.44	4.1	57.56	23.43	4.1	12.3	
4.9	57.06	47.38	4.9	24.56	48.10	4.9	47.09	62.12	5.1	57.51	23.09	5.1	12.2	
5.9	57.29	47.13	5.9	25.22	47.80	5.9	47.12	61.79	6.1	57.50	22.75	6.1	12.1	
6.9	57.52	46.89	6.9	25.93	47.52	6.9	47.13	61.43	7.0	57.49	22.42	7.1	12.0	
7.9	57.76	46.68	7.9	26.65	47.28	7.9	47.15	61.07	8.0	57.49	22.10	8.1	11.9	
8.9	58.00	46.49	8.9	27.37	47.04	8.9	47.19	60.66	9.0	57.52	21.80	9.1	11.8	
9.9	58.21	46.31	9.9	28.05	46.83	9.9	47.24	60.27	10.0	57.55	21.52	10.1	11.8	
10.9	58.41	46.14	10.9	28.67	46.64	10.9	47.33	59.88	11.0	57.56	21.26	11.1	11.7	
11.9	58.60	45.96	11.9	29.22	46.42	11.9	47.42	59.48	12.0	57.57	21.00	12.1	11.6	
12.9	58.78	45.77	12.9	29.74	46.20	12.9	47.52	59.10	13.0	57.56	20.74	13.1	11.5	
13.9	58.96	45.58	13.9	30.26	45.97	13.9	47.65	58.75	14.0	57.53	20.46	14.1	11.4	
14.9	59.14	45.35	14.9	30.82	45.70	14.9	47.76	58.43	15.0	57.50	20.15	15.1	11.3	
15.9	59.36	45.12	15.9	31.44	45.44	15.9	47.85	58.12	16.0	57.49	19.83	16.1	11.2	
16.9	59.58	44.89	16.9	32.17	45.17	16.9	47.94	57.83	17.0	57.48	19.50	17.1	11.1	
17.9	59.85	44.68	17.9	32.99	44.90	17.9	48.01	57.52	18.0	57.51	19.15	18.1	11.0	
18.9	60.12	44.49	18.9	33.87	44.65	18.9	48.07	57.21	19.0	57.55	18.82	19.1	11.0	
19.9	60.41	44.31	19.9	34.81	44.43	19.9	48.14	56.88	20.0	57.60	18.49	20.1	10.9	
20.9	60.70	44.16	20.9	35.74	44.25	20.9	48.22	56.55	21.0	57.69	18.16	21.1	10.9	
21.9	60.97	44.01	21.9	36.65	44.07	21.9	48.31	56.20	22.0	57.78	17.88	22.1	10.9	
22.9	61.24	43.89	22.9	37.50	43.89	22.9	48.42	55.85	23.0	57.86	17.59	23.1	10.9	
23.9	61.48	43.77	23.9	38.30	43.73	23.9	48.55	55.50	24.0	57.92	17.32	24.1	10.9	
24.9	61.72	43.64	24.9	39.06	43.56	24.9	48.69	55.15	24.9	57.98	17.06	25.1	10.9	
25.9	61.95	43.50	25.9	39.81	43.39	25.9	48.84	54.82	25.9	58.04	16.78	26.1	10.8	
26.9	62.18	43.37	26.9	40.54	43.22	26.9	49.00	54.50	26.9	58.09	16.51	27.1	10.8	
27.9	62.41	43.22	27.9	41.28	43.03	27.9	49.15	54.21	27.9	58.13	16.23	28.1	10.7	
28.9	62.65	43.07	28.9	42.06	42.83	28.9	49.30	53.92	28.9	58.18	15.95	29.0	10.7	
29.9	62.91	42.91	29.9	42.89	42.64	29.9	49.46	53.64	29.9	58.22	15.64	30.0	10.6	
30.8	63.18	42.75	30.9	43.79	42.44	30.9	49.60	53.37	30.9	58.28	15.33	31.0	10.6	
31.8	63.46	42.60	31.9	44.75	42.23	31.9	49.73	53.13	31.9	58.36	15.00	32.0	10.6	
13.69		+13.66	50.38		+50.37	11.91		−11.87	12.31		+12.27	11.86		
0^h	57^m	$9^s.300$	1^h	30^m	$13^s.156$	1^h	42^m	$2^s.339$	4^h	10^m	$2^s.561$	5^h	35^m	
+85°	48′	45″.30	+88°	51′	43″.55	−85°	11′	21″.46	+85°	20′	10″.34	+85°	9′	

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

ensse. 5.2		ζ Mensæ. Mag. 5.6			51 H. Cephei. Mag. 5.3			25 H. Camelop. Mag. 5.1			7 G. Octantis. Mag. 6.4		
	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	° ′
1	−84 49	May	6 46	−80 43	May	7 2	+87 11	May	7 13	+82 34	May	7 15	−86 54
	″		s	″		s	″		s	″		s	″
6	57.46	1.2	50.93	55.74	1.2	11.29	10.61	1.2	46.66	45.14	1.2	56.36	26.66
7	57.24	2.2	50.81	55.58	2.2	10.89	10.46	2.2	46.51	45.01	2.2	55.97	26.56
8	57.04	3.2	50.68	55.44	3.2	10.48	10.28	3.2	46.35	44.86	3.2	55.58	26.48
9	56.84	4.2	50.56	55.32	4.2	10.09	10.08	4.2	46.20	44.70	4.2	55.19	26.40
0	56.65	5.2	50.44	55.22	5.2	9.71	9.86	5.2	46.05	44.51	5.2	54.81	26.34
0	56.48	6.2	50.32	55.11	6.2	9.37	9.63	6.2	45.91	44.31	6.2	54.41	26.28
0	56.31	7.2	50.20	55.00	7.2	9.04	9.41	7.2	45.80	44.10	7.2	54.00	26.22
7	56.10	8.2	50.06	54.88	8.2	8.76	9.19	8.2	45.69	43.89	8.2	53.57	26.15
5	55.87	9.2	49.93	54.75	9.2	8.51	8.98	9.2	45.59	43.69	9.2	53.12	26.07
3	55.63	10.1	49.79	54.59	10.2	8.28	8.77	10.2	45.50	43.50	10.2	52.66	25.95
3	55.35	11.1	49.66	54.39	11.2	8.04	8.57	11.2	45.42	43.33	11.2	52.20	25.82
3	55.06	12.1	49.53	54.16	12.2	7.79	8.40	12.2	45.33	43.18	12.2	51.76	25.66
5	54.77	13.1	49.41	53.93	13.2	7.52	8.23	13.2	45.23	43.03	13.2	51.34	25.48
8	54.48	14.1	49.29	53.71	14.1	7.22	8.04	14.2	45.12	42.86	14.2	50.96	25.30
3	54.20	15.1	49.18	53.50	15.1	6.90	7.84	15.2	45.00	42.69	15.2	50.59	25.14
8	53.95	16.1	49.08	53.30	16.1	6.58	7.62	16.2	44.87	42.49	16.2	50.25	25.00
3	53.73	17.1	48.97	53.12	17.1	6.24	7.38	17.1	44.73	42.26	17.2	49.92	24.87
9	53.49	18.1	48.87	52.97	18.1	5.94	7.11	18.1	44.62	42.01	18.1	49.58	24.75
2	53.27	19.1	48.77	52.81	19.1	5.67	6.82	19.1	44.51	41.74	19.1	49.22	24.63
5	53.05	20.1	48.66	52.64	20.1	5.43	6.52	20.1	44.41	41.47	20.1	48.85	24.51
8	52.81	21.1	48.55	52.46	21.1	5.22	6.23	21.1	44.34	41.21	21.1	48.47	24.38
0	52.55	22.1	48.44	52.26	22.1	5.03	5.96	22.1	44.27	40.96	22.1	48.07	24.25
4	52.26	23.1	48.33	52.04	23.1	4.85	5.70	23.1	44.20	40.72	23.1	47.68	24.07
9	51.95	24.1	48.22	51.80	24.1	4.69	5.45	24.1	44.14	40.50	24.1	47.29	23.87
4	51.63	25.1	48.11	51.55	25.1	4.50	5.21	25.1	44.07	40.29	25.1	46.91	23.67
0	51.32	26.1	48.01	51.28	26.1	4.30	4.97	26.1	43.99	40.07	26.1	46.56	23.45
8	50.99	27.1	47.91	51.01	27.1	4.09	4.75	27.1	43.91	39.86	27.1	46.22	23.22
7	50.68	28.1	47.82	50.73	28.1	3.87	4.51	28.1	43.82	39.63	28.1	45.89	22.99
07	50.36	29.1	47.73	50.46	29.1	3.64	4.27	29.1	43.73	39.41	29.1	45.60	22.76
98	50.06	30.1	47.65	50.21	30.1	3.41	4.01	30.1	43.64	39.16	30.1	45.32	22.56
88	49.78	31.1	47.57	49.99	31.1	3.17	3.73	31.1	43.55	38.89	31.1	45.04	22.36
78	49.52	32.1	47.50	49.76	32.1	2.96	3.42	32.1	43.46	38.61	32.1	44.76	22.18
	−11.06		6.21	−6.13		20.37	+20.34		7.74	+7.68		18.53	−18.51
1	14ˢ.756		6ʰ 46ᵐ 58ˢ.546			7ʰ 2ᵐ 4ˢ.048			7ʰ 13ᵐ 42ˢ.294			7ʰ 16ᵐ 20ˢ.292	
	46″.89		−80° 43′ 38″.16			+87° 10′ 54″.74			+82° 34′ 30″.13			−86° 54′ 6″.70	

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. Ca Mag.		
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.	Righ Ascen sion.	
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h r	
May	8 15	+88 53	May	9 8	−85 20	May	9 25	+81 41	May	9 36	−80 34	May	10 2	
	s	″		s	″		s	″		s	″		s	
1.2	80.60	14.29	1.3	52.32	25.10	1.3	29.47	51.29	1.3	21.95	35.67	1.3	14.8	
2.2	79.48	14.24	2.3	52.05	25.16	2.3	29.32	51.35	2.3	21.82	35.77	2.3	14.6	
3.2	78.34	14.16	3.3	51.80	25.23	3.3	29.16	51.39	3.3	21.70	35.86	3.3	14.5	
4.2	77.18	14.08	4.3	51.54	25.31	4.3	29.01	51.40	4.3	21.59	35.97	4.3	14.3	
5.2	76.04	13.97	5.3	51.30	25.40	5.3	28.85	51.41	5.3	21.47	36.09	5.3	14.1	
6.2	74.93	13.84	6.3	51.05	25.49	6.3	28.69	51.38	6.3	21.35	36.21	6.3	13.9	
7.2	73.89	13.69	7.3	50.79	25.60	7.3	28.55	51.34	7.3	21.23	36.36	7.3	13.8	
8.2	72.94	13.54	8.3	50.52	25.72	8.3	28.41	51.29	8.3	21.11	36.50	8.3	13.6	
9.2	72.05	13.39	9.3	50.23	25.82	9.3	28.29	51.23	9.3	20.99	36.64	9.3	13.4	
10.2	71.25	13.25	10.2	49.92	25.89	10.3	28.19	51.18	10.3	20.86	36.76	10.3	13.3	
11.2	70.45	13.12	11.2	49.61	25.94	11.3	28.08	51.14	11.3	20.72	36.85	11.3	13.2	
12.2	69.64	13.01	12.2	49.30	25.96	12.3	27.98	51.10	12.3	20.57	36.91	12.3	13.0	
13.2	68.78	12.91	13.2	49.00	25.96	13.3	27.85	51.10	13.3	20.42	36.96	13.3	12.9	
14.2	67.86	12.81	14.2	48.71	25.96	14.3	27.73	51.09	14.3	20.28	36.99	14.3	12.8	
15.2	66.86	12.69	15.2	48.43	25.95	15.2	27.59	51.08	15.3	20.15	37.01	15.3	12.6	
16.2	65.81	12.56	16.2	48.17	25.95	16.2	27.43	51.06	16.3	20.02	37.03	16.3	12.4	
17.2	64.74	12.39	17.2	47.93	25.95	17.2	27.28	51.01	17.2	19.90	37.06	17.3	12.2	
18.2	63.70	12.20	18.2	47.69	25.98	18.2	27.13	50.93	18.2	19.78	37.10	18.3	12.0	
19.2	62.72	11.98	19.2	47.45	26.01	19.2	26.98	50.84	19.2	19.67	37.18	19.3	11.8	
20.2	61.81	11.76	20.2	47.19	26.05	20.2	26.84	50.73	20.2	19.55	37.26	20.3	11.7	
21.2	60.98	11.54	21.2	46.92	26.09	21.2	26.71	50.60	21.2	19.44	37.33	21.3	11.5	
22.2	60.22	11.31	22.2	46.64	26.12	22.2	26.61	50.48	22.2	19.31	37.39	22.3	11.4	
23.2	59.48	11.12	23.2	46.36	26.13	23.2	26.50	50.37	23.2	19.18	37.43	23.3	11.2	
24.2	58.79	10.92	24.2	46.07	26.10	24.2	26.39	50.27	24.2	19.04	37.43	24.3	11.1	
25.2	58.06	10.74	25.2	45.78	26.07	25.2	26.29	50.18	25.2	18.91	37.42	25.3	10.9	
26.2	57.32	10.57	26.2	45.48	26.02	26.2	26.17	50.10	26.2	18.76	37.39	26.3	10.8	
27.2	56.55	10.40	27.2	45.21	25.95	27.2	26.05	50.02	27.2	18.62	37.36	27.3	10.7	
28.2	55.73	10.22	28.2	44.93	25.87	28.2	25.92	49.95	28.2	18.49	37.33	28.2	10.5	
29.2	54.89	10.04	29.2	44.68	25.79	29.2	25.79	49.86	29.2	18.36	37.28	29.2	10.3	
30.2	54.02	9.85	30.2	44.44	25.71	30.2	25.66	49.76	30.2	18.24	37.22	30.2	10.1	
31.2	53.14	9.64	31.2	44.20	25.64	31.2	25.52	49.64	31.2	18.13	37.17	31.2	10.0	
32.2	52.28	9.38	32.2	43.97	25.58	32.2	25.39	49.50	32.2	18.02	37.13	32.2	9.8	
51.48	+51.47		12.31	−12.27		6.93	+6.85		6.11	−6.03		8.19		
8^h 15^m $48^s.380$			9^h 8^m $57^s.938$			9^h 25^m $21^s.719$			9^h 36^m $22^s.347$			10^h 21^m		
+88° 53′ 0″.29			−85° 19′ 57″.45			+81° 41′ 41″.50			−80° 34′ 6″.83			+82° 58′		

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

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		
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	° ′
10 59	−84 9	May	12 14	+88 9	May	12 46	−84 40	May	12 48	+83 51	May	13 27	−85 22
s	″		s	″		s	″		s	″		s	″
60.18	19.56	1.4	64.86	35.44	1.4	21.14	46.30	1.4	42.59	46.88	1.5	33.58	2.80
60.02	19.76	2.4	64.42	35.68	2.4	21.06	46.59	2.4	42.48	47.18	2.4	33.53	3.12
59.87	19.96	3.4	63.95	35.95	3.4	20.97	46.88	3.4	42.37	47.47	3.4	33.48	3.43
59.71	20.18	4.4	63.43	36.19	4.4	20.90	47.17	4.4	42.24	47.77	4.4	33.43	3.73
59.57	20.40	5.4	62.87	36.42	5.4	20.83	47.49	5.4	42.10	48.04	5.4	33.39	4.05
59.43	20.65	6.4	62.29	36.61	6.4	20.77	47.81	6.4	41.95	48.28	6.4	33.38	4.37
59.28	20.88	7.4	61.71	36.80	7.4	20.71	48.13	7.4	41.81	48.51	7.4	33.36	4.71
59.13	21.13	8.4	61.15	36.98	8.4	20.65	48.47	8.4	41.67	48.72	8.4	33.33	5.08
58.96	21.38	9.4	60.61	37.13	9.4	20.57	48.82	9.4	41.53	48.91	9.4	33.30	5.45
58.78	21.64	10.4	60.13	37.26	10.4	20.47	49.18	10.4	41.41	49.09	10.4	33.24	5.83
58.59	21.87	11.4	59.67	37.40	11.4	20.35	49.53	11.4	41.30	49.27	11.4	33.16	6.20
58.38	22.07	12.4	59.24	37.57	12.4	20.21	49.86	12.4	41.19	49.46	12.4	33.06	6.55
58.18	22.26	13.4	58.79	37.76	13.4	20.07	50.15	13.4	41.08	49.68	13.4	32.93	6.87
57.97	22.41	14.4	58.33	37.95	14.4	19.93	50.43	14.4	40.96	49.91	14.4	32.81	7.17
57.78	22.55	15.4	57.82	38.14	15.4	19.79	50.70	15.4	40.83	50.15	15.4	32.70	7.46
57.59	22.69	16.4	57.23	38.33	16.4	19.66	50.94	16.4	40.68	50.39	16.4	32.59	7.74
57.43	22.83	17.4	56.62	38.53	17.4	19.56	51.19	17.4	40.50	50.63	17.4	32.50	8.00
57.28	22.98	18.4	55.96	38.71	18.4	19.46	51.45	18.4	40.33	50.84	18.4	32.43	8.28
57.12	23.15	19.4	55.28	38.85	19.4	19.36	51.72	19.4	40.15	51.03	19.4	32.37	8.58
56.95	23.34	20.3	54.61	38.96	20.4	19.27	52.00	20.4	39.98	51.20	20.4	32.31	8.91
56.78	23.53	21.3	53.96	39.07	21.4	19.17	52.29	21.4	39.80	51.35	21.4	32.23	9.24
56.60	23.71	22.3	53.35	39.17	22.4	19.05	52.59	22.4	39.64	51.49	22.4	32.14	9.58
56.40	23.88	23.3	52.78	39.25	23.4	18.92	52.88	23.4	39.49	51.63	23.4	32.03	9.90
56.20	24.03	24.3	52.23	39.33	24.4	18.77	53.17	24.4	39.34	51.77	24.4	31.90	10.23
55.98	24.17	25.3	51.70	39.43	25.4	18.60	53.44	25.4	39.20	51.91	25.4	31.76	10.54
55.76	24.29	26.3	51.16	39.53	26.4	18.43	53.68	26.4	39.06	52.07	26.4	31.61	10.83
55.56	24.38	27.3	50.61	39.64	27.4	18.25	53.91	27.4	38.91	52.23	27.4	31.45	11.09
55.36	24.47	28.3	50.05	39.75	28.3	18.07	54.13	28.4	38.75	52.39	28.4	31.27	11.35
55.16	24.53	29.3	49.45	39.87	29.3	17.90	54.33	29.3	38.58	52.56	29.4	31.11	11.60
54.95	24.59	30.3	48.81	39.98	30.3	17.75	54.53	30.3	38.41	52.74	30.4	30.96	11.83
54.77	24.65	31.3	48.13	40.10	31.3	17.60	54.72	31.3	38.23	52.92	31.4	30.81	12.05
54.59	24.73	32.3	47.44	40.21	32.3	17.45	54.91	32.3	38.04	53.08	32.4	30.68	12.27
9.82	−9.77		31.15	+31.14		10.79	−10.74		9.36	−9.30		12.38	−12.34
10h 59m	55s.280		12h 14m	28s.425		12h 46m	7s.152		12h 48m	30s.418		13h 27m	14s.624
84° 8′	50″.60		+88° 9′	36″.08		−84° 40′	22″.34		+83° 51′	50″.47		−85° 21′	42″.23

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. Aq Mag. 5	
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.
	h m s	° ′ ″		h m s	° ′ ″		h m s	° ′ ″		h m s	° ′ ″		h m s
May	14 13	−83 17	May	15 3	+87 32	May	15 24	−84 11	May	16 54	+82 10	May	17 16
1.5	43.55	37.28	1.5	61.86	58.80	1.5	16.88	38.51	1.6	30.11	16.30	1.6	8.50
2.5	43.55	37.60	2.5	61.88	59.14	2.5	16.95	38.82	2.6	30.21	16.61	2.6	8.60
3.5	43.56	37.91	3.5	61.89	59.48	3.5	17.02	39.11	3.6	30.29	16.93	3.6	8.70
4.5	43.56	38.21	4.5	61.85	59.83	4.5	17.10	39.41	4.6	30.34	17.26	4.6	8.80
5.5	43.59	38.53	5.5	61.77	60.19	5.5	17.18	39.70	5.6	30.41	17.60	5.6	8.91
6.5	43.62	38.85	6.5	61.67	60.54	6.5	17.28	39.99	6.6	30.47	17.94	6.6	9.03
7.5	43.64	39.18	7.5	61.55	60.87	7.5	17.38	40.31	7.6	30.52	18.28	7.6	9.17
8.5	43.67	39.54	8.5	61.41	61.17	8.5	17.49	40.63	8.6	30.56	18.61	8.6	9.30
9.5	43.70	39.92	9.5	61.28	61.46	9.5	17.59	40.98	9.6	30.60	18.90	9.6	9.43
10.5	43.71	40.29	10.5	61.17	61.73	10.5	17.68	41.35	10.6	30.64	19.19	10.6	9.56
11.5	43.70	40.67	11.5	61.07	61.99	11.5	17.74	41.73	11.6	30.68	19.47	11.6	9.68
12.5	43.67	41.04	12.5	60.99	62.27	12.5	17.79	42.10	12.6	30.72	19.75	12.6	9.78
13.5	43.63	41.40	13.5	60.93	62.54	13.5	17.83	42.46	13.6	30.77	20.02	13.6	9.87
14.4	43.59	41.73	14.5	60.86	62.85	14.5	17.84	42.81	14.6	30.82	20.30	14.6	9.96
15.4	43.55	42.05	15.5	60.77	63.17	15.5	17.86	43.14	15.6	30.88	20.62	15.6	10.03
16.4	43.51	42.33	16.5	60.65	63.50	16.5	17.89	43.43	16.6	30.92	20.97	16.6	10.11
17.4	43.48	42.61	17.5	60.49	63.83	17.5	17.92	43.72	17.6	30.96	21.32	17.6	10.18
18.4	43.47	42.90	18.5	60.31	64.18	18.5	17.96	44.01	18.5	30.99	21.69	18.6	10.27
19.4	43.46	43.20	19.5	60.08	64.50	19.5	18.01	44.31	19.5	31.00	22.07	19.6	10.36
20.4	43.46	43.52	20.5	59.83	64.81	20.5	18.07	44.62	20.5	31.01	22.42	20.6	10.47
21.4	43.45	43.85	21.5	59.58	65.10	21.5	18.13	44.95	21.5	31.01	22.76	21.6	10.58
22.4	43.43	44.20	22.5	59.34	65.38	22.5	18.19	45.30	22.5	31.02	23.09	22.6	10.68
23.4	43.40	44.54	23.5	59.11	65.64	23.5	18.23	45.66	23.5	31.02	23.40	23.5	10.78
24.4	43.35	44.89	24.5	58.90	65.88	24.5	18.24	46.03	24.5	31.03	23.70	24.5	10.87
25.4	43.30	45.23	25.5	58.71	66.14	25.5	18.25	46.39	25.5	31.04	24.00	25.5	10.95
26.4	43.23	45.56	26.4	58.52	66.41	26.5	18.24	46.73	26.5	31.06	24.29	26.5	11.02
27.4	43.15	45.86	27.4	58.35	66.67	27.5	18.21	47.08	27.5	31.07	24.59	27.5	11.07
28.4	43.07	46.14	28.4	58.15	66.94	28.5	18.18	47.41	28.5	31.08	24.91	28.5	11.12
29.4	42.99	46.41	29.4	57.93	67.22	29.5	18.15	47.71	29.5	31.09	25.24	29.5	11.17
30.4	42.91	46.67	30.4	57.71	67.51	30.5	18.14	47.99	30.5	31.10	25.58	30.5	11.22
31.4	42.85	46.91	31.4	57.44	67.82	31.4	18.12	48.26	31.5	31.10	25.94	31.5	11.26
32.4	42.80	47.16	32.4	57.14	68.13	32.4	18.11	48.54	32.5	31.10	26.31	32.5	11.32
8.56		−8.51	23.40		−23.38	9.89		−9.84	7.34		+7.27	6.24	
14h	13m	27s.793	15h	3m	41s.175	15h	23m	56s.594	16h	54m	25s.488	17h	15m
−83°	17′	21″.03	+87°	33′	10″.52	−84°	11′	30″.39	+82°	10′	32″.75	−80°	47′

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

sæ Minoris. fag. 4.4		χ Octantis. Mag. 5.2			λ Ursæ Minoris. Mag. 6.6			σ Octantis. Mag. 5.5			76 Draconis. Mag. 5.7		
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	° ′
17 59	+86 36	May	18 6	−87 39	May	19 2	+89 0	May	19 29	−89 13	May	20 48	+82 13
s	″		s	″		s	″		s	″		s	″
4.15	34.32	1.6	56.37	39.73	1.7	26.83	45.93	1.7	22.71	7.94	1.8	37.31	16.50
4.42	34.55	2.6	56.84	39.91	2.7	27.98	46.10	2.7	24.30	8.01	2.8	37.48	16.53
4.69	34.81	3.6	57.29	40.07	3.7	29.12	46.28	3.7	25.84	8.08	3.8	37.66	16.57
4.94	35.08	4.6	57.75	40.22	4.7	30.24	46.47	4.7	27.41	8.11	4.7	37.83	16.62
5.18	35.37	5.6	58.22	40.36	5.7	31.30	46.71	5.7	28.99	8.14	5.7	38.01	16.72
5.39	35.68	6.6	58.72	40.50	6.7	32.30	46.95	6.7	30.65	8.18	6.7	38.18	16.84
5.58	35.97	7.6	59.26	40.66	7.7	33.21	47.19	7.7	32.39	8.22	7.7	38.35	16.97
5.76	36.27	8.6	59.81	40.83	8.7	34.03	47.42	8.7	34.23	8.27	8.7	38.50	17.10
5.91	36.54	9.6	60.38	41.02	9.7	34.79	47.66	9.7	36.14	8.33	9.7	38.65	17.23
6.06	36.79	10.6	60.94	41.25	10.7	35.52	47.85	10.7	38.05	8.42	10.7	38.80	17.34
6.21	37.03	11.6	61.47	41.50	11.7	36.25	48.04	11.7	39.94	8.55	11.7	38.93	17.44
6.39	37.27	12.6	61.97	41.77	12.7	37.02	48.23	12.7	41.75	8.68	12.7	39.07	17.53
6.58	37.50	13.6	62.41	42.02	13.7	37.85	48.40	13.7	43.43	8.83	13.7	39.22	17.61
6.77	37.75	14.6	62.81	42.26	14.6	38.76	48.59	14.7	44.99	8.98	14.7	39.36	17.69
6.97	38.02	15.6	63.19	42.50	15.6	39.70	48.82	15.7	46.45	9.12	15.7	39.51	17.78
7.17	38.32	16.6	63.56	42.71	16.6	40.66	49.05	16.7	47.84	9.24	16.7	39.69	17.90
7.36	38.65	17.6	63.93	42.91	17.6	41.60	49.32	17.7	49.22	9.34	17.7	39.86	18.05
7.52	38.98	18.6	64.34	43.10	18.6	42.47	49.61	18.7	50.65	9.42	18.7	40.03	18.23
7.66	39.33	19.6	64.76	43.28	19.6	43.25	49.91	19.7	52.17	9.51	19.7	40.18	18.41
7.76	39.67	20.6	65.21	43.47	20.6	43.93	50.21	20.7	53.77	9.60	20.7	40.33	18.61
7.86	40.00	21.6	65.68	43.69	21.6	44.55	50.50	21.6	55.43	9.72	21.7	40.48	18.82
7.95	40.32	22.6	66.15	43.92	22.6	45.12	50.78	22.6	57.12	9.85	22.7	40.62	19.01
8.04	40.60	23.6	66.59	44.19	23.6	45.67	51.03	23.6	58.81	9.98	23.7	40.75	19.19
8.13	40.89	24.6	67.01	44.45	24.6	46.23	51.28	24.6	60.44	10.15	24.7	40.88	19.37
8.23	41.16	25.6	67.40	44.73	25.6	46.82	51.51	25.6	62.00	10.34	25.7	41.02	19.52
8.33	41.43	26.6	67.76	45.01	26.6	47.43	51.74	26.6	63.49	10.54	26.7	41.15	19.68
8.44	41.72	27.6	68.08	45.30	27.6	48.07	51.99	27.6	64.88	10.74	27.7	41.28	19.82
8.55	42.02	28.6	68.37	45.58	28.6	48.75	52.26	28.6	66.19	10.95	28.7	41.41	19.99
8.66	42.32	29.6	68.66	45.86	29.6	49.44	52.52	29.6	67.43	11.14	29.7	41.55	20.16
8.78	42.64	30.6	68.93	46.11	30.6	50.14	52.80	30.6	68.63	11.32	30.7	41.69	20.35
8.88	42.99	31.6	69.20	46.35	31.6	50.80	53.11	31.6	69.80	11.50	31.7	41.84	20.58
8.97	43.35	32.6	69.48	46.59	32.6	51.42	53.43	32.6	71.00	11.65	32.7	41.99	20.81
3.91	+16.88		24.51	−24.49		58.09	+58.08		73.38	−73.38		7.39	+7.32
7h 59m	1s.307		18h 6m	11s.893		19h 2m	39s.624		19h 27m	42s.218		20h 48m	40s.494
9° 36′	51″.17		−87° 39′	51″.82		+89° 1′	2″.17		−89° 13′	28″.57		+82° 13′	29″.86

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

λ Octantis. Mag. 5.4			υ Octantis. Mag. 5.7			β Octantis. Mag. 4.3			39 H. Cephei. Mag. 5.6			γ¹ Oct Mag.	
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.
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m
May	21 38	−83 5	May	22 16	−86 22	May	22 37	−81 48	May	23 27	+86 50	May	23 4
	s	″		s	″		s	″		s	″		s
1.8	24.74	39.60	1.8	11.79	58.69	1.8	40.22	34.54	1.9	26.42	55.55	1.9	13.2
2.8	24.91	39.46	2.8	12.11	58.51	2.8	40.35	34.35	2.9	26.75	55.35	2.9	13.3
3.8	25.08	39.33	3.8	12.40	58.34	3.8	40.48	34.13	3.9	27.12	55.15	3.9	13.4
4.8	25.25	39.18	4.8	12.69	58.15	4.8	40.59	33.91	4.9	27.48	54.98	4.9	13.5
5.8	25.42	39.04	5.8	12.98	57.97	5.8	40.71	33.70	5.9	27.86	54.84	5.9	13.6
6.8	25.60	38.88	6.8	13.27	57.74	6.8	40.84	33.46	6.9	28.27	54.69	6.9	13.7
7.8	25.78	38.71	7.8	13.59	57.53	7.8	40.97	33.22	7.9	28.66	54.59	7.9	13.8
8.8	25.99	38.55	8.8	13.94	57.31	8.8	41.13	32.98	8.8	29.04	54.49	8.9	13.9
9.8	26.20	38.40	9.8	14.30	57.11	9.8	41.30	32.73	9.8	29.39	54.42	9.9	14.0
10.8	26.43	38.27	10.8	14.69	56.91	10.8	41.47	32.49	10.8	29.72	54.34	10.9	14.2
11.8	26.65	38.15	11.8	15.11	56.75	11.8	41.65	32.29	11.8	30.04	54.26	11.9	14.3
12.8	26.88	38.06	12.8	15.49	56.61	12.8	41.82	32.11	12.8	30.34	54.16	12.9	14.5
13.8	27.09	38.00	13.8	15.88	56.50	13.8	41.99	31.96	13.8	30.65	54.03	13.8	14.6
14.8	27.28	37.95	14.8	16.24	56.39	14.8	42.14	31.82	14.8	30.98	53.91	14.8	14.8
15.8	27.47	37.90	15.8	16.57	56.28	15.8	42.28	31.68	15.8	31.35	53.77	15.8	14.9
16.8	27.65	37.82	16.8	16.88	56.17	16.8	42.42	31.53	16.8	31.74	53.65	16.8	15.1
17.7	27.82	37.74	17.8	17.18	56.06	17.8	42.55	31.37	17.8	32.16	53.55	17.8	15.2
18.7	27.99	37.65	18.8	17.49	55.93	18.8	42.68	31.20	18.8	32.59	53.47	18.8	15.3
19.7	28.18	37.55	19.8	17.80	55.78	19.8	42.81	31.03	19.8	33.03	53.42	19.8	15.4
20.7	28.36	37.44	20.8	18.13	55.64	20.8	42.97	30.85	20.8	33.46	53.39	20.8	15.5
21.7	28.57	37.34	21.8	18.50	55.49	21.8	43.14	30.66	21.8	33.86	53.37	21.8	15.7
22.7	28.79	37.25	22.8	18.87	55.35	22.8	43.31	30.47	22.8	34.24	53.36	22.8	15.8
23.7	28.99	37.19	23.8	19.26	55.24	23.8	43.48	30.31	23.8	34.61	53.35	23.8	16.0
24.7	29.22	37.14	24.8	19.66	55.14	24.8	43.66	30.17	24.8	34.96	53.31	24.8	16.1
25.7	29.44	37.12	25.8	20.05	55.05	25.8	43.83	30.05	25.8	35.30	53.28	25.8	16.3
26.7	29.64	37.11	26.7	20.43	55.01	26.8	44.01	29.95	26.8	35.66	53.24	26.8	16.5
27.7	29.84	37.12	27.7	20.81	54.98	27.8	44.17	29.87	27.8	36.01	53.19	27.8	16.6
28.7	30.03	37.14	28.7	21.17	54.94	28.8	44.33	29.80	28.8	36.37	53.14	28.8	16.8
29.7	30.22	37.15	29.7	21.51	54.91	29.8	44.48	29.73	29.8	36.76	53.10	29.8	16.9
30.7	30.39	37.15	30.7	21.83	54.87	30.8	44.62	29.66	30.8	37.17	53.06	30.8	17.1
31.7	30.56	37.16	31.7	22.15	54.82	31.8	44.77	29.57	31.8	37.60	53.04	31.8	17.2
32.7	30.73	37.15	32.7	22.45	54.78	32.7	44.91	29.49	32.8	38.05	53.04	32.8	17.3
8.32		−8.26	15.85		−15.82	7.02		−6.95	18.19		+18.16	7.63	
21h	38m	19s.542	22h	16m	8s.656	22h	37m	39s.016	23h	27m	44s.125	23h	47m
−83°	6′	6″.99	−86°	23′	27″.13	−81°	49′	2″.34	+86°	50′	58″.89	−82°	28′

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

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		
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	° ′ ″
0 57	+85 48	June	1 29	+88 51	June	1 41	−85 10	June	4 9	+85 20	June	5 35	+85 9
3.46	42.60	0.9	44.75	42.23	0.9	49.73	53.13	0.9	58.36	15.00	1.0	10.63	37.35
3.77	42.47	1.9	45.76	42.03	1.9	49.86	52.86	1.9	58.46	14.67	2.0	10.62	37.01
4.08	42.35	2.9	46.84	41.87	2.9	49.98	52.59	2.9	58.58	14.34	3.0	10.63	36.64
4.41	42.25	3.9	47.95	41.72	3.9	50.10	52.32	3.9	58.72	14.05	4.0	10.67	36.29
4.73	42.18	4.9	49.04	41.60	4.9	50.22	52.01	4.9	58.87	13.76	5.0	10.73	35.97
5.05	42.13	5.9	50.10	41.50	5.9	50.36	51.70	5.9	59.04	13.51	6.0	10.79	35.68
5.34	42.10	6.9	51.11	41.42	6.9	50.54	51.38	6.9	59.19	13.27	7.0	10.86	35.39
5.61	42.06	7.9	52.05	41.35	7.9	50.72	51.06	7.9	59.34	13.03	8.0	10.92	35.14
5.88	42.02	8.8	52.93	41.25	8.9	50.92	50.76	8.9	59.47	12.81	9.0	10.98	34.88
6.12	41.97	9.8	53.78	41.15	9.9	51.12	50.48	9.9	59.57	12.58	10.0	11.00	34.61
6.39	41.87	10.8	54.65	41.03	10.9	51.33	50.23	10.9	59.68	12.33	11.0	11.01	34.34
6.65	41.78	11.8	55.57	40.89	11.8	51.54	49.99	11.9	59.78	12.05	12.0	11.02	34.03
6.94	41.69	12.8	56.58	40.75	12.8	51.72	49.79	12.9	59.90	11.76	13.0	11.05	33.71
7.26	41.63	13.8	57.67	40.61	13.8	51.89	49.59	13.9	60.03	11.44	14.0	11.09	33.36
7.60	41.56	14.8	58.84	40.48	14.8	52.04	49.37	14.9	60.20	11.15	15.0	11.14	33.02
7.94	41.51	15.8	60.05	40.38	15.8	52.19	49.15	15.9	60.38	10.86	15.9	11.22	32.68
8.30	41.49	16.8	61.27	40.31	16.8	52.36	48.93	16.9	60.57	10.58	16.9	11.31	32.33
8.63	41.49	17.8	62.46	40.25	17.8	52.53	48.68	17.9	60.78	10.34	17.9	11.42	32.01
8.96	41.51	18.8	63.60	40.21	18.8	52.71	48.44	18.9	60.99	10.09	18.9	11.54	31.71
9.28	41.53	19.8	64.70	40.18	19.8	52.91	48.18	19.9	61.19	9.88	19.9	11.65	31.43
9.56	41.55	20.8	65.73	40.16	20.8	53.14	47.94	20.9	61.38	9.68	20.9	11.76	31.16
9.85	41.56	21.8	66.72	40.12	21.8	53.37	47.71	21.9	61.55	9.48	21.9	11.86	30.90
10.13	41.57	22.8	67.69	40.09	22.8	53.61	47.51	22.9	61.72	9.25	22.9	11.95	30.63
10.40	41.58	23.8	68.67	40.05	23.8	53.83	47.31	23.9	61.88	9.04	23.9	12.03	30.37
10.68	41.58	24.8	69.67	39.99	24.8	54.07	47.14	24.9	62.05	8.82	24.9	12.11	30.08
10.97	41.57	25.8	70.69	39.94	25.8	54.29	46.99	25.9	62.21	8.58	25.9	12.19	29.80
11.27	41.55	26.8	71.77	39.87	26.8	54.52	46.85	26.9	62.38	8.35	26.9	12.26	29.49
11.59	41.54	27.8	72.91	39.80	27.8	54.71	46.71	27.9	62.56	8.09	27.9	12.35	29.18
11.92	41.55	28.8	74.10	39.74	28.8	54.92	46.57	28.9	62.76	7.82	28.9	12.46	28.86
12.26	41.59	29.8	75.34	39.70	29.8	55.11	46.41	29.9	62.98	7.58	29.9	12.59	28.54
12.63	41.64	30.8	76.61	39.69	30.8	55.31	46.26	30.9	63.23	7.34	30.9	12.73	28.21
12.97	41.73	31.8	77.89	39.69	31.8	55.50	46.08	31.9	63.49	7.12	31.9	12.91	27.91
.69	+13.66		50.32	+50.31		11.90	−11.86		12.30	+12.26		11.85	+11.81
^{h} 57^m	9^s.300		1^h 30^m	13^s.156		1^h 42^m	2^s.339		4^h 10^m	2^s.561		5^h 35^m	12^s.782
° 48′	45″.30		+88° 51′	43″.55		−85° 11′	21″.46		+85° 20′	10″.34		+85° 9′	30″.24

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. Oc Mag.	
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.	Righ Ascen sion.
June	h m s 5 45	° ′ ″ −84 49	June	h m s 6 46	° ′ ″ −80 43	June	h m s 7 2	° ′ ″ +87 10	June	h m s 7 13	° ′ ″ +82 34	June	h m s 7 1
1.0	51.78	49.52	1.1	47.50	49.76	1.1	2.96	63.42	1.1	43.46	38.61	1.1	44.7
2.0	51.68	49.27	2.1	47.42	49.54	2.1	2.77	63.09	2.1	43.39	38.31	2.1	44.4
3.0	51.57	49.03	3.1	47.34	49.33	3.1	2.62	62.75	3.1	43.33	38.00	3.1	44.1
4.0	51.46	48.75	4.1	47.26	49.11	4.1	2.49	62.41	4.1	43.28	37.68	4.1	43.8
5.0	51.33	48.47	5.1	47.17	48.88	5.1	2.40	62.08	5.1	43.24	37.38	5.1	43.5
6.0	51.21	48.15	6.1	47.08	48.62	6.1	2.33	61.78	6.1	43.22	37.09	6.1	43.2
7.0	51.10	47.83	7.1	46.99	48.35	7.1	2.28	61.49	7.1	43.21	36.82	7.1	42.8
8.0	50.99	47.48	8.1	46.91	48.05	8.1	2.24	61.23	8.1	43.19	36.57	8.1	42.5
9.0	50.90	47.13	9.1	46.83	47.73	9.1	2.16	60.97	9.1	43.16	36.32	9.1	42.2
10.0	50.84	46.78	10.1	46.76	47.40	10.1	2.06	60.71	10.1	43.12	36.07	10.1	41.9
11.0	50.79	46.44	11.1	46.70	47.07	11.1	1.93	60.43	11.1	43.07	35.81	11.1	41.7
12.0	50.74	46.11	12.1	46.65	46.79	12.1	1.80	60.14	12.1	43.02	35.54	12.1	41.5
13.0	50.70	45.83	13.1	46.60	46.51	13.1	1.65	59.83	13.1	42.96	35.24	13.1	41.3
14.0	50.65	45.54	14.1	46.55	46.26	14.1	1.53	59.49	14.1	42.91	34.92	14.1	41.1
15.0	50.60	45.27	15.1	46.50	46.02	15.1	1.43	59.15	15.1	42.86	34.59	15.1	40.9
16.0	50.55	45.01	16.0	46.44	45.78	16.1	1.37	58.79	16.1	42.84	34.26	16.1	40.7
17.0	50.48	44.74	17.0	46.39	45.54	17.1	1.34	58.44	17.1	42.83	33.91	17.1	40.4
18.0	50.42	44.43	18.0	46.33	45.28	18.1	1.34	58.10	18.1	42.83	33.56	18.1	40.2
18.9	50.36	44.11	19.0	46.27	44.98	19.1	1.35	57.77	19.1	42.84	33.25	19.1	39.9
19.9	50.30	43.77	20.0	46.21	44.66	20.0	1.38	57.46	20.1	42.84	32.96	20.1	39.7
20.9	50.26	43.41	21.0	46.15	44.31	21.0	1.41	57.16	21.1	42.85	32.69	21.1	39.5
21.9	50.23	43.05	22.0	46.11	43.97	22.0	1.42	56.87	22.1	42.85	32.41	22.1	39.3
22.9	50.22	42.69	23.0	46.07	43.63	23.0	1.42	56.58	23.0	42.85	32.13	23.0	39.1
23.9	50.22	42.35	24.0	46.03	43.29	24.0	1.40	56.29	24.0	42.84	31.87	24.0	38.9
24.9	50.22	42.02	25.0	46.00	42.95	25.0	1.37	56.00	25.0	42.84	31.59	25.0	38.7
25.9	50.23	41.71	26.0	45.98	42.62	26.0	1.34	55.69	26.0	42.82	31.31	26.0	38.6
26.9	50.24	41.38	27.0	45.97	42.33	27.0	1.31	55.37	27.0	42.80	31.00	27.0	38.5
27.9	50.26	41.10	28.0	45.94	42.04	28.0	1.29	55.04	28.0	42.79	30.66	28.0	38.4
28.9	50.27	40.83	29.0	45.91	41.76	29.0	1.28	54.69	29.0	42.78	30.32	29.0	38.3
29.9	50.29	40.56	30.0	45.89	41.49	30.0	1.32	54.33	30.0	42.79	29.96	30.0	38.1
30.9	50.29	40.27	31.0	45.87	41.22	31.0	1.39	53.96	31.0	42.82	29.60	31.0	38.0
31.9	50.28	39.96	32.0	45.85	40.95	32.0	1.50	53.59	32.0	42.86	29.25	32.0	37.9
11.10	−11.05		6.21	−6.13		20.35	+20.32		7.74	+7.67		18.52	-
5^h 46^m	$14^s.756$		6^h 46^m	$58^s.546$		7^h 2^m	$4^s.048$		7^h 13^m	$42^s.294$		7^h 16^m	
−84° 49′	46″.89		−80° 43′	38″.16		+87° 10′	54″.74		+82° 34′	30″.13		−86° 54′	

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

abridge 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		
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	° ′
8 15	+88 53	June	9 8	−85 20	June	9 25	+81 41	June	9 36	−80 34	June	10 21	+82 58
s	″		s	″		s	″		s	″		s	″
52.28	9.38	1.2	43.97	25.58	1.2	25.39	49.50	1.2	18.02	37.13	1.2	9.84	61.17
51.46	9.11	2.2	43.74	25.53	2.2	25.25	49.33	2.2	17.91	37.10	2.2	9.66	61.08
50.70	8.84	3.2	43.51	25.49	3.2	25.12	49.15	3.2	17.80	37.09	3.2	9.48	60.98
50.03	8.55	4.2	43.27	25.46	4.2	25.01	48.95	4.2	17.68	37.09	4.2	9.33	60.85
49.44	8.26	5.2	43.01	25.41	5.2	24.91	48.73	5.2	17.56	37.10	5.2	9.18	60.70
48.93	7.97	6.2	42.75	25.34	6.2	24.82	48.53	6.2	17.44	37.07	6.2	9.04	60.56
48.46	7.72	7.2	42.47	25.27	7.2	24.73	48.35	7.2	17.31	37.02	7.2	8.92	60.42
48.00	7.48	8.2	42.19	25.18	8.2	24.65	48.18	8.2	17.18	36.95	8.2	8.80	60.29
47.52	7.25	9.2	41.91	25.04	9.2	24.57	48.03	9.2	17.04	36.86	9.2	8.68	60.19
46.99	7.03	10.2	41.64	24.89	10.2	24.48	47.88	10.2	16.90	36.73	10.2	8.55	60.10
46.39	6.80	11.2	41.40	24.73	11.2	24.38	47.73	11.2	16.78	36.61	11.2	8.42	60.01
45.74	6.58	12.2	41.18	24.59	12.2	24.25	47.57	12.2	16.67	36.48	12.2	8.26	59.92
45.02	6.29	13.2	40.98	24.45	13.2	24.13	47.40	13.2	16.57	36.36	13.2	8.09	59.80
44.34	5.98	14.2	40.78	24.32	14.2	24.01	47.20	14.2	16.47	36.26	14.2	7.91	59.67
43.71	5.67	15.1	40.58	24.21	15.2	23.90	46.96	15.2	16.37	36.17	15.2	7.74	59.51
43.14	5.34	16.1	40.37	24.11	16.2	23.79	46.71	16.2	16.28	36.09	16.2	7.59	59.33
42.67	5.01	17.1	40.15	24.02	17.2	23.70	46.46	17.2	16.18	36.02	17.2	7.44	59.14
42.29	4.68	18.1	39.91	23.89	18.2	23.61	46.22	18.2	16.07	35.94	18.2	7.30	58.94
41.96	4.37	19.1	39.68	23.76	19.2	23.54	45.98	19.2	15.95	35.84	19.2	7.18	58.73
41.66	4.07	20.1	39.45	23.62	20.1	23.48	45.73	20.2	15.83	35.72	20.2	7.08	58.54
41.37	3.79	21.1	39.21	23.44	21.1	23.41	45.49	21.2	15.71	35.58	21.2	6.97	58.36
41.05	3.50	22.1	38.98	23.26	22.1	23.33	45.29	22.1	15.59	35.41	22.2	6.85	58.19
40.70	3.24	23.1	38.77	23.06	23.1	23.26	45.09	23.1	15.48	35.23	23.2	6.73	58.03
40.34	2.97	24.1	38.57	22.85	24.1	23.19	44.89	24.1	15.37	35.04	24.2	6.61	57.87
39.94	2.70	25.1	38.37	22.64	25.1	23.10	44.67	25.1	15.26	34.84	25.2	6.49	57.72
39.51	2.42	26.1	38.18	22.43	26.1	23.02	44.45	26.1	15.16	34.66	26.2	6.35	57.55
39.08	2.11	27.1	38.00	22.22	27.1	22.92	44.23	27.1	15.07	34.47	27.2	6.20	57.36
38.64	1.80	28.1	37.83	22.03	28.1	22.82	43.98	28.1	14.98	34.28	28.2	6.06	57.16
38.24	1.47	29.1	37.65	21.84	29.1	22.73	43.71	29.1	14.90	34.11	29.2	5.91	56.94
37.92	1.10	30.1	37.49	21.66	30.1	22.64	43.41	30.1	14.82	33.97	30.2	5.78	56.71
37.65	0.72	31.1	37.32	21.48	31.1	22.59	43.09	31.1	14.74	33.83	31.2	5.64	56.45
37.49	0.36	32.1	37.15	21.32	32.1	22.52	42.77	32.1	14.64	33.68	32.2	5.54	56.18
.39	+51.38		12.31	−12.27		6.92	+6.85		6.11	−6.03		8.19	+8.12
h 15m	48s.380		9h 8m	57s.938		9h 25m	21s.719		9h 36m	22s.347		10h 21m	4s.831
° 53′	0″.29		−85° 19′	57″.45		+81° 41′	41″.50		−80° 34′	6″.83		+82° 58′	54″.07

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. *seq.* Mag. 5.8			κ Octa Mag. 5	
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 Ascen.
	h m s	° ′ ″		h m s	° ′ ″		h m s	° ′ ″		h m s	° ′ ″		h m s
June	10 59	−84 9	June	12 14	+88 9	June	12 46	−84 40	June	12 48	+83 51	June	13 27
1.3	54.59	24.73	1.3	47.44	40.21	1.3	17.45	54.91	1.3	38.04	53.08	1.4	30.68
2.3	54.43	24.82	2.3	46.71	40.28	2.3	17.32	55.11	2.3	37.84	53.22	2.4	30.56
3.3	54.25	24.91	3.3	45.99	40.33	3.3	17.19	55.33	3.3	37.64	53.32	3.4	30.45
4.3	54.09	25.03	4.3	45.28	40.37	4.3	17.06	55.56	4.3	37.43	53.41	4.4	30.34
5.3	53.90	25.14	5.3	44.60	40.38	5.3	16.92	55.79	5.3	37.24	53.47	5.4	30.21
6.3	53.70	25.25	6.3	43.97	40.37	6.3	16.75	56.03	6.3	37.06	53.52	6.4	30.06
7.2	53.49	25.35	7.3	43.35	40.36	7.3	16.58	56.27	7.3	36.90	53.56	7.4	29.90
8.2	53.26	25.42	8.3	42.78	40.35	8.3	16.39	56.50	8.3	36.74	53.61	8.3	29.72
9.2	53.03	25.47	9.3	42.24	40.38	9.3	16.19	56.70	9.3	36.59	53.69	9.3	29.52
10.2	52.81	25.49	10.3	41.66	40.42	10.3	15.98	56.88	10.3	36.43	53.78	10.3	29.30
11.2	52.60	25.48	11.3	41.06	40.46	11.3	15.77	57.02	11.3	36.26	53.87	11.3	29.09
12.2	52.41	25.47	12.3	40.41	40.50	12.3	15.57	57.15	12.3	36.07	53.97	12.3	28.90
13.2	52.22	25.45	13.3	39.71	40.54	13.3	15.39	57.29	13.3	35.87	54.06	13.3	28.71
14.2	52.04	25.45	14.3	38.97	40.57	14.3	15.24	57.41	14.3	35.65	54.16	14.3	28.56
15.2	51.88	25.47	15.3	38.21	40.57	15.3	15.09	57.53	15.3	35.43	54.23	15.3	28.40
16.2	51.71	25.50	16.3	37.46	40.54	16.3	14.93	57.68	16.3	35.21	54.27	16.3	28.26
17.2	51.54	25.53	17.3	36.71	40.51	17.3	14.78	57.84	17.3	35.01	54.28	17.3	28.09
18.2	51.35	25.57	18.3	36.02	40.46	18.3	14.61	58.01	18.3	34.81	54.28	18.3	27.92
19.2	51.16	25.61	19.3	35.37	40.37	19.3	14.43	58.18	19.3	34.62	54.27	19.3	27.75
20.2	50.95	25.63	20.3	34.76	40.30	20.3	14.23	58.34	20.3	34.44	54.26	20.3	27.55
21.2	50.73	25.60	21.3	34.16	40.24	21.3	14.02	58.48	21.3	34.27	54.25	21.3	27.32
22.2	50.50	25.57	22.3	33.57	40.19	22.3	13.80	58.60	22.3	34.09	54.25	22.3	27.09
23.2	50.30	25.52	23.3	32.99	40.15	23.3	13.57	58.69	23.3	33.92	54.26	23.3	26.86
24.2	50.09	25.46	24.3	32.39	40.12	24.3	13.35	58.76	24.3	33.74	54.27	24.3	26.63
25.2	49.89	25.37	25.3	31.76	40.08	25.3	13.13	58.82	25.3	33.56	54.29	25.3	26.39
26.2	49.69	25.28	26.2	31.11	40.03	26.3	12.92	58.89	26.3	33.37	54.31	26.3	26.15
27.2	49.51	25.20	27.2	30.43	39.99	27.3	12.73	58.94	27.3	33.16	54.33	27.3	25.94
28.2	49.34	25.11	28.2	29.72	39.94	28.3	12.54	58.99	28.3	32.94	54.34	28.3	25.74
29.2	49.17	25.05	29.2	28.99	39.89	29.3	12.35	59.06	29.3	32.73	54.33	29.3	25.55
30.2	49.01	24.98	30.2	28.26	39.79	30.3	12 18	59.14	30.3	32.51	54.30	30.3	25.36
31.2	48.84	24.93	31.2	27.53	39.67	31.3	12.01	59.23	31.3	32.30	54.24	31.3	25.17
32.2	48.68	24.89	32.2	26.83	39.53	32.3	11.83	59.31	32.3	32.09	54.16	32.3	24.99
9.82		−9.77	31.17		+31.15	10.79		−10.74	9.36		+9.30	12.39	
10^h	59^m	$55^s.280$	12^h	14^m	$28^s.425$	12^h	46^m	$7^s.152$	12^h	48^m	$30^s.418$	13^h	27^m
−84°	8′	50″.60	+88°	9′	36″.08	−84°	40′	22″.34	+83°	51′	50″.47	−85°	21′

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

ctantis. g. 4.1		Groombridge 2283. Mag. 7.2			ρ Octantis. Mag. 5.7			ε Ursæ Minoris. Mag. 4.4			59 G. Apodis. Mag. 5.9		
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	° ′
4 13	−83 17	June	15 3	+87 33	June	15 24	−84 11	June	16 54	+82 10	June	17 16	−80 47
s	″		s	″		s	″		s	″		s	″
42.80	47.16	1.4	57.14	8.13	1.4	18.11	48.54	1.5	31.10	26.31	1.5	11.32	9.18
42.75	47.42	2.4	56.82	8.43	2.4	18.10	48.82	2.5	31.07	26.67	2.5	11.38	9.42
42.70	47.70	3.4	56.47	8.71	3.4	18.11	49.10	3.5	31.05	27.04	3.5	11.45	9.66
42.66	47.98	4.4	56.11	8.96	4.4	18.12	49.41	4.5	31.01	27.38	4.5	11.52	9.91
42.61	48.27	5.4	55.74	9.18	5.4	18.13	49.73	5.5	30.98	27.72	5.5	11.61	10.18
42.56	48.57	6.4	55.38	9.39	6.4	18.14	50.06	6.5	30.93	28.03	6.5	11.69	10.49
42.48	48.89	7.4	55.05	9.58	7.4	18.11	50.41	7.5	30.89	28.31	7.5	11.75	10.81
42.39	49.21	8.4	54.74	9.77	8.4	18.08	50.76	8.5	30.86	28.59	8.5	11.80	11.14
42.30	49.49	9.4	54.45	9.95	9.4	18.03	51.09	9.5	30.83	28.86	9.5	11.85	11.46
42.17	49.76	10.4	54.17	10.17	10.4	17.95	51.42	10.5	30.80	29.16	10.5	11.88	11.79
42.05	50.00	11.4	53.88	10.42	11.4	17.87	51.70	11.5	30.78	29.47	11.5	11.89	12.10
41.95	50.22	12.4	53.56	10.68	12.4	17.80	51.97	12.5	30.75	29.79	12.5	11.90	12.38
41.85	50.42	13.4	53.21	10.94	13.4	17.74	52.21	13.5	30.72	30.14	13.5	11.93	12.64
41.76	50.62	14.4	52.82	11.20	14.4	17.68	52.45	14.5	30.68	30.51	14.5	11.95	12.88
41.68	50.84	15.4	52.40	11.44	15.4	17.65	52.70	15.5	30.62	30.86	15.5	11.98	13.13
41.60	51.06	16.4	51.95	11.67	16.4	17.61	52.95	16.5	30.56	31.20	16.5	12.02	13.37
41.53	51.31	17.4	51.50	11.87	17.4	17.57	53.22	17.5	30.49	31.53	17.5	12.07	13.63
41.45	51.54	18.4	51.04	12.07	18.4	17.54	53.50	18.5	30.41	31.85	18.5	12.11	13.92
41.36	51.79	19.4	50.62	12.22	19.4	17.49	53.81	19.5	30.35	32.14	19.5	12.15	14.23
41.25	52.05	20.4	50.21	12.37	20.4	17.42	54.12	20.5	30.29	32.42	20.5	12.18	14.54
41.13	52.29	21.4	49.83	12.53	21.4	17.34	54.42	21.5	30.21	32.68	21.5	12.21	14.87
41.00	52.52	22.4	49.45	12.70	22.4	17.25	54.71	22.5	30.15	32.95	22.5	12.22	15.19
40.86	52.72	23.4	49.07	12.86	23.4	17.13	55.00	23.5	30.09	33.21	23.5	12.22	15.51
40.72	52.92	24.4	48.70	13.03	24.4	17.01	55.27	24.4	30.03	33.50	24.5	12.21	15.81
40.58	53.09	25.4	48.31	13.21	25.4	16.89	55.51	25.4	29.97	33.78	25.5	12.20	16.10
40.44	53.25	26.4	47.90	13.41	26.4	16.79	55.73	26.4	29.91	34.09	26.5	12.17	16.38
40.31	53.39	27.4	47.48	13.61	27.4	16.68	55.94	27.4	29.83	34.40	27.5	12.15	16.64
40.17	53.52	28.4	47.02	13.81	28.4	16.57	56.14	28.4	29.75	34.72	28.5	12.14	16.88
40.07	53.67	29.4	46.54	13.99	29.4	16.47	56.34	29.4	29.67	35.05	29.4	12.14	17.12
39.96	53.81	30.4	46.03	14.17	30.4	16.39	56.55	30.4	29.57	35.38	30.4	12.14	17.36
39.86	53.99	31.4	45.51	14.32	31.4	16.31	56.77	31.4	29.47	35.67	31.4	12.15	17.59
39.75	54.17	32.3	44.98	14.44	32.4	16.23	57.01	32.4	29.37	35.95	32.4	12.16	17.87
7	−8.51		23.42	+23.40		9.89	−9.84		7.35	+7.28		6.25	−6.17
13m	27s.793		15h 3m	41s.175		15h 23m	56s.594		16h 54m	25s.488		17h 15m	54s.896
17′	21″.03		+87° 33′	10″.52		−84° 11′	30″.39		+82° 10′	32″.75		−80° 47′	6″.56

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 Dra Mag.
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 Ascen sion.
June	h m s 17 59	° ′ ″ +86 36	June	h m s 18 7	° ′ ″ −87 39	June	h m s 19 2	° ′ ″ +89 0	June	h m s 19 30	° ′ ″ −89 13	June	h m s 20 48
1.6	8.97	43.35	1.6	9.48	46.59	1.6	51.42	53.43	1.6	11.00	11.65	1.7	41.9
2.6	9.02	43.72	2.6	9.78	46.82	2.6	51.96	53.76	2.6	12.23	11.80	2.7	42.1
3.5	9.06	44.08	3.6	10.10	47.05	3.6	52.42	54.11	3.6	13.52	11.96	3.7	42.2
4.5	9.06	44.44	4.6	10.46	47.27	4.6	52.78	54.45	4.6	14.91	12.12	4.7	42.4
5.5	9.05	44.78	5.5	10.82	47.53	5.6	53.07	54.77	5.6	16.37	12.28	5.7	42.5
6.5	9.03	45.10	6.5	11.19	47.81	6.6	53.30	55.07	6.6	17.86	12.46	6.7	42.6
7.5	9.01	45.39	7.5	11.52	48.12	7.6	53.51	55.36	7.6	19.32	12.69	7.7	42.7
8.5	9.01	45.67	8.5	11.82	48.45	8.6	53.73	55.63	8.6	20.72	12.93	8.7	42.8
9.5	9.01	45.95	9.5	12.09	48.77	9.6	54.03	55.90	9.6	22.01	13.17	9.7	42.9
10.5	9.04	46.24	10.5	12.30	49.10	10.6	54.39	56.17	10.6	23.15	13.45	10.6	43.0
11.5	9.07	46.55	11.5	12.47	49.41	11.6	54.79	56.46	11.6	24.16	13.70	11.6	43.1
12.5	9.09	46.88	12.5	12.62	49.69	12.6	55.22	56.77	12.6	25.08	13.94	12.6	43.2
13.5	9.10	47.24	13.5	12.77	49.95	13.6	55.63	57.10	13.6	25.96	14.14	13.6	43.4
14.5	9.11	47.61	14.5	12.94	50.19	14.6	55.99	57.46	14.6	26.87	14.35	14.6	43.5
15.5	9.08	47.98	15.5	13.14	50.44	15.6	56.26	57.82	15.6	27.82	14.54	15.6	43.6
16.5	9.04	48.35	16.5	13.36	50.68	16.6	56.44	58.20	16.6	28.86	14.74	16.6	43.7
17.5	8.96	48.71	17.5	13.59	50.95	17.6	56.54	58.56	17.6	29.97	14.94	17.6	43.8
18.5	8.87	49.05	18.5	13.83	51.22	18.6	56.56	58.90	18.6	31.10	15.16	18.6	43.9
19.5	8.78	49.37	19.5	14.06	51.53	19.5	56.56	59.23	19.6	32.24	15.41	19.6	44.0
20.5	8.69	49.67	20.5	14.25	51.85	20.5	56.56	59.55	20.6	33.34	15.68	20.6	44.1
21.5	8.61	49.96	21.5	14.42	52.18	21.5	56.56	59.83	21.6	34.39	15.95	21.6	44.1
22.5	8.53	50.26	22.5	14.56	52.51	22.5	56.59	60.13	22.6	35.32	16.23	22.6	44.2
23.5	8.47	50.55	23.5	14.66	52.84	23.5	56.67	60.42	23.6	36.17	16.51	23.6	44.3
24.5	8.42	50.86	24.5	14.72	53.16	24.5	56.75	60.73	24.6	36.93	16.81	24.6	44.4
25.5	8.36	51.17	25.5	14.77	53.47	25.5	56.87	61.04	25.6	37.60	17.11	25.6	44.5
26.5	8.30	51.48	26.5	14.81	53.77	26.5	56.98	61.35	26.5	38.20	17.38	26.6	44.6
27.5	8.21	51.82	27.5	14.84	54.05	27.5	57.09	61.70	27.5	38.76	17.63	27.6	44.6
28.5	8.13	52.16	28.5	14.86	54.33	28.5	57.15	62.05	28.5	39.31	17.88	28.6	44.7
29.5	8.03	52.53	29.5	14.90	54.59	29.5	57.13	62.41	29.5	39.90	18.13	29.6	44.8
30.5	7.90	52.89	30.5	14.97	54.85	30.5	57.05	62.78	30.5	40.54	18.37	30.6	44.9
31.5	7.74	53.24	31.5	15.07	55.11	31.5	56.88	63.17	31.5	41.26	18.60	31.6	45.0
32.5	7.56	53.58	32.5	15.18	55.38	32.5	56.60	63.53	32.5	42.04	18.85	32.6	45.0
16.93	+16.90		24.53	−24.51		58.23	+58.23		73.52	−73.52		7.39	
17h 59m	1s.307		18h 6m	11s.893		19h 2m	39s.624		19h 27m	42s.218		20h 48m	
+86° 36′	51″.17		−87° 39′	51″.82		+89° 1′	2″.17		−89° 13′	28″.57		+89° 13′	

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

ctantis. ag. 5.4		υ Octantis. Mag. 5.7			β Octantis. Mag. 4.3			39 H. Cephei. Mag. 5.6			γ¹ Octantis. Mag. 5.1		
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	° ′
21 38	−83 5	June	22 16	−86 22	June	22 37	−81 48	June	23 27	+86 50	June	23 47	−82 28
s	″		s	″		s	″		s	″		s	″
30.73	37.15	1.7	22.45	54.78	1.7	44.91	29.49	1.8	38.05	53.04	1.8	17.39	14.66
30.90	37.12	2.7	22.77	54.72	2.7	45.05	29.39	2.8	38.49	53.06	2.8	17.53	14.50
31.08	37.09	3.7	23.09	54.64	3.7	45.20	29.28	3.8	38.94	53.10	3.8	17.67	14.30
31.27	37.06	4.7	23.45	54.57	4.7	45.36	29.16	4.8	39.37	53.16	4.8	17.82	14.10
31.49	37.04	5.7	23.81	54.50	5.7	45.53	29.05	5.8	39.75	53.24	5.8	17.99	13.89
31.70	37.03	6.7	24.22	54.43	6.7	45.71	28.95	6.8	40.14	53.31	6.8	18.16	13.70
31.92	37.05	7.7	24.62	54.40	7.7	45.89	28.89	7.8	40.51	53.38	7.8	18.34	13.52
32.13	37.09	8.7	25.03	54.40	8.7	46.08	28.83	8.8	40.84	53.44	8.8	18.53	13.36
32.35	37.17	9.7	25.42	54.40	9.7	46.26	28.80	9.8	41.19	53.49	9.8	18.73	13.22
32.54	37.25	10.7	25.80	54.45	10.7	46.44	28.79	10.8	41.54	53.53	10.8	18.90	13.11
32.71	37.34	11.7	26.14	54.49	11.7	46.59	28.79	11.8	41.91	53.56	11.8	19.07	13.03
32.87	37.42	12.7	26.46	54.52	12.7	46.72	28.79	12.8	42.31	53.59	12.8	19.22	12.95
33.04	37.48	13.7	26.76	54.55	13.7	46.87	28.79	13.7	42.74	53.64	13.8	19.36	12.87
33.18	37.54	14.7	27.04	54.58	14.7	47.00	28.78	14.7	43.19	53.71	14.8	19.50	12.78
33.34	37.59	15.7	27.35	54.59	15.7	47.14	28.74	15.7	43.64	53.81	15.8	19.64	12.66
33.51	37.62	16.7	27.65	54.60	16.7	47.29	28.70	16.7	44.07	53.93	16.8	19.79	12.54
33.68	37.66	17.7	27.98	54.60	17.7	47.46	28.67	17.7	44.49	54.06	17.8	19.95	12.42
33.87	37.71	18.7	28.35	54.59	18.7	47.62	28.63	18.7	44.88	54.21	18.8	20.13	12.29
34.07	37.79	19.7	28.72	54.62	19.7	47.79	28.62	19.7	45.26	54.35	19.7	20.31	12.18
34.26	37.88	20.7	29.09	54.66	20.7	47.97	28.62	20.7	45.61	54.49	20.7	20.48	12.08
34.46	37.98	21.7	29.46	54.73	21.7	48.15	28.64	21.7	45.95	54.61	21.7	20.67	12.01
34.64	38.10	22.7	29.83	54.81	22.7	48.31	28.67	22.7	46.28	54.74	22.7	20.86	11.96
34.82	38.25	23.7	30.17	54.91	23.7	48.48	28.73	23.7	46.62	54.84	23.7	21.04	11.91
34.98	38.40	24.7	30.50	55.03	24.7	48.63	28.81	24.7	46.98	54.94	24.7	21.21	11.88
35.13	38.55	25.7	30.82	55.15	25.7	48.77	28.88	25.7	47.34	55.07	25.7	21.38	11.86
35.27	38.70	26.7	31.11	55.28	26.7	48.91	28.96	26.7	47.72	55.18	26.7	21.54	11.85
35.42	38.85	27.7	31.39	55.37	27.7	49.04	29.03	27.7	48.12	55.30	27.7	21.68	11.84
35.55	38.99	28.7	31.66	55.48	28.7	49.17	29.09	28.7	48.52	55.44	28.7	21.83	11.83
35.68	39.12	29.7	31.93	55.58	29.7	49.30	29.14	29.7	48.94	55.61	29.7	21.98	11.81
35.82	39.22	30.7	32.21	55.67	30.7	49.43	29.19	30.7	49.35	55.79	30.7	22.13	11.78
35.98	39.32	31.7	32.50	55.73	31.7	49.57	29.24	31.7	49.76	56.01	31.7	22.28	11.73
36.15	39.44	32.6	32.82	55.79	32.7	49.73	29.27	32.7	50.13	56.23	32.7	22.45	11.67
2	−8.26		15.85	−15.81		7.02	−6.95		18.19	+18.16		7.63	−7.56
38m	19s.542		22h	16m 8s.656		22h	37m 39s.016		23h	27m 44s.125		23h	47m 16s.424
6′	6″.99		−86°	23′ 27″.13		−81°	49′ 2″.34		+86°	50′ 58″.89		−82°	28′ 48″.42

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			Groombri Mag.	
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 Ascen sion
	h m s	° ′ ″		h m s	° ′ ″		h m s	° ′ ″		h m s	° ′ ″		h s
July	0 57	+85 48	July	1 30	+88 51	July	1 41	−85 10	July	4 10	+85 20	July	5 3
0.8	12.63	41.64	0.8	16.61	39.69	0.8	55.31	46.26	0.9	3.23	7.34	0.9	12.7
1.8	12.97	41.73	1.8	17.89	39.69	1.8	55.50	46.08	1.9	3.49	7.12	1.9	12.9
2.8	13.31	41.83	2.8	19.14	39.74	2.8	55.71	45.91	2.9	3.76	6.92	2.9	13.0
3.8	13.64	41.94	3.8	20.32	39.80	3.8	55.93	45.71	3.9	4.02	6.76	3.9	13.2
4.8	13.94	42.07	4.8	21.43	39.87	4.8	56.17	45.51	4.9	4.27	6.61	4.9	13.4
5.8	14.23	42.18	5.8	22.48	39.93	5.8	56.43	45.34	5.9	4.51	6.47	5.9	13.6
6.7	14.51	42.28	6.8	23.48	39.98	6.8	56.70	45.19	6.9	4.74	6.34	6.9	13.7
7.7	14.78	42.37	7.8	24.47	40.02	7.8	56.97	45.07	7.9	4.94	6.19	7.9	13.9
8.7	15.05	42.43	8.8	25.49	40.04	8.8	57.22	44.98	8.9	5.15	6.01	8.9	14.0
9.7	15.33	42.49	9.8	26.58	40.04	9.8	57.47	44.91	9.9	5.37	5.82	9.9	14.2
10.7	15.66	42.55	10.8	27.73	40.04	10.8	57.69	44.85	10.9	5.59	5.60	10.9	14.3
11.7	15.99	42.63	11.8	28.98	40.06	11.8	57.91	44.79	11.9	5.84	5.38	11.9	14.5
12.7	16.34	42.73	12.8	30.26	40.11	12.8	58.11	44.73	12.9	6.11	5.18	12.9	14.6
13.7	16.69	42.86	13.8	31.56	40.16	13.8	58.32	44.64	13.9	6.39	4.99	13.9	14.8
14.7	17.04	43.00	14.8	32.85	40.26	14.8	58.54	44.54	14.9	6.69	4.84	14.9	15.1
15.7	17.37	43.16	15.7	34.08	40.36	15.8	58.76	44.44	15.9	6.99	4.70	15.9	15.3
16.7	17.69	43.33	16.7	35.24	40.48	16.8	59.00	44.33	16.9	7.27	4.58	16.9	15.5
17.7	17.97	43.50	17.7	36.34	40.61	17.8	59.27	44.21	17.9	7.56	4.47	17.9	15.7
18.7	18.25	43.66	18.7	37.39	40.72	18.7	59.53	44.11	18.9	7.83	4.38	18.9	15.9
19.7	18.51	43.82	19.7	38.41	40.82	19.7	59.79	44.06	19.8	8.07	4.28	19.9	16.1
20.7	18.78	43.97	20.7	39.41	40.93	20.7	60.07	44.01	20.8	8.32	4.18	20.9	16.3
21.7	19.04	44.11	21.7	40.43	41.02	21.7	60.34	43.99	21.8	8.56	4.07	21.9	16.5
22.7	19.31	44.25	22.7	41.45	41.11	22.7	60.61	43.99	22.8	8.81	3.95	22.9	16.7
23.7	19.59	44.38	23.7	42.51	41.20	23.7	60.85	43.98	23.8	9.05	3.81	23.9	16.9
24.7	19.88	44.53	24.7	43.64	41.29	24.7	61.09	44.02	24.8	9.31	3.67	24.9	17.0
25.7	20.19	44.68	25.7	44.80	41.38	25.7	61.32	44.04	25.8	9.58	3.53	25.9	17.2
26.7	20.50	44.83	26.7	46.01	41.49	26.7	61.55	44.04	26.8	9.87	3.39	26.9	17.5
27.7	20.83	45.01	27.7	47.25	41.62	27.7	61.75	44.04	27.8	10.17	3.25	27.9	17.7
28.7	21.16	45.23	28.7	48.49	41.76	28.7	61.97	44.03	28.8	10.49	3.15	28.9	18.0
29.7	21.47	45.46	29.7	49.71	41.95	29.7	62.20	44.01	29.8	10.83	3.07	29.9	18.2
30.7	21.76	45.70	30.7	50.89	42.14	30.7	62.43	43.99	30.8	11.16	3.01	30.9	18.5
31.7	22.05	45.97	31.7	51.98	42.35	31.7	62.68	43.97	31.8	11.49	2.96	31.9	18.8
13.69	+13.66		50.32	+50.31		11.90	−11.86		12.29	+12.25		11.84	
0^h 57^m	$9^s.300$		1^h 30^m	$13^s.156$		1^h 42^m	$2^s.339$		4^h 10^m	$2^s.561$		5^h 35^m	
+85° 48′	45″.30		+88° 51′	43″.55		−85° 11′	21″.46		+85° 20′	10″.34		+85° 9′	

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

ensse. 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		
t -	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	° ′
1	−84 49	July	6 46	−80 43	July	7 2	+87 10	July	7 13	+82 34	July	7 15	−86 54
	″		s	″		s	″		s	″		s	″
9	40.27	1.0	45.87	41.22	1.0	1.39	53.96	1.0	42.82	29.60	1.0	38.06	14.65
8	39.96	2.0	45.85	40.95	2.0	1.50	53.59	2.0	42.86	29.25	2.0	37.92	14.39
8	39.65	3.0	45.82	40.64	3.0	1.63	53.24	3.0	42.91	28.92	3.0	37.76	14.12
7	39.34	3.9	45.79	40.33	4.0	1.78	52.92	4.0	42.97	28.62	4.0	37.59	13.81
7	39.00	4.9	45.77	40.00	5.0	1.94	52.62	5.0	43.03	28.32	5.0	37.43	13.50
0	38.63	5.9	45.75	39.65	6.0	2.09	52.34	6.0	43.08	28.03	6.0	37.29	13.18
4	38.27	6.9	45.74	39.29	7.0	2.21	52.06	7.0	43.13	27.76	7.0	37.18	12.84
9	37.93	7.9	45.73	38.93	7.9	2.31	51.78	8.0	43.17	27.49	8.0	37.10	12.49
5	37.59	8.9	45.74	38.59	8.9	2.38	51.48	9.0	43.18	27.22	9.0	37.05	12.17
2	37.27	9.9	45.75	38.27	9.9	2.44	51.17	10.0	43.20	26.92	10.0	37.02	11.85
9	36.99	10.9	45.76	37.98	10.9	2.52	50.82	10.9	43.23	26.57	10.9	37.01	11.56
6	36.74	11.9	45.77	37.69	11.9	2.61	50.46	11.9	43.26	26.21	11.9	36.99	11.29
2	36.49	12.9	45.78	37.42	12.9	2.73	50.10	12.9	43.30	25.86	12.9	36.96	11.03
8	36.22	13.9	45.79	37.14	13.9	2.90	49.73	13.9	43.36	25.51	13.9	36.93	10.76
2	35.95	14.9	45.79	36.86	14.9	3.09	49.37	14.9	43.44	25.16	14.9	36.87	10.50
7	35.66	15.9	45.80	36.56	15.9	3.32	49.03	15.9	43.52	24.82	15.9	36.80	10.21
3	35.35	16.9	45.81	36.25	16.9	3.54	48.72	16.9	43.61	24.51	16.9	36.74	9.90
9	35.04	17.9	45.82	35.92	17.9	3.77	48.43	17.9	43.70	24.22	17.9	36.69	9.58
8	34.71	18.9	45.83	35.58	18.9	3.99	48.14	18.9	43.78	23.94	18.9	36.65	9.26
7	34.39	19.9	45.85	35.21	19.9	4.19	47.87	19.9	43.85	23.66	19.9	36.65	8.92
7	34.06	20.9	45.88	34.86	20.9	4.38	47.59	20.9	43.91	23.38	20.9	36.65	8.57
0	33.75	21.9	45.91	34.52	21.9	4.56	47.31	21.9	43.98	23.11	21.9	36.69	8.24
2	33.46	22.9	45.95	34.19	22.9	4.73	47.01	22.9	44.04	22.83	22.9	36.74	7.91
4	33.19	23.9	45.99	33.88	23.9	4.90	46.71	23.9	44.10	22.54	23.9	36.81	7.60
7	32.94	24.9	46.03	33.59	24.9	5.07	46.39	24.9	44.16	22.23	24.9	36.89	7.30
0	32.70	25.9	46.08	33.30	25.9	5.25	46.06	25.9	44.23	21.90	25.9	36.97	7.02
1	32.48	26.9	46.13	33.04	26.9	5.47	45.74	26.9	44.31	21.57	26.9	37.05	6.75
2	32.25	27.9	46.17	32.78	27.9	5.71	45.40	27.9	44.39	21.23	27.9	37.12	6.50
3	32.01	28.9	46.21	32.51	28.9	5.98	45.06	28.9	44.50	20.90	28.9	37.17	6.24
4	31.76	29.9	46.25	32.23	29.9	6.29	44.74	29.9	44.62	20.58	29.9	37.21	5.97
4	31.50	30.9	46.28	31.94	30.9	6.63	44.43	30.9	44.75	20.28	30.9	37.25	5.69
5	31.22	31.9	46.32	31.63	31.9	6.99	44.14	31.9	44.88	19.99	31.9	37.27	5.39
	−11.04		6.20	−6.12		20.33	+20.30		7.74	+7.67		18.51	−18.48
a	14ˢ.756		6ʰ 46ᵐ 58ˢ.546			7ʰ 2ᵐ 4ˢ.048			7ʰ 13ᵐ 42ˢ.294			7ʰ 16ᵐ 20ˢ.292	
	46″.89		−80° 43′ 38″.16			+87° 10′ 54″.74			+82° 34′ 30″.13			−86° 54′ 6″.70	

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. Ca Mag.	
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 Asce sion.
July	h m s 8 15	° ′ ″ +88 52	July	h m s 9 8	−85 20 ″	July	h m s 9 25	° ′ ″ +81 41	July	h m s 9 36	° ′ ″ −80 34	July	h 10
1.1	37.65	60.72	1.1	37.32	21.48	1.1	22.59	43.09	1.1	14.74	33.83	1.2	5.6
2.1	37.49	60.36	2.1	37.15	21.32	2.1	22.52	42.77	2.1	14.64	33.68	2.2	5.5
3.1	37.42	60.02	3.1	36.97	21.16	3.1	22.47	42.44	3.1	14.55	33.54	3.2	5.4
4.1	37.41	59.67	4.1	36.77	20.97	4.1	22.44	42.15	4.1	14.46	33.37	4.1	5.3
5.1	37.42	59.35	5.1	36.57	20.74	5.1	22.41	41.85	5.1	14.36	33.18	5.1	5.2
6.1	37.44	59.03	6.1	36.36	20.50	6.1	22.39	41.56	6.1	14.26	32.97	6.1	5.2
7.1	37.41	58.75	7.1	36.17	20.23	7.1	22.34	41.30	7.1	14.16	32.74	7.1	5.1
8.1	37.30	58.47	8.1	35.99	19.96	8.1	22.30	41.06	8.1	14.06	32.49	8.1	5.0
9.0	37.14	58.16	9.1	35.84	19.70	9.1	22.24	40.82	9.1	13.97	32.23	9.1	4.9
10.0	36.94	57.83	10.1	35.71	19.44	10.1	22.17	40.55	10.1	13.90	31.98	10.1	4.8
11.0	36.73	57.49	11.1	35.60	19.18	11.1	22.11	40.27	11.1	13.84	31.74	11.1	4.6
12.0	36.55	57.12	12.1	35.50	18.95	12.1	22.03	39.96	12.1	13.78	31.51	12.1	4.5
13.0	36.44	56.74	13.1	35.38	18.75	13.1	21.98	39.62	13.1	13.72	31.31	13.1	4.4
14.0	36.43	56.36	14.1	35.25	18.55	14.1	21.93	39.26	14.1	13.66	31.12	14.1	4.3
15.0	36.49	55.96	15.1	35.13	18.33	15.1	21.90	38.90	15.1	13.59	30.93	15.1	4.2
16.0	36.63	55.60	16.1	34.99	18.09	16.1	21.88	38.56	16.1	13.51	30.71	16.1	4.2
17.0	36.81	55.27	17.1	34.84	17.85	17.1	21.87	38.25	17.1	13.43	30.47	17.1	4.1
18.0	37.00	54.93	18.1	34.70	17.58	18.1	21.86	37.92	18.1	13.36	30.21	18.1	4.0
19.0	37.20	54.59	19.1	34.56	17.31	19.1	21.85	37.61	19.1	13.28	29.94	19.1	4.0
20.0	37.37	54.28	20.1	34.43	17.01	20.1	21.84	37.33	20.1	13.21	29.65	20.1	3.9
21.0	37.51	53.98	21.1	34.30	16.71	21.1	21.81	37.05	21.1	13.14	29.35	21.1	3.9
22.0	37.60	53.68	22.0	34.20	16.39	22.1	21.78	36.76	22.1	13.08	29.06	22.1	3.8
23.0	37.67	53.36	23.0	34.11	16.09	23.1	21.75	36.46	23.1	13.02	28.77	23.1	3.7
24.0	37.73	53.04	24.0	34.03	15.80	24.1	21.72	36.16	24.1	12.97	28.47	24.1	3.6
25.0	37.79	52.69	25.0	33.98	15.50	25.1	21.68	35.84	25.1	12.93	28.18	25.1	3.5
26.0	37.87	52.32	26.0	33.92	15.22	26.1	21.65	35.49	26.1	12.89	27.91	26.1	3.5
26.9	38.01	51.96	27.0	33.87	14.96	27.0	21.62	35.14	27.1	12.86	27.65	27.1	3.4
27.9	38.20	51.58	28.0	33.81	14.70	28.0	21.61	34.78	28.1	12.82	27.41	28.1	3.3
28.9	38.49	51.19	29.0	33.75	14.46	29.0	21.60	34.41	29.0	12.78	27.18	29.1	3.2
29.9	38.87	50.81	30.0	33.67	14.20	30.0	21.61	34.03	30.0	12.74	26.95	30.1	3.2
30.9	39.33	50.43	31.0	33.59	13.93	31.0	21.65	33.66	31.0	12.70	26.70	31.1	3.2
31.9	39.83	50.08	32.0	33.50	13.66	32.0	21.67	33.31	32.0	12.65	26.43	32.1	3.2
51.26		+51.25	12.30		−12.26	6.92		+6.85	6.11		−6.02	8.18	
8^h	15^m	$48^s.380$	9^h	8^m	$57^s.938$	9^h	25^m	$21^s.719$	9^h	36^m	$22^s.347$	10^h	21^m
+88°	*53′*	*0″.29*	−85°	19′	57″.45	+81°	41′	41″.50	−80°	34′	6″.83	+82°	58′

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

ntis. 6.3		Bradley 1672. Mag. 6.3			ι Octantis. Mag. 5.4			32 H. Camelop. *seq.* Mag. 5.3			κ Octantis. Mag. 5.6		
t	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.
a	° ′		h m	° ′		h m	° ′		h m	° ′		h m	° ′
)	−84 9	July	12 14	+88 9	July	12 46	−84 40	July	12 48	+83 51	July	13 27	−85 22
	″		s	″		s	″		s	″		s	″
	24.93	1.2	27.53	39.67	1.3	12.01	59.23	1.3	32.30	54.24	1.3	25.17	17.98
	24.89	2.2	26.83	39.53	2.3	11.83	59.31	2.3	32.09	54.16	2.3	24.99	18.13
	24.85	3.2	26.17	39.37	3.3	11.65	59.40	3.3	31.89	54.07	3.3	24.80	18.29
	24.80	4.2	25.57	39.21	4.2	11.46	59.50	4.2	31.70	53.97	4.3	24.58	18.45
	24.75	5.2	25.01	39.07	5.2	11.24	59.58	5.2	31.53	53.86	5.3	24.35	18.59
	24.66	6.2	24.47	38.92	6.2	11.00	59.65	6.2	31.37	53.76	6.3	24.09	18.71
	24.52	7.2	23.93	38.80	7.2	10.77	59.68	7.2	31.20	53.68	7.3	23.83	18.81
	24.38	8.2	23.38	38.67	8.2	10.52	59.69	8.2	31.03	53.62	8.3	23.56	18.88
	24.23	9.2	22.78	38.57	9.2	10.30	59.68	9.2	30.85	53.57	9.3	23.31	18.92
	24.07	10.2	22.13	38.46	10.2	10.09	59.65	10.2	30.65	53.52	10.3	23.06	18.94
	23.92	11.2	21.43	38.34	11.2	9.90	59.62	11.2	30.43	53.46	11.3	22.84	18.97
	23.78	12.2	20.74	38.20	12.2	9.71	59.60	12.2	30.21	53.38	12.3	22.64	18.99
	23.68	13.2	20.02	38.03	13.2	9.55	59.59	13.2	29.99	53.28	13.3	22.45	19.03
	23.57	14.2	19.34	37.84	14.2	9.38	59.60	14.2	29.79	53.14	14.2	22.26	19.09
	23.44	15.2	18.68	37.64	15.2	9.20	59.61	15.2	29.59	53.00	15.2	22.06	19.15
	23.32	16.2	18.08	37.43	16.2	9.00	59.61	16.2	29.40	52.85	16.2	21.84	19.21
9	23.19	17.2	17.52	37.21	17.2	8.79	59.62	17.2	29.22	52.69	17.2	21.61	19.28
1	23.05	18.2	17.00	37.00	18.2	8.57	59.62	18.2	29.05	52.53	18.2	21.36	19.33
3	22.87	19.2	16.48	36.80	19.2	8.35	59.60	19.2	28.88	52.37	19.2	21.09	19.37
6	22.68	20.2	15.97	36.61	20.2	8.12	59.55	20.2	28.73	52.22	20.2	20.82	19.39
9	22.48	21.2	15.46	36.43	21.2	7.88	59.49	21.2	28.56	52.09	21.2	20.56	19.38
2	22.25	22.2	14.94	36.25	22.2	7.66	59.41	22.2	28.39	51.96	22.2	20.29	19.35
7	22.03	23.2	14.38	36.07	23.2	7.44	59.32	23.2	28.21	51.84	23.2	20.03	19.31
3	21.81	24.2	13.81	35.89	24.2	7.24	59.22	24.2	28.03	51.70	24.2	19.78	19.26
0	21.59	25.2	13.21	35.70	25.2	7.04	59.09	25.2	27.84	51.58	25.2	19.54	19.21
7	21.37	26.2	12.60	35.51	26.2	6.86	58.98	26.2	27.64	51.44	26.2	19.32	19.15
6	21.16	27.2	11.97	35.27	27.2	6.68	58.90	27.2	27.44	51.27	27.2	19.12	19.10
5	20.98	28.2	11.35	35.02	28.2	6.52	58.82	28.2	27.24	51.08	28.2	18.92	19.07
3	20.81	29.2	10.75	34.76	29.2	6.35	58.75	29.2	27.05	50.87	29.2	18.72	19.05
1	20.63	30.2	10.19	34.48	30.2	6.18	58.69	30.2	26.86	50.64	30.2	18.51	19.04
9	20.46	31.2	9.70	34.18	31.2	5.99	58.63	31.2	26.71	50.41	31.2	18.29	19.04
4	20.27	32.1	9.23	33.87	32.2	5.80	58.57	32.2	26.55	50.16	32.2	18.06	19.03
	−9.77		31.15	+31.14		10.79	−10.75		9.36	+9.30		12.39	−12.35
a	55ˢ.280		12ʰ	14ᵐ 28ˢ.425		12ʰ	46ᵐ 7ˢ.152		12ʰ	48ᵐ 30ˢ.418		13ʰ	27ᵐ 14ˢ.82A
	50″.60		+88°	9′ 36″.08		−84°	40′ 22″.34		+83°	51′ 50″.47		−85°	21′ 42″.23

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. A Mag.	
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 Ascen sion.
	h m s	° ′ ″		h m s	° ′ ″		h m s	° ′ ″		h m s	° ′ ″		h m s
July	14 13	−83 17	July	15 3	+87 33	July	15 24	−84 11	July	16 54	+82 10	July	17 1
1.3	39.86	53.99	1.4	45.51	14.32	1.4	16.31	56.77	1.4	29.47	35.67	1.4	12.1
2.3	39.75	54.17	2.3	44.98	14.44	2.4	16.23	57.01	2.4	29.37	35.95	2.4	12.1
3.3	39.65	54.36	3.3	44.45	14.54	3.4	16.15	57.27	3.4	29.25	36.21	3.4	12.1
4.3	39.51	54.56	4.3	43.94	14.62	4.4	16.07	57.53	4.4	29.15	36.45	4.4	12.1
5.3	39.39	54.76	5.3	43.47	14.68	5.4	15.95	57.80	5.4	29.04	36.68	5.4	12.1
6.3	39.22	54.95	6.3	43.01	14.75	6.4	15.82	58.07	6.4	28.94	36.89	6.4	12.1
7.3	39.06	55.10	7.3	42.59	14.84	7.3	15.68	58.30	7.4	28.84	37.11	7.4	12.1
8.3	38.89	55.23	8.3	42.15	14.96	8.3	15.52	58.53	8.4	28.75	37.35	8.4	12.1
9.3	38.73	55.34	9.3	41.70	15.08	9.3	15.35	58.71	9.4	28.66	37.58	9.4	12.0
10.3	38.58	55.42	10.3	41.23	15.22	10.3	15.20	58.87	10.4	28.56	37.86	10.4	12.0
11.3	38.44	55.48	11.3	40.71	15.35	11.3	15.06	59.01	11.4	28.44	38.15	11.4	11.9
12.3	38.30	55.56	12.3	40.16	15.49	12.3	14.93	59.16	12.4	28.32	38.44	12.4	11.9
13.3	38.17	55.62	13.3	39.60	15.60	13.3	14.81	59.31	13.4	28.19	38.73	13.4	11.9
14.3	38.05	55.72	14.3	39.02	15.69	14.3	14.71	59.48	14.4	28.06	39.00	14.4	11.8
15.3	37.94	55.83	15.3	38.45	15.75	15.3	14.60	59.66	15.4	27.93	39.23	15.4	11.8
16.3	37.81	55.95	16.3	37.88	15.81	16.3	14.48	59.85	16.4	27.80	39.44	16.4	11.8
17.3	37.67	56.05	17.3	37.35	15.84	17.3	14.34	60.04	17.4	27.66	39.63	17.4	11.8
18.3	37.49	56.17	18.3	36.84	15.87	18.3	14.19	60.23	18.4	27.54	39.82	18.4	11.7
19.3	37.33	56.28	19.3	36.34	15.89	19.3	14.02	60.41	19.4	27.41	40.00	19.4	11.7
20.3	37.16	56.36	20.3	35.87	15.91	20.3	13.85	60.60	20.4	27.29	40.18	20.4	11.6
21.3	36.97	56.42	21.3	35.39	15.94	21.3	13.67	60.75	21.4	27.17	40.36	21.4	11.6
22.3	36.80	56.46	22.3	34.90	15.98	22.3	13.48	60.89	22.4	27.04	40.56	22.4	11.5
23.3	36.62	56.52	23.3	34.40	16.04	23.3	13.29	61.02	23.4	26.93	40.78	23.4	11.4
24.3	36.44	56.50	24.3	33.89	16.10	24.3	13.10	61.13	24.4	26.80	41.00	24.4	11.3
25.3	36.29	56.50	25.3	33.36	16.16	25.3	12.92	61.22	25.4	26.66	41.21	25.4	11.2
26.2	36.14	56.49	26.3	32.80	16.21	26.3	12.76	61.30	26.4	26.53	41.44	26.4	11.2
27.2	35.99	56.49	27.3	32.21	16.26	27.3	12.61	61.37	27.4	26.38	41.67	27.4	11.1
28.2	35.85	56.51	28.3	31.61	16.28	28.3	12.47	61.46	28.4	26.22	41.87	28.4	11.1
29.2	35.72	56.54	29.3	31.01	16.28	29.3	12.33	61.55	29.4	26.05	42.07	29.4	11.0
30.2	35.59	56.57	30.3	30.40	16.25	30.3	12.18	61.67	30.3	25.89	42.25	30.4	11.0
31.2	35.45	56.61	31.3	29.83	16.20	31.3	12.04	61.80	31.3	25.72	42.40	31.4	10.9
32.2	35.28	56.67	32.3	29.26	16.12	32.3	11.88	61.94	32.3	25.58	42.50	32.4	10.9
8.57		−8.51	23.43		+23.41	9.89		−9.84	7.35		+7.28	6.25	
14h	13m	27s.793	15h	3m	41s.175	15h	23m	56s.594	16h	54m	25s.488	17h	15m
−83°	17′	21″.03	+87°	33′	10″.52	−84°	11′	30″.39	+82°	10′	32″.75	−80°	47′

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

rsæ 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		
	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	° ′
r	17 59	+86 36	July	18 7	−87 39	July	19 2	+89 1	July	19 30	−89 13	July	20 48	+82 13
	s	″		s	″		s	″		s	″		s	″
5	7.74	53.24	1.5	15.07	55.11	1.5	56.88	3.17	1.5	41.26	18.60	1.6	45.03	29.38
5	7.56	53.58	2.5	15.18	55.38	2.5	56.60	3.53	2.5	42.04	18.85	2.6	45.09	29.76
5	7.38	53.89	3.5	15.29	55.68	3.5	56.25	3.87	3.5	42.88	19.11	3.6	45.14	30.13
5	7.18	54.19	4.5	15.41	55.99	4.5	55.86	4.20	4.5	43.71	19.41	4.6	45.19	30.47
5	6.99	54.46	5.5	15.48	56.33	5.5	55.48	4.50	5.5	44.49	19.72	5.6	45.23	30.80
5	6.81	54.72	6.5	15.51	56.68	6.5	55.16	4.78	6.5	45.15	20.04	6.6	45.27	31.11
5	6.66	54.99	7.5	15.48	57.02	7.5	54.90	5.08	7.5	45.67	20.36	7.6	45.30	31.41
5	6.51	55.26	8.5	15.43	57.36	8.5	54.68	5.38	8.5	46.07	20.68	8.6	45.35	31.70
5	6.37	55.55	9.5	15.34	57.66	9.5	54.50	5.70	9.5	46.34	20.96	9.6	45.40	32.02
4	6.23	55.86	10.5	15.24	57.95	10.5	54.34	6.04	10.5	46.54	21.24	10.6	45.47	32.36
4	6.06	56.19	11.5	15.14	58.20	11.5	54.12	6.41	11.5	46.73	21.51	11.6	45.52	32.73
4	5.87	56.55	12.4	15.07	58.44	12.5	53.84	6.79	12.5	46.96	21.75	12.6	45.58	33.11
4	5.66	56.89	13.4	15.03	58.69	13.5	53.47	7.17	13.5	47.26	22.00	13.6	45.63	33.51
4	5.43	57.22	14.4	14.99	58.94	14.5	53.01	7.54	14.5	47.61	22.24	14.6	45.67	33.90
4	5.18	57.52	15.4	14.98	59.21	15.5	52.48	7.89	15.5	48.02	22.52	15.6	45.70	34.30
4	4.93	57.81	16.4	14.95	59.50	16.5	51.89	8.23	16.5	48.44	22.80	16.5	45.71	34.68
4	4.68	58.08	17.4	14.90	59.81	17.5	51.29	8.54	17.5	48.83	23.11	17.5	45.73	35.05
4	4.43	58.32	18.4	14.83	60.13	18.5	50.72	8.83	18.5	49.15	23.42	18.5	45.75	35.39
4	4.19	58.56	19.4	14.72	60.45	19.5	50.15	9.12	19.5	49.39	23.74	19.5	45.76	35.73
4	3.96	58.79	20.4	14.58	60.77	20.5	49.63	9.41	20.5	49.53	24.07	20.5	45.77	36.06
4	3.74	59.04	21.4	14.40	61.08	21.5	49.14	9.69	21.5	49.57	24.41	21.5	45.77	36.39
4	3.52	59.29	22.4	14.20	61.37	22.5	48.66	9.99	22.5	49.51	24.73	22.5	45.79	36.71
4	3.30	59.56	23.4	13.97	61.66	23.5	48.20	10.29	23.5	49.39	25.06	23.5	45.80	37.04
4	3.08	59.84	24.4	13.73	61.91	24.5	47.73	10.61	24.5	49.22	25.35	24.5	45.83	37.39
4	2.85	60.12	25.4	13.51	62.16	25.5	47.23	10.93	25.5	49.01	25.64	25.5	45.86	37.76
4	2.59	60.42	26.4	13.30	62.39	26.4	46.69	11.27	26.5	48.81	25.91	26.5	45.87	38.14
4	2.32	60.71	27.4	13.10	62.62	27.4	46.07	11.62	27.5	48.65	26.18	27.5	45.88	38.52
4	2.03	61.01	28.4	12.92	62.84	28.4	45.36	11.97	28.5	48.57	26.42	28.5	45.89	38.94
4	1.71	61.28	29.4	12.78	63.08	29.4	44.56	12.30	29.5	48.54	26.68	29.5	45.89	39.35
4	1.38	61.53	30.4	12.65	63.32	30.4	43.69	12.63	30.5	48.58	26.96	30.5	45.88	39.76
4	1.04	61.76	31.4	12.51	63.60	31.4	42.76	12.92	31.5	48.65	27.25	31.5	45.84	40.14
4	0.70	61.97	32.4	12.34	63.88	32.4	41.82	13.21	32.5	48.67	27.56	32.5	45.82	40.51
4	16.94	+16.91		24.56	−24.54		58.40	+58.39		73.73	−73.73		7.39	+7.33
	17h 59m	1s.307		18h 6m	11s.893		19h 2m	39s.624		19h 27m	42s.218		20h 48m	40s.494
	86° 36′	51″.17		−87° 39′	51″.82		+89° 1′	2″.17		−89° 13′	28″.57		+82° 13′	29″.86

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

λ Octantis. Mag. 5.4			υ Octantis. Mag. 5.7			β Octantis. Mag. 4.3			39 H. Cephei. Mag. 5.6			γ¹ Octa Mag.	
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 Ascen sion.
	h m s	° ′ ″		h m s	° ′ ″		h m s	° ′ ″		h m s	° ′ ″		h m s
July	21 38	−83 5	July	22 16	−86 22	July	22 37	−81 48	July	23 27	+86 50	July	23 4
1.6	35.98	39.32	1.7	32.50	55.73	1.7	49.57	29.24	1.7	49.76	56.01	1.7	22.2
2.6	36.15	39.44	2.6	32.82	55.79	2.7	49.73	29.27	2.7	50.13	56.23	2.7	22.4
3.6	36.32	39.56	3.6	33.14	55.88	3.7	49.88	29.30	3.7	50.46	56.45	3.7	22.6
4.6	36.49	39.70	4.6	33.49	55.97	4.7	50.05	29.35	4.7	50.80	56.68	4.7	22.8
5.6	36.67	39.86	5.6	33.86	56.10	5.7	50.23	29.43	5.7	51.11	56.90	5.7	23.0
6.6	36.84	40.04	6.6	34.19	56.23	6.7	50.39	29.51	6.7	51.39	57.11	6.7	23.2
7.6	36.98	40.25	7.6	34.52	56.40	7.6	50.54	29.65	7.7	51.68	57.29	7.7	23.3
8.6	37.13	40.47	8.6	34.80	56.58	8.6	50.68	29.80	8.7	52.00	57.47	8.7	23.5
9.6	37.25	40.70	9.6	35.08	56.76	9.6	50.80	29.96	9.7	52.33	57.64	9.7	23.6
10.6	37.36	40.89	10.6	35.31	56.94	10.6	50.92	30.11	10.7	52.69	57.82	10.7	23.8
11.6	37.45	41.09	11.6	35.53	57.09	11.6	51.03	30.25	11.7	53.06	58.04	11.7	23.9
12.6	37.56	41.27	12.6	35.75	57.24	12.6	51.13	30.38	12.7	53.45	58.26	12.7	24.1
13.6	37.68	41.44	13.6	35.98	57.39	13.6	51.25	30.50	13.7	53.83	58.50	13.7	24.2
14.6	37.80	41.61	14.6	36.22	57.54	14.6	51.38	30.59	14.7	54.18	58.77	14.7	24.4
15.6	37.93	41.77	15.6	36.49	57.68	15.6	51.51	30.70	15.7	54.52	59.05	15.7	24.5
16.6	38.07	41.95	16.6	36.77	57.84	16.6	51.65	30.82	16.7	54.81	59.32	16.7	24.7
17.6	38.21	42.17	17.6	37.05	58.01	17.6	51.79	30.94	17.7	55.10	59.60	17.7	24.8
18.6	38.34	42.39	18.6	37.34	58.19	18.6	51.93	31.09	18.7	55.38	59.87	18.7	25.0
19.6	38.47	42.63	19.6	37.62	58.41	19.6	52.07	31.27	19.7	55.63	60.12	19.7	25.2
20.6	38.59	42.88	20.6	37.89	58.63	20.6	52.20	31.47	20.6	55.88	60.36	20.7	25.4
21.6	38.69	43.15	21.6	38.12	58.86	21.6	52.32	31.67	21.6	56.14	60.60	21.7	25.5
22.6	38.78	43.41	22.6	38.35	59.11	22.6	52.43	31.87	22.6	56.41	60.84	22.7	25.7
23.6	38.87	43.66	23.6	38.54	59.36	23.6	52.53	32.10	23.6	56.70	61.08	23.7	25.8
24.6	38.95	43.92	24.6	38.73	59.60	24.6	52.63	32.32	24.6	57.00	61.34	24.7	25.9
25.6	39.02	44.16	25.6	38.91	59.83	25.6	52.72	32.52	25.6	57.31	61.60	25.6	26.1
26.6	39.09	44.40	26.6	39.07	60.06	26.6	52.80	32.72	26.6	57.62	61.86	26.6	26.2
27.6	39.16	44.63	27.6	39.23	60.25	27.6	52.88	32.91	27.6	57.94	62.14	27.6	26.3
28.6	39.23	44.84	28.6	39.40	60.46	28.6	52.98	33.07	28.6	58.23	62.46	28.6	26.4
29.5	39.31	45.04	29.6	39.59	60.66	29.6	53.08	33.25	29.6	58.52	62.80	29.6	26.6
30.5	39.41	45.25	30.6	39.80	60.86	30.6	53.18	33.42	30.6	58.79	63.16	30.6	26.7
31.5	39.51	45.47	31.6	40.03	61.07	31.6	53.31	33.59	31.6	59.02	63.50	31.6	26.8
32.5	39.62	45.73	32.6	40.27	61.29	32.6	53.44	33.78	32.6	59.21	63.84	32.6	27.0
8.32	−8.26		15.85	−15.82		7.02	−6.95		18.20	+18.17		7.63	
21h 38m	19s.542		22h 16m	8s.656		22h 37m	39s.016		23h 27m	44s.125		23h 47m	
−83° 6′	6″.99		−86° 23′	27″.13		−81° 49′	2″.34		+86° 50′	58″.89		−82° 28′	

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

	δ 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		
	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	° ′ ″
	0 57	+85 48	Aug.	1 30	+88 51	Aug.	1 42	−85 10	Aug.	4 10	+85 20	Aug.	5 35	+85 9
	22.05	45.97	0.7	51.98	42.35	0.7	2.68	43.97	0.8	11.49	2.96	0.9	18.83	20.71
	22.30	46.22	1.7	53.01	42.56	1.7	2.95	43.95	1.8	11.80	2.93	1.9	19.11	20.56
	22.55	46.47	2.7	53.96	42.76	2.7	3.22	43.95	2.8	12.09	2.92	2.9	19.36	20.42
	22.78	46.70	3.7	54.89	42.96	3.7	3.49	43.98	3.8	12.36	2.89	3.9	19.60	20.27
	23.01	46.90	4.7	55.82	43.11	4.7	3.76	44.02	4.8	12.63	2.85	4.9	19.83	20.12
	23.25	47.10	5.7	56.79	43.26	5.7	4.01	44.10	5.8	12.90	2.80	5.9	20.05	19.94
	23.52	47.31	6.7	57.84	43.41	6.7	4.25	44.18	6.8	13.17	2.72	6.9	20.27	19.76
	23.80	47.51	7.7	58.94	43.56	7.7	4.47	44.26	7.8	13.46	2.64	7.9	20.50	19.54
	24.09	47.74	8.7	60.12	43.73	8.7	4.67	44.35	8.8	13.78	2.54	8.9	20.76	19.32
	24.40	47.97	9.7	61.31	43.92	9.7	4.88	44.44	9.8	14.11	2.47	9.8	21.03	19.12
	24.70	48.23	10.7	62.49	44.14	10.7	5.08	44.50	10.8	14.45	2.41	10.8	21.33	18.92
	24.98	48.51	11.7	63.63	44.38	11.7	5.30	44.56	11.8	14.80	2.39	11.8	21.64	18.74
	25.25	48.81	12.7	64.69	44.62	12.7	5.52	44.61	12.8	15.14	2.39	12.8	21.94	18.60
	25.49	49.10	13.7	65.69	44.88	13.7	5.75	44.67	13.8	15.47	2.41	13.8	22.23	18.47
	25.72	49.40	14.7	66.62	45.13	14.7	6.00	44.75	14.8	15.79	2.44	14.8	22.52	18.37
	25.92	49.69	15.7	67.50	45.38	15.7	6.25	44.83	15.8	16.07	2.47	15.8	22.80	18.27
	26.12	49.96	16.7	68.35	45.63	16.7	6.51	44.95	16.8	16.36	2.50	16.8	23.06	18.17
	26.32	50.23	17.7	69.20	45.85	17.7	6.76	45.08	17.8	16.64	2.53	17.8	23.31	18.07
	26.53	50.48	18.7	70.04	46.05	18.7	7.00	45.22	18.8	16.92	2.54	18.8	23.56	17.95
	26.75	50.74	19.7	70.93	46.25	19.7	7.23	45.36	19.8	17.20	2.53	19.8	23.81	17.83
	26.97	51.01	20.6	71.87	46.46	20.7	7.46	45.53	20.8	17.48	2.52	20.8	24.06	17.69
	27.20	51.27	21.6	72.83	46.68	21.7	7.66	45.72	21.8	17.78	2.51	21.8	24.33	17.55
	27.44	51.53	22.6	73.83	46.91	22.7	7.85	45.90	22.8	18.09	2.49	22.8	24.60	17.42
	27.69	51.81	23.6	74.86	47.16	23.6	8.03	46.07	23.8	18.42	2.48	23.8	24.89	17.27
	27.93	52.12	24.6	75.90	47.42	24.6	8.22	46.23	24.7	18.75	2.48	24.8	25.20	17.14
	28.18	52.44	25.6	76.93	47.71	25.6	8.40	46.38	25.7	19.09	2.52	25.8	25.52	17.04
	28.42	52.79	26.6	77.91	48.02	26.6	8.59	46.50	26.7	19.46	2.58	26.8	25.86	16.93
	28.63	53.14	27.6	78.82	48.34	27.6	8.79	46.63	27.7	19.80	2.67	27.8	26.20	16.86
	28.82	53.49	28.6	79.65	48.68	28.6	9.00	46.76	28.7	20.14	2.78	28.8	26.52	16.81
	28.99	53.84	29.6	80.40	48.99	29.6	9.23	46.90	29.7	20.46	2.89	29.8	26.84	16.78
	29.14	54.18	30.6	81.11	49.29	30.6	9.45	47.06	30.7	20.75	2.99	30.8	27.13	16.75
	29.29	54.52	31.6	81.79	49.58	31.6	9.67	47.24	31.7	21.03	3.09	31.8	27.41	16.71
	+13.66		50.38	+50.37		11.90	−11.86		12.29	+12.25		11.84	+11.80	
	57ᵐ 9ˢ.300		1ʰ 30ᵐ 13ˢ.156			1ʰ 42ᵐ 2ˢ.339			4ʰ 10ᵐ 2ˢ.561			5ʰ 35ᵐ 12ˢ.782		
	48′ 45″.30		+88° 51′ 43″.55			−85° 11′ 21″.46			+85° 20′ 10″.34			+85° 9′ 30″.24		

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. Oct Mag.		
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 Ascen sion.	
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	
Aug.	5 45	−84 49	Aug.	6 46	−80 43	Aug.	7 2	+87 10	Aug.	7 13	+82 34	Aug.	7 1	
	s	″		s	″		s	″		s	″		s	
0.9	52.55	31.22	0.9	46.32	31.63	0.9	6.99	44.14	0.9	44.88	19.99	0.9	37.2	
1.9	52.67	30.94	1.9	46.36	31.32	1.9	7.33	43.87	1.9	45.02	19.72	1.9	37.3	
2.9	52.80	30.65	2.9	46.41	31.00	2.9	7.67	43.62	2.9	45.14	19.48	2.9	37.3	
3.9	52.95	30.35	3.9	46.46	30.66	3.9	7.95	43.39	3.9	45.24	19.23	3.9	37.4	
4.9	53.12	30.08	4.9	46.52	30.35	4.9	8.22	43.13	4.9	45.34	18.97	4.9	37.6	
5.9	53.29	29.84	5.9	46.59	30.06	5.9	8.47	42.86	5.9	45.44	18.71	5.9	37.7	
6.9	53.46	29.63	6.9	46.67	29.80	6.9	8.72	42.58	6.9	45.52	18.42	6.9	37.9	
7.9	53.64	29.43	7.9	46.74	29.55	7.9	8.99	42.28	7.9	45.62	18.11	7.9	38.1	
8.9	53.81	29.26	8.9	46.81	29.31	8.9	9.30	41.97	8.9	45.73	17.80	8.9	38.2	
9.9	53.96	29.08	9.9	46.88	29.09	9.9	9.62	41.64	9.9	45.86	17.48	9.9	38.4	
10.9	54.09	28.89	10.9	46.95	28.86	10.9	9.98	41.32	10.9	45.99	17.16	10.9	38.5	
11.9	54.24	28.71	11.9	47.02	28.61	11.9	10.37	41.02	11.9	46.14	16.86	11.9	38.7	
12.8	54.39	28.50	12.9	47.08	28.35	12.9	10.78	40.75	12.9	46.29	16.59	12.9	38.8	
13.8	54.56	28.27	13.9	47.15	28.07	13.9	11.18	40.51	13.9	46.44	16.34	13.9	38.9	
14.8	54.73	28.04	14.9	47.22	27.79	14.9	11.57	40.28	14.9	46.60	16.10	14.9	39.1	
15.8	54.90	27.80	15.9	47.30	27.51	15.9	11.94	40.06	15.9	46.74	15.88	15.9	39.3	
16.8	55.09	27.58	16.9	47.38	27.22	16.9	12.30	39.85	16.9	46.88	15.66	16.9	39.4	
17.8	55.30	27.37	17.9	47.47	26.94	17.9	12.64	39.63	17.9	47.01	15.43	17.9	39.7	
18.8	55.50	27.17	18.9	47.57	26.68	18.9	12.98	39.41	18.9	47.13	15.20	18.9	39.9	
19.8	55.72	26.99	19.9	47.67	26.43	19.9	13.31	39.16	19.9	47.25	14.96	19.9	40.1	
20.8	55.94	26.84	20.9	47.77	26.21	20.9	13.64	38.92	20.9	47.37	14.71	20.9	40.4	
21.8	56.14	26.71	21.9	47.87	26.00	21.9	13.98	38.66	21.9	47.50	14.44	21.9	40.7	
22.8	56.35	26.58	22.9	47.97	25.80	22.9	14.34	38.39	22.9	47.63	14.18	22.9	40.9	
23.8	56.56	26.47	23.9	48.06	25.60	23.9	14.72	38.13	23.9	47.77	13.91	23.9	41.2	
24.8	56.75	26.36	24.9	48.16	25.42	24.9	15.14	37.87	24.9	47.93	13.63	24.9	41.4	
25.8	56.94	26.24	25.9	48.25	25.24	25.9	15.60	37.61	25.9	48.10	13.38	25.9	41.6	
26.8	57.12	26.10	26.9	48.34	25.06	26.9	16.07	37.37	26.9	48.27	13.14	26.9	41.9	
27.8	57.30	25.96	27.8	48.43	24.85	27.9	16.56	37.16	27.9	48.46	12.91	27.9	42.1	
28.8	57.49	25.79	28.8	48.53	24.63	28.9	17.04	36.97	28.9	48.65	12.71	28.9	42.3	
29.8	57.70	25.62	29.8	48.62	24.40	29.9	17.52	36.78	29.9	48.83	12.52	29.9	42.5	
30.8	57.92	25.47	30.8	48.73	24.17	30.9	17.97	36.61	30.9	49.01	12.35	30.9	42.8	
31.8	58.15	25.32	31.8	48.84	23.95	31.8	18.39	36.45	31.9	49.16	12.18	31.9	43.1	
11.09	−11.04		6.20	−6.12		20.31	+20.28		7.73	+7.67		18.49		
$5^h\ 46^m\ 14^s.756$			$6^h\ 46^m\ 58^s.546$			$7^h\ 2^m\ 4^s.048$			$7^h\ 13^m\ 42^s.294$			$7^h\ 16^m$		
−84° 49′ 46″.89			−80° 43′ 38″.16			+87° 10′ 54″.74			+82° 34′ 30″.13			−86° 54′		

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

	Cambridge 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		
	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	° ′ ″
g.	8 15	+88 52	Aug.	9 8	−85 20	Aug.	9 25	+81 41	Aug.	9 36	−80 34	Aug.	10 21	+82 58
9	39.83	50.08	1.0	33.50	13.66	1.0	21.67	33.31	1.0	12.65	26.43	1.1	3.20	47.51
9	40.35	49.76	2.0	33.40	13.36	2.0	21.70	32.97	2.0	12.60	26.13	2.1	3.20	47.18
9	40.83	49.45	3.0	33.31	13.04	3.0	21.73	32.64	3.0	12.54	25.81	3.1	3.18	46.85
9	41.26	49.14	4.0	33.25	12.70	4.0	21.74	32.34	4.0	12.50	25.48	4.1	3.15	46.54
9	41.62	48.83	5.0	33.20	12.35	5.0	21.75	32.04	5.0	12.46	25.15	5.1	3.12	46.24
9	41.94	48.52	6.0	33.18	12.04	6.0	21.74	31.74	6.0	12.44	24.82	6.1	3.07	45.94
9	42.21	48.19	7.0	33.18	11.72	7.0	21.74	31.40	7.0	12.43	24.51	7.1	3.01	45.63
9	42.51	47.83	8.0	33.18	11.42	8.0	21.73	31.04	8.0	12.43	24.22	8.1	2.95	45.29
9	42.86	47.46	8.9	33.19	11.13	9.0	21.73	30.67	9.0	12.42	23.94	9.0	2.90	44.92
9	43.29	47.07	9.9	33.19	10.86	10.0	21.74	30.28	10.0	12.42	23.67	10.0	2.86	44.53
9	43.81	46.69	10.9	33.20	10.60	11.0	21.77	29.89	11.0	12.41	23.42	11.0	2.84	44.14
9	44.40	46.32	11.9	33.19	10.34	12.0	21.81	29.50	12.0	12.39	23.15	12.0	2.83	43.75
9	45.04	45.98	12.9	33.16	10.07	12.9	21.86	29.14	13.0	12.38	22.88	13.0	2.82	43.37
9	45.71	45.64	13.9	33.13	9.75	13.9	21.91	28.79	14.0	12.36	22.56	14.0	2.83	43.00
9	46.38	45.33	14.9	33.11	9.45	14.9	21.96	28.45	15.0	12.34	22.26	15.0	2.85	42.65
9	47.03	45.02	15.9	33.10	9.12	15.9	22.01	28.11	15.9	12.32	21.94	16.0	2.86	42.32
9	47.65	44.73	16.9	33.11	8.78	16.9	22.05	27.79	16.9	12.31	21.59	17.0	2.86	41.98
9	48.23	44.45	17.9	33.12	8.44	17.9	22.09	27.48	17.9	12.30	21.26	18.0	2.86	41.66
9	48.79	44.16	18.9	33.15	8.11	18.9	22.13	27.16	18.9	12.30	20.91	19.0	2.86	41.34
9	49.31	43.85	19.9	33.19	7.77	19.9	22.15	26.84	19.9	12.30	20.57	20.0	2.85	41.02
9	49.83	43.55	20.9	33.25	7.45	20.9	22.18	26.51	20.9	12.32	20.23	21.0	2.83	40.69
9	50.36	43.24	21.9	33.32	7.14	21.9	22.21	26.17	21.9	12.34	19.91	22.0	2.81	40.33
9	50.92	42.90	22.9	33.40	6.85	22.9	22.24	25.81	22.9	12.37	19.62	23.0	2.79	39.97
9	51.54	42.56	23.9	33.48	6.57	23.9	22.27	25.44	23.9	12.40	19.34	24.0	2.78	39.59
9	52.24	42.21	24.9	33.54	6.31	24.9	22.31	25.07	24.9	12.43	19.07	25.0	2.78	39.21
9	53.01	41.88	25.9	33.60	6.05	25.9	22.38	24.68	25.9	12.46	18.80	26.0	2.81	38.79
9	53.88	41.54	26.9	33.65	5.79	26.9	22.46	24.29	26.9	12.47	18.53	26.9	2.84	38.39
9	54.80	41.22	27.9	33.69	5.52	27.9	22.55	23.93	27.9	12.48	18.26	27.9	2.89	38.00
9	55.75	40.94	28.9	33.73	5.21	28.9	22.64	23.58	28.9	12.49	17.95	28.9	2.95	37.61
9	56.68	40.67	29.9	33.77	4.90	29.9	22.73	23.24	29.9	12.49	17.63	29.9	3.00	37.24
9	57.57	40.41	30.9	33.82	4.58	30.9	22.82	22.93	30.9	12.51	17.31	30.9	3.05	36.90
9	58.38	40.14	31.9	33.91	4.26	31.9	22.89	22.62	31.9	12.54	16.97	31.9	3.10	36.57
	51.12	+51.11		12.30	−12.26		6.92	+6.85		6.11	−6.02		8.18	+8.12
	9h 15m	48s.380		9h	8m 57s.938		9h	25m 21s.719		9h	36m 22s.347		10h	21m 4s.831
	88° 53′	0″.29		−85°	19′ 57″.45		+81°	41′ 41″.50		−80°	34′ 6″.83		+82°	58′ 54″.87

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 *seq.* Mag. 5.3			*κ* Octant Mag. 5.	
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 Ascen- sion.
	h m s	° ′ ″			h m s	° ′ ″			h m s	° ′ ″			h m s	° ′ ″			h m s
Aug.	10 59	−84 9		Aug.	12 13	+88 9		Aug.	12 46	−84 40		Aug.	12 48	+83 51		Aug.	13 27
1.1	43.94	20.27		1.1	69.23	33.87		1.2	5.80	58.57		1.2	26.55	50.16		1.2	18.06
2.1	43.80	20.06		2.1	68.82	33.59		2.2	5.58	58.49		2.2	26.41	49.91		2.2	17.81
3.1	43.65	19.82		3.1	68.42	33.34		3.2	5.36	58.39		3.2	26.28	49.68		3.2	17.54
4.1	43.50	19.55		4.1	68.01	33.09		4.2	5.13	58.25		4.2	26.13	49.47		4.2	17.27
5.1	43.36	19.28		5.1	67.57	32.85		5.2	4.92	58.09		5.2	25.99	49.28		5.2	17.02
6.1	43.26	19.00		6.1	67.10	32.61		6.2	4.73	57.92		6.2	25.81	49.10		6.2	16.77
7.1	43.16	18.72		7.1	66.58	32.38		7.2	4.56	57.75		7.2	25.64	48.90		7.2	16.54
8.1	43.07	18.46		8.1	66.02	32.12		8.2	4.40	57.59		8.2	25.45	48.68		8.2	16.33
9.1	43.01	18.23		9.1	65.46	31.84		9.1	4.25	57.41		9.2	25.27	48.45		9.2	16.14
10.1	42.93	18.00		10.1	64.93	31.53		10.1	4.11	57.26		10.1	25.09	48.20		10.2	15.96
11.1	42.85	17.77		11.1	64.41	31.22		11.1	3.97	57.12		11.1	24.92	47.93		11.2	15.77
12.1	42.77	17.55		12.1	63.95	30.89		12.1	3.81	57.00		12.1	24.76	47.65		12.2	15.58
13.1	42.68	17.32		13.1	63.54	30.55		13.1	3.64	56.86		13.1	24.62	47.36		13.2	15.37
14.1	42.57	17.06		14.1	63.17	30.23		14.1	3.46	56.72		14.1	24.48	47.07		14.2	15.15
15.1	42.47	16.79		15.1	62.83	29.91		15.1	3.28	56.56		15.1	24.35	46.78		15.2	14.91
16.1	42.37	16.52		16.1	62.50	29.60		16.1	3.09	56.38		16.1	24.24	46.52		16.2	14.67
17.1	42.26	16.22		17.1	62.17	29.31		17.1	2.89	56.19		17.1	24.12	46.25		17.2	14.42
18.1	42.17	15.90		18.1	61.84	29.02		18.1	2.70	55.97		18.1	23.99	46.00		18.2	14.18
19.0	42.10	15.58		19.1	61.49	28.72		19.1	2.52	55.73		19.1	23.86	45.75		19.2	13.94
20.0	42.04	15.26		20.1	61.11	28.45		20.1	2.36	55.48		20.1	23.72	45.51		20.1	13.71
21.0	41.97	14.94		21.1	60.70	28.16		21.1	2.21	55.24		21.1	23.57	45.26		21.1	13.51
22.0	41.93	14.63		22.1	60.28	27.86		22.1	2.07	55.00		22.1	23.43	45.00		22.1	13.32
23.0	41.89	14.34		23.1	59.86	27.54		23.1	1.95	54.75		23.1	23.28	44.72		23.1	13.14
24.0	41.87	14.06		24.1	59.43	27.20		24.1	1.84	54.52		24.1	23.12	44.42		24.1	12.99
25.0	41.84	13.79		25.1	59.02	26.84		25.1	1.73	54.31		25.1	22.97	44.10		25.1	12.83
26.0	41.81	13.55		26.1	58.66	26.48		26.1	1.62	54.11		26.1	22.83	43.76		26.1	12.66
27.0	41.77	13.31		27.1	58.34	26.09		27.1	1.49	53.93		27.1	22.72	43.41		27.1	12.49
28.0	41.72	13.04		28.1	58.08	25.69		28.1	1.36	53.75		28.1	22.61	43.06		28.1	12.32
29.0	41.66	12.75		29.1	57.85	25.31		29.1	1.22	53.52		29.1	22.52	42.72		29.1	12.13
30.0	41.60	12.44		30.1	57.66	24.94		30.1	1.06	53.30		30.1	22.44	42.37		30.1	11.91
31.0	41.54	12.12		31.1	57.48	24.61		31.1	0.90	53.06		31.1	22.35	42.05		31.1	11.69
32.0	41.50	11.79		32.1	57.27	24.27		32.1	0.75	52.79		32.1	22.26	41.73		32.1	11.49
9.82		−9.77		31.12		+31.10		10.79		−10.74		9.35		+9.30		12.39	−
10h	59m	55s.280		12h	14m	28s.425		12h	46m	7s.152		12h	48m	30s.418		13h	27m
−84°	8′	50″.60		+88°	9′	36″.08		−84°	40′	22″.34		+83°	51′	50″.47		−85°	21′

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		
	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	° ′
	14 13	−83 17	Aug.	15 3	+87 33	Aug.	15 24	−84 12	Aug.	16 54	+82 10	Aug.	17 16	−80 47
	s	″		s	″		s	″		s	″		s	″
	35.28	56.67	1.3	29.26	16.12	1.3	11.88	1.94	1.3	25.58	42.50	1.4	10.90	25.20
	35.12	56.73	2.3	28.73	16.05	2.3	11.70	2.07	2.3	25.42	42.61	2.4	10.82	25.45
	34.94	56.72	3.3	28.23	15.98	3.3	11.50	2.18	3.3	25.28	42.70	3.4	10.75	25.69
	34.75	56.69	4.3	27.74	15.94	4.3	11.30	2.28	4.3	25.13	42.82	4.4	10.66	25.92
	34.56	56.67	5.3	27.23	15.91	5.3	11.08	2.34	5.3	24.99	42.96	5.3	10.56	26.11
	34.39	56.61	6.3	26.72	15.90	6.3	10.88	2.38	6.3	24.84	43.11	6.3	10.45	26.28
	34.22	56.52	7.3	26.16	15.89	7.3	10.69	2.38	7.3	24.69	43.27	7.3	10.36	26.42
	34.08	56.43	8.2	25.59	15.88	8.3	10.51	2.38	8.3	24.52	43.45	8.3	10.26	26.55
	33.93	56.37	9.2	24.99	15.85	9.3	10.34	2.38	9.3	24.36	43.63	9.3	10.17	26.67
	33.79	56.32	10.2	24.37	15.81	10.3	10.18	2.41	10.3	24.19	43.77	10.3	10.09	26.79
	33.66	56.27	11.2	23.76	15.72	11.3	10.03	2.45	11.3	24.00	43.90	11.3	10.02	26.93
	33.53	56.22	12.2	23.16	15.63	12.3	9.88	2.50	12.3	23.83	44.01	12.3	9.95	27.11
	33.39	56.18	13.2	22.58	15.53	13.2	9.70	2.54	13.3	23.65	44.11	13.3	9.87	27.27
	33.22	56.15	14.2	22.03	15.41	14.2	9.52	2.58	14.3	23.49	44.19	14.3	9.79	27.45
	33.05	56.11	15.2	21.51	15.29	15.2	9.32	2.63	15.3	23.32	44.24	15.3	9.69	27.63
	32.87	56.02	16.2	21.00	15.18	16.2	9.13	2.66	16.3	23.15	44.29	16.3	9.59	27.81
	32.70	55.95	17.2	20.51	15.08	17.2	8.90	2.67	17.3	23.00	44.35	17.3	9.48	27.95
	32.51	55.82	18.2	20.01	14.98	18.2	8.68	2.67	18.3	22.85	44.41	18.3	9.35	28.10
	32.32	55.70	19.2	19.51	14.89	19.2	8.46	2.65	19.3	22.68	44.49	19.3	9.22	28.23
	32.16	55.57	20.2	19.01	14.81	20.2	8.25	2.61	20.3	22.51	44.57	20.3	9.10	28.33
	32.01	55.42	21.2	18.48	14.72	21.2	8.05	2.55	21.3	22.35	44.66	21.3	8.97	28.42
	31.86	55.25	22.2	17.93	14.65	22.2	7.85	2.50	22.3	22.18	44.76	22.3	8.85	28.50
	31.72	55.09	23.2	17.35	14.57	23.2	7.66	2.43	23.3	22.01	44.86	23.3	8.75	28.56
	31.59	54.94	24.2	16.76	14.46	24.2	7.49	2.36	24.3	21.82	44.95	24.3	8.64	28.62
	31.45	54.80	25.2	16.16	14.32	25.2	7.33	2.29	25.3	21.64	45.01	25.3	8.54	28.69
	31.34	54.69	26.2	15.57	14.17	26.2	7.17	2.26	26.3	21.45	45.06	26.3	8.46	28.77
	31.21	54.59	27.2	15.00	13.98	27.2	7.01	2.24	27.3	21.26	45.08	27.3	8.37	28.86
	31.07	54.47	28.2	14.44	13.79	28.2	6.84	2.22	28.3	21.07	45.08	28.3	8.27	28.99
	30.92	54.38	29.2	13.93	13.58	29.2	6.67	2.19	29.3	20.89	45.06	29.3	8.18	29.11
	30.76	54.24	30.2	13.45	13.38	30.2	6.46	2.15	30.3	20.71	45.03	30.3	8.05	29.21
	30.60	54.11	31.2	12.98	13.18	31.2	6.24	2.10	31.3	20.54	45.00	31.3	7.93	29.32
	30.43	53.95	32.2	12.52	13.00	32.2	6.02	2.01	32.3	20.37	45.00	32.3	7.80	29.39
	8.57	−8.51		23.43	+23.41		9.90	−9.85		7.35	+7.28		6.25	−6.17
	14h 13m 27s.793			15h 3m 41s.175			15h 23m 56s.594			16h 54m 25s.488			17h 15m 54s.896	
	−83° 17′ 21″.03			+87° 33′ 10″.52			−84° 11′ 30″.39			+82° 10′ 32″.75			−80° 47′ 6″.56	

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	
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.
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m
Aug.	17 58	+86 37	Aug.	18 7	−87 40	Aug.	19 2	+89 1	Aug.	19 30	−89 13	Aug.	20 4
	s	″		s	″		s	″		s	″		s
1.4	60.70	1.97	1.4	12.34	3.88	1.4	41.82	13.21	1.5	48.67	27.56	1.5	45.8
2.4	60.37	2.17	2.4	12.14	4.17	2.4	40.92	13.48	2.4	48.61	27.88	2.5	45.7
3.4	60.06	2.36	3.4	11.90	4.47	3.4	40.06	13.72	3.4	48.42	28.21	3.5	45.7
4.4	59.77	2.55	4.4	11.62	4.76	4.4	39.28	13.99	4.4	48.09	28.54	4.5	45.7
5.4	59.49	2.77	5.4	11.29	5.01	5.4	38.54	14.25	5.4	47.65	28.84	5.5	45.7
6.4	59.21	2.99	6.4	10.95	5.25	6.4	37.82	14.52	6.4	47.09	29.13	6.5	45.6
7.4	58.90	3.23	7.4	10.61	5.44	7.4	37.09	14.84	7.4	46.51	29.40	7.5	45.6
8.4	58.59	3.47	8.4	10.28	5.64	8.4	36.32	15.16	8.4	45.93	29.65	8.5	45.6
9.4	58.27	3.73	9.4	10.00	5.82	9.4	35.44	15.49	9.4	45.43	29.89	9.5	45.6
10.4	57.90	3.97	10.4	9.72	6.00	10.4	34.49	15.81	10.4	44.98	30.13	10.5	45.6
11.4	57.53	4.21	11.4	9.47	6.20	11.4	33.46	16.10	11.4	44.59	30.38	11.5	45.5
12.4	57.16	4.41	12.4	9.21	6.42	12.4	32.37	16.40	12.4	44.22	30.65	12.5	45.5
13.4	56.77	4.58	13.4	8.94	6.66	13.4	31.26	16.66	13.4	43.85	30.93	13.5	45.4
14.4	56.40	4.74	14.4	8.64	6.89	14.4	30.17	16.89	14.4	43.42	31.22	14.5	45.4
15.4	56.03	4.89	15.4	8.32	7.13	15.4	29.08	17.12	15.4	42.92	31.52	15.5	45.3
16.3	55.68	5.03	16.4	7.96	7.38	16.4	28.05	17.34	16.4	42.32	31.82	16.5	45.2
17.3	55.34	5.18	17.4	7.58	7.61	17.4	27.05	17.57	17.4	41.62	32.12	17.5	45.2
18.3	55.01	5.33	18.3	7.16	7.82	18.4	26.08	17.80	18.4	40.82	32.42	18.5	45.1
19.3	54.67	5.50	19.3	6.72	8.02	19.4	25.14	18.04	19.4	39.95	32.69	19.5	45.1
20.3	54.33	5.68	20.3	6.28	8.20	20.4	24.20	18.28	20.4	39.02	32.95	20.5	45.0
21.3	54.00	5.87	21.3	5.84	8.35	21.4	23.23	18.55	21.4	38.05	33.19	21.5	45.0
22.3	53.63	6.06	22.3	5.40	8.50	22.4	22.24	18.83	22.4	37.10	33.42	22.4	44.9
23.3	53.27	6.24	23.3	4.98	8.66	23.4	21.19	19.10	23.4	36.15	33.66	23.4	44.9
24.3	52.87	6.43	24.3	4.59	8.79	24.4	20.06	19.37	24.4	35.28	33.85	24.4	44.8
25.3	52.46	6.61	25.3	4.22	8.90	25.4	18.84	19.64	25.4	34.46	34.04	25.4	44.7
26.3	52.03	6.76	26.3	3.88	9.05	26.4	17.55	19.89	26.4	33.72	34.26	26.4	44.7
27.3	51.60	6.90	27.3	3.55	9.20	27.4	16.21	20.12	27.4	33.03	34.48	27.4	44.6
28.3	51.17	7.00	28.3	3.19	9.38	28.4	14.85	20.31	28.4	32.33	34.72	28.4	44.5
29.3	50.74	7.08	29.3	2.82	9.56	29.4	13.48	20.51	29.4	31.57	35.00	29.4	44.4
30.3	50.33	7.14	30.3	2.41	9.74	30.4	12.19	20.68	30.4	30.71	35.26	30.4	44.3
31.3	49.94	7.22	31.3	1.94	9.91	31.3	10.95	20.85	31.4	29.71	35.52	31.4	44.2
32.3	49.56	7.31	32.3	1.45	10.06	32.3	9.78	21.02	32.4	28.60	35.77	32.4	44.1
16.95	+16.92		24.58	−24.56		58.55	+58.54		73.97	−73.97		7.40	
17h	59m	1s.307	18h	6m	11s.893	19h	2m	39s.624	19h	27m	42s.218	20h	48m
+86°	36′	51″.17	−87°	39′	51″.82	+89°	1′	2″.17	−89°	13′	28″.57	+82°	13′

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

tantis. ; 5.4		υ Octantis. Mag. 5.7			β Octantis. Mag. 4.3			39 H. Cephei. Mag. 5.6			γ^1 Octantis. Mag. 5.1		
ght sen- n.	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.
m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	° ′
38	−83 5	Aug.	22 16	−86 23	Aug.	22 37	−81 48	Aug.	23 27	+86 51	Aug.	23 47	−82 28
s	″		s	″		s	″		s	″		s	″
.62	45.73	1.6	40.27	1.29	1.6	53.44	33.78	1.6	59.21	3.84	1.6	27.07	13.87
.72	45.99	2.6	40.49	1.53	2.6	53.54	34.00	2.6	59.39	4.16	2.6	27.22	14.01
.82	46.27	3.6	40.70	1.80	3.6	53.65	34.24	3.6	59.58	4.46	3.6	27.37	14.18
.88	46.59	4.6	40.89	2.07	4.6	53.75	34.51	4.6	59.76	4.75	4.6	27.51	14.37
.93	46.90	5.6	41.03	2.36	5.6	53.83	34.77	5.6	59.97	5.04	5.6	27.64	14.59
.97	47.19	6.6	41.14	2.65	6.6	53.89	35.03	6.6	60.20	5.33	6.6	27.75	14.80
.99	47.47	7.6	41.24	2.94	7.6	53.95	35.29	7.6	60.45	5.63	7.6	27.85	14.99
.02	47.75	8.5	41.33	3.18	8.6	54.00	35.53	8.6	60.72	5.95	8.6	27.94	15.20
.05	47.98	9.5	41.42	3.43	9.6	54.06	35.75	9.6	60.97	6.31	9.6	28.03	15.38
.08	48.21	10.5	41.53	3.66	10.6	54.12	35.98	10.6	61.22	6.67	10.6	28.13	15.57
.13	48.44	11.5	41.65	3.89	11.6	54.20	36.19	11.6	61.45	7.04	11.6	28.23	15.74
.18	48.68	12.5	41.79	4.12	12.6	54.28	36.40	12.6	61.63	7.42	12.6	28.36	15.89
.24	48.96	13.5	41.93	4.39	13.5	54.36	36.63	13.6	61.80	7.80	13.6	28.48	16.08
.29	49.24	14.5	42.08	4.67	14.5	54.44	36.88	14.6	61.94	8.15	14.6	28.61	16.27
.34	49.54	15.5	42.22	4.95	15.5	54.52	37.15	15.6	62.07	8.51	15.6	28.73	16.48
.39	49.86	16.5	42.34	5.26	16.5	54.59	37.44	16.6	62.20	8.84	16.6	28.85	16.70
.41	50.19	17.5	42.44	5.58	17.5	54.64	37.75	17.6	62.32	9.16	17.6	28.95	16.96
.42	50.52	18.5	42.53	5.91	18.5	54.69	38.06	18.6	62.45	9.49	18.6	29.06	17.22
.43	50.83	19.5	42.57	6.25	19.5	54.74	38.37	19.6	62.59	9.80	19.6	29.15	17.49
.42	51.14	20.5	42.61	6.57	20.5	54.77	38.68	20.6	62.75	10.13	20.6	29.23	17.77
.40	51.44	21.5	42.63	6.88	21.5	54.80	38.97	21.6	62.92	10.45	21.6	29.31	18.04
.38	51.73	22.5	42.64	7.16	22.5	54.82	39.25	22.6	63.09	10.80	22.6	29.37	18.31
.36	52.00	23.5	42.65	7.45	23.5	54.84	39.53	23.6	63.27	11.16	23.6	29.43	18.57
.34	52.26	24.5	42.65	7.72	24.5	54.87	39.78	24.6	63.45	11.54	24.6	29.49	18.81
.34	52.52	25.5	42.69	7.98	25.5	54.89	40.03	25.6	63.59	11.94	25.6	29.57	19.03
.34	52.77	26.5	42.72	8.22	26.5	54.93	40.27	26.5	63.72	12.34	26.6	29.64	19.24
.35	53.03	27.5	42.78	8.49	27.5	54.96	40.51	27.5	63.81	12.76	27.6	29.72	19.46
.37	53.31	28.5	42.86	8.76	28.5	55.01	40.78	28.5	63.87	13.18	28.6	29.81	19.69
.38	53.60	29.5	42.92	9.06	29.5	55.06	41.06	29.5	63.93	13.57	29.6	29.91	19.94
.39	53.92	30.5	42.97	9.37	30.5	55.10	41.38	30.5	63.96	13.94	30.6	30.01	20.21
.36	54.23	31.5	42.99	9.70	31.5	55.13	41.69	31.5	63.99	14.30	31.5	30.09	20.49
.33	54.55	32.5	43.00	10.03	32.5	55.14	42.02	32.5	64.04	14.66	32.5	30.14	20.81
	−8.26		15.86	−15.83		7.02	−6.95		18.21	+18.18		7.63	−7.56
3m	19s.542		22h	16m 8s.656		22h	37m 39s.016		23h	27m 44s.125		23h	47m 16s.424
3′	6″.99		−86°	23′ 27″.13		−81°	49′ 2″.34		+86°	50′ 58″.89		−82°	28′ 48″.42

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 Mag.
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.
	h m s	° ′ ″		h m s	° ′ ″		h m s	° ′ ″		h m s	° ′ ″	
Sept.	0 57	+85 48	Sept.	1 31	+88 51	Sept.	1 42	−85 10	Sept.	4 10	+85 20	Sept.
0.6	29.29	54.52	0.6	21.79	49.58	0.6	9.67	47.24	0.7	21.03	3.09	0.8
1.6	29.44	54.82	1.6	22.51	49.86	1.6	9.87	47.47	1.7	21.31	3.17	1.8
2.6	29.62	55.11	2.6	23.28	50.12	2.6	10.06	47.70	2.7	21.59	3.23	2.8
3.6	29.81	55.42	3.6	24.11	50.38	3.6	10.24	47.95	3.7	21.90	3.28	3.8
4.6	30.01	55.73	4.6	25.00	50.66	4.6	10.39	48.19	4.7	22.21	3.32	4.8
5.6	30.24	56.05	5.6	25.94	50.94	5.6	10.52	48.42	5.7	22.54	3.36	5.8
6.6	30.44	56.41	6.6	26.85	51.26	6.6	10.66	48.65	6.7	22.88	3.44	6.8
7.6	30.65	56.77	7.6	27.74	51.57	7.6	10.80	48.85	7.7	23.22	3.53	7.8
8.6	30.83	57.15	8.6	28.56	51.92	8.6	10.96	49.06	8.7	23.57	3.65	8.8
9.6	30.99	57.53	9.6	29.30	52.28	9.6	11.13	49.25	9.7	23.91	3.78	9.8
10.6	31.13	57.90	10.6	29.97	52.65	10.6	11.30	49.45	10.7	24.22	3.93	10.8
11.6	31.25	58.27	11.6	30.57	53.00	11.6	11.47	49.66	11.7	24.51	4.09	11.8
12.6	31.36	58.64	12.6	31.12	53.34	12.6	11.65	49.90	12.7	24.81	4.24	12.8
13.6	31.46	58.98	13.6	31.68	53.67	13.6	11.83	50.16	13.7	25.08	4.39	13.8
14.6	31.57	59.32	14.6	32.22	53.98	14.6	11.98	50.43	14.7	25.35	4.53	14.8
15.6	31.67	59.65	15.6	32.78	54.30	15.6	12.14	50.72	15.7	25.61	4.67	15.7
16.6	31.80	59.97	16.6	33.37	54.58	16.6	12.28	51.01	16.7	25.88	4.78	16.7
17.5	31.93	60.30	17.6	34.00	54.86	17.6	12.41	51.31	17.7	26.16	4.89	17.7
18.5	32.06	60.64	18.6	34.65	55.17	18.6	12.51	51.61	18.7	26.45	4.99	18.7
19.5	32.20	60.98	19.6	35.35	55.49	19.6	12.61	51.91	19.7	26.75	5.12	19.7
20.5	32.35	61.35	20.6	36.06	55.83	20.6	12.71	52.19	20.7	27.06	5.24	20.7
21.5	32.50	61.72	21.6	36.77	56.19	21.6	12.79	52.48	21.7	27.38	5.38	21.7
22.5	32.64	62.13	22.6	37.41	56.56	22.6	12.88	52.73	22.7	27.72	5.56	22.7
23.5	32.75	62.54	23.6	38.00	56.97	23.6	12.98	52.97	23.7	28.05	5.75	23.7
24.5	32.84	62.95	24.6	38.51	57.39	24.6	13.08	53.21	24.7	28.35	5.98	24.7
25.5	32.90	63.36	25.6	38.95	57.78	25.6	13.21	53.46	25.7	28.64	6.20	25.7
26.5	32.96	63.75	26.5	39.29	58.16	26.6	13.33	53.73	26.7	28.93	6.42	26.7
27.5	33.00	64.13	27.5	39.62	58.53	27.6	13.46	54.00	27.7	29.17	6.65	27.7
28.5	33.04	64.50	28.5	39.95	58.87	28.5	13.56	54.30	28.7	29.42	6.85	28.7
29.5	33.10	64.84	29.5	40.33	59.22	29.5	13.66	54.63	29.7	29.66	7.04	29.7
30.5	33.17	65.18	30.5	40.77	59.54	30.5	13.73	54.95	30.6	29.93	7.21	30.7
31.5	33.26	65.54	31.5	41.26	59.86	31.5	13.78	55.29	31.6	30.19	7.37	31.7
13.71	+13.67		50.49	+50.48		11.90	−11.86		12.29	+12.25		11.84
0^h	57^m	$9^s.300$	1^h	30^m	$13^s.156$	1^h	42^m	$2^s.339$	4^h	10^m	$2^s.561$	5^h
+85°	48′	45″.30	+88°	51′	43″.55	−85°	11′	21″.46	+85°	20′	10″.34	+85°

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

Mensæ. g. 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		
ight cen-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.
m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	° ′
45	−84 49	Sept.	6 46	−80 43	Sept.	7 2	+87 10	Sept.	7 13	+82 34	Sept.	7 15	−86 53
s	″		s	″		s	″		s	″		s	″
.15	25.32	0.8	48.84	23.95	0.8	18.39	36.45	0.9	49.16	12.18	0.9	43.10	57.26
.38	25.21	1.8	48.96	23.75	1.8	18.79	36.27	1.9	49.31	11.99	1.9	43.41	57.02
.62	25.10	2.8	49.08	23.58	2.8	19.18	36.07	2.9	49.46	11.79	2.9	43.74	56.82
.86	25.05	3.8	49.20	23.44	3.8	19.58	35.86	3.8	49.61	11.57	3.9	44.08	56.63
.09	25.00	4.8	49.32	23.33	4.8	20.00	35.65	4.8	49.76	11.33	4.8	44.41	56.48
.31	24.97	5.8	49.45	23.22	5.8	20.45	35.42	5.8	49.93	11.09	5.8	44.73	56.34
.51	24.93	6.8	49.56	23.11	6.8	20.93	35.20	6.8	50.12	10.84	6.8	45.03	56.21
.72	24.89	7.8	49.67	22.99	7.8	21.43	34.99	7.8	50.30	10.61	7.8	45.32	56.07
.93	24.83	8.8	49.77	22.86	8.8	21.95	34.79	8.8	50.50	10.41	8.8	45.61	55.91
.13	24.75	9.8	49.88	22.72	9.8	22.47	34.63	9.8	50.71	10.24	9.8	45.89	55.74
.36	24.67	10.8	50.00	22.56	10.8	22.99	34.48	10.8	50.91	10.09	10.8	46.19	55.56
.58	24.58	11.8	50.13	22.39	11.8	23.49	34.35	11.8	51.10	9.94	11.8	46.50	55.37
.82	24.49	12.8	50.25	22.23	12.8	23.97	34.23	12.8	51.28	9.80	12.8	46.82	55.18
.07	24.43	13.8	50.38	22.08	13.8	24.43	34.11	13.8	51.45	9.67	13.8	47.18	55.00
.32	24.38	14.8	50.50	21.94	14.8	24.88	33.99	14.8	51.63	9.54	14.8	47.54	54.83
.57	24.37	15.8	50.64	21.83	15.8	25.32	33.86	15.8	51.79	9.40	15.8	47.92	54.67
.82	24.35	16.8	50.78	21.73	16.8	25.76	33.73	16.8	51.95	9.24	16.8	48.31	54.52
.08	24.36	17.8	50.92	21.66	17.8	26.20	33.58	17.8	52.12	9.07	17.8	48.70	54.41
.33	24.40	18.8	51.05	21.60	18.8	26.65	33.43	18.8	52.29	8.90	18.8	49.10	54.31
.57	24.44	19.8	51.19	21.57	19.8	27.12	33.27	19.8	52.46	8.72	19.8	49.49	54.22
.80	24.48	20.8	51.32	21.54	20.8	27.61	33.11	20.8	52.65	8.54	20.8	49.86	54.16
.02	24.52	21.8	51.46	21.50	21.8	28.15	32.95	21.8	52.85	8.37	21.8	50.21	54.09
.23	24.56	22.8	51.58	21.46	22.8	28.70	32.81	22.8	53.06	8.21	22.8	50.55	54.01
.45	24.59	23.8	51.70	21.41	23.8	29.27	32.70	23.8	53.28	8.07	23.8	50.88	53.93
.66	24.60	24.8	51.83	21.34	24.8	29.85	32.61	24.8	53.51	7.97	24.8	51.21	53.84
.88	24.60	25.8	51.95	21.26	25.8	30.41	32.55	25.8	53.73	7.88	25.8	51.54	53.72
.11	24.60	26.8	52.07	21.18	26.8	30.94	32.50	26.8	53.93	7.81	26.8	51.90	53.61
.35	24.61	27.8	52.21	21.12	27.8	31.46	32.45	27.8	54.13	7.74	27.8	52.28	53.50
.61	24.65	28.8	52.34	21.07	28.8	31.93	32.39	28.8	54.31	7.67	28.8	52.69	53.40
.86	24.72	29.8	52.49	21.05	29.8	32.40	32.32	29.8	54.49	7.58	29.8	53.10	53.35
.11	24.81	30.8	52.63	21.06	30.8	32.86	32.24	30.8	54.66	7.47	30.8	53.54	53.30
.35	24.94	31.8	52.78	21.10	31.8	33.35	32.13	31.8	54.84	7.35	31.8	53.97	53.30
	−11.04		6.20	−6.12		20.30	+20.27		7.73	+7.67		18.48	−18.45
	6m 14s.756		6h 46m 58s.546			7h 2m 4s.048			7h 13m 42s.294			7h 16m 20s.292	
	9′ 46″.89		−80° 43′ 38″.16			+87° 10′ 54″.74			+82° 34′ 30″.13			−86° 54′ 6″.70	

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			30 H. Ca Mag. 5	
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.
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m
Sept.	8 15	+88 52	Sept.	9 8	−85 19	Sept.	9 25	+81 41	Sept.	9 36	−80 34	Sept.	10 21
	s	″		s	″		s	″		s	″		s
0.9	58.38	40.14	0.9	33.91	64.26	0.9	22.89	22.62	0.9	12.54	16.97	0.9	3.10
1.9	59.13	39.87	1.9	34.00	63.95	1.9	22.95	22.31	1.9	12.57	16.64	1.9	3.13
2.9	59.85	39.59	2.9	34.12	63.63	2.9	23.00	22.00	2.9	12.62	16.33	2.9	3.15
3.9	60.56	39.29	3.9	34.25	63.35	3.9	23.05	21.67	3.9	12.67	16.04	3.9	3.16
4.9	61.30	38.98	4.9	34.39	63.09	4.9	23.11	21.30	4.9	12.73	15.76	4.9	3.17
5.9	62.11	38.66	5.9	34.53	62.85	5.9	23.18	20.93	5.9	12.78	15.49	5.9	3.19
6.9	63.01	38.33	6.9	34.65	62.63	6.9	23.26	20.55	6.9	12.84	15.25	6.9	3.23
7.9	63.97	38.04	7.9	34.77	62.41	7.9	23.36	20.17	7.9	12.89	15.01	7.9	3.28
8.9	65.00	37.74	8.9	34.87	62.18	8.9	23.45	19.80	8.9	12.94	14.74	8.9	3.35
9.9	66.06	37.46	9.9	34.98	61.90	9.9	23.56	19.47	9.9	12.99	14.46	9.9	3.43
10.9	67.13	37.20	10.9	35.09	61.64	10.9	23.67	19.15	10.9	13.03	14.19	10.9	3.52
11.9	68.16	36.96	11.9	35.19	61.35	11.9	23.78	18.83	11.9	13.08	13.91	11.9	3.60
12.9	69.18	36.74	12.9	35.32	61.06	12.9	23.88	18.54	12.9	13.12	13.61	12.9	3.68
13.9	70.15	36.52	13.9	35.46	60.76	13.9	23.98	18.26	13.9	13.18	13.30	13.9	3.75
14.9	71.08	36.29	14.9	35.61	60.46	14.9	24.07	17.98	14.9	13.23	13.00	14.9	3.81
15.9	71.99	36.07	15.9	35.78	60.18	15.9	24.16	17.68	15.9	13.31	12.68	15.9	3.87
16.9	72.87	35.83	16.9	35.96	59.90	16.9	24.24	17.38	16.9	13.39	12.39	16.9	3.93
17.9	73.75	35.60	17.9	36.14	59.66	17.9	24.33	17.07	17.9	13.47	12.10	17.9	3.98
18.9	74.66	35.35	18.9	36.34	59.42	18.9	24.41	16.75	18.9	13.55	11.84	18.9	4.04
19.8	75.60	35.09	19.9	36.54	59.21	19.9	24.50	16.42	19.9	13.64	11.60	19.9	4.10
20.8	76.61	34.81	20.9	36.73	59.01	20.9	24.60	16.09	20.9	13.72	11.36	20.9	4.17
21.8	77.70	34.54	21.9	36.91	58.82	21.9	24.71	15.74	21.9	13.81	11.14	21.9	4.25
22.8	78.85	34.29	22.9	37.08	58.62	22.9	24.84	15.39	22.9	13.90	10.93	22.9	4.35
23.8	80.07	34.05	23.9	37.25	58.43	23.9	24.98	15.06	23.9	13.98	10.73	23.9	4.46
24.8	81.34	33.84	24.9	37.41	58.22	24.9	25.12	14.76	24.9	14.05	10.51	24.9	4.58
25.8	82.59	33.65	25.9	37.57	58.00	25.9	25.26	14.48	25.9	14.12	10.29	25.9	4.71
26.8	83.82	33.47	26.9	37.73	57.76	26.9	25.40	14.20	26.9	14.20	10.05	26.9	4.84
27.8	84.96	33.30	27.9	37.91	57.52	27.9	25.54	13.93	27.9	14.27	9.79	27.9	4.95
28.8	86.05	33.14	28.9	38.11	57.29	28.9	25.65	13.67	28.9	14.36	9.52	28.9	5.05
29.8	87.07	32.96	29.9	38.34	57.08	29.9	25.75	13.41	29.9	14.46	9.28	29.9	5.15
30.8	88.08	32.77	30.9	38.57	56.89	30.9	25.86	13.14	30.9	14.57	9.04	30.9	5.23
31.8	89.09	32.55	31.9	38.81	56.70	31.9	25.97	12.86	31.9	14.68	8.83	31.9	5.31
51.01		+51.00	12.29		−12.25	6.92		+6.84	6.10		−6.02	8.18	
8^h	15^m	$48^s.380$	9^h	8^m	$57^s.938$	9^h	25^m	$21^s.719$	9^h	36^m	$22^s.347$	10^h	21^m
+88°	53′	0″.29	−85°	19′	57″.45	+81°	41′	41″.50	−80°	34′	6″.83	+82°	58′

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

ctantis. g. 6.3		Bradley 1672. Mag. 6.3			ι Octantis. Mag. 5.4			32 H. Camelop. *seq.* Mag. 5.3			κ Octantis. Mag. 5.6		
ight scen-ion.	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	° ′
0 59	−84 9	Sept.	12 13	+88 9	Sept.	12 45	−84 40	Sept.	12 48	+83 51	Sept.	13 27	−85 22
s	″		s	″		s	″		s	″		s	″
1.50	11.79	1.1	57.27	24.27	1.1	60.75	52.79	1.1	22.26	41.73	1.1	11.49	14.66
1.46	11.46	2.1	57.04	23.94	2.1	60.61	52.51	2.1	22.16	41.44	2.1	11.30	14.42
1.46	11.12	3.1	56.75	23.63	3.1	60.50	52.22	3.1	22.03	41.14	3.1	11.13	14.14
1.48	10.80	4.1	56.42	23.29	4.1	60.41	51.93	4.1	21.91	40.83	4.1	10.98	13.87
1.49	10.50	5.1	56.09	22.94	5.1	60.34	51.65	5.1	21.79	40.51	5.1	10.85	13.63
1.51	10.21	6.1	55.76	22.57	6.1	60.28	51.39	6.1	21.67	40.17	6.1	10.75	13.40
1.54	9.93	7.0	55.47	22.18	7.1	60.21	51.14	7.1	21.56	39.81	7.1	10.64	13.17
1.56	9.66	8.0	55.23	21.78	8.1	60.13	50.90	8.1	21.45	39.43	8.1	10.51	12.94
1.56	9.38	9.0	55.03	21.37	9.1	60.05	50.67	9.1	21.36	39.05	9.1	10.38	12.72
1.56	9.10	10.0	54.89	20.97	10.1	59.96	50.42	10.1	21.28	38.66	10.1	10.24	12.51
1.56	8.82	11.0	54.77	20.58	11.1	59.86	50.15	11.1	21.22	38.29	11.1	10.09	12.29
1.56	8.51	12.0	54.68	20.21	12.1	59.76	49.88	12.1	21.17	37.93	12.1	9.93	12.04
1.55	8.17	13.0	54.60	19.85	13.1	59.65	49.59	13.1	21.11	37.59	13.1	9.77	11.78
1.55	7.84	14.0	54.51	19.49	14.1	59.55	49.27	14.1	21.05	37.25	14.1	9.61	11.50
1.58	7.49	15.0	54.41	19.15	15.0	59.46	48.96	15.0	20.99	36.91	15.1	9.46	11.21
1.62	7.15	16.0	54.28	18.81	16.0	59.38	48.64	16.0	20.92	36.58	16.1	9.32	10.91
1.66	6.82	17.0	54.13	18.47	17.0	59.32	48.29	17.0	20.84	36.27	17.1	9.21	10.59
1.71	6.49	18.0	53.97	18.11	18.0	59.28	47.95	18.0	20.75	35.95	18.1	9.10	10.27
1.78	6.17	19.0	53.79	17.74	19.0	59.25	47.62	19.0	20.67	35.61	19.1	9.00	9.96
1.86	5.87	20.0	53.61	17.37	20.0	59.23	47.30	20.0	20.59	35.24	20.1	8.94	9.67
1.94	5.59	21.0	53.46	16.98	21.0	59.21	47.01	21.0	20.51	34.86	21.1	8.88	9.37
2.00	5.31	22.0	53.33	16.57	22.0	59.20	46.73	22.0	20.45	34.47	22.1	8.83	9.09
2.07	5.06	23.0	53.25	16.16	23.0	59.19	46.46	23.0	20.39	34.07	23.1	8.77	8.85
2.14	4.81	24.0	53.22	15.72	24.0	59.15	46.21	24.0	20.35	33.65	24.1	8.69	8.61
2.19	4.54	24.9	53.25	15.28	25.0	59.11	45.95	25.0	20.32	33.23	25.0	8.60	8.37
2.23	4.26	25.9	53.29	14.87	26.0	59.07	45.67	26.0	20.31	32.82	26.0	8.51	8.10
2.28	3.98	26.9	53.38	14.49	27.0	59.02	45.34	27.0	20.30	32.44	27.0	8.41	7.82
2.34	3.65	27.9	53.44	14.12	28.0	58.97	45.03	28.0	20.29	32.07	28.0	8.31	7.50
2.41	3.33	28.9	53.49	13.75	29.0	58.94	44.70	29.0	20.26	31.71	29.0	8.21	7.17
2.50	3.01	29.9	53.48	13.42	30.0	58.93	44.35	30.0	20.23	31.37	30.0	8.16	6.83
2.60	2.69	30.9	53.44	13.06	31.0	58.94	43.99	31.0	20.19	31.02	31.0	8.12	6.47
2.74	2.41	31.9	53.39	12.70	32.0	58.97	43.65	32.0	20.14	30.66	32.0	8.11	6.12
	−9.76		31.06	+31.05		10.79	−10.74		9.35	+9.30		12.39	−12.35
9m	55s.280		12h	14m 28s.425		12h	46m 7s.152		12h	48m 30s.418		13h	27m 14s.824
8′	50″.60		+88°	9′ 36″.08		−84°	40′ 22″.34		+83°	51′ 50″.47		−85°	21′ 42″.23

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. A Mag.	
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.
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h
Sept.	14 13	−83 17	Sept.	15 2	+87 33	Sept.	15 24	−84 11	Sept.	16 54	+82 10	Sept.	17 1
	s	″		s	″		s	″		s	″		s
1.1	30.43	53.95	1.2	72.52	13.00	1.2	6.02	62.01	1.3	20.37	45.00	1.3	7.8
2.1	30.28	53.73	2.2	72.05	12.86	2.2	5.83	61.91	2.3	20.20	45.03	2.3	7.6
3.1	30.14	53.51	3.2	71.54	12.71	3.2	5.62	61.77	3.3	20.03	45.05	3.3	7.5
4.1	30.01	53.29	4.2	71.01	12.58	4.2	5.43	61.63	4.3	19.85	45.08	4.3	7.4
5.1	29.89	53.08	5.2	70.45	12.41	5.2	5.27	61.48	5.2	19.67	45.12	5.3	7.2
6.1	29.79	52.87	6.2	69.88	12.25	6.2	5.12	61.33	6.2	19.47	45.15	6.3	7.1
7.1	29.69	52.68	7.2	69.31	12.06	7.2	4.97	61.22	7.2	19.29	45.15	7.3	7.0
8.1	29.60	52.50	8.2	68.76	11.85	8.2	4.82	61.11	8.2	19.09	45.12	8.3	6.9
9.1	29.48	52.32	9.2	68.23	11.61	9.2	4.67	61.01	9.2	18.90	45.08	9.3	6.8
10.1	29.36	52.14	10.2	67.72	11.35	10.2	4.50	60.91	10.2	18.70	45.03	10.2	6.7
11.1	29.24	51.96	11.2	67.26	11.09	11.2	4.32	60.81	11.2	18.52	44.94	11.2	6.6
12.1	29.10	51.78	12.2	66.81	10.85	12.2	4.14	60.68	12.2	18.35	44.87	12.2	6.5
13.1	28.97	51.56	13.1	66.39	10.62	13.2	3.94	60.55	13.2	18.18	44.79	13.2	6.3
14.1	28.82	51.33	14.1	65.97	10.39	14.2	3.75	60.40	14.2	18.01	44.72	14.2	6.2
15.1	28.68	51.08	15.1	65.54	10.16	15.2	3.55	60.23	15.2	17.84	44.66	15.2	6.1
16.1	28.56	50.82	16.1	65.11	9.94	16.2	3.35	60.06	16.2	17.68	44.60	16.2	5.9
17.1	28.45	50.54	17.1	64.66	9.75	17.2	3.17	59.85	17.2	17.51	44.55	17.2	5.8
18.1	28.35	50.25	18.1	64.21	9.53	18.1	3.00	59.63	18.2	17.33	44.50	18.2	5.6
19.1	28.25	49.95	19.1	63.73	9.32	19.1	2.85	59.41	19.2	17.15	44.46	19.2	5.5
20.1	28.17	49.67	20.1	63.23	9.10	20.1	2.70	59.19	20.2	16.98	44.42	20.2	5.4
21.1	28.09	49.42	21.1	62.73	8.88	21.1	2.56	58.97	21.2	16.79	44.37	21.2	5.3
22.1	28.04	49.16	22.1	62.24	8.61	22.1	2.44	58.78	22.2	16.60	44.29	22.2	5.2
23.1	27.96	48.94	23.1	61.76	8.31	23.1	2.32	58.60	23.2	16.41	44.17	23.2	5.1
24.1	27.88	48.72	24.1	61.30	8.00	24.1	2.19	58.44	24.2	16.22	44.03	24.2	5.0
25.1	27.81	48.51	25.1	60.88	7.69	25.1	2.05	58.27	25.2	16.04	43.88	25.2	4.9
26.1	27.72	48.27	26.1	60.49	7.38	26.1	1.91	58.11	26.2	15.87	43.72	26.2	4.8
27.1	27.62	48.03	27.1	60.12	7.07	27.1	1.74	57.92	27.2	15.69	43.57	27.2	4.6
28.1	27.52	47.75	28.1	59.77	6.79	28.1	1.57	57.71	28.2	15.52	43.41	28.2	4.5
29.1	27.41	47.42	29.1	59.42	6.51	29.1	1.40	57.49	29.2	15.38	43.27	29.2	4.4
30.1	27.33	47.12	30.1	59.05	6.28	30.1	1.26	57.23	30.2	15.21	43.16	30.2	4.2
31.1	27.27	46.80	31.1	58.66	6.01	31.1	1.12	56.95	31.2	15.05	43.06	31.2	4.1
32.1	27.22	46.47	32.1	58.24	5.76	32.1	1.01	56.67	32.2	14.88	42.96	32.2	4.0
8.57		−8.51	23.42		+23.40	9.90		−9.85	7.35		+7.28	6.25	
14^h	13^m	$27^s.793$	15^h	3^m	$41^s.175$	15^h	23^m	$56^s.594$	16^h	54^m	$25^s.488$	17^h	15^m
−83°	17′	21″.03	+87°	33′	10″.52	−84°	11′	30″.39	+82°	10′	32″.75	−80°	47′

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

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		
	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	° ′ ″
	17 58	+86 37	Sept.	18 6	−87 40	Sept.	19 1	+89 1	Sept.	19 29	−89 13	Sept.	20 48	+82 13
	49.56	7.31	1.3	61.45	10.06	1.3	69.78	21.02	1.4	88.60	35.77	1.4	44.12	51.37
	49.19	7.41	2.3	60.94	10.18	2.3	68.65	21.20	2.4	87.38	36.01	2.4	44.04	51.68
	48.82	7.53	3.3	60.42	10.28	3.3	67.52	21.42	3.4	86.11	36.20	3.4	43.95	52.00
	48.42	7.67	4.3	59.94	10.35	4.3	66.36	21.64	4.4	84.83	36.39	4.4	43.88	52.33
	48.01	7.80	5.3	59.46	10.40	5.3	65.12	21.88	5.4	83.61	36.54	5.4	43.79	52.69
	47.59	7.94	6.3	59.02	10.46	6.3	63.82	22.13	6.4	82.46	36.70	6.4	43.70	53.06
	47.13	8.06	7.3	58.60	10.52	7.3	62.43	22.37	7.3	81.38	36.85	7.4	43.61	53.42
	46.68	8.16	8.3	58.19	10.60	8.3	60.99	22.56	8.3	80.36	37.01	8.4	43.50	53.77
	46.23	8.22	9.3	57.78	10.69	9.3	59.52	22.73	9.3	79.33	37.19	9.4	43.39	54.10
	45.78	8.27	10.3	57.36	10.79	10.3	58.05	22.88	10.3	78.29	37.38	10.4	43.26	54.39
	45.35	8.30	11.3	56.90	10.90	11.3	56.62	23.01	11.3	77.16	37.59	11.4	43.13	54.67
	44.93	8.35	12.3	56.40	11.01	12.3	55.22	23.11	12.3	75.97	37.80	12.4	43.01	54.95
	44.51	8.38	13.3	55.90	11.12	13.3	53.87	23.23	13.3	74.68	38.01	13.4	42.88	55.22
	44.12	8.40	14.3	55.36	11.21	14.3	52.56	23.35	14.3	73.30	38.21	14.4	42.78	55.48
	43.73	8.43	15.3	54.81	11.26	15.3	51.28	23.48	15.3	71.85	38.38	15.4	42.66	55.74
	43.34	8.47	16.3	54.24	11.30	16.3	50.01	23.61	16.3	70.35	38.53	16.4	42.55	56.01
	42.93	8.50	17.3	53.68	11.32	17.3	48.76	23.76	17.3	68.80	38.66	17.4	42.44	56.27
	42.53	8.56	18.3	53.13	11.33	18.3	47.48	23.92	18.3	67.25	38.78	18.4	42.32	56.55
	42.12	8.62	19.3	52.60	11.33	19.3	46.15	24.09	19.3	65.73	38.90	19.4	42.22	56.83
	41.69	8.69	20.3	52.09	11.31	20.3	44.78	24.26	20.3	64.27	38.99	20.4	42.09	57.15
	41.24	8.76	21.3	51.61	11.29	21.3	43.32	24.41	21.3	62.89	39.06	21.4	41.97	57.46
	40.78	8.79	22.3	51.17	11.27	22.3	41.79	24.55	22.3	61.58	39.14	22.4	41.84	57.76
	40.31	8.80	23.2	50.74	11.27	23.3	40.21	24.68	23.3	60.33	39.24	23.4	41.70	58.05
	39.85	8.77	24.2	50.31	11.29	24.3	38.59	24.78	24.3	59.12	39.35	24.4	41.55	58.32
	39.37	8.74	25.2	49.87	11.30	25.3	36.98	24.84	25.3	57.89	39.47	25.4	41.40	58.56
	38.93	8.68	26.2	49.37	11.34	26.3	35.42	24.90	26.3	56.58	39.61	26.4	41.24	58.80
	38.50	8.64	27.2	48.87	11.36	27.3	33.93	24.94	27.3	55.17	39.75	27.4	41.09	59.00
	38.09	8.58	28.2	48.32	11.37	28.3	32.51	24.98	28.3	53.62	39.89	28.3	40.94	59.21
	37.71	8.53	29.2	47.76	11.34	29.3	31.14	25.04	29.3	51.99	39.99	29.3	40.80	59.40
	37.30	8.51	30.2	47.19	11.29	30.3	29.80	25.12	30.3	50.30	40.05	30.3	40.67	59.64
	36.90	8.51	31.2	46.63	11.22	31.3	28.46	25.23	31.3	48.60	40.11	31.3	40.54	59.88
	36.49	8.52	32.2	46.11	11.13	32.3	27.06	25.34	32.3	46.95	40.13	32.3	40.42	60.14
	16.96	+16.93		24.59	−24.57		58.66	+58.65		74.15	−74.15		7.40	+7.33
	$17^h\ 59^m$	$1^s.307$		$18^h\ 6^m$	$11^s.893$		$19^h\ 2^m$	$39^s.624$		$19^h\ 27^m$	$42^s.218$		$20^h\ 48^m$	$40^s.491$
	86° 36′	51″.17		−87° 39′	51″.82		+89° 1′	2″.17		−89° 13′	28″.57		+82° 13′	29″.86

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

λ Octantis. Mag. 5.4			υ Octantis. Mag. 5.7			β Octantis. Mag. 4.3			39 H. Cephei. Mag. 5.6			γ¹ O Ma	
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.	R A si
	h m s	° ′ ″		h m s	° ′ ″		h m s	° ′ ″		h m s	° ′ ″		h
Sept.	21 38	−83 5	Sept.	22 16	−86 23	Sept.	22 37	−81 48	Sept.	23 28	+86 51	Sept.	2
1.5	40.33	54.55	1.5	43.00	10.03	1.5	55.14	42.02	1.5	4.04	14.66	1.5	3
2.5	40.29	54.87	2.5	42.97	10.36	2.5	55.14	42.35	2.5	4.12	14.99	2.5	3
3.5	40.23	55.17	3.5	42.91	10.68	3.5	55.14	42.66	3.5	4.22	15.35	3.5	3
4.4	40.16	55.44	4.5	42.82	10.97	4.5	55.12	42.95	4.5	4.33	15.71	4.5	3
5.4	40.10	55.70	5.5	42.73	11.25	5.5	55.10	43.23	5.5	4.43	16.09	5.5	3
6.4	40.05	55.94	6.5	42.67	11.52	6.5	55.08	43.48	6.5	4.53	16.51	6.5	3
7.4	40.00	56.17	7.5	42.61	11.76	7.5	55.07	43.75	7.5	4.62	16.91	7.5	3
8.4	39.96	56.41	8.5	42.57	12.03	8.5	55.08	44.01	8.5	4.66	17.33	8.5	3
9.4	39.93	56.68	9.5	42.54	12.30	9.5	55.08	44.28	9.5	4.67	17.74	9.5	3
10.4	39.89	56.95	10.5	42.52	12.59	10.5	55.09	44.56	10.5	4.68	18.14	10.5	3
11.4	39.85	57.23	11.5	42.49	12.89	11.5	55.09	44.86	11.5	4.65	18.53	11.5	3
12.4	39.80	57.54	12.5	42.44	13.21	12.5	55.08	45.17	12.5	4.62	18.91	12.5	3
13.4	39.75	57.85	13.4	42.39	13.53	13.5	55.07	45.49	13.5	4.59	19.28	13.5	3
14.4	39.67	58.17	14.4	42.30	13.86	14.5	55.05	45.82	14.5	4.56	19.63	14.5	3
15.4	39.58	58.48	15.4	42.20	14.19	15.5	55.01	46.15	15.5	4.55	19.99	15.5	3
16.4	39.49	58.77	16.4	42.07	14.52	16.5	54.97	46.48	16.5	4.54	20.32	16.5	3
17.4	39.39	59.06	17.4	41.92	14.82	17.5	54.92	46.80	17.5	4.55	20.67	17.5	3
18.4	39.28	59.32	18.4	41.75	15.12	18.5	54.87	47.10	18.5	4.56	21.03	18.5	3
19.4	39.17	59.57	19.4	41.59	15.39	19.4	54.81	47.39	19.5	4.57	21.42	19.5	3
20.4	39.06	59.81	20.4	41.42	15.67	20.4	54.75	47.67	20.5	4.59	21.82	20.5	3
21.4	38.96	60.01	21.4	41.27	15.91	21.4	54.70	47.93	21.5	4.59	22.23	21.5	3
22.4	38.87	60.22	22.4	41.13	16.15	22.4	54.65	48.17	22.5	4.56	22.65	22.5	3
23.4	38.80	60.44	23.4	41.01	16.40	23.4	54.61	48.41	23.5	4.52	23.08	23.5	3
24.4	38.72	60.67	24.4	40.91	16.64	24.4	54.59	48.67	24.5	4.44	23.50	24.5	3
25.4	38.65	60.91	25.4	40.80	16.90	25.4	54.56	48.94	25.5	4.33	23.91	25.5	3
26.4	38.56	61.17	26.4	40.70	17.18	26.4	54.52	49.22	26.5	4.20	24.31	26.5	3
27.4	38.47	61.43	27.4	40.56	17.49	27.4	54.48	49.53	27.5	4.08	24.67	27.5	3
28.4	38.37	61.69	28.4	40.40	17.78	28.4	54.43	49.83	28.5	3.97	25.03	28.5	3
29.4	38.24	61.95	29.4	40.21	18.07	29.4	54.35	50.15	29.5	3.87	25.37	29.5	3
30.4	38.10	62.19	30.4	40.00	18.35	30.4	54.27	50.44	30.5	3.80	25.71	30.5	3
31.4	37.96	62.42	31.4	39.75	18.60	31.4	54.18	50.72	31.4	3.74	26.06	31.5	3
32.4	37.82	62.62	32.4	39.51	18.83	32.4	54.09	50.97	32.4	3.69	26.44	32.5	3
8.32		−8.26	15.87		−15.84	7.02		−6.95	18.23		+18.20	7.63	
21^h	38^m	$19^s.542$	22^h	16^m	$8^s.656$	22^h	37^m	$39^s.016$	23^h	27^m	$44^s.125$	23^h	4
−83°	6′	6″.99	−86°	23′	27″.13	−81°	49′	2″.34	+86°	50′	58″.89	−82°	2

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

phei. .5		α Ursæ Minoris. (*Polaris.*) Mag. 2.1			4 G. Octantis. Mag. 5.6			Groombridge 750. Mag. 6.7			Groombridge 944. Mag. 6.4		
	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	° ′
	+85 49	Oct.	1 31	+88 51	Oct.	1 42	−85 10	Oct.	4 10	+85 20	Oct.	5 35	+85 9
	″		s	″		s	″		s	″		s	″
	5.18	0.5	40.77	59.54	0.5	13.73	54.95	0.6	29.93	7.21	0.7	36.57	16.72
	5.54	1.5	41.26	59.86	1.5	13.78	55.29	1.6	30.19	7.37	1.7	36.85	16.75
	5.91	2.5	41.80	60.19	2.5	13.81	55.63	2.6	30.48	7.54	2.7	37.17	16.78
	6.29	3.5	42.34	60.57	3.5	13.84	55.95	3.6	30.79	7.72	3.7	37.48	16.82
	6.68	4.5	42.86	60.95	4.5	13.87	56.24	4.6	31.10	7.92	4.7	37.82	16.88
	7.10	5.5	43.31	61.36	5.5	13.90	56.53	5.6	31.39	8.14	5.7	38.16	16.95
	7.51	6.5	43.68	61.76	6.5	13.94	56.81	6.6	31.69	8.38	6.7	38.50	17.05
	7.92	7.5	43.98	62.17	7.5	13.98	57.09	7.6	31.97	8.64	7.7	38.82	17.19
2	8.33	8.5	44.20	62.58	8.5	14.04	57.38	8.6	32.22	8.90	8.7	39.13	17.33
2	8.73	9.5	44.37	62.96	9.5	14.11	57.69	9.6	32.46	9.17	9.7	39.42	17.48
1	9.11	10.5	44.50	63.34	10.5	14.17	58.01	10.6	32.69	9.42	10.7	39.70	17.62
'0	9.48	11.5	44.64	63.72	11.5	14.21	58.33	11.6	32.90	9.67	11.7	39.97	17.76
69	9.81	12.5	44.77	64.06	12.5	14.25	58.67	12.6	33.10	9.91	12.7	40.24	17.89
69	10.16	13.5	44.94	64.40	13.5	14.26	59.03	13.6	33.33	10.15	13.7	40.48	18.02
.70	10.51	14.5	45.13	64.75	14.5	14.27	59.40	14.6	33.54	10.39	14.7	40.75	18.14
.71	10.85	15.5	45.35	65.09	15.5	14.26	59.76	15.6	33.76	10.62	15.7	41.01	18.25
.73	11.19	16.5	45.61	65.44	16.5	14.23	60.10	16.6	34.00	10.84	16.7	41.29	18.34
.75	11.56	17.5	45.88	65.80	17.5	14.20	60.45	17.6	34.24	11.05	17.7	41.57	18.43
.78	11.95	18.5	46.14	66.18	18.5	14.17	60.78	18.6	34.51	11.29	18.7	41.88	18.53
.80	12.36	19.5	46.38	66.60	19.5	14.12	61.09	19.6	34.77	11.55	19.7	42.19	18.67
3.80	12.78	20.5	46.56	67.01	20.5	14.09	61.37	20.6	35.04	11.82	20.7	42.51	18.82
3.78	13.19	21.5	46.67	67.43	21.5	14.06	61.66	21.6	35.28	12.13	21.7	42.83	19.00
3.74	13.61	22.5	46.68	67.84	22.5	14.05	61.93	22.6	35.50	12.45	22.6	43.12	19.19
3.67	14.00	23.5	46.60	68.26	23.5	14.05	62.20	23.6	35.71	12.76	23.6	43.41	19.42
3.59	14.37	24.5	46.48	68.64	24.5	14.04	62.51	24.6	35.90	13.08	24.6	43 66	19.64
3.51	14.72	25.5	46.35	69.02	25.5	14.02	62.84	25 6	36.08	13.39	25.6	43.91	19.84
3.44	15.05	26.5	46.25	69.36	26.5	13.99	63.18	26.6	36.24	13.68	26.6	44.14	20.03
3.38	15.38	27.5	46.19	69.70	27.5	13.94	63.53	27.6	36.41	13.94	27.6	44.38	20.19
3.33	15.71	28.5	46.22	70.04	28.5	13.86	63.88	28.6	36.59	14.19	28.6	44.61	20.34
3.30	16.05	29.5	46.27	70.38	29.5	13.76	64.23	29.6	36.79	14.43	29.6	44.87	20.49
3.29	16.40	30.5	46.36	70.75	30.5	13.66	64.56	30.6	37.01	14.70	30.6	45.14	20.64
3.26	16.78	31.5	46.43	71.13	31.5	13.56	64.88	31.6	37.24	14.98	31.6	45.42	20.82
	+13.68		50.62	+50.61		11.91	−11.87		12.30	+12.26		11.84	+11.80
	57m 9s.300		1h 30m 13s.156			1h 42m 2s.339			4h 10m 2s.561			.5h 35m 12s.782	
	48′ 45″.30		+88° 51′ 43″.55			−85° 11′ 21″.46			+85° 20′ 10″.34			+85° 9′ 30″.2A	

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. Oct Mag.	
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 Ascen sion.
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m
Oct.	5 46	−84 49	Oct.	6 46	−80 43	Oct.	7 2	+87 10	Oct.	7 13	+82 34	Oct.	7 1
	s	″		s	″		s	″		s	″		s
0.7	5.11	24.81	0.8	52.63	21.06	0.8	32.86	32.24	0.8	54.66	7.47	0.8	53.5
1.7	5.35	24.94	1.8	52.78	21.10	1.8	33.35	32.13	1.8	54.84	7.35	1.8	53.9
2.7	5.58	25.07	2.8	52.92	21.15	2.8	33.85	32.01	2.8	55.03	7.22	2.8	54.3
3.7	5.80	25.21	3.7	53.06	21.21	3.8	34.38	31.90	3.8	55.23	7.10	3.8	54.7
4.7	6.00	25.31	4.7	53.19	21.26	4.8	34.93	31.79	4.8	55.45	6.98	4.8	55.1
5.7	6.21	25.43	5.7	53.31	21.30	5.8	35.51	31.72	5.8	55.68	6.88	5.8	55.5
6.7	6.41	25.53	6.7	53.45	21.33	6.8	36.09	31.67	6.8	55.91	6.81	6.8	55.8
7.7	6.62	25.62	7.7	53.58	21.35	7.7	36.67	31.64	7.8	56.13	6.76	7.8	56.2
8.7	6.84	25.70	8.7	53.70	21.36	8.7	37.22	31.63	8.8	56.34	6.71	8.8	56.5
9.7	7.06	25.79	9.7	53.84	21.38	9.7	37.75	31.63	9.8	56.55	6.70	9.8	56.9
10.7	7.29	25.92	10.7	53.98	21.41	10.7	38.26	31.64	10.7	56.75	6.69	10.7	57.3
11.7	7.53	26.04	11.7	54.11	21.44	11.7	38.76	31.65	11.7	56.94	6.67	11.7	57.7
12.7	7.77	26.17	12.7	54.26	21.49	12.7	39.25	31.65	12.7	57.13	6.64	12.7	58.2
13.7	8.00	26.31	13.7	54.40	21.56	13.7	39.72	31.64	13.7	57.30	6.61	13.7	58.6
14.7	8.23	26.48	14.7	54.55	21.64	14.7	40.18	31.62	14.7	57.49	6.58	14.7	59.0
15.7	8.46	26.68	15.7	54.69	21.75	15.7	40.66	31.60	15.7	57.67	6.54	15.7	59.5
16.7	8.68	26.89	16.7	54.83	21.88	16.7	41.15	31.57	16.7	57.85	6.49	16.7	59.9
17.7	8.88	27.10	17.7	54.97	22.02	17.7	41.66	31.53	17.7	58.05	6.43	17.7	60.3
18.7	9.08	27.31	18.7	55.10	22.17	18.7	42.20	31.51	18.7	58.27	6.37	18.7	60.7
19.7	9.26	27.50	19.7	55.22	22.31	19.7	42.76	31.50	19.7	58.49	6.34	19.7	61.1
20.7	9.44	27.70	20.7	55.35	22.44	20.7	43.35	31.50	20.7	58.71	6.32	20.7	61.4
21.7	9.61	27.88	21.7	55.47	22.56	21.7	43.93	31.53	21.7	58.94	6.31	21.7	61.8
22.7	9.79	28.03	22.7	55.59	22.66	22.7	44.50	31.58	22.7	59.18	6.34	22.7	62.1
23.7	9.98	28.19	23.7	55.71	22.76	23.7	45.05	31.66	23.7	59.39	6.38	23.7	62.5
24.6	10.17	28.36	24.7	55.84	22.85	24.7	45.57	31.75	24.7	59.59	6.43	24.7	62.8
25.6	10.37	28.55	25.7	55.96	22.97	25.7	46.06	31.83	25.7	59.78	6.49	25.7	63.2
26.6	10.57	28.77	26.7	56.10	23.11	26.7	46.53	31.90	26.7	59.97	6.53	26.7	63.6
27.6	10.77	29.00	27.7	56.23	23.28	27.7	46.99	31.95	27.7	60.14	6.56	27.7	64.1
28.6	10.97	29.26	28.7	56.37	23.48	28.7	47.44	31.99	28.7	60.32	6.57	28.7	64.5
29.6	11.15	29.55	29.7	56.50	23.70	29.7	47.92	32.01	29.7	60.51	6.57	29.7	64.9
30.6	11.31	29.84	30.7	56.62	23.93	30.7	48.43	32.02	30.7	60.70	6.57	30.7	65.3
31.6	11.46	30.12	31.7	56.73	24.15	31.7	48.96	32.05	31.7	60.91	6.58	31.7	65.6
11.08	−11.04		6.20	−6.12		20.29	+20.27		7.73	+7.67		18.48	
5^h	46^m	$14^s.756$	6^h	46^m	$58^s.546$	7^h	2^m	$4^s.048$	7^h	13^m	$42^s.294$	7^h	16^m
−84°	49′	46″.89	−80°	43′	38″.16	+87°	10′	54″.74	+82°	34′	30″.13	−86°	54′

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

ridge 1119. ag. 7.0		ζ Octantis. Mag. 5.4			1 H. Draconis. Mag. 4.6			ζ Chamæleontis. Mag. 5.2			30 H. Camelop. Mag. 5.3		
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	° ′
8 16	+88 52	Oct.	9 8	−85 19	Oct.	9 25	+81 41	Oct.	9 36	−80 34	Oct.	10 21	+82 58
s	″		s	″		s	″		s	″		s	″
8.08	32.77	0.9	38.57	56.89	0.9	25.86	13.14	0.9	14.57	9.04	0.9	5.23	25.86
9.09	32.55	1.9	38.81	56.70	1.9	25.97	12.86	1.9	14.68	8.83	1.9	5.31	25.52
0.15	32.33	2.8	39.06	56.56	2.9	26.08	12.55	2.9	14.80	8.64	2.9	5.40	25.16
1.30	32.10	3.8	39.30	56.43	3.9	26.20	12.22	3.9	14.91	8.49	3.9	5.49	24.80
2.52	31.88	4.8	39.53	56.31	4.9	26.34	11.91	4.9	15.02	8.35	4.9	5.62	24.43
3.80	31.68	5.8	39.74	56.18	5.9	26.49	11.62	5.9	15.13	8.19	5.9	5.75	24.06
5.11	31.50	6.8	39.95	56.05	6.9	26.64	11.33	6.9	15.23	8.02	6.9	5.89	23.72
6.44	31.35	7.8	40.16	55.90	7.8	26.81	11.07	7.9	15.33	7.85	7.9	6.03	23.38
7.75	31.21	8.8	40.36	55.72	8.8	26.96	10.83	8.9	15.43	7.67	8.9	6.18	23.07
9.02	31.09	9.8	40.58	55.55	9.8	27.12	10.59	9.9	15.53	7.48	9.9	6.32	22.77
0.24	30.99	10.8	40.80	55.39	10.8	27.26	10.37	10.8	15.64	7.29	10.9	6.46	22.48
1.42	30.88	11.8	41.04	55.23	11.8	27.41	10.17	11.8	15.74	7.09	11.9	6.60	22.20
2.55	30.76	12.8	41.29	55.07	12.8	27.54	9.97	12.8	15.87	6.89	12.9	6.73	21.93
3.67	30.63	13.8	41.56	54.92	13.8	27.67	9.75	13.8	15.99	6.71	13.9	6.85	21.67
4.76	30.51	14.8	41.83	54.80	14.8	27.80	9.53	14.8	16.12	6.57	14.9	6.96	21.40
5.87	30.39	15.8	42.11	54.69	15.8	27.93	9.30	15.8	16.25	6.43	15.9	7.08	21.12
7.00	30.25	16.8	42.38	54.59	16.8	28.06	9.06	16.8	16.39	6.32	16.9	7.20	20.81
8.18	30.10	17.8	42.67	54.53	17.8	28.19	8.82	17.8	16.53	6.22	17.9	7.32	20.49
9.42	29.94	18.8	42.94	54.48	18.8	28.34	8.57	18.8	16.66	6.13	18.9	7.46	20.17
0.74	29.79	19.8	43.20	54.43	19.8	28.52	8.32	19.8	16.79	6.06	19.9	7.60	19.85
2.12	29.67	20.8	43.44	54.38	20.8	28.68	8.08	20.8	16.92	5.99	20.8	7.78	19.53
3.53	29.57	21.8	43.67	54.33	21.8	28.85	7.85	21.8	17.04	5.91	21.8	7.96	19.23
4.95	29.50	22.8	43.90	54.25	22.8	29.04	7.64	22.8	17.16	5.82	22.8	8.14	18.94
6.33	29.44	23.8	44.14	54.17	23.8	29.22	7.46	23.8	17.27	5.71	23.8	8.32	18.70
7.66	29.40	24.8	44.37	54.08	24.8	29.40	7.31	24.8	17.39	5.61	24.8	8.50	18.45
8.90	29.36	25.8	44.64	53.99	25.8	29.55	7.16	25.8	17.51	5.50	25.8	8.66	18.22
0.08	29.32	26.8	44.92	53.92	26.8	29.70	7.00	26.8	17.64	5.38	26.8	8.81	18.00
1.22	29.27	27.8	45.21	53.87	27.8	29.85	6.82	27.8	17.78	5.30	27.8	8.95	17.78
2.34	29.19	28.8	45.51	53.84	28.8	29.98	6.65	28.8	17.94	5.25	28.8	9.09	17.54
3.50	29.11	29.8	45.81	53.85	29.8	30.12	6.46	29.8	18.08	5.21	29.8	9.24	17.27
4.72	29.02	30.8	46.11	53.89	30.8	30.29	6.25	30.8	18.24	5.21	30.8	9.38	16.99
6.01	28.92	31.8	46.39	53.92	31.8	30.46	6.05	31.8	18.39	5.23	31.8	9.55	16.71
4	+50.93		12.29	−12.25		6.91	+6.84		6.10	−6.02		8.17	+8.11
15m	48s.380		9h	8m 57s.938		9h	25m 21s.719		9h	36m 22s.347		10h	21m 4s.831
53′	0″.29		−85°	19′ 57″.45		+81°	41′ 41″.50		−80°	34′ 6″.83		+82°	58′ 54″.07

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. *seq.* Mag. 5.3			κ Octa Mag.
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 Ascen sion.
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m
Oct.	10 59	−84 8	Oct.	12 13	+88 9	Oct.	12 45	−84 40	Oct.	12 48	+83 51	Oct.	13 27
	s	″		s	″		s	″		s	″		s
0.9	42.60	62.69	0.9	53.44	13.06	1.0	58.94	43.99	1.0	20.19	31.02	1.0	8.12
1.9	42.74	62.41	1.9	53.39	12.70	2.0	58.97	43.65	2.0	20.14	30.66	2.0	8.11
2.9	42.87	62.16	2.9	53.32	12.32	2.9	59.01	43.33	3.0	20.09	30.29	3.0	8.10
3.9	42.99	61.92	3.9	53.27	11.91	3.9	59.07	43.04	3.9	20.05	29.89	4.0	8.11
4.9	43.12	61.70	4.9	53.28	11.49	4.9	59.12	42.76	4.9	20.01	29.47	5.0	8.12
5.9	43.23	61.47	5.9	53.33	11.07	5.9	59.15	42.50	5.9	20.00	29.04	6.0	8.13
6.9	43.33	61.23	6.9	53.43	10.64	6.9	59.17	42.23	6.9	20.00	28.62	7.0	8.12
7.9	43.44	60.98	7.9	53.58	10.22	7.9	59.19	41.95	7.9	20.01	28.20	8.0	8.09
8.9	43.54	60.73	8.9	53.76	9.84	8.9	59.20	41.66	8.9	20.02	27.79	9.0	8.03
9.9	43.63	60.46	9.9	53.94	9.46	9.9	59.21	41.34	9.9	20.06	27.40	10.0	8.03
10.9	43.74	60.19	10.9	54.13	9.10	10.9	59.23	41.01	10.9	20.09	27.02	11.0	7.99
11.9	43.86	59.91	11.9	54.31	8.76	11.9	59.26	40.68	11.9	20.10	26.66	12.0	7.97
12.9	44.00	59.62	12.9	54.46	8.41	12.9	59.29	40.36	12.9	20.11	26.30	13.0	7.96
13.9	44.14	59.34	13.9	54.61	8.07	13.9	59.34	40.01	13.9	20.12	25.95	13.9	7.97
14.9	44.29	59.09	14.9	54.72	7.72	14.9	59.41	39.67	14.9	20.13	25.61	14.9	7.99
15.9	44.46	58.85	15.9	54.82	7.38	15.9	59.50	39.32	15.9	20.13	25.26	15.9	8.03
16.9	44.63	58.61	16.9	54.92	7.01	16.9	59.59	38.99	16.9	20.13	24.89	16.9	8.08
17.9	44.80	58.40	17.9	55.03	6.63	17.9	59.69	38.71	17.9	20.14	24.51	17.9	8.17
18.9	44.98	58.20	18.9	55.16	6.23	18.9	59.80	38.41	18.9	20.15	24.12	18.9	8.28
19.9	45.16	58.02	19.9	55.34	5.82	19.9	59.91	38.15	19.9	20.17	23.71	19.9	8.33
20.9	45.31	57.85	20.9	55.56	5.43	20.9	60.01	37.92	20.9	20.21	23.28	20.9	8.40
21.9	45.46	57.68	21.9	55.84	5.04	21.9	60.10	37.68	21.9	20.27	22.86	21.9	8.46
22.9	45.60	57.50	22.9	56.17	4.64	22.9	60.18	37.42	22.9	20.33	22.45	22.9	8.51
23.9	45.74	57.30	23.9	56.50	4.26	23.9	60.25	37.16	23.9	20.41	22.05	23.9	8.54
24.9	45.89	57.08	24.9	56.86	3.90	24.9	60.33	36.88	24.9	20.49	21.66	24.9	8.58
25.9	46.04	56.86	25.9	57.19	3.57	25.9	60.41	36.58	25.9	20.55	21.29	25.9	8.63
26.9	46.22	56.66	26.9	57.48	3.24	26.9	60.50	36.26	26.9	20.60	20.96	26.9	8.70
27.9	46.41	56.46	27.9	57.72	2.92	27.9	60.63	35.95	27.9	20.65	20.62	27.9	8.79
28.9	46.62	56.27	28.9	57.95	2.61	28.9	60.76	35.65	28.9	20.69	20.28	28.9	8.91
29.9	46.82	56.12	29.9	58.15	2 26	29.9	60.93	35.36	29.9	20.73	19.93	29.9	9.04
30.9	47.05	55.98	30.9	58.38	1.90	30.9	61.10	35.12	30.9	20.77	19.56	30.9	9.18
31.8	47.26	55.87	31.9	58.63	1.53	31.9	61.27	34.88	31.9	20.82	19.17	31.9	9.34
9.81		−9.76	31.01		+30.99	10.78		−10.73	9.35		+9.29	12.38	
10h	59m	55s.280	12h	14m	28s.425	12h	46m	7s.152	12h	48m	30s.418	13h	27m
−84°	8′	50″.60	+88°	9′	36″.08	−84°	40′	22″.34	+83°	51′	50″.47	−85°	21′

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

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		
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	° ′
14 13	−83 17	Oct.	15 2	+87 32	Oct.	15 23	−84 11	Oct.	16 54	+82 10	Oct.	17 16	−80 47
s	″		s	″		s	″		s	″		s	″
27.27	46.80	1.1	58.66	66.01	1.1	61.12	56.95	1.2	15.05	43.06	1.2	4.14	28.48
27.22	46.47	2.1	58.24	65.76	2.1	61.01	56.67	2.2	14.88	42.96	2.2	4.02	28.31
27.19	46.15	3.1	57.79	65.50	3.1	60.91	56.38	3.2	14.70	42.86	3.2	3.92	28.14
27.16	45.87	4.1	57.34	65.21	4.1	60.82	56.12	4.2	14.51	42.74	4.2	3.82	28.00
27.14	45.61	5.1	56.92	64.91	5.1	60.73	55.88	5.2	14.33	42.59	5.2	3.73	27.85
27.11	45.33	6.1	56.50	64.58	6.1	60.65	55.66	6.2	14.16	42.42	6.2	3.65	27.72
27.07	45.05	7.1	56.13	64.21	7.1	60.56	55.43	7.2	13.98	42.23	7.2	3.56	27.60
27.03	44.80	8.1	55.80	63.85	8.1	60.44	55.21	8.2	13.81	42.01	8.2	3.46	27.50
26.98	44.53	9.1	55.48	63.51	9.1	60.32	54.98	9.2	13.65	41.79	9.2	3.34	27.39
26.92	44.23	10.1	55.20	63.19	10.1	60.20	54.74	10.2	13.50	41.58	10.2	3.22	27.26
26.86	43.91	11.1	54.92	62.87	11.1	60.08	54.47	11.1	13.35	41.38	11.2	3.10	27.13
26.81	43.61	12.1	54.66	62.53	12.1	59.96	54.20	12.1	13.21	41.18	12.2	2.98	26.98
26.76	43.28	13.1	54.39	62.21	13.1	59.84	53.92	13.1	13.06	40.98	13.2	2.86	26.80
26.73	42.95	14.1	54.11	61.94	14.1	59.74	53.60	14.1	12.92	40.80	14.2	2.73	26.60
26.70	42.61	15.1	53.80	61.65	15.1	59.64	53.28	15.1	12.77	40.63	15.2	2.62	26.39
26.69	42.26	16.1	53.50	61.37	16.1	59.56	52.94	16.1	12.62	40.47	16.2	2.52	26.17
26.69	41.92	17.1	53.18	61.05	17.1	59.50	52.62	17.1	12.47	40.30	17.1	2.41	25.94
26.71	41.60	18.1	52.85	60.73	18.1	59.44	52.31	18.1	12.31	40.12	18.1	2.32	25.71
26.74	41.27	19.1	52.52	60.39	19.1	59.40	52.01	19.1	12.15	39.91	19.1	2.24	25.49
26.76	41.00	20.0	52.20	60.05	20.1	59.37	51.72	20.1	11.99	39.68	20.1	2.18	25.30
26.78	40.71	21.0	51.91	59.68	21.1	59.34	51.46	21.1	11.84	39.45	21.1	2.12	25.10
26.79	40.44	22.0	51.66	59.29	22.1	59.29	51.20	22.1	11.68	39.18	22.1	2.04	24.92
26.79	40.19	23.0	51.43	58.90	23.1	59.24	50.94	23.1	11.54	38.89	23.1	1.96	24.74
26.80	39.91	24.0	51.24	58.51	24.1	59.18	50.68	24.1	11.40	38.59	24.1	1.88	24.58
26.79	39.60	25.0	51.07	58.15	25.0	59.10	50.41	25.1	11.27	38.32	25.1	1.79	24.40
26.78	39.28	26.0	50.91	57.79	26.0	59.04	50.10	26.1	11.15	38.06	26.1	1.69	24.18
26.79	38.96	27.0	50.75	57.46	27.0	58.98	49.78	27.1	11.03	37.81	27.1	1.59	23.93
26.82	38.61	28.0	50.56	57.14	28.0	58.93	49.43	28.1	10.90	37.57	28.1	1.49	23.66
26.85	38.26	29.0	50.34	56.83	29.0	58.91	49.07	29.1	10.78	37.35	29.1	1.41	23.39
26.90	37.92	30.0	50.09	56.51	30.0	58.90	48.71	30.1	10.65	37.15	30.1	1.33	23.10
26.98	37.60	31.0	49.85	56.17	31.0	58.91	48.38	31.1	10.51	36.92	31.1	1.28	22.80
27.06	37.31	32.0	49.61	55.81	32.0	58.95	48.07	32.1	10.38	36.67	32.1	1.24	22.51
57	−8.51		23.40	+23.37		9.89	−9.84		7.35	+7.28		6.25	−6.17
13m	27s.793		15h	3m 41s.175		15h	23m 56s.594		16h	54m 25s.488		17h	15m 54s.896
17′	21″.03		+87°	33′ 10″.52		−84°	11′ 30″.39		+82°	10′ 32″.75		−80°	47′ 6″.56

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 s 17 58	° ′ ″ +86 37	Oct.	h m s 18 6	° ′ ″ −87 40	Oct.	h m s 19 0	° ′ ″ +89 1	Oct.	h m s 19 29	° ′ ″ −89 13	Oct.	h m s 20 48	°
1.2	36.90	8.51	1.2	46.63	11.22	1.3	88.46	25.23	1.3	48.60	40.11	1.3	40.54	
2.2	36.49	8.52	2.2	46.11	11.13	2.3	87.06	25.34	2.3	46.95	40.13	2.3	40.42	
3.2	36.04	8.52	3.2	45.64	11.03	3.3	85.59	25.45	3.3	45.38	40.14	3.3	40.28	
4.2	35.58	8.50	4.2	45.20	10.94	4.3	84.04	25.56	4.3	43.91	40.14	4.3	40.14	
5.2	35.12	8.47	5.2	44.75	10.84	5.3	82.43	25.63	5.3	42.50	40.14	5.3	39.99	
6.2	34.67	8.42	6.2	44.31	10.76	6.3	80.80	25.69	6.3	41.15	40.18	6.3	39.83	
7.2	34.20	8.32	7.2	43.88	10.69	7.2	79.17	25.73	7.3	39.79	40.23	7.3	39.66	
8.2	33.77	8.22	8.2	43.42	10.63	8.2	77.57	25.73	8.3	38.38	40.27	8.3	39.49	
9.2	33.33	8.11	9.2	42.95	10.58	9.2	76.01	25.72	9.3	36.91	40.32	9.3	39.32	
10.2	32.92	8.01	10.2	42.44	10.50	10.2	74.51	25.72	10.3	35.36	40.36	10.3	39.15	
11.2	32.53	7.90	11.2	41.92	10.42	11.2	73.07	25.70	11.3	33.75	40.41	11.3	39.00	
12.2	32.15	7.79	12.2	41.38	10.34	12.2	71.68	25.69	12.3	32.06	40.42	12.3	38.84	
13.2	31.76	7.69	13.2	40.83	10.24	13.2	70.31	25.70	13.3	30.33	40.43	13.3	38.68	
14.2	31.39	7.60	14.2	40.30	10.10	14.2	68.95	25.71	14.2	28.56	40.41	14.3	38.53	
15.2	31.01	7.53	15.2	39.77	9.95	15.2	67.59	25.71	15.2	26.81	40.38	15.3	38.39	
16.2	30.62	7.45	16.2	39.26	9.78	16.2	66.20	25.74	16.2	25.08	40.35	16.3	38.24	
17.2	30.21	7.38	17.2	38.79	9.60	17.2	64.78	25.77	17.2	23.41	40.27	17.3	38.10	
18.2	29.80	7.30	18.2	38.35	9.41	18.2	63.29	25.80	18.2	21.83	40.19	18.3	37.94	
19.2	29.37	7.20	19.2	37.94	9.23	19.2	61.73	25.81	19.2	20.35	40.09	19.3	37.77	
20.2	28.94	7.07	20.2	37.56	9.08	20.2	60.13	25.81	20.2	18.94	40.03	20.3	37.60	
21.2	28.50	6.94	21.2	37.18	8.93	21.2	58.50	25.77	21.2	17.60	39.96	21.3	37.42	
22.2	28.06	6.77	22.2	36.81	8.79	22.2	56.84	25.73	22.2	16.28	39.91	22.3	37.24	
23.2	27.65	6.59	23.2	36.42	8.66	23.2	55.24	25.67	23.2	14.91	39.87	23.3	37.05	
24.2	27.26	6.39	24.2	36.00	8.53	24.2	53.73	25.58	24.2	13.46	39.84	24.3	36.87	
25.2	26.88	6.20	25.2	35.54	8.38	25.2	52.29	25.47	25.2	11.92	39.81	25.3	36.69	
26.2	26.53	6.02	26.2	35.07	8.21	26.2	50.92	25.38	26.2	10.28	39.77	26.3	36.52	
27.1	26.19	5.87	27.2	34.59	8.01	27.2	49.61	25.32	27.2	8.58	39.69	27.3	36.37	
28.1	25.85	5.73	28.2	34.13	7.78	28.2	48.31	25.28	28.2	6.87	39.57	28.3	36.22	
29.1	25.48	5.60	29.1	33.70	7.54	29.2	46.97	25.24	29.2	5.22	39.43	29.3	36.06	
30.1	25.11	5.47	30.1	33.31	7.28	30.2	45.58	25.21	30.2	3.66	39.28	30.3	35.91	
31.1	24.73	5.33	31.1	32.96	7.03	31.2	44.11	25.18	31.2	2.19	39.10	31.3	35.73	
32.1	24.34	5.20	32.1	32.63	6.78	32.2	42.60	25.14	32.2	0.85	38.92	32.3	35.56	
16.95		+16.93	24.59		−24.57	58.70		+58.69	74.21		−74.20	7.40		+7.33
17h 59m 1s.307			18h 6m 11s.893			19h 2m 39s.624			19h 27m 42s.218			20h 48m 40s.4		
+86° 36′ 51″.17			−87° 39′ 51″.82			+89° 1′ 2″.17			−89° 13′ 28″.57			+82° 13′ 29″.8		

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

ctantis. ag. 5.4		υ Octantis. Mag. 5.7			β Octantis. Mag. 4.3			39 H. Cephei. Mag. 5.6			γ¹ Octantis. Mag. 5.1		
ight scen- 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	° ′
1 38	−83 6	Oct.	22 16	−86 23	Oct.	22 37	−81 48	Oct.	23 27	+86 51	Oct.	23 47	−82 28
s	″		s	″		s	″		s	″		s	″
7.96	2.42	1.4	39.75	18.60	1.4	54.18	50.72	1.4	63.74	26.06	1.5	30.49	29.87
7.82	2.62	2.4	39.51	18.83	2.4	54.09	50.97	2.4	63.69	26.44	2.5	30.43	30.19
7.67	2.81	3.4	39.27	19.05	3.4	54.00	51.20	3.4	63.64	26.83	3.5	30.37	30.47
7.54	2.97	4.4	39.04	19.27	4.4	53.91	51.43	4.4	63.57	27.25	4.5	30.32	30.74
7.42	3.13	5.4	38.84	19.46	5.4	53.83	51.65	5.4	63.47	27.65	5.5	30.26	31.01
7.32	3.30	6.4	38.65	19.66	6.4	53.76	51.87	6.4	63.34	28.06	6.4	30.23	31.27
7.21	3.48	7.4	38.46	19.88	7.4	53.70	52.10	7.4	63.18	28.47	7.4	30.20	31.53
7.08	3.67	8.4	38.28	20.10	8.4	53.64	52.33	8.4	63.01	28.84	8.4	30.17	31.81
6.96	3.88	9.4	38.08	20.34	9.4	53.56	52.59	9.4	62.83	29.19	9.4	30.13	32.09
6.83	4.09	10.4	37.87	20.59	10.4	53.48	52.86	10.4	62.63	29.53	10.4	30.08	32.40
6.70	4.31	11.4	37.65	20.84	11.4	53.39	53.13	11.4	62.45	29.85	11.4	30.03	32.72
6.55	4.51	12.4	37.40	21.09	12.4	53.30	53.41	12.4	62.26	30.18	12.4	29.98	33.05
6.40	4.71	13.4	37.12	21.33	13.4	53.18	53.68	13.4	62.10	30.49	13.4	29.89	33.38
6.22	4.89	14.4	36.84	21.56	14.4	53.06	53.94	14.4	61.95	30.81	14.4	29.81	33.69
6.04	5.06	15.4	36.53	21.78	15.4	52.94	54.18	15.4	61.80	31.13	15.4	29.72	34.00
5.87	5.20	16.4	36.21	21.97	16.4	52.82	54.41	16.4	61.66	31.47	16.4	29.62	34.29
5.70	5.34	17.4	35.90	22.14	17.4	52.69	54.59	17.4	61.52	31.82	17.4	29.52	34.58
5.52	5.44	18.4	35.61	22.29	18.4	52.57	54.77	18.4	61.37	32.19	18.4	29.43	34.85
5.38	5.54	19.4	35.33	22.44	19.4	52.46	54.95	19.4	61.21	32.56	19.4	29.34	35.08
5.23	5.63	20.3	35.06	22.57	20.4	52.36	55.12	20.4	61.02	32.94	20.4	29.26	35.31
5.10	5.72	21.3	34.83	22.70	21.4	52.27	55.29	21.4	60.79	33.31	21.4	29.18	35.53
4.96	5.84	22.3	34.58	22.86	22.4	52.18	55.47	22.4	60.55	33.68	22.4	29.10	35.75
4.83	5.97	23.3	34.35	23.03	23.4	52.09	55.68	23.4	60.28	34.01	23.4	29.04	35.99
4.70	6.09	24.3	34.09	23.21	24.4	51.99	55.87	24.4	60.00	34.34	24.4	28.96	36.26
4.54	6.24	25.3	33.82	23.38	25.3	51.87	56.09	25.4	59.72	34.62	25.4	28.88	36.53
4.37	6.38	26.3	33.51	23.56	26.3	51.74	56.29	26.4	59.48	34.90	26.4	28.78	36.82
4.19	6.49	27.3	33.19	23.74	27.3	51.61	56.49	27.4	59.24	35.18	27.4	28.66	37.10
3.99	6.60	28.3	32.83	23.88	28.3	51.46	56.68	28.4	59.03	35.46	28.4	28.55	37.37
3.80	6.67	29.3	32.47	23.99	29.3	51.31	56.85	29.4	58.84	35.77	29.4	28.40	37.61
3.61	6.73	30.3	32.12	24.09	30.3	51.16	56.98	30.4	58.65	36.08	30.4	28.27	37.85
3.43	6.75	31.3	31.79	24.18	31.3	51.02	57.09	31.4	58.43	36.42	31.4	28.14	38.04
3.26	6.76	32.3	31.46	24.24	32.3	50.89	57.19	32.4	58.20	36.75	32.4	28.01	38.23
.33	−8.27	15.88		−15.85	7.02		−6.95	18.25		+18.22	7.64		−7.57
h 38m	19s.542	22h 16m		8s.656	22h 37m		39s.016	23h 27m		44s.125	23h 47m		16s.424
° 6′	6″.99	−86° 23′		27″.13	−81° 49′		2″.34	+86° 50′		58″.89	−82° 28′		48″.42

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 76 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.	Dec
	h m s	° ′ ″		h m s	° ′ ″		h m s	° ′ ″		h m s	° ′ ″		h m s	
Nov.	0 57	+85 49	Nov.	1 31	+88 52	Nov.	1 42	−85 11	Nov.	4 10	+85 20	Nov.	5 35	+85
0.4	33.26	16.78	0.5	46.43	11.13	0.5	13.56	4.88	0.6	37.24	14.98	0.6	45.42	
1.4	33.22	17.16	1.4	46.45	11.53	1.5	13.45	5.16	1.6	37.46	15.27	1.6	45.70	
2.4	33.16	17.54	2.4	46.39	11.94	2.5	13.35	5.43	2.6	37.66	15.59	2.6	45.99	
3.4	33.08	17.93	3.4	46.24	12.35	3.5	13.26	5.70	3.6	37.86	15.92	3.6	46.27	
4.4	32.97	18.32	4.4	46.02	12.75	4.4	13.18	5.97	4.6	38.04	16.26	4.6	46.52	
5.4	32.84	18.68	5.4	45.74	13.13	5.4	13.12	6.25	5.6	38.19	16.61	5.6	46.76	
6.4	32.72	19.02	6.4	45.41	13.50	6.4	13.04	6.54	6.5	38.33	16.95	6.6	46.99	
7.4	32.58	19.35	7.4	45.07	13.84	7.4	12.95	6.86	7.5	38.46	17.28	7.6	47.20	
8.4	32.45	19.67	8.4	44.73	14.19	8.4	12.86	7.16	8.5	38.56	17.60	8.6	47.40	
9.4	32.32	19.96	9.4	44.39	14.51	9.4	12.76	7.48	9.5	38.69	17.91	9.6	47.59	
10.4	32.19	20.25	10.4	44.10	14.84	10.4	12.63	7.81	10.5	38.81	18.20	10.6	47.78	
11.4	32.09	20.55	11.4	43.84	15.15	11.4	12.51	8.13	11.5	38.93	18.48	11.6	47.97	
12.4	31.99	20.86	12.4	43.60	15.46	12.4	12.36	8.46	12.5	39.05	18.76	12.6	48.17	
13.4	31.89	21.17	13.4	43.39	15.79	13.4	12.18	8.76	13.5	39.20	19.04	13.6	48.40	
14.4	31.79	21.49	14.4	43.19	16.13	14.4	12.02	9.05	14.5	39.35	19.35	14.6	48.62	
15.4	31.70	21.82	15.4	42.96	16.49	15.4	11.85	9.32	15.5	39.50	19.66	15.6	48.85	
16.4	31.58	22.17	16.4	42.67	16.86	16.4	11.69	9.56	16.5	39.66	20.01	16.6	49.09	
17.4	31.44	22.52	17.4	42.32	17.24	17.4	11.54	9.79	17.5	39.81	20.36	17.6	49.33	
18.4	31.27	22.87	18.4	41.89	17.62	18.4	11.39	10.02	18.5	39.94	20.73	18.6	49.56	
19.4	31.10	23.22	19.4	41.36	18.00	19.4	11.25	10.24	19.5	40.04	21.11	19.6	49.76	
20.4	30.91	23.54	20.4	40.78	18.34	20.4	11.12	10.46	20.5	40.13	21.47	20.6	49.95	
21.4	30.71	23.83	21.4	40.17	18.68	21.4	10.98	10.71	21.5	40.19	21.82	21.6	50.11	
22.4	30.50	24.10	22.4	39.57	18.99	22.4	10.84	10.98	22.5	40.24	22.16	22.6	50.26	
23.4	30.32	24.34	23.4	39.02	19.27	23.4	10.66	11.27	23.5	40.30	22.49	23.6	50.40	
24.4	30.15	24.59	24.4	38.53	19.54	24.4	10.48	11.55	24.5	40.35	22.80	24.6	50.54	
25.4	30.00	24.83	25.4	38.09	19.82	25.4	10.26	11.81	25.5	40.43	23.09	25.6	50.69	
26.4	29.86	25.11	26.4	37.68	20.11	26.4	10.04	12.06	26.5	40.52	23.39	26.6	50.87	
27.4	29.73	25.38	27.4	37.28	20.42	27.4	9.82	12.29	27.5	40.62	23.69	27.5	51.05	
28.4	29.58	25.66	28.4	36.85	20.74	28.4	9.60	12.49	28.5	40.72	24.01	28.5	51.23	
29.3	29.41	25.97	29.4	36.35	21.07	29.4	9.39	12.68	29.5	40.82	24.35	29.5	51.42	
30.3	29.23	26.27	30.4	35.78	21.42	30.4	9.19	12.85	30.5	40.89	24.68	30.5	51.61	
31.3	29.01	26.56	31.4	35.11	21.75	31.4	8.99	13.03	31.5	40.95	25.06	31.5	51.77	
13.73	+13.69		50.76	+50.75		11.92	−11.87		12.31	+12.26		11.84	+11.8	
0^h	57^m	$9^s.300$	1^h	30^m	$13^s.156$	1^h	42^m	$2^s.339$	4^h	10^m	$2^s.561$	5^h	35^m	$12^s.$
+85°	48′	45″.30	+88°	51′	43″.55	−85°	11′	21″.46	+85°	20′	10″.34	+85°	9′	30″

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

Date.	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.
		h m s	° ′ ″		h m s	° ′ ″		h m s	° ′ ″		h m s	° ′ ″
1916	Nov.	6 46	−80 43	Nov.	7 2	+87 10	Nov.	7 14	+82 34	Nov.	7 16	−86 53
Dec. 30.12	0.7	56.73	24.15	0.7	48.96	32.05	0.7	0.91	6.58	0.7	5.65	55.04
30.40	1.7	56.84	24.37	1.7	49.51	32.10	1.7	1.13	6.61	1.7	5.98	55.22
30.66	2.7	56.95	24.58	2.7	50.07	32.18	2.7	1.36	6.65	2.7	6.30	55.40
30.90	3.7	57.06	24.76	3.7	50.62	32.29	3.7	1.58	6.72	3.7	6.62	55.55
31.13	4.7	57.16	24.95	4.7	51.16	32.41	4.7	1.79	6.82	4.7	6.94	55.69
31.37	5.7	57.27	25.12	5.7	51.67	32.54	5.7	1.99	6.93	5.7	7.27	55.83
31.61	6.7	57.38	25.30	6.7	52.15	32.68	6.7	2.18	7.04	6.7	7.62	55.99
31.86	7.7	57.49	25.50	7.7	52.61	32.81	7.7	2.36	7.14	7.7	7.98	56.15
32.12	8.7	57.61	25.71	8.7	53.05	32.94	8.7	2.54	7.24	8.7	8.34	56.32
32.40	9.6	57.73	25.93	9.7	53.48	33.07	9.7	2.71	7.35	9.7	8.71	56.49
32.71	10.6	57.85	26.19	10.7	53.89	33.20	10.7	2.88	7.46	10.7	9.08	56.69
33.03	11.6	57.96	26.46	11.7	54.31	33.31	11.7	3.05	7.55	11.7	9.45	56.90
33.37	12.6	58.07	26.73	12.6	54.74	33.41	12.7	3.21	7.63	12.7	9.80	57.14
33.71	13.6	58.18	27.03	13.6	55.19	33.51	13.7	3.39	7.70	13.7	10.14	57.39
34.04	14.6	58.28	27.33	14.6	55.65	33.62	14.7	3.57	7.77	14.7	10.46	57.65
34.38	15.6	58.37	27.63	15.6	56.14	33.74	15.6	3.76	7.86	15.7	10.75	57.91
34.71	16.6	58.46	27.93	16.6	56.65	33.86	16.6	3.97	7.96	16.6	11.01	58.16
35.01	17.6	58.54	28.22	17.6	57.16	34.02	17.6	4.17	8.09	17.6	11.26	58.41
35.30	18.6	58.62	28.47	18.6	57.66	34.19	18.6	4.38	8.25	18.6	11.51	58.64
35.57	19.6	58.70	28.72	19.6	58.14	34.38	19.6	4.58	8.43	19.6	11.76	58.86
35.85	20.6	58.79	28.97	20.6	58.59	34.58	20.6	4.76	8.61	20.6	12.03	59.06
36.13	21.6	58.87	29.23	21.6	59.01	34.80	21.6	4.93	8.80	21.6	12.31	59.27
36.44	22.6	58.97	29.49	22.6	59.38	35.01	22.6	5.08	8.98	22.6	12.61	59.50
36.76	23.6	59.06	29.78	23.6	59.74	35.21	23.6	5.23	9.14	23.6	12.91	59.77
37.12	24.6	59.14	30.10	24.6	60.11	35.40	24.6	5.37	9.29	24.6	13.21	60.05
37.49	25.6	59.22	30.46	25.6	60.47	35.55	25.6	5.52	9.42	25.6	13.50	60.36
37.88	26.6	59.30	30.82	26.6	60.86	35.70	26.6	5.68	9.54	26.6	13.76	60.69
38.26	27.6	59.37	31.17	27.6	61.27	35.86	27.6	5.85	9.66	27.6	14.00	61.03
38.64	28.6	59.43	31.52	28.6	61.70	36.02	28.6	6.03	9.81	28.6	14.20	61.35
38.99	29.6	59.49	31.86	29.6	62.14	36.20	29.6	6.21	9.98	29.6	14.39	61.67
39.32	30.6	59.55	32.19	30.6	62.58	36.42	30.6	6.39	10.16	30.6	14.57	61.97
39.63	31.6	59.60	32.49	31.6	63.01	36.64	31.6	6.57	10.37	31.6	14.75	62.26
	−11.04	6.20	−6.12		20.30	+20.27		7.73	+7.67		18.49	−18.46
	$14^s.756$	6^h	46^m $58^s.546$		7^h	2^m $4^s.048$		7^h	13^m $42^s.294$		7^h	16^m $20^s.292$
	$46''.89$	−80°	43′ 38″.16		+87°	10′ 54″.74		+82°	34′ 30″.13		−86°	54′ 6″.70

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. Ma		
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.	R A s
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		
Nov.	8 17	+88 52	Nov.	9 8	−85 19	Nov.	9 25	+81 41	Nov.	9 36	−80 34	Nov.	1
	s	″		s	″		s	″		s	″		
0.7	6.01	28.92	0.8	46.39	53.92	0.8	30.46	6.05	0.8	18.39	5.23	0.8	
1.7	7.37	28.86	1.8	46.67	53.97	1.8	30.63	5.85	1.8	18.52	5.25	1.8	
2.7	8.76	28.80	2.8	46.92	54.01	2.8	30.81	5.66	2.8	18.66	5.25	2.8	
3.7	10.17	28.77	3.8	47.17	54.02	3.8	31.01	5.51	3.8	18.79	5.24	3.8	1
4.7	11.56	28.78	4.8	47.41	54.03	4.8	31.20	5.37	4.8	18.92	5.22	4.8	1
5.7	12.91	28.79	5.8	47.66	54.03	5.8	31.38	5.25	5.8	19.04	5.19	5.8	1
6.7	14.20	28.81	6.8	47.93	54.04	6.8	31.56	5.15	6.8	19.18	5.17	6.8	1
7.7	15.44	28.84	7.8	48.19	54.04	7.8	31.73	5.06	7.8	19.32	5.14	7.8	1
8.7	16.64	28.87	8.7	48.47	54.05	8.8	31.89	4.98	8.8	19.45	5.12	8.8	1
9.7	17.80	28.88	9.7	48.75	54.07	9.8	32.04	4.89	9.8	19.59	5.11	9.8	1
10.7	18.92	28.89	10.7	49.05	54.12	10.8	32.19	4.81	10.8	19.74	5.13	10.8	1
11.7	20.04	28.91	11.7	49.35	54.17	11.8	32.34	4.71	11.8	19.90	5.16	11.8	1
12.7	21.17	28.91	12.7	49.64	54.25	12.8	32.50	4.60	12.8	20.05	5.20	12.8	1
13.7	22.32	28.90	13.7	49.94	54.36	13.7	32.66	4.48	13.8	20.20	5.26	13.8	1
14.7	23.55	28.90	14.7	50.23	54.48	14.7	32.83	4.35	14.8	20.35	5.35	14.8	1
15.7	24.83	28.91	15.7	50.50	54.61	15.7	33.00	4.22	15.7	20.51	5.45	15.8	1
16.7	26.16	28.93	16.7	50.76	54.75	16.7	33.19	4.12	16.7	20.65	5.56	16.8	1
17.7	27.52	28.97	17.7	51.00	54.87	17.7	33.39	4.02	17.7	20.79	5.64	17.8	1
18.7	28.90	29.02	18.7	51.24	54.97	18.7	33.58	3.95	18.7	20.92	5.75	18.8	1
19.7	30.25	29.10	19.7	51.48	55.08	19.7	33.79	3.90	19.7	21.04	5.84	19.8	1
20.7	31.54	29.19	20.7	51.71	55.16	20.7	33.97	3.86	20.7	21.16	5.90	20.8	1
21.7	32.75	29.30	21.7	51.96	55.25	21.7	34.16	3.86	21.7	21.29	5.96	21.8	1
22.7	33.88	29.42	22.7	52.23	55.37	22.7	34.33	3.85	22.7	21.43	6.03	22.8	1
23.7	34.95	29.52	23.7	52.51	55.50	23.7	34.47	3.83	23.7	21.57	6.11	23.8	1
24.7	35.97	29.62	24.7	52.79	55.64	24.7	34.62	3.80	24.7	21.72	6.22	24.8	1
25.7	37.02	29.68	25.7	53.08	55.80	25.7	34.77	3.76	25.7	21.87	6.35	25.8	1
26.7	38.10	29.73	26.7	53.36	55.99	26.7	34.93	3.70	26.7	22.03	6.54	26.7	1
27.7	39.24	29.77	27.7	53.63	56.22	27.7	35.10	3.63	27.7	22.18	6.72	27.7	1
28.7	40.44	29.84	28.7	53.88	56.45	28.7	35.28	3.56	28.7	22.32	6.92	28.7	1
29.7	41.69	29.93	29.7	54.12	56.64	29.7	35.46	3.52	29.7	22.46	7.11	29.7	1
30.7	42.95	30.02	30.7	54.34	56.84	30.7	35.65	3.50	30.7	22.58	7.29	30.7	1
31.7	44.21	30.16	31.7	54.55	57.04	31.7	35.85	3.49	31.7	22.71	7.48	31.7	1
50.92		+50.91	12.29		−12.25	6.91		+6.84	6.10		−6.02	8.17		
8^h	15^m	$48^s.380$	9^h	8^m	$57^s.938$	9^h	25^m	$21^s.719$	9^h	36^m	$22^s.347$	10^h	2	
+88°	53′	0″.29	−85°	19′	57″.45	+81°	41′	41″.50	−80°	34′	6″.83	+82°	5	

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

ds. 3	Bradley 1672. Mag. 6.3			ι Octantis. Mag. 5.4			32 H. Camelop. *seq.* Mag. 5.3			κ Octantis. Mag. 5.6		
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	° ′
−84 8	Nov.	12 13	+88 8	Nov.	12 46	−84 40	Nov.	12 48	+83 51	Nov.	13 27	−85 21
″		s	″		s	″		s	″		s	″
55.87	0.9	58.63	61.53	0.9	1.27	34.88	0.9	20.82	19.17	0.9	9.34	56.97
55.76	1.9	58.94	61.15	1.9	1.43	34.65	1.9	20.88	18.76	1.9	9.49	56.72
55.66	2.9	59.30	60.76	2.9	1.58	34.44	2.9	20.97	18.35	2.9	9.62	56.47
55.56	3.9	59.70	60.39	3.9	1.72	34.23	3.9	21.07	17.96	3.9	9.75	56.22
55.43	4.9	60.15	60.04	4.9	1.85	34.02	4.9	21.17	17.58	4.9	9.86	55.98
55.30	5.9	60.60	59.71	5.9	1.98	33.79	5.9	21.28	17.21	5.9	9.96	55.71
55.17	6.9	61.07	59.41	6.9	2.11	33.54	6.9	21.39	16.86	6.9	10.07	55.44
55.04	7.9	61.50	59.11	7.9	2.25	33.28	7.9	21.50	16.52	7.9	10.20	55.15
54.89	8.9	61.92	58.82	8.9	2.39	33.01	8.9	21.60	16.20	8.9	10.32	54.86
54.75	9.9	62.34	58.54	9.9	2.56	32.75	9.9	21.70	15.90	9.9	10.46	54.56
54.64	10.9	62.73	58.26	10.9	2.73	32.50	10.9	21.79	15.60	10.9	10.62	54.27
54.54	11.9	63.10	57.98	11.9	2.92	32.25	11.9	21.89	15.29	11.9	10.80	53.98
54.43	12.9	63.45	57.68	12.9	3.12	32.01	12.9	21.98	14.97	12.9	10.98	53.70
54.37	13.9	63.82	57.39	13.9	3.33	31.79	13.9	22.06	14.64	13.9	11.18	53.43
54.32	14.9	64.19	57.08	14.9	3.56	31.59	14.9	22.15	14.30	14.9	11.41	53.19
54.28	15.9	64.61	56.76	15.9	3.77	31.40	15.9	22.26	13.94	15.9	11.61	52.96
54.27	16.9	65.07	56.43	16.9	3.98	31.25	16.9	22.38	13.56	16.9	11.82	52.77
54.27	17.9	65.58	56.10	17.9	4.17	31.10	17.9	22.51	13.19	17.9	12.03	52.58
54.25	18.8	66.14	55.78	18.9	4.36	30.96	18.9	22.66	12.84	18.9	12.21	52.39
54.21	19.8	66.73	55.49	19.9	4.55	30.80	19.9	22.82	12.51	19.9	12.39	52.19
54.16	20.8	67.33	55.21	20.9	4.72	30.62	20.9	22.98	12.20	20.9	12.56	51.97
54.12	21.8	67.91	54.97	21.9	4.90	30.43	21.9	23.13	11.91	21.9	12.73	51.74
54.07	22.8	68.46	54.74	22.9	5.09	30.25	22.9	23.28	11.63	22.9	12.91	51.51
54.02	23.8	68.97	54.52	23.9	5.30	30.06	23.9	23.42	11.37	23.9	13.13	51.27
53.98	24.8	69.44	54.31	24.9	5.53	29.88	24.9	23.53	11.11	24.9	13.36	51.03
53.98	25.8	69.89	54.07	25.9	5.77	29.70	25.9	23.64	10.84	25.9	13.60	50.79
54.02	26.8	70.34	53.83	26.8	6.04	29.56	26.9	23.77	10.55	26.9	13.87	50.59
54.06	27.8	70.80	53.56	27.8	6.30	29.43	27.8	23.90	10.25	27.9	14.14	50.41
54.12	28.8	71.31	53.30	28.8	6.55	29.33	28.8	24.03	9.94	28.9	14.42	50.26
54.20	29.8	71.87	53.04	29.8	6.80	29.25	29.8	24.20	9.62	29.9	14.68	50.12
54.27	30.8	72.48	52.77	30.8	7.04	29.18	30.8	24.37	9.31	30.9	14.92	49.99
54.33	31.8	73.13	52.53	31.8	7.25	29.10	31.8	24.55	9.02	31.9	15.16	49.86
−9.76		30.96	+30.94		10.78	−10.73		9.34	+9.29		12.37	−12.33
55ˢ.280		12ʰ 14ᵐ 28ˢ.425			12ʰ 46ᵐ 7ˢ.152			12ʰ 48ᵐ 30ˢ.418			13ʰ 27ᵐ 14ˢ.624	
50″.60		+88° 9′ 36″.08			−84° 40′ 22″.34			+83° 51′ 50″.47			−85° 21′ 42″.23	

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 s	° ′ ″		h m s	° ′ ″		h m s	° ′ ″		h m s	° ′ ″		h m s	
Nov.	14 13	−83 17	Nov.	15 2	+87 32	Nov.	15 23	−84 11	Nov.	16 54	+82 10	Nov.	17 18	
0.9	27.06	37.31	1.0	49.61	55.81	1.0	58.95	48.07	1.1	10.38	36.67	1.1	1.24	
1.9	27.14	37.02	2.0	49.40	55.44	2.0	58.96	47.79	2.1	10.24	36.39	2.1	1.20	
2.9	27.20	36.76	3.0	49.21	55.02	3.0	58.97	47.51	3.1	10.11	36.09	3.1	1.16	
3.9	27.25	36.49	4.0	49.07	54.61	4.0	58.98	47.23	4.1	9.98	35.78	4.1	1.11	
4.9	27.30	36.22	5.0	48.96	54.23	5.0	58.98	46.95	5.1	9.89	35.45	5.1	1.06	
5.9	27.35	35.95	6.0	48.87	53.85	6.0	58.97	46.67	6.1	9.77	35.12	6.1	0.99	
6.9	27.39	35.67	6.9	48.81	53.47	7.0	58.96	46.35	7.1	9.67	34.80	7.1	0.92	
7.9	27.43	35.36	7.9	48.76	53.09	8.0	58.95	46.03	8.1	9.58	34.50	8.1	0.84	
8.9	27.49	35.05	8.9	48.70	52.74	9.0	58.94	45.71	9.1	9.49	34.20	9.1	0.78	
9.9	27.55	34.73	9.9	48.64	52.40	10.0	58.93	45.35	10.1	9.40	33.90	10.1	0.72	
10.9	27.63	34.41	10.9	48.57	52.07	11.0	58.96	45.01	11.1	9.31	33.62	11.1	0.65	
11.9	27.71	34.10	11.9	48.49	51.75	11.9	58.98	44.66	12.1	9.21	33.35	12.1	0.60	
12.9	27.81	33.79	12.9	48.40	51.42	12.9	59.02	44.32	13.1	9.11	33.10	13.1	0.55	
13.9	27.91	33.49	13.9	48.30	51.06	13.9	59.07	43.98	14.1	9.02	32.82	14.1	0.53	
14.9	28.04	33.21	14.9	48.20	50.71	14.9	59.16	43.66	15.1	8.92	32.52	15.1	0.51	
15.9	28.16	32.96	15.9	48.10	50.34	15.9	59.24	43.34	16.1	8.81	32.21	16.1	0.50	
16.9	28.30	32.72	16.9	48.02	49.93	16.9	59.32	43.06	17.0	8.72	31.85	17.1	0.49	
17.9	28.40	32.49	17.9	47.98	49.53	17.9	59.40	42.78	18.0	8.63	31.49	18.1	0.49	
18.9	28.51	32.27	18.9	47.97	49.12	18.9	59.48	42.52	19.0	8.54	31.12	19.1	0.49	
19.9	28.61	32.04	19.9	48.01	48.71	19.9	59.53	42.26	20.0	8.47	30.75	20.1	0.47	
20.9	28.70	31.80	20.9	48.07	48.33	20.9	59.58	42.00	21.0	8.41	30.37	21.1	0.44	
21.9	28.79	31.53	21.9	48.15	47.95	21.9	59.62	41.71	22.0	8.36	30.02	22.0	0.40	
22.9	28.89	31.26	22.9	48.22	47.61	22.9	59.67	41.40	23.0	8.30	29.69	23.0	0.37	
23.9	29.00	30.97	23.9	48.28	47.28	23.9	59.74	41.07	24.0	8.24	29.37	24.0	0.34	
24.9	29.13	30.69	24.9	48.32	46.96	24.9	59.82	40.72	25.0	8.19	29.10	25.0	0.32	
25.9	29.27	30.41	25.9	48.33	46.64	25.9	59.92	40.39	26.0	8.13	28.82	26.0	0.31	
26.9	29.44	30.16	26.9	48.33	46.32	26.9	60.05	40.07	27.0	8.07	28.52	27.0	0.32	
27.9	29.62	29.92	27.9	48.33	45.96	27.9	60.19	39.76	28.0	8.00	28.21	28.0	0.35	
28.9	29.79	29.72	28.9	48.36	45.60	28.9	60.33	39.48	29.0	7.93	27.88	29.0	0.37	
29.9	29.95	29.53	29.9	48.40	45.23	29.9	60.47	39.22	30.0	7.87	27.51	30.0	0.40	
30.9	30.10	29.35	30.9	48.48	44.85	30.9	60.60	38.97	31.0	7.82	27.13	31.0	0.43	
31.9	30.25	29.18	31.9	48.61	44.47	31.9	60.72	38.73	32.0	7.77	26.76	32.0	0.45	
8.56		−8.50	23.37		+23.35	9.89		−9.84	7.35		+7.28	6.25		−6.1
14h 13m 27s.793			15h 3m 41s.175			15h 23m 56s.594			16h 54m 25s.488			17h 15m 54s.8		
−83° 17′ 21″.03			+87° 33′ 10″.52			−84° 11′ 30″.39			+82° 10′ 32″.75			−80° 47′ 6″.		

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

noris. 4	χ Octantis. Mag. 5.2			λ Ursæ Minoris. Mag. 6.6			σ Octantis. Mag. 5.5			76 Draconis. Mag. 5.7		
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	° ′
+86 36	Nov.	18 6	−87 39	Nov.	19 0	+89 1	Nov.	19 28	−89 13	Nov.	20 48	+82 14
″		s	″		s	″		s	″		s	″
65.20	1.1	32.63	66.78	1.2	42.60	25.14	1.2	60.85	38.92	1.3	35.56	4.87
65.02	2.1	32.34	66.53	2.2	41.06	25.06	2.2	59.57	38.77	2.3	35.39	4.98
64.80	3.1	32.05	66.32	3.2	39.50	24.96	3.2	58.31	38.64	3.2	35.21	5.07
64.57	4.1	31.74	66.12	4.2	37.98	24.83	4.2	57.06	38.53	4.2	35.02	5.13
64.34	5.1	31.42	65.91	5.2	36.52	24.69	5.2	55.76	38.41	5.2	34.84	5.18
64.10	6.1	31.07	65.71	6.2	35.11	24.55	6.2	54.42	38.28	6.2	34.65	5.19
63.86	7.1	30.71	65.48	7.2	33.77	24.40	7.2	52.98	38.15	7.2	34.47	5.20
63.62	8.1	30.33	65.26	8.2	32.49	24.25	8.2	51.51	38.02	8.2	34.30	5.18
63.38	9.1	29.95	65.02	9.2	31.25	24.11	9.2	50.00	37.85	9.2	34.13	5.18
63.17	10.1	29.57	64.75	10.2	30.05	23.96	10.2	48.47	37.68	10.2	33.98	5.21
62.98	11.1	29.21	64.47	11.2	28.86	23.83	11.2	46.96	37.49	11.2	33.82	5.24
62.78	12.1	28.87	64.16	12.1	27.66	23.73	12.2	45.47	37.27	12.2	33.66	5.25
62.58	13.1	28.58	63.85	13.1	26.43	23.63	13.2	44.06	37.04	13.2	33.50	5.27
62.38	14.1	28.29	63.55	14.1	25.16	23.50	14.2	42.73	36.81	14.2	33.34	5.31
62.17	15.1	28.06	63.23	15.1	23.83	23.37	15.2	41.52	36.57	15.2	33.17	5.36
61.93	16.1	27.87	62.94	16.1	22.46	23.26	16.2	40.42	36.34	16.2	33.00	5.39
61.68	17.1	27.70	62.64	17.1	21.06	23.10	17.2	39.41	36.11	17.2	32.82	5.40
61.40	18.1	27.54	62.38	18.1	19.65	22.92	18.2	38.44	35.92	18.2	32.64	5.39
61.11	19.1	27.36	62.13	19.1	18.28	22.71	19.1	37.46	35.71	19.2	32.46	5.35
60.80	20.1	27.17	61.89	20.1	16.99	22.49	20.1	36.44	35.51	20.2	32.27	5.30
60.48	21.1	26.94	61.65	21.1	15.78	22.27	21.1	35.33	35.33	21.2	32.09	5.21
60.20	22.1	26.68	61.37	22.1	14.66	22.05	22.1	34.13	35.13	22.2	31.92	5.12
59.91	23.1	26.43	61.07	23.1	13.62	21.85	23.1	32.88	34.90	23.2	31.77	5.06
59.65	24.1	26.17	60.75	24.1	12.62	21.65	24.1	31.60	34.64	24.2	31.61	4.99
59.42	25.1	25.96	60.41	25.1	11.61	21.47	25.1	30.37	34.36	25.2	31.47	4.93
59.18	26.1	25.78	60.05	26.1	10.56	21.30	26.1	29.23	34.07	26.2	31.32	4.89
58.95	27.1	25.66	59.68	27.1	9.46	21.13	27.1	28.21	33.75	27.2	31.18	4.85
58.70	28.1	25.56	59.34	28.1	8.30	20.97	28.1	27.33	33.44	28.2	31.02	4.81
58.43	29.1	25.51	58.99	29.1	7.11	20.78	29.1	26.54	33.14	29.2	30.85	4.77
58.14	30.1	25.45	58.70	30.1	5.90	20.56	30.1	25.82	32.86	30.2	30.68	4.70
57.83	31.1	25.40	58.40	31.1	4.72	20.32	31.1	25.13	32.59	31.2	30.51	4.61
57.50	32.1	25.34	58.10	32.1	3.59	20.06	32.1	24.41	32.33	32.2	30.33	4.51
+16.92	24.57		−24.55	58.66		+58.65	74.11		−74.10	7.40		+7.33
1ˢ.307	18ʰ	6ᵐ	11ˢ.893	19ʰ	2ᵐ	39ˢ.624	19ʰ	27ᵐ	42ˢ.218	20ʰ	48ᵐ	40ˢ.494
51″.17	−87°	39′	51″.82	+89°	1′	2″.17	−89°	13′	28″.57	+82°	13′	29″.86

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

λ Octantis. Mag. 5.4			υ Octantis. Mag. 5.7			β Octantis. Mag. 4.3			39 H. Cephei. Mag. 5.6			γ¹ Octa Mag. 5	
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 Ascen sion.
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m
Nov.	21 38	−83 6	Nov.	22 16	−86 23	Nov.	22 37	−81 48	Nov.	23 27	+86 51	Nov.	23 47
	s	″		s	″		s	″		s	″		s
1.3	33.26	6.76	1.3	31.46	24.24	1.3	50.89	57.19	1.4	58.20	36.75	1.4	28.01
2.3	33.11	6.77	2.3	31.16	24.31	2.3	50.77	57.28	2.4	57.94	37.09	2.4	27.92
3.3	32.97	6.81	3.3	30.88	24.38	3.3	50.64	57.37	3.4	57.66	37.41	3.4	27.81
4.3	32.82	6.86	4.3	30.60	24.48	4.3	50.53	57.50	4.4	57.35	37.70	4.4	27.71
5.3	32.67	6.91	5.3	30.31	24.58	5.3	50.41	57.62	5.4	57.02	37.99	5.4	27.60
6.3	32.50	6.96	6.3	30.00	24.68	6.3	50.30	57.74	6.4	56.69	38.26	6.4	27.49
7.3	32.34	7.02	7.3	29.69	24.77	7.3	50.17	57.88	7.3	56.37	38.49	7.4	27.38
8.3	32.16	7.08	8.3	29.37	24.87	8.3	50.03	58.02	8.3	56.05	38.73	8.4	27.22
9.3	31.98	7.13	9.3	29.03	24.97	9.3	49.88	58.15	9.3	55.74	38.96	9.4	27.11
10.3	31.79	7.15	10.3	28.66	25.07	10.3	49.73	58.28	10.3	55.45	39.19	10.4	26.97
11.3	31.59	7.16	11.3	28.29	25.14	11.3	49.56	58.38	11.3	55.17	39.42	11.4	26.83
12.3	31.40	7.16	12.3	27.90	25.18	12.3	49.40	58.47	12.3	54.90	39.66	12.3	26.68
13.3	31.21	7.13	13.3	27.52	25.21	13.3	49.24	58.55	13.3	54.63	39.90	13.3	26.49
14.3	31.01	7.09	14.3	27.16	25.22	14.3	49.08	58.60	14.3	54.36	40.16	14.3	26.34
15.3	30.83	7.04	15.3	26.80	25.21	15.3	48.93	58.63	15.3	54.08	40.40	15.3	26.19
16.2	30.68	6.96	16.3	26.47	25.17	16.3	48.80	58.63	16.3	53.77	40.68	16.3	26.04
17.2	30.53	6.89	17.3	26.15	25.14	17.3	48.67	58.64	17.3	53.43	40.95	17.3	25.91
18.2	30.38	6.83	18.3	25.86	25.12	18.3	48.54	58.67	18.3	53.07	41.22	18.3	25.77
19.2	30.24	6.78	19.3	25.57	25.12	19.3	48.42	58.70	19.3	52.69	41.45	19.3	25.63
20.2	30.10	6.74	20.3	25.27	25.12	20.3	48.30	58.74	20.3	52.28	41.65	20.3	25.53
21.2	29.94	6.71	21.3	24.96	25.13	21.3	48.17	58.78	21.3	51.90	41.85	21.3	25.38
22.2	29.77	6.68	22.3	24.64	25.14	22.3	48.03	58.84	22.3	51.52	42.02	22.3	25.23
23.2	29.59	6.64	23.3	24.28	25.15	23.3	47.86	58.90	23.3	51.18	42.18	23.3	25.08
24.2	29.39	6.58	24.3	23.90	25.15	24.3	47.70	58.94	24.3	50.85	42.35	24.3	24.92
25.2	29.20	6.50	25.2	23.51	25.11	25.3	47.53	58.94	25.3	50.53	42.50	25.3	24.74
26.2	29.01	6.38	26.2	23.13	25.05	26.3	47.36	58.92	26.3	50.24	42.66	26.3	24.57
27.2	28.83	6.24	27.2	22.75	24.96	27.3	47.20	58.88	27.3	49.93	42.86	27.3	24.39
28.2	28.66	6.07	28.2	22.40	24.86	28.3	47.05	58.82	28.3	49.61	43.06	28.3	24.23
29.2	28.52	5.92	29.2	22.08	24.75	29.3	46.92	58.76	29.3	49.25	43.26	29.3	24.06
30.2	28.38	5.78	30.2	21.77	24.65	30.3	46.78	58.68	30.3	48.88	43.47	30.3	23.92
31.2	28.24	5.65	31.2	21.49	24.54	31.2	46.66	58.62	31.3	48.47	43.65	31.3	23.78
32.2	28.11	5.55	32.2	21.20	24.46	32.2	46.53	58.58	32.3	48.06	43.78	32.3	23.64
8.33		−8.27	15.88		−15.85	7.02		−6.95	18.26		+18.24	7.64	
21h 38m 19s.542			22h 16m 8s.656			22h 37m 39s.016			23h 27m 44s.125			23h 47m	
−83° 6′ 6″.99			−86° 23′ 27″.13			−81° 49′ 2″.34			+86° 50′ 58″.89			−82° 28′	

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

ephei. 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		
nt n- L.	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.
m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	° ′
57	+85 49	Dec.	1 31	+88 52	Dec.	1 42	−85 11	Dec.	4 10	+85 20	Dec.	5 35	+85 9
	″		s	″		s	″		s	″		s	″
23	26.27	0.4	35.78	21.42	0.4	9.19	12.85	0.5	40.89	24.68	0.5	51.61	28.38
01	26.56	1.4	35.11	21.75	1.4	8.99	13.03	1.5	40.95	25.06	1.5	51.77	28.70
79	26.83	2.4	34.39	22.05	2.4	8.80	13.21	2.5	40.99	25.44	2.5	51.92	29.03
55	27.07	3.4	33.61	22.34	3.4	8.62	13.41	3.5	41.01	25.81	3.5	52.05	29.36
30	27.31	4.4	32.81	22.63	4.4	8.43	13.59	4.5	41.02	26.16	4.5	52.15	29.69
05	27.53	5.4	32.00	22.88	5.4	8.24	13.80	5.5	41.02	26.50	5.5	52.25	30.01
81	27.73	6.4	31.22	23.13	6.4	8.04	14.01	6.5	41.00	26.84	6.5	52.34	30.32
58	27.92	7.3	30.46	23.36	7.4	7.81	14.21	7.5	40.99	27.15	7.5	52.41	30.62
36	28.10	8.3	29.73	23.57	8.4	7.58	14.42	8.5	40.98	27.44	8.5	52.49	30.90
.6	28.29	9.3	29.03	23.80	9.4	7.34	14.63	9.5	40.97	27.73	9.5	52.58	31.18
05	28.47	10.3	28.38	24.02	10.4	7.08	14.82	10.5	40.97	28.01	10.5	52.67	31.45
75	28.66	11.3	27.72	24.26	11.3	6.81	14.97	11.5	40.99	28.32	11.5	52.77	31.72
55	28.86	12.3	27.07	24.53	12.3	6.54	15.12	12.4	41.00	28.63	12.5	52.88	32.00
36	29.09	13.3	26.39	24.79	13.3	6.29	15.25	13.4	41.04	28.96	13.5	53.01	32.31
13	29.33	14.3	25.65	25.06	14.3	6.04	15.35	14.4	41.05	29.31	14.5	53.13	32.62
89	29.55	15.3	24.82	25.33	15.3	5.80	15.45	15.4	41.06	29.68	15.5	53.24	32.96
61	29.75	16.3	23.92	25.61	16.3	5.57	15.53	16.4	41.03	30.05	16.5	53.34	33.32
33	29.95	17.3	22.95	25.86	17.3	5.35	15.62	17.4	41.00	30.43	17.5	53.41	33.69
04	30.13	18.3	21.93	26.07	18.3	5.13	15.71	18.4	40.94	30.77	18.5	53.45	34.04
75	30.27	19.3	20.93	26.27	19.3	4.91	15.84	19.4	40.86	31.10	19.5	53.49	34.38
.46	30.40	20.3	19.95	26.45	20.3	4.67	15.97	20.4	40.77	31.40	20.5	53.49	34.72
.21	30.50	21.3	19.04	26.59	21.3	4.40	16.11	21.4	40.68	31.69	21.5	53.51	35.02
.97	30.60	22.3	18.19	26.74	22.3	4.13	16.25	22.4	40.63	31.95	22.5	53.52	35.28
.74	30.71	23.3	17.39	26.89	23.3	3.85	16.36	23.4	40.57	32.22	23.5	53.56	35.55
.52	30.84	24.3	16.62	27.07	24.3	3.54	16.46	24.4	40.53	32.48	24.5	53.60	35.81
.29	30.97	25.3	15.84	27.24	25.3	3.25	16.51	25.4	40.49	32.75	25.5	53.66	36.11
.06	31.12	26.3	15.01	27.44	26.3	2.97	16.57	26.4	40.45	33.06	26.5	53.71	36.40
2.80	31.27	27.3	14.11	27.64	27.3	2.69	16.60	27.4	40.41	33.37	27.5	53.77	36.72
2.53	31.40	28.3	13.13	27.84	28.3	2.42	16.61	28.4	40.33	33.69	28.5	53.81	37.07
2.24	31.54	29.3	12.07	28.02	29.3	2.18	16.62	29.4	40.24	34.02	29.5	53.83	37.42
1.93	31.63	30.3	10.97	28.17	30.3	1.94	16.62	30.4	40.14	34.34	30.5	53.82	37.78
1.62	31.72	31.3	9.86	28.31	31.3	1.69	16.67	31.4	40.01	34.65	31.5	53.79	38.13
	+13.70		50.87	+50.86		11.92	−11.88		12.31	+12.27		11.85	+11.81
57m	9s.300		1h 30m	13s.156		1h 42m	2s.339		4h 10m	2s.561		5h 35m	12s.782
48′	45″.30		+88° 51′	43″.55		−85° 11′	21″.46		+85° 20′	10″.34		+85° 9′	30″.24

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. O Mag
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.
	h m s	° ′ ″		h m s	° ′ ″		h m s	° ′ ″		h m s	° ′ ″	
Dec.	5 46	−84 49	Dec.	6 46	−80 43	Dec.	7 3	+87 10	Dec.	7 14	+82 34	Dec.
0.5	14.65	39.32	0.6	59.55	32.19	0.6	2.58	36.42	0.6	6.39	10.16	0.6
1.5	14.67	39.63	1.6	59.60	32.49	1.6	3.01	36.64	1.6	6.57	10.37	1.6
2.5	14.70	39.94	2.6	59.66	32.79	2.6	3.40	36.89	2.6	6.73	10.59	2.6
3.5	14.73	40.25	3.6	59.72	33.08	3.6	3.76	37.17	3.6	6.88	10.82	3.6
4.5	14.78	40.56	4.6	59.78	33.38	4.6	4.10	37.43	4.6	7.02	11.06	4.6
5.5	14.82	40.89	5.6	59.83	33.69	5.6	4.42	37.69	5.6	7.15	11.30	5.6
6.5	14.86	41.24	6.6	59.89	34.01	6.6	4.71	37.94	6.6	7.28	11.53	6.6
7.5	14.89	41.60	7.6	59.95	34.36	7.6	4.99	38.19	7.6	7.39	11.76	7.6
8.5	14.91	41.96	8.6	60.01	34.72	8.6	5.27	38.42	8.6	7.50	11.97	8.6
9.5	14.92	42.36	9.6	60.06	35.10	9.6	5.55	38.64	9.6	7.62	12.17	9.6
10.5	14.93	42.75	10.6	60.10	35.50	10.6	5.84	38.86	10.6	7.75	12.36	10.6
11.5	14.93	43.13	11.6	60.15	35.89	11.6	6.14	39.09	11.6	7.87	12.56	11.6
12.5	14.89	43.51	12.6	60.18	36.28	12.6	6.46	39.31	12.6	7.99	12.75	12.6
13.5	14.85	43.88	13.6	60.20	36.67	13.6	6.80	39.54	13.6	8.15	12.97	13.6
14.5	14.81	44.22	14.6	60.22	37.03	14.6	7.14	39.80	14.6	8.30	13.19	14.6
15.5	14.76	44.55	15.5	60.24	37.37	15.6	7.49	40.07	15.6	8.45	13.45	15.6
16.5	14.71	44.87	16.5	60.26	37.70	16.6	7.82	40.37	16.6	8.59	13.72	16.6
17.5	14.67	45.17	17.5	60.27	38.02	17.6	8.11	40.69	17.6	8.71	14.00	17.6
18.5	14.64	45.49	18.5	60.29	38.35	18.6	8.36	41.00	18.6	8.82	14.29	18.6
19.5	14.61	45.81	19.5	60.31	38.68	19.5	8.58	41.30	19.6	8.92	14.59	19.6
20.5	14.58	46.14	20.5	60.33	39.03	20.5	8.77	41.59	20.6	9.01	14.87	20.6
21.5	14.55	46.51	21.5	60.35	39.41	21.5	8.94	41.87	21.6	9.08	15.12	21.6
22.5	14.51	46.90	22.5	60.37	39.81	22.5	9.11	42.12	22.5	9.16	15.36	22.5
23.5	14.45	47.29	23.5	60.39	40.22	23.5	9.30	42.36	23.5	9.25	15.59	23.5
24.5	14.37	47.68	24.5	60.40	40.64	24.5	9.51	42.61	24.5	9.33	15.82	24.5
25.5	14.28	48.05	25.5	60.40	41.04	25.5	9.73	42.87	25.5	9.44	16.04	25.5
26.5	14.17	48.42	26.5	60.39	41.43	26.5	9.98	43.14	26.5	9.55	16.29	26.5
27.5	14.07	48.75	27.5	60.38	41.80	27.5	10.21	43.43	27.5	9.65	16.55	27.5
28.5	13.97	49.07	28.5	60.36	42.15	28.5	10.44	43.75	28.5	9.75	16.84	28.5
29.5	13.86	49.36	29.5	60.34	42.49	29.5	10.65	44.09	29.5	9.85	17.15	29.5
30.5	13.76	49.67	30.5	60.33	42.82	30.5	10.83	44.43	30.5	9.94	17.47	30.5
31.5	13.67	49.98	31.5	60.32	43.16	31.5	10.97	44.78	31.5	10.00	17.79	31.5
11.10	−11.05		6.20	−6.12		20.31	+20.28		7.73	+7.67		18.50
$5^h\ 46^m\ 14^s.756$			$6^h\ 46^m\ 58^s.546$			$7^h\ 2^m\ 4^s.048$			$7^h\ 13^m\ 42^s.294$			7^h 16
−84° 49′ 46″.89			−80° 43′ 38″.16			+87° 10′ 54″.74			+82° 34′ 30″.13			−86° 5

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

mbridge 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		
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	° ′
8 17	+88 52	Dec.	9 8	−85 19	Dec.	9 25	+81 41	Dec.	9 36	−80 34	Dec.	10 21	+82 58
s	″		s	″		s	″		s	″		s	″
42.95	30.02	0.7	54.34	56.84	0.7	35.65	3.50	0.7	22.58	7.29	0.7	15.22	11.80
44.21	30.16	1.7	54.55	57.04	1.7	35.85	3.49	1.7	22.71	7.48	1.7	15.45	11.71
45.41	30.31	2.7	54.76	57.22	2.7	36.03	3.52	2.7	22.83	7.62	2.7	15.67	11.65
46.56	30.48	3.7	54.98	57.40	3.7	36.22	3.56	3.7	22.95	7.77	3.7	15.87	11.61
47.65	30.66	4.7	55.21	57.58	4.7	36.39	3.60	4.7	23.08	7.92	4.7	16.08	11.60
48.68	30.83	5.7	55.44	57.75	5.7	36.55	3.66	5.7	23.20	8.06	5.7	16.27	11.59
49.64	31.01	6.7	55.68	57.93	6.7	36.70	3.74	6.7	23.33	8.22	6.7	16.47	11.58
50.57	31.19	7.7	55.93	58.13	7.7	36.86	3.81	7.7	23.46	8.41	7.7	16.64	11.57
51.47	31.34	8.7	56.17	58.36	8.7	36.99	3.87	8.7	23.60	8.61	8.7	16.82	11.56
52.37	31.49	9.7	56.41	58.59	9.7	37.14	3.92	9.7	23.74	8.83	9.7	16.99	11.54
53.29	31.63	10.7	56.66	58.86	10.7	37.28	3.97	10.7	23.87	9.06	10.7	17.17	11.51
54.24	31.78	11.7	56.90	59.13	11.7	37.44	4.02	11.7	24.00	9.33	11.7	17.34	11.48
55.24	31.91	12.7	57.11	59.42	12.7	37.61	4.04	12.7	24.13	9.59	12.7	17.54	11.43
56.30	32.08	13.7	57.31	59.71	13.7	37.78	4.08	13.7	24.25	9.86	13.7	17.73	11.38
57.38	32.24	14.7	57.50	60.00	14.7	37.96	4.12	14.7	24.36	10.13	14.7	17.96	11.33
58.49	32.43	15.6	57.67	60.29	15.7	38.14	4.20	15.7	24.47	10.40	15.7	18.17	11.33
59.58	32.64	16.6	57.84	60.56	16.7	38.33	4.30	16.7	24.58	10.64	16.7	18.40	11.33
60.61	32.88	17.6	58.00	60.81	17.7	38.50	4.42	17.7	24.67	10.89	17.7	18.62	11.37
61.55	33.14	18.6	58.17	61.04	18.7	38.66	4.56	18.7	24.77	11.12	18.7	18.82	11.43
62.40	33.37	19.6	58.35	61.28	19.7	38.81	4.71	19.7	24.87	11.35	19.7	19.01	11.51
63.15	33.62	20.6	58.54	61.55	20.6	38.95	4.85	20.7	24.98	11.59	20.7	19.19	11.59
63.86	33.86	21.6	58.74	61.83	21.6	39.08	4.99	21.6	25.10	11.86	21.7	19.36	11.65
64.55	34.06	22.6	58.94	62.13	22.6	39.20	5.12	22.6	25.23	12.13	22.7	19.52	11.70
65.27	34.26	23.6	59.15	62.44	23.6	39.33	5.22	23.6	25.35	12.45	23.7	19.68	11.75
66.02	34.46	24.6	59.34	62.78	24.6	39.47	5.31	24.6	25.45	12.77	24.7	19.84	11.78
66.84	34.64	25.6	59.51	63.15	25.6	39.61	5.40	25.6	25.56	13.11	25.7	20.03	11.82
67.68	34.84	26.6	59.66	63.52	26.6	39.76	5.51	26.6	25.66	13.44	26.7	20.21	11.85
68.56	35.07	27.6	59.80	63.86	27.6	39.92	5.64	27.6	25.76	13.77	27.7	20.42	11.90
69.43	35.33	28.6	59.93	64.19	28.6	40.08	5.78	28.6	25.84	14.10	28.7	20.62	11.98
70.25	35.60	29.6	60.03	64.51	29.6	40.24	5.96	29.6	25.93	14.40	29.7	20.83	12.07
71.03	35.88	30.6	60.15	64.80	30.6	40.38	6.14	30.6	26.00	14.71	30.7	21.02	12.18
71.73	36.17	31.6	60.28	65.10	31.6	40.52	6.33	31.6	26.08	14.99	31.7	21.21	12.33
0.96	+50.95		12.29	−12.25		6.91	+6.84		6.10	−6.02		8.17	+8.11
8h 15m 48s.380			9h 8m 57s.938			9h 25m 21s.719			9h 36m 22s.347			10h 21m 4s.831	
?° 53′ 0″.29			−85° 19′ 57″.45			+81° 41′ 41″.50			−80° 34′ 6″.83			+82° 58′ 54″.97	

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. *seq.* Mag. 5.3			κ Octa Mag.
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 Ascen sion.
	h m s	° ′ ″		h m s	° ′ ″		h m s	° ′ ″		h m s	° ′ ″		h m s
Dec.	10 59	−84 8	Dec.	12 14	+88 8	Dec.	12 46	−84 40	Dec.	12 48	+83 51	Dec.	13 27
0.8	53.77	54.27	0.8	12.48	52.77	0.8	7.04	29.18	0.8	24.37	9.31	0.9	14.92
1.8	53.97	54.33	1.8	13.13	52.53	1.8	7.25	29.10	1.8	24.55	9.02	1.9	15.16
2.8	54.18	54.38	2.8	13.79	52.31	2.8	7.47	29.02	2.8	24.73	8.74	2.9	15.39
3.8	54.39	54.42	3.8	14.46	52.12	3.8	7.67	28.93	3.8	24.92	8.48	3.9	15.60
4.8	54.59	54.45	4.8	15.12	51.94	4.8	7.89	28.83	4.8	25.11	8.24	4.9	15.82
5.8	54.81	54.47	5.8	15.77	51.77	5.8	8.11	28.71	5.8	25.29	8.03	5.9	16.05
6.7	55.04	54.50	6.8	16.39	51.61	6.8	8.34	28.60	6.8	25.46	7.83	6.9	16.29
7.7	55.27	54.55	7.8	16.98	51.45	7.8	8.57	28.49	7.8	25.63	7.62	7.8	16.55
8.7	55.51	54.63	8.8	17.55	51.31	8.8	8.84	28.38	8.8	25.80	7.43	8.8	16.82
9.7	55.76	54.71	9.8	18.11	51.16	9.8	9.10	28.29	9.8	25.95	7.22	9.8	17.10
10.7	56.01	54.80	10.8	18.66	50.99	10.8	9.37	28.22	10.8	26.10	7.02	10.8	17.41
11.7	56.26	54.92	11.8	19.22	50.82	11.8	9.66	28.18	11.8	26.26	6.81	11.8	17.71
12.7	56.51	55.07	12.8	19.80	50.63	12.8	9.94	28.16	12.8	26.43	6.58	12.8	18.03
13.7	56.74	55.24	13.8	20.40	50.45	13.8	10.22	28.16	13.8	26.61	6.34	13.8	18.32
14.7	56.96	55.40	14.8	21.07	50.26	14.8	10.48	28.17	14.8	26.81	6.10	14.8	18.62
15.7	57.16	55.55	15.8	21.78	50.08	15.8	10.73	28.19	15.8	27.02	5.87	15.8	18.90
16.7	57.36	55.71	16.8	22.52	49.92	16.8	10.97	28.21	16.8	27.24	5.65	16.8	19.17
17.7	57.55	55.86	17.8	23.27	49.79	17.8	11.20	28.21	17.8	27.45	5.45	17.8	19.42
18.7	57.75	55.98	18.8	24.02	49.69	18.8	11.43	28.19	18.8	27.67	5.27	18.8	19.67
19.7	57.94	56.10	19.8	24.73	49.60	19.8	11.66	28.16	19.8	27.88	5.12	19.8	19.93
20.7	58.17	56.24	20.8	25.38	49.52	20.8	11.90	28.14	20.8	28.07	4.99	20.8	20.21
21.7	58.39	56.38	21.8	26.01	49.46	21.8	12.18	28.12	21.8	28.26	4.88	21.8	20.51
22.7	58.63	56.55	22.8	26.61	49.39	22.8	12.46	28.10	22.8	28.44	4.76	22.8	20.82
23.7	58.87	56.74	23.8	27.18	49.31	23.8	12.75	28.11	23.8	28.61	4.63	23.8	21.15
24.7	59.11	56.96	24.8	27.76	49.22	24.8	13.05	28.15	24.8	28.79	4.48	24.8	21.49
25.7	59.34	57.18	25.7	28.37	49.12	25.8	13.35	28.22	25.8	28.97	4.32	25.8	21.83
26.7	59.55	57.42	26.7	29.03	49.01	26.8	13.63	28.30	26.8	29.17	4.15	26.8	22.16
27.7	59.75	57.66	27.7	29.73	48.91	27.8	13.90	28.38	27.8	29.39	4.00	27.8	22.47
28.7	59.94	57.89	28.7	30.46	48.82	28.8	14.15	28.47	28.8	29.61	3.85	28.8	22.76
29.7	60.12	58.12	29.7	31.22	48.76	29.8	14.39	28.55	29.8	29.83	3.72	29.8	23.05
30.7	60.29	58.33	30.7	31.98	48.72	30.8	14.63	28.64	30.8	30.07	3.62	30.8	23.32
31.7	60.47	58.53	31.7	32.73	48.70	31.8	14.86	28.71	31.8	30.30	3.53	31.8	23.59
9.81		−9.76	30.93		+30.91	10.77		−10.73	9.34		+9.28	12.37	−1
10h	59m	55s.280	12h	14m	28s.425	12h	46m	7s.152	12h	48m	30s.418	13h	27m 1
−84°	8′	50″.60	+88°	9′	36″.08	−84°	40′	22″.34	+83°	51′	50″.47	−85°	21′

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

ıntis. 4.1		Groombridge 2283. Mag. 7.2			ρ Octantis. Mag. 5.7			ε Ursæ Minoris. Mag. 4.4			59 G. Apodis. Mag. 5.9		
ıt h- .	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.
n	° ′		h m	° ′		h m	° ′		h m	° ′		h m	° ′
3	−83 17	Dec.	15 2	+87 32	Dec.	15 24	−84 11	Dec.	16 54	+82 10	Dec.	17 16	−80.47
	″		s	″		s	″		s	″		s	″
0	29.35	0.9	48.48	44.85	0.9	0.60	38.97	1.0	7.82	27.13	1.0	0.43	13.82
5	29.18	1.9	48.61	44.47	1.9	0.72	38.73	2.0	7.77	26.76	2.0	0.45	13.55
8	28.98	2.9	48.75	44.08	2.9	0.82	38.49	3.0	7.74	26.37	3.0	0.47	13.29
2	28.80	3.9	48.93	43.72	3.9	0.92	38.24	4.0	7.72	25.98	4.0	0.48	13.02
4	28.61	4.9	49.12	43.38	4.9	1.02	37.98	4.9	7.70	25.61	5.0	0.48	12.73
8	28.39	5.9	49.31	43.05	5.9	1.13	37.72	5.9	7.68	25.25	6.0	0.48	12.42
3	28.18	6.9	49.50	42.73	6.9	1.25	37.43	6.9	7.67	24.91	7.0	0.49	12.11
9	27.96	7.9	49.69	42.42	7.9	1.37	37.13	7.9	7.66	24.58	8.0	0.50	11.78
6	27.74	8.9	49.87	42.14	8.9	1.50	36.84	8.9	7.65	24.25	9.0	0.51	11.42
3	27.54	9.9	50.02	41.83	9.9	1.65	36.54	9.9	7.63	23.94	10.0	0.55	11.08
2	27.34	10.9	50.17	41.53	10.9	1.82	36.25	10.9	7.60	23.62	10.9	0.59	10.74
1	27.16	11.9	50.32	41.23	11.9	2.00	35.97	11.9	7.58	23.30	11.9	0.64	10.41
1	27.01	12.9	50.46	40.90	12.9	2.19	35.74	12.9	7.57	22.95	12.9	0.70	10.07
3	26.88	13.9	50.63	40.56	13.9	2.38	35.51	13.9	7.56	22.60	13.9	0.77	9.76
3	26.78	14.9	50.81	40.22	14.9	2.57	35.32	14.9	7.54	22.23	14.9	0.85	9.48
1	26.69	15.9	51.04	39.85	15.9	2.76	35.13	15.9	7.53	21.84	15.9	0.92	9.21
0	26.59	16.9	51.31	39.50	16.9	2.93	34.96	16.9	7.53	21.44	16.9	0.97	8.95
7	26.48	17.9	51.61	39.17	17.9	3.09	34.77	17.9	7.56	21.03	17.9	1.03	8.69
3	26.35	18.9	51.92	38.85	18.9	3.24	34.58	18.9	7.58	20.66	18.9	1.08	8.42
9	26.22	19.9	52.24	38.55	19.9	3.39	34.36	19.9	7.61	20.29	19.9	1.12	8.14
6	26.07	20.9	52.55	38.27	20.9	3.56	34.13	20.9	7.65	19.96	20.9	1.16	7.82
5	25.92	21.9	52.84	38.03	21.9	3.73	33.87	21.9	7.68	19.65	21.9	1.21	7.51
7	25.77	22.9	53.10	37.78	22.9	3.92	33.62	22.9	7.70	19.34	22.9	1.27	7.18
9	25.64	23.9	53.34	37.52	23.9	4.14	33.40	23.9	7.72	19.03	23.9	1.35	6.85
2	25.55	24.9	53.58	37.26	24.9	4.37	33.20	24.9	7.74	18.72	24.9	1.44	6.52
5	25.48	25.9	53.82	37.00	25.9	4.61	33.00	25.9	7.75	18.39	25.9	1.53	6.21
7	25.42	26.9	54.09	36.72	26.9	4.84	32.83	26.9	7.76	18.06	26.9	1.64	5.93
0	25.37	27.9	54.39	36.42	27.9	5.07	32.69	27.9	7.80	17.69	27.9	1.75	5.67
9	25.34	28.9	54.73	36.13	28.9	5.28	32.56	28.9	7.85	17.31	28.9	1.84	5.43
9	25.32	29.9	55.10	35.83	29.9	5.48	32.43	29.9	7.89	16.93	29.9	1.93	5.20
8	25.27	30.9	55.49	35.55	30.9	5.68	32.30	30.9	7.94	16.57	30.9	2.02	4.96
6	25.23	31.9	55.90	35.28	31.9	5.87	32.15	31.9	8.00	16.21	31.9	2.10	4.70
	−8.50		23.34	+23.32		9.88	−9.83		7.34	+7.27		6.24	−6.16
=	27ˢ.793		15ʰ	3ᵐ 41ˢ.175		15ʰ 23ᵐ	56ˢ.594		16ʰ 54ᵐ	25ˢ.488		17ʰ 15ᵐ	54ˢ.896
	21″.03		+87° 33′	10″.52		−84° 11′	30″.39		+82° 10′	32″.75		−80° 47′	6″.58

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 Dra Mag	
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.	Ri Asc sio
	h m s	° ′ ″		h m s	° ′ ″		h m s	° ′ ″		h m s	° ′ ″		h s
Dec.	17 58	+86 36	Dec.	18 6	−87 39	Dec.	18 59	+89 1	Dec.	19 28	−89 13	Dec.	20
1.1	15.43	57.83	1.1	25.40	58.40	1.1	64.72	20.32	1.1	25.13	32.59	1.2	30.
2.1	15.20	57.50	2.1	25.34	58.10	2.1	63.59	20.06	2.1	24.41	32.33	2.2	30.
3.0	15.00	57.16	3.1	25.26	57.81	3.1	62.55	19.79	3.1	23.66	32.07	3.2	30.
4.0	14.81	56.81	4.1	25.17	57.54	4.1	61.58	19.52	4.1	22.84	31.81	4.2	30.
5.0	14.66	56.47	5.0	25.06	57.22	5.1	60.68	19.24	5.1	21.98	31.55	5.2	29.
6.0	14.50	56.14	6.0	24.93	56.90	6.1	59.84	18.96	6.1	21.10	31.28	6.2	29.
7.0	14.36	55.83	7.0	24.82	56.56	7.1	59.05	18.69	7.1	20.18	31.00	7.2	29.
8.0	14.22	55.52	8.0	24.71	56.22	8.1	58.29	18.43	8.1	19.28	30.69	8.2	29.
9.0	14.09	55.23	9.0	24.65	55.86	9.1	57.54	18.20	9.1	18.44	30.35	9.2	29.
10.0	13.96	54.95	10.0	24.59	55.48	10.1	56.76	17.98	10.1	17.65	30.01	10.1	29.
11.0	13.82	54.68	11.0	24.59	55.11	11.1	55.97	17.76	11.1	16.96	29.67	11.1	29.
12.0	13.67	54.40	12.0	24.62	54.73	12.1	55.14	17.53	12.1	16.37	29.33	12.1	28.
13.0	13.49	54.11	13.0	24.69	54.38	13.1	54.25	17.30	13.1	15.92	28.98	13.1	28.
14.0	13.32	53.79	14.0	24.79	54.04	14.1	53.32	17.03	14.1	15.57	28.63	14.1	28.
15.0	13.17	53.45	15.0	24.90	53.71	15.1	52.41	16.76	15.1	15.30	28.29	15.1	28.
16.0	13.02	53.09	16.0	25.02	53.39	16.1	51.51	16.45	16.1	15.05	27.98	16.1	28.
17.0	12.88	52.72	17.0	25.12	53.11	17.1	50.68	16.13	17.1	14.78	27.69	17.1	28.
18.0	12.79	52.34	18.0	25.19	52.82	18.1	49.96	15.81	18.1	14.44	27.39	18.1	28.
19.0	12.73	51.97	19.0	25.24	52.51	19.0	49.32	15.47	19.1	14.03	27.10	19.1	27.
20.0	12.67	51.62	20.0	25.27	52.20	20.0	48.79	15.14	20.1	13.53	26.79	20.1	27.
21.0	12.63	51.28	21.0	25.29	51.85	21.0	48.33	14.84	21.1	13.02	26.46	21.1	27.
21.9	12.60	51.01	22.0	25.34	51.47	22.0	47.87	14.56	22.1	12.53	26.09	22.1	27.
22.9	12.56	50.72	22.9	25.44	51.10	23.0	47.41	14.32	23.1	12.11	25.73	23.1	27.
23.9	12.50	50.42	23.9	25.58	50.72	24.0	46.91	14.08	24.1	11.82	25.35	24.1	27.
24.9	12.44	50.13	24.9	25.75	50.36	25.0	46.35	13.82	25.1	11.65	24.95	25.1	27.
25.9	12.35	49.82	25.9	25.97	50.02	26.0	45.74	13.55	26.0	11.62	24.56	26.1	27.
26.9	12.28	49.49	26.9	26.21	49.68	27.0	45.12	13.26	27.0	11.66	24.20	27.1	27.
27.9	12 22	49.15	27.9	26.44	49.34	28.0	44.51	12.94	28.0	11.76	23.85	28.1	26.
28.9	12.17	48.78	28.9	26.67	49.06	29.0	43.97	12.61	29.0	11.86	23.53	29.1	26.
29.9	12.16	48.41	29.9	26.90	48.78	30.0	43.48	12.25	30.0	11.93	23.20	30.1	26.
30.9	12.15	48.03	30.9	27.09	48.49	31.0	43.10	11.89	31.0	11.95	22.88	31.1	26.
31.9	12.18	47.67	31.9	27.28	48.17	32.0	42.78	11.54	32.0	11.93	22.57	32.1	26.
16.94		+16.91	24.54		−24.52	58.55		+58.54	73.89		−73.88	7.40	
17h	59m	1s.307	18h	6m	11s.893	19h	2m	39s.624	19h	27m	42s.218	20h	48
+86°	36′	51″.17	−87°	39′	51″.82	+89°	1′	2″.17	−89°	13′	28″.57	+82°	1

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

. Octantis. Mag. 5.4		υ Octantis. Mag. 5.7			β Octantis. Mag. 4.3			39 H. Cephei. Mag. 5.6			γ^1 Octantis. Mag. 5.1		
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	° ′
21 38	−83 5	Dec.	22 16	−86 23	Dec.	22 37	−81 48	Dec.	23 27	+86 51	Dec.	23 47	−82 28
s	″		s	″		s	″		s	″		s	″
28.24	65.65	1.2	21.49	24.54	1.2	46.66	58.62	1.3	48.47	43.65	1.3	23.78	42.47
28.11	65.55	2.2	21.20	24.46	2.2	46.53	58.58	2.3	48.06	43.78	2.3	23.64	42.50
27.98	65.44	3.2	20.93	24.38	3.2	46.41	58.54	3.3	47.65	43.92	3.3	23.50	42.55
27.83	65.34	4.2	20.60	24.31	4.2	46.28	58.51	4.3	47.23	44.03	4.3	23.36	42.60
27.68	65.23	5.2	20.28	24.25	5.2	46.14	58.48	5.3	46.82	44.13	5.3	23.20	42.66
27.51	65.10	6.2	19.94	24.18	6.2	45.99	58.45	6.3	46.43	44.21	6.3	23.04	42.72
27.34	64.97	7.2	19.60	24.10	7.2	45.84	58.41	7.3	46.05	44.29	7.3	22.86	42.79
27.17	64.82	8.2	19.24	24.00	8.2	45.69	58.35	8.3	45.68	44.36	8.3	22.69	42.85
26.99	64.65	9.2	18.88	23.87	9.2	45.52	58.27	9.3	45.32	44.45	9.3	22.51	42.89
26.82	64.47	10.2	18.52	23.73	10.2	45.36	58.18	10.3	44.99	44.54	10.3	22.33	42.90
26.67	64.27	11.2	18.18	23.57	11.2	45.21	58.06	11.3	44.65	44.61	11.3	22.14	42.90
26.52	64.04	12.2	17.84	23.39	12.2	45.06	57.93	12.3	44.32	44.72	12.3	21.97	42.86
26.39	63.81	13.2	17.52	23.20	13.2	44.91	57.77	13.3	43.94	44.83	13.3	21.80	42.82
26.26	63.57	14.2	17.24	23.02	14.2	44.79	57.62	14.2	43.55	44.94	14.3	21.64	42.76
26.15	63.35	15.2	16.99	22.82	15.2	44.68	57.47	15.2	43.14	45.04	15.3	21.50	42.68
26.05	63.13	16.2	16.74	22.61	16.2	44.58	57.30	16.2	42.72	45.14	16.3	21.36	42.62
25.95	62.93	17.2	16.49	22.43	17.2	44.46	57.15	17.2	42.27	45.20	17.3	21.22	42.56
25.83	62.74	18.2	16.22	22.29	18.2	44.34	57.04	18.2	41.81	45.23	18.2	21.08	42.52
25.71	62.56	19.2	15.96	22.14	19.2	44.22	56.94	19.2	41.38	45.24	19.2	20.93	42.49
25.58	62.37	20.2	15.64	21.97	20.2	44.09	56.82	20.2	40.98	45.24	20.2	20.76	42.47
25.44	62.16	21.2	15.32	21.80	21.2	43.96	56.69	21.2	40.60	45.22	21.2	20.59	42.43
25.30	61.93	22.2	15.02	21.61	22.2	43.80	56.55	22.2	40.23	45.21	22.2	20.41	42.39
25.15	61.67	23.2	14.69	21.40	23.2	43.65	56.37	23.2	39.90	45.23	23.2	20.23	42.32
25.01	61.39	24.2	14.38	21.15	24.2	43.51	56.16	24.2	39.57	45.24	24.2	20.05	42.23
24.90	61.10	25.2	14.09	20.88	25.2	43.38	55.93	25.2	39.23	45.27	25.2	19.87	42.11
24.79	60.80	26.2	13.82	20.61	26.2	43.26	55.70	26.2	38.86	45.31	26.2	19.71	41.97
24.70	60.51	27.2	13.59	20.35	27.2	43.16	55.46	27.2	38.46	45.34	27.2	19.57	41.83
24.62	60.23	28.2	13.37	20.10	28.2	43.05	55.23	28.2	38.05	45.35	28.2	19.42	41.69
24.55	59.96	29.2	13.16	19.85	29.2	42.96	55.04	29.2	37.63	45.34	29.2	19.28	41.56
24.47	59.70	30.2	12.96	19.61	30.2	42.87	54.83	30.2	37.20	45.30	30.2	19.15	41.43
24.38	59.45	31.2	12.74	19.39	31.2	42.76	54.63	31.2	36.77	45.25	31.2	19.01	41.31
24.30	59.20	32.1	12.52	19.16	32.2	42.66	54.45	32.2	36.35	45.19	32.2	18.87	41.19
8.32	−8.26	15.88	−15.85		7.02	−6.95		18.27	+18.24		7.64	−7.57	
21h 38m 19s.542		22h 16m 8s.656			22h 37m 39s.016			23h 27m 44s.125			23h 47m 16s.424		
−83° 6′ 6″.99		−86° 23′ 27″.13			−81° 49′ 2″.34			+86° 50′ 58″.89			−82° 28′ 48″.42		

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 Phœ Mag
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.
	h m s	° ′ ″	h m s	° ′ ″	h m s	° ′ ″	h m s
	0 1	− 6 9	0 4	+28 37	0 4	+58 41	0 5
Jan. 0.2	6.069	75.78	6.334	71.04	44.786	54.43	13.007
	102	55	133	91	301	74	19
10.2	5.967	76.33	6.201	70.13	44.485	53.69	12.808
	96	43	126	117	287	125	18
20.2	5.871	76.76	6.075	68.96	44.198	52.44	12.625
	84	30	113	138	263	171	16
30.1	5.787	77.06	5.962	67.58	43.935	50.73	12.465
	66	15	96	152	226	211	13
Feb. 9.1	5.721	77.21	5.866	66.06	43.709	48.62	12.330
	47	3	70	160	178	241	10
19.1	5.674	77.18	5.796	64.46	43.531	46.21	12.230
	21	23	39	162	116	262	6
Mar. 1.1	5.653	76.95	5.757	62.84	43.415	43.59	12.166
	9	43	4	154	49	270	2
11.0	5.662	76.52	5.753	61.30	43.366	40.89	12.145
	42	68	40	140	26	268	2
21.0	5.704	75.84	5.793	59.90	43.392	38.21	12.170
	79	90	84	117	107	254	7
31.0	5.783	74.94	5.877	58.73	43.499	35.67	12.244
	118	115	130	90	186	231	12
Apr. 10.0	5.901	73.79	6.007	57.83	43.685	33.36	12.369
	158	138	177	56	262	196	17
19.9	6.059	72.41	6.184	57.27	43.947	31.40	12.546
	196	159	221	19	333	156	22
29.9	6.255	70.82	6.405	57.08	44.280	29.84	12.773
	230	177	261	19	395	110	27
May 9.9	6.485	69.05	6.666	57.27	44.675	28.74	13.047
	262	193	295	59	446	59	31
19.8	6.747	67.12	6.961	57.86	45.121	28.15	13.364
	286	203	321	97	486	6	35
29.8	7.033	65.09	7.282	58.83	45.607	28.09	13.716
	305	209	339	133	510	48	37
June 8.8	7.338	63.00	7.621	60.16	46.117	28.57	14.094
	316	209	349	165	523	99	39
18.8	7.654	60.91	7.970	61.81	46.640	29.56	14.492
	318	205	349	193	520	147	40
28.7	7.972	58.86	8.319	63.74	47.160	31.03	14.896
	311	195	341	217	506	193	40
July 8.7	8.283	56.91	8.660	65.91	47.666	32.96	15.296
	298	179	325	234	477	232	38
18.7	8.581	55.12	8.985	68.25	48.143	35.28	15.684
	278	160	300	246	439	267	36
28.7	8.859	53.52	9.285	70.71	48.582	37.95	16.046
	249	138	269	251	393	296	32
Aug. 7.6	9.108	52.14	9.554	73.22	48.975	40.91	16.375
	217	111	235	253	338	317	28
17.6	9.325	51.03	9.789	75.75	49.313	44.08	16.661
	180	85	195	248	279	332	23
27.6	9.505	50.18	9.984	78.23	49.592	47.40	16.898
	143	56	154	239	217	341	18
Sept. 6.5	9.648	49.62	10.138	80.62	49.809	50.81	17.080
	103	30	113	225	153	342	12
16.5	9.751	49.32	10.251	82.87	49.962	54.23	17.206
	65	5	72	207	88	337	6
26.5	9.816	49.27	10.323	84.94	50.050	57.60	17.274
	28	19	34	187	26	325	1
Oct. 6.5	9.844	49.46	10.357	86.81	50.076	60.85	17.286
	3	37	0	163	32	305	4
16.4	9.841	49.83	10.357	88.44	50.044	63.90	17.246
	34	54	33	138	88	280	8
26.4	9.807	50.37	10.324	89.82	49.956	66.70	17.158
	57	65	60	109	140	248	12
Nov. 5.4	9.750	51.02	10.264	90.91	49.816	69.18	17.029
	78	75	82	80	185	210	16
15.4	9.672	51.77	10.182	91.71	49.631	71.28	16.866
	91	77	102	51	225	166	18
25.3	9.581	52.54	10.080	92.22	49.406	72.94	16.681
	102	78	118	17	258	119	20
Dec. 5.3	9.479	53.32	9.962	92.39	49.148	74.13	16.478
	107	76	128	15	282	66	21
15.3	9.372	54.08	9.834	92.24	48.866	74.79	16.265
	110	69	134	45	298	12	21
25.2	9.262	54.77	9.700	91.79	48.568	74.91	16.051
	107	63	137	76	304	42	20
35.2	9.155	55.40	9.563	91.03	48.264	74.49	15.843
Mean Place	5.255	78.77	5.642	55.99	44.428	31.28	12.088
Sec δ, Tan δ	1.006	−0.108	1.140	+0.546	1.925	+1.645	1.445
$D_\phi a$, $D_\omega a$	+0.06	+0.01	+0.06	−0.04	+0.06	−0.11	+0.06
$D_\phi \delta$, $D_\omega \delta$	+0.4	0.0	+0.4	0.0	+0.4	0.0	+0.4

FOR THE UPPER TRANSIT AT WASHINGTON.

on te.	22 Andromedæ. Mag. 5.1		γ Pegasi. Mag. 2.9		σ Andromedæ. Mag. 4.5		ι Ceti. Mag. 3.8	
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.
	h m s 0 5	° ′ ″ +45 36	h m s 0 8	° ′ ″ +14 43	h m s 0 13	° ′ ″ +36 19	h m s 0 15	° ′ ″ − 9 16
.2	60.691	57.54	58.387	30.29	59.976	47.92	12.861	60.13
	195	85	111	81	156	82	108	52
.2	60.496	56.69	58.276	29.48	59.820	47.10	12.753	60.65
	188	126	106	93	151	116	103	38
.2	60.308	55.43	58.170	28.55	59.669	45.94	12.650	61.03
	170	163	96	100	140	144	94	20
.2	60.138	53.80	58.074	27.55	59.529	44.50	12.556	61.23
	147	191	81	102	120	167	79	3
.1	59.991	51.89	57.993	26.53	59.409	42.83	12.477	61.26
	113	214	59	101	94	182	60	18
.1	59.878	49.75	57.934	25.52	59.315	41.01	12.417	61.08
	71	226	33	92	60	189	35	38
.1	59.807	47.49	57.901	24.60	59.255	39.12	12.382	60.70
	22	227	2	80	20	187	7	62
.0	59.785	45.22	57.899	23.80	59.235	37.25	12.375	60.08
	32	220	35	60	26	178	27	84
.0	59.817	43.02	57.934	23.20	59.261	35.47	12.402	59.24
	90	202	75	38	75	158	64	109
.0	59.907	41.00	58.009	22.82	59.336	33.89	12.466	58.15
	148	175	117	10	126	133	104	131
0.0	60.055	39.25	58.126	22.72	59.462	32.56	12.570	56.84
	207	143	159	20	177	100	143	155
9.9	60.262	37.82	58.285	22.92	59.639	31.56	12.713	55.29
	261	102	199	51	226	63	184	173
9.9	60.523	36.80	58.484	23.43	59.865	30.93	12.897	53.56
	309	58	235	83	270	22	221	191
9.9	60.832	36.22	58.719	24.26	60.135	30.71	13.118	51.65
	350	11	269	114	308	20	253	203
9.8	61.182	36.11	58.988	25.40	60.443	30.91	13.371	49.62
	380	37	296	141	339	63	280	212
9.8	61.562	36.48	59.284	26.81	60.782	31.54	13.651	47.50
	403	84	313	166	359	104	302	215
8.8	61.965	37.32	59.597	28.47	61.141	32.58	13.953	45.35
	413	129	324	187	370	141	314	212
8.8	62.378	38.61	59.921	30.34	61.511	33.99	14.267	43.23
	413	171	326	202	373	177	319	206
8.7	62.791	40.32	60.247	32.36	61.884	35.76	14.586	41.17
	402	206	320	213	366	207	315	192
8.7	63.193	42.38	60.567	34.49	62.250	37.83	14.901	39.25
	382	237	306	217	348	230	303	175
8.7	63.575	44.75	60.873	36.66	62.598	40.13	15.204	37.50
	352	265	285	217	325	250	286	152
8.7	63.927	47.40	61.158	38.83	62.923	42.63	15.490	35.98
	315	283	256	211	293	264	259	127
7.6	64.242	50.23	61.414	40.94	63.216	45.27	15.749	34.71
	273	296	225	202	257	271	229	100
7.6	64.515	53.19	61.639	42.96	63.473	47.98	15.978	33.71
	227	305	189	188	216	272	193	69
7.6	64.742	56.24	61.828	44.84	63.689	50.70	16.171	33.02
	179	304	151	170	174	269	155	40
. 6.5	64.921	59.28	61.979	46.54	63.863	53.39	16.326	32.62
	129	300	113	151	130	259	117	11
16.5	65.050	62.28	62.092	48.05	63.993	55.98	16.443	32.51
	80	289	74	130	87	246	78	15
26.5	65.130	65.17	62.166	49.35	64.080	58.44	16.521	32.66
	33	273	40	107	47	228	42	38
6.5	65.163	67.90	62.206	50.42	64.127	60.72	16.563	33.04
	10	251	7	85	7	206	8	58
16.4	65.153	70.41	62.213	51.27	64.134	62.78	16.571	33.62
	50	224	23	60	28	181	23	74
26.4	65.103	72.65	62.190	51.87	64.106	64.59	16.548	34.36
	87	193	46	40	59	152	47	84
. 5.4	65.016	74.58	62.144	52.27	64.047	66.11	16.501	35.20
	119	158	69	16	86	120	69	90
15.4	64.897	76.16	62.075	52.43	63.961	67.31	16.432	36.10
	146	118	85	3	110	85	86	92
25.3	64.751	77.34	61.990	52.40	63.851	68.16	16.346	37.02
	167	77	97	24	128	51	98	89
. 5.3	64.584	78.11	61.893	52.16	63.723	68.67	16.248	37.91
	183	31	108	43	144	12	107	83
15.3	64.401	78.42	61.785	51.73	63.579	68.79	16.141	38.74
	195	15	113	60	153	26	111	74
25.2	64.206	78.27	61.672	51.13	63.426	68.53	16.030	39.48
	199	59	115	76	159	63	113	62
35.2	64.007	77.68	61.557	50.37	63.267	67.90	15.917	40.10
Place	60.119	37.45	57.593	19.85	59.251	30.33	11.958	62.18
Tan δ	1.430	+1.022	1.034	+0.263	1.241	+0.735	1.013	−0.163
D, α	+0.06	−0.07	+0.06	−0.02	+0.06	−0.05	+0.06	+0.01
D 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 Phœni Mag. 2.	
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	
	h m s	° ′ ″	h m s	° ′ ″	h m s	° ′ ″	h m s	
	0 15	−65 21	0 21	+ 1 28	0 21	−77 42	0 22	
Jan. 0.2	46.52	56.29	9.746	54.08	25.85	91.51	12.136	9
	40	84	106	67	91	106	188	
10.2	46.12	55.45	9.640	53.41	24.94	90.45	11.948	9
	38	140	103	64	86	166	179	
20.2	45.74	54.05	9.537	52.77	24.08	88.79	11.769	9
	34	191	94	58	78	219	161	
30.2	45.40	52.14	9.443	52.19	23.30	86.60	11.608	9
	30	238	82	49	66	267	141	
Feb. 9.1	45.10	49.76	9.361	51.70	22.64	83.93	11.467	8
	22	278	63	36	56	307	112	
19.1	44.88	46.98	9.298	51.34	22.08	80.86	11.355	8
	17	312	41	20	42	339	79	
Mar. 1.1	44.71	43.86	9.257	51.14	21.66	77.47	11.276	8
	10	337	10	2	28	363	41	
11.0	44.61	40.49	9.247	51.12	21.38	73.84	11.235	8
	3	357	23	19	13	379	2	
21.0	44.58	36.92	9.270	51.31	21.25	70.05	11.237	8
	6	367	60	42	3	385	48	
31.0	44.64	33.25	9.330	51.73	21.28	66.20	11.285	7
	14	370	99	69	19	385	99	
Apr. 10.0	44.78	29.55	9.429	52.42	21.47	62.35	11.384	7
	23	367	139	92	33	376	148	
19.9	45.01	25.88	9.568	53.34	21.80	58.59	11.532	7
	29	353	181	119	48	358	196	
29.9	45.30	22.35	9.749	54.53	22.28	55.01	11.730	6
	38	334	218	142	63	334	245	
May 9.9	45.68	19.01	9.967	55.95	22.91	51.67	11.975	6
	44	306	251	163	76	301	288	
19.9	46.12	15.95	10.218	57.58	23.67	48.66	12.263	6
	50	273	278	180	86	263	323	
29.8	46.62	13.22	10.496	59.38	24.53	46.03	12.586	5
	55	234	299	193	96	218	354	
June 8.8	47.17	10.88	10.795	61.31	25.49	43.85	12.940	5
	58	186	312	202	102	169	374	
18.8	47.75	9.02	11.107	63.33	26.51	42.16	13.314	5
	59	137	317	205	106	115	384	
28.7	48.34	7.65	11.424	65.38	27.57	41.01	13.698	5
	60	84	314	203	108	59	385	
July 8.7	48.94	6.81	11.738	67.41	28.65	40.42	14.083	5
	59	29	303	196	105	0	375	
18.7	49.53	6.52	12.041	69.37	29.70	40.42	14.458	5
	56	26	286	183	101	56	354	
28.7	50.09	6.78	12.327	71.20	30.71	40.98	14.812	5
	50	81	259	167	93	112	327	
Aug. 7.6	50.59	7.59	12.586	72.87	31.64	42.10	15.139	5
	45	133	231	147	82	164	288	
17.6	51.04	8.92	12.817	74.34	32.46	43.74	15.427	5
	38	179	196	123	68	210	245	
27.6	51.42	10.71	13.013	75.57	33.14	45.84	15.672	5
	29	219	160	100	53	250	195	
Sept. 6.6	51.71	12.90	13.173	76.57	33.67	48.34	15.867	5
	19	251	122	75	36	278	143	
16.5	51.90	15.41	13.295	77.32	34.03	51.12	16.010	5
	10	273	85	49	16	299	89	
26.5	52.00	18.14	13.380	77.81	34.19	54.11	16.099	5
	1	284	51	25	1	308	38	
Oct. 6.5	52.01	20.98	13.431	78.06	34.18	57.19	16.137	5
	9	285	17	5	22	303	13	
16.4	51.92	23.83	13.448	78.11	33.96	60.22	16.124	6
	17	274	12	11	38	288	58	
26.4	51.75	26.57	13.436	77.97	33.58	63.10	16.066	6
	26	249	37	32	54	260	97	
Nov. 5.4	51.49	29.06	13.399	77.65	33.04	65.70	15.969	6
	31	216	58	44	70	221	132	
15.4	51.18	31.22	13.341	77.21	32.34	67.91	15.837	6
	36	175	77	55	79	174	158	
25.3	50.82	32.97	13.264	76.66	31.55	69.65	15.679	6
	10	126	90	62	88	119	177	
Dec. 5.3	50.42	34.23	13.174	76.04	30.67	70.84	15.502	7
	43	71	100	68	94	59	190	
15.3	49.99	34.94	13.074	75.36	29.73	71.43	15.312	7
	43	13	106	71	95	4	196	
25.3	49.56	35.07	12.968	74.65	28.78	71.39	15.116	7
	42	47	109	71	94	66	195	
35.2	49.14	34.60	12.859	73.94	27.84	70.73	14.921	7
Mean Place	45.483	43.94	8.836	48.19	24.623	78.09	11.117	8
Sec δ, Tan δ	2.398	−2.180	1.000	+0.026	4.701	−4.593	1.362	−0
$D_\phi\, a$, $D_m\, a$	+0.06	+0.15	+0.06	0.00	+0.05	+0.31	+0.06	
$D_\phi\, \delta$, $D_m\, \delta$	+0.4	+0.1	+0.4	+0.1	+0.4	+0.1	+0.4	

FOR THE UPPER TRANSIT AT WASHINGTON.

ngton Time.	12 Ceti. Mag. 6.0		13 Ceti. Mag. 5.2		ζ Cassiopeiæ. Mag. 3.7		π Andromedæ. Mag. 4.4	
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.
	h m s 0 25	° ′ ″ − 4 24	h m s 0 30	° ′ ″ − 4 2	h m s 0 32	° ′ ″ +53 26	h m s 0 32	° ′ ″ +33 15
0.2	49.149	52.80	59.497	54.33	21.192	47.51	27.519	62.36
10.2	49.041 108	53.42 62	59.389 108	54.95 62	20.942 250	47.02 49	27.371 148	61.66 70
20.2	48.936 105	53.93 51	59.283 106	55.48 53	20.693 249	46.05 97	27.224 147	60.67 99
30.2	48.838 98	54.32 39	59.184 99	55.89 41	20.456 237	44.64 141	27.083 141	59.40 127
. 9.1	48.752 86	54.56 24	59.096 88	56.14 25	20.244 212	42.84 180	26.958 125	57.93 147
	67	8	70	10	177	211	104	163
19.1	48.685	54.64	59.026	56.24	20.067	40.73	26.854	56.30
. 1.1	48.640 45	54.53 11	58.977 49	56.15 9	19.935 132	38.40 233	26.781 73	54.60 170
11.1	48.624 16	54.21 32	58.958 19	55.85 30	19.858 77	35.96 244	26.744 37	52.91 169
21.0	48.642 18	53.67 54	58.971 13	55.33 52	19.845 13	33.50 246	26.749 5	51.31 160
31.0	48.696 54	52.88 79	59.020 49	54.56 77	19.901 56	31.13 237	26.803 54	49.87 144
	93	102	89	99	125	217	103	120
r. 10.0	48.789	51.86	59.109	53.57	20.026	28.96	26.906	48.67
19.9	48.924 135	50.59 127	59.239 130	52.33 124	20.222 196	27.06 190	27.059 153	47.75 92
29.9	49.098 174	49.10 149	59.410 171	50.87 146	20.485 263	25.52 154	27.262 203	47.19 56
y 9.9	49.311 213	47.41 169	59.619 209	49.20 167	20.807 322	24.41 111	27.510 248	47.01 18
19.9	49.558 247	45.56 185	59.862 243	47.37 183	21.183 376	23.75 66	27.796 286	47.21 20
	273	199	272	197	418	17	320	60
29.8	49.831	43.57	60.134	45.40	21.601	23.58	28.116	47.81
ne 8.8	50.128 297	41.51 206	60.428 294	43.35 205	22.048 447	23.89 31	28.460 344	48.79 98
18.8	50.439 311	39.42 209	60.739 311	41.27 208	22.514 466	24.69 80	28.819 359	50.13 134
28.8	50.756 317	37.36 206	61.055 316	39.20 207	22.986 472	25.96 127	29.183 364	51.80 167
ly 8.7	51.071 315	35.37 199	61.371 316	37.21 199	23.452 466	27.65 169	29.544 361	53.74 194
	304	186	306	187	449	208	348	217
18.7	51.375	33.51	61.677	35.34	23.901	29.73	29.892	55.91
28.7	51.663 288	31.83 168	61.968 291	33.65 169	24.323 422	32.13 240	30.220 328	58.26 235
ig. 7.6	51.926 263	30.36 147	62.234 266	32.17 148	24.709 386	34.82 269	30.521 301	60.72 246
17.6	52.161 235	29.14 122	62.473 239	30.93 124	25.052 343	37.73 291	30.788 267	63.24 252
27.6	52.361 200	28.18 96	62.678 205	29.95 98	25.347 295	40.80 307	31.020 232	65.78 254
	164	67	170	70	242	315	191	250
pt. 6.6	52.525	27.51	62.848	29.25	25.589	43.95	31.211	68.28
16.5	52.651 126	27.10 41	62.980 132	28.82 43	25.776 187	47.13 318	31.361 150	70.69 241
26.5	52.741 90	26.97 13	63.075 95	28.67 15	25.910 134	50.28 315	31.470 109	72.98 229
ct. 6.5	52.794 53	27.06 9	63.135 60	28.75 8	25.989 79	53.32 304	31.540 70	75.08 210
16.5	52.814 20	27.38 32	63.161 26	29.05 30	26.016 27	56.22 290	31.572 32	77.00 192
	9	49	3	47	22	268	1	167
26.4	52.805	27.87	63.158	29.52	25.994	58.90	31.571	78.67
ov. 5.4	52.769 36	28.49 62	63.127 31	30.13 61	25.924 70	61.31 241	31.537 34	80.10 143
15.4	52.712 57	29.21 72	63.074 53	30.86 73	25.811 113	63.39 208	31.475 62	81.23 113
25.3	52.636 76	29.98 77	63.002 72	31.63 77	25.659 152	65.08 169	31.388 87	82.05 82
ec. 5.3	52.546 90	30.78 80	62.916 86	32.43 80	25.475 184	66.35 127	31.281 107	82.55 50
	100	79	98	79	215	80	126	16
15.3	52.446	31.57	62.818	33.22	25.260	67.15	31.155	82.71
25.3	52.338 108	32.32 75	62.712 106	33.98 76	25.025 235	67.45 30	31.015 140	82.53 18
35.2	52.227 111	32.99 67	62.602 110	34.67 69	24.776 249	67.26 19	30.868 147	82.02 51
an Place	48.196	56.65	58.516	58.34	20.390	25.07	26.620	45.46
δ, Tan δ	*1.003*	*−0.077*	*1.002*	*−0.071*	1.679	+1.349	1.196	+0.956
, $D_\alpha \alpha$	*+0.06*	*+0.01*	*+0.06*	*0.00*	+0.07	−0.09	+0.06	−0.04
$D_\alpha \delta$	*+0.4*	*+0.1*	*+0.4*	*+0.1*	+0.4	+0.1	+0.4	+0.1

APPARENT PLACES OF STARS, 1917.

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	ε Andromedæ. Mag. 4.5		δ Andromedæ. Mag. 3.5		α Cassiopeiæ. (*Schedir.*) Var. 2.2–2.8		μ Phœnicis Mag. 4.6	
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.
	h m s 0 34	° ′ ″ +28 51	h m s 0 34	° ′ ″ +30 24	h m s 0 35	° ′ ″ +56 4	h m s 0 37	° ′ ″ +
Jan. 0.2	10.879	56.04	54.075	40.59	48.101	79.47	25.410	96.
10.2	10.742 137	55.33 71	53.936 139	39.88 71	47.827 274	79.06 41	25.194 216	96.
20.2	10.605 137	54.36 97	53.795 141	38.92 96	47.554 273	78.15 91	24.986 208	95.
30.2	10.475 130	53.16 120	53.661 134	37.70 122	47.293 261	76.78 137	24.792 194	94.
Feb. 9.1	10.358 117	51.80 136	53.542 119	36.31 139	47.056 237	74.99 179	24.620 172	92.
	97	147	100	152	199	213	146	
19.1	10.261 68	50.33 152	53.442 71	34.79 157	46.857 150	72.86 236	24.474 111	91.
Mar. 1.1	10.193 35	48.81 149	53.371 37	33.22 156	46.707 90	70.50 250	24.363 71	88.
11.1	10.158 — 5	47.32 139	53.334 — 5	31.66 146	46.617 23	68.00 254	24.292 27	86.
21.0	10.163 50	45.93 120	53.339 51	30.20 130	46.594 — 50	65.46 247	24.265 — 23	83.
31.0	10.213 98	44.73 98	53.390 98	28.90 105	46.644 124	62.99 230	24.288 74	80.
Apr. 10.0	10.311	43.75	53.488	27.85	46.768	60.69	24.362	77.
19.9	10.457 146	43.07 68	53.636 148	27.09 76	46.969 201	58.68 201	24.490 128	74.
29.9	10.649 192	42.73 34	53.832 196	26.66 43	47.240 271	57.01 167	24.672 182	70.
May 9.9	10.884 235	42.73 0	54.071 239	26.60 — 6	47.576 336	55.76 125	24.906 234	67.
19.9	11.160 276	43.12 39	54.349 278	26.92 32	47.968 392	54.96 80	25.187 281	64.
	307	76	311	68	437	31	322	
29.8	11.467	43.88	54.660	27.60	48.405	54.65	25.509	61.
June 8.8	11.796 329	44.99 111	54.995 335	28.66 106	48.875 470	54.84 19	25.865 356	59.
18.8	12.141 345	46.41 142	55.346 351	30.05 139	49.365 490	55.53 69	26.246 381	56.
28.8	12.494 353	48.13 172	55.702 356	31.74 169	49.863 498	56.69 116	26.643 397	55.
July 8.7	12.842 348	50.09 196	56.055 353	33.68 194	50.354 491	58.30 161	27.044 401	53.
	338	215	342	216	476	201	393	
18.7	13.180	52.24	56.397	35.84	50.830	60.31	27.437	52.
28.7	13.499 319	54.53 229	56.720 323	38.13 229	51.277 447	62.67 236	27.816 379	52.
Aug. 7.6	13.790 291	56.89 236	57.016 296	40.53 240	51.687 410	65.34 267	28.166 350	52.
17.6	14.050 260	59.29 240	57.280 264	42.97 244	52.053 366	68.24 290	28.480 314	52.
27.6	14.275 225	61.66 237	57.510 230	45.40 243	52.368 315	71.33 309	28.751 271	53.
	187	231	190	237	260	319	222	
Sept. 6.6	14.462	63.97	57.700	47.77	52.628 204	74.52	28.973	54.
16.5	14.609 147	66.16 219	57.850 150	50.04 227	52.832 146	77.77 325	29.141 168	56.
26.5	14.717 108	68.20 204	57.961 111	52.16 212	52.978 88	81.00 323	29.252 111	58.
Oct. 6.5	14.787 70	70.07 187	58.033 72	54.12 196	53.066 32	84.15 315	29.307 55	61.
16.5	14.821 34	71.72 165	58.068 35	55.87 175	53.098 — 22	87.15 300	29.307 0	63.
	1	144	3	152		280	50	
26.4	14.822	73.16	58.071	57.39	53.076	89.95	29.257	66.
Nov. 5.4	14.793 29	74.33 117	58.042 29	58.66 127	53.004 72	92.48 253	29.163 94	68.
15.4	14.737 56	75.24 91	57.987 55	59.66 100	52.885 119	94.69 221	29.029 134	70.
25.3	14.657 80	75.86 62	57.907 80	60.36 70	52.722 163	96.52 183	28.863 166	72.
Dec. 5.3	14.558 99	76.19 33	57.807 100	60.77 41	52.522 200	97.91 139	28.673 190	74.
	116	3	119	8	231	92	209	
15.3	14.442	76.22	57.688	60.85	52.291	98.83	28.464	75.
25.3	14.314 128	75.94 28	57.557 131	60.61 24	52.034 257	99.24 — 41	28.246 218	76.
35.2	14.178 136	75.39 55	57.418 139	60.09 52	51.763 271	99.14 10	28.025 221	76.
Mean Place	9.953	40.54	53.148	24.57	47.272	56.41	24.283	87.
Sec δ. Tan δ	1.142	+0.551	1.160	+0.587	1.792	+1.487	1.453	−1.
$D_\psi a$, $D_\omega a$	+0.06	−0.04	+0.06	−0.04	+0.07	−0.10	+0.06	+
$D_\psi \delta$, $D_\omega \delta$	+0.4	+0.1	+0.4	+0.2	+0.4	+0.2	+0.4	

FOR THE UPPER TRANSIT AT WASHINGTON.

	β Ceti. Mag. 2.2		o Cassiopeiæ. Mag. 4.7		21 Cassiopeiæ. Mag. 5.6		ζ Andromedæ. Mag. 4.3	
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.
	h m	° ′	h m	° ′	h m	° ′	h m	° ′
	0 39	−18 25	0 40	+47 49	0 40	+74 32	0 42	+23 48
	s	″	s	″	s	″	s	″
	26.503	91.72	6.539	70.41	9.22	30.88	57.151	71.04
123	26.380	92.20 48	6.330 209	69.93 48	8.53 69	30.87 1	57.024 127	70.35 69
121	26.259	92.42 — 22	6.119 211	69.00 93	7.84 69	30.26 61	56.896 128	69.47 88
114	26.145	92.38 4	5.916 203	67.68 132	7.18 66	29.06 120	56.772 124	68.42 105
103	26.042	92.07 31	5.731 185	66.01 167	6.58 60	27.33 173	56.659 113	67.22 120
86		58	156	194	52	220	96	125
	25.956	91.49	5.575	64.07	6.06	25.13	56.563	65.97
63	25.893	90.85 84	117 5.458	61.92 215	39 5.67	257 22.56	71 56.492	127 64.70
34	25.859	89.53 112	71 5.387	59.69 223	28 5.39	282 19.74	39 56.453	122 63.48
2	25.857 —	88.17 136	16 5.371 —	57.45 224	13 5.26 —	295 16.79	3 56.450 —	110 62.38
36	25.893	86.56 161	44 5.415	55.31 214	4 5.30	297 13.82	41 56.491	93 61.45
77		183	107	195	18	288	86	69
	25.970	84.73	5.522	53.36	5.48	10.94	56.577	60.76
119	26.089	82.72 201	169 5.691	167 51.69	34 5.82	265 8.29	132 56.709	42 60.34
162	26.251	80.53 219	230 5.921	132 50.37	49 6.31	235 5.94	179 56.888	10 60.24
202	26.453	78.23 230	287 6.208	95 49.42	60 6.91	195 3.99	221 57.109	— 24 60.48
238	26.691	75.85 238	335 6.543	49 48.93	72 7.63	148 2.51	260 57.369	57 61.05
271		239	374	4 —	81	97	291	90
	26.962	73.46	6.917	48.89	8.44	1.54	57.660	61.95
296	27.258	71.11 235	404 7.321	42 49.31	87 9.31	43 1.11 —	316 57.976	123 63.18
313	27.571	68.85 226	423 7.744	88 50.19	91 10.22	11 1.22	333 58.309	150 64.68
323	27.894	66.76 209	431 8.175	130 51.49	93 11.15	67 1.89	340 58.649	175 66.43
324	28.218	64.86 190	427 8.602	169 53.18	92 12.07	119 3.08	339 58.988	193 68.36
318		163	414	205	89	169	330	210
	28.536	63.23	9.016	55.23	12.96	4.77	59.318	70.46
302	28.838	134 61.89	391 9.407	233 57.56	84 13.80	215 6.92	312 59.630	218 72.64
280	29.118	100 60.89	360 9.767	259 60.15	77 14.57	256 9.48	290 59.920	223 74.87
252	29.370	65 60.24	322 10.089	277 62.92	69 15.26	291 12.39	260 60.180	221 77.08
218	29.588	30 59.94 —	280 10.369	289 65.81	60 15.86	320 15.59	226 60.406	216 79.24
181		5	233	296	48	342	191	206
	29.769	59.99	10.602	68.77	16.34	19.01	60.597	81.30
143	29.912	39 60.38	185 10.787	297 71.74	38 16.72	359 22.60	153 60.750	193 83.23
103	30.015	69 61.07	137 10.924	292 74.66	27 16.99	366 26.26	115 60.865	177 85.00
65	30.080	93 62.00	89 11.013	281 77.47	14 17.13	367 29.93	78 60.943	157 86.57
28	30.108 —	114 63.14	42 11.055 —	265 80.12	2 17.15 —	361 33.54	45 60.988	138 87.95
5		128	2	244	9	344	12	115
	30.103	64.42	11.053	82.56	17.06	36.98	61.000 —	89.10
34	30.069	135 65.77	43 11.010	217 84.73	21 16.85	323 40.21	17 60.983	92 90.02
59	30.010	136 67.13	82 10.928	188 86.61	31 16.54	292 43.13	42 60.941	67 90.69
82	29.928	131 68.44	117 10.811	151 88.12	43 16.11	253 45.66	67 60.874	43 91.12
98	29.830	119 69.63	146 10.665	111 89.23	51 15.60	206 47.72	86 60.788	17 91.29 —
110		106	174	69	59	155	103	7
	29.720	70.69 87	10.491	89.92	15.01	49.27	60.685	91.22
121	29.599	71.56 63	193 10.298	24 90.16 —	65 14.36	96 50.23	118 60.567	33 90.89
125	29.474	72.19	208 10.090	20 89.96	68 13.68	37 50.60	126 60.441	56 90.33
ce	25.444	90.85	5.617	49.29	8.510	4.64	56.147	57.14
n δ	*1.054*	*−0.333*	*1.490*	*+1.104*	3.750	+3.615	1.093	+0.441
	+0.06	*+0.02*	*+0.07*	*−0.07*	+0.08	−0.24	+0.06	−0.03
	+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 Cassiopeiæ. Mag. 3.6		δ Piscium. Mag. 4.6		λ Hydri. Mag. 5.0		20 Cati. Mag. 4.9	
		Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Dec
		h m s	° ′ ″	h m s	° ′ ″	h m s	° ′ ″	h m s	° ″
		0 44	+57 22	0 44	+ 7 8	0 45	−75 21	0 48	−1
Jan.	0.3	5.127	58.92	23.511	9.06	44.83	102.71	46.956	35.
	10.2	4.845 282	58.62 30	23.401 110	8.37 69	44.03 80	102.06 65	46.846 110	36.
	20.2	4.561 284	57.80 82	23.291 110	7.65 72	43.27 76	100.81 125	46.735 111	36.
	30.2	4.286 275	56.51 129	23.183 108	6.95 70	42.55 72	99.00 181	46.627 108	37.
Feb.	9.1	4.036 250	54.80 171	23.086 97	6.27 68	41.90 65	96.68 232	46.527 100	37.
		212	208	84	60	55	278	85	
	19.1	3.824 165	52.72 234	23.002 60	5.67 48	41.35 46	93.90 314	46.442 63	37.
Mar.	1.1	3.659 106	50.38 251	22.942 33	5.19 35	40.89 34	90.76 346	46.379 37	37.
	11.1	3.553 36	47.87 257	22.909 1	4.84 15	40.55 23	87.30 365	46.342 6	37.
	21.0	3.517 — 39	45.30 252	22.908 — 37	4.69 — 6	40.32 8	83.65 377	46.336 — 31	37.
	31.0	3.556 117	42.78 237	22.945 79	4.75 31	40.24 — 4	79.88 333	46.367 71	36.
Apr.	10.0	3.673	40.41	23.024	5.06	40.28	76.05	46.438	35.
	20.0	3.868 195	38.29 212	23.144 120	5.63 57	40.46 18	72.25 380	46.551 113	34.
	29.9	4.137 269	36.51 178	23.308 164	6.46 83	40.76 30	68.57 368	46.706 155	33.
May	9.9	4.476 339	35.12 139	23.510 202	7.56 110	41.21 45	65.09 348	46.900 194	31.
	19.9	4.873 397	34.18 94	23.748 238	8.89 133	41.76 55	61.86 323	47.130 230	30.
		447	45	270	157	66	288	202	
	29.8	5.320	33.73	24.018	10.46	42.42	58.98	47.392	28.
June	8.8	5.802 482	33.77 4	24.312 294	12.20 174	43.17 75	56.51 247	47.678 286	26.
	18.8	6.308 506	34.31 54	24.622 310	14.07 187	43.98 81	54.51 200	47.983 305	24.
	28.8	6.823 515	35.33 102	24.940 318	16.04 197	44.86 88	53.01 150	48.297 314	22.
July	8.7	7.336 513	36.80 147	25.260 320	18.06 202	45.76 90	52.07 94	48.613 316	20.
		497	188	311	199	89	36	308	
	18.7	7.833	38.68	25.571	20.05	46.65	51.71	48.921	18.
	28.7	8.305 472	40.94 226	25.867 296	21.99 194	47.52 87	51.92 21	49.217 296	16.
Aug.	7.7	8.740 435	43.52 258	26.141 274	23.82 183	48.33 81	52.71 79	49.493 276	15.
	17.6	9.132 392	46.34 282	26.389 248	25.48 166	49.07 74	54.06 135	49.741 248	13.
	27.6	9.473 341	49.38 304	26.604 215	26.96 148	49.70 63	55.91 185	49.958 217	12.
		287	316	182	127	52	229	183	
Sept.	6.6	9.760 228	52.54 322	26.786	28.23	50.22 37	58.20	50.143	11.
	16.5	9.988 169	55.76 323	26.931 145	29.28 105	50.59 22	60.86 266	50.291 148	11.
	26.5	10.157 110	58.99 319	27.042 111	30.10 82	50.81 — 7	63.77 291	50.403 112	10.
Oct.	6.5	10.267 52	62.18 304	27.116 74	30.68 58	50.88 10	66.85 308	50.480 77	10.
	16.5	10.319 — 5	65.22 286	27.159 43	31.05 37	50.78 24	69.95 310	50.525 45	11.
				12	15		302	13	
	26.4	10.314	68.08	27.171	31.20	50.54	72.97	50.538	11.
Nov.	5.4	10.256 58	70.68 260	27.156 15	31.18 2	50.15 39	75.77 280	50.524 14	11.
	15.4	10.147 109	72.98 230	27.118 38	30.98 20	49.64 51	78.27 250	50.486 38	12.
	25.4	9.993 154	74.90 192	27.059 59	30.65 33	49.01 63	80.33 206	50.427 59	13.
Dec.	5.3	9.797 196	76.40 150	26.981 78	30.20 45	48.30 71	81.89 156	50.350 77	14.
		231	104	90	56	77	98	91	
	15.3	9.566	77.44	26.891	29.64	47.53	82.87	50.259	14.
	25.3	9.306 260	77.96 52	26.789 102	29.02 62	46.73 80	83.25 — 38	50.157 102	15.
	35.2	9.028 278	77.96 0	26.679 110	28.31 71	45.92 81	83.02 23	50.048 109	16.
Mean Place		4.191	35.55	22.471	0.98	43.258	89.58	45.876	40.
Sec δ, Tan δ		1.855	+1.563	1.008	+0.125	3.959	−3.831	1.000	−0.
$D_\psi a$, $D_\omega a$		+0.07	−0.10	+0.06	−0.01	+0.04	+0.26	+0.06	0.
$D_\psi \delta$, $D_\omega \delta$		+0.4	+0.2	+0.4	+0.2	+0.4	+0.2	+0.4	+0.

FOR THE UPPER TRANSIT AT WASHINGTON.

	γ Cassiopeiæ. Mag. 2.2		μ Andromedæ. Mag. 3.9		α Sculptoris. Mag. 4.4		ε Piscium. Mag. 4.4	
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.
	h m 0 51 s	° ′ +60 16 ″	h m 0 52 s	° ′ +38 2 ″	h m 0 54 s	° ′ −29 47 ″	h m 0 58 s	° ′ + 7 26 ″
3	42.29	27.24	9.522	76.25	37.542	86.03	39.160	45.01
	32	14	162	50	150	40	111	67
2	41.97	27.10	9.360	75.75	37.392	86.43	39.049	44.34
	33	68	167	84	149	5	115	70
2	41.64	26.42	9.193	74.91	37.243	86.48	38.934	43.64
	31	119	163	116	145	32	113	69
2	41.33	25.23	9.030	73.75	37.098	86.16	38.821	42.95
	30	164	152	142	133	68	107	66
2	41.03	23.59	8.878	72.33	36.965	85.48	38.714	42.29
	25	203	131	164	115	103	94	59
.1	40.78	21.56	8.747	70.69	36.850	84.45	38.620	41.70
	20	232	102	177	92	136	72	50
.1	40.58	19.24	8.645	68.92	36.758	83.09	38.548	41.20
	14	254	64	183	63	168	48	35
.1	40.44	16.70	8.581	67.09	36.695	81.41	38.500	40.85
	6	262	20	180	27	195	14	16
.0	40.38	14.08	8.561	65.29	36.668	79.46	38.486	40.69
	2	259	30	167	13	221	23	3
.0	40.40	11.49	8.591	63.62	36.681	77.25	38.509	40.72
	10	248	84	150	56	241	64	28
.0	40.50	9.01	8.675	62.12	36.737	74.84	38.573	41.00
	19	224	139	122	101	258	107	52
.0	40.69	6.77	8.814	60.90	36.838	72.26	38.680	41.52
	27	194	192	91	146	269	150	79
.9	40.96	4.83	9.006	59.99	36.984	69.57	38.830	42.31
	34	155	241	54	191	276	190	104
.9	41.30	3.28	9.247	59.45	37.175	66.81	39.020	43.35
	41	111	287	15	232	277	229	133
.9	41.71	2.17	9.534	59.30	37.407	64.04	39.249	44.65
	47	63	323	25	270	270	262	150
.9	42.18	1.54	9.857	59.55	37.677	61.34	39.511	46.15
	51	13	352	66	299	258	287	170
.8	42.69	1.41	10.209	60.21	37.976	58.76	39.798	47.85
	53	37	371	104	321	239	306	183
.8	43.22	1.78	10.580	61.25	38.297	56.37	40.104	49.68
	55	87	382	139	336	215	316	193
.8	43.77	2.65	10.962	62.64	38.633	54.22	40.420	51.61
	55	133	381	172	341	185	319	197
.7	44.32	3.98	11.343	64.36	38.974	52.37	40.739	53.58
	53	178	372	200	337	150	315	197
.7	44.85	5.76	11.715	66.36	39.311	50.87	41.054	55.55
	51	216	354	222	325	110	300	191
.7	45.36	7.92	12.069	68.58	39.636	49.77	41.354	57.46
	47	251	330	239	304	69	281	181
.7	45.83	10.43	12.399	70.97	39 940	49.08	41.635	59.27
	43	278	298	251	278	25	256	165
.6	46.26	13.21	12.697	73.48	40.218	48.83	41.891	60.92
	37	302	262	259	243	17	227	149
.6	46.63	16.23	12.959	76.07	40.461	49.00	42.118	62.41
	32	318	222	259	205	58	193	128
.6	46.95	19.41	13.181	78.66	40.666	49.58	42.311	63.69
	25	327	182	254	164	95	159	104
.6	47.20	22.68	13.363	81.20	40.830	50.53	42.470	64.73
	20	330	141	246	121	130	124	82
.5	47.40	25.98	13.504	83.66	40.951	51.83	42.594	65.55
	13	327	99	234	78	156	90	59
.5	47.53	29.25	13.603	86.00	41.029	53.39	42.684	66.14
	6	318	59	217	37	176	57	37
.5	47.59	32.43	13.662	88.17	41.066	55.15	42.741	66.51
	1	300	21	196	0	187	26	16
.4	47.60	35.43	13.683	90.13	41.066	57.02	42.767	66.67
	6	278	14	171	36	192	1	2
.4	47.54	38.21	13.669	91.84	41.030	58.94	42.766	66.65
	11	246	45	145	66	186	26	18
.4	47.43	40.67	13.624	93.29	40.964	60.80	42.740	66.47
	16	211	77	113	92	174	48	32
.4	47.27	42.78	13.547	94.42	40.872	62.54	42.692	66.15
	22	169	102	80	114	154	69	44
.3	47.05	44.47	13.445	95.22	40.758	64.08	42.623	65.71
	25	121	127	45	131	129	85	54
.3	46.80	45.68	13.318	95.67	40.627	65.37	42.538	65.17
	29	71	144	8	143	99	99	62
.3	46.51	46.39	13.174	95.75	40.484	66.36	42.439	64.55
	31	18	160	29	151	65	109	67
.3	46.20	46.57	13.014	95.46	40.333	67.01	42.330	63.88
ace	41.231	3.24	*8.460*	*57.80*	36.370	81.70	38.030	36.74
m δ	*2.016*	*+1.751*	*1.270*	*+0.783*	1.153	−0.573	1.008	+0.131
	+0.07	*−0.11*	*+0.07*	*−0.05*	+0.06	+0.04	+0.06	−0.01
	+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. 2.1	
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.
	h m 1 2 s	° ′ −47 9 ″	h m 1 2 s	° ′ +54 30 ″	h m 1 4 s	° ′ −10 36 ″	h m 1 5 s	° +3 ″
Jan. 0.3	24.100	56.84	45.396	72.47	26.046	76.74	5.937	68.4
10.2	23.872 228	57.05 −21	45.152 244	72.30 17	25.929 117	77.38 64	5.786 151	68.0
20.2	23.645 227	56.75 30	44.901 251	71.64 66	25.809 120	77.87 49	5.628 158	67.2
30.2	23.427 218	55.96 79	44.652 249	70.51 113	25.692 117	78.14 27	5.470 158	66.2
Feb. 9.2	23.225 202	54.70 126	44.418 234	68.97 154	25.580 112	78.22 −8	5.320 150	64.9
	179	170	204	190	99	15	133	
19.1	23.046 148	53.00	44.214 164	67.07 219	25.481 80	78.07 39	5.187 107	63.4
Mar. 1.1	22.898 111	50.91 209	44.050 112	64.88 236	25.401 55	77.68 63	*5.080 73	61.8
11.1	22.787 68	48.46 245	43.938 51	62.52 245	25.346 23	77.05 87	5.007 32	60.1
21.0	22.719 18	45.73 273	43.887 17	60.07 243	25.323 13	76.18 111	4.975 −16	58.5
31.0	22.701 −35	42.75 298	43.904 90	57.64 231	25.336 52	75.07 135	4.991 67	57.0
		316						
Apr. 10.0	22.736	39.59	43.994	55.33	25.388	73.72	5.058	55.6
20.0	22.826 90	36.33 326	44.157 163	53.24 209	25.482 94	72.14 158	5.178 120	54.5
29.9	22.972 146	33.01 332	44.393 236	51.45 179	25.619 137	70.37 177	5.350 172	53.7
May 9.9	23.173 201	29.72 329	44.695 302	50.01 144	25.798 179	68.43 194	5.573 223	53.2
19.9	23.425 252	26.53 319	45.057 362	48.99 102	26.015 217	66.33 210	5.840 267	53.1
	298	302	412	56	251	217	306	
29.9	23.723	23.51	45.469	48.43	26.266	64.16	6.146	53.4
June 8.8	24.061 338	20.72 279	45.920 451	48.33 −10	26.544 278	61.95 221	6.482 336	54.0
18.8	24.428 367	18.25 247	46.398 478	48.70 37	26.844 300	59.75 220	6.840 358	55.0
28.8	24.816 388	16.15 210	46.892 494	49.54 84	27.157 313	57.63 212	7.209 369	56.4
July 8.7	25.216 400	14.47 168	47.387 495	50.81 127	27.475 318	55.63 200	7.582 373	58.0
	398	121	486	168	313	182	366	
18.7	25.614	13.26	47.873	52.49	27.788	53.81	7.948	59.9
28.7	26.003 389	12.55 71	48.339 466	54.53 204	28.091 303	52.22 159	8.299 351	62.0
Aug. 7.7	26.370 367	12.36 −19	48.776 437	56.87 234	28.376 285	50.89 133	8.629 330	64.3
17.6	26.706 336	12.70 −34	49.176 400	59.48 261	28.637 261	49.88 101	8.929 300	66.6
27.6	27.002 296	13.53 83	49.532 356	62.28 280	28.868 231	49.18 70	9.196 267	69.0
	250	131	307	294	198	39	232	
Sept. 6.6	27.252 199	14.84	49.839	65.22	29.066	48.79	9.428	71.5
16.6	27.451 145	16.56 172	50.095 256	68.25 303	29.229 163	48.72 −7	9.620 192	73.8
26.5	27.596 89	18.64 208	50.297 202	71.29 304	29.356 127	48.96 −24	9.773 153	76.1
Oct. 6.5	27.685 34	20.98 234	50.445 148	74.27 298	29.448 92	49.46 50	9.886 113	78.3
16.5	27.719 −18	23.49 251	50.538 93	77.17 290	29.505 57	50.21 75	9.961 75	80.3
		258	42	274	24	91	39	
26.4	27.701	26.07	50.580	79.91	29.529	51.12	10.000	82.1
Nov. 5.4	27.634 67	28.62 255	50.571 9	82.42 251	29.525 4	52.16 104	10.005 −5	83.6
15.4	27.524 110	31.03 241	50.513 58	84.65 223	29.494 31	53.27 111	9.977 28	85.0
25.4	27.377 147	33.20 217	50.409 104	86.54 189	29.440 54	54.41 114	9.919 58	86.0
Dec. 5.3	27.199 178	35.06 186	50.265 144	88.05 151	29.365 75	55.52 111	9.834 85	86.8
	292	145	181	107	91	103	109	
15.3	26.997	36.51	50.084	89.12	29.274	56.55	9.725	87.2
25.3	26.778 219	37.53 102	49.870 214	89.73 61	29.170 104	57.47 92	9.595 130	87.3
35.3	26.549 229	38.06 53	49.634 236	89.86 13	29.055 115	58.26 79	9.447 148	87.0
Mean Place	22.806	48.05	44.206	49.74	24.862	78.66	4.762	50.8
Sec δ, Tan δ	*1.471*	−1.079	1.723	+1.403	1.017	−0.187	1.223	+0.7
$D_\psi a$, $D_\omega a$	+0.05	+0.07	+0.07	−0.09	+0.06	+0.01	+0.07	
$D_\psi \delta$, $D_\omega \delta$	+0.4	+0.3	+0.4	+0.3	+0.4	+0.3	+0.4	

FOR THE UPPER TRANSIT AT WASHINGTON.

τ Piscium. Mag. 4.7		ζ Piscium. Mag. 5.6		κ Tucanæ. Mag. 5.0		f Piscium. Mag. 5.3	
Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.
h m	° ′	h m	° ′	h m	° ′	h m	° ′
1 7	+29 38	1 9	+ 7 8	1 12	−69 18	1 13	+ 3 10
s	″	s	″	s	″	s	″
6.276	73.39	24.792	20.55	59.02	73.55	32.212	46.46
136	49	109	67	55	12	109	69
6.140	72.90	24.683	19.88	58.47	73.43	32.103	45.77
143	75	116	68	55	71	117	66
5.997	72.15	24.567	19.20	57.92	72.72	31.986	45.11
144	98	117	67	53	130	117	59
5.853	71.17	24.450	18.53	57.39	71.42	31.869	44.52
137	119	111	64	49	184	112	53
5.716	69.98	24.339	17.89	56.90	69.58	31.757	43.99
121	132	100	57	44	232	104	41
5.595	68.66	24.239	17.32	56.46	67.26	31.653	43.58
100	141	80	46	38	275	84	29
5.495	67.25	24.159	16.86	56.08	64.51	31.569	43.29
67	141	57	33	30	310	60	10
5.428	65.84	24.102	16.53	55.78	61.41	31.509	43.19
29	137	24	15	21	338	28	—
5.399	64.47	24.078	16.38	55.57	58.03	31.481	43.26
14	128	13	—	13	361	7	7
5.413	63.24	24.091	16.42	55.44	54.42	31.488	43.53
62	107	54	4	4	372	47	27
5.475	62.17	24.145	16.71	55.40	50.70	31.535	44.05
113	80	96	52	6	376	88	76
5.588	61.37	24.241	17.23	55.46	46.94	31.623	44.81
162	52	139	78	17	374	136	99
5.750	60.85	24.380	18.01	55.63	43.20	31.759	45.80
209	19	182	102	27	362	176	124
5.959	60.66	24.562	19.03	55.90	39.58	31.935	47.04
253	16	221	128	35	341	213	145
6.212	60.82	24.783	20.31	56.25	36.17	32.148	48.49
288	50	264	148	44	315	250	164
6.500	61.32	25.037	21.79	56.69	33.02	32.398	50.13
320	85	281	167	52	281	277	181
6.820	62.17	25.318	23.46	57.21	30.21	32.675	51.94
339	117	303	180	58	239	297	189
7.159	63.34	25.621	25.26	57.79	27.82	32.972	53.83
353	147	315	190	63	192	309	194
7.512	64.81	25.936	27.16	58.42	25.90	33.281	55.77
355	172	318	194	65	140	315	196
7.867	66.53	26.254	29.10	59.07	24.50	33.596	57.73
349	191	316	194	67	85	314	193
8.216	68.44	26.570	31.04	59.74	23.65	33.910	59.66
337	209	303	189	66	27	303	183
8.553	70.53	26.873	32.93	60.40	23.38	34.213	61.49
315	218	287	178	63	33	285	166
8.868	72.71	27.160	34.71	61.03	23.71	34.498	63.15
289	224	263	162	59	91	264	151
9.157	74.95	27.423	36.33	61.62	24.62	34.762	64.66
256	224	235	145	52	144	237	130
9.413	77.19	27.658	37.78	62.14	26.06	34.999	65.96
223	221	203	124	44	194	205	104
9.636	79.40	27.861	39.02	62.58	28.00	35.204	67.00
186	213	170	102	35	236	171	82
9.822	81.53	28.031	40.04	62.93	30.36	35.375	67.82
148	201	136	78	24	272	137	55
9.970	83.54	28.167	40.82	63.17	33.08	35.512	68.37
111	186	101	56	14	296	104	31
10.081	85.40	28.268	41.38	63.31	36.04	35.616	68.68
74	168	68	34	3	309	71	9
10.155	87.08	28.336	41.72	63.34	39.13	35.687	68.77
41	149	38	13	8	309	41	12
10.196	88.57	28.374	41.85	63.26	42.22	35.728	68.65
8	126	8	5	20	298	10	29
10.204	89.83	28.382	41.80	63.06	45.20	35.738	68.36
23	103	17	22	28	276	13	42
10.181	90.86	28.365	41.58	62.78	47.96	35.725	67.94
48	77	40	35	37	240	39	54
10.133	91.63	28.325	41.23	62.41	50.36	35.686	67.40
75	52	60	46	44	196	61	62
10.058	92.15	28.265	40.77	61.97	52.32	35.625	66.78
97	22	80	55	50	146	78	70
9.961	92.37	28.185	40.22	61.47	53.78	35.547	66.08
118	5	95	62	53	88	94	69
9.843	92.32	28.090	39.60	60.94	54.66	35.453	65.39
131	34	107	67	55	28	106	71
9.712	91.98	27.983	38.93	60.39	54.94	35.347	64.68
e 5.091	57.55	23.597	12.37	57.309	61.27	30.988	39.65
∂ *1.151*	*+0.569*	*1.008*	*+0.125*	2.831	−2.648	1.002	+0.058
+0.07	*−0.04*	*+0.06*	*−0.01*	+0.04	+0.18	+0.06	0.00
+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.	υ Piscium. Mag. 4.7		θ Ceti. Mag. 3.8		δ Cassiopeiæ. Mag. 2.8		γ Phœni Mag. 3
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.
	h m 1 14 s	° ′ +26 49 ″	h m 1 19 s	° ′ − 8 36 ″	h m 1 20 s	° ′ +59 48 ″	h m 1 24 s
Jan. 0.3	55.262	56.29	53.713	37.99	23.925	39.99	47.124
	130	47	116	71	303	19	212
10.3	55.132	55.82	53.597	38.70	23.622	40.18	46.912
	138	72	122	56	318	34	215
20.2	54.994	55.10	53.475	39.26	23.304	39.84	46.697
	140	91	123	38	320	86	212
30.2	54.854	54.19	53.352	39.64	22.984	38.98	46.485
Feb. 9.2	136	108	119	17	306	133	204
	54.718	53.11	53.233	39.81	22.678	37.65	46.281
	122	121	109	3	278	175	187
19.1	54.596	51.90	53.124	39.78	22.400	35.90	46.094
	102	127	92	26	235	209	162
Mar. 1.1	54.494	50.63	53.032	39.52	22.165	33.81	45.932
	71	127	68	48	179	234	129
11.1	54.423	49.36	52.964	39.04	21.986	31.47	45.803
	36	120	38	73	109	249	90
21.1	54.387	48.16	52.926	38.31	21.877	28.98	45.713
	— 7	109	— 4	97	— 31	254	— 46
31.0	54.394	47.07	52.922	37.34	21.846	26.44	45.667
	53	91	37	121	53	248	4
Apr. 10.0	54.447	46.16	52.959	36.13	21.899	23.96	45.671
	102	66	79	143	138	232	57
20.0	54.549	45.50	53.038	34.70	22.037	21.64	45.728
	151	37	122	166	223	207	111
30.0	54.700	45.13	53.160	33.04	22.260	19.57	45.839
May 9.9	198	— 8	165	183	300	173	166
	54.898	45.05	53.325	31.21	22.560	17.84	46.005
19.9	241	26	205	199	373	134	217
	55.139	45.31	53.530	29.22	22.933	16.50	46.222
	277	59	239	211	433	91	264
29.9	55.416	45.90	53.769	27.11	23.366	15.59	46.486
	308	90	270	215	482	44	303
June 8.8	55.724	46.80	54.039	24.96	23.848	15.15	46.789
	330	120	291	216	518	— 3	337
18.8	56.054	48.00	54.330	22.80	24.366	15.18	47.126
	343	147	308	212	541	52	362
28.8	56.397	49.47	54.638	20.68	24.907	15.70	47.488
July 8.8	348	170	314	202	548	98	377
	56.745	51.17	54.952	18.66	25.455	16.68	47.865
	344	188	313	186	544	142	381
18.7	57.089	53.05	55.265	16.80	25.999	18.10	48.246
	333	201	304	164	527	182	375
28.7	57.422	55.06	55.569	15.16	26.526	19.92	48.621
	312	211	289	140	499	219	359
Aug. 7.7	57.734	57.17	55.858	13.76	27.025	22.11	48.980
	289	213	267	112	461	249	334
17.7	58.023	59.30	56.125	12.64	27.486	24.60	49.314
	258	211	241	80	417	274	302
27.6	58.281	61.41	56.366	11.84	27.903	27.34	49.616
	225	207	209	50	365	294	261
Sept. 6.6	58.506	63.48	56.575	11.34	28.268	30.28	49.877
	191	197	176	17	310	308	216
16.6	58.697	65.45	56.751	11.17	28.578	33.36	50.093
	154	185	141	13	251	315	167
26.5	58.851	67.30	56.892	11.30	28.829	36.51	50.260
Oct. 6.5	117	168	107	40	189	317	118
	58.968	68.98	56.999	11.70	29.018	39.68	50.378
16.5	83	152	73	64	129	312	67
	59.051	70.50	57.072	12.34	29.147	42.80	50.445
	50	132	41	83	67	299	16
26.5	59.101	71.82	57.113	13.17	29.214	45.79	50.461
	18	111	11	97	— 6	283	29
Nov. 5.4	59.119	72.93	57.124	14.14	29.220	48.62	50.432
	— 13	89	— 17	107	— 54	257	73
15.4	59.106	73.82	57.107	15.21	29.166	51.19	50.359
	39	65	40	111	110	227	110
25.4	59.067	74.47	57.067	16.32	29.056	53.46	50.249
Dec. 5.4	66	41	64	109	164	190	144
	59.001	74.88	57.003	17.41	28.892	55.36	50.105
	88	15	82	105	214	147	170
15.3	58.913	75.03	56.921	18.46	28.678	56.83	49.935
	108	9	98	95	256	100	192
25.3	58.805	74.94	56.823	19.41	28.422	57.83	49.743
	125	35	113	83	289	48	209
35.3	58.680	74.59	56.710	20.24	28.133	58.31	49.534
Mean Place	54.019	41.37	52.444	40.68	22.443	16.27	45.714
Sec δ, Tan δ	*1.121*	*+0.506*	1.011	−0.151	1.988	+1.718	1.384
$D_\psi a$, $D_\omega a$	+0.06	−0.03	+0.06	+0.01	+0.08	−0.11	+0.05
$D_\psi \delta$, $D_\omega \delta$	+0.4	+0.3	+0.4	+0.3	+0.4	+0.3	+0.4

FOR THE UPPER TRANSIT AT WASHINGTON.

38 Cassiopeiæ. Mag. 6.0				η Piscium. Mag. 3.7				40 Cassiopeiæ. Mag. 5.5				υ Andromedæ. Mag. 4.2			
Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
h	m	°	′	h	m	°	′	h	m	°	′	h	m	°	′
1	25	+69	50	1	27	+14	55	1	31	+72	37	1	31	+40	59
s		″		s		″		s		″		s		″	
3.61		42.28		3.648		16.93		53.40		29.31		56.584		45.90	
3.12	49	42.76	48	3.535	113	16.35	58	52.84	56	29.94	63	56.419	165	45.77	13
2.61	51	42.65	11	3.413	122	15.67	68	52.23	61	29.97	3	56.239	180	45.29	48
2.10	51	41.97	68	3.286	127	14.93	74	51.62	61	29.42	55	56.053	186	44.45	84
1.61	49	40.74	123	3.161	125	14.14	79	51.03	59	28.29	113	55.871	182	43.29	116
	45		173		114		80		54		164		169		142
1.16		39.01		3.047		13.34		50.49		26.65		55.702		41.87	
0.79	37	36.87	214	2.948	99	12.57	77	50.03	46	24.56	209	55.556	146	40.24	163
0.49	30	34.39	248	2.874	74	11.88	69	49.66	37	22.11	245	55.444	112	38.48	176
0.29	20	31.70	269	2.831	43	11.30	58	49.40	26	19.41	270	55.374	70	36.67	181
0.21	8	28.91	279	2.827	4	10.88	42	49.27	13	16.58	283	55.354	20	34.88	179
	4		278		38		20		2		286		34		166
0.25		26.13		2.865		10.68		49.29		13.72		55.388		33.22	
0.41	16	23.44	269	2.948	83	10.70	2	49.45	16	10.94	278	55.482	94	31.73	149
0.69	28	20.98	246	3.076	128	10.98	28	49.74	29	8.38	256	55.633	151	30.50	123
1.08	39	18.84	214	3.249	173	11.52	54	50.16	42	6.08	230	55.839	206	29.57	93
1.57	49	17.07	177	3.463	214	12 35	83	50.71	55	4.16	192	56.098	259	28.99	58
	60		133		251		108		65		149		303		20
2.17		15.74		3.714		13.43		51.36		2.67		56.401		28.79	
2.82	65	14.90	84	3.994	280	14.74	131	52.09	73	1.65	102	56.742	341	28.97	18
3.52	70	14.55	35	4.298	304	16.25	151	52.88	79	1.14	51	57.111	369	29.53	56
4.26	74	14.72	17	4.617	319	17.94	169	53.71	83	1.15	1	57.497	386	30.45	92
5.02	76	15.40	68	4.942	325	19.74	180	54.57	86	1.67	52	57.893	396	31.73	128
	75		116		325		187		85		102		394		158
5.77		16.56		5.267		21.61		55.42		2.69		58.287		33.31	
6.50	73	18.19	163	5.582	315	23.50	189	56.26	84	4.18	149	58.672	385	35.15	184
7.20	70	20.25	206	5.881	299	25.37	187	57.06	80	6.11	193	59.038	366	37.22	207
7.85	65	22.68	243	6.160	279	27.17	180	57.81	75	8.44	233	59.378	340	39.45	223
8.42	57	25.43	275	6.411	251	28.85	168	58.49	68	11.12	268	59.688	310	41.80	235
	52		302		222		155		60		297		275		242
8.94		28.45		6.633		30.40		59.09		14.09		59.963		44.22	
9.38	44	31.67	322	6.823	190	31.78	138	59.61	52	17.29	320	60.200	237	46.67	245
9.74	36	35.02	335	6.979	156	32.95	117	60.03	42	20.65	336	60.397	197	49.09	242
10.00	26	38.45	343	7.102	123	33.94	99	60.36	33	24.11	346	60.553	156	51.45	236
10.18	18	41.89	344	7.193	91	34.72	78	60.58	22	27.60	349	60.669	116	53.69	224
	8		336		58		59		10		345		75		209
10.26		45.25		7.251		35.31		60.68		31.05		60.744		55.78	
10.25	1	48.46	321	7.280	29	35.71	40	60.69	1	34.37	332	60.781	37	57.69	191
10.15	10	51.44	298	7.282	2	35.92	21	60.59	10	37.48	311	60.781	0	59.36	167
9.97	18	54.13	269	7.257	25	35.96	4	60.38	21	40.32	284	60.743	38	60.78	142
9.70	27	56.44	231	7.208	49	35.85	11	60.06	32	42.79	247	60.671	72	61.90	112
	36		186		71		27		40		203		104		80
9.34		58.30		7.137		35.58		59.66		44.82		60.567		62.70	
8.93	41	59.66	136	7.046	91	35.18	40	59.18	48	46.35	153	60.436	131	63.15	45
8.47	46	60.48	82	6.939	107	34.65	53	58.64	54	47.32	97	60.279	157	63.23	8
α	1.814	16.94		2.336		6.06		51.309		3.69		55.147		28.87	
δ	2.902	+2.724		1.035		+0.266		3.347		+3.195		1.325		+0.869	
	+0.09	−0.18		+0.06		−0.02		+0.09		−0.20		+0.07		−0.05	
	+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 Cassi Mag.
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.
	h m s 1 32	° ′ ″ +11 43	h m s 1 32	° ′ ″ +48 12	h m s 1 34	° ′ ″ −57 38	h m s 1 36
Jan. 0.3	43.094	12.09	54.863	50.20	39.082	100.04	12.35
10.3	42.984 110	11.49 60	54.665 198	50.26 — 6	38.752 330	100.45 — 41	11.93 42
20.2	42.863 121	10.83 66	54.448 217	49.88 38	38.416 336	100.31 14	11.49 44
30.2	42.738 125	10.14 69	54.226 222	49.08 80	38.084 332	99.61 70	11.03 46
Feb. 9.2	42.613 125	9.44 70	54.009 217	47.89 119	37.765 319	98.37 124	10.58 45
	115	69	202	152	293	174	41
19.2	42.498	8.75	53.807	46.37	37.472	96.63	10.17
Mar. 1.1	42.398 100	8.12 63	53.633 174	44.59 178	37.212 260	94.44 219	9.82 35
11.1	42.321 77	7.59 53	53.498 135	42.62 197	36.995 217	91.84 260	9.53 29
21.1	42.274 47	7.19 40	53.412 86	40.55 207	36.829 166	88.91 293	9.33 20
31.0	42.264 — 10	6.97 22	53.382 — 30	38.45 210	36.722 107	85.71 320	9.23 — 10
	31	3	33	201	42	341	1
Apr. 10.0	42.295	6.94	53.415	36.44	36.680	82.30	9.24
20.0	42.370 75	7.16 22	53.515 100	34.60 184	36.706 26	78.76 354	9.38 14
30.0	42.490 120	7.61 45	53.679 164	33.01 159	36.803 97	75.16 360	9.61 23
May 9.9	42.655 165	8.33 72	53.906 227	31.72 129	36.969 166	71.59 357	9.95 34
19.9	42.860 205	9.29 96	54.191 285	30.78 94	37.204 235	68.14 345	10.38 43
	242	121	335	53	297	329	53
29.9	43.102	10.50	54.526	30.25	37.501	64.85	10.90
June 8.9	43.375 273	11.91 141	54.901 375	30.13 — 12	37.854 353	61.82 303	11.50 60
18.8	43.673 298	13.51 160	55.309 408	30.43 71	38.253 399	59.13 269	12.14 64
28.8	43.985 312	15.23 172	55.736 427	31.14 110	38.689 436	56.84 229	12.81 67
July 8.8	44.306 321	17.05 182	56.173 437	32.24 146	39.149 460	55.00 184	13.50 69
	321	186	435		472	133	70
18.7	44.627	18.91	56.608	33.70	39.621	53.67	14.20
28.7	44.940 313	20.77 186	57.033 425	35.49 179	40.091 470	52.89 78	14.88 68
Aug. 7.7	45.238 298	22.58 181	57.438 405	37.57 208	40.547 456	52.68 — 21	15.53 65
17.7	45.517 279	24.26 168	57.816 378	39.86 229	40.975 428	53.04 36	16.14 61
27.6	45.769 252	25.84 158	58.160 344	42.34 248	41.364 389	53.97 93	16.69 55
	223	140	306	262	340	145	55
Sept. 6.6	45.992	27.24	58.466	44.96	41.704	55.42	17.19
16.6	46.185 193	28.45 121	58.729 263	47.64 268	41.986 282	57.35 193	17.62 43
26.6	46.345 160	29.45 100	58.948 219	50.34 270	42.205 219	59.67 232	17.97 35
Oct. 6.5	46.471 126	30.23 78	59.122 174	53.01 267	42.353 148	62.33 266	18.25 28
16.5	46.566 95	30.82 59	59.250 128	55.60 259	42.432 79	65.19 286	18.45 20
	63	38	83	248	9	297	11
26.5	46.629	31.20	59.333	58.08	42.441	68.16	18.56
Nov. 5.4	46.662 33	31.39 19	59.371 38	60.37 229	42.381 60	71.12 296	18.59 — 3
15.4	46.668 — 6	31.42 — 3	59.365 — 6	62.43 206	42.259 122	73.95 283	18.54 5
25.4	46.647 21	31.29 13	59.317 48	64.23 180	42.080 179	76.53 258	18.41 13
Dec. 5.4	46.603 44	31.02 27	59.228 89	65.69 146	41.852 228	78.78 225	18.20 21
	68	38	127	111	270	182	21
15.3	46.535	30.64	59.101	66.80	41.582	80.60	17.91
25.3	46.448 87	30.15 49	58.941 160	67.52 72	41.280 302	81.92 132	17.55 36
35.3	46.345 103	29.58 57	58.753 188	67.82 30	40.957 323	82.71 79	17.15 40
Mean Place	41.751	2.35	53.356	29.27	37.452	89.67	10.410
Sec δ, Tan δ	*1.021*	*+0.207*	1.500	*+1.119*	1.869	*−1.579*	2.628
$D_\psi\, a$, $D_\omega\, a$	*+0.06*	−0.01	+0.07	−0.07	+0.04	+0.10	+0.09
$D_\psi\, \delta$, $D_\omega\, \delta$	*+0.4*	+0.4	+0.4	+0.4	+0.4	+0.4	+0.4

FOR THE UPPER TRANSIT AT WASHINGTON.

...shington ...n Time.	ν Piscium. Mag. 4.7		φ Persei. Mag. 4.2		τ Ceti. Mag. 3.6		o Piscium. Mag. 4.5	
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.
	h m s	° ′ ″	h m s	° ′ ″	h m s	° ′ ″	h m s	° ′ ″
	1 37	+ 5 4	1 38	+50 16	1 40	−16 21	1 41	+ 8 44
ı. 0.3	7.980	12.38	28.556	37.44	14.065	86.76	1.908	34.14
10.3	7.874 106	11.71 67	28.346 210	37.60 16	13.938 127	87.51 75	1.801 107	33.52 62
20.2	7.754 120	11.06 65	28.118 228	37.31 29	13.802 136	88.03 52	1.681 120	32.87 65
30.2	7.630 124	10.44 62	27.882 236	36.58 73	13.662 140	88.27 24	1.555 126	32.22 65
b. 9.2	7.507 123	9.89 55	27.649 233	35.46 112	13.523 139	88.24 3	1.429 126	31.59 63
	116	47	217	149	131	33	118	58
19.2	7.391 101	9.42 35	27.432 191	33.97 179	13.392 114	87.91 61	1.311 106	31.01 50
r. 1.1	7.290 80	9.07 21	27.241 150	32.18 199	13.278 93	87.30 87	1.205 82	30.51 39
11.1	7.210 50	8.86 5	27.091 99	30.19 213	13.185 63	86.43 116	1.123 55	30.12 23
21.1	7.160 15	8.81 16	26.992 39	28.06 215	13.122 28	85.27 141	1.068 18	29.89 6
31.0	7.145 24	8.97 37	26.953 24	25.91 209	13.094 11	83.86 167	1.050 23	29.83 15
r. 10.0	7.169	9.34	26.977	23.82	13.105	82.19	1.073	29.98
20.0	7.237 68	9.95 61	27.070 93	21.87 195	13.160 55	80.30 189	1.138 65	30.35 37
30.0	7.350 113	10.79 84	27.231 161	20.16 171	13.259 99	78.21 209	1.249 111	30.98 63
y 9.9	7.505 155	11.87 108	27.458 227	18.74 142	13.403 144	75.98 223	1.404 155	31.83 85
19.9	7.702 197	13.17 130	27.746 288	17.68 106	13.588 185	73.63 235	1.601 197	32.93 110
	232	148	341	67	223	242	234	132
29.9	7.934	14.65	28.087	17.01	13.811	71.21	1.835	34.25
ıe 8.9	8.199 265	16.33 168	28.471 384	16.75 26	14.068 257	68.79 242	2.101 266	35.75 150
18.8	8.488 289	18.11 178	28.888 417	16.92 17	14.350 282	66.42 237	2.391 290	37.42 167
28.8	8.795 307	19.97 186	29.329 441	17.51 59	14.651 301	64.15 227	2.699 308	39.19 177
ly 8.8	9.110 315	21.89 192	29.780 451	18.50 99	14.962 311	62.07 208	3.016 317	41.02 183
	316	187	451	136	315	186	318	185
18.7	9.426	23.76	30.231	19.86	15.277	60.21	3.334	42.87
28.7	9.733 307	25.57 181	30.672 441	21.58 172	15.585 308	58.62 159	3.646 312	44.69 182
g. 7.7	10.030 297	27.25 168	31.095 423	23.59 201	15.881 296	57.36 126	3.945 299	46.43 174
17.7	10.306 276	28.77 152	31.490 395	25.84 225	16.158 277	56.43 93	4.225 280	48.03 160
27.6	10.557 251	30.10 133	31.852 362	28.30 246	16.410 252	55.88 55	4.480 255	49.47 144
	222	111	323	262	222	17	229	125
pt. 6.6	10.779	31.21	32.175	30.92	16.632	55.71	4.709	50.72
16.6	10.972 193	32.08 87	32.456 281	33.62 270	16.822 190	55.91 20	4.906 197	51.77 105
26.6	11.132 160	32.70 62	32.691 235	36.36 274	16.976 154	56.44 53	5.072 166	52.60 83
t. 6.5	11.260 128	33.10 40	32.880 189	39.10 274	17.096 120	57.28 84	5.206 134	53.19 59
16.5	11.356 96	33.26 16	33.021 141	41.78 268	17.180 84	58.39 111	5.308 102	53.58 39
	64	4	94	256	51	129	70	17
26.5	11.420	33.22	33.115	44.34	17.231	59.68	5.378	53.75
ov. 5.4	11.455 35	33.00 22	33.161 46	46.75 241	17.250 19	61.11 143	5.420 42	53.76 1
15.4	11.463 8	32.64 36	33.161 0	48.93 218	17.238 12	62.61 150	5.433 13	53.61 15
25.4	11.444 19	32.16 48	33.116 45	50.85 192	17.199 39	64.11 150	5.419 14	53.31 30
ec. 5.4	11.402 42	31.60 56	33.027 89	52.44 159	17.135 64	65.54 143	5.382 37	52.90 41
	65	64	130	124	86	130	62	49
15.3	11.337	30.96	32.897	53.68	17.049	66.84	5.320	52.41
25.3	11.253 84	30.29 67	32.730 167	54.52 84	16.943 106	67.97 113	5.238 82	51.85 56
35.3	11.152 101	29.60 69	32.534 196	54.93 41	16.821 122	68.90 93	5.137 101	51.23 62
ın Place	6.617	4.95	26.963	16.10	12.695	86.83	0.516	25.46
∂, Tan ∂	*1.004*	*+0.089*	*1.565*	+1.203	1.042	−0.294	1.012	+0.154
, $D_m\,\alpha$	*+0.06*	*−0.01*	*+0.07*	*−0.07*	+0.06	+0.02	+0.06	−0.01
$D_m\,\delta$	*+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.	ε Sculptoris. Mag. 5.4		ζ Ceti. Mag. 3.9		α Trianguli. Mag. 3.6		ε Cassiop Mag. 3
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.
	h m s 1 41	° ′ ″ −25 27	h m s 1 47	° ′ ″ −10 44	h m s 1 48	° ′ ″ +29 10	h m s 1 48
Jan. 0.3	46.709	63.43	23.205	38.36	22.253	45.45	26.49
	141	81	115	82	128		33
10.3	46.568	64.24	23.090	39.18	22.125	45.19	26.16
	150	48	127	62	142	26	36
20.2	46.418	64.72	22.963	39.80	21.983	44.69	25.80
	154	12	132	42	152	50	37
30.2	46.264	64.84	22.831	40.22	21.831	43.96	25.43
	153	23	133	19	153	73	37
Feb. 9.2	46.111	64.61	22.698	40.41	21.678	43.05	25.06
	145	58	128	4	146	91	35
19.2	45.966	64.03	22.570	40.37	21.532	41.97	24.71
	128	92	113	29	131	121	31
Mar. 1.1	45.838	63.11	22.457	40.08	21.401	40.76	24.40
	105	125	93	54	104	126	26
11.1	45.733	61.86	22.364	39.54	21.297	39.50	24.14
	74	158	65	79	70	125	26
21.1	45.659	60.28	22.299	38.75	21.227	38.25	23.96
	38	184	32	104	29	117	18
31.1	45.621	58.44	22.267	37.71	21.198	37.08	23.87
	3	210	8	129	17	105	9
							1
Apr. 10.0	45.624	56.34	22.275	36.42	21.215	36.03	23.86
	47	232	49	152	67	86	9
20.0	45.671	54.02	22.324	34.90	21.282	35.17	23.95
	93	249	95	173	119	62	19
30.0	45.764	51.53	22.419	33.17	21.401	34.55	24.14
	141	262	138	192	169	35	27
May 9.9	45.905	48.91	22.557	31.25	21.570	34.20	24.41
	185	269	181	206	216	5	37
19.9	46.090	46.22	22.738	29.19	21.786	34.15	24.78
	225	271	219	218	259	26	44
29.9	46.315	43.51	22.957	27.01	22.045	34.41	25.22
June 8.9	261	265	252	222	293	57	49
	46.576	40.86	23.209	24.79	22.338	34.98	25.71
18.8	289	252	278	223	321	88	55
	46.865	38.34	23.487	22.56	22.659	35.86	26.26
28.8	311	236	297	216	341	116	58
	47.176	35.98	23.784	20.40	23.000	37.02	26.84
July 8.8	322	211	310	206	352	139	60
	47.498	33.87	24.094	18.34	23.352	38.41	27.44
	328	181	314	190	352	161	60
18.8	47.826	32.06	24.408	16.44	23.704	40.02	28.04
	324	146	308	166	348	176	60
28.7	48.150	30.60	24.716	14.78	24.052	41.78	28.64
Aug. 7.7	312	108	298	141	334	188	58
	48.462	29.52	25.014	13.37	24.386	43.66	29.22
17.7	294	66	281	110	313	195	54
	48.756	28.86	25.295	12.27	24.699	45.61	29.76
27.6	267	22	257	77	289	198	51
	49.023	28.64	25.552	11.50	24.988	47.59	30.27
	239	21	231	43	259	197	45
Sept. 6.6	49.262	28.85	25.783	11.07	25.247	49.56	30.72
	203	62	199	10	227	191	40
16.6	49.465	29.47	25.982	10.97	25.474	51.47	31.12
	166	101	166	24	195	182	32
26.6	49.631	30.48	26.148	11.21	25.669	53.29	31.44
Oct. 6.5	129	132	134	53	159	171	27
	49.760	31.80	26.282	11.74	25.828	55.00	31.71
16.5	91	160	100	80	124	156	21
	49.851	33.40	26.382	12.54	25.952	56.56	31.92
	54	178	67	100	91	141	14
26.5	49.905	35.18	26.449	13.54	26.043	57.97	32.06
	19	190	37	116	57	122	6
Nov. 5.5	49.924	37.08	26.486	14.70	26.100	59.19	32.12
	15	194	8	126	24	104	0
15.4	49.909	39.02	26.494	15.96	26.124	60.23	32.12
	45	189	21	129	7	83	7
25.4	49.864	40.91	26.473	17.25	26.117	61.06	32.05
Dec. 5.4	73	177	46	127	38	60	16
	49.791	42.68	26.427	18.52	26.079	61.66	31.89
	97	156	70	121	67	38	20
15.3	49.694	44.24	26.357	19.73	26.012	62.04	31.69
	118	133	89	109	94	12	26
25.3	49.576	45.57	26.268	20.82	25.918	62.16	31.43
35.3	135	104	108	95	118	13	31
	49.441	46.61	26.160	21.77	25.800	62.03	31.12
Mean Place	45.290	60.82	21.784	40.43	20.746	30.12	24.487
Sec δ, Tan δ	1.108	−0.476	1.018	−0.190	1.145	+0.558	2.223
$D_\phi a$, $D_\omega a$	+0.06	+0.03	+0.06	+0.01	+0.07	−0.03	+0.08
$D_\phi \delta$, $D_\omega \delta$	+0.4	+0.4	+0.4	+0.5	+0.4	+0.5	+0.4

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	ξ Piscium. Mag. 4.8		β Arietis. Mag. 2.7		ψ Phœnicis. Mag. 4.4		υ Ceti. Mag. 4.2	
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.
	h m 1 49 s	° ′ + 2 46 ″	h m 1 50 s	° ′ +20 24 ″	h m 1 50 s	° ′ −46 41 ″	h m 1 56 s	° ′ −21 28 ″
Jan. 0.3	16.855	48.36	4.536	22.54	20.591	100.86	7.101	47.42
10.3	16.750 105	47.67 69	4.423 113	22.13 41	20.361 230	101.63 77	6.971 130	48.34 92
20.2	16.631 119	47.02 65	4.295 128	21.56 57	20.121 240	101.90 27	6.828 143	48.94 60
30.2	16.505 126	46.43 59	4.158 137	20.85 71	19.877 244	101.65 25	6.678 150	49.23 29
Feb. 9.2	16.377 128	45.92 51	4.020 138	20.05 80	19.637 240	100.90 75	6.527 151	49.20 3
	123	39	133	88	226	123	145	36
19.2	16.254 109	45.53 25	3.887 118	19.17 91	19.411 204	99.67 168	6.382 133	48.84 69
Mar. 1.1	16.145 90	45.28 11	3.769 97	18.26 89	19.207 176	97.99 208	6.249 111	48.15 100
11.1	16.055 61	45.17 7	3.672 65	17.37 83	19.031 136	95.91 245	6.138 84	47.15 131
21.1	15.994 27	45.24 28	3.607 27	16.54 71	18.895 90	93.46 275	6.054 49	45.84 160
31.1	15.967 12	45.52 49	3.580 15	15.83 55	18.805 40	90.71 301	6.005 9	44.24 185
Apr. 10.0	15.979	46.01	3.595	15.28	18.765	87.70	5.996	42.39
20.0	16.034 55	46.73 72	3.657 62	14.93 35	18.780 15	84.52 318	6.030 34	40.30 209
30.0	16.134 100	47.68 95	3.767 110	14.82 11	18.853 73	81.21 331	6.110 80	38.02 228
May 9.9	16.277 143	48.87 119	3.924 157	14.98 16	18.984 131	77.85 336	6.236 126	35.59 243
19.9	16.461 184	50.25 138	4.126 202	15.40 42	19.172 188	74.51 334	6.407 171	33.06 253
	224	158	241	71	239	324	211	259
29.9	16.685	51.83	4.367	16.11	19.411	71.27	6.618	30.47
June 8.9	16.941 256	53.55 172	4.642 275	17.07 96	19.697 286	68.22 305	6.866 248	27.91 256
18.8	17.222 281	55.38 183	4.944 302	18.27 120	20.022 325	65.41 281	7.142 276	25.41 250
28.8	17.522 300	57.27 189	5.265 321	19.68 141	20.378 356	62.93 248	7.442 300	23.05 236
July 8.8	17.833 311	59.18 191	5.596 331	21.27 159	20.755 377	60.84 209	7.756 314	20.90 215
	314	180	333	170	389	165	320	190
18.8	18.147	61.04	5.929	22.97	21.144	59.19	8.076	19.00
28.7	18.457 310	62.81 177	6.258 329	24.75 178	21.533 389	58.03 116	8.396 320	17.42 158
Aug. 7.7	18.754 297	64.43 162	6.574 316	26.57 182	21.913 380	57.40 63	8.703 307	16.20 122
17.7	19.034 280	65.88 145	6.871 297	28.38 181	22.273 360	57.30 10	8.996 293	15.36 84
27.6	19.291 257	67.11 123	7.145 274	30.14 176	22.605 332	57.76 46	9.267 271	14.94 42
	232	100	246	165	295	98	243	2
Sept. 6.6	19.523	68.11	7.391	31.79	22.900	58.74	9.510	14.92
16.6	19.724 201	68.85 74	7.606 215	33.34 155	23.152 252	60.21 147	9.722 212	15.32 40
26.6	19.894 170	69.34 49	7.791 185	34.74 140	23.356 204	62.10 189	9.899 177	16.10 78
Oct. 6.5	20.033 139	69.57 23	7.942 151	35.97 123	23.509 153	64.36 226	10.042 143	17.22 112
16.5	20.140 107	69.58 1	8.060 118	37.03 106	23.609 100	66.89 253	10.149 107	18.61 139
	76	20	87	88	48	270	71	160
26.5	20.216	69.38	8.147	37.91	23.657	69.59	10.220	20.21
Nov. 5.5	20.264 48	69.00 38	8.203 56	38.60 69	23.652 5	72.35 276	10.257 37	21.96 175
15.4	20.282 18	68.49 51	8.229 26	39.12 52	23.601 51	75.06 271	10.263 6	23.78 182
25.4	20.274 8	67.87 62	8.226 3	39.47 35	23.506 95	77.61 255	10.237 26	25.58 180
Dec. 5.4	20.239 35	67.18 69	8.194 32	39.63 16	23.370 136	79.92 231	10.183 54	27.30 172
	57	74	58	1	171	196	81	156
15.3	20.182	66.44	8.136	39.62	23.199	81.88	10.102	28.86
25.3	20.101 81	65.69 75	8.053 83	39.44 18	22.999 200	83.43 155	10.000 102	30.22 136
35.3	20.003 98	64.95 74	7.948 105	39.10 34	22.778 221	84.53 110	9.877 123	31.33 111
Mean Place	15.422	41.75	3.057	10.04	19.001	92.87	5.618	46.13
$\mu\delta$, Tan δ	*1.001*	*+0.049*	*1.067*	*+0.372*	1.458	−1.062	1.075	−0.393
μ, $D_m\alpha$	*+0.06*	*0.00*	*+0.07*	−0.02	+0.05	+0.06	+0.06	+0.02
$D_m\delta$	*+0.4*	*+0.5*	*+0.4*	+0.5	+0.4	+0.5	+0.3	+0.5

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	α Hydri. Mag. 3.0		50 Cassiopeiæ. Mag. 4.1		γ Andromedæ pr. Mag. 2.3		α Mag.
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension
	h m s 1 56	° ′ ″ −61 57	h m s 1 56	° ′ ″ +72 1	h m s 1 58	° ′ ″ +41 55	h m s 2 2
Jan. 0.3	10.74	94.94	21.69	38.40	49.563	74.24	31.005
	39	65	52	92	159	13	
10.3	10.35	95.59	21.17	39.32	49.404	74.37	30.892
	41	6	57	34	179	24	
20.3	9.94	95.65	20.60	39.66	49.225	74.13	30.762
	41	−52	59	−24	192	59	
30.2	9.53	95.13	20.01	39.42	49.033	73.54	30.621
	40	108	58	82	196	92	
Feb. 9.2	9.13	94.05	19.43	38.60	48.837	72.62	30.476
	37	161	55	136	189	122	
19.2	8.76	92.44	18.88	37.24	48.648	71.40	30.333
Mar. 1.1	34	209	50	184	170	145	
	8.42	90.35	18.38	35.40	48.478	69.95	30.203
	30	252	40	223	141	163	
11.1	8.12	87.83	17.98	33.17	48.337	68.32	30.096
	25	289	31	254	101	173	
21.1	7.87	84.94	17.67	30.63	48.236	66.59	30.019
	17	319	19	272	52	175	
31.1	7.70	81.75	17.48	27.91	48.184	64.84	29.979
	11	342	7	281	3	169	
Apr. 10.0	7.59	78.33	17.41	25.10	48.187	63.15	29.982
	4	359	−9	278	60	157	
20.0	7.55	74.74	17.50	22.32	48.247	61.58	30.032
	−5	365	22	264	120	136	
30.0	7.60	71.09	17.72	19.68	48.367	60.22	30.131
May 10.0	14	366	34	241	180	109	
	7.74	67.43	18.06	17.27	48.547	59.13	30.279
	21	357	48	209	235	77	
19.9	7.95	63.86	18.54	15.18	48.782	58.36	30.474
	28	341	58	171	284	45	
29.9	8.23	60.45	19.12	13.47	49.066	57.91	30.709
	35	316	67	128	326	8	
June 8.9	8.58	57.29	19.79	12.19	49.392	57.83	30.981
	40	285	74	80	360	−29	
18.8	8.98	54.44	20.53	11.39	49.752	58.12	31.282
	46	245	80	31	383	64	
28.8	9.44	51.99	21.33	11.08	50.135	58.76	31.603
July 8.8	49	200	82	−19	397	98	
	9.93	49.99	22.15	11.27	50.532	59.74	31.937
	51	148	84	69	402	130	
18.8	10.44	48.51	22.99	11.96	50.934	61.04	32.276
	52	92	84	116	396	158	
28.7	10.96	47.59	23.83	13.12	51.330	62.62	32.611
Aug. 7.7	51	35	81	161	385	181	
	11.47	47.24	24.64	14.73	51.715	64.43	32.936
	49	−24	77	202	364	200	
17.7	11.96	47.48	25.41	16.75	52.079	66.43	33.244
	46	83	72	238	338	216	
27.7	12.42	48.31	26.13	19.13	52.417	68.59	33.530
	40	139	65	271	306	225	
Sept. 6.6	12.82	49.70	26.78	21.84	52.723	70.84	33.789
	35	191	57	297	271	230	
16.6	13.17	51.61	27.35	24.81	52.994	73.14	34.020
	27	233	48	317	235	231	
26.6	13.44	53.94	27.83	27.98	53.229	75.45	34.220
Oct. 6.5	20	271	40	330	195	229	
	13.64	56.65	28.23	31.28	53.424	77.74	34.387
	12	295	31	338	156	221	
16.5	13.76	59.60	28.54	34.66	53.580	79.95	34.522
	5	310	20	339	116	209	
26.5	13.81	62.70	28.74	38.05	53.696	82.04	34.625
	−4	312	8	331	75	196	
Nov. 5.5	13.77	65.82	28.82	41.36	53.771	84.00	34.696
	12	301	−1	316	−36	178	
15.4	13.65	68.83	28.81	44.52	53.807	85.78	34.736
	19	281	13	292	−3	154	
25.4	13.46	71.64	28.68	47.44	53.804	87.32	34.744
Dec. 5.4	25	247	22	262	43	128	
	13.21	74.11	28.46	50.06	53.761	88.60	34.723
	30	206	32	222	80	100	
15.4	12.91	76.17	28.14	52.28	53.681	89.60	34.674
	35	157	42	177	115	67	
25.3	12.56	77.74	27.72	54.05	53.566	90.27	34.596
	38	102	48	125	144	33	
35.3	12.18	78.76	27.24	55.30	53.422	90.60	34.495
Mean Place	8.844	84.38	19.026	13.50	47.863	55.46	29.429
Sec δ, Tan δ	*2.128*	*−1.879*	3.240	+3.082	1.344	+0.898	1.087
$D_\psi\, a$, $D_\omega\, a$	+0.04	+0.11	+0.10	−0.18	+0.07	−0.05	+0.07
δ, $D_\omega\, \delta$	+0.3	+0.5	+0.3	+0.5	+0.3	+0.5	+0.3

FOR THE UPPER TRANSIT AT WASHINGTON.

ington Time.	β Trianguli. Mag. 3.1		55 Cassiopeiæ. Mag. 6.2		6 Persei. Mag. 5.4		ξ¹ Ceti. Mag. 4.5	
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.
	h m	° ′	h m	° ′	h m	° ′	h m	° ′
	2 4	+34 35	2 7	+66 8	2 8	+50 40	2 8	+ 8 27
	s	″	s	″	s	″	s	″
0.3	37.638	59.59	59.43	33.94	6.488	71.92	37.464	36.46
10.3	37.506 132	59.57 2	59.07 36	34.83 89	6.294 194	72.37 45	37.364 100	35.85 61
20.3	37.353 153	59.26 31	58.67 40	35.18 35	6.072 222	72.39 2	37.245 119	35.23 62
30.2	37.186 167	58.66 60	58.24 43	34.99 19	5.832 240	71.97 42	37.116 129	34.61 62
. 9.2	37.015 171	57.82 84	57.81 43	34.26 73	5.588 244	71.13 84	36.982 134	34.03 58
	166	107	41	124	237	121	132	54
19.2	36.849	56.75	57.40	33.02	5.351	69.92	36.850	33.49
. 1.1	36.697 152	55.49 126	57.02 38	31.33 169	5.135 216	68.38 154	36.729 121	33.03 46
11.1	36.570 127	54.13 136	56.70 32	29.25 208	4.953 182	66.60 178	36.625 104	32.68 35
21.1	36.478 92	52.71 142	56.47 23	26.91 234	4.816 137	64.62 198	36.548 77	32.47 21
31.1	36.428 50	51.30 141	56.31 16	24.36 255	4.735 81	62.55 207	36.503 45	32.41 6
	2	132	6	263	18	208	5	15
. 10.0	36.426	49.98	56.25	21.73	4.717	60.47	36.498	32.56
20.0	36.478 52	48.81 117	56.30 5	19.14 259	4.768 51	58.48 199	36.536 38	32.90 34
30.0	36.584 106	47.84 97	56.45 15	16.67 247	4.888 120	56.65 183	36.620 84	33.47 57
' 10.0	36.744 160	47.13 71	56.72 27	14.41 226	5.078 190	55.08 157	36.749 129	34.28 81
19.9	36.955 211	46.70 43	57.07 35	12.45 196	5.331 253	53.79 129	36.921 172	35.30 102
	258	11	45	160	313	94	212	124
29.9	37.213	46.59	57.52	10.85	5.644	52.85	37.133	36.54
s 8.9	37.510 297	46.81 22	58.04 52	9.66 119	6.007 363	52.30 55	37.380 247	37.95 141
18.8	37.838 328	47.34 53	58.61 57	8.92 74	6.409 402	52.13 17	37.655 275	39.51 156
28.8	38.190 352	48.19 85	59.23 62	8.64 28	6.841 432	52.38 25	37.953 298	41.20 169
r 8.8	38.555 365	49.32 113	59.89 66	8.83 19	7.292 451	53.01 63	38.263 310	42.94 174
	371	138	66	66	459	101	316	176
18.8	38.926	50.70	60.55	9.49	7.751	54.02	38.579	44.70
28.7	39.293 367	52.30 160	61.21 66	10.59 110	8.207 456	55.36 134	38.893 314	46.42 172
;. 7.7	39.649 356	54.06 176	61.86 65	12.12 153	8.649 442	57.03 167	39.198 305	48.06 164
17.7	39.988 339	55.95 189	62.48 62	14.02 190	9.073 424	58.97 194	39.490 292	49.59 153
27.7	40.303 315	57.93 198	63.06 58	16.26 224	9.468 395	61.14 217	39.762 272	50.96 137
	287	202	54	254	362	233	246	117
t. 6.6	40.590	59.95	63.60	18.80	9.830	63.47	40.008	52.13
16.6	40.845 255	61.98 203	64.07 47	21.58 278	10.152 322	65.94 247	40.227 219	53.10 97
26.6	41.067 222	63.96 198	64.48 41	24.54 296	10.435 283	68.51 257	40.418 191	53.84 74
. 6.5	41.255 188	65.87 191	64.83 35	27.64 310	10.672 237	71.09 258	40.578 160	54.37 53
16.5	41.406 151	67.69 182	65.10 27	30.79 315	10.864 192	73.66 257	40.708 130	54.67 30
	115	168	19	315	145	251	98	11
26.5	41.521	69.37	65.29	33.94	11.009	76.17	40.806	54.78
v. 5.5	41.601 80	70.90 153	65.41 12	37.02 308	11.106 97	78.57 240	40.875 69	54.72 6
15.4	41.646 45	72.26 136	65.45 4	39.97 295	11.154 48	80.81 224	40.915 40	54.49 23
25.4	41.654 8	73.41 115	65.41 4	42.72 275	11.153 1	82.81 200	40.925 10	54.14 35
c. 5.4	41.627 27	74.35 94	65.28 13	45.17 245	11.104 49	84.56 175	40.908 17	53.70 44
	60	67	21	209	94	145	43	52
15.4	41.567	75.02	65.07	47.26	11.010	86.01	40.865	53.18
25.3	41.476 91	75.44 42	64.80 27	48.94 168	10.871 139	87.08 107	40.796 69	52.60 58
35.3	41.355 121	75.57 13	64.47 33	50.13 119	10.694 177	87.76 68	40.706 90	51.98 62
n Place	35.965	42.98	56.952	10.27	4.556	51.26	35.910	28.09
δ, Tan δ	1.215	+0.690	2.472	+2.261	1.578	+1.221	1.011	+0.149
D_α	+0.07	−0.04	+0.09	−0.13	+0.08	−0.07	+0.06	−0.01
D_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.	μ Fornacis. Mag. 5.2		γ Trianguli. Mag. 4.1		67 Ceti. Mag. 5.7		ϕ Eridani Mag. 3.
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.
	h m s 2 9	° ′ ″ −31 6	h m s 2 12	° ′ ″ +33 27	h m s 2 12	° ′ ″ − 6 47	h m s 2 13
Jan. 0.3	16.491	50.96	24.214	66.32	52.088	71.66	34.352
	153	103	127	0	105	88	266
10.3	16.338	51.99	24.087	66.32	51.983	72.54	34.086
	169	64	147	28	122	71	283
20.3	16.169	52.63	23.940	66.04	51.861	73.25	33.803
	177	24	164	54	133	55	293
30.2	15.992	52.87	23.776	65.50	51.728	73.80	33.510
	181	−17	170	79	139	35	292
Feb. 9.2	15.811	52.70	23.606	64.71	51.589	74.15	33.218
	176	58	166	100	137	14	283
19.2	15.635	52.12	23.440	63.71	51.452	74.29	32.935
	162	96	155	118	128	6	262
Mar. 1.2	15.473	51.16	23.285	62.53	51.324	74.23	32.673
	142	134	130	128	109	30	233
11.1	15.331	49.82	23.155	61.25	51.215	73.93	32.440
	112	168	100	134	86	52	192
21.1	15.219	48.14	23.055	59.91	51.129	73.41	32.247
	77	201	57	134	53	77	146
31.1	15.142	46.13	22.998	58.57	51.076	72.64	32.101
	35	228	10	125	15	100	91
Apr. 10.0	15.107	43.85	22.988	57.32	51.061	71.64	32.010
	9	252	42	111	27	124	−33
20.0	15.116	41.33	23.030	56.21	51.088	70.40	31.977
	59	271	97	93	71	146	−30
30.0	15.175	38.62	23.127	55.28	51.159	68.94	32.007
	108	283	149	67	116	167	96
May 10.0	15.283	35.79	23.276	54.61	51.275	67.27	32.103
	157	291	202	41	159	183	158
19.9	15.440	32.88	23.478	54.20	51.434	65.44	32.261
	201	292	247	10	199	196	218
29.9	15.641	29.96	23.725	54.10	51.633	63.48	32.479
	242	285	286	22	234	206	273
June 8.9	15.883	27.11	24.011	54.32	51.867	61.42	32.752
	276	273	321	51	265	210	321
18.9	16.159	24.38	24.332	54.83	52.132	59.32	33.073
	302	252	346	83	286	209	362
28.8	16.461	21.86	24.678	55.66	52.418	57.23	33.435
	321	225	359	108	302	202	390
July 8.8	16.782	19.61	25.037	56.74	52.720	55.21	33.825
	332	192	366	132	309	189	409
18.8	17.114	17.69	25.403	58.06	53.029	53.32	34.234
	335	154	365	154	309	171	418
28.7	17.449	16.15	25.768	59.60	53.338	51.61	34.652
	328	111	354	171	301	150	415
Aug. 7.7	17.777	15.04	26.122	61.31	53.639	50.11	35.067
	313	65	338	181	288	122	401
17.7	18.090	14.39	26.460	63.12	53.927	48.89	35.468
	293	−17	317	191	269	93	374
27.7	18.383	14.22	26.777	65.03	54.196	47.96	35.842
	265	−30	290	193	245	61	340
Sept. 6.6	18.648	14.52	27.067	66.96	54.441	47.35	36.182
	233	77	260	193	218	28	299
16.6	18.881	15.29	27.327	68.89	54.659	47.07	36.481
	197	119	227	189	189	−3	249
26.6	19.078	16.48	27.554	70.78	54.848	47.10	36.730
	160	156	193	183	158	34	195
Oct. 6.6	19.238	18.04	27.747	72.61	55.006	47.44	36.925
	120	187	159	172	126	60	137
16.5	19.358	19.91	27.906	74.33	55.132	48.04	37.062
	81	211	123	159	96	82	77
26.5	19.439	22.02	28.029	75.92	55.228	48.86	37.139
	42	224	89	145	65	99	21
Nov. 5.5	19.481	24.26	28.118	77.37	55.293	49.85	37.160
	−5	228	52	129	34	112	−38
15.4	19.486	26.54	28.170	78.66	55.327	50.97	37.122
	−31	225	18	109	−6	120	91
25.4	19.455	28.79	28.188	79.75	55.333	52.17	37.031
	64	210	−18	89	−23	120	139
Dec. 5.4	19.391	30.89	28.170	80.64	55.310	53.37	36.892
	93	190	51	61	48	116	185
15.4	19.298	32.79	28.119	81.28	55.262	54.53	36.707
	121	161	83	41	74	109	223
25.3	19.177	34.40	28.036	81.69	55.188	55.62	36.484
	144	128	114	14	96	98	253
35.3	19.033	35.68	27.922	81.83	55.092	56.60	36.231
Mean Place	14.907	47.04	22.490	50.23	50.533	75.03	32.555
Sec δ, Tan δ	1.168	−0.604	1.199	+0.661	1.007	−0.119	1.620
$D_\psi\,\alpha$, $D_\omega\,\alpha$	+0.05	+0.03	+0.07	−0.04	+0.06	+0.01	+0.04
$D_\psi\,\delta$, $D_\omega\,\delta$	*+0.3*	+0.5	+0.3	+0.5	+0.3	+0.5	+0.3

FOR THE UPPER TRANSIT AT WASHINGTON.

tom ne.	o Ceti. (*Mira.*) Var. 1.7–9.6		κ Fornacis. Mag. 5.4		δ Hydri. Mag. 4.3		ι Cassiopeiæ. Mag. 4.6	
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.
	h m 2 15 s	° ′ − 3 20 ″	h m 2 18 s	−24 11 ″	h m 2 20 s	−69 1 ″	h m 2 22 s	+67 1 ″
.3	10.717	69.37	46.250	37.21	18.41	83.20	15.31	71.72
.3	10.616 101	70.20 83	46.119 131	38.29 108	17.86 55	84.09 89	14.94 37	72.79 107
.3	10.496 120	70.91 71	45.971 148	39.05 76	17.29 57	84.37 28	14.53 41	73.34 55
.2	10.366 130	71.49 58	45.811 160	39.46 41	16.70 59	84.06 31	14.09 44	73.33 1
.2	10.229 137	71.90 41	45.646 164	39.51 5	16.12 58	83.15 91	13.64 45	72.79 54
	136	24	162	30	56	146	44	107
.2	10.093	72.14	45.484	39.21	15.56	81.69	13.20	71.72
.2	9.966 127	72.21 7	45.331 153	38.54 67	15.04 52	79.72 197	12.79 41	70.18 154
.1	9.856 110	72.06 15	45.197 134	37.54 100	14.58 46	77.29 243	12.44 35	68.24 194
.1	9.772 84	71.71 35	45.088 109	36.21 133	14.17 41	74.48 281	12.17 27	65.99 225
.1	9.719 53	71.14 57	45.013 75	34.57 164	13.85 32	71.32 316	11.97 20	63.51 248
	16	81	36	191	24	340	9	261
.0	9.703	70.33	44.977	32.66	13.61	67.92	11.88	60.90
.0	9.729 26	69.31 102	44.984 7	30.50 216	13.47 14	64.32 360	11.89 1	58.29 261
.0	9.800 71	68.05 126	45.037 53	28.13 237	13.44 3	60.63 369	12.02 13	55.76 253
.0	9.915 115	66.59 146	45.138 101	25.60 253	13.51 7	56.92 371	12.25 23	53.41 235
9.9	10.073 158	64.94 165	45.285 147	22.97 263	13.68 17	53.27 365	12.59 34	51.32 209
	199	178	190	269	27	350	43	175
9.9	10.272	63.16	45.475	20.28	13.95	49.77	13.02	49.57
8.9	10.505 233	61.25 191	45.704 229	17.61 267	14.31 36	46.49 328	13.53 51	48.19 138
8.9	10.769 264	59.27 198	45.968 264	15.02 259	14.75 44	43.52 297	14.11 58	47.25 94
8.8	11.054 285	57.28 199	46.257 289	12.56 246	15.28 53	40.94 258	14.74 63	46.76 49
8.8	11.356 302	55.33 195	46.566 309	10.32 224	15.85 57	38.80 214	15.41 67	46.74 2
	308	187	319	197	62	163	68	44
8.8	11.664	53.46	46.885	8.35	16.47	37.17	16.09	47.18
8.7	11.973 309	51.74 172	47.206 321	6.70 165	17.10 63	36.10 107	16.78 69	48.07 89
7.7	12.274 301	50.22 152	47.522 316	5.42 128	17.75 65	35.63 47	17.46 68	49.38 131
7.7	12.563 289	48.93 129	47.826 304	4.56 86	18.38 63	35.76 13	18.12 66	51.09 171
7.7	12.833 270	47.90 103	48.111 285	4.12 44	18.97 59	36.47 71	18.74 62	53.16 207
	246	73	261	1	55	132	57	237
6.6	13.079	47.17	48.372	4.13	19.52	37.79	19.31	55.53
6.6	13.300 221	46.72 45	48.604 232	4.58 45	19.99 47	39.64 185	19.83 52	58.18 265
6.6	13.490 190	46.59 13	48.804 200	5.44 86	20.38 39	41.98 234	20.29 46	61.02 284
6.6	13.651 161	46.74 15	48.969 165	6.66 122	20.68 30	44.72 274	20.68 39	64.04 302
6.5	13.782 131	47.14 40	49.099 130	8.21 155	20.88 20	47.75 303	21.00 32	67.14 310
	98	63	94	177	9	321	24	313
6.5	13.880	47.77	49.193	9.98	20.97	50.96	21.24	70.27
5.5	13.948 68	48.58 81	49.252 59	11.93 195	20.94 3	54.23 327	21.39 15	73.35 308
5.4	13.988 40	49.51 93	49.276 24	13.96 203	20.82 12	57.43 320	21.47 8	76.35 300
5.4	13.997 9	50.53 102	49.267 9	15.98 202	20.59 23	60.44 301	21.46 1	79.17 282
5.4	13.979 18	51.58 105	49.227 40	17.92 194	20.27 32	63.14 270	21.36 10	81.71 254
	44	106	71	180	40	230	18	222
5.4	13.935	52.63	49.156	19.72	19.87	65.44	21.18	83.93
5.3	13.865 70	53.63 100	49.059 97	21.28 156	19.39 48	67.26 182	20.92 26	85.76 183
5.3	13.772 93	54.54 91	48.937 122	22.56 128	18.87 52	68.53 127	20.58 34	87.12 136
Place	9.150	73.83	44.646	35.30	16.017	72.48	12.509	48.50
Tan δ	1.002	−0.058	1.096	−0.449	2.795	−2.610	2.563	+2.360
∆ α	+0.06	0.00	+0.05	+0.02	+0.02	+0.14	+0.10	−0.13
∆ δ	+0.3	+0.6	+0.3	+0.6	+0.3	+0.6	+0.3	+0.8

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		ν Ce Mag.
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.
	h m 2 23 s	° ′ + 8 5 ″	h m 2 28 s	° ′ −15 36 ″	h m 2 30 s	° ′ +72 27 ″	h m 2 31 s
Jan. 0.3	46.258	27.28	10.749	28.80	10.16	46.29	32.640
	95	62	113	106	46	133	93
10.3	46.163	26.66	10.636	29.86	9.70	47.62	32.547
	116	61	130	81	57	78	114
20.3	46.047	26.05	10.506	30.67	9.13	48.40	32.433
	130	60	144	55	60	20	129
30.2	45.917	25.45	10.362	31.22	8.53	48.60	32.304
	138	57	152	26	61	38	138
Feb. 9.2	45.779	24.88	10.210	31.48	7.92	48.22	32.166
	138	51	153	2	60	94	141
19.2	45.641	24.37	10.057	31.46	7.32	47.28	32.025
	131	43	145	32	56	145	134
Mar. 1.2	45.510	23.94	9.912	31.14	6.76	45.83	31.891
	114	34	129	62	50	191	118
11.1	45.396	23.60	9.783	30.52	6.26	43.92	31.773
	90	19	105	89	40	228	96
21.1	45.306	23.41	9.678	29.63	5.86	41.64	31.677
	57	4	74	118	29	256	65
31.1	45.249	23.37	9.604	28.45	5.57	39.08	31.612
	19	15	37	144	15	271	27
Apr. 10.1	45.230	23.52	9.567	27.01	5.42	36.37	31.585
	23	35	5	169	2	277	15
20.0	45.253	23.87	9.572	25.32	5.40	33.60	31.600
	69	56	49	191	12	272	59
30.0	45.322	24.43	9.621	23.41	5.52	30.88	31.659
	115	79	94	209	25	257	105
May 10.0	45.437	25.22	9.715	21.32	5.77	28.31	31.764
	159	99	140	225	40	234	149
19.9	45.596	26.21	9.855	19.07	6.17	25.97	31.913
	200	121	183	234	51	202	190
29.9	45.796	27.42	10.038	16.73	6.68	23.95	32.103
	236	138	220	238	62	164	227
June 8.9	46.032	28.80	10.258	14.35	7.30	22.31	32.330
	267	153	253	237	71	122	259
18.9	46.299	30.33	10.511	11.98	8.01	21.09	32.589
	289	164	278	230	78	76	283
28.8	46.588	31.97	10.789	9.68	8.79	20.33	32.872
	306	170	296	216	83	29	300
July 8.8	46.894	33.67	11.085	7.52	9.62	20.04	33.172
	313	171	309	197	86	19	310
18.8	47.207	35.38	11.394	5.55	10.48	20.23	33.482
	315	169	311	172	87	66	312
28.8	47.522	37.07	11.705	3.83	11.35	20.89	33.794
	307	159	306	142	86	112	306
Aug. 7.7	47.829	38.66	12.011	2.41	12.21	22.01	34.100
	296	147	297	107	84	156	296
17.7	48.125	40.13	12.308	1.34	13.05	23.57	34.396
	278	132	278	71	80	194	280
27.7	48.403	41.45	12.586	0.63	13.85	25.51	34.676
	256	112	257	32	73	229	258
Sept. 6.6	48.659	42.57	12.843	0.31	14.58	27.80	34.934
	231	91	232	8	68	261	234
16.6	48.890	43.48	13.075	0.39	15.26	30.41	35.168
	202	68	202	44	61	286	207
26.6	49.092	44.16	13.277	0.83	15.87	33.27	35.375
	174	47	171	80	52	306	180
Oct. 6.6	49.266	44.63	13.448	1.63	16.39	36.33	35.555
	145	25	140	110	42	319	149
16.5	49.411	44.88	13.588	2.73	16.81	39.52	35.704
	114	5	106	133	31	327	120
26.5	49.525	44.93	13.694	4.06	17.12	42.79	35.824
	84	12	73	153	22	327	91
Nov. 5.5	49.609	44.81	13.767	5.59	17.34	46.06	35.915
	56	28	43	165	10	320	60
15.5	49.665	44.53	13.810	7.24	17.44	49.26	35.975
	25	39	10	168	1	304	30
25.4	49.690	44.14	13.820	8.92	17.43	52.30	36.005
	3	48	20	165	13	281	2
Dec. 5.4	49.687	43.66	13.800	10.57	17.30	55.11	36.007
	33	55	49	156	25	248	28
15.4	49.654	43.11	13.751	12.13	17.05	57.59	35.979
	59	60	77	142	34	209	55
25.3	49.595	42.51	13.674	13.55	16.71	59.68	35.924
	84	63	101	122	44	163	81
35.3	49.511	41.88	13.573	14.77	16.27	61.31	35.843
Mean Place	44.617	19.19	9.116	29.45	6.628	22.70	30.967
Sec δ, Tan δ	1.010	+0.142	1.038	−0.279	3.318	+3.164	1.004
$D_\psi\, a$, $D_\omega\, a$	+0.06	−0.01	+0.06	+0.01	+0.11	−0.17	+0.06
$D_\psi\, \delta$, $D_\omega\, \delta$	+0.3	+0.6	+0.3	+0.6	+0.3	+0.6	+0.3

FOR THE UPPER TRANSIT AT WASHINGTON.

ngton Time.	μ Hydri. Mag. 5.3		ν Arietis. Mag. 5.4		δ Ceti. Mag. 4.0		ε Hydri. Mag. 4.3	
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.
	h m s 2 33	° ′ ″ −79 27	h m s 2 34	° ′ ″ +21 36	h m s 2 35	° ′ ″ − 0 1	h m s 2 38	° ′ ″ −68 36
0.3	27.66	89.07	7.785	23.37	15.287	38.35	21.00	90.86
	117	89	99	25	94	81	52	116
10.3	26.49	89.96	7.686	23.12	15.193	39.16	20.48	92.02
	125	29	122	38	115	71	56	56
20.3	25.24	90.25	7.564	22.74	15.078	39.87	19.92	92.58
	126	32	139	51	130	61	59	4
30.2	23.98	89.93	7.425	22.23	14.948	40.48	19.33	92.54
	124	91	150	62	140	49	58	62
9.2	22.74	89.02	7.275	21.61	14.808	40.97	18.75	91.92
	121	147	153	72	142	35	57	119
19.2	21.53	87.55	7.122	20.89	14.666	41.32	18.18	90.73
	113	199	146	78	137	18	54	172
1.2	20.40	85.56	6.976	20.11	14.529	41.50	17.64	89.01
	104	243	128	81	122	2	50	220
11.1	19.36	83.13	6.848	19.30	14.407	41.52	17.14	86.81
	92	282	104	78	100	17	44	263
21.1	18.44	80.31	6.744	18.52	14.307	41.35	16.70	84.18
	75	317	69	71	69	37	36	298
31.1	17.69	77.14	6.675	17.81	14.238	40.98	16.34	81.20
	60	340	28	61	33	58	28	327
10.1	17.09	73.74	6.647	17.20	14.205	40.40	16.06	77.93
	43	358	17	46	9	81	18	349
20.0	16.66	70.16	6.664	16.74	14.214	39.59	15.88	74.44
	22	368	65	26	53	102	8	363
30.0	16.44	66.48	6.729	16.48	14.267	38.57	15.80	70.81
	3	369	115	6	98	121	2	368
10.0	16.41	62.79	6.844	16.42	14.365	37.33	15.82	67.13
	16	363	163	19	143	142	11	367
19.9	16.57	59.16	7.007	16.61	14.508	35.91	15.93	63.46
	36	347	207	43	183	160	23	355
29.9	16.93	55.69	7.214	17.04	14.691	34.31	16.16	59.91
	53	325	246	67	221	172	32	338
8.9	17.46	52.44	7.460	17.71	14.912	32.59	16.48	56.53
	71	294	278	89	253	182	40	308
18.9	18.17	49.50	7.738	18.60	15.165	30.77	16.88	53.45
	86	255	304	111	277	187	48	271
28.8	19.03	46.95	8.042	19.71	15.442	28.90	17.36	50.71
	98	210	323	127	295	186	54	232
8.8	20.01	44.85	8.365	20.98	15.737	27.04	17.90	48.39
	107	159	331	141	306	181	58	182
18.8	21.08	43.26	8.696	22.39	16.043	25.23	18.48	46.57
	114	104	333	151	309	169	62	120
28.8	22.22	42.22	9.029	23.90	16.352	23.54	19.10	45.28
	117	43	329	156	303	154	63	71
. 7.7	23.39	41.79	9.358	25.46	16.655	22.00	19.73	44.57
	116	16	317	157	295	134	63	10
17.7	24.55	41.95	9.675	27.03	16.950	20.66	20.36	44.47
	112	77	299	154	279	110	60	53
27.7	25.67	42.72	9.974	28.57	17.229	19.56	20.96	45.00
	103	136	278	148	257	85	56	112
t. 6.6	26.70	44.08	10.252	30.05	17.486	18.71	21.52	46.12
	91	191	253	139	235	56	50	169
16.6	27.61	45.99	10.505	31.44	17.721	18.15	22.02	47.81
	76	238	227	126	207	27	42	219
26.6	28.37	48.37	10.732	32.70	17.928	17.88	22.44	50.00
	59	278	196	114	181	1	34	264
:. 6.6	28.96	51.15	10.928	33.84	18.109	17.87	22.78	52.64
	38	309	167	99	150	24	23	296
16.5	29.34	54.24	11.095	34.83	18.259	18.11	23.01	55.60
	17	325	137	83	120	46	14	319
26.5	29.51	57.49	11.232	35.66	18.379	18.57	23.15	58.79
	6	331	104	68	92	65	3	331
w. 5.5	29.45	60.80	11.336	36.34	18.471	19.22	23.18	62.10
	28	325	74	54	61	78	7	328
15.5	29.17	64.05	11.410	36.88	18.532	20.00	23.11	65.38
	49	305	40	40	31	88	18	313
25.4	28.68	67.10	11.450	37.28	18.563	20.88	22.93	68.51
	68	274	10	25	2	94	29	288
ec. 5.4	28.00	69.84	11.460	37.53	18.565	21.82	22.64	71.39
	86	233	23	11	28	95	36	250
15.4	27.14	72.17	11.437	37.64	18.537	22.77	22.28	73.89
	102	183	55	3	55	92	43	205
25.3	26.12	74.00	11.382	37.61	18.482	23.69	21.85	75.94
	111	129	84	19	82	87	50	152
35.3	25.01	75.29	11.298	37.42	18.400	24.56	21.35	77.46
n Place	23.719	78.11	6.008	11.29	13.607	43.75	18.462	80.74
∂, Tan ∂	5.470	−5.379	1.076	+0.396	1.000	0.000	2.744	−2.555
α, $D_m\alpha$	−0.03	+0.28	+0.07	−0.02	+0.06	0.00	+0.02	+0.13
∂, $D_m\partial$	+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 Ce Mag.	
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.	
	h m		° ′		h m		° ′		h m		° ′		h m	
	2 38		+48 52		2 38		+ 2 53		2 40		−14 12		2 40	
	s		″		s		″		s		″		s	
Jan. 0.3	33.574		60.96		61.581		18.20		11.960		33.41		28.894	
		164		66		91		74		105		110		88
10.3	33.410		61.56		61.490		17.46		11.855		34.51		28.806	
		197		26		113		68		128		87		112
20.3	33.213		61.82		61.377		16.78		11.727		35.38		28.694	
		224		13		130		61		143		61		129
30.3	32.989		61.69		61.247		16.17		11.584		35.99		28.565	
Feb. 9.2	32.752	237	61.16	53	61.108	139	15.65	52	11.432	152	36.33	34	28.424	141
		239		90		143		42		155		7		144
19.2	32.513		60.26		60.965		15.23		11.277		36.40		28.280	
		228		124		138		26		150		23		139
Mar. 1.2	32.285		59.02		60.827		14.97		11.127		36.17		28.141	
		202		152		124		14		137		50		124
11.1	32.083		57.50		60.703		14.83		10.990		35.67		28.017	
		163		173		102		3		113		80		103
21.1	31.920		55.77		60.601		14.86		10.877		34.87		27.914	
		115		187		72		22		83		107		71
31.1	31.805		53.90		60.529		15.08		10.794		33.80		27.843	
		57		192		35		41		48		133		34
Apr. 10.1	31.748		51.98		60.494		15.49		10.746		32.47		27.809	
		10		189		6		63		6		158		8
20.0	31.758		50.09		60.500		16.12		10.740		30.89		27.817	
		75		178		50		84		38		180		84
30.0	31.833		48.31		60.550		16.96		10.778		29.09		27.871	
May 10.0	31.977	144	46.71	160	60.646	96	18.01	105	10.862	84	27.09	200	27.972	101
20.0	32.186	209	45.35	136	60.786	140	19.25	124	10.992	130	24.92	217	28.118	146
		269		106		183		143		172		226		157
29.9	32.455		44.29		60.969		20.68		11.164		22.66		28.305	
June 8.9	32.777	322	43.56	73	61.189	220	22.25	157	11.375	211	20.33	233	28.531	226
		368		38		252		170		245		233		258
18.9	33.145		43.18		61.441		23.95		11.620		18.00		28.789	
		402		2		277		175		271		228		283
28.8	33.547		43.16		61.718		25.70		11.891		15.72		29.072	
July 8.8	33.973	426	43.50	34	62.013	295	27.48	178	12.182	291	13.56	216	29.375	303
		440		70		307		174		305		198		312
18.8	34.413		44.20		62.320		29.22		12.487		11.58		29.687	
		446		103		309		167		308		174		315
28.8	34.859		45.23		62.629		30.89		12.795		9.84		30.002	
		441		132		305		154		306		147		312
Aug. 7.7	35.300		46.55		62.934		32.43		13.101		8.37		30.314	
		428		159		296		137		298		113		301
17.7	35.728		48.14		63.230		33.80		13.399		7.24		30.615	
		406		181		281		115		263		77		287
27.7	36.134		49.95		63.511		34.95		13.682		6.47		30.902	
		381		200		260		93		262		39		267
Sept. 6.7	36.515		51.95		63.771		35.88		13.944		6.08		31.169	
		349		215		238		67		239		1		244
16.6	36.864		54.10		64.009		36.55		14.183		6.07		31.413	
		313		225		211		40		211		37		218
26.6	37.177		56.35		64.220		36.95		14.394		6.44		31.631	
Oct. 6.6	37.453	276	58.66	231	64.405	185	37.10	15	14.576	182	7.16	72	31.822	191
		234		233		155		8		151		102		162
16.5	37.687		60.99		64.560		37.02		14.727		8.18		31.984	
		190		231		125		32		119		129		133
26.5	37.877		63.30		64.685		36.70		14.846		9.47		32.117	
Nov. 5.5	38.021	144	65.54	221	64.782	97	36.22	48	14.934	88	10.94	147	32.220	103
		97		212		66		62		55		160		73
15.5	38.118		67.66		64.848		35.60		14.989		12.54		32.293	
		49		197		36		74		23		166		43
25.4	38.167		69.63		64.884		34.86		15.012		14.20		32.336	
Dec. 5.4	38.165	2	71.40	177	64.891	7	34.07	79	15.005	7	15.83	163	32.348	12
		50		151		21		83		38		157		18
15.4	38.115		72.91		64.867		33.24		14.967		17.40		32.330	
		98		120		52		83		67		144		47
25.4	38.017		74.11		64.815		32.41		14.900		18.84		32.283	
		142		86		79		80		94		125		77
35.3	37.875		74.97		64.736		31.61		14.806		20.09		32.206	
Mean Place	31.361		41.76		59.876		11.96		10.269		34.51		27.153	
Sec δ, Tan δ	*1.520*		*+1.146*		1.001		+0.050		1.031		−0.253		1.015	
Dφ α, Dω α	*+0.08*		*−0.06*		+0.06		0.00		+0.06		+0.01		+0.06	
Dφ δ, Dω δ	*+0.5*		*+0.6*		+0.3		+0.6		+0.3		+0.6		+0.3	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	η Persei. Mag. 3.9		41 Arietis. Mag. 3.7		β Fornacis. Mag. 4.5		σ Arietis. Mag. 5.5	
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.
	h m	° ′	h m	° ′	h m	° ′	h m	° ′
	2 44	+55 33	2 45	+26 55	2 45	−32 44	2 46	+14 44
	s	″	s	″	s	″	s	″
0.3	40.440	27.33	7.526	22.46	38.788	78.37	56.230	36.03
10.3	40.242 198	28.27 91	7.428 98	22.43 3	38.640 148	79.75 138	56.144 86	35.61 42
20.3	40.001 241	28.76 49	7.303 125	22.20 23	38.469 171	80.72 97	56.032 112	35.13 48
30.3	39.729 272	28.81 — 5	7.157 146	21.79 41	38.282 187	81.27 55	55.901 131	34.60 53
9.2	39.440 289	28.41 40	6.997 160	21.22 57	38.085 197	81.38 — 11	55.757 144	34.04 56
	201	83	164	73	199	31	149	58
19.2	39.149	27.58	6.833	20.49	37.886	81.07	55.608	33.46
1.2	38.870 279	26.33 125	6.675 158	19.64 85	37.693 193	80.33 74	55.464 144	32.89 57
11.1	38.621 249	24.75 158	6.532 143	18.71 93	37.516 177	79.19 114	55.333 131	32.35 54
21.1	38.415 206	22.91 184	6.415 117	17.75 96	37.365 151	77.66 153	55.225 108	31.88 47
31.1	38.265 150	20.86 205	6.333 82	16.80 95	37.246 119	75.79 187	55.147 78	31.51 37
	82	216	41	88	80	219	10	23
10.1	38.183 9	18.70	6.292 — 7	15.92	37.166 33	73.60	55.107 — 3	31.28 7
20.0	38.174 — 68	16.53 217	6.299 57	15.16 76	37.133 - 14	71.15 245	55.110 50	31.21 - 11
30.0	38.242 148	14.45 208	6.356 108	14.56 60	37.147 64	68.47 268	55.160 97	31.32 33
10.0	38.390 221	12.50 195	6.464 159	14.16 40	37.211 115	65.62 285	55.257 143	31.65 54
20.0	38.611	10.80 170	6.623	14.00 16	37.326	62.67 295	55.400	32.19
	293	144	205	7	164	299	186	76
29.9	38.904	9.36	6.828	14.07	37.490	59.68	55.586	32.95
8.9	39.257 353	8.27 109	7.074 246	14.41 34	37.698 208	56.71 297	55.812 226	33.91 96
18.9	39.664 407	7.55 72	7.356 282	14.98 57	37.945 247	53.85 286	56.071 259	35.05 114
28.8	40.112 448	7.21 — 34	7.666 310	15.80 82	38.225 280	51.17 268	56.356 285	36.34 129
8.8	40.591 479	7.26 5	7.995 329	16.82 102	38.531 306	48.72 215	56.662 306	37.75 141
	498	43	341	121	322	212	316	148
18.8	41.089	7.69	8.336	18.03	38.853	46.60	56.978	39.23
28.8	41.594 505	8.51 82	8.682 346	19.38 135	39.185 332	44.85 175	57.299 321	40.75 152
7.7	42.096 502	9.68 117	9.024 342	20.83 145	39.518 333	43.54 131	57.617 318	42.26 151
17.7	42.584 488	11.16 148	9.356 332	22.35 152	39.844 326	42.69 85	57.926 309	43.71 145
27.7	43.051 467	12.93 177	9.672 316	23.90 155	40.154 310	42.33 36	58.221 295	45.08 137
	439	203	296	154	291	16	275	123
6.7	43.490	14.96	9.968	25.44	40.445	42.49	58.496	46.31
16.6	43.894 404	17.18 222	10.240 272	26.94 150	40.708 263	43.14 65	58.749 253	47.40 109
26.6	44.258 364	19.55 237	10.485 245	28.36 142	40.940 232	44.26 112	58.977 228	48.32 92
6.6	44.579 321	22.04 249	10.701 216	29.70 134	41.138 198	45.81 155	59.177 200	49.05 73
16.5	44.854 275	24.61 257	10.887 186	30.93 123	41.299 161	47.71 190	59.349 172	49.61 56
	222	259	154	110	122	219	143	39
26.5	45.076	27.20	11.041	32.03	41.421	49.90	59.492	50.00
5.5	45.245 169	29.73 253	11.163 122	33.01 98	41.503 82	52.28 238	59.605 113	50.22 22
15.5	45.359 114	32.19 246	11.253 90	33.86 85	41.547 44	54.76 248	59.687 82	50.31 9
25.4	45.414 — 55	34.51 232	11.307 54	34.55 69	41.551 — 4	57.24 248	59.739 52	50.27 - 4
5.4	45.409 5	36.62 211	11.327 20	35.11 56	41.517 34	59.63 239	59.758 19	50.12 15
	62	185	16	40	70	220	13	25
15.4	45.347	38.47	11.311	35.51	41.447	61.83	59.745	49.87
25.4	45.227 120	40.00 153	11.261 50	35.73 22	41.343 104	63.78 195	59.701 44	49.55 32
35.3	45.054 173	41.16 116	11.178 83	35.78 5	41.210 133	65.39 161	59.627 74	49.14 11
Mean Place	37.944	7.10	5.632	9.16	37.016	74.56	54.428	26.31
Tan δ, Tan δ	1.768	+1.458	1.122	+0.508	1.189	−0.643	1.034	+0.263
α, $D_m\alpha$	+0.09	−0.07	+0.07	−0.03	+0.05	+0.03	+0.07	−0.00
δ, $D_m\delta$	+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 (3 Mag. 4	
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.	
	h m		° ′		h m		° ′		h m		° ′		h m	
	2 47		−21 20		2 48		+52 25		2 52		− 9 13		2 54	
	s		″		s		″		s		″		s	
Jan. 0.3	18.067		44.48		24.234		44.88		24.078		37.56		29.629	
		117		125		175		85		94		107		87
10.3	17.950		45.73		24.059		45.73		23.984		38.63		29.542	
		138		97		216		47		119		89		114
20.3	17.812		46.70		23.843		46.20		23.865		39.52		29.428	
		156		63		245		3		136		67		136
30.3	17.656		47.33		23.598		46.23	—	23.729		40.19		29.292	
		167		29		264		40		148		46		150
Feb. 9.2	17.489		47.62	−	23.334		45.83		23.581		40.65		29.142	
		170		4		267		80		153		21		157
19.2	17.319		47.58		23.067		45.03		23.428		40.86	—	28.985	
		164		40		256		118		150		3		154
Mar. 1.2	17.155		47.18		22.811		43.85		23.278		40.83		28.831	
		151		74		231		149		139		28		140
11.2	17.004		46.44		22.580		42.36		23.139		40.55		28.691	
		129		106		192		176		117		52		117
21.1	16.875		45.38		22.388		40.60		23.022		40.03		28.574	
		99		136		140		193		90		79		87
31.1	16.776		44.02		22.248		38.67		22.932		39.24		28.487	
		63		166		79		202		54		102		49
Apr. 10.1	16.713		42.36		22.169		36.65		22.878		38.22		28.438	
		20		192		10		203		13		128		3
20.0	16.693		40.44		22.159	−	34.62		22.865	—	36.94		28.435	—
		25		215		62		196		30		149		45
30.0	16.718		38.29		22.221		32.66		22.895		35.45		28.480	
		72		234		136		180		75		171		95
May 10.0	16.790		35.95		22.357		30.86		22.970		33.74		28.575	
		118		248		205		157		121		187		142
20.0	16.908		33.47		22.562		29.29		23.091		31.87		28.717	
		163		257		271		130		164		201		186
29.9	17.071		30.90		22.833		27.99		23.255		29.86		28.903	
		204		261		331		98		203		211		229
June 8.9	17.275		28.29		23.164		27.01		23.458		27.75		29.132	
		239		255		379		63		236		214		263
18.9	17.514		25.74		23.543		26.38		23.694		25.61		29.395	
		270		247		418		25		264		212		291
28.9	17.784		23.27		23.961		26.13		23.958		23.49		29.686	
July 8.8	18.074	290	20.98	229	24.409	448	26.25	12	24.244	286	21.44	205	29.999	313
		307		206		466		47		299		193		325
18.8	18.381		18.92		24.875		26.72		24.543		19.51		30.324	
		313		177		473		84		305		173		331
28.8	18.694		17.15		25.348		27.56		24.848		17.78		30.655	
		313		143		471		116		304		150		329
Aug. 7.7	19.007		15.72		25.819		28.72		25.152		16.28		30.984	
		304		104		460		145		298		122		321
17.7	19.311		14.68		26.279		30.17		25.450		15.06		31.305	
		292		63		440		172		285		90		307
27.7	19.603		14.05		26.719		31.89		25.735		14.16		31.612	
		272		19		415		194		266		55		289
Sept. 6.7	19.875		13.86		27.134		33.83		26.001		13.61		31.901	
		248		25		383		213		245		20		268
16.6	20.123		14.11		27.517		35.96		26.246		13.41	—	32.167	
		220		67		346		225		219		15		243
26.6	20.343		14.78		27.863		38.21		26.465		13.56		32.410	
		190		105		306		236		192		47		215
Oct. 6.6	20.533		15.83		28.169		40.57		26.657		14.03		32.625	
		158		138		263		242		163		78		187
16.6	20.691		17.21		28.432		42.99		26.820		14.81		32.812	
		124		167		217		242		134		103		156
26.5	20.815		18.88		28.649		45.41		26.954		15.84		32.968	
		91		186		168		239		103		123		126
Nov. 5.5	20.906		20.74		28.817		47.80		27.057		17.07		33.094	
		56		198		116		230		71		137		96
15.5	20.962		22.72		28.933		50.10		27.128		18.44		33.190	
		22		203		63		215		41		145		61
25.4	20.984		24.75		28.996		52.25		27.169		19.89		33.251	
Dec. 5.4	20.973	11	26.73	198	29.004	− 8	54.22	197	27.177	— 8	21.35	148	33.279	28
		43		187		48		172		22		142		5
15.4	20.930		28.60		28.956		55.94		27.155		22.77		33.274	
		75		168		101		143		52		133		40
25.4	20.855		30.28		28.855		57.37		27.103		24.10		33.234	
		104		145		150		107		81		118		72
35.3	20.751		31.73		28.705		58.44		27.022		25.28		33.162	
Mean Place	16.333		43.61		21.811		25.44		22.329		40.10		27.735	
Sec δ, Tan δ	1.074		−0.391		1.610		+1.300		1.013		−0.162		1.071	
Dψ α, Dω α	+0.05		+0.02		+0.08		−0.06		+0.06		+0.01		+0.07	
Dψ δ, Dω δ	+0.3		+0.7		+0.3		+0.7		+0.3		+0.7		+0.3	

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.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.
	h m s 2 54	° ′ ″ +79 5	h m s 2 55	° ′ ″ −40 37	h m s 2 57	° ′ ″ + 3 45	h m s 2 58	° ′ ″ −23 56
	s	″	s	″	s	″	s	″
t. 0.3	65.57	55.41	8.843	77.75	58.131	59.57	45.736	58.21
	76	180	177	152	83	55	118	139
10.3	64.81	57.21	8.666	79.27	58.048	58.82	45.618	59.60
	89	124	204	106	108	68	141	105
20.3	63.92	58.45	8.462	80.33	57.940	58.14	45.477	60.65
	98	66	222	58	128	62	162	71
30.3	62.94	59.11	8.240	80.91	57.812	57.52	45.315	61.36
	102	4	234	10	142	53	174	35
b. 9.2	61.92	59.15	8.006	81.01	57.670	56.99	45.141	61.71
	102	55	235	38	148	43	179	2
19.2	60.90	58.60	7.771	80.63	57.522	56.56	44.962	61.69
	98	113	230	86	146	31	175	39
r. 1.2	59.92	57.47	7.541	79.77	57.376	56.25	44.787	61.30
	88	166	213	131	136	16	163	76
11.2	59.04	55.81	7.328	78.46	57.240	56.09	44.624	60.54
	76	211	188	172	114	2	143	110
21.1	58.28	53.70	7.140	76.74	57.126	56.07	44.481	59.44
	58	247	153	210	86	16	113	142
31.1	57.70	51.23	6.987	74.64	57.040	56.23	44.368	58.02
	40	272	111	242	53	34	78	173
r. 10.1	57.30	48.51	6.876	72.22	56.987	56.57	44.290	56.29
	19	287	83	272	11	54	36	200
20.0	57.11	45.64	6.813	69.50	56.976	57.11	44.254	54.29
	3	292	10	294	34	76	10	223
30.0	57.14	42.72	6.803	66.56	57.010	57.87	44.264	52.06
	26	285	45	311	79	94	57	243
y 10.0	57.40	39.87	6.848	63.45	57.089	58.81	44.321	49.63
	46	267	99	320	124	116	105	258
20.0	57.86	37.20	6.947	60.25	57.213	59.97	44.426	47.05
	67	243	152	322	167	133	150	265
29.9	58.53	34.77	7.099	57.03	57.380	61.30	44.576	44.40
	84	211	202	317	206	147	193	269
ne 8.9	59.37	32.66	7.301	53.86	57.586	62.77	44.769	41.71
	99	172	247	303	239	160	230	264
18.9	60.36	30.94	7.548	50.83	57.825	64.37	44.999	39.07
	112	128	284	284	268	168	262	253
28.9	61.48	29.66	7.832	47.99	58.093	66.05	45.261	36.54
	123	82	315	254	288	170	286	237
ly 8.8	62.71	28.84	8.147	45.45	58.381	67.75	45.547	34.17
	130	33	337	218	302	168	304	212
18.8	64.01	28.51	8.484	43.27	58.683	69.43	45.851	32.05
	133	15	351	177	307	161	313	182
28.8	65.34	28.66	8.835	41.50	58.990	71.04	46.164	30.23
	135	64	356	120	307	150	316	145
ig. 7.7	66.69	29.30	9.191	40.21	59.297	72.54	46.480	28.78
	133	110	349	79	299	134	310	105
17.7	68.02	30.40	9.540	39.42	59.596	73.88	46.790	27.73
	129	155	338	24	288	114	297	62
27.7	69.31	31.95	9.878	39.18	59.884	75.02	47.087	27.11
	122	195	316	31	271	91	281	16
pt. 6.7	70.53	33.90	10.194	39.49	60.155	75.93	47.368	26.95
	114	232	290	85	250	66	257	30
16.6	71.67	36.22	10.484	40.34	60.405	76.59	47.625	27.25
	104	266	256	136	227	41	232	74
26.6	72.71	38.88	10.740	41.70	60.632	77.00	47.857	27.99
	92	292	218	182	200	16	201	111
ct. 6.6	73.63	41.80	10.958	43.52	60.832	77.16	48.058	29.13
	77	315	178	220	173	8	169	151
16.6	74.40	44.95	11.136	45.72	61.005	77.08	48.227	30.64
	60	330	134	251	146	30	136	179
26.5	75.00	48.25	11.270	48.23	61.151	76.78	48.363	32.43
	44	338	90	270	116	47	101	200
ov. 5.5	75.44	51.63	11.360	50.93	61.267	76.31	48.464	34.43
	25	337	43	280	87	62	65	215
15.5	75.69	55.00	11.403	53.73	61.354	75.69	48.529	36.58
	6	330	0	280	55	73	30	219
25.4	75.75	58.30	11.403	56.53	61.409	74.96	48.559	38.77
	13	313	45	260	24	79	5	214
Dec. 5.4	75.62	61.43	11.358	59.21	61.433	74.17	48.554	40.91
	33	287	87	246	6	82	39	203
15.4	75.29	64.30	11.271	61.67	61.427	73.35	48.515	42.94
	51	251	125	215	39	82	73	184
25.4	74.78	66.81	11.146	63.82	61.388	72.53	48.442	44.78
	68	206	161	180	69	80	102	157
35.3	74.10	68.89	10.985	65.62	61.319	71.73	48.340	46.35
an Place	59.610	32.52	6.964	72.34	56.323	53.30	43.945	56.75
α, Tan δ	5.285	+5.190	1.317	−0.858	1.002	+0.066	1.094	−0.444
, D_α	+0.16	−0.25	+0.05	+0.04	+0.06	0.00	+0.05	+0.02
D_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.	γ Persei. Mag. 3.1		ρ Persei. Var. 3.4–4.2		μ Horologii. Mag. 5.2		θ Hyd Mag.
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.
	h m 2 58 s	° ′ +53 10 ″	h m 2 59 s	° ′ +38 31 ″	h m 3 1 s	° ′ −60 2 ″	h m 3 2 s
Jan. 0.3	49.098	75.80	53.284	25.73	41.48	101.31	7.39
	170	97	111	45	34	157	63
10.3	48.928	76.77	53.173	26.18	41.14	102.88	6.76
	214	57	144	15	37	103	68
20.3	48.714	77.34	53.029	26.33	40.77	103.91	6.08
	248	15	172	13	40	45	72
30.3	48.466	77.49	52.857	26.20	40.37	104.36	5.36
	268	27	190	41	42	12	74
Feb. 9.2	48.198	77.22	52.667	25.79	39.95	104.24	4.62
	275	69	197	70	41	69	73
19.2	47.923	76.53	52.470	25.09	39.54	103.55	3.89
Mar. 1.2	267	109	193	93	40	122	70
	47.656	75.44	52.277	24.16	39.14	102.33	3.19
11.2	246	141	177	114	37	173	66
	47.410	74.03	52.100	23.02	38.77	100.60	2.53
21.1	207	169	150	129	34	218	59
	47.203	72.34	51.950	21.73	38.43	98.42	1.94
31.1	156	189	112	138	20	259	52
	47.047	70.45	51.838	20.35	38.14	95.83	1.42
	95	201	65	141	22	293	42
Apr. 10.1	46.952	68.44	51.773	18.94	37.92	92.90	1.00
	27	204	12	137	16	320	30
20.0	46.925	66.40	51.761	17.57	37.76	89.70	0.70
	47	199	45	126	9	342	20
30.0	46.972	64.41	51.806	16.31	37.67	86.28	0.50
	120	186	103	110	0	355	8
May 10.0	47.092	62.55	51.909	15.21	37.67	82.73	0.42
	193	165	159	89	7	359	4
20.0	47.285	60.90	52.068	14.32	37.74	79.14	0.46
	261	141	213	64	15	356	17
29.9	47.546	59.49	52.281	13.68	37.89	75.58	0.63
	322	109	262	38	22	344	28
June 8.9	47.868	58.40	52.543	13.30	38.11	72.14	0.91
	374	76	303	9	29	325	39
18.9	48.242	57.64	52.846	13.21	38.40	68.89	1.30
	416	39	335	21	35	296	49
28.9	48.658	57.25	53.181	13.42	38.75	65.93	1.79
	449	4	361	49	40	259	58
July 8.8	49.107	57.21	53.542	13.91	39.15	63.34	2.37
	468	33	376	76	44	216	65
18.8	49.575	57.54	53.918	14.67	39.59	61.18	3.02
	480	69	384	99	47	166	70
28.8	50.055	58.23	54.302	15.66	40.06	59.52	3.72
	480	101	384	122	49	110	72
Aug. 7.7	50.535	59.24	54.686	16.88	40.55	58.42	4.44
	471	132	376	138	48	51	74
17.7	51.006	60.56	55.062	18.26	41.03	57.91	5.18
	455	160	361	152	46	10	72
27.7	51.461	62.16	55.423	19.78	41.49	58.01	5.90
	430	182	341	165	44	70	67
Sept. 6.7	51.891	63.98	55.764	21.43	41.93	58.71	6.57
	400	203	318	170	41	129	62
16.6	52.291	66.01	56.082	23.13	42.34	60.00	7.19
	366	218	290	174	36	185	55
26.6	52.657	68.19	56.372	24.87	42.70	61.85	7.74
	327	229	259	175	30	234	45
Oct. 6.6	52.984	70.48	56.631	26.62	43.00	64.19	8.19
	283	237	228	173	24	273	34
16.6	53.267	72.85	56.859	28.35	43.24	66.92	8.53
	237	210	192	168	17	304	21
26.5	53.504	75.25	57.051	30.03	43.41	69.96	8.74
	187	238	156	160	9	322	9
Nov. 5.5	53.691	77.63	57.207	31.63	43.50	73.18	8.83
	136	231	117	151	1	328	4
15.5	53.827	79.94	57.324	33.14	43.51	76.46	8.79
	80	220	76	138	6	323	17
25.4	53.907	82.14	57.400	34.52	43.45	79.69	8.62
	24	202	35	122	13	304	30
Dec. 5.4	53.931	84.16	57.435	35.74	43.32	82.73	8.32
	34	181	8	105	20	277	40
15.4	53.897	85.97	57.427	36.79	43.12	85.50	7.92
	90	151	51	83	26	237	50
25.4	53.807	87.48	57.376	37.62	42.86	87.87	7.42
	145	118	90	58	31	190	59
35.3	53.662	88.66	57.286	38.20	42.55	89.77	6.83
Mean Place	46.536	56.74	51.117	9.94	39.177	92.87	4.324
Sec δ, Tan δ	1.669	+1.336	1.278	+0.796	2.003	−1.736	3.275
$D\psi\,\alpha$, $D_\omega\,\alpha$	+0.09	−0.06	+0.08	−0.04	+0.03	+0.08	0.00
$D\psi\,\delta$, $D_\omega\,\delta$	+0.3	+0.7	+0.3	+0.7	+0.3	+0.7	+0.3

FOR THE UPPER TRANSIT AT WASHINGTON.

ington 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.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.
	h m s 3 2	° ′ ″ +40 38	h m s 3 6	° ′ ″ +19 24	h m s 3 8	° ′ ″ −29 18	h m s 3 9	° ′ ″ +77 25
0.4	47.956	28.58	54.742	59.73	34.512	52.12	50.12	75.23
10.3	47.841 115	29.13 55	54.663 79	59.49 24	34.385 127	53.63 151	49.52 60	77.12 189
20.3	47.691 150	29.37 24	54.554 109	59.17 32	34.232 153	54.79 116	48.79 73	78.50 138
30.3	47.513 178	29.31 6	54.422 132	58.76 41	34.057 175	55.55 76	47.97 82	79.31 81
9.2	47.315 198	28.94 37	54.274 148	58.26 50	33.868 189	55.90 35	47.10 87	79.53 22
	205	67	157	56	195	6	89	38
19.2	47.110	28.27	54.117	57.70	33.673	55.84	46.21	79.15
1.2	46.908 202	27.34 93	53.960 157	57.09 61	33.479 194	55.38 46	45.35 86	78.19 96
11.2	46.721 187	26.17 117	53.814 146	56.46 63	33.297 182	54.52 86	44.57 78	76.70 149
21.1	46.563 158	24.84 133	53.689 125	55.85 61	33.136 161	53.27 125	43.88 69	74.75 195
31.1	46.444 119	23.40 144	53.593 96	55.29 56	33.004 132	51.67 160	43.32 56	72.42 233
	72	149	57	48	97	192	38	262
10.1	46.372	21.91	53.536	54.81	32.907	49.75	42.94	69.80
20.1	46.355 17	20.44 147	53.521 15	54.47 34	32.853 54	47.53 222	42.72 22	67.02 278
30.0	46.397 42	19.07 137	53.553 32	54.29 18	32.846 7	45.08 245	42.69 3	64.16 286
10.0	46.497 100	17.85 122	53.634 81	54.29 0	32.888 42	42.42 266	42.87 18	61.33 283
20.0	46.657 160	16.83 102	53.763 129	54.50 21	32.980 92	39.62 280	43.22 35	58.65 268
	215	77	175	40	139	287	54	248
29.9	46.872	16.06 50	53.938	54.90	33.119	36.75	43.76	56.17
s 8.9	47.136 264	15.56 20	54.154 216	55.53 63	33.304 185	33.86 289	44.45 69	53.99 218
18.9	47.443 307	15.36 10	54.407 253	56.35 82	33.529 225	31.02 284	45.29 84	52.16 183
28.9	47.785 342	15.46 38	54.688 281	57.34 99	33.789 260	28.32 270	46.25 96	50.75 141
r 8.8	48.153 368	15.84 38	54.993 305	58.49 115	34.075 286	25.83 249	47.31 106	49.77 98
	385	67	318	126	307	222	112	50
18.8	48.538	16.51	55.311	59.75	34.382	23.61	48.43	49.27
28.8	48.931 393	17.43 92	55.637 326	61.08 133	34.700 318	21.71 190	49.60 117	49.23 4
g. 7.8	49.324 393	18.58 115	55.963 326	62.44 136	35.024 324	20.22 149	50.79 119	49.67 44
17.7	49.711 387	19.93 135	56.283 320	63.80 136	35.344 320	19.17 105	51.98 119	50.56 89
27.7	50.083 372	21.44 151	56.591 308	65.12 132	35.654 310	18.59 58	53.14 116	51.90 134
	352	164	293	124	294	8	111	175
pt. 6.7	50.435	23.08	56.884	66.36	35.948	18.51	54.25	53.65
16.6	50.764 329	24.81 173	57.157 273	67.49 113	36.221 273	18.92 41	55.30 105	55.78 213
26.6	51.064 300	26.60 179	57.405 248	68.51 102	36.466 245	19.81 89	56.25 95	58.23 245
t. 6.6	51.333 269	28.41 181	57.630 225	69.38 87	36.681 215	21.13 132	57.11 86	60.98 275
16.6	51.570 237	30.22 181	57.827 197	70.11 73	36.864 183	22.84 171	57.85 74	63.96 298
	201	178	168	59	147	203	61	315
26.5	51.771	32.00	57.995	70.70	37.011	24.87	58.46	67.11
ov. 5.5	51.934 163	33.72 172	58.134 139	71.16 46	37.121 110	27.12 225	58.91 45	70.37 326
15.5	52.057 123	35.34 162	58.241 107	71.49 33	37.194 73	29.51 239	59.22 31	73.66 329
25.5	52.138 81	36.84 150	58.315 74	71.70 21	37.228 34	31.94 243	59.36 14	76.90 324
ec. 5.4	52.175 37	38.20 136	58.357 42	71.80 10	37.225 3	34.33 239	59.32 4	80.00 310
	7	116	6	1	41	225	21	288
15.4	52.168	39.36	58.363	71.81	37.184	36.58	59.11	82.88
25.4	52.117 51	40.31 95	58.334 29	71.71 10	37.107 77	38.60 202	58.73 38	85.44 256
35.3	52.024 93	40.99 68	58.271 63	71.52 19	36.997 110	40.33 173	58.21 52	87.60 216
n Place	45.724	12.42	52.788	49.19	32.655	49.45	44.362	53.42
δ, Tan δ	1.318	+0.858	1.060	+0.352	1.147	−0.561	4.596	+4.486
, $D_m \alpha$	+0.06	−0.04	+0.07	−0.02	+0.05	+0.03	+0.15	−0.20
, $D_m \delta$	*+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 Arietis. Mag. 5.0		38 G. Horologii. Mag. 5.7		ζ Eridani. Mag. 4.9		τ Arieti Mag. 5.
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.
	h m s 3 10	° ′ ″ +20 44	h m s 3 10	° ′ ″ −57 37	h m s 3 11	° ′ ″ − 9 7	h m s 3 16
Jan. 0.4	9.614	26.05	29.062	63.44	49.866	35.64	27.949
	79	18	299	170	85	113	74
10.3	9.535	25.87	28.763	65.14	49.781	36.77	27.875
	108	29	338	117	113	97	106
20.3	9.427	25.58	28.425	66.31	49.668	37.74	27.769
	132	39	364	61	135	74	131
30.3	9.295	25.19	28.061	66.92	49.533	38.48	27.638
Feb. 9.2	150	47	379	4	150	52	149
	9.145	24.72	27.682	66.96	49.383	39.00	27.489
	159	56	382	52	158	27	160
19.2	8.986	24.16	27.300	66.44	49.225	39.27	27.329
	159	62	375	106	158	5	161
Mar. 1.2	8.827	23.54	26.925	65.38	49.067	39.32	27.168
	149	65	353	156	147	22	152
11.2	8.678	22.89	26.572	63.82	48.920	39.10	27.016
	128	66	318	203	132	47	133
21.1	8.550	22.23	26.254	61.79	48.788	38.63	26.883
	100	61	274	246	105	73	104
31.1	8.450	21.62	25.980	59.33	48.683	37.90	26.779
	61	53	220	279	72	97	67
Apr. 10.1	8.389	21.09	25.760	56.54	48.611	36.93	26.712
	18	41	158	311	31	122	24
20.1	8.371	20.68	25.602	53.43	48.580	35.71	26.688
	28	26	87	332	11	144	23
30.0	8.399	20.42	25.515	50.11	48.591	34.27	26.711
	78	9	17	348	56	164	72
May 10.0	8.477	20.33	25.498	46.63	48.647	32.63	26.783
	127	10	59	355	103	184	120
20.0	8.604	20.43	25.557	43.08	48.750	30.79	26.903
	172	33	131	353	145	196	167
29.9	8.776	20.76	25.688	39.55	48.895	28.83	27.070
	215	52	201	345	186	208	210
June 8.9	8.991	21.28	25.889	36.10	49.081	26.75	27.280
	252	74	266	326	221	211	247
18.9	9.243	22.02	26.155	32.84	49.302	24.64	27.527
	281	91	325	302	253	212	277
28.9	9.524	22.93	26.480	29.82	49.555	22.52	27.804
July 8.8	305	107	373	266	274	205	302
	9.829	24.00	26.853	27.16	49.829	20.47	28.106
	319	120	411	226	291	193	318
18.8	10.148	25.20	27.264	24.90	50.120	18.54	28.424
	328	128	439	176	301	176	327
28.8	10.476	26.48	27.703	23.14	50.421	16.78	28.751
	329	133	454	124	304	151	328
Aug. 7.8	10.805	27.81	28.157	21.90	50.725	15.27	29.079
	323	134	456	65	298	125	324
17.7	11.128	29.15	28.613	21.25	51.023	14.02	29.403
	313	131	440	4	289	92	315
27.7	11.441	30.46	29.059	21.21	51.312	13.10	29.718
	295	125	425	56	273	59	299
Sept. 6.7	11.736	31.71	29.484	21.77	51.585	12.51	30.017
	276	115	393	116	256	22	280
16.6	12.012	32.86	29.877	22.93	51.841	12.29	30.297
	254	104	350	172	233	13	258
26.6	12.266	33.90	30.227	24.65	52.074	12.42	30.555
Oct. 6.6	229	92	297	222	208	47	235
	12.495	34.82	30.524	26.87	52.282	12.89	30.790
16.6	201	79	298	264	181	78	207
	12.696	35.61	30.762	29.51	52.463	13.67	30.997
	172	65	176	297	151	104	180
26.5	12.868	36.26	30.938	32.48	52.614	14.71	31.177
	143	52	108	317	122	126	149
Nov. 5.5	13.011	36.78	31.046	35.65	52.736	15.97	31.326
	111	40	36	327	91	142	118
15.5	13.122	37.18	31.082	38.92	52.827	17.39	31.444
	78	28	31	324	59	149	55
25.5	13.200	37.46	31.051	42.16	52.886	18.88	31.529
Dec. 5.4	45	17	101	308	26	152	51
	13.245	37.63	30.950	45.24	52.912	20.40	31.580
	8	7	163	283	6	118	14
15.4	13.253	37.70	30.787	48.07	52.906	21.88	31.594
	27	3	222	246	39	140	21
25.4	13.226	37.67	30.565	50.53	52.867	23.28	31.573
35.3	61	13	273	202	70	127	56
	13.165	37.54	30.292	52.55	52.797	24.55	31.517
Mean Place	7.630	15.26	26.793	55.60	48.028	38.13	25.929
Sec δ, Tan δ	1.069	+0.379	1.868	−1.577	1.013	−0.161	1.070
$D_\psi\,\alpha$, $D_\omega\,\alpha$	+0.07	−0.02	+0.03	+0.07	+0.06	+0.01	+0.07
$D_\psi\,\delta$, $D_\omega\,\delta$	+0.3	+0.7	+0.3	+0.7	+0.3	+0.7	+0.3

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	ε Eridani. Mag. 4.3		ι Hydri. Mag. 5.5		α Persei. Mag. 1.9		o Tauri. Mag. 3.8	
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.
	h m	° ′	h m	° ′	h m	° ′	h m	° ′
	3 16	−43 22	3 17	−77 40	3 18	+49 34	3 20	+ 8 44
	s	″	s	″	s	″	s	″
0.4	38.765	77.02	64.19	100.85	25.954	17.71	22.605	22.58
10.3	38.592 173	78.76 174	63.26 93	102.44 159	25.822 132	18.70 99	22.535 70	21.97 61
20.3	38.388 204	80.05 129	62.24 102	103.47 103	25.644 178	19.33 63	22.436 99	21.38 59
30.3	38.161 227	80.84 79	61.16 108	103.88 − 41	25.429 215	19.59 − 26	22.312 124	20.82 56
9.3	37.917 244	81.14 − 30	60.06 110	103.73 15	25.190 239	19.47 12	22.170 142	20.30 52
	253	22	111	74	253	50	152	47
19.2	37.664	80.92	58.95	102.99	24.937	18.97	22.018	19.83
1.2	37.415 249	80.22 70	57.88 107	101.69 130	24.685 252	18.11 86	21.863 155	19.43 40
11.2	37.180 235	79.02 120	56.87 101	99.89 180	24.449 236	16.92 119	21.716 147	19.11 32
21.1	36.968 212	77.40 162	55.94 93	97.65 224	24.243 206	15.47 145	21.588 128	18.91 20
31.1	36.788 180	75.37 203	55.12 82	94.97 268	24.080 163	13.81 166	21.484 104	18.83 − 8
	137	238	70	299	109	179	69	6
10.1	36.651 90	72.99 271	54.42 55	91.98 326	23.971 47	12.02 183	21.415 30	18.89 24
20.1	36.561 39	70.28 294	53.87 39	88.72 343	23.924 − 19	10.19 182	21.385 − 15	19.13 42
30.0	36.522 − 18	67.34 314	53.48 23	85.29 358	23.943 88	8.37 170	21.400 61	19.55 60
10.0	36.540 76	64.20 326	53.25 6	81.71 363	24.031 156	6.67 155	21.461 107	20.15 80
20.0	36.616 132	60.94 330	53.19 − 12	78.08 356	24.187 221	5.12 134	21.568 151	20.95 98
30.0	36.748	57.64	53.31	74.52	24.408	3.78	21.719	21.93
8.9	36.933 185	54.37 327	53.59 28	71.09 343	24.689 281	2.72 106	21.910 191	23.08 115
18.9	37.168 235	51.20 317	54.04 45	67.89 320	25.021 332	1.96 76	22.139 229	24.36 128
28.9	37.445 277	48.24 296	54.64 60	64.96 293	25.395 374	1.51 45	22.397 258	25.75 139
8.8	37.758 313	45.53 271	55.37 73	62.42 254	25.803 408	1.40 − 11	22.678 281	27.21 146
	341	235	84	210	431	22	297	148
18.8	38.099	43.18 193	56.21 93	60.32 158	26.234 446	1.62 52	22.975 308	28.69 147
28.8	38.458 359	41.25 145	57.14 98	58.74 102	26.680 450	2.14 83	23.283 310	30.16 140
. 7.8	38.827 369	39.80 93	58.12 101	57.72 42	27.130 445	2.97 111	23.593 305	31.56 129
17.7	39.196 369	38.87 39	59.13 101	57.30 − 16	27.575 434	4.08 135	23.898 297	32.85 114
27.7	39.558 362	38.48 − 19	60.14 96	57.46 81	28.009 416	5.43 157	24.195 284	33.99 96
t. 6.7	39.902	38.67	61.10	58.27	28.425	7.00	24.479	34.95
16.7	40.224 322	39.42 75	62.00 90	59.70 143	28.817 392	8.74 174	24.744 265	35.71 76
26.6	40.514 290	40.71 129	62.80 80	61.63 193	29.179 362	10.62 188	24.990 246	36.26 55
. 6.6	40.770 256	42.50 179	63.47 67	64.09 246	29.509 330	12.61 199	25.212 222	36.58 32
16.6	40.984 214	44.70 220	63.99 52	66.93 284	29.801 292	14.68 207	25.409 197	36.71 13
	169	255	34	315	252	212	170	7
26.5	41.153	47.25	64.33	70.08	30.053	16.80	25.579	36.64
r. 5.5	41.277 124	50.03 278	64.50 − 17	73.41 333	30.261 208	18.90 210	25.722 143	36.40 24
15.5	41.352 75	52.96 293	64.46 4	76.80 339	30.422 161	20.97 207	25.834 112	36.03 37
25.5	41.379 − 27	55.91 295	64.24 22	80.13 333	30.532 110	22.96 199	25.914 80	35.54 49
:. 5.4	41.358 21	58.78 287	63.84 40	83.25 312	30.590 58	24.82 186	25.963 49	34.98 56
	68	285	58	283	1	167	14	60
15.4	41.290	61.43	63.26	86.08	30.591	26.49	25.977	34.38
25.4	41.178 112	63.82 239	62.53 73	88.51 243	30.539 52	27.93 144	25.957 20	33.75 63
35.4	41.027 151	65.83 201	61.67 86	90.46 195	30.433 106	29.09 116	25.905 52	33.12 63
. Place	36.756	71.60	60.035	91.67	23.335	0.45	20.663	15.33
, Tan ∂	1.376	−0.945	4.690	−4.582	1.542	+1.174	1.012	+0.154
, $D_{1^m}\alpha$	+0.04	+0.04	−0.03	+0.20	+0.08	−0.05	+0.06	−0.01
, $D_{1^m}\partial$	*+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 Eridan Mag. 3.
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.
	h m 3 22	° ′ +59 39	h m 3 22	° ′ + 9 26	h m 3 26	° ′ +12 39	h m 3 29
	s	″	s	″	s	″	s
Jan. 0.4	23.405	26.93	42.084	45.68	19.302	19.25	3.035
	100	140	68	59	66	46	80
10.3	23.215	28.33	42.016	45.09	19.236	18.79	2.955
	248	99	97	57	96	48	111
20.3	22.967	29.32	41.919	44.52	19.140	18.31	2.844
	295	55	123	54	124	48	135
30.3	22.672	29.87	41.796	43.98	19.016	17.83	2.709
	326	8	142	51	143	49	152
Feb. 9.3	22.346	29.95	41.654	43.47	18.873	17.34	2.557
	342	40	152	47	154	48	164
19.2	22.004	29.55	41.502	43.00	18.719	16.86	2.393
	340	84	155	41	157	45	165
Mar. 1.2	21.664	28.71	41.347	42.59	18.562	16.41	2.228
	320	126	147	33	151	40	158
11.2	21.344	27.45	41.200	42.26	18.411	16.01	2.070
	281	162	131	22	134	34	143
21.1	21.063	25.83	41.069	42.04	18.277	15.67	1.927
	227	189	105	11	107	24	117
31.1	20.836	23.94	40.964	41.93	18.170	15.43	1.810
	160	211	70	3	74	12	85
Apr. 10.1	20.676	21.83	40.894	41.96	18.096	15.31	1.725
	81	222	32	20	33	1	48
20.1	20.595	19.61	40.862	42.16	18.063	15.32	1.677
	4	225	13	37	11	19	4
30.0	20.599	17.36	40.875	42.53	18.074	15.51	1.673
	90	219	58	55	57	36	41
May 10.0	20.689	15.17	40.933	43.08	18.131	15.87	1.714
	175	204	106	76	105	55	87
20.0	20.864	13.13	41.039	43.84	18.236	16.42	1.801
	257	185	150	93	149	74	131
30.0	21.121	11.28	41.189	44.77	18.385	17.16	1.932
	332	157	190	108	191	91	173
June 8.9	21.453	9.71	41.379	45.85	18.576	18.07	2.105
	398	125	228	126	228	106	209
18.9	21.851	8.46	41.607	47.11	18.804	19.13	2.314
	454	92	258	134	259	120	240
28.9	22.305	7.54	41.865	48.45	19.063	20.33	2.554
	497	53	281	143	283	129	266
July 8.8	22.802	7.01	42.146	49.88	19.346	21.62	2.820
	529	16	297	145	301	135	284
18.8	23.331	6.85	42.443	51.33	19.647	22.97	3.104
	549	22	308	144	310	136	294
28.8	23.880	7.07	42.751	52.77	19.957	24.33	3.398
	558	59	310	139	314	133	300
Aug. 7.8	24.438	7.66	43.061	54.16	20.271	25.66	3.698
	555	94	308	129	311	126	299
17.7	24.993	8.60	43.369	55.45	20.582	26.92	3.997
	542	127	298	113	302	115	290
27.7	25.535	9.87	43.667	56.58	20.884	28.07	4.287
	522	157	286	97	290	102	278
Sept. 6.7	26.057	11.44	43.953	57.55	21.174	29.09	4.565
	494	183	269	77	274	85	260
16.7	26.551	13.27	44.222	58.32	21.448	29.94	4.825
	458	207	246	57	253	68	240
26.6	27.009	15.34	44.468	58.89	21.701	30.62	5.065
	417	225	225	37	231	48	216
Oct. 6.6	27.426	17.59	44.693	59.26	21.932	31.10	5.281
	371	239	199	14	205	30	191
16.6	27.797	19.98	44.892	59.40	22.137	31.40	5.472
	318	250	173	4	181	14	163
26.5	28.115	22.48	45.065	59.36	22.318	31.54	5.635
	260	255	145	20	151	2	134
Nov. 5.5	28.375	25.03	45.210	59.16	22.469	31.52	5.769
	198	256	115	34	121	15	101
15.5	28.573	27.59	45.325	58.82	22.590	31.37	5.870
	129	249	83	45	91	26	70
25.5	28.702	30.08	45.408	58.37	22.681	31.11	5.940
	61	238	52	52	56	33	36
Dec. 5.4	28.763	32.46	45.460	57.85	22.737	30.78	5.976
	12	218	16	57	22	40	3
15.4	28.751	34.64	45.476	57.28	22.759	30.38	5.979
	85	194	17	59	14	44	32
25.4	28.666	36.58	45.459	56.69	22.745	29.94	5.947
	154	161	51	61	48	46	66
35.4	28.512	38.19	45.408	56.08	22.697	29.48	5.881
Mean Place	20.239	8.13	40.128	38.30	17.304	11.11	1.141
Sec δ, Tan δ	1.979	+1.708	1.014	+0.166	1.025	+0.224	1.015
$D_\psi\, a$, $D_\omega\, a$	+0.10	−0.07	+0.06	−0.01	+0.06	−0.01	+0.06
$D_\psi\, \delta$, $D_\omega\, \delta$	+0.3	+0.8	+0.3	+0.8	+0.2	+0.8	+0.2

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		ν Persei. Mag. 3.9	
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.
	h m s 3 30	° ′ ″ −21 54	h m s 3 37	° ′ ″ +47 31	h m s 3 39	° ′ ″ −10 2	h m s 3 39	° ′ ″ +42 19
h. 0.4	9.119	39.15	3.208	39.42	18.243	35.44	35.532	17.52
10.3	9.023 96	40.72 157	3.102 106	40.44 102	18.171 72	36.72 128	35.444 88	18.33 81
20.3	8.896 127	41.98 126	2.949 153	41.15 71	18.069 102	37.79 107	35.312 132	18.88 55
30.3	8.744 152	42.92 94	2.756 193	41.53 38	17.939 130	38.64 85	35.142 170	19.14 26
h. 9.3	8.573 171	43.51 59	2.532 224	41.56 3	17.789 150	39.24 60	34.944 198	19.10 4
	181	23	240	33	163	37	216	35
19.2	8.392	43.74 —	2.292	41.23	17.626	39.61	34.728	18.75
r. 1.2	8.209 183	43.61 13	2.046 246	40.55 68	17.459 167	39.72 11	34.507 221	18.11 64
11.2	8.032 177	43.14 47	1.811 235	39.56 99	17.297 162	39.55 17	34.296 211	17.21 90
21.2	7.872 160	42.30 84	1.601 210	38.30 126	17.148 149	39.13 42	34.104 192	16.08 113
31.1	7.736 136	41.13 117	1.427 174	36.83 147	17.023 125	38.44 69	33.947 157	14.79 129
	102	145	125	162	96	93	114	141
r. 10.1	7.634	39.68	1.302	35.21	16.927	37.51	33.833	13.38
20.1	7.570 64	37.91 177	1.235 67	33.52 169	16.869 58	36.32 119	33.771 62	11.92 146
30.0	7.550 20	35.88 203	1.231 4	31.82 170	16.853 16	34.90 142	33.768 3	10.49 143
ay 10.0	7.576 26	33.65 223	1.292 61	30.20 162	16.882 29	33.26 164	33.821 56	9.13 136
20.0	7.650 74	31.25 240	1.419 127	28.71 149	16.957 75	31.44 182	33.942 118	7.91 122
	120	252	192	132	119	196	176	104
30.0	7.770	28.73	1.611	27.39	17.076	29.48	34.118	6.87
ne 8.9	7.934 164	26.13 260	1.860 249	26.32 107	17.237 161	27.41 207	34.348 230	6.06 81
18.9	8.138 204	23.56 257	2.162 302	25.51 81	17.437 200	25.27 214	34.627 279	5.49 57
28.9	8.375 237	21.04 252	2.509 347	24.99 52	17.669 232	23.13 214	34.947 320	5.20 29
ly 8.9	8.641 266	18.65 239	2.890 381	24.76 23	17.928 259	21.06 207	35.300 353	5.16 4
	287	217	408	7	278	197	377	24
18.8	8.928	16.48	3.298	24.83	18.206	19.09	35.677	5.40
28.8	9.230 302	14.56 192	3.723 425	25.20 37	18.498 292	17.30 179	36.069 392	5.88 48
ig. 7.8	9.538 308	12.98 158	4.156 433	25.85 65	18.796 298	15.74 156	36.471 402	6.60 72
17.7	9.846 308	11.78 120	4.589 433	26.74 89	19.096 300	14.46 128	36.870 399	7.53 93
27.7	10.147 301	11.00 78	5.015 426	27.87 113	19.390 294	13.50 96	37.264 394	8.65 112
	290	34	412	132	283	61	381	127
pt. 6.7	10.437	10.66 —	5.427	29.19	19.673	12.89	37.645	9.92
16.7	10.710 273	10.78 12	5.819 392	30.69 150	19.942 269	12.66 23	38.008 363	11.31 139
26.6	10.961 251	11.35 57	6.187 368	32.33 164	20.191 249	12.79 — 13	38.349 341	12.80 149
ct. 6.6	11.187 226	12.35 100	6.525 338	34.08 175	20.419 228	13.28 49	38.663 314	14.36 156
16.6	11.384 197	13.72 137	6.831 306	35.92 184	20.622 203	14.10 82	38.949 286	15.96 160
	167	170	269	188	176	111	251	163
26.6	11.551	15.42	7.100	37.80	20.798	15.21	39.200	17.59
ov. 5.5	11.686 135	17.37 195	7.329 229	39.70 190	20.946 148	16.54 133	39.416 216	19.21 162
15.5	11.787 101	19.50 213	7.513 184	41.59 189	21.063 117	18.04 150	39.591 175	20.81 160
25.5	11.852 65	21.71 221	7.649 136	43.43 184	21.147 84	19.66 162	39.724 133	22.34 153
ec. 5.4	11.880 28	23.91 220	7.734 85	45.17 174	21.199 52	21.32 166	39.810 86	23.78 144
9	212		32	159	15	161	37	132
15.4	11.871	26.03	7.766 —	46.76	21.214 — 20	22.93 153	39.847 — 12	25.10
25.4	11.828 43	28.00 197	7.742 24	48.17 141	21.194 53	24.46 140	39.835 63	26.24 114
35.4	11.749 79	29.74 174	7.664 78	49.34 117	21.141	25.86	39.772	27.18 94
n Place	7.202	38.44	0.504	23.67	16.294	37.56	32.977	2.94
δ, Tan δ	*1.078*	*−0.402*	*1.481*	+1.092	1.016	−0.177	1.353	+0.910
$D_m\ \alpha$	*+0.05*	*+0.02*	*+0.08*	−0.04	+0.06	+0.01	+0.08	−0.04
$D_m\ \delta$	*+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				η Tauri. (Alcyone.) Mag. 3.0				τ⁶ Eridani. Mag. 4.3				g Eridani. Mag. 4.2			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m		° ′		h m		° ′		h m		° ′		h m		°	
	3 41		−71 4		3 42		+23 50		3 43		−23 29		3 46		−36	
	s		″		s		″		s		″		s		″	
Jan. 0.4	39.24	31	59.46	197	35.042	59	68.07	1	18.568	93	37.64	170	22.981	129	66.35	
10.4	38.93	40	61.43	154	34.983	94	68.08	9	18.475	126	39.34	141	22.852	165	68.33	
20.3	38.53	48	62.97	105	34.889	127	67.99	21	18.349	152	40.75	107	22.687	194	69.92	
30.3	38.05	54	64.02	51	34.762	150	67.78	31	18.197	175	41.82	70	22.493	217	71.08	
Feb. 9.3	37.51	57	64.53	5	34.612	167	67.47	42	18.022	187	42.52	32	22.276	230	71.78	
19.2	36.94		64.48		34.445		67.05		17.835		42.84		22.046		72.00	
Mar. 1.2	36.36	58	63.90	58	34.273	172	66.53	52	17.644	191	42.80	4	21.811	235	71.76	
11.2	35.81	55	62.80	110	34.107	166	65.94	59	17.457	187	42.38	42	21.582	229	71.09	
21.2	35.32	49	61.24	156	33.955	152	65.30	64	17.285	172	41.60	78	21.370	212	69.95	
31.1	34.90	42	59.28	196	33.830	125	64.61	66	17.136	149	40.47	113	21.183	187	68.42	
		33		226		91		63		118		144		153		
Apr. 10.1	34.57	20	57.02	250	33.739	49	64.01	57	17.018	79	39.03	176	21.030	111	66.52	
20.1	34.37	8	54.52	262	33.690	3	63.44	46	16.939	35	37.27	203	20.919	63	64.28	
30.1	34.29	4	51.90	264	33.687	49	62.98	33	16.904	11	35.24	224	20.856	13	61.74	
May 10.0	34.33	19	49.26	256	33.736	97	62.65	15	16.915	58	33.00	243	20.843	39	58.98	
20.0	34.52	30	46.70	242	33.833	146	62.50	1	16.973	105	30.57	256	20.882	92	56.05	
30.0	34.82		44.28		33.979		62.51		17.078		28.01		20.974		53.00	
June 8.9	35.21	42	42.10	218	34.169	190	62.72	21	17.229	151	25.39	262	21.116	142	49.92	
18.9	35.77	53	40.20	190	34.400	231	63.12	40	17.420	191	22.76	263	21.305	189	46.89	
28.9	36.40	63	38.64	156	34.666	266	63.69	57	17.647	227	20.20	256	21.536	231	43.97	
July 8.9	37.10	70	37.47	117	34.958	292	64.44	73	17.904	257	17.77	243	21.802	266	41.25	
		75		77		314		87		280		222		295		
18.8	37.85		36.70		35.272		65.31		18.184		15.55		22.097		38.81	
28.8	38.61	79	36.36	34	35.597	325	66.29	98	18.482	298	13.59	196	22.413	316	36.72	
Aug. 7.8	39.47	86	36.44	8	35.929	332	67.35	106	18.789	307	11.97	162	22.742	329	35.04	
17.8	40.30	83	36.93	49	36.261	332	68.44	109	19.097	308	10.74	123	23.076	334	33.84	
27.7	41.13	83	37.81	91	36.587	326	69.55	111	19.401	304	9.93	81	23.408	332	33.14	
		80		130		315		108		295		35		323		
Sept. 6.7	41.93		39.11		36.902		70.63		19.696		9.58		23.731		32.99	
16.7	42.70	77	40.79	165	37.202	300	71.65	102	19.976	280	9.71	13	24.037	306	33.39	
26.6	43.43	73	42.78	199	37.484	282	72.60	95	20.236	260	10.30	59	24.322	285	34.32	
Oct. 6.6	44.09	66	45.01	226	37.714	260	73.47	87	20.473	237	11.34	104	24.580	258	35.77	
16.6	44.69	60	47.57	253	37.981	237	74.24	77	20.682	209	12.77	143	24.805	225	37.65	
		52		271		209		66		180		178		191		
26.6	45.21		50.28		38.190		74.90		20.862		14.55		24.996		39.93	
Nov. 5.5	45.64	43	53.11	286	38.372	182	75.48	58	21.010	148	16.60	205	25.148	152	42.50	
15.5	45.97	33	56.08	294	38.522	150	75.97	49	21.123	113	18.83	223	25.258	110	45.26	
25.5	46.20	23	59.03	295	38.638	116	76.37	40	21.200	77	21.16	233	25.325	67	48.11	
Dec. 5.5	46.30	10	61.92	289	38.717	79	76.69	32	21.239	39	23.50	234	25.348	23	50.95	
		2		274		41		23		2		227		22		
15.4	46.28		64.66		38.758		76.92		21.241		25.77		25.326		53.67	
25.4	46.15	13	67.17	251	38.760	2	77.07	15	21.204	37	27.88	211	25.260	66	56.18	
35.4	45.91	24	69.35	218	38.722	38	77.13	6	21.130	74	29.77	189	25.154	106	58.39	
Mean Place	34.461		40.54		32.843		57.71		16.595		36.69		20.924		62.88	
Sec δ, Tan δ	3.085		+2.918		1.093		+0.442		1.090		−0.435		1.243		−0.739	
$D_\phi\, a$, $D_\omega\, a$	+0.12		−0.11		+0.07		−0.02		+0.05		+0.02		+0.04		+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.

ington Time.	γ Hydri. Mag. 3.2		ζ Persei. Mag. 2.9		9 H. Camelop. Mag. 5.2		ε Persei. Mag. 3.0	
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.
	h m	° ′	h m	° ′	h m	° ′	h m	° ′
	3 48	−74 29	3 48	+31 38	3 50	+60 51	3 52	+39 46
	s	″	s	″	s	″	s	″
0.4	34.33	44.67	56.997	29.05	6.52	78.17	19.355	29.53
	67	205	61	38	17	165	70	75
10.4	33.66	46.72	56.936	29.43	6.35	79.82	19.285	30.28
	75	153	102	21	23	128	116	54
20.3	32.91	48.25	56.834	29.64	6.12	81.10	19.169	30.82
	82	96	135	3	28	87	154	27
30.3	32.09	49.21	56.699	29.67	5.84	81.97	19.015	31.09
	87	38	163	16	33	41	184	2
9.3	31.22	49.59	56.536	29.51	5.51	82.38	18.831	31.11
	88	20	180	34	36	6	204	26
19.2	30.34	49.39	56.356	29.17	5.15	82.32	18.627	30.85
	88	76	188	53	36	52	214	52
1.2	29.46	48.63	56.168	28.64	4.79	81.80	18.413	30.33
	86	130	184	70	36	96	207	78
11.2	28.60	47.33	55.984	27.94	4.43	80.84	18.206	29.55
	79	180	167	81	32	136	191	97
21.2	27.81	45.53	55.817	27.13	4.11	79.48	18.015	28.58
	73	225	141	90	27	170	160	115
31.1	27.08	43.28	55.676	26.23	3.84	77.78	17.855	27.43
	63	263	103	94	21	196	120	125
10.1	26.45	40.65	55.573	25.29	3.63	75.82	17.735	26.18
	53	297	59	94	13	215	72	131
20.1	25.92	37.68	55.514	24.35	3.50	73.67	17.663	24.87
	40	323	10	88	5	223	17	129
30.1	25.52	34.45	55.504	23.47	3.45	71.44	17.646	23.58
	28	342	43	78	3	224	40	123
10.0	25.24	31.03	55.547	22.69	3.48	69.20	17.686	22.35
	13	354	98	63	13	216	101	110
20.0	25.11	27.49	55.645	22.06	3.61	67.04	17.787	21.25
	0	356	149	47	21	203	157	94
30.0	25.11	23.93	55.794	21.59	3.82	65.01	17.944	20.31
	14	350	197	26	31	181	210	74
8.9	25.25	20.43	55.991	21.33	4.13	63.20	18.154	19.57
	29	337	241	6	37	154	258	53
18.9	25.54	17.06	56.232	21.27	4.50	61.66	18.412	19.04
	41	313	277	15	43	124	299	27
28.9	25.95	13.93	56.509	21.42	4.93	60.42	18.711	18.77
	52	283	308	35	48	91	332	4
8.9	26.47	11.10	56.817	21.77	5.41	59.51	19.043	18.73
	63	243	329	54	53	54	359	20
18.8	27.10	8.67	57.146	22.31	5.94	58.97	19.402	18.93
	70	196	345	72	55	18	376	42
28.8	27.80	6.71	57.491	23.03	6.49	58.79	19.778	19.35
	77	143	354	84	57	18	385	65
7.8	28.57	5.28	57.845	23.87	7.06	58.97	20.163	20.00
	81	86	354	96	58	53	387	82
17.8	29.38	4.42	58.199	24.83	7.64	59.50	20.550	20.82
	82	24	348	105	57	88	383	98
27.7	30.20	4.18	58.547	25.88	8.21	60.38	20.933	21.80
	81	39	340	110	56	119	373	111
6.7	31.01	4.57	58.887	26.98	8.77	61.57	21.306	22.91
	78	101	324	112	54	147	357	122
16.7	31.79	5.58	59.211	28.10	9.31	63.04	21.663	24.13
	71	160	305	113	51	174	339	130
26.6	32.50	7.18	59.516	29.23	9.82	64.78	22.002	25.43
	63	216	285	111	48	196	315	136
6.6	33.13	9.34	59.801	30.34	10.30	66.74	22.317	26.79
	52	264	259	108	43	217	289	140
16.6	33.65	11.98	60.060	31.42	10.73	68.91	22.606	28.19
	38	301	232	104	38	232	258	141
26.6	34.03	14.99	60.292	32.46	11.11	71.23	22.864	29.60
	25	327	201	99	31	242	224	141
5.5	34.28	18.26	60.493	33.45	11.42	73.65	23.088	31.01
	11	343	168	93	26	248	188	139
15.5	34.39	21.69	60.661	34.38	11.68	76.13	23.276	32.40
	6	345	131	87	19	248	146	135
25.5	34.33	25.14	60.792	35.25	11.87	78.61	23.422	33.75
	19	335	93	79	12	243	102	127
5.5	34.14	28.49	60.885	36.04	11.99	81.04	23.524	35.02
	34	312	49	69	4	231	54	117
15.4	33.80	31.61	60.934	36.73	12.03	83.35	23.578	36.19
	49	280	5	58	4	210	5	104
25.4	33.31	34.41	60.939	37.31	11.99	85.45	23.583	37.23
	60	237	38	46	11	184	45	87
35.4	32.71	36.78	60.901	37.77	11.88	87.29	23.538	38.10
n Place	30.514	36.94	54.636	17.23	2.934	61.14	16.786	16.22
δ, Tan δ	3.740	−3.604	1.175	+0.616	2.054	+1.794	1.301	+0.832
α, $D_n \alpha$	−0.02	+0.13	+0.07	−0.02	+0.10	−0.06	+0.08	−0.03
δ, $D_n \delta$	*+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 Retic Mag. 4.	
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	
	h m s 3 53	° ′ ″ +35 33	h m s 3 54	° ′ ″ −13 44	h m s 3 56	° ′ ″ +12 15	h m s 3 57	
Jan. 0.4	37.001	24.04	11.392	36.70	6.934	31.31	28.25	
10.4	36.939 62	21.62 58	11.324 68	38.19 149	6.888 46	30.83 48	27.94 31	
20.3	36.834 105	25.00 38	11.224 100	39.45 126	6.806 82	30.35 48	27.58 36	
30.3	36.693 141	25.16 16	11.094 130	40.46 101	6.693 113	29.88 47	27.17 41	
Feb. 9.3	36.521 172	25.11 5	10.941 153	41.19 73	6.555 138	29.44 44	26.72 45	
	190	29	169	44	155	43		46
19.3	36.331	24.82	10.772	41.63	6.400	29.01	26.26	
Mar. 1.2	36.132 199	24.32 50	10.597 175	41.77 14	6.237 163	28.62 39	25.79 47	
11.2	35.936 196	23.60 72	10.424 173	41.62 15	6.075 162	28.27 35	25.34 45	
21.2	35.757 179	22.73 87	10.264 160	41.18 44	5.926 149	27.98 29	24.91 43	
31.1	35.606 151	21.72 101	10.124 140	40.44 74	5.799 127	27.79 19	24.53 38	
	113	108	110	101	98	10		34
Apr. 10.1	35.493 68	20.64 111	10.014 74	39.43 128	5.701 59	27.69 2	24.19 27	
20.1	35.425 16	19.53 108	9.940 33	38.15 154	5.642 17	27.71 17	23.92 21	
30.1	35.409 − 39	18.45 100	9.907 — 12	36.61 175	5.625 — 29	27.88 33	23.71 13	
May 10.0	35.448 96	17.45 87	9.919 57	34.86 193	5.654 76	28.21 49	23.58 5	
20.0	35.544 149	16.58 70	9.976 103	32.93 210	5.730 122	28.70 67	23.53 — 4	
30.0	35.693	15.88 52	10.079	30.83	5.852	29.37	23.57	
June 8.9	35.892 199	15.36 29	10.225 146	28.63 220	6.016 164	30.19 82	23.69 12	
18.9	36.138 246	15.07 9	10.409 184	26.39 224	6.220 204	31.15 96	23.89 20	
28.9	36.422 284	14.98 — 15	10.629 220	24.15 224	6.457 237	32.23 108	24.16 27	
July 8.9	36.738 316	15.13 35	10.878 249	21.99 216	6.722 265	33.40 117	24.49 33	
	340		270	203	285	121		39
18.8	37.078	15.48	11.148	19.96	7.007	34.61	24.88	
28.8	37.436 358	16.02 54	11.434 286	18.11 185	7.306 299	35.84 123	25.32 44	
Aug. 7.8	37.802 366	16.74 72	11.730 296	16.53 158	7.615 309	37.02 118	25.79 47	
17.8	38.171 369	17.60 86	12.030 300	15.25 128	7.925 310	38.15 113	26.28 49	
27.7	38.535 364	18.59 99	12.327 297	14.32 93	8.231 306	39.17 102	26.78 50	
	354	108	288	55	298	87		49
Sept. 6.7	38.889	19.67	12.615	13.77	8.529	40.04	27.27	
16.7	39.230 341	20.81 114	12.891 276	13.63 14	8.815 286	40.74 70	27.74 47	
26.6	39.552 322	22.01 120	13.150 259	13.89 − 26	9.086 271	41.27 53	28.18 44	
Oct. 6.6	39.852 300	23.22 121	13.389 239	14.54 65	9.337 251	41.62 35	28.57 39	
16.6	40.128 276	24.43 121	13.604 215	15.54 100	9.568 231	41.78 16	28.91 34	
	246	120	190	132	206	0		28
26.6	40.374	25.63	13.794	16.86	9.774	41.78	29.19	
Nov. 5.5	40.589 215	26.80 117	13.955 161	18.44 158	9.954 180	41.63 15	29.38 19	
15.5	40.769 180	27.94 114	14.085 130	20.20 176	10.105 151	41.35 28	29.50 12	
25.5	40.911 142	29.03 109	14.182 97	22.07 187	10.225 120	40.98 37	29.54 — 4	
Dec. 5.5	41.011 100	30.05 102	14.244 62	23.99 192	10.310 85	40.55 43	29.50 4	
	55	93	25	188	50	47		12
15.4	41.066 9	30.98 81	14.269 11	25.87 178	10.360 11	40.08 50	29.38	20
25.4	41.075 — 38	31.79 65	14.258 48	27.65 162	10.371 — 27	39.58 50	29.18	26
35.4	41.037	32.44	14.210	29.27	10.344	39.08	28.92	
Mean Place	34.530	11.66	9.390	37.92	4.802	24.18	25.568	
Sec δ, Tan δ	1.229	+0.715	1.029	−0.245	1.023	+0.217	2.105	
$D_\psi\, a$, $D_\omega\, a$	+0.08	−0.03	+0.06	+0.01	+0.07	−0.01	+0.02	
$D_\psi\, \delta$, $D_\omega\, \delta$	+0.2	+0.9	+0.2	+0.9	+0.2	+0.9	+0.2	

FOR THE UPPER TRANSIT AT WASHINGTON.

hington n Time.	ν Tauri. Mag. 3.9 Right Ascension.		ν Tauri. Declination.		A Tauri. Mag. 4.5 Right Ascension.		A Tauri. Declination.		c Persei. Mag. 4.0 Right Ascension.		c Persei. Declination.		p Tauri. Mag. 5.6 Right Ascension.		p Tauri. Declination.	
	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		″	
0.4	46.472		41.07		49.395		31.11		40.744		45.44		48.730		64.88	
10.4	46.426	46	40.31	76	49.351	44	31.06	5	40.666	78	46.59	115	48.688	42	65.05	17
20.3	46.344	82	39.61	70	49.268	83	30.93	13	40.535	131	47.49	90	48.605	83	65.11	6
30.3	46.232	112	38.99	62	49.151	117	30.73	20	40.359	176	48.07	58	48.486	119	65.06	5
). 9.3	46.096	136	38.45	54	49.008	143	30.45	28	40.144	215	48.33	26	48.339	147	64.90	16
19.3	45.942	154	38.00	45	48.845	163	30.09	36	39.906	238	48.24	9	48.170	169	64.60	30
r. 1.2	45.780	162	37.65	35	48.674	171	29.66	43	39.657	249	47.82	42	47.991	179	64.18	42
11.2	45.619	161	37.43	22	48.504	170	29.17	49	39.411	246	47.06	76	47.813	178	63.66	52
21.2	45.469	150	37.32	11	48.348	156	28.65	52	39.182	229	46.02	104	47.648	165	63.06	60
31.1	45.341	128	37.34	2	48.212	136	28.12	53	38.986	196	44.73	129	47.504	144	62.41	65
r. 10.1	45.241	100	37.53	19	48.109	103	27.61	51	38.834	152	43.26	147	47.393	111	61.74	67
20.1	45.179	62	37.87	34	48.046	63	27.17	44	38.736	98	41.68	158	47.322	71	61.10	64
30.1	45.157	22	38.39	52	48.028	18	26.81	36	38.698	38	40.04	164	47.297	25	60.51	59
y 10.0	45.180	23	39.09	70	48.057	20	26.59	22	38.725	27	38.42	162	47.321	24	60.02	49
20.0	45.249	69	39.95	86	48.135	78	26.50	9	38.819	94	36.88	154	47.396	75	59.66	36
30.0	45.363	114	40.98	103	48.262	127	26.57	7	38.975	156	35.47	141	47.520	124	59.47	19
ie 9.0	45.519	156	42.17	119	48.434	172	26.83	26	39.193	218	34.26	121	47.693	173	59.43	4
18.9	45.714	195	43.46	129	48.647	213	27.24	41	39.466	273	33.26	100	47.907	214	59.57	14
28.9	45.941	227	44.84	138	48.896	249	27.81	57	39.787	321	32.52	74	48.159	252	59.88	31
y 8.9	46.197	256	46.27	143	49.173	277	28.53	72	40.148	361	32.04	48	48.440	281	60.35	47
18.8	46.473	276	47.71	144	49.473	300	29.35	82	40.540	392	31.85	19	48.747	307	60.97	62
28.8	46.765	292	49.10	139	49.788	315	30.27	92	40.954	414	31.92	7	49.070	323	61.71	74
g. 7.8	47.065	300	50.41	131	50.112	324	31.25	98	41.381	427	32.25	33	49.402	332	62.54	83
17.8	47.367	302	51.57	116	50.439	327	32.24	99	41.814	433	32.83	58	49.739	337	63.43	89
27.7	47.667	300	52.58	101	50.763	324	33.22	98	42.245	431	33.65	82	50.074	335	64.35	92
pt. 6.7	47.959	292	53.37	79	51.079	316	34.16	94	42.667	422	34.66	101	50.402	328	65.26	91
16.7	48.239	280	53.94	57	51.382	303	35.03	87	43.076	409	35.87	121	50.718	316	66.16	90
26.7	48.503	264	54.26	32	51.670	288	35.81	78	43.464	388	37.22	135	51.018	300	67.02	86
t. 6.6	48.750	247	54.35	9	51.939	269	36.49	68	43.827	363	38.70	148	51.301	283	67.82	80
16.6	48.976	226	54.20	15	52.186	247	37.07	58	44.163	336	40.30	160	51.561	260	68.54	72
26.6	49.178	202	53.85	35	52.408	222	37.55	48	44.465	302	41.98	168	51.798	237	69.21	67
ov. 5.5	49.354	176	53.33	52	52.604	196	37.94	39	44.730	265	43.71	173	52.007	209	69.81	60
15.5	49.503	149	52.65	68	52.769	165	38.23	29	44.952	222	45.47	176	52.183	176	70.34	53
25.5	49.620	117	51.87	78	52.902	133	38.44	21	45.126	174	47.22	175	52.327	144	70.82	48
ec. 5.5	49.703	83	51.04	83	52.999	97	38.60	16	45.249	123	48.92	170	52.433	106	71.23	41
15.4	49.751	48	50.18	86	53.057	58	38.69	9	45.317	68	50.53	161	52.499	66	71.58	35
25.4	49.761	10	49.33	85	53.074	17	38.72	3	45.327	10	52.00	147	52.522	23	71.87	29
35.4	49.734	27	48.53	80	53.051	23	38.70	2	45.279	48	53.29	129	52.503	19	72.07	20
n Place	44.381		35.51		47.139		21.96		37.844		31.39		46.378		55.08	
ð, Tan ð	1.005		+0.101		1.077		+0.401		1.480		+1.091		1.115		+0.494	
a, D_{μ} a	+0.06		0.00		+0.07		−0.01		+0.09		−0.04		+0.07		−0.02	
ð, D_{μ} ð	+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.	o¹ Eridani. Mag. 4.1		μ Tauri. Mag. 4.3		α Horologii. Mag. 3.8		α Reticu Mag. 3.
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.
	h m s 4 7	° ′ ″ − 7 2	h m s 4 11	° ′ ″ + 8 41	h m s 4 11	° ′ ″ −42 29	h m s 4 13
Jan. 0.4	50.851	68.69	3.707	13.26	17.286	59.52	23.87
	50	131	40	66	136	232	30
10.4	50.801	70.00	3.667	12.60	17.150	61.84	23.57
	86	113	73	61	178	191	37
20.3	50.715	71.13	3.594	11.99	16.972	63.75	23.20
	117	94	106	56	215	146	41
30.3	50.598	72.07	3.488	11.43	16.757	65.21	22.79
	141	72	133	50	243	98	46
Feb. 9.3	50.457	72.79	3.355	10.93	16.514	66.19	22.33
	161	50	153	42	263	47	48
19.3	50.296	73.29	3.202	10.51	16.251	66.66	21.85
	169	26	164	35	271	3	49
Mar. 1.2	50.127	73.55	3.038	10.16	15.980	66.63	21.36
	169	3	163	28	269	52	48
11.2	49.958	73.58	2.875	9.88	15.711	66.11	20.88
	159	22	154	17	256	100	46
21.2	49.799	73.36	2.721	9.71	15.455	65.11	20.42
	141	45	136	7	233	145	43
31.2	49.658	72.91	2.585	9.64	15.222	63.66	19.99
	112	70	107	5	199	184	38
Apr. 10.1	49.546	72.21	2.478	9.69	15.023	61.82	19.61
	78	93	72	20	158	223	32
20.1	49.468	71.28	2.406	9.89	14.865	59.59	19.29
	38	117	31	34	110	256	23
30.1	49.430	70.11	2.375	10.23	14.755	57.03	19.06
	5	136	13	50	58	281	17
May 10.0	49.435	68.75	2.388	10.73	14.697	54.22	18.89
	50	156	59	67	1	302	9
20.0	49.485	67.19	2.447	11.40	14.696	51.20	18.80
	94	172	105	82	54	315	0
30.0	49.579	65.47	2.552	12.22	14.750	48.05	18.80
	138	184	147	97	109	320	8
June 9.0	49.717	63.63	2.699	13.19	14.859	44.85	18.88
	177	191	186	109	161	319	17
18.9	49.894	61.72	2.885	14.28	15.020	41.66	19.05
	212	195	222	120	210	307	25
28.9	50.106	59.77	3.107	15.48	15.230	38.59	19.30
	240	193	251	126	252	289	32
July 8.9	50.346	57.84	3.358	16.74	15.482	35.70	19.62
	264	184	273	127	287	262	38
18.9	50.610	56.00	3.631	18.01	15.769	33.08	20.00
	280	170	289	126	316	227	42
28.8	50.890	54.30	3.920	19.27	16.085	30.81	20.42
	291	151	299	119	336	184	47
Aug. 7.8	51.181	52.79	4.219	20.46	16.421	28.97	20.89
	296	126	305	110	349	136	50
17.8	51.477	51.53	4.524	21.56	16.770	27.61	21.39
	294	98	303	96	353	82	51
27.7	51.771	50.55	4.827	22.52	17.123	26.79	21.90
	289	64	297	78	348	25	51
Sept. 6.7	52.060	49.91	5.124	23.30	17.471	26.54	22.41
	279	30	287	59	337	33	49
16.7	52.339	49.61	5.411	23.89	17.808	26.87	22.90
	263	4	274	37	319	92	47
26.7	52.602	49.65	5.685	24.26	18.127	27.79	23.37
	247	40	256	15	294	146	43
Oct. 6.6	52.849	50.05	5.941	24.41	18.421	29.25	23.80
	227	72	238	5	263	196	37
16.6	53.076	50.77	6.179	24.36	18.684	31.21	24.17
	202	100	214	25	225	239	30
26.6	53.278	51.77	6.393	24.11	18.909	33.60	24.47
	176	126	191	41	186	274	24
Nov. 5.6	53.454	53.03	6.584	23.70	19.095	36.34	24.71
	148	142	161	54	140	299	15
15.5	53.602	54.45	6.745	23.16	19.235	39.33	24.86
	115	155	131	63	91	311	8
25.5	53.717	56.00	6.876	22.53	19.326	42.44	24.94
	81	160	98	70	42	313	1
Dec. 5.5	53.798	57.60	6.974	21.83	19.368	45.57	24.93
	46	159	61	72	10	302	10
15.4	53.844	59.19	7.035	21.11	19.358	48.59	24.83
	8	153	23	73	60	284	18
25.4	53.852	60.72	7.058	20.38	19.298	51.43	24.65
	31	142	16	71	109	255	28
35.4	53.821	62.14	7.042	19.67	19.189	53.98	24.37
Mean Place	48.789	71.25	1.544	7.40	15.072	55.70	21.071
Sec δ, Tan δ	1.008	−0.124	1.012	+0.153	1.356	−0.916	2.179
$D_\psi\, a$, $D_\omega\, a$	+0.06	0.00	+0.06	0.00	+0.04	+0.03	+0.02
$D_\psi\, \delta$, $D_\omega\, \delta$	+0.2	+0.9	+0.2	+0.9	+0.2	+0.9	+0.2

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Time.	γ Tauri. Mag. 3.9		δ Tauri. Mag. 3.9		υ⁵ Eridani. Mag. 4.1		δ Mensæ. Mag. 5.6	
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.
	h m 4 15 s	° ′ +15 25 ″	h m 4 18 s	° ′ +17 20 ″	h m 4 20 s	° ′ −34 12 ″	h m 4 23 s	° ′ −80 24 ″
0.4	6.319	48.46	11.035	63.11	57.291	34.94	38.89	39.97
	32	35	30	25	94	225	102	241
10.4	6.287	48.11	11.005	62.86	57.197	37.19	37.87	42.38
	71	35	70	27	135	189	120	194
20.3	6.216	47.76	10.935	62.59	57.062	39.08	36.67	44.32
	105	36	105	29	172	149	132	142
30.3	6.111	47.40	10.830	62.30	56.890	40.57	35.35	45.74
	134	36	134	31	201	105	142	86
9.3	5.977	47.04	10.696	61.99	56.689	41.62	33.93	46.60
	155	37	156	34	220	60	147	31
19.3	5.822	46.67	10.540	61.65	56.469	42.22	32.46	46.91
	166	36	169	36	232	15	150	24
1.2	5.656	46.31	10.371	61.29	56.237	42.37	30.96	46.67
	168	36	170	37	232	30	147	81
11.2	5.488	45.95	10.201	60.92	56.005	42.07	29.49	45.86
	158	33	161	37	223	75	143	131
21.2	5.330	45.62	10.040	60.55	55.782	41.32	28.06	44.55
	140	28	142	34	203	116	133	177
31.2	5.190	45.34	9.898	60.21	55.579	40.16	26.73	42.78
	110	21	113	29	175	156	120	222
10.1	5.080	45.13	9.785	59.92	55.404	38.60	25.53	40.56
	74	13	77	21	137	191	105	258
20.1	5.006	45.00	9.708	59.71	55.267	36.69	24.48	37.98
	33	1	35	12	95	223	88	287
30.1	4.973	44.99	9.673	59.59	55.172	34.46	23.60	35.11
	12	11	11	1	46	251	69	315
10.0	4.985	45.10	9.684	59.60	55.126	31.95	22.91	31.96
	60	27	58	14	4	271	49	331
20.0	5.045	45.37	9.742	59.74	55.130	29.24	22.42	28.65
	106	41	105	30	54	286	27	340
30.0	5.151	45.78	9.847	60.04	55.184	26.38	22.15	25.25
	151	57	150	44	104	296	2	342
9.0	5.302	46.35	9.997	60.48	55.288	23.42	22.13	21.83
	192	71	190	59	152	297	19	336
18.9	5.494	47.06	10.187	61.07	55.440	20.45	22.32	18.47
	227	82	227	72	195	291	40	319
28.9	5.721	47.88	10.414	61.79	55.635	17.54	22.72	15.28
	257	93	258	82	232	277	61	299
8.9	5.978	48.81	10.672	62.61	55.867	14.77	23.33	12.29
	279	100	280	90	266	253	80	260
18.9	6.257	49.81	10.952	63.51	56.133	12.24	24.13	9.69
	297	102	299	95	290	224	95	221
28.8	6.554	50.83	11.251	64.46	56.423	10.00	25.08	7.48
	309	103	310	96	310	188	110	174
7.8	6.863	51.86	11.561	65.42	56.733	8.12	26.18	5.74
	312	99	315	94	321	143	120	119
17.8	7.175	52.85	11.876	66.36	57.054	6.69	27.38	4.55
	312	91	315	88	325	94	125	62
27.7	7.487	53.76	12.191	67.24	57.379	5.75	28.63	3.93
	305	81	310	80	323	42	128	1
6.7	7.792	54.57	12.501	68.04	57.702	5.33	29.91	3.94
	298	66	300	67	313	12	125	63
16.7	8.090	55.23	12.801	68.71	58.015	5.45	31.16	4.57
	284	52	289	55	299	66	119	125
26.7	8.374	55.75	13.090	69.26	58.314	6.11	32.35	5.82
	267	38	273	42	279	119	108	182
6.6	8.641	56.13	13.363	69.68	58.593	7.30	33.43	7.64
	248	21	253	27	253	168	94	236
16.6	8.889	56.34	13.616	69.95	58.846	8.98	34.37	10.00
	227	8	232	16	222	210	75	278
26.6	9.116	56.42	13.848	70.11	59.068	11.08	35.12	12.78
	201	6	207	4	190	245	54	314
5.6	9.317	56.36	14.055	70.15	59.258	13.53	35.66	15.92
	173	14	179	5	151	270	30	336
15.5	9.490	56.22	14.234	70.10	59.409	16.23	35.96	19.28
	142	25	147	12	110	284	6	345
25.5	9.632	55.97	14.381	69.98	59.519	19.07	36.02	22.73
	107	29	113	18	66	290	20	346
5.5	9.739	55.68	14.494	69.80	59.585	21.97	35.82	26.19
	70	32	74	21	21	284	44	329
15.4	9.809	55.36	14.568	69.59	59.606	24.81	35.38	29.48
	30	35	33	25	25	269	69	306
25.4	9.839	55.01	14.601	69.34	59.581	27.50	34.69	32.54
	10	36	7	26	71	244	90	271
35.4	9.829	54.65	14.594	69.08	59.510	29.94	33.79	35.25
n Place	4.077	41.32	8.755	55.71	55.139	32.57	32.981	33.81
δ, Tan δ	1.037	+0.276	1.048	+0.312	1.209	−0.680	6.001	−5.917
α, D_α	+0.07	−0.01	+0.07	−0.01	+0.04	+0.02	−0.08	+0.18
δ, D_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 Tauri. Mag. 3.6		m Persei. Mag. 6.1		α Tauri. (*Aldebaran*.) Mag. 1.1		ν Eridani Mag. 4
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.
	h m 4 23	° ′ +18 59	h m 4 27	° ′ +42 53	h m 4 31	° ′ +16 20	h m 4 32
	s	″	s	″	s	″	s
Jan. 0.4	48.409	57.91	37.138	27.48	11.674	42.95	12.385
10.4	48.383 26	57.74 17	37.099 39	28.52 104	11.655 19	42.65 30	12.355 30
20.4	48.317 66	57.55 19	37.006 93	29.38 86	11.594 61	42.34 31	12.287 68
30.3	48.214 103	57.31 24	36.865 141	29.99 61	11.497 97	42.03 31	12.186 101
Feb. 9.3	48.081 133	57.05 26	36.684 181	30.34 35	11.367 130	41.71 32	12.054 132
	156	30	210	8	152	32	154
19.3	47.925	56.75	36.474	30.42	11.215	41.39	11.900
Mar. 1.2	47.754 171	56.40 35	36.248 226	30.20 22	11.046 169	41.06 33	11.731 169
11.2	47.581 173	56.03 37	36.018 230	29.71 49	10.874 172	40.73 33	11.560 171
21.2	47.417 164	55.65 38	35.799 219	28.94 77	10.710 164	40.41 32	11.395 165
31.2	47.271 146	55.28 37	35.603 196	27.96 98	10.561 149	40.12 29	11.244 151
	118	35	160	117	121	22	125
Apr. 10.1	47.153 82	54.93 29	35.443 114	26.79 128	10.440 87	39.90 17	11.119 94
20.1	47.071 40	54.64 19	35.329 61	25.51 135	10.353 47	39.73 7	11.025 56
30.1	47.031 — 6	54.45 9	35.268 1	24.16 137	10.306 1	39.66 — 4	10.969 13
May 10.1	47.037 53	54.36 4	35.267 — 58	22.79 132	10.305 — 45	39.70 18	10.956 — 31
20.0	47.090 101	54.40 18	35.325 118	21.47 121	10.350 91	39.88 32	10.987 76
30.0	47.191	54.58	35.443	20.26	10.441	40.20	11.063
June 9.0	47.338 147	54.91 33	35.618 175	19.18 108	10.578 137	40.65 45	11.181 118
18.9	47.525 187	55.37 46	35.846 228	18.28 90	10.756 178	41.23 58	11.339 158
28.9	47.750 225	55.97 60	36.122 276	17.58 70	10.971 215	41.94 71	11.532 193
July 8.9	48.006 256	56.69 72	36.438 316	17.09 49	11.217 246	42.74 80	11.757 225
	280	80	348	26	271	87	251
18.9	48.286	57.49	36.786	16.83	11.488	43.61	12.008
28.8	48.586 300	58.35 86	37.159 373	16.79 — 4	11.778 290	44.51 90	12.277 269
Aug. 7.8	48.896 310	59.23 88	37.549 390	16.97 18	12.082 304	45.42 91	12.560 283
17.8	49.213 317	60.10 87	37.949 400	17.34 37	12.392 310	46.29 87	12.851 291
27.8	49.531 318	60.94 84	38.351 402	17.89 55	12.705 313	47.10 81	13.144 293
	314	76	397	73	310	70	292
Sept. 6.7	49.845	61.70	38.748	18.62	13.015	47.80	13.436
16.7	50.150 305	62.36 66	39.138 390	19.49 87	13.317 302	48.39 59	13.721 285
26.7	50.444 294	62.91 55	39.515 377	20.48 99	13.609 292	48.84 45	13.994 273
Oct. 6.6	50.723 279	63.35 44	39.872 357	21.58 110	13.887 278	49.15 31	14.254 260
16.6	50.983 260	63.67 32	40.208 336	22.77 119	14.148 261	49.31 16	14.498 244
	239	20	309	126	241	3	224
26.6	51.222	63.87	40.517	24.03	14.389	49.34	14.722
Nov. 5.6	51.436 214	63.97 10	40.794 277	25.36 133	14.606 217	49.26 8	14.921 199
15.5	51.624 188	63.99 2	41.034 240	26.72 136	14.797 191	49.09 17	15.093 172
25.5	51.778 154	63.95 4	41.232 198	28.10 138	14.956 159	48.85 24	15.236 143
Dec. 5.5	51.897 119	63.86 9	41.383 151	29.47 137	15.080 124	48.56 29	15.344 108
	81	12	100	133	86	31	71
15.5	51.978	63.74	41.483	30.80	15.166	48.25	15.415
25.4	52.018 — 3	63.59 15	41.528 — 9	32.05 125	15.213 47	47.93 32	15.447 — 7
35.4	52.015	63.42 17	41.519	33.17 112	15.216 3	47.61 32	15.440
Mean Place	46.086	50.43	34.256	15.99	9.358	36.31	10.231
Sec δ, Tan δ	1.058	+0.344	1.365	+0.929	1.042	+0.293	1.002
$D_\phi\, a$, $D_\omega\, a$	+0.07	0.01	+0.08	−0.02	+0.07	−0.01	+0.06
$D_\phi\, \delta$, $D_\omega\, \delta$	+0.2	+0.9	+0.2	+0.9	+0.2	+0.9	+0.1

FOR THE UPPER TRANSIT AT WASHINGTON.

ington Time.	α Doradus. Mag. 3.5		53 Eridani. Mag. 4.0		τ Tauri. Mag. 4.3		Groombridge 848. Mag. 6.0	
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.
	h m	° ′	h m	° ′	h m	° ′	h m	° ′
	4 32	−55 12	4 34	−14 27	4 37	+22 47	4 37	+75 47
	s	″	s	″	s	″	s	″
. 0.4	14.670	63.39	24.776	54.47	18.124	62.86	45.55	46.56
10.4	14.475 195	66.05 266	24.736 40	56.19 172	18.110 14	62.89 3	45.29 26	49.08 252
20.4	14.223 252	68.27 222	24.656 80	57.69 150	18.051 59	62.88 1	44.88 41	51.26 218
30.3	13.922 301	70.01 174	24.541 115	58.93 124	17.954 97	62.81 7	44.33 55	53.03 177
. 9.3	13.583 339	71.24 123	24.397 144	59.90 97	17.822 132	62.68 13	43.68 65	54.31 128
	366	67	167	66	159	21	75	75
19.3	13.217	71.91	24.230	60.56	17.663	62.47	42.93	55.06
. 1.3	12.836 381	72.04 13	24.050 180	60.92 36	17.489 174	62.20 27	42.15 78	55.24 18
11.2	12.454 382	71.63 41	23.865 185	60.97 5	17.310 179	61.86 34	41.36 79	54.86 38
21.2	12.084 370	70.68 95	23.687 178	60.71 26	17.136 174	61.46 40	40.60 76	53.94 92
31.2	11.740 344	69.24 144	23.524 163	60.16 55	16.980 156	61.02 44	39.92 68	52.50 144
	307	188	140	85	130	45	60	185
. 10.1	11.433	67.36	23.384	59.31	16.850	60.57	39.32	50.65
20.1	11.172 261	65.05 231	23.278 106	58.18 113	16.755 95	60.14 43	38.85 47	48.42 223
30.1	10.967 205	62.39 266	23.210 68	56.79 139	16.703 52	59.75 39	38.53 32	45.92 250
· 10.1	10.826 141	59.43 296	23.183 27	55.16 163	16.697 6	59.45 30	38.37 16	43.26 266
20.0	10.751 75	56.25 318	23.201 18	53.33 183	16.739 42	59.26 19	38.37 0	40.50 276
	5	334	64	199	90	9	18	275
30.0	10.746	52.91	23.265	51.34	16.829	59.17	38.55	37.75
ə 9.0	10.809 63	49.50 341	23.372 107	49.21 213	16.966 137	59.23 6	38.88 33	35.09 266
19.0	10.941 132	46.10 340	23.520 148	47.00 221	17.147 181	59.43 20	39.36 48	32.60 249
28.9	11.138 197	42.80 330	23.705 185	44.79 221	17.366 219	59.75 32	39.99 63	30.34 226
· 8.9	11.392 254	39.70 310	23.923 218	42.62 217	17.618 252	60.19 44	40.75 76	28.37 197
	306	284	244	205	278	55	86	162
18.9	11.698	36.86	24.167	40.57	17.896	60.74	41.61	26.75
28.8	12.049 351	34.40 246	24.434 267	38.69 188	18.196 300	61.37 63	42.55 94	25.50 125
;· 7.8	12.433 384	32.38 202	24.715 281	37.06 163	18.509 313	62.06 69	43.56 101	24.64 86
17.8	12.842 409	30.88 150	25.006 291	35.70 136	18.830 321	62.76 70	44.62 106	24.19 45
27.8	13.266 424	29.95 93	25.301 295	34.70 100	19.155 325	63.46 70	45.71 109	24.16 3
	427	33	293	61	323	67	109	39
t. 6.7	13.693	29.62	25.594	34.09	19.478	64.13	46.80	24.55
16.7	14.114 421	29.91 29	25.882 288	33.88 21	19.795 317	64.75 62	47.88 108	25.35 80
26.7	14.516 402	30.85 94	26.158 276	34.09 21	20.101 306	65.29 54	48.94 106	26.55 120
:. 6.7	14.891 375	32.38 153	26.419 261	34.72 63	20.395 294	65.76 47	49.94 100	28.12 157
16.6	15.228 337	34.46 208	26.664 245	35.73 101	20.672 277	66.14 38	50.88 94	30.03 191
	292	257	223	134	256	30	85	223
26.6	15.520	37.03	26.887	37.07	20.928	66.44	51.73	32.26
v. 5.6	15.757 237	40.00 297	27.084 197	38.72 165	21.161 233	66.67 23	52.47 74	34.76 250
15.5	15.936 179	43.24 324	27.252 168	40.59 187	21.366 205	66.85 18	53.11 64	37.48 272
25.5	16.050 114	46.65 341	27.389 137	42.60 201	21.539 173	66.99 14	53.60 49	40.35 287
c. 5.5	16.096 46	50.11 346	27.490 101	44.68 208	21.677 138	67.09 10	53.94 34	43.30 295
	23	338	63	208	97	9	17	295
15.5	16.073	53.49	27.553	46.76	21.774	67.18	54.11	46.25
25.4	15.980 93	56.69 320	27.575 22	48.76 200	21.828 54	67.24 6	54.12 1	49.11 286
35.4	15.822 158	59.58 289	27.556 19	50.62 186	21.838 10	67.27 3	53.97 15	51.79 268
ı Place	12.109	58.87	22.647	55.42	15.692	55.34	38.363	32.16
), Tan δ	1.753	−1.440	1.033	−0.258	1.085	+0.420	4.075	+3.951
, D_α	+0.03	+0.03	+0.05	+0.01	+0.07	−0.01	+0.16	−0.09
, D_δ	+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 Cœli. Mag. 4.5		4 Camelop. Mag. 5.4		μ Eridani. Mag. 4.2		π³ Orion Mag. 3.	
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	I
	h m 4 37	° ′ −42 0	h m 4 41	° ′ +56 36	h m 4 41	° ′ − 3 24	h m 4 45	
	s	″	s	″	s	″	s	
Jan. 0.4	55.410	82.29	8.713	52.63	23.270	18.33	22.242	
	109	255	58	176	21	128	10	
10.4	55.301	84.84	8.655	54.39	23.249	19.61	22.232	
	157	218	130	150	62	114	50	
20.4	55.144	87.02	8.525	55.89	23.187	20.75	22.182	
	198	175	196	119	97	97	89	
30.3	54.946	88.77	8.329	57.08	23.090	21.72	22.093	
	231	128	250	84	128	76	121	
Feb. 9.3	54.715	90.05	8.079	57.92	22.962	22.48	21.972	
	257	79	292	44	152	59	146	
19.3	54.458	90.84	7.787	58.36	22.810	23.07	21.826	
	271	29	316	4	168	37	163	
Mar. 1.3	54.187	91.13	7.471	58.40	22.642	23.44	21.663	
	275	21	324	39	172	17	168	
11.2	53.912	90.92	7.147	58.01	22.470	23.61	21.495	
	267	69	311	78	167	3	164	
21.2	53.645	90.23	6.836	57.23	22.303	23.58	21.331	
	248	115	285	115	154	26	152	
31.2	53.397	89.08	6.551	56.08	22.149	23.32	21.179	
	221	159	240	145	131	45	127	
Apr. 10.1	53.176	87.49	6.311	54.63	22.018	22.87	21.052	
	183	197	182	170	101	68	97	
20.1	52.993	85.52	6.129	52.93	21.917	22.19	20.955	
	138	232	115	187	62	87	59	
30.1	52.855	83.20	6.014	51.06	21.855	21.32	20.896	
	88	263	41	197	22	107	17	
May 10.1	52.767	80.57	5.973	49.09	21.833	20.25	20.879	
	35	287	38	200	22	126	27	
20.0	52.732	77.70	6.011	47.09	21.855	18.99	20.906	
	21	305	115	196	68	141	72	
30.0	52.753	74.65	6.126	45.13	21.923	17.58	20.978	
	76	313	191	185	110	154	115	
June 9.0	52.829	71.52	6.317	43.28	22.033	16.04	21.093	
	129	316	260	169	150	165	156	
19.0	52.958	68.36	6.577	41.59	22.183	14.39	21.249	
	178	311	326	149	186	170	192	
28.9	53.136	65.25	6.903	40.10	22.369	12.69	21.441	
	222	295	380	124	218	171	225	
July 8.9	53.358	62.30	7.283	38.86	22.587	10.98	21.666	
	262	273	426	98	244	164	250	
18.9	53.620	59.57	7.709	37.88	22.831	9.34	21.916	
	294	241	462	68	265	155	271	
28.8	53.914	57.16	8.171	37.20	23.096	7.79	22.187	
	319	201	491	40	279	140	286	
Aug. 7.8	54.233	55.15	8.662	36.80	23.375	6.39	22.473	
	336	156	508	10	289	119	295	
17.8	54.569	53.59	9.170	36.70	23.664	5.20	22.768	
	345	105	517	20	292	96	299	
27.8	54.914	52.54	9.687	36.90	23.956	4.24	23.067	
	348	48	518	47	292	65	298	
Sept. 6.7	55.262	52.06	10.205	37.37	24.248	3.59	23.365	
	343	10	512	75	287	34	294	
16.7	55.605	52.16	10.717	38.12	24.535	3.25	23.659	
	331	69	497	99	278	3	286	
26.7	55.936	52.85	11.214	39.11	24.813	3.22	23.945	
	310	126	477	124	265	30	274	
Oct. 6.7	56.246	54.11	11.691	40.35	25.078	3.52	24.219	
	284	180	450	145	249	62	258	
16.6	56.530	55.91	12.141	41.80	25.327	4.14	24.477	
	252	227	415	165	230	89	241	
26.6	56.782	58.18	12.556	43.45	25.557	5.03	24.718	
	214	265	374	181	206	113	218	
Nov. 5.6	56.996	60.83	12.930	45.26	25.763	6.16	24.936	
	173	295	325	194	181	131	194	
15.5	57.169	63.78	13.255	47.20	25.944	7.47	25.130	
	126	314	268	203	150	144	163	
25.5	57.295	66.92	13.523	49.23	26.094	8.91	25.293	
	76	320	205	209	117	150	130	
Dec. 5.5	57.371	70.12	13.728	51.32	26.211	10.41	25.423	
	25	315	134	207	80	152	94	
15.5	57.396	73.27	13.862	53.39	26.291	11.93	25.517	
	28	300	61	200	41	147	54	
25.4	57.368	76.27	13.923	55.39	26.332	13.40	25.571	
	80	277	16	186	1	137	12	
35.4	57.288	79.04	13.907	57.25	26.333	14.77	25.583	
Mean Place	53.125	79.29	5.010	40.34	21.091	21.10	19.982	
Sec δ, Tan δ	1.346	−0.901	1.817	+1.517	1.002	−0.059	1.007	+
$D_\psi a$, $D_\omega a$	+0.04	+0.02	+0.10	−0.03	+0.06	0.00	+0.06	
$D_\psi \delta$, $D_\omega \delta$	+0.1	+0.9	+0.1	+0.9	+0.1	+0.9	+0.1	

FOR THE UPPER TRANSIT AT WASHINGTON.

9 Camelop. Mag. 4.4				i Tauri. Mag. 5.1				π^5 Orionis. Mag. 3.9				t Aurigæ. Mag. 2.9			
Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
h m		° ′		h m		° ′		h m		° ′		h m		° ′	
4 45		+66 12		4 46		+18 41		4 49		+ 2 18		4 51		+33 2	
s		″		s		″		s		″		s		″	
52.24		25.12		33.414		64.99		57.867		24.34		37.855		17.20	
52.13	11	27.32	220	33.408	6	64.80	19	57.856	11	23.30	104	37.851	4	17.79	59
51.93	20	29.24	192	33.358	50	64.60	20	57.806	50	22.37	93	37.796	55	18.29	50
51.65	28	30.80	156	33.268	90	64.40	20	57.717	89	21.57	80	37.696	100	18.67	38
51.29	36	31.94	114	33.142	126	64.18	22	57.595	122	20.92	65	37.557	139	18.89	22
	42		68		150		24		147		53		172		7
50.87		32.62		32.992		63.94		57.448		20.39		37.385		18.96	
50.42	45	32.81	19	32.824	168	63.66	28	57.284	164	20.02	37	37.193	192	18.85	11
49.96	46	32.50	31	32.648	176	63.37	29	57.113	171	19.80	22	36.993	200	18.54	31
49.52	44	31.72	78	32.475	173	63.06	31	56.946	167	19.73	7	36.797	196	18.08	46
49.11	41	30.49	123	32.320	155	62.75	31	56.791	155	19.82	9	36.616	181	17.48	60
	35		162		132		29		133		26		153		73
48.76		28.87		32.188		62.46		56.658		20.08		36.463		16.75	
48.48	28	26.95	192	32.088	100	62.23	23	56.556	102	20.49	41	36.347	116	15.95	80
48.29	19	24.78	217	32.030	58	62.05	18	56.491	65	21.08	59	36.276	71	15.11	84
48.21	8	22.46	232	32.015	15	61.97	8	56.467	24	21.85	77	36.254	22	14.28	83
48.22	1	20.06	240	32.046	31	61.99	2	56.487	20	22.78	93	36.283	29	13.49	79
	12		239		79		15		64		107		83		70
48.34		17.67		32.125		62.14		56.551		23.85		36.366		12.79	
48.55	21	15.36	231	32.249	124	62.40	26	56.658	107	25.07	122	36.500	134	12.19	60
48.88	33	13.21	215	32.414	165	62.79	39	56.805	147	26.38	131	36.681	181	11.72	47
49.28	40	11.26	195	32.619	205	63.30	51	56.988	183	27.76	138	36.906	225	11.40	32
49.75	47	9.57	169	32.856	237	63.88	58	57.204	216	29.17	141	37.168	262	11.24	16
	55		140		264		71		241		140		293		3
50.30		8.17		33.120		64.59		57.445		30.57		37.461		11.21	
50.90	60	7.11	106	33.406	286	65.32	73	57.709	264	31.91	134	37.778	317	11.33	12
51.53	63	6.39	72	33.707	301	66.06	74	57.987	278	33.13	122	38.113	335	11.58	25
52.20	67	6.02	37	34.018	311	66.79	73	58.276	289	34.22	109	38.460	347	11.92	34
52.88	68	6.00	2	34.332	314	67.47	68	58.569	293	35.10	88	38.814	354	12.36	44
	69		34		314		62		294		64		353		50
53.57		6.34		34.646		68.09		58.863		35.74		39.167		12.86	
54.25	68	7.03	69	34.957	311	68.60	51	59.154	291	36.13	39	39.516	349	13.41	55
54.92	67	8.05	102	35.260	303	69.02	42	59.436	282	36.23	10	39.858	342	14.00	59
55.56	64	9.38	133	35.550	290	69.31	29	59.708	272	36.06	17	40.188	330	14.61	61
56.17	61	11.01	163	35.824	274	69.49	18	59.965	257	35.64	42	40.502	314	15.23	62
	55		188		259		5		240		67		294		65
56.72		12.89		36.083		69.54		60.205		34.97		40.796		15.88	
57.22	50	15.02	213	36.316	233	69.51	3	60.422	217	34.10	87	41.065	269	16.54	66
57.65	43	17.33	231	36.523	207	69.41	10	60.615	193	33.07	103	41.305	240	17.21	67
58.01	36	19.78	245	36.702	179	69.25	16	60.778	163	31.94	113	41.510	205	17.89	68
58.26	25	22.31	253	36.844	142	69.08	17	60.908	130	30.73	121	41.676	166	18.58	69
	16		254		104		20		94		122		122		69
58.42		24.85		36.948		68.88		61.002		29.51		41.798		19.27	
58.49	7	27.32	247	37.010	62	68.68	20	61.056	54	28.34	117	41.872	74	19.93	66
58.45	4	29.64	232	37.028	18	68.47	21	61.069	13	27.24	110	41.895	23	20.55	62
47.437		12.27		31.010		58.61		55.628		20.81		35.156		8.90	
2.478		+2.268		1.056		+0.338		1.001		+0.040		1.193		+0.650	
+0.12		−0.05		+0.07		−0.01		+0.06		0.00		+0.08		−0.01	
+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 Ta Mag.	
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	
	h m s 4 56	° ′ ″ +43 42	h m s 4 56	° ′ ″ +60 19	h m s 4 56	° ′ ″ +40 57	h m s 4 58	
Jan. 0.4	3.684	15.55	5.82	32.43	43.363	30.47	10.491	
	8	117	5	198	6	102	5	
10.4	3.676	16.72	5.77	34.41	43.357	31.49	10.496	
	67	102	13	175	60	89	42	
20.4	3.609	17.74	5.64	36.16	43.297	32.38	10.454	
	120	83	20	145	112	71	84	
30.3	3.489	18.57	5.44	37.61	43.185	33.09	10.370	
	167	58	27	108	156	51	121	
Feb. 9.3	3.322	19.15	5.17	38.69	43.029	33.60	10.249	
	203	32	32	68	191	27	149	
19.3	3.119	19.47	4.85	39.37	42.838	33.87	10.100	
	227	4	36	24	216	2	171	
Mar. 1.3	2.892	19.51	4.49	39.61	42.622	33.89	9.929	
	238	25	36	20	225	26	180	
11.2	2.654	19.26	4.13	39.41	42.397	33.63	9.749	
	233	53	36	64	222	50	178	
21.2	2.421	18.73	3.77	38.77	42.175	33.13	9.571	
	215	79	34	105	205	73	163	
31.2	2.206	17.94	3.43	37.72	41.970	32.40	9.408	
	186	99	29	139	175	91	141	
Apr. 10.2	2.020	16.95	3.14	36.33	41.795	31.49	9.267	
	143	118	23	169	136	107	108	
20.1	1.877	15.77	2.91	34.64	41.659	30.42	9.159	
	91	128	16	191	88	117	69	
30.1	1.786	14.49	2.75	32.73	41.571	29.25	9.090	
	37	135	8	208	35	121	25	
May 10.1	1.749	13.14	2.67	30.65	41.536	28.04	9.065	
	23	135	1	214	23	122	22	
20.0	1.772	11.79	2.68	28.51	41.559	26.82	9.087	
	84	131	10	214	81	115	69	
30.0	1.856	10.48	2.78	26.37	41.640	25.67	9.156	
	143	121	18	207	137	107	116	
June 9.0	1.999	9.27	2.96	24.30	41.777	24.60	9.272	
	197	109	25	194	191	94	159	
19.0	2.196	8.18	3.21	22.36	41.968	23.66	9.431	
	247	94	32	177	239	79	198	
28.9	2.443	7.24	3.53	20.59	42.207	22.87	9.629	
	291	74	39	153	279	61	232	
July 8.9	2.734	6.50	3.92	19.06	42.486	22.26	9.861	
	327	56	45	127	316	44	262	
18.9	3.061	5.94	4.37	17.79	42.802	21.82	10.123	
	357	36	49	100	344	25	283	
28.9	3.418	5.58	4.86	16.79	43.146	21.57	10.406	
	379	15	52	69	365	8	302	
Aug. 7.8	3.797	5.43	5.38	16.10	43.511	21.49	10.708	
	395	2	56	39	379	10	312	
17.8	4.192	5.45	5.94	15.71	43.890	21.59	11.020	
	402	22	57	7	387	26	318	
27.8	4.594	5.67	6.51	15.64	44.277	21.85	11.338	
	405	37	57	24	389	39	320	
Sept. 6.7	4.999	6.04	7.08	15.88	44.666	22.24	11.658	
	402	53	57	53	387	52	319	
16.7	5.401	6.57	7.65	16.41	45.053	22.76	11.976	
	393	68	55	83	379	63	311	
26.7	5.794	7.25	8.20	17.24	45.432	23.39	12.287	
	381	80	53	111	366	75	300	
Oct. 6.7	6.175	8.05	8.73	18.35	45.798	24.14	12.587	
	364	92	52	135	349	83	287	
16.6	6.539	8.97	9.25	19.70	46.147	24.97	12.874	
	340	102	47	160	328	91	270	
26.6	6.879	9.99	9.72	21.30	46.475	25.88	13.144	
	312	112	43	180	300	99	248	
Nov. 5.6	7.191	11.11	10.15	23.10	46.775	26.87	13.392	
	279	121	39	198	267	106	223	
15.6	7.470	12.32	10.54	25.08	47.042	27.93	13.615	
	238	127	32	213	230	111	193	
25.5	7.708	13.59	10.86	27.21	47.272	29.04	13.808	
	191	131	25	220	186	114	158	
Dec. 5.5	7.899	14.90	11.11	29.41	47.458	30.18	13.966	
	138	132	17	224	136	116	118	
15.5	8.037	16.22	11.28	31.65	47.594	31.34	14.084	
	83	130	8	220	83	113	75	
25.4	8.120	17.52	11.36	33.85	47.677	32.47	14.159	
	25	123	0	208	27	107	28	
35.4	8.145	18.75	11.36	35.93	47.704	33.54	14.188	
Mean Place	0.620	6.11	1.676	21.09	40.402	21.44	8.007	
Sec δ, Tan δ	*1.383*	*+0.956*	2.020	*+1.755*	1.324	*+0.868*	1.075	
$D_\psi a$, $D_\omega a$	*+0.09*	−0.02	+0.11	−0.03	+0.08	−0.02	+0.07	
$D_\psi \delta$, $D_\omega \delta$	*+0.1*	+1.0	+0.1	+1.0	+0.1	+1.0	+0.1	

FOR THE UPPER TRANSIT AT WASHINGTON.

	11 Orionis. Mag. 4.6			η Aurigæ. Mag. 3.3			ε Leporis. Mag. 3.3			β Eridani. Mag. 2.9		
	Right Ascension.		Declination.	Right Ascension.		Declination.	Right Ascension.		Declination.	Right Ascension.		Declination.
	h m	s	° ′ ″	h m	s	° ′ ″	h m	s	° ′ ″	h m	s	° ′ ″
	4 59		+15 17	5 0		+41 7	5 1		−22 28	5 3		− 5 11
		51.898	27.48		44.512	33.07		59.012	54.42		48.376	31.92
	5	51.903	38 27.10	1	44.511	104 34.11	31	58.981	217 56.59	6	48.370	146 33.38
	39	51.864	35 26.75	57	44.454	91 35.02	75	58.906	193 58.52	47	48.323	129 34.67
	81	51.783	32 26.43	109	44.345	74 35.76	115	58.791	162 60.14	87	48.236	110 35.77
	116	51.667	30 26.13	155	44.190	54 36.30	148	58.643	128 61.42	121	48.115	90 36.67
	144		27	190		30	176		92	147		67
		51.523	25.86		44.000	36.60		58.467	62.34		47.968	37.34
	165	51.358	26 25.60	216	43.784	5 36.65	194	58.273	55 62.89	168	47.800	46 37.80
	173	51.185	25 25.35	227	43.557	— 36.43	203	58.070	17 63.06	176	47.624	22 38.02
	172	51.013	22 25.13	224	43.333	22 35.96	201	57.869	— 62.86	175	47.449	47 38.03
	159	50.854	20 24.93	207	43.126	47 35.25	190	57.679	20 62.29	163	47.286	1 37.80
	138		15	179		71	168		57	145		23
		50.716	24.78		42.947	90 34.35		57.511	91 61.38		47.141	44 37.36
	107	50.609	9 24.69	139	42.808	105 33.30	140	57.371	125 60.13	116	47.025	67 36.69
	70	50.539	2 24.67	92	42.716	117 32.13	103	57.268	156 58.57	80	46.945	88 35.81
	27	50.512	— 24.75	39	42.677	121 30.92	62	57.206	182 56.75	41	46.904	109 34.72
	18	50.530	8 24.95	19	42.696	122 29.70	18	57.188	207 54.68	0	46.904	127 33.45
	64		20 31	76		116	28		226	45		143
		50.594	25.26		42.772	28.54		57.216	52.42		46.949	32.02
	108	50.702	43 25.69	133	42.905	109 27.45	73	57.289	240 50.02	88	47.037	157 30.45
	150	50.852	54 26.23	186	43.091	97 26.48	117	57.406	248 47.54	128	47.165	168 28.77
	188	51.040	63 26.86	235	43.326	82 25.66	157	57.563	250 45.04	166	47.331	172 27.05
	222	51.262	72 27.58	276	43.602	65 25.01	193	57.756	244 42.60	199	47.530	172 25.33
	251		77	313		48	225		232	227		167
		51.513	28.35		43.915	24.53		57.981	40.28		47.757	23.66
	272	51.785	79 29.14	342	44.257	29 24.24	251	58.232	211 38.17	250	48.007	158 22.08
	288	52.073	78 29.92	363	44.620	13 24.11	272	58.504	186 36.31	267	48.274	141 20.67
	301	52.374	73 30.65	378	44.998	— 24.15	285	58.789	152 34.79	280	48.554	120 19.47
	307	52.681	66 31.31	386	45.384	4 24.35	296	59.085	112 33.67	287	48.841	95 18.52
	308		55	390		20 34	299		69	291		64
		52.989	31.86		45.774	24.69		59.384	32.98		49.132	17.88
	305	53.294	43 32.29	388	46.162	47 25.16	299	59.683	22 32.76	289	49.421	31 17.57
	300	53.594	28 32.57	381	46.543	59 25.75	292	59.975	— 33.02	283	49.704	1 17.58
	289	53.883	12 32.69	370	46.913	70 26.45	282	60.257	26 33.76	274	49.978	37 17.95
	277	54.160	— 32.67	352	47.265	79 27.24	267	60.524	74 34.96	261	50.239	71 18.66
	260		2 16	333		88	246		120 162	245		99
		54.420	32.51		47.598	28.12		60.770	36.58		50.484	19.65
	240	54.660	27 32.24	305	47.903	96 29.08	221	60.991	196 38.54	225	50.709	126 20.91
	214	54.874	36 31.88	274	48.177	104 30.12	194	61.185	225 40.79	199	50.908	145 22.36
	186	55.060	42 31.46	236	48.413	109 31.21	160	61.345	243 43.22	170	51.078	161 23.97
	152	55.212	44 31.02	192	48.605	114 32.35	123	61.468	254 45.76	138	51.216	167 25.64
	114		46	141		115	82		255	100		169
		55.326	30.56		48.746	33.50		61.550	48.31		51.316	27.33
	72	55.398	44 30.12	88	48.834	114 34.64	38	61.588	248 50.79	60	51.376	164 28.97
	29	55.427	41 29.71	33	48.867	109 35.73	6	61.582	232 53.11	18	51.394	153 30.50
e	49.503		22.30		41.525	24.32		56.812	54.23		46.147	34.02
∂	1.037		+0.273		1.328	+0.873		1.082	−0.414		1.004	−0.091
	+0.07		0.00		+0.08	−0.02		+0.05	+0.01		+0.08	0.00
	+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				β Orionis (Rigel.) Mag. 0.3			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m s		° ′ ″		h m s		° ′ ″		h m s		° ′ ″		h m s		° ′ ″	
	5 7		+38 23		5 8		+79 8		5 9		−16 17		5 10		−8	
Jan. 0.4	47.661	10	22.36	91	60.90	23	30.64	279	14.370	14	69.87	198	35.122	4	48.27	
10.4	47.671	−47	23.27	80	60.67	43	33.43	252	14.356	58	71.85	176	35.118	45	47.88	
20.4	47.624	97	24.07	66	60.24	63	35.95	216	14.298	97	73.61	149	35.073	86	49.33	
30.4	47.527	142	24.73	50	59.61	80	38.11	171	14.201	133	75.10	119	34.987	121	50.54	
Feb. 9.3	47.385	179	25.23	28	58.81	93	39.82	119	14.068	161	76.29	89	34.866	148	51.57	
19.3	47.206	203	25.51	7	57.88	101	41.01	64	13.907	179	77.18	56	34.718	169	52.32	
Mar. 1.3	47.003	218	25.58	−18	56.87	105	41.65	6	13.728	190	77.74	23	34.549	179	52.83	
11.2	46.785	215	25.40	39	55.82	105	41.71	−52	13.538	190	77.97	−10	34.370	179	53.07	
21.2	46.570	202	25.01	60	54.77	98	41.19	106	13.348	180	77.87	40	34.191	169	53.07	
31.2	46.368	175	24.41	79	53.79	88	40.13	157	13.168	160	77.47	73	34.022	151	52.81	
Apr. 10.2	46.193	140	23.62	92	52.91	73	38.56	200	13.008	132	76.74	101	33.871	122	52.36	
20.1	46.053	93	22.70	102	52.18	58	36.56	234	12.876	98	75.73	130	33.749	88	51.73	
30.1	45.960	43	21.68	106	51.60	37	34.22	261	12.778	58	74.43	156	33.661	50	50.97	
May 10.1	45.917	−12	20.62	107	51.23	17	31.61	278	12.720	16	72.87	177	33.611	7	49.98	
20.1	45.929	67	19.55	103	51.06	−5	28.83	286	12.704	−29	71.10	195	33.604	−36	47.96	
30.0	45.996	121	18.52	96	51.11	25	25.97	285	12.733	72	69.15	211	33.640	79	46.38	
June 9.0	46.117	173	17.56	84	51.36	46	23.12	277	12.805	114	67.04	220	33.719	120	44.67	
19.0	46.290	220	16.72	70	51.82	65	20.35	259	12.919	154	64.84	222	33.839	157	42.86	
28.9	46.510	261	16.02	56	52.47	83	17.76	237	13.073	188	62.62	220	33.996	191	41.00	
July 8.9	46.771	296	15.46	41	53.30	98	15.39	207	13.261	220	60.42	210	34.187	221	39.15	
18.9	47.067	324	15.05	24	54.28	112	13.32	174	13.481	244	58.32	195	34.408	244	37.33	
28.9	47.391	347	14.81	10	55.40	123	11.58	138	13.725	266	56.37	172	34.652	264	35.65	
Aug. 7.8	47.738	361	14.71	−4	56.63	131	10.20	97	13.991	279	54.65	144	34.916	277	34.14	
17.8	48.099	371	14.75	17	57.94	137	9.23	56	14.270	288	53.21	108	35.193	286	32.91	
27.8	48.470	375	14.92	30	59.31	141	8.67	14	14.558	293	52.13	70	35.479	289	31.90	
Sept. 6.8	48.845	375	15.22	39	60.72	141	8.53	−29	14.851	293	51.43	−28	35.768	289	31.27	
16.7	49.220	369	15.61	48	62.13	140	8.82	72	15.144	288	51.15	−16	36.057	286	30.96	
26.7	49.589	359	16.09	56	63.53	136	9.54	113	15.432	280	51.31	59	36.343	277	31.02	
Oct. 6.7	49.948	344	16.65	64	64.89	130	10.67	153	15.712	266	51.90	101	36.620	264	31.48	
16.6	50.292	327	17.29	72	66.19	120	12.20	189	15.978	248	52.91	139	36.884	248	32.23	
26.6	50.619	301	18.01	77	67.39	108	14.09	224	16.226	227	54.30	172	37.132	229	33.37	
Nov. 5.6	50.920	271	18.78	84	68.47	93	16.33	253	16.453	199	56.02	198	37.361	204	34.70	
15.6	51.191	237	19.62	90	69.40	77	18.86	276	16.652	169	58.00	217	37.565	175	36.38	
25.5	51.428	195	20.52	94	70.17	57	21.62	293	16.821	135	60.17	227	37.740	142	38.18	
Dec. 5.5	51.623	148	21.46	97	70.74	36	24.55	301	16.956	96	62.44	229	37.882	104	40.03	
15.5	51.771	94	22.43	97	71.10	14	27.56	301	17.052	53	64.73	224	37.986	63	41.90	
25.5	51.865	40	23.40	93	71.24	−9	30.57	289	17.105	10	66.97	208	38.049	21	43.73	
35.4	51.905		24.33		71.15		33.46		17.115		69.05		38.070		45.49	
Mean Place	44.741		14.50		51.183		19.22		12.161		70.46		32.891		47.86	
Sec ∂, Tan ∂	*1.276*		+0.792		5.307		+5.212		1.042		−0.292		1.011		−0.3	
$D_\psi a$, $D_\omega a$	+0.08		−0.01		+0.20		−0.08		+0.05		0.00		+0.08			
$D_\psi \partial$, $D_\omega \partial$	+0.1		+1.0		+0.1		+1.0		+0.1		+1.0		+0.1			

FOR THE UPPER TRANSIT AT WASHINGTON.

	α Aurigæ. (*Capella.*) Mag. 0.2		λ Aurigæ. Mag. 4.8		τ Orionis. Mag. 3.7		ο Columbæ. Mag. 4.9	
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.
	h m s	° ′ ″	h m s	° ′ ″	h m s	° ′ ″	h m s	° ′ ″
	5 10	+45 54	5 13	+40 1	5 13	− 6 55	5 14	−34 58
4	36.534	62.18	21.016	43.24	36.792	57.77	31.580	34.69
4	36.542 — 8	63.48 130	21.032 — 16	44.22 98	36.793 — 1	59.34 157	31.531 49	37.36 267
4	36.486 56	64.65 117	20.992 40	45.11 89	36.751 42	60.75 141	31.434 97	39.75 239
4	36.373 113	65.64 99	20.898 94	45.84 73	36.669 82	61.94 119	31.294 140	41.76 201
3	36.208 165	66.38 74	20.757 141	46.41 57	36.551 118	62.92 98	31.114 180	43.37 161
	205	49	179	36	145	74	211	117
3	36.003	66.87	20.578	46.77	36.406	63.66	30.903	44.54
3	35.770 233	67.05 — 18	20.371 207	46.88 — 11	36.239 167	64.17 51	30.671 232	45.26 72
3	35.522 248	66.93 12	20.151 220	46.74 14	36.061 178	64.42 25	30.428 243	45.52 — 26
2	35.274 248	66.51 42	19.930 221	46.37 37	35.883 178	64.44 2	30.185 243	45.33 19
2	35.042 232	65.79 72	19.722 208	45.77 60	35.715 168	64.21 23	29.952 233	44.68 65
	203	95	183	80	150	46	212	106
2	34.839	64.84	19.539	44.97	35.565	63.75	29.740	43.62
1	34.676 163	63.67 117	19.394 145	44.01 96	35.442 123	63.05 70	29.557 183	42.14 148
1	34.563 113	62.35 132	19.293 101	42.93 108	35.351 91	62.13 92	29.412 145	40.31 183
1	34.506 57	60.94 141	19.243 — 50	41.79 114	35.301 50	60.99 114	29.310 102	38.16 215
1	34.511 — 5	59.48 146	19.249 6	40.63 116	35.292 — 9	59.67 132	29.255 55	35.73 243
	66	145	62	114	34	148	— 6	266
0	34.577	58.03	19.311	39.49	35.326	58.19	29.249	33.07
0	34.703 126	56.64 139	19.428 117	38.41 108	35.404 78	56.55 164	29.293 44	30.27 280
0	34.887 184	55.36 128	19.598 170	37.44 97	35.523 119	54.82 173	29.385 92	27.38 289
0	35.125 238	54.22 114	19.817 219	36.59 85	35.678 155	53.04 178	29.524 139	24.47 291
9	35.408 283	53.24 98	20.079 262	35.89 70	35.868 190	51.24 180	29.705 181	21.64 283
	324	79	298	55	221	173	219	267
9	35.732	52.45	20.377	35.34	36.089	49.51	29.924	18.97
9	36.089 357	51.85 60	20.705 328	34.95 39	36.331 242	47.90 161	30.176 252	16.52 245
8	36.471 382	51.44 41	21.057 352	34.73 22	36.594 263	46.44 146	30.453 277	14.40 212
8	36.873 402	51.24 20	21.425 368	34.66 — 7	36.870 276	45.21 123	30.753 300	12.67 173
8	37.285 412	51.22 — 2	21.804 379	34.72 6	37.155 285	44.24 97	31.066 313	11.40 127
	419	17	384	20	288	65	321	77
8	37.704	51.39	22.188	34.92	37.443	43.59	31.387	10.63
7	38.122 418	51.72 33	22.573 385	35.23 31	37.733 290	43.28 — 31	31.710 323	10.41 — 22
7	38.535 413	52.23 51	22.953 380	35.65 42	38.018 285	43.31 3	32.030 320	10.75 34
7	38.937 402	52.90 67	23.323 370	36.17 52	38.296 278	43.72 41	32.339 309	11.66 91
6	39.324 387	53.70 80	23.679 356	36.78 61	38.563 267	44.47 75	32.632 293	13.10 144
	366	94	339	71	250	108	271	193
6	39.690	54.64	24.018	37.49	38.813	45.55	32.903	15.03
6	40.028 338	55.71 107	24.332 314	38.28 79	39.044 231	46.89 134	33.145 242	17.37 234
6	40.332 304	56.91 120	24.616 284	39.14 86	39.249 205	48.44 155	33.355 210	20.06 269
5	40.596 264	58.19 128	24.864 248	40.08 94	39.428 179	50.16 172	33.526 171	22.98 292
5	40.813 217	59.55 136	25.069 205	41.08 100	39.574 146	51.96 180	33.655 129	26.05 307
	163	139	159	103	107	182	82	309
5	40.976	60.94	25.228	42.11	39.681	53.78	33.737	29.14
5	41.080 104	62.34 140	25.332 104	43.14 103	39.748 67	55.54 176	33.768 — 31	32.15 301
4	41.122 42	63.71 137	25.379 47	44.15 101	39.774 26	57.20 166	33.749 19	34.99 284
e	33.306	53.67	18.021	35.62	34.551	59.47	29.293	33.35
∂	1.437	+1.033	1.306	+0.840	1.007	−0.122	1.220	−0.700
	+0.09	−0.01	+0.08	−0.01	+0.06	0.00	+0.04	+0.01
	+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. 3.1	
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	D
	h m s 5 20	′ ″ + 6 16	h m s 5 21	° ′ ″ +28 32	h m s 5 22	° ′ ″ +62 59	h m s 5 24	
Jan. 0.4	43.058	34.70	5.326	24.26	24.28	67.20	43.577	2
	18	91	27	35	1	218	8	
10.4	43.076	33.79	5.353	24.61	24.27	69.38	43.569	3
	26	81	25	33	10	201	53	
20.4	43.050	32.98	5.328	24.94	24.17	71.39	43.516	3
	68	69	72	29	19	174	95	
30.4	42.982	32.29	5.256	25.23	23.98	73.13	43.421	3
	106	59	115	20	27	142	134	
Feb. 9.3	42.876	31.70	5.141	25.43	23.71	74.55	43.287	3
	136	47	150	11	33	101	163	
19.3	42.740	31.23	4.991	25.54	23.38	75.56	43.124	3
	159	36	176	1	38	58	186	
Mar. 1.3	42.581	30.87	4.815	25.53	23.00	76.14	42.938	3
	170	23	190	13	42	12	198	
11.3	42.411	30.64	4.625	25.40	22.58	76.26	42.740	3
	173	13	192	26	40	34	202	
21.2	42.238	30.51	4.433	25.14	22.18	75.92	42.538	3
	163	2	183	36	38	78	193	
31.2	42.075	30.49	4.250	24.78	21.80	75.14	42.345	3
	146	11	161	46	34	118	175	
Apr. 10.2	41.929	30.60	4.089	24.32	21.46	73.96	42.170	3
	119	25	130	53	29	154	150	
20.1	41.810	30.85	3.959	23.79	21.17	72.42	42.020	3
	86	37	93	56	22	183	116	
30.1	41.724	31.22	3.866	23.23	20.95	70.59	41.904	3
	47	50	47	57	14	205	78	
May 10.1	41.677	31.72	3.819	22.66	20.81	68.54	41.826	3
	4	65	1	54	6	218	36	
20.1	41.673	32.37	3.820	22.12	20.75	66.36	41.790	3
	39	77	50	49	5	225	9	
30.0	41.712	33.14	3.870	21.63	20.80	64.11	41.799	2
	82	89	98	42	13	225	53	
June 9.0	41.794	34.03	3.968	21.21	20.93	61.86	41.852	2
	123	99	145	32	22	218	95	
19.0	41.917	35.02	4.113	20.89	21.15	59.68	41.947	2
	161	106	186	21	30	204	136	
29.0	42.078	36.08	4.299	20.68	21.45	57.64	42.083	2
	194	111	225	11	37	188	174	
July 8.9	42.272	37.19	4.524	20.57	21.82	55.76	42.257	2
	223	111	258	1	44	164	206	
18.9	42.495	38.30	4.782	20.56	22.26	54.12	42.463	1
	247	108	283	7	50	139	234	
28.9	42.742	39.38	5.065	20.63	22.76	52.73	42.697	1
	267	100	306	15	54	110	257	
Aug. 7.8	43.009	40.38	5.371	20.78	23.30	51.63	42.954	1
	280	89	320	21	57	81	275	
17.8	43.289	41.27	5.691	20.99	23.87	50.82	43.229	1
	289	71	330	25	60	50	286	
27.8	43.578	41.98	6.021	21.24	24.47	50.32	43.515	1
	294	53	336	27	62	18	295	
Sept. 6.8	43.872	42.51	6.357	21.51	25.09	50.14	43.810	1
	296	31	337	27	62	14	296	
16.7	44.168	42.82	6.694	21.78	25.71	50.28	44.106	1
	292	8	334	26	61	44	296	
26.7	44.460	42.90	7.028	22.04	26.32	50.72	44.402	1
	286	17	328	25	60	77	288	
Oct. 6.7	44.746	42.73	7.356	22.29	26.92	51.49	44.690	1
	277	39	317	22	59	106	277	
16.7	45.023	42.34	7.673	22.51	27.51	52.55	44.967	1
	262	60	301	22	55	134	259	
26.6	45.285	41.74	7.974	22.73	28.06	53.89	45.226	1
	245	79	283	22	50	160	240	
Nov. 5.6	45.530	40.95	8.257	22.95	28.56	55.49	45.466	1
	222	92	258	24	45	183	214	
15.6	45.752	40.03	8.515	23.19	29.01	57.32	45.680	1
	196	102	227	26	39	205	184	
25.5	45.948	39.01	8.742	23.45	29.40	59.37	45.864	1
	163	107	192	28	32	219	146	
Dec. 5.5	46.111	37.94	8.934	23.73	29.72	61.56	46.010	2
	126	107	150	31	24	228	107	
15.5	46.237	36.87	9.084	24.04	29.96	63.84	46.117	2
	86	104	104	33	14	231	64	
25.5	46.323	35.83	9.188	24.37	30.10	66.15	46.181	2
	43	98	54	34	4	225	18	
35.4	46.366	34.85	9.242	24.71	30.14	68.40	46.199	2
Mean Place	40.711	31.57	2.635	18.52	19.643	58.21	41.340	2
Sec δ, Tan δ	*1.006*	+0.110	1.138	+0.544	2.203	+1.963	1.070	
D ψ α, D ω α	+0.06	0.00	+0.08	−0.01	+0.11	−0.02	+0.05	
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.

tion ime.	χ Aurigæ. Mag. 4.9		δ Orionis. Mag. 2.5		Groombridge 966. Mag. 6.4		α Leporis. Mag. 2.7	
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.
	h m s 5 27	° ′ ″ +32 7	h m s 5 27	° ′ ″ − 0 21	h m s 5 28	° ′ ″ +74 59	h m s 5 29	° ′ ″ −17 52
0.5	22.271	60.02	48.242	32.53	44.61	37.51	6.401	50.86
	31	57	20	129	5	271	1	214
10.4	22.302	60.59	48.262	33.82	44.56	40.22	6.402	53.00
	20	53	25	114	23	250	45	192
20.4	22.282	61.12	48.237	34.96	44.33	42.72	6.357	54.92
	73	47	67	99	39	219	87	165
30.4	22.209	61.59	48.170	35.95	43.94	44.91	6.270	56.57
	115	36	105	83	51	180	125	137
9.3	22.094	61.95	48.065	36.78	43.43	46.71	6.145	57.94
	154	25	135	63	62	135	157	107
19.3	21.940	62.20	47.930	37.41	42.81	48.06	5.988	58.97
	181	9	159	47	70	83	179	70
1.3	21.759	62.29	47.771	37.88	42.11	48.89	5.809	59.67
	197	7	172	27	74	29	192	37
11.3	21.562	62.22	47.599	38.15	41.37	49.18	5.617	60.04
	200	22	175	10	75	26	196	3
21.2	21.362	62.00	47.424	38.25	40.62	48.92	5.421	60.07
	192	40	167	8	72	80	188	32
31.2	21.170	61.60	47.257	38.17	39.90	48.12	5.233	59.75
	170	49	151	27	66	129	171	64
10.2	21.000	61.11	47.106	37.90	39.24	46.83	5.062	59.11
	142	60	125	43	57	173	147	94
20.2	20.858	60.51	46.981	37.47	38.67	45.10	4.915	58.17
	100	69	94	63	45	210	113	124
30.1	20.758	59.82	46.887	36.84	38.22	43.00	4.802	56.93
	56	73	56	79	31	238	76	150
10.1	20.702	59.09	46.831	36.05	37.91	40.62	4.726	55.43
	6	72	14	96	17	260	35	175
20.1	20.696	58.37	46.817	35.09	37.74	38.02	4.691	53.68
	44	69	28	112	2	270	9	195
30.0	20.740	57.68	46.845	33.97	37.72	35.32	4.700	51.73
	93	62	70	124	15	274	52	211
9.0	20.833	57.06	46.915	32.73	37.87	32.58	4.752	49.62
	143	55	111	133	29	270	93	220
19.0	20.976	56.51	47.026	31.40	38.16	29.88	4.845	47.42
	185	46	149	140	44	257	134	226
29.0	21.161	56.05	47.175	30.00	38.60	27.31	4.979	45.16
	225	34	182	143	57	239	171	224
8.9	21.386	55.71	47.357	28.57	39.17	24.92	5.150	42.92
	261	24	212	141	69	215	203	215
18.9	21.647	55.47	47.569	27.16	39.86	22.77	5.353	40.77
	287	12	237	134	79	187	230	200
28.9	21.934	55.35	47.806	25.82	40.65	20.90	5.583	38.77
	311	4	257	120	87	154	254	179
7.9	22.245	55.31	48.063	24.62	41.52	19.36	5.837	36.98
	328	4	272	105	94	118	270	149
17.8	22.573	55.35	48.335	23.57	42.46	18.18	6.107	35.49
	340	13	282	85	100	80	282	115
27.8	22.913	55.48	48.617	22.72	43.46	17.38	6.389	34.34
	348	16	288	58	104	42	291	75
6.8	23.261	55.64	48.905	22.14	44.50	16.96	6.680	33.59
	349	20	291	29	104	3	294	33
16.7	23.610	55.84	49.196	21.85	45.54	16.93	6.974	33.26
	347	24	289	1	104	39	293	12
26.7	23.957	56.08	49.485	21.84	46.58	17.32	7.267	33.38
	342	25	284	30	104	78	287	58
6.7	24.299	56.33	49.769	22.14	47.62	18.10	7.554	33.96
	332	29	275	60	98	117	277	101
16.7	24.631	56.62	50.044	22.74	48.60	19.27	7.831	34.97
	319	29	261	85	94	154	261	141
26.6	24.950	56.91	50.305	23.59	49.54	20.81	8.092	36.38
	296	35	245	110	86	187	243	177
5.6	25.246	57.26	50.550	24.69	50.40	22.68	8.335	38.15
	272	36	222	127	76	220	217	206
15.6	25.518	57.62	50.772	25.96	51.16	24.88	8.552	40.21
	242	44	196	140	65	245	189	226
25.6	25.760	58.06	50.968	27.36	51.81	27.33	8.741	42.47
	203	47	164	147	51	266	153	238
5.5	25.963	58.53	51.132	28.83	52.32	29.99	8.894	44.85
	162	52	128	150	36	278	114	242
15.5	26.125	59.05	51.260	30.33	52.68	32.77	9.008	47.27
	115	54	87	145	20	282	71	239
25.5	26.240	59.59	51.347	31.78	52.88	35.59	9.079	49.66
	62	55	45	137	3	278	27	226
35.4	26.302	60.14	51.392	33.15	52.91	38.37	9.106	51.92
Place	19.471	54.32	*45.937*	*34.69*	37.064	28.43	4.156	51.25
Tan δ	*1.181*	*+0.628*	*1.000*	*−0.006*	3.862	+3.730	1.051	−0.323
α	*+0.08*	*−0.01*	*+0.06*	*0.00*	+0.16	−0.03	+0.05	0.00
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.	ϕ^1 Orionis. Mag. 4.5		ι Orionis. Mag. 2.9		ε Orionis. Mag. 1.8		ζ Tau Mag. 3
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.
	h m 5 30 s	° ′ + 9 26 ″	h m 5 31 s	° ′ − 5 57 ″	h m 5 32 s	° ′ − 1 15 ″	h m 5 32 s
Jan. 0.5	18.175	6.44	24.638	47.17	2.382	12.25	43.590
	29	75	17	158	22	135	36
10.4	18.204	5.69	24.655	48.75	2.404	13.60	43.626
	17	66	27	143	22	120	12
20.4	18.187	5.03	24.628	50.18	2.382	14.80	43.614
	61	58	69	123	65	104	59
30.4	18.126	4.45	24.559	51.41	2.317	15.84	43.555
Feb. 9.3	18.028	3.98	24.452	52.43	2.214	16.70	43.454
	98	47	107	102	103	86	101
	132	38	138	78	134	67	135
19.3	17.896	3.60	24.314	53.21	2.080	17.37	43.319
	155	32	163	56	158	49	163
Mar. 1.3	17.741	3.28	24.151	53.77	1.922	17.86	43.156
	170	21	175	32	172	29	177
11.3	17.571	3.07	23.976	54.09	1.750	18.15	42.979
	174	14	179	9	176	10	182
21.2	17.397	2.93	23.797	54.18	1.574	18.25	42.797
	165	5	173	16	168	8	175
31.2	17.232	2.88	23.624	54.02	1.406	18.17	42.622
	151	3	155	37	154	28	156
Apr. 10.2	17.081	2.91	23.469	53.65	1.252	17.89	42.466
	123	13	131	61	128	46	129
20.2	16.958	3.04	23.338	53.04	1.124	17.43	42.337
	93	24	101	82	97	65	96
30.1	16.865	3.28	23.237	52.22	1.027	16.78	42.241
	52	35	63	102	59	82	54
May 10.1	16.813	3.63	23.174	51.20	0.968	15.96	42.187
	12	46	22	122	18	99	10
20.1	16.801	4.09	23.152	49.98	0.950	14.97	42.177
	32	57	20	138	23	115	36
30.0	16.833	4.66	23.172	48.60	0.973	13.82	42.213
	76	69	62	152	66	127	82
June 9.0	16.909	5.35	23.234	47.08	1.039	12.55	42.295
	117	78	103	163	107	137	125
19.0	17.026	6.13	23.337	45.45	1.146	11.18	42.420
	155	85	140	169	143	144	165
29.0	17.181	6.98	23.477	43.76	1.289	9.74	42.585
July 8.9	17.371	7.88	23.653	42.07	1.467	8.29	42.787
	190	90	176	169	178	145	202
	220	92	206	165	209	144	233
18.9	17.591	8.80	23.859	40.42	1.676	6.85	43.020
	243	90	231	156	233	137	260
28.9	17.834	9.70	24.090	38.86	1.909	5.48	43.280
	265	85	252	141	254	123	280
Aug. 7.9	18.099	10.55	24.342	37.45	2.163	4.25	43.560
	279	74	268	119	269	107	296
17.8	18.378	11.29	24.610	36.26	2.432	3.18	43.856
	290	63	279	95	280	85	308
27.8	18.668	11.92	21.889	35.31	2.712	2.33	44.164
	296	45	286	63	287	58	315
Sept. 6.8	18.964	12.37	25.175	34.68	2.999	1.75	44.479
	298	26	289	31	291	29	317
16.7	19.262	12.63	25.464	34.37	3.290	1.46	44.796
	297	8	288	3	289	0	316
26.7	19.559	12.71	25.752	34.40	3.579	1.46	45.112
Oct. 6.7	19.851	12.57	26.035	34.79	3.863	1.78	45.424
	292	14	283	39	284	32	312
16.7	20.134	12.22	26.310	35.53	4.140	2.41	45.726
	283	35	275	74	277	63	302
	272	52	261	106	263	89	292
26.6	20.406	11.70	26.571	36.59	4.403	3.30	46.018
	254	69	245	132	247	115	275
Nov. 5.6	20.660	11.01	26.816	37.91	4.650	4.45	46.293
	233	80	222	154	226	132	252
15.6	20.893	10.21	27.038	39.45	4.876	5.77	46.545
	207	88	196	171	198	146	224
25.6	21.100	9.33	27.234	41.16	5.074	7.23	46.769
Dec. 5.5	21.275	8.41	27.397	42.95	5.242	8.77	46.962
	175	92	163	179	168	154	193
	139	91	126	182	131	155	153
15.5	21.414	7.50	27.523	44.77	5.373	10.32	47.115
	98	88	86	178	90	152	110
25.5	21.512	6.62	27.609	46.55	5.463	11.84	47.225
	54	81	42	167	48	143	64
35.4	21.566	5.81	27.651	48.22	5.511	13.27	47.289
Mean Place	15.778	3.34	22.359	48.67	0.075	14.21	41.020
Sec δ, Tan δ	*1.014*	*+0.166*	*1.005*	*−0.104*	*1.000*	*−0.022*	*1.002*
$D_\psi\, a$, $D_\omega\, a$	+0.07	0.00	+0.06	0.00	+0.06	0.00	+0.07
$D_\psi\, \delta$, $D_\omega\, \delta$	+0.1	+1.0	0.0	+1.0	0.0	+1.0	0.0

FOR THE UPPER TRANSIT AT WASHINGTON.

ashington n Time.	ζ Orionis. Mag. 2.0		α Columbæ. Mag. 2.8		o Aurigæ. Mag. 5.5		ζ Leporis. Mag. 3.7	
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.
	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 ″
0.5	36.535	66.70	40.923	64.80	31.655	34.69	13.910	66.73
	26	141	23	279	42	156	18	206
10.4	36.561	68.11	40.900	67.59	31.697	36.25	13.928	68.79
	20	126	74	252	27	148	28	188
20.4	36.541	69.37	40.826	70.11	31.670	37.73	13.900	70.67
	61	108	121	218	95	132	72	162
30.4	36.480	70.45	40.705	72.29	31.575	39.05	13.828	72.29
9.3	101	90	164	180	155	109	112	136
	36.379	71.35	40.541	74.09	31.420	40.14	13.716	73.65
	132	70	197	139	206	83	144	106
19.3	36.247	72.05	40.344	75.48	31.214	40.97	13.572	74.71
	157	51	223	94	242	54	170	74
1.3	36.090	72.56	40.121	76.42	30.972	41.51	13.402	75.45
	171	30	238	48	267	19	185	44
11.3	35.919	72.86	39.883	76.90	30.705	41.70	13.217	75.89
	176	11	243	3	274	15	191	12
21.2	35.743	72.97	39.640	76.93	30.431	41.55	13.026	76.01
	170	8	236	42	264	47	186	20
31.2	35.573	72.89	39.404	76.51	30.167	41.08	12.840	75.81
	155	29	218	84	242	78	171	49
10.2	35.418	72.60	39.186	75.67	29.925	40.30	12.669	75.32
	131	47	193	126	294	105	149	79
20.2	35.287	72.13	38.993	74.41	29.721	39.25	12.520	74.53
	101	67	159	163	156	120	117	107
30.1	35.186	71.46	38.834	72.78	29.565	37.96	12.403	73.46
	63	84	118	198	100	145	82	132
10.1	35.123	70.62	38.716	70.80	29.465	36.51	12.321	72.14
	23	101	74	226	38	156	42	156
20.1	35.100	69.61	38.642	68.54	29.427	34.95	12.279	70.58
	19	117	27	251	25	162	0	175
30.0	35.119	68.44	38.615	66.03	29.452	33.33	12.279	68.83
9.0	61	129	21	270	90	162	42	191
	35.180	67.15	38.636	63.33	29.542	31.71	12.321	66.92
19.0	101	140	69	281	153	158	84	202
	35.281	65.75	38.705	60.52	29.695	30.13	12.405	64.90
29.0	139	146	115	284	210	149	124	209
	35.420	64.29	38.820	57.68	29.905	28.64	12.529	62.81
8.9	174	148	158	281	264	138	159	208
	35.594	62.81	38.978	54.87	30.169	27.26	12.688	60.73
	204	145	197	270	311	120	191	202
18.9	35.798	61.36	39.175	52.17	30.480	26.06	12.879	58.71
	229	138	230	248	351	103	220	189
28.9	36.027	59.98	39.405	49.69	30.831	25.03	13.099	56.82
	252	125	261	220	382	85	243	169
7.9	36.279	58.72	39.666	47.49	31.213	24.18	13.342	55.13
	267	107	283	183	409	64	292	145
17.8	36.546	57.65	39.949	45.66	31.622	23.54	13.604	53.68
	278	86	303	142	428	45	276	112
27.8	36.824	56.79	40.252	44.24	32.050	23.09	13.880	52.56
	286	59	314	90	441	23	285	75
6.8	37.110	56.20	40.566	43.34	32.491	22.86	14.165	51.81
	290	29	320	38	448	4	290	36
16.7	37.400	55.91	40.886	42.96	32.939	22.82	14.455	51.45
	289	2	322	17	448	17	292	7
26.7	37.689	55.93	41.208	43.13	33.387	22.99	14.747	51.52
6.7	285	34	315	74	442	36	289	51
	37.974	56.27	41.523	43.87	33.829	23.35	15.036	52.03
16.7	278	65	302	129	432	56	281	91
	38.252	56.92	41.825	45.16	34.261	23.91	15.317	52.94
	266	92	287	179	416	76	269	131
26.6	38.518	57.84	42.112	46.95	34.677	24.67	15.586	54.25
5.6	248	118	261	224	390	94	251	166
	38.766	59.02	42.373	49.19	35.067	25.61	15.837	55.91
15.6	229	137	233	261	358	112	230	193
	38.995	60.39	42.606	51.80	35.425	26.73	16.067	57.84
25.6	202	151	196	287	318	127	201	215
	39.197	61.90	42.802	54.67	35.743	28.00	16.268	59.99
5.5	171	160	154	305	269	141	169	227
	39.368	63.50	42.956	57.72	36.012	29.41	16.437	62.26
	134	161	109	311	213	152	131	232
15.5	39.502	65.11	43.065	60.83	36.225	30.93	16.568	64.58
	95	156	59	307	150	158	88	228
25.5	39.597	66.67	43.124	63.90	36.375	32.51	16.656	66.86
	51	150	7	293	81	158	44	218
35.4	39.648	68.17	43.131	66.83	36.456	34.09	16.700	69.04
an Place	34.227	68.47	38.609	64.00	28.107	28.40	11.644	67.32
: ∂, Tan ∂	*1.001*	*−0.035*	*1.208*	*−0.677*	1.549	+1.183	1.035	−0.285
; D_α α	*+0.06*	*0.00*	*+0.04*	*0.00*	+0.09	−0.01	+0.05	0.00
D_α ∂	*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.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.
	h m s	° ′ ″	h m s	° ′ ″	h m s	° ′ ″	h m s	° ′ ″
	5 43	− 9 41	5 44	−65 45	5 45	+39 7	5 47	−20
Jan. 0.5	51.466	52.68	40.61	61.68	47.262	36.60	47.352	66.94
	25	184	19	336	53	96	15	
10.4	51.491	54.52	40.42	65.04	47.315	37.56	47.367	69.33
	21	164	28	305	7	94	34	
20.4	51.470	56.16	40.14	68.09	47.308	38.50	47.333	71.48
	65	143	37	266	62	86	78	
30.4	51.405	57.59	39.77	70.75	47.246	39.36	47.255	73.38
Feb. 9.4	104	118	44	220	115	72	119	
	51.301	58.77	39.33	72.95	47.131	40.08	47.136	74.96
	136	94	49	169	159	56	153	
19.3	51.165	59.71	38.84	74.64	46.972	40.64	46.983	76.19
	163	66	54	117	192	37	178	
Mar. 1.3	51.002	60.37	38.30	75.81	46.780	41.01	46.805	77.09
	177	40	57	62	215	13	195	
11.3	50.825	60.77	37.73	76.43	46.565	41.14	46.610	77.62
	184	12	57	6	222	9	201	
21.2	50.641	60.89	37.16	76.49	46.343	41.05	46.409	77.73
	179	15	56	48	215	33	198	
31.2	50.462	60.74	36.60	76.01	46.128	40.72	46.211	77.57
	163	39	54	99	198	53	183	
Apr. 10.2	50.299	60.35	36.06	75.02	45.930	40.19	46.028	77.02
	142	66	50	149	168	72	161	
20.2	50.157	59.69	35.56	73.53	45.762	39.47	45.867	76.13
	111	90	44	194	128	86	131	
30.1	50.046	58.79	35.12	71.59	45.634	38.61	45.736	74.95
May 10.1	76	114	37	233	82	98	96	
	49.970	57.65	34.75	69.26	45.552	37.63	45.640	73.46
20.1	36	133	30	270	31	105	54	
	49.934	56.32	34.45	66.56	45.521	36.58	45.586	71.71
	− 6	151	21	297	− 24	107	12	
30.1	49.940	54.81	34.24	63.59	45.545	35.51	45.574	69.75
June 9.0	46	168	12	317	76	105	31	
	49.986	53.13	34.12	60.42	45.621	34.46	45.605	67.61
19.0	89	177	3	332	130	101	75	
	50.075	51.36	34.09	57.10	45.751	33.45	45.680	65.36
29.0	127	183	6	335	178	93	115	
	50.202	49.53	34.15	53.75	45.929	32.52	45.795	63.04
July 8.9	162	185	15	330	223	84	152	
	50.364	47.68	34.30	50.45	46.152	31.68	45.947	60.73
	193	180	24	316	262	71	186	
18.9	50.557	45.88	34.54	47.29	46.414	30.97	46.133	58.49
	221	168	31	291	296	60	218	
28.9	50.778	44.20	34.85	44.38	46.710	30.37	46.351	56.40
Aug. 7.9	242	152	40	257	321	48	241	
	51.020	42.68	35.25	41.81	47.031	29.89	46.592	54.53
17.8	262	129	45	216	345	36	263	
	51.282	41.39	35.70	39.65	47.376	29.53	46.855	52.96
27.8	274	102	50	165	360	24	277	
	51.556	40.37	36.20	38.00	47.736	29.29	47.132	51.72
	283	69	54	108	371	14	289	
Sept. 6.8	51.839	39.68	36.74	36.92	48.107	29.15	47.421	50.90
	289	33	56	45	376	3	296	
16.8	52.128	39.35	37.30	36.47	48.483	29.12	47.717	50.52
26.7	289	6	56	19	380	7	297	
	52.417	39.41	37.86	36.66	48.863	29.19	48.014	50.61
Oct. 6.7	287	43	56	84	376	16	295	
	52.704	39.84	38.42	37.50	49.239	29.35	48.309	51.18
16.7	280	82	53	150	368	27	287	
	52.984	40.66	38.95	39.00	49.607	29.62	48.596	52.22
	268	117	49	208	354	37	276	
26.6	53.252	41.83	39.44	41.08	49.961	29.99	48.872	53.69
Nov. 5.6	251	147	42	261	337	46	256	
	53.503	43.30	39.86	43.69	50.298	30.45	49.128	55.54
15.6	231	173	36	305	311	57	235	
	53.734	45.03	40.22	46.74	50.609	31.02	49.363	57.72
25.6	204	191	28	338	281	68	205	
	53.938	46.94	40.50	50.12	50.890	31.70	49.568	60.13
Dec. 5.5	173	202	18	361	240	77	170	
	54.111	48.96	40.68	53.73	51.130	32.47	49.738	62.71
	135	205	9	370	194	87	131	
15.5	54.246	51.01	40.77	57.43	51.324	33.34	49.869	65.34
	95	202	2	367	142	93	88	
25.5	54.341	53.03	40.75	61.10	51.466	34.27	49.957	67.94
	51	193	13	351	86	96	42	
35.5	54.392	54.96	40.62	64.61	51.552	35.23	49.999	70.43
Mean Place	49.186	53.66	37.312	60.00	44.198	31.68	45.084	67.11
Sec δ, Tan δ	*1.014*	*−0.171*	2.437	−2.222	1.289	+0.813	1.070	−0.382
$D_\psi\,\alpha$, $D_\omega\,\alpha$	+0.06	0.00	0.00	+0.01	+0.08	0.00	+0.05	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.

	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.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.
	h m	° ′	h m	° ′	h m	° ′	h m	° ′
	5 50	+ 7 23	5 52	−14 10	5 52	+54 16	5 53	+44 56
	s	″	s	″	s	″	s	″
	43.093	35.43	39.737	54.69	45.533	53.00	29.793	29.88
	47	92	27	207	61	181	63	131
	43.140	34.51	39.764	56.76	45.594	54.81	29.856	31.19
	— 1	82	— 18	189	— 17	173	— 3	126
	43.139	33.69	39.746	58.65	45.577	56.54	29.853	32.45
	46	68	64	164	94	157	66	115
	43.093	33.01	39.682	60.29	45.483	58.11	29.787	33.60
	87	57	104	139	163	136	124	101
	43.006	32.44	39.578	61.68	45.320	59.47	29.663	34.61
	123	46	138	109	220	107	173	79
	42.883	31.98	39.440	62.77	45.100	60.54	29.490	35.40
	149	34	165	78	266	74	211	55
	42.734	31.64	39.275	63.55	44.834	61.28	29.279	35.95
	167	22	181	48	294	38	236	27
	42.567	31.42	39.094	64.03	44.540	61.66	29.043	36.22
	174	13	190	16	306	0	247	— 1
	42.393	31.29	38.904	64.19	44.234	61.66	28.796	36.21
	170	— 2	187	— 15	301	38	242	31
	42.223	31.27	38.717	64.04	43.933	61.28	28.554	35.90
	156	8	172	43	279	74	223	57
	42.067	31.35	38.545	63.61	43.654	60.54	28.331	35.33
	135	19	152	74	241	106	193	83
	41.932	31.54	38.393	62.87	43.413	59.48	28.138	34.50
	103	30	123	99	192	133	151	102
	41.829	31.84	38.270	61.88	43.221	58.15	27.987	33.48
	68	41	88	126	133	155	101	120
	41.761	32.25	38.182	60.62	43.088	56.60	27.886	32.28
	28	53	49	149	68	172	46	129
	41.733	32.78	38.133	59.13	43.020	54.88	27.840	30.99
	14	65	7	168	3	182	11	136
	41.747	33.43	38.126	57.45	43.023	53.06	27.851	29.63
	56	75	34	185	71	186	70	138
	41.803	34.18	38.160	55.60	43.094	51.20	27.921	28.25
	95	83	76	196	141	184	126	135
	41.898	35.01	38.236	53.64	43.235	49.36	28.047	26.90
	135	91	116	203	205	178	180	128
	42.033	35.92	38.352	51.61	43.440	47.58	28.227	25.62
	170	94	151	203	265	167	230	118
	42.203	36.86	38.503	49.58	43.705	45.91	28.457	24.44
	201	94	183	197	318	153	273	108
	42.404	37.80	38.686	47.61	44.023	44.38	28.730	23.36
	227	92	214	187	365	136	310	94
	42.631	38.72	38.900	45.74	44.388	43.02	29.040	22.42
	250	85	236	168	404	115	342	79
	42.881	39.57	39.136	44.06	44.792	41.87	29.382	21.63
	266	72	257	143	436	95	367	63
	43.147	40.29	39.393	42.63	45.228	40.92	29.749	21.00
	279	60	271	112	459	71	386	49
	43.426	40.89	39.664	41.51	45.687	40.21	30.135	20.51
	289	41	282	76	477	50	401	33
	43.715	41.30	39.946	40.75	46.164	39.71	30.536	20.18
	294	19	289	38	488	25	409	17
	44.009	41.49	40.235	40.37	46.652	39.46	30.945	20.01
	296	— 2	292	— 5	493	— 1	412	— 2
	44.305	41.47	40.527	40.42	47.145	39.45	31.357	19.99
	295	25	289	46	489	23	410	18
	44.600	41.22	40.816	40.88	47.634	39.68	31.767	20.12
	289	47	285	88	483	47	404	29
	44.889	40.75	41.101	41.76	48.117	40.15	32.171	20.41
	280	68	272	128	465	71	390	45
	45.169	40.07	41.373	43.04	48.582	40.86	32.561	20.86
	266	85	257	163	439	94	372	60
	45.435	39.22	41.630	44.67	49.021	41.80	32.933	21.46
	247	97	237	190	406	117	345	78
	45.682	38.25	41.867	46.57	49.427	42.97	33.278	22.24
	222	107	210	213	363	137	311	91
	45.904	37.18	42.077	48.70	49.790	44.34	33.589	23.15
	193	111	178	225	311	156	268	106
	46.097	36.07	42.255	50.95	50.101	45.90	33.857	24.21
	157	111	141	231	249	170	218	118
	46.254	34.96	42.396	53.26	50.350	47.60	34.075	25.39
	116	107	99	227	179	178	162	125
	46.370	33.89	42.495	55.53	50.529	49.38	34.237	26.64
	71	100	54	218	104	182	98	130
	46.441	32.89	42.549	57.71	50.633	51.20	34.335	27.94
	40.683	33.32	37.461	55.27	41.636	47.67	26.464	25.22
	1.008	+0.130	1.031	−0.253	1.713	+1.391	1.413	+0.998
	+0.06	0.00	+0.05	0.00	+0.10	0.00	+0.09	0.00
	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		ν Orionis Mag. 4.4	
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	D
	h m s 5 54	° ′ ″ +37 12	h m s 5 59	° ′ ″ +23 16	h m s 6 2	° ′ ″ −45 1	h m s 6 2	
Jan. 0.5	6.702	32.65	7.161	10.62	7.553	70.36	52.529	4
	64	86	65	0	24	325	63	
10.4	6.766	33.51	7.226	10.62	7.529	73.61	52.592	4
	4	84	12	6	84	297	13	
20.4	6.770	34.35	7.238	10.68	7.445	76.58	52.605	4
	−53	79	−37	9	142	264	−34	
30.4	6.717	35.14	7.201	10.77	7.303	79.22	52.571	4
	104	68	83	10	192	223	78	
Feb. 9.4	6.613	35.82	7.118	10.87	7.111	81.45	52.493	4
	149	55	124	9	234	180	117	
19.3	6.464	36.37	6.994	10.96	6.877	83.25	52.376	4
	183	38	155	6	268	132	146	
Mar. 1.3	6.281	36.75	6.839	11.02	6.609	84.57	52.230	4
	207	16	175	−1	289	81	167	
11.3	6.074	36.91	6.664	11.03	6.320	85.38	52.063	4
	215	−3	184	−6	298	−31	175	
21.3	5.859	36.88	6.480	10.97	6.022	85.69	51.888	4
	211	26	182	12	297	−19	174	
31.2	5.648	36.62	6.298	10.85	5.725	85.50	51.714	4
	195	44	168	18	283	67	162	
Apr. 10.2	5.453	36.18	6.130	10.67	5.442	84.83	51.552	4
	167	61	146	23	259	115	141	
20.2	5.286	35.57	5.984	10.44	5.183	83.68	51.411	4
	130	77	113	26	225	158	111	
30.1	5.156	34.80	5.871	10.18	4.958	82.10	51.300	4
	86	87	76	26	185	198	75	
May 10.1	5.070	33.93	5.795	9.92	4.773	80.12	51.225	4
	36	93	33	24	138	231	35	
20.1	5.034	33.00	5.762	9.68	4.635	77.81	51.190	4
	−15	96	−11	21	87	263	−7	
30.1	5.049	32.04	5.773	9.47	4.548	75.18	51.197	4
	67	96	57	18	−34	285	48	
June 9.0	5.116	31.08	5.830	9.29	4.514	72.33	51.245	4
	118	92	101	12	−20	302	91	
19.0	5.234	30.16	5.931	9.17	4.534	69.31	51.336	4
	166	85	141	6	74	308	131	
29.0	5.400	29.31	6.072	9.11	4.608	66.23	51.467	4
	209	78	181	0	124	307	166	
July 9.0	5.609	28.53	6.253	9.11	4.732	63.16	51.633	4
	249	67	214	5	173	297	199	
18.9	5.858	27.86	6.467	9.16	4.905	60.19	51.832	4
	280	57	242	8	218	280	226	
28.9	6.138	27.29	6.709	9.24	5.123	57.39	52.058	4
	309	48	267	11	257	251	250	
Aug. 7.9	6.447	26.81	6.976	9.35	5.380	54.88	52.308	4
	330	37	288	10	292	215	268	
17.8	6.777	26.44	7.264	9.45	5.672	52.73	52.576	4
	348	28	302	9	318	170	284	
27.8	7.125	26.16	7.566	9.54	5.990	51.03	52.860	5
	359	19	312	4	340	118	294	
Sept. 6.8	7.484	25.97	7.878	9.58	6.330	49.85	53.154	5
	367	11	319	0	355	62	301	
16.8	7.851	25.86	8.197	9.58	6.685	49.23	53.455	5
	369	3	322	−7	361	1	306	
26.7	8.220	25.83	8.519	9.51	7.046	49.22	53.761	5
	369	5	322	13	360	−60	306	
Oct. 6.7	8.589	25.88	8.841	9.38	7.406	49.82	54.067	4
	363	12	319	20	352	121	302	
16.7	8.952	26.00	9.160	9.18	7.758	51.03	54.369	4
	351	22	308	25	336	179	295	
26.7	9.303	26.22	9.468	8.93	8.094	52.82	54.664	4
	336	31	296	27	308	230	283	
Nov. 5.6	9.639	26.53	9.764	8.66	8.402	55.12	54.947	4
	312	41	278	29	276	276	264	
15.6	9.951	26.94	10.042	8.37	8.678	57.88	55.211	4
	283	51	251	27	235	310	242	
25.6	10.234	27.45	10.293	8.10	8.913	60.98	55.453	4
	245	61	220	22	187	333	212	
Dec. 5.5	10.479	28.06	10.513	7.88	9.100	64.31	55.665	4
	201	72	183	17	132	345	176	
15.5	10.680	28.78	10.696	7.71	9.232	67.76	55.841	4
	150	78	139	11	74	346	134	
25.5	10.830	29.56	10.835	7.60	9.306	71.22	55.975	4
	95	84	91	4	14	337	89	
35.5	10.925	30.10	10.926	7.56	9.320	74.59	56.064	4
Mean Place	3.685	28.56	4.505	7.83	5.082	69.80	50.011	4
Sec δ, Tan δ	1.256	+0.759	1.089	+0.430	1.415	−1.002	1.034	+
$D_\psi\, a$, $D_\omega\, a$	+0.08	0.00	+0.07	0.00	+0.03	0.00	+0.07	
$D_\psi\, \delta$, $D_\omega\, \delta$	0.0	+1.0	0.0	+1.0	0.0	+1.0	0.0	

FOR THE UPPER TRANSIT AT WASHINGTON.

n	22 H. Camelop. Mag. 4.7		η Geminorum. Var. 3.2–4.2		2 Lyncis. Mag. 4.4		ζ Canis Majoris. Mag. 3.1	
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.
	h m	° ′	h m	° ′	h m	° ′	h m	° ′
	6 9	+69 20	6 9	+22 31	6 12	+59 2	6 17	−30 1
	s	″	s	″	s	″	s	″
.5	48.24	67.75	54.755	56.99	22.586	37.09	9.844	33.95
.5	48.33 9	70.28 253	54.829 74	56.93 6	22.679 93	39.14 205	9.874 30	36.82 287
.4	48.30 3	72.73 245	54.851 22	56.95 2	22.682 3	41.15 201	9.851 23	39.48 266
.4	48.13 17	75.01 228	54.823 28	57.02 7	22.597 85	43.03 188	9.778 73	41.87 239
.4	47.85 28	77.00 199	54.747 76	57.11 9	22.432 165	44.69 166	9.658 120	43.91 204
	38	164	117	10	236	140	160	166
.3	47.47	78.64	54.630	57.21	22.196	46.09	9.498	45.57
.3	47.02 45	79.86 122	54.482 148	57.28 7	21.904 292	47.13 104	9.308 190	46.83 126
.3	46.51 51	80.61 75	54.310 172	57.31 3	21.574 330	47.78 65	9.094 214	47.69 86
.3	45.97 54	80.87 26	54.128 182	57.30 1	21.222 352	48.02 24	8.870 224	48.11 42
.2	45.44 53	80.62 25	53.945 183	57.23 7	20.872 350	47.84 18	8.645 225	48.11 0
	51	74	170	13	333	59	215	42
.2	44.93	79.88	53.775	57.10	20.539	47.25	8.430	47.69
.2	44.47 46	78.69 119	53.625 150	56.94 16	20.241 298	46.29 96	8.233 197	46.87 82
.2	44.09 38	77.09 160	53.506 119	56.74 20	19.992 249	44.98 131	8.064 169	45.67 120
.1	43.80 29	75.16 193	53.424 82	56.53 21	19.805 187	43.39 159	7.927 137	44.12 155
.1	43.60 20	72.95 221	53.382 42	56.33 20	19.688 117	41.58 181	7.830 97	42.27 185
	10	239	1	18	41	197	54	214
.1	43.50	70.56	53.383	56.15	19.647	39.61	7.776	40.13
.0	43.52 2	68.05 251	53.429 46	56.01 14	19.684 37	37.54 207	7.765 11	37.78 235
.0	43.66 14	65.47 258	53.519 90	55.91 10	19.796 112	35.44 210	7.798 33	35.27 251
.0	43.90 24	62.93 254	53.650 131	55.87 4	19.984 188	33.35 209	7.874 76	32.65 262
.0	44.24 34	60.48 245	53.819 169	55.87 0	20.240 256	31.34 201	7.992 118	30.02 263
	43	231	203	4	319	189	156	256
.9	44.67	58.17	54.022	55.91	20.559	29.45	8.148	27.46
.9	45.19 52	56.06 211	54.253 231	55.97 6	20.936 377	27.72 173	8.339 191	25.04 242
.9	45.78 59	54.18 188	54.511 258	56.05 8	21.359 423	26.19 153	8.562 223	22.84 220
.9	46.44 66	52.59 159	54.788 277	56.11 6	21.824 465	24.86 133	8.812 250	20.93 191
.8	47.14 70	51.29 130	55.082 294	56.15 4	22.322 498	23.78 108	9.084 272	19.39 154
	74	99	307	1	522	84	290	110
.8	47.88	50.30	55.389	56.14	22.844	22.94	9.374	18.29
.8	48.65 77	49.66 64	55.703 314	56.06 8	23.386 542	22.37 57	9.679 305	17.69 60
.7	49.43 78	49.38 28	56.023 320	55.91 15	23.937 551	22.08 29	9.989 310	17.61 8
.7	50.22 79	49.47 9	56.345 322	55.68 23	24.491 554	22.07 1	10.303 314	18.08 47
.7	50.99 77	49.91 44	56.664 319	55.39 29	25.039 548	22.35 28	10.614 311	19.08 100
	76	82	312	34	533	57	301	151
.7	51.75	50.73	56.976	55.05	25.572	22.92	10.915	20.59
.6	52.46 71	51.91 118	57.276 300	54.67 38	26.083 511	23.78 86	11.202 287	22.57 198
.6	53.12 66	53.44 153	57.560 284	54.29 38	26.558 475	24.92 114	11.465 263	24.94 237
.6	53.70 58	55.27 183	57.820 260	53.92 37	26.988 430	26.31 139	11.701 236	27.64 270
.6	54.20 50	57.38 211	58.050 230	53.59 33	27.360 372	27.95 164	11.900 199	30.56 292
	40	232	193	25	306	182	157	304
.5	54.60	59.70	58.243	53.34	27.666	29.77	12.057	33.60
.5	54.89 29	62.16 246	58.392 149	53.15 19	27.894 228	31.73 196	12.167 110	36.64 304
.5	55.04 15	64.71 255	58.494 102	53.05 10	28.036 142	33.77 204	12.227 60	39.62 298
ace	42.225	63.47	52.098	54.92	18.204	33.52	7.529	34.03
an δ	2.836	+2.654	1.083	+0.415	1.944	+1.667	1.155	−0.578
a	+0.13	+0.01	+0.07	0.00	+0.11	+0.01	+0.05	0.00
δ	0.0	+1.0	0.9	+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		8 Monoc Mag.
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.
	h m s 6 17	° ′ ″ +22 33	h m s 6 18	° ′ ″ +49 19	h m s 6 19	° ′ ″ −17 54	h m s 6 19
Jan. 0.5	59.052	27.86	34.155	56.57	4.946	49.37	24.633
	83	7	99	154	48	237	71
10.5	59.135	27.79	34.254	58.11	4.994	51.74	24.704
	30	1	26	153	0	218	23
20.4	59.165	27.80	34.280	59.64	4.994	53.92	24.727
	21	7	46	146	47	195	24
30.4	59.144	27.87	34.234	61.10	4.947	55.87	24.703
	69	10	111	133	92	165	69
Feb. 9.4	59.075	27.97	34.123	62.43	4.855	57.52	24.634
	111	11	169	111	131	135	107
19.3	58.964	28.08	33.954	63.54	4.724	58.87	24.527
	144	10	217	87	161	102	137
Mar. 1.3	58.820	28.18	33.737	64.41	4.563	59.89	24.390
	170	7	250	56	181	69	160
11.3	58.650	28.25	33.487	64.97	4.382	60.58	24.230
	181	2	268	24	193	34	171
21.3	58.469	28.27	33.219	65.21	4.189	60.92	24.059
	182	4	269	9	194	1	173
31.2	58.287	28.23	32.950	65.12	3.995	60.93	23.886
	172	10	254	40	185	32	163
Apr. 10.2	58.115	28.13	32.696	64.72	3.810	60.61	23.723
	153	14	229	72	167	64	146
20.2	57.962	27.99	32.467	64.00	3.643	59.97	23.577
	123	18	190	98	142	94	119
30.2	57.839	27.81	32.277	63.02	3.501	59.03	23.458
	88	20	140	122	110	123	87
May 10.1	57.751	27.61	32.137	61.80	3.391	57.80	23.371
	49	20	86	139	73	148	51
20.1	57.702	27.41	32.051	60.41	3.318	56.32	23.320
	5	18	25	151	34	172	12
30.1	57.697	27.23	32.026	58.90	3.284	54.60	23.308
	39	15	35	160	7	189	29
June 9.0	57.736	27.08	32.061	57.30	3.291	52.71	23.337
	82	12	97	162	47	203	69
19.0	57.818	26.96	32.158	55.68	3.338	50.68	23.406
	123	7	155	161	87	212	106
29.0	57.941	26.89	32.313	54.07	3.425	48.56	23.512
	161	4	209	155	125	214	141
July 9.0	58.102	26.85	32.522	52.52	3.550	46.42	23.653
	195	0	258	146	159	209	174
18.9	58.297	26.85	32.780	51.06	3.709	44.33	23.827
	226	2	303	135	189	199	202
28.9	58.523	26.87	33.083	49.71	3.898	42.34	24.029
	251	2	341	121	218	182	226
Aug. 7.9	58.774	26.89	33.424	48.50	4.116	40.52	24.255
	272	1	371	106	240	155	246
17.9	59.046	26.90	33.795	47.44	4.356	38.97	24.501
	290	3	399	90	260	125	264
27.8	59.336	26.87	34.194	46.54	4.616	37.72	24.765
	304	7	418	71	275	88	276
Sept. 6.8	59.640	26.80	34.612	45.83	4.891	36.84	25.041
	313	14	433	54	286	48	286
16.8	59.953	26.66	35.045	45.29	5.177	36.36	25.327
	319	22	443	36	293	2	292
26.7	60.272	26.44	35.488	44.93	5.470	36.34	25.619
	322	29	447	15	296	43	296
Oct. 6.7	60.594	26.15	35.935	44.78	5.766	36.77	25.915
	322	35	443	5	295	88	294
16.7	60.916	25.80	36.378	44.83	6.061	37.65	26.209
	316	40	436	27	288	132	289
26.7	61.232	25.40	36.814	45.10	6.349	38.97	26.498
	305	43	420	47	276	171	280
Nov. 5.6	61.537	24.97	37.234	45.57	6.625	40.68	26.778
	289	44	394	69	256	203	264
15.6	61.826	24.53	37.628	46.26	6.881	42.71	27.042
	267	42	361	91	233	228	243
25.6	62.093	24.11	37.989	47.17	7.114	44.99	27.285
	238	38	318	111	202	245	215
Dec. 5.6	62.331	23.73	38.307	48.28	7.316	47.44	27.500
	200	30	266	127	164	254	180
15.5	62.531	23.43	38.573	49.55	7.480	49.98	27.680
	158	21	206	141	122	255	142
25.5	62.689	23.22	38.779	50.96	7.602	52.53	27.822
	110	12	138	151	76	246	97
35.5	62.799	23.10	38.917	52.47	7.678	54.99	27.919
Mean Place	56.386	26.30	30.538	54.02	2.655	49.68	22.225
Sec δ, Tan δ	1.083	+0.415	1.534	+1.164	1.051	−0.323	1.003
$D_\alpha \alpha$, $D_\alpha \delta$	+0.07	0.00	+0.09	+0.01	+0.05	0.00	+0.06
$D_\delta \alpha$, $D_\delta \delta$	0.0	+1.0	0.0	+1.0	0.0	+1.0	0.0

FOR THE UPPER TRANSIT AT WASHINGTON.

ington Time.	α Argus. (*Canopus.*) Mag. −0.9		10 Monocerotis. Mag. 5.0		ν Geminorum. Mag. 4.1		8 Lyncis. Mag. 6.0	
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.
	h m 6 22 s	° ′ −52 38 ″	h m 6 23 s	° ′ − 4 42 ″	h m 6 24 s	° ′ +20 15 ″	h m 6 30 s	° ′ +61 33 ″
0.5	9.218	59.91	54.054	35.02	4.729	57.84	11.32	22.60
	21	350	67	172	88	21	13	216
10.5	9.197	63.41	54.121	36.74	4.817	57.63	11.45	24.76
	94	328	20	155	36	14	3	215
20.4	9.103	66.69	54.141	38.29	4.853	57.49	11.48	26.91
	160	296	27	136	16	5	6	205
30.4	8.943	69.65	54.114	39.65	4.837	57.44	11.42	28.96
9.4	221	257	72	115	63	0	17	187
	8.722	72.22	54.042	40.80	4.774	57.44	11.25	30.83
	272	213	110	94	105	4	24	160
19.4	8.450	74.35	53.932	41.74	4.669	57.48	11.01	32.43
	313	165	140	69	138	5	30	126
1.3	8.137	76.00	53.792	42.43	4.531	57.53	10.71	33.69
	342	113	164	48	165	5	35	87
11.3	7.795	77.13	53.628	42.91	4.366	57.58	10.36	34.56
	358	61	174	24	178	2	38	47
21.3	7.437	77.74	53.454	43.15	4.188	57.60	9.98	35.03
	359	9	177	2	180	1	39	1
31.2	7.078	77.83	53.277	43.17	4.008	57.59	9.59	35.04
	348	43	168	20	170	4	37	42
10.2	6.730	77.40	53.109	42.97	3.838	57.55	9.22	34.62
	327	94	152	40	153	8	34	84
20.2	6.403	76.46	52.957	42.57	3.685	57.47	8.88	33.78
	294	140	126	60	125	8	30	122
30.2	6.109	75.06	52.831	41.97	3.560	57.39	8.58	32.56
10.1	252	184	96	81	92	10	23	155
	5.857	73.22	52.735	41.16	3.468	57.29	8.35	31.01
	203	224	60	98	52	8	15	180
20.1	5.654	70.98	52.675	40.18	3.416	57.21	8.20	29.21
	148	257	22	115	11	6	9	201
30.1	5.506	68.41	52.653	39.03	3.405	57.15	8.11	27.20
	89	284	19	127	32	4	0	217
9.1	5.417	65.57	52.672	37.76	3.437	57.11	8.11	25.03
	29	305	57	139	75	1	8	224
19.0	5.388	62.52	52.729	36.37	3.512	57.12	8.19	22.79
	31	315	94	146	115	4	16	225
29.0	5.419	59.37	52.823	34.91	3.627	57.16	8.35	20.54
9.0	93	319	130	149	152	8	23	222
	5.512	56.18	52.953	33.42	3.779	57.24	8.58	18.32
	150	312	162	147	186	10	32	212
18.9	5.662	53.06	53.115	31.95	3.965	57.34	8.90	16.20
	205	296	191	140	217	11	37	200
28.9	5.867	50.10	53.306	30.55	4.182	57.45	9.27	14.20
7.9	256	271	217	127	242	10	42	182
	6.123	47.39	53.523	29.28	4.424	57.55	9.69	12.38
	300	237	238	109	264	7	47	161
17.9	6.423	45.02	53.761	28.19	4.688	57.62	10.16	10.77
	338	192	256	87	281	2	51	140
27.8	6.761	43.10	54.017	27.32	4.969	57.64	10.67	9.37
	369	140	269	59	296	6	55	113
6.8	7.130	41.70	54.286	26.73	5.265	57.58	11.22	8.24
	393	84	281	27	308	14	57	87
16.8	7.523	40.86	54.567	26.46	5.573	57.44	11.79	7.37
	406	23	288	5	313	24	58	57
26.8	7.929	40.63	54.855	26.51	5.886	57.20	12.37	6.80
6.7	411	43	291	40	317	33	59	27
	8.340	41.06	55.146	26.91	6.203	56.87	12.96	6.53
	406	106	291	74	318	43	59	3
16.7	8.746	42.12	55.437	27.65	6.521	56.44	13.55	6.56
	389	168	286	106	313	50	59	36
26.7	9.135	43.80	55.723	28.71	6.834	55.94	14.14	6.92
5.6	363	224	277	134	302	55	56	69
	9.498	46.04	56.000	30.05	7.136	55.39	14.70	7.61
	328	274	261	158	289	57	53	99
15.6	9.826	48.78	56.261	31.63	7.425	54.82	15.23	8.60
	279	314	240	175	266	57	48	131
25.6	10.105	51.92	56.501	33.38	7.691	54.25	15.71	9.91
5.6	225	343	211	186	239	54	43	159
	10.330	55.35	56.712	35.24	7.930	53.71	16.14	11.50
	162	361	178	190	202	47	36	181
15.5	10.492	58.96	56.890	37.14	8.132	53.24	16.50	13.31
	93	366	137	188	162	38	27	200
25.5	10.585	62.62	57.027	39.02	8.294	52.86	16.77	15.31
	24	360	94	180	114	28	18	214
35.5	10.609	66.22	57.121	40.82	8.408	52.58	16.95	17.45
an Place	6.565	*60.04*	*51.718*	*35.53*	2.105	56.75	6.605	20.84
d, Tan *δ*	*1.648*	*−1.310*	*1.003*	*−0.082*	1.066	+0.369	2.090	+1.846
D_α α	+0.03	−0.01	+0.06	0.00	+0.07	0.00	+0.11	+0.02
D_δ 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.	ξ^2 Canis Majoris. Mag. 4.5		23 H. Camelop. Mag. 5.6		51 Aurigæ. Mag. 5.7		γ Gemin Mag.
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.
	h m 6 31 s	° ′ −22 53 ″	h m 6 32 s	° ′ +79 39 ″	h m 6 32 s	° ′ +39 27 ″	h m 6 32 s
Jan. 0.5	36.979	51.59	16.68	27.96	57.687	55.71	57.628
	56	264	19	291	110	94	98
10.5	37.035	54.23	16.87	30.87	57.797	56.65	57.721
	4	247	— 6	286	48	100	43
20.4	37.039	56.70	16.81	33.73	57.845	57.65	57.764
	— 45	221	29	271	— 14	99	— 8
30.4	36.994	58.91	16.52	36.44	57.831	58.64	57.756
	91	192	54	244	72	95	56
Feb. 9.4	36.903	60.83	15.98	38.88	57.759	59.59	57.700
	131	158	73	208	125	84	97
19.4	36.772	62.41	15.25	40.96	57.634	60.43	57.603
	165	122	89	163	168	69	123
Mar. 1.3	36.607	63.63	14.36	42.59	57.466	61.12	57.470
	187	85	102	113	198	50	158
11.3	36.420	64.48	13.34	43.72	57.268	61.62	57.312
	201	49	109	58	219	27	172
21.3	36.219	64.97	12.25	44.30	57.049	61.89	57.140
	204	9	111	— 1	222	— 5	176
31.2	36.015	65.06	11.14	44.29	56.827	61.94	56.964
	197	— 26	108	56	213	19	169
Apr. 10.2	35.818	64.80	10.06	43.73	56.614	61.75	56.795
	181	62	100	110	194	40	152
20.2	35.637	64.18	9.06	42.63	56.420	61.35	56.643
	157	90	89	158	162	60	126
30.2	35.480	63.22	8.17	41.05	56.258	60.75	56.517
	126	128	75	202	122	79	96
May 10.1	35.354	61.94	7.42	39.03	56.136	59.96	56.421
	91	157	56	236	77	91	57
20.1	35.263	60.37	6.86	36.67	56.059	59.05	56.364
	52	181	37	266	28	101	18
30.1	35.211	58.56	6.49	34.01	56.031	58.04	56.346
	11	204	17	254	22	107	23
June 9.1	35.200	56.52	6.32	31.17	56.053	56.97	56.369
	— 30	218	— 6	296	74	111	64
19.0	35.230	54.34	6.38	28.21	56.127	55.86	56.433
	70	229	25	299	123	110	104
29.0	35.300	52.05	6.63	25.22	56.250	54.76	56.537
	109	232	47	296	169	107	139
July 9.0	35.409	49.73	7.10	22.26	56.419	53.69	56.676
	144	229	66	285	211	103	174
18.9	35.553	47.44	7.76	19.41	56.630	52.66	56.850
	178	217	84	266	248	97	203
28.9	35.731	45.27	8.60	16.75	56.878	51.69	57.053
	208	200	99	244	280	89	229
Aug. 7.9	35.939	43.27	9.59	14.31	57.158	50.80	57.282
	233	173	113	215	309	81	252
17.9	36.172	41.54	10.72	12.16	57.467	49.99	57.534
	256	142	125	184	332	72	270
27.8	36.428	40.12	11.97	10.32	57.799	49.27	57.804
	274	103	136	147	351	65	284
Sept. 6.8	36.702	39.09	13.33	8.85	58.150	48.62	58.088
	287	58	142	109	365	57	296
16.8	36.989	38.51	14.75	7.76	58.515	48.05	58.384
	297	11	147	68	376	47	306
26.8	37.286	38.40	16.22	7.08	58.891	47.58	58.690
	303	39	149	25	382	37	310
Oct. 6.7	37.589	38.79	17.71	6.83	59.273	47.21	59.000
	303	88	149	— 19	383	25	312
16.7	37.892	39.67	19.20	7.02	59.656	46.96	59.312
	297	136	145	64	379	14	309
26.7	38.189	41.03	20.65	7.66	60.035	46.82	59.621
	287	178	137	107	369	1	300
Nov. 5.6	38.476	42.81	22.02	8.73	60.404	46.81	59.921
	268	216	129	151	351	— 14	288
15.6	38.744	44.97	23.31	10.24	60.755	46.95	60.209
	245	244	116	189	327	31	267
25.6	38.989	47.41	24.47	12.13	61.082	47.26	60.476
	213	267	99	225	293	46	241
Dec. 5.6	39.202	50.08	25.46	14.38	61.375	47.72	60.717
	175	277	79	255	251	63	206
15.5	39.377	52.85	26.25	16.93	61.626	48.35	60.923
	131	280	58	275	200	78	166
25.5	39.508	55.65	26.83	19.68	61.826	49.13	61.089
	85	273	33	288	144	88	120
35.5	39.593	58.38	27.16	22.56	61.970	50.01	61.209
Mean Place	34.686	51.86	5.571	25.93	54.535	54.79	55.063
Sec δ, Tan δ	1.086	−0.422	5.570	+5.479	1.295	+0.823	1.043
$D_\psi\, a$, $D_\omega\, a$	+0.05	0.00	+0.20	+0.05	+0.08	+0.01	+0.07
$D_\psi\, \delta$, $D_\omega\, \delta$	−0.1	+1.0	−0.1	+1.0	−0.1	+1.0	−0.1

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	ν Argus. Mag. 3.2				ς Monocerotis. Mag. 4.7				ε Geminorum. Mag. 3.2				ξ Geminorum. Mag. 3.4			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	6 35		−43 7		6 36		+ 9 58		6 38		+25 12		6 40		+12 59	
	s		″		s		″		s		″		s		″	
1. 0.5	15.825		21.06		26.918		24.77		52.322		52.19		40.411		10.10	
10.5	15.851	26	24.44	338	27.009	91	23.88	89	52.428	106	52.24	5	40.508	97	9.38	72
20.4	15.815	36	27.61	317	27.051	42	23.12	76	52.481	53	52.39	15	40.556	48	8.78	60
30.4	15.719	96	30.50	289	27.044	7	22.49	63	52.478	3	52.62	23	40.554	2	8.31	47
b. 9.4	15.570	149	33.03	253	26.991	53	21.99	50	52.425	53	52.89	27	40.504	50	7.95	36
		197		213		94		37		99		28		92		24
19.4	15.373		35.16		26.897		21.62		52.326		53.17		40.412		7.71	
r. 1.3	15.138	235	36.84	168	26.768	129	21.36	26	52.190	136	53.42	25	40.285	127	7.54	17
11.3	14.875	263	38.04	120	26.614	154	21.20	16	52.026	164	53.63	21	40.132	153	7.45	9
21.3	14.597	278	38.76	72	26.445	169	21.12	8	51.845	181	53.78	15	39.962	170	7.41	4
31.3	14.314	283	38.98	22	26.273	172	21.12	0	51.659	186	53.84	6	39.789	173	7.43	2
		277		26		166		6		180		3		168		5
r. 10.2	14.037		38.72		26.107		21.18		51.479		53.81		39.621		7.48	
20.2	13.778	259	37.99	73	25.956	151	21.32	14	51.316	163	53.70	11	39.468	153	7.57	9
30.2	13.545	233	36.80	119	25.830	126	21.55	23	51.178	138	53.52	18	39.340	128	7.70	13
ly 10.1	13.347	198	35.19	161	25.734	96	21.83	28	51.075	103	53.27	25	39.241	99	7.88	18
20.1	13.189	158	33.20	199	25.674	60	22.19	36	51.010	65	52.99	28	39.178	63	8.12	24
		111		230		22		44		24		30		25		29
30.1	13.078		30.90		25.652		22.63		50.986		52.69		39.153		8.41	
me 9.1	13.014	64	28.31	259	25.669	17	23.14	51	51.006	20	52.38	31	39.168	15	8.74	33
19.0	13.000	14	25.52	279	25.726	57	23.70	56	51.068	62	52.08	30	39.223	55	9.13	39
29.0	13.037	37	22.59	293	25.821	95	24.31	61	51.173	105	51.80	28	39.315	92	9.55	42
ly 9.0	13.123	86	19.62	297	25.952	131	24.95	64	51.315	142	51.53	27	39.445	130	10.00	45
		133		294		163		64		179		23		163		45
19.0	13.256		16.68		26.115		25.59		51.494		51.30		39.608		10.45	
28.9	13.434	178	13.86	282	26.307	192	26.20	61	51.705	211	51.07	23	39.799	191	10.87	42
ig. 7.9	13.654	220	11.28	258	26.526	219	26.75	55	51.943	238	50.84	23	40.017	218	11.25	38
17.9	13.910	256	9.00	228	26.766	240	27.21	46	52.206	263	50.59	25	40.258	241	11.55	30
27.8	14.197	287	7.12	188	27.025	259	27.54	33	52.488	282	50.33	26	40.518	260	11.73	18
		315		141		274		15		300		30		275		5
pt. 6.8	14.512		5.71		27.299		27.69		52.788		50.03		40.793		11.78	
16.8	14.847	335	4.84	87	27.585	286	27.68	1	53.101	313	49.68	35	41.081	288	11.68	10
26.8	15.197	350	4.55	29	27.880	295	27.46	22	53.423	322	49.29	39	41.379	298	11.41	27
ct. 6.7	15.554	357	4.86	31	28.181	301	27.04	42	53.751	328	48.86	43	41.684	305	10.98	43
16.7	15.910	356	5.80	94	28.484	303	26.42	62	54.083	332	48.38	48	41.991	307	10.36	62
		346		152		300		79		329		50		304		77
26.7	16.256		7.32		28.784		25.63		54.412		47.88		42.295		9.59	
ov. 5.7	16.587	331	9.39	207	29.077	293	24.68	95	54.734	322	47.38	50	42.593	298	8.71	88
15.6	16.891	304	11.94	255	29.358	281	23.62	106	55.042	308	46.90	48	42.881	288	7.74	97
25.6	17.161	270	14.89	295	29.618	260	22.50	112	55.330	288	46.48	42	43.148	267	6.72	102
ec. 5.6	17.389	228	18.12	323	29.854	236	21.35	115	55.590	260	46.13	35	43.390	242	5.71	101
		178		342		202		113		225		23		209		98
15.5	17.567		21.54		30.056		20.22		55.815		45.90		43.599		4.73	
25.5	17.689	122	25.04	350	30.218	162	19.15	107	55.998	183	45.77	13	43.768	169	3.83	90
35.5	17.751	62	28.49	345	30.336	118	18.19	96	56.132	134	45.75	2	43.892	124	3.03	80
n Place	13.382		21.57		24.445		24.51		49.590		51.95		37.896		10.03	
δ, Tan δ	1.370		−0.937		1.015		+0.176		1.105		+0.471		1.026		+0.231	
α, D_α α	+0.04		−0.01		+0.07		0.00		+0.07		+0.01		+0.07		0.00	
δ, D_δ 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 Camel Mag. 5.1	
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	D
	h m 6 40	° ′ +43 39	h m 6 41	° ′ −16 35	h m 6 43	° ′ + 2 30	h m 6 44	
	s	″	s	″	s	″	s	
Jan. 0.5	48.952	41.00	31.581	65.99	34.356	14.19	51.86	
	125	119	67	243	92	137	18	7
10.5	49.077	42.19	31.648	68.42	34.448	12.82	52.04	
	58	123	18	225	44	121	5	7
20.4	49.135	43.42	31.666	70.67	34.492	11.61	52.09	
	9	124	31	200	5	105	7	7
30.4	49.126	44.66	31.635	72.67	34.487	10.56	52.02	
	71	117	76	174	51	88	21	7
Feb. 9.4	49.055	45.83	31.559	74.41	34.436	9.68	51.81	
	128	106	117	145	91	69	30	8
19.4	48.927	46.89	31.442	75.86	34.345	8.99	51.51	
	175	88	150	111	127	52	39	8
Mar. 1.3	48.752	47.77	31.292	76.97	34.218	8.47	51.12	
	210	65	174	79	151	36	47	8
11.3	48.542	48.42	31.118	77.76	34.067	8.11	50.65	
	231	40	187	47	168	18	51	8
21.3	48.311	48.82	30.931	78.23	33.899	7.93	50.14	
	239	13	192	14	171	4	53	8
31.3	48.072	48.95	30.739	78.37	33.728	7.89	49.61	
	232	15	186	19	167	11	51	8
Apr. 10.2	47.840	48.80	30.553	78.18	33.561	8.00	49.10	
	212	40	170	48	153	26	48	
20.2	47.628	48.40	30.383	77.70	33.408	8.26	48.62	
	181	67	148	79	130	38	44	
30.2	47.447	47.73	30.235	76.91	33.278	8.64	48.18	
	141	86	118	106	102	52	36	
May 10.1	47.306	46.87	30.117	75.85	33.176	9.16	47.82	
	94	104	84	131	67	66	27	
20.1	47.212	45.83	30.033	74.54	33.109	9.82	47.55	
	42	119	47	152	31	77	16	
30.1	47.170	44.64	29.986	73.02	33.078	10.59	47.39	
June 9.1	47.181	43.37	29.979	71.30	33.085	11.46	47.33	
	11	127	7	172	7	87	6	
19.0	47.246	42.04	30.011	69.44	33.130	12.41	47.36	
	65	133	32	186	45	95	3	
29.0	47.363	40.69	30.082	67.49	33.213	13.42	47.51	
	117	135	71	195	83	101	15	
July 9.0	47.530	39.37	30.190	65.52	33.331	14.46	47.76	
	167	132	108	197	118	104	25	
19.0	47.742	38.08	30.332	63.57	33.482	15.49	48.10	
	212	129	142	195	151	103	34	
28.9	47.995	36.86	30.506	61.71	33.661	16.48	48.53	
	253	122	174	186	179	99	43	
Aug. 7.9	48.283	35.72	30.709	60.02	33.867	17.37	49.04	
	288	114	203	169	206	89	51	
17.9	48.603	34.66	30.935	58.55	34.095	18.12	49.62	
	320	106	226	147	228	75	58	
27.8	48.950	33.72	31.182	57.38	34.342	18.70	50.26	
	347	94	247	117	247	58	64	
Sept. 6.8	366	83	265	82	265	36	68	
	49.316	32.89	31.447	56.56	34.607	19.06	50.94	
	384	71	279	43	277	11	73	
16.8	49.700	32.18	31.726	56.13	34.884	19.17	51.67	
	397	59	288	1	287	15	76	
26.8	50.097	31.59	32.014	56.12	35.171	19.02	52.43	
	405	45	295	45	294	43	77	
Oct. 6.7	50.502	31.14	32.309	56.57	35.465	18.59	53.20	
	407	28	296	89	297	71	78	
16.7	50.909	30.86	32.605	57.46	35.762	17.88	53.98	
	404	14	293	131	295	95	76	
26.7	51.313	30.72	32.898	58.77	36.057	16.93	54.74	
Nov. 5.7	51.707	30.77	33.182	60.47	36.346	15.75	55.47	
	394	5	284	170	289	118	73	
15.6	52.085	31.01	33.449	62.51	36.623	14.39	56.17	
	378	24	267	204	277	136	70	
25.6	52.436	31.43	33.695	64.80	36.881	12.91	56.82	
	351	42	246	229	258	148	65	
Dec. 5.6	52.752	32.07	33.912	67.26	37.115	11.35	57.39	
	316	64	217	246	234	156	57	
15.5	272	81	182	258	201	158	48	
	53.024	32.88	34.094	69.84	37.316	9.77	57.87	
	219	99	141	257	162	153	37	
25.5	53.243	33.87	34.235	72.41	37.478	8.24	58.24	
	161	111	95	251	118	144	24	
35.5	53.404	34.98	34.330	74.92	37.596	6.80	58.48	
Mean Place	45.621	40.70	29.433	65.39	31.963	14.20	45.850	
Sec δ, Tan δ	1.382	+0.954	1.044	−0.298	1.001	+0.044	2.788	
$D_\psi\, a$, $D_\omega\, a$	+0.09	+0.01	+0.05	0.00	+0.06	0.00	+0.13	
$D_\psi\, \delta$, $D_\omega\, \delta$	−0.1	+1.0	−0.1	+1.0	−0.1	+1.0	−0.1	

FOR THE UPPER TRANSIT AT WASHINGTON.

shington n Time.	θ Geminorum. Mag. 3.6		α Pictoris. Mag. 3.3		τ Argus. Mag. 2.8		15 Lyncis. Mag. 4.5	
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.
	h m 6 47 s	° ′ +34 3 ″	h m 6 47 s	° ′ −61 50 ″	h m 6 47 s	° ′ −50 30 ″	h m 6 50 s	° ′ +58 31 ″
a. 0.5	22.212	44.67	23.50	66.50	55.166	55.23	10.180	58.69
10.5	22.335 123	45.26 59	23.48 2	70.22 372	55.192 26	58.82 359	10.342 162	60.67 198
20.5	22.400 65	45.93 67	23.37 11	73.76 354	55.147 45	62.23 341	10.412 70	62.69 202
30.4	22.405 — 5	46.66 73	23.17 20	77.05 329	55.035 112	65.38 315	10.391 — 21	64.68 199
b. 9.4	22.352 53	47.39 73	22.90 27	79.97 292	54.862 173	68.18 280	10.284 107	66.55 187
	102	68	34	252	228	239	185	165
19.4	22.250	48.07	22.56	82.49	54.634	70.57	10.099	68.20
r. 1.3	22.106 144	48.67 60	22.16 40	84.53 204	54.361 273	72.51 194	9.849 250	69.59 139
11.3	21.929 177	49.15 48	21.72 44	86.07 154	54.054 307	73.96 145	9.548 301	70.63 104
21.3	21.732 197	49.45 30	21.25 47	87.09 102	53.728 326	74.89 93	9.216 332	71.28 65
31.3	21.528 204	49.60 15	20.77 48	87.56 — 47	53.393 335	75.32 — 43	8.871 345	71.52 — 24
	199	— 4	48	5	331	8	341	17
r. 10.2	21.329	49.56	20.29	87.51	53.062	75.24	8.530	71.35
20.2	21.146 183	49.35 21	19.84 45	86.93 58	52.748 314	74.65 59	8.214 316	70.78 57
30.2	20.990 156	48.98 37	19.41 43	85.84 109	52.459 289	73.57 108	7.935 279	69.84 94
y 10.2	20.868 122	48.46 52	19.03 38	84.27 157	52.206 253	72.05 152	7.707 228	68.56 128
20.1	20.787 81	47.84 62	18.71 32	82.27 200	51.994 212	70.10 195	7.540 167	66.99 157
	36	73	26	238	162	229	99	179
30.1	20.751	47.11	18.45	79.89	51.832	67.81	7.441	65.20
ne 9.1	20.761 10	46.34 77	18.25 20	77.17 272	51.723 109	65.20 261	7.413 — 28	63.23 197
19.0	20.817 56	45.53 81	18.12 13	74.19 298	51.668 — 55	62.35 285	7.459 46	61.15 208
29.0	20.919 102	44.71 82	18.08 4	71.05 314	51.671 3	59.33 302	7.576 117	59.01 214
ly 9.0	21.063 144	43.90 81	18.12 — 4	67.82 323	51.730 59	56.24 309	7.763 187	56.87 214
	183	79	11	322	115	307	251	209
19.0	21.246	43.11	18.23	64.60	51.845	53.17	8.014	54.78
28.9	21.466 220	42.35 76	18.41 18	61.48 312	52.012 167	50.19 298	8.324 310	52.77 201
ig. 7.9	21.717 251	41.61 74	18.66 25	58.56 292	52.229 217	47.42 277	8.687 363	50.88 189
17.9	21.994 277	40.93 68	18.98 32	55.96 260	52.493 264	44.95 247	9.097 410	49.15 173
27.9	22.296 302	40.26 67	19.36 38	53.75 221	52.797 304	42.87 208	9.547 450	47.61 154
	320	63	43	173	338	160	483	133
pt. 6.8	22.616	39.63	19.79	52.02	53.135	41.27	10.030	46.28
16.8	22.951 335	39.03 60	20.26 47	50.86 116	53.500 365	40.21 106	10.541 511	45.19 109
26.8	23.300 349	38.46 57	20.75 49	50.31 — 55	53.886 386	39.75 — 46	11.070 529	44.34 85
ct. 6.7	23.657 357	37.93 53	21.26 51	50.42 11	54.283 397	39.91 16	11.613 543	43.77 57
16.7	24.017 360	37.46 47	21.77 51	51.19 77	54.681 398	40.71 80	12.162 549	43.49 — 28
	360	40	49	142	392	145	545	2
26.7	24.377	37.06	22.26	52.61	55.073	42.16	12.707	43.51
ov. 5.7	24.729 352	36.75 31	22.73 47	54.63 202	55.446 373	44.18 202	13.239 532	43.84 33
15.6	25.069 340	36.55 20	23.16 43	57.21 258	55.790 344	46.72 254	13.747 508	44.50 66
25.6	25.387 318	36.48 — 7	23.52 36	60.25 304	56.096 306	49.71 299	14.220 473	45.45 95
ec. 5.6	25.677 290	36.55 7	23.82 30	63.65 340	56.353 257	53.02 331	14.644 424	46.71 126
	252	23	22	364	200	356	364	152
15.6	25.929	36.78	24.04	67.29	56.553	56.58	15.008	48.23
25.5	26.135 206	37.15 37	24.17 13	71.06 377	56.689 136	60.24 366	15.299 291	49.98 175
35.5	26.288 153	37.66 51	24.21 4	74.84 378	56.758 69	63.90 366	15.509 210	51.89 191
n Place	19.245	45.02	20.476	67.91	52.585	56.32	5.803	59.14
δ, Tan δ	1.207	+0.676	2.120	−1.869	1.573	−1.214	1.916	+1.634
α, $D_\alpha \alpha$	+0.08	+0.01	+0.01	−0.03	+0.03	−0.02	+0.10	+0.02
δ, $D_\alpha \delta$	−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.	θ Canis Majoris. Mag. 4.2		ϵ Canis Majoris. Mag. 1.6		ζ Geminorum. Var. 3.7–4.3		o^2 Canis M Mag.
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.
	h m 6 50 s	° ′ −11 55 ″	h m 6 55 s	° ′ −28 51 ″	h m 6 59 s	° ′ +20 41 ″	h m 6 59 s
Jan. 0.5	22.348	61.18	24.117	29.51	13.884	33.99	35.801
	86	220	75	299	123	28	85
10.5	22.434	63.38	24.192	32.50	14.007	33.71	35.886
	37	202	20	283	71	16	33
20.5	22.471	65.40	24.212	35.33	14.078	33.55	35.919
	12	182	33	257	18	4	20
30.4	22.459	67.22	24.179	37.90	14.096	33.51	35.899
	58	157	83	229	34	5	66
Feb. 9.4	22.401	68.79	24.096	40.19	14.062	33.56	35.831
	100	131	127	193	80	12	112
19.4	22.301	70.10	23.969	42.12	13.982	33.68	35.719
	134	102	164	156	120	15	146
Mar. 1.3	22.167	71.12	23.805	43.68	13.862	33.83	35.573
	160	73	192	116	149	17	177
11.3	22.007	71.85	23.613	44.84	13.713	34.00	35.396
	176	45	210	76	170	15	193
21.3	21.831	72.30	23.403	45.60	13.543	34.15	35.203
	183	15	217	33	178	12	203
31.3	21.648	72.45	23.186	45.93	13.365	34.27	35.000
	178	12	214	7	175	9	200
Apr. 10.2	21.470	72.33	22.972	45.86	13.190	34.36	34.800
	165	39	202	46	162	3	189
20.2	21.305	71.94	22.770	45.40	13.028	34.39	34.611
	145	66	182	85	141	3	168
30.2	21.160	71.28	22.588	44.55	12.887	34.39	34.443
	117	90	153	122	111	0	143
May 10.2	21.043	70.38	22.435	43.33	12.776	34.36	34.300
	85	114	119	155	77	3	110
20.1	20.958	69.24	22.316	41.78	12.699	34.30	34.190
	50	133	83	184	38	6	74
30.1	20.908	67.91	22.233	39.94	12.661	34.23	34.116
	11	150	43	210	0	7	36
June 9.1	20.897	66.41	22.190	37.84	12.661	34.16	34.080
	27	165	2	228	41	7	3
19.0	20.924	64.76	22.188	35.56	12.702	34.09	34.083
	64	173	40	242	81	6	43
29.0	20.988	63.03	22.228	33.14	12.783	34.03	34.126
	99	178	80	249	119	6	81
July 9.0	21.087	61.25	22.308	30.65	12.902	33.97	34.207
	134	176	119	248	153	6	118
19.0	21.221	59.49	22.427	28.17	13.055	33.91	34.325
	165	168	154	239	184	8	153
28.9	21.386	57.81	22.581	25.78	13.239	33.83	34.478
	192	155	187	222	213	10	184
Aug. 7.9	21.578	56.26	22.768	23.56	13.452	33.73	34.662
	217	136	219	197	238	15	212
17.9	21.795	54.90	22.987	21.59	13.690	33.58	34.874
	239	109	245	165	260	22	236
27.9	22.034	53.81	23.232	19.94	13.950	33.36	35.110
	257	79	269	124	278	29	260
Sept. 6.8	22.291	53.02	23.501	18.70	14.228	33.07	35.370
	272	42	286	79	293	39	278
16.8	22.563	52.60	23.787	17.91	14.521	32.68	35.648
	284	5	303	29	307	48	291
26.8	22.847	52.55	24.090	17.62	14.828	32.20	35.939
	292	39	312	24	316	57	304
Oct. 6.7	23.139	52.94	24.402	17.86	15.144	31.63	36.243
	296	76	316	78	322	67	307
16.7	23.435	53.70	24.718	18.64	15.466	30.96	36.550
	295	117	315	130	323	74	307
26.7	23.730	54.87	25.033	19.94	15.789	30.22	36.857
	288	153	306	179	319	77	301
Nov. 5.7	24.018	56.40	25.339	21.73	16.108	29.45	37.158
	276	182	291	222	309	79	287
15.6	24.294	58.22	25.630	23.95	16.417	28.66	37.445
	257	207	267	257	293	77	266
25.6	24.551	60.29	25.897	26.52	16.710	27.89	37.711
	231	224	238	283	268	70	239
Dec. 5.6	24.782	62.53	26.135	29.35	16.978	27.19	37.950
	197	232	199	302	236	61	203
15.6	24.979	64.85	26.334	32.37	17.214	26.58	38.153
	157	233	153	308	198	50	160
25.5	25.136	67.18	26.487	35.45	17.412	26.08	38.313
	113	226	104	305	150	37	114
35.5	25.249	69.44	26.591	38.50	17.562	25.71	38.427
Mean Place	20.048	61.24	21.817	30.10	11.248	35.05	33.520
Sec δ, Tan δ	1.022	−0.211	1.142	−0.551	1.069	+0.378	1.092
$D_\psi a$, $D_\omega a$	+0.06	0.00	+0.05	−0.01	+0.07	+0.01	+0.05
$D_\psi \delta$, $D_\omega \delta$	−0.1	+1.0	−0.1	+1.0	−0.1	+1.0	−0.1

FOR THE UPPER TRANSIT AT WASHINGTON.

	γ Canis Majoris. Mag. 4.1		δ Canis Majoris. Mag. 2.0		63 Aurigæ. Mag. 5.1		51 Geminorum. Mag. 5.3	
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.
	h m s 7 0	° ′ ″ −15 30	h m s 7 5	° ′ ″ −26 15	h m s 7 5	° ′ ″ +39 27	h m s 7 8	° ′ ″ +16 17
0.5	2.506 92	35.19 241	3.215 88	37.80 292	60.139 151	23.73 87	38.969 128	61.50 60
10.5	2.598 43	37.60 225	3.303 35	40.72 276	60.290 88	24.60 98	39.097 78	60.90 45
20.5	2.641 — 7	39.85 202	3.338 — 18	43.48 253	60.378 25	25.58 104	39.175 26	60.45 32
30.4	2.634 54	41.87 178	3.320 68	46.01 224	60.403 — 38	26.62 105	39.201 — 25	60.13 18
9.4	2.580 97	43.65 149	3.252 113	48.25 192	60.365 94	27.67 101	39.176 71	59.95 8
19.4	2.483	45.14 118	3.139	50.17 156	60.271	28.68 89	39.105	59.87
1.4	2.350 133	46.32 88	2.988 151	51.73 118	60.128 143	29.57 73	38.994 111	59.87 0
11.3	2.189 161	47.20 56	2.809 179	52.91 79	59.947 181	30.30 54	38.854 140	59.92 5
21.3	2.011 178	47.76 24	2.611 198	53.70 39	59.740 207	30.84 31	38.692 162	60.01 9
31.3	1.826 185	48.00 — 6	2.404 207	54.09 — 1	59.522 218	31.15 — 9	38.520 172	60.12 11
	184		207		217		171	11
10.2	1.642	47.94	2.197	54.10	59.305	31.24	38.349	60.23
20.2	1.471 171	47.56 38	2.002 195	53.72 38	59.102 203	31.08 16	38.190 159	60.35 12
30.2	1.318 153	46.89 67	1.825 177	52.97 75	58.923 179	30.70 38	38.049 141	60.46 11
10.2	1.192 126	45.96 93	1.674 151	51.87 110	58.776 147	30.12 58	37.936 113	60.57 11
20.1	1.096 96	44.77 119	1.556 118	50.46 141	58.670 106	29.36 76	37.855 81	60.70 13
	60	141	83	172	61	90	47	13
30.1	1.036	43.36	1.473	48.74	58.609	28.46	37.808	60.83
9.1	1.013 — 23	41.75 161	1.427 46	46.79 195	58.596 — 13	27.44 102	37.802 — 6	60.97 14
19.1	1.028 15	39.99 176	1.421 — 6	44.64 215	58.632 36	26.34 110	37.834 32	61.13 16
29.0	1.079 51	38.13 186	1.455 34	42.35 229	58.715 83	25.19 115	37.903 69	61.30 17
9.0	1.167 88	36.21 192	1.529 74	40.00 235	58.844 129	24.01 118	38.009 106	61.47 17
	123	191	111	236	172	116	139	16
19.0	1.290	34.30	1.640	37.64	59.016	22.85	38.148	61.63
28.9	1.445 155	32.46 184	1.785 145	35.35 229	59.227 211	21.70 115	38.319 171	61.77 14
7.9	1.628 183	30.77 169	1.963 178	33.22 213	59.473 246	20.57 113	38.518 199	61.86 9
17.9	1.838 210	29.27 150	2.172 209	31.31 191	59.750 277	19.48 109	38.741 223	61.88 — 2
27.9	2.071 233	28.05 122	2.407 235	29.72 159	60.055 305	18.45 103	38.987 246	61.80 8
	254	90	259	122	329	97	266	20
6.8	2.325	27.15	2.666	28.50	60.384	17.48	39.253	61.60
16.8	2.595 270	26.63 52	2.945 279	27.72 78	60.733 349	16.58 90	39.534 281	61.28 32
26.8	2.878 283	26.52 — 11	3.239 294	27.42 — 30	61.097 364	15.75 83	39.829 295	60.82 46
6.8	3.172 294	26.84 32	3.545 306	27.63 21	61.474 377	15.02 73	40.136 307	60.21 61
16.7	3.471 299	27.61 77	3.857 312	28.36 73	61.859 385	14.39 63	40.449 313	59.46 75
	299	119	313	124	387	51	316	85
26.7	3.770	28.80	4.170	29.60	62.246	13.88	40.765	58.61
5.7	4.065 295	30.38 158	4.476 306	31.31 171	62.629 383	13.52 36	41.079 314	57.67 94
15.6	4.348 283	32.29 191	4.770 294	33.44 213	63.002 373	13.34 18	41.384 305	56.67 100
25.6	4.612 264	34.48 219	5.044 274	35.93 249	63.354 352	13.34 0	41.675 291	55.66 101
5.6	4.850 238	36.86 238	5.288 244	38.67 274	63.678 324	13.55 21	41.942 267	54.68 98
	205	249	206	291	286	41	238	91
15.6	5.055	39.35	5.496	41.58	63.964	13.96	42.180	53.77
25.5	5.220 165	41.87 252	5.661 165	44.57 299	64.202 238	14.55 59	42.380 200	52.96 81
35.5	5.340 120	44.35 248	5.778 117	47.55 298	64.386 184	15.33 78	42.535 155	52.30 66
n Place	0.220	35.28	0.931	38.37	56.990	25.69	36.417	62.98
δ, Tan δ	1.088	−0.277	1.115	−0.493	1.295	+0.823	1.042	+0.292
, D_α	+0.05	0.00	+0.05	−0.01	+0.08	+0.02	+0.08	+0.01
, 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 Gemi Mag.
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.
	h m 7 9 s	° ′ −70 21 ″	h m 7 13 s	° ′ +16 41 ″	h m 7 14 s	° ′ −36 56 ″	h m 7 15 s
Jan. 0.5	30.97	48.87	22.027	26.05	15.015	51.65	12.738
	1	382	134	58	87	334	140
10.5	30.96	52.69	22.161	25.47	15.102	54.99	12.878
	13	371	82	44	28	320	88
20.5	30.83	56.40	22.243	25.03	15.130	58.19	12.966
	27	349	30	30	30	297	34
30.4	30.56	59.89	22.273	24.73	15.100	61.16	13.000
	37	319	21	16	84	288	19
Feb. 9.4	30.19	63.08	22.252	24.57	15.016	63.84	12.981
	47	283	68	6	134	234	68
19.4	29.72	65.91	22.184	24.51	14.882	66.18	12.913
Mar. 1.4	29.17	68.30	22.076	24.53	14.706	68.11	12.803
	55	239	108	2	176	193	110
11.3	28.55	70.21	21.937	24.60	14.498	69.62	12.661
	62	191	139	7	208	151	142
21.3	27.89	71.60	21.776	24.71	14.268	70.69	12.495
	66	139	161	11	230	107	166
31.3	27.20	72.47	21.605	24.84	14.026	71.30	12.319
	69	87	171	13	242	61	176
	69	33		12	243	15	176
Apr. 10.3	26.51	72.80	21.434	24.96	13.783	71.45	12.143
	67	19	160	12	234	29	166
20.2	25.84	72.61	21.274	25.08	13.549	71.16	11.977
	64	71	143	12	214	73	148
30.2	25.20	71.90	21.131	25.20	13.335	70.43	11.829
	60	122	116	11	190	115	121
May 10.2	24.60	70.68	21.015	25.31	13.145	69.28	11.708
	53	169	83	11	157	152	89
20.1	24.07	68.99	20.932	25.42	12.988	67.76	11.619
	46	212	49	12	120	186	51
30.1	23.61	66.87	20.883	25.54	12.868	65.90	11.568
	37	248	11	12	79	218	12
June 9.1	23.24	64.39	20.872	25.66	12.789	63.72	11.556
	27	278	27	13	37	241	27
19.1	22.97	61.61	20.899	25.79	12.752	61.31	11.583
	16	303	65	15	6	260	66
29.0	22.81	58.58	20.964	25.94	12.758	58.71	11.649
	6	315	102	13	50	269	104
July 9.0	22.75	55.43	21.066	26.07	12.808	56.02	11.753
	3	321	134	13	92	272	138
19.0	22.78	52.22	21.200	26.20	12.900	53.30	11.891
	16	318	167	10	134	265	171
29.0	22.94	49.04	21.367	26.30	13.034	50.65	12.062
	27	301	194	5	172	250	201
Aug. 7.9	23.21	46.03	21.561	26.35	13.206	48.15	12.263
	38	277	221	3	209	227	226
17.9	23.57	43.26	21.782	26.32	13.415	45.88	12.489
	45	242	242	12	240	194	251
27.9	24.02	40.84	22.024	26.20	13.655	43.94	12.740
	53	198	283	24	271	153	270
Sept. 6.8	24.55	38.86	22.287	25.96	13.926	42.41	13.010
	60	144	279	36	296	106	289
16.8	25.15	37.42	22.566	25.60	14.222	41.35	13.299
	65	86	294	50	315	52	304
26.8	25.80	36.56	22.860	25.10	14.537	40.83	13.603
	68	23	307	63	330	5	316
Oct. 6.8	26.48	36.33	23.167	24.47	14.867	40.88	13.919
	70	45	313	78	338	62	324
16.7	27.18	36.78	23.480	23.69	15.205	41.50	14.243
	68	111	317	88	340	120	328
26.7	27.86	37.89	23.797	22.81	15.545	42.70	14.571
	65	174	317	96	334	175	328
Nov. 5.7	28.51	39.63	24.114	21.85	15.879	44.45	14.899
	60	234	308	101	319	224	320
15.7	29.11	41.97	24.422	20.84	16.198	46.69	15.219
	52	285	295	102	295	267	305
25.6	29.63	44.82	24.717	19.82	16.493	49.36	15.524
	43	325	272	99	262	300	284
Dec. 5.6	30.06	48.07	24.989	18.83	16.755	52.36	15.808
	31	358	242	91	222	322	252
15.6	30.37	51.65	25.231	17.92	16.977	55.58	16.060
	20	376	205	81	174	336	214
25.5	30.57	55.41	25.436	17.11	17.151	58.94	16.274
	7	383	160	66	121	337	169
35.5	30.64	59.24	25.596	16.45	17.272	62.31	16.443
Mean Place	27.280	51.69	19.471	27.81	12.680	52.95	10.085
Sec δ, Tan δ	2.976	−2.803	1.044	+0.300	1.251	−0.752	1.080
$D_\psi a$, $D_\omega a$	-0.01	−0.06	+0.07	+0.01	+0.04	−0.02	+0.07
$D_\psi \delta$, $D_\omega \delta$	-0.1	+1.0	−0.1	+0.9	−0.1	+0.9	−0.1

FOR THE UPPER TRANSIT AT WASHINGTON.

ington Time.	δ Volantis. Mag. 4.0		ι Geminorum. Mag. 3.9		η Canis Majoris. Mag. 2.4		Groombridge 1308. Mag. 5.8	
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.
	h m 7 16 s	° ′ −67 48 ″	h m 7 20 s	° ′ +27 57 ″	h m 7 20 s	° ′ −29 8 ″	h m 7 22 s	° ′ +68 37 ″
L. 0.5	56.36	16.25	37.215	48.05	51.045	24.72	21.40	68.95
	10.5 56.38 2	20.09 384	37.367 152	48.15 10	51.148 103	27.78 306	21.68 28	71.32 237
	20.5 56.29 9	23.84 375	37.465 98	48.41 26	51.196 48	30.73 295	21.82 14	73.80 248
	30.4 56.09 20	27.39 355	37.504 39	48.78 37	51.190 6	33.46 273	21.83 1	76.29 249
b.	9.4 55.79 30	30.66 327	37.489 15	49.24 46	51.132 58	35.91 245	21.73 10	78.69 240
	39	290	67	50	105	212	23	220
	19.4 55.40	33.56	37.422	49.74	51.027	38.03	21.50	80.89
r.	1.4 54.92 48	36.03 247	37.311 111	50.25 51	50.883 144	39.79 176	21.18 32	82.82 193
	11.3 54.39 53	38.03 200	37.165 146	50.72 47	50.705 178	41.17 138	20.77 41	84.38 156
	21.3 53.82 57	39.53 150	36.993 172	51.12 40	50.506 199	42.15 98	20.30 47	85.52 114
	31.3 53.22 60	40.51 98	36.809 184	51.42 30	50.295 211	42.71 56	19.79 51	86.18 66
	60	43	186	17	211	17	51	17
r.	10.3 52.62	40.94	36.623	51.59 6	50.084	42.88	19.28	86.35
	20.2 52.03 59	40.84 10	36.446 177	51.65 −6	49.879 205	42.62 26	18.79 49	86.03 32
	30.2 51.46 57	40.22 62	36.289 157	51.59 6	49.690 189	41.98 64	18.33 46	85.23 80
y	10.2 50.94 52	39.09 113	36.159 130	51.42 17	49.526 164	40.96 102	17.92 41	84.00 123
	20.1 50.48 46	37.48 161	36.061 98	51.13 29	49.390 136	39.62 134	17.59 33	82.37 163
	41	204	59	36	100	167	25	197
	30.1 50.07	35.44	36.002	50.77	49.290	37.95	17.34	80.40
ne	9.1 49.74 33	33.01 243	35.983 19	50.35 42	49.226 64	36.02 193	17.19 15	78.17 223
	19.1 49.50 24	30.28 273	36.004 21	49.87 48	49.202 24	33.86 216	17.13 6	75.72 245
	29.0 49.35 15	27.30 298	36.067 63	49.36 51	49.217 15	31.56 230	17.19 −6	73.13 259
ly	9.0 49.29 −6	24.17 313	36.169 102	48.82 54	49.271 54	29.14 242	17.33 14	70.47 266
	4	320	139	56	92	244	24	268
	19.0 49.33	20.97	36.308	48.26	49.363	26.70	17.57	67.79
	29.0 49.46 13	17.79 318	36.481 173	47.67 59	49.493 130	24.32 238	17.90 33	65.16 263
g.	7.9 49.69 23	14.76 303	36.686 205	47.07 60	49.657 164	22.09 223	18.32 42	62.63 253
	17.9 50.00 31	11.95 281	36.917 231	46.44 63	49.853 196	20.07 202	18.81 49	60.24 239
	27.9 50.40 40	9.49 246	37.175 258	45.78 66	50.079 226	18.34 173	19.37 56	58.05 219
	48	202	280	70	252	135	61	196
pt.	6.8 50.88	7.47	37.455	45.08	50.331	16.99	19.98	56.09
	16.8 51.41 53	5.96 151	37.754 299	44.33 75	50.605 274	16.07 92	20.65 67	54.40 169
	26.8 51.99 58	5.04 92	38.069 315	43.56 77	50.900 295	15.63 44	21.36 71	53.00 140
t.	6.8 52.60 61	4.74 30	38.398 329	42.76 80	51.210 310	15.72 −9	22.10 74	51.94 106
	16.7 53.23 63	5.11 −37	38.736 338	41.95 81	51.528 318	16.35 63	22.85 75	51.25 69
	62	105	344	81	321	115	76	30
	26.7 53.85	6.16	39.080	41.14	51.849	17.50	23.61	50.95
w.	5.7 54.45 60	7.83 167	39.424 344	40.37 77	52.166 317	19.16 166	24.37 76	51.04 9
	15.7 55.00 55	10.11 228	39.761 337	39.67 70	52.473 307	21.28 212	25.10 73	51.56 52
	25.6 55.48 48	12.91 280	40.083 322	39.06 61	52.761 288	23.78 250	25.79 69	52.48 92
ec.	5.6 55.90 42	16.14 323	40.382 299	38.57 49	53.021 260	26.57 279	26.42 63	53.80 132
	31	356	268	33	224	301	55	169
	15.6 56.21	19.70	40.650	38.24	53.245	29.58	26.97	55.49
	25.5 56.43 22	23.46 376	40.879 229	38.08 16	53.427 182	32.69 311	27.42 45	57.50 201
	35.5 56.53 10	27.30 384	41.060 181	38.08 0	53.560 133	35.81 312	27.76 34	59.74 224
n Place	52.958	19.34	34.438	50.80	48.770	25.61	15.511	72.89
δ, Tan δ	2.647	−2.451	1.132	+0.531	1.145	−0.558	2.745	+2.556
α, $D_1\alpha$	0.00	−0.05	+0.07	+0.01	+0.05	−0.01	+0.13	+0.06
δ, $D_1\delta$	*−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 Gemino (Castor. Mag. 2.	
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.	D
	h m		° ′		h m		° ′		h m		° ′		h m	
	7 22		+ 8 27		7 23		+31 56		7 26		−43 7		7 29	
	s		″		s		″		s		″		s	
Jan. 0.5	41.479	136	25.14	112	49.393	162	59.75	35	38.187	96	56.08	354	21.275	168
10.5	41.615	85	24.02	97	49.555	104	60.10	50	38.283	33	59.62	343	21.443	110
20.5	41.700	35	23.05	80	49.659	44	60.60	61	38.316	29	63.05	324	21.553	49
30.5	41.735	15	22.25	63	49.703	12	61.21	70	38.287	90	66.29	294	21.602	8
Feb. 9.4	41.720	61	21.62	47	49.691	67	61.91	72	38.197	145	69.23	260	21.594	62
19.4	41.659		21.15		49.624		62.63		38.052		71.83		21.532	
Mar. 1.4	41.560	99	20.82	33	49.510	114	63.31	68	37.863	189	74.03	220	21.422	110
11.3	41.428	132	20.64	18	49.360	150	63.93	62	37.635	228	75.79	176	21.275	147
21.3	41.275	153	20.56	8	49.182	178	64.45	52	37.381	254	77.09	130	21.099	176
31.3	41.110	165	20.59	3	48.991	191	64.82	37	37.113	268	77.92	83	20.909	190
		165		11		194		21		271		34		195
Apr. 10.3	40.945		20.70		48.797		65.03	6	36.842		78.26		20.714	
20.2	40.787	158	20.88	18	48.612	185	65.09	10	36.577	265	78.12	14	20.527	187
30.2	40.645	142	21.15	27	48.447	165	64.99		36.329	248	77.51	61	20.358	169
May 10.2	40.528	117	21.48	33	48.308	139	64.72	27	36.105	224	76.45	106	20.216	142
20.2	40.439	89	21.88	40	48.204	104	64.32	40	35.912	193	74.97	148	20.108	106
		55		45		65		51		155		185		71
30.1	40.384		22.33		48.139		63.81		35.757		73.12		20.037	
June 9.1	40.365	19	22.84	51	48.115	24	63.21	60	35.644	113	70.94	218	20.008	29
19.1	40.381	16	23.39	55	48.134	19	62.52	69	35.576	68	68.46	248	20.020	12
29.0	40.432	51	23.98	59	48.195	61	61.79	73	35.555	21	65.78	268	20.075	55
July 9.0	40.519	87	24.57	59	48.296	101	61.02	77	35.580	25	62.97	281	20.169	94
		120		58		140		80		71		286		134
19.0	40.639		25.15		48.436		60.22		35.651		60.11		20.303	
29.0	40.788	149	25.68	53	48.613	177	59.40	82	35.769	118	57.28	283	20.473	170
Aug. 7.9	40.966	178	26.14	46	48.822	209	58.57	83	35.931	162	54.58	270	20.676	203
17.9	41.169	203	26.50	36	49.060	238	57.72	85	36.134	203	52.12	246	20.908	232
27.9	41.395	226	26.70	20	49.326	266	56.87	85	36.376	242	49.96	216	21.168	260
		246		4		288		86		276		175		283
Sept. 6.9	41.641		26.74		49.614		56.01		36.652		48.21		21.451	
16.8	41.906	265	26.58	16	49.923	309	55.14	87	36.959	307	46.94	127	21.757	306
26.8	42.186	280	26.21	37	50.249	326	54.27	87	37.290	331	46.21	73	22.080	323
Oct. 6.8	42.479	293	25.62	59	50.590	341	53.41	86	37.641	351	46.06	15	22.419	339
16.7	42.782	303	24.81	81	50.942	352	52.57	84	38.003	362	46.54	48	22.770	351
		307		100		358		78		366		108		357
26.7	43.089		23.81		51.300		51.79		38.369		47.62		23.127	
Nov. 5.7	43.396	307	22.63	118	51.657	357	51.09	70	38.730	361	49.28	166	23.486	359
15.7	43.697	301	21.33	130	52.007	350	50.49	60	39.075	345	51.49	221	23.838	352
25.6	43.986	289	19.94	139	52.344	337	50.02	47	39.397	322	54.17	268	24.177	339
Dec. 5.6	44.253	267	18.52	142	52.657	313	49.72	30	39.683	286	57.22	305	24.494	317
		240		139		282		13		242		333		286
15.6	44.493		17.13		52.939		49.59		39.925		60.55		24.780	
25.6	44.697	204	15.81	132	53.179	240	49.64	5	40.115	190	64.06	351	25.025	245
35.5	44.858	161	14.60	121	53.369	190	49.89	25	40.248	133	67.62	356	25.221	196
Mean Place	39.049		26.92		46.515		62.93		35.800		58.09		18.402	
Sec δ, Tan δ	*1.011*		+0.149		1.178		+0.624		1.370		−0.937		1.180	
$D_\psi\, a,\ D_\omega\, a$	+0.07		0.00		+0.08		+0.01		+0.05		−0.02		+0.08	
$D_\psi\, \delta,\ D_\omega\, \delta$	−0.1		+0.9		−0.1		+0.9		−0.1		+0.9		−0.2	

FOR THE UPPER TRANSIT AT WASHINGTON.

hington n 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.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.
	h m s 7 33	° ′ ″ − 3 55	h m s 7 34	° ′ ″ + 5 26	h m s 7 35	° ′ ″ +58 54	h m s 7 39	° ′ ″ +24 35
1. 0.5	11.366 136	30.15 189	59.798 139	16.26 136	63.927 243	16.18 184	29.046 168	48.84 17
10.5	11.502 86	32.04 173	59.937 91	14.90 120	64.170 152	18.02 200	29.214 115	48.67 1
20.5	11.588 36	33.77 154	60.028 40	13.70 102	64.322 59	20.02 208	29.329 60	48.66 − 15
30.5	11.624 − 13	35.31 134	60.068 − 10	12.68 84	64.381 − 33	22.10 206	29.389 − 4	48.81 29
b. 9.4	11.611 58	36.65 110	60.058 56	11.84 64	64.348 119	24.16 196	29.393 − 48	49.10 37
19.4	11.553 97	37.75 88	60.002 95	11.20 47	64.229 198	26.12 175	29.345 93	49.47 41
r. 1.4	11.456 130	38.63 63	59.907 128	10.73 31	64.031 260	27.87 149	29.252 130	49.88 42
11.4	11.326 151	39.26 42	59.779 150	10.42 15	63.771 306	29.36 115	29.122 158	50.30 40
21.3	11.175 165	39.68 19	59.629 164	10.27 − 3	63.465 334	30.51 77	28.964 173	50.70 35
31.3	11.010 169	39.87 0	59.465 165	10.24 − 9	63.131 345	31.28 − 35	28.791 177	51.05 25
r. 10.3	10.841	39.87	59.300	10.33	62.786	31.63	28.614	51.30
20.2	10.681 160	39.66 21	59.141 159	10.53 20	62.448 338	31.57 6	28.441 173	51.48 18
30.2	10.534 147	39.27 39	58.996 145	10.82 29	62.135 313	31.10 47	28.285 156	51.57 9
ıy 10.2	10.409 125	38.70 57	58.875 121	11.19 37	61.860 275	30.24 86	28.151 134	51.56 1
20.2	10.310 99	37.95 75	58.781 94	11.65 46	61.634 226	29.02 122	28.047 104	51.46 10
	10.243 67	37.06 89	58.719 62	12.19 54	61.467 167	27.49 153	27.977 70	51.29 17
30.1	10.208 35	36.04 102	58.691 − 28	12.80 61	61.364 103	25.71 178	27.944 − 33	51.04 25
ne 9.1	10.207 − 1	34.92 112	58.697 6	13.46 66	61.329 − 35	23.72 199	27.949 5	50.75 29
19.1	10.242 − 35	33.71 121	58.739 42	14.15 69	61.363 34	21.57 215	27.992 43	50.41 34
29.1	10.310 68	32.47 124	58.815 76	14.85 70	61.466 103	19.33 224	28.073 81	50.04 37
ly 9.0	100	124	109	68	168	229	116	42
19.0	10.410	31.23	58.924	15.53	61.634	17.04	28.189	49.62
29.0	10.541 131	30.04 119	59.061 137	16.16 63	61.865 231	14.75 229	28.338 149	49.16 46
ıg. 7.9	10.701 160	28.95 109	59.228 167	16.71 55	62.153 288	12.50 225	28.518 180	48.65 51
17.9	10.886 185	28.00 95	59.420 192	17.14 43	62.494 341	10.34 216	28.727 209	48.09 56
27.9	11.096 210	27.26 74	59.636 216	17.41 27	62.884 390	8.30 204	28.961 234	47.47 62
	232	51	237	8	433	189	259	70
pt. 6.9	11.328	26.75	59.873	17.49	63.317	6.41	29.220	46.77
16.8	11.581 253	26.54 21	60.130 257	17.35 14	63.786 469	4.72 169	29.499 279	46.00 77
26.8	11.850 269	26.64 − 10	60.402 272	16.97 38	64.287 501	3.25 147	29.798 299	45.16 84
ct. 6.8	12.133 283	27.06 42	60.689 287	16.34 63	64.813 526	2.03 122	30.112 314	44.26 90
16.8	12.427 294	27.83 77	60.986 297	15.48 86	65.359 546	1.08 95	30.438 326	43.30 96
	300	109	305	111	555	63	335	99
26.7	12.727	28.92	61.291	14.37	65.914	0.45	30.773	42.31
lov. 5.7	13.030 303	30.30 138	61.595 304	13.07 130	66.469 555	0.16 − 29	31.112 339	41.31 100
15.7	13.327 297	31.94 164	61.895 300	11.61 146	67.012 543	0.20 4	31.447 335	40.36 95
25.6	13.613 286	33.77 183	62.184 289	10.04 157	67.533 521	0.62 42	31.771 324	39.48 88
ec. 5.6	13.879 266	35.73 196	62.453 269	8.42 162	68.016 483	1.40 78	32.076 305	38.70 78
	239	203	243	161	432	113	277	62
15.6	14.118	37.76	62.696	6.81	68.448	2.53	32.353	38.08
25.6	14.320 202	39.78 202	62.903 207	5.25 156	68.815 367	3.97 144	32.593 240	37.61 47
35.5	14.481 161	41.74 196	63.068 165	3.80 145	69.106 291	5.69 172	32.789 196	37.33 28
n Place	9.064	28.96	57.476	18.37	59.578	21.49	26.375	52.70
∂, Tan ∂	1.002	−0.069	1.005	+0.095	1.936	+1.658	1.100	+0.458
D_α a	+0.06	0.00	+0.06	0.00	+0.10	+0.04	+0.07	+0.01
D_α ∂	−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		4 Puppis. Mag. 5.1		ξ Argus. Mag. 3.5		φ Gemin Mag.
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.
	h m 7 40 s	° ′ +28 13 ″	h m 7 42 s	° ′ −14 21 ″	h m 7 45 s	° ′ −24 38 ″	h m 7 48 s
Jan. 0.5	17.122	35.45	9.801	40.95	50.435	61.87	27.940
	172	4	136	247	135	295	181
10.5	17.294	35.49	9.937	43.42	50.570	64.82	28.121
	118	24	87	234	82	284	127
20.5	17.412	35.73	10.024	45.76	50.652	67.66	28.248
	61	37	37	213	28	265	70
30.5	17.473	36.10	10.061	47.89	50.680	70.31	28.318
	4	48	14	191	24	241	13
Feb. 9.4	17.477	36.58	10.047	49.80	50.656	72.72	28.331
	50	56	61	163	72	210	40
19.4	17.427	37.14	9.986	51.43	50.584	74.82	28.291
	98	58	100	136	114	178	87
Mar. 1.4	17.329	37.72	9.886	52.79	50.470	76.60	28.204
	135	56	134	104	148	143	136
11.4	17.194	38.28	9.752	53.83	50.322	78.03	28.078
	164	50	158	74	174	105	156
21.3	17.030	38.78	9.594	54.57	50.148	79.08	27.922
	180	42	171	45	189	68	174
31.3	16.850	39.20	9.423	55.02	49.959	79.76	27.748
	185	29	176	14	195	31	180
Apr. 10.3	16.665	39.49	9.247	55.16	49.764	80.07	27.568
	180	16	172	15	191	7	176
20.2	16.485	39.65	9.075	55.01	49.573	80.00	27.392
	164	4	158	42	179	42	162
30.2	16.321	39.69	8.917	54.59	49.394	79.58	27.230
	141	9	140	70	159	77	141
May 10.2	16.180	39.60	8.777	53.89	49.235	78.81	27.089
	110	21	113	94	135	110	112
20.2	16.070	39.39	8.664	52.95	49.100	77.71	26.977
	75	32	84	118	104	138	78
30.1	15.995	39.07	8.580	51.77	48.996	76.33	26.899
	37	40	53	136	72	166	43
June 9.1	15.958	38.67	8.527	50.41	48.924	74.67	26.856
	1	47	17	152	36	187	4
19.1	15.959	38.20	8.510	48.89	48.888	72.80	26.852
	42	54	17	166	1	203	35
29.1	16.001	37.66	8.527	47.23	48.887	70.77	26.887
	81	59	50	172	36	215	73
July 9.0	16.082	37.07	8.577	45.51	48.923	68.62	26.960
	117	64	85	175	72	219	109
19.0	16.199	36.43	8.662	43.76	48.995	66.43	27.069
	152	67	117	170	107	216	142
29.0	16.351	35.76	8.779	42.06	49.102	64.27	27.211
	183	73	146	159	140	205	175
Aug. 7.9	16.534	35.03	8.925	40.47	49.242	62.22	27.386
	213	75	176	143	172	188	204
17.9	16.747	34.28	9.101	39.04	49.414	60.34	27.590
	240	80	202	120	202	162	231
27.9	16.987	33.48	9.303	37.84	49.616	58.72	27.821
	265	82	226	92	228	129	257
Sept. 6.9	17.252	32.63	9.529	36.92	49.844	57.43	28.078
	285	89	249	56	255	90	278
16.8	17.537	31.74	9.778	36.36	50.099	56.53	28.356
	306	93	268	18	275	46	300
26.8	17.843	30.81	10.046	36.18	50.374	56.07	28.656
	322	96	284	24	294	3	316
Oct. 6.8	18.165	29.85	10.330	36.42	50.668	56.10	28.972
	335	98	296	67	309	53	331
16.8	18.500	28.87	10.626	37.09	50.977	56.63	29.303
	343	97	305	108	316	104	340
26.7	18.843	27.90	10.931	38.17	51.293	57.67	29.643
	347	94	307	148	318	151	345
Nov. 5.7	19.190	26.96	11.238	39.65	51.611	59.18	29.988
	344	86	301	182	313	195	344
15.7	19.534	26.10	11.539	41.47	51.924	61.13	30.332
	333	75	290	212	299	232	334
25.6	19.867	25.35	11.829	43.59	52.223	63.45	30.666
	313	61	270	234	277	263	316
Dec. 5.6	20.180	24.74	12.099	45.93	52.500	66.08	30.982
	284	45	242	248	246	283	289
15.6	20.464	24.29	12.341	48.41	52.746	68.91	31.271
	246	26	205	253	208	295	252
25.6	20.710	24.03	12.546	50.94	52.954	71.86	31.523
	201	7	163	253	162	297	208
35.5	20.911	23.96	12.709	53.47	53.116	74.83	31.731
Mean Place	14.369	39.63	7.563	40.59	48.212	62.57	25.235
Sec δ, Tan δ	1.135	+0.537	1.032	−0.256	1.100	−0.459	1.122
$D_\psi\,\alpha$, $D_\omega\,\alpha$	+0.07	+0.02	+0.05	−0.01	+0.05	−0.01	+0.07
$D_\psi\,\delta$, $D_\omega\,\delta$	−0.2	+0.9	−0.2	+0.9	−0.2	+0.9	−0.2

FOR THE UPPER TRANSIT AT WASHINGTON.

gton time.	26 Lyncis. Mag. 5.7		Groombridge 1374. Mag. 5.6		χ Argus. Mag. 3.6		ω Cancri. Mag. 5.9	
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.
	h m 7 48 s	° ′ +47 46 ″	h m 7 50 s	° ′ +74 8 ″	h m 7 54 s	° ′ −52 45 ″	h m 7 55 s	° ′ −25 36 ″
0.6	43.993	45.24	24.70	22.37	42.658	30.19	57.334	70.40
	222	119	43	246	131	379	186	18
10.5	44.215	46.43	25.13	24.83	42.789	33.98	57.520	70.22
	151	138	26	264	57	374	133	1
20.5	44.366	47.81	25.39	27.47	42.846	37.72	57.653	70.23
	79	149	8	272	17	360	77	20
30.5	44.445	49.30	25.47	30.19	42.829	41.32	57.730	70.43
	5	157	8	269	90	338	21	33
9.4	44.450	50.87	25.39	32.88	42.739	44.70	57.751	70.76
	63	154	23	253	155	307	32	44
19.4	44.387	52.41	25.16	35.41	42.584	47.77	57.719	71.20
	126	145	39	229	213	269	80	50
1.4	44.261	53.86	24.77	37.70	42.371	50.46	57.639	71.70
	178	128	51	194	261	227	119	53
11.4	44.083	55.14	24.26	39.64	42.110	52.73	57.520	72.23
	216	105	60	151	297	181	148	50
21.3	43.867	56.19	23.66	41.15	41.813	54.54	57.372	72.73
	241	78	66	103	321	132	169	44
31.3	43.626	56.97	23.00	42.18	41.492	55.86	57.203	73.17
	250	47	69	51	332	82	176	36
10.3	43.376	57.44	22.31	42.69	41.160	56.68	57.027	73.53
	248	16	70	2	332	30	174	25
20.3	43.128	57.60	21.61	42.67	40.828	56.98	56.853	73.78
	232	17	67	54	321	21	161	16
30.2	42.896	57.43	20.94	42.13	40.507	56.77	56.692	73.94
	203	48	61	104	300	70	141	4
10.2	42.693	56.95	20.33	41.09	40.207	56.07	56.551	73.98
	168	78	52	150	272	118	113	7
20.2	42.525	56.17	19.81	39.59	39.935	54.89	56.438	73.91
	124	102	43	190	234	163	82	16
30.1	42.401	55.15	19.38	37.69	39.701	53.26	56.356	73.75
	75	126	31	226	192	203	48	26
e 9.1	42.326	53.89	19.07	35.43	39.509	51.23	56.308	73.49
	25	143	20	254	143	236	10	33
19.1	42.301	52.46	18.87	32.89	39.366	48.87	56.298	73.16
	27	159	7	274	91	265	28	40
29.1	42.328	50.87	18.80	30.15	39.275	46.22	56.326	72.76
y 9.0	42.406	49.17	18.87	27.27	39.237	43.37	56.390	72.30
	78	170	7	288	38	285	64	46
	128	175	19	296	18	298	99	52
19.0	42.534	47.42	19.06	24.31	39.255	40.39	56.489	71.78
29.0	42.708	45.62	19.37	21.34	39.328	37.39	56.623	71.21
g. 8.0	42.928	43.82	19.80	18.42	39.458	34.46	56.789	70.58
17.9	43.187	42.03	20.35	15.62	39.642	31.69	56.983	69.87
27.9	43.483	40.31	20.99	12.99	39.879	29.20	57.206	69.11
	296	172	64	263	237	249	223	76
	328	165	73	242	284	212	247	83
pt. 6.9	43.811	38.66	21.72	10.57	40.163	27.08	57.453	68.28
16.8	44.170	37.10	22.53	8.43	40.490	25.41	57.722	67.37
26.8	44.557	35.66	23.40	6.58	40.857	24.27	58.013	66.39
t. 6.8	44.965	34.36	24.33	5.09	41.254	23.73	58.324	65.35
16.8	45.391	33.25	25.30	3.99	41.671	23.83	58.649	64.27
	359	156	81	214	327	167	269	91
	387	144	87	185	367	114	291	98
	408	130	93	149	397	54	311	104
	426	111	97	110	417	10	325	108
	437	92	99	68	428	73	336	111
26.7	45.828	32.33	26.29	3.31	42.099	24.56	58.985	63.16
v. 5.7	46.270	31.66	27.28	3.08	42.527	25.94	59.329	62.06
15.7	46.708	31.24	28.25	3.31	42.942	27.91	59.670	61.01
25.7	47.131	31.12	29.18	4.02	43.332	30.43	60.004	60.04
c. 5.6	47.530	31.30	30.04	5.18	43.684	33.41	60.322	59.19
	442	67	99	23	428	138	344	110
	438	42	97	23	415	197	341	105
	423	12	93	71	390	252	334	97
	399	18	86	116	352	298	318	85
	363	48	77	159	302	334	291	67
15.6	47.893	31.78	30.81	6.77	43.986	36.75	60.613	58.52
25.6	48.209	32.56	31.46	8.76	44.230	40.36	60.869	58.02
35.5	48.467	33.59	31.97	11.06	44.405	44.10	61.082	57.71
	316	78	65	199	244	361	256	50
	258	103	51	230	175	374	213	31
n Place	40.533	51.38	17.290	29.49	40.144	33.92	54.675	75.44
), Tan δ	1.488	+1.102	3.659	+3.520	1.652	−1.315	1.109	+0.480
, $D_m\alpha$	*+0.09*	*+0.03*	*+0.14*	+0.11	+0.03	−0.04	+0.07	+0.02
$D_m\delta$	*−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.	χ Geminorum. Mag. 5.0		27 Lyncis. Mag. 4.9		ρ Argus. Mag. 2.9		3 H. Ursæ Mag.
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.
	h m s 7 58	° ′ ″ +28 1	h m s 8 2	° ′ ″ +51 44	h m s 8 4	° ′ ″ −24 3	h m s 8 4
Jan. 0.6	28.149	35.17	17.056	42.15	2.725	50.49	39.94
	192	4	254	134	153	295	38
10.5	28.341	35.13	17.310	43.49	2.878	53.44	40.32
	137	17	178	155	103	286	26
20.5	28.478	35.30	17.488	45.04	2.981	56.30	40.58
	81	33	100	172	49	269	11
30.5	28.559	35.63	17.588	46.76	3.030	58.99	40.69
	24	47	21	178	— 5	245	0
Feb. 9.5	28.583	36.10	17.609	48.54	3.025	61.44	40.69
	— 31	58	— 56	177	54	217	13
19.4	28.552	36.68	17.553	50.31	2.971	63.61	40.56
Mar. 1.4	28.472	37.30	17.429	51.98	2.875	65.48	40.32
	80	62	124	167	96	187	24
11.4	28.351	37.93	17.246	53.48	2.741	67.00	39.97
	121	63	183	150	134	152	35
21.3	28.200	38.51	17.019	54.74	2.579	68.16	39.55
	151	58	227	126	162	116	42
31.3	28.028	39.02	16.761	55.71	2.400	68.96	39.08
	172	51	258	97	179	80	47
	180	40	274	62	187	44	50
Apr. 10.3	27.848	39.42	16.487	56.33	2.213	69.40	38.58
	178	26	274	27	187	6	51
20.3	27.670	39.68	16.213	56.60	2.026	69.46	38.07
	165	14	259	— 9	178	— 30	49
30.2	27.505	39.82	15.954	56.51	1.848	69.16	37.58
May 10.2	27.359	39.83	15.720	56.07	1.687	68.53	37.13
	146	— 1	234	44	161	63	45
20.2	27.241	39.71	15.523	55.28	1.547	67.58	36.73
	118	12	197	79	140	95	40
	85	26	154	108	112	126	33
30.2	27.156	39.45	15.369	54.20	1.435	66.32	36.40
	51	35	105	134	81	152	23
June 9.1	27.105	39.10	15.264	52.86	1.354	64.80	36.17
	13	45	51	158	50	176	16
19.1	27.092	38.65	15.213	51.28	1.304	63.04	36.01
	— 25	52	— 4	174	14	193	7
29.1	27.117	38.13	15.217	49.54	1.290	61.11	35.94
July 9.0	27.179	37.53	15.274	47.65	— 20	59.07	— 4
	62	60	57	189	1.310	204	35.98
	98	66	111	199	55	212	13
19.0	27.277	36.87	15.385	45.66	1.365	56.95	36.11
29.0	27.410	36.14	15.549	43.62	1.453	54.85	36.33
	133	73	164	204	88	210	22
Aug. 8.0	27.576	35.36	15.759	41.55	1.575	52.83	36.63
	166	78	210	207	122	202	30
17.9	27.771	34.52	16.015	39.50	1.730	50.97	37.02
	195	84	256	205	155	186	39
27.9	27.995	33.62	16.313	37.50	1.914	49.35	37.48
	224	90	298	200	184	162	46
	250	95	337	193	215	131	53
Sept. 6.9	28.245	32.67	16.650	35.57	2.129	48.04	38.01
	274	102	371	182	241	96	60
16.8	28.519	31.65	17.021	33.75	2.370	47.08	38.61
	296	107	403	166	266	51	65
26.8	28.815	30.58	17.424	32.09	2.636	46.57	39.26
Oct. 6.8	29.129	29.47	17.854	30.58	2.922	46.53	39.96
	314	111	430	151	286	— 45	70
16.8	29.460	28.34	18.306	29.28	3.227	46.98	40.69
	331	113	452	130	305	94	73
	343	113	467	105	315		76
26.7	29.803	27.21	18.773	28.23	3.542	47.92	41.45
	349	109	475	78	321	143	76
Nov. 5.7	30.152	26.12	19.248	27.45	3.863	49.35	42.21
	350	102	474	49	320	187	76
15.7	30.502	25.10	19.722	26.96	4.183	51.22	42.97
	342	91	462	15	308	226	73
25.7	30.844	24.19	20.184	26.81	4.491	53.48	43.70
Dec. 5.6	325	75	438	— 19	290	257	68
	31.169	23.44	20.622	27.00	4.781	56.05	44.38
	298	58	401	53	261	278	62
15.6	31.467	22.86	21.023	27.53	5.042	58.83	45.00
	264	38	352	88	226	292	54
25.6	31.731	22.48	21.375	28.41	5.268	61.75	45.54
	219	17	290	118	181	296	44
35.5	31.950	22.31	21.665	29.59	5.449	64.71	45.98
Mean Place	25.430	40.62	13.397	49.80	0.537	51.19	34.242
Sec δ, Tan δ	*1.133*	*+0.532*	1.615	+1.268	1.095	−0.447	2.755
$D_\psi\, \alpha$, $D_\omega\, \alpha$	+0.07	+0.02	+0.09	+0.04	+0.05	−0.02	+0.12
$D_\psi\, \delta$, $D_\omega\, \delta$	−0.2	+0.9	−0.2	+0.9	−0.2	+0.9	−0.2

FOR THE UPPER TRANSIT AT WASHINGTON.

hington n Time.	γ Argus. Mag. 2.2		ζ Cancri (*mean*). Mag. 4.7		Bradley 1147. Mag. 5.7		20 Puppis. Mag. 5.0	
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.
	h m s 8 6	° ′ ″ −47 5	h m s 8 7	° ′ ″ +17 53	h m s 8 9	° ′ ″ +76 0	h m s 8 9	° ′ ″ −15 32
ı. 0.6	60.903 153	26.22 368	29.725 187	51.83 70	17.16 53	33.93 241	33.253 164	15.06 257
10.5	61.056 85	29.90 366	29.912 138	51.13 52	17.69 35	36.34 266	33.417 114	17.63 247
20.5	61.141 18	33.56 352	30.050 85	50.61 31	18.04 17	39.00 277	33.531 63	20.10 229
30.5	61.159 — 49	37.08 332	30.135 31	50.30 14	18.21 — 3	41.77 278	33.594 12	22.39 206
b. 9.5	61.110 109	40.40 303	30.166 — 20	50.16 — 2	18.18 22	44.55 269	33.606 — 36	24.45 181
19.4	61.001	43.43	30.146	50.18	17.96	47.24	33.570	26.26
ır. 1.4	60.837 164	46.10 267	30.080 66	50.31 13	17.58 38	49.70 246	33.490 80	27.78 152
11.4	60.628 209	48.36 226	29.975 105	50.55 24	17.05 53	51.84 214	33.374 116	28.99 121
21.3	60.385 243	50.19 183	29.842 133	50.83 28	16.40 65	53.57 173	33.232 142	29.91 92
31.3	60.117 268 280	51.55 136 88	29.689 153 163	51.13 30 31	15.67 73 78	54.84 127 76	33.070 162 169	30.51 60 30
ır. 10.3	59.837	52.43	29.526	51.44	14.89	55.60	32.901	30.81
20.3	59.555 282	52.81 — 38	29.364 162	51.72 28	14.09 80	55.81 — 21	32.731 170	30.82 — 1
30.2	59.281 274	52.70 11	29.211 153	51.97 25	13.32 77	55.49 32	32.570 161	30.53 29
ıy 10.2	59.025 256	52.12 58	29.075 136	52.18 21	12.60 72	54.64 85	32.424 146	29.97 56
20.2	58.792 233 200	51.08 104 148	28.964 111 83	52.35 17 13	11.96 64 55	53.30 134 178	32.300 124 100	29.15 82 105
30.2	58.592	49.60	28.881	52.48	11.41	51.52	32.200	28.10
ne 9.1	58.429 163	47.74 186	28.830 51	52.57 9	10.98 43	49.35 217	32.130 70	26.82 128
19.1	58.306 123	45.54 220	28.812 — 18	52.62 5	10.68 30	46.85 250	32.092 38	25.37 145
29.1	58.228 78	43.05 249	28.829 17	52.63 — 1	10.53 15	44.11 274	32.084 — 8	23.79 158
ly 9.0	58.197 — 31 15	40.36 269 282	28.879 50 84	52.60 3 9	10.51 — 2 12	41.19 292 306	32.110 26 58	22.10 169 172
19.0	58.212	37.54	28.963	52.51	10.63	38.13	32.168	20.38
29.0	58.276 64	34.68 286	29.078 115	52.35 16	10.90 27	35.04 309	32.257 89	18.68 170
ıg. 8.0	58.389 113	31.87 281	29.223 145	52.11 24	11.30 40	31.96 308	32.378 121	17.07 161
17.9	58.549 160	29.22 265	29.397 174	51.79 32	11.83 53	28.97 299	32.529 151	15.60 147
27.9	58.756 207 250	26.80 242 207	29.597 200 224	51.37 42 55	12.48 65 76	26.11 286 266	32.707 178 206	14.34 126 98
pt. 6.9	59.006	24.73	29.821	50.82	13.24	23.45	32.913	13.36
16.9	59.296 290	23.10 163	30.070 249	50.12 70	14.09 85	21.03 242	33.144 231	12.71 65
26.8	59.620 324	21.97 113	30.340 270	49.30 82	15.03 94	18.92 211	33.400 256	12.45 — 26
ct. 6.8	59.975 355	21.40 — 57	30.629 289	48.34 96	16.03 100	17.15 177	33.675 275	12.60 15
16.8	60.352 377 391	21.46 6 68	30.936 307 319	47.25 109 120	17.09 106 110	15.76 139 96	33.967 292 306	13.18 58 100
26.7	60.743	22.14	31.255	46.05	18.19	14.80	34.273	14.18
ov. 5.7	61.138 395	23.43 129	31.581 326	44.78 127	19.29 110	14.30 50	34.585 312	15.59 141
15.7	61.527 389	25.32 189	31.909 328	43.48 130	20.39 110	14.28 — 2	34.898 313	17.38 179
25.7	61.897 370	27.74 242	32.232 323	42.19 129	21.45 106	14.77 49	35.202 304	19.49 211
ec. 5.6	62.237 340 300	30.61 287 323	32.540 308 285	40.95 124 112	22.45 100 90	15.74 97 144	35.491 289 263	21.83 234 252
15.6	62.537	33.84	32.825	39.83	23.35	17.18	35.754	24.35
25.6	62.786 249	37.33 349	33.078 253	38.83 100	24.12 77	19.04 186	35.985 231	26.96 261
35.6	62.975 189	40.97 364	33.291 213	38.01 82	24.74 62	21.28 224	36.174 189	29.57 261
n Place	58.547	29.77	27.241	56.75	9.080	43.16	31.072	14.58
∂, Tan ∂	1.469	−1.076	*1.050*	*+0.323*	4.137	+4.014	1.038	−0.278
; $D_\alpha\,\alpha$	*+0.04*	*−0.04*	*+0.07*	*+0.01*	+0.15	+0.14	+0.05	−0.01
$D_\alpha\,\delta$	*−0.2*	*+0.9*	*−0.2*	*+0.8*	−0.2	+0.8	−0.2	+0.8

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.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Dec.
	h m s 8 12	° ′ ″ + 9 26	h m s 8 17	° ′ ″ +43 26	h m s 8 18	° ′ ″ +18 35	h m s 8 20	° ′ ″ −8
Jan. 0.6	3.269	27.87	12.810	71.30	39.281	52.67	51.344	26.2
	183	122	245	80	200	70	182	
10.5	3.452	26.65	13.055	72.10	39.481	51.97	51.526	30.0
	135	105	181	103	149	50	97	
20.5	3.587	25.60	13.236	73.13	39.630	51.47	51.623	33.9
	83	87	114	123	96	29	10	
30.5	3.670	24.73	13.350	74.36	39.726	51.18	51.633	37.1
	32	64	44	135	42	11	—	
Feb. 9.5	3.702	24.09	13.394	75.71	39.768	51.07	51.559	41.0
	—		—		—	—	74	
	17	46	21	142	9	6	154	
19.4	3.685	23.63	13.373	77.13	39.759	51.13	51.405	44.8
Mar. 1.4	3.623	23.34	13.290	78.53	39.702	51.31	51.181	47.4
	62	29	83	140	57	18	224	
11.4	3.524	23.20	13.154	79.85	39.606	51.60	50.897	50.1
	99	14	136	132	96	29	284	
21.4	3.396	23.18	12.977	81.00	39.477	51.94	50.567	52.1
	128	2	177	115	129	34	330	
31.3	3.249	23.27	12.772	81.95	39.329	52.30	50.201	54.1
	147	—	205	95	148	36	366	
	156	9	221	70	160	36	386	
Apr. 10.3	3.093	23.45	12.551	82.65	39.169	52.66	49.815	55.8
	156	25	224	43	161	33	395	
20.3	2.937	23.70	12.327	83.08	39.008	52.99	49.420	56.1
	148	29	214	13	154	29	393	
30.2	2.789	23.99	12.113	83.21	38.854	53.28	49.028	56.3
	131	33	196	—	139	23	377	
May 10.2	2.658	24.32	11.917	83.05	38.715	53.51	48.651	56.4
	109	38	167	42	116	19	380	
20.2	2.549	24.70	11.750	82.63	38.599	53.70	48.301	55.8
	83	40	132	70	90	13	316	
30.2	2.466	25.10	11.618	81.93	38.509	53.83	47.985	54.2
	54	42	93	93	59	8	273	
June 9.1	2.412	25.52	11.525	81.00	38.450	53.91	47.712	52.1
	21	44	48	114	26	2	225	
19.1	2.391	25.96	11.477	79.86	38.424	53.93	47.487	50.0
	—		—		—	—	169	
	11	45	4	131	6	3	47.318	47.5
29.1	2.402	26.41	11.473	78.55	38.430	53.90	47.318	47.5
	42	43	40	145	40	8	109	
July 9.1	2.444	26.84	11.513	77.10	38.470	53.82	47.209	45.1
	74	39	85	156	73	15	44	
19.0	2.518	27.23	11.598	75.54	38.543	53.67	47.165	42.2
	104	34	128	166	105	23	20	
29.0	2.622	27.57	11.726	73.88	38.648	53.44	47.185	39.2
Aug. 8.0	2.754	27.81	11.894	72.17	38.782	53.14	89	
	132	24	168	171	134	30	47.274	36.2
17.9	2.915	27.96	12.100	70.43	38.945	52.74	156	
	161	15	206	174	163	40	47.430	33.2
27.9	3.102	27.96	12.343	68.68	39.135	52.23	47.651	30.0
	187	0	243	175	190	51	221	
	212	18	276	175	217	63	285	
Sept. 6.9	3.314	27.78	12.619	66.93	39.352	51.60	47.936	28.2
	234	35	309	171	240	77	344	
16.9	3.548	27.43	12.928	65.22	39.592	50.83	48.280	26.2
	258	57	336	163	264	90	395	
26.8	3.806	26.86	13.264	63.59	39.856	49.93	48.675	24.0
Oct. 6.8	4.082	26.07	13.628	62.03	40.141	48.90	438	
	276	79	364	156	285	103	49.113	23.5
16.8	4.375	25.09	14.013	60.59	40.445	47.73	471	
	293	98	385	144	304	117	49.584	23.2
	307	120	403	128	318	126	494	
26.8	4.682	23.89	14.416	59.31	40.763	46.47	50.078	23.1
	316	135	413	108	327	132	499	
Nov. 5.7	4.998	22.54	14.829	58.23	41.090	45.15	50.577	24.1
	317	147	417	86	331	136	491	
15.7	5.315	21.07	15.246	57.37	41.421	43.79	51.068	26.4
	312	155	410	59	327	134	468	
25.7	5.627	19.52	15.656	56.78	41.748	42.45	51.536	28.6
Dec. 5.6	5.926	17.95	16.049	56.48	42.064	41.18	428	
	299	157	393	30	316	127	51.964	31.4
	278	154	366	0	293	115	374	
15.6	6.204	16.41	16.415	56.48	42.357	40.03	52.338	34.0
	246	146	326	32	262	101	310	
25.6	6.450	14.95	16.741	56.80	42.619	39.02	52.648	38.2
	207	132	276	62	225	83	232	
35.6	6.657	13.63	17.017	57.42	42.844	38.19	52.880	41.9
Mean Place	0.915	31.93	9.656	79.70	36.816	58.31	48.714	31.5
Sec δ, Tan δ	1.014	+0.166	1.378	+0.948	1.055	+0.336	1.955	−1.6
$D_\psi\, a$. $D_\omega\, a$	+0.06	+0.01	+0.08	+0.04	+0.07	+0.01	+0.02	−0.0
$D_\psi\, \delta$, $D_\omega\, \delta$	−0.2	+0.8	−0.2	+0.8	−0.2	+0.8	−0.2	+0.8

FOR THE UPPER TRANSIT AT WASHINGTON.

ington n Time.	30 Monocerotis. Mag. 4.0		θ Chamæleontis. Mag. 4.3		o Ursæ Majoris. Mag. 3.5		Groombridge 1450. Mag. 6.0	
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.
	h m s 8 21	° ′ ″ − 3 38	h m s 8 23	° ′ ″ −77 12	h m s 8 23	° ′ ″ +60 59	h m s 8 27	° ′ ″ +38 17
a. 0.6	33.077 181	7.88 200	13.60 27	55.33 380	27.29 34	38.51 168	34.451 242	58.47 42
10.5	33.258 134	9.88 185	13.87 8	59.13 390	27.63 24	40.19 195	34.693 184	58.89 70
20.5	33.392 85	11.73 166	13.95 — 12	63.03 388	27.87 15	42.14 214	34.877 121	59.59 90
30.5	33.477 33	13.39 146	13.83 30	66.91 376	28.02 5	44.28 223	34.998 57	60.49 106
b. 9.5	33.510 — 15	14.85 121	13.53 46	70.67 354	28.07 — 5	46.51 223	35.055 — 6	61.55 117
19.4	33.495	16.06 98	13.07 62	74.21 327	28.02 14	48.74 212	35.049 63	62.72 120
r. 1.4	33.437 95	17.04 74	12.45 74	77.48 291	27.88 21	50.86 193	34.986 114	63.92 116
11.4	33.342 125	17.78 52	11.71 84	80.39 249	27.67 28	52.79 164	34.872 153	65.08 107
21.4	33.217 143	18.30 29	10.87 93	82.88 203	27.39 33	54.43 130	34.719 180	66.15 91
31.3	33.074 154	18.59 10	9.94 98	84.91 155	27.06 35	55.73 90	34.539 198	67.06 72
r. 10.3	32.920	18.69	8.96	86.46	26.71	56.63	34.341	67.78
20.3	32.764 156	18.59 10	7.95 101	87.49 103	26.34 37	57.11 48	34.139 202	68.29 51
30.2	32.615 149	18.30 29	6.93 102	87.98 — 49	25.99 35	57.14 — 3	33.944 195	68.54 25
ay 10.2	32.479 136	17.85 45	5.94 99	87.94 4	25.66 33	56.74 40	33.764 180	68.55 — 1
20.2	32.364 115	17.25 60	4.99 95	87.37 57	25.36 30	55.91 83	33.610 154	68.32 23
	90	75	88	108	24	121	124	46
30.2	32.274	16.50	4.11	86.29	25.12	54.70	33.486	67.86
ne 9.1	32.209 65	15.64 86	3.31 80	84.72 157	24.93 19	53.14 156	33.398 88	67.18 68
19.1	32.175 34	14.67 97	2.62 69	82.73 199	24.80 13	51.29 185	33.347 51	66.32 86
29.1	32.170 — 5	13.62 105	2.07 55	80.36 237	24.75 — 5	49.18 211	33.337 — 10	65.30 102
ly 9.1	32.197 27	12.53 109	1.65 42	77.66 270	24.76 1	46.88 230	33.367 30	64.12 118
	57	109	27	292	8	245	70	129
19.0	32.254	11.44	1.38	74.74	24.84	44.43	33.437	62.83
29.0	32.340 86	10.39 105	1.27 — 11	71.67 307	24.98 14	41.89 254	33.546 109	61.44 139
g. 8.0	32.455 115	9.42 97	1.33 6	68.56 311	25.18 20	39.30 259	33.691 145	59.97 147
17.9	32.598 143	8.57 85	1.55 22	65.52 304	25.45 27	36.73 257	33.873 182	58.43 154
27.9	32.769 171	7.91 66	1.95 40	62.63 289	25.78 33	34.20 253	34.088 215	56.85 158
	197	44	55	260	38	243	247	160
pt. 6.9	32.966	7.47	2.50	60.03	26.16	31.77	34.335	55.25
16.9	33.188 222	7.30 — 17	3.20 70	57.81 222	26.60 44	29.48 229	34.612 277	53.64 161
26.8	33.432 244	7.43 13	4.02 82	56.06 175	27.07 47	27.38 210	34.919 307	52.04 160
t. 6.8	33.699 267	7.88 45	4.94 92	54.85 121	27.58 51	25.50 188	35.250 331	50.47 157
16.8	33.983 284	8.66 78	5.94 100	54.26 — 59	28.13 55	23.90 160	35.605 355	48.97 150
	300	111	103	8	57	129	372	139
26.8	34.283	9.77	6.97	54.34	28.70	22.61	35.977	47.58
w. 5.7	34.592 309	11.17 140	8.02 105	55.07 73	29.28 58	21.66 95	36.363 386	46.32 126
15.7	34.903 311	12.84 167	9.03 101	56.47 140	29.87 59	21.11 55	36.754 391	45.25 107
25.7	35.210 307	14.71 187	9.97 94	58.47 200	30.45 58	20.96 — 15	37.142 388	44.39 86
c. 5.6	35.506 296	16.73 202	10.82 85	61.03 256	31.00 55	21.24 28	37.517 375	43.79 60
	274	211	70	304	51	71	350	32
15.6	35.780	18.84	11.52	64.07	31.51	21.95	37.867	43.47
25.6	36.023 243	20.95 211	12.08 56	67.49 342	31.95 44	23.06 111	38.182 315	43.43 — 4
35.6	36.228 205	23.01 206	12.46 38	71.17 368	32.34 39	24.54 148	38.453 271	43.69 26
n Place	30.868	5.42	9.121	62.21	22.930	48.78	31.536	67.19
d, Tan δ	1.002	−0.064	4.520	−4.409	2.063	+1.804	1.274	+0.790
, D_α	+0.06	0.00	−0.03	−0.17	+0.10	+0.07	+0.08	+0.03
, D_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 Cancri. Mag. 5.5		Groombridge 1446. Mag. 6.3		δ Hydræ. Mag. 4.2		σ Hydr Mag. 4
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.
	h m s 8 27	° ′ ″ +20 43	h m s 8 30	° ′ ″ +73 54	h m s 8 33	° ′ ″ + 5 59	h m s 8 34
Jan. 0.6	57.185	19.66	37.62	65.01	18.077	33.91	27.474
	211	61	54	218	199	150	199
10.6	57.396	19.05	38.16	67.19	18.276	32.41	27.673
	161	40	39	246	153	133	152
20.5	57.557	18.65	38.55	69.65	18.429	31.08	27.825
	107	17	22	266	103	111	102
30.5	57.664	18.48	38.77	72.31	18.532	29.97	27.927
	52	1	6	273	51	90	51
Feb. 9.5	57.716	18.49	38.83	75.04	18.583	29.07	27.978
	0	19	11	270	1	69	2
19.4	57.716	18.68	38.72	77.74	18.584	28.38	27.980
	49	31	27	254	44	49	43
Mar. 1.4	57.667	18.99	38.45	80.28	18.540	27.89	27.937
	91	39	40	229	83	30	82
11.4	57.576	19.38	38.05	82.57	18.457	27.59	27.855
	124	44	51	193	114	14	114
21.4	57.452	19.82	37.54	84.50	18.343	27.45	27.741
	146	45	59	150	134	0	134
31.3	57.306	20.27	36.95	86.00	18.209	27.45	27.607
	160	43	66	102	148	12	147
Apr. 10.3	57.146	20.70	36.29	87.02	18.061	27.57	27.460
	162	38	68	51	152	24	151
20.3	56.984	21.08	35.61	87.53	17.909	27.81	27.309
	157	33	67	3	146	31	146
30.3	56.827	21.41	34.94	87.50	17.763	28.12	27.163
	142	23	64	54	134	38	134
May 10.2	56.685	21.64	34.30	86.96	17.629	28.50	27.029
	120	17	59	104	116	45	115
20.2	56.565	21.81	33.71	85.92	17.513	28.95	26.914
	96	9	52	152	93	49	94
30.2	56.469	21.90	33.19	84.40	17.420	29.44	26.820
	65	1	42	191	65	54	67
June 9.1	56.404	21.91	32.77	82.49	17.355	29.98	26.753
	34	6	31	229	38	56	40
19.1	56.370	21.85	32.46	80.20	17.317	30.54	26.713
	2	13	19	259	8	58	9
29.1	56.368	21.72	32.27	77.61	17.309	31.12	26.704
	32	22	8	281	23	58	21
July 9.1	56.400	21.50	32.19	74.80	17.332	31.70	26.725
	65	28	5	296	52	54	50
19.0	56.465	21.22	32.24	71.84	17.384	32.24	26.775
	95	37	17	308	82	49	80
29.0	56.560	20.85	32.41	68.76	17.466	32.73	26.855
	127	45	28	309	111	40	108
Aug. 8.0	56.687	20.40	32.69	65.67	17.577	33.13	26.963
	156	55	40	309	138	27	135
18.0	56.843	19.85	33.09	62.58	17.715	33.40	27.098
	183	67	50	298	166	13	164
27.9	57.026	19.18	33.59	59.60	17.881	33.53	27.262
	211	78	60	284	191	6	189
Sept. 6.9	57.237	18.40	34.19	56.76	18.072	33.47	27.451
	236	90	70	263	218	27	215
16.9	57.473	17.50	34.89	54.13	18.290	33.20	27.666
	262	102	77	237	241	50	239
26.8	57.735	16.48	35.66	51.76	18.531	32.70	27.905
	283	115	84	208	264	75	263
Oct. 6.8	58.018	15.33	36.50	49.68	18.795	31.95	28.168
	304	125	90	170	283	98	281
16.8	58.322	14.08	37.40	47.98	19.078	30.97	28.449
	320	133	94	132	301	123	299
26.8	58.642	12.75	38.34	46.66	19.379	29.74	28.748
	331	137	96	86	311	142	311
Nov. 5.7	58.973	11.38	39.30	45.80	19.690	28.32	29.059
	337	138	97	32	317	160	316
15.7	59.310	10.00	40.27	45.41	20.007	26.72	29.375
	335	134	95	10	316	170	314
25.7	59.645	8.66	41.22	45.51	20.323	25.02	29.689
	324	125	91	60	305	176	304
Dec. 5.7	59.969	7.41	42.13	46.11	20.628	23.26	29.993
	304	111	83	110	288	176	286
15.6	60.273	6.30	42.96	47.21	20.916	21.50	30.279
	272	95	74	156	258	170	257
25.6	60.545	5.35	43.70	48.77	21.174	19.80	30.536
	235	74	61	197	222	158	223
35.6	60.780	4.61	44.31	50.74	21.396	18.22	30.759
Mean Place	54.709	26.13	30.691	76.50	15.820	38.31	25.244
Sec δ, *Tan* δ	*1.069*	+0.378	3.610	+3.469	1.005	+0.105	1.002
$D_\psi a$, $D_\omega a$	+0.07	+0.02	+0.13	+0.14	+0.06	0.00	+0.06
$D_\psi \delta$, $D_\omega \delta$	−0.2	+0.8	−0.2	+0.8	−0.2	+0.8	−0.2

FOR THE UPPER TRANSIT AT WASHINGTON.

shington n Time.	γ Cancri. Mag. 4.7		δ Cancri. Mag. 4.2		α Pyxidis. Mag. 3.7		ι Cancri. Mag. 4.2	
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.
	h m	° ′	h m	° ′	h m	° ′	h m	° ′
	8 38	+21 45	8 39	+18 27	8 40	−32 53	8 41	+29 3
	s	″	s	″	s	″	s	″
h. 0.6	31.613	56.93	60.655	29.68	17.498	9.40	43.335	43.04
	222	60	219	81	193	330	236	18
10.6	31.835	56.33	60.874	28.87	17.691	12.70	43.571	42.86
	172	37	170	58	139	327	184	7
20.5	32.007	55.96	61.044	28.29	17.830	15.97	43.755	42.93
	119	14	118	36	83	317	129	31
30.5	32.126	55.82	61.162	27.93	17.913	19.14	43.884	43.24
b. 9.5	64	6	64	14	26	297	71	51
	32.190	55.88	61.226	27.79	17.939	22.11	43.955	43.75
	11	25	11	3	28	274	13	67
19.4	32.201	56.13	61.237	27.82	17.911	24.85	43.968	44.42
r. 1.4	39	37	37	20	78	242	40	77
	32.162	56.50	61.200	28.02	17.833	27.27	43.928	45.19
11.4	83	46	80	30	120	208	86	82
	32.079	56.96	61.120	28.32	17.713	29.35	43.842	46.01
21.4	117	52	114	38	154	171	124	81
	31.962	57.48	61.006	28.70	17.559	31.06	43.718	46.82
31.3	142	52	137	42	178	131	150	76
	31.820	58.00	60.869	29.12	17.381	32.37	43.568	47.58
	156	49	152	42	194	92	168	65
r. 10.3	31.664	58.49	60.717	29.54	17.187	33.29	43.400	48.23
20.3	162	44	157	40	200	49	173	54
	31.502	58.93	60.560	29.94	16.987	33.78	43.227	48.77
30.3	157	37	153	36	198	8	169	39
	31.345	59.30	60.407	30.30	16.789	33.86	43.058	49.16
y 10.2	145	28	141	30	188	32	157	22
	31.200	59.58	60.266	30.60	16.601	33.54	42.901	49.38
20.2	126	18	122	24	171	71	138	6
	31.074	59.76	60.144	30.84	16.430	32.83	42.763	49.44
	102	9	99	18	148	109	111	9
30.2	30.972	59.85	60.045	31.02	16.282	31.74	42.652	49.35
ne 9.1	73	0	71	11	123	141	82	27
	30.899	59.85	59.974	31.13	16.159	30.33	42.570	49.08
19.1	43	9	43	5	94	172	51	40
	30.856	59.76	59.931	31.18	16.065	28.61	42.519	48.68
29.1	10	18	11	3	62	197	16	53
	30.846	59.58	59.920	31.15	16.003	26.64	42.503	48.15
ly 9.1	22	28	21	9	27	217	18	67
	30.868	59.30	59.941	31.06	15.976	24.47	42.521	47.48
	53	35	51	17	9	229	52	77
19.0	30.921	58.95	59.992	30.89	15.985	22.18	42.573	46.71
29.0	87	45	83	27	44	235	87	88
	31.008	58.50	60.075	30.62	16.029	19.83	42.660	45.83
g. 8.0	117	55	112	36	80	233	119	98
	31.125	57.95	60.187	30.26	16.109	17.50	42.779	44.85
18.0	145	64	141	46	118	222	151	108
	31.270	57.31	60.328	29.80	16.227	15.28	42.930	43.77
27.9	175	77	170	59	154	202	181	118
	31.445	56.54	60.498	29.21	16.381	13.26	43.111	42.59
	203	88	198	73	189	174	211	125
pt. 6.9	31.648	55.66	60.696	28.48	16.570	11.52	43.322	41.34
16.9	229	99	223	86	225	138	239	133
	31.877	54.67	60.919	27.62	16.795	10.14	43.561	40.01
26.8	256	112	249	101	256	96	267	140
	32.133	53.55	61.168	26.61	17.051	9.18	43.828	38.61
t. 6.8	279	123	272	115	287	47	293	146
	32.412	52.32	61.440	25.46	17.338	8.71	44.121	37.15
16.8	301	133	296	128	312	6	316	149
	32.713	50.99	61.736	24.18	17.650	8.77	44.437	35.66
	318	140	312	139	330	60	336	148
26.8	33.031	49.59	62.048	22.79	17.980	9.37	44.773	34.18
v. 5.7	332	144	326	146	343	115	350	144
	33.363	48.15	62.374	21.33	18.323	10.52	45.123	32.74
15.7	339	143	334	149	347	167	358	136
	33.702	46.72	62.708	19.84	18.670	12.19	45.481	31.38
25.7	339	138	333	147	342	215	358	123
c. 5.7	34.041	45.34	63.041	18.37	19.012	14.34	45.839	30.15
	330	129	325	141	327	256	339	106
	34.371	44.05	63.366	16.96	19.339	16.90	46.188	29.09
	311	113	306	129	301	288	330	85
15.6	34.682	42.92	63.672	15.67	19.640	19.78	46.518	28.24
25.6	283	96	280	112	266	312	300	60
	34.965	41.96	63.952	14.55	19.906	22.90	46.818	27.64
35.6	245	73	241	94	221	324	262	34
	35.210	41.23	64.193	13.61	20.127	26.14	47.080	27.30
n Place	29.155	64.17	58.256	36.47	15.384	11.68	40.736	51.60
δ, Tan δ	1.077	+0.399	1.054	+0.334	1.191	−0.647	1.144	+0.556
, $D_\alpha \alpha$	+0.07	+0.02	+0.07	+0.01	+0.05	−0.03	+0.07	+0.02
, $D_\alpha \delta$	−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.	ε Hydræ. Mag. 3.5		δ Argus. Mag. 2.0		σ² Canori (mean). Mag. 5.5		ζ Hyd Mag.
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.
	h m s 8 42	° ′ ″ + 6 43	h m s 8 42	° ′ ″ −54 24	h m s 8 49	° ′ ″ +80 53	h m s 8 51
Jan. 0.6	25.176	22.07	26.884	8.94	13.700	31.17	2.708
10.6	25.384 208	20.58 149	27.099 215	12.70 376	13.947 247	31.05 12	2.923 215
20.5	25.545 161	19.28 130	27.239 140	16.53 383	14.143 196	31.20 15	3.093 170
30.5	25.657 112	18.19 109	27.302 63	20.33 380	14.281 138	31.60 40	3.213 120
Feb. 9.5	25.717 60	17.31 88	27.288 14	23.99 366	14.361 80	32.21 61	3.281 68
	11	66	86	343	22	73	19
19.5	25.728	16.65	27.202	27.42	14.383	32.99	3.300
Mar. 1.4	25.692 36	16.19 46	27.052 150	30.56 314	14.351 32	33.86 87	3.272 28
11.4	25.617 75	15.93 26	26.844 208	33.35 279	14.269 82	34.79 93	3.203 69
21.4	25.509 108	15.81 12	26.590 254	35.72 237	14.149 120	35.70 91	3.103 100
31.3	25.379 130	15.84 3	26.300 290	37.64 192	14.001 148	36.56 86	2.977 126
	145	15	313	144	168	74	141
Apr. 10.3	25.234	15.99	25.987	39.08	13.833	37.30	2.836
20.3	25.085 149	16.24 25	25.664 323	40.01 93	13.658 175	37.90 60	2.690 146
30.3	24.939 146	16.55 31	25.338 326	40.44 43	13.485 173	38.35 45	2.546 144
May 10.2	24.804 135	16.93 38	25.021 317	40.36 8	13.324 161	38.60 25	2.411 135
20.2	24.687 117	17.37 44	24.724 297	39.78 58	13.179 145	38.67 7	2.292 119
	97	48	273	166	118	11	89
30.2	24.590	17.85	24.451	38.72	13.061	38.56	2.193
June 9.2	24.520 70	18.36 51	24.212 239	37.21 151	12.970 91	38.26 30	2.119 74
19.1	24.476 44	18.88 52	24.012 200	35.30 191	12.913 57	37.81 45	2.070 49
29.1	24.462 14	19.41 53	23.857 155	33.03 227	12.889 24	37.20 61	2.050 20
July 9.1	24.478 16	19.93 52	23.751 106	30.47 256	12.899 10	36.45 75	2.057 7
	45	49	52	277	45	88	37
19.0	24.523	20.42	23.699	27.70	12.944	35.57	2.094
29.0	24.597 74	20.84 42	23.700 1	24.80 290	13.023 79	34.58 99	2.160 66
Aug. 8.0	24.698 101	21.17 33	23.759 59	21.87 293	13.136 113	33.47 111	2.254 94
18.0	24.828 130	21.39 22	23.875 116	19.00 287	13.280 144	32.25 122	2.375 121
27.9	24.986 158	21.45 6	24.049 174	16.31 269	13.457 177	30.96 129	2.523 148
	184	11	233	242	207	138	177
Sept. 6.9	25.170	21.34	24.282	13.89	13.664	29.58	2.700
16.9	25.380 210	21.01 33	24.567 285	11.84 205	13.900 236	28.12 146	2.903 203
26.9	25.615 235	20.46 55	24.902 335	10.26 158	14.166 266	26.60 152	3.131 228
Oct. 6.8	25.874 259	19.66 80	25.280 378	9.22 104	14.457 291	25.04 156	3.386 255
16.8	26.155 281	18.64 102	25.693 413	8.78 44	14.774 317	23.47 157	3.662 276
	298	126	440	19	337	154	296
26.8	26.453	17.38	26.133	8.97	15.111	21.93	3.958
Nov. 5.7	26.764 311	15.93 145	26.586 453	9.81 84	15.466 355	20.43 150	4.269 311
15.7	27.083 319	14.31 162	27.041 455	11.29 148	15.829 363	19.03 140	4.588 319
25.7	27.402 319	12.60 171	27.481 440	13.36 207	16.194 365	17.78 125	4.909 321
Dec. 5.7	27.711 309	10.83 177	27.896 415	15.96 260	16.550 356	16.72 106	5.223 314
	293	177	374	306	340	84	296
15.6	28.004	9.06	28.270	19.02	16.890	15.88	5.519
25.6	28.269 265	7.37 169	28.589 319	22.43 341	17.200 310	15.32 56	5.790 271
35.6	28.499 230	5.80 157	28.847 258	26.08 365	17.472 272	15.04 28	6.028 238
Mean Place	22.940	26.95	24.502	14.47	11.090	40.50	0.503
Sec δ, Tan δ	1.007	+0.118	1.718	−1.397	1.165	+0.598	1.006
$D_\psi a$, $D_\omega a$	+0.06	+0.01	+0.03	−0.06	+0.07	+0.03	+0.06
$D_\psi \delta$, $D_\omega \delta$	−0.3	+0.8	−0.3	+0.8	−0.3	+0.7	−0.3

FOR THE UPPER TRANSIT AT WASHINGTON.

	ι Ursæ Majoris. Mag. 3.1		α Cancri. Mag. 4.3		b^1 Carinæ. Mag. 5.1		κ Ursæ Majoris. Mag. 3.7	
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.
	h m	° ′	h m	° ′	h m	° ′	h m	° ′
	8 53	+48 21	8 53	+12 10	8 54	−58 54	8 57	+47 28
	s	″	s	″	s	″	s	″
	35.169 304	54.22 82	59.255 223	40.55 121	58.955 248	25.15 377	61.141 305	56.04 75
	35.473 239	55.04 115	59.478 177	39.34 101	59.203 166	28.92 388	61.446 243	56.79 107
	35.712 168	56.19 140	59.655 128	38.33 78	59.369 82	32.80 388	61.689 174	57.86 134
	35.880 93	57.59 160	59.783 75	37.55 57	59.451 — 3	36.68 378	61.863 100	59.20 155
	35.973 21	59.19 172	59.858 23	36.98 34	59.448 83	40.46 360	61.963 28	60.75 169
	35.994	60.91	59.881	36.64	59.365	44.06	61.991	62.44
	35.944 50	62.66 175	59.857 24	36.49 15	59.206 159	47.39 333	61.949 42	64.16 172
	35.832 112	64.34 168	59.791 66	36.49 0	58.985 221	50.38 299	61.846 103	65.86 170
	35.668 164	65.90 156	59.692 99	36.63 14	58.708 277	52.97 259	61.692 154	67.41 155
	35.465 203	67.25 135	59.566 126	36.88 25	58.391 317	55.12 215	61.498 194	68.78 137
	229	108	140	30	347	168	221	112
	35.236	68.33 78	59.426	37.18	58.044	56.80	61.277	69.90
	34.994 242	69.11 45	59.279 147	37.53 35	57.678 366	57.98 118	61.043 234	70.72 82
	34.752 242	69.56 10	59.133 146	37.90 37	57.308 370	58.65 67	60.807 236	71.22 50
	34.521 231	69.66 — 24	58.996 137	38.28 38	56.942 366	58.80 — 15	60.582 225	71.38 — 16
	34.313 208	69.42 58	58.875 121	38.66 38	56.591 351	58.42 38	60.378 204	71.20 18
	179		101	37	325	87	176	50
	34.134 144	68.84	58.774	39.03	56.266	57.55	60.202	70.70
	33.990 102	67.96 88	58.699 75	39.37 34	55.974 292	56.20 135	60.060 142	69.88 82
	33.888 58	66.79 117	58.649 50	39.68 31	55.722 252	54.41 179	59.957 103	68.77 111
	33.830 14	65.37 142	58.628 — 21	39.96 28	55.517 205	52.24 217	59.897 60	67.42 135
	33.816 — 33	63.73 164	58.634 6	40.18 22	55.365 152	49.74 250	59.881 — 16	65.83 159
		182	37	17	95	274	28	176
	33.849	61.91	58.671	40.35 9	55.270	47.00	59.909	64.07
	33.927 78	59.95 196	58.737 66	40.44 — 1	55.238 — 32	44.09 291	59.981 72	62.16 191
	34.049 122	57.86 209	58.831 94	40.43 13	55.268 30	41.11 298	60.097 116	60.12 204
	34.215 166	55.70 216	58.954 123	40.30 28	55.365 97	38.17 294	60.255 158	57.99 213
	34.423 208	53.50 220	59.104 150	40.02 43	55.530 165	35.35 282	60.455 200	55.81 218
	249	221	178		231	258	241	220
	34.672	51.29	59.282	39.59	55.761	32.77	60.696	53.61
	34.960 288	49.10 219	59.487 205	38.97 62	56.056 295	30.54 223	60.974 278	51.42 219
	35.283 323	46.98 212	59.719 232	38.16 81	56.410 354	28.75 179	61.290 316	49.29 213
	35.642 359	44.95 203	59.976 257	37.16 100	56.816 406	27.49 126	61.640 350	47.24 205
	36.033 391	43.05 190	60.256 280	35.96 120	57.265 449	26.83 66	62.021 381	45.32 192
	415	170	301	137	482	5	409	175
	36.448	41.35	60.557	34.59	57.747	26.78	62.430	43.57
	36.884 436	39.87 148	60.872 315	33.08 151	58.247 500	27.39 61	62.859 429	42.05 152
	37.333 449	38.68 119	61.197 325	31.46 162	58.752 505	28.67 128	63.301 442	40.79 126
	37.781 448	37.80 88	61.525 328	29.80 166	59.243 491	30.57 190	63.745 444	39.83 96
	38.221 440	37.27 53	61.846 321	28.14 166	59.710 467	33.01 244	64.182 437	39.23 60
	418	15	304	160	421	296	416	23
	38.639	37.12	62.150	26.54	60.131	35.97	64.598	39.00
	39.021 382	37.35 23	62.431 281	25.05 149	60.497 366	39.31 334	64.980 382	39.16 16
	39.355 334	37.96 61	62.676 245	23.72 133	60.790 293	42.93 362	65.315 335	39.69 53
	31.958	66.23	56.993	46.93	56.499	31.66	57.998	68.31
	1.505	+1.125	1.023	+0.216	1.937	−1.658	1.480	+1.091
	+0.08	+0.05	+0.07	+0.01	+0.03	−0.08	+0.08	+0.05
	−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 Ursæ Majoris. Mag. 4.9		κ Cancri. Mag. 5.1		λ Argus. Mag. 2.2		θ Hy Mag
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.
	h m s 9 3	° ′ ″ +67 27	h m s 9 3	° ′ ″ +10 59	h m s 9 4	° ′ ″ −43 5	h m s 9 10
Jan. 0.6	11.57	67.01	17.436	63.93	58.647	45.37	4.965
	48	166	230	133	230	353	22
10.6	12.05	68.67	17.666	62.60	58.877	48.90	5.193
	38	203	185	110	172	359	18
20.6	12.43	70.70	17.851	61.50	59.049	52.49	5.378
	26	229	135	88	110	354	13
30.5	12.69	72.99	17.986	60.62	59.159	56.03	5.515
	13	249	84	65	45	343	8
Feb. 9.5	12.82	75.48	18.070	59.97	59.204	59.46	5.601
	2	256	33	43	14	323	3
19.5	12.84	78.04	18.103	59.54	59.190	62.69	5.637
	10	252	15	22	71	295	1
Mar. 1.4	12.74	80.56	18.088	59.32	59.119	65.64	5.626
	20	237	57	5	121	261	5
11.4	12.54	82.93	18.031	59.27	58.998	68.25	5.575
	31	213	92	9	163	225	8
21.4	12.23	85.06	17.939	59.36	58.835	70.50	5.488
	38	179	119	22	193	184	11
31.4	11.85	86.85	17.820	59.58	58.642	72.34	5.375
	43	139	135	29	216	141	12
Apr. 10.3	11.42	88.24	17.685	59.87	58.426	73.75	5.246
	45	94	144	35	228	95	13
20.3	10.97	89.18	17.541	60.22	58.198	74.70	5.107
	47	45	144	38	233	49	14
30.3	10.50	89.63	17.397	60.60	57.965	75.19	4.967
	46	3	137	40	228	4	13
May 10.3	10.04	89.60	17.260	61.00	57.737	75.23	4.834
	43	52	121	41	215	42	12
20.2	9.61	89.08	17.139	61.41	57.522	74.81	4.714
	38	99	104	40	198	86	10
30.2	9.23	88.09	17.035	61.81	57.324	73.95	4.609
	32	142	80	39	173	127	8
June 9.2	8.91	86.67	16.955	62.20	57.151	72.68	4.525
	26	181	56	36	146	164	5
19.1	8.65	84.86	16.899	62.56	57.005	71.04	4.466
	19	216	28	33	113	198	3
29.1	8.46	82.70	16.871	62.89	56.892	69.06	4.432
	11	243	1	28	78	224	
July 9.1	8.35	80.27	16.870	63.17	56.814	66.82	4.423
	2	268	28	21	39	244	2
19.1	8.33	77.59	16.898	63.38	56.775	64.38	4.443
	5	284	56	15	0	258	4
29.0	8.38	74.75	16.954	63.53	56.775	61.80	4.488
	15	295	85	4	43	262	7
Aug. 8.0	8.53	71.80	17.039	63.57	56.818	59.18	4.562
	21	301	113	8	88	256	10
18.0	8.74	68.79	17.152	63.49	56.906	56.62	4.663
	30	301	140	24	132	243	13
28.0	9.04	65.78	17.292	63.25	57.038	54.19	4.793
	37	294	169	40	176	218	15
Sept. 6.9	9.41	62.84	17.461	62.85	57.214	52.01	4.952
	44	284	196	58	220	185	18
16.9	9.85	60.00	17.657	62.27	57.434	50.16	5.137
	51	266	224	79	262	143	21
26.9	10.36	57.34	17.881	61.48	57.696	48.73	5.351
	58	244	251	99	301	94	24
Oct. 6.8	10.94	54.90	18.132	60.49	57.997	47.79	5.591
	62	215	273	120	334	40	26
16.8	11.56	52.75	18.405	59.29	58.331	47.39	5.857
	66	183	295	138	361	19	28
26.8	12.22	50.92	18.700	57.91	58.692	47.58	6.145
	70	144	313	153	379	79	30
Nov. 5.8	12.92	49.48	19.013	56.38	59.071	48.37	6.452
	71	100	323	166	388	139	31
15.7	13.63	48.48	19.336	54.72	59.459	49.76	6.770
	72	54	327	172	386	194	32
25.7	14.35	47.94	19.663	53.00	59.845	51.70	7.092
	71	5	323	178	373	243	32
Dec. 5.7	15.06	47.89	19.986	51.27	60.218	54.13	7.410
	66	46	307	169	346	285	30
15.6	15.72	48.35	20.293	49.58	60.564	56.98	7.714
	60	95	285	157	309	319	28
25.6	16.32	49.30	20.578	48.01	60.873	60.17	7.996
	53	140	251	143	262	342	25
35.6	16.85	50.70	20.829	46.58	61.135	63.59	8.246
Mean Place	6.642	81.53	15.224	70.48	56.550	49.80	2.860
Sec δ, Tan δ	2.610	+2.411	1.019	+0.194	1.369	−0.936	1.001
$D_\psi\, a$, $D_\omega\, a$	+0.11	+0.12	+0.06	+0.01	+0.04	−0.04	+0.06
$D_\psi\, \delta$, $D_\omega\, \delta$	−0.3	+0.7	−0.3	+0.7	−0.3	+0.7	−0.3

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	β Argus. Mag. 1.8		83 Cancri. Mag. 6.6		ι Argus. Mag. 2.2		40 Lyncis. Mag. 3.3	
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.
	h m 9 12 s	° ′ −69 22 ″	h m 9 14 s	° ′ +18 3 ″	h m 9 14 s	° ′ −58 55 ″	h m 9 16 s	° ′ +34 44 ″
0.6	20.56	22.50	23.394	19.83	54.335	28.40	2.790	27.64
10.6	20.91 35	26.19 369	23.641 247	18.84 99	54.621 286	32.08 368	3.070 280	27.56 8
20.6	21.14 23	30.07 388	23.843 202	18.12 72	54.829 208	35.93 385	3.299 229	27.82 26
30.5	21.26 12	34.03 396	23.995 152	17.64 48	54.952 123	39.82 389	3.472 173	28.36 54
9.5	21.27 1	37.97 394	24.094 99	17.41 23	54.991 39	43.65 383	3.584 112	29.16 80
	11	382	45	1	43	369	50	99
19.5	21.16	41.79	24.139	17.40	54.948	47.34	3.634	30.15
1.4	20.93 23	45.39 360	24.134 5	17.59 19	54.831 117	50.79 345	3.627 7	31.28 113
11.4	20.62 31	48.72 333	24.086 48	17.92 33	54.646 185	53.94 315	3.567 60	32.49 121
21.4	20.23 39	51.68 296	23.999 87	18.35 43	54.403 243	56.73 279	3.463 104	33.67 118
31.4	19.77 46	54.24 256	23.883 116	18.85 50	54.114 289	59.10 237	3.326 137	34.79 112
	51	210	135	53	323	192	163	101
10.3	19.26	56.34	23.748	19.38	53.791	61.02	3.163	35.80
20.3	18.71 55	57.94 160	23.602 146	19.90 52	53.444 347	62.45 143	2.987 176	36.64 84
30.3	18.15 56	59.03 109	23.455 147	20.39 49	53.087 357	63.37 92	2.807 180	37.27 63
10.3	17.58 57	59.59 56	23.314 141	20.82 43	52.729 358	63.76 39	2.633 174	37.69 42
20.2	17.02 56	59.60 1	23.185 129	21.19 37	52.382 347	63.65 11	2.474 159	37.87 18
	53	52	111	29	330	62	140	4
30.2	16.49	59.08	23.074	21.48	52.052	63.03	2.334	37.83
9.2	15.99 50	58.05 103	22.985 89	21.67 19	51.750 302	61.92 111	2.221 113	37.54 29
19.1	15.54 45	56.54 151	22.921 64	21.79 12	51.483 267	60.36 156	2.136 85	37.04 50
29.1	15.15 39	54.58 196	22.883 38	21.81 2	51.258 225	58.39 197	2.082 54	36.33 71
9.1	14.84 31	52.24 234	22.874 9	21.74 7	51.081 177	56.07 232	2.062 20	35.44 89
	23	266	20	17	123	262	14	107
19.1	14.61	49.58	22.894	21.57	50.958	53.45	2.076	34.37
29.0	14.47 14	46.70 288	22.941 47	21.28 29	50.893 65	50.64 281	2.124 48	33.13 124
8.0	14.43 4	43.66 304	23.018 77	20.88 40	50.892 1	47.71 293	2.206 82	31.77 136
18.0	14.48 5	40.59 307	23.124 106	20.36 52	50.956 64	44.77 294	2.322 116	30.27 150
28.0	14.63 15	37.60 299	23.257 133	19.68 68	51.088 132	41.91 286	2.472 150	28.65 162
	27	282	164	82	199	265	183	170
6.9	14.90	34.78	23.421	18.86	51.287	39.26	2.655	26.95
16.9	15.26 36	32.25 253	23.613 192	17.89 97	51.552 265	36.91 235	2.872 217	25.17 178
26.9	15.72 46	30.12 213	23.835 222	16.74 115	51.881 329	34.96 195	3.121 249	23.33 184
6.8	16.26 54	28.47 165	24.085 250	15.45 129	52.265 384	33.50 146	3.401 280	21.46 187
16.8	16.86 60	27.39 108	24.360 275	14.01 144	52.700 435	32.62 88	3.712 311	19.60 186
	66	45	300	155	472	27	336	182
26.8	17.52	26.94	24.660	12.46	53.172	32.35	4.048	17.78
5.8	18.21 69	27.14 20	24.979 319	10.81 165	53.671 499	32.72 37	4.406 358	16.04 174
15.7	18.91 70	28.02 88	25.310 331	9.13 168	54.181 510	33.76 104	4.779 373	14.45 159
25.7	19.60 69	29.55 153	25.648 338	7.45 168	54.687 506	35.42 166	5.160 381	13.04 141
5.7	20.26 66	31.69 214	25.983 335	5.85 160	55.171 484	37.67 225	5.538 378	11.87 117
	59	268	323	150	448	277	364	91
15.7	20.85	34.37	26.306	4.35	55.619	40.44	5.902	10.96
25.6	21.37 52	37.52 315	26.606 300	3.02 133	56.015 396	43.64 320	6.241 339	10.38 58
35.6	21.79 42	41.04 352	26.875 269	1.91 111	56.349 334	47.16 352	6.544 303	10.12 26
Mean Place	17.664	30.83	21.132	28.33.	51.990	35.56	0.205	39.40
δ, Tand	2.839	−2.657	1.052	+0.326	1.938	−1.660	1.217	+0.693
Dα a	+0.01	−0.13	+0.07	+0.02	+0.03	−0.08	+0.07	+0.03
Dα 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.	θ Pyxidis. Mag. 4.9 Right Ascension.		θ Pyxidis. Declination.		α Hydræ. Mag. 2.2 Right Ascension.		α Hydræ. Declination.		h Ursæ Majoris. Mag. 3.8 Right Ascension.		h Ursæ Majoris. Declination.		δ Ursæ Majoris. Right Ascension.	
	h m		° ′		h m		° ′		h m		° ′		h m	
	9 17		−25 36		9 23		− 8 17		9 25		+63 24		9 27	
	s		″		s		″		s		″		s	
Jan. 0.6	50.847		42.28		32.533		56.32		4.30		76.11		15.32	
10.6	51.078	231	45.29	301	32.769	236	58.65	233	4.76	46	77.40	129	15.80	48
20.6	51.261	183	48.30	301	32.960	191	60.87	222	5.14	38	79.10	170	16.26	46
30.5	51.392	131	51.23	293	33.103	143	62.93	206	5.42	28	81.13	203	16.71	45
Feb. 9.5	51.471	79	53.99	276	33.196	93	64.79	186	5.59	17	83.40	227	16.92	21
19.5	51.496	25	56.52	253	33.240	44	66.41	162	5.65	6	85.82	242	16.99	7
Mar. 1.5	51.472	24	58.80	228	33.238	2	67.79	138	5.62	3	88.28	246	16.93	6
11.4	51.405	67	60.77	197	33.193	45	68.89	110	5.49	13	90.66	238	16.74	19
21.4	51.303	102	62.43	166	33.113	80	69.75	86	5.28	21	92.86	220	16.45	29
31.4	51.171	132	63.73	130	33.006	107	70.35	60	5.00	28	94.81	195	16.06	39
Apr. 10.3	51.020	151	64.70	97	32.880	126	70.72	37	4.67	33	96.40	159	15.59	47
20.3	50.857	163	65.30	60	32.743	137	70.85	13	4.30	37	97.60	120	15.09	50
30.3	50.691	166	65.54	24	32.603	140	70.77	8	3.91	39	98.35	75	14.56	53
May 10.3	50.529	162	65.44	10	32.467	136	70.47	30	3.53	38	98.63	28	14.03	53
20.2	50.376	153	65.01	43	32.341	126	70.00	47	3.16	37	98.45	18	13.52	51
30.2	50.239	137	64.24	77	32.229	112	69.35	65	2.83	33	97.81	64	13.04	48
June 9.2	50.121	118	63.18	106	32.135	94	68.55	80	2.54	29	96.72	109	12.62	42
19.2	50.023	98	61.86	132	32.063	72	67.62	93	2.30	24	95.24	148	12.27	35
29.1	49.953	70	60.30	156	32.013	50	66.58	104	2.11	19	93.40	184	11.99	28
July 9.1	49.911	42	58.57	173	31.988	25	65.46	112	1.99	12	91.23	217	11.79	20
19.1	49.896	15	56.70	187	31.988	0	64.31	115	1.93	6	88.80	243	11.68	11
29.0	49.913	17	54.76	194	32.016	28	63.17	114	1.94	1	86.15	265	11.67	1
Aug. 8.0	49.960	47	52.81	195	32.071	55	62.07	110	2.03	9	83.34	281	11.74	7
18.0	50.042	82	50.94	187	32.154	83	61.07	100	2.18	15	80.43	291	11.90	16
28.0	50.157	115	49.23	171	32.267	113	60.23	84	2.39	21	77.46	297	12.15	25
Sept. 6.9	50.305	148	47.72	151	32.408	141	59.61	62	2.66	27	74.50	296	12.49	34
16.9	50.487	182	46.51	121	32.581	173	59.24	37	3.00	34	71.59	291	12.92	43
26.9	50.705	218	45.67	84	32.783	202	59.16	8	3.40	40	68.79	280	13.43	51
Oct. 6.9	50.953	248	45.26	41	33.014	231	59.42	26	3.86	46	66.17	262	14.01	58
16.8	51.231	278	45.30	4	33.273	259	60.04	62	4.37	51	63.76	241	14.66	65
26.8	51.535	304	45.83	53	33.556	283	61.00	96	4.93	56	61.65	211	15.37	71
Nov. 5.8	51.858	323	46.85	102	33.860	304	62.32	132	5.52	59	59.88	177	16.12	75
15.7	52.194	336	48.34	149	34.176	316	63.96	164	6.14	62	58.49	139	16.90	78
25.7	52.533	339	50.27	193	34.499	323	65.87	191	6.77	63	57.55	94	17.70	80
Dec. 5.7	52.866	333	52.57	230	34.819	320	68.01	214	7.39	62	57.10	45	18.49	79
15.7	53.183	317	55.19	262	35.126	307	70.28	227	7.99	60	57.13	3	19.25	76
25.6	53.473	290	58.02	283	35.413	287	72.64	236	8.55	56	57.67	54	19.96	71
35.6	53.727	254	60.99	297	35.668	255	74.99	235	9.05	50	58.68	101	20.59	63
Mean Place	48.883		43.41		30.551		53.44		0.187		92.34		10.177	
Sec δ, Tan δ	1.109		−0.480		1.011		−0.146		2.235		+1.999		2.951	
$D_\psi a$, $D_\omega a$	+0.05		−0.02		+0.06		−0.01		+0.09		+0.10		+0.11	
[illegible]	−0.3		+0.7		−0.3		+0.6		−0.3		+0.8		−0.3	

FOR THE UPPER TRANSIT AT WASHINGTON.

hington n Time.	θ Ursæ Majoris. Mag. 3.3		ψ Argus. Mag. 3.6		ξ Leonis. Mag. 5.1		10 Leonis Minoris. Mag. 4.6	
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.
	h m 9 27 s	° ′ +52 2 ″	h m 9 27 s	° ′ −40 6 ″	h m 9 27 s	° ′ +11 39 ″	h m 9 29 s	° ′ +36 45 ″
L. 0.6	22.095	67.88	27.659	7.23	30.570	57.20	11.219	47.55
10.6	22.454 359	68.61 73	27.913 254	10.61 338	30.821 251	55.81 139	11.517 298	47.50 5
20.6	22.750 296	69.73 112	28.112 199	14.09 348	31.028 207	54.67 114	11.765 248	47.80 30
30.5	22.973 223	71.18 145	28.253 141	17.56 347	31.187 159	53.76 91	11.955 190	48.41 61
b. 9.5	23.119 146	72.91 173	28.334 81	20.93 337	31.295 108	53.10 66	12.085 130	49.29 88
	67	190	22	319	58	43	68	111
19.5	23.186	74.81	28.356	24.12	31.353	52.67	12.153	50.40
r. 1.5	23.175 11	76.80 199	28.322 34	27.07 295	31.361 8	52.47 20	12.160 7	51.65 125
11.4	23.095 80	78.78 198	28.238 84	29.71 264	31.325 36	52.46 1	12.113 47	52.98 133
21.4	22.952 143	80.67 189	28.112 126	32.02 231	31.252 73	52.61 15	12.019 94	54.31 133
31.4	22.761 191	82.36 169	27.953 159	33.93 191	31.151 101	52.88 27	11.887 132	55.58 127
	229	145	184	151	123	36	160	113
r. 10.3	22.532	83.81	27.769	35.44	31.028	53.24	11.727	56.71
20.3	22.280 252	84.94 113	27.570 199	36.53 109	30.893 135	53.65 41	11.552 175	57.68 97
30.3	22.018 262	85.72 78	27.363 207	37.18 65	30.754 139	54.09 44	11.370 182	58.43 75
ay 10.3	21.760 258	86.12 40	27.156 207	37.39 21	30.619 135	54.55 46	11.191 179	58.94 51
20.2	21.514 246	86.14 2	26.956 200	37.16 23	30.494 125	55.00 45	11.024 167	59.19 25
	222	37	186	64	109	42	150	0
30.2	21.292	85.77	26.770	36.52	30.385	55.42	10.874	59.19
ne 9.2	21.099 193	85.03 74	26.603 167	35.48 104	30.293 92	55.81 39	10.749 125	58.92 27
19.2	20.945 154	83.94 109	26.458 145	34.06 142	30.225 68	56.17 36	10.651 98	58.42 50
29.1	20.831 114	82.54 140	26.341 117	32.31 175	30.180 45	56.47 30	10.583 68	57.68 74
ly 9.1	20.761 70	80.85 169	26.255 86	30.28 203	30.161 19	56.70 23	10.549 34	56.72 96
	24	193	54	224	6	16	2	116
19.1	20.737	78.92	26.201	28.04	30.167	56.86	10.547	55.56
29.0	20.759 22	76.77 215	26.183 18	25.64 240	30.201 34	56.93 7	10.579 32	54.23 133
ug. 8.0	20.829 70	74.47 230	26.204 21	23.18 246	30.263 62	56.89 4	10.646 67	52.73 150
18.0	20.946 117	72.03 244	26.266 62	20.74 244	30.351 88	56.71 18	10.748 102	51.09 164
28.0	21.109 163	69.50 253	26.370 104	18.40 234	30.468 117	56.38 33	10.884 136	49.33 176
	210	258	146	213	145	49	172	186
pt. 6.9	21.319	66.92	26.516	16.27	30.613	55.89	11.056	47.47
16.9	21.574 255	64.35 257	26.705 189	14.44 183	30.789 176	55.20 69	11.263 207	45.52 195
26.9	21.874 300	61.82 253	26.937 232	12.98 146	30.994 205	54.32 88	11.503 240	43.52 200
ct. 6.9	22.216 342	59.37 245	27.210 273	11.98 100	31.227 233	53.22 110	11.778 275	41.49 203
16.8	22.598 382	57.06 231	27.519 309	11.50 48	31.488 261	51.93 129	12.085 307	39.48 201
	417	211	338	6	285	147	335	196
26.8	23.015	54.95	27.857	11.56	31.773	50.46	12.420	37.52
ov. 5.8	23.460 445	53.07 188	28.220 363	12.21 65	32.080 307	48.82 164	12.781 361	35.65 187
15.7	23.927 467	51.50 157	28.597 377	13.43 122	32.402 322	47.08 174	13.159 378	33.95 170
25.7	24.404 477	50.29 121	28.978 381	15.19 176	32.732 330	45.27 181	13.548 389	32.15 150
ec. 5.7	24.880 476	49.46 83	29.351 373	17.45 226	33.061 329	43.45 182	13.936 388	31.21 124
	462	40	354	269	320	176	378	95
15.7	25.342	49.06	29.705	20.14	33.381	41.69	14.314	30.26
25.6	25.773 431	49.10 4	30.027 322	23.17 303	33.680 299	40.05 164	14.668 354	29.65 61
35.6	26.161 388	49.55 45	30.310 283	26.45 328	33.949 269	38.56 149	14.989 321	29.40 25
n Place	18.915	83.10	25.682	11.48	28.447	64.89	8.652	60.55
δ, Tan δ	*1.626*	*+1.282*	*1.307*	*−0.842*	1.021	+0.206	1.248	+0.747
$D_m\alpha$	*+0.08*	*+0.07*	*+0.05*	*−0.04*	+0.06	+0.01	+0.07	+0.04
$D_m\delta$	*−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 Antliæ. Mag. 5.0		ε Leonis. Mag. 3.1		υ Argus Mag. 3
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.
	h m 9 36 s	° ′ +10 15 ″	h m 9 40 s	° ′ −27 23 ″	h m 9 41 s	° ′ +24 8 ″	h m 9 44 s
Jan. 0.6	45.437	66.53	31.957	18.68	10.823	73.85	64.05
	256	149	253	303	278	78	38
10.6	45.693	65.04	32.210	21.71	11.101	73.07	64.43
	214	125	208	305	284	50	29
20.6	45.907	63.79	32.418	24.76	11.335	72.57	64.72
	166	102	157	301	186	18	21
30.5	46.073	62.77	32.575	27.77	11.521	72.39	64.93
	117	76	103	288	131	9	10
Feb. 9.5	46.190	62.01	32.678	30.65	11.652	72.48	65.03
	66	53	51	267	76	34	1
19.5	46.256	61.48	32.729	33.32	11.728	72.82	65.04
	17	28	1	244	23	54	9
Mar. 1.5	46.273	61.20	32.730	35.76	11.751	73.36	64.95
	27	9	45	214	26	71	16
11.4	46.246	61.11	32.685	37.90	11.725	74.07	64.79
	65	8	84	184	67	79	24
21.4	46.181	61.19	32.601	39.74	11.658	74.86	64.55
	94	22	115	150	101	84	31
31.4	46.087	61.41	32.486	41.24	11.557	75.70	64.24
	117	32	137	115	126	83	35
Apr. 10.4	45.970	61.73	32.349	42.39	11.431	76.53	63.89
	129	40	152	79	141	78	39
20.3	45.841	62.13	32.197	43.18	11.290	77.31	63.50
	135	44	159	45	148	68	41
30.3	45.706	62.57	32.038	43.63	11.142	77.99	63.09
	133	47	160	8	147	58	43
May 10.3	45.573	63.04	31.878	43.71	10.995	78.57	62.66
	125	47	155	26	139	44	43
20.2	45.448	63.51	31.723	43.45	10.856	79.01	62.23
	110	46	144	60	124	28	42
30.2	45.338	63.97	31.579	42.85	10.732	79.29	61.81
	94	43	128	91	107	14	40
June 9.2	45.244	64.40	31.451	41.94	10.625	79.43	61.41
	72	41	109	120	85	1	36
19.2	45.172	64.81	31.342	40.74	10.540	79.42	61.05
	51	35	88	145	59	18	33
29.1	45.121	65.16	31.254	39.29	10.481	79.24	60.72
	26	30	62	167	33	33	28
July 9.1	45.095	65.46	31.192	37.62	10.448	78.91	60.44
	2	22	35	182	7	48	22
19.1	45.093	65.68	31.157	35.80	10.441	78.43	60.22
	25	15	8	192	22	64	16
29.1	45.118	65.83	31.149	33.88	10.463	77.79	60.06
	51	3	24	196	50	78	8
Aug. 8.0	45.169	65.86	31.173	31.92	10.513	77.01	59.98
	79	11	57	192	81	93	0
18.0	45.248	65.75	31.230	30.00	10.594	76.08	59.98
	108	26	90	180	111	109	8
28.0	45.356	65.49	31.320	28.20	10.705	74.99	60.06
	135	43	127	160	141	124	16
Sept. 6.9	45.491	65.06	31.447	26.60	10.846	73.75	60.22
	166	64	163	134	173	138	25
16.9	45.657	64.42	31.610	25.26	11.019	72.37	60.47
	195	84	200	99	205	153	33
26.9	45.852	63.58	31.810	24.27	11.224	70.84	60.80
	225	105	234	59	236	164	41
Oct. 6.9	46.077	62.53	32.044	23.68	11.460	69.20	61.21
	255	128	269	14	267	175	48
16.8	46.332	61.25	32.313	23.54	11.727	67.45	61.69
	279	146	298	36	296	181	54
26.8	46.611	59.79	32.611	23.90	12.023	65.64	62.23
	302	165	321	85	319	185	57
Nov. 5.8	46.913	58.14	32.932	24.75	12.342	63.79	62.80
	319	176	339	133	338	184	60
15.8	47.232	56.38	33.271	26.08	12.680	61.95	63.40
	329	185	346	179	351	176	61
25.7	47.561	54.53	33.617	27.87	13.031	60.19	64.01
	330	187	345	220	351	164	59
Dec. 5.7	47.891	52.66	33.962	30.07	13.382	58.55	64.60
	321	184	333	253	345	145	56
15.7	48.212	50.82	34.295	32.60	13.727	57.10	65.16
	302	174	309	279	327	123	50
25.6	48.514	49.08	34.604	35.39	14.054	55.87	65.66
	274	158	276	295	297	95	42
35.6	48.788	47.50	34.880	38.34	14.351	54.92	66.08
Mean Place	43.370	74.25	30.080	20.26	8.593	85.02	61.689
Sec δ, Tan δ	*1.016*	*+0.181*	1.126	−0.518	1.096	+0.448	2.339
Dψ a, Dω a	*+0.06*	*+0.01*	+0.05	−0.03	+0.07	+0.02	+0.03
Dψ δ, Dω δ	*−0.3*	*+0.6*	−0.3	+0.6	−0.3	+0.6	−0.3

FOR THE UPPER TRANSIT AT WASHINGTON.

gton ime.	υ Ursæ Majoris. Mag. 3.9		6 Sextantis. Mag. 6.0		μ Leonis. Mag. 4.1		Groombridge 1586. Mag. 6.0	
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.
	h m	° ′	h m	° ′	h m	° ′	h m	° ′
	9 45	+59 25	9 47	− 3 51	9 48	+26 23	9 50	+73 15
	s	″	s	″	s	″	s	″
0.6	9.550	30.01	5.048	18.04	4.987	42.48	65.06	70.64
10.6	9.989 439	30.93 92	5.302 254	20.20 216	5.274 287	41.77 71	65.77 71	72.05 141
20.6	10.357 368	32.29 136	5.516 214	22.24 204	5.517 243	41.37 40	66.36 59	73.93 188
30.6	10.643 286	34.02 173	5.685 169	24.10 186	5.711 194	41.29 8	66.82 46	76.20 227
9.5	10.839 196	36.06 204	5.805 120	25.73 163	5.850 139	41.50 21	67.13 31	78.77 257
	102	223	70	141	85	46	14	275
19.5	10.941	38.29	5.875	27.14	5.935	41.96	67.27	81.52
1.5	10.952 11	40.63 234	5.898 23	28.29 115	5.966 31	42.64 68	67.27 0	84.33 281
11.4	10.877 75	42.97 234	5.878 20	29.21 92	5.947 19	43.46 82	67.11 16	87.09 276
21.4	10.723 154	45.19 222	5.821 57	29.87 66	5.883 64	44.38 92	66.81 30	89.67 258
31.4	10.506 217	47.21 202	5.735 86	30.31 44	5.785 98	45.34 96	66.40 41	91.98 231
	368	174	108	22	125	94	51	195
10.4	10.238	48.95	5.627	30.53	5.660	46.28	65.89	93.93
20.3	9.935 303	50.35 140	5.504 123	30.57 4	5.518 142	47.14 86	65.32 57	95.43 150
30.3	9.613 322	51.33 98	5.375 129	30.44 13	5.368 150	47.90 76	64.70 62	96.45 102
10.3	9.287 326	51.89 56	5.246 129	30.14 30	5.218 150	48.53 63	64.06 64	96.96 51
20.2	8.970 317	52.00 11	5.123 123	29.70 44	5.074 144	49.00 47	63.43 63	96.92 4
	295	34	111	56	131	28	60	57
30.2	8.675	51.66	5.012	29.14	4.943	49.28	62.83	96.35
9.2	8.411 264	50.90 76	4.914 98	28.46 68	4.831 112	49.40 12	62.28 55	95.28 107
19.2	8.185 226	49.72 118	4.835 79	27.69 77	4.739 92	49.34 6	61.79 49	93.74 154
29.1	8.005 180	48.16 156	4.775 60	26.85 84	4.672 67	49.09 25	61.38 41	91.76 198
9.1	7.876 129	46.27 189	4.737 38	25.98 87	4.630 42	48.68 41	61.06 32	89.42 234
	77	218	14	89	14	59	22	269
19.1	7.799	44.09	4.723	25.09	4.616	48.09	60.84	86.73
29.1	7.778 21	41.65 244	4.733 10	24.22 87	4.631 15	47.33 76	60.72 12	83.77 296
8.0	7.814 36	39.02 263	4.769 36	23.41 81	4.674 43	46.41 92	60.71 1	80.62 315
18.0	7.908 94	36.24 278	4.832 63	22.72 69	4.748 74	45.34 107	60.80 9	77.33 329
28.0	8.060 152	33.35 289	4.922 90	22.16 56	4.852 104	44.10 124	61.00 20	73.95 338
	209	293	121	37	135	138	31	338
t. 6.9	8.269	30.42	5.043	21.79	4.987	42.72	61.31	70.57
16.9	8.535 266	27.49 293	5.195 152	21.67 12	5.156 169	41.20 152	61.71 40	67.24 333
26.9	8.857 322	24.61 288	5.377 182	21.82 15	5.357 201	39.54 166	62.22 51	64.03 321
6.9	9.233 376	21.85 276	5.591 214	22.25 43	5.590 233	37.77 177	62.82 60	61.01 302
16.8	9.659 426	19.27 258	5.835 244	23.01 76	5.855 265	35.92 185	63.52 70	58.24 277
	471	236	271	108	295	191	77	244
26.8	10.130	16.91	6.106	24.09	6.150	34.01	64.29	55.80
v. 5.8	10.640 510	14.86 205	6.402 296	25.47 138	6.470 320	32.09 192	65.12 83	53.75 205
15.8	11.180 540	13.15 171	6.715 313	27.14 167	6.811 341	30.21 188	66.00 88	52.14 161
25.7	11.736 556	11.84 131	7.038 323	29.03 189	7.165 354	28.42 179	66.91 91	51.02 112
c. 5.7	12.296 560	11.00 84	7.364 326	31.11 208	7.522 357	26.78 164	67.82 91	50.44 58
	546	35	318	218	351	144	89	0
15.7	12.842	10.65	7.682	33.29	7.873	25.34	68.71	50.44
25.6	13.361 519	10.78 13	7.982 300	35.51 222	8.207 334	24.16 118	69.56 85	50.99 55
35.6	13.831 470	11.41 63	8.255 273	37.72 221	8.513 306	23.26 90	70.31 75	52.09 110
Place	6.034	47.52	3.136	13.59	2.755	54.51	59.596	89.75
, Tan ∂	*1.966*	*+1.693*	*1.002*	*−0.067*	1.116	+0.496	3.474	+3.327
D, *a*	*+0.09*	*+0.09*	*+0.06*	0.00	+0.07	+0.03	+0.11	+0.19
D, ∂	*−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.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Dec.
	h m 9 52	° ′ +41 26	h m 9 53	−54 10	h m 9 55	+ 8 26	h m 10 2	+11
	s	″	s	″	s	″	s	″
Jan. 0.6	38.951	50.28	58.764	13.67	51.682	26.75	50.516	54.6
	333	1	329	345	269	163	283	52.6
10.6	39.284	50.27	59.093	17.12	51.951	25.12	50.799	52.6
	283	40	264	366	229	142	263	51.6
20.6	39.567	50.67	59.357	20.78	52.180	23.70	51.042	51.6
	227	77	194	377	183	117	197	51.1
30.6	39.794	51.44	59.551	24.55	52.363	22.53	51.239	51.1
	164	110	121	378	135	92	147	50.6
Feb. 9.5	39.958	52.54	59.672	28.33	52.498	21.61	51.386	50.6
	97	133	46	369	82	65	96	
19.5	40.055	53.87	59.718	32.02	52.580	20.96	51.482	50.6
	35	151	21	351	38	43	44	
Mar. 1.5	40.090	55.38	59.697	35.53	52.618	20.53	51.526	50.6
	25	161	86	327	9	19	2	
11.4	40.065	56.99	59.611	38.80	52.609	20.34	51.524	51.1
	79	163	144	296	47	0	43	
21.4	39.986	58.62	59.467	41.76	52.562	20.34	51.481	51.1
	122	156	189	260	79	15	77	
31.4	39.864	60.18	59.278	44.36	52.483	20.49	51.404	52.1
	156	143	226	220	103	29	104	
Apr. 10.4	39.708	61.61	59.052	46.56	52.380	20.78	51.300	53.2
	179	122	256	174	119	37	121	
20.3	39.529	62.83	58.796	48.30	52.261	21.15	51.179	53.4
	191	99	274	127	126	44	130	
30.3	39.338	63.82	58.522	49.57	52.135	21.59	51.049	54.1
	193	70	282	79	128	48	133	
May 10.3	39.145	64.52	58.240	50.36	52.007	22.07	50.916	54.5
	188	41	283	30	122	50	128	
20.3	38.957	64.93	57.957	50.66	51.885	22.57	50.788	55.2
	175	10	276	21	112	50	118	
30.2	38.782	65.03	57.681	50.45	51.773	23.07	50.670	55.7
	152	23	261	68	98	49	105	
June 9.2	38.630	64.80	57.420	49.77	51.675	23.56	50.565	56.0
	127	51	240	115	81	47	89	
19.2	38.503	64.29	57.180	48.62	51.594	24.03	50.476	56.3
	100	82	211	156	61	43	67	
29.1	38.403	63.47	56.969	47.06	51.533	24.46	50.409	56.4
	67	108	179	197	40	38	47	
July 9.1	38.336	62.39	56.790	45.09	51.493	24.84	50.362	56.5
	34	131	138	226	17	31	22	
19.1	38.302	61.08	56.652	42.83	51.476	25.15	50.340	56.4
	1	157	93	255	7	22	2	
29.1	38.301	59.51	56.559	40.28	51.483	25.37	50.342	56.1
	37	175	45	269	34	11	28	
Aug. 8.0	38.338	57.76	56.514	37.59	51.517	25.48	50.370	55.7
	74	191	10	278	59	2	54	
18.0	38.412	55.85	56.524	34.81	51.576	25.46	50.424	55.2
	111	208	67	276	87	19	84	
28.0	38.523	53.77	56.591	32.05	51.663	25.27	50.508	54.5
	148	218	126	263	116	36	114	
Sept. 7.0	38.671	51.59	56.717	29.42	51.779	24.91	50.622	53.6
	187	227	189	241	146	56	144	
16.9	38.858	49.32	56.906	27.01	51.925	24.35	50.766	52.5
	226	233	248	208	177	80	177	
26.9	39.084	46.99	57.154	24.93	52.102	23.55	50.943	51.2
	265	234	306	164	210	102	206	
Oct. 6.9	39.349	44.65	57.460	23.29	52.312	22.53	51.151	49.8
	301	231	359	115	239	124	241	
16.8	39.650	42.34	57.819	22.14	52.551	21.29	51.392	48.2
	335	223	403	58	270	146	273	
26.8	39.985	40.11	58.222	21.56	52.821	19.83	51.665	46.5
	366	210	439	4	294	166	299	
Nov. 5.8	40.351	38.01	58.661	21.60	53.115	18.17	51.964	44.6
	391	191	462	66	314	180	320	
15.8	40.742	36.10	59.123	22.26	53.429	16.37	52.284	42.7
	405	166	473	130	327	191	335	
25.7	41.147	34.44	59.596	23.56	53.756	14.46	52.619	40.8
	410	138	467	189	331	196	341	
Dec. 5.7	41.557	33.06	60.063	25.45	54.087	12.50	52.960	38.9
	404	102	447	243	327	195	338	
15.7	41.961	32.04	60.510	27.88	54.414	10.55	53.298	37.1
	385	63	411	289	310	186	325	
25.7	42.346	31.41	60.921	30.77	54.724	8.69	53.623	35.5
	355	23	363	325	286	174	299	
35.6	42.701	31.18	61.284	34.02	55.010	6.95	53.922	34.1
Mean Place	36.398	65.64	56.760	21.11	49.720	34.70	48.496	64.5
Sec δ, Tan δ	*1.334*	*+0.883*	1.708	−1.385	1.011	+0.148	1.047	+0.30
$D_\psi\, a$, $D_\omega\, a$	+0.07	+0.05	+0.04	−0.08	+0.06	+0.01	+0.06	+0.0
$D_\psi\, \delta$, $D_\omega\, \delta$	−0.3	+0.5	−0.3	+0.5	−0.3	+0.5	−0.3	+0.

FOR THE UPPER TRANSIT AT WASHINGTON.

ington Time.	α Leonis. (*Regulus.*) Mag. 1.3		λ Hydræ. Mag. 3.8		q Velorum. Mag. 4.1		32 Ursæ Majoris. Mag. 5.7	
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.
	h m s	° ′ ″	h m s	° ′ ″	h m s	° ′ ″	h m s	° ′ ″
	10 3	+12 21	10 6	−11 56	10 11	−41 42	10 12	+65 30
0.6	59.183	74.71	34.292	38.47	16.664	32.10	5.19	62.69
10.6	59.461 278	73.23 148	34.559 267	40.96 249	16.971 307	35.32 322	5.75 56	63.57 88
20.6	59.699 238	72.00 123	34.788 229	43.39 243	17.228 257	38.70 338	6.23 48	64.96 139
30.6	59.892 193	71.03 97	34.973 185	45.70 231	17.429 201	42.16 346	6.61 38	66.78 182
9.5	60.037 145	70.34 69	35.109 136	47.82 212	17.571 142	45.59 343	6.90 29	68.96 218
	93	43	87	191	84	333	16	243
19.5	60.130	69.91	35.196	49.73	17.655	48.92	7.06	71.39
1.5	60.174 44	69.73 — 18	35.235 — 39	51.39 166	17.681 — 26	52.06 314	7.12 — 6	73.99 260
11.5	60.174 0	69.77 4	35.232 3	52.80 141	17.654 27	54.97 291	7.08 4	76.61 262
21.4	60.133 41	69.99 22	35.189 43	53.93 113	17.580 74	57.57 260	6.94 14	79.14 253
31.4	60.058 75	70.35 36	35.115 74	54.81 88	17.466 114	59.85 228	6.71 23	81.50 236
	99	45	98	61	144	190	30	207
. 10.4	59.959	70.80	35.017	55.42	17.322	61.75	6.41	83.57
20.3	59.842 117	71.32 52	34.901 116	55.79 37	17.153 169	63.25 150	6.04 37	85.29 172
30.3	59.717 125	71.87 55	34.777 124	55.91 — 12	16.969 184	64.34 109	5.65 39	86.59 130
r 10.3	59.589 128	72.43 56	34.649 128	55.81 10	16.776 193	65.00 66	5.24 41	87.43 84
20.3	59.464 125	72.96 53	34.523 126	55.49 32	16.582 194	65.23 — 23	4.83 41	87.79 — 36
	114	50	117	51	190	20	40	13
30.2	59.350	73.46	34.406	54.98	16.392	65.03	4.43	87.66
e 9.2	59.247 103	73.90 44	34.298 108	54.28 70	16.211 181	64.42 61	4.06 37	87.03 63
19.2	59.161 86	74.28 38	34.205 93	53.43 85	16.045 166	63.40 102	3.72 34	85.94 109
29.2	59.095 66	74.59 31	34.130 75	52.44 99	15.897 148	62.02 138	3.44 28	84.42 152
y 9.1	59.049 46	74.81 22	34.073 57	51.34 110	15.774 123	60.31 171	3.22 22	82.50 192
	23	12	36	117	97	198	18	228
19.1	59.026	74.93	34.037	50.17	15.677	58.33	3.04	80.22
29.1	59.026 0	74.94 — 1	34.026 — 11	48.97 120	15.613 64	56.13 220	2.93 11	77.63 259
g. 8.0	59.052 26	74.83 11	34.039 13	47.80 117	15.583 — 30	53.79 234	2.89 — 4	74.81 282
18.0	59.103 51	74.56 27	34.079 40	46.69 111	15.592 9	51.40 239	2.92 3	71.78 303
28.0	59.184 81	74.13 43	34.148 69	45.70 99	15.643 51	49.03 237	3.04 12	68.62 316
	110	60	100	80	96	225	17	324
pt. 7.0	59.294	73.53	34.248	44.90	15.739	46.78	3.21	65.38
16.9	59.433 139	72.72 81	34.381 133	44.32 58	15.881 142	44.76 202	3.46 25	62.12 326
26.9	59.605 172	71.72 100	34.547 166	44.04 — 28	16.071 190	43.04 172	3.78 32	58.90 322
ct. 6.9	59.810 205	70.50 122	34.748 201	44.07 3	16.308 237	41.71 133	4.17 39	55.81 309
16.9	60.045 235	69.08 142	34.980 232	44.47 40	16.588 280	40.85 86	4.63 46	52.88 293
	267	161	265	78	321	35 —	51	268
26.8	60.312	67.47	35.245	45.25	16.909	40.50	5.14	50.20
ov. 5.8	60.605 293	65.72 175	35.536 291	46.39 114	17.264 355	40.71 21	5.72 58	47.82 238
15.8	60.920 315	63.85 187	35.849 313	47.89 150	17.644 380	41.50 79	6.34 62	45.83 199
25.7	61.249 329	61.91 194	36.175 326	49.71 182	18.038 394	42.84 134	6.99 65	44.29 154
ec. 5.7	61.584 335	59.97 194	36.506 331	51.80 209	18.435 397	44.71 187	7.65 66	43.23 106
	332	189	326	229	387	235	65	53
15.7	61.916	58.08	36.832	54.09	18.822	47.06	8.30	42.70
25.7	62.234 318	56.31 177	37.143 311	56.51 242	19.186 364	49.81 275	8.93 63	42.73 3
35.6	62.527 293	54.72 159	37.429 286	58.99 248	19.517 331	52.88 307	9.52 59	43.30 57
n Place	57.221	83.99	32.504	35.89	14.886	37.28	1.438	82.84
δ, Tan δ	1.024	+0.219	1.022	−0.212	1.340	−0.891	2.413	+2.196
, Δα	+0.06	+0.01	+0.06	−0.01	+0.05	−0.05	+0.09	+0.13
Δδ	−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 pr. Mag. 2.6		μ Ursæ M Mag.
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.
	h m 10 12 s	° ′ +23 49 ″	h m 10 12 s	° ′ +43 19 ″	h m 10 15 s	° ′ +20 15 ″	h m 10 17 s
Jan. 0.7	6.695	40.55	8.364	29.00	25.927	30.89	25.831
	6.995 300	39.57 98	8.720 356	28.94 — 6	26.223 296	29.73 116	26.185 354
10.6	7.255 260	38.91 66	9.029 309	29.30 36	26.481 258	28.85 88	26.494 309
20.6	7.468 213	38.58 33	9.282 253	30.07 77	26.694 213	28.30 55	26.749 255
30.6	7.630 162	38.56 — 2	9.472 190	31.19 112	26.857 163	28.06 — 24	26.942 193
Feb. 9.5	109	28	125	140	111	3	130
19.5	7.739	38.84	9.597	32.59	26.968	28.09	27.072
	7.795 56	39.35 51	9.656 — 59	34.21 162	27.028 60	28.39 30	27.138 66
Mar. 1.5	7.802 — 7	40.07 72	9.652 4	35.95 174	27.039 — 11	28.88 49	27.143 — 5
11.5	7.764 — 38	40.92 85	9.592 60	37.73 178	27.007 — 32	29.55 67	27.091 — 52
21.4	7.689 75	41.84 92	9.484 108	39.47 174	26.939 68	30.31 76	26.993 98
31.4	102	94	145	160	96	81	136
Apr. 10.4	7.587	42.78	9.339	41.07	26.843	31.12	26.857
	7.463 124	43.70 92	9.165 174	42.49 142	26.727 116	31.93 81	26.693 164
20.4	7.328 135	44.54 84	8.975 190	43.66 117	26.599 128	32.71 78	26.512 181
30.3	7.189 139	45.27 73	8.778 197	44.55 89	26.467 132	33.41 70	26.323 189
May 10.3	7.052 137	45.88 61	8.583 195	45.11 56	26.336 131	34.02 61	26.134 189
20.3	129	45	186	23	123	49	180
30.2	6.923	46.33 28	8.397	45.34	26.213	34.51	25.954
June 9.2	6.808 115	46.61 12	8.229 168	45.24 10	26.103 110	34.86 35	25.790 164
19.2	6.709 99	46.73 — 6	8.081 148	44.82 42	26.007 96	35.07 21	25.645 145
29.2	6.631 78	46.67 25	7.960 121	44.06 76	25.931 76	35.14 — 7	25.525 120
July 9.1	6.574 57	46.42 41	7.868 92	43.00 106	25.874 57	35.05 9	25.432 93
	33		60	134	33	25	62
19.1	6.541	46.01	7.808	41.66	25.841	34.80	25.370
29.1	6.532 — 9	45.42 59	7.782 — 26	40.06 160	25.831 — 10	34.40 40	25.339 — 31
Aug. 8.0	6.551 19	44.65 77	7.791 9	38.25 181	25.848 17	33.83 57	25.342 3
18.0	6.597 46	43.71 94	7.836 45	36.22 203	25.891 43	33.08 75	25.381 39
28.0	6.673 76	42.59 112	7.920 84	34.02 220	25.963 72	32.17 91	25.457 76
	107	129	124	233	103	110	115
Sept. 7.0	6.780	41.30	8.044	31.69	26.066	31.07	25.572
	6.919 139	39.84 146	8.208 164	29.25 244	26.200 134	29.80 127	25.726 154
16.9	7.093 174	38.22 162	8.413 205	26.75 250	26.367 167	28.35 145	25.921 195
26.9	7.302 209	36.46 176	8.660 247	24.22 253	26.569 202	26.73 162	26.156 235
Oct. 6.9	7.543 241	34.57 189	8.948 288	21.70 252	26.804 235	24.97 176	26.434 278
16.9	274	197	325	243	268	189	316
26.8	7.817	32.60	9.273	19.27	27.072	23.08	26.750
Nov. 5.8	8.121 304	30.57 203	9.635 362	16.97 230	27.368 296	21.11 197	27.100 350
15.8	8.449 328	28.55 202	10.025 390	14.87 210	27.688 320	19.10 201	27.479 379
25.7	8.793 344	26.59 196	10.434 409	13.01 186	28.026 338	17.11 199	27.881 402
Dec. 5.7	9.147 354	24.74 185	10.853 419	11.48 153	28.373 347	15.20 191	28.292 411
	351	166	418	116	346	178	412
15.7	9.498	23.08	11.271	10.32	28.719	13.42	28.704
25.7	9.838 340	21.64 144	11.674 403	9.56 76	29.054 335	11.85 157	29.102 398
35.6	10.153 315	20.49 115	12.050 376	9.24 32	29.365 311	10.51 134	29.475 373
Mean Place	4.638	53.14	5.897	45.96	23.938	42.71	23.446
Sec δ, Tan δ	1.093	+0.442	1.375	+0.943	1.066	+0.369	1.344
$D_\psi a$, $D_\omega a$	+0.07	+0.03	+0.07	+0.06	+0.07	+0.02	+0.07
$D_\psi \delta$, $D_\omega \delta$	−0.4	+0.5	−0.4	+0.5	−0.4	+0.4	−0.4

FOR THE UPPER TRANSIT AT WASHINGTON.

ington Time.	30 H. Ursæ Majoris. Mag. 4.9		μ Hydræ. Mag. 4.1		31 Leonis Minoris. Mag. 4.4		α Antliæ. Mag. 4.4	
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.
	h m s	° ′ ″	h m s	° ′ ″	h m s	° ′ ″	h m s	° ′ ″
	10 18	+65 58	10 22	−16 24	10 23	−37 7	10 23	−30 38
. 0.7	13.88	51.59	6.239	45.16	7.602	42.12	22.799	40.04
10.6	14.45 57	52.43 84	6.521 282	47.78 262	7.942 340	41.66 46	23.096 297	43.01 297
20.6	14.95 50	53.78 135	6.764 243	50.37 259	8.240 298	41.63 3	23.350 254	46.09 308
30.6	15.35 40	55.58 180	6.963 199	52.89 252	8.488 248	41.99 −36	23.556 206	49.17 308
. 9.5	15.64 29	57.75 217	7.114 151	55.26 237	8.679 191	42.72 73	23.711 155	52.18 301
	19	243	103	216	131	103	102	288
19.5	15.83	60.18	7.217	57.42	8.810	43.75	23.813	55.06
r. 1.5	15.91 8	62.79 261	7.272 55	59.37 195	8.881 71	45.04 129	23.863 50	57.75 269
11.5	15.88 −3	65.44 265	7.282 10	61.05 168	8.895 14	46.48 144	23.865 2	60.20 245
21.4	15.74 14	68.02 258	7.252 −30	62.47 142	8.857 −38	48.02 154	23.825 −40	62.35 215
31.4	15.51 23	70.43 241	7.189 63	63.60 113	8.775 82	49.57 155	23.749 76	64.20 185
	30	213	88	86	118	148	105	151
r. 10.4	15.21	72.56	7.101	64.46	8.657	51.05	23.644	65.71
20.4	14.86 35	74.34 178	6.994 107	65.04 58	8.513 144	52.40 135	23.517 127	66.88 117
30.3	14.46 40	75.71 137	6.873 121	65.36 32	8.351 162	53.57 117	23.377 140	67.69 81
y 10.3	14.04 42	76.62 91	6.748 125	65.42 −6	8.182 169	54.52 95	23.227 150	68.15 46
20.3	13.62 42	77.05 −43	6.622 126	65.23 19	8.013 169	55.19 −67	23.076 151	68.25 −10
	40	7	122	42	161	41	148	26
30.2	13.22	76.98	6.500	64.81	7.852	55.60	22.928	67.99
ne 9.2	12.83 39	76.42 56	6.387 113	64.16 65	7.702 150	55.71 −11	22.787 141	67.39 60
19.2	12.48 35	75.38 104	6.285 102	63.32 84	7.570 132	55.52 −19	22.657 130	66.49 90
29.2	12.18 30	73.90 148	6.197 88	62.30 102	7.460 110	55.06 46	22.543 114	65.29 120
ly 9.1	11.94 24	72.02 188	6.128 69	61.13 117	7.374 86	54.31 75	22.447 96	63.83 146
	19	226	51	127	58	100	74	168
19.1	11.75 12	69.76	6.077 28	59.86	7.316 30	53.31	22.373 50	62.15
29.1	11.63 −6	67.19 257	6.049 −4	58.53 133	7.286 −1	52.05 126	22.323 −20	60.32 183
ug. 8.1	11.57 −1	64.37 282	6.045 −24	57.18 135	7.285 −33	50.56 149	22.303 −10	58.40 192
18.0	11.58 9	61.33 304	6.069 52	55.87 131	7.318 67	48.87 169	22.313 −43	56.45 195
28.0	11.67	58.14 319	6.121	54.67 120	7.385	47.00 187	22.356	54.54 191
	16	327	84	104	103	205	82	177
ept. 7.0	11.83	54.87	6.205	53.63	7.488	44.95	22.438	52.77
16.9	12.08 25	51.57 330	6.323 118	52.81 82	7.627 139	42.76 219	22.559 121	51.22 155
26.9	12.39 31	48.31 326	6.477 154	52.26 55	7.805 178	40.47 229	22.721 162	49.95 127
ct. 6.9	12.77 38	45.14 317	6.666 189	52.05 −21	8.022 217	38.09 238	22.924 203	49.04 91
16.9	13.22 45	42.16 298	6.892 226	52.21 16	8.279 257	35.68 241	23.168 244	48.55 49
	51	276	260	50	295	239	280	2
26.8	13.73	39.40	7.152	52.77	8.574	33.29	23.448	48.53
Nov. 5.8	14.30 57	36.96 244	7.440 288	53.72 95	8.902 328	30.97 232	23.761 313	49.02 49
15.8	14.92 62	34.89 207	7.753 313	55.07 135	9.259 357	28.78 219	24.099 338	49.99 97
25.8	15.58 66	33.27 162	8.082 329	56.78 171	9.637 378	26.78 200	24.455 356	51.44 145
Dec. 5.7	16.25 67	32.13 114	8.419 337	58.81 203	10.027 390	25.04 174	24.817 362	53.34 190
	66	60	335	228	391	144	358	240
15.7	16.91	31.53	8.754	61.09	10.418	23.60	25.175	55.64
25.7	17.56 65	31.48 −5	9.075 321	63.56 247	10.799 381	22.53 107	25.517 342	58.26 262
35.6	18.16 60	32.00 52	9.372 297	66.13 257	11.155 356	21.85 68	25.831 314	61.11 285
ean Place	10.162	72.23	4.536	43.67	5.378	58.41	21.115	42.55
ec δ, Tan δ	*2.457*	*+2.244*	*1.043*	*−0.295*	1.254	+0.757	1.163	−0.588
α, $D_m\alpha$	*+0.09*	*+0.14*	*+0.06*	*−0.02*	+0.07	+0.05	+0.05	−0.04
δ, $D_m\delta$	*−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 Sex Mag
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.
	h m	° ′	h m	° ′	h m	° ′	h m
	10 25	+56 23	10 28	+76 7	10 28	+ 9 43	10 37
	s	″	s	″	s	″	s
Jan. 0.7	22.448	63.78	10.19	65.99	28.369	53.58	12.528
	452	38	92	108	290	167	286
10.6	22.900	64.16	11.11	67.07	28.659	51.91	12.817
	395	87	79	161	255	145	255
20.6	23.295	65.03	11.90	68.68	28.914	50.46	13.072
	326	133	65	209	214	119	215
30.6	23.621	66.36	12.55	70.77	29.128	49.27	13.287
	250	172	49	246	167	92	166
Feb. 9.6	23.871	68.08	13.04	73.23	29.295	48.35	13.456
	167	203	31	275	118	63	122
19.5	24.038	70.11	13.35	75.98	29.413	47.72	13.578
	82	223	11	290	70	37	73
Mar. 1.5	24.120	72.34	13.46	78.88	29.483	47.35	13.653
	0	233	6	293	23	12	31
11.5	24.120	74.67	13.40	81.81	29.506	47.23	13.684
	75	233	25	283	17	8	10
21.4	24.045	77.00	13.15	84.64	29.489	47.31	13.674
	141	223	39	262	51	26	42
31.4	23.904	79.23	12.76	87.26	29.438	47.57	13.632
	195	203	52	233	79	38	70
Apr. 10.4	23.709	81.26	12.24	89.59	29.359	47.95	13.562
	237	175	63	192	99	48	90
20.4	23.472	83.01	11.61	91.51	29.260	48.43	13.472
	266	143	72	146	112	54	104
30.3	23.206	84.44	10.89	92.97	29.148	48.97	13.368
	281	103	75	94	119	57	111
May 10.3	22.925	85.47	10.14	93.91	29.029	49.54	13.257
	284	61	77	41	117	58	113
20.3	22.641	86.08	9.37	94.32	28.912	50.12	13.144
	277	18	77	13	114	56	110
30.3	22.364	86.26	8.60	94.19	28.798	50.68	13.034
	259	26	74	68	105	52	104
June 9.2	22.105	86.00	7.86	93.51	28.693	51.20	12.930
	236	70	69	120	93	48	94
19.2	21.869	85.30	7.17	92.31	28.600	51.68	12.836
	203	110	61	169	76	42	81
29.2	21.666	84.20	6.56	90.62	28.524	52.10	12.755
	166	148	52	213	60	35	65
July 9.1	21.500	82.72	6.04	88.49	28.464	52.45	12.690
	125	183	42	252	41	23	49
19.1	21.375	80.89	5.62	85.97	28.423	52.68	12.641
	81	215	31	286	19	14	29
29.1	21.294	78.74	5.31	83.11	28.404	52.82	12.612
	34	241	20	314	3	2	8
Aug. 8.1	21.260	76.33	5.11	79.97	28.407	52.84	12.604
	16	264	7	334	28	13	17
18.0	21.276	73.69	5.04	76.63	28.435	52.71	12.621
	67	281	6	350	54	30	42
28.0	21.343	70.88	5.10	73.13	28.489	52.41	12.663
	120	295	20	357	85	48	73
Sept. 7.0	21.463	67.93	5.30	69.56	28.574	51.93	12.736
	174	303	31	358	115	70	104
17.0	21.637	64.90	5.61	65.98	28.689	51.23	12.840
	229	304	44	350	148	90	136
26.9	21.866	61.86	6.05	62.48	28.837	50.33	12.976
	285	301	57	337	181	114	172
Oct. 6.9	22.151	58.85	6.62	59.11	29.018	49.19	13.148
	337	291	69	317	217	134	208
16.9	22.488	55.94	7.31	55.94	29.235	47.85	13.356
	388	275	80	288	249	157	240
26.8	22.876	53.19	8.11	53.06	29.484	46.28	13.596
	434	251	89	251	278	175	272
Nov. 5.8	23.310	50.68	9.00	50.55	29.762	44.53	13.868
	472	222	97	209	305	190	299
15.8	23.782	48.46	9.97	48.46	30.067	42.63	14.167
	502	187	102	159	322	200	317
25.8	24.284	46.59	10.99	46.87	30.389	40.63	14.484
	517	143	105	105	333	204	329
Dec. 5.7	24.801	45.16	12.04	45.82	30.722	38.59	14.813
	518	96	106	45	334	202	331
15.7	25.319	44.20	13.10	45.37	31.056	36.57	15.144
	504	45	103	13	325	194	322
25.7	25.823	43.75	14.13	45.50	31.381	34.63	15.466
	475	7	97	74	304	178	302
35.7	26.298	43.82	15.10	46.24	31.685	32.85	15.768
Mean Place	19.572	83.75	4.749	88.04	26.559	62.93	10.837
Sec δ, Tan δ	1.807	+1.505	4.173	+4.052	1.015	+0.171	1.000
$D_\psi a$, $D_\omega a$	+0.08	+0.09	+0.10	+0.25	+0.06	+0.01	+0.06
$D_\psi \delta$, $D_\omega \delta$	−0.4	+0.4	−0.4	+0.4	−0.4	+0.4	−0.4

FOR THE UPPER TRANSIT AT WASHINGTON.

	41 Leonis Minoris. Mag. 5.0		θ Argus. Mag. 3.0		42 Leonis Minoris. Mag. 5.4		η Argus. Var. 1.6–6.6	
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.
	h m	° ′	h m	° ′	h m	° ′	h m	° ′
	10 38	+23 36	10 39	−63 57	10 41	+31 6	10 41	−59 14
	s	″	s	″	s	″	s	″
.7	56.266	70.26	61.36	25.64	17.195	55.59	52.004	43.28
.6	56.580 314	69.12 114	61.85 49	28.74 310	17.529 334	54.74 85	52.439 435	46.38 310
.6	56.861 281	68.31 81	62.26 41	32.18 344	17.825 296	54.28 46	52.811 372	49.82 344
.6	57.097 236	67.84 47	62.59 33	35.86 368	18.077 252	54.22 — 6	53.113 302	53.46 364
.6	57.286 189	67.73 11	62.83 24	39.69 383	18.278 201	54.53 31	53.336 223	57.23 377
	136	20	15	387	146	64	144	379
.5	57.422	67.93	62.98	43.56	18.424	55.17	53.480	61.02
.5	57.506 84	68.41 48	63.04 6	47.40 384	18.513 89	56.09 92	53.548 68	64.76 374
.5	57.541 35	69.12 71	63.02 — 2	51.10 370	18.549 36	57.24 115	53.541 — 7	68.34 358
.4	57.530 — 11	69.99 87	62.91 11	54.58 348	18.537 — 12	58.52 128	53.467 74	71.71 337
.4	57.482 48	70.98 99	62.74 17	57.79 321	18.482 55	59.87 135	53.331 136	74.79 308
	82	104	23	287	89	136	187	274
.4	57.400	72.02	62.51	60.66	18.393	61.23	53.144	77.53
.4	57.295 105	73.06 104	62.23 28	63.13 247	18.277 116	62.52 129	52.914 230	79.89 236
.3	57.173 122	74.03 97	61.91 32	65.16 203	18.143 134	63.69 117	52.651 263	81.81 192
0.3	57.043 130	74.91 88	61.56 35	66.73 157	17.999 144	64.69 100	52.363 288	83.25 144
0.3	56.911 132	75.66 75	61.18 38	67.79 106	17.851 148	65.51 82	52.058 305	84.22 97
	129	60	38	55	144	59	312	45
0.3	56.782	76.26	60.80	68.34	17.707	66.10	51.746	84.67
9.2	56.661 121	76.68 42	60.42 38	68.37 — 3	17.571 136	66.44 34	51.435 311	84.63 — 4
.9.2	56.553 108	76.91 23	60.05 37	67.87 50	17.448 123	66.54 — 10	51.134 301	84.10 53
:9.2	56.460 93	76.96 — 5	59.70 35	66.88 99	17.341 107	66.37 17	50.849 285	83.09 101
9.1	56.385 75	76.81 15	59.38 32	65.43 145	17.253 88	65.96 41	50.589 260	81.62 147
	55	34	28	188	65	67	226	187
19.1	56.330	76.47	59.10	63.55	17.188	65.29	50.363	79.75
29.1	56.298 32	75.94 53	58.87 23	61.30 225	17.146 42	64.39 90	50.178 185	77.53 222
8.1	56.288 — 10	75.20 74	58.69 18	58.74 256	17.131 — 15	63.26 113	50.041 137	75.03 250
18.0	56.306 18	74.28 92	58.58 11	55.98 276	17.143 12	61.92 134	49.961 80	72.34 269
28.0	56.352 46	73.15 113	58.56 — 2	53.10 288	17.187 44	60.36 156	49.943 — 18	69.55 279
	77	132	5	289	75	174	51	279
7.0	56.429	71.83	58.61	50.21	17.262	58.62	49.994	66.76
17.0	56.539 110	70.33 150	58.75 14	47.42 279	17.374 112	56.70 192	50.117 123	64.08 268
26.9	56.682 143	68.65 168	58.97 22	44.84 258	17.523 149	54.62 208	50.314 197	61.62 246
6.9	56.863 181	66.81 184	59.28 31	42.59 225	17.709 186	52.43 219	50.587 273	59.49 213
16.9	57.081 218	64.82 199	59.67 39	40.76 183	17.934 225	50.14 229	50.928 341	57.77 172
	253	209	46	134	264	234	406	122
26.8	57.334	62.73	60.13	39.42	18.198	47.80	51.334	56.55
5.8	57.619 285	60.58 215	60.66 53	38.66 76	18.497 299	45.46 234	51.794 460	55.91 64
15.8	57.934 315	58.42 216	61.23 57	38.52 — 14	18.825 328	43.18 228	52.296 502	55.89 — 2
25.8	58.270 336	56.30 212	61.84 61	39.04 52	19.178 353	41.03 215	52.825 529	56.49 60
5.7	58.622 352	54.28 202	62.45 61	40.19 115	19.546 368	39.05 198	53.364 539	57.72 123
	353	184	59	176	372	172	532	183
15.7	58.975	52.44	63.04	41.95	19.918	37.33	53.896	59.55
25.7	59.321 346	50.84 160	63.61 57	44.28 233	20.284 366	35.91 142	54.403 507	61.93 238
35.7	59.650 329	49.51 133	64.13 52	47.09 281	20.630 346	34.85 106	54.869 466	64.76 283
Place	54.375	83.92	59.488	35.70	15.213	71.33	50.234	52.58
Man ∂	*1.091*	*+0.437*	*2.278*	*−2.047*	1.168	+0.604	1.956	−1.681
, a	*+0.07*	*+0.03*	*+0.04*	*−0.13*	+0.07	+0.04	+0.05	−0.11
∂	*−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		l Leonis. Mag. 5.3		δ^2 Chamæleon. Mag. 4.6		ν Hydræ. Mag. 3.3	
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.
	h m s 10 43	° ′ ″ −48 58	h m s 10 44	° ′ ″ +10 58	h m s 10 44	° ′ ″ −80 5	h m s 10 45	° ′ ″ −15
Jan. 0.7	13.403	46.71	55.517	54.44	64.00	56.53	33.280	33.57
	368	309	301	168	105	284	297	36.12
10.6	13.771	49.80	55.818	52.76	65.05	59.37	33.577	36.12
	318	334	268	145	91	328	263	38.68
20.6	14.089	53.14	56.086	51.31	65.96	62.65	33.840	38.68
	261	352	228	116	70	361	221	41.19
30.6	14.350	56.66	56.314	50.15	66.66	66.26	34.061	41.19
	200	357	183	88	50	380	176	43.44
Feb. 9.6	14.550	60.23	56.497	49.27	67.16	70.06	34.237	43.44
	134	356	135	58	28	395	129	
19.5	14.684	63.79	56.632	48.69	67.44	74.01	34.366	45.58
	73	344	86	30	8	398	81	47.51
Mar. 1.5	14.757	67.23	56.718	48.39	67.52	77.99	34.447	47.51
	13	327	40	6	14	393	37	49.17
11.5	14.770	70.50	56.758	48.33	67.38	81.92	34.484	49.17
	−42	303	0	−17	33	377	4	50.53
21.5	14.728	73.53	56.758	48.50	67.05	85.69	34.480	50.53
	90	274	37	34	50	355	38	51.73
31.4	14.638	76.27	56.721	48.84	66.55	89.24	34.442	51.73
	128	239	67	47	67	326	68	
Apr. 10.4	14.510	78.66	56.654	49.31	65.88	92.50	34.374	52.60
	162	201	88	56	80	289	88	53.21
20.4	14.348	80.67	56.566	49.87	65.08	95.39	34.286	53.21
	187	161	103	61	91	247	104	53.57
30.3	14.161	82.28	56.463	50.48	64.17	97.86	34.182	53.57
	204	116	112	64	101	203	113	53.68
May 10.3	13.957	83.44	56.351	51.12	63.16	99.89	34.069	53.68
	217	72	115	63	108	150	118	53.55
20.3	13.740	84.16	56.236	51.75	62.08	101.39	33.951	53.55
	219	25	112	61	113	99	116	
30.3	13.521	84.41	56.124	52.36	60.95	102.38	33.835	53.20
	218	−20	107	55	113	−42	114	52.64
June 9.2	13.303	84.21	56.017	52.91	59.82	102.80	33.721	52.64
	209	65	98	48	112	12	104	51.89
19.2	13.094	83.56	55.919	53.39	58.70	102.68	33.617	51.89
	197	108	84	41	108	66	94	50.98
29.2	12.897	82.48	55.835	53.80	57.62	102.02	33.523	50.98
	177	146	69	31	101	119	81	49.92
July 9.2	12.720	81.02	55.766	54.11	56.61	100.83	33.442	49.92
	152	182	53	20	90	170	63	
19.1	12.568	79.20	55.713	54.31	55.71	99.13	33.379	48.74
	122	211	33	−8	77	211	44	47.52
29.1	12.446	77.09	55.680	54.39	54.94	97.02	33.335	47.52
	85	233	12	−5	60	248	22	46.27
Aug. 8.1	12.361	74.76	55.668	54.34	54.34	94.54	33.313	46.27
	44	247	−13	22	43	279	−1	45.04
18.0	12.317	72.29	55.681	54.12	53.91	91.75	33.314	45.04
	4	254	38	38	21	296	31	43.90
28.0	12.321	69.75	55.719	53.74	53.70	88.79	33.345	43.90
	−54	250	68	56	−1	307	62	
Sept. 7.0	12.375	67.25	55.787	53.18	53.69	85.72	33.407	42.90
	109	236	99	79	23	301	95	42.10
17.0	12.484	64.89	55.886	52.39	53.92	82.71	33.502	42.10
	166	212	131	99	45	288	131	41.55
26.9	12.650	62.77	56.017	51.40	54.37	79.83	33.633	41.55
	223	179	167	123	68	261	169	41.33
Oct. 6.9	12.873	60.98	56.184	50.17	55.05	77.22	33.802	41.33
	280	136	203	143	88	226	207	41.45
16.9	13.153	59.62	56.387	48.74	55.93	74.96	34.009	41.45
	330	87	237	165	105	179	244	
26.9	13.483	58.75	56.624	47.09	56.98	73.17	34.253	41.93
	374	−32	271	183	122	122	276	42.81
Nov. 5.8	13.857	58.43	56.895	45.26	58.20	71.95	34.529	42.81
	410	−26	299	196	132	−61	305	44.08
15.8	14.267	58.69	57.194	43.30	59.52	71.34	34.834	44.08
	435	−86	319	205	138	−5	324	45.70
25.8	14.702	59.55	57.513	41.25	60.90	71.39	35.158	45.70
	444	144	333	209	139	70	337	47.64
Dec. 5.7	15.146	60.99	57.846	39.16	62.29	72.09	35.495	47.64
	440	199	337	205	137	137	340	
15.7	15.586	62.98	58.183	37.11	63.66	73.46	35.835	49.84
	423	246	331	196	129	196	331	52.22
25.7	16.009	65.44	58.514	35.15	64.95	75.42	36.166	52.22
	391	285	314	180	116	254	310	54.71
35.7	16.400	68.29	58.828	33.35	66.11	77.96	36.476	54.71
Mean Place	11.758	53.94	53.786	64.66	61.016	68.64	31.690	31.67
Sec δ, Tan δ	1.521	−1.150	1.019	+0.194	5.819	−5.733	1.039	−0.28
$D\psi\,\alpha$, $D\omega\,\alpha$	+0.05	−0.07	+0.06	+0.01	+0.01	−0.36	+0.06	−0
$D\psi\,\delta$, $D\omega\,\delta$	−0.4	+0.3	−0.4	+0.3	−0.4	+0.3	−0.4	

FOR THE UPPER TRANSIT AT WASHINGTON.

Epoch Time.	46 Leonis Minoris. Mag. 3.9		54 Leonis. Mag. 4.5		ι Antliæ. Mag. 4.7		Groombridge 1706. Mag. 6.3	
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.
	h m s	° ′ ″	h m s	° ′ ″	h m s	° ′ ″	h m s	° ′ ″
	10 48	+34 39	10 51	+25 10	10 52	−36 41	10 53	+78 12
0.7	42.459	28.78	9.150	79.35	52.647	24.65	26.65	30.81
	348	76	325	115	334	201	109	82
10.6	42.807	28.02	9.475	78.20	52.981	27.56	27.74	31.63
	311	35	291	80	293	311	98	141
20.6	43.118	27.67	9.766	77.40	53.274	30.67	28.72	33.04
	266	8	250	44	246	319	83	192
30.6	43.384	27.75	10.016	76.96	53.520	33.86	29.55	34.96
	214	46	202	7	196	320	65	234
9.6	43.598	28.21	10.218	76.89	53.716	37.06	30.20	37.30
	159	81	150	27	141	312	46	289
19.5	43.757	29.02	10.368	77.16	53.857	40.18	30.66	39.99
	101	111	98	55	88	298	24	291
1.5	43.858	30.13	10.466	77.71	53.945	43.16	30.90	42.90
	44	132	48	81	37	279	2	299
11.5	43.902	31.45	10.514	78.52	53.982	45.95	30.92	45.89
	6	147	2	97	9	253	17	295
21.5	43.896	32.92	10.516	79.49	53.973	48.48	30.75	48.84
	50	154	40	110	50	224	38	281
31.4	43.846	34.46	10.476	80.59	53.923	50.72	30.37	51.65
	89	152	73	115	84	194	54	254
10.4	43.757	35.98	10.403	81.74	53.839	52.66	29.83	54.19
	117	144	97	114	109	158	67	218
20.4	43.640	37.42	10.306	82.88	53.730	54.24	29.16	56.37
	138	131	118	109	131	122	80	173
30.3	43.502	38.73	10.188	83.97	53.599	55.46	28.36	58.10
10.3	151	110	128	98	146	84	87	125
	43.351	39.83	10.060	84.95	53.453	56.30	27.49	59.35
20.3	156	88	131	83	155	47	92	73
	43.195	40.71	9.929	85.78	53.298	56.77	26.57	60.08
	154	62	131	66	158	8	93	16
30.3	43.041	41.33	9.798	86.44	53.140	56.85	25.64	60.24
9.2	147	34	125	48	157	29	91	39
	42.894	41.67	9.673	86.92	52.983	56.56	24.73	59.85
19.2	135	6	114	26	150	66	87	95
	42.759	41.73	9.559	87.18	52.833	55.90	23.86	58.90
29.2	118	24	102	6	141	100	80	146
	42.641	41.49	9.457	87.24	52.692	54.90	23.06	57.44
9.2	101	51	85	15	126	132	72	195
	42.540	40.98	9.372	87.09	52.566	53.58	22.34	55.49
	77	79	65	38	107	159	61	236
19.1	42.463	40.19	9.307	86.71	52.459	51.99	21.73	53.13
	53	105	45	58	87	181	49	275
29.1	42.410	39.14	9.262	86.13	52.372	50.18	21.24	50.38
8.1	26	130	21	81	58	198	35	308
	42.384	37.84	9.241	85.32	52.314	48.20	20.89	47.30
18.0	2	154	4	100	28	207	23	332
	42.386	36.30	9.245	84.32	52.286	46.13	20.66	43.98
28.0	35	175	33	122	8	208	8	352
	42.421	34.55	9.278	83.10	52.294	44.05	20.58	40.46
	68	195	64	142	47	203	8	364
7.0	42.489	32.60	9.342	81.68	52.341	42.02	20.66	36.82
	105	213	96	161	92	186	22	370
17.0	42.594	30.47	9.438	80.07	52.433	40.16	20.88	33.12
	143	228	132	179	136	163	38	366
26.9	42.737	28.19	9.570	78.28	52.569	38.53	21.26	29.46
6.9	183	238	170	195	184	130	54	355
	42.920	25.81	9.740	76.33	52.753	37.23	21.80	25.91
16.9	225	245	207	210	230	91	67	339
	43.145	23.36	9.947	74.23	52.983	36.32	22.47	22.52
	264	249	245	219	274	45	81	313
26.9	43.409	20.87	10.192	72.04	53.257	35.87	23.28	19.39
5.8	301	247	279	225	315	4	94	280
	43.710	18.40	10.471	69.79	53.572	35.91	24.22	16.59
15.8	333	238	311	226	346	56	106	238
	44.043	16.02	10.782	67.53	53.918	36.47	25.28	14.21
25.8	361	222	335	220	372	109	113	191
	44.404	13.80	11.117	65.33	54.290	37.56	26.41	12.30
5.7	376	200	352	207	383	158	118	135
	44.780	11.80	11.469	63.26	54.673	39.14	27.59	10.95
	383	172	357	190	385	204	121	77
15.7	45.163	10.08	11.826	61.36	55.058	41.18	28.80	10.18
	378	139	352	164	373	243	120	16
25.7	45.541	8.69	12.178	59.72	55.431	43.61	30.00	10.02
	362	100	336	135	351	276	115	46
35.7	45.903	7.69	12.514	58.37	55.782	46.37	31.15	10.48
Mean Place	40.473	45.71	7.318	93.92	51.107	28.88	21.248	54.54
Sec δ, Tan δ	1.218	+0.691	1.105	+0.470	1.247	−0.745	4.894	+4.790
Δ α, Δ α	+0.07	+0.04	+0.07	+0.03	+0.06	−0.05	+0.10	+0.31
Δ δ, Δ 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.	α Crateris. Mag. 4.2		d Leonis. Mag. 5.0		β Ursæ Majoris. Mag. 2.4		α Ursæ M Mag. 1
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.
	h m s	° ′ ″	h m s	° ′ ″	h m s	° ′ ″	h m s
	10 55	−17 51	10 56	+ 4 3	10 56	+56 48	10 58
Jan. 0.7	45.271	25.59	18.100	39.73	53.125	77.52	39.93
	304	258	302	196	479	5	55
10.7	45.575	28.17	18.402	37.77	53.604	77.57	40.48
	271	259	271	178	432	59	49
20.6	45.846	30.76	18.673	35.99	54.036	78.16	40.97
	232	253	234	155	371	109	42
30.6	46.078	33.29	18.907	34.44	54.407	79.25	41.39
	186	243	189	129	300	155	33
Feb. 9.6	46.264	35.72	19.096	33.15	54.707	80.80	41.72
	137	226	143	102	219	192	25
19.5	46.401	37.98	19.239	32.13	54.926	82.72	41.97
	91	204	96	75	136	221	16
Mar. 1.5	46.492	40.02	19.335	31.38	55.062	84.93	42.13
	47	180	52	49	53	238	6
11.5	46.539	41.82	19.387	30.89	55.115	87.31	42.19
	−5	154	11	24	−23	245	−5
21.5	46.544	43.36	19.398	30.65	55.092	89.76	42.14
	31	129	26	5	95	241	12
31.4	46.513	44.65	19.372	30.60	54.997	92.17	42.02
	60	100	54	−14	156	227	19
Apr. 10.4	46.453	45.65	19.318	30.74	54.841	94.44	41.83
	82	73	77	29	205	204	25
20.4	46.371	46.38	19.241	31.03	54.636	96.48	41.58
	100	48	93	39	241	174	30
30.4	46.271	46.86	19.148	31.42	54.395	98.22	41.28
	110	21	103	48	268	139	32
May 10.3	46.161	47.07	19.045	31.90	54.127	99.61	40.96
	118	3	108	54	280	96	35
20.3	46.043	47.04	18.937	32.44	53.847	100.57	40.61
	118	28	108	57	283	53	35
30.3	45.925	46.76	18.829	33.01	53.564	101.10	40.26
	114	49	104	59	275	9	34
June 9.2	45.811	46.27	18.725	33.60	53.289	101.19	39.92
	110	71	97	58	258	37	32
19.2	45.701	45.56	18.628	34.18	53.031	100.82	39.60
	101	89	87	57	237	81	30
29.2	45.600	44.67	18.541	34.75	52.794	100.01	39.30
	88	105	73	53	206	123	27
July 9.2	45.512	43.62	18.468	35.28	52.588	98.78	39.03
	72	119	59	48	171	163	22
19.1	45.440	42.43	18.409	35.76	52.417	97.15	38.81
	55	127	41	40	133	198	17
29.1	45.385	41.16	18.368	36.16	52.284	95.17	38.64
	33	130	21	30	89	229	12
Aug. 8.1	45.352	39.86	18.347	36.46	52.195	92.88	38.52
	10	130	0	16	43	258	7
18.1	45.342	38.56	18.347	36.62	52.152	90.30	38.45
	−19	123	27	2	−6	281	1
28.0	45.361	37.33	18.374	36.64	52.158	87.49	38.44
	19	110	54	−17	59	300	−5
Sept. 7.0	45.410	36.23	18.428	36.47	52.217	84.49	38.49
	85	92	86	37	114	312	12
17.0	45.495	35.31	18.514	36.10	52.331	81.37	38.61
	120	66	120	62	171	319	19
26.9	45.615	34.65	18.634	35.48	52.502	78.18	38.80
	160	36	155	85	231	320	25
Oct. 6.9	45.775	34.29	18.789	34.63	52.733	74.98	39.05
	200	3	191	111	288	316	33
16.9	45.975	34.26	18.980	33.52	53.021	71.82	39.38
	236	−37	227	136	345	302	39
26.9	46.211	34.63	19.207	32.16	53.366	68.80	39.77
	272	76	261	161	398	284	45
Nov. 5.8	46.483	35.39	19.468	30.55	53.764	65.96	40.22
	302	116	290	181	446	257	50
15.8	46.785	36.55	19.758	28.74	54.210	63.39	40.72
	325	154	314	197	484	222	55
25.8	47.110	38.09	20.072	26.77	54.694	61.17	41.27
	338	186	328	210	508	180	57
Dec. 5.8	47.448	39.95	20.400	24.67	55.202	59.37	41.84
	342	216	333	214	522	134	59
15.7	47.790	42.11	20.733	22.53	55.724	58.03	42.43
	336	236	329	210	517	82	59
25.7	48.126	44.47	21.062	20.43	56.241	57.21	43.02
	318	252	314	203	496	28	58
35.7	48.444	46.99	21.376	18.40	56.737	56.93	43.58
Mean Place	43.737	24.26	16.480	48.08	50.595	99.35	37.132
Sec δ, Tan δ	*1.051*	*0.322*	1.003	+0.071	1.827	+1.529	2.344
Dψ α, Dω α	*+0.06*	*- 0.02*	+0.06	0.00	+0.07	+0.10	+0.07
ψ δ, Dω δ	*0.4*	*+0.3*	-0.4	+0.3	-0.4	+0.3	-0.4

FOR THE UPPER TRANSIT AT WASHINGTON.

ington Time.	χ Leonis. Mag. 4.7		p^4 Leonis. Mag. 5.7		ψ Ursæ Majoris. Mag. 3.2		β Crateris. Mag. 4.5	
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.
	h m 11 0 s	° ′ + 7 46 ″	h m 11 2 s	° ′ + 2 23 ″	h m 11 5 s	° ′ +44 56 ″	h m 11 7 s	° ′ −22 22 ″
0.7	45.824	56.73	41.822	75.32	2.294	36.78	35.890	21.38
10.7	46.130 306	54.88 185	42.125 303	73.29 203	2.690 396	36.29 49	36.206 316	24.02 264
20.6	46.406 276	53.26 162	42.399 274	71.43 186	3.051 361	36.30 1	36.491 285	26.72 270
30.6	46.644 238	51.88 138	42.636 237	69.79 164	3.364 313	36.78 48	36.736 245	29.41 269
. 9.6	46.838 194 147	50.79 109 80	42.830 194 148	68.39 140 112	3.621 257 193	37.71 93 132	36.936 200 153	32.02 261 248
19.5	46.985 101	49.99 52	42.978 101	67.27 87	3.814 130	39.03 164	37.089 105	34.50 230
. 1.5	47.086 56	49.47 26	43.079 57	66.40 59	3.944 65	40.67 186	37.194 59	36.80 206
11.5	47.142 14	49.21 3	43.136 16	65.81 35	4.009 5	42.53 199	37.253 18	38.86 182
21.5	47.156 22	49.18 19	43.152 19	65.46 13	4.014 50	44.52 203	37.271 20	40.68 155
31.4	47.134 53	49.37 33	43.133 49	65.33 5	3.964 96	46.55 190	37.251 49	42.23 127
:. 10.4	47.081	49.70	43.084	65.38	3.868	48.54	37.202	43.50
20.4	47.006 75	50.15 45	43.012 72	65.60 22	3.734 134	50.40 186	37.126 76	44.49 99
30.4	46.915 91	50.69 54	42.923 89	65.93 33	3.571 163	52.04 164	37.033 93	45.20 71
y 10.3	46.812 103	51.28 59	42.823 100	66.37 44	3.390 181	53.42 138	36.926 107	45.63 43
20.3	46.703 109 109	51.90 62 61	42.717 106 107	66.88 51 55	3.198 192 195	54.48 106 71	36.809 117 120	45.77 14 13
30.3	46.594	52.51	42.610	67.43	3.003	55.19	36.689	45.64
ne 9.2	46.488 106	53.10 59	42.506 104	68.02 59	2.813 190	55.55 36	36.571 118	45.25 39
19.2	46.389 99	53.66 56	42.407 99	68.62 60	2.633 180	55.54 1	36.455 116	44.62 63
29.2	46.300 89	54.16 50	42.318 89	69.22 60	2.468 165	55.14 40	36.346 109	43.75 87
ly 9.2	46.223 77 62	54.58 42 34	42.241 77 63	69.80 58 53	2.325 143 120	54.38 76 111	36.248 98 85	42.69 106 124
19.1	46.161	54.92	42.178	70.33	2.205	53.27	36.163	41.45
29.1	46.115 46	55.15 23	42.131 47	70.79 46	2.110 95	51.84 143	36.095 68	40.10 135
ıg. 8.1	46.090 25	55.26 11	42.104 27	71.16 37	2.047 63	50.10 174	36.047 48	38.67 143
18.1	46.086 4	55.23 3	42.098 6	71.42 26	2.018 29	48.08 202	36.025 22	37.21 146
28.0	46.108 22 49	55.03 20 40	42.118 20 46	71.51 9 7	2.025 7 45	45.83 225 246	36.029 4 37	35.78 143 133
pt. 7.0	46.157	54.63	42.164	71.44	2.070	43.37	36.066	34.45
17.0	46.239 82	54.04 59	42.242 78	71.16 28	2.157 87	40.72 265	36.139 73	33.30 115
26.9	46.354 115	53.21 83	42.355 113	70.66 50	2.290 133	37.94 278	36.251 112	32.37 93
:t. 6.9	46.505 151	52.14 107	42.504 149	69.89 77	2.470 180	35.09 285	36.404 153	31.75 62
16.9	46.691 186 224	50.84 130 153	42.689 185 221	68.87 102 130	2.697 227 274	32.20 289 286	36.598 194 234	31.48 27 11
26.9	46.915	49.31	42.910	67.57	2.971	29.34	36.832	31.59
ov. 5.8	47.174 259	47.56 175	43.166 256	66.02 155	3.290 319	26.57 277	37.105 273	32.12 53
15.8	47.462 288	45.65 191	43.452 286	64.26 176	3.649 359	23.98 259	37.410 305	33.08 96
25.8	47.774 312	43.61 204	43.763 311	62.31 195	4.040 391	21.61 237	37.739 329	34.45 137
ec. 5.8	48.102 328 335	41.48 213 211	44.088 325 333	60.21 210 215	4.454 414 426	19.56 205 167	38.084 345 351	36.18 173 208
15.7	48.437	39.37	44.421	58.06	4.880	17.89	38.435	38.26
25.7	48.769 332	37.30 207	44.750 329	55.91 215	5.305 425	16.64 125	38.781 346	40.60 234
35.7	49.085 316	35.36 194	45.065 315	53.84 207	5.714 409	15.86 78	39.111 330	43.14 254
ın Place	44.205	66.38	40.246	83.26	0.238	56.81	34.425	21.40
∂, Tan ∂	*1.009*	*+0.137*	*1.001*	+0.042	1.413	+0.998	1.081	−0.412
, D_α α	*+0.06*	*+0.01*	*+0.06*	0.00	+0.07	+0.06	+0.06	−0.03
D_α ∂	*−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 Crate Mag. ?
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.
	h m 11 9	° ′ +20 58	h m 11 9	° ′ +15 52	h m 11 13	° ′ +33 32	h m 11 15
	s	″	s	″	s	″	s
Jan. 0.7	43.491	29.04	54.783	47.89	61.774	33.07	12.819
	327	143	317	160	355	99	313
10.7	43.818	27.61	55.100	46.29	62.129	32.08	13.132
	286	109	290	131	326	57	284
20.6	44.114	26.52	55.390	44.98	62.455	31.51	13.416
	258	74	252	100	284	13	246
30.6	44.372	25.78	55.642	43.98	62.739	31.38	13.662
	214	38	209	66	237	29	204
Feb. 9.6	44.586	25.40	55.851	43.32	62.976	31.67	13.866
	165	5	161	34	183	68	159
19.6	44.751	25.35	56.012	42.98	63.159	32.35	14.025
	116	28	114	4	128	100	113
Mar. 1.5	44.867	25.63	56.126	42.94	63.287	33.35	14.138
	68	54	66	24	74	128	68
11.5	44.935	26.17	56.192	43.18	63.361	34.63	14.206
	22	77	23	46	23	145	28
21.5	44.957	26.94	56.215	43.64	63.384	36.08	14.234
	18	91	15	64	23	157	7
31.4	44.939	27.85	56.200	44.28	63.361	37.65	14.227
	50	101	47	77	62	160	39
Apr. 10.4	44.889	28.86	56.153	45.05	63.299	39.25	14.188
	78	105	74	83	93	156	64
20.4	44.811	29.91	56.079	45.88	63.206	40.81	14.124
	97	104	91	86	119	145	8
30.4	44.714	30.95	55.988	46.74	63.087	42.26	14.042
	111	97	105	85	135	128	9
May 10.3	44.603	31.92	55.883	47.59	62.952	43.54	13.948
	119	88	111	80	144	107	10
20.3	44.484	32.80	55.772	48.39	62.808	44.61	13.844
	121	74	114	70	148	82	10
30.3	44.363	33.54	55.658	49.09	62.660	45.43	13.736
	117	60	112	61	145	56	10
June 9.3	44.246	34.14	55.546	49.70	62.515	45.99	13.628
	111	43	105	49	139	27	10
19.2	44.135	34.57	55.441	50.19	62.376	46.26	13.522
	102	24	97	36	129	2	9
29.2	44.033	34.81	55.344	50.55	62.247	46.24	13.423
	90	6	85	20	113	32	9
July 9.2	43.943	34.87	55.259	50.75	62.134	45.92	13.332
	73	15	70	5	96	61	7
19.1	43.870	34.72	55.189	50.80	62.038	45.31	13.253
	57	35	54	11	75	88	6
29.1	43.813	34.37	55.135	50.69	61.963	44.43	13.190
	37	54	35	30	53	116	4
Aug. 8.1	43.776	33.83	55.100	50.39	61.910	43.27	13.144
	12	77	12	47	26	141	2
18.1	43.764	33.06	55.088	49.92	61.884	41.86	13.121
	14	96	14	68	3	166	
28.0	43.778	32.10	55.102	49.24	61.887	40.20	13.123
	41	119	41	88	36	188	3
Sept. 7.0	43.819	30.91	55.143	48.36	61.923	38.32	13.155
	75	138	74	110	71	209	6
17.0	43.894	29.53	55.217	47.26	61.994	36.23	13.220
	110	160	108	130	111	226	10
27.0	44.004	27.93	55.325	45.96	62.105	33.97	13.322
	147	179	143	151	151	241	14
Oct. 6.9	44.151	26.14	55.468	44.45	62.256	31.56	13.462
	185	195	183	172	194	251	18
16.9	44.336	24.19	55.651	42.73	62.450	29.05	13.642
	225	211	220	189	235	258	22
26.9	44.561	22.08	55.871	40.84	62.685	26.47	13.862
	262	221	256	204	276	258	25
Nov. 5.8	44.823	19.87	56.127	38.80	62.961	23.89	14.119
	294	227	288	215	313	253	28
15.8	45.117	17.60	56.415	36.65	63.274	21.36	14.408
	321	226	315	219	344	240	31
25.8	45.438	15.34	56.730	34.46	63.618	18.96	14.724
	339	219	333	218	365	220	33
Dec. 5.8	45.777	13.15	57.063	32.28	63.983	16.76	15.057
	349	205	342	209	377	195	34
15.7	46.126	11.10	57.405	30.19	64.360	14.81	15.397
	349	187	341	196	378	161	33
25.7	46.475	9.23	57.746	28.23	64.738	13.20	15.735
	336	159	328	174	366	123	33
35.7	46.811	7.61	58.074	26.49	65.104	11.97	16.059
Mean Place	41.824	43.01	53.160	60.32	59.997	50.74	11.376
Sec δ, Tan δ	1.071	+0.383	1.040	+0.284	1.200	+0.663	1.032
$D_\psi a$, $D_\omega a$	+0.06	+0.02	+0.06	+0.02	+0.06	+0.04	+0.06
$\lambda_\psi \delta$, $D_\omega \delta$	−0.4	+0.2	−0.4	+0.2	−0.4	+0.2	−0.4

FOR THE UPPER TRANSIT AT WASHINGTON.

ington Time.	σ Leonis. Mag. 4.1		π Centauri. Mag. 4.3		ι Leonis. Mag. 4.0		τ Leonis. Mag. 5.2	
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.
	h m s 11 16	° ′ ″ + 6 28	h m s 11 17	° ′ ″ −54 2	h m s 11 19	° ′ ″ +10 58	h m s 11 23	° ′ ″ + 3 18
0.7	52.979	54.51	14.455	0.98	37.419	60.56	41.618	40.02
	312	192	435	279	318	180	314	203
10.7	53.291	52.59	14.890	3.77	37.737	58.76	41.932	37.99
	286	172	389	313	290	154	289	186
20.6	53.577	50.87	15.279	6.90	38.027	57.22	42.221	36.13
	249	148	331	337	255	126	253	162
30.6	53.826	49.39	15.610	10.27	38.282	55.96	42.474	34.51
	208	119	270	354	213	97	213	138
9.6	54.034	48.20	15.880	13.81	38.495	54.99	42.687	33.13
	163	91	203	359	169	65	169	110
19.6	54.197	47.29	16.083	17.40	38.664	54.34	42.856	32.03
	117	61	135	358	121	34	123	81
1.5	54.314	46.68	16.218	20.98	38.785	54.00	42.979	31.22
	73	34	70	347	77	8	80	55
11.5	54.387	46.34	16.288	24.45	38.862	53.92	43.059	30.67
	31	10	10	330	34	18	38	29
21.5	54.418	46.24	16.298	27.75	38.896	54.10	43.097	30.38
	5	12	46	306	3	36	2	8
31.4	54.413	46.36	16.252	30.81	38.893	54.46	43.099	30.30
	37	28	96	277	36	53	30	12
10.4	54.376	46.64	16.156	33.58	38.857	54.99	43.069	30.42
	62	42	137	243	61	64	54	29
20.4	54.314	47.06	16.019	36.01	38.796	55.63	43.015	30.71
	81	52	173	205	81	72	75	40
30.4	54.233	47.58	15.846	38.06	38.715	56.35	42.940	31.11
	93	59	201	163	94	73	88	48
10.3	54.140	48.17	15.645	39.69	38.621	57.08	42.852	31.59
	101	62	221	119	102	73	97	56
20.3	54.039	48.79	15.424	40.88	38.519	57.81	42.755	32.15
	104	63	236	73	107	69	101	60
30.3	53.935	49.42	15.188	41.61	38.412	58.50	42.654	32.75
	104	62	244	26	107	64	102	61
9.3	53.831	50.04	14.944	41.87	38.305	59.14	42.552	33.36
	100	59	246	21	102	57	99	61
19.2	53.731	50.63	14.698	41.66	38.203	59.71	42.453	33.97
	93	54	246	67	95	47	94	59
29.2	53.638	51.17	14.458	40.99	38.108	60.18	42.359	34.56
	83	48	228	112	86	35	85	56
9.2	53.555	51.65	14.230	39.87	38.022	60.53	42.274	35.12
	70	39	208	152	73	24	73	50
19.1	53.485	52.04	14.022	38.35	37.949	60.77	42.201	35.62
	57	30	182	188	58	11	60	42
29.1	53.428	52.34	13.840	36.47	37.891	60.88	42.141	36.04
	38	17	147	219	40	4	44	32
8.1	53.390	52.51	13.693	34.28	37.851	60.84	42.097	36.36
	17	4	105	240	19	22	23	19
18.1	53.373	52.55	13.588	31.88	37.832	60.62	42.074	36.55
	5	14	56	256	3	38	0	5
28.0	53.378	52.41	13.532	29.32	37.835	60.24	42.074	36.60
	35	32	1	261	33	59	28	14
7.0	53.413	52.09	13.533	26.71	37.868	59.65	42.102	36.46
	65	52	61	255	63	81	59	34
17.0	53.478	51.57	13.594	24.16	37.931	58.84	42.161	36.12
	98	76	126	240	96	102	91	56
27.0	53.576	50.81	13.720	21.76	38.027	57.82	42.252	35.56
	136	100	195	214	134	126	129	82
6.9	53.712	49.81	13.915	19.62	38.161	56.56	42.381	34.74
	173	125	260	179	172	148	167	108
16.9	53.885	48.56	14.175	17.83	38.333	55.08	42.548	33.66
	211	148	325	134	210	170	205	133
26.9	54.096	47.08	14.500	16.49	38.543	53.38	42.753	32.33
5.8	54.344	45.37	14.881	15.66	38.790	51.51	42.996	30.75
	248	171	381	83	247	187	243	158
15.8	54.623	43.48	15.310	15.40	39.069	49.48	43.271	28.96
	279	189	429	26	279	203	275	179
25.8	54.930	41.44	15.774	15.73	39.376	47.33	43.574	26.99
	307	204	464	33	307	215	303	197
5.8	55.254	39.31	16.259	16.66	39.703	45.16	43.897	24.88
	324	213	485	93	327	217	323	211
	335	216	491	151	337	215	333	216
15.7	55.589	37.15	16.750	18.17	40.040	43.01	44.230	22.72
	334	211	482	204	337	206	333	216
25.7	55.923	35.04	17.232	20.21	40.377	40.95	44.563	20.56
	322	200	455	251	328	191	324	207
35.7	56.245	33.04	17.687	22.72	40.705	39.04	44.887	18.49
an Place	51.460	64.09	12.999	9.66	35.891	71.67	40.156	48.67
c ∂, Tan ∂	*1.006*	*+0.114*	*1.703*	*−1.378*	1.019	+0.194	1.002	+0.058
α, D_m α	*+0.06*	*+0.01*	*+0.05*	*−0.09*	+0.06	+0.01	+0.06	0.00
, D_m ∂	*−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				υ Leon Mag. 4	
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.	
	h m		° ′		h m		° ′		h m		° ′		h m	
	11 26		+69 46		11 28		−31 23		11 31		−62 33		11 32	
	s		″		s		″		s		″		s	
Jan. 0.7	32.52		56.70		56.346		51.29		58.05		27.40		43.336	
10.7	33.24	72	56.84	14	56.690	344	53.93	264	58.59	54	29.97	257	43.654	318
20.6	33.91	67	57.58	74	57.004	314	56.73	280	59.07	48	32.95	298	43.945	291
30.6	34.50	59	58.89	131	57.279	275	59.62	289	59.49	42	36.25	330	44.203	258
Feb. 9.6	34.98	48	60.72	183	57.509	230	62.53	291	59.84	35	39.81	356	44.422	219
		38		226		181		284		27		368		176
19.6	35.36		62.98		57.690		65.37		60.11		43.49		44.598	
Mar. 1.5	35.62	26	65.56	258	57.823	133	68.09	272	60.30	19	47.22	373	44.730	132
11.5	35.75	13	68.35	279	57.907	84	70.62	253	60.41	11	50.92	370	44.818	88
21.5	35.75	0	71.22	287	57.947	40	72.95	233	60.44	3	54.49	357	44.866	48
31.5	35.63	12	74.07	285	57.948	1	75.01	206	60.40	4	57.88	339	44.877	11
		21		270		35		180		11		314		21
Apr. 10.4	35.42		76.77		57.913		76.81		60.29		61.02		44.856	
20.4	35.11	31	79.22	245	57.849	64	78.31	150	60.13	16	63.84	282	44.810	46
30.4	34.73	38	81.33	211	57.762	87	79.49	118	59.92	21	66.30	246	44.743	67
May 10.3	34.28	45	83.03	170	57.657	105	80.36	87	59.67	25	68.35	205	44.662	81
20.3	33.80	48	84.26	123	57.537	120	80.90	54	59.38	29	69.95	160	44.571	91
		50		74		128		21		31		112		97
30.3	33.30		85.00		57.409		81.11		59.07		71.07		44.474	
June 9.3	32.80	50	85.21	21	57.276	133	81.00	11	58.74	33	71.69	62	44.374	100
19.2	32.30	50	84.90	31	57.142	134	80.57	43	58.40	34	71.81	12	44.275	99
29.2	31.82	48	84.07	83	57.011	131	79.83	74	58.07	33	71.43	38	44.180	95
July 9.2	31.39	43	82.74	133	56.888	123	78.82	101	57.74	33	70.55	88	44.092	88
		39		179		113		127		31		134		79
19.2	31.00		80.95		56.775		77.55		57.43		69.21		44.013	
29.1	30.66	34	78.73	222	56.676	99	76.08	147	57.16	27	67.46	175	43.948	65
Aug. 8.1	30.39	27	76.13	260	56.598	78	74.43	165	56.93	23	65.32	214	43.897	51
18.1	30.20	19	73.21	292	56.544	54	72.70	173	56.74	19	62.89	243	43.866	31
28.0	30.08	12	70.02	319	56.520	24	70.93	177	56.62	12	60.24	265	43.856	10
		3		340		10		174		5		276		19
Sept. 7.0	30.05		66.62		56.530		69.19		56.57		57.48		43.875	
17.0	30.10	5	63.07	355	56.578	48	67.57	162	56.60	3	54.69	279	43.923	48
27.0	30.24	14	59.44	363	56.670	92	66.14	143	56.73	13	51.99	270	44.006	83
Oct. 6.9	30.47	23	55.81	363	56.808	138	64.98	116	56.93	20	49.50	249	44.126	120
16.9	30.80	33	52.27	354	56.993	185	64.16	82	57.22	29	47.33	217	44.285	159
		43		341		231		42		37		177		199
26.9	31.23		48.86		57.224		63.74		57.59		45.56		44.484	
Nov. 5.9	31.74	51	45.70	316	57.498	274	63.75	1	58.04	45	44.28	128	44.720	236
15.8	32.33	59	42.85	285	57.811	313	64.23	48	58.55	51	43.56	72	44.992	272
25.8	32.99	66	40.40	245	58.154	343	65.18	95	59.12	57	43.45	11	45.292	300
Dec. 5.8	33.70	71	38.43	197	58.517	363	66.57	139	59.70	58	43.97	52	45.612	320
		74		143		373		182		60		112		332
15.7	34.44		37.00		58.890		68.39		60.30		45.09		45.944	
25.7	35.19	75	36.15	85	59.260	370	70.57	218	60.88	58	46.81	172	46.278	334
35.7	35.93	74	35.92	23	59.616	356	73.05	248	61.45	57	49.06	225	46.603	325
Mean Place	29.629		81.55		55.004		54.02		56.642		37.87		41.941	
Sec δ, Tan δ	2.894		+2.716		1.172		−0.610		2.170		−1.926		1.000	
$D_\psi\, a$, $D_\omega\, a$	+0.07		+0.18		+0.06		−0.04		+0.05		−0.13		+0.06	
$D_\psi\, \delta$, $D_\omega\, \delta$	−0.4		+0.1		−0.4		+0.1		−0.4		+0.1		−0.4	

FOR THE UPPER TRANSIT AT WASHINGTON.

ngton Time.	π Chamaeleontis. Mag. 5.7		8 Draconis. Mag. 5.5		ζ Crateris. Mag. 4.9		χ Ursæ Majoris. Mag. 3.8	
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.
	h m 11 33	° ′ −75 26	h m 11 37	° ′ +67 11	h m 11 40	° ′ −17 53	h m 11 41	° ′ +48 13
	s	″	s	″	s	″	s	″
0.7	51.35	1.09	53.86	50.55	34.527	22.95	42.205	60.65
	90	236	66	9	329	243	431	75
10.7	52.25	3.45	54.52	50.46	34.856	25.38	42.636	59.90
	81	285	61	53	303	248	402	20
20.7	53.06	6.30	55.13	50.99	35.159	27.86	43.038	59.70
	70	324	55	111	269	246	360	33
30.6	53.76	9.54	55.68	52.10	35.428	30.32	43.398	60.03
	56	356	46	164	229	236	308	84
9.6	54.32	13.10	56.14	53.74	35.657	32.68	43.706	60.87
	44	375	37	210	187	223	248	130
19.6	54.76	16.85	56.51	55.84	35.844	34.91	43.954	62.17
	29	388	26	245	141	203	182	169
1.5	55.05	20.73	56.77	58.29	35.985	36.94	44.136	63.86
	15	390	15	270	97	182	118	197
11.5	55.20	24.63	56.92	60.99	36.082	38.76	44.254	65.83
	1	384	4	282	55	157	53	218
21.5	55.21	28.47	56.96	63.81	36.137	40.33	44.307	68.01
	11	371	7	284	19	134	8	228
31.5	55.10	32.18	56.89	66.65	36.156	41.67	44.299	70.29
	23	348	16	273	15	108	62	228
10.4	54.87	35.66	56.73	69.38	36.141	42.75	44.237	72.57
	36	319	25	251	41	83	107	217
20.4	54.51	38.85	56.48	71.89	36.100	43.58	44.130	74.74
	44	285	31	221	63	58	146	200
30.4	54.07	41.70	56.17	74.10	36.037	44.16	43.986	76.74
	54	243	37	183	80	35	174	174
10.4	53.53	44.13	55.80	75.93	35.957	44.51	43.812	78.48
	57	199	41	139	92	11	193	144
20.3	52.96	46.12	55.39	77.32	35.865	44.62	43.619	79.92
	65	149	43	91	101	11	205	108
30.3	52.31	47.61	54.96	78.23	35.764	44.51	43.414	81.00
	69	97	44	41	106	32	210	69
e 9.3	51.62	48.58	54.52	78.64	35.658	44.19	43.204	81.69
	71	42	44	11	108	51	208	28
19.2	50.91	49.00	54.08	78.53	35.550	43.68	42.996	81.97
	71	12	42	62	106	71	201	13
29.2	50.20	48.88	53.66	77.91	35.444	42.97	42.795	81.84
r 9.2	49.51	48.23	53.27	76.79	35.342	42.12	42.608	81.30
	69	65	39	112	102	85	187	54
	65	118	36	159	93	98	168	93
19.2	48.86	47.05	52.91	75.20	35.249	41.14	42.440	80.37
	59	167	31	203	82	109	147	132
29.1	48.27	45.38	52.60	73.17	35.167	40.05	42.293	79.05
g. 8.1	47.76	43.28	52.34	70.74	35.101	38.90	42.173	77.36
	51	210	26	243	66	115	120	169
18.1	47.35	40.82	52.14	67.98	35.054	37.73	42.085	75.34
	41	246	20	276	47	117	88	202
28.1	47.07	38.08	52.02	64.92	35.032	36.59	42.031	73.04
	28	274	12	306	22	114	54	230
	15	293	6	330	6	105	14	258
ot. 7.0	46.92	35.15	51.96	61.62	35.038	35.54	42.017	70.46
	1	301	2	348	40	91	30	278
17.0	46.91	32.14	51.98	58.14	35.078	34.63	42.047	67.68
	17	297	10	357	77	69	78	296
27.0	47.08	29.17	52.08	54.57	35.155	33.94	42.125	64.72
t. 6.9	47.40	26.35	52.27	50.95	35.272	33.50	42.253	61.62
	32	282	19	362	117	44	128	310
16.9	47.87	23.80	52.54	47.37	35.432	33.37	42.435	58.47
	47	255	27	358	160	13	182	315
	63	216	35	345	202	22	236	315
26.9	48.50	21.64	52.89	43.92	35.634	33.59	42.671	55.32
ov. 5.9	49.25	19.96	53.34	40.65	35.876	34.17	42.959	52.25
	75	168	45	327	242	58	288	307
15.8	50.11	18.83	53.85	37.68	36.155	35.12	43.296	49.32
	86	113	51	297	279	95	337	293
25.8	51.05	18.32	54.43	35.09	36.466	36.44	43.674	46.63
ec. 5.8	94	51	58	259	311	132	378	269
	52.04	18.45	55.06	32.93	36.798	38.10	44.086	44.24
	99	13	63	216	332	166	412	239
	101	78	67	164	345	195	434	200
15.8	53.05	19.23	55.73	31.29	37.143	40.05	44.520	42.24
	100	142	68	106	345	220	443	156
25.7	54.05	20.65	56.41	30.23	37.488	42.25	44.963	40.68
	94	201	67	46	339	235	437	105
35.7	54.99	22.66	57.08	29.77	37.827	44.60	45.400	39.63
an Place	49.733	13.46	51.393	75.59	33.229	21.29	40.449	82.74
δ, Tan δ	*3.978*	*−3.850*	*2.580*	*+2.379*	1.051	−0.323	1.501	+1.120
; $D_m\,\alpha$	*+0.05*	*−0.25*	*+0.07*	*+0.16*	+0.06	−0.02	+0.06	+0.07
$D_m\,\delta$	*−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.	β Leonis. (Denebola.) Mag. 2.2		β Virginis. Mag. 3.8		Groombridge 1830. Mag. 6.5		γ Ursæ M Mag.
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.
	h m 11 44	° ′ +15 1	h m 11 46	° ′ + 2 13	h m 11 48	° ′ +38 18	h m 11 49
	s	″	s	″	s	″	s
Jan. 0.7	51.049	56.95	23.638	48.49	13.562	32.15	30.139
	329	177	324	208	392	128	478
10.7	51.378	55.18	23.962	46.41	13.954	30.87	30.617
	306	149	300	193	369	80	448
20.7	51.684	53.69	24.262	44.48	14.323	30.07	31.065
	275	116	270	170	333	30	405
30.6	51.959	52.53	24.532	42.78	14.656	29.77	31.470
	237	81	233	147	289	17	349
Feb. 9.6	52.196	51.72	24.765	41.31	14.945	29.94	31.819
	192	48	190	118	237	61	283
19.6	52.388	51.24	24.955	40.13	15.182	30.55	32.102
	147	13	146	91	181	101	213
Mar. 1.6	52.535	51.11	25.101	39.22	15.363	31.56	32.315
	101	17	104	62	126	132	137
11.5	52.636	51.28	25.205	38.60	15.489	32.88	32.452
	59	41	63	37	72	157	65
21.5	52.695	51.69	25.268	38.23	15.561	34.45	32.517
	18	64	25	12	22	172	6
31.5	52.713	52.33	25.293	38.11	15.583	36.17	32.511
	15	79	6	7	24	177	67
Apr. 10.4	52.698	53.12	25.287	38.18	15.559	37.94	32.444
	43	90	34	24	63	174	122
20.4	52.655	54.02	25.253	38.42	15.496	39.68	32.322
	68	94	55	37	93	164	167
30.4	52.587	54.96	25.198	38.79	15.403	41.32	32.155
	84	95	72	48	118	147	203
May 10.4	52.503	55.91	25.126	39.27	15.285	42.79	31.952
	96	91	84	55	135	124	228
20.3	52.407	56.82	25.042	39.82	15.150	44.03	31.724
	104	85	92	59	146	97	245
30.3	52.303	57.67	24.950	40.41	15.004	45.00	31.479
	108	74	96	62	151	65	253
June 9.3	52.195	58.41	24.854	41.03	14.853	45.65	31.226
	108	62	97	62	150	32	253
19.3	52.087	59.03	24.757	41.65	14.703	45.97	30.973
	105	49	96	61	146	1	246
29.2	51.982	59.52	24.661	42.26	14.557	45.96	30.727
	99	33	91	58	137	37	232
July 9.2	51.883	59.85	24.570	42.84	14.420	45.59	30.495
	90	16	83	52	123	72	212
19.2	51.793	60.01	24.487	43.36	14.297	44.87	30.283
	79	1	72	45	108	105	189
29.1	51.714	60.00	24.415	43.81	14.189	43.82	30.094
	62	20	59	36	87	138	157
Aug. 8.1	51.652	59.80	24.356	44.17	14.102	42.44	29.937
	45	39	42	23	62	170	121
18.1	51.607	59.41	24.314	44.40	14.040	40.74	29.816
	21	61	19	10	33	199	82
28.1	51.586	58.80	24.295	44.50	14.007	38.75	29.734
	4	82	6	8	2	224	38
Sept. 7.0	51.590	57.98	24.301	44.42	14.005	36.51	29.696
	35	104	37	28	36	249	12
17.0	51.625	56.94	24.338	44.14	14.041	34.02	29.708
	69	128	71	51	76	267	66
27.0	51.694	55.66	24.409	43.63	14.117	31.35	29.774
	107	149	107	76	120	285	123
Oct. 7.0	51.801	54.17	24.516	42.87	14.237	28.50	29.897
	147	172	148	101	167	297	184
16.9	51.948	52.45	24.664	41.86	14.404	25.53	30.081
	187	190	187	129	214	303	244
26.9	52.135	50.55	24.851	40.57	14.618	22.50	30.325
	227	209	227	152	261	304	303
Nov. 5.9	52.362	48.46	25.078	39.05	14.879	19.46	30.628
	265	220	263	176	304	299	359
15.8	52.627	46.26	25.341	37.29	15.183	16.47	30.987
	297	228	295	194	343	284	408
25.8	52.924	43.98	25.636	35.35	15.526	13.63	31.395
	320	228	317	210	372	261	447
Dec. 5.8	53.244	41.70	25.953	33.25	15.898	11.02	31.842
	336	223	332	218	395	233	473
15.8	53.580	39.47	26.285	31.07	16.293	8.69	32.315
	341	210	336	218	403	197	487
25.7	53.921	37.37	26.621	28.89	16.696	6.72	32.802
	335	190	330	214	396	154	484
35.7	54.256	35.47	26.951	26.75	17.092	5.18	33.286
Mean Place	49.653	69.92	22.311	57.16	12.010	52.10	28.353
Sec δ, Tan δ	1.035	+0.268	1.001	+0.039	1.274	+0.790	1.707
$D_\psi a$, $D_\omega a$	+0.06	+0.02	+0.06	0.00	+0.06	+0.05	+0.06
$D_\psi \delta$, $D_\omega \delta$	−0.4	+0.1	−0.4	+0.1	−0.4	+0.1	−0.4

FOR THE UPPER TRANSIT AT WASHINGTON.

agtom Time.	π Virginis. Mag. 4.6		o Virginis. Mag. 4.2		δ Centauri. Mag. 2.9		ε Corvi. Mag. 3.2	
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.
	h m 11 56	° ′ + 7 4	h m 12 0	° ′ + 9 11	h m 12 4	° ′ −50 15	h m 12 5	° ′ −22 9
	s	″	s	″	s	″	s	″
0.7	38.464 328	27.24 200	60.174 330	26.68 196	4.108 447	29.24 233	52.358 344	30.00 236
10.7	38.792 306	25.24 178	60.504 308	24.72 172	4.555 416	31.57 270	52.702 323	32.36 245
20.7	39.098 278	23.46 152	60.812 281	23.00 145	4.971 374	34.27 238	53.025 292	34.81 249
30.6	39.376 240	21.94 124	61.093 244	21.55 114	5.345 323	37.25 317	53.317 254	37.30 246
9.6	39.616 199	20.70 94	61.337 204	20.41 82	5.668 268	40.42 328	53.571 213	39.76 235
19.6	39.815	19.76 62	61.541	19.59 49	5.936	43.70	53.784	42.11
1.6	39.971 156	19.14 32	61.701 160	19.10 21	6.146 210	47.02 332	53.954 170	44.33 222
11.5	40.085 114	18.82 6	61.818 117	18.89 — 7	6.296 150	50.30 328	54.080 126	46.35 202
21.5	40.157 72	18.76 — 18	61.894 76	18.96 32	6.391 95	53.47 317	54.165 85	48.15 180
31.5	40.190 33	18.94 36	61.931 37	19.28 49	6.434 — 43	56.46 299	54.212 47	49.74 159
	1		4		6	278	12	134
10.5	40.191	19.30	61.935	19.77	6.428	59.24	54.224	51.08
20.4	40.162 29	19.82 52	61.909 26	20.40 63	6.379 49	61.74 250	54.206 18	52.17 109
30.4	40.112 50	20.45 63	61.861 48	21.15 75	6.291 88	63.94 220	54.164 42	53.02 85
10.4	40.043 69	21.15 70	61.793 68	21.94 79	6.170 121	65.78 184	54.101 63	53.61 59
20.3	39.960 83	21.87 72	61.711 82	22.75 81	6.022 148	67.23 145	54.021 80	53.96 35
	92	74	92	79	172	106	92	11
30.3	39.868	22.61	61.619	23.54	5.850	68.29	53.929	54.07
ɜ 9.3	39.771 97	23.31 70	61.521 98	24.29 75	5.661 189	68.93 64	53.826 103	53.95 12
19.3	39.671 100	23.97 66	61.420 101	24.96 67	5.459 202	69.13 — 20	53.717 109	53.59 36
29.2	39.571 100	24.57 60	61.318 102	25.55 59	5.250 209	68.89 24	53.605 112	53.02 57
ɣ 9.2	39.475 96	25.08 51	61.219 99	26.04 49	5.041 209	68.23 66	53.493 112	52.25 77
	90	42	93	37	204	106	108	94
19.2	39.385	25.50 30	61.126	26.41 23	4.837	67.17	53.385	51.31
29.2	39.305 80	25.80 15	61.042 84	26.64 9	4.647 190	65.75 142	53.284 101	50.23 108
g. 8.1	39.239 66	25.95 1	60.971 71	26.73 — 8	4.478 169	63.98 177	53.195 89	49.03 120
18.1	39.188 51	25.96 — 17	60.916 55	26.65 28	4.337 141	61.94 204	53.125 70	47.79 124
28.1	39.158 30	25.79 35	60.882 34	26.37 47	4.234 103	59.72 222	53.076 49	46.52 127
	5		11		58	235	21	121
pt. 7.0	39.153	25.44	60.871	25.90	4.176	57.37	53.055	45.31
17.0	39.178 25	24.88 56	60.891 20	25.21 69	4.171 — 5	54.99 238	53.068 13	44.19 112
27.0	39.236 58	24.09 79	60.944 53	24.30 91	4.225 54	52.68 231	53.119 51	43.23 96
t. 7.0	39.331 95	23.06 103	61.034 90	23.14 116	4.342 117	50.54 214	53.212 93	42.51 72
16.9	39.467 136	21.77 129	61.165 131	21.75 139	4.525 183	48.66 188	53.350 138	42.06 45
	176	151	172	163	247	152	184	10
26.9	39.643	20.26	61.337	20.12	4.772	47.14	53.534	41.96
v. 5.9	39.859 216	18.52 174	61.550 213	18.28 184	5.081 309	46.05 109	53.763 229	42.22 26
15.9	40.114 255	16.59 193	61.802 252	16.27 201	5.446 365	45.46 59	54.033 270	42.87 65
25.8	40.400 286	14.50 209	62.086 284	14.11 216	5.856 410	45.40 — 6	54.338 305	43.91 104
c. 5.8	40.713 313	12.32 218	62.398 312	11.89 222	6.300 444	45.90 50	54.670 332	45.30 139
	329	221	329	223	463	105	350	174
15.8	41.042	10.11	62.727	9.66	6.763	46.95	55.020	47.04
25.7	41.378 336	7.94 217	63.063 336	7.48 218	7.232 469	48.52 157	55.375 355	49.06 202
35.7	41.711 333	5.87 207	63.396 333	5.44 204	7.689 457	50.56 204	55.725 350	51.30 224
Place	37.180	37.72	58.908	37.95	2.987	37.19	51.206	29.59
, Tan δ	1.008	+0.124	1.013	+0.162	1.564	−1.203	1.080	−0.407
, D_α	+0.06	*+0.01*	*+0.06*	*+0.01*	+0.06	−0.08	+0.06	−0.03
D_δ	*−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 Cru Mag. 1
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.
	h m s	° ′ ″	h m s	° ′ ″	h m s	° ′ ″	h m s
	12 8	+78 3	12 10	−58 17	12 11	+57 28	12 11
Jan. 0.7	22.32	71.91	45.128	5.58	21.183	72.89	33.234
	116	19	525	216	515	80	339
10.7	23.48	71.72	45.653	7.74	21.698	72.09	33.573
	110	48	489	260	491	19	319
20.7	24.58	72.20	46.142	10.34	22.189	71.90	33.892
	101	110	443	294	452	40	290
30.6	25.59	73.30	46.585	13.28	22.641	72.30	34.182
	89	167	384	321	398	99	255
Feb. 9.6	26.48	74.97	46.969	16.49	23.039	73.29	34.437
	74	217	321	339	332	149	214
19.6	27.22	77.14	47.290	19.88	23.371	74.78	34.651
	55	259	253	348	259	193	173
Mar. 1.6	27.77	79.73	47.543	23.36	23.630	76.71	34.824
	36	286	184	350	181	228	130
11.5	28.13	82.59	47.727	26.86	23.811	78.99	34.954
	15	304	118	343	102	253	90
21.5	28.28	85.63	47.845	30.29	23.913	81.52	35.044
	5	306	54	331	27	265	53
31.5	28.23	88.69	47.899	33.60	23.940	84.17	35.096
	25	300	7	310	45	267	19
Apr. 10.5	27.98	91.69	47.892	36.70	23.895	86.84	35.115
	41	280	60	286	107	257	11
20.4	27.57	94.49	47.832	39.56	23.788	89.41	35.104
	56	250	108	254	162	240	35
30.4	27.01	96.99	47.724	42.10	23.626	91.81	35.069
	70	211	151	219	205	212	56
May 10.4	26.31	99.10	47.573	44.29	23.421	93.93	35.013
	80	166	189	181	241	177	73
20.3	25.51	100.76	47.384	46.10	23.180	95.70	34.940
	87	116	220	137	266	139	85
30.3	24.64	101.92	47.164	47.47	22.914	97.09	34.855
	91	62	245	95	281	94	95
June 9.3	23.73	102.54	46.919	48.42	22.633	98.03	34.760
	94	7	263	45	288	48	102
19.3	22.79	102.61	46.656	48.87	22.345	98.51	34.658
	92	50	275	2	287	0	105
29.2	21.87	102.11	46.381	48.85	22.058	98.51	34.553
	89	102	276	47	278	47	106
July 9.2	20.98	101.09	46.105	48.38	21.780	98.04	34.447
	84	154	272	94	262	94	104
19.2	20.14	99.55	45.833	47.44	21.518	97.10	34.343
	76	203	256	137	240	139	96
29.2	19.38	97.52	45.577	46.07	21.278	95.71	34.247
	68	247	232	176	211	181	86
Aug. 8.1	18.70	95.05	45.345	44.31	21.067	93.90	34.161
	58	284	197	209	176	220	76
18.1	18.12	92.21	45.148	42.22	20.891	91.70	34.091
	45	319	149	235	135	255	49
28.1	17.67	89.02	44.999	39.87	20.756	89.15	34.042
	31	345	94	252	89	284	2
Sept. 7.0	17.36	85.57	44.905	37.35	20.667	86.31	34.019
	18	365	31	262	36	310	
17.0	17.18	81.92	44.874	34.73	20.631	83.21	34.027
	3	377	42	258	21	330	4
27.0	17.15	78.15	44.916	32.15	20.652	79.91	34.071
	13	383	119	247	84	343	8
Oct. 7.0	17.28	74.32	45.035	29.68	20.736	76.48	34.157
	29	380	200	223	150	350	12
16.9	17.57	70.52	45.235	27.45	20.886	72.98	34.285
	45	370	278	190	217	350	17
26.9	18.02	66.82	45.513	25.55	21.103	69.48	34.458
	62	348	353	147	284	342	21
Nov. 5.9	18.64	63.34	45.866	24.08	21.387	66.06	34.676
	76	319	420	99	348	324	25
15.9	19.40	60.15	46.286	23.09	21.735	62.82	34.935
	89	282	476	42	406	297	29
25.8	20.29	57.33	46.762	22.67	22.141	59.85	35.229
	101	234	516	15	455	263	32
Dec. 5.8	21.30	54.99	47.278	22.82	22.596	57.22	35.550
	111	181	541	74	491	220	33
15.8	22.41	53.18	47.819	23.56	23.087	55.02	35.888
	114	121	548	131	512	169	34
25.7	23.55	51.97	48.367	24.87	23.599	53.33	36.236
	117	58	537	184	517	115	34
35.7	24.72	51.39	48.904	26.71	24.116	52.18	36.579
Mean Place	19.650	98.71	44.064	15.32	19.618	97.50	32.104
Sec δ, Tan δ	4.838	+4.734	1.903	−1.619	1.861	+1.569	1.046
$D_\psi a$, $D_\omega a$	+0.06	+0.32	+0.06	−0.11	+0.06	+0.10	+0.06
$D_\psi \delta$, $D_\omega \delta$	−0.4	0.0	−0.4	0.0	−0.4	0.0	−0.4

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	2 Canum Venat. Mag. 5.8		β Chamæleontis. Mag. 4.4		η Virginis. Mag. 4.0		α^1 Crucis. Mag. 1.6	
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.
	h m	° ′	h m	° ′	h m	° ′	h m	° ′
	12 11	+41 6	12 13	−78 50	12 15	− 0 12	12 21	−62 38
	s	″	s	″	s	″	s	″
0.7	59.715	58.12	27.81	52.05	40.716	28.48	59.13	10.85
10.7	60.114 399	56.86 126	29.05 124	53.82 177	41.046 330	30.60 212	59.73 60	12.81 196
20.7	60.494 380	56.11 75	30.21 116	56.13 231	41.358 312	32.61 201	60.29 56	15.24 243
30.7	60.842 348	55.89 22	31.26 105	58.91 278	41.644 286	34.43 182	60.80 51	18.05 281
9.6	61.150 308	56.18 29	32.15 89	62.09 318	41.896 252	36.01 158	61.25 45	21.19 314
	259	78	75	349	213	132	37	336
19.6	61.409	56.96	32.90	65.58	42.109	37.33	61.62	24.55
1.6	61.614 205	58.17 121	33.48 58	69.27 369	42.282 173	38.37 104	61.93 31	28.06 351
11.5	61.762 148	59.74 157	33.88 40	73.09 382	42.413 131	39.13 76	62.16 23	31.61 355
21.5	61.854 92	61.57 183	34.12 24	76.94 385	42.505 92	39.64 51	62.31 15	35.14 353
31.5	61.895 41	63.60 203	34.18 6	80.75 381	42.559 54	39.89 25	62.39 8	38.59 345
	9	213	10	369	21	4	1	328
r. 10.5	61.886	65.73	34.08	84.44	42.580	39.93	62.40	41.87
20.4	61.834 52	67.83 210	33.83 25	87.91 347	42.573 7	39.79 14	62.35 5	44.92 305
30.4	61.746 88	69.87 204	33.42 41	91.13 322	42.540 33	39.48 31	62.24 11	47.69 277
ay 10.4	61.628 118	71.73 186	32.89 53	94.01 288	42.488 52	39.07 41	62.08 16	50.12 243
20.4	61.488 140	73.36 163	32.24 65	96.47 246	42.420 68	38.56 51	61.86 22	52.16 204
	156	135	75	202	79	58	24	163
30.3	61.332	74.71	31.49	98.49	42.341	37.98	61.62	53.79
une 9.3	61.164 168	75.73 102	30.65 84	100.04 155	42.252 89	37.37 61	61.34 28	54.96 117
19.3	60.991 173	76.40 67	29.76 89	101.04 100	42.157 95	36.73 64	61.03 31	55.66 70
29.2	60.820 171	76.70 30	28.83 93	101.50 46	42.059 98	36.09 64	60.70 33	55.86 20
uly 9.2	60.655 165	76.63 7	27.89 94	101.41 9	41.961 98	35.47 62	60.37 33	55.57 29
	159	46	92	64	95	59	33	77
19.2	60.496	76.17	26.97	100.77	41.866	34.88	60.04	54.80
29.2	60.352 144	75.34 83	26.10 87	99.60 117	41.776 90	34.35 53	59.73 31	53.56 124
ug. 8.1	60.226 126	74.15 119	25.32 78	97.93 167	41.697 79	33.90 45	59.44 29	51.90 166
18.1	60.120 106	72.61 154	24.63 69	95.82 211	41.632 65	33.55 35	59.18 26	49.88 202
28.1	60.043 77	70.75 186	24.08 55	93.34 248	41.584 48	33.34 21	58.99 19	47.55 233
	47	215	37	277	21	6	13	257
pt. 7.1	59.996	68.60	23.71	90.57	41.563	33.28	58.86	44.98
17.0	59.987 9	66.18 242	23.51 20	87.61 296	41.569 6	33.40 12	58.79 7	42.30 268
27.0	60.020 33	63.53 265	23.51 0	84.58 303	41.608 39	33.75 35	58.81 2	39.59 271
t. 7.0	60.099 79	60.70 283	23.73 22	81.58 300	41.686 78	34.33 58	58.91 10	36.97 262
16.9	60.226 127	57.72 298	24.16 43	78.74 284	41.804 118	35.17 84	59.11 20	34.53 244
	179	306	64	256	160	111	29	213
26.9	60.405	54.66	24.80	76.18	41.964	36.28	59.40	32.40
v. 5.9	60.634 229	51.61 305	25.60 80	74.01 217	42.168 204	37.65 137	59.78 38	30.66 174
15.9	60.912 278	48.60 301	26.61 101	72.32 169	42.411 243	39.28 163	60.23 45	29.40 126
25.8	61.233 321	45.72 288	27.75 114	71.19 113	42.687 276	41.11 183	60.75 52	28.69 71
c. 5.8	61.592 359	43.07 265	28.98 123	70.68 51	42.992 305	43.12 201	61.32 57	28.55 14
	384	236	128	11	325	213	60	47
15.8	61.976	40.71	30.26	70.79	43.317	45.25	61.92	29.02
25.8	62.376 400	38.74 197	31.56 130	71.55 76	43.651 334	47.43 218	62.54 62	30.08 106
35.7	62.778 402	37.20 154	32.84 128	72.93 138	43.984 333	49.58 215	63.14 60	31.69 161
Place	58.355	79.27	26.825	64.93	39.568	20.31	58.181	21.43
, Tan δ	1.327	*+0.873*	*5.173*	*−5.075*	1.000	−0.004	2.176	−1.933
$D_m\,\alpha$	*+0.06*	*+0.06*	*+0.07*	*−0.34*	+0.06	0.00	+0.06	−0.13
$D_m\,\delta$	*−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.	20 Comæ. Mag. 5.7		δ Corvi. Mag. 3.1		γ Crucis. Mag. 1.6		8 Canum Mag. 4
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.
	h m s	° ′ ″	h m s	° ′ ″	h m s	° ′ ″	h m s
	12 25	+21 20	12 25	−16 3	12 26	−56 38	12 29
Jan. 0.7	34.365	64.53	35.120	15.13	33.971	44.91	49.531
10.7	34.711 346	62.71 182	35.461 341	17.37 224	34.490 519	46.90 199	49.933 402
20.7	35.043 332	61.26 145	35.786 325	19.65 228	34.979 489	49.34 244	50.321 388
30.7	35.349 306	60.19 107	36.083 297	21.92 227	35.426 447	52.12 278	50.680 359
Feb. 9.6	35.622 273	59.53 66	36.347 264	24.11 219	35.821 395	55.19 307	51.002 322
	234	25	227	204	337	326	276
19.6	35.856	59.28	36.574	26.15	36.158	58.45	51.278
Mar. 1.6	36.046 190	59.41 13	36.760 186	28.03 188	36.431 273	61.81 336	51.502 224
11.6	36.192 146	59.89 48	36.905 145	29.69 166	36.642 211	65.21 340	51.671 169
21.5	36.294 102	60.69 80	37.009 104	31.14 145	36.790 148	68.56 335	51.784 113
31.5	36.354 60	61.72 103	37.076 67	32.35 121	36.875 85	71.81 325	51.844 60
	23	122	34	99	29	305	10
Apr. 10.5	36.377	62.94	37.110	33.34	36.904	74.86	51.854
20.4	36.366 11	64.26 132	37.114 −4	34.10 76	36.878 26	77.70 284	51.819 35
30.4	36.328 38	65.62 136	37.092 22	34.65 55	36.805 73	80.26 256	51.745 74
May 10.4	36.265 63	66.97 135	37.049 43	34.99 34	36.689 116	82.49 223	51.639 106
20.4	36.185 80	68.25 128	36.987 62	35.13 14	36.534 155	84.37 188	51.508 131
	95	115	77	−5	186	147	152
30.3	36.090	69.40	36.910	35.08	36.348	85.84	51.356
June 9.3	35.984 106	70.41 101	36.821 89	34.85 23	36.132 216	86.88 104	51.189 167
19.3	35.871 113	71.24 83	36.724 97	34.47 38	35.895 237	87.47 59	51.014 175
29.3	35.754 117	71.85 61	36.621 103	33.93 54	35.643 252	87.60 −13	50.835 179
July 9.2	35.639 115	72.25 40	36.514 107	33.25 68	35.382 261	87.27 −33	50.657 178
	114	15	106	78	257	78	173
19.2	35.525	72.40	36.408	32.47	35.125	86.49	50.484
29.2	35.417 108	72.31 9	36.306 102	31.59 88	34.875 250	85.28 121	50.323 161
Aug. 8.1	35.320 97	71.97 34	36.213 93	30.65 94	34.644 231	83.69 159	50.175 148
18.1	35.237 83	71.37 60	36.133 80	29.69 96	34.444 200	81.76 193	50.048 127
28.1	35.175 62	70.52 85	36.073 60	28.74 95	34.283 161	79.55 221	49.944 104
	40	111	35	89	111	240	73
Sept. 7.1	35.135 9	69.41	36.038 6	27.85 76	34.172 52	77.15	49.871
17.0	35.126 25	68.05 136	36.032 −30	27.09 60	34.120 −16	74.64 251	49.835 −5
27.0	35.151 63	66.43 162	36.062 71	26.49 39	34.136 90	72.11 253	49.840
Oct. 7.0	35.214 105	64.59 184	36.133 115	26.10 11	34.226 167	69.68 243	49.891 51
17.0	35.319 150	62.52 207	36.248 159	25.99 −19	34.393 246	67.47 221	49.992 101
		225				192	153
26.9	35.469	60.27	36.407	26.18	34.639	65.55	50.145
Nov. 5.9	35.663 194	57.87 240	36.612 205	26.69 51	34.958 319	64.02 153	50.351 206
15.9	35.899 236	55.38 249	36.859 247	27.55 86	35.345 387	62.95 107	50.609 258
25.8	36.174 275	52.84 254	37.143 284	28.74 119	35.789 444	62.42 −53	50.914 305
Dec. 5.8	36.482 308	50.33 251	37.457 314	30.23 149	36.279 490	62.45 −3	51.258 344
	331	241	334	178	518	59	375
15.8	36.813	47.92	37.791	32.01	36.797	63.04	51.633
25.8	37.158 345	45.69 223	38.136 345	34.00 199	37.328 531	64.19 115	52.029 396
35.7	37.506 348	43.72 197	38.481	36.16 216	37.856 528	65.87 168	52.430 401
Mean Place	33.217	80.18	34.065	12.48	33.028	54.24	48.338
Sec δ, Tan δ	*1.074*	+0.391	1.041	−0.288	1.819	−1.520	1.341
Dψ a, Dω a	*+0.06*	+0.03	+0.06	−0.02	+0.07	−0.10	+0.06
Dψ δ, Dω δ	*−0.4*	−0.1	−0.4	−0.1	−0.4	−0.1	−0.4

FOR THE UPPER TRANSIT AT WASHINGTON.

	κ Draconis. Mag. 3.9		β Corvi. Mag. 2.8		24 Comæ *seq.* Mag. 5.2		α Muscæ. Mag. 2.9	
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.
	h m	° ′	h m	° ′	h m	° ′	h m	° ′
	12 29	+70 13	12 30	−22 56	12 30	+18 49	12 32	−68 40
	s	″	s	″	s	″	s	″
7	58.43	77.66	2.421	16.71	59.134	46.63	13.88	30.62
	75	69	353	222	343	189	73	171
7	59.18	76.97	2.774	18.93	59.477	44.74	14.61	32.33
	73	3	337	235	330	154	70	223
7	59.91	76.94	3.111	21.28	59.807	43.20	15.31	34.56
	68	61	309	240	305	118	64	267
7	60.59	77.55	3.420	23.68	60.112	42.02	15.95	37.23
	61	122	276	239	273	80	56	304
6	61.20	78.77	3.696	26.07	60.385	41.22	16.51	40.27
	52	177	237	231	226	39	49	332
6	61.72	80.54	3.933	28.38	60.621	40.83	17.00	43.59
	42	224	196	219	193	2	39	352
6	62.14	82.78	4.129	30.57	60.814	40.81	17.39	47.11
	29	260	153	201	150	34	30	362
6	62.43	85.38	4.282	32.58	60.964	41.15	17.69	50.73
	18	285	113	184	107	65	21	364
5	62.61	88.23	4.395	34.42	61.071	41.80	17.90	54.37
	6	296	74	161	66	89	12	360
5	62.67	91.21	4.469	36.03	61.137	42.69	18.02	57.97
	7	299	41	139	30	108	4	347
5	62.60	94.20	4.510	37.42	61.167	43.77	18.06	61.44
	18	288	8	115	3	122	6	328
4	62.42	97.08	4.518	38.57	61.164	44.99	18.00	64.72
	26	266	19	93	32	127	13	302
4	62.16	99.74	4.499	39.50	61.132	46.26	17.87	67.74
	35	236	42	68	54	128	20	270
4	61.81	102.10	4.457	40.18	61.078	47.54	17.67	70.44
	42	197	62	45	74	123	26	234
4	61.39	104.07	4.395	40.63	61.004	48.77	17.41	72.78
	47	152	79	21	89	112	32	192
3	60.92	105.59	4.316	40.84	60.915	49.89	17.09	74.70
	51	103	92	1	100	101	37	146
3	60.41	106.62	4.224	40.83	60.815	50.90	16.72	76.16
	52	51	103	24	108	85	40	97
3	59.89	107.13	4.121	40.59	60.707	51.75	16.32	77.13
	53	3	111	44	112	65	43	45
3	59.36	107.10	4.010	40.15	60.595	52.40	15.89	77.58
	53	55	114	65	114	46	45	6
2	58.83	106.55	3.896	39.50	60.481	52.86	15.44	77.52
	50	107	115	82	112	23	44	57
2	58.33	105.48	3.781	38.68	60.369	53.09	15.00	76.95
2	57.85	108.92	3.669	37.71	60.262	53.11	14.57	75.88
1	57.42	101.89	3.565	36.61	60.164	52.88	14.17	74.34
1	57.05	99.44	3.476	35.41	60.078	52.42	13.81	72.38
1	56.74	96.62	3.407	34.19	60.013	51.70	13.52	70.07
	24	315	69	122	65	72	29	231
			44	120	43	96	22	259
1	56.50	93.47	3.363	32.99	59.970	50.74	13.30	67.48
0	56.35	90.05	3.351	31.86	59.956	49.53	13.18	64.72
0	56.29	86.45	3.377	30.87	59.976	48.07	13.17	61.87
0	56.32	82.72	3.446	30.08	60.034	46.37	13.26	59.06
0	56.45	78.94	3.560	29.54	60.133	44.45	13.47	56.40
	13	378	114	54	99	192	21	266
	24	375	162	23	143	214	33	241
9	56.69	75.19	3.722	29.31	60.276	42.31	13.80	53.99
9	57.04	71.56	3.931	29.43	60.463	40.01	14.23	51.96
9	57.48	68.16	4.184	29.91	60.694	37.60	14.77	50.38
8	58.02	65.06	4.477	30.77	60.964	35.13	15.39	49.33
8	58.64	62.35	4.801	32.00	61.266	32.65	16.08	48.88
	62	271	324	123	302	248	69	45
	68	223	346	157	326	240	73	14
8	59.32	60.12	5.147	33.57	61.592	30.25	16.81	49.02
8	60.04	58.44	5.504	35.43	61.932	27.99	17.56	49.77
7	60.79	57.38	5.860	37.53	62.277	25.97	18.30	51.13
	72	168	357	186	340	226	75	75
	75	106	356	210	345	202	74	136
ace	56.924	104.25	1.405	16.40	58.031	61.51	13.073	42.18
an δ	2.958	+2.784	1.086	−0.423	1.057	+0.341	2.751	−2.582
α	+0.05	+0.18	+0.06	−0.03	+0.06	+0.02	+0.07	−0.17
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.	χ Virginis. Mag. 4.8		γ Centauri. Mag. 2.4		γ Virginis (*mean*). Mag. 2.9		ρ Virgin Mag. 5.
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.
	h m 12 34 s	° ′ − 7 32 ″	h m 12 36 s	−48 30 ″	h m 12 37 s	− 0 59 ″	h m 12 37 s
Jan. 0.7	58.654	26.06	56.856	7.72	28.306	47.69	42.086
	336	216	452	198	333	212	338
10.7	58.990	28.22	57.308	9.70	28.639	49.81	42.424
	322	213	432	235	320	201	324
20.7	59.312	30.35	57.740	12.05	28.959	51.82	42.748
	297	203	397	267	296	185	300
30.7	59.609	32.38	58.137	14.72	29.255	53.67	43.048
Feb. 9.6	266	186	355	288	265	161	270
	59.875	34.24	58.492	17.60	29.520	55.28	43.318
	231	165	307	304	231	137	236
19.6	60.106	35.89	58.799	20.64	29.751	56.65	43.554
Mar. 1.6	191	143	254	309	191	108	195
	60.297	37.32	59.053	23.73	29.942	57.73	43.749
11.6	151	118	201	310	152	80	154
	60.448	38.50	59.254	26.83	30.094	58.53	43.903
21.5	112	94	148	302	112	54	113
	60.560	39.44	59.402	29.85	30.206	59.07	44.016
31.5	76	68	97	291	76	28	75
	60.636	40.12	59.499	32.76	30.282	59.35	44.091
	44	47	49	273	44	7	40
Apr. 10.5	60.680	40.59	59.548	35.49	30.326	59.42	44.131
	13	26	6	250	12	12	9
20.4	60.693	40.85	59.554	37.99	30.338	59.30	44.140
	15	8	35	224	14	29	19
30.4	60.678	40.93	59.519	40.23	30.324	59.01	44.121
May 10.4	35	9	71	194	35	41	41
	60.643	40.84	59.448	42.17	30.289	58.60	44.080
20.4	53	23	104	160	55	51	60
	60.590	40.61	59.344	43.77	30.234	58.09	44.020
	70	35	131	124	70	58	76
30.3	60.520	40.26	59.213	45.01	30.164	57.51	43.944
June 9.3	81	45	155	86	81	62	88
	60.439	39.81	59.058	45.87	30.083	56.89	43.856
19.3	90	53	174	47	90	64	96
	60.349	39.28	58.884	46.34	29.993	56.25	43.760
29.3	97	60	189	5	97	65	102
	60.252	38.68	58.695	46.39	29.896	55.60	43.658
July 9.2	102	65	198	36	101	63	106
	60.150	38.03	58.497	46.03	29.795	54.97	43.552
	102	67	200	75	102	60	105
19.2	60.048	37.36	58.297	45.28	29.693	54.37	43.447
	99	69	195	112	99	55	102
29.2	59.949	36.67	58.102	44.16	29.594	53.82	43.345
Aug. 8.1	92	68	183	146	92	47	94
	59.857	35.99	57.919	42.70	29.502	53.35	43.251
18.1	80	63	162	176	82	37	83
	59.777	35.36	57.757	40.94	29.420	52.98	43.168
28.1	62	55	132	198	64	25	66
	59.715	34.81	57.625	38.96	29.356	52.73	43.102
	41	45	95	215	43	11	44
Sept. 7.1	59.674	34.36	57.530	36.81	29.313	52.62	43.058
	12	28	46	223	16	7	17
17.0	59.662	34.08	57.484	34.58	29.297	52.69	43.041
	21	11	7	222	17	29	15
27.0	59.683	33.97	57.491	32.36	29.314	52.98	43.056
Oct. 7.0	60	12	68	211	56	52	53
	59.743	34.09	57.559	30.25	29.370	53.50	43.109
17.0	101	38	133	191	95	78	92
	59.844	34.47	57.692	28.34	29.465	54.28	43.201
	145	66	199	162	138	102	137
26.9	59.989	35.13	57.891	26.72	29.603	55.30	43.338
Nov. 5.9	188	94	263	125	183	130	181
	60.177	36.07	58.154	25.47	29.786	56.60	43.519
15.9	232	123	323	80	225	155	223
	60.409	37.30	58.477	24.67	30.011	58.15	43.742
25.8	270	151	374	32	263	177	262
	60.679	38.81	58.851	24.35	30.274	59.92	44.004
Dec. 5.8	301	175	415	20	295	195	294
	60.980	40.56	59.266	24.55	30.569	61.87	44.298
	322	194	444	72	317	210	318
15.8	61.302	42.50	59.710	25.27	30.886	63.97	44.616
	335	208	458	123	330	214	333
25.8	61.637	44.58	60.168	26.50	31.216	66.11	44.949
35.7	338	214	458	170	334	214	336
	61.975	46.72	60.626	28.20	31.550	68.25	45.285
Mean Place	57.636	20.34	55.952	15.08	27.290	39.62	41.049
Sec δ, Tan δ	1.009	−0.132	1.509	−1.131	1.000	−0.017	1.018
$D_\psi a$, $D_\omega a$	+0.06	−0.01	+0.07	−0.07	+0.06	0.00	+0.07
$D_\psi \delta$, $D_\omega \delta$	−0.4	−0.2	−0.4	−0.2	−0.4	−0.2	−0.4

FOR THE UPPER TRANSIT AT WASHINGTON.

76 Ursæ Majoris. Mag. 5.9				β Crucis. Mag. 1.5				31 Comæ. Mag. 5.1				n Centauri. Mag. 4.3			
Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
h m	s	° ′	″	h m	s	° ′	″	h m	s	° ′	″	h m	s	° ′	″
12 37		+63 9		12 42		−59 13		12 47		+27 58		12 48		−39 43	
	57.89		41.04 97		52.445		57.35		40.405		73.63		50.925		34.90
	58.48 59		40.07 34		53.004 559		59.09 174		40.765 360		71.82 181		51.335 410		36.87 197
	59.06 58		39.73 — 30		53.537 533		61.30 221		41.113 348		70.40 142		51.727 392		39.13 226
	59.60 54		40.03 92		54.031 494		63.91 261		41.442 329		69.44 96		52.092 365		41.64 251
	60.08 48		40.95 147		54.475 444		66.82 291		41.740 298		68.94 50		52.423 331		44.30 266
	42				385		315		260		3		289		274
	60.50		42.42		54.860		69.97		42.000		68.91		52.712		47.04
	60.84 34		44.39 197		55.180 320		73.27 330		42.217 217		69.32 41		52.956 244		49.81 277
	61.09 25		46.75 236		55.436 256		76.65 338		42.390 173		70.12 80		53.153 197		52.53 272
	61.26 17		49.41 266		55.624 188		80.02 337		42.517 127		71.26 114		53.305 152		55.15 262
	61.34 — 8		52.23 282		55.748 124		83.33 331		42.600 83		72.66 140		53.412 107		57.64 249
	3		288		62		317		44		160		66		230
	61.31		55.11		55.810		86.50		42.644		74.26		53.478		59.94
	61.22 9		57.93 282		55.814 — 4		89.46 296		42.649 — 5		75.96 170		53.507 — 29		62.02 208
	61.06 16		60.59 266		55.762 52		92.19 273		42.622 27		77.70 174		53.501 6		63.87 185
	60.83 23		63.00 241		55.661 101		94.60 241		42.568 54		79.40 170		53.463 38		65.43 156
	60.55 28		65.06 206		55.515 146		96.67 207		42.489 79		80.99 159		53.397 66		66.71 128
	31		166		185		169		97		144		90		97
	60.24		66.72		55.330		98.36		42.392		82.43		53.307		67.68
	59.89 35		67.92 120		55.109 221		99.62 126		42.279 113		83.67 124		53.194 113		68.32 64
	59.53 36		68.65 73		54.859 250		100.44 82		42.157 122		84.67 100		53.064 130		68.62 — 30
	59.16 37		68.88 — 23		54.588 271		100.80 — 36		42.027 130		85.39 72		52.919 145		68.59 3
	58.79 37		68.59 29		54.304 284		100.69 11		41.892 135		85.84 45		52.764 155		68.21 38
	36		79		288		58		134		14		159		70
	58.43		67.80		54.016		100.11		41.758		85.98		52.605		67.51
	58.09 34		66.52 128		53.732 284		99.08 103		41.628 130		85.81 17		52.446 159		66.51 100
	57.78 31		64.79 173		53.466 266		97.64 144		41.506 122		85.34 47		52.295 151		65.23 128
	57.50 28		62.62 217		53.226 240		95.82 182		41.397 109		84.55 79		52.158 137		63.72 151
	57.27 23		60.06 256		53.026 200		93.68 214		41.306 91		83.46 109		52.044 114		62.02 170
	18		288		149		237		67		138		84		181
	57.09		57.18		52.877		91.31		41.239		82.08		51.960		60.21
	56.97 12		53.99 319		52.790 87		88.78 253		41.200 39		80.40 168		51.914 46		58.35 186
	56.92 — 5		50.58 341		52.774 — 16		86.20 258		41.195 — 5		78.47 193		51.914 0		56.52 183
	56.94 2		46.99 359		52.838 64		83.66 254		41.230 35		76.28 219		51.965 51		54.82 170
	57.04 10		43.31 368		52.985 147		81.28 238		41.309 79		73.89 239		52.072 107		53.30 152
	18		368		232		211		125		258		165		122
	57.22		39.63		53.217		79.17		41.434		71.31		52.237		52.08
	57.48 26		36.01 362		53.532 315		77.42 175		41.607 173		68.60 271		52.459 222		51.19 89
	57.82 34		32.56 345		53.921 389		76.09 133		41.827 220		65.82 278		52.735 276		50.70 49
	58.24 42		29.36 320		54.376 455		75.27 82		42.091 264		63.04 278		53.060 325		50.67 — 3
	58.72 48		26.50 286		54.884 508		75.00 — 27		42.392 301		60.32 272		53.424 364		51.10 43
	53		242		545		30		330		255		392		89
	59.25		24.08		55.429		75.30		42.722		57.77		53.816		51.99
	59.82 57		22.18 190		55.992 563		76.17 87		43.072 350		55.44 233		54.224 408		53.32 133
	60.41 59		20.85 133		56.556 564		77.59 142		43.429 357		53.42 202		54.635 411		55.05 173
	56.652		66.88		51.646		67.14		39.407		91.52		50.062		39.77
	2.215		*+1.976*		*1.955*		*−1.680*		1.132		+0.531		1.300		−0.831
	+0.05		*+0.13*		*+0.07*		−0.11		+0.06		+0.03		+0.07		−0.05
	−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 Musca Mag. 3.6	
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	D
	h m 12 50	° ′ +56 23	h m 12 51	° ′ + 3 50	h m 12 52	° ′ +38 45	h m 12 56	
	s	″	s	″	s	″	s	
Jan. 0.8	23.948	71.62	26.250	43.90	9.829	38.03	32.73	5
	501	128	334	209	390	166	84	
10.7	24.449	70.34	26.584	41.81	10.219	36.37	33.57	5
	492	68	324	193	381	116	80	
20.7	24.941	69.66	26.908	39.88	10.600	35.21	34.37	5
	467	4	302	170	359	64	75	
30.7	25.408	69.62	27.210	38.18	10.959	34.57	35.12	5
	425	55	275	145	328	10	69	
Feb. 9.6	25.833	70.17	27.485	36.73	11.287	34.47	35.81	6
	370	113	241	114	287	42	61	
19.6	26.203	71.30	27.726	35.59	11.574	34.89	36.42	6
	309	165	203	84	241	91	50	
Mar. 1.6	26.512	72.95	27.929	34.75	11.815	35.80	36.92	6
	238	208	165	54	190	133	41	
11.6	26.750	75.03	28.094	34.21	12.005	37.13	37.33	7
	166	239	126	24	138	168	31	
21.5	26.916	77.42	28.220	33.97	12.143	38.81	37.64	7
	93	263	89	2	89	193	22	
31.5	27.009	80.05	28.309	33.99	12.232	40.74	37.86	7
	24	274	55	25	41	212	10	
Apr. 10.5	27.033	82.79	28.364	34.24	12.273	42.86	37.96	8
	42	274	24	42	2	218	2	
20.5	26.991	85.53	28.388	34.66	12.271	45.04	37.98	8
	101	263	2	57	41	217	7	
30.4	26.890	88.16	28.386	35.23	12.230	47.21	37.91	8
	151	244	27	68	75	207	16	
May 10.4	26.739	90.60	28.359	35.91	12.155	49.28	37.75	9
	192	215	46	74	102	191	24	
20.4	26.547	92.75	28.313	36.65	12.053	51.19	37.51	9
	228	180	62	76	126	166	31	
30.3	26.319	94.55	28.251	37.41	11.927	52.85	37.20	9
June 9.3	255	141	78	77	141	139	38	
	26.064	95.96	28.173	38.18	11.786	54.24	36.82	9
19.3	271	95	89	74	159	106	43	
	25.793	96.91	28.084	38.92	11.627	55.30	36.39	9
29.3	282	49	97	69	166	71	47	
	25.511	97.40	27.987	39.61	11.461	56.01	35.92	10
July 9.2	285	1	103	63	169	33	50	
	25.226	97.41	27.884	40.24	11.292	56.34	35.42	10
	281	47	105	55	169	5	51	
19.2	24.945	96.94	27.779	40.79	11.123	56.29	34.91	10
	270	95	105	45	163	42	51	
29.2	24.675	95.99	27.674	41.24	10.960	55.87	34.40	9
	251	140	100	33	154	81	49	
Aug. 8.2	24.424	94.59	27.574	41.57	10.806	55.06	33.91	9
	226	183	91	18	140	119	44	
18.1	24.198	92.76	27.483	41.75	10.666	53.87	33.47	9
	194	223	75	4	118	153	37	
28.1	24.004	90.53	27.408	41.79	10.548	52.34	33.10	9
	154	260	56	15	93	186	30	
Sept. 7.1	23.850	87.93	27.352	41.64	10.455	50.48	32.80	9
	107	290	29	34	60	218	21	
17.0	23.743	85.03	27.323	41.30	10.395	48.30	32.59	9
	54	317	1	56	22	246	9	
27.0	23.689	81.86	27.324	40.74	10.373	45.84	32.50	9
	6	337	39	81	23	270	3	
Oct. 7.0	23.695	78.49	27.363	39.93	10.396	43.14	32.53	8
	70	352	81	104	70	289	17	
17.0	23.765	74.97	27.444	38.89	10.466	40.25	32.70	8
	139	358	124	130	121	304	29	
26.9	23.904	71.39	27.568	37.59	10.587	37.21	32.99	8
Nov. 5.9	208	358	168	155	175	312	42	
	24.112	67.81	27.736	36.04	10.762	34.09	33.41	8
15.9	278	346	212	176	227	313	54	
	24.390	64.35	27.948	34.28	10.989	30.96	33.95	8
25.9	342	328	252	195	275	305	66	
	24.732	61.07	28.200	32.33	11.264	27.91	34.61	8
Dec. 5.8	390	299	285	210	318	290	73	
	25.131	58.08	28.485	30.23	11.582	25.01	35.34	8
	445	261	311	218	353	265	79	
15.8	25.576	55.47	28.796	28.05	11.935	22.36	36.13	8
	477	215	327	220	375	234	83	
25.8	26.053	53.32	29.123	25.85	12.310	20.02	36.96	8
	497	162	333	214	385	192	83	
35.7	26.550	51.70	29.456	23.71	12.695	18.10	37.79	8
Mean Place	22.936	96.46	25.308	53.79	8.856	58.99	32.256	
Sec δ, Tan δ	1.807	+1.505	1.002	+0.067	1.282	+0.803	3.088	
$D_\psi\, a,\ D_\omega\, a$	+0.05	+0.10	+0.06	0.00	+0.06	+0.05	+0.08	
$D_\psi\, \delta,\ D_\omega\, \delta$	−0.4	−0.2	−0.4	−0.2	−0.4	−0.2	−0.4	

FOR THE UPPER TRANSIT AT WASHINGTON.

shington an Time.	ε Virginis. Mag. 3.0		θ Virginis. Mag. 4.4		43 Comæ. Mag. 4.3		20 Canum Venat. Mag. 4.7	
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.
	h m 12 58	° ′ +11 23	h m 13 5	° ′ − 5 5	h m 13 8	′ +28 17	h m 13 13	° ′ +40 59
	s	″	s	″	s	″	s	″
ı. 0.8	3.623	65.41	39.882	53.04	0.960	37.03	50.216	72.15
	338	205	338	209	358	191	395	182
10.7	3.961	63.36	40.220	55.13	1.318	35.12	50.611	70.33
	328	181	329	204	350	150	391	130
20.7	4.289	61.55	40.549	57.17	1.668	33.62	51.002	69.03
	308	151	309	192	335	105	376	75
30.7	4.597	60.04	40.858	59.09	2.003	32.57	51.378	68.28
›. 9.7	283 4.880	117 58.87	285 41.143	173 60.82	307 2.310	58 31.99	348 51.726	19 68.09
	249	82	252	152	273	9	310	35
19.6	5.129	58.05	41.395	62.34	2.583	31.90	52.036	68.44
	211	46	217	127	235	37	268	87
r. 1.6	5.340	57.59	41.612	63.61	2.818	32.27	52.304	69.31
	172	11	179	102	191	78	218	134
11.6	5.512	57.48	41.791	64.63	3.009	33.05	52.522	70.65
	132	20	143	75	147	115	168	172
21.6	5.644	57.68	41.934	65.38	3.156	34.20	52.690	72.37
	96	47	107	51	103	144	117	202
31.5	5.740	58.15	42.041	65.89	3.259	35.64	52.807	74.39
	59	72	73	28	63	167	66	222
r. 10.5	5.799	58.87	42.114	66.17	3.322	37.31	52.873	76.61
	27	87	43	8	25	180	21	233
20.5	5.826	59.74	42.157	66.25	3.347	39.11	52.894	78.94
	0	98	15	9	8	185	21	234
30.4	5.826	60.72	42.172	66.16	3.339	40.96	52.873	81.28
y 10.4	26 5.800	105 61.77	9 42.163	25 65.91	39 3.300	183 42.79	59 52.814	227 83.55
	47	107	32	35	65	175	91	210
20.4	5.753	62.84	42.131	65.56	3.235	44.54	52.723	85.65
	66	104	49	45	87	160	119	189
30.4	5.687	63.88	42.082	65.11	3.148	46.14	52.604	87.54
ne 9.3	80 5.607	98 64.86	67 42.015	52 64.59	104 3.044	141 47.55	141 52.463	160 89.14
	92	89	80	58	120	116	160	126
19.3	5.515	65.75	41.935	64.01	2.924	48.71	52.303	90.40
	101	77	91	61	131	90	172	90
29.3	5.414	66.52	41.844	63.40	2.793	49.61	52.131	91.30
ly 9.3	108 5.306	63 67.15	100 41.744	63 62.77	138 2.655	61 50.22	180 51.951	51 91.81
	112	47	106	62	141	30	185	11
19.2	5.194	67.62	41.638	62.15	2.514	50.52	51.766	91.92
	111	29	108	61	142	1	185	29
29.2	5.083	67.91	41.530	61.54	2.372	50.51	51.581	91.63
g. 8.2	106 4.977	12 68.03	105 41.425	58 60.96	137 2.235	34 50.17	177 51.404	71 90.92
	98	8	98	51	127	66	165	110
18.1	4.879	67.95	41.327	60.45	2.108	49.51	51.239	89.82
	84	30	86	42	111	97	148	148
28.1	4.795	67.65	41.241	60.03	1.997	48.54	51.091	88.34
	63	51	65	30	92	130	123	184
pt. 7.1	4.732	67.14	41.176	59.73	1.905	47.24	50.968	86.50
	38	76	41	15	63	159	92	218
17.1	4.694	66.38	41.135	59.58	1.842	45.65	50.876	84.32
	7	99	9	2	29	187	55	248
27.0	4.687	65.39	41.126	59.60	1.813	43.78	50.821	81.84
t. 7.0	30 4.717	125 64.14	28 41.154	25 59.85	9 1.822	214 41.64	10 50.811	274 79.10
	71	148	69	48	52	237	39	297
17.0	4.788	62.66	41.223	60.33	1.874	39.27	50.850	76.13
	116	172	115	75	100	257	94	313
26.9	4.904	60.94	41.338	61.08	1.974	36.70	50.944	73.00
rv. 5.9	161 5.065	193 59.01	161 41.499	101 62.09	150 2.124	271 33.99	147 51.091	323 69.77
	205	213	205	129	198	281	203	326
15.9	5.270	56.88	41.704	63.38	2.322	31.18	51.294	66.51
	246	225	247	154	244	283	256	319
25.9	5.516	54.63	41.951	64.92	2.566	28.35	51.550	63.32
ic. 5.8	281 5.797	233 52.30	281 42.232	174 66.66	283 2.849	277 25.58	303 51.853	304 60.28
	310	234	310	192	318	263	343	282
15.8	6.107	49.96	42.542	68.58	3.167	22.95	52.196	57.46
	326	228	327	203	340	242	370	248
25.8	6.433	47.68	42.869	70.61	3.507	20.53	52.566	54.98
	335	215	335	209	353	211	390	208
35.8	6.768	45.53	43.204	72.70	3.860	18.42	52.956	52.90
n Place	2.714	77.96	39.035	46.26	0.119	55.05	49.448	93.61
δ, Tan δ	1.020	+0.202	1.004	−0.089	1.136	+0.538	1.325	+0.869
, $D_\alpha a$	+0.06	+0.01	+0.06	−0.01	+0.06	+0.03	+0.05	+0.06
$D_\alpha \delta$	−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.	γ Hydræ. Mag. 3.3		ι Centauri. Mag. 2.9		ζ¹ Ursæ Majoris. (*Mizar.*) Mag. 2.4		α Virginis. (*Spica.*) Mag. 1.2	
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.
	h m 13 14 s	° ′ −22 44 ″	h m 13 15 s	° ′ −36 16 ″	h m 13 20 s	° ′ +55 20 ″	h m 13 20 s	° ′ −10 43 ″
Jan. 0.8	25.109	2.90	56.183	25.81	35.856	66.18	49.845	47.05
	360	194	398	175	483	164	343	302
10.7	25.469	4.84	56.581	27.56	36.339	64.54	50.188	49.07
	351	209	390	204	484	105	336	206
20.7	25.820	6.93	56.971	29.60	36.823	63.49	50.524	51.11
	334	216	369	224	468	42	319	198
30.7	26.154	9.09	57.340	31.84	37.291	63.07	50.843	53.09
	306	217	339	239	437	21	295	184
Feb. 9.7	26.460	11.26	57.679	34.23	37.728	63.28	51.138	54.95
	275	210	304	247	393	82	266	169
19.6	26.735	13.36	57.983	36.70	38.121	64.10	51.404	56.64
	238	202	265	249	339	138	232	138
Mar. 1.6	26.973	15.38	58.248	39.19	38.460	65.48	51.636	58.14
	200	188	223	246	276	186	196	120
11.6	27.173	17.26	58.471	41.65	38.736	67.34	51.832	59.43
	163	171	180	237	211	226	159	100
21.6	27.336	18.97	58.651	44.02	38.947	69.60	51.991	60.47
	124	153	140	225	140	256	124	81
31.5	27.460	20.50	58.791	46.27	39.087	72.16	52.115	61.30
	91	134	100	208	74	273	92	52
Apr. 10.5	27.551	21.84	58.891	48.35	39.161	74.89	52.207	61.89
	58	112	64	190	10	281	60	62
20.5	27.609	22.96	58.955	50.25	39.171	77.70	52.267	62.30
	27	93	28	168	51	277	31	51
30.4	27.636	23.89	58.983	51.93	39.120	80.47	52.298	62.51
	2	72	3	146	104	262	7	56
May 10.4	27.638	24.61	58.980	53.39	39.016	83.09	52.305	62.56
	24	52	33	120	151	241	18	47
20.4	27.614	25.13	58.947	54.59	38.865	85.50	52.287	62.47
	46	31	60	95	191	210	38	23
30.4	27.568	25.44	58.887	55.54	38.674	87.60	52.249	62.24
June 9.3	27.501	25.56	58.803	56.19	38.449	89.33	52.192	61.91
	67	12	84	65	225	173	57	33
19.3	27.418	25.49	58.698	56.56	38.198	90.64	52.117	61.49
	83	7	105	37	251	131	75	42
29.3	27.319	25.22	58.573	56.64	37.930	91.51	52.029	60.99
	99	27	125	8	268	87	88	51
July 9.3	27.208	24.78	58.434	56.42	37.651	91.90	51.929	60.42
	111	44	139	22	279	39	100	60
	120	61	149	51	285	9	109	69
19.2	27.088	24.17	58.285	55.91	37.366	91.81	51.820	59.80
	123	77	154	79	283	57	113	66
29.2	26.965	23.40	58.131	55.12	37.083	91.24	51.707	59.14
	123	89	153	104	272	105	113	67
Aug. 8.2	26.842	22.51	57.978	54.08	36.811	90.19	51.594	58.47
	115	99	144	127	254	150	108	66
18.1	26.727	21.52	57.834	52.81	36.557	88.69	51.486	57.81
	102	106	127	144	231	193	97	60
28.1	26.625	20.46	57.707	51.37	36.326	86.76	51.389	57.18
	81	107	104	156	196	232	79	52
Sept. 7.1	26.544	19.39	57.603	49.81	36.130	84.44	51.310	56.63
	54	104	70	163	155	270	55	56
17.1	26.490	18.35	57.533	48.18	35.975	81.74	51.255	56.19
	19	95	30	162	107	300	23	55
27.0	26.471	17.40	57.503	46.56	35.868	78.74	51.232	55.90
	21	84	17	153	50	325	14	57
Oct. 7.0	26.492	16.59	57.520	45.03	35.818	75.49	51.246	55.79
	68	69	71	138	12	346	56	55
17.0	26.560	15.99	57.591	43.65	35.830	72.03	51.302	55.91
	117	34	128	113	80	358	103	37
27.0	26.677	15.65	57.719	42.52	35.910	68.45	51.405	56.28
Nov. 5.9	26.844	15.60	57.904	41.69	36.061	64.83	51.555	56.93
	167	5	185	83	151	362	150	65
15.9	27.060	15.88	58.143	41.21	36.282	61.24	51.751	57.86
	216	28	239	48	221	359	196	73
25.9	27.321	16.51	58.433	41.14	36.571	57.80	51.991	59.07
	261	63	290	7	289	344	240	107
Dec. 5.8	27.621	17.47	58.765	41.49	36.922	54.58	52.268	60.53
	300	96	332	35	351	322	277	146
	329	129	366	76	404	289	308	181
15.8	27.950	18.76	59.131	42.25	37.326	51.69	52.576	62.22
	350	158	387	116	445	247	328	194
25.8	28.300	20.34	59.518	43.41	37.771	49.22	52.904	64.08
	356	180	397	154	471	197	338	194
35.8	28.656	22.14	59.915	44.95	38.242	47.25	53.242	66.04
Mean Place	24.338	2.20	55.465	29.10	35.249	90.68	49.090	42.19
Sec δ, Tan δ	1.084	−0.419	1.240	−0.734	1.759	+1.447	1.018	−0.189
$D_\psi a$, $D_\omega a$	+0.06	−0.03	+0.07	−0.05	−0.05	+0.09	+0.06	−0.01
$D_\psi \delta$, $D_\omega \delta$	−0.4	0.3	0.4	−0.3	0.4	−0.3	−0.4	−0.2

FOR THE UPPER TRANSIT AT WASHINGTON.

ton ne.	Groombridge 2001. Mag. 6.1		70 Virginis. Mag. 5.2		ζ Virginis. Mag. 3.4		17 H. Canum. Venat. Mag. 5.0	
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.
	h m 13 23 s	° ′ +72 48 ″	h m 13 24 s	° ′ +14 12 ″	h m 13 30 s	° ′ − 0 10 ″	h m 13 31 s	° ′ +37 35 ″
0.8	61.06	53.20	22.964	64.74	28.443	27.34	6.195	66.10
0.8	61.88 82	51.87 133	23.302 338	62.63 211	28.778 335	29.41 207	6.574 379	64.10 200
0.7	62.70 82	51.19 68	23.636 334	60.77 186	29.108 330	31.38 197	6.954 380	62.58 152
0.7	63.51 81	51.19 0	23.956 320	59.24 153	29.425 317	33.18 180	7.322 368	61.59 99
9.7	64.27 76	51.85 66	24.253 297	58.08 116	29.719 294	34.74 156	7.666 344	61.16 — 43
	69	128	267	77	267	132	312	10
9.6	64.96	53.13	24.520	57.31	29.986	36.06	7.978	61.26
1.6	65.56 60	54.98 185	24.754 234	56.92 39	30.221 235	37.08 102	8.251 273	61.89 63
1.6	66.03 47	57.31 233	24.950 196	56.90 — 2	30.420 199	37.81 73	8.480 229	63.00 111
1.6	66.38 35	60.01 270	25.109 159	57.23 33	30.584 164	38.26 45	8.662 182	64.52 152
1.5	66.60 22	62.95 294	25.230 121	57.86 63	30.713 129	38.44 — 18	8.797 135	66.36 184
	8	310	85	88	96	5	89	209
0.5	66.68 —	66.05	25.315	58.74	30.809	38.39	8.886	68.45
0.5	66.63 5	69.16 311	25.367 52	59.80 106	30.874 65	38.13 26	8.932 46	70.68 223
0.5	66.46 17	72.16 300	25.388 — 21	60.99 119	30.911 37	37.71 42	8.937 — 5	72.97 229
0.4	66.18 28	74.96 280	25.383 5	62.24 125	30.921 — 10	37.16 55	8.905 — 32	75.22 225
0.4	65.80 38	77.45 249	25.353 30	63.51 127	30.907 14	36.53 63	8.840 65	77.35 213
	48	211	51	123	35	71	92	196
0.4	65.32	79.56	25.302	64.74	30.872	35.82	8.748	79.31
9.3	64.78 54	81.24 168	25.231 71	65.88 114	30.818 54	35.10 72	8.630 118	81.01 170
9.3	64.19 59	82.42 118	25.145 86	66.91 103	30.746 72	34.37 73	8.492 138	82.42 141
9.3	63.56 63	83.09 67	25.045 100	67.80 89	30.660 86	33.67 70	8.338 154	83.49 107
9.3	62.92 64	83.22 — 13	24.934 111	68.51 71	30.561 99	32.99 68	8.171 167	84.20 71
	65	41	118	53	108	62	174	33
9.2	62.27	82.81	24.816	69.04	30.453	32.37	7.997	84.53 —
9.2	61.63 64	81.86 95	24.695 121	69.35 31	30.340 113	31.82 55	7.821 176	84.47 6
8.2	61.01 62	80.41 145	24.574 121	69.46 — 11	30.225 115	31.36 46	7.647 174	84.02 45
8.2	60.43 58	78.48 193	24.459 115	69.32 14	30.114 111	31.00 36	7.481 166	83.18 84
8.1	59.91 52	76.10 238	24.354 105	68.96 36	30.012 102	30.78 22	7.328 153	81.95 123
	46	277	87	61	86	8	133	159
7.1	59.45	73.33	24.267	68.35	29.926	30.70 —	7.195	80.36
7.1	59.09 36	70.20 313	24.203 64	67.49 86	29.863 63	30.79 9	7.092 103	78.43 193
7.0	58.81 28	66.78 342	24.169 — 34	66.36 113	29.829 — 34	31.09 30	7.023 69	76.17 226
7.0	58.63 18	63.15 363	24.170 1	64.99 137	29.830 1	31.60 51	6.994 — 29	73.62 255
7.0	58.57 6	59.36 379	24.212 42	63.36 163	29.872 42	32.35 75	7.013 19	70.84 278
	— 7	385	87	186	87	99	70	299
7.0	58.64	55.51	24.299	61.50	29.959	33.34	7.083	67.85
5.9	58.83 19	51.68 383	24.432 133	59.41 209	30.093 134	34.60 126	7.207 124	64.73 312
5.9	59.15 32	47.97 371	24.612 180	57.16 225	30.273 180	36.08 148	7.386 179	61.54 319
5.9	59.59 44	44.47 350	24.837 225	54.78 238	30.497 224	37.80 172	7.618 232	58.36 318
5.9	60.15 56	41.29 318	25.101 264	52.33 245	30.759 262	39.68 188	7.897 279	55.29 307
	65	277	296	245	294	201	320	290
5.8	60.80	38.52	25.397	49.88	31.053	41.69	8.217	52.39
5.8	61.53 73	36.24 228	25.715 318	47.50 238	31.369 316	43.78 209	8.568 351	49.79 260
5.8	62.32 79	34.54 170	26.047 332	45.27 223	31.697 328	45.87 209	8.938 370	47.55 224
lace	60.915	79.90	22.227	78.23	27.735	18.77	5.572	86.55
an ∂	*3.385*	*+3.234*	*1.032*	+0.253	1.000	−0.003	1.282	+0.770
α	*+0.03*	*+0.20*	*+0.06*	+0.02	+0.06	0.00	+0.05	+0.05
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 Centauri. Mag. 2.6				m Virginis. Mag. 5.2				τ Boötis. Mag. 4.5				η Ursæ M (Alka Mag.	
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.	
	h m	s	° ′	″	h m	s	° ′	″	h m	s	° ′	″	h m	s
	13 34		−53 2		13 37		− 8 17		13 43		+17 51		13 44	
Jan. 0.8		37.607		34.11		15.868		10.32		19.678		57.21		16.726
10.8		38.113 506		35.32 121		16.207 339		12.31 199		20.015 337		55.08 213		17.155 429
20.7		38.610 497		36.96 164		16.542 335		14.28 197		20.351 336		53.22 186		17.591 436
30.7		39.089 479		38.98 202		16.865 323		16.18 190		20.678 327		51.72 150		18.019 428
Feb. 9.7		39.536 447		41.31 233		17.167 302		17.94 176		20.985 307		50.62 110		18.425 406
		407		258		275		157		281		68		373
19.7		39.943		43.89		17.442		19.51		21.266		49.94 25		18.798
Mar. 1.6		40.303 360		46.64 275		17.684 242		20.87 136		21.515 249		49.69 — 15		19.127 329
11.6		40.613 310		49.51 287		17.893 209		21.99 112		21.729 214		49.84 52		19.404 277
21.6		40.872 259		52.42 291		18.067 174		22.88 89		21.905 176		50.36 85		19.627 223
31.5		41.078 206		55.32 290		18.207 140		23.52 64		22.045 140		51.21 112		19.793 166
		154		283		106		43		103				108
Apr. 10.5		41.232 104		58.15 271		18.313 75		23.95 22		22.148 69		52.33 131		19.901 52
20.5		41.336 55		60.86 254		18.388 48		24.17 5		22.217 36		53.64 144		19.953 — 2
30.5		41.391 8		63.40 232		18.436 19		24.22 — 11		22.253 8		55.08 150		19.951 48
May 10.4		41.399 — 36		65.72 206		18.455 — 4		24.11 25		22.261 — 19		56.58 151		19.903 93
20.4		41.363 79		67.78 177		18.451 27		23.86 34		22.242 42		58.09 146		19.810 133
30.4		41.284		69.55 145		18.424		23.52		22.200		59.55		19.677
June 9.4		41.167 117		71.00 108		18.377 47		23.09 43		22.134 66		60.91 136		19.511 166
19.3		41.014 153		72.08 69		18.310 67		22.60 49		22.051 83		62.11 120		19.318 193
29.3		40.832 182		72.77 28		18.228 82		22.05 55		21.951 100		63.15 104		19.102 216
July 9.3		40.623 209		73.05 12		18.132 96		21.46 59		21.836 115		63.99 84		18.870 232
		227				108		60		124		61		243
19.2		40.396		72.93		18.024		20.86		21.712		64.60		18.627
29.2		40.159 237		72.40 53		17.909 115		20.24 62		21.581 131		64.97 37		18.380 247
Aug. 8.2		39.921 238		71.47 93		17.792 117		19.64 60		21.447 134		65.08 — 11		18.135 245
18.2		39.691 230		70.17 130		17.678 114		19.07 57		21.317 130		64.93 15		17.898 237
28.1		39.482 209		68.55 162		17.572 106		18.55 52		21.196 121		64.52 41		17.679 219
		177		189		91		43		107		70		196
Sept. 7.1		39.305 135		66.66 211		17.481 67		18.12 31		21.089 86		63.82 96		17.483 163
17.1		39.170 82		64.55 223		17.414 39		17.81 15		21.003 56		62.86 125		17.320 122
27.1		39.088 18		62.32 226		17.375 4		17.66 — 3		20.947 21		61.61 153		17.198 75
Oct. 7.0		39.070 — 53		60.06 220		17.371 — 39		17.69 25		20.926 — 19		60.08 177		17.123 19
17.0		39.123 128		57.86 201		17.410 84		17.94 48		20.945 64		58.31 202		17.104 — 42
27.0		39.251		55.82		17.494		18.42		21.009		56.29		17.146
Nov. 5.9		39.454 203		54.03 179		17.626 132		19.17 75		21.122 113		54.06 223		17.250 104
15.9		39.732 278		52.57 146		17.806 180		20.18 101		21.283 161		51.66 240		17.420 170
25.9		40.077 345		51.52 105		18.030 224		21.46 128		21.490 207		49.14 252		17.655 235
Dec. 5.9		40.481 401		50.93 59		18.294 264		22.96 150		21.739 249		46.56 258		17.949 294
		450		10		296		171		284		255		345
15.8		40.931		50.83		18.590		24.67		22.023		44.01		18.294
25.8		41.414 483		51.23 40		18.910 320		26.53 186		22.336 313		41.55 246		18.681 387
35.8		41.913 499		52.12 89		19.243 333		28.48 195		22.664 328		39.26 229		19.096 415
Mean Place		37.129		41.91		15.201		4.56		19.071		71.79		16.341
Sec δ, Tan δ		*1.664*		*−1.329*		1.011		*−0.146*		1.051		*+0.322*		1.547
Dψ α, Dω α		*+0.08*		*−0.08*		+0.06		*−0.01*		+0.06		*+0.02*		+0.05
Dψ δ, Dω δ		*−0.4*		*-0.4*		−0.4		*−0.4*		−0.4		*−0.4*		−0.4

FOR THE UPPER TRANSIT AT WASHINGTON.

hington n Time.	89 Virginis. Mag. 5.1		ζ Centauri. Mag. 3.1		η Boötis. Mag. 2.8		θ Apodis. Var. 5.5–6.6	
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.
	h m	° ′	h m	° ′	h m	° ′	h m	° ′
	13 45	−17 43	13 50	−46 52	13 50	+18 48	13 57	−76 23
	s	″	s	″	s	″	s	″
. 0.8	22.101	18.71	21.669	43.34	44.523	33.19	11.00	37.57
10.8	22.450 349	20.53 182	22.126 457	44.50 116	44.860 337	31.00 219	12.14 114	37.85 28
20.7	22.798 348	22.45 192	22.579 453	46.05 155	45.198 338	29.11 189	13.27 113	38.70 85
30.7	23.134 336	24.39 194	23.017 438	47.92 187	45.528 330	27.59 152	14.39 112	40.12 142
). 9.7	23.448 314	26.30 191	23.432 415	50.06 214	45.839 311	26.48 111	15.45 106	42.00 188
	289	183	381	235	287	68	99	233
19.7	23.737	28.13	23.813	52.41	46.126	25.80	16.44	44.33
r. 1.6	23.994 257	29.82 169	24.156 343	54.91 250	46.381 255	25.55 25	17.33 89	47.05 272
11.6	24.217 223	31.36 154	24.456 300	57.49 258	46.602 221	25.72 17	18.12 79	50.06 301
21.6	24.406 189	32.72 136	24.711 255	60.09 260	46.787 185	26.27 55	18.79 67	53.29 323
31.6	24.560 154	33.88 116	24.921 210	62.66 257	46.934 147	27.15 88	19.34 55	56.68 339
	120	97	165	251	111	117	41	346
r. 10.5	24.680	34.85	25.086	65.17	47.045	28.32	19.75	60.14
20.5	24.770 90	35.62 77	25.207 121	67.56 239	47.122 77	29.68 136	20.03 28	63.61 347
30.5	24.829 59	36.23 61	25.286 79	69.79 223	47.167 45	31.17 149	20.17 14	67.00 339
y 10.4	24.860 31	36.66 43	25.323 37	71.83 204	47.181 14	32.73 156	20.18 1	70.25 325
20.4	24.865 5	36.92 26	25.321 2	73.65 182	47.168 13	34.30 157	20.06 12	73.29 304
	20	12	40	156	38	152	25	281
30.4	24.845	37.04	25.281	75.21	47.130	35.82	19.81	76.10
ne 9.4	24.803 42	37.01 3	25.204 77	76.48 127	47.070 60	37.23 141	19.44 37	78.52 242
19.3	24.739 64	36.83 18	25.094 110	77.45 97	46.989 81	38.50 127	18.97 47	80.58 206
29.3	24.656 83	36.53 30	24.956 138	78.07 62	46.890 99	39.58 108	18.39 58	82.18 160
ly 9.3	24.557 99	36.12 41	24.791 165	78.34 27	46.776 114	40.45 87	17.74 65	83.33 115
	112	53	185	9	125	63	70	60
19.3	24.445	35.59	24.606	78.25	46.651	41.08	17.04	83.93
29.2	24.323 122	34.97 62	24.408 198	77.82 43	46.518 133	41.47 39	16.29 75	84.00 7
g. 8.2	24.197 126	34.25 72	24.204 204	77.02 80	46.381 137	41.59 12	15.54 75	83.54 46
18.2	24.072 125	33.48 77	24.003 201	75.90 112	46.247 134	41.43 16	14.81 73	82.55 99
28.1	23.956 116	32.69 79	23.815 188	74.50 140	46.120 127	41.01 42	14.12 69	81.05 150
	101	79	164	166	113	72	60	195
pt. 7.1	23.855	31.90	23.651	72.84	46.007	40.29	13.52	79.10
17.1	23.777 78	31.16 74	23.521 130	71.00 184	45.915 92	39.30 99	13.02 50	76.78 232
27.1	23.729 48	30.51 65	23.436 85	69.06 194	45.851 64	38.01 129	12.65 37	74.14 264
t. 7.0	23.719 10	29.99 52	23.405 31	67.08 198	45.822 29	36.45 156	12.44 21	71.30 284
17.0	23.753 34	29.66 33	23.434 29	65.16 192	45.834 12	34.63 182	12.41 3	68.34 296
	81	11	97	178	57	207	14	294
27.0	23.834	29.55	23.531	63.38	45.891	32.56	12.55	65.40
ov. 6.0	23.965 131	29.71 16	23.695 164	61.83 155	45.995 104	30.28 228	12.89 34	62.60 280
15.9	24.146 181	30.14 43	23.928 233	60.59 124	46.149 154	27.83 245	13.40 51	60.04 256
25.9	24.374 228	30.88 74	24.223 295	59.72 87	46.350 201	25.25 258	14.09 69	57.83 221
ec. 5.9	24.644 270	31.90 102	24.573 350	59.25 47	46.595 245	22.63 262	14.92 83	56.08 175
	305	131	396	1	280	260	96	125
15.8	24.949	33.21	24.969	59.24	46.875	20.03	15.88	54.83
25.8	25.277 328	34.74 153	25.397 428	59.68 44	47.185 310	17.53 250	16.92 104	54.14 69
35.8	25.621 344	36.46 172	25.845 448	60.57 89	47.512 327	15.20 233	18.03 111	54.05 9
an Place	21.487	16.12	21.223	49.39	43.968	47.97	11.699	48.82
δ, Tan δ	*1.050*	*−0.320*	*1.463*	*−1.068*	1.056	+0.341	4.253	−4.134
$D_m\,\alpha$	*+0.06*	*−0.02*	*+0.07*	*−0.06*	+0.06	+0.02	+0.11	−0.24
$D_m\,\delta$	*−0.4*	*−0.4*	*−0.4*	*−0.5*	−0.4	−0.5	−0.3	−0.5

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 Hyd Mag. 3
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.
	h m s 13 57	° ′ ″ +27 46	h m s 13 57	° ′ ″ + 1 56	h m s 13 57	° ′ ″ −59 58	h m s 14 1
Jan. 0.8	25.195	55.66	25.821	35.33	57.425	14.73	38.954
	347	221	330	206	587	72	366
10.8	25.542	53.45	26.151	33.27	58.012	15.45	39.320
	351	183	331	194	587	120	366
20.7	25.893	51.62	26.482	31.33	58.599	16.65	39.686
	345	139	322	176	573	164	356
30.7	26.238	50.23	26.804	29.57	59.172	18.29	40.042
Feb. 9.7	26.566	49.32	27.109	28.06	59.716	20.32	40.381
	328	91	305	151	544	203	339
	302	40	283	123	505	235	313
19.7	26.868	48.92	27.392	26.83	60.221	22.67	40.694
	271	10	252	93	457	263	285
Mar. 1.6	27.139	49.02	27.644	25.90	60.678	25.30	40.979
	236	56	221	61	403	280	250
11.6	27.375	49.58	27.865	25.29	61.081	28.10	41.229
	197	97	190	31	346	293	215
21.6	27.572	50.55	28.055	24.98	61.427	31.03	41.444
	157	135	154	4	285	300	181
31.6	27.729	51.90	28.209	24.94	61.712	34.03	41.625
	118	164	122	23	225	300	147
Apr. 10.5	27.847	53.54	28.331	25.17	61.937	37.03	41.772
	79	183	92	42	164	294	112
20.5	27.926	55.37	28.423	25.59	62.101	39.97	41.884
	45	195	61	59	104	283	82
30.5	27.971	57.32	28.484	26.18	62.205	42.80	41.966
	11	200	34	73	44	265	51
May 10.4	27.982	59.32	28.518	26.91	62.249	45.45	42.017
	20	197	9	80	14	245	21
20.4	27.962	61.29	28.527	27.71	62.235	47.90	42.038
	47	187	16	85	69	217	6
30.4	27.915	63.16	28.511	28.56	62.166	50.07	42.032
	74	170	38	86	122	186	35
June 9.4	27.841	64.86	28.473	29.42	62.044	51.93	41.997
	95	150	58	84	171	151	58
19.3	27.746	66.36	28.415	30.26	61.873	53.44	41.939
	116	124	78	81	216	111	83
29.3	27.630	67.60	28.337	31.07	61.657	54.55	41.856
July 9.3	27.498	68.56	28.243	31.80	61.405	55.24	41.754
	132	96	94	73	252	69	102
	144	65	107	66	281	25	120
19.3	27.354	69.21	28.136	32.46	61.124	55.49	41.634
	153	32	118	56	302	19	132
29.2	27.201	69.53	28.018	33.02	60.822	55.30	41.502
	156	0	122	45	309	64	141
Aug. 8.2	27.045	69.53	27.896	33.47	60.513	54.66	41.361
	155	36	123	32	304	108	140
18.2	26.890	69.17	27.773	33.79	60.209	53.58	41.221
	148	69	117	17	287	147	135
28.1	26.742	68.48	27.656	33.96	59.922	52.11	41.086
	133	104	105	1	253	181	120
Sept. 7.1	26.609	67.44	27.551	33.97	59.669	50.30	40.966
	110	135	85	18	206	211	100
17.1	26.499	63.09	27.466	33.79	59.463	48.19	40.866
	82	169	58	37	145	232	65
27.1	26.417	64.40	27.408	33.42	59.318	45.87	40.801
	47	199	25	61	73	244	28
Oct. 7.0	26.370	62.41	27.383	32.81	59.245	43.43	40.773
	4	225	15	83	10	247	17
17.0	26.366	60.16	27.398	31.98	59.255	40.96	40.790
	43	251	59	108	99	239	69
27.0	26.409	57.65	27.457	30.90	59.354	38.57	40.859
	95	269	107	131	191	220	122
Nov. 6.0	26.504	54.96	27.564	29.59	59.545	36.37	40.981
	145	284	154	156	282	193	176
15.9	26.649	52.12	27.718	28.03	59.827	34.44	41.157
	195	292	200	176	365	156	227
25.9	26.844	49.20	27.918	26.27	60.192	32.88	41.384
Dec. 5.9	27.086	46.28	28.160	24.35	60.631	31.75	41.657
	242	292	242	192	439	113	273
	282	283	276	204	501	65	311
15.8	27.368	43.45	28.436	22.31	61.132	31.10	41.968
	315	265	305	210	547	13	339
25.8	27.683	40.80	28.741	20.21	61.679	30.97	42.307
	335	241	321	209	575	38	359
35.8	28.018	38.39	29.062	18.12	62.254	31.35	42.666
Mean Place	24.729	73.03	25.268	44.56	57.232	23.52	38.444
Sec δ, Tan δ	1.130	+0.527	1.001	+0.034	1.999	−1.730	1.115
$D_\psi \alpha$, $D_\omega \alpha$	+0.05	+0.03	+0.06	0.00	+0.08	−0.10	+0.07
$D_\psi \delta$, $D_\omega \delta$	−0.3	−0.5	−0.3	−0.5	−0.3	−0.5	−0.3

FOR THE UPPER TRANSIT AT WASHINGTON.

ion me.	θ Centauri. Mag. 2.3		α Draconis. Mag. 3.6		δ Boötis. Mag. 4.8		κ Virginis. Mag. 4.3	
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.
	h m s 14 1	° ′ ″ −35 57	h m s 14 2	° ′ ″ +64 45	h m s 14 6	° ′ ″ +25 28	h m s 14 8	° ′ ″ − 9 53
.8	47.982	40.91	8.29	55.03	37.278	46.75	28.455	21.85
	397	132	57	195	340	225	336	185
.8	48.379	42.23	8.86	53.08	37.618	44.50	28.791	23.70
	397	161	59	133	345	191	338	186
.8	48.776	43.84	9.45	51.75	37.963	42.59	29.129	25.56
	386	183	60	68	341	148	330	180
.7	49.162	45.67	10.05	51.07	38.304	41.11	29.459	27.36
	367	200	58	1	326	101	315	168
.7	49.529	47.67	10.63	51.08	38.630	40.10	29.774	29.04
	340	212	54	65	303	53	292	154
.7	49.869	49.79	11.17	51.73	38.933	39.57	30.066	30.58
	307	216	48	127	275	4	265	134
1.6	50.176	51.95	11.65	53.00	39.208	39.53	30.331	31.92
	271	217	41	183	239	43	236	111
1.6	50.447	54.12	12.06	54.83	39.447	39.96	30.567	33.03
	235	212	33	230	203	85	203	89
1.6	50.682	56.24	12.39	57.13	39.650	40.81	30.770	33.92
	196	205	25	267	165	122	170	66
1.6	50.878	58.29	12.64	59.80	39.815	42.03	30.940	34.58
	159	195	17	291	127	150	140	45
0.5	51.037	60.24	12.81	62.71	39.942	43.53	31.080	35.03
	122	181	7	307	92	174	108	25
0.5	51.159	62.05	12.88	65.78	40.034	45.27	31.188	35.28
	86	164	1	307	55	187	79	9
0.5	51.245	63.69	12.87	68.85	40.089	47.14	31.267	35.37
	53	148	9	299	23	193	52	7
0.5	51.298	65.17	12.78	71.84	40.112	49.07	31.319	35.30
	18	129	18	281	7	192	24	20
0.4	51.316	66.46	12.60	74.65	40.105	50.99	31.343	35.10
	13	106	24	252	37	185	0	30
0.4	51.303	67.52	12.36	77.17	40.068	52.84	31.343	34.80
	43	85	29	216	62	170	26	38
9.4	51.260	68.37	12.07	79.33	40.006	54.54	31.317	34.42
	74	59	34	175	85	151	48	44
9.3	51.186	68.96	11.73	81.08	39.921	56.05	31.269	33.98
	98	34	38	129	106	127	70	50
9.3	51.088	69.30	11.35	82.37	39.815	57.32	31.199	33.48
	123	9	42	79	124	102	89	54
9.3	50.965	69.39	10.93	83.16	39.691	58.34	31.110	32.94
	142	19	43	28	138	72	104	57
9.3	50.823	69.20	10.50	83.44	39.553	59.06	31.006	32.37
	155	44	43	24	148	43	118	59
9.2	50.668	68.76	10.07	83.20	39.405	59.49	30.888	31.78
	165	70	44	76	154	9	125	58
8.2	50.503	68.06	9.63	82.44	39.251	59.58	30.763	31.20
	164	93	43	127	154	24	127	57
8.2	50.339	67.13	9.20	81.17	39.097	59.34	30.636	30.63
	157	114	40	175	148	56	123	53
8.2	50.182	65.99	8.80	79.42	38.949	58.78	30.513	30.10
	140	130	37	220	136	89	111	46
7.1	50.042	64.69	8.43	77.22	38.813	57.89	30.402	29.64
	113	141	32	261	114	122	93	37
7.1	49.929	63.28	8.11	74.61	38.699	56.67	30.309	29.27
	78	146	26	298	89	154	66	24
7.1	49.851	61.82	7.85	71.63	38.610	55.13	30.243	29.03
	35	144	18	328	53	183	32	9
7.0	49.816	60.38	7.67	68.35	38.557	53.30	30.211	28.94
	16	136	12	353	12	212	0	11
7.0	49.832	59.02	7.55	64.82	38.545	51.18	30.220	29.05
	72	120	3	370	35	236	54	33
7.0	49.904	57.82	7.52	61.12	38.580	48.82	30.274	29.38
	132	98	6	379	84	259	102	57
6.0	50.036	56.84	7.58	57.33	38.664	46.23	30.376	29.95
	191	68	16	379	135	274	152	83
5.9	50.227	56.16	7.74	53.54	38.799	43.49	30.528	30.78
	246	36	26	370	186	283	199	109
5.9	50.473	55.80	8.00	49.84	38.985	40.66	30.727	31.87
	296	0	34	348	232	286	243	131
5.9	50.769	55.80	8.34	46.36	39.217	37.80	30.970	33.18
	337	39	42	318	273	281	279	153
5.9	51.106	56.19	8.76	43.18	39.490	34.99	31.249	34.71
	367	76	49	278	306	265	308	168
5.8	51.473	56.95	9.25	40.40	39.796	32.34	31.557	36.39
	387	110	54	228	328	243	326	179
5.8	51.860	58.05	9.79	38.12	40.124	29.91	31.883	38.18
lace	47.518	43.84	8.553	80.01	36.864	63.30	27.955	16.58
an δ	*1.235*	*−0.726*	*2.346*	*+2.122*	1.108	+0.476	1.015	−0.174
α	*+0.07*	*−0.04*	*+0.03*	*+0.12*	+0.05	+0.03	+0.06	−0.01
	−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		ι Virginis. Mag. 4.2		α Boötis. (*Arcturus.*) Mag. 0.2		λ
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascens
	h m s 14 9	° ′ ″ +77 55	h m s 14 11	° ′ ″ − 5 36	h m s 14 11	° ′ ″ +19 36	h s 14
Jan. 0.8	7.19	49.09	40.075	24.49	52.913	35.66	13.934
	102	178	330	194	329	230	
10.8	8.21	47.31	40.405	26.43	53.242	33.36	14.330
	109	116	334	189	335	200	
20.8	9.30	46.15	40.739	28.32	53.577	31.36	14.739
	110	48	328	180	330	163	
30.7	10.40	45.67	41.067	30.12	53.907	29.73	15.148
	109	19	311	163	317	122	
Feb. 9.7	11.49	45.86	41.378	31.75	54.224	28.51	15.543
	102	86	291	144	295	78	
19.7	12.51	46.72	41.669	33.19	54.519	27.73	15.915
	93	148	265	119	267	33	
Mar. 1.6	13.44	48.20	41.934	34.38	54.786	27.40	16.251
	80	203	235	94	236	11	
11.6	14.24	50.23	42.169	35.32	55.022	27.51	16.545
	64	249	202	68	201	50	
21.6	14.88	52.72	42.371	36.00	55.223	28.01	16.792
	47	282	171	45	166	87	
31.6	15.35	55.54	42.542	36.45	55.389	28.88	16.988
	27	307	141	20	130	116	
Apr. 10.5	15.62	58.61	42.683	36.65	55.519	30.04	17.133
	10	318	108	1	96	138	
20.5	15.72	61.79	42.791	36.66	55.615	31.42	17.226
	10	317	80	17	63	154	
30.5	15.62	64.96	42.871	36.49	55.678	32.96	17.270
	26	305	52	31	32	164	
May 10.5	15.36	68.01	42.923	36.18	55.710	34.60	17.266
	42	283	25	42	4	163	
20.4	14.94	70.84	42.948	35.76	55.714	36.23	17.220
	58	252	1	50	25	160	
30.4	14.36	73.36	42.949	35.26	55.689	37.83	17.132
	71	213	25	56	50	151	
June 9.4	13.65	75.49	42.924	34.70	55.639	39.34	17.008
	81	169	47	60	74	136	
19.3	12.84	77.18	42.877	34.10	55.565	40.70	16.852
	89	119	69	61	93	116	
29.3	11.95	78.37	42.808	33.49	55.472	41.86	16.670
	95	68	87	62	113	96	
July 9.3	11.00	79.05	42.721	32.87	55.359	42.82	16.464
	99	14	104	60	128	71	
19.3	10.01	79.19	42.617	32.27	55.231	43.53	16.242
	101	41	117	57	139	46	
29.2	9.00	78.78	42.500	31.70	55.092	43.99	16.009
	101	95	124	53	145	17	
Aug. 8.2	7.99	77.83	42.376	31.17	54.947	44.16	15.770
	97	144	127	48	148	12	
18.2	7.02	76.39	42.249	30.69	54.799	44.04	15.533
	92	194	124	39	143	39	
28.2	6.10	74.45	42.125	30.30	54.656	43.65	15.305
	84	238	113	28	131	69	
Sept. 7.1	5.26	72.07	42.012	30.02	54.525	42.96	15.096
	75	277	95	17	112	99	
17.1	4.51	69.30	41.917	29.85	54.413	41.97	14.911
	62	314	68	2	87	129	
27.1	3.89	66.16	41.849	29.83	54.326	40.68	14.761
	51	343	36	18	54	158	
Oct. 7.0	3.38	62.73	41.813	30.01	54.272	39.10	14.654
	35	364	4	37	13	185	
17.0	3.03	59.09	41.817	30.38	54.259	37.25	14.597
	17	378	49	60	31	211	
27.0	2.86	55.31	41.866	30.98	54.290	35.14	14.597
	0	384	97	84	79	233	
Nov. 6.0	2.86	51.47	41.963	31.82	54.369	32.81	14.657
	19	381	145	110	129	252	
15.9	3.05	47.66	42.108	32.92	54.498	30.29	14.781
	36	368	193	132	179	264	
25.9	3.41	43.98	42.301	34.24	54.677	27.65	14.969
	54	344	235	153	224	271	
Dec. 5.9	3.95	40.54	42.536	35.77	54.901	24.94	15.216
	71	309	273	172	264	270	
15.9	4.66	37.45	42.809	37.49	55.165	22.24	15.516
	85	266	302	183	295	260	
25.8	5.51	34.79	43.111	39.32	55.460	19.64	15.861
	97	214	321	191	318	244	
35.8	6.48	32.65	43.432	41.23	55.778	17.20	16.240
Mean Place	9.051	74.88	39.592	17.81	52.501	50.39	13.805
Sec δ, Tan δ	4.782	+4.677	1.005	−0.098	1.062	+0.356	1.452
$D_\psi\, a$, $D_\omega\, a$	−0.01	+0.26	+0.06	−0.01	+0.06	+0.02	+0.05
$D_\psi\, \delta$, $D_\omega\, \delta$	−0.3	−0.5	−0.3	−0.5	−0.3	−0.5	−0.3

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Time.	λ Virginis. Mag. 4.6				ϑ Libræ. Mag. 6.3				θ Boötis. Mag. 4.1				f Boötis. Mag. 5.4			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	14 14		−12 59		14 18		−11 20		14 22		+52 13		14 22		+19 35	
	s		″		s		″		s		″		s		″	
0.8	37.380		26.98		57.924		12.71		22.235		39.80		36.046		43.59	
10.8	37.717	337	28.74	176	58.258	334	14.49	178	22.656	421	37.49	231	36.373	327	41.31	228
20.8	38.058	341	30.54	180	58.597	339	16.29	180	23.097	441	35.72	177	36.708	335	39.33	198
30.7	38.393	335	32.33	179	58.931	334	18.06	177	23.542	445	34.54	118	37.040	332	37.71	162
9.7	38.713	320	34.03	170	59.251	320	19.73	167	23.976	434	34.01	53	37.361	321	36.50	121
		289		158		298		154		410		10		301		77
19.7	39.012		35.61		59.549		21.27		24.386		34.11		37.662		35.73	
1.7	39.285	273	37.03	142	59.823	274	22.63	136	24.762	376	34.84	73	37.938	276	35.42	31
11.6	39.527	242	38.26	123	60.067	244	23.77	114	25.092	330	36.14	130	38.183	245	35.55	13
21.6	39.737	210	39.29	103	60.280	213	24.71	94	25.370	278	37.95	181	38.395	212	36.09	54
31.6	39.917	180	40.11	82	60.462	182	25.43	72	25.594	224	40.19	224	38.573	178	36.99	90
		147		61		150		51		166		256		144		122
10.5	40.064		40.72		60.612		25.94		25.760		42.75		38.717		38.21	
20.5	40.180	116	41.16	44	60.732	120	26.27	33	25.867	107	45.52	277	38.825	108	39.66	145
30.5	40.268	88	41.41	25	60.823	91	26.41	14	25.916	49	48.39	287	38.901	76	41.28	162
10.5	40.326	58	41.52	11	60.884	61	26.42	1	25.910	6	51.26	287	38.946	45	42.99	171
20.4	40.356	30	41.49	3	60.918	34	26.30	12	25.853	57	54.04	278	38.960	14	44.74	175
		6		14		9		24		104		258		14		171
30.4	40.362		41.35		60.927		26.06		25.749		56.62		38.946		46.45	
9.4	40.341	21	41.10	25	60.909	18	25.74	32	25.602	147	58.94	232	38.905	41	48.05	160
19.4	40.297	44	40.78	32	60.868	41	25.35	39	25.418	184	60.92	198	38.840	65	49.53	148
29.3	40.229	68	40.38	40	60.803	65	24.90	45	25.200	218	62.51	159	38.753	87	50.82	129
9.3	40.142	87	39.91	47	60.718	85	24.41	49	24.956	244	63.67	116	38.646	107	51.89	107
		106		52		103		53		265		70		125		84
19.3	40.036		39.39		60.615		23.88		24.691		64.37		38.521		52.73	
29.2	39.917	119	38.84	55	60.497	118	23.31	57	24.412	279	64.60	23	38.384	137	53.29	56
8.2	39.791	126	38.25	59	60.371	126	22.74	57	24.127	285	64.34	26	38.239	145	53.58	29
18.2	39.661	130	37.64	61	60.241	130	22.17	57	23.843	284	63.60	74	38.090	149	53.59	1
28.2	39.534	127	37.05	59	60.112	129	21.63	54	23.568	275	62.39	121	37.943	147	53.30	29
		116		56		117		49		256		166		136		59
t. 7.1	39.418		36.49		59.995		21.14		23.312		60.73		37.807		52.71	
17.1	39.319	99	36.00	49	59.894	101	20.72	42	23.083	229	58.64	209	37.688	119	51.82	89
27.1	39.248	71	35.61	39	59.819	75	20.42	30	22.892	191	56.15	249	37.593	95	50.63	119
7.1	39.211	37	35.37	24	59.778	41	20.27	15	22.747	145	53.32	283	37.531	62	49.15	148
17.0	39.214	3	35.29	8	59.775	3	20.28	1	22.657	90	50.18	314	37.508	23	47.38	177
		49		14		44		24		29		337		21		202
27.0	39.263		35.43		59.819		20.52		22.628		46.81		37.529		45.36	
v. 6.0	39.360	97	35.79	36	59.913	94	20.98	46	22.667	39	43.26	355	37.599	70	43.11	225
15.9	39.509	149	36.42	63	60.055	142	21.69	71	22.776	109	39.63	363	37.719	120	40.67	241
25.9	39.706	197	37.29	87	60.246	191	22.65	96	22.955	179	36.00	363	37.888	169	38.08	259
c. 5.9	39.947	241	38.42	113	60.481	235	23.86	121	23.201	246	32.48	352	38.104	216	35.43	265
		278		135		274		141		308		333		257		266
15.9	40.225		39.77		60.755		25.27		23.509		29.15		38.361		32.77	
25.8	40.534	309	41.32	155	61.059	304	26.86	159	23.869	360	26.15	300	38.651	290	30.21	256
35.8	40.861	327	43.01	169	61.383	324	28.57	171	24.270	401	23.55	260	38.966	315	27.80	241
n Place	36.912		22.71		57.478		7.90		22.329		62.20		35.703		58.11	
δ, Tan δ	1.026		−0.231		1.020		−0.201		1.633		+1.290		1.061		+0.358	
$D_m\,\alpha$	+0.06		−0.01		+0.07		−0.01		+0.04		+0.07		+0.06		+0.02	
$D_m\,\delta$	−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		5 Ursæ Minoris. Mag. 4.4		ρ Boötis. Mag. 3.8		γ Boö Mag. 3
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.
	h m s	° ′ ″	h m s	° ′ ″	h m s	° ′ ″	h m s
	14 23	− 1 51	14 27	+76 3	14 28	+30 43	14 28
Jan. 0.8	55.873	30.98	38.93	29.25	15.423	49.25	44.314
	324	196	87	205	340	237	358
10.8	56.197	32.94	39.80	27.20	15.763	46.88	44.672
	329	189	94	142	351	199	371
20.8	56.526	34.83	40.74	25.78	16.114	44.89	45.043
	326	175	97	77	350	153	374
30.7	56.852	36.58	41.71	25.01	16.464	43.36	45.417
	313	154	96	10	341	102	364
Feb. 9.7	57.165	38.12	42.67	24.91	16.805	42.34	45.781
	294	131	91	59	322	50	343
19.7	57.459	39.43	43.58	25.50	17.127	41.84	46.124
	269	104	85	123	295	4	316
Mar. 1.7	57.728	40.47	44.43	26.73	17.422	41.88	46.440
	242	75	75	181	263	55	283
11.6	57.970	41.22	45.18	28.54	17.685	42.43	46.723
	211	48	62	230	227	102	242
21.6	58.181	41.70	45.80	30.84	17.912	43.45	46.965
	181	20	47	271	191	141	200
31.6	58.362	41.90	46.27	33.55	18.103	44.86	47.165
	149	3	33	299	151	175	156
Apr. 10.6	58.511	41.87	46.60	36.54	18.254	46.61	47.321
	118	26	17	316	112	199	113
20.5	58.629	41.61	46.77	39.70	18.366	48.60	47.434
	90	43	1	320	75	217	71
30.5	58.719	41.18	46.76	42.90	18.441	50.77	47.505
	61	56	15	314	39	223	29
May 10.5	58.780	40.62	46.61	46.04	18.480	53.00	47.534
	32	67	29	296	6	222	9
20.4	58.812	39.95	46.32	49.00	18.486	55.22	47.525
	8	74	44	270	28	213	45
30.4	58.820	39.21	45.88	51.70	18.458	57.35	47.480
	18	76	55	236	58	199	79
June 9.4	58.802	38.45	45.33	54.06	18.400	59.34	47.401
	40	78	65	194	85	178	110
19.4	58.762	37.67	44.68	56.00	18.315	61.12	47.291
	65	75	73	147	110	152	136
29.3	58.697	36.92	43.95	57.47	18.205	62.64	47.155
	83	71	80	97	132	122	161
July 9.3	58.614	36.21	43.15	58.44	18.073	63.86	46.994
	102	67	85	44	150	90	179
19.3	58.512	35.54	42.30	58.88	17.923	64.76	46.815
	117	59	87	9	165	54	194
29.3	58.395	34.95	41.43	58.79	17.758	65.30	46.621
	126	52	88	63	173	18	202
Aug. 8.2	58.269	34.43	40.55	58.16	17.585	65.48	46.419
	131	43	87	115	176	19	205
18.2	58.138	34.00	39.68	57.01	17.409	65.29	46.214
	130	30	83	160	174	56	201
28.2	58.008	33.70	38.85	55.35	17.235	64.73	46.013
	120	16	77	212	163	93	189
Sept. 7.1	57.888	33.54	38.08	53.23	17.072	63.80	45.824
	104	3	71	255	145	130	168
17.1	57.784	33.51	37.37	50.68	16.927	62.50	45.656
	79	16	61	294	118	165	141
27.1	57.705	33.67	36.76	47.74	16.809	60.85	45.515
	49	35	50	325	85	198	103
Oct. 7.1	57.656	34.02	36.26	44.49	16.724	58.87	45.412
	10	56	36	352	44	227	59
17.0	57.646	34.58	35.90	40.97	16.680	56.60	45.353
	34	80	23	371	4	255	9
27.0	57.680	35.38	35.67	37.26	16.684	54.05	45.344
	83	103	7	381	55	277	47
Nov. 6.0	57.763	36.41	35.60	33.45	16.739	51.28	45.391
	130	128	9	383	108	294	104
16.0	57.893	37.69	35.69	29.62	16.847	48.34	45.495
	178	148	25	374	162	304	162
25.9	58.071	39.17	35.94	25.88	17.009	45.30	45.657
	223	168	41	355	213	304	218
Dec. 5.9	58.294	40.85	36.35	22.33	17.222	42.26	45.875
	261	183	58	326	259	299	267
15.9	58.555	42.68	36.93	19.07	17.481	39.27	46.142
	291	192	69	286	296	282	308
25.8	58.846	44.60	37.62	16.21	17.777	36.45	46.450
	314	195	81	238	324	256	342
35.8	59.160	46.55	38.43	13.83	18.101	33.89	46.792
Mean Place	55.458	23.14	40.979	54.14	15.208	66.73	44.200
Sec δ, Tan δ	1.001	−0.032	4.151	+4.029	1.163	+0.594	1.281
$D_\phi a$, $D_\omega a$	+0.06	0.00	0.00	+0.22	+0.05	+0.03	+0.05
$D_\phi \delta$, $D_\omega \delta$	−0.3	−0.6	−0.3	−0.6	−0.3	−0.6	−0.3

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	η Centauri. Mag. 2.6		σ Boötis. Mag. 4.5		α^2 Centauri. Mag. 0.3		33 Boötis. Mag. 5.4	
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.
	h m s	° ′ ″	h m s	° ′ ″	h m s	° ′ ″	h m s	° ′ ″
	14 30	−41 47	14 31	+30 5	14 33	−60 29	14 35	+44 45
0.8	14.096	33.90	4.237	61.38	57.69	22.64	44.916	23.09
10.8	14.514 418	34.75 85	4.574 337	58.99 239	58.27 58	22.93 29	45.290 374	20.64 245
20.8	14.939 425	35.93 118	4.923 349	56.99 200	58.86 59	23.70 77	45.681 391	18.67 197
30.7	15.360 421	37.39 146	5.273 350	55.44 155	59.45 59	24.91 121	46.079 398	17.26 141
9.7	15.766 406	39.10 171	5.614 341	54.38 106	60.01 56	26.52 161	46.469 390	16.44 82
	385	189	322	53	54	196	372	20
19.7	16.151	40.99	5.936	53.85	60.55	28.48	46.841	16.24
1.7	16.506 355	43.01 202	6.232 296	53.86 1	61.04 49	30.73 225	47.184 343	16.64 40
11.6	16.828 322	45.11 210	6.497 265	54.36 50	61.49 45	33.21 248	47.491 307	17.62 98
21.6	17.113 285	47.24 213	6.728 231	55.33 97	61.88 39	35.86 265	47.757 266	19.12 150
31.6	17.360 247	49.35 211	6.920 192	56.71 138	62.21 33	38.61 275	47.976 219	21.04 192
	209	208	154	172	27	280	172	228
10.6	17.569	51.43	7.074	58.43	62.48	41.41	48.148	23.32
20.5	17.739 170	53.42 199	7.190 116	60.39 196	62.69 21	44.20 279	48.271 123	25.87 255
30.5	17.870 131	55.31 189	7.269 79	62.54 215	62.84 15	46.93 273	48.347 76	28.56 269
10.5	17.963 93	57.07 176	7.313 44	64.75 221	62.93 9	49.55 262	48.375 28	31.30 274
20.4	18.017 54	58.66 159	7.322 9	66.96 221	62.96 3	52.01 246	48.359 16	34.00 270
	16	141	24	213	3	224	57	255
30.4	18.033	60.07	7.298	69.09	62.93	54.25	48.302	36.55
9.4	18.011 22	61.25 118	7.245 53	71.09 200	62.84 9	56.22 197	48.208 94	38.90 235
19.4	17.954 57	62.21 96	7.164 81	72.88 179	62.69 15	57.89 167	48.078 130	40.95 205
29.3	17.864 90	62.91 70	7.057 107	74.40 152	62.48 21	59.21 132	47.917 161	42.68 173
9.3	17.741 123	63.33 42	6.929 128	75.64 124	62.24 24	60.15 94	47.731 186	44.02 134
	148	12	147	93	29	53	210	93
19.3	17.593	63.45	6.782	76.57	61.95	60.68	47.521	44.95
29.3	17.422 171	63.27 18	6.619 163	77.14 57	61.64 31	60.77 9	47.297 224	45.44 49
8.2	17.237 185	62.81 46	6.448 171	77.34 20	61.31 33	60.43 34	47.062 235	45.48 4
18.2	17.046 191	62.05 76	6.273 175	77.18 16	60.98 33	59.66 77	46.824 238	45.06 42
28.2	16.858 188	61.03 102	6.101 172	76.67 51	60.65 33	58.47 119	46.590 234	44.20 86
	176	127	162	89	30	158	222	132
7.1	16.682	59.76	5.939	75.78	60.35	56.89	46.368	42.88
17.1	16.531 151	58.32 144	5.794 145	74.52 126	60.10 25	55.00 189	46.168 200	41.15 173
27.1	16.415 116	56.74 158	5.675 119	72.91 161	59.89 21	52.84 216	45.998 170	39.03 212
7.1	16.342 73	55.08 166	5.589 86	70.98 193	59.75 14	50.50 234	45.866 132	36.53 250
17.0	16.323 19	53.46 162	5.544 45	68.74 224	59.70 5	48.07 243	45.783 83	33.73 280
	42	156	1	252	3	242	31	309
27.0	16.365	51.90	5.545	66.22	59.73	45.65	45.752	30.64
6.0	16.469 104	50.50 140	5.597 52	63.49 273	59.85 12	43.33 232	45.781 29	27.35 329
16.0	16.638 169	49.35 115	5.703 106	60.59 290	60.08 23	41.23 210	45.873 92	23.93 342
25.9	16.871 233	48.47 88	5.863 160	57.58 301	60.40 32	39.43 180	46.027 154	20.45 348
5.9	17.160 289	47.95 52	6.073 210	54.55 303	60.79 39	37.99 144	46.241 214	17.02 343
	339	15	255	297	46	100	270	329
15.9	17.499	47.80	6.328	51.58	61.25	36.99	46.511	13.73
25.8	17.875 376	48.03 23	6.622 294	48.77 281	61.77 52	36.46 53	46.828 317	10.70 303
35.8	18.280 405	48.63 60	6.944 322	46.20 257	62.33 56	36.42 4	47.184 356	8.00 270
Place	13.824	37.92	4.036	78.60	57.052	36.71	44.969	43.53
Tan δ	*1.341*	*−0.894*	*1.156*	*+0.580*	2.030	−1.767	1.408	+0.992
$D_m \alpha$	*+0.08*	*−0.05*	*+0.05*	+0.03	+0.09	−0.09	+0.04	+0.05
$D_m \delta$	*−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.	α Apodis. Mag. 3.8		μ Virginis. Mag. 4.0		ε Bootis. Mag. 2.7		109 Virg Mag. 3
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.
	h m s 14 37	° ′ ″ −78 41	h m s 14 38	° ′ ″ − 5 17	h m s 14 41	° ′ ″ +27 24	h m s 14 42
Jan. 0.8	27.24	27.21	41.395	59.48	21.891	68.35	3.397
	131	40	322	185	327	242	316
10.8	28.55	26.81	41.717	61.33	22.218	65.93	3.713
	136	17	330	182	340	208	325
20.8	29.91	26.98	42.047	63.15	22.558	63.87	4.038
	137	73	328	172	343	164	324
30.8	31.28	27.71	42.375	64.87	22.901	62.23	4.362
	134	125	319	156	335	117	316
Feb. 9.7	32.62	28.96	42.694	66.43	23.236	61.06	4.678
	128	173	301	136	320	66	286
19.7	33.90	30.69	42.995	67.79	23.556	60.40	4.976
	121	217	280	112	296	14	278
Mar. 1.7	35.11	32.86	43.275	68.91	23.852	60.26	5.254
	109	253	253	88	267	36	252
11.6	36.20	35.39	43.528	69.79	24.119	60.62	5.506
	98	283	225	60	235	82	228
21.6	37.18	38.22	43.753	70.39	24.354	61.44	5.729
	84	307	195	37	199	124	195
31.6	38.02	41.29	43.948	70.76	24.553	62.68	5.924
	69	323	165	12	163	158	163
Apr. 10.6	38.71	44.52	44.113	70.88	24.716	64.26	6.087
	54	333	136	8	126	184	135
20.5	39.25	47.85	44.249	70.80	24.842	66.10	6.222
	38	336	106	25	92	208	105
30.5	39.63	51.21	44.355	70.55	24.934	68.13	6.327
	20	331	78	39	56	213	76
May 10.5	39.83	54.52	44.433	70.16	24.990	70.26	6.403
	5	320	51	49	22	215	48
20.4	39.88	57.72	44.484	69.67	25.012	72.41	6.451
	12	300	22	58	10	209	20
30.4	39.76	60.72	44.506	69.09	25.002	74.50	6.471
	30	276	3	62	39	197	6
June 9.4	39.46	63.48	44.503	68.47	24.963	76.47	6.465
	43	243	31	65	68	180	33
19.4	39.03	65.91	44.472	67.82	24.895	78.27	6.432
	57	205	54	65	94	156	56
29.3	38.46	67.96	44.418	67.17	24.801	79.83	6.376
	70	161	78	64	119	128	81
July 9.3	37.76	69.57	44.340	66.53	24.682	81.11	6.295
	81	113	97	62	138	100	99
19.3	36.95	70.70	44.243	65.91	24.544	82.11	6.196
	87	62	115	58	154	67	118
29.3	36.08	71.32	44.128	65.33	24.390	82.78	6.078
	92	8	127	53	167	32	129
Aug. 8.2	35.16	71.40	44.001	64.80	24.223	83.10	5.949
	93	48	134	46	171	2	137
18.2	34.23	70.92	43.867	64.34	24.052	83.08	5.812
	90	100	135	38	171	38	138
28.2	33.33	69.92	43.732	63.96	23.881	82.70	5.674
	84	151	128	28	163	74	131
Sept. 7.1	32.49	68.41	43.604	63.68	23.718	81.96	5.543
	73	198	112	16	148	109	117
17.1	31.76	66.43	43.492	63.52	23.570	80.87	5.426
	61	235	91	1	123	143	96
27.1	31.15	64.08	43.401	63.51	23.447	79.44	5.330
	44	270	60	17	93	177	66
Oct. 7.1	30.71	61.38	43.341	63.68	23.354	77.67	5.264
	23	289	21	35	53	208	28
17.0	30.48	58.49	43.320	64.03	23.301	75.59	5.236
	3	299	22	56	8	235	14
27.0	30.45	55.50	43.342	64.59	23.293	73.24	5.250
	19	298	69	81	42	259	61
Nov. 6.0	30.64	52.52	43.411	65.40	23.335	70.65	5.311
	42	284	119	103	96	277	111
16.0	31.06	49.68	43.530	66.43	23.431	67.88	5.422
	64	259	168	126	148	290	159
25.9	31.70	47.09	43.698	67.69	23.579	64.98	5.581
	85	225	214	146	198	295	204
Dec. 5.9	32.55	44.84	43.912	69.15	23.777	62.03	5.785
	101	181	254	164	244	292	245
15.9	33.56	43.03	44.166	70.79	24.021	59.11	6.030
	116	131	286	175	281	280	278
25.8	34.72	41.72	44.452	72.54	24.302	56.31	6.308
	126	76	310	183	313	257	303
35.8	35.98	40.96	44.762	74.37	24.615	53.74	6.611
Mean Place	28.968	37.47	41.050	52.80	21.734	84.57	3.086
Sec δ. Tan δ	5.102	−5.002	1.004	−0.093	1.127	+0.519	1.001
$D_\psi a$, $D_\omega a$	+0.14	−0.26	+0.06	0.00	+0.05	+0.03	+0.06
$D_\psi \delta$, $D_\omega \delta$	−0.3	−0.6	−0.3	−0.6	−0.3	−0.8	−0.3

FOR THE UPPER TRANSIT AT WASHINGTON.

hington Time.	8 Libræ. Mag. 5.3		α Libræ. Mag. 2.9		Groombridge 2164. Mag. 5.7		β Ursæ Minoris. Mag. 2.2	
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.
	h m s	° ′ ″	h m s	° ′ ″	h m s	° ′ ″	h m s	° ′ ″
	14 46	−15 39	14 46	−15 41	14 49	+59 37	14 50	+74 29
0.8	5.873	13.55	17.320	54.70	19.213	28.90	53.71	17.20
	331	153	331	153	457	250	75	232
10.8	6.204	15.08	17.651	56.23	19.670	26.40	54.46	14.88
	341	160	341	160	491	195	82	175
20.8	6.545	16.68	17.992	57.83	20.161	24.45	55.28	13.13
	341	162	340	162	507	132	86	111
30.8	6.886	18.30	18.332	59.45	20.668	23.13	56.14	12.02
9.7	331	158	331	158	508	68	88	42
	7.217	19.88	18.663	61.03	21.176	22.45	57.02	11.60
	315	149	315	149	490	0	85	26
19.7	7.532	21.37	18.978	62.52	21.666	22.45	57.87	11.86
	292	136	292	136	459	65	80	93
1.7	7.824	22.73	19.270	63.88	22.125	23.10	58.67	12.79
	267	120	267	120	415	127	73	154
11.6	8.091	23.93	19.537	65.08	22.540	24.37	59.40	14.33
	240	103	240	103	360	183	62	208
21.6	8.331	24.96	19.777	66.11	22.900	26.20	60.02	16.41
	210	85	210	85	298	230	51	253
31.6	8.541	25.81	19.987	66.96	23.198	28.50	60.53	18.94
	181	67	182	66	229	267	37	287
10.6	8.722	26.48	20.169	67.62	23.427	31.17	60.90	21.81
	150	50	150	50	159	292	24	311
20.5	8.872	26.98	20.319	68.12	23.586	34.09	61.13	24.92
	121	34	122	35	88	308	10	321
30.5	8.993	27.32	20.441	68.47	23.674	37.17	61.23	28.13
	92	19	92	20	18	312	−6	322
10.5	9.085	27.51	20.533	68.67	23.692	40.29	61.17	31.35
	62	8	63	8	−49	303	18	309
20.5	9.147	27.59	20.596	68.75	23.643	43.32	60.99	34.44
	33	−2	33	−2	112	287	31	289
30.4	9.180	27.57	20.629	68.73	23.531	46.19	60.68	37.33
	6	12	6	12	171	260	43	259
9.4	9.186	27.45	20.635	68.61	23.360	48.79	60.25	39.92
	−24	22	−23	21	224	230	53	222
19.4	9.162	27.23	20.612	68.40	23.136	51.09	59.72	42.14
	49	28	49	28	269	190	63	179
29.3	9.113	26.95	20.563	68.12	22.867	52.99	59.09	43.93
9.3	75	36	75	35	309	145	68	131
	9.038	26.59	20.488	67.77	22.558	54.44	58.41	45.24
	97	41	98	41	340	98	74	81
19.3	8.941	26.18	20.390	67.36	22.218	55.42	57.67	46.05
	117	47	117	47	363	49	78	29
29.3	8.824	25.71	20.273	66.89	21.855	55.91	56.89	46.34
8.2	131	52	131	52	377	−3	80	25
	8.693	25.19	20.142	66.37	21.478	55.88	56.09	46.09
18.2	139	55	140	56	381	53	80	79
	8.554	24.64	20.002	65.81	21.097	55.35	55.29	45.30
28,2	142	57	142	57	376	104	79	129
	8.412	24.07	19.860	65.24	20.721	54.31	54.50	44.01
	135	57	136	57	358	152	75	178
7.2	8.277	23.50	19.724	64.67	20.363	52.79	53.75	42.23
	120	54	120	55	331	199	69	225
17.1	8.157	22.96	19.604	64.12	20.032	50.80	53.06	39.98
	99	48	99	48	291	242	60	266
27.1	8.058	22.48	19.505	63.64	19.741	48.38	52.46	37.32
7.1	66	37	66	38	241	279	53	303
	7.992	22.11	19.439	63.26	19.500	45.59	51.93	34.29
17.0	26	24	27	25	179	313	41	333
	7.966	21.87	19.412	63.01	19.321	42.46	51.52	30.96
	−18	7	−18	6	110	340	29	358
27.0	7.984	21.80	19.430	62.95	19.211	39.06	51.23	27.38
6.0	67	14	68	14	30	361	15	374
	8.051	21.94	19.498	63.09	19.181	35.45	51.08	23.64
16.0	119	36	119	35	53	372	0	381
	8.170	22.30	19.617	63.44	19.234	31.73	51.08	19.83
25.9	170	61	170	61	137	375	15	378
	8.340	22.91	19.787	64.05	19.371	27.98	51.23	16.05
5.9	218	85	218	85	220	367	31	367
	8.558	23.76	20.005	64.90	19.591	24.31	51.54	12.38
	260	108	260	108	298	347	44	343
15.9	8.818	24.84	20.265	65.98	19.889	20.84	51.98	8.96
	294	127	294	127	367	317	57	308
25.9	9.112	26.11	20.559	67.25	20.256	17.67	52.55	5.88
35.8	318	144	318	143	427	278	69	263
	9.430	27.55	20.877	68.68	20.683	14.89	53.24	3.25
n Place	5.561	10.04	17.008	51.20	19.924	51.22	56.060	40.81
δ, Tan δ	*1.039*	*−0.280*	*1.039*	−0.281	1.978	+1.706	3.740	+3.603
$D_m\,\alpha$	*+0.07*	*−0.01*	+0.07	−0.01	+0.03	+0.08	0.00	+0.18
$D_m\,\delta$	*−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.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.
	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 ″
Jan. 0.8	15.964	36.40	18.289	39.34	5.324	58.27	32.355	30.86
	323	163	311	228	415	57	317	32.56
10.8	16.287	38.03	18.600	37.06	5.739	58.84	32.672	
	333	166	324	203	428	89	329	34.24
20.8	16.620	39.69	18.924	35.03	6.167	59.73	33.001	
	334	162	326	173	429	119	331	35.88
30.8	16.954	41.31	19.250	33.30	6.596	60.92	33.332	
	326	154	320	139	420	144	323	37.49
Feb. 9.7	17.280	42.85	19.570	31.91	7.016	62.36	33.655	
	311	140	305	97	401	165	308	39.13
19.7	17.591	44.25	19.875	30.94	7.417	64.01	33.963	
	291	122	286	54	377	180	290	40.75
Mar. 1.7	17.882	45.47	20.161	30.40	7.794	65.81	34.253	
	265	103	260	13	347	190	265	42.38
11.7	18.147	46.50	20.421	30.27	8.141	67.71	34.518	
	240	82	233	28	314	197	241	43.80
21.6	18.387	47.32	20.654	30.55	8.455	69.68	34.759	
	211	59	202	65	279	199	212	45.13
31.6	18.598	47.91	20.856	31.20	8.734	71.67	34.971	
	182	40	170	96	240	198	183	46.33
Apr. 10.6	18.780	48.31	21.026	32.16	8.974	73.65	35.154	
	152	21	141	123	203	193	154	47.48
20.5	18.932	48.52	21.167	33.39	9.177	75.58	35.308	
	124	5	108	142	164	186	125	48.48
30.5	19.056	48.57	21.275	34.81	9.341	77.44	35.433	
	95	9	77	155	125	176	97	49.26
May 10.5	19.151	48.48	21.352	36.36	9.466	79.20	35.530	
	66	21	48	162	84	163	68	49.94
20.5	19.217	48.27	21.400	37.98	9.550	80.83	35.598	
	38	29	17	163	45	148	41	50.40
30.4	19.255	47.98	21.417	39.61	9.595	82.31	35.639	
	8	37	11	157	4	130	11	50.94
June 9.4	19.263	47.61	21.406	41.18	9.599	83.61	35.650	
	19	42	38	147	36	109	17	51.42
19.4	19.244	47.19	21.368	42.65	9.563	84.70	35.633	
	45	46	65	134	74	86	43	51.86
29.4	19.199	46.73	21.303	43.99	9.489	85.56	35.590	
	71	50	89	116	109	58	70	52.28
July 9.3	19.128	46.23	21.214	45.15	9.380	86.14	35.520	
	93	51	111	96	141	31	92	52.70
19.3	19.035	45.72	21.103	46.11	9.239	86.45	35.428	
	114	52	128	74	168	3	113	53.12
29.3	18.921	45.20	20.975	46.85	9.071	86.48	35.315	
	128	52	141	50	187	27	127	53.57
Aug. 8.2	18.793	44.68	20.834	47.35	8.884	86.21	35.188	
	137	52	150	24	198	57	137	54.04
18.2	18.656	44.16	20.684	47.59	8.686	85.64	35.051	
	140	48	152	1	201	85	141	54.55
28.2	18.516	43.68	20.532	47.58	8.485	84.79	34.910	
	136	44	147	29	193	111	136	55.12
Sept. 7.2	18.380	43.24	20.385	47.29	8.292	83.68	34.774	
	122	37	135	58	173	132	124	55.76
17.1	18.258	42.87	20.250	46.71	8.119	82.36	34.650	
	102	27	112	83	143	148	105	56.50
27.1	18.156	42.60	20.138	45.88	7.976	80.88	34.545	
	70	15	84	114	99	160	74	57.35
Oct. 7.1	18.086	42.45	20.054	44.74	7.877	79.28	34.471	
	33	1	49	140	47	164	37	58.34
17.1	18.053	42.46	20.005	43.34	7.830	77.64	34.434	
	11	20	5	168	11	160	5	59.52
27.0	18.064	42.66	20.000	41.66	7.841	76.04	34.439	
	59	40	42	192	75	148	53	35.87
Nov. 6.0	18.123	43.06	20.042	39.74	7.916	74.56	34.492	
	109	63	91	215	143	130	103	36.44
16.0	18.232	43.69	20.133	37.59	8.059	73.26	34.595	
	160	86	143	231	208	104	153	37.24
25.9	18.392	44.55	20.276	35.28	8.267	72.22	34.748	
	208	109	188	243	268	74	200	38.26
Dec. 5.9	18.600	45.64	20.464	32.85	8.535	71.48	34.948	
	249	128	233	249	322	40	243	39.49
15.9	18.849	46.92	20.697	30.36	8.857	71.08	35.191	
	282	144	269	247	365	4	277	40.90
25.9	19.131	48.36	20.966	27.89	9.222	71.04	35.468	
	309	158	296	236	398	32	303	42.46
35.8	19.440	49.94	21.262	25.53	9.620	71.36	35.771	44.12
Mean Place	15.680	31.52	18.093	51.83	5.179	62.05	32.093	25.13
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 Scorpii. Mag. 3.4		ψ Boötis. Mag. 4.7		c Boötis. Mag. 5.0	
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.
	h m	° ′	h m	° ′	h m	° ′	h m	° ′
	14 58	+40 42	14 59	−24 57	15 0	+27 15	15 3	+25 11
	s	″	s	″	s	″	s	″
0.8	49.013	43.79	12.748	24.11	53.365	58.68	39.364	15.17
	345	261	346	115	316	249	312	247
10.8	49.358	41.18	13.094	25.26	53.681	56.19	39.676	12.70
	365	217	357	130	332	216	329	216
20.8	49.723	39.01	13.451	26.56	54.013	54.03	40.005	10.54
	375	166	358	142	338	174	336	177
30.8	50.098	37.35	13.809	27.98	54.351	52.29	40.341	8.77
	373	109	351	148	336	128	332	132
9.7	50.471	36.26	14.160	29.46	54.687	51.01	40.673	7.45
	361	49	337	150	324	77	321	83
19.7	50.832	35.77	14.497	30.96	55.011	50.24	40.994	6.62
	339	11	317	148	303	25	302	32
1.7	51.171	35.88	14.814	32.44	55.314	49.99	41.296	6.30
	309	68	291	141	279	27	278	18
11.7	51.480	36.56	15.105	33.85	55.593	50.26	41.574	6.48
	274	122	264	132	248	74	249	66
21.6	51.754	37.78	15.369	35.17	55.841	51.00	41.823	7.14
	236	170	237	121	216	118	217	108
31.6	51.990	39.48	15.606	36.38	56.057	52.18	42.040	8.22
	192	209	205	110	183	155	185	143
10.6	52.182	41.57	15.811	37.48	56.240	53.73	42.225	9.65
	150	237	175	96	146	183	150	174
20.5	52.332	43.94	15.986	38.44	56.386	55.56	42.375	11.39
	106	258	144	86	111	205	115	195
30.5	52.438	46.52	16.130	39.30	56.497	57.61	42.490	13.34
	63	268	113	72	77	217	81	209
10.5	52.501	49.20	16.243	40.02	56.574	59.78	42.571	15.43
	20	268	81	61	43	221	49	213
20.5	52.521	51.88	16.324	40.63	56.617	61.99	42.620	17.56
	19	259	51	48	9	218	15	209
30.4	52.502	54.47	16.375	41.11	56.626	64.17	42.635	19.65
	58	244	17	37	24	207	17	202
9.4	52.444	56.91	16.392	41.48	56.602	66.24	42.618	21.67
	94	219	14	23	54	192	47	188
19.4	52.350	59.10	16.378	41.71	56.548	68.16	42.571	23.55
	127	191	44	12	83	169	76	166
29.4	52.223	61.01	16.334	41.83	56.465	69.85	42.495	25.21
9.3	157	156	74	1	110	144	102	142
	52.066	62.57	16.260	41.82	56.355	71.29	42.393	26.63
	181	118	100	15	133	114	127	114
19.3	51.885	63.75	16.160	41.67	56.222	72.43	42.266	27.77
	202	77	124	30	153	82	146	83
29.3	51.683	64.52	16.036	41.37	56.069	73.25	42.120	28.60
	218	34	140	42	168	49	162	52
8.2	51.465	64.86	15.896	40.95	55.901	73.74	41.958	29.12
	226	9	151	55	177	13	171	17
18.2	51.239	64.77	15.745	40.40	55.724	73.87	41.787	29.29
	226	53	156	65	179	24	174	18
28.2	51.013	64.24	15.589	39.75	55.545	73.63	41.613	29.11
	219	97	152	75	175	59	171	51
7.2	50.794	63.27	15.437	39.00	55.370	73.04	41.442	28.60
	203	138	138	81	162	95	157	88
17.1	50.591	61.89	15.299	38.19	55.208	72.09	41.285	27.72
	178	180	113	83	141	131	138	122
27.1	50.413	60.09	15.186	37.36	55.067	70.78	41.147	26.50
7.1	145	218	82	81	111	165	109	156
	50.268	57.91	15.104	36.55	54.956	69.13	41.038	24.94
17.1	102	253	40	73	73	198	72	186
	50.166	55.38	15.064	35.82	54.883	67.15	40.966	23.08
	52	283	7	63	29	226	29	217
27.0	50.114	52.55	15.071	35.19	54.854	64.89	40.937	20.91
	4	308	59	46	20	252	20	241
Nov. 6.0	50.118	49.47	15.130	34.73	54.874	62.37	40.957	18.50
	62	325	114	25	72	273	72	264
16.0	50.180	46.22	15.244	34.48	54.946	59.64	41.029	15.86
	123	336	169	1	126	288	124	279
25.9	50.303	42.86	15.413	34.47	55.072	56.76	41.153	13.07
Dec. 5.9	182	338	220	25	178	294	175	287
	50.485	39.48	15.633	34.72	55.250	53.82	41.328	10.20
	237	330	265	51	225	294	223	287
15.9	50.722	36.18	15.898	35.23	55.475	50.88	41.551	7.33
	284	310	302	77	266	285	263	279
25.9	51.006	33.08	16.200	36.00	55.741	48.03	41.814	4.54
	323	282	330	99	298	294	295	301
35.8	51.329	30.26	16.530	36.99	56.039	45.39	42.109	1.93
Mean Place	49.182	62.45	12.512	23.19	53.334	74.23	39.326	30.10
δ, Tan δ	*1.319*	*+0.860*	*1.103*	*−0.465*	1.125	+0.515	1.105	+0.470
Var. $D_m\alpha$	*+0.05*	*+0.04*	*+0.07*	*−0.02*	+0.05	+0.02	+0.05	+0.02
$D_m\delta$	*−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		ι Libræ. Mag. 4.7		3 Serpentis. Mag. 5.4		γ Triang. Mag.
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.
	h m s	° ′ ″	h m s	° ′ ″	h m s	° ′ ″	h m s
	15 6	−51 46	15 7	−19 28	15 11	+ 5 14	15 11
Jan. 0.9	18.760	57.26	29.405	45.09	3.861	38.97	7.62
	469	8	330	126	302	204	72
10.8	19.229	57.34	29.735	46.35	4.163	36.93	8.34
	489	48	342	138	316	192	78
20.8	19.718	57.82	30.077	47.73	4.479	35.01	9.09
	495	85	345	144	320	171	78
30.8	20.213	58.67	30.422	49.17	4.799	33.30	9.87
Feb. 9.7	488	119	341	146	317	146	77
	20.701	59.86	30.763	50.63	5.116	31.84	10.64
	472	148	328	140	306	114	75
19.7	21.173	61.34	31.091	52.03	5.422	30.70	11.39
						81	
Mar. 1.7	447	173	308	132	290	89	71
	21.620	63.07	31.399	53.35	5.712	29.89	12.10
11.7	417	192	287	121	268	47	67
	22.037	64.99	31.686	54.56	5.980	29.42	12.77
21.6	380	208	261	107	243	12	62
	22.417	67.07	31.947	55.63	6.223	29.30	13.39
31.6	340	218	234	93	216	21	55
	22.757	69.25	32.181	56.56	6.439	29.51	13.94
	299	224	204	78	190	49	48
Apr. 10.6	23.056	71.49	32.385	57.34	6.629	30.00	14.42
	253	227	176	63	159	75	41
20.6	23.309	73.76	32.561	57.97	6.788	30.75	14.83
	208	224	147	50	132	94	33
30.5	23.517	76.00	32.708	58.47	6.920	31.69	15.16
May 10.5	160	219	117	38	101	108	28
	23.677	78.19	32.825	58.85	7.021	32.77	15.39
20.5	111	208	87	25	71	119	15
	23.788	80.27	32.912	59.10	7.092	33.96	15.54
	61	195	54	16	45	123	6
30.4	23.849	82.22	32.966	59.26	7.137	35.19	15.60
	11	177	25	7	13	122	2
June 9.4	23.860	83.99	32.991	59.33	7.150	36.41	15.58
	39	154	5	3	15	117	11
19.4	23.821	85.53	32.986	59.30	7.135	37.58	15.47
	87	129	36	11	42	112	21
29.4	23.734	86.82	32.950	59.19	7.093	38.70	15.26
July 9.3	132	101	67	19	69	101	27
	23.602	87.83	32.883	59.00	7.024	39.71	14.99
	172	68	91	28	93	88	34
19.3	23.430	88.51	32.792	58.72	6.931	40.59	14.65
	207	33	115	36	114	74	39
29.3	23.223	88.84	32.677	58.36	6.817	41.33	14.26
Aug. 8.3	232	2	132	43	131	59	44
	22.991	88.82	32.545	57.93	6.686	41.92	13.82
18.2	248	40	145	50	142	42	46
	22.743	88.42	32.400	57.43	6.544	42.34	13.36
28.2	253	76	151	57	148	22	47
	22.490	87.66	32.249	56.86	6.396	42.56	12.89
	246	110	147	60	146	4	45
Sept. 7.2	22.244	86.56	32.102	56.26	6.250	42.60	12.44
	223	140	137	61	137	19	42
17.1	22.021	85.16	31.965	55.65	6.113	42.41	12.02
	190	167	115	60	117	39	35
27.1	21.831	83.49	31.850	55.05	5.996	42.02	11.67
Oct. 7.1	141	185	85	53	92	63	28
	21.690	81.64	31.765	54.52	5.904	41.39	11.39
17.1	83	198	49	45	57	85	19
	21.607	79.66	31.716	54.07	5.847	40.54	11.20
	14	201	2	30	16	111	6
27.0	21.593	77.65	31.714	53.77	5.831	39.43	11.14
	62	196	49	15	30	133	5
Nov. 6.0	21.655	75.69	31.763	53.62	5.861	38.10	11.19
	139	182	101	6	79	157	17
16.0	21.794	73.87	31.864	53.68	5.940	36.53	11.36
	215	160	153	30	129	176	31
26.0	22.009	72.27	32.017	53.98	6.069	34.77	11.67
Dec. 5.9	289	131	204	53	177	193	42
	22.298	70.96	32.221	54.51	6.246	32.84	12.09
	352	98	248	76	220	203	52
15.9	22.650	69.98	32.469	55.27	6.466	30.81	12.61
	406	58	285	98	257	209	61
25.9	23.056	69.40	32.754	56.25	6.723	28.72	13.22
	447	19	314	117	286	208	68
35.8	23.503	69.21	33.068	57.42	7.009	26.64	13.90
Mean Place	18.818	62.64	29.193	42.58	3.707	48.40	8.361
Sec δ, Tan δ	*1.617*	*−1.270*	1.061	−0.354	1.004	+0.092	2.734
$D_\psi a$, $D_\omega a$	+0.08	−0.06	+0.07	−0.02	+0.06	0.00	+0.11
$D_\psi \delta$, $D_\omega \delta$	−0.3	−0.7	−0.3	−0.7	−0.3	−0.7	−0.3

FOR THE UPPER TRANSIT AT WASHINGTON.

	δ Boötis. Mag. 3.5		β Libræ. Mag. 2.7		γ Ursæ Minoris. Mag. 3.1		μ Boötis *pr.* Mag. 4.5	
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.
	h m s	° ′ ″	h m s	° ′ ″	h m s	° ′ ″	h m s	° ′ ″
	15 12	+33 36	15 12	− 9 4	15 20	+72 7	15 21	+37 39
0.9	9.271	69.02	32.483	44.12	48.51	23.92	21.019	46.52
	319	263	312	161	61	266	320	270
10.8	9.590	66.39	32.795	45.73	49.12	21.26	21.339	43.82
	339	225	325	161	68	213	345	232
20.8	9.929	64.14	33.120	47.34	49.80	19.13	21.684	41.50
	350	179	329	157	74	151	357	184
30.8	10.279	62.35	33.449	48.91	50.54	17.62	22.041	39.66
	350	128	325	146	77	85	360	130
9.7	10.629	61.07	33.774	50.37	51.31	16.77	22.401	38.36
	340	73	314	130	76	17	352	73
19.7	10.969	60.34	34.088	51.67	52.07	16.60	22.753	37.63
	323	17	296	110	74	52	337	14
1.7	11.292	60.17	34.384	52.77	52.81	17.12	23.090	37.49
	297	39	275	89	68	116	312	46
11.7	11.589	60.56	34.659	53.66	53.49	18.28	23.402	37.95
	268	92	251	66	61	175	284	99
21.6	11.857	61.48	34.910	54.32	54.10	20.03	23.686	38.94
	235	138	226	44	52	227	249	149
31.6	12.092	62.86	35.136	54.76	54.62	22.30	23.935	40.13
	198	178	198	22	41	268	212	190
10.6	12.290	64.64	35.334	54.98	55.03	24.98	24.147	42.33
	161	210	170	4	30	300	173	224
20.6	12.451	66.74	35.504	55.02	55.33	27.98	24.320	44.57
	123	231	142	12	18	318	132	247
30.5	12.574	69.05	35.646	54.90	55.51	31.16	24.452	47.04
	84	245	113	27	5	326	93	263
10.5	12.658	71.50	35.759	54.63	55.56	34.42	24.545	49.67
	48	249	84	37	6	323	51	266
20.5	12.706	73.99	35.843	54.26	55.50	37.65	24.596	52.33
	9	245	56	44	18	309	12	262
30.4	12.715	76.44	35.899	53.82	55.32	40.74	24.608	54.95
	26	234	25	50	28	287	28	251
9.4	12.689	78.78	35.924	53.32	55.04	43.61	24.580	57.46
	60	215	4	54	39	255	65	232
19.4	12.629	80.93	35.920	52.78	54.65	46.16	24.515	59.78
	92	191	34	55	47	217	99	205
29.4	12.537	82.84	35.886	52.23	54.18	48.33	24.416	61.83
	123	161	61	56	56	174	132	175
9.3	12.414	84.45	35.825	51.67	53.62	50.07	24.284	63.58
	147	127	86	56	61	127	161	141
19.3	12.267	85.72	35.739	51.11	53.01	51.34	24.123	64.99
	171	93	109	54	66	75	184	101
29.3	12.096	86.65	35.630	50.57	52.35	52.09	23.939	66.00
	187	54	127	51	69	24	203	61
8.3	11.909	87.19	35.503	50.06	51.66	52.33	23.736	66.61
	198	14	139	48	71	29	217	18
18.2	11.711	87.33	35.364	49.58	50.95	52.04	23.519	66.79
	202	26	146	44	71	81	222	24
28.2	11.509	87.07	35.218	49.14	50.24	51.23	23.297	66.55
	199	67	144	37	69	133	220	67
7.2	11.310	86.40	35.074	48.77	49.55	49.90	23.077	65.88
	188	107	134	29	65	182	207	110
17.1	11.122	85.33	34.940	48.48	48.90	48.08	22.870	64.78
	165	146	114	17	60	227	188	150
27.1	10.957	83.87	34.826	48.31	48.30	45.81	22.682	63.28
	136	182	88	6	52	208	158	189
7.1	10.821	82.05	34.738	48.25	47.78	43.13	22.524	61.39
	98	218	52	10	44	305	119	227
17.1	10.723	79.87	34.686	48.35	47.34	40.08	22.405	59.12
	53	250	9	30	34	335	73	259
27.0	10.670	77.37	34.677	48.65	47.00	36.73	22.332	56.53
	0	275	38	48	22	359	21	286
6.0	10.670	74.62	34.715	49.13	46.78	33.14	22.311	53.67
	53	298	88	70	9	373	36	309
16.0	10.723	71.64	34.803	49.83	46.69	29.41	22.347	50.58
	110	311	138	92	5	378	96	323
26.0	10.833	68.53	34.941	50.75	46.74	25.63	22.443	47.35
	165	317	187	113	17	374	153	329
5.9	10.998	65.36	35.128	51.88	46.91	21.89	22.596	44.06
	216	315	231	130	31	358	208	327
15.9	11.214	62.21	35.359	53.18	47.22	18.31	22.804	40.79
	262	301	267	146	45	332	256	313
25.9	11.476	59.20	35.626	54.64	47.67	14.99	23.060	37.66
	299	280	296	155	54	292	297	288
35.8	11.775	56.40	35.922	56.19	48.21	12.07	23.357	34.78
an Place	9.406	85.59	32.293	38.73	51.060	45.49	21.295	63.51
c δ, Tan δ	*1.201*	*+0.665*	*1.013*	*−0.160*	3.258	+3.101	1.263	+0.772
, $D_m\,\alpha$	*+0.05*	*+0.03*	*+0.06*	−0.01	0.00	+0.13	+0.05	+0.03
$D_m\,\delta$	*−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.	τ^1 Serpentis. Mag. 5.5		ζ Draconis. Mag. 3.5		32 Librae. Mag. 5.9		β Coronae Mag.
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.
	h m 15 21 s	° ′ +15 42 ″	h m 15 23 s	° ′ +59 14 ″	h m 15 23 s	° ′ −16 25 ″	h m 15 24 s
Jan. 0.9	56.353	56.83	3.881	62.67	34.500	44.08	24.276
	294	233	414	279	317	128	304
10.8	56.647	54.50	4.295	59.88	34.817	45.36	24.580
	314	209	458	229	332	136	325
20.8	56.961	52.41	4.753	57.59	35.149	46.72	24.905
	321	180	486	171	338	139	336
30.8	57.282	50.61	5.239	55.88	35.487	48.11	25.241
	320	145	498	108	336	137	338
Feb. 9.8	57.602	49.16	5.737	54.80	35.823	49.48	25.579
	312	104	492	40	326	130	331
19.7	57.914	48.12	6.229	54.40	36.149	50.78	25.910
	297	50	475	27	309	117	316
Mar. 1.7	58.211	47.53	6.704	54.67	36.458	51.95	26.226
	276	17	442	93	291	104	294
11.7	58.487	47.36	7.146	55.60	36.749	52.99	26.520
	252	26	397	152	267	89	268
21.6	58.739	47.62	7.543	57.12	37.016	53.88	26.788
	226	66	343	205	243	71	238
31.6	58.965	48.28	7.886	59.17	37.259	54.59	27.026
	196	99	282	249	215	56	205
Apr. 10.6	59.161	49.27	8.168	61.66	37.474	55.15	27.231
	167	129	218	281	189	40	171
20.6	59.328	50.56	8.386	64.47	37.663	55.55	27.402
	137	152	148	305	159	26	137
30.5	59.465	52.08	8.534	67.52	37.822	55.81	27.539
	105	167	80	316	130	14	100
May 10.5	59.570	53.75	8.614	70.68	37.952	55.95	27.639
	74	176	11	317	101	4	64
20.5	59.644	55.51	8.625	73.85	38.053	55.99	27.703
	45	178	56	306	69	5	28
30.5	59.689	57.29	8.569	76.91	38.122	55.94	27.731
	11	174	118	288	39	12	6
June 9.4	59.700	59.03	8.451	79.79	38.161	55.82	27.725
	18	164	178	260	7	18	40
19.4	59.682	60.67	8.273	82.39	38.168	55.64	27.685
	47	151	231	226	24	25	73
29.4	59.635	62.18	8.042	84.65	38.144	55.39	27.612
	78	133	278	185	54	29	103
July 9.3	59.557	63.51	7.764	86.50	38.090	55.10	27.509
	100	113	319	144	83	34	131
19.3	59.457	64.64	7.445	87.94	38.007	54.76	27.378
	124	91	353	93	108	39	154
29.3	59.333	65.55	7.092	88.87	37.899	54.37	27.224
	142	65	375	44	127	42	174
Aug. 8.3	59.191	66.20	6.717	89.31	37.772	53.95	27.050
	156	39	389	7	143	46	186
18.2	59.035	66.59	6.328	89.24	37.629	53.49	26.864
	161	11	394	58	151	48	194
28.2	58.874	66.70	5.934	88.66	37.478	53.01	26.670
	162	18	387	109	151	49	192
Sept. 7.2	58.712	66.52	5.547	87.57	37.327	52.52	26.478
	153	46	367	157	142	48	182
17.2	58.559	66.06	5.180	86.00	37.185	52.04	26.296
	137	76	335	204	124	45	164
27.1	58.422	65.30	4.845	83.96	37.061	51.59	26.132
	110	105	293	246	97	38	138
Oct. 7.1	58.312	64.25	4.552	81.50	36.964	51.21	25.994
	76	134	236	284	61	27	101
17.1	58.236	62.91	4.316	78.66	36.903	50.94	25.893
	36	163	170	319	18	15	58
27.0	58.200	61.28	4.146	75.47	36.885	50.79	25.835
	10	187	97	345	30	2	10
Nov. 6.0	58.210	59.41	4.049	72.02	36.915	50.81	25.825
	60	212	15	362	82	22	43
16.0	58.270	57.29	4.034	68.40	36.997	51.03	25.868
	111	229	68	372	134	42	99
26.0	58.381	55.00	4.102	64.68	37.131	51.45	25.967
	160	241	154	372	185	64	151
Dec. 5.9	58.541	52.56	4.256	60.96	37.316	52.09	26.118
	206	249	237	360	230	86	202
15.9	58.747	50.07	4.493	57.36	37.546	52.95	26.320
	246	249	311	338	269	104	246
25.9	58.993	47.58	4.804	53.98	37.815	53.99	26.566
	277	241	377	303	298	119	282
35.9	59.270	45.17	5.181	50.95	38.113	55.18	26.848
Mean Place	56.323	68.76	4.993	82.97	34.354	40.70	24.423
Sec δ, Tan δ	1.039	+0.281	1.956	+1.681	1.043	−0.295	1.148
$D\psi\,\alpha$, $D\omega\,\alpha$	+0.06	+0.01	+0.03	+0.07	+0.07	−0.01	+0.05
$D\psi\,\delta$, $D\omega\,\delta$	−0.3	−0.8	−0.3	−0.8	−0.3	−0.8	−0.2

FOR THE UPPER TRANSIT AT WASHINGTON.

ington Time.	ν^1 Boötis. Mag. 5.2		γ Lupi (*mean*). Mag. 3.0		γ Libræ. Mag. 4.0		α Coronæ Borealis. Mag. 2.3	
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.
	h m s 15 27	° ′ ″ +41 6	h m s 15 29	° ′ ″ −40 53	h m s 15 30	° ′ ″ −14 30	h m s 15 31	° ′ ″ +26 59
L. 0.9	56.477	38.05	36.230	17.53	52.973	52.20	10.242	21.53
	323	279	385	25	311	131	297	259
10.8	56.800	35.26	36.615	17.78	53.284	53.51	10.539	18.94
	351	237	407	54	325	138	318	228
20.8	57.151	32.89	37.022	18.32	53.609	54.89	10.857	16.66
	366	187	415	81	333	138	331	191
30.8	57.517	31.02	37.437	19.13	53.942	56.27	11.188	14.75
b. 9.8	57.889	29.69	37.851	20.17	54.275	57.61	11.521	13.31
	372	133	414	104	333	134	333	144
	366	74	404	124	324	125	327	93
19.7	58.255	28.95	38.255	21.41	54.599	58.86	11.848	12.38
	350	12	388	138	308	110	314	42
r. 1.7	58.605	28.83	38.643	22.79	54.907	59.96	12.162	11.96
	329	49	366	149	292	96	293	11
11.7	58.934	29.32	39.009	24.28	55.199	60.92	12.455	12.07
	298	104	338	156	270	78	269	61
21.7	59.232	30.36	39.347	25.84	55.469	61.70	12.724	12.68
	264	156	309	161	244	60	241	107
31.6	59.496	31.92	39.656	27.45	55.713	62.30	12.965	13.75
	225	200	278	163	219	43	210	147
r. 10.6	59.721	33.92	39.934	29.08	55.932	62.73	13.175	15.22
	185	233	243	162	194	26	178	180
20.6	59.906	36.25	40.177	30.70	56.126	62.99	13.353	17.02
	141	259	208	158	164	12	144	205
30.5	60.047	38.84	40.385	32.28	56.290	63.11	13.497	19.07
y 10.5	98	274	170	153	137	1	109	221
	60.145	41.58	40.555	33.81	56.427	63.12	13.606	21.28
20.5	55	279	131	146	106	9	74	229
	60.200	44.37	40.686	35.27	56.533	63.03	13.680	23.57
	12	276	91	136	76	10	39	230
30.5	60.212	47.13	40.777	36.63	56.609	62.84	13.719	25.87
ne 9.4	29	263	49	124	45	24	5	223
	60.183	49.76	40.826	37.87	56.654	62.60	13.724	28.10
19.4	70	243	6	108	12	28	29	208
	60.113	52.19	40.832	38.95	56.666	62.32	13.695	30.18
29.4	107	216	35	91	19	33	62	190
	60.006	54.35	40.797	39.86	56.647	61.99	13.633	32.07
ly 9.4	141	186	75	70	49	37	92	165
	59.865	56.21	40.722	40.56	56.598	61.62	13.541	33.72
	173	148	112	50	79	39	121	138
19.3	59.692	57.69	40.610	41.06	56.519	61.23	13.420	35.10
	199	108	145	25	103	41	145	106
29.3	59.493	58.77	40.465	41.31	56.416	60.82	13.275	36.16
ig. 8.3	219	65	173	2	127	44	166	72
	59.274	59.42	40.292	41.29	56.289	60.38	13.109	36.88
18.2	233	22	191	29	142	45	180	37
	59.041	59.64	40.101	41.00	56.147	59.93	12.929	37.25
28.2	240	23	202	54	151	45	187	1
	58.801	59.41	39.899	40.46	55.996	59.48	12.742	37.26
	239	68	202	80	152	45	188	36
pt. 7.2	58.562	58.73	39.697	39.66	55.844	59.03	12.554	36.90
	227	112	190	101	145	42	180	73
17.2	58.335	57.61	39.507	38.65	55.699	58.61	12.374	36.17
	206	155	167	122	127	37	162	110
27.1	58.129	56.06	39.340	37.43	55.572	58.24	12.212	35.07
ct. 7.1	177	196	132	135	102	30	137	144
	57.952	54.10	39.208	36.08	55.470	57.94	12.075	33.63
17.1	138	233	86	144	67	17	102	180
	57.814	51.77	39.122	34.64	55.403	57.77	11.973	31.83
	90	267	32	145	25	4	61	211
27.1	57.724	49.10	39.090	33.19	55.378	57.73	11.912	29.72
ov. 6.0	36	296	30	140	23	12	13	239
	57.688	46.14	39.120	31.79	55.401	57.85	11.899	27.33
16.0	22	318	94	127	74	32	40	264
	57.710	42.96	39.214	30.52	55.475	58.17	11.939	24.69
26.0	84	333	158	109	126	52	93	280
	57.794	39.63	39.372	29.43	55.601	58.69	12.032	21.89
ec. 5.9	145	339	221	86	175	74	146	291
	57.939	36.24	39.593	28.57	55.776	59.43	12.178	18.98
	202	336	277	58	222	92	195	295
15.9	58.141	32.88	39.870	27.99	55.998	60.35	12.373	16.03
25.9	253	322	325	27	261	111	238	288
	58.394	29.66	40.195	27.72	56.259	61.46	12.611	13.15
35.9	299	296	365	4	292	124	276	272
	58.693	26.70	40.560	27.76	56.551	62.70	12.887	10.43
an Place	56.882	55.34	36.230	20.03	52.856	48.31	10.392	35.81
δ, Tan δ	*1.327*	*+0.873*	*1.323*	*−0.866*	1.033	−0.259	1.122	+0.509
D_α	*+0.04*	*+0.04*	*+0.08*	−0.04	+0.07	−0.01	+0.05	+0.02
D_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.	ζ Cor. Bor. *seq.* Mag. 5.1		α Serpentis. Mag. 2.8		β Serpentis. Mag. 3.7		κ Serpent Mag. 4.3	
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	D
	h m s 15 36	° ′ ″ +36 53	h m s 15 40	° ′ ″ + 6 40	h m s 15 42	° ′ ″ +15 40	h m s 15 45	+
Jan. 0.9	14.790	60.67	10.713	60.30	21.342	39.38	0.051	37
10.9	15.097 307	57.90 277	10.997 284	58.24 206	21.626 284	37.04 234	0.332 281	35
20.8	15.429 332	55.50 240	11.302 305	56.31 193	21.929 303	34.92 212	0.636 304	32
30.8	15.779 350	53.55 195	11.616 314	54.60 171	22.244 315	33.07 185	0.951 315	31
Feb. 9.8	16.135 356	52.14 141	11.932 316	53.14 146	22.562 318	31.58 149	1.271 320	29
	351	86	310	114	313	109	315	
19.7	16.486	51.28	12.242	52.00	22.875	30.49	1.586	28
Mar. 1.7	16.825 339	51.01 — 27	12.539 297	51.22 78	23.176 301	29.84 65	1.890 304	27
11.7	17.143 318	51.33 87	12.820 281	50.79 43	23.462 286	29.63 — 21	2.178 288	27
21.7	17.434 291	52.20 138	13.080 260	50.74 — 5	23.726 264	29.85 63	2.445 267	27
31.6	17.695 261	53.58 182	13.318 238	51.03 29	23.966 240	30.48 98	2.689 244	28
	226		212	60	213		216	
Apr. 10.6	17.921	55.40	13.530	51.63	24.179	31.46	2.905	29
20.6	18.110 189	57.58 218	13.716 186	52.49 86	24.365 186	32.76 130	3.093 188	31
30.6	18.260 150	60.01 243	13.873 157	53.56 107	24.521 156	34.29 153	3.250 157	33
May 10.5	18.369 109	62.63 262	14.002 129	54.80 124	24.647 126	36.01 172	3.377 127	34
20.5	18.438 69	65.31 268	14.102 100	56.14 134	24.742 95	37.82 181	3.472 95	36
	29	267	68	139	62	184	62	
30.5	18.467	67.98	14.170	57.53	24.804	39.66	3.534	38
June 9.4	18.457 10	70.55 257	14.208 38	58.93 140	24.834 — 30	41.48 182	3.564 — 30	40
19.4	18.409 48	72.95 240	14.215 — 7	60.28 135	24.833 1	43.22 174	3.561 3	42
29.4	18.324 85	75.11 216	14.191 24	61.55 127	24.799 34	44.83 161	3.524 37	44
July 9.4	18.204 120	76.99 188	14.137 54	62.70 115	24.735 64	46.28 145	3.457 67	45
	151	153	82	102	92	123	96	
19.3	18.053	78.52	14.055	63.72	24.643	47.51	3.361	47
29.3	17.877 176	79.67 115	13.947 108	64.58 86	24.524 119	48.53 102	3.238 123	48
Aug. 8.3	17.679 198	80.43 76	13.819 128	65.26 68	24.385 139	49.29 76	3.094 144	49
18.3	17.464 215	80.78 — 35	13.674 145	65.77 51	24.229 156	49.80 51	2.933 161	49
28.2	17.242 222	80.70 8	13.519 155	66.06 29	24.062 167	50.01 — 21	2.762 171	49
	223	52	157	9	168	6	174	
Sept. 7.2	17.019	80.18	13.362	66.15 —	23.894	49.95	2.588	49
17.2	16.805 214	79.25 93	13.210 152	66.01 14	23.732 162	49.59 36	2.420 168	49
27.1	16.609 196	77.89 136	13.073 137	65.65 36	23.585 147	48.94 65	2.265 155	48
Oct. 7.1	16.440 169	76.13 176	12.959 114	65.04 61	23.458 127	47.97 97	2.133 132	47
17.1	16.308 132	74.00 213	12.877 82	64.20 84	23.363 95	46.72 125	2.033 100	45
	88	248	43	110	55	155	61	
27.1	16.220	71.52	12.834 —	63.10	23.308	45.17	1.972	44
Nov. 6.0	16.183 — 37	68.76 276	12.835 1	61.77 133	23.299 — 9	43.37 180	1.956 — 16	42
16.0	16.201 18	65.75 301	12.885 50	60.20 157	23.338 39	41.33 204	1.990 34	40
26.0	16.278 77	62.58 317	12.984 99	58.44 176	23.428 90	39.09 224	2.075 85	37
Dec. 6.0	16.413 135	59.32 326	13.133 149	56.51 193	23.568 140	36.70 239	2.210 135	35
	191	325	194	204	187	248	183	
15.9	16.604	56.07	13.327	54.47	23.755	34.22	2.393	33
25.9	16.844 240	52.92 315	13.560 233	52.37 210	23.984 229	31.74 248	2.619 226	30
35.9	17.125 281	49.99 293	13.826 266	50.28 209	24.247 263	29.33 241	2.880 261	27
Mean Place	15.152	76.73	10.702	69.49	21.414	50.67	0.164	49
Sec δ, Tan δ	1.250	+0.751	1.007	+0.117	1.039	+0.281	1.054	+0
$D_\alpha a$, $D_\omega a$	+0.04	+0.03	+0.06	0.00	+0.05	+0.01	+0.05	+
$D_\phi \delta$, $D_\omega \delta$	−0.2	−0.8	−0.2	−0.8	−0.2	−0.8	−0.2	

FOR THE UPPER TRANSIT AT WASHINGTON.

shington n 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.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.
	h m s 15 45	° ′ ″ − 3 10	h m s 15 45	° ′ ″ +62 50	h m s 15 46	° ′ ″ + 4 43	h m s 15 46	° ′ ″ +78 2
a. 0.9	17.245	44.04	22.20	61.57	40.620	28.30	54.64	41.52
10.9	17.532 287	45.74 170	22.61 41	58.61 296	40.902 282	26.32 198	55.39 75	38.72 280
20.8	17.839 307	47.38 164	23.09 48	56.14 247	41.204 302	24.45 187	56.28 89	36.41 231
30.8	18.155 316	48.93 155	23.60 51	54.24 190	41.516 312	22.77 168	57.28 100	34.68 173
b. 9.8	18.473 318	50.32 139	24.13 53	52.95 129	41.831 315	21.32 145	58.34 106	33.58 110
	313	117	54	62	310	114	109	42
19.7	18.786	51.49	24.67	52.33	42.141	20.18	59.43	33.16
r. 1.7	19.086 300	52.40 91	25.20 53	52.41 8	42.440 299	19.37 81	60.50 107	33.41 25
11.7	19.372 286	53.04 64	25.71 51	53.14 73	42.724 284	18.90 47	61.52 102	34.33 92
21.7	19.638 266	53.42 38	26.17 46	54.50 136	42.987 263	18.78 12	62.46 94	35.86 153
31.6	19.882 244	53.51 9	26.58 41	56.43 193	43.230 243	19.00 22	63.28 82	37.93 207
	220	17	34	240	217	51	68	253
pr. 10.6	20.102	53.34	26.92	58.83	43.447	19.51	63.96	40.46
20.6	20.297 195	52.97 37	27.19 27	61.60 277	43.639 192	20.29 78	64.46 50	43.34 288
30.6	20.464 167	52.42 55	27.39 20	64.65 305	43.803 164	21.28 99	64.80 34	46.46 312
ay 10.5	20.605 141	51.71 71	27.51 12	67.85 320	43.940 137	22.43 115	64.94 14	49.71 325
20.5	20.715 110	50.91 80	27.55 4	71.11 326	44.046 106	23.68 125	64.92 — 2	52.98 327
	81	87	3	320	76	131	21	319
30.5	20.796	50.04	27.52	74.31	44.122	24.99	64.71	56.17
me 9.4	20.847 51	49.15 89	27.41 11	77.35 304	44.168 46	26.31 132	64.32 39	59.16 299
19.4	20.865 18	48.26 89	27.22 19	80.16 281	44.182 14	27.59 128	63.78 54	61.89 273
29.4	20.852 — 13	47.39 87	26.98 24	82.65 249	44.164 18	28.81 122	63.10 68	64.29 240
ly 9.4	20.809 43	46.57 82	26.68 30	84.75 210	44.116 48	29.92 111	62.28 82	66.28 199
	74	75	36	167	77	99	92	154
19.3	20.735	45.82	26.32	86.42	44.039	30.91	61.36	67.82
29.3	20.636 99	45.16 66	25.92 40	87.63 121	43.936 103	31.76 85	60.36 100	68.87 105
ng. 8.3	20.513 123	44.58 58	25.50 42	88.34 71	43.810 126	32.44 68	59.29 107	69.42 55
18.3	20.374 139	44.09 49	25.05 45	88.54 20	43.667 143	32.96 52	58.19 110	69.45 — 3
28.2	20.224 150	43.71 38	24.58 47	88.22 — 32	43.513 154	33.30 34	57.08 111	68.94 51
	154	25	46	84	158	13	111	101
ept. 7.2	20.070	43.46	24.12	87.38	43.355	33.43	55.97	67.93
17.2	19.921 149	43.34 12	23.68 44	86.04 134	43.202 153	33.37 6	54.90 107	66.43 150
27.1	19.785 136	43.36 — 2	23.26 42	84.21 183	43.063 139	33.08 29	53.90 100	64.45 198
ct. 7.1	19.673 112	43.55 19	22.89 37	81.92 229	42.946 117	32.58 50	53.00 90	62.04 241
17.1	19.592 81	43.92 37	22.57 32	79.22 270	42.860 86	31.85 73	52.20 80	59.25 279
	41	56	25	305	48	97	64	314
27.1	19.551	44.48	22.32	76.17	42.812	30.88	51.56	56.11
ov. 6.0	19.554 3	45.25 77	22.16 16	72.82 335	42.809 — 3	29.66 122	51.06 50	52.71 340
16.0	19.605 51	46.22 97	22.08 — 8	69.24 358	42.854 45	28.24 142	50.75 31	49.10 361
26.0	19.707 102	47.40 118	22.09 1	65.54 370	42.949 95	26.60 164	50.63 12	45.40 370
Dec. 6.0	19.858 151	48.76 136	22.19 10	61.80 374	43.093 144	24.80 180	50.71 — 8	41.70 370
	197	151	20	367	188	193	28	358
15.9	20.055	50.27	22.39	58.13	43.281	22.87	50.99	38.12
25.9	20.290 235	51.90 163	22.68 29	54.65 348	43.510 229	20.87 200	51.47 48	34.74 338
35.9	20.559 269	53.58 168	23.06 38	51.46 319	43.773 263	18.87 200	52.13 66	31.69 305
ean Place	17.206	37.38	23.868	80.66	40.625	36.86	59.691	61.37
ec δ, Tan δ	1.002	−0.056	2.192	+1.950	1.003	+0.083	4.829	+4.724
ha, $D_\alpha a$	+0.06	0.00	+0.02	+0.07	+0.06	0.00	−0.04	+0.17
δ, $D_\alpha \delta$	−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.	β Triang. Aust. Mag. 3.0		λ Libræ. Mag. 5.1		γ Serpentis. Mag. 3.9		π Scorpii. Mag. 3.0	
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.
	h m s	° ′ ″	h m s	° ′ ″	h m s	° ′ ″	h m s	° ′ ″
	15 47	−63 10	15 48	−19 55	15 52	+15 55	15 53	−25
Jan. 0.9	48.34	27.12	30.797	14.59	36.984	43.28	49.657	35.36
	57	86	310	99	276	238	317	
10.9	48.91	26.26	31.107	15.58	37.260	40.90	49.974	36.05
	61	43	328	109	299	217	339	
20.8	49.52	25.83	31.435	16.67	37.559	38.73	50.313	36.89
	64	1	338	116	312	191	352	
30.8	50.16	25.82	31.773	17.83	37.871	36.82	50.665	37.85
	65	−42	340	116	316	154	354	
Feb. 9.8	50.81	26.24	32.113	18.99	38.187	35.28	51.019	38.89
	64	81	336	114	314	115	349	
19.7	51.45	27.05	32.449	20.13	38.501	34.13	51.368	39.94
	63	118	324	107	304	71	339	
Mar. 1.7	52.08	28.23	32.773	21.20	38.805	33.42	51.707	41.00
	60	149	307	97	290	27	322	
11.7	52.68	29.72	33.080	22.17	39.095	33.15	52.030	42.04
	56	179	289	85	270	−17	308	
21.7	53.24	31.51	33.369	23.02	39.365	33.32	52.333	43.01
	52	202	265	72	246	59	282	
31.6	53.76	33.53	33.634	23.74	39.611	33.91	52.615	43.91
	46	221	241	59	222	96	256	
Apr. 10.6	54.22	35.74	33.875	24.33	39.833	34.87	52.871	44.74
	42	236	215	48	195	127	231	
20.6	54.64	38.10	34.090	24.81	40.028	36.14	53.102	45.47
	35	246	189	36	166	152	202	
30.6	54.99	40.56	34.279	25.17	40.194	37.66	53.304	46.13
	28	251	159	25	136	171	172	
May 10.5	55.27	43.07	34.438	25.42	40.330	39.37	53.476	46.71
	22	252	128	17	104	181	141	
20.5	55.49	45.59	34.566	25.59	40.434	41.18	53.617	47.22
	15	247	97	11	72	185	106	
30.5	55.64	48.06	34.663	25.70	40.506	43.03	53.723	47.66
June 9.4	55.71	50.42	34.726	25.74	40.546	44.87	53.794	48.03
	−1	236	63	−4	40	184	71	
19.4	55.70	52.61	34.755	25.72	40.553	46.64	53.829	48.33
	8	219	29	2	−7	177	35	
29.4	55.62	54.60	34.751	25.64	40.527	48.27	53.829	48.55
July 9.4	15	199	−4	8	26	163	0	
	55.47	56.30	34.712	25.51	40.469	49.75	53.794	48.70
	21	170	39	13	58	148	35	
		139	72	19	87	127	72	
19.3	55.26	57.69	34.640	25.32	40.382	51.02	53.722	48.74
	28	102	100	25	115	104	103	
29.3	54.98	58.71	34.540	25.07	40.267	52.06	53.619	48.68
	32	62	125	31	137	79	130	
Aug. 8.3	54.66	59.33	34.415	24.76	40.130	52.85	53.489	48.51
	36	−18	144	36	155	53	151	
18.3	54.30	59.51	34.271	24.40	39.975	53.38	53.338	48.22
	37	−25	157	42	168	−23	166	
28.2	53.93	59.26	34.114	23.98	39.807	53.61	53.172	47.83
	38	70	162	47	171	5	170	
Sept. 7.2	53.55	58.56	33.952	23.51	39.636	53.56	53.002	47.33
	37	113	157	50	166	35	166	
17.2	53.18	57.43	33.795	23.01	39.470	53.21	52.836	46.73
	33	152	142	50	155	65	151	
27.1	52.85	55.91	33.653	22.51	39.315	52.56	52.685	46.07
Oct. 7.1	28	185	117	48	133	94	126	
	52.57	54.06	33.536	22.03	39.182	51.62	52.559	45.38
	20	214	83	43	102	125	92	
17.1	52.37	51.92	33.453	21.60	39.080	50.37	52.467	44.69
	12	232	41	34	64	154	48	
27.1	52.25	49.60	33.412	21.26	39.016	48.83	52.419	44.04
Nov. 6.0	3	241	7	21	−20	181	3	
	52.22	47.19	33.419	21.05	38.996	47.02	52.422	43.48
	−9	242	59	−6	−28	206	56	
16.0	52.31	44.77	33.478	20.99	39.024	44.96	52.478	43.05
	18	232	112	13	80	225	113	
26.0	52.49	42.45	33.590	21.12	39.104	42.71	52.591	42.80
Dec. 6.0	29	213	164	34	130	241	166	
	52.78	40.32	33.754	21.46	39.234	40.30	52.757	42.73
	37	186	213	52	178	250	217	
15.9	53.15	38.46	33.967	21.98	39.412	37.80	52.974	42.89
	46	152	255	73	220	251	261	
25.9	53.61	36.94	34.222	22.71	39.632	35.29	53.235	43.24
	54	113	288	88	256	246	298	
35.9	54.15	35.81	34.510	23.59	39.888	32.83	53.533	43.79
Mean Place	49.006	32.92	30.751	12.01	37.106	54.25	49.642	34.10
Sec δ, Tan δ	2.216	−1.978	1.064	−0.362	1.040	+0.285	1.111	−0.485
$D_\psi a$, $D_\omega a$	+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.

hington a Time.	ε Coronæ Borealis. Mag. 4.2		δ Scorpii. Mag. 2.5		θ Draconis. Mag. 4.1		β Scorpii. Mag. 2.9	
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.
	h m 15 54 s	° ′ +27 6 ″	h m 15 55 s	° ′ −22 23 ″	h m 16 0 s	° ′ +58 46 ″	h m 16 0 s	° ′ −19 34 ″
.. 0.9	8.730	49.64	25.349	13.25	18.492	54.19	36.445	47.72
	279	265	309	83	358	305	301	93
10.9	9.009	46.99	25.658	14.08	18.850	51.14	36.746	48.65
	305	237	330	94	411	262	321	102
20.8	9.314	44.62	25.988	15.02	19.261	48.52	37.067	49.67
	321	200	342	106	451	208	333	108
30.8	9.635	42.62	26.330	16.08	19.712	46.44	37.400	50.75
). 9.8	328	156	345	108	475	148	338	109
	9.963	41.06	26.675	17.16	20.187	44.96	37.738	51.84
	327	106	340	107	484	83	335	106
19.8	10.290	40.00	27.015	18.23	20.671	44.13	38.073	52.90
	319	54	331	103	479	15	326	98
r. 1.7	10.609	39.46	27.346	19.26	21.150	43.98	38.399	53.88
	302	1	316	97	460	53	310	89
11.7	10.911	39.47	27.662	20.23	21.610	44.51	38.709	54.77
	281	51	296	87	426	115	294	76
21.7	11.192	39.98	27.958	21.10	22.036	45.66	39.003	55.53
	258	99	275	77	384	174	273	63
31.6	11.450	40.97	28.233	21.87	22.420	47.40	39.276	56.16
	230	141	251	65	331	225	250	51
r. 10.6	11.680	42.38	28.484	22.52	22.751	49.65	39.526	56.67
	198	178	226	56	273	265	226	40
20.6	11.878	44.16	28.710	23.08	23.024	52.30	39.752	57.07
	165	206	198	46	211	297	199	28
30.6	12.043	46.22	28.908	23.54	23.235	55.27	39.951	57.35
y 10.5	132	224	169	38	143	316	171	18
	12.175	48.46	29.077	23.92	23.378	58.43	40.122	57.53
20.5	99	235	139	30	77	325	141	12
	12.274	50.81	29.216	24.22	23.455	61.68	40.263	57.65
	62	239	106	22	9	323	108	5
30.5	12.336	53.20	29.322	24.44	23.464	64.91	40.371	57.70
	25	234	71	17	59	312	75	0
ne 9.5	12.361	55.54	29.393	24.61	23.405	68.03	40.446	57.70
	10	223	36	11	122	292	40	5
19.4	12.351	57.77	29.429	24.72	23.283	70.95	40.486	57.65
	45	204	1	5	182	263	5	10
29.4	12.306	59.81	29.430	24.77	23.101	73.58	40.491	57.55
ly 9.4	79	182	35	2	236	229	30	13
	12.227	61.63	29.395	24.75	22.865	75.87	40.461	57.42
	111	155	68	8	288	189	64	19
19.3	12.116	63.18	29.327	24.67	22.577	77.76	40.397	57.23
	138	124	100	15	329	144	94	24
29.3	11.978	64.42	29.227	24.52	22.248	79.20	40.303	56.99
ug. 8.3	163	92	125	25	364	97	122	28
	11.815	65.34	29.102	24.27	21.884	80.17	40.181	56.71
18.3	180	56	146	32	388	45	143	33
	11.635	65.90	28.956	23.95	21.496	80.62	40.038	56.38
28.2	192	19	162	39	403	4	158	38
	11.443	66.09	28.794	23.56	21.093	80.58	39.880	56.00
	196	18	166	47	405	56	164	43
ept. 7.2	11.247	65.91	28.628	23.09	20.688	80.02	39.716	55.57
	192	56	161	53	396	107	161	45
17.2	11.055	65.35	28.467	22.56	20.292	78.95	39.555	55.12
	179	92	148	56	375	156	147	47
27.2	10.876	64.43	28.319	22.00	19.917	77.39	39.408	54.65
kt. 7.1	155	130	123	56	339	203	126	44
	10.721	63.13	28.196	21.44	19.578	75.36	39.282	54.21
17.1	123	166	91	53	293	246	92	40
	10.598	61.47	28.105	20.91	19.285	72.90	39.190	53.81
	84	199	48	47	232	284	52	32
27.1	10.514	59.48	28.057	20.44	19.053	70.06	39.138	53.49
	38	228	2	36	165	318	5	19
ov. 6.0	10.476	57.20	28.059	20.08	18.888	66.88	39.133	53.30
	13	255	53	21	87	344	48	6
16.0	10.489	54.65	28.112	19.87	18.801	63.44	39.181	53.24
	66	275	108	4	4	360	100	12
26.0	10.555	51.90	28.220	19.83	18.797	59.84	39.281	53.36
ec. 6.0	120	288	160	16	81	369	152	31
	10.675	49.02	28.380	19.99	18.878	56.15	39.433	53.67
	171	293	210	35	164	306	201	49
15.9	10.846	46.09	28.590	20.34	19.042	52.49	39.634	54.16
	217	290	253	54	245	351	244	69
25.9	11.063	43.19	28.843	20.88	19.287	48.98	39.878	54.85
	256	277	288	72	316	326	278	82
35.9	11.319	40.42	29.131	21.60	19.603	45.72	40.156	55.67
n Place	9.009	62.90	25.331	11.19	19.978	71.79	36.440	45.90
δ, Tan δ	*1.123*	*+0.512*	*1.082*	−0.412	1.929	+1.650	1.061	−0.356
$D_m\,\alpha$	*+0.05*	*+0.02*	*+0.07*	−0.01	+0.02	+0.06	+0.07	−0.01
$D_m\,\delta$	*−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.	κ Herculis. Mag. 5.3		Groombridge 2390. Mag. 5.4		φ Herculis. Mag. 4.3		δ¹ Apo Mag. 4
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.
	h m 16 4	° ′ +17 15	h m 16 6	° ′ +68 1	h m 16 6	° ′ +45 8	h m 16 7
	s	″	s	″	s	″	s
Jan. 0.9	19.448	50.62	2.89	25.14	8.463	51.56	50.83
	268	240	43	307	296	300	112
10.9	19.716	48.22	3.32	22.07	8.759	48.56	51.95
	291	219	52	262	332	264	123
20.8	20.007	46.03	3.84	19.45	9.091	45.92	53.18
	308	190	57	207	361	217	131
30.8	20.315	44.13	4.41	17.38	9.452	43.75	54.49
	313	155	62	145	376	163	136
Feb. 9.8	20.628	42.58	5.03	15.93	9.828	42.12	55.85
	314	114	63	79	382	102	138
19.8	20.942	41.44	5.66	15.14	10.210	41.10	57.23
	306	69	64	12	376	39	136
Mar. 1.7	21.248	40.75	6.30	15.02	10.586	40.71	58.59
	294	23	60	57	362	24	133
11.7	21.542	40.52	6.90	15.59	10.948	40.95	59.92
	275	22	57	122	338	85	126
21.7	21.817	40.74	7.47	16.81	11.286	41.80	61.18
	256	64	52	180	308	142	116
31.6	22.073	41.38	7.99	18.61	11.594	43.22	62.34
	229	104	44	232	273	191	107
Apr. 10.6	22.302	42.42	8.43	20.93	11.867	45.13	63.41
	204	136	36	272	235	233	94
20.6	22.506	43.78	8.79	23.65	12.102	47.46	64.35
	176	162	27	303	191	265	81
30.6	22.682	45.40	9.06	26.68	12.293	50.11	65.16
	146	182	17	322	145	286	65
May 10.5	22.828	47.22	9.23	29.90	12.438	52.97	65.81
	114	194	7	332	98	298	49
20.5	22.942	49.16	9.30	33.22	12.536	55.95	66.30
	82	200	2	331	50	301	32
30.5	23.024	51.16	9.28	36.53	12.586	58.96	66.62
	48	198	11	318	3	294	13
June 9.5	23.072	53.14	9.17	39.71	12.589	61.90	66.75
	14	190	21	295	44	278	3
19.4	23.086	55.04	8.96	42.66	12.545	64.68	66.72
	21	179	29	269	89	255	22
29.4	23.065	56.83	8.67	45.35	12.456	67.23	66.50
	52	161	37	233	132	224	38
July 9.4	23.013	58.44	8.30	47.68	12.324	69.47	66.12
	84	141	44	191	171	191	53
19.3	22.929	59.85	7.86	49.59	12.153	71.38	65.59
	114	116	48	143	207	151	67
29.3	22.815	61.01	7.38	51.02	11.946	72.89	64.92
	136	90	55	97	234	107	80
Aug. 8.3	22.679	61.91	6.83	51.99	11.712	73.96	64.12
	158	63	57	44	257	62	88
18.3	22.521	62.54	6.26	52.43	11.455	74.58	63.24
	172	34	59	6	271	16	92
28.2	22.349	62.88	5.67	52.37	11.184	74.74	62.32
	177	2	59	60	276	31	94
Sept. 7.2	22.172	62.90	5.08	51.77	10.908	74.43	61.38
	175	26	58	112	274	78	92
17.2	21.997	62.64	4.50	50.65	10.634	73.65	60.46
	164	59	56	160	257	126	86
27.2	21.833	62.05	3.94	49.05	10.377	72.39	59.60
	143	91	50	210	233	170	74
Oct. 7.1	21.690	61.14	3.44	46.95	10.144	70.69	58.86
	114	121	45	252	196	213	61
17.1	21.576	59.93	2.99	44.43	9.948	68.56	58.25
	77	151	37	291	152	251	43
27.1	21.499	58.42	2.62	41.52	9.796	66.05	57.82
	32	179	28	325	98	284	22
Nov. 6.0	21.467	56.63	2.34	38.27	9.698	63.21	57.60
	15	204	17	349	39	313	1
16.0	21.482	54.59	2.17	34.78	9.659	60.08	57.59
	65	220	7	306	24	332	22
26.0	21.547	52.33	2.10	31.12	9.683	56.76	57.81
	116	241	5	373	90	345	44
Dec. 6.0	21.663	49.92	2.15	27.39	9.773	53.31	58.25
	165	250	16	309	153	346	66
15.9	21.828	47.42	2.31	23.70	9.926	49.85	58.91
	208	253	27	354	213	338	84
25.9	22.036	44.89	2.58	20.16	10.139	46.47	59.75
	245	248	38	328	265	318	103
35.9	22.281	42.41	2.96	16.88	10.404	43.29	60.78
Mean Place	19.637	61.45	5.472	43.00	9.264	67.12	53.722
Sec δ, Tan δ	1.047	+0.311	2.672	+2.478	1.418	+1.005	5.012
$D_\psi\, a$, $D_\omega\, a$	+0.05	+0.01	0.00	+0.08	+0.04	+0.03	+0.18
$D_\psi\, \delta$, $D_\omega\, \delta$	−0.2	−0.9	−0.2	−0.9	−0.2	−0.9	−0.2

FOR THE UPPER TRANSIT AT WASHINGTON.

gtion ime.	δ Ophiuchi. Mag. 3.0		σ Cor. Bor. *seq.* Mag. 5.8		19 Ursæ Minoris. Mag. 5.5		γ² Normæ. Mag. 4.1	
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.
	h m 16 9 s	° ′ − 3 28 ″	h m 16 11 s	° ′ +34 3 ″	h m 16 13 s	° ′ +76 4 ″	h m 16 13 s	° ′ −49 57 ″
0.9	59.604	59.44	33.679	52.84	5.63	55.52	36.877	8.37
10.9	59.875 271	61.05 161	33.950 271	49.98 286	6.20 57	52.49 303	37.279 402	7.77 60
20.8	60.170 295	62.62 157	34.253 303	47.44 254	6.92 72	49.90 259	37.716 437	7.48 29
30.8	60.479 309	64.09 147	34.577 324	45.29 215	7.74 82	47.84 206	38.175 459	7.49 1
9.8	60.792 313	65.40 131	34.913 336	43.62 167	8.63 89	46.39 145	38.645 470	7.82 33
	313	110	340	113	94	80	471	61
19.8	61.105	66.50	35.253	42.49	9.57	45.59	39.116	8.43
1.7	61.409 304	67.37 87	35.588 335	41.93 56	10.51 94	45.48 11	39.579 463	9.27 84
11.7	61.703 294	67.96 59	35.911 323	41.95 2	11.43 92	46.05 57	40.027 448	10.33 106
21.7	61.981 278	68.27 31	36.214 303	42.54 59	12.29 86	47.25 120	40.455 428	11.59 126
31.7	62.240 259	68.33 6	36.495 281	43.65 111	13.07 78	49.04 179	40.855 400	12.99 140
	240	21	251	158	66	230	371	154
10.6	62.480	68.12	36.746	45.23	13.73	51.34	41.226	14.53
20.6	62.693 213	67.70 42	36.966 220	47.22 199	14.27 54	54.05 271	41.562 336	16.18 165
30.6	62.883 190	67.08 62	37.152 186	49.51 229	14.67 40	57.08 303	41.860 298	17.89 171
r 10.5	63.046 163	66.33 75	37.300 148	52.03 252	14.90 23	60.30 322	42.116 256	19.65 176
20.5	63.181 135	65.48 85	37.411 111	54.68 265	14.99 9	63.61 331	42.326 210	21.42 177
	104	92	72	270	7	329	161	175
30.5	63.285	64.56	37.483	57.38	14.92	66.90	42.487	23.17
ıe 9.5	63.358 73	63.62 94	37.514 31	60.04 266	14.70 22	70.08 318	42.597 110	24.87 170
19.4	63.397 39	62.68 94	37.506 8	62.57 253	14.33 37	73.04 296	42.653 56	26.46 159
29.4	63.403 6	61.77 91	37.459 47	64.93 236	13.83 50	75.72 268	42.654 1	27.92 146
y 9.4	63.376 27	60.92 85	37.373 86	67.03 210	13.21 62	78.05 233	42.602 52	29.22 130
	60	78	121	182	73	191	104	107
19.4	63.316	60.14	37.252	68.85	12.48	79.96	42.498	30.29
29.3	63.227 89	59.44 70	37.100 152	70.32 147	11.66 82	81.42 146	42.347 151	31.10 81
ıg. 8.3	63.111 116	58.84 60	36.921 179	71.42 110	10.77 89	82.39 97	42.155 192	31.64 54
18.3	62.975 136	58.34 50	36.719 202	72.13 71	9.84 93	82.84 45	41.930 225	31.86 22
28.2	62.824 151	57.94 40	36.501 218	72.42 29	8.87 97	82.79 5	41.683 247	31.75 11
	159	26	223	11	97	57	257	44
pt. 7.2	62.665	57.68	36.278	72.31	7.90	82.22	41.426	31.31
17.2	62.507 158	57.53 15	36.056 222	71.76 55	6.95 95	81.13 109	41.172 254	30.53 78
27.2	62.359 148	57.53 0	35.847 209	70.80 96	6.04 91	79.55 158	40.935 237	29.45 108
ct. 7.1	62.232 127	57.68 15	35.658 189	69.44 136	5.19 85	77.50 205	40.731 204	28.11 134
17.1	62.132 100	58.01 33	35.500 158	67.67 177	4.44 75	75.01 249	40.571 160	26.56 155
	63	50	118	214	65	286	104	172
27.1	62.069	58.51	35.382	65.53	3.79	72.15	40.467	24.84
ov. 6.1	62.050 19	59.22 71	35.311 71	63.07 246	3.28 51	68.96 319	40.431 36	23.05 179
16.0	62.078 28	60.11 89	35.292 19	60.33 274	2.92 36	65.52 344	40.468 37	21.25 180
26.0	62.156 78	61.20 109	35.329 37	57.37 296	2.73 19	61.91 361	40.578 110	19.53 172
ec. 6.0	62.284 128	62.47 127	35.423 94	54.26 311	2.70 3	58.22 369	40.764 186	17.96 157
	174	141	118	316	16	365	256	138
15.9	62.458	63.88	35.571	51.10	2.86	54.57	41.020	16.58
25.9	62.674 216	65.40 152	35.771 200	47.98 312	3.19 33	51.07 350	41.337 317	15.47 111
35.9	62.925 251	66.99 159	36.016 245	45.00 298	3.67 48	47.83 324	41.708 371	14.66 81
n Place	59.656	53.21	34.188	66.39	10.417	73.09	37.194	11.27
δ, Tan δ	1.002	−0.061	1.207	+0.676	4.158	+4.036	1.554	−1.190
ı, D_∞ α	+0.06	0.00	+0.05	+0.02	−0.03	+0.12	+0.09	−0.04
), D_∞ 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 Ophiuchi. Mag. 3.3		σ Scorpii. Mag. 3.1		τ Herculis. Mag. 3.9		γ Herculis. Mag. 3.8	
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.
	h m s 16 13	° ′ ″ − 4 29	h m s 16 16	° ′ ″ −25 23	h m s 16 17	° ′ ″ +46 30	h m s 16 18	° ′ ″ +19
Jan. 0.9	s 55.608	″ 33.79	s 8.363	″ 42.42	s 13.826	″ 22.48	s 15.200	″ 39.24
	271	154	302	55	287	307	258	38.78
10.9	55.879	35.33	8.665	42.97	14.113	19.41	15.458	
	293	151	325	69	327	272	283	34.51
20.8	56.172	36.84	8.990	43.66	14.440	16.69	15.741	
	308	143	341	78	359	226	302	32.58
30.8	56.480	38.27	9.331	44.44	14.799	14.43	16.043	
	314	128	349	86	378	171	312	30.96
Feb. 9.8	56.794	39.55	9.680	45.30	15.177	12.72	16.355	
	313	108	348	89	386	112	314	
19.8	57.107	40.63	10.028	46.19	15.563	11.60	16.669	29.77
	306	86	341	87	384	48	309	
Mar. 1.7	57.413	41.49	10.369	47.06	15.947	11.12	16.978	29.05
	296	59	330	85	372	16	298	
11.7	57.709	42.08	10.699	47.91	16.319	11.28	17.276	28.81
	281	32	314	79	351	79	284	
21.7	57.990	42.40	11.013	48.70	16.670	12.07	17.560	29.04
	261	7	294	71	324	136	264	
31.7	58.251	42.47	11.307	49.41	16.994	13.43	17.824	29.78
	242	19	274	66	289	188	242	
Apr. 10.6	58.493	42.28	11.581	50.07	17.283	15.31	18.066	30.82
	219	38	249	58	249	232	215	
20.6	58.712	41.90	11.830	50.65	17.532	17.63	18.281	32.25
	195	57	221	51	206	266	189	
30.6	58.907	41.33	12.051	51.16	17.738	20.29	18.470	33.98
	167	73	194	45	161	289	158	
May 10.5	59.074	40.60	12.245	51.61	17.899	23.18	18.628	35.91
	140	81	163	40	112	304	126	
20.5	59.214	39.79	12.408	52.01	18.011	26.22	18.754	37.97
	109	88	129	35	63	307	94	
30.5	59.323	38.91	12.537	52.36	18.074	29.29	18.848	40.11
	77	90	95	30	13	301	59	
June 9.5	59.400	38.01	12.632	52.66	18.087	32.30	18.907	42.23
	44	90	57	24	36	288	23	
19.4	59.444	37.11	12.689	52.90	18.051	35.18	18.930	44.29
	10	87	19	21	83	265	12	
29.4	59.454	36.24	12.708	53.11	17.968	37.83	18.918	46.22
	24	83	19	15	129	237	46	
July 9.4	59.430	35.41	12.689	53.26	17.839	40.20	18.872	47.98
	57	75	57	7	171	202	80	
19.4	59.373	34.66	12.632	53.33	17.668	42.22	18.792	49.51
	86	67	90	0	208	163	111	
29.3	59.287	33.99	12.542	53.33	17.460	43.85	18.681	50.80
	114	60	121	9	239	121	137	
Aug. 8.3	59.173	33.39	12.421	53.24	17.221	45.06	18.544	51.83
	135	50	146	21	265	75	160	
18.3	59.038	32.89	12.275	53.03	16.956	45.81	18.384	52.55
	151	40	165	29	281	29	175	
28.2	58.887	32.49	12.110	52.74	16.675	46.10	18.209	52.97
	159	29	173	39	289	20	183	
Sept. 7.2	58.728	32.20	11.937	52.35	16.386	45.90	18.026	53.07
	159	16	173	48	287	68	183	
17.2	58.569	32.04	11.764	51.87	16.099	45.22	17.843	52.84
	149	4	161	56	274	115	174	
27.2	58.420	32.00	11.603	51.31	15.825	44.07	17.669	52.27
	129	11	141	60	250	161	155	
Oct. 7.1	58.291	32.11	11.462	50.71	15.575	42.46	17.514	51.39
	103	27	109	61	215	204	127	
17.1	58.188	32.38	11.353	50.10	15.360	40.42	17.387	50.18
	65	44	68	59	171	245	93	
27.1	58.123	32.82	11.285	49.51	15.189	37.97	17.294	48.65
	22	64	20	53	118	280	50	
Nov. 6.1	58.101	33.46	11.265	48.98	15.071	35.17	17.244	46.83
	26	82	32	43	59	310	1	
16.0	58.127	34.28	11.297	48.55	15.012	32.07	17.243	44.74
	75	100	88	27	7	331	50	
26.0	58.202	35.28	11.385	48.28	15.019	28.76	17.293	42.44
	125	119	144	12	72	345	100	
Dec. 6.0	58.327	36.47	11.529	48.16	15.091	25.31	17.393	39.97
	171	134	194	6	138	350	150	
15.9	58.498	37.81	11.723	48.22	15.229	21.81	17.543	37.38
	214	145	240	26	198	342	194	
25.9	58.712	39.26	11.963	48.48	15.427	18.39	17.737	34.79
	270	162	278	43	255	324	233	
35.9	58.962	40.78	12.241	48.91	15.682	15.15	17.970	32.26
Mean Place	55.670	27.83	8.421	40.82	14.756	37.45	15.476	49.87
Sec. δ, Tan δ	1.003	−0.079	1.107	−0.475	1.453	+1.054	1.060	+0.35
$D_{\alpha}\alpha$, $D_{\omega}\alpha$	+0.06	0.00	+0.07	−0.01	+0.04	+0.03	+0.05	+0
$D_{\alpha}\delta$, $D_{\omega}\delta$	−0.2	−0.9	−0.2	−0.9	−0.2	−0.9	−0.2	−

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	η Ursæ Minoris. Mag. 5.0				γ Apodis. Mag. 3.9				ω Herculis. Mag. 4.5				η Draconis. Mag. 2.9			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	16 19		+75 56		16 20		−78 42		16 21		+14 13		16 22		+61 41	
	s		″		s		″		s		″		s		″	
h. 0.9	49.88		32.61		37.53		41.62		34.620		15.25		49.92		50.46	
10.9	50.43	55	29.54	307	38.62	109	39.78	184	34.876	256	12.96	220	50.26	34	47.27	319
20.9	51.12	69	26.90	264	39.84	122	38.38	140	35.155	279	10.86	210	50.67	41	44.47	280
30.8	51.91	79	24.77	213	41.16	132	37.46	92	35.452	297	8.98	188	51.13	46	42.18	229
h. 9.8	52.79	88	23.24	153	42.54	138	37.04	42	35.760	308	7.43	155	51.62	49	40.47	171
		92		87		140		6		310		118		51		107
19.8	53.71		22.37		43.94		37.10		36.070		6.25		52.13		39.40	
r. 1.7	54.64	93	22.17	20	45.33	139	37.63	53	36.374	304	5.49	76	52.65	52	39.02	38
11.7	55.55	91	22.66	49	46.70	137	38.62	99	36.670	296	5.16	33	53.16	51	39.31	29
21.7	56.42	87	23.78	112	48.01	131	40.01	139	36.951	281	5.26	10	53.64	48	40.27	96
31.7	57.20	78	25.50	172	49.24	123	41.79	178	37.213	262	5.78	52	54.08	44	41.84	157
		67		223		113		211		242		91		39		211
r. 10.6	57.87		27.73		50.37		43.90		37.455		6.69		54.47		43.95	
20.6	58.42	55	30.40	267	51.38	101	46.30	240	37.672	217	7.92	123	54.80	33	46.50	255
30.6	58.84	42	33.40	300	52.25	87	48.93	263	37.864	192	9.41	149	55.06	26	49.39	289
y 10.6	59.10	26	36.60	320	52.97	72	51.73	280	38.026	162	11.10	169	55.25	19	52.55	316
20.5	59.21	11	39.92	332	53.53	56	54.64	291	38.159	133	12.93	183	55.36	11	55.84	329
		4		332		38		297		101		190		4		331
30.5	59.17		43.24		53.91		57.61		38.260		14.83		55.40		59.15	
he 9.5	58.97	20	46.45	321	54.12	21	60.55	294	38.326	66	16.73	190	55.37	3	62.40	325
19.4	58.63	34	49.47	302	54.14	2	63.39	284	38.359	33	18.58	185	55.27	10	65.48	308
29.4	58.16	47	52.23	276	53.97	17	66.06	267	38.358	1	20.33	175	55.09	18	68.32	284
ky 9.4	57.55	61	54.63	240	53.63	34	68.50	244	38.321	37	21.92	159	54.85	24	70.84	252
		70		201		51		212		69		141		30		214
19.4	56.85		56.64		53.12		70.62		38.252		23.33		54.55		72.98	
29.3	56.05	80	58.20	156	52.47	65	72.36	174	38.153	99	24.52	119	54.20	35	74.69	171
ng. 8.3	55.18	87	59.28	108	51.69	78	73.67	131	38.024	129	25.49	97	53.80	40	75.93	124
18.3	54.26	92	59.85	57	50.81	88	74.49	82	37.875	149	26.19	70	53.36	44	76.68	75
28.3	53.30	96	59.91	6	49.86	95	74.79	30	37.709	166	26.63	44	52.91	45	76.92	24
		96		47		97		24		175		16		45		27
ept. 7.2	52.34		59.44		48.89		74.55		37.534		26.79		52.46		76.65	
17.2	51.39	95	58.46	98	47.93	96	73.76	79	37.359	175	26.66	13	52.00	46	75.85	80
27.2	50.47	92	56.99	147	47.04	89	72.45	131	37.193	166	26.24	42	51.56	44	74.54	131
ct. 7.1	49.62	85	55.04	195	46.24	80	70.65	180	37.043	150	25.53	71	51.17	39	72.75	179
17.1	48.85	77	52.65	239	45.58	66	68.43	222	36.921	122	24.53	100	50.81	36	70.50	225
		67		278		49		257		87		130		31		267
27.1	48.18		49.87		45.09		65.86		36.834		23.23		50.50		67.83	
ov. 6.1	47.66	52	46.75	312	44.79	30	63.04	282	36.788	46	21.65	158	50.27	23	64.79	304
16.0	47.28	38	43.37	338	44.73	6	60.07	297	36.790	2	19.83	182	50.12	15	61.47	332
26.0	47.06	22	39.79	358	44.88	15	57.07	300	36.841	51	17.78	205	50.05	7	57.91	356
c. 6.0	47.01	5	36.13	366	45.26	38	54.15	292	36.942	101	15.57	221	50.09	4	54.24	367
		12		364		61		275		149		233		12		369
15.9	47.13		32.49		45.87		51.40		37.091		13.24		50.21		50.55	
25.9	47.43	30	28.98	351	46.68	81	48.94	246	37.285	194	10.88	236	50.42	21	46.97	358
35.9	47.89	46	25.71	327	47.68	100	46.83	211	37.517	232	8.53	235	50.71	29	43.59	338
Place	54.741		49.54		40.624		47.43		34.845		24.78		51.890		66.46	
, Tan δ	4.118		+3.994		5.110		−5.012		1.032		+0.253		2.109		+1.857	
, D. α	−0.03		+0.11		+0.18		−0.14		+0.05		+0.01		+0.02		+0.05	
, D. 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		A Draco Mag.
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.
	h m s	° ′ ″	h m s	° ′ ″	h m s	° ′ ″	h m s
	16 24	−26 14	16 26	+21 39	16 26	+ 2 9	16 28
Jan. 0.9	18.837	57.29	38.687	59.85	43.416	45.88	5.29
	298	44	251	254	256	180	40
10.9	19.135	57.73	38.938	57.31	43.672	44.08	5.69
	323	59	278	234	280	172	48
20.9	19.458	58.32	39.216	54.97	43.952	42.36	6.17
	339	70	300	203	296	157	56
30.8	19.797	59.02	39.516	52.94	44.248	40.79	6.73
	348	77	310	165	306	137	61
Feb. 9.8	20.145	59.79	39.826	51.29	44.554	39.42	7.34
	350	81	315	121	308	110	65
19.8	20.495	60.60	40.141	50.08	44.862	38.32	7.99
	345	81	312	74	303	81	66
Mar. 1.7	20.840	61.41	40.453	49.34	45.165	37.51	8.65
	334	78	303	24	295	49	64
11.7	21.174	62.19	40.756	49.10	45.460	37.02	9.29
	320	74	289	25	282	15	62
21.7	21.494	62.93	41.045	49.35	45.742	36.87	9.91
	301	68	271	72	264	16	56
31.7	21.795	63.61	41.316	50.07	46.006	37.03	10.47
	282	62	248	115	246	45	50
Apr. 10.6	22.077	64.23	41.564	51.22	46.252	37.48	10.97
	257	56	223	152	224	73	41
20.6	22.334	64.79	41.787	52.74	46.476	38.21	11.38
	233	51	196	181	199	93	32
30.6	22.567	65.30	41.983	54.55	46.675	39.14	11.70
	203	46	165	205	173	110	24
May 10.6	22.770	65.76	42.148	56.60	46.848	40.24	11.94
	173	41	134	218	146	123	13
20.5	22.943	66.17	42.282	58.78	46.994	41.47	12.07
	140	37	100	225	115	128	3
30.5	23.083	66.54	42.382	61.03	47.109	42.75	12.10
	103	34	64	226	83	131	7
June 9.5	23.186	66.88	42.446	63.29	47.192	44.06	12.03
	65	29	28	218	50	129	18
19.4	23.251	67.17	42.474	65.47	47.242	45.35	11.85
	26	24	9	205	15	123	26
29.4	23.277	67.41	42.465	67.52	47.257	46.58	11.59
	13	20	44	188	19	114	35
July 9.4	23.264	67.61	42.421	69.40	47.238	47.72	11.24
	50	13	79	165	53	103	43
19.4	23.214	67.74	42.342	71.05	47.185	48.75	10.81
	88	4	112	140	85	90	49
29.3	23.126	67.78	42.230	72.45	47.100	49.65	10.32
	119	4	139	111	112	74	55
Aug. 8.3	23.007	67.74	42.091	73.56	46.988	50.39	9.77
	145	14	163	79	135	60	59
18.3	22.862	67.60	41.928	74.35	46.853	50.99	9.18
	166	26	180	48	153	44	62
28.3	22.696	67.34	41.748	74.83	46.700	51.43	8.56
	175	36	189	13	164	25	63
Sept. 7.2	22.521	66.98	41.559	74.96	46.536	51.68	7.93
	177	46	191	22	163	8	63
17.2	22.344	66.52	41.368	74.74	46.373	51.76	7.30
	166	54	183	56	157	11	61
27.2	22.178	65.98	41.185	74.18	46.216	51.65	6.69
	147	59	164	90	141	32	57
Oct. 7.1	22.031	65.39	41.021	73.28	46.075	51.33	6.12
	115	63	139	125	113	53	51
17.1	21.916	64.76	40.882	72.03	45.962	50.80	5.61
	75	62	103	158	79	75	43
27.1	21.841	64.14	40.779	70.45	45.883	50.05	5.18
	28	57	61	187	38	95	35
Nov. 6.1	21.813	63.57	40.718	68.58	45.845	49.10	4.83
	24	48	13	216	8	117	25
16.0	21.837	63.09	40.705	66.42	45.853	47.93	4.58
	80	35	38	238	57	137	13
26.0	21.917	62.74	40.743	64.04	45.910	46.56	4.45
	135	19	90	257	106	153	2
Dec. 6.0	22.052	62.55	40.833	61.47	46.016	45.03	4.43
	187	3	139	266	154	169	10
16.0	22.239	62.52	40.972	58.81	46.170	43.34	4.53
	234	17	185	269	197	177	22
25.9	22.473	62.69	41.157	56.12	46.367	41.57	4.75
	273	33	226	262	232	180	34
35.9	22.746	63.02	41.383	53.50	46.599	39.77	5.09
Mean Place	18.923	55.76	39.031	70.50	43.554	52.94	8.325
Sec δ, Tan δ	1.115	−0.493	1.076	+0.397	1.001	+0.038	2.783
$D_\psi\, a$, $D_\omega\, a$	+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.

ington Time.	τ Scorpii. Mag. 2.9		σ Herculis. Mag. 4.2		ζ Ophiuchi. Mag. 2.7		24 Scorpii. Mag. 5.0	
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.
	h m s 16 30	° ′ ″ −28 2	h m s 16 31	° ′ ″ +42 36	h m s 16 32	° ′ ″ −10 23	h m s 16 36	° ′ ″ −17 34
0.9	42.631	42.91	24.749	13.35	35.093	64.21	46.116	60.01
	298	31	263	308	264	120	270	81
10.9	42.929	43.22	25.012	10.27	35.357	65.41	46.386	60.82
	323	46	303	275	288	121	297	87
20.9	43.252	43.68	25.315	7.52	35.645	66.62	46.683	61.69
	341	57	333	233	306	117	314	91
30.8	43.593	44.25	25.648	5.19	35.951	67.79	46.997	62.60
9.8	353	67	355	183	315	109	325	89
	43.946	44.92	26.003	3.36	36.266	68.88	47.322	63.49
	354	74	364	126	317	96	327	83
19.8	44.300	45.66	26.367	2.10	36.583	69.84	47.649	64.32
	349	75	365	64	313	78	325	74
1.7	44.649	46.41	26.732	1.46	36.896	70.62	47.974	65.06
	341	74	356	1	305	60	317	63
11.7	44.990	47.15	27.088	1.45	37.201	71.22	48.291	65.69
	328	71	341	60	293	39	304	50
21.7	45.318	47.86	27.429	2.05	37.494	71.61	48.595	66.19
	309	68	317	119	277	18	290	37
31.7	45.627	48.54	27.746	3.24	37.771	71.79	48.885	66.56
	290	65	289	170	259	2	272	21
10.6	45.917	49.19	28.035	4.94	38.030	71.77	49.157	66.77
	267	60	254	215	239	20	250	11
20.6	46.184	49.79	28.289	7.09	38.269	71.57	49.407	66.88
	242	55	217	252	215	33	228	1
30.6	46.426	50.34	28.506	9.61	38.484	71.24	49.635	66.89
10.6	212	52	175	277	190	45	201	8
	46.638	50.86	28.681	12.38	38.674	70.79	49.836	66.81
20.5	182	48	131	294	161	54	173	15
	46.820	51.34	28.812	15.32	38.835	70.25	50.009	66.66
	148	46	86	300	132	60	143	19
30.5	46.968	51.80	28.898	18.32	38.967	69.65	50.152	66.47
	111	43	39	299	99	62	108	21
9.5	47.079	52.23	28.937	21.31	39.066	69.03	50.260	66.26
	73	39	7	288	64	62	73	23
19.4	47.152	52.62	28.930	24.19	39.130	68.41	50.333	66.03
	32	34	53	268	28	61	35	24
29.4	47.184	52.96	28.877	26.87	39.158	67.80	50.368	65.79
9.4	8	29	98	243	8	59	2	24
	47.176	53.25	28.779	29.30	39.150	67.21	50.366	65.55
	46	21	139	212	42	55	39	24
19.4	47.130	53.46	28.640	31.42	39.108	66.66	50.327	65.31
	85	13	178	176	76	50	74	24
29.3	47.045	53.59	28.462	33.18	39.032	66.16	50.253	65.07
8.3	119	3	212	135	107	46	106	26
	46.926	53.62	28.250	34.53	38.925	65.70	50.147	64.81
18.3	146	8	237	93	131	42	132	27
	46.780	53.54	28.013	35.46	38.794	65.28	50.015	64.54
28.3	167	21	257	48	149	36	153	29
	46.613	53.33	27.756	35.94	38.645	64.92	49.862	64.25
	178	32	266	1	161	31	167	30
7.2	46.435	53.01	27.490	35.95	38.484	64.61	49.695	63.95
	181	44	268	45	165	24	168	32
17.2	46.254	52.57	27.222	35.50	38.319	64.37	49.527	63.63
	172	54	258	92	157	18	162	31
27.2	46.082	52.03	26.964	34.58	38.162	64.19	49.365	63.32
7.1	153	62	239	138	140	9	145	30
	45.929	51.41	26.725	33.20	38.022	64.10	49.220	63.02
17.1	122	68	208	182	113	2	118	25
	45.807	50.73	26.517	31.38	37.909	64.12	49.102	62.77
	83	69	168	222	78	13	82	19
27.1	45.724	50.04	26.349	29.16	37.831	64.25	49.020	62.58
6.1	35	65	119	259	36	29	39	10
	45.689	49.39	26.230	26.57	37.795	64.54	48.981	62.48
16.0	17	59	64	290	11	44	9	1
	45.706	48.80	26.166	23.67	37.806	64.98	48.990	62.49
26.0	74	48	3	315	61	60	62	15
	45.780	48.32	26.163	20.52	37.867	65.58	49.052	62.64
6.0	130	33	58	331	111	78	113	32
	45.910	47.99	26.221	17.21	37.978	66.36	49.165	62.96
	183	16	120	339	160	92	163	46
16.0	46.093	47.83	26.341	13.82	38.138	67.28	49.328	63.42
	231	2	179	335	204	105	208	61
25.9	46.324	47.85	26.520	10.47	38.342	68.33	49.536	64.03
35.9	272	20	231	322	239	113	249	73
	46.596	48.05	26.751	7.25	38.581	69.46	49.785	64.76
Place	42.742	41.64	25.615	26.80	35.194	59.67	46.219	56.80
Tan δ	1.133	−0.533	1.359	+0.920	1.017	−0.184	1.049	−0.317
D_α	+0.07	−0.01	+0.04	+0.02	+0.07	0.00	+0.07	−0.01
D_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		Groombrid Mag.
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.
	h m s	° ′ ″	h m s	° ′ ″	h m s	° ′ ″	h m s
	16 38	+31 44	16 39	−68 52	16 40	+39 4	16 43
Jan. 0.9	8.835	57.32	50.40	33.37	2.192	33.37	41.630
	243	285	61	171	249	304	284
10.9	9.078	54.47	51.01	31.66	2.441	30.33	41.914
	277	258	68	133	287	274	344
20.9	9.355	51.89	51.69	30.33	2.728	27.59	42.258
	304	223	73	95	318	235	392
30.8	9.659	49.66	52.42	29.38	3.046	25.24	42.650
	319	180	77	51	338	188	427
Feb. 9.8	9.978	47.86	53.19	28.87	3.384	23.36	43.077
	328	129	79	9	348	133	451
19.8	10.306	46.57	53.98	28.78	3.732	22.03	43.528
	329	74	79	31	351	74	456
Mar. 1.8	10.635	45.83	54.77	29.09	4.083	21.29	43.986
	322	18	78	70	345	13	454
11.7	10.957	45.65	55.55	29.79	4.428	21.16	44.440
	308	39	76	107	331	49	437
21.7	11.265	46.04	56.31	30.86	4.759	21.65	44.877
	291	92	72	138	310	105	408
31.7	11.556	46.96	57.03	32.24	5.069	22.70	45.285
	267	141	67	169	286	157	371
Apr. 10.6	11.823	48.37	57.70	33.93	5.355	24.27	45.656
	241	184	61	194	255	202	326
20.6	12.064	50.21	58.31	35.87	5.610	26.29	45.982
	209	218	54	217	220	238	272
30.6	12.273	52.39	58.85	38.04	5.830	28.67	46.254
	175	244	48	233	182	267	215
May 10.6	12.448	54.83	59.33	40.37	6.012	31.34	46.469
	142	262	39	246	143	283	152
20.5	12.590	57.45	59.72	42.83	6.155	34.17	46.621
	102	269	30	252	100	293	87
30.5	12.692	60.14	60.02	45.35	6.255	37.10	46.708
	62	270	21	254	56	292	22
June 9.5	12.754	62.84	60.23	47.89	6.311	40.02	46.730
	23	261	9	248	12	283	43
19.5	12.777	65.45	60.32	50.37	6.323	42.85	46.687
	18	248	0	237	34	266	106
29.4	12.759	67.93	60.32	52.74	6.289	45.51	46.581
	59	226	10	219	77	244	166
July 9.4	12.700	70.19	60.22	54.93	6.212	47.95	46.415
	95	199	19	195	118	213	223
19.4	12.605	72.18	60.03	56.88	6.094	50.08	46.192
	132	168	28	163	156	180	274
29.3	12.473	73.86	59.75	58.51	5.938	51.88	45.918
	163	134	36	126	189	142	317
Aug. 8.3	12.310	75.20	59.39	59.77	5.749	53.30	45.601
	188	97	44	86	217	101	352
18.3	12.122	76.17	58.95	60.63	5.532	54.31	45.249
	208	58	47	40	237	58	377
28.3	11.914	76.75	58.48	61.03	5.295	54.89	44.872
	219	17	50	7	248	13	392
Sept. 7.2	11.695	76.92	57.98	60.96	5.047	55.02	44.480
	222	25	50	55	252	32	395
17.2	11.473	76.67	57.48	60.41	4.795	54.70	44.085
	214	66	49	103	245	78	385
27.2	11.259	76.01	56.99	59.38	4.550	53.92	43.700
	199	107	43	146	227	122	361
Oct. 7.2	11.060	74.94	56.56	57.92	4.323	52.70	43.339
	172	147	37	187	199	165	326
17.1	10.888	73.47	56.19	56.05	4.124	51.05	43.013
	136	183	28	220	162	206	278
27.1	10.752	71.64	55.91	53.85	3.962	48.99	42.735
	95	219	17	243	115	242	219
Nov. 6.1	10.657	69.45	55.74	51.42	3.847	46.57	42.516
	43	249	6	260	63	274	149
16.0	10.614	66.96	55.68	48.82	3.784	43.83	42.367
	10	275	8	265	7	301	74
26.0	10.624	64.21	55.76	46.17	3.777	40.82	42.293
	64	292	20	260	54	318	6
Dec. 6.0	10.688	61.29	55.96	43.57	3.831	37.64	42.299
	119	303	33	246	112	328	87
16.0	10.807	58.26	56.29	41.11	3.943	34.36	42.386
	170	304	44	223	168	327	166
25.9	10.977	55.22	56.73	38.88	4.111	31.09	42.552
	216	294	55	195	218	316	239
35.9	11.193	52.28	57.28	36.93	4.329	27.93	42.791
Mean Place	9.418	68.88	51.756	37.47	2.984	45.77	43.346
Sec δ, Tan δ	1.176	+0.619	2.775	−2.589	1.288	+0.812	1.833
$D_\psi a$, $D_\omega a$	+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.	ε Scorpii. Mag. 2.4		49 Herculis. Mag. 6.4		ε¹ Aræ. Mag. 4.2		κ Ophiuchi. Mag. 3.4	
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.
	h m s	° ′ ″	h m s	° ′ ″	h m s	° ′ ″	h m s	° ′ ″
	16 44	−34 8	16 48	+15 6	16 52	−53 1	16 53	+ 9 29
0.9	46.842	38.20	17.752	36.52	57.231	62.11	44.031	63.90
10.9	47.142 300	38.09 11	17.984 232	34.21 231	57.611 380	60.96 115	44.261 230	61.84 206
20.9	47.473 331	38.16 7	18.247 263	32.06 215	58.036 425	60.08 88	44.520 259	59.89 195
30.8	47.827 354	38.40 24	18.530 283	30.14 192	58.496 460	59.51 57	44.799 279	58.14 175
9.8	48.193 366	38.77 37	18.828 298	28.54 160	58.978 482	59.24 27	45.093 294	56.64 150
	371	49	305	123	494	0	301	117
19.8	48.564	39.26	19.133	27.31	59.472	59.24	45.394	55.47
1.8	48.935 371	39.84 58	19.437 304	26.49 82	59.968 496	59.52 28	45.695 301	54.66 81
11.7	49.299 364	40.48 64	19.738 301	26.12 37	60.458 490	60.05 53	45.993 298	54.24 42
21.7	49.650 351	41.17 69	20.028 290	26.19 −7	60.935 477	60.83 78	46.282 289	54.22 2
31.7	49.986 336	41.88 71	20.304 276	26.69 50	61.393 458	61.81 98	46.558 276	54.59 −37
	317	74	258	90	432	117	259	73
10.7	50.303	42.62	20.562	27.59	61.825	62.98	46.817	55.32
20.6	50.597 294	43.36 74	20.800 238	28.85 126	62.227 402	64.31 133	47.057 240	56.38 106
30.6	50.865 268	44.12 76	21.013 213	30.40 155	62.593 366	65.80 149	47.275 218	57.69 131
10.6	51.105 240	44.88 76	21.200 187	32.16 176	62.920 327	67.40 160	47.468 193	59.20 151
20.5	51.312 207	45.64 76	21.358 158	34.08 192	63.199 279	69.08 168	47.632 164	60.88 168
	170	77	125	201	228	174	135	175
30.5	51.482	46.41	21.483	36.09	63.427	70.82	47.767	62.63
9.5	51.613 131	47.16 75	21.575 92	38.13 204	63.601 174	72.58 176	47.868 101	64.40 177
19.5	51.703 90	47.88 72	21.631 56	40.12 199	63.717 116	74.31 173	47.934 66	66.15 175
29.4	51.749 46	48.55 67	21.650 19	42.02 190	63.771 54	75.97 166	47.963 29	67.81 166
9.4	51.750 1	49.17 62	21.632 −18	43.79 177	63.763 −8	77.54 157	47.956 −7	69.37 156
	42	54	53	157	68	140	42	140
19.4	51.708	49.71	21.579	45.36	63.695	78.94	47.914	70.77
29.4	51.623 85	50.14 43	21.492 87	46.73 137	63.569 126	80.11 117	47.836 78	71.99 122
8.3	51.501 122	50.42 28	21.373 119	47.85 112	63.391 178	81.05 94	47.727 109	73.01 102
18.3	51.347 154	50.54 12	21.229 144	48.72 87	63.168 223	81.68 63	47.592 135	73.82 81
28.3	51.168 179	50.50 −4	21.063 166	49.30 58	62.911 257	81.99 31	47.434 158	74.39 57
	194	22	178	30	278	3	171	32
7.2	50.974	50.28	20.885	49.60	62.633	81.96	47.263	74.71
17.2	50.776 198	49.88 40	20.703 182	49.61 −1	62.348 285	81.56 40	47.087 176	74.80 −9
27.2	50.584 192	49.31 57	20.525 178	49.30 31	62.070 278	80.81 75	46.915 172	74.62 18
7.2	50.411 173	48.59 72	20.361 164	48.70 60	61.815 255	79.73 108	46.756 159	74.19 43
17.1	50.267 144	47.76 83	20.219 142	47.80 90	61.599 216	78.37 136	46.618 138	73.49 70
	103	91	108	121	163	161	106	96
27.1	50.164	46.85	20.111	46.59	61.436	76.76	46.512	72.53
6.1	50.110 54	45.91 94	20.042 69	45.11 148	61.338 98	74.98 178	46.444 68	71.31 122
16.1	50.112 −2	44.99 92	20.017 25	43.35 176	61.311 27	73.09 189	46.421 23	69.85 146
26.0	50.172 60	44.14 85	20.041 −24	41.37 198	61.363 −52	71.17 192	46.445 −24	68.17 168
6.0	50.291 119	43.41 73	20.115 74	39.19 218	61.495 132	69.31 186	46.518 73	66.31 186
	175	60	123	230	208	174	121	200
16.0	50.466	42.81	20.238	36.89	61.703	67.57	46.639	64.31
25.9	50.694 228	42.39 42	20.405 167	34.53 236	61.984 281	66.01 156	46.805 166	62.24 207
35.9	50.967 273	42.15 24	20.614 209	32.18 235	62.327 343	64.67 134	47.011 206	60.15 209
In Place	47.028	37.71	18.083	45.09	57.748	63.96	44.315	71.40
δ, Tan δ	1.208	−0.678	1.036	+0.270	1.663	−1.329	1.014	+0.168
α, D_m α	+0.08	−0.01	+0.05	+0.01	+0.09	−0.03	+0.06	0.00
δ, D_m 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		d Herculis. Mag. 5.3		η Ophi Mag.
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.
	h m	° ′	h m	° ′	h m	° ′	h m
	16 56	− 4 5	16 57	+31 2	16 58	+33 40	17 5
	s	″	s	″	s	″	s
Jan. 0.9	40.810	61.88	6.161	42.05	31.699	65.03	36.776
	237	141	226	286	226	294	244
10.9	41.047	63.29	6.387	39.19	31.925	62.09	37.020
	266	138	262	263	263	269	273
20.9	41.313	64.67	6.649	36.56	32.188	59.40	37.293
	285	130	289	232	293	237	285
30.8	41.598	65.97	6.938	34.24	32.481	57.03	37.588
	298	114	310	189	315	193	310
Feb. 9.8	41.896	67.11	7.248	32.35	32.796	55.10	37.898
	307	97	321	139	326	144	317
19.8	42.203	68.08	7.569	30.96	33.122	53.66	38.215
	306	73	326	88	331	88	319
Mar. 1.8	42.509	68.81	7.895	30.08	33.453	52.78	38.534
	301	48	323	31	330	30	316
11.7	42.810	69.29	8.218	29.77	33.783	52.48	38.850
	294	20	313	26	321	28	310
21.7	43.104	69.49	8.531	30.03	34.104	52.76	39.160
	281	—	299	80	304	83	297
31.7	43.385	69.43	8.830	30.83	34.408	53.59	39.457
	267	6	280	130	286	134	285
Apr. 10.7	43.652	69.11	9.110	32.13	34.694	54.93	39.742
	249	53	254	174	260	180	268
20.6	43.901	68.58	9.364	33.87	34.954	56.73	40.010
	228	72	228	211	231	219	247
30.6	44.129	67.86	9.592	35.98	35.185	58.92	40.257
	203	87	196	238	198	247	225
May 10.6	44.332	66.99	9.788	38.36	35.383	61.39	40.482
	177	97	161	259	162	267	197
20.5	44.509	66.02	9.949	40.95	35.545	64.06	40.679
	148	103	124	270	124	279	167
30.5	44.657	64.99	10.073	43.65	35.669	66.85	40.846
	115	106	85	272	84	281	135
June 9.5	44.772	63.93	10.158	46.37	35.753	69.66	40.981
	80	105	45	267	41	277	99
19.5	44.852	62.88	10.203	49.04	35.794	72.43	41.080
	46	100	2	253	—	263	60
29.4	44.898	61.88	10.205	51.57	35.793	75.06	41.140
	8	94	—	236	44	244	21
July 9.4	44.906	60.94	10.166	53.93	35.749	77.50	41.161
	—	85	79	211	85	217	—
	29						18
19.4	44.877	60.09	10.087	56.04	35.664	79.67	41.143
	64	76	117	182	124	189	56
29.4	44.813	59.33	9.970	57.86	35.540	81.56	41.087
	96	64	151	148	158	154	92
Aug. 8.3	44.717	58.69	9.819	59.34	35.382	83.10	40.995
	124	54	179	113	187	116	121
18.3	44.593	58.15	9.640	60.47	35.195	84.26	40.874
	146	43	202	74	212	76	145
28.3	44.447	57.72	9.438	61.21	34.983	85.02	40.729
	162	31	217	34	225	34	164
Sept. 7.2	44.285	57.41	9.221	61.55	34.758	85.36	40.565
	167	17	223	7	232	7	171
17.2	44.118	57.24	8.998	61.48	34.526	85.29	40.394
	163	5	219	47	229	50	169
27.2	43.955	57.19	8.779	61.01	34.297	84.79	40.225
	152	—	204	89	214	93	156
Oct. 7.2	43.803	57.28	8.575	60.12	34.083	83.86	40.069
	129	25	182	130	192	135	135
17.1	43.674	57.53	8.393	58.82	33.891	82.51	39.934
	98	40	149	169	158	175	103
27.1	43.576	57.93	8.244	57.13	33.733	80.76	39.831
	58	57	109	204	117	212	63
Nov. 6.1	43.518	58.50	8.135	55.09	33.616	78.64	39.768
	15	75	61	236	69	245	17
16.1	43.503	59.25	8.074	52.73	33.547	76.19	39.751
	—	91	8	264	16	272	—
	33						31
26.0	43.536	60.16	8.066	50.09	33.531	73.47	39.782
	83	108	—	284	—	293	83
Dec. 6.0	43.619	61.24	8.112	47.25	33.570	70.54	39.865
	130	123	46	297	39	306	132
			99		95		
16.0	43.749	62.47	8.211	44.28	33.665	67.48	39.997
	174	132	150	301	148	309	179
25.9	43.923	63.79	8.361	41.27	33.813	64.39	40.176
	214	138	197	294	196	302	219
35.9	44.137	65.17	8.558	38.33	34.009	61.37	40.395
Mean Place	40.999	56.57	6.805	52.31	32.416	75.49	36.950
Sec δ, Tan δ	1.003	−0.072	1.167	+0.602	1.202	+0.667	1.039
$D_\psi a$, $D_\omega a$	+0.06	0.00	+0.05	+0.01	+0.04	+0.01	+0.07
$D_\psi \delta$, $D_\omega \delta$	−0.1	−1.0	−0.1	−1.0	−0.1	−1.0	−0.1

FOR THE UPPER TRANSIT AT WASHINGTON.

ı	η Scorpii. Mag. 3.4				ζ Draconis. Mag. 3.2				α Herculis. Var. 3.1–3.9				δ Herculis. Mag. 3.2			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	17 6		−43 7		17 8		+65 48		17 10		+14 28		17 11		+24 55	
	s		″		s		″		s		″		s		″	
9	11.984	312	51.94	75	29.73	27	48.32	340	51.342	213	54.99	225	36.736	211	61.96	268
9	12.296	351	51.19	55	30.00	37	44.92	309	51.555	245	52.74	212	36.947	245	59.28	249
9	12.647	379	50.64	34	30.37	45	41.83	267	51.800	270	50.62	191	37.192	273	56.79	221
9	13.026	401	50.30	13	30.82	51	39.16	216	52.070	286	48.71	162	37.465	293	54.58	186
3	13.427	411	50.17	6	31.33	55	37.00	156	52.356	297	47.09	126	37.758	306	52.72	142
8	13.838	415	50.23	24	31.88	57	35.44	90	52.653	302	45.83	86	38.064	312	51.30	92
8	14.253	412	50.47	39	32.45	58	34.54	22	52.955	300	44.97	42	38.376	311	50.38	42
7	14.665	404	50.86	53	33.03	57	34.32	46	53.255	295	44.55	1	38.687	305	49.96	11
7	15.069	390	51.39	67	33.60	54	34.78	111	53.550	284	44.56	45	38.992	294	50.07	62
7	15.459	372	52.06	78	34.14	50	35.89	171	53.834	270	45.01	86	39.286	279	50.69	109
7	15.831	349	52.84	87	34.64	44	37.60	224	54.104	252	45.87	122	39.565	258	51.78	152
6	16.180	323	53.71	96	35.08	37	39.84	268	54.356	231	47.09	151	39.823	235	53.30	187
.6	16.503	291	54.67	105	35.45	30	42.52	302	54.587	205	48.60	176	40.058	208	55.17	216
.6	16.794	255	55.72	112	35.75	22	45.54	325	54.792	179	50.36	193	40.266	176	57.33	236
.6	17.049	215	56.84	116	35.97	13	48.79	339	54.971	147	52.29	204	40.442	142	59.69	248
.5	17.264	171	58.00	119	36.10	4	52.18	341	55.118	113	54.33	207	40.584	106	62.17	253
.5	17.435	124	59.19	120	36.14	5	55.59	335	55.231	77	56.40	205	40.690	66	64.70	249
.5	17.559	72	60.39	115	36.09	14	58.94	319	55.308	40	58.45	197	40.756	27	67.19	240
.4	17.631	22	61.54	111	35.95	21	62.13	294	55.348	2	60.42	184	40.783	14	69.59	224
.4	17.653	31	62.65	101	35.74	30	65.07	263	55.350	36	62.26	166	40.769	53	71.83	203
.4	17.622	82	63.66	88	35.44	37	67.70	226	55.314	74	63.92	147	40.716	91	73.86	177
9.4	17.540	127	64.54	69	35.07	43	69.96	184	55.240	107	65.39	123	40.625	127	75.63	149
8.3	17.413	167	65.23	50	34.64	49	71.80	138	55.133	135	66.62	98	40.498	156	77.12	116
8.3	17.246	198	65.73	25	34.15	53	73.18	88	54.998	160	67.60	70	40.342	180	78.28	82
8.3	17.048	221	65.98	1	33.62	55	74.06	38	54.838	175	68.30	44	40.162	197	79.10	47
7.3	16.827	230	65.99	26	33.07	55	74.44	15	54.663	184	68.74	13	39.965	206	79.57	9
17.2	16.597	227	65.73	51	32.52	55	74.29	67	54.479	183	68.87	17	39.759	204	79.66	29
27.2	16.370	210	65.22	77	31.97	53	73.62	119	54.296	172	68.70	46	39.555	194	79.37	67
7.2	16.160	181	64.45	98	31.44	50	72.43	170	54.124	153	68.24	77	39.361	173	78.70	103
17.1	15.979	141	63.47	117	30.94	44	70.73	217	53.971	123	67.47	107	39.188	144	77.67	139
27.1	15.838	88	62.30	128	30.50	37	68.56	259	53.848	87	66.40	134	39.044	106	76.28	175
6.1	15.750	29	61.02	137	30.13	29	65.97	298	53.761	44	65.06	163	38.938	62	74.53	206
16.1	15.721	35	59.65	138	29.84	20	62.99	328	53.717	3	63.43	185	38.876	12	72.47	232
26.0	15.756	103	58.27	132	29.64	9	59.71	351	53.720	52	61.58	207	38.864	38	70.15	255
6.0	15.859	167	56.95	122	29.55	1	56.20	362	53.772	100	59.51	220	38.902	89	67.60	269
16.0	16.026	226	55.73	107	29.56	12	52.58	364	53.872	147	57.31	228	38.991	139	64.91	275
26.0	16.252	281	54.66	90	29.68	22	48.94	351	54.019	187	55.03	228	39.130	182	62.16	273
35.9	16.533		53.76		29.90		45.43		54.206		52.75		39.312		59.43	
lace	12.319		52.14		32.643		60.27		51.730		62.46		37.296		70.61	
an δ	1.370		−0.937		2.441		+2.227		1.033		+0.258		1.103		+0.465	
α	+0.09		−0.01		0.00		+0.03		+0.05		0.00		+0.05		+0.01	
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.	π Herculis. Mag. 3.4		θ Ophiuchi. Mag. 3.4		ψ Herculis. Mag. 5.4		β A Mag
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.
	h m s	° ′ ″	h m s	° ′ ″	h m s	° ′ ″	h m s
	17 12	+36 53	17 16	−24 55	17 17	+32 34	17 18
Jan. 0.9	8.457	57.33	54.416	6.40	32.412	16.26	23.168
	211	304	260	17	206	286	28
10.9	8.668	54.29	54.666	6.57	32.618	13.31	23.531
	254	282	281	27	245	275	42
20.9	8.922	51.47	54.947	6.84	32.863	10.56	23.948
	286	247	307	34	275	246	49
30.9	9.208	49.00	55.254	7.18	33.138	8.12	24.407
	313	205	338	38	301	204	48
Feb. 9.8	9.521	46.95	55.577	7.56	33.439	6.08	24.896
	339	155	328	30	316	186	38
19.8	9.860	45.40	55.910	7.95	33.755	4.52	25.404
	338	97	337	38	333	108	33
Mar. 1.8	10.198	44.43	56.247	8.33	34.061	3.49	25.922
	338	38	337	34	327	45	33
11.8	10.526	44.05	56.584	8.67	34.408	3.04	26.441
	333	21	331	30	322	11	33
21.7	10.859	44.26	56.915	8.97	34.730	3.15	26.954
	320	79	322	23	310	67	49
31.7	11.179	45.05	57.237	9.20	35.040	3.82	27.453
	300	134	308	18	294	119	47
Apr. 10.7	11.479	46.39	57.545	9.38	35.334	5.01	27.928
	277	181	292	14	273	166	48
20.6	11.756	48.20	57.837	9.52	35.607	6.67	28.379
	248	222	273	11	247	226	42
30.6	12.004	50.42	58.110	9.63	35.854	8.73	28.796
	215	255	249	8	216	287	37
May 10.6	12.219	52.97	58.359	9.71	36.070	11.10	29.173
	178	277	221	8	189	331	33
20.6	12.397	55.74	58.580	9.79	36.253	13.71	29.504
	139	290	191	7	146	374	27
30.5	12.536	58.64	58.771	9.86	36.399	16.45	29.782
	95	295	155	10	105	280	22
June 9.5	12.631	61.59	58.926	9.96	36.504	19.25	30.003
	51	292	117	11	63	278	18
19.5	12.682	64.51	59.043	10.07	36.567	22.03	30.162
	6	280	76	12	20	267	9
29.5	12.688	67.31	59.119	10.19	36.587	24.70	30.254
	−40	260	34	13	−23	249	2
July 9.4	12.648	69.91	59.153	10.32	36.564	27.19	30.279
	84	236	−9	13	66	227	−4
19.4	12.564	72.27	59.144	10.45	36.498	29.46	30.236
	125	206	50	11	106	198	10
29.4	12.439	74.33	59.094	10.56	36.392	31.44	30.128
	163	171	89	7	142	166	16
Aug. 8.3	12.276	76.04	59.005	10.63	36.250	33.10	29.960
	194	132	124	2	176	129	22
18.3	12.082	77.36	58.881	10.65	36.074	34.39	29.739
	221	93	151	−4	201	93	26
28.3	11.861	78.29	58.730	10.61	35.873	35.31	29.476
	238	49	172	11	220	51	26
Sept. 7.3	11.623	78.78	58.558	10.50	35.653	35.82	29.184
	247	5	181	20	229	9	30
17.2	11.376	78.83	58.377	10.30	35.424	35.91	28.875
	246	−40	181	29	230	−34	30
27.2	11.130	78.43	58.196	10.01	35.194	35.57	28.569
	234	85	170	35	218	76	29
Oct. 7.2	10.896	77.58	58.026	9.66	34.976	34.81	28.278
	212	128	149	40	199	118	23
17.2	10.684	76.30	57.877	9.26	34.777	33.63	28.023
	180	171	116	43	168	159	20
27.1	10.504	74.59	57.761	8.83	34.609	32.04	27.817
	140	211	75	43	130	196	14
Nov. 6.1	10.364	72.48	57.686	8.40	34.479	30.08	27.674
	92	245	27	40	85	230	7
16.1	10.272	70.03	57.659	8.00	34.394	27.78	27.603
	38	275	24	34	34	261	1
26.0	10.234	67.28	57.683	7.66	34.360	25.17	27.613
	−18	298	77	24	−20	283	9
Dec. 6.0	10.252	64.30	57.760	7.42	34.380	22.34	27.705
	74	313	130	14	75	299	17
16.0	10.326	61.17	57.890	7.28	34.455	19.35	27.879
	130	318	179	2	127	305	28
26.0	10.456	57.99	58.069	7.26	34.582	16.30	28.129
	181	312	222	−9	174	302	31
35.9	10.637	54.87	58.291	7.35	34.756	13.28	28.448
Mean Place	9.316	67.14	54.620	4.13	33.166	25.28	23.824
Sec δ, Tan δ	1.250	+0.751	1.103	−0.465	1.187	+0.839	1.763
$D_\psi\, a$, $D_\omega\, a$	+0.04	+0.01	+0.07	−0.01	+0.04	+0.01	+0.10
$D_\psi\, \delta$, $D_\omega\, \delta$	−0.1	−1.0	−0.1	−1.0	−0.1	−1.0	−0.1

FOR THE UPPER TRANSIT AT WASHINGTON.

	b Ophiuchi. Mag. 4.3				*σ* Ophiuchi. Mag. 4.4				*δ* Aræ. Mag. 3.8				*α* Aræ. Mag. 3.0			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	17 21		−24 6		17 22		+ 4 12		17 23		−60 36		17 25		−49 48	
	s		″		s		″		s		″		s		″	
.9	17.738		3.09		23.449		36.12		35.15		57.78		24.871		41.95	
.9	17.982	244	3.29	20	23.659	210	34.37	175	35.54	39	55.98	180	25.190	319	40.68	127
.9	18.258	276	3.57	28	23.898	239	32.70	167	36.01	47	54.45	153	25.557	367	39.62	106
.9	18.560	302	3.91	34	24.162	264	31.16	154	36.52	51	53.22	123	25.962	405	38.79	83
.8	18.879	319	4.29	38	24.443	281	29.82	134	37.07	55	52.30	92	26.393	431	38.21	58
		330		38		292		106		58		58		450		35
.8	19.209		4.67		24.735		28.76		37.65		51.72		26.843		37.86	
.8	19.543	334	5.03	36	25.033	298	28.00	76	38.24	59	51.45	27	27.301	458	37.74	12
.8	19.877	334	5.34	31	25.331	298	27.57	43	38.83	59	51.50	5	27.762	461	37.84	10
.7	20.207	330	5.59	25	25.626	295	27.49	8	39.41	58	51.86	36	28.218	456	38.16	32
.7	20.528	321	5.79	20	25.912	286	27.76	27	39.98	57	52.51	65	28.663	445	38.67	51
		308		14		274		60		55		94		429		70
.7	20.836		5.93		26.186		28.36		40.53		53.45		29.092		39.37	
.6	21.129	293	6.01	8	26.444	258	29.24	88	41.05	52	54.64	119	29.498	406	40.23	86
.6	21.403	274	6.05	4	26.685	241	30.38	114	41.53	48	56.04	140	29.878	380	41.25	102
.6	21.653	250	6.07	2	26.902	217	31.71	133	41.96	43	57.66	162	30.223	345	42.43	118
.6	21.876	223	6.08	1	27.096	194	33.18	147	42.34	38	59.45	179	30.530	307	43.72	129
		194		2		164		156		32		192		262		139
.5	22.070		6.10		27.260		34.74		42.66		61.37		30.792		45.11	
9.5	22.228	158	6.12	2	27.391	131	36.33	159	42.92	26	63.38	201	31.004	212	46.58	147
19.5	22.348	120	6.17	5	27.490	99	37.90	157	43.10	18	65.43	205	31.162	158	48.09	151
29.5	22.428	80	6.24	7	27.550	60	39.42	152	43.20	10	67.47	204	31.262	100	49.59	150
9.4	22.466	38	6.32	8	27.572	22	40.84	142	43.22	2	69.45	198	31.301	39	51.05	146
		5		8		16		130		5		185		21		137
19.4	22.461		6.40		27.556		42.14		43.17		71.30		31.280		52.42	
29.4	22.415	46	6.48	8	27.502	54	43.28	114	43.04	13	72.95	165	31.201	79	53.64	122
8.3	22.330	85	6.54	6	27.415	87	44.26	98	42.85	19	74.35	140	31.068	133	54.69	105
18.3	22.210	120	6.55	1	27.296	119	45.06	80	42.59	26	75.45	110	30.886	182	55.50	81
28.3	22.062	148	6.52	3	27.153	143	45.65	59	42.28	31	76.20	75	30.664	222	56.05	55
		170		10		163		41		34		36		251		25
. 7.3	21.892		6.42		26.990		46.06		41.94		76.56		30.413		56.30	
17.2	21.712	180	6.24	18	26.818	172	46.26	20	41.57	37	76.51	5	30.148	265	56.23	7
27.2	21.531	181	6.00	24	26.645	173	46.25	1	41.20	37	76.05	46	29.881	267	55.82	41
7.2	21.361	170	5.68	32	26.481	164	46.02	23	40.86	34	75.16	89	29.628	253	55.10	72
17.2	21.211	150	5.32	36	26.334	147	45.58	44	40.56	30	73.90	126	29.403	225	54.09	101
		118		38		119		67		26		161		183		128
27.1	21.093		4.94		26.215		44.91		40.30		72.29		29.220		52.81	
. 6.1	21.015	78	4.56	38	26.131	84	44.03	88	40.12	18	70.40	189	29.092	128	51.33	148
16.1	20.983	32	4.21	35	26.089	42	42.93	110	40.02	10	68.29	211	29.027	65	49.70	163
26.0	21.002	19	3.92	29	26.093	4	41.64	129	40.00	2	66.05	224	29.033	6	47.99	171
. 6.0	21.074	72	3.72	20	26.143	50	40.17	147	40.08	8	63.77	228	29.111	78	46.26	173
		124		10		99		163		19		224		151		166
16.0	21.198		3.62		26.242		38.54		40.27		61.53		29.262		44.60	
26.0	21.371	173	3.63	1	26.384	142	36.84	170	40.53	26	59.41	212	29.481	219	43.04	156
35.9	21.588	217	3.74	11	26.568	184	35.09	175	40.88	35	57.46	195	29.763	282	41.63	141
Place	17.948		0.68		23.753		41.90		36.038		59.05		25.373		42.21	
Tan δ	1.096		−0.447		1.003		+0.074		2.038		−1.776		1.550		−1.184	
$D_m\ \alpha$	+0.07		−0.01		+0.06		0.00		+0.11		−0.02		+0.09		−0.01	
$D_m\ \delta$	*−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 Oph Mag.
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.
	h m s 17 27	° ′ ″ +26 10	h m s 17 27	° ′ ″ −37 2	h m s 17 28	° ′ ″ +52 21	h m s 17 31
Jan. 1.0	22.393	12.97	57.934	40.67	31.752	35.01	4.446
	195	271	267	59	203	338	196
10.9	22.588	10.26	58.201	40.08	31.955	31.63	4.642
	232	253	306	44	264	313	229
20.9	22.820	7.73	58.507	39.64	32.219	28.50	4.871
	262	228	335	30	314	278	256
30.9	23.082	5.45	58.842	39.34	32.533	25.72	5.127
Feb. 9.8	285 23.367	192 3.53	357 59.199	16 39.18	356 32.889	231 23.41	275 5.402
	301	150	370	4	385	177	289
19.8	23.668	2.03	59.569	39.14	33.274	21.64	5.691
	310	101	378	7	406	115	296
Mar. 1.8	23.978	1.02	59.947	39.21	33.680	20.49	5.987
	313	49	379	17	414	49	298
11.8	24.291	0.53	60.326	39.38	34.094	20.00	6.285
	309	5	375	25	411	15	296
21.7	24.600	0.58	60.701	39.63	34.505	20.15	6.581
	300	57	367	31	398	81	290
31.7	24.900	1.15	61.068	39.94	34.903	20.96	6.871
	288	106	354	38	378	143	278
Apr. 10.7	25.188	2.21	61.422	40.32	35.281	22.39	7.149
	271	150	337	45	346	196	263
20.7	25.459	3.71	61.759	40.77	35.627	24.35	7.412
	247	188	317	52	308	242	245
30.6	25.706	5.59	62.076	41.29	35.935	26.77	7.657
May 10.6	221 25.927	219 7.78	290 62.366	58 41.87	264 36.199	280 29.57	223 7.880
	191	240	259	64	213	308	197
20.6	26.118	10.18	62.625	42.51	36.412	32.65	8.077
	157	256	226	71	160	326	167
30.5	26.275	12.74	62.851	43.22	36.572	35.91	8.244
	120	262	185	76	102	333	134
June 9.5	26.395	15.36	63.036	43.98	36.674	39.24	8.378
	82	261	142	78	41	332	98
19.5	26.477	17.97	63.178	44.76	36.715	42.56	8.476
	40	251	94	80	18	321	60
29.5	26.517	20.48	63.272	45.56	36.697	45.77	8.536
July 9.4	1 26.516	238 22.86	46 63.318	80 46.36	77 36.620	301 48.78	21 8.557
	43	216	3	75	135	277	18
19.4	26.473	25.02	63.315	47.11	36.485	51.55	8.539
	83	193	51	67	190	243	57
29.4	26.390	26.95	63.264	47.78	36.295	53.98	8.482
	119	163	97	58	238	205	92
Aug. 8.4	26.271	28.58	63.167	48.36	36.057	56.03	8.390
	152	130	137	44	278	164	124
18.3	26.119	29.88	63.030	48.80	35.779	57.67	8.266
	178	97	171	28	314	118	150
28.3	25.941	30.85	62.859	49.08	35.465	58.85	8.116
	198	60	194	10	337	70	170
Sept. 7.3	25.743	31.45	62.665	49.18	35.128	59.55	7.946
	209	22	208	10	350	20	181
17.2	25.534	31.67	62.457	49.08	34.778	59.75	7.765
	210	17	210	32	353	31	184
27.2	25.324	31.50	62.247	48.76	34.425	59.44	7.581
Oct. 7.2	203 25.121	55 30.95	200 62.047	50 48.26	342 34.083	83 58.61	176 7.405
	185	93	177	69	318	132	159
17.2	24.936	30.02	61.870	47.57	33.765	57.29	7.246
	156	132	144	83	285	180	132
27.1	24.780	28.70	61.726	46.74	33.480	55.49	7.114
	121	167	98	94	238	226	100
Nov. 6.1	24.659	27.03	61.628	45.80	33.242	53.23	7.014
	78	200	45	101	181	265	58
16.1	24.581	25.03	61.583	44.79	33.061	50.58	6.956
	31	228	12	102	118	300	13
26.1	24.550	22.75	61.595	43.77	32.943	47.58	6.943
Dec. 6.0	20 24.570	252 20.23	71 61.666	100 42.77	49 32.894	326 44.32	35 6.978
	71	268	130	93	21	344	83
16.0	24.641	17.55	61.796	41.84	32.915	40.88	7.061
	121	276	185	83	94	350	128
26.0	24.762	14.79	61.981	41.01	33.009	37.38	7.189
	168	275	237	68	162	346	170
35.9	24.930	12.04	62.218	40.33	33.171	33.32	7.359
Mean Place	23.022	20.76	58.232	39.60	33.393	44.46	4.857
Sec δ, Tan δ	1.114	+0.491	1.253	−0.755	1.638	+1.297	1.025
$D_\psi \alpha$, $D_\omega \alpha$	+0.05	0.00	+0.08	−0.01	+0.03	+0.01	+0.06
$D_\psi \delta$, $D_\omega \delta$	−0.1	−1.0	−0.1	−1.0	−0.1	−1.0	−0.1

FOR THE UPPER TRANSIT AT WASHINGTON.

	ξ Serpentis. Mag. 3.6		ι Herculis. Mag. 3.8		ω Draconis. Mag. 4.9		η Pavonis. Mag. 3.6	
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.
	h m s	° ′ ″	h m s	° ′ ″	h m s	° ′ ″	h m s	° ′ ″
	17 32	−15 20	17 37	+46 2	17 37	+68 47	17 37	−64 40
.0	49.718	53.42	6.016	51.45	22.44	38.01	33.76	68.17
.9	49.938 220	54.06 64	6.203 187	48.16 329	22.67 23	34.55 346	34.17 41	66.07 210
.9	50.190 252	54.73 67	6.442 239	45.09 307	23.01 34	31.31 324	34.66 49	64.21 186
.9	50.466 276	55.40 67	6.725 283	42.35 274	23.44 43	28.44 287	35.22 56	62.66 155
.8	50.760 294	56.03 63	7.045 320	40.03 232	23.95 51	26.03 241	35.83 61	61.43 123
	307	54	347	180	57	185	64	90
.8	51.067	56.57	7.392	38.23 121	24.52	24.18	36.47	60.53
.8	51.380 313	56.99 42	7.756 364	37.02 59	25.14 62	22.95 123	37.13 66	59.99 54
.8	51.695 315	57.27 28	8.129 373	36.43 — 6	25.78 64	22.39 56	37.80 67	59.80 19
.7	52.007 312	57.41 14	8.502 373	36.49 68	26.42 64	22.52 13	38.47 67	59.95 15
.7	52.312 305	57.40 1	8.866 364	37.17 128	27.05 63	23.30 78	39.12 65	60.43 48
	296	16	346		59	143	63	80
.7	52.608	57.24	9.212	38.45	27.64	24.73	39.75	61.23
.7	52.890 282	56.95 29	9.536 324	40.27 182	28.18 54	26.71 198	40.36 61	62.32 109
.6	53.155 265	56.56 39	9.828 292	42.55 228	28.65 47	29.19 248	40.91 55	63.68 136
.6	53.401 246	56.09 47	10.084 256	45.22 267	29.04 39	32.05 286	41.42 51	65.29 161
.6	53.621 220	55.58 51	10.299 215	48.17 295	29.33 29	35.22 317	41.87 45	67.10 181
	192	54	168	314	21	337	39	199
.5	53.813	55.04	10.467	51.31	29.54	38.59	42.26	69.09
.5	53.972 159	54.51 53	10.585 118	54.54 323	29.65 11	42.05 346	42.57 31	71.22 213
.5	54.095 123	54.01 50	10.652 67	57.77 323	29.65 0	45.51 346	42.79 22	73.41 219
.5	54.180 85	53.54 47	10.665 13	60.92 315	29.55 10	48.87 336	42.92 13	75.63 222
.4	54.226 46	53.12 42	10.625 — 40	63.89 297	29.34 21	52.05 318	42.96 4	77.80 217
	3	37	93	274	30	291	— 4	205
.4	54.229	52.75	10.532	66.63	29.04	54.96	42.92	79.85
.4	54.192 37	52.43 32	10.390 142	69.06 243	28.66 38	57.55 259	42.79 13	81.74 189
.4	54.117 75	52.16 27	10.202 188	71.14 208	28.20 46	59.75 220	42.58 21	83.37 163
.3	54.007 110	51.94 22	9.976 226	72.83 169	27.67 53	61.53 178	42.29 29	84.71 134
.3	53.870 137	51.73 21	9.716 260	74.08 125	27.09 58	62.84 131	41.93 36	85.69 98
	159	18	284	80	62	81	40	57
.3	53.711	51.55	9.432	74.88	26.47	63.65	41.53	86.26
.2	53.540 171	51.38 17	9.134 298	75.20 32	25.82 65	63.95 30	41.11 42	86.39 — 13
.2	53.366 174	51.23 15	8.833 301	75.02 18	25.17 65	63.72 23	40.68 43	86.06 33
.2	53.201 165	51.11 12	8.539 294	74.36 66	24.54 63	62.97 75	40.27 41	85.29 77
.2	53.053 148	51.02 9	8.264 275	73.21 115	23.94 60	61.69 128	39.90 37	84.08 121
	120	4	244	102	55	178	32	159
.1	52.933	50.98	8.020	71.59	23.39	59.91	39.58	82.49
.1	52.848 85	51.00 2	7.816 204	69.54 205	22.90 49	57.66 225	39.34 24	80.57 192
.1	52.807 41	51.10 10	7.662 154	67.07 247	22.49 41	54.99 267	39.18 16	78.37 220
.1	52.814 — 7	51.31 21	7.565 97	64.26 281	22.18 31	51.95 304	39.13 5	76.00 237
.0	52.869 55	51.62 31	7.527 38	61.16 310	21.99 19	48.64 331	39.18 — 5	73.53 247
	105	42	26	328	8	351	17	247
.0	52.974	52.04	7.553	57.88	21.91	45.13	39.35	71.06
.0	53.125 151	52.55 51	7.643 90	54.51 337	21.95 4	41.55 358	39.61 26	68.66 240
.9	53.318 193	53.15 60	7.793 150	51.16 335	22.10 15	37.99 356	39.96 35	66.42 224
lace	49.942	50.00	7.326	59.82	26.140	47.02	34.919	69.06
an δ	1.037	−0.274	1.441	+1.037	2.765	+2.578	2.339	−2.114
ω α	+0.07	0.00	+0.03	+0.01	−0.01	+0.02	+0.11	−0.01
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.	β Ophiuchi. Mag. 2.9		τ^1 Scorpii. Mag. 3.1		μ Herculis. Mag. 3.5		ψ Draco Mag.
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.
	h m s	° ′ ″	h m s	° ′ ″	h m s	° ′ ″	h m s
	17 39	+ 4 35	17 41	−40 5	17 43	+27 45	17 43
Jan. 1.0	21.976	58.55	46.402	46.89	11.871	59.55	20.03
	192	172	262	87	178	278	23
10.9	22.168	56.83	46.664	46.02	12.049	56.77	20.26
	226	165	302	71	217	262	35
20.9	22.394	55.18	46.966	45.31	12.266	54.15	20.61
	252	152	335	57	250	239	47
30.9	22.646	53.66	47.301	44.74	12.516	51.76	21.08
	271	132	361	41	275	203	58
Feb. 9.9	22.917	52.34	47.662	44.33	12.791	49.73	21.66
	285	105	377	27	293	161	65
19.8	23.202	51.29	48.039	44.06	13.084	48.12	22.31
	293	75	389	15	308	112	71
Mar. 1.8	23.495	50.54	48.428	43.91	13.392	47.00	23.02
	296	42	392	2	312	59	75
11.8	23.791	50.12	48.820	−43.89	13.704	46.41	23.77
	295	6	391	8	313	6	75
21.7	24.086	−50.06	49.211	43.97	14.017	−46.35	24.52
	290	30	385	21	306	50	73
31.7	24.376	50.36	49.596	44.18	14.323	46.85	25.25
	280	63	376	31	297	99	69
Apr. 10.7	24.656	50.99	49.972	44.49	14.620	47.84	25.94
	268	91	358	40	281	146	62
20.7	24.924	51.90	50.330	44.89	14.901	49.30	26.56
	251	119	338	50	259	185	56
30.6	25.175	53.09	50.668	45.39	15.160	51.15	27.12
	232	138	313	60	236	220	46
May 10.6	25.407	54.47	50.981	45.99	15.396	53.35	27.58
	206	153	284	70	205	243	35
20.6	25.613	56.00	51.265	46.69	15.601	55.78	27.93
	179	163	247	78	171	261	24
30.6	25.792	57.63	51.512	47.47	15.772	58.39	28.17
	147	167	207	85	136	268	11
June 9.5	25.939	59.30	51.719	48.32	15.908	61.07	28.28
	112	165	161	91	96	270	0
19.5	26.051	60.95	51.880	49.23	16.004	63.77	28.28
	75	159	113	95	53	261	13
29.5	26.126	62.54	51.993	50.18	16.057	66.38	28.15
	36	150	63	96	9	249	24
July 9.4	26.162	64.04	52.056	51.14	16.066	68.87	27.91
	2	137	9	93	33	230	36
19.4	26.160	65.41	52.065	52.07	16.033	71.17	27.55
	42	123	42	85	75	205	46
29.4	26.118	66.64	52.023	52.92	15.958	73.22	27.09
	79	104	91	75	114	176	56
Aug. 8.4	26.039	67.68	51.932	53.67	15.844	74.98	26.53
	112	87	135	62	148	145	63
18.3	25.927	68.55	51.797	54.29	15.696	76.43	25.90
	138	66	172	45	178	109	69
28.3	25.789	69.21	51.625	54.74	15.518	77.52	25.21
	160	47	200	23	199	72	75
Sept. 7.3	25.629	69.68	51.425	54.97	15.319	78.24	24.46
	172	25	218	2	214	34	77
17.3	25.457	69.93	51.207	−54.99	15.105	−78.58	23.69
	176	4	223	21	218	6	78
27.2	25.281	−69.97	50.984	54.78	14.887	78.52	22.91
	171	18	212	44	211	45	76
Oct. 7.2	25.110	69.79	50.772	54.34	14.676	78.07	22.15
	153	39	195	66	197	85	74
17.2	24.957	69.40	50.577	53.68	14.479	77.22	21.41
	128	62	161	85	171	125	68
27.1	24.829	68.78	50.416	52.83	14.308	75.97	20.73
	97	84	117	101	138	162	60
Nov. 6.1	24.732	67.94	50.299	51.82	14.170	74.35	20.13
	56	105	65	112	95	197	51
16.1	24.676	66.89	50.234	50.70	14.075	72.38	19.62
	12	126	7	119	49	227	40
26.1	24.664	65.63	−50.227	49.51	−14.026	70.11	19.22
	35	143	55	117	1	253	27
Dec. 6.0	24.699	64.20	50.282	48.34	14.027	67.58	18.95
	82	159	116	115	52	270	14
16.0	24.781	62.61	50.398	47.19	14.079	64.88	18.81
	126	168	175	107	101	281	0
26.0	24.907	60.93	50.573	46.12	14.180	62.07	18.81
	168	170	228	96	149	281	14
36.0	25.075	59.23	50.801	45.16	14.329	59.26	18.95
Mean Place	22.313	63.81	46.752	45.73	12.573	66.42	24.658
Sec δ, Tan δ	1.003	+0.080	1.307	−0.842	1.130	+0.527	3.270
$D_\psi a$, $D_\omega a$	+0.06	0.00	+0.08	0.00	+0.05	0.00	−0.02
$D_\psi \delta$, $D_\omega \delta$	0.0	−1.0	0.0	−1.0	0.0	−1.0	0.0

FOR THE UPPER TRANSIT AT WASHINGTON.

	γ Ophiuchi. Mag. 3.7		89 Herculis. Mag. 5.5		ξ Draconis. Mag. 3.9		35 Draconis. Mag. 5.0	
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.
	h m	° ′	h m	° ′	h m	° ′	h m	° ′
	17 43	+ 2 44	17 52	+26 3	17 52	+56 52	17 53	+76 58
	s	″	s	″	s	″	s	″
0	43.487	10.43	3.630	38.58	3.596	59.95	3.01	21.45
9	43.677 190	8.82 161	3.800 170	35.90 268	3.767 171	56.49 346	3.24 23	18.01 344
9	43.901 224	7.27 155	4.009 209	33.36 254	4.010 243	53.22 327	3.64 40	14.75 326
9	44.151 250	5.84 143	4.250 241	31.03 233	4.314 304	50.28 294	4.21 57	11.82 293
9	44.420 269	4.59 125	4.518 268	29.04 199	4.671 357	47.76 252	4.93 72	9.32 250
	283	101	288	158	399	199	83	198
8	44.703	3.58 72	4.806	27.46 112	5.070	45.77 139	5.76	7.34 138
8	44.995 292	2.86 39	5.108 302	26.34 62	5.498 428	44.38 76	6.68 92	5.96 74
8	45.291 296	2.47 7	5.416 308	25.72 8	5.945 447	43.62 7	7.65 97	5.22 7
7	45.586 295	2.40 — 26	5.726 310	25.64 — 45	6.397 452	43.55 — 58	8.65 100	5.15 — 59
7	45.877 291	2.66 59	6.032 306	26.09 96	6.842 445	44.13 122	9.63 98	5.74 122
	283		297		428		93	
7	46.160	3.25	6.329	27.05	7.270	45.35	10.56	6.96
7	46.430 270	4.11 86	6.613 284	28.45 140	7.669 399	47.15 180	11.41 85	8.76 180
6	46.683 253	5.23 112	6.877 264	30.26 181	8.030 361	49.45 230	12.15 74	11.07 231
6	46.918 235	6.53 130	7.119 242	32.40 214	8.345 315	52.18 273	12.77 62	13.79 272
6	47.129 211	7.98 145	7.332 213	34.79 239	8.606 261	55.24 306	13.26 49	16.85 306
	184	154	182	257	201	327	31	328
6	47.313	9.52	7.514	37.36	8.807	58.51	13.57	20.13
5	47.465 152	11.09 157	7.660 146	40.02 266	8.944 137	61.92 341	13.72 — 15	23.54 341
5	47.583 118	12.65 156	7.766 106	42.69 267	9.014 70	65.36 344	13.71 1	26.98 344
5	47.664 81	14.16 151	7.831 65	45.30 261	9.016 — 2	68.74 338	13.54 17	30.36 338
4	47.705 41	15.58 142	7.854 — 23	47.79 249	8.950 66	71.97 323	13.20 34	33.59 323
	3	130	21	232	132	299	49	299
4	47.708	16.88	7.833	50.11	8.818	74.96	12.71	36.58
4	47.671 37	18.02 114	7.770 63	52.18 207	8.621 197	77.66 270	12.08 63	39.29 271
4	47.597 74	19.01 99	7.667 103	53.99 181	8.368 253	80.02 236	11.31 77	41.65 236
3	47.490 107	19.83 82	7.529 138	55.48 149	8.065 303	81.97 195	10.45 86	43.60 195
3	47.355 135	20.45 62	7.361 168	56.63 115	7.719 346	83.47 150	9.49 96	45.10 150
	157	45	191	80	377	103	103	103
7	47.198	20.90 24	7.170	57.43 43	7.342	84.50	8.46	46.13
7	47.027 171	21.14 6	6.963 207	57.86 4	6.943 399	85.02 52	7.40 106	46.66 53
7	46.852 175	21.20 — 16	6.751 212	57.90 — 35	6.538 405	85.02 0	6.32 108	46.66 0
7	46.684 168	21.04 34	6.543 208	57.55 74	6.139 399	84.50 52	5.25 107	46.15 51
7	46.529 155	20.70 55	6.348 195	56.81 112	5.757 382	83.47 103	4.21 104	45.12 103
	129		170		348	154	97	153
7	46.400	20.15	6.178	55.69	5.409	81.93	3.24	43.59
6	46.301 99	19.38 77	6.039 139	54.20 149	5.105 304	79.90 203	2.36 88	41.58 201
6	46.243 58	18.42 96	5.940 99	52.38 182	4.857 248	77.43 247	1.62 74	39.12 246
6	46.229 — 14	17.26 116	5.887 53	50.24 214	4.675 182	74.59 284	1.00 62	36.29 283
6	46.262 33	15.94 132	5.882 — 5	47.86 238	4.565 110	71.42 317	0.55 45	33.14 315
	79	146	46	258	32	338	27	337
6	46.341	14.48	5.928	45.28	4.533	68.04	0.28	29.77
6	46.465 124	12.92 156	6.022 94	42.59 269	4.580 47	64.53 351	0.20 — 8	26.28 349
6	46.630 165	11.32 160	6.163 141	39.88 271	4.703 123	61.03 350	0.30 10	22.79 349
ace	43.813	15.38	4.310	44.75	5.684	67.24	9.799	28.71
n ∂	1.001	+0.048	1.113	+0.489	1.830	+1.533	4.437	+4.323
α	+0.06	0.00	+0.05	0.00	+0.02	0.00	−0.05	+0.01
∂	*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.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.
	h m s 17 53	° ′ ″ +37 15	h m s 17 54	° ′ ″ − 9 45	h m s 17 54	° ′ ″ +29 15	h m s 17 54	° ′ ″ +51
Jan. 1.0	23.386	32.31	27.130	55.65	31.620	15.75	39.040	46.
10.9	23.551 165	29.24 307	27.322 192	56.53 88	31.786 166	12.95 280	39.204 164	43.
20.9	23.762 211	26.33 291	27.549 227	57.40 87	31.993 207	10.29 266	39.429 225	39.
30.9	24.013 251	23.70 263	27.802 253	58.23 83	32.234 241	7.86 243	39.708 279	36.
Feb. 9.9	24.294 281	21.43 227	28.075 273	58.96 73	32.504 270	5.78 208	40.032 324	34.
	307	180	288	60	290	166	360	
19.8	24.601	19.63	28.363	59.56	32.794	4.12	40.392	32.
Mar. 1.8	24.925 324	18.36 127	28.661 298	59.99 43	33.099 305	2.94 118	40.778 386	31.
11.8	25.259 334	17.67 69	28.964 303	60.22 23	33.413 314	2.29 65	41.179 401	30.
21.8	25.596 337	17.57 10	29.268 304	60.25 3	33.729 316	2.20 9	41.585 406	30.
31.7	25.929 333	18.08 51	29.570 302	60.06 19	34.042 313	2.65 45	41.986 401	30.
	322	107	295	38	302	98	387	
Apr. 10.7	26.251	19.15	29.865	59.68	34.344	3.63	42.373	31.
20.7	26.556 305	20.74 159	30.150 285	59.13 55	34.634 290	5.08 145	42.735 362	33.
30.6	26.840 284	22.79 205	30.422 272	58.42 71	34.905 271	6.95 187	43.068 333	35.
May 10.6	27.094 254	25.20 241	30.674 252	57.60 82	35.151 246	9.17 222	43.361 293	38.
20.6	27.316 222	27.92 272	30.905 231	56.71 89	35.367 216	11.67 250	43.608 247	41.
	185	291	203	92	184	267	196	
30.6	27.501	30.83	31.108	55.79	35.551	14.34	43.804	44.
June 9.5	27.643 142	33.87 304	31.281 173	54.86 93	35.698 147	17.11 277	43.944 140	48.
19.5	27.741 98	36.91 304	31.421 140	53.96 90	35.804 106	19.91 280	44.027 83	51.
29.5	27.792 51	39.91 300	31.521 100	53.11 85	35.868 64	22.65 274	44.050 23	54.
July 9.4	27.794 2	42.78 287	31.582 61	52.33 78	35.889 21	25.27 262	44.012 38	57.
	45	265	19	68	25	243	98	
19.4	27.749	45.43	31.601	51.65	35.864	27.70	43.914	60.
29.4	27.658 91	47.84 241	31.579 22	51.05 60	35.796 68	29.89 219	43.761 153	63.
Aug. 8.4	27.524 134	49.92 208	31.518 61	50.55 50	35.688 108	31.80 191	43.555 206	65.
18.3	27.351 173	51.65 173	31.422 96	50.13 42	35.544 144	33.38 158	43.303 252	67.
28.3	27.145 206	53.00 135	31.294 128	49.80 33	35.368 176	34.61 123	43.014 289	69.
	230	93	150	23	200	86	320	
Sept. 7.3	26.915	53.93	31.144	49.57	35.168	35.47	42.694	70.
17.3	26.669 246	54.42 49	30.977 167	49.40 17	34.952 216	35.94 47	42.355 339	70.
27.2	26.417 252	54.46 4	30.804 173	49.30 10	34.730 222	35.98 4	42.008 347	70.
Oct. 7.2	26.168 249	54.05 41	30.636 168	49.29 1	34.512 218	35.63 35	41.665 343	70.
17.2	25.933 235	53.18 87	30.481 155	49.36 7	34.308 204	34.88 75	41.340 325	69.
	208	131	131	16	181	117	296	
27.1	25.725	51.87	30.350	49.52	34.127	33.71	41.044	68.
Nov. 6.1	25.551 174	50.13 174	30.251 99	49.79 27	33.979 148	32.16 155	40.787 257	66.
16.1	25.419 132	47.99 214	30.192 59	50.15 36	33.871 108	30.26 190	40.581 206	63.
26.1	25.336 83	45.51 248	30.177 15	50.63 48	33.809 62	28.02 224	40.434 147	60.
Dec. 6.0	25.306 30	42.75 276	30.209 32	51.23 60	33.796 13	25.53 249	40.351 83	57.
	25	297	79	71	38	269	15	
16.0	25.331	39.78	30.288	51.94	33.834	22.84	40.336	54.
26.0	25.410 79	36.68 310	30.413 125	52.72 78	33.923 89	20.03 281	40.391 55	51.
36.0	25.543 133	33.58 310	30.578 165	53.57 85	34.059 136	17.20 283	40.512 121	47.
Mean Place	24.377	38.91	27.394	51.93	32.377	21.90	40.717	53.36
Sec δ, Tan δ	1.257	+0.761	1.015	−0.172	1.146	+0.560	1.606	+1.257
$D_\gamma a$, $D_\omega a$	+0.04	0.00	+0.07	0.00	+0.05	0.00	+0.03	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.

ington Time.	67 Ophiuchi. Mag. 3.9		θ Aræ. Mag. 3.9		γ Sagittarii. Mag. 3.1		70 Ophiuchi. Mag. 4.1	
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.
	h m s	° ′ ″	h m s	° ′ ″	h m s	° ′ ″	h m s	° ′ ″
	17 56	+ 2 55	18 0	−50 5	18 0	−30 25	18 1	+ 2 30
. 1.0	28.956	60.11	9.617	55.83	28.202	36.85	15.211	59.50
10.9	29.136 180	58.53 158	9.890 273	54.29 154	28.418 216	36.45 40	15.387 176	57.93 157
20.9	29.348 212	56.99 154	10.216 326	52.90 139	28.673 255	36.13 32	15.596 209	56.40 153
30.9	29.587 239	55.58 141	10.585 369	51.70 120	28.959 286	35.90 23	15.833 237	54.99 141
). 9.9	29.849 262	54.35 123	10.989 404	50.69 101	29.269 310	35.71 19	16.092 259	53.76 123
	277	100	428	79	328	14	275	101
19.8	30.126	53.35	11.417	49.90	29.597	35.57	16.367	52.75
:. 1.8	30.414 288	52.65 70	11.863 446	49.32 58	29.937 340	35.46 11	16.654 287	52.03 72
11.8	30.707 293	52.27 38	12.319 456	48.94 38	30.283 346	35.36 10	16.947 293	51.62 41
21.8	31.002 295	52.21 — 6	12.779 460	48.79 — 15	30.632 349	35.28 8	17.243 296	51.55 — 7
31.7	31.295 293	52.50 29	13.235 456	48.85 6	30.979 347	35.21 7	17.537 294	51.81 26
	287	61	446	20	341	6	288	57
:. 10.7	31.582	53.11	13.681	49.11	31.320	35.15	17.825	52.38
20.7	31.858 276	54.00 89	14.113 432	49.56 45	31.651 331	35.10 5	18.104 279	53.23 85
30.6	32.120 262	55.15 115	14.523 410	50.21 65	31.965 314	35.09 — 1	18.368 264	54.34 111
y 10.6	32.364 244	56.49 134	14.906 383	51.03 82	32.261 296	35.12 3	18.615 247	55.64 130
20.6	32.585 221	57.98 149	15.253 347	52.03 100	32.533 272	35.21 9	18.841 226	57.10 146
	195	158	307	117	241	15	198	154
30.6	32.780	59.56	15.560	53.20	32.774	35.36	19.039	58.64
ıe 9.5	32.943 163	61.18 162	15.819 259	54.49 129	32.981 207	35.60 24	19.207 168	60.22 158
19.5	33.072 129	62.80 162	16.026 207	55.87 138	33.148 167	35.89 29	19.342 135	61.80 158
29.5	33.165 93	64.36 156	16.174 148	57.32 145	33.272 124	36.24 35	19.440 98	63.33 153
.y 9.5	33.217 52	65.82 146	16.260 86	58.80 148	33.350 78	36.63 39	19.497 57	64.76 143
	13	135	24	145	31	43	17	132
19.4	33.230	67.17	16.284	60.25	33.381	37.06	19.514	66.08
29.4	33.202 28	68.36 119	16.246 38	61.63 138	33.364 17	37.50 44	19.491 23	67.24 116
ıg. 8.4	33.135 67	69.40 104	16.147 99	62.88 125	33.301 63	37.91 41	19.429 62	68.24 100
18.3	33.035 100	70.26 86	15.993 154	63.94 106	33.197 104	38.28 37	19.334 95	69.07 83
28.3	32.904 131	70.93 67	15.793 200	64.78 84	33.057 140	38.57 29	19.206 128	69.71 64
	153	48	236	57	170	18	150	46
ɐpt. 7.3	32.751	71.41 29	15.557	65.35 27	32.887	38.75 — 6	19.056	70.17 26
17.3	32.581 170	71.70 9	15.294 263	65.62 — 5	32.700 187	38.81 — 6	18.888 168	70.43 — 7
27.2	32.407 174	71.79 — 11	15.022 272	65.57 40	32.503 197	38.75 21	18.713 175	70.50 — 14
ɔt. 7.2	32.235 172	71.68 33	14.753 269	65.17 71	32.310 193	38.54 33	18.541 172	70.36 33
17.2	32.077 158	71.35 52	14.505 248	64.46 100	32.133 177	38.21 41	18.383 158	70.03 53
	137		215		151		138	
27.2	31.940	70.83	14.290	63.46	31.982	37.77	18.245	69.50
ov. 6.1	31.835 105	70.10 73	14.122 168	62.18 128	31.867 115	37.23 54	18.138 107	68.76 74
16.1	31.768 67	69.17 93	14.012 110	60.70 148	31.797 70	36.64 59	18.068 70	67.83 93
26.1	31.744 24	68.04 113	13.969 43	59.05 165	31.776 21	36.01 63	18.040 28	66.71 112
ec. 6.0	31.765 — 21	66.75 129	13.995 — 26	57.33 172	31.809 — 33	35.39 62	18.057 — 17	65.43 128
	67	143	99	175	86	58	63	142
16.0	31.832	65.32	14.094	55.58	31.895	34.81	18.120	64.01
26.0	31.943 111	63.79 153	14.261 167	53.86 172	32.034 139	34.28 53	18.227 107	62.49 152
36.0	32.096 153	62.21 158	14.494 233	52.24 162	32.219 185	33.82 46	18.378 151	60.93 156
ın Place	29.302	64.66	10.166	54.79	28.482	34.56	15.559	63.87
∂, Tan ∂	1.001	+0.051	1.559	−1.196	1.160	−0.587	1.001	+0.044
α, D∞ α	+0.06	0.00	+0.09	0.00	+0.08	0.00	+0.06	0.00
∂, D∞ ∂	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 Sagitta Mag. 3.	
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	
	h m 18 3 s	° ′ + 9 32 ″	h m 18 4 s	° ′ +28 44 ″	h m 18 8 s	° ′ −21 4 ″	h m 18 12 s	
Jan. 1.0	24.426	59.76	17.497	55.50	47.686	56.76	0.362	
	167	192	156	278	192	13	217	
11.0	24.593	57.84	17.653	52.72	47.878	56.89	0.579	
	203	184	197	264	229	16	259	
20.9	24.796	56.00	17.850	50.08	48.107	57.05	0.838	
	230	169	231	243	258	18	294	
30.9	25.026	54.31	18.081	47.65	48.365	57.23	1.132	
	255	148	262	210	281	16	321	
Feb. 9.9	25.281	52.83	18.343	45.55	48.646	57.39	1.453	
	272	118	283	169	300	12	344	
19.8	25.553	51.65	18.626	43.86	48.946	57.51	1.797	
	284	84	301	122	311	6	358	
Mar. 1.8	25.837	50.81	18.927	42.64	49.257	57.57	2.155	
	291	47	310	70	319	2	368	
11.8	26.128	50.34	19.237	41.94	49.576	57.55	2.523	
	295	7	315	15	322	10	371	
21.8	26.423	50.27	19.552	41.79	49.898	57.45	2.894	
	293	33	313	40	322	19	373	
31.7	26.716	50.60	19.865	42.19	50.220	57.26	3.267	
	288	71	305	92	317	28	368	
Apr. 10.7	27.004	51.31	20.170	43.11	50.537	56.98	3.635	
	278	106	294	141	309	35	358	
20.7	27.282	52.37	20.464	44.52	50.846	56.63	3.993	
	264	135	276	183	297	40	343	
30.7	27.546	53.72	20.740	46.35	51.143	56.23	4.336	
	246	160	253	219	280	42	324	
May 10.6	27.792	55.32	20.993	48.54	51.423	55.81	4.660	
	224	179	225	245	257	42	298	
20.6	28.016	57.11	21.218	50.99	51.680	55.39	4.958	
	196	191	194	267	231	40	267	
30.6	28.212	59.02	21.412	53.66	51.911	54.99	5.225	
	164	197	157	276	199	35	233	
June 9.5	28.376	60.99	21.569	56.42	52.110	54.64	5.458	
	130	197	117	280	164	30	189	
19.5	28.506	62.96	21.686	59.22	52.274	54.34	5.647	
	94	192	74	276	123	24	144	
29.5	28.600	64.88	21.760	61.98	52.397	54.10	5.791	
	52	183	30	264	81	16	93	
July 9.5	28.652	66.71	21.790	64.62	52.478	53.94	5.884	
	12	169	15	247	37	10	43	
19.4	28.664	68.40	21.775	67.09	52.515	53.84	5.927	
	29	152	59	225	8	4	9	
29.4	28.635	69.92	21.716	69.34	52.507	53.80	5.918	
	68	132	100	196	50	1	59	
Aug. 8.4	28.567	71.24	21.616	71.30	52.457	53.79	5.859	
	104	110	137	164	91	2	106	
18.4	28.463	72.34	21.479	72.94	52.366	53.81	5.753	
	133	88	170	131	125	3	145	
28.3	28.330	73.22	21.309	74.25	52.241	53.84	5.608	
	158	62	195	94	152	1	179	
Sept. 7.3	28.172	73.84	21.114	75.19	52.089	53.85	5.429	
	174	38	213	55	172	1	201	
17.3	27.998	74.22	20.901	75.74	51.917	53.84	5.228	
	181	11	220	15	180	5	212	
27.2	27.817	74.33	20.681	75.89	51.737	53.79	5.016	
	179	15	218	26	179	8	210	
Oct. 7.2	27.638	74.18	20.463	75.63	51.558	53.71	4.806	
	166	40	205	67	165	12	198	
17.2	27.472	73.78	20.258	74.96	51.393	53.59	4.608	
	146	68	185	107	144	15	172	
27.2	27.326	73.10	20.073	73.89	51.249	53.44	4.436	
	116	92	153	146	111	16	135	
Nov. 6.1	27.210	72.18	19.920	72.43	51.138	53.28	4.301	
	78	118	114	182	70	16	90	
16.1	27.132	71.00	19.806	70.61	51.068	53.12	4.211	
	37	140	70	215	26	13	38	
26.1	27.095	69.60	19.736	68.46	51.042	52.99	4.173	
	7	161	21	241	23	9	19	
Dec. 6.1	27.102	67.99	19.715	66.05	51.065	52.90	4.192	
	54	176	28	264	73	2	76	
16.0	27.156	66.23	19.743	63.41	51.138	52.88	4.268	
	99	187	79	276	120	3	132	
26.0	27.255	64.36	19.822	60.65	51.258	52.91	4.400	
	140	191	125	280	164	9	183	
36.0	27.395	62.45	19.947	57.85	51.422	53.00	4.583	
Mean Place	24.848	64.42	18.259	60.95	47.943	53.84	0.696	
Sec δ, Tan δ	1.014	+0.168	1.141	+0.549	1.072	−0.386	1.249	
$D_\psi a$, $D_\omega a$	+0.06	0.00	+0.05	0.00	+0.07	0.00	+0.08	
$D_\psi \delta$, $D_\omega \delta$	0.0	−1.0	0.0	−1.0	0.0	−1.0	0.0	

FOR THE UPPER TRANSIT AT WASHINGTON.

	Groombridge 2533. Mag. 5.4		36 Draconis. Mag. 5.0		δ Sagittarii. Mag. 2.8		η Serpentis. Mag. 3.4	
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.
	h m 18 13 s	° ′ +42 7 ″	h m 18 13 s	° ′ +64 21 ″	h m 18 15 s	° ′ −29 51 ″	h m 18 17 s	° ′ − 2 55 ″
.0	2.637	44.46	22.11	63.20	40.538	54.89	0.529	20.11
.0	2.778 141	41.27 319	22.24 13	59.70 350	40.739 201	54.44 45	0.693 164	21.32 121
.9	2.969 191	38.22 305	22.47 23	56.34 336	40.976 237	54.06 38	0.892 199	22.49 117
.9	3.205 236	35.41 281	22.78 31	53.25 309	41.247 271	53.72 34	1.118 226	23.59 110
.9	3.479 274	32.97 244	23.17 39	50.54 271	41.545 298	53.44 28	1.368 250	24.55 96
	305	200	45	221	316	26	268	77
.8	3.784	30.97	23.62	48.33	41.861	53.18	1.636	25.32
.8	4.112 328	29.50 147	24.12 50	46.69 164	42.192 331	52.94 24	1.918 282	25.86 54
.8	4.457 345	28.63 87	24.65 53	45.69 100	42.533 341	52.72 22	2.208 290	26.13 27
.8	4.811 354	28.37 — 26	25.20 55	45.35 — 34	42.878 345	52.49 23	2.503 295	26.14 — 1
.7	5.163 352	28.72 35	25.75 55	45.68 33	43.224 346	52.27 22	2.798 295	25.86 28
	345	95	54	100	342	20	293	54
.7	5.508	29.67	26.29	46.68	43.566	52.07	3.091	25.32
.7	5.840 332	31.17 150	26.79 50	48.27 159	43.900 334	51.87 20	3.377 286	24.53 79
.7	6.150 310	33.18 201	27.25 46	50.41 214	44.222 322	51.70 17	3.652 275	23.54 99
.6	6.432 282	35.61 243	27.66 41	53.02 261	44.525 303	51.59 11	3.911 259	22.38 116
.6	6.680 248	38.36 275	27.99 33	56.01 299	44.807 282	51.54 5	4.151 240	21.11 127
	209	301	26	325	254	3	214	133
.6	6.889	41.37	28.25	59.26	45.061	51.57	4.365	19.78
.5	7.053 164	44.53 316	28.44 19	62.69 343	45.280 219	51.67 10	4.551 186	18.42 136
.5	7.170 117	47.75 322	28.54 10	66.21 352	45.462 182	51.85 18	4.702 151	17.07 135
.5	7.237 67	50.94 319	28.56 2	69.70 349	45.603 141	52.13 28	4.817 115	15.79 128
.5	7.251 — 14	54.03 309	28.49 — 7	73.10 340	45.695 92	52.46 33	4.891 74	14.60 119
	37	291	16	320	45	39	33	109
.4	7.214	56.94	28.33	76.30	45.740	52.85	4.924	13.51
.4	7.126 88	59.60 266	28.08 25	79.25 295	45.738 2	53.26 41	4.916 8	12.54 97
.4	6.991 135	61.97 237	27.77 31	81.87 262	45.690 48	53.67 41	4.868 48	11.72 82
.4	6.812 179	63.97 200	27.39 38	84.11 224	45.597 93	54.06 39	4.782 86	11.05 67
.3	6.595 217	65.58 161	26.95 44	85.91 180	45.467 130	54.40 34	4.663 119	10.52 53
	245	119	48	134	162	24	144	38
.3	6.350	66.77	26.47	87.25	45.305	54.64	4.519	10.14
.3	6.083 267	67.51 74	25.96 51	88.09 84	45.123 182	54.79 15	4.355 164	9.91 23
.2	5.807 276	67.77 — 26	25.43 53	88.42 — 33	44.929 194	54.81 — 2	4.182 173	9.82 — 9
.2	5.530 277	67.56 21	24.90 53	88.21 21	44.736 193	54.70 11	4.009 173	9.87 5
.2	5.266 264	66.87 69	24.39 51	87.46 75	44.554 182	54.45 25	3.847 162	10.07 20
	243	117	48	127	158	35	143	36
.2	5.023	65.70	23.91	86.19	44.396	54.10	3.704	10.43
.1	4.813 210	64.07 163	23.47 44	84.41 178	44.271 125	53.64 46	3.589 115	10.93 50
.1	4.644 169	62.01 206	23.10 37	82.16 225	44.189 82	53.11 53	3.510 79	11.58 65
.1	4.523 121	59.58 243	22.80 30	79.48 268	44.153 36	52.54 57	3.472 38	12.38 80
.1	4.457 66	56.83 275	22.58 22	76.44 304	44.169 — 16	51.94 60	3.479 — 7	13.31 93
	10	301	11	330	70	58	51	106
.0	4.447	53.82	22.47	73.14	44.239	51.36	3.530	14.37
.0	4.496 49	50.66 316	22.45 — 2	69.65 349	44.360 121	50.82 54	3.625 95	15.53 116
.0	4.601 105	47.45 321	22.52 7	66.12 353	44.528 168	50.33 49	3.762 137	16.72 119
Place	3.849	49.53	25.151	68.30	40.823	52.34	0.847	16.45
Tan δ	1.348	+0.905	2.312	+2.084	1.153	−0.574	1.001	−0.051
) α	+0.04	0.00	+0.01	−0.01	+0.08	0.00	+0.06	0.00
) 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.	ε Sagittarii. Mag. 2.0		109 Herculis. Mag. 3.9		α Telescopii. Mag. 3.8		χ Draco Mag. 3
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.
	h m 18 18 s	° ′ −34 25 ″	h m 18 20 s	° ′ +21 43 ″	h m 18 20 s	° ′ −46 0 ″	h m 18 22 s
Jan. 1.0	39.439	31.95	9.015	47.38	48.699	57.68	28.34
	204	72	143	248	229	144	11
11.0	39.643	31.23	9.158	44.90	48.928	56.24	28.45
	246	67	183	238	279	123	25
20.9	39.889	30.56	9.341	42.52	49.207	54.91	28.70
	280	59	216	219	322	119	38
30.9	40.169	29.97	9.557	40.33	49.529	53.72	29.08
	308	52	244	193	357	106	49
Feb. 9.9	40.477	29.45	9.801	38.40	49.886	52.66	29.57
	329	45	267	157	382	90	60
19.9	40.806	29.00	10.068	36.83	50.268	51.76	30.17
	346	39	283	115	403	73	68
Mar. 1.8	41.152	28.61	10.351	35.68	50.671	51.03	30.85
	356	35	295	69	416	58	73
11.8	41.508	28.26	10.646	34.99	51.087	50.45	31.58
	361	29	302	19	423	40	77
21.8	41.869	27.97	10.948	34.80	51.510	50.05	32.35
	363	23	303	—	425	23	77
31.7	42.232	27.74	11.251	35.11	51.935	49.82	33.12
	359	18	300	31	421	8	75
Apr. 10.7	42.591	27.56	11.551	35.89	52.356	49.74	33.87
	351	12	292	123	412	11	71
20.7	42.942	27.44	11.843	37.12	52.768	49.85	34.58
	339	4	279	163	395	29	65
30.7	43.281	27.40	12.122	38.75	53.163	50.14	35.23
	321	4	259	194	375	45	56
May 10.6	43.602	27.44	12.381	40.69	53.538	50.59	35.79
	297	14	236	224	346	64	47
20.6	43.899	27.58	12.617	42.93	53.884	51.23	36.26
	267	25	208	240	310	80	36
30.6	44.166	27.83	12.825	45.33	54.194	52.03	36.62
	232	34	175	251	269	94	24
June 9.6	44.398	28.17	13.000	47.84	54.463	52.97	36.86
	193	44	138	257	222	107	11
19.5	44.591	28.61	13.138	50.41	54.685	54.04	36.97
	148	53	98	252	168	119	1
29.5	44.739	29.14	13.236	52.93	54.853	55.23	36.96
	99	60	56	243	111	124	13
July 9.5	44.838	29.74	13.292	55.36	54.964	56.47	36.83
	50	64	12	229	52	126	25
19.4	44.888	30.38	13.304	57.65	55.016	57.73	36.58
	1	66	31	207	8	125	39
29.4	44.887	31.04	13.273	59.72	55.008	58.98	36.19
	51	64	73	185	66	116	48
Aug. 8.4	44.836	31.68	13.200	61.57	54.942	60.14	35.71
	97	58	111	156	119	104	57
18.4	44.739	32.26	13.089	63.13	54.823	61.18	35.14
	137	50	143	125	168	88	66
28.3	44.602	32.76	12.946	64.38	54.655	62.06	34.48
	170	38	172	95	206	66	72
Sept. 7.3	44.432	33.14	12.774	65.33	54.449	62.72	33.76
	193	22	180	60	233	41	76
17.3	44.239	33.36	12.585	65.93	54.216	63.13	33.00
	204	6	199	24	249	13	80
27.3	44.035	33.42	12.386	66.17	53.967	63.26	32.20
	205	11	201	11	249	16	80
Oct. 7.2	43.830	33.31	12.185	66.06	53.718	63.10	31.40
	193	30	191	47	237	45	78
17.2	43.637	33.01	11.994	65.59	53.481	62.65	30.62
	169	46	171	84	208	74	75
27.2	43.468	32.55	11.823	64.75	53.273	61.91	29.87
	135	60	145	118	169	99	69
Nov. 6.1	43.333	31.95	11.678	63.57	53.104	60.92	29.18
	91	73	109	152	119	121	61
16.1	43.242	31.22	11.569	62.05	52.985	59.71	28.57
	41	80	68	181	62	136	50
26.1	43.201	30.42	11.501	60.24	52.923	58.35	28.07
	13	84	23	208	3	147	38
Dec. 6.1	43.214	29.58	11.478	58.16	52.926	56.88	27.69
	67	85	24	227	67	153	27
16.0	43.281	28.73	11.502	55.89	52.993	55.35	27.42
	121	83	70	242	130	154	13
26.0	43.402	27.90	11.572	53.47	53.123	53.81	27.29
	172	79	116	247	192	148	3
36.0	43.574	27.11	11.688	51.00	53.315	52.33	27.32
Mean Place	39.755	29.56	9.641	51.57	49.165	55.68	33.352
Sec δ, Tan δ	1.212	−0.685	1.076	+0.399	1.440	−1.036	3.362
$D_\psi\, a$, $D_\omega\, a$	+0.08	0.00	+0.05	0.00	+0.09	+0.01	−0.02
$D_\psi\, \delta$, $D_\omega\, \delta$	0.0	−1.0	0.0	−1.0	0.0	−1.0	0.0

FOR THE UPPER TRANSIT AT WASHINGTON.

ington Time.	λ Sagittarii. Mag. 2.9		c Serpentis. Mag. 5.4		1 Aquilæ. Mag. 4.1		ζ Pavonis. Mag. 4.1	
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.
	h m 18 22	° ′ −25 28	h m 18 25	° ′ − 2 2	h m 18 30	° ′ − 8 18	h m 18 33	° ′ −71 29
	s	″	s	″	s	″	s	″
1.0	50.642	10.44	21.467	27.25	41.128	14.28	18.54	65.91
	184	20	156	121	157	82	37	277
11.0	50.826	10.24	21.623	28.46	41.285	15.10	18.91	63.14
	223	16	192	119	191	81	48	263
20.9	51.049	10.08	21.815	29.65	41.476	15.91	19.39	60.51
	254	14	220	109	222	76	59	242
30.9	51.303	9.94	22.035	30.74	41.698	16.67	19.98	58.09
b. 9.9	278	13	246	96	246	65	68	215
	51.581	9.81	22.281	31.70	41.944	17.32	20.66	55.94
	302	14	263	76	267	51	74	185
19.9	51.883	9.67	22.544	32.46	42.211	17.83	21.40	54.09
r. 1.8	315	17	278	52	281	32	80	150
	52.198	9.50	22.822	32.98	42.492	18.15	22.20	52.59
11.8	325	20	288	27	291	12	84	113
	52.523	9.30	23.110	33.25	42.783	18.27	23.04	51.46
21.8	331	25	293	3	298	11	87	76
	52.854	9.05	23.403	33.22	43.081	18.16	23.91	50.70
31.7	332	29	297	31	301	33	87	37
	53.186	8.76	23.700	32.91	43.382	17.83	24.78	50.33
	330	33	295	61	300	54	86	0
r. 10.7	53.516	8.43	23.995	32.30	43.682	17.29	25.64	50.33
	324	35	290	83	296	74	85	40
20.7	53.840	8.08	24.285	31.47	43.978	16.55	26.49	50.73
	313	35	279	107	287	89	82	77
30.7	54.153	7.73	24.564	30.40	44.265	15.66	27.31	51.50
y 10.6	296	33	264	122	273	101	76	113
	54.449	7.40	24.828	29.18	44.538	14.65	28.07	52.63
20.6	276	30	245	135	254	110	70	145
	54.725	7.10	25.073	27.83	44.792	13.55	28.77	54.08
	250	21	220	143	231	114	61	175
30.6	54.975	6.86	25.293	26.40	45.023	12.41	29.38	55.83
ne 9.6	218	18	192	115	202	113	52	200
	55.193	6.68	25.485	24.95	45.225	11.28	29.90	57.83
19.5	182	9	160	144	169	111	12	221
	55.375	6.59	25.645	23.51	45.394	10.17	30.32	60.04
29.5	143	1	122	139	132	101	31	235
	55.518	6.58	25.767	22.12	45.526	9.13	30.63	62.39
ly 9.5	99	8	83	126	93	95	18	243
	55.617	6.66	25.850	20.86	45.619	8.18	30.81	64.82
	51	13	41	119	50	85	6	243
19.4	55.668	6.79	25.891	19.67	45.669	7.33	30.87	67.25
	— 4	19	1	105	− 7	72	6	237
29.4	55.672	6.98	25.890	18.62	45.676	6.61	30.81	69.62
g. 8.4	40	22	43	89	35	60	19	220
	55.632	7.20	25.847	17.73	45.641	6.01	30.62	71.82
18.4	83	23	79	75	74	19	32	198
	55.549	7.43	25.768	16.98	45.567	5.52	30.30	73.80
28.3	121	22	114	58	109	37	40	167
	55.428	7.65	25.654	16.40	45.458	5.15	29.90	75.47
	151	17	141	44	136	25	49	129
pt. 7.3	55.277	7.82	25.513	15.96	45.322	4.90	29.41	76.76
	175	12	160	27	159	16	55	85
17.3	55.102	7.94	25.353	15.69	45.163	4.74	28.86	77.61
	185	5	170	13	170	6	59	38
27.3	54.917	7.99	25.183	15.56	44.993	4.68	28.27	77.99
t. 7.2	186	4	173	4	172	3	61	12
	54.731	7.95	25.010	15.60	44.821	4.71	27.66	77.87
17.2	176	13	163	18	163	11	58	64
	54.555	7.82	24.847	15.78	44.658	4.82	27.08	77.23
	154	22	146	34	147	22	54	114
27.2	54.401	7.60	24.701	16.12	44.511	5.04	26.54	76.09
ov. 6.1	124	27	118	51	119	31	47	161
	54.277	7.33	24.583	16.63	44.392	5.35	26.07	74.48
16.1	85	32	84	65	85	41	37	201
	54.192	7.01	24.499	17.28	44.307	5.76	25.70	72.47
26.1	40	34	42	81	46	51	24	234
	54.152	6.67	24.457	18.09	44.261	6.27	25.46	70.13
ec. 6.1	— 10	33	0	94	1	61	13	262
	54.162	6.34	24.457	19.03	44.260	6.88	25.33	67.51
	60	32	43	107	— 43	71	— 1	277
16.0	54.222	6.02	24.500	20.10	44.303	7.59	25.34	64.74
	109	28	88	115	87	77	14	285
26.0	54.331	5.74	24.588	21.25	44.390	8.36	25.48	61.89
36.0	155	23	129	121	130	81	29	283
	54.486	5.51	24.717	22.46	44.520	9.17	25.77	59.06
n Place	50.911	7.64	21.795	23.78	41.420	11.05	20.434	64.20
∂, Tan ∂	1.108	−0.476	1.001	−0.036	1.011	−0.146	3.152	−2.989
, $D_m \alpha$	+0.07	0.00	+0.06	0.00	+0.06	0.00	+0.14	+0.03
, $D_m \partial$	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 Lyræ. (*Vega.*) Mag. 0.1				ζ Aquilæ. Mag. 4.7				φ Sagittarii. Mag. 3.3				110 Herc Mag. 4	
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.	
	h m	s	° ′	″	h m	s	° ′	″	h m	s	° ′	″	h m	s
	18 34		+38 42		18 37		− 9 7		18 40		−27 4		18 42	
Jan. 1.0	6.597		17.40		43.529		61.76		27.989		40.73		4.710	
		116		306		151		75		168		39		122
11.0	6.713		14.34		43.680		62.51		28.157		40.34		4.832	
		166		298		185		73		208		36		161
20.9	6.879		11.36		43.865		63.24		28.365		39.98		4.993	
		209		277		217		66		240		34		194
30.9	7.088		8.59		44.082		63.90		28.605		39.64		5.187	
		248		245		241		58		270		34		226
Feb. 9.9	7.336		6.14		44.323		64.48		28.875		39.30		5.413	
		280		205		263		44		291		34		251
19.9	7.616		4.09		44.586		64.92		29.166		38.96		5.664	
		306		155		278		25		310		36		269
Mar. 1.8	7.922		2.54		44.864		65.17		29.476		38.60		5.933	
		324		100		290		6		322		38		285
11.8	8.246		1.54		45.154		65.23		29.798		38.22		6.218	
		336		40		297		−		332		42		296
21.8	8.582		1.14		45.451		65.07		30.130		37.80		6.514	
		342		−		302		16		336		45		301
31.8	8.924		1.34		45.753		64.71		30.466		37.35		6.815	
		339		20		302		36		336		46		301
Apr. 10.7	9.263		2.13		46.055		64.14		30.802		36.89		7.116	
		331		134		298		57		333		47		297
20.7	9.594		3.47		46.353		63.38		31.135		36.42		7.413	
		315		184		291		76		326		45		288
30.7	9.909		5.31		46.644		62.47		31.461		35.97		7.701	
		292		228		278		91		310		41		273
May 10.6	10.201		7.59		46.922		61.45		31.771		35.56		7.974	
		263		263		259		102		292		36		251
20.6	10.464		10.22		47.181		60.35		32.063		35.20		8.225	
		229		289		237		110		268		28		227
30.6	10.693		13.11		47.418		59.22		32.331		34.92		8.452	
		190		308		209		113		238		18		194
June 9.6	10.883		16.19		47.627		58.09		32.569		34.74		8.646	
		144		316		177		110		201		9		159
19.5	11.027		19.35		47.804		56.99		32.770		34.65		8.805	
		97		317		139		102		161		−		120
29.5	11.124		22.52		47.943		55.97		32.931		34.67		8.925	
		46		309		100		93		116		2		78
July 9.5	11.170		25.61		48.043		55.04		33.047		34.78		9.003	
		−		294		57		82		69		11		−
		4										21		34
19.5	11.166		28.55		48.100		54.22		33.116		34.99		9.037	
		54		274		14		70		22		27		10
29.4	11.112		31.29		48.114		53.52		33.138		35.26		9.027	
		102		246		−		59		−		31		53
Aug. 8.4	11.010		33.75		48.085		52.93		33.112		35.57		8.974	
		147		213		69		46		71		34		92
18.4	10.863		35.88		48.016		52.47		33.041		35.91		8.882	
		184		178		105		35		111		33		129
28.3	10.679		37.66		47.911		52.12		32.930		36.24		8.753	
		218		137		133		24		144		28		158
Sept. 7.3	10.461		39.03		47.778		51.88		32.786		36.52		8.595	
		240		95		155		15		171		22		180
17.3	10.221		39.98		47.623		51.73		32.615		36.74		8.415	
		254		50		170		6		185		14		194
27.3	9.967		40.48		47.453		51.67		32.430		36.88		8.221	
		258		4		172		−		189		4		198
Oct. 7.2	9.709		40.52		47.281		51.70		32.241		36.92		8.023	
		251		−		165		3		182		−		192
17.2	9.458		40.09		47.116		51.80		32.059		36.85		7.831	
		233		43		149		10		164		7		177
				80				19				17		
27.2	9.225		39.20		46.967		51.99		31.895		36.68		7.654	
		205		135		122		28		137		27		153
Nov. 6.2	9.020		37.85		46.845		52.27		31.758		36.41		7.501	
		169		179		90		37		99		34		120
16.1	8.851		36.06		46.755		52.64		31.659		36.07		7.381	
		126		218		50		46		55		39		82
26.1	8.725		33.88		46.705		53.10		31.604		35.68		7.299	
		76		251		−		54		−		42		40
Dec. 6.1	8.649		31.37		46.698		53.64		31.596		35.26		7.259	
		24		278		37		62		42		43		−
		−												4
16.0	8.625		28.59		46.735		54.26		31.638		34.83		7.263	
		29		297		81		70		91		43		50
26.0	8.654		25.62		46.816		54.96		31.729		34.40		7.313	
		83		306		124		74		137		40		92
36.0	8.737		22.56		46.940		55.70		31.866		34.00		7.405	
Mean Place	7.695		20.61		43.817		58.66		28.264		37.80		5.321	
Sec δ, Tan δ	1.281		+0.801		1.013		−0.161		1.123		−0.511		1.067	
$D_\psi\,\alpha$, $D_\omega\,\alpha$	+0.04		−0.01		+0.07		0.00		+0.07		+0.01		+0.05	
$D_\psi\,\delta$, $D_\omega\,\delta$	+0.1		−1.0		+0.1		−1.0		+0.1		−1.0		+0.1	

FOR THE UPPER TRANSIT AT WASHINGTON.

ington Time.	6 Aquilæ. Mag. 4.5		λ Pavonis. Mag. 4.4		β Lyræ. Var. 3.4–4.1		50 Draconis. Mag. 5.4	
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.
	h m s 18 42	° ′ ″ − 4 50	h m s 18 44	° ′ ″ −62 16	h m s 18 47	° ′ ″ +33 15	h m s 18 48	° ′ ″ +75 19
h. 1.0	45.920	18.58	30.77	65.56	0.001	53.87	57.44	70.27
11.0	46.062 142	19.56 98	31.02 25	63.13 243	0.107 106	51.01 286	57.44 0	66.83 344
21.0	46.239 177	20.53 97	31.36 34	60.81 232	0.258 151	48.20 281	57.61 17	63.42 341
30.9	46.447 208	21.42 89	31.76 40	58.65 216	0.449 191	45.58 262	57.95 34	60.19 323
h. 9.9	46.680 233	22.18 76	32.22 46	56.68 197	0.677 228	43.23 235	58.43 48	57.26 293
	255	60	51	172	259	197	61	253
19.9	46.935	22.78	32.73	54.96	0.936	41.26	59.04	54.73
r. 1.8	47.206 271	23.17 39	33.29 56	53.49 147	1.220 284	39.74 152	59.76 72	52.70 203
11.8	47.490 284	23.31 14	33.87 58	52.32 117	1.524 304	38.73 101	60.56 80	51.26 144
21.8	47.782 292	23.21 10	34.47 60	51.44 88	1.840 316	38.29 44	61.43 87	50.45 81
31.8	48.079 297	22.84 37	35.08 61	50.89 55	2.163 323	38.42 13	62.32 89	50.30 15
	298	62	61	24	325	68	89	52
r. 10.7	48.377	22.22	35.69	50.65	2.488	39.10	63.21	50.82
20.7	48.673 296	21.38 84	36.29 60	50.73 8	2.808 320	40.32 122	64.05 84	51.96 114
30.7	48.961 288	20.35 103	36.87 58	51.13 40	3.115 307	42.02 170	64.85 80	53.69 173
ay 10.7	49.237 276	19.16 119	37.42 55	51.85 72	3.406 291	44.15 213	65.56 71	55.93 224
20.6	49.495 258	17.87 129	37.93 51	52.85 100	3.671 265	46.62 247	66.16 60	58.62 269
	236	135	46	130	237	272	49	305
30.6	49.731	16.52	38.39	54.15	3.908	49.34	66.65	61.67
ne 9.6	49.940 209	15.16 136	38.80 41	55.69 154	4.108 200	52.25 291	67.00 35	64.97 330
19.5	50.116 176	13.81 135	39.14 34	57.43 174	4.268 160	55.26 301	67.21 21	68.43 346
29.5	50.257 141	12.53 128	39.39 25	59.33 190	4.384 116	58.29 303	67.28 7	71.97 354
ly 9.5	50.357 100	11.35 118	39.57 18	61.34 201	4.453 69	61.25 296	67.18 10	75.48 351
	58	108	8	205	21	284	23	341
19.5	50.415	10.27	39.65	63.39	4.474	64.09	66.95	78.89
29.4	50.431 16	9.33 94	39.65 0	65.43 204	4.446 28	66.73 264	66.58 37	82.12 323
ig. 8.4	50.405 26	8.53 80	39.56 9	67.37 194	4.372 74	69.13 240	66.08 50	85.09 297
18.4	50.338 67	7.88 65	39.39 17	69.14 177	4.254 118	71.22 209	65.45 63	87.75 266
28.4	50.236 102	7.36 52	39.15 24	70.67 153	4.097 157	72.98 176	64.72 73	90.03 228
	132	37	30	122	188	139	82	187
pt. 7.3	50.104	6.99	38.85	71.89	3.909	74.37	63.90	91.90
17.3	49.951 153	6.76 23	38.49 36	72.76 87	3.695 214	75.36 99	63.02 88	93.31 141
27.3	49.783 168	6.66 10	38.10 39	73.24 48	3.467 228	75.94 58	62.10 92	94.21 90
ct. 7.2	49.610 173	6.68 2	37.70 40	73.27 3	3.233 234	76.08 14	61.15 95	94.60 39
17.2	49.445 165	6.82 14	37.32 38	72.86 41	3.004 229	75.79 29	60.20 95	94.46 14
	151	28	35	85	214	73	91	68
27.2	49.294	7.10	36.97	72.01	2.790	75.06	59.29	93.78
ov. 6.2	49.169 125	7.50 40	36.66 31	70.74 127	2.600 190	73.89 117	58.43 86	92.57 121
16.1	49.075 94	8.02 52	36.41 25	69.11 163	2.443 157	72.32 157	57.64 79	90.84 173
26.1	49.020 55	8.66 64	36.24 17	67.17 194	2.326 117	70.36 196	56.95 69	88.63 221
ec. 6.1	49.006 14	9.42 76	36.16 8	64.98 219	2.253 73	68.08 228	56.40 55	85.99 264
	30	86	1	235	21	256	42	300
16.1	49.036	10.28	36.17	62.63	2.229	65.52	55.98	82.99
26.0	49.110 74	11.21 93	36.28 11	60.19 244	2.254 25	62.78 274	55.71 27	79.74 325
36.0	49.224 114	12.17 96	36.48 20	57.73 246	2.328 74	59.93 285	55.62 9	76.33 341
n Place	46.231	15.57	31.787	63.04	0.919	56.11	63.584	71.11
δ, Tan δ	1.004	−0.085	2.150	−1.903	1.196	+0.656	3.950	+3.821
s, D_α	+0.06	0.00	+0.11	+0.02	+0.04	−0.01	−0.04	−0.05
), 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.	*o* Draconis. Mag. 4.8		*σ* Sagittarii. Mag. 2.1		*θ* Serpentis *pr.* Mag. 4.5		R Lyn Var. 4.0
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.
	h m s 18 49	° ′ ″ +59 16	h m s 18 50	° ′ ″ −26 23	h m s 18 52	° ′ ″ + 4 5	h m s 18 52
Jan. 1.0	56.294	70.53	6.845	66.68	5.201	38.14	47.268
	67	345	156	37	126	148	88
11.0	56.361	67.08	7.001	66.31	5.327	36.66	47.356
	147	339	196	37	161	145	141
21.0	56.508	63.69	7.197	65.94	5.488	35.21	47.497
	221	321	229	35	192	134	191
30.9	56.729	60.48	7.426	65.59	5.680	33.87	47.688
	290	257	200	37	220	117	237
Feb. 9.9	57.019	57.58	7.686	65.22	5.900	32.70	47.925
	349	248	282	37	242	96	275
19.9	57.368	55.10	7.968	64.85	6.142	31.74	48.200
	399	197	301	41	261	67	308
Mar. 1.8	57.767	53.13	8.269	64.44	6.403	31.07	48.508
	438	137	316	45	275	35	332
11.8	58.205	51.76	8.585	63.99	6.678	30.72	48.840
	463	74	326	49	286	2	351
21.8	58.668	51.02	8.911	63.50	6.964	30.70	49.191
	476	7	333	53	292	33	360
31.8	59.144	50.95	9.244	62.97	7.256	31.03	49.551
	477	58	335	55	295	67	362
Apr. 10.7	59.621	51.53	9.579	62.42	7.551	31.70	49.913
	465	122	333	55	293	97	356
20.7	60.086	52.75	9.912	61.87	7.844	32.67	50.269
	439	179	327	55	287	125	343
30.7	60.525	54.54	10.239	61.32	8.131	33.92	50.612
	403	231	315	51	276	147	321
May 10.7	60.928	56.85	10.554	60.81	8.407	35.39	50.933
	358	275	297	44	258	165	291
20.6	61.286	59.60	10.851	60.37	8.665	37.04	51.224
	302	309	274	38	238	176	255
30.6	61.588	62.69	11.125	59.99	8.903	38.80	51.479
	239	333	244	27	209	182	214
June 9.6	61.827	66.02	11.369	59.72	9.112	40.62	51.693
	171	350	209	17	178	183	166
19.5	61.998	69.52	11.578	59.55	9.290	42.45	51.859
	98	355	169	6	142	179	116
29.5	62.096	73.07	11.747	59.49	9.432	44.24	51.975
	23	351	125	6	101	171	61
July 9.5	62.119	76.58	11.872	59.55	9.533	45.95	52.036
	53	341	79	15	60	157	6
19.5	62.066	79.99	11.951	59.70	9.593	47.52	52.042
	126	321	30	23	17	144	49
29.4	61.940	83.20	11.981	59.93	9.610	48.96	51.993
	197	295	18	29	25	125	101
Aug. 8.4	61.743	86.15	11.963	60.22	9.585	50.21	51.892
	260	261	64	33	66	106	150
18.4	61.483	88.76	11.899	60.55	9.519	51.27	51.742
	317	224	104	33	101	87	194
28.4	61.166	91.00	11.795	60.88	9.418	52.14	51.548
	364	181	138	30	132	66	230
Sept. 7.3	60.802	92.81	11.657	61.18	9.286	52.80	51.318
	401	134	166	26	154	45	259
17.3	60.401	94.15	11.491	61.44	9.132	53.25	51.059
	423	85	183	18	170	23	277
27.3	59.978	95.00	11.308	61.62	8.962	53.48	50.782
	435	33	188	9	175	3	284
Oct. 7.2	59.543	95.33	11.120	61.71	8.787	53.51	50.498
	431	21	184	1	170	19	281
17.2	59.112	95.12	10.936	61.70	8.617	53.32	50.217
	414	75	166	11	156	39	266
27.2	58.698	94.37	10.770	61.59	8.461	52.93	49.951
	381	128	140	20	134	59	242
Nov. 6.2	58.317	93.09	10.630	61.39	8.327	52.34	49.709
	337	179	104	29	103	81	207
16.1	57.980	91.30	10.526	61.10	8.224	51.53	49.502
	281	226	63	34	68	99	164
26.1	57.699	89.04	10.463	60.76	8.156	50.54	49.338
	216	268	17	38	27	117	115
Dec. 6.1	57.483	86.36	10.446	60.38	8.129	49.37	49.223
	143	303	32	39	15	131	61
16.1	57.340	83.33	10.478	59.99	8.144	48.06	49.162
	64	327	80	39	58	141	6
26.0	57.276	80.06	10.558	59.60	8.202	46.65	49.156
	16	341	126	39	97	147	52
36.0	57.292	76.65	10.684	59.21	8.299	45.18	49.208
Mean Place	58.730	71.75	7.114	63.66	5.582	40.76	48.588
Sec δ, Tan δ	1.958	+1.683	1.116	−0.496	1.003	+0.072	1.386
$D_\psi\, a$, $D_\omega\, a$	+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.

gton Time.	γ Lyræ. Mag. 3.3		ε Aquilæ. Mag. 4.2		ζ Sagittarii. Mag. 2.7		ζ Aquilæ. Mag. 3.0	
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.
	h m 18 55	° ′ +32 34	h m 18 55	° ′ +14 57	h m 18 57	° ′ −29 59	h m 19 1	° ′ +13 44
	s	″	s	″	s	″	s	″
1.0	49.401	28.17	50.786	14.57	19.607	63.39	35.204	19.23
11.0	49.498 97	25.35 282	50.900 114	12.52 205	19.760 153	62.76 63	35.312 108	17.25 198
21.0	49.639 141	22.58 277	51.050 150	10.51 201	19.953 193	62.14 62	35.457 145	15.32 193
30.9	49.821 182	19.98 260	51.233 183	8.63 188	20.182 229	61.53 61	35.636 179	13.50 182
9.9	50.040 219	17.63 235	51.447 214	6.97 166	20.443 261	60.94 59	35.845 209	11.88 162
	251	199	237	140	285	60	253	145
19.9	50.291	15.64	51.684	5.57	20.728	60.34	36.078	10.53
1.8	50.567 276	14.09 155	51.943 259	4.54 103	21.034 306	59.74 60	36.333 255	9.53 100
11.8	50.865 298	13.05 104	52.218 275	3.91 63	21.356 322	59.13 61	36.605 272	8.92 61
21.8	51.177 312	12.57 48	52.505 287	3.70 21	21.690 334	58.52 61	36.889 284	8.72 20
31.8	51.497 320	12.64 7	52.799 294	3.92 22	22.033 343	57.91 61	37.182 293	8.95 23
	324	63	297	66	345	59	297	65
10.7	51.821	13.27	53.096	4.58	22.378	57.32	37.479	9.60
20.7	52.142 321	14.43 116	53.391 295	5.64 106	22.722 344	56.76 56	37.775 296	10.65 105
30.7	52.452 310	16.07 164	53.680 289	7.06 142	23.061 339	56.24 52	38.066 291	12.01 139
10.7	52.747 295	18.14 207	53.957 277	8.80 174	23.389 328	55.79 45	38.346 280	13.75 171
20.6	53.020 273	20.56 242	54.216 259	10.79 199	23.698 309	55.43 36	38.608 262	15.70 195
	243	270	236	218	288	25	242	214
30.6	53.263	23.26	54.452	12.97	23.986	55.18	38.850	17.84
9.6	53.471 208	26.14 288	54.659 207	15.26 229	24.243 257	55.04 14	39.063 213	20.09 225
19.5	53.641 170	29.13 299	54.834 175	17.60 234	24.465 222	55.03 1	39.243 180	22.38 229
29.5	53.767 126	32.15 302	54.972 138	19.93 233	24.646 181	55.15 12	39.387 144	24.67 229
9.5	53.846 79	35.13 298	55.069 97	22.19 226	24.783 137	55.40 25	39.489 102	26.88 221
	32	285	53	212	88	34	60	209
19.5	53.878	37.98	55.122	24.31	24.871	55.74	39.549	28.97
29.4	53.861 17	40.64 266	55.132 10	26.28 197	24.910 39	56.16 42	39.565 16	30.90 193
8.4	53.797 64	43.07 243	55.098 34	28.04 176	24.897 13	56.64 48	39.538 27	32.62 172
18.4	53.689 108	45.21 214	55.024 74	29.56 152	24.837 60	57.15 51	39.470 68	34.13 151
28.4	53.541 148	47.03 182	54.913 111	30.82 126	24.734 103	57.65 50	39.365 105	35.38 125
	181	145	140	100	139	45	136	99
7.3	53.360	48.48	54.773	31.82	24.595	58.10	39.229	36.37
17.3	53.153 207	49.54 106	54.607 166	32.52 70	24.426 169	58.47 37	39.067 162	37.07 70
27.3	52.930 223	50.19 65	54.427 180	32.93 41	24.239 187	58.73 26	38.891 176	37.49 42
7.2	52.700 230	50.42 23	54.240 187	33.03 10	24.045 194	58.87 14	38.707 184	37.61 12
17.2	52.473 227	50.21 21	54.057 183	32.82 21	23.854 191	58.88 1	38.525 182	37.43 18
	213	65	169	51	175	14	168	46
27.2	52.260	49.56	53.888	32.31	23.679	58.74	38.357	36.97
6.2	52.068 192	48.49 107	53.739 149	31.49 82	23.529 150	58.46 28	38.208 149	36.21 76
16.1	51.909 159	47.01 148	53.621 118	30.39 110	23.415 114	58.07 39	38.089 119	35.16 105
26.1	51.787 122	45.15 186	53.537 84	29.02 137	23.343 72	57.59 48	38.005 84	33.86 130
6.1	51.709 78	42.95 220	53.495 42	27.41 161	23.316 27	57.03 56	37.959 46	32.33 153
	32	249	1	181	25	60	4	174
16.1	51.677	40.46	53.494	25.60	23.341	56.43	37.955	30.59
26.0	51.694 17	37.78 268	53.537 43	23.64 196	23.414 73	55.80 63	37.994 39	28.71 188
36.0	51.760 66	34.99 279	53.622 85	21.61 203	23.536 122	55.17 63	38.075 81	26.75 196
an Place	50.298	29.74	51.301	16.73	19.884	60.26	35.698	21.13
δ, Tan δ	1.187	+0.639	1.035	+0.267	1.155	−0.577	1.029	+0.245
α, $D_n\alpha$	+0.04	−0.01	+0.05	0.00	+0.08	+0.01	+0.05	0.00
δ, $D_n\delta$	*+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 Lyræ. Mag. 5.1		π Sagitt Mag. 3
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination	Right Ascension.
	h m	° ′	h m	° ′	h m	° ′	h m
	19 1	− 5 0	19 3	−38 1	19 4	+35 57	19 4
	s	″	s	″	s	″	s
Jan. 1.0	50.348	30.77	49.226	69.70	19.421	68.82	49.462
	124	92	155	115	82	291	135
11.0	50.472	31.69	49.381	68.55	19.503	65.91	49.597
	159	90	202	113	132	287	173
21.0	50.631	32.59	49.583	67.42	19.635	63.04	49.770
	190	82	242	110	174	273	206
30.9	50.821	33.41	49.825	66.32	19.809	60.31	49.976
Feb. 9.9	51.039	34.10	50.100	65.26	20.022	57.85	50.211
	218	69	275	106	213	246	235
	240	54	306	100	248	210	261
19.9	51.279	34.64	50.406	64.26	20.270	55.75	50.472
	261	32	329	95	277	167	279
Mar. 1.9	51.540	34.96	50.735	63.31	20.547	54.08	50.751
	275	9	349	88	300	116	295
11.8	51.815	35.05	51.084	62.43	20.847	52.92	51.046
	286	— 17	362	81	317	61	309
21.8	52.101	34.88	51.446	61.62	21.164	52.31	51.355
	295	42	372	72	329	1	317
31.8	52.396	34.46	51.818	60.90	21.493	52.30	51.672
	299	68	377	64	333	55	322
Apr. 10.7	52.695	33.78	52.195	60.26	21.826	52.85	51.994
	299	89	377	52	330	110	322
20.7	52.994	32.89	52.572	59.74	22.156	53.95	52.316
	295	108	372	40	323	162	319
30.7	53.289	31.81	52.944	59.34	22.479	55.57	52.635
May 10.7	53.574	30.56	53.304	59.09	22.785	57.64	52.943
	285	125	360	25	306	207	308
20.6	53.845	29.21	53.645	58.99	23.069	60.08	53.238
	271	135	341	10	284	244	295
	249	140	317	— 6	254	274	274
30.6	54.094	27.81	53.962	59.05	23.323	62.82	53.512
	224	142	286	25	219	296	246
June 9.6	54.318	26.39	54.248	59.30	23.542	65.78	53.758
	194	140	246	40	178	310	214
19.6	54.512	24.99	54.494	59.70	23.720	68.88	53.972
	157	133	203	55	134	314	177
29.5	54.669	23.66	54.697	60.25	23.854	72.02	54.149
July 9.5	54.786	22.43	54.850	60.95	23.940	75.12	54.283
	117	123	153	70	86	310	134
	76	110	100	79	36	299	89
19.5	54.862	21.33	54.950	61.74	23.976	78.11	54.372
	32	98	44	87	15	283	42
29.4	54.894	20.35	54.994	62.61	23.961	80.94	54.414
	12	83	— 9	91	64	258	— 4
Aug. 8.4	54.882	19.52	54.985	63.52	23.897	83.52	54.410
	53	67	63	90	109	230	49
18.4	54.829	18.85	54.922	64.42	23.788	85.82	54.361
	89	52	110	84	152	197	89
28.4	54.740	18.33	54.812	65.26	23.636	87.79	54.272
	123	38	152	73	186	160	125
Sept. 7.3	54.617	17.95	54.660	65.99	23.450	89.39	54.147
	147	24	184	61	214	120	152
17.3	54.470	17.71	54.476	66.60	23.236	90.59	53.995
	164	11	206	42	233	78	172
27.3	54.306	17.60	54.270	67.02	23.003	91.37	53.823
Oct. 7.3	54.136	17.62	54.054	67.23	22.761	91.71	53.644
	170	2	216	21	242	34	179
17.2	53.969	17.76	53.842	67.23	22.521	91.59	53.467
	167	14	212	0	240	12	177
	155	27	199	24	229	58	163
27.2	53.814	18.03	53.643	66.99	22.292	91.01	53.304
	134	38	171	44	207	101	141
Nov. 6.2	53.680	18.41	53.472	66.55	22.085	90.00	53.163
	104	49	134	65	177	147	109
16.1	53.576	18.90	53.338	65.90	21.908	88.53	53.054
	68	61	90	82	140	185	71
26.1	53.508	19.51	53.248	65.08	21.768	86.68	52.983
Dec. 6.1	53.480	20.23	53.209	64.13	21.672	84.47	52.955
	28	72	39	95	96	221	28
	13	80	— 15	105	48	253	— 17
16.1	53.493	21.03	53.224	63.08	21.624	81.94	52.972
	55	88	69	111	2	274	62
26.0	53.548	21.91	53.293	61.97	21.626	79.20	53.034
	96	91	120	114	51	287	105
36.0	53.644	22.82	53.413	60.83	21.677	76.33	53.139
Mean Place	50.651	28.20	49.557	66.34	20.420	69.57	49.713
Sec δ, Tan δ	1.004	−0.088	1.270	−0.782	1.236	+0.726	1.072
$D_\psi a$, $D_\omega a$	+0.06	0.00	+0.08	+0.01	+0.04	−0.01	+0.07
$D_\psi \delta$, $D_\omega \delta$	+0.1	−1.0	+0.1	−1.0	+0.1	−1.0	+0.1

FOR THE UPPER TRANSIT AT WASHINGTON.

ington Time.	ψ Sagittarii. Mag. 4.9		δ Draconis. Mag. 3.2		d Sagittarii. Mag. 5.0		θ Lyræ. Mag. 4.5	
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.
	h m	° ′	h m	° ′	h m	° ′	h m	° ′
	19 10	−25 23	19 12	+67 30	19 12	−19 5	19 13	+37 58
	s	″	s	″	s	″	s	″
. 1.0	26.881	66.12	28.76	57.42	46.514	68.82	28.124	67.33
	130	38	1	342	125	1	70	295
11.0	27.011	65.74	28.75	54.00	46.639	68.83	28.194	64.38
	172	46	—	343	163	1	118	293
21.0	27.183	65.34	10	50.57	46.802	68.82	28.312	61.45
	208	41	28.85	352	194	5	164	280
30.9	27.391	64.93	20	47.25	46.996	68.77	28.476	58.65
	238	43	29.05	306	225	11	205	255
). 9.9	27.629	64.50	30	44.19	47.221	68.66	28.681	56.10
	261	48	29.35	270	250	18	243	220
	19.9 27.893	64.02	29.74	41.49	47.471	68.48	28.924	53.90
				239			274	178
r. 1.9	28.177	63.50	30.22	39.26	47.741	68.19	29.198	52.12
	284	52	48	167	270	29	300	126
11.8	28.460	62.92	30.75	37.59	48.028	67.79	29.498	50.86
	303	58	53	106	287	40	320	70
21.8	28.796	62.29	31.33	36.53	48.330	67.27	29.818	50.16
	316	63	58	39	302	52	333	11
31.8	29.121	61.60	31.93	36.14	48.641	66.64	30.151	50.05
	325	69	60	26	311	63	340	—
	332	72	61		316	73		48
r. 10.7	29.453	60.88	32.54	36.40	48.957	65.91	30.491	50.53
	333	73	61	92	319	81	340	104
20.7	29.786	60.15	33.15	37.32	49.276	65.10	30.831	51.57
	329	73	58	152	316	87	342	156
30.7	30.115	59.42	33.73	38.84	49.592	64.23	31.163	53.13
	321	69	54	208	307	90	318	204
y 10.7	30.436	58.73	34.27	40.92	49.899	63.33	31.481	55.17
	305	64	47	255	294	88	294	244
20.6	30.741	58.09	34.74	43.47	50.193	62.45	31.775	57.61
	286	55	41	295	276	85	266	275
30.6	31.027	57.54	35.15	46.42	50.469	61.60	32.041	60.36
	259	46	33	325	248	78	231	290
ne 9.6	31.286	57.08	35.48	49.67	50.717	60.82	32.272	63.35
	225	33	24	347	217	68	189	313
19.6	31.511	56.75	35.72	53.14	50.934	60.14	32.461	66.48
	188	19	15	358	182	58	144	320
29.5	31.699	56.56	35.87	56.72	51.116	59.56	32.605	69.68
	144	8	3	362	140	45	93	319
ly 9.5	31.843	56.48	35.90	60.34	51.256	59.11	32.698	72.87
	98	5	6	354	97	32	43	308
19.5	31.941	56.53	35.84	63.88	51.353	58.79	32.741	75.95
	50	16	15	311	48	20	8	293
29.4	31.991	56.69	35.69	67.29	51.401	58.59	32.733	78.88
	1	25	24	320	3	10	60	271
ig. 8.4	31.992	56.94	35.45	70.49	51.404	58.49	32.673	81.59
	—	31	33	291	—	0	107	243
18.4	31.947	57.25	35.12	73.40	51.363	58.49	32.566	84.02
	45	34	42	256	83	7	151	209
28.4	31.859	57.59	34.70	75.96	51.280	58.56	32.415	86.11
	88	35	48	216	119	14	187	173
pt. 7.3	31.734	57.94	34.22	78.12	51.161	58.70	32.228	87.84
	155	32	54	172	146	15	218	133
17.3	31.579	58.26	33.68	79.84	51.015	58.85	32.010	89.17
	174	26	57	123	167	15	238	91
27.3	31.405	58.52	33.11	81.07	50.848	59.00	31.772	90.08
	184	19	59	72	177	15	248	46
ct. 7.3	31.221	58.71	32.52	81.79	50.671	59.15	31.524	90.54
	183	10	60	18	174	13	249	—
17.2	31.038	58.81	31.92	81.97	50.497	59.28	31.275	1
	170	0	58	37	164	9	239	90.53
								47
27.2	30.868	58.81	31.34	81.60	50.333	59.37	31.036	90.06
	149	9	56	92	111	7	218	93
ov. 6.2	30.719	58.72	30.78	80.68	50.192	59.44	30.818	89.13
	116	17	50	146	112	4	191	139
16.1	30.603	58.55	30.28	79.22	50.080	59.48	30.627	87.74
	78	25	45	198	76	3	153	182
26.1	30.525	58.30	29.83	77.24	50.004	59.51	30.474	85.92
	35	30	37	243	35	1	110	219
ec. 6.1	30.490	58.00	29.46	74.81	49.969	59.52	30.364	83.73
	—	34	29	282	—	1	63	251
	11				9			
16.1	30.501	57.66	29.17	71.99	49.978	59.53	30.301	81.22
	58	36	18	315	53	2	14	275
26.0	30.559	57.30	28.99	68.84	50.031	59.55	30.287	78.47
	102	38	7	334	95	1	37	200
36.0	30.661	56.92	28.92	65.50	50.126	59.56	30.324	75.57
n Place	27.129	62.96	32.414	55.85	46.758	65.88	29.188	67.19
δ, Tan δ	1.107	−0.475	2.615	+2.416	1.058	−0.346	1.269	+0.781
, D_α	+0.07	+0.01	0.00	−0.05	+0.07	+0.01	+0.04	−0.02
, D_δ	*+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.	ω Aquilæ. Mag. 5.1		κ Cygni. Mag. 4.0		τ Draconis. Mag. 4.6		δ Aq Mag
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension
	h m s	° ′ ″	h m s	° ′ ″	h m s	° ′ ″	h m s
	19 13	+11 26	19 15	+53 12	19 17	+73 11	19 21
Jan. 1.0	54.783	40.09	9.264	54.67	4.32	68.70	18.471
11.0	54.880 97	38.28 181	9.304 40	51.37 330	4.26 6	65.32 338	18.568
21.0	55.015 135	36.49 179	9.409 105	48.07 330	4.33 7	61.90 342	18.703
30.9	55.183 168	34.82 167	9.578 169	44.89 318	4.55 22	58.57 333	18.870
Feb. 9.9	55.382 199	33.32 150	9.807 229	41.97 292	4.91 36	55.48 309	19.065
	224	124	281	256	47	275	
19.9	55.606	32.08	10.088	39.41	5.38	52.73	19.286
Mar. 1.9	55.852 246	31.14 94	10.416 328	37.32 209	5.96 58	50.43 230	19.529
11.8	56.117 265	30.58 56	10.782 366	35.77 155	6.63 67	48.68 175	19.791
21.8	56.396 279	30.41 17	11.177 395	34.84 93	7.36 73	47.54 114	20.067
31.8	56.685 289	30.65 24	11.589 412	34.54 30	8.14 78	47.05 49	20.354
	295	64	420	34	78	16	
Apr. 10.8	56.980	31.29	12.009	34.88	8.92	47.21	20.648
20.7	57.278 298	32.31 102	12.427 418	35.87 99	9.70 78	48.02 81	20.946
30.7	57.572 294	33.67 136	12.832 405	37.43 156	10.45 75	49.45 143	21.242
May 10.7	57.857 285	35.33 166	13.215 383	39.52 209	11.14 69	51.43 198	21.531
20.6	58.127 270	37.21 188	13.565 350	42.08 256	11.75 61	53.90 247	21.808
	249	207	309	293	52	287	
30.6	58.376	39.28	13.874	45.01	12.27	56.77	22.065
June 9.6	58.599 223	41.45 217	14.133 259	48.21 320	12.67 40	59.97 320	22.298
19.6	58.792 193	43.67 222	14.338 205	51.61 340	12.95 28	63.38 341	22.501
29.5	58.948 156	45.88 221	14.481 143	55.13 352	13.12 17	66.95 357	22.670
July 9.5	59.064 116	48.01 213	14.561 80	58.64 351	13.15 3	70.55 360	22.799
	74	202	14	344	11	355	
19.5	59.138	50.03	14.575	62.08	13.04	74.10	22.887
29.5	59.168 30	51.90 187	14.523 52	65.38 330	12.82 22	77.53 343	22.931
Aug. 8.4	59.154 14	53.57 167	14.408 115	68.46 308	12.48 34	80.77 324	22.932
18.4	59.098 56	55.04 147	14.233 175	71.25 279	12.02 46	83.74 297	22.891
28.4	59.005 93	56.26 122	14.005 228	73.68 243	11.45 57	86.37 263	22.811
	126	97	274	205	66	225	
Sept. 7.3	58.879	57.23	13.731	75.73	10.79	88.62	22.697
17.3	58.727 152	57.93 70	13.420 311	77.34 161	10.08 71	90.43 181	22.556
27.3	58.556 171	58.37 44	13.083 337	78.47 113	9.31 77	91.77 134	22.396
Oct. 7.3	58.377 179	58.53 16	12.730 353	79.10 63	8.50 81	92.61 84	22.227
17.2	58.199 178	58.41 12	12.377 353	79.22 12	7.68 82	92.91 30	22.058
	167	38	344	41	80	25	
27.2	58.032	58.03	12.033	78.81	6.88	92.66	21.898
Nov. 6.2	57.883 149	57.37 66	11.710 323	77.85 96	6.11 77	91.86 80	21.755
16.2	57.761 122	56.45 92	11.422 288	76.39 146	5.40 71	90.51 135	21.639
26.1	57.671 90	55.28 117	11.177 245	74.45 194	4.77 63	88.65 186	21.555
Dec. 6.1	57.620 51	53.89 139	10.984 193	72.07 238	4.23 54	86.31 234	21.507
	11	158	133	276	43	275	
16.1	57.609	52.31	10.851	69.31	3.80	83.56	21.499
26.0	57.639 30	50.60 171	10.781 70	66.26 305	3.50 30	80.48 308	21.531
36.0	57.710 71	48.80 180	10.778 3	63.02 324	3.35 15	77.18 330	21.603
Mean Place	55.236	41.49	11.130	53.51	9.537	66.36	18.819
Sec δ, Tan δ	1.020	+0.202	1.670	+1.337	3.460	+3.312	1.001
$D_\psi a$, $D_\omega a$	+0.06	0.00	+0.03	−0.03	−0.02	−0.07	+0.06
$D_\psi \delta$, $D_\omega \delta$	+0.1	−0.9	+0.1	−0.9	+0.1	−0.9	+0.1

FOR THE UPPER TRANSIT AT WASHINGTON.

ington Time.	β Cygni. Mag. 3.2		ι Cygni. Mag. 3.9		μ Aquilæ. Mag. 4.6		h Sagittarii. Mag. 4.7	
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.
	h m 19 27 s	° ′ +27 46 ″	h m 19 27 s	° ′ +51 32 ″	h m 19 30 s	′ ′ + 7 11 ″	h m 19 31 s	′ ′ −25 3 ″
h. 1.0	21.686	64.94	35.110	71.22	1.730	66.15	39.235	67.46
11.0	21.754 68	62.40 254	35.135 25	67.99 323	1.817 87	64.61 154	39.344 109	67.05 41
21.0	21.864 110	59.87 253	35.224 89	64.74 325	1.940 123	63.09 152	39.493 149	66.60 45
31.0	22.013 149	57.45 242	35.373 149	61.59 315	2.095 155	61.66 143	39.677 184	66.11 49
h. 9.9	22.197 184	55.24 221	35.580 207	58.66 293	2.280 185	60.41 125	39.893 216	65.57 54
	218	192	259	260	213	105	241	59
19.9	22.415	53.32	35.839	56.06	2.493	59.36	40.137	64.98
p. 1.9	22.662 247	51.79 153	36.145 306	53.91 215	2.729 236	58.60 76	40.405 268	64.33 65
11.8	22.932 270	50.71 108	36.490 345	52.29 162	2.985 256	58.15 45	40.693 288	63.60 73
21.8	23.221 289	50.12 59	36.864 374	51.25 104	3.257 272	58.07 8	40.998 305	62.81 79
31.8	23.526 305	50.06 — 6	37.261 397	50.85 40	3.541 284	58.36 29	41.316 318	61.97 84
	313	48	407	23	293	65	337	89
r. 10.8	23.839	50.54	37.668	51.08	3.834	59.01	41.643	61.08
20.7	24.155 316	51.52 98	38.077 409	51.93 85	4.132 298	59.99 98	41.976 333	60.17 91
30.7	24.468 313	52.97 145	38.477 400	53.39 146	4.429 297	61.29 130	42.309 333	59.27 90
ay 10.7	24.771 303	54.82 185	38.859 382	55.38 199	4.720 291	62.86 157	42.637 328	58.40 87
20.7	25.059 288	57.05 223	39.212 353	57.83 245	4.999 279	64.63 177	42.954 317	57.60 80
	264	251	316	284	260	192	298	70
30.6	25.323	59.56	39.528	60.67	5.259	66.55	43.252	56.90
ne 9.6	25.560 237	62.27 271	39.799 271	63.82 315	5.497 238	68.57 202	43.526 274	56.30 60
19.6	25.761 201	65.11 284	40.019 220	67.18 336	5.705 208	70.64 207	43.769 243	55.83 47
29.5	25.922 161	68.01 290	40.181 162	70.66 348	5.878 173	72.67 203	43.975 206	55.51 32
ly 9.5	26.040 118	70.88 287	40.282 101	74.17 351	6.012 134	74.63 196	44.139 164	55.36 15
	72	279	37	346	93	186	119	2
19.5	26.112	73.67	40.319	77.63	6.105	76.49	44.258	55.34
29.5	26.136 24	76.30 263	40.293 26	80.97 334	6.154 49	78.18 169	44.328 70	55.45 11
ug. 8.4	26.113 — 23	78.74 244	40.203 90	84.10 313	6.159 5	79.71 153	44.349 — 21	55.69 24
18.4	26.045 68	80.92 218	40.055 148	86.96 286	6.122 37	81.04 133	44.322 27	56.00 31
28.4	25.935 110	82.82 190	39.854 201	89.49 253	6.045 77	82.13 109	44.250 72	56.37 37
	145	157	248	216	111	88	111	40
pt. 7.4	25.790	84.39	39.606	91.65	5.934	83.01	44.139	56.77
17.3	25.615 175	85.61 122	39.321 285	93.38 173	5.796 138	83.64 63	43.996 143	57.16 39
27.3	25.420 195	86.45 84	39.006 315	94.65 127	5.636 160	84.04 40	43.829 167	57.52 36
ct. 7.3	25.213 207	86.92 47	38.676 330	95.43 78	5.466 170	84.20 16	43.650 179	57.81 29
17.2	25.003 210	86.98 — 6	38.340 336	95.69 26	5.294 172	84.13 — 7	43.467 183	58.01 20
	202	35	320	25	164	32	174	11
27.2	24.801	86.63	38.011	95.44	5.130	83.81	43.293	58.12
ov. 6.2	24.616 185	85.88 75	37.702 309	94.66 78	4.982 148	83.29 52	43.139 154	58.13 — 1
16.2	24.456 160	84.74 114	37.422 280	93.36 130	4.858 124	82.51 78	43.012 127	58.04 9
26.1	24.328 128	83.23 151	37.180 242	91.56 180	4.764 94	81.54 97	42.918 94	57.87 17
ec. 6.1	24.237 91	81.39 184	36.987 193	89.32 224	4.707 57	80.37 117	42.866 52	57.61 26
	49	213	137	203	19	132	9	30
16.1	24.188	79.26	36.850	86.69	4.688	79.05	42.857	57.31
26.1	24.183 — 5	76.91 235	36.771 79	83.74 295	4.708 20	77.61 144	42.893 36	56.96 35
36.0	24.221 38	74.42 249	36.755 16	80.60 314	4.768 60	76.08 153	42.973 80	56.57 39
an Place	22.426	64.40	36.836	68.92	2.113	67.10	39.459	64.19
δ, Tan δ	1.130	+0.527	1.608	+1.260	1.008	+0.127	1.104	−0.468
α, $D_m\alpha$	+0.05	−0.01	+0.03	−0.03	+0.06	0.00	+0.07	+0.01
δ, $D_m\delta$	*+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		54 Sagittarii. Mag. 5.4		β Sagi Mag.
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.
	h m s	° ′ ″	h m s	° ′ ″	h m s	° ′ ″	h m s
	19 32	− 7 12	19 34	+50 1	19 35	−16 28	19 37
Jan. 1.0	25.381	48.17	11.352	44.90	57.948	66.99	18.730
	94	69	19	317	97	12	70
11.0	25.475	48.86	11.371	41.73	58.045	67.11	18.800
	131	65	80	320	136	7	107
21.0	25.606	49.51	11.451	38.53	58.181	67.18	18.907
	164	60	140	312	170	2	143
31.0	25.770	50.11	11.591	35.41	58.351	67.20	19.050
	192	47	195	292	200	— 7	176
Feb. 9.9	25.962	50.58	11.786	32.49	58.551	67.13	19.226
	220	31	216	259	226	17	205
19.9	26.182	50.89	12.032	29.90	58.777	66.96	19.431
	240	13	292	216	250	30	231
Mar. 1.9	26.422	51.02 —	12.324	27.74	59.027	66.66	19.662
	261	7	330	165	268	44	254
11.8	26.683	50.95	12.654	26.09	59.295	66.22	19.916
	276	32	361	107	286	58	272
21.8	26.959	50.63	13.015	25.02	59.581	65.64	20.188
	289	55	383	44	300	73	287
31.8	27.248	50.08	13.398	24.58 —	59.881	64.91	20.475
	297	77	397	18	309	86	297
Apr. 10.8	27.545	49.31	13.795	24.76	60.190	64.05	20.772
	303	98	399	80	314	97	302
20.7	27.848	48.33	14.194	25.56	60.504	63.08	21.074
	303	116	393	141	316	105	302
30.7	28.151	47.17	14.587	26.97	60.820	62.03	21.376
	298	128	378	193	311	110	296
May 10.7	28.449	45.89	14.965	28.90	61.131	60.93	21.672
	288	138	351	241	300	111	285
20.7	28.737	44.51	15.316	31.31	61.431	59.82	21.957
	271	143	317	279	285	108	265
30.6	29.008	43.08	15.633	34.10	61.716	58.74	22.222
	248	142	275	311	261	103	241
June 9.6	29.256	41.66	15.908	37.21	61.977	57.71	22.463
	219	140	226	333	234	93	210
19.6	29.475	40.26	16.134	40.54	62.211	56.78	22.673
	186	131	171	345	198	82	174
29.5	29.661	38.95	16.305	43.99	62.409	55.96	22.847
	149	120	112	350	159	67	134
July 9.5	29.810	37.75	16.417	47.49	62.568	55.29	22.981
	104	107	50	346	115	54	92
19.5	29.914	36.68	16.467	50.95	62.683	54.75	23.073
	61	93	12	334	70	40	47
29.5	29.975	35.75	16.455	54.29	62.753	54.35	23.120
	17	76	73	314	24	25	1
Aug. 8.4	29.992 —	34.99	16.382	57.43	62.777 —	54.10	23.121 —
	28	61	130	290	22	13	42
18.4	29.964	34.38	16.252	60.33	62.755	53.97	23.079
	67	46	184	256	65	3	83
28.4	29.897	33.92	16.068	62.89	62.690	53.94 —	22.996
	104	32	231	220	101	7	118
Sept. 7.4	29.793	33.60	15.837	65.09	62.589	54.01	22.878
	131	17	269	178	133	13	147
17.3	29.662	33.43	15.568	66.87	62.456	54.14	22.731
	153	7	297	133	154	16	169
27.3	29.509	33.36	15.271	68.20	62.302	54.30	22.562
	166	4	314	85	169	19	181
Oct. 7.3	29.343	33.40	14.957	69.05	62.133	54.49	22.381
	166	16	321	35	171	20	194
17.2	29.177	33.56	14.636	69.40 —	61.962	54.69	22.197
	159	25	315	18	163	19	178
27.2	29.018	33.81	14.321	69.22	61.799	54.88	22.019
	143	33	298	70	148	19	163
Nov. 6.2	28.875	34.14	14.023	68.52	61.651	55.07	21.856
	118	41	271	121	122	17	141
16.2	28.757	34.55	13.752	67.31	61.529	55.24	21.715
	87	49	234	171	90	16	110
26.1	28.670	35.04	13.518	65.60	61.439	55.40	21.605
	51	56	188	216	52	16	76
Dec. 6.1	28.619	35.60	13.330	63.44	61.387	55.56	21.529
	11	62	136	255	12	15	38
16.1	28.608	36.22	13.194	60.89	61.375	55.71	21.491
	29	67	80	286	30	14	1
26.1	28.637	36.89	13.114	58.03	61.405	55.85	21.492
	69	73	20	310	71	13	43
36.0	28.706	37.62	13.094	54.93	61.476	55.98	21.535
Mean Place	25.638	46.14	12.963	42.06	58.167	64.31	19.243
Sec δ, Tan δ	1.008	−0.127	1.557	+1.193	1.043	−0.296	1.048
$D_\psi a$, $D_\omega a$	+0.06	0.00	+0.03	−0.03	+0.07	+0.01	+0.05
$D_\psi \delta$, $D_\omega \delta$	+0.2	−0.9	+0.2	−0.9	+0.2	−0.9	+0.2

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	15 Cygni. Mag. 5.0		f Sagittarii. Mag. 5.1		γ Aquilæ. Mag. 2.8		δ Cygni. Mag. 3.0	
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.
	h m s	° ′ ″	h m s	° ′ ″	h m s	° ′ ″	h m s	° ′ ″
	19 41	+37 8	19 41	−19 57	19 42	+10 21	19 42	+44 55
1.0	16.044	74.39	31.089	44.50	18.413	36.36	21.588	42.44
11.0	16.083 39	71.59 280	31.183 94	44.38 12	18.484 71	34.68 168	21.610 22	39.40 304
21.0	16.170 87	68.75 284	31.316 133	44.22 16	18.592 108	33.03 165	21.686 76	36.33 307
31.0	16.301 131	65.98 277	31.483 167	43.99 23	18.733 141	31.46 157	21.814 128	33.33 300
9.9	16.475 174 213	63.42 256 227	31.682 199 225	43.70 29 38	18.906 173 202	30.04 142 118	21.992 178 224	30.51 282 250
19.9	16.688	61.15	31.907	43.32	19.108	28.86	22.216	28.01
1.9	16.937 249	59.28 187	32.158 251	42.84 48	19.333 225	27.97 89	22.482 266	25.91 210
11.9	17.215 278	57.87 141	32.428 270	42.24 60	19.582 249	27.42 55	22.783 301	24.30 161
21.8	17.519 304	57.00 87	32.716 288	41.52 72	19.848 266	27.24 18	23.113 330	23.25 105
31.8	17.841 322 334	56.69 31 26	33.020 304 313	40.70 82 91	20.129 281 292	27.46 22 61	23.466 353 366	22.81 44 16
10.8	18.175	56.95	33.333	39.79	20.421	28.07	23.832	22.97
20.7	18.515 340	57.78 83	33.653 320	38.79 100	20.719 298	29.05 98	24.204 372	23.73 76
30.7	18.855 340	59.14 136	33.975 322	37.75 104	21.019 300	30.37 132	24.573 369	25.07 134
10.7	19.184 329	61.00 186	34.294 319	36.70 105	21.314 295	31.99 162	24.929 356	26.93 186
20.7	19.495 311 290	63.27 227 263	34.602 308 294	35.67 103 98	21.599 285 267	33.84 185 204	25.267 338 308	29.25 232 271
30.6	19.785	65.90	34.896	34.69	21.866	35.88	25.575	31.96
9.6	20.042 257	68.79 289	35.167 271	33.80 89	22.111 245	38.04 216	25.846 271	34.98 302
19.6	20.260 218	71.89 310	35.408 241	33.02 78	22.327 216	40.26 222	26.074 228	38.20 322
29.6	20.436 176	75.07 318	35.615 207	32.38 64	22.510 183	42.47 221	26.254 180	41.56 336
9.5	20.565 129 79	78.27 320 315	35.782 167 123	31.87 51 35	22.653 143 101	44.63 216 205	26.381 127 70	44.96 340 337
19.5	20.644	81.42	35.905	31.52	22.754	46.68	26.451	48.33
29.5	20.670 26	84.44 302	35.982 77	31.33 19	22.811 57	48.58 190	26.464 13	51.59 326
8.4	20.644 26	87.29 285	36.011 29	31.26 7	22.824 13	50.30 172	26.420 44	54.65 306
18.4	20.569 75	89.88 259	35.994 17	31.30 4	22.793 31	51.82 152	26.321 99	57.48 283
28.4	20.448 121 161	92.18 230 194	35.933 61 99	31.45 15 23	22.722 71 106	53.11 129 104	26.173 148 192	59.99 251 216
7.4	20.287	94.12	35.834	31.68	22.616	54.15	25.981	62.15
17.3	20.095 192	95.69 157	35.701 133	31.94 26	22.481 135	54.94 79	25.752 229	63.92 177
27.3	19.874 221	96.85 116	35.544 157	32.22 28	22.323 158	55.47 53	25.495 257	65.25 133
7.3	19.639 235	97.59 74	35.374 170	32.48 26	22.153 170	55.73 26	25.221 274	66.11 86
17.3	19.399 240 235	97.87 28 18	35.200 174 168	32.71 23 19	21.979 174 168	55.73 0 25	24.940 281 277	66.50 39 12
27.2	19.164	97.69	35.032	32.90	21.811	55.48	24.663	66.38
6.2	18.943 221	97.04 65	34.880 152	33.05 15	21.657 154	54.95 53	24.401 262	65.76 62
16.2	18.745 198	95.93 111	34.753 127	33.14 9	21.525 132	54.17 78	24.163 238	64.64 112
26.1	18.579 166	94.40 153	34.657 96	33.19 5	21.422 103	53.16 101	23.958 205	63.05 159
6.1	18.450 129 85	92.47 193 227	34.599 58 17	33.20 1 3	21.353 69 33	51.93 123 141	23.794 164 117	61.02 203 241
16.1	18.365	90.20	34.582	33.17	21.320	50.52	23.677	58.61
26.1	18.325 40	87.65 255	34.607 25	33.11 6	21.326 6	48.96 156	23.610 67	55.89 272
36.0	18.332 7	84.90 275	34.674 67	33.01 10	21.370 44	47.32 164	23.596 14	52.95 294
n Place	17.033	72.00	31.295	41.56	18.817	36.48	22.897	39.24
δ, Tan δ	*1.255*	*+0.758*	*1.064*	*−0.363*	1.017	+0.184	1.412	+0.907
$D_m\,\alpha$	*+0.04*	*−0.02*	*+0.07*	+0.01	+0.06	−0.01	+0.04	−0.03
$D_m\,\delta$	*+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.	δ Sagittæ. Mag. 3.8		α Aquilæ. (*Altair.*) Mag. 0.9		η Aquilæ. Var. 3.7–4.4		ε Draco Mag. 4.
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.
	h m 19 43 s	° ′ +18 19 ″	h m 19 46 s	° ′ + 8 38 ″	h m 19 48 s	° ′ + 0 47 ″	h m 19 48 s
Jan. 1.0	40.696	44.37	43.646	53.37	14.429	29.47	23.64
	62	200	73	155	74	111	12
11.0	40.758	42.31	43.719	51.82	14.503	28.36	23.52
	100	206	108	153	110	110	0
21.0	40.858	40.25	43.827	50.29	14.613	27.26	23.52
	135	197	141	145	141	102	12
31.0	40.993	38.28	43.968	48.84	14.754	26.24	23.64
	170	181	173	129	173	88	23
Feb. 9.9	41.163	36.47	44.141	47.55	14.927	25.36	23.87
	200	154	201	106	200	68	34
19.9	41.363	34.93	44.342	46.49	15.127	24.68	24.21
	225	122	226	79	223	46	45
Mar. 1.9	41.588	33.71	44.568	45.70	15.350	24.22	24.66
	251	84	247	46	245	18	53
11.9	41.839	32.87	44.815	45.24	15.595	24.04	25.19
	270	40	267	9	264	—	60
21.8	42.109	32.47	45.082	45.15	15.859	24.16	25.79
	286	—	280	—	278	12	64
31.8	42.395	5	45.362	28	16.137	24.58	26.43
	297	32.52	292	45.43	290	42	68
		50		66		72	
Apr. 10.8	42.692	33.02	45.654	46.09	16.427	25.30	27.11
	304	94	299	100	298	100	68
20.7	42.996	33.96	45.953	47.09	16.725	26.30	27.79
	304	135	300	134	300	128	67
30.7	43.300	35.31	46.253	48.43	17.025	27.58	28.46
	300	171	297	162	297	146	64
May 10.7	43.600	37.02	46.550	50.05	17.322	29.04	29.10
	288	202	286	184	289	165	59
20.7	43.888	39.04	46.836	51.89	17.611	30.69	29.69
	270	224	271	201	274	175	52
30.6	44.158	41.28	47.107	53.90	17.885	32.44	30.21
	246	242	247	213	252	180	44
June 9.6	44.404	43.70	47.354	56.03	18.137	34.24	30.65
	215	253	218	216	225	182	34
19.6	44.619	46.23	47.572	58.19	18.362	36.06	30.99
	180	255	186	216	193	177	25
29.6	44.799	48.78	47.758	60.35	18.555	37.83	31.24
	140	252	147	208	155	167	13
July 9.5	44.939	51.30	47.905	62.43	18.710	39.50	31.37
	97	244	105	198	113	157	3
19.5	45.036	53.74	48.010	64.41	18.823	41.07	31.40
	51	230	61	183	70	142	9
29.5	45.087	56.04	48.071	66.24	18.893	42.49	31.31
	6	210	16	165	26	123	19
Aug. 8.4	45.093	58.14	48.087	67.89	18.919	43.72	31.12
	—	189	—	144	—	106	30
18.4	38	60.03	26	69.33	17	44.78	30.82
	45.055	163	48.061	121	18.902	86	39
28.4	79	61.66	67	70.54	59	45.64	30.43
	44.976	136	102	99	18.843	66	47
	115				95		
Sept. 7.4	44.861	63.02	47.892	71.53	18.748	46.30	29.96
	145	104	132	73	125	47	55
17.3	44.716	64.06	47.760	72.26	18.623	46.77	29.41
	168	74	153	49	146	28	60
27.3	44.548	64.80	47.607	72.75	18.477	47.05	28.81
	180	43	168	23	161	10	64
Oct. 7.3	44.368	65.23	47.439	73.98	18.316	47.15	28.17
	185	8	170	—	166	—	66
17.3	44.183	65.31	47.269	1	18.150	8	27.51
	180	24	164	72.97	161	47.07	66
				26		26	
27.2	44.003	65.07	47.105	72.71	17.989	46.81	26.85
	166	57	152	49	149	42	65
Nov. 6.2	43.837	64.50	46.953	72.22	17.840	46.39	26.20
	144	89	129	74	126	58	62
16.2	43.693	63.61	46.824	71.48	17.714	45.81	25.58
	115	120	101	94	98	73	55
26.1	43.578	62.41	46.723	70.54	17.616	45.08	25.03
	82	147	67	116	64	86	49
Dec. 6.1	43.496	60.94	46.656	69.38	17.552	44.22	24.54
	45	172	31	132	28	97	40
16.1	43.451	59.22	46.625	68.06	17.524	43.25	24.14
	5	190	8	144	10	107	31
26.1	43.446	57.32	46.633	66.62	17.534	42.18	23.83
	—	202	45	153	48	111	19
36.0	35 43.481	55.30	46.678	65.09	17.582	41.07	23.64
Mean Place	41.215	43.62	44.024	53.59	14.719	30.35	27.750
Sec δ, Tan δ	1.053	+0.331	1.012	+0.152	1.000	+0.014	2.932
Dψ α, Dω α	+0.05	−0.01	+0.06	0.00	+0.06	0.00	0.00
Dψ δ, Dω δ	+0.2	−0.9	+0.2	−0.9	+0.2	−0.9	+0.2

FOR THE UPPER TRANSIT AT WASHINGTON.

dington Time.	ι Sagittarii. Mag. 4.2		ε Pavonis. Mag. 4.1		β Aquilæ. Mag. 3.9		γ Sagittæ. Mag. 3.7	
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.
	h m	° ′	h m	° ′	h m	° ′	h m	° ′
	19 49	−42 5	19 50	−73 7	19 51	+ 6 11	19 55	+19 15
	s	″	s	″	s	″	s	″
1.1	31.909	19.32	58.82	57.44	13.837	54.90	3.417	58.96
11.0	32.008 99	17.83 149	58.94 12	54.37 307	13.903 66	53.47 143	3.467 50	56.90 206
21.0	32.156 148	16.27 156	59.20 26	51.26 311	14.005 102	52.06 141	3.554 87	54.83 207
31.0	32.350 194	14.68 159	59.57 37	48.19 307	14.140 135	50.72 134	3.679 125	52.83 200
b. 9.9	32.583 233	13.09 159	60.07 50	45.22 297	14.307 167	49.54 118	3.837 158	50.98 185
	271	157	59	280	194	98	189	159
19.9	32.854	11.52	60.66	42.42	14.501	48.56	4.026	49.39
r. 1.9	33.158 304	10.00 152	61.36 70	39.87 255	14.721 220	47.85 71	4.244 218	48.12 127
11.9	33.488 330	8.54 146	62.13 77	37.59 228	14.962 241	47.44 41	4.487 243	47.23 89
21.8	33.841 353	7.16 138	62.96 83	35.64 195	15.224 262	47.38 6	4.752 265	46.76 47
31.8	34.213 372	5.89 127	63.83 87	34.05 159	15.501 277	47.67 29	5.034 282	46.75 1
	386	114	90	121	290	64	296	45
r. 10.8	34.599	4.75	64.73	32.84	15.791	48.31	5.330	47.20
20.7	34.994 395	3.75 100	65.66 93	32.04 80	16.088 297	49.28 97	5.636 306	48.10 90
30.7	35.392 398	2.92 83	66.58 92	31.66 38	16.388 300	50.57 129	5.943 307	49.41 131
ay 10.7	35.786 394	2.30 62	67.48 90	31.70 4	16.686 298	52.12 155	6.247 304	51.10 169
20.7	36.170 384	1.88 42	68.35 87	32.17 47	16.974 288	53.87 175	6.541 294	53.11 201
	365	18	81	87	274	190	278	225
30.6	36.535	1.70	69.16	33.04	17.248	55.77	6.819	55.36
ne 9.6	36.871 336	1.75 5	69.88 72	34.32 128	17.500 252	57.78 201	7.073 254	57.80 244
19.6	37.173 302	2.05 30	70.53 65	35.95 163	17.724 224	59.82 204	7.297 224	60.36 256
29.6	37.433 260	2.56 51	71.07 54	37.88 193	17.917 193	61.84 202	7.488 191	62.96 260
ly 9.5	37.644 211	3.30 74	71.49 42	40.08 220	18.071 154	63.80 196	7.639 151	65.54 258
	157	90	28	238	112	185	107	251
19.5	37.801	4.20	71.77	42.46	18.183	65.65	7.746	68.05
29.5	37.901 100	5.25 105	71.92 15	44.95 249	18.252 69	67.34 169	7.808 62	70.42 237
ug. 8.4	37.940 39	6.41 116	71.93 1	47.46 251	18.276 21	68.87 153	7.824 16	72.61 219
18.4	37.920 20	7.61 120	71.78 15	49.92 246	18.257 19	70.20 133	7.796 28	74.59 198
28.4	37.846 74	8.79 118	71.52 26	52.23 231	18.197 60	71.30 110	7.725 71	76.31 172
	125	113	39	206	95	89	108	145
pt. 7.4	37.721	9.92	71.13	54.29	18.102	72.19	7.617	77.76
17.3	37.554 167	10.94 102	70.63 50	56.02 173	17.975 127	72.84 65	7.478 139	78.90 114
27.3	37.355 199	11.79 85	70.05 58	57.35 133	17.826 149	73.28 44	7.315 163	79.73 83
ct. 7.3	37.134 221	12.40 61	69.41 64	58.22 87	17.662 164	73.47 19	7.137 178	80.24 51
17.3	36.906 228	12.77 37	68.74 67	58.57 35	17.494 168	73.45 2	6.953 184	80.40 16
	223	9	66	19	164	26	181	17
27.2	36.683	12.86	68.08	58.38	17.330	73.19	6.772	80.23
ov. 6.2	36.477 206	12.67 19	67.46 62	57.66 72	17.179 151	72.72 47	6.604 168	79.73 50
16.2	36.300 177	12.21 46	66.89 57	56.41 125	17.048 131	72.04 68	6.454 150	78.90 83
26.1	36.160 140	11.48 73	66.41 48	54.67 174	16.945 103	71.16 88	6.332 122	77.75 115
ec. 6.1	36.068 92	10.52 96	66.03 38	52.50 217	16.875 70	70.10 106	6.242 90	76.32 143
	42	117	25	253	34	123	54	168
16.1	36.026	9.35	65.78	49.97	16.841	68.87	6.188	74.64
26.1	36.035 9	8.04 131	65.67 11	47.18 279	16.843 2	67.54 133	6.172 16	72.76 188
36.0	36.098 63	6.61 143	65.69 2	44.20 298	16.883 40	66.13 141	6.195 23	70.74 202
n Place	32.212	14.69	60.707	51.67	14.175	55.08	3.931	57.45
δ, Tan δ	1.348	−0.903	3.446	−3.298	1.006	+0.109	1.059	+0.350
α, $D_m\alpha$	+0.08	+0.03	+0.14	+0.10	+0.06	0.00	+0.05	−0.01
δ, $D_m\delta$	+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.		σ Sagittarii. Mag. 4.6		τ Aquilæ. Mag. 5.6		θ Aquilæ. Mag. 3.4		o Cygni Mag. 4
		Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.
		h m	° ′	h m	° ′	h m	° ′	h m
		19 57	−27 56	20 0	+ 7 2	20 7	− 1 3	20 10
		s	″	s	″	s	″	s
Jan.	1.1	33.222	33.32	4.806	35.65	1.133	67.00	59.832
		83	64	58	143	57	96	19
	11.0	33.305	32.68	4.864	34.22	1.190	67.96	59.813
		123	73	92	142	92	94	35
	21.0	33.428	31.95	4.956	32.80	1.282	68.90	59.848
		160	77	127	135	125	86	89
	31.0	33.588	31.18	5.083	31.45	1.407	69.76	59.937
		192	83	158	119	156	72	143
Feb.	10.0	33.780	30.35	5.241	30.26	1.563	70.48	60.080
		225	90	186	100	183	55	192
	19.9	34.005	29.45	5.427	29.26	1.746	71.03	60.272
Mar.	1.9	34.257	28.50	5.640	28.54	1.956	71.36	60.510
		252	95	213	72	210	33	238
	11.9	34.532	27.49	5.875	28.11	2.189	71.44	60.790
		275	101	235	43	233	8	280
	21.8	34.829	26.43	6.132	28.03	2.443	71.23	61.107
		297	106	257	8	254	21	317
	31.8	35.143	25.34	6.406	28.31	2.715	70.74	61.453
		314	109	274	28	272	49	346
		327	111	287	64	286	78	366
Apr.	10.8	35.470	24.23	6.693	28.95	3.001	69.96	61.819
		337	111	296	97	297	104	379
	20.8	35.807	23.12	6.989	29.92	3.298	68.92	62.198
		342	107	301	130	302	129	384
	30.7	36.149	22.05	7.290	31.22	3.600	67.63	62.582
May	10.7	341	100	299	157	303	148	378
		36.490	21.05	7.589	32.79	3.903	66.15	62.960
	20.7	333	91	291	178	297	164	364
		36.823	20.14	7.880	34.57	4.200	64.51	63.324
		319	78	278	195	285	174	338
	30.7	37.142	19.36	8.158	36.52	4.485	62.77	63.662
June	9.6	297	65	257	205	265	178	305
		37.439	18.71	8.415	38.57	4.750	60.99	63.967
	19.6	268	47	232	210	241	178	265
		37.707	18.24	8.647	40.67	4.991	59.21	64.232
	29.6	235	28	198	210	209	173	218
		37.942	17.96	8.845	42.77	5.200	57.48	64.450
July	9.5	193	10	161	203	172	162	165
		38.135	17.86	9.006	44.80	5.372	55.86	64.615
		147	7	121	193	132	152	108
	19.5	38.282	17.93	9.127	46.73	5.504	54.34	64.723
		98	24	77	179	80	136	50
	29.5	38.380	18.17	9.204	48.52	5.593	52.98	64.773
Aug.	8.5	47	37	32	160	44	117	9
		38.427	18.54	9.236	50.12	5.637	51.81	64.764
	18.4	4	48	12	142	0	100	66
		38.423	19.02	9.224	51.54	5.637	50.81	64.698
	28.4	51	56	53	119	43	81	120
		38.372	19.58	9.171	52.73	5.594	50.00	64.578
		93	59	89	96	80	61	169
Sept.	7.4	38.279	20.17	9.082	53.69	5.514	49.39	64.409
		131	59	122	72	113	43	210
	17.4	38.148	20.76	8.960	54.41	5.401	48.96	64.199
		159	55	145	50	137	24	242
	27.3	37.989	21.31	8.815	54.91	5.264	48.72	63.957
Oct.	7.3	176	47	161	25	154	8	267
		37.813	21.78	8.654	55.16	5.110	48.64	63.690
	17.3	185	36	167	2	161	8	280
		37.628	22.14	8.487	55.18	4.949	48.72	63.410
		182	22	164	21	160	24	282
	27.2	37.446	22.36	8.323	54.97	4.789	48.96	63.128
Nov.	6.2	166	10	154	43	149	37	274
		37.280	22.46	8.169	54.54	4.640	49.33	62.854
	16.2	145	4	134	66	131	51	255
		37.135	22.42	8.035	53.88	4.509	49.84	62.599
	26.2	112	19	107	86	104	65	229
		37.023	22.23	7.928	53.02	4.405	50.49	62.370
Dec.	6.1	76	32	76	104	74	76	193
		36.947	21.91	7.852	51.98	4.331	51.25	62.177
		34	42	43	121	42	85	152
	16.1	36.913	21.49	7.809	50.77	4.289	52.10	62.025
		10	51	6	133	4	92	104
	26.1	36.923	20.98	7.803	49.44	4.285	53.02	61.921
	36.1	53	60	32	141	32	97	53
		36.976	20.38	7.835	48.03	4.317	53.99	61.868
Mean Place		33.406	29.64	5.136	35.37	1.371	66.48	61.132
Sec δ, Tan δ		1.132	−0.530	1.008	+0.124	1.000	−0.019	1.452
$D\psi\,\alpha$, $D_\omega\,\alpha$		+0.07	+0.02	+0.06	0.00	+0.06	0.00	+0.04
$D\psi\,\delta$, $D_\omega\,\delta$		+0.2	−0.9	+0.2	−0.9	+0.2	−0.9	+0.2

FOR THE UPPER TRANSIT AT WASHINGTON.

hington n Time.	κ Cephei. Mag. 4.4		24 Vulpeculæ. Mag. 5.4		α^2 Capricorni. Mag. 3.8		β Capricorni. Mag. 3.2	
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.
	h m 20 11 s	° ′ +77 27 ″	h m 20 13 s	° ′ +24 24 ″	h m 20 13 s	° ′ −12 47 ″	h m 20 16 s	° ′ −15 2 ″
1.1	35.66	51.93	13.439	56.29	26.889	72.49	20.858	41.69
	34	308		221	58	24		12
11.0	35.32	48.85	13.465	54.08	26.947	72.73	20.914	41.81
	18	326	26	226	93	21	56	5
21.0	35.14	45.59	13.530	51.82	27.040	72.94	21.006	41.86
	2	332	65	221	128	12	92	3
31.0	35.16	42.27	13.632	49.61	27.168	73.06	21.132	41.83
	22	326	102	207	159	1	126	13
10.0	35.38	39.01	13.770	47.54	27.327	73.07	21.290	41.70
	40	306	138	184	186	12	158	28
19.9	35.78	35.95	13.943	45.70	27.513	72.95	187 21.477	41.42
1.9	36.36	33.21	14.148	44.19	27.727	72.66	214	41.02
	58	274	205	151	214	29	21.691	40
11.9	37.08	30.89	14.381	43.06	27.964	72.20	237	40.45
	72	232	233	113	237	46	21.928	57
21.8	37.92	29.09	14.641	42.37	28.224	71.55	250	39.70
	84	180	260	69	260	65	22.188	75
31.8	38.86	27.87	14.922	42.15	28.502	70.72	279	38.80
	94	122	281	22	278	83	22.467	90
	101	59	299	28	293	100	296	105
10.8	39.87	27.28	15.221	42.43	28.795	69.72	22.763	37.75
	103	6	310	77	306	116	306	119
20.8	40.90	27.34	15.531	43.20	29.101	68.56	23.069	36.56
	103	69	315	122	312	127	315	127
30.7	41.93	28.03	15.846	44.42	29.413	67.29	23.384	35.29
	98	129	315	164	314	136	316	135
10.7	42.91	29.32	16.161	46.06	29.727	65.93	23.700	33.94
	92	185	306	201	309	141	313	135
20.7	43.83	31.17	16.467	48.07	30.036	64.52	24.013	32.59
	83	236	293	230	298	140	302	136
30.7	44.66	33.53	16.760	50.37	30.334	63.12	24.315	31.23
9.6	45.36	36.30	17.029	52.92	30.615	61.76	24.600	29.95
	70	277	269	235	281	136	285	128
19.6	45.92	39.43	17.271	55.62	30.870	60.48	24.859	28.77
	56	313	242	270	255	128	259	118
29.6	46.34	42.81	17.477	58.41	31.094	59.33	25.089	27.71
	42	338	206	279	224	115	230	106
9.5	46.59	46.37	17.644	61.22	31.283	58.30	25.284	26.79
	25	356	167	281	189	103	195	92
	7	364	122	276	147	87	151	74
19.5	46.66	50.01	17.766	63.98	31.430	57.43	25.435	26.05
	9	365	76	265	102	68	106	57
29.5	46.57	53.66	17.842	66.63	31.532	56.75	25.541	25.48
8.5	46.32	57.22	17.871	69.11	31.588	56.22	25.602	25.08
	25	356	29	248	56	53	61	40
18.4	45.89	60.65	17.854	71.39	31.599	55.86	25.616	24.85
	43	343	17	228	11	36	14	23
28.4	45.33	63.85	17.793	73.41	31.565	55.67	25.584	24.76
	56	320	61	202	34	19	32	9
	70	291	102	173	74	7	71	5
7.4	44.63	66.76	17.691	75.14	31.491	55.60	25.513	24.81
	83	256	135	144	108	4	108	14
17.4	43.80	69.32	17.556	76.58	31.383	55.64	25.405	24.95
	91	215	162	109	135	14	133	23
27.3	42.89	71.47	17.394	77.67	31.248	55.78	25.272	25.18
	100	169	179	73	153	22	153	27
7.3	41.89	73.16	17.215	78.40	31.095	56.00	25.119	25.45
	104	120	189	37	162	26	163	30
17.3	40.85	74.36	17.026	78.77	30.933	56.26	24.956	25.75
	107	67	190	0	161	29	163	31
27.2	39.78	75.03	16.836	78.77	30.772	56.55	24.793	26.06
6.2	38.72	75.14	16.655	78.39	30.621	56.86	24.640	26.36
	106	11	181	38	151	31	153	30
16.2	37.69	74.67	16.491	77.65	30.487	57.18	24.504	26.65
	103	47	164	74	134	32	136	29
26.2	36.72	73.63	16.350	76.54	30.380	57.51	24.395	26.92
	97	104	141	111	107	33	109	27
6.1	35.84	72.05	16.240	75.11	30.304	57.84	24.316	27.17
	88	158	110	143	76	33	79	25
	77	209	76	173	42	33	45	22
16.1	35.07	69.96	16.164	73.38	30.262	58.17	24.271	27.39
	62	254	40	197	5	31	7	19
26.1	34.45	67.42	16.124	71.41	30.257	58.48	24.264	27.58
	47	291	1	216	32	29	31	15
36.1	33.98	64.51	16.123	69.25	30.289	58.77	24.295	27.73
n Place	42.531	43.18	14.008	53.00	27.046	70.54	21.000	39.49
, Tan δ	4.607	+4.497	1.098	+0.454	1.026	−0.227	1.035	−0.269
, D_α	−0.04	−0.16	+0.05	−0.02	+0.07	+0.01	+0.07	+0.01
, D_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.	α Pavonis. Mag. 2.1		γ Cygni. Mag. 2.3		π Capricorni. Mag. 5.2		ρ Capri Mag.
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.
	h m s	° ′ ″	h m s	° ′ ″	h m s	° ′ ″	h m s
	20 19	−56 59	20 19	+39 59	20 22	−18 28	20 24
Jan. 1.1	4.805	74.37	13.961	31.33	34.193	66.92	7.574
	53	232	10	271	51	10	49
11.0	4.858	72.05	13.951	28.62	34.244	66.82	7.623
	120	244	37	281	88	17	86
21.0	4.978	69.61	13.988	25.81	34.332	66.65	7.709
	185	250	84	282	123	27	121
31.0	5.163	67.11	14.072	22.99	34.455	66.38	7.830
	244	251	131	270	155	37	152
Feb. 10.0	5.407	64.60	14.203	20.29	34.610	66.01	7.982
	300	246	174	246	183	48	182
19.9	5.707	62.14	14.377	17.83	34.793	65.53	8.164
Mar. 1.9	6.056 349	59.77 237	14.593 216	15.71 212	35.006 213	64.91 62	8.374 210
11.9	6.449 393	57.54 223	14.846 253	14.01 170	35.243 237	64.15 76	8.609 235
21.9	6.881 432	55.50 204	15.132 286	12.81 120	35.504 261	63.26 89	8.868 259
31.8	7.344 463	53.66 184	15.447 315	12.16 65	35.785 281	62.23 103	9.147 279
	490	159	335	8	298	115	296
Apr. 10.8	7.834	52.07	15.782	12.08	36.083	61.08	9.443
	507	131	350	51	311	124	311
20.8	8.341	50.76	16.132	12.59	36.394	59.84	9.754
	517	101	355	105	320	131	318
30.7	8.858	49.75	16.487	13.64	36.714	58.53	10.072
	519	68	353	158	322	133	322
May 10.7	9.377	49.07	16.840	15.22	37.036	57.20	10.394
	509	33	343	205	320	132	319
20.7	9.886	48.74	17.183	17.27	37.356	55.88	10.713
	489	2	324	246	309	128	309
30.7	10.375	48.76	17.507	19.73	37.665	54.60	11.022
	458	38	296	278	293	118	294
June 9.6	10.833	49.14	17.803	22.51	37.958	53.42	11.316
	416	72	261	301	269	106	269
19.6	11.249	49.86	18.064	25.55	38.227	52.36	11.585
	365	104	220	320	239	92	239
29.6	11.614	50.90	18.284	28.75	38.466	51.44	11.824
	304	132	173	329	202	74	202
July 9.6	11.918	52.22	18.457	32.04	38.668	50.70	12.026
	234	158	123	330	160	57	161
19.5	12.152	53.80	18.580	35.34	38.828	50.13	12.187
	159	176	69	323	115	38	117
29.5	12.311	55.56	18.649	38.57	38.943	49.75	12.304
	80	189	15	309	68	20	69
Aug. 8.5	12.391	57.45	18.664	41.66	39.011	49.55	12.373
	0	195	38	290	20	5	21
18.4	12.391	59.40	18.626	44.56	39.031	49.50	12.394
	76	193	88	263	25	10	24
28.4	12.315	61.33	18.538	47.19	39.006	49.60	12.370
	148	183	134	234	67	22	66
Sept. 7.4	12.167	63.16	18.404	49.53	38.939	49.82	12.304
	210	165	173	198	104	30	102
17.4	11.957	64.81	18.231	51.51	38.835	50.12	12.202
	262	141	204	159	133	35	132
27.3	11.695	66.22	18.027	53.10	38.702	50.47	12.070
	300	108	225	116	153	38	152
Oct. 7.3	11.395	67.30	17.802	54.26	38.549	50.85	11.918
	321	71	239	72	165	37	165
17.3	11.074	68.01	17.563	54.98	38.384	51.22	11.753
	326	30	212	25	165	35	161
27.3	10.748	68.31	17.321	55.23	38.219	51.57	11.589
	314	12	236	23	157	30	157
Nov. 6.2	10.434	68.19	17.085	55.00	38.062	51.87	11.432
	287	56	219	71	140	24	140
16.2	10.147	67.63	16.866	54.29	37.922	52.11	11.292
	245	96	196	117	114	20	115
26.2	9.902	66.67	16.670	53.12	37.808	52.31	11.177
	194	136	164	162	84	13	85
Dec. 6.1	9.708	65.31	16.506	51.50	37.724	52.44	11.092
	131	170	127	202	51	8	51
16.1	9.577	63.61	16.379	49.48	37.673	52.52	11.041
	66	197	85	234	12	1	14
26.1	9.511	61.64	16.294	47.14	37.661	52.53	11.027
	5	221	41	261	25	5	24
36.1	9.516	59.43	16.253	44.53	37.686	52.48	11.051
Mean Place	5.338	67.87	14.948	25.47	34.314	64.20	7.690
Sec δ, Tan δ	1.836	−1.540	1.305	+0.839	1.054	−0.334	1.052
$D_\psi\, \alpha$, $D_\omega\, \alpha$	+0.09	+0.06	+0.04	−0.03	+0.07	+0.01	+0.07
$D_\psi\, \delta$, $D_\omega\, \delta$	+0.2	−0.8	+0.2	−0.8	+0.2	−0.8	+0.2

FOR THE UPPER TRANSIT AT WASHINGTON.

ington a Time.	41 Cygni. Mag. 4.1		θ Cephei. Mag. 4.3		ε Delphini. Mag. 4.0		Groombridge 3241. Mag. 6.4	
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.
	h m s 20 25	° ′ ″ +30 5	h m s 20 28	° ′ ″ +62 42	h m s 20 29	′ ″ +11 1	h m s 20 30	° ′ ″ +72 14
h. 1.1	59.639	32.45	9.00	62.60	14.572	15.52	18.15	72.41
	11.0 59.644 5	30.09 236	8.87 13	59.57 303	14.599 27	13.99 153	17.89 26	69.42 299
	21.0 59.687 43	27.65 244	8.82 5	56.36 321	14.660 61	12.13 186	17.74 15	66.21 321
	31.0 59.772 85	25.22 243	8.85 — 3	53.08 328	14.754 94	10.93 120	17.73 1	62.90 331
b.	10.0 59.896 124	22.91 231	8.97 12	49.86 322	14.882 128	9.56 137	17.86 13	59.62 328
	162	209	21	303	158	117	26	312
	19.9 60.058	20.82	9.18	46.83	15.040	8.39	18.12	56.50
r.	1.9 60.255 197	19.04 178	9.47 29	44.11 272	15.227 187	7.47 92	18.50 38	53.65 285
	11.9 60.484 229	17.66 138	9.82 35	41.81 230	15.442 215	6.87 60	18.99 49	51.21 244
	21.9 60.744 260	16.73 93	10.24 42	40.01 180	15.681 239	6.63 24	19.57 58	49.26 195
	31.8 61.027 283	16.29 44	10.71 47	38.79 122	15.943 262	6.77 — 14	20.23 66	47.89 137
	305	— 8	50	60	279	52	72	77
r.	10.8 61.332	16.37	11.21	38.19	16.222	7.29	20.95	47.12
	20.8 61.650 318	16.98 61	11.73 52	38.25 6	16.516 294	8.19 90	21.70 75	46.99 — 13
	30.7 61.977 327	18.09 111	12.26 53	38.93 68	16.819 303	9.45 126	22.46 76	47.52 53
y	10.7 62.304 327	19.66 157	12.79 53	40.22 129	17.125 306	11.02 157	23.21 75	48.65 113
	20.7 62.625 321	21.64 198	13.30 51	42.08 186	17.426 301	12.84 182	23.92 71	50.36 171
	306	233	47	235	293	205	65	223
	30.7 62.931	23.97	13.77	44.43	17.719	14.89	24.57	52.59
ne	9.6 63.216 285	26.59 262	14.19 42	47.22 279	17.994 275	17.08 219	25.15 58	55.28 269
	19.6 63.471 255	29.41 282	14.54 35	50.37 315	18.244 250	19.35 227	25.64 49	58.34 306
	29.6 63.690 219	32.36 295	14.84 30	53.77 340	18.465 221	21.66 231	26.02 38	61.69 335
ly	9.6 63.869 179	35.36 300	15.05 21	57.36 359	18.651 186	23.93 227	26.28 26	65.25 356
	134	300	14	367	145	218	16	368
	19.5 64.003	38.36	15.19	61.03	18.796	26.11	26.44	68.93
	29.5 64.089 86	41.27 291	15.24 5	64.71 368	18.897 101	28.16 205	26.46 2	72.64 371
ig.	8.5 64.126 37	44.04 277	15.21 — 3	68.32 361	18.954 57	30.06 190	26.37 — 9	76.31 367
	18.4 64.115 — 11	46.60 256	15.10 11	71.77 345	18.966 12	31.75 169	26.16 21	79.84 353
	28.4 64.057 58	48.92 232	14.90 20	75.01 324	18.935 31	33.22 147	25.84 32	83.18 334
	101	203	27	291	71	122	43	307
pt.	7.4 63.956	50.95	14.63	77.95	18.864	34.44	25.41	86.25
	17.4 63.821 135	52.65 170	14.31 32	80.54 259	18.759 105	35.42 98	24.89 52	88.98 273
	27.3 63.656 165	54.01 136	13.94 37	82.73 219	18.628 131	36.13 71	24.29 60	91.35 237
ct.	7.3 63.469 187	54.99 98	13.52 42	84.46 173	18.477 151	36.59 46	23.64 65	93.25 190
	17.3 63.271 198	55.57 58	13.08 44	85.70 124	18.316 161	36.78 19	22.94 70	94.65 140
	202	17	46	70	161	7	72	88
	27.3 63.069	55.74	12.62	86.40	18.152	36.71	22.22	95.53
ov.	6.2 62.872 197	55.49 25	12.17 45	86.55 — 15	17.994 158	36.37 34	21.50 72	95.85 — 32
	16.2 62.690 182	54.83 66	11.73 44	86.14 41	17.850 144	35.79 58	20.79 71	95.59 26
	26.2 62.531 159	53.77 106	11.32 41	85.14 100	17.728 122	34.96 83	20.11 68	94.75 84
ec.	6.1 62.400 131	52.34 143	10.95 37	83.61 153	17.632 96	33.91 105	19.49 62	93.34 141
	100	178	32	203	66	125	53	193
	16.1 62.300	50.56	10.63	81.58	17.566	32.66	18.96	91.41
	26.1 62.238 62	48.49 207	10.38 25	79.09 249	17.534 — 32	31.27 139	18.51 45	89.01 240
	36.1 62.215 23	46.21 228	10.21 17	76.25 284	17.536 2	29.77 150	18.17 34	86.22 279
n Place	60.298	27.48	11.516	53.24	14.877	13.40	22.523	62.00
δ, Tan δ	1.156	+0.579	2.181	+1.939	1.019	+0.195	3.280	+3.124
; $D_m\alpha$	+0.05	−0.02	+0.02	−0.08	+0.06	−0.01	0.00	−0.13
′, $D_m\delta$	+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		υ Capricorni. Mag. 5.3		α Delph Mag. 3
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.
	h m s	° ′ ″	h m s	° ′ ″	h m s	° ′ ″	h m s
	20 31	−47 34	20 33	+14 18	20 35	−18 25	20 35
Jan. 1.1	43.698	61.44	39.118	23.33	19.518	56.01	46.640
	39	181	20	169	39	10	17
11.1	43.737	59.63	39.138	21.64	19.557	55.91	46.657
	91	195	54	171	74	21	50
21.0	43.828	57.68	39.192	19.93	19.631	55.70	46.707
	143	204	88	165	109	29	85
31.0	43.971	55.64	39.280	18.28	19.740	55.41	46.792
	190	212	122	155	140	40	119
Feb. 10.0	44.161	53.52	39.402	16.73	19.880	55.01	46.911
	233	212	153	135	171	53	151
19.9	44.394	51.40	39.555	15.38	20.051	54.48	47.062
	274	209	183	107	200	67	181
Mar. 1.9	44.668	49.31	39.738	14.31	20.251	53.81	47.243
	311	204	212	75	226	81	211
11.9	44.979	47.27	39.950	13.56	20.477	53.00	47.454
	344	195	237	38	252	96	236
21.9	45.323	45.32	40.187	13.18	20.729	52.04	47.690
	372	183	262	—	272	110	261
31.8	45.695	43.49	40.449	13.19	21.001	50.94	47.951
	397	167	280	1	292	122	280
				44			
Apr. 10.8	46.092	41.82	40.729	13.63	21.293	49.72	48.231
	415	148	296	84	309	131	295
20.8	46.507	40.34	41.025	14.47	21.602	48.41	48.526
	427	125	304	122	318	138	306
30.8	46.934	39.09	41.329	15.69	21.920	47.03	48.832
	432	101	308	157	323	141	310
May 10.7	47.366	38.08	41.637	17.26	22.243	45.62	49.142
	428	72	305	185	323	140	306
20.7	47.794	37.36	41.942	19.11	22.566	44.22	49.448
	416	44	295	210	315	134	296
30.7	48.210	36.92	42.237	21.21	22.881	42.88	49.744
	394	12	278	226	299	126	280
June 9.6	48.604	36.80	42.515	23.47	23.180	41.62	50.024
	363	19	254	239	278	112	256
19.6	48.967	36.99	42.769	25.86	23.458	40.50	50.280
	322	49	225	243	247	98	225
29.6	49.289	37.48	42.994	28.29	23.705	39.52	50.505
	274	79	188	242	212	80	190
July 9.6	49.563	38.27	43.182	30.71	23.917	38.72	50.695
	219	103	147	235	172	60	149
19.5	49.782	39.30	43.329	33.06	24.089	38.12	50.844
	158	126	104	223	127	43	105
29.5	49.940	40.56	43.433	35.29	24.216	37.69	50.949
	92	143	59	206	80	22	60
Aug. 8.5	50.032	41.99	43.492	37.35	24.296	37.47	51.009
	28	152	14	188	32	6	15
18.5	50.060	43.51	43.506	39.23	24.328	37.41	51.024
	36	157	30	164	15	9	29
28.4	50.024	45.08	43.476	40.87	24.313	37.50	50.995
	97	155	70	140	57	24	69
Sept. 7.4	49.927	46.63	43.406	42.27	24.256	37.74	50.926
	149	146	103	113	94	32	104
17.4	49.778	48.09	43.303	43.40	24.162	38.06	50.822
	192	129	131	86	126	38	132
27.3	49.586	49.38	43.172	44.26	24.036	38.44	50.690
	225	107	152	56	147	41	152
Oct. 7.3	49.361	50.45	43.020	44.82	23.889	38.85	50.538
	244	79	165	27	160	42	166
17.3	49.117	51.24	42.855	45.09	23.729	39.27	50.372
	251	47	166	0	163	40	168
27.3	48.866	51.71	42.689	45.09	23.566	39.67	50.204
	244	12	161	30	158	35	162
Nov. 6.2	48.622	51.83	42.528	44.79	23.408	40.02	50.042
	223	23	148	59	143	29	150
16.2	48.399	51.60	42.380	44.20	23.265	40.31	49.892
	193	58	127	85	120	22	131
26.2	48.206	51.02	42.253	43.35	23.145	40.53	49.761
	151	90	103	110	91	17	105
Dec. 6.2	48.055	50.12	42.150	42.25	23.054	40.70	49.656
	104	122	72	132	58	9	75
16.1	47.951	48.90	42.078	40.93	22.996	40.79	49.581
	53	147	39	151	23	3	43
26.1	47.898	47.43	42.039	39.42	22.973	40.82	49.538
	1	169	6	163	11	5	8
36.1	47.899	45.74	42.033	37.79	22.984	40.77	49.530
Mean Place	43.960	55.24	39.453	20.44	19.605	53.45	46.988
Sec δ, Tan δ	1.482	−1.094	1.032	+0.255	1.054	−0.333	1.038
$D_\psi a$, $D_\omega a$	+0.08	+0.04	+0.06	−0.01	+0.07	+0.01	+0.06
$D_\psi \delta$. $D_\omega \delta$	+0.2	−0.8	+0.2	−0.8	+0.2	−0.8	+0.3

FOR THE UPPER TRANSIT AT WASHINGTON.

ington Time.	β Pavonis. Mag. 3.6		α Cygni. (*Deneb.*) Mag. 1.3		δ Delphini. Mag. 4.5		ψ Capricorni. Mag. 4.3	
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.
	h m	° ′	h m	° ′	h m	° ′	h m	° ′
	20 37	−66 29	20 38	+44 58	20 39	+14 46	20 41	−25 33
	s	″	s	″	s	″	s	″
1.1	28.78	77.64	35.010	67.56	34.722	36.81	10.984	74.82
11.1	28.77 1	74.90 274	34.963 47	64.84 272	34.736 14	35.16 168	11.018 34	74.29 53
21.0	28.85 8	71.99 291	34.966 3	61.97 287	34.783 47	33.45 171	11.090 72	73.65 64
31.0	29.02 17	69.00 299	35.020 54	59.05 292	34.865 82	31.78 167	11.197 107	72.89 76
10.0	29.28 26	65.99 301	35.124 104	56.20 285	34.981 116	30.22 156	11.338 141	72.04 85
	34	297	155	285	147	136	173	97
19.9	29.62	63.02	35.279	53.55	35.128	28.86	11.511	71.07
1.9	30.04 42	60.17 285	35.482 203	51.18 237	35.306 178	27.76 110	11.715 204	70.00 107
11.9	30.52 48	57.50 267	35.729 247	49.23 195	35.513 207	26.99 77	11.947 232	68.82 118
21.9	31.06 54	55.04 246	36.016 287	47.76 147	35.746 233	26.59 40	12.205 258	67.55 127
31.8	31.64 58	52.85 219	36.336 320	46.84 92	36.004 258	26.57 2	12.487 282	66.21 134
	62	189	349	35	277	40	303	141
10.8	32.26	50.96	36.685	46.49	36.281	26.97	12.790	64.80
20.8	32.92 66	49.42 154	37.052 367	46.73 24	36.574 293	27.78 81	13.109 319	63.39 141
30.8	33.59 67	48.26 116	37.430 378	47.55 82	36.879 305	28.98 120	13.440 331	61.97 142
10.7	34.27 68	47.49 77	37.809 379	48.93 138	37.187 308	30.52 154	13.777 337	60.59 138
20.7	34.94 67	47.14 35	38.181 372	50.82 189	37.492 305	32.37 185	14.114 337	59.30 129
	65	8	353	234	298	209	331	117
30.7	35.59	47.22	38.534	53.16	37.790	34.46	14.445	58.13
e 9.6	36.20 61	47.70 48	38.862 328	55.88 272	38.072 282	36.74 228	14.760 315	57.09 104
19.6	36.76 56	48.59 89	39.153 291	58.90 302	38.329 257	39.12 238	15.053 293	56.24 85
29.6	37.26 50	49.87 128	39.402 249	62.13 323	38.559 230	41.58 246	15.317 264	55.60 64
y 9.6	37.66 40	51.48 161	39.603 201	65.50 337	38.751 192	44.03 245	15.544 227	55.16 44
	33	190	147	343	153	237	186	22
19.5	37.99	53.38	39.750	68.93	38.904	46.40	15.730	54.94
29.5	38.22 23	55.51 213	39.839 89	72.34 341	39.014 110	48.67 227	15.869 139	54.93 1
g. 8.5	38.35 13	57.78 227	39.872 33	75.65 331	39.078 64	50.77 210	15.958 89	55.12 19
18.5	38.36 1	60.13 235	39.849 23	78.78 313	39.097 19	52.69 192	15.998 40	55.47 35
28.4	38.27 9	62.46 233	39.770 79	81.70 292	39.072 25	54.37 168	15.989 9	55.97 50
	18	222	129	262	65	145	56	59
pt. 7.4	38.09	64.68	39.641	84.32	39.007	55.82	15.933	56.56
17.4	37.82 27	66.70 202	39.469 172	86.60 228	38.908 99	56.98 116	15.839 94	57.21 65
27.3	37.47 35	68.44 174	39.260 209	88.51 191	38.779 129	57.88 90	15.710 129	57.87 66
t. 7.3	37.06 41	69.82 138	39.024 236	89.99 148	38.630 149	58.48 60	15.558 152	58.51 64
17.3	36.61 45	70.77 95	38.770 254	91.02 103	38.467 163	58.79 31	15.388 170	59.08 57
	47	48	262	54	166	3	173	49
27.3	36.14	71.25	38.508	91.56	38.301	58.82	15.215	59.57
v. 6.2	35.68 46	71.21 4	38.249 259	91.60 4	38.140 161	58.55 27	15.048 167	59.94 37
16.2	35.24 44	70.66 55	38.000 249	91.14 46	37.990 150	57.99 56	14.894 154	60.15 21
26.2	34.85 39	69.61 105	37.772 228	90.17 97	37.859 131	57.16 83	14.763 131	60.24 9
c. 6.2	34.52 33	68.10 151	37.573 199	88.72 145	37.754 105	56.08 108	14.661 102	60.19 5
	25	194	164	188	76	131	67	21
16.1	34.27	66.16	37.409	86.84	37.678	54.77	14.594	59.98
26.1	34.11 16	63.87 229	37.285 124	84.57 227	37.633 45	53.28 149	14.562 32	59.66 32
36.1	34.03 8	61.28 259	37.207 78	81.98 259	37.623 10	51.65 163	14.569 7	59.21 45
. Place	29.681	69.90	36.119	59.39	35.044	33.59	11.051	71.19
, Tan δ	2.508	−2.300	1.414	+1.000	1.034	+0.264	1.109	−0.478
D. α	+0.11	+0.10	+0.04	−0.04	+0.06	−0.01	+0.07	+0.02
D. 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 *seq.* Mag. 4.5		ε Cygni. Mag. 2.6		ε Aquarii. Mag. 3.8		η Cap Mag.
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.
	h m s	° ′ ″	h m s	° ′ ″	h m s	° ′ ″	h m s
	20 42	+15 49	20 42	+33 39	20 43	− 9 47	20 43
Jan. 1.1	48.119	31.79	50.479	38.22	10.963	62.21	33.96
	10	172	19	238	29	39	14
11.1	48.129	30.07	50.460	35.84	10.992	62.60	33.82
	43	176	— 22	251	62	32	7
21.0	48.172	28.31	50.482	33.33	11.054	62.92	33.75
	78	172	63	252	93	23	— 1
31.0	48.250	26.59	50.545	30.81	11.147	63.15	33.76
	112	160	105	244	126	11	9
Feb. 10.0	48.362	24.99	50.650	28.37	11.273	63.26	33.85
	143	143	145	225	156	— 4	17
19.9	48.505	23.56	50.795	26.12	11.429	63.22	34.02
	176	115	183	195	183	23	24
Mar. 1.9	48.681	22.41	50.978	24.17	11.612	62.99	34.26
	205	83	220	157	211	41	33
11.9	48.886	21.58	51.198	22.60	11.823	62.58	34.59
	231	47	254	113	235	64	38
21.9	49.117	21.11	51.452	21.47	12.058	61.94	34.97
	257	5	282	63	259	84	44
31.8	49.374	21.06	51.734	20.84	12.317	61.10	35.41
	277	36	307	10	278	105	48
Apr. 10.8	49.651	21.42	52.041	20.74	12.595	60.05	35.89
	293	78	325	44	294	124	50
20.8	49.944	22.20	52.366	21.18	12.889	58.81	36.39
	305	118	336	97	307	139	52
30.8	50.249	23.38	52.702	22.15	13.196	57.42	36.91
	310	153	340	145	312	150	53
May 10.7	50.559	24.91	53.042	23.60	13.508	55.92	37.43
	308	183	336	190	313	158	50
20.7	50.867	26.74	53.378	25.50	13.821	54.34	37.93
	298	210	324	229	305	161	47
30.7	51.165	28.84	53.702	27.79	14.126	52.73	38.40
	284	229	302	261	292	159	43
June 9.6	51.449	31.13	54.004	30.40	14.418	51.14	38.83
	260	242	275	284	271	153	38
19.6	51.709	33.55	54.279	33.24	14.689	49.61	39.21
	232	248	239	303	243	142	31
29.6	51.941	36.03	54.518	36.27	14.932	48.19	39.52
	195	248	198	311	210	129	24
July 9.6	52.136	38.51	54.716	39.38	15.142	46.90	39.76
	155	243	153	313	170	112	17
19.5	52.291	40.94	54.869	42.51	15.312	45.78	39.93
	112	233	104	307	128	94	9
29.5	52.403	43.27	54.973	45.58	15.440	44.84	40.02
	67	217	53	296	82	75	0
Aug. 8.5	52.470	45.44	55.026	48.54	15.522	44.09	40.02
	22	197	— 3	279	37	57	7
18.5	52.492	47.41	55.029	51.33	15.559	43.52	39.95
	— 22	174	— 46	255	— 8	38	16
28.4	52.470	49.15	54.983	53.88	15.551	43.14	39.79
	63	150	90	228	49	21	22
Sept. 7.4	52.407	50.65	54.893	56.16	15.502	42.93	39.57
	98	122	129	195	86	6	28
17.4	52.309	51.87	54.764	58.11	15.416	42.87	39.29
	128	94	161	160	116	— 7	33
27.3	52.181	52.81	54.603	59.71	15.300	42.94	38.96
	149	65	185	122	137	17	38
Oct. 7.3	52.032	53.46	54.418	60.93	15.163	43.11	38.58
	163	35	201	81	151	27	41
17.3	51.869	53.81	54.217	61.74	15.012	43.38	38.17
	167	5	207	39	155	32	42
27.3	51.702	53.86	54.010	62.13	14.857	43.70	37.75
	162	25	204	5	150	38	43
Nov. 6.2	51.540	53.61	53.806	62.08	14.707	44.08	37.32
	151	54	194	48	138	41	42
16.2	51.389	53.07	53.612	61.60	14.569	44.49	36.90
	133	83	175	92	117	43	39
26.2	51.256	52.24	53.437	60.68	14.452	44.92	36.51
	108	110	150	133	93	45	36
Dec. 6.2	51.148	51.14	53.287	59.35	14.359	45.37	36.15
	80	132	118	170	61	46	31
16.1	51.068	49.82	53.169	57.65	14.298	45.83	35.84
	49	152	84	203	29	45	26
26.1	51.019	48.30	53.085	55.62	14.269	46.28	35.58
	14	167	46	228	3	42	19
36.1	51.005	46.63	53.039	53.34	14.272	46.70	35.39
Mean Place	48.447	28.19	51.169	31.48	11.054	61.17	36.226
Sec δ, Tan δ	1.039	+0.283	1.201	+0.666	1.015	−0.173	2.097
$D_\psi a$, $D_\omega a$	+0.06	−0.01	+0.05	−0.03	+0.06	+0.01	+0.02
$D_\psi \delta$, $D_\omega \delta$	+0.3	−0.8	+0.3	−0.8	+0.3	−0.8	+0.3

FOR THE UPPER TRANSIT AT WASHINGTON.

	μ Aquarii. Mag. 4.8		β Indi. Mag. 3.7		32 Vulpeculæ. Mag. 5.2		220 H^{1}. Draconis. Mag. 5.6	
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.
	h m	° ′	h m	° ′	h m	° ′	h m	° ′
	20 48	− 9 17	20 48	−58 45	20 51	+27 44	20 51	+80 14
	s	″	s	″	s	″	s	″
1.1	10.627	45.05	19.513	72.65	0.827	35.18	15.39	43.46
	25	41	6	235	16	217	67	273
11.1	10.652	45.46	19.507	70.30	0.811	33.01	14.72	40.73
	57	34	62	251	22	225	45	303
21.0	10.709	45.80	19.569	67.76	0.833	30.76	14.27	37.70
	88	24	129	266	60	227	21	321
31.0	10.797	46.04	19.698	65.10	0.893	28.49	14.06	34.49
	121	13	195	273	96	218	3	325
10.0	10.918	46.17	19.893	62.37	0.989	26.31	14.09	31.24
	151	2	254	272	131	200	29	319
20.0	11.069	46.15	20.147	59.65	1.123	24.31	14.38	28.05
	178	22	311	268	171	172	52	290
1.9	11.247	45.93	20.458	56.97	1.294	22.59	14.90	25.09
	207	10	362	256	205	138	74	267
11.9	11.454	45.53	20.820	54.41	1.499	21.21	15.64	22.42
	231	63	408	241	236	96	92	221
21.9	11.685	44.90	21.228	52.00	1.735	20.25	16.56	20.21
	255	84	449	222	266	49	108	171
31.8	11.940	44.06	21.677	49.78	2.001	19.76	17.64	18.50
	275	105	483	197	289	2	121	113
10.8	12.215	43.01	22.160	47.81	2.290	19.78	18.85	17.37
	292	124	510	171	309	50	128	49
20.8	12.507	41.77	22.670	46.10	2.599	20.28	20.13	16.88
	305	140	528	139	321	99	130	9
30.8	12.812	40.37	23.198	44.71	2.920	21.27	21.43	16.97
	311	152	537	103	326	113	130	75
10.7	13.123	38.85	23.735	43.68	3.246	22.70	22.73	17.72
	312	161	536	67	325	185	124	135
20.7	13.435	37.24	24.271	43.01	3.571	24.55	23.97	19.07
	306	163	523	29	316	221	115	188
30.7	13.741	35.61	24.794	42.72	3.887	26.76	25.12	20.95
	294	162	498	10	298	249	103	237
9.7	14.035	33.99	25.292	42.82	4.185	29.25	26.15	23.32
	274	157	461	48	274	270	88	278
19.6	14.309	32.42	25.753	43.30	4.459	31.95	27.03	26.10
	246	147	414	86	241	284	69	313
29.6	14.555	30.95	26.167	44.16	4.700	34.79	27.72	29.23
	212	133	355	120	203	292	51	340
9.6	14.767	29.62	26.522	45.36	4.903	37.71	28.23	32.63
	175	116	286	149	161	292	30	358
19.5	14.942	28.46	26.808	46.85	5.064	40.63	28.53	36.21
	132	99	212	176	115	286	10	368
29.5	15.074	27.47	27.020	48.61	5.179	43.49	28.63	39.89
	87	80	129	193	66	274	12	372
8.5	15.161	26.67	27.149	50.54	5.245	46.23	28.51	43.61
	42	60	46	205	19	255	33	363
18.5	15.203	26.07	27.195	52.59	5.264	48.78	28.18	47.24
	2	42	36	210	28	234	52	349
28.4	15.201	25.65	27.159	54.69	5.236	51.12	27.66	50.73
	45	23	113	204	71	207	72	328
7.4	15.156	25.42	27.046	56.73	5.165	53.19	26.94	54.01
	82	8	186	191	109	177	87	303
17.4	15.074	25.34	26.860	58.64	5.056	54.96	26.07	57.04
	113	5	246	169	140	144	103	267
27.4	14.961	25.39	26.614	60.33	4.916	56.40	25.04	59.71
	134	16	294	141	165	109	116	225
7.3	14.827	25.55	26.320	61.74	4.751	57.49	23.88	61.99
	148	27	325	104	180	71	124	183
17.3	14.679	25.82	25.995	62.78	4.571	58.20	22.64	63.82
	154	33	341	64	187	33	131	132
27.3	14.525	26.15	25.654	63.42	4.384	58.53	21.33	65.14
	150	38	339	18	185	6	135	75
6.2	14.375	26.53	25.315	63.60	4.199	58.47	19.98	65.89
	138	42	321	26	176	45	134	20
16.2	14.237	26.95	24.994	63.34	4.023	58.02	18.64	66.09
	119	46	288	72	158	84	131	40
26.2	14.118	27.41	24.706	62.62	3.865	57.18	17.33	65.69
	95	47	242	116	137	121	124	97
6.2	14.023	27.88	24.464	61.46	3.728	55.97	16.09	64.72
	65	17	185	155	107	155	111	153
16.1	13.958	28.35	24.279	59.91	3.621	54.42	14.98	63.19
	33	46	123	190	75	183	98	205
26.1	13.925	28.81	24.156	58.01	3.546	52.59	14.00	61.14
	1	44	56	220	41	207	79	252
36.1	13.924	29.25	24.100	55.81	3.505	50.52	13.21	58.62
n Place	10.706	44.18	19.977	64.98	1.338	28.91	23.721	30.34
δ, Tan δ	1.013	−0.164	1.929	−1.649	1.130	+0.526	5.902	+5.817
, D$_{m}$ α	+0.06	+0.01	+0.09	+0.07	+0.05	−0.02	−0.05	−0.26
, D$_{m}$ 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.	ν Cygni. Mag. 4.0		α Octantis. Mag. 5.2		γ Microscopii. Mag. 4.7		θ Capricorni. Mag. 4.2	
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.
	h m s	° ′ ″	h m s	° ′ ″	h m s	° ′ ″	h m s	° ′ ″
	20 54	+40 50	20 54	−77 20	20 56	−32 34	21 1	−17
Jan. 1.1	3.822 51	57.96 254	40.26 18	40.25 310	12.222 17	63.38 93	16.993 16	50.79
11.1	3.771 5	55.42 269	40.08 1	37.15 331	12.239 55	62.45 108	17.007 46	50.72
21.0	3.766 40	52.73 275	40.07 17	33.84 341	12.294 93	61.37 123	17.053 81	50.55
31.0	3.806 87	49.98 270	40.24 32	30.43 345	12.387 132	60.14 134	17.134 113	50.25
Feb. 10.0	3.893 133	47.28 253	40.56 48	26.98 340	12.519 166	58.80 144	17.247 143	49.83
20.0	4.026	44.75	41.04	23.58	12.685	57.36	17.390	49.26
Mar. 1.9	4.204 178	42.49 226	41.67 63	20.32 326	12.885 200	55.84 152	17.563 173	48.64
11.9	4.424 220	40.59 190	42.42 75	17.26 306	13.116 231	54.24 160	17.766 203	47.97
21.9	4.684 260	39.14 145	43.29 87	14.46 280	13.377 261	52.59 165	17.995 229	47.04
31.9	4.979 295	38.22 92	44.25 96	11.97 249	13.664 287	50.93 166	18.250 255	45.44
	323	38	105	213	312	166	277	
Apr. 10.8	5.302	37.84	45.30	9.84	13.976	49.27	18.527	44.12
20.8	5.647 345	38.03 19	46.40 110	8.11 173	14.308 332	47.66 161	18.824 297	42.66
30.8	6.005 358	38.78 75	47.54 114	6.83 128	14.656 348	46.11 155	19.136 312	41.18
May 10.7	6.369 364	40.07 129	48.70 116	6.00 83	15.012 356	44.67 144	19.457 321	39.69
20.7	6.730 361 348	41.86 179 222	49.84 114 112	5.65 35 13	15.370 358 353	43.38 129 110	19.781 324 320	38.09
30.7	7.078	44.08	50.96	5.78	15.723	42.28	20.101	36.57
June 9.7	7.405 327	46.68 260	52.02 106	6.39 61	16.064 341	41.38 90	20.410 309	35.14
19.6	7.701 296	49.57 289	52.98 96	7.45 106	16.384 320	40.72 66	20.701 291	33.84
29.6	7.960 259	52.69 312	53.84 86	8.94 149	16.674 290	40.31 41	20.965 264	32.71
July 9.6	8.175 215 166	55.95 326 312	54.57 73 58	10.82 188 220	16.926 252 210	40.16 15 10	21.198 233 194	31.75
19.5	8.341	59.27	55.15	13.02	17.136	40.26	21.392	31.01
29.5	8.455 114	62.58 331	55.56 41	15.47 245	17.298 162	40.61 35	21.543 151	30.46
Aug. 8.5	8.514 59	65.80 322	55.79 23	18.10 263	17.408 110	41.18 57	21.647 104	30.12
18.5	8.520 6	68.87 307	55.83 4	20.82 272	17.465 57	41.93 75	21.704 57	30.00
28.4	8.473 −47	71.73 286	55.70 13	23.51 269	17.470 5	42.80 87	21.715 11	30.04
	96	259	32	258	45	96	33	
Sept. 7.4	8.377	74.32	55.38	26.09	17.425	43.76	21.682	30.25
17.4	8.238 139	76.59 227	54.88 50	28.47 238	17.334 91	44.76 100	21.608 74	30.57
27.4	8.063 175	78.52 193	54.25 63	30.52 205	17.206 128	45.75 99	21.501 107	30.99
Oct. 7.3	7.860 203	80.03 151	53.50 75	32.17 165	17.048 158	46.66 91	21.370 131	31.46
17.3	7.638 222	81.11 108	52.66 84	33.34 117	16.872 176	47.45 79	21.222 148	31.95
	233	63	90	61	185	62	157	
27.3	7.405	81.74	51.76	33.98	16.687	48.07	21.065	32.43
Nov. 6.2	7.172 233	81.90 16	50.86 90	34.07 −9	16.504 183	48.51 44	20.909 156	32.88
16.2	6.948 224	81.57 −33	49.98 88	33.54 53	16.334 170	48.73 22	20.764 145	33.28
26.2	6.741 207	80.76 81	49.16 82	32.44 110	16.183 151	48.73 0	20.637 127	33.61
Dec. 6.2	6.556 185 151	79.49 127 170	48.43 73 60	30.79 165 215	16.061 122 89	48.51 22 43	20.533 104 75	33.86
16.1	6.402	77.79	47.83	28.64	15.972	48.08	20.458	34.04
26.1	6.285 117	75.71 208	47.39 44	26.07 257	15.920 52	47.43 65	20.414 44	34.13
36.1	6.207 78	73.33 238	47.09 30	23.15 292	15.907 13	46.63 80	20.403 11	34.13
Mean Place	4.689	49.17	42.416	31.45	12.259	58.56	17.001	48.54
Sec δ, Tan δ	1.322	+0.865	4.563	−4.452	1.187	−0.639	1.049	−0.31
$D_\psi\,\alpha$, $D_\omega\,\alpha$	+0.04	−0.04	+0.15	+0.20	+0.07	+0.03	+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

hington Time.	ξ Cygni. Mag. 3.9		61 Cygni *pr.* Mag. 5.6		ν Aquarii. Mag. 4.5		Bradley 2777. Mag. 5.9	
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.
	h m	° ′	h m	° ′	h m	° ′	h m	° ′
	21 1	+43 35	21 3	+38 20	21 5	+11 42	21 7	+7 47
	s	″	s	″	s	″	s	″
. 1.1	53.744	56.51	9.717	34.95	4.434	31.09	5.06	38.68
	66	253	38	232	10	24	57	262
11.1	53.678	53.98	9.679	32.63	4.444	31.33	4.49	36.06
	22	272	4	249	41	18	40	296
21.0	53.656	51.26	9.683	30.14	4.485	31.51	4.09	33.10
	27	280	46	255	73	7	21	317
31.0	53.683	48.46	9.729	27.59	4.558	31.58	3.88	29.93
	75	277	91	250	105	6	3	326
). 10.0	53.758	45.69	9.820	25.09	4.663	31.52	3.85	26.67
	124	263	135	235	134	23	18	322
20.0	53.882	43.06	9.955	22.74	4.797	31.29	4.03	23.45
	172	238	178	207	164	38	37	304
r. 1.9	54.054	40.68	10.133	20.67	4.961	30.91	4.40	20.41
	217	202	220	172	193	58	54	275
11.9	54.271	38.66	10.353	18.95	5.154	30.33	4.94	17.66
	261	157	258	129	220	79	71	235
21.9	54.532	37.09	10.611	17.66	5.374	29 54	5.65	15.31
	298	107	291	78	245	98	84	184
31.9	54.830	36.02	10.902	16.88	5.619	28.56	6.49	13.47
	328	52	322	25	270	118	95	129
r. 10.8	55.158	35.50	11.224	16.63	5.889	27.38	7.44	12.18
	354	7	343	30	288	134	102	68
20.8	55.512	35.57	11.567	16.93	6.177	26.04	8.46	11.50
	369	63	359	85	304	149	106	4
30.8	55.881	36.20	11.926	17.78	6.481	24.55	9.52	11.46
	376	118	365	138	313	158	106	57
y 10.7	56.257	37.38	12.291	19.16	6.794	22.97	10.58	12.03
	374	170	364	186	318	165	104	118
20.7	56.631	39.08	12.655	21.02	7.112	21.32	11.62	13.21
	303	216	352	229	314	165	98	174
30.7	56.994	41.24	13.007	23.31	7.426	19.67	12.60	14.95
ne 9.7	340	256	334	265	302	160	90	225
	57.334	43.80	13.341	25.96	7.728	18.07	13.50	17.20
19.6	310	287	306	295	286	154	78	270
	57.644	46.67	13.647	28.91	8.014	16.53	14.28	19.90
29.6	273	313	270	315	260	142	64	307
	57.917	49.80	13.917	32.06	8.274	15.11	14.92	22.97
ly 9.6	229	331	229	328	228	127	50	335
	58.146	53.11	14.146	35.34	8.502	13.84	15.12	26.32
	177	337	182	335	192	108	34	337
19.6	58.323	56.48	14.328	38.69	8.694	12.76	15.76	29.89
	124	339	130	333	149	89	16	370
29.5	58.447	59.87	14.458	42.02	8.843	11.87	15.92	33.59
	68	332	79	324	104	69	1	375
ıg. 8.5	58.515	63.19	14.537	45.26	8.947	11.18	15.93	37.34
	11	319	27	309	58	49	16	371
18.5	58.526	66.38	14.564	48.35	9.005	10.69	15.77	41.05
	43	298	25	288	13	28	34	360
28.4	58.483	69.36	14.539	51.23	9.018	10.41	15.43	44.65
	94	274	73	262	30	12	48	341
ept. 7.4	58.389	72.10	14.466	53.85	8.988	10.29	14.95	48.06
	139	242	115	231	69	4	62	316
17.4	58.250	74.52	14.351	56.16	8.919	10.33	14.33	51.22
	178	206	149	195	100	17	76	284
27.4	58.072	76.58	14.202	58.11	8.819	10.50	13.57	54.06
ct. 7.3	209	166	179	157	126	28	85	245
	57.863	78.24	14.023	59.68	8.693	10.78	12.72	56.51
17.3	229	123	197	115	142	35	94	201
	57.634	79.47	13.826	60.83	8.551	11.13	11.78	58.52
	242	77	208	71	150	39	100	152
27.3	57.392	80.24	13.618	61.54	8.401	11.52	10.78	60.04
ov. 6.3	245	29	209	25	150	43	104	97
	57.147	80.53	13.409	61.79	8.251	11.95	9.74	61.01
16.2	238	22	202	21	140	44	105	40
	56.909	80.31	13.207	61.58	8.111	12.39	8.69	61.41
26.2	224	71	187	67	123	43	103	19
	56.685	79.60	13.020	60.91	7.988	12.82	7.66	61.22
ec. 6.2	200	119	164	112	102	42	98	78
	56.485	78.41	12.856	59.79	7.886	13.24	6.68	60.44
	171	164	136	153	75	39	90	137
16.1	56.314	76.77	12.720	58.26	7.811	13.63	5.78	59.07
	135	264	103	189	46	36	79	190
26.1	56.179	74.73	12.617	56.37	7.765	13.99	4.99	57.17
	97	236	65	220	15	30	66	238
36.1	56.082	72.37	12.552	54.17	7.750	14.29	4.33	54.79
an Place	54.674	46.67	10.466	26.13	4.447	30.02	11.200	24.11
δ, Tan δ	1.381	+0.952	1.275	+0.791	1.021	−0.207	4.730	+4.623
α, D_α α	+0.04	−0.05	+0.05	−0.04	+0.06	+0.01	−0.02	−0.22
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.	3 Piscis Australis. Mag. 5.6				ζ Cygni. Mag. 3.4				τ Cygni. Mag. 3.8				α Equuli. Mag. 4.1			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m	s	° ′	″	h m	s	° ′	″	h m	s	° ′	″	h m	s	° ′	″
	21 8		−27 57		21 9		+29 53		21 11		+37 41		21 11		+ 4	
Jan. 1.1		22.226		34.99		23.696		16.89		27.964		35.61		40.409		17.2
		4		66		36		212		56		231		5		
11.1		22.230		34.33		23.660		14.77		27.908		33.30		40.404		16.1
		41		80		1		227		17		249		26		
21.1		22.271		33.53		23.659		12.50		27.891		30.81		40.430		15.0
		78		95		38		231		24		257		57		
31.0		22.349		32.58		23.697		10.19		27.915		28.24		40.487		13.9
		113		108		76		225		69		254		88		
Feb. 10.0		22.462		31.50		23.773		7.94		27.984		25.70		40.575		13.0
		145		122		114		209		113		241		119		
20.0		22.607		30.28		23.887		5.85		28.097		23.29		40.694		12.2
		179		134		153		185		154		217		149		
Mar. 1.9		22.786		28.94		24.040		4.00		28.251		21.12		40.843		11.6
		209		143		189		152		197		182		180		
11.9		22.995		27.51		24.229		2.48		28.448		19.30		41.023		11.3
		239		152		225		111		236		142		208		
21.9		23.234		25.99		24.454		1.37		28.684		17.88		41.231		11.3
		268		159		257		65		272		92		234		
31.9		23.502		24.40		24.711		0.72		28.956		16.96		41.465		11.7
		291		164		283		17		303		40		259		
Apr. 10.8		23.793		22.76		24.994		0.55		29.259		16.56		41.724		12.3
		314		165		307		34		327		12		278		
20.8		24.107		21.11		25.301		0.89		29.586		16.68		42.002		13.3
		320		162		323		84		344		68		295		
30.8		24.436		19.49		25.624		1.73		29.930		17.36		42.297		14.6
		341		156		332		131		354		119		306		
May 10.8		24.777		17.93		25.956		3.04		30.284		18.55		42.603		16.1
		346		146		334		174		355		169		310		
20.7		25.123		16.47		26.290		4.78		30.639		20.24		42.913		17.9
		343		131		327		212		346		211		305		
30.7		25.466		15.16		26.617		6.90		30.985		22.35		43.218		19.8
		333		113		311		242		330		250		296		
June 9.7		25.799		14.03		26.928		9.32		31.315		24.85		43.514		21.8
		313		94		290		269		305		277		278		
19.6		26.112		13.09		27.218		12.01		31.620		27.62		43.792		24.0
		289		70		259		285		271		302		253		
29.6		26.401		12.39		27.477		14.86		31.891		30.64		44.045		26.0
		253		46		222		296		231		315		222		
July 9.6		26.654		11.93		27.699		17.82		32.122		33.79		44.267		28.1
		214		20		180		299		186		323		186		
19.6		26.868		11.73		27.879		20.81		32.308		37.02		44.453		30.1
		168		3		134		295		137		324		145		
29.5		27.036		11.76		28.013		23.76		32.445		40.26		44.598		31.9
		119		27		87		286		84		317		101		
Aug. 8.5		27.155		12.03		28.100		26.62		32.529		43.43		44.699		33.5
		68		47		37		271		33		302		57		
18.5		27.223		12.50		28.137		29.33		32.562		46.45		44.756		35.0
		18		63		11		249		18		283		13		
28.4		27.241		13.13		28.126		31.82		32.544		49.28		44.769		36.2
		30		77		55		224		67		258		29		
Sept. 7.4		27.211		13.90		28.071		34.06		32.477		51.86		44.740		37.3
		71		84		94		196		109		230		66		
17.4		27.137		14.74		27.977		36.02		32.368		54.16		44.674		38.1
		112		86		129		163		146		194		97		
27.4		27.025		15.60		27.848		37.65		32.222		56.10		44.577		38.6
		140		84		156		127		176		157		122		
Oct. 7.3		26.885		16.44		27.692		38.92		32.046		57.67		44.455		39.0
		161		76		174		92		196		117		138		
17.3		26.724		17.20		27.518		39.84		31.850		58.84		44.317		39.1
		170		66		184		52		209		74		146		
27.3		26.554		17.86		27.334		40.36		31.641		59.58		44.171		39.1
		171		52		187		11		212		29		148		
Nov. 6.3		26.383		18.38		27.147		40.47		31.429		59.87		44.023		38.8
		162		36		181		29		208		18		142		
16.2		26.221		18.74		26.966		40.18		31.221		59.69		43.881		38.3
		143		17		166		70		195		63		124		
26.2		26.078		18.91		26.800		39.48		31.026		59.06		43.757		37.7
		119		1		148		109		174		108		106		
Dec. 6.2		25.959		18.90		26.652		38.39		30.852		57.98		43.651		36.9
		91		20		122		143		150		150		83		
16.1		25.868		18.70		26.530		36.96		30.702		56.48		43.568		36.0
		56		37		94		176		117		186		55		
26.1		25.812		18.33		26.436		35.20		30.585		54.62		43.513		35.0
		20		54		60		202		83		217		27		
36.1		25.792		17.79		26.376		33.18		30.502		52.45		43.486		33.9
Mean Place		22.207		30.84		24.176		9.03		28.636		26.11		40.506		14.60
Sec δ, Tan δ		1.132		−0.531		1.153		+0.575		1.264		+0.773		1.004		+0.086
$D_\psi\,\alpha$, $D_\omega\,\alpha$		+0.07		+0.03		+0.05		−0.03		+0.05		−0.04		+0.06		0.00
$D_\psi\,\delta$, $D_\omega\,\delta$		+0.3		−0.7		+0.3		−0.7		+0.3		−0.7		+0.3		−0.7

FOR THE UPPER TRANSIT AT WASHINGTON.

hington n Time.	σ Cygni. Mag. 4.3		θ^1 Microscopii. Mag. 4.9		α Cephei. Mag. 2.6		ι Capricorni. Mag. 4.3	
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.
	h m 21 14 s	° ′ +39 2 ″	h m 21 15 s	° ′ −41 9 ″	h m 21 16 s	° ′ +62 13 ″	h m 21 17 s	° ′ −17 10 ″
1.1	8.600	57.08	27.274	46.43	33.96	74.84	37.699	81.38
	64	234	14	136	20	263	2	5
11.1	8.536	54.74	27.260	45.07	33.76	72.21	37.697	81.33
	23	254	—	158	13	292	—	18
21.1	8.513	52.20	27.290	43.49	33.63	69.29	37.728	81.15
	—	262	72	175	—	312	31	30
31.0	8.533	49.58	27.362	41.74	33.58	66.17	37.791	80.85
	20	260	114	189	5	317	63	43
b. 10.0	8.596	46.98	27.476	39.85	33.60	63.00	37.885	80.42
	63	248	151	198	11	310	94	58
20.0	8.704	44.50	27.630	37.87	33.71	59.90	38.011	79.84
	153	223	194	207	19	283	156	76
r. 1.9	8.857	42.27	27.824	35.80	33.90	56.97	38.167	79.08
	197	191	229	210	27	260	186	91
11.9	9.054	40.36	28.053	33.70	34.17	54.37	38.353	78.17
	235	148	266	211	34	218	215	109
21.9	9.289	38.88	28.319	31.59	34.51	52.19	38.568	77.08
	273	100	299	207	41	168	241	124
31.9	9.562	37.88	28.618	29.52	34.92	50.51	38.809	75.84
	306	48	327	200	46	112	268	139
r. 10.8	9.868	37.40	28.945	27.52	35.38	49.39	39.077	74.45
	330	6	353	190	50	50	288	150
20.8	10.198	37.46	29.298	25.62	35.88	48.89	39.365	72.95
	349	62	372	174	52	11	307	150
30.8	10.547	38.08	29.670	23.88	36.40	49.00	39.672	71.36
	358	115	387	155	54	73	317	165
ay 10.8	10.905	39.23	30.057	22.33	36.94	49.73	39.989	69.71
	360	164	392	134	53	133	321	164
20.7	11.265	40.87	30.449	20.99	37.47	51.06	40.313	68.07
	351	208	391	107	51	185	323	160
30.7	11.616	42.95	30.840	19.92	37.98	52.94	40.636	66.47
	334	247	380	78	48	257	315	152
ne 9.7	11.950	45.42	31.220	19.14	38.46	55.31	40.951	64.95
	310	277	359	48	44	278	298	140
19.6	12.260	48.19	31.579	18.66	38.90	58.09	41.249	63.55
	277	301	331	15	38	314	275	122
29.6	12.537	51.20	31.910	18.51	39.28	61.23	41.524	62.33
	235	317	293	—	31	340	243	105
ly 9.6	12.772	54.37	32.203	18.67	39.59	64.63	41.767	61.28
	190	325	248	46	23	359	207	84
19.6	12.962	57.62	32.451	19.13	39.82	68.22	41.974	60.44
	139	327	197	75	15	370	165	61
29.5	13.101	60.89	32.648	19.88	39.97	71.92	42.139	59.83
	87	320	139	99	8	371	120	40
ug. 8.5	13.188	64.09	32.787	20.87	40.05	75.63	42.259	59.43
	34	307	81	120	0	366	73	18
18.5	13.222	67.16	32.868	22.07	40.05	79.29	42.332	59.25
	—	289	—	133	9	351	26	—
28.5	13.204	70.05	32.892	23.40	39.96	82.80	42.358	59.27
	18	263	35	143	16	332	19	19
pt. 7.4	13.138	72.68	32.857	24.83	39.80	86.12	42.339	59.46
	110	234	85	145	23	303	59	33
17.4	13.028	75.02	32.772	26.28	39.57	89.15	42.280	59.79
	148	201	131	139	29	269	93	43
27.4	12.880	77.03	32.641	27.67	39.28	91.84	42.187	60.22
	178	162	168	127	33	230	122	50
ct. 7.3	12.702	78.65	32.473	28.94	38.95	94.14	42.065	60.72
	200	122	192	108	38	186	140	53
17.3	12.502	79.87	32.281	30.02	38.57	96.00	41.925	61.25
	214	78	207	87	41	135	151	53
27.3	12.288	80.65	32.074	30.89	38.16	97.35	41.774	61.78
	217	33	210	58	41	83	152	51
ov. 6.3	12.071	80.98	31.864	31.47	37.75	98.18	41.622	62.29
	212	14	204	27	42	26	146	46
16.2	11.859	80.84	31.660	31.74	37.33	98.44	41.476	62.75
	202	61	185	3	41	32	131	39
26.2	11.657	80.23	31.475	31.71	36.92	98.12	41.345	63.14
	182	100	158	36	39	88	109	31
ec. 6.2	11.475	79.17	31.317	31.35	36.53	97.24	41.236	63.45
	156	149	124	67	35	145	85	21
16.2	11.319	77.68	31.193	30.68	36.18	95.79	41.151	63.66
	125	186	86	95	30	196	56	13
26.1	11.194	75.82	31.107	29.73	35.88	93.83	41.095	63.79
	90	221	43	121	25	239	25	3
36.1	11.104	73.61	31.064	28.52	35.63	91.44	41.070	63.82
n Place	9.301	47.12	27.288	40.04	36.023	60.93	37.651	79.32
δ, Tan δ	1.288	+0.811	1.328	−0.874	2.147	+1.900	1.047	−0.309
, $D_m \alpha$	+0.05	−0.04	+0.08	+0.04	+0.03	−0.10	+0.07	+0.02
, $D_m \delta$	*+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.	1 Pegasi. Mag. 4.2		γ Pavonis. Mag. 4.3		ζ Capricorni. Mag. 3.9		g Cyg Mag. 5
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.
	h m s 21 18	° ′ ″ +19 26	h m s 21 19	° ′ ″ −65 44	h m s 21 21	° ′ ″ −22 45	h m s 21 26
Jan. 1.1	14.619	61.83	35.29	43.53	55.965	80.58	22.255
	26	170	11	257	7	35	101
11.1	14.593	60.13	35.18	40.96	55.958	80.23	22.154
	6	179	3	283	27	50	56
21.1	14.599	58.34	35.15	38.13	55.985	79.73	22.096
	40	181	6	303	60	65	10
31.0	14.639	56.53	35.21	35.10	56.045	79.08	22.086
	73	173	15	313	91	79	41
Feb. 10.0	14.712	54.80	35.36	31.97	56.136	78.29	22.127
	108	157	23	317	125	94	91
20.0	14.820	53.23	35.59	28.80	56.261	77.35	22.218
	141	135	30	315	157	108	144
Mar. 1.9	14.961	51.88	35.89	25.65	56.418	76.27	22.362
	175	104	37	305	187	124	196
11.9	15.136	50.84	36.26	22.60	56.605	75.03	22.558
	207	68	43	292	218	136	242
21.9	15.343	50.16	36.69	19.68	56.823	73.67	22.800
	236	28	50	269	247	148	287
31.9	15.579	49.88	37.19	16.99	57.070	72.19	23.087
	264	15	54	244	271	158	323
Apr. 10.8	15.843	50.03	37.73	14.55	57.341	70.61	23.410
	286	58	59	213	296	166	355
20.8	16.129	50.61	38.32	12.42	57.637	68.95	23.765
	304	100	63	177	314	168	377
30.8	16.433	51.61	38.95	10.65	57.951	67.27	24.142
	314	138	64	140	326	167	390
May 10.8	16.747	52.99	39.59	9.25	58.277	65.60	24.532
	319	175	65	97	334	161	394
20.7	17.066	54.74	40.24	8.28	58.611	63.99	24.926
	315	205	65	54	334	152	385
30.7	17.381	56.79	40.89	7.74	58.945	62.47	25.311
	303	228	62	8	326	140	369
June 9.7	17.684	59.07	41.51	7.66	59.271	61.07	25.680
	285	246	58	36	309	121	341
19.6	17.969	61.53	42.09	8.02	59.580	59.86	26.021
	259	259	54	79	287	102	306
29.6	18.228	64.12	42.63	8.81	59.867	58.84	26.327
	226	263	47	120	254	78	262
July 9.6	18.454	66.75	43.10	10.01	60.121	58.06	26.589
	188	261	40	157	217	56	213
19.6	18.642	69.36	43.50	11.58	60.338	57.50	26.802
	146	253	31	188	174	30	159
29.5	18.788	71.89	43.81	13.46	60.512	57.20	26.961
	101	242	21	214	128	8	101
Aug. 8.5	18.889	74.31	44.02	15.60	60.640	57.12	27.062
	55	225	10	229	79	16	43
18.5	18.944	76.56	44.12	17.89	60.719	57.28	27.105
	10	203	1	239	31	33	14
28.5	18.954	78.59	44.13	20.28	60.750	57.61	27.091
	33	180	9	238	16	49	68
Sept. 7.4	18.921	80.39	44.04	22.66	60.734	58.10	27.023
	71	153	19	228	58	62	117
17.4	18.850	81.92	43.85	24.94	60.676	58.72	26.906
	103	124	27	207	95	68	159
27.4	18.747	83.16	43.58	27.01	60.581	59.40	26.747
	130	95	35	178	125	73	195
Oct. 7.3	18.617	84.11	43.23	28.79	60.456	60.13	26.552
	148	63	40	143	144	70	222
17.3	18.469	84.74	42.83	30.22	60.312	60.83	26.330
	158	31	43	98	156	65	240
27.3	18.311	85.05	42.40	31.20	60.156	61.48	26.090
	161	0	45	49	159	57	248
Nov. 6.3	18.150	85.05	41.95	31.69	59.997	62.05	25.842
	155	34	41	3	153	46	248
16.2	17.995	84.71	41.51	31.66	59.844	62.51	25.594
	144	64	41	55	139	33	240
26.2	17.851	84.07	41.10	31.11	59.705	62.84	25.354
	125	93	37	106	117	18	221
Dec. 6.2	17.726	83.14	40.73	30.05	59.588	63.02	25.133
	104	122	31	154	92	4	198
16.2	17.622	81.92	40.42	28.51	59.496	63.06	24.935
	76	144	24	198	62	10	166
26.1	17.546	80.48	40.18	26.53	59.434	62.96	24.769
	48	164	17	235	30	26	129
36.1	17.498	78.84	40.01	24.18	59.404	62.70	24.640
Mean Place	14.864	55.70	35.870	34.26	55.893	77.40	23.141
Sec δ, Tan δ	1.061	+0.353	2.434	−2.219	1.084	−0.420	1.444
$D_\psi a$, $D_\omega a$	+0.05	−0.02	+0.10	+0.11	+0.07	+0.02	+0.04
$D_\psi \delta$, $D_\omega \delta$	+0.3	−0.6	+0.3	−0.6	+0.3	−0.6	+0.3

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.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.
	h m s 21 27	° ′ ″ − 5 55	h m s 21 27	° ′ ″ +70 11	h m s 21 33	° ′ ″ − 8 13	h m s 21 33	° ′ ″ +40 2
h. 1.1	11.484	72.54	32.60	62.04	20.166	37.15	36.673	36.04
11.1	11.472 12	73.08 54	32.25 35	59.53 251	20.150 16	37.56 41	36.588 85	33.81 223
21.1	11.490 — 18	73.56 48	32.01 24	56.68 285	20.165 — 15	37.90 34	36.541 47	31.36 245
31.0	11.537 47	73.94 38	31.86 15	53.58 310	20.207 42	38.12 22	36.536 5	28.77 259
h. 10.0	11.615 78	74.18 24	31.82 4	50.36 322	20.281 74	38.22 10	36.574 — 38	26.19 258
20.0	11.724 109	74.28 10	31.91 — 9	47.15 321	20.385 104	38.16 — 6	36.658 84	23.68 251
r. 2.0	11.862 138	74.18 — 10	32.12 21	44.09 306	20.518 133	37.90 26	36.789 131	21.37 231
11.9	12.031 169	73.85 33	32.43 31	41.29 280	20.683 165	37.44 46	36.964 175	19.37 200
21.9	12.229 198	73.30 55	32.85 42	38.88 241	20.876 193	36.75 69	37.183 219	17.76 161
31.9	12.454 225	72.49 81	33.36 51	36.94 194	21.099 223	35.84 91	37.443 260	16.60 116
r. 10.8	12.706 252	71.45 104	33.95 59	35.54 140	21.348 249	34.70 114	37.739 296	15.94 66
20.8	12.980 274	70.18 127	34.60 65	34.74 80	21.620 272	33.36 134	38.064 325	15.83 — 11
30.8	13.272 292	68.72 146	35.30 70	34.57 — 17	21.911 291	31.85 151	38.412 348	16.26 43
ry 10.8	13.579 307	67.08 164	36.00 70	35.02 45	22.218 307	30.19 166	38.774 362	17.24 98
20.7	13.891 312	65.34 174	36.69 69	36.07 105	22.532 314	28.44 175	39.141 367	18.71 147
30.7	14.204 313	63.53 181	37.37 68	37.71 164	22.847 315	26.63 181	39.505 364	20.64 193
ne 9.7	14.509 305	61.69 184	38.00 63	39.86 215	23.155 308	24.83 180	39.854 349	22.97 233
19.7	14.800 291	59.88 181	38.57 57	42.47 261	23.451 296	23.08 175	40.182 328	25.64 267
29.6	15.068 268	58.15 173	39.06 49	45.48 301	23.725 274	21.43 165	40.478 296	28.57 293
ly 9.6	15.308 240	56.55 160	39.47 41	48.79 331	23.970 245	19.90 153	40.735 257	31.70 313
19.6	15.512 204	55.09 146	39.79 32	52.34 355	24.181 211	18.54 136	40.949 214	34.94 324
29.5	15.677 165	53.81 128	39.99 20	56.04 370	24.353 172	17.38 116	41.113 164	38.22 328
ug. 8.5	15.798 121	52.75 106	40.09 — 10	59.80 376	24.482 129	16.42 96	41.225 112	41.47 325
18.5	15.875 77	51.88 87	40.08 — 1	63.56 376	24.565 83	15.69 73	41.284 59	44.61 314
28.5	15.907 32	51.24 64	39.97 11	67.22 366	24.604 39	15.16 53	41.290 6	47.60 299
pt. 7.4	15.896 — 11	50.79 45	39.75 22	70.72 350	24.600 — 4	14.85 31	41.246 44	50.37 277
17.4	15.847 49	50.54 25	39.44 31	73.98 326	24.558 42	14.72 13	41.157 89	52.86 249
27.4	15.764 83	50.46 — 8	39.05 39	76.93 295	24.480 78	14.75 — 3	41.027 130	55.03 217
ct. 7.4	15.653 111	50.54 8	38.59 46	79.51 258	24.375 105	14.93 18	40.864 163	56.84 181
17.3	15.525 128	50.75 21	38.06 53	81.65 214	24.248 127	15.22 29	40.677 187	58.27 143
27.3	15.385 140	51.06 31	37.50 56	83.32 167	24.110 138	15.60 38	40.473 204	59.26 99
ov. 6.3	15.243 142	51.46 40	36.91 59	84.45 113	23.969 141	16.05 45	40.261 212	59.80 54
16.2	15.105 138	51.93 47	36.30 61	85.02 57	23.831 138	16.54 49	40.048 213	59.87 — 7
26.2	14.979 126	52.46 53	35.70 60	84.99 — 3	23.704 127	17.05 51	39.843 205	59.47 40
ec. 6.2	14.871 108	53.02 56	35.12 58	84.37 62	23.594 110	17.58 53	39.653 190	58.61 86
	86	58	53	120	89	52	168	131
16.2	14.785	53.60	34.59	83.17	23.505	18.10	39.485	57.30
26.1	14.725 60	54.19 59	34.11 48	81.41 176	23.442 63	18.60 50	39.342 143	55.58 172
36.1	14.693 32	54.76 57	33.70 41	79.16 225	23.405 37	19.07 47	39.233 109	53.51 207
n Place	11.442	73.11	35.732	46.22	20.090	37.29	37.291	24.51
δ, Tan δ	1.005	−0.104	2.952	+2.778	1.010	−0.145	1.306	+0.840
t, $D_m\alpha$	+0.06	+0.01	+0.02	−0.15	+0.06	+0.01	+0.05	−0.04
), $D_m\delta$	*+0.3*	*−0.6*	*+0.3*	−0.6	+0.3	−0.6	+0.3	−0.8

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. 3.1	
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	D
	h m 21 35 s	° ′ −17 1 ″	h m 21 40 s	° ′ + 9 29 ″	h m 21 40 s	° ′ +70 55 ″	h m 21 42 s	
Jan. 1.1	29.794	77.78	6.527	42.70	39.54	61.52	27.841	7
	18	4	30	123	40	235	23	
11.1	29.776	77.74	6.497	41.47	39.14	59.17	27.818	7
	13	18	4	125	28	274	6	
21.1	29.789	77.56	6.493	40.22	38.86	56.43	27.824	7
	44	30	27	123	19	302	37	
31.0	29.833	77.26	6.520	38.99	38.67	53.41	27.861	7
	75	45	58	114	8	317	68	
Feb. 10.0	29.908	76.81	6.578	37.85	38.59	50.24	27.929	7
	107	62	87	100	5	320	97	
20.0	30.015	76.19	6.665	36.85	38.64	47.04	28.026	7
	137	79	121	79	18	309	130	
Mar. 2.0	30.152	75.40	6.786	36.06	38.82	43.95	28.156	7
	168	96	153	54	29	286	161	
11.9	30.320	74.44	6.939	35.52	39.11	41.09	28.317	7
	199	115	184	22	40	251	191	
21.9	30.519	73.29	7.123	35.30	39.51	38.58	28.508	7
	227	130	215	11	50	207	222	
31.9	30.746	71.99	7.338	35.41	40.01	36.51	28.730	7
	256	144	242	46	59	155	250	
Apr. 10.9	31.002	70.55	7.580	35.87	40.60	34.96	28.980	7
	278	158	269	81	65	96	275	
20.8	31.280	68.97	7.849	36.68	41.25	34.00	29.255	6
	301	160	288	115	71	36	296	
30.8	31.581	67.28	8.137	37.83	41.96	33.64	29.551	6
	314	171	304	146	73	25	313	
May 10.8	31.895	65.57	8.441	39.29	42.69	33.89	29.864	6
	322	174	311	173	72	89	323	
20.7	32.217	63.83	8.752	41.02	43.41	34.78	30.187	6
	326	170	313	195	70	146	325	
30.7	32.543	62.13	9.065	42.97	44.11	36.24	30.512	6
June 9.7	319	160	306	212	67	200	321	
	32.862	60.53	9.371	45.09	44.78	38.24	30.833	6
19.7	306	149	292	222	62	248	308	
	33.168	59.04	9.663	47.31	45.40	40.72	31.141	5
29.6	285	132	271	227	54	290	289	
	33.453	57.72	9.934	49.58	45.94	43.62	31.430	5
July 9.6	257	113	242	226	46	320	260	
	33.710	56.59	10.176	51.84	46.40	46.82	31.690	5
	221	91	208	221	36	349	226	
19.6	33.931	55.68	10.384	54.05	46.76	50.31	31.916	5
	181	68	169	209	24	367	187	
29.6	34.112	55.00	10.553	56.14	47.00	53.98	32.103	5
	137	45	126	195	14	376	143	
Aug. 8.5	34.249	54.55	10.679	58.09	47.14	57.74	32.246	5
	90	21	82	176	4	378	97	
18.5	34.339	54.34	10.761	59.85	47.18	61.52	32.343	5
	44	0	38	156	8	372	50	
28.5	34.383	54.34	10.799	61.41	47.10	65.24	32.393	5
	1	19	3	133	18	357	5	
Sept. 7.4	34.382	54.53	10.796	62.74	46.92	68.81	32.398	5
	43	34	43	108	29	338	36	
17.4	34.339	54.87	10.753	63.82	46.63	72.19	32.362	5
	79	46	77	85	37	308	73	
27.4	34.260	55.33	10.676	64.67	46.26	75.27	32.289	5
	110	54	103	60	45	272	104	
Oct. 7.4	34.150	55.87	10.573	65.27	45.81	77.99	32.185	5
	130	59	125	36	51	232	126	
17.3	34.020	56.46	10.448	65.63	45.30	80.31	32.059	5
	143	60	137	11	57	185	139	
27.3	33.877	57.06	10.311	65.74	44.73	82.16	31.920	5
	148	57	142	11	60	134	145	
Nov. 6.3	33.729	57.63	10.169	65.63	44.13	83.50	31.775	5
	144	52	140	35	62	78	142	
16.3	33.585	58.15	10.029	65.28	43.51	84.28	31.633	5
	134	46	131	55	62	18	133	
26.2	33.451	58.61	9.898	64.73	42.89	84.46	31.500	5
	115	37	117	75	60	42	117	
Dec. 6.2	33.336	58.98	9.781	63.98	42.29	84.04	31.383	5
	93	25	99	92	57	102	96	
16.2	33.243	59.23	9.682	63.06	41.72	83.02	31.287	5
	67	16	75	108	51	157	71	
26.1	33.176	59.39	9.607	61.98	41.21	81.45	31.216	5
	38	6	51	119	45	209	45	
36.1	33.138	59.45	9.556	60.79	40.76	79.36	31.171	5
Mean Place	29.676	75.90	6.553	37.98	42.615	44.50	27.698	
Sec δ, Tan δ	1.046	−0.306	1.014	+0.167	3.061	+2.893	1.043	
$D_\psi a$, $D_\omega a$	+0.07	+0.02	+0.06	−0.01	+0.02	−0.16	+0.06	
$D_\psi \delta$, $D_\omega \delta$	+0.3	−0.6	+0.3	−0.6	+0.3	−0.6	+0.3	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	π^2 Cygni. Mag. 4.3		μ Capricorni. Mag. 5.2		γ Gruis. Mag. 3.2		16 Pegasi. Mag. 5.0	
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.
	h m s	° ′ ″	h m s	° ′ ″	h m s	° ′ ″	h m s	° ′ ″
	21 43	+48 55	21 48	−13 56	21 48	−37 44	21 49	+25 31
Jan. 1.1	42.658 133	44.43 229	46.502 27	36.44 12	54.568 48	87.48 107	16.890 60	72.39 176
11.1	42.525 89	42.14 258	46.475 0	36.56 1	54.520 10	86.41 132	16.830 30	70.63 190
21.1	42.436 40	39.56 276	46.475 31	36.57 — 12	54.510 27	85.09 154	16.800 — 1	68.73 197
31.0	42.396 — 12	36.80 281	46.506 60	36.45 29	54.537 66	83.55 173	16.801 37	66.76 196
Feb. 10.0	42.408 66	33.96 280	46.566 90	36.16 45	54.603 101	81.82 189	16.838 72	64.80 185
20.0	42.474	31.16	46.656	35.71	54.707	79.93	16.910	62.95
Mar. 2.0	42.597 123	28.53 263	46.778 122	35.07 64	54.848 141	77.91 202	17.020 110	61.29 166
11.9	42.775 178	26.16 237	46.931 153	34.25 82	55.027 179	75.79 212	17.167 147	59.89 140
21.9	43.006 231	24.17 199	47.114 183	33.24 101	55.244 217	73.61 218	17.350 183	58.85 104
31.9	43.286 280 324	22.64 153 102	47.329 215 242	32.02 122 139	55.496 252 285	71.40 221 219	17.569 219 252	58.21 64 22
Apr. 10.9	43.610	21.62 45	47.571	30.63	55.781	69.21	17.821	57.99
20.8	43.971 361	21.17 — 12	47.840 269	29.09 154	56.096 315	67.09 212	18.101 280	58.24 25
30.8	44.358 387	21.29 69	48.130 290	27.41 168	56.436 340	65.05 204	18.405 304	58.95 71
May 10.8	44.764 406	21.98 124	48.438 308	25.66 175	56.797 361	63.16 189	18.724 319	60.09 114
20.7	45.176 412 409	23.22 176	48.757 319 322	23.86 180 179	57.170 373 378	61.47 169 147	19.053 329 331	61.64 155 190
30.7	45.585	24.98	49.079	22.07	57.548	60.00 119	19.384	63.54
June 9.7	45.978 393	27.20 222	49.397 318	20.33 174	57.922 374	58.81 90	19.708 324	65.77 223
19.7	46.347 369	29.82 262	49.704 307	18.69 164	58.284 362	57.91 57	20.015 307	68.23 246
29.6	46.680 333	32.77 295	49.993 289	17.18 151	58.623 339	57.34 24	20.300 285	70.88 265
July 9.6	46.971 291 241	35.96 319 337	50.254 261 229	15.86 132 111	58.931 308 269	57.10 — 9	20.555 255 218	73.64 276 280
19.6	47.212 184	39.33	50.483 190	14.75 90	59.200 223	57.19	20.773 176	76.44 279
29.6	47.396 127	42.79 346	50.673 147	13.85 66	59.423 172	57.60 41	20.949 132	79.23 272
Aug. 8.5	47.523 68	46.28 349	50.820 102	13.19 42	59.595 118	58.30 70	21.081 85	81.95 257
18.5	47.591 — 8	49.72 344	50.922 56	12.77 19	59.713 62	59.25 95	21.166 — 39	84.52 242
28.5	47.599 — 50	53.03 331 311	50.978 12	12.58 0	59.775 — 6	60.43 118 131	21.205 — 6	86.94 218
Sept. 7.4	47.549	56.14	50.990	12.58	59.781	61.74	21.199	89.12
17.4	47.447 102	59.01 287	50.960 30	12.77 19	59.736 45	63.15 141	21.153 46	91.05 193
27.4	47.299 148	61.57 256	50.892 68	13.10 33	59.646 90	64.58 143	21.070 83	92.70 165
Oct. 7.4	47.112 187	63.76 219	50.796 96	13.54 44	59.516 130	65.96 138	20.956 114	94.04 134
17.3	46.892 220 241	65.55 179 134	50.676 120 134	14.06 52 57	59.355 161 179	67.23 127 108	20.820 136 151	95.04 100 66
27.3	46.651	66.89 86	50.542	14.63	59.176	68.31	20.669	95.70
Nov. 6.3	46.396 255	67.75 35	50.402 140	15.20 57	58.986 190	69.18 87	20.509 160	96.01 — 31
16.3	46.135 261	68.10 — 17	50.262 140	15.75 55	58.797 189	69.78 60	20.348 161	95.96 5
26.2	45.880 255	67.93 69	50.131 131	16.27 52	58.618 179	70.08 30	20.192 156	95.54 42
Dec. 6.2	45.637 243 222	67.24 120	50.015 116 97	16.73 46 39	58.457 161 137	70.08 0 31	20.049 143 127	94.77 77 109
16.2	45.415	66.04	49.918	17.12	58.320	69.77	19.922	93.68
26.1	45.221 194	64.38 166	49.845 73	17.42 30	58.213 107	69.15 62	19.817 105	92.29 139
36.1	45.062 159	62.29 209	49.796 49	17.62 20	58.140 73	68.25 90	19.738 79	90.64 165
Mean Place	43.539	30.44	46.341	35.42	54.415	81.18	17.082	63.21
δ, Tan δ	1.522	+1.147	1.030	−0.248	1.265	−0.774	1.108	+0.478
α, $D_{20}\alpha$	+0.04	−0.06	+0.06	+0.01	+0.07	+0.04	+0.05	−0.03
δ, $D_{20}\delta$	*+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 Aqua Mag. 3	
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.	
	h m		° ′		h m		° ′		h m		° ′		h m	
	21 51		+73 18		21 57		−57 7		21 57		+12 43		22 1	
	s		″		s		″		s		″		s	
Jan. 1.1	45.79	48	52.22	223	1.080	109	49.13	188	2.737	47	24.72	128	31.448	39
11.1	45.31	38	50.00	265	0.971	53	47.25	222	2.690	19	23.44	135	31.409	14
21.1	44.93	27	47.35	295	0.918	6	45.03	248	2.671	8	22.09	135	31.395	13
31.1	44.66	12	44.40	315	0.924	64	42.55	208	2.679	39	20.74	128	31.408	41
Feb. 10.0	44.54	1	41.25	322	0.988	122	39.87	282	2.718	71	19.46	115	31.449	71
20.0	44.55		38.03		1.110		37.05		2.789		18.31		31.520	
Mar. 2.0	44.70	15	34.90	313	1.289	179	34.14	291	2.892	103	17.34	97	31.622	102
11.9	44.99	29	31.96	294	1.525	236	31.22	292	3.028	136	16.64	70	31.755	133
21.9	45.41	42	29.33	263	1.815	290	28.34	288	3.198	170	16.22	42	31.921	166
31.9	45.95	54	27.12	221	2.155	340	25.55	279	3.401	203	16.15	7	32.118	197
		64		170		390		262		232		30		226
Apr. 10.9	46.59		25.42	114	2.545		22.93		3.633		16.45		32.344	
20.8	47.31	72	24.28	56	2.977	432	20.50	243	3.894	261	17.12	67	32.599	255
30.8	48.08	77	23.72	7	3.442	465	18.34	216	4.177	283	18.14	102	32.876	277
May 10.8	48.89	81	23.79		3.936	494	16.48	186	4.479	302	19.49	135	33.172	296
20.8	49.71	82	24.49	70	4.448	512	14.97	151	4.792	313	21.16	167	33.481	309
		81		128		520		111		316		191		314
30.7	50.52		25.77		4.968		13.86		5.108		23.07		33.795	
June 9.7	51.28	76	27.59	182	5.484	516	13.16	70	5.420	312	25.20	213	34.107	312
19.7	51.98	70	29.91	232	5.983	499	12.88	28	5.720	300	27.46	226	34.408	301
29.6	52.61	63	32.67	276	6.453	470	13.04	16	6.002	282	29.80	234	34.692	284
July 9.6	53.14	53	35.80	313	6.884	431	13.62	58	6.256	254	32.17	237	34.951	259
		43		342		377		100		222		234		227
19.6	53.57		39.22		7.261		14.62		6.478		34.51		35.178	
29.6	53.88	31	42.83	361	7.578	317	15.99	137	6.661	183	36.77	226	35.370	192
Aug. 8.5	54.06	18	46.58	375	7.825	247	17.70	171	6.804	143	38.89	212	35.520	150
18.5	54.13	7	50.38	380	7.996	171	19.66	196	6.902	98	40.85	196	35.627	107
28.5	54.07	6	54.14	376	8.088	92	21.83	217	6.956	54	42.61	176	35.690	63
		18		365		14		227		12		154		21
Sept. 7.5	53.89		57.79		8.102		24.10		6.968		44.15		35.711	
17.4	53.60	29	61.25	346	8.040	62	26.39	229	6.939	29	45.44	129	35.692	19
27.4	53.20	40	64.49	324	7.910	130	28.61	222	6.875	64	46.48	104	35.638	54
Oct. 7.4	52.72	48	67.40	291	7.719	191	30.66	205	6.784	91	47.26	78	35.553	85
17.3	52.15	57	69.88	248	7.479	240	32.47	181	6.668	116	47.79	53	35.447	106
		63		204		273		148		129		26		123
27.3	51.52		71.92	152	7.206		33.95		6.539		48.05		35.324	
Nov. 6.3	50.84	68	73.44	98	6.910	296	35.03	108	6.400	139	48.06	1	35.193	131
16.3	50.14	70	74.42	39	6.609	301	35.67	64	6.260	140	47.81	25	35.062	131
26.2	49.43	71	74.81	22	6.316	293	35.84	17	6.127	133	47.33	48	34.936	126
Dec. 6.2	48.73	70	74.59		6.047	269	35.53	31	6.005	122	46.62	71	34.821	115
		67		82		239		78		108		91		100
16.2	48.06		73.77		5.808		34.75		5.897		45.71		34.721	
26.2	47.44	62	72.36	141	5.614	194	33.52	123	5.810	87	44.62	109	34.641	80
36.1	46.90	54	70.42	194	5.467	147	31.88	164	5.745	65	43.37	125	34.583	58
Mean Place	49.247		33.99		1.104		39.60		2.716		18.54		31.295	
Sec δ, Tan δ	3.483		+3.336		1.842		−1.547		1.025		+0.226		1.000	
$D_\psi a$, $D_\omega a$	+0.01		−0.19		+0.08		+0.09		+0.06		−0.01		+0.06	
$D_\psi \delta$, $D_\omega \delta$	+0.3		−0.5		+0.3		−0.5		+0.3		−0.5		+0.3	

FOR THE UPPER TRANSIT AT WASHINGTON.

ι Aquarii. Mag. 4.4				20 Cephei. Mag. 5.4				α Gruis. Mag. 2.2				ι Pegasi. Mag. 4.0			
ight ension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
m		° ′		h	m	° ′		h	m	° ′		h	m	° ′	
: 1		−14 15		22	2	+62 22		22	3	−47 21		22	3	+24 56	
		″		s		″		s		″		s		″	
382	39	83.36	12	27.56	27	66.88	217	0.630	86	57.66	147	8.673	68	30.90	166
343	12	83.48	1	27.29	21	64.71	257	0.544	45	56.19	178	8.605	41	29.24	180
331	17	83.47	15	27.08	14	62.14	285	0.499	1	54.41	205	8.564	10	27.44	188
348	45	83.32	32	26.94	6	59.29	303	0.498	44	52.36	225	8.554	24	25.56	189
393	76	83.00	48	26.88	2	56.26	308	0.542	90	50.11	243	8.578	59	23.67	180
369		82.52		26.90		53.18		0.632		47.68		8.637		21.87	
776	107	81.84	68	27.00	10	50.18	300	0.767	135	45.12	256	8.731	94	20.26	161
914	138	80.98	86	27.19	19	47.38	280	0.947	180	42.50	262	8.864	133	18.88	138
085	171	79.91	107	27.45	26	44.90	248	1.172	225	39.85	265	9.035	171	17.84	104
288	203	78.64	127	27.79	34	42.84	206	1.438	266	37.23	262	9.242	207	17.18	66
	282		144		41		157		306		254		241		25
520		77.20		28.20		41.27		1.744		34.69		9.483		16.93	
780	260	75.60	160	28.67	47	40.25	102	2.087	343	32.26	243	9.755	272	17.12	19
064	284	73.88	172	29.17	50	39.83	42	2.461	374	30.01	225	10.052	297	17.76	64
368	304	72.07	181	29.70	53	40.01	18	2.860	399	28.00	201	10.367	315	18.84	108
685	317	70.22	185	30.25	55	40.79	78	3.276	416	26.25	175	10.695	328	20.32	148
	323		184		54		136		425		144		332		184
008		68.38		30.79		42.15		3.701		24.81	108	11.027		22.16	
329	321	66.59	179	31.32	53	44.05	190	4.124	423	23.73	72	11.355	328	24.31	215
640	311	64.91	168	31.81	49	46.40	235	4.536	412	23.01	32	11.670	315	26.71	240
935	295	63.36	155	32.26	45	49.18	278	4.925	389	22.69	7	11.963	293	29.30	259
205	270	62.01	135	32.66	40	52.31	313	5.282	357	22.76	45	12.229	266	32.01	271
	238		114		32		338		315				232		277
443		60.87		32.98		55.69		5.597		23.21		12.461		34.78	
643	200	59.95	92	33.23	25	59.26	357	5.861	264	24.03	82	12.652	191	37.53	275
802	159	59.29	66	33.41	18	62.94	368	6.069	208	25.19	116	12.799	147	40.22	269
916	114	58.86	43	33.51	10	66.66	372	6.215	146	26.61	142	12.901	102	42.78	256
984	68	58.67	19	33.53	2	70.33	367	6.298	83	28.27	166	12.957	56	45.19	241
	23		2		6		353		19		180		10		218
007		58.69		33.47		73.86		6.317		30.07		12.967		47.37	
989	18	58.91	22	33.33	14	77.21	335	6.275	42	31.95	188	12.937	30	49.32	195
933	56	59.27	36	33.13	20	80.29	308	6.176	99	33.82	187	12.869	68	50.99	167
846	87	59.76	49	32.88	25	83.04	275	6.030	146	35.60	178	12.771	98	52.37	138
734	112	60.33	57	32.57	31	85.41	237	5.846	184	37.20	160	12.646	125	53.43	106
	128		61		35		192		213		137		141		70
606		60.94		32.22		87.33	141	5.633		38.57	106	12.505		54.13	
470	136	61.56	62	31.85	37	88.74	88	5.405	228	39.63	70	12.354	151	54.50	37
332	138	62.16	60	31.46	39	89.62	32	5.172	233	40.33	31	12.199	155	54.53	3
200	132	62.72	56	31.06	40	89.94	27	4.945	227	40.64	8	12.048	151	54.20	33
081	119	63.21	49	30.66	40	89.67	84	4.736	209	40.56	48	11.905	143	53.53	67
	103		41		37				185				128		99
978		63.62		30.29		88.83		4.551		40.08		11.777		52.54	
896	82	63.94	32	29.95	34	87.42	141	4.399	152	39.19	89	11.668	109	51.25	129
839	57	64.14	20	29.65	30	85.52	190	4.283	116	37.94	125	11.581	87	49.72	153
.362		82.40		29.121		49.19		0.476		49.43		8.777		21.20	
.032		−0.254		*2.157*		*+1.912*		1.476		−1.086		1.103		+0.465	
06		*+0.01*		*+0.04*		*−0.11*		+0.08		+0.06		+0.05		−0.03	
		−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 Cq Mag.
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.
	h m s 22 6	° ′ ″ + 5 47	h m s 22 6	° ′ ″ +32 46	h m s 22 7	° ′ ″ +57 47	h m s 22 8
Jan. 1.1	0.934	25.43	17.768	25.73	57.225	47.99	10.08
	47	99	89	182	221	212	
11.1	0.887	24.44	17.679	23.91	57.004	45.87	9.61
	21	100	59	206	172	249	
21.1	0.866	23.44	17.620	21.85	56.832	43.38	9.23
	— 5	97	26	218	114	277	
31.1	0.871	22.47	17.594	19.67	56.718	40.61	8.95
	35	89	— 11	222	50	294	
Feb. 10.0	0.906	21.58	17.605	17.45	56.668	37.67	8.79
	64	73	48	215	17	298	
20.0	0.970	20.85	17.653	15.30	56.685	34.69	8.76
	95	56	91	201	90	291	
Mar. 2.0	1.065	20.29	17.744	13.29	56.775	31.78	8.86
	129	30	132	176	161	270	
12.0	1.194	19.99	17.876	11.53	56.936	29.08	9.06
	162	— 4	174	144	232	239	
21.9	1.356	19.95	18.050	10.09	57.168	26.69	9.44
	193	— 27	215	103	297	198	
31.9	1.549	20.22	18.265	9.06	57.465	24.71	9.90
	225	59	252	50	357	149	
Apr. 10.9	1.774	20.81	18.517	8.47	57.822	23.22	10.47
	253	90	284	— 11	407	94	
20.8	2.027	21.71	18.801	8.36	58.229	22.28	11.11
	277	121	313	— 38	447	— 37	
30.8	2.304	22.92	19.114	8.74	58.676	21.91	11.82
	295	148	332	87	473	22	
May 10.8	2.599	24.40	19.446	9.61	59.149	22.13	12.57
	310	173	345	133	487	81	
20.8	2.909	26.13	19.791	10.94	59.636	22.94	13.34
	315	191	349	175	488	138	
30.7	3.224	28.04	20.140	12.69	60.124	24.32	14.10
	313	200	344	213	476	190	
June 9.7	3.537	30.10	20.484	14.82	60.600	26.22	14.84
	302	214	330	243	449	234	
19.7	3.839	32.24	20.814	17.25	61.049	28.56	15.53
	286	217	307	269	412	276	
29.7	4.125	34.41	21.121	19.94	61.461	31.32	16.16
	260	214	277	286	365	309	
July 9.6	4.385	36.55	21.398	22.80	61.826	34.41	16.70
	230	206	240	297	309	334	
19.6	4.615	38.61	21.638	25.77	62.135	37.75	17.14
	192	195	197	301	245	353	
29.6	4.807	40.56	21.835	28.78	62.380	41.28	17.49
	153	179	152	299	177	361	
Aug. 8.5	4.960	42.35	21.987	31.77	62.557	44.89	17.73
	109	159	103	291	109	364	
18.5	5.069	43.94	22.090	34.68	62.666	48.53	17.86
	66	139	54	277	37	359	
28.5	5.135	45.33	22.144	37.45	62.703	52.12	17.85
	23	115	8	256	— 31	345	
Sept. 7.5	5.158	46.48	22.152	40.01	62.672	55.57	17.75
	16	94	36	234	96	326	
17.4	5.142	47.42	22.116	42.35	62.576	58.83	17.55
	51	69	76	204	154	300	
27.4	5.091	48.11	22.040	44.39	62.422	61.83	17.24
	82	47	110	173	207	266	
Oct. 7.4	5.009	48.58	21.930	46.12	62.215	64.49	16.84
	103	25	136	140	250	229	
17.4	4.906	48.83	21.794	47.52	61.965	66.78	16.36
	121	5	156	101	285	185	
27.3	4.785	48.88	21.638	48.53	61.680	68.63	15.82
	130	15	169	63	311	136	
Nov. 6.3	4.655	48.73	21.469	49.16	61.369	69.99	15.23
	131	34	173	22	325	84	
16.3	4.524	48.39	21.296	49.38	61.044	70.83	14.60
	127	50	172	— 20	330	29	
26.2	4.397	47.89	21.124	49.18	60.714	71.12	13.96
	117	67	163	60	325	— 27	
Dec. 6.2	4.280	47.22	20.961	48.58	60.389	70.85	13.33
	103	78	151	100	309	83	
16.2	4.177	46.44	20.810	47.58	60.080	70.02	12.71
	85	90	131	136	285	137	
26.2	4.092	45.54	20.679	46.22	59.795	68.65	12.13
	63	98	108	168	249	186	
36.1	4.029	44.56	20.571	44.54	59.546	66.79	11.61
Mean Place	0.805	20.84	17.996	13.86	58.365	30.65	12.885
Sec δ, Tan δ	1.005	+0.101	1.189	+0.644	1.876	+1.588	3.225
$D_\psi \alpha$, $D_\omega \alpha$	+0.06	−0.01	+0.05	−0.04	+0.04	−0.09	+0.02
$D_\psi \delta$, $D_\omega \delta$	+0.3	−0.5	+0.3	−0.5	+0.4	−0.5	+0.4

FOR THE UPPER TRANSIT AT WASHINGTON.

ight ension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
		θ Aquarii. Mag. 4.3		α Tucanæ. Mag. 2.9				γ Aquarii. Mag. 4.0				31 Pegasi. Mag. 4.9			
m		° ′		h m		° ′		h m		° ′		h m		° ′	
12		− 8 11		22 12		−60 39		22 17		− 1 47		22 17		+11 47	
		"		s		"		s		"		s		"	
539	46	48.32	40	49.49	17	95.38	200	22.420	51	78.50	67	26.094	59	18.17	118
493	21	48.72	31	49.32	12	93.38	235	22.369	26	79.17	62	26.035	35	16.99	123
472	—	49.03	18	49.20	5	91.03	266	22.343	2	79.79	54	26.000	10	15.76	124
477	5	49.21	5	49.15	—	88.37	290	22.341	—	80.33	42	25.990	—	14.52	118
510	33	49.26	—	49.17	2	85.47	307	22.368	27	80.75	26	26.009	19	13.34	107
	63		11		8				55				50		
573		49.15		49.25		82.40		22.423		81.01		26.059		12.27	
366	93	48.84	31	49.39	14	79.24	316	22.509	86	81.09	8	26.142	83	11.37	90
792	126	48.31	53	49.59	20	76.04	320	22.628	119	80.94	15	26.258	116	10.72	65
950	158	47.54	77	49.85	26	72.88	316	22.779	151	80.55	39	26.409	151	10.35	37
139	189	46.56	98	50.18	33	69.82	306	22.962	183	79.88	67	26.594	185	10.30	5
	221		121		38		291		216		92		217		29
360		45.35		50.56		66.91		23.178		78.96		26.811		10.59	
610	250	43.93	142	50.99	43	64.22	269	23.423	245	77.77	119	27.059	248	11.25	66
884	274	42.32	161	51.47	48	61.80	242	23.693	270	76.34	143	27.335	276	12.25	100
179	295	40.58	174	51.98	51	59.70	210	23.984	291	74.70	164	27.627	292	13.57	132
490	311	38.73	185	52.52	54	57.97	173	24.291	307	72.91	179	27.937	310	15.19	162
	317		191		55		132		314		193		317		187
807		36.82		53.07		56.65		24.605		70.98		28.254		17.06	
124	317	34.91	191	53.62	55	55.78	87	24.920	315	68.99	199	28.570	316	19.14	208
432	308	33.04	187	54.15	53	55.36	42	25.227	307	66.98	201	28.877	307	21.36	222
726	294	31.26	178	54.65	50	55.40	—	25.519	292	65.01	197	29.169	292	23.66	230
996	270	29.62	164	55.11	46	55.90	4	25.788	269	63.12	189	29.437	268	25.99	233
	241		147		42		50		240		176		238		230
237		28.15		55.53		56.83	93	26.028		61.36		29.675		28.29	
441	204	26.90	125	55.88	35	58.19	136	26.232	204	59.77	159	29.877	202	30.51	222
605	164	25.86	104	56.16	28	59.90	171	26.397	165	58.37	140	30.037	160	32.60	209
726	121	25.06	80	56.35	19	61.90	200	26.520	123	57.19	118	30.156	119	34.54	194
802	76	24.48	58	56.46	11	64.10	220	26.599	79	56.23	96	30.232	76	36.27	173
	33		35		2		238		37		72		32		152
835		24.13		56.48	—	66.48		26.636		55.51		30.264	—	37.79	
827	8	24.01	12	56.42	6	68.88	240	26.633	3	55.00	51	30.256	8	39.06	127
783	44	24.06	—	56.28	14	71.22	234	26.592	41	54.71	29	30.213	43	40.10	104
707	76	24.28	5	56.07	21	73.41	219	26.521	71	54.61	10	30.138	75	40.88	78
607	100	24.63	22	55.81	26	75.34	193	26.426	95	54.68	—	30.040	98	41.42	54
	119		35		31		160		114		23		118		28
488		25.07		55.50		76.94		26.312		54.91		29.922		41.70	
360	128	25.58	51	55.15	35	78.13	119	26.189	123	55.26	35	29.794	128	41.74	—
229	131	26.14	56	54.80	35	78.86	73	26.062	127	55.72	46	29.662	132	41.54	4
102	127	26.72	58	54.45	35	79.10	—	25.937	125	56.27	55	29.532	130	41.13	20
986	116	27.30	58	54.11	34	78.83	27	25.822	115	56.89	62	29.408	124	40.49	41
	103		55		30		79		104		66		110		64
883		27.85		53.81		78.04		25.718		57.55		29.298		39.66	83
798	85	28.37	52	53.55	26	76.76	128	25.631	87	58.24	69	29.204	94	38.68	98
735	63	28.83	46	53.33	22	75.04	172	25.565	66	58.93	69	29.128	76	37.54	114
295		49.13		49.495		85.05		22.185		81.22		25.960		11.51	
010		−0.144		2.042		−1.780		1.000		−0.031		1.022		+0.209	
06		+0.01		+0.08		+0.11		+0.06		0.00		+0.06		−0.01	
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 Lac Mag.
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.
	h m s 22 20	° ′ ″ +51 48	h m s 22 21	° ′ ″ + 0 57	h m s 22 26	° ′ ″ −11 5	h m s 22 27
Jan. 1.2	16.946	63.41	2.526	24.30	15.710	70.69	51.662
	184	198	54	77	56	26	175
11.1	16.762	61.43	2.472	23.53	15.654	70.95	51.487
	144	233	30	75	32	16	141
21.1	16.618	59.10	2.442	22.78	15.622	71.11	51.346
	99	261	6	67	8	2	98
31.1	16.519	56.49	2.436	22.11	15.614	71.13	51.248
	46	277	22	58	21	13	50
Feb. 10.0	16.473	53.72	2.458	21.53	15.635	71.00	51.198
	10	281	50	43	48	33	3
20.0	16.483	50.91	2.508	21.10	15.683	70.67	51.201
	69	275	83	23	80	51	59
Mar. 2.0	16.552	48.16	2.591	20.87	15.763	70.16	51.260
	131	255	114	2	112	73	118
12.0	16.683	45.61	2.705	20.85	15.875	69.43	51.378
	192	226	147	25	145	93	177
21.9	16.875	43.35	2.852	21.10	16.020	68.50	51.555
	250	188	180	51	178	116	235
31.9	17.125	41.47	3.032	21.61	16.198	67.34	51.790
	304	140	212	80	211	136	296
Apr. 10.9	17.429	40.07	3.244	22.41	16.409	65.98	52.076
	350	88	241	108	241	155	333
20.9	17.779	39.19	3.485	23.49	16.650	64.43	52.409
	389	33	269	134	269	171	370
30.8	18.168	38.86	3.754	24.83	16.919	62.72	52.779
	416	24	289	158	291	183	401
May 10.8	18.584	39.10	4.043	26.41	17.210	60.89	53.180
	434	80	305	176	308	190	419
20.8	19.018	39.90	4.348	28.17	17.518	58.99	53.599
	438	134	313	192	318	194	426
30.7	19.456	41.24	4.661	30.09	17.836	57.05	54.025
	430	184	315	201	320	192	422
June 9.7	19.886	43.08	4.976	32.10	18.156	55.13	54.447
	414	228	306	205	315	185	407
19.7	20.300	45.36	5.282	34.15	18.471	53.28	54.854
	384	267	293	205	300	174	380
29.7	20.684	48.03	5.575	36.20	18.771	51.54	55.234
	346	299	269	199	281	156	346
July 9.6	21.030	51.02	5.844	38.19	19.052	49.98	55.580
	299	323	242	189	251	138	302
19.6	21.329	54.25	6.086	40.08	19.303	48.60	55.882
	245	339	206	174	217	115	251
29.6	21.574	57.64	6.292	41.82	19.520	47.45	56.133
	188	348	167	154	178	92	196
Aug. 8.6	21.762	61.12	6.459	43.36	19.698	46.53	56.329
	127	350	125	135	135	66	138
18.5	21.889	64.62	6.584	44.71	19.833	45.87	56.467
	66	345	82	112	92	41	79
28.5	21.955	68.07	6.666	45.83	19.925	45.46	56.546
	5	332	40	90	47	17	21
Sept. 7.5	21.960	71.39	6.706	46.73	19.972	45.29	56.567
	53	313	0	66	5	3	34
17.4	21.907	74.52	6.706	47.39	19.977	45.32	56.533
	105	288	37	45	32	23	86
27.4	21.802	77.40	6.669	47.84	19.945	45.55	56.447
	151	256	69	23	66	37	131
Oct. 7.4	21.651	79.96	6.600	48.07	19.879	45.92	56.316
	189	219	92	5	92	49	169
17.4	21.462	82.15	6.508	48.12	19.787	46.41	56.147
	223	178	112	12	112	58	201
27.3	21.239	83.93	6.396	48.00	19.675	46.99	55.946
	244	132	122	29	124	62	224
Nov. 6.3	20.995	85.25	6.274	47.71	19.551	47.61	55.722
	260	83	126	41	129	64	239
16.3	20.735	86.08	6.148	47.30	19.422	48.25	55.483
	265	31	125	52	128	62	246
26.3	20.470	86.39	6.023	46.78	19.294	48.87	55.237
	263	22	116	63	119	59	245
Dec. 6.2	20.207	86.17	5.907	46.15	19.175	49.46	54.992
	252	76	105	71	109	53	237
16.2	19.955	85.41	5.802	45.44	19.066	49.99	54.755
	234	127	90	75	92	45	220
26.2	19.721	84.14	5.712	44.69	18.974	50.44	54.535
	204	173	69	78	72	36	197
36.1	19.517	82.41	5.643	43.91	18.902	50.80	54.338
Mean Place	17.636	46.37	2.291	20.70	15.390	70.87	52.200
Sec δ, Tan δ	1.618	+1.272	1.000	+0.017	1.019	−0.196	1.551
$D_\psi\, \alpha$, $D_\omega\, \alpha$	+0.05	−0.08	+0.06	0.00	+0.06	+0.01	+0.05
$D_\psi\, \delta$, $D_\omega\, \delta$	+0.4	−0.4	+0.4	−0.4	+0.4	−0.4	+0.4

FOR THE UPPER TRANSIT AT WASHINGTON.

	υ Aquarii. Mag. 5.3		226 B. Cephei. Mag. 5.7		η Aquarii. Mag. 4.1		10 Lacertæ. Mag. 4.9	
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.
	h m	° ′	h m	° ′	h m	° ′	h m	° ′
	22 30	−21 7	22 30	+75 47	22 31	− 0 32	22 35	+38 36
	s	″	s	″	s	″	s	″
.2	9.663	64.66	45.96	76.42	5.799	40.91	31.956	79.34
.1	9.601 62	64.51 15	45.29 67	74.68 174	5.739 60	41.61 70	31.830 126	77.63 171
.1	9.562 39	64.17 34	44.72 57	72.44 224	5.701 38	42.27 66	31.729 101	75.62 201
.1	9.551 11	63.64 53	44.27 45	69.80 264	5.688 13	42.86 59	31.662 67	73.42 220
.1	9.568 17	62.89 75	43.98 29	66.87 293	5.701 13	43.34 48	31.631 31	71.10 232
	46	93	15	312	40	34	10	233
.0	9.614	61.96	43.83	63.75	5.741	43.68	31.641	68.77
.0	9.693 79	60.82 114	43.85 2	60.58 317	5.813 72	43.81 13	31.696 55	66.52 225
.0	9.806 113	59.50 132	44.04 19	57.51 307	5.917 104	43.73 8	31.797 101	64.46 206
.9	9.953 147	57.99 151	44.38 34	54.63 288	6.054 137	43.40 33	31.945 148	62.67 179
.9	10.135 182	56.31 168	44.88 50	52.08 255	6.226 172	42.80 60	32.141 196	61.25 142
	216	180	64	213	204	87	240	99
.9	10.351	54.51	45.52	49.95	6.430	41.93	32.381	60.26
.9	10.598 247	52.60 191	46.28 76	48.32 163	6.665 235	40.79 114	32.660 279	59.74 52
.8	10.873 275	50.61 199	47.12 84	47.24 108	6.929 264	39.41 138	32.975 315	59.71 3
.8	11.173 300	48.59 202	48.03 91	46.76 48	7.215 286	37.79 162	33.318 343	60.20 49
.8	11.491 318	46.59 200	48.97 94	46.88 12	7.519 304	36.01 178	33.678 360	61.17 97
	329	194	95	72	313	193	370	144
.8	11.820	44.65	49.92	47.60	7.832	34.08	34.048	62.61
.7	12.153 333	42.83 182	50.85 93	48.90 130	8.147 315	32.07 201	34.418 370	64.47 186
.7	12.482 329	41.19 164	51.74 89	50.74 184	8.458 311	30.03 204	34.778 360	66.72 225
.7	12.797 315	39.74 145	52.56 82	53.07 233	8.755 297	28.01 202	35.119 341	69.27 255
.6	13.091 294	38.55 119	53.28 72	55.83 276	9.031 276	26.06 195	35.431 312	72.07 280
	266	95	62	313	248	183	278	298
.6	13.357	37.60	53.90	58.96	9.279	24.23	35.709	75.05
.6	13.587 230	36.94 66	54.40 50	62.38 342	9.494 215	22.56 167	35.945 236	78.15 310
.6	13.777 190	36.58 36	54.76 36	66.00 362	9.670 176	21.07 149	36.135 190	81.29 314
.5	13.923 146	36.49 9	54.99 23	69.75 375	9.805 135	19.80 127	36.276 141	84.40 311
.5	14.023 100	36.67 18	55.08 9	73.57 382	9.898 93	18.76 104	36.367 91	87.41 301
	53	42	5	380	50	81	40	288
.5	14.076	37.09	55.03	77.37	9.948	17.95	36.407	90.29
.4	14.085 9	37.70 61	54.84 19	81.07 370	9.957 9	17.37 58	36.401 6	92.96 267
.4	14.052 33	38.48 78	54.53 31	84.59 352	9.929 28	17.00 37	36.352 49	95.40 244
.4	13.983 69	39.36 88	54.10 43	87.86 327	9.869 60	16.84 16	36.264 88	97.53 213
.4	13.887 96	40.29 93	53.56 54	90.80 294	9.785 84	16.86 2	36.143 121	99.33 180
	120	94	64	255	104	19	146	144
.3	13.767	41.23	52.92	93.35	9.681	17.05	35.997	100.77
.3	13.635 132	42.12 89	52.21 71	95.44 209	9.563 118	17.38 33	35.831 166	101.81 104
.3	13.496 139	42.92 80	51.45 76	97.01 157	9.440 123	17.82 44	35.654 177	102.42 61
.3	13.358 138	43.60 68	50.65 80	98.02 101	9.318 122	18.36 54	35.471 183	102.59 17
.2	13.226 132	44.14 54	49.83 82	98.42 40	9.202 116	18.98 62	35.289 182	102.32 27
	118	37	82	22	107	68	175	72
.2	13.108	44.51	49.01	98.20	9.095	19.66	35.114	101.60
.2	13.006 102	44.68 17	48.23 78	97.38 82	9.003 92	20.38 72	34.952 162	100.46 114
.1	12.926 80	44.68 0	47.52 71	95.96 142	8.928 75	21.11 73	34.808 144	98.95 151
ace	9.299	62.09	49.232	55.01	5.504	44.30	32.103	64.45
an ∂	1.072	−0.386	4.078	+3.953	1.000	−0.009	1.280	+0.799
″ α	+0.06	+0.02	+0.02	−0.24	+0.06	0.00	+0.05	−0.05
″ ∂	*+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 Pega Mag. 3
		Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.
		h m s	° ′ ″	h m s	° ′ ″	h m s	° ′ ″	h m s
		22 36	−27 28	22 37	+10 23	22 37	−47 18	22 39
Jan.	1.2	4.445	41.72	19.577	58.55	43.390	77.70	6.608
		74	40	69	106	127	125	102
	11.1	4.371	41.32	19.508	57.49	43.263	76.45	6.506
		50	66	50	112	91	161	78
	21.1	4.321	40.66	19.458	56.37	43.172	74.84	6.428
		22	88	25	112	52	193	53
	31.1	4.299	39.78	19.433	55.25	43.120	72.91	6.376
		8	111	1	107	10	221	20
Feb.	10.1	4.307	38.67	19.434	54.18	43.110	70.70	6.356
		41	133	31	96	34	262	16
	20.0	4.348	37.34	19.465	53.22	43.144	68.28	6.372
		74	152	62	79	78	262	54
Mar.	2.0	4.422	35.82	19.527	52.43	43.222	65.66	6.426
		109	171	96	58	124	274	94
	12.0	4.531	34.11	19.623	51.85	43.346	62.92	6.520
		144	186	132	30	171	281	137
	21.9	4.675	32.25	19.755	51.55	43.517	60.11	6.657
		181	199	167	1	217	284	179
	31.9	4.856	30.26	19.922	51.54	43.734	57.27	6.836
		217	210	202	33	262	280	219
Apr.	10.9	5.073	28.16	20.124	51.87	43.996	54.47	7.055
		251	216	234	67	303	271	257
	20.9	5.324	26.00	20.358	52.54	44.299	51.76	7.312
		281	218	264	99	342	256	288
	30.8	5.605	23.82	20.622	53.53	44.641	49.20	7.600
		307	215	287	132	374	227	315
May	10.8	5.912	21.67	20.909	54.85	45.015	46.83	7.915
		327	207	306	160	399	210	338
	20.8	6.239	19.60	21.215	56.45	45.414	44.73	8.248
		339	195	315	184	415	180	344
	30.8	6.578	17.65	21.530	58.29	45.829	42.93	8.592
		345	178	319	202	421	147	345
June	9.7	6.923	15.87	21.849	60.31	46.250	41.46	8.937
		341	154	314	218	418	108	338
	19.7	7.264	14.33	22.163	62.49	46.668	40.38	9.275
		330	129	299	225	403	67	322
	29.7	7.594	13.04	22.462	64.74	47.071	39.71	9.597
		308	101	280	227	379	24	297
July	9.6	7.902	12.03	22.742	67.01	47.450	39.47	9.894
		280	69	251	224	344	17	265
	19.6	8.182	11.34	22.993	69.25	47.794	39.64	10.159
		244	36	217	215	300	58	228
	29.6	8.426	10.98	23.210	71.40	48.094	40.22	10.387
		202	5	179	204	247	95	187
Aug.	8.6	8.628	10.93	23.389	73.44	48.341	41.17	10.574
		157	26	139	187	189	131	142
	18.5	8.785	11.19	23.528	75.31	48.530	42.48	10.716
		108	52	96	167	129	160	95
	28.5	8.893	11.71	23.624	76.98	48.659	44.08	10.811
		60	78	53	146	66	180	49
Sept.	7.5	8.953	12.49	23.677	78.44	48.725	45.88	10.860
		13	97	13	123	2	195	6
	17.5	8.966	13.46	23.690	79.67	48.727	47.83	10.866
		31	112	24	99	55	201	34
	27.4	8.935	14.58	23.666	80.66	48.672	49.84	10.832
		70	119	55	74	107	199	70
Oct.	7.4	8.865	15.77	23.611	81.40	48.565	51.83	10.762
		101	120	82	51	151	187	98
	17.4	8.764	16.97	23.529	81.91	48.414	53.70	10.664
		126	116	102	26	185	166	123
	27.3	8.638	18.13	23.427	82.17	48.229	55.36	10.541
		141	106	117	5	211	140	139
Nov.	6.3	8.497	19.19	23.310	82.22	48.018	56.76	10.402
		149	92	122	19	224	106	149
	16.3	8.348	20.11	23.188	82.03	47.794	57.82	10.253
		150	72	125	38	226	68	154
	26.3	8.198	20.83	23.063	81.65	47.568	58.50	10.099
		144	51	122	57	220	26	152
Dec.	6.2	8.054	21.34	22.941	81.08	47.348	58.76	9.947
		132	26	112	76	203	16	145
	16.2	7.922	21.60	22.829	80.32	47.145	58.60	9.802
		114	3	100	89	180	58	134
	26.2	7.808	21.63	22.729	79.43	46.965	58.02	9.668
		93	24	84	102	151	99	117
	36.2	7.715	21.39	22.645	78.41	46.814	57.03	9.551
Mean Place		4.046	37.50	19.326	51.67	43.040	68.97	6.566
Sec δ, Tan δ		1.127	−0.520	1.017	+0.184	1.475	−1.084	1.152
*D*ψ *a*, *D*ω *a*		+0.07	+0.03	+0.06	−0.01	+0.07	+0.07	+0.06
*D*ψ *δ*, *D*ω *δ*		+0.4	−0.4	+0.4	−0.1	+0.4	−0.4	+0.4

FOR THE UPPER TRANSIT AT WASHINGTON.

	λ Pegasi. Mag. 4.1		ε Gruis. Mag. 3.7		τ Aquarii. Mag. 4.2		μ Pegasi. Mag. 3.7	
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.
	h m	° ′	h m	° ′	h m	° ′	h m	° ′
	22 42	+23 7	22 43	−51 44	22 45	−14 1	22 45	+24 9
	s	″	s	″	s	″	s	″
2	32.038 90	53.67 128	33.185 155	82.36 138	12.378 68	51.86 18	59.914 94	58.15 138
1	31.948 68	52.29 154	33.030 116	80.98 177	12.310 48	52.04 3	59.820 72	56.77 155
1	31.880 44	50.75 166	32.914 74	79.21 212	12.262 24	52.07 13	59.748 48	55.22 168
1	31.836 14	49.09 168	32.840 27	77.09 241	12.238 1	51.94 33	59.700 18	53.54 170
1	31.822 18	47.41 162	32.813 20	74.68 265	12.239 30	51.61 51	59.682 15	51.84 166
0	31.840	45.79	32.833	72.03	12.269	51.10	59.697	50.18
0	31.893 53	44.28 151	32.903 70	69.21 282	12.329 60	50.38 72	59.745 48	48.63 155
0	31.983 90	42.99 129	33.023 120	66.27 294	12.420 91	49.46 92	59.833 88	47.27 136
0	32.113 130	41.96 103	33.194 171	63.26 301	12.548 128	48.32 114	59.960 127	46.19 108
0	32.282 169	41.27 69	33.416 222	60.25 301	12.709 161	46.99 133	60.127 167	45.44 75
	208	31	272	296	196	153	206	39
0	32.490	40.96	33.688	57.29	12.905	45.46	60.333	45.05
0	32.733 243	41.05 9	34.005 317	54.44 285	13.133 228	43.75 171	60.574 241	45.08 3
3	33.007 274	41.55 50	34.365 360	51.77 267	13.393 260	41.92 183	60.847 273	45.53 45
3	33.307 300	42.46 91	34.761 396	49.33 244	13.676 283	39.98 194	61.147 300	46.38 85
3	33.626 319	43.76 130	35.183 422	47.18 215	13.980 304	37.98 200	61.466 319	47.64 126
	330	166	442	181	318	200	332	162
3	33.956	45.42	35.625	45.37 144	14.298	35.98	61.798	49.26
7	34.289 333	47.37 195	36.076 451	43.93 102	14.621 323	34.02 196	62.133 335	51.18 192
7	34.616 327	49.59 222	36.524 448	42.91 59	14.942 321	32.16 186	62.463 330	53.38 220
7	34.928 312	52.00 241	36.959 435	42.32 14	15.252 310	30.45 171	62.779 316	55.78 240
3	35.219 291	54.56 256	37.367 408	42.18 31	15.545 293	28.92 153	63.073 294	58.34 256
	261	261	373		265	133	265	264
3	35.480	57.17	37.740	42.49	15.810	27.59	63.338	60.98
3	35.706 226	59.80 263	38.066 326	43.22 73	16.044 234	26.54 105	63.569 231	63.63 265
3	35.893 187	62.38 258	38.337 271	44.36 114	16.239 195	25.74 80	63.760 191	66.24 261
5	36.037 144	64.87 249	38.547 210	45.84 148	16.394 155	25.20 54	63.907 147	68.77 253
5	36.137 100	67.22 235	38.690 143	47.63 179	16.504 110	24.94 26	64.010 103	71.17 240
	55	215	75	200	66	2	60	222
5	36.192	69.37	38.765	49.63	16.570	24.92	64.070	73.39
5	36.206 14	71.31 194	38.771 6	51.79 216	16.594 24	25.14 22	64.087 17	75.38 199
4	36.181 25	73.00 169	38.714 57	53.99 220	16.579 15	25.54 40	64.066 21	77.13 175
4	36.122 59	74.43 143	38.599 115	56.14 215	16.529 50	26.09 55	64.011 55	78.62 149
4	36.036 86	75.56 113	38.434 165	58.17 203	16.449 80	26.76 67	63.926 85	79.80 118
	110	83	208	180	101	75	107	90
3	35.926	76.39	38.228	59.97	16.348	27.51	63.819	80.70
3	35.802 124	76.91 52	37.994 234	61.46 149	16.230 118	28.27 76	63.694 125	81.27 57
3	35.668 134	77.11 20	37.743 251	62.59 113	16.105 125	29.02 75	63.560 134	81.51 24
3	35.529 139	76.98 13	37.486 257	63.30 71	15.978 127	29.72 70	63.421 139	81.42 9
2	35.392 137	76.55 43	37.234 252	63.56 26	15.855 123	30.35 63	63.283 138	81.02 40
	130	74	230	20	113	54	133	71
2	35.262	75.81	36.998	63.36	15.742	30.89	63.150	80.31
2	35.143 119	74.79 102	36.786 212	62.69 67	15.640 102	31.31 42	63.029 121	79.31 100
2	35.039 104	73.52 127	36.605 181	61.58 111	15.556 84	31.58 27	62.922 107	78.04 127
e	31.883	42.77	32.835	72.77	11.957	51.42	59.749	46.83
δ	*1.087*	*+0.427*	*1.615*	*−1.269*	1.031	−0.250	1.096	+0.449
	+0.06	*−0.03*	*+0.07*	+0.08	+0.06	+0.02	+0.06	−0.03
	+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.	ι Cephei. Mag. 3.7		λ Aquarii. Mag. 3.8		ρ Indi. Mag. 6.1		δ Aquarii. Mag. 3.	
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.
	h m s 22 46	° ′ ″ +65 45	h m s 22 48	° ′ ″ − 8 0	h m s 22 48	° ′ ″ −70 30	h m s 22 50	° ′ ″
Jan. 1.2	42.05	70.14	17.530	76.29	53.93	75.09	15.260	
	36	166	69	41	39	204	73	
11.1	41.69	68.48	17.461	76.70	53.54	73.05	15.187	
	31	214	50	31	31	250	54	
21.1	41.38	66.34	17.411	77.01	53.23	70.55	15.133	
	26	254	27	18	22	287	30	
31.1	41.12	63.80	17.384	77.19	53.01	67.68	15.103	
	17	282	3	3	13	318	5	
Feb. 10.1	40.95	60.98	17.381	77.22	52.88	64.50	15.098	
	9	299	26	15	4	339	24	
20.0	40.86	57.99	17.407	77.07	52.84	61.11	15.122	
	0	304	56	34	5	356	54	
Mar. 2.0	40.86	54.95	17.463	76.73	52.89	57.55	15.176	
	10	297	87	55	15	361	88	
12.0	40.96	51.98	17.550	76.18	53.04	53.94	15.264	
	21	276	122	79	26	359	122	
22.0	41.17	49.22	17.672	75.39	53.30	50.35	15.386	
	29	245	157	102	34	350	158	
31.9	41.46	46.77	17.829	74.37	53.64	46.85	15.544	
	38	204	190	126	43	335	192	
Apr. 10.9	41.84	44.73	18.019	73.11	54.07	43.50	15.736	
	46	155	224	145	51	311	227	
20.9	42.30	43.18	18.243	71.66	54.58	40.39	15.963	
	52	102	254	166	59	283	257	
30.8	42.82	42.16	18.497	70.00	55.17	37.56	16.220	
	56	43	280	181	65	246	283	
May 10.8	43.38	41.73	18.777	68.19	55.82	35.10	16.503	
	60	16	300	192	69	206	306	
20.8	43.98	41.89	19.077	66.27	56.51	33.04	16.809	
	61	74	313	198	73	161	319	
30.8	44.59	42.63	19.390	64.29	57.24	31.43	17.128	
	61	130	319	201	75	112	326	
June 9.7	45.20	43.93	19.709	62.28	57.99	30.31	17.454	
	59	183	317	196	74	61	324	
19.7	45.79	45.76	20.026	60.32	58.73	29.70	17.778	
	56	231	305	188	72	9	315	
29.7	46.35	48.07	20.331	58.44	59.45	29.61	18.093	
	50	272	289	175	67	45	296	
July 9.7	46.85	50.79	20.620	56.69	60.12	30.06	18.389	
	45	308	262	156	62	94	271	
19.6	47.30	53.87	20.882	55.13	60.74	31.00	18.660	
	37	334	232	136	54	142	240	
29.6	47.67	57.21	21.114	53.77	61.28	32.42	18.900	
	30	356	194	112	45	184	201	
Aug. 8.6	47.97	60.77	21.308	52.65	61.73	34.26	19.101	
	21	367	153	88	34	220	160	
18.5	48.18	64.44	21.461	51.77	62.07	36.46	19.261	
	12	372	111	62	22	248	116	
28.5	48.30	68.16	21.572	51.15	62.29	38.94	19.377	
	4	370	68	39	10	267	72	
Sept. 7.5	48.34	71.86	21.640	50.76	62.39	41.61	19.449	
	4	359	27	14	1	276	28	
17.5	48.30	75.45	21.667	50.62	62.38	44.37	19.477	
	12	341	12	6	15	274	12	
27.4	48.18	78.86	21.655	50.68	62.23	47.11	19.465	
	19	316	45	25	26	261	46	
Oct. 7.4	47.99	82.02	21.610	50.93	61.97	49.72	19.419	
	27	286	74	39	35	238	77	
17.4	47.72	84.88	21.536	51.32	61.62	52.10	19.342	
	32	246	94	50	43	203	100	
27.4	47.40	87.34	21.442	51.82	61.19	54.13	19.242	
	36	201	110	58	50	161	117	
Nov. 6.3	47.04	89.35	21.332	52.40	60.69	55.74	19.125	
	40	152	120	63	54	111	125	
16.3	46.64	90.87	21.212	53.03	60.15	56.85	19.000	
	43	96	122	65	56	56	129	
26.3	46.21	91.83	21.090	53.68	59.59	57.41	18.871	
	44	40	117	63	57	3	125	
Dec. 6.2	45.77	92.23	20.973	54.31	59.02	57.38	18.746	
	44	20	111	61	53	60	117	
16.2	45.33	92.03	20.862	54.92	58.49	56.78	18.629	
	42	79	99	56	50	118	105	
26.2	44.91	91.24	20.763	55.48	57.99	55.60	18.524	
	40	135	84	49	44	173	89	
36.2	44.51	89.89	20.679	55.97	57.55	53.87	18.435	
Mean Place	43.309	48.98	17.113	77.70	53.950	63.03	14.807	45.11
Sec δ, Tan δ	2.436	+2.222	1.010	−0.141	2.998	−2.826	1.042	−0.222
$D_\psi\,\alpha$, $D_\omega\,\alpha$	+0.04	−0.11	+0.06	+0.01	+0.08	+0.18	+0.06	+0.02
$D_\psi\,\delta$, $D_\omega\,\delta$	+0.1	−0.3	+0.4	−0.3	+0.4	−0.3	+0.4	−0.3

FOR THE UPPER TRANSIT AT WASHINGTON.

m s.	α Piscis Australis. (*Fomalhaut.*) Mag. 1.3				o Andromedæ. Mag. 3.6				β Pegasi. Var. 2.2–2.7				α Pegasi. (*Markab.*) Mag. 2.6			
	Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
	h m	s	° ′	″	h m	s	° ′	″	h m	s	° ′	″	h m	s	° ′	″
	22 53		−30 3		22 58		+41 52		22 59		+27 37		23 0		+14 45	
2	4.533	92	49.89	42	5.883	153	63.49	155	45.122	108	69.11	135	37.852	87	39.34	110
1	4.441	67	49.47	72	5.730	129	61.94	187	45.014	89	67.76	158	37.765	69	38.24	120
1	4.374	42	48.75	97	5.601	100	60.07	214	44.925	64	66.18	172	37.696	49	37.04	124
.	4.332	12	47.78	124	5.501	63	57.93	231	44.861	36	64.46	180	37.647	23	35.80	123
.	4.320	20	46.54	146	5.438	21	55.62	238	44.825	4	62.66	179	37.624	5	34.57	115
)	4.340		45.08		5.417		53.24		44.821		60.87		37.629		33.42	
)	4.394	54	43.39	169	5.441	24	50.89	235	44.854	33	59.17	170	37.667	38	32.39	103
)	4.483	89	41.52	187	5.514	73	48.69	220	44.926	72	57.63	154	37.739	72	31.57	82
)	4.610	127	39.49	203	5.639	125	46.71	198	45.040	114	56.35	128	37.848	109	31.00	57
)	4.776	166	37.31	218	5.815	176	45.05	166	45.197	157	55.38	97	37.995	147	30.73	27
		204		227		226		126		198		59		184		6
)	4.980		35.04		6.041		43.79		45.395		54.79		38.179		30.79	
)	5.221	241	32.72	232	6.313	272	42.98	81	45.631	236	54.60	19	38.400	221	31.19	40
3	5.494	273	30.38	234	6.625	312	42.66	32	45.903	272	54.84	24	38.654	254	31.95	76
3	5.797	303	28.09	229	6.970	345	42.84	18	46.205	302	55.51	67	38.934	280	33.06	111
8	6.123	326	25.91	218	7.338	368	43.53	69	46.528	323	56.59	108	39.237	303	34.48	142
		342		205		383		118		337		147		317		171
8	6.465		23.86		7.721		44.71		46.865		58.06		39.554		36.19	
7	6.817	352	22.00	186	8.108	387	46.33	162	47.208	343	59.88	182	39.877	323	38.13	194
.7	7.167	350	20.40	160	8.490	382	48.37	204	47.549	341	62.01	213	40.199	322	40.27	214
.7	7.507	340	19.07	133	8.856	366	50.75	238	47.877	328	64.38	237	40.510	311	42.53	226
.7	7.831	324	18.06	101	9.196	340	53.43	268	48.184	307	66.93	255	40.803	293	44.86	233
		296		67		307		290		280		267		268		235
.6	8.127		17.39		9.503		56.33		48.464		69.60		41.071		47.21	
.6	8.389	262	17.07	32	9.771	268	59.40	307	48.709	245	72.33	273	41.309	238	49.52	231
.6	8.610	221	17.08	1	9.993	222	62.55	315	48.916	207	75.05	272	41.509	200	51.74	222
.5	8.787	177	17.44	36	10.166	173	65.73	318	49.080	164	77.72	267	41.669	160	53.82	208
.5	8.915	128	18.09	65	10.289	123	68.86	313	49.199	119	80.27	255	41.788	119	55.74	192
		79		91		71		301		75		240		77		172
7.5	8.994	30	19.00		10.360	22	71.87	287	49.274	32	82.67	220	41.865	36	57.46	150
7.5	9.024	14	20.14	114	10.382	24	74.74	264	49.306	8	84.87	197	41.901	1	58.96	125
7.4	9.010	55	21.42	128	10.358	65	77.38	238	49.298	44	86.84	170	41.900	35	60.21	102
7.4	8.955	91	22.78	136	10.293	102	79.76	206	49.254	75	88.54	142	41.865	64	61.23	75
7.4	8.864	118	24.17	139	10.191	132	81.82	172	49.179	99	89.96	110	41.801	87	61.98	52
7.4	8.746		25.51		10.059		83.54		49.080		91.06		41.714		62.50	
6.3	8.610	136	26.73	122	9.902	157	84.86	132	48.960	120	91.84	78	41.611	103	62.75	25
6.3	8.461	149	27.80	107	9.728	174	85.77	91	48.828	132	92.28	44	41.495	116	62.77	2
6.3	8.309	152	28.66	86	9.543	185	86.22	45	48.688	140	92.37	9	41.374	121	62.53	24
6.2	8.159	150	29.26	60	9.353	190	86.22	0	48.546	142	92.11	26	41.252	122	62.07	46
		142		34		188		46		140		61		117		68
6.2	8.017		29.60		9.165		85.76		48.406		91.50		41.135		61.39	
6.2	7.891	126	29.66	6	8.984	181	84.85	91	48.274	132	90.58	92	41.024	111	60.53	86
6.2	7.782	109	29.42	24	8.816	168	83.52	133	48.155	119	89.37	121	40.925	99	59.50	103
ace	4.049		44.98		5.916		46.70		44.908		56.23		37.503		30.41	
an δ	1.155		−0.579		1.343		+0.897		1.129		+0.524		1.034		+0.264	
α	+0.06		+0.04		+0.05		−0.06		+0.06		−0.03		+0.06		−0.02	
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 Gru Mag.
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.
	h m s	° ′ ″	h m s	° ′ ″	h m s	° ′ ″	h m s
	23 2	+ 8 57	23 5	−21 36	23 5	+74 56	23 5
Jan. 1.2	49.746	46.07	1.916	86.19	13.10	42.50	40.447
	82	93	89	5	66	132	149
11.2	49.664	45.14	1.827	86.14	12.42	41.18	40.298
	65	99	68	29	60	167	118
21.1	49.599	44.15	1.759	85.85	11.82	39.31	40.180
	45	98	46	51	50	223	85
31.1	49.554	43.17	1.713	85.34	11.32	36.98	40.095
	20	94	21	74	39	271	49
Feb. 10.1	49.534	42.23	1.692	84.60	10.93	34.27	40.046
	— 6	84	— 7	96	24	296	9
20.0	49.540	41.39	1.699	83.64	10.69	31.31	40.037
	37	67	39	119	10	311	34
Mar. 2.0	49.577	40.72	1.738	82.45	10.59	28.20	40.071
	71	48	73	140	— 6	311	75
12.0	49.648	40.24	1.811	81.05	10.65	25.09	40.149
	104	22	108	161	22	298	125
22.0	49.752	40.02	1.919	79.44	10.87	22.11	40.274
	144	— 5	144	178	36	276	171
31.9	49.896	40.07	2.063	77.66	11.23	19.36	40.445
	180	36	183	193	51	240	218
Apr. 10.9	50.076	40.43	2.246	75.73	11.74	16.96	40.663
	215	68	218	206	65	196	263
20.9	50.291	41.11	2.464	73.67	12.39	15.00	40.926
	247	99	252	215	74	145	304
30.9	50.538	42.10	2.716	71.52	13.13	13.55	41.230
	274	130	280	219	82	88	341
May 10.8	50.812	43.40	2.996	69.33	13.95	12.67	41.571
	297	157	306	218	88	— 31	370
20.8	51.109	44.97	3.302	67.15	14.83	12.36	41.941
	311	179	322	210	91	28	393
30.8	51.420	46.76	3.624	65.05	15.74	12.64	42.334
	318	197	331	200	92	87	405
June 9.7	51.738	48.73	3.955	63.05	16.66	13.51	42.739
	318	212	333	184	89	144	408
19.7	52.056	50.85	4.288	61.21	17.55	14.95	43.147
	307	219	327	162	85	195	401
29.7	52.363	53.04	4.615	59.59	18.40	16.90	43.548
	292	220	310	138	78	242	383
July 9.7	52.655	55.24	4.925	58.21	19.18	19.32	43.931
	267	218	287	108	68	282	355
19.6	52.922	57.42	5.212	57.13	19.86	22.14	44.286
	238	209	255	78	60	318	317
29.6	53.160	59.51	5.467	56.35	20.46	25.32	44.603
	202	197	219	48	48	345	271
Aug. 8.6	53.362	61.48	5.686	55.87	20.94	28.77	44.874
	162	181	178	15	36	364	219
18.6	53.524	63.29	5.864	55.72	21.30	32.41	45.093
	121	180	133	15	24	377	162
28.5	53.645	64.89	5.997	55.87	21.54	36.18	45.255
	80	140	88	41	9	381	102
Sept. 7.5	53.725	66.29	6.085	56.28	21.63	39.99	45.357
	40	116	44	66	—	378	41
17.5	53.765	67.45	6.129	56.94	21.61	43.77	45.398
	3	94	2	84	2	366	— 16
27.4	53.768	68.39	6.131	57.78	21.46	47.43	45.382
	32	68	37	99	15	348	69
Oct. 7.4	53.736	69.07	6.094	58.77	21.18	50.91	45.313
	60	47	69	107	28	322	115
17.4	53.676	69.54	6.025	59.84	20.81	54.13	45.198
	83	23	95	109	37	287	154
27.4	53.593	69.77	5.930	60.93	20.33	57.00	45.044
	99	3	115	107	48	246	182
Nov. 6.3	53.494	69.80	5.815	62.00	19.77	59.46	44.862
	111	17	126	99	56	199	202
16.3	53.383	69.63	5.689	62.99	19.13	61.45	44.660
	116	36	133	87	64	144	213
26.3	53.267	69.27	5.556	63.86	18.44	62.89	44.447
	117	53	132	71	69	87	211
Dec. 6.3	53.150	68.74	5.424	64.57	17.70	63.76	44.236
	113	68	126	53	74	26	205
16.2	53.037	68.06	5.298	65.10	16.95	64.02	44.031
	106	81	116	31	74	36	190
26.2	52.931	67.25	5.182	65.41	16.21	63.66	43.841
	94	91	102	10	71	97	167
36.2	52.837	66.34	5.080	65.51	15.50	62.69	43.674
Mean Place	49.342	38.97	1.376	83.65	15.234	19.07	39.922
Sec δ, Tan δ	1.012	+0.158	1.076	−0.396	3.850	+3.718	1.432
$D_\psi a$, $D_\omega a$	+0.06	−0.01	+0.06	+0.03	+0.04	−0.24	+0.07
$D_\psi \delta$, $D_\omega \delta$	+0.4	−0.2	+0.4	−0.2	+0.4	−0.2	+0.4

FOR THE UPPER TRANSIT AT WASHINGTON.

[ing]ton [T]ime.	59 Pegasi. Mag. 5.2 Right Ascension.		Declination.		5 H¹. Cassiopeiæ. Mag. 5.6 Right Ascension.		Declination.		φ Aquarii. Mag. 4.4 Right Ascension.		Declination.		ψ Aquarii. Mag. 4.5 Right Ascension.		Declination.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	23 7		+ 8 16		23 9		+56 42		23 10		− 6 29		23 11		− 9 31	
	s		″		s		″		s		″		s		″	
1.2	33.156	84	16.17	91	16.539	252	56.74	145	1.974	81	45.88	47	33.208	82	82.75	39
11.2	33.072	67	15.26	94	16.287	221	55.29	189	1.893	67	46.35	38	33.126	65	83.14	24
21.1	33.005	49	14.32	95	16.066	181	53.40	227	1.826	44	46.73	26	33.061	46	83.38	11
31.1	32.956	24	13.37	89	15.885	131	51.13	256	1.782	22	46.99	12	33.015	23	83.49	6
10.1	32.932	1	12.48	79	15.754	73	48.57	273	1.760	2	47.11	6	32.992	2	83.43	25
20.0	32.933	33	11.69	63	15.681	6	45.84	279	1.762	33	47.05	26	32.994	33	83.18	44
2.0	32.966	66	11.06	43	15.675	62	43.05	274	1.795	66	46.79	49	33.027	65	82.74	67
12.0	33.032	102	10.63	19	15.737	136	40.31	255	1.861	98	46.30	69	33.092	97	82.07	89
22.0	33.134	137	10.44	10	15.873	206	37.76	228	1.959	135	45.61	95	33.189	135	81.18	113
31.9	33.271	176	10.54	38	16.079	276	35.48	191	2.094	171	44.66	118	33.324	172	80.05	134
10.9	33.447	211	10.92	71	16.355	339	33.57	146	2.265	208	43.48	141	33.496	206	78.71	155
20.9	33.658	243	11.63	102	16.694	393	32.11	94	2.473	239	42.07	163	33.702	238	77.16	173
30.9	33.901	271	12.65	130	17.087	438	31.17	41	2.712	267	40.44	176	33.940	269	75.43	188
10.8	34.172	294	13.95	158	17.525	470	30.76	15	2.979	291	38.68	190	34.209	291	73.55	198
20.8	34.466	310	15.53	179	17.995	491	30.91	70	3.270	307	36.78	201	34.500	309	71.57	204
30.8	34.776	318	17.32	196	18.486	497	31.61	123	3.577	317	34.77	203	34.809	318	69.53	204
9.7	35.094	318	19.28	211	18.983	490	32.84	174	3.894	318	32.74	202	35.127	320	67.49	200
19.7	35.412	309	21.39	218	19.473	469	34.58	219	4.212	312	30.72	194	35.447	315	65.49	191
29.7	35.721	294	23.57	220	19.942	439	36.77	258	4.524	295	28.78	182	35.762	299	63.58	176
9.7	36.015	269	25.77	215	20.381	397	39.35	292	4.819	273	26.96	166	36.061	278	61.82	156
19.6	36.284	241	27.92	206	20.778	348	42.27	318	5.092	246	25.30	149	36.339	248	60.26	135
29.6	36.525	205	29.98	194	21.126	291	45.45	336	5.338	209	23.81	124	36.587	214	58.91	110
8.6	36.730	167	31.92	177	21.417	230	48.81	350	5.547	172	22.57	98	36.801	176	57.81	85
18.6	36.897	126	33.69	157	21.647	165	52.31	354	5.719	133	21.59	75	36.977	134	56.96	56
28.5	37.023	85	35.26	136	21.812	100	55.85	350	5.852	88	20.84	45	37.111	93	56.40	30
t. 7.5	37.108	45	36.62	112	21.912	36	59.35	342	5.940	50	20.39	25	37.204	51	56.10	7
17.5	37.153	7	37.74	90	21.948	25	62.77	325	5.990	9	20.14	3	37.255	11	56.03	17
27.4	37.160	27	38.64	65	21.923	81	66.02	302	5.999	23	20.11	19	37.266	24	56.20	35
7.4	37.133	55	39.29	43	21.842	133	69.04	274	5.976	55	20.30	37	37.242	53	56.55	50
17.4	37.078	79	39.72	21	21.709	178	71.78	237	5.921	77	20.67	49	37.189	79	57.05	62
27.4	36.999	96	39.93	1	21.531	216	74.15	196	5.844	99	21.16	56	37.110	96	57.67	70
r. 6.3	36.903	108	39.94	20	21.315	245	76.11	151	5.745	108	21.72	64	37.014	109	58.37	73
16.3	36.795	114	39.74	36	21.070	269	77.62	100	5.637	113	22.36	67	36.905	116	59.10	73
26.3	36.681	116	39.38	52	20.801	281	78.62	47	5.524	116	23.03	68	36.789	116	59.83	69
6.3	36.565	113	38.86	68	20.520	287	79.09	8	5.408	113	23.71	67	36.673	113	60.52	65
16.2	36.452	105	38.18	79	20.233	282	79.01	63	5.295	103	24.38	63	36.560	105	61.17	57
26.2	36.347	95	37.39	88	19.951	269	78.38	115	5.192	94	25.01	56	36.455	94	61.74	48
36.2	36.252		36.51		19.682		77.23		5.098		25.57		36.361		62.22	
Place	32.720		9.18		16.897		35.99		1.450		48.06		32.666		83.99	
Tan δ	1.011		+0.145		1.822		+1.523		1.006		−0.114		1.014		−0.168	
D_m α	+0.06		−0.01		+0.05		−0.10		+0.06		+0.01		+0.06		+0.01	
D_m 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		o Cephe Mag. 4.5	
		Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	D
		h m s	° ′ ″	h m s	° ′ ″	h m s	° ′ ″	h m s	
		23 12	−58 40	23 12	+ 2 49	23 14	−32 58	23 15	
Jan.	1.2	36.035	99.83	52.229	48.24	21.281	69.56	11.75	4
	11.2	35.791 244	98.44 139	52.147 82	47.49 75	21.168 113	69.14 42	11.32 43	4
	21.1	35.588 203	96.59 185	52.081 66	46.75 74	21.075 93	68.39 75	10.93 39	4
	31.1	35.431 157	94.33 226	52.033 48	46.07 68	21.008 67	67.34 105	10.60 33	4
Feb.	10.1	35.326 105	91.72 261	52.008 25	45.47 60	20.967 41	66.00 134	10.35 25	4
		49	288	0	48	8	161	16	
	20.1	35.277	88.84	52.008	44.99 29	20.959	64.39	10.19	3
Mar.	2.0	35.285 8	85.72 312	52.038 30	44.70 11	20.985 26	62.55 184	10.12 7	3
	12.0	35.354 69	82.46 326	52.100 62	44.59 15	21.048 63	60.49 206	10.16 4	3
	22.0	35.485 131	79.12 334	52.197 97	44.74 40	21.150 102	58.26 223	10.30 14	2
	31.9	35.680 195	75.77 335	52.331 134	45.14 69	21.291 141	55.89 237	10.55 25	2
		255	331	170		183	246	35	
Apr.	10.9	35.935	72.46	52.501	45.83	21.474	53.43	10.90	2
	20.9	36.249 314	69.28 318	52.707 206	46.78 95	21.697 223	50.91 252	11.34 44	2
	30.9	36.617 368	66.29 299	52.945 238	48.02 124	21.957 260	48.39 252	11.85 51	2
May	10.8	37.033 416	63.55 274	53.213 268	49.50 148	22.251 294	45.92 247	12.43 58	2
	20.8	37.490 457	61.12 243	53.503 290	51.20 170	22.571 320	43.56 236	13.06 63	2
		487	206	309	188	341	219	65	
	30.8	37.977	59.06	53.812	53.08	22.912	41.37	13.71	2
June	9.8	38.482 505	57.42 164	54.128 316	55.08 200	23.267 355	39.38 199	14.37 66	2
	19.7	38.993 511	56.23 119	54.447 319	57.15 207	23.625 358	37.67 171	15.02 65	2
	29.7	39.498 505	55.52 71	54.758 311	59.26 211	23.976 351	36.26 141	15.65 63	2
July	9.7	39.981 483	55.30 22	55.054 296	61.32 206	24.314 338	35.20 106	16.23 58	2
		450	29	274	199	314	69	53	
	19.6	40.431	55.59	55.328	63.31	24.628	34.51	16.76	2
	29.6	40.835 404	56.36 77	55.573 245	65.18 187	24.911 283	34.19 32	17.22 46	3
Aug.	8.6	41.181 346	57.58 122	55.784 211	66.86 168	25.155 244	34.24 5	17.61 39	3
	18.6	41.460 279	59.21 163	55.958 174	68.36 150	25.355 200	34.66 42	17.90 29	4
	28.5	41.666 206	61.19 198	56.090 132	69.63 127	25.507 152	35.42 76	18.11 21	4
		127	226	93	104	103	105	12	
Sept.	7.5	41.793 47	63.45 243	56.183 52	70.67 80	25.610 53	36.47 129	18.23 4	4
	17.5	41.840 30	65.88 232	56.235 14	71.47 58	25.663 6	37.76 146	18.27 5	5
	27.5	41.810 104	68.40 250	56.249 20	72.05 35	25.669 38	39.22 157	18.22 14	5
Oct.	7.4	41.706 169	70.90 239	56.229 49	72.40 14	25.631 76	40.79 160	18.08 22	5
	17.4	41.537	73.29	56.180	72.54 5	25.555	42.39	17.86	6
		225	216	73		108	156	28	
	27.4	41.312	75.45 185	56.107	72.49	25.447	43.95	17.58	6
Nov.	6.3	41.042 270	77.30 145	56.016 91	72.27 22	25.316 131	45.39 144	17.24 34	6
	16.3	40.741 301	78.75 100	55.913 103	71.91 36	25.169 147	46.65 126	16.85 39	6
	26.3	40.423 318	79.75 50	55.804 109	71.43 48	25.013 156	47.68 103	16.42 43	6
Dec.	6.3	40.099 324	80.25 3	55.692 112	70.84 59	24.855 158	48.43 75	15.96 46	7
		316		109	66	154	46	47	
	16.2	39.783	80.22	55.583	70.18	24.701	48.89	15.49	7
	26.2	39.486 297	79.66 56	55.480 103	69.44 74	24.557 144	49.01 12	15.02 47	7
	36.2	39.216 270	78.60 106	55.386 94	68.68 76	24.429 128	48.80 21	14.57 45	6
Mean Place		35.551	88.76	51.731	42.94	20.684	63.88	12.670	2
Sec δ, Tan δ		1.924	−1.644	1.001	+0.049	1.192	−0.649	2.631	+
$D_\psi a$, $D_\omega a$		+0.07	+0.11	+0.06	0.00	+0.06	+0.04	+0.05	
$D_\psi \delta$, $D_\omega \delta$		+0.4	−0.2	+0.4	−0.2	+0.4	−0.2	+0.4	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	τ Pegasi. Mag. 4.6		b¹ Aquarii. Mag. 4.2		4 Cassiopeiæ. Mag. 5.2		υ Pegasi. Mag. 4.6	
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.
	h m 23 16 s	° ′ +23 17 ″	h m 23 18 s	° ′ −20 32 ″	h m 23 21 s	° ′ +61 49 ″	h m 23 21 s	° ′ +22 56 ″
h. 1.2	31.962	20.96	37.369	76.21	8.16	59.47	14.478	61.05
11.2	31.856 106	19.77 119	37.274 95	76.25 −4	7.84 32	58.19 128	14.371 107	59.90 115
21.1	31.764 92	18.40 137	37.197 77	76.05 20	7.54 30	56.41 178	14.278 93	58.57 133
31.1	31.694 70	16.91 149	37.139 58	75.63 42	7.29 25	54.20 221	14.206 72	57.11 146
h. 10.1	31.647 47	15.35 156	37.105 34	74.97 66	7.09 20	51.66 254	14.156 50	55.59 152
	16	155	7	88	13	276	20	151
20.1	31.631	13.80	37.098	74.09	6.96	48.90	14.136	54.08
r. 2.0	31.648 17	12.34 146	37.122 24	72.96 113	6.91 5	46.02 288	14.150 14	52.65 143
12.0	31.703 55	11.04 130	37.179 57	71.63 133	6.94 3	43.15 287	14.199 49	51.39 126
22.0	31.796 93	9.98 106	37.270 91	70.08 155	7.06 12	40.40 275	14.288 89	50.34 105
31.9	31.932 136	9.21 77	37.400 130	68.34 174	7.26 20	37.91 249	14.419 131	49.58 76
	177	45	168	191	29	216	172	44
r. 10.9	32.109	8.76	37.568	66.43	7.55	35.75	14.591	49.14
20.9	32.326 217	8.70 −6	37.772 204	64.38 205	7.90 35	34.02 173	14.804 213	49.08 −6
30.9	32.580 254	9.04 34	38.010 238	62.23 215	8.32 42	32.78 124	15.054 250	49.41 33
ay 10.8	32.863 283	9.77 73	38.280 270	60.03 220	8.80 48	32.07 71	15.334 280	50.13 72
20.8	33.172 309	10.88 111	38.577 297	57.82 221	9.32 52	31.92 15	15.641 307	51.23 110
	326	146	314	216	54	42	324	143
30.8	33.498	12.34	38.891	55.66	9.86	32.34	15.965	52.66
ne 9.8	33.833 335	14.12 178	39.218 327	53.60 206	10.42 56	33.32 98	16.299 334	54.41 175
19.7	34.168 335	16.17 205	39.549 331	51.69 191	10.97 55	34.82 150	16.634 335	56.44 203
29.7	34.495 327	18.42 225	39.875 326	49.98 171	11.50 53	36.80 198	16.962 328	58.68 224
ly 9.7	34.804 309	20.84 242	40.187 312	48.51 147	12.00 50	39.22 242	17.273 311	61.06 238
	287	251	292	119	45	278	289	248
19.6	35.091	23.35	40.479	47.32	12.45	42.00	17.562	63.54
29.6	35.345 254	25.89 254	40.742 263	46.42 90	12.85 40	45.10 310	17.820 258	66.07 253
ig. 8.6	35.563 218	28.42 253	40.971 229	45.85 57	13.19 34	48.43 333	18.043 223	68.58 251
18.6	35.742 179	30.88 246	41.160 189	45.60 −25	13.46 27	51.94 351	18.227 184	71.01 243
28.5	35.878 136	33.22 234	41.306 146	45.65 −5	13.65 19	55.53 359	18.370 143	73.33 232
	95	217	101	35	13	361	99	215
pt. 7.5	35.973	35.39	41.407	46.00	13.78 5	59.14	18.469	75.48
17.5	36.025 52	37.37 198	41.464 57	46.59 59	13.83 −2	62.68 354	18.527 58	77.45 197
27.5	36.038 13	39.13 176	41.480 16	47.40 81	13.81 8	66.11 343	18.546 19	79.19 174
t. 7.4	36.015 −23	40.63 150	41.457 −23	48.36 96	13.73 15	69.35 324	18.528 −18	80.69 150
17.4	35.962 53	41.87 124	41.401 56	49.43 107	13.58 20	72.31 296	18.480 48	81.92 123
	80	96	84	111		262	75	96
27.4	35.882	42.83	41.317	50.54	13.38	74.93	18.405	82.88
ov. 6.3	35.782 100	43.49 66	41.213 104	51.64 110	13.12 26	77.17 224	18.310 95	83.53 65
16.3	35.667 115	43.85 36	41.093 120	52.68 104	12.83 29	78.95 178	18.199 111	83.90 37
26.3	35.542 125	43.91 6	40.966 127	53.62 94	12.51 32	80.23 128	18.077 122	83.97 7
ec. 6.3	35.413 129	43.66 −25	40.837 129	54.41 79	12.17 34	80.97 74	17.950 127	83.74 −23
	130	53	126	60	36	17	128	51
16.2	35.283	43.13	40.711	55.01	11.81	81.14	17.822	83.23
26.2	35.158 125	42.31 82	40.593 118	55.43 42	11.46 35	80.74 40	17.697 125	82.44 79
36.2	35.042 116	41.23 108	40.485 108	55.61 18	11.11 35	79.76 98	17.581 116	81.42 102
n Place	31.586	8.86	36.761	74.07	8.592	37.20	14.067	48.93
δ, Tan δ	1.089	+0.430	1.068	−0.375	2.118	+1.868	1.086	+0.423
$D_m\,\alpha$	+0.06	−0.03	+0.06	+0.02	+0.05	−0.12	+0.06	−0.03
$D_m\,\delta$	+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 Scul Mag
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.
	h m s	° ′ ″	h m s	° ′ ″	h m s	° ′ ″	h m s
	23 22	+ 0 48	23 23	+ 5 55	23 24	+12 18	23 28
Jan. 1.2	41.222	8.89	45.961	29.30	57.852	17.84	32.131
	87	69	90	81	95	95	12
11.2	41.135	8.20	45.871	28.49	57.757	16.89	31.993
	73	66	75	83	82	103	11
21.1	41.062	7.54	45.796	27.66	57.675	15.86	31.876
	57	60	60	81	63	106	9
31.1	41.005	6.94	45.736	26.85	57.612	14.80	31.783
	34	49	38	74	43	105	6
Feb. 10.1	40.971	6.45	45.698	26.11	57.569	13.75	31.720
	10	36	12	63	16	98	3
20.1	40.961	6.09	45.686	25.48	57.553	12.77	31.689
Mar. 2.0	40.980	5.91	45.703	24.99	57.567	11.92	31.693
	19	18	17	49	14	85	
12.0	41.030	5.93	45.752	24.71	57.613	11.26	31.736
	50	2	49	28	46	66	4
22.0	41.116	6.20	45.837	24.66	57.697	10.82	31.821
	86	27	85	5	84	44	8
31.9	41.239	6.71	45.959	24.88	57.820	10.66	31.950
	128	51	122	22	123	16	12
	160	79	160	49	162	15	17
Apr. 10.9	41.399	7.50	46.119	25.37	57.982	10.81	32.123
	197	106	196	80	200	46	21
20.9	41.596	8.56	46.315	26.17	58.182	11.27	32.339
	230	131	230	109	234	80	25
30.9	41.826	9.87	46.545	27.26	58.416	12.07	32.596
May 10.8	261	155	262	135	266	112	29
	42.087	11.42	46.807	28.61	58.682	13.19	32.890
20.8	285	174	286	160	291	141	32
	42.372	13.16	47.093	30.21	58.973	14.60	33.214
	304	189	305	180	310	167	35
30.8	42.676	15.05	47.398	32.01	59.283	16.27	33.564
June 9.8	315	201	315	196	320	189	36
	42.991	17.06	47.713	33.97	59.603	18.16	33.929
19.7	318	207	318	208	322	207	37
	43.309	19.13	48.031	36.05	59.925	20.23	34.302
29.7	312	207	313	212	317	217	37
	43.621	21.20	48.344	38.17	60.242	22.40	34.673
July 9.7	298	202	298	213	303	224	35
	43.919	23.22	48.642	40.30	60.545	24.64	35.031
	279	193	279	207	282	224	33
19.6	44.198	25.15	48.921	42.37	60.827	26.88	35.369
	251	179	251	197	253	219	30
29.6	44.449	26.94	49.172	44.34	61.080	29.07	35.675
Aug. 8.6	217	159	218	184	220	210	26
	44.666	28.53	49.390	46.18	61.300	31.17	35.943
18.6	180	140	181	165	183	196	22
	44.846	29.93	49.571	47.83	61.483	33.13	36.167
28.5	142	116	142	145	143	180	17
	44.988	31.09	49.713	49.28	61.626	34.93	36.342
	101	92	101	121	102	158	12
Sept. 7.5	45.089	32.01	49.814	50.49	61.728	36.51	36.465
	60	68	61	100	62	137	7
17.5	45.149	32.69	49.875	51.49	61.790	37.88	36.535
	23	45	23	75	24	113	1
27.5	45.172	33.14	49.898	52.24	61.814	39.01	36.554
Oct. 7.4	12	22	11	53	10	91	2
	45.160	33.36	49.887	52.77	61.804	39.92	36.525
17.4	41	3	40	30	40	65	7
	45.119	33.39	49.847	53.07	61.764	40.57	36.454
	67	14	66	11	65	43	10
27.4	45.052	33.25	49.781	53.18	61.699	41.00	36.346
Nov. 6.3	84	31	84	8	84	20	13
	44.968	32.94	49.697	53.10	61.615	41.20	36.210
16.3	99	43	99	26	100	1	15
	44.869	32.51	49.598	52.84	61.515	41.19	36.054
26.3	107	54	107	41	109	24	17
	44.762	31.97	49.491	52.43	61.406	40.95	35.884
Dec. 6.3	111	61	112	53	113	42	17
	44.651	31.36	49.379	51.90	61.293	40.53	35.709
	110	67	112	65	115	60	17
16.2	44.541	30.69	49.267	51.25	61.178	39.93	35.535
	106	72	107	75	111	77	16
26.2	44.435	29.97	49.160	50.50	61.067	39.16	35.370
	97	72	99	81	105	90	15
36.2	44.338	29.25	49.061	49.69	60.962	38.26	35.217
Mean Place	40.659	4.07	45.118	22.75	57.338	9.10	31.456
Sec δ. Tan δ	1.000	+0.014	1.005	+0.101	1.024	+0.218	1.274
$D\psi\,a$, $D\omega\,a$	+0.06	0.00	+0.06	−0.01	+0.06	−0.01	+0.06
$D\psi\,\delta$. $D\omega\,\delta$	+0.4	−0.2	+0.4	−0.2	+0.4	−0.2	+0.4

FOR THE UPPER TRANSIT AT WASHINGTON.

72 Pegasi (*mean*). Mag. 5.2		λ Andromedæ. Mag. 4.0		ι Andromedæ. Mag. 4.3		ι Piscium. Mag. 4.3	
Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.
h m	° ′	h m	° ′	h m	° ′	h m	° ′
23 29	+30 52	23 33	+46 0	23 34	+42 48	23 35	+ 5 10
s	″	s	″	s	″	s	″
9.324	16.70	30.044	49.44	3.942	49.01	41.442	41.29
9.196 128	15.50 120	29.856 188	48.21 123	3.769 173	47.79 122	41.349 93	40.50 79
9.083 113	14.06 144	29.686 170	46.59 162	3.613 156	46.20 159	41.267 82	39.70 80
9.988 95	12.41 165	29.539 147	44.64 195	3.479 134	44.32 188	41.201 66	38.93 77
9.920 68	10.63 178	29.426 113	42.44 220	3.376 103	42.20 212	41.154 47	38.24 69
38	183	72	235	65	225	22	59
9.882	8.80	29.354	40.09	3.311	39.95	41.132	37.65
9.879 3	7.00 180	29.328 26	37.68 241	3.289 22	37.66 229	41.137 5	37.20 45
9.918 39	5.33 167	29.354 26	35.31 237	3.316 27	35.43 223	41.175 38	36.96 24
0.000 82	3.84 149	29.436 82	33.11 220	3.396 80	33.37 206	41.248 73	36.94 2
0.127 127	2.63 121	29.576 140	31.15 196	3.530 134	31.56 181	41.359 111	37.19 25
172	87	196	163	189	148	150	51
0.299	1.76	29.772	29.52	3.719	30.08	41.509	37.70
0.515 216	1.26 50	30.023 251	28.30 122	3.959 240	29.00 108	41.696 187	38.51 81
0.772 257	1.18 8	30.322 299	27.52 78	4.245 286	28.37 63	41.919 223	39.60 109
1.063 291	1.53 35	30.663 341	27.23 29	4.571 326	28.22 15	42.174 255	40.95 135
1.382 319	2.31 78	31.037 374	27.44 21	4.930 359	28.55 33	42.456 282	42.54 159
339	119	398	72	381	81	302	179
1.721	3.50	31.435	28.16	5.311	29.36	42.758	44.33
2.072 351	5.06 156	31.844 409	29.35 119	5.704 393	30.64 128	43.072 314	46.27 194
2.424 352	6.95 189	32.256 412	30.99 164	6.100 396	32.34 170	43.392 320	48.31 204
2.770 346	9.13 218	32.659 403	33.03 204	6.488 388	34.42 208	43.708 316	50.41 210
3.100 330	11.54 241	33.043 384	35.41 238	6.857 369	36.81 239	44.011 303	52.50 209
306	259	355	268	342	267	286	204
3.406	14.13	33.398	38.09	7.199	39.48	44.297	54.54
3.682 276	16.81 268	33.717 319	40.98 289	7.506 307	42.35 287	44.556 259	56.47 193
3.921 239	19.54 273	33.993 276	44.05 307	7.773 267	45.36 301	44.784 228	58.26 179
4.119 198	22.26 272	34.222 229	47.19 314	7.995 222	48.44 308	44.976 192	59.86 160
4.274 155	24.92 266	34.399 177	50.36 317	8.168 173	51.53 309	45.129 153	61.26 140
111	253	126	314	123	302	114	117
4.385	27.45	34.525	53.50	8.291	54.55	45.243	62.43
4.453 68	29.83 238	34.600 75	56.53 303	8.366 75	57.47 292	45.317 74	63.37 94
4.479 26	31.99 216	34.625 25	59.41 288	8.393 27	60.22 275	45.353 36	64.06 69
4.467 12	33.92 193	34.603 22	62.07 266	8.376 17	62.75 253	45.355 2	64.54 48
4.422 45	35.59 167	34.540 63	64.47 240	8.320 56	65.02 227	45.326 29	64.79 25
76	138	99	208	91	195	53	6
4.346	36.97	34.441	66.55	8.229	66.97	45.273	64.85
4.248 98	38.02 105	34.308 133	68.27 172	8.107 122	68.57 160	45.197 76	64.72 13
4.130 118	38.73 71	34.149 159	69.58 131	7.962 145	69.79 122	45.107 90	64.43 29
3.998 132	39.09 36	33.970 179	70.46 88	7.797 165	70.58 79	45.007 100	64.00 43
3.858 140	39.10 1	33.777 193	70.89 43	7.619 178	70.93 35	44.900 107	63.45 55
143	36	201	4	185	9	110	65
3.715	38.74	33.576	70.85	7.434	70.84	44.790	62.80
3.572 143	38.04 70	33.374 202	70.33 52	7.247 187	70.29 55	44.683 107	62.06 74
3.434 138	37.01 103	33.175 199	69.34 99	7.065 182	69.32 97	44.581 102	61.27 79
49.929	1.86	29.829	30.22	3.667	30.57	40.825	34.77
1.165	*+0.598*	*1.440*	*+1.036*	1.363	+0.926	1.004	+0.091
-0.06	*−0.04*	*+0.06*	*−0.07*	+0.06	−0.06	+0.06	−0.01
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		ω² Aquarii. Mag. 4.6		i¹ Aqu Mag.
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.
	h m s	° ′ ″	h m s	° ′ ″	h m s	° ′ ″	h m s
	23 35	+77 10	23 36	+43 52	23 38	−14 59	23 39
Jan. 1.2	54.17	33.91	19.213	45.91	25.846	74.02	54.614
11.2	53.34 83	33.04 87	19.035 178	44.72 119	25.747 99	74.29 27	54.511 103
21.2	52.56 78	31.57 147	18.873 162	43.15 157	25.660 87	74.38 — 9	54.420 91
31.1	51.87 69	29.58 199	18.733 140	41.27 188	25.591 69	74.27 11	54.347 73
Feb. 10.1	51.31 56	27.15 243	18.625 108	39.14 213	25.541 50	73.94 33	54.294 53
	41	277	70	227	25	54	27
20.1	50.90	24.38	18.555	36.87	25.516	73.40	54.267
Mar. 2.0	50.65 — 8	21.38 300	18.529 — 26	34.56 231	25.519 3	72.62 78	54.267 0
12.0	50.57 12	18.29 309	18.553 24	32.29 227	25.554 35	71.62 100	54.300 33
22.0	50.69	15.24 305	18.630 77	30.19 210	25.624 70	70.39 123	54.368 68
Apr. 1.0	50.99 30	12.33 291	18.763 133	28.32 187	25.731 107	68.94 145	54.474 106
	48	264	189	153	145	166	145
10.9	51.47	9.69	18.952	26.79	25.876	67.28	54.619
20.9	52.11 64	7.42 227	19.192 240	25.65 114	26.059 183	65.45 183	54.802 183
30.9	52.89 78	5.60 182	19.480 288	24.96 69	26.280 221	63.47 198	55.023 221
May 10.8	53.78 89	4.29 131	19.808 328	24.74 — 22	26.533 253	61.37 210	55.277 254
20.8	54.76 98	3.54 75	20.171 363	25.01 27	26.813 280	59.21 216	55.559 282
	104	17	385	76	304	217	305
30.8	55.80	3.37	20.556	25.77	27.117	57.04	55.864
June 9.8	56.87 107	3.78 41	20.955 399	26.99 122	27.434 317	54.91 213	56.184 320
19.7	57.93 106	4.77 99	21.356 401	28.65 166	27.758 324	52.87 204	56.511 327
29.7	58.95 102	6.30 153	21.749 393	30.70 205	28.081 323	50.98 189	56.838 327
July 9.7	59.92 97	8.33 203	22.125 376	33.07 237	28.392 311	49.28 170	57.155 317
	89	249	348	266	295	147	298
19.7	60.81	10.82	22.473	35.73	28.687	47.81	57.453
29.6	61.60 79	13.70 288	22.786 313	38.59 286	28.955 268	46.62 119	57.727 274
Aug. 8.6	62.27 67	16.91 321	23.059 273	41.62 303	29.193 238	45.71 91	57.969 242
18.6	62.81 54	20.39 348	23.286 227	44.71 309	29.394 201	45.11 60	58.174 205
28.5	63.22 41	24.05 366	23.464 178	47.82 311	29.555 161	44.82 29	58.339 165
	26	378	128	306	118	1	122
Sept. 7.5	63.48 — 11	27.83 382	23.592 78	50.88 296	29.673 77	44.81	58.461
17.5	63.59 — 3	31.65 378	23.670 31	53.84 280	29.750 37	45.08 27	58.540 79
27.5	63.56 18	35.43 366	23.701 — 15	56.64 258	29.787 1	45.57 49	58.578 38
Oct. 7.4	63.38 31	39.09 345	23.686 55	59.22 233	29.788 — 34	46.28 71	58.578 0
17.4	63.07 45	42.54 317	23.631 91	61.55 201	29.754 61	47.12 84	58.543 35
27.4	62.62	45.71	23.540	63.56	29.693	48.05	58.479
Nov. 6.4	62.06 56	48.55 284	23.418 122	65.21 165	29.610 83	49.04 99	58.393 86
16.3	61.40 66	50.94 239	23.271 147	66.48 127	29.510 100	50.02 98	58.289 104
26.3	60.65 75	52.84 190	23.103 168	67.32 84	29.399 111	50.95 93	58.172 117
Dec. 6.3	59.84 81	54.18 134	22.922 181	67.72 — 40	29.281 118	51.79 84	58.050 122
	86	74	189	5	118	71	124
16.2	58.98	54.92	22.733	67.67	29.163	52.50	57.926
26.2	58.10 88	55.04 — 12	22.541 192	67.16 51	29.048 115	53.08 58	57.806 120
36.2	57.24 86	54.53 51	22.356 185	66.21 95	28.940 108	53.50 42	57.694 112
Mean Place	55.858	8.83	18.934	27.14	25.143	73.76	53.896
Sec δ, Tan δ	4.505	+4.393	1.387	+0.962	1.035	−0.268	1.056
$D_\psi a$, $D_\omega a$	+0.05	−0.29	+0.06	−0.06	+0.06	+0.02	+0.06
$D_\psi \delta$, $D_\omega \delta$	+0.4	−0.1	+0.4	−0.1	+0.4	−0.1	+0.4

FOR THE UPPER TRANSIT AT WASHINGTON.

ington n Time.	ψ Andromedæ. Mag. 5.1		41 H. Cephei. Mag. 5.0		δ Sculptoris. Mag. 4.6		φ Pegasi. Mag. 5.2	
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.
	h m s 23 41	° ′ ″ +45 57	h m s 23 43	° ′ ″ +67 20	h m s 23 44	° ′ ″ −28 34	h m s 23 48	° ′ ″ +18 39
t. 1.2	55.267	53.08	55.62	67.99	37.001	87.29	16.405	44.77
11.2	55.076 191	51.95 113	55.18 44	67.04 95	36.880 121	87.21 8	16.295 110	43.81 96
21.2	54.899 177	50.41 154	54.77 41	65.56 148	36.772 108	86.81 40	16.194 101	42.71 110
31.1	54.747 152	48.55 186	54.40 37	63.59 197	36.682 90	86.09 72	16.107 87	41.50 121
). 10.1	54.626 121	46.42 213	54.10 30	61.22 237	36.616 66	85.09 100	16.041 66	40.25 125
	83	230	22	269	41	129	43	124
20.1	54.543	44.12	53.88	58.53	36.575	83.80	15.998	39.01
:. 2.0	54.506 37	41.75 237	53.75 13	55.66 287	36.566 9	82.25 155	15.986 12	37.86 115
12.0	54.520 14	39.41 234	53.72 3	52.71 295	36.592 26	80.45 180	16.008 22	36.84 102
22.0	54.590 70	37.22 219	53.80 8	49.81 290	36.655 63	78.44 201	16.068 60	36.03 81
r. 1.0	54.718 128	35.24 198	53.98 18	47.07 274	36.758 103	76.24 220	16.169 101	35.46 57
	186	165	28	245	144	234	144	26
10.9	54.904	33.59	54.26	44.62	36.902	73.90	16.313	35.20
20.9	55.145 241	32.33 126	54.65 39	42.54 208	37.086 184	71.45 245	16.497 184	35.27 7
30.9	55.436 291	31.51 82	55.11 46	40.91 163	37.311 225	68.94 251	16.720 223	35.68 41
y 10.9	55.769 333	31.16 35	55.65 54	39.78 113	37.572 261	66.43 251	16.979 259	36.45 77
20.8	56.139 370	31.31 15	56.25 60	39.20 58	37.865 293	63.96 247	17.266 287	37.55 110
	394	64	63	1	317	236	311	141
30.8	56.533	31.95	56.88	39.19	38.182	61.60	17.577	38.96
ne 9.8	56.943 410	33.07 112	57.54 66	39.74 55	38.515 333	59.41 219	17.901 324	40.66 170
19.7	57.356 413	34.63 156	58.20 66	40.84 110	38.859 344	57.43 198	18.231 330	42.58 192
29.7	57.762 406	36.60 197	58.85 65	42.45 161	39.203 344	55.73 170	18.559 328	44.69 211
ly 9.7	58.150 388	38.93 233	59.46 61	44.54 209	39.538 335	54.33 140	18.877 318	46.92 223
	361	262	57	252	318	104	298	231
19.7	58.511	41.55	60.03	47.06	39.856	53.29	19.175	49.23
29.6	58.839 328	44.39 284	60.55 52	49.94 288	40.148 292	52.61 68	19.449 274	51.56 233
ig. 8.6	59.125 286	47.42 303	61.00 45	53.13 319	40.407 259	52.30 31	19.690 241	53.84 228
18.6	59.364 239	50.54 312	61.35 35	56.53 340	40.627 220	52.37 7	19.896 206	56.05 221
28.6	59.554 190	53.69 315	61.64 29	60.11 358	40.805 178	52.79 42	20.063 167	58.12 207
	138	313	20	365	132	76	127	192
pt. 7.5	59.692 87	56.82	61.84	63.76	40.937	53.55	20.190	60.04
17.5	59.779	59.85 303	61.96 12	67.43 367	41.022 85	54.59 104	20.277 87	61.76 172
27.5	59.816 37	62.75 290	61.99 3	71.03 360	41.063 41	55.87 128	20.327 50	63.27 151
ct. 7.4	59.807 9	65.44 269	61.94 5	74.48 345	41.063 0	57.30 143	20.340 13	64.54 127
17.4	59.757 50	67.87 243	61.81 13	77.74 326	41.023 40	58.83 153	20.322 18	65.58 104
	90	213	22	296	73	156	46	79
27.4	59.667	70.00	61.59	80.70	40.950	60.39	20.276	66.37
ov. 6.4	59.545 122	71.78 178	61.32 27	83.31 261	40.852 98	61.89 150	20.206 70	66.91 54
16.3	59.396 149	73.18 140	61.00 32	85.49 218	40.733 119	63.28 139	20.119 87	67.19 28
26.3	59.223 173	74.15 97	60.62 38	87.19 170	40.600 133	64.50 122	20.017 102	67.23 4
ec. 6.3	59.036 187	74.66 51	60.20 42	88.36 117	40.460 140	65.49 99	19.905 112	67.01 22
	198	4	44	60	113	71	118	44
16.3	58.838	74.70	59.76	88.96	40.317	66.20	19.787	66.57
26.2	58.635 203	74.28 42	59.30 46	88.95 1	40.177 140	66.64 44	19.668 119	65.89 68
36.2	58.436 199	73.39 89	58.85 45	88.36 59	40.045 132	66.77 13	19.551 117	65.03 86
n Place	54.967	33.59	55.971	43.89	36.240	82.88	15.780	33.40
δ, Tan δ	1.439	+1.034	2.597	+2.396	1.139	−0.545	1.056	+0.338
, $D_m a$	+0.06	−0.07	+0.06	−0.16	+0.06	+0.04	+0.06	−0.02
$D_m \delta$	+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.	ρ Cassiopeiæ. Mag. 4.8		Groombridge 4163. Mag. 6.6		ω Piscium. Mag. 4.0	
	Right Ascension.	Declination.	Right Ascension.	Declination.	Right Ascension.	Declination.
	h m 23 50	° ′ +57 2	h m 23 50	° ′ +73 56	h m 23 55	° + 6
	s	″	s	″	s	″
Jan. 1.2	13.877	37.82	45.73	79.44	3.625	21.17
	280	97	66	74	101	
11.2	13.597	36.85	45.07	78.70	3.524	20.41
	261	146	62	132	93	
21.2	13.336	35.39	44.45	77.38	3.431	19.62
	233	189	56	185	80	
31.1	13.103	33.50	43.89	75.53	3.351	18.85
	191	224	46	231	62	
Feb. 10.1	12.912	31.26	43.43	73.22	3.289	18.14
	141	250	36	266	42	
20.1	12.771	28.76	43.07	70.56	3.247	17.51
	81	265	24	290	13	
Mar. 2.0	12.690	26.11	42.83	67.66	3.234	17.03
	15	269	9	303	18	
12.0	12.675	23.42	42.74	64.63	3.252	16.73
	60	261	6	302	53	
22.0	12.735	20.81	42.80	61.61	3.305	16.63
	135	243	21	290	91	
Apr. 1.0	12.870	18.38	43.01	58.71	3.396	16.80
	208	214	35	265	131	
10.9	13.078	16.24	43.36	56.06	3.527	17.23
	279	177	49	232	171	
20.9	13.357	14.47	43.85	53.74	3.698	17.95
	342	133	60	189	209	
30.9	13.699	13.14	44.45	51.85	3.907	18.95
	398	84	71	138	242	
May 10.9	14.097	12.30	45.16	50.47	4.149	20.23
	443	33	78	86	272	
20.8	14.540	11.97	45.94	49.61	4.421	21.74
	475	21	84	29	295	
30.8	15.015	12.18	46.78	49.32	4.716	23.47
	495	74	88	29	312	
June 9.8	15.510	12.92	47.66	49.61	5.028	25.36
	500	126	88	85	319	
19.7	16.010	14.18	48.54	50.46	5.347	27.38
	492	172	86	141	319	
29.7	16.502	15.90	49.40	51.87	5.666	29.46
	471	216	83	190	309	
July 9.7	16.973	18.06	50.23	53.77	5.975	31.56
	411	253	77	235	294	
19.7	17.414	20.59	51.00	56.12	6.269	33.62
	401	283	69	276	270	
29.6	17.815	23.42	51.69	58.88	6.539	35.59
	351	310	61	311	242	
Aug. 8.6	18.166	26.52	52.30	61.99	6.781	37.42
	296	327	50	337	207	
18.6	18.462	29.79	52.80	65.36	6.988	39.08
	235	339	39	359	171	
28.6	18.697	33.18	53.19	68.95	7.159	40.56
	174	343	28	370	132	
Sept. 7.5	18.871	36.61	53.47	72.65	7.291	41.80
	112	341	17	376	94	
17.5	18.983	40.02	53.64	76.41	7.385	42.82
	50	331	4	373	56	
27.5	19.033	43.33	53.68	80.14	7.441	43.59
	10	314	7	364	20	
Oct. 7.4	19.023	46.47	53.61	83.78	7.461	44.14
	65	293	18	345	9	
17.1	18.958	49.40	53.43	87.23	7.452	44.48
	116	261	29	319	38	
27.1	18.842	52.04	53.14	90.42	7.414	44.60
	161	229	38	286	60	
Nov. 6.4	18.681	54.33	52.76	93.28	7.354	44.54
	201	189	48	245	78	
16.3	18.480	56.22	52.28	95.73	7.276	44.31
	233	143	55	197	92	
26.3	18.247	57.65	51.73	97.70	7.184	43.93
	261	92	60	143	101	
Dec. 6.3	17.986	58.57	51.13	99.13	7.083	43.43
	278	41	65	85	107	
16.3	17.708	58.98	50.48	99.98	6.976	42.82
	287	14	68	25	109	
26.2	17.421	58.84	49.80	100.23	6.867	42.11
	288	67	67	38	107	
36.2	17.133	58.17	49.13	99.85	6.760	41.35
Mean Place	13.711	15.48	46.461	54.22	2.897	13.92
Sec. δ, Tan δ	1.838	+1.542	3.618	+3.477	1.006	+0.112
$D_{\psi\alpha}$, $D_{\omega\alpha}$	+0.06	−0.10	+0.06	−0.23	+0.06	−0.09
$D_{\psi\delta}$, $D_{\omega\delta}$	−0.1	0.0	+0.4	0.0	+0.4	0.0

FOR THE UPPER TRANSIT AT WASHINGTON.

ε Tucanæ. Mag. 4.7				30 Piscium. Mag. 4.7				2 Ceti. Mag. 4.6			
Right Ascension.		Declination.		Right Ascension.		Declination.		Right Ascension.		Declination.	
h m		° ′		h m		° ′		h m		° ′	
23 55		−66 1		23 57		− 6 28		23 59		−17 47	
s		″		s		″		s		″	
37.54		91.37		42.998		28.42		30.163		54.22	
37.14	40	90.24	113	42.897	101	28.95	53	30.053	110	54.49	27
36.77	37	88.56	168	42.805	92	29.36	41	29.951	102	54.54	5
36.45	32	86.40	216	42.725	80	29.63	27	29.864	87	54.35	19
36.19	26	83.81	259	42.663	62	29.75	12	29.795	69	53.93	42
	19		296		42		5		49		68
36.00	12	80.85	324	42.621	15	29.70	27	29.746	17	53.25	91
35.88	6	77.61	347	42.606	15	29.43	48	29.729	11	52.34	116
35.82	4	74.14	358	42.621	49	28.95	72	29.740	46	51.18	139
35.86	12	70.56	365	42.670	87	28.23	94	29.786	85	49.79	162
35.98	19	66.91	364	42.757	126	27.29	119	29.871	123	48.17	181
36.17		63.27		42.883		26.10		29.994		46.36	
36.45	28	59.74	353	43.048	165	24.70	140	30.158	164	44.37	199
36.81	36	56.36	338	43.250	202	23.07	163	30.361	203	42.24	213
37.23	42	53.24	312	43.486	236	21.27	180	30.598	237	40.02	222
37.72	49	50.41	283	43.753	267	19.33	194	30.868	270	37.75	227
	54		245		290		204		295		228
38.26		47.96		44.043		17.29		31.163		35.47	
38.84	58	45.94	202	44.351	308	15.20	209	31.476	313	33.25	222
39.44	60	44.39	155	44.667	316	13.11	209	31.800	324	31.16	209
40.05	61	43.36	103	44.985	318	11.08	203	32.126	326	29.21	195
40.66	61	42.88	48	45.295	310	9.16	192	32.446	320	27.49	172
	58		5		295		176		303		146
41.24		42.93		45.590		7.40		32.749		26.03	
41.78	54	43.52	59	45.864	274	5.84	156	33.033	284	24.86	117
42.26	48	44.63	111	46.109	245	4.51	133	33.287	254	24.02	84
42.67	41	46.23	160	46.320	211	3.45	106	33.506	219	23.49	53
42.99	32	48.25	202	46.494	174	2.66	79	33.687	181	23.30	19
	24		236		136		53		142		12
43.23		50.61		46.630		2.13		33.829		23.42	
43.37	14	53.25	264	46.726	96	1.88	25	33.927	98	23.83	41
43.42	5	56.05	280	46.783	57	1.88	0	33.985	58	24.51	68
43.36	6	58.90	285	46.804	21	2.11	23	34.004	19	25.40	89
43.20	16	61.69	279	46.792	12	2.52	41	33.989	15	26.43	103
	23		260		38		56		45		114
42.97		64.29		46.754		3.08		33.944		27.57	
42.67	30	66.63	234	46.691	63	3.76	68	33.873	71	28.74	117
42.30	37	68.57	194	46.610	81	4.51	75	33.782	91	29.90	116
41.89	41	70.06	149	46.516	94	5.29	78	33.677	105	30.98	108
41.46	43	71.02	96	46.413	103	6.07	78	33.561	116	31.96	98
	45		39		109		75		120		83
41.01		71.41		46.304		6.82		33.441		32.79	
40.57	44	71.22	19	46.194	110	7.50	68	33.320	121	33.42	63
40.14	43	70.45	77	46.085	109	8.11	61	33.203	117	33.85	43
36.742		79.02		42.213		31.21		29.339		53.22	
2.462		*−2.250*		*1.006*		−0.113		1.050		−0.321	
+0.06		*+0.15*		+0.06		+0.01		+0.06		+0.02	
+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 Sem. Pass. Merid.
		h m s	s	° ′ ″	″	m s	s	′ ″	m s
Jan.	1	18 46 47.50	11.041	−23 0 53.2	+12.34	+ 3 40.62	+1.182	16 17.87	1 11.05
	2	18 51 12.32	11.027	22 55 43.3	13.48	4 8.82	1.167	16 17.88	1 11.00
	3	18 55 36.77	11.010	22 50 6.1	14.61	4 36.63	1.150	16 17.88	1 10.95
	4	19 0 0.82	10.993	22 44 1.6	15.75	5 4.05	1.133	16 17.88	1 10.90
	5	19 4 24.45	10.975	22 37 30.1	16.87	5 31.04	1.115	16 17.87	1 10.84
	6	19 8 47.62	10.956	−22 30 31.9	+17.98	+ 5 57.58	+1.096	16 17.85	1 10.78
	7	19 13 10.33	10.936	22 23 7.0	19.09	6 23.66	1.076	16 17.82	1 10.72
	8	19 17 32.53	10.914	22 15 15.7	20.18	6 49.23	1.054	16 17.79	1 10.65
	9	19 21 54.20	10.892	22 6 58.1	21.27	7 14.29	1.032	16 17.76	1 10.57
	10	19 26 15.34	10.869	21 58 14.7	22.35	7 38.80	1.010	16 17.72	1 10.49
	11	19 30 35.92	10.845	−21 49 5.4	+23.42	+ 8 2.75	+0.986	16 17.67	1 10.41
	12	19 34 55.90	10.820	21 39 30.6	24.47	8 26.12	0.962	16 17.62	1 10.33
	13	19 39 15.29	10.794	21 29 30.7	25.52	8 48.89	0.935	16 17.56	1 10.25
	14	19 43 34.06	10.768	21 19 5.9	26.55	9 11.04	0.909	16 17.50	1 10.16
	15	19 47 52.19	10.741	21 8 16.3	27.57	9 32.55	0.882	16 17.42	1 10.07
	16	19 52 9.66	10.714	−20 57 2.4	+28.58	+ 9 53.40	+0.856	16 17.34	1 9.97
	17	19 56 26.45	10.685	20 45 24.4	29.58	10 13.58	0.827	16 17.26	1 9.88
	18	20 0 42.55	10.656	20 33 22.7	30.56	10 33.08	0.798	16 17.18	1 9.78
	19	20 4 57.95	10.626	20 20 57.6	31.53	10 51.85	0.768	16 17.09	1 9.68
	20	20 9 12.62	10.595	20 8 9.3	32.48	11 9.92	0.737	16 17.00	1 9.58
	21	20 13 26.55	10.564	−19 54 58.4	+33.42	+11 27.25	+0.706	16 16.90	1 9.47
	22	20 17 39.72	10.533	19 41 25.3	34.33	11 43.81	0.674	16 16.80	1 9.37
	23	20 21 52.11	10.500	19 27 30.1	35.24	11 59.60	0.642	16 16.70	1 9.26
	24	20 26 3.72	10.467	19 13 13.4	36.14	12 14.61	0.609	16 16.59	1 9.15
	25	20 30 14.52	10.433	18 58 35.6	37.00	12 28.82	0.575	16 16.48	1 9.04
	26	20 34 24.50	10.399	−18 43 36.9	+37.86	+12 42.21	+0.541	16 16.37	1 8.93
	27	20 38 33.67	10.365	18 28 18.0	38.70	12 54.79	0.507	16 16.25	1 8.81
	28	20 42 42.00	10.330	18 12 39.2	39.52	13 6.52	0.472	16 16.13	1 8.70
	29	20 46 49.50	10.295	17 56 40.8	40.33	13 17.43	0.438	16 16.00	1 8.59
	30	20 50 56.15	10.260	17 40 23.2	41.12	13 27.50	0.403	16 15.88	1 8.47
	31	20 55 1.96	10.225	−17 23 46.9	+41.89	+13 36.73	+0.368	16 15.74	1 8.36
Feb.	1	20 59 6.93	10.190	17 6 52.3	42.65	13 45.12	0.333	16 15.61	1 8.24
	2	21 3 11.07	10.155	16 49 39.7	43.39	13 52.68	0.298	16 15.46	1 8.13
	3	21 7 14.36	10.121	16 32 9.5	44.11	13 59.40	0.263	16 15.32	1 8.01
	4	21 11 16.83	10.086	16 14 22.2	44.82	14 5.29	0.229	16 15.16	1 7.90
	5	21 15 18.48	10.052	−15 56 18.2	+45.51	+14 10.37	+0.195	16 15.00	1 7.79
	6	21 19 19.30	10.018	15 37 57.8	46.18	14 14.63	0.161	16 14.83	1 7.67
	7	21 23 19.32	9.984	15 19 21.4	46.84	14 18.08	0.127	16 14.66	1 7.56
	8	21 27 18.54	9.951	15 0 29.4	47.48	14 20.74	0.094	16 14.49	1 7.45
	9	21 31 16.97	9.918	14 41 22.1	48.11	14 22.60	0.061	16 14.31	1 7.34
	10	21 35 14.61	9.886	−14 22 0.3	+48.72	+14 23.69	+0.029	16 14.12	1 7.23
	11	21 39 11.49	9.854	14 2 23.9	49.30	14 24.01	−0.003	16 13.94	1 7.12
	12	21 43 7.60	9.823	13 42 33.6	49.88	14 23.58	0.034	16 13.75	1 7.01
	13	21 47 2.98	9.792	13 22 29.6	50.44	14 22.40	0.064	16 13.55	1 6.90
	14	21 50 57.62	9.762	13 2 12.4	50.98	14 20.48	0.094	16 13.35	1 6.79
	15	21 54 51.54	9.732	−12 41 42.6	+51.50	+14 17.85	−0.124	16 13.14	1 6.68
	16	*21 58 44.74*	9.703	−12 21 0.4	+52.01	+14 14.51	−0.153	16 12.93	1 6.58

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

WASHINGTON APPARENT NOON.

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.
s	° ′ ″	″	m s	s	′ ″	m s	h m s
9.708	−12 21 0.4	+52.01	+14 14.51	−0.153	16 12.93	1 6.58	21 44 27.89
9.674	12 0 6.1	52.50	14 10.48	0.182	16 12.72	1 6.48	21 48 24.45
9.645	11 39 0.4	52.97	14 5.76	0.211	16 12.51	1 6.38	21 52 21.00
9.617	11 17 43.7	53.41	14 0.37	0.239	16 12.29	1 6.28	21 56 17.55
9.589	10 56 16.3	53.85	13 54.31	0.266	16 12.07	1 6.18	22 0 14.11
9.562	−10 34 38.6	+54.27	+13 47.59	−0.293	16 11.85	1 6.09	22 4 10.66
9.536	10 12 51.2	54.67	13 40.24	0.320	16 11.63	1 5.99	22 8 7.21
9.509	9 50 54.5	55.05	13 32.25	0.346	16 11.41	1 5.90	22 12 3.77
9.484	9 28 48.9	55.40	13 23.63	0.371	16 11.19	1 5.81	22 16 0.32
9.459	9 6 34.9	55.75	13 14.41	0.396	16 10.96	1 5.73	22 19 56.88
9.434	− 8 44 13.0	+56.08	+13 4.60	−0.421	16 10.73	1 5.64	22 23 53.43
9.410	8 21 43.4	56.38	12 54.20	0.445	16 10.50	1 5.56	22 27 49.98
9.387	7 59 6.6	56.67	12 43.24	0.468	16 10.27	1 5.49	22 31 46.54
9.365	7 36 23.0	56.95	12 31.73	0.490	16 10.04	1 5.41	22 35 43.09
9.344	7 13 32.9	57.21	12 19.70	0.511	16 9.80	1 5.34	22 39 39.65
9.323	− 6 50 36.7	+57.46	+12 7.17	−0.532	16 9.56	1 5.27	22 43 36.20
9.303	6 27 35.0	57.68	11 54.14	0.552	16 9.32	1 5.21	22 47 32.75
9.283	6 4 28.0	57.89	11 40.66	0.571	16 9.08	1 5.14	22 51 29.31
9.265	5 41 16.0	58.09	11 26.72	0.590	16 8.83	1 5.08	22 55 25.86
9.248	5 17 59.4	58.28	11 12.36	0.606	16 8.58	1 5.02	22 59 22.41
9.232	− 4 54 38.6	+58.44	+10 57.61	−0.622	16 8.32	1 4.96	23 3 18.97
9.217	4 31 14.0	58.59	10 42.48	0.638	16 8.06	1 4.91	23 7 15.52
9.202	4 7 46.0	58.74	10 27.00	0.652	16 7.80	1 4.85	23 11 12.07
9.189	3 44 14.8	58.85	10 11.18	0.666	16 7.53	1 4.81	23 15 8.63
9.177	3 20 40.8	58.96	9 55.06	0.678	16 7.27	1 4.76	23 19 5.18
9.166	− 2 57 4.5	+59.06	+ 9 38.64	−0.689	16 7.00	1 4.72	23 23 1.73
9.155	2 33 26.1	59.13	9 21.97	0.700	16 6.73	1 4.68	23 26 58.28
9.145	2 9 45.9	59.20	9 5.05	0.709	16 6.46	1 4.64	23 30 54.84
9.136	1 46 4.5	59.25	8 47.91	0.718	16 6.18	1 4.60	23 34 51.39
9.129	1 22 22.2	59.27	8 30.59	0.725	16 5.91	1 4.57	23 38 47.94
9.122	− 0 58 39.2	+59.29	+ 8 13.09	−0.732	16 5.63	1 4.55	23 42 44.50
9.116	0 34 56.0	59.30	7 55.43	0.738	16 5.36	1 4.53	23 46 41.05
9.110	− 0 11 13.0	59.27	7 37.63	0.744	16 5.08	1 4.51	23 50 37.60
9.105	+ 0 12 29.3	59.24	7 19.72	0.749	16 4.80	1 4.49	23 54 34.16
9.101	0 36 10.7	59.20	7 1.68	0.753	16 4.53	1 4.47	23 58 30.71
9.098	+ 0 59 50.7	+59.13	+ 6 43.56	−0.756	16 4.25	1 4.46	0 2 27.26
9.096	1 23 29.0	59.05	6 25.38	0.759	16 3.98	1 4.45	0 6 23.81
9.094	1 47 5.1	58.95	6 7.14	0.761	16 3.71	1 4.44	0 10 20.37
9.092	2 10 38.8	58.84	5 48.84	0.762	16 3.43	1 4.44	0 14 16.92
9.091	2 34 9.5	58.71	5 30.53	0.763	16 3.16	1 4.44	0 18 13.47
9.091	+ 2 57 37.0	+58.57	+ 5 12.22	−0.763	16 2.89	1 4.44	0 22 10.03
9.092	3 21 0.9	58.41	4 53.91	0.762	16 2.62	1 4.44	0 26 6.58
9.094	3 44 20.7	58.24	4 35.63	0.760	16 2.35	1 4.45	0 30 3.13
9.097	4 7 36.4	58.06	4 17.41	0.757	16 2.08	1 4.46	0 33 59.69
9.100	4 30 47.4	57.86	3 59.26	0.754	16 1.81	1 4.48	0 37 56.24
9.104	+ 4 53 53.4	+57.64	+ 3 41.20	−0.750	16 1.54	1 4.49	0 41 52.79
9.109	*+ 5 16 54.1*	*+57.41*	+ 3 23.25	−0.745	16 1.26	1 4.52	0 45 49.34

Interval of semidiameter passing meridian, subtract 0s.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.
		h m s	s	° ′ ″	″	m s	s	′ ″	m s
Apr.	1	0 41 56.15	9.100	+ 4 30 47.4	+57.86	+3 59.26	−0.754	16 1.81	1 4.48
	2	0 45 34.60	9.104	4 53 53.4	57.64	3 41.20	0.780	16 1.54	1 4.49
	3	0 49 13.16	9.109	5 16 54.1	57.41	3 23.25	0.745	16 1.26	1 4.52
	4	0 52 51.85	9.115	5 39 49.3	57.17	3 5.44	0.730	16 0.99	1 4.54
	5	0 56 30.68	9.122	6 2 38.4	56.91	2 47.77	0.732	16 0.72	1 4.57
	6	1 0 9.70	9.130	+ 6 25 21.3	+56.65	+2 30.29	−0.724	16 0.44	1 4.60
	7	1 3 48.91	9.139	6 47 57.6	56.37	2 12.99	0.716	16 0.17	1 4.63
	8	1 7 28.35	9.148	7 10 27.0	56.07	1 55.92	0.707	15 59.90	1 4.66
	9	1 11 8.03	9.158	7 32 49.2	55.76	1 39.09	0.696	15 59.62	1 4.70
	10	1 14 47.95	9.170	7 55 3.7	55.44	1 22.51	0.684	15 59.34	1 4.74
	11	1 18 28.16	9.182	+ 8 17 10.5	+55.11	+1 6.22	−0.672	15 59.07	1 4.78
	12	1 22 8.69	9.195	8 39 9.0	54.76	0 50.22	0.659	15 58.79	1 4.82
	13	1 25 49.52	9.208	9 0 59.1	54.40	0 34.55	0.646	15 58.51	1 4.87
	14	1 29 30.70	9.223	9 22 40.2	54.03	0 19.22	0.632	15 58.24	1 4.91
	15	1 33 12.24	9.238	9 44 12.2	53.63	+0 4.23	0.617	15 57.96	1 4.96
	16	1 36 54.14	9.254	+10 5 34.6	+53.23	−0 10.37	−0.601	15 57.69	1 5.01
	17	1 40 36.43	9.271	10 26 47.1	52.81	0 24.60	0.584	15 57.42	1 5.07
	18	1 44 19.13	9.288	10 47 49.4	52.37	0 38.42	0.567	15 57.15	1 5.13
	19	1 48 2.23	9.305	11 8 41.0	51.92	0 51.84	0.550	15 56.89	1 5.18
	20	1 51 45.74	9.322	11 29 21.6	51.46	1 4.83	0.532	15 56.63	1 5.24
	21	1 55 29.69	9.340	+11 49 51.0	+50.98	−1 17.41	−0.515	15 56.37	1 5.31
	22	1 59 14.07	9.359	12 10 8.7	50.48	1 29.54	0.496	15 56.11	1 5.37
	23	2 2 58.91	9.378	12 30 14.3	49.98	1 41.24	0.478	15 55.86	1 5.44
	24	2 6 44.20	9.397	12 50 7.6	49.45	1 52.47	0.459	15 55.61	1 5.51
	25	2 10 29.95	9.416	13 9 48.1	48.91	2 3.25	0.440	15 55.36	1 5.58
	26	2 14 16.16	9.435	+13 29 15.6	+48.37	−2 13.56	−0.420	15 55.12	1 5.65
	27	2 18 2.86	9.455	13 48 29.7	47.80	2 23.39	0.400	15 54.88	1 5.72
	28	2 21 50.04	9.476	14 7 30.2	47.22	2 32.73	0.379	15 54.64	1 5.80
	29	2 25 37.73	9.497	14 26 16.5	46.63	2 41.58	0.359	15 54.40	1 5.88
	30	2 29 25.92	9.518	14 44 48.6	46.03	2 49.93	0.337	15 54.16	1 5.95
May	1	2 33 14.62	9.540	+15 3 6.1	+45.42	−2 57.75	−0.315	15 53.93	1 6.03
	2	2 37 3.84	9.562	15 21 8.6	44.79	3 5.06	0.293	15 53.70	1 6.11
	3	2 40 53.60	9.585	15 38 56.0	44.15	3 11.84	0.271	15 53.46	1 6.19
	4	2 44 43.89	9.607	15 56 27.8	43.50	3 18.09	0.249	15 53.24	1 6.27
	5	2 48 34.73	9.630	16 13 43.7	42.83	3 23.79	0.226	15 53.01	1 6.35
	6	2 52 26.13	9.653	+16 30 43.0	+42.15	−3 28.93	−0.203	15 52.78	1 6.43
	7	2 56 18.10	9.677	16 47 27.0	41.46	3 33.51	0.179	15 52.56	1 6.51
	8	3 0 10.63	9.701	17 3 53.8	40.76	3 37.53	0.155	15 52.34	1 6.59
	9	3 4 3.73	9.725	17 20 3.5	40.05	3 40.96	0.131	15 52.11	1 6.68
	10	3 7 57.43	9.749	17 35 56.0	39.32	3 43.82	0.107	15 51.90	1 6.76
	11	3 11 51.72	9.774	+17 51 30.9	+38.58	−3 46.08	−0.082	15 51.68	1 6.84
	12	3 15 46.59	9.799	18 6 48.0	37.83	3 47.75	0.057	15 51.47	1 6.92
	13	3 19 42.07	9.824	18 21 46.9	37.07	3 48.83	0.033	15 51.26	1 7.00
	14	3 23 38.14	9.848	18 36 27.3	36.29	3 49.31	−0.008	15 51.05	1 7.08
	15	3 27 34.80	9.873	18 50 49.1	35.51	3 49.20	+0.017	15 50.84	1 7.16
	16	3 31 32.07	9.898	+19 4 51.7	+34.71	−3 48.50	+0.041	15 50.64	1 7.24
	17	3 35 29.92	9.922	+19 18 35.1	+33.89	−3 47.22	+0.065	15 50.44	1 7.32

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

WASHINGTON APPARENT NOON.

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.
s	° ′ ″	″	m s	s	′ ″	m s	h m s
9.922	+19 18 35.1	+33.89	−3 47.22	+0.065	15 50.44	1 7.32	3 39 17.75
9.946	19 31 58.8	33.07	3 45.35	0.089	15 50.24	1 7.40	3 43 14.31
9.970	19 45 2.7	32.24	3 42.92	0.113	15 50.05	1 7.48	3 47 10.86
9.992	19 57 46.4	31.40	3 39.95	0.136	15 49.86	1 7.56	3 51 7.42
10.015	20 10 9.7	30.54	3 36.41	0.159	15 49.68	1 7.63	3 55 3.98
10.037	+20 22 12.3	+29.67	−3 32.35	+0.180	15 49.51	1 7.71	3 59 0.54
10.058	20 33 53.8	28.79	3 27.76	0.201	15 49.34	1 7.78	4 2 57.09
10.079	20 45 14.2	27.91	3 22.66	0.222	15 49.17	1 7.85	4 6 53.65
10.100	20 56 13.2	27.01	3 17.06	0.243	15 49.01	1 7.92	4 10 50.21
10.120	21 6 50.6	26.10	3 10.99	0.263	15 48.85	1 7.99	4 14 46.76
10.139	+21 17 6.1	+25.18	−3 4.44	+0.282	15 48.70	1 8.06	4 18 43.32
10.159	21 26 59.6	24.26	2 57.43	0.301	15 48.55	1 8.13	4 22 39.88
10.177	21 36 30.7	23.33	2 49.99	0.319	15 48.40	1 8.19	4 26 36.43
10.195	21 45 39.3	22.39	2 42.11	0.337	15 48.26	1 8.25	4 30 32.99
10.211	21 54 25.4	21.44	2 33.81	0.354	15 48.12	1 8.31	4 34 29.55
10.227	+22 2 48.6	+20.48	−2 25.12	+0.370	15 47.98	1 8.37	4 38 26.11
10.243	22 10 48.8	19.52	2 16.04	0.386	15 47.85	1 8.43	4 42 22.66
10.259	22 18 25.8	18.55	2 6.58	0.401	15 47.72	1 8.48	4 46 19.22
10.274	22 25 39.4	17.58	1 56.77	0.416	15 47.59	1 8.53	4 50 15.78
10.288	22 32 29.5	16.60	1 46.62	0.430	15 47.47	1 8.58	4 54 12.34
10.302	+22 38 56.0	+15.61	−1 36.12	+0.444	15 47.35	1 8.63	4 58 8.89
10.315	22 44 58.8	14.62	1 25.31	0.457	15 47.23	1 8.67	5 2 5.45
10.327	22 50 37.7	13.62	1 14.19	0.470	15 47.12	1 8.71	5 6 2.01
10.338	22 55 52.6	12.61	1 2.78	0.481	15 47.01	1 8.75	5 9 58.57
10.349	23 0 43.2	11.60	0 51.11	0.492	15 46.90	1 8.78	5 13 55.13
10.360	+23 5 9.6	+10.58	−0 39.17	+0.502	15 46.79	1 8.81	5 17 51.68
10.369	23 9 11.5	9.57	0 27.02	0.511	15 46.68	1 8.83	5 21 48.24
10.377	23 12 49.1	8.55	0 14.64	0.519	15 46.59	1 8.86	5 25 44.80
10.384	23 16 2.1	7.53	−0 2.09	0.526	15 46.49	1 8.88	5 29 41.36
10.391	23 18 50.4	6.50	+0 10.62	0.532	15 46.40	1 8.90	5 33 37.92
10.396	+23 21 14.0	+ 5.47	+0 23.48	+0.538	15 46.32	1 8.91	5 37 34.47
10.400	23 23 12.9	4.44	0 36.45	0.542	15 46.25	1 8.92	5 41 31.03
10.402	23 24 46.9	3.40	0 49.50	0.544	15 46.18	1 8.93	5 45 27.59
10.404	23 25 56.2	2.37	1 2.59	0.546	15 46.11	1 8.94	5 49 24.15
10.405	23 26 40.6	1.33	1 15.71	0.547	15 46.05	1 8.94	5 53 20.71
10.404	+23 27 0.2	+ 0.30	+1 28.84	+0.546	15 4 .99	1 8.94	5 57 17.26
10.402	23 26 55.0	− 0.73	1 41.93	0.544	15 45.94	1 8.94	6 1 13.82
10.399	23 26 25.0	1.77	1 54.97	0.541	15 45.90	1 8.93	6 5 10.38
10.395	23 25 30.2	2.80	2 7.91	0.537	15 45.86	1 8.92	6 9 6.94
10.390	23 24 10.7	3.83	2 20.74	0.532	15 45.82	1 8.91	6 13 3.50
10.385	+23 22 26.4	− 4.86	+2 33.46	+0.527	15 45.79	1 8.89	6 17 0.05
10.377	23 20 17.6	5.88	2 46.01	0.519	15 45.77	1 8.87	6 20 56.61
10.369	23 17 44.1	6.90	2 58.38	0.511	15 45.75	1 8.85	6 24 53.17
10.360	23 14 46.3	7.92	3 10.56	0.502	15 45.73	1 8.81	6 28 49.73
10.350	23 11 23.9	8.94	3 22.50	0.493	15 45.72	1 8.78	6 32 46.28
10.340	+23 7 37.2	− 9.95	+3 34.19	+0.482	15 45.71	1 8.75	6 36 42.84
10.328	*+23 3 26.5*	*−10.96*	+3 45.63	+0.470	15 45.71	1 8.71	6 40 39.40

e interval of semidiameter passing meridian, subtract 0s.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.
		h m s	s	° ′ ″	″	m s	s	′ ″	m s
July	1	6 40 17.62	10.340	+23 7 37.2	− 9.95	+3 34.19	+0.482	15 45.71	1 8.75
	2	6 44 25.64	10.328	23 3 26.5	10.95	3 45.63	0.470	15 45.71	1 8.71
	3	6 48 33.38	10.316	22 58 51.5	11.95	3 56.76	0.458	15 45.70	1 8.67
	4	6 52 40.80	10.303	22 53 52.5	12.95	4 7.61	0.445	15 45.70	1 8.63
	5	6 56 47.93	10.290	22 48 29.6	13.95	4 18.15	0.432	15 45.71	1 8.59
	6	7 0 54.71	10.276	+22 42 42.9	−14.93	+4 28.34	+0.418	15 45.71	1 8.54
	7	7 5 1.15	10.261	22 36 32.7	15.92	4 38.20	0.403	15 45.72	1 8.49
	8	7 9 7.24	10.246	22 29 58.7	16.90	4 47.70	0.389	15 45.74	1 8.44
	9	7 13 12.96	10.230	22 23 1.5	17.87	4 56.84	0.372	15 45.75	1 8.38
	10	7 17 18.28	10.213	22 15 41.0	18.84	5 5.58	0.355	15 45.78	1 8.32
	11	7 21 23.21	10.196	+22 7 57.3	−19.79	+5 13.92	+0.338	15 45.81	1 8.26
	12	7 25 27.70	10.178	21 59 50.9	20.74	5 21.85	0.321	15 45.84	1 8.20
	13	7 29 31.76	10.160	21 51 21.6	21.69	5 29.32	0.302	15 45.87	1 8.14
	14	7 33 35.37	10.141	21 42 29.9	22.62	5 36.35	0.283	15 45.91	1 8.07
	15	7 37 38.51	10.121	21 33 15.9	23.55	5 42.93	0.264	15 45.95	1 8.00
	16	7 41 41.16	10.100	+21 23 39.8	−24.46	+5 49.00	+0.243	15 46.00	1 7.92
	17	7 45 43.30	10.078	21 13 41.8	25.36	5 54.57	0.221	15 46.05	1 7.85
	18	7 49 44.92	10.056	21 3 22.1	26.26	5 59.62	0.199	15 46.12	1 7.77
	19	7 53 46.01	10.034	20 52 41.2	27.15	6 4.14	0.177	15 46.18	1 7.70
	20	7 57 46.53	10.011	20 41 39.1	28.02	6 8.10	0.154	15 46.26	1 7.62
	21	8 1 46.51	9.987	+20 30 16.1	−28.88	+6 11.51	+0.130	15 46.34	1 7.54
	22	8 5 45.92	9.963	20 18 32.5	29.74	6 14.35	0.106	15 46.42	1 7.46
	23	8 9 44.73	9.939	20 6 28.4	30.59	6 16.60	0.082	15 46.51	1 7.38
	24	8 13 42.96	9.914	19 54 4.3	31.42	6 18.26	0.057	15 46.60	1 7.29
	25	8 17 40.59	9.888	19 41 20.4	32.23	6 19.32	0.032	15 46.70	1 7.21
	26	8 21 37.60	9.862	+19 28 16.9	−33.04	+6 19.79	+0.006	15 46.80	1 7.13
	27	8 25 34.00	9.837	19 14 54.2	33.84	6 19.63	−0.020	15 46.90	1 7.04
	28	8 29 29.78	9.811	19 1 12.4	34.63	6 18.86	0.045	15 47.02	1 6.96
	29	8 33 24.95	9.785	18 47 11.9	35.40	6 17.47	0.071	15 47.13	1 6.87
	30	8 37 19.48	9.759	18 32 53.0	36.16	6 15.46	0.097	15 47.25	1 6.79
	31	8 41 13.40	9.733	+18 18 15.9	−36.92	+6 12.82	−0.123	15 47.37	1 6.70
Aug.	1	8 45 6.70	9.708	18 3 20.8	37.66	6 9.57	0.148	15 47.50	1 6.61
	2	8 48 59.38	9.683	17 48 8.1	38.39	6 5.71	0.173	15 47.62	1 6.53
	3	8 52 51.46	9.658	17 32 38.0	39.11	6 1.24	0.198	15 47.75	1 6.44
	4	8 56 42.93	9.633	17 16 50.8	39.82	5 56.17	0.223	15 47.88	1 6.35
	5	9 0 33.80	9.608	+17 0 46.9	−40.51	+5 50.51	−0.248	15 48.02	1 6.27
	6	9 4 24.10	9.584	16 44 26.2	41.20	5 44.26	0.272	15 48.15	1 6.18
	7	9 8 13.80	9.559	16 27 49.2	41.87	5 37.44	0.296	15 48.29	1 6.09
	8	9 12 2.94	9.536	16 10 56.2	42.54	5 30.04	0.320	15 48.44	1 6.01
	9	9 15 51.51	9.512	15 53 47.5	43.18	5 22.08	0.343	15 48.58	1 5.92
	10	9 19 39.53	9.489	+15 36 23.4	−43.81	+5 13.56	−0.367	15 48.73	1 5.84
	11	9 23 26.98	9.466	15 18 44.2	44.44	5 4.48	0.390	15 48.88	1 5.76
	12	9 27 13.89	9.443	15 0 50.2	45.05	4 54.85	0.413	15 49.04	1 5.67
	13	9 31 0.24	9.420	14 42 41.6	45.65	4 44.69	0.435	15 49.21	1 5.59
	14	9 34 46.06	9.398	14 24 19.0	46.23	4 33.98	0.457	15 49.38	1 5.51
	15	*9 38 31.35*	9.376	+14 5 42.6	−46.80	+4 22.74	−0.479	15 49.55	1 5.44
	16	*9 42 16.10*	9.354	+13 46 52.6	−47.36	+4 10.98	−0.501	15 49.72	1 5.38

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

FOR WASHINGTON APPARENT NOON.

Dec.	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
16	9 42 16.10	9.354	+13 46 52.6	−47.36	+ 4 10.98	−0.501	15 49.72	1 5.36	9 38 4.44
17	9 46 0.34	9.333	13 27 49.5	47.89	3 58.69	0.522	15 49.90	1 5.29	9 42 1.00
18	9 49 44.07	9.312	13 8 33.7	48.42	3 45.90	0.543	15 50.09	1 5.21	9 45 57.55
19	9 53 27.29	9.291	12 49 5.4	48.94	3 32.60	0.564	15 50.28	1 5.14	9 49 54.11
20	9 57 10.02	9.271	12 29 24.8	49.43	3 18.82	0.584	15 50.47	1 5.07	9 53 50.66
21	10 0 52.26	9.250	+12 9 32.5	−49.91	+ 3 4.55	−0.604	15 50.67	1 5.00	9 57 47.22
22	10 4 34.03	9.231	11 49 28.8	50.39	2 49.79	0.624	15 50.87	1 4.94	10 1 43.77
23	10 8 15.32	9.211	11 29 13.8	50.85	2 34.58	0.643	15 51.08	1 4.87	10 5 40.32
24	10 11 56.17	9.193	11 8 48.1	51.29	2 18.91	0.662	15 51.29	1 4.81	10 9 36.88
25	10 15 36.58	9.175	10 48 11.9	51.72	2 2.81	0.680	15 51.50	1 4.74	10 13 33.43
26	10 19 16.56	9.157	+10 27 25.6	−52.14	+ 1 46.27	−0.698	15 51.72	1 4.68	10 17 29.99
27	10 22 56.12	9.140	10 6 29.4	52.54	1 29.34	0.714	15 51.94	1 4.63	10 21 26.54
28	10 26 35.28	9.124	9 45 23.7	52.93	1 11.99	0.730	15 52.16	1 4.57	10 25 23.09
29	10 30 14.06	9.109	9 24 8.7	53.31	0 54.27	0.746	15 52.39	1 4.52	10 29 19.65
30	10 33 52.49	9.094	9 2 44.9	53.67	0 36.19	0.760	15 52.61	1 4.47	10 33 16.20
31	10 37 30.57	9.080	+ 8 41 12.4	−54.02	+ 0 17.77	−0.774	15 52.84	1 4.42	10 37 12.76
1	10 41 8.33	9.067	8 19 31.6	54.37	− 0 0.98	0.788	15 53.06	1 4.37	10 41 9.31
2	10 44 45.79	9.055	7 57 42.8	54.70	0 20.02	0.799	15 53.29	1 4.33	10 45 5.86
3	10 48 22.97	9.044	7 35 46.1	55.02	0 39.34	0.810	15 53.52	1 4.29	10 49 2.42
4	10 51 59.90	9.034	7 13 41.9	55.32	0 58.91	0.820	15 53.75	1 4.25	10 52 58.97
5	10 55 36.59	9.024	+ 6 51 30.6	−55.61	− 1 18.72	−0.830	15 53.99	1 4.22	10 56 55.52
6	10 59 13.07	9.016	6 29 12.5	55.89	1 38.73	0.838	15 54.22	1 4.18	11 0 52.08
7	11 2 49.37	9.009	6 6 47.8	56.16	1 58.94	0.845	15 54.46	1 4.15	11 4 48.63
8	11 6 25.47	9.002	5 44 16.9	56.41	2 19.33	0.852	15 54.69	1 4.13	11 8 45.18
9	11 10 1.42	8.995	5 21 40.2	56.65	2 39.88	0.859	15 54.93	1 4.10	11 12 41.73
10	11 13 37.23	8.990	+ 4 58 58.0	−56.87	− 3 0.56	−0.864	15 55.18	1 4.08	11 16 38.29
11	11 17 12.94	8.985	4 36 10.4	57.08	3 21.35	0.869	15 55.42	1 4.06	11 20 34.84
12	11 20 48.53	8.981	4 13 18.0	57.28	3 42.26	0.873	15 55.67	1 4.05	11 24 31.39
13	11 24 24.02	8.978	3 50 21.2	57.46	4 3.26	0.876	15 55.92	1 4.03	11 28 27.95
14	11 27 59.46	8.976	3 27 20.2	57.62	4 24.32	0.878	15 56.18	1 4.02	11 32 24.50
15	11 31 34.84	8.974	+ 3 4 15.5	−57.77	− 4 45.44	−0.880	15 56.43	1 4.01	11 36 21.05
16	11 35 10.17	8.972	2 41 7.2	57.91	5 6.60	0.882	15 56.69	1 4.01	11 40 17.61
17	11 38 45.50	8.972	2 17 55.9	58.02	5 27.77	0.882	15 56.96	1 4.01	11 44 14.16
18	11 42 20.82	8.972	1 54 41.8	58.13	5 48.94	0.882	15 57.22	1 4.01	11 48 10.71
19	11 45 56.15	8.973	1 31 25.3	58.23	6 10.11	0.881	15 57.49	1 4.01	11 52 7.26
20	11 49 31.52	8.974	+ 1 8 6.8	−58.30	− 6 31.23	−0.880	15 57.76	1 4.02	11 56 3.82
21	11 53 6.93	8.977	0 44 46.6	58.37	6 52.31	0.877	15 58.03	1 4.03	12 0 0.37
22	11 56 42.42	8.981	+ 0 21 25.1	58.42	7 13.32	0.873	15 58.30	1 4.04	12 3 56.92
23	12 0 18.00	8.985	− 0 1 57.3	58.45	7 34.24	0.869	15 58.58	1 4.06	12 7 53.48
24	12 3 53.67	8.989	0 25 20.5	58.47	7 55.06	0.865	15 58.86	1 4.08	12 11 50.03
25	12 7 29.48	8.995	− 0 48 44.0	−58.48	− 8 15.75	−0.859	15 59.13	1 4.11	12 15 46.58
26	12 11 5.42	9.001	1 12 7.4	58.47	8 36.29	0.853	15 59.41	1 4.14	12 19 43.14
27	12 14 41.54	9.009	1 35 30.4	58.44	8 56.68	0.845	15 59.69	1 4.17	12 23 39.69
28	12 18 17.86	9.018	1 58 52.7	58.41	9 16.87	0.837	15 59.97	1 4.20	12 27 36.24
29	12 21 54.38	9.027	2 22 14.0	58.36	9 36.84	0.827	16 0.24	1 4.23	12 31 32.79
30	12 25 31.14	9.037	− 2 45 34.0	−58.30	− 9 56.57	−0.817	16 0.52	1 4.27	12 35 29.35
1	12 29 *8.16*	*9.049*	*− 3 8 52.5*	−58.22	−10 16.05	−0.805	16 0.80	1 4.31	12 39 25.90

Note.—For mean time interval of semidiameter passing meridian, subtract 0s.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. Pas Merid.
		h m s	s	° ′ ″	″	m s	s	′ ″	m s
Oct.	1	12 29 8.16	9.049	− 3 8 52.5	−58.22	−10 16.05	−0.805	16 0.80	1 4.3
	2	12 32 45.49	9.062	3 32 9.0	58.14	10 35.22	0.792	16 1.07	1 4.3
	3	12 36 23.12	9.075	3 55 23.1	58.03	10 54.09	0.779	16 1.35	1 4.4
	4	12 40 1.10	9.089	4 18 34.6	57.91	11 12.62	0.765	16 1.62	1 4.4
	5	12 43 39.43	9.105	4 41 43.2	57.78	11 30.79	0.749	16 1.89	1 4.5
	6	12 47 18.16	9.122	− 5 4 48.3	−57.64	−11 48.56	−0.732	16 2.16	1 4.5
	7	12 50 57.28	9.139	5 27 49.9	57.48	12 5.95	0.715	16 2.43	1 4.6
	8	12 54 36.84	9.157	5 50 47.4	57.30	12 22.90	0.697	16 2.70	1 4.6
	9	12 58 16.83	9.176	6 13 40.4	57.11	12 39.41	0.678	16 2.98	1 4.7
	10	13 1 57.30	9.196	6 36 28.5	56.89	12 55.46	0.659	16 3.25	1 4.8
	11	13 5 38.24	9.216	− 6 59 11.5	−56.67	−13 11.02	−0.639	16 3.52	1 4.8
	12	13 9 19.68	9.238	7 21 49.0	56.43	13 26.10	0.617	16 3.79	1 4.9
	13	13 13 1.63	9.260	7 44 20.3	56.17	13 40.65	0.595	16 4.06	1 5.0
	14	13 16 44.12	9.282	8 6 45.2	55.90	13 54.69	0.573	16 4.34	1 5.1
	15	13 20 27.16	9.305	8 29 3.5	55.61	14 8.17	0.550	16 4.61	1 5.1
	16	13 24 10.75	9.328	− 8 51 14.5	−55.30	−14 21.08	−0.526	16 4.88	1 5.2
	17	13 27 54.92	9.352	9 13 17.9	54.98	14 33.43	0.502	16 5.16	1 5.3
	18	13 31 39.69	9.378	9 35 13.4	54.64	14 45.20	0.478	16 5.43	1 5.4
	19	13 35 25.05	9.404	9 57 0.5	54.28	14 56.36	0.452	16 5.71	1 5.5
	20	13 39 11.03	9.430	10 18 38.7	53.90	15 6.90	0.426	16 5.98	1 5.6
	21	13 42 57.65	9.456	−10 40 7.8	−53.51	−15 16.81	−0.399	16 6.26	1 5.7
	22	13 46 44.91	9.483	11 1 27.3	53.10	15 26.08	0.373	16 6.53	1 5.8
	23	13 50 32.80	9.510	11 22 36.7	52.68	15 34.70	0.345	16 6.81	1 5.9
	24	13 54 21.39	9.538	11 43 35.8	52.23	15 42.65	0.317	16 7.08	1 6.0
	25	13 58 10.66	9.567	12 4 24.1	51.78	15 49.92	0.289	16 7.35	1 6.1
	26	14 2 0.62	9.596	−12 25 1.3	−51.31	−15 56.50	−0.259	16 7.62	1 6.2
	27	14 5 51.30	9.627	12 45 27.0	50.82	16 2.35	0.229	16 7.88	1 6.3
	28	14 9 42.72	9.658	13 5 40.7	50.31	16 7.48	0.198	16 8.15	1 6.4
	29	14 13 34.88	9.690	13 25 42.1	49.80	16 11.85	0.166	16 8.40	1 6.5
	30	14 17 27.81	9.722	13 45 30.9	49.26	16 15.47	0.134	16 8.66	1 6.6
	31	14 21 21.52	9.755	−14 5 6.7	−48.71	−16 18.31	−0.102	16 8.91	1 6.7
Nov.	1	14 25 16.03	9.788	14 24 28.9	48.14	16 20.34	0.068	16 9.16	1 6.8
	2	14 29 11.35	9.822	14 43 37.4	47.55	16 21.59	0.035	16 9.40	1 7.0
	3	14 33 7.48	9.856	15 2 31.5	46.95	16 22.01	−0.001	16 9.64	1 7.1
	4	14 37 4.45	9.891	15 21 11.1	46.34	16 21.59	+0.034	16 9.88	1 7.2
	5	14 41 2.26	9.926	−15 39 35.7	−45.70	−16 20.34	+0.070	16 10.12	1 7.3
	6	14 45 0.92	9.962	15 57 44.7	45.04	16 18.24	0.105	16 10.35	1 7.4
	7	14 49 0.44	9.998	16 15 37.9	44.37	16 15.29	0.141	16 10.59	1 7.5
	8	14 53 0.81	10.034	16 33 14.8	43.69	16 11.47	0.177	16 10.82	1 7.7
	9	14 57 2.06	10.070	16 50 34.9	42.99	16 6.81	0.213	16 11.04	1 7.8
	10	15 1 4.16	10.106	−17 7 37.9	−42.26	−16 1.27	+0.249	16 11.27	1 7.9
	11	15 5 7.13	10.142	17 24 23.4	41.52	15 54.88	0.285	16 11.49	1 8.0
	12	15 9 10.95	10.178	17 40 51.0	40.77	15 47.62	0.320	16 11.71	1 8.
	13	15 13 15.65	10.213	17 57 0.1	39.99	15 39.51	0.356	16 11.93	1 8.3
	14	15 17 21.20	10.249	18 12 50.4	39.20	15 30.54	0.391	16 12.14	1 8.4
	15	15 21 27.60	10.284	−18 28 21.6	−38.39	−15 20.72	+0.426	16 12.36	1 8.5
	16	*15 25 34.85*	10.319	−18 43 33.3	−37.57	−15 10.06	+0.461	16 12.57	1 8.6

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

WASHINGTON APPARENT NOON.

	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.
	s	° ′ ″	″	m s	s	′ ″	m s	h m s
5	10.319	−18 43 33.3	−37.57	−15 10.06	+0.461	16 12.57	1 8.66	15 40 47.40
1	10.353	18 58 24.9	36.73	14 58.57	0.496	16 12.78	1 8.78	15 44 43.95
3	10.388	19 12 56.1	35.87	14 46.25	0.530	16 12.99	1 8.89	15 48 40.51
6	10.422	19 27 6.6	35.00	14 33.12	0.564	16 13.20	1 9.00	15 52 37.07
8	10.455	19 40 56.0	34.11	14 19.19	0.597	16 13.40	1 9.12	15 56 33.62
0	10.488	−19 54 23.9	−33.21	−14 4.47	+0.630	16 13.60	1 9.23	16 0 30.18
1	10.521	20 7 29.9	32.29	13 48.96	0.662	16 13.80	1 9.34	16 4 26.74
9	10.553	20 20 13.7	31.36	13 32.68	0.694	16 14.00	1 9.45	16 8 23.29
3	10.585	20 32 35.1	30.41	13 15.65	0.726	16 14.18	1 9.56	16 12 19.85
2	10.615	20 44 33.5	29.45	12 57.86	0.757	16 14.37	1 9.66	16 16 16.41
6	10.646	−20 56 8.6	−28.48	−12 39.33	+0.787	16 14.55	1 9.76	16 20 12.97
2	10.676	21 7 20.3	27.49	12 20.07	0.817	16 14.73	1 9.86	16 24 9.52
0	10.705	21 18 8.3	26.49	12 0.09	0.847	16 14.89	1 9.96	16 28 6.08
0	10.735	21 28 32.1	25.48	11 39.41	0.876	16 15.05	1 10.06	16 32 2.64
8	10.763	21 38 31.4	24.46	11 18.05	0.904	16 15.21	1 10.15	16 35 59.19
5	10.791	−21 48 6.0	−23.42	−10 56.00	+0.932	16 15.37	1 10.24	16 39 55.75
7	10.819	21 57 15.5	22.37	10 33.31	0.959	16 15.52	1 10.33	16 43 52.31
3	10.845	22 5 59.7	21.31	10 9.97	0.985	16 15.66	1 10.41	16 47 48.87
2	10.870	22 14 18.3	20.24	9 46.01	1.010	16 15.80	1 10.49	16 51 45.43
9	10.894	22 22 11.1	19.16	9 21.46	1.035	16 15.93	1 10.57	16 55 41.98
5	10.918	−22 29 37.8	−18.06	− 8 56.33	+1.058	16 16.06	1 10.64	16 59 38.54
4	10.940	22 36 38.2	16.96	8 30.66	1.080	16 16.18	1 10.70	17 3 35.10
6	10.961	22 43 11.8	15.85	8 4.46	1.101	16 16.30	1 10.77	17 7 31.66
8	10.981	22 49 18.8	14.73	7 37.78	1.121	16 16.41	1 10.83	17 11 28.22
5	11.000	22 54 58.8	13.60	7 10.64	1.140	16 16.52	1 10.89	17 15 24.77
6	11.016	−23 0 11.5	−12.46	− 6 43.07	+1.157	16 16.63	1 10.95	17 19 21.33
5	11.032	23 4 56.9	11.31	6 15.10	1.173	16 16.73	1 11.00	17 23 17.89
2	11.047	23 9 14.8	10.16	5 46.78	1.187	16 16.84	1 11.04	17 27 14.45
0	11.060	23 13 5.0	9.01	5 18.12	1.200	16 16.93	1 11.08	17 31 11.01
8	11.071	23 16 27.3	7.85	4 49.18	1.211	16 17.03	1 11.12	17 35 7.56
2	11.081	−23 19 21.7	− 6.69	− 4 19.99	+1.221	16 17.12	1 11.16	17 39 4.12
6	11.088	23 21 48.2	5.52	3 50.59	1.228	16 17.20	1 11.18	17 43 0.68
8	11.095	23 23 46.6	4.35	3 21.00	1.235	16 17.29	1 11.20	17 46 57.24
3	11.100	23 25 16.7	3.17	2 51.29	1.240	16 17.36	1 11.22	17 50 53.80
9	11.104	23 26 18.7	2.00	2 21.47	1.244	16 17.43	1 11.24	17 54 50.36
3	11.106	−23 26 52.4	− 0.82	− 1 51.58	+1.246	16 17.50	1 11.25	17 58 46.91
8	11.106	23 26 57.9	+ 0.36	1 21.67	1.246	16 17.57	1 11.25	18 2 43.47
4	11.106	23 26 35.1	1.54	0 51.75	1.246	16 17.63	1 11.25	18 6 40.03
7	11.103	23 25 44.1	2.71	− 0 21.86	1.243	16 17.68	1 11.25	18 10 36.59
2	11.100	23 24 24.8	3.89	+ 0 7.96	1.240	16 17.73	1 11.24	18 14 33.15
9	11.096	−23 22 37.4	+ 5.06	+ 0 37.68	+1.236	16 17.77	1 11.23	18 18 29.71
3	11.090	23 20 21.8	6.24	1 7.28	1.230	16 17.81	1 11.21	18 22 26.26
2	11.083	23 17 38.0	7.41	1 36.73	1.223	16 17.83	1 11.19	18 26 22.82
2	11.075	23 14 26.2	8.57	2 6.00	1.215	16 17.85	1 11.16	18 30 19.38
1	11.066	23 10 46.4	9.74	2 35.05	1.206	16 17.87	1 11.13	18 34 15.94
6	11.055	−23 6 38.8	+10.90	+ 3 3.87	+1.195	16 17.88	1 11.09	18 38 12.50

time interval of semidiameter passing meridian, subtract 0.13 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.	Ver. per Hour of Long.	Geocentric Declination of Center.	Var. per Hour of Long.	S. T. of Semid. Passing Meridian.	Geocentric Semidiameter.	Equatorial Horizontal Parallax.	Bright Limbs.
		h m	m	h m s	s	° ′ ″	″	s	′ ″	′ ″	
Jan. 1	U	6 57.69	2.019	1 41 56.25	131.34	+16 9 51.5	+698.7	66.95	15 30.6	56 49.4	I.
1	L	19 22.09	2.048	2 8 22.44	133.07	18 22 30.9	626.5	67.37	15 24.9	56 28.7	
2	U	7 46.85	2.079	2 35 10.38	134.95	20 19 59.8	547.0	67.84	15 19.7	56 9.4	I.
2	L	20 11.98	2.110	3 2 20.81	136.78	22 0 54.1	460.9	68.28	15 14.8	55 51.5	
3	U	8 37.47	2.137	3 29 52.32	138.42	+23 23 59.3	+369.1	68.67	15 10.3	55 35.1	I.
3	L	21 3.24	2.158	3 57 41.33	139.67	24 28 13.5	272.6	68.95	15 6.2	55 20.0	
4	U	9 29.21	2.169	4 25 42.14	140.37	25 12 49.7	173.0	69.09	15 2.5	55 6.2	I.
4	L	21 55.26	2.170	4 53 47.52	140.42	25 37 20.5	+ 72.0	69.07	14 59.1	54 53.9	
5	U	10 21.24	2.159	5 21 49.15	139.74	+25 41 39.9	− 28.5	68.87	14 56.1	54 42.7	I.
5	L	22 47.02	2.136	5 49 38.38	138.35	25 26 4.4	126.9	68.49	14 53.4	54 32.9	
6	U	11 12.46	2.102	6 17 7.00	136.32	24 51 12.3	221.0	67.94	14 51.0	54 24.2	I.
6	L	23 37.43	2.060	6 44 7.99	133.77	23 58 1.6	309.8	67.27	14 49.0	54 16.8	
7	U	12 1.86	2.011	7 10 35.89	130.84	+22 47 45.4	−391.8	66.50	14 47.3	54 10.5	I.
8	L	0 25.68	1.959	7 36 27.23	127.69	21 21 49.2	466.4	65.67	14 45.9	54 5.5	
8	U	12 48.87	1.906	8 1 40.47	124.52	19 41 45.0	533.0	64.82	14 44.9	54 1.8	II.
9	L	1 11.42	1.855	8 26 15.98	121.43	17 49 8.1	591.8	64.00	14 44.2	53 59.4	
9	U	13 33.39	1.807	8 50 15.79	118.58	+15 45 33.4	−642.7	63.25	14 44.0	53 58.4	II.
10	L	1 54.82	1.765	9 13 43.32	116.07	13 32 33.7	686.1	62.58	14 44.1	53 59.0	
10	U	14 15.79	1.730	9 36 43.17	113.97	11 11 37.5	722.1	62.03	14 44.7	54 1.2	II.
11	L	2 36.39	1.704	9 59 20.80	112.38	8 44 9.5	751.4	61.61	14 45.8	54 5.2	
11	U	14 56.72	1.686	10 21 42.44	111.32	+ 6 11 29.6	−774.1	61.34	14 47.4	54 11.0	II.
12	L	3 16.90	1.679	10 43 54.89	110.85	3 34 54.2	790.7	61.24	14 49.6	54 18.9	
12	U	15 37.05	1.681	11 6 5.41	111.01	+ 0 55 37.9	801.0	61.32	14 52.3	54 28.9	II.
13	L	3 57.30	1.695	11 28 21.75	111.82	− 1 45 5.7	805.2	61.59	14 55.6	54 41.1	
13	U	16 17.77	1.720	11 50 51.99	113.34	− 4 26 0.7	−802.9	62.05	14 59.6	54 55.7	II.
14	L	4 38.62	1.757	12 13 44.59	115.56	7 5 48.3	793.7	62.69	15 4.2	55 12.5	
14	U	16 59.99	1.806	12 37 8.35	118.52	9 43 2.0	777.1	63.53	15 9.4	55 31.8	II.
15	L	5 22.02	1.868	13 1 12.14	122.24	12 16 5.7	751.9	64.56	15 15.3	55 53.3	
15	U	17 44.87	1.942	13 26 4.89	126.68	−14 43 10.4	−717.0	65.77	15 21.7	56 17.0	II.
16	L	6 8.67	2.027	13 51 55.16	131.81	17 2 11.2	671.1	67.13	15 28.8	56 42.8	
16	U	18 33.55	2.122	14 18 50.62	137.53	19 10 46.3	612.4	68.61	15 36.3	57 10.4	II.
17	L	6 59.62	2.224	14 46 57.38	143.65	21 6 14.5	539.7	70.16	15 44.2	57 39.4	
17	U	19 26.94	2.329	15 16 19.03	149.96	−22 45 38.5	−451.6	71.72	15 52.4	58 9.4	II.
18	L	7 55.50	2.430	15 46 55.61	156.08	24 5 49.8	347.6	73.20	16 0.7	58 39.8	
18	U	20 25.23	2.522	16 18 42.53	161.61	25 3 38.7	228.0	74.50	16 8.9	59 9.9	II.
19	L	8 55.96	2.597	16 51 30.05	166.11	25 36 8.6	− 94.9	75.53	16 16.8	59 39.0	
19	U	21 27.46	2.648	17 25 3.23	169.16	−25 40 55.0	+ 48.5	76.23	16 24.2	60 6.2	II.
20	L	9 59.40	2.670	17 59 3.07	170.52	25 16 22.6	197.2	76.51	16 30.8	60 30.6	
20	U	22 31.43	2.664	18 33 8.41	170.09	24 22 2.1	345.6	76.37	16 36.5	60 51.5	II.
21	L	11 3.20	2.629	19 6 58.57	168.02	22 58 36.4	487.1	75.87	16 41.0	61 8.0	
21	U	23 34.43	2.573	19 40 15.68	164.64	−21 7 59.5	+616.5	75.06	16 44.2	61 19.5	
22	L	12 4.89	2.502	20 12 46.50	160.39	18 53 5.3	729.4	74.03	16 45.8	61 25.6	
23	U	0 34.45	2.424	20 44 23.10	155.69	16 17 31.4	822.8	72.89	16 46.0	61 26.1	
23	L	13 3.06	2.345	21 15 2.69	150.94	13 25 21.3	895.3	71.74	16 44.6	61 20.9	
24	U	1 30.75	2.271	21 44 46.80	146.49	−10 20 47.6	+946.8	70.64	16 42.7	61 10.4	I.

Jan. 4, U Defective Illumination of N. 0′.83.
Jan. 5, U Defective Illumination of S. 0′.02.
Jan. 6, U Defective Illumination of S. 0′.24.
Jan. 7, U Defective Illumination of N. 0′.91.

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

	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.	Geocentric Semidiameter.	Equatorial Horizontal Parallax.	Bright Limbs.
	m	h m s	s	° ′ ″	″	s	′ ″	′ ″	
75	2.271	21 44 46.80	146.49	−10 20 47.6	+946.8	70.64	16 41.7	61 10.4	I. S.
59	2.205	22 13 40.22	142.53	7 7 58.6	978.0	69.67	16 37.5	60 55.1	
71	2.150	22 41 49.93	139.22	3 50 49.8	990.4	68.86	16 32.2	60 35.5	I. S.
24	2.107	23 9 24.20	136.63	− 0 32 56.7	985.7	68.22	16 25.9	60 12.3	
33	2.076	23 36 31.78	134.77	+ 2 42 25.9	+965.7	67.77	16 18.8	59 46.4	I. S.
12	2.057	0 3 21.47	133.63	5 52 25.0	932.0	67.50	16 11.2	59 18.6	
75	2.049	0 30 1.58	133.16	8 54 28.0	886.6	67.41	16 3.4	58 49.7	I. S.
34	2.051	0 56 39.67	133.28	11 46 20.5	830.6	67.47	15 55.4	58 20.4	
01	2.061	1 23 22.23	133.89	+14 26 4.3	+765.3	67.65	15 47.5	57 51.4	I. S.
84	2.078	1 50 14.47	134.87	16 51 54.6	691.8	67.92	15 39.8	57 23.1	
90	2.098	2 17 20.04	136.08	19 2 18.7	611.1	68.24	15 32.4	56 56.0	I. S.
20	2.119	2 44 40.80	137.37	20 55 55.9	524.0	68.57	15 25.4	56 30.4	
76	2.140	3 12 16.70	138.59	+22 31 36.8	+431.9	68.87	15 18.9	56 6.7	I. S.
54	2.156	3 40 5.82	139.55	23 48 25.2	335.5	69.11	15 13.0	55 44.9	
47	2.165	4 8 4.30	140.12	24 45 39.2	236.4	69.23	15 7.7	55 25.3	I. S.
47	2.166	4 36 6.68	140.18	25 22 53.2	135.8	69.22	15 2.9	55 7.7	
42	2.158	5 4 6.38	139.67	+25 39 59.4	+ 35.4	69.04	14 58.6	54 52.3	I. S.
21	2.139	5 31 56.21	138.55	25 37 8.7	− 63.4	68.71	14 55.0	54 39.0	
71	2.110	5 59 29.01	136.84	25 14 50.1	159.0	68.24	14 52.0	54 27.8	I. N. S.
83	2.074	6 26 38.27	134.63	24 33 50.6	250.1	67.63	14 49.4	54 18.4	
46	2.031	6 53 18.62	132.03	+23 35 11.0	−335.5	66.92	14 47.4	54 10.9	I. N.
55	1.984	7 19 26.17	129.19	22 20 4.6	414.4	66.13	14 45.8	54 5.2	
06	1.934	7 44 58.66	126.22	20 49 53.4	486.2	65.32	14 44.7	54 1.1	I. N.
97	1.885	8 9 55.54	123.27	19 6 4.6	550.6	64.50	14 44.0	53 58.5	
31	1.839	8 34 17.78	120.47	+17 10 8.5	−607.4	63.73	14 43.7	53 57.3	I. N. S.
11	1.796	8 58 7.73	117.91	15 3 35.8	656.7	63.01	14 43.7	53 57.5	
43	1.759	9 21 28.85	115.67	12 47 56.0	698.6	62.39	14 44.2	53 59.1	I. II. S.
35	1.729	9 44 25.56	113.85	10 24 37.5	733.3	61.88	14 45.0	54 2.0	
94	1.706	10 7 3.02	112.48	+ 7 55 5.6	−760.8	61.50	14 46.1	54 6.2	II. S.
32	1.691	10 29 26.96	111.60	5 20 44.0	781.5	61.27	14 47.6	54 11.8	
57	1.686	10 51 43.63	111.27	2 42 54.6	795.5	61.20	14 49.5	54 18.7	II. S.
81	1.689	11 13 59.68	111.50	+ 0 2 58.4	802.7	61.29	14 51.8	54 27.0	
15	1.703	11 36 22.03	112.32	− 2 37 43.2	−803.0	61.56	14 54.5	54 36.9	II. S.
72	1.727	11 58 57.98	113.78	5 17 47.3	796.4	62.00	14 57.6	54 48.3	
65	1.762	12 21 55.01	115.84	7 55 47.5	782.3	62.61	15 1.1	55 1.4	II. S.
05	1.807	12 45 20.78	118.56	10 30 12.1	760.4	63.39	15 5.1	55 16.1	
05	1.862	13 9 22.97	121.91	−12 59 22.6	−729.8	64.34	15 9.6	55 32.6	II. S.
79	1.928	13 34 9.11	125.88	15 21 31.0	689.9	65.44	15 14.6	55 50.9	
37	2.004	13 59 46.27	130.41	17 34 39.1	639.7	66.67	15 20.1	56 11.0	II. S.
91	2.087	14 26 20.63	135.39	19 36 36.4	577.9	68.00	15 26.1	56 32.9	
47	2.175	14 53 56.90	140.70	−21 25 1.0	−504.0	69.38	15 32.5	56 56.4	II. S.
10	2.265	15 22 37.68	146.11	22 57 20.5	417.0	70.76	15 39.3	57 21.3	
81	2.352	15 52 22.67	151.35	24 10 57.2	316.9	72.07	15 46.4	57 47.4	II. S.
51	2.431	16 23 8.01	156.11	25 3 14.4	204.0	73.23	15 53.7	58 14.4	
09	2.497	16 54 45.94	160.06	−25 31 47.9	− 79.9	74.17	16 1.2	58 41.7	II. S.

ective Illumination of S. 0″.12. Feb. 5, 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 Semid. Passing Meridian.	Geocentric Semidiameter.	Equatorial Horizontal Parallax.	Bright Limb
		h m	m	h m s	s	° ′ ″	″	s	′ ″	′ ″	
Feb. 15	U	19 11.09	2.497	16 54 45.94	160.06	−25 31 47.9	− 79.9	74.17	16 1.2	58 41.7	II.
16	L	7 41.35	2.544	17 27 4.85	162.89	25 34 36.8	+ 52.9	74.83	16 8.6	59 8.9	
16	U	20 12.05	2.569	17 59 50.07	164.41	25 10 17.7	190.8	75.16	16 15.8	59 35.3	II.N
17	L	8 42.92	2.571	18 32 45.27	164.56	24 18 14.6	329.5	75.16	16 22.6	60 0.2	
17	U	21 13.68	2.552	19 5 34.18	163.39	−22 58 47.0	+ 464.1	74.84	16 28.7	60 22.8	II.N
18	L	9 44.09	2.515	19 38 2.32	161.14	21 13 11.1	590.1	74.27	16 34.0	60 42.3	
18	U	22 13.97	2.464	20 9 58.45	158.12	19 3 34.7	703.5	73.51	16 38.3	60 58.0	II.N
19	L	10 43.20	2.407	20 41 15.26	154.64	16 32 49.7	801.1	72.63	16 41.4	61 9.3	
19	U	23 11.72	2.347	21 11 49.43	151.05	−13 44 20.0	+ 880.7	71.73	16 43.1	61 15.7	II.N
20	L	11 39.54	2.290	21 41 41.33	147.63	10 41 50.5	940.9	70.87	16 43.4	61 16.8	
21	U	0 6.71	2.239	22 10 54.21	144.58	7 29 16.3	981.4	70.10	16 42.3	61 12.5	
21	L	12 33.32	2.197	22 39 33.42	142.05	4 10 33.3	1002.5	69.46	16 39.7	61 3.0	
22	U	0 59.48	2.165	23 7 45.67	140.10	− 0 49 30.9	+1004.9	68.97	16 35.7	60 48.6	
22	L	13 25.31	2.143	23 35 38.25	138.77	+ 2 30 13.1	989.7	68.65	16 30.6	60 29.7	
23	U	1 50.94	2.131	0 3 18.60	138.05	5 45 16.7	958.3	68.49	16 24.4	60 7.0	I.
23	L	14 16.49	2.128	0 30 53.77	137.89	8 52 34.8	912.3	68.48	16 17.4	59 41.3	
24	U	2 42.05	2.133	0 58 29.97	138.21	+11 49 22.5	+ 853.5	68.59	16 9.8	59 13.3	I.
24	L	15 7.71	2.145	1 26 12.32	138.89	14 33 13.2	783.1	68.80	16 1.8	58 43.9	
25	U	3 33.54	2.160	1 54 4.50	139.82	17 1 59.8	703.0	69.08	15 53.7	58 13.8	I.
25	L	15 59.57	2.177	2 22 8.49	140.85	19 13 54.6	614.7	69.36	15 45.4	57 43.7	
26	U	4 25.79	2.193	2 50 24.46	141.79	+21 7 29.2	+ 520.0	69.63	15 37.3	57 14.2	I.
26	L	16 52.18	2.205	3 18 50.59	142.51	22 41 34.4	420.2	69.83	15 29.6	56 45.9	
27	U	5 18.68	2.211	3 47 23.32	142.86	23 55 21.7	317.3	69.94	15 22.4	56 19.3	I.
27	L	17 45.21	2.209	4 15 57.46	142.73	24 48 22.8	212.8	69.91	15 15.6	55 54.6	
28	U	6 11.65	2.197	4 44 26.71	142.04	+25 20 30.0	+ 108.6	69.74	15 9.5	55 32.2	I.
28	L	18 37.90	2.176	5 12 44.18	140.77	25 31 56.3	+ 6.3	69.41	15 4.1	55 12.2	
Mar. 1	U	7 3.84	2.146	5 40 43.01	138.95	25 23 13.0	− 92.8	68.92	14 59.3	54 54.7	I.
1	L	19 29.36	2.107	6 8 16.95	136.64	24 55 8.2	187.1	68.30	14 55.2	54 39.7	
2	U	7 54.39	2.063	6 35 20.86	133.96	+24 8 43.4	− 276.0	67.58	14 51.8	54 27.3	I.
2	L	20 18.85	2.014	7 1 51.05	131.04	23 5 10.7	358.4	66.78	14 49.1	54 17.4	
3	U	8 42.72	1.964	7 27 45.40	128.01	21 45 49.1	434.0	65.94	14 47.1	54 9.9	I.
3	L	21 5.99	1.914	7 53 3.39	124.99	20 12 2.4	502.6	65.10	14 45.7	54 4.7	
4	U	9 28.66	1.866	8 17 46.01	122.13	+18 25 15.6	− 564.0	64.29	14 44.9	54 1.7	I.
4	L	21 50.79	1.822	8 41 55.50	119.50	16 26 54.8	618.3	63.53	14 44.6	54 0.7	
5	U	10 12.42	1.784	9 5 35.23	117.19	14 18 24.5	665.6	62.86	14 44.8	54 1.6	I.
5	L	22 33.63	1.752	9 28 49.45	115.25	12 1 8.6	705.9	62.29	14 45.5	54 4.2	
6	U	10 54.49	1.727	9 51 43.04	113.76	+ 9 36 29.7	− 739.5	61.85	14 46.7	54 8.4	I.
6	L	23 15.11	1.710	10 14 21.50	112.74	7 5 49.5	766.1	61.54	14 48.2	54 14.1	
7	U	11 35.57	1.701	10 36 50.69	112.22	4 30 29.4	785.9	61.38	14 50.1	54 21.0	I.
7	L	23 55.98	1.701	10 59 16.85	112.23	+ 1 51 52.3	799.0	61.37	14 52.3	54 29.1	
8	U	12 16.44	1.711	11 21 46.41	112.80	− 0 48 38.2	− 804.9	61.53	14 54.8	54 38.3	I. II
9	L	0 37.07	1.730	11 44 26.05	113.92	3 29 35.1	803.2	61.85	14 57.6	54 48.6	
9	U	12 57.99	1.758	12 7 22.58	115.60	6 9 27.3	794.0	62.33	15 0.7	54 59.8	II
10	L	1 19.30	1.795	12 30 42.85	117.87	8 46 39.3	776.5	62.98	15 4.0	55 11.9	
10	*U*	*13 41.11*	1.842	12 54 33.66	120.60	−11 19 29.1	− 750.2	63.78	15 7.6	55 25.0	U

Mar. 1, U Defective Illumination of *N.* 0″.24.
Mar. 7, U Defective Illumination of *N.* 0″.32.

Mar. 8, U Defective Illumination of I. 0.2

T OF MOON'S CENTER OVER THE MERIDIAN OF WASHINGTON.

	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.	Geocentric Semidiameter.	Equatorial Horizontal Parallax.	Bright Limbs.
	m	h m s	s	° ′ ″	″	s	′ ″	′ ″	
11	1.842	12 54 33.66	120.69	−11 19 29.1	−750.2	63.78	15 7.6	55 25.0	II. S.
54	1.898	13 19 1.58	124.05	13 46 7.4	714.5	64.71	15 11.4	55 39.0	
99	1.962	13 44 12.73	127.89	16 4 37.6	668.7	65.77	15 15.4	55 53.9	II. S.
35	2.032	14 10 12.42	132.12	18 12 54.6	612.2	66.92	15 19.8	56 9.7	
49	2.107	14 37 4.76	136.64	−20 8 46.5	−544.4	68.13	15 24.3	56 26.5	II. S.
23	2.184	15 4 52.12	141.26	21 49 55.6	465.0	69.34	15 29.1	56 44.2	
90	2.259	15 33 34.61	145.79	23 14 1.9	374.1	70.52	15 34.2	57 2.8	II. S.
44	2.329	16 3 9.63	149.96	24 18 48.5	271.9	71.59	15 39.5	57 22.2	
75	2.389	16 33 31.54	153.56	−25 2 8.4	−159.8	72.50	15 45.0	57 42.3	II. S.
70	2.434	17 4 31.70	156.31	25 22 12.7	− 39.8	73.18	15 50.6	58 3.0	
11	2.463	17 35 58.96	158.06	25 17 39.8	+ 85.9	73.61	15 56.3	58 23.9	II. *N.* S.
75	2.474	18 7 40.54	158.70	24 47 41.4	213.8	73.77	16 2.1	58 44.9	
41	2.466	18 39 23.24	158.25	−23 52 10.2	+340.8	73.65	16 7.7	59 5.5	II. N.
88	2.443	19 10 54.79	156.86	22 31 40.2	463.1	73.29	16 13.1	59 25.2	
00	2.408	19 42 5.02	154.74	20 47 26.5	577.6	72.75	16 18.1	59 43.7	II. N.
64	2.365	20 12 46.62	152.14	18 41 20.1	681.5	72.08	16 22.6	60 0.3	
74	2.318	20 42 55.45	149.33	−16 15 43.2	+772.4	71.35	16 26.5	60 14.5	II. N.
28	2.272	21 12 30.59	146.55	13 33 21.4	848.6	70.63	16 29.6	60 25.8	
29	2.230	21 41 33.76	144.03	10 37 19.1	909.0	69.96	16 31.7	60 33.6	II. N.
83	2.195	22 10 8.90	141.91	7 30 52.1	952.6	69.38	16 32.7	60 37.6	
00	2.168	22 38 21.51	140.29	− 4 17 23.7	+979.1	68.95	16 32.7	60 37.4	II. N.
90	2.151	23 6 18.13	139.24	− 1 0 20.6	988.4	68.67	16 31.5	60 32.9	
65	2.143	23 34 5.69	138.78	+ 2 16 51.5	980.7	68.54	16 29.1	60 24.1	
36	2.145	0 1 51.12	138.89	5 30 51.0	956.5	68.55	16 25.5	60 11.1	
15	2.155	0 29 40.83	139.49	+ 8 38 23.9	+916.4	68.71	16 20.9	59 54.3	
10	2.171	0 57 40.33	140.49	11 36 26.1	861.6	68.97	16 15.5	59 34.2	
28	2.193	1 25 53.83	141.79	14 22 7.9	793.3	69.33	16 9.2	59 11.2	I. S.
74	2.217	1 54 23.83	143.22	16 52 56.1	712.9	69.71	16 2.3	58 46.0	
48	2.240	2 23 10.90	144.60	+19 6 37.5	+622.3	70.09	15 55.0	58 19.2	I. S.
48	2.259	2 52 13.42	145.76	21 1 21.2	523.7	70.41	15 47.5	57 51.7	
67	2.272	3 21 27.60	146.52	22 35 41.5	419.0	70.64	15 40.0	57 24.0	I. S.
96	2.275	3 50 47.65	146.72	23 48 40.3	310.5	70.73	15 32.6	56 56.7	
22	2.267	4 20 6.27	146.27	+24 39 47.8	+200.8	70.64	15 25.4	56 30.4	I. S.
32	2.248	4 49 15.23	145.11	25 9 1.8	+ 92.0	70.38	15 18.6	56 5.5	
13	2.217	5 18 6.17	143.27	25 16 46.7	− 13.8	69.94	15 12.3	55 42.5	I. S.
50	2.177	5 46 31.28	140.82	25 3 49.1	114.8	69.33	15 6.6	55 21.6	
34	2.128	6 14 24.02	137.90	+24 31 14.3	−209.9	68.60	15 1.6	55 3.2	I. N.
56	2.074	6 41 39.61	134.66	23 40 20.5	297.9	67.76	14 57.3	54 47.3	
11	2.018	7 8 15.08	131.24	22 32 34.5	378.5	66.86	14 53.7	54 34.1	I. N.
98	1.961	7 34 9.45	127.84	21 9 26.9	451.5	65.95	14 50.9	54 23.7	
18	1.906	7 59 23.51	124.55	+19 32 28.7	−516.9	65.04	14 48.7	54 15.9	I. N.
75	1.856	8 23 59.63	121.52	17 43 9.0	575.1	64.20	14 47.4	54 10.9	
75	1.811	8 48 1.37	118.83	15 42 53.6	626.3	63.44	14 46.7	54 8.5	I. N.
25	1.774	9 11 33.32	116.57	13 33 5.0	670.7	62.78	14 46.7	54 8.5	
35	1.744	9 34 40.81	114.77	+11 15 2.3	−708.7	62.24	14 47.4	54 10.9	I. N.

Mar. 15, U Defective Illumination of N. 0′.13.

FOR TRANSIT OF MOON'S CENTER OVER THE MERIDIAN OF WASHINGT

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.	Geocentric Semidiameter.	Equatorial Horizontal Parallax.	Li
		h m	m	h m s	s	° ′ ″	″	s	′ ″	′ ″	
Apr. 2	U	8 51.35	1.744	9 34 40.81	114.77	+11 15 2.3	−708.7	62.24	14 47.4	54 10.9	I.
2	L	21 12.13	1.723	9 57 29.69	113.47	8 50 2.2	740.4	61.84	14 48.6	54 15.5	
3	U	9 32.71	1.710	10 20 6.25	112.71	6 19 19.8	765.8	61.59	14 50.4	54 22.1	I.
3	L	21 53.20	1.706	10 42 37.06	112.51	3 44 11.4	784.7	61.50	14 52.7	54 30.5	
4	U	10 13.70	1.712	11 5 8.92	112.88	+ 1 5 54.4	−797.0	61.58	14 55.5	54 40.5	I.
4	L	22 34.34	1.728	11 27 48.74	113.85	− 1 34 9.4	802.4	61.82	14 58.5	54 51.8	
5	U	10 55.23	1.754	11 50 43.58	115.39	4 14 33.9	800.3	62.22	15 1.9	55 4.3	I.
5	L	23 16.48	1.789	12 14 0.46	117.52	6 53 45.7	790.2	62.80	15 5.6	55 17.8	
6	U	11 38.21	1.834	12 37 46.36	120.22	− 9 30 3.3	−771.2	63.53	15 9.5	55 32.1	I.
7	L	0 0.54	1.888	13 2 7.96	123.47	12 1 36.4	742.6	64.40	15 13.5	55 46.9	
7	U	12 23.56	1.950	13 27 11.45	127.20	14 26 24.5	703.6	65.41	15 17.7	56 2.0	II.
8	L	0 47.37	2.019	13 53 2.21	131.32	16 42 17.8	653.3	66.50	15 21.8	56 17.4	
8	U	13 12.04	2.092	14 19 44.35	135.73	−18 46 58.0	−591.3	67.67	15 26.1	56 32.9	II.
9	L	1 37.59	2.167	14 47 20.30	140.26	20 38 0.8	517.1	68.85	15 30.3	56 48.3	
9	U	14 4.05	2.241	15 15 50.17	144.68	22 12 59.9	430.7	70.00	15 34.5	57 3.7	II.
10	L	2 31.35	2.309	15 45 11.29	148.76	23 29 32.9	333.0	71.05	15 38.6	57 18.9	
10	U	14 59.42	2.367	16 15 18.06	152.24	−24 25 28.9	−224.8	71.94	15 42.7	57 33.8	II.
11	L	3 28.10	2.411	16 46 1.77	154.89	24 58 56.3	−108.6	72.62	15 46.7	57 48.5	
11	U	15 57.20	2.438	17 17 11.22	156.51	25 8 31.9	+ 13.2	73.05	15 50.6	58 2.9	II.
12	L	4 26.52	2.446	17 48 33.52	157.02	24 53 27.7	137.6	73.20	15 54.4	58 17.0	
12	U	16 55.84	2.436	18 19 55.41	156.45	−24 13 34.3	+260.9	73.09	15 58.1	58 30.5	II.
13	L	5 24.94	2.411	18 51 4.47	154.92	23 9 22.9	380.0	72.73	16 1.7	58 43.6	
13	U	17 53.65	2.373	19 21 50.40	152.64	21 42 1.4	492.1	72.18	16 5.1	58 56.0	II.
14	L	6 21.86	2.327	19 52 5.74	149.87	19 53 9.5	594.8	71.50	16 8.2	59 7.5	
14	U	18 49.49	2.277	20 21 46.24	146.87	−17 44 51.2	+686.2	70.75	16 11.1	59 18.0	II.
15	L	7 16.52	2.228	20 50 50.82	143.91	15 19 29.5	765.2	69.99	16 13.6	59 27.3	
15	U	19 42.98	2.183	21 19 21.23	141.21	12 39 39.0	830.9	69.28	16 15.7	59 35.0	II.
16	L	8 8.94	2.145	21 47 21.43	138.91	9 48 2.8	882.8	68.67	16 17.3	59 40.9	
16	U	20 34.50	2.116	22 14 57.14	137.14	− 6 47 29.2	+920.3	68.18	16 18.3	59 44.7	II.
17	L	8 59.76	2.096	22 42 15.17	135.97	3 40 49.7	943.7	67.85	16 18.7	59 46.1	
17	U	21 24.85	2.087	23 9 22.99	135.44	− 0 30 58.3	952.4	67.68	16 18.4	59 44.9	II.
18	L	9 49.90	2.089	23 36 28.30	135.55	+ 2 39 9.2	946.4	67.68	16 17.3	59 40.9	
18	U	22 15.03	2.101	0 3 38.56	136.26	+ 5 46 36.6	+925.7	67.84	16 15.5	59 34.1	II.
19	L	10 40.35	2.122	0 31 0.61	137.50	8 48 27.8	890.4	68.13	16 12.8	59 24.3	
19	U	23 5.97	2.150	0 58 40.33	139.18	11 41 49.3	840.9	68.55	16 9.4	59 11.7	
20	L	11 31.96	2.182	1 26 42.12	141.15	14 23 53.2	777.6	69.04	16 5.2	58 56.4	
20	U	23 58.36	2.217	1 55 8.53	143.26	+16 51 59.9	+701.5	69.57	16 0.4	58 38.7	
21	L	12 25.17	2.251	2 23 59.89	145.28	19 3 13.8	614.0	70.08	15 55.0	58 19.0	
22	U	0 52.36	2.280	2 53 14.05	147.01	20 56 57.4	516.8	70.52	15 49.2	57 57.6	
22	L	13 19.85	2.300	3 22 46.22	148.26	22 29 56.9	412.0	70.85	15 43.0	57 35.1	
23	U	1 47.52	2.310	3 52 29.28	148.81	+23 41 27.5	+302.4	71.01	15 36.7	57 11.9	I.
23	L	14 15.22	2.305	4 22 14.23	148.55	24 30 45.4	190.5	70.98	15 30.4	56 48.6	
24	U	2 42.79	2.287	4 51 50.95	147.43	24 57 40.7	+ 79.0	70.74	15 24.1	56 25.7	I.
24	L	15 10.05	2.254	5 21 9.19	145.48	25 2 35.0	− 29.3	70.29	15 18.1	56 3.5	
25	U	3 36.84	2.209	5 49 59.51	142.80	+24 46 18.6	−132.4	69.65	15 12.4	55 42.6	I.

April 5, U Defective Illumination of S. 0″.24. April 12, U Defective Illumination of S. 0″.2

RANSIT 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. Passing Meridian.	Geocentric Semidiameter.	Equatorial Horizontal Parallax.	Bright Limbs.
	h m	m	h m s	s	° ′ ″	″	s	′ ″	′ ″	
J	3 36.84	2.209	5 49 59.51	142.90	+24 46 18.6	−132.4	69.65	15 12.4	55 42.6	I. S.
	16 3.04	2.156	6 18 14.11	139.56	24 10 4.4	228.7	68.85	15 7.1	55 23.4	
J	4 28.55	2.096	6 45 47.32	135.93	23 15 21.8	317.1	67.95	15 2.4	55 6.0	I. N.
	16 53.32	2.033	7 12 35.84	132.14	22 3 49.0	397.0	66.99	14 58.3	54 50.9	
J	5 17.33	1.970	7 38 38.71	128.36	+20 37 8.4	−468.4	66.01	14 54.8	54 38.3	I. N.
	17 40.60	1.910	8 3 57.12	124.75	18 57 1.1	531.4	65.06	14 52.1	54 28.2	
J	6 3.18	1.855	8 28 33.96	121.45	17 5 4.0	586.7	64.17	14 50.1	54 20.8	I. N.
	18 25.15	1.807	8 52 33.54	118.56	15 2 48.2	634.7	63.38	14 48.8	54 16.1	
J	6 46.58	1.767	9 16 1.23	116.15	+12 51 38.4	−675.8	62.70	14 48.3	54 14.2	I. N.
	19 7.58	1.736	9 39 3.15	114.27	10 32 53.6	710.6	62.16	14 48.5	54 15.1	
J	7 28.27	1.714	10 1 45.96	112.97	8 7 48.0	739.3	61.78	14 49.5	54 18.6	I. N.
	19 48.75	1.702	10 24 16.77	112.27	5 37 33.2	762.2	61.56	14 51.1	54 24.7	
J	8 9.16	1.701	10 46 42.86	112.19	+ 3 3 18.9	−779.2	61.50	14 53.4	54 33.2	I. N.
L	20 29.62	1.710	11 9 11.82	112.74	+ 0 26 16.7	790.1	61.63	14 56.4	54 44.0	
U	8 50.25	1.730	11 31 51.32	113.95	− 2 12 18.4	794.6	61.94	14 59.9	54 56.8	I. N.
L	21 11.18	1.761	11 54 49.14	115.80	4 51 5.3	792.0	62.42	15 3.9	55 11.4	
U	9 32.55	1.802	12 18 13.08	118.30	− 7 28 35.2	−781.5	63.08	15 8.3	55 27.6	I. N.
L	21 54.48	1.854	12 42 10.81	121.43	10 3 8.8	762.5	63.90	15 13.0	55 44.9	
U	10 17.10	1.916	13 6 49.65	125.14	12 32 54.6	733.4	64.88	15 18.0	56 3.2	I. N.
L	22 40.51	1.987	13 32 16.35	129.39	14 55 47.9	693.5	65.98	15 23.1	56 22.0	
U	11 4.81	2.064	13 58 36.61	134.05	−17 9 30.7	−641.5	67.18	15 28.3	56 41.1	I. *N.* S.
L	23 30.06	2.146	14 25 54.58	138.98	19 11 33.2	576.6	68.44	15 33.5	57 0.1	
U	11 56.31	2.229	14 54 12.15	143.95	20 59 16.5	498.3	69.69	15 38.5	57 18.6	I. II. S.
L	0 23.54	2.308	15 23 28.39	148.71	22 29 59.4	406.6	70.88	15 43.3	57 36.3	
U	12 51.67	2.378	15 53 38.90	152.94	−23 41 5.6	−302.4	71.94	15 47.9	57 53.1	II. S.
L	1 20.56	2.435	16 24 35.60	156.35	24 30 15.1	187.6	72.79	15 52.1	58 8.5	
U	13 50.03	2.474	16 56 6.98	158.67	24 55 34.8	− 64.7	73.37	15 55.9	58 22.5	II. S.
L	2 19.84	2.491	17 27 58.74	159.73	24 55 49.5	+ 62.7	73.65	15 59.3	58 35.0	
U	14 49.73	2.487	17 59 55.31	159.47	−24 30 29.0	+190.5	73.63	16 2.3	58 45.8	II. N. S.
L	3 19.44	2.462	18 31 41.35	158.01	23 39 51.4	314.8	73.31	16 4.8	58 55.0	
U	15 48.76	2.421	19 3 3.39	155.52	22 25 0.9	432.1	72.73	16 6.8	59 2.5	II. N.
L	4 17.51	2.368	19 33 51.02	152.32	20 47 40.4	539.5	71.98	16 8.4	59 8.4	
U	16 45.57	2.308	20 3 57.58	148.73	−18 50 2.5	+634.7	71.12	16 9.6	59 12.8	II. N.
L	5 12.90	2.247	20 33 20.20	145.05	16 34 39.5	716.9	70.22	16 10.4	59 15.7	
U	17 39.51	2.189	21 1 59.50	141.55	14 4 13.7	785.2	69.34	16 10.8	59 17.2	II. N.
L	6 5.46	2.137	21 29 58.92	138.44	11 21 31.7	839.5	68.56	16 10.9	59 17.3	
U	18 30.83	2.094	21 57 24.04	135.86	− 8 29 19.2	+880.3	67.89	16 10.6	59 16.2	II. N.
L	6 55.76	2.062	22 24 21.96	133.91	5 30 18.6	907.7	67.37	16 9.9	59 13.8	
J	19 20.37	2.041	22 51 0.70	132.67	− 2 27 8.9	921.8	67.03	16 8.9	59 10.0	II. N.
L	7 44.80	2.032	23 17 28.71	132.12	+ 0 37 34.2	923.3	66.87	16 7.5	59 4.9	
J	20 9.19	2.035	23 43 54.47	132.29	+ 3 41 17.4	+911.8	66.88	16 5.7	58 58.5	II. N.
L	8 33.68	2.049	0 10 26.16	133.11	6 41 29.0	887.9	67.07	16 3.6	58 50.6	
J	20 58.39	2.072	0 37 11.32	134.51	9 35 37.6	851.4	67.41	16 1.1	58 41.3	II. N.
L	9 23.43	2.103	1 4 16.40	136.41	12 21 12.5	802.4	67.87	15 58.1	58 30.4	
J	*21 48.89*	*2.141*	*1 31 46.45*	*138.65*	+14 55 45.4	+741.1	68.41	15 54.8	58 18.2	II. N.

7 5, U Defective Illumination of N. 0′.11. May 9, U Defective Illumination of N. 0′.23.

FOR TRANSIT OF MOON'S CENTER OVER THE MERIDIAN OF WASHINGT

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.	Geocentric Semidiameter.	Equatorial Horizontal Parallax.	Bd Lin
		h m	m	h m s	s	° ′ ″	″	s	′ ″	′ ″	
May 17	U	21 48.89	2.141	1 31 46.45	138.65	+14 55 45.4	+741.1	68.41	15 54.8	58 18.2	II.
18	L	10 14.82	2.181	1 59 44.64	141.06	17 16 51.6	668.1	69.00	15 51.0	58 4.5	
18	U	22 41.23	2.220	2 28 11.93	143.45	19 22 14.2	584.0	69.58	15 46.9	57 49.5	II.
19	L	11 8.10	2.256	2 57 6.62	145.59	21 9 48.9	490.3	70.10	15 42.5	57 33.3	
19	U	23 35.35	2.284	3 26 24.31	147.25	+22 37 49.9	+388.6	70.51	15 37.8	57 16.1	
20	L	12 2.86	2.300	3 55 57.95	148.22	23 44 55.3	281.5	70.74	15 32.9	56 58.1	
21	U	0 30.49	2.302	4 25 38.30	148.35	24 30 12.7	171.2	70.78	15 27.9	56 39.7	
21	L	12 58.05	2.289	4 55 14.68	147.56	24 53 22.0	+ 60.6	70.60	15 22.9	56 21.1	
22	U	1 25.36	2.260	5 24 36.02	145.85	+24 54 37.2	− 47.5	70.20	15 17.8	56 2.6	I.
22	L	13 52.24	2.219	5 53 31.85	143.33	24 34 42.4	150.7	69.59	15 12.9	55 44.7	
23	U	2 18.56	2.166	6 21 53.26	140.15	23 54 48.0	247.2	68.82	15 8.3	55 27.6	I.
23	L	14 44.19	2.105	6 49 33.53	136.51	22 56 24.1	335.4	67.92	15 3.9	55 11.6	
24	U	3 9.06	2.041	7 16 28.50	132.64	+21 41 13.3	−414.9	66.95	15 0.0	54 57.1	I.
24	L	15 33.16	1.976	7 42 36.54	128.72	20 11 3.4	485.2	65.95	14 56.5	54 44.3	
25	U	3 56.49	1.913	8 7 58.35	124.95	18 27 43.0	546.7	64.98	14 53.5	54 33.5	I.
25	L	16 19.09	1.855	8 32 36.57	121.48	16 32 55.5	599.9	64.07	14 51.2	54 24.9	
26	U	4 41.04	1.804	8 56 35.41	118.40	+14 28 18.9	−645.1	63.26	14 49.5	54 18.7	I.
26	L	17 2.43	1.761	9 20 0.29	115.83	12 15 23.2	683.1	62.56	14 48.5	54 15.0	
27	U	5 23.35	1.728	9 42 57.46	113.80	9 55 31.3	714.5	62.01	14 48.2	54 13.9	I.
27	L	17 43.93	1.704	10 5 33.83	112.37	7 29 59.0	730.8	61.62	14 48.6	54 15.5	
28	U	6 4.28	1.690	10 27 56.74	111.56	+ 4 59 58.0	−739.4	61.39	14 49.8	54 19.9	I.
28	L	18 24.54	1.688	10 50 13.84	111.41	+ 2 26 36.2	773.3	61.35	14 51.8	54 27.0	
29	U	6 44.84	1.696	11 12 33.08	111.92	− 0 8 58.5	781.5	61.48	14 54.4	54 36.8	I.
29	L	19 5.30	1.716	11 35 2.60	113.12	2 45 36.5	783.8	61.80	14 57.8	54 49.1	
30	U	7 26.07	1.748	11 57 50.69	115.02	− 5 22 3.8	−779.6	62.31	15 1.8	55 3.9	I.
30	L	19 47.29	1.791	12 21 5.74	117.61	7 56 58.9	768.2	63.01	15 6.5	55 21.0	
31	U	8 9.10	1.846	12 44 56.12	120.90	10 28 50.1	748.8	63.89	15 11.7	55 40.0	I.
31	L	20 31.63	1.911	13 9 30.00	124.86	12 55 52.7	719.9	64.92	15 17.3	56 0.8	
June 1	U	8 55.02	1.987	13 34 55.06	129.42	−15 16 7.6	−680.6	66.10	15 23.4	56 23.0	I.
1	L	21 19.36	2.071	14 1 17.95	134.47	17 27 19.7	629.3	67.40	15 29.7	56 46.1	
2	U	9 44.75	2.161	14 28 43.86	139.88	19 26 58.0	564.8	68.76	15 36.1	57 9.8	I.
2	L	22 11.24	2.253	14 57 15.61	145.41	21 12 18.4	486.3	70.13	15 42.6	57 33.5	
3	U	10 38.81	2.342	15 26 52.96	150.75	−22 40 29.5	−393.3	71.43	15 48.9	57 56.7	I.
3	L	23 7.41	2.422	15 57 31.73	155.58	23 48 40.7	286.5	72.60	15 55.0	58 18.9	
4	U	11 36.89	2.488	16 29 3.47	159.53	24 34 15.5	167.5	73.54	16 0.6	58 39.6	I.
5	L	0 7.03	2.533	17 1 15.53	162.26	24 55 4.8	− 39.5	74.19	16 5.7	58 58.3	
5	U	12 37.58	2.555	17 33 51.86	163.55	−24 49 11.4	+ 93.8	74.50	16 10.1	59 14.6	II.
6	L	1 8.24	2.551	18 6 34.58	163.32	24 17 30.7	227.7	74.46	16 13.8	59 28.2	
6	U	13 38.71	2.524	18 39 5.98	161.69	23 18 55.0	357.2	74.09	16 16.7	59 38.9	II.
7	L	2 8.73	2.477	19 11 10.39	158.88	21 55 12.6	478.1	73.44	16 18.8	59 46.4	
7	U	14 38.10	2.416	19 42 35.73	155.24	−20 8 28.6	+586.9	72.59	16 20.0	59 50.9	II.
8	L	3 6.69	2.348	20 13 14.30	151.14	18 1 23.2	681.4	71.62	16 20.4	59 52.3	
8	U	15 34.45	2.279	20 43 2.78	146.95	15 36 57.5	760.2	70.61	16 20.1	59 51.0	II.
9	L	4 1.39	2.212	21 12 1.80	142.95	12 58 23.1	822.9	69.64	16 19.0	59 47.0	
9	U	16 27.57	2.153	21 40 15.16	139.37	−10 8 51.5	+869.8	68.75	16 17.3	59 40.8	V

June 4, U Defective Illumination of N. 0′.98.
June 5, U Defective Illumination of N. 0′.93.

June 6, U Defective Illumination of S. 0′.91

ISIT 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. Passing Meridian.	Geocentric Semidiameter.	Equatorial Horizontal Parallax.	Bright Limbs.
m	m	h m s	s	° ′ ″	″	s	′ ″	′ ″	
27.57	2.153	21 40 15.16	139.37	−10 8 51.5	+869.8	68.75	16 17.3	59 40.8	II. N.
53.09	2.103	22 7 48.93	136.37	7 11 27.9	901.7	68.00	16 15.0	59 32.6	
18.09	2.064	22 34 50.77	134.06	4 9 8.5	919.3	67.41	16 12.3	59 22.7	II. N.
42.69	2.038	23 1 29.17	132.47	− 1 4 39.4	923.4	67.01	16 9.3	59 11.5	
7.05	2.024	23 27 53.03	131.63	+ 1 59 23.6	+915.0	66.79	16 5.9	58 59.1	II. N.
31.31	2.022	23 54 11.21	131.52	5 0 32.6	894.5	66.75	16 2.3	58 45.9	
55.62	2.032	0 20 32.15	132.09	7 56 26.4	862.5	66.89	15 58.6	58 32.1	II. N.
20.11	2.051	0 47 3.57	133.25	10 44 49.7	819.4	67.17	15 54.6	58 17.7	
44.88	2.079	1 13 52.14	134.92	+13 23 30.0	+765.5	67.58	15 50.6	58 3.0	II. N.
10.02	2.113	1 41 3.13	136.96	15 50 18.8	700.9	68.09	15 46.5	57 47.9	
35.59	2.150	2 8 40.02	139.20	18 3 12.4	626.3	68.63	15 42.3	57 32.6	II. N.
1.62	2.187	2 36 44.11	141.46	20 0 14.0	542.4	69.17	15 38.1	57 17.2	
28.08	2.221	3 5 14.25	143.51	+21 39 36.8	+450.0	69.66	15 33.9	57 1.6	II. N.
54.91	2.249	3 34 6.72	145.15	22 59 48.6	350.8	70.04	15 29.7	56 46.0	
22.01	2.265	4 3 15.22	146.15	23 59 37.6	246.6	70.27	15 25.4	56 30.3	II. N.
49.23	2.269	4 32 31.35	146.40	24 38 16.7	139.6	70.30	15 21.1	56 14.7	
16.41	2.259	5 1 45.23	145.77	+24 55 27.2	+ 32.2	70.13	15 16.9	55 59.3	
43.39	2.234	5 30 46.39	144.28	24 51 19.8	− 72.9	69.75	15 12.8	55 44.2	
9.98	2.196	5 59 24.76	141.99	24 26 34.5	173.7	69.17	15 8.8	55 29.5	
36.05	2.147	6 27 31.60	139.05	23 42 16.6	268.0	68.44	15 5.0	55 15.5	
1.49	2.091	6 55 0.08	135.64	+22 39 51.1	−354.7	67.57	15 1.4	55 2.2	I. N.
26.21	2.029	7 21 45.72	131.95	21 20 56.9	432.8	66.63	14 58.0	54 49.9	
50.19	1.967	7 47 46.46	128.18	19 47 20.6	501.8	65.67	14 55.0	54 38.8	I. N.
13.42	1.906	8 13 2.39	124.51	18 0 50.7	561.7	64.72	14 52.3	54 29.0	
35.94	1.849	8 37 35.67	121.09	+16 3 13.4	−613.1	63.82	14 50.1	54 20.9	I. N.
57.81	1.798	9 1 29.98	118.03	13 56 9.3	656.2	63.02	14 48.4	54 14.5	
19.12	1.755	9 24 50.23	115.43	11 41 13.4	691.8	62.33	14 47.2	54 10.1	I. N.
39.96	1.720	9 47 42.24	113.34	9 19 52.5	720.5	61.78	14 46.5	54 7.8	
0.44	1.695	10 10 12.54	111.82	+ 6 53 27.1	−742.7	61.38	14 46.5	54 7.8	I. N.
20.67	1.679	10 32 28.16	110.89	4 23 11.7	758.9	61.15	14 47.2	54 10.2	
40.78	1.675	10 54 36.52	110.61	+ 1 50 16.8	769.3	61.09	14 48.6	54 15.2	I. N.
0.90	1.681	11 16 45.34	110.98	− 0 44 9.6	774.1	61.21	14 50.6	54 22.8	
21.16	1.698	11 39 2.59	112.02	− 3 18 58.9	−773.2	61.51	14 53.4	54 33.0	I. N.
41.70	1.727	12 1 36.48	113.76	5 53 0.5	766.0	62.01	14 56.9	54 45.9	
2.65	1.767	12 24 35.37	116.19	8 24 58.1	752.3	62.69	15 1.2	55 1.4	I. N.
24.16	1.820	12 48 7.72	119.32	10 53 27.2	731.3	63.55	15 6.1	55 19.5	
46.37	1.883	13 12 21.89	123.15	−13 16 53.3	−701.6	64.58	15 11.6	55 39.9	I. N.
9.40	1.957	13 37 25.97	127.63	15 33 27.7	662.3	65.76	15 17.8	56 2.5	
33.38	2.041	14 3 27.29	132.67	17 41 6.5	612.2	67.07	15 24.5	56 27.0	I. N.
58.42	2.133	14 30 31.94	138.16	19 37 29.8	549.6	68.47	15 31.6	56 53.1	
24.58	2.228	14 58 44.05	143.88	−21 20 2.4	−473.5	69.89	15 39.0	57 20.2	I. N.
51.88	2.322	15 28 4.89	149.56	22 45 57.6	383.3	71.28	15 46.5	57 47.9	
20.29	2.410	15 58 32.11	154.88	23 52 24.3	278.9	72.55	15 54.1	58 15.7	I. N.
49.68	2.486	16 29 59.01	159.45	24 36 38.4	161.4	73.63	16 1.5	58 42.8	
19.89	2.544	17 2 14.45	162.91	−24 56 16.2	− 33.3	74.43	16 8.5	59 8.5	I. N.S.

July 2, U Defective Illumination of N. 0′.01.

FOR TRANSIT OF MOON'S CENTER OVER THE MERIDIAN OF WASHINGTO

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.	Geocentric Semidiameter.	Equatorial Horizontal Parallax.	Bdg Lim
		h m	m	h m s	s	° ′ ″	″	s	′ ″	′ ″	
July 2	U	10 19.89	2.544	17 2 14.45	162.91	−24 56 16.2	− 33.3	74.43	16 8.5	59 8.5	I.
2	L	22 50.65	2.578	17 35 3.31	164.98	24 49 30.5	+101.8	74.90	16 15.0	59 32.3	
3	U	11 21.67	2.587	18 8 7.83	165.51	24 15 24.3	239.2	75.01	16 20.7	59 53.3	I.
3	L	23 52.64	2.571	18 41 9.50	164.53	23 14 0.0	373.9	74.77	16 25.5	60 11.0	
4	U	12 23.28	2.533	19 13 51.20	162.23	−21 46 21.6	+500.8	74.22	16 29.3	60 24.9	II
5	L	0 53.35	2.478	19 45 58.96	158.93	19 54 28.9	615.6	73.43	16 31.9	60 34.6	
5	U	13 22.70	2.413	20 17 23.08	155.02	17 41 7.8	715.2	72.50	16 33.4	60 40.0	II
6	L	1 51.24	2.344	20 47 58.48	150.87	15 9 34.4	797.4	71.51	16 33.7	60 41.0	
6	U	14 18.96	2.276	21 17 44.29	146.81	−12 23 22.3	+861.6	70.53	16 32.8	60 37.8	I
7	L	2 45.90	2.214	21 46 43.23	143.09	9 26 9.4	907.6	69.62	16 30.8	60 30.6	
7	U	15 12.14	2.161	22 15 0.56	139.89	6 21 29.3	936.2	68.84	16 27.9	60 19.8	I
8	L	3 37.81	2.119	22 42 43.39	137.35	3 12 44.9	948.5	68.22	16 24.2	60 6.0	
8	U	16 3.05	2.089	23 9 59.87	135.51	− 0 3 5.6	+945.6	67.77	16 19.7	59 49.6	I
9	L	4 27.99	2.070	23 36 58.54	134.39	+ 3 4 34.2	928.8	67.50	16 14.7	59 31.2	
9	U	16 52.77	2.063	0 3 47.94	133.96	6 7 34.4	899.2	67.41	16 9.3	59 11.4	I
10	L	5 17.54	2.067	0 30 36.17	134.18	9 3 27.5	857.8	67.47	16 3.6	58 50.6	
10	U	17 42.40	2.080	0 57 30.54	134.97	+11 49 58.0	+805.5	67.68	15 57.8	58 29.3	I
11	L	6 7.47	2.100	1 24 37.26	136.22	14 24 59.4	743.1	68.01	15 52.0	58 7.9	
11	U	18 32.83	2.126	1 52 1.05	137.79	16 46 34.6	671.2	68.41	15 46.2	57 46.7	I
12	L	6 58.52	2.155	2 19 44.94	139.54	18 52 55.5	590.8	68.83	15 40.5	57 25.9	
12	U	19 24.56	2.184	2 47 49.89	141.27	+20 42 24.5	+502.7	69.25	15 35.0	57 5.8	I
13	L	7 50.93	2.210	3 16 14.58	142.80	22 13 35.8	408.1	69.61	15 29.8	56 46.5	
13	U	20 17.56	2.229	3 44 55.41	143.93	23 25 19.1	308.3	69.87	15 24.7	56 28.0	I
14	L	8 44.37	2.238	4 13 46.64	144.50	24 16 42.8	205.2	69.98	15 20.0	56 10.5	
14	U	21 11.23	2.236	4 42 40.76	144.39	+24 47 17.5	+100.6	69.92	15 15.5	55 54.0	I
15	L	9 37.99	2.222	5 11 29.11	143.54	24 56 58.0	− 3.5	69.68	15 11.3	55 38.5	
15	U	22 4.51	2.196	5 40 2.71	141.95	24 46 3.7	104.9	69.24	15 7.3	55 23.9	I
16	L	10 30.64	2.158	6 8 12.97	139.67	24 15 18.4	201.7	68.64	15 3.6	55 10.4	
16	U	22 56.25	2.111	6 35 52.50	136.84	+23 25 46.8	−292.3	67.89	15 0.2	54 57.9	I
17	L	11 21.27	2.057	7 2 55.63	133.62	22 18 50.4	375.7	67.05	14 57.1	54 46.4	
17	U	23 45.61	2.000	7 29 18.63	130.18	20 56 2.9	450.9	66.13	14 54.2	54 36.0	
18	L	12 9.26	1.942	7 54 59.87	126.69	19 19 4.8	517.4	65.21	14 51.7	54 26.7	
19	U	0 32.22	1.885	8 19 59.61	123.29	+17 29 39.9	−575.3	64.30	14 49.5	54 18.6	
19	L	12 54.53	1.833	8 44 19.82	120.12	15 29 30.5	624.9	63.45	14 47.6	54 11.8	
20	U	1 16.23	1.786	9 8 3.84	117.28	13 20 16.1	666.2	62.70	14 46.2	54 6.4	I.
20	L	13 37.41	1.745	9 31 16.15	114.85	11 3 31.2	700.1	62.04	14 45.1	54 2.5	
21	U	1 58.14	1.712	9 54 2.02	112.88	+ 8 40 45.0	−726.5	61.52	14 44.5	54 0.2	I.
21	L	14 18.54	1.688	10 16 27.40	111.43	6 13 20.3	746.4	61.14	14 44.3	53 59.6	
22	U	2 38.70	1.673	10 38 38.70	110.54	3 42 36.2	759.9	60.92	14 44.7	54 0.9	I.
22	L	14 58.74	1.668	11 0 42.73	110.23	+ 1 9 46.7	767.4	60.86	14 45.6	54 4.2	
23	U	3 18.78	1.673	11 22 46.58	110.52	− 1 23 55.4	−768.7	60.96	14 47.1	54 9.7	I.
23	L	15 38.94	1.688	11 44 57.58	111.43	3 57 19.3	764.2	61.25	14 49.2	54 17.4	
24	U	3 59.34	1.714	12 7 23.33	112.97	6 29 12.6	753.6	61.72	14 51.9	54 27.5	I.
24	L	16 20.11	1.750	12 30 11.50	115.17	8 58 19.2	736.4	62.36	14 55.3	54 40.0	
25	U	4 41.39	1.798	12 53 29.96	118.02	−11 23 17.3	−712.1	63.17	14 59.4	54 55.9	I.

July 2, U Defective Illumination of N. 0′.01. *July 3, U Defective Illumination of N.0′*

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

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.	Geocentric Semidiameter.	Equatorial Horizontal Parallax.	Bright Limbs.
	h m	m	h m s	s	° ′ ″	″	s	′ ″	′ ″	
J	4 41.39	1.798	12 53 29.96	118.02	−11 23 17.3	−712.1	63.17	14 59.4	54 55.0	I. N.
L	17 3.30	1.856	13 17 26.47	121.50	13 42 37.9	680.0	64.14	15 4.2	55 12.5	
J	5 25.97	1.924	13 42 8.57	125.61	15 54 41.2	639.0	65.26	15 9.6	55 32.5	I. N.
L	17 49.51	2.001	14 7 43.22	130.26	17 57 34.9	588.3	66.50	15 15.7	55 54.8	
J	6 14.03	2.086	14 34 16.39	135.34	−19 49 14.4	−526.5	67.82	15 22.4	56 19.3	I. N.
L	18 39.59	2.175	15 1 52.48	140.70	21 27 21.4	452.6	69.19	15 29.6	56 45.7	
J	7 6.23	2.265	15 30 33.56	146.13	22 49 27.0	366.2	70.54	15 37.2	57 13.7	I. N.
L	19 33.93	2.352	16 0 18.72	151.34	23 52 56.8	266.7	71.81	15 45.2	57 43.0	
J	8 2.63	2.429	16 31 3.44	156.01	−24 35 18.4	−154.9	72.92	15 53.3	58 12.9	I. N.
L	20 32.17	2.492	17 2 39.26	159.79	24 54 12.4	− 32.5	73.81	16 1.5	58 42.9	
U	9 2.36	2.536	17 34 54.00	162.45	24 47 46.4	+ 97.9	74.41	16 9.5	59 12.3	I. N.S.
L	21 32.96	2.558	18 7 32.75	163.78	24 14 47.2	232.3	74.69	16 17.1	59 40.2	
U	10 3.67	2.558	18 40 19.17	163.73	−23 14 51.8	+366.4	74.65	16 24.1	60 5.9	I. N.S.
L	22 34.26	2.536	19 12 57.38	162.44	21 48 33.9	495.3	74.32	16 30.3	60 28.6	
U	11 4.47	2.498	19 45 13.59	160.12	19 57 23.7	614.4	73.75	16 35.5	60 47.5	I. N.S.
L	23 34.15	2.447	20 16 57.39	157.00	17 43 41.3	720.1	73.00	16 39.4	61 2.0	
U	12 3.18	2.391	20 48 2.27	153.69	−15 10 27.5	+809.3	72.17	16 42.0	61 11.6	I. II. N.S.
L	0 31.52	2.333	21 18 25.78	150.24	12 21 11.4	880.2	71.32	16 43.2	61 16.0	
U	12 59.19	2.279	21 48 8.86	147.00	9 19 38.2	932.1	70.53	16 43.0	61 15.2	II. N.
L	1 26.25	2.232	22 17 15.25	144.16	6 9 38.9	964.7	69.84	16 41.4	61 9.2	
U	13 52.80	2.194	22 45 50.64	141.85	− 2 55 0.6	+978.7	69.27	16 38.4	60 58.3	II. N.
L	2 18.95	2.166	23 14 1.92	140.15	+ 0 20 39.0	975.1	68.86	16 34.2	60 43.1	
U	14 44.82	2.148	23 41 56.58	139.07	3 33 55.7	955.1	68.62	16 29.1	60 24.2	II. N.
L	3 10.53	2.140	0 9 42.11	138.62	6 41 41.8	920.2	68.53	16 23.1	60 2.3	
U	15 36.21	2.142	0 37 25.54	138.71	+ 9 41 6.1	+871.7	68.58	16 16.5	59 38.0	II. N.
L	4 1.97	2.151	1 5 13.14	139.29	12 29 34.8	811.1	68.76	16 9.5	59 12.1	
U	16 27.87	2.167	1 33 9.90	140.22	15 4 50.6	739.8	69.02	16 2.2	58 45.3	II. N.
L	4 53.98	2.186	2 1 19.29	141.37	17 24 52.6	659.1	69.33	15 54.8	58 18.2	
U	17 20.33	2.206	2 29 43.00	142.58	+19 27 56.2	+570.3	69.64	15 47.4	57 51.3	II. N.
L	5 46.92	2.224	2 58 20.71	143.67	21 12 34.1	475.9	69.92	15 40.3	57 25.1	
U	18 13.70	2.238	3 27 10.02	144.49	22 37 36.8	374.7	70.12	15 33.4	56 59.9	II. N.
L	6 40.59	2.244	3 56 6.53	144.86	23 42 14.4	271.1	70.20	15 26.9	56 36.1	
U	19 7.51	2.241	4 25 4.25	144.66	+24 25 58.6	+166.1	70.14	15 20.9	56 13.8	II. N.
L	7 34.33	2.227	4 53 55.94	143.84	24 48 43.1	+ 61.5	69.91	15 15.3	55 53.2	
U	20 0.92	2.203	5 22 33.85	142.38	24 50 44.5	− 40.8	69.50	15 10.1	55 34.3	II. N.
L	8 27.15	2.168	5 50 50.41	140.29	24 32 39.8	139.2	68.94	15 5.4	55 17.2	
U	20 52.91	2.125	6 18 38.78	137.70	+23 55 25.7	−232.2	68.25	15 1.3	55 1.9	II. S.
L	9 18.12	2.075	6 45 53.52	134.71	23 0 14.1	318.6	67.44	14 57.6	54 48.3	
U	21 42.70	2.021	7 12 30.78	131.47	21 48 28.7	397.7	66.56	14 54.3	54 36.4	II. S.
L	10 6.63	1.966	7 38 28.46	128.14	20 21 41.3	468.9	65.65	14 51.5	54 26.1	
U	22 29.89	1.911	8 3 46.24	124.84	+18 41 27.8	−532.1	64.74	14 49.1	54 17.4	II. S.
L	10 52.50	1.859	8 28 25.34	121.71	16 49 25.6	587.0	63.88	14 47.2	54 10.2	
U	23 14.52	1.811	8 52 28.28	118.83	14 47 10.5	634.2	63.08	14 45.6	54 4.4	
L	11 36.00	1.769	9 15 58.70	116.30	12 36 16.5	673.6	62.37	14 44.4	54 0.0	
J	*23 57.01*	*1.734*	*9 39 1.08*	*114.18*	+10 18 13.8	−705.7	61.77	14 43.6	53 57.1	

July 31, U Defective Illumination of N. 1″.00.
Aug. 1, U Defective Illumination of N. 0″.56.

Aug. 2, U Defective Illumination of II. 0″.00.
Aug. 2, U Defective Illumination of S. 0″.30.

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.	Geocentric Semidiameter.	Equatorial Horizontal Parallax.	
		h m	m	h m s	s	° ′ ″	″	s	′ ″	′ ″	
Aug. 16	U	23 57.01	1.734	9 39 1.08	114.18	+10 18 13.8	−705.7	61.77	14 43.6	53 57.1	
17	L	12 17.64	1.706	10 1 40.57	112.49	7 54 29.0	730.7	61.30	14 43.2	53 55.6	
18	U	0 37.98	1.686	10 24 2.77	111.29	5 26 25.5	748.8	60.97	14 43.2	53 55.5	
18	L	12 58.14	1.675	10 46 13.63	110.61	2 55 22.9	760.4	60.79	14 43.6	53 56.9	
19	U	1 18.21	1.672	11 8 19.45	110.45	+ 0 22 39.2	−765.7	60.77	14 44.4	53 59.8	I.
19	L	13 38.30	1.678	11 30 26.67	110.84	− 2 10 29.2	764.6	60.90	14 45.6	54 4.3	
20	U	1 58.53	1.694	11 52 41.92	111.80	4 42 45.7	757.0	61.20	14 47.3	54 10.5	I.
20	L	14 19.00	1.719	12 15 11.98	113.31	7 12 52.4	742.9	61.65	14 49.5	54 18.5	
21	U	2 39.84	1.754	12 38 3.65	115.40	− 9 39 28.8	−721.9	62.26	14 52.2	54 28.4	I.
21	L	15 1.14	1.798	13 1 23.74	118.05	12 1 10.8	693.7	63.03	14 55.4	54 40.2	
22	U	3 23.03	1.851	13 25 18.92	121.24	14 16 27.3	657.7	63.93	14 59.1	54 54.0	I.
22	L	15 45.61	1.913	13 49 55.51	124.94	16 23 40.7	613.1	64.96	15 3.5	55 9.9	
23	U	4 8.97	1.982	14 15 19.18	129.08	−18 21 5.0	−559.3	66.09	15 8.4	55 28.0	I.
23	L	16 33.19	2.056	14 41 34.71	133.56	20 6 45.4	495.6	67.29	15 13.9	55 48.2	
24	U	4 58.32	2.134	15 8 45.32	138.23	21 38 39.1	421.5	68.51	15 19.9	56 10.4	I.
24	L	17 24.40	2.212	15 36 52.40	142.94	22 54 37.4	336.4	69.72	15 26.5	56 34.6	
25	U	5 51.40	2.287	16 5 54.89	147.43	−23 52 29.4	−240.4	70.85	15 33.6	57 0.5	I.
25	L	18 19.25	2.354	16 35 48.86	151.47	24 30 7.4	134.2	71.85	15 41.1	57 28.0	
26	U	6 47.84	2.409	17 6 27.42	154.82	24 45 35.6	− 19.2	72.66	15 48.9	57 56.6	I.
26	L	19 17.02	2.456	17 37 41.01	157.27	24 37 19.7	+102.7	73.24	15 56.9	58 25.8	
27	U	7 46.58	2.474	18 9 17.98	158.70	−24 4 14.4	+228.5	73.55	16 4.8	58 55.1	I.
27	L	20 16.32	2.480	18 41 5.66	159.07	23 5 53.3	354.8	73.60	16 12.6	59 23.8	
28	U	8 46.04	2.470	19 12 51.64	158.44	21 42 32.7	477.8	73.42	16 20.1	59 51.2	I.
28	L	21 15.54	2.446	19 44 24.97	156.99	19 55 15.2	593.7	73.04	16 27.0	60 16.6	
29	U	9 44.69	2.412	20 15 37.18	154.96	−17 45 45.8	+699.2	72.51	16 33.1	60 39.0	I.
29	L	22 13.40	2.373	20 46 22.76	152.61	15 16 29.0	791.1	71.91	16 38.2	60 57.7	
30	U	10 41.63	2.332	21 16 39.34	150.17	12 30 21.0	867.3	71.28	16 42.1	61 12.0	I.
30	L	23 9.38	2.294	21 46 27.40	147.88	9 30 42.2	926.0	70.70	16 44.7	61 21.4	
31	U	11 36.71	2.262	22 15 49.78	145.92	− 6 21 8.9	+966.3	70.20	16 45.8	61 25.5	I.
Sept. 1	L	0 3.69	2.236	22 44 51.16	144.39	− 3 5 26.7	987.5	69.82	16 45.4	61 24.2	
1	U	12 30.41	2.219	23 13 37.26	143.38	+ 0 12 37.0	990.0	69.57	16 43.6	61 17.3	
2	L	0 56.99	2.211	23 42 11.46	142.91	3 29 19.0	974.0	69.46	16 40.3	61 5.3	
2	U	13 23.52	2.212	0 10 49.05	142.95	+ 6 41 5.4	+940.8	69.49	16 35.7	60 48.5	
3	L	1 50.11	2.220	0 39 26.86	143.43	9 44 35.3	891.6	69.63	16 30.0	60 27.6	
3	U	14 16.83	2.234	1 8 12.69	144.26	12 36 44.5	827.7	69.87	16 23.4	60 3.3	
4	L	2 43.74	2.251	1 37 9.98	145.31	15 14 48.4	750.9	70.17	16 16.1	59 36.4	
4	U	15 10.86	2.270	2 6 20.43	146.42	+17 36 24.3	+663.3	70.48	16 8.3	59 7.7	
5	L	3 38.21	2.287	2 35 43.71	147.43	19 39 32.9	566.8	70.76	16 0.2	58 38.0	
5	U	16 5.72	2.298	3 5 17.38	148.13	21 22 40.6	463.6	70.96	15 52.0	58 8.0	
6	L	4 33.33	2.302	3 34 56.99	148.38	22 44 40.6	355.9	71.04	15 43.9	57 38.3	
6	U	17 0.94	2.297	4 4 36.30	148.06	+23 44 54.0	+246.1	70.98	15 36.1	57 9.6	
7	L	5 28.42	2.281	4 34 7.85	147.09	24 23 9.5	136.6	70.75	15 28.6	56 42.2	
7	U	17 55.64	2.254	5 3 23.71	145.44	24 39 42.3	+ 29.4	70.34	15 21.6	56 16.5	
8	L	6 22.47	2.216	5 32 16.01	143.18	24 35 11.3	− 73.7	69.77	15 15.2	55 52.8	
8	U	18 48.79	2.169	6 0 37.79	140.38	+24 10 36.5	−171.1	69.04	15 9.3	55 31.3	

Aug. 27, U Defective Illumination of N. 0′.29. Aug. 31, U Defective Illumination of S.

OF MOON'S CENTER OVER THE MERIDIAN OF WASHINGTON.

	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.	Geocentric Semidiameter.	Equatorial Horizontal Parallax.	Bright Limbs.
	m	h m s	s	° ′ ″	″	s	′ ″	′ ″	
9	2.169	6 0 37.79	140.38	+24 10 36.5	−171.1	69.04	15 9.3	55 31.3	II. S.
1	2.116	6 28 23.47	137.18	23 27 12.8	261.7	68.20	15 4.0	55 12.0	
3	2.059	6 55 29.20	133.74	22 26 26.5	344.7	67.28	14 59.4	54 55.0	II. S.
2	2.001	7 21 52.96	130.22	21 9 50.9	419.9	66.33	14 55.4	54 40.4	
3	1.943	7 47 34.51	126.73	+19 39 2.0	−486.9	65.37	14 52.1	54 28.1	II. S.
5	1.888	8 12 35.17	123.42	17 55 35.8	546.1	64.45	14 49.3	54 18.0	
9	1.837	8 36 57.62	120.38	16 1 6.1	597.5	63.59	14 47.1	54 10.0	II. S.
6	1.792	9 0 45.59	117.68	13 57 3.9	641.6	62.81	14 45.5	54 3.9	
3	1.754	9 24 3.60	115.39	+11 44 56.6	−678.4	62.15	14 44.4	53 59.8	II. S.
9	1.724	9 46 56.80	113.55	9 26 8.3	708.5	61.60	14 43.7	53 57.5	
3	1.701	10 9 30.72	112.18	7 2 0.1	731.9	61.19	14 43.5	53 56.8	II. S.
5	1.686	10 31 51.21	111.31	4 33 51.2	748.6	60.92	14 43.8	53 57.7	
4	1.680	10 54 4.29	110.96	+ 2 2 59.3	−759.0	60.81	14 44.4	54 0.0	
1	1.683	11 16 16.18	111.12	− 0 29 17.5	762.8	60.85	14 45.4	54 3.7	
6	1.694	11 38 33.09	111.79	3 1 40.9	759.9	61.04	14 46.8	54 8.8	
1	1.714	12 1 1.31	113.00	5 32 50.3	750.4	61.39	14 48.6	54 15.2	
4	1.743	12 23 47.07	114.72	− 8 1 22.4	−733.7	61.88	14 50.7	54 22.9	
7	1.780	12 46 56.50	116.94	10 25 49.7	709.5	62.51	14 53.1	54 31.8	
9	1.825	13 10 35.57	119.65	12 44 40.2	677.4	63.27	14 55.9	54 42.1	I. N.
9	1.877	13 34 49.78	122.79	14 56 16.8	637.1	64.14	14 59.0	54 53.7	
6	1.936	13 59 44.06	126.32	−16 58 56.4	−587.9	65.12	15 2.6	55 6.7	I. N.
7	1.999	14 25 22.50	130.14	18 50 50.8	529.5	66.16	15 6.5	55 21.1	
6	2.066	14 51 47.95	134.13	20 30 6.8	461.5	67.24	15 10.8	55 37.0	I. N.
5	2.133	15 19 1.73	138.16	21 54 48.4	383.8	68.32	15 15.6	55 54.4	
3	2.197	15 47 3.20	142.05	−23 3 0.1	−296.6	69.34	15 20.7	56 13.2	I. N.
6	2.256	16 15 49.59	145.61	23 52 50.6	200.4	70.26	15 26.2	56 33.5	
5	2.307	16 45 15.79	148.66	24 22 38.3	− 96.3	71.04	15 32.1	56 55.2	I. N.
8	2.346	17 15 14.56	151.02	24 30 56.8	+ 14.2	71.64	15 38.4	57 18.1	
0	2.372	17 45 37.00	152.59	−24 16 42.2	+128.9	72.03	15 44.9	57 42.1	I. N.
6	2.384	18 16 13.21	153.31	23 39 17.2	245.4	72.21	15 51.7	58 6.8	
7	2.383	18 46 53.19	153.22	22 38 35.5	361.1	72.18	15 58.5	58 31.9	I. S.
0	2.370	19 17 27.83	152.44	21 15 4.2	473.3	71.97	16 5.3	58 57.0	
2	2.348	19 47 49.67	151.13	−19 29 41.8	+579.1	71.63	16 12.0	59 21.6	I. S.
3	2.321	20 17 53.46	149.47	17 23 59.1	676.3	71.19	16 18.4	59 45.0	
0	2.291	20 47 36.47	147.70	14 59 54.3	762.5	70.72	16 24.3	60 6.6	I. S.
2	2.263	21 16 58.40	145.99	12 19 49.7	835.9	70.26	16 29.5	60 25.7	
2	2.238	21 46 1.14	144.52	− 9 26 28.7	+895.0	69.87	16 33.9	60 41.7	I. S.
7	2.220	22 14 48.45	143.44	6 22 51.9	938.4	69.56	16 37.2	60 53.9	
4	2.210	22 43 25.40	142.81	− 3 12 13.8	965.0	69.38	16 39.4	61 1.8	I. S.
4	2.208	23 11 57.91	142.70	+ 0 2 0.9	974.3	69.32	16 40.2	61 5.0	
6	2.215	23 40 32.23	143.11	+ 3 16 20.9	+965.9	69.41	16 39.8	61 3.3	I. N. S.
2	2.230	0 9 14.47	144.01	6 27 12.2	939.6	69.63	16 37.9	60 56.6	
0	2.252	0 38 10.06	145.32	9 31 4.2	896.1	69.96	16 34.8	60 45.0	*I.* II. N.
8	2.278	1 7 23.27	146.92	12 24 33.2	836.0	70.37	16 30.4	60 29.0	
9	*2.307*	*1 36 56.62*	*148.65*	+15 4 28.5	+760.8	70.81	16 24.9	60 8.9	II. N.

Sept. 30, U Defective Illumination of *I.* 0.06.

FOR TRANSIT OF MOON'S CENTER OVER THE MERIDIAN OF WASHINGT

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.	Geocentric Semidiameter.	Equatorial Horizontal Parallax.	Br Li
		h m	m	h m s	s	° ′ ″	″	s	′ ″	′ ″	
Oct. 1	U	12 55.39	2.307	1 36 56.62	148.65	+15 4 28.5	+760.8	70.81	16 24.9	60 8.9	II.
2	L	1 23.24	2.335	2 6 50.57	150.31	17 27 58.9	672.2	71.24	16 18.5	59 45.4	
2	U	13 51.40	2.358	2 37 3.14	151.71	19 32 37.3	572.6	71.61	16 11.4	59 19.3	II.
3	L	2 19.80	2.373	3 7 29.78	152.63	21 16 26.5	464.5	71.87	16 3.8	58 51.2	
3	U	14 48.31	2.377	3 38 3.62	152.89	+22 38 3.3	+350.9	71.97	15 55.8	58 21.9	II.
4	L	3 16.80	2.368	4 8 35.89	152.35	23 36 40.8	235.1	71.87	15 47.7	57 52.3	
4	U	15 45.10	2.345	4 38 56.67	150.97	24 12 9.2	120.0	71.56	15 39.7	57 22.9	II.
5	L	4 13.04	2.309	5 8 55.93	148.78	24 24 52.9	+ 8.2	71.04	15 31.9	56 54.4	
5	U	16 40.47	2.261	5 38 24.35	145.86	+24 15 46.5	− 98.1	70.34	15 24.5	56 27.3	II.
6	L	5 7.25	2.203	6 7 14.25	142.38	23 46 8.3	197.0	69.48	15 17.6	56 1.9	
6	U	17 33.30	2.139	6 35 19.95	138.53	22 57 32.9	287.5	68.52	15 11.3	55 38.7	II.
7	L	5 58.57	2.072	7 2 38.20	134.50	21 51 44.6	369.0	67.48	15 5.6	55 17.8	
7	U	18 23.03	2.005	7 29 7.95	130.46	+20 30 31.5	−441.6	66.43	15 0.6	54 59.4	II.
8	L	6 46.69	1.941	7 54 50.22	126.61	18 55 40.4	505.4	65.39	14 56.3	54 43.7	
8	U	19 9.62	1.881	8 19 47.74	123.03	17 8 53.7	560.9	64.41	14 52.7	54 30.5	II.
9	L	7 31.87	1.828	8 44 4.56	119.84	15 11 48.3	608.6	63.52	14 49.9	54 20.0	
9	U	19 53.52	1.782	9 7 45.69	117.10	+13 5 54.7	−649.0	62.74	14 47.7	54 12.1	II.
10	L	8 14.68	1.745	9 30 56.81	114.84	10 52 36.9	682.7	62.08	14 46.2	54 6.7	
10	U	20 35.44	1.716	9 53 44.08	113.12	8 33 14.4	710.0	61.57	14 45.4	54 3.6	II.
11	L	8 55.91	1.697	10 16 13.91	111.94	6 9 2.4	731.0	61.20	14 45.2	54 2.8	
11	U	21 16.20	1.686	10 38 32.89	111.31	+ 3 41 14.6	−746.0	60.98	14 45.5	54 4.0	II.
12	L	9 36.42	1.685	11 0 47.66	111.24	+ 1 11 3.5	754.8	60.93	14 46.4	54 7.2	
12	U	21 56.68	1.693	11 23 4.92	111.73	− 1 20 16.9	757.5	61.03	14 47.7	54 12.2	II.
13	L	10 17.09	1.710	11 45 31.25	112.76	3 51 30.2	753.7	61.30	14 49.5	54 18.7	
13	U	22 37.76	1.736	12 8 13.24	114.33	− 6 21 16.1	−742.8	61.71	14 51.7	54 26.7	II.
14	L	10 58.80	1.771	12 31 17.25	116.42	8 48 8.7	724.6	62.27	14 54.2	54 35.9	
14	U	23 20.30	1.814	12 54 49.35	119.01	11 10 35.9	698.4	62.97	14 57.0	54 46.2	
15	L	11 42.37	1.865	13 18 55.19	122.04	13 26 58.7	663.9	63.79	15 0.1	54 57.5	
16	U	0 5.08	1.921	13 43 39.76	125.45	−15 35 31.5	−620.1	64.71	15 3.4	55 9.7	
16	L	12 28.50	1.983	14 9 7.14	129.15	17 34 21.7	566.7	65.69	15 6.9	55 22.7	
17	U	0 52.68	2.047	14 35 20.09	133.02	19 21 32.0	503.4	66.72	15 10.6	55 36.3	I.
17	L	13 17.63	2.112	15 2 19.82	136.92	20 55 2.5	430.1	67.75	15 14.5	55 50.5	
18	U	1 43.35	2.174	15 30 5.47	140.65	−22 12 53.7	−346.9	68.74	15 18.6	56 5.3	I.
18	L	14 9.79	2.230	15 58 34.04	144.04	23 13 12.2	254.7	69.62	15 22.8	56 20.7	
19	U	2 36.84	2.278	16 27 40.20	146.89	23 54 16.1	154.7	70.36	15 27.1	56 36.7	I.
19	L	15 4.40	2.314	16 57 16.48	149.04	24 14 40.5	− 48.5	70.93	15 31.6	56 53.1	
20	U	3 32.31	2.336	17 27 13.76	150.37	−24 13 23.7	+ 61.8	71.30	15 36.2	57 10.1	I.
20	L	16 0.40	2.344	17 57 22.03	150.86	23 49 51.3	173.7	71.45	15 40.9	57 27.4	
21	U	4 28.50	2.338	18 27 31.19	150.53	23 3 58.7	284.7	71.39	15 45.8	57 45.2	I.
21	L	16 56.47	2.321	18 57 32.09	149.51	21 56 11.4	392.4	71.16	15 50.7	58 3.2	
22	U	5 24.18	2.295	19 27 17.31	147.95	−20 27 23.7	+494.4	70.79	15 55.6	58 21.3	I.
22	L	17 51.54	2.264	19 56 41.65	146.06	18 38 54.2	589.1	70.32	16 0.5	58 39.3	
23	U	6 18.50	2.230	20 25 42.40	144.05	16 32 22.9	674.6	69.82	16 5.3	58 57.0	I.
23	L	18 45.07	2.198	20 54 19.35	142.13	14 9 47.4	749.6	69.32	16 9.9	59 13.9	
24	U	7 11.28	2.171	21 22 34.56	140.46	−11 33 18.3	+813.2	68.88	16 14.3	59 29.8	I.

Oct. 5, U Defective Illumination of S. 0′ .86.

OF MOON'S CENTER OVER THE MERIDIAN OF WASHINGTON.

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.	Geocentric Semidiameter.	Equatorial Horizontal Parallax.	Bright Limbs.
m	h m s	s	° ′ ″	″	s	′ ″	′ ″	
2.171	21 22 34.56	140.46	−11 33 18.3	+813.2	68.88	16 14.3	59 29.8	I. S.
2.150	21 50 31.96	139.18	8 45 18.3	864.6	68.53	16 18.2	59 44.2	
2.137	22 18 16.95	138.41	5 48 19.9	902.8	68.30	16 21.6	59 56.7	I. S.
2.133	22 45 55.98	138.20	− 2 45 5.3	927.2	68.22	16 24.4	60 6.8	
2.140	23 13 36.08	138.59	+ 0 21 34.7	+936.9	68.29	16 26.4	60 14.1	I. S.
2.156	23 41 24.50	139.58	3 28 40.5	931.4	68.51	16 27.5	60 18.2	
2.182	0 9 28.21	141.13	6 33 6.1	910.1	68.87	16 27.6	60 18.8	I. S.
2.216	0 37 53.42	143.15	9 31 39.9	872.8	69.36	16 26.8	60 15.6	
2.255	1 6 45.14	145.51	+12 21 8.8	+819.3	69.93	16 24.9	60 8.6	I. *N.* S.
2.297	1 36 6.50	148.05	14 58 22.2	750.3	70.55	16 21.9	59 57.8	
2.338	2 5 58.31	150.55	17 20 18.8	666.8	71.16	16 18.0	59 43.3	I. *II.* N.
2.375	2 36 18.63	152.76	19 24 14.2	570.4	71.70	16 13.1	59 25.5	
2.403	3 7 2.39	154.42	+21 7 48.4	+463.8	72.12	16 7.5	59 4.9	II. N.
2.417	3 38 1.58	155.30	22 29 13.8	349.5	72.34	16 1.2	58 41.9	
2.416	4 9 5.76	155.23	23 27 21.2	231.3	72.35	15 54.5	58 17.1	II. N.
2.398	4 40 2.87	154.12	24 1 43.8	+112.7	72.11	15 47.4	57 51.2	
2.362	5 10 40.45	151.98	+24 12 36.8	− 3.1	71.63	15 40.2	57 24.8	II. N.
2.312	5 40 46.83	148.94	24 0 53.1	113.1	70.92	15 33.1	56 58.5	
2.249	6 10 12.28	145.20	23 27 56.5	214.9	70.02	15 26.1	56 32.9	II. *N.* S.
2.179	6 38 49.62	140.97	22 35 32.7	307.4	68.99	15 19.4	56 8.5	
2.105	7 6 34.65	136.52	+21 25 39.7	−389.7	67.88	15 13.2	55 45.7	II. S.
2.031	7 33 25.93	132.05	20 0 20.3	461.8	66.75	15 7.5	55 24.9	
1.960	7 59 24.52	127.77	18 21 35.1	524.1	65.64	15 2.5	55 6.3	II. S.
1.894	8 24 33.55	123.81	16 31 18.4	577.2	64.60	14 58.1	54 50.1	
1.836	8 48 57.69	120.29	+14 31 15.4	−621.9	63.65	14 54.4	54 36.6	II. S.
1.786	9 12 42.69	117.29	12 23 2.6	659.0	62.83	14 51.5	54 25.9	
1.745	9 35 55.06	114.86	10 8 7.0	689.1	62.15	14 49.3	54 17.9	II. S.
1.715	9 58 41.77	113.02	7 47 48.0	713.0	61.61	14 47.8	54 12.6	
1.694	10 21 10.06	111.80	+ 5 23 18.8	−730.9	61.25	14 47.2	54 10.2	II. S.
1.684	10 43 27.32	111.19	2 55 49.1	743.1	61.06	14 47.3	54 10.4	
1.684	11 5 40.97	111.20	+ 0 26 26.3	749.7	61.03	14 48.0	54 13.1	II. S.
1.695	11 27 58.46	111.82	− 2 3 41.3	750.6	61.17	14 49.4	54 18.2	
1.716	11 50 27.17	113.06	− 4 33 23.0	−745.3	61.48	14 51.4	54 25.5	II. S.
1.746	12 13 14.35	114.90	7 1 22.8	733.6	61.96	14 53.9	54 34.9	
1.786	12 36 27.09	117.32	9 26 18.4	714.5	62.60	14 57.0	54 46.1	II. S.
1.835	13 0 12.13	120.27	11 46 39.4	687.5	63.37	15 0.4	54 58.9	
1.892	13 24 35.64	123.72	−14 0 45.3	−651.9	64.27	15 4.3	55 12.9	II. S.
1.957	13 49 43.03	127.58	16 6 46.3	606.5	65.27	15 8.4	55 28.0	
2.026	14 15 38.50	131.72	18 2 43.0	551.0	66.34	15 12.7	55 43.9	
2.097	14 42 24.71	136.00	19 46 28.2	484.7	67.43	15 17.2	56 0.2	
2.167	15 10 2.14	140.22	−21 15 51.2	−407.4	68.50	15 21.7	56 16.8	
2.233	15 38 28.92	144.17	22 28 41.8	319.3	69.50	15 26.2	56 33.3	
2.290	16 7 40.32	147.62	23 22 57.7	221.7	70.36	15 30.6	56 49.7	
2.335	16 37 28.81	150.33	23 56 52.1	116.1	71.05	15 35.0	57 5.6	
2.365	17 7 44.55	152.13	−24 9 2.2	− 4.9	71.52	15 39.2	57 20.9	I. N.

tive Illumination of N. 0''.35.
tive Illumination of II. 0''.04.

Nov. 2, U Defective Illumination of N.0'.56.

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.	Geocentric Semidiameter.	Equatorial Horizontal Parallax.	Mo Lib
		h m	m	h m s	s	° ′ ″	″	s	′ ″	′ ″	
Nov. 16	U	1 26.71	2.365	17 7 44.55	152.13	−24 9 2.2	− 4.9	71.52	15 39.2	57 20.9	I.
16	L	13 55.19	2.378	17 38 15.87	152.92	23 58 36.1	+109.4	71.74	15 43.2	57 35.6	
17	U	2 23.72	2.374	18 8 50.55	152.70	23 25 17.1	223.5	71.72	15 47.0	57 49.6	I.
17	L	14 52.11	2.355	18 39 16.86	151.55	22 29 25.1	334.5	71.47	15 50.6	58 2.7	
18	U	3 20.19	2.324	19 9 24.74	149.66	−21 11 55.1	+439.4	71.04	15 53.9	58 14.9	I.
18	L	15 47.84	2.284	19 39 6.60	147.26	19 34 11.8	536.3	70.48	15 57.0	58 26.4	
19	U	4 14.98	2.239	20 8 17.76	144.58	17 38 3.4	623.3	69.84	15 59.9	58 37.0	I.
19	L	16 41.58	2.194	20 36 56.51	141.89	15 25 34.8	699.5	69.19	16 2.5	58 46.7	
20	U	5 7.66	2.153	21 5 3.90	139.38	−12 59 1.9	+764.0	68.57	16 4.9	58 55.5	I.
20	L	17 33.28	2.118	21 32 43.35	137.25	10 20 46.7	816.5	68.04	16 7.1	59 3.5	
21	U	5 58.52	2.091	22 0 0.06	135.62	7 33 14.3	856.8	67.62	16 9.0	59 10.4	I.
21	L	18 23.49	2.073	22 27 0.63	134.59	4 38 52.0	884.9	67.35	16 10.6	59 16.2	
22	U	6 48.31	2.067	22 53 52.60	134.19	− 1 40 8.8	+900.3	67.23	16 11.8	59 20.8	I.
22	L	19 13.13	2.072	23 20 43.91	134.48	+ 1 20 24.9	903.1	67.29	16 12.7	59 24.1	
23	U	7 38.07	2.087	23 47 42.69	135.43	4 20 14.4	892.9	67.52	16 13.2	59 25.7	I.
23	L	20 3.26	2.113	0 14 56.79	137.01	7 16 41.7	869.3	67.89	16 13.1	59 25.5	
24	U	8 28.83	2.149	0 42 33.32	139.16	+10 7 4.9	+832.2	68.40	16 12.5	59 23.3	I.
24	L	20 54.87	2.192	1 10 38.25	141.74	12 48 38.6	781.1	69.02	16 11.3	59 19.0	
25	U	9 21.45	2.239	1 39 15.89	144.58	15 18 35.9	716.2	69.71	16 9.6	59 12.5	I.
25	L	21 48.61	2.287	2 8 28.27	147.48	17 34 13.2	637.9	70.40	16 7.1	59 3.6	
26	U	10 16.34	2.333	2 38 14.70	150.20	+19 32 55.0	+547.1	71.05	16 4.1	58 52.3	I.
26	L	22 44.57	2.370	3 8 31.38	152.48	21 12 22.0	445.7	71.59	16 0.4	58 38.8	
27	U	11 13.19	2.396	3 39 11.24	154.03	22 30 38.9	335.9	71.95	15 56.1	58 23.1	I.
27	L	23 42.02	2.407	4 10 4.34	154.65	23 26 22.9	220.7	72.09	15 51.3	58 5.5	
28	U	12 10.87	2.399	4 40 58.57	154.20	+23 58 49.5	+103.6	71.99	15 46.1	57 46.4	
29	L	0 39.53	2.373	5 11 40.78	152.65	24 7 55.8	− 12.0	71.62	15 40.6	57 26.0	
29	U	13 7.77	2.331	5 41 58.08	150.07	23 54 19.5	123.0	71.01	15 34.8	57 4.9	
30	L	1 35.40	2.274	6 11 39.09	146.64	23 19 13.3	226.5	70.18	15 28.9	56 43.4	
30	U	14 2.29	2.206	6 40 34.94	142.59	+22 24 18.5	−320.9	69.20	15 23.1	56 22.0	
Dec. 1	L	2 28.33	2.133	7 8 39.71	138.17	21 11 33.6	404.8	68.11	15 17.4	56 1.2	
1	U	14 53.47	2.057	7 35 50.49	133.63	19 43 6.7	477.9	66.98	15 12.0	55 41.3	
2	L	3 17.71	1.984	8 2 7.30	129.20	18 1 6.7	540.4	65.87	15 7.0	55 22.7	
2	U	15 41.09	1.915	8 27 32.43	125.05	+16 7 37.3	−592.8	64.80	15 2.4	55 5.8	
3	L	4 3.69	1.852	8 52 10.04	121.30	14 4 34.7	636.1	63.82	14 58.3	54 50.9	
3	U	16 25.58	1.798	9 16 5.65	118.06	11 53 43.9	671.1	62.96	14 54.8	54 38.2	
4	L	4 46.89	1.754	9 39 25.74	115.38	9 36 40.0	698.4	62.25	14 52.0	54 27.9	
4	U	17 7.72	1.720	10 2 17.34	113.32	+ 7 14 47.8	−719.1	61.69	14 49.9	54 20.2	
5	L	5 28.20	1.696	10 24 47.86	111.87	4 49 24.3	733.7	61.30	14 48.6	54 15.3	
5	U	17 48.46	1.683	10 47 4.97	111.08	+ 2 21 40.1	742.7	61.08	14 48.0	54 13.1	
6	L	6 8.62	1.680	11 9 16.49	110.95	− 0 7 18.2	746.1	61.04	14 48.2	54 13.8	
6	U	18 28.83	1.689	11 31 30.22	111.45	− 2 36 25.6	−744.1	61.17	14 49.1	54 17.2	
7	L	6 49.20	1.708	11 53 54.02	112.62	5 4 35.7	736.6	61.49	14 50.8	54 23.5	
7	U	19 9.86	1.738	12 16 35.72	114.44	7 30 39.2	723.0	61.97	14 53.2	54 32.4	
8	L	7 30.96	1.779	12 39 43.04	116.89	9 53 20.7	702.7	62.62	14 56.3	54 43.8	
8	U	19 52.60	1.830	13 3 23.41	119.94	−12 11 16.3	−675.2	63.44	15 0.1	54 57.5	

Nov. 27, U Defective Illumination of S. 0′.04.
Nov. 28, U Defective Illumination of S. 0′.56.

Nov. 29, U Defective Illumination of S.
Nov. 30, U Defective Illumination of

OF MOON'S CENTER OVER THE MERIDIAN OF WASHINGTON.

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.	Geocentric Semidiameter.	Equatorial Horizontal Parallax.	Bright Limbs.
m	h m s	s	° ′ ″	″	s	′ ″	′ ″	
1.830	13 3 23.41	119.94	−12 11 16.3	−675.2	63.44	15 0.1	54 57.5	II. S.
1.890	13 27 43.89	123.56	14 22 52.8	639.4	64.38	15 4.4	55 13.4	
1.958	13 52 50.81	127.67	16 26 24.9	594.3	65.44	15 9.2	55 31.1	II. S.
2.033	14 18 49.38	132.15	18 19 55.9	539.0	66.58	15 14.5	55 50.3	
2.111	14 45 43.24	136.85	−20 1 18.1	−472.8	67.76	15 20.0	56 10.7	II. S.
2.189	15 13 33.83	141.57	21 28 16.1	395.0	68.93	15 25.8	56 31.9	
2.264	15 42 19.89	146.05	22 38 30.9	305.6	70.02	15 31.6	56 53.3	II. S.
2.330	16 11 57.02	150.02	23 29 48.7	205.6	70.99	15 37.5	57 14.7	
2.383	16 42 17.49	153.23	−24 0 8.8	− 96.4	71.75	15 43.1	57 35.5	
2.419	17 13 10.55	155.43	24 7 55.4	+ 19.5	72.28	15 48.5	57 55.3	
2.437	17 44 23.14	156.47	23 52 6.0	139.0	72.53	15 53.5	58 13.7	
2.435	18 15 41.18	156.34	23 12 19.7	258.4	72.51	15 58.1	58 30.3	
2.414	18 46 50.89	155.11	−22 9 0.0	+374.0	72.23	16 2.1	58 44.9	I. S.
2.379	19 17 40.25	152.99	20 43 13.2	482.4	71.74	16 5.5	58 57.4	
2.333	19 48 0.04	150.23	18 56 42.8	580.8	71.09	16 8.2	59 7.5	I. S.
2.282	20 17 44.34	147.12	16 51 41.8	667.2	70.35	16 10.3	59 15.2	
2.229	20 46 50.66	143.93	−14 30 42.3	+740.4	69.59	16 11.8	59 20.6	I. S.
2.179	21 15 19.70	140.94	11 56 27.9	799.6	68.88	16 12.7	59 23.8	
2.135	21 43 14.76	138.31	9 11 46.5	844.9	68.24	16 13.0	59 24.9	I. S.
2.100	22 10 41.18	136.20	6 19 25.0	876.4	67.72	16 12.8	59 24.2	
2.075	22 37 45.73	134.68	− 3 22 6.2	+894.5	67.35	16 12.1	59 21.8	I. S.
2.061	23 4 36.12	133.83	− 0 22 28.2	899.7	67.14	16 11.0	59 17.9	
2.058	23 31 20.50	133.68	+ 2 36 55.4	892.3	67.11	16 9.6	59 12.7	I. S.
2.067	23 58 7.11	134.21	5 33 35.7	872.5	67.25	16 7.9	59 6.4	
2.086	0 25 3.90	135.37	+ 8 25 6.3	+840.6	67.54	16 5.9	58 59.1	I. S.
2.115	0 52 18.10	137.09	11 9 2.8	796.8	67.98	16 3.7	58 50.8	
2.151	1 19 55.88	139.27	13 43 2.3	741.1	68.51	16 1.2	58 41.7	I. S.
2.192	1 48 1.82	141.76	16 4 43.8	673.8	69.12	15 58.5	58 31.7	
2.236	2 16 38.56	144.37	+18 11 50.5	+595.4	69.74	15 55.5	58 20.8	I. S.
2.278	2 45 46.27	146.88	20 2 12.8	506.6	70.33	15 52.3	58 9.2	
2.314	3 15 22.30	149.05	21 33 53.8	408.8	70.84	15 48.9	57 56.7	I. S.
2.340	3 45 21.16	150.64	22 45 15.1	303.7	71.20	15 45.3	57 43.3	
2.353	4 15 34.59	151.45	+23 35 3.2	+193.7	71.36	15 41.4	57 29.2	I. S.
2.351	4 45 52.20	151.32	24 2 36.1	+ 81.6	71.30	15 37.3	57 14.3	
2.333	5 16 2.36	150.20	24 7 45.6	− 29.6	71.01	15 33.1	56 58.7	I. N. S.
2.298	5 45 53.28	148.13	23 50 59.4	137.2	70.48	15 28.7	56 42.7	
2.250	6 15 14.19	145.23	+23 13 17.2	−238.5	69.75	15 24.2	56 26.2	I. II. N. S.
2.191	6 43 56.17	141.68	22 16 6.9	331.6	68.86	15 19.7	56 9.6	
2.125	7 11 52.80	137.71	21 1 16.0	415.2	67.86	15 15.2	55 53.1	II. N. S.
2.056	7 39 0.45	133.55	19 30 44.5	488.3	66.81	15 10.8	55 37.0	
1.987	8 5 18.00	129.39	+17 46 37.1	−551.1	65.75	15 6.6	55 21.4	II. S.
1.921	8 30 46.71	125.43	15 50 57.8	603.7	64.73	15 2.6	55 6.7	
1.861	8 55 29.70	121.80	13 45 45.4	646.8	63.79	14 58.9	54 53.1	II. S.
1.807	9 19 31.53	118.59	11 32 50.2	681.1	62.95	14 55.6	54 41.0	
1.762	9 42 57.83	115.89	+ 9 13 53.6	−707.1	62.23	14 52.7	54 30.5	II. S.

tive Illumination of N. 0″.00.
tive Illumination of II. 0ᵖ.05.

Dec. 27, U Defective Illumination of N.0″.00.
Dec. 28, U Defective Illumination of N.0″.58.

FOR TRANSIT AT WASHINGTON.

Date.	Wash. Mean Time.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semidiam.	S. T of Sem. Pass. Mer.
	h m	h m s	° ′ ″	″	″	s
Jan. 1	1 27	20 10 12.08	−21 24 9.6	8.6	3.3	0.23
2	1 27	20 14 40.02	20 59 40.9	8.8	3.3	0.24
3	1 27	20 18 43.30	20 34 58.3	9.0	3.4	0.24
4	1 27	20 22 18.89	20 10 17.8	9.3	3.5	0.25
5	1 26	20 25 23.54	19 45 57.0	9.6	3.6	0.25
6	1 25	20 27 53.87	−19 22 15.4	9.9	3.7	0.26
7	1 23	20 29 46.56	18 59 33.2	10.2	3.9	0.27
8	1 20	20 30 58.39	18 38 11.9	10.5	4.0	0.28
9	1 17	20 31 26.53	18 18 32.5	10.8	4.1	0.28
10	1 12	20 31 8.71	18 0 55.6	11.1	4.2	0.29
11	1 7	20 30 3.48	−17 45 39.5	11.5	4.4	0.30
12	1 2	20 28 10.56	17 32 59.3	11.8	4.5	0.31
13	0 55	20 25 31.09	17 23 5.9	12.1	4.6	0.32
14	0 48	20 22 7.80	17 16 5.3	12.4	4.7	0.33
15	0 40	20 18 5.23	17 11 57.8	12.6	4.8	0.34
16	0 31	20 13 29.58	−17 10 37.0	12.9	4.9	0.34
17	0 22	20 8 28.60	17 11 52.5	13.0	5.0	0.34
18	0 13	20 3 11.18	17 15 28.6	13.2	5.0	0.35
19	0 4	19 57 46.81	17 21 7.3	13.2	5.0	0.35
19	23 55	19 52 25.03	17 28 28.8	13.3	5.0	0.35
20	23 45	19 47 14.80	−17 37 13.2	13.2	5.0	0.35
21	23 37	19 42 24.04	17 47 1.8	13.1	5.0	0.35
22	23 28	19 37 59.32	17 57 37.3	13.0	4.9	0.35
23	23 21	19 34 5.63	18 8 44.7	12.9	4.9	0.34
24	23 13	19 30 46.46	18 20 10.2	12.7	4.8	0.34
25	23 7	19 28 3.83	−18 31 42.6	12.5	4.7	0.33
26	23 1	19 25 58.57	18 43 11.9	12.2	4.6	0.33
27	22 55	19 24 30.47	18 54 29.3	12.0	4.6	0.32
28	22 50	19 23 38.58	19 5 27.1	11.7	4.5	0.32
29	22 46	19 23 21.42	19 15 58.8	11.5	4.4	0.31
30	22 43	19 23 37.10	−19 25 58.2	11.3	4.3	0.30
31	22 39	19 24 23.57	19 35 19.9	11.0	4.2	0.30
Feb. 1	22 37	19 25 38.68	19 43 59.1	10.8	4.1	0.29
2	22 34	19 27 20.29	19 51 51.3	10.6	4.0	0.29
3	22 33	19 29 26.28	19 58 52.8	10.3	3.9	0.28
4	22 31	19 31 54.63	−20 5 0.1	10.1	3.8	0.27
5	22 30	19 34 43.41	20 10 9.9	9.9	3.8	0.27
6	22 29	19 37 50.90	20 14 19.5	9.8	3.7	0.26
7	22 29	19 41 15.43	20 17 26.4	9.6	3.6	0.26
8	22 28	19 44 55.51	20 19 28.6	9.4	3.6	0.25
9	22 28	19 48 49.78	−20 20 23.9	9.2	3.5	0.25
10	22 28	19 52 56.95	20 20 10.8	9.1	3.4	0.25
11	22 29	19 57 15.87	20 18 47.5	8.9	3.4	0.24
12	22 29	20 1 45.54	20 16 13.2	8.8	3.3	0.24
13	22 30	20 6 24.99	20 12 26.2	8.7	3.3	0.23
14	*22 31*	*20 11 13.38*	−20 7 26.0	8.5	3.2	0.23
15	*22 32*	*20 16 9.92*	−20 1 11.5	8.4	3.2	0.23

Date.	Wash. Mean Time.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.
	h m	h m s	° ′ ″	″
Feb. 15	22 32	20 16 9.92	−20 1 11.5	8.4
16	22 33	20 21 13.91	19 53 42.2	8.3
17	22 34	20 26 24.72	19 44 57.2	8.2
18	22 36	20 31 41.78	19 34 56.4	8.1
19	22 37	20 37 4.55	19 23 39.1	8.0
20	22 39	20 42 32.57	−19 11 4.9	7.9
21	22 40	20 48 5.40	18 57 14.0	7.8
22	22 42	20 53 42.69	18 42 5.8	7.7
23	22 44	20 59 24.07	18 25 40.1	7.6
24	22 45	21 5 9.25	18 7 57.2	7.5
25	22 47	21 10 57.94	−17 48 56.7	7.5
26	22 49	21 16 49.92	17 28 38.4	7.4
27	22 51	21 22 44.96	17 7 2.8	7.3
28	22 53	21 28 42.91	16 44 9.5	7.2
Mar. 1	22 55	21 34 43.57	16 19 58.9	7.2
2	22 57	21 40 46.85	−15 54 30.7	7.1
3	22 59	21 46 52.60	15 27 45.2	7.1
4	23 2	21 53 0.73	14 59 42.4	7.0
5	23 4	21 59 11.20	14 30 22.7	7.0
6	23 6	22 5 23.93	13 59 46.1	6.9
7	23 8	22 11 38.89	−13 27 52.7	6.9
8	23 11	22 17 56.07	12 54 42.9	6.8
9	23 13	22 24 15.45	12 20 16.9	6.8
10	23 16	22 30 37.10	11 44 35.0	6.8
11	23 18	22 37 0.99	11 7 37.5	6.7
12	23 21	22 43 27.18	−10 29 24.8	6.7
13	23 23	22 49 55.74	9 49 57.4	6.7
14	23 26	22 56 26.75	9 9 15.7	6.6
15	23 28	23 3 0.27	8 27 20.6	6.6
16	23 31	23 9 36.39	7 44 12.5	6.6
17	23 34	23 16 15.22	− 6 59 52.8	6.6
18	23 36	23 22 56.87	6 14 22.0	6.5
19	23 39	23 29 41.42	5 27 41.5	6.5
20	23 42	23 36 28.99	4 39 52.9	6.5
21	23 45	23 43 19.68	3 50 57.8	6.5
22	23 48	23 50 13.62	− 3 0 58.3	6.5
23	23 51	23 57 10.85	2 9 56.8	6.5
24	23 54	0 4 11.46	1 17 56.2	6.5
25	23 57	0 11 15.53	− 0 25 0.0	6.5
27	0 0	0 18 23.02	+ 0 28 48.3	6.5
28	0 3	0 25 33.95	+ 1 23 23.6	6.5
29	0 7	0 32 48.23	2 18 40.7	6.6
30	0 10	0 40 5.73	3 14 33.4	6.6
31	0 13	0 47 26.25	4 10 54.8	6.6
Apr. 1	0 17	0 54 49.50	5 7 36.7	6.7
2	0 20	1 2 15.08	+ 6 4 30.1	6.7
3	0 24	1 9 42.50	+ 7 1 24.8	6.8

FOR TRANSIT AT WASHINGTON.

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	° ′ ″	″	″	s		h m	h m s	° ′ ″	″	″	s
0 54 49.50	+ 5 7 36.7	6.7	2.5	0.17	May 16	23 52	3 31 2.07	+17 57 11.5	16.0	6.0	0.42
1 2 15.08	6 4 30.1	6.7	2.5	0.17	17	23 46	3 28 58.23	17 32 12.5	16.0	6.0	0.42
1 9 42.50	7 1 24.8	6.8	2.6	0.17	18	23 40	3 26 58.20	17 7 46.9	15.9	6.0	0.42
1 17 11.18	7 58 10.2	6.8	2.6	0.17	19	23 34	3 25 4.07	16 44 11.5	15.9	6.0	0.42
1 24 40.36	8 54 34.0	6.9	2.6	0.18	20	23 28	3 23 17.75	16 21 42.8	15.8	6.0	0.42
1 32 9.24	+ 9 50 23.9	7.0	2.6	0.18	21	23 23	3 21 40.98	+16 0 35.1	15.7	5.9	0.41
1 39 36.85	10 45 26.8	7.1	2.7	0.18	22	23 17	3 20 15.26	15 41 1.9	15.5	5.9	0.41
1 47 2.14	11 39 29.4	7.2	2.7	0.18	23	23 12	3 19 1.95	15 23 14.6	15.4	5.8	0.40
1 54 23.97	12 32 18.0	7.3	2.8	0.19	24	23 7	3 18 2.14	15 7 22.7	15.2	5.7	0.40
2 1 41.11	13 23 39.8	7.4	2.8	0.19	25	23 3	3 17 16.78	14 53 33.8	14.9	5.7	0.39
2 8 52.31	+14 13 22.1	7.5	2.9	0.19	26	22 58	3 16 46.59	+14 41 53.4	14.7	5.6	0.39
2 15 56.28	15 1 13.4	7.7	2.9	0.20	27	22 54	3 16 32.12	14 32 25.5	14.5	5.5	0.38
2 22 51.73	15 47 3.1	7.8	3.0	0.20	28	22 50	3 16 33.75	14 25 12.5	14.2	5.4	0.37
2 29 37.41	16 30 42.1	8.0	3.0	0.21	29	22 47	3 16 51.76	14 20 14.8	14.0	5.3	0.37
2 36 12.09	17 12 2.2	8.1	3.1	0.21	30	22 43	3 17 26.31	14 17 31.9	13.7	5.2	0.36
2 42 34.60	+17 50 57.1	8.3	3.2	0.22	31	22 40	3 18 17.43	+14 17 1.8	13.4	5.1	0.35
2 48 43.85	18 27 21.8	8.5	3.2	0.23	June 1	22 37	3 19 25.11	14 18 42.0	13.2	5.0	0.34
2 54 38.79	19 1 12.5	8.7	3.3	0.23	2	22 35	3 20 49.27	14 22 28.7	12.9	4.9	0.34
3 0 18.48	19 32 26.2	9.0	3.4	0.24	3	22 32	3 22 29.77	14 28 17.4	12.6	4.8	0.33
3 5 41.98	20 1 1.7	9.2	3.5	0.25	4	22 30	3 24 26.45	14 36 3.3	12.3	4.7	0.32
3 10 48.49	+20 26 58.1	9.5	3.6	0.25	5	22 29	3 26 39.13	+14 45 40.9	12.1	4.6	0.32
3 15 37.23	20 50 15.4	9.7	3.7	0.26	6	22 27	3 29 7.68	14 57 4.7	11.8	4.5	0.31
3 20 7.48	21 10 53.8	10.0	3.8	0.27	7	22 26	3 31 51.89	15 10 8.9	11.5	4.4	0.30
3 24 18.61	21 28 54.2	10.2	3.9	0.28	8	22 25	3 34 51.60	15 24 46.7	11.3	4.3	0.30
3 28 10.00	21 44 17.8	10.5	4.0	0.28	9	22 24	3 38 6.65	15 40 52.1	11.0	4.2	0.29
3 31 41.12	+21 57 6.0	10.8	4.1	0.29	10	22 24	3 41 36.94	+15 58 18.5	10.8	4.1	0.28
3 34 51.53	22 7 20.2	11.1	4.2	0.30	11	22 24	3 45 22.33	16 16 59.0	10.5	4.0	0.28
3 37 40.76	22 15 1.9	11.4	4.3	0.31	12	22 24	3 49 22.76	16 36 46.9	10.3	3.9	0.27
3 40 8.53	22 20 12.5	11.7	4.5	0.32	13	22 24	3 53 38.18	16 57 35.2	10.1	3.8	0.27
3 42 14.58	22 22 54.2	12.1	4.6	0.33	14	22 25	3 58 8.56	17 19 16.9	9.9	3.7	0.26
3 43 58.77	+22 23 8.3	12.4	4.7	0.34	15	22 26	4 2 53.94	+17 41 44.8	9.6	3.7	0.26
3 45 21.10	22 20 56.8	12.7	4.8	0.35	16	22 27	4 7 54.30	18 4 51.3	9.4	3.6	0.25
3 46 21.69	22 16 22.3	13.0	4.9	0.35	17	22 28	4 13 9.74	18 28 28.7	9.2	3.5	0.25
3 47 0.81	22 9 27.5	13.3	5.1	0.36	18	22 30	4 18 40.31	18 52 28.9	9.0	3.4	0.24
3 47 18.91	22 0 15.7	13.6	5.2	0.37	19	22 31	4 24 26.11	19 16 43.8	8.8	3.4	0.24
3 47 16.68	+21 48 50.8	14.0	5.3	0.38	20	22 33	4 30 27.24	+19 41 4.6	8.7	3.3	0.23
3 46 54.94	21 35 18.1	14.2	5.4	0.39	21	22 36	4 36 43.75	20 5 22.2	8.5	3.2	0.23
3 46 14.77	21 19 43.8	14.5	5.5	0.39	22	22 38	4 43 15.73	20 29 27.1	8.3	3.2	0.23
3 45 17.48	21 2 15.3	14.8	5.6	0.40	23	22 41	4 50 3.21	20 53 9.2	8.1	3.1	0.22
3 44 4.56	20 43 1.8	15.0	5.7	0.40	24	22 44	4 57 6.19	21 16 18.1	8.0	3.0	0.22
3 42 37.76	+20 22 13.4	15.2	5.8	0.41	25	22 48	5 4 24.56	+21 38 42.6	7.9	3.0	0.22
3 40 58.99	20 0 2.7	15.4	5.9	0.42	26	22 51	5 11 58.15	22 0 11.2	7.7	2.9	0.21
3 39 10.33	19 36 42.5	15.6	5.9	0.42	27	22 55	5 19 46.70	22 20 32.3	7.6	2.9	0.21
3 37 13.98	19 12 29.0	15.7	6.0	0.42	28	22 59	5 27 49.76	22 39 33.6	7.5	2.8	0.21
3 35 12.25	18 47 37.6	15.8	6.0	0.42	29	23 3	5 36 6.79	22 57 2.7	7.3	2.8	0.20
3 33 7.50	*+18 22 25.8*	*15.9*	*6.0*	*0.42*	30	23 8	5 44 37.05	+23 12 47.6	7.2	2.8	0.20
3 31 2.07	*+17 57 11.5*	*16.0*	*6.0*	*0.42*	July 1	23 13	5 53 19.64	+23 26 36.5	7.1	2	

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.
	h m	h m s	° ′ ″	″	″	s		h m	h m s	° ′ ″	″
July 1	23 13	5 53 19.64	+23 26 36.5	7.1	2.7	0.20	Aug. 17	1 43	11 25 1.23	+2 26 47.9	8.8
2	23 18	6 2 13.42	23 38 17.9	7.1	2.7	0.20	18	1 43	11 28 59.79	1 50 26.7	8.9
3	23 23	6 11 17.14	23 47 41.1	7.0	2.6	0.19	19	1 43	11 32 49.85	1 14 51.6	9.1
4	23 28	6 20 29.34	23 54 37.1	6.9	2.6	0.19	20	1 42	11 36 31.09	0 40 7.1	9.2
5	23 33	6 29 48.45	23 58 58.0	6.8	2.6	0.19	21	1 42	11 40 3.21	+0 6 17.5	9.3
6	23 39	6 39 12.74	+24 0 37.5	6.8	2.6	0.19	22	1 41	11 43 25.85	−0 26 32.5	9.5
7	23 44	6 48 40.46	23 59 31.2	6.7	2.5	0.19	23	1 41	11 46 38.58	0 58 17.8	9.6
8	23 50	6 58 9.80	23 55 37.0	6.7	2.5	0.18	24	1 40	11 49 40.91	1 28 52.7	9.8
9	23 55	7 7 39.01	23 48 54.6	6.7	2.5	0.18	25	1 39	11 52 32.35	1 58 11.4	10.0
11	0 1	7 17 6.37	23 39 25.5	6.6	2.5	0.18	26	1 37	11 55 12.29	2 26 7.5	10.1
12	0 6	7 26 30.28	+23 27 13.2	6.6	2.5	0.18	27	1 36	11 57 40.07	−2 52 34.0	10.3
13	0 12	7 35 49.31	23 12 22.5	6.6	2.5	0.18	28	1 34	11 59 54.99	3 17 23.5	10.5
14	0 17	7 45 2.16	22 54 59.8	6.6	2.5	0.18	29	1 32	12 1 56.30	3 40 27.8	10.7
15	0 22	7 54 7.70	22 35 12.3	6.6	2.5	0.18	30	1 30	12 3 43.19	4 1 38.1	10.9
16	0 27	8 3 4.98	22 13 8.0	6.6	2.5	0.18	31	1 28	12 5 14.79	4 20 45.1	11.1
17	0 32	8 11 53.24	+21 48 55.8	6.6	2.5	0.18	Sept. 1	1 25	12 6 30.22	−4 37 38.7	11.3
18	0 37	8 20 31.87	21 22 44.2	6.6	2.5	0.18	2	1 22	12 7 28.54	4 52 8.2	11.5
19	0 41	8 29 0.41	20 54 42.4	6.6	2.5	0.18	3	1 19	12 8 8.80	5 4 2.1	11.7
20	0 45	8 37 18.55	20 24 59.2	6.7	2.5	0.18	4	1 15	12 8 30.11	5 13 8.5	11.9
21	0 50	8 45 26.09	19 53 43.4	6.7	2.5	0.18	5	1 11	12 8 31.59	5 19 15.0	12.1
22	0 54	8 53 22.91	+19 21 3.4	6.7	2.6	0.18	6	1 7	12 8 12.48	−5 22 9.2	12.3
23	0 57	9 1 8.99	18 47 7.5	6.8	2.6	0.18	7	1 3	12 7 32.12	5 21 39.2	12.6
24	1 1	9 8 44.41	18 12 3.4	6.8	2.6	0.18	8	0 58	12 6 30.05	5 17 33.0	12.8
25	1 5	9 16 9.24	17 35 58.4	6.9	2.6	0.18	9	0 52	12 5 6.13	5 9 40.8	12.9
26	1 8	9 23 23.64	16 58 59.6	6.9	2.6	0.18	10	0 47	12 3 20.51	4 57 54.4	13.1
27	1 11	9 30 27.82	+16 21 13.4	7.0	2.6	0.18	11	0 41	12 1 13.76	−4 42 8.6	13.3
28	1 14	9 37 21.93	15 42 45.8	7.0	2.7	0.18	12	0 34	11 58 47.00	4 22 22.2	13.4
29	1 17	9 44 6.22	15 3 43.0	7.1	2.7	0.19	13	0 27	11 56 1.89	3 58 39.0	13.6
30	1 19	9 50 40.92	14 24 10.1	7.1	2.7	0.19	14	0 21	11 53 0.76	3 31 9.2	13.6
31	1 22	9 57 6.22	13 44 12.4	7.2	2.7	0.19	15	0 13	11 49 46.56	3 0 9.1	13.7
Aug. 1	1 24	10 3 22.37	+13 3 54.6	7.3	2.8	0.19	16	0 6	11 46 22.91	−2 26 3.2	13.7
2	1 26	10 9 29.55	12 23 21.2	7.3	2.8	0.19	16	23 59	11 42 54.05	1 49 22.8	13.7
3	1 28	10 15 28.01	11 42 36.7	7.4	2.8	0.19	17	23 51	11 39 24.69	1 10 46.5	13.6
4	1 30	10 21 17.94	11 1 44.9	7.5	2.8	0.19	18	23 44	11 35 59.89	−0 30 59.0	13.5
5	1 32	10 26 59.49	10 20 49.8	7.6	2.9	0.19	19	23 37	11 32 44.95	+0 9 10.8	13.3
6	1 34	10 32 32.85	+ 9 39 55.2	7.7	2.9	0.20	20	23 30	11 29 45.03	+0 48 51.9	13.1
7	1 35	10 37 58.14	8 59 4.5	7.8	2.9	0.20	21	23 23	11 27 5.11	1 27 12.6	12.9
8	1 36	10 43 15.49	8 18 21.3	7.8	3.0	0.20	22	23 17	11 24 49.71	2 3 24.4	12.6
9	1 38	10 48 25.01	7 37 49.0	7.9	3.0	0.20	23	23 11	11 23 2.73	2 36 41.9	12.3
10	1 39	10 53 26.75	6 57 31.2	8.0	3.0	0.20	24	23 6	11 21 47.31	3 6 26.3	12.0
11	1 40	10 58 20.76	+ 6 17 30.9	8.1	3.1	0.21	25	23 2	11 21 5.83	+3 32 4.8	11.7
12	1 40	11 3 7.05	5 37 51.6	8.2	3.1	0.21	26	22 58	11 20 59.76	3 53 12.4	11.3
13	1 41	11 7 45.62	4 58 36.6	8.3	3.2	0.21	27	22 54	11 21 29.76	4 9 31.1	11.0
14	1 42	11 12 16.41	4 19 49.1	8.5	3.2	0.21	28	22 51	11 22 35.73	4 20 50.5	10.7
15	1 42	11 16 39.36	3 41 32.8	8.6	3.2	0.22	29	22 49	11 24 16.85	4 27 6.2	10.5
16	*1 43*	*11 20 54.35*	+ 3 3 51.3	8.7	3.3	0.22	30	22 47	11 26 31.71	+4 28 20.4	10
17	*1 43*	*11 25 1.23*	+ 2 26 47.9	8.8	3.3	0.22	Oct. 1	22 46	11 29 18.41	+4 24 40.0	

FOR TRANSIT AT WASHINGTON.

sh. an te.	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.
m	h m s	° ′ ″	″	″	s		h m	h m s	° ′ ″	″	″	s
46	11 29 18.41	+ 4 24 40.0	9.7	3.7	0.25	Nov.15	0 12	15 49 11.38	−21 7 35.1	6.1	2.3	0.17
45	11 32 34.70	4 16 16.2	9.4	3.6	0.24	16	0 15	15 55 37.87	21 33 2.3	6.2	2.3	0.17
45	11 36 18.06	4 3 23.8	9.1	3.5	0.23	17	0 17	16 2 5.64	21 57 25.8	6.2	2.3	0.17
45	11 40 25.83	3 46 20.3	8.9	3.4	0.23	18	0 20	16 8 34.68	22 20 44.0	6.2	2.4	0.17
46	11 44 55.28	3 25 25.0	8.6	3.3	0.22	19	0 22	16 15 4.95	22 42 55.4	6.2	2.4	0.17
47	11 49 43.78	+ 3 0 58.2	8.4	3.2	0.21	20	0 25	16 21 36.45	−23 3 58.6	6.3	2.4	0.17
48	11 54 48.72	2 33 21.1	8.2	3.1	0.21	21	0 28	16 28 9.10	23 23 52.3	6.3	2.4	0.17
49	12 0 7.73	2 2 54.6	8.0	3.0	0.20	22	0 30	16 34 42.84	23 42 34.8	6.3	2.4	0.17
51	12 5 38.58	1 29 59.1	7.8	3.0	0.20	23	0 33	16 41 17.58	24 0 4.8	6.4	2.4	0.18
53	12 11 19.28	0 54 54.3	7.7	2.9	0.19	24	0 35	16 47 53.20	24 16 21.1	6.4	2.4	0.18
55	12 17 8.05	+ 0 17 58.8	7.5	2.8	0.19	25	0 38	16 54 29.59	−24 31 22.2	6.4	2.4	0.18
57	12 23 3.33	− 0 20 30.0	7.4	2.8	0.19	26	0 41	17 1 6.54	24 45 6.3	6.5	2.5	0.18
59	12 29 3.82	1 0 16.4	7.2	2.8	0.18	27	0 43	17 7 43.89	24 57 32.3	6.5	2.5	0.18
1	12 35 8.35	1 41 5.9	7.1	2.7	0.18	28	0 46	17 14 21.39	25 8 38.8	6.6	2.5	0.18
3	12 41 15.99	2 22 45.1	7.0	2.7	0.18	29	0 49	17 20 58.79	25 18 24.4	6.7	2.5	0.19
5	12 47 25.95	− 3 5 2.4	6.9	2.6	0.18	30	0 51	17 27 35.78	−25 26 48.1	6.7	2.5	0.19
7	12 53 37.58	3 47 47.3	6.8	2.6	0.17	Dec. 1	0 54	17 34 12.01	25 33 48.3	6.8	2.6	0.19
10	12 59 50.37	4 30 50.2	6.7	2.6	0.17	2	0 57	17 40 47.07	25 39 23.9	6.9	2.6	0.19
12	13 6 3.92	5 14 3.0	6.7	2.5	0.17	3	0 59	17 47 20.51	25 43 34.1	6.9	2.6	0.19
14	13 12 17.90	5 57 18.1	6.6	2.5	0.17	4	1 2	17 53 51.79	25 46 17.9	7.0	2.7	0.20
16	13 18 32.10	− 6 40 29.2	6.5	2.5	0.17	5	1 4	18 0 20.34	−25 47 34.7	7.1	2.7	0.20
19	13 24 46.34	7 23 30.2	6.5	2.5	0.17	6	1 7	18 6 45.43	25 47 23.9	7.2	2.7	0.20
21	13 31 0.51	8 6 16.6	6.4	2.4	0.16	7	1 9	18 13 6.33	25 45 45.3	7.3	2.8	0.20
23	13 37 14.56	8 48 43.5	6.4	2.4	0.16	8	1 12	18 19 22.14	25 42 39.2	7.4	2.8	0.21
26	13 43 28.47	9 30 46.9	6.3	2.4	0.16	9	1 14	18 25 31.89	25 38 5.6	7.5	2.9	0.21
28	13 49 42.19	−10 12 23.3	6.3	2.4	0.16	10	1 16	18 31 34.43	−25 32 5.7	7.7	2.9	0.22
30	13 55 55.82	10 53 29.6	6.3	2.4	0.16	11	1 18	18 37 28.47	25 24 40.9	7.8	3.0	0.22
32	14 2 9.39	11 34 2.8	6.2	2.4	0.16	12	1 20	18 43 12.60	25 15 53.2	8.0	3.0	0.23
35	14 8 22.94	12 14 0.5	6.2	2.3	0.16	13	1 21	18 48 45.16	25 5 45.1	8.1	3.1	0.23
37	14 14 36.57	12 53 20.3	6.2	2.3	0.16	14	1 23	18 54 4.32	24 54 20.0	8.3	3.1	0.23
39	14 20 50.35	−13 32 0.0	6.2	2.3	0.16	15	1 24	18 59 8.02	−24 41 42.3	8.5	3.2	0.23
41	14 27 4.41	14 9 57.6	6.1	2.3	0.16	16	1 25	19 3 53.96	24 27 57.3	8.7	3.3	0.24
44	14 33 18.80	14 47 11.4	6.1	2.3	0.16	17	1 25	19 8 19.53	24 13 11.6	8.9	3.4	0.25
46	14 39 33.64	15 23 39.7	6.1	2.3	0.16	18	1 25	19 12 21.93	23 57 32.7	9.1	3.4	0.25
48	14 45 49.03	15 59 20.8	6.1	2.3	0.16	19	1 25	19 15 58.06	23 41 9.0	9.3	3.5	0.26
51	14 52 5.06	−16 34 13.0	6.1	2.3	0.16	20	1 24	19 19 4.59	−23 24 10.7	9.6	3.7	0.27
53	14 58 21.81	17 8 15.0	6.1	2.3	0.16	21	1 23	19 21 37.99	23 6 49.0	9.9	3.8	0.27
55	15 4 39.38	17 41 25.4	6.1	2.3	0.16	22	1 21	19 23 34.66	22 49 16.1	10.2	3.9	0.28
58	15 10 57.85	18 13 42.7	6.1	2.3	0.16	23	1 18	19 24 51.02	22 31 44.3	10.5	4.0	0.29
0	15 17 17.30	18 45 5.5	6.1	2.3	0.16	24	1 15	19 25 23.68	22 14 27.0	10.8	4.1	0.29
3	15 23 37.79	−19 15 32.5	6.1	2.3	0.16	25	1 10	19 25 9.71	−21 57 37.6	11.1	4.2	0.30
5	15 29 59.41	19 45 2.3	6.1	2.3	0.16	26	1 5	19 24 6.85	21 41 28.0	11.4	4.3	0.31
7	15 36 22.19	20 13 33.5	6.1	2.3	0.16	27	1 0	19 22 14.03	21 26 9.8	11.7	4.5	0.32
10	15 42 46.17	20 41 5.0	6.1	2.3	0.17	28	0 53	19 19 31.58	21 11 51.8	12.0	4.6	0.32
12	15 49 11.38	21 7 35.1	6.1	2.3	0.17	29	0 46	19 16 1.60	20 58 41.8	12.3	4.7	0.33
15	*15 55 37.87*	*−21 33 2.3*	*6.2*	*2.3*	*0.17*	30	0 38	19 11 48.24	−20 46 44.7	12.6	4.8	0.34
17	*16 2 5.64*	*−21 57 25.8*	*6.2*	*2.3*	*0.17*	31	0 29	19 6 57.75	−20 36 4.3	12.8	4.8	0.34

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.
	h m	h m s	° ′ ″	″	″	s		h m	h m s	° ′ ″	″
Jan. 0	22 3	16 46 2.78	−21 11 13.0	6.2	6.0	0.43	Feb. 15	23 7	20 51 31.88	−18 26 38.9	5.5
1	22 5	16 51 19.66	21 22 39.8	6.2	6.0	0.43	16	23 8	20 56 37.79	18 8 6.9	5.5
2	22 6	16 56 37.44	21 33 29.8	6.1	5.9	0.42	17	23 10	21 1 42.55	17 49 3.7	5.4
3	22 7	17 1 56.05	21 43 42.2	6.1	5.9	0.42	18	23 11	21 6 46.19	17 29 29.9	5.4
4	22 9	17 7 15.47	21 53 16.8	6.1	5.9	0.42	19	23 12	21 11 48.66	17 9 26.4	5.4
5	22 10	17 12 35.67	−22 2 12.9	6.1	5.9	0.42	20	23 13	21 16 49.97	−16 48 53.7	5.4
6	22 11	17 17 56.59	22 10 30.2	6.0	5.9	0.42	21	23 14	21 21 50.13	16 27 52.6	5.4
7	22 13	17 23 18.19	22 18 8.1	6.0	5.9	0.42	22	23 15	21 26 49.12	16 6 23.7	5.4
8	22 14	17 28 40.42	22 25 6.4	6.0	5.8	0.42	23	23 16	21 31 46.95	15 44 27.9	5.4
9	22 16	17 34 3.25	22 31 24.6	6.0	5.8	0.42	24	23 17	21 36 43.62	15 22 6.0	5.4
10	22 17	17 39 26.61	−22 37 2.4	6.0	5.8	0.42	25	23 18	21 41 39.16	−14 59 18.5	5.4
11	22 19	17 44 50.45	22 41 59.4	6.0	5.8	0.42	26	23 19	21 46 33.56	14 36 6.2	5.4
12	22 20	17 50 14.73	22 46 15.6	5.9	5.8	0.42	27	23 20	21 51 26.83	14 12 29.8	5.3
13	22 22	17 55 39.38	22 49 50.5	5.9	5.7	0.42	28	23 21	21 56 18.99	13 48 30.3	5.3
14	22 23	18 1 4.35	22 52 43.9	5.9	5.7	0.41	Mar. 1	23 22	22 1 10.07	13 24 8.1	5.3
15	22 25	18 6 29.57	−22 54 55.6	5.9	5.7	0.41	2	23 22	22 6 0.08	−12 59 24.1	5.3
16	22 26	18 11 55.00	22 56 25.4	5.9	5.7	0.41	3	23 23	22 10 49.05	12 34 19.0	5.3
17	22 27	18 17 20.56	22 57 13.3	5.9	5.7	0.41	4	23 24	22 15 36.98	12 8 53.5	5.3
18	22 29	18 22 46.21	22 57 19.2	5.8	5.7	0.41	5	23 25	22 20 23.91	11 43 8.3	5.3
19	22 30	18 28 11.87	22 56 42.9	5.8	5.7	0.41	6	23 26	22 25 9.88	11 17 4.2	5.3
20	22 32	18 33 37.50	−22 55 24.6	5.8	5.6	0.41	7	23 27	22 29 54.88	−10 50 42.0	5.3
21	22 33	18 39 3.02	22 53 24.2	5.8	5.6	0.41	8	23 27	22 34 38.98	10 24 2.2	5.3
22	22 35	18 44 28.34	22 50 41.8	5.8	5.6	0.41	9	23 28	22 39 22.18	9 57 5.8	5.3
23	22 36	18 49 53.45	22 47 17.5	5.8	5.6	0.41	10	23 29	22 44 4.53	9 29 53.3	5.3
24	22 38	18 55 18.27	22 43 11.4	5.7	5.6	0.40	11	23 30	22 48 46.06	9 2 25.6	5.3
25	22 39	19 0 42.73	−22 38 23.5	5.7	5.6	0.40	12	23 30	22 53 26.79	− 8 34 43.5	5.2
26	22 41	19 6 6.78	22 32 54.2	5.7	5.6	0.40	13	23 31	22 58 6.76	8 6 47.4	5.2
27	22 42	19 11 30.37	22 26 43.7	5.7	5.5	0.40	14	23 32	23 2 46.02	7 38 38.4	5.2
28	22 44	19 16 53.44	22 19 52.2	5.7	5.5	0.40	15	23 33	23 7 24.59	7 10 16.9	5.2
29	22 45	19 22 15.93	22 12 19.9	5.7	5.5	0.40	16	23 33	23 12 2.50	6 41 44.0	5.2
30	22 46	19 27 37.81	−22 4 7.1	5.7	5.5	0.40	17	23 34	23 16 39.79	− 6 13 0.1	5.2
31	22 48	19 32 59.02	21 55 14.3	5.6	5.5	0.40	18	23 35	23 21 16.51	5 44 6.1	5.2
Feb. 1	22 49	19 38 19.53	21 45 41.6	5.6	5.5	0.40	19	23 35	23 25 52.68	5 15 2.6	5.2
2	22 51	19 43 39.27	21 35 29.6	5.6	5.5	0.39	20	23 36	23 30 28.34	4 45 50.7	5.2
3	22 52	19 48 58.23	21 24 38.6	5.6	5.5	0.39	21	23 37	23 35 3.53	4 16 30.8	5.2
4	22 53	19 54 16.35	−21 13 8.8	5.6	5.4	0.39	22	23 37	23 39 38.28	− 3 47 3.8	5.2
5	22 55	19 59 33.61	21 1 1.1	5.6	5.4	0.39	23	23 38	23 44 12.64	3 17 30.4	5.2
6	22 56	20 4 49.96	20 48 15.6	5.6	5.4	0.38	24	23 39	23 48 46.63	2 47 51.3	5.2
7	22 57	20 10 5.38	20 34 53.0	5.6	5.4	0.38	25	23 39	23 53 20.31	2 18 7.4	5.2
8	22 59	20 15 19.83	20 20 53.6	5.5	5.4	0.38	26	23 40	23 57 53.70	1 48 19.2	5.2
9	23 0	20 20 33.29	−20 6 18.2	5.5	5.4	0.38	27	23 40	0 2 26.84	− 1 18 27.6	5.2
10	23 1	20 25 45.72	19 51 7.2	5.5	5.4	0.38	28	23 41	0 6 59.79	0 48 33.2	5.2
11	23 2	20 30 57.11	19 35 21.2	5.5	5.4	0.38	29	23 42	0 11 32.57	− 0 18 36.8	5.2
12	23 4	20 36 7.44	19 19 0.7	5.5	5.3	0.38	30	23 42	0 16 5.24	+ 0 11 21.0	5.2
13	23 5	20 41 16.69	19 2 6.5	5.5	5.3	0.38	31	23 43	0 20 37.83	0 41 19.4	5.1
14	*23 6*	*20 46 24.84*	−18 44 38.9	5.5	5.3	0.38	Apr. 1	23 43	0 25 10.39	+ 1 11 17.7	5.1
15	*23 7*	*20 51 31.88*	−18 26 38.9	5.5	5.3	0.38	2	23 44	0 29 42.95	+ 1 41 15.3	5.5

FOR TRANSIT AT WASHINGTON.

rent ht sion.	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.
s	° ′ ″	″	″	s		h m	h m s	° ′ ″	″	″	s
10.39	+ 1 11 17.7	5.1	5.0	0.33	May 18	0 21	4 4 17.73	+20 40 33.9	5.1	5.0	0.35
12.95	1 41 15.3	5.1	5.0	0.33	19	0 22	4 9 26.26	20 56 50.9	5.1	5.0	0.35
15.56	2 11 11.4	5.1	5.0	0.33	20	0 23	4 14 35.84	21 12 33.3	5.1	5.0	0.35
18.28	2 41 5.3	5.1	5.0	0.33	21	0 25	4 19 46.46	21 27 40.4	5.1	5.0	0.36
21.13	3 10 56.3	5.1	5.0	0.33	22	0 26	4 24 58.08	21 42 11.7	5.1	5.0	0.36
54.17	+ 3 40 43.7	5.1	5.0	0.33	23	0 27	4 30 10.69	+21 56 6.4	5.1	5.0	0.36
27.42	4 10 26.8	5.1	5.0	0.33	24	0 28	4 35 24.24	22 9 24.2	5.1	5.0	0.36
0.94	4 40 5.0	5.1	5.0	0.33	25	0 30	4 40 38.71	22 22 4.5	5.1	5.0	0.36
34.78	5 9 37.4	5.1	5.0	0.33	26	0 31	4 45 54.06	22 34 6.7	5.1	5.0	0.36
8.96	5 39 3.3	5.1	5.0	0.33	27	0 32	4 51 10.26	22 45 30.2	5.2	5.0	0.36
43.54	+ 6 8 22.2	5.1	5.0	0.33	28	0 34	4 56 27.24	+22 56 14.6	5.2	5.0	0.36
18.55	6 37 33.1	5.1	5.0	0.33	29	0 35	5 1 44.98	23 6 19.5	5.2	5.0	0.36
54.04	7 6 35.4	5.1	5.0	0.33	30	0 36	5 7 3.44	23 15 44.6	5.2	5.0	0.36
30.04	7 35 28.5	5.1	5.0	0.33	31	0 38	5 12 22.58	23 24 29.2	5.2	5.0	0.37
6.59	8 4 11.4	5.1	5.0	0.33	June 1	0 39	5 17 42.33	23 32 33.0	5.2	5.0	0.37
43.74	+ 8 32 43.6	5.1	5.0	0.33	2	0 41	5 23 2.64	+23 39 55.8	5.2	5.0	0.37
21.52	9 1 4.2	5.1	5.0	0.33	3	0 42	5 28 23.48	23 46 37.0	5.2	5.0	0.37
59.94	9 29 12.6	5.1	5.0	0.33	4	0 43	5 33 44.80	23 52 36.5	5.2	5.0	0.37
39.06	9 57 7.9	5.1	5.0	0.33	5	0 45	5 39 6.52	23 57 54.0	5.2	5.1	0.37
18.91	10 24 49.5	5.1	5.0	0.34	6	0 46	5 44 28.62	24 2 29.3	5.2	5.1	0.37
59.51	+10 52 16.5	5.1	5.0	0.34	7	0 48	5 49 51.02	+24 6 22.0	5.2	5.1	0.37
40.90	11 19 28.2	5.1	5.0	0.34	8	0 49	5 55 13.67	24 9 32.0	5.2	5.1	0.37
23.11	11 46 23.9	5.1	5.0	0.34	9	0 50	6 0 36.53	24 11 59.2	5.2	5.1	0.37
6.16	12 13 2.8	5.1	5.0	0.34	10	0 52	6 5 59.51	24 13 43.3	5.2	5.1	0.37
50.08	12 39 24.2	5.1	5.0	0.34	11	0 53	6 11 22.58	24 14 44.3	5.3	5.1	0.37
34.90	+13 5 27.3	5.1	5.0	0.34	12	0 55	6 16 45.67	+24 15 2.2	5.3	5.1	0.37
20.64	13 31 11.4	5.1	5.0	0.34	13	0 56	6 22 8.72	24 14 37.0	5.3	5.1	0.37
7.33	13 56 35.8	5.1	5.0	0.34	14	0 58	6 27 31.65	24 13 28.4	5.3	5.1	0.37
55.01	14 21 39.7	5.1	5.0	0.34	15	0 59	6 32 54.42	24 11 36.8	5.3	5.1	0.37
43.67	14 46 22.4	5.1	5.0	0.34	16	1 1	6 38 16.96	24 9 1.9	5.3	5.1	0.37
33.35	+15 10 43.1	5.1	5.0	0.34	17	1 2	6 43 39.21	+24 5 44.2	5.3	5.1	0.37
24.06	15 34 41.1	5.1	5.0	0.34	18	1 3	6 49 1.10	24 1 43.6	5.3	5.2	0.37
15.84	15 58 15.6	5.1	5.0	0.34	19	1 5	6 54 22.58	23 57 0.3	5.3	5.2	0.37
8.69	16 21 26.0	5.1	5.0	0.34	20	1 6	6 59 43.60	23 51 34.4	5.3	5.2	0.38
2.64	16 44 11.5	5.1	5.0	0.34	21	1 8	7 5 4.08	23 45 26.1	5.3	5.2	0.38
57.67	+17 6 31.3	5.1	5.0	0.34	22	1 9	7 10 23.96	+23 38 36.0	5.4	5.2	0.38
53.82	17 28 24.8	5.1	5.0	0.34	23	1 10	7 15 43.19	23 31 4.1	5.4	5.2	0.38
51.10	17 49 51.3	5.1	5.0	0.34	24	1 12	7 21 1.72	23 22 50.7	5.4	5.2	0.38
49.52	18 10 50.0	5.1	5.0	0.35	25	1 13	7 26 19.48	23 13 56.4	5.4	5.2	0.38
49.07	18 31 20.1	5.1	5.0	0.35	26	1 14	7 31 36.44	23 4 21.4	5.4	5.2	0.38
49.77	+18 51 21.1	5.1	5.0	0.35	27	1 16	7 36 52.55	+22 54 6.1	5.4	5.2	0.38
51.61	19 10 52.1	5.1	5.0	0.35	28	1 17	7 42 7.76	22 43 10.9	5.4	5.2	0.38
54.58	19 29 52.4	5.1	5.0	0.35	29	1 18	7 47 22.01	22 31 36.3	5.4	5.3	0.38
58.70	19 48 21.5	5.1	5.0	0.35	30	1 20	7 52 35.29	22 19 22.8	5.4	5.3	0.38
3.93	20 6 18.5	5.1	5.0	0.35	July 1	1 21	7 57 47.53	22 6 30.9	5.5	5.3	0.38
10.28	*+20 23 42.9*	*5.1*	*5.0*	*0.35*	2	1 22	8 2 58.73	+21 53 0.8	5.5	5.3	0.38
7.73	*+20 40 33.9*	*5.1*	*5.0*	*0.35*	3	1 23	8 8 8.84	+21 38 53.4	5.5	5.3	0.38

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
	h m	h m s	° ′ ″	″	″	s		h m	h m s	° ′ ″	″
July 1	1 21	7 57 47.53	+22 6 30.9	5.5	5.3	0.38	Aug. 16	1 58	11 36 23.36	+ 3 45 3.3	6.3
2	1 22	8 2 58.73	21 53 0.8	5.5	5.3	0.38	17	1 58	11 40 46.94	3 14 25.9	6.3
3	1 23	8 8 8.84	21 38 53.4	5.5	5.3	0.38	18	1 59	11 45 10.09	2 43 42.8	6.4
4	1 25	8 13 17.83	21 24 9.0	5.5	5.3	0.38	19	1 59	11 49 32.86	2 12 54.8	6.4
5	1 26	8 18 25.68	21 8 48.4	5.5	5.3	0.38	20	2 0	11 53 55.31	1 42 2.4	6.4
6	1 27	8 23 32.37	+20 52 52.0	5.5	5.3	0.38	21	2 0	11 58 17.45	+ 1 11 6.4	6.4
7	1 28	8 28 37.88	20 36 20.3	5.5	5.4	0.38	22	2 1	12 2 39.33	0 40 7.5	6.5
8	1 29	8 33 42.18	20 19 13.9	5.5	5.4	0.38	23	2 1	12 7 0.99	+ 0 9 6.4	6.5
9	1 30	8 38 45.26	20 1 33.7	5.6	5.4	0.38	24	2 1	12 11 22.46	− 0 21 56.1	6.5
10	1 31	8 43 47.10	19 43 20.0	5.6	5.4	0.38	25	2 2	12 15 43.78	0 52 59.4	6.5
11	1 32	8 48 47.72	+19 24 33.6	5.6	5.4	0.38	26	2 2	12 20 5.00	− 1 24 3.0	6.6
12	1 33	8 53 47.07	19 5 15.2	5.6	5.4	0.38	27	2 3	12 24 26.15	1 55 5.8	6.6
13	1 35	8 58 45.17	18 45 25.4	5.6	5.4	0.38	28	2 3	12 28 47.28	2 26 7.4	6.6
14	1 35	9 3 41.99	18 25 4.8	5.6	5.5	0.38	29	2 3	12 33 8.41	2 57 7.0	6.7
15	1 36	9 8 37.55	18 4 14.2	5.6	5.5	0.38	30	2 4	12 37 29.59	3 28 3.9	6.7
16	1 37	9 13 31.85	+17 42 54.3	5.7	5.5	0.38	31	2 4	12 41 50.86	− 3 58 57.5	6.7
17	1 38	9 18 24.88	17 21 5.7	5.7	5.5	0.38	Sept. 1	2 5	12 46 12.27	4 29 47.2	6.8
18	1 39	9 23 16.64	16 58 49.2	5.7	5.5	0.38	2	2 5	12 50 33.87	5 0 32.2	6.8
19	1 40	9 28 7.13	16 36 5.5	5.7	5.5	0.38	3	2 6	12 54 55.68	5 31 11.8	6.8
20	1 41	9 32 56.36	16 12 55.4	5.7	5.6	0.39	4	2 6	12 59 17.76	6 1 45.6	6.9
21	1 42	9 37 44.36	+15 49 19.6	5.7	5.6	0.39	5	2 6	13 3 40.13	− 6 32 12.6	6.9
22	1 43	9 42 31.11	15 25 18.8	5.8	5.6	0.39	6	2 7	13 8 2.85	7 2 32.4	6.9
23	1 44	9 47 16.64	15 0 53.8	5.8	5.6	0.39	7	2 7	13 12 25.97	7 32 44.1	7.0
24	1 44	9 52 0.95	14 36 5.2	5.8	5.6	0.39	8	2 8	13 16 49.51	8 2 47.1	7.0
25	1 45	9 56 44.07	14 10 53.8	5.8	5.6	0.39	9	2 8	13 21 13.52	8 32 40.6	7.0
26	1 46	10 1 26.01	+13 45 20.4	5.8	5.7	0.39	10	2 9	13 25 38.01	− 9 2 24.0	7.1
27	1 47	10 6 6.79	13 19 25.7	5.9	5.7	0.39	11	2 9	13 30 3.05	9 31 56.6	7.1
28	1 47	10 10 46.44	12 53 10.6	5.9	5.7	0.39	12	2 10	13 34 28.67	10 1 17.7	7.1
29	1 48	10 15 24.96	12 26 35.5	5.9	5.7	0.39	13	2 10	13 38 54.88	10 30 26.5	7.2
30	1 49	10 20 2.40	11 59 41.4	5.9	5.7	0.39	14	2 11	13 43 21.74	10 59 22.4	7.2
31	1 49	10 24 38.78	+11 32 28.8	5.9	5.8	0.39	15	2 11	13 47 49.28	−11 28 4.6	7.3
Aug. 1	1 50	10 29 14.12	11 4 58.6	6.0	5.8	0.39	16	2 12	13 52 17.50	11 56 32.3	7.3
2	1 51	10 33 48.44	10 37 11.4	6.0	5.8	0.39	17	2 12	13 56 46.46	12 24 44.9	7.3
3	1 51	10 38 21.80	10 9 8.1	6.0	5.8	0.39	18	2 13	14 1 16.17	12 52 41.7	7.4
4	1 52	10 42 54.22	9 40 49.1	6.0	5.8	0.39	19	2 13	14 5 46.65	13 20 21.9	7.4
5	1 52	10 47 25.74	+ 9 12 15.4	6.0	5.9	0.40	20	2 14	14 10 17.94	−13 47 44.6	7.5
6	1 53	10 51 56.39	8 43 27.5	6.1	5.9	0.40	21	2 14	14 14 50.05	14 14 49.2	7.5
7	1 54	10 56 26.21	8 14 26.1	6.1	5.9	0.40	22	2 15	14 19 23.01	14 41 35.2	7.5
8	1 54	11 0 55.24	7 45 11.9	6.1	5.9	0.40	23	2 16	14 23 56.83	15 8 1.6	7.6
9	1 55	11 5 23.51	7 15 45.7	6.1	5.9	0.40	24	2 16	14 28 31.54	15 34 7.7	7.6
10	1 55	11 9 51.06	+ 6 46 8.1	6.2	6.0	0.40	25	2 17	14 33 7.14	−15 59 52.9	7.7
11	1 56	11 14 17.92	6 16 19.8	6.2	6.0	0.40	26	2 18	14 37 43.65	16 25 16.2	7.7
12	1 56	11 18 44.15	5 46 21.7	6.2	6.0	0.40	27	2 18	14 42 21.09	16 50 17.2	7.8
13	1 57	11 23 9.76	5 16 14.1	6.2	6.0	0.40	28	2 19	14 46 59.47	17 14 55.1	7.8
14	1 57	11 27 34.81	4 45 58.2	6.3	6.1	0.41	29	2 20	14 51 38.80	17 39 9.0	7.9
15	1 58	11 31 59.33	+ 4 15 34.3	6.3	6.1	0.41	30	2 20	14 56 19.08	−18 2 58.4	7.9
16	1 58	11 36 23.36	+ 3 45 3.3	6.3	6.1	0.41	Oct. 1	2 21	15 1 0.34	−18 28 22.3	8

FOR TRANSIT AT WASHINGTON.

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	° ′ ″	″	″	s		h m	h m s	° ′ ″	″	″	s
15 1 0.34	−18 26 22.5	8.0	7.7	0.54	Nov. 15	3 5	18 42 22.93	−26 8 46.8	11.3	11.0	0.81
15 5 42.58	18 49 20.8	8.0	7.8	0.55	16	3 6	18 47 12.08	26 3 58.2	11.4	11.1	0.82
15 10 25.80	19 11 52.3	8.1	7.8	0.55	17	3 7	18 51 59.73	25 58 30.7	11.5	11.2	0.83
15 15 10.02	19 33 56.7	8.1	7.9	0.56	18	3 8	18 56 45.81	25 52 24.7	11.6	11.3	0.83
15 19 55.23	19 55 32.9	8.2	8.0	0.56	19	3 8	19 1 30.23	25 45 40.8	11.7	11.4	0.84
15 24 41.43	−20 16 40.5	8.2	8.0	0.57	20	3 9	19 6 12.88	−25 38 19.3	11.9	11.6	0.85
15 29 28.62	20 37 18.7	8.3	8.0	0.57	21	3 10	19 10 53.69	25 30 20.8	12.0	11.7	0.86
15 34 16.79	20 57 26.8	8.3	8.1	0.58	22	3 11	19 15 32.56	25 21 46.0	12.1	11.8	0.87
15 39 5.93	21 17 4.2	8.4	8.2	0.58	23	3 11	19 20 9.38	25 12 35.4	12.2	11.9	0.88
15 43 56.03	21 36 10.5	8.4	8.2	0.59	24	3 12	19 24 44.09	25 2 49.6	12.4	12.0	0.88
15 48 47.07	−21 54 44.6	8.5	8.3	0.59	25	3 12	19 29 16.61	−24 52 29.4	12.5	12.1	0.89
15 53 39.03	22 12 46.0	8.6	8.3	0.60	26	3 13	19 33 46.83	24 41 35.2	12.6	12.3	0.90
15 58 31.87	22 30 14.3	8.6	8.4	0.60	27	3 14	19 38 14.69	24 30 7.8	12.8	12.4	0.91
16 3 25.60	22 47 8.6	8.7	8.5	0.61	28	3 14	19 42 40.09	24 18 8.1	12.9	12.5	0.92
16 8 20.15	23 3 28.4	8.7	8.5	0.62	29	3 14	19 47 2.98	24 5 36.6	13.1	12.7	0.93
16 13 15.51	−23 19 13.3	8.8	8.5	0.62	30	3 15	19 51 23.28	−23 52 34.2	13.2	12.8	0.94
16 18 11.65	23 34 22.4	8.9	8.6	0.63	Dec. 1	3 15	19 55 40.89	23 39 1.7	13.4	13.0	0.94
16 23 8.50	23 48 55.4	8.9	8.7	0.63	2	3 15	19 59 55.78	23 24 59.7	13.5	13.1	0.95
16 28 6.02	24 2 51.7	9.0	8.7	0.64	3	3 16	20 4 7.84	23 10 29.2	13.7	13.3	0.96
16 33 4.16	24 16 10.8	9.1	8.8	0.64	4	3 16	20 8 17.03	22 55 30.8	13.8	13.4	0.97
16 38 2.88	−24 28 52.4	9.1	8.9	0.65	5	3 16	20 12 23.24	−22 40 5.7	14.0	13.6	0.98
16 43 2.12	24 40 55.8	9.2	8.9	0.65	6	3 16	20 16 26.42	22 24 14.6	14.2	13.8	0.99
16 48 1.81	24 52 20.6	9.3	9.0	0.66	7	3 16	20 20 26.47	22 7 58.4	14.3	13.9	1.00
16 53 1.90	25 3 6.6	9.3	9.1	0.67	8	3 16	20 24 23.36	21 51 17.8	14.5	14.1	1.01
16 58 2.33	25 13 13.3	9.4	9.1	0.68	9	3 16	20 28 16.97	21 34 14.2	14.7	14.3	1.02
17 3 3.02	−25 22 40.3	9.5	9.2	0.68	10	3 16	20 32 7.25	−21 16 48.1	14.9	14.5	1.03
17 8 3.93	25 31 27.5	9.6	9.3	0.69	11	3 16	20 35 54.08	20 59 0.8	15.1	14.6	1.04
17 13 4.97	25 39 34.3	9.6	9.4	0.69	12	3 16	20 39 37.42	20 40 53.1	15.2	14.8	1.05
17 18 6.08	25 47 0.8	9.7	9.4	0.70	13	3 16	20 43 17.15	20 22 26.1	15.4	15.0	1.06
17 23 7.18	25 53 46.5	9.8	9.5	0.71	14	3 15	20 46 53.20	20 3 41.1	15.6	15.2	1.07
17 28 8.22	−25 59 51.5	9.9	9.6	0.71	15	3 15	20 50 25.47	−19 44 38.8	15.9	15.4	1.08
17 33 9.12	26 5 15.3	10.0	9.7	0.72	16	3 14	20 53 53.86	19 25 20.6	16.1	15.6	1.10
17 38 9.80	26 9 57.9	10.1	9.8	0.73	17	3 14	20 57 18.25	19 5 47.4	16.3	15.8	1.11
17 43 10.19	26 13 59.3	10.1	9.8	0.74	18	3 13	21 0 38.56	18 46 0.7	16.5	16.0	1.13
17 48 10.20	26 17 19.3	10.2	9.9	0.74	19	3 12	21 3 54.65	18 26 1.4	16.7	16.2	1.14
17 53 9.78	−26 19 58.0	10.3	10.0	0.75	20	3 12	21 7 6.42	−18 5 50.9	17.0	16.5	1.16
17 58 8.83	26 21 55.2	10.4	10.1	0.76	21	3 11	21 10 13.75	17 45 30.3	17.2	16.7	1.17
18 3 7.29	26 23 11.2	10.5	10.2	0.76	22	3 10	21 13 16.53	17 25 1.0	17.5	17.0	1.19
18 8 5.05	26 23 45.7	10.6	10.3	0.77	23	3 9	21 16 14.61	17 4 24.0	17.7	17.2	1.20
18 13 2.04	26 23 39.3	10.7	10.4	0.77	24	3 8	21 19 7.87	16 43 40.8	18.0	17.5	1.22
18 17 58.17	−26 22 51.8	10.8	10.5	0.78	25	3 7	21 21 56.19	−16 22 52.6	18.2	17.7	1.23
18 22 53.36	26 21 23.5	10.9	10.6	0.79	26	3 6	21 24 39.43	16 2 0.8	18.5	18.0	1.25
18 27 47.52	26 19 14.5	11.0	10.7	0.79	27	3 4	21 27 17.44	15 41 6.6	18.8	18.3	1.27
18 32 40.56	26 16 25.1	11.1	10.8	0.80	28	3 3	21 29 50.09	15 20 11.4	19.1	18.5	1.28
18 37 32.40	26 12 55.8	11.2	10.9	0.80	29	3 1	21 32 17.23	14 59 16.4	19.4	18.8	1.30
18 42 22.93	*−26 8 46.8*	*11.3*	*11.0*	0.81	30	3 0	21 34 38.73	−14 38 23.3	19.7	19.1	1.31
18 47 12.06	*−26 3 58.2*	*11.4*	*11.1*	0.82	31	2 58	21 36 54.40	−14 17 33.4	20.0	19.4	1.33

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.
	h m	h m s	° ′ ″	″	″	s		h m	h m s	° ′ ″	″
Sept.30	20 19	8 57 58.99	+18 26 40.8	4.6	2.6	0.18	Nov.15	18 59	10 39 21.99	+10 29 43.5	5.
Oct. 1	20 18	9 0 24.95	18 17 21.9	4.6	2.6	0.19	16	18 57	10 41 18.96	10 19 8.2	5.
2	20 16	9 2 50.33	18 7 58.0	4.6	2.6	0.19	17	18 55	10 43 15.20	10 8 34.8	5.
3	20 15	9 5 15.14	17 58 29.3	4.6	2.6	0.19	18	18 53	10 45 10.73	9 58 3.3	5.
4	20 13	9 7 39.38	17 48 56.0	4.6	2.7	0.19	19	18 51	10 47 5.51	9 47 34.1	5.
5	20 12	9 10 3.03	+17 39 18.0	4.7	2.7	0.19	20	18 49	10 48 59.55	+ 9 37 7.1	5.
6	20 10	9 12 26.09	17 29 35.8	4.7	2.7	0.19	21	18 47	10 50 52.83	9 26 42.6	5.
7	20 8	9 14 48.57	17 19 49.3	4.7	2.7	0.19	22	18 45	10 52 45.37	9 16 20.7	5.
8	20 7	9 17 10.45	17 9 58.8	4.7	2.7	0.19	23	18 43	10 54 37.13	9 6 1.6	5.
9	20 5	9 19 31.74	17 0 4.3	4.7	2.7	0.19	24	18 41	10 56 28.15	8 55 45.2	5.
10	20 4	9 21 52.44	+16 50 6.0	4.7	2.7	0.19	25	18 39	10 58 18.41	+ 8 45 32.0	6.
11	20 2	9 24 12.52	16 40 4.2	4.8	2.7	0.19	26	18 37	11 0 7.88	8 35 21.9	6.
12	20 0	9 26 32.01	16 29 58.8	4.8	2.7	0.19	27	18 35	11 1 56.58	8 25 15.0	6.
13	19 59	9 28 50.90	16 19 50.1	4.8	2.8	0.19	28	18 33	11 3 44.48	8 15 11.8	6.
14	19 57	9 31 9.18	16 9 38.4	4.8	2.8	0.19	29	18 30	11 5 31.57	8 5 12.0	6.
15	19 56	9 33 26.84	+15 59 23.5	4.8	2.8	0.19	30	18 28	11 7 17.86	+ 7 55 16.0	6.
16	19 54	9 35 43.87	15 49 5.8	4.9	2.8	0.19	Dec. 1	18 26	11 9 3.33	7 45 24.0	6.
17	19 52	9 38 0.30	15 38 45.5	4.9	2.8	0.19	2	18 24	11 10 47.95	7 35 36.1	6.
18	19 51	9 40 16.10	15 28 22.6	4.9	2.8	0.19	3	18 22	11 12 31.72	7 25 52.7	6.
19	19 49	9 42 31.27	15 17 57.4	4.9	2.8	0.19	4	18 19	11 14 14.62	7 16 13.8	6.
20	19 47	9 44 45.82	+15 7 29.8	4.9	2.8	0.20	5	18 17	11 15 56.64	+ 7 6 39.6	6.
21	19 45	9 46 59.76	14 57 0.0	5.0	2.9	0.20	6	18 15	11 17 37.77	6 57 10.3	6.
22	19 44	9 49 13.08	14 46 28.3	5.0	2.9	0.20	7	18 13	11 19 17.99	6 47 46.2	6.
23	19 42	9 51 25.76	14 35 54.7	5.0	2.9	0.20	8	18 10	11 20 57.27	6 38 27.4	6.
24	19 40	9 53 37.82	14 25 19.2	5.0	2.9	0.20	9	18 8	11 22 35.61	6 29 14.0	6.
25	19 39	9 55 49.27	+14 14 42.1	5.1	2.9	0.20	10	18 6	11 24 12.98	+ 6 20 6.3	6.
26	19 37	9 58 0.08	14 4 3.6	5.1	2.9	0.20	11	18 4	11 25 49.36	6 11 4.4	6.
27	19 35	10 0 10.27	13 53 23.7	5.1	2.9	0.20	12	18 1	11 27 24.74	6 2 8.6	6.
28	19 33	10 2 19.83	13 42 42.6	5.1	2.9	0.20	13	17 59	11 28 59.09	5 53 19.1	6.
29	19 31	10 4 28.79	13 32 0.4	5.1	2.9	0.20	14	17 56	11 30 32.41	5 44 36.0	6.
30	19 30	10 6 37.12	+13 21 17.2	5.2	3.0	0.20	15	17 54	11 32 4.66	+ 5 35 59.5	6.
31	19 28	10 8 44.81	13 10 33.2	5.2	3.0	0.20	16	17 52	11 33 35.84	5 27 29.8	6.
Nov. 1	19 26	10 10 51.89	12 59 48.6	5.2	3.0	0.20	17	17 49	11 35 5.92	5 19 6.9	6.
2	19 24	10 12 58.33	12 49 3.5	5.3	3.0	0.21	18	17 47	11 36 34.88	5 10 51.3	7.
3	19 22	10 15 4.14	12 38 18.0	5.3	3.0	0.21	19	17 44	11 38 2.72	5 2 43.0	7.
4	19 20	10 17 9.30	+12 27 32.2	5.3	3.0	0.21	20	17 42	11 39 29.40	+ 4 54 42.0	7.
5	19 19	10 19 13.81	12 16 46.5	5.3	3.1	0.21	21	17 39	11 40 54.92	4 46 48.7	7.
6	19 17	10 21 17.68	12 6 0.8	5.4	3.1	0.21	22	17 37	11 42 19.26	4 39 3.2	7.
7	19 15	10 23 20.88	11 55 15.5	5.4	3.1	0.21	23	17 34	11 43 42.39	4 31 25.7	7.
8	19 13	10 25 23.41	11 44 30.7	5.4	3.1	0.21	24	17 32	11 45 4.29	4 23 56.3	7.
9	19 11	10 27 25.28	+11 33 46.6	5.4	3.1	0.21	25	17 29	11 46 24.94	+ 4 16 35.1	7.
10	19 9	10 29 26.47	11 23 3.1	5.5	3.1	0.21	26	17 26	11 47 44.32	4 9 22.5	7.
11	19 7	10 31 26.98	11 12 20.6	5.5	3.2	0.21	27	17 24	11 49 2.40	4 2 18.6	7.
12	19 5	10 33 26.78	11 1 39.3	5.5	3.2	0.22	28	17 21	11 50 19.16	3 55 23.7	7.
13	19 3	10 35 25.89	10 50 59.2	5.6	3.2	0.22	29	17 18	11 51 34.55	3 48 38.0	7.
14	*19 1*	*10 37 24.29*	*+10 40 20.6*	*5.6*	*3.2*	*0.22*	30	17 16	11 52 48.57	+ 3 42 1.8	7.
15	*18 59*	*10 39 21.99*	*+10 29 43.5*	*5.6*	*3.2*	*0.22*	31	17 13	11 54 1.17	+ 3 35 35.2	7.

Stellar magnitude at opposition in March, 1918, —1.1.

FOR TRANSIT AT WASHINGTON.

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	° ′ ″	″	″	s		h m	h m s	° ′ ″	″	″	s
1 37 2.41	+ 8 45 51.2	1.9	20.3	1.46	Aug. 17	18 43	4 28 6.59	+20 54 14.9	1.7	18.2	1.39
1 37 11.70	8 47 4.7	1.9	20.3	1.46	18	18 40	4 28 38.52	20 55 21.4	1.7	18.3	1.39
1 37 21.75	8 48 22.5	1.9	20.2	1.45	19	18 36	4 29 9.84	20 56 26.0	1.7	18.3	1.39
1 37 32.55	8 49 44.4	1.9	20.1	1.45	20	18 33	4 29 40.56	20 57 28.9	1.7	18.4	1.40
1 37 44.08	8 51 10.6	1.9	20.1	1.44	21	18 29	4 30 10.67	20 58 30.0	1.7	18.4	1.40
1 37 56.35	+ 8 52 41.1	1.9	20.0	1.44	22	18 26	4 30 40.14	+20 59 29.5	1.7	18.5	1.41
1 38 9.35	8 54 15.6	1.9	19.9	1.43	23	18 22	4 31 8.99	21 0 27.2	1.7	18.5	1.41
1 38 23.08	8 55 54.0	1.9	19.9	1.43	24	18 19	4 31 37.20	21 1 23.1	1.7	18.6	1.41
1 38 37.53	8 57 36.6	1.8	19.8	1.42	25	18 15	4 32 4.76	21 2 17.4	1.7	18.6	1.42
1 38 52.71	8 59 23.1	1.8	19.7	1.42	26	18 12	4 32 31.68	21 3 10.0	1.8	18.7	1.42
1 39 8.59	+ 9 1 13.6	1.8	19.7	1.41	27	18 9	4 32 57.93	+21 4 0.8	1.8	18.8	1.43
1 39 25.18	9 3 7.9	1.8	19.6	1.41	28	18 5	4 33 23.52	21 4 50.1	1.8	18.8	1.43
1 39 42.47	9 5 6.1	1.8	19.5	1.40	29	18 2	4 33 48.43	21 5 37.5	1.8	18.9	1.44
1 40 0.46	9 7 8.1	1.8	19.5	1.40	30	17 58	4 34 12.66	21 6 23.4	1.8	18.9	1.44
1 40 19.12	9 9 13.9	1.8	19.4	1.40	31	17 54	4 34 36.21	21 7 7.5	1.8	19.0	1.45
1 40 38.49	+ 9 11 23.4	1.8	19.3	1.39	Sept. 1	17 51	4 34 59.05	+21 7 49.9	1.8	19.1	1.45
1 40 58.53	9 13 36.5	1.8	19.3	1.39	2	17 47	4 35 21.20	21 8 30.7	1.8	19.1	1.45
1 41 19.25	9 15 53.4	1.8	19.2	1.38	3	17 44	4 35 42.65	21 9 9.9	1.8	19.2	1.46
1 41 40.63	9 18 13.9	1.8	19.2	1.38	4	17 40	4 36 3.37	21 9 47.4	1.8	19.2	1.46
1 42 2.68	9 20 37.8	1.8	19.1	1.37	5	17 36	4 36 23.38	21 10 23.3	1.8	19.3	1.47
1 42 25.38	+ 9 23 5.3	1.8	19.0	1.37	6	17 33	4 36 42.64	+21 10 57.5	1.8	19.4	1.47
1 42 48.73	9 25 36.3	1.8	19.0	1.36	7	17 29	4 37 1.16	21 11 30.1	1.8	19.4	1.48
1 43 12.74	9 28 10.6	1.8	18.9	1.36	8	17 26	4 37 18.93	21 12 1.1	1.8	19.5	1.48
1 43 37.38	9 30 48.3	1.8	18.8	1.35	9	17 22	4 37 35.95	21 12 30.3	1.8	19.5	1.49
1 44 2.66	9 33 29.3	1.8	18.8	1.35	10	17 18	4 37 52.19	21 12 58.1	1.8	19.6	1.49
1 44 28.57	+ 9 36 13.5	1.8	18.7	1.35	11	17 15	4 38 7.67	+21 13 24.1	1.8	19.7	1.49
1 44 55.09	9 39 1.0	1.7	18.7	1.35	12	17 11	4 38 22.36	21 13 48.6	1.8	19.7	1.50
1 45 22.22	9 41 51.4	1.7	18.6	1.34	13	17 7	4 38 36.26	21 14 11.5	1.8	19.8	1.50
1 45 49.94	9 44 44.9	1.7	18.5	1.34	14	17 4	4 38 49.37	21 14 32.6	1.9	19.8	1.51
1 46 18.26	9 47 41.5	1.7	18.5	1.33	15	17 0	4 39 1.68	21 14 52.3	1.9	19.9	1.51
1 46 47.16	+ 9 50 41.0	1.7	18.4	1.33	16	16 56	4 39 13.18	+21 15 10.3	1.9	20.0	1.52
1 47 16.65	9 53 43.4	1.7	18.4	1.33	17	16 52	4 39 23.88	21 15 26.8	1.9	20.0	1.52
1 47 46.69	9 56 48.5	1.7	18.3	1.32	18	16 49	4 39 33.77	21 15 41.5	1.9	20.1	1.53
1 48 17.31	9 59 56.4	1.7	18.3	1.32	19	16 45	4 39 42.83	21 15 54.8	1.9	20.2	1.53
1 48 48.49	10 3 7.1	1.7	18.2	1.32	20	16 41	4 39 51.07	21 16 6.5	1.9	20.2	1.54
1 49 20.21	+10 6 20.4	1.7	18.2	1.31	21	16 37	4 39 58.49	+21 16 16.6	1.9	20.3	1.54
1 49 52.48	10 9 36.3	1.7	18.1	1.31	22	16 33	4 40 5.08	21 16 25.1	1.9	20.4	1.55
1 50 25.27	10 12 54.8	1.7	18.1	1.30	23	16 30	4 40 10.83	21 16 32.1	1.9	20.4	1.55
1 50 58.59	10 16 15.7	1.7	18.0	1.30	24	16 26	4 40 15.75	21 16 37.4	1.9	20.5	1.56
1 51 32.45	10 19 39.1	1.7	17.9	1.29	25	16 22	4 40 19.82	21 16 41.2	1.9	20.5	1.56
1 52 6.82	+10 23 4.9	1.7	17.9	1.29	26	16 18	4 40 23.06	+21 16 43.5	1.9	20.6	1.57
1 52 41.70	10 26 33.0	1.7	17.8	1.29	27	16 14	4 40 25.45	21 16 44.2	1.9	20.7	1.57
1 53 17.07	10 30 3.5	1.7	17.8	1.29	28	16 10	4 40 27.00	21 16 43.3	1.9	20.7	1.58
1 53 52.95	10 33 36.2	1.7	17.8	1.29	29	16 6	4 40 27.71	21 16 40.8	1.9	20.8	1.59
1 54 29.31	10 37 11.2	1.7	17.7	1.28	30	16 2	4 40 27.58	21 16 36.8	2.0	20.9	1.60
4 27 34.07	*+20 53 6.8*	*1.7*	*18.2*	1.38	Oct. 1	15 58	4 40 26.58	+21 16 31.3	2.0	20.9	1.60
4 28 6.59	*+20 54 14.9*	*1.7*	*18.2*	1.39	2	15 54	4 40 24.75	+21 16 24.2	2.0	21.0	1.6

Stellar magnitude at opposition in November, 1917, −2.4.

FOR TRANSIT AT WASHINGTON.

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
Oct. 1	15 58	4 40 26.58	+21 16 31.3	2.0	20.9	1.60
2	15 54	4 40 24.75	21 16 24.2	2.0	21.0	1.61
3	15 50	4 40 22.06	21 16 15.5	2.0	21.1	1.61
4	15 46	4 40 18.52	21 16 5.3	2.0	21.1	1.61
5	15 42	4 40 14.13	21 15 53.6	2.0	21.2	1.62
6	15 38	4 40 8.88	+21 15 40.2	2.0	21.2	1.62
7	15 34	4 40 2.77	21 15 25.3	2.0	21.3	1.63
8	15 30	4 39 55.82	21 15 8.9	2.0	21.4	1.63
9	15 26	4 39 48.01	21 14 50.8	2.0	21.4	1.63
10	15 22	4 39 39.35	21 14 31.3	2.0	21.5	1.64
11	15 18	4 39 29.83	+21 14 10.2	2.0	21.5	1.64
12	15 14	4 39 19.49	21 13 47.5	2.0	21.6	1.65
13	15 10	4 39 8.31	21 13 23.4	2.0	21.7	1.65
14	15 6	4 38 56.29	21 12 57.7	2.0	21.7	1.66
15	15 2	4 38 43.44	21 12 30.4	2.0	21.8	1.66
16	14 58	4 38 29.78	+21 12 1.6	2.0	21.8	1.66
17	14 53	4 38 15.30	21 11 31.4	2.0	21.9	1.67
18	14 49	4 38 0.02	21 10 59.7	2.0	21.9	1.67
19	14 45	4 37 43.93	21 10 26.5	2.1	22.0	1.68
20	14 41	4 37 27.07	21 9 51.6	2.1	22.1	1.68
21	14 37	4 37 9.43	+21 9 15.3	2.1	22.1	1.68
22	14 32	4 36 51.03	21 8 37.5	2.1	22.2	1.69
23	14 28	4 36 31.88	21 7 58.3	2.1	22.2	1.69
24	14 24	4 36 11.98	21 7 17.6	2.1	22.3	1.70
25	14 20	4 35 51.36	21 6 35.6	2.1	22.3	1.70
26	14 15	4 35 30.01	+21 5 52.0	2.1	22.4	1.70
27	14 11	4 35 7.98	21 5 7.1	2.1	22.4	1.71
28	14 7	4 34 45.25	21 4 20.6	2.1	22.5	1.71
29	14 2	4 34 21.85	21 3 32.7	2.1	22.5	1.71
30	13 58	4 33 57.78	21 2 43.6	2.1	22.5	1.71
31	13 54	4 33 33.06	+21 1 53.1	2.1	22.6	1.72
Nov. 1	13 49	4 33 7.70	21 1 1.2	2.1	22.6	1.72
2	13 45	4 32 41.74	21 0 8.0	2.1	22.7	1.72
3	13 40	4 32 15.16	20 59 3.5	2.1	22.7	1.73
4	13 36	4 31 48.01	20 58 17.8	2.1	22.7	1.73
5	13 32	4 31 20.29	+20 57 20.8	2.1	22.8	1.73
6	13 27	4 30 52.02	20 56 22.5	2.1	22.8	1.74
7	13 23	4 30 23.21	20 55 22.9	2.1	22.8	1.74
8	13 18	4 29 53.91	20 54 22.2	2.1	22.9	1.74
9	13 14	4 29 24.11	20 53 20.3	2.1	22.9	1.74
10	13 10	4 28 53.85	+20 52 17.2	2.1	22.9	1.74
11	13 5	4 28 23.14	20 51 13.0	2.2	23.0	1.74
12	13 1	4 27 52.00	20 50 7.9	2.2	23.0	1.75
13	12 56	4 27 20.48	20 49 1.7	2.2	23.0	1.75
14	12 52	4 26 48.57	20 47 54.6	2.2	23.0	1.75
15	*12 47*	*4 26 16.32*	*+20 46 46.6*	2.2	23.1	1.75
16	*12 43*	*4 25 43.74*	*+20 45 37.7*	2.2	23.1	1.75

Date.	Wash. Mean Time.	Apparent Right Ascension.	Apparent Declination.	Ha Pa
	h m	h m s	° ′ ″	′
Nov. 15	12 47	4 26 16.32	+20 46 46.6	2.
16	12 43	4 25 43.74	20 45 37.7	2.
17	12 38	4 25 10.87	20 44 27.9	2.
18	12 34	4 24 37.73	20 43 17.4	2.
19	12 29	4 24 4.34	20 42 6.1	2.
20	12 25	4 23 30.73	+20 40 54.2	2.
21	12 20	4 22 56.93	20 39 41.5	2.
22	12 16	4 22 22.97	20 38 28.4	2.
23	12 11	4 21 48.86	20 37 14.7	2.
24	12 7	4 21 14.64	20 36 0.5	2.
25	12 2	4 20 40.33	+20 34 45.9	2.
26	11 58	4 20 5.96	20 33 30.9	2.
27	11 53	4 19 31.57	20 32 15.7	2.
28	11 49	4 18 57.13	20 31 0.1	2.
29	11 44	4 18 22.73	20 29 44.5	2.
30	11 40	4 17 48.36	+20 28 28.7	2.
Dec. 1	11 35	4 17 14.06	20 27 12.9	2.
2	11 31	4 16 39.85	20 25 57.1	2.
3	11 26	4 16 5.75	20 24 41.4	2.
4	11 22	4 15 31.80	20 23 25.8	2.
5	11 17	4 14 58.01	+20 22 10.4	2.
6	11 13	4 14 24.41	20 20 55.4	2.
7	11 8	4 13 51.03	20 19 40.5	2.
8	11 4	4 13 17.89	20 18 26.2	2.
9	10 59	4 12 45.02	20 17 12.4	2.
10	10 55	4 12 12.45	+20 15 59.2	2.
11	10 51	4 11 40.19	20 14 46.7	2.
12	10 46	4 11 8.29	20 13 34.8	2.
13	10 42	4 10 36.77	20 12 23.6	2.
14	10 37	4 10 5.62	20 11 13.5	2.
15	10 33	4 9 34.90	+20 10 4.3	2.
16	10 28	4 9 4.63	20 8 56.0	2.
17	10 24	4 8 34.82	20 7 48.8	2.
18	10 19	4 8 5.51	20 6 42.6	2.
19	10 15	4 7 36.69	20 5 37.8	2.
20	10 11	4 7 8.42	+20 4 34.3	2.
21	10 6	4 6 40.68	20 3 32.0	2.
22	10 2	4 6 13.52	20 2 31.2	2.
23	9 57	4 5 46.94	20 1 31.8	2.
24	9 53	4 5 20.96	20 0 33.9	2.
25	9 49	4 4 55.59	+19 59 37.6	2.
26	9 44	4 4 30.85	19 58 42.8	2.
27	9 40	4 4 6.76	19 57 49.9	2.
28	9 36	4 3 43.33	19 56 58.7	2.
29	9 32	4 3 20.59	19 56 9.3	2.
30	9 27	4 2 58.53	+19 55 21.7	2
31	9 23	4 2 37.17	+19 54 35.9	

Stellar magnitude at opposition in November, 1917, −2.4.

FOR TRANSIT AT WASHINGTON.

	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
0	13 21	8 2 29.61	+20 38 45.0	1.1	9.5	0.74	Feb. 15	10 6	7 47 37.99	+21 24 12.4	1.1	9.4	0.74
1	13 17	8 2 10.59	20 39 47.1	1.1	9.5	0.74	16	10 1	7 47 22.29	21 24 58.0	1.1	9.4	0.74
2	13 13	8 1 51.40	20 40 49.7	1.1	9.5	0.75	17	9 57	7 47 6.92	21 25 42.7	1.1	9.4	0.74
3	13 8	8 1 32.03	20 41 52.5	1.1	9.6	0.75	18	9 53	7 46 51.87	21 26 26.3	1.1	9.4	0.74
4	13 4	8 1 12.51	20 42 55.6	1.1	9.6	0.75	19	9 49	7 46 37.15	21 27 9.0	1.1	9.4	0.74
5	13 0	8 0 52.83	+20 43 59.1	1.1	9.6	0.75	20	9 45	7 46 22.79	+21 27 50.6	1.1	9.4	0.74
6	12 56	8 0 33.01	20 45 2.7	1.1	9.6	0.75	21	9 40	7 46 8.77	21 28 31.2	1.1	9.4	0.74
7	12 51	8 0 13.05	20 46 6.6	1.1	9.6	0.75	22	9 36	7 45 55.11	21 29 10.9	1.1	9.4	0.73
8	12 47	7 59 52.98	20 47 10.5	1.1	9.6	0.75	23	9 32	7 45 41.83	21 29 49.5	1.1	9.3	0.73
9	12 43	7 59 32.81	20 48 14.6	1.1	9.6	0.75	24	9 28	7 45 28.92	21 30 27.0	1.1	9.3	0.73
10	12 39	7 59 12.54	+20 49 18.8	1.1	9.6	0.75	25	9 24	7 45 16.39	+21 31 3.5	1.1	9.3	0.73
11	12 34	7 58 52.19	20 50 23.2	1.1	9.6	0.75	26	9 20	7 45 4.25	21 31 39.0	1.1	9.3	0.73
12	12 30	7 58 31.75	20 51 27.5	1.1	9.6	0.75	27	9 16	7 44 52.51	21 32 13.2	1.1	9.3	0.73
13	12 26	7 58 11.26	20 52 31.8	1.1	9.6	0.75	28	9 11	7 44 41.16	21 32 46.4	1.1	9.3	0.73
14	12 21	7 57 50.72	20 53 35.9	1.1	9.6	0.75	Mar. 1	9 7	7 44 30.22	21 33 18.5	1.1	9.3	0.73
15	12 17	7 57 30.13	+20 54 40.1	1.1	9.6	0.75	2	9 3	7 44 19.68	+21 33 49.4	1.1	9.2	0.73
16	12 13	7 57 9.53	20 55 44.2	1.1	9.6	0.75	3	8 59	7 44 9.57	21 34 19.3	1.1	9.2	0.73
17	12 9	7 56 48.91	20 56 48.1	1.1	9.6	0.75	4	8 55	7 43 59.87	21 34 48.0	1.0	9.2	0.73
18	12 4	7 56 28.28	20 57 51.7	1.1	9.6	0.75	5	8 51	7 43 50.59	21 35 15.7	1.0	9.2	0.72
19	12 0	7 56 7.66	20 58 55.2	1.1	9.6	0.75	6	8 47	7 43 41.74	21 35 42.3	1.0	9.2	0.72
20	11 56	7 55 47.06	+20 59 58.4	1.1	9.6	0.75	7	8 43	7 43 33.34	+21 36 7.7	1.0	9.2	0.72
21	11 52	7 55 26.50	21 1 1.3	1.1	9.6	0.75	8	8 39	7 43 25.35	21 36 32.0	1.0	9.2	0.72
22	11 47	7 55 5.99	21 2 4.0	1.1	9.6	0.75	9	8 35	7 43 17.80	21 36 55.1	1.0	9.2	0.72
23	11 43	7 54 45.54	21 3 6.3	1.1	9.6	0.75	10	8 31	7 43 10.69	21 37 17.2	1.0	9.1	0.72
24	11 39	7 54 25.15	21 4 8.1	1.1	9.6	0.75	11	8 27	7 43 4.03	21 37 38.1	1.0	9.1	0.72
25	11 34	7 54 4.85	+21 5 9.5	1.1	9.6	0.75	12	8 23	7 42 57.81	+21 37 57.8	1.0	9.1	0.72
26	11 30	7 53 44.65	21 6 10.5	1.1	9.6	0.75	13	8 18	7 42 52.04	21 38 16.5	1.0	9.1	0.71
27	11 26	7 53 24.56	21 7 11.0	1.1	9.6	0.75	14	8 14	7 42 46.72	21 38 33.9	1.0	9.1	0.71
28	11 22	7 53 4.60	21 8 10.9	1.1	9.6	0.75	15	8 10	7 42 41.86	21 38 50.2	1.0	9.1	0.71
29	11 17	7 52 44.76	21 9 10.3	1.1	9.6	0.75	16	8 6	7 42 37.46	21 39 5.3	1.0	9.0	0.71
30	11 13	7 52 25.07	+21 10 9.1	1.1	9.6	0.75	17	8 2	7 42 33.50	+21 39 19.4	1.0	9.0	0.71
31	11 9	7 52 5.52	21 11 7.3	1.1	9.6	0.75	18	7 58	7 42 30.01	21 39 32.1	1.0	9.0	0.71
Feb. 1	11 5	7 51 46.16	21 12 4.9	1.1	9.6	0.75	19	7 54	7 42 26.99	21 39 43.8	1.0	9.0	0.71
2	11 0	7 51 26.96	21 13 1.7	1.1	9.6	0.75	20	7 51	7 42 24.43	21 39 54.4	1.0	9.0	0.71
3	10 56	7 51 7.95	21 13 58.0	1.1	9.5	0.75	21	7 47	7 42 22.34	21 40 3.7	1.0	9.0	0.71
4	10 52	7 50 49.14	+21 14 53.5	1.1	9.5	0.75	22	7 43	7 42 20.71	+21 40 11.8	1.0	9.0	0.70
5	10 48	7 50 30.53	21 15 48.4	1.1	9.5	0.75	23	7 39	7 42 19.56	21 40 18.8	1.0	8.9	0.70
6	10 43	7 50 12.14	21 16 42.5	1.1	9.5	0.75	24	7 35	7 42 18.88	21 40 24.6	1.0	8.9	0.70
7	10 39	7 49 53.98	21 17 35.7	1.1	9.5	0.74	25	7 31	7 42 18.67	21 40 29.2	1.0	8.9	0.70
8	10 35	7 49 36.05	21 18 28.3	1.1	9.5	0.74	26	7 27	7 42 18.93	21 40 32.6	1.0	8.9	0.70
9	10 31	7 49 18.38	+21 19 20.0	1.1	9.5	0.74	27	7 23	7 42 19.66	+21 40 34.9	1.0	8.9	0.70
10	10 27	7 49 0.95	21 20 10.8	1.1	9.5	0.74	28	7 19	7 42 20.86	21 40 36.0	1.0	8.9	0.70
11	10 22	7 48 43.80	21 21 0.9	1.1	9.5	0.74	29	7 15	7 42 22.53	21 40 36.0	1.0	8.8	0.69
12	10 18	7 48 26.91	21 21 50.1	1.1	9.5	0.74	30	7 11	7 42 24.66	21 40 34.7	1.0	8.8	0.69
13	10 14	7 48 10.31	21 22 38.5	1.1	9.5	0.74	31	7 7	7 42 27.26	21 40 32.4	1.0	8.8	0.69
14	*10 10*	*7 47 54.00*	*+21 23 25.9*	*1.1*	*9.5*	*0.74*	Apr. 1	7 3	7 42 30.33	+21 40 28.8	1.0	8.8	0.69
15	*10 6*	*7 47 37.99*	*+21 24 12.4*	*1.1*	*9.4*	*0.74*	2	7 0	7 42 33.85	+21 40 24.1	1.0	8.8	0.69

Stellar magnitude at opposition in January, 1917, −0.1.

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.
	h m	h m s	° ′ ″	″	″	s		h m	h m s	° ′ ″	″
Apr. 1	7 3	7 42 30.33	+21 40 28.8	1.0	8.8	0.69	Nov. 15	17 29	9 8 30.07	+17 8 50.3	1.0
2	7 0	7 42 33.85	21 40 24.1	1.0	8.8	0.69	16	17 25	9 8 34.42	17 8 41.9	1.0
3	6 56	7 42 37.84	21 40 18.2	1.0	8.8	0.69	17	17 21	9 8 38.34	17 8 35.4	1.0
4	6 52	7 42 42.29	21 40 11.2	1.0	8.8	0.69	18	17 17	9 8 41.80	17 8 30.8	1.0
5	6 48	7 42 47.19	21 40 3.1	1.0	8.7	0.68	19	17 13	9 8 44.83	17 8 28.2	1.0
6	6 44	7 42 52.55	+21 39 53.8	1.0	8.7	0.68	20	17 9	9 8 47.40	+17 8 27.6	1.0
7	6 40	7 42 58.36	21 39 43.4	1.0	8.7	0.68	21	17 5	9 8 49.53	17 8 29.1	1.0
8	6 37	7 43 4.63	21 39 31.7	1.0	8.7	0.68	22	17 2	9 8 51.21	17 8 32.4	1.0
9	6 33	7 43 11.34	21 39 19.0	1.0	8.7	0.68	23	16 58	9 8 52.45	17 8 37.8	1.0
10	6 29	7 43 18.50	21 39 5.2	1.0	8.6	0.68	24	16 54	9 8 53.23	17 8 45.1	1.0
11	6 25	7 43 26.10	+21 38 50.2	1.0	8.6	0.68	25	16 50	9 8 53.57	+17 8 54.4	1.0
12	6 21	7 43 34.16	21 38 34.2	1.0	8.6	0.68	26	16 46	9 8 53.45	17 9 5.6	1.0
13	6 17	7 43 42.64	21 38 17.0	1.0	8.6	0.68	27	16 42	9 8 52.89	17 9 18.8	1.0
14	6 14	7 43 51.57	21 37 58.8	1.0	8.6	0.67	28	16 38	9 8 51.89	17 9 33.9	1.0
15	6 10	7 44 0.94	21 37 39.4	1.0	8.6	0.67	29	16 34	9 8 50.44	17 9 51.0	1.0
16	6 6	7 44 10.75	+21 37 18.8	1.0	8.6	0.67	30	16 30	9 8 48.55	+17 10 10.0	1.0
17	6 2	7 44 20.98	21 36 57.1	1.0	8.5	0.67	Dec. 1	16 26	9 8 46.20	17 10 31.0	1.0
18	5 59	7 44 31.64	21 36 34.2	1.0	8.5	0.67	2	16 22	9 8 43.42	17 10 53.9	1.0
19	5 55	7 44 42.73	21 36 10.3	1.0	8.5	0.67	3	16 18	9 8 40.18	17 11 18.8	1.0
20	5 51	7 44 54.25	21 35 45.2	1.0	8.5	0.67	4	16 14	9 8 36.51	17 11 45.6	1.0
Oct. 20	19 7	9 4 7.28	+17 23 24.1	0.9	8.3	0.64	5	16 10	9 8 32.39	+17 12 14.3	1.0
21	19 3	9 4 22.40	17 22 28.9	0.9	8.3	0.64	6	16 6	9 8 27.84	17 12 44.9	1.0
22	18 59	9 4 37.14	17 21 35.4	0.9	8.3	0.64	7	16 2	9 8 22.84	17 13 17.4	1.0
23	18 56	9 4 51.51	17 20 43.3	0.9	8.3	0.64	8	15 58	9 8 17.41	17 13 51.8	1.0
24	18 52	9 5 5.49	17 19 53.0	0.9	8.4	0.64	9	15 54	9 8 11.55	17 14 28.1	1.0
25	18 48	9 5 19.09	+17 19 4.3	1.0	8.4	0.64	10	15 50	9 8 5.25	+17 15 6.3	1.0
26	18 45	9 5 32.30	17 18 17.3	1.0	8.4	0.64	11	15 46	9 7 58.53	17 15 46.3	1.0
27	18 41	9 5 45.11	17 17 31.8	1.0	8.4	0.64	12	15 42	9 7 51.37	17 16 28.1	1.0
28	18 37	9 5 57.52	17 16 48.1	1.0	8.4	0.64	13	15 38	9 7 43.80	17 17 11.8	1.0
29	18 33	9 6 9.54	17 16 6.2	1.0	8.4	0.64	14	15 34	9 7 35.81	17 17 57.1	1.0
30	18 30	9 6 21.15	+17 15 25.9	1.0	8.4	0.65	15	15 30	9 7 27.40	+17 18 44.2	1.0
31	18 26	9 6 32.37	17 14 47.4	1.0	8.5	0.65	16	15 26	9 7 18.58	17 19 33.1	1.0
Nov. 1	18 22	9 6 43.18	17 14 10.6	1.0	8.5	0.65	17	15 22	9 7 9.35	17 20 23.5	1.0
2	18 18	9 6 53.58	17 13 35.7	1.0	8.5	0.65	18	15 18	9 6 59.73	17 21 15.7	1.0
3	18 15	9 7 3.56	17 13 2.4	1.0	8.5	0.65	19	15 13	9 6 49.70	17 22 9.4	1.0
4	18 11	9 7 13.13	+17 12 31.1	1.0	8.5	0.65	20	15 9	9 6 39.29	+17 23 4.9	1.0
5	18 7	9 7 22.28	17 12 1.5	1.0	8.5	0.65	21	15 5	9 6 28.49	17 24 1.9	1.0
6	18 3	9 7 31.00	17 11 33.8	1.0	8.6	0.65	22	15 1	9 6 17.32	17 25 0.4	1.0
7	17 59	9 7 39.30	17 11 8.0	1.0	8.6	0.66	23	14 57	9 6 5.77	17 26 0.5	1.1
8	17 56	9 7 47.17	17 10 44.1	1.0	8.6	0.66	24	14 53	9 5 53.86	17 27 2.0	1.1
9	17 52	9 7 54.61	+17 10 22.0	1.0	8.6	0.66	25	14 49	9 5 41.59	+17 28 4.9	1.1
10	17 48	9 8 1.61	17 10 1.9	1.0	8.6	0.66	26	14 45	9 5 28.97	17 29 9.3	1.1
11	17 44	9 8 8.18	17 9 43.7	1.0	8.6	0.66	27	14 40	9 5 15.99	17 30 15.0	1.1
12	17 40	9 8 14.32	17 9 27.5	1.0	8.6	0.66	28	14 36	9 5 2.68	17 31 22.0	1.1
13	17 36	9 8 20.01	17 9 13.1	1.0	8.7	0.66	29	14 32	9 4 49.02	17 32 30.5	1.1
14	17 33	9 8 25.27	+17 9 0.7	1.0	8.7	0.66	30	14 28	9 4 35.05	+17 33 40.1	1.1
15	17 29	9 8 30.07	+17 8 50.3	1.0	8.7	0.67	31	14 24	9 4 20.74	+17 34 51.9	1.1

Stellar magnitude at opposition in January, 1917, −0.1.

FOR TRANSIT AT WASHINGTON.

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	° ′ ″	″	″	s		h m	h m s	° ′ ″	″	″	s
21 45 1.52	−14 19 8.6	0.4	1.7	0.12	July 22	13 39	21 40 54.36	−14 41 26.5	0.5	1.8	0.12
21 44 59.76	14 19 20.0	0.4	1.7	0.12	23	13 35	21 40 46.00	14 42 9.6	0.5	1.8	0.12
21 44 57.82	14 19 32.3	0.5	1.7	0.12	24	13 31	21 40 37.57	14 42 53.0	0.5	1.8	0.12
21 44 55.69	14 19 45.5	0.5	1.7	0.12	25	13 27	21 40 29.04	14 43 36.8	0.5	1.8	0.12
21 44 53.38	14 19 59.6	0.5	1.7	0.12	26	13 23	21 40 20.45	14 44 21.0	0.5	1.8	0.12
21 44 50.89	−14 20 14.6	0.5	1.7	0.12	27	13 19	21 40 11.78	−14 45 5.3	0.5	1.8	0.12
21 44 48.23	14 20 30.5	0.5	1.7	0.12	28	13 15	21 40 3.04	14 45 50.0	0.5	1.8	0.12
21 44 45.39	14 20 47.3	0.5	1.7	0.12	29	13 10	21 39 54.24	14 46 34.9	0.5	1.8	0.12
21 44 42.36	14 21 5.0	0.5	1.7	0.12	30	13 6	21 39 45.39	14 47 20.2	0.5	1.8	0.12
21 44 39.16	14 21 23.6	0.5	1.7	0.12	31	13 2	21 39 36.48	14 48 5.5	0.5	1.8	0.12
21 44 35.79	−14 21 43.1	0.5	1.7	0.12	Aug. 1	12 58	21 39 27.51	−14 48 51.1	0.5	1.8	0.12
21 44 32.24	14 22 3.4	0.5	1.7	0.12	2	12 54	21 39 18.48	14 49 36.8	0.5	1.8	0.12
21 44 28.52	14 22 24.5	0.5	1.7	0.12	3	12 50	21 39 9.42	14 50 22.6	0.5	1.8	0.12
21 44 24.63	14 22 46.5	0.5	1.7	0.12	4	12 46	21 39 0.31	14 51 8.8	0.5	1.8	0.12
21 44 20.57	14 23 9.3	0.5	1.7	0.12	5	12 42	21 38 51.16	14 51 55.0	0.5	1.8	0.12
21 44 16.34	−14 23 33.0	0.5	1.7	0.12	6	12 38	21 38 41.97	−14 52 41.3	0.5	1.8	0.12
21 44 11.95	14 23 57.5	0.5	1.7	0.12	7	12 34	21 38 32.75	14 53 27.7	0.5	1.8	0.12
21 44 7.40	14 24 22.8	0.5	1.7	0.12	8	12 30	21 38 23.50	14 54 14.3	0.5	1.8	0.12
21 44 2.69	14 24 48.9	0.5	1.7	0.12	9	12 26	21 38 14.22	14 55 0.8	0.5	1.8	0.12
21 43 57.81	14 25 15.7	0.5	1.7	0.12	10	12 22	21 38 4.93	14 55 47.4	0.5	1.8	0.12
21 43 52.78	−14 25 43.3	0.5	1.7	0.12	11	12 18	21 37 55.61	−14 56 34.0	0.5	1.8	0.12
21 43 47.59	14 26 11.7	0.5	1.7	0.12	12	12 13	21 37 46.28	14 57 20.6	0.5	1.8	0.12
21 43 42.25	14 26 40.8	0.5	1.7	0.12	13	12 9	21 37 36.95	14 58 7.1	0.5	1.8	0.12
21 43 36.76	14 27 10.6	0.5	1.7	0.12	14	12 5	21 37 27.60	14 58 53.7	0.5	1.8	0.12
21 43 31.12	14 27 41.1	0.5	1.7	0.12	15	12 1	21 37 18.25	14 59 40.1	0.5	1.8	0.12
21 43 25.34	−14 28 12.3	0.5	1.7	0.12	16	11 57	21 37 8.89	−15 0 26.5	0.5	1.8	0.12
21 43 19.41	14 28 44.2	0.5	1.7	0.12	17	11 53	21 36 59.55	15 1 12.8	0.5	1.8	0.12
21 43 13.34	14 29 16.8	0.5	1.7	0.12	18	11 49	21 36 50.21	15 1 59.0	0.5	1.8	0.12
21 43 7.14	14 29 50.1	0.5	1.7	0.12	19	11 45	21 36 40.90	15 2 45.0	0.5	1.8	0.12
21 43 0.79	14 30 24.0	0.5	1.7	0.12	20	11 41	21 36 31.59	15 3 30.9	0.5	1.8	0.12
21 42 54.30	−14 30 58.5	0.5	1.7	0.12	21	11 37	21 36 22.31	−15 4 16.7	0.5	1.8	0.12
21 42 47.69	14 31 33.7	0.5	1.7	0.12	22	11 32	21 36 13.05	15 5 2.1	0.5	1.8	0.12
21 42 40.95	14 32 9.5	0.5	1.7	0.12	23	11 28	21 36 3.83	15 5 47.4	0.5	1.8	0.12
21 42 34.08	14 32 45.9	0.5	1.8	0.12	24	11 24	21 35 54.64	15 6 32.4	0.5	1.8	0.12
21 42 27.08	14 33 22.9	0.5	1.8	0.12	25	11 20	21 35 45.47	15 7 17.2	0.5	1.8	0.12
21 42 19.96	−14 34 0.4	0.5	1.8	0.12	26	11 16	21 35 36.36	−15 8 1.7	0.5	1.8	0.12
21 42 12.72	14 34 38.5	0.5	1.8	0.12	27	11 12	21 35 27.29	15 8 45.9	0.5	1.8	0.12
21 42 5.37	14 35 17.1	0.5	1.8	0.12	28	11 8	21 35 18.27	15 9 29.9	0.5	1.8	0.12
21 41 57.89	14 35 56.3	0.5	1.8	0.12	29	11 4	21 35 9.31	15 10 13.4	0.5	1.8	0.12
21 41 50.31	14 36 35.9	0.5	1.8	0.12	30	11 0	21 35 0.40	15 10 56.6	0.5	1.8	0.12
21 41 42.61	−14 37 16.1	0.5	1.8	0.12	31	10 56	21 34 51.54	−15 11 39.6	0.5	1.8	0.12
21 41 34.82	14 37 56.8	0.5	1.8	0.12	Sept. 1	10 52	21 34 42.75	15 12 22.1	0.5	1.8	0.12
21 41 26.92	14 38 37.9	0.5	1.8	0.12	2	10 48	21 34 34.03	15 13 4.2	0.5	1.8	0.12
21 41 18.92	14 39 19.4	0.5	1.8	0.12	3	10 44	21 34 25.37	15 13 45.8	0.5	1.8	0.12
21 41 10.83	14 40 1.4	0.5	1.8	0.12	4	10 40	21 34 16.79	15 14 27.1	0.5	1.8	0.12
21 41 2.64	*−14 40 43.8*	*0.5*	*1.8*	*0.12*	5	10 35	21 34 8.29	−15 15 8.0	0.5	1.8	0.12
21 40 54.36	*−14 41 26.5*	*0.5*	*1.8*	*0.12*	6	10 31	21 33 59.86	−15 15 48.4	0.5	1.8	0.12

Stellar magnitude at opposition, in August, 1917, 6.0.

FOR TRANSIT AT WASHINGTON.

Date.	Wash. Mean Time.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semidiam.	S.T. of Sem. Pass. Mer.
	h m	h m s	° ′ ″	″	″	s
Sept. 6	10 31	21 33 59.86	−15 15 48.4	0.5	1.8	0.12
7	10 27	21 33 51.52	15 16 28.4	0.5	1.8	0.12
8	10 23	21 33 43.26	15 17 7.9	0.5	1.8	0.12
9	10 19	21 33 35.09	15 17 46.8	0.5	1.8	0.12
10	10 15	21 33 27.02	15 18 25.2	0.5	1.8	0.12
11	10 11	21 33 19.04	−15 19 3.1	0.5	1.8	0.12
12	10 7	21 33 11.17	15 19 40.4	0.5	1.8	0.12
13	10 3	21 33 3.41	15 20 17.1	0.5	1.8	0.12
14	9 59	21 32 55.75	15 20 53.3	0.5	1.8	0.12
15	9 55	21 32 48.21	15 21 28.9	0.5	1.8	0.12
16	9 51	21 32 40.77	−15 22 3.8	0.5	1.8	0.12
17	9 47	21 32 33.45	15 22 38.1	0.5	1.8	0.12
18	9 43	21 32 26.26	15 23 11.8	0.5	1.8	0.12
19	9 39	21 32 19.20	15 23 44.8	0.5	1.7	0.12
20	9 35	21 32 12.26	15 24 17.2	0.5	1.7	0.12
21	9 30	21 32 5.46	−15 24 48.8	0.5	1.7	0.12
22	9 26	21 31 58.78	15 25 19.8	0.5	1.7	0.12
23	9 22	21 31 52.25	15 25 50.0	0.5	1.7	0.12
24	9 18	21 31 45.85	15 26 19.5	0.5	1.7	0.12
25	9 14	21 31 39.60	15 26 48.3	0.5	1.7	0.12
26	9 10	21 31 33.49	−15 27 16.4	0.5	1.7	0.12
27	9 6	21 31 27.53	15 27 43.7	0.5	1.7	0.12
28	9 2	21 31 21.71	15 28 10.2	0.5	1.7	0.12
29	8 58	21 31 16.05	15 28 36.0	0.5	1.7	0.12
30	8 54	21 31 10.55	15 29 1.0	0.5	1.7	0.12
Oct. 1	8 50	21 31 5.19	−15 29 25.1	0.5	1.7	0.12
2	8 46	21 31 0.00	15 29 48.4	0.5	1.7	0.12
3	8 42	21 30 54.98	15 30 11.1	0.5	1.7	0.12
4	8 38	21 30 50.11	15 30 32.9	0.5	1.7	0.12
5	8 34	21 30 45.41	15 30 53.8	0.5	1.7	0.12
6	8 30	21 30 40.86	−15 31 13.8	0.5	1.7	0.12
7	8 26	21 30 36.50	15 31 33.0	0.5	1.7	0.12
8	8 22	21 30 32.31	15 31 51.5	0.5	1.7	0.12
9	8 18	21 30 28.28	15 32 9.0	0.5	1.7	0.12
10	8 14	21 30 24.43	15 32 25.6	0.5	1.7	0.12
11	8 10	21 30 20.76	−15 32 41.4	0.5	1.7	0.12
12	8 6	21 30 17.28	15 32 56.3	0.5	1.7	0.12
13	8 2	21 30 13.98	15 33 10.3	0.5	1.7	0.12
14	7 58	21 30 10.86	15 33 23.3	0.5	1.7	0.12
15	7 54	21 30 7.92	15 33 35.5	0.5	1.7	0.12
16	7 50	21 30 5.17	−15 33 46.7	0.5	1.7	0.12
17	7 46	21 30 2.61	15 33 57.0	0.5	1.7	0.12
18	7 42	21 30 0.23	15 34 6.4	0.5	1.7	0.12
19	7 38	21 29 58.05	15 34 14.8	0.5	1.7	0.12
20	7 34	21 29 56.06	15 34 22.3	0.4	1.7	0.12
21	*7 30*	*21 29 54.26*	*−15 34 28.9*	*0.4*	*1.7*	*0.12*
22	*7 26*	*21 29 52.65*	*−15 34 34.5*	*0.4*	*1.7*	*0.12*

Date.	Wash. Mean Time.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.
	h m	h m s	° ′ ″	″
Oct. 22	7 26	21 29 52.65	−15 34 34.5	0.4
23	7 22	21 29 51.25	15 34 39.2	0.4
24	7 18	21 29 50.04	15 34 42.9	0.4
25	7 14	21 29 49.02	15 34 45.6	0.4
26	7 11	21 29 48.19	15 34 47.4	0.4
27	7 7	21 29 47.56	−15 34 48.3	0.4
28	7 3	21 29 47.13	15 34 48.2	0.4
29	6 59	21 29 46.90	15 34 47.2	0.4
30	6 55	21 29 46.87	15 34 45.2	0.4
31	6 51	21 29 47.03	15 34 42.2	0.4
Nov. 1	6 47	21 29 47.41	−15 34 38.3	0.4
2	6 43	21 29 47.97	15 34 33.4	0.4
3	6 39	21 29 48.73	15 34 27.6	0.4
4	6 35	21 29 49.70	15 34 20.8	0.4
5	6 31	21 29 50.86	15 34 13.1	0.4
6	6 27	21 29 52.23	−15 34 4.3	0.4
7	6 24	21 29 53.79	15 33 54.6	0.4
8	6 20	21 29 55.55	15 33 43.9	0.4
9	6 16	21 29 57.52	15 33 32.3	0.4
10	6 12	21 29 59.68	15 33 19.7	0.4
11	6 8	21 30 2.05	−15 33 6.1	0.4
12	6 4	21 30 4.62	15 32 51.6	0.4
13	6 0	21 30 7.39	15 32 36.1	0.4
14	5 56	21 30 10.35	15 32 19.6	0.4
15	5 52	21 30 13.52	15 32 2.2	0.4
16	5 48	21 30 16.89	−15 31 43.8	0.4
17	5 45	21 30 20.45	15 31 24.5	0.4
18	5 41	21 30 24.21	15 31 4.2	0.4
19	5 37	21 30 28.17	15 30 43.0	0.4
20	5 33	21 30 32.32	15 30 20.8	0.4
21	5 29	21 30 36.68	−15 29 57.7	0.4
22	5 25	21 30 41.23	15 29 33.7	0.4
23	5 22	21 30 45.96	15 29 8.8	0.4
24	5 18	21 30 50.88	15 28 43.0	0.4
25	5 14	21 30 55.99	15 28 16.2	0.4
26	5 10	21 31 1.29	−15 27 48.6	0.4
27	5 6	21 31 6.77	15 27 20.1	0.4
28	5 2	21 31 12.44	15 26 50.6	0.4
29	4 58	21 31 18.29	15 26 20.2	0.4
30	4 55	21 31 24.33	15 25 49.0	0.4
Dec. 1	4 51	21 31 30.55	−15 25 17.0	0.4
2	4 47	21 31 36.94	15 24 44.1	0.4
3	4 43	21 31 43.52	15 24 10.3	0.4
4	4 39	21 31 50.28	15 23 35.6	0.4
5	4 36	21 31 57.21	15 23 0.1	0.4
6	4 32	21 32 4.32	−15 22 23.7	0.4
7	4 28	21 32 11.59	−15 21 46.5	0.4

Stellar magnitude at opposition, in August, 1917, 6.0.

FOR TRANSIT AT WASHINGTON.

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	° ′ ″	″	″	s		h m	h m s	° ′ ″	″	″	s
8 25 33.79	+19 0 9.6	0.3	1.3	0.09	Feb. 15	10 38	8 20 25.84	+19 18 5.2	0.3	1.3	0.09
8 25 27.56	19 0 31.5	0.3	1.3	0.09	16	10 34	8 20 19.64	19 18 26.8	0.3	1.3	0.09
8 25 21.27	19 0 53.7	0.3	1.3	0.09	17	10 30	8 20 13.51	19 18 48.1	0.3	1.3	0.09
8 25 14.94	19 1 16.0	0.3	1.3	0.09	18	10 26	8 20 7.46	19 19 9.2	0.3	1.3	0.09
8 25 8.54	19 1 38.5	0.3	1.3	0.09	19	10 22	8 20 1.46	19 19 30.0	0.3	1.3	0.09
8 25 2.09	+19 2 1.3	0.3	1.3	0.09	20	10 18	8 19 55.54	+19 19 50.6	0.3	1.3	0.09
8 24 55.59	19 2 24.1	0.3	1.3	0.09	21	10 14	8 19 49.70	19 20 10.9	0.3	1.3	0.09
8 24 49.04	19 2 47.1	0.3	1.3	0.09	22	10 10	8 19 43.92	19 20 31.1	0.3	1.3	0.09
8 24 42.44	19 3 10.3	0.3	1.3	0.09	23	10 6	8 19 38.23	19 20 50.8	0.3	1.3	0.09
8 24 35.81	19 3 33.6	0.3	1.3	0.09	24	10 2	8 19 32.63	19 21 10.4	0.3	1.3	0.09
8 24 29.14	+19 3 57.0	0.3	1.3	0.09	25	9 58	8 19 27.10	+19 21 29.6	0.3	1.3	0.09
8 24 22.42	19 4 20.5	0.3	1.3	0.09	26	9 54	8 19 21.66	19 21 48.6	0.3	1.3	0.09
8 24 15.67	19 4 44.2	0.3	1.3	0.09	27	9 50	8 19 16.31	19 22 7.3	0.3	1.3	0.09
8 24 8.90	19 5 7.9	0.3	1.3	0.09	28	9 46	8 19 11.05	19 22 25.6	0.3	1.3	0.09
8 24 2.09	19 5 31.7	0.3	1.3	0.09	Mar. 1	9 42	8 19 5.88	19 22 43.6	0.3	1.3	0.09
8 23 55.26	+19 5 55.7	0.3	1.3	0.09	2	9 38	8 19 0.80	+19 23 1.4	0.3	1.3	0.09
8 23 48.39	19 6 19.7	0.3	1.3	0.09	3	9 34	8 18 55.82	19 23 18.8	0.3	1.3	0.09
8 23 41.51	19 6 43.9	0.3	1.3	0.09	4	9 30	8 18 50.93	19 23 35.9	0.3	1.3	0.09
8 23 34.60	19 7 8.0	0.3	1.3	0.09	5	9 26	8 18 46.15	19 23 52.7	0.3	1.3	0.09
8 23 27.69	19 7 32.1	0.3	1.3	0.09	6	9 22	8 18 41.47	19 24 9.1	0.3	1.3	0.09
8 23 20.77	+19 7 56.3	0.3	1.3	0.09	7	9 18	8 18 36.89	+19 24 25.2	0.3	1.3	0.09
8 23 13.84	19 8 20.6	0.3	1.3	0.09	8	9 14	8 18 32.41	19 24 40.9	0.3	1.3	0.09
8 23 6.90	19 8 44.8	0.3	1.3	0.09	9	9 10	8 18 28.05	19 24 56.4	0.3	1.3	0.09
8 22 59.95	19 9 9.0	0.3	1.3	0.09	10	9 6	8 18 23.79	19 25 11.4	0.3	1.3	0.09
8 22 53.01	19 9 33.3	0.3	1.3	0.09	11	9 2	8 18 19.63	19 25 26.0	0.3	1.3	0.09
8 22 46.07	+19 9 57.5	0.3	1.3	0.09	12	8 58	8 18 15.60	+19 25 40.3	0.3	1.3	0.09
8 22 39.13	19 10 21.7	0.3	1.3	0.09	13	8 54	8 18 11.67	19 25 54.3	0.3	1.3	0.09
8 22 32.19	19 10 45.9	0.3	1.3	0.09	14	8 50	8 18 7.85	19 26 7.9	0.3	1.3	0.09
8 22 25.27	19 11 10.0	0.3	1.3	0.09	15	8 46	8 18 4.15	19 26 21.1	0.3	1.3	0.09
8 22 18.37	19 11 34.1	0.3	1.3	0.09	16	8 42	8 18 0.56	19 26 33.9	0.3	1.3	0.09
8 22 11.49	+19 11 58.0	0.3	1.3	0.09	17	8 38	8 17 57.10	+19 26 46.3	0.3	1.3	0.09
8 22 4.62	19 12 21.9	0.3	1.3	0.09	18	8 34	8 17 53.76	19 26 58.4	0.3	1.3	0.09
8 21 57.78	19 12 45.7	0.3	1.3	0.09	19	8 30	8 17 50.53	19 27 10.0	0.3	1.3	0.09
8 21 50.96	19 13 9.4	0.3	1.3	0.09	20	8 26	8 17 47.41	19 27 21.2	0.3	1.3	0.09
8 21 44.18	19 13 32.9	0.3	1.3	0.09	21	8 22	8 17 44.43	19 27 32.0	0.3	1.3	0.09
8 21 37.42	+19 13 56.5	0.3	1.3	0.09	22	8 18	8 17 41.58	+19 27 42.4	0.3	1.3	0.09
8 21 30.69	19 14 19.9	0.3	1.3	0.09	23	8 14	8 17 38.85	19 27 52.4	0.3	1.3	0.09
8 21 24.01	19 14 43.1	0.3	1.3	0.09	24	8 10	8 17 36.24	19 28 2.0	0.3	1.2	0.09
8 21 17.36	19 15 6.2	0.3	1.3	0.09	25	8 6	8 17 33.77	19 28 11.1	0.3	1.2	0.09
8 21 10.75	19 15 29.2	0.3	1.3	0.09	26	8 2	8 17 31.43	19 28 19.8	0.3	1.2	0.09
8 21 4.18	+19 15 52.1	0.3	1.3	0.09	27	7 58	8 17 29.22	+19 28 28.1	0.3	1.2	0.09
8 20 57.65	19 16 14.7	0.3	1.3	0.09	28	7 54	8 17 27.13	19 28 36.1	0.3	1.2	0.09
8 20 51.18	19 16 37.2	0.3	1.3	0.09	29	7 50	8 17 25.18	19 28 43.6	0.3	1.2	0.09
8 20 44.76	19 16 59.5	0.3	1.3	0.09	30	7 46	8 17 23.36	19 28 50.6	0.3	1.2	0.09
8 20 38.40	19 17 21.6	0.3	1.3	0.09	31	7 42	8 17 21.68	19 28 57.2	0.3	1.2	0.09
8 20 32.10	+19 17 43.6	0.3	1.3	0.09	Apr. 1	7 38	8 17 20.12	+19 29 3.4	0.3	1.2	0.09
8 20 25.84	+19 18 5.2	0.3	1.3	0.09	2	7 34	8 17 18.70	+19 29 9.1	0.3	1.2	0.09

Stellar magnitude at opposition in January, 1917, 7.7.

FOR TRANSIT AT WASHINGTON.

Date.	Wash. Mean Time.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semidiam.	S. T. of Sem. Pass. Mer.
	h m	h m s	° ′ ″	″	″	s
Apr. 1	7 38	8 17 20.12	+19 29 3.4	0.3	1.2	0.09
2	7 34	8 17 18.70	19 29 9.1	0.3	1.2	0.09
3	7 30	8 17 17.41	19 29 14.4	0.3	1.2	0.09
4	7 26	8 17 16.25	19 29 19.3	0.3	1.2	0.09
5	7 22	8 17 15.23	19 29 23.7	0.3	1.2	0.09
6	7 18	8 17 14.35	+19 29 27.6	0.3	1.2	0.09
7	7 14	8 17 13.61	19 29 31.2	0.3	1.2	0.09
8	7 10	8 17 13.00	19 29 34.3	0.3	1.2	0.09
9	7 7	8 17 12.52	19 29 37.0	0.3	1.2	0.09
10	7 3	8 17 12.18	19 29 39.2	0.3	1.2	0.09
11	6 59	8 17 11.98	+19 29 41.1	0.3	1.2	0.09
12	6 55	8 17 11.92	19 29 42.5	0.3	1.2	0.09
13	6 51	8 17 11.99	19 29 43.3	0.3	1.2	0.09
14	6 47	8 17 12.20	19 29 43.7	0.3	1.2	0.09
15	6 43	8 17 12.54	19 29 43.7	0.3	1.2	0.09
16	6 39	8 17 13.03	+19 29 43.2	0.3	1.2	0.09
17	6 35	8 17 13.64	19 29 42.3	0.3	1.2	0.09
18	6 31	8 17 14.40	19 29 40.9	0.3	1.2	0.09
19	6 27	8 17 15.30	19 29 39.1	0.3	1.2	0.09
20	6 23	8 17 16.33	19 29 36.8	0.3	1.2	0.09
Oct. 20	18 40	8 37 25.29	+18 21 32.8	0.3	1.2	0.09
21	18 36	8 37 27.91	18 21 23.5	0.3	1.2	0.09
22	18 32	8 37 30.39	18 21 14.5	0.3	1.2	0.09
23	18 28	8 37 32.74	18 21 6.1	0.3	1.2	0.09
24	18 24	8 37 34.95	18 20 58.1	0.3	1.2	0.09
25	18 20	8 37 37.03	+18 20 50.6	0.3	1.2	0.09
26	18 17	8 37 38.98	18 20 43.7	0.3	1.2	0.09
27	18 13	8 37 40.79	18 20 37.3	0.3	1.2	0.09
28	18 9	8 37 42.46	18 20 31.4	0.3	1.2	0.09
29	18 5	8 37 43.99	18 20 26.0	0.3	1.2	0.09
30	18 1	8 37 45.39	+18 20 21.1	0.3	1.2	0.09
31	17 57	8 37 46.65	18 20 16.7	0.3	1.2	0.09
Nov. 1	17 53	8 37 47.77	18 20 12.8	0.3	1.2	0.09
2	17 49	8 37 48.75	18 20 9.4	0.3	1.2	0.09
3	17 45	8 37 49.59	18 20 6.6	0.3	1.2	0.09
4	17 41	8 37 50.30	+18 20 4.2	0.3	1.2	0.09
5	17 37	8 37 50.87	18 20 2.4	0.3	1.2	0.09
6	17 33	8 37 51.30	18 20 1.1	0.3	1.2	0.09
7	17 30	8 37 51.59	18 20 0.3	0.3	1.2	0.09
8	17 26	8 37 51.74	18 20 0.0	0.3	1.2	0.09
9	17 22	8 37 51.75	+18 20 0.3	0.3	1.2	0.09
10	17 18	8 37 51.62	18 20 1.0	0.3	1.2	0.09
11	17 14	8 37 51.36	18 20 2.3	0.3	1.2	0.09
12	17 10	8 37 50.95	18 20 4.1	0.3	1.2	0.09
13	17 6	8 37 50.41	18 20 6.5	0.3	1.2	0.09
14	*17 2*	*8 37 49.73*	+18 20 9.3	0.3	1.2	0.09
15	*16 58*	*8 37 48.91*	+18 20 12.7	0.3	1.2	0.09

Date.	Wash. Mean Time.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.
	h m	h m s	° ′ ″	″
Nov. 15	16 58	8 37 48.91	+18 20 12.7	0.3
16	16 54	8 37 47.95	18 20 16.6	0.3
17	16 50	8 37 46.85	18 20 21.0	0.3
18	16 46	8 37 45.62	18 20 25.9	0.3
19	16 42	8 37 44.25	18 20 31.3	0.3
20	16 38	8 37 42.75	+18 20 37.2	0.3
21	16 34	8 37 41.11	18 20 43.6	0.3
22	16 30	8 37 39.34	18 20 50.6	0.3
23	16 27	8 37 37.44	18 20 58.0	0.3
24	16 23	8 37 35.41	18 21 5.9	0.3
25	16 19	8 37 33.24	+18 21 14.3	0.3
26	16 15	8 37 30.94	18 21 23.2	0.3
27	16 11	8 37 28.52	18 21 32.6	0.3
28	16 7	8 37 25.97	18 21 42.5	0.3
29	16 3	8 37 23.29	18 21 52.7	0.3
30	15 59	8 37 20.48	+18 22 3.5	0.3
Dec. 1	15 55	8 37 17.55	18 22 14.7	0.3
2	15 51	8 37 14.49	18 22 26.4	0.3
3	15 47	8 37 11.31	18 22 38.5	0.3
4	15 43	8 37 8.01	18 22 51.1	0.3
5	15 39	8 37 4.59	+18 23 4.2	0.3
6	15 35	8 37 1.05	18 23 17.7	0.3
7	15 31	8 36 57.39	18 23 31.6	0.3
8	15 27	8 36 53.61	18 23 46.0	0.3
9	15 23	8 36 49.72	18 24 0.8	0.3
10	15 19	8 36 45.72	+18 24 16.0	0.3
11	15 15	8 36 41.60	18 24 31.6	0.3
12	15 11	8 36 37.37	18 24 47.6	0.3
13	15 7	8 36 33.03	18 25 4.1	0.3
14	15 3	8 36 28.59	18 25 20.9	0.3
15	14 59	8 36 24.04	+18 25 38.2	0.3
16	14 55	8 36 19.38	18 25 55.8	0.3
17	14 51	8 36 14.63	18 26 13.8	0.3
18	14 47	8 36 9.77	18 26 32.2	0.3
19	14 43	8 36 4.82	18 26 50.8	0.3
20	14 39	8 35 59.77	+18 27 9.9	0.3
21	14 35	8 35 54.62	18 27 29.3	0.3
22	14 31	8 35 49.39	18 27 49.1	0.3
23	14 27	8 35 44.06	18 28 9.1	0.3
24	14 23	8 35 38.66	18 28 29.5	0.3
25	14 19	8 35 33.17	+18 28 50.1	0.3
26	14 15	8 35 27.60	18 29 11.1	0.3
27	14 11	8 35 21.95	18 29 32.3	0.3
28	14 7	8 35 16.22	18 29 53.8	0.3
29	14 2	8 35 10.41	18 30 15.6	0.3
30	13 58	8 35 4.54	+18 30 37.8	0.3
31	13 54	8 34 58.58	+18 31 0.0	0.3

Stellar magnitude at opposition in January, 1917, 7.7.

PART III.

PHENOMENA.

In the year 1917 there will be seven eclipses, four of the Sun and three the Moon.

I.—*A Total Eclipse of the Moon*, 1917, January 7, visible at Washington the beginning visible generally in central and western Europe, northwest Africa, North and South America, and the central and eastern portions of the Pacific Ocean; the ending visible generally in North America, northwest South America, northern and northeastern Asia, and eastern Australia.

ELEMENTS OF THE ECLIPSE.

Greenwich mean time of ☍ in right ascension, January d 7 h 19 m 37 s 51.9

	h m s		s
Sun's right ascension	19 15 47.52	Hourly motion	10.92
Moon's right ascension	7 15 47.52	Hourly motion	126.02
	° ′ ″		′ ″
Sun's declination	−22 18 27.7	Hourly motion	+ 0 19.7
Moon's declination	+22 31 53.8	Hourly motion	− 6 34.0
Sun's equa. hor. parallax	8.9	Sun's true semidiameter	16 15.9
Moon's equa. hor. parallax	54 9.8	Moon's true semidiameter	14 44.8

CIRCUMSTANCES OF THE ECLIPSE.

		d h m	
Moon enters penumbra	Jan.	7 16 35.7	Greenwich Mean Time.
Moon enters shadow		7 17 50.4	
Total eclipse begins		7 19 0.4	
Middle of the eclipse		7 19 44.6	
Total eclipse ends		7 20 28.8	
Moon leaves shadow		7 21 38.6	
Moon leaves penumbra		7 22 52.7	

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	117 to E.	+ 86 48	+22 43
Last	91 to W.	+142 0	+22 18

Magnitude of the eclipse=1.369 (Moon's diameter=1.0).

II.—*A Partial Eclipse of the Sun*, 1917, January 22, invisible at Washington.

ELEMENTS OF THE ECLIPSE.

Greenwich mean time of ☌ in right ascension, January d 22 h 20 m 8 s 29.8

	h m s		s s
Sun and Moon's R. A	20 20 15.52	Hourly motions	10.51 and 152.97
	° ′ ″		′ ″
Sun's declination	19 32 52.6	Hourly motion	+ 0 34.9
Moon's declination	18 18 23.6	Hourly motion	+12 3.2
Sun's equa. hor. parallax	8.9	Sun's true semidiameter	16 14.8
Moon's equa. hor. parallax	61 26.7	Moon's true semidiameter	16 43.7

CIRCUMSTANCES OF THE ECLIPSE.

		Greenwich Mean Time.	Longitude from Greenwich.	Latitude.
		d h m	° ′	° ′
Eclipse begins	Jan.	22 17 43.4	−18 2.1	+28 1.6
Greatest eclipse		22 19 28.3	−25 42.7	+63 15.2
Eclipse ends		22 21 13.0	−95 56.2	+60 28.0

Magnitude of greatest eclipse=0.725 (Sun's diameter=1.0).

III.—*A Partial Eclipse of the Sun*, 1917, June 18–19, invisible at Washington.

ELEMENTS OF THE ECLIPSE.

Greenwich mean time of ☌ in right ascension, June d 19 h 1 m 4 s 37.1

	h m s		s
Sun and Moon's R. A.	5 49 44.49	Hourly motions	10.40 and 137.78
	° ′ ″		′ ″
Sun's declination	+23 25 46.2	Hourly motion	+ 0 2.5
Moon's declination	+24 37 15.9	Hourly motion	− 2 15.1
Sun's equa. hor. parallax	8.7	Sun's true semidiameter	15 44.3
Moon's equa. hor. parallax	55 34.9	Moon's true semidiameter	15 8.0

CIRCUMSTANCES OF THE ECLIPSE.

	Greenwich Mean Time.	Longitude from Greenwich.	Latitude.
	d h m	° ′	° ′
Eclipse begins	June 18 23 36.0	+118 43.2	+52 54.9
Greatest eclipse	19 1 16.2	−150 6.0	+66 10.5
Eclipse ends	19 2 56.5	− 72 35.0	+45 48.3

Magnitude of greatest eclipse=0.473 (Sun's diameter=1.0).

IV.—*A Total Eclipse of the Moon*, 1917, July 4, invisible at Washington; beginning visible generally in Asia except the northeastern portion, Australia, Africa, Europe except the northwestern portions, and the south Atlantic ocean; the ending visible generally in western Australia, southwestern Asia, Europe, Africa, and South America.

ELEMENTS OF THE ECLIPSE.

Greenwich mean time of ☍ in right ascension, July d 4 h 9 m 41 s 46.3

	h m s		s
Sun's right ascension	6 53 27.05	Hourly motion	10.30
Moon's right ascension	18 53 27.05	Hourly motion	157.11
	° ′ ″		′ ″
Sun's declination	+22 52 53.9	Hourly motion	− 0 13.1
Moon's declination	−22 44 11.1	Hourly motion	+ 6 45.3
Sun's equa. hor. parallax	8.7	Sun's true semidiameter	15 43.9
Moon's equa. hor. parallax	60 17.1	Moon's true semidiameter	16 24.8

CIRCUMSTANCES OF THE ECLIPSE.

		d	h	m	
Moon enters penumbra	July	4	6	55.8	Greenwich Mean Time.
Moon enters shadow		4	7	52.2	
Total eclipse begins		4	8	50.6	
Middle of the eclipse		4	9	38.9	
Total eclipse ends		4	10	27.2	
Moon leaves shadow		4	11	25.4	
Moon leaves penumbra		4	12	21.3	

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	87 to E.	−61 52	−22 56
Last	109 to W.	−10 45	−22 32

Magnitude of the eclipse=1.625 (Moon's diameter=1.0).

V.—*A Partial Eclipse of the Sun*, 1917, July 18, invisible at Washington

ELEMENTS OF THE ECLIPSE.

Greenwich mean time of δ in right ascension, July 18 d 15 h 34 m 16.6 s

Sun and Moon's R. A.	7 h 51 m 28.79 s		Hourly motions	10.05 s and 123.17 s	
Sun's declination	+20 ° 58 ′ 48.8 ″		Hourly motion	− 0 ′ 26.6 ″	
Moon's declination	+19 33 20.4		Hourly motion	− 8 12.7	
Sun's equa. hor. parallax	8.7		Sun's true semidiameter	15 44.3	
Moon's equa. hor. parallax	54 28.4		Moon's true semidiameter	14 49.9	

CIRCUMSTANCES OF THE ECLIPSE.

		Greenwich Mean Time. d h m	Longitude from Greenwich. ° ′	Latitude. ° ′
Eclipse begins	July	18 13 56.5	− 93 30.7	−53 24.3
Greatest eclipse		18 14 42.5	−101 52.2	−63 43.5
Eclipse ends		18 15 28.3	−124 27.5	−68 56.6

Magnitude of greatest eclipse=0.086 (Sun's diameter=1.0).

VI.—*An Annular Eclipse of the Sun*, 1917, December 13, invisible at Washington.

ELEMENTS OF THE ECLIPSE.

Greenwich mean time of δ in right ascension, December 13 d 21 h 23 m 24.0 s

Sun and Moon's R. A.	17 h 24 m 27.34 s		Hourly motions	11.05 s and 149.88 s	
Sun's declination	−23 ° 11 ′ 54.5 ″		Hourly motion	− 0 ′ 9.4 ″	
Moon's declination	−24 4 57.9		Hourly motion	+ 1 0.1	
Sun's equa. hor. parallax	8.9		Sun's true semidiameter	16 15.0	
Moon's equa. hor. parallax	58 2.5		Moon's true semidiameter	15 48.2	

CIRCUMSTANCES OF THE ECLIPSE.

		Greenwich Mean Time. d h m	Longitude from Greenwich. ° ′	Latitude. ° ′
Eclipse begins	Dec.	13 19 9.7	+ 36 6.9	−34 48.4
Central eclipse begins		13 20 43.8	+ 87 52.7	−59 1.9
Central eclipse at local apparent midnight		13 21 23.4	+142 12.8	−89 56.6
Central eclipse ends		13 22 10.5	−155 41.2	−56 7.8
Eclipse ends		13 23 44.5	−107 27.1	−31 1.9

I.—*A Total Eclipse of the Moon*, 1917, December 27, visible at Wash- the beginning visible generally in North and South America, through- Pacific Ocean, and the extreme northeastern portion of Asia; the visible generally in North America, throughout the Pacific Ocean, in Asia, and Australia.

ELEMENTS OF THE ECLIPSE.

Greenwich mean time of ☍ in right ascension, December 27 d 21 h 53 m 49.2 s

	h m s				s
n's right ascension	18 26 39.29		Hourly motion		11.08
on's right ascension	6 26 39.29		Hourly motion		138.74
	° ′ ″			′	″
n's declination	−23 18 30.5		Hourly motion	+ 0	7.1
on's declination	+22 52 58.5		Hourly motion	4	26.5
n's equa. hor. parallax	8.9		Sun's true semidiameter	16	15.9
on's equa. hor. parallax	56 20.1		Moon's true semidiameter	15	20.3

CIRCUMSTANCES OF THE ECLIPSE.

		d	h	m	
on enters penumbra	Dec.	27	18	53.5	Greenwich Mean Time.
on enters shadow		27	20	5.1	
otal eclipse begins		27	21	38.1	
iddle of the eclipse		27	21	46.3	
otal eclipse ends		27	21	54.6	
on leaves shadow		27	23	27.4	
on leaves penumbra		27	24	38.8	

ntacts of Shadow ith Moon's Limb.	Angles of Position from the North Point.	The Moon being in the Zenith in Longitude from Greenwich	and in Latitude
	°	° ′	° ′
First	72 to E.	+121 52	+23 1
Last	55 to W.	+170 39	+22 46

Magnitude of the eclipse=1.011 (Moon's diameter=1.0).

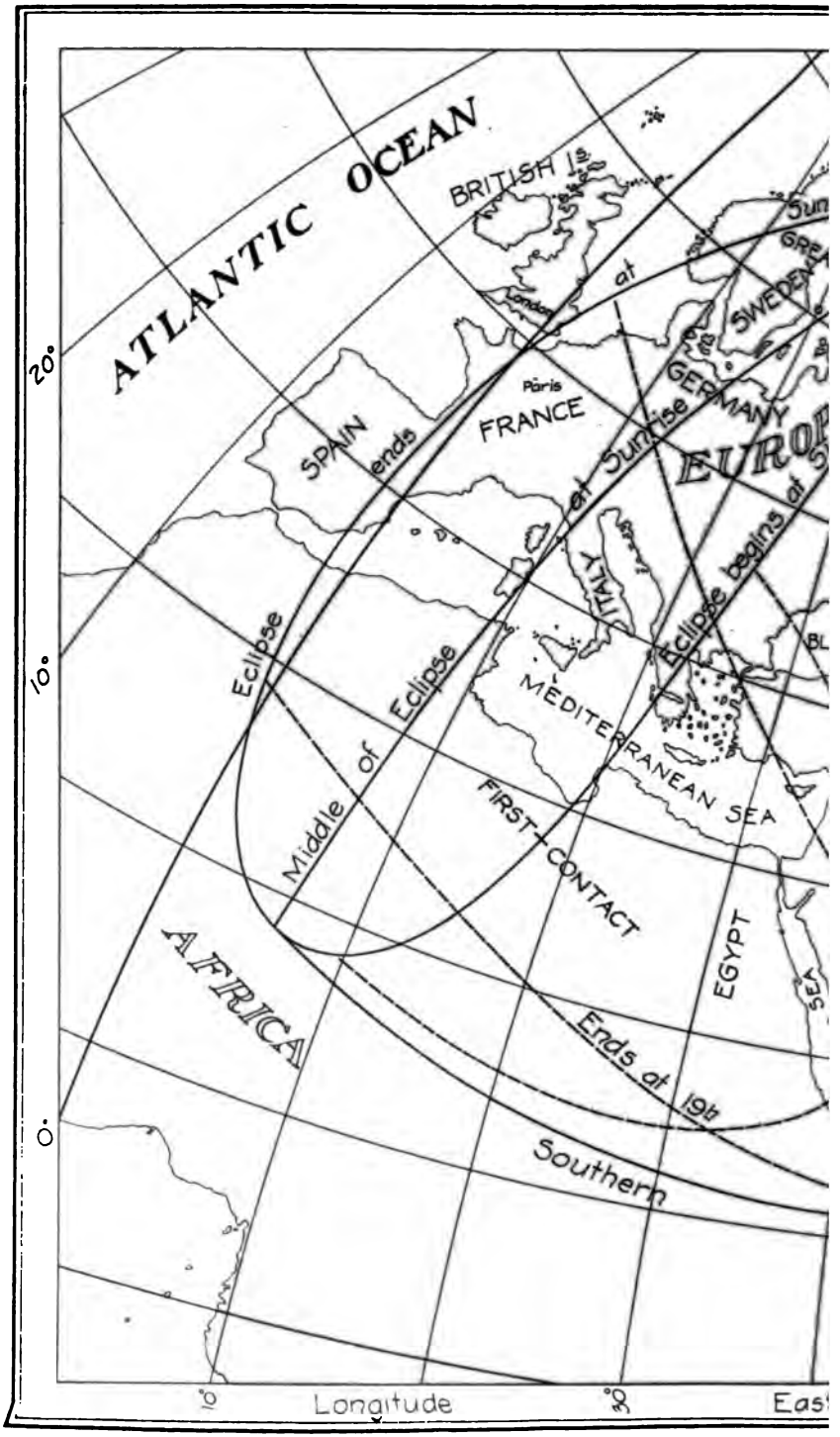
e regions within which the first, second, and fourth eclipses of the Sun ble are laid down on the accompanying charts, from which, by means lotted lines, the Greenwich mean times of beginning and ending at any ay be found with an uncertainty which will vary from three or four s for a high Sun to fifteen or twenty minutes when the Sun is near izon.

BESSELIAN ELEMENTS OF THE PARTIAL ECLIPSE OF THE 1917, JANUARY 22.

Greenwich Mean Time.	Coordinates of Center of Shadow on Fundamental Plane.		Direction of Axis of Shadow.			R Pen Fun
	x	y	Log sin d	Log cos d	μ	
h m					° ′	
17 40	−1.36546	+0.75266	−9.52507	+9.97415	262 1.8	+0.
50	1.27351	0.78377	9.52504	9.97415	264 31.8	0.
18 0	−1.18156	+0.81488	−9.52501	+9.97416	267 1.8	+0.
10	1.08961	0.84600	9.52497	9.97416	269 31.7	0.
20	0.99765	0.87713	9.52494	9.97416	272 1.7	0.
30	0.90570	0.90826	9.52491	9.97417	274 31.7	0.
40	0.81374	0.93939	9.52487	9.97417	277 1.7	0.
50	0.72179	0.97053	9.52484	9.97418	279 31.7	0.
19 0	−0.62983	+1.00167	−9.52481	+9.97418	282 1.7	+0
10	0.53788	1.03282	9.52478	9.97419	284 31.7	0
20	0.44593	1.06397	9.52474	9.97419	287 1.7	0
30	0.35397	1.09513	9.52471	9.97419	289 31.6	0
40	0.26202	1.12629	9.52468	9.97420	292 1.6	0
50	0.17007	1.15746	9.52465	9.97420	294 31.6	0
20 0	−0.07812	+1.18863	−9.52461	+9.97421	297 1.6	+0
10	+0.01382	1.21980	9.52458	9.97421	299 31.6	0
20	0.10577	1.25098	9.52455	9.97421	302 1.6	0
30	0.19771	1.28216	9.52451	9.97422	304 31.6	0
40	0.28964	1.31335	9.52448	9.97422	307 1.6	0
50	0.38158	1.34454	9.52445	9.97423	309 31.5	0
21 0	+0.47351	+1.37573	−9.52442	+9.97423	312 1.5	+0
10	0.56544	1.40693	9.52438	9.97423	314 31.5	0.
20	+0.65737	+1.43813	−9.52435	+9.97424	317 1.5	+0.

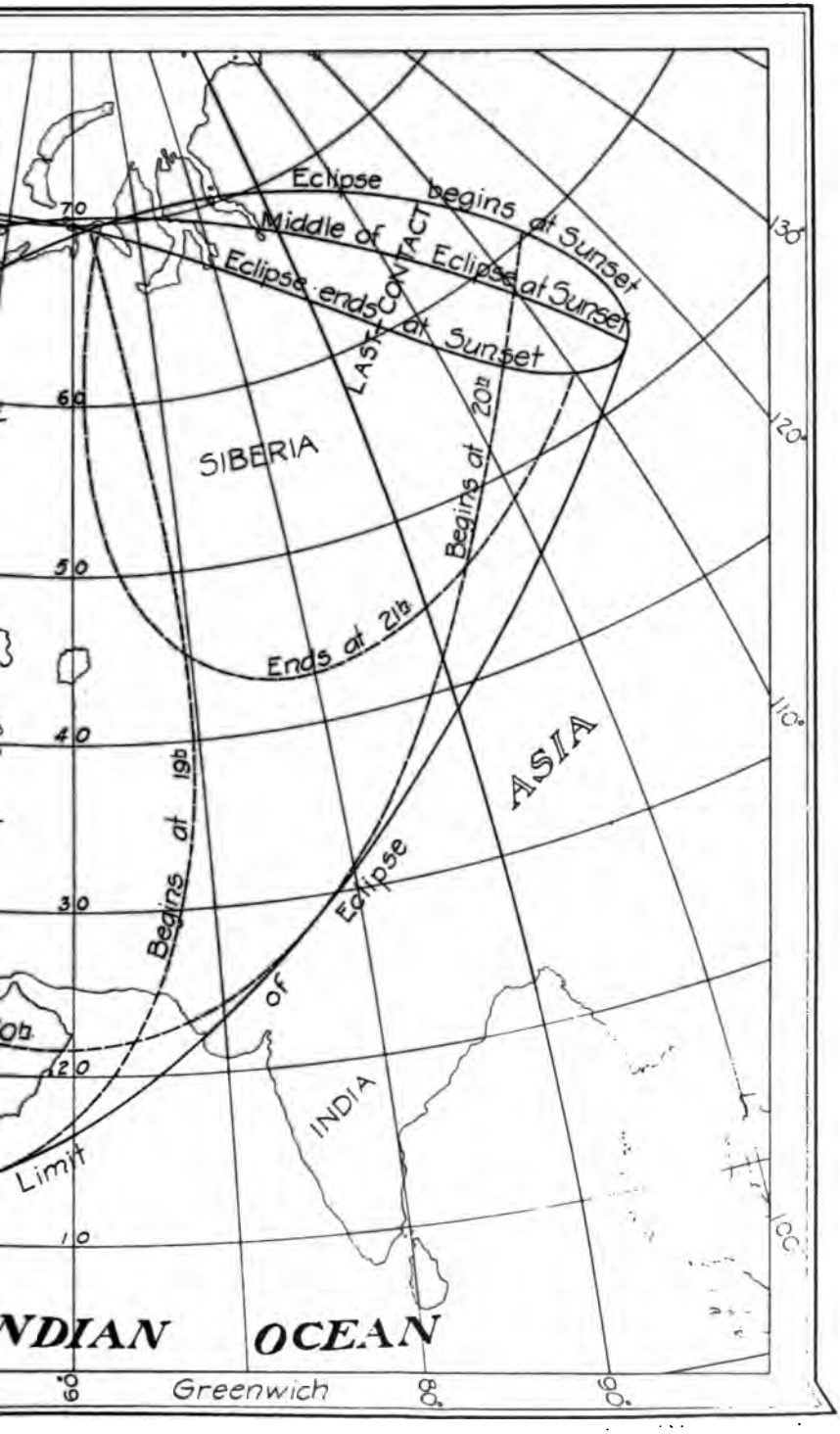
Greenwich Mean Time.	Log x' for 1 Minute.	Log y' for 1 Minute.	Log μ' for 1 Minute.	Log Tangent of Cone. Penumbr
h m				
17 0	+7.9635	+7.4925	+1.1761	+7.6766
18 0	7.9636	7.4930	1.1761	7.6766
19 0	7.9636	7.4934	1.1761	7.6766
20 0	7.9635	7.4938	1.1761	7.6766
21 0	7.9635	7.4941	1.1761	7.6766
22 0	+7.9633	+7.4943	+1.1761	+7.6766

PARTIAL ECLIPS



Note:- The hours of begin

UARY 22nd 1917



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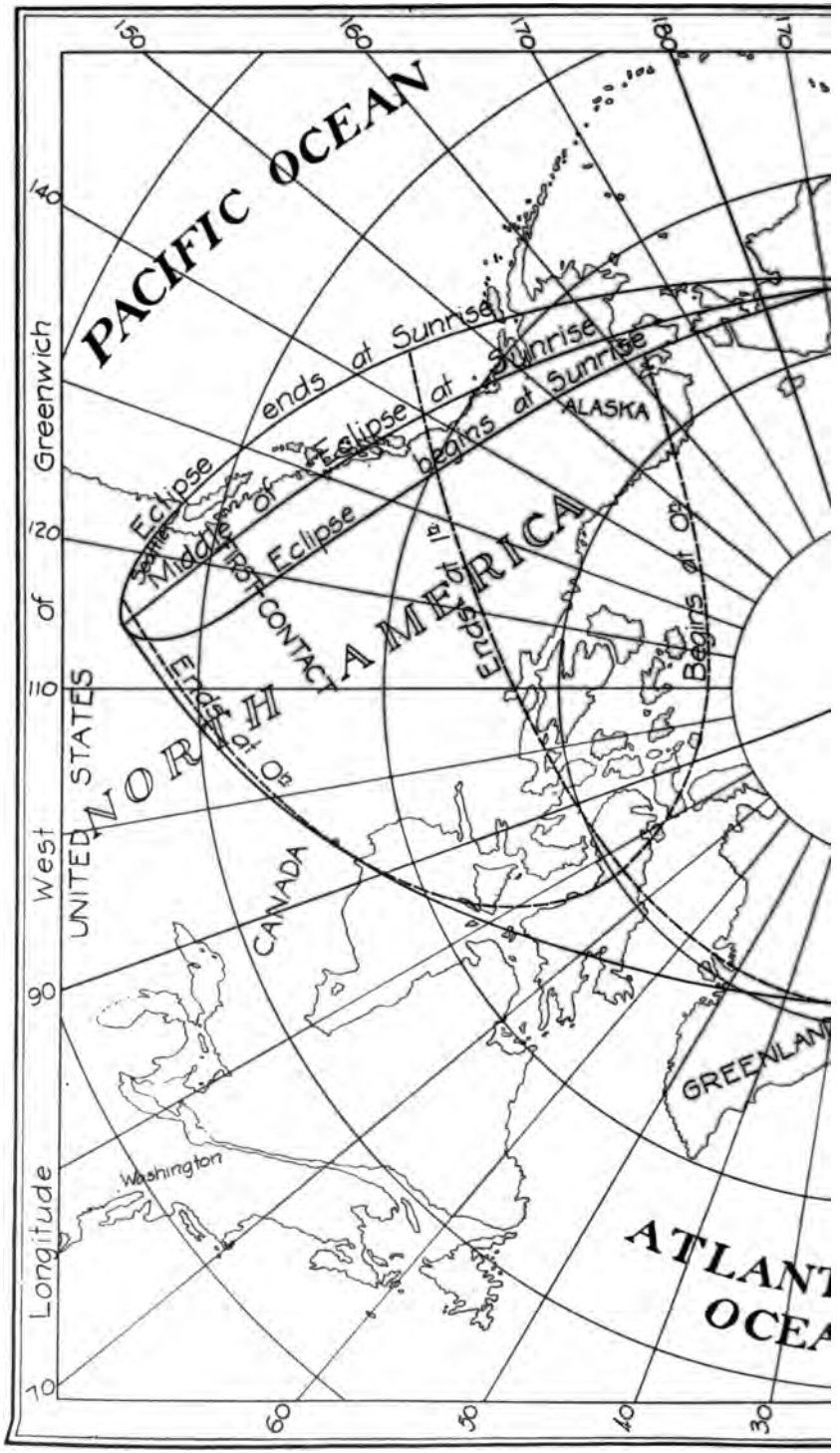
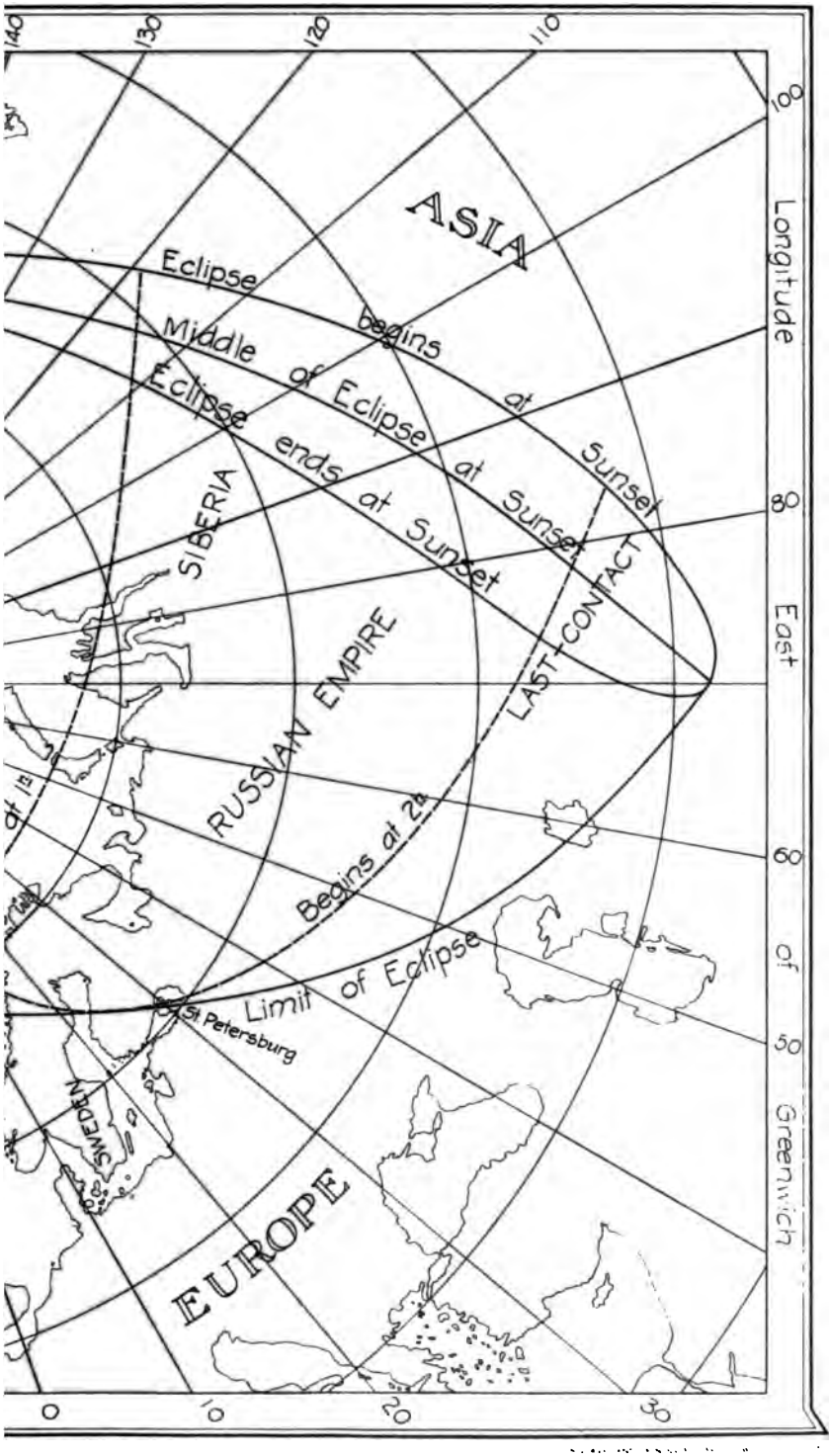
PARTIAL ECl



Note: The hours of beginn

JUNE 18th-19th 1917.



essed in Greenwich Mean Time.

LIAN ELEMENTS OF THE PARTIAL ECLIPSE OF THE SUN, 1917, JUNE 18–19.

h e.	Coordinates of Center of Shadow on Fundamental Plane.		Direction of Axis of Shadow.			Radius of Penumbra on Fundamental Plane.
	x	y	Log sin d	Log cos d	μ	l
					° ′	
	−0.82353	+1.35363	+9.59939	+9.96264	352 15.0	+0.55664
	0.73650	1.34691	9.59939	9.96264	354 45.0	0.55666
	0.64946	1.34019	9.59940	9.96264	357 15.0	0.55668
	−0.56242	+1.33345	+9.59940	+9.96264	359 45.0	+0.55670
	0.47538	1.32670	9.59940	9.96264	2 15.0	0.55672
	0.38834	1.31993	9.59940	9.96264	4 45.0	0.55674
	0.30131	1.31316	9.59941	9.96264	7 14.9	0.55676
	0.21427	1.30637	9.59941	9.96264	9 44.9	0.55678
	0.12723	1.29958	9.59941	9.96264	12 14.9	0.55680
	−0.04020	+1.29277	+9.59941	+9.96264	14 44.9	+0.55682
	+0.04683	1.28594	9.59942	9.96264	17 14.9	0.55683
	0.13387	1.27911	9.59942	9.96264	19 44.9	0.55685
	0.22089	1.27227	9.59942	9.96264	22 14.9	0.55687
	0.30792	1.26541	9.59942	9.96264	24 44.9	0.55688
	0.39495	1.25854	9.59942	9.96264	27 14.9	0.55690
	+0.48197	+1.25166	+9.59943	+9.96264	29 44.9	+0.55691
	0.56899	1.24477	9.59943	9.96264	32 14.9	0.55692
	0.65601	1.23787	9.59943	9.96264	34 44.8	0.55694
	0.74302	1.23095	9.59943	9.96264	37 14.8	0.55695
	0.83004	1.22403	9.59944	9.96264	39 44.8	0.55696
	0.91704	1.21709	9.59944	9.96264	42 14.8	0.55697
	+1.00405	+1.21014	+9.59944	+9.96263	44 44.8	+0.55699

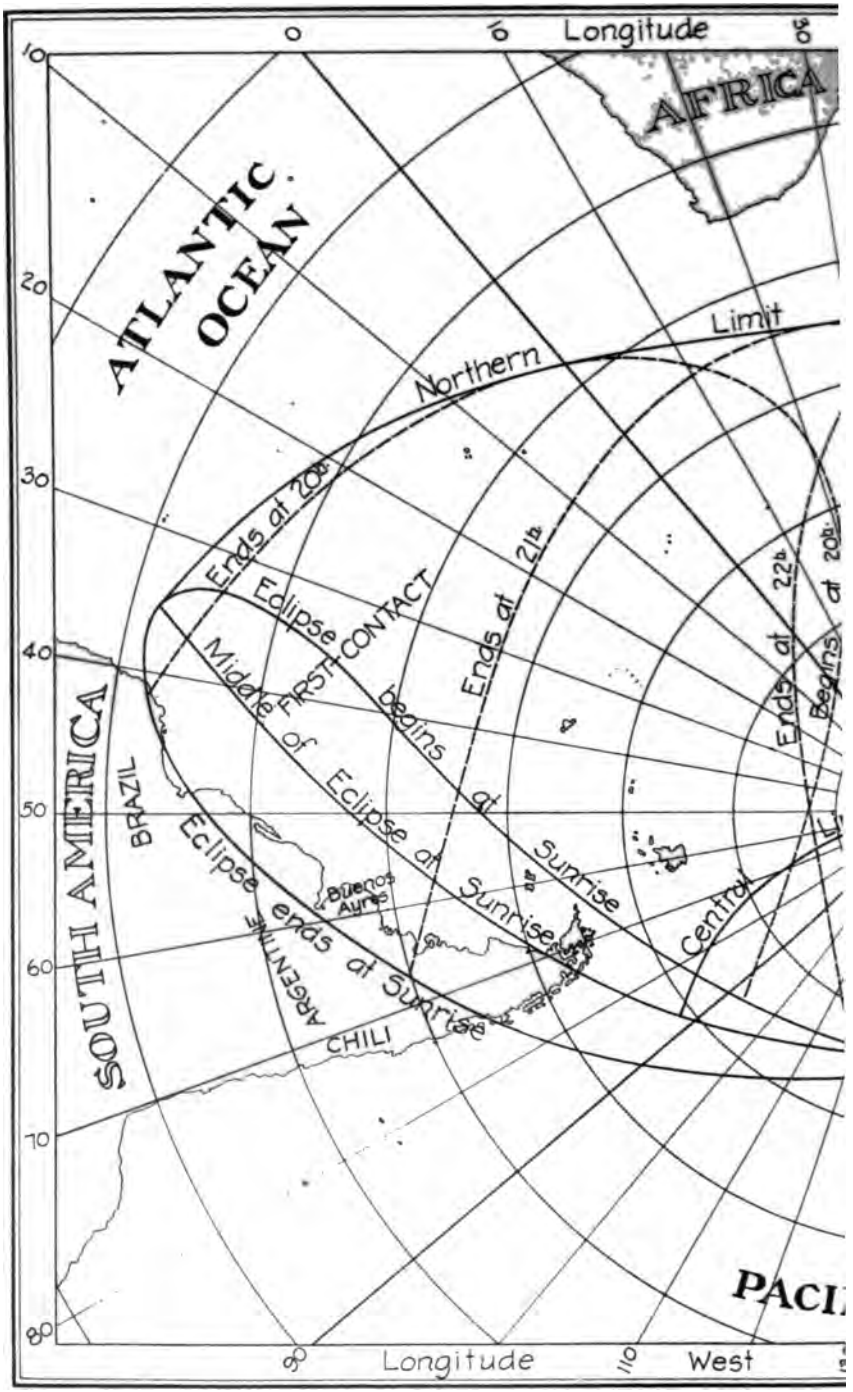
ch ne.	Log x' for 1 Minute.	Log y' for 1 Minute.	Log n' for 1 Minute.	Log Tangent of Angle of Cone. Penumbra.
	+7.9397	−6.8243	+1.1761	+7.66289
	7.9397	6.8290	1.1761	7.66289
	7.9397	6.8335	1.1761	7.66289
	7.9396	6.8380	1.1761	7.66289
	+7.9395	−6.8423	+1.1761	+7.66289

BESSELIAN ELEMENTS OF THE PARTIAL ECLIPSE OF THE 1917, JULY 18.

Greenwich Mean Time.	Coordinates of Center of Shadow on Fundamental Plane.		Direction of Axis of Shadow.			Ra Pen Fun
	x	y	Log sin d	Log cos d	μ	
h m					° ′	
13 50	−0.85266	−1.32437	+9.55426	+9.97016	205 59.5	+(
14 0	−0.77088	−1.34822	+9.55423	+9.97017	208 29.5	+(
10	0.68911	1.37206	9.55421	9.97017	210 59.6	(
20	0.60734	1.39591	9.55419	9.97017	213 29.6	(
30	0.52556	1.41977	9.55416	9.97018	215 59.6	(
40	0.44379	1.44362	9.55414	9.97018	218 29.6	(
50	0.36202	1.46748	9.55412	9.97018	220 59.6	(
15 0	−0.28025	−1.49135	+9.55409	+9.97019	223 29.6	+(
10	0.19849	1.51522	9.55407	9.97019	225 59.6	(
20	0.11672	1.53909	9.55405	9.97019	228 29.6	(
30	−0.03496	−1.56297	+9.55402	+9.97020	230 59.6	+(

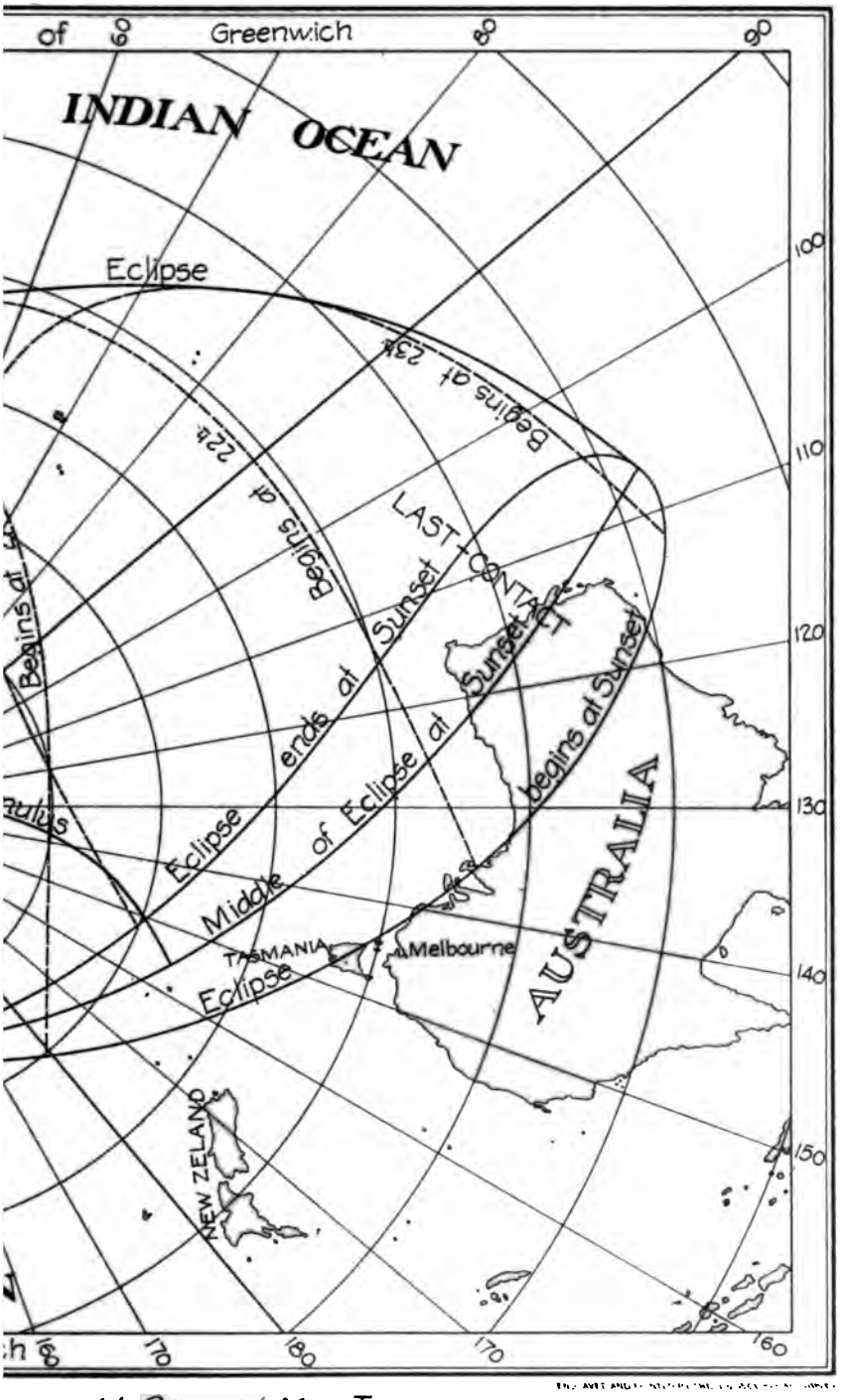
Greenwich Mean Time.	Log x' for 1 Minute.	Log y' for 1 Minute.	Log μ' for 1 Minute.	Log Tangent of Con Penumb
h m				
13 0	+7.9126	−7.3769	+1.1761	+7.66
14 0	7.9126	7.3774	1.1761	7.66
15 0	7.9126	7.3778	1.1761	7.66
16 0	+7.9125	−7.3782	+1.1761	+7.66

ANNULAR ECLIP

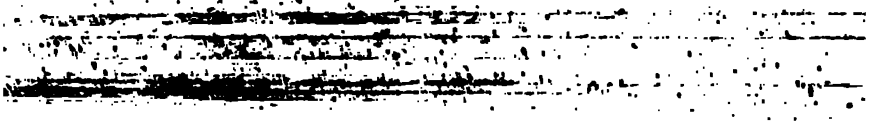


Note:- The hours of beginning

CEMBER 13th 1917



pressed in Greenwich Mean Time.



[AN ELEMENTS OF THE ANNULAR ECLIPSE OF THE SUN, 1917, DECEMBER 13.

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	l_1	l_2
				° ′		
−1.30792	−0.96399	−9.59525	+9.96341	286 22.3	+0.55386	+0.00791
1.21673	0.96076	9.59526	9.96341	288 52.3	0.55385	0.00790
1.12554	0.95751	9.59527	9.96341	291 22.3	0.55384	0.00788
1.03434	0.95425	9.59528	9.96341	293 52.2	0.55383	0.00787
0.94314	0.95098	9.59528	9.96341	296 22.2	0.55382	0.00786
0.85194	0.94770	9.59529	9.96341	298 52.2	0.55380	0.00785
−0.76073	−0.94440	−9.59530	+9.96340	301 22.1	+0.55379	+0.00783
0.66952	0.94110	9.59531	9.96340	303 52.1	0.55377	0.00782
0.57831	0.93778	9.59532	9.96340	306 22.0	0.55376	0.00780
0.48710	0.93445	9.59532	9.96340	308 52.0	0.55374	0.00779
0.39588	0.93111	9.59533	9.96340	311 22.0	0.55373	0.00777
0.30467	0.92775	9.59534	9.96340	313 51.9	0.55371	0.00775
−0.21345	−0.92438	−9.59535	+9.96340	316 21.9	+0.55369	+0.00774
0.12223	0.92101	9.59535	9.96339	318 51.9	0.55367	0.00772
−0.03101	0.91762	9.59536	9.96339	321 21.8	0.55365	0.00770
+0.06021	0.91421	9.59537	9.96339	323 51.8	0.55363	0.00768
0.15143	0.91080	9.59538	9.96339	326 21.8	0.55361	0.00766
0.24265	0.90737	9.59539	9.96339	328 51.7	0.55359	0.00764
+0.33388	−0.90394	−9.59539	+9.96339	331 21.7	+0.55357	+0.00762
0.42510	0.90049	9.59540	9.96339	333 51.7	0.55355	0.00759
0.51632	0.89703	9.59541	9.96338	336 21.6	0.55353	0.00757
0.60754	0.89355	9.59542	9.96338	338 51.6	0.55350	0.00755
0.69876	0.89007	9.59542	9.96338	341 21.6	0.55348	0.00752
0.78998	0.88657	9.59543	9.96338	343 51.5	0.55345	0.00750
+0.88120	−0.88307	−9.59544	+9.96338	346 21.5	+0.55343	+0.00747
0.97242	0.87955	9.59545	9.96338	348 51.5	0.55340	0.00745
1.06363	0.87602	9.59546	9.96338	351 21.4	0.55337	0.00742
1.15485	0.87247	9.59546	9.96337	353 51.4	0.55335	0.00739
1.24606	0.86892	9.59547	9.96337	356 21.3	0.55332	0.00736
+1.33727	−0.86535	−9.59548	+9.96337	358 51.3	+0.55329	+0.00734

Log x' for 1 Minute.	Log y' for 1 Minute.	Log μ' for 1 Minute.	Log Tangents of Angles of Cones.	
			Penumbra.	Shadow.
+7.9599	+6.5090	+1.1760	+7.67678	+7.67461
7.9600	6.5186	1.1760	7.67678	7.67461
7.9601	6.5279	1.1760	7.67678	7.67461
7.9601	6.5370	1.1760	7.67678	7.67461
7.9601	*6.5457*	1.1760	7.67678	7.67461
+7.9600	*+6.5544*	+1.1760	+7.67678	+7.67462

MEAN PLACES FOR 1917.0. (January 0^d.431, Greenwich.)

	Name of Star.	Magnitude.	Right Ascension.	Annual Proper Motion.	Declination.	A Prop
			h m s	s	° ′ ″	
36	Piscium	6.2	0 12 18.061	−0.0027	+ 7 46 46.28	
d	Piscium	5.4	0 16 19.561	+0.0003	7 43 45.86	
136 B.	Piscium	6.5	0 36 54.451	−0.0084	8 54 8.23	
58	Piscium	5.7	0 42 41.549	+0.0033	11 31 17.34	
75	Piscium	6.3	1 2 11.506	+0.0012	12 30 41.64	
η	Piscium	3.7	1 27 2.336	+0.0015	+14 55 6.06	
101	Piscium	6.2	1 31 20.025	+0.0010	14 14 15.15	
105	Piscium	6.1	1 35 11.944	+0.0053	15 59 6.69	
3	Arietis	6.4	1 42 4.759	+0.0031	16 59 51.57	
4	Arietis	5.8	1 43 40.616	+0.0035	16 32 34.23	
ε	Arietis	5.1	1 52 48.778	+0.0021	+17 24 45.99	
35 B.	Arietis	6.4	1 59 9.265	−0.0008	17 51 17.54	
47 B.	Arietis	6.5	2 3 12.281	−0.0037	17 38 4.20	
20 H^1.	Arietis	6.4	2 4 49.346	+0.0112	16 50 8.00	
15	Arietis	5.9	2 6 1.337	+0.0059	19 6 33.12	
θ	Arietis	5.6	2 13 30.336	−0.0007	+19 31 4.04	
26	Arietis	6.2	2 25 58.908	+0.0050	19 29 15.37	
μ	Arietis	5.7	2 37 40.977	+0.0023	19 39 30.88	
47	Arietis	5.8	2 53 19.960	+0.0160	20 20 12.17	
ε	Arietis (*mean*)	4.6	2 54 27.735	−0.0009	21 0 32.67	
ζ	Arietis	5.0	3 10 7.630	−0.0019	+20 44 15.26	
τ	Arietis	5.2	3 16 25.929	+0.0023	20 50 54.99	
63	Arietis	5.2	3 17 58.432	−0.0032	20 26 45.94	
65	Arietis	6.0	3 19 38.782	+0.0006	20 30 35.22	
66	Arietis	6.1	3 23 35.276	+0.0006	22 31 7.40	
7	Tauri	5.9	3 29 31.506	+0.0013	+24 11 12.88	
16	Tauri	5.4	3 39 51.960	+0.0009	24 1 45.17	
17	Tauri	3.8	3 39 56.601	+0.0016	23 51 11.68	
18	Tauri	5.6	3 40 12.351	+0.0004	24 34 47.38	
q	Tauri	4.3	3 40 15.798	+0.0010	24 12 28.48	
20	Tauri	4.1	3 40 53.075	+0.0016	+24 6 33.49	
21	Tauri	5.8	3 40 57.563	+0.0012	24 17 46.73	
22	Tauri	6.5	3 41 6.003	+0.0006	24 16 11.48	
23	Tauri	4.3	3 41 23.796	+0.0017	23 41 26.18	
η	Tauri	3.0	3 42 32.843	+0.0016	23 50 57.71	
104 B.	Tauri	5.5	3 43 25.782	+0.0008	+23 10 1.59	
27	Tauri	3.7	3 44 13.414	+0.0013	23 48 1.89	
28	Tauri	5.2	3 44 14.703	+0.0009	23 53 2.52	
133 B.	Tauri	5.9	3 45 2.197	+0.0025	21 59 33.63	
32	Tauri	5.8	3 51 57.597	+0.0045	22 14 23.34	
33	Tauri	6.0	3 52 8.478	+0.0026	+22 56 7.97	
161 B.	Tauri	6.5	3 56 1.098	+0.0027	22 58 4.20	
36	Tauri	5.6	3 59 23.644	+0.0001	23 52 41.81	
192 B.	Tauri	6.1	4 7 55.709	−0.0016	22 12 3.44	
χ	Tauri	5.3	4 17 31.756	+0.0028	25 26 3.70	
62	Tauri	6.1	4 18 59.363	+0.0008	+24 6 30.79	
υ	Tauri	4.2	4 21 20.313	+0.0079	22 37 34.72	
72	Tauri	5.4	4 22 19.497	+0.0004	22 48 37.13	
284 B.	Tauri	6.0	4 31 29.183	+0.0109	23 10 19.34	
τ	Tauri	4.3	4 37 15.692	+0.0007	22 47 55.34	
95	Tauri	6.2	4 38 12.128	+0.0014	+23 55 57.12	

AN PLACES FOR 1917.0. (January 0^d.431, Greenwich.)

of Star.	Magnitude.	Right Ascension.	Annual Proper Motion.	Declination.	Annual Proper Motion.
		h m s	s	° ′ ″	″
. . .	6.2	4 40 41.687	+0.0005	+23 28 36.43	+0.004
. . .	6.3	4 51 12.205	−0.0001	24 27 37.89	−0.033
. . .	6.0	4 52 46.381	+0.0003	23 49 11.34	−0.035
. . .	5.6	4 53 4.532	+0.0023	24 55 23.31	−0.061
. . .	5.5	5 3 3.077	+0.0003	24 9 22.94	−0.021
. . .	5.4	5 24 9.974	+0.0015	+25 5 3.37	−0.038
. . .	5.1	5 30 22.901	+0.0010	23 59 7.42	−0.031
. . .	5.1	5 34 35.552	+0.0018	25 51 5.78	−0.029
. . .	6.0	5 38 17.090	+0.0011	23 9 56.91	−0.042
. . .	5.0	5 43 55.306	0.0000	24 32 26.80	−0.023
. . .	5.8	5 51 51.154	....	+24 14 18.91	. . .
. . .	4.7	5 52 50.641	0.0000	25 56 40.93	−0.007
norum . .	4.3	5 59 4.505	+0.0002	23 16 7.83	−0.109
norum . .	5.6	6 4 41.651	+0.0014	23 7 41.32	+0.001
norum . .	5.9	6 6 26.941	+0.0011	24 26 22.44	−0.061
norum . .	6.3	6 7 17.244	+0.0007	+22 55 41.85	−0.013
norum (*var.*) .	3.2	6 9 52.098	−0.0038	22 31 54.92	−0.016
norum . .	6.1	6 11 14.787	−0.0009	23 59 52.01	−0.026
norum . .	6.2	6 11 54.920	+0.0004	23 46 12.13	−0.008
norum . .	3.2	6 17 56.386	+0.0046	22 33 26.30	−0.114
norum . .	6.0	6 20 30.284	−0.0004	+23 22 27.44	+0.015
norum . .	6.5	6 32 21.972	−0.0021	24 39 38.50	−0.002
norum . .	3.2	6 38 49.590	−0.0001	25 12 51.95	−0.018
norum . .	5.2	6 46 34.693	+0.0003	21 51 36.19	−0.045
norum . .	5.8	6 46 57.780	−0.0006	23 42 2.93	−0.021
norum . .	5.2	6 57 21.435	−0.0003	+24 20 5.47	0.000
norum (*var.*) .	3.7	6 59 11.248	−0.0002	20 41 35.05	−0.007
norum . .	5.9	7 0 18.650	0.0000	22 45 45.91	−0.020
norum . .	6.5	7 5 11.403	−0.0082	21 23 33.90	−0.448
norum . .	3.5	7 15 10.085	−0.0010	22 8 10.35	−0.015
norum . .	5.2	7 17 3.070	−0.0044	+20 36 4.88	−0.025
norum . .	6.0	7 18 28.960	−0.0022	23 6 21.33	−0.054
norum . .	6.4	7 21 56.062	−0.0219	21 42 9.15	−0.022
norum . .	5.8	7 22 2.878	−0.0002	20 25 27.48	−0.023
norum . .	5.3	7 22 48.886	−0.0035	21 36 58.09	−0.110
norum . .	6.3	7 40 17.070	−0.0013	+20 30 58.44	−0.012
norum . .	5.0	7 41 19.247	−0.0048	18 42 48.58	−0.063
norum . .	6.2	7 47 7.258	−0.0029	19 32 18.85	−0.030
norum . .	5.2	7 50 49.393	−0.0011	20 6 14.43	−0.043
norum . .	6.3	7 55 57.875	−0.0018	20 2 40.83	−0.007
ri . . .	5.7	7 56 2.077	−0.0001	+17 32 13.11	−0.010
ri . . .	6.1	7 59 57.582	−0.0020	19 4 38.61	−0.046
ri (*mean*) . .	4.7	8 7 27.241	+0.0051	17 53 56.75	−0.129
ri . . .	5.9	8 18 36.816	−0.0038	18 35 58.31	−0.031
ri . . .	6.2	8 21 8.140	−0.0132	17 19 14.35	−0.153
ri . . .	5.5	8 26 51.941	−0.0039	+18 22 32.20	−0.068
ri . . .	6.3	8 31 28.571	+0.0006	15 36 5.07	−0.027
ri . . .	6.3	8 46 24.249	−0.0075	15 39 33.47	+0.076
ri . . .	5.1	8 52 37.325	+0.0041	15 38 30.60	+0.022
ri . . .	5.7	8 52 57.216	+0.0043	15 54 2.86	+0.023
ri . . .	6.5	9 5 15.952	−0.0008	+11 54 11.11	−0.070

MEAN PLACES FOR 1917.0. (January 0^d.431, Greenwich.)

Name of Star.	Magnitude.	Right Ascension.	Annual Proper Motion.	Declination.	A Prop
		h m s	s	° ′ ″	
81 Cancri	6.4	9 7 45.207	−0.0359	+15 19 52.49	
222 B. Cancri	6.3	9 13 21.711	+0.0046	11 50 57.72	
ξ Leonis	5.1	9 27 28.447	−0.0063	11 40 4.89	
h Leonis	5.2	9 27 30.786	+0.0001	10 4 56.78	
o Leonis	3.8	9 36 43.370	−0.0096	10 16 14.25	
83 B. Leonis	5.9	9 52 2.016	−0.0075	+ 9 19 37.42	
89 B. Leonis	6.2	9 53 43.926	+0.0010	8 42 38.46	
π Leonis	4.9	9 55 49.720	−0.0029	8 26 34.70	
14 Sextantis	6.3	10 2 27.099	−0.0022	6 1 0.98	
43 Leonis	6.3	10 18 39.932	−0.0017	6 57 52.26	
155 B. Leonis	6.5	10 18 56.009	−0.0167	+ 6 6 56.43	
35 Sextantis	6.1	10 39 2.515	+0.0018	5 11 1.26	
237 B. Leonis	6.3	10 47 57.895	+0.0002	1 27 55.02	
55 Leonis	6.1	10 51 26.255	+0.0073	1 10 46.69	
p^3 Leonis	6.1	10 59 21.719	−0.0045	0 26 47.06	
p^4 Leonis	5.7	11 2 40.246	−0.0253	+ 2 24 23.26	
p^5 Leonis	5.3	11 9 30.665	−0.0029	0 22 56.19	
359 B. Leonis	6.3	11 19 2.972	−0.0024	+ 0 35 16.21	
388 B. Leonis	6.3	11 23 39.253	−0.0025	− 1 14 34.43	
e Leonis	5.1	11 26 4.456	+0.0018	2 32 42.85	
431 B. Leonis	6.2	11 34 9.581	−0.0028	− 1 58 37.02	
13 B. Virginis	5.9	11 46 47.658	+0.0008	4 52 17.75	
64 B. Virginis	6.5	12 6 11.672	−0.0004	7 18 45.30	
78 B. Virginis	6.5	12 10 0.320	−0.0051	5 15 27.62	
q Virginis	5.3	12 29 29.633	−0.0057	8 59 39.19	
370 B. Virginis	6.0	12 49 59.434	−0.0058	−11 11 55.66	
69 Virginis	4.9	13 23 1.377	−0.0086	15 32 36.72	
75 Virginis	5.6	13 28 25.411	−0.0050	14 56 10.72	
83 Virginis	5.6	13 40 0.939	+0.0007	15 45 43.43	
85 Virginis	6.1	13 41 6.770	−0.0029	15 21 3.19	
87 Virginis	5.8	13 42 54.232	+0.0025	−17 26 41.30	
89 Virginis	5.1	13 45 21.487	−0.0077	17 43 16.12	
214 G. Virginis	6.5	14 0 42.318	−0.0036	15 56 20.31	
43 H. Virginis	5.5	14 10 49.466	−0.0031	17 48 50.20	
231 G. Virginis	6.4	14 12 28.259	−0.0005	18 12 0.11	
236 G. Virginis	5.7	14 14 2.704	−0.0039	−18 19 54.48	
9 G. Librae	6.5	14 30 10.364	+0.0032	20 4 32.31	
17 G. Librae	6.4	14 41 28.209	−0.0047	20 49 28.80	
18 G. Librae	6.1	14 42 30.284	−0.0032	20 58 38.29	
43 B. Librae	5.7	14 52 36.945	+0.0746	21 2 32.52	
47 G. Librae	6.1	15 1 39.657	+0.0066	−21 42 34.40	
64 G. Librae	5.8	15 11 34.108	−0.0028	22 5 34.49	
153 B. Librae	6.3	15 28 14.106	−0.0006	24 12 29.89	
169 B. Librae	6.0	15 32 55.078	−0.0017	22 52 0.86	
177 B. Librae	6.2	15 34 28.253	−0.0016	22 52 46.25	
42 Librae	5.0	15 35 22.266	−0.0018	−23 32 56.98	
A Scorpii	4.6	15 48 37.514	−0.0017	25 4 48.20	
31 B. Scorpii	5.4	15 48 56.179	−0.0022	24 17 12.36	
32 B. Scorpii	5.3	15 48 59.250	−0.0023	23 43 53.18	
3 Scorpii	5.9	15 49 40.271	−0.0031	−24 59 54.58	

AN PLACES FOR 1917.0. (January 0^d.431, Greenwich.)

of Star.	Magnitude.	Right Ascension.	Annual Proper Motion.	Declination.	Annual Proper Motion.
		h m s	s	° ′ ″	″
i . . .	5.4	15 53 35.970	−0.0031	−24 35 33.59	+0.004
i . . .	2.5	15 55 25.331	−0.0012	22 23 11.19	−0.035
i . . .	4.9	15 58 19.493	−0.0048	25 38 5.25	−0.043
i . . .	6.4	15 58 55.524	+0.0017	24 29 53.90	−0.032
i . . .	5.7	16 1 9.190	−0.0011	23 22 50.27	−0.005
i . . .	6.2	16 2 52.845	0.0000	−24 14 27.16	−0.068
i . . .	5.8	16 3 46.260	+0.0032	23 27 52.47	−0.012
i . . .	6.3	16 8 45.844	−0.0004	24 12 38.64	−0.034
i . . .	6.0	16 9 51.473	−0.0005	25 16 1.31	+0.012
i . . .	4.9	16 15 38.310	−0.0012	23 58 12.35	−0.013
i . . .	3.1	16 16 8.421	−0.0011	−25 23 40.82	−0.039
chi . .	4.7	16 20 36.261	−0.0015	23 15 22.79	−0.008
i (*Antares*) .	1.2	16 24 18.923	−0.0006	26 14 55.76	−0.028
i . . .	4.8	16 25 9.754	−0.0004	24 55 59.86	−0.016
i . . .	6.2	16 26 17.073	−0.0013	26 21 28.40	−0.037
i . . .	6.1	16 36 34.259	−0.0024	−24 18 28.39	−0.004
chi . .	5.5	16 51 47.594	+0.0002	23 1 10.92	−0.034
chi . .	6.3	16 54 52.692	+0.0005	24 58 1.46	−0.015
chi . .	5.8	16 55 4.318	+0.0036	24 51 47.95	−0.053
chi . .	6.2	17 1 44.501	−0.0008	26 24 6.72	−0.046
chi . .	6.3	17 7 7.937	+0.0058	−25 9 12.73	−0.045
chi (*First Star*)	5.4	17 10 14.447	−0.0369	26 28 55.83	−1.169
chi . .	5.1	17 12 56.852	−0.0046	24 11 51.01	−0.011
chi . .	3.4	17 16 54.620	−0.0006	24 55 4.13	−0.036
chi . .	6.3	17 20 1.734	+0.0010	24 10 7.19	+0.017
chi . .	4.3	17 21 17.948	−0.0009	−24 6 0.68	−0.137
chi . .	6.3	17 21 47.060	−0.0010	25 52 15.11	−0.003
chi . .	4.8	17 26 21.022	0.0000	23 53 58.09	−0.030
chi . .	6.0	17 26 35.150	+0.0012	26 12 25.23	−0.026
chi . .	6.1	17 49 47.596	−0.0001	24 52 17.96	−0.015
ırii . .	4.8	17 54 43.475	+0.0001	−23 48 34.52	−0.058
ırii . .	5.7	17 56 52.623	−0.0013	22 46 45.50	−0.044
ırii . .	5.5	17 57 45.883	−0.0003	24 16 57.22	−0.007
ırii . .	6.0	17 58 47.035	−0.0006	24 21 48.31	−0.006
ırii . .	5.2	18 6 39.480	+0.0018	23 43 9.19	−0.042
ırii . .	6.4	18 13 33.366	−0.0044	−25 38 12.95	−0.062
ırii . .	6.4	18 16 24.841	+0.0014	24 57 12.94	−0.001
ırii . .	2.9	18 22 50.911	−0.0033	25 28 7.64	−0.199
ırii . .	5.7	18 28 49.279	−0.0002	24 5 43.14	−0.020
ırii . .	5.8	18 33 27.791	−0.0015	23 34 36.15	−0.020
ırii . .	6.1	18 36 47.917	+0.0021	−23 54 42.11	−0.023
ırii . .	5.7	18 39 43.447	−0.0008	25 5 43.64	−0.041
ırii . .	5.6	18 41 20.326	+0.0018	22 28 47.72	+0.010
ırii . .	6.2	18 45 51.080	−0.0041	22 15 28.83	−0.024
ırii . .	5.8	18 49 2.466	−0.0008	21 27 44.46	−0.015
ırii . .	5.0	18 49 9.568	+0.0001	−22 50 53.04	−0.022
ırii . .	5.1	18 50 6.114	+0.0069	22 46 33.42	−0.024
ırii . .	5.9	18 50 59.155	−0.0010	23 16 49.94	−0.021
ırii . .	5.1	18 52 24.529	−0.0010	20 45 57.13	−0.011
ırii . .	3.7	18 52 46.722	+0.0023	−21 13 0.46	−0.023

MEAN PLACES FOR 1917.0. (January 0^d.431, Greenwich.)

Name of Star.	Magnitude.	Right Ascension.	Annual Proper Motion.	Declination.	An Prop
		h m s	s	° ′ ″	
168 B. Sagittarii	6.3	18 56 37.599	+0.0005	−22 48 47.45	+
o Sagittarii	3.9	18 59 42.583	+0.0050	21 51 50.76	-
191 B. Sagittarii	6.5	19 3 43.633	−0.0011	23 19 19.94	-
π Sagittarii	3.0	19 4 49.713	−0.0005	21 9 23.62	-
199 B. Sagittarii	6.4	19 7 30.461	−0.0003	21 47 49.75	-
222 B. Sagittarii	5.5	19 15 39.745	−0.0016	−22 33 28.51	+
50 Sagittarii	5.5	19 21 22.193	+0.0019	21 56 30.86	-
253 B. Sagittarii	6.1	19 25 58.579	+0.0026	21 29 8.75	-
266 B. Sagittarii	6.1	19 31 35.803	+0.0003	19 2 13.39	-
f Sagittarii	5.1	19 41 31.295	−0.0099	19 57 41.56	-
57 Sagittarii	6.0	19 47 22.702	+0.0001	−19 15 23.95	-
σ Capricorni	5.5	20 14 36.382	−0.0002	19 22 42.17	-
π Capricorni	5.2	20 22 34.314	+0.0004	18 29 4.29	-
31 B. Capricorni	6.4	20 24 3.064	+0.0013	16 1 0.64	-
ρ Capricorni	5.0	20 24 7.690	−0.0013	18 5 20.02	-
o Capricorni	5.6	20 25 8.531	+0.0012	−18 51 31.30	-
27 G. Capricorni	6.2	20 26 25.300	−0.0058	15 20 5.34	-
47 B. Capricorni	6.2	20 30 50.554	+0.0055	16 48 42.46	-
τ Capricorni	5.2	20 34 38.003	+0.0006	15 14 47.84	-
61 B. Capricorni	5.9	20 35 52.876	−0.0032	16 25 12.50	-
94 B. Capricorni	5.7	20 53 2.004	+0.0046	−16 21 4.93	-
95 B. Capricorni	5.9	20 54 6.283	....	14 48 15.32	
γ Aquarii	4.5	21 5 4.447	+0.0057	11 42 30.02	-
53 B. Aquarii	6.5	21 11 26.929	+0.0004	13 32 48.83	-
18 Aquarii	5.5	21 19 39.440	+0.0054	13 14 6.00	-
19 Aquarii	5.6	21 20 45.525	+0.0012	−10 6 9.10	
72 B. Aquarii	6.5	21 23 44.115	−0.0045	11 55 42.05	
137 B. Capricorni	6.2	21 35 0.512	+0.0001	10 57 2.84	
c^1 Capricorni	5.3	21 40 34.815	+0.0004	9 27 50.63	
c^2 Capricorni	6.3	21 41 50.672	+0.0008	9 39 34.32	
λ Capricorni	5.5	21 42 4.124	+0.0015	−11 44 57.30	
96 B. Aquarii	6.5	21 49 9.841	−0.0001	10 42 10.48	
30 Aquarii	5.6	21 58 54.494	+0.0011	6 55 25.82	
θ Aquarii	4.3	22 12 27.295	+0.0074	8 11 49.13	
44 Aquarii	5.7	22 12 46.581	−0.0003	5 48 7.35	
ρ Aquarii	5.3	22 15 49.967	+0.0008	− 8 14 18.57	
170 B. Aquarii	6.0	22 19 11.092	+0.0012	7 36 51.56	
51 Aquarii	5.8	22 19 47.505	+0.0011	5 15 26.67	
186 B. Aquarii	6.1	22 26 57.266	+0.0129	6 58 45.38	
187 B. Aquarii	6.3	22 27 0.907	−0.0051	3 20 11.42	
κ Aquarii	5.2	22 33 27.532	−0.0049	− 4 39 23.29	
207 B. Aquarii	6.3	22 36 30.325	....	3 59 10.07	
6 G. Piscium	6.2	22 53 59.129	+0.0002	2 50 24.24	
3 Piscium	6.3	22 56 22.554	+0.0028	0 15 36.20	
22 B. Piscium	6.4	23 19 16.465	+0.0043	− 0 9 51.61	
κ Piscium	4.9	23 22 40.659	+0.0056	+ 0 48 4.07	
9 Piscium	6.4	23 22 59.697	+0.0032	0 39 59.78	
16 Piscium	5.7	23 32 9.143	−0.0074	1 38 29.43	
19 Piscium	5.4	23 42 8.970	−0.0034	3 1 34.68	
ω Piscium	4.0	23 55 2.897	+0.0102	+ 6 24 13.92	

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

JANUARY.

THE STAR'S					AT CONJUNCTION IN R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1917.0. Δα	Δδ	Apparent Declination.	Greenwich Mean Time.	Hour Angle, H.	Y	x'	y'	N.	S.
		s	″	° ′	d h m	h m				°	°
Piscium	3.7	+1.30	+10.8	+14 55.3	1 5 3.1	− 1 40.8	−0.1227	0.5351	+0.2082	+35	−42
Piscium	6.2	1.33	10.6	14 14.4	7 5.4	+ 0 17.6	+1.0164	0.5357	0.2055	+90	+21
Piscium	6.1	1.35	11.1	15 59.3	8 55.4	+ 2 4.0	−0.4510	0.5361	0.2029	+17	−60
Arietis	6.4	1.40	11.4	17 0.1	12 10.6	+ 5 12.8	−0.8678	0.5370	0.1981	− 7	−73
Arietis	5.8	1.41	11.2	16 32.8	12 55.9	+ 5 56.6	−0.2387	0.5372	0.1970	+29	−47
Arietis	5.1	+1.47	+11.4	+17 25.0	17 14.0	+10 6.3	−0.3255	0.5383	+0.1905	+24	−51
B. Arietis	6.4	1.51	11.5	17 51.5	20 12.5	−11 1.1	−0.2344	0.5392	0.1858	+29	−46
B. Arietis	6.5	1.54	11.4	17 38.3	22 6.3	− 9 11.0	+0.3488	0.5398	0.1828	+62	−15
B. Arietis	6.4	1.54	11.1	16 50.3	22 51.6	− 8 27.1	+1.3349	0.5400	0.1815	+72	+60
Arietis	5.9	1.56	11.8	19 6.7	23 25.2	− 7 54.6	−0.9777	0.5402	0.1806	−15	−71
Arietis	5.6	+1.61	+11.8	+19 31.3	2 2 54.5	− 4 32.3	−0.7937	0.5413	+0.1747	− 3	−70
Arietis	6.2	1.69	11.6	19 29.5	8 41.6	+ 1 3.2	+0.2196	0.5431	0.1646	+54	−19
Arietis	5.7	1.76	11.4	19 39.7	14 5.2	+ 6 16.0	+0.8998	0.5448	0.1548	+90	+19
Arietis	5.8	1.86	11.2	20 20.4	21 15.0	−10 48.7	+1.2370	0.5470	0.1410	+87	+49
Arietis (*mean*)	4.6	1.88	11.3	21 0.7	21 45.9	−10 18.8	+0.5885	0.5472	0.1400	+83	+ 3
Arietis	6.1	+2.06	+10.7	+22 31.3	3 10 57.2	+ 2 25.5	+0.6384	0.5510	+0.1129	+89	+ 8
Tauri	5.9	2.11	11.0	24 11.4	13 37.3	+ 5 0.0	−0.8679	0.5517	0.1072	− 9	−66
Tauri	5.4	2.17	10.5	24 1.9	18 15.4	+ 9 28.6	−0.2250	0.5528	0.0971	+29	−36
Tauri	3.8	2.17	10.5	23 51.4	18 17.5	+ 9 30.6	−0.0314	0.5528	0.0970	+40	−25
Tauri	5.6	2.18	10.7	24 35.0	18 24.5	+ 9 37.4	−0.8057	0.5528	0.0967	− 5	−65
Tauri	4.3	+2.17	+10.6	+24 12.7	18 26.1	+ 9 38.9	−0.4011	0.5528	+0.0967	+19	−46
Tauri	4.1	2.17	10.5	24 6.7	18 42.7	+ 9 55.0	−0.2677	0.5529	0.0961	+26	−38
Tauri	5.8	2.18	10.6	24 18.0	18 44.7	+ 9 56.9	0.4667	0.5529	0.0960	+15	−50
Tauri	6.5	2.18	10.6	24 16.4	18 48.5	+10 0.6	−0.4321	0.5529	0.0958	+17	−48
Tauri	4.3	2.17	10.4	23 41.6	18 56.5	+10 8.3	+0.2071	0.5529	0.0955	+54	−13
Tauri	3.0	+2.18	+10.4	+23 51.1	19 27.3	+10 38.0	+0.0843	0.5531	+0.0944	+46	−19
B. Tauri	5.5	2.18	10.2	23 10.2	19 51.0	+11 0.9	+0.8595	0.5532	0.0935	+90	+23
Tauri	3.7	2.19	10.3	23 48.2	20 12.3	+11 21.4	+0.2073	0.5532	0.0928	+54	−12
Tauri	5.2	2.19	10.3	23 53.2	20 12.8	+11 21.9	+0.1178	0.5532	0.0927	+49	−17
Tauri	5.6	2.27	9.6	23 52.9	4 2 58.0	− 6 6.8	+0.7002	0.5545	0.0775	+90	+16
Tauri	5.3	+2.38	+ 9.1	+25 26.2	11 1.2	+ 1 39.5	−0.4397	0.5557	+0.0588	+17	−45
Tauri	6.1	2.37	8.7	24 6.7	11 40.1	+ 2 17.1	+1.0402	0.5558	0.0574	+90	+39
B. Tauri	6.3	2.52	7.1	24 27.8	5 1 55.9	− 7 57.0	+1.2419	0.5564	0.0238	+80	+61
Tauri	5.6	2.53	7.1	24 55.5	2 45.6	− 7 9.0	+0.7556	0.5564	+0.0218	+90	+24
Tauri	5.4	2.64	5.2	25 5.1	16 33.3	+ 6 9.8	+0.6574	0.5552	−0.0109	+90	+20
Tauri	5.1	+2.69	+ 4.7	+25 51.2	21 12.2	+10 39.1	−0.2605	0.5544	−0.0218	+27	−30
Tauri	5.0	2.69	3.9	24 32.5	6 1 22.6	− 9 19.2	+1.0691	0.5535	0.0316	+90	+44
B. Tauri	5.8	2.70	3.4	24 14.4	4 56.2	− 5 52.9	+1.2756	0.5527	0.0397	+66	+65
Tauri	4.7	2.74	3.5	25 56.7	5 22.9	− 5 27.1	−0.6195	0.5526	0.0408	+ 6	−56
Geminorum	5.9	2.74	2.4	24 26.4	11 31.3	+ 0 28.7	+0.7449	0.5508	0.0547	+90	+20
Geminorum	6.1	+2.74	+ 2.1	+23 59.9	13 41.8	+ 2 34.8	+1.1080	0.5501	−0.0596	+90	+44
B. Geminorum	6.5	2.78	0.7	24 39.7	23 20.8	+11 54.2	−0.2991	0.5465	0.0806	+24	−38
Geminorum	3.2	2.80	+ 0.3	25 12.9	7 2 19.6	− 9 13.0	−1.1606	0.5454	0.0869	−34	−65
B. Geminorum	5.8	2.78	− 0.4	23 42.0	6 5.8	− 5 34.2	+0.1698	0.5437	0.0947	+52	−14
Geminorum	5.2	2.80	1.1	24 20.1	10 57.0	− 0 52.7	−1.0150	0.5415	0.1045	−20	−66
Geminorum	5.9	+2.76	− 1.3	+22 45.7	12 20.2	+ 0 27.7	+0.5781	0.5409	−0.1072	+82	+ 5
Geminorum	3.5	2.76	2.3	22 8.1	19 21.6	+ 7 15.6	+0.4714	0.5375	0.1207	+72	− 2
Geminorum	6.0	2.77	2.5	23 6.3	20 56.4	+ 8 47.2	−0.7960	0.5367	0.1237	− 4	−67
B. Geminorum	*6.4*	*2.74*	*2.8*	*21 42.1*	22 35.4	+10 23.0	+0.5526	0.5358	0.1267	+80	+ 2
Geminorum	*5.3*	*2.74*	*2.8*	*21 36.9*	23 0.7	+10 47.5	+0.5948	0.5356	0.1275	+84	+ 4
Geminorum	*6.3*	*2.71*	*− 3.9*	*+20 30.9*	8 7 27.0	− 5 2.2	+0.6762	0.5313	−0.1424	+90	+

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS

JANUARY.

Name.	Mag.	Red'ns from 1917.0. Δα	Δδ	Apparent Declination.	At Conjunction in R. A. Greenwich Mean Time.	Hour Angle, H	Y	x'	y'
		s	″	° ′	d h m	h m			
209 B. Geminorum	6.2	+2.69	− 4.3	+19 32.2	8 10 47.4	− 1 48.1	+1.2766	0.5296	−0.148
85 Geminorum	5.2	2.69	4.6	20 6.2	12 36.5	− 0 2.4	+0.3775	0.5285	0.150
217 B. Geminorum	6.3	2.69	4.9	20 2.6	15 8.6	+ 2 25.0	+0.0557	0.5272	0.155
SATURN	−0.1	. . .	. . .	20 47.1	17 4.1	+ 4 16.9	−1.0702	0.5300	0.158
10 H. Cancri	6.1	2.67	5.1	19 4.6	17 7.4	+ 4 20.0	+0.8200	0.5262	0.158
d^1 Cancri	5.9	+2.63	− 6.2	+18 35.9	9 2 28.0	−10 36.5	−0.1914	0.5213	−0.171
d^2 Cancri	6.2	2.61	6.3	17 19.1	3 44.6	− 9 22.2	+1.0090	0.5206	0.173
NEPTUNE	7.7	. . .	. . .	19 3.4	5 30.5	− 7 39.5	−1.2299	0.5210	0.176
θ Cancri	5.5	2.61	6.7	18 22.4	6 39.3	− 6 32.7	−0.6747	0.5191	0.177
54 Cancri	6.3	2.53	7.5	15 39.4	16 42.5	+ 3 12.6	+0.4938	0.5141	0.190
o^1 Cancri	5.1	+2.51	− 7.9	+15 38.4	19 56.8	+ 6 21.2	−0.1093	0.5126	−0.194
o^2 Cancri	5.7	2.52	7.9	15 53.9	20 7.2	+ 6 31.3	−0.4307	0.5125	0.194
81 Cancri	6.4	2.47	8.6	15 19.7	10 3 54.3	− 9 55.2	−1.3429	0.5090	0.202
ξ Leonis	5.1	2.36	9.0	11 39.9	14 25.9	+ 0 18.5	+0.5423	0.5047	0.212
o Leonis	3.8	2.32	9.2	10 16.1	19 25.4	+ 5 9.5	+1.0232	0.5029	0.216
83 B. Leonis	5.9	+2.26	− 9.7	+ 9 19.5	11 3 45.4	−10 44.4	+0.2399	0.5003	−0.222
89 B. Leonis	6.2	2.25	9.6	8 42.5	4 41.2	− 9 50.1	+0.7167	0.5001	0.223
π Leonis	4.9	2.24	9.7	8 26.4	5 50.1	− 8 43.1	+0.7569	0.4997	0.224
43 Leonis	6.3	2.14	10.2	6 57.7	18 25.1	+ 3 31.1	−0.4680	0.4970	0.230
155 B. Leonis	6.5	2.13	10.0	6 6.8	18 34.0	+ 3 39.8	+0.4380	0.4969	0.230
35 Sextantis	6.1	+2.05	−10.4	+ 5 10.8	12 5 43.6	− 9 29.0	−1.1330	0.4955	−0.235
p^4 Leonis	5.7	1.93	10.4	2 24.2	18 52.4	+ 3 18.3	−1.1781	0.4954	0.235
p^5 Leonis	5.3	1.89	10.0	0 22.8	22 40.4	+ 7 0.2	+0.1457	0.4956	0.235
359 B. Leonis	6.3	1.85	10.2	+ 0 35.1	13 3 57.7	−11 51.2	−1.3419	0.4962	0.235
388 B. Leonis	6.3	1.83	9.8	− 1 14.7	6 30.6	− 9 22.4	+0.0613	0.4965	0.235
e Leonis	5.1	+1.80	− 9.4	− 2 32.9	7 50.8	− 8 4.4	+1.1716	0.4967	−0.235
431 B. Leonis	6.2	1.78	9.7	1 58.8	12 18.2	− 3 44.4	−0.5153	0.4975	0.235
13 B. Virginis	5.9	1.71	9.0	4 52.4	19 13.7	+ 2 59.7	+1.0047	0.4993	0.237
64 B. Virginis	6.5	1.62	8.5	7 18.9	14 5 44.9	−10 46.9	+1.1808	0.5028	0.234
q Virginis	5.3	1.50	8.2	8 59.8	18 8.8	+ 1 15.8	+0.1290	0.5084	0.228
370 B. Virginis	6.0	+1.41	− 7.6	−11 12.1	15 4 48.0	+11 36.3	+0.1061	0.5145	−0.22
69 Virginis	4.9	1.25	6.2	15 32.7	21 23.8	+ 3 41.8	+1.1885	0.5260	0.20
75 Virginis	5.6	1.23	6.4	14 56.3	16 0 2.3	+ 6 15.3	−0.0036	0.5281	0.20
83 Virginis	5.6	1.17	6.1	15 45.8	5 38.4	+11 40.7	−0.2521	0.5326	0.19
85 Virginis	6.1	1.17	6.2	15 21.2	6 9.9	−11 48.8	−0.7922	0.5330	0.19
87 Virginis	5.8	+1.16	− 5.5	−17 26.8	7 1.2	−10 59.2	+1.2609	0.5337	−0.19
89 Virginis	5.1	1.15	5.4	17 43.4	8 11.3	− 9 51.4	+1.3245	0.5347	0.19
43 H. Virginis	5.5	1.03	5.4	17 48.9	20 3.6	+ 1 37.5	−0.7965	0.5452	0.17
231 G. Virginis	6.4	1.02	5.3	18 12.1	20 48.7	+ 2 21.0	−0.5236	0.5459	0.17
236 G. Virginis	5.7	1.02	5.2	18 20.0	21 31.7	+ 3 2.5	−0.5115	0.5465	0.17
9 G. Libræ	6.5	+0.94	− 4.6	−20 4.6	17 4 46.7	+10 2.6	+0.0852	0.5534	−0.16
17 G. Libræ	6.4	0.89	4.3	20 49.6	9 45.1	− 9 9.5	+0.0737	0.5581	0.15
18 G. Libræ	6.1	0.89	4.3	20 58.7	10 12.2	− 8 43.3	+0.1630	0.5585	0.15
43 B. Libræ	5.7	0.85	4.3	21 2.6	14 34.7	− 4 30.2	−0.4249	0.5627	0.14
47 G. Libræ	6.1	0.80	4.0	21 42.6	18 26.4	− 0 47.0	−0.2792	0.5664	0.13
64 G. Libræ	5.8	+0.76	− 3.8	−22 5.6	22 36.7	+ 3 14.1	−0.4383	0.5704	−0.12
153 B. Libræ	6.3	0.69	3.1	24 12.6	18 5 30.4	+ 9 52.4	+0.9048	0.5768	0.11
169 B. Libræ	6.0	0.67	3.5	22 52.1	7 25.0	+11 42.6	−0.6857	0.5785	0.10
177 B. Libræ	6.2	0.66	3.5	22 52.8	8 2.9	−11 41.0	−0.7406	0.5791	0.10
42 Libræ	5.0	0.66	3.3	23 33.0	8 24.8	−11 19.9	−0.0924	0.5794	0.10
A Scorpii	4.6	+0.61	− 2.8	−25 4.9	13 44.7	− 6 12.3	+0.9414	0.5841	−0.9

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

JANUARY.

THE STAR'S					AT CONJUNCTION IN R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1917.0. Δα	Δδ	Apparent Declination.	Greenwich Mean Time.	Hour Angle, *H*	Y″	*x′*	*y′*	N.	S.
		s	″	° ′	d h m	h m				°	°
3. Scorpii	5.4	+0.60	−3.1	−24 17.3	18 13 52.2	− 6 5.1	+0.1189	0.5842	−0.0929	+29	−35
3. Scorpii	5.3	0.60	3.2	23 43.9	13 53.4	− 6 4.0	−0.4506	0.5842	0.0928	− 1	−71
Scorpii	5.9	0.60	2.8	25 0.0	14 9.8	− 5 48.3	+0.8191	0.5845	0.0921	+65	+ 6
B. Scorpii	5.4	0.59	3.0	24 35.6	15 43.5	− 4 18.2	+0.2632	0.5858	0.0881	+36	−27
B. Scorpii	4.9	0.57	2.6	25 38.1	17 35.8	− 2 30.3	+1.1652	0.5874	0.0832	+64	+35
B. Scorpii	6.4	+0.56	−3.0	−24 29.9	17 50.0	− 2 16.7	−0.0131	0.5876	−0.0826	+21	−42
B. Scorpii	5.7	0.56	3.3	23 22.9	18 42.7	− 1 26.1	−1.2232	0.5883	0.0803	−55	−86
G. Scorpii	6.2	0.55	3.0	24 14.5	19 23.4	− 0 47.0	0.4006	0.5888	0.0785	0	−67
G. Scorpii	5.8	0.54	3.4	23 27.9	19 44.4	− 0 26.9	−1.2181	0.5892	0.0775	−54	−86
G. Scorpii	6.3	0.53	3.0	24 12.7	21 41.8	+ 1 25.8	−0.6043	0.5907	0.0723	−11	−86
B. Scorpii	6.0	+0.52	−2.7	−25 16.1	22 7.4	+ 1 50.4	+0.4388	0.5910	−0.0711	+45	−17
Scorpii	4.9	0.50	3.1	23 58.3	19 0 22.3	+ 4 0.0	−1.0309	0.5927	0.0649	−38	−90
Scorpii	3.1	0.50	2.7	25 23.7	0 34.0	+ 4 11.2	+0.4021	0.5929	0.0644	+43	−19
Scorpii	1.2	0.47	2.4	26 15.0	3 43.5	+ 7 13.0	+1.0769	0.5952	0.0556	+64	+26
Scorpii	4.8	0.46	2.8	24 56.0	4 3.0	+ 7 31.7	−0.2731	0.5954	0.0547	+ 5	−58
B. Scorpii	6.2	+0.46	−2.4	−26 21.5	4 28.9	+ 7 56.5	+1.1455	0.5957	−0.0534	+64	+34
B. Scorpii	6.1	0.42	2.9	24 18.5	8 25.0	+11 43.0	−1.1146	0.5984	0.0421	−47	−90
B. Ophiuchi	6.3	0.36	2.7	24 58.1	15 20.6	− 5 38.6	−0.6677	0.6024	0.0216	−19	−90
Ophiuchi	5.8	0.36	2.7	24 51.8	15 25.0	− 5 34.4	−0.7735	0.6025	0.0214	−25	−90
B. Ophiuchi	6.2	0.34	2.4	26 24.2	17 55.2	− 3 10.5	+0.7274	0.6038	0.0138	+64	+ 1
B. Ophiuchi	6.3	+0.32	−2.6	−25 9.3	19 56.1	− 1 14.5	−0.5461	0.6047	−0.0076	−14	−80
Ophi. (1*st star*)	5.4	0.31	2.4	26 29.0	21 5.7	− 0 7.8	+0.7780	0.6052	−0.0041	+64	+ 4
Ophiuchi	3.4	0.29	2.7	24 55.1	23 34.6	+ 2 14.8	−0.7882	0.6062	+0.0035	−27	−90
G. Ophiuchi	6.3	0.28	2.5	25 52.3	20 1 23.1	+ 3 58.7	+0.1761	0.6069	0.0091	+25	−31
G. Ophiuchi	6.0	0.26	2.4	26 12.5	3 9.8	+ 5 40.9	+0.5325	0.6075	0.0147	+47	−11
Ophiuchi	6.1	+0.20	−2.6	−24 52.3	11 43.5	−10 7.2	−0.5570	0.6095	+0.0414	−11	−81
Sagittarii	5.5	0.18	2.7	24 17.0	14 39.4	− 7 18.9	−1.0057	0.6099	0.0505	−38	−90
Sagittarii	6.0	0.18	−2.7	24 21.9	15 1.8	− 6 57.3	−0.9062	0.6099	0.0517	−31	−90
					NEW MOON.						
Aquarii	5.3	+0.18	+0.1	− 8 14.3	24 20 2.6	− 5 57.0	+1.3338	0.5593	+0.2586	+81	+44
3. Aquarii	6.0	0.19	0.2	7 36.9	21 30.7	− 4 32.1	+1.0994	0.5585	0.2594	+82	+20
Aquarii	5.8	0.18	0.7	5 15.4	21 46.7	− 4 16.6	−1.1554	0.5583	0.2595	−26	−90
3. Aquarii	6.1	0.21	0.5	6 58.7	25 0 55.8	− 1 14.1	+1.3641	0.5566	0.2609	+78	+49
Aquarii	5.2	0.22	1.0	4 39.4	3 48.5	+ 1 32.5	−0.1774	0.5551	0.2620	+32	−51
3. Aquarii	6.3	+0.22	+1.2	− 3 59.1	5 9.7	+ 2 50.9	−0.4857	0.5544	+0.2624	+16	−71
3. Piscium	6.2	−0.28	1.8	2 50.4	12 59.1	+10 24.1	+0.4378	0.5508	0.2638	+67	−19
3. Piscium	6.4	0.36	2.9	− 0 9.8	26 0 27.6	− 2 30.8	+0.8016	0.5465	0.2628	+90	+ 1
Piscium	4.9	0.37	3.2	+ 0 48.1	2 1.1	− 1 0.5	+0.2459	0.5460	0.2625	+55	−29
Piscium	6.4	0.37	3.2	0 40.0	2 9.8	− 0 52.0	+0.4186	0.5460	0.2624	+66	−20
Piscium	5.7	+0.40	+3.6	+ 1 38.6	6 21.9	+ 3 11.5	+0.5434	0.5447	+0.2611	+75	−13
Piscium	5.4	0.44	4.1	3 1.6	10 58.3	+ 7 38.7	+0.3524	0.5435	0.2590	+62	−23
Piscium	6.2	0.57	6.0	7 46.9	27 0 57.0	− 2 50.3	−0.8862	0.5412	0.2501	− 6	−82
Piscium	5.4	0.59	6.0	7 43.9	2 49.4	− 1 1.6	−0.3690	0.5410	0.2486	+22	−61
3. Piscium	6.5	0.69	6.7	8 54.2	12 21.7	+ 8 14.6	+0.7796	0.5405	0.2397	+90	+ 2
Piscium	5.7	+0.72	+7.6	+11 31.4	15 6.5	+10 51.1	−1.2581	0.5404	+0.2368	−35	−78
Piscium	6.3	0.82	8.1	12 30.8	28 0 11.4	− 4 22.1	−0.1754	0.5408	0.2263	+32	−47
Piscium	3.7	0.97	9.0	14 55.3	11 43.7	+ 6 47.2	−0.1429	0.5419	0.2107	+34	−43
Piscium	6.2	1.00	8.8	14 14.4	13 43.0	+ 8 42.6	+0.9810	0.5422	0.2078	+90	+19
Piscium	*6.1*	*1.02*	*9.5*	15 59.3	15 30.3	+10 26.3	−0.4678	0.5424	0.2051	+16	−61
Arietis	*6.4*	*+1.06*	*+9.8*	+17 0.0	18 40.9	−10 29.4	−0.8802	0.5429	+0.2002	− 7	−71

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

JANUARY.

THE STAR'S						AT CONJUNCTION IN R. A.				
	Name.	Mag.	Red'ns from 1917.0. Δα	Δδ	Apparent Declination.	Greenwich Mean Time.	Hour Angle, H	Y	x'	y'
			s	"	° ′	d h m	h m			
4	Arietis	5.8	+1.08	+ 9.6	+16 32.7	28 19 25.1	− 9 46.7	−0.2589	0.5430	+0.1991
ι	Arietis	5.1	1.13	9.9	17 24.9	23 37.6	− 5 42.6	−0.3455	0.5437	0.1922
35 B.	Arietis	6.4	1.18	10.0	17 51.5	29 2 32.5	− 2 53.6	−0.2559	0.5442	0.1874
47 B.	Arietis	6.5	1.20	9.9	17 38.2	4 24.0	− 1 5.8	+0.3208	0.5446	0.1843
20 H¹.	Arietis	6.4	1.21	9.5	16 50.3	5 8.4	− 0 22.9	+1.2960	0.5447	0.1829
15	Arietis	5.9	+1.22	+10.4	+19 6.7	5 41.4	+ 0 9.0	−0.9919	0.5448	+0.1820
θ	Arietis	5.6	1.28	10.5	19 31.2	9 6.9	+ 3 27.5	−0.8106	0.5455	0.1760
26	Arietis	6.2	1.36	10.3	19 29.4	14 48.2	+ 8 57.3	+0.1920	0.5466	0.1656
μ	Arietis	5.7	1.44	10.2	19 39.7	20 7.1	− 9 54.6	+0.8661	0.5477	0.1555
47	Arietis	5.8	1.55	10.2	20 20.4	30 3 11.6	− 3 4.7	+1.2012	0.5491	0.1415
ε	Arietis (*mean*)	4.6	+1.56	+10.4	+21 0.7	3 42.2	− 2 35.1	+0.5575	0.5492	+0.1404
66	Arietis	6.1	1.77	10.2	22 31.3	16 46.6	+10 2.4	+0.6079	0.5516	0.1130
7	Tauri	5.9	1.82	10.6	24 11.4	19 25.8	−11 24.0	−0.8902	0.5520	0.1072
16	Tauri	5.4	1.89	10.2	24 1.9	31 0 2.5	− 6 56.9	−0.2508	0.5526	0.0970
17	Tauri	3.8	1.89	10.2	23 51.4	0 4.5	− 6 55.0	−0.0581	0.5527	0.0970
18	Tauri	5.6	+1.90	+10.4	+24 35.0	0 11.6	− 6 48.2	−0.8289	0.5527	+0.0967
q	Tauri	4.3	1.90	10.3	24 12.6	0 13.1	− 6 46.7	−0.4260	0.5527	0.0966
20	Tauri	4.1	1.90	10.2	24 6.7	0 29.7	− 6 30.6	−0.2933	0.5527	0.0960
21	Tauri	5.8	1.90	10.3	24 18.0	0 31.7	− 6 28.7	−0.4914	0.5526	0.0968
22	Tauri	6.5	1.90	10.2	24 16.4	0 35.4	− 6 25.0	−0.4570	0.5528	0.0958
23	Tauri	4.3	+1.90	+10.0	+23 41.6	0 43.4	− 6 17.4	+0.1793	0.5528	+0.0955
η	Tauri	3.0	1.91	10.1	23 51.1	1 14.1	− 5 47.8	+0.0570	0.5528	0.0944
104 B.	Tauri	5.5	1.91	9.8	23 10.2	1 37.7	− 5 25.0	+0.8289	0.5529	0.0935
27	Tauri	3.7	1.92	10.0	23 48.2	1 58.9	− 5 4.6	+0.1795	0.5529	0.0927
28	Tauri	5.2	1.92	10.0	23 53.2	1 59.5	− 5 4.0	+0.0905	0.5529	0.0927
36	Tauri	5.6	+2.02	+ 9.4	+23 52.9	8 43.5	+ 1 26.0	+0.6710	0.5537	+0.0774
χ	Tauri	5.3	2.16	9.2	25 26.2	16 46.4	+ 9 12.1	−0.4646	0.5542	0.0589
62	Tauri	6.1	+2.15	+ 8.7	+24 6.7	17 25.2	+ 9 49.6	+1.0114	0.5542	+0.0574

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315 B.	Tauri	6.3	+2.35	+ 7.3	+24 27.8	1 7 42.6	− 0 22.8	+1.2161	0.5541	+0.0230
k	Tauri	5.6	2.37	7.3	24 55.5	8 32.5	+ 0 25.3	+0.7305	0.5541	+0.0211
118	Tauri	5.4	2.54	5.6	25 5.2	22 23.8	−10 12.2	+0.6355	0.5524	−0.0104
125	Tauri	5.1	2.61	5.2	25 51.2	2 3 4.1	− 5 41.6	−0.2812	0.5515	0.0211
132	Tauri	5.0	+2.63	+ 4.3	+24 32.5	7 15.9	− 1 38.5	+1.0496	0.5506	−0.0317
412 B.	Tauri	5.8	2.66	3.7	24 14.4	10 50.7	+ 1 49.0	+1.2573	0.5497	0.0397
139	Tauri	4.7	2.70	4.1	25 56.7	11 17.7	+ 2 15.1	−0.6386	0.5496	0.0402
5	Geminorum	5.9	2.73	2.8	24 26.4	17 28.3	+ 8 13.1	+0.7284	0.5479	0.0541
8	Geminorum	6.1	2.74	2.4	23 59.9	19 39.6	+10 19.9	+1.0925	0.5472	0.0585
52 B.	Geminorum	6.5	+2.84	+ 1.1	+24 39.7	3 5 22.2	− 4 16.9	−0.3127	0.5439	−0.0795
ε	Geminorum	3.2	2.87	+ 0.8	25 12.9	8 22.0	− 1 23.1	−1.1739	0.5427	0.0867
87 B.	Geminorum	5.8	2.86	− 0.1	23 42.0	12 9.6	+ 2 17.0	+0.1593	0.5412	0.0937
ω	Geminorum	5.2	2.91	0.7	24 20.0	17 2.4	+ 7 0.2	−1.0249	0.5393	0.1037
44	Geminorum	5.9	2.88	1.2	22 45.7	18 25.9	+ 8 20.9	+0.5705	0.5387	0.1067
δ	Geminorum	3.5	+2.91	− 2.4	+22 8.1	4 1 29.6	− 8 49.1	+0.4668	0.5356	−0.1197
58	Geminorum	6.0	2.94	2.5	23 6.3	3 4.8	− 7 16.9	−0.8014	0.5349	0.1227
149 B.	Geminorum	6.4	2.92	2.9	21 42.1	4 44.2	− 5 40.7	+0.5496	0.5341	0.1258
63	Geminorum	5.3	2.92	3.0	21 36.9	5 9.6	− 5 16.2	+0.5921	0.5339	0.1268
79	Geminorum	6.3	2.93	4.4	20 30.9	13 37.9	+ 2 56.1	+0.8776	0.5300	0.1417
209 B.	Geminorum	6.2	+2.92	− 5.0	+19 32.2	16 58.9	+ 6 10.8	+1.2803	0.5284	−0.1477

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

FEBRUARY.

The Star's					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1917.0 Δα	Red'ns from 1917.0 Δδ	Apparent Declination.	Greenwich Mean Time.	Hour Angle, *H*	*Y*	*x'*	*y'*	N.	S.
		s	″	° ′	d h m	h m				°	°
Saturn	0.0	. . .	. . .	+21 15.0	4 18 45.7	+ 7 54.3	−0.8872	0.5311	−0.1508	− 9	−69
Geminorum	5.2	+2.94	− 5.2	20 6.2	18 48.3	+ 7 56.8	+0.3814	0.5276	0.1501	+65	−10
B. Geminorum	6.3	2.94	5.5	20 2.6	21 20.9	+10 24.7	+0.0606	0.5264	0.1542	+45	−27
H. Cancri	6.1	2.93	5.9	19 4.5	23 19.9	−11 40.0	+0.8267	0.5254	0.1573	+90	+14
Cancri	5.9	2.94	7.2	18 35.9	5 8 41.4	− 2 35.5	−0.1801	0.5211	0.1712	+32	−42
Cancri	6.2	+2.92	− 7.5	+17 19.1	9 58.1	− 1 21.2	+1.0220	0.5205	−0.1730	+90	+25
Neptune	7.7	. . .	. . .	19 14.2	10 9.0	− 1 10.6	−1.1427	0.5217	0.1736	−28	−71
Cancri	5.5	2.94	7.8	18 22.4	12 53.0	+ 1 28.5	−0.6611	0.5192	0.1770	+ 5	−70
Cancri	6.3	2.90	9.2	15 39.4	22 56.0	+11 13.6	+0.5145	0.5147	0.1899	+75	− 8
Cancri	5.1	2.90	9.6	15 38.4	6 2 10.1	− 9 38.0	−0.0865	0.5134	0.1937	+37	−39
Cancri	5.7	+2.90	− 9.6	+15 53.9	2 20.5	− 9 27.9	−0.4080	0.5133	−0.1939	+20	−58
Cancri	6.4	2.89	10.5	15 19.7	10 6.8	− 1 55.1	−1.3149	0.5102	0.2024	−45	−75
Leonis	5.1	2.82	11.6	11 39.9	20 36.6	+ 8 16.7	+0.5783	0.5064	0.2125	+79	− 7
Leonis	3.8	2.79	12.1	10 16.0	7 1 35.1	−10 53.3	+1.0631	0.5048	0.2166	+90	+21
B. Leonis	5.9	2.77	12.8	9 19.4	9 53.2	− 2 49.2	+0.2860	0.5024	0.2228	+58	−24
B. Leonis	6.2	+2.76	−12.8	+ 8 42.4	10 48.7	− 1 55.2	+0.7636	0.5022	−0.2234	+90	+ 1
Leonis	4.9	2.75	12.9	8 26.4	11 57.3	− 0 48.5	+0.8047	0.5019	0.2242	+90	+ 3
Leonis	6.3	2.70	13.8	6 57.6	8 0 28.9	+11 22.4	−0.4107	0.4994	0.2312	+20	−64
B. Leonis	6.5	2.69	13.7	6 6.7	0 37.8	+11 31.0	+0.4957	0.4994	0.2313	+72	−15
Sextantis	6.1	2.64	14.4	5 10.8	11 44.5	− 1 40.6	−1.0676	0.4980	0.2356	−18	−85
Leonis	5.7	+2.57	−14.8	+ 2 24.1	9 0 50.2	+11 3.6	−1.1034	0.4976	−0.2385	−21	−88
Leonis	5.3	2.54	14.6	0 22.7	4 37.6	− 9 15.2	+0.2251	0.4978	0.2388	+54	−30
B. Leonis	6.3	2.52	14.9	+ 0 35.0	9 54.2	− 4 7.3	−1.2616	0.4982	0.2390	−34	−89
B. Leonis	6.3	2.50	14.7	− 1 14.8	12 26.7	− 1 39.0	+0.1464	0.4984	0.2389	+49	−34
Leonis	5.1	2.49	14.5	2 33.0	13 46.8	− 0 21.0	+1.2601	0.4986	0.2389	+87	+34
B. Leonis	6.2	+2.47	−14.8	− 1 58.9	18 14.0	+ 3 58.8	−0.4278	0.4993	−0.2384	+19	−67
B. Virginis	5.9	2.42	14.4	4 52.5	10 1 9.6	+10 43.0	+1.1016	0.5006	0.2372	+85	+20
B. Virginis	6.5	2.36	14.0	7 19.0	11 42.0	− 3 2.3	+1.2860	0.5035	0.2340	+83	+38
Virginis	5.3	2.29	13.7	8 59.9	11 0 9.7	+ 9 4.1	+0.2367	0.5081	0.2280	+52	−29
B. Virginis	6.0	2.22	13.1	11 12.1	10 54.4	− 4 29.9	+0.2188	0.5131	0.2208	+50	−30
Virginis	4.9	+2.12	−11.6	−15 32.8	12 3 43.2	+11 48.6	+1.3174	0.5228	−0.2056	+74	+46
Virginis	5.6	2.09	11.8	14 56.4	6 24.4	− 9 35.1	+0.1149	0.5245	0.2027	+41	−35
Virginis	5.6	2.05	11.4	15 45.9	12 6.5	− 4 3.6	−0.1350	0.5284	0.1960	+28	−49
Virginis	6.1	2.05	11.5	15 21.2	12 38.6	− 3 32.5	−0.6807	0.5288	0.1954	− 1	−90
H. Virginis	5.5	1.94	10.3	17 49.0	13 2 50.5	+10 11.9	−0.6847	0.5392	0.1760	− 4	−90
ɣ. Virginis	6.4	+1.94	−10.1	−18 12.2	3 36.7	+10 56.6	−0.4085	0.5398	−0.1748	+11	−67
ɣ. Virginis	5.7	1.93	10.1	18 20.1	4 20.8	+11 39.2	−0.3962	0.5404	0.1737	+11	−66
ɣ. Libræ	6.5	1.87	9.2	20 4.7	11 47.1	− 5 9.4	+0.2083	0.5463	0.1617	+41	−30
ɣ. Libræ	6.4	1.83	8.7	20 49.6	16 54.0	− 0 12.9	+0.1964	0.5504	0.1527	+40	−31
ɣ. Libræ	6.1	1.83	8.6	20 58.8	17 21.8	+ 0 14.0	+0.2869	0.5508	0.1519	+45	−26
β. Libræ	5.7	+1.79	− 8.6	−21 2.7	21 52.2	+ 4 35.0	−0.3100	0.5545	−0.1435	+12	−60
β. Libræ	6.1	1.75	8.0	21 42.7	14 1 51.0	+ 8 25.3	−0.1628	0.5578	0.1357	+19	−51
β. Libræ	5.8	1.71	7.6	22 5.7	6 9.4	−11 25.5	−0.3252	0.5612	0.1269	+ 9	−61
β. Libræ	6.3	1.65	6.5	24 12.6	13 17.0	− 4 33.4	+1.0374	0.5669	0.1115	+66	+22
β. Libræ	6.0	1.62	6.9	22 52.1	15 15.6	− 2 39.1	−0.5791	0.5685	0.1070	− 6	−82
β. Libræ	6.2	+1.61	− 6.8	−22 52.9	15 54.7	− 2 1.5	−0.6352	0.5690	−0.1055	− 9	−89
Libræ	5.0	1.62	6.6	23 33.1	16 17.4	− 1 39.6	+0.0234	0.5693	0.1046	+25	−40
Scorpii	4.6	1.57	5.7	25 4.9	21 48.8	+ 3 39.4	+1.0726	0.5736	0.0917	+65	+25
β. Scorpii	5.4	1.56	6.0	24 17.3	21 56.5	+ 3 46.8	+0.2365	0.5737	0.0914	+35	−28
β. *Scorpii*	*5.3*	*1.56*	*6.2*	*23 44.0*	21 57.8	+ 3 48.0	−0.3425	0.5737	0.0913	+ 5	−63
Scorpii	*5.9*	*+1.56*	*− 5.7*	*−25 0.0*	22 14.7	+ 4 4.4	+0.9482	0.5739	−0.0906	+65	+1

ELEMENTS FOR THE PREDICTION OF OCCULTATION

FEBRUARY.

THE STAR'S					AT CONJUNCTION IN R. A.				
Name.	Mag.	Red'ns from 1917.0. $\Delta\alpha$	$\Delta\delta$	Apparent Declination.	Greenwich Mean Time.	Hour Angle, H	Y	x'	y
		s	"	° ′	d h m	h m			
40 B. Scorpii	5.4	+1.54	−5.8	−24 35.7	14 23 51.9	+ 5 37.9	+0.3825	0.5751	−0.0
50 B. Scorpii	6.4	1.52	5.7	24 30.0	15 2 3.0	+ 7 44.0	+0.1007	0.5767	0.0
57 B. Scorpii	5.7	1.50	6.0	23 22.9	2 57.6	+ 8 36.6	−1.1300	0.5774	0.0
24 G. Scorpii	6.2	1.50	5.7	24 14.5	3 39.9	+ 9 17.3	−0.2939	0.5779	0.0
27 G. Scorpii	5.8	1.49	5.9	23 28.0	4 1.6	+ 9 38.2	−1.1252	0.5781	0.0
41 G. Scorpii	6.3	+1.47	−5.6	−24 12.7	6 3.3	+11 35.2	−0.5019	0.5795	−0.0
85 B. Scorpii	6.0	1.47	5.2	25 16.1	6 29.9	−11 59.2	+0.5587	0.5799	0.0
19 Scorpii	4.9	1.44	5.5	23 58.3	8 49.9	− 9 44.7	−0.9370	0.5814	0.0
σ Scorpii	3.1	1.44	4.9	25 23.8	9 2.0	− 9 33.0	+0.5203	0.5816	0.0
α Scorpii	1.2	1.41	4.4	26 15.0	12 18.7	− 6 23.9	+1.2051	0.5837	0.0
22 Scorpii	4.8	+1.40	−4.9	−24 56.1	12 39.0	− 6 4.4	−0.1680	0.5839	−0.0
116 B. Scorpii	6.2	1.41	4.4	26 21.5	13 5.8	− 5 38.6	+1.2745	0.5842	0.0
126 B. Scorpii	6.1	1.34	4.8	24 18.6	17 10.9	− 1 43.2	−1.0262	0.5867	0.0
88 B. Ophiuchi	6.3	1.26	4.2	24 58.1	16 0 22.5	+ 5 11.3	−0.5754	0.5906	0.0
26 Ophiuchi	5.8	1.26	4.2	24 51.9	0 27.0	+ 5 15.6	−0.6830	0.5906	0.0
118 B. Ophiuchi	6.2	+1.24	−3.5	−26 24.2	3 2.9	+ 7 45.2	+0.8420	0.5919	−0.0
137 B. Ophiuchi	6.3	1.21	3.8	25 9.3	5 8.5	+ 9 45.7	−0.4544	0.5929	0.0
36 Ophi. (*1st star*)	5.4	1.20	3.4	26 29.0	6 20.7	+10 55.0	+0.8914	0.5934	−0.0
θ Ophiuchi	3.4	1.16	3.7	24 55.1	8 55.3	−10 36.5	−0.7028	0.5944	+0.0
136 G. Ophiuchi	6.3	1.15	3.2	25 52.3	10 47.9	− 8 48.5	+0.2764	0.5951	0.0
151 G. Ophiuchi	6.0	+1.13	−3.0	−26 12.5	12 38.6	− 7 2.3	+0.6375	0.5957	+0.0
63 Ophiuchi	6.1	1.02	2.9	24 52.3	21 31.2	+ 1 28.5	−0.4759	0.5980	0.0
7 Sagittarii	5.5	0.98	2.9	24 17.0	17 0 33.4	+ 4 23.3	−0.9339	0.5986	0.0
9 Sagittarii	6.0	0.98	2.9	24 21.9	0 56.7	+ 4 45.7	−0.8330	0.5986	0.0
67 B. Sagittarii	6.4	0.93	2.2	25 38.3	6 33.7	+10 8.8	+0.7749	0.5991	0.0
70 B. Sagittarii	6.4	+0.91	−2.3	−24 57.3	7 38.9	+11 11.4	+0.1628	0.5992	+0.0
λ Sagittarii	2.9	0.89	2.1	25 28.2	10 5.6	−10 28.0	+0.8578	0.5993	0.0
24 Sagittarii	5.7	0.86	2.3	24 5.8	12 21.8	− 8 17.4	−0.3358	0.5992	0.0
117 B. Sagittarii	5.8	0.83	2.4	23 34.6	14 7.7	− 6 35.9	−0.7023	0.5992	0.0
26 Sagittarii	6.1	0.82	2.2	23 54.7	15 23.8	− 5 22.9	−0.2526	0.5991	0.0
126 B. Sagittarii	5.7	+0.82	−1.8	−25 5.8	16 30.6	− 4 18.8	+1.0338	0.5990	+0.0
ν^1 Sagittarii	5.0	0.77	2.2	22 50.9	20 6.2	− 0 52.2	−0.8473	0.5986	0.1
ν^2 Sagittarii	5.1	0.76	2.2	22 46.6	20 27.7	− 0 31.4	−0.8809	0.5985	0.1
154 B. Sagittarii	5.9	0.76	2.0	23 16.9	20 47.9	− 0 12.1	−0.3420	0.5985	0.1
168 B. Sagittarii	6.3	0.74	2.1	22 48.8	22 57.1	+ 1 51.9	−0.5691	0.5981	0.1
191 B. Sagittarii	6.5	+0.72	−1.8	−23 19.4	18 1 39.9	+ 4 28.0	+0.2555	0.5976	+0.1
199 B. Sagittarii	6.4	0.70	2.1	21 47.9	3 6.7	+ 5 51.2	−1.0817	0.5972	0.1
222 B. Sagittarii	5.5	0.68	1.7	22 33.5	6 14.4	+ 8 51.2	+0.0780	0.5965	0.1
50 Sagittarii	5.5	0.65	1.8	21 56.5	8 26.1	+10 57.6	−0.2338	0.5958	0.1
253 B. Sagittarii	6.1	0.64	1.8	21 29.2	10 12.6	−11 20.2	−0.4344	0.5953	0.1
f Sagittarii	5.1	+0.58	−1.8	−19 57.7	16 13.7	− 5 33.6	−1.0293	0.5933	+0.1
σ Capricorni	5.5	0.49	−1.3	−19 22.7	19 5 12.4	+ 6 54.0	+0.6566	0.5878	0.1
				NEW MOON.					
36 Piscium	6.2	+0.38	+4.1	+ 7 46.8	23 11 2.3	+ 9 3.0	−0.9921	0.5513	+0.2
d Piscium	5.4	+0.40	+4.1	+ 7 43.8	12 51.1	+10 48.1	−0.4843	0.5512	+0.2
136 B. Piscium	6.5	0.46	4.7	8 54.2	22 7.4	− 4 14.7	+0.6365	0.5511	0.2
75 Piscium	6.3	0.54	6.0	12 30.8	24 9 30.1	+ 6 44.7	−0.3158	0.5516	0.2
η Piscium	3.7	0.65	6.8	14 55.2	20 38.6	− 6 29.8	−0.2936	0.5526	0.2
101 Piscium	6.2	0.67	6.7	14 14.4	22 33.9	− 4 38.5	+0.8110	0.5528	0.2
105 Piscium	6.1	+0.69	+7.2	+15 59.2	25 0 17.5	− 2 58.6	−0.6162	0.5530	+0

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

FEBRUARY.

The Star's					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1917.0. Δα	Δδ	Apparent Declination.	Greenwich Mean Time.	Hour Angle, *H*	*Y*	*x'*	*y'*	N.	S.
		s	"	° ′	d h m	h m				°	°
Arietis	6.4	+0.72	+7.6	+17 0.0	25 3 21.7	− 0 0.7	−1.0244	0.5533	+0.2033	−17	−73
Arietis	5.8	0.73	7.4	16 32.7	4 4.4	+ 0 40.5	−0.4133	0.5534	0.2021	+19	−57
Arietis	5.1	0.78	7.8	17 24.9	8 8.5	+ 4 36.1	−0.5012	0.5540	0.1952	+14	−62
Arietis	6.4	0.81	7.9	17 51.4	10 57.6	+ 7 19.3	−0.4148	0.5543	0.1903	+19	−56
Arietis	6.5	0.83	7.9	17 38.2	12 45.4	+ 9 3.4	+0.1516	0.5546	0.1870	+50	−25
Arietis	6.4	+0.84	+7.6	+16 50.3	13 28.5	+ 9 45.0	+1.1116	0.5547	+0.1857	+90	+31
Arietis	5.9	0.85	8.3	19 6.7	14 0.4	+10 15.8	−1.1411	0.5548	0.1847	−28	−71
Arietis	5.6	0.89	8.4	19 31.2	17 19.2	−10 32.4	−0.9646	0.5552	0.1786	−14	−70
Arietis	6.2	0.96	8.4	19 29.4	22 49.9	− 5 13.2	+0.0202	0.5560	0.1680	+42	−30
Arietis	5.7	1.03	8.5	19 39.7	26 3 59.2	− 0 14.8	+0.6825	0.5566	0.1577	+90	+ 6
Arietis	5.8	+1.13	+8.5	+20 20.3	10 51.5	+ 6 22.9	+1.0112	0.5575	+0.1433	+90	+29
Arietis (*mean*)	4.6	1.14	8.8	21 0.7	11 21.2	+ 6 51.6	+0.3766	0.5575	0.1423	+65	− 8
Arietis	6.1	1.33	8.8	22 31.3	27 0 5.2	− 4 51.4	+0.4246	0.5586	0.1143	+69	− 3
Tauri	5.9	1.38	9.3	24 11.4	2 40.6	− 2 21.5	−1.0547	0.5588	0.1085	−23	−66
Tauri	5.4	1.45	9.1	24 1.9	7 11.0	+ 1 59.3	−0.4237	0.5590	0.0981	+18	−47
Tauri	3.8	+1.45	+9.0	+23 51.3	7 13.0	+ 2 1.2	−0.2333	0.5590	+0.0981	+28	−36
Tauri	5.6	1.45	9.2	24 34.9	7 19.9	+ 2 7.9	−0.9947	0.5590	0.0978	−19	−65
Tauri	4.3	1.45	9.1	24 12.6	7 21.4	+ 2 9.3	−0.5968	0.5590	0.0977	+ 8	−59
Tauri	4.1	1.45	9.1	24 6.7	7 37.6	+ 2 25.0	−0.4657	0.5590	0.0971	+15	−50
Tauri	5.8	1.46	9.1	24 17.9	7 39.6	+ 2 26.9	−0.6614	0.5590	0.0970	+ 4	−63
Tauri	6.5	+1.46	+9.1	+24 16.3	7 43.3	+ 2 30.5	−0.6274	0.5590	+0.0969	+ 6	−61
Tauri	4.3	1.46	8.9	23 41.6	7 51.0	+ 2 37.9	+0.0012	0.5590	0.0966	+41	−23
Tauri	3.0	1.46	8.9	23 51.1	8 21.1	+ 3 6.9	−0.1195	0.5590	0.0954	+35	−30
B. Tauri	5.5	1.46	8.7	23 10.2	8 44.1	+ 3 29.0	+0.6431	0.5591	0.0945	+90	+11
Tauri	3.7	1.47	8.9	23 48.2	9 4.9	+ 3 49.2	+0.0014	0.5591	0.0937	+42	−23
Tauri	5.2	+1.47	+8.9	+23 53.2	9 5.4	+ 3 49.6	−0.0866	0.5591	+0.0937	+36	−28
Tauri	6.0	1.52	8.4	22 56.3	12 31.8	+ 7 8.7	+1.2339	0.5591	0.0857	+84	+55
Tauri	5.6	1.58	8.5	23 52.8	15 41.3	+10 11.5	+0.4879	0.5591	0.0783	+74	+ 4
Tauri	5.3	1.72	8.5	25 26.2	23 35.3	− 6 11.4	−0.6347	0.5587	0.0595	+ 5	−58
Tauri	6.1	1.71	8.0	24 6.6	28 0 13.5	− 5 34.6	+0.8266	0.5587	0.0580	+90	+25
B. Tauri	6.3	+1.93	+6.9	+24 27.7	14 18.5	+ 8 0.6	+1.0343	0.5570	+0.0243	+90	+42
Tauri	5.6	+1.95	+7.0	+24 55.5	15 7.8	+ 8 48.1	+0.5532	0.5568	+0.0224	+81	+13

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Tauri	5.4	+2.15	+5.7	+25 5.2	1 4 50.7	− 1 57.8	+0.4652	0.5539	−0.0101	+73	+ 9
Tauri	5.1	2.22	5.4	25 51.2	9 29.0	+ 2 30.9	−0.4434	0.5526	0.0209	+16	−42
Tauri	5.0	2.26	4.5	24 32.5	13 39.2	+ 6 32.3	+0.8818	0.5513	0.0305	+90	+31
B. Tauri	5.8	2.30	4.0	24 14.4	17 12.9	+ 9 58.7	+1.0909	0.5502	0.0386	+90	+45
Tauri	4.7	2.34	4.5	25 56.8	17 39.7	+10 24.6	−0.7947	0.5500	0.0396	− 5	−64
Geminorum	5.9	+2.39	+3.2	+24 26.4	23 48.7	− 7 39.0	+0.5693	0.5478	−0.0533	+82	+10
Geminorum	6.1	2.41	2.8	23 59.9	2 1 59.6	− 5 32.6	+0.9333	0.5470	0.0581	+90	+32
Geminorum	6.2	2.41	2.7	23 46.2	2 17.9	− 5 14.9	+1.1658	0.5469	0.0588	+90	+50
B. Geminorum	6.5	2.54	1.7	24 39.7	11 41.0	+ 3 49.3	−0.4590	0.5432	0.0788	+16	−48
B. Geminorum	5.8	2.59	+0.5	23 42.1	18 28.2	+10 23.0	+0.0169	0.5402	0.0927	+42	−23
Geminorum	5.2	+2.65	0.0	+24 20.1	23 21.0	− 8 53.8	−1.1599	0.5380	−0.1024	−34	−66
Geminorum	5.9	2.64	−0.6	22 45.8	3 0 44.7	− 7 32.8	+0.4325	0.5374	0.1051	+70	− 2
Geminorum	3.5	2.69	1.8	22 8.1	7 48.7	− 0 42.4	+0.3361	0.5343	0.1184	+62	− 9
Geminorum	6.0	2.72	1.8	23 6.3	9 24.1	+ 0 49.9	−0.9278	0.5334	0.1213	−13	−67
B. Geminorum	6.4	2.71	2.4	21 42.1	11 3.6	+ 2 26.2	+0.4221	0.5326	0.1244	+66	− 5
Geminorum	5.3	+2.72	−2.4	+21 36.9	11 29.1	+ 2 50.9	+0.4649	0.5324	−0.1251	+72	− 2

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

MARCH.

The Star's						At Conjunction in R. A.				
	Name.	Mag.	Red'ns from 1917.0. Δα	Δδ	Apparent Declination.	Greenwich Mean Time.	Hour Angle, H	Y'	x'	y'
			s	"	° ′	d h m	h m			
79	Geminorum	6.3	+2.76	− 3.9	+20 30.9	3 19 58.2	+11 4.0	+0.5598	0.5284	−0.139
	Saturn	0.1	. . .	. . .	21 34.5	21 49.4	−11 8.3	−0.8772	0.5295	0.143
209 B.	Geminorum	6.2	2.77	4.6	19 32.2	23 19.7	− 9 40.9	+1.1656	0.5270	0.145
85	Geminorum	5.2	2.80	4.7	20 6.2	4 1 9.3	− 7 54.7	+0.2702	0.5261	0.148
217 B.	Geminorum	6.3	2.81	5.1	20 2.6	3 42.2	− 5 26.5	−0.0471	0.5249	0.152
10 H.	Cancri	6.1	+2.81	− 5.6	+19 4.6	5 41.4	− 3 31.0	+0.7206	0.5240	−0.155
d^1	Cancri	5.9	2.86	6.9	18 35.9	15 4.1	+ 5 34.6	−0.2728	0.5198	0.169
	Neptune	7.7	. . .	. . .	19 23.6	15 9.8	+ 5 40.2	−1.1727	0.5207	0.169
d^2	Cancri	6.2	2.84	7.4	17 19.1	16 20.9	+ 6 49.1	+0.9298	0.5193	0.171
θ	Cancri	5.5	2.88	7.5	18 22.4	19 16.1	+ 9 39.1	−0.7475	0.5180	0.175
54	Cancri	6.3	+2.88	− 9.3	+15 39.4	5 5 19.8	− 4 35.1	+0.4417	0.5139	−0.188
o^1	Cancri	5.1	2.90	9.7	15 38.3	8 34.1	− 1 26.6	−0.1537	0.5127	0.191
o^2	Cancri	5.7	2.90	9.7	15 53.9	8 44.5	− 1 16.5	−0.4747	0.5126	0.192
ξ	Leonis	5.1	2.90	12.5	11 39.9	6 3 0.1	− 7 32.3	+0.5406	0.5066	0.210
o	Leonis	3.8	2.90	13.1	10 16.0	7 58.0	− 2 42.9	+1.0334	0.5053	0.215
83 B.	Leonis	5.9	+2.90	−14.0	+ 9 19.4	16 14.6	+ 5 19.8	+0.2721	0.5034	−0.221
89 B.	Leonis	6.2	2.90	14.1	8 42.4	17 10.0	+ 6 13.6	+0.7506	0.5032	0.222
π	Leonis	4.9	2.90	14.3	8 26.3	18 18.3	+ 7 20.0	+0.7938	0.5030	0.222
43	Leonis	6.3	2.90	15.5	6 57.6	7 6 46.5	− 4 32.6	−0.3962	0.5011	0.230
155 B.	Leonis	6.5	2.89	15.6	6 6.7	6 55.3	− 4 24.1	+0.5088	0.5011	0.230
35	Sextantis	6.1	+2.90	−16.4	+ 5 10.7	17 57.9	+ 6 20.2	−1.0301	0.5003	−0.234
p^4	Leonis	5.7	2.88	17.3	2 24.1	8 6 57.6	− 5 1.5	−1.0405	0.5006	0.238
p^5	Leonis	5.3	2.86	17.5	0 22.6	10 43.0	− 1 22.3	+0.2921	0.5009	0.238
359 B.	Leonis	6.3	2.86	17.7	+ 0 35.0	15 56.8	+ 3 42.8	−1.1810	0.5015	0.238
388 B.	Leonis	6.3	2.86	17.8	− 1 14.9	18 28.0	+ 6 9.8	+0.2283	0.5019	0.238
e	Leonis	5.1	+2.85	−17.8	− 2 33.0	19 47.3	+ 7 26.9	+1.3418	0.5021	−0.238
431 B.	Leonis	6.2	2.85	18.0	1 58.9	9 0 12.0	+11 44.2	−0.3338	0.5029	0.238
13 B.	Virginis	5.9	2.83	18.0	4 52.6	7 3.6	− 5 35.6	+1.2047	0.5044	0.237
78 B.	Virginis	6.5	2.82	18.2	5 15.8	19 31.9	+ 6 31.4	−1.3092	0.5081	0.233
q	Virginis	5.3	2.80	17.8	9 0.0	10 5 50.6	− 7 27.5	+0.3812	0.5120	0.228
370 B.	Virginis	6.0	+2.78	−17.4	−11 12.2	16 30.0	+ 2 53.1	+0.3798	0.5168	−0.220
75	Virginis	5.6	2.74	16.2	14 56.4	11 11 53.0	− 2 19.3	+0.3020	0.5274	0.205
83	Virginis	5.6	2.73	15.8	15 46.0	17 34.0	+ 3 11.1	+0.0583	0.5309	0.195
85	Virginis	6.1	2.72	15.9	15 21.3	18 6.0	+ 3 42.1	−0.4875	0.5312	0.195
43 H.	Virginis	5.5	2.68	14.5	17 49.1	12 8 17.6	− 6 33.7	−0.4788	0.5405	0.175
231 G.	Virginis	6.4	+2.68	−14.4	−18 12.2	9 3.9	− 5 48.9	−0.2012	0.5410	−0.174
236 G.	Virginis	5.7	2.68	14.3	18 20.1	9 48.0	− 5 6.3	−0.1882	0.5415	0.173
9 G.	Librae	6.5	2.65	13.2	20 4.8	17 15.8	+ 2 6.6	+0.4241	0.5467	0.160
17 G.	Librae	6.4	2.63	12.7	20 49.7	22 24.4	+ 7 4.8	+0.4158	0.5503	0.151
18 G.	Librae	6.1	2.63	12.6	20 58.9	22 52.4	+ 7 31.9	+0.5070	0.5506	0.150
43 B.	Librae	5.7	+2.61	−12.6	−21 2.8	13 3 24.8	+11 54.9	−0.0902	0.5538	−0.142
47 G.	Librae	6.1	2.58	11.7	21 42.8	7 25.8	− 8 12.5	+0.0597	0.5566	0.134
64 G.	Librae	5.8	2.55	11.2	22 5.8	11 46.9	− 4 0.6	−0.1019	0.5595	0.125
153 B.	Librae	6.3	2.53	9.8	24 12.7	19 0.0	+ 2 57.0	+1.2737	0.5643	0.110
169 B.	Librae	6.0	2.49	10.1	22 52.2	21 0.3	+ 4 52.9	−0.3552	0.5656	0.105
177 B.	Librae	6.2	+2.49	−10.0	−22 52.9	21 40.1	+ 5 31.4	−0.4116	0.5660	−0.104
42	Librae	5.0	2.49	9.7	23 33.1	22 3.2	+ 5 53.6	+0.2526	0.5663	0.103
31 B.	Scorpii	5.4	2.45	8.9	24 17.4	14 3 47.8	+11 25.5	+0.4688	0.5698	0.090
32 B.	Scorpii	5.3	2.44	9.1	23 44.0	3 49.1	+11 26.8	−0.1154	0.5699	0.090
3	Scorpii	5.9	2.46	8.6	25 0.1	4 6.4	+11 43.5	+1.1872	0.5700	0.089
40 B.	*Scorpii*	5.4	+2.44	− 8.6	−24 35.7	5 45.3	−10 41.3	+0.6166	0.5710	−0.08

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

MARCH.

The Star's					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1917.0. Δα	Δδ	Apparent Declination.	Greenwich Mean Time.	Hour Angle, *H*	Γ″	*x′*	*y′*	N.	S.
		s	″	° ′	d h m	h m				°	°
3. Scorpii	6.4	+2.42	−8.4	−24 30.0	14 7 58.9	− 8 32.7	+0.3325	0.5723	−0.0803	+40	−23
3. Scorpii	5.7	2.39	8.6	23 23.0	8 54.6	− 7 39.0	−0.9104	0.5729	0.0780	−29	−90
3. Scorpii	6.2	2.40	8.3	24 14.6	9 37.7	− 6 57.5	−0.0659	0.5732	0.0763	+18	−45
3. Scorpii	5.8	2.38	8.5	23 28.0	9 59.9	− 6 36.2	−0.9057	0.5735	0.0754	−28	−90
3. Scorpii	6.3	2.38	8.0	24 12.8	12 4.1	− 4 36.6	−0.2761	0.5746	0.0703	+ 7	−58
B. Scorpii	6.0	+2.39	−7.6	−25 16.1	12 31.2	− 4 10.5	+0.7956	0.5749	−0.0691	+65	+ 5
Scorpii	4.9	2.34	7.8	23 58.3	14 54.2	− 1 53.0	−0.7160	0.5761	0.0632	−18	−90
Scorpii	3.1	2.36	7.3	25 23.8	15 6.6	− 1 41.0	+0.7571	0.5762	0.0627	+65	+ 3
Scorpii	4.8	2.32	7.0	24 56.1	18 48.5	+ 1 52.5	+0.0611	0.5781	0.0532	+22	−38
B. Scorpii	6.1	2.26	6.7	24 18.6	23 27.1	+ 6 20.5	−0.8078	0.5803	0.0411	−26	−90
B. Ophiuchi	6.3	+2.19	−5.6	−24 58.1	15 6 50.1	−10 33.6	−0.3534	0.5832	−0.0214	− 2	−64
Ophiuchi	5.8	2.18	5.7	24 51.9	6 54.7	−10 29.2	−0.4625	0.5833	0.0212	− 8	−72
B. Ophiuchi	6.2	2.18	4.8	26 24.2	9 35.0	− 7 55.1	+1.0820	0.5842	0.0139	+64	+28
B. Ophiuchi	6.3	2.14	5.0	25 9.3	11 44.2	− 5 51.0	−0.2324	0.5849	0.0081	+ 3	−55
Oph. (*1st star*)	5.4	2.14	4.6	26 29.0	12 58.6	− 4 39.6	+1.1315	0.5852	0.0047	+64	+33
Ophiuchi	5.1	+2.09	−5.1	−24 11.9	14 3.2	− 3 37.4	−1.2300	0.5856	−0.0017	−61	−83
Ophiuchi	3.4	2.08	4.6	24 55.1	15 37.8	− 2 6.4	−0.4858	0.5860	+0.0026	−11	−74
B. Ophiuchi	6.3	2.06	4.8	24 10.2	16 52.1	− 0 55.1	−1.2521	0.5863	0.0061	−63	−77
G. Ophiuchi	6.3	2.08	4.1	25 52.3	17 33.9	− 0 14.9	+0.5066	0.5865	0.0080	+45	−12
G. Ophiuhci	6.0	2.06	3.7	26 12.5	19 28.1	+ 1 34.8	+0.8721	0.5869	0.0132	+64	+11
Ophiuchi	6.1	+1.92	−3.2	−24 52.4	16 4 38.2	+10 23.2	−0.2622	0.5884	+0.0388	+ 4	−57
Sagittarii	4.8	1.88	3.3	23 48.6	6 34.8	−11 44.9	−1.2687	0.5885	0.0442	−64	−73
Sagittarii	5.5	1.88	3.0	24 17.0	7 46.6	−10 35.9	−0.7293	0.5886	0.0475	−20	−90
Sagittarii	6.0	1.87	3.0	24 21.9	8 10.7	−10 12.8	−0.6271	0.5887	0.0486	−14	−89
Sagittarii	5.2	1.82	2.8	23 43.2	11 16.7	− 7 14.1	−1.1204	0.5888	0.0572	−46	−90
B. Sagittarii	6.4	+1.82	−1.9	−25 38.2	13 59.6	− 4 37.7	+1.0026	0.5888	+0.0647	+64	+20
B. Sagittarii	6.4	1.79	2.0	24 57.2	15 7.1	− 3 32.8	+0.3799	0.5887	0.0678	+42	−20
Sagittarii	2.9	1.76	1.5	25 28.2	17 39.2	− 1 6.9	+1.0845	0.5887	0.0747	+65	+27
Sagittarii	5.7	1.72	1.7	24 5.7	20 0.3	+ 1 8.7	−0.1306	0.5885	0.0811	+15	−49
B. Sagittarii	5.8	1.69	1.7	23 34.6	21 50.1	+ 2 54.2	−0.5048	0.5883	0.0861	− 4	−74
Sagittarii	6.1	+1.67	−1.5	−23 54.7	23 9.0	+ 4 10.0	−0.0487	0.5882	+0.0896	+20	−44
B. Sagittarii	5.7	1.67	0.9	25 5.7	17 0 18.3	+ 5 16.5	+1.2583	0.5881	0.0927	+65	+50
Sagittarii	5.0	1.60	1.3	22 50.9	4 2.0	+ 8 51.5	−0.6579	0.5876	0.1026	−11	−90
Sagittarii	5.1	1.59	1.3	22 46.6	4 24.3	+ 9 12.9	−0.6924	0.5874	0.1036	−13	−90
B. Sagittarii	5.9	1.59	1.1	23 16.8	4 45.3	+ 9 33.1	−0.1447	0.5874	0.1045	+16	−50
3. Sagittarii	6.3	+1.56	−1.0	−22 48.8	6 59.3	+11 41.7	−0.3778	0.5870	+0.1103	+ 5	−65
Sagittarii	3.9	1.53	1.2	21 51.9	8 12.7	−11 7.7	−1.2010	0.5868	0.1135	−49	−90
3. Sagittarii	6.5	1.53	0.6	23 19.3	9 48.3	− 9 35.9	+0.4580	0.5864	0.1176	+51	−16
3. Sagittarii	6.4	1.49	1.0	21 47.8	11 18.4	− 8 9.1	−0.9036	0.5861	0.1214	−24	−90
3. Sagittarii	5.5	1.46	0.4	22 33.5	14 33.2	− 5 2.1	+0.2723	0.5852	0.1296	+41	−26
Sagittarii	5.5	+1.42	−0.4	−21 56.5	16 49.9	− 2 50.7	−0.0474	0.5847	+0.1352	+24	−44
3. Sagittarii	6.1	1.40	0.4	21 29.2	18 40.5	− 1 4.4	−0.2537	0.5841	0.1397	+14	−56
Sagittarii	5.1	1.30	0.3	19 57.7	18 0 55.2	+ 4 55.8	−0.8666	0.5822	0.1545	−18	−90
Sagittarii	6.0	1.27	−0.3	19 15.4	3 17.1	+ 7 12.1	−1.2019	0.5814	0.1599	−44	−90
Capricorni	5.5	1.14	+0.7	19 22.7	14 22.4	− 6 7.9	+0.8277	0.5774	0.1836	+71	+ 5
Capricorni	5.2	+1.10	+0.7	−18 29.1	17 39.0	− 2 58.8	+0.5462	0.5761	+0.1902	+63	−12
Capricorni	5.0	1.09	0.6	18 5.3	18 17.5	− 2 21.7	+0.2735	0.5758	0.1914	+47	−26
Capricorni	5.6	1.09	0.9	18 51.5	18 42.6	− 1 57.6	+1.1221	0.5757	0.1922	+71	+26
3. Capricorni	6.2	1.05	0.5	16 48.7	21 4.0	+ 0 18.5	−0.4621	0.5748	0.1967	+ 9	−70
3. Capricorni	5.9	1.02	0.6	16 25.2	23 9.4	+ 2 19.3	−0.4372	0.5739	0.2005	+10	−69
3. *Capricorni*	*5.7*	*+0.95*	*+1.0*	−16 21.1	19 6 19.3	+ 9 13.1	+0.9756	0.5711	+0.2129	+74	+14

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS

MARCH.

THE STAR'S					AT CONJUNCTION IN R. A.				
Name.	Mag.	Red'ns from 1917.0.		Apparent Declination.	Greenwich Mean Time.	Hour Angle, H	Y	x'	y'
		$\Delta\alpha$	$\Delta\delta$						
		s	"	° ′	d h m	h m			
95 B. Capricorni	5.9	+0.93	+0.7	-14 48.2	19 6 46.3	+ 9 39.1	-0.4675	0.5709	+0.21
53 B. Aquarii	6.5	0.86	0.9	13 32.8	14 5.9	− 7 17.5	-0.1094	0.5681	0.22
18 Aquarii	5.5	0.82	1.1	13 14.1	17 35.5	− 3 55.5	+0.3752	0.5668	0.22
72 B. Aquarii	6.5	0.80	0.9	11 55.7	19 20.0	− 2 14.7	-0.5188	0.5661	0.23
137 B. Capricorni	6.2	0.75	1.0	10 57.0	20 0 10.3	+ 2 25.1	-0.3506	0.5644	0.23
c^1 Capricorni	5.3	+0.72	+0.8	− 9 27.8	2 34.4	+ 4 44.0	-1.2485	0.5636	+0.24
c^2 Capricorni	6.3	0.72	0.9	9 39.6	3 7.2	+ 5 15.6	-0.9231	0.5634	0.24
λ Capricorni	5.5	0.74	1.3	11 44.9	3 13.0	+ 5 21.2	+1.1705	0.5634	0.24
96 B. Aquarii	6.5	0.71	1.3	-10 42.2	6 17.3	+ 8 18.9	+0.8805	0.5624	0.24
				NEW	*MOON.*				
τ Arietis	5.1	+0.56	+5.8	+17 24.9	24 18 12.9	− 7 31.3	-0.6769	0.5621	+0.19
35 B. Arietis	6.4	0.58	6.0	17 51.4	20 58.2	− 4 52.0	-0.5961	0.5626	0.19
47 B. Arietis	6.5	0.59	6.0	17 38.2	22 43.5	− 3 10.4	-0.0380	0.5630	0.18
20 H^1. Arietis	6.4	0.60	5.8	16 50.2	23 25.5	− 2 29.9	+0.9113	0.5632	0.18
15 Arietis	5.9	+0.60	+6.2	+19 6.7	23 56.7	− 1 59.8	-1.3202	0.5632	+0.18
θ Arietis	5.6	0.62	6.4	19 31.2	25 3 10.8	+ 1 7.3	-1.1504	0.5639	0.17
26 Arietis	6.2	0.66	6.4	19 29.4	8 33.3	+ 6 18.2	-0.1842	0.5648	0.16
μ Arietis	5.7	0.72	6.5	19 39.6	13 34.8	+11 8.7	+0.4634	0.5656	0.15
47 Arietis	5.8	0.79	6.7	20 20.3	20 16.5	− 6 24.0	+0.7790	0.5666	0.14
ε Arietis (*mean*)	4.6	+0.79	+6.8	+21 0.7	20 45.4	− 5 56.2	+0.1509	0.5666	+0.14
66 Arietis	6.1	0.94	7.1	22 31.2	26 9 9.6	+ 6 0.9	+0.1834	0.5677	0.11
7 Tauri	5.9	0.97	7.5	24 11.3	11 40.9	+ 8 26.7	-1.2810	0.5678	0.10
16 Tauri	5.4	1.02	7.3	24 1.9	16 4.4	-11 19.5	-0.6619	0.5679	0.09
17 Tauri	3.8	1.02	7.3	23 51.3	16 6.3	-11 17.7	-0.4738	0.5679	0.09
18 Tauri	5.6	+1.03	+7.5	+24 34.9	16 13.0	-11 11.1	-1.2263	0.5679	+0.09
q Tauri	4.3	1.03	7.4	24 12.6	16 14.5	-11 9.7	-0.8331	0.5679	0.09
20 Tauri	4.1	1.03	7.3	24 6.7	16 30.3	-10 54.5	-0.7038	0.5679	0.09
21 Tauri	5.8	1.03	7.4	24 17.9	16 32.2	-10 52.7	-0.8972	0.5679	0.09
22 Tauri	6.5	1.03	7.4	24 16.3	16 35.8	-10 49.2	-0.8636	0.5679	0.09
23 Tauri	4.3	+1.03	+7.2	+23 41.6	16 43.3	-10 42.0	-0.2426	0.5679	+0.09
η Tauri	3.0	1.04	7.2	23 51.1	17 12.6	-10 13.8	-0.3624	0.5679	0.09
104 B. Tauri	5.5	1.04	7.0	23 10.1	17 35.1	− 9 52.0	+0.3908	0.5679	0.09
27 Tauri	3.7	1.05	7.2	23 48.2	17 55.3	− 9 32.6	-0.2435	0.5678	0.09
28 Tauri	5.2	1.05	7.2	23 53.2	17 55.9	− 9 32.1	-0.3305	0.5678	0.09
33 Tauri	6.0	+1.09	+6.8	+22 56.2	21 17.0	− 6 18.3	+0.9714	0.5678	+0.08
161 B. Tauri	6.5	1.11	6.8	22 58.2	22 55.7	− 4 43.1	+1.0768	0.5677	0.08
36 Tauri	5.6	1.13	7.0	23 52.8	27 0 21.8	− 3 20.2	+0.2316	0.5676	0.07
χ Tauri	5.3	1.24	7.2	25 26.2	8 4.2	+ 4 5.4	-0.8838	0.5668	0.05
62 Tauri	6.1	1.24	6.7	24 6.6	8 41.5	+ 4 41.3	+0.5600	0.5667	0.05
95 Tauri	6.2	+1.36	+6.2	+23 56.1	16 53.2	-11 24.8	+1.1459	0.5654	+0.03
315 B. Tauri	6.3	1.44	6.0	24 27.7	22 27.4	− 6 2.7	+0.7580	0.5641	0.02
k Tauri	5.6	1.45	6.1	24 55.5	23 15.6	− 5 16.3	+0.2818	0.5639	0.02
103 Tauri	5.5	1.51	5.5	24 9.5	28 3 33.3	− 1 7.9	+1.1787	0.5627	+0.01
118 Tauri	5.4	1.64	5.1	25 5.1	12 42.3	+ 7 41.5	+0.1902	0.5597	-0.01
125 Tauri	5.1	+1.72	+5.0	+25 51.2	17 15.7	-11 54.8	-0.7107	0.5580	-0.02
132 Tauri	5.0	1.76	4.2	24 32.5	21 21.7	− 7 57.5	+0.6014	0.5564	0.03
412 B. Tauri	5.8	1.80	3.7	24 14.4	29 0 52.0	− 4 34.5	+0.8084	0.5549	0.03
139 Tauri	4.7	1.83	4.3	25 56.8	1 18.4	− 4 9.0	-1.0606	0.5547	0.03
5 Geminorum	5.9	1.89	3.1	24 26.4	7 22.2	+ 1 42.2	+0.2914	0.5519	0.05
8 *Geminorum*	6.1	+1.91	+2.8	+23 59.9	9 31.3	+ 3 46.9	+0.0527	0.5509	-0.06

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

MARCH.

	The Star's				At Conjunction in R. A.					Limiting Parallels.	
	Name.	Mag.	Red'ns from 1917.0. Δα	Δδ	Apparent Declination.	Greenwich Mean Time.	Hour Angle, H	Y	x′	y′	N.	S.
			s	″	° ′	d h m	h m				°	°
	Geminorum	6.2	+1.92	+ 2.7	+23 46.2	29 9 49.4	+ 4 4.4	+0.8833	0.5508	−0.0589	+90	+28
B.	Geminorum	6.0	1.96	2.1	23 22.5	13 41.9	+ 7 49.0	+1.0716	0.5489	0.0674	+90	+41
B.	Geminorum	6.5	2.05	2.0	24 39.7	19 5.8	−10 58.2	−0.7277	0.5462	0 0788	− 1	−65
B.	Geminorum	5.8	2.12	+ 0.9	23 42.1	30 1 48.8	− 4 28.7	−0.2538	0.5426	0.0926	+27	−37
	Geminorum	5.9	2.18	− 0.1	22 45.8	8 2.1	+ 1 32.3	+0.1615	0.5393	0.1048	+51	−16
	Geminorum	3.5	+2.25	− 1.1	+22 8.2	15 3.2	+ 8 19.7	+0.0689	0.5355	0.1179	+45	−22
	Geminorum	6.0	2.28	1.0	23 6.3	16 38.0	+ 9 51.4	−1.1873	0.5346	0.1208	−36	−67
B.	Geminorum	6.4	2.27	1.7	21 42.1	18 17.0	+11 27.2	+0.1563	0.5338	0.1238	+50	−19
	Geminorum	5.3	2.28	1.8	21 36.9	18 42.3	+11 51.7	+0.1992	0.5335	0.1245	+53	−16
	Geminorum	6.3	2.35	3.1	20 30.9	31 3 9.1	− 3 57.5	+0.2994	0.5290	0.1390	+59	13
	Saturn	0.3	. . .	. . .	+21 40.6	4 11.1	− 2 57.4	−1.1265	0.5281	−0.1407	−29	−68
B.	Geminorum	6.2	+2.37	− 3.9	19 32.2	6 29.9	− 0 43.0	+0.9053	0.5272	0.1444	+90	−20
	Geminorum	5.2	2.40	3.9	20 6.2	8 19.2	+ 1 2.9	+0.0151	0.5262	0.1473	+42	−29
B.	Geminorum	6.3	2.42	4.2	20 2.6	10 51.6	+ 3 30.6	−0.2987	0.5250	0.1513	+25	−46
H.	Cancri	6.1	2.43	4.8	19 4.6	12 50.6	+ 5 25.9	+0.4679	0.5239	0.1543	+71	− 6
	Cancri (*mean*)	4.7	+2.44	− 5.6	+17 53.9	16 35.0	+ 9 3.5	+1.1839	0.5221	−0.1599	+90	+40
	Cancri	5.9	2.51	6.0	18 35.9	22 12.4	− 9 29.4	−0.5127	0.5193	0.1679	+13	−61
	Cancri	6.2	+2.49	− 6.6	+17 19.1	23 29.1	− 8 15.0	+0.6876	0.5188	−0.1696	+90	+ 4

APRIL.

	Cancri	5.5	+2.54	− 6.6	+18 22.4	1 2 24.1	− 5 25.3	−0.9814	0.5174	−0.1736	−16	−72
	Cancri	6.3	2.58	8.5	15 39.4	12 27.9	+ 4 20.6	+0.2171	0.5130	0.1862	+53	−23
	Cancri	5.1	2.61	8.9	15 38.4	15 42.2	+ 7 29.2	−0.3725	0.5118	0.1899	+21	−56
	Cancri	5.7	2.61	8.8	15 53.9	15 52.6	+ 7 39.3	−0.6925	0.5117	0.1901	+ 3	−75
	Leonis	5.1	+2.68	−12.0	+11 39.9	2 10 8.9	+ 1 24.1	+0.3497	0.5057	−0.2085	+61	−20
	Leonis	3.8	2.69	12.8	10 16.0	15 7.0	+ 6 13.7	+0.8505	0.5044	0.2127	+90	+ 7
B.	Leonis	5.9	2.73	13.7	9 19.4	23 23.8	− 9 43.5	+0.1064	0.5027	0.2190	+47	−33
B.	Leonis	6.2	2.74	14.0	8 42.4	3 0 19.2	− 8 49.5	+0.5860	0.5026	0.2197	+79	− 8
	Leonis	4.9	2.74	14.1	8 26.3	1 27.5	− 7 43.2	+0.6313	0.5024	0.2205	+83	− 6
	Leonis	6.3	+2.79	−15.5	+ 6 57.6	13 55.2	+ 4 23.8	−0.5304	0.5009	−0.2278	+13	−73
B.	Leonis	6.5	2.78	15.7	6 6.7	14 4.0	+ 4 32.3	+0.3731	0.5009	0.2279	+63	−21
	Sextantis	6.1	2.83	16.7	5 10.7	4 1 5.4	− 8 44.7	−1.1377	0.5007	0.2326	−24	−85
	Leonis	5.7	2.86	17.9	2 24.1	14 2.2	+ 3 50.7	−1.1165	0.5016	0.2360	−22	−88
	Leonis	5.3	2.88	18.4	0 22.6	17 46.5	+ 7 28.7	+0.2217	0.5021	0.2365	+53	−30
B.	Leonis	6.3	+2.90	−18.6	+ 0 35.0	22 58.6	−11 27.9	−1.2340	0.5030	−0.2369	−32	−89
B.	Leonis	6.3	2.90	19.0	− 1 14.9	5 1 28.8	− 9 1.8	+0.1773	0.5036	0.2370	+51	−32
	Leonis	5.1	2.90	19.2	2 33.0	2 47.6	− 7 45.1	+1.2906	0.5039	0.2370	+87	+38
B.	Leonis	6.2	2.92	19.3	1 58.9	7 10.4	− 3 29.7	−0.3685	0.5049	0.2367	+22	−62
B.	Virginis	5.9	2.94	19.8	4 52.6	13 58.6	+ 3 7.0	+1.1818	0.5068	0.2358	+85	+28
B.	Virginis	6.5	+2.98	−20.0	− 5 15.8	6 2 19.8	− 8 53.0	−1.2904	0.5114	−0.2321	−40	−90
	Virginis	5.3	3.02	20.2	9 0.0	12 31.5	+ 1 0.9	+0.4185	0.5158	0.2272	+64	−19
B.	Virginis	6.0	3.06	20.0	11 12.3	23 2.7	+11 13.3	+0.4431	0.5213	0.2201	+64	−18
	Virginis	5.6	3.12	19.2	14 56.5	7 18 9.3	+ 5 44.5	+0.4104	0.5327	0.2020	+59	−19
	Virginis	5.6	3.14	18.8	15 46.0	23 45.3	+11 9.8	+0.1803	0.5363	0.1953	+44	−31
	Virginis	6.1	+3.14	−18.8	−15 21.4	8 0 16.8	+11 40.3	−0.3615	0.5367	−0.1946	+15	−63
B.	Virginis	5.5	3.17	17.5	17 49.1	14 15.8	+ 1 11.9	−0.3241	0.5462	0.1749	+15	−60
B.	Virginis	6.4	3.18	17.4	18 12.3	15 1.4	+ 1 56.1	−0.0465	0.5467	0.1737	+29	−44
B.	Virginis	5.7	3.18	17.4	18 20.2	15 44.9	+ 2 38.1	−0.0322	0.5472	0.1726	+30	−43
B.	Libræ	*6.5*	*3.20*	*16.4*	*20 4.8*	23 6.4	+ 9 44.7	+0.5909	0.5523	0.1603	+65	− 8
	Libræ	*6.4*	*+3.21*	*−15.8*	*−20 49.7*	9 4 10.7	− 9 21.5	+0.5918	0.5558	−0.1513	+64	− 8

ELEMENTS FOR THE PREDICTION OF OCCULTATIO

APRIL.

THE STAR'S					AT CONJUNCTION IN R. A.				
Name.	Mag.	Red'ns from 1917.0. Δα	Δδ	Apparent Declination.	Greenwich Mean Time.	Hour Angle, H	Y	x'	
		s	″	° ′	d h m	h m			
18 G. Libræ	6.1	+3.21	−15.7	−20 58.9	9 4 38.4	− 8 54.8	+0.6834	0.5561	−0
43 B. Libræ	5.7	3.22	15.7	21 2.8	9 7.2	− 4 35.4	+0.0965	0.5592	0
47 G. Libræ	6.1	3.22	14.6	21 42.8	13 5.2	− 0 45.8	+0.2522	0.5618	0
64 G. Libræ	5.8	3.21	14.0	22 5.8	17 23.3	+ 3 23.2	+0.0978	0.5646	0
169 B. Libræ	6.0	3.20	12.6	22 52.2	10 2 31.0	−11 49.0	−0.1416	0.5701	0
177 B. Libræ	6.2	+3.19	−12.5	−22 53.0	3 10.4	−11 11.0	−0.1970	0.5705	−0
42 Libræ	5.0	3.20	12.3	23 33.2	3 33.2	−10 49.0	+0.4658	0.5707	0
31 B. Scorpii	5.4	3.19	11.3	24 17.4	9 15.0	− 5 19.9	+0.6892	0.5739	0
32 B. Scorpii	5.3	3.18	11.4	23 44.1	9 16.3	− 5 18.6	+0.1063	0.5739	0
40 B. Scorpii	5.4	3.19	10.9	24 35.7	11 11.6	− 3 27.7	+0.8391	0.5749	0
50 B. Scorpii	6.4	+3.18	−10.6	−24 30.1	13 24.3	− 1 19.9	+0.5584	0.5760	−0
57 B. Scorpii	5.7	3.15	10.7	23 23.0	14 19.6	− 0 26.6	−0.6813	0.5765	0
24 G. Scorpii	6.2	3.16	10.4	24 14.6	15 2.4	+ 0 14.6	+0.1626	0.5768	0
27 G. Scorpii	5.8	3.15	10.5	23 28.0	15 24.5	+ 0 35.8	−0.6754	0.5770	0
41 G. Scorpii	6.3	3.15	10.0	24 12.8	17 28.0	+ 2 34.7	−0.0446	0.5780	0
85 B. Scorpii	6.0	+3.17	− 9.7	−25 16.2	17 55.0	+ 3 0.6	+1.0263	0.5782	−0
19 Scorpii	4.9	3.13	9.6	23 58.4	20 17.3	+ 5 17.5	−0.4810	0.5792	0
σ Scorpii	3.1	3.16	9.3	25 23.8	20 29.6	+ 5 29.4	+0.9909	0.5793	0
22 Scorpii	4.8	3.12	8.8	24 56.1	11 0 10.6	+ 9 1.9	+0.2994	0.5808	0
126 B. Scorpii	6.1	3.08	8.2	24 18.6	4 48.4	−10 30.9	−0.5649	0.5825	0
88 B. Ophiuchi	6.3	+3.03	− 6.8	−24 58.1	12 11.1	− 3 25.3	−0.1043	0.5847	−0
26 Ophiuchi	5.8	3.03	6.8	24 51.9	12 15.8	− 3 20.8	−0.2135	0.5847	0
137 B. Ophiuchi	6.3	3.00	5.9	25 9.3	17 5.7	+ 1 17.8	+0.0206	0.5857	0
39 Ophiuchi	5.1	2.95	5.8	24 11.9	19 25.1	+ 3 31.8	−0.9776	0.5861	−0
θ Ophiuchi	3.4	2.95	5.3	24 55.2	21 0.0	+ 5 2.9	−0.2307	0.5863	+0
191 B. Ophiuchi	6.3	+2.92	− 5.3	−24 10.2	22 14.6	+ 6 14.7	−0.9983	0.5865	+0
b Ophiuchi	4.3	2.92	5.3	24 6.1	22 45.0	+ 6 43.9	−1.0651	0.5865	0
136 G. Ophiuchi	6.3	2.96	4.6	25 52.3	22 56.6	+ 6 55.1	+0.7656	0.5866	0
51 Ophiuchi	4.8	2.89	5.0	23 54.0	12 0 45.8	+ 8 40.0	−1.2497	0.5867	0
151 G. Ophiuchi	6.0	2.94	4.2	26 12.5	0 51.4	+ 8 45.4	+1.1336	0.5867	0
63 Ophiuchi	6.1	+2.82	− 3.1	−24 52.4	10 5.4	− 6 22.2	+0.0005	0.5870	+0
4 Sagittarii	4.8	2.77	3.1	23 48.6	12 3.0	− 4 29.3	−1.0099	0.5870	0
7 Sagittarii	5.5	2.77	2.7	24 17.0	13 15.6	− 3 19.5	−0.4675	0.5869	0
9 Sagittarii	6.0	2.76	2.6	24 21.8	13 39.9	− 2 56.2	−0.3647	0.5869	0
1 Sagittarii	5.2	2.72	2.3	23 43.2	16 47.9	+ 0 4.5	−0.8597	0.5866	0
67 B. Sagittarii	6.4	+2.72	− 1.3	−25 38.2	19 32.8	+ 2 42.9	+1.2765	0.5862	+0
70 B. Sagittarii	6.4	2.69	1.3	24 57.2	20 41.2	+ 3 48.6	+0.6504	0.5860	0
24 Sagittarii	5.7	2.61	0.8	24 5.7	13 1 38.4	+ 8 34.2	+0.1380	0.5852	0
117 B. Sagittarii	5.8	2.57	0.6	23 34.6	3 29.9	+10 21.4	−0.2385	0.5848	0
26 Sagittarii	6.1	2.57	0.3	23 54.7	4 50.0	+11 38.4	+0.2211	0.5845	0
28 Sagittarii	5.6	+2.51	− 0.5	−22 28.8	6 39.3	−10 36.6	−1.0770	0.5840	+0
30 Sagittarii	6.2	2.49	− 0.3	22 15.5	8 28.1	− 8 52.0	−1.1291	0.5835	0
ν^1 Sagittarii	5.0	2.48	+ 0.1	22 50.9	9 47.9	− 7 35.3	−0.3926	0.5832	0
ν^2 Sagittarii	5.1	2.48	0.1	22 46.6	10 10.7	− 7 13.3	−0.4274	0.5830	0
154 B. Sagittarii	5.9	2.48	0.4	23 16.8	10 32.1	− 6 52.8	+0.1248	0.5830	0
168 B. Sagittarii	6.3	+2.44	+ 0.5	−22 48.8	12 48.5	− 4 41.7	−0.1104	0.5823	+0
o Sagittarii	3.9	2.41	0.4	21 51.8	14 3.3	− 3 29.7	−0.9409	0.5819	0
191 B. Sagittarii	6.5	2.41	1.1	23 19.3	15 40.8	− 1 56.0	+0.7328	0.5814	0
199 B. Sagittarii	6.4	2.36	0.8	21 47.8	17 12.8	− 0 27.6	−0.6415	0.5808	0
222 B. Sagittarii	5.5	2.33	1.6	22 33.4	20 31.6	+ 2 43.7	+0.5451	0.5796	0
50 Sagittarii	5.5	+2.29	+ 1.7	−21 56.5	22 51.3	+ 4 58.1	+0.2218	0.5788	

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

APRIL.

THE STAR'S					AT CONJUNCTION IN R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1917.0. Δα	Δδ	Apparent Declination.	Greenwich Mean Time.	Hour Angle, *H*	Y	*x'*	*y'*	N.	S.
		s	″	° ′	d h m	h m				°	°
B. Sagittarii	6.1	+2.26	+1.8	−21 29.1	14 0 44.4	+ 6 46.8	+0.0130	0.5781	+0.1378	+28	−40
Sagittarii	5.1	2.14	2.1	19 57.7	7 8.0	−11 4.1	−0.6091	0.5755	0.1521	− 3	−84
Sagittarii	6.0	2.10	2.2	19 15.4	9 33.5	− 8 44.0	−0.9495	0.5745	0.1573	−23	−90
Capricorni	5.5	1.95	3.6	19 22.6	20 56.7	+ 2 13.8	+1.0978	0.5695	0.1802	+71	+25
Capricorni	5.2	1.89	3.7	18 29.0	15 0 18.9	+ 5 28.7	+0.8103	0.5680	0.1865	+72	+ 4
Capricorni	5.0	+1.88	+3.6	−18 5.3	0 58.6	+ 6 6.9	+0.5335	0.5677	+0.1877	+63	−12
B. Capricorni	6.2	1.82	3.5	16 48.6	3 50.0	+ 8 52.0	−0.2145	0.5664	0.1927	+22	−53
B. Capricorni	5.9	1.78	3.6	16 25.1	5 59.2	+10 56.6	−0.1913	0.5655	0.1964	+24	−52
B. Capricorni	5.7	1.69	4.3	16 21.0	13 22.3	− 5 56.3	+1.2334	0.5623	0.2083	+74	+36
B. Capricorni	5.9	1.66	3.8	14 48.2	13 50.1	− 5 29.4	−0.2307	0.5622	0.2090	+23	−54
B. Aquarii	6.5	+1.56	+4.1	−13 32.7	21 23.6	+ 1 47.9	+0.1228	0.5591	+0.2198	+43	−34
Aquarii	5.5	1.51	4.4	13 14.0	16 0 59.9	+ 5 16.6	+0.6094	0.5577	0.2244	+73	− 8
B. Aquarii	6.5	1.48	4.1	11 55.6	2 47.8	+ 7 0.7	−0.3006	0.5571	0.2266	+22	−58
B. Capricorni	6.2	1.41	4.2	10 57.0	7 47.4	+11 49.9	−0.1378	0.5553	0.2324	+30	−49
Capricorni	5.3	1.37	3.9	9 27.8	10 16.2	− 9 46.5	−1.0534	0.5546	0.2350	−21	−90
Capricorni	6.3	+1.37	+4.0	− 9 39.5	10 50.0	− 9 13.9	−0.7241	0.5544	+0.2356	0	−90
B. Aquarii	6.5	1.34	4.6	10 42.1	14 6.3	− 6 4.4	+1.1007	0.5534	0.2388	+79	+22
Aquarii	4.3	1.21	4.6	8 11.7	17 0 35.5	+ 4 3.3	+1.1326	0.5507	0.2473	+82	+24
Aquarii	5.7	1.19	3.9	5 48.1	0 44.2	+ 4 11.7	−1.2366	0.5506	0.2474	−34	−90
B. Aquarii	6.0	1.17	4.6	7 36.8	3 38.4	+ 7 0.0	+1.3042	0.5500	0.2492	+83	+41
Aquarii	5.8	+1.15	+4.0	− 5 15.4	3 54.9	+ 7 15.9	−0.9937	0.5500	+0.2494	−14	−90
Aquarii	5.2	1.09	4.2	4 39.3	10 7.8	−10 43.8	−0.0363	0.5489	0.2527	+39	−43
B. Aquarii	6.3	1.07	4.2	3 59.1	11 31.1	− 9 23.3	−0.3580	0.5488	0.2533	+22	−62
G. Piscium	6.2	1.00	4.3	2 50.3	19 30.3	− 1 40.3	+0.5256	0.5479	0.2558	+74	−13
B. Piscium	6.4	0.89	4.3	− 0 9.8	18 7 5.6	+ 9 31.6	+0.8117	0.5477	0.2567	+90	+ 2
Piscium	4.9	+0.88	+4.2	+ 0 48.1	8 39.2	+11 2.0	+0.2423	0.5477	+0.2565	+55	−29
Piscium	6.4	0.88	4.2	0 40.1	8 48.0	+11 10.5	+0.4147	0.5477	0.2565	+66	−20
Piscium	5.7	0.84	4.3	1 38.6	12 59.8	− 8 46.2	+0.5108	0.5480	0.2559	+72	−15
Piscium	5.4	0.81	4.2	3 1.6	17 34.5	− 4 20.7	+0.2877	0.5483	0.2546	+57	−26
				NEW MOON.							
Tauri	4.1	+0.83	+5.6	+24 6.7	23 2 4.5	+ 0 27.7	−0.8795	0.5733	+0.0967	−11	−66
Tauri	5.8	0.83	5.7	24 17.9	2 6.4	+ 0 29.5	−1.0721	0.5733	0.0966	−26	−66
Tauri	6.5	0.83	5.7	24 16.3	2 9.9	+ 0 33.0	−1.0388	0.5734	0.0965	−23	−66
Tauri	4.3	0.83	5.6	23 41.5	2 17.4	+ 0 40.2	−0.4207	0.5734	0.0962	+17	−47
Tauri	3.0	+0.84	+5.6	+23 51.1	2 46.3	+ 1 8.0	−0.5409	0.5734	+0.0950	+10	−56
B. Tauri	5.5	0.84	5.5	23 10.1	3 8.5	+ 1 29.4	+0.2081	0.5734	0.0941	+53	−13
Tauri	3.7	0.84	5.6	23 48.1	3 28.4	+ 1 48.6	−0.4239	0.5734	0.0933	+17	−47
Tauri	5.2	0.84	5.6	23 53.1	3 29.0	+ 1 49.1	−0.5104	0.5734	0.0933	+12	−53
Tauri	6.0	0.87	5.4	22 56.2	6 47.4	+ 5 0.1	+0.7790	0.5735	0.0852	+90	+19
B. Tauri	6.5	+0.88	+5.3	+22 58.2	8 24.8	+ 6 34.0	+0.8809	0.5735	+0.0812	+90	+26
Tauri	5.6	0.90	5.4	23 52.8	9 49.6	+ 7 55.6	+0.0373	0.5735	0.0777	+43	−20
Tauri	5.3	0.97	5.5	25 26.2	17 25.4	− 8 45.4	−1.0847	0.5730	0.0588	−28	−65
Tauri	6.1	0.97	5.2	24 6.6	18 2.2	− 8 10.0	+0.3497	0.5729	0.0572	+63	− 2
Tauri	6.2	1.05	4.9	23 56.0	24 2 6.3	− 0 23.8	+0.9186	0.5717	0.0369	+90	+33
B. Tauri	6.3	+1.11	+4.7	+24 27.7	7 35.2	+ 4 52.9	+0.5250	0.5705	+0.0232	+77	+11
Tauri	6.0	1.11	4.6	23 49.3	8 14.9	+ 5 31.3	+1.2214	0.5703	0.0215	+85	+59
Tauri	5.6	1.12	4.8	24 55.5	8 22.6	+ 5 38.7	+0.0507	0.5703	0.0212	+44	−14
Tauri	5.5	1.16	4.4	24 9.5	12 36.1	+ 9 42.9	+0.9355	0.5691	+0.0106	+90	+36
Tauri	*5.4*	*1.26*	*4.1*	*25 5.1*	21 36.3	− 5 36.6	−0.0583	0.5660	−0.0116	+38	−19
Tauri	*5.1*	*+1.28*	*+3.6*	*+23 59.2*	25 0 16.4	− 3 2.3	+1.0807	0.5649	−0.0180	+90	+4

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS

APRIL.

THE STAR'S					AT CONJUNCTION IN R. A.				
Name.	Mag.	Red'ns from 1917.0. Δα	Δδ	Apparent Declination.	Greenwich Mean Time.	Hour Angle, H	Y	x'	y'
		s	″	° ′	d h m	h m			
125 Tauri	5.1	+1.32	+ 4.0	+25 51.2	25 2 5.2	– 1 17.4	–0.9585	0.5642	–0.02
132 Tauri	5.0	1.35	3.4	24 32.5	6 7.4	+ 2 36.2	+0.3398	0.5624	0.03
412 B. Tauri	5.8	1.39	3.0	24 14.4	9 34.4	+ 5 55.8	+0.5415	0.5608	0.04
5 Geminorum	5.9	1.46	2.6	24 26.4	15 58.5	–11 53.7	+0.0214	0.5576	0.05
8 Geminorum	6.1	1.48	2.3	23 59.9	18 5.8	– 9 50.9	+0.3781	0.5564	0.05
9 Geminorum	6.2	+1.48	+ 2.2	+23 46.2	18 23.5	– 9 33.7	+0.6068	0.5563	–0.06
36 B. Geminorum	6.0	1.52	1.8	23 22.5	22 12.7	– 5 52.5	+0.7904	0.5542	0.06
52 B. Geminorum	6.5	1.60	1.7	24 39.7	26 3 32.0	– 0 44.1	–1.0015	0.5511	0.08
87 B. Geminorum	5.8	1.66	+ 0.8	23 42.1	10 9.8	+ 5 40.2	–0.5359	0.5472	0.09
44 Geminorum	5.9	1.72	0.0	22 45.8	16 18.5	+11 36.6	–0.1274	0.5434	0.10
120 B. Geminorum	6.5	+1.73	– 0.8	+21 23.6	18 34.6	–10 11.8	+1.1245	0.5420	–0.11
δ Geminorum	3.5	1.79	0.9	22 8.2	23 14.9	– 5 40.8	–0.2232	0.5391	0.11
149 B. Geminorum	6.4	1.81	1.3	21 42.1	27 2 26.8	– 2 35.3	–0.1378	0.5372	0.12
61 Geminorum	5.8	1.80	1.8	20 25.4	2 30.0	– 2 32.1	+1.2560	0.5371	0.12
63 Geminorum	5.3	1.82	1.4	21 36.9	2 51.8	– 2 10.9	–0.0954	0.5369	0.12
79 Geminorum	6.3	+1.90	– 2.6	+20 30.9	11 14.0	+ 5 55.1	+0.0014	0.5318	–0.13
209 B. Geminorum	6.2	1.92	3.3	19 32.3	14 33.2	+ 9 8.0	+0.6038	0.5298	0.14
85 Geminorum	5.2	1.95	3.2	20 6.2	16 21.7	+10 53.1	–0.2827	0.5286	0.14
217 B. Geminorum	6.3	1.98	3.5	20 2.6	18 53.0	–10 40.3	–0.5955	0.5271	0.15
10 H. Cancri	6.1	1.98	4.0	19 4.6	20 51.2	– 8 45.8	+0.1675	0.5260	0.15
ζ Cancri (*mean*)	4.7	+2.00	– 4.8	+17 53.9	28 0 34.3	– 5 9.6	+0.8806	0.5238	–0.16
d^1 Cancri	5.9	2.07	5.1	18 35.9	6 9.9	+ 0 15.8	–0.8093	0.5207	0.16
d^2 Cancri	6.2	2.06	5.7	17 19.1	7 26.3	+ 1 29.8	+0.3868	0.5200	0.16
θ Cancri	5.5	2.11	5.6	18 22.4	10 20.6	+ 4 18.9	–1.2761	0.5185	0.17
54 Cancri	6.3	2.16	7.5	15 39.4	20 22.6	– 9 57.0	–0.0786	0.5135	0.18
o^1 Cancri	5.1	+2.20	– 7.8	+15 38.4	23 36.5	– 6 48.8	–0.6655	0.5120	–0.18
o^2 Cancri	5.7	2.20	7.7	15 53.9	23 46.9	– 6 38.7	–0.9845	0.5119	0.18
ξ Leonis	5.1	2.32	10.8	11 39.9	29 18 3.1	+11 6.1	+0.0675	0.5049	0.20
o Leonis	3.8	2.34	11.7	10 16.0	23 1.6	– 8 3.9	+0.5724	0.5034	0.21
83 B. Leonis	5.9	2.41	12.6	9 19.4	30 7 19.5	0 0.0	–0.1620	0.5015	0.21
89 B. Leonis	6.2	+2.41	–12.9	+ 8 42.4	8 14.9	+ 0 53.9	+0.3183	0.5012	–0.21
π Leonis	4.9	2.42	13.1	8 26.4	9 23.5	+ 2 0.5	+0.3649	0.5011	0.21
43 Leonis	6.3	2.51	14.5	6 57.6	21 53.4	– 9 50.3	–0.7795	0.4994	0.22
155 B. Leonis	6.5	+2.50	–14.8	+ 6 6.7	22 2.2	– 9 41.8	+0.1239	0.4994	–0.22

MAY.

35 Sextantis	6.1	+2.58	–15.7	+ 5 10.8	1 9 5.6	+ 1 3.4	–1.3690	0.4990	–0.23
p^3 Leonis	6.1	2.64	17.7	0 26.5	20 15.9	+11 55.2	+1.2506	0.4999	0.23
p^4 Leonis	5.7	2.66	17.3	2 24.1	22 4.8	–10 18.9	–1.3244	0.5001	0.23
p^5 Leonis	5.3	+2.69	–18.0	+ 0 22.6	2 1 49.7	– 6 40.3	+0.0206	0.5007	–0.23
388 B. Leonis	6.3	2.74	18.8	– 1 14.9	9 32.8	+ 0 50.0	–0.0081	0.5024	0.23
e Leonis	5.1	2.75	19.1	2 33.0	10 51.8	+ 2 6.8	+1.1072	0.5027	0.23
431 B. Leonis	6.2	2.79	19.1	1 58.9	15 14.9	+ 6 22.5	–0.5413	0.5039	0.23
13 B. Virginis	5.9	2.83	20.0	4 52.6	22 3.4	–11 0.5	+1.0224	0.5062	0.23
64 B. Virginis	6.5	+2.91	–20.6	– 7 19.1	3 8 23.3	– 0 58.2	+1.2732	0.5103	–0.23
q Virginis	5.3	3.02	20.9	9 0.0	20 33.8	+10 51.0	+0.3126	0.5164	0.22
370 B. Virginis	6.0	3.10	21.1	11 12.3	4 7 2.0	– 2 59.6	+0.3626	0.5226	0.21
75 Virginis	5.6	3.27	20.6	14 56.5	5 1 59.4	– 8 37.7	+0.3766	0.5354	0.20
83 Virginis	5.6	3.32	20.4	15 46.1	7 31.8	– 3 16.0	+0.1613	0.5395	0.19
85 Virginis	6.1	+3.32	–20.3	–15 21.4	8 3.0	– 2 45.8	–0.3763	0.5399	–0

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

MAY.

The Star's					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1917.0. Δα	Δδ	Apparent Declination.	Greenwich Mean Time.	Hour Angle, H	Y	x'	y'	N.	S.
		s	"	° ′	d h m	h m				°	°
H. Virginis	5.5	+3.44	−19.2	−17 49.2	5 21 51.3	+10 35.1	−0.3055	0.5505	−0.1739	+16	−59
3. Virginis	6.4	3.45	19.2	18 12.3	22 36.8	+11 18.6	−0.0279	0.5510	0.1727	+30	−42
2. Virginis	5.7	3.46	19.1	18 20.2	23 19.2	+12 0.0	−0.0120	0.5516	0.1716	+31	−42
3. Librae	6.5	3.53	18.4	20 4.8	6 6 34.0	− 5 0.0	+0.6237	0.5572	0.1594	+66	− 5
2. Librae	6.4	3.57	17.8	20 49.8	11 33.4	− 0 11.1	+0.6357	0.5611	0.1504	+66	− 5
G. Librae	6.1	+3.57	−17.7	−20 58.9	12 0.7	+ 0 15.2	+0.7277	0.5614	−0.1495	+69	0
B. Librae	5.7	3.62	17.7	21 2.8	16 25.0	+ 4 30.1	+0.1549	0.5648	0.1410	+36	−32
G. Librae	6.1	3.63	16.5	21 42.8	20 18.8	+ 8 15.5	+0.3179	0.5676	0.1332	+44	−23
G. Librae	5.8	3.65	15.8	22 5.8	7 0 32.3	−11 40.2	+0.1737	0.5707	0.1243	+35	−31
B. Librae	6.0	3.69	14.3	22 52.3	9 29.7	− 3 2.7	−0.0451	0.5767	0.1042	+22	−44
B. Librae	6.2	+3.70	−14.2	−22 53.0	10 8.4	− 2 25.4	−0.0987	0.5771	−0.1027	+19	−47
Librae	5.0	3.71	14.0	23 33.2	10 30.8	− 2 3.9	+0.5592	0.5774	0.1018	+56	− 9
B. Scorpii	5.4	3.74	13.0	24 17.4	16 5.9	+ 3 18.5	+0.7917	0.5808	0.0884	+66	+ 5
B. Scorpii	5.3	3.73	13.0	23 44.1	16 7.2	+ 3 19.8	+0.2139	0.5808	0.0884	+34	−29
B. Scorpii	5.4	3.75	12.6	24 35.8	18 0.3	+ 5 8.6	+0.9441	0.5818	0.0838	+65	+16
B. Scorpii	6.4	+3.75	−12.2	−24 30.1	20 10.3	+ 7 13.6	+0.6698	0.5830	−0.0783	+62	− 3
B. Scorpii	5.7	3.72	12.1	23 23.0	21 4.6	+ 8 5.9	−0.5573	0.5835	0.0760	− 8	−80
G. Scorpii	6.2	3.74	11.9	24 14.6	21 46.6	+ 8 46.3	+0.2805	0.5838	0.0743	+36	−25
G. Scorpii	5.8	3.73	11.9	23 28.1	22 8.2	+ 9 7.0	−0.5495	0.5840	0.0734	− 8	−79
G. Scorpii	6.3	3.74	11.4	24 12.8	8 0 9.2	+11 3.4	+0.0796	0.5850	0.0682	+25	−36
B. Scorpii	6.0	+3.77	−11.2	−25 16.2	0 35.7	+11 28.9	+1.1419	0.5853	−0.0671	+65	+34
Scorpii	4.9	3.74	10.9	23 58.4	2 55.2	−10 17.0	−0.3479	0.5863	0.0610	+ 2	−63
Scorpii	3.1	3.78	10.7	25 23.9	3 7.3	−10 5.4	+1.1116	0.5864	0.0605	+65	+30
Ophiuchi	4.7	3.72	10.6	23 15.6	4 54.6	− 8 22.3	−1.2011	0.5872	0.0558	−54	−89
Scorpii	4.8	3.76	10.0	24 56.2	6 44.0	− 6 37.1	+0.4326	0.5881	0.0510	+44	−16
B. Scorpii	6.1	+3.73	− 9.1	−24 18.6	11 16.4	− 2 15.3	−0.4164	0.5897	−0.0388	− 4	−68
B. Ophiuchi	6.3	3.73	7.4	24 58.1	18 30.5	+ 4 41.6	+0.0525	0.5917	0.0191	+19	−38
Ophiuchi	5.8	3.73	7.5	24 51.9	18 35.1	+ 4 46.1	−0.0556	0.5917	0.0188	+13	−44
B. Ophiuchi	6.3	3.72	6.4	25 9.3	23 19.6	+ 9 19.2	+0.1841	0.5927	−0.0056	+25	−30
Ophiuchi	3.4	3.70	5.6	24 55.2	9 3 9.6	−11 0.0	−0.0591	0.5932	+0.0051	+12	−44
B. Ophiuchi	6.3	+3.67	− 5.4	−24 10.2	4 22.8	− 9 49.7	−0.8188	0.5933	+0.0085	−29	−90
Ophiuchi	4.3	3.66	5.4	24 6.1	4 52.7	− 9 21.0	−0.8843	0.5933	0.0099	−33	−90
3. Ophiuchi	6.3	3.71	5.0	25 52.3	5 4.1	− 9 10.0	+0.9322	0.5934	0.0104	+64	+15
Ophiuchi	4.8	3.65	5.0	23 54.1	6 51.3	− 7 27.1	−1.0646	0.5935	0.0155	−45	−90
Ophiuchi	6.1	3.61	2.7	24 52.3	16 1.5	+ 1 21.1	+0.1892	0.5933	0.0410	+29	−30
Sagittarii	4.8	+3.57	− 2.5	−23 48.6	17 57.3	+ 3 12.4	−0.8116	0.5930	+0.0463	−26	−90
Sagittarii	5.5	3.57	2.2	24 17.0	19 8.7	+ 4 20.9	−0.2714	0.5929	0.0496	+ 5	−58
Sagittarii	6.0	3.57	2.1	24 21.8	19 32.6	+ 4 43.9	−0.1688	0.5928	0.0507	+10	−51
Sagittarii	5.2	3.53	1.5	23 43.2	22 37.8	+ 7 41.7	−0.6566	0.5923	0.0592	−15	−90
B. Sagittarii	6.4	3.53	− 0.4	24 57.2	10 2 27.8	+11 22.6	+0.8489	0.5915	0.0696	+65	+ 9
Sagittarii	5.7	+3.46	+ 0.4	−24 5.7	7 21.1	− 7 55.7	+0.3455	0.5902	+0.0826	+41	−21
B. Sagittarii	5.8	3.43	0.7	23 34.6	9 11.2	− 6 9.9	−0.0267	0.5897	0.0874	+21	−42
Sagittarii	6.1	3.42	1.0	23 54.7	10 30.4	− 4 53.9	+0.4319	0.5892	0.0909	+47	−16
Sagittarii	5.6	3.37	1.0	22 28.8	12 18.4	− 3 10.1	−0.8575	0.5886	0.0956	−24	−90
Sagittarii	6.2	3.34	1.3	22 15.5	14 6.0	− 1 26.7	−0.9076	0.5879	0.1002	−26	−90
Sagittarii	5.0	+3.34	+ 1.8	−22 50.9	15 25.0	− 0 10.8	−0.1733	0.5874	+0.1035	+14	−51
Sagittarii	5.1	3.34	1.8	22 46.5	15 47.5	+ 0 10.8	−0.2076	0.5873	0.1045	+13	−53
3. Sagittarii	5.9	3.34	2.0	23 16.8	16 8.6	+ 0 31.2	+0.3425	0.5872	0.1053	+43	−22
3. Sagittarii	6.3	3.31	2.4	22 48.8	18 23.8	+ 2 41.0	+0.1107	0.5862	0.1110	+30	−35
Sagittarii	*3.9*	*3.27*	*2.3*	21 51.8	19 37.8	+ 3 52.1	−0.7152	0.5857	0.1140	−13	−90
Sagittarii	*6.5*	*+3.29*	*+ 3.1*	−23 19.3	21 14.5	+ 5 25.1	+0.9533	0.5850	+0.1179	+67	+18

ELEMENTS FOR THE PREDICTION OF OCCULTATI

MAY.

THE STAR'S					AT CONJUNCTION IN R. A.			
Name.	Mag.	Red'ns from 1917.0.		Apparent Declination.	Greenwich Mean Time.	Hour Angle, H	Y	x'
		$\Delta\alpha$	$\Delta\delta$					
		s	"	° ′	d h m	h m		
π Sagittarii	3.0	+3.23	+2.5	−21 9.4	10 21 41.0	+ 5 50.6	−1.1948	0.5848
199 B. Sagittarii	6.4	3.23	2.9	21 47.8	22 45.6	+ 6 52.6	−0.4143	0.5843
222 B. Sagittarii	5.5	3.21	3.8	22 33.4	11 2 3.0	+10 2.4	+0.7713	0.5828
50 Sagittarii	5.5	3.17	4.1	21 56.4	4 21.8	−11 44.1	+0.4511	0.5817
253 B. Sagittarii	6.1	3.14	4.3	21 29.1	6 14.1	− 9 56.1	+0.2445	0.5807
f Sagittarii	5.1	+3.02	+5.0	−19 57.6	12 36.0	− 3 48.7	−0.3717	0.5775
57 Sagittarii	6.0	2.97	5.2	19 15.3	15 1.0	− 1 29.1	−0.7102	0.5761
π Capricorni	5.2	2.76	7.3	18 29.0	12 5 46.4	−11 16.6	+1.0568	0.5679
31 B. Capricorni	6.4	2.71	6.5	16 0.9	6 24.1	−10 40.2	−1.3244	0.5675
ρ Capricorni	5.0	2.74	7.2	18 5.2	6 26.1	−10 38.3	+0.7800	0.5675
47 B. Capricorni	6.2	+2.68	+7.2	−16 48.6	9 18.2	− 7 52.5	+0.0319	0.5659
τ Capricorni	5.2	2.64	6.9	15 14.7	10 55.7	− 6 18.5	−1.2373	0.5650
61 B. Capricorni	5.9	2.65	7.4	16 25.1	11 27.9	− 5 47.4	+0.0556	0.5648
95 B. Capricorni	5.9	2.52	7.9	14 48.1	19 21.6	+ 1 49.4	+0.0169	0.5604
53 B. Aquarii	6.5	2.40	8.4	13 32.7	13 2 59.1	+ 9 10.8	+0.3713	0.5565
18 Aquarii	5.5	+2.34	+8.7	−13 14.0	6 37.8	−11 18.1	+0.8595	0.5547
72 B. Aquarii	6.5	2.30	8.4	11 55.6	8 26.9	− 9 32.8	−0.0555	0.5539
137 B. Capricorni	6.2	2.23	8.6	10 56.9	13 30.3	− 4 39.8	+0.1063	0.5516
c^1 Capricorni	5.3	2.18	8.3	9 27.7	16 1.2	− 2 14.1	−0.8163	0.5506
c^2 Capricorni	6.3	2.17	8.5	9 39.4	16 35.5	− 1 41.0	−0.4853	0.5503
96 B. Aquarii	6.5	+2.14	+9.1	−10 42.0	19 54.8	+ 1 31.6	+1.3500	0.5490
θ Aquarii	4.3	1.98	9.2	8 11.7	14 6 34.6	+11 49.8	+1.3759	0.5454
44 Aquarii	5.7	1.96	8.3	5 48.0	6 43.5	+11 58.4	−1.0131	0.5453
51 Aquarii	5.8	1.91	8.4	5 15.3	9 57.8	− 8 53.8	−0.7714	0.5444
κ Aquarii	5.2	1.84	8.6	4 39.2	16 18.2	− 2 46.0	+0.1878	0.5430
207 B. Aquarii	6.3	+1.81	+8.5	− 3 59.0	17 43.3	− 1 23.7	−0.1385	0.5427
6 G. Piscium	6.2	1.71	8.6	2 50.3	15 1 52.9	+ 6 29.8	+0.7436	0.5414
22 B. Piscium	6.4	1.57	8.4	− 0 9.7	13 44.4	− 6 2.0	+1.0160	0.5407
κ Piscium	4.9	1.55	8.1	+ 0 48.2	15 20.3	− 4 29.3	+0.4378	0.5407
9 Piscium	6.4	1.55	8.2	0 40.1	15 29.2	− 4 20.7	+0.6120	0.5407
16 Piscium	5.7	+1.50	+8.1	+ 1 38.6	19 47.2	− 0 11.2	+0.7021	0.5408
19 Piscium	5.4	1.45	7.9	3 1.7	16 0 28.6	+ 4 21.0	+0.4683	0.5412
36 Piscium	6.2	1.31	6.9	7 46.9	14 34.7	− 6 0.7	−0.8980	0.5433
d Piscium	5.4	1.30	7.1	7 43.9	16 27.1	− 4 12.0	−0.3937	0.5437
136 B. Piscium	6.5	1.22	7.0	8 54.3	17 1 59.4	+ 5 1.3	+0.6768	0.5461
75 Piscium	6.3	+1.14	+6.4	+12 30.8	13 35.3	− 7 46.2	−0.3719	0.5498
η Piscium	3.7	1.08	6.1	14 55.2	18 0 50.1	+ 3 5.5	−0.4266	0.5538
101 Piscium	6.2	1.07	6.3	14 14.4	2 45.8	+ 4 57.3	+0.6713	0.5546
105 Piscium	6.1	1.06	6.0	15 59.2	4 29.6	+ 6 37.5	−0.7752	0.5553
3 Arietis	6.4	1.04	5.8	17 0.0	7 33.9	+ 9 35.4	−1.2048	0.5565
4 Arietis	5.8	+1.04	+5.9	+16 32.7	8 16.6	+10 16.7	−0.5960	0.5567
ι Arietis	5.1	1.03	5.8	17 24.9	12 19.8	− 9 48.6	−0.7102	0.5583
				NEW MOON.				
132 Tauri	5.0	+1.22	+2.5	+24 32.5	22 14 51.5	−10 51.8	+0.1996	0.5655
412 B. Tauri	5.8	+1.24	+2.2	+24 14.4	18 17.4	− 7 33.3	+0.3957	0.5641
5 Geminorum	5.9	1.29	1.8	24 26.4	23 0 39.1	− 1 25.2	−0.1331	0.5610
8 Geminorum	6.1	1.30	1.6	23 59.9	2 45.4	+ 0 36.7	+0.2199	0.5599
9 Geminorum	6.2	1.30	1.5	23 46.2	3 3.1	+ 0 53.8	+0.4477	0.5597
36 B. Geminorum	6.0	1.32	1.2	23 22.5	6 50.6	+ 4 33.3	+0.8255	0.5577
52 B. Geminorum	6.5	+1.38	+1.1	+24 39.7	12 7.6	+ 9 39.3	−1.1699	0.5

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

MAY.

The Star's Name.	Mag.	Red'ns from 1917.0. Δα	Red'ns from 1917.0. Δδ	Apparent Declination.	At Conjunction in R. A. Greenwich Mean Time.	Hour Angle, H	Y	x′	y′	Limiting Parallels. N.	Limiting Parallels. S.
		s	″	° ′	d h m	h m				°	°
ε. Geminorum	5.8	+1.42	+ 0.3	+23 42.1	23 18 42.3	− 7 59.5	−0.7138	0.5509	−0.0955	0	−66
Geminorum	5.9	1.46	− 0.3	22 45.8	24 0 48.2	− 2 5.9	−0.3138	0.5470	0.1076	+23	−42
δ. Geminorum	6.5	1.46	0.9	21 23.6	3 3.2	+ 0 4.6	+0.9322	0.5457	0.1119	+90	+26
Geminorum	3.5	1.51	1.0	22 8.2	7 41.4	+ 4 33.6	−0.4175	0.5427	0.1206	+17	−50
Geminorum	5.2	1.50	1.5	20 36.1	8 34.2	+ 5 24.6	+1.1517	0.5421	0.1222	+90	+42
β. Geminorum	6.4	+1.52	− 1.4	+21 42.1	10 51.7	+ 7 37.6	−0.3358	0.5406	−0.1263	+22	−46
Geminorum	5.8	1.52	1.7	20 25.4	10 54.9	+ 7 40.7	+1.0545	0.5405	0.1264	+90	+33
Geminorum	5.3	1.53	1.5	21 36.9	11 16.6	+ 8 1.8	−0.2939	0.5403	0.1270	+24	−43
Geminorum	6.3	1.59	2.4	20 30.9	19 35.1	− 7 55.9	−0.2059	0.5349	0.1412	+29	−40
β. Geminorum	6.2	1.61	3.0	19 32.3	22 52.9	− 4 44.3	+0 3918	0.5328	0.1465	+65	− 9
Geminorum	5.2	+1.63	− 3.0	+20 6.2	25 0 40.6	− 3 0.2	−0.4942	0.5316	−0.1494	+14	−58
β. Geminorum	6.3	1.65	3.2	20 2.6	3 11.0	− 0 34.5	−0.8086	0.5300	0.1532	− 5	−70
H. Cancri	6.1	1.66	3.6	19 4.6	5 8.4	+ 1 19.2	−0.0490	0.5288	0.1561	+38	−33
Cancri (*mean*)	4.7	1.68	4.3	17 53.9	8 50.2	+ 4 54.2	+0.6596	0.5264	0.1615	+89	+ 4
Cancri	5.9	1.73	4.5	18 35.9	14 23.9	+10 17.7	−1.0312	0.5230	0.1692	−20	−71
Cancri	6.2	+1.72	− 5.0	+17 19.2	15 39.9	+11 31.3	+0.1619	0.5223	−0.1709	+50	−24
β. Cancri	6.3	1.75	6.0	15 36.0	20 53.6	− 7 24.5	+1.1462	0.5192	0.1775	+90	+34
Cancri	6.3	1.82	6.6	15 39.4	26 4 32.8	+ 0 1.0	−0.3105	0.5151	0.1865	+24	−51
Cancri	5.1	1.85	6.8	15 38.4	7 46.2	+ 3 8.7	−0.8981	0.5134	0.1900	− 9	−74
Cancri	5.7	1.85	6.8	15 53.9	7 56.6	+ 3 18.8	−1.2169	0.5133	0.1902	−35	−74
β. Cancri	6.3	+1.90	− 9.0	+11 50.8	18 39.8	−10 16.6	+1.1641	0.5082	−0.2008	+90	+32
Leonis	5.1	1.97	9.6	11 39.9	27 2 11.4	− 2 57.9	−0.1710	0.5052	0.2072	+32	−47
Leonis	3.8	2.00	10.4	10 16.1	7 10.2	+ 1 52.5	+0.3337	0.5034	0.2110	+60	−21
β. Leonis	5.9	2.07	11.3	9 19.4	15 29.0	+ 9 57.3	−0.4005	0.5008	0.2167	+20	−62
β. Leonis	6.2	2.07	11.6	8 42.4	16 24.6	+10 51.4	+0.0803	0.5007	0.2173	+45	−35
Leonis	4.9	+2.08	−11.8	+ 8 26.4	17 33.3	+11 58.2	+0.1271	0.5003	−0.2180	+48	32
Leonis	6.3	2.19	13.1	6 57.7	28 6 6.2	+ 0 10.3	−1.0154	0.4979	0.2245	−16	−83
β. Leonis	6.5	2.17	13.3	6 6.7	6 15.0	+ 0 18.8	−0.1104	0.4979	0.2245	+35	−46
β. Leonis	6.3	2.30	15.9	1 27.7	22 18.8	− 8 3.7	+1.3667	0.4970	0.2299	+80	+51
Leonis	6.1	2.32	16.1	1 10.5	29 0 14.2	− 6 11.5	+1.2385	0.4971	0.2304	+90	+34
Leonis	6.1	+2.35	−16.5	+ 0 26.5	4 37.3	− 1 55.5	+1.0327	0.4974	−0.2312	+90	+17
Leonis	5.3	2.41	16.7	+ 0 22.7	10 13.8	+ 3 31.7	−0.1957	0.4980	0.2318	+30	−51
β. Leonis	6.3	2.48	17.6	− 1 14.9	18 0.9	+11 6.0	−0.2169	0.4994	0.2321	+29	−53
Leonis	5.1	2.49	18.0	2 33.0	19 20.6	−11 36.5	+0.9030	0.4997	0.2320	+87	+ 8
β. Leonis	6.2	2.53	17.9	1 58.9	23 46.0	− 7 18.5	−0.7455	0.5008	0.2317	+ 1	−90
β. Virginis	5.9	+2.60	−19.1	− 4 52.6	30 6 38.2	− 0 37.8	+0.8308	0.5030	−0.2307	+85	+ 4
β. Virginis	6.5	2.71	19.9	7 19.1	17 3.8	+ 9 30.1	+1.0956	0.5071	0.2279	+83	+22
Virginis	5.3	2.85	20.4	9 0.0	31 5 20.6	− 2 34.4	+0.1497	0.5133	0.2224	+47	−33
β. Virginis	6.0	+2.98	−20.8	−11 12.3	15 53.6	+ 7 39.8	+0.2159	0.5196	−0.2156	+49	−29

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Virginis	5.6	+3.22	−20.8	−14 56.5	1 10 57.4	+ 2 8.3	+0.2613	0.5334	−0.1983	+49	−27
Virginis	5.6	3.30	20.7	15 46.1	16 30.8	+ 7 31.0	+0.0553	0.5378	0.1918	+37	−38
Virginis	6.1	3.30	20.5	15 21.4	17 2.1	+ 8 1.3	−0.4814	0.5382	0.1912	+10	−71
H. Virginis	5.5	+3.49	−19.8	−17 49.2	2 6 51.3	− 2 37.0	−0.3858	0.5499	−0.1720	+12	−65
G. Virginis	6.4	3.50	19.7	18 12.3	7 36.2	− 1 53.6	−0.1072	0.5505	0.1709	+26	−47
G. Virginis	5.7	3.51	19.7	18 20.1	8 19.1	− 1 12.1	−0.0900	0.5511	0.1698	+26	−46
G. Libræ	*6.5*	*3.63*	*19.2*	*20 4.9*	15 33.0	+ 5 46.9	+0.5570	0.5574	0.1578	+62	−10
G. Libræ	*6.4*	*3.70*	*18.7*	*20 49.8*	20 31.4	+10 34.8	+0.5775	0.5617	0.1488	+62	− 9
γ. Libræ	*6.1*	*+3.70*	*−18.6*	*−20 58.9*	20 58.5	+11 0.8	+0.6700	0.5621	−0.1480	+68	−

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS

JUNE.

THE STAR'S					AT CONJUNCTION IN R. A.				
Name.	Mag.	Red'ns from 1917.0. Δα	Δδ	Apparent Declination.	Greenwich Mean Time.	Hour Angle, H	Y'	x'	y'
		s	″	° ′	d h m	h m			
43 B. Libræ	5.7	+3.79	−18.8	−21 2.9	3 1 21.5	− 8 45.5	+0.1066	0.5658	−0.13
47 G. Libræ	6.1	3.81	17.4	21 42.9	5 13.9	− 5 1.4	+0.2755	0.5691	0.13
64 G. Libræ	5.8	3.86	16.8	22 5.9	9 25.5	− 0 59.1	+0.1392	0.5726	0.12
169 B. Libræ	6.0	3.96	15.2	22 52.3	18 18.0	+ 7 33.5	−0.0633	0.5796	0.10
177 B. Libræ	6.2	3.97	15.1	22 53.0	18 56.2	+ 8 10.3	−0.1155	0.5800	0.10
42 Libræ	5.0	+3.99	−15.1	−23 33.2	19 18.4	+ 8 31.7	+0.5394	0.5803	−0.10
31 B. Scorpii	5.4	4.05	14.1	24 17.4	4 0 49.7	−10 9.8	+0.7793	0.5842	0.08
32 B. Scorpii	5.3	4.04	14.0	23 44.1	0 50.9	−10 8.7	+0.2052	0.5843	0.08
40 B. Scorpii	5.4	4.08	13.7	24 35.8	2 42.6	− 8 21.3	+0.9337	0.5855	0.08
50 B. Scorpii	6.4	4.09	13.2	24 30.1	4 50.9	− 6 17.9	+0.6646	0.5869	0.07
57 B. Scorpii	5.7	+4.07	−12.9	−23 23.1	5 44.4	− 5 26.5	−0.5527	0.5875	−0.07
24 G. Scorpii	6.2	4.10	12.8	24 14.7	6 25.8	− 4 46.5	+0.2805	0.5879	0.07
27 G. Scorpii	5.8	4.08	12.7	23 28.1	6 47.2	− 4 26.1	−0.5431	0.5882	0.07
41 G. Scorpii	6.3	4.11	12.3	24 12.8	8 46.5	− 2 31.5	+0.0849	0.5894	0.06
85 B. Scorpii	6.0	4.14	12.2	25 16.2	9 12.6	− 2 6.4	+1.1402	0.5896	0.06
19 Scorpii	4.9	+4.12	−11.7	−23 58.4	11 30.0	+ 0 5.6	−0.3350	0.5910	−0.05
σ Scorpii	3.1	4.16	11.7	25 23.9	11 41.9	+ 0 17.0	+1.1137	0.5911	0.05
ρ Ophiuchi	4.7	4.11	11.2	23 15.6	13 27.5	+ 1 58.4	−1.1781	0.5920	0.05
22 Scorpii	4.8	4.17	10.8	24 56.2	15 15.1	+ 3 41.8	+0.4456	0.5929	0.04
126 B. Scorpii	6.1	4.18	9.7	24 18.6	19 43.0	+ 7 59.0	−0.3893	0.5951	0.03
88 B. Ophiuchi	6.3	+4.22	− 8.0	−24 58.2	5 2 49.2	− 9 11.8	+0.0868	0.5978	−0.01
26 Ophiuchi	5.8	4.22	8.0	24 51.9	2 53.7	− 9 7.5	−0.0202	0.5978	0.01
137 B. Ophiuchi	6.3	4.25	6.8	25 9.3	7 32.6	− 4 40.0	+0.2244	0.5991	−0.00
39 Ophiuchi	5.1	4.22	6.2	24 12.0	9 46.7	− 2 31.3	−0.7491	0.5997	+0.00
θ Ophiuchi	3.4	4.24	5.8	24 55.2	11 17.9	− 1 3.8	−0.0108	0.6000	0.00
191 B. Ophiuchi	6.3	+4.22	− 5.5	−24 10.2	12 29.7	+ 0 5.1	−0.7610	0.6002	+0.01
b Ophiuchi	4.3	4.22	5.4	24 6.1	12 58.9	+ 0 33.0	−0.8251	0.6003	0.01
136 G. Ophiuchi	6.3	4.27	5.3	25 52.3	13 10.0	+ 0 43.7	+0.9732	0.6002	0.01
51 Ophiuchi	4.8	4.21	4.9	23 54.1	14 55.0	+ 2 24.5	−1.0005	0.6005	0.01
63 Ophiuchi	6.1	4.24	2.5	24 52.3	23 52.9	+11 0.3	+0.2533	0.6009	0.04
4 Sagittarii	4.8	+4.20	− 2.1	−23 48.6	6 1 46.0	−11 11.2	−0.7338	0.6007	+0.04
7 Sagittarii	5.5	4.21	1.7	24 17.0	2 55.8	−10 4.2	−0.1979	0.6007	0.05
9 Sagittarii	6.0	4.21	1.6	24 21.8	3 19.2	− 9 41.9	−0.0958	0.6006	0.05
1 Sagittarii	5.2	4.18	− 0.9	23 43.2	6 20.0	− 6 48.4	−0.5739	0.6002	0.06
70 B. Sagittarii	6.4	4.21	+ 0.3	24 57.2	10 4.4	− 3 13.1	+0.9195	0.5996	0.07
24 Sagittarii	5.7	+4.16	+ 1.4	−24 5.7	14 50.6	+ 1 21.4	+0.4284	0.5984	+0.08
117 B. Sagittarii	5.8	4.13	1.8	23 34.6	16 37.9	+ 3 4.4	+0.0628	0.5979	0.09
26 Sagittarii	6.1	4.14	2.2	23 54.7	17 55.2	+ 4 18.5	+0.5178	0.5975	0.09
28 Sagittarii	5.6	4.08	2.4	22 28.8	19 40.5	+ 5 59.6	−0.7543	0.5969	0.09
30 Sagittarii	6.2	4.06	2.8	22 15.4	21 25.4	+ 7 40.3	−0.8016	0.5963	0.10
ν^1 Sagittarii	5.0	+4.08	+ 3.2	−22 50.8	22 42.5	+ 8 54.3	−0.0742	0.5958	+0.10
ν^2 Sagittarii	5.1	4.07	3.3	22 46.5	23 4.4	+ 9 15.4	−0.1077	0.5957	0.10
154 B. Sagittarii	5.9	4.08	3.5	23 16.8	23 25.1	+ 9 35.1	+0.4364	0.5955	0.10
168 B. Sagittarii	6.3	4.05	4.0	22 48.7	7 1 36.8	+11 41.6	+0.2101	0.5946	0.11
o Sagittarii	3.9	4.02	4.1	21 51.8	2 49.0	−11 9.1	−0.6046	0.5940	0.11
191 B. Sagittarii	6.5	+4.05	+ 4.7	−23 19.3	4 23.3	− 9 38.6	+1.0462	0.5934	+0.12
π Sagittarii	3.0	3.98	4.5	21 9.3	4 49.2	− 9 13.7	−1.0760	0.5932	0.12
199 B. Sagittarii	6.4	3.99	4.8	21 47.7	5 52.2	− 8 13.2	−0.3034	0.5927	0.12
222 B. Sagittarii	5.5	3.99	5.8	22 33.4	9 4.6	− 5 8.4	+0.8721	0.5912	0.13
50 Sagittarii	5.5	3.95	6.2	21 56.4	11 19.9	− 2 58.4	+0.5583	0.5893	0.13
253 B. Sagittarii	6.1	+3.92	+ 6.5	−21 29.0	13 9.5	− 1 13.1	+0.3562	0.5890	+0.1

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

JUNE.

The Star's					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1917.0. Δα	Δδ	Apparent Declination.	Greenwich Mean Time.	Hour Angle, H	Y'	x'	y'	N.	S.
		s	"	° ′	d h m	h m				°	°
Sagittarii	5.1	+3.82	+ 7.6	−19 57.6	7 19 22.0	+ 4 44.8	−0.2459	0.5854	+0.1563	+16	−55
Sagittarii	6.0	3.78	8.0	19 15.3	21 43.5	+ 7 0.9	−0.5781	0.5841	0.1613	− 1	−81
Capricorni	5.2	3.60	10.7	18 28.9	8 12 8.4	− 3 7.0	+1.1838	0.5750	0.1897	+72	+33
Capricorni	6.4	3.54	10.2	16 0.8	12 45.4	− 2 31.4	−1.1721	0.5746	0.1908	−37	−90
Capricorni	5.0	3.59	10.7	18 5.2	12 47.3	− 2 29.6	+0.9105	0.5746	0.1908	+72	+11
Capricorni	6.2	+3.53	+10.9	−16 48.5	15 35.6	+ 0 12.5	+0.1726	0.5728	+0.1956	+42	−31
Capricorni	5.2	3.48	10.8	15 14.6	17 11.1	+ 1 44.4	−1.0827	0.5718	0.1983	−29	−90
Capricorni	5.9	3.49	11.2	16 25.0	17 42.6	+ 2 14.8	+0.1978	0.5714	0.1992	+44	−30
Capricorni	5.9	3.37	12.0	14 48.1	9 1 26.8	+ 9 41.9	+0.1654	0.5665	0.2110	+44	−32
Aquarii	6.5	3.25	12.8	13 32.6	8 55.9	− 7 5.0	+0.5216	0.5619	0.2210	+67	−13
Aquarii	5.5	+3.21	+13.2	−13 13.9	12 30.9	− 3 37.6	+1.0083	0.5598	+0.2252	+77	+16
Aquarii	6.5	3.16	13.1	11 55.5	14 18.3	− 1 54.1	+0.1013	0.5588	0.2272	+42	−35
Capricorni	6.2	3.09	13.4	10 56.8	19 17.2	+ 2 54.4	+0.2641	0.5560	0.2323	+52	−27
Capricorni	5.3	3.04	13.2	9 27.6	21 46.0	+ 5 18.1	−0.6514	0.5547	0.2347	+ 4	−86
Capricorni	6.3	3.03	13.4	9 39.4	22 19.8	+ 5 50.7	−0.3224	0.5544	0.2352	+21	−60
Aquarii	5.6	+2.90	+13.3	− 6 55.2	10 6 0.0	−10 44.9	−1.2480	0.5506	+0.2412	−37	−90
Aquarii	5.7	2.81	13.5	5 47.9	12 18.4	− 4 39.3	−0.8455	0.5479	0.2451	− 6	−90
Aquarii	5.8	2.77	13.6	5 15.2	15 31.2	− 1 33.0	−0.6050	0.5466	0.2468	+ 8	−80
Aquarii	5.2	2.69	13.9	4 39.2	21 49.1	+ 4 32.3	+0.3505	0.5444	0.2492	+60	−22
Aquarii	6.3	2.67	13.8	3 58.9	23 13.7	+ 5 54.1	+0.0251	0.5439	0.2497	+42	−40
Piscium	6.2	+2.56	+14.0	− 2 50.2	11 7 21.7	−10 14.1	+0.9045	0.5418	+0.2512	+87	+ 8
Piscium	6.4	2.41	13.7	− 0 9.6	19 13.2	+ 1 14.1	+1.1745	0.5397	0.2509	+90	+28
Piscium	4.9	2.39	13.4	+ 0 48.3	20 49.3	+ 2 47.0	+0.5955	0.5396	0.2506	+79	− 9
Piscium	6.4	2.39	13.5	0 40.2	20 58.3	+ 2 55.7	+0.7697	0.5395	0.2506	+90	0
Piscium	5.7	2.33	13.3	1 38.7	12 1 17.1	+ 7 6.1	+0.8581	0.5392	0.2496	+90	+ 6
Piscium	5.4	+2.27	+13.0	+ 3 1.8	6 0.0	+11 39.8	+0.6217	0.5391	+0.2480	+82	− 8
Piscium	4.0	2.21	12.0	6 24.4	12 5.0	− 6 27.1	−1.3238	0.5392	0.2452	−44	−83
Piscium	6.2	2.12	11.7	7 47.0	20 12.6	+ 1 24.6	−0.7589	0.5399	0.2404	0	−82
Piscium	5.4	2.10	11.8	7 44.0	22 6.2	+ 3 14.4	−0.2542	0.5402	0.2390	+27	−54
Piscium	6.5	2.00	11.4	8 54.3	13 7 45.1	−11 25.6	+0.8129	0.5418	0.2311	+90	+ 5
Piscium	5.7	+1.98	+10.6	+11 31.5	10 27.2	− 8 48.9	−1.2590	0.5424	+0.2285	−37	−78
Piscium	6.3	1.90	10.3	12 30.9	19 30.7	− 0 3.4	−0.2530	0.5447	0.2189	+27	−51
Piscium	3.7	1.81	9.4	14 55.3	14 6 56.3	+10 59.1	−0.3207	0.5483	0.2044	+23	−53
Piscium	6.2	1.80	9.6	14 14.4	8 54.0	−11 7.1	+0.7828	0.5490	0.2017	+90	+ 7
Piscium	6.1	1.79	9.1	15 59.3	10 39.6	− 9 25.0	−0.6761	0.5496	0.1992	+ 4	−73
Arietis	6.4	+1.76	+ 8.8	+17 0.0	13 47.0	− 6 24.0	−1.1126	0.5507	+0.1945	−25	−73
Arietis	5.8	1.76	8.8	16 32.7	14 30.4	− 5 42.0	−0.5002	0.5510	0.1934	+14	−62
Arietis	5.1	1.73	8.5	17 24.9	18 38.0	− 1 42.9	−0.6201	0.5525	0.1870	+ 7	−69
Arietis	6.4	1.71	8.3	17 51.4	21 29.1	+ 1 2.2	−0.5541	0.5535	0.1823	+11	−64
Arietis	6.5	1.69	8.4	17 38.2	23 18.1	+ 2 47.5	+0.0036	0.5542	0.1793	+41	−32
Arietis	6.4	+1.69	+ 8.5	+16 50.3	15 0 1.5	+ 3 29.4	+0.9655	0.5545	+0.1781	+90	+22
Arietis	5.9	1.70	7.9	19 6.7	0 33.7	+ 4 0.5	−1.3085	0.5547	0.1771	−51	−70
Arietis	5.6	1.67	7.7	19 31.2	3 54.0	+ 7 13.9	−1.1542	0.5559	0.1713	−31	−70
Arietis	6.2	1.64	7.6	19 29.4	9 26.2	−11 25.5	−0.2032	0.5580	0.1613	+30	−41
Arietis	5.7	1.61	7.4	19 39.6	14 35.6	− 6 26.9	+0.4247	0.5598	0.1514	+68	− 7
Arietis	5.8	+1.58	+ 7.0	+20 20.3	21 26.5	+ 0 9.4	+0.7053	0.5622	+0.1377	+90	+10
Arietis (*mean*)	4.6	1.57	6.8	21 0.7	21 56.0	+ 0 37.9	+0.0668	0.5624	0.1366	+45	−24
Arietis	5.0	1.53	6.5	20 44.4	16 4 44.1	+ 7 11.4	+1.2348	0.5645	0.1223	+87	+52
Arietis	6.1	1.52	5.9	22 31.2	10 32.6	−11 12.6	+0.0322	0.5660	0.1095	+43	−23
Tauri	*5.4*	*1.50*	*5.3*	24 1.8	17 31.8	− 4 28.5	−0.8548	0.5677	0.0936	− 9	−66
Tauri	*3.8*	*+1.50*	*+ 5.4*	*+23 51.3*	17 33.7	− 4 26.7	−0.6655	0.5677	+0.0935	+ 3	−63

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS

JUNE.

THE STAR'S						AT CONJUNCTION IN R. A.				
Name.	Mag.	Red'ns from 1917.0. Δα	Δδ	Apparent Declination.	Greenwich Mean Time.	Hour Angle, H	Y	x'	y'
		s	″	° ′	d h m	h m			
q Tauri	4.3	+1.50	+ 5.3	+24 12.6	16 17 42.0	− 4 18.7	−1.0280	0.5677	+0.09
20 Tauri	4.1	1.50	5.3	24 6.6	17 57.9	− 4 3.3	−0.8990	0.5678	0.09
21 Tauri	5.8	1.50	5.3	24 17.9	17 59.8	− 4 1.5	−1.0940	0.5678	0.09
22 Tauri	6.5	1.50	5.3	24 16.3	18 3.4	− 3 57.9	−1.0604	0.5678	0.09
23 Tauri	4.3	1.50	5.4	23 41.5	18 11.1	− 3 50.6	−0.4358	0.5678	0.09
η Tauri	3.0	+1.50	+ 5.3	+23 51.1	18 40.6	− 3 22.2	−0.5589	0.5679	+0.09
104 B. Tauri	5.5	1.49	5.4	23 10.1	19 3.3	− 3 0.4	+0.1974	0.5680	0.09
27 Tauri	3.7	1.50	5.3	23 48.1	19 23.6	− 2 40.7	−0.4427	0.5680	0.08
28 Tauri	5.2	1.50	5.3	23 53.1	19 24.2	− 2 40.2	−0.5303	0.5680	0.08
33 Tauri	6.0	1.48	5.2	22 56.2	22 46.6	+ 0 34.8	+0.7624	0.5686	0.08
161 B. Tauri	6.5	+1.47	+ 5.1	+22 58.2	17 0 25.8	+ 2 10.7	+0.8600	0.5689	+0.07
					NEW MOON.				
79 Geminorum	6.3	+1.53	− 2.6	+20 30.9	21 3 22.8	+ 1 39.5	−0.2750	0.5365	−0.14
209 B. Geminorum	6.2	1.54	3.0	19 32.3	6 40.2	+ 4 50.6	+0.3208	0.5345	0.14
85 Geminorum	5.2	+1.55	− 3.1	+20 6.2	8 27.8	+ 6 34.8	−0.5674	0.5333	−0.15
217 B. Geminorum	6.3	1.56	3.3	20 2.6	10 57.9	+ 9 0.1	−0.8840	0.5317	0.15
10 H. Cancri	6.1	1.56	3.6	19 4.6	12 55.1	+10 53.6	−0.1251	0.5305	0.15
ζ Cancri (*mean*)	4.7	1.57	4.1	17 53.9	16 36.3	− 9 32.1	+0.5814	0.5283	0.16
d^1 Cancri	5.9	1.60	4.4	18 35.9	22 9.3	− 4 9.3	−1.1145	0.5249	0.17
d^2 Cancri	6.2	+1.59	− 4.8	+17 19.2	23 25.1	− 2 55.9	+0.0786	0.5241	−0.17
90 B. Cancri	6.3	1.61	5.5	15 36.0	22 4 38.1	+ 2 7.8	+1.0604	0.5210	0.17
54 Cancri	6.3	1.65	6.0	15 39.5	12 16.3	+ 9 32.3	−0.4018	0.5168	0.18
o^1 Cancri	5.1	1.68	6.3	15 38.4	15 29.3	−11 20.5	−0.9918	0.5150	0.19
o^2 Cancri	5.7	1.68	6.2	15 53.9	15 39.6	−11 10.4	−1.3110	0.5149	0.19
222 B. Cancri	6.3	+1.71	− 8.0	+11 50.8	23 2 21.8	− 0 46.9	+1.0672	0.5096	−0.20
ξ Leonis	5.1	1.75	8.6	11 39.9	9 53.1	+ 6 31.5	−0.2725	0.5063	0.20
o Leonis	3.8	1.78	9.3	10 16.1	14 51.8	+11 21.7	+0.2313	0.5043	0.21
83 B. Leonis	5.9	1.83	10.0	9 19.5	23 10.9	− 4 33.1	−0.5069	0.5013	0.21
89 B. Leonis	6.2	1.84	10.3	8 42.5	24 0 6.6	− 3 38.9	−0.0253	0.5011	0.21
π Leonis	4.9	+1.84	−10.4	+ 8 26.4	1 15.4	− 2 32.0	+0.0215	0.5007	−0.21
43 Leonis	6.3	1.93	11.7	6 57.7	13 50.3	+ 9 42.2	−1.1264	0.4976	0.22
155 B. Leonis	6.5	1.92	11.9	6 6.7	13 59.2	+ 9 50.8	−0.2190	0.4975	0.22
237 B. Leonis	6.3	2.03	14.2	1 27.7	25 6 7.9	+ 1 33.1	+1.2633	0.4957	0.22
55 Leonis	6.1	2.05	14.4	1 10.5	8 4.1	+ 3 26.1	+1.1347	0.4956	0.22
p^3 Leonis	6.1	+2.08	−14.8	+ 0 26.5	12 29.2	+ 7 44.1	+0.9287	0.4956	−0.23
p^5 Leonis	5.3	2.14	15.1	+ 0 22.7	18 8.6	−10 45.7	−0.3044	0.4959	0.23
388 B. Leonis	6.3	2.21	15.9	− 1 14.8	26 2 0.2	− 3 7.0	−0.3245	0.4968	0.23
e Leonis	5.1	2.22	16.3	2 33.0	3 20.7	− 1 48.7	+0.8017	0.4970	0.23
431 B. Leonis	6.2	2.27	16.3	1 58.9	7 49.1	+ 2 32.4	−0.8547	0.4978	0.23
13 B. Virginis	5.9	+2.33	−17.4	− 4 52.6	14 46.3	+ 9 18.1	+0.7326	0.4995	−0.22
64 B. Virginis	6.5	2.45	18.4	7 19.1	27 1 20.4	− 4 25.5	+1.0033	0.5030	0.22
q Virginis	5.3	2.60	19.0	9 0.0	13 48.3	+ 7 41.2	+0.0568	0.5086	0.22
370 B. Virginis	6.0	2.74	19.6	11 12.3	28 0 31.6	− 5 54.2	+0.1290	0.5145	0.21
75 Virginis	5.6	3.02	20.0	14 56.5	19 55.1	−11 6.1	+0.1859	0.5278	0.19
83 Virginis	5.6	+3.11	−20.0	−15 46.1	29 1 34.3	− 5 37.5	−0.0179	0.5322	−0.18
85 Virginis	6.1	3.12	19.8	15 21.4	2 6.1	− 5 6.8	−0.5579	0.5326	0.18
43 H. Virginis	5.5	3.35	19.4	17 49.2	16 8.9	+ 8 28.7	−0.4521	0.5444	0.16
231 G. Virginis	6.4	3.37	19.4	18 12.3	16 54.5	+ 9 12.8	−0.1713	0.5451	0.16
236 G. Virginis	5.7	3.38	19.4	18 20.2	17 38.1	+ 9 54.9	−0.1535	0.5457	0.16
q G. Librae	6.5	+3.52	−19.1	−20 4.9	30 0 58.6	− 6 59.5	+0.5021	0.5522	−0.

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

JUNE.

The Star's					At Conjunction in R. A.						Limiting Parallels.	
Name.	Mag.	Red'ns from 1917.0. Δα	Δδ	Apparent Declination.	Greenwich Mean Time.	Hour Angle, H	Y'	x'	y'		N.	S.
		s	"	° ′	d h m	h m					°	°
δ. Libræ	6.4	+3.61	−18.7	−20 49.8	30 6 1.2	− 2 7.4	+0.5258	0.5567	−0.1469		+59	−12
β. Libræ	6.1	3.62	18.6	20 58.9	6 28.6	− 1 41.0	+0.6190	0.5571	0.1461		+65	− 7
B. Libræ	5.7	3.72	18.8	21 2.9	10 55.0	+ 2 36.0	+0.0559	0.5611	0.1378		+30	−38
β. Libræ	6.1	3.76	17.6	21 42.9	14 50.3	+ 6 22.9	+0.2282	0.5646	0.1302		+39	−28
δ. Libræ	5.8	+3.83	−17.0	−22 5.9	19 4.7	+10 28.1	+0.0942	0.5683	−0.1215		+31	−36

JULY.

B. Libræ	6.0	+3.98	−15.6	−22 52.3	1 4 2.4	− 4 54.0	−0.1028	0.5760	−0.1017		+18	−47
B. Libræ	6.2	3.99	15.4	22 53.0	4 40.9	− 4 16.9	−0.1546	0.5765	0.1003		+15	−50
Libræ	5.0	+4.01	−15.5	−23 33.2	5 3.3	− 3 55.4	+0.5020	0.5768	−0.0994		+53	−13
B. Scorpii	5.4	4.11	14.6	24 17.4	10 37.0	+ 1 25.6	+0.7458	0.5813	0.0862		+66	+ 2
B. Scorpii	5.3	4.09	14.4	23 44.1	10 38.2	+ 1 26.8	+0.1706	0.5813	0.0862		+31	−31
B. Scorpii	5.4	4.14	14.2	24 35.8	12 30.6	+ 3 14.9	+0.9014	0.5828	0.0816		+65	+12
B. Scorpii	6.4	4.17	13.7	24 30.1	14 39.7	+ 5 19.0	+0.6332	0.5844	0.0762		+60	− 5
B. Scorpii	5.7	+4.15	−13.3	−23 23.1	15 33.4	+ 6 10.7	−0.5848	0.5851	−0.0740		−10	−83
G. Scorpii	6.2	4.18	13.3	24 14.7	16 15.1	+ 6 50.7	+0.2497	0.5856	0.0722		+35	−26
G. Scorpii	5.8	4.17	13.1	23 28.1	16 36.5	+ 7 11.3	−0.5744	0.5858	0.0713		−10	−82
G. Scorpii	6.3	4.21	12.8	24 12.9	18 36.3	+ 9 6.5	+0.0554	0.5873	0.0662		+23	−38
B. Scorpii	6.0	4.25	12.9	25 16.2	19 2.5	+ 9 31.6	+1.1115	0.5875	0.0651		+65	+30
Scorpii	4.9	+4.24	−12.1	−23 58.4	21 20.4	+11 44.1	−0.3628	0.5891	−0.0591		0	−64
Scorpii	3.1	4.28	12.3	25 23.9	21 32.3	+11 55.5	+1.0863	0.5893	0.0585		+65	+28
Ophiuchi	4.7	4.24	11.5	23 15.6	23 18.3	−10 22.7	−1.2044	0.5904	0.0539		−55	−88
Scorpii	4.8	4.31	11.4	24 56.2	2 1 6.1	− 8 39.1	+0.4201	0.5916	0.0491		+43	−17
B. Scorpii	6.1	4.34	10.2	24 18.6	5 34.2	− 4 21.8	−0.4113	0.5942	0.0369		− 4	−68
B. Ophiuchi	6.3	+4.44	− 8.4	−24 58.2	12 39.9	+ 2 26.8	+0.0686	0.5978	−0.0170		+20	−37
Ophiuchi	5.8	4.44	8.4	24 51.9	12 44.4	+ 2 31.2	−0.0381	0.5979	0.0168		+14	−43
B. Ophiuchi	6.3	4.49	7.2	25 9.3	17 22.4	+ 6 57.9	+0.2087	0.5998	−0.0035		+26	−29
Ophiuchi	5..	4.47	6.4	24 12.0	19 35.9	+ 9 5.9	−0.7603	0.6006	+0.0029		−26	−90
Ophiuchi	3.4	4.51	6.1	24 55.2	21 6.6	+10 32.9	−0.0235	0.6012	0.0073		+14	−42
B. Ophiuchi	6.3	+4.50	− 5.6	−24 10.2	22 18.0	+11 41.3	−0.7702	0.6014	+0.0107		−26	−90
Ophiuchi	4.3	4.50	5.6	24 6.1	22 47.0	−11 50.9	−0.8336	0.6016	0.0121		−30	−90
G. Ophiuchi	6.3	4.56	5.7	25 52.3	22 58.1	−11 40.2	+0.9578	0.6016	0.0127		+64	+17
Ophiuchi	4.8	4.50	5.0	23 54.1	3 0 42.3	−10 0.2	−1.0069	0.6021	0.0177		−41	−90
Ophiuchi	6.1	4.59	2.5	24 52.3	9 35.6	− 1 28.9	+0.2466	0.6036	0.0437		+32	−27
Sagittarii	4.8	+4.56	− 1.9	−23 48.6	11 27.5	+ 0 18.4	−0.7337	0.6038	+0.0492		−21	−90
Sagittarii	5.5	4.58	1.6	24 17.0	12 36.5	+ 1 24.6	−0.2002	0.6038	0.0525		+ 8	−53
Sagittarii	6.0	4.59	1.5	24 21.8	12 59.6	+ 1 46.6	−0.0986	0.6039	0.0537		+14	−47
Sagittarii	5.2	4.58	− 0.6	23 43.2	15 58.2	+ 4 37.9	−0.5718	0.6039	0.0623		−10	−82
B. Sagittarii	6.4	4.63	+ 0.4	24 57.2	19 39.7	+ 8 10.2	+0.9132	0.6037	0.0729		+65	+13
Sagittarii	5.7	+4.61	+ 1.9	−24 5.7	4 0 21.6	−11 19.5	+0.4278	0.6031	+0.0863		+46	−16
B. Sagittarii	5.8	4.59	2.3	23 34.6	2 7.2	− 9 38.3	+0.0661	0.6028	0.0913		+26	−37
Sagittarii	6.1	4.60	2.7	23 54.7	3 23.2	− 8 25.4	+0.5179	0.6026	0.0948		+53	−12
Sagittarii	5.6	4.56	3.3	22 28.7	5 6.8	− 6 46.2	−0.7423	0.6022	0.0996		−17	−90
Sagittarii	6.2	4.54	3.7	22 15.4	6 49.8	− 5 7.3	−0.7880	0.6018	0.1043		−19	−90
Sagittarii	5.0	+4.57	+ 4.1	−22 50.8	8 5.4	− 3 54.8	−0.0666	0.6014	+0.1077		+20	−45
Sagittarii	5.1	4.57	4.2	22 46.5	8 27.0	− 3 34.1	−0.0996	0.6013	0.1087		+19	−47
B. Sagittarii	5.9	4.58	4.3	23 16.8	8 47.2	− 3 14.7	+0.4397	0.6012	0.1096		+49	−16
B. Sagittarii	6.3	4.56	4.9	22 48.7	10 56.5	− 1 10.7	+0.2165	0.6006	0.1154		+36	−29
Sagittarii	*3.9*	*4.53*	*5.2*	21 51.8	12 7.3	− 0 2.8	−0.5897	0.6001	0.1185		− 6	−83
Sagittarii	*6.5*	*+4.58*	*+ 5.7*	−23 19.2	13 39.7	+ 1 25.8	+1.0457	0.5996	+0.1226		+67	+22

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS

JULY.

THE STAR'S						AT CONJUNCTION IN R. A.				
Name.	Mag.	Red'ns from 1917.0.		Apparent Declination.	Greenwich Mean Time.	Hour Angle, H	Y	x'	y'
		$\Delta\alpha$	$\Delta\delta$						
		s	"	° ′	d h m	h m			
π Sagittarii	3.0	+4.50	+ 5.8	−21 9.3	4 14 5.0	+ 1 50.1	−1.0553	0.5995	+0.12
199 B. Sagittarii	6.4	4.52	6.0	21 47.7	15 6.8	+ 2 49.4	−0.2899	0.5991	0.12
222 B. Sagittarii	5.5	4.54	6.9	22 33.4	18 15.2	+ 5 50.1	+0.8748	0.5979	0.13
50 Sagittarii	5.5	4.51	7.6	21 56.4	20 27.5	+ 7 57.2	+0.5653	0.5969	0.13
253 B. Sagittarii	6.1	4.50	8.0	21 29.0	22 14.6	+ 9 39.9	+0.3661	0.5961	0.14
f Sagittarii	5.1	+4.42	+ 9.5	−19 57.5	5 4 18.3	− 8 31.0	−0.2264	0.5932	+0.15
57 Sagittarii	6.0	4.39	10.0	19 15.2	6 36.3	− 6 18.5	−0.5535	0.5919	0.16
π Capricorni	5.2	4.28	13.3	18 28.9	20 38.3	+ 7 10.7	+1.1915	0.5838	0.13
31 B. Capricorni	6.4	4.21	13.2	16 0.8	21 14.2	+ 7 45.1	−1.1330	0.5835	0.19
ρ Capricorni	5.0	4.26	13.4	18 5.1	21 16.0	+ 7 46.9	+0.9220	0.5834	0.19
47 B. Capricorni	6.2	+4.21	+13.8	−16 48.5	23 59.6	+10 24.2	+0.1949	0.5817	+0.19
τ Capricorni	5.2	4.16	13.9	15 14.6	6 1 32.3	+11 53.5	−1.0429	0.5808	0.20
61 B. Capricorni	5.9	4.18	14.3	16 25.0	2 3.0	−11 37.2	+0.2205	0.5805	0.20
95 B. Capricorni	5.9	4.08	15.5	14 48.0	9 33.6	− 4 23.4	+0.1909	0.5758	0.21
53 B. Aquarii	6.5	3.99	16.6	13 32.5	16 49.3	+ 2 36.2	+0.5441	0.5712	0.22
18 Aquarii	5.5	+3.95	+17.2	−13 13.8	20 17.8	+ 5 57.0	+1.0248	0.5692	+0.22
72 B. Aquarii	6.5	3.91	17.2	11 55.4	22 1.9	+ 7 37.3	+0.1311	0.5681	0.23
137 B. Capricorni	6.2	3.85	17.7	10 56.8	7 2 51.8	−11 43.3	+0.2928	0.5653	0.23
c^1 Capricorni	5.3	3.80	17.7	9 27.5	5 16.0	− 9 24.2	−0.6092	0.5639	0.23
c^2 Capricorni	6.3	3.80	17.9	9 39.3	5 48.9	− 8 52.5	−0.2848	0.5636	0.23
30 Aquarii	5.6	+3.69	+18.2	− 6 55.1	13 15.3	− 1 42.0	−1.1960	0.5596	+0.24
44 Aquarii	5.7	3.61	18.6	5 47.8	19 22.5	+ 4 12.4	−0.7986	0.5566	0.24
51 Aquarii	5.8	3.57	18.8	5 15.1	22 20.7	+ 7 13.0	−0.5612	0.5552	0.25
κ Aquarii	5.2	3.50	19.1	4 39.1	8 4 36.9	−10 52.3	+0.3821	0.5526	0.25
207 B. Aquarii	6.3	3.48	19.1	3 58.8	5 59.2	− 9 32.9	+0.0610	0.5520	0.25
6 G. Piscium	6.2	+3.39	+19.4	− 2 50.1	13 54.2	− 1 54.0	+0.9299	0.5493	+0.25
3 Piscium	6.3	3.36	18.7	0 15.3	14 59.4	− 0 51.0	−1.3737	0.5490	0.25
22 B. Piscium	6.4	3.25	19.3	− 0 9.5	9 1 28.3	+ 9 16.6	+1.1978	0.5462	0.25
κ Piscium	4.9	3.23	19.0	+ 0 48.4	3 2.2	+10 47.4	+0.6253	0.5459	0.25
9 Piscium	6.4	3.23	19.1	0 40.3	3 10.9	+10 55.8	+0.7975	0.5459	0.25
16 Piscium	5.7	+3.18	+19.0	+ 1 38.8	7 24.1	− 8 59.5	+0.8852	0.5452	+0.25
19 Piscium	5.4	3.13	18.7	3 1.9	12 1.2	− 4 31.6	+0.6513	0.5446	0.25
ω Piscium	4.0	3.07	17.6	6 24.5	17 59.2	+ 1 14.5	−1.2765	0.5440	0.24
36 Piscium	6.2	2.99	17.3	7 47.1	10 1 58.8	+ 8 58.1	−0.7187	0.5438	0.24
d Piscium	5.4	2.97	17.3	7 44.1	3 50.6	+10 46.2	−0.2184	0.5439	0.24
136 B. Piscium	6.5	+2.87	+16.8	+ 8 54.4	13 22.0	− 4 1.4	+0.8401	0.5445	+0.23
58 Piscium	5.7	2.86	15.9	11 31.6	16 2.3	− 1 26.4	−1.2196	0.5448	0.22
75 Piscium	6.3	2.78	15.4	12 31.0	11 1 1.1	+ 7 14.4	−0.2218	0.5461	0.21
η Piscium	3.7	2.68	14.2	14 55.3	12 23.1	− 5 46.7	−0.2921	0.5484	0.20
101 Piscium	6.2	2.66	14.3	14 14.5	14 20.3	− 3 53.4	+0.8079	0.5489	0.20
105 Piscium	6.1	+2.66	+13.6	+15 59.3	16 5.7	− 2 11.6	−0.6476	0.5493	+0.19
3 Arietis	6.4	2.64	13.1	17 0.1	19 12.9	+ 0 49.3	−1.0842	0.5501	0.19
4 Arietis	5.8	2.63	13.2	16 32.8	19 56.2	+ 1 31.1	−0.4732	0.5503	0.19
z Arietis	5.1	2.60	12.7	17 25.0	12 0 3.8	+ 5 30.1	−0.5942	0.5514	0.18
35 B. Arietis	6.4	2.57	12.4	17 51.5	2 55.0	+ 8 15.5	−0.5291	0.5521	0.18
47 B. Arietis	6.5	+2.55	+12.4	+17 38.3	4 44.2	+10 1.0	+0.0276	0.5527	+0.17
20 B. Arietis	6.4	2.55	12.5	16 50.3	5 27.7	+10 42.9	+0.9887	0.5529	0.17
15 Arietis	5.9	2.56	11.8	19 6.7	6 0.0	+11 14.1	−1.2840	0.5530	0.17
θ Arietis	5.6	2.53	11.5	19 31.3	9 20.8	− 9 32.0	−1.1310	0.5540	0.17
26 Arietis	6.2	2.49	11.2	19 29.4	14 54.2	− 4 10.2	−0.1816	0.5556	0.16
μ *Arietis*	5.7	+2.44	+10.7	+19 39.7	20 5.3	+ 0 50.1	+0.4457	0.5571	+0.15

EMENTS FOR THE PREDICTION OF OCCULTATIONS.

JULY.

THE STAR'S					AT CONJUNCTION IN R. A.					Limiting Parallels.	
ne.	Mag.	Red'ns from 1917.0. Δα	Δδ	Apparent Declination.	Greenwich Mean Time.	Hour Angle, H	Y	x'	y'	N.	S.
		s	″	° ′	d h m	h m				°	°
tis	5.8	+2.40	+10.0	+20 20.4	13 2 59.0	+ 7 29.3	+0.7256	0.5589	+0.1367	+90	+11
tis (*mean*)	4.6	2.40	9.8	21 0.7	3 28.8	+ 7 58.1	+0.0859	0.5590	0.1357	+46	−23
tis	5.0	2.34	9.2	20 44.4	10 20.2	− 9 25.1	+1.2555	0.5608	0.1212	+83	+54
tis	6.1	2.31	8.2	22 31.3	16 12.0	− 3 45.7	+0.0487	0.5621	0.1085	+44	−22
ri	5.4	2.28	7.2	24 1.9	23 15.5	+ 3 2.6	−0.8426	0.5634	0.0927	− 8	−66
ri	3.8	+2.27	+ 7.2	+23 51.3	23 17.6	+ 3 4.6	−0.6527	0.5634	+0.0926	+ 4	−62
ri	4.3	2.28	7.1	24 12.6	23 25.9	+ 3 12.6	−1.0164	0.5634	0.0923	−21	−66
ri	4.1	2.27	7.1	24 6.7	23 42.0	+ 3 28.2	−0.8871	0.5635	0.0917	−11	−66
ri	5.8	2.28	7.1	24 17.9	23 43.9	+ 3 30.0	−1.0827	0.5635	0.0916	−27	−66
ri	6.5	2.27	7.1	24 16.3	23 47.6	+ 3 33.6	−1.0491	0.5635	0.0915	−24	−66
ri	4.3	+2.27	+ 7.2	+23 41.6	23 55.3	+ 3 41.0	−0.4224	0.5635	+0.0912	+17	−47
ri	3.0	2.26	7.1	23 51.1	14 0 25.2	+ 4 9.8	−0.5460	0.5636	0.0901	+10	−55
ri	5.5	2.25	7.3	23 10.1	0 48.0	+ 4 31.7	+0.2129	0.5637	0.0892	+54	−12
ri	3.7	2.26	7.1	23 48.2	1 8.6	+ 4 51.7	−0.4295	0.5637	0.0884	+16	−47
ri	5.2	2.26	7.1	23 53.2	1 9.2	+ 4 52.2	−0.5174	0.5637	0.0884	+12	−53
ri	6.0	+2.22	+ 7.0	+22 56.3	4 33.9	+ 8 9.6	+0.7794	0.5643	+0.0805	+90	+20
ri	6.5	2.21	6.8	22 58.2	6 14.3	+ 9 46.3	+0.8772	0.5644	0.0766	+90	+27
ri	5.6	2.21	6.5	23 52.8	7 41.7	+11 10.7	+0.0170	0.5646	0.0732	+42	−20
ri	5.3	2.18	5.4	25 26.2	15 30.5	− 5 17.5	−1.1442	0.5652	0.0548	−34	−65
ri	6.1	2.16	5.6	24 6.6	16 8.2	− 4 41.0	+0.3067	0.5653	0.0533	+60	− 3
ri	6.2	+2.10	+ 4.8	+23 56.0	15 0 24.6	+ 3 17.6	+0.8566	0.5653	+0.0335	+90	+29
ri	6.3	2.07	4.2	24 27.7	6 1.0	+ 8 41.8	+0.4413	0.5650	0.0200	+70	+ 7
ri	6.0	2.06	4.2	23 49.3	6 41.6	+ 9 21.0	+1.1432	0.5649	0.0184	+90	+51
ri	5.6	2.07	4.0	24 55.5	6 49.4	+ 9 28.6	−0.0405	0.5649	0.0180	+38	−18
ri	5.5	2.04	3.7	24 9.4	11 8.0	−10 22.2	+0.8408	0.5644	+0.0077	+90	+31
ri	5.4	+2.00	+ 2.6	+25 5.1	20 17.6	− 1 32.2	−0.1884	0.5628	−0.0142	+30	−26
ri	5.1	1.97	2.5	23 59.2	23 0.1	+ 1 4.6	+0.9527	0.5622	0.0206	+90	+37
ri	5.1	1.99	2.0	25 51.1	16 0 50.5	+ 2 51.0	−1.1080	0.5617	0.0249	−30	−64
ri	5.0	1.95	1.8	24 32.5	4 55.6	+ 6 47.4	+0.1897	0.5606	0.0344	+52	− 8
ri	5.8	1.93	1.6	24 14.3	8 25.0	+10 9.5	+0.3836	0.5595	0.0425	+66	+ 2
ninorum	5.9	+1.90	+ 0.8	+24 26.4	14 52.6	− 7 36.5	−0.1561	0.5573	−0.0571	+32	−28
				NEW	*MOON.*						
nis	5.1	+1.72	− 8.0	+11 39.9	20 16 44.4	− 8 49.6	−0.2514	0.5075	−0.2082	+27	−51
nis	3.8	1.72	8.5	10 16.1	21 42.9	− 3 59.5	+0.2548	0.5055	0.2119	+55	−24
nis	5.9	+1.75	− 9.2	+ 9 19.5	21 6 1.8	+ 4 5.4	−0.4825	0.5026	−0.2174	+15	−67
nis	6.2	1.75	9.5	8 42.5	6 57.5	+ 4 59.5	+0.0003	0.5023	0.2179	+41	−39
nis	4.9	1 75	9.5	8 26.4	8 6.3	+ 6 6.4	+0.0475	0.5020	0.2186	+43	−36
nis	6.3	1.80	10.6	6 57.7	20 41.2	− 5 39.4	−1.0997	0.4986	0.2246	−22	−83
nis	6.5	1.79	10.8	6 6.8	20 50.1	− 5 30.8	−0.1897	0.4986	0.2247	+31	−59
nis	6.3	+1.86	−12.6	+ 1 27.7	22 13 0.3	+10 13.1	+1.3025	0.4962	−0.2292	+90	+41
nis	6.1	1.87	12.8	1 10.6	14 56.8	−11 53.6	+1.1741	0.4960	0.2295	+90	+27
nis	6.1	1.90	13.2	0 26.6	19 22.8	− 7 34.8	+0.9690	0.4958	0.2301	+90	+12
nis	5.3	1.94	13.4	+ 0 22.7	23 1 3.4	− 2 3.3	−0.2672	0.4958	0.2304	+27	−56
nis	6.3	1.99	14.1	− 1 14.8	8 57.6	+ 5 37.9	−0.2852	0.4962	0.2301	+26	−57
nis	5.1	+2.00	−14.5	− 2 33.0	10 18.5	+ 6 56.7	+0.8467	0.4963	−0.2300	+87	+ 5
nis	6.2	2.04	14.5	1 58.9	14 48.7	+11 19.5	−0.8167	0.4968	0.2294	− 3	−90
ginis	5.9	2.09	15.6	4 52.6	21 49.3	− 5 51.3	+0.7813	0.4981	0.2279	+85	+ 1
ginis	6.5	2.19	16.6	7 19.0	24 8 29.6	+ 4 31.4	+1.0570	0.5008	0.2245	+83	+18
ginis	*5.3*	*2.32*	*17.1*	*8 59.9*	21 7.2	− 7 12.2	+0.1068	0.5053	0.2183	+44	−35
inis	*6.0*	*+2.45*	*−17.8*	*−11 12.2*	25 8 0.5	+ 3 22.3	+0.1815	0.5104	−0.2112	+47	−31

ELEMENTS FOR THE PREDICTION OF OCCULTATI

JULY.

THE STAR'S					AT CONJUNCTION IN R. A.			
Name.	Mag.	Red'ns from 1917.0. Δα	Δδ	Apparent Declination.	Greenwich Mean Time.	Hour Angle, H	Y	x'
		s	"	° ′	d h m	h m		
75 Virginis	5.6	+2.73	−18.5	−14 56.5	26 3 46.1	− 1 27.4	+0.2412	0.5221
83 Virginis	5.6	2.82	18.5	15 46.0	9 32.6	+ 4 8.5	+0.0355	0.5261
85 Virginis	6.1	2.82	18.3	15 21.4	10 5.1	+ 4 40.0	−0.5100	0.5265
43 H. Virginis	5.5	3.06	18.2	17 49.1	27 0 27.7	− 5 24.7	−0.4034	0.5373
231 G. Virginis	6.4	3.08	18.2	18 12.3	1 14.5	− 4 39.4	−0.1196	0.5379
236 G. Virginis	5.7	+3.09	−18.2	−18 20.2	1 59.1	− 3 56.3	−0.1017	0.5386
9 G. Libræ	6.5	3.24	18.1	20 4.8	9 30.6	+ 3 20.4	+0.5606	0.5446
17 G. Libræ	6.4	3.33	17.9	20 49.8	14 40.9	+ 8 20.2	+0.5841	0.5490
18 G. Libræ	6.1	3.34	17.8	20 58.9	15 9.1	+ 8 47.4	+0.6782	0.5493
43 B. Libræ	5.7	3.47	18.3	21 2.8	19 42.4	−10 48.7	+0.1083	0.5532
47 G. Libræ	6.1	+3.50	−17.0	−21 42.9	23 43.7	− 6 55.7	+0.2819	0.5565
64 G. Libræ	5.8	3.58	16.4	22 5.8	28 4 4.8	− 2 43.8	+0.1456	0.5602
169 B. Libræ	6.0	3.76	15.2	22 52.3	13 16.3	+ 6 7.8	−0.0555	0.5678
177 B. Libræ	6.2	3.77	15.1	22 53.0	13 55.9	+ 6 46.0	−0.1080	0.5683
42 Libræ	5.0	3.79	15.3	23 33.2	14 18.8	+ 7 8.1	+0.5555	0.5686
31 B. Scorpii	5.4	+3.90	−14.5	−24 17.4	20 0.9	−11 22.5	+0.8002	0.5732
32 B. Scorpii	5.3	3.89	14.3	23 44.1	20 2.2	−11 21.3	+0.2192	0.5732
40 B. Scorpii	5.4	3.94	14.2	24 35.8	21 57.3	− 9 30.5	+0.9567	0.5747
50 B. Scorpii	6.4	3.98	13.7	24 30.1	29 0 9.5	− 7 23.2	+0.6851	0.5764
57 B. Scorpii	5.7	3.96	13.2	23 23.1	1 4.6	− 6 30.1	−0.5452	0.5770
24 G. Scorpii	6.2	+4.00	−13.3	−24 14.7	1 47.2	− 5 49.0	+0.2973	0.5776
27 G. Scorpii	5.8	3.99	13.0	23 28.1	2 9.2	− 5 27.9	−0.5351	0.5779
41 G. Scorpii	6.3	4.04	12.8	24 12.9	4 11.9	− 3 29.9	+0.1003	0.5794
85 B. Scorpii	6.0	4.08	13.0	25 16.2	4 38.7	− 3 4.1	+1.1665	0.5797
19 Scorpii	4.9	4.08	12.1	23 58.4	6 59.8	− 0 48.5	−0.3227	0.5814
σ Scorpii	3.1	+4.12	−12.5	−25 23.9	7 12.0	− 0 36.7	+1.1399	0.5815
ρ Ophiuchi	4.7	4.09	11.4	23 15.6	9 0.4	+ 1 7.5	−1.1727	0.5827
22 Scorpii	4.8	4.17	11.6	24 56.2	10 50.7	+ 2 53.6	+0.4662	0.5839
126 B. Scorpii	6.1	4.22	10.3	24 18.6	15 24.6	+ 7 16.8	−0.3742	0.5869
88 B. Ophiuchi	6.3	4.35	8.7	24 58.2	22 39.2	− 9 45.8	+0.1070	0.5910
26 Ophiuchi	5.8	+4.35	− 8.7	−24 51.9	22 43.8	− 9 41.3	−0.0005	0.5910
137 B. Ophiuchi	6.3	4.42	7.5	25 9.3	30 3 27.1	− 5 9.3	+0.2460	0.5934
39 Ophiuchi	5.1	4.42	6.6	24 12.0	5 43.0	− 2 58.9	−0.7306	0.5944
0 Ophiuchi	3.4	4.47	6.4	24 55.2	7 15.3	− 1 30.3	+0.0105	0.5950
191 B. Ophiuchi	6.3	4.46	5.9	24 10.2	8 27.8	− 0 20.7	−0.7415	0.5955
b Ophiuchi	4.3	+4.46	− 5.8	−24 6.1	8 57.4	+ 0 7.7	−0.8055	0.5957
136 G. Ophiuchi	6.3	4.52	6.1	25 52.4	9 8.6	+ 0 18.5	+0.9973	0.5957
51 Ophiuchi	4.8	4.48	5.2	23 54.1	10 54.6	+ 2 0.2	−0.9805	0.5964
63 Ophiuchi	6.1	4.61	2.8	24 52.3	19 55.6	+10 39.2	+0.2759	0.5990
4 Sagittarii	4.8	4.60	2.1	23 48.6	21 48.9	−11 32.1	−0.7097	0.5993
7 Sagittarii	5.5	+4.63	− 1.8	−24 17.0	22 58.7	−10 25.1	−0.1745	0.5996
9 Sagittarii	6.0	4.63	1.7	24 21.8	23 22.1	−10 2.8	−0.0727	0.5996
1 Sagittarii	5.2	4.64	− 0.7	23 43.2	31 2 22.6	− 7 9.6	−0.5491	0.6000
70 B. Sagittarii	6.4	4.72	+ 0.1	24 57.2	6 6.2	− 3 35.2	+0.9386	0.6003
24 Sagittarii	5.7	4.72	1.7	24 5.7	10 50.3	+ 0 57.3	+0.4487	0.6004
117 B. Sagittarii	5.8	+4.72	+ 2.3	−23 34.6	12 36.6	+ 2 39.3	+0.0851	0.6004
26 Sagittarii	6.1	4.74	2.6	23 54.7	13 53.0	+ 3 52.5	+0.5368	0.6003
28 Sagittarii	5.6	4.70	3.4	22 28.7	15 37.1	+ 5 32.4	−0.7262	0.6002
30 Sagittarii	6.2	4.70	3.9	22 15.4	17 20.6	+ 7 11.6	−0.7729	0.6001
ν^1 *Sagittarii*	5.0	4.73	4.2	22 50.8	18 36.5	+ 8 24.5	−0.0515	0.5999
ν^2 *Sagittarii*	5.1	+4.73	+ 4.3	−22 46.5	18 58.2	+ 8 45.2	−0.0847	0.5998

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

JULY.

The Star's Name.	Mag.	Red'ns from 1917.0. Δα	Δδ	Apparent Declination.	Greenwich Mean Time.	Hour Angle. H	Y	x′	y′	Limiting Parallels. N.	S.
		s	″	° ′	d h m	h m				°	°
Sagittarii	5.9	+4.75	+ 4.3	−23 16.8	31 19 18.5	+ 9 4.7	+0.4546	0.5997	+0.1087	+50	−15
Sagittarii	6.3	4.74	5.0	22 48.7	21 28.1	+11 9.0	+0.2299	0.5994	0.1145	+37	−28
Sagittarii	3.9	+4.72	+ 5.5	−21 51.8	22 39.0	−11 43.0	−0.5771	0.5992	+0.1177	− 5	−81

AUGUST.

The Star's Name.	Mag.	Δα	Δδ	Apparent Declination.	Greenwich Mean Time.	Hour Angle. H	Y	x′	y′	N.	S.
Sagittarii	6.5	+4.78	+ 5.8	−23 19.2	1 0 11.5	−10 14.2	+1.0569	0.5990	+0.1218	+67	+24
Sagittarii	3.0	4.71	6.2	21 9.3	0 36.8	− 9 49.9	−1.0435	0.5988	0.1229	−34	−90
Sagittarii	6.4	4.73	6.4	21 47.7	1 38.6	− 8 50.6	−0.2791	0.5986	0.1256	+11	−58
Sagittarii	5.5	4.77	7.2	22 33.4	4 46.9	− 5 49.9	+0.8821	0.5979	0.1337	+67	+10
Sagittarii	5.5	+4.75	+ 7.9	−21 56.4	6 59.0	− 3 43.2	+0.5714	0.5973	+0.1393	+60	− 9
B. Sagittarii	6.1	4.74	8.5	21 29.0	8 45.8	− 2 0.8	+0.3711	0.5967	0.1438	+48	−20
Sagittarii	5.1	4.70	10.3	19 57.5	14 47.9	+ 3 46.8	−0.2243	0.5947	0.1584	+17	−54
Sagittarii	6.0	4.69	11.0	19 15.2	17 5.0	+ 5 58.4	−0.5519	0.5939	0.1638	+ 1	−78
Capricorni	5.2	4.65	14.6	18 28.8	2 6 58.4	− 4 41.0	+1.1725	0.5878	0.1934	+72	+32
B. Capricorni	6.4	+4.59	+14.9	−16 0.8	7 33.8	− 4 7.1	−1.1374	0.5876	+0.1946	−34	−90
Capricorni	5.0	4.64	14.8	18 5.1	7 35.7	− 4 5.3	+0.9042	0.5875	0.1947	+72	+10
B. Capricorni	6.2	4.61	15.5	16 48.4	10 17.0	− 1 30.2	+0.1795	0.5862	0.1998	+43	−31
Capricorni	5.2	4.56	15.9	15 14.5	11 48.3	− 0 2.5	−1.0506	0.5855	0.2026	−26	−90
B. Capricorni	5.9	4.58	16.0	16 24.9	12 18.4	+ 0 26.4	+0.2031	0.5852	0.2035	+44	−30
B. Capricorni	5.9	+4.53	+17.6	−14 48.0	19 41.4	+ 7 32.4	+0.1672	0.5815	+0.2160	+45	−32
B. Aquarii	6.5	4.47	19.0	13 32.5	3 2 48.3	− 9 36.7	+0.5106	0.5779	0.2266	+66	−13
Aquarii	5.5	4.45	19.7	13 13.8	6 12.2	− 6 20.5	+0.9830	0.5762	0.2312	+77	+14
B. Aquarii	6.5	4.41	20.0	11 55.4	7 54.0	− 4 42.6	+0.0971	0.5753	0.2333	+42	−35
B. Capricorni	6.2	4.37	20.7	10 56.7	12 36.8	− 0 10.2	+0.2526	0.5730	0.2388	+52	−27
Capricorni	5.3	+4.33	+21.0	− 9 27.5	14 57.4	+ 2 5.2	−0.6408	0.5718	+0.2412	+ 4	−84
Capricorni	6.3	4.33	21.1	9 39.2	15 29.4	+ 2 36.0	−0.3207	0.5716	0.2418	+21	−59
Aquarii	5.6	4.25	21.9	6 55.1	22 43.8	+ 9 34.5	−1.2264	0.5682	0.2483	−35	−90
Aquarii	5.7	4.20	22.6	5 47.7	4 4 40.5	− 8 41.6	−0.8387	0.5657	0.2524	− 5	−90
Aquarii	5.8	4.17	22.8	5 15.1	7 42.1	− 5 46.6	−0.6069	0.5644	0.2541	+ 8	−80
Aquarii	5.2	+4.12	+23.3	− 4 39.0	13 38.0	− 0 3.4	+0.3181	0.5622	+0.2566	+58	−24
B. Aquarii	6.3	4.11	23.4	3 58.8	14 57.8	+ 1 13.6	+0.0005	0.5617	0.2571	+40	−41
G. Piscium	6.2	4.05	23.9	2 50.0	22 37.4	+ 8 36.9	+0.8501	0.5592	0.2586	+87	+ 5
B. Piscium	6.4	3.95	24.2	− 0 9.5	5 9 48.6	− 4 35.2	+1.1049	0.5564	0.2579	+90	+22
Piscium	4.9	3.93	24.0	+ 0 48.5	11 19.4	− 3 7.5	+0.5402	0.5561	0.2575	+75	−12
Piscium	6.4	+3.93	+24.0	+ 0 40.4	11 27.9	− 2 59.4	+0.7097	0.5560	+0.2575	+90	− 3
Piscium	5.7	3.89	24.0	1 38.9	15 32.6	+ 0 56.9	+0.7931	0.5553	0.2562	+90	+ 2
Piscium	5.4	3.86	23.8	3 2.0	20 0.3	+ 5 15.3	+0.5598	0.5546	0.2544	+76	−11
Piscium	4.0	3.82	23.0	6 24.6	6 1 46.6	+10 49.6	−1.3416	0.5540	0.2512	−46	−81
Piscium	6.2	3.76	22.8	7 47.2	9 30.4	− 5 42.6	−0.7970	0.5535	0.2457	− 2	−82
Piscium	5.4	+3.74	+22.8	+ 7 44.1	11 18.7	− 3 58.0	−0.3053	0.5534	+0.2442	+25	−57
B. Piscium	6.5	3.67	22.2	8 54.5	20 32.2	+ 4 56.4	+0.7331	0.5535	0.2355	+90	+ 1
Piscium	5.7	3.67	21.4	11 31.6	23 7.6	+ 7 26.4	−1.2976	0.5536	0.2327	−42	−78
Piscium	6.3	3.61	20.7	12 31.0	7 7 50.8	− 8 8.5	−0.3176	0.5543	0.2222	+24	−54
Piscium	3.7	3.54	19.3	14 55.4	18 54.6	+ 2 32.3	−0.3903	0.5556	0.2067	+20	−57
Piscium	6.2	+3.52	+19.4	+14 14.6	20 49.0	+ 4 22.7	+0.6955	0.5559	+0.2038	+90	+ 2
Piscium	6.1	3.52	18.7	15 59.4	22 31.8	+ 6 1.9	−0.7422	0.5561	0.2011	0	−74
Arietis	6.4	3.51	18.1	17 0.2	8 1 34.5	+ 8 58.4	−1.1743	0.5566	0.1962	−31	−73
Arietis	5.8	3.50	18.2	16 32.9	2 16.9	+ 9 39.3	−0.5707	0.5567	0.1951	+10	−67
Arietis	5.1	3.47	17.6	17 25.1	6 18.9	−10 27.3	−0.6910	0.5574	0.1883	+ 3	−72
Arietis	6.4	+3.46	+17.2	+17 51.6	9 6.6	− 7 45.4	−0.6271	0.5579	+0.1831	+ 7	−69

ELEMENTS FOR THE PREDICTION OF OCCULTATIO

AUGUST.

Name.	Mag.	Red'ns from 1917.0. Δα	Red'ns from 1917.0. Δδ	Apparent Declination.	At Conjunction in R. A. Greenwich Mean Time.	Hour Angle, H	Y	x'	
		s	″	° ′	d h m	h m			
47 B. Arietis	6.5	+3.44	+17.1	+17 38.4	8 10 53.4	− 6 2.4	−0.0768	0.5582	+0
20 H¹. Arietis	6.4	3.43	17.2	16 50.4	11 36.1	− 5 21.2	+0.8739	0.5584	0
θ Arietis	5.6	3.42	16.0	19 31.3	15 24.8	− 1 40.6	−1.2236	0.5590	0
26 Arietis	6.2	3.38	15.4	19 29.5	20 52.3	+ 3 35.4	−0.2841	0.5600	0
μ Arietis	5.7	3.34	14.8	19 39.8	9 1 58.4	+ 8 30.6	+0.3377	0.5609	0
47 Arietis	5.8	+3.30	+13.8	+20 20.4	8 46.3	− 8 56.1	+0.6165	0.5620	+0
ε Arietis (*mean*)	4.6	3.29	13.6	21 0.8	9 15.7	− 8 27.7	−0.0180	0.5621	0
ζ Arietis	5.0	3.23	12.8	20 44.5	16 2.4	− 1 55.6	+1.1444	0.5630	0
66 Arietis	6.1	3.21	11.4	22 31.3	21 50.8	+ 3 40.4	−0.0525	0.5638	0
16 Tauri	5.4	3.17	10.0	24 1.9	10 4 51.3	+10 25.8	−0.9373	0.5644	0
17 Tauri	3.8	+3.17	+10.0	+23 51.4	4 53.3	+10 27.7	−0.7484	0.5644	+0
q Tauri	4.3	3.17	9.9	24 12.6	5 1.5	+10 35.6	−1.1102	0.5644	0
20 Tauri	4.1	3.17	9.9	24 6.7	5 17.6	+10 51.2	−0.9815	0.5644	0
21 Tauri	5.8	3.17	9.8	24 17.9	5 19.5	+10 53.0	−1.1760	0.5644	0
22 Tauri	6.5	3.17	9.8	24 16.4	5 23.1	+10 56.4	−1.1426	0.5644	0
23 Tauri	4.3	+3.16	+10.0	+23 41.6	5 30.8	+11 3.9	−0.5191	0.5644	+0
η Tauri	3.0	3.16	9.9	23 51.1	6 0.5	+11 32.5	−0.6419	0.5645	0
104 B. Tauri	5.5	3.14	10.1	23 10.2	6 23.2	+11 54.3	+0.1131	0.5645	0
27 Tauri	3.7	3.15	9.8	23 48.2	6 43.7	−11 45.9	−0.5259	0.5645	0
28 Tauri	5.2	3.15	9.8	23 53.2	6 44.3	−11 45.3	−0.6134	0.5645	0
33 Tauri	6.0	+3.10	+ 9.7	+22 56.3	10 7.9	− 8 29.0	+0.6782	0.5646	+0
161 B. Tauri	6.5	3.09	9.4	22 58.2	11 47.8	− 6 52.7	+0.7763	0.5647	0
36 Tauri	5.6	3.09	8.9	23 52.8	13 14.9	− 5 28.7	−0.0795	0.5647	0
χ Tauri	5.3	3.05	7.3	25 26.2	21 2.5	+ 2 1.9	−1.2341	0.5646	0
62 Tauri	6.1	3.02	7.6	24 6.6	21 40.1	+ 2 38.3	+0.2124	0.5646	0
95 Tauri	6.2	+2.94	+ 6.5	+23 56.1	11 5 56.3	+10 36.5	+0.7648	0.5640	+0
315 B. Tauri	6.3	2.90	5.5	24 27.7	11 33.0	− 7 58.9	+0.3534	0.5634	0
99 Tauri	6.0	2.88	5.6	23 49.3	12 13.8	− 7 19.6	+1.0545	0.5632	0
k Tauri	5.6	2.90	5.2	24 55.5	12 21.6	− 7 12.0	−0.1272	0.5632	0
103 Tauri	5.5	2.84	4.9	24 9.5	16 40.8	− 3 2.1	+0.7552	0.5625	+0
118 Tauri	5.4	+2.78	+ 3.3	+25 5.1	12 1 52.4	+ 5 50.0	−0.2678	0.5604	−0
121 Tauri	5.1	2.73	3.2	23 59.2	4 35.7	+ 8 27.6	+0.8747	0.5597	0
125 Tauri	5.1	2.75	2.4	25 51.1	6 26.6	+10 14.6	−1.1845	0.5591	0
132 Tauri	5.0	2.68	2.2	24 32.5	10 33.0	− 9 47.8	+0.1159	0.5579	0
412 B. Tauri	5.8	2.65	1.8	24 14.3	14 3.5	− 6 24.6	+0.3122	0.5568	0
1 Geminorum	4.3	+2.60	+ 1.6	+23 16.2	17 16.1	− 3 18.7	+1.2215	0.5556	−0
3 Geminorum	5.6	2.58	1.3	23 7.7	19 46.4	− 0 53.5	+1.2465	0.5547	0
5 Geminorum	5.9	2.60	0.8	24 26.4	20 33.5	− 0 8.1	−0.2233	0.5544	0
8 Geminorum	6.1	2.57	0.7	23 59.9	22 42.5	+ 1 56.4	+0.1321	0.5536	0
9 Geminorum	6.2	2.56	0.7	23 46.2	23 0.5	+ 2 13.8	+0.3618	0.5534	0
36 B. Geminorum	6.0	+2.52	+ 0.3	+23 22.5	13 2 52.6	+ 5 58.1	+0.5402	0.5519	−0
52 B. Geminorum	6.5	2.50	− 0.7	24 39.6	8 15.6	+11 10.0	−1.2705	0.5496	0
d Geminorum	5.2	2.40	0.9	21 51.6	14 46.5	− 6 32.3	+1.2212	0.5466	0
87 B. Geminorum	5.8	2.43	1.4	23 42.0	14 57.1	− 6 22.0	−0.8109	0.5465	0
MARS	1.7	. . .	. . .	23 34.5	15 59.9	− 5 21.4	−0.7754	0.5166	0
44 Geminorum	5.9	+2.37	− 1.9	+22 45.7	21 8.6	− 0 22.9	−0.4076	0.5434	−0
120 B. Geminorum	6.5	2.33	2.2	21 23.5	23 25.5	+ 1 49.5	+0.8476	0.5423	0
δ Geminorum	3.5	2.31	2.7	22 8.1	14 4 7.3	+ 6 22.1	−0.5109	0.5400	0
56 Geminorum	5.2	2.27	2.5	20 36.0	5 0.8	+ 7 13.7	+1.0690	0.5395	0
149 B. Geminorum	6.4	2.27	3.0	21 42.1	7 19.9	+ 9 28.4	−0.4279	0.5383	0
61 Geminorum	5.8	+2.26	− 2.7	+20 25.4	7 23.1	+ 9 31.5	+0.9714	0.5383	−

LEMENTS FOR THE PREDICTION OF OCCULTATIONS.

AUGUST.

THE STAR'S					AT CONJUNCTION IN R. A.						Limiting Parallels.	
Name.	Mag.	Red'ns from 1917.0. Δα	Δδ	Apparent Declination.	Greenwich Mean Time.	Hour Angle, H	Y'	x'	y'		N.	S.
		s	"	° ′	d h m	h m					°	°
eminorum	5.3	+2.28	− 3.0	+21 36.9	14 7 45.0	+ 9 52.7	−0.3856	0.5381	−0.1263		+19	−48
eminorum	6.3	2.21	3.7	20 30.9	16 8.5	− 5 59.8	−0.2944	0.5338	0.1405		+24	−45
eminorum	6.2	2.17	4.0	19 32.2	19 27.9	− 2 46.8	+0.3082	0.5320	0.1458		+59	−13
eminorum	5.2	2.17	4.2	20 6.2	21 16.4	− 1 1.7	−0.5822	0.5311	0.1487		+ 8	−63
eminorum	6.3	2.16	4.5	20 2.6	23 47.8	+ 1 25.0	−0.8970	0.5297	0.1526		−11	−70
ancri	6.1	+2.13	− 4.6	+19 4.6	15 1 46.0	+ 3 19.6	−0.1322	0.5287	−0.1555		+33	−37
ancri (*mean*)	4.7	2.10	4.8	17 53.9	5 29.0	+ 6 55.7	+0.5821	0.5268	0.1610		+81	0
				NEW	*MOON.*							
eonis	5.3	+1.87	−12.2	+ 0 22.7	19 7 7.3	+ 5 48.1	−0.1579	0.4975	−0.2300		+32	−49
eonis	6.3	+1.89	−12.8	− 1 14.8	15 0.7	−10 31.4	−0.1666	0.4978	−0.2297		+32	−50
eonis	5.1	1.89	13.0	2 32.9	16 21.6	− 9 12.7	+0.9694	0.4979	0.2296		+87	+13
eonis	6.2	1.92	13.1	1 58.8	20 51.6	− 4 50.1	−0.6928	0.4984	0.2289		+ 4	−89
irginis	5.9	1.94	13.8	4 52.5	20 3 52.1	+ 1 58.9	+0.9171	0.4994	0.2274		+85	+ 9
irginis	6.5	2.00	14.6	7 19.0	14 33.2	−11 37.6	+1.2053	0.5017	0.2238		+83	+31
irginis	5.3	+2.09	−15.2	− 8 59.9	21 3 13.2	+ 0 41.1	+0.2634	0.5056	−0.2175		+53	−27
irginis	6.0	2.19	15.8	11 12.2	14 10.3	+11 19.5	+0.3471	0.5099	0.2101		+57	−22
irginis	5.6	2.42	16.5	14 56.5	22 10 7.5	+ 6 41.6	+0.4190	0.5200	0.1920		+58	−18
irginis	5.6	2.49	16.5	15 46.0	15 58.7	−11 37.9	+0.2143	0.5234	0.1854		+46	−29
irginis	6.1	2.50	16.4	15 21.3	16 31.7	−11 5.9	−0.3355	0.5237	0.1848		+16	−60
irginis	5.5	+2.70	−16.4	−17 49.1	23 7 8.6	+ 3 3.7	−0.2248	0.5331	−0.1658		+20	−54
irginis	6.4	2.72	16.4	18 12.3	7 56.3	+ 3 49.9	+0.0619	0.5336	0.1647		+34	−37
irginis	5.7	2.73	16.4	18 20.2	8 41.8	+ 4 33.9	+0.0801	0.5341	0.1636		+35	−36
ibræ	6.5	2.86	16.4	20 4.8	16 22.6	+11 59.8	+0.7503	0.5394	0.1518		+70	+ 2
ibræ	6.4	2.95	16.3	20 49.8	21 39.8	− 6 53.3	+0.7744	0.5432	0.1432		+69	+ 3
ibræ	6.1	+2.96	−16.2	−20 58.9	22 8.6	− 6 25.6	+0.8697	0.5436	−0.1424		+69	+ 9
ibræ	5.7	3.08	16.9	21 2.8	24 2 48.5	− 1 54.9	+0.2931	0.5469	0.1342		+44	−24
ibræ	6.1	3.12	15.6	21 42.8	6 55.8	+ 2 4.1	+0.4684	0.5499	0.1268		+53	−15
ibræ	5.8	3.19	15.1	22 5.8	11 23.8	+ 6 22.9	+0.3297	0.5531	0.1183		+44	−22
ibræ	6.0	3.36	14.2	22 52.3	20 50.6	− 8 30.2	+0.1238	0.5599	0.0992		+30	−34
ibræ	6.2	+3.37	−14.1	−22 53.0	21 31.3	− 7 50.9	+0.0702	0.5604	−0.0978		+27	−37
ibræ	5.0	3.39	14.3	23 33.2	21 54.9	− 7 28.1	+0.7425	0.5606	0.0969		+66	+ 2
corpii	5.4	3.51	13.6	24 17.4	25 3 47.2	− 1 48.5	+0.9885	0.5647	0.0841		+66	+19
corpii	5.3	3.50	13.4	23 44.1	3 48.5	− 1 47.2	+0.3996	0.5647	0.0841		+45	−18
corpii	5.4	3.55	13.4	24 35.8	5 47.1	+ 0 7.1	+1.1466	0.5662	0.0797		+65	+34
corpii	2.5	+3.51	−12.5	−22 23.4	6 33.8	+ 0 52.1	−1.2439	0.5666	−0.0779		−57	−83
corpii	6.4	3.59	13.0	24 30.1	8 3.4	+ 2 18.4	+0.8704	0.5676	0.0745		+65	+11
corpii	5.7	3.58	12.4	23 23.0	9 0.2	+ 3 13.2	−0.3776	0.5682	0.0723		+ 1	−65
corpii	6.2	3.61	12.6	24 14.7	9 44.2	+ 3 55.6	+0.4764	0.5687	0.0706		+49	−14
corpii	5.8	3.60	12.3	23 28.1	10 6.8	+ 4 17.4	−0.3678	0.5689	0.0698		+ 2	−64
corpii	6.3	+3.65	−12.2	−24 12.8	12 13.3	+ 6 19.2	+0.2755	0.5703	−0.0648		+36	−25
corpii	4.9	3.70	11.5	23 58.4	15 6.6	+ 9 6.1	−0.1550	0.5721	0.0580		+11	−50
phiuchi	4.7	3.71	10.9	23 15.6	17 11.0	+11 5.9	−1.0182	0.5734	0.0530		−39	−90
corpii	4.8	3.79	11.1	24 56.2	19 4.9	−11 4.5	+0.6429	0.5745	0.0483		+59	− 4
corpii	6.1	3.85	9.9	24 18.6	23 47.8	− 6 32.2	−0.2123	0.5771	0.0366		+ 6	−54
phiuchi	6.3	+4.00	− 8.6	−24 58.2	26 7 16.7	+ 0 39.7	+0.2708	0.5810	−0.0175		+31	−25
phiuchi	5.8	4.00	8.5	24 51.9	7 21.4	+ 0 44.2	+0.1617	0.5810	0.0173		+25	−31
phiuchi	6.3	4.09	7.5	25 9.3	12 14.1	+ 5 25.6	+0.4082	0.5833	−0.0045		+39	−17
phiuchi	*5.1*	*4.09*	*6.6*	*24 12.0*	14 34.4	+ 7 40.5	−0.5842	0.5843	+0.0017		−16	−83
phiuchi	*3.4*	*4.14*	*6.5*	*24 55.2*	16 9.8	+ 9 12.2	+0.1662	0.5849	0.0059		+24	−33
hiuchi	*6.3*	*+4.14*	*− 5.9*	*−24 10.2*	17 24.8	+10 24.3	−0.5975	0.5854	+0.0093		−16	

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS

AUGUST.

The Star's					At Conjunction in R. A.				
Name.	Mag.	Red'ns from 1917.0.		Apparent Declination.	Greenwich Mean Time.	Hour Angle, H	Y	x'	y'
		$\Delta\alpha$	$\Delta\delta$						
		s	"	° ′	d h m	h m			
b Ophiuchi	4.3	+4.14	− 5.9	−24 6.1	26 17 55.3	+10 53.5	−0.6629	0.5856	+0.01
136 G. Ophiuchi	6.3	4.20	6.3	25 52.4	18 6.9	+11 4.7	+1.1654	0.5856	0.01
51 Ophiuchi	4.8	4.16	5.2	23 54.1	19 56.3	−11 10.1	−0.8420	0.5863	0.01
63 Ophiuchi	6.1	4.33	3.2	24 52.4	27 5 14.9	− 2 13.5	+0.4235	0.5890	0.04
4 Sagittarii	4.8	4.32	2.4	23 48.6	7 11.8	− 0 21.2	−0.5774	0.5895	0.04
7 Sagittarii	5.5	+4.36	− 2.2	−24 17.0	8 23.8	+ 0 48.0	−0.0361	0.5897	+0.04
9 Sagittarii	6.0	4.36	2.0	24 21.8	8 47.9	+ 1 11.0	+0.0667	0.5898	0.05
1 Sagittarii	5.2	4.39	1.1	23 43.2	11 54.2	+ 4 10.1	−0.4193	0.5904	0.05
70 B. Sagittarii	6.4	4.48	− 0.4	24 57.2	15 44.6	+ 7 51.3	+1.0839	0.5909	0.06
24 Sagittarii	5.7	4.51	+ 1.2	24 5.7	20 37.1	−11 27.8	+0.5818	0.5912	0.06
117 B. Sagittarii	5.8	+4.51	+ 1.8	−23 34.6	22 26.5	− 9 42.7	+0.2115	0.5914	+0.06
26 Sagittarii	6.1	4.54	2.1	23 54.7	23 45.1	− 8 27.3	+0.6672	0.5914	0.09
28 Sagittarii	5.6	4.51	3.0	22 28.7	28 1 32.1	− 6 44.5	−0.6133	0.5914	0.09
30 Sagittarii	6.2	4.52	3.6	22 15.4	3 18.5	− 5 2.4	−0.6625	0.5914	0.10
ν^1 Sagittarii	5.0	4.56	3.8	22 50.8	4 36.5	− 3 47.4	+0.0658	0.5914	0.10
ν^2 Sagittarii	5.1	+4.56	+ 3.9	−22 46.5	4 58.7	− 3 26.2	+0.0317	0.5913	+0.10
154 B. Sagittarii	5.9	4.58	3.8	23 16.8	5 19.6	− 3 6.2	+0.5768	0.5913	0.10
168 B. Sagittarii	6.3	4.58	4.6	22 48.7	7 32.6	− 0 58.4	+0.3465	0.5912	0.11
o Sagittarii	3.9	4.57	5.1	21 51.8	8 45.4	+ 0 11.5	−0.4711	0.5911	0.11
191 B. Sagittarii	6.5	4.63	5.2	23 19.2	10 20.2	+ 1 42.6	+1.1788	0.5910	0.11
π Sagittarii	3.0	+4.56	+ 5.9	−21 9.3	10 46.2	+ 2 7.6	−0.9451	0.5909	+0.11
199 B. Sagittarii	6.4	4.59	6.0	21 47.7	11 49.5	+ 3 8.3	−0.1737	0.5908	0.12
222 B. Sagittarii	5.5	4.64	6.7	22 33.4	15 2.4	+ 6 13.7	+0.9951	0.5904	0.13
50 Sagittarii	5.5	4.64	7.5	21 56.4	17 17.6	+ 8 23.5	+0.6776	0.5901	0.13
253 B. Sagittarii	6.1	4.64	8.1	21 29.0	19 6.9	+10 8.4	+0.4726	0.5897	0.14
f Sagittarii	5.1	+4.63	+10.1	−19 57.5	29 1 16.6	− 7 56.3	−0.1375	0.5885	+0.15
57 Sagittarii	6.0	4.63	10.9	19 15.2	3 36.4	− 5 42.0	−0.4714	0.5879	0.16
π Capricorni	5.2	4.68	14.7	18 28.8	17 43.1	+ 7 51.8	+1.2407	0.5839	0.19
31 B. Capricorni	6.4	4.62	15.3	16 0.8	18 19.0	+ 8 26.4	−1.0832	0.5837	0.19
ρ Capricorni	5.0	4.67	14.9	18 5.1	18 20.8	+ 8 28.2	+0.9696	0.5837	0.19
47 B. Capricorni	6.2	+4.65	+15.8	−16 48.4	21 4.0	+11 5.1	+0.2359	0.5828	+0.19
τ Capricorni	5.2	4.61	16.4	15 14.5	22 36.3	−11 26.2	−1.0028	0.5823	0.19
61 B. Capricorni	5.9	4.64	16.4	16 24.9	23 6.8	−10 56.9	+0.2558	0.5822	0.20
95 B. Capricorni	5.9	4.63	18.3	14 48.0	30 6 33.4	− 3 47.3	+0.2056	0.5796	0.21
53 B. Aquarii	6.5	4.61	20.0	13 32.5	13 42.3	+ 3 5.5	+0.5352	0.5771	0.22
18 Aquarii	5.5	+4.61	+20.7	−13 13.8	17 6.6	+ 6 22.1	+1.0009	0.5760	+0.22
72 B. Aquarii	6.5	4.58	21.2	11 55.3	18 48.4	+ 8 0.1	+0.1108	0.5754	0.23
137 B. Capricorni	6.2	4.56	22.1	10 56.7	23 31.0	−11 27.8	+0.2565	0.5739	0.23
c^1 Capricorni	5.3	4.54	22.6	9 27.5	31 1 51.2	− 9 12.8	−0.6410	0.5732	0.23
c^2 Capricorni	6.3	4.54	22.7	9 39.2	2 23.1	− 8 42.0	−0.3223	0.5730	0.24
30 Aquarii	5.6	+4.50	+24.0	− 6 55.0	9 35.2	− 1 45.8	−1.2401	0.5708	+0.24
44 Aquarii	5.7	4.48	24.9	5 47.7	15 28.8	+ 3 54.7	−0.8649	0.5691	0.25
51 Aquarii	5.8	+4.47	+25.3	− 5 15.0	18 28.4	+ 6 47.9	−0.6400	0.5683	+0.25

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κ Aquarii	5.2	+4.45	+25.9	− 4 39.0	1 0 19.7	−11 33.4	+0.2678	0.5669	+0.25
207 B. Aquarii	6.3	4.45	26.1	3 58.7	1 38.3	−10 17.7	−0.0506	0.5667	0.25
6 G. Piscium	6.2	4.42	26.8	2 50.0	9 10.4	− 3 1.9	+0.7767	0.5653	0.25
22 B. Piscium	6.4	4.38	27.5	− 0 9.4	20 7.8	+ 7 32.1	+1.0047	0.5637	0.25
κ *Piscium*	4.9	+4.37	+27.4	+ 0 48.5	21 36.6	+ 8 57.6	+0.4423	0.5636	+0

EMENTS FOR THE PREDICTION OF OCCULTATIONS.

SEPTEMBER.

THE STAR'S					AT CONJUNCTION IN R. A.						
ne.	Mag.	Red'ns from 1917.0. Δα	Δδ	Apparent Declination.	Greenwich Mean Time.	Hour Angle, H	Y	x'	y'	Limiting Parallels. N.	S.
		s	″	° ′	d h m	h m				°	°
ium	6.4	+4.37	+27.5	+ 0 40.5	1 21 44.8	+ 9 5.6	+0.6098	0.5636	+0.2590	+81	− 8
ium	5.7	4.35	27.7	1 39.0	2 1 43.7	−11 3.9	+0.6840	0.5632	0.2580	+88	− 4
ium	5.4	4.34	27.6	3 2.0	6 4.8	− 6 52.1	+0.4444	0.5630	0.2563	+67	−17
ium	6.2	4.30	27.1	7 47.2	19 12.4	+ 5 47.5	−0.9197	0.5629	0.2482	−10	−82
ium	5.4	4.30	27.1	7 44.2	20 57.5	+ 7 28.8	−0.4374	0.5630	0.2467	+17	−65
ium	6.5	+4.27	+26.6	+ 8 54.6	3 5 54.1	− 7 53.7	+0.5723	0.5636	+0.2381	+78	− 8
ium	6.3	4.26	25.4	12 31.1	16 51.0	+ 2 39.7	−0.4793	0.5647	0.2250	+15	−65
ium	3.7	4.24	24.0	14 55.5	4 3 33.2	−11 1.2	−0.5641	0.5661	0.2093	+10	−68
ium	6.2	4.22	24.0	14 14.7	5 23.8	− 9 14.6	+0.5030	0.5664	0.2064	+73	− 8
ium	6.1	4.24	23.4	15 59.5	7 3.2	− 7 38.8	−0.9144	0.5666	0.2037	−11	−74
tis	6.4	+4.24	+22.8	+17 0.2	10 0.0	− 4 48.5	−1.3429	0.5671	+0.1988	−59	−68
tis	5.8	4.23	22.8	16 33.0	10 41.0	− 4 8.8	−0.7493	0.5671	0.1976	− 1	−74
tis	5.1	4.22	22.2	17 25.1	14 35.2	− 0 23.2	−0.8715	0.5677	0.1908	− 8	−73
tis	6.4	4.21	21.7	17 51.7	17 17.4	+ 2 13.1	−0.8111	0.5681	0.1858	− 5	−72
tis	6.5	4.20	21.5	17 38.4	19 0.9	+ 3 52.8	−0.2707	0.5684	0.1826	+26	−47
tis	6.4	+4.19	+21.6	+16 50.5	19 42.2	+ 4 32.6	+0.6648	0.5685	+0.1813	+89	+ 3
tis	6.2	4.18	19.7	19 29.6	5 4 40.9	−10 48.3	−0.4822	0.5697	0.1637	+14	−58
tis	5.7	4.15	18.9	19 39.8	9 37.8	− 6 2.3	+0.1271	0.5703	0.1534	+48	−22
tis	5.8	4.13	17.7	20 20.5	16 13.8	+ 0 19.2	+0.3986	0.5709	0.1391	+66	− 7
tis (*mean*)	4.6	4.13	17.4	21 0.8	16 42.3	+ 0 46.6	−0.2270	0.5710	0.1381	+28	−40
tis	5.0	+4.08	+16.3	+20 44.5	23 17.7	+ 7 7.4	+0.9165	0.5714	+0.1233	+90	+25
tis	5.2	4.06	15.9	20 51.2	6 1 56.7	+ 9 40.5	+1.1224	0.5716	0.1173	+90	+41
tis	6.1	4.08	14.8	22 31.4	4 57.0	−11 25.8	−0.2656	0.5716	0.1103	+26	−39
ri	5.4	4.06	13.0	24 2.0	11 47.2	− 4 50.8	−1.1406	0.5716	0.0941	−33	−66
ri	3.8	4.05	13.1	23 51.4	11 49.1	− 4 49.0	−0.9541	0.5716	0.0941	−17	−66
ri	4.1	+4.06	+12.9	+24 6.8	12 12.8	− 4 26.2	−1.1843	0.5716	+0.0931	−38	−66
ri	4.3	4.04	13.0	23 41.7	12 25.7	− 4 13.8	−0.7279	0.5715	0.0926	− 1	−66
ri	3.0	4.04	12.9	23 51.2	12 54.7	− 3 45.8	−0.8492	0.5715	0.0915	− 9	−66
ri	5.5	4.02	13.1	23 10.2	13 16.9	− 3 24.4	−0.1039	0.5715	0.0906	+35	−28
ri	3.7	4.04	12.8	23 48.2	13 36.9	− 3 5.2	−0.7349	0.5715	0.0898	− 2	−66
ri	5.2	+4.04	+12.8	+23 53.3	13 37.5	− 3 4.6	−0.8212	0.5715	+0.0898	− 7	−66
ri	5.9	3.99	13.3	21 59.8	13 57.4	− 2 45.4	+1.1828	0.5715	0.0890	+90	+49
ri	5.8	3.97	12.7	22 14.6	16 51.9	+ 0 2.7	+1.1754	0.5714	0.0820	+90	+49
ri	6.0	3.99	12.5	22 56.3	16 56.5	+ 0 7.1	+0.4540	0.5713	0.0818	+71	+ 2
ri	6.5	3.97	12.1	22 58.3	18 34.2	+ 1 41.2	+0.5508	0.5712	0.0778	+79	+ 8
ri	5.6	+3.98	+11.6	+23 52.9	19 59.4	+ 3 3.2	−0.2947	0.5711	+0.0744	+24	−38
ri	6.1	3.91	9.9	24 6.7	7 4 14.4	+11 0.0	−0.0061	0.5701	0.0543	+40	−20
ri	6.0	3.84	9.1	23 10.5	9 31.2	− 7 54.8	+1.2372	0.5692	0.0413	+82	+60
ri	6.2	3.83	8.4	23 56.1	12 21.8	− 5 10.5	+0.5419	0.5687	0.0344	+79	+11
ri	6.2	3.80	8.3	23 28.7	13 25.2	− 4 9.4	+1.0604	0.5684	0.0318	+90	+44
ri	6.3	+3.79	+ 7.1	+24 27.8	17 53.2	+ 0 8.8	+0.1360	0.5673	+0.0209	+49	− 9
ri	6.0	3.76	7.2	23 49.3	18 33.3	+ 0 47.5	+0.8308	0.5672	0.0193	+90	+29
ri	5.6	3.79	6.7	24 55.5	18 41.1	+ 0 55.1	−0.3399	0.5672	0.0190	+21	−35
ri	5.5	3.72	6.2	24 9.5	22 56.7	+ 5 1.4	+0.5359	0.5660	+0.0087	+78	+13
ri	5.4	3.65	4.1	25 5.1	8 8 1.6	−10 13.4	−0.4751	0.5630	−0.0130	+13	−44
ri	5.1	+3.59	+ 4.0	+23 59.2	10 43.2	− 7 37.5	+0.6600	0.5620	−0.0194	+90	+19
ri	5.0	3.54	2.6	24 32.5	16 37.2	− 1 56.1	−0.0903	0.5597	0.0330	+35	−22
ri	5.8	3.49	2.1	24 14.4	20 6.1	+ 1 25.4	+0.1068	0.5582	0.0409	+47	−13
ginorum	4.3	3.43	1.8	23 16.2	23 17.3	+ 4 29.9	+1.0128	0.5569	0.0481	+90	+39
ginorum	5.6	3.40	1.4	23 7.7	9 1 46.7	+ 6 54.1	+1.0395	0.5557	0.0536	+90	+40
ginorum	5.9	+3.42	+ 0.8	+24 26.4	2 33.5	+ 7 39.3	−0.4214	0.5553	−0.0553	+17	− 4

ELEMENTS FOR THE PREDICTION OF OCCULTATION

SEPTEMBER.

The Star's						At Conjunction in R. A.				
	Name.	Mag.	Red'ns from 1917.0. Δα	Δδ	Apparent Declination.	Greenwich Mean Time.	Hour Angle, H	Y	x'	y
			s	"	° ′	d h m	h m			
6	Geminorum	6.3	+3.38	+ 1.3	+22 55.7	9 2 55.9	+ 8 1.0	+1.1932	0.5552	−0.0
8	Geminorum	6.1	3.39	0.6	23 59.9	4 41.8	+ 9 43.2	−0.0666	0.5543	0.0
9	Geminorum	6.2	3.38	0.6	23 46.2	4 59.7	+10 0.4	+0.1621	0.5542	0.0
36 B.	Geminorum	6.0	3.33	+ 0.1	23 22.5	8 50.7	−10 16.5	+0.3424	0.5523	0.0
d	Geminorum	5.2	3.16	− 1.5	21 51.6	20 42.3	+ 1 11.0	+1.0311	0.5462	0.0
87 B.	Geminorum	5.8	+3.20	− 2.2	+23 42.0	20 52.9	+ 1 21.2	−0.9931	0.5461	−0.0
44	Geminorum	5.9	3.11	2.8	22 45.7	10 3 3.9	+ 7 19.8	−0.5857	0.5428	0.1
120 B.	Geminorum	6.5	3.05	3.1	21 23.5	5 20.7	+ 9 32.2	+0.6679	0.5416	0.1
δ	Geminorum	3.5	3.02	3.8	22 8.1	10 2.4	− 9 55.4	−0.6817	0.5390	0.1
56	Geminorum	5.2	2.98	3.4	20 36.0	10 55.9	− 9 3.6	+0.8949	0.5386	0.1
149 B.	Geminorum	6.4	+2.96	− 4.1	+21 42.1	13 15.1	− 6 48.9	−0.5956	0.5373	−0.1
61	Geminorum	5.8	2.95	3.7	20 25.4	13 18.3	− 6 45.8	+0.8004	0.5373	0.1
63	Geminorum	5.3	2.97	4.2	21 36.9	13 40.2	− 6 24.7	−0.5529	0.5371	0.1
79	Geminorum	6.3	2.86	5.1	20 30.9	22 4.2	+ 1 43.3	−0.4520	0.5325	0.1
209 B.	Geminorum	6.2	2.81	5.2	19 32.2	11 1 23.9	+ 4 56.6	+0.1537	0.5307	0.1
85	Geminorum	5.2	+2.80	− 5.7	+20 6.1	3 12.6	+ 6 41.9	−0.7328	0.5298	−0.1
217 B.	Geminorum	6.3	2.78	6.0	20 2.6	5 44.3	+ 9 8.9	−1.0440	0.5284	0.1
10 H.	Cancri	6.1	2.74	6.0	19 4.5	7 42.7	+11 3.7	−0.2776	0.5274	0.1
ζ	Cancri (*mean*)	4.7	2.68	6.2	17 53.8	11 26.2	− 9 19.7	+0.4412	0.5254	0.1
d^1	Cancri	5.9	2.64	7.0	18 35.9	17 2.0	− 3 54.1	−1.2448	0.5226	0.1
d^2	Cancri	6.2	+2.60	− 7.0	+17 19.1	18 18.5	− 2 40.0	−0.0440	0.5220	−0.1
90 B.	Cancri	6.3	2.54	7.1	15 36.0	23 33.9	+ 2 26.0	+0.9564	0.5194	0.1
54	Cancri	6.3	2.47	7.9	15 39.4	12 7 14.8	+ 9 53.3	−0.4871	0.5160	0.1
o^1	Cancri	5.1	2.45	8.3	15 38.4	10 28.8	−10 58.5	−1.0687	0.5146	0.1
222 B.	Cancri	6.3	2.32	8.6	11 50.8	21 23.3	− 0 22.9	+1.0330	0.5102	0.1
ξ	Leonis	5.1	+2.26	− 9.4	+11 39.9	13 4 55.2	+ 6 56.1	−0.2848	0.5076	−0.2
o	Leonis	3.8	2.22	9.6	10 16.1	9 53.9	+11 46.3	+0.2382	0.5060	0.2
83 B.	Leonis	5.9	2.17	10.1	9 19.5	18 12.4	− 4 9.1	−0.4719	0.5037	0.2
89 B.	Leonis	6.2	2.16	10.1	8 42.5	19 8.0	− 3 15.1	+0.0145	0.5036	0.2
π	Leonis	4.9	2.15	10.2	+ 8 26.4	20 16.7	− 2 8.3	+0.0656	0.5033	0.2
					NEW MOON.					
75	Virginis	5.6	+2.20	−14.6	−14 56.4	18 15 39.4	− 9 59.2	+0.6128	0.5222	−0.1
83	Virginis	5.6	2.25	14.6	15 46.0	21 30.2	− 4 19.1	+0.4162	0.5254	0.1
85	Virginis	6.1	2.25	14.5	15 21.3	22 3.1	− 3 47.2	−0.1341	0.5257	0.1
214 G.	Virginis	6.5	+2.34	−14.2	−15 56.6	19 7 45.2	+ 5 37.1	−1.2165	0.5312	−0.1
43 H.	Virginis	5.5	2.41	14.4	17 49.1	12 41.0	+10 23.5	−0.0052	0.5341	0.1
231 G.	Virginis	6.4	2.42	14.4	18 12.2	13 28.8	+11 9.8	+0.2835	0.5346	0.1
236 G.	Virginis	5.7	2.42	14.5	18 20.1	14 14.4	+11 53.9	+0.3027	0.5350	0.1
9 G.	Librae	6.5	2.53	14.4	20 4.8	21 57.1	− 4 38.2	+0.9840	0.5397	0.1
17 G.	Librae	6.4	+2.60	−14.3	−20 49.7	20 3 16.3	+ 0 30.5	+1.0137	0.5430	−0.1
18 G.	Librae	6.1	2.60	14.3	20 58.9	3 45.4	+ 0 58.7	+1.1099	0.5433	0.1
43 B.	Librae	5.7	2.72	15.2	21 2.8	8 27.4	+ 5 31.3	+0.5344	0.5462	0.1
47 G.	Librae	6.1	2.73	13.8	21 42.8	12 37.1	+ 9 32.7	+0.7141	0.5488	0.1
64 G.	Librae	5.8	2.79	13.4	22 5.8	17 7.9	−10 5.7	+0.5779	0.5515	0.1
169 B.	Librae	5.0	+2.94	−12.6	−22 52.2	21 2 42.2	− 0 51.2	+0.3761	0.5572	−0.0
177 B.	Librae	6.2	2.95	12.5	22 53.0	3 23.5	− 0 11.2	+0.3225	0.5576	0.0
42	Librae	5.0	2.96	12.6	23 33.2	3 47.4	+ 0 11.9	+1.0005	0.5578	0.0
31 B.	Scorpii	5.4	3.06	12.1	24 17.4	9 45.4	+ 5 57.3	+1.2520	0.5612	0.0
32 B.	Scorpii	5.3	3.05	11.9	23 44.1	9 46.8	+ 5 58.6	+0.6577	0.5612	0.0
δ	*Scorpii*	2.5	+3.07	−11.1	−22 23.4	12 35.1	+ 8 40.9	−1.0003	0.5627	−0.

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

SEPTEMBER.

THE STAR'S					AT CONJUNCTION IN R. A.						Limiting Parallels.	
Name.	Mag.	Red'ns from 1917.0. Δα	Δδ	Apparent Declination.	Greenwich Mean Time.	Hour Angle, H	Y	x′	y′		N.	S.
		s	″	° ′	d h m	h m					°	°
B. Scorpii	6.4	+3.13	−11.6	−24 30.1	21 14 6.3	+10 8.8	+1.1347	0.5635	−0.0734		+66	+33
B. Scorpii	5.7	3.13	11.1	23 23.0	15 4.2	+11 4.7	−0.1251	0.5640	0.0713		+14	−48
B. Scorpii	6.2	3.16	11.3	24 14.6	15 49.0	+11 47.9	+0.7376	0.5644	0.0696		+66	+ 2
B. Scorpii	5.8	3.15	11.0	23 28.1	16 12.1	−11 49.8	−0.1150	0.5646	0.0687		+15	−47
B. Scorpii	6.3	3.19	10.9	24 12.8	18 21.1	− 9 45.5	+0.5354	0.5657	0.0639		+52	−10
Scorpii	4.9	+3.23	−10.4	−23 58.4	21 18.0	− 6 55.0	+0.1011	0.5672	−0.0570		+25	−35
Ophiuchi	4.7	3.25	9.8	23 15.5	23 25.2	− 4 52.5	−0.7712	0.5682	0.0521		−22	−90
Scorpii	4.8	3.32	10.0	24 56.2	22 1 21.5	− 3 0.4	+0.9085	0.5691	0.0475		+65	+14
B. Scorpii	6.1	3.38	9.0	24 18.6	6 11.1	+ 1 38.6	+0.0441	0.5712	0.0360		+20	−38
B. Ophiuchi	6.3	3.51	7.8	24 58.2	13 51.4	+ 9 1.9	+0.5331	0.5742	0.0172		+48	−10
Ophiuchi	5.8	+3.51	− 7.8	−24 51.9	13 56.3	+ 9 6.6	+0.4225	0.5742	−0.0170		+41	−16
B. Ophiuchi	6.3	3.60	6.9	25 9.3	18 57.0	−10 4.0	+0.6719	0.5759	−0.0045		+59	− 2
Ophiuchi	5.1	3.61	6.1	24 12.0	21 21.4	− 7 45.0	−0.3342	0.5767	+0.0016		− 3	−62
Ophiuchi	3.4	3.65	6.0	24 55.2	22 59.5	− 6 10.6	+0.4260	0.5771	0.0058		+40	−16
B. Ophiuchi	6.3	3.65	5.4	24 10.2	23 0 16.7	− 4 56.4	−0.3485	0.5774	0.0090		− 3	−63
Ophiuchi	4.3	+3.66	− 5.4	−24 6.1	0 48.1	− 4 26.2	−0.4149	0.5776	+0.0104		− 7	−68
Ophiuchi	4.8	3.68	4.9	23 54.0	2 52.8	− 2 26.1	−0.5973	0.5781	0.0157		−16	−85
Ophiuchi	6.1	3.86	3.1	24 52.4	12 29.0	+ 6 48.2	+0.6830	0.5800	0.0402		+62	− 1
Sagittarii	4.8	3.85	2.3	23 48.6	14 29.8	+ 8 44.4	−0.3339	0.5803	0.0454		+ 1	−62
Sagittarii	5.5	3.89	2.2	24 17.0	15 44.2	+ 9 56.0	+0.2150	0.5804	0.0486		+31	−28
Sagittarii	6.0	+3.89	− 2.0	−24 21.8	16 9.2	+10 20.1	+0.3192	0.5805	+0.0497		+37	−22
Sagittarii	5.2	3.92	− 1.1	23 43.2	19 21.7	−10 34.8	−0.1760	0.5808	0.0578		+10	−51
Sagittarii	5.7	4.06	+ 0.8	24 5.7	24 4 22.8	− 1 54.3	+0.8352	0.5811	0.0807		+66	+ 8
B. Sagittarii	5.8	4.07	1.5	23 34.6	6 16.2	− 0 5.3	+0.4576	0.5811	0.0854		+49	−15
Sagittarii	6.1	4.10	1.7	23 54.7	7 37.6	+ 1 13.0	+0.9196	0.5811	0.0888		+66	+14
Sagittarii	5.6	+4.08	+ 2.6	−22 28.8	9 28.4	+ 2 59.6	−0.3829	0.5810	+0.0934		+ 3	−65
Sagittarii	6.2	4.09	3.1	22 15.4	11 18.6	+ 4 45.6	−0.4346	0.5809	0.0980		+ 1	−69
Sagittarii	5.8	4.08	3.7	21 27.7	12 36.5	+ 6 0.5	−1.1204	0.5808	0.1011		−42	−90
Sagittarii	5.0	4.13	3.2	22 50.8	12 39.4	+ 6 3.4	+0.3044	0.5809	0.1012		+41	−23
Sagittarii	5.1	4.14	3.4	22 46.5	13 2.5	+ 6 25.4	+0.2694	0.5808	0.1022		+39	−25
B. Sagittarii	5.9	+4.15	+ 3.3	−23 16.8	13 24.1	+ 6 46.2	+0.8231	0.5808	+0.1030		+67	+ 7
Sagittarii	3.7	4.10	4.2	21 12.9	14 7.9	+ 7 28.4	−1.2142	0.5808	0.1048		−52	−89
B. Sagittarii	6.3	4.17	4.0	22 48.7	15 42.0	+ 8 58.9	+0.5869	0.5806	0.1086		+59	− 7
Sagittarii	3.9	4.16	4.6	21 51.8	16 57.4	+10 11.4	−0.2452	0.5805	0.1117		+12	−55
Sagittarii	3.0	4.15	5.4	21 9.3	19 2.7	−11 48.1	−0.7291	0.5803	0.1167		−14	−90
B. Sagittarii	6.4	+4.19	+ 5.4	−21 47.7	20 8.3	−10 45.0	+0.0538	0.5802	+0.1193		+28	−37
B. Sagittarii	5.5	4.25	6.0	22 33.4	23 28.3	− 7 32.5	+1.2384	0.5797	0.1271		+67	+14
Sagittarii	5.5	4.26	6.8	21 56.4	25 1 48.4	− 5 17.8	+0.9130	0.5794	0.1324		+68	+13
B. Sagittarii	6.1	4.27	7.4	21 29.0	3 41.7	− 3 28.8	+0.7026	0.5791	0.1368		+68	− 1
Sagittarii	5.1	4.28	9.4	19 57.5	10 4.9	+ 2 39.9	+0.0743	0.5779	0.1510		+32	−36
Sagittarii	6.0	+4.29	+10.2	−19 15.2	12 29.7	+ 4 59.3	−0.2681	0.5774	+0.1562		+15	−56
B. Capricorni	6.4	4.35	14.7	16 0.8	26 3 43.2	+ 4 21.4	−0.9121	0.5739	0.1865		−18	−90
Capricorni	5.0	4.40	14.1	18 5.1	3 45.2	+ 4 19.5	+1.1719	0.5739	0.1865		+72	+32
B. Capricorni	6.2	4.39	15.1	16 48.5	6 33.7	+ 1 37.2	+0.4221	0.5732	0.1916		+57	−18
Capricorni	5.2	4.36	15.9	15 14.5	8 9.1	− 0 5.4	−0.8381	0.5729	0.1945		−12	−90
B. Capricorni	5.9	+4.39	+15.8	−16 21.9	8 40.5	+ 0 24.8	+0.4383	0.5727	+0.1954		+58	−17
B. Capricorni	5.9	4.42	17.8	14 48.0	16 21.2	+ 7 48.7	+0.3724	0.5708	0.2081		+56	−20
B. Aquarii	6.5	4.44	19.5	13 32.5	23 42.7	− 9 6.0	+0.6910	0.5691	0.2190		+76	− 3
Aquarii	5.5	4.46	20.3	13 13.8	27 3 12.7	− 5 43.7	+1.1545	0.5683	0.2237		+77	+28
B. Aquarii	6.5	4.43	21.0	11 55.4	4 57.2	− 4 3.0	−0.2492	0.5680	0.2260		+50	−25
t. Capricorni	6.2	+4.44	+22.0	−10 56.7	9 47.0	+ 0 36.3	+0.3853	0.5670	+0.2318		+59	−20

ELEMENTS FOR THE PREDICTION OF OCCULTATION

SEPTEMBER.

	The Star's Name.	Mag.	Red'ns from 1917.0. Δα	Red'ns from 1917.0. Δδ	Apparent Declination.	At Conjunction in R. A. Greenwich Mean Time.	Hour Angle, H	Y	x'	y'
			s	″	° ′	d h m	h m			
c^1	Capricorni	5.3	+4.43	+22.8	− 9 27.5	27 12 10.6	+ 2 54.7	−0.5281	0.5665	+0.23
c^2	Capricorni	6.3	4.43	22.8	9 39.2	12 43.2	+ 3 26.2	−0.2071	0.5664	0.23
30	Aquarii	5.6	4.43	24.5	6 55.0	20 4.7	+10 31.8	−1.1520	0.5652	0.24
44	Aquarii	5.7	4.44	25.6	5 47.7	28 2 4.9	− 7 40.9	−0.7876	0.5644	0.24
51	Aquarii	5.8	4.45	26.0	5 15.0	5 7.6	− 4 44.7	−0.5685	0.5641	0.24
κ	Aquarii	5.2	+4.46	+26.8	− 4 38.9	11 4.0	+ 0 59.1	+0.3304	0.5636	+0.25
207 B.	Aquarii	6.3	4.47	27.1	3 58.7	12 23.6	+ 2 15.8	+0.0060	0.5635	0.25
6 G.	Piscium	6.2	4.49	27.9	2 49.9	20 0.5	+ 9 36.5	+0.8163	0.5632	0.25
22 B.	Piscium	6.4	4.51	29.1	− 0 9.4	29 7 2.0	− 3 45.4	+1.0117	0.5634	0.25
κ	Piscium	4.9	4.51	29.2	+ 0 48.6	8 31.0	− 2 19.7	+0.4433	0.5635	0.25
9	Piscium	6.4	+4.51	+29.2	+ 0 40.5	8 39.3	− 2 11.7	+0.6109	0.5636	+0.25
16	Piscium	5.7	4.51	29.5	1 39.0	12 38.6	+ 1 39.2	+0.6732	0.5638	0.25
19	Piscium	5.4	4.52	29.7	3 2.1	16 59.4	+ 5 50.8	+0.4203	0.5643	0.25
36	Piscium	6.2	4.56	29.9	7 47.3	30 6 3.4	− 5 33.4	−0.9791	0.5662	0.24
d	Piscium	5.4	4.57	29.8	7 44.3	7 47.6	− 3 52.9	−0.5025	0.5665	0.24
136 B.	Piscium	6.5	+4.60	+29.4	+ 8 54.6	16 38.5	+ 4 38.8	+0.4795	0.5683	+0.23

OCTOBER.

75	Piscium	6.3	+4.66	+28.7	+12 31.2	1 3 25.8	− 8 57.3	−0.5943	0.5708	+0.22
η	Piscium	3.7	+4.71	+27.4	+14 55.6	13 56.1	+ 1 9.9	−0.7028	0.5735	+0.20
101	Piscium	6.2	4.70	27.3	14 14.7	15 44.4	+ 2 54.2	+0.3511	0.5739	0.20
105	Piscium	6.1	4.73	26.9	15 59.6	17 21.8	+ 4 27.9	−1.0577	0.5743	0.20
4	Arietis	5.8	4.74	26.3	16 33.0	20 54.8	+ 7 53.0	−0.9016	0.5752	0.19
ι	Arietis	5.1	4.76	25.7	17 25.2	2 0 43.6	+11 33.3	−1.0304	0.5761	0.19
35 B.	Arietis	6.4	+4.76	+25.2	+17 51.7	3 21.9	− 9 54.2	−0.9757	0.5767	+0.18
47 B.	Arietis	6.5	4.76	25.0	17 38.5	5 2.9	− 8 17.1	−0.4442	0.5771	0.18
20 H^1.	Arietis	6.4	4.75	24.9	16 50.5	5 43.2	− 7 38.3	+0.4802	0.5772	0.18
26	Arietis	6.2	4.80	23.1	19 29.6	14 28.2	+ 0 47.0	−0.6711	0.5790	0.16
μ	Arietis	5.7	4.79	22.2	19 39.9	19 17.2	+ 5 25.1	−0.0774	0.5798	0.15
47	Arietis	5.8	+4.81	+20.8	+20 20.6	3 1 42.4	+11 35.8	+0.1800	0.5807	+0.13
ε	Arietis (*mean*)	4.6	4.81	20.6	21 0.9	2 10.1	−11 57.5	−0.4385	0.5807	0.13
ζ	Arietis	5.0	4.78	19.3	20 44.6	8 34.5	− 5 47.8	+0.6806	0.5813	0.12
τ	Arietis	5.2	4.78	18.7	20 51.2	11 9.0	− 3 19.2	+0.8800	0.5814	0.11
66	Arietis	6.1	4.82	17.6	22 31.4	14 4.3	− 0 30.6	−0.4939	0.5814	0.11
17	Tauri	3.8	+4.83	+15.8	+23 51.5	20 44.6	+ 5 54.5	−1.1818	0.5814	+0.09
23	Tauri	4.3	4.82	15.6	23 41.7	21 20.2	+ 6 28.7	−0.9594	0.5813	0.09
η	Tauri	3.0	4.82	15.5	23 51.2	21 48.4	+ 6 55.9	−1.0796	0.5813	0.09
104 B.	Tauri	5.5	4.80	15.6	23 10.3	22 10.0	+ 7 16.6	−0.3447	0.5813	0.09
27	Tauri	3.7	4.82	15.3	23 48.3	22 29.4	+ 7 35.3	−0.9676	0.5813	0.09
28	Tauri	5.2	+4.82	+15.3	+23 53.3	22 30.0	+ 7 35.9	−1.0528	0.5813	+0.09
133 B.	Tauri	5.9	4.76	15.8	21 59.8	22 49.3	+ 7 54.4	+0.9241	0.5813	0.08
32	Tauri	5.8	4.76	15.0	22 14.6	4 1 38.9	+10 37.6	+0.9134	0.5810	0.08
33	Tauri	6.0	4.78	14.8	22 56.4	1 43.4	+10 41.8	+0.2015	0.5810	0.08
161 B.	Tauri	6.5	4.77	14.4	22 58.3	3 18.4	−11 46.8	+0.2953	0.5808	0.07
36	Tauri	5.6	+4.79	+13.8	+23 52.9	4 41.1	−10 27.2	−0.5405	0.5807	+0.07
62	Tauri	6.1	4.74	11.8	24 6.7	12 42.5	− 2 44.1	−0.2638	0.5794	0.05
72	Tauri	5.4	4.69	11.9	22 48.8	14 4.7	− 1 25.0	+1.1591	0.5790	0.05
284 B.	*Tauri*	6.0	4.68	10.8	23 10.5	17 50.7	+ 2 12.4	+0.9585	0.5782	0.04
95	*Tauri*	6.2	4.68	9.9	23 56.1	20 36.9	+ 4 52.4	+0.2701	0.5774	0.0
300 B.	*Tauri*	6.2	+4.65	+ 9.8	+23 28.8	21 38.7	+ 5 51.9	+0.7810	0.5771	+0

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

OCTOBER.

The Star's					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1917.0 Δα	Red'ns from 1917.0 Δδ	Apparent Declination.	Greenwich Mean Time.	Hour Angle, H	Y	x'	y'	N.	S.
		s	″	° ′	d h m	h m				°	°
Tauri	6.3	+4.65	+ 8.3	+24 27.8	5 1 59.8	+10 3.2	−0.1345	0.5758	+0.0206	+32	−24
Tauri	6.0	4.62	8.4	23 49.3	2 38.9	+10 40.9	+0.5508	0.5756	0.0190	+79	+13
Tauri	5.6	4.66	8.0	24 55.5	2 46.4	+10 48.1	−0.6049	0.5755	0.0187	+ 6	−54
Tauri	5.5	4.59	7.2	24 9.5	6 55.7	− 9 11.9	+0.2570	0.5740	+0.0083	+56	− 2
Tauri	5.4	4.54	4.6	25 5.1	15 47.8	− 0 39.4	−0.7465	0.5703	−0.0135	− 3	−65
Tauri	5.1	+4.48	+ 4.4	+23 59.2	18 25.7	+ 1 52.6	+0.3738	0.5691	−0.0198	+64	+ 3
Tauri	6.0	4.41	3.8	23 10.0	21 47.5	+ 5 7.1	+1.1655	0.5674	0.0279	+90	+53
Tauri	5.0	4.43	2.8	24 32.5	6 0 12.2	+ 7 26.5	−0.3701	0.5663	0.0335	+19	−39
Tauri	5.8	4.38	2.0	24 14.4	3 36.8	+10 43.7	−0.1763	0.5645	0.0415	+30	−28
Geminorum	4.3	4.31	1.6	23 16.2	6 44.2	−10 15.5	+0.7190	0.5628	0.0486	+90	+19
Geminorum	5.6	+4.28	+ 1.1	+23 7.7	9 10.8	− 7 54.2	+0.7451	0.5614	−0.0541	+90	+21
Geminorum	5.9	4.32	0.4	24 26.4	9 56.7	− 7 9.9	−0.7005	0.5610	0.0558	0	−64
Geminorum	6.3	4.26	0.9	22 55.7	10 18.7	− 6 48.7	+0.8970	0.5608	0.0566	+90	+30
Gemin. (*var.*)	3.2	4.23	0.8	22 31.9	11 26.4	− 5 43.3	+1.2570	0.5601	0.0591	+79	+62
Geminorum	6.1	4.27	0.1	23 59.9	12 2.7	− 5 8.3	−0.3498	0.5597	0.0604	+20	−40
Geminorum	6.2	+4.26	+ 0.1	+23 46.2	12 20.3	− 4 51.4	−0.1236	0.5595	−0.0611	+33	−27
Geminorum	3.2	4.19	− 0.1	22 33.4	14 59.2	− 2 18.0	+1.0088	0.5580	0.0669	+90	+37
Geminorum	6.0	4.20	0.6	23 22.4	16 7.2	− 1 12.5	+0.0546	0.5574	0.0693	+43	−18
Geminorum	5.2	4.01	2.7	21 51.6	7 3 47.8	+10 4.0	+0.7376	0.5501	0.0935	+90	+16
Geminorum	5.8	4.07	3.4	23 42.0	3 58.3	+10 14.2	−1.2687	0.5500	0.0938	−53	−66
Geminorum	5.9	+3.96	− 4.3	+22 45.7	10 4.3	− 7 52.2	−0.8642	0.5462	−0.1055	−10	−67
Geminorum	6.5	3.89	4.6	21 23.5	12 19.4	− 5 41.7	+0.3798	0.5447	0.1098	+64	− 5
Geminorum	3.5	3.86	5.5	22 8.1	16 58.0	− 1 12.2	−0.9580	0.5418	0.1182	−16	−68
Geminorum	5.2	3.80	5.1	20 36.0	17 50.9	− 0 21.1	+0.6072	0.5412	0.1198	+84	+ 6
Geminorum	6.4	3.79	6.0	21 42.1	20 8.6	+ 1 52.2	−0.8714	0.5398	0.1238	−10	−69
Geminorum	5.8	+3.77	− 5.5	+20 25.4	20 11.9	+ 1 55.3	+0.5145	0.5397	−0.1239	+75	0
Geminorum	5.3	3.79	6.1	21 36.9	20 33.6	+ 2 16.3	−0.8289	0.5395	0.1245	− 7	−68
Geminorum	6.3	3.66	7.2	20 30.9	8 4 53.0	+10 19.7	−0.7250	0.5343	0.1383	0	−69
Geminorum	5.0	3.61	6.6	18 42.7	5 23.0	+10 48.7	+1.1771	0.5339	0.1391	+90	+43
Geminorum	6.2	3.59	7.4	19 32.2	8 11.2	−10 28.5	−0.1211	0.5322	0.1435	+33	−36
Geminorum	5.2	+3.58	− 7.9	+20 6.1	9 59.2	− 8 43.9	−1.0012	0.5311	−0.1462	−19	−70
Geminorum	6.3	3.55	8.3	20 2.5	12 29.8	− 6 17.9	−1.3090	0.5296	0.1500	−55	−69
Cancri	6.1	3.50	8.3	19 4.5	14 27.5	− 4 23.9	−0.5455	0.5284	0.1528	+10	−62
Cancri (*mean*)	4.7	3.44	8.6	17 53.8	18 9.6	− 0 48.7	+0.1724	0.5263	0.1581	+50	−22
Cancri	6.2	3.33	9.5	17 19.1	9 1 0.0	+ 5 49.1	−0.3041	0.5225	0.1672	+24	−49
Cancri	6.3	+3.24	− 9.6	+15 35.9	6 14.2	+10 53.9	+0.6975	0.5196	−0.1737	+90	+ 4
Cancri	6.3	3.15	10.6	15 39.4	13 53.9	− 5 40.2	−0.7314	0.5158	0.1825	0	−74
Cancri	5.1	3.12	11.0	15 38.3	17 7.4	− 2 32.4	−1.3069	0.5143	0.1860	−48	−74
Cancri	6.3	2.95	11.2	11 50.8	10 4 1.1	+ 8 2.5	+0.8034	0.5096	0.1966	+90	+ 7
Leonis	5.1	2.86	12.1	11 39.9	11 32.6	− 8 38.9	−0.4988	0.5069	0.2029	+14	−66
Leonis	5.2	+2.84	−11.6	+10 4.8	11 33.8	− 8 37.8	+1.2546	0.5069	−0.2029	+90	+41
Leonis	3.8	2.79	12.2	10 16.0	16 31.2	− 3 48.8	+0.0315	0.5054	0.2067	+42	−36
Leonis	5.9	2.71	12.7	9 19.4	11 0 49.5	+ 4 15.5	−0.6622	0.5031	0.2122	+ 5	−79
Leonis	6.2	2.70	12.6	8 42.4	1 45.1	+ 5 9.6	−0.1749	0.5029	0.2128	+31	−48
Leonis	4.9	2.68	12.6	8 26.4	2 53.8	+ 6 16.3	−0.1217	0.5027	0.2135	+34	−45
Leonis	6.3	+2.57	−13.4	+ 6 57.6	15 26.1	− 5 32.1	−1.1991	0.5005	−0.2198	−31	−83
Leonis	6.5	2.55	13.1	6 6.7	15 35.0	− 5 23.4	−0.2893	0.5005	0.2199	+25	−56
Leonis	6.3	2.41	13.2	1 27.7	12 7 39.1	+10 14.4	+1.2931	0.4995	0.2249	+90	+41
Leonis	6.1	2.40	13.3	1 10.6	9 34.6	−11 53.3	+1.1761	0.4995	0.2253	+90	+29
Leonis	*6.1*	*2.36*	*13.4*	0 26.6	13 58.3	− 7 36.8	+0.9969	0.4987	0.2260	+90	+15
Leonis	*5.3*	*+2.34*	*−13.7*	+ 0 22.7	19 35.8	− 2 8.6	−0.2052	0.5001	−0.2265	+29	−55

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS

OCTOBER.

Name.	Mag.	The Star's Red'ns from 1917.0. Δα	Δδ	Apparent Declination.	At Conjunction in R. A. Greenwich Mean Time.	Hour Angle, H	Y	x	y
		s	"	° ′	d h m	h m			
388 B. Leonis	6.3	+2.29	-13.7	- 1 14.8	13 3 25.2	+ 5 28.0	-0.1774	0.5011	-0.226
e Leonis	5.1	2.28	13.6	2 32.9	4 45.3	+ 6 45.9	+0.9614	0.5013	0.226
431 B. Leonis	6.2	2.27	13.8	1 58.8	9 12.5	+11 5.7	-0.6749	0.5021	0.225
				NEW MOON.					
47 G. Libræ	6.1	+2.53	-12.0	-21 42.8	17 18 8.8	- 7 8.2	+0.8902	0.5529	-0.124
64 G. Libræ	5.8	2.57	11.7	22 5.8	22 37.4	- 2 48.8	+0.7620	0.5555	0.116
169 B. Libræ	6.0	2.67	10.9	22 52.2	18 8 7.7	+ 6 21.6	+0.5760	0.5608	0.096
177 B. Libræ	6.2	2.68	10.8	22 53.0	8 48.7	+ 7 1.2	+0.5235	0.5612	0.095
42 Libræ	5.0	2.69	10.9	23 33.1	9 12.5	+ 7 24.2	+1.2015	0.5613	0.094
32 B. Scorpii	5.3	+2.75	-10.3	-23 44.1	15 10.0	-10 50.9	+0.8680	0.5643	-0.081
δ Scorpii	2.5	2.76	9.6	22 23.3	17 57.6	- 8 9.3	-0.7859	0.5656	0.075
57 B. Scorpii	5.7	2.81	9.5	23 23.0	20 26.2	- 5 46.0	+0.0926	0.5668	0.070
24 G. Scorpii	6.2	2.83	9.6	24 14.6	21 10.9	- 5 2.9	+0.9565	0.5671	0.068
27 G. Scorpii	5.8	2.82	9.4	23 28.0	21 33.9	- 4 40.8	+0.1043	0.5673	0.067
41 G. Scorpii	6.3	+2.86	- 9.3	-24 12.8	23 42.6	- 2 36.7	+0.7577	0.5682	-0.062
19 Scorpii	4.9	2.89	8.8	23 58.4	19 2 39.2	+ 0 13.5	+0.3269	0.5694	0.055
ρ Ophiuchi	4.7	2.90	8.4	23 15.5	4 46.2	+ 2 15.9	-0.5438	0.5702	0.050
22 Scorpii	4.8	2.95	8.5	24 56.1	6 42.5	+ 4 8.0	+1.1404	0.5710	0.046
VENUS	-3.7	...	...	24 3.0	7 57.1	+ 5 19.9	+0.1454	0.5227	0.033
126 B. Scorpii	6.1	+2.99	- 7.6	-24 18.6	11 32.3	+ 8 47.2	+0.2802	0.5726	-0.034
24 Ophiuchi	5.5	3.05	6.3	23 1.3	17 56.3	- 9 3.0	-1.2538	0.5745	0.019
88 B. Ophiuchi	6.3	3.10	6.6	24 58.1	19 13.8	- 7 48.3	+0.7788	0.5748	0.016
26 Ophiuchi	5.8	3.11	6.6	24 51.9	19 18.7	- 7 43.6	+0.6680	0.5748	0.015
137 B. Ophiuchi	6.3	3.18	5.8	25 9.3	20 0 20.8	- 2 52.8	+0.9234	0.5759	-0.003
39 Ophiuchi	5.1	+3.18	- 5.1	-24 11.9	2 46.1	- 0 32.9	-0.0845	0.5764	+0.002
θ Ophiuchi	3.4	3.22	5.0	24 55.2	4 25.0	+ 1 2.2	+0.6805	0.5767	0.006
191 B. Ophiuchi	6.3	3.22	4.5	24 10.2	5 42.7	+ 2 17.0	-0.0965	0.5768	0.009
b Ophiuchi	4.3	3.22	4.5	24 6.1	6 14.3	+ 2 47.4	-0.1628	0.5769	0.011
51 Ophiuchi	4.8	3.24	4.0	23 54.0	8 20.0	+ 4 48.6	-0.3445	0.5772	0.016
63 Ophiuchi	6.1	+3.39	- 2.5	-24 52.3	18 2.2	- 9 51.0	+0.9502	0.5778	+0.040
4 Sagittarii	4.8	3.39	1.8	23 48.6	20 4.5	- 7 53.5	-0.0722	0.5779	0.045
21 G. Sagittarii	5.7	3.37	1.2	22 46.8	20 57.9	- 7 2.1	-1.1065	0.5780	0.048
7 Sagittarii	5.5	3.42	1.6	24 17.0	21 19.9	- 6 40.9	+0.4812	0.5779	0.049
9 Sagittarii	6.0	3.43	1.6	24 21.8	21 45.2	- 6 16.5	+0.5864	0.5778	0.050
1 Sagittarii	5.2	+3.45	- 0.7	-23 43.2	21 1 0.5	- 3 8.6	+0.0894	0.5778	+0.058
24 Sagittarii	5.7	3.57	+ 1.0	24 5.7	10 10.6	+ 5 40.8	+1.1135	0.5770	0.080
117 B. Sagittarii	5.8	3.58	1.6	23 34.6	12 6.0	+ 7 31.9	+0.7333	0.5767	0.085
26 Sagittarii	6.1	3.61	1.7	23 54.7	13 29.0	+ 8 51.7	+1.2002	0.5765	0.088
28 Sagittarii	5.6	3.59	2.6	22 28.8	15 22.0	+10 40.5	-0.1143	0.5762	0.092
30 Sagittarii	6.2	+3.61	+ 3.1	-22 15.4	17 14.5	-11 31.2	-0.1661	0.5759	+0.097
33 Sagittarii	5.8	3.60	3.6	21 27.7	18 34.0	-10 14.6	-0.8587	0.5757	0.100
ν^1 Sagittarii	5.0	3.64	3.2	22 50.8	18 37.0	-10 11.7	+0.5807	0.5757	0.100
ν^2 Sagittarii	5.1	3.65	3.3	22 46.5	19 0.5	- 9 49.2	+0.5454	0.5756	0.101
154 B. Sagittarii	5.9	3.66	3.2	23 16.8	19 22.6	- 9 27.8	+1.1050	0.5755	0.102
ξ Sagittarii	3.7	+3.62	+ 4.0	-21 12.9	20 7.4	- 8 44.7	-0.9534	0.5754	+0.104
168 B. Sagittarii	6.3	3.68	3.9	22 48.7	21 43.6	- 7 12.1	+0.8669	0.5751	0.107
o Sagittarii	3.9	3.67	4.4	21 51.8	23 0.7	- 5 57.9	+0.0261	0.5748	0.110
π Sagittarii	3.0	3.67	5.1	21 9.3	22 1 8.9	- 3 54.4	-0.4631	0.5743	0.115
199 B. Sagittarii	6.4	3.70	5.1	21 47.7	2 16.1	- 2 49.7	+0.3286	0.5741	0.117
50 Sagittarii	5.5	+3.78	+ 6.3	-21 56.4	8 4.7	+ 2 46.0	+1.1983	0.5726	+0.1

MENTS FOR THE PREDICTION OF OCCULTATIONS.

OCTOBER.

The Star's					At Conjunction in R. A.					Limiting Parallels.	
	Mag.	Red'ns from 1917.0. Δα	Δδ	Apparent Declination.	Greenwich Mean Time.	Hour Angle, H	Y	x'	y'	N.	S.
		s	"	° ′	d h m	h m				°	°
arii	6.1	+3.79	+ 6.9	−21 29.0	22 10 0.9	+ 4 37.9	+0.9853	0.5722	+0.1349	+69	+18
arii	6.1	3.75	8.2	19 2.1	12 23.0	+ 6 54.7	−1.2067	0.5715	0.1399	−47	−90
arii	5.1	3.81	8.7	19 57.5	16 34.6	+10 57.2	+0.3481	0.5703	0.1486	+48	−21
arii	6.0	3.83	9.5	19 15.2	19 3.6	−10 39.2	+0.0003	0.5696	0.1536	+29	−40
corni	6.4	3.91	13.9	16 0.8	23 10 45.6	+ 4 28.6	−0.6621	0.5648	0.1827	− 3	−88
corni	6.2	+3.90	+14.2	−15 19.9	11 47.0	+ 5 27.7	−1.1682	0.5645	+0.1844	−37	−90
corni	6.2	3.97	14.1	16 48.5	13 41.8	+ 7 18.5	+0.6905	0.5640	0.1876	+73	− 2
corni	5.2	3.94	15.0	15 14.5	15 20.3	+ 8 53.4	−0.5905	0.5635	0.1903	+ 2	−80
corni	5.9	3.97	14.8	16 25.0	15 52.8	+ 9 24.8	+0.7054	0.5634	0.1913	+74	− 1
corni	5.9	4.01	16.7	14 48.0	23 49.4	− 6 55.6	+0.6313	0.5611	0.2034	+72	− 6
rii	6.5	+4.06	+18.4	−13 32.5	24 7 26.4	+ 0 25.4	+0.9465	0.5592	+0.2138	+76	+13
rii	6.5	4.08	19.9	11 55.4	12 52.1	+ 5 39.7	+0.4904	0.5579	0.2205	+65	−14
corni	6.2	4.11	21.0	10 56.7	17 52.3	+10 29.4	+0.6215	0.5569	0.2261	+75	− 7
corni	5.3	4.10	21.9	9 27.5	20 21.0	−11 7.0	−0.3110	0.5565	0.2287	+21	−58
corni	6.3	4.11	21.9	9 39.2	20 54.8	−10 34.4	+0.0145	0.5564	0.2292	+38	−39
rii	5.6	+4.14	+23.8	− 6 55.0	25 4 31.9	− 3 13.2	−0.9590	0.5553	+0.2361	−14	−90
rii	5.7	4.18	24.9	5 47.7	10 44.8	+ 2 47.0	−0.6002	0.5546	0.2408	+ 7	−80
rii	5.8	4.20	25.4	5 15.0	13 53.7	+ 5 49.3	−0.3836	0.5545	0.2428	+19	−63
rii	5.2	4.24	26.2	4 39.0	20 2.2	+11 45.2	+0.5169	0.5543	0.2461	+71	−13
rii	6.3	4.25	26.6	3 58.7	21 24.4	−10 55.5	+0.1844	0.5543	0.2467	+50	−30
um	6.2	+4.31	+27.5	− 2 49.9	26 5 15.9	− 3 20.1	+0.9890	0.5545	+0.2493	+87	+15
um	6.3	4.30	28.4	0 15.1	6 20.4	− 2 17.8	−1.3165	0.5546	0.2495	−44	−88
um	6.4	4.39	29.0	− 0 9.4	16 36.9	+ 7 37.5	+1.1582	0.5557	0.2503	+90	+27
um	4.9	4.40	29.2	+ 0 48.6	18 8.3	+ 9 5.7	+0.5780	0.5560	0.2502	+77	−10
um	6.4	4.39	29.2	0 40.5	18 16.9	+ 9 14.0	+0.7474	0.5560	0.2501	+90	0
um	5.7	+4.42	+29.7	+ 1 39.0	22 22.5	−10 48.8	+0.7995	0.5567	+0.2495	+90	+ 3
um	5.4	4.46	30.0	3 2.1	27 2 50.0	− 6 30.6	+0.5312	0.5576	0.2484	+74	−12
um	6.2	4.58	30.9	7 47.3	16 11.0	+ 6 22.4	−0.9199	0.5611	0.2418	−10	−82
um	5.4	4.59	30.9	7 44.3	17 57.2	+ 8 4.8	−0.4432	0.5617	0.2406	+17	−65
um	6.5	4.67	30.6	8 54.6	28 2 57.0	− 7 14.5	+0.5226	0.5647	0.2332	+73	−10
um	6.3	+4.80	+30.4	+12 31.2	13 52.2	+ 3 17.2	−0.5894	0.5687	+0.2212	+ 8	−72
um	3.7	4.92	29.4	14 55.6	29 0 27.2	−10 30.8	−0.7261	0.5728	0.2067	+ 1	−75
um	6.2	4.92	29.1	14 14.7	2 16.1	− 8 45.9	+0.3272	0.5736	0.2040	+60	−17
um	6.1	4.97	29.0	15 59.6	3 53.8	− 7 11.9	−1.0909	0.5742	0.2014	−24	−74
is	5.8	5.00	28.5	16 33.0	7 27.5	− 3 46.1	−0.9431	0.5756	0.1956	−13	−73
is	5.1	+5.05	+27.9	+17 25.2	11 16.6	− 0 5.4	−1.0815	0.5771	+0.1890	−24	−73
is	6.4	5.07	27.5	17 51.8	13 55.0	+ 2 27.0	−1.0331	0.5780	0.1843	−20	−72
is	6.5	5.08	27.2	17 38.5	15 35.8	+ 4 4.1	−0.5050	0.5786	0.1812	+13	−61
is	6.4	5.08	27.0	16 50.6	16 16.0	+ 4 42.9	+0.4186	0.5789	0.1799	+66	−10
is	6.2	5.19	25.4	19 29.7	30 0 59.3	−10 53.7	−0.7545	0.5818	0.1627	− 2	−71
is	5.7	+5.22	+24.4	+19 39.9	5 46.5	− 6 17.5	−0.1727	0.5832	+0.1526	+30	−38
is	5.8	5.28	22.9	20 20.6	12 8.6	− 0 9.9	+0.0692	0.5849	0.1385	+44	−23
is (*mean*)	4.6	5.28	22.8	21 0.9	12 36.1	+ 0 16.5	−0.5487	0.5850	0.1375	+10	−59
is	5.0	5.30	21.2	20 44.6	18 56.4	+ 6 22.2	+0.5524	0.5862	0.1227	+78	+ 3
is	5.2	5.31	20.6	20 51.3	21 29.1	+ 8 49.0	+0.7451	0.5866	0.1167	+90	+15
is	5.2	+5.30	+20.5	+20 27.1	22 6.4	+ 9 24.8	+1.2270	0.5867	+0.1152	+88	+52
is	6.0	5.30	20.4	20 30.9	22 46.8	+10 3.7	+1.2398	0.5868	0.1135	+86	+54
is	6.1	5.37	19.7	22 31.5	31 0 22.1	+11 35.4	−0.6288	0.5870	0.1097	+ 4	−62
i	4.3	5.42	17.6	23 41.7	7 31.9	− 5 31.5	−1.1058	0.5875	0.0919	−30	−66
i	*3.0*	*5.43*	*17.5*	23 51.3	7 59.6	− 5 4.8	−1.2262	0.5875	0.0907	−45	−66
	5.5	*+5.41*	*+17.5*	+23 10.3	8 20.9	− 4 44.3	−0.4962	0.5875	+0.0899	+12	−52

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS

OCTOBER.

The Star's Name.	Mag.	Red'ns from 1917.0. Δα	Red'ns from 1917.0. Δδ	Apparent Declination.	At Conjunction in R. A. Greenwich Mean Time.	Hour Angle, H	Y	x'	y'
		s	"	° ′	d h m	h m			
27 Tauri	3.7	+5.43	+17.3	+23 48.3	31 8 40.0	− 4 26.0	−1.1161	0.5876	+0.08
28 Tauri	5.2	5.43	17.3	23 53.3	8 40.5	− 4 25.5	−1.2008	0.5875	0.08
133 B. Tauri	5.9	5.37	17.4	21 59.8	8 59.6	− 4 7.1	+0.7636	0.5876	0.08
32 Tauri	5.8	5.38	16.6	22 14.7	11 46.4	− 1 26.8	+0.7472	0.5875	0.08
33 Tauri	6.0	5.40	16.6	22 56.4	11 50.8	− 1 22.6	+0.0398	0.5875	0.08
161 B. Tauri	6.5	+5.40	+16.1	+22 58.3	13 24.3	+ 0 7.3	+0.1299	0.5875	+0.07
36 Tauri	5.6	5.44	15.6	23 53.0	14 45.7	+ 1 25.5	−0.7029	0.5874	0.07
192 B. Tauri	6.1	5.37	14.8	22 12.3	18 11.4	+ 4 43.3	+1.2595	0.5872	0.06
62 Tauri	6.1	5.43	13.2	24 6.7	22 38.5	+ 9 0.0	−0.4424	0.5866	0.05
υ Tauri	4.2	5.38	13.2	22 37.8	23 35.2	+ 9 54.6	+1.1368	0.5865	0.05
72 Tauri	5.4	+5.38	+13.0	+22 48.8	23 59.1	+10 17.5	+0.9671	0.5864	+0.04

NOVEMBER.

284 B. Tauri	6.0	+5.39	+11.8	+23 10.5	1 3 40.8	−10 9.4	+0.7614	0.5857	+0.04
τ Tauri	4.3	+5.36	+11.2	+22 48.1	6 0.8	− 7 54.7	+1.2361	0.5852	+0.03
95 Tauri	6.2	5.40	10.9	23 56.1	6 23.7	− 7 32.7	+0.0739	0.5851	0.03
300 B. Tauri	6.2	5.38	10.7	23 28.8	7 24.2	− 6 34.5	+0.5787	0.5848	0.03
315 B. Tauri	6.3	5.41	9.2	24 27.8	11 40.1	− 2 28.5	−0.3360	0.5835	0.01
99 Tauri	6.0	5.38	9.1	23 49.3	12 18.4	− 1 51.7	+0.3423	0.5834	0.01
k Tauri	5.6	+5.42	+ 8.8	+24 55.5	12 25.8	− 1 44.6	−0.8033	0.5833	+0.01
103 Tauri	5.5	5.37	7.8	24 9.5	16 29.8	+ 2 10.2	+0.0445	0.5819	+0.00
118 Tauri	5.4	5.36	4.9	25 5.1	2 1 10.6	+10 31.2	−0.9624	0.5783	−0.01
121 Tauri	5.1	5.29	4.4	23 59.2	3 45.1	−11 0.0	+0.1437	0.5770	0.02
394 B. Tauri	6.0	5.23	3.6	23 10.0	7 2.6	− 7 49.9	+0.9232	0.5754	0.02
132 Tauri	5.0	+5.27	+ 2.6	+24 32.5	9 24.1	− 5 33.6	−0.6005	0.5741	−0.03
412 B. Tauri	5.8	5.23	1.6	24 14.3	12 44.3	− 2 20.8	−0.4128	0.5722	0.04
1 Geminorum	4.3	5.16	0.9	23 16.1	15 47.7	+ 0 35.8	+0.4699	0.5704	0.05
3 Geminorum	5.6	5.14	+ 0.4	23 7.7	18 11.2	+ 2 54.1	+0.4930	0.5690	0.05
5 Geminorum	5.9	5.18	− 0.3	24 26.4	18 56.1	+ 3 37.5	−0.9392	0.5685	0.05
6 Geminorum	6.3	+5.12	+ 0.1	+22 55.7	19 17.6	+ 3 58.1	+0.6421	0.5683	−0.05
η Gemin. (*var.*)	3.2	5.09	− 0.1	22 31.9	20 23.9	+ 5 2.0	+0.9973	0.5676	0.06
8 Geminorum	6.1	5.14	0.7	23 59.9	20 59.4	+ 5 36.3	−0.5943	0.5672	0.06
9 Geminorum	6.2	5.13	0.7	23 46.2	21 16.6	+ 5 52.8	−0.3706	0.5670	0.06
μ Geminorum	3.2	5.06	1.2	22 33.4	23 52.2	+ 8 22.9	+0.7477	0.5654	0.06
36 B. Geminorum	6.0	+5.08	− 1.6	+23 22.4	3 0 58.8	+ 9 27.0	−0.1983	0.5647	−0.07
d Geminorum	5.2	4.90	4.4	21 51.5	12 25.1	− 3 30.9	+0.4673	0.5568	0.03
ζ Gemin. (*var.*)	3.7	4.79	5.4	20 41.5	18 3.9	+ 1 56.3	+1.1527	0.5528	0.10
44 Geminorum	5.9	4.86	6.2	22 45.7	18 34.4	+ 2 25.7	−1.1246	0.5525	0.10
120 B. Geminorum	6.5	4.78	6.7	21 23.5	20 47.0	+ 4 33.8	+0.1061	0.5509	0.11
δ Geminorum	3.5	+4.75	− 7.7	+22 8.0	4 1 20.5	+ 8 58.2	−1.2227	0.5476	−0.11
56 Geminorum	5.2	4.68	7.4	20 36.0	2 12.4	+ 9 48.3	+0.3279	0.5469	0.12
149 B. Geminorum	6.4	4.68	8.3	21 42.0	4 27.8	+11 59.2	−1.1390	0.5453	0.12
61 Geminorum	5.8	4.66	7.9	20 25.3	4 30.9	−11 57.8	+0.2346	0.5452	0.12
63 Geminorum	5.3	4.69	8.5	21 36.8	4 52.3	−11 37.2	−1.0972	0.5450	0.12
79 Geminorum	6.3	+4.55	− 9.9	+20 30.8	13 3.6	− 3 42.1	−0.9989	0.5391	−0.13
g Geminorum	5.0	4.48	9.4	18 42.7	13 33.0	− 3 13.5	+0.8874	0.5388	0.14
209 B. Geminorum	6.2	4.48	10.3	19 32.1	16 18.7	− 0 33.2	−0.4013	0.5368	0.14
85 Geminorum	5.2	4.47	10.9	20 6.1	18 5.0	+ 1 9.7	−1.2751	0.5356	0.14
3 Cancri	5.7	4.37	10.5	17 32.0	20 35.5	+ 3 35.4	+1.1417	0.5338	0.15
10 H. Cancri	6.1	+4.38	−11.4	+19 4.5	22 29.6	+ 5 25.9	−0.8246	0.5325	−0

EMENTS FOR THE PREDICTION OF OCCULTATIONS.

NOVEMBER.

THE STAR'S					AT CONJUNCTION IN R. A.						Limiting Parallels.	
ie.	Mag.	Red'ns from 1917.0. Δα	Δδ	Apparent Declination.	Greenwich Mean Time.	Hour Angle, *H*	*Y*	*x*	*y*		N.	S.
		s	″	° ′	d h m	h m					°	°
ri (*mean*)	4.7	+4.31	−11.8	+17 53.7	5 2 8.8	+ 8 58.2	−0.1129	0.5300	−0.1591		+34	−37
ri	6.2	4.19	13.0	17 19.0	8 54.1	− 8 29.0	−0.5869	0.5256	0.1690		+ 8	−67
ri	6.3	4.10	13.2	15 35.9	14 4.9	− 3 27.7	+0.4081	0.5224	0.1743		+65	−12
ri	6.3	3.99	14.4	15 39.3	21 40.2	+ 3 53.8	−1.0112	0.5180	0.1828		−13	−74
ri	6.5	3.80	14.7	11 53.9	6 7 26.1	−10 37.4	+1.2865	0.5129	0.1925		+88	+47
ri	6.3	+3.76	−15.2	+11 50.7	11 41.1	− 6 29.8	+0.5204	0.5108	−0.1963		+73	− 9
is	5.1	3.65	16.2	11 39.8	19 10.3	+ 0 46.5	−0.7715	0.5076	0.2023		− 2	−78
is	5.2	3.64	15.6	10 4.7	19 11.6	+ 0 47.6	+0.9746	0.5076	0.2023		+90	+17
is	3.8	3.57	16.3	10 16.0	7 0 7.7	+ 5 35.4	−0.2402	0.5057	0.2059		+27	−51
is	5.9	3.46	16.8	9 19.3	8 24.6	−10 21.7	−0.9247	0.5031	0.2111		−11	−81
is	6.2	+3.45	−16.7	+ 8 42.4	9 20.0	− 9 27.8	−0.4381	0.5028	−0.2117		+17	−64
is	4.9	3.43	16.8	8 26.3	10 28.5	− 8 21.2	−0.3840	0.5024	0.2123		+20	−60
is	6.5	3.26	17.2	6 6.7	23 8.8	+ 3 58.1	−0.5374	0.4998	0.2183		+12	−72
is	6.3	3.08	16.9	1 27.6	8 15 13.1	− 4 24.0	+1.0642	0.4984	0.2229		+90	+20
is	6.1	3.07	16.9	1 10.5	17 8.7	− 2 31.5	+0.9504	0.4984	0.2232		+90	+12
is	6.1	+3.02	−16.9	+ 0 26.5	21 32.6	+ 1 45.2	+0.7785	0.4985	−0.2239		+90	+ 2
is	5.3	2.97	17.3	+ 0 22.6	9 3 10.5	+ 7 13.7	−0.4123	0.4969	0.2243		+18	−65
is	6.3	2.90	17.1	− 1 14.9	11 0.2	− 9 9.4	−0.3708	0.4999	0.2242		+20	−62
is	5.1	2.89	16.8	2 33.0	12 20.4	− 7 51.3	+0.7688	0.5002	0.2241		+87	+ 1
is	6.2	2.85	17.1	1 58.9	16 47.8	− 3 31.3	−0.8567	0.5010	0.2236		− 7	−90
inis	5.9	+2.80	−16.6	− 4 52.6	23 43.7	+ 3 13.2	+0.7912	0.5028	−0.2224		+85	+ 2
inis	6.5	2.73	16.2	7 19.0	10 10 16.6	−10 31.6	+1.1477	0.5061	0.2192		+83	+27
inis	5.3	2.66	16.0	8 59.9	22 44.9	+ 1 35.5	+0.2934	0.5113	0.2133		+54	−24
inis	6.0	2.62	15.5	11 12.2	11 9 30.5	−11 57.7	+0.4469	0.5166	0.2063		+63	−16
inis	5.6	2.58	14.4	14 56.4	12 5 4.1	+ 7 0.7	+0.6408	0.5281	−0.1887		+72	− 5
				NEW MOON.								
iuchi	5.1	+3.00	− 4.0	−24 11.9	16 8 44.2	+ 7 12.5	+0.0532	0.5825	+0.0041		+18	−37
iuchi	3.4	3.03	3.9	24 55.1	10 21.5	+ 8 46.1	+0.8158	0.5827	0.0083		+65	+ 8
iuchi	6.3	3.03	3.5	24 10.2	11 38.0	+ 9 59.7	+0.0455	0.5829	0.0115		+18	−37
iuchi	4.3	+3.03	− 3.5	−24 6.1	12 9.1	+10 29.8	−0.0197	0.5830	+0.0128		+15	−41
iuchi	4.8	3.04	3.0	23 54.0	14 13.0	−11 31.2	−0.1974	0.5831	0.0181		+ 6	−52
iuchi	6.1	3.14	1.5	24 52.3	23 46.8	− 2 19.1	+1.1035	0.5833	0.0425		+65	+31
ttarii	4.8	3.13	1.0	23 48.6	17 1 47.5	− 0 23.1	+0.0890	0.5833	0.0476		+23	−35
ttarii	5.7	3.12	0.6	22 46.8	2 40.2	+ 0 27.6	−0.9390	0.5832	0.0498		−33	−90
ttarii	5.5	+3.15	− 0.8	−24 17.0	3 1.9	+ 0 48.5	+0.6413	0.5831	+0.0507		+59	− 3
ttarii	6.0	3.16	− 0.7	24 21.8	3 26.9	+ 1 12.5	+0.7465	0.5831	0.0517		+66	+ 3
ttarii	5.2	3.17	0.0	23 43.2	6 39.7	+ 4 18.0	+0.2561	0.5828	0.0598		+34	−25
ttarii	5.8	3.26	+ 2.1	23 34.6	17 38.2	− 9 8.5	+0.9110	0.5809	0.0867		+66	+14
ttarii	5.6	3.27	3.0	22 28.7	20 52.5	− 6 1.5	+0.0696	0.5801	0.0945		+27	−36
ttarii	6.2	+3.27	+ 3.4	−22 15.4	22 44.1	− 4 14.2	+0.0199	0.5796	+0.0988		+24	−39
ttarii	5.8	3.27	3.8	21 27.7	18 0 3.1	− 2 58.2	−0.6696	0.5792	0.1019		−12	−90
ttarii	5.0	3.30	3.5	22 50.8	0 6.0	− 2 55.3	+0.7662	0.5792	0.1020		+67	+ 4
ttarii	5.1	3.31	3.6	22 46.5	0 29.4	− 2 32.9	+0.7315	0.5791	0.1029		+67	+ 2
ttarii	5.9	3.32	3.5	23 16.8	0 51.3	− 2 11.7	+1.2901	0.5790	0.1038		+66	+60
ttarii	5.1	+3.26	+ 4.3	−20 45.9	1 26.6	− 1 37.9	−1.2443	0.5788	+0.1051		−55	−85
ttarii	3.7	3.28	4.2	21 12.9	1 35.7	− 1 29.0	−0.7628	0.5788	0.1055		−17	−90
ttarii	6.3	3.33	4.1	22 48.7	3 11.3	+ 0 2.9	+1.0553	0.5783	0.1091		+67	+25
ttarii	3.9	3.32	4.5	21 51.8	4 27.9	+ 1 16.7	+0.2174	0.5779	0.1121		+37	−28
ttarii	3.0	3.32	5.2	21 9.3	6 35.4	+ 3 19.4	−0.2690	0.5772	0.1169		+11	−56
tarii	6.4	+3.35	+ 5.2	−21 47.7	7 42.3	+ 4 23.8	+0.5227	0.5768	+0.1193		+56	−11

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS

NOVEMBER.

THE STAR'S					AT CONJUNCTION IN R. A.				
Name.	Mag.	Red'ns from 1917.0. Δα	Δδ	Apparent Declination.	Greenwich Mean Time.	Hour Angle, H	Y''	x'	y'
		s	"	° ′	d h m	h m			
253 B. Sagittarii	6.1	+3.41	+ 6.8	−21 29.0	18 15 25.4	+11 49.8	+1.1862	0.5740	+0.136
266 B. Sagittarii	6.1	3.38	7.9	19 2.1	17 47.3	− 9 53.7	−1.0038	0.5731	0.140
f Sagittarii	5.1	3.43	8.4	19 57.6	21 58.8	− 5 51.4	+0.5546	0.5714	0.149
57 Sagittarii	6.0	3.44	9.1	19 15.2	19 0 27.9	− 3 27.6	+0.2083	0.5703	0.154
31 B. Capricorni	6.4	3.52	13.0	16 0.8	16 13.7	+11 44.1	−0.4484	0.5636	0.182
27 G. Capricorni	6.2	+3.50	+13.4	−15 19.9	17 15.6	−11 16.3	−0.9561	0.5632	+0.184
47 B. Capricorni	6.2	3.57	13.2	16 48.5	19 11.3	− 9 24.7	+0.9109	0.5623	0.187
τ Capricorni	5.2	3.54	14.1	15 14.6	20 50.7	− 7 48.8	−0.3752	0.5616	0.189
61 B. Capricorni	5.9	3.57	13.8	16 25.0	21 23.5	− 7 17.1	+0.9269	0.5614	0.190
95 B. Capricorni	5.9	3.62	15.6	14 48.0	20 5 25.2	+ 0 27.7	+0.8549	0.5582	0.202
ν Aquarii	4.5	+3.61	+17.4	−11 42.2	10 17.8	+ 5 10.1	−1.2973	0.5563	+0.208
53 B. Aquarii	6.5	3.67	17.2	13 32.5	13 8.7	+ 7 55.1	+1.1737	0.5552	0.212
72 B. Aquarii	6.5	3.69	18.6	11 55.4	18 39.7	−10 45.3	+0.7140	0.5534	0.218
137 B. Capricorni	6.2	3.72	19.6	10 56.7	23 45.3	− 5 50.1	+0.8457	0.5518	0.223
c^1 Capricorni	5.3	3.73	20.5	9 27.5	21 2 17.0	− 3 23.6	−0.0963	0.5510	0.226
c^2 Capricorni	6.3	+3.74	+20.5	− 9 39.2	2 51.5	− 2 50.3	+0.2321	0.5509	+0.226
30 Aquarii	5.6	3.78	22.5	6 55.1	10 38.5	+ 4 40.9	−0.7552	0.5490	0.232
44 Aquarii	5.7	3.83	23.6	5 47.7	17 0.2	+10 49.9	−0.3967	0.5478	0.237
51 Aquarii	5.8	3.86	24.1	5 15.0	20 13.9	−10 3.0	−0.1800	0.5473	0.238
187 B. Aquarii	6.3	3.86	25.1	3 19.8	23 33.6	− 6 49.9	−1.3268	0.5469	0.240
κ Aquarii	5.2	+3.91	+24.8	− 4 39.0	22 2 32.1	− 3 57.4	+0.7265	0.5466	+0.241
207 B. Aquarii	6.3	3.92	25.2	3 58.7	3 56.5	− 2 35.8	+0.3386	0.5465	0.242
6 G. Piscium	6.2	4.00	26.2	2 50.0	12 1.4	+ 5 12.9	+1.1963	0.5462	0.244
3 Piscium	6.3	4.00	27.2	0 15.2	13 7.8	+ 6 17.1	−1.1419	0.5462	0.244
22 B. Piscium	6.4	4.12	27.8	− 0 9.4	23 42.9	− 7 28.9	+1.3550	0.5469	0.245
κ Piscium	4.9	+4.14	+28.1	+ 0 48.5	23 1 17.2	− 5 57.8	+0.7643	0.5470	+0.244
9 Piscium	6.4	4.14	28.1	0 40.5	1 26.0	− 5 49.4	+0.9360	0.5470	0.244
16 Piscium	5.7	4.17	28.7	1 39.0	5 39.2	− 1 44.5	+0.9832	0.5477	0.244
19 Piscium	5.4	4.23	29.1	3 2.1	10 15.1	+ 2 42.2	+0.7046	0.5485	0.242
ω Piscium	4.0	4.31	30.1	6 24.7	16 9.8	+ 8 25.0	−1.2763	0.5498	0.240
36 Piscium	6.2	+4.40	+30.5	+ 7 47.3	24 0 1.5	− 7 59.4	−0.7899	0.5520	+0.236
d Piscium	5.4	4.43	30.5	7 44.3	1 51.0	− 6 13.6	−0.3091	0.5525	0.235
136 B. Piscium	6.5	4.55	30.3	8 54.6	11 7.5	+ 2 43.9	+0.6547	0.5558	0.227
75 Piscium	6.3	4.74	30.6	12 31.2	22 22.2	−10 24.9	−0.4937	0.5603	0.216
η Piscium	3.7	4.92	29.9	14 55.6	25 9 14.8	+ 0 4.6	−0.6524	0.5652	0.202
101 Piscium	6.2	+4.93	+29.5	+14 14.7	11 6.4	+ 1 52.3	+0.4109	0.5660	+0.199
105 Piscium	6.1	4.99	29.6	15 59.6	12 46.7	+ 3 28.9	−1.0283	0.5668	0.197
4 Arietis	5.8	5.04	29.2	16 33.1	16 25.7	+ 7 0.0	−0.8852	0.5685	0.191
ι Arietis	5.1	5.11	28.8	17 25.2	20 20.3	+10 46.1	−1.0323	0.5703	0.185
35 B. Arietis	6.4	5.15	28.4	17 51.8	23 2.3	−10 37.7	−0.9882	0.5715	0.180
47 B. Arietis	6.5	+5.17	+28.1	+17 38.5	26 0 45.4	− 8 58.4	−0.4573	0.5723	+0.177
20 H[1]. Arietis	6.4	5.17	27.6	16 50.6	1 26.5	− 8 18.8	+0.4752	0.5726	0.176
26 Arietis	6.2	5.34	26.5	19 29.7	10 20.5	+ 0 15.4	−0.7269	0.5765	0.159
μ Arietis	5.7	5.40	25.4	19 39.9	15 12.8	+ 4 56.9	−0.1485	0.5785	0.149
47 Arietis	5.8	5.51	24.0	20 20.6	21 41.1	+11 10.6	+0.0833	0.5809	0.135
ε Arietis (*mean*)	4.6	+5.52	+24.0	+21 0.9	22 9.0	+11 37.4	−0.5404	0.5811	+0.134
ζ Arietis	5.0	5.57	22.2	20 44.6	27 4 34.5	− 6 11.7	+0.5572	0.5831	0.120
τ Arietis	5.2	5.61	21.6	20 51.3	7 8.9	− 3 43.1	+0.7462	0.5839	0.114
63 Arietis	5.2	5.59	21.4	20 27.1	7 46.6	− 3 6.9	+1.2302	0.5840	0.112
65 Arietis	6.0	5.60	21.2	20 30.9	8 27.5	− 2 27.5	+1.2417	0.5842	0.111
66 Arietis	6.1	+5.69	+20.8	+22 31.5	10 3.8	− 0 54.9	−0.6417	0.5846	+0.1

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

NOVEMBER.

Name.	Mag.	Red'ns from 1917.0. Δα	Red'ns from 1917.0. Δδ	Apparent Declination.	Greenwich Mean Time.	Hour Angle. H	Y	x′	y′	Limiting Parallels. N.	Limiting Parallels. S.
		s	″	° ′	d h m	h m				°	°
Tauri	4.3	+5.80	+18.9	+23 41.8	27 17 17.5	+ 6 2.1	-1.1332	0.5860	+0.0899	-33	-66
Tauri	3.0	5.81	18.7	23 51.3	17 45.4	+ 6 29.1	-1.2549	0.5861	0.0888	-50	-66
. Tauri	5.5	5.79	18.6	23 10.3	18 6.8	+ 6 49.6	-0.5220	0.5862	0.0879	+10	-53
Tauri	3.7	5.81	18.5	23 48.3	18 26.1	+ 7 8.2	-1.1453	0.5862	0.0871	-34	-66
Tauri	5.2	5.82	18.5	23 53.4	18 26.7	+ 7 8.7	-1.2304	0.5862	0.0871	-46	-66
. Tauri	5.9	+5.75	+18.3	+21 59.9	18 45.8	+ 7 27.1	+0.7428	0.5863	+0.0863	+90	+18
Tauri	5.8	5.78	17.5	22 14.7	21 33.8	+10 8.6	+0.7212	0.5866	0.0793	+90	+17
Tauri	6.0	5.80	17.6	22 56.4	21 38.2	+10 12.9	+0.0105	0.5866	0.0791	+40	-21
. Tauri	6.5	5.82	17.0	22 58.4	23 12.2	+11 43.3	+0.0983	0.5868	0.0752	+46	-16
Tauri	5.6	5.86	16.6	23 53.0	28 0 34.0	-10 58.1	-0.7400	0.5869	0.0718	- 3	-66
. Tauri	6.1	+5.81	+15.6	+22 12.3	4 0.7	- 7 39.4	+1.2233	0.5870	+0.0630	+86	+57
Tauri	6.1	5.92	14.1	24 6.7	8 28.6	- 3 21.9	-0.4912	0.5870	0.0516	+12	-48
Tauri	4.2	5.86	13.8	22 37.8	9 25.4	- 2 27.1	+1.0904	0.5870	0.0491	+90	+45
Tauri	5.4	5.87	13.7	22 48.8	9 49.3	- 2 4.2	+0.9195	0.5870	0.0481	+90	+32
). Tauri	6.0	5.91	12.4	23 10.5	13 31.3	+ 1 29.2	+0.7068	0.5867	0.0386	+90	+20
Tauri	4.3	+5.89	+11.7	+22 48.1	15 51.4	+ 3 43.8	+1.1782	0.5864	+0.0325	+90	+54
Tauri	6.2	5.94	11.5	23 56.1	16 14.2	+ 4 5.8	+0.0138	0.5864	0.0315	+41	-17
3. Tauri	6.2	5.92	11.2	23 28.8	17 14.7	+ 5 4.0	+0.5176	0.5862	0.0289	+76	+10
3. Tauri	6.3	5.98	9.7	24 27.8	21 30.2	+ 9 9.7	-0.4047	0.5855	0.0179	+17	-40
Tauri	6.0	5.95	9.5	23 49.3	22 8.4	+ 9 46.4	+0.2731	0.5854	0.0163	+57	- 1
Tauri	5.6	+6.00	+ 9.4	+24 55.5	22 15.8	+ 9 53.5	-0.8734	0.5853	+0.0160	-12	-65
Tauri	5.5	5.97	8.1	24 9.5	29 2 19.1	-10 12.6	-0.0313	0.5843	+0.0055	+38	-16
Tauri	5.4	6.01	5.0	25 5.1	10 57.2	- 1 54.1	-1.0498	0.5815	-0.0164	-26	-65
Tauri	5.1	5.95	4.2	23 59.2	13 30.8	+ 0 33.7	+0.0512	0.5805	0.0228	+43	-14
B. Tauri	6.0	5.91	3.2	23 10.0	16 46.8	+ 3 42.4	+0.8246	0.5791	0.0309	+90	+28
Tauri	5.0	+5.96	+ 2.3	+24 32.5	19 7.2	+ 5 57.6	-0.6992	0.5780	-0.0366	0	-64
B. Tauri	5.8	5.94	1.2	24 14.3	22 25.7	+ 9 8.5	-0.5163	0.5764	0.0447	+10	-49
Geminorum	4.3	5.88	+ 0.2	23 16.1	30 1 27.3	-11 56.5	+0.3599	0.5748	0.0519	+63	0
Geminorum	5.6	5.87	- 0.5	23 7.7	3 49.4	- 9 39.6	+0.3797	0.5735	0.0574	+64	0
Geminorum	5.9	5.92	1.0	24 26.4	4 33.9	- 8 56.7	-1.0489	0.5731	0.0592	-25	-66
Geminorum	6.3	+5.85	- 0.8	+22 55.7	4 55.2	- 8 36.3	+0.5268	0.5729	-0.0600	+76	+ 8
Gemin. (*var.*)	3.2	5.82	1.2	22 31.9	6 0.7	- 7 33.1	+0.8793	0.5723	0.0625	+90	+28
Geminorum	6.1	5.89	1.6	23 59.8	6 35.8	- 6 59.2	-0.7077	0.5719	0.0639	- 1	-65
Geminorum	6.2	5.88	1.6	23 46.2	6 52.9	- 6 42.8	-0.4851	0.5717	0.0645	+12	-49
Geminorum	3.2	5.81	2.4	22 33.4	9 26.8	- 4 14.5	+0.6260	0.5702	0.0703	+87	+12
B. Geminorum	6.0	+5.84	- 2.8	+23 22.4	10 32.6	- 3 11.1	-0.3179	0.5695	-0.0728	+22	-39
Geminorum	5.2	+5.70	- 6.1	+21 51.5	21 50.5	+ 7 42.5	+0.3312	0.5621	-0.0971	+61	- 6

DECEMBER.

Gemin. (*var.*)	3.7	+5.61	- 7.6	+20 41.5	1 3 24.8	10 54.8	-1.0069	0.5582	-0.1082	+90	+32
Geminorum	5.9	5.68	8.1	22 45.6	3 54.9	-10 25.8	-1.2598	0.5578	0.1092	-49	-67
B. Geminorum	6.5	5.60	8.9	21 23.4	6 5.6	- 8 19.6	-0.0371	0.5563	0.1134	+38	-27
Geminorum	5.2	5.53	9.9	20 35.9	11 26.6	- 3 9.6	+0.1776	0.5524	0.1234	+51	-17
B. Geminorum	6.4	5.53	10.8	21 42.0	13 40.0	- 1 0.7	-1.2838	0.5507	0.1274	-53	-68
Geminorum	5.8	+5.50	-10.5	+20 25.3	13 43.1	- 0 57.7	+0.0828	0.5507	-0.1275	+45	-22
Geminorum	5.3	5.54	10.9	21 36.8	14 4.1	- 0 37.4	-1.2426	0.5504	0.1281	-45	-68
Geminorum	6.3	5.42	12.8	20 30.8	22 8.4	+ 7 10.7	-1.1522	0.5445	0.1417	-32	-69
Geminorum	5.0	5.35	12.5	18 42.6	22 37.4	+ 7 38.8	+0.7233	0.5441	0.1425	+90	+10
B. *Geminorum*	*6.2*	*5.35*	*13.4*	*19 32.1*	2 1 20.7	+10 16.8	-0.5607	0.5421	0.1468	+ 9	-62
Cancri	*5.7*	*+5.24*	*-13.9*	*+17 32.0*	5 33.9	- 9 38.3	+0.9705	0.5390	-0.1532	+90	+2

ELEMENTS FOR THE PREDICTION OF OCCULTATION

DECEMBER.

The Star's						At Conjunction in R. A.				
	Name.	Mag.	Red'ns from 1917.0. Δα	Δδ	Apparent Declination.	Greenwich Mean Time.	Hour Angle, H	Y	x'	y
			s	″	° ′	d h m	h m			
10	H. Cancri	6.1	+5.27	−14.8	+19 4.4	2 7 26.3	− 7 49.4	−0.9866	0.5376	−0.1
ζ	Cancri (*mean*)	4.7	5.20	15.4	17 53.7	11 2.5	− 4 20.2	−0.2816	0.5350	0.1
d^2	Cancri	6.2	5.08	16.7	17 19.0	17 42.3	+ 2 7.1	−0.7577	0.5304	0.1
90	B. Cancri	6.3	4.99	17.2	15 35.8	22 49.0	+ 7 4.2	+0.2289	0.5268	0.1
54	Cancri	6.3	4.90	18.6	15 39.2	3 6 13.7	− 9 39.8	−1.1874	0.5220	0.1
209	B. Cancri	6.5	+4.70	−19.4	+11 53.9	15 58.1	− 0 17.6	+1.0956	0.5163	−0.1
222	B. Cancri	6.3	4.65	20.0	11 50.6	20 10.6	+ 3 47.5	+0.3317	0.5139	0.1
ξ	Leonis	5.1	4.55	21.1	11 39.7	4 3 35.7	+10 59.6	−0.9572	0.5102	0.2
h	Leonis	5.2	4.53	20.5	10 4.6	3 36.9	+11 0.8	+0.7826	0.5102	0.2
o	Leonis	3.8	4.47	21.3	10 15.9	8 30.7	− 8 13.8	−0.4284	0.5080	0.2
83	B. Leonis	5.9	+4.36	−22.0	+ 9 19.3	16 44.4	− 0 14.0	−1.1113	0.5047	−0.2
89	B. Leonis	6.2	4.35	22.0	8 42.3	17 39.5	+ 0 39.5	−0.6261	0.5044	0.2
π	Leonis	4.9	4.33	22.0	8 26.2	18 47.7	+ 1 45.8	−0.5721	0.5040	0.2
14	Sextantis	6.3	4.25	21.6	6 0.7	22 23.6	+ 5 15.7	+1.3372	0.5027	0.2
155	B. Leonis	6.5	4.14	22.6	6 6.6	5 7 25.0	− 9 57.9	−0.7238	0.5003	0.2
237	B. Leonis	6.3	+3.95	−22.2	+ 1 27.5	23 28.3	+ 5 39.0	+0.8813	0.4978	−0.2
55	Leonis	6.1	3.93	22.2	1 10.4	6 1 24.0	+ 7 31.6	+0.7687	0.4976	0.2
p^3	Leonis	6.1	3.87	22.2	0 26.4	5 48.3	+11 48.7	+0.5994	0.4975	0.2
p^4	Leonis	5.3	3.82	22.5	+ 0 22.6	11 26.9	− 6 42.0	−0.5879	0.4975	0.2
388	B. Leonis	6.3	3.74	22.3	− 1 14.9	19 18.2	+ 0 56.5	−0.5413	0.4981	0.2
e	Leonis	5.1	+3.73	−21.9	− 2 33.1	20 38.7	+ 2 14.8	+0.5998	0.4983	−0.2
431	B. Leonis	6.2	3.69	22.2	1 59.0	7 1 7.3	+ 6 36.0	−1.0233	0.4989	0.2
13	B. Virginis	5.9	3.62	21.4	4 52.7	8 5.4	−10 37.4	+0.6316	0.5004	0.2
64	B. Virginis	6.5	3.54	20.8	7 19.1	18 42.0	− 0 18.5	+0.9983	0.5034	0.2
q	Virginis	5.3	3.44	20.2	9 0.0	8 7 15.3	+11 53.5	+0.1557	0.5083	0.2
370	B. Virginis	6.0	+3.38	−19.3	−11 12.2	18 5.1	− 1 35.2	+0.3212	0.5136	−0.2
75	Virginis	5.6	3.28	17.5	14 56.5	9 13 45.6	− 6 20.0	+0.5383	0.5255	0.1
83	Virginis	5.6	3.27	16.9	15 46.0	19 31.2	− 0 55.1	+0.3758	0.5295	0.1
85	Virginis	6.1	3.26	17.0	15 21.3	20 3.6	− 0 23.7	−0.1671	0.5299	0.1
214	G. Virginis	6.5	3.22	16.2	15 56.6	10 5 35.5	+ 8 50.2	−1.1860	0.5367	0.1
43	H. Virginis	5.5	+3.22	−15.3	−17 49.1	10 25.3	−10 29.3	+0.6410	0.5404	−0.1
231	G. Virginis	6.4	3.23	15.1	18 12.3	11 12.1	− 9 44.0	+0.3311	0.5410	0.1
236	G. Virginis	5.7	3.22	15.1	18 20.2	11 56.7	− 9 0.8	+0.3541	0.5415	0.1
9	G. Libræ	6.5	3.22	14.0	20 4.8	19 29.0	− 1 43.4	+1.0684	0.5473	0.1
17	G. Libræ	6.4	3.21	13.4	20 49.7	11 0 40.5	+ 3 17.6	+1.1244	0.5513	0.1
18	G. Libræ	6.1	+3.21	−13.3	−20 58.9	1 8.8	+ 3 44.9	+1.2220	0.5516	−0.1
43	B. Libræ	5.7	3.27	14.4	21 2.8	5 43.5	+ 8 10.3	+0.6762	0.5551	0.1
47	G. Libræ	6.1	3.21	12.2	21 42.8	9 46.4	−11 55.2	+0.8736	0.5582	0.1
64	G. Libræ	5.8	3.20	−11.6	22 5.8	14 9.6	− 7 41.2	+0.7604	0.5615	−0.1
					NEW	*MOON.*				
253	B. Sagittarii	6.1	+3.30	+ 7.0	−21 29.0	15 22 13.5	− 3 34.5	+1.2372	0.5823	+0.1
266	B. Sagittarii	6.1	3.25	7.9	19 2.1	16 0 31.8	− 1 21.5	−0.9270	0.5813	0.1
f	Sagittarii	5.1	3.28	8.4	19 57.6	4 37.2	+ 2 34.6	+0.6173	0.5795	0.1
57	Sagittarii	6.0	3.29	9.0	19 15.2	7 2.7	+ 4 54.7	+0.2765	0.5784	0.1
31	B. Capricorni	6.4	+3.31	+12.5	−16 0.8	22 26.6	− 4 15.6	−0.3639	0.5709	+0.1
27	G. Capricorni	6.2	3.29	12.7	15 19.9	23 27.2	− 3 17.3	−0.8664	0.5704	0.1
47	B. Capricorni	6.2	3.35	12.7	16 48.5	17 1 20.4	− 1 23.1	+0.9840	0.5695	0.1
τ	Capricorni	5.2	3.32	13.4	15 14.6	2 57.7	+ 0 5.6	−0.2894	0.5687	0.1
61	B. Capricorni	5.9	3.34	13.3	16 25.0	3 29.8	+ 0 36.6	+1.0011	0.5684	0.1
95	B. Capricorni	5.9	+3.37	+14.8	−14 48.0	11 21.9	+ 8 11.7	+0.9344	0.5644	+0.1

EMENTS FOR THE PREDICTION OF OCCULTATIONS.

DECEMBER.

THE STAR'S					AT CONJUNCTION IN R. A.						Limiting Parallels.	
	Mag.	Red'ns from 1917.0. Δα	Δδ	Apparent Declination.	Greenwich Mean Time.	Hour Angle, *H*	*Y'*	*x'*	*y'*		N.	S.
		s	"	° ′	d h m	h m					°	°
rii	4.5	+3.35	+16.4	−11 42.2	17 16 9.0	−11 11.2	−1.1988	0.5621	+0.2112		−37	−90
rii	6.5	3.40	16.2	13 32.5	18 57.0	− 8 29.3	+1.2546	0.5608	0.2146		+76	+39
rii	5.6	3.38	17.6	10 5.9	23 3.5	− 4 31.3	−1.3336	0.5590	0.2102		−53	−81
rii	6.5	3.41	17.4	11 55.4	18 0 22.7	− 3 14.9	+0.8008	0.5584	0.2206		+78	+ 4
icorni	6.2	3.44	18.4	10 56.7	5 24.0	+ 1 35.9	+0.9336	0.5562	0.2256		+79	+12
icorni	5.3	+3.44	+19.2	− 9 27.5	7 53.7	+ 4 0.5	−0.0023	0.5552	+0.2278		+37	−40
icorni	6.3	3.45	19.2	9 30.3	8 27.7	+ 4 33.3	+0.3244	0.5550	0.2283		+56	−23
rii	5.6	3.48	21.0	6 55.1	16 9.6	+11 59.4	−0.6571	0.5521	0.2343		+ 3	−85
rii	5.7	3.52	22.0	5 47.8	22 23.1	− 5 54.9	−0.2998	0.5501	0.2381		+23	−57
rii	5.8	3.55	22.4	5 15.1	19 1 40.6	− 2 49.0	−0.0838	0.5492	0.2397		+35	−45
rii	6.3	+3.56	+23.4	− 3 19.8	4 59.3	+ 0 23.1	−1.2285	0.5484	+0.2411		−35	−90
rii	5.2	3.60	23.1	4 39.0	7 57.1	+ 3 14.9	+0.8214	0.5477	0.2422		+85	+ 4
rii	6.3	3.62	23.5	3 53.8	9 21.3	+ 4 36.2	+0.4839	0.5474	0.2426		+69	−14
um	6.2	3.70	24.4	2 50.0	17 25.7	−11 35.4	+1.2919	0.5461	0.2442		+87	+41
um	6.3	3.69	25.5	− 0 15.2	18 32.1	−10 31.2	−1.0475	0.5459	0.2443		−19	−90
um	4.9	+3.84	+26.4	+ 0 48.5	20 6 44.3	+ 1 16.7	+0.8589	0.5451	+0.2437		+90	+ 7
um	6.4	3.84	26.4	0 40.4	6 53.1	+ 1 25.1	+1.0310	0.5451	0.2437		+90	+18
um	5.7	3.88	26.9	1 38.9	11 8.2	+ 5 31.9	+1.0780	0.5451	0.2427		+90	+21
um	5.4	3.94	27.4	3 2.0	15 46.6	+10 1.0	+0.7973	0.5454	0.2412		+90	+ 3
um	4.0	4.03	28.6	6 24.7	21 45.2	− 8 12.3	−1.1955	0.5460	0.2385		−31	−84
um	6.2	+4.13	+29.1	+ 7 47.3	21 5 43.3	− 0 30.2	−0.7109	0.5472	+0.2338		+ 2	−82
um	5.4	4.16	29.1	7 44.2	7 34.5	+ 1 17.3	−0.2279	0.5476	0.2325		+28	−51
um	6.5	4.30	29.0	8 54.6	17 0.6	+10 24.3	+0.7386	0.5499	0.2249		+90	+ 2
um	5.7	4.37	29.9	11 31.8	19 38.8	−11 2.8	−1.3395	0.5506	0.2224		−51	−76
um	6.3	4.52	29.5	12 31.2	22 4 28.9	− 2 30.8	−0.4260	0.5534	0.2130		+17	−60
um	3.7	+4.74	+29.3	+14 55.6	15 36.3	+ 8 13.6	−0.5934	0.5576	+0.1988		+ 8	−69
um	6.2	4.76	28.8	14 14.7	17 30.7	+10 4.0	+0.4798	0.5584	0.1962		+70	− 9
um	6.1	4.82	29.1	15 59.6	19 13.4	+11 43.1	−0.9757	0.5590	0.1937		−16	−74
tis	5.8	4.89	28.8	16 33.0	22 57.7	− 8 40.4	−0.8338	0.5605	0.1881		− 7	−73
tis	5.1	4.97	28.4	17 25.2	23 2 58.2	− 4 48.4	−0.9852	0.5622	0.1817		−17	−73
tis	6.4	+5.02	+28.1	+17 51.8	5 44.3	− 2 8.1	−0.9425	0.5634	+0.1772		−14	−72
tis	6.5	5.05	27.8	17 38.5	7 30.1	− 0 26.1	−0.4068	0.5641	0.1742		+18	−54
tis	6.4	5.06	27.3	16 50.6	8 12.3	+ 0 14.5	+0.5358	0.5644	0.1730		+75	− 3
tis	6.2	5.27	26.5	19 29.7	17 20.0	+ 9 2.6	−0.6861	0.5682	0.1564		+ 2	−70
tis	5.7	5.35	25.5	19 39.9	22 20.0	−10 8.3	−0.1043	0.5702	0.1468		+34	−34
tis	5.8	+5.49	+24.1	+20 20.6	24 4 58.3	− 3 44.5	+0.1259	0.5727	+0.1332		+47	−20
tis (*mean*)	4.6	5.50	24.2	21 0.9	5 26.9	− 3 17.0	−0.5053	0.5729	0.1322		+12	−56
tis	5.0	5.60	22.4	20 44.6	12 2.2	+ 3 3.7	+0.6005	0.5752	0.1180		+83	+ 6
tis	5.2	5.65	21.8	20 51.3	14 40.5	+ 5 36.2	+0.7899	0.5760	0.1121		+90	+18
tis	5.2	5.64	21.6	20 27.1	15 19.1	+ 6 13.3	+1.2789	0.5762	0.1107		+77	+61
tis	6.0	+5.65	+21.4	+20 30.9	16 1.0	+ 6 53.7	+1.2899	0.5764	+0.1091		+73	+64
tis	6.1	5.75	21.3	22 31.5	17 39.7	+ 8 28.7	−0.6153	0.5769	0.1054		+ 5	−61
ri	4.3	5.90	19.5	23 41.8	25 1 3.6	− 8 24.0	−1.1163	0.5787	0.0882		−31	−66
ri	3.0	5.91	19.4	23 51.3	1 32.2	− 7 56.4	−1.2396	0.5788	0.0871		−47	−66
ri	5.5	5.89	19.1	23 10.3	1 54.2	− 7 35.3	−0.4990	0.5789	0.0862		+12	−52
ri	3.7	+5.92	+19.1	+23 48.4	2 13.9	− 7 16.3	−1.1292	0.5790	+0.0854		−32	−66
ri	5.2	5.92	19.2	23 53.1	2 14.4	− 7 15.8	−1.2152	0.5790	0.0854		−43	−66
ri	5.9	5.86	18.6	21 59.9	2 34.0	− 6 56.9	+0.7787	0.5791	0.0846		+90	+20
ri	5.8	5.91	17.8	22 14.7	5 25.8	− 4 11.7	+0.7549	0.5796	0.0777		+90	+19
ri	*6.0*	*5.93*	*18.0*	*22 56.4*	5 30.3	− 4 7.2	+0.0369	0.5796	0.0776		+42	−20
i	6.5	+5.96	+17.5	+22 58.4	7 6.4	− 2 34.8	+0.1246	0.5799	+0.0737		+47	−15

ELEMENTS FOR THE PREDICTION OF OCCULTATIC

DECEMBER.

THE STAR'S						AT CONJUNCTION IN R. A.				
	Name.	Mag.	Red'ns from 1917.0.		Apparent Declination.	Greenwich Mean Time.	Hour Angle, H	Υ	x'	
			$\Delta\alpha$	$\Delta\delta$						
			s	"	° ′	d h m	h m			
36	Tauri	5.6	+6.01	+17.2	+23 53.0	25 8 30.0	− 1 14.4	−0.7230	0.5801	+
192 B.	Tauri	6.1	5.98	15.8	22 12.3	12 1.1	+ 2 8.8	+1.2578	0.5806	
62	Tauri	6.1	6.12	14.6	24 6.8	16 34.5	+ 6 31.8	−0.4761	0.5809	
υ	Tauri	4.2	6.07	14.0	22 37.8	17 32.5	+ 7 27.6	+1.1198	0.5810	
72	Tauri	5.4	6.07	14.0	22 48.9	17 56.8	+ 7 51.1	+0.9471	0.5810	
284 B.	Tauri	6.0	+6.14	+12.7	+23 10.5	21 43.1	+11 28.8	+0.7301	0.5810	+
τ	Tauri	4.3	6.13	11.9	22 48.1	26 0 5.7	−10 14.0	+1.2041	0.5810	
95	Tauri	6.2	6.19	11.9	23 56.2	0 29.0	− 9 51.6	+0.0292	0.5810	
300 B.	Tauri	6.2	6.18	11.5	23 28.8	1 30.5	− 8 52.4	+0.5368	0.5810	
315 B.	Tauri	6.3	6.26	10.1	24 27.8	5 50.4	− 4 42.3	−0.3956	0.5806	
99	Tauri	6.0	+6.24	+ 9.8	+23 49.4	6 29.2	− 4 5.0	+0.2873	0.5805	+
k	Tauri	5.6	6.29	9.8	24 55.6	6 36.7	− 3 57.8	−0.8686	0.5805	
103	Tauri	5.5	6.28	8.3	24 9.5	10 43.9	+ 0 0.1	−0.0218	0.5800	+
118	Tauri	5.4	6.38	5.2	25 5.1	19 29.3	+ 8 25.9	−1.0515	0.5781	−
121	Tauri	5.1	6.34	4.2	23 59.2	22 4.7	+10 55.5	+0.0557	0.5774	
394 B.	Tauri	6.0	+6.32	+ 3.0	+23 10.0	27 1 23.0	− 9 53.6	+0.8322	0.5763	−
132	Tauri	5.0	6.39	2.2	24 32.5	3 44.9	− 7 36.9	−0.7018	0.5755	
412 B.	Tauri	5.8	6.39	+ 1.0	24 14.3	7 5.3	− 4 24.0	−0.5192	0.5742	
1	Geminorum	4.3	6.35	− 0.2	23 16.1	10 8.5	− 1 27.4	+0.3603	0.5730	
3	Geminorum	5.6	6.34	1.0	23 7.7	12 31.7	+ 0 50.6	+0.3791	0.5719	
5	Geminorum	5.9	+6.41	− 1.3	+24 26.4	13 16.6	+ 1 33.7	−1.0567	0.5716	−
6	Geminorum	6.3	6.34	1.4	22 55.7	13 38.0	+ 1 54.4	+0.5264	0.5714	
η	Gemin. (*var.*)	3.2	6.31	1.8	22 31.9	14 44.0	+ 2 58.0	+0.8800	0.5709	
8	Geminorum	6.1	6.39	2.0	23 59.8	15 19.4	+ 3 32.1	−0.7145	0.5706	
9	Geminorum	6.2	6.38	2.1	23 46.2	15 36.5	+ 3 48.7	−0.4910	0.5705	
μ	Geminorum	3.2	+6.33	− 3.1	+22 33.4	18 11.4	+ 6 18.0	+0.6238	0.5692	−
36 B.	Geminorum	6.0	6.36	3.4	23 22.4	19 17.6	+ 7 21.8	−0.3245	0.5687	
d	Geminorum	5.2	6.27	7.3	21 51.5	28 6 38.2	− 5 41.9	+0.3227	0.5624	
ζ	Gemin. (*var.*)	3.7	6.21	9.1	20 41.4	12 13.1	− 0 18.7	+0.9978	0.5590	
44	Geminorum	5.9	6.30	9.4	22 45.6	12 43.2	+ 0 10.4	−1.2742	0.5586	
120 B.	Geminorum	6.5	+6.22	−10.4	+21 23.4	14 54.0	+ 2 16.7	−0.0498	0.5573	−
56	Geminorum	5.2	6.17	11.7	20 35.9	20 14.8	+ 7 26.5	+0.1639	0.5538	
149 B.	Geminorum	6.4	6.19	12.4	21 41.9	22 28.1	+ 9 35.3	−1.3002	0.5523	
61	Geminorum	5.8	6.15	12.4	20 25.3	22 31.2	+ 9 38.2	+0.0680	0.5523	
63	Geminorum	5.3	6.20	12.6	21 36.8	22 52.2	+ 9 58.6	−1.2590	0.5521	
79	Geminorum	6.3	+6.11	−14.9	+20 30.7	29 6 55.2	− 6 14.6	−1.1699	0.5466	−
g	Geminorum	5.0	6.03	14.9	18 42.6	7 24.2	− 5 46.6	+0.7067	0.5463	
209 B.	Geminorum	6.2	6.05	15.7	19 32.1	10 6.8	− 3 9.2	−0.5786	0.5444	
3	Cancri	5.7	5.95	16.6	17 31.9	14 19.0	+ 0 54.7	+0.9518	0.5416	
10 H.	Cancri	6.1	5.99	17.4	19 4.4	16 10.8	+ 2 43.0	−1.0057	0.5404	
ζ	Cancri (*mean*)	4.7	+5.93	−18.3	+17 53.6	19 45.9	+ 6 11.0	−0.3014	0.5379	−
d^2	Cancri	6.2	5.84	19.9	17 18.9	30 2 23.3	−11 24.1	−0.7783	0.5334	
90 B.	Cancri	6.3	5.75	20.7	15 35.7	7 28.0	− 6 29.0	+0.2069	0.5301	
54	Cancri	6.3	5.68	22.3	15 39.2	14 54.4	+ 0 43.7	−1.2088	0.5254	
209 B.	Cancri	6.5	5.50	23.7	11 53.8	31 0 29.3	+10 1.4	+1.0708	0.5197	
222 B.	Cancri	6.3	+5.47	−24.4	+11 50.6	4 39.8	− 9 55.5	+0.3076	0.5174	−
ξ	Leonis	5.1	5.39	25.7	11 39.7	12 1.5	− 2 46.7	−0.9796	0.5135	
h	Leonis	5.2	5.36	25.3	10 4.5	12 2.7	− 2 45.5	+0.7579	0.5135	
o	Leonis	3.8	+5.31	−26.1	+10 15.8	16 54.3	+ 1 57.7	−0.4515	0.5111	−

OCCULTATIONS VISIBLE AT WASHINGTON.

The Star's		IMMERSION.				EMERSION.				Duration of Occultation.
		Washington.		Angle from—		Washington.		Angle from—		
Name.	Mag.	Sidereal Time.	Mean Time.	North Point.	Vertex.	Sidereal Time.	Mean Time.	North Point.	Vertex.	
		h m	h m	°	°	h m	h m	°	°	h m
66 Arietis	6.1	23 7	4 16	108	165	0 6	5 14	207	260	0 59
23 Tauri	4.3	10 0	15 6	12	320	10 13	15 20	345	294	0 13
5 Geminorum	5.9	23 48	4 44	152	204	0 13	5 9	202	256	0 25
44 Geminorum	5.9	0 29	5 21	125	177	1 19	6 12	240	295	0 50
δ Geminorum	3.5	9 48	14 39	106	51	11 2	15 53	302	244	1 14
149 B. Geminorum	6.4	13 43	18 33	45	353	14 6	18 56	354	304	0 23
63 Geminorum	5.3	14 4	18 55	52	1	14 33	19 23	346	298	0 28
85 Geminorum	5.2	0 43	5 32	91	140	1 41	6 29	285	338	0 57
217 B. Geminorum	6.3	3 23	8 11	57	113	4 16	9 3	328	24	0 52
54 Cancri	6.3	5 37	10 21	169	220	6 23	11 6	236	283	0 45
ξ Leonis	5.1	2 57	7 38	165	216	3 29	8 10	231	283	0 32
155 B. Leonis	6.5	7 24	11 59	141	185	8 43	13 18	286	317	1 19
q Virginis †	5.3	6 31	10 55	88	140	7 23	11 47	330	19	0 52
85 B. Scorpii †	6.0	11 8	15 16	71	120	11 58	16 5	322	6	0 50
19 Piscium	5.4	2 48	6 25	70	26	3 52	7 30	229	180	1 5
26 Arietis	6.2	7 12	10 37	55	359	8 11	11 35	283	229	0 58
66 Arietis	6.1	9 18	12 39	124	70	10 4	13 24	229	178	0 45
5 Geminorum	5.9	10 16	13 24	158	99	10 58	14 6	234	176	0 42
87 B. Geminorum	5.8	2 7	5 13	60	118	3 9	6 15	305	4	1 2
44 Geminorum	5.9	11 0	14 4	104	45	12 5	15 9	298	242	1 5
85 Geminorum	5.2	11 28	14 28	52	356	11 57	14 58	1	305	0 29
ξ Leonis	5.1	13 31	16 23	57	4	14 0	16 52	4	311	0 29
3 Scorpii	5.9	13 42	16 3	136	162	14 54	17 14	260	273	1 11
47 B. Arietis	6.5	6 59	8 37	46	351	7 52	9 30	286	233	0 53
ε Arietis (*mean*)	4.6	4 51	6 26	106	56	6 1	7 36	228	172	1 10
36 Tauri	5.6	9 58	11 28	88	34	10 54	12 24	273	223	0 56
k Tauri	5.6	9 26	10 52	118	60	10 26	11 52	256	200	1 0
83 B. Leonis	5.9	9 17	10 20	80	93	10 17	11 20	354	344	1 0
89 B. Leonis	6.2	11 9	12 11	141	114	12 28	13 31	292	249	1 20
π Leonis	4.9	12 42	13 44	119	74	13 55	14 57	307	256	1 13
370 B. Virginis	6.0	8 45	9 32	111	156	9 54	10 41	315	352	1 9
9 G. Libræ †	6.5	9 36	10 16	103	152	10 39	11 18	309	352	1 2
u Arietis ‡	5.7	9 31	9 19	80	31	10 22	10 10	263	218	0 51
118 Tauri	5.4	8 36	8 13	54	354	9 26	9 3	327	268	0 50
10 H. Cancri	6.1	7 53	7 18	136	140	9 19	8 44	278	240	1 26
54 Cancri	6.3	6 38	5 59	100	146	8 4	7 25	315	335	1 26
o Leonis	3.8	11 10	10 27	164	132	12 15	11 31	267	222	1 4
155 B. Leonis	6.5	8 29	7 42	113	147	9 54	9 6	319	328	1 24
σ Scorpii	3.1	16 9	14 53	116	117	17 31	16 15	260	244	1 22
70 B. Sagittarii	6.4	16 2	14 38	22	49	16 36	15 13	331	352	0 35
σ Capricorni	5.5	15 36	14 4	113	161	16 29	14 58	218	260	0 53
209 B. Geminorum	6.2	12 42	10 20	80	25	13 33	11 11	326	272	0 51
31 B. Scorpii	5.4	12 33	9 32	119	157	13 45	10 43	277	303	1 11
40 B. Scorpii	5.4	15 14	12 12	113	122	16 38	13 36	272	262	1 23
50 B. Scorpii	6.4	18 36	15 33	45	14	19 26	16 24	319	280	0 51
191 B. Sagittarii	6.5	18 47	15 32	90	94	20 4	16 49	233	220	1 17
64 B. Virginis ‡	6.5	17 38	13 5	136	86	18 33	14 0	267	215	0 55
42 Libræ ‡	*5.0*	*20 7*	*15 18*	13	327	20 19	15 30	352	305	0 12

—*The angles of position are counted from the north point and vertex of the Moon's limb toward the east.*
mersion below the horizon of Washington. ‡ Emersion below the horizon of Washington.

OCCULTATIONS VISIBLE AT WASHINGTON.

Date.	The Star's Name.	Mag.	Immersion. Washington. Sidereal Time.	Immersion. Washington. Mean Time.	Immersion. Angle from— North Point.	Immersion. Angle from— Vertex.	Emersion. Washington. Sidereal Time.	Emersion. Washington. Mean Time.	Emersion. Angle from— North Point.
			h m	h m	°	°	h m	h m	°
June 11	22 B. Piscium	6.4	17 28	12 8	103	154	18 13	12 53	204
11	9 Piscium	6.4	19 41	14 21	35	81	20 44	15 23	261
11	κ Piscium	4.9	20 5	14 45	341	25	20 20	15 0	316
15	47 Arietis	5.8	20 10	14 34	51	101	21 0	15 24	270
25	p^3 Leonis	6.1	14 20	8 6	120	76	15 32	9 18	301
26	13 B. Virginis ‡	5.9	17 2	10 43	56	6	17 36	11 17	351
July 1	50 B. Scorpii	6.4	15 56	9 18	26	27	16 20	9 41	354
3	70 B. Sagittarii	6.4	22 13	15 26	154	112	22 24	15 36	173
4	222 B. Sagittarii	5.5	19 38	12 48	80	75	20 53	14 2	238
4	50 Sagittarii	5.5	22 47	15 56	66	27	23 49	16 57	249
27	18 G. Librae ‡	6.1	19 16	10 55	59	13	20 7	11 46	317
Aug. 5	16 Piscium	5.7	17 43	8 47	26	77	18 27	9 30	282
5	19 Piscium	5.4	23 16	14 19	53	62	0 32	15 34	235
6	136 B. Piscium	6.5	23 32	14 30	95	119	0 31	15 30	196
7	101 Piscium	6.2	23 35	14 30	94	136	0 38	15 33	203
10	62 Tauri	6.1	0 30	15 13	19	78	1 9	15 52	311
12	8 Geminorum	6.1	1 26	16 1	27	84	1 59	16 34	329
12	9 Geminorum	6.2	1 26	16 2	91	149	2 38	17 13	266
28	222 B. Sagittarii	5.5	20 18	9 51	116	102	21 8	10 41	200
28	50 Sagittarii ‡	5.5	23 18	12 51	99	56	0 9	13 42	217
30	72 B. Aquarii	6.5	1 37	15 2	342	297	1 50	15 14	319
Sept. 1	κ Piscium	4.9	4 2	17 18	98	48	4 49	18 5	210
4	20 H^1. Arietis	6.4	0 28	13 32	109	149	1 21	14 26	195
6	33 Tauri	6.0	21 26	10 24	6	58	21 46	10 43	323
6	161 B. Tauri	6.5	22 41	11 38	68	124	23 43	12 40	258
7	99 Tauri	6.0	22 54	11 47	148	202	23 16	12 9	191
23	63 Ophiuchi	6.1	19 47	7 38	54	30	20 57	8 48	282
24	154 B. Sagittarii	5.9	20 38	8 24	87	64	21 48	9 35	233
26	95 B. Capricorni	5.9	0 20	11 58	42	2	1 19	12 57	260
29	16 Piscium	5.7	18 46	6 13	356	46	19 9	6 37	309
29	19 Piscium	5.4	0 17	11 44	44	33	1 29	12 56	247
30	136 B. Piscium	6.5	23 22	10 44	42	68	0 33	11 56	251
Oct. 4	95 Tauri	6.2	3 30	14 36	85	126	4 57	16 3	262
5	121 Tauri	5.1	0 27	11 30	72	129	1 31	12 34	275
7	56 Geminorum †	5.2	0 0	10 55	122	170	0 49	11 44	247
7	61 Geminorum	5.8	2 27	13 22	142	198	3 16	14 11	232
21	24 Sagittarii	5.7	18 52	4 53	141	136	19 26	5 27	190
21	117 B. Sagittarii	5.8	21 25	7 26	83	50	22 32	8 33	240
23	47 B. Capricorni	6.2	23 5	8 57	87	55	0 5	9 57	216
24	72 B. Aquarii	6.5	22 0	7 49	16	7	22 58	8 47	279
26	κ Piscium	4.9	4 27	14 7	149	99	4 32	14 12	160
29	20 H^1. Arietis	6.4	0 47	10 15	64	98	2 4	11 33	243
Nov. 2	1 Geminorum	4.3	23 36	8 49	81	133	0 34	9 46	273
2	3 Geminorum	5.6	2 19	11 32	130	188	3 17	12 29	229
3	120 B. Geminorum	6.5	5 27	14 35	69	115	6 41	15 49	320
10	q Virginis †	5.3	6 54	15 35	110	162	7 57	16 37	305
24	136 B. Piscium	6.5	20 45	4 32	32	82	21 43	5 30	267
27	32 Tauri	5.8	9 56	17 29	144	91	10 28	18 0	216

Note.—The angles of position are counted from the north point and vertex of the Moon's limb towa
† *Immersion* below the horizon of Washington. ‡ Emersion below the horizon of Wash

OCCULTATIONS VISIBLE AT WASHINGTON.

The Star's		IMMERSION.				EMERSION.				Duration of Occultation.
		Washington.		Angle from—		Washington.		Angle from—		
Name.	Mag.	Sidereal Time.	Mean Time.	North Point.	Vertex.	Sidereal Time.	Mean Time.	North Point.	Vertex.	
		h m	h m	°	°	h m	h m	°	°	h m
284 B. Tauri	6.0	23 8	6 38	114	170	23 56	7 27	221	278	0 48
300 B. Tauri	6.2	4 15	11 45	154	172	4 47	12 17	197	193	0 31
d Geminorum	5.2	9 56	17 17	66	10	10 46	18 8	333	276	0 50
g Geminorum	5.0	10 56	18 13	135	81	12 1	19 18	274	218	1 5
222 B. Cancri	6.3	6 22	13 32	120	168	7 47	14 57	294	327	1 25
237 B. Leonis	6.3	11 23	18 24	162	151	12 35	19 36	271	241	1 11
e Leonis	5.1	7 9	14 7	182	230	7 41	14 39	237	283	0 32
101 Piscium	6.2	7 23	13 18	103	51	8 12	14 7	228	178	0 49
ζ Arietis	5.0	23 30	5 18	87	144	0 36	6 25	230	283	1 7
3 Geminorum	5.6	23 58	5 34	69	122	0 54	6 30	286	343	0 56
6 Geminorum	6.3	1 9	6 45	120	177	2 6	7 42	237	295	0 57
μ Geminorum	3.2	8 3	13 39	178	130	8 27	14 3	212	160	0 24

—The angles of position are counted from the north point and vertex of the Moon's limb toward the east.

EPHEMERIS FOR PHYSICAL OBSERVATIONS OF THE SU

FOR GREENWICH MEAN NOON.

Date.	P	B_0	L_0	Date.	P	B_0
	°	°	°		°	°
Jan. 1	+ 1.99	−3.16	162.77	July 5	− 0.88	+3.42
6	− 0.44	3.73	96.92	10	+ 1.39	3.94
11	2.86	4.27	31.07	15	3.64	4.43
16	5.23	4.77	325.24	20	5.85	4.90
21	7.54	5.24	259.40	25	8.00	5.32
26	− 9.76	−5.66	193.57	30	+10.07	+5.72
31	11.89	6.04	127.74	Aug. 4	12.06	6.07
Feb. 5	13.90	6.37	61.90	9	13.96	6.38
10	15.79	6.65	356.07	14	15.75	6.64
15	17.54	6.88	290.23	19	17.42	6.86
20	−19.15	−7.05	224.39	24	+18.98	+7.04
25	20.62	7.17	158.54	29	20.40	7.16
Mar. 2	21.93	7.24	92.67	Sept. 3	21.69	7.23
7	23.08	7.25	26.80	8	22.84	7.25
12	24.07	7.20	320.91	13	23.84	7.22
17	−24.89	−7.10	255.00	18	+24.68	+7.13
22	25.54	6.94	189.08	23	25.37	6.99
27	26.01	6.74	123.15	28	25.89	6.80
Apr. 1	26.31	6.48	57.19	Oct. 3	26.24	6.56
6	26.43	6.18	351.21	8	26.41	6.27
11	−26.36	−5.83	285.21	13	+26.40	+5.94
16	26.11	5.44	219.19	18	26.20	5.55
21	25.68	5.01	153.16	23	25.81	5.13
26	25.06	4.55	87.10	28	25.23	4.66
May 1	24.26	4.06	21.02	Nov. 2	24.45	4.16
6	−23.28	−3.53	314.93	7	+23.47	+3.63
11	22.13	2.99	248.81	12	22.29	3.07
16	20.80	2.42	182.69	17	20.93	2.48
21	19.31	1.84	116.55	22	19.38	1.87
26	17.67	1.25	50.39	27	17.65	1.25
31	−15.88	−0.65	344.23	Dec. 2	+15.76	+0.61
June 5	13.98	−0.05	278.06	7	13.73	−0.03
10	11.96	+0.55	211.88	12	11.56	0.67
15	9.85	1.15	145.69	17	9.30	1.29
20	7.66	1.74	79.51	22	6.95	1.93
25	− 5.43	+2.32	13.33	27	+ 4.55	−2.54
30	− 3.16	+2.88	307.14	32	+ 2.11	−3.13

In the above table, P is the position-angle of the axis of rotation measured eastw the north point of the disk, while L_0 and B_0 are the heliographic longitudes and latitude tively, of the center of the disk. The longitudes are reckoned from the Solar Meridi *passed through* the ascending node of the Sun's equator on the ecliptic, on January 1, 185 *vich Mean Noon.*

MEAN EQUATOR, ORBIT, AND MEAN LONGITUDE.

FOR GREENWICH MEAN NOON.

Mean Equator.			Orbit.		Mean Longitude.	Mean Solar Days.	Motion in Mean Longitude.
i	Δ	Ω'	Γ'	Ω	$\mathbb{C}$		
° ′	° ′	° ′	° ′	° ′	° ′		° ′
22 57.5	107 0.1	3 41.4	306 2.1	290 23.4	2 41.7	0.1	1 19.06
22 58.3	106 27.8	3 42.1	307 8.9	289 51.6	134 27.5	0.2	2 38.12
22 59.1	105 55.4	3 42.7	308 15.7	289 19.8	266 13.4	0.3	3 57.18
22 59.9	105 23.2	3 43.3	309 22.6	288 48.0	37 59.2	0.4	5 16.23
23 0.7	104 50.9	3 43.8	310 29.4	288 16.3	169 45.1	0.5	6 35.29
						0.6	7 54.35
23 1.6	104 18.6	3 44.4	311 36.3	287 44.5	301 30.9	0.7	9 13.41
23 2.4	103 46.4	3 44.9	312 43.1	287 12.7	73 16.7	0.8	10 32.47
23 3.2	103 14.1	3 45.4	313 50.0	286 40.9	205 2.6	0.9	11 51.53
23 4.0	102 41.9	3 45.9	314 56.8	286 9.2	336 48.4	1.0	13 10.58
23 4.9	102 9.7	3 46.4	316 3.6	285 37.4	108 34.2	2.0	26 21.17
						3.0	39 31.75
23 5.7	101 37.5	3 46.8	317 10.5	285 5.6	240 20.1	4.0	52 42.33
23 6.5	101 5.4	3 47.2	318 17.3	284 33.9	12 5.9	5.0	65 52.92
23 7.4	100 33.2	3 47.7	319 24.2	284 2.1	143 51.8	6.0	79 3.50
23 8.2	100 1.1	3 48.0	320 31.0	283 30.3	275 37.6	7.0	92 14.09
23 9.0	99 29.0	3 48.4	321 37.9	282 58.5	47 23.4	8.0	105 24.67
						9.0	118 35.25
23 9.9	98 56.9	3 48.8	322 44.7	282 26.8	179 9.3	10.0	131 45.84
23 10.7	98 24.9	3 49.1	323 51.5	281 55.0	310 55.1		
23 11.6	97 52.8	3 49.4	324 58.4	281 23.2	82 41.0	Hours.	° ′
23 12.4	97 20.8	3 49.7	326 5.2	280 51.5	214 26.8	1	0 32.94
23 13.3	96 48.8	3 49.9	327 12.1	280 19.7	346 12.6	2	1 5.88
						3	1 38.82
23 14.1	96 16.8	3 50.2	328 18.9	279 47.9	117 58.5	4	2 11.76
23 15.0	95 44.9	3 50.4	329 25.7	279 16.1	249 44.3	5	2 44.70
23 15.8	95 12.9	3 50.6	330 32.6	278 44.4	21 30.1	6	3 17.65
23 16.6	94 41.0	3 50.8	331 39.4	278 12.6	153 16.0	7	3 50.59
23 17.5	94 9.1	3 51.0	332 46.3	277 40.8	285 1.8	8	4 23.53
						9	4 56.47
23 18.4	93 37.2	3 51.1	333 53.1	277 9.0	56 47.7	10	5 29.41
23 19.2	93 5.3	3 51.2	335 0.0	276 37.3	188 33.5	11	6 2.35
23 20.0	92 33.4	3 51.4	336 6.8	276 5.5	320 19.3	12	6 35.29
23 20.9	92 1.6	3 51.4	337 13.6	275 33.7	92 5.2	13	7 8.23
23 21.8	91 29.8	3 51.5	338 20.5	275 2.0	223 51.0	14	7 41.17
						15	8 14.11
23 22.6	90 57.9	3 51.6	339 27.3	274 30.2	355 36.8	16	8 47.06
23 23.4	90 26.2	3 51.6	340 34.2	273 58.4	127 22.7	17	9 20.00
23 24.3	89 54.4	3 51.6	341 41.0	273 26.6	259 8.5	18	9 52.94
23 25.2	89 22.6	3 51.6	342 47.9	272 54.9	30 54.4	19	10 25.88
23 26.0	88 50.9	3 51.5	343 54.7	272 23.1	162 40.2	20	10 58.82
						21	11 31.76
23 26.9	88 19.2	3 51.5	345 1.5	271 51.3	294 26.0	22	12 4.70
23 27.7	87 47.5	3 51.4	346 8.4	271 19.5	66 11.9	23	12 37.64
23 28.6	87 15.9	3 51.3	347 15.2	270 47.8	197 57.7		

Daily motion of Γ' . . . . . +6′.684
***Daily motion of Ω* . . . . . −3′.177**

EPHEMERIS FOR PHYSICAL OBSERVATIONS OF THE MO

FOR GREENWICH MEAN MIDNIGHT.

Date.		The Earth's Selenographic—		Physical Libration.		The Sun's Selenographic—	
		Long.	Lat.	Long.	Lat.	Colong.	Lat.
		°	°	°	°	°	°
Jan.	1	+6.98	−6.72	0.00	+0.01	11.56	−0.24
	2	6.75	6.30	0.00	0.01	23.70	0.22
	3	6.24	5.59	0.00	0.01	35.84	0.19
	4	5.50	4.61	0.00	0.01	47.98	0.16
	5	4.53	3.44	0.00	0.01	60.11	0.13
	6	+3.41	−2.13	0.00	+0.01	72.24	−0.10
	7	2.16	−0.73	0.00	0.01	84.38	0.07
	8	+0.82	+0.69	0.00	0.01	96.50	0.04
	9	−0.57	2.07	0.00	0.01	108.64	−0.01
	10	1.98	3.36	−0.01	0.01	120.77	+0.02
	11	−3.34	+4.51	−0.01	+0.01	132.90	+0.05
	12	4.62	5.48	0.01	0.01	145.04	0.08
	13	5.76	6.21	0.01	0.01	157.18	0.10
	14	6.68	6.68	0.01	0.01	169.33	0.13
	15	7.34	6.84	0.01	0.01	181.48	0.15
	16	−7.67	+6.68	−0.01	+0.01	193.64	+0.18
	17	7.62	6.16	0.01	0.01	205.81	0.20
	18	7.14	5.29	0.01	0.01	217.99	0.23
	19	6.23	4.07	0.01	0.01	230.17	0.25
	20	4.91	2.56	0.01	0.01	242.36	0.28
	21	−3.23	+0.84	−0.01	+0.01	254.55	+0.31
	22	−1.31	−0.96	0.01	0.01	266.74	0.34
	23	+0.72	2.70	0.01	0.01	278.93	0.36
	24	2.70	4.25	0.01	0.01	291.12	0.39
	25	4.48	5.48	0.01	0.01	303.32	0.42
	26	+5.93	−6.31	−0.01	+0.01	315.50	+0.46
	27	6.97	6.74	0.01	0.01	327.68	0.48
	28	7.55	6.76	0.01	0.01	339.85	0.51
	29	7.68	6.40	0.01	0.01	352.02	0.54
	30	7.40	5.74	0.01	0.01	4.18	0.57
	31	+6.76	−4.81	−0.01	+0.01	16.33	+0.60
Feb.	1	5.83	3.68	0.01	0.01	28.48	0.63
	2	4.68	2.40	0.01	0.01	40.63	0.66
	3	3.38	−1.04	0.01	0.01	52.77	0.69
	4	2.01	+0.37	0.01	0.02	64.91	0.72
	5	+0.60	+1.75	−0.01	+0.02	77.05	+0.75
	6	−0.80	3.05	0.01	0.02	89.18	0.77
	7	2.14	4.23	0.01	0.02	101.32	0.80
	8	3.40	5.23	0.02	0.02	113.46	0.82
	9	4.55	6.01	0.02	0.02	125.59	0.84
	10	−5.55	+6.52	−0.02	+0.02	137.73	+0.86
	11	6.37	6.74	0.02	0.02	149.88	0.88
	12	6.98	6.65	0.02	0.02	162.03	0.90
	13	7.33	6.23	0.02	0.02	174.19	0.92
	14	7.38	5.48	0.02	0.02	186.36	0.93
	15	−7.10	+4.41	−0.02	+0.02	198.53	+0.95
	16	−6.44	+3.06	−0.02	+0.02	210.71	+0.97

EPHEMERIS FOR PHYSICAL OBSERVATIONS OF THE MOON.

FOR GREENWICH MEAN MIDNIGHT.

te.	The Earth's Selenographic—		Physical Libration.		The Sun's Selenographic—		C
	Long.	Lat.	Long.	Lat.	Colong.	Lat.	
	°	°	°	°	°	°	°
16	−6.44	+3.06	−0.02	+0.02	210.71	+0.97	4.84
17	5.40	+1.49	0.02	0.02	222.89	0.98	358.71
18	3.98	−0.22	0.02	0.02	235.08	1.00	352.69
19	2.24	1.95	0.02	0.02	247.28	1.02	347.28
20	−0.30	3.56	0.01	0.02	259.48	1.04	342.82
21	+1.71	−4.92	−0.01	+0.02	271.68	+1.07	339.52
22	3.62	5.92	0.01	0.02	283.89	1.09	337.49
23	5.25	6.50	0.01	0.02	296.09	1.11	336.79
24	6.50	6.66	0.01	0.02	308.29	1.13	337.43
25	7.26	6.40	0.01	0.02	320.48	1.16	339.37
26	+7.52	−5.80	−0.01	+0.02	332.67	+1.18	342.51
27	7.30	4.92	0.01	0.02	344.85	1.20	346.63
28	6.67	3.82	0.01	0.02	357.02	1.23	351.44
1	5.71	2.57	0.01	0.02	9.20	1.25	356.60
2	4.51	−1.23	0.01	0.02	21.36	1.27	1.76
3	+3.15	+0.15	−0.02	+0.02	33.52	+1.29	6.64
4	1.73	1.51	0.02	0.02	45.68	1.31	11.07
5	+0.30	2.81	0.02	0.02	57.83	1.33	14.90
6	−1.05	3.98	0.02	0.02	69.98	1.35	18.08
7	2.29	5.00	0.02	0.02	82.13	1.36	20.54
8	−3.39	+5.79	−0.02	+0.02	94.28	+1.38	22.24
9	4.33	6.34	0.02	0.02	106.42	1.39	23.10
10	5.10	6.59	0.02	0.02	118.57	1.40	23.03
11	5.69	6.54	0.02	0.02	130.73	1.40	21.94
12	6.10	6.16	0.02	0.02	142.88	1.40	19.72
13	−6.31	+5.46	−0.02	+0.02	155.05	+1.41	16.34
14	6.31	4.47	0.02	0.02	167.22	1.41	11.86
15	6.07	3.21	0.02	0.02	179.39	1.42	6.49
16	5.57	1.74	0.02	0.02	191.57	1.42	0.62
17	4.76	+0.14	0.02	0.02	203.76	1.42	354.71
18	−3.65	−1.50	−0.02	+0.02	215.96	+1.43	349.22
19	2.26	3.08	0.02	0.02	228.16	1.43	344.50
20	−0.64	4.46	0.02	0.02	240.37	1.44	340.78
21	+1.10	5.54	0.02	0.02	252.58	1.45	338.21
22	2.81	6.25	0.02	0.02	264.80	1.46	336.91
23	+4 35	−6 53	−0.02	+0.02	277.02	+1.47	336.95
24	5.56	6.39	0.02	0.02	289.24	1.48	338.36
25	6.36	5.87	0.02	0.02	301.45	1.49	341.09
26	6.67	5.03	0.02	0.02	313.66	1.50	344.96
27	6.52	3.95	0.02	0.02	325.86	1.51	349.68
28	+5.95	−2.70	−0.02	+0.02	338.07	+1.52	354.87
29	5.02	−1.35	0.02	0.02	350.26	1.53	0.15
30	3.84	+0.03	0.02	0.02	2.45	1.54	5.21
31	2.50	1.38	0.02	0.02	14.63	1.55	9.82
1	+1.09	2.67	0.02	0.02	26.81	1.56	13.85
2	*−0.29*	*+3.84*	*−0.02*	+0.02	38.99	+1.57	17.23
3	*−1.58*	*+4.86*	*−0.02*	+0.02	51.16	+1.57	19.92

EPHEMERIS FOR PHYSICAL OBSERVATIONS OF THE MOON

FOR GREENWICH MEAN MIDNIGHT.

Date.		The Earth's Selenographic—		Physical Libration.		The Sun's Selenographic—		
		Long.	Lat.	Long.	Lat.	Colong.	Lat.	
		°	°	°	°	°	°	
Apr.	1	+1.09	+2.67	−0.02	+0.02	26.81	+1.56	1
	2	−0.29	3.84	0.02	0.02	38.99	1.57	1
	3	1.58	4.86	0.02	0.02	51.16	1.57	1
	4	2.71	5.68	0.02	0.02	63.33	1.58	2
	5	3.64	6.24	0.02	0.02	75.50	1.58	2
	6	−4.35	+6.53	−0.02	+0.02	87.66	+1.57	2
	7	4.84	6.50	0.03	0.02	99.82	1.57	2
	8	5.12	6.14	0.03	0.02	111.99	1.56	2
	9	5.20	5.46	0.03	0.02	124.15	1.55	1
	10	5.12	4.48	0.03	0.02	136.32	1.54	1
	11	−4.88	+3.24	−0.02	+0.02	148.50	+1.53	
	12	4.48	1.80	0.02	0.02	160.68	1.51	
	13	3.91	+0.23	0.02	0.02	172.86	1.50	3
	14	3.17	−1.36	0.02	0.02	185.06	1.49	3
	15	2.24	2.90	0.02	0.02	197.26	1.48	3
	16	−1.13	−4.26	−0.02	+0.02	209.47	+1.47	3
	17	+0.13	5.37	0.02	0.02	221.69	1.46	3
	18	1.46	6.14	0.02	0.02	233.91	1.45	3
	19	2.77	6.50	0.02	0.02	246.14	1.45	3
	20	3.94	6.46	0.02	0.02	258.37	1.44	3
	21	+4.87	−6.02	−0.02	+0.02	270.60	+1.44	3
	22	5.46	5.24	0.02	0.02	282.84	1.44	3
	23	5.66	4.18	0.02	0.02	295.07	1.43	3
	24	5.45	2.93	0.02	0.02	307.30	1.43	3
	25	4.86	1.57	0.02	0.02	319.52	1.43	3
	26	+3.95	−0.16	−0.02	+0.02	331.74	+1.42	
	27	2.80	+1.23	0.02	0.02	343.95	1.42	
	28	1.50	2.55	0.02	0.02	356.16	1.42	
	29	+0.13	3.76	0.02	0.02	8.37	1.42	
	30	−1.21	4.80	0.02	0.02	20.56	1.41	
May	1	−2.44	+5.65	−0.02	+0.02	32.76	+1.40	
	2	3.48	6.25	0.02	0.03	44.95	1.40	
	3	4.27	6.58	0.02	0.03	57.13	1.39	
	4	4.80	6.60	0.02	0.03	69.32	1.37	
	5	5.04	6.29	0.02	0.03	81.50	1.36	
	6	−5.02	+5.65	−0.02	+0.03	93.67	+1.34	
	7	4.75	4.68	0.02	0.03	105.85	1.32	
	8	4.28	3.43	0.02	0.03	118.03	1.29	
	9	3.66	1.96	0.02	0.02	130.21	1.26	
	10	2.92	+0.36	0.02	0.02	142.40	1.24	3
	11	−2.08	−1.27	−0.02	+0.02	154.59	+1.21	3
	12	1.18	2.83	0.02	0.02	166.79	1.19	3
	13	−0.22	4.22	0.02	0.02	179.00	1.16	3
	14	+0.78	5.35	0.02	0.02	191.21	1.14	3
	15	1.78	6.16	0.01	0.02	203.44	1.11	3
	16	+2.75	−6.58	−0.01	+0.02	215.66	+1.09	3
	17	+3.62	−6.61	−0.01	+0.02	227.90	+1.08	

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.	
	°	°	°	°	°	°	°
17	+3.62	−6.61	−0.01	+0.02	227.90	+1.08	337.12
18	4.34	6.25	0.01	0.02	240.14	1.06	338.84
19	4.83	5.53	0.01	0.02	252.38	1.04	341.85
20	5.04	4.52	0.01	0.02	264.62	1.03	345.97
21	4.95	3.28	0.01	0.02	276.87	1.01	350.91
22	+4.54	−1.91	−0.01	+0.02	289.12	+1.00	356.27
23	3.84	−0.46	0.01	0.03	301.36	0.98	1.65
24	2.87	+0.97	0.01	0.03	313.60	0.97	6.70
25	1.71	2.35	0.01	0.03	325.83	0.96	11.22
26	+0.41	3.61	0.02	0.03	338.06	0.95	15.09
27	−0.93	+4.70	−0.02	+0.03	350.29	+0.93	18.26
28	2.24	5.61	0.02	0.03	2.51	0.92	20.71
29	3.44	6.27	0.02	0.03	14.72	0.90	22.39
30	4.44	6.67	0.02	0.03	26.93	0.89	23.24
31	5.18	6.77	0.02	0.03	39.14	0.87	23.15
1	−5.62	+6.54	−0.02	+0.03	51.33	+0.85	21.99
2	5.72	5.98	0.02	0.03	63.53	0.82	19.64
3	5.48	5.08	0.02	0.03	75.72	0.80	16.02
4	4.93	3.86	0.02	0.03	87.90	0.77	11.20
5	4.10	2.40	0.02	0.03	100.09	0.74	5.49
6	−3.07	+0.76	−0.02	+0.03	112.28	+0.70	359.35
7	1.89	−0.95	0.01	0.03	124.47	0.67	353.39
8	−0.65	2.59	0.01	0.03	136.67	0.63	348.02
9	+0.60	4.08	0.01	0.03	148.87	0.60	343.54
10	1.78	5.29	0.01	0.03	161.08	0.56	340.13
11	+2.86	−6.16	−0.01	+0.03	173.29	+0.53	337.84
12	3.79	6.66	0.01	0.03	185.51	0.50	336.73
13	4.53	6.75	0.01	0.03	197.74	0.47	336.85
14	5.06	6.46	0.01	0.03	209.97	0.44	338.23
15	5.36	5.81	0.01	0.03	222.21	0.42	340.86
16	+5.41	−4.86	−0.01	+0.03	234.46	+0.39	344.63
17	5.21	3.67	0.01	0.03	246.71	0.37	349.31
18	4.76	2.31	0.01	0.03	258.96	0.34	354.54
19	4.08	−0.86	0.01	0.03	271.21	0.32	359.92
20	3.18	+0.60	0.01	0.03	283.46	0.30	5.11
21	+2.09	+2.02	−0.01	+0.03	295.71	+0.28	9.83
22	+0.86	3.33	0.01	0.03	307.96	0.27	13.94
23	−0.45	4.49	0.01	0.03	320.20	0.25	17.35
24	1.79	5.46	0.01	0.03	332.44	0.23	20.03
25	3.10	6.19	0.01	0.03	344.68	0.22	21.96
26	−4.29	+6.66	−0.01	+0.03	356.90	+0.20	23.09
27	5.30	6.85	0.01	0.03	9.13	0.18	23.34
28	6.07	6.73	0.01	0.03	21.34	0.16	22.59
29	6.52	6.28	0.01	0.03	33.56	0.13	20.73
30	6.61	5.50	0.01	0.03	45.76	0.11	17.64
1	*−6.32*	*+4.40*	−0.01	+0.03	57.96	+0.08	13.32
2	*−5.63*	*+3.01*	−0.01	+0.03	70.16	+0.05	7.93

EPHEMERIS FOR PHYSICAL OBSERVATIONS OF THE MOON

FOR GREENWICH MEAN MIDNIGHT.

Date.		The Earth's Selenographic—		Physical Libration.		The Sun's Selenographic—		
		Long.	Lat.	Long.	Lat.	Colong.	Lat.	
		°	°	°	°	°	°	
July	1	−6.32	+4.40	−0.01	+0.03	57.96	+0.08	1
	2	5.63	3.01	0.01	0.03	70.16	0.05	
	3	4.58	+1.40	0.01	0.03	82.35	+0.01	
	4	3.22	−0.33	0.01	0.03	94.54	−0.02	35
	5	−1.65	2.06	−0.01	0.03	106.73	0.06	34
	6	+0.03	−3.66	0.00	+0.03	118.92	−0.10	34
	7	1.69	5.01	0.00	0.03	131.12	0.13	34
	8	3.22	6.01	0.00	0.03	143.32	0.17	33
	9	4.53	6.61	0.00	0.03	155.53	0.20	33
	10	5.54	6.79	0.00	0.03	167.74	0.23	33
	11	+6.23	−6.57	0.00	+0.03	179.96	−0.27	33
	12	6.58	5.98	0.00	0.03	192.19	0.30	34
	13	6.59	5.09	0.00	0.03	204.42	0.32	34
	14	6.31	3.95	0.00	0.03	216.66	0.35	34
	15	5.76	2.64	0.00	0.03	228.91	0.38	35
	16	+4.99	−1.22	0.00	+0.03	241.15	−0.40	35
	17	4.04	+0.23	0.00	0.03	253.40	0.43	
	18	2.93	1.66	0.00	0.03	265.65	0.45	
	19	1.70	3.00	0.00	0.03	277.90	0.47	1
	20	+0.41	4.19	0.00	0.03	290.16	0.49	1
	21	−0.93	+5.21	0.00	+0.03	302.40	−0.51	1
	22	2.27	6.00	0.00	0.03	314.65	0.52	2
	23	3.56	6.53	0.00	0.03	326.89	0.54	2
	24	4.74	6.79	0.00	0.03	339.13	0.56	2
	25	5.78	6.76	0.00	0.03	351.36	0.58	2
	26	−6.59	+6.41	0.00	+0.03	3.58	−0.59	2
	27	7.11	5.75	0.00	0.03	15.80	0.61	1
	28	7.30	4.78	0.00	0.03	28.01	0.63	1
	29	7.08	3.53	0.00	0.03	40.22	0.66	1
	30	6.44	2.04	0.00	0.03	52.41	0.68	
	31	−5.36	+0.38	0.00	+0.03	64.60	−0.71	35
Aug.	1	3.88	−1.35	0.00	0.03	76.79	0.74	35
	2	2.09	3.02	0.00	0.03	88.98	0.77	34
	3	−0.10	4.49	0.00	0.03	101.16	0.80	34
	4	+1.92	5.64	0.00	0.03	113.35	0.83	33
	5	+3.79	−6.39	+0.01	+0.03	125.54	−0.86	33
	6	5.39	6.70	0.01	0.03	137.74	0.89	33
	7	6.60	6.57	0.01	0.03	149.94	0.92	33
	8	7.37	6.05	0.01	0.03	162.14	0.94	33
	9	7.68	5.21	0.01	0.03	174.35	0.97	34
	10	+7.58	−4.11	+0.01	+0.03	186.57	−0.99	34
	11	7.11	2.84	0.01	0.03	198.80	1.02	35
	12	6.34	1.46	0.01	0.03	211.03	1.04	35
	13	5.35	−0.03	0.01	0.03	223.26	1.06	
	14	4.20	+1.38	0.01	0.03	235.50	1.08	
	15	*+2.93*	*+2.71*	*+0.01*	*+0.03*	*247.74*	*−1.10*	
	16	*+1.61*	*+3.92*	*+0.01*	*+0.03*	*259.98*	*−1.12*	

HEMERIS 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.	
	°	°	°	°	°	°	°
16	+1.61	+3.92	+0.01	+0.03	259.98	−1.12	15.64
17	+0.27	4.95	0.01	0.03	272.23	1.13	18.73
18	−1.06	5.77	0.01	0.03	284.47	1.15	21.08
19	2.36	6.34	+0.01	0.03	296.71	1.16	22.65
20	3.58	6.64	0.00	0.03	308.95	1.17	23.39
21	−4.72	+6.66	0.00	+0.03	321.19	−1.18	23.21
22	5.71	6.37	0.00	0.03	333.42	1.19	22.05
23	6.53	5.79	0.00	0.03	345.64	1.20	19.81
24	7.11	4.92	0.00	0.03	357.86	1.21	16.45
25	7.40	3.79	0.00	0.03	10.07	1.22	12.02
26	−7.32	+2.42	0.00	+0.03	22.27	−1.23	6.70
27	6.83	+0.88	0.00	0.03	34.47	1.24	0.81
28	5.89	−0.76	+0.01	0.03	46.66	1.26	354.82
29	4.51	2.40	0.01	0.03	58.84	1.28	349.18
30	2.75	3.92	0.01	0.03	71.02	1.30	344.30
31	−0.70	−5.17	+0.01	+0.03	83.20	−1.31	340.46
1	+1.46	6.06	0.01	0.03	95.37	1.33	337.86
2	3.53	6.52	0.01	0.03	107.55	1.35	336.62
3	5.34	6.51	0.01	0.03	119.72	1.37	336.83
4	6.74	6.08	0.01	0.03	131.90	1.38	338.49
5	+7.65	−5.29	+0.01	+0.03	144.09	−1.40	341.49
6	8.04	4.22	0.01	0.03	156.28	1.42	345.62
7	7.95	2.96	0.01	0.03	168.48	1.43	350.54
8	7.44	1.58	0.01	0.03	180.68	1.44	355.86
9	6.59	−0.17	0.01	0.03	192.89	1.46	1.20
10	5.50	+1.23	+0.01	+0.03	205.10	−1.47	6.25
11	4.25	2.55	0.01	0.03	217.32	1.48	10.82
12	2.92	3.75	0.01	0.04	229.55	1.49	14.78
13	1.56	4.78	0.01	0.04	241.77	1.50	18.05
14	+0.22	5.61	0.01	0.04	254.00	1.51	20.60
15	−1.06	+6.20	+0.01	+0.04	266.23	−1.51	22.38
16	2.26	6.52	0.01	0.04	278.46	1.52	23.33
17	3.37	6.55	0.01	0.04	290.69	1.52	23.38
18	4.36	6.30	0.01	0.04	302.92	1.52	22.44
19	5.23	5.74	0.01	0.04	315.14	1.52	20.45
20	−5.94	+4.92	+0.01	+0.04	327.36	−1.52	17.37
21	6.47	3.84	0.01	0.04	339.57	1.51	13.25
22	6.76	2.54	0.01	0.03	351.78	1.51	8.24
23	6.76	+1.08	0.01	0.03	3.98	1.51	2.63
24	6.41	−0.48	0.01	0.03	16.17	1.51	356.81
25	−5.68	−2.05	+0.01	+0.03	28.36	−1.51	351.18
26	4.52	3.53	0.01	0.03	40.53	1.51	346.13
27	2.99	4.81	0.01	0.03	52.70	1.51	341.94
28	−1.15	5.79	0.01	0.03	64.87	1.51	338.82
29	+0.86	6.36	0.01	0.03	77.03	1.51	336.97
30	+2.86	−6.49	+0.01	+0.03	89.19	−1.51	336.52
1	+4.66	−6.17	+0.01	+0.03	101.35	−1.52	337.56

EPHEMERIS FOR PHYSICAL OBSERVATIONS OF THE MOON

FOR GREENWICH MEAN MIDNIGHT.

Date.		The Earth's Selenographic—		Physical Libration.		The Sun's Selenographic—		
		Long.	Lat.	Long.	Lat.	Colong.	Lat.	
		°	°	°	°	°	°	
Oct.	1	+4.66	−6.17	+0.01	+0.03	101.35	−1.52	
	2	6.11	5.45	0.02	0.03	113.51	1.52	
	3	7.09	4.41	0.02	0.03	125.67	1.52	
	4	7.57	3.14	0.02	0.03	137.84	1.52	
	5	7.55	1.74	0.02	0.03	150.01	1.52	
	6	+7.09	−0.30	+0.01	+0.04	162.19	−1.52	
	7	6.27	+1.13	0.01	0.04	174.38	1.52	
	8	5.19	2.47	0.01	0.04	186.57	1.52	
	9	3.93	3.69	0.01	0.04	198.76	1.52	
	10	2.60	4.73	0.01	0.04	210.96	1.52	
	11	+1.25	+5.57	+0.01	+0.04	223.17	−1.52	
	12	−0.05	6.18	0.01	0.04	235.38	1.51	
	13	1.25	6.52	0.01	0.04	247.59	1.51	
	14	2.32	6.57	0.01	0.04	259.80	1.50	
	15	3.25	6.33	0.01	0.04	272.02	1.49	
	16	−4.03	+5.79	+0.01	+0.04	284.23	−1.48	
	17	4.67	4.96	0.01	0.04	296.44	1.47	
	18	5.14	3.88	0.01	0.04	308.65	1.46	
	19	5.46	2.59	0.01	0.04	320.86	1.44	
	20	5.58	+1.14	0.01	0.04	333.06	1.43	
	21	−5.49	−0.39	+0.01	+0.04	345.25	−1.41	
	22	5.14	1.93	0.01	0.04	357.44	1.39	
	23	4.50	3.39	0.01	0.03	9.62	1.38	
	24	3.56	4.67	0.01	0.03	21.79	1.36	
	25	2.32	5.68	0.01	0.03	33.95	1.35	
	26	−0.84	−6.33	+0.01	+0.03	46.11	−1.33	
	27	+0.80	6.57	0.01	0.03	58.26	1.32	
	28	2.44	6.37	0.01	0.03	70.40	1.30	
	29	3.96	5.75	0.01	0.03	82.55	1.28	
	30	5.20	4.77	0.01	0.03	94.69	1.27	
	31	+6.08	−3.51	+0.01	+0.03	106.83	−1.25	
Nov.	1	6.52	2.08	0.01	0.04	118.98	1.24	
	2	6.52	−0.58	0.01	0.04	131.13	1.22	
	3	6.11	+0.91	0.01	0.04	143.28	1.21	
	4	5.36	2.32	0.01	0.04	155.44	1.19	
	5	+4.34	+3.59	+0.01	+0.04	167.61	−1.18	
	6	3.13	4.69	0.01	0.04	179.78	1.17	
	7	1.83	5.58	0.01	0.04	191.96	1.16	
	8	+0.52	6.22	0.01	0.04	204.14	1.14	
	9	−0.74	6.61	0.01	0.04	216.33	1.13	
	10	−1.86	+6.71	+0.01	+0.04	228.52	−1.12	
	11	2.83	6.50	0.01	0.04	240.72	1.10	
	12	3.60	6.00	0.01	0.04	252.91	1.08	
	13	4.15	5.20	0.01	0.04	265.11	1.07	
	14	4.50	4.12	0.01	0.04	277.31	1.05	
	15	−4.64	+2.82	+0.01	+0.04	289.51	−1.02	
	16	−4.60	+1.34	+0.01	+0.04	301.71	−1.00	

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.	
	°	°	°	°	°	°	°
16	−4.60	+1.34	+0.01	+0.04	301.71	−1.00	5.35
17	4.37	−0.24	0.01	0.04	313.90	0.97	359.56
18	3.96	1.82	0.01	0.04	326.09	0.95	353.85
19	3.39	3.31	0.01	0.04	338.28	0.92	348.61
20	2.64	4.62	0.01	0.04	350.45	0.89	344.10
21	−1.73	−5.67	+0.01	+0.04	2.62	−0.86	340.51
22	−0.68	6.38	0.01	0.04	14.78	0.83	337.97
23	+0.48	6.69	0.01	0.04	26.93	0.80	336.61
24	1.67	6.59	0.01	0.04	39.08	0.77	336.54
25	2.82	6.08	0.01	0.04	51.22	0.74	337.86
26	+3.85	−5.19	+0.01	+0.04	63.35	−0.71	340.59
27	4.67	4.00	0.01	0.04	75.49	0.68	344.61
28	5.21	2.60	0.01	0.04	87.62	0.65	349.63
29	5.43	−1.07	0.01	0.04	99.75	0.62	355.20
30	5.32	+0.48	0.01	0.04	111.88	0.60	0.85
1	+4.87	+1.97	+0.01	+0.04	124.02	−0.57	6.19
2	4.13	3.33	0.01	0.04	136.16	0.55	10.96
3	3.15	4.52	0.01	0.04	148.31	0.53	15.03
4	1.99	5.48	0.01	0.04	160.46	0.50	18.34
5	+0.73	6.21	+0.01	0.04	172.61	0.48	20.87
6	−0.56	+6.66	0.00	+0.04	184.77	−0.47	22.60
7	1.79	6.84	0.00	0.04	196.94	0.45	23.50
8	2.91	6.72	0.00	0.04	209.11	0.43	23.47
9	3.83	6.30	0.00	0.04	221.29	0.41	22.44
10	4.52	5.57	0.00	0.04	233.48	0.39	20.30
11	−4.94	+4.56	0.00	+0.04	245.66	−0.36	17.01
12	5.06	3.29	0.00	0.04	257.85	0.34	12.60
13	4.88	1.81	0.00	0.04	270.04	0.32	7.28
14	4.43	+0.20	0.00	0.04	282.23	0.29	1.42
15	3.74	−1.45	0.00	0.04	294.42	0.26	355.49
16	−2.86	−3.03	0.00	+0.04	306.61	−0.23	349.94
17	1.84	4.43	0.00	0.04	318.80	0.20	345.11
18	−0.74	5.56	0.00	0.04	330.97	0.16	341.22
19	+0.38	6.35	0.00	0.04	343.14	0.13	338.41
20	1.46	6.74	0.00	0.04	355.31	0.10	336.77
21	+2.46	−6.72	0.00	+0.04	7.46	−0.06	336.39
22	3.34	6.30	0.00	0.04	19.61	−0.02	337.34
23	4.06	5.51	0.00	0.04	31.76	+0.01	339.64
24	4.59	4.40	0.00	0.04	43.89	0.05	343.21
25	4.90	3.07	0.00	0.04	56.02	0.09	347.85
26	+5.00	−1.58	0.00	+0.04	68.15	+0.12	353.20
27	4.85	−0.04	0.00	0.04	80.28	0.16	358.82
28	4.47	+1.48	0.00	0.04	92.41	0.19	4.30
29	3.86	2.90	0.00	0.04	104.54	0.22	9.32
30	3.04	4.17	0.00	0.04	116.67	0.25	13.68
31	*+2.03*	*+5.22*	0.00	+0.04	128.80	+0.28	17.29
32	*+0.88*	*+6.03*	0.00	+0.04	140.94	+0.30	20.12

FOR GREENWICH MEAN NOON.

Date.	k	i	θ	L	Stellar Mag.	Date.	k	i	θ	L
		°	°					°	°	
Jan. 1	0.650	72	352	59.1	−0.4	July 5	0.934	30	185	67.5
6	0.451	96	347	61.5	−0.1	10	0.993	9	212	65.6
11	0.212	125	342	41.8	+0.8	15	0.990	12	344	57.8
16	0.035	158	324	8.4	2.1	20	0.947	27	3	48.7
21	0.026	161	204	6.0	2.3	25	0.888	39	11	41.5
26	0.158	133	184	27.6	+1.2	30	0.827	49	16	36.1
31	0.322	110	178	39.5	0.7	Aug. 4	0.766	58	19	33.0
Feb. 5	0.464	94	175	40.3	0.4	9	0.707	66	22	31.4
10	0.573	82	171	37.1	0.2	14	0.646	73	24	30.9
15	0.656	72	168	33.5	0.2	19	0.580	81	26	31.2
20	0.721	64	164	30.8	+0.1	24	0.504	90	28	32.1
25	0.775	57	160	29.2	0.0	29	0.415	100	30	32.7
Mar. 2	0.821	50	157	28.6	−0.1	Sept. 3	0.309	112	32	31.4
7	0.862	44	153	29.1	0.2	8	0.188	129	36	25.9
12	0.901	37	150	31.0	0.4	13	0.071	149	44	12.3
17	0.939	29	146	34.4	−0.7	18	0.006	171	96	1.3
22	0.972	19	142	39.9	1.0	23	0.056	153	192	11.8
27	0.996	7	125	47.9	1.5	28	0.228	123	203	40.0
Apr. 1	0.994	9	351	58.0	1.6	Oct. 3	0.464	94	207	63.2
6	0.943	28	337	67.4	1.4	8	0.681	69	209	66.3
11	0.826	49	336	70.3	−1.1	13	0.835	48	211	57.8
16	0.663	71	336	64.4	−0.6	18	0.925	32	212	46.8
21	0.489	91	337	53.0	0.0	23	0.971	20	213	38.0
26	0.330	110	338	40.0	+0.6	28	0.993	10	214	31.9
May 1	0.198	127	339	27.2	1.2	Nov. 2	1.000	2	225	28.0
6	0.094	144	340	14.6	+1.9	7	0.998	5	21	25.0
11	0.026	162	342	4.4	2.6	12	0.991	11	22	24.0
16	0.000	178	40	0.0	3.5	17	0.978	17	20	24.7
21	0.020	164	149	3.3	2.8	22	0.959	23	17	25.9
26	0.075	148	152	11.2	2.1	27	0.932	30	14	28.4
31	0.154	134	154	19.8	+1.6	Dec. 2	0.893	38	10	32.4
June 5	0.243	121	156	27.0	1.2	7	0.834	48	6	38.5
10	0.340	109	158	33.0	0.8	12	0.745	61	2	46.7
15	0.446	96	161	38.8	+0.5	17	0.608	78	358	55.3
20	0.562	83	165	45.6	0.0	22	0.412	100	354	57.0
25	0.691	68	169	53.7	−0.4	27	0.181	130	350	36.7
30	0.824	50	176	62.3	−0.9	32	0.019	164	328	4.9

NOTATION.

k=the ratio of the area of the illuminated portion of the apparent disk to the area of 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 porti with the meridian.

L=the brilliancy of the disk. The unit of L is the amount of light received by an circular disk with the same albedo as the planet, subtending an angular rad second of arc, situated at distance unity from the Sun, and illuminated by as the mean disk of the planet is illuminated.

FOR GREENWICH MEAN NOON.

te.	k	i	θ	L	Stellar Mag.	Date.	k	i	θ	L	Stellar Mag.
		°	°					°	°		
1	0.885	39.6	189.5	61.0	−3.4	July 5	0.945	27.2	8.7	52.2	−3.3
6	0.895	37.8	186.7	59.5	3.4	10	0.936	29.2	10.9	52.9	3.3
11	0.904	36.0	183.7	58.2	3.4	15	0.927	31.2	12.9	53.8	3.3
16	0.913	34.3	180.6	57.0	3.4	20	0.918	33.2	14.8	54.8	3.3
21	0.921	32.5	177.5	55.8	3.4	25	0.908	35.3	16.4	55.8	3.3
26	0.929	30.9	174.3	54.7	−3.4	30	0.898	37.3	17.9	56.9	−3.3
31	0.937	29.2	171.2	53.7	3.3	Aug. 4	0.887	39.3	19.2	58.1	3.3
. 5	0.944	27.5	168.1	52.8	3.3	9	0.876	41.2	20.2	59.4	3.4
10	0.950	25.8	165.2	51.9	3.3	14	0.864	43.2	21.1	60.8	3.4
15	0.956	24.1	162.4	51.2	3.3	19	0.852	45.2	21.7	62.3	3.4
20	0.962	22.4	159.8	50.5	−3.3	24	0.840	47.1	22.1	64.0	−3.4
25	0.967	20.8	157.3	49.8	3.3	29	0.827	49.1	22.3	65.8	3.4
r. 2	0.972	19.2	155.0	49.2	3.4	Sept. 3	0.814	51.1	22.3	67.8	3.4
7	0.977	17.5	152.9	48.7	3.4	8	0.801	53.0	22.0	70.0	3.4
12	0.981	15.8	151.0	48.2	3.4	13	0.787	55.0	21.5	72.3	3.5
17	0.985	14.2	149.3	47.8	−3.4	18	0.773	57.0	20.8	74.8	−3.5
22	0.988	12.5	147.6	47.5	3.4	23	0.758	58.9	19.8	77.6	3.5
27	0.991	10.8	146.0	47.2	3.4	28	0.743	60.9	18.7	80.6	3.5
r. 1	0.994	9.1	144.2	47.0	3.4	Oct. 3	0.727	62.9	17.3	84.0	3.6
6	0.996	7.4	142.2	46.8	3.4	8	0.712	65.0	15.7	87.6	3.6
11	0.998	5.6	139.2	46.7	−3.4	13	0.695	67.0	13.9	91.5	−3.6
16	0.999	4.0	133.7	46.6	3.5	18	0.678	69.1	11.9	95.9	3.7
21	1.000	2.3	119.8	46.6	3.5	23	0.661	71.2	9.7	100.7	3.7
26	1.000	1.3	69.0	46.6	3.5	28	0.643	73.4	7.5	105.9	3.7
y 1	1.000	2.2	11.6	46.7	3.5	Nov. 2	0.624	75.7	5.1	111.7	3.8
6	0.999	3.8	356.2	46.8	−3.5	7	0.604	78.0	2.7	118.0	−3.8
11	0.998	5.6	351.5	47.0	3.4	12	0.584	80.4	0.3	125.0	3.9
16	0.996	7.5	350.0	47.2	3.4	17	0.562	82.9	357.9	132.5	3.9
21	0.993	9.4	350.2	47.5	3.4	22	0.539	85.5	355.6	140.8	4.0
26	0.990	11.3	351.2	47.8	3.4	27	0.515	88.2	353.3	149.8	4.0
31	0.987	13.3	352.7	48.2	−3.4	Dec. 2	0.490	91.1	351.2	159.4	−4.1
me 5	0.983	15.2	354.6	48.6	3.4	7	0.463	94.2	349.2	169.9	4.2
10	0.978	17.2	356.8	49.0	3.4	12	0.434	97.6	347.4	180.8	4.2
15	0.972	19.2	359.2	49.6	3.4	17	0.404	101.1	345.7	192.0	4.3
20	0.966	21.2	1.6	50.1	3.4	22	0.370	105.1	344.1	202.5	4.3
25	0.960	23.2	4.0	50.7	−3.3	27	0.334	109.4	342.6	212.0	−4.4
30	0.953	25.2	6.4	51.4	−3.3	32	0.295	114.2	341.0	218.4	−4.4

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.

39398°—1917——40

EPHEMERIS FOR PHYSICAL OBSERVATIONS OF MAR

FOR GREENWICH MEAN NOON.

Date.	Light-Time.	Stellar Magnitude.	P	$A_\oplus+180°$	$D_\oplus$	$A_\odot-A_\oplus$	$D_\odot$
	m		°	°	°	°	°
Oct. 1	15.98	+1.6	358.10	221.05	+16.95	−29.59	+ 5.05
3	15.87	1.6	358.84	222.25	17.29	29.92	5.43
5	15.76	1.6	359.57	223.45	17.63	30.24	5.80
7	15.64	1.6	0.30	224.64	17.95	30.57	6.18
9	15.52	1.6	1.02	225.84	18.26	30.89	6.55
11	15.41	+1.6	1.75	227.04	+18.57	−31.22	+ 6.91
13	15.29	1.6	2.46	228.23	18.86	31.54	7.28
15	15.16	1.5	3.18	229.42	19.15	31.86	7.64
17	15.04	1.5	3.88	230.60	19.42	32.18	8.00
19	14.92	1.5	4.59	231.79	19.69	32.50	8.36
21	14.79	+1.5	5.28	232.97	+19.94	−32.82	+ 8.71
23	14.66	1.5	5.98	234.15	20.18	33.13	9.07
25	14.53	1.5	6.66	235.32	20.42	33.43	9.42
27	14.40	1.5	7.34	236.49	20.64	33.74	9.76
29	14.27	1.4	8.02	237.65	20.85	34.04	10.10
31	14.13	+1.4	8.68	238.82	+21.05	−34.33	+10.44
Nov. 2	14.00	1.4	9.34	239.97	21.24	34.63	10.78
4	13.86	1.4	9.99	241.12	21.43	34.91	11.12
6	13.72	1.4	10.64	242.27	21.60	35.19	11.45
8	13.58	1.4	11.27	243.41	21.76	35.46	11.78
10	13.44	+1.3	11.90	244.54	+21.91	−35.73	+12.10
12	13.30	1.3	12.52	245.66	22.05	35.98	12.42
14	13.15	1.3	13.13	246.78	22.18	36.23	12.74
16	13.00	1.3	13.73	247.88	22.30	36.47	13.05
18	12.86	1.3	14.32	248.98	22.41	36.70	13.36
20	12.71	+1.2	14.91	250.07	+22.51	−36.92	+13.67
22	12.56	1.2	15.48	251.14	22.60	37.12	13.98
24	12.41	1.2	16.04	252.21	22.68	37.32	14.28
26	12.26	1.2	16.59	253.26	22.76	37.50	14.57
28	12.11	1.1	17.13	254.30	22.82	37.66	14.87
30	11.95	+1.1	17.66	255.33	+22.87	−37.82	+15.16
Dec. 2	11.80	1.1	18.17	256.34	22.92	37.95	15.44
4	11.65	1.1	18.68	257.34	22.96	38.08	15.72
6	11.49	1.0	19.17	258.33	22.98	38.18	16.00
8	11.33	1.0	19.65	259.30	23.00	38.27	16.28
10	11.19	+1.0	20.12	260.25	+23.02	−38.34	+16.55
12	11.02	1.0	20.57	261.18	23.02	38.39	16.81
14	10.86	0.9	20.91	262.10	23.02	38.42	17.07
16	10.70	0.9	21.44	262.99	23.01	38.43	17.33
18	10.55	0.8	21.85	263.86	22.99	38.42	17.59
20	10.39	+0.8	22.25	264.71	+22.97	−38.38	+17.84
22	10.23	0.8	22.63	265.54	22.94	38.32	18.08
24	10.07	0.8	23.00	266.34	22.91	38.23	18.32
26	9.91	0.7	23.36	267.12	22.87	38.12	18.56
28	9.75	0.7	23.70	267.88	22.83	37.98	18.79
30	*9.60*	+0.6	24.02	268.61	+22.78	−37.81	+19.02
32	*9.44*	+0.6	24.33	269.31	+22.73	−37.62	+19.24

EPHEMERIS FOR PHYSICAL OBSERVATIONS OF MARS.

FOR GREENWICH MEAN NOON.

							Mean Time of Transit of Zero Meridian.	
	k	Diameter.	i	q	Q	Central Meridian.	Of Date.	Of Intermediate Date.
		"	°	"	°	°	h m	h m
1	0.927	5.25	31.32	0.38	287.00	288.41	4 54.3	5 34.1
3	0.926	5.29	31.57	0.39	287.35	269.03	6 14.0	6 53.8
5	0.925	5.33	31.82	0.40	287.69	249.64	7 33.6	8 13.5
7	0.924	5.37	32.06	0.41	288.00	230.26	8 53.3	9 33.2
9	0.923	5.41	32.29	0.42	288.33	210.87	10 13.0	10 52.8
11	0.922	5.45	32.53	0.43	288.64	191.49	11 32.7	12 12.5
13	0.920	5.49	32.76	0.44	288.94	172.11	12 52.3	13 32.2
15	0.919	5.53	32.98	0.45	289.22	152.74	14 12.0	14 51.8
17	0.918	5.58	33.20	0.46	289.50	133.36	15 31.6	16 11.4
19	0.917	5.63	33.42	0.47	289.76	113.99	16 51.2	17 31.0
21	0.916	5.68	33.63	0.48	290.02	94.63	18 10.8	18 50.6
23	0.915	5.72	33.84	0.49	290.26	75.26	19 30.4	20 10.2
25	0.914	5.78	34.04	0.50	290.50	55.91	20 50.0	21 29.7
27	0.913	5.83	34.24	0.50	290.72	36.56	22 9.5	22 49.3
29	0.912	5.88	34.43	0.51	290.94	17.21	23 29.0	. . . . .
31	0.911	5.94	34.61	0.52	291.14	357.86	0 8.8	0 48.6
2	0.911	6.00	34.79	0.54	291.33	338.52	1 28.3	2 8.0
4	0.910	6.06	34.97	0.55	291.52	319.19	2 47.8	3 27.5
6	0.909	6.12	35.14	0.56	291.69	299.86	4 7.2	4 46.9
8	0.908	6.18	35.30	0.57	291.85	280.54	5 26.6	6 6.3
10	0.907	6.25	35.45	0.58	292.00	261.23	6 46.0	7 25.6
12	0.907	6.31	35.59	0.59	292.15	241.92	8 5.3	8 45.0
14	0.906	6.38	35.73	0.60	292.28	222.62	9 24.6	10 4.3
16	0.905	6.45	35.86	0.61	292.40	203.34	10 43.9	11 23.5
18	0.905	6.53	35.97	0.62	292.52	184.06	12 3.1	12 42.7
20	0.904	6.60	36.08	0.63	292.62	164.80	13 22.3	14 1.8
22	0.904	6.68	36.18	0.64	292.72	145.54	14 41.4	15 21.0
24	0.903	6.76	36.27	0.65	292.81	126.30	16 0.5	16 40.0
26	0.903	6.85	36.35	0.67	292.88	107.06	17 19.5	17 59.0
28	0.902	6.93	36.42	0.68	292.95	87.85	18 38.5	19 17.9
30	0.902	7.02	36.47	0.69	293.01	68.64	19 57.4	20 36.8
2	0.902	7.11	36.51	0.70	293.06	49.45	21 16.2	21 55.6
4	0.902	7.21	36.54	0.71	293.10	30.27	22 35.0	23 14.4
6	0.902	7.30	36.56	0.72	293.14	11.11	23 53.7	. . . . .
8	0.902	7.40	36.56	0.73	293.16	351.96	0 33.0	1 12.4
10	0.902	7.51	36.55	0.74	293.18	332.83	1 51.6	2 30.9
12	0.902	7.62	36.52	0.75	293.19	313.72	3 10.2	3 49.4
14	0.902	7.73	36.48	0.76	293.19	294.63	4 28.6	5 7.8
16	0.902	7.84	36.42	0.76	293.18	275.56	5 47.0	6 26.1
18	0.903	7.96	36.34	0.77	293.17	256.51	7 5.2	7 44.3
20	0.903	8.08	36.24	0.78	293.14	237.48	8 23.4	9 2.4
22	0.904	8.20	36.12	0.79	293.11	218.47	9 41.4	10 20.4
24	0.905	8.33	35.98	0.80	293.07	199.49	10 59.4	11 38.4
26	0.905	8.47	35.82	0.80	293.03	180.53	12 17.3	12 56.2
28	0.906	8.60	35.64	0.81	292.97	161.60	13 35.0	14 13.9
30	*0.907*	*8.74*	*35.43*	0.81	292.91	142.70	14 52.7	15 31.4
32	*0.909*	*8.89*	*35.20*	0.81	292.84	123.82	16 10.1	. . . . .

EPHEMERIS FOR PHYSICAL OBSERVATIONS OF JUPITER

FOR GREENWICH MEAN NOON.

Date.		Light-Time.	Stellar Magnitude.	P	$A_{\oplus}+180°$	$D_{\oplus}$	$A_{\odot}+180°$	
		m		°	°	°	°	
Jan.	1	38.42	−2.1	337.30	249.92	+2.88	260.94	+1
	8	39.34	2.1	337.37	250.28	2.85	261.58	1
	15	40.27	2.0	337.47	250.80	2.83	262.21	1
	22	41.20	2.0	337.60	251.46	2.81	262.85	1
	29	42.13	1.9	337.77	252.27	2.80	263.48	1
Feb.	5	43.03	−1.9	337.96	253.20	+2.79	264.12	+1
	12	43.91	1.8	338.19	254.24	2.79	264.76	
	19	44.75	1.8	338.45	255.39	2.79	265.39	
	26	45.55	1.8	338.73	256.64	2.79	266.02	
Mar.	5	46.29	1.7	339.05	257.96	2.79	266.66	
	12	46.98	−1.7	339.40	259.36	+2.80	267.29	+
	19	47.60	1.7	339.78	260.82	2.81	267.93	
	26	48.15	1.6	340.18	262.33	2.82	268.56	
Apr.	2	48.64	1.6	340.61	263.89	2.83	269.20	
	9	49.04	1.6	341.07	265.48	2.85	269.83	
June	5	49.39	−1.6	345.51	278.88	+2.94	274.97	+
	12	49.07	1.6	346.10	280.48	2.95	275.60	
	19	48.68	1.6	346.69	282.04	2.95	276.23	
	26	48.22	1.6	347.28	283.56	2.96	276.86	
July	3	47.69	1.6	347.87	285.03	2.97	277.49	
	10	47.10	−1.7	348.43	286.45	+2.98	278.12	+
	17	46.45	1.7	348.98	287.80	2.98	278.74	
	24	45.74	1.7	349.51	289.08	2.99	279.37	
	31	44.99	1.8	350.01	290.28	2.99	280.00	
Aug.	7	44.19	1.8	350.48	291.39	3.00	280.62	
	14	43.36	−1.8	350.91	292.40	+3.01	281.25	+
	21	42.50	1.9	351.30	293.30	3.01	281.87	
	28	41.63	1.9	351.63	294.07	3.02	282.50	
Sept.	4	40.74	2.0	351.92	294.72	3.02	283.12	
	11	39.86	2.0	352.14	295.23	3.03	283.75	
	18	38.99	−2.1	352.29	295.59	+3.04	284.37	+
	25	38.14	2.1	352.38	295.79	3.05	284.99	
Oct.	2	37.33	2.2	352.40	295.83	3.05	285.62	
	9	36.57	2.2	352.35	295.70	3.06	286.24	
	16	35.88	2.2	352.22	295.41	3.07	286.86	
	23	35.26	−2.3	352.02	294.96	+3.07	287.48	+
	30	34.73	2.3	351.77	294.37	3.07	288.10	
Nov.	6	34.31	2.3	351.46	293.65	3.07	288.72	
	13	33.99	2.4	351.10	292.82	3.07	289.34	
	20	33.80	2.4	350.71	291.92	3.06	289.96	
	27	33.73	−2.4	350.31	290.97	+3.05	290.58	+
Dec.	4	33.79	2.4	349.91	290.02	3.03	291.20	
	11	33.98	2.4	349.52	289.10	3.01	291.82	
	18	34.29	2.3	349.16	288.23	2.99	292.43	
	25	34.71	2.3	348.85	287.47	2.96	293.05	
	32	35.25	−2.3	348.59	286.82	+2.94	293.67	

EMERIS FOR PHYSICAL OBSERVATIONS OF JUPITER.

FOR GREENWICH MEAN NOON.

	Equatorial Diameter.	Excess of Equat. Diameter over Polar.	i	q	Q	Central Meridian. System I.	Central Meridian. System II.	Correction for Phase.
	"	"	°	"	°	°	°	°
1	43.34	2.62	11.00	0.40	68.38	16.63	176.53	−0.53
8	42.34	2.56	11.28	0.41	68.60	41.01	147.51	0.55
15	41.36	2.50	11.40	0.41	68.82	65.22	118.32	0.56
22	40.42	2.45	11.37	0.40	69.07	89.29	88.98	0.56
29	39.53	2.39	11.20	0.38	69.33	113.22	59.51	0.55
5	38.70	2.34	10.91	0.35	69.62	137.04	29.92	−0.52
12	37.92	2.29	10.50	0.32	69.93	160.76	0.23	0.48
19	37.21	2.25	10.00	0.28	70.27	184.39	330.46	0.44
26	36.56	2.21	9.39	0.25	70.65	207.97	300.63	0.38
5	35.97	2.18	8.69	0.21	71.07	231.49	270.75	0.33
12	35.45	2.15	7.93	0.17	71.53	254.97	240.82	−0.27
19	34.98	2.12	7.10	0.13	72.06	278.43	210.88	0.22
26	34.58	2.09	6.23	0.10	72.64	301.88	180.92	0.17
2	34.24	2.07	5.31	0.07	73.32	325.33	150.96	0.12
9	33.96	2.05	4.35	0.05	74.19	348.79	121.02	−0.08
5	33.71	2.04	3.91	0.04	253.63	335.48	32.79	+0.07
12	33.93	2.05	4.87	0.06	254.68	359.38	3.28	0.10
19	34.20	2.07	5.80	0.09	255.57	23.35	333.84	0.15
26	34.53	2.09	6.69	0.12	256.37	47.41	304.49	0.20
3	34.92	2.11	7.53	0.15	257.11	71.57	275.23	0.25
10	35.36	2.14	8.32	0.19	257.79	95.81	246.06	+0.30
17	35.85	2.17	9.04	0.23	258.43	120.16	217.00	0.36
24	36.41	2.20	9.70	0.26	259.02	144.61	188.03	0.41
31	37.02	2.24	10.27	0.30	259.58	169.17	159.18	0.46
7	37.68	2.28	10.75	0.33	260.11	193.84	130.44	0.50
14	38.40	2.32	11.13	0.36	260.59	218.64	101.82	+0.54
21	39.18	2.37	11.40	0.39	261.03	243.57	73.33	0.56
28	40.00	2.42	11.56	0.41	261.43	268.62	44.98	0.58
4	40.87	2.47	11.58	0.42	261.79	293.81	16.75	0.58
11	41.78	2.53	11.47	0.42	262.08	319.14	348.67	0.57
18	42.71	2.58	11.20	0.41	262.33	344.62	320.73	+0.54
25	43.66	2.64	10.78	0.38	262.53	10.23	292.93	0.50
2	44.60	2.70	10.19	0.35	262.68	35.99	265.27	0.45
9	45.53	2.75	9.45	0.31	262.79	61.88	237.74	0.39
16	46.41	2.81	8.54	0.26	262.86	87.89	210.34	0.32
23	47.22	2.86	7.47	0.20	262.92	114.01	183.05	+0.24
30	47.94	2.90	6.26	0.14	263.02	140.23	155.85	0.17
6	48.54	2.94	4.92	0.09	263.24	166.50	128.72	0.10
13	48.99	2.96	3.47	0.04	263.85	192.82	101.63	0.05
20	49.27	2.98	1.96	0.01	265.76	219.15	74.54	+0.02
27	49.37	2.99	0.43	0.00	284.11	245.44	47.42	0.00
4	49.28	2.98	1.19	0.01	71.73	271.65	20.22	−0.01
11	49.01	2.97	2.71	0.03	76.18	297.76	352.93	0.03
18	48.57	2.94	4.20	0.06	77.20	323.74	325.49	0.08
25	47.97	2.90	5.58	0.11	77.58	349.54	297.89	0.14
32	*47.24*	*2.86*	*6.83*	0.17	77.73	15.16	270.10	−0.20

EPHEMERIS FOR PHYSICAL OBSERVATIONS OF JUPITER, SYSTEM I.

GREENWICH MEAN TIME.

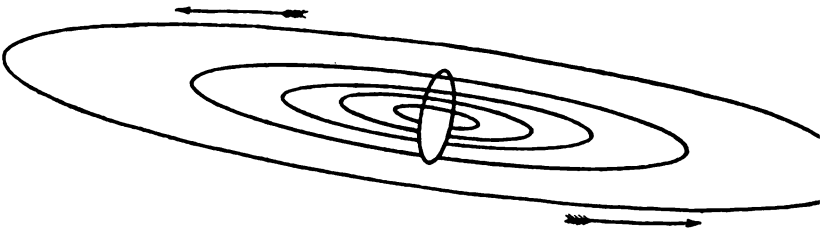
Transit of Zero Meridian.				Interval between Successive Transits.	Transit of Zero Meridian.				Interval between Successive Transits.	Transit of Zero Meridian.				Interval between Successive Transits.
	d	h	m	h m		d	h	m	h m		d	h	m	h
Jan.	1	9	24.17	9 50.59	June	5	0	40.13	9 50.63	Sept.	19	15	46.25	9
	3	10	37.10			7	1	53.30			21	16	58.63	
	5	11	50.05			9	3	6.45			23	18	10.99	
	7	13	3.03			11	4	19.60			25	19	23.33	
	9	14	16.03			13	5	32.74			27	20	35.65	
	11	15	29.05	9 50.61		15	6	45.86	9 50.62		29	21	47.95	9
	13	16	42.09			17	7	58.97		Oct.	1	23	0.24	
	15	17	55.15			19	9	12.07			4	0	12.50	
	17	19	8.22			21	10	25.15			6	1	24.75	
	19	20	21.32			23	11	38.22			8	2	36.99	
	21	21	34.43	9 50.63		25	12	51.28	9 50.61		10	3	49.21	9
	23	22	47.56			27	14	4.33			12	5	1.41	
	26	0	0.71			29	15	17.36			14	6	13.60	
	28	1	13.87		July	1	16	30.38			16	7	25.76	
	30	2	27.05			3	17	43.39			18	8	37.92	
Feb.	1	3	40.24	9 50.64		5	18	56.38	9 50.59		20	9	50.06	9
	3	4	53.44			7	20	9.36			22	11	2.19	
	5	6	6.66			9	21	22.33			24	12	14.30	
	7	7	19.89			11	22	35.28			26	13	26.40	
	9	8	33.13			13	23	48.21			28	14	38.50	
	11	9	46.39	9 50.65		16	1	1.13	9 50.58		30	15	50.57	9
	13	10	59.65			18	2	14.04		Nov.	1	17	2.64	
	15	12	12.92			20	3	26.93			3	18	14.70	
	17	13	26.20			22	4	39.82			5	19	26.75	
	19	14	39.49			24	5	52.68			7	20	38.80	
	21	15	52.79	9 50.66		26	7	5.52	9 50.56		9	21	50.84	9
	23	17	6.10			28	8	18.36			11	23	2.87	
	25	18	19.41			30	9	31.18			14	0	14.89	
	27	19	32.73		Aug.	1	10	43.98			16	1	26.92	
Mar.	1	20	46.06			3	11	56.77			18	2	38.94	
	3	21	59.39	9 50.67		5	13	9.54	9 50.55		20	3	50.97	9
	5	23	12.73			7	14	22.29			22	5	3.00	
	8	0	26.07			9	15	35.03			24	6	15.03	
	10	1	39.42			11	16	47.75			26	7	27.07	
	12	2	52.77			13	18	0.46			28	8	39.12	
	14	4	6.13	9 50.67		15	19	13.15	9 50.53		30	9	51.17	9
	16	5	19.48			17	20	25.82		Dec.	2	11	3.24	
	18	6	32.84			19	21	38.48			4	12	15.32	
	20	7	46.21			21	22	51.12			6	13	27.43	
	22	8	59.57			24	0	3.74			8	14	39.55	
	24	10	12.94	9 50.67		26	1	16.35	9 50.51		10	15	51.69	9
	26	11	26.31			28	2	28.94			12	17	3.86	
	28	12	39.67			30	3	41.51			14	18	16.05	
	30	13	53.04		Sept.	1	4	54.06			16	19	28.26	
Apr.	1	15	6.41			3	6	6.60			18	20	40.50	
	3	16	19.78	9 50.67		5	7	19.12	9 50.50		20	21	52.77	9
	5	17	33.14			7	8	31.62			22	23	5.06	
	7	18	46.50			9	9	44.10			25	0	17.38	
	9	19	59.87			11	10	56.57			27	1	29.73	
	11	21	13.23			13	12	9.02			29	2	42.10	
	.	.	.			15	13	21.45	9 50.48		31	3	54.50	
	.	.	.			17	14	33.86			33	5	6.93	

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.
d h m	h m	d h m	h m	d h m	h m
1 5 4.49	9 55.77	June 5 9 1.44	9 55.81	Sept. 20 22 33.66	9 55.65
3 6 43.31		7 10 40.50		23 0 11.91	
5 8 22.15		9 12 19.56		25 1 50.14	
7 10 1.02		11 13 58.60		27 3 28.36	
9 11 39.91		13 15 37.63		29 5 6.55	
11 13 18.82	9 55.79	15 17 16.65	9 55.80	Oct. 1 6 44.73	9 55.63
13 14 57.75		17 18 55.65		3 8 22.89	
15 16 36.70		19 20 34.64		5 10 1.04	
17 18 15.67		21 22 13.62		7 11 39.15	
19 19 54.66		23 23 52.59		9 13 17.25	
21 21 33.67	9 55.81	26 1 31.54	9 55.78	11 14 55.34	9 55.61
23 23 12.69		28 3 10.48		13 16 33.41	
26 0 51.73		30 4 49.41		15 18 11.47	
28 2 30.79		July 2 6 28.32		17 19 49.51	
30 4 9.86		4 8 7.22		19 21 27.54	
1 5 48.95	9 55.82	6 9 46.10	9 55.77	21 23 5.55	9 55.60
3 7 28.05		8 11 24.97		24 0 43.55	
5 9 7.16		10 13 3.82		26 2 21.53	
7 10 46.29		12 14 42.66		28 3 59.50	
9 12 25.43		14 16 21.49		30 5 37.46	
11 14 4.58	9 55.83	16 18 0.31	9 55.76	Nov. 1 7 15.41	9 55.59
13 15 43.74		18 19 39.10		3 8 53.35	
15 17 22.91		20 21 17.89		5 10 31.29	
17 19 2.09		22 22 56.65		7 12 9.21	
19 20 41.28		25 0 35.41		9 13 47.12	
21 22 20.48	9 55.84	27 2 14.14	9 55.74	11 15 25.04	9 55.58
23 23 59.69		29 3 52.86		13 17 2.94	
26 1 38.90		31 5 31.57		15 18 40.84	
28 3 18.12		Aug. 2 7 10.26		17 20 18.75	
2 4 57.34		4 8 48.93		19 21 56.65	
4 6 36.58	9 55.85	6 10 27.59	9 55.73	21 23 34.55	9 55.58
6 8 15.81		8 12 6.23		24 1 12.47	
8 9 55.06		10 13 44.85		26 2 50.38	
10 11 34.31		12 15 23.46		28 4 28.31	
12 13 13.56		14 17 2.05		30 6 6.24	
14 14 52.81	9 55.85	16 18 40.62	9 55.71	Dec. 2 7 44.19	9 55.60
16 16 32.07		18 20 19.18		4 9 22.15	
18 18 11.33		20 21 57.72		6 11 0.13	
20 19 50.59		22 23 36.24		8 12 38.13	
22 21 29.85		25 1 14.74		10 14 16.15	
24 23 9.12	9 55.85	27 2 53.23	9 55.69	12 15 54.19	9 55.62
27 0 48.39		29 4 31.70		14 17 32.26	
29 2 27.66		31 6 10.15		16 19 10.35	
31 4 6.93		Sept. 2 7 48.58		18 20 48.47	
2 5 46.19		4 9 27.00		20 22 26.62	
4 7 25.46	9 55.85	6 11 5.39	9 55.67	23 0 4.79	9 55.65
6 9 4.72		8 12 43.77		25 1 42.99	
8 10 43.98		10 14 22.14		27 3 21.22	
10 12 23.25		12 16 0.48		29 4 59.48	
12 14 2.49		14 17 38.80		31 6 37.77	
.....		16 19 17.11	9 55.65	33 8 16.08	9 55.87
.....		18 20 55.40		35 9 54.41	

South



North

APPARENT ORBITS OF THE SATELLITES OF JUPITER AT DATE OF (TION, NOVEMBER 28, 1917, AS SEEN IN AN INVERTING TELESCOP ELONGATED IN THE RATIO OF THREE TO ONE IN THE DIRECTION OI MINOR AXES.

In the above diagram the central ellipse represents the disk of Jupiter, and the inn that of Satellite V.

In the diagrams of the configurations of Jupiter's four brighter satellites, pages Jupiter is represented by a light disk, ○, in the center of the page, and the relative pc the satellites at the Greenwich time stated above the diagrams are indicated by dots. ignation of each satellite is shown by a numeral placed to the right or left of the dot, as the motion of the satellite at the instant in question is toward the east or toward the motion being always toward the numeral. In constructing the diagrams the latitud satellites are always considered zero, except where two or more of them chance to be the same distance from the planet, when they are placed one above the other, accordin apparent latitudes. If, at the epoch of any configuration, one or more satellites are on the disk of the planet, that phenomenon is indicated by a light disk, ○, at the left-l of the page; and if any satellites are invisible on account of being occulted behind th the planet, or eclipsed by its shadow, that circumstance is indicated by a dark disk, right-hand side of the page. In both cases the annexed numerals serve to point o satellites are thus rendered invisible.

MEAN SYNODIC PERIODS OF THE SATELLITES.

	d	h	m	s	d
I.	1	18	28	35.946	= 1.769 860 49
II.	3	13	17	53.736	= 3.554 094 17
III.	7	3	59	35.856	= 7.166 387 22
IV.	16	18	5	6.916	=16.753 552 27

	d	h	m	s	d
V.	0	11	57	27.635	= 0.49
VI.					=266.00
VII.					=276.67

SATELLITE V.

NWICH MEAN TIME OF EVERY TWENTIETH GREATEST ELONGATION.

d	h		d	h		d	h		d	h	
1	10.2	E.	Oct. 12	22.7	E.	Jan. 1	16.2	W.	Oct. 13	4.7	W.
11	9.3	E.	22	21.8	E.	11	15.3	W.	23	3.8	W.
21	8.5	E.	Nov. 1	20.9	E.	21	14.5	W.	Nov. 2	2.9	W.
31	7.7	E.	11	20.0	E.	31	13.7	W.	12	2.0	W.
..	..		21	19.1	E.	..	..		22	1.0	W.
3	2.3	E.	Dec. 1	18.1	E.	Sept. 3	8.2	W.	Dec. 2	0.1	W.
13	1.4	E.	11	17.2	E.	13	7.4	W.	11	23.2	W.
23	0.5	E.	21	16.3	E.	23	6.5	W.	21	22.3	W.
2	23.6	E.	31	15.4	E.	Oct. 3	5.6	W.	31	21.4	W.

REENWICH MEAN TIME OF SUPERIOR GEOCENTRIC CONJUNCTION.

SATELLITE I.

d	h	m	s	d	h	m	s	d	h	m	s	d	h	m	s
1	21	29	47	Mar. 26	2	41	45	July 20	23	58	36	Oct. 12	4	14	48
3	15	58	14	27	21	12	7	22	18	28	15	13	22	41	38
5	10	26	39	29	15	42	32	24	12	57	48	15	17	8	31
7	4	55	13	31	10	12	56	26	7	27	21	17	11	35	15
8	23	23	48	Apr. 2	4	43	20	28	1	56	49	19	6	1	59
10	17	52	32	3	23	13	45	29	20	26	19	21	0	28	33
12	12	21	14	5	17	44	12	31	14	55	42	22	18	55	11
14	6	50	5	7	12	14	39	Aug. 2	9	25	6	24	13	21	39
16	1	18	56	9	6	45	5	4	3	54	24	26	7	48	9
17	19	47	57	11	1	15	31	5	22	23	44	28	2	14	29
19	14	16	54	12	19	46	0	7	16	52	57	29	20	40	53
21	8	46	1	14	14	16	28	9	11	22	10	31	15	7	8
23	3	15	7	16	8	46	55	11	5	51	17	Nov. 2	9	33	26
24	21	44	22	18	3	17	22	13	0	20	27	4	3	59	34
26	16	13	34	19	21	47	52	14	18	49	28	5	22	25	46
28	10	42	54	21	16	18	21	16	13	18	30	7	16	51	50
30	5	12	14	..	..	..	..	18	7	47	25	9	11	17	58
31	23	41	43	..	..	..	..	20	2	16	22	11	5	43	56
2	18	11	8	..	..	..	..	21	20	45	12	13	0	10	0
4	12	40	40	June 1	9	58	2	23	15	14	1	14	18	35	57
6	7	10	13	3	4	28	23	25	9	42	42	16	13	1	57
8	1	39	52	4	22	58	39	27	4	11	27	18	7	27	50
9	20	9	29	6	17	28	56	28	22	40	3	20	1	53	49
11	14	39	12	8	11	59	11	30	17	8	39	21	20	19	41
13	9	8	55	10	6	29	29	Sept. 1	11	37	6	23	14	45	39
15	3	38	45	12	0	59	39	3	6	5	37	25	9	11	29
16	22	8	32	13	19	29	51	5	0	33	58	27	3	37	27
18	16	38	25	15	14	0	2	6	19	2	20	28	22	3	19
20	11	8	17	17	8	30	14	8	13	30	33	30	16	29	17
22	5	38	17	19	3	0	21	10	7	58	49	Dec. 2	10	55	9
24	0	8	13	20	21	30	29	12	2	26	55	4	5	21	10
25	18	38	14	22	16	0	35	13	20	55	1	5	23	47	5
27	13	8	15	24	10	30	41	15	15	22	58	7	18	13	9
1	7	38	21	26	5	0	43	17	9	50	58	9	12	39	6
3	2	8	25	27	23	30	45	19	4	18	48	11	7	5	13
4	20	38	33	29	18	0	45	20	22	46	38	13	1	31	17
6	15	8	41	July 1	12	30	45	22	17	14	18	14	19	57	29
8	9	38	54	3	7	0	41	24	11	42	2	16	14	23	36
10	4	9	4	5	1	30	37	26	6	9	35	18	8	49	54
11	22	39	17	6	20	0	30	28	0	37	9	20	3	16	8
13	17	9	31	8	14	30	25	29	19	4	32	21	21	42	32
15	11	39	49	10	9	0	14	Oct. 1	13	31	59	23	16	8	51
17	6	10	4	*12*	*3*	*30*	*3*	3	7	59	15	25	10	35	22
19	*0*	*40*	*23*	*13*	*21*	*59*	*49*	5	2	26	32	27	5	1	51
20	*19*	*10*	*41*	*15*	*16*	*29*	*36*	6	20	53	38	28	23	28	30
22	*13*	*41*	*3*	*17*	*10*	*59*	*17*	8	15	20	49	30	17	55	
	8	*11*	*23*	*19*	*5*	*28*	*59*	10	9	47	48	32	12	21	

GREENWICH MEAN TIME OF SUPERIOR GEOCENTRIC CONJUNCTIO

SATELLITE II.

	d	h	m	s		d	h	m	s		d	h	m	s		d
Jan.	1	7	14	45	Mar.	27	15	57	52	July	19	13	40	36	Oct.	12
	4	20	31	0		31	5	24	6		23	3	3	37		16
	8	9	47	49	Apr.	3	18	49	44		26	16	25	48		19
	11	23	5	18		7	8	16	16		30	5	48	3		23
	15	12	23	19		10	21	42	10	Aug.	2	19	9	30		27
	19	1	42	0		14	11	8	57		6	8	30	58		30
	22	15	1	5		18	0	34	59		9	21	51	39	Nov.	3
	26	4	20	54		21	14	1	57		13	11	12	12		6
	29	17	41	1		..	..	..	..		17	0	32	1		10
Feb.	2	7	1	53		..	..	..	..		20	13	51	38		13
	5	20	22	57		..	..	..	..		24	3	10	33		17
	9	9	44	45	June	3	7	19	48		27	16	29	8		20
	12	23	6	40		6	20	45	19		31	5	47	2		24
	16	12	29	20		10	10	11	32	Sept.	3	19	4	33		27
	20	1	52	3		13	23	36	45		7	8	21	25	Dec.	1
	23	15	15	31		17	13	2	38		10	21	37	50		5
	27	4	38	54		21	2	27	30		14	10	53	34		8
Mar.	2	18	3	3		24	15	52	54		18	0	8	48		12
	6	7	27	4		28	5	17	21		21	13	23	22		15
	9	20	51	53	July	1	18	42	15		25	2	37	25		19
	13	10	16	23		5	8	6	15		28	15	50	49		22
	16	23	41	45		8	21	30	34	Oct.	2	5	3	36		26
	20	13	6	41		12	10	54	1		5	18	15	49		29
	24	2	32	33		16	0	17	43		9	7	27	24		33

SATELLITE III.

	d	h	m	s		d	h	m	s		d	h	m	s		d
Jan.	5	12	3	55	Apr.	1	15	14	21	July	18	10	20	8	Oct.	12
	12	16	0	55		8	19	43	22		25	14	38	49		19
	19	20	3	2		16	0	13	17	Aug.	1	18	55	9		26
	27	0	9	0		..	..	..	..		8	23	9	21	Nov.	2
Feb.	3	4	19	11		..	..	..	..		16	3	19	48		9
	10	8	32	7		..	..	..	..		23	7	26	51		17
	17	12	48	7	June	5	7	48	13		30	11	29	36		24
	24	17	7	0		12	12	17	1	Sept.	6	15	28	20	Dec.	1
Mar.	3	21	28	35		19	16	45	24		13	19	23	11		8
	11	1	52	55		26	21	11	52		20	23	13	38		15
	18	6	18	39	July	4	1	36	53		28	3	0	1		22
	25	10	46	13		11	5	59	32	Oct.	5	6	40	55		29

SATELLITE IV.

	d	h	m	s		d	h	m	s		d	h	m	s		d
Jan.	6	7	33	33	Apr.	17	6	9	23	June	23	17	50	16	Oct.	2
	23	1	41	8		..	..	..	..	July	10	14	16	8		19
Feb.	8	20	41	26		..	..	..	..		27	10	16	35	Nov.	4
	25	16	24	24		..	..	..	..	Aug.	13	5	42	52		21
Mar.	14	12	38	46		..	..	..	..		30	0	26	38	Dec.	7
	31	9	16	28	June	6	21	6	15	Sept.	15	18	18	54		24

DIFFERENTIAL COORDINATES OF SATELLITE VI.

FOR GREENWICH MEAN NOON.

Jan.	$\alpha_{VI}-\alpha_{Jup.}$	$\delta_{VI}-\delta_{Jup.}$	Date.	$\alpha_{VI}-\alpha_{Jup.}$	$\delta_{VI}-\delta_{Jup.}$	Date.	$\alpha_{VI}-\alpha_{Jup.}$	$\delta_{VI}-\delta_{Jup.}$
	m s	′		m s	′		m s	′
0	+4 21	− 5.0	June 18	−2 16	−15.3	Sept. 26	+3 39	−13.2
4	4 20	3.5	22	2 7	16.8	30	3 53	11.1
8	4 18	2.0	26	1 58	18.1	Oct. 4	4 5	8.9
12	4 14	− 0.5	30	1 48	19.4	8	4 16	6.5
16	4 9	+ 0.9	July 4	1 37	20.6	12	4 26	3.9
20	+4 3	+ 2.3	8	−1 26	−21.6	16	+4 33	− 1.3
24	3 55	3.7	12	1 14	22.5	20	4 38	+ 1.4
28	3 46	5.0	16	1 1	23.4	24	4 41	4.2
1	3 36	6.3	20	0 47	24.1	28	4 40	7.0
5	3 25	7.5	24	0 33	24.7	Nov. 1	4 37	9.8
9	+3 13	+ 8.7	28	−0 19	−25.1	5	+4 30	+12.6
13	3 0	9.8	Aug. 1	−0 4	25.4	9	4 20	15.3
17	2 46	10.8	5	+0 11	25.6	13	4 6	17.8
21	2 32	11.8	9	0 27	25.6	17	3 49	20.2
25	2 17	12.7	13	0 43	25.5	21	3 28	22.3
1	+2 1	+13.5	17	+0 59	−25.2	25	+3 3	+24.0
5	1 44	14.2	21	1 15	24.7	29	2 36	25.4
9	1 27	14.8	25	1 32	24.1	Dec. 3	2 5	26.3
13	1 9	15.2	29	1 48	23.3	7	1 33	26.7
17	0 51	15.6	Sept. 2	2 5	22.4	11	0 59	26.6
21	+0 32	+15.7	6	+2 21	−21.3	15	+0 25	+26.0
25	+0 14	15.7	10	2 38	20.0	19	−0 10	24.9
29	−0 5	15.5	14	2 54	18.6	23	0 43	23.3
2	−0 23	+15.1	18	3 10	17.0	27	1 15	21.3
	. ..	...	22	+3 25	−15.2	31	−1 44	+19.0

DIFFERENTIAL COORDINATES OF SATELLITE VII.

Jan.	$\alpha_{VII}-\alpha_{Jup.}$	$\delta_{VII}-\delta_{Jup.}$	Date.	$\alpha_{VII}-\alpha_{Jup.}$	$\delta_{VII}-\delta_{Jup.}$	Date.	$\alpha_{VII}-\alpha_{Jup.}$	$\delta_{VII}-\delta_{Jup.}$
	m s	′		m s	′		m s	′
0	−4 39	+ 7.8	June 18	+1 46	− 2.9	Sept. 26	−4 28	+24.2
4	4 32	8.4	22	1 34	1.7	30	4 39	24.0
8	4 23	8.9	26	1 22	− 0.5	Oct. 4	4 48	23.8
12	4 14	9.3	30	1 8	+ 0.8	8	4 56	23.3
16	4 3	9.6	July 4	0 54	2.2	12	5 3	22.7
20	−3 52	+ 9.8	8	+0 40	+ 3.6	16	−5 7	+21.9
24	3 40	10.0	12	0 25	5.1	20	5 9	20.9
28	3 28	10.1	16	+0 10	6.6	24	5 10	19.8
1	3 15	10.0	20	−0 6	8.0	28	5 8	18.5
5	3 1	10.0	24	0 22	9.5	Nov. 1	5 3	17.1
9	−2 47	+ 9.8	28	−0 38	+10.9	5	−4 56	+15.6
13	2 33	9.5	Aug. 1	0 54	12.3	9	4 47	14.0
17	2 19	9.2	5	1 11	13.7	13	4 34	12.2
21	2 4	8.7	9	1 27	15.1	17	4 19	10.4
25	1 49	8.3	13	1 44	16.4	21	4 2	8.5
1	−1 34	+ 7.7	17	−2 0	+17.6	25	−3 41	+ 6.5
5	1 20	7.1	21	2 17	18.7	29	3 19	4.6
9	1 4	6.4	25	2 33	19.8	Dec. 3	2 54	2.6
13	0 49	5.7	29	2 49	20.8	7	2 28	+ 0.7
17	0 34	4.9	Sept. 2	3 5	21.7	11	2 0	− 1.1
21	−0 19	+ 4.1	6	−3 20	+22.4	15	−1 31	− 2.9
25	−0 4	3.2	10	3 35	23.1	19	1 1	4.6
29	+0 11	2.3	14	3 50	23.6	23	0 31	6.2
2	+0 26	+ 1.3	18	4 4	23.9	27	−0 1	7.7
	. ..	...	22	−4 16	+24.1	31	+0 28	− 9.0

SATELLITES OF JUPITER, 1917.

GREENWICH MEAN TIME.

JANUARY.

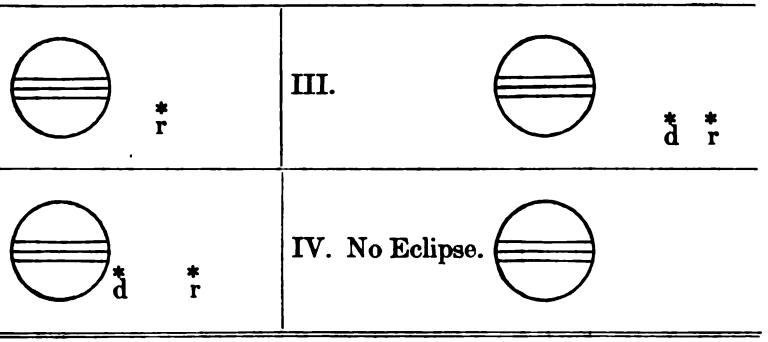
d	h	m	s		d	h	m	s		d	h	m	s		d	h	m	s	
1	0	22	40	I. Sh. I.	8	13	43	53	II.*Ec. R.	16	10	41	21	III.*Sh. I.	24	2	47	9	
	1	15	1	I. Tr. E.		22	18	9	I. Oc. D.		12	20	7	III.*Sh. E.			85	348	I
	2	31	14	I. Sh. E.							21	22	55	I. Tr. I.		11	29	26	I
	5	56	51	II. Oc. D.	9	1	4	58	III. Tr. I.		22	42	53	I. Sh. I.		11	36	11	I
	8	32	41	II. Oc. R.		1	49	13	I. Ec. R.		23	32	29	I. Tr. E.		14	6	59	I
	8	33	57	II. Ec. D.		3	3	13	III. Tr. E.							20	38	40	
	11	6	46	II.*Ec. R.		6	38	58	III. Sh. I.	17	0	51	25	I. Sh. E.					
	20	24	11	I. Oc. D.		8	18	15	III. Sh. E.		6	14	48	II. Tr. I.	25	0	9	37	
	21	10	56	III. Tr. I.		19	27	55	I. Tr. I.		8	50	19	II. Tr. E.		17	48	7	
	23	6	33	III. Tr. E.		20	47	13	I. Sh. I.		8	58	25	II. Sh. I.		19	7	29	
	23	53	27	I. Ec. R.		21	37	20	I. Tr. E.		11	29	28	II.*Sh. E.		19	57	53	
						22	55	44	I. Sh. E.		18	42	16	I. Oc. D.		21	16	3	
2	2	35	59	III. Sh. I.							22	13	56	I. Ec. R.					
	4	15	50	III. Sh. E.	10	3	37	47	II. Tr. I.						26	3	2	19	
	17	34	3	I.*Tr. I.		6	13	10	II. Tr. E.	18	15	51	48	I.*Tr. I.			53	928	
	18	51	35	I. Sh. I.		6	20	30	II. Sh. I.		17	11	46	I. Sh. I.			54	50	
	19	43	20	I. Tr. E.		8	51	50	II. Sh. E.		18	1	24	I. Tr. E.		8	17	37	
	21	0	8	I. Sh. E.		16	46	53	I.*Oc. D.		19	20	18	I. Sh. E.		15	7	52	
						20	18	12	I. Ec. R.							18	38	30	
3	1	2	53	II. Tr. I.						19	0	23	34	II. Oc. D.		23	6	18	I
	3	38	5	II. Tr. E.	11	13	56	32	I.*Tr. I.		3	0	26	II. Oc. R.					
	3	42	24	II. Sh. I.		15	16	5	I.*Sh. I.		3	7	23	II. Ec. D.	27	1	11	43	I
	6	14	3	II. Sh. E.		16	5	59	I.*Tr. E.		5	40	3	II. Ec. R.		4	41	3	I
	14	52	37	I.*Oc. D.		17	24	36	I. Sh. E.		13	11	13	I.*Oc. D.		6	22	12	I
	18	22	27	I. Ec. R.		21	47	3	II. Oc. D.		16	42	49	I.*Ec. R.		12	17	23	
											19	1	2	III. Oc. D.		13	36	28	
4	12	2	23	I.*Tr. I.	12	0	23	33	II. Oc. R.		21	5	3	III. Oc. R.		14	27	12	
	13	20	27	I.*Sh. I.		0	29	53	II. Ec. D.							15	45	3	
	14	11	42	I.*Tr. E.		3	2	37	II. Ec. R.	20	0	38	40	III. Ec. D.		22	14	10	
	15	28	59	I.*Sh. E.		11	15	35	I.*Oc. D.		2	20	13	III. Ec. R.					
	19	12	58	II. Oc. D.		14	47	5	I.*Ec. R.		10	20	49	I. Tr. I.	28	0	49	49	
	21	49	3	II. Oc. R.		14	59	49	III.*Oc. D.		11	40	45	I.*Sh. I.		0	55	7	
	21	52	35	II. Ec. D.		17	2	1	III.*Oc. R.		12	30	29	I.*Tr. E.		3	25	48	
						20	35	44	III. Ec. D.		13	49	17	I.*Sh. E.		9	37	12	
5	0	25	23	II. Ec. R.		22	17	46	III. Ec. R.		19	34	17	II. Tr. I.		13	7	26	
	9	21	2	I. Oc. D.							22	9	51	II. Tr. E.					
	11	3	59	III.*Oc. D.	13	8	25	17	I. Tr. I.		22	17	29	II. Sh. I.	29	6	46	39	
	12	51	20	I.*Ec. R.		9	45	3	I. Sh. I.							8	5	21	
	13	3	51	III.*Oc. R.		10	34	47	I. Tr. E.	21	0	48	23	II. Sh. E.		8	56	30	
	16	33	24	III.*Ec. D.		11	53	34	I.*Sh. E.		7	40	19	I. Oc. D.		10	13	59	
	18	15	56	III. Ec. R.		16	56	18	II.*Tr. I.		11	11	46	I.*Ec. R.		16	22	23	I
						19	31	44	II. Tr. E.							18	59	38	I
6	6	30	51	I. Tr. I.		19	39	40	II. Sh. I.	22	4	49	51	I. Tr. I.		19	3	41	I
	7	49	24	I. Sh. I.		22	10	50	II. Sh. E.		6	9	38	I. Sh. I.		21	36	16	I
	8	40	12	I. Tr. E.							6	59	32	I. Tr. E.					
	9	57	56	I. Sh. E.	14	5	44	25	I. Oc. D.		8	18	12	I. Sh. E.	30	4	6	32	
	14	20	22	II.*Tr. I.		9	16	3	I. Ec. R.		13	42	35	II.*Oc. D.		7	36	19	
	16	55	38	II.*Tr. E.							16	19	35	II.*Oc. R.		13	13	6	II
	17	1	42	II.*Sh. I.	15	2	54	3	I. Tr. I.		16	26	2	II.*Ec. D.		15	16	22	II
	19	33	10	II. Sh. E.		4	13	56	I. Sh. I.		18	58	39	II. Ec. R.		18	45	35	II
						5	3	35	I. Tr. E.							20	23	32	II
7	3	49	35	I. Oc. D.		6	22	28	I. Sh. E.	23	2	9	25	I. Oc. D.					
	7	20	18	I. Ec. R.		11	4	59	II.*Oc. D.		5	40	39	I. Ec. R.	31	1	16	2	
						13	41	39	II.*Oc. R.		9	6	10	III. Tr. I.		2	34	20	
8	0	59	19	I. Tr. I.		13	48	31	II.*Ec. D.		11	8	13	III.*Tr. E.		3	25	55	
	2	18	16	I. Sh. I.		16	21	12	II.*Ec. R.		14	43	32	III.*Sh. I.		4	42	57	
	3	8	43	I. Tr. E.							16	21	53	III.*Sh. E.		11	34	35	I
	4	26	48	I. Sh. E.	16	0	13	15	I. Oc. D.		23	18	59	I. Tr. I.		14	10	16	I
	8	29	41	II. Oc. D.		3	44	57	I. Ec. R.							14	13	44	I
	11	5	58	II.*Oc. R.		5	3	20	III. Tr. I.	24	0	38	36	I. Sh. I.		16	44	21	I
	11	11	9	II.*Ec. D.		7	3	42	III. Tr. E.		1	28	42	I. Tr. E.		22	36	0	

NOTE.—I. denotes ingress; E., egress; D., disappearance; R., reappearance; Ec., eclipse; Oc., *Tr., transit of the satellite;* Sh., transit of the shadow. *Visible at Washington.

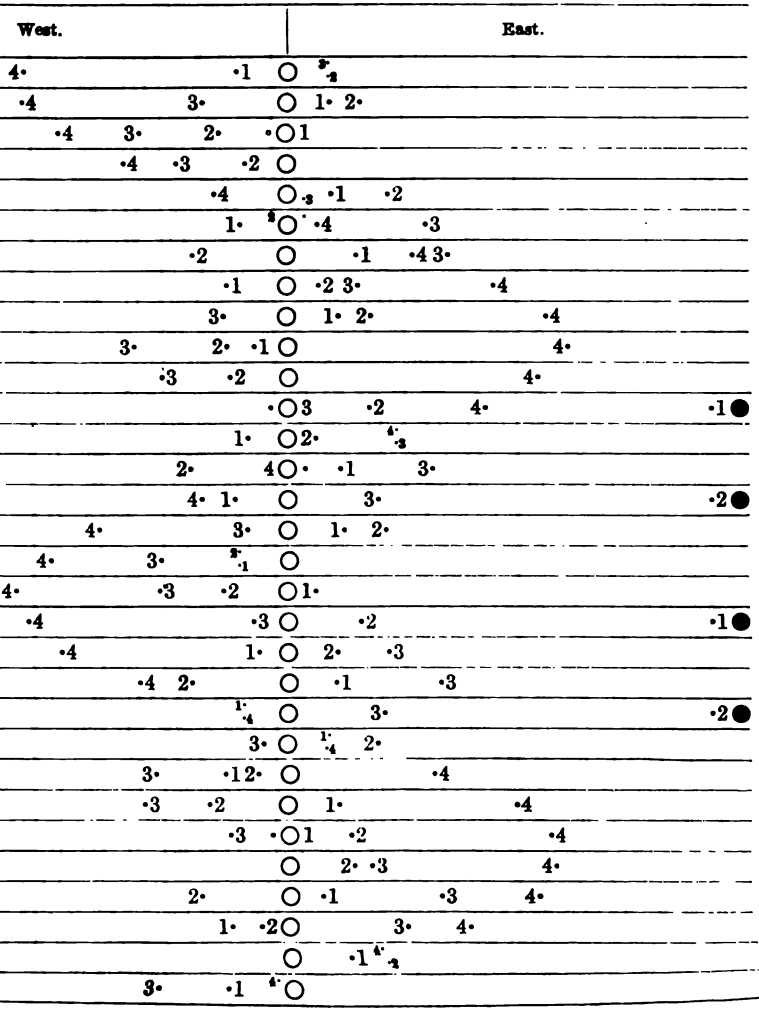
GREENWICH MEAN TIME.

JANUARY.

Phases of the Eclipses of the Satellites for an Inverting Telescope.



Configurations at 14h 0m for an Inverting Telescope.



GREENWICH MEAN TIME.

FEBRUARY.

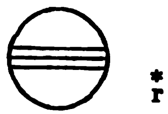
d	h	m	s		d	h	m	s		d	h	m	s		d	h	m	s	
1	2	5	16	I. Ec. R.	9	19	3	47	I. Oc. D.	17	21	32	35	I. Sh. E.	26	15	48	17	I.
	19	45	24	I. Tr. I.		22	29	43	I. Ec. R.							16	52	42	I.
	21	3	13	I. Sh. I.						18	6	23	14	II. Tr. I.		17	57	25	I.
	21	55	20	I. Tr. E.	10	7	28	37	III. Oc. D.		8	46	50	II. Sh. I.					
	23	11	52	I. Sh. E.		9	35	38	III. Oc. R.		8	58	51	II. Tr. E.	27	3	20	6	II.
						12	45	24	III.*Ec. D.		11	17	5	II. Sh. E.		8	7	52	II.
2	5	43	12	II. Oc. D.		14	25	58	III.*Ec. R.		15	32	45	I. Oc. D.		12	2	37	I.*
	8	20	35	II. Oc. R.		16	13	15	I. Tr. I.		18	54	5	I. Ec. R.		15	18	19	I.
	8	22	46	II. Ec. D.		17	27	56	I. Sh. I.										
	10	55	20	II. Ec. R.		18	23	24	I. Tr. E.	19	12	42	12	I.*Tr. I.	28	6	18	15	III.
	17	5	25	I. Oc. D.		19	36	43	I. Sh. E.		13	52	34	I.*Sh. I.		8	23	9	III.
	20	34	8	I. Ec. R.							14	52	35	I.*Tr. E.		9	12	17	I.
					11	3	38	51	II. Tr. I.		16	1	31	I. Sh. E.		10	17	14	I.
3	3	15	59	III. Oc. D.		6	9	48	II. Sh. I.							10	55	18	III.
	5	22	23	III. Oc. R.		6	14	31	II. Tr. E.	20	0	33	15	II. Oc. D.		11	22	51	I.
	8	43	36	III. Ec. D.		8	40	10	II. Sh. E.		5	29	50	II. Ec. R.		12	26	23	I.*
	10	24	27	III. Ec. R.		13	33	31	I.*Oc. D.		10	2	38	I. Oc. D.		12	32	20	III.*
	14	14	54	I.*Tr. I.		16	58	36	I. Ec. R.		13	22	55	I.*Ec. R.		22	31	53	II.
	15	32	12	I.*Sh. I.															
	16	24	52	I. Tr. E.	12	10	42	55	I. Tr. I.	21	1	56	54	III. Tr. I.					
	17	40	52	I. Sh. E.		11	56	50	I.*Sh. I.		4	1	48	III. Tr. E.					
						12	53	7	I.*Tr. E.		6	52	35	III. Sh. I.					
4	0	55	45	II. Tr. I.		14	5	39	I.*Sh. E.		7	12	11	I. Tr. I.					
	3	31	26	II. Tr. E.		21	47	53	II. Oc. D.		8	21	32	I. Sh. I.					
	3	32	33	II. Sh. I.							8	29	43	III. Sh. E.					
	6	3	3	II. Sh. E.	13	2	51	51	II. Ec. R.		9	22	35	I. Tr. E.					
	11	34	58	I.*Oc. D.		8	3	14	I. Oc. D.		10	30	31	I. Sh. E.					
	15	3	3	I.*Ec. R.		11	27	27	I.*Ec. R.		19	45	46	II. Tr. I.					
						21	38	57	III. Tr. I.		22	5	13	II. Sh. I.					
5	8	44	22	I. Tr. I.		23	43	36	III. Tr. E.		22	21	22	II. Tr. E.					
	10	1	5	I. Sh. I.															
	10	54	24	I. Tr. E.	14	2	50	18	III. Sh. I.	22	0	35	25	II. Sh. E.					
	12	9	48	I.*Sh. E.		4	27	36	III. Sh. E.		4	32	37	I. Oc. D.					
	19	4	13	II. Oc. D.		5	12	43	I. Tr. I.		7	51	49	I. Ec. R.					
						6	25	48	I. Sh. I.										
6	0	14	1	II. Ec. R.		7	22	57	I. Tr. E.	23	1	42	5	I. Tr. I.					
	6	4	30	I. Oc. D.		8	34	39	I. Sh. E.		2	50	24	I. Sh. I.					
	9	31	55	I. Ec. R.		17	0	45	II. Tr. I.		3	52	32	I. Tr. E.					
	17	23	57	III. Tr. I.		19	28	16	II. Sh. I.		4	59	25	I. Sh. E.					
	19	28	5	III. Tr. E.		19	36	26	II. Tr. E.		13	56	42	II.*Oc. D.					
	22	47	38	III. Sh. I.		21	58	35	II. Sh. E.		18	49	7	II. Ec. R.					
											23	2	34	I. Oc. D.					
7	0	25	14	III. Sh. E.	15	2	33	4	I. Oc. D.										
	3	13	59	I. Tr. I.		5	56	22	I. Ec. R.	24	2	20	38	I. Ec. R.					
	4	30	4	I. Sh. I.		23	42	27	I. Tr. I.		16	3	21	III. Oc. D.					
	5	24	2	I. Tr. E.							18	10	38	III. Oc. R.					
	6	38	47	I. Sh. E.	16	0	54	41	I. Sh. I.		20	12	9	I. Tr. I.					
	14	16	58	II.*Tr. I.		1	52	44	I. Tr. E.		20	48	43	III. Ec. D.					
	16	51	5	II. Sh. I.		3	3	33	I. Sh. E.		21	19	23	I. Sh. I.					
	16	52	39	II. Tr. E.		11	10	32	II. Oc. D.		22	22	39	I. Tr. E.					
	19	21	32	II. Sh. E.		16	11	5	II. Ec. R.		22	28	49	III. Ec. R.					
						21	2	52	I. Oc. D.		23	28	27	I. Sh. E.					
8	0	34	10	I. Oc. D.															
	4	0	51	I. Ec. R.	17	0	25	13	I. Ec. R.	25	9	8	47	II. Tr. I.					
	21	43	32	I. Tr. I.		11	44	29	III.*Oc. D.		11	23	40	II. Sh. I.					
	22	58	57	I. Sh. I.		13	51	46	III.*Oc. R.		11	44	19	II.*Tr. E.					
	23	53	38	I. Tr. E.		16	47	1	III. Ec. D.		13	53	49	II.*Sh. E.					
						18	12	21	I. Tr. I.		17	32	36	I. Oc. D.					
9	1	7	42	I. Sh. E.		18	27	21	III. Ec. R.		20	49	30	I. Ec. R.					
	8	25	59	II. Oc. D.		19	23	40	I. Sh. I.										
	13	33	9	II.*Ec. R.		20	22	41	I. Tr. E.	26	14	42	10	I.*Tr. I.					

NOTE.—I. denotes ingress; E., egress; D., disappearance; R., reappearance; Ec., eclipse; Oc., occ Tr., transit of the satellite; Sh., transit of the shadow. *Visible at Washington.

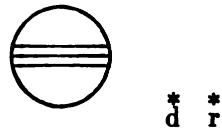
GREENWICH MEAN TIME.

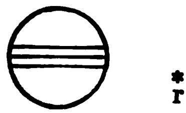
FEBRUARY.

Phases of the Eclipses of the Satellites for an Inverting Telescope.

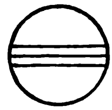


III.





IV. No Eclipse.



Configurations at 13ʰ 30ᵐ for an Inverting Telescope.

West.		East.
•3 4••2	O	1•
4• •3 •1	O	•2
4• 1	O	• 2•/•3
4• 2•	O	•3 •1●
•4 1•/•2	O	3•
•4	O	3• •1 •2
•4 3• 1• 2	O	•
•3 •2 •4	O	1•
•3 •1	O	•4 •2●
	O	1• 2• •4 •3●
2• .	O	1 •3 •4
•2 1•	O	3• •4
	O	3•/•1 •2 4•
3• 1•	O	2• 4•
3• 2•	O	•1 4•
•3 •1	O	4• •2●
4•	O	1• 2• •3●
4• 2• •1	O	•3
4• •2	O	3•
4•	O	•1 3•/•2
•4 3•/1•	O	2•
•4 3• 2•	O	•1
•4 •3 •1 •	O	2
•4 •	O	3 1• 2•
2•/•1 •	O	4 •3
•2 1	O	• •4 3•
	O	•2 3• •4 •1●
3•/1•	O	2• •4

GREENWICH MEAN TIME.

MARCH.

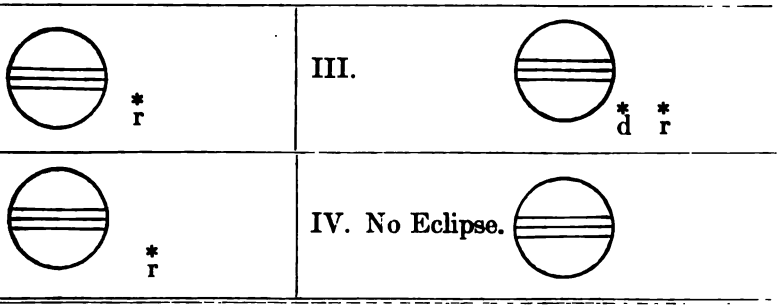
d	h	m	s		d	h	m	s		d	h	m	s		d	h	m	s	
1	0	41	59	II. Sh. I.	9	19	33	8	II. Oc. D.	18	5	15	54	I. Sh. E.	26	4	30	16	I.
	1	7	23	II. Tr. E.							7	21	36	III. Oc. R.		22	47	0	I.
	3	12	7	II. Sh. E.	10	0	5	26	II. Ec. R.		8	54	40	III. Ec. D.		23	30	48	I.
	6	32	44	I. Oc. D.		3	3	30	I. Oc. D.		10	34	23	III. Ec. R.					
	9	47	11	I. Ec. R.		6	11	15	I. Ec. R.		17	30	46	II. Tr. I.	27	0	58	5	I.
											19	12	54	II. Sh. I.		1	40	30	I.
2	3	42	20	I. Tr. I.	11	0	13	28	I. Tr. I.		20	5	48	II. Tr. E.		14	39	22	II.
	4	46	6	I. Sh. I.		0	49	39	III. Oc. D.		21	42	54	II. Sh. E.		18	40	39	II.
	5	52	57	I. Tr. E.		1	10	45	I. Sh. I.		23	34	52	I. Oc. D.		20	6	39	I.
	6	55	16	I. Sh. E.		2	24	16	I. Tr. E.							22	59	0	I.
	16	44	16	II. Oc. D.		2	56	11	III. Oc. R.	19	2	35	12	I. Ec. R.					
	21	27	14	II. Ec. R.		3	20	7	I. Sh. E.		20	45	11	I. Tr. I.	28	17	17	34	I.
						4	52	56	III. Ec. D.		21	35	14	I. Sh. I.		17	59	44	I.
3	1	2	48	I. Oc. D.		6	32	42	III. Ec. R.		22	56	9	I. Tr. E.		19	28	39	I.
	4	15	59	I. Ec. R.		14	42	41	II. Tr. I.		23	44	48	I. Sh. E.		20	9	28	I.
	20	25	5	III. Oc. D.		16	36	40	II. Sh. I.										
	22	12	33	I. Tr. I.		17	17	55	II. Tr. E.	20	11	48	4	II. Oc. D.	29	0	1	47	III.
	22	32	5	III. Oc. R.		19	6	42	II. Sh. E.		16	2	23	II. Ec. R.		2	4	42	III.
	23	15	5	I. Sh. I.		21	33	44	I. Oc. D.		18	5	11	I. Oc. D.		3	2	22	III.
											21	3	58	I. Ec. R.		4	39	26	III.
4	0	23	12	I. Tr. E.	12	0	40	3	I. Ec. R.							9	43	53	II.
	0	50	33	III. Ec. D.		18	43	44	I. Tr. I.	21	15	15	40	I. Tr. I.		11	6	51	II.
	1	24	18	I. Sh. E.		19	39	37	I. Sh. I.		16	4	10	I. Sh. I.		12	18	33	II.*
	2	30	28	III. Ec. R.		20	54	34	I. Tr. E.		17	26	39	I. Tr. E.		13	36	48	II.
	11	55	19	II.*Tr. I.		21	49	2	I. Sh. E.		18	13	46	I. Sh. E.		14	37	6	I.
	14	0	17	II.*Sh. I.							19	33	24	III. Tr. I.		17	27	46	I.
	14	30	44	II.*Tr. E.	13	8	57	40	II. Oc. D.		21	37	3	III. Tr. E.					
	16	30	22	II. Sh. E.		13	24	10	II.*Ec. R.		23	0	47	III. Sh. I.	30	11	48	0	I.
	19	32	57	I. Oc. D.		16	3	58	I. Oc. D.							12	28	33	I.*
	22	44	49	I. Ec. R.		19	8	50	I. Ec. R.	22	0	37	48	III. Sh. E.		13	59	8	I.
											6	55	0	II. Tr. I.		14	38	19	I.
5	16	42	42	I. Tr. I.	14	13	14	6	I.*Tr. I.		8	30	56	II. Sh. I.					
	17	43	58	I. Sh. I.		14	8	34	I. Sh. I.		9	29	56	II. Tr. E.	31	4	5	38	II.
	18	53	24	I. Tr. E.		15	6	34	III. Tr. I.		11	0	55	II. Sh. E.		8	0	10	II.
	19	53	13	I. Sh. E.		15	24	58	I. Tr. E.		12	35	34	I.*Oc. D.		9	7	30	I.
						16	18	1	I. Sh. E.		15	32	45	I. Ec. R.		11	56	30	I.
6	6	8	18	II. Oc. D.		17	10	50	III. Tr. E.										
	10	46	0	II. Ec. R.		18	59	9	III. Sh. I.	23	9	46	2	I. Tr. I.					
	14	3	5	I.*Oc. D.		20	36	9	III. Sh. E.		10	33	0	I. Sh. I.					
	17	13	37	I. Ec. R.							11	57	4	I.*Tr. E.					
					15	4	6	38	II. Tr. I.		12	42	38	I.*Sh. E.					
7	10	41	27	III. Tr. I.		5	54	49	II. Sh. I.										
	11	12	57	I. Tr. I.		6	41	47	II. Tr. E.	24	1	13	58	II. Oc. D.					
	12	12	55	I.*Sh. I.		8	24	51	II. Sh. E.		5	21	54	II. Ec. R.					
	12	46	7	III.*Tr. E.		10	34	17	I. Oc. D.		7	5	54	I. Oc. D.					
	13	23	40	I.*Tr. E.		13	37	39	I.*Ec. R.		10	1	31	I. Ec. R.					
	14	22	13	I.*Sh. E.															
	14	57	21	III. Sh. I.	16	7	44	23	I. Tr. I.	25	4	16	34	I. Tr. I.					
	16	34	21	III. Sh. E.		8	37	24	I. Sh. I.		5	1	57	I. Sh. I.					
						9	55	18	I. Tr. E.		6	27	37	I. Tr. E.					
8	1	18	53	II. Tr. I.		10	46	54	I. Sh. E.		7	11	37	I. Sh. E.					
	3	18	29	II. Sh. I.		22	23	4	II. Oc. D.		9	43	39	III. Oc. D.					
	3	54	13	II. Tr. E.							11	48	48	III. Oc. R.					
	5	48	34	II. Sh. E.	17	2	43	38	II. Ec. R.		12	56	30	III.*Ec. D.					
	8	33	19	I. Oc. D.		5	4	33	I. Oc. D.		14	36	14	III. Ec. R.					
	11	42	28	I.*Ec. R.		8	6	26	I. Ec. R.		20	19	23	II. Tr. I.					
											21	48	54	II. Sh. I.					
9	5	43	7	I. Tr. I.	18	2	14	50	I. Tr. I.		22	54	11	II. Tr. E.					
	6	41	46	I. Sh. I.		3	6	23	I. Sh. I.										
	7	53	54	I. Tr. E.		4	25	46	I. Tr. E.	26	0	18	52	II. Sh. E.					
	8	51	6	I. Sh. E.		5	15	42	III. Oc. D.		1	36	17	I. Oc. D.					

*NOTE.—I. denotes ingress; E., egress; D., disappearance; R., reappearance; Ec., eclipse; Oc., occ
Tr., transit of the satellite; Sh., transit of the shadow.* *Visible at Washington.

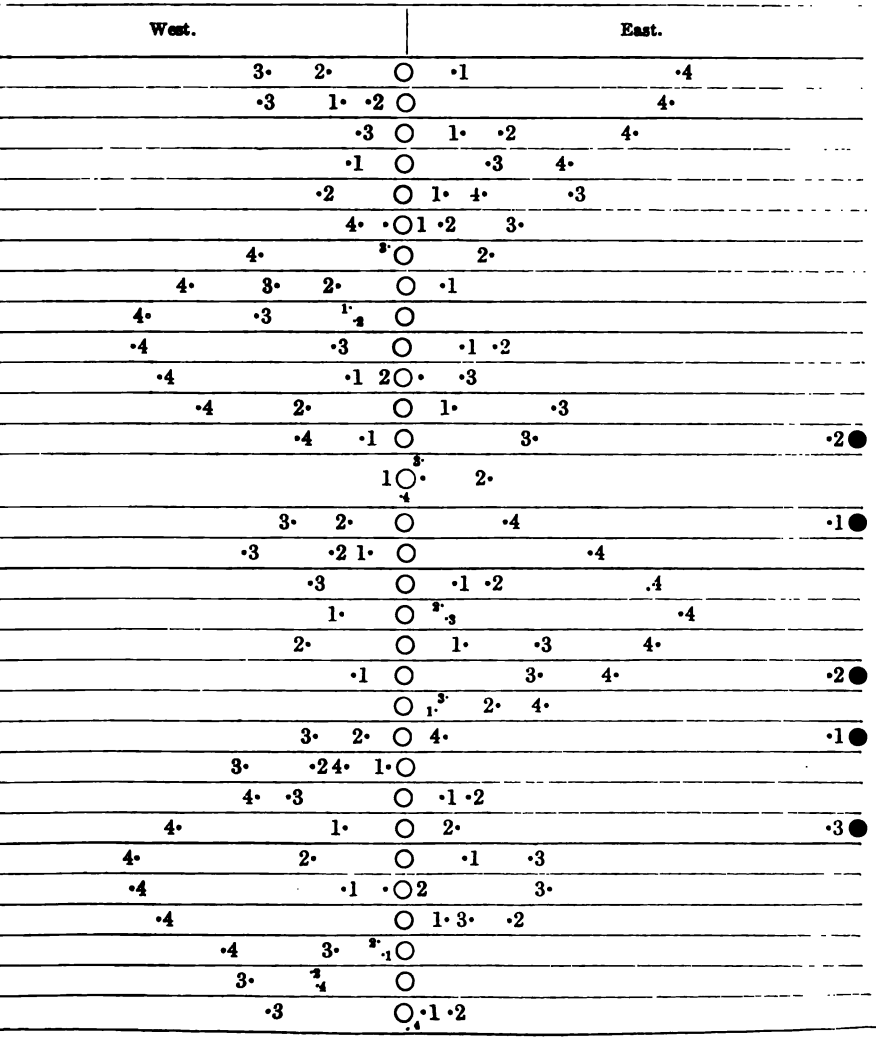
GREENWICH MEAN TIME.

MARCH.

Phases of the Eclipses of the Satellites for an Inverting Telescope.



Configurations at 13h 0m for an Inverting Telescope.



GREENWICH MEAN TIME.

APRIL.

d	h	m	s		d	h	m	s		d	h	m	s		d	h	m	s	
1	6	18	36	I. Tr. I.	5	19	22	41	I. Ec. R.	11	23	33	22	I. Tr. E.	17	5	17	10	
	6	57	29	I. Sh. I.												7	5	13	
	8	29	45	I. Tr. E.	6	13	50	15	I. Tr. I.	12	0	0	39	I. Sh. E.		7	27	12	
	9	7	17	I. Sh. E.		14	24	2	I. Sh. I.		9	3	1	III. Tr. I.		23	16	55	
	14	12	12	III. Oc. D.		16	1	26	I. Tr. E.		11	4	11	III. Tr. E.					
	16	16	30	III. Oc. R.		16	33	55	I. Sh. E.		11	6	13	III. Sh. I.	18	2	12	3	
	16	57	32	III. Ec. D.							12	43	33	III.*Sh. E.		2	35	22	
	18	37	19	III. Ec. R.	7	6	57	57	II. Oc. D.		15	22	40	II. Tr. I.		4	43	33	
	23	8	28	II. Tr. I.		10	38	26	II. Ec. R.		16	18	9	II. Sh. I.		23	24	41	
						11	9	15	I. Oc. D.		17	56	44	II. Tr. E.		23	46	3	
2	0	24	44	II. Sh. I.		13	51	24	I. Ec. R.		18	40	38	I. Oc. D.					
	1	43	0	II. Tr. E.							18	48	1	II. Sh. E.	19	1	35	56	
	2	54	40	II. Sh. E.	8	8	20	54	I. Tr. I.		21	17	30	I. Ec. R.		1	56	7	
	3	37	55	I. Oc. D.		8	52	58	I. Sh. I.							13	35	12	I
	6	25	14	I. Ec. R.		10	32	7	I. Tr. E.	13	15	52	41	I. Tr. I.		15	8	16	I
						11	2	53	I. Sh. E.		16	19	27	I. Sh. I.		15	35	26	I
3	0	49	7	I. Tr. I.		18	41	41	III. Oc. D.		18	3	55	I. Tr. E.		16	45	50	I
	1	26	20	I. Sh. I.		20	45	3	III. Oc. R.		18	29	27	I. Sh. E.		18	12	25	
	3	0	17	I. Tr. E.		20	58	22	III. Ec. D.							18	53	34	
	3	36	9	I. Sh. E.		22	38	15	III. Ec. R.	14	9	50	47	II. Oc. D.		20	42	33	
	17	31	21	II. Oc. D.							13	11	7	I. Oc. D.		20	46	8	
	21	18	54	II. Ec. R.	9	1	57	51	II. Tr. I.		13	16	42	II. Ec. R.		21	23	23	
	22	8	20	I. Oc. D.		3	0	22	II. Sh. I.		15	46	12	I. Ec. R.		23	12	14	
						4	32	5	II. Tr. E.										
4	0	53	56	I. Ec. R.		5	30	17	II. Sh. E.	15	10	23	22	I. Tr. I.	20	17	55	15	
	19	19	44	I. Tr. I.		5	39	42	I. Oc. D.		10	48	23	I. Sh. I.		18	14	49	
	19	55	14	I. Sh. I.		8	20	6	I. Ec. R.		12	34	37	I.*Tr. E.		20	6	30	
	21	30	55	I. Tr. E.							12	58	23	I. Sh. E.		20	24	53	
	22	5	6	I. Sh. E.	10	2	51	28	I. Tr. I.		23	12	6	III. Oc. D.					
						3	21	47	I. Sh. I.						21	12	43	58	
5	4	32	4	III. Tr. I.		5	2	41	I. Tr. E.	16	2	39	16	III. Ec. R.		15	13	2	
	6	34	8	III. Tr. E.		5	31	43	I. Sh. E.		4	47	30	II. Tr. I.		15	54	54	
	7	4	31	III. Sh. I.		20	23	55	II. Oc. D.		5	35	50	II. Sh. I.		17	40	55	
	8	41	40	III. Sh. E.		23	57	10	II. Ec. R.		7	21	24	II. Tr. E.					
	12	33	9	II.*Tr. I.							7	41	35	I. Oc. D.	22	12	25	58	
	13	42	36	II. Sh. I.	11	0	10	9	I. Oc. D.		8	5	42	II. Sh. E.		12	43	43	
	15	7	32	II. Tr. E.		2	48	47	I. Ec. R.		10	14	52	I. Ec. R.		14	37	13	
	16	12	31	II. Sh. E.		21	22	8	I. Tr. I.							14	53	48	
	16	38	48	I. Oc. D.		21	50	41	I. Sh. I.	17	4	53	58	I. Tr. I.					

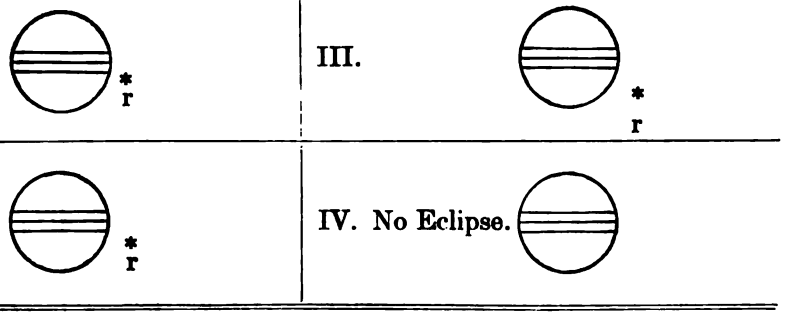
By reason of the proximity of Jupiter to the Sun the phenomen satellites are not given from April 23 to May 31.

NOTE.—I. denotes ingress; E., egress; D., disappearance; R., reappearance; Ec., eclipse; Oc Tr., transit of the satellite; Sh., transit of the shadow. *Visible at Washington.

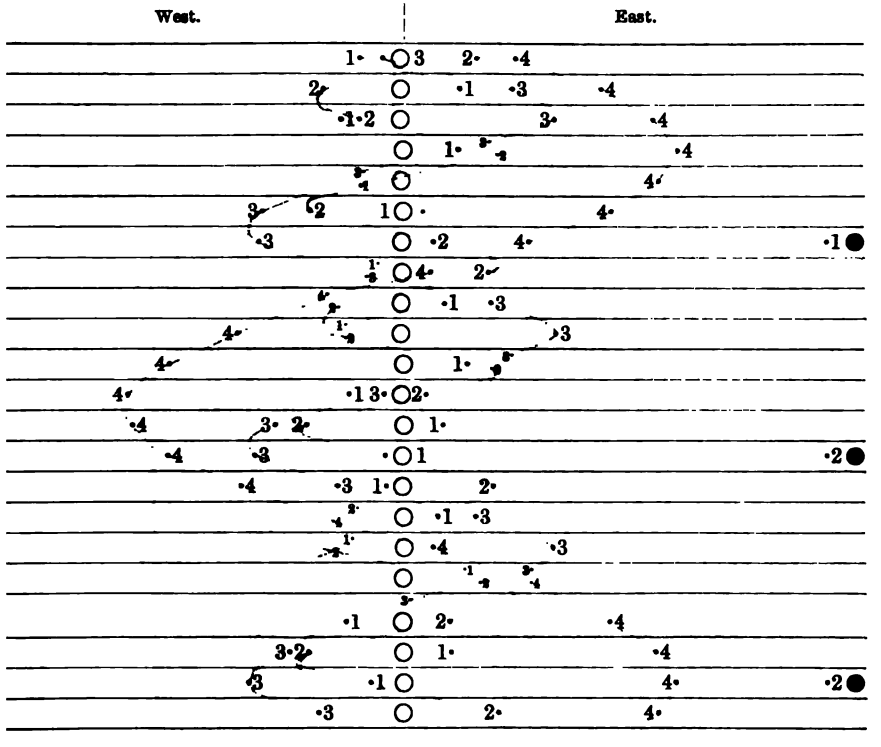
GREENWICH MEAN TIME.

APRIL.

Phases of the Eclipses of the Satellites for an Inverting Telescope.



Configurations at 12h 45m for an Inverting Telescope.



GREENWICH MEAN TIME.

JUNE.

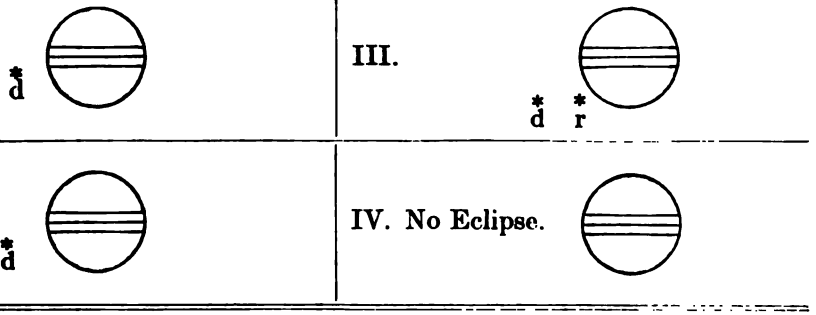
d	h	m	s		d	h	m	s		d	h	m	s		d	h	m	s	
1	8	29	21	I. Ec. D.	8	23	11	2	III. Tr. E.	17	10	25	55	II. Ec. D.	26	6	5	47	I.
	10	23	29	II. Sh. I.							14	18	53	II. Oc. R.		7	25	17	II.
	11	3	8	I. Oc. R.	9	7	40	17	I. Sh. I.							8	59	4	II.
	11	10	13	II. Tr. I.		8	11	58	I. Tr. I.	18	4	3	48	I. Sh. I.		9	54	13	II.
	12	52	51	II. Sh. E.		9	50	16	I. Sh. E.		4	43	52	I. Tr. I.		11	28	51	II.
	13	41	33	II. Tr. E.		10	22	38	I. Tr. E.		6	13	38	I. Sh. E.		17	5	16	III
	15	14	52	III. Sh. I.							6	54	19	I. Tr. E.		18	48	59	III
	16	46	35	III. Tr. I.	10	4	52	2	I. Ec. D.							20	14	50	III
	16	54	22	III. Sh. E.		7	34	32	I. Oc. R.	19	1	14	35	I. Ec. D.		22	8	52	III
	18	41	10	III. Tr. E.		7	48	28	II. Ec. D.		4	5	25	I. Oc. R.					
						11	28	1	II. Oc. R.		4	50	28	II. Sh. I.	27	0	27	5	I
2	5	45	26	I. Sh. I.							6	11	27	II. Tr. I.		1	15	3	I
	6	10	8	I. Tr. I.	11	2	9	3	I. Sh. I.		7	19	32	II. Sh. E.		2	36	47	I
	7	55	29	I. Sh. E.		2	42	26	I. Tr. I.		8	41	40	II. Tr. E.		3	25	15	I
	8	20	57	I. Tr. E.		4	18	59	I. Sh. E.		13	5	6	III. Ec. D.		21	37	3	I
						4	53	4	I. Tr. E.		14	48	15	III. Ec. R.					
3	2	57	55	I. Ec. D.		23	20	33	I. Ec. D.		15	48	6	III. Oc. D.	28	0	35	49	I
	5	10	53	II. Ec. D.							17	42	41	III. Oc. R.		2	21	18	II
	5	33	28	I. Oc. R.	12	2	4	44	I. Oc. R.		22	32	26	I. Sh. I.		6	33	15	II
	8	36	32	II. Oc. R.		2	15	43	II. Sh. I.		23	14	7	I. Tr. I.		18	55	48	I
						3	23	19	II. Tr. I.							19	45	17	I
4	0	14	13	I. Sh. I.		4	44	54	II. Sh. E.	20	0	42	15	I. Sh. E.		21	5	28	I
	0	40	40	I. Tr. I.		5	53	58	II. Tr. E.		1	24	31	I. Tr. E.		21	55	26	I
	2	24	15	I. Sh. E.		9	4	16	III. Ec. D.		19	43	5	I. Ec. D.					
	2	51	28	I. Tr. E.		10	46	56	III. Ec. R.		22	35	33	I. Oc. R.	29	16	5	31	I
	21	26	26	I. Ec. D.		11	19	23	III. Oc. D.		23	44	8	II. Ec. D.		19	5	48	I
	23	40	54	II. Sh. I.		13	14	38	III. Oc. R.							20	42	39	II
						20	37	42	I. Sh. I.	21	3	43	38	II. Oc. R.		22	22	36	II
5	0	3	45	I. Oc. R.		21	12	47	I. Tr. I.		17	1	10	I. Sh. I.		23	11	33	II
	0	34	41	II. Tr. I.		22	47	37	I. Sh. E.		17	44	28	I. Tr. I.					
	2	10	13	II. Sh. E.		23	23	22	I. Tr. E.		19	10	58	I. Sh. E.	30	0	52	12	II
	3	5	47	II. Tr. E.							19	54	49	I. Tr. E.		7	17	9	III
	5	4	1	III. Ec. D.	13	17	49	3	I. Ec. D.							8	58	42	III
	6	46	12	III. Ec. R.		20	34	56	I. Oc. R.	22	14	11	34	I. Ec. D.		10	39	54	III
	6	50	15	III. Oc. D.		21	6	46	II.*Ec. D.		17	5	38	I. Oc. R.		12	31	40	III
	8	46	11	III. Oc. R.							18	7	51	II. Sh. I.		13	24	22	I
	18	42	53	I. Sh. I.	14	0	53	8	II. Oc. R.		19	35	18	II. Tr. I.		14	15	21	I
	19	11	6	I. Tr. I.		15	6	27	I. Sh. I.		20	36	51	II.*Sh. E.		15	34	1	I
	20	52	54	I. Sh. E.		15	43	13	I. Tr. I.		22	5	19	II. Tr. E.		16	25	26	I
	21	21	51	I. Tr. E.		17	16	21	I. Sh. E.										
						17	53	45	I. Tr. E.	23	3	16	58	III. Sh. I.					
6	15	54	58	I. Ec. D.							4	58	0	III. Sh. E.					
	18	29	15	II. Ec. D.	15	12	17	34	I. Ec. D.		6	13	47	III. Tr. I.					
	18	34	1	I. Oc. R.		15	5	6	I. Oc. R.		8	6	13	III. Tr. E.					
	22	1	56	II. Oc. R.		15	33	5	II. Sh. I.		11	29	46	I. Sh. I.					
						16	47	25	II. Tr. I.		12	14	39	I. Tr. I.					
7	13	11	39	I. Sh. I.		18	2	12	II. Sh. E.		13	39	32	I. Sh. E.					
	13	41	36	I. Tr. I.		19	17	53	II. Tr. E.		14	24	56	I. Tr. E.					
	15	21	39	I. Sh. E.		23	16	41	III. Sh. I.										
	15	52	19	I. Tr. E.						24	8	40	5	I. Ec. D.					
					16	0	57	11	III. Sh. E.		11	35	45	I. Oc. R.					
8	10	23	30	I. Ec. D.		1	46	13	III. Tr. I.		13	3	9	II. Ec. D.					
	12	58	19	II. Sh. I.		3	39	20	III. Tr. E.		17	8	55	II. Oc. R.					
	13	4	16	I. Oc. R.		9	35	4	I. Sh. I.										
	13	59	2	II. Tr. I.		10	13	30	I. Tr. I.	25	5	58	28	I. Sh. I.					
	15	27	33	II. Sh. E.		11	44	57	I. Sh. E.		6	44	54	I. Tr. I.					
	16	29	56	II. Tr. E.		12	23	59	I. Tr. E.		8	8	12	I. Sh. E.					
	19	16	6	III. Sh. I.							8	55	9	I. Tr. E.					
	20	56	6	III. Sh. E.	17	6	46	5	I. Ec. D.										
	21	17	12	III. Tr. I.		9	35	18	I. Oc. R.	26	3	8	34	I. Ec. D.					

NOTE.—I. denotes ingress; E., egress; D., disappearance; R., reappearance; Ec., eclipse; Oc., Tr., transit of the satellite; Sh., transit of the shadow. *Visible at Washington.

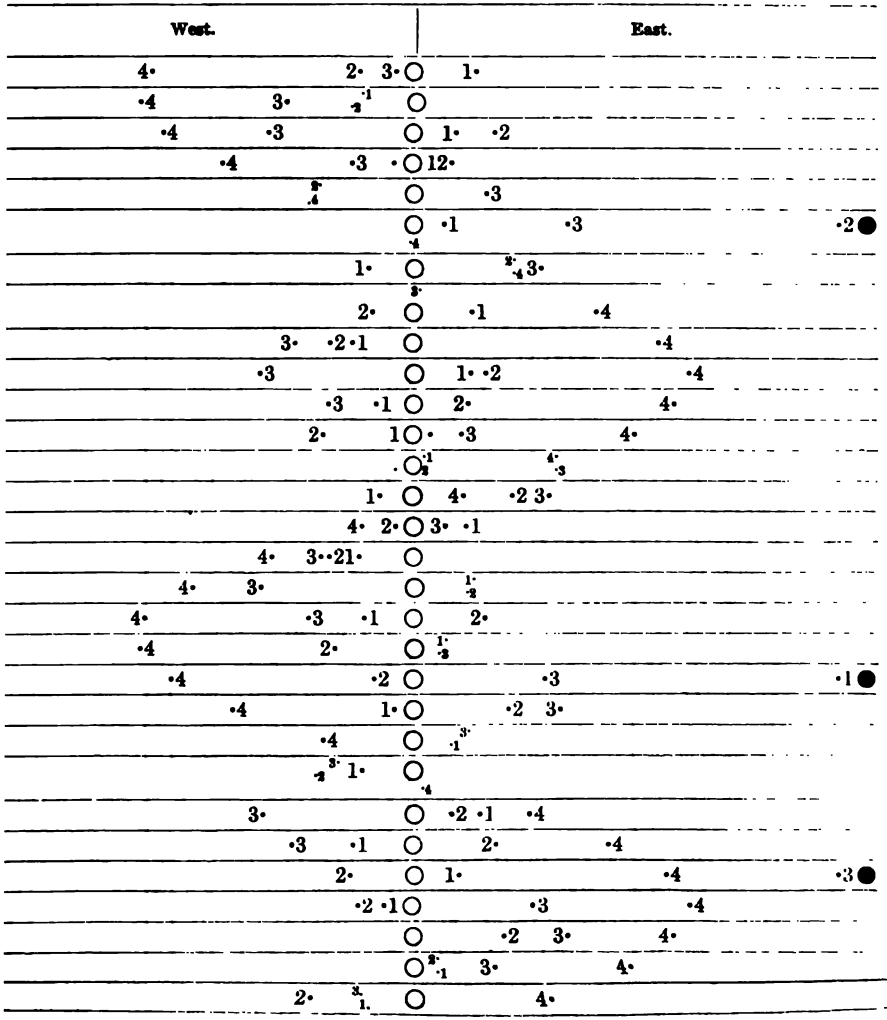
GREENWICH MEAN TIME.

JUNE.

Phases of the Eclipses of the Satellites for an Inverting Telescope.



Configurations at 20h 45m for an Inverting Telescope.



GREENWICH MEAN TIME.

JULY.

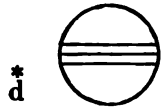
d h m s		d h m s		d h m s		d h m s	
1 10 34 1	I. Ec. D.	10 10 5 18	I. Oc. R.	18 9 23 46	III. Oc. D.	27 4 42 37	I
13 35 49	I. Oc. R.	12 34 56	II. Sh. I.	9 24 25	I. Tr. E.	5 52 33	I
15 40 13	II. Ec. D.	14 32 13	II. Tr. I.	11 16 30	III. Oc. R.	23 40 53	I
19 58 2	II.*Oc. R.	15 3 39	II. Sh. E.				
		17 1 9	II. Tr. E.	19 3 18 39	I. Ec. D.	28 3 1 54	I
2 7 53 4	I. Sh. I.			6 34 3	I. Oc. R.	7 2 19	II
8 45 29	I. Tr. I.	11 1 4 58	III. Ec. D.	10 11 47	II. Ec. D.	9 23 55	II
10 2 40	I. Sh. E.	2 50 1	III. Ec. R.	14 55 49	II. Oc. R.	9 30 49	II
10 55 31	I. Tr. E.	4 16 8	I. Sh. I.			11 51 52	II
		5 2 58	III. Oc. D.	20 0 39 11	I. Sh. I.	21 1 58	
3 5 2 29	I. Ec. D.	5 15 28	I. Tr. I.	1 44 40	I. Tr. I.	22 12 44	
8 5 45	I. Oc. R.	6 25 35	I. Sh. E.	2 48 27	I. Sh. E.	23 11 5	
10 0 5	II. Sh. I.	6 56 6	III. Oc. R.	3 54 11	I. Tr. E.	23 18 26	III
11 46 0	II. Tr. I.	7 25 15	I. Tr. E.	21 47 5	I. Ec. D.		
12 28 55	II. Sh. E.					29 0 21 59	
14 15 22	II. Tr. E.	12 1 24 50	I. Ec. D.	21 1 3 40	I. Oc. R.	1 2 35	II
21 5 29	III.*Ec. D.	4 35 7	I. Oc. R.	4 27 18	II. Sh. I.	4 6 11	II
22 49 51	III. Ec. R.	7 35 9	II. Ec. D.	6 39 59	II. Tr. I.	5 55 53	II
		12 9 28	II. Oc. R.	6 55 53	II. Sh. E.	18 9 21	
4 0 40 6	III. Oc. D.	22 44 49	I. Sh. I.	9 8 19	II. Tr. E.	21 31 24	
2 21 39	I. Sh. I.	23 45 26	I. Tr. I.	19 7 42	I.*Sh. I.		
2 33 40	III. Oc. R.			19 18 1	III.*Sh. I.	30 2 6 37	I
3 15 31	I. Tr. I.	13 0 54 13	I. Sh. E.	20 14 19	I.*Tr. I.	7 2 56	I
4 31 14	I. Sh. E.	1 55 9	I. Tr. E.	21 1 25	III.*Sh. E.	15 30 33	
5 25 30	I. Tr. E.	19 53 16	I.*Ec. D.	21 16 56	I.*Sh. E.	16 42 15	
23 30 57	I. Ec. D.	23 4 52	I. Oc. R.	22 23 46	I. Tr. E.	17 39 38	
				23 47 53	III. Tr. I.	18 51 27	
5 2 35 41	I. Oc. R.	14 1 52 23	II. Sh. I.				
4 58 20	II. Ec. D.	3 55 3	II. Tr. I.	22 1 38 2	III. Tr. E.	31 12 37 47	
9 21 55	II. Oc. R.	4 21 3	II. Sh. E.	16 15 34	I. Ec. D.	16 0 48	
20 50 21	I.*Sh. I.	6 23 48	II. Tr. E.	19 33 20	I.*Oc. R.	20 19 47	I
21 45 37	I. Tr. I.	15 17 53	III. Sh. I.	23 30 19	II. Ec. D.	22 45 12	I
22 59 53	I. Sh. E.	17 0 36	III. Sh. E.			22 48 16	I
23 55 33	I. Tr. E.	17 13 21	I. Sh. I.	23 4 18 43	II. Oc. R.		
		18 15 14	I. Tr. I.	13 36 19	I. Sh. I.		
6 17 59 25	I. Ec. D.	19 22 43	I.*Sh. E.	14 44 1	I. Tr. I.		
21 5 34	I.*Oc. R.	19 27 24	III.*Tr. I.	15 45 31	I. Sh. E.		
23 17 29	II. Sh. I.	20 24 54	I.*Tr. E.	16 53 25	I. Tr. E.		
		21 18 3	III.*Tr. E.				
7 1 9 11	II. Tr. I.			24 10 44 0	I. Ec. D.		
1 46 15	II. Sh. E.	15 14 21 46	I. Ec. D.	14 2 53	I. Oc. R.		
3 38 22	II. Tr. E.	17 34 40	I. Oc. R.	17 44 45	II. Sh. I.		
11 17 14	III. Sh. I.	20 53 48	II.*Ec. D.	20 2 0	II.*Tr. I.		
12 59 21	III. Sh. E.			20 13 18	II.*Sh. E.		
15 4 17	III. Tr. I.	16 1 33 3	II. Oc. R.	22 30 9	II. Tr. E.		
15 18 54	I. Sh. I.	11 41 59	I. Sh. I.				
16 15 34	I. Tr. I.	12 45 6	I. Tr. I.	25 8 4 51	I. Sh. I.		
16 55 28	III. Tr. E.	13 51 19	I. Sh. E.	9 3 52	III. Ec. D.		
17 28 25	I. Sh. E.	14 54 43	I. Tr. E.	9 13 37	I. Tr. I.		
18 25 27	I. Tr. E.			10 14 1	I. Sh. E.		
		17 8 50 12	I. Ec. D.	10 50 19	III. Ec. R.		
8 12 27 55	I. Ec. D.	12 4 22	I. Oc. R.	11 22 57	I. Tr. E.		
15 35 28	I. Oc. R.	15 9 49	II. Sh. I.	13 42 40	III. Oc. D.		
18 17 6	II. Ec. D.	17 17 36	II. Tr. I.	15 34 58	III. Oc. R.		
22 46 8	II. Oc. R.	17 38 26	II. Sh. E.				
		19 46 8	II.*Tr. E.	26 5 12 28	I. Ec. D.		
9 9 47 34	I. Sh. I.			8 32 26	I. Oc. R.		
10 45 34	I. Tr. I.	18 5 4 19	III. Ec. D.	12 48 13	II. Ec. D.		
11 57 2	I. Sh. E.	6 10 32	I. Sh. I.	17 40 47	II. Oc. R.		
12 55 23	I. Tr. E.	6 50 4	III. Ec. R.				
		7 14 51	I. Tr. I.	27 2 33 28	I. Sh. I.		
10 6 56 22	I. Ec. D	8 19 51	I. Sh. E.	3 43 15	I. Tr. I.		

NOTE.—*I.* denotes Ingress; E., egress; D., disappearance; R., reappearance; Ec., eclipse; Oc., Tr., transit of the satellite; Sh., transit of the shadow. *Visible at Washington.

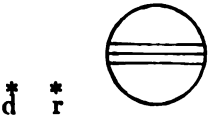
GREENWICH MEAN TIME.

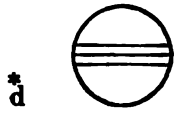
JULY.

Phases of the Eclipses of the Satellites for an Inverting Telescope.

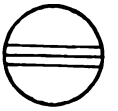


III.

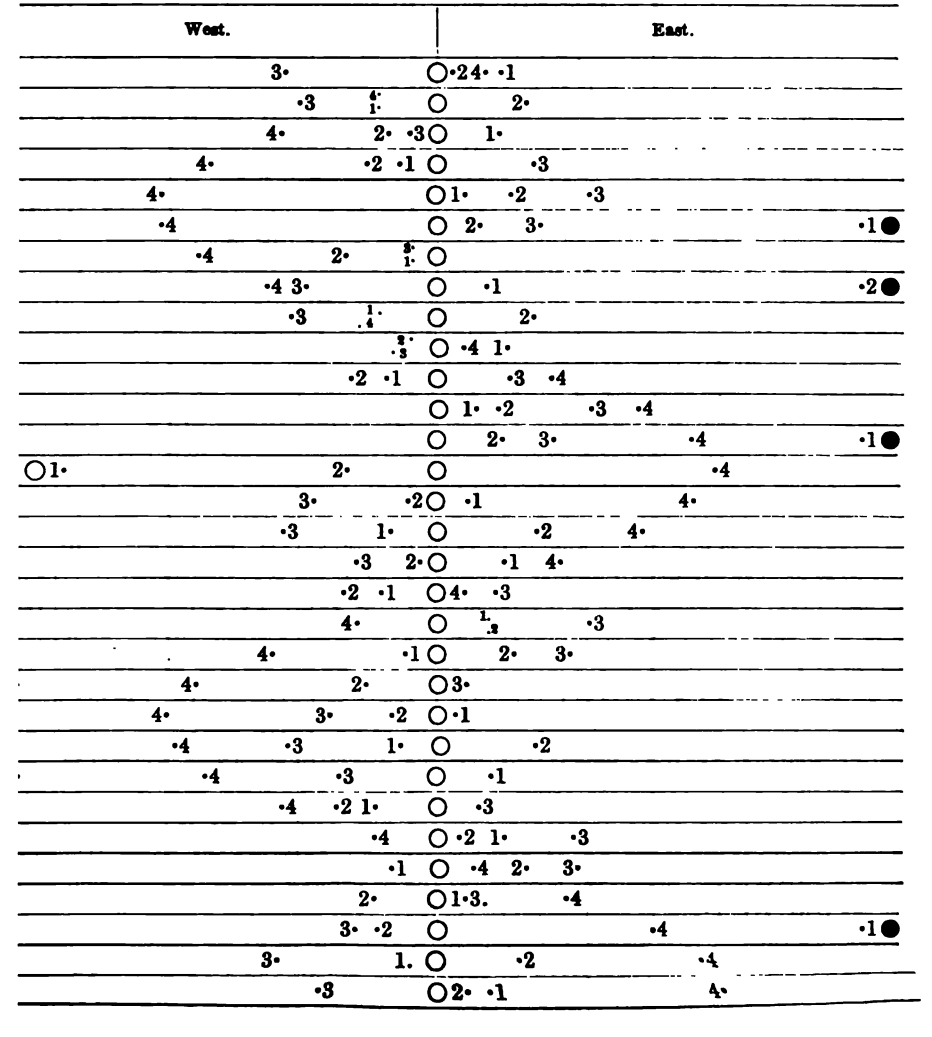




IV. No Eclipse.



Configurations at 20h 15m for an Inverting Telescope.



GREENWICH MEAN TIME.

AUGUST.

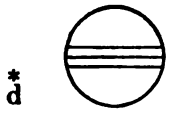
d h m s		d h m s		d h m s		d h m s	
1 1 13 8	II. Tr. E.	8 22 13 38	III. Oc. D.	16 20 36 21	II.*Ec. D.	24 10 9 41	I. S
9 59 4	I. Sh. I.			23 6 50	II. Ec. R.	11 29 54	I. T
11 11 40	I. Tr. I.	9 0 5 4	III. Oc. R.	23 17 40	II. Oc. D.	12 18 27	I. S
12 8 6	I. Sh. E.	9 0 0	I. Ec. D.			13 38 30	I. T
13 3 35	III. Ec. D.	12 27 17	I. Oc. R.	17 1 46 23	II. Oc. R.		
13 20 49	I. Tr. E.	18 0 30	II.*Ec. D.	8 15 46	I. Sh. I.	25 7 15 55	I. E
14 50 46	III. Ec. R.	20 31 5	II.*Ec. R.	9 34 31	I. Tr. I.	10 47 50	I. C
17 59 13	III. Oc. D.	20 37 5	II.*Oc. D.	10 24 35	I. Sh. E.	17 23 7	II.*S
19 51 5	III.*Oc. R.	23 6 13	II. Oc. R.	11 43 16	I. Tr. E.	19 51 37	II.*S
						20 6 49	II.*T
2 7 6 14	I. Ec. D.	10 6 21 45	I. Sh. I.	18 5 22 9	I. Ec. D.	22 33 31	II. T
10 30 12	I. Oc. R.	7 38 14	I. Tr. I.	8 52 32	I. Oc. R.		
15 24 27	II. Ec. D.	8 30 40	I. Sh. E.	14 47 47	II. Sh. I.	26 4 38 6	I. S
20 24 17	II.*Oc. R.	9 47 9	I. Tr. E.	17 16 14	II.*Sh. E.	5 58 32	I. T
				17 28 20	II.*Tr. I.	6 46 52	I. S
3 4 27 39	I. Sh. I.	11 3 28 24	I. Ec. D.	19 55 17	II.*Tr. E.	8 7 8	I. T
5 41 7	I. Tr. I.	6 56 24	I. Oc. R.			15 16 36	III. S
6 36 41	I. Sh. E.	12 12 32	II. Sh. I.	19 2 44 11	I. Sh. I.	17 4 2	III.*S
7 50 13	I. Tr. E.	14 40 58	II. Sh. E.	4 3 23	I. Tr. I.	20 47 17	III.*T
		14 48 12	II. Tr. I.	4 53 1	I. Sh. E.	22 34 52	III. T
4 1 34 39	I. Ec. D.	17 15 28	II. Tr. E.	6 12 7	I. Tr. E.		
4 59 30	I. Oc. R.			11 17 13	III. Sh. I.	27 1 44 25	I. E
9 37 22	II. Sh. I.	12 0 50 12	I. Sh. I.	13 3 45	III. Sh. E.	5 16 34	I. O
12 5 50	II. Sh. E.	2 7 20	I. Tr. I.	16 42 5	III. Tr. I.	12 29 56	II. E
12 6 41	II. Tr. I.	2 59 6	I. Sh. E.	18 30 16	III.*Tr. E.	15 0 16	II. E
14 34 17	II. Tr. E.	4 16 12	I. Tr. E.	23 50 39	I. Ec. D.	15 15 4	II. O
22 56 8	I. Sh. I.	7 17 45	III. Sh. I.			17 43 12	II.*O
		9 3 28	III. Sh. E.	20 3 21 29	I. Oc. R.	23 6 35	I. S
5 0 10 25	I. Tr. I.	12 33 16	III. Tr. I.	9 54 23	II. Ec. D.		
1 5 8	I. Sh. E.	14 22 0	III. Tr. E.	12 24 48	II. Ec. R.	28 0 27 12	I. T
2 19 29	I. Tr. E.	21 56 53	I. Ec. D.	12 37 22	II. Oc. D.	1 15 21	I. S
3 18 14	III. Sh. I.			15 5 53	II. Oc. R.	2 35 45	I. T
5 3 8	III. Sh. E.	13 1 25 33	I. Oc. R.	21 12 42	I.*Sh. I.	20 12 50	I.*E
8 21 18	III. Tr. I.	7 18 40	II. Ec. D.	22 32 18	I. Tr. I.	23 45 10	I. O
10 10 31	III. Tr. E.	9 49 10	II. Ec. R.	23 21 31	I. Sh. E.		
20 3 8	I.*Ec. D.	9 57 45	II. Oc. D.			29 6 40 42	II. S
23 28 50	I. Oc. R.	12 26 40	II. Oc. R.	21 0 40 59	I. Tr. E.	9 9 13	II. S
		19 18 45	I.*Sh. I.	18 19 4	I.*Ec. D.	9 25 15	II. T
6 4 42 45	II. Ec. D.	20 36 27	I.*Tr. I.	21 50 19	I.*Oc. R.	11 51 49	II. T
7 13 22	II. Ec. R.	21 27 37	I.*Sh. E.			17 35 1	I.*S
7 16 18	II. Oc. D.	22 45 18	I. Tr. E.	22 4 5 20	II. Sh. I.	18 55 45	I.*T
9 45 38	II. Oc. R.			6 33 47	II. Sh. E.	19 43 46	I.*S
17 24 42	I. Sh. I.	14 16 25 18	I. Ec. D.	6 47 37	II. Tr. I.	21 4 16	I.*T
18 39 45	I.*Tr. I.	19 54 35	I.*Oc. R.	9 14 25	II. Tr. E.		
19 33 40	I.*Sh. E.			15 41 9	I. Sh. I.	30 5 2 26	III. E
20 48 45	I.*Tr. E.	15 1 30 4	II. Sh. I.	17 1 5	I.*Tr. I.	6 53 1	III. E
		3 58 29	II. Sh. E.	17 49 57	I.*Sh. E.	10 34 37	III. O
7 14 31 33	I. Ec. D.	4 8 19	II. Tr. I.	19 9 43	I.*Tr. E.	12 24 34	III. O
17 58 3	I.*Oc. R.	6 35 25	II. Tr. E.			14 41 18	I. E
22 54 52	II. Sh. I.	13 47 12	I. Sh. I.	23 1 3 20	III. Ec. D.	18 13 46	I.*O
		15 5 28	I. Tr. I.	2 53 1	III. Ec. R.		
8 1 23 18	II. Sh. E.	15 56 4	I. Sh. E.	6 31 35	III. Oc. D.	31 1 47 31	II. E
1 27 30	II. Tr. I.	17 14 15	I. Tr. E.	8 22 6	III. Oc. R.	4 17 49	II. E
3 54 55	II. Tr. E.	21 3 35	III.*Ec. D.	12 47 31	I. Ec. D.	4 33 3	II. O
11 53 11	I. Sh. I.	22 52 23	III. Ec. R.	16 19 8	I. Oc. R.	7 1 1	II. O
13 8 58	I. Tr. I.			23 12 3	II. Ec. D.	12 3 32	I. S
14 2 7	I. Sh. E.	16 2 24 16	III. Oc. D.			13 24 19	I. T
15 17 56	I. Tr. E.	4 15 20	III. Oc. R.	24 1 42 26	II. Ec. R.	14 12 16	I. S
17 3 54	III. Ec. D.	10 53 45	I. Ec. D.	1 56 23	II. Oc. D.	15 32 48	I. T
18 51 52	III.*Ec. R.	14 23 37	I. Oc. R.	4 24 43	II. Oc. R.		

NOTE.—I. denotes ingress; E., egress; D., disappearance; R., reappearance; Ec., eclipse; Oc., occul
Tr., *transit of the satellite*; Sh., transit of the shadow. *Visible at Washington.

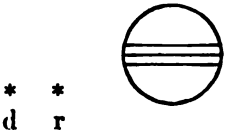
GREENWICH MEAN TIME.

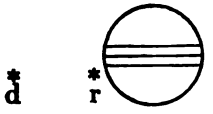
AUGUST.

Phases of the Eclipses of the Satellites for an Inverting Telescope.

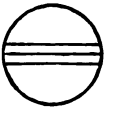


III.

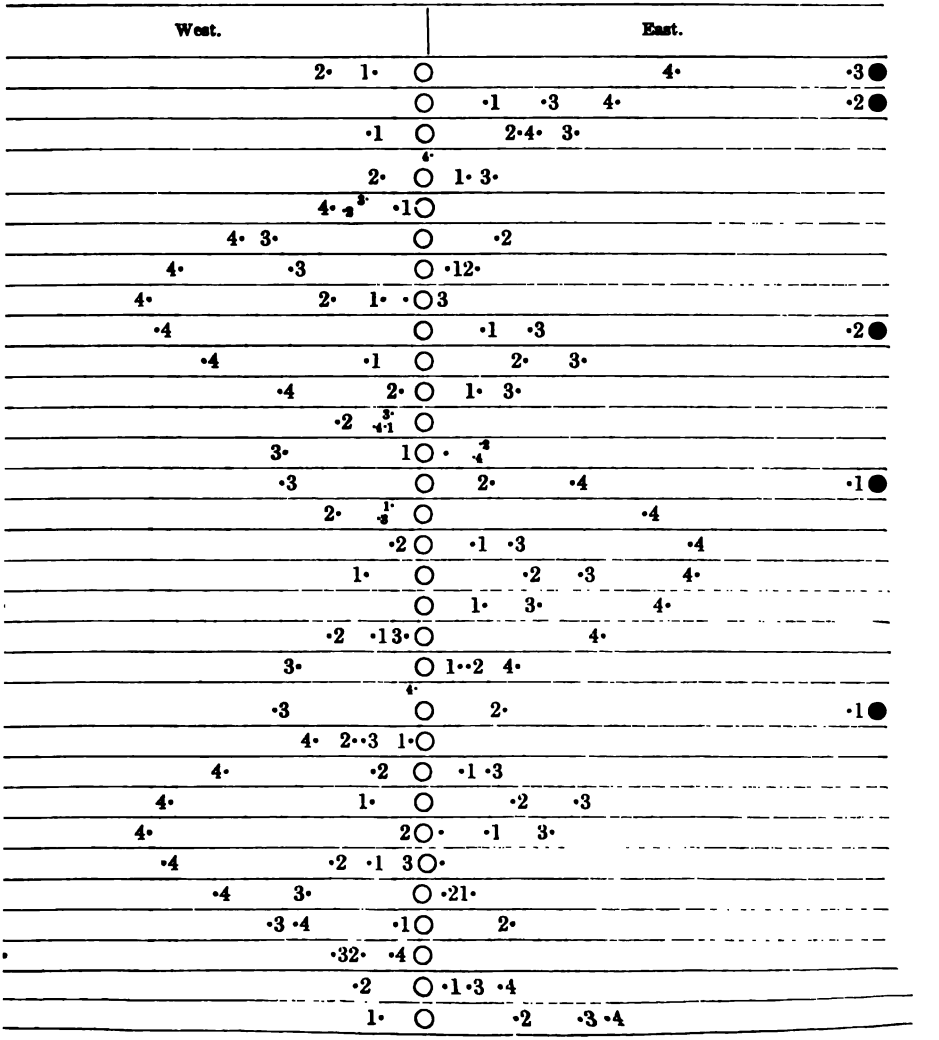




IV. No Eclipse.



Configurations at 19h 30m for an Inverting Telescope.



GREENWICH MEAN TIME.

SEPTEMBER.

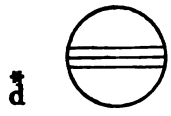
d	h	m	s		d	h	m	s		d	h	m	s		d	h	m	s	
1	9	9	42	I. Ec. D.	9	8	25	41	I. Sh. I.	17	7	25	52	I. Ec. D.	25	1	24	2	II
	12	42	14	I. Oc. R.			9	45	53	I. Tr. I.			8	39	52	III. Tr. I.			35	0	47	II
	19	58	36	II.*Sh. I.			10	34	26	I. Sh. E.			10	25	30	III. Tr. E.			6	41	24	I
	22	27	10	II. Sh. E.			11	54	17	I. Tr. E.			10	56	5	I. Oc. R.			7	56	25	I
	22	43	39	II. Tr. I.			23	16	4	III. Sh. I.			20	15	37	II.*Ec. D.			8	50	20	I
													22	45	42	II. Ec. R.			10	4	48	
2	1	10	7	II. Tr. E.	10	1	5	26	III. Sh. E.				22	55	16	II. Oc. D.						
	6	31	56	I. Sh. I.			4	46	39	III. Tr. I.							26	3	48	14	
	7	52	44	I. Tr. I.			5	32	1	I. Ec. D.	18	1	22	20	II. Oc. R.				7	14	42	
	8	40	40	I. Sh. E.			6	32	57	III. Tr. E.			4	47	47	I. Sh. I.			17	3	23	I
	10	1	12	I. Tr. E.			9	3	56	I. Oc. R.			6	5	47	I. Tr. I.			19	32	35	I
	19	16	35	III.*Sh. I.			17	40	33	II.*Ec. D.			6	56	37	I. Sh. E.			19	36	30	I
	21	4	56	III.*Sh. E.			20	10	42	II.*Ec. R.			8	14	8	I. Tr. E.			22	2	30	I
							20	24	7	II.*Oc. D.												
3	0	49	17	III. Tr. I.			22	51	31	II. Oc. R.	19	1	54	19	I. Ec. D.		27	1	9	47	
	2	36	14	III. Tr. E.									5	23	55	I. Oc. R.			2	23	52	
	3	38	12	I. Ec. D.	11	2	54	7	I. Sh. I.				14	27	31	II. Sh. I.			3	18	45	
	7	10	45	I. Oc. R.			4	14	0	I. Tr. I.			16	56	29	II.*Sh. E.			4	32	15	
	15	5	18	II. Ec. D.			5	2	53	I. Sh. E.			17	6	53	II.*Tr. I.			21	0	32	II
	17	35	32	II.*Ec. R.			6	22	24	I. Tr. E.			19	32	57	II.*Tr. E.			22	16	46	
	17	50	40	II.*Oc. D.									23	16	10	I. Sh. I.			22	54	57	II
	20	18	26	II.*Oc. R.	12	0	0	27	I. Ec. D.													
							3	32	2	I. Oc. R.	20	0	33	31	I. Tr. I.		28	1	42	15	
4	1	0	23	I. Sh. I.			11	51	46	II. Sh. I.			1	25	2	I. Sh. E.			2	6	33	II
	2	21	7	I. Tr. I.			14	20	32	II. Sh. E.			2	41	53	I. Tr. E.			3	53	29	II
	3	9	8	I. Sh. E.			14	35	1	II. Tr. I.			17	0	18	III.*Ec. D.			12	7	57	I
	4	29	35	I. Tr. E.			17	1	12	II.*Tr. E.			18	53	43	III.*Ec. R.			17	4	8	I
	22	6	37	I.*Ec. D.			21	22	31	I.*Sh. I.			20	22	49	I.*Ec. D.			19	38	13	
							22	42	2	I. Tr. I.			22	19	44	III.*Oc. D.			20	51	19	
5	1	39	6	I. Oc. R.			23	31	18	I. Sh. E.			23	51	45	I. Oc. R.			21	47	13	
	9	16	11	II. Sh. I.															22	59	42	
	11	44	48	II. Sh. E.	13	0	50	24	I. Tr. E.		21	0	7	31	III. Oc. R.							
	12	1	7	II. Tr. I.			13	0	46	III. Ec. D.			9	33	2	II. Ec. D.	29	16	45	11	
	14	27	28	II. Tr. E.			14	53	13	III. Ec. R.			12	3	6	II. Ec. R.			20	9	38	
	19	28	48	I.*Sh. I.			18	28	53	III.*Oc. D.			12	9	54	II. Oc. D.						
	20	49	25	I.*Tr. I.			18	28	56	I.*Ec. D.			14	36	50	II. Oc. R.	30	6	21	39	I
	21	37	33	I.*Sh. E.			20	17	28	III.*Oc. R.			17	44	37	I.*Sh. I.			8	50	48	I
	22	57	51	I. Tr. E.			22	0	9	I.*Oc. R.			19	1	15	I.*Tr. I.			8	51	0	I
													19	53	30	I.*Sh. E.			11	16	49	I
6	9	1	27	III. Ec. D.	14	6	58	0	II. Ec. D.				21	9	37	I.*Tr. E.			14	6	36	
	10	52	58	III. Ec. R.			9	28	9	II. Ec. R.									15	18	38	
	14	33	40	III. Oc. D.			9	39	57	II. Oc. D.	22	14	51	14	I. Ec. D.				16	15	38	
	16	22	59	III.*Oc. R.			12	7	11	II. Oc. R.			18	19	25	I.*Oc. R.			17	27	2	
	16	35	6	I.*Ec. D.			15	50	59	I.*Sh. I.												
	20	7	28	I.*Oc. R.			17	10	3	I.*Tr. I.	23	3	45	41	II. Sh. I.							
							17	59	46	I.*Sh. E.			6	14	46	II. Sh. E.						
7	4	22	51	II. Ec. D.			19	18	26	I.*Tr. E.			6	22	16	II. Tr. I.						
	6	53	3	II. Ec. R.									8	48	19	II. Tr. E.						
	7	7	37	II. Oc. D.	15	12	57	20	I. Ec. D.				12	12	59	I. Sh. I.						
	9	35	13	II. Oc. R.			16	28	5	I.*Oc. R.			13	28	51	I. Tr. I.						
	13	57	18	I. Sh. I.									14	21	54	I. Sh. E.						
	15	17	43	I. Tr. I.	16	1	9	52	II. Sh. I.				15	37	13	I.*Tr. E.						
	16	6	2	I.*Sh. E.			3	38	44	II. Sh. E.												
	17	26	8	I.*Tr. E.			3	51	30	II. Tr. I.	24	7	15	5	III. Sh. I.							
							6	17	38	II. Tr. E.			9	6	39	III. Sh. E.						
8	11	3	30	I. Ec. D.			10	19	21	I. Sh. I.			9	19	47	I. Ec. D.						
	14	35	40	I. Oc. R.			11	37	56	I. Tr. I.			12	27	57	III. Tr. I.						
	22	34	10	II. Sh. I.			12	28	10	I. Sh. E.			12	47	9	I. Oc. R.						
							13	46	18	I. Tr. E.			14	12	52	III. Tr. E.						
9	1	2	51	II. Sh. E.									22	50	34	II. Ec. D.						
	1	18	35	II. Tr. I.	17	3	15	50	III. Sh. I.													
	3	44	51	II. Tr. E.			5	6	18	III. Sh. E.	25	1	20	35	II. Ec. R.							

NOTE.—*I.* denotes ingress; E., egress; D., disappearance; R., reappearance; Ec., eclipse; Oc., *Tr.*, transit of the satellite; Sh., transit of the shadow. *Visible at Washington.

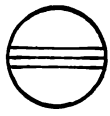
GREENWICH MEAN TIME.

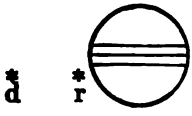
SEPTEMBER.

Phases of the Eclipses of the Satellites for an Inverting Telescope.

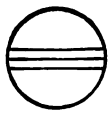


III.





IV. No Eclipse.



Configurations at 19h 0m for an Inverting Telescope.

	West.	East.
1		○ 2· ·1 3· ·4
2	2· 1·	○ 3· ·4
3	3·	○ 1· 4· ·2
4	3· ·1	○ 2· 4·
5	·3 2·	○ 1· 4·
6	·2	○ ·3 4· ·1
7	·1	○ ·2 ·3
8	4·	○ ·1 3·
9	4· 2· 1·	○ 3·
10	4· 3·	○ 1· ·2
11	·4 3· ·1	○ 2·
12	·4 ·3 2·	○ 1·
13	·4 ·2	○ ·1 ● ·3
14	1· ·4	○ ·2 ·3
15		○ ·1 2· 3·
16	2· 1·	○ 3· ·4
17	3· ·2	○ ·1 ·4
18	3· ·1	○ ·2 ·4
19	2· ·3	○ 1· ·4
20	·2	○ 4·
21	1	○ · ·2 ·3 4·
22		○ ·1 2· 4· 3·
23	2· 1·	○ 4· 3·
24	4·	○ ·1
25	4· 3· 1·	○ ·2
26	4· ·3 2	○ · 1·
27	4· ·2	○
28	·4	○ ·3
29	·4	○ 2· ·3
30	·4 2· 1·	○ 3·

GREENWICH MEAN TIME.

OCTOBER.

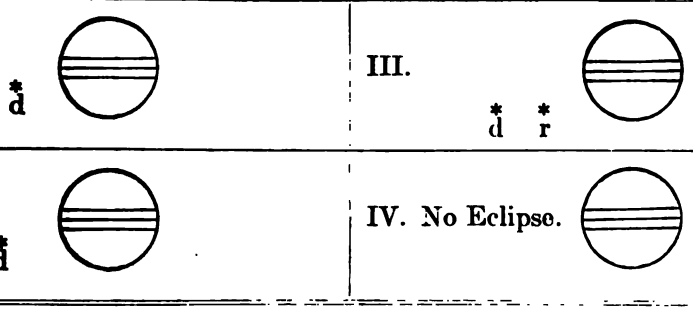
d	h	m	s		d	h	m	s		d	h	m	s		d	h	m	s	
1	11	13	45	I. Ec. D.	9	11	34	15	I. Tr. I.	18	5	17	58	II. Tr. E.	26	16	22	2	III.*
	11	14	6	III. Sh. I.		12	37	49	I. Sh. E.		6	50	34	I. Sh. I.		18	6	12	III.*
	13	6	51	III. Sh. E.		13	42	44	I. Tr. E.		7	48	3	I. Tr. I.		22	26	48	II.*
	14	37	5	I.*Oc. R.							9	0	2	I. Sh. E.					
	16	11	9	III.*Tr. I.	10	7	36	17	I. Ec. D.		9	56	40	I. Tr. E.	27	2	29	51	II.
	17	55	19	III.*Tr. E.		10	52	53	I. Oc. R.							3	12	41	I.
						22	15	36	II.*Sh. I.	19	3	59	3	I. Ec. D.		4	0	17	I.
2	1	25	23	II. Ec. D.							7	7	4	I. Oc. R.		5	22	23	I.
	6	16	52	II. Oc. R.	11	0	28	58	II. Tr. I.		8	59	10	III. Ec. D.		6	9	2	I.
	8	35	0	I. Sh. I.		0	45	22	II. Sh. E.		10	56	49	III. Ec. R.					
	9	45	54	I. Tr. I.		2	55	2	II. Tr. E.		12	55	24	III. Oc. D.	28	0	21	51	I.
	10	44	4	I. Sh. E.		4	56	57	I. Sh. I.		14	40	9	III.*Oc. R.		3	19	34	I.
	11	54	20	I. Tr. E.		6	1	8	I. Tr. I.		19	52	10	II.*Ec. D.		16	47	18	II.*
						7	6	14	I. Sh. E.							18	22	26	II.*
3	5	42	13	I. Ec. D.		8	9	38	I. Tr. E.	20	0	11	45	II. Oc. R.		19	17	54	II.*
	9	4	21	I. Oc. R.							1	19	1	I. Sh. I.		20	48	55	II.*
	19	39	25	II.*Sh. I.	12	2	4	52	I. Ec. D.		2	14	39	I. Tr. I.		21	41	6	I.*
	22	3	54	II.*Tr. I.		4	59	57	III. Ec. D.		3	28	31	I. Sh. E.		22	26	33	I.*
	22	8	54	II.*Sh. E.		5	19	54	I. Oc. R.		4	23	17	I. Tr. E.		23	50	51	I.
						6	56	30	III. Ec. R.		22	27	32	I.*Ec. D.					
4	0	29	54	II. Tr. E.		9	24	19	III. Oc. D.						29	0	35	20	I.
	3	3	22	I. Sh. I.		11	9	40	III. Oc. R.	21	1	33	38	I. Oc. R.		18	50	31	I.*
	4	13	5	I. Tr. I.		17	17	30	II.*Ec. D.		14	10	36	II.*Sh. I.		21	45	58	I.*
	5	12	29	I. Sh. E.		21	51	32	II.*Oc. R.		16	2	47	II.*Tr. I.					
	6	21	30	I. Tr. E.		23	25	24	I. Sh. I.		16	40	53	II.*Sh. E.	30	3	11	30	III.
											18	29	3	II.*Tr. E.		5	9	12	III.
5	0	10	46	I. Ec. D.	13	0	28	0	I. Tr. I.		19	47	25	I.*Sh. I.		6	17	17	III.
	1	0	10	III. Ec. D.		1	34	43	I. Sh. E.		20	41	9	I.*Tr. I.		7	59	18	III.
	2	55	38	III. Ec. R.		2	36	31	I. Tr. E.		21	56	58	I.*Sh. E.		11	44	6	II.
	3	31	38	I. Oc. R.		20	33	20	I.*Ec. D.		22	49	48	I.*Tr. E.		15	38	10	II.*
	5	47	52	III. Oc. D.		23	46	43	I. Oc. R.							16	9	32	I.*
	7	33	58	III. Oc. R.						22	16	56	10	I.*Ec. D.		16	52	45	I.*
	14	42	45	II.*Ec. D.	14	11	34	5	II. Sh. I.		20	0	16	I.*Oc. R.		18	19	20	I.*
	19	29	0	II.*Oc. R.		13	41	2	II.*Tr. I.		23	12	5	III. Sh. I.		19	1	34	I.*
	21	31	48	I.*Sh. I.		14	4	2	II.*Sh. E.										
	22	40	14	I. Tr. I.		16	7	9	II.*Tr. E.	23	1	8	30	III. Sh. E.	31	13	19	5	I.*
	23	40	57	I. Sh. E.		17	53	47	I.*Sh. I.		2	52	38	III. Tr. I.		16	12	13	I.*
						18	54	45	I.*Tr. I.		4	34	54	III. Tr. E.					
6	0	48	40	I. Tr. E.		20	3	9	I.*Sh. E.		9	9	27	II. Ec. D.					
	18	39	13	I.*Ec. D.		21	3	18	I.*Tr. E.		13	21	1	II.*Oc. R.					
	21	58	44	I.*Oc. R.							14	15	49	I.*Sh. I.					
					15	15	1	56	I.*Ec. D.		15	7	35	I.*Tr. I.					
7	8	57	48	II. Sh. I.		18	13	37	I.*Oc. R.		16	25	26	I.*Sh. E.					
	11	17	4	II. Tr. I.		19	12	18	III.*Sh. I.		17	16	16	I.*Tr. E.					
	11	27	26	II. Sh. E.		21	7	27	III.*Sh. E.										
	13	43	7	II. Tr. E.		23	23	9	III. Tr. I.	24	11	24	43	I. Ec. D.					
	16	0	11	I.*Sh. I.							14	26	44	I.*Oc. R.					
	17	7	16	I.*Tr. I.	16	1	5	55	III. Tr. E.										
	18	9	22	I.*Sh. E.		6	34	49	II. Ec. D.	25	3	28	32	II. Sh. I.					
	19	15	44	I.*Tr. E.		11	1	54	II. Oc. R.		5	12	26	II. Tr. I.					
						12	22	11	I. Sh. I.		5	58	58	II. Sh. E.					
8	13	7	48	I. Ec. D.		13	21	27	I. Tr. I.		7	38	47	II. Tr. E.					
	15	13	12	III.*Sh. I.		14	31	36	I.*Sh. E.		8	44	13	I. Sh. I.					
	16	25	54	I.*Oc. R.		15	30	2	I.*Tr. E.		9	33	56	I. Tr. I.					
	17	7	8	III.*Sh. E.							10	53	53	I. Sh. E.					
	19	49	37	III.*Tr. I.	17	9	30	27	I. Ec. D.		11	42	40	I. Tr. E.					
	21	33	2	III.*Tr. E.		12	40	20	I. Oc. R.										
										26	5	53	20	I. Ec. D.					
9	4	0	8	II. Ec. D.	18	0	51	58	II. Sh. I.		8	53	14	I. Oc. R.					
	8	40	32	II. Oc. R.		2	51	47	II. Tr. I.		12	58	26	III.*Ec. D.					
	10	28	35	I. Sh. I.		3	22	4	II. Sh. E.		14	57	11	III.*Ec. R.					

NOTE.—*I.* denotes ingress; E., egress; D., disappearance; R., reappearance; Ec., eclipse; Oc., occ
Tr., transit of the satellite; Sh., transit of the shadow. * Visible at Washington.

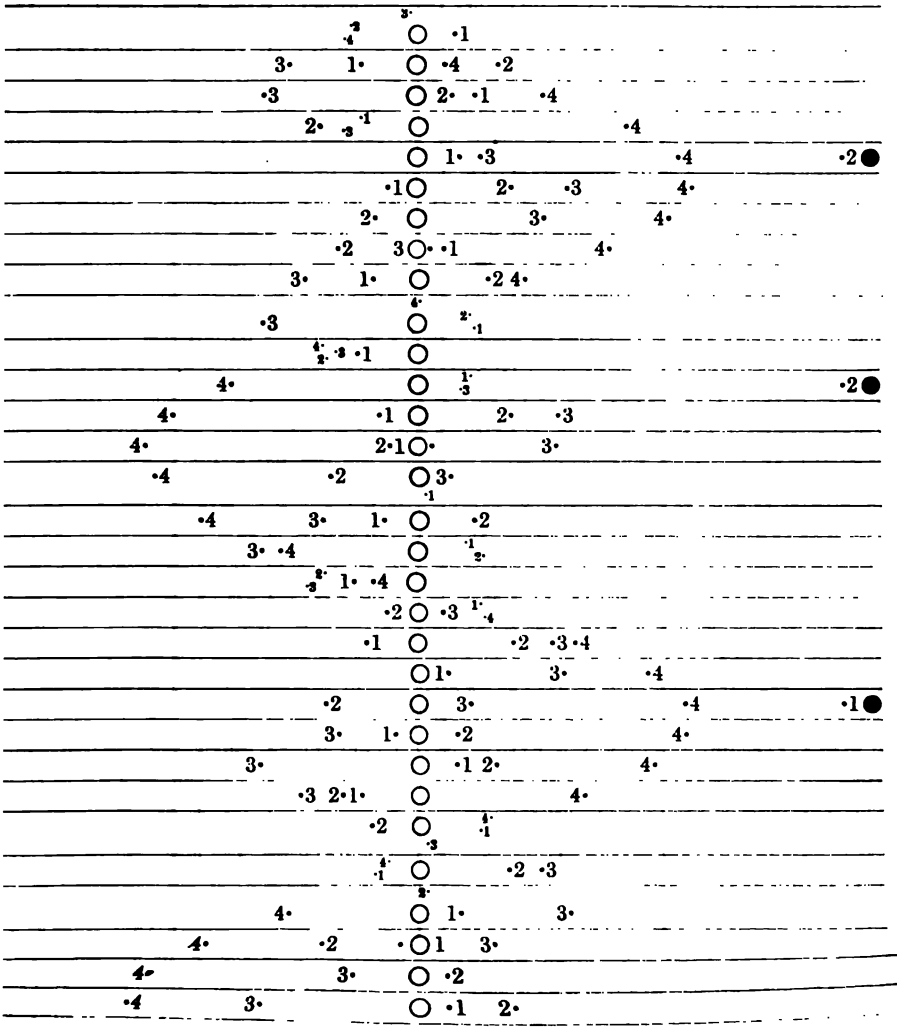
GREENWICH MEAN TIME.

OCTOBER.

Phases of the Eclipses of the Satellites for an Inverting Telescope.



Configurations at 18h 15m for an Inverting Telescope.



GREENWICH MEAN TIME.

NOVEMBER.

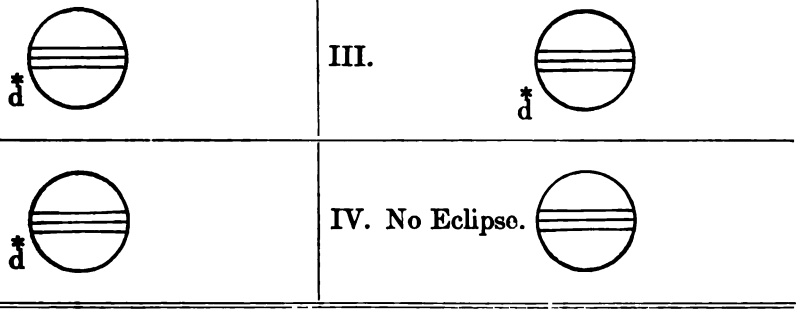
d	h	m	s		d	h	m	s		d	h	m	s		d	h	m	s	
1	6	5	19	II. Sh. I.	9	20	58	7	III.*Ec. D.	18	8	32	57	I. Oc. R.	27	19	9	48	III.*
	7	31	8	II. Tr. I.		22	59	7	III.*Ec. R.							19	24	42	III.*
	8	36	4	II. Sh. E.		23	4	27	III.*Oc. D.	19	0	38	48	II. Sh. I.		21	9	17	III.*
	9	57	44	II. Tr. E.							1	11	52	II. Tr. I.		21	12	36	III.*
	10	37	57	I. Sh. I.	10	0	48	28	III. Oc. R.		3	10	11	II. Sh. E.		22	2	53	II.*
	11	18	54	I. Tr. I.		3	36	3	II. Ec. D.		3	22	49	I. Sh. I.		23	45	34	I.
	12	47	48	I.*Sh. E.		7	0	18	I. Sh. I.		3	38	19	I. Tr. I.		23	47	14	I.
	13	27	45	I.*Tr. E.		7	0	48	II. Oc. R.		3	39	19	II. Tr. E.					
						7	29	2	I. Tr. I.		5	33	2	I. Sh. E.	28	0	33	41	II.
2	7	47	45	I. Ec. D.		9	10	21	I. Sh. E.		5	47	27	I. Tr. E.		1	55	54	I.
	10	38	31	I. Oc. R.		9	38	2	I. Tr. E.							1	56	29	I.
	16	58	7	III.*Ec. D.						20	0	34	19	I. Ec. D.		20	57	53	I.*
	18	58	0	III.*Ec. R.	11	4	10	52	I. Ec. D.		2	58	56	I. Oc. R.		23	9	18	I.*
	19	44	56	III.*Oc. D.		6	49	2	I. Oc. R.		15	10	9	III.*Sh. I.					
	21	28	51	III.*Oc. R.		22	1	24	II.*Sh. I.		16	10	51	III.*Tr. I.	29	16	33	24	II.*
						22	56	38	II.*Tr. I.		17	11	44	III.*Sh. E.		16	34	54	II.*
3	1	1	26	II. Ec. D.							17	54	12	III.*Tr. E.		18	13	0	I.*
	4	46	6	II. Oc. R.	12	0	32	34	II. Sh. E.		19	28	6	II.*Ec. D.		18	14	8	I.*
	5	6	26	I. Sh. I.		1	23	42	II. Tr. E.		21	51	21	I.*Sh. I.		19	1	27	II.*
	5	45	2	I. Tr. I.		1	28	47	I. Sh. I.		22	4	6	I.*Tr. I.		19	6	32	II.*
	7	16	19	I. Sh. E.		1	54	57	I. Tr. I.		22	20	53	II.*Oc. R.		20	22	17	I.*
	7	53	54	I. Tr. E.		3	38	52	I. Sh. E.							20	24	29	I.*
						4	3	59	I. Tr. E.	21	0	1	36	I. Sh. E.					
4	2	16	18	I. Ec. D.		22	39	35	I.*Ec. D.		0	13	16	I. Tr. E.	30	15	24	4	I.*
	5	4	39	I. Oc. R.							19	2	59	I.*Ec. D.		17	38	8	I.*
	19	24	14	II.*Sh. I.	13	1	15	7	I. Oc. R.		21	24	49	I.*Oc. R.					
	20	40	17	II.*Tr. I.		11	10	44	III. Sh. I.										
	21	55	8	II.*Sh. E.		12	55	49	III.*Tr. I.	22	13	57	9	II.*Sh. I.					
	23	7	2	II.*Tr. E.		13	11	3	III.*Sh. E.		14	18	49	II.*Tr. I.					
	23	34	53	I. Sh. I.		14	38	21	III.*Tr. E.		16	19	52	I.*Sh. I.					
						16	53	24	II.*Ec. D.		16	28	39	II.*Sh. E.					
5	0	11	6	I. Tr. I.		19	57	17	I.*Sh. I.		16	29	52	I.*Tr. I.					
	1	44	49	I. Sh. E.	20	7	41		II.*Oc. R.		16	46	27	II.*Tr. E.					
	2	20	1	I. Tr. E.		20	20	49	I.*Tr. I.		18	30	8	I.*Sh. E.					
	20	44	59	I.*Ec. D.	22	7	24		I.*Sh. E.		18	39	4	I.*Tr. E.					
	23	30	52	I. Oc. R.		22	29	53	I.*Tr. E.										
										23	13	31	45	I.*Ec. D.					
6	7	11	18	III. Sh. I.	14	17	8	13	I.*Ec. D.		15	50	47	I.*Oc. R.					
	9	10	20	III. Sh. E.		19	41	3	I.*Oc. R.										
	9	38	22	III. Tr. I.						24	4	59	9	III. Ec. D.					
	11	20	28	III. Tr. E.	15	11	19	38	II.*Sh. I.		7	22	24	III. Oc. R.					
	14	18	44	II.*Ec. D.		12	3	54	II.*Tr. I.		8	45	30	II. Ec. D.					
	17	53	36	II.*Oc. R.		13	50	55	II.*Sh. E.		10	48	27	I.*Sh. I.					
	18	3	21	I.*Sh. I.		14	25	46	I.*Sh. I.		10	55	40	I.*Tr. I.					
	18	37	6	I.*Tr. I.		14	31	9	II.*Tr. E.		11	27	18	II.*Oc. R.					
	20	13	19	I.*Sh. E.		14	46	39	I.*Tr. I.		12	58	44	I.*Sh. E.					
	20	46	3	I.*Tr. E.		16	35	54	I.*Sh. E.		13	4	53	I.*Tr. E.					
						16	55	44	I.*Tr. E.										
7	15	13	35	I.*Ec. D.						25	8	0	24	I. Ec. D.					
	17	56	56	I.*Oc. R.	16	11	36	57	I.*Ec. D.		10	16	38	I. Oc. R.					
						14	7	4	I.*Oc. R.										
8	8	42	22	II. Sh. I.						26	3	16	29	II. Sh. I.					
	9	48	11	II. Tr. I.	17	0	58	54	III. Ec. D.		3	26	34	II. Tr. I.					
	11	13	24	II. Sh. E.		4	6	25	III. Oc. R.		5	17	1	I. Sh. I.					
	12	15	5	II.*Tr. E.		6	10	46	II. Ec. D.		5	21	28	I. Tr. I.					
	12	31	48	I.*Sh. I.		8	54	18	I. Sh. I.		5	48	2	II. Sh. E.					
	13	3	4	I.*Tr. I.		9	12	30	I. Tr. I.		5	54	26	II. Tr. E.					
	14	41	48	I.*Sh. E.		9	14	24	II. Oc. R.		7	27	19	I. Sh. E.					
	15	12	2	I.*Tr. E.		11	4	29	I. Sh. E.		7	30	41	I. Tr. E.					
						11	21	37	I.*Tr. E.										
9	9	42	17	I. Ec. D.						27	2	29	12	I. Ec. D.					
	12	23	4	I.*Oc. R.	18	6	5	34	I. Ec. D.		4	42	37	I. Oc. R.					

NOTE.—I. denotes ingress; E., egress; D., disappearance; R., reappearance; Ec., eclipse; Oc., o
Tr., transit of the satellite; Sh., transit of the shadow. *Visible at Washington.

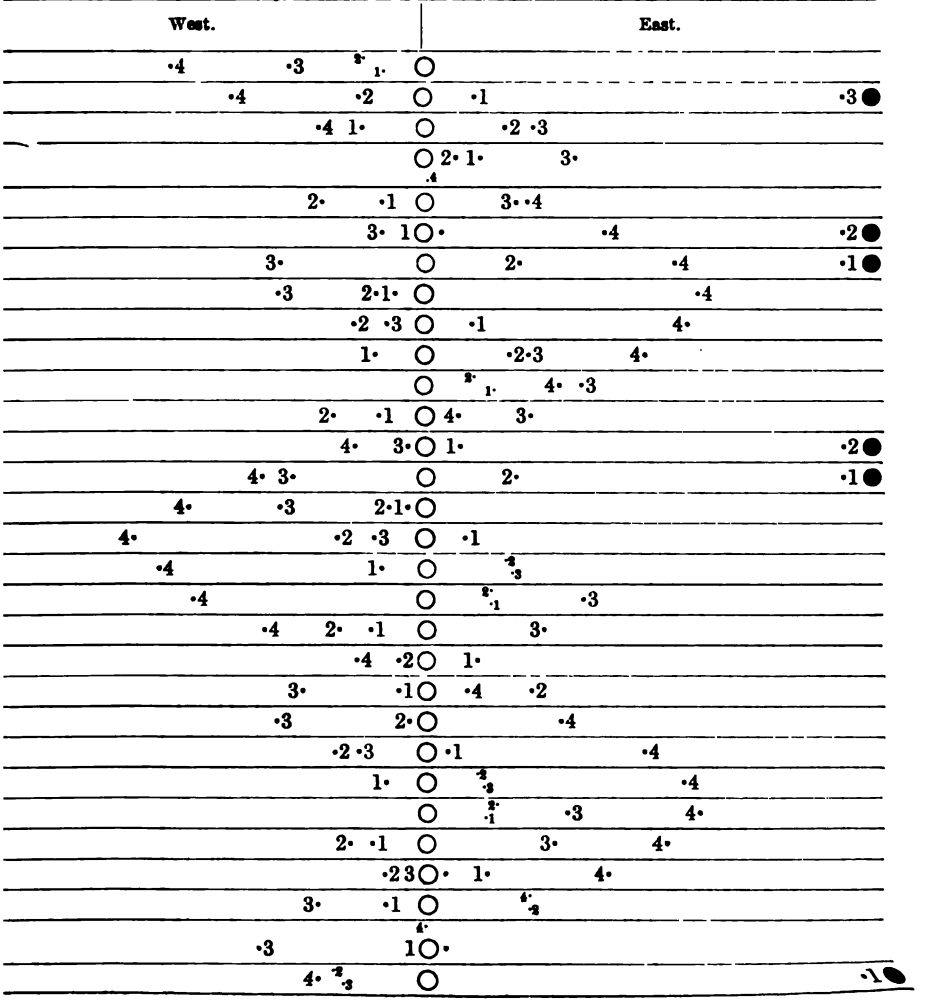
GREENWICH MEAN TIME.

NOVEMBER.

Phases of the Eclipses of the Satellites for an Inverting Telescope.



Configurations at 17h 15m for an Inverting Telescope.



GREENWICH MEAN TIME.

DECEMBER.

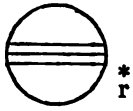
d	h	m	s		d	h	m	s		d	h	m	s		d	h	m	s	
1	8	51	10	III. Oc. D.	10	8	32	24	II. Sh. I.	19	5	10	24	III. Tr. I.	28	1	9	59	I.
	11	4	9	III.*Ec. R.			8	48	10	I. Tr. I.			5	29	2	I. Sh. I.			13	39	34	II.
	11	13	14	II.*Oc. D.			9	5	48	I. Sh. I.			7	1	5	III. Tr. E.			15	27	I.
	12	38	49	I.*Tr. I.		10	25	9	II.*Tr. E.			7	7	49	I. Tr. E.			3	7	33	II.
	12	42	45	I.*Sh. I.		10	57	32	I.*Tr. E.			7	10	15	III. Sh. I.			3	19	24	I.
	13	50	26	II.*Ec. R.		11	4	6	II.*Sh. E.			7	39	21	I. Sh. E.			4	2	40	I.
	14	48	7	I.*Tr. E.		11	16	10	I.*Sh. E.			8	18	10	II. Ec. R.			4	9	25	II.
	14	53	5	I.*Sh. E.								9	16	32	III. Sh. E.			5	39	10	II.
					11	5	59	55	I. Oc. D.									22	23	1	I.
2	9	49	55	I. Oc. D.		8	30	53	I. Ec. R.	20	2	10	44	I. Oc. D.							
	12	6	50	I.*Ec. R.								4	55	1	I. Ec. R.	29	1	19	26	I.
					12	1	53	35	III. Tr. I.		23	20	50	II. Tr. I.			19	36	31	I.
3	5	41	13	II. Tr. I.		2	32	35	II. Oc. D.		23	24	35	I. Tr. I.			20	11	1	II.
	5	54	21	II. Sh. I.		3	10	5	III. Sh. I.		23	57	42	I. Sh. I.			20	21	10	I.
	7	4	39	I. Tr. I.		3	14	7	I. Tr. I.								21	45	56	I.
	7	11	21	I. Sh. I.		3	34	26	I. Sh. I.	21	0	29	11	II. Sh. I.			22	1	16	III.
	8	9	30	II. Tr. E.		3	41	53	III. Tr. E.		1	34	0	I. Tr. E.			22	31	22	I.
	8	26	0	II. Sh. E.		5	15	14	III. Sh. E.		1	50	15	II. Tr. E.			23	57	41	III.
	9	13	57	I. Tr. E.		5	23	29	I. Tr. E.		2	7	59	I. Sh. E.						
	9	21	42	I. Sh. E.		5	42	57	II. Ec. R.		3	0	52	II. Sh. E.	30	0	11	11	II.
						5	44	47	I. Sh. E.		20	37	8	I.*Oc. D.		1	0	48	III.
4	4	15	56	I. Oc. D.							23	23	57	I. Ec. R.		3	10	21	III.
	6	35	41	I. Ec. R.	13	0	25	58	I. Oc. D.							16	49	35	I.
	22	38	21	III.*Tr. I.		2	59	40	I. Ec. R.	22	17	50	52	I.*Tr. I.		19	48	16	I.
	23	9	33	III.*Sh. I.		21	3	53	II.*Tr. I.		17	54	24	II.*Oc. D.					
						21	40	6	I.*Tr. I.		18	26	23	I.*Sh. I.	31	14	3	7	I.
5	0	19	30	II. Oc. D.		21	50	57	II.*Sh. I.		18	39	15	III.*Oc. D.		14	49	53	I.
	0	24	36	III. Tr. E.		22	3	4	I.*Sh. I.		20	0	16	I.*Tr. E.		14	50	9	II.
	1	13	32	III. Sh. E.		23	32	51	II. Tr. E.		20	32	59	III.*Oc. R.		16	12	31	I.
	1	30	28	I. Tr. I.		23	49	29	I. Tr. E.		20	36	40	I.*Sh. E.		16	27	15	II.
	1	39	56	I. Sh. I.							21	0	3	III.*Ec. D.		17	0	4	I.
	3	7	54	II. Ec. R.	14	0	13	24	I. Sh. E.		21	35	48	II.*Ec. R.		17	20	13	II.
	3	39	48	I. Tr. E.		0	22	41	II. Sh. E.		23	8	18	III. Ec. R.		18	58	46	II.
	3	50	18	I. Sh. E.		18	52	9	I.*Oc. D.										
	22	41	49	I.*Oc. D.		21	28	33	I.*Ec. R.	23	15	3	26	I.*Oc. D.					
											17	52	44	I.*Ec. R.					
6	1	4	25	I. Ec. R.	15	15	20	51	III.*Oc. D.										
	18	48	14	II.*Tr. I.		15	39	31	II.*Oc. D.	24	12	17	12	I.*Tr. I.					
	19	12	51	II.*Sh. I.		16	6	10	I.*Tr. I.		12	30	26	II.*Tr. I.					
	19	56	19	I.*Tr. I.		16	31	43	I.*Sh. I.		12	55	5	I.*Sh. I.					
	20	8	32	I.*Sh. I.		18	15	33	I.*Tr. E.		13	48	52	II.*Sh. I.					
	21	16	44	II.*Tr. E.		18	42	3	I.*Sh. E.		14	26	36	I.*Tr. E.					
	21	44	33	II.*Sh. E.		19	0	32	II.*Ec. R.		15	0	4	II.*Tr. E.					
	22	5	40	I.*Tr. E.		19	6	35	III.*Ec. R.		15	5	20	I.*Sh. E.					
	22	18	54	I.*Sh. E.							16	20	29	II.*Sh. E.					
					16	13	18	15	I.*Oc. D.										
7	17	7	53	I.*Oc. D.		15	57	19	I.*Ec. R.	25	9	29	55	I. Oc. D.					
	19	33	16	I.*Ec. R.							12	21	40	I.*Ec. R.					
					17	10	12	39	II. Tr. I.										
8	12	5	17	III.*Oc. D.		10	32	17	I.*Tr. I.	26	6	43	34	I. Tr. I.					
	13	25	57	II.*Oc. D.		11	0	23	I.*Sh. I.		7	2	28	II. Oc. D.					
	14	22	14	I.*Tr. I.		11	10	34	II.*Sh. I.		7	23	45	I. Sh. I.					
	14	37	10	I.*Sh. I.		12	41	40	I.*Tr. E.		8	30	37	III. Tr. I.					
	15	5	19	III.*Ec. R.		12	41	51	II.*Tr. E.		8	52	59	I. Tr. E.					
	16	25	25	II.*Ec. R.		13	10	42	I.*Sh. E.		9	34	0	I. Sh. E.					
	16	31	34	I.*Tr. E.		13	42	15	II.*Sh. E.		10	23	52	III.*Tr. E.					
	16	47	32	I.*Sh. E.							10	53	29	II.*Ec. R.					
					18	7	44	31	I. Oc. D.		11	10	49	III.*Sh. I.					
9	11	33	49	I.*Oc. D.		10	26	13	I.*Ec. R.		13	18	14	III.*Sh. E.					
	14	2	1	I.*Ec. R.															
					19	4	46	46	II. Oc. D.	27	3	56	23	I. Oc. D.					
10	7	56	25	II. Tr. I.		4	58	24	I. Tr. I.		6	50	29	I. Ec. R.					

NOTE.—I. denotes Ingress; E., egress; D., disappearance; R., reappearance; Ec., eclipse; Oc., Tr., transit of the satellite; Sh., transit of the shadow. *Visible at Washington.

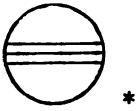
GREENWICH MEAN TIME.

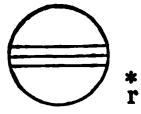
DECEMBER.

Phases of the Eclipses of the Satellites for an Inverting Telescope.

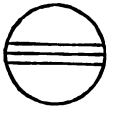


III.

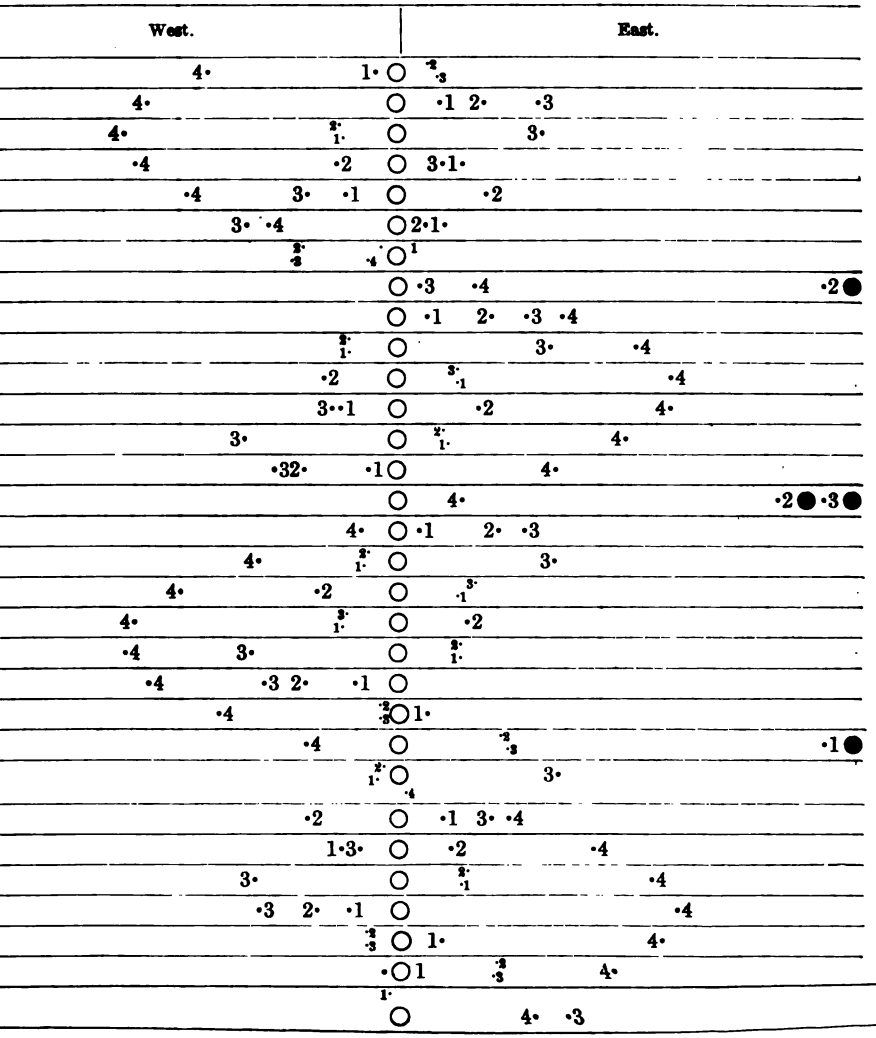




IV. No Eclipse.



Configurations at 16h 15m for an Inverting Telescope.



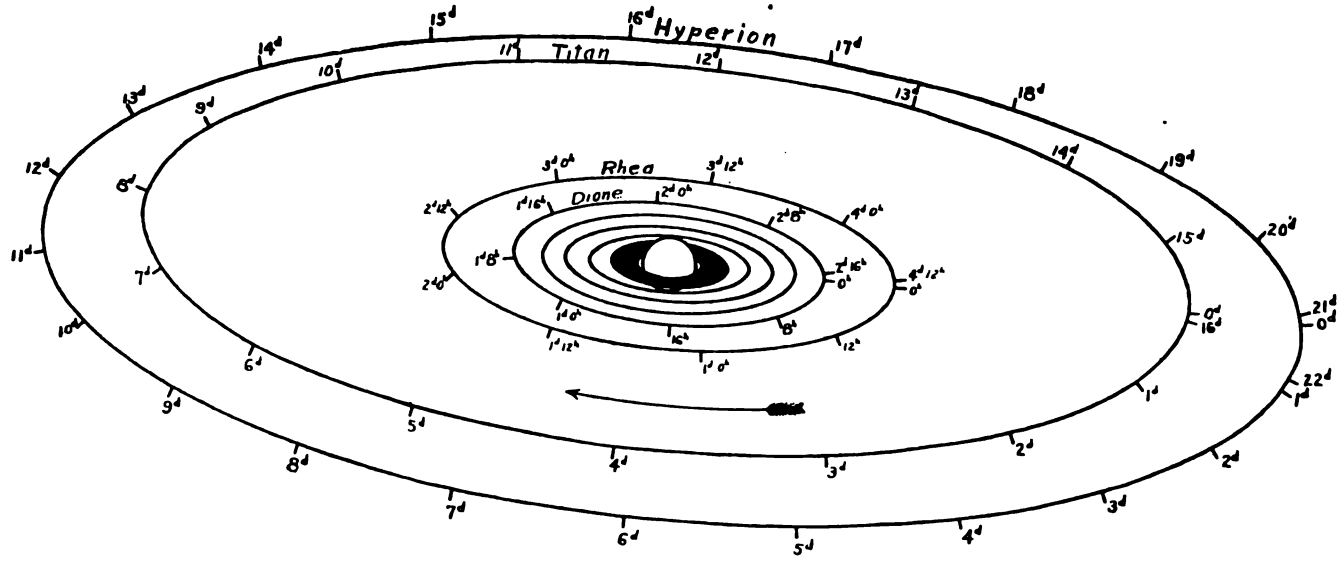
ELEMENTS FOR DETERMINING THE GEOCENTRIC POSITION, APPEARANCE AND MAGNITUDE OF SATURN'S RINGS.

Greenwich Mean Midnight.		a	b	P	B	U	ω	B'	
		"	"	° ′	° ′	° ′	° ′	° ′	
Jan.	1	46.23	−16.78	−7 18.6	−21 17.2	356 5.0	42 23.4	−21 51.6	3
	9	46.40	17.03	7 18.6	21 30.1	355 26.8	42 23.3	21 46.8	3
	17	46.46	17.23	7 18.7	21 43.6	354 47.0	42 23.3	21 41.9	3
	25	46.39	17.35	7 18.5	21 56.8	354 7.0	42 23.2	21 37.0	3
Feb.	2	46.22	17.43	7 18.4	22 9.4	353 28.4	42 23.2	21 32.0	3
	10	45.92	−17.46	−7 18.2	−22 20.8	352 52.9	42 23.2	−21 27.0	3
	18	45.55	17.44	7 17.9	22 31.0	352 21.2	42 23.1	21 22.0	3
	26	45.08	17.36	7 17.7	22 39.4	351 54.8	42 23.1	21 16.9	3
Mar.	6	44.56	17.24	7 17.6	22 45.8	351 34.6	42 23.0	21 11.8	3
	14	43.98	17.07	7 17.5	22 50.3	351 21.2	42 23.0	21 6.6	3
	22	43.38	−16.86	−7 17.5	−22 52.7	351 14.8	42 23.0	−21 1.4	3
	30	42.74	16.62	7 17.5	22 52.8	351 15.7	42 22.9	20 56.3	3
Apr.	7	42.12	16.36	7 17.6	22 51.1	351 24.0	42 22.9	20 51.1	3
	15	41.49	16.07	7 17.8	22 47.0	351 39.5	42 22.9	20 45.8	3
	23	40.90	15.77	7 18.0	22 41.0	352 1.7	42 22.8	20 40.6	3
May	1	40.33	−15.47	−7 18.2	−22 33.4	352 30.4	42 22.8	−20 35.3	3
	9	39.80	15.16	7 18.5	22 23.6	353 4.9	42 22.7	20 30.1	3
	17	39.30	14.85	7 18.7	22 12.1	353 44.6	42 22.7	20 24.7	3
	25	38.85	14.54	7 19.0	21 58.9	354 29.1	42 22.7	20 19.3	3
June	2	38.45	14.24	7 19.1	21 44.4	355 18.0	42 22.6	20 13.9	3
	10	38.10	−13.94	−7 19.1	−21 28.3	356 10.3	42 22.6	−20 8.5	3
	18	37.80	13.66	7 19.0	21 10.9	357 5.5	42 22.6	20 2.9	3
	26	37.56	13.38	7 18.7	20 52.3	358 3.2	42 22.5	19 57.4	3
July	4	37.37	13.11	7 18.3	20 32.8	359 2.6	42 22.5	19 51.8	3
	12	37.24	12.86	7 17.7	20 12.6	0 3.3	42 22.5	19 46.3	3
	20	37.16	−12.62	−7 17.0	−19 51.5	1 4.8	42 22.4	−19 40.7	3
	28	37.14	12.40	7 16.1	19 29.9	2 6.5	42 22.4	19 35.0	3
Aug.	5	37.17	12.19	7 15.2	19 8.3	3 7.9	42 22.3	19 29.4	3
	13	37.26	12.00	7 14.1	18 46.6	4 8.3	42 22.3	19 23.7	3
	21	37.41	11.82	7 12.8	18 25.0	5 7.4	42 22.3	19 18.0	3
	29	37.61	−11.66	−7 11.5	−18 3.6	6 4.7	42 22.2	−19 12.2	3
Sept.	6	37.87	11.52	7 10.1	17 43.0	6 59.4	42 22.2	19 6.5	3
	14	38.19	11.41	7 8.6	17 23.4	7 51.2	42 22.2	19 0.7	3
	22	38.56	11.32	7 7.3	17 4.7	8 39.8	42 22.1	18 54.8	3
	30	38.97	11.26	7 5.9	16 47.9	9 24.2	42 22.1	18 49.0	3
Oct.	8	39.44	−11.22	−7 4.7	−16 32.5	10 4.3	42 22.0	−18 43.1	3
	16	39.94	11.22	7 3.5	16 19.1	10 39.2	42 22.0	18 37.3	3
	24	40.49	11.25	7 2.5	16 7.9	11 8.8	42 22.0	18 31.3	3
Nov.	1	41.06	11.31	7 1.7	15 59.3	11 32.5	42 21.9	18 25.4	3
	9	41.67	11.41	7 1.1	15 53.3	11 49.9	42 21.9	18 19.5	3
	17	42.28	−11.54	−7 0.7	−15 50.0	12 0.8	42 21.9	−18 13.6	3
	25	42.91	11.70	7 0.6	15 49.9	12 4.9	42 21.8	18 7.6	3
Dec.	3	43.51	11.90	7 0.7	15 52.4	12 2.0	42 21.8	18 1.6	3
	11	44.09	12.13	7 1.1	15 58.0	11 52.5	42 21.7	17 55.5	3
	19	44.62	12.38	7 1.9	16 6.2	11 36.6	42 21.7	17 49.4	3
	27	45.10	−12.64	−7 2.8	−16 17.0	11 14.6	42 21.7	−17 43.4	3

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 B indicates that the visible surface of the rings is the south



APPARENT ORBITS OF THE SEVEN INNER SATELLITES OF SATURN,

AT DATE OF OPPOSITION, JANUARY 17, 1917,

AS SEEN IN AN INVERTING TELESCOPE.

Names of the Satellites.	Mean Synodic Periods.	
	d	h
I. Mimas.	0	22.6
II. Enceladus.	1	8.9
III. Tethys.	1	21.3
IV. Dione.	2	17.7
V. Rhea.	4	12.5
VI. Titan.	15	23.3
VII. Hyperion.	21	7.6
VIII. Iapetus.	79	22.1
IX. Phœbe.	523	15.6

GREENWICH MEAN TIME.

In the diagram on the preceding page, the points of the orbits marked "0" are th eastern elongation, as seen in an inverting telescope. The times of these elongation found from the following tables, and the apparent position of a satellite at any other t be marked on the diagram by setting off on the proper orbit the elapsed interval in hours since the last eastern elongation. The orbits of the five inner satellites are re circular, and the time of any greatest elongation not given in the tables may be read from those given by adding or subtracting the proper multiple of the mean synodic per Titan, Hyperion, and Iapetus the eccentricity is taken into account, and for Iapetus both of the greatest elongations and of the conjunctions are given. The following abb are used in the tables:

E., Eastern Elongation. I., Inferior Conjunction (north of planet).
W., Western Elongation. S., Superior Conjunction (south of planet).

MIMAS.

Greatest Elongations Visible in the United States.

	d h		d h		d h		d h		d h	
Jan.	1 19.0 E.	Jan.	29 14.0 W.	Feb.	25 21.9 W.	Apr.	3 16.0 W.	Oct.	12 23.4 W.	Nov.
	2 17.6 E.		30 1.4 E.		26 20.5 W.		4 14.6 W.		13 22.0 W.	
	3 16.2 E.		30 12.7 W.		27 19.1 W.		5 13.3 W.		14 20.6 W.	
	4 14.8 E.		31 0.0 E.		28 17.7 W.		8 20.4 E.		15 19.3 W.	Dec.
	5 2.1 W.		31 11.3 W.	Mar.	1 16.4 W.		9 19.0 E.		20 1.1 E.	
	5 13.4 E.		31 22.6 E.		2 15.0 W.		10 17.7 E.		20 23.7 E.	
	6 0.8 W.	Feb.	1 21.2 E.		3 13.6 W.		11 16.3 E.		21 22.3 E.	
	6 12.1 E.		2 19.8 E.		4 12.2 W.		12 14.9 E.		22 20.9 E.	
	6 23.4 W.		3 18.4 E.		5 22.2 E.		13 13.5 E.		23 19.5 E.	
	7 22.0 W.		4 17.0 E.		6 20.8 E.		17 19.3 W.		24 18.1 E.	
	8 20.6 W.		5 15.6 E.		7 19.4 E.		18 18.0 W.		28 1.3 W.	
	9 19.2 W.		6 14.2 E.		8 18.0 E.		19 16.6 W.		28 23.9 W.	
	10 17.8 W.		7 12.9 E.		9 16.7 E.		20 15.2 W.		29 22.5 W.	
	11 16.4 W.		8 0.2 W.		10 15.3 E.		21 13.8 W.		30 21.2 W.	
	12 15.0 W.		8 11.5 E.		11 13.9 E.		25 19.6 E.		31 19.8 W.	
	13 13.6 W.		8 22.8 W.		12 12.5 E.		26 18.3 E.	Nov.	1 18.4 W.	
	14 1.0 E.		9 21.4 W.		13 22.4 W.		27 16.9 E.		6 0.2 E.	
	14 12.3 W.		10 20.0 W.		14 21.0 W.		28 15.5 E.		6 22.8 E.	
	14 23.6 E.		11 18.6 W.		15 19.7 W.		29 14.1 E.		7 21.4 E.	
	15 22.2 E.		12 17.2 W.		16 18.3 W.	May	4 18.6 W.		8 20.0 E.	
	16 20.8 E.		13 15.8 W.		17 16.9 W.		5 17.2 W.		9 18.6 E.	
	17 19.4 E.		14 14.4 W.		18 15.5 W.		6 15.8 W.		10 17.3 E.	
	18 18.0 E.		15 13.1 W.		19 14.1 W.		7 14.4 W.		13 1.8 W.	
	19 16.6 E.		16 0.4 E.		20 12.8 W.		8 13.1 W.		14 0.4 W.	
	20 15.2 E.		16 11.7 W.		22 21.3 E.		13 17.5 E.		14 23.0 W.	
	21 13.8 E.		16 23.0 E.		23 19.9 E.		14 16.1 E.		15 21.7 W.	
	22 1.2 W.		17 21.6 E.		24 18.5 E.		15 14.7 E.		16 20.3 W.	
	22 12.5 E.		18 20.2 E.		25 17.2 E.		16 13.4 E.		17 18.9 W.	
	22 23.8 W.		19 18.8 E.		26 15.8 E.		. . . .		18 17.5 W.	
	23 22.4 W.		20 17.4 E.		27 14.4 E.		. . . .		22 0.7 E.	
	24 21.0 W.		21 16.1 E.		28 13.0 E.	Oct.	4 0.5 E.		22 23.3 E.	
	25 19.6 W.		22 14.7 E.		30 21.5 W.		4 23.1 E.		23 21.9 E.	
	26 18.2 W.		23 13.3 E.		31 20.2 W.		5 21.7 E.		24 20.5 E.	
	27 16.8 W.		24 11.9 E.	Apr.	1 18.8 W.		6 20.3 E.		25 19.1 E.	
	28 15.4 W.		24 23.3 W.		2 17.4 W.		12 0.8 W.		26 17.8 E.	

GREENWICH MEAN TIME.

ENCELADUS.

	d h		d h		d h		d h		d h		
E.	Feb. 11 1.5	E.	Mar. 22 19.0	E.	May 1 13.0	E.	Oct. 18 12.4	E.	Nov. 27 6.1	E.	
E.	12 10.4	E.	24 3.9	E.	2 21.8	E.	19 21.3	E.	28 15.0	E.	
E.	13 19.3	E.	25 12.8	E.	4 6.7	E.	21 6.2	E.	29 23.9	E.	
E.	15 4.1	E.	26 21.7	E.	5 15.6	E.	22 15.1	E.	Dec. 1 8.7	E.	
E.	16 13.0	E.	28 6.6	E.	7 0.5	E.	24 0.0	E.	2 17.6	E.	
E.	17 21.8	E.	29 15.5	E.	8 9.4	E.	25 8.9	E.	4 2.5	E.	
E.	19 6.7	E.	31 0.4	E.	9 18.3	E.	26 17.7	E.	5 11.4	E.	
E.	20 15.6	E.	Apr. 1 9.2	E.	11 3.2	E.	28 2.6	E.	6 20.3	E.	
E.	22 0.5	E.	2 18.1	E.	12 12.1	E.	29 11.5	E.	8 5.2	E.	
E.	23 9.4	E.	4 3.0	E.	13 21.0	E.	30 20.4	E.	9 14.0	E.	
E.	24 18.2	E.	5 11.9	E.	15 5.9	E.	Nov. 1 5.3	E.	10 22.9	E.	
E.	26 3.1	E.	6 20.8	E.	16 14.8	E.	2 14.2	E.	12 7.8	E.	
E.	27 12.0	E.	8 5.7	E.	17 23.7	E.	3 23.1	E.	13 16.7	E.	
E.	28 20.9	E.	9 14.6	E.	19 8.5	E.	5 8.0	E.	15 1.6	E.	
E.	Mar. 2 5.8	E.	10 23.5	E.	. . . .		6 16.8	E.	16 10.5	E.	
E.	3 14.7	E.	12 8.4	E.	. . . .		8 1.7	E.	17 19.3	E.	
E.	4 23.5	E.	13 17.3	E.	Sept. 30 16.7	E.	9 10.6	E.	19 4.2	E.	
E.	6 8.4	E.	15 2.2	E.	Oct. 2 1.6	E.	10 19.5	E.	20 13.1	E.	
E.	7 17.3	E.	16 11.1	E.	3 10.5	E.	12 4.4	E.	21 22.0	E.	
E.	9 2.2	E.	17 20.0	E.	4 19.4	E.	13 13.3	E.	23 6.8	E.	
E.	10 11.1	E.	19 4.9	E.	6 4.3	E.	14 22.1	E.	24 15.7	E.	
E.	11 19.9	E.	20 13.8	E.	7 13.2	E.	16 7.0	E.	26 0.6	E.	
E.	13 4.8	E.	21 22.7	E.	8 22.1	E.	17 15.9	E.	27 9.4	E.	
E.	14 13.7	E.	23 7.6	E.	10 7.0	E.	19 0.8	E.	28 18.3	E.	
E.	15 22.6	E.	24 16.5	E.	11 15.9	E.	20 9.7	E.	30 3.1	E.	
E.	17 7.5	E.	26 1.4	E.	13 0.8	E.	21 18.6	E.	31 12.0	E.	
E.	18 16.4	E.	27 10.3	E.	14 9.7	E.	23 3.4	E.			
E.	20 1.2	E.	28 19.2	E.	15 18.6	E.	24 12.3	E.			
E.	21 10.1	E.	30 4.1	E.	17 3.5	E.	25 21.2	E.			

TETHYS.

h	d h		d h		d h		d h		d h		
.2 E.	Feb. 9 19.3	E.	Mar. 21 10.6	E.	Apr. 30 2.3	E.	Oct. 15 4.9	E.	Nov. 23 20.4	E.	
.5 E.	11 16.6	E.	23 7.9	E.	May 1 23.6	E.	17 2.2	E.	25 17.7	E.	
.8 E.	13 13.8	E.	25 5.2	E.	3 20.9	E.	18 23.5	E.	27 15.1	E.	
.1 E.	15 11.1	E.	27 2.5	E.	5 18.2	E.	20 20.8	E.	29 12.4	E.	
.4 E.	17 8.4	E.	28 23.8	E.	7 15.6	E.	22 18.2	E.	Dec. 1 9.7	E.	
.7 E.	19 5.7	E.	30 21.1	E.	9 12.9	E.	24 15.5	E.	3 7.0	E.	
.9 E.	21 3.0	E.	Apr. 1 18.4	E.	11 10.2	E.	26 12.8	E.	5 4.3	E.	
.2 E.	23 0.3	E.	3 15.7	E.	13 7.5	E.	28 10.1	E.	7 1.6	E.	
.5 E.	24 21.6	E.	5 13.0	E.	15 4.9	E.	30 7.5	E.	8 22.9	E.	
.8 E.	26 18.9	E.	7 10.3	E.	17 2.2	E.	Nov. 1 4.8	E.	10 20.2	E.	
.1 E.	28 16.2	E.	9 7.6	E.	18 23.5	E.	3 2.1	E.	12 17.5	E.	
.4 E.	Mar. 2 13.5	E.	11 4.9	E.	. . . .		4 23.4	E.	14 14.8	E.	
.7 E.	4 10.8	E.	13 2.3	E.	. . . .		6 20.7	E.	16 12.1	E.	
.0 E.	6 8.1	E.	14 23.6	E.	Sept. 30 2.3	E.	8 18.0	E.	18 9.4	E.	
.2 E.	8 5.4	E.	16 21.0	E.	Oct. 1 23.6	E.	10 15.3	E.	20 6.7	E.	
.5 E.	10 2.7	E.	18 18.3	E.	3 20.9	E.	12 12.6	E.	22 4.0	E.	
.8 E.	12 0.0	E.	20 15.6	E.	5 18.3	E.	14 9.9	E.	24 1.3	E.	
.1 E.	13 21.3	E.	22 13.0	E.	7 15.6	E.	16 7.2	E.	25 22.6	E.	
.4 E.	15 18.7	E.	24 10.3	E.	9 12.9	E.	18 4.5	E.	27 19.9	E.	
.7 E.	17 16.0	E.	26 7.6	E.	11 10.2	E.	20 1.8	E.	29 17.1	E.	
.0 E.	19 13.3	E.	28 4.9	E.	13 7.6	E.	21 23.1	E.	31 14.4	E.	

GREENWICH MEAN TIME.

DIONE.

	d h		d h		d h		d h		d h		d
Jan.	1 6.4 E.	Feb.	11 7.0 E.	Mar.	24 8.1 E.	May	4 9.6 E.	Oct.	21 5.5 E.	Dec.	1
	4 0.0 E.		14 0.6 E.		27 1.8 E.		7 3.4 E.		23 23.2 E.		4
	6 17.6 E.		16 18.3 E.		29 19.5 E.		9 21.1 E.		26 16.9 E.		6
	9 11.3 E.		19 11.9 E.	Apr.	1 13.1 E.		12 14.8 E.		29 10.7 E.		9
	12 4.9 E.		22 5.6 E.		4 6.8 E.		15 8.5 E.	Nov.	1 4.4 E.		12
	14 22.5 E.		24 23.3 E.		7 0.5 E.		18 2.3 E.		3 22.1 E.		14
	17 16.2 E.		27 16.9 E.		9 18.2 E.		. . . .		6 15.8 E.		17
	20 9.8 E.	Mar.	2 10.6 E.		12 11.9 E.		. . . .		9 9.5 E.		20
	23 3.4 E.		5 4.3 E.		15 5.6 E.	Oct.	2 1.5 E.		12 3.1 E.		23
	25 21.1 E.		7 22.0 E.		17 23.3 E.		4 19.2 E.		14 20.8 E.		25
	28 14.7 E.		10 15.7 E.		20 17.1 E.		7 12.9 E.		17 14.5 E.		28
	31 8.4 E.		13 9.4 E.		23 10.8 E.		10 6.6 E.		20 8.2 E.		31
Feb.	3 2.0 E.		16 3.0 E.		26 4.5 E.		13 0.4 E.		23 1.9 E.		
	5 19.7 E.		18 20.7 E.		28 22.2 E.		15 18.1 E.		25 19.6 E.		
	8 13.3 E.		21 14.4 E.	May	1 15.9 E.		18 11.8 E.		28 13.2 E.		

RHEA.

	d h		d h		d h		d h		d h		d
Jan.	3 23.9 E.	Feb.	13 14.7 E.	Mar.	26 6.1 E.	May	5 22.5 E.	Oct.	15 19.0 E.	Nov.	28
	8 12.2 E.		18 3.1 E.		30 18.6 E.		10 11.0 E.		20 7.5 E.		29
	13 0.5 E.		22 15.4 E.	Apr.	4 7.0 E.		14 23.6 E.		24 20.0 E.	Dec.	4
	17 12.8 E.		27 3.8 E.		8 19.5 E.		19 12.1 E.		29 8.4 E.		9
	23 1.1 E.	Mar.	3 16.1 E.		13 8.0 E.		. . . .	Nov.	2 20.9 E.		13
	26 13.4 E.		8 4.5 E.		17 20.5 E.		. . . .		7 9.4 E.		18
	31 1.7 E.		12 16.9 E.		22 9.0 E.	Oct.	2 5.4 E.		11 21.8 E.		22
Feb.	4 14.1 E.		17 5.3 E.		26 21.5 E.		6 18.0 E.		16 10.3 E.		27
	9 2.4 E.		21 17.7 E.	May	1 10.0 E.		11 6.5 E.		20 22.7 E.		31

TITAN.

	d h		d h		d h		d h		d h		d
Jan.	7 5.7 E.	Feb.	15 16.3 W.	Mar.	27 18.6 E.	May	6 10.2 W.	Oct.	13 16.2 W.	Nov.	22
	14 21.6 W.		23 22.0 E.	Apr.	4 11.2 W.		14 17.2 E.		21 22.4 E.		30
	23 3.0 E.	Mar.	3 14.1 W.		12 17.7 E.		. . . .		29 15.9 W.	Dec.	8
	30 18.9 W.		11 20.1 E.		20 10.5 W.		. . . .	Nov.	6 21.8 E.		16
Feb.	8 0.4 E.		19 12.4 W.		28 17.2 E.	Oct.	5 22.5 E.		14 15.2 W.		24

HYPERION.

	d h		d h		d h		d h		d h		d
Jan.	5 12.4 E.	Feb.	16 15.7 E.	Mar.	30 22.3 E.	May	12 10.8 E.	Oct.	21 3.9 W.	Dec.	2
	17 1.5 W.		28 5.3 W.	Apr.	11 13.6 W.		. . . .		31 1.4 E.		12
	26 13.9 E.	Mar.	9 18.4 E.		21 3.9 E.		. . . .	Nov.	11 14.0 W.		24
Feb.	7 3.0 W.		21 8.7 W.	May	2 19.7 W.	Oct.	9 14.2 E.		21 11.6 E.		

IAPETUS.

	d h		d h		d h		d h		d h		d
Jan.	10 8.5 E.	Feb.	17 16.8 W.	Mar.	29 18.9 E.	May	8 3.7 W.	Oct.	17 10.2 W.	Nov.	27
	30 2.6 I.	Mar.	9 0.5 S.	Apr.	19 1.3 I.		. . . .	Nov.	6 11.4 S.	Dec.	17

DIFFERENTIAL COORDINATES OF PHOEBE.

FOR GREENWICH MEAN NOON.

e.	$\alpha_{Ph.}-\alpha_{Sat.}$	$\delta_{Ph.}-\delta_{Sat.}$	Date.	$\alpha_{Ph.}-\alpha_{Sat.}$	$\delta_{Ph.}-\delta_{Sat.}$	Date.	$\alpha_{Ph.}-\alpha_{Sat.}$	$\delta_{Ph.}-\delta_{Sat.}$
	m s	′ ″		m s	′ ″		m s	′ ″
0	+2 9.7	−6 15	Apr. 14	+1 47.5	−1 30	Sept. 20	−1 48.4	+ 8 34
2	2 11.6	6 14	16	1 45.2	1 24	22	1 50.3	8 41
4	2 13.3	6 12	18	1 42.8	1 18	24	1 52.2	8 48
6	2 15.0	6 10	20	1 40.4	1 12	26	1 54.1	8 54
8	2 16.6	6 7	22	1 37.9	1 6	28	1 55.9	9 0
10	+2 18.1	−6 4	24	+1 35.4	−1 0	30	−1 57.6	+ 9 6
12	2 19.5	6 1	26	1 32.8	0 54	Oct. 2	1 59.3	9 12
14	2 20.8	5 58	28	1 30.2	0 48	4	2 1.0	9 18
16	2 22.0	5 54	30	1 27.6	0 42	6	2 2.6	9 23
18	2 23.0	5 50	May 2	1 25.0	0 36	8	2 4.2	9 28
20	+2 24.0	−5 46	4	+1 22.3	−0 29	10	−2 5.7	+ 9 33
22	2 24.9	5 41	6	1 19.6	0 23	12	2 7.2	9 38
24	2 25.7	5 36	8	1 16.8	0 17	14	2 8.6	9 42
26	2 26.4	5 31	10	1 14.0	0 11	16	2 9.9	9 46
28	2 27.0	5 26	12	1 11.2	−0 5	18	2 11.2	9 50
30	+2 27.6	−5 21	14	+1 8.4	+0 2	20	−2 12.5	+ 9 54
1	2 28.0	5 16	16	1 5.5	0 8	22	2 13.7	9 57
3	2 28.3	5 10	18	1 2.7	0 15	24	2 14.9	10 0
5	2 28.5	5 4	20	0 59.8	0 21	26	2 16.0	10 2
7	2 28.7	4 58	22	0 56.9	0 28	28	2 17.0	10 4
9	+2 28.7	−4 52	24	+0 53.9	+0 34	30	−2 18.0	+10 6
11	2 28.6	4 46	26	0 51.0	0 41	Nov. 1	2 19.0	10 8
13	2 28.5	4 40	28	0 48.0	0 48	3	2 19.8	10 9
15	2 28.2	4 33	30	0 45.1	0 54	5	2 20.6	10 10
17	2 27.9	4 27	June 1	0 42.1	1 1	7	2 21.4	10 11
19	+2 27.5	−4 21	3	+0 39.1	+1 8	9	−2 22.1	+10 11
21	2 27.0	4 14	5	0 36.1	1 15	11	2 22.8	10 11
23	2 26.4	4 8	7	0 33.0	1 23	13	2 23.4	10 11
25	2 25.7	4 1	9	0 30.0	1 30	15	2 23.9	10 10
27	2 25.0	3 55	11	0 27.0	1 37	17	2 24.4	10 9
1	+2 24.1	−3 48	13	+0 24.0	+1 44	19	−2 24.8	+10 8
3	2 23.2	3 42	15	0 20.9	1 52	21	2 25.1	10 6
5	2 22.2	3 35	17	0 17.9	2 0	23	2 25.4	10 4
7	2 21.1	3 28	19	0 14.9	2 7	25	2 25.6	10 1
9	2 20.0	3 22	21	0 11.8	2 15	27	2 25.8	9 58
11	+2 18.7	−3 16	23	+0 8.8	+2 23	29	−2 25.9	+ 9 55
13	2 17.4	3 9	25	0 5.8	2 31	Dec. 1	2 25.9	9 51
15	2 16.0	3 3	27	+0 2.8	+2 39	3	2 25.9	9 47
17	2 14.6	2 56		. . . .	. . .	5	2 25.8	9 43
19	2 13.0	2 50		. . . .	. . .	7	2 25.6	9 38
21	+2 11.4	−2 44	Aug. 27	−1 22.3	+7 2	9	−2 25.3	+ 9 33
23	2 9.8	2 37	29	1 24.7	7 10	11	2 25.0	9 27
25	2 8.0	2 31	31	1 27.0	7 18	13	2 24.6	9 21
27	2 6.2	2 25	Sept. 2	1 29.3	7 26	15	2 24.2	9 15
29	2 4.4	2 19	4	1 31.6	7 34	17	2 23.6	9 8
31	+2 2.5	−2 12	6	−1 33.8	+7 42	19	−2 23.0	+ 9 1
2	2 0.5	2 6	8	1 36.0	7 50	21	2 22.4	8 53
4	1 58.5	2 0	10	1 38.2	7 58	23	2 21.6	8 46
6	1 56.4	1 54	12	1 40.3	8 5	25	2 20.8	8 38
8	1 54.3	1 48	14	1 42.4	8 13	27	2 19.9	8 29
10	+1 52.1	−1 42	16	−1 44.4	+8 20	29	−2 18.9	+ 8 20
12	*+1 49.8*	*−1 36*	18	−1 46.5	+8 27	31	−2 17.8	+ 8 11

Time from Eastern Elongation.	Mimas.		Time from Eastern Elongation.	Enceladus.		Tethys.		Time from Eastern Elongation.	Di
	p^1	F		p^1	F	p^1	F		p^1
h	°		d h	°		°		d h	°
0.0	83.2	1.000	0 0	83.2	1.000	83.2	1.000	0 0	83.2
0.5	80.4	0.992	0 1	79.1	0.984	80.1	0.992	0 2	79.1
1.0	77.4	0.967	0 2	74.7	0.938	77.0	0.967	0 4	74.7
1.5	74.3	0.926	0 3	69.8	0.864	73.6	0.928	0 6	69.7
2.0	70.8	0.870	0 4	63.6	0.766	69.8	0.874	0 8	63.6
2.5	66.8	0.801	0 5	55.6	0.652	65.6	0.807	0 10	55.5
3.0	62.0	0.721	0 6	43.9	0.532	60.4	0.730	0 12	43.7
3.5	55.8	0.634	0 7	25.9	0.428	54.0	0.647	0 14	25.7
4.0	47.7	0.544	0 8	359.7	0.372	45.6	0.562	0 16	359.4
4.5	36.5	0.460	0 9	331.1	0.395	34.4	0.482	0 18	330.8
5.0	20.7	0.391	0 10	309.4	0.482	19.1	0.418	0 20	309.3
5.5	0.1	0.355	0 11	295.4	0.598	359.9	0.384	0 22	295.3
6.0	337.9	0.363	0 12	286.0	0.717	339.4	0.392	1 0	285.9
6.5	319.0	0.414	0 13	279.1	0.823	321.4	0.437	1 2	279.0
7.0	305.1	0.491	0 14	273.7	0.908	307.7	0.508	1 4	273.6
7.5	295.2	0.579	0 15	269.1	0.968	297.5	0.591	1 6	269.1
8.0	288.0	0.668	0 16	265.0	0.997	289.9	0.676	1 8	264.9
8.5	282.4	0.753	0 17	260.9	0.995	284.0	0.758	1 10	260.8
9.0	277.9	0.829	0 18	256.7	0.962	279.2	0.831	1 12	256.6
9.5	274.1	0.893	0 19	252.0	0.900	275.1	0.894	1 14	251.9
10.0	270.8	0.943	0 20	246.5	0.812	271.6	0.943	1 16	246.3
10.5	267.8	0.978	0 21	239.5	0.704	268.3	0.978	1 18	239.2
11.0	264.9	0.997	0 22	229.6	0.585	265.2	0.995	1 20	229.3
11.5	262.1	0.999	0 23	214.8	0.470	262.1	0.999	1 22	214.2
12.0	259.2	0.984	1 0	192.2	0.388	259.0	0.985	2 0	191.3
12.5	256.3	0.953	1 1	163.3	0.374	255.8	0.955	2 2	162.4
13.0	253.0	0.906	1 2	138.0	0.438	252.3	0.910	2 4	137.3
13.5	249.4	0.845	1 3	120.9	0.546	248.4	0.852	2 6	120.4
14.0	245.1	0.772	1 4	109.7	0.665	243.9	0.781	2 8	109.4
14.5	239.8	0.689	1 5	101.9	0.778	238.4	0.702	2 10	101.7
15.0	233.0	0.600	1 6	96.0	0.874	231.4	0.617	2 12	95.8
15.5	223.9	0.511	1 7	91.1	0.945	222.1	0.533	2 14	90.9
16.0	211.1	0.431	1 8	86.8	0.988	209.6	0.457	2 16	86.6
16.5	193.3	0.372	1 9	82.7	1.000	192.9	0.402	2 18	82.5
17.0	171.5	0.352	1 10			172.8	0.382		
17.5	150.1	0.379	1 11			152.7	0.404		
18.0	133.1	0.441	1 12			136.2	0.460		
18.5	121.0	0.524	1 13			123.8	0.536		
19.0	112.2	0.613	1 14			114.7	0.620		
19.5	105.7	0.701	1 15			107.8	0.705		
20.0	100.6	0.783	1 16			102.3	0.784		
20.5	96.4	0.854	1 17			97.7	0.854		
21.0	92.8	0.914	1 18			93.8	0.912		
21.5	89.6	0.958	1 19			90.4	0.957		
22.0	86.7	0.987	1 20			87.2	0.986		
22.5	83.8	1.000	1 21			84.1	0.999		
23.0	81.0	0.995	1 22			81.1	0.996		

Position angle of satellite $p = p^1 + (P - P_0)$.

Apparent distance of satellite $s = F^{\frac{a(\rho)}{\rho}}$.

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	°	
83.2	1.000	0 0	83.2	0.994	83.2	1.007	0	84.5	1.025
79.4	0.987	0 10	79.6	0.978	80.6	1.010	2	83.4	1.011
75.4	0.949	0 20	75.9	0.938	78.0	1.000	4	82.2	0.974
71.0	0.887	1 6	71.7	0.876	75.3	0.978	6	80.8	0.913
65.8	0.804	1 16	66.8	0.795	72.4	0.945	8	79.2	0.832
59.3	0.706	2 2	60.6	0.698	69.3	0.901	10	77.3	0.732
50.4	0.599	2 12	52.3	0.592	65.9	0.849	12	74.6	0.614
37.8	0.494	2 22	40.3	0.487	61.9	0.789	14	70.6	0.484
19.1	0.410	3 8	22.4	0.399	57.3	0.723	16	63.5	0.345
354.1	0.375	3 18	357.8	0.357	51.7	0.654	18	46.8	0.210
328.8	0.405	4 4	331.4	0.379	44.8	0.584	20	357.2	0.130
309.7	0.487	4 14	311.2	0.456	36.0	0.518	22	304.1	0.200
296.6	0.591	5 0	297.6	0.559	24.9	0.461	24	286.0	0.333
287.6	0.699	5 10	288.3	0.666	11.1	0.419	26	278.4	0.471
280.9	0.798	5 20	281.6	0.767	355.3	0.402	28	274.2	0.601
275.7	0.882	6 6	276.4	0.855	339.2	0.412	30	271.4	0.717
271.2	0.945	6 16	272.0	0.925	324.6	0.447	32	269.4	0.812
267.2	0.985	7 2	268.2	0.974	312.7	0.499	34	267.8	0.891
263.4	1.000	7 12	264.7	1.001	303.3	0.563	36	266.4	0.944
259.7	0.989	7 22	261.3	1.003	295.9	0.632	38	265.1	0.971
255.7	0.952	8 8	257.8	0.984	289.9	0.701	40	263.8	0.972
251.4	0.892	8 18	254.1	0.943	285.0	0.767	42	262.5	0.948
246.2	0.811	9 4	250.0	0.881	280.8	0.827	44	261.2	0.899
239.8	0.713	9 14	245.1	0.803	277.2	0.880	46	259.6	0.827
231.2	0.606	10 0	239.1	0.712	273.9	0.923	48	257.6	0.734
218.8	0.500	10 10	231.2	0.613	271.0	0.956	50	255.0	0.623
200.6	0.414	10 20	220.2	0.515	268.1	0.977	52	251.2	0.499
176.0	0.375	11 6	204.6	0.431	265.4	0.985	54	244.7	0.365
150.4	0.401	11 16	183.3	0.382	262.6	0.980	56	230.6	0.233
130.8	0.480	12 2	159.4	0.387	259.8	0.962	58	190.6	0.138
117.4	0.583	12 12	138.8	0.442	256.9	0.929	60	133.0	0.178
108.2	0.691	12 22	124.0	0.529	253.7	0.884	62	110.0	0.300
101.4	0.791	13 8	113.5	0.628	250.1	0.826	64	100.9	0.435
96.0	0.876	13 18	106.0	0.725	245.8	0.757	66	96.1	0.566
91.5	0.942	14 4	100.2	0.814	240.7	0.679	68	93.0	0.686
87.5	0.983	14 14	95.4	0.889	234.2	0.595	70	90.8	0.792
83.7	1.000	15 0	91.3	0.945	225.4	0.510	72	89.1	0.880
79.9	0.990	15 10	87.6	0.981	213.2	0.431	74	87.7	0.949
		15 20	84.1	0.995	196.8	0.373	76	86.4	0.996
		16 6	80.6	0.984	176.0	0.355	78	85.3	1.021
		16 16			154.5	0.363	80	84.1	1.023
		17 2			136.8	0.417			
		17 12			123.9	0.492			
		17 22			114.5	0.576			
		18 8			107.6	0.662			
		18 18			102.2	0.742			
		19 4			97.8	0.816			
		19 14			94.2	0.879			
		20 0			90.9	0.930			
		20 10			88.0	0.969			
		20 20			85.3	0.995			
		21 6			82.6	1.008			

Position angle of satellite $p = p^1 + (P - P_0)$.

Apparent distance of satellite $s = F\frac{a(\rho)}{\rho}$.

FOR GREENWICH MEAN MIDNIGHT.

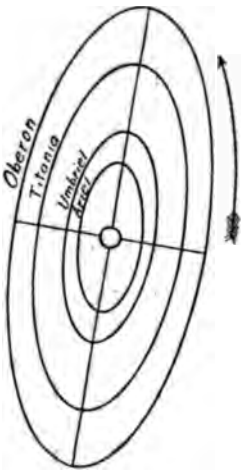
Date.		Mimas.		Enceladus.		Tethys.		Dione.	
		$P-P_0$	$\frac{a(\rho)}{\rho}$	$P-P_0$	$\frac{a(\rho)}{\rho}$	$P-P_0$	$\frac{a(\rho)}{\rho}$	$P-P_0$	$\frac{a(\rho)}{\rho}$
		°	″	°	″	°	″	°	″
Jan.	1	+0.5	31.5	−0.5	40.4	+0.4	50.0	−0.6	64.1
	6	0.7	31.6	0.5	40.5	0.4	50.2	0.6	64.3
	11	0.8	31.6	0.5	40.6	0.3	50.3	0.6	64.4
	16	0.8	31.7	0.5	40.6	0.3	50.3	0.6	64.4
	21	0.9	31.7	0.5	40.6	0.3	50.3	0.6	64.4
	26	+1.0	31.6	−0.5	40.6	+0.3	50.2	−0.6	64.3
	31	1.1	31.5	0.5	40.5	0.3	50.1	0.6	64.1
Feb.	5	1.2	31.4	0.5	40.3	0.3	49.9	0.6	63.9
	10	1.2	31.3	0.5	40.2	0.3	49.7	0.5	63.7
	15	1.2	31.2	0.5	40.0	0.3	49.5	0.5	63.4
	20	+1.3	31.0	−0.5	39.7	+0.3	49.2	−0.5	63.0
	25	1.3	30.8	0.5	39.5	0.3	48.9	0.5	62.6
Mar.	2	1.3	30.6	0.5	39.2	0.3	48.5	0.5	62.1
	7	1.3	30.3	0.5	38.9	0.3	48.2	0.5	61.7
	12	1.2	30.1	0.5	38.6	0.2	47.8	0.5	61.2
	17	+1.2	29.8	−0.5	38.3	+0.2	47.4	−0.5	60.7
	22	1.2	29.6	0.5	37.9	0.2	46.9	0.5	60.1
	27	1.1	29.3	0.5	37.6	0.2	46.5	0.5	59.6
Apr.	1	1.0	29.0	0.4	37.2	0.2	46.1	0.5	59.0
	6	0.9	28.8	0.4	36.9	0.2	45.7	0.5	58.5
	11	+0.8	28.5	−0.5	36.6	+0.1	45.3	−0.5	58.0
	16	0.7	28.2	0.5	36.2	0.1	44.8	0.5	57.4
	21	0.6	28.0	0.5	35.9	0.1	44.4	0.5	56.9
	26	0.5	27.7	0.5	35.6	+0.1	44.0	0.5	56.4
May	1	0.3	27.5	0.5	35.3	0.0	43.7	0.5	55.9
	6	+0.2	27.3	−0.5	35.0	0.0	43.3	−0.5	55.4
	11	0.0	27.0	−0.5	34.7	0.0	42.9	−0.6	55.0
	..	..	...	..	...	..	...	..	...
Oct.	7	−1.1	26.8	−0.2	34.4	−0.7	42.6	−0.3	54.6
	12	1.0	27.0	0.2	34.7	0.7	42.9	0.3	55.0
	17	−0.8	27.3	−0.2	35.0	−0.7	43.3	−0.3	55.4
	22	0.6	27.5	0.2	35.3	0.7	43.7	0.3	55.9
	27	0.5	27.7	0.2	35.6	0.7	44.0	0.3	56.4
Nov.	1	0.3	28.0	0.2	35.9	0.8	44.4	0.3	56.9
	6	−0.2	28.2	0.2	36.2	0.8	44.8	0.2	57.4
	11	0.0	28.5	−0.2	36.6	−0.8	45.3	−0.2	58.0
	16	+0.2	28.8	0.2	36.9	0.8	45.7	0.2	58.5
	21	0.3	29.0	0.2	37.2	0.8	46.1	0.2	59.0
	26	0.4	29.3	0.2	37.6	0.8	46.5	0.2	59.6
Dec.	1	0.6	29.5	0.2	37.9	0.8	46.9	0.2	60.1
	6	+0.7	29.8	−0.2	38.2	−0.8	47.3	−0.2	60.6
	11	0.8	30.0	0.2	38.5	0.9	47.7	0.2	61.1
	16	0.9	30.3	0.2	38.8	0.9	48.1	0.3	61.6
	21	1.0	30.5	0.2	39.1	0.9	48.4	0.3	62.0
	26	*1.1*	30.7	0.2	39.4	0.9	48.7	0.3	62.4
	31	+1.1	30.9	−0.2	39.6	−1.0	49.0	−0.3	62

FOR GREENWICH MEAN MIDNIGHT.

ate.	Rhea.		Titan.		Hyperion.		Iapetus.	
	$P-P_0$	$\frac{a(\rho)}{\rho}$	$P-P_0$	$\frac{a(\rho)}{\rho}$	$P-P_0$	$\frac{a(\rho)}{\rho}$	$P-P_0$	$\frac{a(\rho)}{\rho}$
	°	″	°	″	°	″	°	″
. 1	−0.3	89.5	−0.1	208	+0.2	251	+0.3	605
6	0.3	89.7	0.1	208	0.2	252	0.2	606
11	0.3	89.9	0.1	208	0.2	252	+0.1	607
16	0.3	90.0	0.1	208	0.2	253	0.0	608
21	0.3	89.9	0.1	208	0.2	252	−0.1	607
26	−0.3	89.8	−0.1	208	+0.3	252	−0.2	607
31	0.3	89.6	0.1	208	0.3	252	0.3	605
). 5	0.3	89.3	0.1	207	0.3	251	0.4	603
10	0.3	88.9	0.1	206	0.3	250	0.4	601
15	0.3	88.5	0.1	205	0.3	248	0.5	598
20	−0.3	88.0	−0.1	204	+0.3	247	−0.6	594
25	0.3	87.4	0.1	203	0.3	246	0.6	591
r. 2	0.3	86.8	0.1	201	0.3	244	0.7	586
7	0.3	86.1	0.1	200	0.3	242	0.8	582
12	0.3	85.4	0.1	198	0.3	240	0.8	577
17	−0.3	84.7	−0.1	196	+0.3	238	−0.8	572
22	0.3	84.0	0.1	195	0.3	236	0.8	567
27	0.3	83.2	0.1	193	0.3	234	0.8	562
r. 1	0.3	82.4	0.1	191	0.3	232	0.8	557
6	0.3	81.7	0.1	189	0.3	230	0.8	552
11	−0.3	80.9	−0.1	188	+0.3	227	−0.8	547
16	0.3	80.2	0.1	186	0.3	225	0.7	542
21	0.3	79.5	0.1	184	0.3	223	0.7	537
26	0.3	78.8	0.1	183	0.3	221	0.6	532
y 1	0.3	78.1	0.1	181	0.3	219	0.5	528
6	−0.3	77.4	−0.1	180	+0.3	218	−0.4	523
11	−0.3	76.8	−0.1	178	+0.2	216	−0.4	519
..	..	...	..	...	..	...	..	...
:. 7	−0.2	76.2	+0.2	177	+0.4	214	+3.9	515
12	0.2	76.8	0.2	178	0.4	216	4.0	519
17	−0.2	77.4	+0.2	180	+0.4	218	+4.1	523
22	0.2	78.1	0.2	181	0.4	219	4.1	528
27	0.2	78.8	0.2	183	0.4	221	4.2	532
v. 1	0.2	79.5	0.2	184	0.4	223	4.3	537
6	0.2	80.2	0.2	186	0.4	225	4.3	542
11	−0.2	80.9	+0.2	188	+0.4	227	+4.4	547
16	0.2	81.7	0.2	189	0.4	230	4.4	552
21	0.2	82.4	0.2	191	0.4	232	4.4	557
26	0.2	83.2	0.2	193	0.4	234	4.4	562
:. 1	0.2	83.9	0.2	194	0.4	236	4.4	567
6	−0.2	84.6	+0.2	196	+0.4	238	+4.4	572
11	0.2	85.3	0.2	198	0.4	240	4.4	576
16	0.2	86.0	0.2	199	0.4	242	4.3	581
21	0.2	86.6	0.2	201	0.4	243	4.3	585
26	*0.2*	*87.2*	0.2	202	0.4	245	4.2	589
31	*−0.2*	*87.7*	+0.2	203	+0.4	246	+4.1	592

APPARENT ORBITS OF THE SATELLITES OF URANUS AT DATE OF OPPOSI AUGUST 14, 1917, AS SEEN IN AN INVERTING TELESCOPE.

South



North

Apparent Apsides.

Date.	Position Angle.	App. Distances. Ariel.	Umbriel.
	°	"	"
May 7	349.6	13.2	18.4
Aug. 15	350.2	13.9	19.4
Nov. 23	350.8	13.1	18.3

Apparent Apsides.

Date.	Position Angle.	App. D Titania.
	°	"
May 7	349.6	30.1
Aug. 15	350.2	31.9
Nov. 23	350.8	30.0

GREENWICH MEAN TIME OF GREATEST ELONGATION.

ARIEL.		UMBRIEL.		TITANIA.		OBE
North.	South.	North.	South.	North.	South.	North an
d h	d h	d h	d h	d h	d h	
May 16 9.4	May 20 4.1	May 8 4.7	May 10 6.4	May 8 10.9	May 12 19.3	May 2
23 22.8	27 17.5	16 11.6	18 13.3	17 3 8	21 12.2	June
31 12.3	June 4 7.0	24 18.5	26 20.2	25 20.7	30 5.1	1
June 8 1.7	11 20.4	June 2 1.4	June 4 3.1	June 3 13.6	June 7 22.1	1
15 15.2	19 9.9	10 8.3	12 10.0	12 6.5	16 15.0	2
23 4.6	26 23.4	18 15.2	20 17.0	20 23.5	25 8.0	July
30 18.1	July 4 12.8	26 22.1	28 23.9	29 16.4	July 4 0.9	
July 8 7.6	12 2.3	July 5 5.1	July 7 6.8	July 8 9.4	12 17.9	1
15 21.0	19 15.8	13 12.0	15 13.7	17 2.4	21 10.8	2
23 10.5	27 5.2	21 18.9	23 20.6	25 19.3	30 3 8	2
31 0.0	Aug. 3 18 7	30 1.8	Aug. 1 3.6	Aug. 3 12.3	Aug. 7 20 8	Aug.
Aug. 7 13.4	11 8.2	Aug. 7 8.8	9 10.5	12 5.2	16 13.7	1
15 2.9	18 21.6	15 15.7	17 17.4	20 22.2	25 6.7	1
22 16.4	26 11.1	23 22.6	26 0.4	29 15.2	Sept. 2 23.7	2
30 5.9	Sept. 3 0.6	Sept. 1 5.6	Sept. 3 7.3	Sept. 7 8.2	11 16.7	3
Sept. 6 19.3	10 14.1	9 12.5	11 14.2	16 1.2	20 9.6	Sept.
14 8 8	18 3.6	17 19.4	19 21.2	24 18.1	29 2.6	1
21 22 3	25 17.0	26 2.4	28 4.1	Oct. 3 11.1	Oct. 7 19.6	2
29 11.8	Oct. 3 6.5	Oct. 4 9.3	Oct. 6 11.1	12 4.1	16 12.6	2
Oct. 7 1.3	10 20.0	12 16.3	14 18.0	20 21.0	25 5.5	Oct.
14 14.8	18 9.5	20 23.2	23 1.0	29 14.0	Nov. 2 22.5	1
22 4.2	25 23.0	29 6.2	31 7.9	Nov. 7 7.0	11 15.4	1
29 17.7	Nov. 2 12.5	Nov. 6 13.1	Nov. 8 14.8	15 23.9	20 8.4	2
Nov. 6 7.2	10 1.9	14 20.0	16 21.8	24 16.9	29 1.3	3
13 20.7	17 15.4	23 3 0	25 4.7	Dec. 3 9.8	Dec. 7 18 3	Nov.

In the above diagram the central circle represents the planet.

For Ariel every third greatest elongation is given, and for Umbriel every alternate o *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 $13^d\ 11^h.118$.

e from thern gation.	Ariel.		Umbriel.		Time from Northern Elongation.	Titania.		Time from Northern Elongation.	Oberon.	
	p^1	F	p^1	F		p^1	F		p^1	F
h	°		°		d h	°		d h	°	
0	350.2	1.000	350.2	1.000	0 0	350.2	1.000	0 0	350.2	1.000
2	355.2	0.982	353.2	0.993	0 5	353.8	0.991	0 8	354.0	0.990
4	0.6	0.930	356.3	0.974	0 10	357.6	0.963	0 16	357.8	0.960
6	6.8	0.847	359.6	0.942	0 15	1.6	0.918	1 0	2.0	0.912
8	14.6	0.741	3.2	0.898	0 20	6.1	0.857	1 8	6.8	0.848
10	25.4	0.621	7.1	0.843	1 1	11.4	0.783	1 16	12.5	0.770
12	41.2	0.507	11.7	0.780	1 6	17.9	0.700	2 0	19.5	0.682
14	64.5	0.429	17.1	0.711	1 11	26.3	0.613	2 8	28.7	0.592
16	92.6	0.423	23.7	0.637	1 16	37.3	0.529	2 16	41.0	0.507
18	116.8	0.494	32.1	0.564	1 21	52.2	0.459	3 0	57.7	0.443
20	133.4	0.606	42.8	0.498	2 2	71.0	0.420	3 8	78.1	0.416
22	144.6	0.726	56.4	0.447	2 7	91.6	0.422	3 16	99.0	0.434
0	152.8	0.835	72.7	0.418	2 12	110.0	0.466	4 0	116.5	0.493
2	159.1	0.922	90.0	0.420	2 17	124.4	0.537	4 8	129.6	0.575
4	164.6	0.978	106.0	0.452	2 22	135.2	0.622	4 16	139.4	0.665
6	169.6	1.000	119.2	0.507	3 3	143.2	0.710	5 0	146.7	0.753
8	174.6	0.986	129.6	0.574	3 8	149.6	0.792	5 8	152.6	0.833
10	179.9	0.938	137.7	0.647	3 13	154.8	0.864	5 16	157.5	0.901
12	186.0	0.859	144.1	0.720	3 18	159.3	0.924	6 0	161.8	0.953
14	193.6	0.755	149.4	0.789	3 23	163.3	0.967	6 8	165.8	0.986
16	203.9	0.636	153.9	0.851	4 4	167.0	0.993	6 16	169.5	1.000
18	218.9	0.519	157.8	0.904	4 9	170.6	1.000	7 0	173.2	0.994
20	241.2	0.435	161.3	0.947	4 14	174.2	0.989	7 8	177.0	0.968
22	269.2	0.419	164.5	0.977	4 19	178.0	0.959	7 16	181.2	0.923
0	294.2	0.482	167.6	0.995	5 0	182.0	0.912	8 0	185.8	0.862
2	311.7	0.591	170.6	1.000	5 5	186.6	0.850	8 8	191.3	0.786
4	323.5	0.712	173.6	0.992	5 10	192.1	0.775	8 16	198.0	0.700
6	331.9	0.823	176.8	0.970	5 15	198.7	0.691	9 0	206.7	0.609
8	338.4	0.913	180.1	0.936	5 20	207.3	0.604	9 8	218.3	0.523
10	344.0	0.972	183.7	0.891	6 1	218.7	0.520	9 16	234.1	0.453
12	349.0	0.999	187.7	0.835	6 6	234.0	0.454	10 0	253.9	0.418
14	354.0	0.990	192.4	0.771	6 11	253.2	0.418	10 8	275.1	0.427
16			197.9	0.701	6 16	273.7	0.425	10 16	293.4	0.479
18			204.7	0.627	6 21	291.8	0.472	11 0	307.4	0.557
20			213.4	0.555	7 2	305.7	0.546	11 8	317.6	0.647
22			224.5	0.490	7 7	316.1	0.632	11 16	325.4	0.736
0			238.5	0.441	7 12	324.0	0.718	12 0	331.6	0.819
2			255.0	0.417	7 17	330.2	0.800	12 8	336.6	0.889
4			272.3	0.423	7 22	335.3	0.871	12 16	341.0	0.944
6			288.0	0.458	8 3	339.7	0.929	13 0	345.0	0.981
8			300.8	0.515	8 8	343.7	0.970	13 8	348.8	0.998
10			310.8	0.584	8 13	347.4	0.994	13 16	352.5	0.996
12			318.6	0.657	8 18	351.0	1.000			
14			324.9	0.730						
16			330.0	0.798						
18			334.4	0.859						
20			338.3	0.911						
22			341.7	0.952						
0			345.0	0.980						
2			348.0	0.997						
4			351.0	1.000						

Position angle of satellite $p = p^1 + (P - P_0)$.

Apparent distance of satellite $s = F\frac{\sigma(\rho)}{\rho}$.

FOR GREENWICH MEAN NOON.

Date.	$P-P_0$	$\frac{a(\rho)}{\rho}$ Ariel.	Umbriel.	Titania.	Oberon.	Date.	$P-P_0$	$\frac{a(\rho)}{\rho}$ Ariel.	Umbriel.	Titani
	°	"	"	"	"		°	"	"	"
Apr. 20	−0.4	13.0	18.1	29.7	39.7	Aug. 18	0.0	13.9	19.4	31.9
25	0.5	13.0	18.2	29.8	39.9	23	+0.1	13.9	19.4	31.8
30	0.5	13.1	18.2	29.9	40.0	28	0.2	13.9	19.4	31.8
May 5	0.6	13.2	18.3	30.1	40.2	Sept. 2	0.2	13.9	19.4	31.8
10	0.6	13.2	18.4	30.2	40.4	7	0.3	13.9	19.3	31.7
15	−0.6	13.3	18.5	30.3	40.5	12	+0.4	13.8	19.3	31.6
20	0.6	13.3	18.6	30.4	40.7	17	0.4	13.8	19.2	31.6
25	0.6	13.4	18.6	30.6	40.9	22	0.5	13.8	19.2	31.5
30	0.6	13.4	18.7	30.7	41.0	27	0.5	13.7	19.1	31.4
June 4	0.6	13.5	18.8	30.8	41.2	Oct. 2	0.6	13.7	19.1	31.3
9	−0.6	13.5	18.9	30.9	41.4	7	+0.6	13.6	19.0	31.2
14	0.6	13.6	18.9	31.0	41.5	12	0.6	13.6	18.9	31.1
19	0.6	13.6	19.0	31.2	41.7	17	0.6	13.5	18.9	31.0
24	0.6	13.7	19.1	31.3	41.8	22	0.6	13.5	18.8	30.8
29	0.5	13.7	19.1	31.4	42.0	27	0.6	13.4	18.7	30.7
July 4	−0.5	13.8	19.2	31.5	42.1	Nov. 1	+0.6	13.4	18.6	30.6
9	0.4	13.8	19.2	31.6	42.2	6	0.6	13.3	18.6	30.4
14	0.4	13.8	19.3	31.6	42.3	11	0.6	13.3	18.5	30.3
19	0.3	13.9	19.3	31.7	42.4	16	0.6	13.2	18.4	30.2
24	0.3	13.9	19.4	31.8	42.5	21	0.6	13.1	18.3	30.0
29	−0.2	13.9	19.4	31.8	42.5	26	+0.5	13.1	18.2	29.9
Aug. 3	0.2	13.9	19.4	31.8	42.6	Dec. 1	0.5	13.0	18.2	29.8
8	−0.1	13.9	19.4	31.8	42.6	6	0.4	13.0	18.1	29.7
13	0.0	13.9	19.4	31.9	42.6	11	+0.4	12.9	18.0	29.6

SATELLITE OF NEPTUNE, 1917.

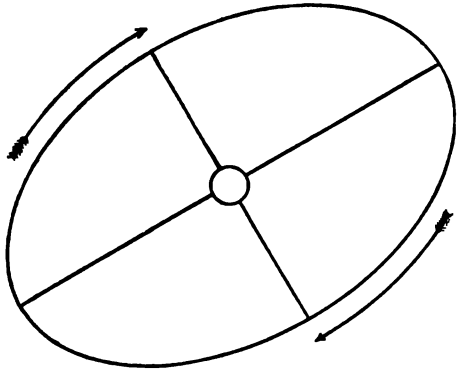
Time from Eastern Elongation.	p^1	F	Time from Eastern Elongation.	p^1	F	Date.	$P-P_0$	$\frac{a(\rho)}{\rho}$	Date.	$P-P$
d h	°		d h	°			°	"		°
0 0	120.1	1.000	3 0	297.8	0.999	Jan. 1	+0.7	16.8	May 1	−1.
0 3	115.3	0.995	3 3	292.8	0.988	6	0.5	16.8	6	1.
0 6	110.3	0.979	3 6	287.8	0.967	11	0.4	16.8	11	1.
0 9	105.1	0.953	3 9	282.4	0.937	16	0.2	16.8	16	1.
0 12	99.6	0.918	3 12	276.7	0.899	21	+0.1	16.8	21	−1.
0 15	93.6	0.877	3 15	270.4	0.855	26	−0.1	16.8	Oct. 2	+3.
0 18	86.9	0.831	3 18	263.4	0.807	31	0.2	16.8	7	3.
0 21	79.5	0.782	3 21	255.4	0.758	Feb. 5	0.4	16.8	12	3.
1 0	71.0	0.734	4 0	246.4	0.712	10	0.6	16.8	17	3.
1 3	61.5	0.692	4 3	236.4	0.674	15	0.7	16.8	22	3.
1 6	50.8	0.658	4 6	225.2	0.646	20	−0.8	16.7	27	+3.
1 9	39.2	0.638	4 9	213.3	0.634	25	1.0	16.7	Nov. 1	3.
1 12	27.2	0.634	4 12	201.2	0.638	Mar. 2	1.1	16.7	6	3.
1 15	15.3	0.646	4 15	189.6	0.658	7	1.2	16.6	11	3.
1 18	4.1	0.673	4 18	179.0	0.691	12	1.3	16.6	16	3.
1 21	354.0	0.712	4 21	169.4	0.734	17	−1.4	16.6	21	+3.
2 0	345.0	0.758	5 0	160.9	0.781	22	1.5	16.5	26	3.
2 3	337.0	0.806	5 3	153.4	0.830	27	1.5	16.5	Dec. 1	3.
2 6	330.0	0.854	5 6	146.8	0.877	Apr. 1	1.6	16.5	6	3.
2 9	323.7	0.899	5 9	140.8	0.918	6	1.6	16.4	11	3.
2 12	317.9	0.937	5 12	135.2	0.953	11	−1.6	16.4	16	+3.
2 15	312.6	0.967	5 15	130.0	0.979	16	1.6	16.3	21	3.
2 18	307.5	0.988	5 18	125.1	0.994	21	1.6	16.3	26	3.
2 21	302.6	0.999	5 21	120.2	1.000	26	−1.6	16.2	31	+3.

Position angle of satellite $p = p^1 + (P - P_0)$.

Apparent distance of satellite $s = F\frac{a(\rho)}{\rho}$.

'ARENT ORBIT OF THE SATELLITE OF NEPTUNE AT DATE OF OPPOSITION, JANUARY 23, 1917, AS SEEN IN AN INVERTING TELESCOPE.

South



North

Date.	Position Angle of Apsis.	Apparent Distance at Apsis.
	°	″
Jan. 23	120.1	16.8
May 3	118.7	16.2
Oct. 14	123 8	16.1
Dec. 33	123.2	16.7

GREENWICH MEAN TIME OF GREATEST ELONGATION.

East.		West.		East.		West.		East.		West.	
d	h		d h		d h		d h		d h		d h
2	0.2	Jan.	4 22.8	Mar.	25 7.8	Mar.	28 6.4	Oct.	11 1.2	Oct.	13 23.7
7	21.3		10 19.9		31 4.9	Apr.	3 3 4		16 22.2		19 20.7
13	18.5		16 17.0	Apr.	6 2.0		9 0 5		22 19.2		25 17.7
19	15.6		22 14 1		11 23.0		14 21.6		28 16.2		31 14.7
25	12.7		28 11.3		17 20.1		20 18.6	Nov.	3 13.2	Nov.	6 11.7
31	9 8	Feb.	3 8 4		23 17.1		26 15.7		9 10.3		12 8.8
6	6.9		9 5 5		29 14.2	May	2 12.7		15 7.3		18 5.8
12	4.1		15 2.6	May	5 11.2		8 9.7		21 4.3		24 2.9
18	1.2		20 23 8		11 8.2		14 6.7		27 1.4		29 23.9
23	22.3		26 20.9		17 5.2		20 3.7	Dec.	2 22.5	Dec.	5 21.0
1	19 4	Mar.	4 18.0		23 2.2		26 0.7		8 19.5		11 18.1
7	16 5		10 15.1		28 23.2		31 21.7		14 16.6		17 15.1
13	13 6		16 12.2		. . . . .		. . . . .		20 13.7		23 12.2
19	10.7		22 9 3	Oct.	5 4.2	Oct.	8 2 7		26 10.8		29 9.3

In the above diagram the central circle represents the planet.
The sidereal period of the satellite of Neptune is $5^d\ 21^h.044$.

GREENWICH MEAN TIME.

PLANETARY CONFIGURATIONS.

	d	h	m						
Jan.	1	9	47	☌ ♃ ☾	. . . . .	♃	−	6	58
	2	15	–	☿	Greatest elong. E.	19	22		
	3	0	–	⊕	in Perihelion.				
	7	–	–	☾	Tot. ecl. vis. at Wash.				
	7	5	–	☿	in ♌				
	8	17	4	☌ ♄ ☾	. . . . .	♄	+	0	58
	9	5	31	☌ ♆ ☾	. . . . .	♆	+	1	6
	9	9	–	☿	Stationary.				
	11	20	–	☿	in Perihelion.				
	13	13	–	☌ ☿ ♂	. . . . .	☿	+	3	5
	16	21	–	□ ♃ ☉					
	17	7	–	☍ ♄ ☉					
	18	18	–	☌ ☿ ☉	Inferior.				
	21	3	51	☌ ♀ ☾	. . . . .	♀	+	1	26
	22	–	–	☉	Par. ecl. invis. at Wash.				
	22	3	–	☿	Greatest Hel. Lat. N.				
	22	5	28	☌ ☿ ☾	. . . . .	☿	+	3	13
	23	10	34	☌ ♂ ☾	. . . . .	♂	−	3	13
	23	13	–	☍ ♆ ☉					
	23	22	39	☌ ♋ ☾	. . . . .	♋	−	3	30
	26	12	–	♂	Greatest Hel. Lat. S.				
	27	21	–	♀	in ♍				
	28	20	17	☌ ♃ ☾	. . . . .	♃	−	6	45
	30	4	–	☿	Stationary.				
	30	9	–	☌ ☿ ♀	. . . . .	☿	+	2	53
Feb.	2	10	–	☌ ♂ ♋	. . . . .	♂	−	0	26
	4	18	46	☌ ♄ ☾	. . . . .	♄	+	0	48
	5	10	9	☌ ♆ ☾	. . . . .	♆	+	1	2
	8	12	–	☌ ♋ ☉					
	11	21	–	☿	Greatest elong. W.	26	3		
	14	14	–	☿	in ♍				
	19	12	49	☌ ☿ ☾	. . . . .	☿	−	2	20
	20	4	19	☌ ♀ ☾	. . . . .	♀	−	3	25
	20	5	–	♂	in Perihelion.				
	20	12	45	☌ ♋ ☾	. . . . .	♋	−	3	38
	21	11	52	☌ ♂ ☾	. . . . .	♂	−	5	10
	24	10	–	☌ ♀ ♋	. . . . .	♀	−	0	23
	24	20	–	☿	in Aphelion.				
	25	12	6	☌ ♃ ☾	. . . . .	♃	−	6	21
	28	10	–	☌ ♂ ☉					
Mar.	2	2	–	☌ ☿ ♋	. . . . .	☿	−	1	12
	3	11	–	♀	in Aphelion.				
	3	21	49	☌ ♄ ☾	. . . . .	♄	+	0	47
	4	15	10	☌ ♆ ☾	. . . . .	♆	+	1	3
	17	4	–	☿	Greatest Hel. Lat. S.				
	18	10	–	☌ ☿ ♀	. . . . .	☿	−	0	43
	20	1	24	☌ ♋ ☾	. . . . .	♋	−	3	52
	20	16	38	☉	enters ♈, Spring com.				
	22	5	12	☌ ♀ ☾	. . . . .	♀	−	6	40
	22	9	27	☌ ☿ ☾	. . . . .	☿	−	7	13
	22	12	11	☌ ♂ ☾	. . . . .	♂	−	6	12
	23	20	–	☌ ☿ ♂	. . . . .	☿	−	0	56
	25	7	26	☌ ♃ ☾	. . . . .	♃	−	5	51
	25	12	–	♄	Stationary.				

	d	h	m						
Mar.	25	18	–	♀	Greatest Hel. La				
	29	5	–	☌ ☿ ☉	Superior.				
	30	20	–	☌ ♀ ♂	. . . . .	♀			
	31	4	11	☌ ♄ ☾	. . . . .	♄			
	31	21	33	☌ ♆ ☾	. . . . .	♆			
Apr.	5	5	–	☿	in ♌				
	9	19	–	☿	in Perihelion.				
	12	12	–	☿	Stationary.				
	14	1	–	□ ♄ ☉					
	16	7	–	☌ ☿ ♃	. . . . .	☿			
	16	11	2	☌ ♋ ☾	. . . . .	♋			
	20	2	–	☿	Greatest Hel. Lat				
	20	10	29	☌ ♂ ☾	. . . . .	♂			
	21	3	47	☌ ♀ ☾	. . . . .	♀			
	22	3	54	☌ ♃ ☾	. . . . .	♃			
	22	8	–	□ ♆ ☉					
	22	16	15	☌ ☿ ☾	. . . . .	☿			
	24	8	–	☿	Greatest elong. E.				
	25	20	–	☌ ♀ ☉	Superior.				
	27	14	13	☌ ♄ ☾	. . . . .	♄			
	28	5	35	☌ ♆ ☾	. . . . .	♆			
May	5	14	–	☌ ♀ ♃	. . . . .	♀			
	5	15	–	☿	Stationary.				
	8	23	–	☌ ♃ ☉					
	13	6	–	☌ ☿ ♀	. . . . .	☿			
	13	13	–	☿	in ♍				
	13	17	54	☌ ♋ ☾	. . . . .	♋			
	14	14	–	□ ♋ ☉					
	16	8	–	☌ ☿ ☉	Inferior.				
	19	6	46	☌ ♂ ☾	. . . . .	♂			
	19	23	43	☌ ♃ ☾	. . . . .	♃			
	20	4	11	☌ ☿ ☾	. . . . .	☿			
	21	0	–	♀	in ♌				
	21	2	57	☌ ♀ ☾	. . . . .	♀			
	23	19	–	☿	in Aphelion.				
	24	9	–	☌ ☿ ♃	. . . . .	☿			
	25	2	55	☌ ♄ ☾	. . . . .	♄			
	25	14	43	☌ ♆ ☾	. . . . .	♆			
	28	14	–	☿	Stationary.				
	28	23	–	♋	Stationary.				
June	5	12	–	☌ ☿ ♂	. . . . .	☿			
	8	0	–	☌ ♂ ♃	. . . . .	♂			
	8	14	–	☌ ☿ ♃	. . . . .	☿			
	9	23	41	☌ ♋ ☾	. . . . .	♋			
	11	11	–	☌ ☿ ♂	. . . . .	☿			
	11	12	–	☿	Greatest elong. W.				
	13	4	–	☿	Greatest Hel. Lat.				
	16	17	51	☌ ♃ ☾	. . . . .	♃			
	17	1	51	☌ ♂ ☾	. . . . .	♂			
	17	5	40	☌ ☿ ☾	. . . . .	☿			
	19	–	–	☉	Par. ecl. invis. at				
	20	8	34	☌ ♀ ☾	. . . . .	♀			
	21	12	14	☉	enters ♋, Summe				
	21	16	49	☌ ♄ ☾	. . . . .	♄			

GREENWICH MEAN TIME.

PLANETARY CONFIGURATIONS.

m				° ′		d	h	m						° ′	
2	☌ ☿ ☾	. . . . .	☿	+ 1 56	Oct.	1	0	–	☌ ♂ ♄	. . . . .	♂	+ 0 40			
–	☌ ♂	in ♌				2	18	–	☌ ☿	in Perihelion.					
–	☌ ♀	in Perihelion.				4	4	–	☌ ☿	Greatest elong. W.		17 56			
–	☌ ☿	in ♌				4	21	27	☌ ♃ ☾	. . . . .	♃	– 2 57			
–	☌ ⊕	in Aphelion.				9	8	54	☌ ♆ ☾	. . . . .	♆	+ 2 36			
–	☾	Tot. ecl. invis. at Wash.				9	21	25	☌ ♄ ☾	. . . . .	♄	+ 3 52			
–	☌ ☿ ♄	. . . . .	☿	+ 1 4		10	7	36	☌ ♂ ☾	. . . . .	♂	+ 5 2			
–	☌ ☿ ♆	. . . . .	☿	+ 1 43		13	1	–	☿	Greatest Hel. Lat. N.					
–	☿	in Perihelion.				14	4	–	☿	in Aphelion.					
14	☌ ☿ ☾	. . . . .	☉	– 4 41		14	16	37	☌ ☿ ☾	. . . . .	☿	+ 7 33			
–	☌ ☿ ☉	Superior.				19	7	57	☌ ☿ ☾	. . . . .	☿	– 0 8			
53	☌ ♃ ☾	. . . . .	♃	– 4 5		24	15	32	☌ ☉ ☾	. . . . .	☉	– 4 44			
–	☿	Greatest Hel. Lat. N.				30	4	–	☉	Stationary.					
41	☌ ♂ ☾	. . . . .	♂	– 1 26		30	14	–	□ ♆ ☉						
–	☿	Greatest Hel. Lat N.			Nov.	1	4	25	☌ ♃ ☾	. . . . .	♃	– 2 55			
–	☉	Par. ecl. invis. at Wash.				3	6	–	☌ ☿ ☉	Superior.					
–	☌ ☿ ♄	. . . . .	☿	+ 1 25		5	10	–	☿	Greatest Hel. Lat. S.					
–	☌ ☿ ♆	. . . . .	☿	+ 2 3		5	12	–	☿	in ♍					
48	☌ ♄ ☾	. . . . .	♄	+ 2 33		5	17	16	☌ ♆ ☾	. . . . .	♆	+ 2 53			
52	☌ ♆ ☾	. . . . .	♆	+ 2 1		6	8	32	☌ ♄ ☾	. . . . .	♄	+ 4 19			
9	☌ ☿ ☾	. . . . .	☿	+ 4 11		6	16	–	□ ♄ ☉						
12	☌ ♀ ☾	. . . . .	♀	+ 5 23		8	1	37	☌ ♂ ☾	. . . . .	♂	+ 6 46			
–	☌ ♄ ☉					9	13	–	♆	Stationary.					
–	☌ ♆ ☉					12	8	–	□ ☉ ☉						
–	☌ ♄ ♆	. . . . .	♄	+ 0 39		14	20	50	☌ ☿ ☾	. . . . .	☿	+ 1 48			
20	☌ ☉ ☾	. . . . .	☉	– 4 34		15	17	–	☿	in Aphelion.					
–	☿	in ♍				18	2	46	☌ ♀ ☾	. . . . .	♀	– 4 4			
51	☌ ♃ ☾	. . . . .	♃	– 3 39		20	21	43	☌ ☉ ☾	. . . . .	☉	– 4 56			
0	☌ ♂ ☾	. . . . .	♂	+ 0 42		26	4	–	♄	Stationary.					
–	☍ ☉ ☉					28	8	30	☌ ♃ ☾	. . . . .	♃	– 3 7			
3	☌ ♆ ☾	. . . . .	♆	+ 2 7		28	18	–	☍ ♃ ☉						
18	☌ ♄ ☾	. . . . .	♄	+ 2 55		29	20	–	♀	Greatest elong. E.		47 18			
–	☿	in Aphelion.			Dec.	3	1	39	☌ ♆ ☾	. . . . .	♆	+ 3 2			
21	☌ ☿ ☾	. . . . .	☿	+ 3 36		3	17	42	☌ ♄ ☾	. . . . .	♄	+ 4 36			
52	☌ ♀ ☾	. . . . .	♀	+ 6 33		6	2	–	☿	Greatest Hel. Lat. S.					
–	☿	Greatest elong. E.		27 23		6	15	37	☌ ♂ ☾	. . . . .	♂	+ 8 0			
28	☌ ☉ ☾	. . . . .	☉	– 4 30		11	16	–	□ ☌ ♂ ☉						
–	□ ♃ ☉					13	–	–	☉	Ann. ecl. invis. at Wash.					
–	☿	Stationary.				15	11	42	☌ ☿ ☾	. . . . .	☿	– 3 4			
47	☌ ♃ ☾	. . . . .	♃	– 3 14		16	18	–	☿	Greatest elong. E.		20 20			
–	☿	Greatest Hel. Lat. S.				17	13	1	☌ ♀ ☾	. . . . .	♀	– 5 30			
–	♀	in ♍				18	4	47	☌ ☉ ☾	. . . . .	☉	– 5 5			
53	☌ ♂ ☾	. . . . .	♂	+ 2 55		21	21	46	☉	enters ♑, Winter com.					
54	☌ ♆ ☾	. . . . .	♆	+ 2 18		24	11	–	☿	Stationary.					
12	☌ ♄ ☾	. . . . .	♄	+ 3 22		25	0	–	♂	Greatest Hel. Lat. N.					
7	☌ ☿ ☾	. . . . .	☿	+ 1 31		25	2	–	☿	in ♌					
–	☌ ☿ ☉	Inferior.				25	10	46	☌ ♃ ☾	. . . . .	♃	– 3 20			
30	☌ ♀ ☾	. . . . .	♀	+ 4 5		27	–	–	☾	Tot. ecl. vis. at Wash.					
–	☌ ♂ ♆	. . . . .	♂	+ 1 18		29	17	–	☿	in Perihelion.					
1	☉	enters ♎, Autumn com.				30	9	13	☌ ♆ ☾	. . . . .	♆	+ 3 0			
–	☿	Stationary.				30	20	–	☌ ♀ ☉	. . . . .	♀	+ 0 35			
14	☌ ☉ ☾	. . . . .	☉	– 4 33		31	0	4	☌ ♄ ☾	. . . . .	♄	+ 4 37			
–	☿	in ♌				31	17	–	♀	in ♌					
–	♃	Stationary.													

No.	Place.	Latitude.	Reduction to Geocentric Latitude.	Altitude (*Meters*).	Log ρ (*Including altitude*).	Longitude from Greenwich.
		° ′ ″	′ ″			h m s
1	Abbadia, France	+43 22 52.2	−11 34.4	69	9.999317	+ 0 7 0.1
2	Adelaide, S. Australia	−34 55 38.0 [a]	+10 52.4	41 [b]	9.999526	− 9 14 20.07 [a]
3	Adelaide, S. Australia	−34 55 37.4 [c]	+10 52.4	. . .	9.999523	− 9 14 20.17 [c]
4	Albany, N. Y.	+42 39 12.7 [a]	−11 33.1	70 [a]	9.999336	+ 4 55 7.12 [a]
5	Albany, N. Y.	+42 39 49.5 [a]	−11 33.1	52	9.999335	+ 4 54 59.97 [a]
6	Algiers, Algeria	+36 47 50	−11 6.7	342	9.999501	− 0 12 8.38
7	Allegheny, Pa.	+40 28 58.1 [d]	−11 26.7	370 [d]	9.999411	+ 5 20 5.39 [d]
8	Allegheny, Pa.	+40 27 41.6	−11 26.6	. . .	9.999387	+ 5 20 2.93
9	Amherst, Mass.	+42 21 56.5 [e]	−11 32.5	110 [e]	9.999346	+ 4 50 5.93 [e]
10	Amherst, Mass.	+42 22 17.1 [f]	−11 32.5	. . .	9.999338	+ 4 50 4.67 [f]
11	Ann Arbor, Mich.	+42 16 48.7 [a]	−11 32.3	282 [a]	9.999360	+ 5 34 55.27 [a]
12	Appleton, Wis.	+44 15 39.2 [g]	−11 35.4	242	9.999307	+ 5 53 35.92 [g]
13	Arcetri, Italy	+43 45 14.4	−11 34.9	184	9.999316	− 0 45 1.30
14	Arequipa, Peru	−16 22 28.0 [h]	+ 6 15.2	2451 [h]	0.000052	+ 4 46 11.73 [h]
15	Armagh, Ireland	+54 21 12.7 [c]	−10 59.6	61 [c]	9.999040	+ 0 26 35.4 [c]
16	Athens, Greece	+37 58 19.7 [i]	−11 14.3	107 [i]	9.999456	− 1 34 53 [i]
17	Baltimore, Md.	+39 17 52.0 [j]	−11 21.5	36 [j]	9.999418	+ 5 6 29.1 [j]
18	Bamberg, Bavaria	+49 53 6.0 [c]	−11 26.0	299 [c]	9.999167	− 0 43 33.57 [c]
19	Barcelona, Spain	+41 25 18	−11 30.0	420	9.999391	− 0 8 28.0
20	Beloit, Wis.	+42 30 8.4	−11 32.8	. . .	9.999335	+ 5 56 7.4
21	Bergedorf, Germany	+53 28 46.2	−11 6.1	35	9.999060	− 0 40 57.74
22	Berkeley, Cal.	+37 52 23.6	−11 13.7	97	9.999458	+ 8 9 2.72
23	Berlin, Prussia	+52 30 16.7 [k]	−11 12.5	47 [k]	9.999085	− 0 53 34.80 [k]
24	Berlin, Prussia	+52 31 13.1	−11 12.4	. . .	9.999081	− 0 53 34.41
25	Berlin, Prussia	+52 31 30.7	−11 12.4	. . .	9.999081	− 0 53 27.40
26	Berlin, Prussia	+52 29 7	−11 12.6	38	9.999084	− 0 53 54.2
27	Berne, Switzerland	+46 57 8.7	−11 34.2	573	9.999260	− 0 29 45.70 [a]
28	Besançon, France	+47 14 59.0	−11 33.7	312	9.999235	− 0 23 57.13
29	Birr Castle, Ireland	+53 5 47	−11 8.7	56	9.999071	+ 0 31 40.9
30	Bloomington, Ind.	+39 9 56 [d]	−11 20.8	238 [d]	9.999435	+ 5 46 5 [d]
31	Bogota, Colombia	+ 4 35 55.2 [c]	− 1 50.8	2634	0.000170	+ 4 56 23.5
32	Bombay (Colaba), India	+18 53 36.2 [c]	− 7 5.1	14 [c]	9.999849	− 4 51 15.72 [c]
33	Bonn, Prussia	+50 43 45.0 [k]	−11 22.3	62 [l]	9.999130	− 0 28 23.17 [k]
34	Bordeaux (Floirac), France	+44 50 7.2 [a]	−11 35.6	73	9.999281	+ 0 2 5.51 [a]
35	Boston, Mass.	+42 20 58 [m]	−11 32.5	31 [m]	9.999341	+ 4 44 19.1 [m]
36	Boston, Mass.	+42 21 32.5	−11 32.5	48	9.999342	+ 4 44 15.0
37	Bothkamp, Prussia	+54 12 9.6 [n]	−11 0.8	32 [n]	9.999042	− 0 40 31.02 [n]
38	Bremen, Germany	+53 4 36	−11 8.8	. . .	9.999067	− 0 35 15
39	Breslau, Prussia	+51 6 55.8 [k]	−11 20.4	147 [k]	9.999126	− 1 8 8.72 [k]
40	Brisbane, Queensland	−27 28 0.0	+ 9 28.3	. . .	9.999691	−10 12 6.17
41	Brussels (Uccle), Belgium	+50 47 55.5 [a]	−11 21.9	105 [a]	9.999131	− 0 17 26.05 [a]
42	Brussels, Belgium	+50 51 10.6 [c]	−11 21.7	. . .	9.999123	− 0 17 28.02 [c]
43	Budapest, Hungary	+47 29 34.7 [c]	−11 33.2	131 [c]	9.999217	− 1 16 15.3 [c]
44	Cambridge, England	+52 12 51.6	−11 14.3	28	9.999091	− 0 0 22.75
45	Cambridge, Mass.	+42 22 47.6 [o]	−11 32.6	24	9.999340	+ 4 44 31.05 [o]
46	Cape of Good Hope	−33 56 3.5 [p]	+10 43.6	13 [p]	9.999548	− 1 13 54.76 [p]
47	Carloforte, Sardinia	+39 8 8.9 [q]	−11 20.7	18 [q]	9.999421	− 0 33 14.9 [q]
48	Catania, Sicily	+37 30 13.2 [c]	−11 11.4	49 [c]	9.999464	− 1 0 20.70 [c]
49	Charkow, Russia	+50 0 9.9 [a]	−11 25.5	138 [r]	9.999153	− 2 24 55.75 [a]
50	Charlottesville, Va.	+38 2 1.2 [c]	−11 14.6	259 [c]	9.999465	+ 5 14 5.33 [c]

[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] Cercle Syngros.
[j] Center of instrument house.
[k] Center of observatory.
[l] Floor of meridian room.
[m] Foot of pillar of 7-in. equa
[n] Cube of equatorial.
[o] Dome of 15-in. equatorial.
[p] 8-in. meridian circle.
[q] Zenith telescope.
[r] Barometer in meridian roo

Authority for—		Description.
Latitude.	Longitude.	
. Astron., Bruxelles, 1907.	*Les Obs. Astron.*, Bruxelles, 1907.	Obs. Paris Acad. of Sci., Hendaye.
from Govt. Astronomer, 1913.	Letter from Govt. Astronomer, 1913.	Govt. Obs., since 1884.
rom Govt. Astronomer, 1913.	Letter from Govt. Astronomer. 1913.	Govt. Obs., before 1884.
: from Director, 1913.	Letter from Director, 1913.	Dudley Obs., since 1893.
: from Director, 1913.	Letter from Director, 1913.	Dudley Obs., before 1893.
s. Astron., Bruxelles, 1907.	*Astron. Nach.*, Nr. 3993, 1905.	At Bouzaréah. Old Obs. 3'.8 S., 8s E.
cations of Obs., 1909.	*Publications* of Obs., 1909.	[a] Obs. Western Univ. of Pa., since 1905.
r from Director, 1897.	Letter from Director, 1897.	Obs. Western Univ. of Pa., before 1905.
r from Director, 1913.	Letter from Director, 1913.	Amherst College Obs., since 1903.
: from Director, 1913.	Letter from Director, 1913.	Lawrence Obs., before 1903.
: from Director, 1913.	Letter from Director, 1913.	Detroit Obs., Univ. of Mich.
otnote (*b*).	See footnote (*b*).	Underwood Obs., Lawrence College.
. dell'Osserv., 1900.	*Astron. Nach.*, Nr. 3993, 1905.	Royal Observatory.
rd Annals, 1903.	*Harvard Annals*, 1903.	Branch of Harvard Coll. Obs.
h *Catalogue of Stars*, 1840.	*Armagh Catalogue of Stars*, 1840.	Armagh Observatory.
les de l'Obs., 1910.	Letter from Director, 1913.	[c] National Observatory.
r from Director, 1913.	Letter from Director, 1913.	Johns Hopkins Univ. Obs.
r from Director, 1913.	*Astron. Nach.*, Nr. 3993, 1905.	Remeis Observatory.
s. Astron., Bruxelles, 1907.	*Les Obs. Astron.*, Bruxelles, 1907.	Fabra Obs., Acad. of Sci. and Arts.
r from Director, 1897.	Letter from Director, 1897.	Smith Obs., Beloit College.
r from Director, 1913.	*Astron. Nach.*, Nr. 3993, 1905.	Hamburg Obs., since 1909.
r from Director, 1897.	Letter from Director, 1897.	Students' Obs., Univ. of Cal.
n. Nach., Nr. 3545, 1898.	*Astron. Nach.*, Nr. 3993, 1905.	Royal Obs., since 1835.
r from Director, 1913.	Letter from Director, 1913.	Royal Obs., before 1835.
n. Nach., Nr. 3170, 1893.	*Astron. Nach.*, Nr. 3170, 1893.	Urania Observatory.
s. Astron., Bruxelles, 1907.	*Les Obs. Astron.*, Bruxelles, 1907.	Treptow Observatory.
ıer Jahrbuch.	*Astron. Nach.*, Nr. 3202, 1893.	Observatory, Cantonal Univ.
n. Nach., Nr. 2805, 1887.	*Astron. Nach.*, Nr. 2805, 1887.	National Observatory.
h *Nautical Almanac.*	British *Nautical Almanac.*	Private Obs. of Earl of Rosse.
r from Director, 1913.	Letter from Director, 1913.	Kirkwood Obs., Univ. of Ind.
r from Director, 1913.	Letter from Director, 1913.	National Observatory.
r from Director, 1913.	Letter from Director, 1913.	Government Observatory.
r from Director, 1913.	*Astron. Nach.*, Nr. 3993, 1905.	Royal Observatory.
r from Director, 1897.	*Annales de l'Obs.*, 1885.	Obs., Univ. of Bordeaux.
r from Director, 1909.	Letter from Director, 1909.	Boston Univ. Obs., since 1908.
r from Director, 1895.	Letter from Director, 1895.	Boston Univ. Obs., before 1908.
zu Bothkamp, 1872.	Letter from Director, 1913.	Obs. of Herr von Bülow.
n. Nach., Nr. 15, 1822.	*Astron. Nach.*, Nr. 15, 1822.	Formerly Olber's Obs.
r from Director, 1897.	*Astron. Nach.*, Nr. 3993, 1905.	Royal University Obs.
h *Nautical Almanac.*	[e] British *Nautical Almanac.*	Brisbane Observatory.
r from Director, 1913.	Letter from Director, 1913.	Royal Obs., since 1891.
les de l'Obs., 1857.	Letter from Director, 1913.	Royal Obs., before 1891.
n. Nach., Nr. 2752, 1886.	*Astron. Nach.*, Nr. 2752, 1886.	University Observatory.
r from Director, 1879.	Letter from Director, 1879.	University Observatory.
rd Annals, 1887.	*U. S. C. and G. S. Report*, 1897.	Harvard College Obs.
len. *Catalogue of Stars*, 1885.	*Monthly Notices, R. A. S.*, Nov. 1908.	Royal Observatory.
otnote (*d*).	Letter from Director, 1913.	International Lat. Obs.
r from Director, 1913.	Letter from Director, 1913.	Royal Obs. of Catania and Etna.
les de l'Obs., 1904.	*Annales de l'Obs.*, 1904.	University Observatory.
r 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".4 S., 0s.1 W. of Cercle Syngros.
[d] *Resultate des Internationalen Breitendienstes*, 1900–1908.
[e] With the new value of the longitude of Sydney.

No.	Place.	Latitude.	Reduction to Geocentric Latitude.	Altitude (*Meters*).	Log ρ (*Including altitude*).	Longitude from Greenwich.
		° ′ ″	′ ″			h m s
51	Chicago, Ill.	+41 50 1.0	−11 31.2	. . .	9.999352	+5 50 26.84
52	Christiania, Norway	+59 54 44.0 [a]	−10 4.6	25 [a]	9.998908	−0 42 53.50 [c]
53	Cincinnati, Ohio	+39 8 19.8 [b]	−11 20.7	247 [b]	9.999437	+5 37 41.40 [d]
54	Cincinnati, Ohio	+39 6 26.5	−11 20.5	. . .	9.999421	+5 37 59.00
55	Cleveland, Ohio	+41 30 14.5 [c]	−11 30.2	215 [c]	9.999375	+5 26 25.86 [c]
56	Clinton, N. Y.	+43 3 17.0	−11 33.9	276	9.999340	+5 1 37.45
57	Coimbra, Portugal	+40 12 24.5	−11 25.6	99	9.999400	+0 33 43.1
58	Columbia, Mo.	+38 56 51.7 [d]	−11 19.7	225 [e]	9.999440	+6 9 18.33 [d]
59	Columbus, Ohio	+39 59 50.4 [d]	−11 24.7	233 [d]	9.999414	+5 32 2.60 [d]
60	Copenhagen, Denmark	+55 41 12.6	−10 48.6	14	9.999005	−0 50 18.69 [f]
61	Cordova, Arg. Rep.	−31 25 15.5 [g]	+10 18.0	434 [g]	9.999634	+4 16 48.22 [g]
62	Cracow, Austria	+50 3 52.0 [a]	−11 25.2	221 [a]	9.999157	−1 19 50.27 [a]
63	Danzig, Prussia	+54 21 18.0	−10 59.6	3	9.999036	−1 14 39.6
64	Dehra Dun, India	+30 18 51.8 [h]	−10 5.3	681 [h]	9.999676	−5 12 11.76 [h]
65	Denver, Colo.	+39 40 36.4 [a]	−11 23.3	1644 [i]	9.999518	+6 59 47.72 [a]
66	Des Moines, Iowa	+41 36 0	−11 30.5	296	9.999378	+6 14 30.56
67	Dorpat (Jurjew), Russia	+58 22 47.2 [a]	−10 22.1	67 [a]	9.998945	−1 46 53.22 [a]
68	Dresden, Saxony	+51 2 16.8	−11 20.8	121	9.999126	−0 54 54.74
69	Dublin, Ireland	+53 23 13.1 [a]	−11 6.7	86 [a]	9.999066	+0 25 21.1 [a]
70	Dun Echt, Scotland	+57 9 36	−10 34.8	141	9.998979	+0 9 40.0
71	Durham, England	+54 46 6.2 [j]	−10 56.4	107 [k]	9.999033	+0 6 19.75 [j]
72	Dusseldorf, Prussia	+51 12 25.0 [l]	−11 19.9	46 [l]	9.999117	−0 27 2.69 [l]
73	Edinburgh, Scotland	+55 55 30.0 [a]	−10 46.5	134 [m]	9.999007	+0 12 44.22 [a]
74	Edinburgh, Scotland	+55 57 23.2 [n]	−10 46.2	106 [o]	9.998995	+0 12 43.05 [n]
75	Elmira, N. Y.	+42 6 25	−11 31.9	. . .	9.999345	+5 7 13.90
76	Evanston, Ill.	+42 3 33.4	−11 31.8	175	9.999358	+5 50 42.3
77	Flagstaff, Ariz.	+35 12 30.5	−10 54.7	2210	9.999667	+7 26 44.58
78	Gaithersburg, Md.	+39 8 13.2 [r]	−11 20.7	165	9.999431	+5 8 47.73
79	Geneva, N. Y.	+42 52 46.2	−11 33.6	152	9.999336	+5 8 1.00
80	Geneva, Switzerland	+46 11 59.3 [a]	−11 35.2	407 [a]	9.999268	−0 24 36.61 [a]
81	Genoa, Italy	+44 25 9.3 [a]	−11 35.5	105	9.999293	−0 35 41.28 [a]
82	Georgetown, D. C.	+38 54 26.7 [b]	−11 19.5	47	9.999429	+5 8 18.26 [b]
83	Glasgow, Mo.	+39 13 45.6	−11 21.1	227	9.999433	+6 11 18.08
84	Glasgow, Scotland	+55 52 42.8 [a]	−10 46.9	55 [p]	9.999003	+0 17 10.55 [a]
85	Gotha, Germany	+50 56 37.9 [l]	−11 21.2	322 [a]	9.999142	−0 42 50.51 [l]
86	Gotha, Germany	+50 56 4.4 [j]	−11 21.2	360 [j]	9.999145	−0 42 55.09 [j]
87	Göttingen, Prussia	+51 31 48.1 [q]	−11 18.2	161 [q]	9.999116	−0 39 46.22 [q]
88	Greencastle, Ind.	+39 38 46.6 [a]	−11 23.1	262 [a]	9.999425	+5 47 24.36 [a]
89	Greenwich, England	+51 28 38.2 [a]	−11 18.5	49 [a]	9.999110	0 0 0.00 [a]
90	Hamburg, Germany	+53 33 6.0	−11 5.6	25	9.999057	−0 39 53.60 [c]
91	Hamburg, Germany	+53 32 51.3 [d]	−11 5.6	30 [d]	9.999058	−0 39 53.46 [c]
92	Hanover N. H.	+43 42 15.3	−11 34.8	183	9.999317	+4 49 8.02
93	Haverford Pa.	+40 0 40.1 [r]	−11 24.8	. . .	9.999398	+5 1 12.70 [r]
94	Heidelberg, Baden	+49 23 55.2 [s]	−11 27.8	567 [s]	9.999198	−0 34 53.13 [s]
95	Heidelberg, Baden	+49 23 55.7 [t]	−11 27.8	570 [t]	9.999198	−0 34 52.96 [t]
96	Heidelberg, Baden	+49 24 34.3 [l]	−11 27.8	126 [l]	9.999168	−0 34 46.80 [l]
97	Helsingfors, Finland	+60 9 42.3 [a]	−10 1.5	33 [a]	9.998903	−1 39 49.10 [c]
98	Herény, Hungary	+47 15 47.4	−11 33.7	229	9.999229	−1 6 24.7
99	Hong Kong, China	+22 18 13.2 [j]	− 8 7.4	33 [j]	9.999793	−7 36 41.86 [j]
100	Iowa City, Iowa	+41 40 0	−11 30.7	183	9.999369	+6 6 6

[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 roo
[q] Position of meridian circle
[r] Zenith telescope.
[s] Repsold meridian circle.
[t] Bruce telescope.

Authority for—		Description.
Latitude.	Longitude.	
U. S. Lake Survey, 1864.	Smithsonian *Report*, 1886.	[a] Dearborn Observatory.
Astron. Nach., Nr. 3193, 1893.	*Astron. Nach.*, Nr. 3993, 1905.	University Observatory.
Publications of the Obs., 1908.	*Astronomical Journal*, 1897.	Cincinnati Obs., since 1873.
Letter from Director, 1897.	*Astronomical Journal*, 1854.	Cincinnati Obs. before 1873.
Letter from Director, 1913.	Letter from Director, 1913.	Case Obs., Case School of Appl'd Sci.
Astron. Nach., Nr. 2553, 1883.	*Astron. Nach.*, Nr. 2553, 1883.	Litchfield Obs., Hamilton College.
Eph. Astron. de Coimbra, 1889.	*Eph. Astron. de Coimbra*, 1889.	University Observatory.
Trans. Acad. of Sci. of St. Louis, 1894.	*Trans. Acad. of Sci. of St. Louis*, 1894.	Laws Obs., Univ. of Mo.
Letter from Director, 1913.	Letter from Director, 1899.	McMillin Obs., State Univ.
British *Nautical Almanac*.	*Astron. Nach.*, Nr. 3993, 1905.	University Observatory.
Resultados del Obs., 1887.	*Resultados del Obs.*, 1887.	National Observatory.
Letter from Director, 1913.	Letter from Director, 1913.	Imperial and Royal Obs.
Letter from Director, 1897.	Letter from Director, 1897.	Obs. of the School of Navigation.
Great Trig. Survey of India, 1906.	Letter from Supt. of Survey, 1913.	Haig Obs., Trig. Survey of India.
Letter from Director, 1913.	Letter from Director, 1913.	Chamberlin Obs., Univ. of Denver.
Les Obs. Astron., Bruxelles, 1907.	*Les Obs. Astron.*, Bruxelles, 1907.	Drake Univ. Obs.
Publikationen der Sternw., 1911.	*Astron. Nach.*, Nr. 3993, 1905.	Imperial University Obs.
Berliner Jahrbuch.	*Berliner Jahrbuch.*	[b] Baron Engelhardt's Obs.
Trans. Royal Dublin Soc., 1889.	*Trans. Royal Irish Acad.*, 1838.	Dunsink Obs., Trinity College.
Letter from Royal Astronomer, 1897.	Letter from Royal Astronomer, 1897.	[c] Lord Crawford's Obs.
Letter from Director, 1913.	Letter from Director, 1913.	University Observatory.
Astron. Nach., Nr. 643, 1848.	Letter from Director, 1913.	Municipal Obs., Bilk.
Monthly Notices, R. A. S., 1907.	Letter from Director, 1913.	Royal Obs. since 1895; Blackford Hill.
Monthly Notices, R. A. S., 1896.	*Edinburgh Observations*, 1858.	[d] Royal Obs. before 1895; Calton Hill.
Letter from Director, 1912.	Letter from Director, 1912.	Elmira College Obs.
Letter from Director, 1893.	Letter from Director, 1893.	Dearborn Obs., North Western Univ.
British *Nautical Almanac*.	British *Nautical Almanac*.	Lowell Observatory.
See footnote (*j*).	See footnote (*k*).	International Lat. Obs.
Les Obs. Astron., Bruxelles, 1907.	*Les Obs. Astron.*, Bruxelles, 1907.	Smith Observatory.
Memoire par J. Pidoux, 1900.	*Astron. Nach.*, Nr. 3993, 1905.	Municipal Observatory.
Letter from Director, 1897.	*Astron. Nach.*, Nr. 3993, 1905.	Hydrographic Institute.
See footnote (*e*).	See footnote (*e*).	Georgetown College Obs.
Astron. Nach., Nr. 2625, 1884.	*Washington Observations*, 1877.	Morrison Observatory.
First Glasgow Catalogue, 1870.	*Monthly Notices, R. A. S.*, 1865.	University Observatory.
Letter from Director, 1913.	Letter from Director, 1913.	Ducal Obs. since 1857.
Letter, Director new Obs., 1913.	Letter, Director new Obs., 1913.	Ducal Obs. before 1857.
Astron. Nach., Nr. 4428, 1910.	*Astron. Nach.*, Nr. 3993, 1905.	Royal University Obs.
Letter from Director, 1912.	Letter from Director, 1912.	McKim Obs., De Pauw Univ.
Greenwich Observations, 1910.	*Greenwich Observations*, 1910.	[f] Royal Observatory.
Letter, Director new Obs., 1913.	*Astron. Nach.*, Nr. 3993, 1905.	[g] Hamburg Observatory before 1909.
Letter from Director, 1913.	Letter from Director, 1913.	[h] Imperial Marine Obs.
Letter from Director, 1894.	Letter from Director, 1894.	Shattuck Obs., Dartmouth College.
Proc. Amer. Ph. Soc., 1883.	*Proc. Amer. Ph. Soc.*, 1883.	Haverford College Obs.
Letter from Director, 1913.	Letter from Director, 1913.	Astron. Institute, Königstuhl Obs.
Publik. des Obs., Königstuhl, 1902.	*Publik. des Obs., Königstuhl*, 1902.	Astrophys. Inst., Königstuhl Obs.
Publik. des Obs., Königstuhl, 1902.	*Publik. des Obs., Königstuhl*, 1902.	[i] Dr. Wolf's Obs. before 1898.
Letter from Director, 1913.	*Astron. Nach.*, Nr. 3993, 1905.	Imperial Univ. Obs.
Astron. Nach., Nr. 2633, 1884.	British *Nautical Almanac*.	Astrophysical Observatory.
Hong Kong Observations, 1897.	Letter from Director, 1897.	Colonial Observatory.
Les Obs. Astron., Bruxelles, 1907.	*Les Obs. Astron.*, 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 1851*, 7½ ft. N., 19 ft. W.
[g] *At Bergedorf since 1909.*
[h] *Transit instrument* before 1908, 0″.5 N., 0s.04 W.
[i] *Instruments transferred to the Astrophysical Institute of the Königstuhl Obs. in 1898.*
[j] *Resultate des Internationalen Breitendienstes*, 1900–1908.
[k] *Resultate des Internationalen Breitendienstes*, Band I, 1903.

No.	Place.	Latitude.	Reduction to Geocentric Latitude.	Altitude (*Meters*).	Log ρ (*Including altitude*).	Longitude from Greenwich.
		° ′ ″	′ ″			h m s
101	Ithaca, N. Y.	+42 26 47.3 *a*	−11 32.6	256 *a*	9.999354	+5 5 55.99 *a*
102	Ithaca, N. Y.	+42 26 51.4	−11 32.6	. . .	9.999337	+5 5 56.47
103	Jamaica, West Indies	+18 24 51 *b*	− 6 55.9	540 *b*	9.999892	+5 11 29.48 *b*
104	Jena, Saxe-Weimar	+50 55 34.9 *c*	−11 21.3	165 *c*	9.999132	−0 46 20.22 *c*
105	Jena, Saxe-Weimar	+50 55 35.8	−11 21.3	155	9.999131	−0 46 20.31
106	Jena, Saxe-Weimar	+50 56 11.0	−11 21.3	174	9.999132	−0 46 20.73
107	Johannesburg, Transvaal	−26 10 54.6 *d*	+ 9 9.8	1804 *d*	9.999840	−1 52 18.0 *d*
108	Kalocsa, Hungary	+46 31 41.7 *b*	−11 34.8	117 *e*	9.999240	−1 15 54.12 *b*
109	Kasan, Russia	+55 50 20.0 *f*	−10 47.3	98 *f*	9.999007	−3 15 15.61 *f*
110	Kasan, Russia	+55 47 23.9 *g*	−10 47.7	79 *g*	9.999007	−3 16 29.00 *g*
111	Kew, England	+51 28 6	−11 18.5	10	9.999108	+0 1 15.1
112	Kief, Russia	+50 27 10.0 *w*	−11 23.5	179 *f*	9.999145	−2 2 0.56 *f*
113	Kiel, Prussia	+54 20 27.6 *f*	−10 59.7	52 *f*	9.999040	−0 40 35.45 *f*
114	Kis-Kartal, Hungary	+47 41 54.8	−11 32.8	. . .	9.999202	−1 18 11.7
115	Königsberg, Prussia	+54 42 50.5 *f*	−10 56.8	24 *f*	9.999029	−1 21 58.97 *f*
116	Kremsmunster, Austria	+48 3 23.1 *f*	−11 32.0	384 *f*	9.999220	−0 56 31.58 *f*
117	La Plata, Arg. Rep.	−34 54 31.8 *h*	+10 52.2	18 *h*	9.999525	+3 51 44.8 *h*
118	Leiden, Netherlands	+52 9 19.8 *f*	−11 14.6	6 *f*	9.999090	−0 17 56.15 *f*
119	Leipzig, Saxony	+51 20 5.9 *i*	−11 19.2	119 *i*	9.999118	−0 49 33.92 *i*
120	Leipzig, Saxony	+51 20 20.1	−11 19.2	. . .	9.999110	−0 49 29.92
121	Liege, Belgium	+50 37 6	−11 22.8	127	9.999137	−0 22 15.44
122	Lisbon (Tapada), Portugal	+38 42 30.5 *j*	−11 18.5	95 *j*	9.999437	+0 36 44.68 *j*
123	Liverpool, England	+53 24 4.8	−11 6.6	61	9.999064	+0 12 17.33
124	Liverpool, England	+53 24 47.8	−11 6.5	. . .	9.999059	+0 12 0.11
125	Lund, Sweden	+55 41 51.6 *i*	−10 48.5	38	9.999006	−0 52 44.97 *i*
126	Lund, Sweden	+55 52 12.0	−10 47.0	. . .	9.999000	−0 52 47.50
127	Lussinpiccolo, Austria	+44 32 11.0	−11 35.5	42	9.999286	−0 57 52.41
128	Lyons, France	+45 41 41.0	−11 35.5	299	9.999274	−0 19 8.52 *k*
129	Madison, Wis.	+43 4 36.8 *f*	−11 33.9	292 *l*	9.999340	+5 57 37.90 *f*
130	Madras, India	+13 4 8.0 *f*	− 5 5.5	7	9.999926	−5 20 59.14
131	Madrid, Spain	+40 24 30.0 *m*	−11 26.4	655 *m*	9.999433	+0 14 45.09 *m*
132	Manila, P. I.	+14 34 41	− 5 38.2	3	9.999908	−8 3 54.2
133	Mare Island, Cal.	+38 5 55.8 *n*	−11 15.0	18 *n*	9.999447	+8 9 5.63 *n*
134	Markree, Ireland	+54 10 31.8	−11 1.0	45	9.999044	+0 33 48.4
135	Marseilles, France	+43 18 19 *f*	−11 34.3	75 *o*	9.999320	−0 21 34.55 *j*
136	Marseilles, France	+43 17 52	−11 34.3	27	9.999317	−0 21 28.1
137	Mauritius (Port Louis)	−20 5 39	+ 7 27.7	54	9.999832	−3 50 12.6
138	Melbourne, Victoria	−37 49 53.2 *p*	+11 13.4	28 *q*	9.999454	−9 39 53.92 *i*
139	Meudon, France	+48 48 18	−11 29.8	162	9.999185	−0 8 55.6
140	Middletown, Conn.	+41 33 16.0	−11 30.4	. . .	9.999359	+4 50 37.18
141	Milan, Italy	+45 27 59.3	−11 35.6	120	9.999268	−0 36 45.88 *s*
142	Minneapolis, Minn.	+44 58 40.0 *r*	−11 35.7	260 *r*	9.999290	+6 12 56.84 *t*
143	Mizusawa, Japan	+39 8 3.6 *x*	−11 20.7	62	9.999424	−9 24 30.75
144	Modena, Italy	+44 38 51.4	−11 35.6	64	9.999285	−0 43 43.40
145	Montreal, Canada	+45 30 20 *s*	−11 35.6	57 *s*	9.999262	+4 54 18.63 *t*
146	Moscow (Presnia), Russia	+55 45 19.5	−10 48.0	150 *f*	9.999012	−2 30 17.03 *t*
147	Mount Hamilton, Cal.	+37 20 25.6 *r*	−11 10.4	1284 *r*	9.999552	+8 6 34.89 *t*
148	Mount Wilson, Cal.	+34 12 59.5 *t*	−10 46.2	1799 *t*	9.999663	+7 52 14.33 *t*
149	Mount Wilson, Cal.	+34 12 55	−10 46.1	1727 *u*	9.999658	+7 52 14.3
150	Munich, Bavaria	+48 8 45.5 *v*	−11 31.7	529 *v*	9.999227	−0 46 26.02 *t*

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, 4
of prime vertical transit
x Zenith telescope.

Authority for—		Description.
Latitude.	Longitude.	
Letter from the Dean, 1913.	Letter from the Dean, 1913.	[a] Fuertes Obs., Cornell Univ.
Letter from the Dean, 1913.	Letter from the Dean, 1913.	[b] Fuertes Obs., Cornell Univ.
Memoirs, R. A. S., 1879.	See footnote ([c]).	Mr. Hall's Obs., Montego Bay.
Letter from Director, 1913.	Letter from Director, 1913.	Univ. Obs., since 1888.
Letter, Director new Obs., 1913.	Letter, Director new Obs., 1913.	Univ. Obs., before 1888.
V. J. S. Astron. Gesell., 1910.	*V. J. S. Astron. Gesell.*, 1910.	The late Dr. Winkler's Obs.
Transvaal Obs. *Circular*, 1910.	Transvaal Obs. *Circular*, 1910.	Union Obs., formerly Transvaal Obs.
Letter from Director, 1913.	Letter from Director, 1913.	Archiepiscopal Haynald Obs.
Letter from Director, 1913.	Publications of the Obs., 1911.	Engelhardt Obs., Univ. of Kasan.
Publications of the Obs., 1911.	Letter from Director, 1913.	University Observatory.
Letter from Director, 1897.	Letter from Director, 1897.	Meteorological Obs., London.
Annales de l' Obs., Vol. IV, 1883.	*Astron. Nach.*, Nr. 3993, 1905.	Imperial Univ. Obs.
Les Obs. Astron., Bruxelles, 1907.	*Astron. Nach.*, Nr. 3993, 1905.	[d] Royal University Obs.
Les Obs. Astron., Bruxelles, 1907.	*Les Obs. Astron.*, Bruxelles, 1907.	Near Aszód, Hungary.
Letter from Director, 1913.	*Astron. Nach.*, Nr. 3993, 1905.	Royal University Obs.
Letter from Director, 1897.	*Astron. Nach.*, Nr. 3993, 1905.	Obs. of the Benedictines.
Letter from Director, 1913.	Letter from Director, 1913.	National Univ. Obs.
Letter from Director, 1913.	*Astron. Nach.*, Nr. 3993, 1905.	University Observatory.
Letter from Director, 1913.	*Astron. Nach.*, Nr. 3993, 1905.	University Obs., since 1861.
Letter, Director new Obs., 1913.	Letter, Director new Obs., 1913.	University Obs., before 1861.
Les Obs. Astron., Bruxelles, 1907.	*Les Obs. Astron.*, Bruxelles, 1907.	University Obs., Cointe.
Letter from Director, 1913.	*Astron. Nach.*, Nr. 3202, 1893.	Obs. of Lisbon.
Monthly Notices, R. A. S., 1894.	*Monthly Notices, R. A. S.*, 1894.	Bidston, Birkenhead, since 1867.
British *Nautical Almanac*, 1872.	British *Nautical Almanac*, 1872.	Liverpool Obs., before 1867.
Letter from Director, 1913.	*Astron. Nach.*, Nr. 3993, 1905.	Royal Univ. Obs., since 1867.
Letter, Director new Obs., 1913.	Letter, Director new Obs., 1913.	Royal Univ. Obs., before 1867.
Letter from Director, 1897.	Letter from Director, 1897.	Manora Observatory.
Letter from Director, 1897.	*Astron. Nach.*, Nr. 3202, 1893.	Obs. of the Univ., St. Genis Laval.
Publications of the Obs., 1892.	Letter from Director, 1912.	Washburn Obs., Univ. of Wis.
Great Trig. Survey of India, 1906.	*Great Trig Survey of India*, 1901.	Obs. founded by East India Co.
Annuario del Obs., 1912.	*Astron. Nach.*, Nr. 3993, 1905.	Astron. and Meteorolog. Obs.
Les Obs. Astron., Bruxelles, 1907.	*Les Obs. Astron.*, Bruxelles, 1907.	Meteorological Observatory.
Letter from Director, 1913.	*Lick Obs. Bulletin*, 1908.	Chronom. and Time Sta., Navy Yd.
Astron. Nach., Nr. 758, 1851.	British *Nautical Almanac*, 1901.	Col. Cooper's Observatory.
Letter from Director, 1913.	*Astron. Nach.*, Nr. 3993, 1905.	See footnote ([e]).
Letter, Director new Obs., 1913.	Letter, Director new Obs., 1913.	See footnote ([f]).
Mag. and Meteor. *Results*, 1908.	Mag. and Meteor. *Results*, 1908.	Royal Alfred Obs.
Astron. Results, 1881–84.	[i] *Astron. Results*, 1881–84.	[g] Government Observatory.
Les Obs. Astron., Bruxelles, 1907.	*Les Obs. Astron.*, Bruxelles, 1907.	Seine-et-Oise, near Paris.
Letter from Director, 1894.	Letter from Director, 1894.	Wesleyan University Obs.
Pubbl. del R. Osserv., 1914.	*Astron. Nach.*, Nr. 3993, 1905.	Royal Observatory, Brera.
Letter from Director, 1913.	Letter from Director, 1913.	Obs. Univ. of Minn.
See footnote ([h]).	*Les Obs. Astron.*, Bruxelles, 1907.	International Lat. Obs.
Letter from Director, 1913.	Letter from Director, 1913.	Royal Univ. Geophysical Obs.
Letter from Director, 1912.	*U. S. C. and G. S. Report*, 1897.	McGill University Obs.
Les Obs. Astron., Bruxelles, 1907.	*Astron. Nach.*, Nr. 3993, 1905.	Obs. of the Imperial Univ.
Publications of the Obs., 1900.	*U. S. C. and G. S. Report*, 1897.	Lick Obs., Univ. of Cal.
Astrophysical Journal, 1906.	*Astrophysical Journal*, 1906.	Solar Obs., Carnegie Inst.
Letter from C. G. Abbot, 1912.	Letter from C. G. Abbot, 1912.	Branch of Smithsn. Astrophys. Obs.
Letter from Director, 1897.	*Astron. Nach.*, 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., 0s.12 E.
[e] National Obs., Univ. of Aix-Marseilles, 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 Geocentric Latitude.	Altitude (*Meters*).	Log ρ (*Including altitude*).	Longitude from Greenwich.
		° ′ ″	′ ″			h m s
151	Naples, Italy	+40 51 46.3	−11 28.1	164	9.999388	−0 57 1.70
152	Nashville, Tenn	+36 8 54.4 *b*	−11 2.0	172 *c*	9.999505	+5 47 12.2
153	Neuchâtel, Switzerland	+46 59 50.6	−11 34.1	488	9.999254	−0 27 49.90
154	New Brunswick, N. J.	+40 30 1.4 *b*	−11 26.7	21 *b*	9.999387	+4 57 47.45
155	New Haven, Conn.	+41 19 22.3	−11 29.6	40	9.999368	+4 51 40.58
156	New Haven, Conn.	+41 18 36.5	−11 29.6	. . .	9.999365	+4 51 42.16
157	New York, N. Y.	+40 48 34.6	−11 27.9	25	9.999380	+4 55 50
158	New York, N. Y.	+40 45 23.1	−11 27.7	. . .	9.999379	+4 55 53.64
159	Nice, France	+43 43 16.9 *e*	−11 34.9	378	9.999330	−0 29 12.15
160	Nikolaieff, Russia	+46 58 22.1	−11 34.2	55	9.999225	−2 7 53.78
161	Northampton, Mass.	+42 19 1.9 *b*	−11 32.4	70 *b*	9.999345	+4 50 33.10
162	Northfield, Minn.	+44 27 41.6 *f*	−11 35.5	290 *f*	9.999305	+6 12 35.92
163	Oakland, Cal.	+37 48 5 *d*	−11 13.2	11 *d*	9.999454	+8 9 6.55
164	Odessa, Russia	+46 28 37.5	−11 34.9	. . .	9.999234	−2 3 2.18
165	Odessa, Russia	+46 28 36.7 *d*	−11 34.9	55 *d*	9.999237	−2 3 2.04
166	O-Gyalla, Hungary	+47 52 27.3	−11 32.4	113	9.999206	−1 12 45.49
167	Omaha, Nebr.	+41 16 5.6 *b*	−11 29.5	344 *b*	9.999390	+6 23 46.96
168	Orono, Me.	+44 54 0	−11 35.6	38	9.999277	+4 34 40.3
169	Ottawa, Canada	+45 23 39.1 *d*	−11 35.6	85 *g*	9.999267	+5 2 51.98
170	Oxford, Miss.	+34 22 12.6	−10 47.5	. . .	9.999536	+5 58 7.18
171	Oxford, England	+51 45 35.6 *d*	−11 16.9	65 *h*	9.999104	+0 5 2.6
172	Oxford, England	+51 45 34.2	−11 16.9	64	9.999104	+0 5 0.40
173	Padua, Italy	+45 24 1.0 *i*	−11 35.6	31 *j*	9.999263	−0 47 29.13
174	Palermo, Sicily	+38 6 44.0 *k*	−11 15.1	76 *d*	9.999451	−0 53 25.87
175	Paris, France	+48 50 11.2 *l*	−11 29.8	67 *m*	9.999178	−0 9 20.93
176	Perth, West Australia	−31 57 8.9 *d*	+10 23.8	60	9.999597	−7 43 21.51
177	Philadelphia, Pa.	+39 58 2.1 *o*	−11 24.6	74 *o*	9.999404	+5 1 6.81
178	Pola, Austria	+44 51 48.6 *d*	−11 35.6	32 *d*	9.999277	−0 55 23.07
179	Potsdam, Prussia	+52 22 56.0 *p*	−11 13.3	97 *p*	9.999091	−0 52 15.86
180	Poughkeepsie N Y.	+41 41 18	−11 30.8	61	9.999360	+4 55 33.6
181	Prague, Bohemia	+50 5 16.0 *o*	−11 25.1	197 *o*	9.999155	−0 57 40.28
182	Princeton, N. J.	+40 20 55.8	−11 26.1	75	9.999395	+4 58 39.44
183	Princeton, N. J.	+40 20 57.8 *d*	−11 26.1	65 *d*	9.999394	+4 58 37.61
184	Providence, R. I.	+41 50 21	−11 31.2	64	9.999356	+4 45 35.95
185	Providence, R. I.	+41 49 46.4	−11 31.2	. . .	9.999352	+4 45 37.64
186	Pulkowa, Russia	+59 46 18.7 *a*	−10 6.2	75 *q*	9.998914	−2 1 18.57
187	Quebec, Canada	+46 47 59.2	−11 34.4	90	9.999231	+4 44 52.71
188	Quito, Ecuador	− 0 14 0	+ 0 5.6	2908	0.000198	+5 14 6.66
189	Riga, Russia	+56 57 9.3	−10 36.9	. . .	9.998974	−1 36 28.10
190	Rio de Janeiro, Brazil	−22 54 23.8 *o*	+ 8 17.7	62 *o*	9.999784	+2 52 41.4
191	Rome, Italy	+41 53 53.6 *d*	−11 31.3	51 *j*	9.999354	−0 49 55.12
192	Rome, Italy	+41 53 33.6 *d*	−11 31.3	65 *q*	9.999355	−0 49 56.34
193	Rome, Italy	+41 54 12.4 *d*	−11 31.4	100 *d*	9.999357	−0 49 48.02
194	Rome, Italy	+41 54 16.7	−11 31.4	75 *j*	9.999355	−0 49 49.28
195	San Fernando, Spain	+36 27 42.0 *s*	−11 4.3	30 *s*	9.999488	+0 24 49.32
196	San Fernando, Spain	+36 31 7	−11 4.7	. . .	9.999485	+0 25 10.82
197	San Francisco, Cal.	+37 47 27.9	−11 13.2	. . .	9.999454	+8 9 42.86
198	San Luis, Arg. Rep.	−33 17 45.7	+10 37.6	800	9.999616	+4 25 22
199	Santiago, Chile	−33 26 42 *d*	+10 39.0	520 *d*	9.999594	+4 42 46.0 *d*
200	Santiago, Chile	−33 26 25	+10 38.9	619	9.999600	+4 42 36.5
201	Santiago, Chile	−33 33 46 *b*	+10 40.1	580 *b*	9.999595	+4 42 46 *b*

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.
t West transit pier.

Authority for— Latitude.	Longitude.	Description.
Letter from Director, 1897.	*Astron. Nach.*, Nr. 3202, 1893.	Royal Obs., Capo di Monte.
Letter from the Dean, 1913.	Letter from Director, 1893.	Obs. of Vanderbilt Univ.
Swiss Triangulation, 1890.	*Astron. Nach.*, Nr. 3202, 1893.	Cantonal Observatory.
Letter from Director, 1913.	Letter from Director, 1913.	SchanckObs.,RutgersCollege.
Letter from Director, 1893.	See footnote (*h*).	Yale Univ. Obs., since 1882.
Letter, Director new Obs., 1893.	Letter, Director new Obs., 1893.	Yale Univ. Obs., before 1882.
Contributions from the Obs., 1906.	*Contributions from the Obs.*, 1906.	Columbia Univ. Obs., since 1897.
Letter from Director, 1879.	British *Nautical Almanac*.	Columbia Univ. Obs., before 1897.
Annales de l'Obs., Tome II, 1887.	*Astron. Nach.*, Nr. 3993, 1905.	Mt. Gros, near Nice.
Les Obs. Astron., Bruxelles, 1907.	*Astron. Nach.*, Nr. 3202, 1893.	Naval Observatory.
Letter from Director, 1913.	Harvard *Annals*, 1893.	Smith College Obs.
Letter from Director, 1912.	*Publications* of Obs., 1901.	[a] Goodsell Obs., Carleton College.
Letter from Director, 1912.	Letter from Director, 1912.	Chabot Observatory.
Pulkowa *Mitteilungen*, No. 56, 1913.	*Astron. Nach.*, Nr. 3993, 1905.	Branch of Pulkowa Obs.
Letter from Director, 1897.	*Astron. Nach.*, Nr. 3993, 1905.	University Observatory.
Letter from Director, 1897.	Letter from Director, 1897.	Royal Astrophysical Obs.
Letter from Director, 1912.	Letter from Director, 1912.	Creighton University Obs.
Letter from Director, 1912.	Letter from Director, 1912.	Obs. Univ. of Maine.
Letter from Chief Astronomer, 1913.	Letter from Chief Astronomer, 1913.	Dominion Astronomical Obs.
Smithsonian *Report*, 1880.	Smithsonian *Report*, 1880.	Obs. Univ. of Mississippi.
Radcliffe Catalogue of Stars, 1900.	*Radcliffe Observations*, 1842.	Radcliffe Observatory.
Oxford Astron. Observations, 1878.	*Oxford Astron. Observations*, 1878.	University Observatory.
Letter from Director, 1913.	*Astron. Nach.*, Nr. 3993, 1905.	Royal University Obs.
Letter from Director, 1913.	*Astron. Nach.*, Nr. 3202, 1893.	Royal Observatory.
Letter from Director, 1913.	*Astron. Nach.*, Nr. 3993, 1905.	Observatory of Paris.
Meridian Observations, Vol. 2, 1908.	[c] *Meridian Observations*, Vol. 2, 1908.	Government Observatory.
Letter from Director, 1913.	Letter from Director, 1913.	Flower Obs., Univ. of Pa.
Letter from Director, 1913.	Letter from Director, 1913.	See footnote (*b*).
Veröff. K. Preuss. Geod. Inst., 1905.	*Astron. Nach.*, Nr. 3993, 1905.	Royal Astrophysical Obs.
Smithsonian *Report*, 1880.	Smithsonian *Report*, 1880.	Vassar College Obs.
Prague *Observations*, 1907.	*Astron. Nach.*, Nr. 3993, 1905.	mperial and Royal Obs.
Letter from Director, 1913.	Letter from Director, 19 3.	Halsted Obs. Princeton Univ.
Letter from Director, 1913.	*Washington Observations*, 1878.	Obs. of Instruction, Princeton Univ.
Letter from Director, 1893.	Letter from Director, 1893.	Ladd Obs., Brown Univ.
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See footnote (*c*).	See footnote (*c*).	National Observatory.
Memorie del R. Osserv., 1904.	Letter from Director, 1913.	Royal Obs. at Roman College.
Letter from Director, 1913.	*Astron. Nach.*, Nr. 3993, 1905.	Royal Univ. Obs. at Capitol.
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Pubbl. della Specola Vaticana, 1905.	*Astron. Nach.*, Nr. 3993, 1905.	[d] Vatican Obs., before 1906–7.
Annales del Obs., 1892.	Letter from Director, 1913.	Naval Obs., since 1797.
Letter, Director new Obs., 1913.	Letter, Director new Obs., 1913.	[e] Naval Obs., before 1797.
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Letter from Director, 1911.	Letter from Director, 1911.	Southern Obs. of Carnegie Inst.
Letter from Director, 1913.	Letter from Director, 1913.	[f] Nationa Obs., since 862.
Letter, Director new Obs., 1913.	Letter, Director new Obs., 1913.	[g] National Obs., before 1862.
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 Cadiz.*
[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 Geocentric Latitude.	Altitude (*Meters*).	Log ρ (*Including altitude*).	Longitude from Greenwich.
		° ′ ″	′ ″			h m s
202	South Bethlehem, Pa.	+40 36 23.2 *a*	−11 27.2	110	9.999391	+ 5 1 31.96
203	South Hadley, Mass.	+42 15 18.2 *b*	−11 32.2	76 *b*	9.999346	+ 4 50 20.40
204	St. Louis, Mo.	+38 38 3.0	−11 18.1	. . .	9.999432	+ 6 0 49.26
205	St. Petersburg, Russia	+59 56 32.0	−10 4.2	4	9.998906	− 2 1 11.4
206	Stockholm, Sweden	+59 20 32.7 *c*	−10 11.3	44 *c*	9.998922	− 1 12 13.97
207	Stonyhurst, England	+53 50 40	−11 3.4	117 *c*	9.999056	+ 0 9 52.68
208	Strassburg, Alsace	+48 35 0.3 *c*	−11 30.5	144 *c*	9.999190	− 0 31 4.52
209	Swarthmore, Pa.	+39 54 23.3	−11 24.3	. . .	9.999401	+ 5 1 24.89
210	Sydney, N. S. W.	−33 51 41.1	+10 42.9	44	9.999552	−10 4 49.31
211	Syracuse, N. Y.	+43 2 13.1	−11 33.9	160	9.999332	+ 5 4 33.36
212	Syracuse, N. Y.	+43 0 48.8 *h*	−11 33.8	137 *u*	9.999332	+ 5 4 34.31
213	Tacubaya, Mexico	+19 24 17.9 *c*	− 7 14.8	2285 *c*	9.999995	+ 6 36 46.67
214	Tashkent, Turkestan	+41 19 31.3	−11 29.6	457	9.999396	− 4 37 10.80
215	Taunton, Mass.	+41 54 0	−11 31.3	8	9.999351	+ 4 44 20
216	Teramo, Italy	+42 39 27 *d*	−11 33.1	398	9.999358	− 0 54 56
217	Tokyo, Japan	+35 39 17.0 *c*	−10 58.3	25	9.999507	− 9 18 58.22
218	Toronto, Canada	+43 39 46.0 *f*	−11 34.8	110 *g*	9.999313	+ 5 17 34.70
219	Toronto, Canada	+43 40 0.8 *g*	−11 34.8	116 *g*	9.999313	+ 5 17 35.60
220	Toulouse, France	+43 36 44.0	−11 34.7	194	9.999320	− 0 5 51.23
221	Triest, Austria	+45 38 35.5 *h*	−11 35.5	68 *i*	9.999260	− 0 55 5.23
222	Triest, Austria	+45 38 45.4 *j*	−11 35.5	26 *i*	9.999257	− 0 55 3.0
223	Tschardjui, Turkestan	+39 8 11.0 *d*	−11 20.7	188 *d*	9.999433	− 4 14 17.2
224	Tschardjui, Turkestan	+39 8 10.7 *d*	−11 20.7	167	9.999431	− 4 13 57.3
225	Tulse Hill, England	+51 26 47	−11 18.6	48	9.999111	+ 0 0 27.7
226	Turin, Italy	+45 2 16.2 *k*	−11 35.7	618 *k*	9.999313	− 0 31 3
227	Turin, Italy	+45 4 8.3 *c*	−11 35.7	276 *i*	9.999288	− 0 30 47.15
228	Tuscaloosa, Ala.	+33 12 36.8 *c*	−10 36.7	69	9.999568	+ 5 50 11.74
229	Ukiah, Cal.	+39 8 12.1 *d*	−11 20.7	220 *d*	9.999435	+ 8 12 50.3
230	Upsala, Sweden	+59 51 29.4 *b*	−10 5.2	21 *b*	9.998909	− 1 10 30.12
231	Urbana, Ill.	+40 6 20.2 *l*	−11 25.2	236 *l*	9.999412	+ 5 52 53.90
232	Utrecht, Netherlands	+52 5 9.7 *m*	−11 15.0	12 *m*	9.999093	− 0 20 31.0
233	Utrecht, Netherlands	+52 5 13	−11 15.0	23	9.999093	− 0 20 28.9
234	Venice, Italy	+45 26 10.5 *c*	−11 35.6	15 *c*	9.999261	− 0 49 22.12
235	Vienna, Austria	+48 13 55.1 *n*	−11 31.5	240 *i*	9.999205	− 1 5 21.35
236	Vienna, Austria	+48 12 35.5	−11 31.6	186 *i*	9.999202	− 1 5 31.61
237	Vienna, Austria	+48 12 53.8	−11 31.6	214	9.999204	− 1 5 25.17
238	Vienna, Austria	+48 12 46.7 *c*	−11 31.6	285	9.999209	− 1 5 10.96
239	Warsaw, Russia	+52 13 4.6 *c*	−11 14.3	121 *c*	9.999097	− 1 24 7.25
240	Washington, D. C.	+38 55 14.0 *o*	−11 19.6	82 *p*	9.999431	+ 5 8 15.78
241	Washington, D. C.	+38 53 38.7 *q*	−11 19.4	31 *r*	9.999428	+ 5 8 12.15
242	Washington, D. C.	+38 53 17.3 *s*	−11 19.4	10 *s*	9.999427	+ 5 8 6.24
243	Washington, D. C.	+38 56 14.8 *a*	−11 19.7	. . .	9.999425	+ 5 8 0.0
244	Wellesley, Mass.	+42 17 34.8	−11 32.3	61	9.999344	+ 4 45 12.7
245	Wellington, N. Z.	−41 17 3.8 *b*	+11 29.5	127 *b*	9.999375	−11 39 4.27
246	West Point, N. Y.	+41 23 22.1	−11 29.9	170	9.999375	+ 4 55 50.55
247	Wilhelmshaven, Germany	+53 31 52.1 *c*	−11 5.7	9 *c*	9.999057	− 0 32 35.06
248	Williams Bay, Wis.	+42 34 12.6 *t*	−11 33.0	320 *t*	9.999355	+ 5 54 13.24
249	Williamstown, Mass.	+42 42 30	−11 33.2	213	9.999344	+ 4 52 50
250	Winchester, Mass.	+42 27 11	−11 32.7	30	9.999338	+ 4 44 32.4
251	Windsor, N. S. W.	−33 36 30.8 *b*	+10 40.6	16 *r*	9.999556	−10 3 19.9
252	Zô-Sè, China	+31 5 48.0 *c*	−10 14.4	100 *c*	9.999619	− 8 4 44.82
253	Zurich, Switzerland	+47 22 38.3 *c*	−11 33.5	469 *c*	9.999243	− 0 34 12.26

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 bulk
q Small dome.
r Barometer.
s Riderostat pier.
t 40-inch equatorial.
u Intersection of equator

Authority for— Latitude.	Longitude.	Description.
r from Director, 1913.	*Washington Observations*, 1875.	Sayre Obs., Lehigh Univ.
. *Jour. of Sci.*, 1883.	Letter from Director, 1913.	Williston Obs., Mt. Holyoke Coll.
r from Director, 1897.	*U. S. C. and G. S. Report*, 1897.	[a] Washington University Obs.
n. Nach., Nr. 2582, 1884.	*Astron. Nach.*, Nr. 2582, 1884.	Imperial University Obs.
r from Director, 1914.	*Astron. Nach.*, Nr. 3993, 1905.	Obs. of Acad. of Sci.
r from Director, 1913.	*Monthly Notices, R. A. S.*, 1851.	Stonyhurst College Obs.
len der Sternw., 1896.	*Astron. Nach.*, Nr. 3993, 1905.	Imperial Univ. Obs.
r from Director, 1912.	Letter from Director, 1912.	Sproul Obs., Swarthmore College.
n. Results, 1879–81.	See footnote (*b*).	Government Observatory.
r from Director, 1891.	Letter from Director, 1891.	Syracuse Univ. Obs.
r from Director, 1914.	Letter from Director, 1914.	Roe Observatory.
in del Obs., 1914.	*Annuario del Obs.*, 1902.	National Observatory.
r from Director, 1897.	Letter from Director, 1897.	Tashkent Observatory.
s. Astron., Bruxelles, 1907.	*Les Obs. Astron.*, Bruxelles, 1907.	Mr. Metcalf's Obs., before 1911.
l. dell'Osserv., 1900.	Letter from Director, 1913.	Collurania Observatory.
ıles de l'Obs., 1894.	*Annales de l'Obs.*, 1894.	University Observatory.
r from Director, 1913.	Letter from Director, 1913.	University Observatory.
r from Director, 1912.	Letter from Director, 1912.	Meteorological Observatory.
ıles de l'Obs., 1912.	British *Nautical Almanac*.	University Observatory.
r from Director, 1913.	Letter from Director, 1913.	[c] Imperial and Royal Maritime Obs.
, Director new Obs., 1913.	Letter, Director new Obs., 1913.	[d] Imperial and Royal MaritimeObs.
m. Nach., Nr. 4588, 1912.	Letter from Director, 1913.	International Lat. Obs., since 1909.
ootnote (*e*).	See footnote (*f*).	International Lat. Obs., before 1909.
sh *Nautical Almanac*.	British *Nautical Almanac*.	Obs. of Sir W. Huggins, London.
r from Director, 1913.	Letter from Director, 1913.	[f] Royal Obs. of the Univ., since 1913.
r from Director, 1913.	*Astron. Nach.*, Nr. 3993, 1905.	[g] Royal Obs. of the Univ., before 1913.
r from Director, 1897.	Letter from Director, 1897.	Obs. Univ. of Ala.
footnote (*e*).	Letter from Director, 1912.	International Lat. Obs.
r from Director, 1913.	*Astron. Nach.*, Nr. 3993, 1905.	University Observatory.
r from Director, 1913.	Letter from Director, 1913.	Obs., Univ. of Ill.
r from Director, 1913.	Letter from Director, 1913.	University Obs., since 1855.
r, Director new Obs., 1913.	Letter, Director new Obs., 1913.	University Obs., before 1855.
r from Director, 1913.	Letter from Director, 1913.	Obs. of the Nautical Institute.
footnote (*h*).	*Astron. Nach.*, Nr. 3993, 1905.	[i] Imperial and Royal Univ. Obs.
r, Director new Obs., 1913.	Letter, Director new Obs., 1913.	[j] Imperial and Royal Univ. Obs.
iner Jahrbuch.	*Berliner Jahrbuch*.	Oppolzer Obs., Josephstadt.
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on. Nach., Nr. 4666, 1913.	*Astron. Nach.*, Nr. 3993, 1905.	Imperial University Obs.
Naval Obs. Publications, 1900.	*U. S. C. and G. S. Report*, 1897.	U. S. N. Obs., Georgetown Heights.
footnote (*m*).	*U. S. C. and G. S. Report*, 1897.	U. S. Naval Obs., 1842–1893.
er from Director, 1912.	Letter from Director, 1912.	Smithsonian Astrophysical Obs.
onomical Journal, 1897.	*Astronomical Journal*, 1897.	Catholic Univ. Obs., Brookland.
er from Director, 1912.	*Les Obs. Astron.*, Bruxelles, 1907.	Whitin Obs., Wellesley College.
Zealand Gazette, May 7, 1914.	*New Zealand Gazette*, May 7, 1914.	Hector Observatory.
er from Director, 1891.	Letter from Director, 1891.	[k] U. S. Military Academy.
er from Director, 1913.	*Astron. Nach.*, Nr. 3993, 1905.	Imperial Naval Obs.
ophysical Journal, 1901.	*Astrophysical Journal*, 1901.	Yerkes Obs., Univ. of Chicago.
er from Director, 1893.	Letter from Director, 1893.	Field Memorial Obs., Williams Coll.
er from Director, 1913.	Letter from Director, 1913.	Mr. Metcalf's Obs., since 1911.
thly Notices, R.A.S., 1884.	[n] *Monthly Notices, R.A. S.*, 1888.	Mr. John Tebbutt's Obs.
iales de l'Obs., 1907.	*Annales de l'Obs.*, 1907.	Obs. of the Jesuits near Shanghai.
er from Director, 1913.	*Astron. Nach.*, Nr. 3202, 1893.	Obs. of Swiss Polytechnic School.

ratory 0h.125 E.
a Government Astronomer at Adelaide, 1913.

Internationalen Breitendienstes, 1900–1908.
rhese.
Sadama.
ten des K. K. Gradmessungs-Bureau, 1896.

[g] Since 1879.
[j] Before 1879.
[k] Old observatory 9′ N., 1s.2 E.
[l] *Resultate des Internationalen Breitendienstes*, Band I, 1903.
[m] *Washington Observations* for 1892, Appendix I, pp. XXI and XXII.
[n] And the new value of the longitude of Sydney.

THE COMPUTATION OF LUNAR DISTANCES.

Tables of lunar distances are no longer given in the Ephemeris, in a ance with the decision of the Navy Department that they are now o practical use to navigators. However, in case it is desired to use this m the angular distance between the Moon and any heavenly body may l culated by solving the spherical triangle of which the known parts are th distances of the Moon and the other body and the difference of thei ascensions, or, in other words, the angle at the pole between their hour- Then, the Greenwich mean time of the observation being approximately k and the lunar distances for the star or other body calculated for the eve before and after, the required lunar distance may be interpolated a longitude derived by the methods given in books on navigation.

EXAMPLE 1.

Find the lunar distance of Aldebaran, March 5, 1917, at 10 P. M., Greenwich Mean T

Let α and δ = Right Ascension and Declination of the star
" α' and δ' = " " " " " " Moon
" D = Lunar Distance
Also let tan M = tan δ' sec $(\alpha-\alpha')$
Then cos D = sin δ' cos $(M-\delta)$ cosec M

α = $4^h\ 31^m\ 11^s.0$	M = 33° 53′ 48″
α' = $8^h\ 55^m\ 24^s.6$	δ = +16° 20′ 41″
$\alpha-\alpha'$ = $19^h\ 35^m\ 46^s.4$	$M-\delta$ = 17° 33′ 7″
$\alpha-\alpha'$ = 293° 56′ 36″	sin δ' = 9.420069
δ' = + 15° 15′ 8″	cos $(M-\delta)$ = 9.979295
tan δ' = 9.435642	cosec M = 0.253602
sec $(\alpha-\alpha')$ = 0.391653	cos D = 9.652966
tan M = 9.827295	D = 63° 16′ 22″

EXAMPLE 2.

Find the lunar distance of Jupiter March 26, 1917, at noon, Greenwich Mean Time. 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 $\frac{1}{2}(\delta+\delta')$ cosec $\frac{1}{2}(\delta-\delta')$
Then sin $\frac{1}{2}$ D = sin $\frac{1}{2}(\alpha-\alpha')$ cos $\frac{1}{2}(\delta+\delta')$ cosec N
Sin N and sin $\frac{1}{2}(\alpha-\alpha')$ have the same algebraic sign.

α = $2^h\ 23^m\ 57^s.5$	tan $\frac{1}{2}(\alpha-\alpha')$ = 8.920918 n
α' = $3^h\ 2^m\ 4^s.6$	cos $\frac{1}{2}(\delta+\delta')$ = 9.979520
$\alpha-\alpha'$ = $23^h\ 21^m\ 52^s.9$	cosec $\frac{1}{2}(\delta-\delta')$ = 1.142053 n
$\alpha-\alpha'$ = 350° 28′ 14″	tan N = 0.042491
δ = + 13° 19′ 23″	N = 47° 47′ 54″
δ' = + 21° 35′ 33″	
$\delta+\delta'$ = + 34° 54′ 56″	sin $\frac{1}{2}(\alpha-\alpha')$ = 8.919414
$\delta-\delta'$ = − 8° 16′ 10″	cos $\frac{1}{2}(\delta+\delta')$ = 9.979520
	cosec N = 0.130308
$\frac{1}{2}(\alpha-\alpha')$ = 175° 14′ 7″	sin $\frac{1}{2}$ D = 9.029242
$\frac{1}{2}(\delta+\delta')$ = + 17° 27′ 28″	$\frac{1}{2}$ D = 6° 8′ 25″
$\frac{1}{2}(\delta-\delta')$ = − 4° 8′ 5″	D = 12° 16′ 50″

FINDING THE LATITUDE BY AN OBSERVED ALTITUDE OF POLARIS, 1917.

Reduce the observed altitude of Polaris to the true altitude.
Reduce the recorded time of observation to the local sidereal time.
Take out the apparent right ascension and declination of Polaris for the time of observation.
Subtract the apparent right ascension from the local sidereal time of observation and the **inder is** the hour-angle of Polaris.
With this hour-angle as the vertical argument, and the apparent declination of Polaris as the **ontal argument**, take out the correction from Table I and add it to or subtract it from the **altitude**, according to its sign.
For other altitudes than 45°, corrections taken from the supplementary table at the bottom **able I (Table Ia)** may be applied when necessary for the degree of accuracy required.
Example.—1917, August 5, at $10^h\ 40^m\ 30^s$ P. M. local mean solar time, in longitude 59° west **reenwich**, suppose the true altitude of Polaris to be 33° 20′ 0″, required the latitude of the **e.**

	h	m	s
Local astronomical mean time	10	40	30
Reduction from Table III for $10^h\ 40^m\ 30^s$		+ 1	45
Greenwich sidereal time of mean noon, August 5, page 10	8	53	52
Reduction from Table III, for longitude ($-3^h\ 56^m$ west, or plus)		+ 0	39
Sum (having regard to signs) is equal to local sidereal time	19	36	46
R. A. of Polaris (page 281) for time of observation	1	30	56
Remainder is equal to hour-angle of Polaris	18	5	50
Decl. of Polaris (page 281) for time of observation, 88° 51′ 43″			
	°	′	″
True altitude	+33	20	0
Correction from Table I		−1	4
Correction from Table Ia			−14
Latitude of the place	+33	18	42

Observations of Polaris for latitude should be made when practicable near the times of upper **r lower** culminations (hour-angle 0^h or 12^h). However, at sea, if made near elongation (hour-**gle** 6^h or 18^h), the hour-angle, and hence the local time, should be known within one minute.

Decl. / H. A.	88° 51′ 40″		88° 51′ 50″		88° 52′ 0″		88° 52′ 10″		88° 52′ 20″		88° 52′ 30″		Decl. / H. A.
h m	′ ″		′ ″		′ ″		′ ″		′ ″		′ ″		h m
0 0	−68 20	0	−68 10	0	−68 0	0	−67 50	0	−67 40	0	−67 30	0	24 0
3	68 20	1	68 10	1	68 0	1	67 50	1	67 40	1	67 30	1	23 57
6	68 19	2	68 9	2	67 59	2	67 49	2	67 39	2	67 29	2	54
9	68 17	3	68 7	3	67 57	3	67 47	3	67 37	3	67 27	3	51
12	68 14	3	68 4	3	67 54	3	67 44	3	67 34	3	67 24	3	48
0 15	−68 11	4	−68 1	4	−67 51	4	−67 41	4	−67 31	4	−67 21	4	23 45
18	68 7	5	67 57	5	67 47	4	67 37	4	67 27	4	67 17	4	42
21	68 2	5	67 52	5	67 43	4	67 33	4	67 23	4	67 13	4	39
24	67 57	6	67 47	6	67 37	6	67 27	6	67 17	6	67 7	6	36
27	67 51	7	67 41	7	67 31	7	67 21	7	67 11	7	67 1	6	33
0 30	−67 44	7	−67 34	7	−67 24	7	−67 14	7	−67 4	7	−66 55	8	23 30
33	67 37	8	67 27	8	67 17	8	67 7	8	66 57	8	66 47	8	27
36	67 29	9	67 19	9	67 9	9	66 59	9	66 49	9	66 39	9	24
39	67 20	10	67 10	10	67 0	10	66 50	9	66 40	9	66 30	9	21
42	67 10	10	67 0	10	66 50	10	66 41	11	66 31	11	66 21	10	18
0 45	−67 0	11	−66 50	11	−66 40	11	−66 30	11	−66 20	11	−66 11	11	23 15
48	66 49	12	66 39	12	66 29	11	66 19	11	66 9	11	66 0	12	12
51	66 37	13	66 27	12	66 17	12	66 8	13	65 58	12	65 48	12	9
54	66 24	13	66 15	13	66 5	13	65 55	13	65 46	13	65 36	13	6
0 57	66 11	13	66 2	14	65 52	13	65 42	13	65 33	14	65 23	14	3
1 0	−65 58	15	−65 48	14	−65 38	14	−65 29	15	−65 19	14	−65 9	14	23 0
3	65 43	15	65 34	16	65 24	15	65 14	15	65 5	15	64 55	15	22 57
6	65 28	16	65 18	16	65 9	16	64 59	16	64 50	16	64 40	16	54
9	65 12	16	65 2	16	64 53	16	64 43	16	64 34	16	64 24	16	51
1 12	*−64 56*	16	*−64 46*	16	−64 36	17	−64 27	16	−64 18	16	−64 8	16	22 48

FOR FINDING THE LATITUDE BY AN OBSERVED ALTITUDE OF POLAI

H. A. \ Decl.	88° 51′ 40″		88° 51′ 50″		88° 52′ 0″		88° 52′ 10″		88° 52′ 20″		88° 52′ 30″	
h m	′ ″		′ ″		′ ″		′ ″		′ ″		′ ″	
1 12	−64 56	18	−64 46	17	−64 36	17	−64 27	17	−64 18	18	−64 8	17
15	64 38	18	64 29	18	64 19	17	64 10	18	64 0	17	63 51	18
18	64 20	18	64 11	19	64 2	19	63 52	18	63 43	19	63 33	18
21	64 2	20	63 52	19	63 43	19	63 34	19	63 24	19	63 15	19
24	63 42	20	63 33	20	63 24	20	63 15	20	63 5	19	62 56	20
1 27	−63 22	20	−63 13	20	−63 4	20	−62 55	21	−62 46	21	−62 36	20
30	63 2	21	62 53	21	62 44	21	62 34	21	62 25	21	62 16	21
33	62 41	22	62 32	22	62 23	22	62 13	21	62 4	22	61 55	22
36	62 19	23	62 10	23	62 1	23	61 52	23	61 42	22	61 33	22
39	61 56	23	61 47	23	61 38	23	61 29	23	61 20	23	61 11	23
1 42	−61 33	24	−61 24	24	−61 15	24	−61 6	24	−60 57	23	−60 48	23
45	61 9	24	61 0	25	60 51	24	60 42	24	60 34	25	60 25	24
48	60 45	25	60 35	25	60 27	25	60 18	25	60 9	25	60 1	25
51	60 20	26	60 10	25	60 2	25	59 53	25	59 44	25	59 36	26
54	59 54	26	59 45	26	59 37	27	59 28	26	59 19	26	59 10	26
1 57	−59 28	27	−59 19	27	−59 10	27	−59 2	27	−58 53	27	−58 44	26
2 0	59 1	28	58 52	28	58 43	27	58 35	28	58 26	27	58 18	28
3	58 33	28	58 24	28	58 16	28	58 7	28	57 59	28	57 50	28
6	58 5	29	57 56	28	57 48	29	57 39	28	57 31	29	57 22	28
9	57 36	29	57 28	30	57 19	29	57 11	29	57 2	29	56 54	29
2 12	−57 7	30	−56 58	30	−56 50	30	−56 42	30	−56 33	29	−56 25	30
15	56 37	31	56 28	30	56 20	30	56 12	31	56 4	31	55 55	30
18	56 6	31	55 58	31	55 50	31	55 41	31	55 33	31	55 25	31
21	55 35	32	55 27	32	55 19	32	55 10	31	55 2	31	54 54	31
24	55 3	32	54 55	32	54 47	32	54 39	32	54 31	32	54 23	32
2 27	−54 31	33	−54 23	33	−54 15	33	−54 7	33	−53 59	33	−53 51	33
30	53 58	34	53 50	34	53 42	33	53 34	33	53 26	33	53 18	33
33	53 24	34	53 16	34	53 9	34	53 1	34	52 53	34	52 45	33
36	52 50	34	52 42	34	52 35	34	52 27	34	52 19	34	52 12	34
39	52 16	35	52 8	35	52 1	35	51 53	35	51 45	34	51 38	35
2 42	−51 41	36	−51 33	35	−51 26	36	−51 18	35	−51 11	36	−51 3	35
45	51 5	36	50 58	36	50 50	36	50 43	36	50 35	36	50 28	36
48	50 29	37	50 22	37	50 14	36	50 7	37	49 59	36	49 52	36
51	49 52	37	49 45	37	49 38	36	49 30	37	49 23	37	49 16	37
54	49 15	38	49 8	38	49 1	38	48 53	37	48 46	37	48 39	37
2 57	−48 37	38	−48 30	38	−48 23	38	−48 16	38	−48 9	38	−48 2	38
3 0	47 59	39	47 52	39	47 45	39	47 38	38	47 31	38	47 24	38
3	47 20	39	47 13	39	47 6	39	47 0	39	46 53	39	46 46	39
6	46 41	40	46 34	39	46 27	39	46 21	40	46 14	39	46 7	39
9	46 1	40	45 55	40	45 48	40	45 41	40	45 35	40	45 28	40
3 12	−45 21	41	−45 15	41	−45 8	40	−45 1	40	−44 55	40	−44 48	40
15	44 40	41	44 34	41	44 28	41	44 21	41	44 15	41	44 8	41
18	43 59	41	43 53	41	43 47	42	43 40	41	43 34	41	43 27	41
21	43 18	42	43 12	42	43 5	42	42 59	42	42 53	42	42 46	41
24	42 36	43	42 30	43	42 23	42	42 17	42	42 11	42	42 5	42
3 27	−41 53	43	−41 47	43	−41 41	42	−41 35	42	−41 29	42	−41 23	42
30	41 10	43	41 4	43	40 59	43	40 53	43	40 47	43	40 41	43
33	40 27	43	40 21	43	40 16	44	40 10	44	40 4	43	39 58	43
36	39 44	44	39 38	44	39 32	44	39 26	44	39 21	44	39 15	44
39	39 00	45	38 54	44	38 48	44	38 42	44	38 37	44	38 31	44
3 42	−38 15	45	−38 9	45	−38 4	45	−37 58	44	−37 53	45	−37 47	44
45	37 30	45	37 24	45	37 19	45	37 14	45	37 8	45	37 3	45
48	36 45	46	36 39	45	36 34	46	36 29	46	36 23	45	36 18	45
51	35 59	46	35 54	46	35 48	45	35 43	45	35 38	45	35 33	46
54	35 13	46	35 8	46	35 3	46	34 58	45	34 53	46	34 47	45
3 57	−34 27	47	−34 22	47	−34 17	47	−34 12	47	−34 7	47	−34 2	47
4 0	33 40	47	33 35	47	33 30	47	33 25	47	33 20	46	33 15	46
3	32 53	48	32 48	48	32 43	47	32 38	47	32 34	47	32 29	47
6	32 5	48	32 0	47	31 56	48	31 51	47	31 47	47	31 42	47
4 9	−31 17	48	−31 13	47	−31 8	48	−31 4	47	−30 59	48	−30 55	47

INDING THE LATITUDE BY AN OBSERVED ALTITUDE OF POLARIS, 1917.

L	88° 51′ 40″		88° 51′ 50″		88° 52′ 0″		88° 52′ 10″		88° 52′ 20″		88° 52′ 30″		Decl. / H. A.
	′ ″		′ ″		′ ″		′ ″		′ ″		′ ″		h m
	−31 17	48	−31 13	48	−31 8	48	−31 4	48	−30 59	47	−30 55	48	19 51
	30 29	48	30 25	49	30 20	48	30 16	48	30 12	48	30 7	48	48
	29 41	49	29 36	49	29 32	49	29 28	48	29 24	48	29 19	48	45
	28 52	49	28 47	48	28 43	49	28 40	49	28 36	49	28 31	48	42
	28 3	49	27 59	49	27 55	49	27 51	49	27 47	49	27 43	49	39
	−27 14	50	−27 10	50	−27 6	49	−27 2	49	−26 58	49	−26 54	49	19 36
	26 24	50	26 20	49	26 17	50	26 13	49	26 9	49	26 5	49	33
	25 34	50	25 31	50	25 27	50	25 24	50	25 20	50	25 16	49	30
	24 44	50	24 41	50	24 37	50	24 34	50	24 30	50	24 27	50	27
	23 54	51	23 51	51	23 47	50	23 44	50	23 40	50	23 37	50	24
	−23 3	51	−23 0	51	−22 57	51	−22 54	51	−22 50	50	−22 47	50	19 21
	22 12	51	22 9	51	22 6	51	22 3	50	22 0	51	21 57	51	18
	21 21	51	21 18	51	21 15	51	21 13	51	21 9	50	21 6	50	15
	20 30	51	20 27	51	20 24	51	20 22	51	20 19	51	20 16	51	12
	19 39	52	19 36	52	19 33	51	19 31	52	19 28	51	19 25	51	9
	−18 47	52	−18 44	51	−18 42	52	−18 39	51	−18 37	52	−18 34	51	19 6
	17 55	52	17 53	52	17 50	52	17 48	52	17 45	51	17 43	52	3
	17 3	52	17 1	52	16 58	51	16 56	52	16 54	52	16 51	51	19 0
	16 11	52	16 9	52	16 7	52	16 4	52	16 2	52	16 0	52	18 57
	15 19	52	15 17	53	15 15	53	15 12	52	15 10	52	15 8	52	54
	−14 27	53	−14 24	52	−14 22	52	−14 20	52	−14 18	52	−14 16	52	18 51
	13 34	53	13 32	53	13 30	53	13 28	52	13 26	52	13 24	52	48
	12 41	53	12 39	53	12 37	52	12 36	53	12 34	53	12 32	52	45
	11 48	53	11 46	53	11 45	53	11 43	53	11 41	52	11 40	53	42
	10 55	53	10 53	53	10 52	53	10 50	52	10 49	53	10 47	52	39
	−10 2	53	−10 0	53	− 9 59	53	− 9 58	53	− 9 56	52	− 9 55	53	18 36
	9 9	53	9 7	53	9 6	53	9 5	53	9 4	53	9 2	52	33
	8 16	54	8 14	53	8 13	53	8 12	53	8 11	53	8 10	53	30
	7 22	54	7 21	53	7 20	53	7 19	53	7 18	53	7 17	53	27
	6 28	53	6 28	54	6 27	54	6 26	53	6 25	53	6 24	53	24
	−5 35	54	− 5 34	53	− 5 33	53	− 5 33	53	− 5 32	53	− 5 31	53	18 21
	4 41	53	4 41	53	4 40	53	4 40	54	4 39	53	4 38	53	18
	3 48	54	3 48	54	3 47	54	3 46	53	3 46	53	3 45	53	15
	2 54	54	2 54	54	2 53	53	2 53	53	2 53	53	2 52	53	12
	2 0	53	2 0	54	2 0	54	2 0	54	2 0	54	1 59	53	9
	− 1 7	54	− 1 6	53	− 1 6	53	− 1 6	53	− 1 6	53	− 1 6	53	18 6
	− 0 13	54	− 0 13	54	− 0 13	53	− 0 13	53	− 0 13	53	− 0 13	53	3
	+ 0 41	53	+ 0 41	53	+ 0 40	54	+ 0 40	53	+ 0 40	53	+ 0 40	53	18 0
	1 34	54	1 34	54	1 34	53	1 33	54	1 33	53	1 33	53	17 57
	2 28	54	2 28	53	2 27	53	2 27	53	2 26	53	2 26	53	54
	+ 3 22	53	+ 3 21	54	+ 3 20	54	+ 3 20	53	+ 3 19	53	+ 3 19	53	17 51
	4 15	54	4 15	53	4 14	53	4 13	53	4 12	53	4 12	52	48
	5 9	53	5 8	53	5 7	53	5 6	53	5 5	53	5 4	53	45
	6 2	54	6 1	53	6 0	53	5 59	53	5 58	53	5 57	53	42
	6 56	53	6 54	54	6 53	53	6 52	53	6 51	53	6 50	53	39
	+ 7 49	53	+ 7 48	53	+ 7 46	53	+ 7 45	53	+ 7 44	53	+ 7 43	52	17 36
	8 42	53	8 41	53	8 39	53	8 38	53	8 37	52	8 35	53	33
	9 35	53	9 34	53	9 32	53	9 31	52	9 29	53	9 28	52	30
	10 28	53	10 27	52	10 25	53	10 23	53	10 22	52	10 20	52	27
	11 21	53	11 19	53	11 18	52	11 16	52	11 14	52	11 12	53	24
	+12 14	53	+12 12	53	+12 10	53	+12 8	53	+12 6	53	+12 5	52	17 21
	13 7	52	13 5	52	13 3	52	13 1	52	12 59	52	12 57	52	18
	13 59	53	13 57	52	13 55	52	13 53	52	13 51	51	13 48	51	15
	14 52	52	14 49	52	14 47	52	14 45	52	14 42	52	14 40	52	12
	15 44	52	15 41	52	15 39	52	15 37	51	15 34	52	15 32	51	9
	+16 36	52	+16 33	52	+16 31	51	+16 28	52	+16 26	51	+16 23	51	17 6
	17 28	51	17 25	51	17 22	52	17 20	51	17 17	51	17 14	51	3
	18 19	52	18 16	52	18 14	51	18 11	51	18 8	51	18 5	51	17 0
	19 11	51	*19 8*	51	19 5	51	19 2	51	18 59	51	18 56	51	16 57
	+20 2	51	*+19 59*	51	+19 56	51	+19 53	51	+19 50	51	+19 47	51	16 54

FOR FINDING THE LATITUDE BY AN OBSERVED ALTITUDE OF POLARIS,

H. A. \ Decl.	88° 51′ 40″		88° 51′ 50″		88° 52′ 0″		88° 52′ 10″		88° 52′ 20″		88° 52′ 30″		Dif.
h m	′ ″		′ ″		′ ″		′ ″		′ ″		′ ″		
7 6	+20 2	51	+19 59	51	+19 56	51	+19 53	51	+19 50	51	+19 47	50	1
9	20 53	51	20 50	51	20 47	51	20 44	50	20 41	50	20 37	51	
12	21 44	51	21 41	50	21 37	50	21 34	50	21 31	50	21 28	50	
15	22 35	50	22 31	50	22 28	50	22 24	50	22 21	50	22 18	49	
18	23 25	50	23 21	50	23 18	50	23 14	50	23 11	50	23 7	50	
7 21	+24 15	50	+24 11	50	+24 8	49	+24 4	50	+24 1	49	+23 57	49	1
24	25 5	50	25 1	50	24 57	50	24 54	49	24 50	49	24 46	49	
27	25 55	49	25 51	49	25 47	49	25 43	49	25 39	49	25 35	49	
30	26 44	49	26 40	50	26 36	49	26 32	49	26 28	49	26 24	48	
33	27 33	49	27 30	48	27 25	48	27 21	48	27 17	48	27 12	49	
7 36	+28 22	48	+28 18	48	+28 13	49	+28 9	48	+28 5	48	+28 1	48	1
39	29 10	48	29 6	48	29 2	48	28 57	48	28 53	48	28 49	47	
42	29 58	48	29 54	48	29 50	47	29 45	48	29 41	47	29 36	47	
45	30 46	48	30 42	47	30 37	47	30 33	47	30 28	47	30 23	47	
48	31 34	47	31 29	47	31 24	47	31 20	47	31 15	47	31 10	47	
7 51	+32 21	47	+32 16	47	+32 11	47	+32 7	46	+32 2	46	+31 57	46	1
54	33 8	47	33 3	47	32 58	46	32 53	46	32 48	46	32 43	46	
7 57	33 55	46	33 50	46	33 44	46	33 39	46	33 34	46	33 29	46	
8 0	34 41	46	34 36	45	34 30	46	34 25	46	34 20	46	34 15	45	1
3	35 27	45	35 21	46	35 16	45	35 11	45	35 6	45	35 0	45	1
8 6	+36 12	45	+36 7	45	+36 1	45	+35 56	45	+35 51	44	+35 45	45	1
9	36 57	45	36 52	44	36 46	45	36 41	44	36 35	44	36 30	44	
12	37 42	44	37 36	44	37 31	44	37 25	44	37 19	44	37 14	44	
15	38 26	44	38 20	44	38 15	44	38 9	44	38 3	44	37 58	43	
18	39 10	44	39 4	44	38 58	43	38 53	43	38 47	43	38 41	43	
8 21	+39 54	43	+39 48	43	+39 42	43	+39 36	43	+39 30	43	+39 24	43	1
24	40 37	43	40 31	42	40 25	42	40 19	42	40 13	42	40 7	42	
27	41 20	42	41 13	42	41 7	42	41 1	42	40 55	42	40 49	42	
30	42 2	42	41 55	42	41 49	42	41 43	42	41 37	41	41 31	41	
33	42 44	41	42 37	42	42 31	41	42 25	41	42 18	41	42 12	41	
8 36	+43 25	41	+43 19	41	+43 12	41	+43 6	41	+42 59	41	+42 53	40	1
39	44 6	40	44 0	40	43 53	40	43 47	40	43 40	40	43 33	40	
42	44 46	40	44 40	40	44 33	40	44 27	40	44 20	40	44 13	40	
45	45 26	40	45 20	39	45 13	39	45 7	39	45 0	39	44 53	39	
48	46 6	40	45 59	39	45 52	39	45 46	39	45 39	39	45 32	39	
8 51	+46 45	39	+46 38	39	+46 31	39	+46 25	38	+46 18	38	+46 11	38	1
54	47 24	38	47 17	38	47 10	38	47 3	38	46 56	38	46 49	38	
8 57	48 2	38	47 55	38	47 48	37	47 41	37	47 34	37	47 27	37	
9 0	48 40	37	48 33	37	48 25	37	48 18	37	48 11	37	48 4	37	1
3	49 17	37	49 10	37	49 2	37	48 55	36	48 48	36	48 41	36	1
9 6	+49 54	36	+49 46	36	+49 39	36	+49 31	36	+49 24	36	+49 17	36	1
9	50 30	35	50 22	36	50 15	35	50 7	36	50 0	35	49 53	35	
12	51 5	35	50 58	35	50 50	35	50 43	35	50 35	35	50 28	34	
15	51 40	35	51 33	34	51 25	35	51 18	34	51 10	34	51 2	35	
18	52 15	34	52 7	34	52 0	34	51 52	34	51 44	34	51 37	33	
9 21	+52 49	34	+52 41	34	+52 34	33	+52 26	33	+52 18	33	+52 10	33	1
24	53 23	33	53 15	33	53 7	33	52 59	33	52 51	33	52 43	33	
27	53 56	33	53 48	32	53 40	32	53 32	32	53 24	32	53 16	32	
30	54 28	32	54 20	32	54 12	32	54 4	32	53 56	32	53 48	31	
33	55 0	32	54 52	31	54 44	31	54 36	31	54 28	31	54 19	31	
9 36	+55 31	31	+55 23	31	+55 15	30	+55 7	30	+54 59	30	+54 50	31	14
39	56 2	30	55 54	30	55 45	30	55 37	30	55 29	30	55 21	30	
42	56 32	30	56 24	29	56 15	30	56 7	30	55 59	29	55 51	29	
45	57 2	29	56 53	29	56 45	29	56 37	29	56 28	29	56 20	29	
48	57 31	29	57 22	29	57 14	28	57 6	28	56 57	28	56 49	28	
9 51	+57 59	28	+57 51	28	+57 42	28	+57 34	27	+57 25	28	+57 17	27	14
54	58 27	27	58 19	27	58 10	27	58 1	27	57 53	27	57 44	27	
9 57	58 54	27	58 46	26	58 37	27	58 28	27	58 20	26	58 11	26	
10 0	*59 21*	26	59 12	26	59 4	26	58 55	26	58 46	26	58 37	26	14
10 3	+59 47		+59 38		+59 30		+59 21		+59 12		+59 3		

TABLE I.

INDING THE LATITUDE BY AN OBSERVED ALTITUDE OF POLARIS, 1917.

L.	88° 51′ 40″		88° 51′ 50″		88° 52′ 0″		88° 52′ 10″		88° 52′ 20″		88° 52′ 30″		Decl. / H. A.
	′	″	′	″	′	″	′	″	′	″	′	″	h m
	+59	47	+59	38	+59	30	+59	21	+59	12	+59	3	13 57
	60	13 26	60	4 26	59	55 25	59	46 25	59	37 25	59	28 25	54
	60	37 24	60	28 25	60	20 25	60	11 24	60	2 24	59	53 24	51
	61	2 25	60	53 23	60	44 24	60	35 23	60	26 23	60	17 23	48
	61	25 23	61	16 23	61	7 23	60	58 23	60	49 23	60	40 23	45
	+61	48 23	+61	39 23	+61	30 22	+61	21 22	+61	12 22	+61	3 22	13 42
	62	11 21	62	2 21	61	52 22	61	43 22	61	34 22	61	25 21	39
	62	32 21	62	23 21	62	14 21	62	5 21	61	56 21	61	46 21	36
	62	53 21	62	44 21	62	35 20	62	26 20	62	17 20	62	7 21	33
	63	14 20	63	5 19	62	55 20	62	46 20	62	37 20	62	28 19	30
	+63	34 19	+63	24 20	+63	15 19	+63	6 19	+62	57 19	+62	47 19	13 27
	63	53 19	63	44 18	63	34 19	63	25 18	63	16 18	63	6 18	24
	64	12 17	64	2 18	63	53 18	63	43 18	63	34 18	63	24 18	21
	64	29 18	64	20 17	64	11 17	64	1 17	63	52 17	63	42 17	18
	64	47 16	64	37 17	64	28 16	64	18 17	64	9 16	63	59 17	15
	+65	3 16	+64	54 16	+64	44 16	+64	35 16	+64	25 16	+64	16 15	13 12
	65	19 15	65	10 15	65	0 15	64	51 15	64	41 15	64	31 15	9
	65	34 15	65	25 15	65	15 15	65	6 14	64	56 15	64	46 15	6
	65	49 14	65	40 14	65	30 14	65	20 14	65	11 13	65	1 14	3
	66	3 13	65	54 13	65	44 13	65	34 13	65	24 14	65	15 13	13 0
	+66	16 13	+66	7 12	+65	57 12	+65	47 13	+65	38 12	+65	28 12	12 57
	66	29 12	66	19 12	66	9 12	66	0 12	65	50 12	65	40 12	54
	66	41 11	66	31 11	66	21 12	66	12 11	66	2 11	65	52 11	51
	66	52 11	66	42 11	66	33 10	66	23 10	66	13 11	66	3 11	48
	67	3 10	66	53 10	66	43 10	66	33 10	66	24 9	66	14 10	45
	+67	13 9	+67	3 9	+66	53 9	+66	43 9	+66	33 9	+66	24 9	12 42
	67	22 8	67	12 8	67	2 9	66	52 9	66	42 9	66	33 8	39
	67	30 8	67	20 8	67	11 8	67	1 8	66	51 8	66	41 8	36
	67	38 8	67	28 8	67	19 7	67	9 7	66	59 7	66	49 7	33
	67	46 6	67	36 6	67	26 6	67	16 6	67	6 6	66	56 6	30
	+67	52 6	+67	42 6	+67	32 6	+67	22 6	+67	12 6	+67	2 6	12 27
	67	58 5	67	48 5	67	38 5	67	28 5	67	18 5	67	8 5	24
	68	3 5	67	53 5	67	43 5	67	33 5	67	23 5	67	13 5	21
	68	8 3	67	58 3	67	48 3	67	38 5	67	28 3	67	18 3	18
	68	11 3	68	1 3	67	51 3	67	41 3	67	31 3	67	21 3	15
	+68	14 3	+68	4 3	+67	54 3	+67	44 3	+67	34 3	+67	24 3	12 12
	68	17 2	68	7 2	67	57 2	67	47 2	67	37 2	67	27 2	9
	68	19 1	68	9 1	67	59 1	67	49 1	67	39 1	67	29 1	6
	68	20 0	68	10 0	68	0 0	67	50 0	67	40 0	67	30 0	3
	+68	20	+68	10	+68	0	+67	50	+67	40	+67	30	12 0

TABLE Ia.

able I has been computed for an altitude of 45°. For other altitudes, corrections taken he following table may be applied when the desired degree of accuracy requires it.

Altitude.	10°	20°	30°	40°	50°	60°	70°	Altitude. / H. A.	
h	″	″	″	″	″	″	″	h	h
12	0	0	0	0	0	0	0	12	24
11	− 2	− 2	− 1	0	0	+ 2	+ 5	13	23
10	8	7	4	−2	+2	8	18	14	22
9	17	13	9	3	4	15	36	15	21
8	25	20	13	5	6	23	53	16	20
7	32	24	16	6	7	28	66	17	19
6	−34	−26	−17	−7	+8	+30	+71	18	18

TABLE II.

SIDEREAL INTO MEAN SOLAR TIME.

TO BE SUBTRACTED FROM A SIDEREAL TIME INTERVAL.

Sidereal.	0h	1h	2h	3h	4h	5h	6h	7h	s
m	m s	m s	m s	m s	m s	m s	m s	m 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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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*
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*
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*

SIDEREAL INTO MEAN SOLAR TIME.

TO BE SUBTRACTED FROM A SIDEREAL TIME INTERVAL.

	8h	9h	10h	11h	12h	13h	14h	15h	For Seconds.	
	m s	m s	m s	m s	m s	m s	m s	m s	s	s
	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 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
	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
	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
	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	0.159
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	0.1

TABLE II.

SIDEREAL INTO MEAN SOLAR TIME.

TO BE SUBTRACTED FROM A SIDEREAL TIME INTERVAL.

Sidereal.	16^h	17^h	18^h	19^h	20^h	21^h	22^h	23^h	I Sec
m	m s	m s	m s	m s	m s	m s	m s	m 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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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

TABLE III.

MEAN SOLAR INTO SIDEREAL TIME.

TO BE ADDED TO A MEAN TIME INTERVAL.

0h	1h	2h	3h	4h	5h	6h	7h	For Seconds.	
m s	m s	m s	m s	m s	m s	m s	m s	s	s
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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	0.15
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	0.1

TABLE III.

MEAN SOLAR INTO SIDEREAL TIME.

TO BE ADDED TO A MEAN TIME INTERVAL.

Mean Solar.	8h	9h	10h	11h	12h	13h	14h	15h	Sr
m	m s	m s	m s	m s	m s	m s	m s	m 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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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

TABLE III.

MEAN SOLAR INTO SIDEREAL TIME.

TO BE ADDED TO A MEAN TIME INTERVAL.

Mean Solar.	16h	17h	18h	19h	20h	21h	22h	23h	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

TABLE IV.

AZIMUTH OF POLARIS AT ALL HOUR ANGLES, 1917.

[For hour angles 0h to 12h the star is west of north, and for hour angles 12h to 24h it is east

H.A. \ Lat.	10°	15°	20°	22°	24°	26°	28°	30°	32°
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
10	0 3.0	0 3.1	0 3.2	0 3.2	0 3.3	0 3.3	0 3.4	0 3.5	0 3.5
20	0 6.0	0 6.2	0 6.3	0 6.4	0 6.5	0 6.6	0 6.8	0 6.9	0 7.1
0 30	0 9.0	0 9.2	0 9.5	0 9.6	0 9.8	0 10.0	0 10.1	0 10.3	0 10.6
40	0 12.0	0 12.3	0 12.6	0 12.8	0 13.0	0 13.2	0 13.5	0 13.8	0 14.1
50	0 15.0	0 15.3	0 15.7	0 16.0	0 16.2	0 16.5	0 16.8	0 17.2	0 17.5
1 0	0 17.9	0 18.3	0 18.8	0 19.1	0 19.4	0 19.7	0 20.1	0 20.5	0 21.0
10	0 20.8	0 21.3	0 21.9	0 22.2	0 22.5	0 22.9	0 23.4	0 23.8	0 24.4
20	0 23.7	0 24.2	0 24.9	0 25.2	0 25.6	0 26.1	0 26.6	0 27.1	0 27.7
1 30	0 26.5	0 27.0	0 27.8	0 28.2	0 28.7	0 29.2	0 29.7	0 30.3	0 31.0
40	0 29.2	0 29.9	0 30.7	0 31.2	0 31.7	0 32.2	0 32.8	0 33.5	0 34.2
50	0 31.9	0 32.6	0 33.6	0 34.1	0 34.6	0 35.2	0 35.8	0 36.6	0 37.4
2 0	0 34.6	0 35.3	0 36.4	0 36.9	0 37.5	0 38.1	0 38.8	0 39.6	0 40.5
10	0 37.2	0 37.9	0 39.1	0 39.6	0 40.2	0 40.9	0 41.7	0 42.5	0 43.5
20	0 39.7	0 40.5	0 41.7	0 42.3	0 42.9	0 43.7	0 44.5	0 45.4	0 46.4
2 30	0 42.1	0 43.0	0 44.2	0 44.9	0 45.6	0 46.4	0 47.2	0 48.2	0 49.2
40	0 44.5	0 45.4	0 46.7	0 47.4	0 48.1	0 48.9	0 49.8	0 50.8	0 52.0
50	0 46.7	0 47.7	0 49.1	0 49.8	0 50.6	0 51.4	0 52.4	0 53.4	0 54.6
3 0	0 48.9	0 49.9	0 51.4	0 52.1	0 52.9	0 53.8	0 54.8	0 55.9	0 57.1
10	0 51.0	0 52.0	0 53.6	0 54.3	0 55.2	0 56.1	0 57.1	0 58.3	0 59.5
20	0 52.9	0 54.0	0 55.6	0 56.4	0 57.3	0 58.2	0 59.3	1 0.5	1 1.8
3 30	0 54.8	0 56.0	0 57.6	0 58.4	0 59.3	1 0.3	1 1.4	1 2.7	1 4.0
40	0 56.6	0 57.8	0 59.5	1 0.3	1 1.2	1 2.2	1 3.4	1 4.7	1 6.1
50	0 58.3	0 59.5	1 1.2	1 2.1	1 3.0	1 4.1	1 5.2	1 6.6	1 8.0
4 0	0 59.8	1 1.1	1 2.8	1 3.7	1 4.7	1 5.8	1 7.0	1 8.3	1 9.8
10	1 1.3	1 2.5	1 4.3	1 5.2	1 6.2	1 7.3	1 8.6	1 9.9	1 11.4
20	1 2.6	1 3.9	1 5.7	1 6.6	1 7.6	1 8.8	1 10.0	1 11.4	1 13.0
4 30	1 3.8	1 5.1	1 7.0	1 7.9	1 8.9	1 10.1	1 11.4	1 12.8	1 14.3
40	1 4.9	1 6.2	1 8.1	1 9.0	1 10.1	1 11.2	1 12.5	1 14.0	1 15.6
50	1 5.8	1 7.2	1 9.1	1 10.0	1 11.1	1 12.3	1 13.6	1 15.1	1 16.7
5 0	1 6.7	1 8.0	1 9.9	1 10.9	1 12.0	1 13.2	1 14.5	1 16.0	1 17.6
10	1 7.4	1 8.7	1 10.7	1 11.6	1 12.7	1 13.9	1 15.3	1 16.8	1 18.4
20	1 8.0	1 9.3	1 11.3	1 12.2	1 13.3	1 14.5	1 15.9	1 17.4	1 19.0
5 30	1 8.4	1 9.8	1 11.7	1 12.7	1 13.8	1 15.0	1 16.4	1 17.9	1 19.5
40	1 8.7	1 10.1	1 12.0	1 13.0	1 14.1	1 15.3	1 16.7	1 18.2	1 19.9
50	1 8.9	1 10.3	1 12.2	1 13.2	1 14.3	1 15.5	1 16.9	1 18.4	1 20.1
6 0	1 9.0	1 10.3	1 12.3	1 13.2	1 14.3	1 15.6	1 16.9	1 18.4	1 20.1
10	1 8.9	1 10.2	1 12.2	1 13.2	1 14.2	1 15.5	1 16.8	1 18.3	1 20.0
20	1 8.7	1 10.0	1 12.0	1 12.9	1 14.0	1 15.2	1 16.6	1 18.0	1 19.7
6 30	1 8.3	1 9.7	1 11.6	1 12.5	1 13.6	1 14.8	1 16.2	1 17.6	1 19.3
40	1 7.9	1 9.2	1 11.1	1 12.0	1 13.1	1 14.3	1 15.6	1 17.1	1 18.7
50	1 7.3	1 8.6	1 10.5	1 11.4	1 12.4	1 13.6	1 14.9	1 16.4	1 18.0
7 0	1 6.6	1 7.8	1 9.7	1 10.6	1 11.6	1 12.8	1 14.1	1 15.5	1 17.1
10	1 5.7	1 6.9	1 8.8	1 9.7	1 10.7	1 11.9	1 13.1	1 14.5	1 16.1
20	1 4.7	1 5.9	1 7.8	1 8.6	1 9.6	1 10.8	1 12.0	1 13.4	1 14.9
7 30	1 3.6	1 4.8	1 6.6	1 7.5	1 8.4	1 9.6	1 10.8	1 12.1	1 13.6
40	1 2.4	1 3.6	1 5.3	1 6.2	1 7.1	1 8.2	1 9.4	1 10.7	1 12.2
50	1 1.1	1 2.2	1 3.9	1 4.7	1 5.7	1 6.7	1 7.9	1 9.2	1 10.6
8 0	0 59.6	1 0.7	1 2.4	1 3.2	1 4.1	1 5.1	1 6.3	1 7.5	1 8.9
10	0 58.1	0 59.1	1 0.7	1 1.5	1 2.4	1 3.4	1 4.5	1 5.7	1 7.1
20	0 56.4	0 57.4	0 59.0	0 59.7	1 0.6	1 1.6	1 2.6	1 3.8	1 5.1
8 30	0 54.6	0 55.6	0 57.1	0 57.8	0 58.7	0 59.6	1 0.6	1 1.8	1 3.1
40	0 52.7	0 53.7	0 55.1	0 55.8	0 56.6	0 57.5	0 58.5	0 59.6	1 0.9
50	0 50.7	0 51.6	0 53.0	0 53.7	0 54.5	0 55.4	0 56.3	0 57.4	0 58.6
9 0	*0 48.6*	0 49.5	0 50.8	0 51.5	0 52.2	0 53.1	0 54.0	0 55.0	0 56.1

AZIMUTH OF POLARIS AT ALL HOUR ANGLES, 1917.

[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 48.6	0 49.5	0 50.8	0 51.5	0 52.2	0 53.1	0 54.0	0 55.0	0 56.1	15 0
10	0 46.5	0 47.3	0 48.6	0 49.2	0 49.9	0 50.7	0 51.6	0 52.5	0 53.6	14 50
20	0 44.2	0 45.0	0 46.2	0 46.8	0 47.5	0 48.2	0 49.0	0 50.0	0 51.0	40
9 30	0 41.9	0 42.6	0 43.7	0 44.3	0 44.9	0 45.6	0 46.4	0 47.3	0 48.3	14 30
40	0 39.5	0 40.2	0 41.2	0 41.7	0 42.3	0 43.0	0 43.7	0 44.6	0 45.5	20
50	0 37.0	0 37.6	0 38.6	0 39.1	0 39.6	0 40.3	0 41.0	0 41.7	0 42.6	10
10 0	0 34.4	0 35.0	0 35.9	0 36.4	0 36.9	0 37.5	0 38.1	0 38.8	0 39.6	14 0
10	0 31.8	0 32.3	0 33.1	0 33.6	0 34.1	0 34.6	0 35.2	0 35.8	0 36.6	13 50
20	0 29.1	0 29.6	0 30.3	0 30.7	0 31.2	0 31.7	0 32.2	0 32.8	0 33.5	40
10 30	0 26.3	0 26.8	0 27.5	0 27.8	0 28.2	0 28.7	0 29.2	0 29.7	0 30.3	13 30
40	0 23.5	0 23.9	0 24.6	0 24.9	0 25.2	0 25.6	0 26.0	0 26.5	0 27.1	20
50	0 20.7	0 21.0	0 21.6	0 21.9	0 22.2	0 22.5	0 22.9	0 23.3	0 23.8	10
11 0	0 17.8	0 18.1	0 18.6	0 18.8	0 19.1	0 19.4	0 19.7	0 20.1	0 20.5	13 0
10	0 14.9	0 15.1	0 15.5	0 15.7	0 16.0	0 16.2	0 16.5	0 16.8	0 17.1	12 50
20	0 11.9	0 12.1	0 12.5	0 12.6	0 12.8	0 13.0	0 13.2	0 13.5	0 13.7	40
11 30	0 9.0	0 9.1	0 9.4	0 9.5	0 9.6	0 9.8	0 9.9	0 10.1	0 10.3	12 30
40	0 6.0	0 6.1	0 6.2	0 6.3	0 6.4	0 6.5	0 6.6	0 6.8	0 6.9	20
50	0 3.0	0 3.0	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. / A.	32°	34°	36°	38°	40°	42°	44°	46°	48°	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 3.5	0 3.6	0 3.7	0 3.8	0 3.9	0 4.1	0 4.2	0 4.4	0 4.5	23 50
20	0 7.1	0 7.2	0 7.4	0 7.6	0 7.8	0 8.1	0 8.4	0 8.7	0 9.0	40
0 30	0 10.6	0 10.8	0 11.1	0 11.4	0 11.8	0 12.1	0 12.6	0 13.0	0 13.5	23 30
40	0 14.1	0 14.4	0 14.8	0 15.2	0 15.7	0 16.1	0 16.7	0 17.3	0 18.0	20
50	0 17.5	0 18.0	0 18.4	0 18.9	0 19.5	0 20.1	0 20.8	0 21.6	0 22.4	10
1 0	0 21.0	0 21.5	0 22.0	0 22.6	0 23.3	0 24.1	0 24.9	0 25.8	0 26.8	23 0
10	0 24.4	0 24.9	0 25.6	0 26.3	0 27.1	0 28.0	0 28.9	0 30.0	0 31.2	22 50
20	0 27.7	0 28.4	0 29.1	0 29.9	0 30.8	0 31.8	0 32.9	0 34.1	0 35.4	40
1 30	0 31.0	0 31.7	0 32.5	0 33.4	0 34.4	0 35.6	0 36.8	0 38.1	0 39.6	22 30
40	0 34.2	0 35.0	0 35.9	0 36.9	0 38.0	0 39.3	0 40.6	0 42.1	0 43.8	20
50	0 37.4	0 38.3	0 39.3	0 40.3	0 41.5	0 42.9	0 44.3	0 46.0	0 47.8	10
2 0	0 40.5	0 41.4	0 42.5	0 43.7	0 45.0	0 46.4	0 48.0	0 49.8	0 51.7	22 0
10	0 43.5	0 44.5	0 45.6	0 46.9	0 48.3	0 49.8	0 51.5	0 53.4	0 55.5	21 50
20	0 46.4	0 47.5	0 48.7	0 50.1	0 51.6	0 53.2	0 55.0	0 57.0	0 59.3	40
2 30	0 49.2	0 50.4	0 51.7	0 53.1	0 54.7	0 56.4	0 58.3	1 0.5	1 2.9	21 30
40	0 52.0	0 53.2	0 54.6	0 56.0	0 57.7	0 59.6	1 1.6	1 3.8	1 6.3	20
50	0 54.6	0 55.9	0 57.3	0 58.9	1 0.6	1 2.6	1 4.7	1 7.0	1 9.7	10
3 0	0 57.1	0 58.5	1 0.0	1 1.6	1 3.4	1 5.4	1 7.7	1 10.1	1 12.9	21 0
10	0 59.5	1 0.9	1 2.5	1 4.2	1 6.1	1 8.2	1 10.5	1 13.1	1 15.9	20 50
20	1 1.8	1 3.3	1 4.9	1 6.7	1 8.6	1 10.8	1 13.2	1 15.9	1 18.8	40
3 30	1 4.0	1 5.5	1 7.2	1 9.0	1 11.0	1 13.3	1 15.8	1 18.5	1 21.6	20 30
40	1 6.1	1 7.6	1 9.3	1 11.2	1 13.3	1 15.6	1 18.2	1 21.0	1 24.2	20
50	1 8.0	1 9.6	1 11.4	1 13.3	1 15.4	1 17.8	1 20.4	1 23.4	1 26.6	10
4 0	1 9.8	1 11.4	1 13.2	1 15.2	1 17.4	1 19.8	1 22.5	1 25.5	1 28.9	20 0
10	1 11.4	1 13.1	1 15.0	1 17.0	1 19.2	1 21.7	1 24.5	1 27.5	1 31.0	19 50
20	1 13.0	1 14.7	1 16.6	1 18.6	1 20.9	1 23.4	1 26.3	1 29.4	1 32.9	40
4 30	1 14.3	1 16.1	1 18.0	1 20.1	1 22.4	1 25.0	1 27.9	1 31.0	1 34.6	19 30
40	1 15.6	1 17.3	1 19.3	1 21.4	1 23.8	1 26.4	1 29.3	1 32.5	1 36.1	20
50	*1 16.7*	*1 18.4*	*1 20.4*	*1 22.6*	1 25.0	1 27.6	1 30.6	1 33.8	1 37.4	10
5 0	*1 17.6*	*1 19.4*	*1 21.4*	1 23.6	1 26.0	1 28.7	1 31.7	1 34.9	1 38.6	19 0

TABLE IV.

AZIMUTH OF POLARIS AT ALL HOUR ANGLES, 1917.

[For hour angles 0h to 12h the star is west of north, and for hour angles 12h to 24h it is east of

H.A. \ Lat.	32°	34°	36°	38°	40°	42°	44°	46°	48°	L
h m	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	
5 0	1 17.6	1 19.4	1 21.4	1 23.6	1 26.0	1 28.7	1 31.7	1 34.9	1 38.6	
10	1 18.4	1 20.2	1 22.2	1 24.4	1 26.9	1 29.6	1 32.6	1 35.9	1 39.6	
20	1 19.0	1 20.9	1 22.9	1 25.1	1 27.6	1 30.3	1 33.3	1 36.6	1 40.3	
5 30	1 19.5	1 21.4	1 23.4	1 25.6	1 28.1	1 30.8	1 33.8	1 37.2	1 40.9	
40	1 19.9	1 21.7	1 23.7	1 26.0	1 28.5	1 31.2	1 34.2	1 37.6	1 41.3	
50	1 20.1	1 21.9	1 23.9	1 26.2	1 28.6	1 31.4	1 34.4	1 37.8	1 41.5	
6 0	1 20.1	1 21.9	1 24.0	1 26.2	1 28.7	1 31.4	1 34.4	1 37.8	1 41.5	
10	1 20.0	1 21.8	1 23.8	1 26.0	1 28.5	1 31.2	1 34.2	1 37.6	1 41.3	
20	1 19.7	1 21.5	1 23.5	1 25.7	1 28.2	1 30.9	1 33.9	1 37.2	1 40.9	
6 30	1 19.3	1 21.1	1 23.1	1 25.3	1 27.7	1 30.4	1 33.4	1 36.7	1 40.3	
40	1 18.7	1 20.5	1 22.5	1 24.7	1 27.1	1 29.7	1 32.7	1 35.9	1 39.6	
50	1 18.0	1 19.8	1 21.7	1 23.9	1 26.2	1 28.9	1 31.8	1 35.0	1 38.6	
7 0	1 17.1	1 18.9	1 20.8	1 22.9	1 25.3	1 27.9	1 30.7	1 33.9	1 37.5	
10	1 16.1	1 17.8	1 19.7	1 21.8	1 24.1	1 26.7	1 29.5	1 32.7	1 36.2	
20	1 14.9	1 16.6	1 18.5	1 20.6	1 22.8	1 25.4	1 28.1	1 31.2	1 34.7	
7 30	1 13.6	1 15.3	1 17.1	1 19.1	1 21.4	1 23.9	1 26.6	1 29.6	1 33.0	
40	1 12.2	1 13.8	1 15.6	1 17.6	1 19.8	1 22.2	1 24.9	1 27.8	1 31.1	
50	1 10.6	1 12.2	1 14.0	1 15.9	1 18.0	1 20.4	1 23.0	1 25.9	1 29.1	
8 0	1 8.9	1 10.5	1 12.2	1 14.1	1 16.1	1 18.4	1 21.0	1 23.8	1 26.9	
10	1 7.1	1 8.6	1 10.3	1 12.1	1 14.1	1 16.3	1 18.8	1 21.6	1 24.6	
20	1 5.1	1 6.6	1 8.2	1 10.0	1 11.9	1 14.1	1 16.5	1 19.2	1 22.1	
8 30	1 3.1	1 4.5	1 6.0	1 7.7	1 9.6	1 11.7	1 14.0	1 16.6	1 19.4	
40	1 0.9	1 2.2	1 3.7	1 5.4	1 7.2	1 9.2	1 11.4	1 13.9	1 16.7	
50	0 58.6	0 59.9	1 1.3	1 2.9	1 4.6	1 6.6	1 8.7	1 11.1	1 13.7	
9 0	0 56.1	0 57.4	0 58.8	1 0.3	1 2.0	1 3.8	1 5.9	1 8.1	1 10.7	
10	0 53.6	0 54.8	0 56.1	0 57.6	0 59.2	1 0.9	1 2.9	1 5.1	1 7.5	
20	0 51.0	0 52.1	0 53.4	0 54.7	0 56.3	0 57.9	0 59.8	1 1.8	1 4.1	
9 30	0 48.3	0 49.3	0 50.5	0 51.8	0 53.3	0 54.8	0 56.6	0 58.5	1 0.7	
40	0 45.5	0 46.5	0 47.6	0 48.8	0 50.2	0 51.7	0 53.3	0 55.1	0 57.2	
50	0 42.6	0 43.5	0 44.6	0 45.7	0 47.0	0 48.4	0 49.9	0 51.6	0 53.5	
10 0	0 39.6	0 40.5	0 41.5	0 42.5	0 43.7	0 45.0	0 46.4	0 48.0	0 49.8	
10	0 36.6	0 37.4	0 38.3	0 39.2	0 40.3	0 41.5	0 42.9	0 44.3	0 46.0	
20	0 33.5	0 34.2	0 35.0	0 35.9	0 36.9	0 38.0	0 39.2	0 40.6	0 42.1	
10 30	0 30.3	0 31.0	0 31.7	0 32.5	0 33.4	0 34.4	0 35.5	0 36.7	0 38.1	
40	0 27.1	0 27.7	0 28.3	0 29.0	0 29.9	0 30.7	0 31.7	0 32.8	0 34.0	
50	0 23.8	0 24.3	0 24.9	0 25.5	0 26.3	0 27.0	0 27.9	0 28.8	0 29.9	
11 0	0 20.5	0 20.9	0 21.4	0 22.0	0 22.6	0 23.3	0 24.0	0 24.8	0 25.7	
10	0 17.1	0 17.5	0 17.9	0 18.4	0 18.9	0 19.4	0 20.1	0 20.7	0 21.5	
20	0 13.7	0 14.0	0 14.4	0 14.7	0 15.1	0 15.6	0 16.1	0 16.6	0 17.2	
11 30	0 10.3	0 10.5	0 10.8	0 11.1	0 11.4	0 11.7	0 12.1	0 12.5	0 13.0	
40	0 6.9	0 7.0	0 7.2	0 7.4	0 7.6	0 7.8	0 8.1	0 8.3	0 8.6	
50	0 3.5	0 3.5	0 3.6	0 3.7	0 3.8	0 3.9	0 4.0	0 4.2	0 4.3	
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	

H.A. \ Lat.	48°	50°	52°	54°	56°	58°	60°	61°	62°	L
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	
10	0 4.5	0 4.7	0 4.9	0 5.2	0 5.5	0 5.8	0 6.1	0 6.3	0 6.6	
20	0 9.0	0 9.4	0 9.8	0 10.3	0 10.9	0 11.5	0 12.3	0 12.7	0 13.1	
0 30	0 13.5	0 14.1	0 14.8	0 15.5	0 16.3	0 17.3	0 18.4	0 19.0	0 19.6	
40	0 18.0	0 18.8	0 19.6	0 20.6	0 21.7	0 23.0	0 24.4	0 25.2	0 26.1	
50	0 22.4	0 23.4	0 24.5	0 25.7	0 27.0	0 28.6	0 30.4	0 31.4	0 32.5	
1 0	*0 26.8*	0 28.0	0 29.3	0 30.7	0 32.3	0 34.2	0 36.4	0 37.6	0 38.8	

AZIMUTH OF POLARIS AT ALL HOUR ANGLES, 1917.

[gles 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.]

48°	50°	52°	54°	56°	58°	60°	61°	62°	Lat. / H. A.
° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	h m
0 26.8	0 28.0	0 29.3	0 30.7	0 32.3	0 34.2	0 36.4	0 37.6	0 38.8	23 0
0 31.2	0 32.5	0 34.0	0 35.6	0 37.5	0 39.7	0 42.2	0 43.6	0 45.1	22 50
0 35.4	0 36.9	0 38.6	0 40.5	0 42.7	0 45.1	0 48.0	0 49.6	0 51.3	40
0 39.6	0 41.3	0 43.2	0 45.3	0 47.7	0 50.5	0 53.7	0 55.4	0 57.3	22 30
0 43.8	0 45.6	0 47.7	0 50.0	0 52.7	0 55.7	0 59.3	1 1.2	1 3.3	20
0 47.8	0 49.8	0 52.1	0 54.6	0 57.5	1 0.8	1 4.7	1 6.8	1 9.1	10
0 51.7	0 53.9	0 56.4	0 59.1	1 2.3	1 5.8	1 10.0	1 12.3	1 14.7	22 0
0 55.5	0 57.9	1 0.5	1 3.5	1 6.9	1 10.7	1 15.1	1 17.6	1 20.2	21 50
0 59.3	1 1.8	1 4.6	1 7.7	1 11.3	1 15.4	1 20.1	1 22.8	1 25.6	40
1 2.9	1 5.5	1 8.5	1 11.9	1 15.7	1 20.0	1 25.0	1 27.8	1 30.7	21 30
1 6.3	1 9.1	1 12.3	1 15.8	1 19.8	1 24.4	1 29.7	1 32.6	1 35.7	20
1 9.7	1 12.6	1 15.9	1 19.6	1 23.8	1 28.6	1 34.1	1 37.2	1 40.5	10
1 12.9	1 16.0	1 19.4	1 23.3	1 27.7	1 32.7	1 38.4	1 41.6	1 45.0	21 0
1 15.9	1 19.1	1 22.7	1 26.8	1 31.3	1 36.5	1 42.5	1 45.8	1 49.4	20 50
1 18.8	1 22.2	1 25.9	1 30.1	1 34.8	1 40.2	1 46.4	1 49.8	1 53.5	40
1 21.6	1 25.0	1 28.9	1 33.2	1 38.1	1 43.6	1 50.0	1 53.6	1 57.4	20 30
1 24.2	1 27.7	1 31.7	1 36.1	1 41.2	1 46.9	1 53.5	1 57.1	2 1.0	20
1 26.6	1 30.2	1 34.3	1 38.9	1 44.0	1 49.9	1 56.7	2 0.4	2 4.5	10
1 28.9	1 32.6	1 36.7	1 41.4	1 46.7	1 52.7	1 59.7	2 3.5	2 7.6	20 0
1 31.0	1 34.7	1 39.0	1 43.8	1 49.2	1 55.3	2 2.4	2 6.3	2 10.5	19 50
1 32.9	1 36.7	1 41.0	1 45.9	1 51.4	1 57.7	2 4.9	2 8.9	2 13.2	40
1 34.6	1 38.5	1 42.9	1 47.9	1 53.5	1 59.8	2 7.1	2 11.2	2 15.5	19 30
1 36.1	1 40.1	1 44.6	1 49.6	1 55.3	2 1.7	2 9.1	2 13.2	2 17.6	20
1 37.4	1 41.5	1 46.0	1 51.1	1 56.9	2 3.4	2 10.9	2 15.0	2 19.5	10
1 38.6	1 42.7	1 47.3	1 52.4	1 58.2	2 4.8	2 12.3	2 16.5	2 21.0	19 0
1 39.6	1 43.7	1 48.3	1 53.5	1 59.3	2 6.0	2 13.6	2 17.8	2 22.3	18 50
1 40.3	1 44.5	1 49.1	1 54.3	2 0.2	2 6.9	2 14.5	2 18.8	2 23.3	40
1 40.9	1 45.1	1 49.7	1 55.0	2 0.9	2 7.6	2 15.2	2 19.5	2 24.1	18 30
1 41.3	1 45.5	1 50.1	1 55.4	2 1.3	2 8.0	2 15.7	2 19.9	2 24.5	20
1 41.5	1 45.7	1 50.3	1 55.6	2 1.5	2 8.2	2 15.9	2 20.1	2 24.7	10
1 41.5	1 45.7	1 50.3	1 55.6	2 1.5	2 8.2	2 15.8	2 20.0	2 24.6	18 0
1 41.3	1 45.4	1 50.1	1 55.3	2 1.2	2 7.9	2 15.5	2 19.7	2 24.2	17 50
1 40.9	1 45.0	1 49.6	1 54.8	2 0.7	2 7.3	2 14.9	2 19.1	2 23.6	40
1 40.3	1 44.4	1 49.0	1 54.2	2 0.0	2 6.5	2 14.0	2 18.2	2 22.7	17 30
1 39.6	1 43.6	1 48.2	1 53.3	1 59.0	2 5.5	2 12.9	2 17.0	2 21.5	20
1 38.6	1 42.6	1 47.1	1 52.1	1 57.8	2 4.3	2 11.6	2 15.6	2 20.0	10
1 37.5	1 41.4	1 45.9	1 50.8	1 56.4	2 2.8	2 10.0	2 14.0	2 18.3	17 0
1 36.2	1 40.0	1 44.4	1 49.3	1 54.8	2 1.1	2 8.2	2 12.1	2 16.4	16 50
1 34.7	1 38.5	1 42.8	1 47.6	1 53.0	1 59.1	2 6.1	2 10.0	2 14.2	40
1 33.0	1 36.7	1 40.9	1 45.6	1 51.0	1 57.0	2 3.8	2 7.6	2 11.7	16 30
1 31.1	1 34.8	1 38.9	1 43.5	1 48.7	1 54.6	2 1.3	2 5.0	2 9.0	20
1 29.1	1 32.7	1 36.7	1 41.2	1 46.3	1 52.0	1 58.6	2 2.2	2 6.1	10
1 26.9	1 30.4	1 34.3	1 38.7	1 43.6	1 49.2	1 55.6	1 59.2	2 3.0	16 0
1 24.6	1 28.0	1 31.8	1 36.0	1 40.8	1 46.3	1 52.5	1 55.9	1 59.6	15 50
1 22.1	1 25.4	1 29.1	1 33.2	1 37.8	1 43.1	1 49.1	1 52.4	1 56.0	40
1 19.4	1 22.6	1 26.2	1 30.2	1 34.6	1 39.7	1 45.5	1 48.7	1 52.2	15 30
1 16.7	1 19.7	1 23.1	1 27.0	1 31.3	1 36.2	1 41.8	1 44.9	1 48.2	20
1 13.7	1 16.7	1 19.9	1 23.6	1 27.8	1 32.5	1 37.9	1 40.8	1 44.0	10
1 10.7	1 13.5	1 16.6	1 20.1	1 24.1	1 28.6	1 33.8	1 36.6	1 39.7	15 0
1 7.5	1 10.2	1 13.1	1 16.5	1 20.3	1 24.6	1 29.5	1 32.2	1 35.1	14 50
1 4.1	1 6.7	1 9.5	1 12.7	1 16.3	1 20.4	1 25.1	1 27.6	1 30.4	40
1 0.7	1 3.1	1 5.8	1 8.8	1 12.2	1 16.1	1 20.5	1 22.9	1 25.5	14 30
0 57.2	0 59.4	1 2.0	1 4.8	1 8.0	1 11.6	1 15.8	1 18.1	1 20.5	20
0 53.5	0 55.6	0 58.0	1 0.7	1 3.6	1 7.0	1 10.9	1 13.1	1 15.4	10
0 49.8	*0 51.8*	*0 53.9*	*0 56.4*	0 59.2	1 2.3	1 6.0	1 8.0	1 10.1	14 0

TABLE IV.

AZIMUTH OF POLARIS AT ALL HOUR ANGLES, 1917.

[For hour angles 0h to 12h the star is west of north, and for hour angles 12h to 24h it is east of

H.A. \ Lat.	48°	50°	52°	54°	56°	58°	60°	61°	62°	Lat
h m	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	
10 0	0 49.8	0 51.8	0 53.9	0 56.4	0 59.2	1 2.3	1 6.0	1 8.0	1 10.1	1
10	0 46.0	0 47.8	0 49.8	0 52.1	0 54.6	0 57.5	1 0.9	1 2.7	1 4.7	1
20	0 42.1	0 43.7	0 45.6	0 47.6	0 50.0	0 52.6	0 55.7	0 57.4	0 59.2	
10 30	0 38.1	0 39.6	0 41.2	0 43.1	0 45.2	0 47.6	0 50.4	0 51.9	0 53.5	1
40	0 34.0	0 35.3	0 36.8	0 38.5	0 40.4	0 42.5	0 45.0	0 46.4	0 47.8	
50	0 29.9	0 31.1	0 32.4	0 33.8	0 35.5	0 37.4	0 39.6	0 40.7	0 42.0	
11 0	0 25.7	0 26.7	0 27.9	0 29.1	0 30.5	0 32.2	0 34.0	0 35.0	0 36.1	1
10	0 21.5	0 22.3	0 23.3	0 24.3	0 25.5	0 26.9	0 28.5	0 29.3	0 30.2	1
20	0 17.2	0 17.9	0 18.7	0 19.5	0 20.5	0 21.6	0 22.8	0 23.5	0 24.2	
11 30	0 13.0	0 13.5	0 14.0	0 14.7	0 15.4	0 16.2	0 17.2	0 17.7	0 18.2	1
40	0 8.6	0 9.0	0 9.4	0 9.8	0 10.3	0 10.8	0 11.5	0 11.8	0 12.2	
50	0 4.3	0 4.5	0 4.7	0 4.9	0 5.1	0 5.4	0 5.7	0 5.9	0 6.1	
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	1

H.A. \ Lat.	62°	63°	64°	65°	66°	67°	68°	69°	70°	Lat
h m	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	h
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
10	0 6.6	0 6.8	0 7.0	0 7.3	0 7.6	0 8.0	0 8.3	0 8.7	0 9.2	23
20	0 13.1	0 13.6	0 14.1	0 14.6	0 15.2	0 15.9	0 16.6	0 17.4	0 18.3	
0 30	0 19.6	0 20.3	0 21.1	0 21.9	0 22.8	0 23.8	0 24.9	0 26.1	0 27.4	23
40	0 26.1	0 27.0	0 28.0	0 29.1	0 30.3	0 31.6	0 33.1	0 34.7	0 36.4	
50	0 32.5	0 33.7	0 34.9	0 36.3	0 37.8	0 39.4	0 41.2	0 43.2	0 45.4	
1 0	0 38.8	0 40.2	0 41.7	0 43.4	0 45.2	0 47.1	0 49.2	0 51.6	0 54.2	23
10	0 45.1	0 46.7	0 48.5	0 50.4	0 52.4	0 54.7	0 57.2	0 59.9	1 3.0	22
20	0 51.3	0 53.1	0 55.1	0 57.2	0 59.6	1 2.2	1 5.0	1 8.1	1 11.6	
1 30	0 57.3	0 59.4	1 1.6	1 4.0	1 6.6	1 9.5	1 12.7	1 16.1	1 20.0	22
40	1 3.3	1 5.5	1 8.0	1 10.6	1 13.5	1 16.7	1 20.2	1 24.0	1 28.2	
50	1 9.1	1 11.5	1 14.2	1 17.1	1 20.2	1 23.7	1 27.5	1 31.7	1 36.3	
2 0	1 14.7	1 17.4	1 20.3	1 23.4	1 26.8	1 30.5	1 34.6	1 39.2	1 44.2	2
10	1 20.2	1 23.1	1 26.2	1 29.5	1 33.2	1 37.2	1 41.6	1 46.4	1 51.8	2
20	1 25.6	1 28.6	1 31.9	1 35.5	1 39.4	1 43.6	1 48.3	1 53.5	1 59.2	
2 30	1 30.7	1 33.9	1 37.4	1 41.2	1 45.3	1 49.8	1 54.8	2 0.2	2 6.3	2
40	1 35.7	1 39.1	1 42.7	1 46.7	1 51.1	1 55.8	2 1.0	2 6.8	2 13.1	
50	1 40.5	1 44.0	1 47.8	1 52.0	1 56.6	2 1.6	2 7.0	2 13.0	2 19.7	
3 0	1 45.0	1 48.7	1 52.7	1 57.1	2 1.9	2 7.1	2 12.7	2 19.0	2 26.0	2
10	1 49.4	1 53.2	1 57.4	2 1.9	2 6.9	2 12.3	2 18.2	2 24.7	2 31.9	2
20	1 53.5	1 57.5	2 1.8	2 6.5	2 11.6	2 17.2	2 23.3	2 30.1	2 37.5	
3 30	1 57.4	2 1.5	2 6.0	2 10.8	2 16.1	2 21.9	2 28.2	2 35.1	2 42.8	2
40	2 1.0	2 5.3	2 9.9	2 14.9	2 20.3	2 26.2	2 32.7	2 39.9	2 47.8	
50	2 4.5	2 8.8	2 13.5	2 18.6	2 24.2	2 30.3	2 37.0	2 44.3	2 52.4	
4 0	2 7.6	2 12.1	2 16.9	2 22.1	2 27.8	2 34.0	2 40.9	2 48.4	2 56.6	2
10	2 10.5	2 15.1	2 20.0	2 25.3	2 31.1	2 37.5	2 44.4	2 52.1	3 0.5	
20	2 13.2	2 17.8	2 22.8	2 28.2	2 34.1	2 40.6	2 47.7	2 55.5	3 4.0	
4 30	2 15.5	2 20.2	2 25.3	2 30.8	2 36.8	2 43.4	2 50.6	2 58.5	3 7.2	
40	2 17.6	2 22.4	2 27.5	2 33.1	2 39.2	2 45.9	2 53.1	3 1.1	3 10.0	
50	2 19.5	2 24.3	2 29.5	2 35.2	2 41.3	2 48.0	2 55.4	3 3.4	3 12.4	
5 0	2 21.0	2 25.9	2 31.2	2 36.9	2 43.1	2 49.8	2 57.2	3 5.4	3 14.4	
10	2 22.3	2 27.2	2 32.5	2 38.2	2 44.5	2 51.3	2 58.8	3 7.0	3 16.0	
20	2 23.3	2 28.2	2 33.6	2 39.3	2 45.6	2 52.5	2 59.9	3 8.2	3 17.2	
5 30	2 24.1	2 29.0	2 34.3	2 40.1	2 46.4	2 53.3	3 0.8	3 9.0	3 18.1	
40	2 24.5	2 29.5	2 34.8	2 40.6	2 46.9	2 53.7	3 1.2	3 9.5	3 18.6	
50	2 24.7	2 29.6	2 35.0	2 40.8	2 47.0	2 53.9	3 1.4	3 9.6	3 18.7	
6 0	2 24.6	2 29.5	2 34.8	2 40.6	2 46.9	2 53.7	3 1.2	3 9.4	3 18.4	

AZIMUTH OF POLARIS AT ALL HOUR ANGLES, 1917.

ngles 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.]

62°	63°	64°	65°	66°	67°	68°	69°	70°	Lat. / H.A.
° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	h m
2 24.6	2 29.5	2 34.8	2 40.6	2 46.9	2 53.7	3 1.2	3 9.4	3 18.4	18 0
2 24.2	2 29.1	2 34.4	2 40.2	2 46.4	2 53.2	3 0.6	3 8.7	3 17.7	17 50
2 23.6	2 28.5	2 33.7	2 39.4	2 45.6	2 52.3	2 59.7	3 7.8	3 16.7	40
2 22.7	2 27.5	2 32.7	2 38.4	2 44.5	2 51.2	2 58.5	3 6.5	3 15.3	17 30
2 21.5	2 26.3	2 31.4	2 37.0	2 43.1	2 49.7	2 56.9	3 4.8	3 13.5	20
2 20.0	2 24.8	2 29.9	2 35.4	2 41.4	2 47.9	2 55.0	3 2.8	3 11.4	10
2 18.3	2 23.0	2 28.0	2 33.5	2 39.4	2 45.8	2 52.8	3 0.5	3 9.0	17 0
2 16.4	2 21.0	2 25.9	2 31.3	2 37.1	2 43.4	2 50.3	2 57.8	3 6.2	16 50
2 14.2	2 18.7	2 23.5	2 28.8	2 34.5	2 40.7	2 47.4	2 54.9	3 3.0	40
2 11.7	2 16.1	2 20.9	2 26.0	2 31.6	2 37.7	2 44.3	2 51.6	2 59.6	16 30
2 9.0	2 13.3	2 18.0	2 23.0	2 28.5	2 34.4	2 40.9	2 48.0	2 55.8	20
2 6.1	2 10.3	2 14.8	2 19.7	2 25.1	2 30.8	2 37.2	2 44.1	2 51.7	10
2 3.0	2 7.1	2 11.5	2 16.2	2 21.4	2 27.0	2 33.2	2 39.9	2 47.3	16 0
1 59.6	2 3.6	2 7.8	2 12.5	2 17.5	2 23.0	2 28.9	2 35.4	2 42.6	15 50
1 56.0	1 59.8	2 4.0	2 8.5	2 13.3	2 18.6	2 24.4	2 30.7	2 37.6	40
1 52.2	1 55.9	1 59.9	2 4.2	2 8.9	2 14.0	2 19.6	2 25.7	2 32.4	15 30
1 48.2	1 51.8	1 55.6	1 59.8	2 4.3	2 9.2	2 14.6	2 20.5	2 26.9	20
1 44.0	1 47.5	1 51.2	1 55.2	1 59.5	2 4.2	2 9.4	2 15.0	2 21.2	10
1 39.7	1 42.9	1 46.5	1 50.3	1 54.5	1 59.0	2 3.9	2 9.3	2 15.2	15 0
1 35.1	1 38.2	1 41.6	1 45.3	1 49.2	1 53.5	1 58.2	2 3.3	2 8.9	14 50
1 30.4	1 33.4	1 36.6	1 40.0	1 43.8	1 47.9	1 52.3	1 57.2	2 2.5	40
1 25.5	1 28.3	1 31.4	1 34.6	1 38.2	1 42.0	1 46.2	1 50.8	1 55.9	14 30
1 20.5	1 23.1	1 26.0	1 29.1	1 32.4	1 36.0	1 40.0	1 44.3	1 49.0	20
1 15.4	1 17.8	1 20.5	1 23.4	1 26.5	1 29.9	1 33.6	1 37.6	1 42.0	10
1 10.1	1 12.4	1 14.8	1 17.5	1 20.4	1 23.5	1 27.0	1 30.7	1 34.8	14 0
1 4.7	1 6.8	1 9.1	1 11.5	1 14.2	1 17.1	1 20.2	1 23.7	1 27.5	13 50
0 59.2	1 1.1	1 3.2	1 5.4	1 7.8	1 10.5	1 13.4	1 16.5	1 20.0	40
0 53.5	0 55.3	0 57.2	0 59.2	1 1.4	1 3.8	1 6.4	1 9.2	1 12.4	13 30
0 47.8	0 49.4	0 51.1	0 52.9	0 54.8	0 57.0	0 59.3	1 1.8	1 4.6	20
0 42.0	0 43.4	0 44.9	0 46.5	0 48.2	0 50.1	0 52.1	0 54.3	0 56.8	10
0 36.1	0 37.3	0 38.6	0 40.0	0 41.5	0 43.1	0 44.8	0 46.7	0 48.8	13 0
0 30.2	0 31.2	0 32.3	0 33.4	0 34.7	0 36.0	0 37.5	0 39.1	0 40.8	12 50
0 24.2	0 25.0	0 25.9	0 26.8	0 27.8	0 28.9	0 30.0	0 31.3	0 32.7	40
0 18.2	0 18.8	0 19.4	0 20.1	0 20.9	0 21.7	0 22.6	0 23.5	0 24.6	12 30
0 12.2	0 12.6	0 13.0	0 13.4	0 13.9	0 14.5	0 15.1	0 15.7	0 16.4	20
0 6.1	0 6.3	0 6.5	0 6.7	0 7.0	0 7.2	0 7.5	0 7.9	0 8.2	10
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.

IV has been computed for a declination of 88° 52′ 5″. For other declinations of Polaris ion given below should be applied to the Azimuth taken from Table IV.

th. /	0′	20′	40′	60′	80′	100′	120′	140′	160′	180′	200′	Azimuth. / Decl.
′	′	′	′	′	′	′	′	′	′	′	′	° ′ ″
)	0.0	+0.1	+0.2	+0.4	+0.5	+0.6	+0.7	+0.8	+1.0	+1.1	+1.2	88 51 40
)	0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0	88 51 45
)	0.0	+0.1	0.1	0.2	0.3	0.4	0.4	0.5	0.6	0.7	0.7	88 51 50
)	0.0	0.0	+0.1	0.1	0.2	0.2	0.3	0.3	0.4	0.4	0.5	88 51 55
)	0.0	0.0	0.0	+0.1	+0.1	+0.1	+0.1	+0.2	+0.2	+0.2	+0.2	88 52 0
)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	88 52 5
)	0.0	0.0	0.0	−0.1	−0.1	−0.1	−0.1	−0.2	−0.2	−0.2	−0.2	88 52 10
)	0.0	0.0	−0.1	−0.1	−0.2	−0.2	−0.3	−0.3	−0.4	−0.4	−0.5	88 52 15
)	*0.0*	*−0.1*	*0.1*	*0.2*	*0.3*	*0.4*	*0.4*	*0.5*	*0.6*	*0.7*	*0.7*	*88 52 20*
	0.0	*0.1*	*0.2*	*0.3*	*0.4*	*0.5*	*0.6*	*0.7*	*0.8*	*0.9*	*1.0*	*88 52 25*
	0.0	*−0.1*	*−0.2*	*−0.4*	*−0.5*	*−0.6*	*−0.7*	*−0.8*	*−1.0*	*−1.1*	*−1.2*	*88 52 30*

TABLE V.

AZIMUTH OF POLARIS AT ELONGATION, 1917.

Lat. \ Decl.	88° 51′ 40″	88° 51′ 50″	88° 52′ 0″	88° 52′ 10″	88° 52′ 20″	88° 52′ 30″	Variation for 1′ of Lat.
° ′	° ′ ″	° ′ ″	° ′ ″	° ′ ″	° ′ ″	° ′ ″	″
10 0	1 9 23.3	1 9 13.1	1 9 2.9	1 8 52.8	1 8 42.6	1 8 32.5	+0.21
10 20	1 9 27.6	1 9 17.4	1 9 7.3	1 8 57.1	1 8 46.9	1 8 36.8	0.22
10 40	1 9 32.1	1 9 21.9	1 9 11.8	1 9 1.6	1 8 51.4	1 8 41.2	0.23
11 0	1 9 36.8	1 9 26.6	1 9 16.4	1 9 6.2	1 8 56.0	1 8 45.8	0.24
11 20	1 9 41.6	1 9 31.4	1 9 21.2	1 9 11.0	1 9 0.8	1 8 50.6	0.24
11 40	1 9 46.5	1 9 36.3	1 9 26.1	1 9 15.9	1 9 5.7	1 8 55.5	+0.25
12 0	1 9 51.6	1 9 41.4	1 9 31.2	1 9 20.9	1 9 10.7	1 9 0.5	0.26
12 20	1 9 56.9	1 9 46.6	1 9 36.4	1 9 26.2	1 9 15.9	1 9 5.7	0.27
12 40	1 10 2.3	1 9 52.0	1 9 41.8	1 9 31.5	1 9 21.3	1 9 11.0	0.27
13 0	1 10 7.9	1 9 57.6	1 9 47.3	1 9 37.1	1 9 26.8	1 9 16.5	0.28
13 20	1 10 13.6	1 10 3.3	1 9 53.0	1 9 42.8	1 9 32.5	1 9 22.2	+0.29
13 40	1 10 19.5	1 10 9.2	1 9 58.9	1 9 48.6	1 9 38.3	1 9 28.0	0.30
14 0	1 10 25.5	1 10 15.2	1 10 4.9	1 9 54.6	1 9 44.3	1 9 34.0	0.30
14 20	1 10 31.7	1 10 21.4	1 10 11.1	1 10 0.8	1 9 50.5	1 9 40.1	0.31
14 40	1 10 38.1	1 10 27.8	1 10 17.4	1 10 7.1	1 9 56.8	1 9 46.4	0.32
15 0	1 10 44.6	1 10 34.3	1 10 23.9	1 10 13.6	1 10 3.2	1 9 52.9	+0.33
15 20	1 10 51.4	1 10 41.0	1 10 30.6	1 10 20.2	1 10 9.9	1 9 59.5	0.34
15 40	1 10 58.2	1 10 47.8	1 10 37.4	1 10 27.1	1 10 16.7	1 10 6.3	0.34
16 0	1 11 5.2	1 10 54.8	1 10 44.4	1 10 34.0	1 10 23.6	1 10 13.2	0.35
16 20	1 11 12.4	1 11 2.0	1 10 51.6	1 10 41.2	1 10 30.8	1 10 20.3	0.36
16 40	1 11 19.8	1 11 9.4	1 10 58.9	1 10 48.5	1 10 38.1	1 10 27.6	+0.37
17 0	1 11 27.4	1 11 16.9	1 11 6.4	1 10 56.0	1 10 45.5	1 10 35.1	0.38
17 20	1 11 35.1	1 11 24.6	1 11 14.1	1 11 3.6	1 10 53.2	1 10 42.7	0.39
17 40	1 11 43.0	1 11 32.5	1 11 22.0	1 11 11.5	1 11 1.0	1 10 50.5	0.40
18 0	1 11 51.0	1 11 40.5	1 11 30.0	1 11 19.5	1 11 9.0	1 10 58.5	0.40
18 20	1 11 59.3	1 11 48.7	1 11 38.2	1 11 27.7	1 11 17.1	1 11 6.6	+0.41
18 40	1 12 7.7	1 11 57.1	1 11 46.6	1 11 36.0	1 11 25.5	1 11 14.9	0.42
19 0	1 12 16.3	1 12 5.7	1 11 55.1	1 11 44.5	1 11 34.0	1 11 23.4	0.43
19 20	1 12 25.1	1 12 14.5	1 12 3.9	1 11 53.3	1 11 42.7	1 11 32.1	0.44
19 40	1 12 34.0	1 12 23.4	1 12 12.8	1 12 2.2	1 11 51.5	1 11 40.9	0.45
20 0	1 12 43.2	1 12 32.5	1 12 21.9	1 12 11.2	1 12 0.6	1 11 50.0	+0.46
20 20	1 12 52.5	1 12 41.8	1 12 31.2	1 12 20.5	1 12 9.8	1 11 59.2	0.47
20 40	1 13 2.0	1 12 51.3	1 12 40.7	1 12 30.0	1 12 19.3	1 12 8.6	0.48
21 0	1 13 11.7	1 13 1.0	1 12 50.3	1 12 39.6	1 12 28.9	1 12 18.2	0.49
21 20	1 13 21.6	1 13 10.9	1 13 0.2	1 12 49.4	1 12 38.7	1 12 28.0	0.50
21 40	1 13 31.7	1 13 21.0	1 13 10.2	1 12 59.5	1 12 48.7	1 12 37.9	+0.51
22 0	1 13 42.0	1 13 31.2	1 13 20.5	1 13 9.7	1 12 58.9	1 12 48.1	0.52
22 20	1 13 52.5	1 13 41.7	1 13 30.9	1 13 20.1	1 13 9.3	1 12 58.5	0.53
22 40	1 14 3.2	1 13 52.4	1 13 41.6	1 13 30.7	1 13 19.9	1 13 9.0	0.54
23 0	1 14 14.1	1 14 3.3	1 13 52.4	1 13 41.5	1 13 30.7	1 13 19.8	0.55
23 20	1 14 25.2	1 14 14.3	1 14 3.4	1 13 52.6	1 13 41.7	1 13 30.8	+0.56
23 40	1 14 36.5	1 14 25.6	1 14 14.7	1 14 3.8	1 13 52.9	1 13 42.0	0.57
24 0	1 14 48.1	1 14 37.1	1 14 26.2	1 14 15.2	1 14 4.3	1 13 53.3	0.58
24 20	1 14 59.8	1 14 48.8	1 14 37.9	1 14 26.9	1 14 15.9	1 14 4.9	0.59
24 40	1 15 11.8	1 15 0.8	1 14 49.7	1 14 38.7	1 14 27.7	1 14 16.7	0.60
25 0	1 15 23.9	1 15 12.9	1 15 1.8	1 14 50.8	1 14 39.8	1 14 28.7	+0.61
25 20	1 15 36.3	1 15 25.2	1 15 14.2	1 15 3.1	1 14 52.0	1 14 41.0	0.62
25 40	1 15 48.9	1 15 37.8	1 15 26.7	1 15 15.6	1 15 4.5	1 14 53.4	0.63
26 0	1 16 1.7	1 15 50.6	1 15 39.5	1 15 28.4	1 15 17.2	1 15 6.1	0.64
26 20	1 16 14.8	1 16 3.6	1 15 52.5	1 15 41.3	1 15 30.2	1 15 19.0	0.65
26 40	1 16 28.1	1 16 16.9	1 16 5.7	1 15 54.5	1 15 43.3	1 15 32.1	+0.67
27 0	1 16 41.6	1 16 30.4	1 16 19.2	1 16 7.9	1 15 56.7	1 15 45.5	0.68
27 20	1 16 55.4	1 16 44.1	1 16 32.9	1 16 21.6	1 16 10.3	1 15 59.1	0.69
27 40	1 17 9.4	1 16 58.1	1 16 46.8	1 16 35.5	1 16 24.2	1 16 12.9	0.70
28 0	1 17 23.6	1 17 12.3	1 17 1.0	1 16 49.6	1 16 38.3	1 16 27.0	0.71
28 20	1 17 38.1	1 17 26.8	1 17 15.4	1 17 4.0	1 16 52.7	1 16 41.3	+0.73
28 40	1 17 52.8	1 17 41.5	1 17 30.1	1 17 18.7	1 17 7.3	1 16 55.9	0.74
29 0	1 18 7.8	1 17 56.4	1 17 45.0	1 17 33.5	1 17 22.1	1 17 10.7	0.75
29 20	1 18 23.1	1 18 11.6	1 18 0.2	1 17 48.7	1 17 37.2	1 17 25.7	0.76
29 40	*1 18 38.6*	1 18 27.1	1 18 15.6	1 18 4.1	1 17 52.6	1 17 41.0	0.7
30 0	*1 18 54.4*	1 18 42.8	1 18 31.3	1 18 19.7	1 18 8.2	1 17 56.6	+0

AZIMUTH OF POLARIS AT ELONGATION, 1917.

Hour Angle	88° 51′ 40″	88° 51′ 50″	88° 52′ 0″	88° 52′ 10″	88° 52′ 20″	88° 52′ 30″	Variation for— 1′ of Lat.	Variation for— 1″ of δ.
h m	° ′ ″	° ′ ″	° ′ ″	° ′ ″	° ′ ″	° ′ ″	″	″
0 0	1 18 54.4	1 18 42.8	1 18 31.3	1 18 19.7	1 18 8.2	1 17 56.6	+0.79	−1.16
10	1 19 2.4	1 18 50.8	1 18 39.2	1 18 27.7	1 18 16.1	1 18 4.5	0.80	1.16
20	1 19 10.4	1 18 58.8	1 18 47.2	1 18 35.7	1 18 24.1	1 18 12.5	0.80	1.16
30	1 19 18.5	1 19 6.9	1 18 55.3	1 18 43.7	1 18 32.1	1 18 20.5	0.81	1.16
40	1 19 26.7	1 19 15.1	1 19 3.5	1 18 51.8	1 18 40.2	1 18 28.6	0.82	1.16
50	1 19 35.0	1 19 23.3	1 19 11.7	1 19 0.0	1 18 48.4	1 18 36.8	+0.82	−1.16
0	1 19 43.3	1 19 31.6	1 19 20.0	1 19 8.3	1 18 56.6	1 18 45.0	0.83	1.17
10	1 19 51.7	1 19 40.0	1 19 28.3	1 19 16.6	1 19 4.9	1 18 53.3	0.84	1.17
20	1 20 0.2	1 19 48.5	1 19 36.8	1 19 25.0	1 19 13.3	1 19 1.6	0.85	1.17
30	1 20 8.7	1 19 57.0	1 19 45.3	1 19 33.5	1 19 21.8	1 19 10.1	0.85	1.17
40	1 20 17.3	1 20 5.6	1 19 53.8	1 19 42.1	1 19 30.3	1 19 18.6	+0.86	−1.17
50	1 20 26.0	1 20 14.2	1 20 2.5	1 19 50.7	1 19 38.9	1 19 27.2	0.87	1.18
0	1 20 34.8	1 20 23.0	1 20 11.2	1 19 59.4	1 19 47.6	1 19 35.8	0.87	1.18
10	1 20 43.6	1 20 31.8	1 20 19.9	1 20 8.1	1 19 56.3	1 19 44.5	0.88	1.18
20	1 20 52.5	1 20 40.6	1 20 28.8	1 20 17.0	1 20 5.1	1 19 53.3	0.89	1.18
30	1 21 1.5	1 20 49.6	1 20 37.7	1 20 25.9	1 20 14.0	1 20 2.2	+0.90	−1.19
40	1 21 10.5	1 20 58.6	1 20 46.7	1 20 34.9	1 20 23.0	1 20 11.1	0.90	1.19
50	1 21 19.6	1 21 7.7	1 20 55.8	1 20 43.9	1 20 32.0	1 20 20.1	0.91	1.19
0	1 21 28.8	1 21 16.9	1 21 5.0	1 20 53.1	1 20 41.1	1 20 29.2	0.92	1.19
10	1 21 38.1	1 21 26.2	1 21 14.2	1 21 2.3	1 20 50.3	1 20 38.4	0.92	1.19
20	1 21 47.4	1 21 35.5	1 21 23.5	1 21 11.5	1 20 59.6	1 20 47.6	+0.93	−1.20
30	1 21 56.9	1 21 44.9	1 21 32.9	1 21 20.9	1 21 8.9	1 20 56.9	0.94	1.20
40	1 22 6.4	1 21 54.4	1 21 42.4	1 21 30.3	1 21 18.3	1 21 6.3	0.95	1.20
50	1 22 16.0	1 22 3.9	1 21 51.9	1 21 39.9	1 21 27.8	1 21 15.8	0.96	1.20
0	1 22 25.6	1 22 13.6	1 22 1.5	1 21 49.5	1 21 37.4	1 21 25.3	0.96	1.21
10	1 22 35.4	1 22 23.3	1 22 11.2	1 21 59.1	1 21 47.0	1 21 34.9	+0.97	−1.21
20	1 22 45.2	1 22 33.1	1 22 21.0	1 22 8.9	1 21 56.8	1 21 44.6	0.98	1.21
30	1 22 55.1	1 22 43.0	1 22 30.9	1 22 18.7	1 22 6.6	1 21 54.4	0.99	1.21
40	1 23 5.1	1 22 53.0	1 22 40.8	1 22 28.6	1 22 16.5	1 22 4.3	1.00	1.22
50	1 23 15.2	1 23 3.0	1 22 50.8	1 22 38.6	1 22 26.5	1 22 14.3	1.00	1.22
0	1 23 25.3	1 23 13.1	1 23 0.9	1 22 48.7	1 22 36.5	1 22 24.3	+1.01	−1.22
10	1 23 35.6	1 23 23.4	1 23 11.1	1 22 58.9	1 22 46.6	1 22 34.4	1.02	1.22
20	1 23 45.9	1 23 33.6	1 23 21.4	1 23 9.1	1 22 56.9	1 22 44.6	1.03	1.23
30	1 23 56.3	1 23 44.0	1 23 31.7	1 23 19.5	1 23 7.2	1 22 54.9	1.04	1.23
40	1 24 6.8	1 23 54.5	1 23 42.2	1 23 29.9	1 23 17.6	1 23 5.3	1.05	1.23
50	1 24 17.4	1 24 5.0	1 23 52.7	1 23 40.4	1 23 28.0	1 23 15.7	+1.06	−1.23
0	1 24 28.0	1 24 15.7	1 24 3.3	1 23 51.0	1 23 38.6	1 23 26.2	1.06	1.24
10	1 24 38.8	1 24 26.4	1 24 14.0	1 24 1.6	1 23 49.3	1 23 36.9	1.07	1.24
20	1 24 49.6	1 24 37.2	1 24 24.8	1 24 12.4	1 24 0.0	1 23 47.6	1.08	1.24
30	1 25 0.6	1 24 48.2	1 24 35.7	1 24 23.3	1 24 10.8	1 23 58.4	1.09	1.24
40	1 25 11.6	1 24 59.2	1 24 46.7	1 24 34.2	1 24 21.7	1 24 9.3	+1.10	−1.25
50	1 25 22.7	1 25 10.2	1 24 57.7	1 24 45.2	1 24 32.7	1 24 20.2	1.11	1.25
0	1 25 34.0	1 25 21.4	1 25 8.9	1 24 56.4	1 24 43.9	1 24 31.3	1.12	1.25
10	1 25 45.2	1 25 32.7	1 25 20.1	1 25 7.6	1 24 55.1	1 24 42.5	1.13	1.25
20	1 25 56.6	1 25 44.1	1 25 31.5	1 25 18.9	1 25 6.3	1 24 53.8	1.14	1.26
30	1 26 8.1	1 25 55.5	1 25 42.9	1 25 30.3	1 25 17.7	1 25 5.1	+1.15	−1.26
40	1 26 19.7	1 26 7.1	1 25 54.5	1 25 41.8	1 25 29.2	1 25 16.5	1.16	1.26
50	1 26 31.4	1 26 18.7	1 26 6.1	1 25 53.4	1 25 40.8	1 25 28.1	1.16	1.27
0	1 26 43.2	1 26 30.5	1 26 17.8	1 26 5.1	1 25 52.4	1 25 39.7	1.17	1.27
10	1 26 55.1	1 26 42.3	1 26 29.6	1 26 16.9	1 26 4.2	1 25 51.5	1.18	1.27
20	1 27 7.0	1 26 54.3	1 26 41.5	1 26 28.8	1 26 16.0	1 26 3.3	+1.19	−1.27
30	1 27 19.1	1 27 6.3	1 26 53.5	1 26 40.8	1 26 28.0	1 26 15.2	1.20	1.28
40	1 27 31.3	1 27 18.5	1 27 5.7	1 26 52.9	1 26 40.0	1 26 27.2	1.21	1.28
50	1 27 43.6	1 27 30.7	1 27 17.9	1 27 5.0	1 26 52.2	1 26 39.4	1.22	1.28
0	1 27 55.9	1 27 43.1	1 27 30.2	1 27 17.3	1 27 4.5	1 26 51.6	1.23	1.29
10	1 28 8.4	1 27 55.5	1 27 42.6	1 27 29.7	1 27 16.8	1 27 3.9	+1.24	−1.29
20	1 28 21.0	1 28 8.1	1 27 55.1	1 27 42.2	1 27 29.3	1 27 16.4	1.26	1.29
30	1 28 33.7	1 28 20.7	1 28 7.8	1 27 54.8	1 27 41.9	1 27 28.9	1.27	1.30
40	1 28 46.5	1 28 33.5	1 28 20.5	1 28 7.5	1 27 54.5	1 27 41.5	1.28	1.30
50	*1 28 59.4*	*1 28 46.4*	1 28 33.4	1 28 20.3	1 28 7.3	1 27 54.3	1.29	1.30
0	*1 29 12.4*	*1 28 59.4*	1 28 46.3	1 28 33.2	1 28 20.2	1 28 7.1	+1.30	−1.31

TABLE V.

AZIMUTH OF POLARIS AT ELONGATION, 1917.

Lat. \ Decl.	88° 51′ 40″	88° 51′ 50″	88° 52′ 0″	88° 52′ 10″	88° 52′ 20″	88° 52′ 30″	Variation 1′ of Lat.
° ′	° ′ ″	° ′ ″	° ′ ″	° ′ ″	° ′ ″	° ′ ″	″
40 0	1 29 12.4	1 28 59.4	1 28 46.3	1 28 33.2	1 28 20.2	1 28 7.1	+1.30
40 10	1 29 25.5	1 29 12.4	1 28 59.4	1 28 46.3	1 28 33.2	1 28 20.1	1.31
40 20	1 29 38.8	1 29 25.7	1 29 12.5	1 28 59.4	1 28 46.3	1 28 33.2	1.32
40 30	1 29 52.1	1 29 39.0	1 29 25.8	1 29 12.7	1 28 59.5	1 28 46.4	1.33
40 40	1 30 5.6	1 29 52.4	1 29 39.2	1 29 26.0	1 29 12.8	1 28 59.6	1.34
40 50	1 30 19.1	1 30 5.9	1 29 52.7	1 29 39.5	1 29 26.3	1 29 13.0	+1.35
41 0	1 30 32.8	1 30 19.6	1 30 6.3	1 29 53.1	1 29 39.8	1 29 26.6	1.37
41 10	1 30 46.6	1 30 33.3	1 30 20.1	1 30 6.8	1 29 53.5	1 29 40.2	1.38
41 20	1 31 0.5	1 30 47.2	1 30 33.9	1 30 20.6	1 30 7.3	1 29 53.9	1.39
41 30	1 31 14.6	1 31 1.2	1 30 47.9	1 30 34.5	1 30 21.2	1 30 7.8	1.40
41 40	1 31 28.7	1 31 15.3	1 31 2.0	1 30 48.6	1 30 35.2	1 30 21.8	+1.41
41 50	1 31 43.0	1 31 29.6	1 31 16.2	1 31 2.7	1 30 49.3	1 30 35.9	1.42
42 0	1 31 57.4	1 31 43.9	1 31 30.5	1 31 17.0	1 31 3.6	1 30 50.1	1.43
42 10	1 32 11.9	1 31 58.4	1 31 44.9	1 31 31.4	1 31 17.9	1 31 4.4	1.45
42 20	1 32 26.5	1 32 13.0	1 31 59.5	1 31 46.0	1 31 32.4	1 31 18.9	1.46
42 30	1 32 41.3	1 32 27.7	1 32 14.2	1 32 0.6	1 31 47.0	1 31 33.5	+1.47
42 40	1 32 56.2	1 32 42.6	1 32 29.0	1 32 15.4	1 32 1.8	1 31 48.2	1.48
42 50	1 33 11.2	1 32 57.6	1 32 43.9	1 32 30.3	1 32 16.7	1 32 3.0	1.50
43 0	1 33 26.4	1 33 12.7	1 32 59.0	1 32 45.3	1 32 31.7	1 32 18.0	1.51
43 10	1 33 41.6	1 33 27.9	1 33 14.2	1 33 0.5	1 32 46.8	1 32 33.1	1.52
43 20	1 33 57.0	1 33 43.3	1 33 29.5	1 33 15.8	1 33 2.0	1 32 48.3	+1.54
43 30	1 34 12.6	1 33 58.8	1 33 45.0	1 33 31.2	1 33 17.4	1 33 3.6	1.55
43 40	1 34 28.3	1 34 14.4	1 34 0.6	1 33 46.8	1 33 33.0	1 33 19.1	1.56
43 50	1 34 44.1	1 34 30.2	1 34 16.3	1 34 2.5	1 33 48.6	1 33 34.7	1.58
44 0	1 35 0.0	1 34 46.1	1 34 32.2	1 34 18.3	1 34 4.4	1 33 50.5	1.59
44 10	1 35 16.1	1 35 2.2	1 34 48.2	1 34 34.3	1 34 20.3	1 34 6.4	+1.61
44 20	1 35 32.3	1 35 18.4	1 35 4.4	1 34 50.4	1 34 36.4	1 34 22.4	1.62
44 30	1 35 48.7	1 35 34.7	1 35 20.7	1 35 6.6	1 34 52.6	1 34 38.6	1.63
44 40	1 36 5.2	1 35 51.2	1 35 37.1	1 35 23.0	1 35 9.0	1 34 54.9	1.64
44 50	1 36 21.9	1 36 7.8	1 35 53.6	1 35 39.5	1 35 25.4	1 35 11.3	1.66
45 0	1 36 38.7	1 36 24.5	1 36 10.4	1 35 56.2	1 35 42.1	1 35 27.9	+1.68
45 10	1 36 55.6	1 36 41.4	1 36 27.2	1 36 13.0	1 35 58.9	1 35 44.7	1.69
45 20	1 37 12.7	1 36 58.5	1 36 44.2	1 36 30.0	1 36 15.8	1 36 1.6	1.71
45 30	1 37 29.9	1 37 15.7	1 37 1.4	1 36 47.1	1 36 32.9	1 36 18.6	1.72
45 40	1 37 47.3	1 37 33.0	1 37 18.7	1 37 4.4	1 36 50.1	1 36 35.8	1.74
45 50	1 38 4.9	1 37 50.5	1 37 36.2	1 37 21.8	1 37 7.5	1 36 53.1	+1.75
46 0	1 38 22.6	1 38 8.2	1 37 53.8	1 37 39.4	1 37 25.0	1 37 10.6	1.77
46 10	1 38 40.5	1 38 26.0	1 38 11.6	1 37 57.1	1 37 42.7	1 37 28.3	1.78
46 20	1 38 58.5	1 38 44.0	1 38 29.5	1 38 15.0	1 38 0.5	1 37 46.1	1.80
46 30	1 39 16.7	1 39 2.1	1 38 47.6	1 38 33.1	1 38 18.5	1 38 4.0	1.82
46 40	1 39 35.0	1 39 20.4	1 39 5.9	1 38 51.3	1 38 36.7	1 38 22.1	+1.83
46 50	1 39 53.5	1 39 38.9	1 39 24.3	1 39 9.7	1 38 55.0	1 38 40.4	1.85
47 0	1 40 12.2	1 39 57.5	1 39 42.9	1 39 28.2	1 39 13.5	1 38 58.9	1.86
47 10	1 40 31.0	1 40 16.3	1 40 1.6	1 39 46.9	1 39 32.2	1 39 17.5	1.88
47 20	1 40 50.1	1 40 35.3	1 40 20.5	1 40 5.8	1 39 51.0	1 39 36.3	1.90
47 30	1 41 9.2	1 40 54.4	1 40 39.6	1 40 24.8	1 40 10.0	1 39 55.2	+1.92
47 40	1 41 28.6	1 41 13.8	1 40 58.9	1 40 44.0	1 40 29.2	1 40 14.3	1.93
47 50	1 41 48.1	1 41 33.2	1 41 18.3	1 41 3.4	1 40 48.5	1 40 33.6	1.95
48 0	1 42 7.8	1 41 52.9	1 41 38.0	1 41 23.0	1 41 8.1	1 40 53.1	1.97
48 10	1 42 27.7	1 42 12.8	1 41 57.8	1 41 42.8	1 41 27.8	1 41 12.8	1.98
48 20	1 42 47.8	1 42 32.8	1 42 17.7	1 42 2.7	1 41 47.6	1 41 32.6	+2.00
48 30	1 43 8.1	1 42 53.0	1 42 37.9	1 42 22.8	1 42 7.7	1 41 52.6	2.02
48 40	1 43 28.5	1 43 13.4	1 42 58.2	1 42 43.1	1 42 27.9	1 42 12.8	2.04
48 50	1 43 49.2	1 43 34.0	1 43 18.8	1 43 3.6	1 42 48.4	1 42 33.2	2.06
49 0	1 44 10.0	1 43 54.7	1 43 39.5	1 43 24.2	1 43 9.0	1 42 53.8	2.08
49 10	1 44 31.0	1 44 15.7	1 44 0.4	1 43 45.1	1 43 29.8	1 43 14.5	+2.10
49 20	1 44 52.2	1 44 36.9	1 44 21.5	1 44 6.2	1 43 50.8	1 43 35.5	2.12
49 30	1 45 13.6	1 44 58.2	1 44 42.8	1 44 27.4	1 44 12.0	1 43 56.6	2.14
49 40	1 45 35.2	1 45 19.8	1 45 4.3	1 44 48.9	1 44 33.4	1 44 18.0	2.16
49 50	1 45 57.0	1 45 41.5	1 45 26.0	1 45 10.5	1 44 55.0	1 44 39.5	2.18
50 0	1 46 19.1	1 46 3.5	1 45 47.9	1 45 32.4	1 45 16.8	1 45 1.3	+2.2

AZIMUTH OF POLARIS AT ELONGATION, 1917.

88° 51′ 40″	88° 51′ 50″	88° 52′ 0″	88° 52′ 10″	88° 52′ 20″	88° 52′ 30″	Variation for— 1′ of Lat.	Variation for— 1″ of δ.
° ′ ″	° ′ ″	° ′ ″	° ′ ″	° ′ ″	° ′ ″	″	″
1 46 19.1	1 46 3.5	1 45 47.9	1 45 32.4	1 45 16.8	1 45 1.3	+2.20	−1.56
1 46 41.3	1 46 25.7	1 46 10.1	1 45 54.4	1 45 38.8	1 45 23.2	2.22	1.56
1 47 3.7	1 46 48.1	1 46 32.4	1 46 16.7	1 46 1.1	1 45 45.4	2.24	1.57
1 47 26.4	1 47 10.6	1 46 54.9	1 46 39.2	1 46 23.5	1 46 7.7	2.26	1.57
1 47 49.2	1 47 33.5	1 47 17.7	1 47 1.9	1 46 46.1	1 46 30.3	2.28	1.58
1 48 12.3	1 47 56.5	1 47 40.6	1 47 24.8	1 47 9.0	1 46 53.1	+2.30	−1.58
1 48 35.6	1 48 19.7	1 48 3.8	1 47 47.9	1 47 32.0	1 47 16.1	2.33	1.59
1 48 59.1	1 48 43.2	1 48 27.2	1 48 11.3	1 47 55.3	1 47 39.4	2.35	1.59
1 49 22.9	1 49 6.9	1 48 50.9	1 48 34.9	1 48 18.9	1 48 2.9	2.37	1.60
1 49 46.9	1 49 30.8	1 49 14.7	1 48 58.7	1 48 42.6	1 48 26.5	2.39	1.61
1 50 11.1	1 49 55.0	1 49 38.8	1 49 22.7	1 49 6.6	1 48 50.4	+2.42	−1.61
1 50 35.5	1 50 19.4	1 50 3.2	1 49 47.0	1 49 30.8	1 49 14.6	2.44	1.62
1 51 0.2	1 50 44.0	1 50 27.7	1 50 11.5	1 49 55.2	1 49 39.0	2.46	1.62
1 51 25.1	1 51 8.8	1 50 52.5	1 50 36.2	1 50 19.9	1 50 3.6	2.49	1.63
1 51 50.3	1 51 34.0	1 51 17.6	1 51 1.2	1 50 44.8	1 50 28.5	2.51	1.64
1 52 15.7	1 51 59.3	1 51 42.9	1 51 26.4	1 51 10.0	1 50 53.6	+2.54	−1.64
1 52 41.4	1 52 24.9	1 52 8.4	1 51 51.9	1 51 35.4	1 51 18.9	2.56	1.65
1 53 7.3	1 52 50.8	1 52 34.2	1 52 17.7	1 52 1.1	1 51 44.5	2.59	1.66
1 53 33.5	1 53 16.9	1 53 0.3	1 52 43.6	1 52 27.0	1 52 10.4	2.61	1.66
1 54 0.0	1 53 43.3	1 53 26.6	1 53 9.9	1 52 53.2	1 52 36.5	2.64	1.67
1 54 26.7	1 54 9.9	1 53 53.2	1 53 36.4	1 53 19.7	1 53 2.9	+2.67	−1.68
1 54 53.6	1 54 36.8	1 54 20.0	1 54 3.2	1 53 46.4	1 53 29.6	2.69	1.68
1 55 20.9	1 55 4.0	1 54 47.1	1 54 30.2	1 54 13.4	1 53 56.5	2.72	1.69
1 55 48.4	1 55 31.5	1 55 14.5	1 54 57.6	1 54 40.6	1 54 23.7	2.75	1.69
1 56 16.2	1 55 59.2	1 55 42.2	1 55 25.1	1 55 8.1	1 54 51.1	2.78	1.70
1 56 44.3	1 56 27.2	1 56 10.1	1 55 53.0	1 55 35.9	1 55 18.8	+2.80	−1.71
1 57 12.7	1 56 55.5	1 56 38.3	1 56 21.2	1 56 4.0	1 55 46.9	2.83	1.72
1 57 41.3	1 57 24.1	1 57 6.9	1 56 49.6	1 56 32.4	1 56 15.2	2.86	1.72
1 58 10.3	1 57 53.0	1 57 35.7	1 57 18.4	1 57 1.1	1 56 43.8	2.89	1.73
1 58 39.5	1 58 22.2	1 58 4.8	1 57 47.4	1 57 30.1	1 57 12.7	2.92	1.74
1 59 9.1	1 58 51.6	1 58 34.2	1 58 16.8	1 57 59.3	1 57 41.9	+2.95	−1.74
1 59 39.0	1 59 21.4	1 59 3.9	1 58 46.4	1 58 28.9	1 58 11.4	2.98	1.75
2 0 9.1	1 59 51.6	1 59 34.0	1 59 16.4	1 58 58.8	1 58 41.2	3.01	1.76
2 0 39.6	2 0 22.0	2 0 4.3	1 59 46.6	1 59 29.0	1 59 11.4	3.04	1.76
2 1 10.4	2 0 52.7	2 0 35.0	2 0 17.2	1 59 59.5	1 59 41.8	3.08	1.77
2 1 41.6	2 1 23.8	2 1 6.0	2 0 48.1	2 0 30.3	2 0 12.5	+3.11	−1.78
2 2 13.1	2 1 55.2	2 1 37.3	2 1 19.4	2 1 1.5	2 0 43.6	3.14	1.79
2 2 44.9	2 2 26.9	2 2 8.9	2 1 51.0	2 1 33.0	2 1 15.0	3.18	1.80
2 3 17.0	2 2 59.0	2 2 40.9	2 2 22.9	2 2 4.8	2 1 46.8	3.21	1.80
2 3 49.5	2 3 31.4	2 3 13.2	2 2 55.1	2 2 37.0	2 2 18.9	3.24	1.81
2 4 22.3	2 4 4.1	2 3 45.9	2 3 27.7	2 3 9.5	2 2 51.3	+3.28	−1.82
2 4 55.5	2 4 37.2	2 4 19.0	2 4 0.7	2 3 42.4	2 3 24.1	3.32	1.83
2 5 29.1	2 5 10.7	2 4 52.4	2 4 34.0	2 4 15.6	2 3 57.2	3.35	1.84
2 6 3.0	2 5 44.6	2 5 26.1	2 5 7.7	2 4 49.2	2 4 30.8	3.38	1.84
2 6 37.3	2 6 18.8	2 6 0.2	2 5 41.7	2 5 23.2	2 5 4.6	3.42	1.85
2 7 12.0	2 6 53.4	2 6 34.7	2 6 16.1	2 5 57.5	2 5 38.9	+3.46	−1.86
2 7 47.0	2 7 28.3	2 7 9.6	2 6 50.9	2 6 32.2	2 6 13.5	3.50	1.87
2 8 22.5	2 8 3.7	2 7 44.9	2 7 26.1	2 7 7.3	2 6 48.5	3.54	1.88
2 8 58.3	2 8 39.4	2 8 20.6	2 8 1.7	2 7 42.8	2 7 23.9	3.58	1.89
2 9 34.6	2 9 15.6	2 8 56.6	2 8 37.7	2 8 18.7	2 7 59.7	3.62	1.90
2 10 11.2	2 9 52.2	2 9 33.1	2 9 14.0	2 8 55.0	2 8 35.9	+3.66	−1.91
2 10 48.3	2 10 29.1	2 10 10.0	2 9 50.8	2 9 31.7	2 9 12.6	3.71	1.91
2 11 25.8	2 11 6.5	2 10 47.3	2 10 28.1	2 10 8.8	2 9 49.6	3.75	1.92
2 12 3.7	2 11 44.4	2 11 25.0	2 11 5.7	2 10 46.4	2 10 27.0	3.79	1.93
2 12 42.0	2 12 22.6	2 12 3.2	2 11 43.8	2 11 24.3	2 11 4.9	3.84	1.94
2 13 20.8	2 13 1.3	2 12 41.8	2 12 22.3	2 12 2.7	2 11 43.2	+3.88	−1.95
2 14 0.0	2 13 40.4	2 13 20.8	2 13 1.2	2 12 41.6	2 12 22.0	3.92	1.96
2 14 39.7	2 14 20.0	2 14 0.3	2 13 40.6	2 13 20.9	2 13 1.2	3.97	1.97
2 15 19.9	2 15 0.1	2 14 40.3	2 14 20.5	2 14 0.6	2 13 40.8	4.02	1.98
2 16 0.5	*2 15 40.6*	*2 15 20.7*	2 15 0.8	2 14 40.9	2 14 21.0	4.06	1.99
2 16 41.6	*2 16 21.6*	*2 16 1.6*	2 15 41.6	2 15 21.6	2 15 1.8	+4.11	−2.0

TABLE V.

AZIMUTH OF POLARIS AT ELONGATION, 1917.

Lat. \ Decl.	88° 51′ 40″	88° 51′ 50″	88° 52′ 0″	88° 52′ 10″	88° 52′ 20″	88° 52′ 30″	Variation 1′ of Lat.
° ′	° ′ ″	° ′ ″	° ′ ″	° ′ ″	° ′ ″	° ′ ″	″
60 0	2 16 41.6	2 16 21.6	2 16 1.6	2 15 41.6	2 15 21.6	2 15 1.6	+4.11
60 10	2 17 23.2	2 17 3.1	2 16 43.0	2 16 22.9	2 16 2.8	2 15 42.6	4.16
60 20	2 18 5.3	2 17 45.1	2 17 24.9	2 17 4.6	2 16 44.4	2 16 24.2	4.21
60 30	2 18 47.9	2 18 27.6	2 18 7.2	2 17 46.9	2 17 26.6	2 17 6.3	4.26
60 40	2 19 31.0	2 19 10.6	2 18 50.1	2 18 29.7	2 18 9.3	2 17 48.8	4.31
60 50	2 20 14.6	2 19 54.1	2 19 33.5	2 19 13.0	2 18 52.5	2 18 31.9	+4.36
61 0	2 20 58.7	2 20 38.1	2 20 17.5	2 19 56.8	2 19 36.2	2 19 15.5	4.42
61 10	2 21 43.4	2 21 22.7	2 21 1.9	2 20 41.2	2 20 20.4	2 19 59.7	4.47
61 20	2 22 28.6	2 22 7.8	2 21 46.9	2 21 26.1	2 21 5.2	2 20 44.4	4.52
61 30	2 23 14.4	2 22 53.5	2 22 32.5	2 22 11.5	2 21 50.6	2 21 29.6	4.58
61 40	2 24 0.8	2 23 39.7	2 23 18.6	2 22 57.5	2 22 36.5	2 22 15.4	+4.64
61 50	2 24 47.7	2 24 26.5	2 24 5.3	2 23 44.1	2 23 23.0	2 23 1.8	4.70
62 0	2 25 35.3	2 25 13.9	2 24 52.6	2 24 31.3	2 24 10.0	2 23 48.7	4.76
62 10	2 26 23.4	2 26 1.9	2 25 40.5	2 25 19.1	2 24 57.6	2 24 36.2	4.81
62 20	2 27 12.1	2 26 50.6	2 26 29.0	2 26 7.4	2 25 45.9	2 25 24.3	4.87
62 30	2 28 1.4	2 27 39.8	2 27 18.1	2 26 56.4	2 26 34.8	2 26 13.1	+4.94
62 40	2 28 51.4	2 28 29.6	2 28 7.8	2 27 46.0	2 27 24.3	2 27 2.5	5.00
62 50	2 29 42.0	2 29 20.1	2 28 58.2	2 28 36.3	2 28 14.4	2 27 52.5	5.06
63 0	2 30 33.3	2 30 11.3	2 29 49.2	2 29 27.2	2 29 5.1	2 28 43.1	5.13
63 10	2 31 25.3	2 31 3.1	2 30 40.9	2 30 18.8	2 29 56.6	2 29 34.4	5.20
63 20	2 32 17.9	2 31 55.6	2 31 33.3	2 31 11.0	2 30 48.7	2 30 26.4	+5.26
63 30	2 33 11.2	2 32 48.8	2 32 26.3	2 32 3.9	2 31 41.5	2 31 19.0	5.33
63 40	2 34 5.2	2 33 42.6	2 33 20.1	2 32 57.5	2 32 35.0	2 32 12.4	5.40
63 50	2 34 59.9	2 34 37.2	2 34 14.5	2 33 51.8	2 33 29.2	2 33 6.5	5.48
64 0	2 35 55.4	2 35 32.6	2 35 9.7	2 34 46.9	2 34 24.1	2 34 1.2	5.55
64 10	2 36 51.6	2 36 28.6	2 36 5.7	2 35 42.7	2 35 19.7	2 34 56.8	+5.63
64 20	2 37 48.6	2 37 25.5	2 37 2.4	2 36 39.3	2 36 16.1	2 35 53.0	5.70
64 30	2 38 46.3	2 38 23.1	2 37 59.8	2 37 36.6	2 37 13.3	2 36 50.1	5.78
64 40	2 39 44.9	2 39 21.5	2 38 58.1	2 38 34.7	2 38 11.3	2 37 47.9	5.86
64 50	2 40 44.2	2 40 20.7	2 39 57.1	2 39 33.6	2 39 10.1	2 38 46.5	5.94
65 0	2 41 44.4	2 41 20.7	2 40 57.0	2 40 33.3	2 40 9.6	2 39 45.9	+6.02
65 10	2 42 45.4	2 42 21.5	2 41 57.7	2 41 33.9	2 41 10.0	2 40 46.2	6.10
65 20	2 43 47.2	2 43 23.2	2 42 59.3	2 42 35.3	2 42 11.3	2 41 47.3	6.19
65 30	2 44 50.0	2 44 25.8	2 44 1.7	2 43 37.6	2 43 13.4	2 42 49.3	6.28
65 40	2 45 53.6	2 45 29.3	2 45 5.0	2 44 40.7	2 44 16.4	2 43 52.1	6.37
65 50	2 46 58.1	2 46 33.7	2 46 9.2	2 45 44.8	2 45 20.3	2 44 55.9	+6.46
66 0	2 48 3.6	2 47 39.0	2 47 14.4	2 46 49.8	2 46 25.1	2 46 0.5	6.56
66 10	2 49 10.0	2 48 45.2	2 48 20.5	2 47 55.7	2 47 30.9	2 47 6.1	6.65
66 20	2 50 17.4	2 49 52.4	2 49 27.5	2 49 2.6	2 48 37.6	2 48 12.7	6.75
66 30	2 51 25.7	2 51 0.6	2 50 35.5	2 50 10.4	2 49 45.3	2 49 20.2	6.85
66 40	2 52 35.1	2 52 9.8	2 51 44.6	2 51 19.3	2 50 54.0	2 50 28.7	+6.95
66 50	2 53 45.5	2 53 20.1	2 52 54.6	2 52 29.2	2 52 3.7	2 51 38.3	7.05
67 0	2 54 57.0	2 54 31.4	2 54 5.7	2 53 40.1	2 53 14.5	2 52 48.9	7.16
67 10	2 56 9.5	2 55 43.7	2 55 17.9	2 54 52.1	2 54 26.3	2 54 0.5	7.27
67 20	2 57 23.2	2 56 57.2	2 56 31.2	2 56 5.2	2 55 39.3	2 55 13.3	7.38
67 30	2 58 37.9	2 58 11.8	2 57 45.6	2 57 19.4	2 56 53.3	2 56 27.1	+7.49
67 40	2 59 53.8	2 59 27.5	2 59 1.2	2 58 34.8	2 58 8.5	2 57 42.1	7.60
67 50	3 1 10.9	3 0 44.4	3 0 17.9	2 59 51.3	2 59 24.8	2 58 58.3	7.72
68 0	3 2 29.2	3 2 2.5	3 1 35.8	3 1 9.0	3 0 42.3	3 0 15.6	7.84
68 10	3 3 48.8	3 3 21.8	3 2 54.9	3 2 28.0	3 2 1.1	3 1 34.2	7.97
68 20	3 5 9.6	3 4 42.4	3 4 15.3	3 3 48.2	3 3 21.1	3 2 54.0	+8.10
68 30	3 6 31.6	3 6 4.3	3 5 37.0	3 5 9.7	3 4 42.3	3 4 15.0	8.23
68 40	3 7 55.0	3 7 27.5	3 7 0.0	3 6 32.4	3 6 4.9	3 5 37.4	8.36
68 50	3 9 19.8	3 8 52.0	3 8 24.3	3 7 56.6	3 7 28.8	3 7 1.1	8.49
69 0	3 10 45.9	3 10 17.9	3 9 50.0	3 9 22.1	3 8 54.1	3 8 26.2	8.63
69 10	3 12 13.4	3 11 45.3	3 11 17.1	3 10 49.0	3 10 20.8	3 9 52.6	+8.77
69 20	3 13 42.4	3 13 14.0	3 12 45.7	3 12 17.3	3 11 48.9	3 11 20.5	8.92
69 30	3 15 12.9	3 14 44.3	3 14 15.7	3 13 47.1	3 13 18.5	3 12 49.9	9.06
69 40	3 16 44.9	3 16 16.0	3 15 47.2	3 15 18.4	3 14 49.6	3 14 20.8	9.22
69 50	*3 18 18.4*	3 17 49.4	3 17 20.3	3 16 51.3	3 16 22.2	3 15 53.2	9.38
70 0	*3 19 53.6*	3 19 24.3	3 18 55.0	3 18 25.7	3 17 56.4	3 17 27.2	+9.54

:DUCING TO ELONGATION OBSERVATIONS MADE NEAR ELONGATION.

ith long.	1° 0′	1° 10′	1° 20′	1° 30′	1° 40′	1° 50′	2° 0′	2° 10′	Azimuth at Elong. / Time.*
	″	″	″	″	″	″	″	″	m
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
	0.0	0.0	0.0	+ 0.1	+ 0.1	+ 0.1	+ 0.1	+ 0.1	1
	+ 0.1	+ 0.2	+ 0.2	0.2	0.2	0.3	0.3	0.3	2
	0.3	0.4	0.4	0.5	0.5	0.6	0.6	0.7	3
	0.5	0.6	0.7	0.8	0.9	1.0	1.1	1.2	4
	+ 0.9	+ 1.0	+ 1.1	+ 1.3	+ 1.4	+ 1.6	+ 1.7	+ 1.9	5
	1.2	1.4	1.6	1.8	2.1	2.3	2.5	2.7	6
	1.7	2.0	2.2	2.5	2.8	3.1	3.4	3.7	7
	2.2	2.6	2.9	3.3	3.7	4.0	4.4	4.8	8
	2.8	3.2	3.7	4.2	4.6	5.1	5.6	6.0	9
	+ 3.4	+ 4.0	+ 4.6	+ 5.1	+ 5.7	+ 6.3	+ 6.9	+ 7.4	10
	4.1	4.8	5.5	6.2	6.9	7.6	8.3	9.0	11
	4.9	5.8	6.6	7.4	8.2	9.0	9.9	10.7	12
	5.8	6.8	7.7	8.7	9.7	10.6	11.6	12.6	13
	6.7	7.8	9.0	10.1	11.2	12.3	13.4	14.6	14
	+ 7.7	+ 9.0	+10.3	+11.6	+12.8	+14.1	+15.4	+16.7	15
	8.8	10.2	11.7	13.2	14.6	16.1	17.5	19.0	16
	9.9	11.5	13.2	14.9	16.5	18.2	19.8	21.5	17
	11.1	12.9	14.8	16.7	18.5	20.4	22.2	24.1	18
	12.4	14.4	16.5	18.6	20.6	22.7	24.7	26.8	19
	+13.7	+16.0	+18.3	+20.6	+22.8	+25.1	+27.4	+29.7	20
	15.1	17.6	20.1	22.7	25.2	27.7	30.2	32.7	21
	16.6	19.3	22.1	24.9	27.6	30.4	33.2	35.9	22
	18.1	21.1	24.2	27.2	30.2	33.2	36.2	39.3	23
	19.7	23.0	26.3	29.6	32.9	36.2	39.5	42.8	24
	+21.4	+25.0	+28.5	+32.1	+35.7	+39.2	+42.8	+46.4	25

uth long.	2° 10′	2° 20′	2° 30′	2° 40′	2° 50′	3° 0′	3° 10′	3° 20′	Azimuth at Elong. / Time.*
	″	″	″	″	″	″	″	″	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	1
	0.3	0.3	0.4	0.4	0.4	0.4	0.4	0.5	2
	0.7	0.7	0.8	0.8	0.9	0.9	1.0	1.0	3
	1.2	1.3	1.4	1.5	1.6	1.6	1.7	1.8	4
	+ 1.9	+ 2.0	+ 2.1	+ 2.3	+ 2.4	+ 2.6	+ 2.7	+ 2.9	5
	2.7	2.9	3.1	3.3	3.5	3.7	3.9	4.1	6
	3.7	3.9	4.2	4.5	4.8	5.0	5.3	5.6	7
	4.8	5.1	5.5	5.9	6.2	6.6	7.0	7.3	8
	6.0	6.5	7.0	7.4	7.9	8.3	8.8	9.3	9
	+ 7.4	+ 8.0	+ 8.6	+ 9.2	+ 9.7	+10.3	+10.9	+11.4	10
	9.0	9.7	10.4	11.1	11.8	12.4	13.1	13.8	11
	10.7	11.5	12.3	13.2	14.0	14.8	15.6	16.5	12
	12.6	13.5	14.5	15.4	16.4	17.4	18.4	19.3	13
	14.6	15.7	16.8	17.9	19.0	20.2	21.3	22.4	14
	+16.7	+18.0	+19.3	+20.6	+21.9	+23.1	+24.4	+25.7	15
	19.0	20.5	21.9	23.4	24.9	26.3	27.8	29.3	16
	21.5	23.1	24.8	26.4	28.1	29.7	31.4	33.0	17
	24.1	25.9	27.8	29.6	31.5	33.3	35.2	37.0	18
	26.8	28.9	30.9	33.0	35.1	37.1	39.2	41.3	19
	+29.7	+32.0	+34.3	+36.6	+38.8	+41.1	+43.4	+45.7	20
	32.7	35.3	37.8	40.3	42.8	45.3	47.9	50.4	21
	35.9	38.7	41.5	44.2	47.0	49.8	52.5	55.3	22
	39.3	42.3	45.3	48.3	51.4	54.4	57.4	60.4	23
	42.8	46.0	49.3	52.6	55.9	59.2	62.5	65.8	24
	+46.4	*+49.9*	*+53.5*	+57.1	+60.7	+64.2	+67.8	+71.4	25

l time from elongation.

FOR FINDING THE TIMES OF UPPER AND LOWER CULMINATION OF POLAR 1917, FROM THE OBSERVED TIMES WHEN THE STAR IS ON THE SA VERTICAL CIRCLE WITH THE STARS ζ URSÆ MAJORIS (MIZAR) *SUB PO* AND δ CASSIOPEIÆ *SUB POLO*, RESPECTIVELY.

Except at high latitudes, the pole star at either upper or lower culmination furnish simple and convenient method for laying down a meridian line on the earth's surface at pa in the northern hemisphere. When the local time is unknown and accurate astronomical in ments are not available, the time of culmination of Polaris may be found by observing instant when Polaris is vertically above (has the same azimuth as) ζ Ursæ Majoris (Mizar) be the pole, or δ Cassiopeiæ below the pole. In the former case, for the year 1917, Polari approaching upper culmination and in the latter case it is approaching lower culmination. T mean time interval which elapses between either of the observed times above mentioned a upper or lower culmination, as the case may be, is given for ζ Ursæ Majoris and δ Cassiopeiæ ten-day intervals in the following table. This method can not be used at places south of 3 north latitude.

ζ URSÆ MAJORIS (MIZAR).
(Upper culmination of Polaris.)

Date.	Lat. 40°	45°	50°	55°	60°
	m s	m s	m s	m s	m s
Jan. 1	9 26	9 24	9 22	9 19	9 16
11	9 16	9 14	9 12	9 9	9 6
21	9 5	9 3	9 1	8 59	8 55
31	8 54	8 53	8 51	8 48	8 45
Feb. 10	8 44	8 43	8 41	8 38	8 35
20	8 35	8 34	8 32	8 29	8 26
Mar. 2	8 28	8 26	8 24	8 22	8 18
June 30	9 11	9 10	9 8	9 5	9 2
July 10	9 23	9 21	9 19	9 16	9 12
20	9 34	9 32	9 30	9 27	9 23
30	9 44	9 43	9 40	9 38	9 34
Aug. 9	9 55	9 53	9 51	9 48	9 44
19	10 5	10 3	10 1	9 58	9 54
29	10 14	10 12	10 9	10 7	10 3
Sept. 8	10 22	10 20	10 17	10 14	10 10
18	10 28	10 26	10 24	10 21	10 17
28	10 33	10 31	10 29	10 26	10 22
Oct. 8	10 37	10 35	10 33	10 29	10 26
18	10 39	10 37	10 35	10 31	10 28
28	10 39	10 38	10 35	10 32	10 28
Nov. 7	10 38	10 36	10 34	10 31	10 27
17	10 35	10 33	10 31	10 28	10 24
27	10 30	10 28	10 26	10 23	10 19
Dec. 7	10 24	10 22	10 19	10 16	10 13
17	10 16	10 14	10 12	10 8	10 5
27	10 7	10 5	10 3	10 0	9 56
31	10 3	10 1	9 59	9 56	9 52

δ CASSIOPEIÆ.
(Lower culmination of Polaris.)

Date.	Lat. 35°	40°	45°	50°	55°
	m s	m s	m s	m s	m s
Jan. 1	10 33	10 35	10 36	10 39	10 4
11	10 22	10 24	10 26	10 28	10 3
21	10 12	10 14	10 15	10 18	10 2
31	10 1	10 3	10 4	10 7	10 1
Feb. 10	9 51	9 52	9 54	9 57	9 0
20	9 42	9 43	9 45	9 47	9 5
Mar. 2	9 34	9 35	9 37	9 39	9 4
12	9 28	9 29	9 31	9 33	9 3
22	9 23	9 25	9 27	9 29	9 31
Apr. 1	9 21	9 22	9 24	9 26	9 29
11	9 20	9 22	9 23	9 26	9 28
21	9 22	9 24	9 25	9 28	9 30
May 1	9 26	9 28	9 29	9 31	9 34
11	9 32	9 33	9 34	9 37	9 40
21	9 39	9 40	9 42	9 44	9 47
31	9 47	9 49	9 50	9 53	9 56
June 10	9 57	9 59	10 0	10 3	10 6
20	10 8	10 9	10 11	10 13	10 16
30	10 19	10 20	10 22	10 24	10 27
July 10	10 30	10 32	10 33	10 36	10 39
20	10 41	10 43	10 44	10 47	10 50
July 30	10 52	10 54	10 56	10 59	11 2
Nov. 27	11 39	11 41	11 43	11 46	11 49
Dec. 7	11 32	11 34	11 36	11 39	11 42
17	11 24	11 26	11 28	11 31	11 34
27	11 15	11 17	11 18	11 21	11 24
31	11 11	11 13	11 14	11 17	11 20

ARENT PLACE, TIME OF UPPER CULMINATION, AND TIME INTERVAL BETWEEN UPPER CULMINATION AND ELONGATION EAST OR WEST, OF POLARIS, 1917.

The local mean time of culmination on any meridian for a given date is found by taking the following table the *Mean Time* of the nearest Greenwich culmination, and applying to e product of the *Var. per Day* by the integral number of intervening days, this product g numerically additive for an earlier date and subtractive for a later date than that given ne table; and by applying also the product of the *Var. per Hour* by the longitude from nwich expressed in hours and fractions of an hour, this product being numerically additive ast longitudes and subtractive for West longitudes.

The time interval between upper and lower culmination is 12^h diminished by one-half the erical 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 *minus* Upper Culm.
	Apparent Right Ascension.	Apparent Declination.	Mean Time.	Var. per Day.	Var. per Hour.		
	h m s 1 29	° ′ ″ +88 51	h m s	m s	s W. E.	°	W. E. h m
n. 1	89	70.6	6 47 7	−3 56.9	−9.87+	10	+5 58.2−
11	79	71.6	6 ·7 37	3 57.0	9.88	12	5 58.1
21	68	71.9	5 28 8	3 57.0	9.88	14	5 57.9
31	58	71.5	4 48 38	3 56.9	9.87	16	5 57.7
b. 10	48	70.5	4 9 9	3 56.9	9.87	18	5 57.6
20	39	69.0	3 29 41	−3 56.8	−9.87+	20	+5 57.4−
r. 2	31	66.9	2 50 14	3 56.6	9.86	22	5 57.2
12	25	64.3	2 10 49	3 56.5	9.85	24	5 57.0
22	20	61.5	1 31 25	3 56.3	9.84	26	5 56.8
r. 1	18	58.5	0 52 4	3 56.0	9.83	28	5 56.6
11	17	55.3	0 12 44	−3 55.8	−9.82+	30	+5 56.4−
20	19	52.2	23 33 27	3 55.6	9.82	32	5 56.2
30	23	49.3	22 54 11	3 55.4	9.81	34	5 56.0
y 10	28	46.7	22 14 58	3 55.3	9.80	36	5 55.7
20	35	44.4	21 35 46	3 55.1	9.80	38	5 55.5
30	44	42.5	20 56 35	−3 55.0	−9.79+	40	+5 55.2−
ne 9	54	41.1	20 17 26	3 54.9	9.79	42	5 54.9
19	64	40.2	19 38 17	3 54.8	9.78	44	5 54.7
29	75	39.8	18 59 9	3 54.8	9.78	46	5 54.3
ly 9	87	40.0	18 20 1	3 54.8	9.78	48	5 54.0
19	98	40.7	17 40 54	−3 54.8	−9.78+	50	+5 53.6−
29	109	42.0	17 1 46	3 54.8	9.78	52	5 53.2
g. 8	120	43.7	16 22 37	3 54.9	9.79	54	5 52.8
18	130	45.9	15 43 28	3 54.9	9.79	56	5 52.3
28	139	48.6	15 4 18	3 55.0	9.79	58	5 51.8
pt. 7	147	51.6	14 25 7	−3 55.2	−9.80+	60	+5 51.2−
17	154	54.8	13 45 55	3 55.3	9.80	62	5 50.5
27	160	58.4	13 6 41	3 55.4	9.81	64	5 49.8
t. 7	164	62.0	12 27 26	3 55.6	9.82	66	5 48.9
17	166	65.8	11 48 9	3 55.8	9.82	68	5 47.8
27	167	69.6	11 8 51	−3 55.9	−9.83+	70	+5 46.6−
v. 6	165	73.3	10 29 31	3 56.1	9.84		
16	162	76.8	9 50 9	3 56.3	9.85		
26	158	80.1	9 10 45	3 56.4	9.85		
c. 6	152	83.0	8 31 20	3 56.6	9.86		
16	144	85.5	7 51 53	−3 56.8	−9.87+		
26	135	87.5	7 12 25	−3 56.9	−9.87+		

N THE ARRANGEMENT AND USE OF THE AMERICAN EPHEMERIS AND NAUTICAL ALMANAC.

There are in general use three different kinds of time, True Solar Time—so 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 s
day is shorter than the mean solar day by $3^m\ 56^s.555$ sidereal time or 3^m
mean solar time, the tropical year of 365.2422 mean solar days con
366.2422 sidereal days. Sidereal time and the length of the sidereal d
subject to slight irregularities on account of small differences betwe
positions of the true and mean equinoxes.

The mean solar and sidereal days are each divided into 24 hours.
March 23 (civil date) of each year, about two days after the vernal e
there is an instant when the face of a sidereal clock shows the same ti
mean time clock, and the former gains on the latter $3^m\ 56^s.555$ sidere
per mean solar day, so that at the end of a year it will have gained one s
day and will again agree with the mean time clock.

The Civil Day begins at midnight and comprises 24 hours, the hour
counted from 0 to 12 in two series; the first, marked A. M., runnin
midnight to noon, and the second, marked P. M., running from noon to mi

The Astronomical Day begins at noon on the civil day of the sam
the 24 hours being counted from 0 to 24, running from noon of one
noon of the next following day. Astronomical time as well as civil tim
be either apparent or mean.

The civil day begins twelve hours before the astronomical day; th
the first half of the civil day coincides with the last half of the pr
astronomical day, and the last half of the civil day coincides with the fi
of the astronomical day of the same date. Hence we have the followin

To convert Civil Time into Astronomical Time.—If the civil time is
A. M., take one from the day and add twelve to the hours; if the civil
marked P. M., take away the designation P. M. Thus, January 9, 2 d
A. M., civil time, is January 8, 14^h, astronomical time; and Januar
o'clock, P. M., civil time, is January 9, 2^h, astronomical time.

To convert Astronomical Time into Civil Time.—If the astronomical
less than twelve hours, write P. M. after it; if greater than twelve
subtract twelve hours from it, mark the result A. M., and add one to th

*To convert Solar or Sidereal Time of any meridian B to that of
meridian A*, add the difference of longitude expressed in time when A
of B, and subtract the difference of longitude when A is west of B.

Greenwich mean time, which at any fixed observatory is obtai
applying the longitude to the local mean time, on board ship is usually
from the mean time chronometer set to Greenwich time.

Greenwich mean noon of any date means the noon at the beginning
astronomical day.

PART I.—THE EPHEMERIS FOR THE MERIDIAN OF GREEN

Pages 2–17 contain for Greenwich mean noon of each day the
*Apparent Right Ascension, Apparent Declination, Semidiameter, Hor
Parallax, True Longitude, and Latitude.* They also contain the *Logar
the Radius Vector of the Earth*, the *Precession in Longitude*, the *Nuta
Longitude*, the *Aberration*, the *True Obliquity*, the *Equation of Time*, the S
Time or Right Ascension of Mean Sun, and the *Mean Time of Sidereal
Adjoining columns contain*, for each Greenwich mean noon, the Vario

ur for those of the quantities for which it seemed advisable to give a rate motion. By multiplying any one of those variations by the hours and rts of an hour from Greenwich mean noon and adding the product algebically to the corresponding quantity at noon, we obtain an approximate lue of the quantity in question for any given Greenwich mean time. If eat exactness is desired, the value of the hourly variation is found for the ne halfway between Greenwich mean noon and the given Greenwich mean ne before multiplying by the hours and parts of an hour from Greenwich an noon.

. It is to be noted that here, as elsewhere throughout the volume, the posite sign used with declinations or latitudes indicates north and the negative n south.

. The Sun's *Apparent Right Ascension* and *Declination* are affected both by erration and by nutation, and therefore denote the *apparent* position of the e Sun. The Sun's *True Longitude* is the true geometric longitude not corted 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 rpose of finding latitude, local time, or azimuth.

The Sun's *Semidiameter* is used in reducing the altitude of the upper or wer limb of the Sun to the altitude of the center; and in reducing the angular stance between the limb of the Sun and any other object to the distance from e center of the Sun.

The *Horizontal Parallax* is the angle subtended by the equatorial radius the Earth, as seen from the center of the Sun.

The *Precession in Longitude* is the quantity to be applied to the longitude the Sun referred to the mean equinox of the beginning of the Besselian titious year, i. e., the instant when the Sun's mean longitude is 280°, in der to refer it to the mean equinox of date.

The *Nutation in Longitude* is the quantity to be applied to the longitude a body referred to the mean equinox of date in order to refer it to the true uinox, short-period terms being neglected.

The *Aberration* is the quantity to be subtracted from the true longitude the Sun in order to obtain its apparent longitude.

The *True Obliquity* is the inclination of the Earth's equator to the ecliptic, ort-period terms being neglected.

The corrections to the values of the nutation and the obliquity here given, 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 e hour angle of the true Sun at that instant. When interpolated to any ven Greenwich mean time, it is the correction to be applied to mean time in der to obtain apparent time.

The *Sidereal Time of Mean Noon* is the right ascension of the mean Sun Greenwich mean noon. It may be reduced for the longitude or to any reenwich mean time by using the hourly variation, $+9^s.8565$; or by Table I, page 693 of this volume, for reducing intervals of mean time to sidereal ne. It is useful *in converting* mean time to sidereal time. We first find the *eenwich 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 of the mean Sun, will give the hour angle of the vernal equinox, or the sid time required.

The sidereal time of mean noon, reduced for the longitude of the pl also used in converting sidereal time to mean time. Subtracting the re value from the given sidereal time gives the interval of sidereal time past and that is converted into the required mean time by subtracting from corresponding reduction of a sidereal interval to a mean-time interval, from Table II, page 690 of this volume. If the sidereal interval is less $3^m\ 56^s.555$, there are two mean times corresponding to the given sidereal one a few minutes after the preceding noon, and the other a few minutes l the following noon, the mean time interval between these two mean being $23^h\ 56^m\ 4^s.09$. The mean time, approximately known, will always which one is to be taken. Instead of using Table II, the reduction of a sid to a mean time interval may be found by multiplying $-9^s.8296$ by the and parts of an hour of the sidereal interval.

The *Mean Time of Sidereal Noon* is the number of hours, minutes seconds after Greenwich mean noon when the vernal equinox passe meridian of Greenwich; it may be reduced to any other meridian by the hourly variation, $-9^s.8296$, to effect the necessary interpolation, c reduction may be taken directly from Table II. In the same way the r tion may be made to any Greenwich sidereal time, and the result will represent $24^h -$ Right Ascension of the Mean Sun. This column may b veniently used for converting sidereal to mean time, or—which is the problem—for finding the time of meridian passage of a star whose right a sion is known, by adding to the mean time of the *preceding* local sidereal 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 1917, April 14, $2^h\ 5^m\ 20^s$, at a place whose longitude is 58° 20′, or $3^h\ 53^m\ 20^s$ west from Greenwich

		h	m	s
Local mean time	April 14,	2	5	20
Longitude from Greenwich (additive) . .		3	53	20
Greenwich mean time . . .	April 14,	5	58	40

Reducing the minutes and seconds to decimals of an hour, we find this moment is $5^h.978$ after Greenwich mean noon on April 14, or 18 before Greenwich mean noon on April 15.

On page 6 of the Ephemeris we find that the variation of declinatic hour is:

	″
At Greenwich mean noon, April 14	+54.12
At Greenwich mean noon, April 15	+53.73
Difference for one day	− 0.39

If great exactness is desired, we find the amount of this hourly var for the time halfway between Greenwich noon and the time of observ that is, for 3 hours after Greenwich noon of the 14th, this being half of 6 l Three hours is 0.125 of a day; so the calculation is as follows:

		″
Variation at Greenwich mean noon, April 14		+54.12
Change in 0.125 of a day.	−0″.39×0.125	− 0.05
Variation at 3 hours after noon		+54.07

	°	′	″
Declination at Greenwich noon, April 14	+9	18	2.1
Change in 5.978 hours +54″.07×5.978	+	5	23.2
Sun's declination at time of observation	+9	23	25.3

With equal facility the computation might have been made backward from the succeeding noon. Thus in the example just given the time is 18h.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″.88. Then we find:

	°	′	″
Declination at Greenwich noon, April 15	+9	39	36.3
Change in −18.022 hours, +53″.88×−18.022	−	16	11.0
Sun's declination at time of observation	+9	23	25.3

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 1917, July 13, 10h 3m 30s, A. M., mean time, at a place whose longitude is 85° 15′, or 5h 41m west from Greenwich.

		h	m	s	
Local astronomical mean time	July 12,	22	3	30	
Longitude from Greenwich (additive)		5	41	0	
Greenwich mean time	July 13,	3	44	30	=h 3.7417

		Sun's Right Ascension. h m s		*Equation of Time.* m s
Greenwich noon, July 13		7 28 38.63		−5 27.74
Change in 3.7417 hours	10s.162×3.7417	+ 38.02	−0s.305×3.7417	− 1.14
		7 29 16.65		−5 28.88

In this case the hourly variations interpolated to half the interval, or 1.87 after noon, have been used.

3. If the sidereal time is required for the same time and place, we have:

	h	m	s
Sidereal time at Greenwich mean noon, July 13	7	23	10.89
Reduction for 3h 44m 30s from Table III, or 9s.8565×3.7417		+	36.88
Add the local astronomical mean time	22	3	30.00
The required sidereal time (rejecting 24h)	5	27	17.77

4. On 1917, July 13, A. M., at a place whose longitude is 85° 15′ W., suppose the sidereal time to be 5h 27m 17s.77 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.

		h	m	s
Sidereal time at Greenwich mean noon, July 12		7	19	14.34
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	20	10.36
The given sidereal time ($+24^h$, if necessary for the following subtraction)		29	27	17.77
Subtracting the first from the second gives the sidereal interval from noon		22	7	7.41 = $22^h.1187$
Reduction for $22^h\ 7^m\ 7^s.41$ from Table II, or $-9^s.8296 \times 22.1187$			−3	37.42
The required astronomical mean time	July 12,	22	3	29.99

Second solution.

		h	m	s
Mean time at Greenwich sidereal noon	July 12,	16	38	1.71
Reduction for longitude from Table II, or $-9^s.8296 \times 5.6833$				−55.86
Mean time of *preceding* local sidereal noon	July 12,	16	37	5.85
Add the given sidereal time		5	27	17.77
Reduction for $5^h\ 27^m\ 17^s.77$ from Table II, or $-9^s.8296 \times 5.4549$				−53.62
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 1917.0* 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 1917, January 25, $10^h\ 10^m\ 30^s$, astronomical mean time at Greenwich:

		Right Ascension. h m s		*Declination.* ° ′ ″
January 25, 10^h		22 47 20.84		−3 11 30.1
Change in 10.5 minutes	$2^s.2307 \times 10.5$	23.42	$+15''.944 \times 10.5$	+ 2 47.4
January 25, $10^h\ 10^m\ 30^s$		22 47 44.26		−3 8 42.7

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 *oon's Longitude* and *Latitude* referred to the true equinox and the ecliptic, *Semidiameter*, and its *Equatorial Horizontal Parallax*. The column adjoin- g that of the horizontal parallax gives the variation of that quantity per ur, by means of which it can be reduced to any other Greenwich mean time the manner shown in the preceding examples. When allowing for change the variation itself, note must be taken of the fact that the tabular interval here 12 hours instead of 24. The quantity thus obtained is the equatorial rizontal parallax; to obtain the horizontal parallax at any given place, the rrection for the latitude of the place must be applied. The reduction of e Moon's semidiameter may be readily found by multiplying the reduction the horizontal parallax by 0.2725 (see page xiii), or by simply computing e proportional part.

If, for example, the semidiameter of the Moon is to be taken out for 1917, arch 10, 7^h, P. M., Greenwich mean time, we see that the difference of the midiameters at noon and midnight of March 10 is $3''.3$; then,

$$12^h : 7^h = 3''.3 : 1''.9$$

hich is the correction to be added to the semidiameter at noon, because the midiameter is increasing. The Moon's semidiameter for March 10, 7^h, is erefore $15'\ 4''.2$.

The Moon's semidiameter and horizontal parallax are required for all bservations of the Moon.

Pages 118–133 contain also: The *Moon's Age*, or the time elapsed since e preceding new Moon, given to tenths of a day; the mean time of the *Moon's ransit, Upper* and *Lower*, at Greenwich, given to tenths of a minute; and the *ariation per Hour* of the latter quantity, that is, the variation for one hour f longitude, by means of which the local time of an upper or lower transit f 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 phemeris followed immediately by the heliocentric ephemeris.

The geocentric ephemeris gives the planet's *Apparent Right Ascension* and *pparent Declination* with the respective *Variations per Hour* or *per Day*. he positions thus given are referred to the true equator and equinox, and re corrected for aberration. The geocentric ephemeris gives also the *Loga- ithm of Distance from Earth* with the *Variation per Hour* or *per Day*, the planet's *emidiameter* and *Horizontal Parallax*, and, to tenths of a minute, the time f *Transit Meridian of Greenwich*. All the data, except the last named, are ven for Greenwich mean noon.

The right ascension and declination of a planet are required whenever it observed for time, latitude, or azimuth. The mode of reducing the ephem- is positions of planets to other instants of Greenwich mean time is the same that already given for the Sun. The local mean time of meridian transit any planet at any place can be found by dividing the proper daily difference the ephemeris times by 24, multiplying the quotient by the longitude of the ace expressed in hours and fractions, and applying the product with its oper sign to the time of Greenwich transit.

The heliocentric ephemeris gives the *Heliocentric* Longitude, Mean Equinox *Date; the Heliocentric Latitude;* and the *Logarithm* of Radius Vector; with

their respective *Variations per Day*. The heliocentric longitude may be refe to the true equinox by applying nutation. The variations are given for instant of Greenwich mean noon. The column *Reduction to Orbit* contains correction to be applied to the heliocentric longitude in order to obtain longitude measured along the orbit of the planet. This orbit longitud equal to the distance from the mean equinox to the node, plus the dist from the node to the planet. The heliocentric latitude is referred to the ecli of the date. The *Logarithm of Radius Vector* is the logarithm of the dist of the center of the planet from that of the Sun.

PART II.—THE EPHEMERIS FOR THE MERIDIAN OF WA INGTON.

Pages 200–201 contain formulæ for reducing mean positions of star apparent positions, including expressions for the Besselian star-numbers star-constants, and for the independent star-numbers; the whole based u the constants of the Paris Conference of May, 1896, and expressed in notation of BESSEL.

Pages 202–205 contain the logarithms of the *Besselian Star-Numbers, A C, D*, for each Washington mean midnight, with the values of *E* appende the bottoms of the pages. The terms of short period have been inclu These numbers serve to reduce the mean place of a star at the beginnin the Besselian fictitious year to its apparent place at any of the dates for wh the numbers are given, and in ordinary cases four-figure logarithms suf but where extreme accuracy is desired the logarithms of *A, C*, and *D* are so times needed to five places of decimals. Along with the solar day, the column contains the sidereal hour of Washington mean midnight for cer dates, and by interpolation among them it is easy to find the sidereal t for which any set of quantities is given.

The following is an example of the reduction of a star to apparent plac the Besselian star-numbers:

Computation of the apparent place of 2 Aquilæ, July 2, 1917, for the upper transit at Washin

log *a*	0.5165	log *b*	7.2446 *n*	log *c*	8.0440	log *d*	8.8235 *n*
log *A*	9.9260	log *B*	0.0766 *n*	log *C*	0.5420	log *D*	1.3035 *n*
log *a′*	0.5166	log *b′*	9.9941	log *c′*	9.4341	log *d′*	8.4152 *n*
log *Aa*	0.4425	log *Bb*	7.3212	log *Cc*	8.5860	log *Dd*	0.1270
log *Aa′*	0.4426	log *Bb′*	0.0707 *n*	log *Cc′*	9.9761	log *Dd′*	9.7187

		h	m	s		°	′
Mean Place, 1917.0	$\alpha_0 =$	18	37	43.817	$\delta_0 =$	−9	7
	$Aa =$			+2.770	$Aa' =$		
	$Bb =$			+0.002	$Bb' =$		
	$Cc =$			+0.039	$Cc' =$		
	$Dd =$			+1.340	$Dd' =$		
	$E =$			+0.003	$r\mu' =$		
	$r\mu =$			+0.001			
Apparent Place, July 2,	$\alpha =$	18	37	47.972	$\delta =$	−9	7

Pages 206–213 contain the *Independent Star-Numbers*, which can freque be advantageously used instead of the *Besselian Star-Numbers*. The term short period have been included. These quantities are connected with th *of Bessel by the* relations given on page 200, which also contains the form *and precepts for* the application of both systems of numbers. In order

Besselian numbers, it is necessary to have the values of the star-constants, c, d, a', b', c', d', while the independent star-numbers render it possible to mine the apparent place of a star without computing these star-constants. -figure logarithms usually suffice, but where extreme accuracy is desired logarithms of g and h are needed to five places of decimals, and G and H eeded to one-tenth of a minute of arc. The column τ gives the fraction of ar, 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 the independent star-numbers:

putation of the apparent place of 2 Aquilæ, July 2, 1917, for the upper transit at Washington.

	h m				° ′		
	G=23 43.9			δ_0= − 9 8.0			
	α_0=18 37.7			$G+\alpha_0$= 18h 21m.6			
	H=11 20.7			$H+\alpha_0$= 5 58.4			
						h m s	
log $\frac{1}{\tau}$	8.8239	log $\frac{1}{\tau}$	8.8239	α_0=		18 37 43.817	
log g	1.2291	log h	1.3099	$f+f'$=		+2.594	
sin $(G+\alpha_0)$	9.9981 n	sin $(H+\alpha_0)$	0.0000	(g) =		+0.181	
tan δ_0	9.2062 n	sec δ_0	0.0055	(h) =		+1.378	
				$\tau\mu$ =		+0.001	
log (g)	9.2573	log (h)	0.1393				
				α =		18 37 47.971	
log g	1.2291	log h	1.3099	δ_0 =	− 9	7 58.66	
cos $(G+\alpha_0)$	8.9736	cos $(H+\alpha_0)$	7.8439	(g')=		+1.59	
		sin δ_0	9.2007 n	(h')=		−0.02	
log (g')	0.2027			(i) =		+1.49	
		log (h')	8.3545 n	$\tau\mu'$=		0.00	
				δ =	− 9	7 55.60	
log i	0.1793						
cos δ_0	9.9945						
log (i)	0.1738						

Page 214 contains for every tenth sidereal day the *Besselian* and *Independent Star-Numbers*, exclusive of all short-period terms. They are useful in mputing ephemerides of stars, similar to those on pages 316–513, for which its containing short-period terms should not be employed.

Pages 215–216 contain for Washington mean midnight of each day the ort-period terms of the nutation in longitude and obliquity, for use in conction with the formulæ on page 201, and the coefficients mentioned later, hich are given for each star on pages 316–513.

Pages 217–230 contain the *Mean Places of Ten-day Stars* for the beginning the Besselian fictitious year. These pages give also the magnitude, speci type, annual variations, and proper motions for each star. The annual riations are to be considered as the differential coefficients of each coordinate th respect to the time at the beginning of the year.

Page 231 contains, for the *Circumpolar Stars*, the same data as the immeately preceding pages do for the ten-day stars.

Pages 232–315 contain for every upper transit at Washington the apparent sitions of seventeen northern and eighteen southern circumpolar stars ranged in the order of their right ascensions. The mean solar time of transit *given in the column Washington Mean Time*, in order that each transit above

and below the pole may be readily identified. Suppose, for examp the transit of Polaris below the pole on January 26 is to be found, and to know whether it precedes or follows the upper transit of the sar On page 232 we find that the upper transit occurs January 26.2; tl transit, therefore, occurs January 26.7. But the lower transit of Jul cedes the upper one, which occurs July 1.8. A transit occurring ver at noon may also be identified without a computation to ascertain th mean date, by simply noting the tenth of a day in the column *Wa Mean Time.*

The secant and tangent of the apparent declination for the 15th month and the mean place in right ascension and declination for the be of the year are given for each star at the foot of the page.

Pages 316–513 contain, for every tenth upper transit at Washing apparent places of 790 stars, being all those given in the list of mea of ten-day stars. The *Washington Mean Time* in the left-hand col each page gives the day and tenth of the transit, so that intermediate may be readily identified; and to facilitate interpolation, the differ each coordinate are given for every ten days.

In connection with the ephemeris of each ten-day star there are g the foot of the page, (1) the seconds of the mean place in both right as and declination for the beginning of the year, (2) the secant and the of the mean of the star's greatest and least apparent declinations dur year, and (3) the coefficients of the short-period terms of the nutation, of which is explained on page 201.

Pages 514–521 contain, for Washington apparent noon, the *Appare Ascension* and *Declination* of the Sun, the *Equation of Time*, and the *V per Hour* of these quantities; the *Semidiameter* of the Sun, and the *Time of Semidiameter Passing Meridian*. The last column on each pa tains the *Sidereal Time of Mean Noon*.

The *Equation of Time, Mean–App.* is the correction to be apr apparent time in order to obtain mean time. Each number as given mean time of transit of the Sun's center over the meridian of Wash counted from the nearest noon.

Pages 522–537 contain the *Right Ascension of Center*, the *Geocentri nation of Center*, the *Sidereal Time of Semidiameter Passing Meridian*, t *centric Semidiameter*, and the *Equatorial Horizontal Parallax* of the Mo the *Washington Mean Time* at the moment of each upper and lower over the meridian of Washington.

The *Variation per Hour of Longitude* is the correction to be applied case to the quantity in the preceding column to obtain its value for t of transit over the meridian one hour west of Washington, supposing t of change to be uniform and equal to what it is at the instant of tran the meridian of Washington. The quantities in the third column, wh rected for another longitude by the hourly variations, give the local me of transit for that longitude. By means of the variations per hour of lo any one of the quantities under consideration can be computed wit exactness for the moment of transit over any meridian not more than o *distant from* Washington. To obtain the same accuracy for more

idians, we may proceed as follows: Let F represent either the *Washington an Time*, the *Right Ascension of Center*, or the *Geocentric Declination of ter*, and let V represent the corresponding *Variation per Hour of Longitude.* e down three successive values of F, together with the corresponding es of V, and difference the latter as in the following scheme, where the ddle values, F_0 and V_0, belong to the culmination from which is to be derived 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

$$F_\lambda = F_0 + \lambda V_0 + \frac{\lambda^2}{48}(a' + a'') + \frac{\lambda^3 b}{864}$$

here λ must be expressed in hours and decimals of an hour, and reckoned om Washington or from 180° from Washington according as the upper or wer culmination is used for the middle value (F_0). Adding twelve hours to e Washington time of lower transit at Washington gives the local time of pper transit at places whose longitude is 180° from Washington.

The column *Bright Limbs* is given to indicate to the observer which limbs e illuminated. When one limb is full and the terminator is within 1″ of e opposite limb, both can be well observed, and in such cases both are indi-ted, the defective limb being indicated by an italic letter or numeral, and the rrection for defective illumination (as seen from Washington) being given in footnote.

Pages 538–554 contain for each of the seven major planets, the geocentric *pparent Right Ascension* and *Declination*, the *Horizontal Parallax*, *Semi-iameter*, *Sidereal Time of Semidiameter Passing Meridian*, and the *Washington lean Time*, for the moments of all transits which it is usually desirable to bserve over the meridian of Washington. The stellar magnitude at opposi-on for Mars, Jupiter, Saturn, Uranus, and Neptune, respectively, is given at e 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 ar, expressed in Greenwich mean time, except in the case of the occultations sible at Washington, where Washington time is used.

Pages 556–563 contain all necessary data respecting the solar and lunar lipses which occur during the year.

The eclipse elements are given for the moment of conjunction of the Sun d Moon in right ascension, but the subsequent tables and results are com-ted from the exact positions of these bodies at the several instants referred . The times and angles designated as the circumstances of a lunar eclipse main the same throughout all parts of the Earth, and require no explanation yond 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
The principal circumstances of each total and annular eclipse of the Su
stated in five lines, as follows:—

The line entitled "Eclipse begins" gives the Greenwich mean ti
which the Moon's penumbra first touches the Earth, together with the la
and longitude of the point of contact.

The line entitled "Central eclipse begins" gives the time when the s
the Moon's shadow first touches the Earth, and the latitude and longitu
the point of contact follow.

The line entitled "Central eclipse at local apparent noon" gives th
when the axes of the Earth and of the shadow cone lie in the same
The latitude and longitude of the point where the axis of the shadow
then cuts the Earth's surface follow, and there the eclipse will be centr
the Sun will be exactly on the meridian.

The lines entitled "Central eclipse ends" and "Eclipse ends" give, r
tively, the times when and the localities where these events occur, the
nomena being the converse of those denoted by the similar phrases f
beginning.

In the case of partial solar eclipses the axis of the Moon's shadow do
come into contact with the Earth, and the three lines entitled, respect
"Central eclipse begins," "Central eclipse at local apparent noon," and
tral eclipse ends," are replaced by a single line entitled "Greatest ecl
whereon are given the time when and the latitude and longitude whe
eclipse attains its greatest magnitude. The latter phenomenon neces
occurs with the Sun in the horizon.

Maps of the Eclipses.—The regions in which each eclipse is visib
shown upon the map relating to it, from which may be taken approxim
for any place, both the times of the beginning and ending of the eclips
its magnitude. The dotted curves show the outline of the shadow fo
hour of Greenwich mean time, and therefore pass through all places whe
eclipse begins or ends at the hour indicated. To find the instant of begi
at any place, we determine by inspection between what pair of these c
lines the place is situated. The eclipse will then begin between th
responding hours of Greenwich mean time; and the fraction of the hou
be determined by dividing the hour in the same proportion as the spac
resenting it on the map is divided by the place in question. This di
may be made a little more exact by allowing for the changes in the spa
indicated by their varying width. The Greenwich mean time thus found
be reduced to local mean time by applying the longitude.

As an example, suppose we wish to find the times at which the ecli
1917, January 22, begins and ends at Kasan, Russia, latitude +55
longitude −48° 49′.

For the beginning we compare the distance of the place from the
of 18^h and 19^h, and find it to correspond to about 40 minutes from the f
thus giving for the approximate time of beginning $18^h\ 40^m$; for the e
compare the distance of the place from the curves of 20^h and 21^h, and
to be about 50 minutes from the former, thus giving for the approximat
of ending $20^h\ 50^m$, and both of these results are probably correct to
3 or 4 minutes.

Changing to local mean time, we shall have—

		Beginning.	*Ending.*
		d h m	d h m
Greenwich mean time	January	22 18 40	22 20 50
Longitude east		3 15	3 15
Local mean time	January	22 21 55	23 0 5

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 relative 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 th variations in one minute, are taken for the same moment from the table elements.

(3) From (1) and (2) the position and motion of the observer relativ the axis of the shadow are found.

(4) The radius of the penumbra or umbra at a distance from the fu mental plane equal to that of the observer is also computed.

(5) Then, assuming the motions to be uniform, we determine the required for the observer to be brought to a distance from the axis of shadow equal to this radius.

The formulæ and directions for the several steps in the computation as follows:—

(1) Find $\rho \cos \varphi'$ and $\rho \sin \varphi'$, which are the geocentric coordinat the station referred to the Earth's equator, ρ being the distance from center of the Earth and φ' the geocentric latitude. These coordinates ma computed from the following table based on the compression of the E 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	1	0.00293	1
5	0.00001	3	0.00292	3
10	0.00004	6	0.00289	6
15	0.00010	7	0.00283	7
20	0.00017	9	0.00276	9
25	0.00026	11	0.00267	11
30	0.00037	11	0.00256	11
35	0.00048	12	0.00245	13
40	0.00060	13	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	10	0.00183	10
65	0.00120	9	0.00173	9
70	0.00129	8	0.00164	8
75	0.00137	5	0.00156	5
80	0.00142	3	0.00151	3
85	0.00145	1	0.00148	2
90	0.00146		0.00146	

For the assumed Greenwich mean time of computation, take fron table of elements the values of sin d, cos d, and μ. Then, with λ for the l tude west from Greenwich, the coordinates of the observer will be—

$$\xi = \rho \cos \varphi' \sin (\mu - \lambda)$$
$$\eta = \rho \sin \varphi' \cos d - \rho \cos \varphi' \sin d \cos (\mu - \lambda) = \eta_1 - \eta_2$$
$$\zeta = \rho \sin \varphi' \sin d + \rho \cos \varphi' \cos d \cos (\mu - \lambda) = \zeta_1 + \zeta_2$$

k their variations in one minute of mean time will be—

$$\xi' = [7.63992]\ \rho \cos \varphi' \cos (\mu - \lambda)$$
$$\eta' = [7.63992]\ \rho \cos \varphi' \sin d \sin (\mu - \lambda) = [7.63992]\ \xi \sin d$$
ζ' is not needed.

(2) For the same assumed moment of Greenwich mean time, take from tables of elements the coordinates x and y of the axis of the shadow, together h their variations for one minute, which are equal to one-tenth of the ferences of two consecutive numbers. These variations are represented by 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 rela- e to the observer, and the relative motions, n and N, are computed by e formulæ—

$$m \sin M = x - \xi$$
$$m \cos M = y - \eta$$
$$n \sin N = x' - \xi'$$
$$n \cos N = y' - \eta'$$

(4) Both for the shadow and for the penumbra, the radius L at the dis- nce ζ from the fundamental plane is computed by the formulæ—

$$L = l - \zeta \tan f$$

and f being taken from the table of elements, and ζ computed in (1).

(5) If the time chosen for computation is exactly that of the beginning or ding of the eclipse, we shall have—

$$m = L$$

ut, as this condition will rarely be fulfilled on a first trial, a correction τ to ie assumed time is computed thus: Find the angle ψ from the equation—

$$\sin \psi = \frac{m \sin (M - N)}{L}$$

here will be two values for this angle, of which one will be in the first and ie other in the second quadrant when $\sin \psi$ is positive, and one in the third id the other in the fourth quadrant when $\sin \psi$ is negative; but simplicity ill be gained by taking only that value of ψ for which $\cos \psi$ is positive. This alue lies between the limits $+90°$ and $-90°$. The correction τ to the assumed ne of beginning or ending of the eclipse will then be found, in minutes, om—

$$\tau = -\frac{m \cos (M - N)}{n} \mp \frac{L \cos \psi}{n}$$

iere the double sign is to be taken negative for the beginning and positive r the ending.

However, one such pair of values of τ can not give the times of both ginning and ending with accuracy. To attain that, we must commence the mputation by assuming two times, one near the beginning and the other ar the ending of the eclipse, both of which may be derived from the chart th sufficient exactness. The computation for the first assumed time will *re 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—

$$\delta\tau = \mp\frac{\tau(l'+[5.3100]\xi\cos d)}{n\cos\psi} - \frac{[4.9788]\tau^2}{n\cos\psi}[\xi\sin(N\mp\psi) - \eta_2\cos(N\mp\psi)]$$

$$\tau_0 = \tau + \delta\tau$$

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—

$$P = N - \psi \pm 180° \text{ for the beginning,}$$

or $$P = N + \psi \text{ for the ending,}$$

it being assumed that, in each case, the value of ψ is taken between the limits $\pm 90°$.

Computation of the Solar Eclipse of 1917, January 22, for Kasan, Russia.

The position of Kasan is—

		°	′	″
Latitude,	$\varphi =$	+55	50	20
Longitude,	$\lambda =$	−48	49	8

and its geocentric coordinates are—

$$\rho\sin\varphi' = 9.91582$$
$$\rho\cos\varphi' = 9.75087$$

'rom the Eclipse Chart we find the approximate times of the phases to

	d	h	m	
Beginning	January 22	18	40	Greenwich Mean Time.
Ending	22	20	50	

	Beginning.	Ending.
T	Jan. 22, $18^h\ 40^m$	$20^h\ 50^m$
	° ′ ″	° ′ ″
μ	277 1 42	309 31 30
λ	− 48 49 8	− 48 49 8
$\mu-\lambda$	+325 50 50	+358 20 38
$\rho\cos\varphi'$	9.75037	9.75037
$\sin(\mu-\lambda)$	9.74927 n	8.46091 n
$\log\xi$	9.49964 n	8.21128 n
ξ	−0.31597	−0.01627
$\rho\sin\varphi'$	9.91582	9.91582
$\cos d$	9.97417	9.97423
$\log\eta_1$	9.88999	9.89005
η_1	+0.77623	+0.77633
$\rho\cos\varphi'$	9.75037	9.75037
$\sin d$	9.52487 n	9.52445 n
$\cos(\mu-\lambda)$	9.91780	9.99982
$\log\eta_2$	9.19304 n	9.27464 n
η_2	−0.15597	−0.18821
$\eta=\eta_1-\eta_2$	+0.93220	+0.96454
$\rho\sin\varphi'\sin d$	9.44069 n	9.44027 n
ζ_1	−0.27586	−0.27559
$\rho\cos\varphi'\cos d\cos(\mu-\lambda)$	9.64234	9.72442
ζ_2	+0.43887	+0.53018
$\zeta=\zeta_1+\zeta_2$	+0.16301	+0.25459
const. log.	7.63992	7.63992
$\rho\cos\varphi'\cos(\mu-\lambda)$	9.66817	9.75019
$\log\xi'$	7.30809	7.39011
ξ'	+0.002033	+0.002455
const. log.	7.63992	7.63992
$\xi\sin d$	9.02451	7.73573
$\log\eta'$	6.66443	5.37565
η'	+0.000462	+0.000024
$x-\xi$	−0.49777	+0.39785
$y-\eta$	+0.00719	+0.38000
$x'-\xi'$	+0.007163	+0.006739
$y'-\eta'$	+0.002652	+0.003095
$m\sin M$	9.69703 n	9.59972
$m\cos M$	7.85673	9.57978
$\tan M$	1.84030 n	0.01994
M	270° 49′ 39″	46° 18′ 54″
$\sin M$	9.99995 n	9.85923
$\log m$	9.69708	9.74049
$n\sin N$	7.85509	7.82860
$n\cos N$	7.42357	7.49066
$\tan N$	0.43152	0.33794

	Beginning.	E
N	69° 41′ 2″	65° 1
sin N	9.97210	9.
log n	7.88299	7.
tan f	7.67665	7.
log ζ	9.21222	9.
	6.88887	7.
$\zeta \tan f$	+0.00077	+0.
l	+0.53797	+0.
L	+0.53720	+0.
$M-N$	201° 8′ 37″	340°
sin $(M-N)$	9.55715 n	9
log m	9.69708	9
colog L	0.26986	0
sin ψ	9.52409 n	9
ψ	−19° 31′ 40″	−19°
log $\frac{m}{n}$	1.81409	1
cos $(M-N)$	9.96973 n	9
	1.78382 n	1
$-\frac{m}{n}\cos(M-N)$	+60.789	−
log L	9.73014	9
cos ψ	9.97427	9
colog n	2.11701	2
	1.82142	1
$\mp\frac{L\cos\psi}{n}$	−66.286	+
	m	
τ	− 5.497	−
	d h m	d h
$T+\tau$	22 18 34.503	22 20

Since the value of τ for the beginning is rather large, we compu
rrection $\delta\tau$ for this phase as follows:

	Beginning.		Be
const. log	5.3100	cos $(N-\psi)$	
log ξ	9.4996 n	log η_2	
cos d	9.9742	log $\eta_2 \cos(N-\psi)$	
	4.7838 n		
number	−0.0000061	$\xi \sin(N-\psi)$	−
l'	0.0000000	$\eta_2 \cos(N-\psi)$	−
sum	−0.0000061	diff.	−
log (sum)	4.7838 n	log (diff.)	
log $(-\tau)$	0.7401	const. log	
colog n	2.1170	log τ^2	
sec ψ	0.0257	colog $(n \cos\psi)$	
	7.6666 n		
(1)	−0.0046	(2)	+
$N-\psi$	89° 13′		
sin $(N-\psi)$	0.0000	(1)+(2)=$\delta\tau$	+
log ξ	9.4996 n	τ	−
log $\xi \sin(N-\psi)$	9.4996 n	τ_0	−

The corrected time of beginning is, therefore,

T_0=January $22^d\ 18^h\ 34^m.511$

Whence we find—

	Beginning. d h m	Ending. d h m
Greenwich Mean Time, January	22 18 34.511	22 20 48.078
λ	− 3 15.276	− 3 15.276
Local Mean Time, January	22 21 49.787	23 0 3.354

Therefore we have—

	d	h	m	s	
Beginning of the Eclipse, January	22	21	49	47.2	Local Mean Time.
End of the Eclipse, January	23	0	3	21.2	

	Beginning. ° ′	Ending. ° ′
$N \mp \phi$	89 12.7	45 49.1
constant	180 0.0	0 0.0
Angle of position, P	269 12.7	45 49.1

m the north point of the Sun's disk toward the east for direct image.

Pages 564–568 contain the adopted mean places and annual proper motions such stars, as bright as magnitude 6.5, as will be occulted during the year the Moon.

Pages 569–610 contain the elements for the prediction of the times of ultations of stars and planets by the Moon during the current year. The tem of coordinates employed is similar to that already described for eclipses, e fundamental plane passing through the center of the Earth, and being ken perpendicular to the line joining the star and the center of the Moon, t the cone circumscribing the Moon and star is regarded as a cylinder which tercepts the fundamental plane in a circle having the same linear diameter the Moon.

In the columns referring to the star, those headed *Red'ns from 1917.0* give e quantities necessary to reduce the mean place of the star at the beginning 1917 to its apparent place at the time of occultation. These reductions are fficiently accurate to be definitive.

Under the general head, *At Conjunction in R. A.*, are five columns giving rtain quantities for the moment of geocentric conjunction of the Moon and ar in right ascension, as follows:

The *Greenwich Mean Time* is the moment, T, at which the two bodies are geocentric conjunction in right ascension. At that moment the coordinate of the axis of the cylinder on the fundamental plane has the value zero. ıe column *Hour Angle*, H, gives the common geocentric hour-angle of the oon and star at the same moment, expressed in sidereal time and counted ım the meridian of Greenwich—positive toward the west and negative ward the east. Column Y gives the coordinate y of the axis of the cylinder ıon the fundamental plane at the same moment. Columns x' and y' give e variations of x and y in one hour of mean time. The linear unit in these lumns is the Earth's equatorial radius. The limiting parallels, north and uth, show the extreme limits of latitude within which the occultation will be sible.

By the aid of these elements, the time of immersion and emersion star relative to the limb of the Moon may be computed for any part o Earth by a method nearly the same as that already explained for comp eclipses, but somewhat more simple.

Prediction of Occultations for a given Place.—When it is desired to pr the circumstances of one or more occultations at any place, the first ste be to select them from the general list given in the Ephemeris. The condi of visibility are:—

1. The limiting parallels in the last columns must include the latitu the place.

2. The quantity $H-\lambda$, taken without regard to sign, must be less the semidiurnal arc of the star by at least one hour. On very rare occa an emersion might be seen in the east, or an immersion in the west, whe difference is a few minutes less than an hour.

3. The Sun must not be much more than an hour above the horizon a local mean time $T-\lambda$, unless the star is bright enough to be seen in the day

When many occultations are to be selected, the most convenient c will be to write the value of $-\lambda$ on the bottom of a slip of paper, and in pa through the list of occultations to pause over each one for which conditio is fulfilled, and examine by means of the slip whether conditions (2) an are also fulfilled. If either fails, the computer passes on. Sometimes i be difficult to determine whether $H-\lambda$ or $T-\lambda$ falls within the limits; a such cases the computer may mark the occultation for trial and leav decision for the subsequent operations. The whole list can be gone ov less than a day, and it will probably be found that about one-tenth o occultations are marked for trial.

The next step will be to compute the local times of immersion and sion from the elements, and to that end let—

T=the instant of geocentric conjunction of Moon and star in right ascension, expre 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 $\rho \cos \varphi$ to be computed by the formulæ and table given in connection with ec on page 724.

The next step will be to find the approximate instant of apparent junction of the Moon and star as seen from the place, and that may be de from the time of geocentric conjunction by the application of an approxi correction taken from DOWNES's table, printed in the volumes of the Ame Ephemeris for 1882 to 1899. This correction must be reckoned in mean hours, and will be designated by the symbol t. It will have the same sign

When DOWNES's table is not available, the correction may be com from the formulæ—

$$\xi_0 = \rho \cos \varphi' \sin h_0$$

$$\xi' = [9.4192]\, \rho \cos \varphi' \cos \tfrac{4}{3} h_0$$

$$t = \frac{\xi_0}{x' - \xi'}$$

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 $\pm 90°$. 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—

$$P = N-\psi+\delta P \quad \text{for immersion,}$$
$$\text{or} \quad P = N+\psi+\delta P \pm 180° \quad \text{for emersion,}$$

where the angles $N-\psi$ and $N+\psi$ are taken directly from the computat
$\delta\tau$, and δP is found in degrees of arc from the expression,

$$\delta P = \mp \frac{[7.3038]r^2}{\cos\psi}[\eta_2 \sin N + \xi \cos N]$$

In the latter formula the double sign is to be taken negative for an imm
and positive for an emersion.

The angle from the vertex, V, is also reckoned in the direction fr
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
or negative.

The value of τ employed in the latter formula must be so taken as
respond with the phase for which C is required.

In the volumes of the American Ephemeris for the years 1882
instructions are given for constructing three special tables which greatly
ish the labor of computing occultations, but as these tables should
from 4700 to 6300 quantities, and as they would apply only to the p
which they were computed, it will rarely be worth while to undertake t
of forming them. Those who desire further information on the subje
consult any one of the volumes in question.

As an example of an isolated occultation, we will compute that
Leonis on March 6, 1917, for Evanston, Ill., whose position is—

$$\varphi = +42^\circ\ 3'\ 33''.4$$
$$\lambda = +\ 5^h\ 50^m\ 42^s.3$$

and whose geocentric coordinates are—

$$\rho \sin\varphi' = 9.8237$$
$$\rho \cos\varphi' = 9.8713$$

From the elements on page 576 we have,

$$T = 17^h\ 10^m.0$$
$$H = +\ 6\ 13.6$$

and

$$h_0 = H - \lambda = +\ 0\ 22.9$$

From the formulæ on page 730, we find the correction, t, to the Gr
mean time of geocentric conjunction, T, to be about $+0^h\ 14^m.4$; there
Greenwich mean time of apparent conjunction is—

$$T + t = \text{March } 6^d\ 17^h\ 24^m.4$$

	Apparent Declination.	G. M. T. of ☌	Hour Angle.	Y	x'
89 B. Leonis.	° ′	d h m	h m		
	+8 42.4	Mar. 6 17 10.0	+6 13.6	+0.7506	0.5032

$T+s$ Mar.	$6^d\ 17^h\ 24^m.4$
h_0	+ 0 22.9
t_0	+ 0 14.4
h_0+t_0	+ 0 37.3
$\rho \cos \varphi'$	9.8713
$\sin (h_0+t_0)$	9.2096
$\log \xi$	9.0809
ξ	+0.1205
$\rho \sin \varphi'$	9.8237
$\cos \delta$	9.9980
$\log \eta_1$	9.8187
η_1	+0.6587
$\rho \cos \varphi'$	9.8713
$\sin \delta$	9.1801
$\cos (h_0+t_0)$	9.9942
$\log \eta_2$	9.0456
η_2	+0.1111
$\eta_1-\eta_2=\eta$	+0.5476
const. log	9.4192
$\rho \cos \varphi' \cos (h_0+t_0)$	9.8655
$\log \xi'$	9.2847
ξ'	+0.1926
const. log	9.4192
$\xi \sin \delta$	8.2610
$\log \eta'$	7.6802
η'	+0.0048
$\log x'$	9.7018
$\log s$	9.3802
$\log x$	9.0820
x	+0.1208
$\log y'$	$9.3464\,n$
$\log y't$	$8.7266\,n$
$y't$	−0.0533
Y'	+0.7506
y	+0.6973

$x-\xi$	+0.0003
$y-\eta$	+0.1497
$x'-\xi'$	+0.3106
$y'-\eta'$	−0.2268
$m \sin M$	6.4771
$m \cos M$	9.1752
$\tan M$	7.3019
M	0° 7′
$\cos M$	0.0000
$\log m$	9.1752
$n \sin N$	9.4922
$n \cos N$	$9.3556\,n$
$\tan N$	$0.1366\,n$
N	126° 8′
$\sin N$	9.9072
$\log n$	9.5850
const. log	0.5646
$\log m$	9.1752
$\sin (M-N)$	$9.9079\,n$
$\sin \psi$	$9.6477\,n$
ψ	−26° 23′
const. log	1.7782
$\log \frac{m}{n}$	9.5902
$\cos (M-N)$	$9.7694\,n$
	$1.1378\,n$
$\frac{[1.7782]m}{n} \cos (M-N)$	+13.73
const. log	1.2135
colog n	0.4150
$\cos \psi$	9.9522
	1.5807
$\mp\frac{[1.2135]\cos \psi}{n}$	∓38.08
τ for immersion	−24.35
τ for emersion	+51.81

ıe computation of $\delta\tau$ for the two contacts is as follows:

	Immersion.	Emersion.
$N \mp \psi$	152° 31′	99° 45′
$\cos (N \mp \psi)$	$9.9480\,n$	$9.2288\,n$
$\log \eta_2$	9.0456	9.0456
$\log (1)$	$8.9936\,n$	$8.2744\,n$
(1)	−0.0985	−0.0188
$\sin (N \mp \psi)$	9.6642	9.9937
$\log \xi$	9.0809	9.0809
$\log (2)$	8.7451	9.0746
(2)	+0.0556	+0.1187
(1)−(2)	−0.1541	−0.1375
$\log [(1)-(2)]$	$9.1878\,n$	$9.1383\,n$
const. log	6.7591	6.7591
$\log \tau^2$	2.7730	3.4238
colog $(n \cos \phi)$	0.4628	0.4628
$\log \delta\tau$	$9.1827\,n$	$9.7990\,n$

		Immersion.	Emersion.
		m	m
	$\delta\tau$	− 0.15	− 0.02
	$\tau+\delta\tau$	− 24.50	+ 51.19
		d h m	h m
	$T+t$ Mar.	6 17 24.4	17 24.4
Greenwich Mean Time of Phase,	"	6 16 59.9	18 15.0
	λ	+ 5 50.7	+ 5 50.7
Evanston Mean Time	Mar.	6 11 9.2	12 24.9

To find δP and P:

$\log \eta_2$	9.0456	$\log \xi$	9.0809	(3)	+0.0897
$\sin N$	9.9072	$\cos N$	9.7706 n	(4)	−0.0710
$\log$ (3)	8.9528	$\log$ (4)	8.8515 n	(3)+(4)	+0.0187

	Immersion.	Emersion.
$\log$ [(3)+(4)]	8.2718	8.2718
const. log	7.3038 n	7.3038
$\log r^2$	2.7730	3.4288
colog cos ψ	0.0478	0.0478
$\log \delta P$	8.3964 n	9.0322
δP	0.0	+0.1
$N \mp \psi$	152.5	99.8
constant	0.0	180.0
Angle of position, P	152.5	279.9

from the north point of the M rd the east, for direct image.

Pages 611–613 contain in ata necessary for observing every occultation of the general list at Washington during the current year.

Page 614 contains the *Ephemeris for Physical Observations of the Sun.*

Page 615 contains certain elements referring to the Moon, its equator, and its orbit.

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

$\mathcal{A}$ = 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.

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

$\Gamma^{\vee}$ = the longitude of the perigee of the Moon's orbit, referred to the mean equinox of date.

Ω = the longitude of the ascending node of the Moon's orbit on the ecliptic, referred to the mean equinox of date.

$\mathbb{C}$ = the Moon's mean longitude, referred to the mean equinox of date.

Pages 616–623 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 given in the second and third columns, respectively, the physical libra being given separately in the fourth and fifth columns. The Sun's sel graphic colongitude (90° − longitude) and latitude and the position-ang the Moon's axis, C, in the sixth, seventh, and eighth columns, respectively, all been corrected for the effect of physical libration.

When the libration in longitude is positive, the mean center of the disk is placed toward the east—that is, the region thus exposed to view is on the st limb—and when the libration in latitude is positive the mean center of e disk is displaced toward the south—that is the region thus exposed to ew is on the north limb.

The altitude of the Sun, A, at any given time above the horizon of any int on the Moon whose selenographic longitude and latitude, λ and β, are own, may be computed from the following formula, the Sun's selenographic ngitude 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 624–625 contain the data with reference to the illuminated disks of rcury and Venus. The angle θ is the angle which the arc of the great circle m the planet to the Sun makes with the arc from the planet toward the west, asured in the direction west, north, east, south. It is measured from 0° to)°. We may also regard θ as expressing the angle which the line of cusps kes with the meridian, the positive direction of the meridian being toward e north, and the positive direction of the line of cusps that in which a person lowing this line would have the illuminated portion of the disk on his right.

Pages 626–627 contain the *Ephemeris for Physical Observations of Mars.* e quantities here given have been corrected for aberration, so that in using em they should be interpolated to the actual time of observation.

P = the position-angle of the axis of rotation measured eastward from the north point of the disk.

$\oplus$, $A_\odot$ = the planetocentric right ascensions of the Earth and Sun, respectively, measured in the plane of the planet's equator from its vernal equinox.

$\oplus$, $D_\odot$ = the planetocentric declinations of the Earth and Sun, respectively, referred to the planet's equator.

$\odot_\delta$ = the planetocentric longitude of the Sun measured in the plane of the planet's orbit from its vernal equinox.

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 the Earth as seen from the planet.

q = the angular value of the greatest defect of illumination as seen from the Earth.

Q = 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 ich bisects the disk, measured from the adopted zero meridian.

The columns headed *Mean Time of Transit of Zero Meridian* contain the eenwich Mean Time of every transit of the zero meridian across the actual nter of the disk.

Pages 628–631 contain the *Ephemeris for Physical Observations of Jupiter.*

The columns headed *Central Meridian* contain the longitudes of the merid- n which bisects the disk, measured from the adopted zero meridian of System I d System II, respectively.

The column headed *Correction for Phase* contains the corrections to be plied to the longitudes of the central meridian to obtain the longitudes of e *meridian bisecting the illuminated disk.*

declination between Jupiter and Satellites VI and VII, and t
of the Satellites I–IV together with their configurations.

Page 658 contains the *Magnitude of Saturn* and the *Elemen*

a, b = the major axis and minor axis, respectively, of the outer ellipse of
P = the position angle of the northern semi-minor axis of the rings, m
north, positive towards the east.
B = the Saturnicentric latitude of the Earth referred to the plane of t
towards the north.
$U+180°$ = the Saturnicentric longitude of the Earth measured in the plane
their ascending node on the Earth's equator.
ω = the distance in the plane of the rings from their ascending node on th
to their ascending node on the ecliptic.
B' = the Saturnicentric latitude of the Sun referred to the plane of t
towards the north.
$U'+180°$ = the Saturnicentric longitude of the Sun measured in the plane of th
ascending node on the ecliptic.

Pages 659–667 contain, concerning the *Satellites of Saturn*, t
the orbits of the seven inner satellites, the times of elongation for
satellites, the differences in right ascension and declination be
and Phœbe, the ninth satellite, and tables for predicting the p
and distances from the center of the planet of the first eight sat

Page 668 contains the diagram of the orbits of the satelli
together with the times of their elongations.

Pages 669–670 contain tables for predicting the position-a
tances from the center of the planet of the satellites of Uranus

Page 671 contains the diagram of the orbit of the satellit
together with the times of its elongations.

Pages 672–673 contain the *Phenomena*, or the configuratio
Moon, and planets, expressed in the symbols of page xx. The p

Pages 674–683 contain the *Positions of Observatories*, together with a list the authorities from which the positions are obtained. The tabular arrangeit is self-explanatory.

Page 684 contains two examples in the computation of lunar distances, ch are inserted because lunar distance tables are no longer published.

Pages 685–709 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 aris.*

Table VII—For finding the *Apparent Place, Time of Upper Culmination, Time Interval between Upper Culmination and Elongation*, of Polaris.

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IN[illegible]X TO APPARENT PLACES OF STARS, 1917.

GENERAL INDEX.

GENERAL INDEX.