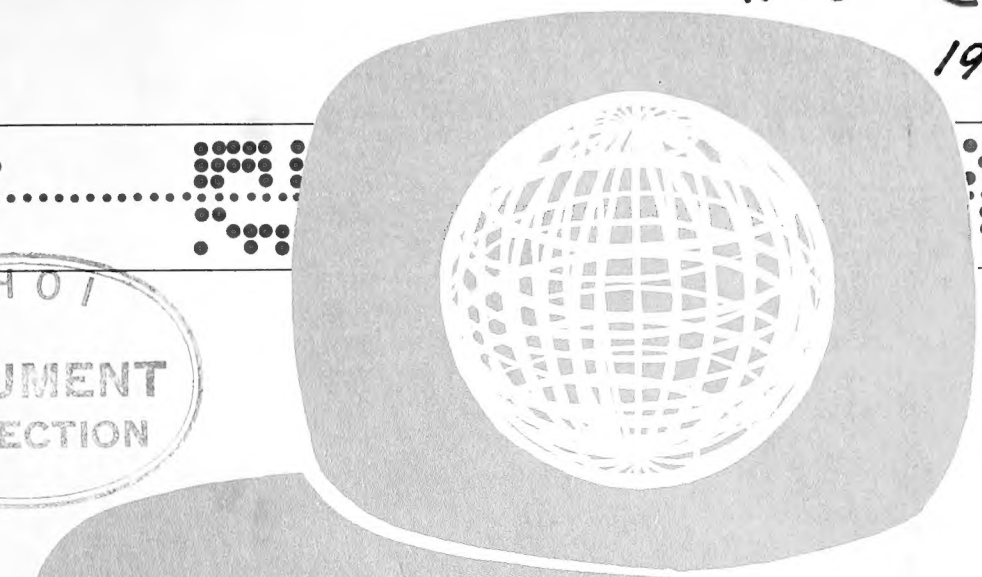

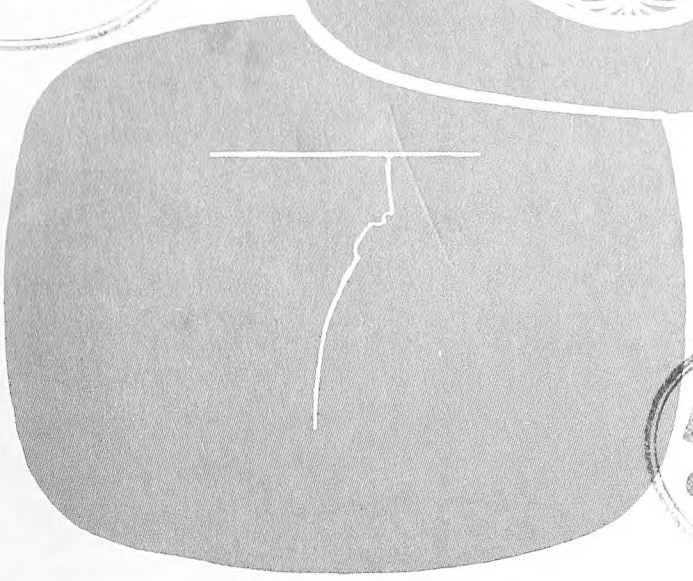

COMPUTER PROGRAMS IN OCEANOGRAPHY

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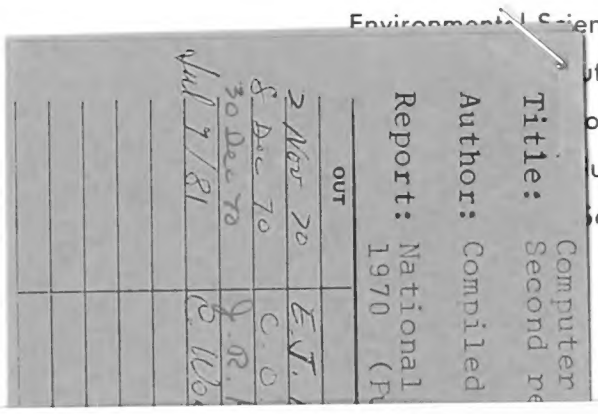

NATIONAL OCEANOGRAPHIC DATA CENTER

CATALOG SERIES

COMPUTER PROGRAMS IN OCEANOGRAPHY

Compiled by C. DINGER

PUBLICATION C-5

(Second Revision)

1970

PRICE $1.35

ACKNOWLEDGMENT

The cooperation of the individuals and organizations who contributed program abstracts is greatly appreciated.

DISCLAIMER

This catalog is mainly a compilation of information voluntarily contributed by various individuals and institutions. The National Oceanographic Data Center cannot assume responsibility for the accuracy of the abstracts or the proper functioning of the programs, except for those originated at the Center.

Any information to correct or update the programs in this catalog will be appreciated.

CONTENTS

INTRODUCTION

This second major revision of the National Oceanographic Data Center's (NODC's) catalog Computer Programs in Oceanography is issued to foster awareness of computer programs related to oceanography and to facilitate their exchange between interested groups.

As in the first revision, the material is arranged under subject headings, with each entry containing the program title, program language, computer system the program is written for, indication whether a copy is on file at NODC, brief program description provided by originator, and name and address of person to contact for further details.

This catalog only begins to reflect the present programs originated by NODC for the new in-house computer. Supplements or revised editions will be issued, and abstracts of NODC's latest programs will be incorporated, as well as contributions from other institutions not received in time for inclusion in this catalog. Also, a revised edition of the NODC publication G-15, User's Guide to NODC's Data Processing Systems, planned for the near future will contain updated computer programming information.

Documentation on file at NODC or assistance in locating a program can be obtained by writing to:

The Director
National Oceanographic Data Center
Washington, D. C. 20390

Contributors of new programs are requested to fill out the abstract form in the back of this catalog and send it to the above address.

SOURCES OF INFORMATION

Catalogs of computer programs pertaining to disciplines related to oceanography have been compiled by various organizations. The following is a listing of such publications known to NODC at this time. The Center would appreciate further information about existing computer programs for inclusion in following editions of this catalog.

RESEARCH COMPUTATION CENTER PROGRAM LIBRARY

A compilation of computer programs written by Naval Research Laboratory personnel. For further information, contact:

Mrs. Janet P. Mason, Code 7813
Mathematics and Information Services Division
Naval Research Laboratory
Washington, D. C. 20390

NATIONAL COMPUTER PROGRAM INDEX

Includes GOSSIP (Geologically Oriented Scheme for Sharing Information in Programming) and the Rokdoc Package, a library of routines for statistical analysis, summary, and display of data concerning sedimentary rocks. Inquiries should be directed to:

Assistant Librarian
Department of Geology
University of Reading
Whiteknights Park
Reading RGG-2AB
England

COOPERATIVE OCEANOGRAPHIC PROGRAMMING EFFORT (COPE)

A compilation of computer programs in use at the Woods Hole Oceanographic Institution. For further information, contact:

Editors of COPE
Woods Hole Oceanographic Institution
Woods Hole, Massachusetts 02543

COMPUTER SOFTWARE MANAGEMENT AND INFORMATION CENTER (COSMIC)

A catalog of programs generated by the NASA space effort. Many of the programs are of a general nature. For further information, contact:

COSMIC
Computer Center
University of Georgia
Athens, Georgia 30601

NAVAL ORDNANCE LABORATORY LIBRARY OF COMPUTER PROGRAMS

A catalog of programs in use at the Naval Ordnance Laboratory. For further information, contact:

Mathematics Department
U. S. Naval Ordnance Laboratory
at White Oak
Silver Spring, Maryland 20910

KANSAS GEOLOGICAL SURVEY - COMPUTER CONTRIBUTIONS

A series of publications devoted to computer programs and examples of problem-solving applications in the earth sciences. For further information, contact:

Dr. Daniel F. Merriam, Editor
Computer Contributions
Kansas Geological Survey
University of Kansas
Lawrence, Kansas 66045

BIOLOGICAL OCEANOGRAPHY
-*-*-*-*-*-*-*-*-*-*-*-

RYLD, BIOM

LANGUAGE - FORTRAN IV
COMPUTER - IBM 1130

(COPY ON FILE AT NODC)
COMPUTES THE APPROXIMATE YIELD OF A FISH STOCK PER RECRUITMENT BY EITHER OF TWO METHODS (ARITHMETIC OR EXPONENTIAL APROXIMATIONS), OR THE PROGRAM SIMPLY COMPUTES THE STOCK BIOMASS WHEN THERE IS NO FISHING. OUTPUT-- AN EQUILIBRIUM YIELD MATRIX WITH UP TO 400 ENTRIES CORRESPONDING TO 20 AGES AT ENTRY AND 20 MULTIPLIERS. AUTHORS-- L.V. PIENAAR AND J.A. THOMSON, TECHNICAL REPORT NO. 92 (UNPUBLISHED MANUSCRIPT, NOV 1968). EARLIER VERSION OF PROGRAM WRITTEN BY L. E. GALES, COLLEGE OF FISHERIES, UNIVERSITY OF WASHINGTON. DIRECT INQUIRIES TO -

FISHERIES RESEARCH BOARD OF CANADA
BIOLOGICAL STATION
NANAIMO, B. C.

CHLOROPHYLL PIGMENT AND CAROTENOID PIGMENT

LANGUAGE - FORTRAN II
COMPUTER - IBM 1620 II

(COPY ON FILE AT NODC)
TWO SIMILAR BUT SEPARATE ROUTINES. CALCULATION METHOD BASED ON THE USE OF 1.0 CM. CELLS. DATA CARDS INPUT, OUTPUT IS PRINTED LISTING AND PUNCH CARDS. AUTHOR-- DR. MALCOLM HAIR.

INSTITUTE OF MARINE SCIENCE
ADELPHI UNIVERSITY
OAKDALE, LONG ISLAND, N.Y. 11769

COMBINED CHLOROPHYLL AND PRODUCTIVITY

LANGUAGE - FORTRAN IV
COMPUTER - CDC 6400

(COPY ON FILE AT NODC)
COMPUTES ASSIMILATION OF PRODUCTIVITY IN SEA WATER AND COMPUTES THE QUANTITIES OF CHLOROPHYLL A, B, AND C, AND THE AMOUNT OF CAROTENOIDS IN SEA WATER. WRITTEN BY MARSHA WALLIN, NOV 1963. BASED UPON TWO PROGRAMS PREPARED IN 1962 FOR THE IBM 709 BY M.R. RONA. THE CHLOROPHYLL PROGRAM DETERMINES THE AMOUNT OF PLANKTON PIGMENTS USING THE EQUATIONS OF RICHARDS AND THOMPSON. THE PRODUCTIVITY PROGRAM (CARBON 14) DETERMINES THE PRODUCTION OF MARINE PHYTOPLANKTON BY USING NEILSEN'S METHOD. OUTPUT CONSISTS OF BOTH PRINTED MATTER AND OF LIBRARY CARDS. THE LIBRARY CARDS MAY BE USED AS INPUT TO A MULTIPLE REGRESSION PROGRAM TO DERIVE A RELATION BETWEEN PRODUCTIVITY AND CHLOROPHYLL A. FINALLY, A PLOT ROUTINE MAY BE CALLED TO GRAPH ONE OR SEVERAL VARIABLES AS A FUNCTION OF DEPTH, OR TO DISPLAY THE HORIZONTAL DISTRIBUTION OF ANY GIVEN PROPERTY. REVISED IN 1969 FOR THE CDC-6400.

DR. G. C. ANDERSON
DEPARTMENT OF OCEANOGRAPHY
UNIVERSITY OF WASHINGTON
SEATTLE, WASH. 98105

ECOPROD

LANGUAGE - FORTRAN IV
COMPUTER - CDC 6600

(COPY ON FILE AT NODC)
COMPUTES GROSS AND NET PRODUCTIVITY, RESPIRATION, P/R RATIO, PHOTOSYNTHETIC QUOTIENT, EFFICIENCY, DIFFUSION COEFFICIENT, GIVEN SUNLIGHT DATA AND DIURNAL MEASURES OF OXYGEN AND/OR CARBON DIOXIDE. CORE STORAGE REQUIRED-- 25,000 60-BIT WORDS. AUTHOR-- WILLIAM LONGLEY.

THE UNIVERSITY OF TEXAS

MARINE SCIENCE INSTITUTE
PORT ARANSAS, TEXAS 78373

JOB (SPECIES DIVERSITY)

LANGUAGE - FORTRAN IV
COMPUTER - CDC 6600

(COPY ON FILE AT NODC)
CALCULATES SPECIES DIVERSITY INDEX FOR NUMBERS OF ORGANISMS AND/OR WEIGHT OF ORGANISMS, UTILIZING THE DIVERSITY INDEX EQUATION DERIVED FROM MARGALEF. PROGRAM CALLS SUBROUTINE 'SEASON' WHICH CALCULATES SEASONAL AVERAGES FOR A GIVEN STATION, SEASONAL LIMITS BEING INDICATED BY A CONTROL CARD. THIS SUBROUTINE OUTPUTS MEAN, STANDARD DEVIATION, AND RANGE OF DIVERSITY INDICES FOR EACH SEASONAL GROUP. OTHER DESIRED GROUPINGS MAY BE ENTERED BY A GROUPING CONTROL CARD. CORE STORAGE NECESSARY-- 50,000 60-BIT WORDS. AUTHOR-- A.D. EATON.

WILLIAM LONGLEY
THE UNIVERSITY OF TEXAS
MARINE SCIENCE INSTITUTE
PORT ARANSAS, TEXAS 78373

OXYGEN

LANGUAGE - FORTRAN IV
COMPUTER - CDC 6600

(COPY ON FILE AT NODC)
DETERMINES PRODUCTIVITY BY OXYGEN DIURNAL CURVE METHOD. INPUT INCLUDES OXYGEN CONCENTRATION AND OXYGEN PROBE PARAMETERS. OUTPUT CONTAINS NET AND GROSS PRODUCTIVITY AND P/R PLUS ORIGINAL DATA. AUTHOR-- WILLIAM LONGLEY.

THE UNIVERSITY OF TEXAS
MARINE SCIENCE INSTITUTE
PORT ARANSAS, TEXAS 78373

MARINE BIOLOGICAL ENVIRONMENTAL SUMMARIES

LANGUAGE - FORTRAN
COMPUTER - IBM 7074

CODED CHARACTERISTICS FOR SPECIFIED LOCALITIES ARE SUMMARIZED FOR THE FOLLOWING MARINE BIOLOGICAL PHENOMENA-- AMBIENT BACKGROUND NOISE, ATTACHED AND FLOATING MARINE VEGETATION, BIOLUMINESCENCE, AND DANGEROUS MARINE LIFE. CHARACTERISTICS INCLUDE-- HABITAT, PERIOD OF ACTIVITY, FREQUENCY, RANGE OF SOUND, MAXIMUM SOUND PRESSURE LEVEL, AREAL DISTRIBUTION OF MARINE VEGETATION, TYPE AND INTENSITY OF BIOLUMINESCENCE, AND CAUSES AND EFFECTS OF SPECIFIED DANGEROUS MARINE LIFE. AUTHOR-- R.M. HOLCOMBE. OS NO. 53338.

OCEANOGRAPHIC ANALYSIS DIV., CODE 3301
NAVAL OCEANOGRAPHIC OFFICE
SUITLAND, MD. 20390

LENGTH-WEIGHT FREQUENCY

LANGUAGE - FORTRAN IV
COMPUTER - IBM 360/65

CALCULATES LENGTH-WEIGHT FREQUENCY DISTRIBUTION VALUES FROM SKIPJACK CATCH DATA.

BUREAU OF COMMERCIAL FISHERIES BIOLOGICAL LAB.
ATTN. DR. R.A. BARKLEY, OCEANOGRAPHER
P.O. BOX 3830
HONOLULU, HAWAII 96812

BIODETERIORATION PROJECT

LANGUAGE - AUTOCODER
COMPUTER - IBM 7074

(COPY ON FILE AT NODC)
MONTHLY AND YEARLY SUMMARIES OF THE RESULTS OF FOULING MEASURED ON EXPOSED AND CONTROL PANELS. OS NO. 52272. AUTHOR-- JUDY YAVNER.

DEVELOPMENT DIVISION, CODE 2300
NATIONAL OCEANOGRAPHIC DATA CENTER
WASHINGTON, D.C. 20390

CONCENTRATIONS PER SQUARE METER OF SURFACE IN THE OCEAN AND LAKES FROM CONCENTRATIONS PER VOLUME (UWMS-1006)

LANGUAGE - FORTRAN IV
COMPUTER - IBM 7094-II/ 7040 DCS

(COPY ON FILE AT NODC)
COMPUTES VARIOUS CHEMICAL AND BIOLOGICAL COMPOUND CONCENTRATIONS AS WELL AS PRODUCTIVITY RATES PER SQUARE METER OF WATER SURFACE, FROM INTEGRATED VALUES ON 'PER VOLUME' BASIS. TEN CONCENTRATIONS AND RATES ARE INTEGRATED OVER UP TO SEVEN PAIRS OF OPTIONAL DEPTH LIMITS. REF. A 31-PAGE REPORT (UWMS-1006, JUN 1966) BY THE DEPARTMENT OF OCEANOGRAPHY, APPLIED MATHEMATICS SECTION. CORE STORAGE NEEDED- 2231 WORDS. SOURCE DECK HAS 771 CARDS.

H. MACINTOSH, COMPUTER SERVICES
DEPARTMENT OF OCEANOGRAPHY
UNIVERSITY OF WASHINGTON
SEATTLE, WASH. 98105

PHYTOPLANKTON NUMBERS, VOLUMES AND SURFACE AREAS BY SPECIES (UWMS-1008 AND UWMS-1009)

LANGUAGE - FORTRAN IV
COMPUTER - IBM 7094-II/ 7040 DCS

(COPY ON FILE AT NODC)
TWO PROGRAMS, DIFFERING IN INPUT FORMAT ONLY, COMPUTE CONCENTRATIONS OF CELL NUMBERS, CELL SURFACE AREAS, AND CELL AND PLASMA VOLUMES IN MARINE PHYTOPLANKTON POPULATIONS. ALSO MEAN CELL AREAS, MEAN CELL VOLUMES AND MEAN PLASMA VOLUMES AS WELL AS THE RATIOS CELL AREA TO CELL VOLUME AND CELL AREA TO PLASMA VOLUME ARE COMPUTED OPTIONALLY. THE INPUT QUANTITIES ARE OBTAINED FROM MICROSCOPICAL EXAMINATION OF SEAWATER SAMPLES. A SUBROUTINE COMPUTES THE AREA, VOLUME AND PLASMA VOLUME OF A CELL FROM MEASURED DIMENSIONS OF DIVERSE SPECIES. CORE STORAGE REQUIRED-- 23,836 WORDS FOR MAIN PROGRAM AND SUBROUTINES IN FORTRAN AND MAP. SOURCE DECK HAS 1211 CARDS. REF. A 93 PAGE REPORT-- SPECIAL REPORT NO. 38 (M66-41,JULY 1966), BY PAAVO E. KOVALA AND JERRY D. LARRANCE.

H. MACINTOSH, COMPUTER SERVICES
DEPARTMENT OF OCEANOGRAPHY
UNIVERSITY OF WASHINGTON
SEATTLE, WASH. 98105

CHLOROPHYLL CALCULATIONS

LANGUAGE - MAC
COMPUTER - ICT 1301

CALCULATES CHLOROPHYLL USING THE FORMULA OF STRICKLAND IN 'A MANUAL OF SEA WATER ANALYSIS' PP. 110-112. AUTHORS-- A.M. SHIPLEY AND D. SACKS.

UNIVERSITY OF CAPE TOWN
OCEANOGRAPHY DEPARTMENT
ATTN. MR. A.M. SHIPLEY
PRIVATE BAG, RONDEBOSCH, C.P.
REPUBLIC OF SOUTH AFRICA

PROGRAM REGROUP

LANGUAGE - FORTRAN
COMPUTER - CDC 3600

(COPY ON FILE AT NODC)
THE PROGRAM DETERMINES THE NUMBERS OF OCCURRENCES AND JOINT OCCURRENCES OF THE SPECIES IN THE SET OF SAMPLES. IT THEN CALCULATES AN INDEX OF AFFINITY FOR EACH PAIR OF SPECIES. THE SPECIES ARE ORDERED IN TERMS OF THE NUMBERS OF AFFINITIES THEY HAVE AND THIS LIST IS PRINTED ALONG WITH A LIST OF NAMES, CODE NUMBERS AND NUMBERS OF OCCURRENCES. THE PROGRAM THEN DETERMINES THE LARGEST GROUP THAT COULD BE FORMED, TESTS TO SEE WHETHER THAT MANY SPECIES ALL HAVE AFFINITY WITH EACH OTHER AND, IF THEY DO, PRINTS OUT THE GROUP. IF THEY DO NOT IT

TRIES THE NEXT SMALLER GROUP, ETC. THOSE SPECIES WHICH HAD AFFINITY ONLY WITH THIS GROUP - AND/OR EARLIER GROUPS - ARE LISTED. THE REMAINING SPECIES ARE REORDERED AND THE PROCESS CONTINUED UNTIL ALL SPECIES HAVE BEEN PUT EITHER IN GROUPS OR IN THE LIST OF SPECIES WITH AFFINITIES WITH GROUPS. LIMITS-- 200 SPECIES. DIRECT INQUIRIES TO--

DR. E. W. FAGER
SCRIPPS INSTITUTION OF OCEANOGRAPHY
P.O. BOX 109
LA JOLLA, CALIFORNIA 92037

CHLOR

LANGUAGE - FORTRAN IV
COMPUTER - CDC 3600

THIS PROGRAM WILL EITHER CALCULATE CHLOROPHYLL A, B, C CONCENTRATIONS IN MICROGRAMS PER LITER OF SEAWATER AND THE CONVERSION FACTORS FOR THE FLUOROMETER USING SPECTROPHOTOMETER READINGS, OR CALCULATE CHLOROPHYLL A AND PHAEOPHYTIN CONCENTRATIONS IN MICROGRAMS PER LITER OF SEAWATER, USING THE FLUOROMETER READINGS. A SIMILAR PROGRAM WAS WRITTEN EARLIER AT S.I.O. FOR THE CDC 1604.

MR. DAVID WIRTH
OCEANIC RESEARCH DIVISION
SCRIPPS INSTITUTION OF OCEANOGRAPHY
P.O. BOX 109
LA JOLLA, CALIFORNIA 92037

NUTRIENT CHEMISTRY CONCENTRATION

LANGUAGE - (NOT GIVEN)
COMPUTER - CDC 1604

COMPUTES CONCENTRATIONS OF INORGANIC PHOSPHORUS, SILICATE, NITRITE, NITRATE, FROM THE APPROXIMATE RAW DATA.

SCRIPPS INSTITUTION OF OCEANOGRAPHY
LA JOLLA, CALIFORNIA 92037

PRIMARY PRODUCTIVITY

LANGUAGE - (NOT GIVEN)
COMPUTER - CDC 1604

COMPUTES PRIMARY PRODUCTIVITY FROM ACTIVITY OF CARBON, DURATION OF INCUBATION, TYPE OF INCUBATION, SAMPLE ACTIVITY AND DEPTH.

SCRIPPS INSTITUTION OF OCEANOGRAPHY
LA JOLLA, CALIFORNIA 92037

ZOOPLANKTON VOLUME

LANGUAGE - (NOT GIVEN)
COMPUTER - CDC 1604

COMPUTES ZOOPLANKTON VOLUME FROM VARIOUS TYPES OF HAUL.

SCRIPPS INSTITUTION OF OCEANOGRAPHY
LA JOLLA, CALIFORNIA 92037

ALKALINITY AND SPECIFIC ALKALINITY

LANGUAGE - FORTRAN AND FORCOM
COMPUTER - IBM 1620

THE INPUT CARDS OF THIS PROGRAM ARE PRE-PUNCHED WITH THE STATION NUMBER, DATE, WIRE LENGTH AND BOTTLE NUMBER, THEN SENT TO THE CHEMISTRY LABORATORY WHERE THE PH VALUE AND THE SALINITY VALUE ARE PUNCHED ON THE CARDS. THE CARDS ARE THEN RETURNED AND PROCESSED THROUGH THE COMPUTER.

UNIVERSITY OF MIAMI
MARINE LABORATORY
COMPUTING CENTER
1 RICKENBACKER CAUSEWAY
VIRGINIA KEY, MIAMI, FLORIDA

SALINITY VALUE CALCULATION

LANGUAGE - FORTRAN AND FORCOM
COMPUTER - IBM 1620

THE INPUT CARDS ARE PRE-PUNCHED WITH STATION NUMBER, DATE, WIRE LENGTH AND BOTTLE NUMBER, THEN SENT TO THE CHEMISTRY LABORATORY WHERE THE X AND Y ARM READINGS ARE PUNCHED. THE CARDS ARE THEN RETURNED AND PROCESSED THROUGH THE COMPUTER. AN 80-80 BOARD ON THE IBM 407 IS USED FOR LISTING THE OUTPUT OF THIS PROGRAM.

UNIVERSITY OF MIAMI
MARINE LABORATORY
COMPUTING CENTER
1 RICKENBACKER CAUSEWAY
VIRGINIA KEY, MIAMI, FLORIDA

SPECIAL CHEMISTRY CALCULATIONS

LANGUAGE - FORTRAN IV
COMPUTER - IBM 1130

READS SPECIAL CHEMISTRY (PHOSPHATE, SILICATE, NITRATE, ETC.) RAW DATA CARDS, AND COMPUTES FINAL VALUES. OUTPUT FROM THE PROGRAM-- WORKING RECORD OF THE DATA FILE, FINAL REPORT IN PUBLISHABLE FORM, PLOTS OF ANY VARIABLES VS. DEPTH, PLOTS OF ANY VARIABLE VS. VARIABLE, AND STANDARD OBSERVED CARDS. DOCUMENTATION-- OPERATING INSTRUCTIONS ONLY.

UNIVERSITY OF WASHINGTON
DEPARTMENT OF OCEANOGRAPHY
22A OCEANOGRAPHY TEACHING BLDG.
ATTN. MRS. HELLA MACINTOSH
SEATTLE, WASH. 98105

WATER CHEMISTRY

LANGUAGE - FORTRAN IV
COMPUTER - IBM 360/65

(COPY ON FILE AT NODC)
CALCULATES THE DIELECTRIC CONSTANT OF WATER 0 TO 360 DEG. C (WATER SATURATED FOR T OVER 100 DEG. C), THE DENSITY OF WATER (0 TO 360 DEG. C), THE EXTENDED DEBYE-HUECKEL ACTIVITY COEFFICIENTS OF CHARGED SPECIES, THE ACTIVITY PRODUCTS FOR 33 HYDROLYSIS REACTIONS INCLUDING OXIDES, HYDROXIDES, CARBONATES, SULFIDES AND SILICATES, THE CONCENTRATIONS AND ACTIVITIES OF 10 ION PAIRS OR COMPLEXES, AND OF 22 AQUEOUS SPECIES, THE OXIDATION POTENTIAL CALIBRATIONS, THE STANDARD STATE OXIDATION POTENTIALS AND EH VALUES AT EQUILIBRIUM FOR 13 REDOX REACTIONS, MOLES AND PPM OF CATIONS AT EQUILIBRIUM WITH 42 SOLID PHASES AND THE CHEMICAL POTENTIALS FOR EACH OF THE 42 REACTIONS ALONG WITH ACTIVITY PRODUCT/EQUILIBRIUM CONSTANT RATIOS FOR THE HYDROLYSIS REACTIONS. PROGRAM NO. M0101, FEB 1968.

U. S. GEOLOGICAL SURVEY
COMPUTER CENTER DIVISION
ATTN. RALPH EICHER, CHIEF
BRANCH OF SCIENTIFIC APPLICATIONS
WASHINGTON, D. C. 20242

ISALBP

LANGUAGE - FORTRAN II
COMPUTER - CDC 3100

CALCULATES THE SALINITY ANOMALY FROM A STANDARD T/S OR THETA/S CURVE FOR NORTH ATLANTIC CENTRAL WATER BY L.V. WORTHINGTON. THE RESULTS ARE OUTPUT ON THE LINE PRINTER, STATION BY STATION. STORAGE REQUIREMENT-- 2540 DECIMAL. AUTHOR-- A.B. GRANT (JUNE 1968).

DIRECTOR
ATLANTIC OCEANOGRAPHIC LABORATORY
BEDFORD INSTITUTE
DARTMOUTH, NOVA SCOTIA, CANADA

ISATBP

LANGUAGE - FORTRAN II
COMPUTER - CDC 3100

CALCULATES THE PERCENTAGE OF OXYGEN SATURATION IN SEA WATER, ACCORDING TO TABLES AND FORMULAE BY MONTGOMERY (1967), AS WELL AS AN OXYGEN A-NOMALY ON A SIGMA-T SURFACE, ACCORDING TO A TABULATED CURVE BY RICH-ARDS AND REDFIELD (1955). THE RESULTS ARE OUTPUT ON THE LINE PRINTER, STATION BY STATION. AUTHOR-- A.B. GRANT (JUNE 1968).

DIRECTOR
ATLANTIC OCEANOGRAPHIC LABORATORY
BEDFORD INSTITUTE
DARTMOUTH, NOVA SCOTIA, CANADA

PERCENTAGE SATURATION OF OXYGEN IN ESTUARINE WATERS
(COPY ON FILE AT NODC)

LANGUAGE - FORTRAN IV-G
COMPUTER - IBM 360/65

COMPUTES THE PERCENTAGE SATURATION OF DISSOLVED OXYGEN IN ESTUARINE, OR BRACKISH WATER. BECAUSE OF THE TEMPERATURE COMPENSATION AT A FIXED 25 DEG. C IN THE CONDUCTIVITY MEASUREMENTS, SALINITY IS GIVEN AS INPUT AND IS USED TO COMPUTE CHLORINITY. THIS COMPUTED CHLORINITY, WITH THE ACCOMPANYING TEMPERATURE, IS USED TO DETERMINE THE OXYGEN SOLUBILITY OF THE WATER. THE MAXIMUM PERCENTAGE SATURATION OF THE DISSOLVED OXY-GEN IN THE WATER IS CALCULATED FROM THE GIVEN OXYGEN CONTENT AND THE COMPUTED OXYGEN SOLUBILITY. THE SAME PROCEDURE IS USED TO ASCERTAIN THE MINIMUM PERCENTAGE SATURATION OF OXYGEN. INDEPENDENTLY OF THE DISSOLVED OXYGEN DATA, THERE IS ANOTHER SET OF MEASURED TEMPERATURE AND CONDUCTIVITY FROM WHICH SALINITY IS COMPUTED. PROGRAM NO. B528, BY PATRICIA A. FULTON, APR 1969.

U. S. GEOLOGICAL SURVEY
COMPUTER CENTER DIVISION
ATTN. RALPH EICHER, CHIEF
BRANCH OF SCIENTIFIC APPLICATIONS
WASHINGTON, D. C. 20242

AOU, ISAOU

LANGUAGE - FORTRAN
COMPUTER - IBM 360/65

CALCULATES SIGMA-T, SATURATION VALUES OF OXYGEN, APPARENT OXYGEN UTIL-IZATION, AND RATIOS OF A.O.U. TO PHOSPHATE. USES H. O. FORMAT (1960) CARDS.

BUREAU OF COMMERCIAL FISHERIES
HONOLULU, HAWAII 96812

OXYGEN/NITROGEN SATURATION

LANGUAGE - FORTRAN
COMPUTER - IBM 7074

GIVES OXYGEN IN ML/L, MG/L, AND PERCENT SATURATION. ALSO GIVES APPARENT OXYGEN UTILIZATION, NITROGEN IN ML/L, AND NITROGEN PERCENT SATURATION. THE PROGRAM WILL ACCEPT DATA DERIVED FROM EITHER GAS PARTITIONER OR TITRATION METHODS. OS PROGRAM NO. 59209, BY GORDON WILCHER.

OCEAN SURVEYS DIVISION, CODE 9230
NAVAL OCEANOGRAPHIC OFFICE
SUITLAND, MD. 20390

SALINITY

LANGUAGE - FORTRAN IV
COMPUTER - HONEYWELL516

(COPY ON FILE AT NODC)
CONVERTS READINGS FROM THE SALINOMETER TO SALINITIES, GIVEN THE TEMPERATURE AND CONDUCTIVITY RATIO. TELETYPE I/O.

COMMANDING OFFICER
U.S. COAST GUARD OCEANOGRAPHIC UNIT
BLDG. 159-E, NAVY YARD ANNEX
WASHINGTON, D. C. 20390

OXYGEN

LANGUAGE - FORTRAN IV
COMPUTER - HONEYWELL516

(COPY ON FILE AT NODC)
COMPUTES VALUES OF OXYGEN. TELETYPE I/O.

COMMANDING OFFICER
U.S. COAST GUARD OCEANOGRAPHIC UNIT
BLDG. 159-E, NAVY YARD ANNEX
WASHINGTON, D. C. 20390

PHOSPHATE

LANGUAGE - FORTRAN IV
COMPUTER - HONEYWELL516

(COPY ON FILE AT NODC)
COMPUTES PHOSPHATE VALUES. TELETYPE I/O.

COMMANDING OFFICER
U.S. COAST GUARD OCEANOGRAPHIC UNIT
BLDG. 159-E, NAVY YARD ANNEX
WASHINGTON, D. C. 20390

INDUCTIVE SALINOMETER SALINITY CONVERSION

LANGUAGE - PDP8 FORTRAN
COMPUTER - PDP-5, 8S

(COPY ON FILE AT NODC)
ACCEPTS BOTTLE NUMBER, TEMPERATURE OF SAMPLE, AND CONDUCTIVITY RATIO OF SAMPLE AND OUTPUTS A SALINITY CORRECTED FOR TEMPERATURE AND SHEAR.

COMMANDING OFFICER
U.S. COAST GUARD OCEANOGRAPHIC UNIT
BLDG. 159-E, NAVY YARD ANNEX
WASHINGTON, D. C. 20390

SPECIFIC CONDUCTIVITY WITH PRESSURE EFFECT

LANGUAGE - FORTRAN
COMPUTER - IBM OS/360

(COPY ON FILE AT NODC)
COMPUTES SPECIFIC CONDUCTIVITIES FROM MEASURED VALUES OF RESISTANCE FOR THE ELECTROLYTIC SOLUTION AND THE PRESSURES AT WHICH THE MEASUREMENTS WERE MADE. THE PROGRAM ALSO DETERMINES OTHER USEFUL QUANTITIES NEEDED TO DETERMINE THE EFFECT OF PRESSURE ON THE IONIC CONDUCTANCE THROUGH THE UPPER 2000 METERS OF THE OCEAN'S WATER COLUMN. THE CONDUCTIVITY INCREASE WHICH RESULTS SOLELY FROM SOLUTION CONCENTRATION CHANGES DURING COMPRESSION IS DETERMINED AND FOUND TO BE A SIGNIFICANT

ERROR SOURCE. REF. THESIS BY MICHAEL E. MAYS (DEC 1968, 89 P).

NAVAL POSTGRADUATE SCHOOL
MONTEREY, CALIFORNIA 93940

SALINITY - CONDUCTIVITY FORMULA

LANGUAGE - FORTRAN
COMPUTER - IBM 7074

EVALUATES A NEWLY DEVELOPED EQUATION RELATING SEA WATER ELECTRICAL CONDUCTIVITY AND SALINITY. AUTHOR-- W.L. GUIDRY. OS NO. 20184.

COMPUTER DEPARTMENT, CODE 0831
NAVAL OCEANOGRAPHIC OFFICE
SUITLAND, MD. 20390

CHLORINITY - SALINITY

LANGUAGE - FORTRAN II
COMPUTER - IBM 7094

SUBROUTINE COMPUTES CHLORINITY AND SALINITY FROM MEASUREMENTS OF TEMPERATURE AND CONDUCTIVITY. USES MODIFICATION OF POLLAK'S (1954) EQUATIONS RELATING CONDUCTIVITY, TEMPERATURE, AND CHLORINITY.

HARVEY E. WALTERS
CHESAPEAKE BAY INSTITUTE
THE JOHNS HOPKINS UNIVERSITY
CHARLES AND 34TH ST.
BALTIMORE, MD. 21218

TOTAL CO(2)

LANGUAGE - FORTRAN II
COMPUTER - IBM 7094

COMPUTES TOTAL CO(2) FROM MEASUREMENTS OF TEMPERATURE, CHLORINITY, PH, AND ALKALINITY. FOLLOWS METHOD OF H.W. HARVEY (1960). LINEAR INTERPOLATION IN TWO VARIABLES IS PERFORMED IN THE TABLES. OUTPUT IS A TABULATION FOR EACH STATION OF DEPTH, INPUT DATA, AND TOTAL CO(2). OPTIONALLY, OFF-LINE CALCOMP PLOTS OF TOTAL CO(2) VS. DEPTH CAN BE PRODUCED. CORE STORAGE NECESSARY-- 3430 WORDS PLUS PLOTTER ROUTINES.

HARVEY E. WALTERS
CHESAPEAKE BAY INSTITUTE
THE JOHNS HOPKINS UNIVERSITY
CHARLES AND 34TH ST.
BALTIMORE, MD. 21218

GAMMA-RAY SPECTRA

LANGUAGE - FORTRAN
COMPUTER - (NOT GIVEN)

(COPY ON FILE AT NODC)
IDENTIFIES AND MEASURES COMPONENTS IN A MIXTURE OF GAMMA-EMITTING RADIONUCLIDES. THE COMPUTER PROGRAM WILL BE USEFUL IN ANALYZING THE LARGE NUMBER OF LOW ACTIVITY MIXTURES OF RADIONUCLIDES THAT ARE TO BE MADE IN THE PROGRAM TO DETERMINE THE PHYSICAL-CHEMICAL SPECIES OF THE RADIONUCLIDE DEBRIS PRODUCED BY UNDERWATER NUCLEAR EXPLOSIONS. REF. REPORT TR-67-46, U.S. NAVAL RADIOLOGICAL DEFENSE LABORATORY, BY JAMES F. PESTANER AND DANIEL L. LOVE.

DIVISION OF BIOLOGY AND MEDICINE
U.S. ATOMIC ENERGY COMMISSION
WASHINGTON, D. C. 20545

OPTIMIZATION OF VTE SALINE WATER PLANTS

LANGUAGE - FORTRAN IV
COMPUTER - IBM 7094

(COPY ON FILE AT NODC)
PROGRAM AND SUBROUTINES TO DEVELOP AN OPTIMUM DESIGN OF A MIMIMUM COST VTE (VERTICAL TUBE EVAPORATOR) FALLING FILM PLANT FOR PRODUCING FRESH WATER FROM SEA WATER. RESEARCH AND DEVELOPMENT PROGRESS REPORT NO.

404 (FEB 1969, 164 P).

U.S. DEPARTMENT OF THE INTERIOR
OFFICE OF SALINE WATER
WASHINGTON, D.C. 20240

PHYSICAL OCEANOGRAPHY DATA REDUCTION PROGRAMS FOR THE CDC 3100
LANGUAGE - FORTRAN II
COMPUTER - CDC 3100

(COPY ON FILE AT NODC)

AN OCEANOGRAPHIC DATA PROCESSING SYSTEM DESIGNED TO ACCEPT THE DATA FROM THE ORIGINAL LOG SHEETS. COMPUTES OBSERVED TEMPERATURES AND PRESSURES FROM THERMOMETER READINGS, SALINITIES FROM THE CONDUCTIVITY RATIO READINGS, THE DISSOLVED OXYGEN FROM THE TITRES AND THE REACTIVE SILICA CONCENTRATIONS FROM THE OPTICAL DENSITIES. THE DATA INPUT MAY BE PUNCHED PAPER TAPE FROM THE PDP-8 SYSTEM (B.I. COMPUTER NOTE 68-5-C) OR PUNCHED CARDS. THE FINAL PROGRAM IN THE SYSTEM COMPUTES DEPTH, POTENTIAL TEMPERATURE, SURFACE DENSITY ANOMALY, POTENTIAL SURFACE DENSITY ANOMALY AND SPECIFIC VOLUME ANOMALY. THE PROGRAM ALSO CAN COMPUTE THE DYNAMIC HEIGHT AND POTENTIAL ENERGY ANOMALY AT GIVEN PRESSURES AND MAY ALSO GIVE A MAGNETIC TAPE OF THE DATA IN CARD IMAGE OF THE CODC FORMAT. CORE STORAGE-- 16K. REF. B.I. COMPUTER NOTE 68-10-C (OCT 1968, 280 PAGES), BY R. REINIGER, C.K. ROSS, P. TRITES AND D.J. LAWRENCE.

DIRECTOR
ATLANTIC OCEANOGRAPHIC LABORATORY
BEDFORD INSTITUTE
DARTMOUTH, NOVA SCOTIA, CANADA

PHYSICAL OCEANOGRAPHY DATA REDUCTION PROGRAMS FOR THE PDP-8
LANGUAGE - PAL III
COMPUTER - PDP-8

(COPY ON FILE AT NODC)

A SYSTEM OF PROGRAMS THAT ACCEPTS RAW DATA AS RECORDED ON DECK SHEETS. CALCULATES THE CORRECTED TEMPERATURES, USES THE HIGHEST ORDER LEAST SQUARES FIT TO OBTAIN THE SMOOTHED PRESSURES, CALCULATES DEPTH, SPECIFIC VOLUME ANOMALY, POTENTIAL TEMPERATURE, AND DENSITY ANOMALIES. ALSO FORMATS RAW CHEMISTRY DATA. INCLUDES A SET OF PLOTTING ROUTINES. CORE STORAGE-- 4K. REF. B.I. COMPUTER NOTE 68-5-C (258 P, MAY 1968), BY C.K. ROSS, R. REINIGER, A.B. GRANT.

DIRECTOR
ATLANTIC OCEANOGRAPHIC LABORATORY
BEDFORD INSTITUTE
DARTMOUTH, NOVA SCOTIA, CANADA

STADAT 2
LANGUAGE - FORTRAN II
COMPUTER - GE 225

(COPY ON FILE AT NODC)

A CHAIN OF EIGHT PROGRAMS WHICH REDUCE AND EDIT HYDROGRAPHIC STATION DATA, CALCULATE AND SMOOTH THERMOMETRIC DEPTHS. BASED UPON WOODS HOLE O.I. PROGRAM 'HYLOG' (VERSION FOR GE-225). THE FINAL DATA MAY BE EITHER A PRINTOUT OR NODC FORMAT PUNCHCARDS. REF. BIO COMPUTER NOTE 66-5-C. AUTHOR-- F.K. KEYTE. (SEE ALSO 'ON THE FORMULAS FOR CORRECTING REVERSING THERMOMETERS' REF. NO. 64-29, WHOI, BY FREEMAN K. KEYTE.)

BEDFORD INSTITUTE
DARTMOUTH, N.S., CANADA

REDUCTION AND DISPLAY OF DATA ACQUIRED AT SEA
LANGUAGE - FORTRAN II
COMPUTER - IBM 1130

(COPY ON FILE AT NODC)

A SYSTEM OF PROGRAMS (NAVIGATION, GRAVITY, TOPOGRAPHY, MAGNETICS) FOR THE REDUCTION, STORAGE AND DISPLAY OF UNDERWAY DATA ACQUIRED AT SEA. THE COMPUTER INSTALLATION CONSISTS OF AN IBM 1130 AND INCLUDES RANDOM ACCESS DISK CARTRIDGES AND AN ON-LINE CALCOMP 30 IN. PLOTTER. A LARGE

NUMBER OF THE PROGRAMS UTILIZE NAVIGATION POINTS TOGETHER WITH RAW DIGITIZED GEOPHYSICAL DATA PRESENTED AS A TIME SERIES, WHERE THE DIFFERENT DATA MAY BE READ AT UNEQUAL TIME INTERVALS. REF. TECH. REPORT NO. 1 (AUGUST 1969, 348 P.) BY MANIK TALWANI.

LAMONT-DOHERTY GEOLOGICAL OBSERVATORY
COLUMBIA UNIVERSITY
PALISADES, NEW YORK 10964

RICHARDSON CURRENT METER FILM READING

LANGUAGE - DECAL
COMPUTER - PDP-7(9)

A SYSTEM OF PROGRAMS UNDER AN ON-LINE TYPEWRITER CONTROL PROGRAM TO AUTOMATICALLY READ DATA (CURRENT SPEED AND DIRECTION), RECORDED ON 16-MM FILM, INTO A PDP-7 COMPUTER, USING A PROGRAMMABLE FILM READING DEVICE. DATA OUTPUT IS AVAILABLE IN THE FORM OF NUMERICAL LISTINGS OR IN DIGITAL FORM ON MAGNETIC TAPE. A DIGITAL X-Y PLOTTER MAY ALSO BE USED TO PRODUCE GRAPHS AND HISTOGRAMS OF CURRENT SPEED AND DIRECTION. THE MOST IMPORTANT IN THE SYSTEM OF PROGRAMS IS THE 'NINEPOINT FILM READER'. THE OTHER PROGRAMS ARE-- 'CHANNEL POSITIONING', 'ENTER CHANNELS', 'WRITE DATA', 'GRAPHING', 'CLEAR NINEPOINT RECORD', 'AUTOMATIC FRAME ADVANCE', 'LEFT OR RIGHT SCAN', 'ALL CHANNELS ON TOTALS', 'DOT SCANNING', 'DIAMOND SCANNER', 'MICROSCOPE', AND 'TEST SINGLE CHANNEL'. BROCHURE DESCRIBING THE SYSTEM IS AVAILABLE ON REQUEST.

DR. DANIEL M. FORSYTH
INFORMATION INTERNATIONAL, INC.
89 BRIGHTON AVENUE
BOSTON, MASSACHUSETTS 02134

BRAINCON DATA REDUCTION

LANGUAGE - FORTRAN IV
COMPUTER - IBM 1800 SYS

(COPY ON FILE AT NODC)
CONVERTS DATA IN THE FORM OF ANGULAR POSITIONS OF THE ROTOR AND COMPASS ARCS FROM BRAINCOM TYPE 316 CURRENT METERS INTO VALUES OF CURRENT SPEED AND DIRECTION, TILT DIRECTION, N-S AND E-W CURRENT COMPONENTS AND DISPLACEMENTS (IN KILOMETRES) FROM ANY ARBITRARY ORIGEN. DATA IS OUTPUT TO LINEPRINTER WITH COLUMN HEADINGS AND MAGNETIC TAPE WITHOUT HEADINGS. EXECUTION TIME-- OF THE ORDER OF 3 MINS. PER 100 CARDS (2 MINS. FOR ONE DAY OF RECORD). N.I.O. PROGRAM NO. 178. AUTHOR-- W. J. GOULD.

NATIONAL INSTITUTE OF OCEANOGRAPHY
WORMLEY, GODALMING, SURREY
ENGLAND

Q FACTORS

LANGUAGE - FORTRAN V
COMPUTER - ATLAS I

CALCULATES THE PRESSURE IN DECIBARS FROM THE READING OF T(U)-T(W) GIVEN BY AN UNPROTECTED REVERSING THERMOMETER. THE OUTPUT CONSISTS OF A TABLE OF VALUES OF PRESSURE FOR TEMPERATURES IN STEPS OF 0.1 DEGR C. N.I.O. PROGRAM 63. AUTHOR-- ELIZABETH PALETHORPE. DESCRIBED IN N.I.O. INTERNAL REPORT NO. 7, JAN 1968.

NATIONAL INSTITUTE OF OCEANOGRAPHY
WORMLEY, GODALMING, SURREY
ENGLAND

NIO PROGRAM 59 - THERMOMETER CORRECTIONS FOR DEEP-SEA REVERSING THERMOMETERS

LANGUAGE - CHLF 3/4
COMPUTER - MERCURY

BOTH PROTECTED AND UNPROTECTED THERMOMETERS CAN BE DEALT WITH. CORRECTIONS ARE DEPENDENT ON THE WATER TEMPERATURE, THE AMBIENT TEMPERATURE IN THE LABORATORY, AND THE INDEX ERRORS OF THE THERMOMETERS. AUTHOR-- JAMES CREASE. REF. N.I.O. INTERNAL REPORT NO. N6.

NATIONAL INSTITUTE OF OCEANOGRAPHY
WORMLEY, GODALMING, SURREY
ENGLAND

DEEP

LANGUAGE - FORTRAN
COMPUTER - HP 2115A

(COPY ON FILE AT NODC)
DIGITIZES SALINITY-TEMPERATURE-DEPTH DATA ON LINE USING TIME AS CRITERION FOR SELECTING POINTS. INPUT ARE FREQUENCIES FROM S.T.D. SYSTEM AND STATION HEADING DATA THROUGH TELETYPE. OUTPUT ON PAPER TAPE HAS STATION IDENTIFICATION FIELDS, TIME INTERVAL BETWEEN DATA POINTS, AND THE S.T.D. DATA - PRESSURE, TEMPERATURE, SALINITY. REF. FRB TECHNICAL REPORT NO. 152 (DEC 1969), BY A. HUYER AND C. A. COLLINS (UNPUB. MS.)

DR. C. A. COLLINS
MARINE SCIENCES BRANCH, DEMR
PACIFIC OCEANOGRAPHIC GROUP
BIOLOGICAL STATION
NANAIMO, B.C., CANADA

TCHK2 (THERMOMETER CORRECT)

LANGUAGE - FORTRAN VI
COMPUTER - IBM 1130

(COPY ON FILE AT NODC)
PURPOSE-- TO CORRECT DEEP-SEA REVERSING THERMOMETERS, TO COMPUTE THERMOMETRIC DEPTHS, TO ALLOW SPURIOUS VALUES TO BE REMOVED FROM THE L-Z TABLE, TO SMOOTH THE L-Z TABLE, AND TO PUNCH SMOOTHED DEPTH AND OBSERVED TEMPERATURE AND SALINITY AND OXYGEN VALUES ONTO CARDS IN CODC FORMAT. PROGRAM AND SUB-PROGRAMS DESCRIBED IN FRB MANUSCRIPT REPORT NO. 1071 (DEC 1969, UNPUBLISHED MANUSCRIPT), BY C. A. COLLINS, R. L. K. TRIPE, AND S. K. WONG. POG HAS TWO OTHER THERMOMETER CORRECTION PROGRAMS - TCHK1 USES THE L/Z METHOD, TCHK3 COMPUTES PRESSURE.

PACIFIC OCEANOGRAPHIC GROUP
BIOLOGICAL STATION
NANAIMO, B.C., CANADA

TEMPERATURE AND DEPTH CALCULATIONS

LANGUAGE - FORTRAN AND AUTOCODER
COMPUTER - IBM 1620 AND IBM 1401

(COPY ON FILE AT NODC)
AT PRESENT THERE IS NO PROVISION FOR CALCULATING WIRE ANGLE DEPTH. DENSITY VALUES USED ARE THOSE FOR THE NORTH ATLANTIC. THE INPUT IS IN TWO PARTS. FIRST THE THERMOMETER TABLES ARE READ IN, THEN THE DATA CARDS. THE OUTPUT CARD IS A REPRODUCTION OF THE INPUT DATA CARD, PLUS ALL NECESSARY CALCULATIONS. AUTHORS-- D.T. EGER, D.L. SHAFFER.

UNIVERSITY OF MIAMI
MARINE LABORATORY
COMPUTING CENTER
1 RICKENBACKER CAUSEWAY
VIRGINIA KEY, MIAMI, FLORIDA

THERMOMETER CORRECTION

LANGUAGE - FORTRAN IV
COMPUTER - HONEYWELL516

(COPY ON FILE AT NODC)
CORRECTS DEEP-SEA REVERSING THERMOMETERS AND CALCULATES THERMOMETRIC DEPTHS, GIVEN THE THERMOMETER CONSTANTS AND THE INDIVIDUAL THERMOMETER READINGS. TELETYPE I/O - HIGH SPEED PAPER TAPE READER DESIRABLE.

COMMANDING OFFICER
U.S. COAST GUARD OCEANOGRAPHIC UNIT
BLDG. 159-E, NAVY YARD ANNEX
WASHINGTON, D. C. 20390

THERMOCHECK II - TEMPERATURE CORRECTION

LANGUAGE - FORTRAN IV
COMPUTER - CDC 3100 AND IBM 360/65

(COPY ON FILE AT NODC)
CORRECTS DEEP-SEA REVERSING THERMOMETERS, CALCULATES THERMOMETRIC DEPTH. AUTHOR-- LEO M. FLETCHER. THE ORIGINAL VERSION, WITH DOCUMENTATION, WAS WRITTEN IN FORTRAN FOR THE IBM 1620.

CANADIAN OCEANOGRAPHIC DATA CENTRE
615 BOOTH STREET
OTTAWA, CANADA

TWO FIVE (HYDROGRAPHIC DATA REDUCTION)

LANGUAGE - FORTRAN 63, FORTRAN IV
COMPUTER - CDC 3600, IBM 1800

PROCESSES RAW DATA TO OBTAIN CORRECTED DEPTH, TEMPERATURE, SALINITY, AND OXYGEN-- 1) PROTECTED DEEP-SEA REVERSING THERMOMETER READINGS TO OBTAIN THE CORRECTED IN-SITU WATER TEMPERATURE. 2) UNPROTECTED DEEP-SEA REVERSING THERMOMETER READINGS TO OBTAIN THE THERMOMETRIC DEPTH, CORRECTED FOR GRAVITY VARIATIONS AND FOR THE MEAN DENSITY OF THE OVERLAYING WATER COLUMN IN ANY OCEAN. 3) FITS LEAST SQUARES CURVES TO WIRE LENGTH VS. (WIRE LENGTH MINUS THERMOMETRIC DEPTH) TO DETERMINE THE ACCEPTED DEPTH. 4) CALCULATES SALINITY FROM RAW SALINITY READINGS 5) CALCULATES DISSOLVED OXYGEN CONCENTRATIONS FROM TITRATIONS. REF. A REPORT (UNPUBLISHED MANUSCRIPT) BY NORMA MANTYLA.

MRS. NORMA L. MANTYLA
MARINE LIFE RESEARCH GROUP
SCRIPPS INSTITUTION OF OCEANOGRAPHY
P.O. BOX 109
LA JOLLA, CALIFORNIA 92037

S.T.D. DATA PROCESSING

LANGUAGE - FORTRAN IV
COMPUTER - CDC 3600

(COPY ON FILE AT NODC)
A PROGRAM WITH SUBROUTINES TO PROCESS SALINITY-TEMPERATURE-DEPTH DATA RECORDED IN THE FIELD. DESCRIPTION AND LISTINGS IN A BCF SPECIAL SCIENTIFIC REPORT - FISHERIES NO. 588 'PROCESSING OF DIGITAL DATA LOGGER STD TAPES AT THE SCRIPPS INSTITUTION OF OCEANOGRAPHY AND THE BUREAU OF COMMERCIAL FISHERIES, LA JOLLA CALIFORNIA' (JUNE 1969), BY DR. JAMES H. JONES.

DR. BRUCE TAFT
OCEANIC RESEARCH DIVISION
SCRIPPS INSTITUTION OF OCEANOGRAPHY
P.O. BOX 109
LA JOLLA, CALIFORNIA 92037

THERMOMETER CORRECTION AND THERMOMETRIC DEPTH

LANGUAGE - FORTRAN
COMPUTER - IBM 7074

(COPY ON FILE AT NODC)
COMPUTES THERMOMETER CORRECTIONS AND THERMOMETRIC DEPTHS AND THEN PRINTS THIS DATA IN THE FORMAT OF THE U.S. NAVAL OCEANOGRAPHIC LOG SHEET 'A'. IMR NO. 0-9-63 (UNPUBLISHED MANUSCRIPT). AUTHOR-- S. C. PORTER.

COMPUTER SYSTEMS DIVISION
NATIONAL OCEANOGRAPHIC DATA CENTER
WASHINGTON, D. C. 20390

BATHYMETRIC DATA REDUCTION

LANGUAGE - FORTRAN
COMPUTER - IBM 7074

PROCESSES DATA GATHERED WHILE NAVIGATING WITH ANY CIRCULAR AND/OR HYPERBOLIC SYSTEM. EIGHT OPTIONS ARE AVAILABLE PERTAINING TO POSITION CONVERSION, FORM OF INPUT, DATA SMOOTHING, SPECIAL CORRECTIONS, AND INTERPOLATION OF POSITION-DEPENDENT VALUES SUCH AS CONTOUR CROSSINGS. OS NO. 53559.

G. C. DONOHUE, CODE 8006
NAVAL OCEANOGRAPHIC OFFICE
SUITLAND, MD. 20390

SYNOPTIC PROGRAM (UWMS-0980)

LANGUAGE - FORTRAN II
COMPUTER - IBM 7094-II/7040 DCS AND CDC 6400

(COPY ON FILE AT NODC)
REDUCES DATA FROM RAW SHIP-BOARD OBSERVATIONS. CORRECTS THERMOMETERS AND COMPUTES THERMOMETRIC DEPTHS, WIRE ANGLE DEPTHS, SALINITIES FROM BRIDGE READINGS, OXYGEN VALUES FROM TITRATIONS, THEN COMPUTES SIGMA-T, OXYGEN SATURATION PERCENT, AND APPARENT OXYGEN UTILUZATION. CORE STORAGE REQUIRED-- 25,335 WORDS FOR MAIN PROGRAM, 2058 WORDS FOR SUBROUTINES. REF. A 150 PAGE REPORT (UWMS-0980, APR 1967) AND TECHNICAL REPORT NO. 181 (M67-8, JAN 1968), BY EUGENE E. COLLIAS. THERE IS ALSO A MORE LIMITED VERSION FOR THE IBM-1130. REVISED 1969 FOR THE CDC-6400.

H. MACINTOSH, COMPUTER SERVICES
DEPARTMENT OF OCEANOGRAPHY
UNIVERSITY OF WASHINGTON
SEATTLE, WASH. 98105

UNDERWAY DATA SYSTEM

LANGUAGE - FORTRAN
COMPUTER - IBM 1130

PROCESSES DATA COLLECTED FROM UP TO 7 MONITORED SENSORS AND FROM THE AUTOANALYZER WHILE UNDERWAY. INPUT-- PAPER TAPE - RECORDS TAKEN ABOUT ONCE A MINUTE. OUTPUT-- COLLECTED DATA PUNCHED ON CARDS AVERAGED OVER A GIVEN PERIOD. DATA IS THEN USUALLY RUN THROUGH THE IBM CONTOURING SYSTEM (NCS) AND PLOTTED. DOCUMENTATION-- OPERATING INSTRUCTIONS ONLY

UNIVERSITY OF WASHINGTON
DEPARTMENT OF OCEANOGRAPHY
22A OCEANOGRAPHY TEACHING BLDG.
ATTN. MRS. HELLA MACINTOSH
SEATTLE, WASH. 98105

SALINITY-TEMPERATURE-DEPTH CALCULATIONS

LANGUAGE - FORTRAN IV, ASSEMBLER
COMPUTER - IBM 1130

THIS SYSTEM READS AND EDITS PAPER TAPE FROM A BISSETT-BERMAN STD CAST. THE RAW DATA (FREQUENCIES) ARE CONVERTED TO REAL VALUES. INPUT TO PROGRAM-- PUNCHED PAPER TAPE FROM THE HEWLETT-PACKARD DAS. FOUR CHANNELS ARE PUNCHED - SALINITY, TEMPERATURE, SOUND VELOCITY, AND DEPTH. OUTPUT-- LISTING OF REAL VALUES, PLOT OF EACH VARIABLE VS. DEPTH, AND A SECTION PLOT OF SALINITY AND/OR TEMPERATURE VS. DEPTH FOR A MAXIMUM OF 10 STATIONS. DOCUMENTATION-- OPERATING INSTRUCTIONS ONLY.

UNIVERSITY OF WASHINGTON
DEPARTMENT OF OCEANOGRAPHY
22A OCEANOGRAPHY TEACHING BLDG.
ATTN. MRS. HELLA MACINTOSH
SEATTLE, WASH. 98105

S.T.D. CORRECTION

LANGUAGE - FORTRAN IV
COMPUTER - IBM 7094

CORRECTS THE SALINITY AS RECORDED BY THE S.T.D. INSTRUMENT FOR ERRORS INTRODUCED BY THE TEMPERATURE GRADIENT, LOWERING SPEED, AND TIME CONSTANT OF THE S.T.D. AUTHOR-- J. HUBERTZ.

TEXAS A AND M UNIVERSITY
COLLEGE OF GEOSCIENCES
DEPARTMENT OF OCEANOGRAPHY
COLLEGE STATION, TEXAS 77843

HYDRO

LANGUAGE - FORTRAN IV-E
COMPUTER - IBM 360/50

PROVIDES I/O FOR HYDROGRAPHIC DATA. USES SUBROUTINES TO CORRECT REVERSING THERMOMETERS AND CALCULATE THERMOMETRIC DEPTH. APPLIES METER WHEEL CORRECTION, AVERAGES TEMPERATURE VALUES, WRITES ALTERNATE VALUES WHERE NECESSARY. WRITES APPROPRIATE MESSAGES ON CONDITION OF DATA. WRITES THERMOMETER HISTORY SHOWING WHICH THERMOMETERS MALFUNCTIONED AND WHICH PAIRS OF PROTECTED THERMOMETERS YIELD ALTERNATE VALUES. SUBROUTINES NEEDED-- TEMP, LINT, UTEMP, AZIZ. WRITE-UPS FOR THIS AND OTHER UNIV. OF R. I. PROGRAMS FOR PROCESSING OF HYDROGRAPHIC DATA ARE PRINTED IN A MEMORANDUM, DATED JANUARY 1970, WRITTEN BY R. K. SEXTON.

ROBERT K. SEXTON
NARRAGANSETT MARINE LABORATORY
UNIVERSITY OF RHODE ISLAND
KINGSTON, RHODE ISLAND 02881

TEMP

LANGUAGE - FORTRAN IV-E
COMPUTER - IBM 360/50

SUBROUTINE CALCULATES INDEX AND THERMAL EXPANSION CORRECTIONS FOR PROTECTED REVERSING THERMOMETERS, ASSOCIATES A TOLERANCE WITH EACH THERMOMETER ACCORDING TO RANGE, SETS MESSAGE INDICATORS FOR VARIOUS DATA CONDITIONS. AUXILIARY AND MAIN INDEX CORRECTIONS ARE COMPUTED BY LINEAR INTERPOLATION BETWEEN POINTS IN THE THERMOMETER DATA ARRAY, 'PTHRM'. THERMAL EXPANSION CORRECTION IS COMPUTED USING EQUATION (29) PAGE 11, FROM 'ON THE FORMULA FOR CORRECTING REVERSING THERMOMETERS', BY F.K. KEYTE, WHOI, REF. NO. 64-29.
SUBROUTINES NEEDED-- LINT.

ROBERT K. SEXTON
NARRAGANSETT MARINE LABORATORY
UNIVERSITY OF RHODE ISLAND
KINGSTON, RHODE ISLAND 02881

UTEMP

LANGUAGE - FORTRAN IV-E
COMPUTER - IBM 360/50

SUBROUTINE CALCULATES INDEX AND THERMAL EXPANSION CORRECTIONS FOR UNPROTECTED THERMOMETERS. IT SELECTS A 'Q' VALUE APPROPRIATE TO THE DEPTH OF REVERSAL. SETS MESSAGE INDICATORS FOR VARIOUS DATA CONDITIONS. AUXILIARY AND MAIN INDEX CORRECTIONS ARE COMPUTED BY LINEAR INTERPOLATION BETWEEN POINTS IN THE THERMOMETER ARRAY, 'UTHRM'. THERMAL EXPANSION CORRECTION IS COMPUTED USING EQUATION (8), PAGE 8, FROM 'ON THE FORMULAS FOR CORRECTING REVERSING THERMOMETERS', BY F.K. KEYTE, WHOI, REF. NO. 64-29. IF A 'Q' VALUE FOR THE THERMOMETER IN QUESTION CHANGES WITH DEPTH, WIRE LENGTH IS USED TO COMPUTE THE CORRECT VALUE BY LINEAR INTERPOLATION BETWEEN PRESSURE POINTS. IF THE WIRE LENGTH IS OUTSIDE THE END POINTS, 'Q' VALUES CORRESPONDING TO THE END POINT VALUE ARE USED.
SUBROUTINE NEEDED-- LINT

ROBERT K. SEXTON
NARRAGANSETT MARINE LABORATORY

UNIVERSITY OF RHODE ISLAND
KINGSTON, RHODE ISLAND 02881

REVERSING THERMOMETER CORRECTION

LANGUAGE - FORTRAN IV
COMPUTER - IBM 360/65

CALCULATIONS OF CORRECTED TEMPERATURES AND THERMOMETRIC DEPTHS FROM REVERSING THERMOMETER READINGS. OUTPUT INCLUDES AVERAGE TEMPERATURE, DIFFERENCE BETWEEN CORRECTED TEMPERATURES, AND L-Z VALUES.

BUREAU OF COMMERCIAL FISHERIES BIOLOGICAL LAB.
ATTN. DR. R. A. BARKLEY
P.O. BOX 3830
HONOLULU, HAWAII 96812

THERMOMETER CORRECTION AND THERMOMETRIC DEPTH

LANGUAGE - PAL III
COMPUTER - PDP-5, 8S

(COPY ON FILE AT NODC)
CORRECTS BOTH PROTECTED AND UNPROTECTED REVERSING THERMOMETERS. DETERMINES THERMOMETRIC DEPTH BY AN ITERATIVE PROCESS. CAN CORRECT A MAXIMUM OF 58 THERMOMETERS. DESIGNED FOR USE ABOARD VESSEL. WRITTEN FOR THE U.S. COAST GUARD BY LT. R.M. O'HAGAN (RET.), DIGITAL EQUIPMENT CORP., MAYNARD, MASS. COPY OF PROGRAM IS DEPOSITED WITH DECUS. REF. U.S. COAST GUARD OCEANOGRAPHIC MANUSCRIPT 'OCEANOGRAPHIC COMPUTER PROGRAMS FOR THE PDP-5', 15 OCT. 1964 (UNPUBLISHED MANUSCRIPT).

DIGITAL EQUIPMENT CORPORATION
MAYNARD, MASSACHUSETTS 01754

HYLOG

LANGUAGE - FORTRAN IV-H
COMPUTER - SDS SIGMA 7

TAKES RAW OCEANOGRAPHIC STATION DATA, CORRECTS THE TEMPERATURES AND FINDS THE DEPTH OF EACH OBSERVATION. INPUT-- CARDS AND 9-TRACK MAGNETIC TAPE IN GENERALIZED FORMAT. CORE STORAGE NEEDED-- 14,452 WORDS.

INFORMATION PROCESSING CENTER
ATTN. MARY HUNT
WOODS HOLE OCEANOGRAPHIC INSTITUTION
WOODS HOLE, MASSACHUSETTS 02543

THRCL

LANGUAGE - FORTRAN IV-H
COMPUTER - SDS SIGMA 7

PREPARES A MAGNETIC TAPE FILE OF THERMOMETER CALIBRATION RECORDS TO BE USED WITH PROGRAM 'HYLOG'. THE THERMOMETER CALIBRATIONS ARE INPUT ON CARDS.

INFORMATION PROCESSING CENTER
ATTN. MARY HUNT
WOODS HOLE OCEANOGRAPHIC INSTITUTION
WOODS HOLE, MASSACHUSETTS 02543

COMPUTER UTILITY PROGRAM

LANGUAGE - FORTRAN
COMPUTER - CDC 3800

PROVIDES I/O MEDIA TO MEDIA CONVERSIONS AND/OR TRANSFERS UNDER COMPUTER OPERATING SYSTEMS CONTROL. THIS PROGRAM PROVIDES A SIMPLE METHOD TO COPY, PRINT, COMPARE, PUNCH, SKIP, OR DESCRIBE RECORDS AND FILES ON AN INPUT SOURCE TO THE CDC 3800 COMPUTER. NRL MEMO. REPORT 1935. AUTHORS-- T. ROZANSKI, J. BURGESS, D. GOSSETT, D. SHANNON.

DORIS E. GOSSETT
RESEARCH COMPUTATION CENTER
MATHEMATICS AND INFORMATION SCIENCES DIVISION
NAVAL RESEARCH LABORATORY, WASHINGTON, D. C. 20390

NELEDIT

LANGUAGE - FORTRAN
COMPUTER - CDC 3800

EDITS CARDS OR CARD IMAGES UNDER OPERATING SYSTEM CONTROL. PROVIDES A SIMPLE METHOD OF RESEQUENCING, SEQUENCING, PRINTING, INSERTING, DELETING AND REPLACING CARD IMAGES WHICH EXIST ON AN INPUT SOURCE TO THE COMPUTER. NRL MEMO. REPORT 1936. AUTHORS-- J. BURGESS, D. GOSSETT, D. SHANNON.

DORIS E. GOSSETT
RESEARCH COMPUTATION CENTER
MATHEMATICS AND INFORMATION SCIENCES DIVISION
NAVAL RESEARCH LABORATORY, WASHINGTON, D. C. 20390

JOB EDIT FOR L-Z PROGRAM

LANGUAGE - AUTOCODER
COMPUTER - IBM 1401

(COPY ON FILE AT NODC)
USES OUTPUT TAPE FROM TEMPERATURE AND DEPTH PROGRAM AS INPUT. AUTHOR-- D.L. SHAFFER.

UNIVERSITY OF MIAMI
MARINE LABORATORY
COMPUTING CENTER
1 RICKENBACKER CAUSEWAY
VIRGINIA KEY, MIAMI, FLORIDA

A TAPE INPUT AND OUTPUT SUBROUTINE

LANGUAGE - AUTOCODER
COMPUTER - IBM 7074

(COPY ON FILE AT NODC)
THE 'TAPIO' (TAPE INPUT AND OUTPUT) PROGRAM IS DESIGNED TO BE CALLED BY FORTRAN. IT CAN BE USED TO OPERATE DATA TAPES MUCH FASTER THAN OTHERWISE POSSIBLE, MAKING USE OF THE FEATURE OF 'SIMULTANEITY'. ALSO, IT WILL CALL AN 'EDIT' PROGRAM AS REQUIRED, FOR INPUT AND OUTPUT PROCEDURES. USING TAPIO MAKES IT NECESSARY TO WRITE YOUR OWN EDIT PROGRAM. REF. IMR NO. M-2-64, JAN 1965 (UNPUBLISHED MANUSCRIPT). AUTHOR - PHILLIP J. LAUTENSCHLAGER.

DATA SYSTEMS CENTER, CODE 083
NAVAL OCEANOGRAPHIC OFFICE
SUITLAND, MD. 20390

LORAN EDIT

LANGUAGE - FORTRAN
COMPUTER - IBM 7074

(COPY ON FILE AT NODC)
EDITS LORAN RATES FOR CHARTING COORDINATES AND/OR FINAL LORAN-A AND LORAN-C TABLE PUBLICATION. REF. A REPORT IR NO. 69-87, OCT 1969, BY

KATHLEEN A. JENNINGS, WHICH DESCRIBES THIS AND OTHER PROGRAMS AND PROCEDURES USED AT THE NAVAL OCEANOGRAPHIC OFFICE IN THE LORAN TABLE EDITING PROCESS. FURTHER INFORMATION MAY BE OBTAINED FROM THE FIELD MANAGEMENT AND DISSEMINATION DEPT. (CODE 44), OR THE AUTHOR.

NAVIGATIONAL SCIENCE DIV., CODE 5320
TECHNICAL PRODUCTION DEPT.
NAVAL OCEANOGRAPHIC OFFICE
SUITLAND, MD. 20390

SOUND SPEED EDIT

LANGUAGE - FORTRAN
COMPUTER - IBM 7074

TAKES NODC DATA CARDS HAVING TIME SERIES SOUND SPEED DATA, ADDS ON A BOTTOM PART BECAUSE THE TIME SERIES DATA DOES NOT GO TO THE BOTTOM OF THE WATER COLUMN, AND REARRANGES THE DATA TO MAKE IT ACCEPTABLE TO THE RAY TRACE PROGRAM OF CISNEY. OS NO. 53817. AUTHOR-- R.R. GLEASON.

EXPLORATORY OCEANOGRAPHY DIV., CODE 7200
NAVAL OCEANOGRAPHIC OFFICE
SUITLAND, MD. 20390

CARDS

LANGUAGE - FORTRAN IV-E
COMPUTER - IBM 360/50

CONVERTS PUNCHED OUTPUT FROM 'SIGMAT' TO INPUT FOR 'HEIGHT'.

ROBERT K. SEXTON
NARRAGANSETT MARINE LABORATORY
UNIVERSITY OF RHODE ISLAND
KINGSTON, RHODE ISLAND 02881

DEPTHS

LANGUAGE - FORTRAN IV-E
COMPUTER - IBM 360/50

CONVERTS PUNCHED OUTPUT FROM 'HYDRO' TO INPUT FOR 'SIGMAT'.

ROBERT K. SEXTON
NARRAGANSETT MARINE LABORATORY
UNIVERSITY OF RHODE ISLAND
KINGSTON, RHODE ISLAND 02881

RDTHRM

LANGUAGE - FORTRAN IV-E
COMPUTER - IBM 360/50

READS THERMOMETER DATA AS IT IS READ BY 'HYDRO' AND WRITES OUT THE DATA IN A FORMAT SUITABLE FOR CHECKING.

ROBERT K. SEXTON
NARRAGANSETT MARINE LABORATORY
UNIVERSITY OF RHODE ISLAND
KINGSTON, RHODE ISLAND 02881

DATA

LANGUAGE - FORTRAN IV-H
COMPUTER - SDS SIGMA 7

SUBROUTINE READS OCEANOGRAPHIC STATION DATA CARDS AND RETURNS THE INFORMATION CONTAINED THEREIN TO THE USER, ONE STATION FOR EACH CALL.

INFORMATION PROCESSING CENTER
ATTN. MARY HUNT
WOODS HOLE OCEANOGRAPHIC INSTITUTION
WOODS HOLE, MASSACHUSETTS 02543

SCRUB

LANGUAGE - FORTRAN IV-H
COMPUTER - SDS SIGMA 7

PROVIDES SEVERAL METHODS BY WHICH DATA STORED IN WHOI STANDARD FORMAT MAY BE EDITED AND TESTED. OUTPUT IS THE CORRECTED VERSION OF THE DATA ON 9-TRACK MAG. TAPE.

INFORMATION PROCESSING CENTER
ATTN. JOHN A. MALTAIS
WOODS HOLE OCEANOGRAPHIC INSTITUTION
WOODS HOLE, MASSACHUSETTS 02543

BATHYTHERMOGRAPH OUTPUT

LANGUAGE - SPS
COMPUTER - IBM 1401

(COPY ON FILE AT NODC)
TAPE TO CARD/PRINT EDITING PROGRAM. BLOCKED INPUT WITH MSQ OR CRUISE SEQUENCE FORMS CONTROL. USES TAPE SEARCH, SELECTION AND DUPLICATION. OS NO. 52291. AUTHOR-- J.C. JENSON.

COMPUTER SYSTEMS DIVISION
NATIONAL OCEANOGRAPHIC DATA CENTER
WASHINGTON, D. C. 20390

CARD-TO-TAPE FOR INPUT TO THE 7074

LANGUAGE - SPS II
COMPUTER - IBM 1401

(COPY ON FILE AT NODC)
SPECIAL CARD-TO-TAPE ROUTINE FOR DATA INPUT TO THE IBM 7074, WITH OPTIONAL ZONE PUNCH EDITING, PRINTOUT OF TAPE RECORDS, MULTI-FILE PROVISIONS. AUTHOR-- LARRY WOLCOTT.

COMPUTER DEPARTMENT, CODE 083
NAVAL OCEANOGRAPHIC OFFICE
SUITLAND, MD. 20390

OCEANS II REPORT GENERATOR

LANGUAGE - SPS
COMPUTER - IBM 1401

(COPY ON FILE AT NODC)
USED FOR HIGH SPEED PREPARATION OF OCEANS II OUTPUT FOR DATA RECORD PUBLICATION. (NOTE-- CODC IS NOW USING A LATER VERSION OF THIS DECK.)

CANADIAN OCEANOGRAPHIC DATA CENTRE
615 BOOTH STREET
OTTAWA, CANADA

CONVERSION, NODC TO ICES

LANGUAGE - SPS
COMPUTER - IBM 1401

(COPY ON FILE AT NODC)
CONVERTS NODC OCEAN STATION DATA ON CARDS/TAPE TO ICES FORMAT CARDS. INCLUDES OPTIONAL SUBROUTINE IN SPS LANGUAGE FOR CALCULATION OF OXYGEN PERCENT OF SATURATION USING FOX'S FORMULAE. OS NO. 52282. AUTHOR - C. DINGER. NODC-ICES AND ICES-NODC CONVERSION PROGRAMS ARE CURRENTLY BEING COMPLETELY REWRITTEN FOR THE IBM 360/40, IN ASSEMBLER AND PL/I LANGUAGES, BY SALLY KEEHN.

COMPUTER SYSTEMS DIVISION
NATIONAL OCEANOGRAPHIC DATA CENTER
WASHINGTON, D. C. 20390

OCEAN STATION DATA OUTPUT, NODC FORMAT

LANGUAGE - SPS
COMPUTER - IBM 1401

(COPY ON FILE AT NODC)
OCEAN STATION RECORDS ON TAPE ARE PUNCHED ON CARDS AND/OR EDITED INTO PRINTOUT. OS NO. 52280. ANOTHER VERSION OF THIS PROGRAM PRINTS, FOR FINAL NODC FILES, MONITORED STATION DATA FROM ZONE-EDITED, BLOCKED AND SORTED TAPE RECORDS. OS NO. 52287, BY C. DINGER. A NEW STATION DATA

OUTPUT PROGRAM IS AT PRESENT BEING WRITTEN FOR THE IBM 360/40, IN PL/I LANGUAGE, BY JOHN MCHUGH.

COMPUTER SYSTEMS DIVISION
NATIONAL OCEANOGRAPHIC DATA CENTER
WASHINGTON, D. C. 20390

STATION DATA CONVERSION, CODC TO NODC

LANGUAGE - SPS
COMPUTER - IBM 1401

(COPY ON FILE AT NODC)
CANADIAN OCEANOGRAPHIC DATA CENTRE STATION DATA IS TRANSFERRED OR CONVERTED TO THE NEW NODC FORMAT. CODC CRUISE MASTER CARDS MUST BE PRECEDED BY A NODC LEADER CARD. OS NO. 52212. AUTHOR-- RUDI SAENGER.

COMPUTER SYSTEMS DIVISION
NATIONAL OCEANOGRAPHIC DATA CENTER
WASHINGTON, D. C. 20390

--* GEOPHYSICS, MARINE *-*-*

BLACKBODY SPECTRAL RADIANCE

LANGUAGE - FORTRAN
COMPUTER - CDC 3800

COMPUTES SPECTRAL RADIANCE OF A BLACKBODY RADIATOR USING ONE DEGREE INCREMENTS OF TEMPERATURE AND 0.05 MICROMETER INCREMENTS OF WAVELENGTH. INPUT PARAMETERS ARE TEMPERATURE AND WAVELENGTH.

APPLIED OCEANOGRAPHY BRANCH - CODE 8310
NAVAL RESEARCH LABORATORY
WASHINGTON, D. C. 20390

BLACKBODY RADIANCE

LANGUAGE - FORTRAN
COMPUTER - CDC 3800

COMPUTES RADIANCE OF A BLACKBODY RADIATOR IN A SPECIFIED WAVELENGTH INTERVAL USING ONE DEGREE INCREMENTS OF TEMPERATURE AND 0.05 MICROMETER INCREMENTS OF WAVELENGTH. INPUT PARAMETERS ARE TEMPERATURE AND WAVELENGTH.

APPLIED OCEANOGRAPHY BRANCH - CODE 8310
NAVAL RESEARCH LABORATORY
WASHINGTON, D. C. 20390

LONG WAVE RADIATION

LANGUAGE - FORTRAN IV
COMPUTER - IBM 360/65

CALCULATES RADIATION VALUES FOR THE SUOMI-KUHN RADIOMETER. INPUT DATA FROM THE TRADE WIND ZONE OCEANOGRAPHY PROGRAM RADIATION CARDS.

BUREAU OF COMMERCIAL FISHERIES
2570 DOLE STREET
HONOLULU, HAWAII 96812

OBSERVATION DRAPING (GRAVITY)

LANGUAGE - FORTRAN
COMPUTER - IBM 7074

REDUCES OBSERVATION DATA TAKEN WITH LACOSTE-ROMBERG SEA/AIR OR SUBMARINE GRAVIMETERS TO OBSERVED GRAVITY VALUE AND FREE-AIR ANOMALY. INTERPOLATES GEOGRAPHIC POSITION FROM SMOOTHED FIX, COURSE, AND SPEED. GENERATES BC CHART NO. AND X,Y COORDINATES FOR MERCATOR PROJECTION FOR EACH STATION. OS NO. 53543. AUTHOR-- R.K. LATTIMORE.

GRAVITY DIVISION, CODE 83
NAVAL OCEANOGRAPHIC OFFICE
SUITLAND, MD. 20390

REDUCTION AND DISPLAY OF DATA ACQUIRED AT SEA

LANGUAGE - FORTRAN II
COMPUTER - IBM 1130

(COPY ON FILE AT NODC)
A SYSTEM OF PROGRAMS (NAVIGATION, GRAVITY, TOPOGRAPHY, MAGNETICS) FOR THE REDUCTION, STORAGE AND DISPLAY OF UNDERWAY DATA ACQUIRED AT SEA. THE COMPUTER INSTALLATION CONSISTS OF AN IBM 1130 AND INCLUDES RANDOM ACCESS DISK CARTRIDGES AND AN ON-LINE CALCOMP 30 IN. PLOTTER. A LARGE NUMBER OF THE PROGRAMS UTILIZE NAVIGATION POINTS TOGETHER WITH RAW DIGITIZED GEOPHYSICAL DATA PRESENTED AS A TIME SERIES, WHERE THE DIFFERENT DATA MAY BE READ AT UNEQUAL TIME INTERVALS. REF. TECH. REPORT NO. 1 (AUGUST 1969, 348 P.) BY MANIK TALWANI.

LAMONT-DOHERTY GEOLOGICAL OBSERVATORY
COLUMBIA UNIVERSITY
PALISADES, NEW YORK 10964

TALWANI 2-D GRAVITY

LANGUAGE - FORTRAN IV-H
COMPUTER - IBM 360/65

(COPY ON FILE AT NODC)
CALCULATES THE VERTICAL COMPONENT OF GRAVITATIONAL ATTRACTION OF TWO-DIMENSIONAL BODIES OF ARBITRARY SHAPE BY APPROXIMATING THEM TO MANY-SIDED POLYGONS. THE TECHNIQUE IS FROM TALWANI, WORZEL, AND LANDISMAN IN JGR, VOL. 64 NO. 1, 1959. OUTPUT-- THE GRAVITY VALUES ARE PRINTED IN TABLES, AND THE CALCULATED PROFILE AND THE OBSERVED PROFILE IF ONE EXISTS ARE PLOTTED ON THE LINE PRINTER IN EITHER A PAGE SIZE PLOT OR AN EXTENDED PLOT WITH THE X-AXIS RUNNING DOWN THE PAGE. PROGRAM CONTAINS OPTION OF UNITS IN MILES, KILOFEET, OR KILOMETERS. THE PROGRAM NO. IS W9206 (MAY, 1968).

U. S. GEOLOGICAL SURVEY
COMPUTER CENTER DIVISION
ATTN. RALPH EICHER, CHIEF
BRANCH OF SCIENTIFIC APPLICATIONS
WASHINGTON, D. C. 20242

PROFILE CARD-TO-TAPE FOR GEOPAC

LANGUAGE - FORTRAN IV-H
COMPUTER - IBM 360/65

(COPY ON FILE AT NODC)
USED TO PUT DATA, USUALLY PROFILE DATA, PUNCHED ON CARDS ONTO MAGNETIC TAPE FOR SUBSEQUENT PROCESSING BY OTHER PROGRAMS IN A PACKAGE OF PROGRAMS FOR TWO-DIMENSIONAL GRAVITY AND MAGNETIC CALCULATIONS. OPTIONS IN THE PROGRAM ALLOW FOR THE PRELIMINARY OPERATIONS OF SCALING, SHIFTING, OR DETRENDING THE DATA. PROFILES MAY ALSO BE CONCATENATED TO COMBINE SEVERAL DATA SETS AS ONE. PROGRAM NO. W9325, BY RALPH EICHER.

U. S. GEOLOGICAL SURVEY
COMPUTER CENTER DIVISION
ATTN. RALPH EICHER, CHIEF
BRANCH OF SCIENTIFIC APPLICATIONS
WASHINGTON, D. C. 20242

2D MAGNETIC ANOMALIES

LANGUAGE - FORTRAN
COMPUTER - IBM 1800 SYS

COMPUTES HORIZONTAL AND VERTICAL AND TOTAL MAGNETIC ANOMALIES ARISING FROM PRISMS OF ARBITRARY CROSS-SECTION AND MAGNETISATION AND INFINITE IN LENGTH. A VERSION FOR THE ATLAS I IS ALSO IN FORTRAN. N.I.O. PROGRAM 102, BY E. PALETHORPE AND J. CREASE. REF. N.I.O. INTERNAL REPORT NO. N.10, NOV 1968.

NATIONAL INSTITUTE OF OCEANOGRAPHY
WORMLEY, GODALMING, SURREY
ENGLAND

COMPUTATION AND PLOTTING OF MAGNETIC ANOMALIES AND GRADIENTS

LANGUAGE - FORTRAN II
COMPUTER - IBM 7094 W/ CALCOMP

(COPY ON FILE AT NODC)
COMPUTES THE ANOMALY PROFILES FOR TOTAL FIELD, HORIZONTAL AND VERTICAL COMPONENTS, FIRST AND SECOND VERTICAL DERIVATIVES AND FIRST AND SECOND HORIZONTAL DERIVATIVES OVER A UNIFORMLY MAGNETIZED TWO-DIMENSIONAL POLYGON OF IRREGULAR CROSS-SECTION. OUTPUT MAY BE PRINTED OR PLOTTED. REF. 'POTENTIAL APPLICATIONS OF MAGNETIC GRADIENTS TO MARINE GEOPHYSICS' BY WILLIAM E. BYRD, JR., JUNE 1967. PROGRAM MODIFIED AND EXPANDED FROM TALWANI AND HEIRTZLER (1964).

DEPARTMENT OF GEOLOGY AND GEOPHYSICS

MASSACHUSETTS INSTITUTE OF TECHNOLOGY
CAMBRIDGE, MASSACHUSETTS 02139

SOLAR RADIATION CONVERSION

LANGUAGE - FORTRAN
COMPUTER - IBM 7074

AVERAGES THE RADIATION READINGS FROM THE EPPLEY PYRHELIOMETER AND BECKMAN-WHITLEY RADIOMETER FOR EVERY 15 MINUTES. CONVERTS FROM MV TO LANGLEYS/MIN. AND CALCULATES NET RADIATION FROM BOTH INSTRUMENTS. A MODIFICATION OF THIS PROGRAM WAS MADE TO INCLUDE A THORNTHWAITE NET RADIOMETER. ORIGINAL PROGRAM BY S.M. LAZANOFF REWRITTEN BY MARY E. MYERS.

COMPUTER DEPARTMENT, CODE 0831
NAVAL OCEANOGRAPHIC OFFICE
SUITLAND, MD. 20390

SEAMOUNT MAGNETIZATION

LANGUAGE - FORTRAN
COMPUTER - IBM 7074

COMPUTES THE MAGNITUDE AND DIRECTION OF MAGNETIZATION OF A UNIFORMLY MAGNETIZED BODY FROM ITS SHAPE AND MAGNETIC INTENSITY. OS NO. 53533. AUTHOR-- G. VAN VOORHIS.

MAGNETICS DIVISION, CODE 8200
NAVAL OCEANOGRAPHIC OFFICE
SUITLAND, MD. 20390

VAM INTERPOLATION II

LANGUAGE - FORTRAN
COMPUTER - IBM 7074

COMPUTES INCLINATION, MAGNETIC HEADING, RELATIVE BEARING, AND DECLINATION. OUTPUT CONTAINS TRACK, DATE, AIRCRAFT TIME, POSITION, DECLINATION, DIP, HORIZONTAL INTENSITY (FORCE), ALTITUDE, AND GROUND SPEED FOR EACH FIVE MINUTES OF TIME. OS NO. 35032, BY W. H. HANCOCK.

NAVAL OCEANOGRAPHIC OFFICE
SUITLAND, MD. 20390

SEISMIC SLOPING LAYER COMPUTATION

LANGUAGE - FORTRAN II
COMPUTER - IBM 709

GIVES TRUE VELOCITIES AND THICKNESSES OF LAYERS FOR SEISMIC REFRACTION PROFILES. INPUT ARE HORIZONTAL AND AVERAGE VERTICAL WATER VELOCITIES AND APPARENT ONE-WAY VELOCITIES OF SUBSURFACE INTERFACES DERIVED FROM TRAVEL-TIME GRAPHS. COMPUTATION FOLLOWS GEOMETRIC METHOD FOR PLANE SEISMIC WAVES UTILIZING SNELL'S LAW. AUTHOR-- JOHN ANTOINE.

TEXAS A AND M UNIVERSITY
COLLEGE OF GEOSCIENCES
DEPARTMENT OF OCEANOGRAPHY
COLLEGE STATION, TEXAS 77843

TIME TERM, SEISMIC REFRACTION INTERPRETATION

LANGUAGE - FORTRAN IV
COMPUTER - IBM 7094

(COPY ON FILE AT NODC)
ANALYZES A SET OF DATA THAT APPEARS TO HAVE BEEN GENERATED BY A HEAD WAVE SYSTEM PROPAGATING ALONG A PARTICULAR BOUNDARY. READS THE STANDARD TRAVEL-TIME DATA CARDS (CARNEGIE INST, WASH, DTM). TIME TERMS ARE CALCULATED FOR THE BEST LEAST-SQUARE FITTING VELOCITY. IN ADDITION, CALCULATES THE STANDARD DEVIATION OF THE SOLUTION AS A FUNCTION OF VELOCITY AND EXAMINES THE MATRIX OF RESIDUALS FOR FREQUENCY AND DEPENDENCE UPON DISTANCE. THESE FEATURES OF THE MATRIX ARE PRESENTED IN GRAPH FORM. AUTHOR-- M.J. BERRY.

UNIVERSITY OF TORONTO
DEPARTMENT OF PHYSICS
GEOPHYSICS LABORATORY
ATTN. DR. G. F. WEST
TORONTO 5 ONTARIO

--* SEDIMENT ANALYSIS AND MECHANICS *-*-*

GEOLOGICAL SAMPLE CONVERSION

LANGUAGE - FORTRAN
COMPUTER - IBM 7074

(COPY ON FILE AT NODC)
CONVERTS-EDITS TO NODC FORMAT FOR CARDS, DATA ON SAMPLES COLLECTED OR STUDIED AS PART OF THE JOINT WOODS HOLE O.I. - U.S. GEOLOGICAL SURVEY, ATLANTIC CONTINENTAL MARGIN PROGRAM. INCLUDES AN INDICATOR OF DEPTH RANGE VIA TABLE LOOK-UP, AND COMPUTATION OF MARSDEN SQUARE. OS NO. - 52231. AUTHOR-- R. VAN WIE.

COMPUTER SYSTEMS DIVISION
NATIONAL OCEANOGRAPHIC DATA CENTER
WASHINGTON, D. C. 20390

MASS PHYSICAL PROPERTIES

LANGUAGE - FORTRAN
COMPUTER - IBM 7074

COMPUTES THE RESULTS OF ENGINEERING ANALYSES IN THE GEOLOGICAL LAB. THESE ANALYSES INCLUDE DENSITY, SPECIFIC GRAVITY, VOID RATIO, ATTERBURG LIMITS, COHESION, COMPRESSIVE STRENGTH, CONSOLIDATION, MOISTURE CONTENT, ETC. OS NO. 59202.

OCEAN SURVEYS, CODE 9200
NAVAL OCEANOGRAPHIC OFFICE
SUITLAND, MD. 20390

SEDIMENT SIZE

LANGUAGE - FORTRAN
COMPUTER - IBM 7074

COMPUTES THE FREQUENCY OF THE GRAIN SIZE DISTRIBUTION AND THE STATISTICAL PARAMETERS, AND RECORDS PERTINENT FIELD DATA AND COMPOSITIONAL DATA DETERMINED IN THE LABORATORY. THE PROGRAM WILL HANDLE DATA FROM AN INDEFINITE NUMBER OF CORE SAMPLES. OUTPUT PRINTED IN TABULAR FORM. REF. INFORMAL MANUSCRIPT IM NO. 66-11, AUG. 1966, 'SEDIMENT SIZE COMPUTER PROGRAM'. AUTHORS-- DR. J.B. RUCKER AND R.A. STEWART, EXPLORATORY OCEANOGRAPHY DIV. CODE 7220. FURTHER INFORMATION MAY BE OBTAINED THROUGH DISSEMINATION DEPARTMENT, CODE 44, OR THE AUTHORS.

NAVAL OCEANOGRAPHIC OFFICE
SUITLAND, MD. 20390

GRAIN SIZE

LANGUAGE - FORTRAN II
COMPUTER - GE 225

A COMPUTER PROGRAM FOR GRAIN-SIZE DATA, BY JOHN SHLEE AND JACQUELINE WEBSTER, 1965, WOODS HOLE OCEANOGRAPHIC INSTITUTION REF. NO. 65-42 (UNPUBLISHED MANUSCRIPT). THIS PROGRAM AND SEVERAL OTHERS FOR SEDIMENT DATA PROCESSING ARE PRODUCTS OF THE U.S. GEOLOGICAL SURVEY'S MARINE GEOLOGY AND HYDROLOGY PROGRAM.

J. WEBSTER
WOODS HOLE OCEANOGRAPHIC INSTITUTION
WOODS HOLE, MASS.

STANDARD-SIZE ANALYSIS OF SEDIMENTS

LANGUAGE - FORTRAN II
COMPUTER - IBM 1620

COMPUTES THE MEAN, STANDARD DEVIATION, SKEWNESS, AND KURTOSIS BY THE METHOD OF MOMENTS FOR SIZE DISTRIBUTION OF PARTICLES AS DETERMINED BY STANDARD SEDIMENT ANALYSIS, THE FRACTION OF THE TOTAL SAMPLE IN EACH SIZE CLASS, AND THE FRACTION OF SAND-SIZE MATERIAL COMPOSED OF UP TO 10 DIFFERENT COMPONENTS. AUTHORS-- J.W. PIERCE, U.S. NATIONAL MUSEUM, AND D.I. GOOD, KANSAS GEOL. SURVEY. REF. SPECIAL DISTRIBUTION PUBLICATION 28 (1965). RUNNING TIME-- LESS THAN 5 HOURS FOR 400 SAMPLES.

DR. DANIEL F. MERRIAM, EDITOR, COMPUTER CONTRIBUTIONS
KANSAS GEOLOGICAL SURVEY
COMPUTER APPLICATIONS LABORATORY
THE UNIVERSITY OF KANSAS
LAWRENCE, KANSAS 66045

SEDIMENT DATA

LANGUAGE - FORTRAN II
COMPUTER - IBM 709 AND CDC 6400

ALL SEDIMENT DATA COMPUTATIONS, SUCH AS MEANS AND STANDARD DEVIATIONS OF TEXTURE, TOTAL TEXTURE, CARBONATE AND NON-CARBONATE FRACTIONS, AS WELL AS ORGANIC NITROGEN AND CARBON DATA HANDLING. PROGRAM REVISED IN 1964. AUTHOR-- PROF. H.G. GOODELL.

DEPARTMENT OF GEOLOGY
FLORIDA STATE UNIVERSITY
TALLAHASSEE, FLORIDA 32306

ENGINEERING INDEX PROPERTIES OF CORE SAMPLES

LANGUAGE - FORTRAN II-D
COMPUTER - IBM 1620 II

(COPY ON FILE AT NODC)
REDUCES DATA AND TABULATES RESULTS FOR TESTS ON BULK WET DENSITY, VANE SHEAR STRENGTHS, ORIGINAL WATER CONTENT, LIQUID LIMIT, PLASTIC LIMIT, AND SPECIFIC GRAVITY OF SOLIDS. IN ADDITION, FROM THE ABOVE RESULTS, OTHER INDEX PROPERTIES ARE SIMULTANEOUSLY COMPUTED AND TABULATED. THE OUTPUT TABLE LISTS RESULTS IN COLUMNS REPRESENTING EACH DEPTH SEGMENT ANALYZED. PUBLISHED AS AN NCEL TECHNICAL REPORT, REF. NO. R-566 (FEB 1968, 165 P), BY MELVIN C. HIRONAKA.

U.S. NAVAL CIVIL ENGINEERING LABORATORY
PORT HUENEME, CALIFORNIA 93041

GRAIN SIZE ANALYSIS WITH DIRECT PLOTTING

LANGUAGE - FORTRAN II-D
COMPUTER - IBM 1620 II

(COPY ON FILE AT NODC)
INPUT DATA ARE SAMPLE IDENTIFICATION, SAMPLE WEIGHTS, HYDROMETER READINGS, AND SIEVE READINGS. OUTPUT ON IBM 1627 MODEL I PLOTTER IS A PARTICLE SIZE DISTRIBUTION CURVE. ANOTHER PROGRAM WRITTEN FOR OUTPUT ON CARDS OF A TABLE WITH PROPER HEADINGS AND VALUES FOR PARTICLE DIAMETERS AND PERCENT FINER BY WEIGHT. REF. NCEL REPORT NO. R-566, BY MELVIN C. HIRONAKA.

U.S. NAVAL CIVIL ENGINEERING LABORATORY
PORT HUENEME, CALIFORNIA 93041

CARBONATE - ORGANIC CARBON ANALYSIS OF SEDIMENTS

LANGUAGE - FORTRAN II-D
COMPUTER - IBM 1620 II

(COPY ON FILE AT NODC)
REDUCES DATA FROM THE CARBON DETERMINATOR AND TABULATES RESULTS OF THE ANALYSIS OF DEEP OCEAN SEDIMENTS FOR CARBONATE AND ORGANIC CARBON PERCENTAGES. OUTPUT IN SAME FORMAT AS IN PROGRAM FOR ENGINEERING INDEX PROPERTIES, TO WHICH THE OUTPUT FROM THIS PROGRAM IS ADDED. PROGRAM LISTINGS AND WRITEUPS INCLUDED IN AN NCEL REPORT, NO. R-566, BY MELVIN HIRONAKA.

U.S. NAVAL CIVIL ENGINEERING LABORATORY
PORT HUENEME, CALIFORNIA 93041

DIRECT SHEAR TEST WITH DIRECT PLOTTING — LANGUAGE - FORTRAN II-D
COMPUTER - IBM 1620 II

(COPY ON FILE AT NODC)
REDUCES DATA AND PLOTS SHEAR STRESS VERSUS SHEAR DISPLACEMENT WITH APPROPRIATE HEADINGS AND LABELS, USING IBM MODEL I PLOTTER. ANOTHER PROGRAM, 'DIRECT SHEAR TEST', USES THE SAME DATA FORMATS BUT PRESENTS THE RESULTS IN THE FORM OF TABULATIONS RATHER THAN PLOTS. REF. NCEL REPORT R-566. AUTHOR-- MELVIN C. HIRONAKA.

U.S. NAVAL CIVIL ENGINEERING LABORATORY
PORT HUENEME, CALIFORNIA 93041

TRIAXIAL COMPRESSION TEST WITH DIRECT PLOTTING — LANGUAGE - FORTRAN II-D
COMPUTER - IBM 1620 II

(COPY ON FILE AT NODC)
REDUCES THE DATA FROM TRIAXIAL COMPRESSION TESTS AND PLOTS STRESS VS. STRAIN WITH HEADINGS FOR SAMPLE IDENTIFICATION, LATERAL PRESSURE, ETC. ANOTHER PROGRAM REDUCES THE SAME RAW DATA AND PRESENTS THE RESULTS IN THE FORM OF TABULATIONS, ONE FOR EACH TEST. LISTINGS AND DESCRIPTIONS FOR BOTH PROGRAMS INCLUDED IN AN NCEL REPORT, REF. NO. R-566, BY M.C. HIRONAKA.

U.S. NAVAL CIVIL ENGINEERING LABORATORY
PORT HUENEME, CALIFORNIA 93041

CONSOLIDATION TEST (E VS. LOG TIME PLOT) — LANGUAGE - FORTRAN II-D
COMPUTER - IBM 1620 II

(COPY ON FILE AT NODC)
REDUCES THE DATA OBTAINED FROM THE CONSOLIDATION TEST READINGS. INPUT INCLUDES SAMPLE IDENTIFICATION AND CHARACTERISTICS, AND TEST CHARACTERISTICS. THE OUTPUT FROM THIS PROGRAM IS IN TWO FORMS-- PLOTS AND PUNCHED CARDS. THE LOG OF TIME IS PLOTTED VS. THE VOID RATIO. THE CARDS ARE USED AS INPUT TO THE NEXT CONSOLIDATION TEST PROGRAM.

U.S. NAVAL CIVIL ENGINEERING LABORATORY
PORT HUENEME, CALIFORNIA 93041

CONSOLIDATION TEST (E VS. LOG P AND C(V) VS. LOG P PLOTS) — LANGUAGE - FORTRAN II-D
COMPUTER - IBM 1620 II

(COPY ON FILE AT NODC)
DEVELOPES PLOTS FOR VOID RATIO VS. LOG OF PRESSURE AND COEFFICIENT OF CONSOLIDATION VS. LOG OF PRESSURE. THE INPUT TO THIS PROGRAM CONSISTS OF THE OUTPUT CARDS FROM THE PREVIOUS PROGRAM TOGETHER WITH THE VALUES OF VOID RATIO AND PRESSURE AT 100 0/0 CONSOLIDATION AND THE TIME AND VOID RATIO AT 50 0/0 CONSOLIDATION. THESE DATA WERE OBTAINED FROM THE PLOTS OF VOID RATIO VS. LOG OF TIME IN ACCORDANCE WITH THE TERZAGHI CONSOLIDATION THEORY. EXAMPLES OF INPUT AND OUTPUT, WITH PROGRAM DESCRIPTIONS AND LISTINGS, INCLUDED IN NCEL REPORT R-566 (FEB 68, 165 P) BY MELVIN C. HIRONAKA.

U.S. NAVAL CIVIL ENGINEERING LABORATORY
PORT HUENEME, CALIFORNIA 93041

PERMEABILITY TEST WITH DIRECT PLOTTING — LANGUAGE - FORTRAN II-D
COMPUTER - IBM 1620 II

(COPY ON FILE AT NODC)
REDUCES TEST DATA AND PLOTS CURVE OF PERMEABILITY VERSUS TIME WITH APPROPRIATE HEADINGS AND LABELS, USING IBM 1627 MODEL I PLOTTER. THE PLOTTING SCALE IS A VARIABLE INCORPORATED IN THE PROGRAM, SINCE PERMEABILITY VALUES FOR FINE-GRAINED SOILS VARY THROUGHOUT A WIDE RANGE. REF. NCEL REPORT R-566. AUTHOR-- MELVIN C. HIRONAKA.

U.S. NAVAL CIVIL ENGINEERING LABORATORY
PORT HUENEME, CALIFORNIA 93041

SETTLEMENT ANALYSIS

LANGUAGE - FORTRAN II-D
COMPUTER - IBM 1620 II

(COPY ON FILE AT NODC)
ESTIMATES SETTLEMENT VALUES FROM LABORATORY TEST RESULTS, FOR DEEP OCEAN FOUNDATION INVESTIGATIONS. INPUT ARE SEDIMENT PROPERTIES AND STRUCTURE CHARACTERISTICS. OUTPUT IS A TABLE LISTING TOTAL SETTLEMENT, FOOTING DIMENSIONS, STRUCTURE LOAD, CHANGE IN THICKNESS OF INCREMENTAL LAYERS AT CORRESPONDING DEPTH IN SEDIMENT, INITIAL STRESS, AND CHANGE IN STRESS. EQUATIONS, ETC., DESCRIBED IN AN NCEL REPORT, NO. R-566, BY MELVIN C. HIRONAKA.

U.S. NAVAL CIVIL ENGINEERING LABORATORY
PORT HUENEME, CALIFORNIA 93041

SUMMARY PLOTS

LANGUAGE - FORTRAN II-D
COMPUTER - IBM 1620 II

(COPY ON FILE AT NODC)
PLOTS THE RESULTS FROM THE LABORATORY ANALYSIS OF CORE SAMPLES. THE INPUT DATA ARE THE OUTPUT RESULTS ON CARDS FROM THE PREVIOUS PROGRAMS AND MISCELLANEOUS ANALYSES. SINCE THE LINK SYSTEM OF PROGRAMMING IS USED, THE ITEMS TO BE PLOTTED CAN BE INCREASED OR DECREASED WITH SLIGHT MODIFICATIONS, DEPENDING ON THE USER'S REQUIREMENTS. OUTPUT IS A SEQUENCE OF PLOTS. THE DEPTH INTO THE SEDIMENT COLUMN IS PLOTTED WITH REFERENCE TO THE ORDINATE, AND THE VARIOUS PROPERTIES ALONG THE ABSCISSA ON VARIABLE SCALES. REF. A TECHNICAL REPORT NO. R-566 'COMPUTER REDUCTION OF DATA FROM ENGINEERING TESTS ON SOILS AND OCEAN SEDIMENTS'. AUTHOR-- MELVIN C. HIRONAKA, NCEL.

U.S. NAVAL CIVIL ENGINEERING LABORATORY
PORT HUENEME, CALIFORNIA 93041

BKGEOL (SEDIMENT ANALYSIS STATISTICS)

LANGUAGE - FORTRAN IV
COMPUTER - IBM 7094-II/
7040 DCS

(COPY ON FILE AT NODC)
MODIFICATION OF U.W. ROUTINE 213 FOR THE 709 PREPARED IN FORTRAN II BY E.E. COLLIAS AND M.R. RONA (REF. TECH. REPORT NO. 87, 1963). ACCEPTS INPUT DATA IN A MORE ELEMENTARY FORM THAN PREVIOUS PROGRAM AND THE ANALYST MAKES NO CALCULATIONS. INCLUDES PROVISION FOR COMPENSATING FOR VARIATIONS IN DENSITY, TEMPERATURE, AND ERRORS IN PIPETTING DEPTH AND/OR TIME. OUTPUT IS A LIST OF INPUT DATA, LIST OF COMPONENT, RATIO, TRASK, INMAN, AND FOLK AND WARD STATISTICS, SHEPARD DIAGRAM INFORMATION AND PASSEGA'S C-M VALUES. OPTIONAL PUNCH CARD OUTPUT. PROGRAM DATE-- MAY 1966. AUTHOR-- WILLIAM ANIKOUCHINE, JORG, ESSA. (A PLOT ROUTINE WAS PREPARED TO GRAPH PERCENTILE VS PHI-SIZES FROM THE RESULTS OF THE MAIN PROGRAM.)

W. ANIKOUCHINE, RES. ASSOCIATE
JORG-ESSA, C/O DEPT. OF OCEANOGRAPHY
UNIVERSITY OF WASHINGTON
SEATTLE, WASH. 98105

CONDU

LANGUAGE - FORTRAN IV
COMPUTER - IBM 7094-II/
7040 DCS

(COPY ON FILE AT NODC)
CALCULATES THERMAL CONDUCTIVITY OF MARINE SEDIMENTS FROM DATA OBTAINED WITH A TRANSIENT TYPE NEEDLE PROBE (ALPINE MODEL 328). TEMPERATURE-MILLIVOLT CALIBRATION TABLES ARE INPUT AS DATA, WITH LINEAR INTERPOLATION EMPLOYED IN THE TABLE LOOK-UP SUBROUTINE. ADJACENT PAIRS OF TIME AND TEMPERATURE VALUES ARE USED TO CALCULATE CONDUCTIVITY VALUES. VALUES LYING OUTSIDE OF TWO STANDARD DEVIATIONS ARE REJECTED. OUTPUT IS

LISTING AND PLOTS. THE BEST CONDUCTIVITY VALUE IS COMPUTED AND PRINTED. AUTHOR-- WILLIAM ANIKOUCHINE, JOINT OCEANOGRAPHIC RESEARCH GROUP (JORG, ESSA), UNIV. OF WASHINGTON. A COPY OF THIS PROGRAM IS ALSO ON FILE WITH THE PACIFIC OCEANOGRAPHIC LABORATORY, 1801 FAIRVIEW AVE. EAST, SEATTLE, WASH., MR. THEODORE V. RYAN, DIRECTOR.

RADM. HAROLD J. SEABORG
DIRECTOR, PACIFIC MARINE CENTER
COAST AND GEODETIC SURVEY, USESSA
1801 FAIRVIEW AVENUE, EAST
SEATTLE, WASH. 98102

SEDIMENT GRANULOMETRIC ANALYSIS (UWMS-1003)

LANGUAGE - FORTRAN IV AND MAP
COMPUTER - IBM 7094-II/7040 DCS AND CDC 6400

(COPY ON FILE AT NODC)
THE OUTPUT LISTS INPUT DATA, COMPUTED FRACTION PERCENTAGES, ACCUMULATED PERCENTAGES, WEIGHT PERCENTAGES OF GRAVEL, SAND, SILT, AND CLAY, SAND/MUD RATIO, SHEPARD CLASS, TETRAHEDRAL GROUP, PHI-SIZES AT CERTAIN PERCENTILES, TRASK, INMAN, FOLK AND WARD VALUES, AND MOMENTS MEASURES WITH AND WITHOUT SHEPARD'S CORRECTIONS. REF. A REPORT (UWMS-1003, AUG 1966) BY THE DEPT. OF OCEANOGRAPHY, APPLIED MATHEMATICS SECTION. CORE STORAGE NECESSARY-- 5327 WORDS. SOURCE DECK HAS 775 CARDS. REVISED 1969 FOR THE CDC-6400.

H. MACINTOSH, COMPUTER SERVICES
DEPARTMENT OF OCEANOGRAPHY
UNIVERSITY OF WASHINGTON
SEATTLE, WASH. 98105

SEDIMENT TEXTURAL ANALYSIS

LANGUAGE - FORTRAN
COMPUTER - (NOT GIVEN)

(COPY ON FILE AT NODC)
A COMPREHENSIVE PROGRAM, DESIGNED FOR SMALL COMPUTERS, FOR THE TEXTURAL ANALYSIS OF GROUPED SEDIMENT DATA, INCLUDING SIEVED AND PIPETTED SAMPLES. THE PROGRAM CONVERTS THE RAW WEIGHTS OF SIZE-GRADED SEDIMENT INTO WEIGHT PERCENTS, CUMULATIVE PERCENTS, AND A FREQUENCY HISTOGRAM. COMPUTED STATISTICS INCLUDE-- PERCENTS OF GRAVEL, SAND, SILT, AND CLAY FOR LITHOFACIES ANALYSIS, AND MEAN, STANDARD DEVIATION, SKEWNESS, AND KURTOSIS, COMPUTED BY THE METHODS OF MOMENTS, TRASK, INMAN, AND FOLK AND WARD. REF. A REPORT (UNPUBLISHED) JULY '69, 27 P, BY SAM UPCHURCH.

DIRECTOR
GREAT LAKES RESEARCH CENTER
DEPT. OF THE ARMY, CORPS OF ENGINEERS
LAKE SURVEY DISTRICT
DETROIT, MICHIGAN 48226

GEOLOGICAL SAMPLING INVENTORY PLOT

LANGUAGE - FORTRAN
COMPUTER - IBM 7074 AND CALCOMP 564

(COPY ON FILE AT NODC)
DISPLAYS GEOLOGICAL SAMPLING INVENTORY DATA AND LOCATION ON CALCOMP PLOTS, GIVEN THE MARSDEN SQUARE OR ADJACENT RECTANGULAR ARRAY OF MARSDEN SQUARES. INPUT IS THE NODC GEOSORTED FILE OF GEOLOGICAL DATA. AUTHOR-- ROBERT VAN WIE.

COMPUTER SYSTEMS DIVISION, CODE 2400
NATIONAL OCEANOGRAPHIC DATA CENTER
WASHINGTON, D.C. 20390

BOTTOM SEDIMENT DISTRIBUTION PLOT

LANGUAGE - FORTRAN
COMPUTER - IBM 7074 W/ CALCOMP 564

(COPY ON FILE AT NODC)
PLOTS BOTTOM SEDIMENT NOTATIONS ON A MERCATOR PROJECTION OF ANY NUMBER OF DEGREES OF LATITUDE AND LONGITUDE AND TO A SPECIFIED SCALE. CALCOMP SUBROUTINES ARE USED, ALSO A COUNT SUBROUTINE DESIGNED BY MR. WALTER YERGEN OF THIS DIVISION. REF. IMR NO. 0-10-66, MAY 1966 (UNPUBLISHED MANUSCRIPT), BY R.J. VAN WYCKHOUSE, WHICH LISTS AN EARLIER PROGRAM FOR PRIMARY GRAIN SIZE, AND AN INFORMAL REPORT IR NO. 68-49, JULY 1968, BY FREDERICK MAAS. DDC USERS MAY OBTAIN COPIES OF THE LATTER REPORT DIRECTLY FROM DDC, OR THROUGH THE COMMANDER, NAVAL OCEANOGRAPHIC OFFICE, ATTN. CODE 40.

OCEANOGRAPHIC ANALYSIS, GEOLOGY SEC.
NAVAL OCEANOGRAPHIC OFFICE
SUITLAND, MD. 20390

BIOP (BIOLOGY PLOT)

LANGUAGE - FORTRAN IV
COMPUTER - CDC 3600, CDC 160A

DOES POSITION (LATITUDE, LONGITUDE) PLOTTING OF BIOLOGICAL SPECIES ON THE CALIFORNIA OFFSHORE IN MERCATOR PROJECTION. AUTHORS-- MR. MANLEY, L. W. YOUNG.

MARINE LIFE RESEARCH GROUP
SCRIPPS INSTITUTION OF OCEANOGRAPHY
P.O. BOX 109
LA JOLLA, CALIFORNIA 92037

MATHEMATICAL SIMULATION OF MARINE SEDIMENTATION

LANGUAGE - FORTRAN IV
COMPUTER - IBM 7040 AND IBM 7094

BY MATHEMATICAL MEANS, IN SYMBOLIC THREE-DIMENSIONAL SPACE, THE MODEL IMITATES THE PROCESSES OF TECTONIC WARPING, WINNOWING OF SEDIMENTS ALONG BEACHES, FORMATION OF DELTAS, AND THE GROWTH AND INTERACTION OF ORGANISM COMMUNITIES, INCLUDING ALGAL BANKS AND CORAL REEFS. THE MODEL IS RUN FORWARD, BY INCREMENTS, THROUGH GEOLOGIC TIME. OUTPUT IS IN THE FORM OF LITHOFACIES MAPS, STRUCTURE MAPS, BIOFACIES MAPS, SEA WATER DEPTH MAPS, AND GEOLOGICAL CROSS SECTIONS THAT SHOW BOTH STRUCTURE AND FACIES RELATIONSHIPS. COMPUTER CONTRIBUTION 9, BY J.W. HARBAUGH AND W.J. WAHLSTEDT, 1967.

DR. DANIEL F. MERRIAM, EDITOR
COMPUTER CONTRIBUTIONS
KANSAS GEOLOGICAL SURVEY

THE UNIVERSITY OF KANSAS
LAWRENCE, KANSAS 66044

VECTOR TREND ANALYSIS OF DIRECTIONAL DATA

LANGUAGE - FORTRAN IV
COMPUTER - IBM 7090/94

ANALYZES REGIONAL TRENDS IN DIRECTIONAL DATA. ORTHOGONAL POLYNOMIAL RESPONSE SURFACES ARE COMPUTED AND PLOTTED AS ISOAZIMUTH AND VECTOR TREND MAPS TO AID IN INTERPRETING REGIONAL FLOW PATTERNS. EXAMPLES ARE GIVEN OF THE STUDY OF THE DISTRIBUTION OF CURRENTS WHICH EXISTED WHEN A SEDIMENT WAS DEPOSITED. REF. COMPUTER CONTRIBUTION 11, BY WILLIAM T. FOX (1967).

DR. DANIEL F. MERRIAM, EDITOR
COMPUTER CONTRIBUTIONS
KANSAS GEOLOGICAL SURVEY
THE UNIVERSITY OF KANSAS
LAWRENCE, KANSAS 66044

SIMULATION OF DELTAIC SEDIMENTATION

LANGUAGE - FORTRAN IV-H
COMPUTER - IBM 360/67,
CALCOMP

A SEDIMENT-LADEN RIVER FLOWING INTO A TIDELESS, CURRENTLESS MARINE BASIN IS MODELED AS A PLANE JET DISCHARGING HORIZONTALLY AT THE OCEAN SURFACE. A VELOCITY FIELD IS CALCULATED USING EQUATIONS FOR OPEN-CHANNEL AND PLANE JET FLOW. SEDIMENT BEHAVIOR IS TREATED STATISTICALLY. NOMINAL SEDIMENT PARTICLES ARE TRACED ALONG TRAJECTORIES FROM THE MOUTH AS THEY SPREAD LATERALLY AND SETTLE VERTICALLY. A DYNAMIC MODEL PERMITS A DELTA TO BUILD FORWARD DURING SEVERAL TIME INCREMENTS, NOMINAL PARTICLE TRAJECTORIES ADJUSTING AUTOMATICALLY TO THE POSITION OF THE DELTA LIP. AUTHORS-- G.F. BONHAM-CARTER AND A.J. SUTHERLAND. COMPUTER CONTRIBUTION 24 (APR 1968).

DR. DANIEL F. MERRIAM, EDITOR
COMPUTER CONTRIBUTIONS
KANSAS GEOLOGICAL SURVEY
THE UNIVERSITY OF KANSAS
LAWRENCE, KANSAS 66044

AUTOMATIC CONTOURING

(ABSTRACT NOT RECEIVED.) COMPUTER CONTRIBUTION 23 'COMPUTER PROGRAMS FOR AUTOMATIC CONTOURING', BY D.B. MC INTYRE, D.D. POLLARD, AND R. SMITH, (1968).

DR. DANIEL F. MERRIAM, EDITOR
COMPUTER CONTRIBUTIONS
KANSAS GEOLOGICAL SURVEY
THE UNIVERSITY OF KANSAS
LAWRENCE, KANSAS 66044

GRIDIT, REGRIDIT, AUTOMATED CONTOUR

LANGUAGE - FORTRAN
COMPUTER - (NOT GIVEN)

(COPY ON FILE AT NODC)
THREE PROGRAMS WHICH ENABLE THE USER TO GRAPHICALLY PRODUCE A CONTOUR MAP BY THE COMPUTER-PLOTTER METHOD. THE GRIDIT PROGRAM PRODUCES A DIGITIZED MATRIX FROM DATA POINTS WHICH HAVE BEEN SCREENED FOR GROSS ERRORS. REGRIDIT PRODUCES A DIGITIZED MATRIX FROM RAW UNCHECKED DATA POINTS. AUTOMATED CONTOUR CONSTRUCTS A CONTOUR CHART FROM A DIGITIZED MATRIX. AN EXAMPLE IS GIVEN FOR USE OF THE PROGRAM IN CONTOURING THE BATHYMETRY OF OCEAN BOTTOM. REF. IM NO. 67-4 (INFORMAL MANUSCRIPT) 'AN AUTOMATED PROCEDURE FOR PRODUCING CONTOUR CHARTS', BY ROGER T. OSBORN, FEB. 1967.

HYDROGRAPHIC DIV., CODE 8100

NAVAL OCEANOGRAPHIC OFFICE
SUITLAND, MD. 20390

FAA PLOT

LANGUAGE - FORTRAN
COMPUTER - IBM 7074

(COPY ON FILE AT NODC)
ACCEPTS THREE CARD IMAGES AND A SUPPLIED SET OF FAA DATA CARDS AS INPUT. THE OUTPUT IS A MAGNETIC TAPE TO DRIVE THE E-51, E-103, OR THE E-108 CONCORD DIGITAL PLOTTERS USING THE ECHELON MODE. THE END PRODUCT IS A FILM POSITIVE WITH A PLUS SYMBOL FOR THE POSITION OF THE FAA PLOTS. THE MERCATOR, TRANSVERSE MERCATOR, AND LAMBERT CONIC CONFORMAL PROJECTION WITH TWO STANDARD PARALLELS ARE THE THREE PROJECTIONS WHICH CAN BE USED TO PLOT PROGRAM OUTPUTS. O.S. NO. 65652. AUTHORS-- RONALD M. BOLTON AND J. PARRINELLO.

NAUTICAL CHART DIVISION, CODE 5620
NAVAL OCEANOGRAPHIC OFFICE
SUITLAND, MD. 20390

SOUNDING PLOT

LANGUAGE - FORTRAN
COMPUTER - CDC 3100 AND IBM 7074

ACCEPTS LORAC, LORAN, OR RAYDIST LANE VALUES. SHIPS TRACK AND SOUNDINGS ARE PLOTTED ON THE CALCOMP. PRIMARY VERSION IS FOR THE CDC-3100 COMPUTER. AN OBJECT DECK FOR IBM 7074 WILL BE PRODUCED. PLOTTING IS DONE IN UTM MODE. OS NO. 58419. AUTHOR-- G.R. BILLS.

GEODESY DIVISION, CODE 8420
NAVAL OCEANOGRAPHIC OFFICE
SUITLAND, MD. 20390

THREE-DIMENSIONAL SURFACE PLOTS

LANGUAGE - FORTRAN
COMPUTER - CDC 3800

SUBROUTINE 'SURFACE' ALLOWS THREE-DIMENSIONAL PLOTS TO BE GENERATED ON THE 565 CALCOMP PLOTTER. THIS SUBROUTINE WILL PRODUCE A SURFACE PLOT OF DATA THAT CAN BE REDUCED TO ONE SINGLE-VALUED DEPENDENT AND TWO INDEPENDENT VARIABLES. NRL MEMO. REPORT 2015. AUTHOR-- J. MOORE.

JOHN C. MOORE
RADAR TECHNIQUES
RADAR DIVISION
NAVAL RESEARCH LABORATORY, WASHINGTON, D. C. 20390

LINE PRINTER PLOTS

LANGUAGE - FORTRAN, COMPASS
COMPUTER - CDC 3800

A SUBROUTINE PACKAGE WRITTEN AT THE UNIVERSITY OF WISCONSIN TO PRODUCE LINE PRINTER PLOTS HAS BEEN MODIFIED TO RUN ON NRL'S CDC 3800 . NRL MEMO. REPORT 2046. AUTHOR-- D. DENTON.

DIANNA L. DENTON
RESEARCH COMPUTATION CENTER
MATHEMATICS AND INFORMATION SCIENCES DIVISION
NAVAL RESEARCH LABORATORY, WASHINGTON, D. C. 20390

PLOT THETA-S CURVES

LANGUAGE - FORTRAN II
COMPUTER - CDC 3100/ PDP-8 AND CALCOMP

PLOTS POTENTIAL TEMPERATURE VS. SALINITY. CARD INPUT, OUTPUT PRINTED LISTING AND PUNCHED PAPER TAPE. STATION PLOT USES A PDP-8 COMPUTER,

PAPER TAPE READER, AND CALCOMP. AUTHOR-- R. REINIGER.

DIRECTOR
ATLANTIC OCEANOGRAPHIC LABORATORY
BEDFORD INSTITUTE
DARMOUTH, NOVA SCOTIA, CANADA

PLOT STATION POSITIONS

LANGUAGE - FORTRAN II
COMPUTER - CDC 3100/ PDP-8 AND CALCOMP

PLOTS CRUISE STATION POSITIONS ON MERCATOR'S PROJECTION AND WRITES IN STATION NUMBER. 'PLOTL' PLOTTING ROUTINE USED WITH PDP-8 COMPUTER AND THE CALCOMP. AUTHOR-- R. REINIGER (SEPT 1968).

DIRECTOR
ATLANTIC OCEANOGRAPHIC LABORATORY
BEDFORD INSTITUTE
DARTMOUTH, NOVA SCOTIA, CANADA

SECTION PLOTTING

LANGUAGE - FORTRAN
COMPUTER - CDC 3100/ PDP-8 AND CALCOMP

(COPY ON FILE AT NODC)
THE PROGRAM USES THE CDC 3100 PLOTTING SUBROUTINES TO GENERATE DATA FOR THE PDP-8 PLOTTING PROGRAM. THE USER MAY SPECIFY A LEGEND (UP TO 480 CHARACTERS), LABEL SIZES, SCALE FACTORS, THE PARAMETER TO BE PLOTTED AND THE ISOPLETHS TO BE DETERMINED. THE PLOTTING IS DONE ON A CALCOMP 31 IN. PLOTTER UNDER CONTROL OF THE PDP-8. CRUISE DATA IS READ FROM MAGNETIC TAPE BY THE CDC 3100 IN MODIFIED CODC FORMAT OR BI FORMAT. STORAGE REQUIREMENTS-- 11000(8) IN THE CDC 3100 (INCLUDING PLOTTING SUB-PROGRAMS). AN ITERATIVE METHOD IS USED IN CONJUNCTION WITH AN INTERPOLATION FUNCTION TO DETERMINE ISOPLETH DEPTHS. THE INTERPOLATION FUNCTION IS DESCRIBED IN A BEDFORD INSTITUTE REPORT, BIO 66-3 (FEB 1966, UNPUBLISHED MANUSCRIPT) BY R.F. REINIGER AND C.K. ROSS

DIRECTOR
ATLANTIC OCEANOGRAPHIC LABORATORY
BEDFORD INSTITUTE
DARTMOUTH, NOVA SCOTIA, CANADA

TIME SERIES PLOTTING

LANGUAGE - FORTRAN 32
COMPUTER - CDC 3100/ PDP-8 AND CALCOMP

(COPY ON FILE AT NODC)
THE PROGRAM USES THE CDC 3100 PLOTTING SUBROUTINES TO GENERATE DATA FOR THE PDP-8 PLOTTING PROGRAM. THE USER MAY SPECIFY A LEGEND (UP TO 480 CHARACTERS), LABEL SIZES, SCALE FACTORS, THE PARAMETER TO BE PLOTTED AND THE ISOPLETHS TO BE DETERMINED. THE PLOTTING IS DONE ON A CALCOMP 31 IN. PLOTTER UNDER CONTROL OF THE PDP-8. CRUISE DATA IS READ FROM MAGNETIC TAPE BY THE CDC 3100 IN BI FORMAT. TIME IS PLOTTED ALONG THE X AXIS (DRUM MOVEMENT) AND DEPTH ALONG THE Z AXIS (PEN MOVEMENT). STATIONS ARE PLOTTED TO THE NEAREST DAY. AUTHOR-- D.J. LAWRENCE (06/06/69).

DIRECTOR
ATLANTIC OCEANOGRAPHIC LABORATORY
BEDFORD INSTITUTE
DARTMOUTH, NOVA SCOTIA, CANADA

PLOG

LANGUAGE - FORTRAN IV
COMPUTER - IBM 1130/IBM

1627 PLOTTER

(COPY ON FILE AT NODC)
PLOTS THE RESULTS OF HYDROGRAPHIC CASTS IN A FORMAT SUITABLE FOR PUBLICATION. PRODUCES 8 1/2 BY 10 IN. PLOTS OF LOG(10)DEPTH VS. TEMPERATURE, SALINITY, AND OXYGEN.

DR. C. A. COLLINS
MARINE SCIENCES BRANCH, DEMR
PACIFIC OCEANOGRAPHIC GROUP
BIOLOGICAL STATION
NANAIMO, B.C., CANADA

STP01

LANGUAGE - FORTRAN IV
COMPUTER - IBM 1130/IBM 1627 PLOTTER

(COPY ON FILE AT NODC)
PLOTS DIGITIZED S.T.D. DATA IN A FORMAT SUITABLE FOR PUBLICATION. THE PLOTTER DRAWS AND LABELS AXES AND PLOTS TEMPERATURE AND SALINITY VS. DEPTH.

DR. C. A. COLLINS
MARINE SCIENCES BRANCH, DEMR
PACIFIC OCEANOGRAPHIC GROUP
BIOLOGICAL STATION
NANAIMO, B.C., CANADA

PSAL1 (PLOT TEMPERATURE-SALINITY)

LANGUAGE - FORTRAN VI
COMPUTER - IBM 1130

(COPY ON FILE AT NODC)
PLOTS T-S AND EXPANDED T-S CURVES. INPUT-- HYDROGRAPHIC DATA IN CODC FORMAT. ANOTHER PROGRAM, PSAL3, PLOTS OXYGEN-SALINITY AND TEMPERATURE-OXYGEN CURVES. REF. FRB MS. REPORT NO. 1071 (DEC 1969), BY C.A. COLLINS, R.L.K. TRIPE AND S.K. WONG.

PACIFIC OCEANOGRAPHIC GROUP
BIOLOGICAL STATION
NANAIMO, B.C., CANADA

GENERAL PURPOSE PLOT AND 'SPECTDPLOT'

LANGUAGE - FORTRAN
COMPUTER - IBM 7074 W/ CALCOMP

(COPY ON FILE AT NODC)
TWO PROGRAMS WITH CONSIDERABLE GENERALITY WHICH ALLOW THE USER TO DEFINE HIS ORIGIN, SCALE FACTORS, GRID ANNOTATION AND DATA SET, OR ANY NUMBER OF DATA SETS. AN ADDED PROVISION ALLOWS DATA RECORDED IN THE FIELD (I.E. ABOARD RESEARCH SHIPS), TO BE PROCESSED DIRECTLY FROM THE FIELD TAPES WITH A MINIMUM OF PREPARATORY PROCESSING. EITHER THE ROTARY-TYPE OR FLAT-BED PLOTTER MAY BE USED. OS NOS. 20255 AND 20264. INFORMAL REPORT REF. NO. IR 69-65 (AUG 1969, 70P). AUTHOR-- ERNEST L. MABREY. FURTHER INFORMATION MAY BE OBTAINED FROM THE DISSEMINATION DEPT. (CODE 44), OR THE AUTHOR.

SCIENTIFIC APPLICATIONS DIV., CODE 0831
COMPUTER DEPARTMENT
NAVAL OCEANOGRAPHIC OFFICE
SUITLAND, MD. 20390

SHIPBOARD SURVEY SYSTEM -- ON-STATION PLOT

LANGUAGE - FORTRAN
COMPUTER - IBM 7074

PLOTS SALINITY, SOUND SPEED, TEMPERATURE, AND AMBIENT LIGHT VERSUS DEPTH. INPUT IS FROM PROGRAM NO. 10132. AUTHOR-- J. WARDEN. OS NO. 10131.

COMPUTER DEPARTMENT, CODE 083
NAVAL OCEANOGRAPHIC OFFICE

SUITLAND, MD. 20390

PROFL

LANGUAGE - FORTRAN IV
COMPUTER - CDC 3600

PLOTS DATA VALUES AGAINST DEPTH OR OTHER PARAMETERS.

MR. DAVID WIRTH
OCEANIC RESEARCH DIVISION
SCRIPPS INSTITUTION OF OCEANOGRAPHY
P.O. BOX 109
LA JOLLA, CALIFORNIA 92037

OCEANOGRAPHIC STATION CURVE PLOTTING FOR 1401

LANGUAGE - AUTOCODER
COMPUTER - IBM 1401

(COPY ON FILE AT NODC)
USES A PLOT AND SYMBOL ROUTINE FOR THE IBM 1401. VARIABLES SCALED INCLUDE DEPTH, TEMPERATURE, SALINITY, SIGMA-T, DELTA ALPHA, OXYGEN, AND PHOSPHATE. AUTHOR-- D.L. SHAFFER, INSTITUTE OF MARINE SCIENCE.

UNIVERSITY OF MIAMI
MARINE LABORATORY
COMPUTER CENTER
1 RICKENBACKER CAUSEWAY
VIRGINIA KEY, MIAMI, FLORIDA

THE VORTEX OCEAN MODEL

LANGUAGE - DECAL
COMPUTER - PDP-7(9)

SIMULATES A VORTEX OCEAN MODEL AND DISPLAYS RESULTS ON COMPUTER SCOPE. COLLECTS STATISTICS ON THE MODEL. RESEARCHER CAN CONTROL THE CONFIGURATION OF THE SIMULATION, MAY AT ANY TIME DURING COMPUTATION EXAMINE OR CHANGE THE VALUE OF ANY VARIABLE. IN THE MODEL, A SET OF VORTICES INTERACT IN A CIRCULAR OR UNBOUNDED OCEAN. NUMBER OF VORTICES CAN BE VARIED FROM 1 TO 31. ALSO, A SPECIAL TEST POINT USED TO COLLECT STATISTICS ON THE EFFECTS OF THE VORTICES. EACH VORTEX ROTATES WITH A STRENGTH, WHERE THE (I)TH VORTEX ROTATES WITH STRENGTH S(I). THE ROTATION OF EACH VORTEX AFFECTS THE POSITION OF ALL OTHERS. OPERATION IS SUFFICIENTLY FAST TO SHOW SEVERAL VORTICES IN OPERATION, FLICKER-FREE. PROGRAM IS CONTROLLED FROM AN ON-LINE TYPEWRITER VIA CONTROL CHARACTERS. PROGRAM WRITEUP IS AVAILABLE ON REQUEST.

DR. DANIEL M. FORSYTH
INFORMATION INTERNATIONAL, INC.
89 BRIGHTON AVENUE
BOSTON, MASSACHUSETTS 02134

WORLD OCEANOGRAPHIC DATA DISPLAY

LANGUAGE - DECAL
COMPUTER - PDP-7(9)

THE WODD SYSTEM ENABLES A RESEARCHER TO CONDUCT AN ANALYSIS OF OCEANOGRAPHIC DATA USING A SERIES OF VISUAL DISPLAYS GENERATED BY A DIGITAL COMPUTER. THE EVENTUAL GOAL OF THE SYSTEM WILL BE TO HOLD AND MAKE AVAILABLE FOR DISPLAY THE ENTIRE BODY OF WORLD OCEANOGRAPHIC DATA. THE RESEARCHER WILL BE ABLE TO SELECT SPECIFIC DATA FOR DISPLAY, IN THE FORM OF CONTOUR LINES AGAINST A MAP OF SELECTED OCEANIC DATA. HE WILL BE ABLE TO VARY THE PARAMETERS OF THE DATA SELECTED AND OBSERVE THE RESULTING VARIATIONS IN THE CONTOUR LINES. AT ITS PRESENT STAGE OF DEVELOPMENT, THE SYSTEM CONSISTS OF A PDP-7 COMPUTER, A CATHODE RAY TUBE VISUAL DISPLAY UNIT, A MAGNETIC TAPE UNIT, A LIGHT PEN, INPUT-OUTPUT TYPEWRITER. BROCHURE DESCRIBING SYSTEM IS AVAILABLE ON REQUEST

DR. DANIEL M. FORSYTH
INFORMATION INTERNATIONAL, INC.
89 BRIGHTON AVENUE
BOSTON, MASSACHUSETTS 02134

MACHINE PLOTTING ON MERCATOR-PROJECTION

LANGUAGE - FORTRAN
COMPUTER - CDC 1604 W/ CALCOMP 165

(COPY ON FILE AT NODC)
UTILIZES MERIDIONAL PARTS TO LOCATE DATA POINTS ON MERCATOR-PROJECTION MAPS. FORTRAN PROGRAM USES A SHARED-TIME PLOTTING ROUTINE. THE CONTINENT OUTLINES CAN ALSO BE PLOTTED BY STRAIGHT-LINE SEGMENTS. REF.-- NUWC TP 89 (DEC 1968, 44 P.). AUTHOR-- L.A. SMOTHERS. PROGRAMMER-- K.K. STARR.

OCEAN SCIENCES DEPARTMENT
NAVAL UNDERSEA RESEARCH AND DEVELOPMENT CENTER
SAN DIEGO, CALIFORNIA 92132

VACOTS (VERTICALLY ANALYZED CONTOURS OF OCEANOGRAPHIC TEMPERATURES AND SALINITIES)

LANGUAGE - FORTRAN 63
COMPUTER - CDC 3600 W/ CALCOMP

(COPY ON FILE AT NODC)
PROVIDES A RAPID AND ACCURATE MEANS OF CONSTRUCTING VERTICAL CROSS-SECTIONS OF SEA TEMPERATURES AND SALINITIES. ALTHOUGH THIS PROGRAM HAS BEEN DESIGNED TO USE S.T.D. DATA RECORDED ON MAGNETIC TAPE, OTHER VERSIONS ALSO ARE BEING USED TO CONTOUR BIOLOGICAL, CHEMICAL AND OTHER PHYSICAL OCEANOGRAPHIC DATA. EACH VERTICAL SECTION IS DIVIDED INTO TWO PARTS - THE UPPER SECTION FOR THE CONTOURS FROM SURFACE TO 300 M. AND THE LOWER SECTION FROM 300 M. TO 1000 M. CORE MEMORY SIZE NEEDED - 32,000 WORDS. RUNNING TIME-- TO ANALYZE AND PLOT CONTOURS AT INTERVALS OF 1 DEGREE C. FOR TEMPERATURE AND .1 0/00 FOR SALINITY FROM THE SURFACE TO 1000 M. FOR 50 STATIONS REQUIRES 4 MINUTES OF COMPUTER TIME ON THE CDC 3600 AND 25 MINUTES ON THE CALCOMP 30 IN. PLOTTER. AUTHOR - FORREST MILLER.

BUREAU OF COMMERCIAL FISHERIES
P.O. BOX 271
LA JOLLA, CALIFORNIA 92038

TEMPERATURE-SALINITY PLOT

LANGUAGE - FORTRAN
COMPUTER - CDC 3100/ CALCOMP 750

(COPY ON FILE AT NODC)
PROVIDES FOR THE PRODUCTION OF TEMPERATURE-SALINITY DIAGRAMS FROM SERIAL OCEANOGRAPHIC OBSERVATIONS. INPUT IS DATA CARDS AND A PLOT CONTROL CARD. OUTPUT IS PLOTTER TAPE AND A PRINTED SUMMARY OF OUT-OF-RANGE DATA. REF. MS REPORT NO. 6 (1967). AUTHOR-- J.R. WILSON.

OCEANOGRAPHIC RESEARCH DIVISION
MARINE SCIENCES BRANCH
DEPT. OF ENERGY, MINES AND RESOURCES
OTTAWA, CANADA

TEMPERATURE-SALINITY CURVES

LANGUAGE - FORTRAN IV
COMPUTER - IBM 360/65, CALCOMP

(COPY ON FILE AT NODC)
PLOTS TEMPERATURE VS. SALINITY CURVES ON 12 IN. PLOTTER, EITHER SINGLE OR MULTIPLE STATIONS. INPUT IS ICES FORMAT HYDROGRAPHIC DATA. CORE STORAGE USED-- 31K BYTES (INCLUDES PLOT ROUTINES). AUTHOR-- MARILYNN BORKOWSKI.

BUREAU OF COMMERCIAL FISHERIES
TROPICAL ATLANTIC BIOLOGICAL LABORATORY
75 VIRGINIA BEACH DRIVE
MIAMI, FLORIDA 33149

OXYGEN, PHOSPHATE, DENSITY PLOTS

LANGUAGE - FORTRAN IV
COMPUTER - IBM 360/65, CALCOMP

(COPY ON FILE AT NODC)
PLOTS OXYGEN VS. PHOSPHATE, OXYGEN VS. SIGMA-T, AND PHOSPHATE VS. SIGMA-T (SINGLE OR MULTIPLE STATION) FOR PURPOSES OF QUALITY CONTROL AND STUDY OF WATER TYPES. INPUT IS HYDROGRAPHIC DATA IN ICES FORMAT. CORE STORAGE USED-- 33K BYTES INCLUDING PLOT ROUTINES. AUTHOR-- MARILYNN BORKOWSKI.

BUREAU OF COMMERCIAL FISHERIES
TROPICAL ATLANTIC BIOLOGICAL LABORATORY
75 VIRGINIA BEACH DRIVE
MIAMI, FLORIDA 33149

MERCATOR STATION PLOT

LANGUAGE - FORTRAN IV
COMPUTER - IBM 360/65, CALCOMP

WRITES STATION NUMBERS AT THEIR POSITIONS ON A MERCATOR PROJECTION IN ANY SCALE/DEGREE. INPUT-- STATION HEADER CARDS IN ICES FORMAT. AUTHOR-- MARILYNN BORKOWSKI.

BUREAU OF COMMERCIAL FISHERIES
TROPICAL ATLANTIC BIOLOGICAL LABORATORY
75 VIRGINIA BEACH DRIVE
MIAMI, FLORIDA 33149

HORIZONTAL SECTIONS

LANGUAGE - FORTRAN IV
COMPUTER - IBM 360/65, CALCOMP

WRITES IN VALUES OF TEMPERATURE, SALINITY, OXYGEN, PHOSPHATE, ON SEPARATE MERCATOR PROJECTIONS, AT SPECIFIED DEPTHS. INPUT-- HYDROGRAPHIC DATA IN ICES FORMAT, AT STANDARD DEPTHS. AUTHOR-- MARILYNN BORKOWSKI.

BUREAU OF COMMERCIAL FISHERIES
TROPICAL ATLANTIC BIOLOGICAL LABORATORY
75 VIRGINIA BEACH DRIVE
MIAMI, FLORIDA 33149

GENERAL MERCATOR PLOT

LANGUAGE - FORTRAN IV
COMPUTER - IBM 360/65, CALCOMP

PLOTS ANY VARIABLE ON A MERCATOR PROJECTION. HAS OPTION OF WRITING IN VALUE OR MAKING A POINT PLOT, AND OF CONNECTING THE POINTS WITH LINES. INPUT-- ANY HEADER CARDS IN ICES FORMAT. PROJECTION PLOT MAY BE IN ANY SCALE PER DEGREE, AND MAY INCLUDE A COASTLINE (OBTAINED FROM A DIGITIZED WORLD TAPE LAYOUT). CORE STORAGE NECESSARY-- 42K BYTES (INCLUDES PLOT ROUTINES). AUTHOR-- MARILYNN BORKOWSKI.

BUREAU OF COMMERCIAL FISHERIES
TROPICAL ATLANTIC BIOLOGICAL LABORATORY
75 VIRGINIA BEACH DRIVE
MIAMI, FLORIDA 33149

ISOS,OXOS,PHOS

LANGUAGE - FORTRAN IV
COMPUTER - IBM 360/65 WITH CALCOMP

PLOTS ISENTROPIC SECTIONS FOR SALINITY, OXYGEN, OR PHOSPHATE FOR THE STANDARD STATIONS OF THE TRADE WIND ZONE OCEANOGRAPHY PROGRAM. INPUT IS THE TRADE WIND ZONE OCEANOGRAPHY PROGRAM ISENTROPIC FORMAT CARDS.

BUREAU OF COMMERCIAL FISHERIES
P. O. BOX 3830
HONOLULU, HAWAII 96812

TSIP,THOX,THOT

LANGUAGE - FORTRAN IV
COMPUTER - IBM 360/65
WITH CALCOMP

PLOTS TIME HISTORY OF TEMPERATURE, SALINITY, OR OXYGEN FOR STANDARD STATIONS OF THE TRADE WIND ZONE OCEANOGRAPHY PROGRAM PILOT STUDY. INPUT IS TRADE WIND ZONE OCEANOGRAPHY PROGRAM ISENTROPIC FORMAT CARDS.

BUREAU OF COMMERCIAL FISHERIES
P. O. BOX 3830
HONOLULU, HAWAII 96812

BATHYTHERMOGRAM COMPOSITE PLOT

LANGUAGE - FORTRAN
COMPUTER - IBM1401/7074

(COPY ON FILE AT NODC)
COMPUTES (1) NUMBER OF OBSERVATIONS AT 50 METER INTERVALS, (2) PERCENTAGE FOR EACH QUALITY CODE, (3) PLOTS PER SEASON AND AREA (AS DETERMINED BY A 1401 PROGRAM) USUALLY TO 35 LINES PER PAGE (NEVER EXCEEDING 44). INPUT-- NODC FORMAT DIGITIZED BT DATA, SORTED BY STATION AND DEPTH. OUTPUT-- TAPE FOR CALCOMP 670/564 PLOTTER. OS NO. 52208. AUTHOR-- RUDI SAENGER.

COMPUTER SYSTEMS DIVISION
NATIONAL OCEANOGRAPHIC DATA CENTER
WASHINGTON, D. C. 20390

INVENTORY PLOT

LANGUAGE - FORTRAN IV
COMPUTER - IBM 360/40,
CALCOMP 763

DISPLAYS AN INVENTORY OF STATION DATA PARAMETERS, BT DATA, GEOLOGICAL SAMPLES, ETC. (ANY GEOGRAPHICALLY SORTED DATA FILE), BY 1-DEGREE, 2-DEGREE, AND 5-DEGREE SQUARES, AND ON ANY OF EIGHT MAP PROJECTIONS OF SPHERE. OUTPUT-- A TAPE FOR THE CALCOMP 780/763 DRUM PLOTTER. AUTHOR-- JOHN WARD. WILL USE A STATION DATA PARAMETER INVENTORY PROGRAM NOW BEING WRITTEN IN ASSEMBLER LANGUAGE BY JEFF GORDON, AND OTHER PROJECTED PROGRAMS.

COMPUTER SYSTEMS DIVISION
NATIONAL OCEANOGRAPHIC DATA CENTER
WASHINGTON, D. C. 20390

CRUISE TRACK - MERCATOR PROJECTION

LANGUAGE - FORTRAN
COMPUTER - IBM 7074

(COPY ON FILE AT NODC)
INPUT-- NASA DIGITIZED WORLD LAYOUT TAPE, AND NODC FORMAT STATION DATA (UP TO 600 STATIONS IN A CRUISE). PROCEDURE-- DETERMINE MAXIMUM AND MINIMUM LATITUDE, AND ROUND TO NEAREST FIVE DEGREES, THEN DETERMINE SCALE FACTOR, LONGER SIDE EQUAL TO 20 INCHES. OUTPUT-- TAPE FOR CALCOMP 670/564 PLOTTER. OS NO. 52210. AUTHOR-- RUDI SAENGER. NOTE-- THIS WILL SOON BE REPLACED AT NODC BY A NEW MULTI-PROJECTION PROGRAM FOR CRUISE TRACKS, WRITTEN IN FORTRAN BY JOHN WARD FOR THE IBM 360.

COMPUTER SYSTEMS DIVISION
NATIONAL OCEANOGRAPHIC DATA CENTER
WASHINGTON, D. C. 20390

VERTICAL SUMMARY HISTOGRAM PLOT

LANGUAGE - FORTRAN
COMPUTER - IBM 7074 AND
CALCOMP 564

(COPY ON FILE AT NODC)
PLOTS PERCENT-FREQUENCY HISTOGRAMS AT EACH OF A MAXIMUM OF 20 STANDARD DEPTHS, EACH PLOT FOR A GIVEN 1-DEGREE SQUARE AND MONTH. INPUT DATA ARE PREPARED BY THE STATION DATA VERTICAL ARRAY SUMMARY PROGRAM. NO. 52235. AUTHOR-- ROBERT VAN WIE.

COMPUTER SYSTEMS DIVISION, CODE 2400
NATIONAL OCEANOGRAPHIC DATA CENTER
WASHINGTON, D.C. 20390

DENSITY-SALINITY MID PLOT

LANGUAGE - FORTRAN
COMPUTER - IBM 7074

(COPY ON FILE AT NODC)
USES SELECTED DENSITY-SALINITY VALUES (OUTPUT FROM PROGRAM NO. 52321) TO DRAW SINGLE PLOTS AND 6-4-6 COMPOSITE PLOTS IN A GEOGRAPHICALLY CONTIGUOUS AREA. THE COMPOSITE PLOTS ENABLE ANALYSES OF THESE MIDPOINT VALUES IN RELATION TO THEIR SURROUNDINGS. CORRECTIONS CAN THEN BE MADE ON THOSE SELECTED DENSITY-SALINITY POINTS TO BETTER REPRESENT THE MIDPOINT VALUE OF THAT PARTICULAR WATER MASS. OS NO. 52322. AUTHOR-- R.P. STEIN.

DEVELOPMENT DIVISION, CODE 2310
NATIONAL OCEANOGRAPHIC DATA CENTER
WASHINGTON, D. C. 20390

PRESORTED SIGMA-T VERSUS DEPTH AND SALINITY

LANGUAGE - FORTRAN
COMPUTER - IBM 7074

(COPY ON FILE AT NODC)
PLOTS SIGMA-T VERSUS DEPTH AND SALINITY, COMPOSITE BY MARSDEN SQUARES AND AREAS PREPUNCHED IN COL. 3-4. LIMITS-- DEPTH - 0 TO 3000, SIGMA-T - 22.0 TO 29.0, SALINITY - 32.5 TO 38.5. INPUT-- NODC FORMAT STATION DATA ON TAPE, SORTED BY MARSDEN SQUARE, AREA, STATION AND DEPTH. OUTPUT-- TAPE FOR CALCOMP 670/564 PLOTTER. OS NO. 52221. AUTHOR-- RUDI SAENGER.

COMPUTER SYSTEMS DIVISION
NATIONAL OCEANOGRAPHIC DATA CENTER
WASHINGTON, D. C. 20390

STATION DATA PLOT - SIX VARIABLES

LANGUAGE - FORTRAN
COMPUTER - IBM 7074

(COPY ON FILE AT NODC)
PLOTS TEMPERATURE VERSUS DEPTH, SALINITY, OXYGEN, PHOSPHATE. ALSO SALINITY AND SIGMA-T VERSUS DEPTH. LIMITS-- DEPTH - 0 TO 1250, TEMPERATURE - 3.5 TO 31.0. INPUT-- NODC FORMAT OBSERVED DATA, SORTED BY STATION AND DEPTH. OUTPUT-- TAPE FOR CALCOMP 670/564 PLOTTER. OS NO. 52206. AUTHOR-- RUDI SAENGER.

COMPUTER SYSTEMS DIVISION
NATIONAL OCEANOGRAPHIC DATA CENTER
WASHINGTON, D. C. 20390

SOUND VELOCITY DEPTH PROFILES

LANGUAGE - FORTRAN
COMPUTER - IBM 7074 W/ CALCOMP 564

(COPY ON FILE AT NODC)
PLOTS CURVES OF DEPTHS VERSUS SOUND VELOCITIES FOR SELECTED MONTHS IN A 1-DEG. SQUARE AREA FOR WHICH THERE ARE AT LEAST 8 STATIONS EXCEEDING 150 METERS, OR FOR SELECTED SEASONS HAVING 5 OR MORE STATIONS EXCEEDING 400 METERS. OS NO. 52228. AUTHOR-- ROBERT VAN WIE.

COMPUTER SYSTEMS DIVISION
NATIONAL OCEANOGRAPHIC DATA CENTER
WASHINGTON, D. C. 20390

VERTICAL SECTION PLOT - STATION DATA

LANGUAGE - FORTRAN
COMPUTER - IBM 7074

(COPY ON FILE AT NODC)
(1) EACH VERTICAL SECTION PLOT CONTOURS ONE OF THE FOLLOWING-- TEMPERATURE, SALINITY, SIGMA-T, GYMNODINIUM BREVE, INORGANIC PHOSPHORUS, TO-

TAL PHOSPHORUS, NITROGEN, SILICON, OR COPPER.
(2) PLOTS VERTICAL SECTIONS WITH NUMERICAL INSTEAD OF CONTOUR LINES FOR PARAMETERS INORGANIC PHOSPHORUS, TOTAL PHOSPHORUS, NITROGEN, SILICON, OR COPPER. INPUT-- OBSERVED NODC FORMAT STATION DATA TAPE ZONE-EDITED TO 120 CHARACTERS PER RECORD, SORTED BY CRUISE REFERENCE NO. OUTPUT-- INPUT TAPE TO CALCOMP PLOTTER 670/564. RUNNING TIME-- ABOUT 70 SECTIONS PER HOUR. OS NO. 52279. AUTHOR-- ROBERT VAN WIE, MODIFYING AND CONTINUING OS NOS. 52278 AND 52279 BY DANIEL ROBERTS.

COMPUTER SYSTEMS DIVISION
NATIONAL OCEANOGRAPHIC DATA CENTER
WASHINGTON, D. C. 20390

OCEANOGRAPHIC DATA PLOTTING PROGRAM FOR N.O.D.C. DATA

LANGUAGE - FORTRAN II
COMPUTER - IBM 1620 FOR CALCOMP 560

(COPY ON FILE AT NODC)
THE INPUT DATA CARDS ARE RECEIVED FROM THE NATIONAL OCEANOGRAPHIC DATA CENTER. THE PROGRAM IS DESIGNED TO PLOT OCEANOGRAPHIC STATION DATA DOWN TO A DEPTH OF 10,000 METERS. THIS IS DONE ON A SERIES OF UP TO 5 GRAPHS, EACH OF WHICH HAS A RANGE OF 2,000 METERS. THIS IS A COMPOSITE GRAPH CONSISTING OF TEMPERATURE, SIGMA-T, SOUND VELOCITY, SALINITY, OXYGEN AND PHOSPHATE. THE SALINITY, PHOSPHATE AND OXYGEN VALUES ARE PLOTTED VS TEMPERATURE. DENSITY, SOUND VELOCITY AND TEMPERATURE ARE PLOTTED AGAINST DEPTH. ALL TEMPERATURE DEPENDENT VARIABLES ARE PLOTTED ON THE FIRST GRAPH. THE CONTINUING GRAPHS CONTAIN ONLY DEPTH DEPENDENT VARIABLES. THE GRAPH IS FULLY IDENTIFIED AS TO REFERENCE NUMBER, STATION LOCATION AND DATE, ETC. EACH CURVE IS IDENTIFIED BY ITS PLOTTING SYMBOL. AUTHORS-- D.L. SHAFFER AND D.T. EGER.

UNIVERSITY OF MIAMI
MARINE LABORATORY
COMPUTER CENTER
1 RICKENBACKER CAUSEWAY
VIRGINIA KEY, MIAMI, FLORIDA

OCEANOGRAPHIC DATA PLOTTING PROGRAM, I.C.E.S.

LANGUAGE - FORTRAN II
COMPUTER - IBM 1620 FOR CALCOMP 560

(COPY ON FILE AT NODC)
THE INPUT TO THIS PROGRAM CONSISTS OF THE OUTPUT OF THE IN SITU OCEANOGRAPHIC DATA PROCESSING PROGRAM. HOWEVER, THIS PROGRAM REQUIRES THAT HEADER CARDS BE INCLUDED. SINCE THE PROGRAM ESSENTIALLY INTEGRATES ONE STATION AT A TIME AND THEN PLOTS IT, THE HEADER CARDS SERVE TO INDICATE THE BEGINNING OF A NEW STATION. AUTHOR-- D.L. SHAFFER.

UNIVERSITY OF MIAMI
MARINE LABORATORY
COMPUTER CENTER
1 RICKENBACKER CAUSEWAY
VIRGINIA KEY, MIAMI, FLORIDA

HISTO

LANGUAGE - FORTRAN IV-H
COMPUTER - SDS SIGMA 7

PRODUCES HORIZONTAL BAR HISTOGRAMS OF ANY VARIABLE THAT IS STORED ON MAGNETIC TAPE IN STANDARD WHOI FORMAT. OUTPUT IS A BAR HISTOGRAM DRAWN BY THE LINE PRINTER. THE WHOI GENERALIZED TAPE FORMAT IS PRESENTED IN A TECHNICAL REPORT 'A NINE CHANNEL DIGITAL MAGNETIC TAPE FOR STORING OCEANOGRAPHIC DATA', REF. NO. 69-55, JULY 1969, BY JOHN A. MALTAIS.

INFORMATION PROCESSING CENTER
ATTN. JOHN A. MALTAIS
WOODS HOLE OCEANOGRAPHIC INSTITUTION
WOODS HOLE, MASSACHUSETTS 02543

LISPLO

LANGUAGE - FORTRAN IV-H
COMPUTER - SDS SIGMA 7

LISTS AND PLOTS THE DATA STORED ON WHOI FORMAT MAGNETIC TAPE. OUTPUT IS ON THE LINE PRINTER. THREE TYPES OF PLOT ARE POSSIBLE - A) VARIABLE VS TIME OR SEQUENCE NUMBER, B) ANGLE AND SPEED VS TIME, C) TWO VARIABLES (ONE ON A MINUS AND ONE ON A PLUS SCALE) VS TIME.

INFORMATION PROCESSING CENTER
ATTN. JOHN A. MALTAIS
WOODS HOLE OCEANOGRAPHIC INSTITUTION
WOODS HOLE, MASSACHUSETTS 02543

TSPLOT

LANGUAGE - FORTRAN IV-E
COMPUTER - IBM 360/50

GENERATES A PUNCHED DECK TO BE USED AS INPUT TO THE BENSON-LEHNER DELTA INCREMENTAL PLOTTER. FOR EACH HYDROGRAPHIC STATION A SEPARATE TEMPERATURE VS. SALINITY GRAPH IS DRAWN. SALINITY RANGE IS 32.6 0/00 TO 37.8 0/00. ON THE SAME PAGE TWO TEMPERATURE VS. DEPTH GRAPHS ARE DRAWN, ONE FROM 0 TO 600 M, THE OTHER FROM 200 M TO THE BOTTOM. THESE ARE COMPLETE WITH AXIS, TICK MARKS AND LABELS. SIZE OF GRAPHS IS AN INPUT VARIABLE.

ROBERT K. SEXTON
NARRAGANSETT MARINE LABORATORY
UNIVERSITY OF RHODE ISLAND
KINGSTON, RHODE ISLAND 02881

SEQUENTIAL PLOTTING

LANGUAGE - FORTRAN
COMPUTER - (NOT GIVEN)

(COPY ON FILE AT NODC)
SUBROUTINES PRODUCE PLOTS USING A DIGITAL COMPUTER OUTPUT PRINTER. THE CONSECUTIVE X,Y DATA POINTS ARE PLOTTED WITH SYMBOLS CONSISTING OF LETTERS AND NUMERALS. PERMITS RAPID PLOTTING OF EITHER A SINGLE- OR MULTIVALUED CURVE WHEN HIGH RESOLUTION IS NOT REQUIRED. REF. NELC REPORT 1613 (MAR 1969, 40 P) BY R.G. ROCK. DIRECT INQUIRIES TO--

NAVAL ELECTRONICS LABORATORY CENTER
SAN DIEGO, CALIFORNIA 92152

DATA FIELD GRID EXPANSION

LANGUAGE - MACHINE
COMPUTER - CDC 1604 AND CDC 3100

EXPANDS A PORTION OF A 63X63 GRID DATA FIELD TO ANY DESIRED SCALE. THE EXTRACTED PORTION OF THE BASIC FIELD IS OF ARBITRARILY SELECTED SIZE, SCALE, LOCATION, ORIENTATION, AND CONTOUR INTERVAL. THE METHOD EMPLOYED IS DOUBLE INTERIOR QUADRATIC INTERPOLATION FROM THE ORIGINAL GRID POINTS TO THE LOCATION OF THE ARRAY IN THE NEW FIELD. THE TIME REQUIRED FOR THE EXTRACTION PROCESS IS SIX SECONDS IN THE 1604 AND LESS THAN TWO SECONDS IN THE 3100 COMPUTER. REF. TECHNICAL MEMO NO. 1, ALSO TECHNICAL NOTE NO. 21 (1966)

COMMANDING OFFICER
FLEET NUMERICAL WEATHER CENTRAL
MONTEREY, CALIFORNIA 93940

--* CURVE AND SURFACE FITTING *-*-*

LEAST SQUARES CURVE FITTING IN TWO, THREE, AND FOUR DIMENSIONS

LANGUAGE - FORTRAN II
COMPUTER - CDC 3100

(COPY ON FILE AT NODC)
THREE SUBROUTINES, 'UCF', 'BCF', AND 'TCF' (FOR UNIVARIATE, BIVARIATE, AND TRIVARIATE CURVE-FIT), FOR USE IN TWO-, THREE-, AND FOUR-SPACE. CURVE COEFFICIENTS CALCULATED BY REDUCTION TECHNIQUE DUE TO P.D. CROUT (1941). OUTPUT-- PRINTOUT OF COEFFICIENTS, IN NORMALIZED FLOATING-POINT, AND DIFFERENCES CURVE-TO-POINTS, IN SAME FORMAT. SATELLITE SUBROUTINE 'SYMMET' IS CALLED, WHICH SOLVES M SIMULTANEOUS ALGEBRAIC EQUATIONS IN X. CORE STORAGE NECESSARY-- 2074(8), 2076(8), AND 2256 (8), RESPECTIVELY, + 630(8) FOR SUBROUTINE SYMMET. REF. B.I.O. COMPUTER NOTE 68-1-C, JAN 1968. AUTHOR-- F.K. KEYTE.

DIRECTOR
ATLANTIC OCEANOGRAPHIC LABORATORY
BEDFORD INSTITUTE
DARTMOUTH, NOVA SCOTIA, CANADA

A GENERALIZED 2-DIMENSIONAL REGRESSION PROCEDURE

LANGUAGE - ALGOL AND FORTRAN IV
COMPUTER - B5500 AND IBM 7040

ENABLES SELECTION OF BEST FIT OF A SET OF OBSERVATIONS WITHOUT REGENERATION OF LOWER ORDER COEFFICIENTS. USES THE MINIMIZATION PROPERTY OF ORTHOGONAL FUNCTIONS. AUTHOR-- JOHN R. DEMPSEY, NORTHERN NATURAL GAS COMPANY. PUBLISHED 1966 AS 'COMPUTER CONTRIBUTION 2' WITH ALGOL LANGUAGE LISTING. A FORTRAN VERSION HAS BEEN RUN ON THE IBM 7040.

DR. DANIEL F. MERRIAM, EDITOR, COMPUTER CONTRIBUTIONS
KANSAS GEOLOGICAL SURVEY
THE UNIVERSITY OF KANSAS
LAWRENCE, KANSAS 66044

GENERAL REGRESSION

LANGUAGE - PL/1
COMPUTER - IBM OS/360

(COPY ON FILE AT NODC)
OBSERVATIONS MAY BE SELECTED BY GROUPS - UP TO 75 GROUPS ARE ALLOWED. THESE SELECTED OBSERVATIONS ARE TO BE USED TO COMPUTE SIMPLE CORRELATIONS BETWEEN ALL PAIRS OF THE SELECTED VARIABLES. SOME OF THE CORRELATION COEFFICIENTS MAY BE FURTHER USED AS NORMAL EQUATION COEFFICIENTS OR CONSTANTS FOR REGRESSION ANALYSES INVOLVING TWO OR MORE OF THESE VARIABLES. IF DESIRED, A DIFFERENT SUBSET OF OBSERVATIONS MAY BE SELECTED TO COMPUTE RESIDUALS, STANDARD ERRORS OF PREDICTED VALUES, ETC. EITHER CARDS OR TAPE MAY CONTAIN MOST OF THE DATA. IF TAPE IS TO BE USED FOR THE OBSERVATION MATRIX, IT MUST HAVE BEEN CREATED BY A DIFFERENT PROGRAM AND BE IN A SPECIAL PL/1 STREAM I/O FORMAT.

U. S. GEOLOGICAL SURVEY
COMPUTER CENTER DIVISION
ATTN. RALPH EICHER, CHIEF
BRANCH OF SCIENTIFIC APPLICATIONS
WASHINGTON, D. C. 20242

GRAPHIC SYSTEM FOR CURVE FITTING

LANGUAGE - (NOT GIVEN)
COMPUTER - IBM 360/40 W/ IBM 2250

PROGRAM SYSTEM CONSISTS OF A SET OF NEARLY INDEPENDENT SECTIONS FUNCTIONING ONLY WHEN CALLED BY THE 'MAIN' PROGRAM. THE USER ENTERS A CURVE INTO THE 360/40 VIA A RAND TABLET AND INTERACTIVELY TO SPECIFY VARIOUS WAYS OF FITTING, EDITING AND DISPLAYING THE CURVE ON AN IBM 2250 SCOPE. THE LAST STEP OUTPUT IS PUNCH CARDS WITH DATA POINTS OR COEFFICIENTS. THE SYSTEM FOR IBM 360 ALONG WITH THE PACKAGE OF GRAPHICS USED AT RAND TAKE UP ROUGHLY ONE-HALF OF THE COMPUTER CORE MEMORY. DOCUMENT BY A.S. PRIVER, SEPT 1969. THE DDC NO. IS AD 693 920.

THE RAND CORPORATION
1700 MAIN ST.
SANTA MONICA, CALIF. 90406

BARTLETT'S CURVE FITTING

LANGUAGE - FORTRAN
COMPUTER - IBM 1800 SYS

(COPY ON FILE AT NODC)
BARTLETT'S METHOD FOR COMPUTING THE BEST VALUES FOR FITTING A LINEAR RELATIONSHIP OR AN EXPONENTIAL RELATIONSHIP. THE 70 0/0 AND 90 0/0 CONFIDENCE LIMITS ON THE SLOPE ARE ALSO FOUND. THE PROGRAM TAKES A MAXIMUM OF 99 SETS OF DATA EACH WITH A MAXIMUM OF 500 POINTS. N.I.O. PROGRAM 174. AUTHOR-- MAUREEN TYLER.

NATIONAL INSTITUTE OF OCEANOGRAPHY
WORMLEY, GODALMING, SURREY
ENGLAND

CRVFT

LANGUAGE - FORTRAN II
COMPUTER - GE 225

(COPY ON FILE AT NODC)
ROUTINE TO FIND EITHER BEST LEAST SQUARES FIT TO N POINTS WITHIN SPECIFIED STANDARD DEVIATION 'SIGMA', OR FIT A SPECIFIED 'M-CURVE' ORDER CURVE. FORMER EXECUTED BY M-CURVE NEGATIVE, LATTER BY M-CURVE NON-NEGATIVE. IN EITHER CASE 'SD' IS ACTUAL STANDARD DEVIATION AS CALCULATED. AUTHOR-- F.K. KEYTE. LISTED IN APPENDIX 5 OF BIO COMPUTER NOTE 66-5-C. A 14-PAGE WRITEUP IS IN THE 'COPE' CATALOG (1965) OF WOODS HOLE OCEANOGRAPHIC INSTITUTION.

DIRECTOR
ATLANTIC OCEANOGRAPHIC LABORATORY
BEDFORD INSTITUTE
DARTMOUTH, NOVA SCOTIA, CANADA

LEAST SQUARES PLOT

LANGUAGE - FORTRAN
COMPUTER - IBM 7074

FITS AN N-DEGREE POLYNOMIAL (MAX. N=10) OR AN EXPONENTIAL FUNCTION TO DATA POINTS (MAX. 300), PLOTTING THE ACTUAL CURVE AND THE COMPUTED CURVE FOR COMPARISON OR PLOTTING THE DATA POINTS ONLY TO HELP IDENTIFY THE TYPE OF CURVE THEY REPRESENT. OS NO. 10112. AUTHOR-- JAMES S. WARDEN.

COMPUTER DEPARTMENT, CODE 083
NAVAL OCEANOGRAPHIC OFFICE
SUITLAND, MD. 20390

CALCULATING AND PLOTTING TIME-TREND CURVES

LANGUAGE - FORTRAN, FAP
COMPUTER - IBM 7090/94

COMPUTES AND PLOTS A SERIES OF SMOOTHED OR GRADUATED CURVES BASED ON A SEQUENCE OF GEOLOGIC OBSERVATIONS. NINE SMOOTHING FORMULAE ARE USED WHICH CORRESPOND TO CYCLES OF INCREASING MAGNITUDE WITHIN THE DATA, FOR EACH OF TEN VARIABLES WITH UP TO 500 OBSERVATIONS PER VARIABLE. LEAST SQUARES ANALYSIS IS USED TO FIT A SERIES OF 3RD ORDER POLYNOMIALS TO THE DATA. STORAGE REQUIREMENTS-- 24,757 LOCATIONS. RUNNING TIME-- ABOUT 2 MINUTES TO COMPUTE ALL NINE CURVES FOR 100 OBSERVATIONS

ON A SINGLE VARIABLE. AUTHOR-- WILLIAM T. FOX, WILLIAMS COLLEGE. (SPECIAL DISTRIBUTION PUBLICATION 12)

DR. DANIEL F. MERRIAM, EDITOR, COMPUTER CONTRIBUTIONS
KANSAS GEOLOGICAL SURVEY
COMPUTER APPLICATIONS LABORATORY
THE UNIVERSITY OF KANSAS
LAWRENCE, KANSAS 66045

TREND-SURFACE PROGRAM WITH UNRESTRICTED INPUT

LANGUAGE - FORTRAN II AND IV, AND BALGOL
COMPUTER - IBM 1620

DIFFERS FROM PREVIOUS TREND-SURFACE PROGRAM FOR THE IBM 1620 (SPECIAL DISTRIBUTION PUBLICATION 14, BY D.I. GOOD, 1964) IN ONE MAJOR ASPECT-- DATA ARE NOT STORED IN A DIMENSION ARRAY WITHIN THE COMPUTER, BUT ARE PROCESSED AND ACCUMULATED AS READ IN. THE PROGRAM, THEREFORE, IS THEORETICALLY CAPABLE OF INCORPORATING AN INFINITE NUMBER OF DATA POINTS. PRODUCES VALUES UP TO THE FOURTH-DEGREE EQUATIONS. STORAGE REQUIREMENTS-- APPROXIMATELY 18K BITS. RUNNING TIME-- TWO PASSES ARE NECESSARY, REQUIRING ABOUT 12 MINUTES PER 100 DATA POINTS ON EACH PASS. AUTHORS-- ROBERT J. SAMPSON AND JOHN C. DAVIS, IDAHO STATE UNIV. REF.-- SPECIAL DISTRIBUTION PUBLICATION 26 (1966).

DR. DANIEL F. MERRIAM, EDITOR, COMPUTER CONTRIBUTIONS
KANSAS GEOLOGICAL SURVEY
COMPUTER APPLICATIONS LABORATORY
THE UNIVERSITY OF KANSAS
LAWRENCE, KANSAS 66045

MULTIVARIATE NON-LINEAR REGRESSION

LANGUAGE - FORTRAN II AND IV
COMPUTER - IBM 709 AND CDC 6400

COMPUTES MULTIVARIATE NON-LINEAR REGRESSION (TREND SURFACE) THROUGH THE QUINTIC WITH ANALYSIS OF VARIANCE FOR SELECTION OF BEST FIT, FOR N=2500.

DEPARTMENT OF GEOLOGY
FLORIDA STATE UNIVERSITY
TALLAHASSEE, FLORIDA 32306

TREND SURFACES FOR DEGREES 1 THROUGH 6

LANGUAGE - FORTRAN IV
COMPUTER - IBM 7040

POLYNOMIAL SURFACES ARE FITTED UP TO THE SIXTH DEGREE. THE SURFACES MAY BE CONTOURED AND THE RESIDUALS PLOTTED. RANGE IS UP TO 500 DATA POINTS. APPROXIMATELY 40 MINUTES ARE REQUIRED FOR 200 DATA POINTS FOR 7-1/2 BY 9 TREND-SURFACE MAPS THROUGH SIXTH DEGREE. STORAGE REQUIREMENTS FOR THE 7040-- 16K AND 4 MAG. TAPES. AUTHORS-- MONT O'LEARY OF THE UNIV. OF KANSAS, R.H. LIPPERT OF SHELL OIL CO., OWEN T. SPITZ OF KANSAS GEOL. SURVEY. REVISED FROM D.I. GOOD'S PROGRAM FOR THE IBM1620 WHICH WAS PUBLISHED IN 1964 AS KANSAS GEOLOGICAL SURVEY SPECIAL DISTRIBUTION PUBLICATION 14.

DR. DANIEL F. MERRIAM, EDITOR, COMPUTER CONTRIBUTIONS
KANSAS GEOLOGICAL SURVEY
COMPUTER APPLICATIONS LABORATORY
THE UNIVERSITY OF KANSAS
LAWRENCE, KANSAS 66045

TREND MAP, WITH RESIDUALS AND CONTOURS

LANGUAGE - MAD
COMPUTER - IBM 7090

(COPY ON FILE AT NODC)

USES THE LEAST SQUARES TECHNIQUE TO FIT AN EQUATION TO GEOGRAPHICALLY DISPERSED DATA. OUTPUT INCLUDES PRINTED MAPS. AUTHOR-- W.R. TOBLER.

THE UNIVERSITY OF MICHIGAN
DEPARTMENT OF GEOGRAPHY
ATTN. DR. W. R. TOBLER
ANN ARBOR, MICHIGAN 48104

--* MATHEMATICAL AND STATISTICAL ANALYSIS *-*-*

SBWR0 (SHIPBORNE WAVE RECORDER ANALYSIS)
LANGUAGE - FORTRAN IV
COMPUTER - IBM 1800 SYS

(COPY ON FILE AT NODC)
GIVEN VALUES OF THE HIGHEST AND SECOND HIGHEST CRESTS, THE LOWEST AND SECOND LOWEST TROUGHS, THE NUMBER OF ZERO CROSSINGS AND THE NUMBER OF CRESTS IN A SHORT RECORD FROM THE N.I.O. SHIPBORNE WAVE RECORDER, COMPUTES THE SPECTRAL WIDTH PARAMETER AND THE SIGNIFICANT WAVE HEIGHT AND ALSO THE PREDICTED MAXIMUM HEIGHT IN A PERIOD OF THREE HOURS, AND STORES THE RESULTS ON LINEPRINTER AND DISK. N.I.O. PROGRAM NO. 89. AUTHOR-- EILEEN PAGE.

NATIONAL INSTITUTE OF OCEANOGRAPHY
WORMLEY, GODALMING, SURREY
ENGLAND

HILOW (GENERATE ARBITRARY FILTER)
LANGUAGE - FORTRAN IV
COMPUTER - IBM 1800 SYS

(COPY ON FILE AT NODC)
GENERATES A LOWPASS, BANDPASS, OR HIGHPASS FILTER DEFINED BY 3 PARAMETERS, WITH OR WITHOUT ITS CONJUGATE, PUNCHES THE MULTIPLIERS ON CARDS, AND LISTS ITS AMPLITUDE RESPONSE OVER THE FULL FREQUENCY RANGE. N.I.O. PROGRAM NO. 158. AUTHOR-- D.E. CARTWRIGHT.

NATIONAL INSTITUTE OF OCEANOGRAPHY
WORMLEY, GODALMING, SURREY
ENGLAND

SUBROUTINES DETRND, AUTCOV, CRSCOV, FOURTR
LANGUAGE - FORTRAN IV
COMPUTER - IBM 360/40

(COPY ON FILE AT NODC)
A SET OF PROGRAMS DEALING WITH SPECTRA. DETRND REMOVES THE MEAN, OR THE MEAN AND LINEAR TREND (SLOPE) FROM A TIME SERIES. AUTCOV COMPUTES THE AUTOCOVARIANCE OF THE TIME SERIES. CRSCOV COMPUTES THE AUTO- AND CROSS-COVARIANCES OF TWO SEQUENCES. FOURTR COMPUTES EITHER THE SINE OR COSINE FOURIER TRANSFORM. SMOOTHING OF EITHER IS OPTIONAL. LISTED AND DESCRIBED IN THE PUBLICATION 'WATER WAVE TEACHING AIDS', WHICH APPEARS AS TECHNICAL NOTE 13 OF THE M.I.T. HYDRODYNAMICS LABORATORY. THESE ROUTINES ARE ADAPTED FROM A PROGRAM WRITTEN AT BELL TELEPHONE LABS BY M.J.R. HEALY (1962).

PROF. RALPH H. CROSS
ROOM 48-209 HYDRODYNAMICS LABORATORY
MASSACHUSETTS INSTITUTE OF TECHNOLOGY
CAMBRIDGE, MASSACHUSETTS 02139

DIGITAL POWER SPECTRUM ANALYSIS
LANGUAGE - FORTRAN IV
COMPUTER - IBM 7090

THE PROGRAM WAS ORIGINALLY INTENDED TO ANALYZE UNDERWATER SOUND. THE HYDROPHONE OUTPUT IN ANALOG FORM IS FIRST DIGITIZED. THE PROGRAM THEN COMPUTES THE POWER SPECTRUM ESTIMATE UTILIZING THE FAST FOURIER TRANSFORM. THE POWER IS COMPUTED FOR A LINEAR SET OF FREQUENCIES. THIS

INFORMATION IS WRITTEN ON AN OUTPUT TAPE.

DR. J. W. WRENCH, JR.
HEAD, MATHEMATICAL COMP. DIVISION
NAVAL SHIP RESEARCH AND DEVELOPMENT CENTER
WASHINGTON, D.C. 20007

STATISTICAL AND PEAK-TO-PEAK ANALYSIS

LANGUAGE - FORTRAN IV AND MAP
COMPUTER - IBM 7090

USED IN THE ANALYSIS OF SHIP TRIAL DATA TO STUDY THE ELASTIC RESPONSES OF SURFACE SHIP STRUCTURES TO RANDOM SEA ENVIRONMENT. CALCULATES STATISTICAL AND PEAK TO PEAK PARAMETERS ASSOCIATED WITH DIGITIZED RANDOM DATA. PROCESSES UP TO 14 CHANNELS OF DATA CONCURRENTLY, AND ALLOWS SELECTION OF EITHER CALIBRATED OR UNCALIBRATED RESULTS. REF. NSRDC APPLIED MATHEMATICS LABORATORY TECHNICAL NOTE AML-35-69, MAY 1969, 'JB1M PROGRAM FOR STATISTICAL AND PEAK-TO-PEAK ANALYSIS', BY MICHAEL CHERNIK.

DR. J. W. WRENCH, JR.
HEAD, MATHEMATICAL COMP. DIVISION
NAVAL SHIP RESEARCH AND DEVELOPMENT CENTER
WASHINGTON, D.C. 20007

PARTIAL AND ORDINARY COHERENCE

LANGUAGE - FORTRAN IV AND MAP
COMPUTER - IBM 7090

PROGRAM PRTCOH CALCULATES THE PARTIAL COHERENCE FOR RANDOM DATA FROM A LINEAR SYSTEM, AND OCOH CALCULATES THE ORDINARY COHERENCE FROM THE SAME DATA. THE DATA IS ASSUMED TO BE STATIONARY RANDOM DATA FROM A MULTIPLE-INPUT SYSTEM WITH A SINGLE OUTPUT. BOTH PROGRAMS COMPUTE THE TRANSFER RESPONSE FUNCTION FOR EACH INPUT. REF. APPLIED MATHEMATICS LABORATORY TECHNICAL NOTE AML-31-69, MAY 1969, 'COMPUTER PROGRAMS FOR PARTIAL AND ORDINARY COHERENCE' BY ANTHONY C. MELODIA.

DR. J. W. WRENCH, JR.
HEAD, MATHEMATICAL COMP. DIVISION
NAVAL SHIP RESEARCH AND DEVELOPMENT CENTER
WASHINGTON, D.C. 20007

SAVED (SHOCK AND VIBRATIONAL EXPERIMENTAL DATA REDUCTION)

LANGUAGE - FORTRAN IV AND MAP
COMPUTER - IBM 7090

REDUCES BLAST TEST DATA FROM ANY ONE OF FOUR TYPES OF TRANSDUCERS--VELOCITY METERS, ACCELEROMETERS, PRESSURE GAUGES AND STRAIN GAUGES. THROUGH PROGRAMMED OPTIONS THE INPUT DATA, AFTER BEING CALIBRATED, MAY BE SMOOTHED, FILTERED OR LISTED BEFORE BEING PLOTTED AS A FUNCTION OF TIME. FOR VELOCITY DATA, TRANSDUCER CORRECTIONS WERE APPLIED AND DISPLACEMENT IS COMPUTED AND PLOTTED. FOR ACCELERATION DATA, VELOCITY AND DISPLACEMENT ARE COMPUTED AND PLOTTED. INPUT DATA IS READ FROM A DIGITAL MAGNETIC TAPE IN A PREDEFINED FORMAT. DESCRIPTION IS IN NSRDC APPLIED MATHEMATICS LABORATORY TECHNICAL NOTE AML-14-69, MARCH 1969, ENTITLED 'A DIGITAL PROGRAM FOR REDUCING SHOCK AND VIBRATIONAL EXPERIMENTAL DATA' BY ANTHONY V. CINCOTTA.

DR. J. W. WRENCH, JR.
HEAD, MATHEMATICAL COMP. DIVISION
NAVAL SHIP RESEARCH AND DEVELOPMENT CENTER
WASHINGTON, D.C. 20007

BLACKY (TIME SERIES ANALYSIS)

LANGUAGE - FORTRAN IV
COMPUTER - IBM OS/360

(COPY ON FILE AT NODC)

N.P.G.S. LIBRARY PROGRAM. COMPUTES, FOR TWO SIMULTANEOUS TIME SERIES, CROSS SPECTRA, POWER SPECTRA, PHASE AND COHERENCE. SUBPROGRAMS OBTAIN THE FILTERED SERIES, REMOVE THE TREND, AND COMPUTE THE AUTO- AND CROSS CORRELATIONS. THESIS BY JOHN G. MCMILLAN (JUNE 1968) USES DIGITAL ANALYSIS BY PROGRAM BLACKY IN THE STUDY OF TEMPERATURE FLUCTUATIONS NEAR THE AIR-SEA INTERFACE, THE WAVE FIELD AT THE SAME POINT, AND THE DOWNSTREAM WIND VELOCITY.

NAVAL POSTGRADUATE SCHOOL
MONTEREY, CALIFORNIA 93940

SPECTRAL ANALYSIS OF TIME SERIES

LANGUAGE - FORTRAN IV AND ALGOL 60
COMPUTER - UNIVAC 1108 AND B5500

(COPY ON FILE AT NODC)
FINDS THE SPECTRA, COSPECTRA, QUADSPECTRA, COHERENCE, AND PHASE OF TWO TIME SERIES OR A SINGLE SPECTRUM OF ONE SERIES. USES THE FAST FOURIER TRANSFORM (ALGORITHM OF COOLEY AND TUKEY, 1965). REF. SPECIAL REPORT NO. 6, MARCH 1969, BY EVERETT J. FEE.

THE LIBRARIAN
CENTER FOR GREAT LAKES STUDIES
UNIVERSITY OF WISCONSIN-MILWAUKEE
MILWAUKEE, WISCONSIN 53201 USA

WAVEIN AND DIFRAK

LANGUAGE - FORTRAN
COMPUTER - IBM 7094 AND CDC 6400

A PAIR OF PROGRAMS FOR (1)SPECTRAL ANALYSIS OF WAVE DATA, AND (2)COMPUTATION AND PLOT OF THE DIFFRACTION COEFFICIENTS. AUTHOR-- SHOU-SHAN FAN, C.E.R.C., WASH., D.C.

PROF. ROBERT L. WIEGEL
DEPARTMENT OF CIVIL ENGINEERING
UNIVERSITY OF CALIFORNIA
BERKELEY, CALIF. 94720

POWER SPECTRUM ANALYSIS

LANGUAGE - FORTRAN AND BINARY
COMPUTER - IBM 7090 AND IBM 704

USED IN THE ANALYSIS OF OCEAN WAVE RECORDS, WHICH GIVE THE FLUCTUATION OF THE HYDROSTATIC PRESSURE AT A POINT UNDER THE SEA AS A FUNCTION OF TIME. DIVIDED INTO TWO PROGRAMS-- AML PROBLEM 840-017C COMPUTES ONLY THE AUTOCORRELATION AND SPECTRAL ESTIMATES FOR EACH SINGLE TIME SERIES, AML PROBLEM 840-157B COMPUTES, IN ADDITION, THE TWO CROSS-CORRELATIONS, NAMELY, THE IN-PHASE SPECTRUM (CO-SPECTRUM) AND THE OUT-OF-PHASE SPECTRUM (QUA-SPECTRUM) FOR THE SIMULTANEOUS TIME RECORDS, ALSO COMPUTES THE MEASURE OF COHERENCY OF THE SYSTEM. REF. AML REPORT 131 (1963), 'IBM 704 POWER-SPECTRUM ANALYSIS'.

MR. GENE H. GLEISSNER
HEAD, APPLIED MATHEMATICS LABORATORY
NAVAL SHIP RESEARCH AND DEVELOPMENT CENTER
WASHINGTON, D.C. 20007

PROJECT COD LIVER

LANGUAGE - FORTRAN II AND MAP
COMPUTER - IBM 7090

DIGITAL POWER SPECTRA ANALYSIS. BASIC WORK PERFORMED WITH HYDROPHONES USED FOR WAVE PHENOMENA STUDY. AN SC-4020 PLOTS DATA FOR DISCRETE AMPLITUDES VS. DISCRETE FREQUENCIES. ALSO USED IS AN ELECTRONIC ENGIN-

EERING COMPANY DATA FORMAT TRANSLATOR (ANALOG-DIGITAL). (PROGRAM DOCUMENTED BUT CONTROLLED FOR DISTRIBUTION BECAUSE OF CLASSIFIED APPLICATIONS OF THE SPECIALLY DEVELOPED MATHEMATICAL TECHNIQUES USED)

MR. GENE H. GLEISSNER
HEAD, APPLIED MATHEMATICS LABORATORY
NAVAL SHIP RESEARCH AND DEVELOPMENT CENTER
WASHINGTON, D.C. 20007

POWER SPECTRUM ANALYSIS

LANGUAGE - BASIC
COMPUTER - PB-250

(COPY ON FILE AT NODC)
COMPUTES POWER SPECTRA, CROSS-SPECTRA, AND COHERENCIES. THE METHOD OF TUKEY IS USED TO CALCULATE THE REQUIRED SINGLE AND CROSS SPECTRA. THE MAXIMUM NUMBER OF LAGS ALLOWED IS 240 FOR SINGLE SPECTRUM AND 128 FOR CROSS-SPECTRA. MEMORY SIZE-- 6960. AUTHOR-- S.R. CLARK. REF. TECHNICAL MEMORANDUM 64-5 (JULY 1964). ALSO INCLUDED IN THE TECH. MEMO. ARE PRETREATMENT AND CALIBRATION PROGRAMS. REF. ALSO PNL LAB. NOTE 61-11 'POWER SPECTRUM ANALYSIS WITH THE LGP-30'.

PACIFIC NAVAL LABORATORY
H.M.C. DOCKYARD
ESQUIMALT, B. C., CANADA

POWER SPECTRA ESTIMATION

LANGUAGE - FORTRAN
COMPUTER - CDC 3200

COMPUTES SPECTRUM AND AUTO-CORRELATION OF ONE TIME SERIES AND/OR THE SPECTRA, CO-SPECTRUM, QUADRATURE SPECTRUM, AUTO-CORRELATION AND CROSS-CORRELATION OF TWO SIMULTANEOUS TIME SERIES. PERFORMS FOURIER TRANSFORM ON COVARIANCE FUNCTIONS (TUKEY SPECTRUM ESTIMATION) ALSO PERFORMS SMOOTHING ON SPECTRA BY METHOD CALLED 'HANNING'. NO OFFICIAL DOCUMENTATION HAS BEEN PUBLISHED.

NAVAL UNDERWATER WEAPONS RESEARCH
AND ENGINEERING STATION
ATTN. CODE DA3B
NEWPORT, RHODE ISLAND 02840

HARMONIC ANALYSIS

LANGUAGE - MAC
COMPUTER - ICT 1301

HARMONIC ANALYSIS USING SHUSTER'S CRITERION FOR THE DETERMINATION OF SIGNIFICANT AMPLITUDES. AUTHORS-- A.M. SHIPLEY AND D. SACKS.

UNIVERSITY OF CAPE TOWN
OCEANOGRAPHY DEPARTMENT
ATTN. MR. A.M. SHIPLEY
PRIVATE BAG, RONDEBOSCH, C.P.
REPUBLIC OF SOUTH AFRICA

NUSPEC

LANGUAGE - FORTRAN IV-H
COMPUTER - SDS SIGMA 7

A SET OF FOUR PROGRAMS WHICH COMPUTES THE AUTO- AND CROSS-SPECTRAL ESTIMATES FOR TIME SERIES, FOR 1 TO 2048 FREQUENCIES.

INFORMATION PROCESSING CENTER
ATTN. ROBERT MILLARD
WOODS HOLE OCEANOGRAPHIC INSTITUTION
WOODS HOLE, MASSACHUSETTS 02543

BETA-MODEL WITH WHITE FORCING AND VARIABLE BETA

LANGUAGE - FORTRAN IV-H
COMPUTER - SDS SIGMA-7

(COPY ON FILE AT NODC)
PROGRAM USED TO ESTIMATE THE SPECTRUM OF CURRENT RECORDS THAT ARE IRREGULARLY SAMPLED, AND WITH EXTENSIVE GAPS, BY A NEW FORM OF COMPLEX DEMODULATION, ALLOWING EXAMINATION OF PERIODS UP TO 100 DAYS. SPECIAL APPLICATION TO THE SEARCH FOR THE EXISTENCE OF EQUIVALENT-BAROTROPIC TOPOGRAPHIC (ROSSBY) WAVES ON THE WESTERN SIDE OF THE NORTH ATLANTIC. THE AUTOSPECTRA LEVEL OFF AT LOWEST FREQUENCIES, NO LONGER INCREASING AS A POWER LAW. STRONG COHERENCES WERE FOUND AT LOW FREQUENCIES BETWEEN THE U AND V COMPONENTS AND BETWEEN THE LEVELS. REF. A TECHNICAL REPORT NO. 69-67 (UNPUBLISHED MANUSCRIPT), AUG 1969, BY RORY THOMPSON.

DR. N. P. FOFONOFF, CHAIRMAN
DEPT. OF PHYSICAL OCEANOGRAPHY
WOODS HOLE OCEANOGRAPHIC INSTITUTION
WOODS HOLE, MASSACHUSETTS 02543

CIRCSTAT

LANGUAGE - FORTRAN IV
COMPUTER - CDC 3400

(COPY ON FILE AT NODC)
COMPUTES THE SIGNIFICANT STATISTICS FOR CIRCULAR NORMALLY DISTRIBUTED DATA, AS WELL AS GIVING CALCULATIONS FOR USE IN TESTING HYPOTHESES. A CONTROL CARD DETERMINES THE TEST PERFORMED. IN ALL CASES, THE VECTOR DIRECTION, VECTOR LENGTH, AND VECTOR STRENGTH ARE COMPUTED. TESTS OF PREFERRED ORIENTATION ARE CONDUCTED BY THE RAYLEIGH R-TEST OR BY THE GREENWOOD-DURAND U-TEST. BIMODAL DATA MAY BE TREATED BY PROGRAM CIRCSTAT. REF. TECHNICAL REPORT NO. 3, OFFICE OF NAVAL RESEARCH, FEB. 1967, BY THOMAS A. JONES.

DEPARTMENT OF GEOLOGY
NORTHWESTERN UNIVERSITY
EVANSTON, ILLINOIS 60201

BOMM (TIME SERIES)

LANGUAGE - FORTRAN, COMPASS
COMPUTER - IBM OS/360, CDC 3600

A COLLECTION OF PROGRAMS HAVING TIME SERIES AS OPERANDS PRIMARILY DESIGNED FOR ANALYSIS, CORRELATION AND DECOMPOSITION OF RECORDS. COPIES AVAILABLE THROUGH 'SHARE' AND 'COOP'. AUTHORS-- SIR EDWARD BULLARD, MRS. FLORANCE OGALBY DORMER, WALTER MUNK AND GAYLORD MILLER.

MRS. FLORENCE O. DORMER
INSTITUTE OF GEOPHYSICS AND PLANETARY PHYSICS
SCRIPPS INSTITUTION OF OCEANOGRAPHY
P.O. BOX 109
LA JOLLA, CALIFORNIA 92037

ANALYSIS OF NON-LINEAR RESPONSE SURFACE

LANGUAGE - FORTRAN IV
COMPUTER - IBM 1130

(COPY ON FILE AT NODC)
ANALYZES THE DATA FROM RESPONSE SURFACE EXPERIMENTS WHEN TWO OR THREE FACTORS ARE MEASURED. OPTIONS ALLOW CALCULATION OF MAXIMUM LIKELIHOOD ESTIMATES OF POWER TRANSFORMATIONS OF BOTH INDEPENDENT AND DEPENDENT VARIABLES, AND THE PLOTTING OF THEIR RELATIVE MAXIMUM LIKELIHOOD GRAPHS, AS A MEASURE OF THE PRECISION OF THE ESTIMATES. THE DATA IS THEN SUBJECTED TO ANALYSIS OF VARIANCE, USING ORTHOGONAL POLYNOMIALS, AND PRINCIPAL COMPONENT ANALYSIS, AND SPECIFIED CONTOURS OF THE DEPENDENT VARIABLE ARE PLOTTED, BOTH WITHOUT AND WITH TRANSFORMATION. REF. FRB TECHNICAL REPORT NO. 87 (PUBLISHED MANUSCRIPT, AUG 1968) BY J. K. LINDSEY. DIRECT INQUIRIES TO--

FISHERIES RESEARCH BOARD OF CANADA
BIOLOGICAL STATION
NANAIMO, B. C.

MULDA

LANGUAGE - FORTRAN IV
COMPUTER - IBM 1130

(COPY ON FILE AT NODC)
A COMPLETE MULTIPLE DISCRIMINANT ANALYSIS IS PERFORMED BY SIX INTERRELATED PROGRAMS WHICH ARE EXECUTED IN SUCCESSION THROUGH THE LINK FEATURE IN 1130 FORTRAN. WILL ACCEPT UP TO 25 VARIATES AND AS MANY AS 10 GROUPS. ANY NUMBER OF ADDITIONAL DATA CARDS CAN BE READ AND PROCESSED AFTER THE DISCRIMINANT ANALYSIS HAS BEEN COMPLETED. THE VALUE OF THE DISCRIMINANT FUNCTION, CLASSIFICATION CHI-SQUARES AND PROBABILITIES OF GROUP MEMBERSHIP ARE COMPUTED AND PRINTED FOR EACH ADDITIONAL M-VARIATE OBSERVATION. AUTHORS-- L.V. PIENAAR AND J.A. THOMSON, FRB TECHNICAL REPORT NO. 112, MAR 1969 (UNPUBLISHED MANUSCRIPT). DIRECT INQUIRIES TO--

FISHERIES RESEARCH BOARD OF CANADA
BIOLOGICAL STATION
NANAIMO, B.C.

SCALING SUBROUTINE

LANGUAGE - FORTRAN
COMPUTER - CDC 3800

SCALES AN ARRAY OF FLOATING POINT NUMBERS, CORRESPONDING TO A SINGLE COORDINATE, PREPARING THEM FOR INPUT TO THE 565 CALCOMP PLOTTER. NRL MEMO. REPORT 2047. AUTHORS-- J. LANGWORTHY, J. HOUSTON.

JAMES B. LANGWORTHY
THEORY BRANCH
NUCLEAR PHYSICS DIVISION
NAVAL RESEARCH LABORATORY, WASHINGTON, D. C. 20390

EVALUATE BESSEL FUNCTIONS

LANGUAGE - FORTRAN
COMPUTER - CDC 3800

A SET OF SUBROUTINES THAT EVALUATE, IN SINGLE AND DOUBLE PRECISION, BESSEL FUNCTIONS OF THE FIRST AND SECOND KINDS FOR ORDERS ZERO AND ONE FOR POSITIVE REAL ARGUMENTS. ALSO TO EVALUATE, IN SINGLE AND DOUBLE PRECISION, BESSEL FUNCTIONS OF THE FIRST AND SECOND KINDS FOR INTEGER OR FRACTIONAL ORDERS AND POSITIVE REAL ARGUMENTS. NRL MEMO. REPORTS 1975-1978. AUTHORS-- J. MASON, R. BAIER.

JANET P. MASON
RESEARCH COMPUTATION CENTER
MATHEMATICS AND INFORMATION SCIENCES DIVISION
NAVAL RESEARCH LABORATORY, WASHINGTON, D. C. 20390

DETERMINANT OF A REAL SYMMETRIC MATRIX

LANGUAGE - FORTRAN
COMPUTER - CDC 3800

A SUBROUTINE WRITTEN AT ARGONNE NATIONAL LABORATORY THAT SOLVES, INVERTS, AND FINDS THE DETERMINANT OF SYMMETRIC REAL MATRICES, HAS BEEN MODIFIED. IT REQUIRES THAT ONLY THE UPPER TRIANGULAR PORTION OF THE MATRIX BE INPUT, THEREBY REDUCING THE MATRIX STORAGE REQUIREMENT TO N(N+1)/2 LOCATIONS. NRL MEMO. REPORT 2009. AUTHOR-- J. MASON

JANET P. MASON
RESEARCH COMPUTATION CENTER
MATHEMATICS AND INFORMATION SCIENCES DIVISION
NAVAL RESEARCH LABORATORY, WASHINGTON, D. C. 20390

SUBROUTINE TO FIND THE REAL ZEROS OF A SINGLE-VALUED FUNCTION OF ONE REAL VARIABLE

LANGUAGE - FORTRAN
COMPUTER - CDC 3800

FINDS THE REAL ZEROS OF A SINGLE-VALUED FUNCTION OF ONE REAL VARIABLE BY A MODIFIED METHOD OF FALSE POSITION. FINDS WITHIN A SPECIFIED TOL-

ERANCE (DELTA) THOSE POINTS X(I) ALONG A GIVEN CLOSED INTERVAL FOR WHICH THE FUNCTIONAL VALUE FX(I) SATISFIES THE ABSOLUTE VALUE OF FX(I) LESS THAN DELTA. EACH POINT AND THE CORRESPONDING FUNCTIONAL VALUE ARE STORED IN A TABLE. NRL MEMO. REPORT 1974. AUTHORS-- J. MASON, H. TOOTHMAN.

JANET P. MASON
RESEARCH COMPUTATION CENTER
MATHEMATICS AND INFORMATION SCIENCES DIVISION
NAVAL RESEARCH LABORATORY, WASHINGTON, D. C. 20390

CROSS-ASSOCIATION OF NONNUMERIC SEQUENCES

LANGUAGE - ALGOL 60 AND FORTRAN IV
COMPUTER - ELLIOTT 803C IBM 7040/44

READS A PAIR OF SEQUENCES WHOSE ELEMENTS BELONG TO A NONORDERED SET. THE DATA ARE READ IN A NUMERIC CODE. THE PROGRAM SLIDES THE SEQUENCES PAST EACH OTHER ONE OR MORE STEPS AT A TIME AND FOR EACH MATCH POSITION COUNTS THE NUMBER OF COMPARISONS (SIZE OF OVERLAP). VARIOUS SIGNIFICANCE MEASURES AND OVERALL SIMILARITY ESTIMATES ARE MADE. AUTHORS-M.J. SACKIN AND P.H.A. SNEATH, UNIV. OF LEICESTER, D.F. MERRIAM, KANSAS GEOL. SURVEY. REF. SPECIAL DISTRIBUTION PUBLICATION 23 (1965).

DR. DANIEL F. MERRIAM, EDITOR, COMPUTER CONTRIBUTIONS
KANSAS GEOLOGICAL SURVEY
COMPUTER APPLICATIONS LABORATORY
THE UNIVERSITY OF KANSAS
LAWRENCE, KANSAS 66045

SIMULATION OF TRANSGRESSION AND REGRESSION WITH CONTINUOUS-TIME MARKOV MODELS

LANGUAGE - FORTRAN IV
COMPUTER - CDC 6400

REPORT (COMPUTER CONTRIBUTION 26) IS CONCERNED WITH A STOCHASTIC SIMULATION MODEL IN WHICH THE PATTERN OF LITHOLOGIC SUCCESSION IS EXAMINED IN TERMS OF THE LENGTH OF TIME THAT THE SYSTEM REMAINS IN A GIVEN STATE, ONCE IT HAS ENTERED THAT STATE. THE MODEL IS ALSO BASED ON TRANSGRESSIVE-REGRESSIVE MOTION OF A SHORELINE (OR STRANDLINE), WITH THE RESULTING LITHOLOGIC UNITS DEVELOPING AS RESPONSES TO THE MOVEMENT OF SEDIMENTARY MARINE OR NONMARINE ENVIRONMENTS LATERALLY AND THROUGH TIME. AUTHOR-- W.C. KRUMBEIN. TWO COMPUTER PROGRAMS ARE LISTED IN THE APPENDIX, ONE FOR TRANSFORMING A TRANSITION PROBABILITY MATRIX TO ITS CORRESPONDING TRANSITION RATE MATRIX AND VICE VERSA, AND THE OTHER ('BOREHOLE') FOR SIMULATING LATERAL-SHIFT PHENOMENA, SUCH AS TRANSGRESSION AND REGRESSION WITH A CONTINUOUS-TIME DISCRETE-STATE MARKOV MODEL.

DR. DANIEL F. MERRIAM, EDITOR
COMPUTER CONTRIBUTIONS
KANSAS GEOLOGICAL SURVEY
THE UNIVERSITY OF KANSAS
LAWRENCE, KANSAS 66044

POWER SPECTRUM OF GEOLOGICAL SURFACES

LANGUAGE - FORTRAN IV
COMPUTER - GE 625 AND IBM 7040

TWO-DIMENSIONAL POWER SPECTRUM IS USED FOR NUMERICAL DESCRIPTION OF OBSERVED SURFACES. DATA MUST BE GRIDDED - MAXIMUM IS 100 BY 100 POINTS. RUNNING TIME FOR MAXIMUM ARRAY IS ABOUT 20 MINUTES ON GE 625. COMPUTER CONTRIBUTION 16, BY J.E. ESLER AND F.W. PRESTON, 1967.

DR. DANIEL F. MERRIAM, EDITOR
COMPUTER CONTRIBUTIONS
KANSAS GEOLOGICAL SURVEY
THE UNIVERSITY OF KANSAS
LAWRENCE, KANSAS 66044

TREND ANALYSIS USING DOUBLE FOURIER SERIES

LANGUAGE - FORTRAN IV
COMPUTER - GE 625

HARMONIC ANALYSIS USEFUL FOR DATA SUSPECTED OF CONTAINING OSCILLATORY PHENOMENA. DESIGNED FOR DATA OBTAINABLE ON A REGULARLY SPACED, RECTANGULAR GRID. THE PROGRAM COMPUTES COEFFICIENTS OF FOURIER SERIES AND EVALUATES AND PLOTS THE FUNCTION. ALSO COMPUTES AND PLOTS RESIDUAL VALUES. ALLOWS UP TO 71 X 73 GRID POINTS AND UP TO 25TH HARMONIC IN BOTH DIRECTIONS. COMPUTER CONTRIBUTION 29, BY JOHN W. HARBAUGH AND MICHAEL J. SACKIN (JUNE 1968). AN EARLIER PROGRAM WAS DEVELOPED FOR DOUBLE FOURIER SERIES ANALYSIS OF SURFACES WITH IRREGULARLY SPACED DATA. REF. COMPUTER CONTRIBUTION 5, BY W.R. JAMES (1966).

DR. DANIEL F. MERRIAM, EDITOR
COMPUTER CONTRIBUTIONS
KANSAS GEOLOGICAL SURVEY
THE UNIVERSITY OF KANSAS
LAWRENCE, KANSAS 66044

FOURIER ANALYSIS - PROGRAM L101

LANGUAGE - FORTRAN
COMPUTER - IBM 7090

(COPY ON FILE AT NODC)
OBTAINS AMPLITUDES AND PHASES OF FREQUENCY COMPONENTS IN ANY RECORD. STANDARD FOURIER ANALYSIS PLUS USE OF TUKEY COSINE WINDOW TO REDUCE EDGE EFFECTS. CORE STORAGE USED-- 32K. AUTHOR-- ALSOP.

LAMONT-DOHERTY GEOLOGICAL OBSERVATORY
COLUMBIA UNIVERSITY
PALISADES, NEW YORK 10964

CLUSTER ANALYSIS

LANGUAGE - FORTRAN
COMPUTER - IBM 1800 SYS

(COPY ON FILE AT NODC)
CARRIES OUT A SINGLE LINKAGE CLUSTER ANALYSIS USING DATA IN THE FORM OF AN UPPER TRIANGULAR SIMILARITY MATRIX. OUTPUT-- A) SIMILARITY LEVEL OF CLUSTERING CYCLE, B) A LIST OF THE LINKAGES THAT OCCUR AT THAT SIMILARITY LEVEL, C) AT THE END OF THE CYCLE THE CLUSTER NUMBERS AND A LIST OF THE ENTITIES MAKING UP EACH CLUSTER IS PRINTED. RUN TIME-- A MATRIX OF ORDER 60 TOOK APPROXIMATELY 15 MINUTES TO CLUSTER. N.I.O. PROGRAM NO. 166. AUTHOR-- M. FASHAM.

NATIONAL INSTITUTE OF OCEANOGRAPHY
WORMLEY, GODALMING, SURREY
ENGLAND

Q-MODE CLUSTER ANALYSIS

LANGUAGE - FORTRAN IV
COMPUTER - IBM 7090/94,
IBM 360/67

CLASSIFIES OBJECTS INTO GROUPS ON THE BASIS OF A LARGE NUMBER OF NON-QUANTITATIVE CHARACTERS. HAS BEEN USED FOR GEOLOGICAL SAMPLES, BIOLOGICAL TAXONOMY, ETC. RANGE LIMITED TO 130 OBJECTS AND 100 ATTRIBUTES. OUTPUT MAY BE USED TO DRAW DENDROGRAMS WITH A CALCOMP PLOTTER. REF. COMPUTER CONTRIBUTION 17. AUTHOR-- G.F. BONHAM-CARTER, STANFORD UNIVERSITY.

DR. DANIEL F. MERRIAM, EDITOR
COMPUTER CONTRIBUTIONS
KANSAS GEOLOGICAL SURVEY
THE UNIVERSITY OF KANSAS
LAWRENCE, KANSAS 66044

MULTIVARIATE DISCRIMINANT ANALYSIS

LANGUAGE - FORTRAN II
COMPUTER - IBM 1620

COMPUTES THE MULTIVARIATE DISCRIMINANT FUNCTION AND MAHALANOBIS' GENERALIZED DISTANCE FOR TWO GROUPS, ANALYZES THE SIGNIFICANCE OF THE DIFFERENCE BETWEEN THE GROUPS, AND CLASSIFIES INDIVIDUAL SAMPLES. 20 VARIABLES MAY BE CONSIDERED SIMULTANEOUSLY. THE TWO SAMPLE GROUPS MAY CONTAIN ANY NUMBER OF SAMPLES. MATRIX INVERSION IS AVOIDED BY USING A MODIFICATION OF A PROCEDURE SUGGESTED BY RAO IN WHICH SAMPLES ARE OPERATED UPON ONE AT A TIME. USES POOLED ESTIMATES OF VARIANCE AND COVARIANCE IN A SERIES OF SIMULTANEOUS EQUATIONS, WHICH ARE SOLVED BY THE GAUSS-JORDAN METHOD OF APPROXIMATIONS. CORE STORAGE USED-- 20 K. AUTHORS-- J.C. DAVIS AND R.J. SAMPSON, COMPUTER CONTRIBUTION NO. 4.

DR. DANIEL F. MERRIAM, EDITOR, COMPUTER CONTRIBUTIONS
KANSAS GEOLOGICAL SURVEY
THE UNIVERSITY OF KANSAS
LAWRENCE, KANSAS 66044

TWO-DIMENSIONAL AUTOCORRELATION

LANGUAGE - FORTRAN
COMPUTER - IBM 7090 AND IBM 1401

(COPY ON FILE AT NODC)
APPLIES REGRESSION AND CORRELATION ANALYSES TO A SAMPLE OF OCEAN TERRAIN. COMPUTES VARIANCE AND COVARIANCE AS FUNCTION OF POSITION IN DATA FIELD. REF. ARTHUR D. LITTLE, INC. TECHNICAL REPORT NO. 1440464 -- 'STATISTICAL ANALYSES OF OCEAN TERRAIN AND CONTOUR PLOTTING PROCEDURES'. APPENDICES B AND C OF REPORT DESCRIBE (BUT DO NOT LIST) TWO ROUTINES USED - 'CORRELATION CONSTANTS' (IBM 7090 FORTRAN) AND 'LOCAL MEANS AND VARIANCES' (IBM 1401 FORTRAN). THE A.D. NO. IS AD-601-538. COPIES HAVE BEEN DEPOSITED WITH THE DEFENSE DOCUMENTATION CENTER.

MISS MARIAN L. HOBBS, LIBRARIAN
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ARTHUR D. LITTLE, INC.
35 ACORN PARK
CAMBRIDGE, MASS. 02140

STATISTICS I, II, III

LANGUAGE - FORTRAN IV
COMPUTER - CDC 3100

(COPY ON FILE AT NODC)
THREE SEPARATE PROGRAMS FOR THE PROCESSING OF LIMNOLOGICAL DATA. THEY CALCULATE MEANS, STANDARD DEVIATIONS, STANDARD ERRORS AND OTHER STATISTICS OF VARIOUS LIMNOLOGICAL PARAMETERS. STATISTICS I GIVES WEIGHTED CRUISE-MEAN VALUES, CRUISE-MEAN EPILIMNION AND HYPOLIMNION VALUES, TABULATIONS OF THE RELATION BETWEEN TEMPERATURE AND OTHER PARAMETERS, AND NEAR-BOTTOM MEANS. STATISTICS II IS ESPECIALLY DESIGNED TO STUDY REGIONAL ANOMALIES IN THE DISTRIBUTION OF ANY PARAMETER. STATISTICS III IS A MORE SPECIALIZED PROGRAM ANALYSING THE VARIABILITY IN A SET OF DATA IN TERMS OF RANDOM AND SYSTEMATIC COMPONENTS. INPUT-- DATA ON TAPE IN CODC FORMAT. PROGRAMS DESCRIBED IN MANUSCRIPT REPORT NO. 13 (1970), BY DR. H. E. SWEERS.

MARINE SCIENCES BRANCH
DEPARTMENT OF ENERGY, MINES AND RESOURCES
615 BOOTH STREET
OTTAWA, ONTARIO, CANADA

CURRENT

LANGUAGE - FORTRAN IV
COMPUTER - OS/360

PROVIDES ELEMENTARY STATISTICS FOR THREE TIME SERIES OF CURRENT TEMPERATURE, SPEED, AND DIRECTION. MEANS ARE COMPUTED HOURLY, DAILY AND FOR THE ENTIRE SERIES. A HISTOGRAM IS PROVIDED DAILY AND FOR THE SERIES. VARIANCE AND STANDARD DEVIATION ARE COMPUTED FOR THE SERIES. OPTIONAL GRAPHICAL OUTPUTS HISTOGRAMS ARE PROVIDED. APPLICATIONS ARE MADE TO CONTINUOUS BOTTOM CURRENT MEASUREMENTS IN A SUBMARINE CANYON AND CONCURRENT WIND, WAVE, AND TIDAL DATA, IN THESES BY J.J. DOOLEY, JUN 1968, AND BY I.J. NJUS, DEC 1968.

NAVAL POSTGRADUATE SCHOOL
MONTEREY, CALIFORNIA 93940

SINGLE INTEGRATION

LANGUAGE - FORTRAN
COMPUTER - IBM 7074

EQUALLY SPACED TIME SERIES DATA IS INTEGRATED ONCE USING TICK'S METHOD. THE DATA MUST BE SAMPLED AT A RATE OF AT LEAST TWICE THE NYQUIST FREQUENCY. OS NO. 53477. AUTHOR-- D.B. ROSS. REF. IM NO. 66-36.

EXPLORATORY OCEANOGRAPHY DIV., CODE 7200
NAVAL OCEANOGRAPHIC OFFICE
SUITLAND, MD. 20390

STATS

LANGUAGE - FORTRAN IV-H
COMPUTER - SDS SIGMA 7

COMPUTES AND LISTS STATISTICAL QUANTITIES RELATED TO VARIABLES STORED ON TAPE IN WHOI STANDARD DATA FORMAT.

INFORMATION PROCESSING CENTER
ATTN. JOHN A. MALTAIS
WOODS HOLE OCEANOGRAPHIC INSTITUTION
WOODS HOLE, MASSACHUSETTS 02543

SATELLITE NAVIGATION

LANGUAGE - FORTRAN AND ASSEMBLER
COMPUTER - IBM 1800 SYS

(COPY ON FILE AT NODC)
A SET OF PROGRAMS FOR VARIOUS ASPECTS OF SATELLITE NAVIGATION. THE PROGRAMS FALL NATURALLY INTO TWO SECTIONS, THOSE INVOLVED IN THE ON-LINE REDUCTION OF DATA FROM THE SATELLITE AND THOSE INVOLVED IN THE ANALYSIS BOTH ON-LINE AND OFF-LINE. REF. N.I.O. REPORT N.20, AUG 28 1969.

NATIONAL INSTITUTE OF OCEANOGRAPHY
ATTN. MR. JAMES CREASE
WORMLEY, GODALMING, SURREY
ENGLAND

ALERT

LANGUAGE - FORTRAN IV
COMPUTER - IBM 1130

(COPY ON FILE AT NODC)
CALCULATES THE RISE AND SET TIMES AND TIME OF CLOSEST APPROACH OF SATELLITES. OUTPUT FROM PROGRAM IS A LISTING OF ALERT INFORMATION, AND PUNCH CARDS FOR NEXT PROGRAM 'ASORT'. CORE STORAGE USED-- 5836 WORDS.

DR. C. A. COLLINS
MARINE SCIENCES BRANCH, DEMR
PACIFIC OCEANOGRAPHIC GROUP
BIOLOGICAL STATION
NANAIMO, B.C., CANADA

ASORT

LANGUAGE - FORTRAN IV
COMPUTER - IBM 1130

(COPY ON FILE AT NODC)
SORTS THE OUTPUT OF RISE TIMES OF SATELLITES FROM THE PROGRAM 'ALERT' IN CHRONOLOGICAL ORDER. A LISTING IS PRINTED ON THE IBM 1132. CORE STORAGE REQUIREMENTS-- 12,040 WORDS. DESCRIPTIONS OF BOTH PROGRAMS ARE IN FRB MANUSCRIPT REPORT NO. 1071 (DEC 1969), BY C.A. COLLINS, R. L.K. TRIPE, AND S.K. WONG (UNPUBLISHED MANUSCRIPT).

DR. C. A. COLLINS
MARINE SCIENCES BRANCH, DEMR
PACIFIC OCEANOGRAPHIC GROUP
BIOLOGICAL STATION
NANAIMO, B.C., CANADA

BECNAV (BEACON NAVIGATION PROGRAM)

LANGUAGE - FORTRAN
COMPUTER - CDC 3200

(COPY ON FILE AT NODC)
COMPUTES THE SHIPS POSITION AT EACH FIX FROM TWO OR MORE BEACONS WHOSE POSITION HAS BEEN ACCURATELY DETERMINED. A FIX CONSISTS OF THE DELAY TIMES FROM TWO OR MORE BEACONS. CORE STORAGE NEEDED-- ABOUT 8K WORDS. AUTHOR-- S. KOCHANSKI, NSSNF. (PROGRAM DOCUMENTATION UNCLASSIFIED BUT DISTRIBUTION CONTROLLED BY NSSNF)

COMMANDING OFFICER
NAVAL STRATEGIC SYSTEMS NAVIGATION FACILITY
FLUSHING AND WASHINGTON AVENUES
BROOKLYN, NEW YORK 11251

SPANS1A

LANGUAGE - FORTRAN
COMPUTER - CDC 3200

(COPY ON FILE AT NODC)
COMPUTES THE RELATIVE POSITION OF A TRIAD OF BEACONS USING THE DELAY

TIMES FROM THREE BEACONS. LIMIT, 40 FIXES PER TRACK. CORE STORAGE NEEDED-- ABOUT 14K WORDS. AUTHOR-- S. KOCHANSKI, NSSNF. (PROGRAM DOCUMENTATION UNCLASSIFIED BUT DISTRIBUTION CONTROLLED BY NSSNF)

COMMANDING OFFICER
NAVAL STRATEGIC SYSTEMS NAVIGATION FACILITY
FLUSHING AND WASHINGTON AVENUES
BROOKLYN, NEW YORK 11251

SPANS1B

LANGUAGE - FORTRAN
COMPUTER - CDC 3200

(COPY ON FILE AT NODC)
TRANSLATES AND ROTATES A SET OF BEACON COORDINATES FROM LOCAL COORDINATES TO GEODETIC COORDINATES. INPUT TO PROGRAM-- SHIPS POSITIONS FROM EXTERNAL FIXES AND CORRESPONDING POSITIONS FROM 'BECNAV' PROGRAM, AND BEACON POSITIONS IN LOCAL COORDINATES FROM 'SPANS1A'. AUTHOR-- S. KOCHANSKI, NSSNF. (PROGRAM DOCUMENTATION UNCLASSIFIED BUT DISTRIBUTION CONTROLLED BY NSSNF)

COMMANDING OFFICER
NAVAL STRATEGIC SYSTEMS NAVIGATION FACILITY
FLUSHING AND WASHINGTON AVENUES
BROOKLYN, NEW YORK 11251

GREAT CIRCLE DISTANCE BETWEEN TWO POINTS

LANGUAGE - FORTRAN
COMPUTER - CDC 3800

DETERMINES THE DISTANCE IN NAUTICAL MILES ALONG THE GREAT CIRCLE PATH BETWEEN TWO POINTS ON THE EARTH, AND THE INITIAL AND FINAL BEARINGS OF THAT PATH. THE EARTH IS ASSUMED SPHERICAL WITH ONE NAUTICAL MILE PER MINUTE OF ARC. DOCUMENTATION AVAILABLE-- NRL COMPUTER NOTE 32.

DAVID CHANG, CODE 8170
ACOUSTICS DIVISION
NAVAL RESEARCH LABORATORY, WASHINGTON, D. C. 20390

GREAT CIRCLE PATHS FROM A POINT

LANGUAGE - FORTRAN
COMPUTER - CDC 3800

FROM A GREAT CIRCLE PATH SPECIFIED BY AN INITIAL POINT AND BEARING, THE PROGRAM GIVES THE LOCATIONS AND BEARINGS OF POINTS AT A GIVEN ARRAY OF DISTANCES IN NAUTICAL MILES ALONG THAT PATH. DOCUMENTATION -- NRL COMPUTER NOTE 33.

DAVID CHANG, CODE 8170
ACOUSTICS DIVISION
NAVAL RESEARCH LABORATORY, WASHINGTON, D. C. 20390

ASTRONOMIC POSITION, AZIMUTH METHOD

LANGUAGE - FORTRAN IV-H
COMPUTER - IBM 360/65

(COPY ON FILE AT NODC)
CALCULATES THE LATITUDE AND LONGITUDE OF AN ASTRONOMIC OBSERVATION STATION, GIVEN MEASURED HORIZONTAL ANGLES BETWEEN STARS AND FIXED MARK ALONG WITH THE OBSERVATION TIMES. A SET OF OBSERVATION EQUATIONS IS SOLVED BY THE METHOD OF LEAST SQUARES TO OBTAIN CORRECTIONS TO ASSUMED VALUES OF LATITUDE, LONGITUDE, AND THE AZIMUTH OF THE REFERENCE MARK AS WELL AS PROBABLE ERRORS FOR THESE THREE QUANTITIES. THE ADJUSTMENT IS ITERATED FIVE TIMES OR UNTIL THE CORRECTIONS BECOME LESS THAN 0.005 SECONDS, EITHER OF WHICH CAUSES A PROGRAM HALT. OUTPUT-- A TABLE OF INPUT INFORMATION AND A RECORD OF THE PROCESS OF REFINEMENT FOR EACH SET OF STATION DATA READ IN. STORAGE NEEDED-- APPROX. 37,500 BYTES FOR THE PROGRAM PLUS ITS SUBROUTINES. AUTHOR-- SPENCER ROEDDER. A PREVIOUS VERSION OF THIS PROGRAM WAS WRITTEN IN ALGOL FOR THE BURROUGHS 220, IN SINGLE PRECISION.

U.S. GEOLOGICAL SURVEY

COMPUTER CENTER DIVISION
ATTN. RALPH EICHER, CHIEF
BRANCH OF SCIENTIFIC APPLICATIONS
WASHINGTON, D. C. 20242

ASTRONOMIC LATITUDE

LANGUAGE - FORTRAN
COMPUTER - (NOT GIVEN)

(COPY ON FILE AT NODC)
DETERMINATION OF FIRST ORDER ASTRONOMIC LATITUDE BY THE STERNECK METHOD. ALSO A PROGRAM USING THE METHOD OF 'POLARIS AND SOUTH STAR'. ALSO SUBROUTINES FOR THE BALDINI, THE GARFINKEL, AND THE U.S. COAST AND GEODETIC SURVEY REFRACTION MODELS. REF. A REPORT 'INVESTIGATIONS IN DETERMINING ASTRONOMIC LATITUDES AND THEIR COMPUTER PROGRAMS' IR NO. 68-21 (189 P., APR 1968). AUTHOR-- LARRY BOURQUIN, CODE 8430, GEODESY. FURTHER INFORMATION MAY BE OBTAINED THROUGH DISSEMINATION DEPARTMENT - CODE 44, OR THE AUTHOR.

NAVAL OCEANOGRAPHIC OFFICE
SUITLAND, MD. 20390

DEAD RECKONING NAVIGATION SYSTEM

LANGUAGE - FORTRAN
COMPUTER - IBM 1130

THIS SYSTEM IS USED AS A NAVIGATION AID TO COMPUTE AND PLOT THE CRUISE TRACK OF THE SHIP AND TO INDICATE THE LOCATIONS AT WHICH DATA WERE COLLECTED EN ROUTE. INPUT TO PROGRAM-- SHIP'S SPEED AND HEADING, WIND SPEED AND DIRECTION FROM PAPER TAPE (HEWLETT-PACKARD DATA ACQUISITION SYSTEM), AND FIXES ON CARDS. OUTPUT-- PLOT OF CRUISE TRACK. DOCUMENTATION-- OPERATING INSTRUCTIONS ONLY.

UNIVERSITY OF WASHINGTON
DEPARTMENT OF OCEANOGRAPHY
22A OCEANOGRAPHY TEACHING BLDG.
ATTN. MRS. HELLA MACINTOSH
SEATTLE, WASH. 98105

REDUCTION AND DISPLAY OF DATA ACQUIRED AT SEA

LANGUAGE - FORTRAN II
COMPUTER - IBM 1130

(COPY ON FILE AT NODC)
A SYSTEM OF PROGRAMS (NAVIGATION, GRAVITY, TOPOGRAPHY, MAGNETICS) FOR THE REDUCTION, STORAGE AND DISPLAY OF UNDERWAY DATA ACQUIRED AT SEA. THE COMPUTER INSTALLATION CONSISTS OF AN IBM 1130 AND INCLUDES RANDOM ACCESS DISK CARTRIDGES AND AN ON-LINE CALCOMP 30 IN. PLOTTER. A LARGE NUMBER OF THE PROGRAMS UTILIZE NAVIGATION POINTS TOGETHER WITH RAW DIGITIZED GEOPHYSICAL DATA PRESENTED AS A TIME SERIES, WHERE THE DIFFERENT DATA MAY BE READ AT UNEQUAL TIME INTERVALS. REF. TECH. REPORT NO. 1 (AUGUST 1969, 348 P.) BY MANIK TALWANI.

LAMONT-DOHERTY GEOLOGICAL OBSERVATORY
COLUMBIA UNIVERSITY
PALISADES, NEW YORK 10964

SODANO INVERSE

LANGUAGE - FORTRAN
COMPUTER - CDC 3100

(COPY ON FILE AT NODC)
COMPUTES THE NORMAL SECTION LENGTH AND THE FORWARD AND REVERSE AZIMUTHS OF THE GEODESIC BETWEEN TWO POINTS FOR WHICH THE GEOGRAPHIC COORDINATES ARE KNOWN. THIS COMPUTATION IS USEFUL IN DETERMINING AZIMUTH AND DISTANCE BETWEEN TRIANGULATION STATIONS FOR WHICH GEOGRAPHIC POSITIONS HAVE BEEN DETERMINED BUT WHICH ARE NOT CONNECTED BY DIRECT OBSERVATION. OS NO. 4236. AUTHOR-- ANDREW CAMPBELL. MODIFIED BY C. E. PIERCE, MARCH 1967.

GEODESY DIVISION, CODE 8420
NAVAL OCEANOGRAPHIC OFFICE
SUITLAND MD. 20390

SUBROUTINE 'CIRAZD'

LANGUAGE - FORTRAN
COMPUTER - IBM 7074

(COPY ON FILE AT NODC)
FINDS THE DISTANCE AND AZIMUTH BETWEEN TWO POINTS ON THE EARTH'S SURFACE WHEN THE EARTH IS ASSUMED TO BE A SPHERE. IF EITHER POLE IS USED FOR THE CENTER POINT, THE ANGLE GIVEN IS WITH RESPECT TO GRID NORTH. BY USE OF TRIGONOMETRIC IDENTITIES AND ABSOLUTE VALUE FUNCTIONS, THIS PROGRAM AVOIDS MANY OF THE COMPUTATIONAL PROBLEMS USUALLY FOUND IN DISTANCE COMPUTATIONS. O.S. NO. 55690. AUTHOR-- BARRY TURETT.

NAUTICAL CHART DIVISION, CODE 5600
NAVAL OCEANOGRAPHIC OFFICE
SUITLAND, MD. 20390

CIRCULAR CHARTING

LANGUAGE - FORTRAN
COMPUTER - IBM 7074

COMPUTES COORDINATES FOR CONCENTRIC CIRCLES AT SPECIFIED INTERVALS ALONG LATITUDE AND/OR LONGITUDE WITH A FIXED BROADCASTING STATION POSITION AS COMMON CENTER. COMPUTED DISTANCES ARE GEODESICS BASED ON ANY SPECIFIED GEOID. OS NO. 20132. AUTHOR-- CHARLES KIRKLAND.

COMPUTER DEPARTMENT, CODE 0831
NAVAL OCEANOGRAPHIC OFFICE
SUITLAND, MD. 20390

GEODETIC DATUM CONVERSION

LANGUAGE - FORTRAN
COMPUTER - IBM 7074

TRANSFORMS GEODETIC COORDINATES FROM ONE DATUM TO ANOTHER BY UTILIZING A GIVEN SHIFT (IN TERMS OF RECTANGULAR SPACE COORDINATES) BETWEEN THE ORIGINS OF TWO DATUMS AND APPLYING THIS SHIFT, TOGETHER WITH DIFFERENCES IN THE SPHEROIDAL PARAMETERS, IN FORMULAS DERIVED FOR THIS PURPOSE. OS NO. 55305. AUTHOR-- ROBERT M. WILLEMS.

NAVIGATIONAL SCIENCE DIV., CODE 5300
NAVAL OCEANOGRAPHIC OFFICE
SUITLAND, MD. 20390

GEODETIC DATUM REDUCTION

LANGUAGE - FORTRAN
COMPUTER - IBM 7074

REDUCES GEODETIC POSITIONS FROM ONE GEODETIC DATUM TO ANOTHER BY USE OF THE VENING MEINESZ EQUATIONS. THE PREFERRED DATUMS INVOLVED ARE EUROPEAN DATUM, NORTH AMERICAN DATUM AND TOKYO DATUM. OS NO. 55301. AUTHOR-- D.J. FINDLAY.

NAVIGATIONAL SCIENCE DIV., CODE 5300
NAVAL OCEANOGRAPHIC OFFICE
SUITLAND, MD. 20390

COMPUTE GEOGRAPHIC POSITIONS

LANGUAGE - SPS
COMPUTER - IBM 1620

(COPY ON FILE AT NODC)
USCGS PROGRAM NO. 15. COMPUTES GEOGRAPHIC POSITIONS, GIVEN STARTING POSITION, AZIMUTH, AND LENGTH ON ANY ONE OF SIX SPHEROIDS. THREE TYPES OF COMPUTATIONS CAN BE OBTAINED-- SINGLE POSITIONS, A LOOP, OR A TRAVERSE. CONTROL IS BY JOB CARD. LENGTH INPUT MAY BE IN METERS, FEET, STATUTE OR NAUTICAL MILES, OR ELECTRONIC LANES.

ESSA, COAST AND GEODETIC SURVEY
WASHINGTON SCIENCE CENTER, BLDG. 2
ROCKVILLE, MD. 20852

LORAN C (VERSION 2)

LANGUAGE - SPS
COMPUTER - IBM 1620

(COPY ON FILE AT NODC)
COMPUTES TABLES GIVING THE POINTS OF INTERSECTION OF LORAN C HYPERBOLAS WITH MERIDIANS AND/OR PARALLELS OF THE EARTH SPHEROID. MICROSECOND VALUES ARE COMPUTED AT INTERVALS VARYING FROM 1 1/4 MIN. TO 20 MIN. FOR ANY OR ALL OF FOUR POSSIBLE PAIRS OF STATIONS. PROGRAM CAN ALSO BE USED TO COMPUTE MICROSECOND VALUES AT GRID INTERSECTIONS. STORAGE 100K. PROGRAM CAN BE MODIFIED FOR USE ON IBM1620 OF 60K CAPACITY.

ESSA, COAST AND GEODETIC SURVEY
WASHINGTON SCIENCE CENTER, BLDG. 2
ROCKVILLE, MD. 20852

GEODETIC POSITION COMPUTATION AND PLOT

LANGUAGE - FORTRAN
COMPUTER - IBM 7074 W/
CALCOMP 564

(COPY ON FILE AT NODC)
COMPUTES GEODETIC POSITIONS AT DESIRED INTERVALS ALONG INCREMENTAL OR MISCELLANEOUS AZIMUTHS. OPTION TO PLOT OR LIST. PLOT USES THE 'LAMB' SUBROUTINE WITH TWO STANDARD PARALLELS. OS NO. 55321. AUTHOR-- MERLE L. NELSON. AN INFORMAL REPORT IR NO. 69-35 LISTS ADDITIONAL COMPUTER PROGRAMS AND DESCRIBES PROCEDURES FOR PRODUCTION OF SECONDARY PHASE CORRECTION CHARTS AND TABLES. THESE SUPPLEMENTARY PROGRAMS, WRITTEN BY MR EDWIN STEPHENSON AND MISS BARBARA GRAY, ARE IN 7074 AUTOCODER OR FORTRAN. INFORMATION MAY BE OBTAINED FROM DISSEMINATION CONTROL DEPT. CODE 44, OR THE AUTHOR.

NAVAL OCEANOGRAPHIC OFFICE
WASHINGTON, D.C. 20390

LORAN A AND C SKYWAVE

LANGUAGE - FORTRAN
COMPUTER - IBM 7074

COMPUTES POINTS FOR LORAN SKYWAVES WHICH ARE PRODUCED WHEN TRANSMITTED RADIO SIGNALS THAT TRAVEL UPWARD AND OUTWARD ENCOUNTER THE IONOSPHERE. (TWO DIFFERENT PROGRAM DECKS USED FOR LORAN A AND C SKYWAVES) AUTHOR-- ROBERT VAN WIE. OS NO. 20158.

COMPUTER DEPARTMENT, CODE 083
NAVAL OCEANOGRAPHIC OFFICE
SUITLAND, MD. 20390

LORAN COORDINATE COMPUTATION

LANGUAGE - FORTRAN
COMPUTER - IBM 7074

(COPY ON FILE AT NODC)
COMPUTES CHARTING COORDINATES ALONG LINES OF LATITUDE OR LONGITUDE FOR LORAN CURVES AT SPECIFIED INTERVALS. INCLUDES SUBROUTINE BSLN, TO COMPUTE COORDINATES ALONG THE BASELINE AND BASELINE EXTENSIONS. RUNNING TIME-- 500-800 POINTS/MINUTE ON THE 7074. REF. IMR NO. N-1-64 (UNPUBLISHED MANUSCRIPT). OS NO. 20100. AUTHOR-- CHARLES KIRKLAND.

COMPUTER DEPARTMENT, CODE 0831
NAVAL OCEANOGRAPHIC OFFICE
SUITLAND, MD. 20390

LORAN TO GEOGRAPHIC, GEOG. TO LORAN CONVERSIONS

LANGUAGE - FORTRAN
COMPUTER - IBM 7074

(COPY ON FILE AT NODC)
CONVERTS LORAN TIME OR PHASE DIFFERENCES TO GEOGRAPHIC COORDINATES BY NON-ITERATIVE METHOD (GEODESIC INVERSE DEVELOPED BY E.M. SODANO). THE CONVERSIONS ARE FOR LORAN A OR LORAN C OR FOR A MIXTURE OF THE TWO. REF. IMR NO. N-3-64 (UNPUBLISHED MANUSCRIPT). AUTHOR-- A.C. CAMPBELL.

GEODESY DIVISION, CODE 8430
NAVAL OCEANOGRAPHIC OFFICE
SUITLAND, MD. 20390

SUBROUTINE SDANO

LANGUAGE - FORTRAN IV
COMPUTER - IBM 1800 SYS

(COPY ON FILE AT NODC)
GIVEN THE GEOGRAPHICAL CO-ORDINATES OF TWO POINTS, SDANO CALCULATES THE GEODETIC DISTANCE AND AZIMUTHS BETWEEN THEM. BASED ON METHOD OF E.S. SODANO FOR A NON-ITERATIVE SOLUTION OF THE INVERSE AND DIRECT GEODETIC PROBLEMS. N.I.O. PROG. NO. -46. AUTHOR-- M. FASHAM.

NATIONAL INSTITUTE OF OCEANOGRAPHY
WORMLEY, GODALMING, SURREY
ENGLAND

HNV1 (LORAN/DECCA FILE INITIALISATION)

LANGUAGE - FORTRAN IV
COMPUTER - IBM 1800 SYS

(COPY ON FILE AT NODC)
GIVEN INPUT DATA ON A MASTER-SLAVE PAIR, HNV1 CALCULATES CERTAIN GEODETIC VALUES AND STORES THEN ON TAPE FILE FOR LATER USE BY PROGRAM HNAV. N.I.O. PROGRAM NO. 164. AUTHOR-- M. FASHAM.

NATIONAL INSTITUTE OF OCEANOGRAPHY
WORMLEY, GODALMING, SURREY
ENGLAND

HNAV (LORAN/DECCA COORDINATES CALCULATION)

LANGUAGE - FORTRAN IV
COMPUTER - IBM 1800 SYS

(COPY ON FILE AT NODC)
GIVEN A DECCA, LORAN-A OR LORAN-C FIX, CALCULATES THE LATITUDE AND LONGITUDE. THE METHOD FOR A HYPERBOLIC SYSTEM WITH SEPARATE MASTER IS USED FOR ALL CASES. THE CONSTANTS FOR THE HYPERBOLOIDS ARE CALCULATED IN METRES FOR BOTH LORAN AND DECCA THUS ALLOWING A FIX TO BE CALCULATED IF ONE LORAN READING AND ONE DECCA READING ARE KNOWN. N.I.O. PROGRAM NO. 165. USES 'SDANO' AND OTHER SUBROUTINES. AUTHOR-- M. FASHAM

NATIONAL INSTITUTE OF OCEANOGRAPHY
WORMLEY, GODALMING, SURREY
ENGLAND

SUBROUTINE 'MAP'

LANGUAGE - FORTRAN IV
COMPUTER - IBM 360/40,
CALCOMP 763

PROVIDES A WIDE VARIETY OF MAP PROJECTIONS AND GRIDS TO FACILITATE THE DISPLAY OF GEOGRAPHICAL DATA. THE PROGRAM HAS BEEN WRITTEN IN AS MODULAR A FORM AS POSSIBLE TO ALLOW FOR EASE OF INSERTION OR DELETION OF ROUTINES. PRESENTLY UNDER DEVELOPMENT BY JOHN O. WARD, THIRTEEN MAP PROJECTIONS ARE NOW AVAILABLE, AND IN THE NEAR FUTURE SIX MORE WILL BE ADDED.

COMPUTER SYSTEMS DIVISION
NATIONAL OCEANOGRAPHIC DATA CENTER
WASHINGTON, D. C. 20390

INDIVIDUAL POINT GENERATOR FOR MAP PROJECTIONS

LANGUAGE - FORTRAN II
COMPUTER - IBM 7074

(COPY ON FILE AT NODC)
CONVERTS GEOGRAPHIC POSITIONS TO DISCRETE POINTS IN RECTANGULAR COORDINATES ON THE FOLLOWING PROJECTIONS-- MERCATOR, TRANSVERSE MERCATOR, GNOMONIC, POLAR STEREOGRAPHIC, AZIMUTHAL EQUIDISTANT, LAMBERT CONFORMAL (WITH TWO OR ONE STANDARD PARALLELS), LAMBERT AZIMUTHAL EQUAL AREA POLAR, LAMBERT EQUAL AREA CYLINDRICAL, MILLER, ALBERS EQUAL AREA CONIC, RECTIFIED SKEW ORTHOMORPHIC, AND OBLIQUE MERCATOR. CARTOGRAPHIC

DATA MAY BE PRODUCED IN EITHER GRAPHIC OR TABULAR FORM. OS NO. 55646 (MAIN PROGRAM. EACH OF THE 13 PROJECTION SUBROUTINES HAS ITS OWN OPEN SHOP NUMBER). AUTHORS-- RONALD BOLTON, LOUIS ROWEN, GREGORY VEGA. REF. INFORMAL REPORT IR NO. 69-23, MAR 1969 'COMPUTER PROGRAMS AND SUBROUTINES FOR AUTOMATED CARTOGRAPHY', BY J. PARRINELLO, NAUTICAL CHART DIVISION. FURTHER INFORMATION MAY BE OBTAINED THROUGH DISSEMINATION DEPARTMENT CODE 44, OR THE AUTHORS.

NAVAL OCEANOGRAPHIC OFFICE
WASHINGTON, D.C. 20390

INDIVIDUAL POINT GENERATOR FOR DISTANCE AND AZIMUTH COMPUTATIONS

LANGUAGE - FORTRAN II
COMPUTER - IBM 7074

USES THE GEODETIC LATITUDE AND LONGITUDE OF TWO POINTS TO COMPUTE THE DISTANCE AND AZIMUTH FROM ONE POINT TO THE OTHER. RESULTS WILL BE IN TABULAR FORM WITH THE DISTANCE IN METERS AND THE AZIMUTH AND BACK AZIMUTH IN DEGREES, MINUTES AND SECONDS. O.S. NO. 65616, BY R.M. BOLTON.

NAUTICAL CHART DIVISION, CODE 5620
U.S. NAVAL OCEANOGRAPHIC OFFICE
WASHINGTON D. C. 20390

PARAMETRIC MAP

LANGUAGE - FORTRAN II
COMPUTER - IBM 7074

GENERATES ANY HYPERBOLIC NAVIGATION SYSTEM BY USING PARAMETRIC EQUATIONS. GENERATES PLOTTING COORDINATES FOR LORAN A, LORAN C, OMEGA AND DECCA CHARTS. WILL PROCESS ALL LATTICE LINES THAT FALL WITHIN A SPECIFIED GEOGRAPHIC AREA. CAN BE DISPLAYED ON ANY OF THE FOLLOWING MAP PROJECTIONS-- MERCATOR, TRANSVERSE MERCATOR, LAMBERT CONFORMAL CONIC, OBLIQUE MERCATOR, POLYCONIC. O.S. NO. 53012. AUTHORS-- R.A. BOLTON, R.M. BOLTON.

NAUTICAL CHART DIVISION, CODE 5620
U.S. NAVAL OCEANOGRAPHIC OFFICE
WASHINGTON D. C. 20390

DECCA HI-FIX

LANGUAGE - FORTRAN
COMPUTER - PDP-5, 8S

GENERAL PURPOSE PROGRAM FOR CONVERSION OF HYPERBOLIC COORDINATES TO X-Y COORDINATE SYSTEMS. TYPE GEOGRAPHIC COORDINATES OF MASTER AND SLAVE STATIONS - PAPER TAPE OR KEYBOARD INPUT FOR LANE COUNTS, OUTPUT ON ASR-33 TELEPRINTER. WRITTEN FOR THE U.S. COAST GUARD BY LT. R.M. O'HAGAN (RET.). COPY OF PROGRAM WAS DEPOSITED WITH DECUS (DIGITAL EQUIPMENT CORP. USERS SOCIETY).

DIGITAL EQUIPMENT CORPORATION
MAYNARD, MASSACHUSETTS 01754

HYPERMAP

LANGUAGE - FORTRAN
COMPUTER - (NOT GIVEN)

(COPY ON FILE AT NODC)
A SERIES OF PROGRAMS FOR DRAWING MAPS AND PLOTTING DATA ON THEM. THE PROGRAM OPERATES UNDER A SIMPLE COMMAND LANGUAGE WHICH ENABLES THE USER TO REFER TO HIS DATA AND THE MAP DATA BY NAME. THERE ARE ELEVEN PROJECTION OPTIONS AVAILABLE IN THE BASIC TRANSFORMATION SUBROUTINE. A MORE ADVANCED PACKAGE (WITH SEVERAL PROJECTIONS TAKING THE ELLIPTICITY OF THE EARTH INTO ACCOUNT) IS UNDER DEVELOPMENT. AUTHOR-- DR ROBERT L PARKER, UNIV. OF CALIFORNIA AT SAN DIEGO.

PROF. JOHN D. MUDIE
SCRIPPS INSTITUTION OF OCEANOGRAPHY
LA JOLLA, CALIF. 92037

GENERAL MAP PROJECTION

LANGUAGE - MAD
COMPUTER - IBM 7090 W/ CALCOMP 763

(COPY ON FILE AT NODC)
CONVERSION (OR GENERATION) OF LATITUDE AND LONGITUDE VALUES TO MAP PROJECTION COORDINATES. INCLUDES ALL COMMONLY EMPLOYED PROJECTIONS OF SPHERE. OBLIQUE CASES MAY BE AUTOMATICALLY OBTAINED. AUTHOR-- W. R. TOBLER.

THE UNIVERSITY OF MICHIGAN
DEPARTMENT OF GEOGRAPHY
ATTN. DR. W. R. TOBLER
ANN ARBOR, MICHIGAN 48104

FINITE MAP PROJECTION DISTORTIONS

LANGUAGE - MAD
COMPUTER - IBM 7090

(COPY ON FILE AT NODC)
PROGRAMS AND SUBROUTINES TO ESTIMATE THE ERRORS INTRODUCED BY THE SUBSTITUTION OF MAP PROJECTION COORDINATES FOR SPHERICAL COORDINATES. STATISTICAL COMPUTATIONS OF FINITE DISTORTION ARE RELATED TO TISSOT'S INDICATRIX AS A GENERAL CONTRIBUTION TO THE ANALYSIS OF MAP PROJECTIONS. REF. TECHNICAL REPORT NO. 3 'GEOGRAPHICAL COORDINATE COMPUTATIONS PART II', BY W. R. TOBLER, DEPT. OF GEOGRAPHY.

THE UNIVERSITY OF MICHIGAN
ANN ARBOR, MICHIGAN

--* AIR-SEA INTERACTION AND HEAT BUDGET *-*-*

FUNCTION VAPW

LANGUAGE - FORTRAN IV
COMPUTER - IBM 1801/02

(COPY ON FILE AT NODC)
SUBPROGRAM CALCULATES SATURATION VAPOUR PRESSURE OVER WATER. INPUT IS TEMPERATURE IN DEGR. K. USES AN EQUATION FROM SMITHSONIAN TABLES PAGE 350. THE FUNCTION CONVERTS THE LOG OUTPUT OF THIS EQUATION TO ACTUAL PRESSURE IN MILLIBARS. N.I.O. PROG. NO. -24. AUTHOR-- R. HOWARTH.

NATIONAL INSTITUTE OF OCEANOGRAPHY
WORMLEY, GODALMING, SURREY
ENGLAND

AIR-SEA

LANGUAGE - FORTRAN
COMPUTER - IBM 7074

DETERMINES THE RELATION BETWEEN THE 500 MB. WIND FIELD AND OCEAN SURFACE CONDITIONS (WAVES), THROUGH THE USE OF STATISTICAL METHODS. O.S. PROGRAM NO. 53464, BY W.H. GEMMILL.

OCEANOGRAPHIC PREDICTION DIV., CODE 3400
NAVAL OCEANOGRAPHIC OFFICE
SUITLAND, MD. 20390

CLOUD COVER AND DAILY SEA TEMPERATURE

LANGUAGE - FORTRAN
COMPUTER - IBM 7074

DIVIDES CLOUD COVER INTO THREE GROUPS AND COMPUTES MEAN TEMPERATURE BY HOUR OF DAY AND BY DAY FOR EACH DEPTH. OS NO. 53414. AUTHOR-- D. B. NIX.

OCEANOGRAPHIC PREDICTION DIV., CODE 3400
NAVAL OCEANOGRAPHIC OFFICE
SUITLAND, MD. 20390

LAYER DEPTH PLOT

LANGUAGE - FORTRAN
COMPUTER - IBM 7074

COMPUTES AND PLOTS LAYER DEPTH, ON A SYNOPTIC BASIS, FROM VARIOUS DEFINITIONS. OS NO. 53453. AUTHOR-- D.B. NIX.

OCEANOGRAPHIC PREDICTION DIV., CODE 3400
NAVAL OCEANOGRAPHIC OFFICE
SUITLAND, MD. 20390

PREDICTION OF VERTICAL TEMPERATURE CHANGE

LANGUAGE - FORTRAN
COMPUTER - IBM 7074

(COPY ON FILE AT NODC)
A TECHNIQUE BASED PRIMARILY ON HEAT BUDGET AND WIND MIXING CALCULATIONS HAS BEEN DEVELOPED FOR PREDICTING THE VERTICAL THERMAL STRUCTURE OF THE OCEAN. THE TECHNIQUE ESSENTIALLY MODIFIES THE INITIAL THERMAL STRUCTURE THROUGH INCIDENT SOLAR RADIATION, BACK RADIATION, SENSIBLE AND EVAPORATIVE HEAT EXCHANGE, CONVECTIVE HEAT TRANSFER IN THE WATER MASS, AND WIND MIXING. PREDICTIONS ARE MADE AT 6-HOUR INTERVALS UNTIL 1200Z ON THE DATE OF FORECAST. THE PREDICTED BT IS PRINTED OUT, ALSO CAN BE PLOTTED WITH A BENSON-LEHNER MODEL J PLOTTER. AUTHORS-- W.H. GEMMILL AND D.B. NIX. REF. IMR NO. 0-42-65 (UNPUBLISHED MANUSCRIPT).

SEE ALSO IMR NO. 0-45-65 BY B. THOMPSON, AND IMR NO. 0-13-66 BY BARNETT AND AMSTUTZ. PROGRAM LISTINGS SEPARATE FROM MANUSCRIPTS.

OCEANOGRAPHIC PREDICTION DIV., CODE 3400
NAVAL OCEANOGRAPHIC OFFICE
SUITLAND, MD. 20390

TWO-DIMENSIONAL POWER SPECTRUM FOR SWOP II

LANGUAGE - FORTRAN
COMPUTER - IBM 7074

DETERMINATION OF SPECTRUM ASSOCIATED WITH THE SPATIAL DISTRIBUTION OF ENERGY AS OBTAINED FROM AN INSTANTANEOUS PICTURE OF THE OCEAN TAKEN FROM AIRCRAFT (SWOP II). OS NO. 53484. AUTHOR-- C.M. WINGER.

OCEANOGRAPHIC PREDICTION DIV., CODE 3400
NAVAL OCEANOGRAPHIC OFFICE
SUITLAND, MD. 20390

WIND STRESS

LANGUAGE - FORTRAN
COMPUTER - IBM 7074

DETERMINES WIND STRESS ON THE OCEAN SURFACE. OS NO. 53462. AUTHOR-- W.H. GEMMILL.

OCEANOGRAPHIC PREDICTION DIV., CODE 3400
NAVAL OCEANOGRAPHIC OFFICE
SUITLAND, MD. 20390

TRANSPORT COMPUTATIONS FROM ATMOSPHERIC PRESSURE

LANGUAGE - FORTRAN II AND IV
COMPUTER - IBM 1620, IBM 7040 AND IBM 1130

(COPY ON FILE AT NODC - FORTRAN II FOR 1620 ONLY)
COMPUTES, ACCORDING TO A SYSTEM OF ANALYSIS DESIGNED BY DR. N.P. FOFONOFF, THE STEADY STATE MASS TRANSPORT IN THE OCEAN FROM ATMOSPHERIC PRESSURE DATA, MERIDIONAL AND ZONAL COMPONENTS OF EKMAN TRANSPORT, TOTAL MERIDIONAL TRANSPORT, INTEGRATED TRANSPORT AND INTEGRATED GEOSTROPHIC TRANSPORT. INPUT ARE SEA LEVEL PRESSURE CARDS FROM THE EXTENDED FORECAST DIV. OF THE U.S. WEATHER BUREAU. OUTPUT ARE MEAN MONTHLY VALUES FOR THE SPECIFIED GRID OF ALTERNATE 5 DEGREES OF LATITUDE AND LONGITUDE IN THE NORTHERN HEMISPHERE. FORTRAN II PROGRAM IS PUBLISHED IN FISHERIES RESEARCH BOARD OF CANADA, MS. SERIES (OCEAN. AND LIMNOL.) NO. 163, 1963 BY DR. CHARLOTTE FROESE. FORTRAN IV PROGRAM HELD BY STATISTICAL SERVICES, FISHERIES RESEARCH BOARD OF CANADA, BIOLOGICAL STATION, NANAIMO, B. C., CANADA.

OCEANOGRAPHER-IN-CHARGE
PACIFIC OCEANOGRAPHIC GROUP
BIOLOGICAL STATION
NANAIMO, B. C., CANADA

SYNOPTIC ANALYSIS AND FORECASTING OF SURFACE CURRENTS

LANGUAGE - MACHINE
COMPUTER - CDC 1604 AND CDC 3200

INPUT IS SURFACE WIND ANALYSIS/FORECAST, SEA SURFACE TEMPERATURE ANALYSIS/FORECAST, 600 FEET TEMPERATURE ANALYSIS AND SOME CLIMATOLOGY. OUTPUT IS SURFACE CURRENT TRANSPORT IN NAUTICAL MILES PER 24 HOURS, CURRENT DIRECTION AND STREAM FUNCTION. REF. FNWF TECHNICAL NOTE NO. 9 AND HUBERT (1965). DIRECT REQUESTS FOR INFORMATION TO--

COMMANDING OFFICER
FLEET NUMERICAL WEATHER CENTRAL
MONTEREY, CALIFORNIA 93940

WIND CURRENTS

LANGUAGE - MAD
COMPUTER - IBM 7090

COMPUTES CURRENTS FROM STANDARD WIND OBSERVATIONS.

VINCENT NOBLE
THE UNIVERSITY OF MICHIGAN
GREAT LAKES RESEARCH DIVISION
INSTITUTE OF SCIENCE AND TECHNOLOGY
1077 NORTH UNIVERSITY BUILDING
ANN ARBOR, MICHIGAN 48104

RADIATION TEMPERATURE OF SEA SURFACE

LANGUAGE - FORTRAN
COMPUTER - (NOT GIVEN)

(COPY ON FILE AT NODC)
EVALUATES THREE EMPIRICAL EQUATIONS, DEVELOPED BY REGRESSION METHODS, TO OBTAIN AN ESTIMATE OF THE DIFFERENCE BETWEEN SKIN AND BUCKET TEMPERATURES FROM STANDARD WEATHER OBSERVATIONS MADE AT SEA. THESIS BY ROBERT D. BOUDREAU, REF. NO. 65-15T (1965, 79 P).

DEPT. OF OCEANOGRAPHY
COLLEGE OF GEOSCIENCES
TEXAS A AND M UNIVERSITY
COLLEGE STATION, TEXAS 77843

SYNOPTIC ANALYSIS AND FORECASTING OF POTENTIAL MIXED LAYER DEPTH

LANGUAGE - MACHINE
COMPUTER - CDC 1604 AND CDC 3200

INPUT TO PROGRAM-- CLIMATOLOGY, SYNOPTIC WAVE HEIGHT ANALYSIS/FORECAST, SEA SURFACE TEMPERATURE ANALYSIS, 600 FEET TEMPERATURE ANALYSIS/FORECAST, AND BT OBSERVATIONS. OUTPUT IS MIXED LAYER DEPTH IN FEET AT GRID POINTS (63X63 FIELD), TENDENCY OF THERMOCLINE NEXT 24 HOURS, MAGNITUDE, AND SHORT TERM FLUCTUATIONS OF THE THERMOCLINE. REF-- SEE FNWF TECHNICAL NOTE NO. 10 AND/OR NO. 21. DIRECT INQUIRIES TO--

COMMANDING OFFICER
FLEET NUMERICAL WEATHER CENTRAL
MONTEREY, CALIFORNIA 93940

--* CURRENTS AND TRANSFER PROCESSES *-*-*

SURFACE CURRENT SUMMARY

LANGUAGE - AUTOCODER
COMPUTER - IBM 7074

(COPY ON FILE AT NODC)
THE RESULTANT CURRENT SPEED AND RESULTANT CURRENT DIRECTIONS ARE COMPUTED BY MARSDEN SQUARE, 1-DEG. OR 5-DEG. SQUARE AND MONTH FROM H 1-9, NETHERLANDS 193 OR JAPANESE 118 DATA. OS NO. 52252. AUTHOR-- MAXINE JACKSON.

COMPUTER SYSTEMS DIVISION
NATIONAL OCEANOGRAPHIC DATA CENTER
WASHINGTON, D. C. 20390

MODIFIED SURFACE CURRENTS

LANGUAGE - AUTOCODER
COMPUTER - IBM 7074

(COPY ON FILE AT NODC)
MODIFIES M.H. JACKSON'S PROGRAM TO PROVIDE THE SAME INFORMATION ON A FILE REPRESENTING THE H 1-9, 118 (JAPANESE), 193 (NETHERLANDS) FILES COMBINED. AUTHOR-- C.S. CALDWELL. OS NO. 20156.

COMPUTER DEPARTMENT, CODE 083

NAVAL OCEANOGRAPHIC OFFICE
SUITLAND, MD. 20390

STATISTICAL SURFACE CURRENT ROSE

LANGUAGE - AUTOCODER
COMPUTER - IBM 7074

CALCULATES FREQUENCIES OF A NORMAL DISTRIBUTION, POPULATING THE DIRECTION-SPEED GROUPS OF A STANDARD ROSE FORMAT, WHICH BEST FITS THE ACTUAL DATA SURFACE (REF. SP-64 -A STATISTICAL ROSE PROGRAM-, BY W. YERGEN). OS NO. 53301. AUTHOR-- W. YERGEN.

OCEANOGRAPHIC ANALYSIS DIV., CODE 3300
NAVAL OCEANOGRAPHIC OFFICE
SUITLAND, MD. 20390

COMPUTE ADVECTION

LANGUAGE - FORTRAN
COMPUTER - IBM 1401

COMPUTES HORIZONTAL ADVECTION FROM AN INITIAL POINT IN THE WATER COLUMN FROM EQUATIONS DESCRIBED BY A. FISHER, IM NO. 66-9 (INFORMAL MANUSCRIPT). FROM KNOWN INPUTS OF DENSITY, CURRENT VELOCITIES, AND TEMPERATURE GRADIENTS, ADVECTION IS COMPUTED FROM AN INITIAL POINT OVER A GIVEN DISTANCE, ASSUMING NO VERTICAL HEAT LOSS. HORIZONTAL COMPONENTS IN THE X,Y PLANE ARE COMPUTED AND A RESULTANT VECTOR IS DETERMINED. OS NO. 53490. AUTHOR-- R.K. FRANKLIN.

OCEANOGRAPHIC PREDICTION DIV., CODE 3400
NAVAL OCEANOGRAPHIC OFFICE
SUITLAND, MD. 20390

GVPA,VPA

LANGUAGE - FORTRAN IV
COMPUTER - IBM 360/65

CALCULATES VELOCITIES AND TRANSPORTS FOR AS MANY AS 50 SUCCESSIVE STATION PAIRS. USES AS INPUT INTERPOLATED DATA ON CARDS FROM PROGRAM 'DYNAM', WHICH CALCULATES DYNAMIC HEIGHTS AT STANDARD DEPTHS.

BUREAU OF COMMERCIAL FISHERIES
P. O. BOX 3830
HONOLULU, HAWAII 96812

STANDARD-VECTOR DEVIATION ROSE FOR CURRENT DATA

LANGUAGE - FORTRAN
COMPUTER - IBM 7074

(COPY ON FILE AT NODC)
CALCULATES THE FOLLOWING PARAMETERS FOR A TWO DIMENSIONAL NORMAL ELLIPTICAL DISTRIBUTED CURRENT FIELD-- MEAN SPEED, COMPONENTS OF THE VECTOR MEAN, COMPONENTS OF THE STANDARD-VECTOR DEVIATION ALONG THE PRINCIPAL AXES, AND THE INCLINATION OF THE MAJOR AXIS. PROGRAM HAS BEEN IN USE PRINCIPALLY AS AN AID IN AIR-SEA RESCUE OPERATIONS. INPUT IS CURRENT DATA WHICH HAS BEEN TABULATED IN SPECIFIED SPEED-INTERVAL CLASSES FOR EIGHT COMPASS POINTS. REF. IMR O-22-65 (UNPUBLISHED MANUSCRIPT). AUTHOR-- DONALD A. BURNS, CODE 7200.

OCEANOGRAPHIC ANALYSIS DIV., CODE 3300
NAVAL OCEANOGRAPHIC OFFICE
SUITLAND, MD. 20390

GULF STREAM PATH

LANGUAGE - FORTRAN
COMPUTER - IBM 7074

PREDICTS THE PATH OF THE GULF STREAM BY MEANS OF 1) A SINE GENERATED FUNCTION, 2) THE CONSERVATION OF POTENTIAL VORTICITY, AND 3) HARMONIC ANALYSIS. AUTHOR-- W.H. GEMMILL.

OCEANOGRAPHIC PREDICTION DIV., CODE 3430
NAVAL OCEANOGRAPHIC OFFICE

SUITLAND, MARYLAND 20390

VELOCITY AND HORIZONTAL EDDY COEFFICIENTS

LANGUAGE - FORTRAN
COMPUTER - IBM 709

COMPUTATION OF VELOCITY AND HORIZONTAL MIXING EDDY COEFFICIENTS ALONG ISENTROPIC SURFACES. AUTHOR-- A.D. KIRWAN.

TEXAS A AND M UNIVERSITY
COLLEGE OF GEOSCIENCES
DEPARTMENT OF OCEANOGRAPHY
COLLEGE STATION, TEXAS 77843

SALINITY DISTRIBUTION IN ONE-DIMENSIONAL ESTUARY

LANGUAGE - FORTRAN
COMPUTER - (NOT GIVEN)

(COPY ON FILE AT NODC)
A MODEL IS CONSTRUCTED FOR AN ESTUARY TO PREDICT THE SALINITY DISTRIBUTION FOR A GIVEN FRESH WATER INFLOW, WITH APPLICATION TO THE UPPER CHESAPEAKE BAY AND THE SUSQUEHANNA RIVER. BASED ON A SALT CONTINUITY EQUATION IN WHICH THE SEAWARD SALT ADVECTION IS BALANCED BY TURBULENT DIFFUSION TOWARD THE HEAD OF THE BAY. IN FINAL FORM, IT IS A LINEAR, SECOND-ORDER, AND PARABOLIC PARTIAL DIFFERENTIAL EQUATION WITH VARIABLE COEFFICIENTS WHICH ARE FUNCTIONS OF BOTH SPACE AND TIME. REF. 69-7, TECH. REPORT 54 (MAY 1969, 70P.) BY WILLIAM BOICOURT.

CHESAPEAKE BAY INSTITUTE
THE JOHNS HOPKINS UNIVERSITY
BALTIMORE, MD. 21218

PROCESSING OF OCEANOGRAPHIC OBSERVATIONS

LANGUAGE - FORTRAN II
COMPUTER - IBM 1620 II

(COPY ON FILE AT NODC)
A NUMBER OF PROGRAMS AND SUBROUTINES FOR PROCESSING 'MICHELSENS CONTAINER' DATA (AUTOMATIC CURRENT AND TEMPERATURE MEASUREMENTS), FOR PROCESSING EKMAN CURRENT METER DATA, AND FOR HARMONIC ANALYSIS AND POWER SPECTRUM ANALYSIS. REF. TECHNICAL REPORT NO. 37, NATO SUBCOMMITEE ON OCEANOGRAPHIC RESEARCH (105 P., FEB 1967). AUTHOR-- DR. H.E. SWEERS (OF THE CANADIAN OCEANOGRAPHIC DATA CENTRE).

GEOPHYSICAL INSTITUTE
UNIVERSITY OF BERGEN
BERGEN, NORWAY

DRIFT BOTTLE DATA COMPUTATION

LANGUAGE - AUTOCODER
COMPUTER - IBM 7074

(COPY ON FILE AT NODC)
COMPUTES THE FOLLOWING FROM BOTTLE RECOVERY INFORMATION-- BEARING, NAUTICAL MILES DRIFTED, NUMBER OF DAYS ADRIFT, AND SPEED IN NAUTICAL MILES PER DAY. COMPUTES MARSDEN AND 1/4-DEGREE SQUARES OF RELEASE. OUTPUT ON MAGNETIC TAPE. AUTHOR-- JUDY YAVNER. USED WITH A TAPE TO PRINT/CARD EDITING AND SELECTION PROGRAM. AUTHOR-- JOHN JENSON.

COMPUTER SYSTEMS DIVISION, CODE 2400
NATIONAL OCEANOGRAPHIC DATA CENTER
WASHINGTON, D.C. 20390

LATERAL RELATIVE DISTRIBUTION OF MATERIAL FROM A CONTINUOUS SOURCE IN A CONSTANT CURRENT

LANGUAGE - FORTRAN II
COMPUTER - IBM 7094

PREDICTS THE RATIO OF THE CONCENTRATION OF A CONTAMINANT TO ITS CENTER LINE VALUE AS A FUNCTION OF LONGITUDINAL AND TRANSVERSE DISTANCE FROM THE SOURCE DUE TO HORIZONTAL ADVECTION AND DIFFUSION WHEN DISCHARGED AS A VERTICAL LINE SOURCE OF UNIT DEPTH AND UNIT RATE OF DISCHARGE IN AN UNBOUNDED MEDIUM. INPUT ARE THE VELOCITY (A CONSTANT), THE LONGITUDINAL AND TRANSVERSE COORDINATES, AND THE DIFFUSION VELOCITY, I.E.,

THE SPREADING COEFFICIENT, A MEASURE OF THE HORIZONTAL DIFFUSION. THE OKUBO-PRITCHARD MODEL FOR AN INSTANTANEOUS RELEASE IS USED FOR THE MODEL. AUTHORS-- H.E. WALTERS AND H.H. CARTER.

HARVEY E. WALTERS
CHESAPEAKE BAY INSTITUTE
THE JOHNS HOPKINS UNIVERSITY
CHARLES AND 34TH ST.
BALTIMORE, MD. 21218

CONTINUOUS LINE SOURCE (REFLECTED)

LANGUAGE - FORTRAN II
COMPUTER - IBM 7094

PREDICTS THE HORIZONTAL STEADY STATE DISTRIBUTION OF A CONTAMINANT DUE TO HORIZONTAL ADVECTION AND DIFFUSION WHEN DISCHARGED AS A VERTICAL PLANE SOURCE OF UNIT DEPTH AND UNIT RATE OF DISCHARGE AND LOCATED PERPENDICULAR TO A BOUNDARY. THE VELOCITY IS ASSUMED TO BE CONSTANT. THE OKUBO-PRITCHARD MODEL FOR AN INSTANTANEOUS RELEASE IS USED. IT IS INTEGRATED LATERALLY TO TRANSFORM A VERTICAL LINE SOURCE SOLUTION TO A SOLUTION FOR A VERTICAL PLANE SOURCE AND IS TOTALLY RELECTED AT THE BOUNDARY TO QUANTITATE THE BOUNDARY EFFECT. AUTHORS-- H.E. WALTERS AND H.H. CARTER.

HARVEY E. WALTERS
CHESAPEAKE BAY INSTITUTE
THE JOHNS HOPKINS UNIVERSITY
CHARLES AND 34TH ST.
BALTIMORE, MD. 21218

CONTINUOUS SOURCE IN TIDAL ESTUARY PER UNIT DEPTH AND UNIT RATE OF RELEASE

LANGUAGE - FORTRAN II
COMPUTER - IBM 7094

PREDICTS THE CENTERLINE LONGITUDINAL DISTRIBUTION OF A CONTAMINANT AS A FUNCTION OF PUMPING TIME, DUE TO HORIZONTAL ADVECTION AND DIFFUSION WHEN DISCHARGED AS A VERTICAL LINE SOURCE OF UNIT DEPTH AT A CONSTANT RATE IN A TIDAL ESTUARY. INPUT ARE THE MAXIMUM TIDAL VELOCITY, THE NON-TIDAL VELOCITY, THE DIFFUSION VELOCITY I.E. SPREADING COEFFICIENT, A MEASURE OF HORIZONTAL DIFFUSION, PUMPING TIME I.E. TIME SINCE SOURCE WAS INITIATED, AND THE LONGITUDINAL DISTANCE FROM THE SOURCE. STORAGE NECESSARY-- 15000 WORDS (CAN BE EASILY CHANGED TO 7000 WORDS). AUTHORS - H.E. WALTERS AND H.H. CARTER.

HARVEY E. WALTERS
CHESAPEAKE BAY INSTITUTE
THE JOHNS HOPKINS UNIVERSITY
CHARLES AND 34TH ST.
BALTIMORE, MD. 21218

CONTINUOUS SOURCE IN TIDAL ESTUARY PER UNIT DEPTH AND UNIT RATE OF RELEASE, WITH COOLING TERM

LANGUAGE - FORTRAN II
COMPUTER - IBM 7094

PREDICTS THE CENTERLINE LONGITUDINAL DISTRIBUTION OF HEAT AS A FUNCTION OF PUMPING TIME DUE TO HORIZONTAL ADVECTION, DIFFUSION, AND ATMOSPHERIC COOLING WHEN DISCHARGED AS A VERTICAL LINE SOURCE AT A CONSTANT RATE IN A TIDAL ESTUARY. THE OKUBO-PRITCHARD MODEL FOR AN INSTANTANEOUS RELEASE IS USED FOR THE MODEL. IT IS FURTHER ASSUMED THAT EACH INFINITESIMAL RELEASE COOLS EXPONENTIALLY WITH TIME. THE RATE COEFFICIENT IS CALLED THE COOLING COEFFICIENT. CORE STORAGE NECESSARY-- 15000 WORDS (CAN BE RUN USING 7000 WORDS). AUTHORS-- H.E. WALTERS AND H.H. CARTER.

HARVEY E. WALTERS
CHESAPEAKE BAY INSTITUTE
THE JOHNS HOPKINS UNIVERSITY
CHARLES AND 34TH ST.
BALTIMORE, MD. 21218

CURRENT METER DYNAMICS

LANGUAGE - MAC
COMPUTER - IBM OS/360

PROGRAM WITH SUBROUTINES AS ESTIMATOR FOR DERIVING POSITION AND EULER ATTITUDE (PITCH AND ROLL) ANGLES SO THAT PRECISE CURRENT METER DYNAMICS CAN BE OBTAINED. APPLIED TO A REAL CASE PROBLEM FOR WHICH SIMULATION RESULTS ARE DISCUSSED. THESIS BY MICHEL FROIDEVAUX (JAN 1968) 'APPLICATION OF STATISTICAL ESTIMATION TO THE DETERMINATION OF OCEAN CURRENT METER DYNAMICS'.

INSTRUMENTATION LABORATORY
MASSACHUSETTS INSTITUTE OF TECHNOLOGY
CAMBRIDGE, MASSACHUSETTS 02139

CURRENT METER TURBULENCE

LANGUAGE - FORTRAN
COMPUTER - IBM 7074

GIVES AN INDICATION OF TURBULENCE IN THE OCEAN BY COMPUTING MEASURES OF THE DEVIATIONS FROM MEANS OVER VARIOUS LENGTHS OF TIME. OS NO. - 57202. AUTHOR-- ROBERT R. GLEASON.

EXPLORATORY OCEANOGRAPHY DIV., CODE 7200
NAVAL OCEANOGRAPHIC OFFICE
SUITLAND, MD. 20390

FLOW METER PLOTS

LANGUAGE - FORTRAN IV
COMPUTER - IBM 360/65, CALCOMP

(COPY ON FILE AT NODC)
DETERMINES FLOW METER PERFORMANCE AND PLOTS NUMBER OF REVOLUTIONS VS. TIME. OUTPUT GIVES THE COEFFICIENT OF CORRELATION AND STANDARD DEVIATION, AND THE REGRESSION LINE AND 1.96 STANDARD DEVIATIONS ARE MARKED OFF ON THE PLOT. CORE STORAGE USED-- 31K BYTES (WITH PLOT ROUTINES). AUTHOR-- MARILYNN BORKOWSKI.

BUREAU OF COMMERCIAL FISHERIES
TROPICAL ATLANTIC BIOLOGICAL LABORATORY
75 VIRGINIA BEACH DRIVE
MIAMI, FLORIDA 33149

FILM DATA PROCESSING

LANGUAGE - FORTRAN-60
COMPUTER - CDC 1604

ACCEPTS RICHARDSON'S CURRENT DATA FROM A BINARY TAPE SUPPLIED BY INFORMATION INTERNATIONAL, INC. NORTH-SOUTH AND EAST-WEST VELOCITY COMPONENTS ARE COMPUTED FROM THE COMPASS, VANE, R0 AND R10 COUNTERS, AND ALL INFORMATION MAY BE PRINTED EVERY TIME SLICE. A HISTOGRAM OF THESE COMPONENTS IS PRINTED AT THE END OF EACH FILM. FURTHERMORE, AN ENVELOPE OF THE CURRENT ANGLES AND CURRENT SPEEDS IS SHOWN AT 2-HOUR INTERVALS. FINALLY, 6-HOUR MEANS AND STANDARD DEVIATIONS OF VELOCITY COMPONENTS ARE PUNCHED ON CARDS FOR FURTHER PROCESSING. 1200-CHARACTER RECORDS ARE READ INTO STORAGE BY MEANS OF A MACHINE LANGUAGE SUBROUTINE. THE REMAINING PROGRAM IS IN FORTRAN. AUTHOR-- EMANUEL MEHR, COLLEGE OF ENGINEERING, NYU.

NEW YORK UNIVERSITY
SCHOOL OF ENGINEERING AND SCIENCE
GEOPHYSICAL SCIENCES LABORATORY
2455 SEDGWICK AVE., BRONX, N.Y. 10468

DATUBA

LANGUAGE - FORTRAN-63
COMPUTER - CDC 3800

ANALYZES THE DEFLECTIONS OF A TRI-MOORED, SUBSURFACE, BUOY-CABLE ARRAY ACTED ON BY CURRENT-INDUCED FORCES. SOLUTION IS BY THE METHODS OF

IMAGINARY REACTIONS AND SUCCESSIVE APPROXIMATIONS. CALCULATES THE HYDRODYNAMIC FORCES, AND BOTH NORMAL AND TANGENTIAL DRAGS ARE INCLUDED. DOCUMENTED IN NRL REPORT 6894 (MAY 1969), BY R.A. SKOP AND R.E. KAPLAN. MEMORY REQUIREMENTS-- APPROX. 16000 WORDS FOR THE ARRAYS IN COMMON AND 2100 WORDS FOR THE MAIN PROGRAM AND SUBPROGRAMS.

NAVAL RESEARCH LABORATORY
4555 OVERLOOK AVENUE, S.W.
WASHINGTON, D. C. 20390

CABLE CONFIGURATION

LANGUAGE - FORTRAN IV
COMPUTER - IBM 1800 SYS

(COPY ON FILE AT NODC)
COMPUTES THE EQUILIBRIUM CONFIGURATION AND TENSIONS OF A CABLE TOWING A SUBMERGED BODY FOR FAIRED, UNFAIRED, AND DISCONTINUOUS (LOWER PART FAIRED) CABLES. THE OUTPUT ON THE LINE PRINTER GIVES THE VALUES OF THE INPUT DATA FOLLOWED BY VARIOUS CALCULATED VALUES. THE SOLUTION IS FOUND FOR THE 'HEAVY GENERAL CABLE' LAW OF CABLE LOADINGS AS DESCRIBED BY M.C. EAMES (1968). EXECUTION TIME-- ABOUT 30 SECS. FOR EACH CASE. N.I.O. PROGRAM NO. 168. AUTHOR-- CATHERINE CLAYSON.

NATIONAL INSTITUTE OF OCEANOGRAPHY
WORMLEY, GODALMING, SURREY
ENGLAND

CURRENT METER ANALYSIS

LANGUAGE - FORTRAN IV
COMPUTER - IBM 1800 SYS

READS, CALIBRATES AND PLOTS DATA FROM BERGEN OR PLESSEY CURRENT METERS. DATA IS READ FROM CARDS. ANY ONE OF THE READINGS MAY BE TAKEN AS ROTOR COUNT, THE DIFFERENCES BETWEEN CONSECUTIVE READINGS THEN BEING USED BY THE PROGRAM AS THE BASIS OF CURRENT SPEED. THREE GRAPHS MAY BE PLOTTED (E.G. SPEED, DIRECTION, AND TEMPERATURE). ALL RESULTS ARE ALSO OUTPUT TO MAGNETIC TAPE. N.I.O. PROGRAM 111 BY W.T.J. SLADE. WRITE-UP IN N.I.O. INTERNAL REPORT NO. N.12, DEC 1968.

NATIONAL INSTITUTE OF OCEANOGRAPHY
WORMLEY, GODALMING, SURREY
ENGLAND

CURRENT METER CONVERSION

LANGUAGE - FORTRAN IV
COMPUTER - IBM 1800 SYS

CONVERTS RAW CURRENT METER DATA INTO CALIBRATED OUTPUT FOR RECORDING ON BOTH LINE-PRINTER AND MAGNETIC TAPE. N.I.O. SUB-PROGRAM -11, BY W.T.J. SLADE (REF. N.I.O. INTERNAL REPORT NO. N.12).

NATIONAL INSTITUTE OF OCEANOGRAPHY
WORMLEY, GODALMING, SURREY
ENGLAND

VEL

LANGUAGE - FORTRAN IV-H
COMPUTER - SDS SIGMA 7

COMPUTES GEOSTROPHIC VELOCITY DIFFERENCE BETWEEN TWO OCEANOGRAPHIC STATIONS, ACCORDING TO A FORMULA DESCRIBED BY N.P. FOFONOFF AND CHARLOTTE FROESE. (PROGRAM WRITTEN AS SUBROUTINE - NO I/P OR O/P)

INFORMATION PROCESSING CENTER
ATTN. MARY HUNT
WOODS HOLE OCEANOGRAPHIC INSTITUTION
WOODS HOLE, MASSACHUSETTS 02543

VTR

LANGUAGE - FORTRAN IV-H
COMPUTER - SDS SIGMA 7

SUBROUTINE COMPUTES VOLUME TRANSPORT BETWEEN TWO STATIONS.

INFORMATION PROCESSING CENTER
ATTN. MARY HUNT
WOODS HOLE OCEANOGRAPHIC INSTITUTION
WOODS HOLE, MASSACHUSETTS 02543

THISTO

LANGUAGE - FORTRAN IV-H
COMPUTER - SDS SIGMA 7

PRODUCES A TWO DIMENSIONAL FREQUENCY DISTRIBUTION OF SAMPLES AVERAGED OVER CHOSEN INTERVAL AGAINST TIME. INPUT-- CONTROL CARDS AND 9-TRACK MAG. TAPE. OUTPUT-- A LINE PRINTER PLOT OF AVERAGED COMPASS, VANE, DIRECTION, AND SPEED AGAINST TIME.

INFORMATION PROCESSING CENTER
ATTN. JOHN A. MALTAIS
WOODS HOLE OCEANOGRAPHIC INSTITUTION
WOODS HOLE, MASSACHUSETTS 02543

VECTAV

LANGUAGE - FORTRAN IV-H
COMPUTER - SDS SIGMA 7

PRODUCES A NINE TRACK MAG. TAPE IN WHOI FORMAT OF EAST AND NORTH VELOCITY VECTOR AVERAGES AND THEIR CORRESPONDING POLAR REPRESENTATIONS. INPUT-- CONTROL CARDS AND DATA ON 9-TRACK TAPE.

INFORMATION PROCESSING CENTER
ATTN. JOHN A. MALTAIS
WOODS HOLE OCEANOGRAPHIC INSTITUTION
WOODS HOLE, MASSACHUSETTS 02543

PROVEC

LANGUAGE - FORTRAN IV-H
COMPUTER - SDS SIGMA 7

COMPUTES PROGRESSIVE VECTORS FROM DIRECTION AND SPEED VALUES. INPUT-- CONTROL CARDS AND 9-TRACK MAG. TAPE IN WHOI FORMAT. OUTPUT-- LISTING, ON LINE PRINTER, OF PROGRESSIVE VECTORS AND/OR A MAG. TAPE TO BE USED WITH A PDP-5 DRIVEN CALCOMP FOR A PLOT OF THE VECTORS.

INFORMATION PROCESSING CENTER
ATTN. JOHN A. MALTAIS
WOODS HOLE OCEANOGRAPHIC INSTITUTION
WOODS HOLE, MASSACHUSETTS 02543

--* ICE IN THE SEA *-*-*

ICEGRID MODIFIED

LANGUAGE - FORTRAN 60
COMPUTER - IBM 1604

(COPY ON FILE AT NODC)
INCORPORATES PROGRAMS 'ICEMELT' AND 'ICEGRID'. TAKES INTO CONSIDERATION THE EFFECTS OF MELTING ON THE PRODUCTION OF FIVE-DAY FORECASTS OF THE WIND DRIFT AND CONCENTRATION OF SEA ICE, USING EQUATIONS AFTER ZUBOV AND AN EARLIER PROGRAM OF KNODLE. USES A 26X21 GRID-POINT ARRAY WITH VARIABLE SCALE. OUTPUT FIELDS ARE CONCENTRATION, DIRECTION AND DISTANCE OF MOVEMENT. DOCUMENTED IN THESIS BY KENNETH M. IRVINE (UNPUBLISHED, 1965).

NAVAL POSTGRADUATE SCHOOL
MONTEREY, CALIFORNIA 93940

ICE POTENTIAL

LANGUAGE - FORTRAN
COMPUTER - IBM 7074

PROCESSES OBSERVED SEA ICE CONDITIONS SO THEY CAN BE USED IN FORECASTING SEA ICE CONDITIONS. OS NO. 20141. AUTHOR-- L.A. WALKER.

DATA SYSTEMS CENTER, CODE 0831
NAVAL OCEANOGRAPHIC OFFICE
SUITLAND, MD. 20390

STATISTICAL ANALYSIS OF ICE DATA

LANGUAGE - FORTRAN
COMPUTER - IBM 7074

COMPUTES THE MEAN CONCENTRATION VALUES, MEAN AGE SEVERITY VALUES, AND MEAN FLOE SIZE SEVERITY VALUE OF ICE DATA. AUTHOR-- BARBARA GRAY.

OCEANOGRAPHIC PREDICTION, CODE 3400
NAVAL OCEANOGRAPHIC OFFICE
SUITLAND, MD. 20390

SEA ICE STUDIES

LANGUAGE - FORTRAN IV
COMPUTER - IBM 7090/94

(COPY ON FILE AT NODC)
A GENERALIZED PROGRAM WITH SEVERAL OPTIONS THAT ALLOW CONSIDERABLE LATITUDE IN THE SPECIFICATION OF INPUT AND OUTPUT DATA. A MAIN PROGRAM READS IN THE INPUT DATA AND SUMMARIZES THE RESULTS OF EACH YEAR'S INTEGRATION. SUBROUTINE YARIT CALCULATES THE TEMPERATURE AND THICKNESS CHANGES OF THE ICE AND SNOW FOR EACH TIME STEP DURING THE YEAR. SUBROUTINE FLIP TAKES THE MONTHLY VALUES OF THE INDEPENDENT ENERGY FLUXES AT THE UPPER BOUNDARY AND PRODUCES SMOOTHED VALUES FOR EACH TIME STEP. SUBROUTINE SALPR CALCULATES THE SALINITY PROFILE FOR EACH TIME STEP. FINALLY, SUBROUTINE RITE WRITES THE TEMPERATURE PROFILE, ICE THICKNESS AND MASS CHANGES FOR EACH 10-DAY PERIOD THROUGHOUT THE YEAR. LISTED IN A MEMORANDUM RM-6093-PR (NOV 1969, 173 P) 'NUMERICAL PREDICTION OF THE THERMODYNAMIC RESPONSE OF ARCTIC SEA ICE TO ENVIRONMENTAL CHANGES' BY G.A. MAYKUT AND N. UNTERSTEINER. PREPARED FOR U.S. AIR FORCE PROJECT RAND.

THE RAND CORPORATION
1700 MAIN ST.
SANTA MONICA, CALIF. 90406

-- PHYSICAL PROPERTIES - ANALYSES AND SUMMARIES -*-*

DEVIATION OF TEMP. AND SALINITY PART 1 (DOTS-1)

LANGUAGE - AUTOCODER
COMPUTER - IBM 7074

(COPY ON FILE AT NODC)
A PROTOTYPE PROGRAM TO MONITOR NODC FORMAT COMPUTED OCEAN STATION DATA FOR ERRORS. OS NO. 52305. AUTHOR-- S.C. PORTER.

DEVELOPMENT DIVISION, CODE 2320
NATIONAL OCEANOGRAPHIC DATA CENTER
WASHINGTON, D.C. 20390

OBJECTIVE THERMOCLINE ANALYSIS

LANGUAGE - FORTRAN IV-H
COMPUTER - IBM 360 SER. AND CDC 6500

(COPY ON FILE AT NODC)
READS DIGITIZED BATHYTHERMOGRAPH TRACES AND THEN ANALYZES THEM OBJECTIVELY BY GAUSSIAN AND NON-GAUSSIAN METHODS FOR THE TOP, CENTER, AND BASE OF THE MAIN THERMOCLINE. ADDITIONALLY, SUCH FEATURES AS MULTIPLE

THERMOCLINES, INVERSIONS, AND THERMAL TRANSIENTS ARE IDENTIFIED ALSO AND THEIR KEY POINTS ARE INCLUDED IN THE INFORMATIONAL DATA PRINTOUT. THESIS BY ERIC F. GROSFILS 'OBJECTIVE DIGITAL ANALYSIS OF BATHYTHERMOGRAPH TRACES' (UNPUBLISHED MANUSCRIPT, DEC. 1968, 130 P).

NAVAL POSTGRADUATE SCHOOL
MONTEREY, CALIFORNIA 93940

GRADIENT SUMMARY BY 1-DEG SQUARE, MONTH

LANGUAGE - AUTOCODER
COMPUTER - IBM 7074

(COPY ON FILE AT NODC)
COMPUTES AND PRINTS AVERAGE TEMPERATURE GRADIENTS FOR EACH 20 METER DEPTH INTERVAL, BY EACH OF 12 MONTHS, ALONG WITH THE NUMBER OF OBS THE MEAN IS BASED ON. ANY SIGNIFICANT POSITIVE GRADIENTS (INCREASE OF 0.2 DEG. C/20M OR MORE) SUMMARIZED SEPARATELY ON SAME PAGE. INPUT IS NODC DIGITIZED BT FILE, SORTED GEOGRAPHICALLY. OS NO. 62401. AUTHOR-- JEFF GORDON (REVISED JULY 1969).

COMPUTER SYSTEMS DIV., CODE 2400
NATIONAL OCEANOGRAPHIC DATA CENTER
WASHINGTON, D. C. 20390

THERMOCLINE AND MIXED LAYER DEPTHS

LANGUAGE - AUTOCODER
COMPUTER - IBM 7074

(COPY ON FILE AT NODC)
DETERMINES AND PRINTS OUT THE DEPTHS OF THE MIXED LAYER AND TOP OF THE THERMOCLINE FOR INDIVIDUAL BT OBSERVATIONS, WITH MEANS FOR EACH MONTH WITHIN A 1-DEGREE SQUARE. USES GRADIENT CRITERIA GIVEN BY CODE 2120 SCIENTIST (BASED LARGELY ON NODC'S GRADIENT SUMMARY PROGRAM OUTPUT), AND ENTERED ON CONTROL CARDS. COMPARISON IS MADE WITH ABSOLUTE VALUE OF GRADIENT/ 10M. OS NO. 62402. AUTHOR-- JEFF GORDON (JULY 1969).

COMPUTER SYSTEMS DIV., CODE 2400
NATIONAL OCEANOGRAPHIC DATA CENTER
WASHINGTON, D. C. 20390

S.E.R.C. BT ANALYSIS

LANGUAGE - AUTOCODER
COMPUTER - IBM 7074

(COPY ON FILE AT NODC)
ERROR CHECKS DATA AND COMPUTES LAYER DEPTH, SURFACE EFFECT, MEAN GRADIENT, MAXIMUM NEGATIVE GRADIENT, ASCENDANT AND FIRST NEGATIVE GRADIENT. A SOUND VELOCITY COMPUTATION IS ALSO MADE. OS NO. 20113. REPORT NO. 0-31-63 (UNPUBLISHED MANUSCRIPT). AUTHOR-- M.E. MYERS.

COMPUTER DEPARTMENT, CODE 0831
NAVAL OCEANOGRAPHIC OFFICE
SUITLAND, MD. 20390

GDNP,GRAD

LANGUAGE - FORTRAN IV
COMPUTER - IBM 360/65
WITH CALCOMP

CALCULATES THE GRADIENTS OF DENSITY, TEMPERATURE, AND SALINITY AS FUNCTIONS OF SIGMA-T ALONG 4 STANDARD SECTIONS IN THE TRADE WIND ZONE OCEANOGRAPHY PROGRAM PILOT STUDY AREA. CALCOMP DIGITAL PLOTTER REQUIRED FOR PROGRAM 'GRAD'.

BUREAU OF COMMERCIAL FISHERIES
P. O. BOX 3830
HONOLULU, HAWAII 96812

BT TEMPERATURE GRADIENT DISTRIBUTION

LANGUAGE - FORTRAN
COMPUTER - IBM 7074

COMPUTES A FREQUENCY TABLE OF GRADIENTS IN 30 INTERVALS BY DEPTHS. ANY

EXCEPTIONS TO THE INTERVALS WITH THEIR CORRESPONDING DEPTH AND THE MEAN GRADIENT FOR EACH DEPTH IS PRINTED ALSO. OS NO. 10120. AUTHOR - M.V. JENNINGS.

COMPUTER DEPARTMENT, CODE 0831
NAVAL OCEANOGRAPHIC OFFICE
SUITLAND, MD. 20390

MONTHLY SONIC LAYER DEPTH

LANGUAGE - FORTRAN
COMPUTER - IBM 7074

CALCULATES SONIC LAYER DEPTH FROM BT TRACES AND CONVERTS POSITION TO PLOT ON MERCATOR BASE WITHOUT OVERPRINTS. OS NO. 53480. AUTHOR-- D.B. NIX.

OCEANOGRAPHIC PREDICTION DIV., CODE 3400
NAVAL OCEANOGRAPHIC OFFICE
SUITLAND, MD. 20390

SEA SURFACE TEMPERATURE DISTRIBUTION

LANGUAGE - FORTRAN
COMPUTER - IBM 7074

(COPY ON FILE AT NODC)
TABULATES THE FREQUENCY, PERCENT FREQ., CUMULATIVE PERCENT FREQ., AND MEAN TEMPERATURE FOR ALL ONE-DEGREE SQUARES AND MONTHS PROVIDED BY SEA SURFACE TEMPERATURE SUMMARY CARDS FROM ASHEVILLE, N. C. OS NO. 20136. AUTHOR-- J. LECKIE.

COMPUTER DEPARTMENT, CODE 0831
NAVAL OCEANOGRAPHIC OFFICE
SUITLAND, MD. 20390

TEMPERATURE DISTRIBUTION BY ONE-DEGREE SQUARES

LANGUAGE - FORTRAN
COMPUTER - IBM 7074

(COPY ON FILE AT NODC)
COMPUTES AND TABULATES A FREQUENCY DISTRIBUTION FOR SELECTED TEMPERATURE INTERVALS AND STANDARD DEPTHS, AND THE MAXIMUM, MINIMUM, AND MEAN VALUES OF TEMPERATURE FOR EACH STANDARD DEPTH. A REPORT IS PRODUCED FOR EACH ONE-DEGREE SQUARE. OS NO. 20126 PART 5. AUTHOR-- C.S. CALDWELL.

COMPUTER DEPARTMENT, CODE 083
NAVAL OCEANOGRAPHIC OFFICE
SUITLAND, MD. 20390

TEMPERATURE AVERAGE SUMMARY BY 1-DEGREE SQUARES

LANGUAGE - FORTRAN
COMPUTER - IBM 7074

(COPY ON FILE AT NODC)
COMPUTES FOR EACH ONE-DEGREE SQUARE WITHIN A MARSDEN SQ., FROM GEOGRAPHIC STATION DATA, A SEASONAL AVERAGE AND FREQUENCY AND A TWELVE MONTH AVERAGE AND FREQUENCY, AT EACH OF FOURTEEN SELECTED STANDARD DEPTHS. OS NO. 20123. AUTHOR-- C.S. CALDWELL.

COMPUTER DEPARTMENT, CODE 083
NAVAL OCEANOGRAPHIC OFFICE
SUITLAND, MD. 20390

VERTICAL TEMPERATURE GRADIENTS

LANGUAGE - FORTRAN
COMPUTER - IBM 7074

(COPY ON FILE AT NODC)
COMPUTES, FROM GEOGRAPHIC STATION DATA, THE VERTICAL TEMPERATURE GRADIENT LARGEST IN ABSOLUTE MAGNITUDE BETWEEN SUCCESSIVE STANDARD DEPTHS, FOR EACH STATION. THESE GRADIENTS ARE TABULATED IN FREQUENCY DISTRIBUTION FORMAT, AND AVERAGES ARE CALCULATED FOR EACH ONE-DEGREE SQUARE. OS NO. 20126 PART 2. AUTHOR-- C.S. CALDWELL.

COMPUTER DEPARTMENT, CODE 083
NAVAL OCEANOGRAPHIC OFFICE
SUITLAND, MD. 20390

DENSITY (SIGMA-T) GRADIENT BY 1-DEGREE SQUARE

LANGUAGE - FORTRAN
COMPUTER - IBM 7074

(COPY ON FILE AT NODC)
COMPUTES, FROM GEOGRAPHIC STATION DATA, THE VERTICAL SIGMA-T GRADIENT LARGEST IN ABSOLUTE MAGNITUDE BETWEEN SUCCESSIVE STANDARD DEPTHS, FOR EACH STATION. THESE GRADIENTS ARE TABULATED FOR FREQUENCY DISTRIBUTION FORMAT, AND AVERAGES ARE CALCULATED FOR EACH 1-DEG SQ. OS NO. 20122. AUTHOR-- C.S. CALDWELL.

COMPUTER DEPARTMENT, CODE 083
NAVAL OCEANOGRAPHIC OFFICE
SUITLAND, MD. 20390

THERMOCLINE ONE-DEGREE

LANGUAGE - AUTOCODER
COMPUTER - IBM 7074

(COPY ON FILE AT NODC)
PRODUCES A DESCRIPTION OF THE THERMOCLINE BY DEFINING THE TOP, BOTTOM, MAGNITUDE, AND INTENSITY OF THE THERMOCLINE AND THE MOST EXTREME INTENSITY WITHIN THE THERMOCLINE. THE PRINTED REPORT CONTAINS THE ABOVE QUANTITIES FOR EACH STATION WITHIN A 1-DEGREE SQUARE, ALSO AVERAGE VALUES FOR THE 1-DEGREE SQUARE. IN PRODUCTION MODE, THE PROGRAM USES A CONSTANT THERMOCLINE CRITERION. IN THE TEST MODE, THE CRITERION MAY BE INCREMENTED FOR ANOTHER PASS OF THE SAME DATA TAPE. OS NO. 20126, PART 4. AUTHOR-- C.S. CALDWELL.

COMPUTER DEPARTMENT, CODE 083
NAVAL OCEANOGRAPHIC OFFICE
SUITLAND, MARYLAND 20390

SALINITY GRADIENT BY ONE-DEGREE SQUARE

LANGUAGE - FORTRAN
COMPUTER - IBM 7074

(COPY ON FILE AT NODC)
COMPUTES, FROM GEOGRAPHIC STATION DATA, THE VERTICAL SALINITY GRADIENT LARGEST IN ABSOLUTE MAGNITUDE BETWEEN SUCCESSIVE STANDARD DEPTHS, FOR EACH STATION. THIS INFORMATION IS TABULATED IN FREQUENCY DISTRIBUTION FORM, AND AVERAGES ARE CALCULATED FOR EACH ONE-DEGREE SQUARE. THE FREQUENCY INTERVAL IS 0.01 0/00/M BETWEEN LIMITS OF -0.5 AND +2.5 0/00/M. OS NO. 20121. AUTHOR-- C.S. CALDWELL.

COMPUTER DEPARTMENT, CODE 083
NAVAL OCEANOGRAPHIC OFFICE
SUITLAND, MD. 20390

SALINITY DEVIATION COMPUTATION WITH PLOT

LANGUAGE - FORTRAN
COMPUTER - IBM 7074

(COPY ON FILE AT NODC)
THE DEVIATIONS OF SALINITY FROM RELATED MODELS ARE COMPUTED FOR SERIAL OCEANOGRAPHIC STATION DATA AND A SALINITY PROFILE PLOTTED. OS NO. - 52301. AUTHOR-- S.C. PORTER.

DEVELOPMENT DIVISION, CODE 2320
NATIONAL OCEANOGRAPHIC DATA CENTER
WASHINGTON, D. C. 20390

STATION DATA VERTICAL ARRAY SUMMARY

LANGUAGE - AUTOCODER
COMPUTER - IBM 7074

(COPY ON FILE AT NODC)
SUMMARIZES FOR ANY COMBINATION OF SIX PARAMETERS (TEMPERATURE, SALINITY, SIGMA-T, OXYGEN, SOUND VELOCITY, DYNAMIC DEPTH) AND COMPUTES MAXIMUM AND MINIMUM VALUES, NUMBER OF OBSERVATIONS, MEANS AND STANDARD DEVIATIONS AT STANDARD LEVELS. SUMMARIES MAY BE MONTHLY OR YEARLY AND

BY SELECTED ONE-DEGREE SQUARES. THERE IS AN OPTION TO GENERATE A SPECIAL CONDENSED TAPE FOR INPUT TO A HISTOGRAM PLOT PROGRAM. OS NO. 52257. AUTHOR-- MAXINE JACKSON.

COMPUTER SYSTEMS DIVISION
NATIONAL OCEANOGRAPHIC DATA CENTER
WASHINGTON, D.C. 20390

MARSDEN SQUARE AVERAGES FROM OCEAN STATION GEO-SORTED FILE
LANGUAGE - FORTRAN
COMPUTER - IBM 7074

(COPY ON FILE AT NODC)
CALCULATES AVERAGE SEA SURFACE SOUND VELOCITY, AVERAGE LAYER DEPTH, AVERAGE DEPTH OF THE SOUND CHANNEL AXIS, AND AVERAGE SOUND VELOCITY AT THE SOUND CHANNEL AXIS. THESE VALUES ARE CALCULATED FOR EACH ONE-DEGREE QUADRANGLE FOR EACH MONTH. A SUBPROGRAM 'AREAD' IS CALLED WHICH GAINS ACCESS TO THE NODC ARCHIVE TAPE FILE OF SORTED OCEANOGRAPHIC DATA. REF. INFORMAL REPORT IR NO. 67-95 (DEC 1967), ENTITLED 'EXTRACTING INFORMATION FROM THE GEO-SORT FILE BY COMPUTER PROGRAMING', BY J. C. FRANCE, OCEANOGRAPHIC ANALYSIS DIVISION, CODE 3316. FURTHER INFORMATION MAY BE OBTAINED FROM DISSEMINATION DEPT. CODE 44, OR THE AUTHOR

NAVAL OCEANOGRAPHIC OFFICE
WASHINGTON, D.C. 20390

STATION DATA PARAMETER INVENTORY
LANGUAGE - FORTRAN
COMPUTER - IBM 7074

(COPY ON FILE AT NODC)
LISTS GEOSORTED STATION DATA, ONE LINE FOR EACH STATION, SHOWING, BESIDES NORMAL IDENTIFICATION FIELDS, THE DEPTH TO BOTTOM, MAXIMUM SAMPLE DEPTH, PRESENCE OR ABSENCE OF WATER COLOR AND TRANSPARENCY CODES, MAXIMUM DEPTH OF SOUND VELOCITIES, MINIMUM DEPTH, AND A VERTICAL INDICATOR WHICH IS THE ARITHMETIC AVERAGE OF VERTICAL SAMPLE SPACING IN TENS OF METERS. OS NO 52230. ALSO, PROGRAM CAN WRITE OUTPUT, INTERNAL NOTATION, FOR INPUT TO A PLOTTER PROGRAM (OS NO. 52229). AUTHOR - ROBERT VAN WIE.

COMPUTER SYSTEMS DIVISION
NATIONAL OCEANOGRAPHIC DATA CENTER
WASHINGTON, D.C. 20390

DAILY SEAWATER OBSERVATIONS
LANGUAGE - FORTRAN IV
COMPUTER - CDC 3100

INPUTS DAILY OBSERVATIONS OF TEMPERATURE AND SALINITY AND OUTPUTS (1) QUARTERLY STATISTICS (2) ANNUAL STATISTICS (3) A LISTING OF SEVEN-DAY NORMALLY WEIGHTED MEANS FOR ONE YEAR (4) A PLOT OF NORMALLY WEIGHTED MEANS FOR ONE YEAR. AUTHOR-- H. SOMERS. EARLY VERSION IN FORTRAN II-D FOR THE IBM 1620.

CANADIAN OCEANOGRAPHIC DATA CENTRE
615 BOOTH STREET
OTTAWA, CANADA

OCEANOGRAPHIC SUMMARY (NOS. 1,2,3)
LANGUAGE - FORTRAN IV
COMPUTER - IBM 360/65

SUMMARIZES TEMPERATURE, SALINITY, DEPTH AND OXYGEN BY 1-DEGREE SQUARES AND OTHER DEGREE AREAS WITHIN SELECTED MARSDEN SQUARES, AT SELECTED SIGMA-T LEVELS. VERSIONS OF PROGRAM FOR CARD OR TAPE INPUT, AND EITHER CHART OR VERTICAL SECTION OUTPUT.

BUREAU OF COMMERCIAL FISHERIES BIOLOGICAL LAB.
ATTN. DR. R. A. BARKLEY, OCEANOGRAPHER
P.O. BOX 3830
HONOLULU, HAWAII 96812

SEA SENSE - DATA DISPLAY

LANGUAGE - FORTRAN
COMPUTER - IBM 7074

(COPY ON FILE AT NODC)
EVALUATES NOMAD (NAVAL OCEANOGRAPHIC AND METEOROLOGICAL AUTOMATIC DEVICE) BUOY DATA, AND OUTPUTS A DISPLAY OF EACH OF THE 5 METEOROLOGICAL PARAMETERS. THE DISPLAY IS PRINTED BY THE IBM 1401. IN ADDITION TO THE DISPLAY, THE PROGRAM TOTALS THE NUMBER OF OBSERVATIONS MISSING FOR ANY MONTH, AND PRINTS A HISTOGRAM OF THE DATA FOR EACH MONTH. THIS PROGRAM IS ONE OF A CONTINUING SERIES OF COMPUTER PROGRAMS IN PROJECT SEA SENSE. AUTHOR-- DIANA LAMAR.

SERVICES DIVISION, CODE 2210
NATIONAL OCEANOGRAPHIC DATA CENTER
WASHINGTON, D. C. 20390

SEA SENSE - LIMIT

LANGUAGE - FORTRAN
COMPUTER - IBM 7074

(COPY ON FILE AT NODC)
COMPARES NOMAD BUOY DATA TO ESTABLISHED NORMALS OF ABSOLUTE VALUES AND TO ACCEPTABLE MAP DATA. A MONTHLY TOTAL FOR EACH PARAMETER IS COMPUTED AND PRINTED FOR DATA WHICH IS GOOD, BAD, DOUBTFUL AND MISSING. ALSO COMPUTES THE PERCENT OF WIND SPEEDS IN EACH BEAUFORT FORCE CATEGORY AND PRINTS THIS WITH THE NORMALS EXPECTED FOR THAT MONTH. WIND DIRECTION PERCENTS ARE COMPUTED ACCORDING TO THE 9 CATEGORIES OF WIND DIRECTION, AND PRINTED VS. THE NORMALS. ALSO THE MEANS OF NOMAD AND MAP DATA ARE COMPUTED AND PRINTED VS. THE LIMIT MEANS. AUTHOR-- DIANA LAMAR.

SERVICES DIVISION, CODE 2210
NATIONAL OCEANOGRAPHIC DATA CENTER
WASHINGTON, D. C. 20390

SEA SENSE - STANDARD DEVIATION

LANGUAGE - FORTRAN
COMPUTER - IBM 7074

(COPY ON FILE AT NODC)
COMPUTES THE MEAN AND STANDARD DEVIATION FOR EACH OF 5 METEOROLOGICAL PARAMETERS FOR EACH MONTH OF NOMAD BUOY DATA. IF MAP DATA IS AVAILABLE, THE MEANS AND STANDARD DEVIATIONS AND MEANS AND STANDARD DEVIATIONS OF THE DIFFERENCES BETWEEN NOMAD AND MAP DATA ARE COMPUTED. ALSO COMPUTES THE TOTAL MEAN SIGNAL STRENGTH AND THE MEANS FOR EACH SYNOPTIC HOUR. AUTHOR-- DIANA LAMAR.

SERVICES DIVISION, CODE 2210
NATIONAL OCEANOGRAPHIC DATA CENTER
WASHINGTON, D. C. 20390

SYNOPTIC MARINE WEATHER DATA SUMMARY

LANGUAGE - FORTRAN-62
COMPUTER - CDC 3600

COMPILATION OF MONTHLY SEA SURFACE TEMPERATURES AND ANOMALIES (DEGREES CENTIGRADE), AIR TEMPERATURES (DEGREES CENTIGRADE), DEWPOINT TEMPERATURES (DEGREES CENTIGRADE), BAROMETRIC PRESSURES (MILLIBARS), X- AND Y- WIND VECTORS (KNOTS), WIND SPEEDS (KNOTS), CLOUD COVER (TENTHS OF SKY COVERED), AND HEAT BUDGET VALUES (ENERGY EXCHANGE ACROSS AIR-SEA INTERFACE IN CALORIES/CENTIMETER SQUARED/DAY) WITH NUMBER OF OBSERVATIONS BY FIVE DEGREE QUADRANGLES - PACIFIC OCEAN. AUTHOR-- MARVIN W. CLINE

DIRECTOR
FISHERY OCEANOGRAPHY CENTER
BUREAU OF COMMERCIAL FISHERIES
P.O. BOX 271
LA JOLLA, CALIFORNIA 92038

SEA SURFACE TEMPERATURE DATA SUMMARY

LANGUAGE - FORTRAN-62
COMPUTER - CDC 3600

COMPILATION OF MONTHLY SEA SURFACE TEMPERATURES (DEGREES FAHRENHEIT) WITH NUMBER OF OBSERVATIONS BY ONE-DEGREE QUADRANGLES - PACIFIC OCEAN.

DIRECTOR
FISHERY OCEANOGRAPHY CENTER
BUREAU OF COMMERCIAL FISHERIES
P.O. BOX 271
LA JOLLA, CALIFORNIA 92038

SEA SURFACE TEMPERATURE AND ANOMALY SUMMARY

LANGUAGE - FORTRAN-62
COMPUTER - CDC 3600

COMPILATION OF MONTHLY SEA SURFACE TEMPERATURES (DEGREES FAHRENHEIT AND CENTIGRADE) AND ANOMALIES FROM LONG TERM MEAN WITH NUMBER OF OBSERVATIONS BY TWO-DEGREE QUADRANGLES - PACIFIC OCEAN.

DIRECTOR
FISHERY OCEANOGRAPHY CENTER
BUREAU OF COMMERCIAL FISHERIES
P.O. BOX 271
LA JOLLA, CALIFORNIA 92038

HEMISPHERIC SEA SURFACE TEMPERATURE ANALYSIS

LANGUAGE - MACHINE
COMPUTER - CDC 1604

(A) MAINTAINS UP-TO-DATE LARGE SCALE SYNOPTIC SEA SURFACE TEMPERATURE DISTRIBUTION FOR NORTHERN HEMISPHERE, (B) SUPPLIES INPUT MATERIAL FOR DETAILED ANALYSIS OF SELECTED LOCAL REGIONS ON A CURRENT BASIS ONLY. OUTPUT FROM PROGRAM-- (A) CALCOMP HARD COPY MAP, SCALE 1/60 MILLION, WITH ISOTHERMS AT 2-DEG INTERVALS, (B) 63X63 ARRAY OF GRID POINT VALUES ON POLAR STEREOGRAPHIC PROJECTION WITH EQUATOR AN INSCRIBED CIRCLE (C) CERTAIN MEAN CHARTS OF SEA SURFACE TEMPERATURE FOR 5 DAYS, 15 DAYS AND MONTHLY. REF. TECHNICAL NOTE NO. 21 (1966).

COMMANDING OFFICER
FLEET NUMERICAL WEATHER CENTRAL
MONTEREY, CALIFORNIA 93940

GG T SEA

LANGUAGE - MACHINE
COMPUTER - CDC 1604

CALCULATES THE LOCATION OF LARGE SCALE HYPER-BAROCLINIC ZONES IN THE OCEANS. INPUT IS THE OUTPUT FROM THE SEA SURFACE TEMPERATURE ANALYSIS PROGRAM. OUTPUT ARE ISOLINES OF THE GG PARAMETER. THE DIRECTIONAL SECOND SPACE DERIVATIVE OF THE BASIC PARAMETER IS COMPUTED. CORE STORAGE-- 32000 48-BIT WORDS. ADDITIONAL STORAGE REQUIREMENTS-- ONE MILLION WORD DRUM. DATA IS IN THE STANDARD FNWC FORMAT. DIRECT REQUESTS FOR INFORMATION TO--

COMMANDING OFFICER
FLEET NUMERICAL WEATHER CENTRAL
MONTEREY, CALIFORNIA 93940

AVERAGE TEMPERATURES IN WATER COLUMN

LANGUAGE - MAD
COMPUTER - IBM 7090

COMPUTES AVERAGE TEMPERATURE FOR EACH 10 METER LAYER IN WATER COLUMN. AVERAGE COMPUTED FOR EACH 1-DEG. LAT. X 1-DEG. LONG. SQUARE FOR EACH MONTH. INPUT-- DIGITIZED BT DATA.

VINCENT NOBLE
THE UNIVERSITY OF MICHIGAN
GREAT LAKES RESEARCH DIVISION

1077 NORTH UNIVERSITY BUILDING
ANN ARBOR, MICHIGAN 48104

SUBSURFACE THERMAL STRUCTURE ANALYSIS

LANGUAGE - SCRAP
COMPUTER - CDC 1604

PRODUCES ANALYSIS OF (1) TEMPERATURE AT TOP OF THERMOCLINE (2) TEMPERATURE AT SELECTED SUBSURFACE LEVELS (3) GRADIENT, MAGNITUDE, AND BOTTOM OF THERMOCLINE AND (4) THERMOCLINE TENDENCY AND FLUCTUATIONS. INPUT TO PROGRAM-- (1) SEA SURFACE TEMPERATURE ANALYSIS (2) GRADIENT OF TRANSIENTS (3) PREVIOUS ANALYSIS OF ALL LEVELS (4) CLIMATOLOGY OF ALL LEVELS (5) ANALYSIS OF MIXED LAYER DEPTH, AND CURRENT TRANSPORT (6) BT REPORTS (7) WAVE HEIGHT FORECASTS AND (8) MIXED LAYER DEPTH FORECASTS. INPUT IS IN FNWC STANDARD FORMAT FIELDS. REF. TECH. NOTE NO. 21.

COMMANDING OFFICER
FLEET NUMERICAL WEATHER CENTRAL
MONTEREY, CALIFORNIA 93940

OCEAN STATION DEPTH SUMMARY

LANGUAGE - SPS
COMPUTER - IBM 1401

(COPY ON FILE AT NODC)
USES THE NODC MASTER CARD FILE FOR OCEAN STATIONS WORLDWIDE, WHICH, IN ADDITION TO ALL IDENTIFICATION FIELDS, CONTAINS DEPTH TO BOTTOM AND MAXIMUM SAMPLE INFORMATION. THE RECORDS ARE PUT ON TAPE, GEO-SORTED, ZONE-EDITED AND BLOCKED. THE FILE IS UPDATED SEMIANNUALLY. THE SUMMARY PROGRAM, REQUESTED BY NAVOCEANO MARINE SCIENCES DEPT., MAKES A TALLY OF THE NUMBER OF STATIONS WITH MAX. SAMPLES WITHIN GIVEN INTERVALS, WITHIN A GIVEN DISTANCE FROM THE BOTTOM, ETC. TOTAL COUNTS ARE PRINTED FOR EACH MARSDEN SQ., AND GRAND TOTALS FOR THE FILE. OS NO. 52286. AUTHOR-- C. DINGER

COMPUTER SYSTEMS DIVISION
NATIONAL OCEANOGRAPHIC DATA CENTER
WASHINGTON, D. C. 20390

--* PHYSICAL QUANTITIES, COMPUTATION OF *-*-*

STATION DATA COMPUTE

LANGUAGE - AUTOCODER
COMPUTER - IBM 7074

(COPY ON FILE AT NODC)
INTERPOLATES FOR TEMPERATURE, SALINITY, AND OXYGEN AT STANDARD DEPTHS. COMPUTES SIGMA-T AND WILSON'S SOUND SPEED AT OBSERVED AND STANDARD DEPTHS, COMPUTES SPECIFIC VOLUME ANOMALY AND DYNAMIC DEPTH ANOMALY AT STANDARD DEPTHS. OS NO. 52251, AUTHOR-- MAXINE JACKSON. ANOTHER PROGRAM FOR NODC STATION DATA COMPUTATIONS WAS WRITTEN LATER FOR THE GE-235/DATANET 30 SYSTEM IN BASIC LANGUAGE, BY JIM NOEL. CURRENTLY, THE 'COMPUTE' PROGRAM IS BEING REWRITTEN IN PL/I FOR THE IBM OS/360, BY MAXINE JACKSON AND MICHAEL FLANAGAN.

COMPUTER SYSTEMS DIVISION
NATIONAL OCEANOGRAPHIC DATA CENTER
WASHINGTON, D. C. 20390

BATHYTHERMOGRAPH DATA CONVERTER

LANGUAGE - AUTOCODER
COMPUTER - IBM 7074

(COPY ON FILE AT NODC)
CONVERTS BT TEMPERATURE DATA FROM 10 FEET - FAHRENHEIT, 2 FATHOMS - FAHRENHEIT, 6 METERS - CENTIGRADE TO 5 METERS - CENTIGRADE INTERVALS. OS NO. 52253. AUTHOR-- MAXINE JACKSON. NODC HAS ALSO IN THE PROGRAM LIBRARY A FORTRAN LANGUAGE ROUTINE TO CONVERT BT DATA, NODC FORMAT,

FROM FAHRENHEIT/FEET AT 10 FT. INTERVALS TO CELSIUS/METERS AT 5 METER INTERVALS USING LINEAR INTERPOLATION. AUTHOR-- RUDI SAENGER. OS NO. 52202.

COMPUTER SYSTEMS DIVISION
NATIONAL OCEANOGRAPHIC DATA CENTER
WASHINGTON, D. C. 20390

NIO PROGRAM 58 ATLAS - STATION DATA

LANGUAGE - EMA
COMPUTER - ATLAS 1

VARIOUS PROPERTIES OF SEA WATER ARE CALCULATED FROM THE SETS OF READINGS OF PRESSURE (OR DEPTH), TEMPERATURE AND SALINITY TAKEN AT A STATION. SOME RESULTS ARE GIVEN AT OBSERVED, AND SOME AT STANDARD, PRESSURES. THERE ARE SEVERAL VERSIONS OF THIS PROGRAM DEPENDING ON WHETHER PRESSURE OR DEPTH IS INPUT. AUTHOR-- JAMES CREASE. REF. N.I.O. INTERNAL REPORT NO. N6.

NATIONAL INSTITUTE OF OCEANOGRAPHY
WORMLEY, GODALMING, SURREY
ENGLAND

INTERPOLATION OF SPECIFIC VOLUME ANOMALY

LANGUAGE - FORTRAN
COMPUTER - IBM 7074

(COPY ON FILE AT NODC)
COMPUTES SPECIFIC VOLUME ANOMALIES AND DYNAMIC DEPTH ANOMALIES AT OBSERVED LEVELS. FIELDS OCCUPY THE SAME POSITIONS AS ON THE NODC FORMAT STANDARD CARD AND REPLACE SOME CHEMISTRY FIELDS. AT STANDARD DEPTHS SPECIFIC VOLUME ANOMALIES ARE INTERPOLATED FROM THE OBSERVED LEVELS RATHER THAN COMPUTED FROM INTERPOLATED TEMPERATURE AND SALINITY AS HAS BEEN DONE PREVIOUSLY. DYNAMIC DEPTH ANOMALIES AT THESE STANDARD DEPTHS ARE THEN COMPUTED FROM THESE INTERPOLATED SPECIFIC VOLUME ANOMALIES. AN OUTPUT LISTING MAY BE MADE WHICH COMPARES THE TWO FIELDS AT STANDARD DEPTHS WITH THE SAME TWO FIELDS APPEARING ON THE INPUT DATA TO SHOW THE RESULTANT DIFFERENCES. OS NO. 52232. AUTHOR-- ROBERT VAN WIE.

COMPUTER SYSTEMS DIVISION, CODE 2400
NATIONAL OCEANOGRAPHIC DATA CENTER
WASHINGTON, D.C. 20390

INTERPOLATION FOR OCEANOGRAPHIC DATA

LANGUAGE - FORTRAN
COMPUTER - CDC 3200 AND IBM 1620

(COPY ON FILE AT NODC)
INTERPOLATES THE VALUES OF DEPTH, TEMPERATURE, AND SALINITY AT ISENTROPIC LEVELS (CONSTANT VALUES OF THE DENSITY FUNCTIONS). USES A FOUR-POINT LAGRANGIAN POLYNOMIAL, EXCEPT MODIFICATIONS ARE MADE WHERE COMMON OCEANOGRAPHIC CONDITIONS DISTORT THE POLYNOMIAL. A DETAILED TECHNICAL REPORT PUBLISHED IN TM NO. 312 (FEB. 1964), AUTHORS-- J. FARRELL AND R. LAVOIE. COPIES OBTAINABLE FROM DDC, NUWS, NODC.

NAVAL UNDERWATER WEAPONS RESEARCH
AND ENGINEERING STATION
NEWPORT, RHODE ISLAND 02840

PHYSICAL OCEANOGRAPHY DATA REDUCTION PROGRAMS FOR THE CDC 3100

LANGUAGE - FORTRAN II
COMPUTER - CDC 3100

(COPY ON FILE AT NODC)
AN OCEANOGRAPHIC DATA PROCESSING SYSTEM DESIGNED TO ACCEPT THE DATA FROM THE ORIGINAL LOG SHEETS. COMPUTES OBSERVED TEMPERATURES AND PRESSURES FROM THERMOMETER READINGS, SALINITIES FROM THE CONDUCTIVITY RATIO READINGS, THE DISSOLVED OXYGEN FROM THE TITRES AND THE REACTIVE SILICA CONCENTRATIONS FROM THE OPTICAL DENSITIES. THE DATA INPUT MAY BE PUNCHED PAPER TAPE FROM THE PDP-8 SYSTEM (B.I. COMPUTER NOTE 68-5-C) OR PUNCHED CARDS. THE FINAL PROGRAM IN THE SYSTEM COMPUTES DEPTH,

POTENTIAL TEMPERATURE, SURFACE DENSITY ANOMALY, POTENTIAL SURFACE DENSITY ANOMALY AND SPECIFIC VOLUME ANOMALY. THE PROGRAM ALSO CAN COMPUTE THE DYNAMIC HEIGHT AND POTENTIAL ENERGY ANOMALY AT GIVEN PRESSURES AND MAY ALSO GIVE A MAGNETIC TAPE OF THE DATA IN CARD IMAGE OF THE CODC FORMAT. CORE STORAGE-- 16K. REF. B.I. COMPUTER NOTE 68-10-C (OCT 1968, 280 PAGES), BY R. REINIGER, C.K. ROSS, P. TRITES AND D.J. LAWRENCE.

DIRECTOR
ATLANTIC OCEANOGRAPHIC LABORATORY
BEDFORD INSTITUTE
DARTMOUTH, NOVA SCOTIA, CANADA

WET

LANGUAGE - FORTRAN
COMPUTER - HP 2115A

(COPY ON FILE AT NODC)
FOR SHIPBOARD PROCESSING OF DIGITIZED SALINITY-TEMPERATURE-DEPTH DATA. INPUT IS ON PAPER TAPE (SEE FRB PROGRAM 'DEEP'). OUTPUT ARE PARAMETERS AT STANDARD PRESSURES - TEMPERATURE, SALINITY, SIGMA-T, DELTA-D, SPECIFIC GRAVITY ANOMALY, SPECIFIC VOLUME ANOMALY, GEOPOTENTIAL ANOMALY, AND POTENTIAL ENERGY. DOCUMENTATION IN FRB TECHNICAL REPORT NO. 152 (DECEMBER 1969), BY A. HUYER AND C. A. COLLINS (UNPUBLISHED MS.).

DR. C. A. COLLINS
MARINE SCIENCES BRANCH, DEMR
PACIFIC OCEANOGRAPHIC GROUP
BIOLOGICAL STATION
NANAIMO, B.C., CANADA

STP02

LANGUAGE - FORTRAN IV
COMPUTER - IBM 1130

(COPY ON FILE AT NODC)
COMPUTES DERIVED OCEANOGRAPHIC QUANTITIES FOR BISSETT-BERMAN S.T.D. CASTS. PRINTED OUTPUT HAS PRESSURE, TEMPERATURE, SALINITY, DEPTH, SIGMA-T, SPECIFIC VOLUME ANOMALY, POTENTIAL TEMPERATURE AND DENSITY, DYNAMIC HEIGHT, POTENTIAL ENERGY ANOMALY, OXGYEN CONTENT. SOUND VELOCITY OPTIONAL. INPUT DATA IS IN CODC FORMAT. DOCUMENTED IN FRB MANUSCRIPT REPORT (UNPUBLISHED) NO. 1071 (DECEMBER 1969), BY C.A. COLLINS, R.L.K. TRIPE AND S.K. WONG.

DR. C. A. COLLINS
MARINE SCIENCES BRANCH, DEMR
PACIFIC OCEANOGRAPHIC GROUP
BIOLOGICAL STATION
NANAIMO, B.C., CANADA

HYDRO

LANGUAGE - FORTRAN IV
COMPUTER - IBM 1130

(COPY ON FILE AT NODC)
COMPUTES DERIVED OCEANOGRAPHIC QUANTITIES FOR HYDROGRAPHIC CASTS. OUTPUT ON IBM 1132 PRINTER LISTS PRESSURE, TEMPERATURE, SALINITY, DEPTH, SIGMA-T, SPECIFIC VOLUME ANOMALY, POTENTIAL TEMPERATURE AND DENSITY, DYNAMIC HEIGHT, POTENTIAL ENERGY ANOMALY, AND OXYGEN CONTENT, WITH SOUND VELOCITY OPTIONAL. DESCRIPTION AND LISTINGS IN FRB (UNPUBLISHED) MANUSCRIPT REPORT NO. 1071 (DEC 1969).

DR. C. A. COLLINS
MARINE SCIENCES BRANCH, DEMR
PACIFIC OCEANOGRAPHIC GROUP
BIOLOGICAL STATION
NANAIMO, B.C., CANADA

CADS (CALCULATE DEPENDENT QUANTITIES)

LANGUAGE - FORTRAN IV
COMPUTER - IBM 1800

FROM THE OBSERVED DEPTHS, TEMPERATURES AND SALINITIES, CALCULATES THE

VARIOUS DEPENDENT QUANTITIES, SUCH AS POTENTIAL TEMPERATURES, SPECIFIC VOLUME ANOMALIES, SIGMAS, AND DYNAMIC HEIGHTS. INTERPOLATES FOR THESE QUANTITIES AT STANDARD DEPTH USING A DOUBLE LAGRANGE'S INTERPOLATION METHOD. FROM A PAIR OF STATIONS WITH A REFERENCE DEPTH, MEAN LATITUDE AND DISTANCE BETWEEN STATIONS, CALCULATES AT STANDARD DEPTHS RELATIVE VELOCITIES AND VOLUME TRANSPORTS. AUTHORS-- MR. MANLEY, L.W. YOUNG.

MARINE LIFE RESEARCH GROUP
SCRIPPS INSTITUTION OF OCEANOGRAPHY
P.O. BOX 109
LA JOLLA, CALIFORNIA 92037

GO (POTENTIAL TEMP., SIGMA THETA, OXYGEN) — LANGUAGE - FORTRAN IV
COMPUTER - IBM 1800

GIVEN DEPTHS, TEMPERATURES, SALINITIES, AND OXYGENS, CALCULATES POTENTIAL TEMPERATURES, SIGMA THETA'S, AND OXYGENS IN UNITS OF ML/KG. AUTHORS-- MR. MANLEY, L. W. YOUNG.

MARINE LIFE RESEARCH GROUP
SCRIPPS INSTITUTION OF OCEANOGRAPHY
P.O. BOX 109
LA JOLLA, CALIFORNIA 92037

FUNCTION POTLT (POTENTIAL TEMPERATURE) — LANGUAGE - FORTRAN
COMPUTER - IBM 1800

(COPY ON FILE AT NODC)
SUBPROGRAM COMPUTES POTENTIAL TEMPERATURE OF SEA WATER GIVEN SALINITY, TEMPERATURE, AND PRESSURE. P IS IN NEWTONS/SQ M.

NATIONAL INSTITUTE OF OCEANOGRAPHY
WORMLEY, GODALMING, SURREY
ENGLAND

FUNCTION ALPHA (SPECIFIC VOLUME) — LANGUAGE - FORTRAN
COMPUTER - IBM 1800

(COPY ON FILE AT NODC)
SUBPROGRAM COMPUTES SPECIFIC VOLUME OF SEA WATER GIVEN SIGMA-T, SIGMA-ZERO, TEMPERATURE, AND PRESSURE. P IS IN DECIBARS

NATIONAL INSTITUTE OF OCEANOGRAPHY
WORMLEY, GODALMING, SURREY
ENGLAND

FUNCTION SIGM0 — LANGUAGE - FORTRAN
COMPUTER - IBM 1800

(COPY ON FILE AT NODC)
SUBPROGRAM COMPUTES HYDROGRAPHIC FUNCTION SIGMA ZERO FROM SALINITY.

NATIONAL INSTITUTE OF OCEANOGRAPHY
WORMLEY, GODALMING, SURREY
ENGLAND

FUNCTION SIGMT — LANGUAGE - FORTRAN
COMPUTER - IBM 1800

(COPY ON FILE AT NODC)
SUBPROGRAM COMPUTES HYDROGRAPHIC FUNCTION SIGMA-T, FROM SIGMA-0 AND TEMPERATURE.

NATIONAL INSTITUTE OF OCEANOGRAPHY
WORMLEY, GODALMING, SURREY
ENGLAND

IN SITU OCEANOGRAPHIC DATA PROGRAM — LANGUAGE - FORTRAN IV

COMPUTER - IBM 360/65

COMPUTES SIGMA-T, DELTA ALPHA (SPEC. VOL. ANOM.), OXYGEN PER CENT SATURATION. ICES FORMAT CARD-TO-CARD. OUTPUT CARDS CONTAIN THE COMPUTED PARAMETERS ALONG WITH THE HYDRO DATA. AUTHOR-- MARILYNN BORKOWSKI, MODIFYING AN EARLIER PROGRAM BY D.L. SHAFFER FOR THE IBM 1620.

BUREAU OF COMMERCIAL FISHERIES
TROPICAL ATLANTIC BIOLOGICAL LABORATORY
75 VIRGINIA BEACH DRIVE
MIAMI, FLORIDA 33149

OCEANS III

LANGUAGE - FORTRAN IV
COMPUTER - IBM 360/65

OCEANOGRAPHIC STATION PROGRAM, USED FOR QUALITY CONTROL, INTERNAL EDITING, UNIT CONVERSION, COMPUTATION OF MARSDEN SQUARE, SIGMA-T, SOUND VELOCITY. ALSO USED FOR INTERPOLATION TO STANDARD DEPTHS USING RATTRAY'S SCHEME AND COMPUTATION OF SPECIFIC VOLUME ANOMALY, DYNAMIC DEPTH AND POTENTIAL ENERGY ANOMALY. EARLIER VERSION FOR THE IBM 1620 TITLED OCEANS II IS NO LONGER USED AT CODC.

CANADIAN OCEANOGRAPHIC DATA CENTRE
615 BOOTH STREET
OTTAWA, CANADA

DENSITY-SALINITY LINEAR INTERPOLATION

LANGUAGE - FORTRAN
COMPUTER - IBM 7074

(COPY ON FILE AT NODC)
SELECTED DENSITY-SALINITY VALUES TO REPRESENT THE WATER MASS MIDPOINTS OF PARTICULAR AREAS. LINEARLY INTERPOLATES THESE DENSITY-SALINITY VALUES WITH THE RESULTING SALINITIES GIVEN AT EVERY 0.01 SIGMA-T INCREMENT. OS NO. 52321. AUTHOR-- R.P. STEIN.

DEVELOPMENT DIVISION, CODE 2300
NATIONAL OCEANOGRAPHIC DATA CENTER
WASHINGTON, D. C. 20390

S.T.D. EDIT AND INTERPOLATE

LANGUAGE - FORTRAN
COMPUTER - IBM 1130

EDITS, AVERAGES, AND INTERPOLATES STD DATA TO 3-METER INTERVALS. OUTPUT-- SALINITIES AND TEMPERATURES ON CARDS IN CONDENSED FORMAT, AND A LISTING OF DISCARDED VALUES. PROGRAM NO. UWMS-1130.

UNIVERSITY OF WASHINGTON
DEPARTMENT OF OCEANOGRAPHY
22A OCEANOGRAPHY TEACHING BLDG.
ATTN. MRS. HELLA MACINTOSH
SEATTLE, WASH. 98105

INTERPOLATION

LANGUAGE - FORTRAN IV
COMPUTER - IBM 360/65

INTERPOLATES TEMPERATURE, SALINITY, OXYGEN, PHOSPHATE FOR STANDARD DEPTHS, AND DEPTH, TEMPERATURE, SALINITY, OXYGEN, PHOSPHATE FOR STANDARD SIGMA-T SURFACES. INPUT IS ICES FORMAT DATA. METHOD USED IS MEAN OF TWO LAGRANGE POLYNOMIALS, WITH LINEAR INTERPOLATION AT TOP AND BOTTOM OF CAST. CORE STORAGE USED-- 30K BYTES. AUTHOR-- MARILYNN R. BORKOWSKI.

BUREAU OF COMMERCIAL FISHERIES
TROPICAL ATLANTIC BIOLOGICAL LABORATORY
75 VIRGINIA BEACH DRIVE
MIAMI, FLORIDA 33149

INTERPOLATION OF OCEAN STATION DATA AT ISENTROPIC LEVELS

LANGUAGE - FORTRAN
COMPUTER - IBM 7074 AND IBM 1620

(COPY ON FILE AT NODC)
INTERPOLATES DEPTH, TEMPERATURE, AND SALINITY AT ISENTROPIC LEVELS. NUOS (NUWR AND ES) PROGRAM FOR THE IBM 1620 REVISED FOR IBM 7074 BY RUDI SAENGER. THERE ARE TWO VERSIONS OF THIS PROGRAM - (1A) STARTING AT SIGMA-T OF FIRST DATA CARD COMPUTING 99 LEVELS, (1B) STARTING AT SIGMA-T 23.00 COMPUTING 50 LEVELS. INPUT CONSISTS OF NODC'S OCEAN STATION DATA CARDS.

COMPUTER SYSTEMS DIVISION
NATIONAL OCEANOGRAPHIC DATA CENTER
WASHINGTON, D. C. 20390

SHIPBOARD SURVEY -- ON-STATION MODE

LANGUAGE - FORTRAN
COMPUTER - IBM 7074

PROCESSES MAGNETIC TAPES MADE ON-STATION TO-- (1) GENERATE A MAGNETIC TAPE OF SELECTED RECORDED DATA IN NUMERIC FORMAT FOR INPUT TO A PLOTTER PROGRAM (OS NO. 10131), (2) COMPUTE SIGMA-T, SPECIFIC VOLUME ANOMALY AND DYNAMIC DEPTH ANOMALY, (3) PRODUCE PRINTER LISTINGS OF THE RECORDED DATA AND THE CORRESPONDING COMPUTED VALUES, USED IN SELECTING STATIONS FOR WHICH DATA IS TO BE PLOTTED. OS NO. 10132. AUTHOR-- GAY M. BROOK.

NAVIGATIONAL SCIENCE, CODE 5320
NAVAL OCEANOGRAPHIC OFFICE
SUITLAND, MD. 20390

OCEANOGRAPHIC DATA PROGRAM F

LANGUAGE - FORTRAN IV
COMPUTER - IBM 7094

(COPY ON FILE AT NODC)
LAGRANGIAN INTERPOLATIONS AT STANDARD DEPTHS AND COMPUTATION OF SUCH OCEANOGRAPHIC QUANTITIES AS DYNAMIC HEIGHT, THERMOSTERIC ANOMALY, SIGMA-T, SOUND VELOCITY, ETC. ORIGINAL PROGRAM FOR THE IBM 650 BY KILMER AND DUXBURY, 1959, FOR INTERPOLATION AND CALCULATION OF DYNAMIC HEIGHT (TEXAS A. AND M. TECH. REPORT NO. 59-24T), REVISED NOV 1962 BY NOWLIN. EACH STATION REQUIRES HEADER CARDS TO SPECIFY THE ARRANGEMENT OF THE PRINTED OUTPUT AND FOR ADDITIONAL INFORMATION.

TEXAS A AND M UNIVERSITY
COLLEGE OF GEOSCIENCES
DEPARTMENT OF OCEANOGRAPHY
COLLEGE STATION, TEXAS 77843

SIGMAT

LANGUAGE - FORTRAN IV-E
COMPUTER - IBM 360/50

CALCULATES SIGMA-T, DELTA, DELTA-T, POTENTIAL TEMPERATURE, POTENTIAL SIGMA-T, AND POTENTIAL DELTA AT OBSERVED DEPTHS. THE CALCULATION OF POTENTIAL TEMPERATURE IS AN APPROXIMATION SINCE DEPTH IS USED INSTEAD OF PRESSURE. FORMULA USED FOR POTENTIAL TEMPERATURE IS THAT OF FOFONOFF AND FROESE (1958). CALCULATION OF OTHER QUANTITIES IS THE SAME AS IN SUBROUTINE 'SIGMA'.
SUBROUTINES NEEDED-- SIGMA.

ROBERT K. SEXTON
NARRAGANSETT MARINE LABORATORY
UNIVERSITY OF RHODE ISLAND
KINGSTON, RHODE ISLAND 02881

HEIGHT

LANGUAGE - FORTRAN IV-E
COMPUTER - IBM 360/50

UTILIZES OUTPUT FROM PROGRAM 'CARDS' TO CALCULATE DYNAMIC HEIGHTS, GEOSTROPHIC VELOCITIES, TRANSPORTS, AND DELTA VALUES INTERPOLATED AT STANDARD DEPTHS, AS WELL AS POTENTIAL DELTA, AND SIGMA-T AT OBSERVED DEPTHS. CAN ALSO YIELD PUNCHED OUTPUT FOR INPUT TO A PLOTTER ROUTINE. SUBROUTINES NEEDED-- SPEWIT, VEL, MSTRCD, VTR, PDEN, EXTIME, SIGMA, LAINT, DYNHT, HOLES.

ROBERT K. SEXTON
NARRAGANSETT MARINE LABORATORY
UNIVERSITY OF RHODE ISLAND
KINGSTON, RHODE ISLAND 02881

INTEST

LANGUAGE - FORTRAN IV-E
COMPUTER - IBM 360/50

GIVEN SERIAL OBSERVATIONS OF TEMPERATURE, SALINITY AND DEPTH, IT COMPUTES DELTA AT OBSERVED DEPTHS AND CREATES AN ARRAY 'ZSTD' OF STANDARD DEPTHS EVERY 20 M TO 100 M, EVERY 100 M TO 800 M, AND EVERY 200 M THEREAFTER, AND A CORRESPONDING ARRAY 'SUMDEL' CONTAINING A NUMERICAL INTEGRATION OF DELTA WITH DEPTH, IN DYNAMIC CENTIMETERS. SUBROUTINES-- SIGMAD, DELINT.

ROBERT K. SEXTON
NARRAGANSETT MARINE LABORATORY
UNIVERSITY OF RHODE ISLAND
KINGSTON, RHODE ISLAND 02881

AZIZ

LANGUAGE - FORTRAN IV-E
COMPUTER - IBM 360/50

SUBROUTINE COMPUTES THERMOMETRIC DEPTH FROM CORRECTED PROTECTED AND UNPROTECTED THERMOMETER READINGS. AN ESTIMATE OF DEPTH IS OBTAINED BY TAKING 100 TIMES THE DIFFERENCE IN UNPROTECTED AND PROTECTED THERMOMETER READINGS. THIS ESTIMATE IS USED TO CALCULATE A FIRST VALUE FOR MEAN DENSITY, RHO, USING AN EQUATION FROM A POLYNOMIAL FIT OF WUST'S DATA OF MEAN DENSITY WITH DEPTH IN THE NORTH ATLANTIC ('THERMOMETRIC MEASUREMENT OF DEPTH' BY G. WUST, IN THE HYDROGRAPHIC REVIEW 10, 1933, TABLE 1, PAGE 34). THIS DENSITY IS USED IN THE EXPRESSION D (METERS) EQUALS (TU-TW/Q * RHO) TO CALCULATE DEPTH. THIS DEPTH IS USED TO RECALCULATE THE MEAN DENSITY, RHO, AND THE LAST TWO STEPS ITERATED UNTIL SUCCESSIVE CALCULATIONS AGREE TO WITHIN 0.25 METERS.

ROBERT K. SEXTON
NARRAGANSETT MARINE LABORATORY
UNIVERSITY OF RHODE ISLAND
KINGSTON, RHODE ISLAND 02881

LINT

LANGUAGE - FORTRAN IV-E
COMPUTER - IBM 360/50

SUBROUTINE PROVIDES LINEAR INTERPOLATION OF AN X VALUE FOR THE GIVEN Y VALUE. IF Y IS OUTSIDE THE LIMITS OF THE Y AXIS, THE CORRESPONDING X END POINT VALUE IS USED, AND THE MESSAGE INDICATOR IS SET TO SHOW THIS.

ROBERT K. SEXTON
NARRAGANSETT MARINE LABORATORY
UNIVERSITY OF RHODE ISLAND
KINGSTON, RHODE ISLAND 02881

DELINT

LANGUAGE - FORTRAN IV-E
COMPUTER - IBM 360/50

GIVEN OBSERVED DEPTH, TEMPERATURE AND SALINITY, STANDARD DEPTHS ARE GENERATED AND PLACED IN THE ARRAY BETWEEN THE OBSERVED DEPTHS. IT CALCULATES DELTA FOR OBSERVED DEPTHS AND INTERPOLATES DELTAS FOR

STANDARD DEPTHS.
SUBROUTINES NEEDED-- SIGMAD.

ROBERT K. SEXTON
NARRAGANSETT MARINE LABORATORY
UNIVERSITY OF RHODE ISLAND
KINGSTON, RHODE ISLAND 02881

SIGMA

LANGUAGE - FORTRAN IV-E
COMPUTER - IBM 360/50

SUBROUTINE CALCULATES SIGMA-T, DELTA, IN SITU SPECIFIC VOLUME AND STANDARD WATER COLUMN SPECIFIC VOLUME FROM THE GIVEN CHLORINITY, TEMPERATURE AND DEPTH. THE EQUATIONS USED ARE THOSE CITED BY FOFONOFF IN 'THE SEA', VOL. 1, INTERSCIENCE PUBLISHER, N.Y., 1962, M.N. HILL, ED., USING EQUATION (21), PAGE 8, TO COMPUTE SIGMA ZERO, EQUATION (22) AND THE QUANTITIES FOLLOWING EQUATION (24) TO COMPUTE SIGMA-T, AND USING EQUATION (25) AND (26), PAGE 10, TO COMPUTE SPECIFIC VOLUME.

ROBERT K. SEXTON
NARRAGANSETT MARINE LABORATORY
UNIVERSITY OF RHODE ISLAND
KINGSTON, RHODE ISLAND 02881

SIGMAD

LANGUAGE - FORTRAN IV-E
COMPUTER - IBM 360/50

DOUBLE PRECISION VERSION OF 'SIGMA'.

ROBERT K. SEXTON
NARRAGANSETT MARINE LABORATORY
UNIVERSITY OF RHODE ISLAND
KINGSTON, RHODE ISLAND 02881

DYNHT

LANGUAGE - FORTRAN II
COMPUTER - GE 225

COMPUTES AN ARRAY OF DYNAMIC HEIGHTS (EXPRESSED IN DYNAMIC METERS) FOR SPECIFIED ARRAYS OF PRESSURE AND SPECIFIC VOLUME ANOMALIES. AUTHOR-- JACQUELINE WEBSTER.

INFORMATION PROCESSING CENTER
WOODS HOLE OCEANOGRAPHIC INSTITUTION
WOODS HOLE, MASS. 02543

PEN

LANGUAGE - FORTRAN II
COMPUTER - GE 225

COMPUTES POTENTIAL ENERGY ANOMALY, USING THE TRAPEZOIDAL RULE OF INTEGRATION. PEN SUBROUTINE OCCUPIES 130(8) OR 88(10) LOCATIONS IN MEMORY. AUTHOR-- JACQUELINE WEBSTER.

INFORMATION PROCESSING CENTER
WOODS HOLE OCEANOGRAPHIC INSTITUTION
WOODS HOLE, MASS. 02543

VFREQ

LANGUAGE - FORTRAN II
COMPUTER - GE 225

COMPUTES TABLES OF VAISALA FREQUENCY (RADIANS/SEC.) AND IN SITU DENSITY (GRAMS/CC.), GIVEN TABLES OF DEPTH, TEMPERATURE, AND SALINITY AND THE LATITUDE OF OBSERVATION. AUTHOR-- H. PERKINS.

INFORMATION PROCESSING CENTER
WOODS HOLE OCEANOGRAPHIC INSTITUTION

WOODS HOLE, MASS. 02543

DYNAMIC HEIGHT CALCULATION

LANGUAGE - FORTRAN II
COMPUTER - IBM 1620

INTEGRATES ONE STATION AT A TIME AND THEN PUNCHES THE VALUES IN ORDER. THERE IS AN OPTION, UNDER SENSE SWITCH CONTROL, OF USING THE CALCOMP 560 TO PLOT THE VALUE OF DYNAMIC HEIGHT AGAINST DEPTH. THE INPUT TO THIS PROGRAM IS THE SAME AS THAT FOR THE OCEANOGRAPHIC DATA PROCESSING PROGRAM FOR THE I.C.E.S. FORMAT.

UNIVERSITY OF MIAMI
MARINE LABORATORY
COMPUTER CENTER
1 RICKENBACKER CAUSEWAY
VIRGINIA KEY, MIAMI, FLORIDA

OCEANOGRAPHIC DATA COMPUTATION

LANGUAGE - FORTRAN II
COMPUTER - IBM 709 AND CDC 6400

COMPUTES SALINITY AND SIGMA-T FROM CHLORINITY AND TEMPERATURE INPUT DATA, AND COMPUTES DISSOLVED OXYGEN AND OXYGEN SATURATION.

DEPARTMENT OF GEOLOGY
FLORIDA STATE UNIVERSITY
TALLAHASSEE, FLORIDA 32306

SEA WATER DENSITY -- THERMOSTERIC ANOMALY

LANGUAGE - FORTRAN II
COMPUTER - IBM 7094

SUBROUTINE COMPUTES SIGMA-T AND DELTA-T FROM MEASUREMENTS OF TEMPERATURE AND CHLORINITY. SIGMA-T IS CALCULATED BY THE METHOD OF KNUDSEN. DELTA-T IS COMPUTED BY DEFINITION FROM SIGMA-T.

HARVEY E. WALTERS
CHESAPEAKE BAY INSTITUTE
THE JOHNS HOPKINS UNIVERSITY
CHARLES AND 34TH ST.
BALTIMORE, MD. 21218

SYNOPTIC PROGRAM (UWMS-0980)

LANGUAGE - FORTRAN II
COMPUTER - IBM 7094-II/7040 DCS AND CDC 6400

(COPY ON FILE AT NODC)
REDUCES DATA FROM RAW SHIP-BOARD OBSERVATIONS. CORRECTS THERMOMETERS AND COMPUTES THERMOMETRIC DEPTHS, WIRE ANGLE DEPTHS, SALINITIES FROM BRIDGE READINGS, OXYGEN VALUES FROM TITRATIONS, THEN COMPUTES SIGMA-T, OXYGEN SATURATION PERCENT, AND APPARENT OXYGEN UTILUZATION. CORE STORAGE REQUIRED-- 25,335 WORDS FOR MAIN PROGRAM, 2058 WORDS FOR SUBROUTINES. REF. A 150 PAGE REPORT (UWMS-0980, APR 1967) AND TECHNICAL REPORT NO. 181 (M67-8, JAN 1968), BY EUGENE E. COLLIAS. THERE IS ALSO A MORE LIMITED VERSION FOR THE IBM-1130. REVISED 1969 FOR THE CDC-6400.

H. MACINTOSH, COMPUTER SERVICES
DEPARTMENT OF OCEANOGRAPHY
UNIVERSITY OF WASHINGTON
SEATTLE, WASH. 98105

INTERPOLATION PROGRAM (UWMS-0959)

LANGUAGE - FORTRAN IV
COMPUTER - CDC 6400

INTERPOLATES HYDROGRAPHIC DATA TO STANDARD DEPTHS, AND COMPUTES THE

DYNAMIC QUANTITIES. THE INTERPOLATION METHOD TAKES AN AVERAGE OF THE POINTS OBTAINED FROM TWO PARABOLIC FITS. CORE STORAGE NEEDED-- 32 K WORDS. DOCUMENTATION-- USAGE INSTRUCTIONS. AN OLDER UNIVERSITY OF WASHINGTON PROGRAM 'INTERPOLATION FOR OFFSHORE OCEANOGRAPHIC DATA', IN FORTRAN IV FOR THE IBM 7094, IS IN THE LIBRARY FILE AT THE NODC. THIS INTERPOLATES OCEAN STATION VARIABLES TO STANDARD DEPTHS, USING LAGRANGE SUBROUTINE, CALCULATES ERROR TERMS FOR INTERPOLATIONS, COMPUTES SIGMA-T, SPECIFIC VOLUME ANOMALY, DYNAMIC DEPTH, AND POTENTIAL ENERGY. THE DECK HAS ABOUT 1500 CARDS, INCLUDING TWO FAP SUBROUTINES AND A BINARY EDITOR PROGRAM.

UNIVERSITY OF WASHINGTON
DEPARTMENT OF OCEANOGRAPHY
22A OCEANOGRAPHY TEACHING BLDG.
ATTN. MRS. HELLA MACINTOSH
SEATTLE, WASH. 98105

OCEANOGRAPHIC REPORT PREPARATION

LANGUAGE - FORTRAN IV
COMPUTER - IBM 360/65

INCLUDES CALCULATION OF SIGMA-T AND SPECIFIC VOLUME ANOMALY FOR OBSERVED POINTS, RATTRAY-TYPE LAGRANGE INTERPOLATION AND DYNAMIC DEPTH CALCULATION AT STANDARD DEPTHS.

BUREAU OF COMMERCIAL FISHERIES BIOLOGICAL LAB.
ATTN. DR. R. A. BARKLEY
P.O. BOX 3830
HONOLULU, HAWAII 96812

OCCOMP

LANGUAGE - FORTRAN IV-H
COMPUTER - SDS SIGMA 7

COMPUTES VARIOUS OCEANOGRAPHIC PARAMETERS FROM NODC FORMAT STATION DATA CARDS. OUTPUT IS ON LINE PRINTER. PROGRAM REQUIRES CORE STORAGE OF 12,752 WORDS.

INFORMATION PROCESSING CENTER
ATTN. MARY HUNT
WOODS HOLE OCEANOGRAPHIC INSTITUTION
WOODS HOLE, MASSACHUSETTS 02543

POTEMP, DPOTEM

LANGUAGE - FORTRAN IV-H
COMPUTER - SDS SIGMA 7

(COPY ON FILE AT NODC)
SUBROTUINE COMPUTES THE POTENTIAL TEMPERATURE OF SEA WATER AT A GIVEN TEMPERATURE, SALINITY AND PRESSURE USING A FORMULA OF N.P. FOFONOFF AND C. FROESE IN THE P.O.G. MS REPORT SERIES NO. 27. WRITTEN IN FORTRAN II FOR THE GE 225 BY J. WEBSTER. CONVERTED TO FORTRAN IV-H BY M. HUNT (APRIL 1968). DPOTEM IS A FORM OF POTEMP USING DOUBLE PRECISION VARIABLES. STORAGE REQUIREMENTS-- 137(10) LOCATIONS FOR POTEMP, 116(10) LOCATIONS FOR DPOTEM.

INFORMATION PROCESSING CENTER
ATTN. MARY HUNT
WOODS HOLE OCEANOGRAPHIC INSTITUTION
WOODS HOLE, MASSACHUSETTS 02543

SIGMAT, DSIGMT

LANGUAGE - FORTRAN IV-H
COMPUTER - SDS SIGMA 7

SUBROUTINE COMPUTES SIGMA-T FROM TEMPERATURE AND SALINITY BY KNUDSEN'S FORMULA REWRITTEN BY FOFONOFF AND TABATA. DSIGMT IS DOUBLE-PRECISION FORM OF SIGMAT.

INFORMATION PROCESSING CENTER
ATTN. MARY HUNT

WOODS HOLE OCEANOGRAPHIC INSTITUTION
WOODS HOLE, MASSACHUSETTS 02543

SPVOL, DSPVOL

LANGUAGE - FORTRAN IV-H
COMPUTER - SDS SIGMA 7

SUBROUTINE COMPUTES THE SPECIFIC VOLUME OF SEAWATER AT A GIVEN TEMPERATURE, PRESSURE, SIGMA-0 AND SIGMA-T, USING THE FORMULA BY V.W. EKMAN, REWRITTEN BY FOFONOFF AND TABALA (P.O.G. MANUSCRIPT SERIES NO. 25). DSPVOL IS A FORM OF SPVOL USING DOUBLE-PRECISION VARIABLES. 'ALPHA', THE OUTPUT FROM THE SUBROUTINE, IS THE SPECIFIC VOLUME IN MILLILITRES PER GRAM. THE USE OF SUBROUTINE SIGMAT WOULD BE REQUIRED BEFORE CALLING SPVOL, AND DSIGMT WOULD BE REQUIRED BEFORE CALLING DSPVOL. STORAGE REQUIREMENTS-- 239(10) LOCATIONS FOR SPVOL, 204(10) LOCATIONS FOR DSPVOL. WRITTEN IN FORTRAN II FOR THE GE 225 BY J. WEBSTER, CONVERTED TO FORTRAN IV-H BY M. HUNT (APRIL 1968).

INFORMATION PROCESSING CENTER
ATTN. MARY HUNT
WOODS HOLE OCEANOGRAPHIC INSTITUTION
WOODS HOLE, MASSACHUSETTS 02543

ATG

LANGUAGE - FORTRAN IV-H
COMPUTER - SDS SIGMA 7

CALCULATES ADIABATIC TEMPERATURE GRADIENT FOR SPECIFIED VALUES OF PRESSURE, TEMPERATURE, AND SALINITY, USING AN EMPIRICAL FORMULA DEVELOPED BY N.P. FOFONOFF. (PROGRAM WRITTEN AS SUBROUTINE.)

INFORMATION PROCESSING CENTER
ATTN. MARY HUNT
WOODS HOLE OCEANOGRAPHIC INSTITUTION
WOODS HOLE, MASSACHUSETTS 02543

DSTABF

LANGUAGE - FORTRAN IV-H
COMPUTER - SDS SIGMA 7

SUBROUTINE COMPUTES STABILITY FREQUENCY FROM HYDROGRAPHIC STATION DATA, ACCORDING TO A RELATIONSHIP DERIVED BY HESSELBERG AND SVERDRUP.

INFORMATION PROCESSING CENTER
ATTN. MARY HUNT
WOODS HOLE OCEANOGRAPHIC INSTITUTION
WOODS HOLE, MASSACHUSETTS 02543

SVANOM

LANGUAGE - FORTRAN IV-H
COMPUTER - SDS SIGMA 7

SUBROUTINE COMPUTES THE SPECIFIC VOLUME ANOMALY, GIVEN THE PRESSURE AND THE SPECIFIC VOLUME, FROM AN EMPIRICAL FORMULA DEVISED BY FOFONOFF AND TABATA.

INFORMATION PROCESSING CENTER
ATTN. MARY HUNT
WOODS HOLE OCEANOGRAPHIC INSTITUTION
WOODS HOLE, MASSACHUSETTS 02543

PRESS

LANGUAGE - FORTRAN IV-H
COMPUTER - SDS SIGMA 7

SUBROUTINE COMPUTES A SERIES OF PRESSURES FROM A GIVEN SERIES OF DEPTHS, TEMPERATURES, SALINITIES, AND THEIR LATITUDE. THE EQUATION FOR PRESSURE IS INTEGRATED BY SUCCESSIVE APPROXIMATIONS.

INFORMATION PROCESSING CENTER
ATTN. MARY HUNT
WOODS HOLE OCEANOGRAPHIC INSTITUTION
WOODS HOLE, MASSACHUSETTS 02543

DELTA-ALPHA AND SIGMA-T

LANGUAGE - MAC
COMPUTER - ICT 1301

CALCULATES DELTA-ALPHA AND SIGMA-T AS A FUNCTION OF SALINITY, TEMPERATURE, AND DEPTH. AUTHORS-- A.M. SHIPLEY AND D. SACKS

UNIVERSITY OF CAPE TOWN
OCEANOGRAPHY DEPARTMENT
ATTN. MR. A.M. SHIPLEY
PRIVATE BAG, RONDEBOSCH, C.P.
REPUBLIC OF SOUTH AFRICA

DYNAMIC HEIGHT AND CURRENT DYNAMICS

LANGUAGE - MAD
COMPUTER - IBM 7090

COMPUTES DYNAMIC HEIGHT, VOLUME TRANSPORT, AND NORMAL VELOCITY FOR FRESH WATER.

VINCENT NOBLE
THE UNIVERSITY OF MICHIGAN
GREAT LAKES RESEARCH DIVISION
INSTITUTE OF SCIENCE AND TECHNOLOGY
1077 NORTH UNIVERSITY BUILDING
ANN ARBOR, MICHIGAN 48104

OCEANOGRAPHIC ANALYSIS AND STATION SUMMARY

LANGUAGE - PAL III
COMPUTER - PDP-5, 8S

FORMATS AND RECORDS OCEANOGRAPHIC DATA INCLUDING SURFACE ENVIRONMENTAL PHENOMENA, COMPUTES SIGMA-T, THE ANOMALY OF SPECIFIC VOLUME, AND SOUND VELOCITY AT OBSERVED VALUES OF DEPTH-TEMPERATURE-SALINITY. COMPUTES SIGMA-T AND ANOMALY OF SPECIFIC VOLUME FROM SCALED VALUES OF TEMPERATURE AND SALINITY, THE RESULTS OF A LAGRANGIAN INTERPOLATION. DOES A DEPTH INTEGRATION OF ANOMALY OF SPECIFIC VOLUME FROM THE OBSERVED OR SCALED VALUES IN ORDER TO CALCULATE THE DYNAMIC HEIGHT FROM A LEVEL OF NO-MOTION. PRINCIPALLY USED ABOARD OCEANOGRAPHIC VESSEL BY THE FIELD OCEANOGRAPHER IMMEDIATELY AFTER STATION. WRITTEN FOR THE U.S. COAST GUARD BY LT. R.M. O'HAGAN (RET.), DIGITAL EQUIPMENT CORP., MAYNARD, MASS. COPY OF PROGRAM DEPOSITED WITH DECUS. REF. U.S. COAST GUARD OCEANOGRAPHIC MANUSCRIPT 'OCEANOGRAPHIC COMPUTER PROGRAMS FOR THE PDP-5', 15 OCT. 1964 (UNPUBLISHED MANUSCRIPT). PROGRAM REVISED IN 1965.

DIGITAL EQUIPMENT CORPORATION
MAYNARD, MASSACHUSETTS 01754

DISSOLVED OXYGEN AND POTENTIAL TEMPERATURE

LANGUAGE - PAL III
COMPUTER - PDP-5, 8S

CALCULATES DISSOLVED OXYGEN FROM A GIVEN THIOSULPHATE TITER. CALCULATES PERCENT SATURATION OF OXYGEN (FOX'S FORMULAE). CALCULATES POTENTIAL TEMPERATURE. ASR-33 TELEPRINTER INPUT-OUTPUT. PROGRAM PRINCIPALLY USED ABOARD OCEANOGRAPHIC VESSEL. WRITTEN FOR THE U.S. COAST GUARD BY LT. R.M. O'HAGAN (RET.), DIGITAL EQUIPMENT CORP., MAYNARD, MASS. COPY DEPOSITED WITH DECUS.

DIGITAL EQUIPMENT CORPORATION
MAYNARD, MASSACHUSETTS 01754

OCEAN STATION COMPUTATIONS

LANGUAGE - (NOT GIVEN)
COMPUTER - CDC 1604

INTERPOLATION AT STANDARD DEPTHS OF TEMPERATURE AND SALINITY, SIGMA-T AND THE DYNAMICS COMPUTATIONS.

SCRIPPS INSTITUTION OF OCEANOGRAPHY
LA JOLLA, CALIFORNIA 92037

RADIATION ATTENUATION

LANGUAGE - (NOT GIVEN)
COMPUTER - CDC 1604

COMPUTATION OF THE ATTENUATION COEFFICIENTS FROM SUBMARINE IRRADIANCE MEASUREMENTS.

SCRIPPS INSTITUTION OF OCEANOGRAPHY
LA JOLLA, CALIFORNIA 92037

--* SOUND - RAY PATH *-*-*

ACOUSTIC RAY TRACING

LANGUAGE - FORTRAN II
COMPUTER - IBM 7090

(COPY ON FILE AT NODC)
CALCULATES UNDERWATER SOUND PROPAGATION. PROGRAM REQUIRES INPUT WHICH DESCRIBES THE SOURCE, THE FIELD, THE SURFACE AND THE BOTTOM. OUTPUT IS A REPORT ON MAGNETIC TAPE WHICH GIVES RAY PATH, SLOPE, CURVATURE, AND LENGTH. ALSO GIVEN ARE REFLECTION AND EXTREMA STATISTICS, TRAVEL TIME, WAVE FRONT CURVATURE, AND INTENSITY. PROGRAM AND DOCUMENTATION PUBLISHED IN ARTHUR D. LITTLE, INC. TECHNICAL REPORT NO. 1470764. THE A.D. NO. IS AD 605 328. ALSO AVAILABLE FROM THE DEFENSE DOCUMENTATION CENTER.

MISS MARIAN L. HOBBS, LIBRARIAN
TRIDENT/ASW LIBRARY
ARTHUR D. LITTLE, INC.
35 ACORN PARK
CAMBRIDGE, MASS. 02140

TRLOSS

LANGUAGE - FORTRAN
COMPUTER - CDC 6600

COMPUTES LONG-RANGE TRANSMISSION LOSS BY PROBABILISTIC METHODS, USING A STATISTICAL APPROXIMATION TO RAY-TRACING. INPUT-- PUNCHED CARDS CONTAINING VELOCITY PROFILES, BOTTOM, TOPOGRAPHY (ROUGH) AND TARGET RANGES. OUTPUT-- LISTS OF INTENSITIES (RELATIVE TO SOURCE INTENSITY) AS FUNCTIONS OF DEPTH AT EACH OF THE TARGET RANGES. CORE STORAGE NECESSARY-- 30(8)K WORDS. AUTHOR-- MISS ELLEN WILLIAMS.

MARIAN L. HOBBS, LIBRARIAN
ARTHUR D. LITTLE, INC
ACORN PARK
CAMBRIDGE, MASS. 02140

SONAR IN REFRACTIVE WATER

LANGUAGE - FORTRAN IV
COMPUTER - UNIVAC 1108

(COPY ON FILE AT NODC)
TRACES SOUND RAYS, COMPUTES REVERBERATION, COMPUTES ACQUISITION LAMINAE (VERTICAL PLANE), IN A LINEAR-GRADIENT OR CONTINUOUS-GRADIENT MEDIUM. CORE STORAGE USED-- APPROX. 30,000 WORDS. SUPERSEDES ALL PREVIOUS VERSIONS OF THE PROGRAM. DOCUMENTED AS NUC TECHNICAL PUBLICATION NO. 164 (VOL.1, 196 P AND VOL.2, 356 P) 'DIGITAL COMPUTER PROGRAMS FOR ANALYZING ACOUSTIC SEARCH PERFORMANCE IN REFRACTIVE WATERS', NUC PROGRAMS 800000 AND 800001, BY PHILIP MARSH AND A.B. POYNTER, ORDNANCE SYSTEMS DEPARTMENT, DECEMBER 1969. (DOCUMENTS UNCLASSIFIED BUT TRANS-

MITTALS CONTROLLED BY NUC.)

NAVAL UNDERSEA RESEARCH AND DEVELOPMENT CENTER
PASADENA LABORATORY
ATTN. PHILIP MARSH
3202 E. FOOTHILL BLVD.
PASADENA, CALIF. 91107

RAY SORT

LANGUAGE - FORTRAN IV
COMPUTER - UNIVAC 1108

(COPY ON FILE AT NODC)
SORTS CERTAIN SOUND RAY DATA (FROM TAPE WRITTEN BY THE 'SONAR IN REFRACTIVE WATER' PROGRAM) BY DEPTH, INITIAL RAY ANGLE, AND DEPTH-INTERSECTION NUMBER. SOURCE PROGRAM HAS 450 INSTRUCTIONS. CORE STORAGE-- ABOUT 31,000 WORDS. DOCUMENTED AS NUC TECHNICAL PUBLICATION NO. 164 (VOL.1, 196 P AND VOL.2, 356 P) 'DIGITAL COMPUTER PROGRAMS FOR ANALYZING ACOUSTIC SEARCH PERFORMANCE IN REFRACTIVE WATERS, NUC PROGRAMS 800000 AND 800001, BY PHILIP MARSH AND A.B. POYNTER, ORDNANCE SYSTEMS DEPARTMENT, DECEMBER 1969. (DOCUMENTS UNCLASSIFIED BUT TRANSMITTALS CONTROLLED BY NUC.)

NAVAL UNDERSEA RESEARCH AND DEVELOPMENT CENTER
PASADENA LABORATORY
ATTN. PHILIP MARSH
3202 E. FOOTHILL BLVD.
PASADENA, CALIF. 91107

RAYMOR

LANGUAGE - FORTRAN V
COMPUTER - UNIVAC 1108

(COPY ON FILE AT NODC)
COMPUTES RAYLEIGH-MORSE BOTTOM REFLECTION COEFFICIENTS, ALSO PHASE CHANGES OF THE REFLECTED AND TRANSMITTED ACOUSTIC WAVE. AUTHOR-- J.C. REEVES.

NAVAL UNDERSEA RESEARCH AND DEVELOPMENT CENTER
PASADENA LABORATORY
3202 E. FOOTHILL BOULEVARD
PASADENA, CALIFORNIA 91107

NEWFIT

LANGUAGE - FORTRAN V
COMPUTER - UNIVAC 1108

(COPY ON FILE AT NODC)
FITS A VELOCITY PROFILE WITH A SERIES OF CURVE SEGMENTS HAVING CONTINUOUS FIRST DERIVATIVES AT POINTS OF INTERSECTION. OUTPUT-- PRINTED LISTINGS OF ORIGINAL DATA, FITTED DATA, AND COEFFICIENTS OF CURVE SEGMENTS - ALSO CARDS FOR INPUT TO 'SONAR IN REFRACTIVE WATER' PROGRAM. NEWFIT IS THE MAIN ROUTINE OF THE NEW CURVE FITTING PROGRAM. A REPORT AP-PROG-C-8070 (FEB 1968, 98 P), BY MELVIN O. BROWN, DOCUMENTS THE DETAILS OF THE ENTIRE PROGRAM. CORE STORAGE NECESSARY-- APPROX. 25,000 WORDS, INCLUDING LIBRARY AND SYSTEM ROUTINES.

NAVAL UNDERSEA RESEARCH AND DEVELOPMENT CENTER
PASADENA LABORATORY
ATTN. PHILIP MARSH
3202 E. FOOTHILL BLVD.
PASADENA, CALIF. 91107

PATTERN FUNCTION CALCULATIONS

LANGUAGE - FORTRAN IV
COMPUTER - UNIVAC 1108

(COPY ON FILE AT NODC)
COMPUTES TRANSDUCER PATTERN FUNCTIONS NEEDED IN THE SONAR EQUATIONS WHEN ESTIMATING SEARCH PERFORMANCE OF ACOUSTIC TORPEDOES. THE DESIRED PARAMETERS INCLUDE THE TRANSMIT AND RECEIVE DIRECTIVITY INDEXES AND THE VOLUME AND BOUNDARY REVERBERATION INDEXES. IN A VEHICLE EMPLOYED IN CIRCULAR SEARCH, THE REVERBERATION INDEXES ARE FUNCTIONS OF TURN RATE AND ELAPSED TIME IN THE PING CYCLE. THE OUTPUT IS USED BY THE

'SONAR IN REFRACTIVE WATER' PROGRAM. THEORY, FLOW CHARTS, AND LISTING GIVEN IN REPORT AP-PROG-C-7035 (APR 1967, 80 P), BY HERBERT S. KAPLAN.

NAVAL UNDERSEA RESEARCH AND DEVELOPMENT CENTER
PASADENA LABORATORY
ATTN. PHILIP MARSH
3202 E. FOOTHILL BLVD.
PASADENA, CALIF. 91107

HORIZONTAL GRADIENT RAY TRACING

LANGUAGE - FORTRAN-63
COMPUTER - CDC 3800

DESCRIBES ACOUSTIC PATHS OF UP TO 1000 RAYS AS THEY PROGRESS THROUGH THE OCEAN FROM A POINT SOURCE AT ARBITRARY RANGE AND DEPTH. ALL RAYS ARE TRACED SIMULTANEOUSLY IN ONE PASS THROUGH THE VELOCITY FIELD. AS THE RAYS ARE TRACED SEVERAL TYPES OF INTENSITY CALCULATIONS ARE PERFORMED AND A MULTIPLOT OF RAYS CONSTRUCTED. BASIC INPUT CONSISTS OF A MAGNETIC TAPE GENERATED BY THE 'GENERAL VELOCITY FIELD' PROGRAM. OUTPUT-- RANGES, DEPTHS, TRAVEL TIME, SINE OF ANGLE, NUMBER OF TURNING POINTS, NUMBER OF SURFACE AND BOTTOM HITS, AND SIGNAL STRENGTH OF EACH RAY AT RANGES SPECIFIED BY THE USER. ALSO, TYPE I, II, III INTENSITIES, TRANSMISSION LOSS AND TRANSMISSION ANOMALY. BASIC IDEAS CONTAINED IN HUDSON LAB TECHNICAL REPORT NO. 150 (1968). PROGRAM DOCUMENTATION FORTHCOMING.

J. J. CORNYN, CODE 8140
ACOUSTICS DIVISION
NAVAL RESEARCH LABORATORY
WASHINGTON, D. C. 20390

RAY TRACING

LANGUAGE - FORTRAN IV
COMPUTER - CDC 3800

CALCULATES RAY THEORY, ARRIVALS AND INTENSITIES AT A LARGE NUMBER OF RECEIVERS. INPUT-- VELOCITY PROFILE EITHER AS V VS. Z OR T,S VS. Z. ALSO SOURCE AND RECEIVER DEPTHS, INITIAL RAY ANGLES AND RECEIVER RANGES, BEAM PATTERNS (IF ANY), BOTTOM LOSS TABLE, SURFACE LOSS, FREQUENCY. OUTPUT-- LISTINGS AND PLOTS. EITHER COHERENT OR RANDOM PHASE ARRIVAL SUMS ARE AVAILABLE.

EDWARD L. WRIGHT, CODE 8172
ACOUSTICS DIVISION
NAVAL RESEARCH LABORATORY
WASHINGTON, D. C. 20390

ACOUSTIC RAY TRACING

LANGUAGE - FORTRAN-63
COMPUTER - CDC 3800

CALCULATES PATHS OF ACOUSTIC RAYS FROM A POINT SOURCE IN THE OCEAN, THROUGH A SERIES OF SOUND SPEED PROFILES, ALONG WITH THEIR TRAVEL TIMES AND TRANSMISSION LOSSES. REFLECTIONS OF THE RAYS FROM A LINEAR SEGMENTED BOTTOM ARE CALCULATED. COMPUTES CLOSED FORM PATH ELEMENTS BETWEEN LAYER BOUNDARIES IN THE PROFILE. RAYS ARE TRACED SEQUENTIALLY. PROGRAM WILL BE DOCUMENTED IN A FORTHCOMING REPORT.

E. B. WRIGHT
CODE 8177, ACOUSTICS DIVISION
NAVAL RESEARCH LABORATORY
WASHINGTON, D. C. 20390

RAY TRACE PROCESSING

LANGUAGE - FORTRAN-63
COMPUTER - CDC 3800

USES OUTPUT OF RAY TRACING PROGRAM TO CALCULATE TRANSMISSION LOSS BY A CHOICE OF THREE METHODS. LOSS AT RECEIVERS IS COMPUTED BY-- A) PHASE-DEPENDENT RAY SUM, B) RANDOM-PHASE RAY SUM, C) STATISTICAL DISTRIBU-

TION OF ARRIVALS. OUTPUT-- TRANSMISSION LOSS AS A FUNCTION OF RANGE FOR UP TO 20 RECEIVER DEPTHS AND UP TO 200 RANGE INCREMENTS.

E. B. WRIGHT
CODE 8177, ACOUSTICS DIVISION
NAVAL RESEARCH LABORATORY
WASHINGTON, D. C. 20390

RAY TRACING

LANGUAGE - FORTRAN AND KLERER-MAY USER LANG.
COMPUTER - (NOT GIVEN)

(COPY ON FILE AT NODC)
A SERIES OF PROGRAMS FOR THE CALCULATION OF THE ACOUSTICAL FIELD IN LONG-RANGE (SEVERAL HUNDRED TO SEVERAL THOUSAND MILES), LOW FREQUENCY UNDERWATER SOUND PROPAGATION IN THE DEEP OCEAN. INVOLVES THE CALCULATION OF RAY TRAJECTORIES, AND INTENSITY CALCULATIONS THAT ARE BASED ON THE MAPPING OF RAY DENSITIES INTO THE FAR ACOUSTICAL FIELD. I/P FORMAT FROM NODC DATA TAPES OR FLEET NUMERICAL WEATHER CENTRAL CARDS. REF. 'THE HUDSON LABORATORIES RAY TRACING PROGRAM' (JUNE 1968, 363 P.) AUTHORS-- H. DAVIS, H. FLEMING, W.A. HARDY, R. MININGHAM, AND S. ROSENBAUM.

RAYTR (RAY-TRACING)

LANGUAGE - FORTRAN IV
COMPUTER - IBM 360/44

TRACES SOUND RAY PATHS IN A LAYERED FLUID MEDIUM. TRAVEL-TIMES, RELATIVE TRAVEL-TIMES, TOTAL PATH LENGTHS ALONG THE RAY, INTENSITIES AND THE COORDINATES OF FOCI ARE ALSO COMPUTED. THE PROGRAM IS SIMILAR IN MANY RESPECTS TO H.W. DOSSO, ET AL 'RAY TRACING WITH A PB-250', TECH. MEMO. 63-11 (UNPUBLISHED). THE NUMBER OF ALLOWED SOUND-SPEED VS DEPTH AND BOTTOM PROFILE DATA ENTRIES HAS BEEN INCREASED FROM 32 TO 360. AUTHOR-- R.W. DE JEAN. DESCRIBED IN TECHNICAL MEMO. 68-5, FEB 1968.

DEFENCE RESEARCH ESTABLISHMENT PACIFIC
VICTORIA, B. C. CANADA

ORD 1 (OLMSTED RAY DIAGRAM PROGRAM NO. 1)

LANGUAGE - FORTRAN
COMPUTER - GE 225

CONSTRUCTS (OPTICAL/ACOUSTIC) RAYS IN A MEDIUM WHERE THE VELOCITY OF LIGHT/SOUND VARIES CONTINUOUSLY WITH ONE COORDINATE (DEPTH). THE RAYS ARE CONFINED TO A RANGE-DEPTH PLANE OF FINITE DEPTH (A LAYER) AND MUST ORIGINATE FROM A SOURCE PLACED AT ANY DEPTH IN THE LAYER AND AT ANGLES OF INCIDENCE GREATER THAN 0 AND LESS THAN 180 DEG. WHEN A RAY REACHES A VERTEX (OF REFRACTION OR REFLECTION) THE REMAINDER OF THE RAY IS CONSTRUCTED BY SYMMETRY AND PERIODIC EXTENSION. POINTS ARE THEN COMPUTED ALONG THESE RAYS AT INTERVALS OF EQUAL RANGE. AUTHOR-- COERT OLMSTED, FEB. 1965.

WOODS HOLE OCEANOGRAPHIC INSTITUTION
WOODS HOLE, MASS. 02543

ORD 2 (OLMSTED RAY DIAGRAM PROGRAM NO. 2)

LANGUAGE - FORTRAN
COMPUTER - GE 225

SERVES THE SAME PURPOSE AS ORD 1 EXCEPT THAT THE OUTPUT POINTS ARE AT EQUAL TIME INCREMENTS RATHER THAN AT EQUAL RANGE INCREMENTS AND THUS, WHEN PLOTTED, WILL ENABLE ONE TO TRACE WAVE FRONTS AS WELL AS RAYS. THERE IS NO SYMMETRICAL OR PERIODIC EXTENSION. THE RAY PATH IS COMPUTED LOCALLY ALL THE WAY OUT TO MAXIMUM RANGE. AUTHOR-- COERT OLMSTED, FEB. 1965.

WOODS HOLE OCEANOGRAPHIC INSTITUTION
WOODS HOLE, MASS. 02543

AN ACOUSTIC MODEL

LANGUAGE - FORTRAN
COMPUTER - IBM 7074

PRESENTS A SOLUTION FOR THE RAYLEIGH REFLECTION COEFFICIENT WITH A FOUR LAYER MODEL. OS NO. 20118. AUTHOR-- M.E. MYERS.

COMPUTER DEPARTMENT, CODE 0831
NAVAL OCEANOGRAPHIC OFFICE
SUITLAND, MD. 20390

CRITICAL ACOUSTIC RATIO

LANGUAGE - FORTRAN
COMPUTER - IBM 7074

DETERMINATION OF CRITICAL RATIO OF TRIGONOMETRIC FUNCTIONS OF ACOUSTIC ANGLES INVOLVED IN CONNECTION WITH THE CONVERGENCE INTERVAL FOR A 3-LAYER MODEL OF THE OCEAN. OS NO. 53483. AUTHOR-- C.M. WINGER.

OCEANOGRAPHIC PREDICTION DIV., CODE 3400
NAVAL OCEANOGRAPHIC OFFICE
SUITLAND, MD. 20390

RAY PATH

LANGUAGE - FORTRAN
COMPUTER - IBM 7074

(COPY ON FILE AT NODC)
COMPUTES RANGES AND TRAVEL TIMES FOR SOUND RAYS. OS NO. 53810. AUTHOR L.W. CISNEY.

EXPLORATORY OCEANOGRAPHY DIV., CODE 7200
NAVAL OCEANOGRAPHIC OFFICE
SUITLAND, MD. 20390

BOTTOM REFLECTION ANALYSIS

LANGUAGE - FORTRAN
COMPUTER - IBM 7074

(COPY ON FILE AT NODC)
DETERMINES ENERGY LEVEL OF SOUND SOURCES AT CERTAIN DISCRETE FREQUENCIES BY MEANS OF HARMONIC ANALYSIS. OS NO. 53806. AUTHOR-- L.W. CISNEY.

EXPLORATORY OCEANOGRAPHY DIV., CODE 7200
NAVAL OCEANOGRAPHIC OFFICE
SUITLAND, MD. 20390

CONVERGENCE ZONE RANGE

LANGUAGE - FORTRAN
COMPUTER - IBM 7074

(COPY ON FILE AT NODC)
COMPUTES RANGES TO THE FIRST CONVERGENCE ZONE. THE WIDTH OF THE RESWEPT AND INSONIFIED ZONES AND THE RELIABLE ACOUSTIC PATH RANGE ARE ALSO COMPUTED. IN ADDITION, LAYER DEPTH, CHANNEL DEPTH, OPTIMUM DEPTH, BOTTOM VELOCITY, AND DEPTH EXCESS ARE EXTRACTED AND LISTED IN THE OUTPUT. INPUT EITHER CARD OR TAPE. OS NO. 53334. (RESTRICTED) AUTHOR-- R. BUTTERWORTH.

OCEANOGRAPHIC ANALYSIS DIV., CODE 3300
NAVAL OCEANOGRAPHIC OFFICE
SUITLAND, MD. 20390

LIGHT AND SOUND INSTRUCTION D

LANGUAGE - FORTRAN
COMPUTER - IBM 7074

(COPY ON FILE AT NODC)
COMPUTES THE CONVERGENCE ZONE PARAMETERS USING THE V(X) METHOD (EQUATIONS OF DONALD COLE), BY ONE-DEGREE QUADRANGLE, BY MONTH AND BY SEASON. AUTHOR-- M.C. CHURCH.

COMPUTER DEPARTMENT, CODE 083
NAVAL OCEANOGRAPHIC OFFICE
SUITLAND, MD. 20390

RAY TRACING

LANGUAGE - FORTRAN II
COMPUTER - IBM 704

(COPY ON FILE AT NODC)
COMPUTES HORIZONTAL RANGE, TRAVEL TIME, AND SPREADING LOSS THROUGH A MEDIUM CONSISTING OF LAYERS OF CONSTANT VELOCITY GRADIENT (THE V(X) METHOD OF DONALD COLE). A PRINTED OUTPUT CONTAINS LAYERED INFORMATION. OPTION TO WRITE A PLOTTER TAPE FOR USE ON THE EAI 3440 DIGITAL PLOTTER. REF. USL TECH. MEMORANDUM NO. 907-78-66 (APRIL, 1966)

PAULINE ONYX
NAVY UNDERWATER SOUND LABORATORY, BLDG. 80
FORT TRUMBULL, NEW LONDON, CONN. 06320

BOTTOM REFLECTIVITY

LANGUAGE - FORTRAN II
COMPUTER - IBM 704

(COPY ON FILE AT NODC)
USL PROGRAM NO. 0289. COMPUTES THREE ACOUSTIC REFLECTION COEFFICIENTS AS A FUNCTION OF INCIDENT ANGLE AND FREQUENCY. THE PROGRAM ACCOUNTS FOR DIFFERENCE IN PATH LENGTH, DEPTH OF SOURCE AND RECEIVERS, WATER, BOTTOM SLOPE, VELOCITY GRADIENT AND RECORDED TRAVEL TIME. REF. USL TECH. MEMORANDUMS NOS. 913-4-65 AND 907-144-65. THE LATTER REPORT ALSO SERVES TO DOCUMENT A SUPPLEMENTAL COMPUTER PROGRAM (USL NO. 0427, IN FORTRAN) FOR COMPUTING MEANS AND STANDARD DEVIATIONS OF THE THREE REFLECTION COEFFICIENTS.

R. WHITTAKER
NAVY UNDERWATER SOUND LABORATORY, BLDG. 80
FORT TRUMBULL, NEW LONDON, CONN. 06320

TWO DIMENSIONAL RAY TRACE

LANGUAGE - SCRAP, MAP
COMPUTER - CDC 1604 AND CDC 3200

DESCRIBES THE PATH OF SOUND EMITTED FROM A POINT SOURCE AS IT PROGRESSES THROUGH THE OCEAN IN ONE HORIZONTAL DIRECTION, TAKING INTO CONSIDERATION BOTH HORIZONTAL AND VERTICAL VARIATION IN THE SOUND VELOCITY OF THE OCEAN. ONE PATH IS TRACED FOR EACH SPECIFIED INITIAL ANGLE FROM THE HORIZONTAL. BEHAVIOR OF RAY PATH IS CONTROLLED BY SOUND VELOCITY GRADIENTS- CORRECTION FOR EARTH CURVATURE IS ADDED. OUTPUT IS A PRINTED LIST AND ALSO IN BINARY FORMAT SUITABLE FOR ADAPTATION TO A PLOTTER. DIRECT INQUIRIES FOR INFORMATION TO--

COMMANDING OFFICER
FLEET NUMERICAL WEATHER CENTRAL
NAVAL POSTGRADUATE SCHOOL
MONTEREY, CALIFORNIA 93940

THESIS3 (SONOBUOY FIXING ERROR)

LANGUAGE - FORTRAN
COMPUTER - (NOT GIVEN)

CALCULATES THE EFFECTS OF HORIZONTAL VELOCITY GRADIENTS IN SEA WATER WHEN OBTAINING A FIX ON A TARGET BY TWO PASSIVE DIRECTIONAL SENSORS. THESIS BY JAMES W. PIGMAN (MAY 1966).

NAVAL POSTGRADUATE SCHOOL
MONTEREY, CALIFORNIA 93940

NEAR-FIELD ARRAY TESTING

LANGUAGE - FORTRAN
COMPUTER - PDP-8

PROGRAM INVESTIGATES THEORETICALLY THE EFFECT OF IRREGULARITIES IN THE

POSITIONS OF TRANSDUCER ELEMENTS IN AN ACOUSTIC 'NEAR-FIELD' ARRAY. REPORT NO. NRL-6728 (MAY 1968, 40P) BY GERALD A. SABIN. DDC NO. IS AD-669-449.

UNDERWATER SOUND REFERENCE DIV.
NAVAL RESEARCH LABORATORY
ORLANDO, FLORIDA

--* SOUND - NORMAL MODES *-*-*

NORMAL MODE SOLUTIONS FOR SOUND SPEED PROFILES

LANGUAGE - FORTRAN IV
COMPUTER - CDC 3800

PROVIDES A NORMAL MODE SOLUTION OF THE WAVE EQUATION WITH THE SOUND SPEED PROFILE FOR THE MEDIUM REPRESENTED BY A SET OF DISCRETE VALUES. THE SEA BOTTOM IS ASSUMED TO BE A SEMI-INFINITE FLUID, SPECIFIED BY A CONSTANT DENSITY AND A CONSTANT SPEED OF SOUND AND WITH NO ATTENUATION. THE INTERFACE BETWEEN THE WATER COLUMN AND THE BOTTOM IS FLAT AND LEVEL. USER SELECTS THE MAXIMUM NUMBER OF MODES DESIRED. OUTPUT-- THE NORMALIZED EIGENFUNCTIONS OR MODE SHAPES ARE OBTAINED FROM THE EIGENVALUES AND PLOTTED. THE GROUP VELOCITY CHARACTERISTIC IS OBTAINED OVER A RANGE OF FREQUENCIES AND TABULATED. PROPAGATION LOSS IS PLOTTED AS A FUNCTION OF RANGE. DOCUMENTATION WILL BE IN A FORTHCOMING NRL REPORT.

JOHN CYBULSKI
CODE 8177, ACOUSTICS DIVISION
NAVAL RESEARCH LABORATORY
WASHINGTON, D. C. 20390

PROPAGATION LOSS - NORMAL MODES

LANGUAGE - FORTRAN
COMPUTER - CDC 3800

CALCULATES UNDERWATER SOUND PROPAGATION IN A HORIZONTALLY STRATIFIED MEDIUM. THE PROGRAM CALCULATES A SET OF HORIZONTAL PHASE VELOCITIES FOR THE NORMAL MODES AND THEN SERIES THE MODE AMPLITUDE FUNCTIONS TO FIND THE SOUND LEVELS. INPUT-- SOUND VELOCITY PROFILE, SOURCE DEPTH, POSITION OF RECEIVERS IN RANGE AND DEPTH, SURFACE LOSS, AND BOTTOM LOSS TABLE. OUTPUT-- PROPAGATION LOSS AT THE VARIOUS RECEIVERS. PROCEDURE-- APPROXIMATE VALUES OF THE HORIZONTAL PHASE VELOCITY ARE CALCULATED USING RAY THEORY. EXACT VALUES ARE FOUND BY ITERATING IN THE COMPLEX PLANE. SOUND INTENSITIES ARE CALCULATED BY FORMING THE SERIES OF NORMAL AMPLITUDE FUNCTIONS. DOCUMENTATION-- FORTHCOMING NRL REPORT

DR. H. P. BUCKER, JR.
CODE 8170
NAVAL RESEARCH LABORATORY
WASHINGTON, D. C. 20390

--* SOUND - SPEED COMPUTATIONS *-*-*

SOUND VELOCITY

LANGUAGE - FORTRAN
COMPUTER - CDC 3200

(COPY ON FILE AT NODC)
COMPUTES SOUND VELOCITY USING WILSON'S EQUATIONS. OUTPUT CARDS HAVE VELOCITY OF SOUND IN METERS/SEC, PRESSURE IN KG/SQ-CM, SIGMA-T, IN ADDITION TO INPUT STATION DATA AND IDENTIFICATION.

NAVAL UNDERWATER WEAPONS RESEARCH

AND ENGINEERING STATION
NEWPORT, RHODE ISLAND 02840

FATHOMETER CORRECTION

LANGUAGE - FORTRAN
COMPUTER - CDC 1604

(COPY ON FILE AT NODC)
CORRECTS ECHO SOUNDER READINGS BY COMPUTING ACTUAL TRAVEL TIME FROM A LINEAR SEGMENT VELOCITY PROFILE. INPUT-- DEPTH VS. VELOCITY POINTS ON CARDS. OUTPUT IS PRINTED LIST OF ACTUAL DEPTHS, FATHOMETER DEPTHS AND CORRECTIONS (FATHOMS). A SUBROUTINE FOR THE CALCOMP PLOTS DIFFERENCES VS. ECHO SOUNDER DEPTHS. CORE STORAGE USED-- 4100.

COMMANDER
NAVAL UNDERSEA RESEARCH AND DEVELOPMENT CENTER
ATTN. D. F. GORDON
SAN DIEGO, CALIFORNIA 92132

GENERAL VELOCITY FIELD

LANGUAGE - FORTRAN-63
COMPUTER - CDC 3800,
DRUM SCOPE

GIVEN A SERIES OF INCOMPLETE VELOCITY PROFILES ALONG A RANGE TRACK THE PROGRAM EXTRAPOLATES THE DEEP PROFILES TO THE BOTTOM USING WILSON'S EQUATION AND INTERPOLATES BETWEEN THE DEEP PROFILES IN ORDER TO EXTEND THE SHALLOW PROFILES. THE RESULT IS A COMPLETE DESCRIPTION OF THE VELOCITY FIELD OVER THE RANGE-DEPTH PLANE. OUTPUT FROM PROGRAM INCLUDES-- VELOCITY, GRADIENT, AND CURVATURE AT DEPTHS AND RANGES SPECIFIED BY USER, A CALCOMP CONTOUR PLOT OF SPECIFIED VELOCITY FIELD, AND A 3-DIMENSIONAL PLOT OF VELOCITY VS. RANGE AND DEPTH. STORAGE NECESSARY-- 117,450 OCTAL WORDS OF CORE AND 2 CDC-863 DRUMS.

J. J. CORNYN, CODE 8140
ACOUSTICS DIVISION
NAVAL RESEARCH LABORATORY, WASHINGTON, D. C. 20390

SVLIM

LANGUAGE - FORTRAN II
COMPUTER - CDC 3100

(COPY ON FILE AT NODC)
EXAMPLE OF 'LIMITS' RETRIEVAL FUNCTIONS USED TO EXTRACT SOUND VELOCITY PROFILES. THE PROGRAM READS CONTROL CARDS SPECIFYING GEOGRAPHICAL AND SEASONAL LIMITS OF INTEREST, SCANS A COMPACTED NODC FORMAT FILE FOR OCEAN STATIONS FALLING WITHIN THE SELECTED LIMITS, CONVERTS THE PROFILE FROM METERS/SEC TO FEET/SEC AND PRINTS THE PROFILE. REF. INFORMAL REPORT IR NO. 69-59, JULY 1969. AUTHOR-- WALT YERGEN, EXPLORATORY OCEANOGRAPHY DIVISION, CODE 7240. FURTHER INFORMATION MAY BE OBTAINED FROM THE DISSEMINATION DEPARTMENT CODE 44, OR THE AUTHOR.

NAVAL OCEANOGRAPHIC OFFICE
SUITLAND, MARYLAND 20390

DETERMINATION OF POSSIBLE MAGNITUTE OF ERROR IN VERTICAL SOUND VELOCITY

LANGUAGE - FORTRAN
COMPUTER - IBM 7074

(COPY ON FILE AT NODC)
PROGRAM REQUESTED BY THE COAST AND GEODETIC SURVEY TO CORRECT FATHOMETER READINGS. PROVIDES-- (1) HARMONIC MEAN OF SOUND VELOCITY IN M/SEC AT CHOSEN DEPTHS (2) MEAN VERTICAL SV AT ABOVE DEPTHS WITHIN ONE MARSDEN SQ. (3) VARIANCE OF 2 (4) DIFFERENCE BETWEEN STANDARD AND COMPUTED SV, TESTED AGAINST GIVEN ALLOWABLE ERROR VALUES (5) NUMBER OF STATIONS USED AT EACH DEPTH WITHIN EACH MARSDEN SQ. INPUT MUST BE IN NODC FORMAT TAPE, ZONE-EDITED, IN DEPTH SEQUENCE AND SORTED ON MARSDEN SQUARES. AUTHOR-- RUDI SAENGER. OS NO. 52203.

COMPUTER SYSTEMS DIVISION
NATIONAL OCEANOGRAPHIC DATA CENTER
WASHINGTON, D. C. 20390

LIGHT AND SOUND INSTRUCTION B

LANGUAGE - FORTRAN
COMPUTER - IBM 7074

COMPUTES THE HARMONIC MEAN SOUND VELOCITY, TRAVEL TIME, AND CORRECTION RATIO AT 100-FATHOM DEPTH INTERVALS BY ONE-DEGREE SQUARE. OS NO. - 20111. AUTHOR-- M.C. CHURCH.

COMPUTER DEPARTMENT, CODE 083
NAVAL OCEANOGRAPHIC OFFICE
SUITLAND, MD. 20390

VELOCITY OF SOUND IN SEA WATER

LANGUAGE - FORTRAN
COMPUTER - IBM 1620

(COPY ON FILE AT NODC)
COMPUTES ONE PAGE AT A TIME FOR A GIVEN DEPTH AND A GIVEN SET OF 10 SALINITIES AND TEMPERATURES. A TABLE OF PRESSURES IS READ IN AND CONVERTED TO DEPTHS. USES LATER VERSION OF WILSON'S FORMULA FOUND IN THE JASA VOL. 32 NO. 10 (1960).

ESSA, COAST AND GEODETIC SURVEY
WASHINGTON SCIENCE CENTER, BLDG. 2
ROCKVILLE, MD. 20852

WATERVEL

LANGUAGE - FORTRAN AND BINARY
COMPUTER - (NOT GIVEN)

(COPY ON FILE AT NODC)
COMPUTES SOUND VELOCITY AFTER WILSON (1960-2), SOUNDING VELOCITY, REFLECTION TIME. VALUES INTERPOLATED FROM STANDARD DEPTHS. UNITS CONVERSION ENGLISH TO METRIC. AUTHOR-- HELEN KIRK.

SCRIPPS INSTITUTION OF OCEANOGRAPHY
ATTN. G.G. SHOR
LA JOLLA, CALIF. 92038

FUNCTION SDVEL

LANGUAGE - FORTRAN
COMPUTER - IBM 1800 SYS

(COPY ON FILE AT NODC)
SUBPROGRAM COMPUTES SOUND VELOCITY IN SEA WATER FROM TEMPERATURE, SALINITY AND PRESSURE USING WILSON'S FORMULAE. A CONVERSION OF PRESSURE IS MADE FROM NEWTONS/SQ METRE TO KGF/CM SQ.

NATIONAL INSTITUTE OF OCEANOGRAPHY
WORMLEY, GODALMING, SURREY
ENGLAND

SOUND VELOCITY IN OCEAN WATER

LANGUAGE - FORTRAN II
COMPUTER - IBM 704

(COPY ON FILE AT NODC)
USL PROGRAM NO. 0240. COMPUTES SOUND VELOCITY AS A FUNCTION OF DEPTH, TEMPERATURE, SALINITY AND LATITUDE. EQUATIONS USED WERE OBTAINED FROM AN NEL PUBLICATION (M.A. PEDERSEN, ET AL, 1962). A PRINTED OUTPUT HAS THE INPUT PARAMETERS AND THE COMPUTED VALUES OF SOUND VELOCITY, PRESSURE, AND DENSITY (RHO) FOR EACH DEPTH. REF. USL TECH. MEMORANDUM NO. 907-94-66 (MAY, 1966).

M. J. GOLDSTEIN
NAVY UNDERWATER SOUND LABORATORY, BLDG. 80
FORT TRUMBULL, NEW LONDON, CONN. 06320

SDGVEL (SOUNDING CORRECTION)

LANGUAGE - FORTRAN IV
COMPUTER - IBM 7094-II/ 7040 DCS

(COPY ON FILE AT NODC)

CORRECTS OBSERVED DEPTHS FOR LATITUDINAL AND LONGITUDINAL VARIATION IN SOUNDING VELOCITY. SOUNDING VELOCITIES CALCULATED BY NODC ARE ENTERED INTO STORAGE AS A LINEAR ARRAY. OBSERVED LATITUDE, LONGITUDE, AND DEPTH ARE ENTERED INTO THE TABLE AS SEARCH PARAMETERS, AND A THREE-DIMENSIONAL LINEAR INTERPOLATION IS PERFORMED TO OBTAIN AN APPROPRIATE VALUE FOR SOUNDING VELOCITY. THIS IS APPLIED TO THE OBSERVED DEPTH. AN ITERATION ROUTINE REFINES THE CORRECTED DEPTH TO WITHIN A PREDETERMINED ERROR. THE INPUT IS VIA PUNCHED CARDS AND A PRINTED OUTPUT IS PRODUCED. ESTIMATED RUNNING TIME-- 0.04 SECONDS PER DATA ENTRY. AUTHOR-- WILLIAM ANIKOUCHINE, JORG, ESSA.

DEPARTMENT OF OCEANOGRAPHY
UNIVERSITY OF WASHINGTON
SEATTLE, WASH. 98105

AN/UYK-1 SOUND VELOCITY

LANGUAGE - LOGANDS AND LOGRAMS
COMPUTER - AN/UYK-1

COMPUTES SOUND VELOCITY BY TWO DIFFERENT MEANS FOR COMPARISON WITH THE SOUND VELOCIMETER VALUE OBTAINED THROUGH BISSETT-BERMAN SYSTEM. ALSO COMPUTES PRESSURE, MEAN, VARIANCE, STANDARD DEVIATION, SIGMA-T, SPECIFIC VOLUME, SPECIFIC VOLUME ANOMALY, AND DYNAMIC HEIGHT ANOMALY. OS NO. 20154. AUTHOR-- O.A. SMITH.

COMPUTER DEPARTMENT, CODE 0831
NAVAL OCEANOGRAPHIC OFFICE
SUITLAND, MD. 20390

VELOCITY OF SOUND

LANGUAGE - MAC
COMPUTER - ICT 1301

CALCULATION OF VELOCITY OF SOUND IN SEA WATER, USING WILSON'S EQUATION. (A MAC ROUTINE WAS ALSO WRITTEN FOR THE CALCULATION OF PRESSURE IN DECI-BARS) AUTHORS-- A.M. SHIPLEY AND D. SACKS.

UNIVERSITY OF CAPE TOWN
OCEANOGRAPHY DEPARTMENT
ATTN. MR. A.M. SHIPLEY
PRIVATE BAG, RONDEBOSCH, C.P.
REPUBLIC OF SOUTH AFRICA

SONVEL

LANGUAGE - FORTRAN IV-H
COMPUTER - SDS SIGMA 7

SUBROUTINE COMPUTES THE SPEED OF SOUND IN SEA WATER FROM THE TEMPERATURE, SALINITY AND PRESSURE ACCORDING TO W.D. WILSON'S FORMULAS. AN EARLIER VERSION WAS WRITTEN BY JACQUELINE WEBSTER IN FORTRAN II FOR THE GE 225.

INFORMATION PROCESSING CENTER
ATTN. MARY HUNT
WOODS HOLE OCEANOGRAPHIC INSTITUTION
WOODS HOLE, MASSACHUSETTS 02543

--* TIDES, ASTRONOMICAL *-*-*

HARMONIC ANALYSIS OF TIDAL DATA

LANGUAGE - FORTRAN IV
COMPUTER - CDC 6600

(COPY ON FILE AT NODC)
THE PROGRAM GENERATES A VARIABLE LENGTH SINE TABLE IN FIVE QUADRANTS

AND THE INDEPENDENT VARIABLES WHICH ARE FUNCTIONS OF TIME ARE EXTRACTED FROM THIS TABLE. THE LEAST SQUARES METHOD IS EMPLOYED AND THE HARMONIC CONSTANTS ARE DERIVED BY THE USE OF A MULTIPLE CORRELATION SCREENING PROCESS WHICH CAN BE TERMINATED WHEN THE REGRESSION EQUATION CONTAINS A SPECIFIED NUMBER OF TERMS OR WHEN THE NEXT CONSTITUENT WILL NOT EXPLAIN A PREDETERMINED FRACTION OF THE VARIANCE. TIDE HEIGHTS ARE READ INTO CORE STORAGE FROM MAGNETIC TAPE OR CARDS. OTHER INPUT INCLUDES CONSTITUENT SPEEDS IN DEGREES PER SOLAR HOUR, NODE FACTORS, AND EQUILIBRIUM ARGUMENTS IN DEGREES. THE OUTPUT IS AN ORDERED LISTING OF HARMONIC CONSTANTS. NO PROVISION IS MADE FOR ELIMINATION OF COMPONENT EFFECTS. CORE STORAGE NECESSARY - 38,000 WORDS. AUTHOR - ROBERT A. CUMMINGS. EARLIER VERSIONS WRITTEN FOR THE IBM 1620-I AND FOR THE IBM 7030 (STRETCH) COMPUTERS.

OCEANOGRAPHY DIVISION
ESSA, COAST AND GEODETIC SURVEY
ROCKVILLE, MD. 20852

TIDAL CURRENT PREDICTION

LANGUAGE - FORTRAN IV
COMPUTER - CDC 6600

(COPY ON FILE AT NODC)
COMPUTES HOURLY VELOCITIES OF THE CURRENT, TIMES OF SLACK AND TIMES AND VELOCITIES OF MAXIMUM CURRENT USING THE HARMONIC METHOD IN WHICH THE CONSTITUENT VELOCITIES ARE COMBINED INTO THE RESULTANT VELOCITY. HOURLY VALUES ARE SCREENED TO DETERMINE BETWEEN WHICH HOURS A SLACK OR MAXIMUM OCCURS. THEN CALCULATION AND COMPARISON OF THE VELOCITIES ARE MADE AT 0.1 HOUR INTERVALS UNTIL THE TIME OF SLACK OR EXTREME VELOCITY IS DETERMINED. CORE STORAGE NECESSARY-- 11,000 WORDS. AUTHOR - ROBERT A. CUMMINGS.

OCEANOGRAPHY DIVISION
ESSA, COAST AND GEODETIC SURVEY
ROCKVILLE, MD. 20852

NIO PROGRAM 48 - TIDAL ANALYSIS AND PREDICTION

LANGUAGE - CHLF 3/4
COMPUTER - MERCURY

GENERAL PURPOSE PROGRAM FOR (1) THE ANALYSIS OF A YEAR'S HOURLY OBSERVED VALUES OF TIDAL HEIGHT INTO 63 TIDAL CONSTITUENTS, (2) THE PREDICTION OF VALUES OF TIDAL HEIGHT FOR A SPECIFIED PERIOD AND SPECIFIED INTERVAL BETWEEN PREDICTIONS, (3) THE CALCULATION OF RESIDUALS (OBSERVATIONS - PREDICTIONS) FOR A SPECIFIED PERIOD AND INTERVAL. AUTHOR-- JAMES CREASE. REF. N.I.O. INTERNAL REPORT NO. N5, PAGES 21-26. THIS PROGRAM SHOULD BE ADAPTABLE TO THE ATLAS COMPUTER.

NATIONAL INSTITUTE OF OCEANOGRAPHY
WORMLEY, GODALMING, SURREY
ENGLAND

THEORETICAL RADIAL TIDAL FORCE

LANGUAGE - MAD
COMPUTER - IBM 7090

(COPY ON FILE AT NODC)
THERE ARE THREE INPUT FORMATS TO THIS PROGRAM-- 1) ASTRONOMICAL DATA FROM THE NAUTICAL ALMANAC. 2) THE SOLAR EPHEMERIS OBTAINED FROM THE SAME SOURCE. ONLY THE EARTH-SUN RADIUS VECTOR IS NEEDED. 3) LIST OF LOCAL CONSTANTS, LATITUDE AND LONGITUDE IN DEGREES OF ARC AND MINUTES, ELEVATION IN CENTIMETERS. OUTPUT GIVES LUNAR, SOLAR, AND TOTAL TIDAL FORCES AND THE VECTOR DATE. PROGRAM ACCOMODATES MAXIMUM OF 725 HOURS (30 DAYS) OF DATA IN CORE STORAGE. AUTHOR-- HENRY L. POLLAK.

DEPT. OF EARTH AND PLANETARY SCIENCES
414 SPACE RESEARCH COORDINATION CENTER
UNIVERSITY OF PITTSBURGH
PITTSBURGH, PENNA 15213

ASTRONOMICAL TIDE PREDICTION

LANGUAGE - FORTRAN 66

COMPUTER - CDC 6600

(COPY ON FILE AT NODC)
COMPUTES HOURLY VALUES ALSO TIME AND HEIGHTS OF HIGH AND LOW WATER USING THE HARMONIC METHOD IN WHICH THE CONSTITUENT TIDES ARE COMBINED INTO THE RESULTANT TIDE. HOURLY VALUES ARE SCREENED TO DETERMINE BETWEEN WHICH HOURS A TIDE EXTREME WILL OCCUR, THEN CALCULATION AND COMPARISON OF THE TIDES ARE MADE AT 0.1 HOUR INTERVALS UNTIL THE EXTREME TIDE IS DETERMINED. ANY ARBITRARY DATUM PLANE MAY BE SELECTED. THE OUTPUT IS OPTIONAL AND MAY BE HOURLY TIDES, HIGH AND LOW TIDES, OR BOTH. RUNNING TIME FOR BOTH-- ABOUT 25 SECONDS FOR ONE STATION FOR ONE YEAR. AUTHORS-- N.A. PORE (WEATHER BUREAU) AND R.A. CUMMINGS (COAST AND GEODETIC SURVEY). EARLIER VERSIONS WRITTEN FOR THE IBM 704 AND IN SOS FOR THE IBM 7090/94. REVISED IN 1966. PROGRAM DESCRIPTION AND LISTING ARE GIVEN IN WEATHER BUREAU TECHNICAL MEMORANDUM WTBM TDL-6, JANUARY 1967.

OCEANOGRAPHY DIVISION
ESSA, COAST AND GEODETIC SURVEY
ROCKVILLE, MD. 20852

TIDES

LANGUAGE - FORTRAN 60
COMPUTER - (NOT GIVEN)

(COPY ON FILE AT NODC)
PREDICTS TIDES IN THE OPEN SEA UTILIZING THE BASIC HYDRODYNAMIC EQUATIONS, FOR THE PRINCIPAL LUNAR SEMIDIURNAL CONSTITUENT M2. APPLICATION IS MADE TO THE ANALYSIS OF THE TIDAL REGIME IN THE GULF OF MEXICO. REF. THESIS BY THOMAS H. GAINER, JR. (MAY 1966, 92 P).

NAVAL POSTGRADUATE SCHOOL
MONTEREY, CALIFORNIA 93940

TIDAL PREDICTION

LANGUAGE - MAC
COMPUTER - ICT 1301

(COPY ON FILE AT NODC)
COMPUTES TIMES OF HIGH AND LOW WATER FOR A PORT FOR ONE YEAR. INPUT, ON PUNCHED CARDS, ARE SPEED, AMPLITUDES, AND INITIAL ANGLES. USES ITERATION METHOD, FOLLOWING NEWTON. SOURCE LANGUAGE-- MANCHESTER AUTOCODE. REQUIRES 800 WORDS STORAGE ON ICT 1301.

UNIVERSITY OF CAPE TOWN
OCEANOGRAPHY DEPARTMENT
ATTN. MR. A.M. SHIPLEY
PRIVATE BAG, RONDEBOSCH, C.P.
REPUBLIC OF SOUTH AFRICA

PREDICTION OF HOURLY TIDE

LANGUAGE - (NOT GIVEN)
COMPUTER - MERCURY

COMPUTES HEIGHT OF TIDE BY EVALUATING A HARMONIC FUNCTION USING 42 COMPONENTS, FOR EACH HOUR OVER A PERIOD OF 370 DAYS. INCLUDES SUBROUTINE FOR COSINE FUNCTION. RUNNING TIME ABOUT 50 MINUTES FOR ONE STATION FOR 370-DAY PERIOD.

HYDROGRAPHER OF THE NAVY
ARGENTINE NAVY HYDROGRAPHIC OFFICE
AVENIDA MONTES DE OCA 2124
BUENOS AIRES, REPUBLICA ARGENTINA

--* WAVES AND HYDROMECHANICS *-*-*

SURFACE WAVE RAYS

LANGUAGE - FORTRAN II AND FAP

COMPUTER - IBM7094/CAL-
COMP 670/564

(COPY ON FILE AT NODC)
CALCULATES AND PLOTS WAVE-RAY PATTERNS FOR A COASTAL AREA OF INTEREST. GIVEN A GRID OF DEPTH VALUES, THE INITIAL POSITION OF A WAVE RAY, AND THE DIRECTION OF TRAVEL AND PERIOD OF THE WAVE, SUCCESSIVE POINTS ON THE RAY PATH ARE CALCULATED FOR OUTPUT ON TAPE. THE PLOTTER USES THIS TAPE TO PLOT THE WAVE RAYS. FOR EACH POINT ON THE PATH, WATER DEPTH AND BOTTOM SLOPE ARE INTERPOLATED FROM THE DEPTH GRID, WAVE SPEED AND CURVATURE ARE COMPUTED ACCORDING TO CLASSIC THEORY, AND THE COORDINATES OF THE NEXT POINT ARE APPROXIMATED BY AN ITERATION PROCEDURE. APPROXIMATELY 11,000 POSITIONS OF STORAGE ARE REQUIRED FOR THE DATA (EXCLUSIVE OF DEPTH GRID) AND THE PROGRAM. IN ADDITION, ONE MEMORY POSITION IS NECESSARY FOR EACH COORDINATE INTERSECTION ON THE DEPTH GRID. REPORTED IN TECHNICAL MEMORANDUM NO. 17 (1966) OF THE U.S. ARMY COASTAL ENGINEERING RESEARCH CENTER (CERC), WASHINGTON, D.C. 20016. AUTHOR-- W. STANLEY WILSON, JOHNS HOPKINS UNIV. CARD DECK AND TM17 DEPOSITED AT CERC.

W. S. WILSON
DEPARTMENT OF OCEANOGRAPHY
THE JOHNS HOPKINS UNIVERSITY
BALTIMORE, MD. 21218

WAVES

LANGUAGE - SCRAP
COMPUTER - CDC 1604

COMPUTES WIND WAVE AND SWELL-- HEIGHT, PERIOD, DIRECTION, MEAN WAVE HEIGHT FOR PAST 36 HOURS. INPUT ARE SURFACE WINDS, SEA SURFACE TEMPERATURE, AND ANALYZED WAVE HEIGHTS FOR PAST 72 HOURS. OUTPUT ANALYSIS INCLUDES 12, 24, 36, 48 HOUR WIND WAVE AND SWELL HEIGHTS AND COMBINED HEIGHTS, ETC. CORE STORAGE NEEDED-- 76046(8) WORDS. ADDITIONAL STORAGE-- 24 UNIVAC DRUM BLOCK AREAS OF 7634(8). DIRECT INQUIRIES TO--

COMMANDING OFFICER
FLEET NUMERICAL WEATHER CENTRAL
MONTEREY, CALIFORNIA 93940

GENERATION OF WATER WAVES BY TURBULENT WIND FLOW

LANGUAGE - FORTRAN
COMPUTER - IBM 360/67

(COPY ON FILE AT NODC)
PROGRAM COMPUTES VELOCITY PROFILE, NORMAL PRESSURE, TANGENTIAL SHEAR STRESS, AND WAVE GROWTH RATE. REF. THESIS BY PAUL R. KLINEDINST, JR., JUNE 1968 (UNPUBLISHED MS.).

NAVAL POSTGRADUATE SCHOOL
MONTEREY, CALIFORNIA 93940

OPTIMUM TRACK SHIP ROUTING

LANGUAGE - MACHINE AND
FORTRAN IV
COMPUTER - PB-440 AND
UNIVAC 1107

SELECTS OPTIMUM ROUTES FOR OCEAN VESSELS TRANSITING N. ATLANTIC OCEAN, GIVEN INPUT DATA ON SEA HEIGHTS AND DIRECTION. OUTPUT-- MAG TAPE AND PRINTOUT INDICATING OPTIMUM PATH OF SHIP, AND TIME REQUIRED TO CROSS BY BOTH OPTIMUM AND PRESPECIFIED FIXED ROUTE. AUTHOR-- F.W. NAGLE.

COMMANDING OFFICER
NAVY WEATHER RESEARCH FACILITY
BLDG. R-48, NAVAL AIR STATION
NORFOLK, VIRGINIA 23511

VC2AP3 SHIP ROUTING

LANGUAGE - FORTRAN
COMPUTER - CDC 1604

CALCULATES THE OPTIMUM TRACK SHIP ROUTE OF A VC2AP3 VESSEL ON A TRANS-PACIFIC VOYAGE. THE PROGRAM CAN BE MODIFIED EASILY TO PROVIDE ROUTES FOR OTHER TYPE VESSELS IN ANY OCEAN AREA OF THE N. HEMISPHERE. USES TWO ADVANCES IN THE CALCULUS OF VARIATIONS METHOD FOR MINIMAL-TIME SHIP ROUTING. INCORPORATES LONG-RANGE (5-DAY AND 30-DAY) WEATHER FORECASTS TO EXTRAPOLATE THE FNWC OCEAN WAVE FIELD FORECASTS TO EIGHT DAYS. MAIN PROGRAM AND SUBROUTINES LISTED IN TECHNICAL REPORT NO. 81 (JULY 1967), BY G.J. HALTINER, W.E. BLEICK, AND F.D. FAULKNER.

NAVAL POSTGRADUATE SCHOOL
MONTEREY, CALIFORNIA 93940

SEICHE ANALYSIS

LANGUAGE - FORTRAN II AND ALGOL
COMPUTER - IBM 360/50

(COPY ON FILE AT NODC)
COMPUTES THE SEICHE PARAMETERS IN ACTUAL BASINS, GULFS OR BAYS. REF. SPECIAL REPORT NO. 4 'DIGITAL COMPUTER PROGRAMS FOR THE DEFANT METHOD OF SEICHE ANALYSIS', JULY 1968, BY EVERETT J. FEE.

THE LIBRARIAN
CENTER FOR GREAT LAKES STUDIES
UNIVERSITY OF WISCONSIN-MILWAUKEE
MILWAUKEE,WISCONSIN 53201 USA

PROFIL (TSUNAMI PROFILES)

LANGUAGE - FORTRAN IV
COMPUTER - IBM 7094

TREATS A TSUNAMI OR OTHER LONG WAVE AS IF IT WERE A TRAIN OF UNIFORM PERIODIC WAVES MOVING OVER A BOTTOM OF CONSTANT SLOPE, USING LINEAR SHALLOW-WATER THEORY. THE RESULTS ARE PLOTTED ON A SERIES OF GRAPHS. PROGRAM LISTED IN TECHNICAL REPORT HEL 16-1 (OCT 1966) 'LONG WAVE PROFILES OVER A SLOPE', BY R.H. CROSS AND R.L. WIEGEL.

UNIVERSITY OF CALIFORNIA
HYDRAULIC ENGINEERING LABORATORY
BERKELEY, CALIFORNIA 94720

WAVE SHOALING

LANGUAGE - FORTRAN
COMPUTER - IBM 7040

(COPY ON FILE AT NODC)
CALCULATES THE TRANSFORMATION OF A WAVE PROPAGATING FROM DEEP WATER TO THE SHORE, APPLYING THE PRINCIPLE OF CONSERVATION OF ENERGY FLUX. THE FIFTH ORDER GRAVITY WAVE THEORY OF SKJELBREIA AND HENDRIKSON (1960) IS USED IN THE CALCULATIONS. THE QUALITATIVE FEATURES OF THE RESULTS ARE THE SAME AS THOSE OBTAINED BY LE MEHAUTE AND WEBB (1964). HOWEVER, THE SHOALING COEFFICIENT IS SMALLER IN MAGNITUDE. REF. NESCO REPORT SN-134-9 (1966), BY R.C.Y. KOH AND B.J. LE MEHAUTE. PROGRAMERS-- ROBERT WHALIN AND MARYANN MOORE.

NATIONAL ENGINEERING SCIENCE CO.
711 SOUTH FAIR OAKS AVE.
PASADENA, CALIFORNIA

SUBROUTINE LENG1

LANGUAGE - FORTRAN IV
COMPUTER - IBM 360/40

(COPY ON FILE AT NODC)
COMPUTES WAVE LENGTHS AND SPEED OF GRAVITY WAVES, GIVEN THE PERIOD AND WATER DEPTH, USING SMALL-AMPLITUDE (AND STOKES' SECOND-ORDER) WAVE THEORY. OUTPUT ARE WAVE LENGTH AND SPEED, AND THE DEEP-WATER WAVE LENGTH. THE IMPLICIT EQUATIONS ARE APPROXIMATED, THEN ITERATION IS PERFORMED TO REDUCE THE ERROR.

PROF. RALPH H. CROSS
ROOM 48-209 HYDRODYNAMICS LABORATORY
MASSACHUSETTS INSTITUTE OF TECHNOLOGY

CAMBRIDGE, MASSACHUSETTS 02139

PROFILE

LANGUAGE - FORTRAN IV
COMPUTER - IBM 360/40

(COPY ON FILE AT NODC)
COMPUTES AND PLOTS THE WAVE PROFILE GIVEN THE SPECTRUM (IN THE FORM OF THE FOURIER COEFFICIENTS). INPUT-- THE NUMBER OF COMPONENTS, AND THE NUMBER OF VALUES OF ETA TO BE COMPUTED AND PLOTTED, ARE READ IN AT EXECUTION TIME. OUTPUT-- A PRINTER PLOT (ON A PRINTER WITH A 132-CHARACTER LINE) OF ETA VS. T. REF. TECH. NOTE NO. 13 'WATER WAVE TEACHING AIDS' (R.H. CROSS, SEP 1968), HYDRODYNAMICS LABORATORY, DEPARTMENT OF CIVIL ENGINEERING.

PROF. RALPH H. CROSS
ROOM 48-209 HYDRODYNAMICS LABORATORY
MASSACHUSETTS INSTITUTE OF TECHNOLOGY
CAMBRIDGE, MASSACHUSETTS 02139

SUBROUTINE PROF1

LANGUAGE - FORTRAN IV
COMPUTER - IBM 360/40

(COPY ON FILE AT NODC)
COMPUTES WATER SURFACE ELEVATIONS, ETA(X) OR ETA(T), OVER A WAVE PERIOD, USING LINEAR WAVE THEORY. INPUT-- WAVE HEIGHT, PERIOD AND LENGTH, AND THE WATER DEPTH. OUTPUT-- RETURNS THE THREE ARRAYS OF X, T, AND ETA FOR T=0, PER/40,...,PER AND X=0, L/40, 2L/40,...,L. WRITEUPS AND LISTING IN TECHNICAL NOTE NO. 13 OF THE HYDRODYNAMICS LABORATORY. ALTERNATIVE SUBROUTINES, PROF2 AND PROF3, ACCOMPLISH THE SAME PURPOSE USING STOKES' SECOND- AND THIRD-ORDER WAVE EQUATIONS.

PROF. RALPH H. CROSS
ROOM 48-209 HYDRODYNAMICS LABORATORY
MASSACHUSETTS INSTITUTE OF TECHNOLOGY
CAMBRIDGE, MASSACHUSETTS 02139

SUBROUTINE REFL1

LANGUAGE - FORTRAN IV
COMPUTER - IBM 360/40

(COPY ON FILE AT NODC)
COMPUTES WATER SURFACE PROFILES FOR THE PARTIAL (TWO-DIMENSIONAL) REFLECTION OF A LINEAR (SMALL-AMPLITUDE) WAVE FROM A STRUCTURE. INPUT - THE INCIDENT WAVE HEIGHT, PERIOD, AND LENGTH, THE WATER DEPTH, AND THE REFLECTION COEFFICIENT. OUTPUT-- PRINTS WATER SURFACE PROFILES FOR TWO WAVE LENGTHS, FOR T = 0, T/4, T/2, AND 3T/4. DOCUMENTATION IS IN TECHNICAL NOTE 13, M.I.T. HYDRODYNAMICS LABORATORY (SEPT 1968, 92 P).

PROF. RALPH H. CROSS
ROOM 48-209 HYDRODYNAMICS LABORATORY
MASSACHUSETTS INSTITUTE OF TECHNOLOGY
CAMBRIDGE, MASSACHUSETTS 02139

SUBROUTINES UOFT1, WOFT1, UTOFT1, WTOFT1

LANGUAGE - FORTRAN IV
COMPUTER - IBM 360/40

(COPY ON FILE AT NODC)
COMPUTES VALUES OF U(T), W(T), THE PARTIAL DERIVATIVE OF U WITH RESPECT TO T, OR THE PARTIAL DERIVATIVE OF W WITH RESPECT TO T, I.E. THE HORIZONTAL AND VERTICAL FLOW VELOCITIES AND THEIR ACCELERATIONS OVER A WAVE PERIOD AT A GIVEN DEPTH, Z, USING LINEAR WAVE THEORY. INPUT ARE WAVE HEIGHT, PERIOD, AND LENGTH, THE WATER DEPTH, AND THE DESIRED VALUE OF Z. OUTPUT-- RETURNS ARRAYS OF T AND U(T), W(T), ETC., FOR T=0, PER/40, 2PER/40,...,PER. ALTERNATE SETS OF SUBROUTINES CARRY OUT THE SAME PURPOSE USING STOKES' SECOND- AND THIRD-ORDER WAVE EQUATIONS. WRITEUPS AND LISTINGS IN TECHNICAL NOTE NO. 13 OF THE M.I.T. HYDRODYNAMICS LABORATORY (SEPT 1968).

PROF. RALPH H. CROSS
ROOM 48-209 HYDRODYNAMICS LABORATORY
MASSACHUSETTS INSTITUTE OF TECHNOLOGY

CAMBRIDGE, MASSACHUSETTS 02139

SUBROUTINES UMAX1, WMAX1, UTMAX1, WTMAX1

LANGUAGE - FORTRAN IV
COMPUTER - IBM 360/40

(COPY ON FILE AT NODC)
COMPUTES U(MAX), W(MAX), THE PARTIAL DERIVATIVE OF U WITH RESPECT TO T (MAX), OR THE PARTIAL DERIVATIVE OF W WITH RESPECT TO T (MAX) I.E. THE MAXIMUM FLOW VELOCITIES IN THE X AND Z DIRECTIONS AND THEIR CORRESPONDING TEMPORAL ACCELERATIONS, AS A FUNCTION OF Z, FROM Z = -H TO Z = ETA(MAX), USING LINEAR WAVE THEORY. INPUT-- WAVE HEIGHT, PERIOD, AND LENGTH, AND THE WATER DEPTH. OUTPUT-- RETURNS ARRAYS OF Z AND UMAX(Z) ETC., FOR Z = -H, -(29/30)H, -(28/30)H,... FOR Z LESS THAN ETA(MAX). ALTERNATE SETS OF ROUTINES CARRY OUT THE SAME PURPOSE USING STOKES' SECOND- AND THIRD-ORDER EQUATIONS. WRITEUPS AND LISTINGS IN TECHNICAL NOTE NO. 13 OF THE M.I.T. HYDRODYNAMICS LABORATORY.

PROF. RALPH H. CROSS
ROOM 48-209 HYDRODYNAMICS LABORATORY
MASSACHUSETTS INSTITUTE OF TECHNOLOGY
CAMBRIDGE, MASSACHUSETTS 02139

WAVE FORCE DISTRIBUTION, TEMPORAL AND SPACIAL

LANGUAGE - FORTRAN IV
COMPUTER - IBM 7090/94

(COPY ON FILE AT NODC)
GIVEN THE WATER DENSITY, THE WATER DEPTH, THE PILE DATA, AND A CHOICE OF WAVE HEIGHT AND PERIOD COMBINATIONS, THIS PROGRAM COMPUTES THE DISTRIBUTION OF FORCE ALONG A PILE OF ANY SHAPE. ALSO CALCULATED IS THE FORCE AT THE WATER SURFACE. THESE DISTRIBUTIONS ARE CALCULATED FOR TWENTY EQUALLY SPACED POINTS THROUGHOUT THE WAVE CYCLE. IF THE VALUES OF C(M) AND C(D), (MASS AND DRAG COEFFICIENTS), ARE UNSPECIFIED, THE VALUES ASSUMED ARE C(M) = 2.0 AND C(D) = 1.6. THE PROGRAM ALLOWS OTHER VALUES TO BE SPECIFIED IN CASE THE SITUATION (I.E., THE PILE SHAPE) CALLS FOR IT. PROGRAM WRITTEN FOR THE WAVE RESEARCH LAB AT THE UNIV. OF CALIF. REF. HEL REPORT 9-4 'WAVE FORCE PROGRAMS', BY R.H. CROSS.

PROF. RALPH H. CROSS
ROOM 48-209 HYDRODYNAMICS LABORATORY
MASSACHUSETTS INSTITUTE OF TECHNOLOGY
CAMBRIDGE, MASSACHUSETTS 02139

WAVE FORCES AND MOMENTS

LANGUAGE - FORTRAN IV
COMPUTER - IBM 7090/94

(COPY ON FILE AT NODC)
GIVEN THE DESIRED COMBINATIONS OF WAVE HEIGHT AND PERIOD, PILE DIAMETER, AND WATER DEPTH, COMPUTES THE WAVE LENGTH, CHECKS FOR EXCESSIVE STEEPNESS, AND COMPUTES THE TOTAL FORCE ON, AND THE MOMENT ABOUT THE BASE OF, THE PILES CHOSEN. THE FORMULAS USED ARE DERIVED FROM LINEAR THEORY EXCEPT THAT INTEGRATION IS CARRIED TO THE FREE SURFACE, AS CALCULATED. FORCE AND MOMENT ARE COMPUTED FOR 40 POINTS IN A WAVE CYCLE. REF. U. OF CALIF. HEL REPORT 9-4 'WAVE FORCE PROGRAMS' BY R.H. CROSS.

PROF. RALPH H. CROSS
ROOM 48-209 HYDRODYNAMICS LABORATORY
MASSACHUSETTS INSTITUTE OF TECHNOLOGY

SEAKEEPING

LANGUAGE - FORTRAN IV
COMPUTER - IBM 1130

(COPY ON FILE AT NODC)
PREDICTS HEAVE, PITCH, AND ACCELERATION OF A DESIGNATED HULL FORM IN REGULAR WAVES OVER A RANGE OF WAVE LENGTHS AND WAVE AMPLITUDES. THE PROGRAM IS DIVIDED INTO FOUR MAINLINE SECTIONS-- PART I SETS UP THE INPUT DATA FOR THE TWO CALCULATING SECTIONS OF THE PROGRAM. PART II CALCULATES THE SIMULATED ADDED MASS AND AMPLITUDE OF THE GENERATED WAVES OF THE HULL FORM. PART III CALCULATES THE AMPLITUDES OF HEAVE, PITCH, AND ACCELERATION, AND PART IV PLOTS AND CURVE FITS THIS INFORMATION. REPORT REF. NO. USCG-PROGRAM-ENE-12 (JUL 68, 116 P) BY JACK

W. LEWIS, ICEBREAKER DESIGN BRANCH.

U. S. COAST GUARD HEADQUARTERS
NAVAL ENGINEERING DIVISION
1300 E ST., NW
WASHINGTON, D. C. 20591

LONGITUDINAL STRENGTH OF SHIP HULL

LANGUAGE - FORTRAN IV
COMPUTER - IBM 7090

EXTENDS THE STATIC BALANCE METHOD OF CALCULATING SHEAR AND BENDING MOMENT RESPONSES TO INCLUDE A WIDE RANGE OF WAVE HEIGHTS, LENGTHS, AND POSITIONS WITH RESPECT TO AMIDSHIPS FOR A SHIP VERTICALLY BALANCED IN HEAD-ON TROCHOIDAL WAVES. THE PROGRAM HAS THE OPTION OF INCLUDING OR OMITTING THE SMITH CORRECTION, AND THE FINAL DATA MAY BE PRESENTED IN EITHER TABULAR OR GRAPHICAL FORM. PROGRAM YP04 PROVIDES A MEASURE OF THE LONGITUDINAL STRENGTH FROM THE STATIC BALANCE. YP05 IS A METHOD OF PLOTTING THE LONGITUDINAL STRENGTH CURVES, PROGRAMMED BY MRS. SHARON E. GOOD. REF. REPORT NO. 2272 (JAN 67, 93 P), BY GEOFFREY O. THOMAS. DDC NO. IS AD-647-807.

MR. GENE H. GLEISSNER
HEAD, APPLIED MATHEMATICS LABORATORY
NAVAL SHIP RESEARCH AND DEVELOPMENT CENTER
WASHINGTON, D.C. 20007

WAVE STATISTICS (PART I AND PART II)

LANGUAGE - FORTRAN IV
COMPUTER - IBM OS/360

DETERMINES WAVE STATISTICS OF A SEA RECORD. THE STATISTICS INCLUDE-- NUMBER OF WAVES, R.M.S., MEAN, MAX., AND SIGNIFICANT WAVE HEIGHT, AND SPECTRAL DECOMPOSITION OF THE SEA SURFACE. OUTPUT-- PRINTOUT OF WAVE STATISTICS, AND PLOT OF SPECTRAL ESTIMATE. AUTHOR-- J. E. MAMRING.

PROF. FREDERICK F. MONROE
DEPT. OF OCEAN ENGINEERING
FLORIDA ATLANTIC UNIVERSITY
BOCA RATON, FLORIDA 33432

WAVEIN AND DIFRAK

LANGUAGE - FORTRAN
COMPUTER - IBM 7094 AND CDC 6400

A PAIR OF PROGRAMS FOR (1)SPECTRAL ANALYSIS OF WAVE DATA, AND (2)COMPUTATION AND PLOT OF THE DIFFRACTION COEFFICIENTS. AUTHOR-- SHOU-SHAN FAN, C.E.R.C., WASH., D.C.

PROF. ROBERT L. WIEGEL
DEPARTMENT OF CIVIL ENGINEERING
UNIVERSITY OF CALIFORNIA
BERKELEY, CALIF. 94720

REFRACTION OF WAVES APPROACHING A COASTLINE

LANGUAGE - FORTRAN IV
COMPUTER - IBM 7090/94

A PROGRAM TO CONSTRUCT REFRACTION DIAGRAMS AND COMPUTE WAVE HEIGHTS FOR WAVES MOVING INTO SHOALING WATER. CONSISTS OF MAIN PROGRAM WAVES I AND SUBROUTINES RAYCON, REFRAC, CURVE, DEPTH, HEIGHT, ERROR, WRITER. SOLVES THE REFRACTION EQUATION AND THE WAVE INTENSITY EQUATION FOR ARBITRARY BOTTOM SHAPES. SOLUTION WAS SOUGHT BY USE OF THE NUMERICAL METHODS OF FINITE DIFFERENCES. ONE OF THREE HYDRAULIC ENGINEERING PROBLEMS DESCRIBED IN TECH. REPT. NO. TR-80 (JUN 67, 185 P) BY R. S. DOBSON. PROGRAMS ARE LISTED IN THE REPORT. THE DDC NUMBER IS AD-659-309.

DEPT. OF CIVIL ENGINEERING

STANFORD UNIVERSITY
STANDFORD, CALIFORNIA

SIMULATION OF WIND-GENERATED WAVES

LANGUAGE - FORTRAN IV
COMPUTER - IBM 7090/94

INVESTIGATES AND COMPARES THE LABORATORY SIMULATED AND PROTOTYPE 'SEA' DATA. USES PROGRAMS WAVHTS (COMPUTE WAVE HEIGHTS AND THEIR STATISTICAL PROPERTIES), SPECTR (COMPUTE NORMALIZED SPECTRUM), STATS (COMPUTE VARIOUS STATISTICAL PROPERTIES OF THE SEA SURFACE RECORD), AND CONVRT (CONVERTS SCRAMBLED VOLTAGE RECORDS TO TIME SERIES OF SURFACE DISPLACEMENT). REF. TECH. REPORT NO. 65 'LABORATORY SIMULATION OF SEA WAVES' (JUL 1966, 134 P), BY JOSEPH M. COLONELL.

STANFORD UNIVERSITY
DEPT. OF CIVIL ENGINEERING
STANFORD, CALIFORNIA

BIOLOGICAL STATION FILE

LANGUAGE - EMA
COMPUTER - ATLAS I

A SET OF FOUR PROGRAMS WHICH CONSTITUTE A COMPLETE SYSTEM FOR PREPARING, MAINTAINING AND ACCESSING A MAGNETIC TAPE FILE OF BIOLOGICAL STATION DATA. N.I.O. PROGRAMS 94, 94/A, 94/B, AND 94/C. AUTHORS-- MARGARET RINGROSE AND BRIAN HINDE.

NATIONAL INSTITUTE OF OCEANOGRAPHY
WORMLEY, GODALMING, SURREY
ENGLAND

GREAT CIRCLE RETRIEVAL

LANGUAGE - FORTRAN
COMPUTER - CDC 3800

THERE ARE THREE DIFFERENT OPTIONS AVAILABLE-- (1) GIVEN TWO POINTS ON THE EARTH'S SURFACE, THE PROGRAM CALCULATES THE GREAT CIRCLE ROUTE BETWEEN THE TWO POINTS AND THE CORRESPONDING MARSDEN SQUARES ALONG AND AT A GIVEN DISTANCE FROM THE TRACK. THE DATA TAPES ARE SEARCHED BY MARSDEN SQUARES AND THE SOUND VELOCITY PROFILES, TEMPERATURE, SALINITY AND DEPTH OF OBSERVATION ARE ABSTRACTED. (2) INDIVIDUAL MARSDEN SQS. MAY BE INPUT INTO THE PROGRAM AND THE ABOVE QUANTITIES ARE ABSTRACTED. (3) A POINT, A RADIUS OF INTEREST IN NAUTICAL MILES, AND A CLUSTER OF MARSDEN SQUARES MAY BE SPECIFIED. THE PROGRAM WILL ABSTRACT ALL THE STATIONS WITHIN A CIRCULAR AREA OF THE POINT FOR THE GIVEN MONTHS. THE INPUT RETRIEVAL PROGRAM, BY WALTER YERGEN, USES DATA TAPES COMPACTED FROM THE NODC FILE. STORAGE REQUIREMENTS-- 105,056 OCTAL WORDS OF CORE, AND ONE CDC DISC FILE.

B. G. ROBERTS, JR., CODE 8177
ACOUSTICS DIVISION
NAVAL RESEARCH LABORATORY, WASHINGTON, D. C. 20390

CORE COMPUTER PROGRAM

LANGUAGE - FORTRAN
COMPUTER - (NOT GIVEN)

(COPY ON FILE AT NODC)
A PROGRAM PACKAGE DESIGNED FOR USE ON A RECONNAISSANCE BASIS, LISTING ALL CORES IN THE L-DGO COLLECTION CONTAINING CHARACTERISTICS SPECIFIED BY THE USER. THE PROGRAM OUTPUTS THE REQUIRED LIST OF CORES WITH A SHORT DESCRIPTION OF EACH CORE. AS SPECIFIED ON FOUR CONTROL CARDS, CORES MAY BE REQUESTED FROM CERTAIN LOCATIONS, OF CERTAIN LENGTHS, TAKEN IN A CERTAIN RANGE OF WATER DEPTHS, OF SPECIFIED AGE, LITHOLOGY AND CONTAINING SPECIFIC PALEONTOLOGIC AND MINERALOGIC COMPONENTS. CORES WHICH ARE ORIENTED, HAVE APPEARED IN PUBLICATIONS AND HAVE PALEOMAGNETIC DATA AVAILABLE CAN ALSO BE REQUESTED.

MR. ROY R. CAPO
CORE CURATOR
LAMONT-DOHERTY GEOLOGICAL OBSERVATORY
PALISADES, NEW YORK 10964

STORAGE AND RETRIEVAL OF GEOPHYSICAL DATA

LANGUAGE - FORTRAN
COMPUTER - (NOT GIVEN)

(COPY ON FILE AT NODC)
A SYSTEM OF PROGRAMS AND SUBROUTINES FOR THE STORAGE, EDITING, AND RETRIEVAL OF DATA, SET UP BY THE MARINE GEOPHYSICS GROUP AT BEDFORD INSTITUTE OF OCEANOGRAPHY. THE MAIN RETRIEVAL PROGRAM SEARCHES FOR A PARTICULAR FILE ON TAPE, READS AND PRINTS FILE LABELS, AND CONTROLS THE PROCESSING SUBROUTINES CALLED. DOCUMENTED IN BIO COMPUTER NOTE 67-3-C (NOV 1967), BY D. I. ROSS.

BEDFORD INSTITUTE

DARTMOUTH, NOVA SCOTIA, CANADA

OCEANS CATALOGUE I AND II

LANGUAGE - FORTRAN IV
COMPUTER - CDC 3100

PROGRAM I - FACILITATES UPDATING OF CHARTS THAT DEPICT THE GEOGRAPHICAL DATA DISTRIBUTION ILLUSTRATED IN THE OCEANOGRAPHIC DATA CATALOGUE. PROGRAM II - COMPILES AND LISTS AN INDEX OF CANADIAN REFERENCE NUMBERS IN GEOGRAPHICAL SEQUENCES FOR THE OCEANOGRAPHIC DATA CATALOGUE. AUTHOR-- J. ZEBARTH.

CANADIAN OCEANOGRAPHIC DATA CENTRE
615 BOOTH STREET
OTTAWA, CANADA

BUREAU OF COMMERCIAL FISHERIES, MIAMI

FLOW METER PLOTS	IBM 360/65FORTRAN IV	72
GENERAL MERCATOR PLOT	IBM 360/65FORTRAN IV	40
HORIZONTAL SECTIONS	IBM 360/65FORTRAN IV	40
IN SITU OCEANOGRAPHIC DATA	IBM 360/65FORTRAN IV	85
INTERPOLATION	IBM 360/65FORTRAN IV	86
MERCATOR STATION PLOT	IBM 360/65FORTRAN IV	40
OXYGEN, PHOSPHATE, DENSITY PLOTS	IBM 360/65FORTRAN IV	39
TEMPERATURE-SALINITY CURVES	IBM 360/65FORTRAN IV	39

CALIFORNIA, UNIVERSITY OF

WAVEIN AND DIFRAK	IBM 7094, FORTRAN CDC 6400	50,110
PROFIL (TSUNAMI PROFILES)	IBM 7094 FORTRAN IV	107

CANADIAN OCEANOGRAPHIC DATA CENTRE

DAILY SEAWATER OBSERVATIONS	CDC 3100, FORTRAN IV, IBM 1620 FORTRAN II-D	79
OCEANS II REPORT GENERATOR	IBM 1401 SPS	23
OCEANS III	IBM 360/65FORTRAN IV	86
OCEANS CATALOGUE I AND II	CDC 3100 FORTRAN IV	113
STATISTICS I, II, III	CDC 3100 FORTRAN IV	56
THERMOCHECK II - TEMP. CORRECTION	CDC 3100, FORTRAN IV IBM 360/65	17
TEMPERATURE-SALINITY PLOT	CDC 3100 FORTRAN	39

CAPE TOWN, UNIVERSITY OF

CHLOROPHYLL CALCULATIONS	ICT 1301 MAC	07
DELTA-ALPHA AND SIGMA-T	ICT 1301 MAC	93
HARMONIC ANALYSIS	ICT 1301 MAC	51
TIDAL PREDICTION	ICT 1301 MAC	105
VELOCITY OF SOUND	ICT 1301 MAC	103

COAST AND GEODETIC SURVEY, SEATTLE

CONDU (THERMAL CONDUCTIVITY)	IBM7094-IIFORTRAN IV /7040 DCS	31

COAST AND GEODETIC SURVEY, WASHINGTON, D. C.

ASTRONOMICAL TIDE PREDICTION	CDC 6600 FORTRAN-66	104
COMPUTE GEOGRAPHIC POSITIONS	IBM 1620 SPS	61
HARMONIC ANALYSIS OF TIDAL DATA	CDC 6600, FORTRAN IV IBM 7030 FORTRAN II	103
LORAN C	IBM 1620 SPS	62
TIDAL CURRENT PREDICTION	CDC 6600 FORTRAN IV	104
VELOCITY OF SOUND	IBM 1620 FORTRAN	102

COAST GUARD OCEANOGRAPHIC UNIT

OXYGEN COMPUTATION	H-516 FORTRAN IV	11
PHOSPHATE COMPUTATION	H-516 FORTRAN IV	11
SALINITY CONVERSION	H-516 FORTRAN IV	11
THERMOMETER CORRECTION	H-516 FORTRAN IV	16

COAST GUARD HEADQUARTERS, OFFICE OF ENGINEERING

SEAKEEPING	IBM 1130 FORTRAN IV	109

COLUMBIA UNIVERSITY, HUDSON LABORATORIES

RAY TRACING	NOT GIVEN	FORTRAN AND USER LANG.	97

COMMERCE, DEPARTMENT OF (SEE COAST AND GEODETIC SURVEY)

DEFENSE, DEPARTMENT OF (SEE FLEET..., NAVAL..., NAVY...)

DEFENSE RESEARCH ESTABLISHMENT PACIFIC

RAYTR (RAY-TRACING)	IBM 360/44	FORTRAN IV	97

DIGITAL EQUIPMENT COMPUTER USERS' SOCIETY

DECCA HI-FIX	PDP-5, 8S	FORTRAN	64
DISSOLVED OXYGEN, POTENTIAL TEMP.	PDP-5, 8S	PAL III	93
OCEAN STATION ANALYSIS AND SUMMARY	PDP-5, 8S	PAL III	93
THERMOMETER CORR. AND THERMO. DEPTH	PDP-5, 8S	PAL III	20

FLEET NUMERICAL WEATHER CENTRAL

DATA FIELD GRID EXPANSION	CDC 1604, CDC 3100	MACHINE	44
FORECASTING OF SURFACE CURRENTS	CDC 1604, CDC 3200	MACHINE	67
GG T SEA	CDC 1604	MACHINE	81
POTENTIAL MIXED LAYER DEPTH	CDC 1604, CDC 3200	MACHINE	68
SEA SURFACE TEMPERATURE ANALYSIS	CDC 1604	MACHINE	81
SUBSURFACE THERMAL STRUCTURE ANALYSIS	CDC 1604	SCRAP	82
TWO DIMENSIONAL RAY TRACE	CDC 1604, CDC 3200	SCRAP, MAP	99
WAVES	CDC 1604	SCRAP	106

FLORIDA ATLANTIC UNIVERSITY

WAVE STATISTICS	IBM OS/360	FORTRAN IV	110

FLORIDA STATE UNIVERSITY

MULTIVARIATE NON-LINEAR REGRESSION	IBM 709, CDC 6400	FORTRAN II AND IV	47
OCEANOGRAPHIC DATA COMPUTATION	IBM 709, CDC 6400	FORTRAN II	90
SEDIMENT DATA	IBM 709, CDC 6400	FORTRAN II	29

GEOLOGICAL SURVEY

ASTRONOMIC POSITION	IBM 360/65	FORTRAN IV-H	59
GENERAL REGRESSION	IBM 360/65	PL/1	45
PERCENTAGE SATURATION OF OXYGEN	IBM 360/65	FORTRAN IV-G	10
PROFILE CARD-TO-TAPE FOR GEOPAC	IBM 360/65	FORTRAN IV-H	26
TALWANI 2-D GRAVITY	IBM 360/65	FORTRAN IV-H	26
WATER CHEMISTRY	IBM 360/65	FORTRAN IV	09

INFORMATION INTERNATIONAL, INC.

RICHARDSON CURRENT METER FILM READ.	PDP-7(9)	DECAL	15

THE VORTEX OCEAN MODEL	PDP-7(9)	DECAL	38
WORLD OCEANO. DATA DISPLAY	PDP-7(9)	DECAL	38

INTERIOR, DEPARTMENT OF THE (SEE BUREAU OF COMMERCIAL FISHERIES, GEOLOGICAL SURVEY)

JOHNS HOPKINS UNIVERSITY

CHLORINITY - SALINITY	IBM 7094	FORTRAN II	12
CONTINUOUS LINE SOURCE	IBM 7094	FORTRAN II	71
CONTINUOUS SOURCE PER UNIT DEPTH	IBM 7094	FORTRAN II	71
CONTINUOUS SOURCE, WITH COOLING TERM	IBM 7094	FORTRAN II	71
DENSITY - THERMOSTERIC ANOMALY	IBM 7094	FORTRAN II	90
LATERAL RELATIVE DISTRIBUTION	IBM 7094	FORTRAN II	70
SALINITY DISTRIBUTION IN ESTUARY	NOT GIVEN	FORTRAN	70
SURFACE WAVE RAYS	IBM 7094	FORTRAN II	105
TOTAL CO(2)	IBM 7094	FORTRAN II	12

KANSAS, UNIVERSITY OF - STATE GEOLOGICAL SURVEY

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CALCULATE AND PLOT TIME-TREND CURVES	IBM7090/94	FORTRAN, FAP	46
CROSS-ASSOCIATION OF SEQUENCES	IBM7040/44	FORTRAN IV, ELLIOTT803	ALGOL 60 54
MULTIVARIATE DISCRIMINANT ANALYSIS	IBM 1620	FORTRAN II	55
POWER SPECTRUM OF GEOLOGICAL SURFACE	GE 625, IBM 7040	FORTRAN IV	54
Q-MODE CLUSTER ANALYSIS	IBM360/67, IBM7090/94	FORTRAN IV	55
SIMULATION OF DELTAIC SEDIMENTATION	IBM 360/67	FORTRAN IV-H	34
SIMULATION OF MARINE SEDIMENTATION	IBM 7040, IBM 7090/94	FORTRAN IV	33
SIMULATION OF TRANSGRESSION IN TIME	CDC 6400	FORTRAN IV	54
STANDARD-SIZE ANALYSIS OF SEDIMENTS	IBM 1620	FORTRAN II	29
TREND ANALYSIS USING FOURIER SERIES	GE 625	FORTRAN IV	55
TREND-SURFACE WITH UNRESTRICTED I/P	IBM 1620	FORTRAN II, IV, BALGOL	47
TREND SURFACES DEGREES 1 TO 6	IBM 7040	FORTRAN IV	47
2-DIMENSIONAL REGRESSION	B5500, IBM 7040	ALGOL, FORTRAN IV	45
VECTOR TREND ANAL. DIRECTIONAL DATA	IBM7090/94	FORTRAN IV	34

LAMONT GEOLOGICAL OBSERVATORY (COLUMBIA UNIVERSITY)

CORE INFORMATION	NOT GIVEN	FORTRAN	112
FOURIER ANALYSIS	IBM 7090	FORTRAN	55
REDUCTION, DISPLAY OF SEA DATA	IBM 1130	FORTRAN	14,25,60

MASSACHUSETTS INSTITUTE OF TECHNOLOGY

CURRENT METER DYNAMICS	IBM OS/360	MAC	72
DETRND, ETC. (SPECTRA SUBROUTINES)	IBM 360/40	FORTRAN IV	48
LENG1 (WAVE LENGTH AND SPEED)	IBM 360/40	FORTRAN IV	107
MAGNETIC ANOMALIES AND GRADIENTS	IBM 7094	FORTRAN II	26
PROFILE	IBM 360/40	FORTRAN IV	108
PROF1 (WATER ELEV. OVER WAVE PERIOD)	IBM 360/40	FORTRAN IV	108
REFL1 (REFLECTED WAVE)	IBM 360/40	FORTRAN IV	108
UMAX1, ETC. (MAX. FLOW VELOC.)	IBM 360/40	FORTRAN IV	109
UOFT1, ETC. (FLOW VELOCITIES)	IBM 360/40	FORTRAN IV	108
WAVE FORCE DISTRIBUTION	IBM7090/94	FORTRAN IV	109
WAVE FORCES AND MOMENTS	IBM7090/94	FORTRAN IV	109

MIAMI, UNIVERSITY OF

ALKALINITY AND SPECIFIC ALKALINITY	IBM 1620	FORTRAN	09
DYNAMIC HEIGHT CALCULATION	IBM 1620	FORTRAN II	90
JOB EDIT FOR L-Z PROGRAM	IBM 1401	AUTOCODER	21
OCEANO. DATA PLOTTING FOR ICES DATA	IBM 1620	FORTRAN II	43
OCEANO. DATA PLOTTING FOR NODC DATA	IBM 1620	FORTRAN II	43
OCEAN STA. CURVE PLOTTING FOR 1401	IBM 1401	AUTOCODER	38
SALINITY VALUE CALCULATION	IBM 1620	FORTRAN	09
TEMPERATURE AND DEPTH CALCULATIONS	IBM 1620, IBM 1401	FORTRAN AND AUTOCODER	16

MICHIGAN, UNIVERSITY OF

AVG. TEMPERATURES IN WATER COLUMN	IBM 7090	MAD	81
DYNAMIC HEIGHT AND CURRENT DYNAMICS	IBM 7090	MAD	93
GENERAL MAP PROJECTION	IBM 7090	MAD	65
MAP PROJECTION DISTORTIONS	IBM 7090	MAD	65
TREND MAP, WITH RESIDUALS	IBM 7090	MAD	47
WIND CURRENTS	IBM 7090	MAD	68

NATIONAL ENGINEERING SCIENCE CO.

WAVE SHOALING	IBM 7040	FORTRAN	107

NATIONAL INSTITUTE OF OCEANOGRAPHY

ALPHA (SPECIFIC VOLUME)	IBM 1800	FORTRAN	85
BARTLETT'S CURVE FITTING	IBM 1800	FORTRAN	46
BIOLOGICAL STATION FILE	ATLAS I	EMA	112
BRAINCON DATA REDUCTION	IBM 1800	FORTRAN IV	15
CABLE CONFIGURATION	IBM 1800	FORTRAN IV	73
CLUSTER ANALYSIS	IBM 1800	FORTRAN	55
CURRENT METER ANALYSIS	IBM 1800	FORTRAN IV	73
CURRENT METER CONVERSION	IBM 1800	FORTRAN IV	73
HILOW	IBM 1800	FORTRAN IV	48
HNAV (LORAN/DECCA COORDINATES CALC.)	IBM 1800	FORTRAN IV	63
HNV1 (LORAN/DECCA FILE)	IBM 1800	FORTRAN IV	63
POTLT (POTENTIAL TEMPERATURE)	IBM 1800	FORTRAN	85
Q FACTORS	ATLAS I	FORTRAN V	15
SATELLITE NAVIGATION	IBM 1800	FORTRAN AND ASSEMBLER	58
SBWRO (WAVE RECORDER ANALYSIS)	IBM 1800	FORTRAN IV	48
SDANO (INVERSE GEODETIC)	IBM 1800	FORTRAN IV	63
SDVEL	IBM 1800	FORTRAN	102
SIGMO	IBM 1800	FORTRAN	85
SIGMT	IBM 1800	FORTRAN	85
STATION DATA (ATLAS)	ATLAS I	EMA	83
THERMOMETER CORRECTIONS	MERCURY	CHLF 3/4	15
TIDAL ANALYSIS AND PREDICTION	MERCURY	CHLF 3/4	104
2D MAGNETIC ANOMALIES	IBM 1800	FORTRAN	26
VAPW (SATURATION VAPOR PRESSURE)	IBM 1800	FORTRAN IV	66

NATIONAL OCEANOGRAPHIC DATA CENTER

BATHYTHERMOGRAM COMPOSITE PLOT	IBM 7074	FORTRAN	41
BATHYTHERMOGRAPH DATA CONVERTER	IBM 7074	AUTOCODER	82
BATHYTHERMOGRAPH OUTPUT	IBM 1401	SPS	23
BIODETERIORATION	IBM 7074	AUTOCODER	06
CONVERSION, NODC TO ICES	IBM 1401	SPS	23
CRUISE TRACK	IBM 7074	FORTRAN	41
DENSITY-SALINITY LINEAR INTERPOL.	IBM 7074	FORTRAN	86
DENSITY-SALINITY MID PLOT	IBM 7074	FORTRAN	42
DEVIATION OF TEMP. AND SALIN. PART 1	IBM 7074	AUTOCODER	75
DRIFT BOTTLE DATA COMPUTATION	IBM 7074	AUTOCODER	70
ERROR IN VERTICAL SOUND VELOCITY	IBM 7074	FORTRAN	101
GEOLOGICAL SAMPLE CONVERSION	IBM 7074	FORTRAN	28
GEOLOGICAL SAMPLING INVENTORY PLOT	IBM 7074	FORTRAN	33

GRADIENT SUMMARY BY 1-DEG SQ., MONTH	IBM 7074	AUTOCODER	76
INTERPOLATION OF OCEAN STATION DATA	IBM 7074	FORTRAN	87
INTERPOLATION SPECIFIC VOL ANOMALY	IBM 7074	FORTRAN	83
INVENTORY PLOT	IBM 360/40	FORTRAN IV	41
OCEAN STATION DATA OUTPUT, NODC	IBM 1401	SPS	23
OCEAN STATION DEPTH SUMMARY	IBM 1401	SPS	82
SALINITY DEVIATION PROGPLOT	IBM 7074	FORTRAN	78
SEA SENSE - DATA DISPLAY	IBM 7074	FORTRAN	80
SEA SENSE - LIMIT	IBM 7074	FORTRAN	80
SEA SENSE - STANDARD DEVIATION	IBM 7074	FORTRAN	80
SIGMA-T VS DEPTH, SALINITY (PLOT)	IBM 7074	FORTRAN	42
SOUND VELOCITY DEPTH PROFILES	IBM 7074	FORTRAN	42
STATION DATA COMPUTE	IBM 7074	AUTOCODER	82
STA. DATA CONVERSION, CODC TO NODC	IBM 1401	SPS	24
STATION DATA PARAMETER INVENTORY	IBM 7074	FORTRAN	79
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NAVAL CIVIL ENGINEERING LABORATORY

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NAVAL ELECTRONICS LABORATORY CENTER

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CRITICAL ACOUSTIC RATIO	IBM 7074	FORTRAN	98
CURRENT METER TURBULENCE	IBM 7074	FORTRAN	72
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OBSERVATION DRAPING (GRAVITY)	IBM 7074	FORTRAN	25
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PARAMETRIC MAP	IBM 7074	FORTRAN II	64
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NAVAL POSTGRADUATE SCHOOL

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SPECIFIC CONDUCTIVITY	IBM OS/360	FORTRAN	11
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VC2AP3 SHIP ROUTING	CDC 1604	FORTRAN	106
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NAVAL RESEARCH LABORATORY

ACOUSTIC RAY TRACING	CDC 3800	FORTRAN-63	96
BLACKBODY RADIANCE	CDC 3800	FORTRAN	25
BLACKBODY SPECTRAL RADIANCE	CDC 3800	FORTRAN	25
DATUBA (BUOY-CABLE DEFLECT.)	CDC 3800	FORTRAN-63	72
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DISTANCE BETWEEN TWO POINTS	CDC 3800	FORTRAN	59
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HORIZONTAL GRADIENT RAY TRACING	CDC 3800	FORTRAN-63	96
LINE PRINTER PLOTS	CDC 3800	FORTRAN, COMPASS	35
NELEDIT	CDC 3800	FORTRAN	21
PROPAGATION LOSS - NORMAL MODES	CDC 3800	FORTRAN	100
RAY TRACING	CDC 3800	FORTRAN IV	96
RAY TRACE PROCESSING	CDC 3800	FORTRAN-63	96
SCALING SUBROUTINE	CDC 3800	FORTRAN	53
SOUND SPEED PROFILES - NORMAL MODES	CDC 3800	FORTRAN IV	100
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NAVAL RESEARCH LABORATORY, ORLANDO

NEAR-FIELD ARRAY TESTING	PDP-8	FORTRAN	99

NAVAL SHIP RESEARCH AND DEVELOPMENT CENTER

DIGITAL POWER SPECTRUM ANALYSIS	IBM 7090	FORTRAN IV	48
LONG. STRENGTH OF SHIP HULL	IBM 7090	FORTRAN IV	110
PARTIAL AND ORDINARY COHERENCE	IBM 7090	FORTRAN IV AND MAP	49
POWER SPECTRUM ANALYSIS	IBM 7090, IBM 704	FORTRAN	50
PROJECT COD LIVER	IBM 7090	FORTRAN II AND MAP	50
SAVED (BLAST TEST DATA REDUCTION)	IBM 7090	FORTRAN IV AND MAP	49
STATISTICAL AND PEAK-TO-PEAK ANAL.	IBM 7090	FORTRAN IV AND MAP	49

NAVAL STRATEGIC SYSTEMS NAVIGATION FACILITY

BECNAV (BEACON NAVIGATION)	CDC 3200	FORTRAN	58
SPANS1A (BEACON POSITION)	CDC 3200	FORTRAN	58
SPANS1B (BEACON POSITION)	CDC 3200	FORTRAN	59

NAVAL UNDERSEA RESEARCH AND DEVELOPMENT CENTER, PASADENA

NEWFIT	UNIVAC1108	FORTRAN IV	95
PATTERN FUNCTION CALCULATIONS	UNIVAC1108	FORTRAN IV	95
RAYMOR	UNIVAC1108	FORTRAN V	95
RAY SORT	UNIVAC1108	FORTRAN IV	95
SONAR IN REFRACTIVE WATER	UNIVAC1108	FORTRAN IV	94

NAVAL UNDERSEA RESEARCH AND DEVELOPMENT CENTER, SAN DIEGO

FATHOMETER CORRECTION	CDC 1604	FORTRAN	101
MACHINE PLOTTING ON MERCATOR PROJ.	CDC 1604	FORTRAN	39

NAVAL UNDERWATER WEAPONS RESEARCH AND ENGINEERING STATION

INTERPOLATION FOR OCEANOGRAPHIC DATA	CDC 3200, IBM 1620	FORTRAN	83
POWER SPECTRA ESTIMATION	CDC 3200	FORTRAN	51
SOUND VELOCITY	CDC 3200	FORTRAN	100

NAVY UNDERWATER SOUND LABORATORY

BOTTOM REFLECTIVITY	IBM 704	FORTRAN II	99

RAY TRACING	IBM 704	FORTRAN II	99
SOUND VELOCITY IN OCEAN WATER	IBM 704	FORTRAN II	102

NAVY WEATHER RESEARCH FACILITY

OPTIMUM TRACK SHIP ROUTING	PB-440, UNIVAC1107	MACHINE, FORTRAN IV	106

NEW YORK UNIVERSITY

FILM DATA PROCESSING	CDC 1604	FORTRAN-60	72

NORTHWESTERN UNIVERSITY

CIRCSTAT	CDC 3400	FORTRAN IV	52

PACIFIC NAVAL LABORATORY, CANADA

POWER SPECTRUM ANALYSIS	PB-250	BASIC	51

PACIFIC OCEANOGRAPHIC GROUP

ALERT (SATELLITE TIMES)	IBM 1130	FORTRAN IV	58
ANAL. OF NON-LINEAR RESPONSE SURFACES	IBM 1130	FORTRAN IV	52
ASORT (SORT O/P OF ALERT)	IBM 1130	FORTRAN IV	58
DEEP (S.T.D. DIGITIZING)	HP 2115A	FORTRAN	16
HYDRO (COMPUTE FROM HYDRO DATA)	IBM 1130	FORTRAN IV	84
MULDA (MULTIPLE DISCRIMINANT ANAL.)	IBM 1130	FORTRAN IV	53
PLOG (PLOT HYDRO. DATA)	IBM 1130	FORTRAN IV	36
PSAL1 (PLOT TEMPERATURE-SALINITY)	IBM 1130	FORTRAN VI	37
RYLD (FISH STOCK YIELD)	IBM 1130	FORTRAN IV	05
STP01 (PLOT S.T.D. DATA)	IBM 1130	FORTRAN IV	37
STP02 (COMPUTE FROM S.T.D. DATA)	IBM 1130	FORTRAN IV	84
TCHK3 (THERMOMETER CORR.)	IBM 1130	FORTRAN VI	16
TRANSPORT COMP. FROM ATMOS. PRESSURE	IBM 1620, IBM 7040, IBM 1130	FORTRAN II AND IV	67
WET (S.T.D. DATA PROCESSING)	HP 2115A	FORTRAN	84

PITTSBURGH, UNIVERSITY OF

THEORETICAL RADIAL TIDAL FORCE	IBM 7090	MAD	104

RAND CORPORATION

SEA ICE STUDIES	IBM7090/94	FORTRAN IV	75
GRAPHIC SYSTEM FOR CURVE FITTING	IBM 360/40	(NOT GIVEN)	45

RHODE ISLAND, UNIVERSITY OF

AZIZ (THERMOMETRIC DEPTH)	IBM 360/50	FORTRAN IV-E	88
CARDS	IBM 360/50	FORTRAN IV-E	22
DELINT (DELTA CALC AND INTERPOLATION)	IBM 360/50	FORTRAN IV-E	88
DEPTHS	IBM 360/50	FORTRAN IV-E	22
HEIGHT	IBM 360/50	FORTRAN IV-E	87
HYDRO	IBM 360/50	FORTRAN IV-E	19
INTEST	IBM 360/50	FORTRAN IV-E	88
LINT (LINEAR INTERPOLATION)	IBM 360/50	FORTRAN IV-E	88
RDTHRM (READ THERMOMETER DATA)	IBM 360/50	FORTRAN IV-E	22
SIGMA	IBM 360/50	FORTRAN IV-E	89
SIGMAD	IBM 360/50	FORTRAN IV-E	89
SIGMAT	IBM 360/50	FORTRAN IV-E	87

TEMP	IBM 360/50	FORTRAN IV-E	19
TSPLOT	IBM 360/50	FORTRAN IV-E	44
UTEMP (UNPROTECTED THERMOMETER)	IBM 360/50	FORTRAN IV-E	19

SALINE WATER, OFFICE OF

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SCRIPPS INSTITUTION OF OCEANOGRAPHY

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	CDC 3600	COMPASS	
CADS (CALC. DEPENDENT QUANTITIES)	IBM 1800	FORTRAN IV	84
CHLOR	CDC 3600	FORTRAN IV	08
GO (POT. TEMP., SIGMA THETA, OXY.)	IBM 1800	FORTRAN IV	85
HYPERMAP	NOT GIVEN	FORTRAN	64
NUTRIENT CHEMISTRY CONCENTRATION	CDC 1604	(NOT GIVEN)	08
OCEAN STATION COMPUTATIONS	CDC 1604	(NOT GIVEN)	93
PRIMARY PRODUCTIVITY	CDC 1604	(NOT GIVEN)	08
PROFL	CDC 3600	FORTRAN IV	38
RADIATION ATTENUATION	CDC 1604	(NOT GIVEN)	94
PROGRAM REGROUP	CDC 3600	FORTRAN	07
S.T.D. DATA PROCESSING	CDC 3600	FORTRAN IV	17
TWO FIVE (DATA REDUCTION)	CDC 3600,	FORTRAN-63,	17
	IBM 1800	FORTRAN IV	
WATERVEL (SOUND VELOCITY)	NOT GIVEN	FORTRAN	102
ZOOPLANKTON VOLUME	CDC 1604	(NOT GIVEN)	08

STANFORD UNIVERSITY

REFRACTION OF WAVES	IBM7090/94	FORTRAN IV	110
SIMULATION OF WIND-GENERATED WAVES	IBM7090/94	FORTRAN IV	111

TEXAS A. AND M. UNIVERSITY

OCEANOGRAPHIC DATA PROGRAM F	IBM 7094	FORTRAN	87
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S.T.D. CORRECTION	IBM 7094	FORTRAN IV	19
VELOCITY, HORIZ. EDDY COEFFIFIENTS	IBM 709	FORTRAN	70

TEXAS, UNIVERSITY OF

ECOPROD	CDC 6600	FORTRAN IV	05
JOB (SPECIES DIVERSITY)	CDC 6600	FORTRAN IV	06
OXYGEN	CDC 6600	FORTRAN IV	06

TORONTO, UNIVERSITY OF

TIME TERM, SEISMIC REFRACTION INTERP.	IBM 7094	FORTRAN IV	27

TRANSPORTATION, DEPARTMENT OF (SEE COAST GUARD...)

WASHINGTON, UNIVERSITY OF

BKGEOL (SEDIMENT STATISTICS)	IBM7094-II /7040 DCS	FORTRAN IV	31
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CONCENTRATIONS PER SQUARE METER	IBM7094-II /7040 DCS	FORTRAN IV	07
DEAD RECKONING NAVIGATION SYSTEM	IBM 1130	FORTRAN	60

INTERPOLATION PROGRAM	CDC 6400	FORTRAN IV	90
PHYTOPLANKTON NUMBERS, ETC.	IBM7094-II /7040 DCS	FORTRAN IV	07
SDGVEL (SOUNDING CORRECTION)	IBM7094-II /7040 DCS	FORTRAN IV	102
SEDIMENT GRANULOMETRIC ANALYSIS	IBM7094-II /7040 DCS	FORTRAN IV	32
SPECIAL CHEMISTRY CALCULATIONS	IBM 1130	FORTRAN IV	09
S.T.D. CALCULATIONS	IBM 1130	FORTRAN IV, ASSEMBLER	18
S.T.D. EDIT AND INTERPOLATE	IBM 1130	FORTRAN	86
SYNOPTIC PROGRAM	IBM7094-II /7040 DCS, CDC 6400	FORTRAN II	18,90
UNDERWAY DATA SYSTEM	IBM 1130	FORTRAN	18

WISCONSIN, UNIVERSITY OF

SEICHE ANALYSIS	IBM 360/50	ALGOL, FORTRAN II	107
SPECTRAL ANALYSIS OF TIME SERIES	B5500, UNIVAC1108	ALGOL 60, FORTRAN IV	50

WOODS HOLE OCEANOGRAPHIC INSTITUTION

ATG (ADIABATIC TEMPERATURE GRADIENT	SDS SIGMA7	FORTRAN IV-H	92
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DATA	SDS SIGMA7	FORTRAN IV-H	22
DSTABF (STABILITY FREQUENCY)	SDS SIGMA7	FORTRAN IV-H	92
DYNHT (DYNAMIC HEIGHTS)	GE 225	FORTRAN II	89
GRAIN SIZE	GE 225	FORTRAN II	28
HISTO (HISTOGRAM PLOT)	SDS SIGMA7	FORTRAN IV-H	43
HYLOG (HYDRO. STA. DATA REDUCTION)	SDS SIGMA7	FORTRAN IV-H	20
LISPLO (LIST AND PLOT)	SDS SIGMA7	FORTRAN IV-H	44
NUSPEC (SPECTRUM ESTIMATION)	SDS SIGMA7	FORTRAN IV-H	51
OCCOMP (OCEANOGRAPHIC COMPUTE)	SDS SIGMA7	FORTRAN IV-H	91
ORD 1 (OLMSTED RAY DIAGRAM NO. 1)	GE 225	FORTRAN	97
ORD 2 (OLMSTED RAY DIAGRAM NO. 2)	GE 225	FORTRAN	97
PEN (POTENTIAL ENERGY ANOMALY)	GE 225	FORTRAN II	89
POTEMP (POTENTIAL TEMPERATURE)	GE 225, SDS SIGMA7	FORTRAN II, FORTRAN IV-H	91
PRESS	SDS SIGMA7	FORTRAN IV-H	92
PROVEC (PROGRESSIVE VECTORS)	SDS SIGMA7	FORTRAN IV-H	74
SCRUB (DATA EDIT AND CORRECT)	SDS SIGMA7	FORTRAN IV-H	23
SIGMAT	SDS SIGMA7	FORTRAN IV-H	91
SONVEL (SOUND VELOCITY)	SDS SIGMA7	FORTRAN IV-H	103
SPVOL	SDS SIGMA7	FORTRAN IV-H	92
STATS (STATISTICAL QUANTITIES)	SDS SIGMA7	FORTRAN IV-H	57
SVANOM (SPECIFIC VOLUME ANOMALY)	SDS SIGMA7	FORTRAN IV-H	92
THISTO (TWO-DIMEN. FREQ. DISTRIB.)	SDS SIGMA7	FORTRAN IV-H	74
THRCL (THERMOMETER CALIBRATION)	SDS SIGMA7	FORTRAN IV-H	20
VECTAV (VECTOR AVERAGES)	SDS SIGMA7	FORTRAN IV-H	74
VEL (GEOSTROPHIC VELOCITY)	SDS SIGMA7	FORTRAN IV-H	73
VFREQ (VAISALA FREQUENCY COMP.)	GE 225	FORTRAN II	89
VTR (VOLUME TRANSPORT)	SDS SIGMA7	FORTRAN IV-H	73

ALGOL, BALGOL

AUTOCODER

DECAL

FORTRAN

UTILITY	CDC 3800	FORTRAN	21
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TRLOSS (TRANSMISSION LOSS)	CDC 6600	FORTRAN	94
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ORD 1 (OLMSTED RAY DIAGRAM NO. 1)	GE 225	FORTRAN	97
ORD 2 (OLMSTED RAY DIAGRAM NO. 2)	GE 225	FORTRAN	97
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ANAL. OF NON-LINEAR RESPONSE SURFACES	IBM 1130	FORTRAN	52
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VAM INTERPOLATION II	IBM 7074	FORTRAN	27
VERTICAL SECTION PLOT - STATION DATA	IBM 7074	FORTRAN	42
VERTICAL SUMMARY HISTOGRAM PLOT	IBM 7074	FORTRAN	41
VERTICAL TEMPERATURE GRADIENTS	IBM 7074	FORTRAN	77
WIND STRESS	IBM 7074	FORTRAN	67
VELOCITY, HORIZ. EDDY COEFFIFIENTS	IBM 709	FORTRAN	70
FOURIER ANALYSIS	IBM 7090	FORTRAN	55
POWER SPECTRUM ANALYSIS	IBM 7090, IBM 704	FORTRAN	50
TWO-DIMENSIONAL AUTOCORRELATION	IBM 7090, IBM 1401	FORTRAN	56
CALCULATE AND PLOT TIME-TREND CURVES	IBM7090/94	FORTRAN, FAP	46
OCEANOGRAPHIC DATA PROGRAM F	IBM 7094	FORTRAN	87
WAVEIN AND DIFRAK	IBM 7094	FORTRAN	50,110
BOMM (TIME SERIES)	IBM OS/360	FORTRAN	52
SPECIFIC CONDUCTIVITY	IBM OS/360	FORTRAN	11
WAVES GENERATED BY TURBULENT WIND	IBM 360/67	FORTRAN	106
DECCA HI-FIX	PDP-5, 8S	FORTRAN	64
INDUCTIVE SALINOMETER SALINITY CONV.	PDP-5, 8S	FORTRAN	11
NEAR-FIELD ARRAY TESTING	PDP-8	FORTRAN	99
RETRIEVAL OF GEOPHYSICAL DATA	NOT GIVEN	FORTRAN	112
SALINITY DISTRIBUTION IN ESTUARY	NOT GIVEN	FORTRAN	70
CORE INFORMATION	NOT GIVEN	FORTRAN	112
ASTRONOMIC LATITUDE	NOT GIVEN	FORTRAN	60
GRIDIT, REGRIDIT, AUTOMATED CONTOUR	NOT GIVEN	FORTRAN	34
HYPERMAP	NOT GIVEN	FORTRAN	64
RADIATION TEMP. OF SEA SURFACE	NOT GIVEN	FORTRAN	68
RAY TRACING	NOT GIVEN	FORTRAN	97
SEDIMENT TEXTURAL ANALYSIS	NOT GIVEN	FORTRAN	32
SEQUENTIAL PLOTTING	NOT GIVEN	FORTRAN	44
SONOBUOY FIXING ERROR	NOT GIVEN	FORTRAN	99
WATERVEL (SOUND VELOCITY)	NOT GIVEN	FORTRAN	102
DATA REDUCTION FOR THE CDC 3100	CDC 3100	FORTRAN II	14,83
ISALBP (SALINITY ANOMALY)	CDC 3100	FORTRAN II	10
ISATBP (OXYGEN ANOMALY AND SAT.)	CDC 3100	FORTRAN II	10
LEAST SQUARES CURVE FITTING	CDC 3100	FORTRAN II	45
PLOT STATION POSITIONS	CDC 3100	FORTRAN II	36
PLOT THETA-S CURVES	CDC 3100	FORTRAN II	35
SVLIM (SOUND VELOCITY RETRIEVAL)	CDC 3100	FORTRAN II	101
OCEANOGRAPHIC DATA COMPUTATION	CDC 6400	FORTRAN II	90
SEDIMENT DATA	CDC 6400	FORTRAN II	29

SYNOPTIC PROGRAM	CDC 6400	FORTRAN II	18,90
STADAT 2	GE 200 SER	FORTRAN II	14
DYNHT (DYNAMIC HEIGHTS)	GE 225	FORTRAN II	89
GRAIN SIZE	GE 225	FORTRAN II	28
PEN (POTENTIAL ENERGY ANOMALY)	GE 225	FORTRAN II	89
POTEMP (POTENTIAL TEMPERATURE)	GE 225	FORTRAN II	91
VFREQ (VAISALA FREQUENCY COMP.)	GE 225	FORTRAN II	89
DYNAMIC HEIGHT CALCULATION	IBM 1620	FORTRAN II	90
MULTIVARIATE DISCRIMINANT ANALYSIS	IBM 1620	FORTRAN II	55
OCEANO. DATA PLOTTING FOR ICES DATA	IBM 1620	FORTRAN II	43
OCEANO. DATA PLOTTING FOR NODC DATA	IBM 1620	FORTRAN II	43
STANDARD-SIZE ANALYSIS OF SEDIMENTS	IBM 1620	FORTRAN II	29
TREND-SURFACE WITH UNRESTRICTED I/P	IBM 1620	FORTRAN II	47
TRANSPORT COMP. FROM ATMOS. PRESSURE	IBM 1620	FORTRAN II	67
CHLOROPHYLL AND CAROTENOID PIGMENT	IBM 1620II	FORTRAN II	05
PROCESSING OF OCEANOGRAPHIC OBS.	IBM 1620II	FORTRAN II	70
HARMONIC ANALYSIS OF TIDAL DATA	IBM 7030	FORTRAN II	103
BOTTOM REFLECTIVITY	IBM 704	FORTRAN II	99
RAY TRACING	IBM 704	FORTRAN II	99
SOUND VELOCITY IN OCEAN WATER	IBM 704	FORTRAN II	102
PARAMETRIC MAP	IBM 7074	FORTRAN II	64
POINT GENERATOR FOR DISTANCE-AZIMUTH	IBM 7074	FORTRAN II	64
POINT GENERATOR FOR MAP PROJECTIONS	IBM 7074	FORTRAN II	63
MULTIVARIATE NON-LINEAR REGRESSION	IBM 709	FORTRAN II	47
OCEANOGRAPHIC DATA COMPUTATION	IBM 709	FORTRAN II	90
SEDIMENT DATA	IBM 709	FORTRAN II	29
SEISMIC SLOPING LAYER	IBM 709	FORTRAN II	27
ACOUSTIC RAY TRACING	IBM 7090	FORTRAN II	94
PROJECT COD LIVER	IBM 7090	FORTRAN II	50
CHLORINITY - SALINITY	IBM 7094	FORTRAN II	12
CONTINUOUS LINE SOURCE	IBM 7094	FORTRAN II	71
CONTINUOUS SOURCE PER UNIT DEPTH	IBM 7094	FORTRAN II	71
CONTINUOUS SOURCE, WITH COOLING TERM	IBM 7094	FORTRAN II	71
DENSITY - THERMOSTERIC ANOMALY	IBM 7094	FORTRAN II	90
LATERAL RELATIVE DISTRIBUTION	IBM 7094	FORTRAN II	70
SURFACE WAVE RAYS	IBM 7094	FORTRAN II	105
TOTAL CO(2)	IBM 7094	FORTRAN II	12
MAGNETIC ANOMALIES AND GRADIENTS	IBM 7094	FORTRAN II	26
SYNOPTIC PROGRAM	IBM7094-II /7040 DCS	FORTRAN II	18,90
SEICHE ANALYSIS	IBM 360/50	FORTRAN II	107
DAILY SEAWATER OBSERVATIONS	IBM 1620	FORTRAN II-D	79
CARBONATE-CARBON ANALYSIS OF SED.	IBM 1620II	FORTRAN II-D	29
CONSOLIDATION TESTS ON OCEAN SEDIMENT	IBM 1620II	FORTRAN II-D	30
DIRECT SHEAR TEST ON OCEAN SEDIMENT	IBM 1620II	FORTRAN II-D	30
ENG. INDEX PROP. OF CORE SAMPLES	IBM 1620II	FORTRAN II-D	29
GRAIN SIZE ANALYSIS - PLOT AND TAB	IBM 1620II	FORTRAN II-D	29
PERMEABILITY TEST ON OCEAN SED.	IBM 1620II	FORTRAN II-D	30
SETTLEMENT ANALYSIS	IBM 1620II	FORTRAN II-D	31
SUMMARY PLOTS OF SED. TEST RESULTS	IBM 1620II	FORTRAN II-D	31
TRIAXIAL COMPRESSION TEST	IBM 1620II	FORTRAN II-D	30
DAILY SEAWATER OBSERVATIONS	CDC 3100	FORTRAN IV	79
OCEANS CATALOGUE I AND II	CDC 3100	FORTRAN IV	113
STATISTICS I, II, III	CDC 3100	FORTRAN IV	56
THERMOCHECK - TEMP. CORRECTION	CDC 3100	FORTRAN IV	17
CIRCSTAT	CDC 3400	FORTRAN IV	52
BIOP (BIOLOGY PLOT)	CDC 3600	FORTRAN IV	33
CHLOR	CDC 3600	FORTRAN IV	08
PROFL	CDC 3600	FORTRAN IV	38
S.T.D. DATA PROCESSING	CDC 3600	FORTRAN IV	17
RAY TRACING	CDC 3800	FORTRAN IV	96
SOUND SPEED PROFILES - NORMAL MODES	CDC 3800	FORTRAN IV	100
CHLOROPHYLL AND PRODUCTIVITY	CDC 6400	FORTRAN IV	05
INTERPOLATION PROGRAM	CDC 6400	FORTRAN IV	90
MULTIVARIATE NON-LINEAR REGRESSION	CDC 6400	FORTRAN IV	47
SIMULATION OF TRANSGRESSION IN TIME	CDC 6400	FORTRAN IV	54
HARMONIC ANALYSIS OF TIDAL DATA	CDC 6600	FORTRAN IV	103
TIDAL CURRENT PREDICTION	CDC 6600	FORTRAN IV	104
ECOPROD	CDC 6600	FORTRAN IV	05
JOB (SPECIES DIVERSITY)	CDC 6600	FORTRAN IV	06

OXYGEN	CDC 6600	FORTRAN IV	06
POWER SPECTRUM OF GEOLOGICAL SURFACE	GE 625	FORTRAN IV	54
TREND ANALYSIS USING FOURIER SERIES	GE 625	FORTRAN IV	55
OXYGEN COMPUTATION	H-516	FORTRAN IV	11
PHOSPHATE COMPUTATION	H-516	FORTRAN IV	11
SALINITY CONVERSION	H-516	FORTRAN IV	11
THERMOMETER CORRECTION	H-516	FORTRAN IV	16
SEAKEEPING	IBM 1130	FORTRAN IV	109
ALERT (SATELLITE TIMES)	IBM 1130	FORTRAN IV	58
ASORT (SORT O/P OF ALERT)	IBM 1130	FORTRAN IV	58
ANAL. OF NON-LINEAR RESPONSE SURFACES	IBM 1130	FORTRAN IV	52
HYDRO (COMPUTE FROM HYDRO DATA)	IBM 1130	FORTRAN IV	84
MULDA (MULTIPLE DISCRIMINANT ANAL.)	IBM 1130	FORTRAN IV	53
PLOG (PLOT HYDRO. DATA)	IBM 1130	FORTRAN IV	36
RYLD (FISH STOCK YIELD)	IBM 1130	FORTRAN IV	05
SPECIAL CHEMISTRY CALCULATIONS	IBM 1130	FORTRAN IV	09
S.T.D. CALCULATIONS	IBM 1130	FORTRAN IV	18
TRANSPORT COMP. FROM ATMOS. PRESSURE	IBM 1130	FORTRAN IV	67
STP01 (PLOT S.T.D. DATA)	IBM 1130	FORTRAN IV	37
STP02 (COMPUTE FROM S.T.D. DATA)	IBM 1130	FORTRAN IV	84
TREND-SURFACE WITH UNRESTRICTED I/P	IBM 1620	FORTRAN IV	47
BRAINCON DATA REDUCTION	IBM 1800	FORTRAN IV	15
CABLE CONFIGURATION	IBM 1800	FORTRAN IV	73
CURRENT METER ANALYSIS	IBM 1800	FORTRAN IV	73
CURRENT METER CONVERSION	IBM 1800	FORTRAN IV	73
HILOW	IBM 1800	FORTRAN IV	48
HNAV (LORAN/DECCA COORDINATES CALC.)	IBM 1800	FORTRAN IV	63
HNV1 (LORAN/DECCA FILE)	IBM 1800	FORTRAN IV	63
SBWR0 (WAVE RECORDER ANALYSIS)	IBM 1800	FORTRAN IV	48
SDAN0 (INVERSE GEODETIC)	IBM 1800	FORTRAN IV	63
VAPW (SATURATION VAPOR PRESSURE)	IBM 1800	FORTRAN IV	66
CADS (CALC. DEPENDENT QUANTITIES)	IBM 1800	FORTRAN IV	84
GO (POT. TEMP., SIGMA THETA, OXY.)	IBM 1800	FORTRAN IV	85
TWO FIVE (DATA REDUCTION)	IBM 1800	FORTRAN IV	17
TRANSPORT COMP. FROM ATMOS. PRESSURE	IBM 7040	FORTRAN IV	67
POWER SPECTRUM OF GEOLOGICAL SURFACE	IBM 7040	FORTRAN IV	54
TREND SURFACES DEGREES 1 TO 6	IBM 7040	FORTRAN IV	47
SIMULATION OF MARINE SEDIMENTATION	IBM 7040	FORTRAN IV	33
2-DIMENSIONAL REGRESSION	IBM 7040	FORTRAN IV	45
CROSS-ASSOCIATION OF SEQUENCES	IBM7040/44	FORTRAN IV	54
DIGITAL POWER SPECTRUM ANALYSIS	IBM 7090	FORTRAN IV	48
LONG. STRENGTH OF SHIP HULL	IBM 7090	FORTRAN IV	110
PARTIAL AND ORDINARY COHERENCE	IBM 7090	FORTRAN IV	49
SAVED (BLAST TEST DATA REDUCTION)	IBM 7090	FORTRAN IV	49
STATISTICAL AND PEAK-TO-PEAK ANAL.	IBM 7090	FORTRAN IV	49
ASTRONOMICAL TIDE PREDICTION	IBM7090/94	FORTRAN IV	104
REFRACTION OF WAVES	IBM7090/94	FORTRAN IV	110
SIMULATION OF WIND-GENERATED WAVES	IBM7090/94	FORTRAN IV	111
SEA ICE STUDIES	IBM7090/94	FORTRAN IV	75
SIMULATION OF MARINE SEDIMENTATION	IBM7090/94	FORTRAN IV	33
VECTOR TREND ANAL. DIRECTIONAL DATA	IBM7090/94	FORTRAN IV	34
WAVE FORCE DISTRIBUTION	IBM7090/94	FORTRAN IV	109
WAVE FORCES AND MOMENTS	IBM7090/94	FORTRAN IV	109
PROFIL (TSUNAMI PROFILES)	IBM 7094	FORTRAN IV	107
OPTIMIZATION OF VTE WATER PLANTS	IBM 7094	FORTRAN IV	12
S.T.D. CORRECTION	IBM 7094	FORTRAN IV	19
TIME TERM, SEISMIC REFRACTION INTERP.	IBM 7094	FORTRAN IV	27
CONDU (THERMAL CONDUCTIVITY)	IBM7094-II /7040 DCS	FORTRAN IV	31
BKGEOL (SEDIMENT STATISTICS)	IBM7094-II /7040 DCS	FORTRAN IV	31
CONCENTRATIONS PER SQUARE METER	IBM7094-II /7040 DCS	FORTRAN IV	07
PHYTOPLANKTON NUMBERS, ETC.	IBM7094-II /7040 DCS	FORTRAN IV	07
SDGVEL (SOUNDING CORRECTION)	IBM7094-II /7040 DCS	FORTRAN IV	102
SEDIMENT GRANULOMETRIC ANALYSIS	IBM7094-II /7040 DCS	FORTRAN IV	32
WAVE STATISTICS	IBM OS/360	FORTRAN IV	110

BLACKY (TIME SERIES ANALYSIS)	IBM OS/360FORTRAN	IV	49
CURRENT	IBM OS/360FORTRAN	IV	56
DETRND, ETC. (SPECTRA SUBROUT+NES)	IBM 360/40FORTRAN	IV	48
LENG1 (WAVE LENGTH AND SPEED)	IBM 360/40FORTRAN	IV	107
PROFILE	IBM 360/40FORTRAN	IV	108
PROF1 (WATER ELEV. OVER WAVE PERIOD)	IBM 360/40FORTRAN	IV	108
REFL1 (REFLECTED WAVE)	IBM 360/40FORTRAN	IV	108
UMAX1, ETC. (MAX. FLOW VELOC.)	IBM 360/40FORTRAN	IV	109
UOFT1, ETC. (FLOW VELOCITIES)	IBM 360/40FORTRAN	IV	108
INVENTORY PLOT	IBM 360/40FORTRAN	IV	41
SUBROUTINE 'MAP'	IBM 360/40FORTRAN	IV	63
RAYTR (RAY-TRACING)	IBM 360/44FORTRAN	IV	97
AOU,ISAOU (CALC. OF OXYGEN, ETC.)	IBM 360/65FORTRAN	IV	10
GDNP,GRAD (CALC. OF GRADIENTS)	IBM 360/65FORTRAN	IV	76
GVPA,VPA (CALC. OF CURRENTS)	IBM 360/65FORTRAN	IV	69
ISOS,OXOS,PHOS (ISENTROPIC PLOT)	IBM 360/65FORTRAN	IV	40
LENGTH-WEIGHT FREQUENCY	IBM 360/65FORTRAN	IV	06
LONG WAVE RADIATION	IBM 360/65FORTRAN	IV	25
OCEANOGRAPHIC REPORT PREPARATION	IBM 360/65FORTRAN	IV	91
OCEANOGRAPHIC SUMMARY (NOS. 1,2,3)	IBM 360/65FORTRAN	IV	79
REVERSING THERMOMETER CORRECTION	IBM 360/65FORTRAN	IV	20
TSIP,THOX,THOT (PLOT TIME HISTORY)	IBM 360/65FORTRAN	IV	41
FLOW METER PLOTS	IBM 360/65FORTRAN	IV	72
GENERAL MERCATOR PLOT	IBM 360/65FORTRAN	IV	40
HORIZONTAL SECTIONS	IBM 360/65FORTRAN	IV	40
IN SITU OCEANOGRAPHIC DATA	IBM 360/65FORTRAN	IV	85
INTERPOLATION	IBM 360/65FORTRAN	IV	86
MERCATOR STATION PLOT	IBM 360/65FORTRAN	IV	40
OXYGEN, PHOSPHATE, DENSITY PLOTS	IBM 360/65FORTRAN	IV	39
TEMPERATURE-SALINITY CURVES	IBM 360/65FORTRAN	IV	39
OCEANS III	IBM 360/65FORTRAN	IV	86
THERMOCHECK - TEMP. CORRECTION	IBM 360/65FORTRAN	IV	17
WATER CHEMISTRY	IBM 360/65FORTRAN	IV	09
Q-MODE CLUSTER ANALYSIS	IBM360/67,FORTRAN	IV	55
	IBM7090/94		
OPTIMUM TRACK SHIP ROUTING	UNIVAC1107FORTRAN	IV	106
NEWFIT	UNIVAC1108FORTRAN	IV	95
PATTERN FUNCTION CALCULATIONS	UNIVAC1108FORTRAN	IV	95
RAY SORT	UNIVAC1108FORTRAN	IV	95
SONAR IN REFRACTIVE WATER	UNIVAC1108FORTRAN	IV	94
SPECTRAL ANALYSIS OF TIME SERIES	UNIVAC1108FORTRAN	IV	50
AZIZ (THERMOMETRIC DEPTH)	IBM 360/50FORTRAN	IV-E	88
CARDS	IBM 360/50FORTRAN	IV-E	22
DELINT (DELTA CALC AND INTERPOLATION)	IBM 360/50FORTRAN	IV-E	88
DEPTHS	IBM 360/50FORTRAN	IV-E	22
HEIGHT	IBM 360/50FORTRAN	IV-E	87
HYDRO	IBM 360/50FORTRAN	IV-E	19
INTEST	IBM 360/50FORTRAN	IV-E	88
LINT (LINEAR INTERPOLATION)	IBM 360/50FORTRAN	IV-E	88
RDTHRM (READ THERMOMETER DATA)	IBM 360/50FORTRAN	IV-E	22
SIGMA	IBM 360/50FORTRAN	IV-E	89
SIGMAD	IBM 360/50FORTRAN	IV-E	89
SIGMAT	IBM 360/50FORTRAN	IV-E	87
TEMP	IBM 360/50FORTRAN	IV-E	19
TSPLOT	IBM 360/50FORTRAN	IV-E	44
UTEMP (UNPROTECTED THERMOMETER)	IBM 360/50FORTRAN	IV-E	19
PERCENTAGE SATURATION OF OXYGEN	IBM 360/65FORTRAN	IV-G	10
OBJECTIVE THERMOCLINE ANALYSIS	CDC 6500 FORTRAN	IV-H	75
OBJECTIVE THERMOCLINE ANALYSIS	IBM OS/360FORTRAN	IV-H	75
ASTRONOMIC POSITION	IBM 360/65FORTRAN	IV-H	59
PROFILE CARD-TO-TAPE FOR GEOPAC	IBM 360/65FORTRAN	IV-H	26
TALWANI 2-D GRAVITY	IBM 360/65FORTRAN	IV-H	26
SIMULATION OF DELTAIC SEDIMENTATION	IBM 360/67FORTRAN	IV-H	34
ATG (ADIABATIC TEMPERATURE GRADIENT	SDS SIGMA7FORTRAN	IV-H	92
BETA-MODEL WITH WHITE FORCING	SDS SIGMA7FORTRAN	IV-H	52
DATA	SDS SIGMA7FORTRAN	IV-H	22
DSTABF (STABILITY FREQUENCY)	SDS SIGMA7FORTRAN	IV-H	92
HISTO (HISTOGRAM PLOT)	SDS SIGMA7FORTRAN	IV-H	43
HYLOG (HYDRO. STA. DATA REDUCTION)	SDS SIGMA7FORTRAN	IV-H	20
LISPLO (LIST AND PLOT)	SDS SIGMA7FORTRAN	IV-H	44

NUSPEC (SPECTRUM ESTIMATION)	SDS SIGMA7	FORTRAN IV-H	51
OCCOMP (OCEANOGRAPHIC COMPUTE)	SDS SIGMA7	FORTRAN IV-H	91
POTEMP (POTENTIAL TEMPERATURE)	SDS SIGMA7	FORTRAN IV-H	91
PRESS	SDS SIGMA7	FORTRAN IV-H	92
PROVEC (PROGRESSIVE VECTORS)	SDS SIGMA7	FORTRAN IV-H	74
SCRUB (DATA EDIT AND CORRECT)	SDS SIGMA7	FORTRAN IV-H	23
SIGMAT	SDS SIGMA7	FORTRAN IV-H	91
SONVEL (SOUND VELOCITY)	SDS SIGMA7	FORTRAN IV-H	103
SPVOL	SDS SIGMA7	FORTRAN IV-H	92
STATS (STATISTICAL QUANTITIES)	SDS SIGMA7	FORTRAN IV-H	57
SVANOM (SPECIFIC VOLUME ANOMALY)	SDS SIGMA7	FORTRAN IV-H	92
THISTO (TWO-DIMEN. FREQ. DISTRIB.)	SDS SIGMA7	FORTRAN IV-H	74
THRCL (THERMOMETER CALIBRATION)	SDS SIGMA7	FORTRAN IV-H	20
VECTAV (VECTOR AVERAGES)	SDS SIGMA7	FORTRAN IV-H	74
VEL (GEOSTROPHIC VELOCITY)	SDS SIGMA7	FORTRAN IV-H	73
VTR (VOLUME TRANSPORT)	SDS SIGMA7	FORTRAN IV-H	73
Q FACTORS	ATLAS I	FORTRAN V	15
RAYMOR	UNIVAC1108	FORTRAN V	95
PSAL1 (PLOT TEMPERATURE-SALINITY)	IBM 1130	FORTRAN VI	37
TCHK3 (THERMOMETER CORR.)	IBM 1130	FORTRAN VI	16
TIME SERIES PLOTTING	CDC 3100	FORTRAN-32	36
FILM DATA PROCESSING	CDC 1604	FORTRAN-60	72
ICEGRID MODIFIED	CDC 1604	FORTRAN-60	74
TIDES	NOT GIVEN	FORTRAN-60	105
SEA SURFACE TEMP. AND ANOMALY SUM.	CDC 3600	FORTRAN-62	81
SEA SURFACE TEMP. DATA SUMMARY	CDC 3600	FORTRAN-62	81
SYNOPTIC MARINE WEATHER DATA SUMMARY	CDC 3600	FORTRAN-62	80
VACOTS (VERTICAL SECTION PLOT)	CDC 3600	FORTRAN-63	39
ACOUSTIC RAY TRACING	CDC 3800	FORTRAN-63	96
DATUBA (BUOY-CABLE DEFLECT.)	CDC 3800	FORTRAN-63	72
GENERAL VELOCITY FIELD	CDC 3800	FORTRAN-63	101
HORIZONTAL GRADIENT RAY TRACING	CDC 3800	FORTRAN-63	96
RAY TRACE PROCESSING	CDC 3800	FORTRAN-63	96
TWO FIVE (DATA REDUCTION)	CDC 3600	FORTRAN-63	17
ASTRONOMICAL TIDE PREDICTION	CDC 6600	FORTRAN-66	104

MAC

CURRENT METER DYNAMICS	IBM OS/360	MAC	72
CHLOROPHYLL CALCULATIONS	ICT 1301	MAC	07
DELTA-ALPHA AND SIGMA-T	ICT 1301	MAC	93
HARMONIC ANALYSIS	ICT 1301	MAC	51
TIDAL PREDICTION	ICT 1301	MAC	105
VELOCITY OF SOUND	ICT 1301	MAC	103

MAD

AVG. TEMPERATURES IN WATER COLUMN	IBM 7090	MAD	81
DYNAMIC HEIGHT AND CURRENT DYNAMICS	IBM 7090	MAD	93
GENERAL MAP PROJECTION	IBM 7090	MAD	65
MAP PROJECTION DISTORTIONS	IBM 7090	MAD	65
THEORETICAL RADIAL TIDAL FORCE	IBM 7090	MAD	104
TREND MAP, WITH RESIDUALS	IBM 7090	MAD	47
WIND CURRENTS	IBM 7090	MAD	68

PAL

DISSOLVED OXYGEN, POTENTIAL TEMP.	PDP-5, 8S	PAL III	93
OCEAN STATION ANALYSIS AND SUMMARY	PDP-5, 8S	PAL III	93
THERMOMETER CORR. AND THERMO. DEPTH	PDP-5, 8S	PAL III	20
DATA REDUCTION FOR THE PDP-8	PDP-8	PAL III	14

SCRAP

SUBSURFACE THERMAL STRUCTURE ANALYSIS	CDC 1604	SCRAP	82
WAVES	CDC 1604	SCRAP	106

TWO DIMENSIONAL RAY TRACE	CDC 1604, CDC 3200	SCRAP, MAP	99

SPS

OCEANS II REPORT GENERATOR	IBM 1401	SPS	23
BATHYTHERMOGRAPH OUTPUT	IBM 1401	SPS	23
CONVERSION, NODC TO ICES	IBM 1401	SPS	23
OCEAN STATION DATA OUTPUT, NODC	IBM 1401	SPS	15
OCEAN STATION DEPTH SUMMARY	IBM 1401	SPS	82
STA. DATA CONVERSION, CODC TO NODC	IBM 1401	SPS	24
COMPUTE GEOGRAPHIC POSITIONS	IBM 1620	SPS	61
LORAN C	IBM 1620	SPS	62

MISCELLANEOUS

S.T.D. CALCULATIONS	IBM 1130	ASSEMBLER	18
SATELLITE NAVIGATION	IBM 1801	ASSEMBLER	58
GENERAL REGRESSION	IBM 360/65	PL/1	45
POWER SPECTRUM ANALYSIS	PB-250	BASIC	51
THERMOMETER CORRECTIONS	MERCURY	CHLF 3/4	15
TIDAL ANALYSIS AND PREDICTION	MERCURY	CHLF 3/4	104
BOMM (TIME SERIES)	CDC 3600	COMPASS	52
LINE PRINTER PLOTS	CDC 3800	COMPASS	35
BIOLOGICAL STATION FILE	ATLAS I	EMA	112
STATION DATA (ATLAS)	ATLAS 1	EMA	83
AN/UYK-1 SOUND VELOCITY	AN/UYK-1	LOGANDS	103

BURROUGHS

CONTROL DATA CORPORATION

TWO FIVE (DATA REDUCTION)	CDC 3600	FORTRAN-63	17
BLACKBODY RADIANCE	CDC 3800	FORTRAN	25
BLACKBODY SPECTRAL RADIANCE	CDC 3800	FORTRAN	25
DETERMINANT OF A SYMMETRIC MATRIX	CDC 3800	FORTRAN	53
DISTANCE BETWEEN TWO POINTS	CDC 3800	FORTRAN	59
EVALUATE BESSEL FUNCTIONS	CDC 3800	FORTRAN	53
FIND REAL ZEROS OF FUNCTION	CDC 3800	FORTRAN	53
GREAT CIRCLE PATHS FROM A POINT	CDC 3800	FORTRAN	59
GREAT CIRCLE RETRIEVAL	CDC 3800	FORTRAN	112
LINE PRINTER PLOTS	CDC 3800	FORTRAN COMPASS	35
NELEDIT	CDC 3800	FORTRAN	21
PROPAGATION LOSS - NORMAL MODES	CDC 3800	FORTRAN	100
SCALING SUBROUTINE	CDC 3800	FORTRAN	53
THREE-DIMENSIONAL SURFACE PLOTS	CDC 3800	FORTRAN	35
UTILITY	CDC 3800	FORTRAN	21
RAY TRACING	CDC 3800	FORTRAN IV	96
SOUND SPEED PROFILES - NORMAL MODES	CDC 3800	FORTRAN IV	100
ACOUSTIC RAY TRACING	CDC 3800	FORTRAN-63	96
DATUBA (BUOY-CABLE DEFLECT.)	CDC 3800	FORTRAN-63	72
GENERAL VELOCITY FIELD	CDC 3800	FORTRAN-63	101
HORIZONTAL GRADIENT RAY TRACING	CDC 3800	FORTRAN-63	96
RAY TRACE PROCESSING	CDC 3800	FORTRAN-63	96
WAVEIN AND DIFRAK	CDC 6400	FORTRAN	50,110
OCEANOGRAPHIC DATA COMPUTATION	CDC 6400	FORTRAN II	90
SEDIMENT DATA	CDC 6400	FORTRAN II	29
SYNOPTIC PROGRAM	CDC 6400	FORTRAN II	18,90
CHLOROPHYLL AND PRODUCTIVITY	CDC 6400	FORTRAN IV	05
INTERPOLATION PROGRAM	CDC 6400	FORTRAN IV	90
MULTIVARIATE NON-LINEAR REGRESSION	CDC 6400	FORTRAN IV	47
SIMULATION OF TRANSGRESSION IN TIME	CDC 6400	FORTRAN IV	54
OBJECTIVE THERMOCLINE ANALYSIS	CDC 6500	FORTRAN IV-H	75
TRLOSS (TRANSMISSION LOSS)	CDC 6600	FORTRAN	94
HARMONIC ANALYSIS OF TIDAL DATA	CDC 6600	FORTRAN IV	103
TIDAL CURRENT PREDICTION	CDC 6600	FORTRAN IV	104
ECOPROD	CDC 6600	FORTRAN IV	05
JOB (SPECIES DIVERSITY)	CDC 6600	FORTRAN IV	06
OXYGEN	CDC 6600	FORTRAN IV	06
ASTRONOMICAL TIDE PREDICTION	CDC 6600	FORTRAN-66	104

DIGITAL EQUIPMENT CORPORATION

DECCA HI-FIX	PDP-5, 8S	FORTRAN	64
INDUCTIVE SALINOMETER SALINITY CONV.	PDP-5, 8S	FORTRAN	11
DISSOLVED OXYGEN, POTENTIAL TEMP.	PDP-5, 8S	PAL III	93
OCEAN STATION ANALYSIS AND SUMMARY	PDP-5, 8S	PAL III	93
THERMOMETER CORR. AND THERMO. DEPTH	PDP-5, 8S	PAL III	20
RICHARDSON CURRENT METER FILM READ.	PDP-7(9)	DECAL	15
THE VORTEX OCEAN MODEL	PDP-7(9)	DECAL	38
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RYLD (FISH STOCK YIELD)	IBM 1130	FORTRAN IV	05
STP01 (PLOT S.T.D. DATA)	IBM 1130	FORTRAN IV	37
STP02 (COMPUTE FROM S.T.D. DATA)	IBM 1130	FORTRAN IV	84
SPECIAL CHEMISTRY CALCULATIONS	IBM 1130	FORTRAN IV	09
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TRANSPORT COMP. FROM ATMOS. PRESSURE	IBM 1130	FORTRAN IV	67
PSAL1 (PLOT TEMPERATURE-SALINITY)	IBM 1130	FORTRAN VI	37
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TWO-DIMENSIONAL AUTOCORRELATION	IBM 1401	FORTRAN	56
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CONVERSION, NODC TO ICES	IBM 1401	SPS	23
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THERMOCHECK II - TEMP. CORRECTION	IBM 1620	FORTRAN	17
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TRANSPORT COMP. FROM ATMOS. PRESSURE	IBM 1620	FORTRAN II	67
DYNAMIC HEIGHT CALCULATION	IBM 1620	FORTRAN II	90
MULTIVARIATE DISCRIMINANT ANALYSIS	IBM 1620	FORTRAN II	55
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CONSOLIDATION TESTS ON OCEAN SEDIMENT	IBM 1620II	FORTRAN II-D	30
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SEA SURFACE TEMPERATURE DISTRIBUTION	IBM 7074	FORTRAN	77
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MULTIVARIATE NON-LINEAR REGRESSION	IBM 709	FORTRAN II	47
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OPTIMIZATION OF VTE WATER PLANTS	IBM 7094	FORTRAN IV	12
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CHLOROPHYLL CALCULATIONS	ICT 1301	MAC	07
DELTA-ALPHA AND SIGMA-T	ICT 1301	MAC	93
HARMONIC ANALYSIS	ICT 1301	MAC	51
TIDAL PREDICTION	ICT 1301	MAC	105
VELOCITY OF SOUND	ICT 1301	MAC	103
THERMOMETER CORRECTIONS	MERCURY	CHLF 3/4	15
TIDAL ANALYSIS AND PREDICTION	MERCURY	CHLF 3/4	104
PREDICTION OF HOURLY TIDE	MERCURY	NOT GIVEN	105
POWER SPECTRUM ANALYSIS	PB-250	BASIC	51
OPTIMUM TRACK SHIP ROUTING	PB-440	MACHINE	106

COMPUTER PROGRAM ABSTRACT FORM

This is a source sheet for the NODC publication Computer Programs in Oceanography. Please use a separate form for each program.

GENERAL INFORMATION

Title of program _____

Person to be contacted for further information concerning this program (NODC will refer all inquiries to this person)
Name _____ Telephone Number _____
Institution _____
Address _____

Are you willing to make the source program available to the oceanographic community? _____ If yes, please forward a documented copy of the program to the NODC. Whenever the NODC acts as an intermediary in the transmittal of this program, you will be given full credit.

PROGRAM DESCRIPTION

Purpose of program _____
_____
_____

Input to program (type and format of data) _____
_____
_____

Output from program (form and content) _____
_____
_____

General procedure followed (i.e., mathematical methods or statistical techniques used, approximations, etc.) _____
_____
_____

Source language of program _____

Documentation available _____
_____
_____

HARDWARE REQUIREMENTS

Core storage necessary (number of characters or words, please specify) _____

Additional storage requirements _____

Number of tape units used _____

Special input-output requirements _____

Other requirements _____

Computer for which program has been written _____