



CD-ROMs NODC-02 and NODC-03: Global Ocean Temperature and Salinity Profiles

Washington, D.C.
July 1991

U.S. DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
National Environmental Satellite, Data, and Information Service

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Each year NODC responds to thousands of data and information requests from users in the United States and around the world. NODC welcomes inquiries from all potential users. Please contact the:

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1. INTRODUCTION

The National Oceanographic Data Center has released a set of two CD-ROMs containing global ocean temperature and salinity profiles taken between 1900 and 1990. Volume 1 of this set (CD-ROM NODC-02) contains 1.62 million profiles from the Atlantic, Indian, and Polar Oceans totaling 451 MB; Volume 2 (CD-ROM NODC-03) contains 1.57 million profiles from the Pacific Ocean totaling 474 MB of data.

The NODC released its first CD-ROM in late 1989. That CD-ROM contained Pacific Ocean temperature-depth and salinity-depth profiles taken between 1900 and 1988. Designated as CD-ROM NODC-01, the disc was an experimental prototype developed by the NODC to test the feasibility and practicality of distributing large portions of its digital oceanographic database for use with desktop microprocessors. A limited number of this CD-ROM and its associated data access and display software was distributed to researchers for testing and evaluation.

The two new temperature-salinity profile CD-ROMs are an enhancement and extension to global data coverage of the original prototype CD-ROM. Comments and suggestions from researchers who had the opportunity to use the prototype disc are reflected in many modifications and improvements in the two new discs and their software. The NODC expresses its gratitude to all those who provided us their comments and helped us to develop an improved data product.

Data on CD-ROMs NODC-02 and NODC-03 are recorded in ASCII format so they are easy to access and manipulate. The CD-ROMs are formatted in the ISO 9660 standard. NODC-developed data access and display software for these discs is provided on a single high-density disk (either 5.25-inch or 3.5-inch). The software enables users to access, subset, copy, and display profiles. An inventory module allows the user to display counts of profiles on the CD-ROM to the one-degree square level. Other software that references NODC "Cruise" information and ship names is also provided. Because substantial changes were made in the software, the original version distributed with the prototype CD-ROM NODC-01 will not operate with these two new CD-ROMs.

The NODC Global Ocean Temperature and Salinity Profile CD-ROMs are available on order from

the NODC. An order form is included at the back of this report.

2. DISC CONTENTS

The National Oceanographic Data Center's CD-ROMs NODC-02 and NODC-03 contain temperature and salinity profiles selected from NODC's data bases in January 1991. The earliest observation on these discs dates from the year 1900; the most recent from 1990.

The area of data selection for CD-ROM NODC-02 is the North and South Atlantic and Indian Oceans extending north and south to the poles. Specifically, the western boundary follows the 100°W meridian southward to Mexico, then the east coast of Central and South America, and--in the Drake Passage--the 70°W meridian. The eastern boundary is the 110°E meridian.

The area of data selection for CD-ROM NODC-03 is the North and South Pacific Oceans extending northward and southward to the poles. The western boundary is the 110°E meridian. The eastern boundary follows the 100°W meridian southward to Mexico, then the west coast of Central and South America, and--in the Drake Passage--the 70°W meridian.

The data are organized by ten-degree latitude-longitude squares, which are identified using the World Meteorological Organization (WMO) ten-degree square numbering scheme (Appendix A and Appendix B).

The data included on these two CD-ROMs were selected from NODC's six major temperature and salinity profile data files:

1. Oceanographic station (Nansen cast) data (SD2);
2. Low-resolution conductivity/salinity-temperature-depth (C/STD) data (C/STD profiles with parameter values at selected depths derived from original high resolution profiles);
3. Mechanical bathythermograph (MBT) data;
4. Expendable bathythermograph (XBT) data;
5. Selected-level bathythermograph (SBT) data (XBT data submitted to NODC at user-specified depths rather than at inflection points); and

6. IGOSS radio message bathythermograph (IBT) data.

The SBT data files are usually from an XBT instrument, but the digitization methods are unknown. Therefore these data are maintained separately from NODC's standard BT files. The IBT (IGOSS Radio Message BT) data are the least accurate and, unlike the other data types, have never been thoroughly quality evaluated.

Except for the IBT temperature profiles, most of the data have undergone some degree of NODC quality checking before inclusion in the data archives. This includes logical testing for valid (in water) positions; parameter values within normal minimum/maximum temperature ranges; observed depths not exceeding bathymetric depth; and reasonable vessel speed of advance. In addition, SD2 and C/STD data are screened by NODC oceanographic staff who set quality flags in the data record to denote questionable parameter values.

All selected data were passed through a gross range check for temperature (-3.00° to 46.00° Celsius) and for salinity (00.00 to 46.00 parts per thousand). Values that were outside these ranges were eliminated and replaced with -9999. Also, blank values were replaced with -9999. Of all of the data, only the IBT file had temperature values outside the range and these values were eliminated.

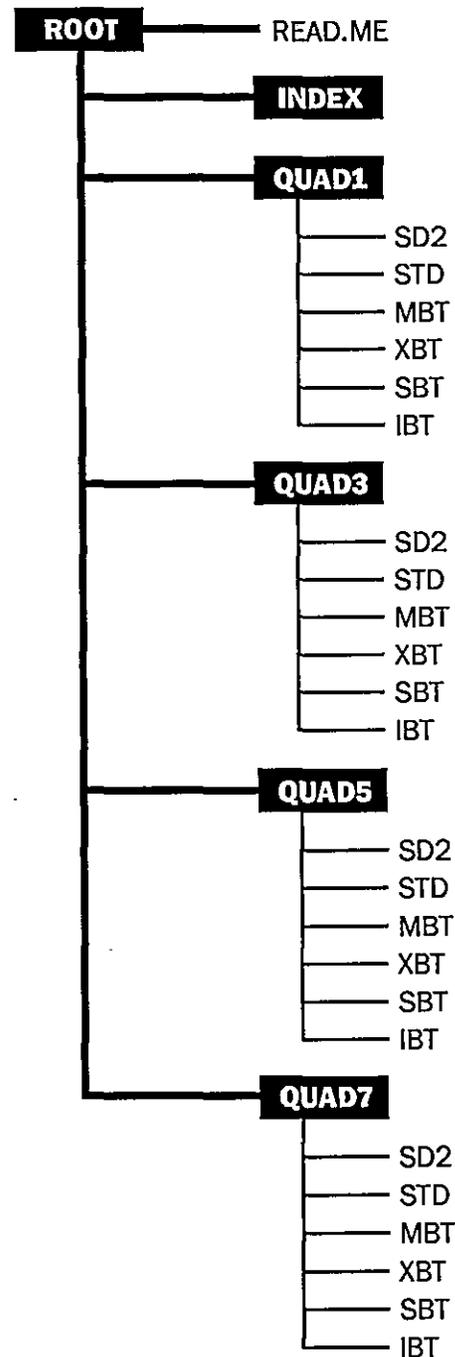
3. DISC DIRECTORY STRUCTURE

All data are stored as ASCII characters readily accessible by most MS-DOS compatible software. The organization of the data on the CD-ROMs and the conventions used in the naming of the subdirectories and files will enable the novice to navigate and select data from them. Operating within the MS-DOS environment, CD-ROMs NODC-02 and NODC-03 have the following directory structure:

ROOT Directory - containing a Read.me file that is an abbreviated version of this documentation.

INDEX Subdirectory - containing several index files that are either required for the data access/display software or may be of help for user-developed retrieval software:

Figure 1. Subdirectory Structure of CD-ROMs NODC-02 and NODC-03



ONESQ - an index file for the inventory program containing station counts for each one-degree square.

KEYFILE - a sequential file used in conjunction with the SHIP.ROM direct access file for retrieval.

ing and displaying the ship and institute names for each NODC cruise identifier.

SHIP.ROM - a direct access character file containing the ship and institute names.

ATLANTIC.IDX (for CD-ROM NODC-02) or **PACIFIC.IDX** (for CD-ROM NODC-03) - a sequential binary file of each observation on the CD-ROM containing the same information as the first 36 bytes of each record plus the maximum depth of each profile and the byte address for that profile on the ten degree square file.

QUAD1 Subdirectory - containing six subdirectories: SD2, STD, MBT, XBT, SBT, AND IBT containing the profiles for WMO Quadrant 1 (North and East).

QUAD3 Subdirectory - containing six subdirectories: SD2, STD, MBT, XBT, SBT, AND IBT containing the profiles for WMO Quadrant 3 (South and East).

QUAD5 Subdirectory - containing six subdirectories: SD2, STD, MBT, XBT, SBT, AND IBT containing the profiles for WMO Quadrant 5 (South and West).

QUAD7 Subdirectory - Contains six subdirectories: SD2, STD, MBT, XBT, SBT, AND IBT containing the profiles for WMO Quadrant 7 (North and West).

Subdirectories SD2, STD, MBT, XBT, SBT, AND IBT under the respective WMO quadrant subdirectory contain the actual profile data organized into files named according to the data type (i.e., SD2, STD), the WMO ten-degree square number, and suffixed by ".ROM". A sample file name is:

SD23409.ROM

SD2 = Identifier for data from the Oceanographic Station Data File.

3409 = WMO ten-degree square number, which is determined as follows:

3 = Quadrant 3 (South Latitude, East Longitude)

4 = 40°N to 50°N Latitude

09 = 090°E to 100°E Longitude

ROM = File extension indicating data residing on the CD-ROM disc.

4. FILE STRUCTURE/FORMAT

All temperature and temperature/salinity profile data appear on the disk with a .ROM suffix. These files are written as a series of variable length ASCII records.

In each .ROM file physical records represent a complete profile or observed station. The first 36 characters represent the profile "header" and contain descriptive information about the profile, including date-time, position, vessel, instrument/data type, NODC cruise and station number, and the number of observed depth levels. Characters 37 through the end of the record contain measured parameters in a series of repeating groups. For SD2 and STD data records, each repeating group is 16 characters long representing depth, temperature, temperature precision code, salinity, and salinity precision code. Bathythermograph records (MBT, XBT, SBT, and IBT) have repeating groups of eight (8) characters representing only depth and temperature. The actual record length will correspond to either 8 or 16 times the number of observed levels plus the 36-byte header. A detailed record layout for .ROM files can be found in Appendix C, Tables C.1 through C.3.

The file naming convention is intentionally redundant so that files downloaded from the CD-ROM to other DOS storage devices can still be completely identified from their names. For example, an Oceanographic Station (Nansen cast) data file will have a fully qualified name such as \QUAD5\SD2\SD25008.ROM, with both the quadrant (5) and the data type (SD2) repeated. If the above file were copied to a hard disk as SD25008.ROM, for example, the naming convention enables the user to know that the file contains Oceanographic Station (Nansen cast) data from WMO ten-degree square 5008 and was copied directly from the CD-ROM file.

5. SYSTEM REQUIREMENTS

The minimum hardware requirements for accessing data and information from CD-ROMs NODC-02 and NODC-03 are:

- CD-ROM reader capable of accessing a disk formatted with the ISO 9660 standard, and

- Microsoft MS-DOS Extensions for CD-ROM, Version 2.0 or higher.

In addition, to execute the NODC companion software, the following are required:

- 640 Kb of memory, with at least 500 Kb available,
- EGA graphics adapter,
- EGA or multi-synchronous color graphics monitor, and
- 1.2 MB, 5.25-inch floppy disk drive or 1.44 MB, 3.5-inch floppy disk drive.

6. DATA ACCESS AND DISPLAY SOFTWARE

Users have the option of receiving the data access and display software on disk in either 5.25-inch high density (1.2 MB) or 3.5-inch high density (1.44 MB) format. This disk contains three executable software modules (and their source code) for accessing and displaying data from and information about CD-ROMs NODC-02 and NODC-03, as well as various files required by the CD-ROM software.

The software disk does not include driver software for various CD-ROM devices. These drivers and various operating system extensions to make use of CD readers as part of the DOS environment are the responsibility of the user. Under normal DOS usage of CD-ROM readers, a drive letter (usually between E and Z) is assigned to the device. The user is required to know the drive letter assigned before executing any of the NODC CD-ROM companion software. It is strongly recommended that backup copies of the NODC diskette be made upon receipt, and that the backups or copies of the software be used for program execution.

All programs and subroutines are written in QuickBASIC (version 4.5). To improve the performance of the software or to provide capabilities that are not available with BASIC, NODC has used numerous ProBAS subroutines (from Hammerly Computer Services, Inc.). All programs are written for EGA graphics.

All of the modules are screen and menu oriented. The user is generally provided with enough information to make practical use of the modules at the first sitting. The main selection and display routine, ROMSEL, has built-in help screens. As with

most software, a bit of practice should enable users to become quite comfortable with these routines.

Installation procedures

For single floppy disk users:

Prepare a blank, formatted diskette

Place the NODC diskette in Drive A

Type DISKCOPY A: B:

Follow the DISKCOPY utility instructions

Remove and store the NODC diskette

Place the backup diskette in Drive A

Type A:

Type ROMSEL to display profiles, or
CDINV to run inventories

For dual floppy disk users:

Prepare a blank, formatted diskette

Place the NODC diskette in Drive A

Place the blank, formatted diskette in Drive B

Type DISKCOPY A: B:

Follow the DISKCOPY utility instructions

Remove and store the NODC diskette

Place the backup diskette in Drive A

Type A:

Type ROMSEL to display profiles, or
CDINV to run inventories

For hard disk drive users:

Prepare at least one backup diskette as above

Create a subdirectory on your hard disk, for example:

```
MKDIR NODC02
```

Insert a backup of the NODC diskette in Drive A. Move to the created hard drive subdirectory, for example:

```
C:
CD \NODC02
```

Copy the contents into the subdirectory:

```
A:
COPY *.* C:\NODC02
```

The following string of commands may now be used to execute the NODC software:

```
C:
CD \NODC02
ROMSEL (to display profiles) or
CDINV (to run inventories)
```

The data access and display software includes:

CDINV. This module enables users to produce an on-screen count of the number of profiles contained in the files of CD-ROMs NODC-02 and NODC-03. The inventory provides this information to the "one-degree square" level of detail, i.e., the number of profiles found in a latitude-longitude rectangle bordered by single, whole degrees.

CDINV may be executed as a stand-alone module by:

- Moving to the DOS Drive and Subdirectory that contains the program; and
- Typing CDINV followed by a CR or Enter

If available, a mouse may also be used to initiate the CDINV module.

CDINV provides a screen showing the four WMO quadrants covering the Pacific Ocean. The user may select a quadrant of choice by using the arrow keys or a mouse. Once the quadrant is chosen, pressing the CR or Enter key continues the search. Typing an X followed by CR or Enter will terminate the program.

The second screen displays all of the WMO ten degree squares found in that quadrant that contain profile data. Again, using the arrow keys or mouse, the user selects the ten-degree square desired. A CR or Enter key will continue the search. The user may return to the quadrant

select screen by typing Q and either CR or Enter. The program may be terminated with an X and either a CR or Enter or the proper mouse button.

The next screen provides the user with a selection of data types to display by a numbering code: 1 for SD2, 2 for STD, etc. Any single data type may be chosen by entering the number followed by CR or Enter. A combination of data types or all data types may also be selected. For a combination, the user is prompted to respond to a "yes" or "no" for the inclusion of each type of data.

The final screen or series of screens presents a count of the number of profiles for each one-degree square within the selected ten-degree square. If the user has selected a combination of data types, a summary screen tallying all selected types will be displayed. After each screen, the user is prompted to press a CR or Enter to proceed. After the last screen is shown, the user returns to the ten-degree square selection.

ROMSEL. This module allows the user to scan the profiles on the CD-ROM, plot the profiles on a color Enhanced Graphics Adapter (EGA) monitor, and/or subset the profiles to another DOS device. The program is completely menu driven and requires files that reside on both the CD and the software diskette.

To execute ROMSEL, the user simply moves to the device and directory containing the program and its companion files and types:

ROMSEL

followed by a CR or Enter.

The user is prompted through a series of menus to provide the detailed selection criteria desired. At any point in the selection menu process the user may respond with the letter "H" or the F1 function key to display a single page "help" screen. These screens are designed to provide more detailed information about the selection prompting process.

As each data selection and plotting option is chosen, the selection criteria are displayed on the right side of the screen. At the termination of the selection process, the user is requested to review the options chosen and to make a final decision as to whether to continue or to restart the selection process.

Many of the data selection/data display options have default settings. Where defaults exist, the default values are displayed on the prompting screen. Pressing a CR or Enter key will select the default values. As the user makes selections, those selections become the default values. This feature allows for ease of changing one or two options on a second or third pass through the selection process by merely pressing the CR or Enter key at each non-changing option.

ROMSEL enables users to:

- Display, subset, or display and subset profile data from the CD;
- Select from any, all, or any combination of the six data types;
- Select data from any WMO ten-degree square;
- Select data by inclusive dates, by single years, or by months for all years;
- Select data by vessel, identified either by NODC shipcode or by ship name;
- Select data by NODC Country Code (see Appendix D);
- Select data by NODC Cruise Number;
- Select data for profiles deeper than a user selected minimum depth;
- Plot temperature-depth profiles with user selected ranges, and, where appropriate, to plot salinity-depth or temperature-depth profiles; and
- Select and display data through various combinations of the above.

The profile plotting options provide a two-screen, EGA color display. Selected profiles are displayed at user chosen speeds on the main screen. For temperature-depth (T-Z), salinity-depth (S-Z), and temperature-salinity (T-S) plots, the user may toggle to the secondary screen to display the actual data values for the profile plotted on the main screen. For combination plots displaying all profile options, the main screen displays T-S curves while the secondary screen displays T-Z and S-Z curves. No data value display is available with this option.

For all plotting options the main screen is divided into three segments. The left portion of the screen displays the selected profile, either T-Z, S-Z, or T-S curves. For combination plots the T-S curve is plotted. The upper right portion of the screen displays information from the profile header for the plotted data. The lower right portion displays the geographic area selected (i.e., the WMO ten-degree square.) As each station is plotted, its location is highlighted.

During plotting the user controls various operations by means of the keyboard function keys. The developers have reserved some of these keys for future enhancements. ROMSEL uses the following keys:

F1 - Pressing this key during T-Z, S-Z, or T-S plotting toggles to the data value display screen while plotting pauses. All header and profile information is displayed. For stations with more depth values than can be displayed on one page, an option exists to display the remainder on further pages. Pressing any non-function key while viewing the data display page will return to the main screen and resume plotting.

If the user has chosen the combination option of displaying all three types of curves (T-Z, S-Z, and T-S), the F1 key has no effect.

F2 - Reserved for future use.

F3 - Pressing this key during plotting freezes the screen.

F4 - Pressing this key after the F3 key has been pressed resumes plotting.

F5 - Data are plotted at a range of ten speeds, each speed represented by a delay indicator value from 0 through 9. This value is displayed in the upper right hand portion of the screen. Initially, all plots begin with a mid-range setting of 4. Pressing this key will increase the plotting speed (decreasing the delay indicator). Once a value of zero (0) has been reached, this key has no further effect.

F6 - Pressing this key reverses the action of the F5 key and decreases the data plotting speed (increasing the delay indicator value). Once the maximum value of nine (9) has been reached, this key no further effect.

F7 - For T-Z, S-Z, and T-S combination plots, pressing this key toggles between display screens. For all other plotting options, this key has no effect.

F8 - This key is reserved for future use.

F9 - Pressing this key during plotting terminates the plot and returns the user to the selection menu. If the user specifies data subsetting while plotting, the output file is closed at the last profile that was plotted.

F10 - Pressing this key during plotting terminates the plot and the program. As with the F9 key, any output files are closed at the point of termination.

As a menu driven module, ROMSEL is easier to operate than to explain. By exercising the program's various options and observing the results, users should quickly become familiar with its operation and comfortable with its use.

SHIPDARD. This module enables the user access to information about NODC Reference Numbers. These reference numbers are found in bytes 28 through 32 of the profile header (see Appendix C., Table C.1). SHIPDARD prompts the user for the reference number and provides the names of the vessel and the institution that submitted the profile to the NODC.

SHIPDARD may be executed as a stand-alone module by:

- Moving to the DOS Drive and Subdirectory that contains the program; and
- Typing SHIPDARD followed by a CR or Enter.

SHIPDARD opens by prompting the user for the CD-ROM DOS Drive Letter. The user must type the letter followed by a CR or Enter. A second screen appears which asks for the data type requested. Please note that some redundancy exists among reference numbers across data types. The user enters the data type followed by CR or Enter.

Once the data type is selected, the user is prompted for the cruise or reference number. For bathythermograph (XBT, MBT, SBT, and IBT) data this information is found in bytes 28 through 32 of the data header. For SD2 and STD data the reference is a concatenation of the first two bytes

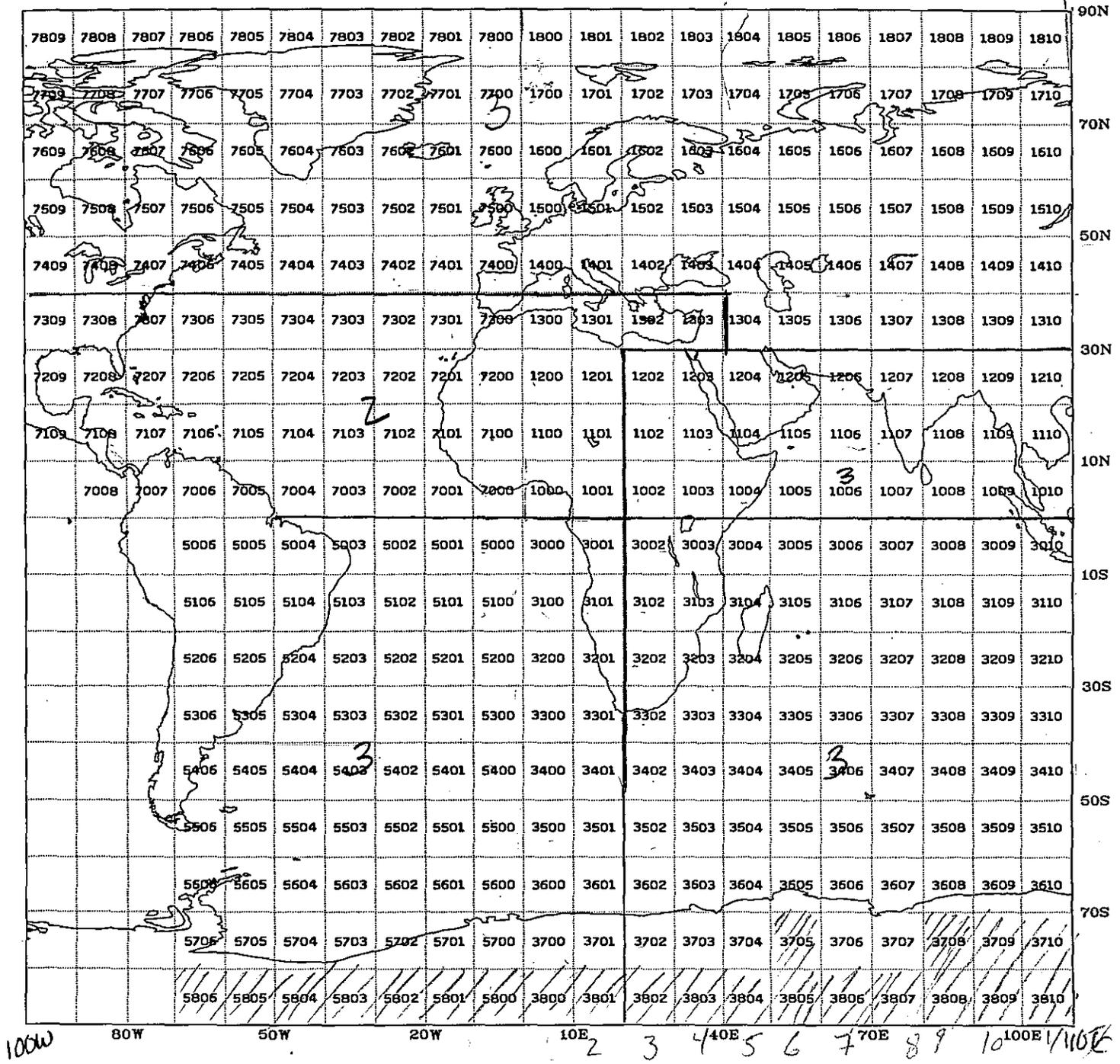
of the vessel identifier (bytes 20 and 21 of the header) with the last four bytes (29 through 32) of the reference number found in the header. The user enters the number followed by CR or Enter.

The software accesses the files SHIP and KEYFILE on the CD, returning the vessel and institution names to the screen. The user may continue scanning references or quit the program. Upon program termination, the user has the option to print the information obtained.

7. SOFTWARE UPDATES

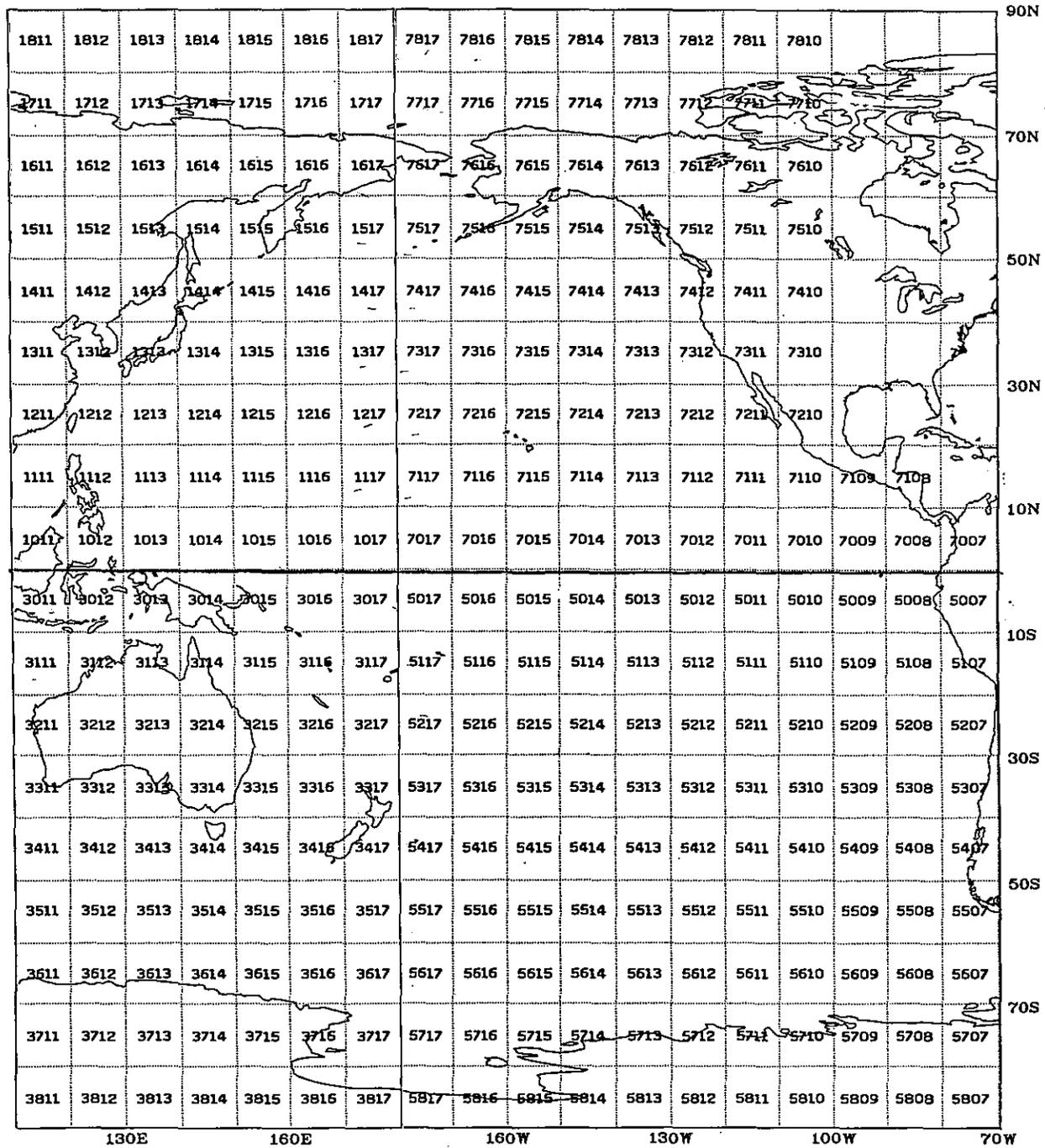
The software initially distributed with CD-ROMs NODC-02 and NODC-03 is version 2.0 of NODC's data access and display software. Because it was extensively modified in response to many user comments and suggestions, this version will not work with CD-ROM NODC-01, the experimental prototype Pacific Ocean temperature-salinity CD-ROM. To receive updates to the software that may be issued in the future, users are encouraged to fill out and return to the NODC a copy of the software registration form (Appendix E).

Appendix A. WMO Ten-Degree Squares for the Atlantic and Indian Oceans



- Tim - are 14 levels in S, T - did you
 run ^{to} 19 levels -

Appendix B. WMO Ten-Degree Squares for the Pacific Ocean



Appendix C. Data Formats

Table C.1 Header Format of .ROM Files			
<i>Field</i>	<i>Starting Column</i>	<i>Length</i>	<i>Description</i>
WMO QUAD	1	1	WMO quadrant code: 1=northeast 3=southeast 5=southwest 7=northwest
LATITUDE	2	4	Latitude (DDMM)
LONGITUDE	6	5	Longitude (DDDMM)
DATE	11	6	Date (YYMMDD)
TIME	17	3	Time (hours to tenths)
VESSEL	20	4	NODC ship code consisting of a two-character country code and a two-character vessel code
NUMBER OF GROUPS	24	3	Number of depth-temp or depth-temp-salinity repeating groups
DATA TYPE	27	1	NODC archive data type: 1 = SD2 2 = C/STD 3 = MBT 4 = XBT 5 = SBT 6 = IBT
CRUISE	28	5	NODC-assigned cruise reference number
STATION	33	4	NODC-assigned station reference number

Table C.2 Format of Repeating Data Groups for SD2 and STD Files

<i>Field</i>	<i>Starting Column</i>	<i>Length</i>	<i>Description</i>
DEPTH	37	4	First depth (whole meters)
TEMPERATURE	41	5	First temperature (degrees Celsius)
TEMPERATURE PRECISION	46	1	Precision code: 1 = Tenths of a degree 2 = Hundredths 3 = Thousandths 7 = NODC doubtful (hundredths) 8 = Originator doubtful (hundredths)
SALINITY	47	5	First salinity (parts per thousand)
SALINITY PRECISION	52	1	Precision code same as for temperature
.			
.			
.			

(A series of 16-byte long repeating groups of the above start at byte 37. The total number of such groups is given in the header.)

Table C.3 Format of Repeating Data Groups for Bathythermograph Files

<i>Field</i>	<i>Starting Column</i>	<i>Length</i>	<i>Description</i>
DEPTH	37	4	First depth (whole meters)
TEMPERATURE	41	4	First temperature (degrees Centigrade to hundredths)
.			
.			
.			

(A series of 8-byte long repeating groups of the above start at byte 37. The total number of such groups is given in the header)

Appendix D. NODC Country Codes

<i>Code</i>	<i>Country</i>	<i>Code</i>	<i>Country</i>
AL	ALGERIA	26	DENMARK
BA	BARBADOS	27	ARAB REPUBLIC OF EGYPT
BH	BAHAMAS	28	ECUADOR
BN	BONAIRE	29	SPAIN
CA	CURACAO	31	UNITED STATES
CI	CAYMAN ISLANDS	32	UNITED STATES
CR	COSTA RICA	34	FINLAND
CU	CUBA	35	FRANCE
CY	CYPRUS	36	GREECE
GH	GHANA	41	INDIA
GR	GRENADA	42	INDONESIA
IC	IVORY COAST	45	IRELAND
JA	JAMAICA	46	ICELAND
MA	MAURITIUS	47	ISRAEL
M	MALTA	48	ITALY
MO	MONACO	49	JAPAN
MS	MALAYSIA	54	LIBERIA
NI	NIGERIA	55	MALAGASY REPUBLIC
OM	OMAN	56	MOROCCO
PA	PANAMA	57	MEXICO
RC	CONGO, PEOPLE'S REPUBLIC OF THE	58	NORWAY
SE	SENEGAL	59	NEW CALEDONIA
SI	SINGAPORE	61	NEW ZEALAND
SL	SIERRA LEONE	62	PAKISTAN
SU	SUDAN	64	NETHERLANDS
TN	TONGA	65	PERU
TT	TRINIDAD/TOBAGO	66	PHILIPPINES
ZA	TANZANIA	67	POLAND
ZZ	MISCELLANEOUS ORGANIZATIONAL UNITS	68	PORTUGAL
06	GERMANY, FEDERAL REPUBLIC OF	74	UNITED KINGDOM
07	GERMANY, DEMOCRATIC REPUBLIC OF	76	CHINA, PEOPLE'S REPUBLIC OF
08	ARGENTINA	77	SWEDEN
09	AUSTRALIA	86	THAILAND
10	AUSTRIA	88	TUNISIA
11	BELGIUM	89	TURKEY
14	BRAZIL	90	UNION OF SOVIET SOCIALIST REPUBLICS
15	BULGARIA	91	SOUTH AFRICA
18	CANADA	92	URUGUAY
20	CHILE	93	VENEZUELA
21	TAIWAN	94	VIETNAM
22	COLOMBIA	95	YUGOSLAVIA
24	KOREA, REPUBLIC OF		

Appendix E. Software Registration Form

Recipients of the companion software provided with CD-ROMs NODC-02 and NODC-03 may distribute copies of the executable code to any individual or group. The Center does intend, however, to periodically upgrade the software by correcting errors and adding features. To receive software updates, please make a photocopy of this registration form, fill it in, and mail or Fax (202-606-4586) it to:

National Oceanographic Data Center
NOAA/NESDIS E/OC21
Attn: R. Abram
1825 Connecticut Ave., NW
Washington, DC 20235

NAME _____

ORGANIZATION _____

ADDRESS _____

TELEPHONE: _____ INTERNET: _____ OMNET: _____

SYSTEM CONFIGURATION

CPU Make/Model _____

CD-ROM Drive Make/Model _____

Graphics Card (check one): EGA VGA Make _____

Printer Make/Model _____

MS-DOS Version _____

Compilers (please check all that apply):

BASIC Manufacturer _____ Version _____

C Manufacturer _____ Version _____

Pascal Manufacturer _____ Version _____

FORTRAN Manufacturer _____ Version _____

Other _____

Manufacturer _____ Version _____

