



COMDTINST 3142.1

29 DEC 1988

COMMANDANT INSTRUCTION 3142.1

Subj: Bathythermograph Program

- Ref: (a) COMDTINST M3161.10, Manual for Marine Science Operations  
(b) SIPPICAN Manual R-603C Series: Instruction Manual for the Expendable Bathythermograph System (NOTAL).  
(c) COMDTINST M5500.11 Series; Coast Guard Security Manual.  
(d) NAVOCEANCOMINST 3140.1H; U.S. Navy Oceanographic and Meteorological Support System Manual (FOUO) (NOTAL)

1. PURPOSE. This instruction describes the program for the collection and reporting of bathythermograph observations.
2. DIRECTIVES AFFECTED. COMDTINST 3161.1F is canceled.
3. OBJECTIVE. The U.S. Coast Guard cooperates with the U.S. Navy in its bathythermograph (BT) program. BT information is used by the Navy for thermal structure forecasting to support submarine and antisubmarine operations. In addition, ocean temperature distributions of daily, seasonal and yearly scales provide vital information to the National Weather Service (NWS). The Expendable Bathythermograph (XBT) is presently the best single system for measuring temperature distribution. This equipment provides a continuous record of the temperature of ocean water as a function of depth and can be employed while a vessel is underway, minimizing interference with other missions. Reference (a) contains Coast Guard operational procedures for the XBT; reference (b) provides a technical description of the instrument operation and maintenance.
4. BACKGROUND. Commander, Naval Oceanography Command, through the Fleet Numerical Oceanography Center, collects oceanographic data required for the environmental analysis and forecasts used in fleet operations.

The National Weather Service uses oceanographic temperature data for their Gulf Stream analysis program. These programs rely on real time XBT data as well as detailed analysis of the original data and logs. On occasion Headquarters, area or district commanders may authorize special XBT surveys. In such cases the requesting authority will be responsible for purchasing XBT probes or reimbursing the cutter for XBT probes used for the special project.

5. OBSERVATIONS. Subject to availability of probes all XBT equipped Coast Guard cutters shall make bathythermograph observations every six hours while underway in water depths exceeding 100 fathoms, and may occasionally be directed to make observations in water depths less than 100 fathoms for special projects. Observations to the maximum depth obtainable shall be made four times daily at 0000, 0600, 1200, and 1800Z using the T-4 (450 meter) XBT probe. Modification to the routine schedule of observations may be necessary from time to time. Deviation from the schedule can be authorized by Commanding Officer, Fleet Numerical Oceanography Center. Deviations shall be reported to Commandant (G-NIO) and Commander International Ice Patrol. Should operational commitments of higher priority conflict with required XBT observations, casts should be taken as close as possible to the scheduled times.
6. REPORTS:
  - a. Bathythermograph observations shall be encoded for radio transmission in the JJXX format indicated on the Bathythermograph Log Sheet (NOAA Form 77-22). This format is required for efficient automated processing and analysis, and all older formats are obsolete and shall not be used. The log sheet pad contains detailed instructions and coding information.
  - b. XBT data shall be transmitted by PRIORITY precedence to the appropriate AIG (for both unclassified and classified messages):
    - (1) AIG 7608: For BATHY observations in the NORTH PACIFIC, SOUTH PACIFIC and INDIAN OCEANS and their associated seas and basins; all areas SOUTH of 60 degrees SOUTH LATITUDE.

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- (2) AIG 7641: For BATHY observations in the NORTH and SOUTH ATLANTIC OCEANS; GULF OF MEXICO; NORTH, NORWEGIAN, BALTIC, RED, MEDITERRANEAN and CARIBBEAN SEAS; the GREAT LAKES; all areas NORTH of 60 degrees NORTH LATITUDE.
7. LOGS. CNOC 3167/2//NOAA Form 77-22 BATHYTHERMOGRAPH LOG, is the prescribed permanent XBT record. The forms are in pads of fifty sheets with a fold out cover containing preparation, mailing and ordering instructions. Bathythermograph logs shall be finalized at the end of each calendar month or at the end of a cruise, whichever occurs first and submitted with the uncut XBT traces to the National Oceanographic Data Center (NODC), Washington, DC 20235. When specialized oceanographic cruises are being conducted at Headquarters, area, or district direction, logs and analog trace sheets shall be disposed of as directed by the requesting Coast Guard command. The recipient is responsible for applying acceptable quality control procedures to the data before forwarding to NODC. Enclosure (1) is a reproduction of the log instructions which includes a sample filled-out log form CNOC 3137/2//NOAA Form 77-22.
8. CLASSIFICATION OF XBT OBSERVATIONS AND MESSAGES. During certain classified operations, release of oceanographic information may reveal involvement with classified missions or give a classified position. In such cases, data (messages and logs) shall be assigned the appropriate classification. Additionally, such XBT data shall be safeguarded according to procedures outlined in reference (c). Facilities for handling classified XBT data are not available at the NODC. Therefore, classified logs and annotated traces shall be sent directly to the Fleet Numerical Oceanography Center, Monterey, CA 93943.
9. PROCUREMENT AND MAINTENANCE.
  - a. XBT Equipment. Commandant (G-TES) is responsible for the initial procurement of XBT systems. Routine maintenance of permanently installed XBTs is the responsibility of individual ships. Any maintenance problems which are beyond the capability of the ship's force should be referred to the appropriate MLC (tes-1). Additional support information is available in reference (d).

- (1) The XBT systems on Coast Guard cutters are Navy-supported. Commandant receives funding annually for system maintenance and distributes these funds to MLC commanders through the CG-4144 process, "Operating Guide Summary of Budget Estimates."
- (2) Norfolk Naval Shipyard, Portsmouth, VA has been designated as the primary source for SSQ series XBT system repair. Equipment requiring repair should be shipped with a DD-1149, "Requisition and Invoice/ Shipping Document" to Code 966. Code 213 handles repairables. Before shipping equipment to the shipyard, make arrangements by phone (804) 396-7513.

Note: The MK2A XBT system, currently installed on Coast Guard cutters, is no longer in production. The U.S. Navy is in the process of procuring replacement systems for its fleet and the Coast Guard's. Commandant (G-TES) is the point of contact for replacement systems. Replacements are not expected soon, but a schedule will be promulgated when available. In the meantime, the existing system will be supported to the extent feasible.

b. Consumables.

- (1) AR-4 XBT chart paper (for use with T-4 probes) may be requisitioned from: Supply Center Brooklyn; Stock Number: 6655-00-162-2481; Part 212777-1; Unit of Issue: roll.
- (2) Probes should be ordered well in advance of anticipated usage. No stock number is necessary. For special cruises (see paragraph 4) XBT probes will be supplied by the sponsoring organization; or, arrangements may be made to draw probes from the cutter's current stock, with replacement to be made by the sponsoring organization at a later date. XBT probes for special projects may be purchased directly from the manufacturer: Sippican Ocean Systems, Inc., 7 Barnabas Road, Marion, MA 02738; (617) 748-1160. T-4 XBT probes may be obtained at no cost by letter or telephone request to:

Commanding Officer  
Fleet Numerical Oceanography Center  
Monterey, CA 93940  
Telephone: (408) 647-4451

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10. ACTION.

- a. Area commanders and other operational commanders may promulgate additional instructions as deemed necessary to comply with special requirements for XBT data collection and reporting within their commands.
- b. Commanding Officers of all cutters equipped with XBT systems shall comply with the provisions of this instruction.
- c. Any problems of a technical nature should be addressed to Commander, International Ice Patrol (FTS 642-2626). Questions of a policy nature should be referred to Commandant (G-NIO) (FTS 267-1450).

11. FORMS AVAILABILITY. Additional Bathythermograph Log Sheets, NOAA-77-22 may be procured from Supply Center Brooklyn, using SN 7530-00-F02-1830.

/s/ A. B. Smith  
Acting Chief, Office of  
Navigation Safety &  
Waterway Services

Encl: (1) Instructions for Preparing the Bathythermograph Log Sheet



**4. AIR TEMP - REF BULB (S, ETI)**  
 a. Temp. of air in vicinity of bulb  
 b. Temp. of air in vicinity of bulb  
 c. Temp. of air in vicinity of bulb

**5. SEA TEMP (T<sub>1</sub>, T<sub>2</sub>, T<sub>3</sub>) (INSTR)**  
 a. Sea temperature (surface)  
 b. Sea temperature (100 to 1000 ft)  
 c. Sea temperature (1000 to 10000 ft)

**6. WIND (V, D, H, S, G, R, T)**  
 a. Wind velocity (knots)  
 b. Wind direction (true)  
 c. Wind gust (knots)  
 d. Wind force (pennant)  
 e. Wind state (smooth, choppy, etc.)  
 f. Wind gust (knots)

**7. WAVE (H, P, D, S, T)**  
 a. Wave height (feet)  
 b. Wave period (seconds)  
 c. Wave direction (true)  
 d. Wave force (pennant)  
 e. Wave state (smooth, choppy, etc.)  
 f. Wave gust (feet)

**8. SWELL (H, P, D, S, T)**  
 a. Swell height (feet)  
 b. Swell period (seconds)  
 c. Swell direction (true)  
 d. Swell force (pennant)  
 e. Swell state (smooth, choppy, etc.)  
 f. Swell gust (feet)

**9. LIGHTS OF WIND WAVE AND SWELL**  
 a. Light of wind wave  
 b. Light of wind wave  
 c. Light of wind wave  
 d. Light of wind wave  
 e. Light of wind wave  
 f. Light of wind wave

**10. SURFACE (S, ETI)**  
 a. Surface temperature  
 b. Surface temperature  
 c. Surface temperature

**11. LONGITUDE (L, H, M, S, D)**  
 a. Longitude (degrees)  
 b. Longitude (minutes)  
 c. Longitude (seconds)  
 d. Longitude (degrees)

**12. INDICATOR GROUP (S, ETI)**  
 a. Indicator group (S, ETI)  
 b. Indicator group (S, ETI)  
 c. Indicator group (S, ETI)

**13. METRIC (S, ETI)**  
 a. Metric (S, ETI)  
 b. Metric (S, ETI)  
 c. Metric (S, ETI)

**14. SURFACE (S, ETI)**  
 a. Surface (S, ETI)  
 b. Surface (S, ETI)  
 c. Surface (S, ETI)

**15. SUBSURFACE (S, ETI)**  
 a. Subsurface (S, ETI)  
 b. Subsurface (S, ETI)  
 c. Subsurface (S, ETI)

**IV. ADDITIONAL NAVY INSTRUCTIONS**

A. SHIPS WITH WIND RECORDING INSTRUMENTS SHOULD USE THE REFERENCE AND RADIO MESSAGE INFORMATION IN THIS SECTION FOR NAVY SHIP USE ONLY.

B. METRIC (S, ETI) - Enter the metric value in the appropriate column.

C. SURFACE (S, ETI) - Enter the surface temperature in the appropriate column.

D. SUBSURFACE (S, ETI) - Enter the subsurface temperature in the appropriate column.

**SAMPLE MESSAGE**

FM USCGC BARBER (12345) 1000Z 15 SEP 68  
 TO: ADMIRALTY (01000) 1000Z 15 SEP 68  
 FROM: USCGC BARBER (12345) 1000Z 15 SEP 68  
 INFO: ADMIRALTY (01000) 1000Z 15 SEP 68

**BATHY THERMOGRAPH LOG SHEET**

SHIP: USCGC BARBER (12345)  
 DATE: 15 SEP 68  
 TIME: 1000Z