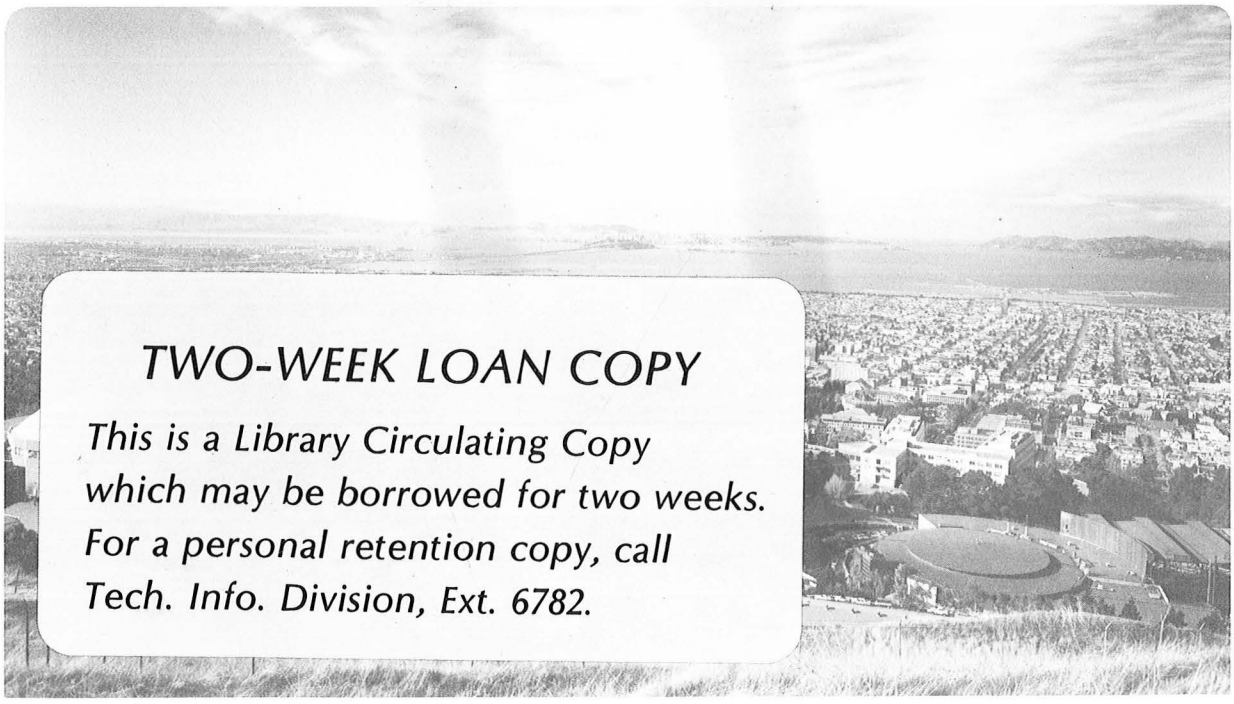
Lawrence Berkeley Laboratory
UNIVERSITY OF CALIFORNIA, BERKELEY

EARTH SCIENCES DIVISION

PHYSICAL OCEANOGRAPHIC DATA FROM THE OTEC PUNTA TUNA, PUERTO RICO SITE September 1979 - June 1980

Daniel Frye, Allan Davison, and Karen Leavitt

January 1981



Prepared for the U.S. Department of Energy under Contract W-7405-ENG-48

DISCLAIMER

LBL 12327

PHYSICAL OCEANOGRAPHIC DATA FROM THE OTEC PUNTA TUNA, PUERTO RICO SITE

September 1979 - June 1980

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PREFACE

Coastal Marine Research Inc. deployed a current meter array at the Punta Tuna, Puerto Rico OTEC site in September 1979 using current meters loaned by National Oceanographic and Atmospheric Administration (NOAA)/ Atlantic Oceanic and Meteorological Laboratories (AOML). Recovery was accomplished from O.S.S. Researcher in March 1980 by NOAA/AOML and Lawrence Berkeley Laboratory personnel. Additional field data was obtained by EG&G during a deployment cruise in June 1980 (PROTEC-08)

Data processing and primary report preparation was done by EG&G. The report presented here has been edited by LBL from the draft report.

EXECUTIVE SUMMARY

Current meter data taken at three depths at the Punta Tuna, Puerto Rico OTEC site (17°53'49"N, 65°45'14.5"W) from 27 September 1979 to 8 February 1980 are summarized below:

Depth meters	Maximum Speed cm/sec	Mean Speed cm/sec	Standard Deviation cm/sec	Dominant Direction Degrees True	% of Observations in that Direction
125	36.0	13.4	6.0	225°-270°	63.3
239	39.5	15.5	7.3	225°-270°	63.3
932	21.4	6.4	3.9	240°-285°	24.2

18 XBT and 15 CTD stations taken in June 1890 from the R.V. Jean A of the Puerto Rican Department Natural Resources indicated the following oceanographic conditions, which are in accord with archival records. Tropical surface water (28.5°C, 35.8 $^{o}/_{oo}$) extended in a mixed layer to 50 meters. A ΔT of 20°C from the surface was found at 700 meters, approximately. The subtropical underwater salinity maximum was found at 150 meters. At 1000 meters temperatures were constant at 5.5°C.

1. INTRODUCTION

This report is the first in a series of data reports describing the results of an oceanographic measurement program being conducted off the southeast corner of Puerto Rico. EG&G, Environmental Consultants is performing the work for Lawrence Berkeley Laboratories (LBL) in support of the Department of Energy's Ocean Thermal Energy Conversion (OTEC) program. The study site is a proposed OTEC site and is located about 20 km off Punta Tuna.

The objectives of the measurement program are to document the physical oceanography of the site as related to the engineering and environmental factors involved in OTEC design and operation. Oceanographic measurements include:

1) A subsurface mooring instrumented with five current, temperature, and pressure recorders.

2) Quarterly hydrographic cruises to measure salinity, temperature, and depth profiles on a grid of 33 stations in the vicinity of the mooring site.

The first cruise, conducted between 16 and 21 June 1980, included the initial mooring deployment and a CTD (conductivity, temperature, and depth) and XBT (expendable bathythermograph) survey. The CTD/XBT measurements are presented in this report and results of the in situ measurements will be included in subsequent reports.

Also included in this report are results of in situ current, temperature, and pressure measurements made during two previous programs. In September 1979, Coastal Marine Research (CMR) deployed a mooring at approximately the same site as the present mooring. Results from three of these instruments

are included in Section 3 of this report. The Naval Underwater Systems Center deployed a mooring at this site in February 1979 and partial results from one instrument on this mooring are also presented in Section 3.

The second oceanographic cruise on the present program is planned for August 1980 and will include a mooring retrieval and redeployment and an XBT survey. A data report describing these data will be issued in October 1980.

2. DESCRIPTION OF THE MEASUREMENT PROGRAM

2.1 MEASUREMENTS PERFORMED DURING THE JUNE 1980 CRUISE

A Neil Brown Instrument Systems, Inc., Mark III CTD system with associated XYY recorder and audio tape recorder was used to obtain profiles of temperature and conductivity at the stations shown in Figure 2-1. Water samples were collected and reversing thermometers were tripped (at the bottom of most casts) to provide a check on CTD operation. A total of 15 CTD stations were occupied and good quality data were recorded at each station.

XBT profiles were collected using a Sippican Model MK2A recorder with T-7 probes, providing temperature profiles to a depth of about 900 meters. Nineteen XBT casts were made and good quality data were recorded on each cast. Sea surface temperature was measured with a mercury thermometer at each XBT station as a check on XBT operation.

The CTD and XBT operations were conducted over a 5-day period between 17 and 21 June 1980. Prior to the CTD work, a brief bathymetry survey in the area of the planned mooring location was conducted. On 21 June 1980, a mooring instrumented with five current meters was deployed at 17°54'N latitude and 65°45'W longitude in about 2020 meters of water (Figure 2-2).

Instrumentation on the mooring consisted of two Neil Brown Acoustic Current Meters (NB-ACM) and three Aanderaa RCM-5 Current Meters. The NB-ACM's, which measure current by using the phase shift in a sound wave propagating between closely spaced transducers, were installed at depths of 120 and 160 meters. The RCM-5's, which utilize a Savonius rotor and vane assembly to measure current velocity, were installed at depths of about 235, 435, and 935 meters. Note that these depths are about 85 meters deeper than originally planned because the precise water depth at the mooring site was not positively known prior to deployment.

The current meters were programmed to record data for a minimum of 90 days. The NB-ACM's measure average current velocity during every 2-minute interval and record 10 of these averages and a single temperature value every 20 minutes. The RCM-5's, equipped with extended data storage capability, record average current speed, instantaneous current direction, temperature, and pressure at 10-minute intervals.

The mooring was deployed using an anchor-last method and was located using a Motorola Mini-Ranger with shore-based transponders installed at Punta Tuna and Punta Lima. The anchor was released at 1255 (local time) on 21 June 1980.

2.2 CURRENT DATA COLLECTED DURING PREVIOUS PROGRAMS

Current data from two outside sources are included in this report. A single RCM-5 record was recovered from a mooring deployed by the Naval Underwater Systems Center in February 1979. The recovered instrument was deployed at about 100-meter depth at 17°51'42"N latitude and 65°49'54"W longitude and was programmed to record current velocity, temperature, and pressure at 10-minute intervals. Approximately 31 days of data were collected before the instrument either malfunctioned or sank to a depth below its pressure sensor range. The speed data recorded by this instrument included numerous erroneous high speed values which limit the usefulness of these data.

Data from another mooring deployed at 17°53'49"N latitude and 65°45'14.5" W longitude are also included in Section 3. On this mooring (Figure 2-3), four Aanderaa RCM-5's were positioned at depths of 125, 180, 239, and 932 meters in about 2015 meters of water (Coastal Marine Research, 1980). Three of these instruments functioned normally for 2 to 3 months while the fourth (180-meter depth) failed to record any data. These instruments were deployed on 27 September 1979 by Coastal Marine Research and retrieved by NOAA in March 1980. The RCM-5's recorded data on current, temperature, and pressure at 20-minute intervals.

TABLE 2-1. STATION POSITIONS, PROTEC-08, June 1980

EG&G Station	Latitude, (N)	Longitude (W)
1	18° 03'	65° 32'
2	18° 01'	65° 31'
3	77° 57' 54.0"	65° 31' 6.0"
4	17° 55'	65° 30'
5	17° 53' 24"	65° 30' 0.0"
6	17° 57' 12.0"	65° 33' 0.0"
7	17° 57'	65° 35'
8	17° 56' 0.0"	65° 37' 30.0"
9	17° 55'	65° 39'
10	17° 55' 12.0"	65° 41' 18"
11	17° 54' 30.0"	65° 42' 54.0"
12	17° 54'	65° 45'
13	17° 50' 18.0"	65° 45' 6.0"
14	17° 50' 18.0"	65° 44' 0.0"
15	17° 48' 18.0"	65° 43' 30.0"
16	17° 46'	65° 43'
17	17° 44' 48.0"	65° 42' 42.0"
18	17° 43' 6.0"	65° 41' 30.0"
19	17° 44' 36.0"	65° 57' 18.0"
20	17° 47'	65° 58'
21	17° 50' 24.0"	65° 59' 6.0"
22	17° 53'	66° 00'
23	17° 55' 48.0"	66° 0' 42.0"
24	17° 50' 48.0"	65° 57' 0.0"
25	17° 51'	65° 55'
26	17° 52'	65° 53' 0.0"
27	17° 52'	65° 51'
28	17° 53' 12.0"	65° 49' 0.0"
29	17° 53'	65° 47'
30	17° 56' 18.0"	65° 45' 48.0"
31	17° 58' 6.0"	65° 46' 36.0"
32	17° 59'	65° 46'
33	18° 20' 0.0"	65° 45' 48.0"

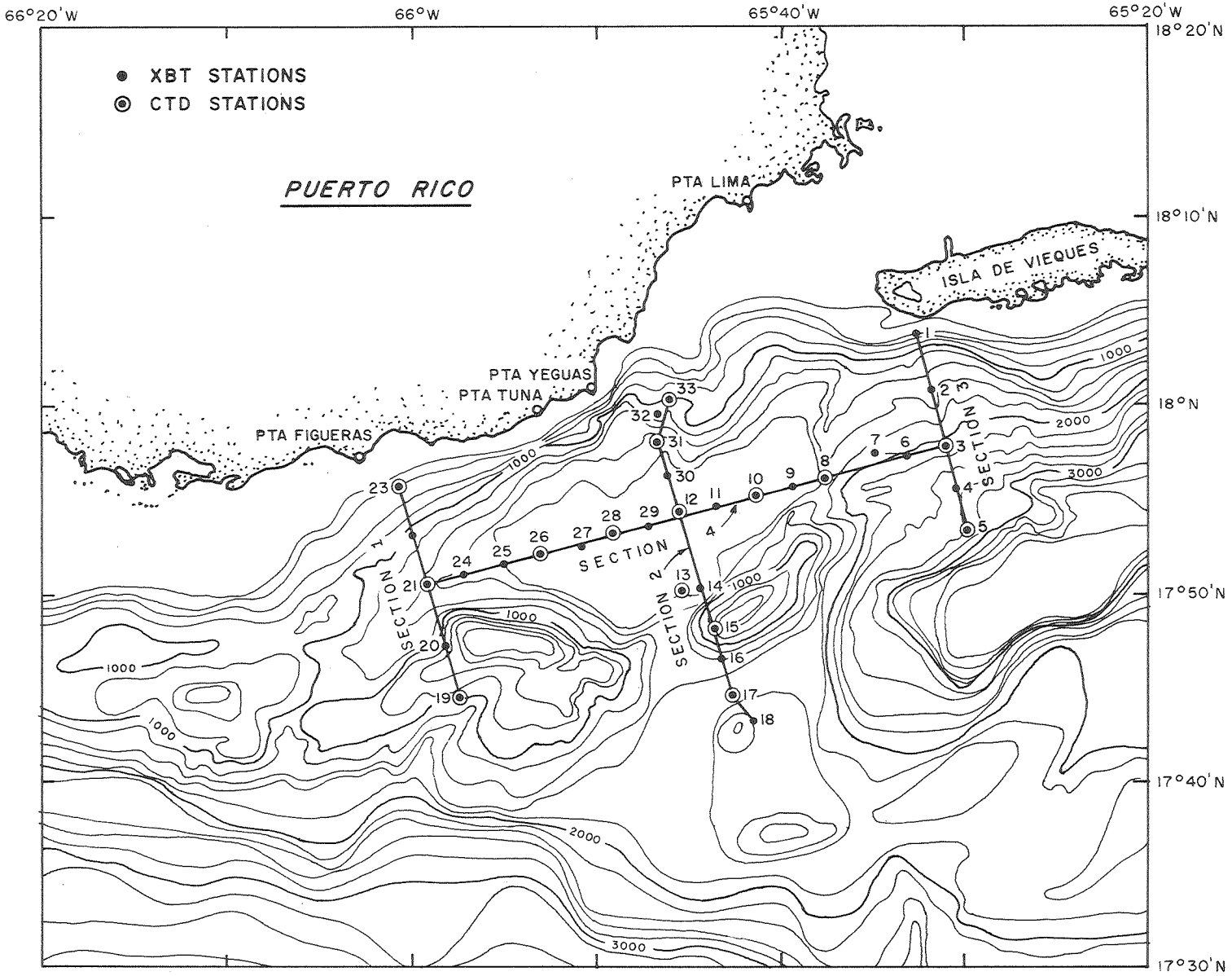

Figure 2-1. Locations of the mooring site and the XBT and CTD stations. Mooring is located at approximate position of Station 12.

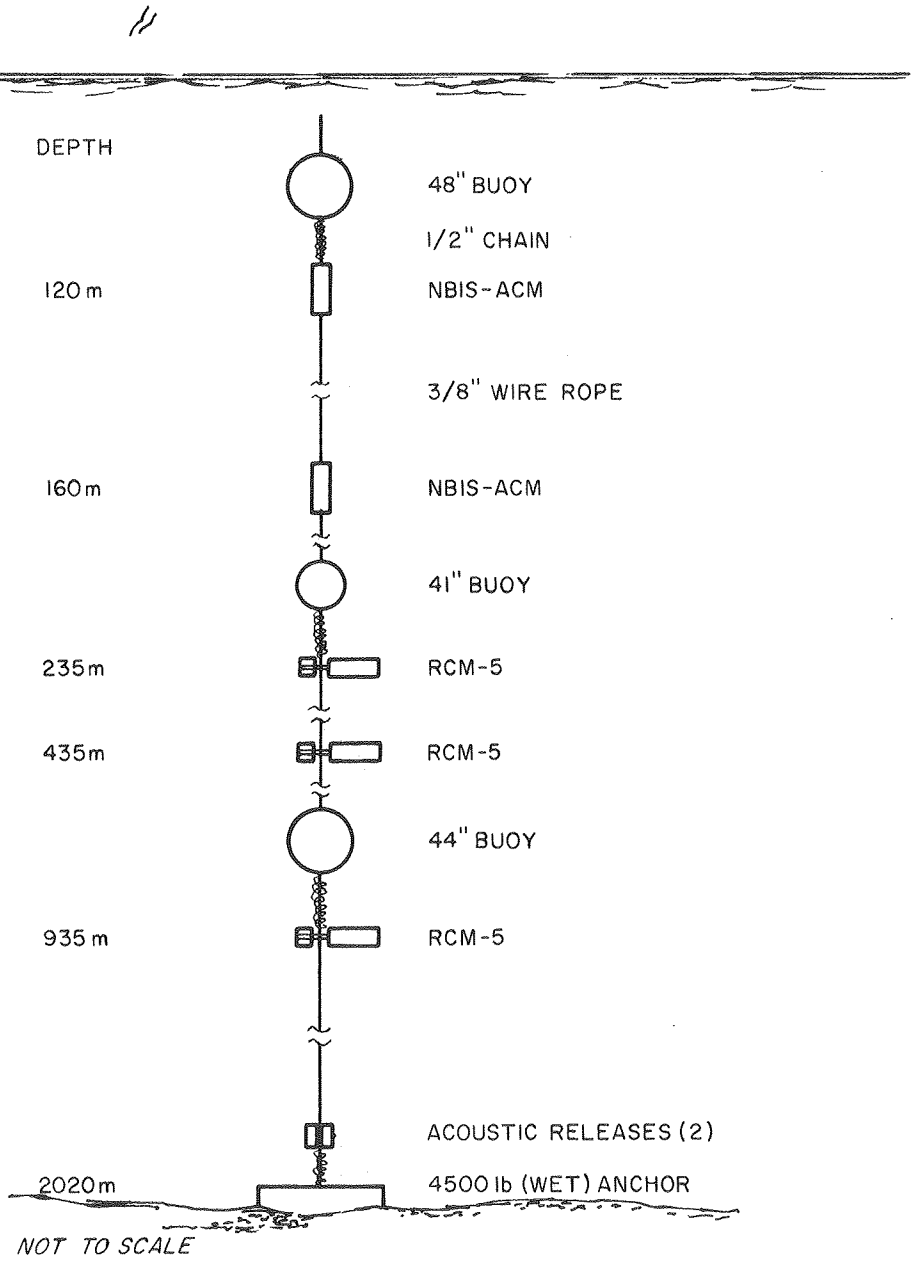

Figure 2-2. Mooring deployed at 17°54'N and 65°45'W on 21 June 1980.

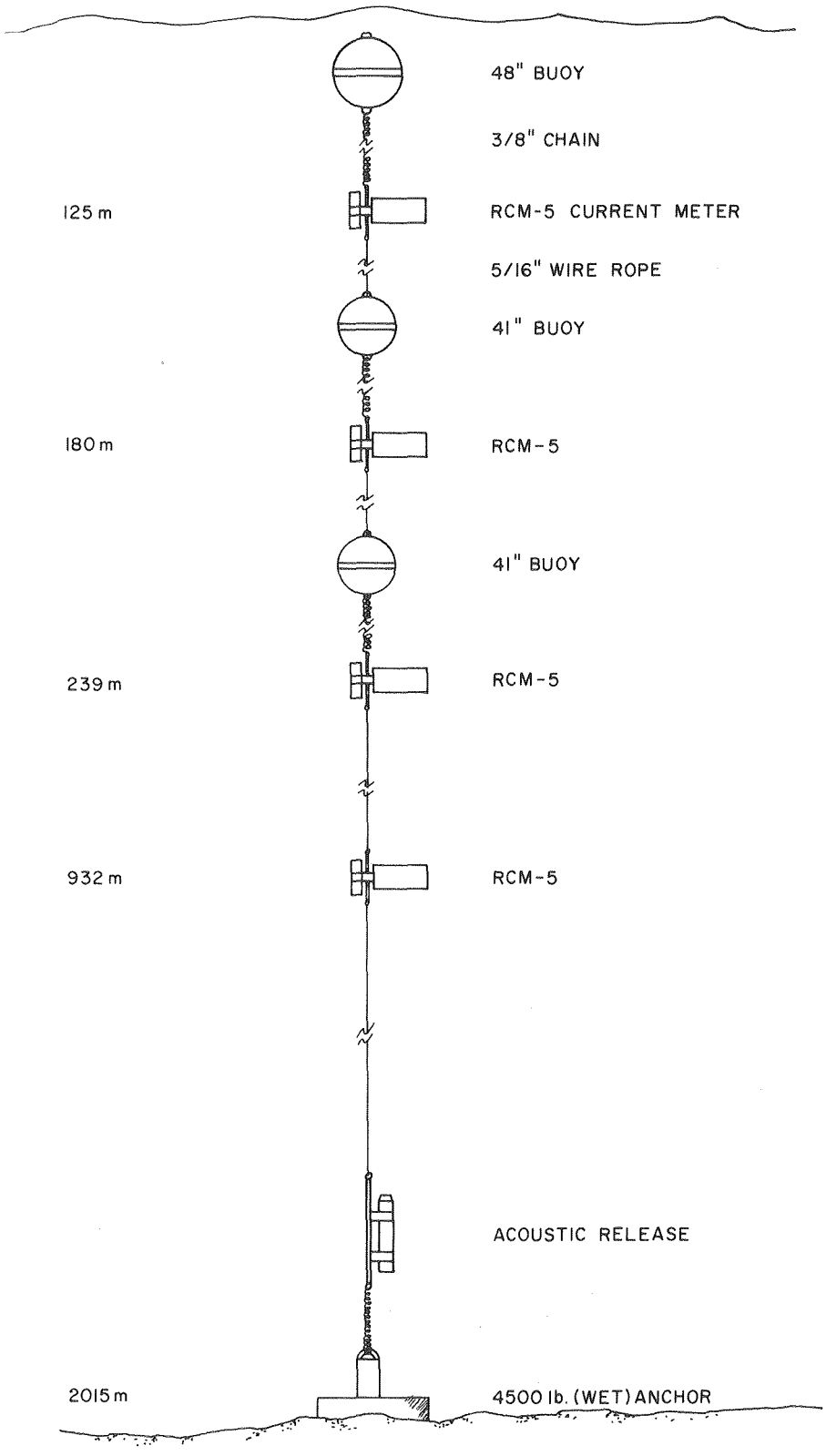

Figure 2-3. Mooring deployed by CMR at 17°53'49"N and 65°45'14.5"W on 27 September 1979.

3. DESCRIPTION OF THE DATA PRODUCTS

3.1 CTD AND XBT DATA PRODUCTS

CTD data recorded on the audio tape recorder were transcribed onto a 9-track digital tape at EG&G's Waltham facility. This 9-track tape was then used to produce an edited tape from which salinity and depth were calculated from the measured parameters using programs developed at Woods Hole Oceanographic Institution (Scarlet, 1975). Values of salinity, temperature, and depth at 0.5-meter intervals were checked for quality and then archived.

XBT traces were digitized and transcribed to 9-track tape at WHOI. The digitized data were then checked for quality against the original records and archived on EG&G's data archive system. The archived data from the CTD and XBT were used to produce the displays described below.

3.1.1 Temperature Profiles (XBT Data)

Figures 3-1 through 3-19 show temperature in °C versus depth in meters. Station number is shown at the top of each plot and should be referenced to Figure 2-1.

3.1.2 Temperature, Salinity, σ_t Profiles (CTD Data)

Figures 3-20 through 3-34 show temperature (°C), salinity (°/oo), and σ_t versus depth as computed from CTD casts at the stations shown in Figure 2-1. σ_t is defined as $(\rho_{st}-1) \times 1000$ where ρ_{st} equals the density of seawater at the observed salinity, s, temperature, t, and at atmospheric pressure.

3.1.3 Sea Tables

Tables 3-1 through 3-14 show the measured temperature, conductivity, and pressure as well as a variety of computed variables at 25-decibar pressure intervals (Note that Station 12 is not included in these tables due to noise in this data record.) Starting from the left side of this table, the variables listed are:

Column	Variable
1	Pressure (dbars)
2	Depth (meters)
3	Temperature (°C)
4	Conductivity (mmhos/cm)
5	Salinity (parts per thousand)
6	σ_t
7	Specific volume (inverse of density - cm^3/gm)
8	Specific volume anomaly (cm^3/gm) - the difference between the specific volume of this water and standard seawater (35 $^{o}/_{oo}$, 0°C, in situ pressure)
9	Travel time of sound (seconds)
10	Dynamic height (dynamic m). Integral of the specific volume anomaly over the depth range.
11	Brunt-Vaisala frequency (cycles/hour)
12	Sound velocity (meters/sec)

3.1.4 Temperature Sections

Temperature sections (Figures 3-35 through 3-38) are based on CTD and XBT data plotted along each of the 4 lines shown in Figure 2-1. Isotherms in °C are plotted every 2°C.

3.1.5 Salinity Sections

Salinity sections (Figures 3-39 through 3-42) are based on CTD data and are plotted along each of the 4 lines shown in Figure 2-1. Isohalines are plotted every 0.2 $^{o}/_{oo}$.

3.2 CURRENT METER RESULTS

Aanderaa tapes from both the CMR and NUSC deployments were transcribed onto 9-track tape at EG&G's Waltham facility. After checking these data for quality, current speed, direction, temperature, and pressure values were archived and a 9-track tape of the unaveraged values was produced. Note that the NUSC data record was judged to contain poor quality speed data. As a result, not all data products were produced for this record. From the archived data, a series of data products has been produced which are presented in this section. These products include:

3.2.1 Time Series Displays

Half-hour averages of 9 variables from each current record are plotted as a function of time in Figures 3-45 to 3-47. Starting from the top, the following variables are plotted:

1. Current speed (cm/sec)
2. Current direction (true)
3. Current vector (cm/sec). A line drawn up from the origin represents a current flowing to the north.
4. North component of current velocity (cm/sec)
5. East component of current velocity (cm/sec)
6. Cross-isobath component of current velocity (cm/sec)
7. Along-isobath component of current velocity (cm/sec)
8. Temperature (°C)
9. Pressure (mbars)

In addition to the current time series, a plot of wind velocity versus time is presented in Figure 3-48. The time interval in this plot is coincident with the deployment period of the CMR current meters. The following wind variables are plotted at hourly intervals:

1. Wind speed (m/sec)
2. Wind direction (true)
3. Wind vector (m/sec). A line drawn up from the origin represents a wind from the north.

3.2.2 Current Statistics

Tables 3-15 through 3-18 summarize the current information according to frequency of occurrence within speed and direction intervals. In addition, sums and percentages of total occurrences are given for each speed class and direction class, along with other statistics such as mean, extreme speeds, mean component speeds, and standard deviations. Note that the data from the NUSC current meter, Table 3-18, is contaminated by erroneous high speeds.

3.2.3 Current Histograms

In Figures 3-49 through 3-72. percent of time of occurrence is shown on the ordinate and the measured value is shown on the abscissa. The following variables are plotted in this manner:

1. Current speed (cm/sec)
2. Current direction (true)
3. North component of current vector (cm/sec)
4. East component of current vector (cm/sec)
5. Along-shore component of current vector (cm/sec)
6. Cross-shore component of current vector (cm/sec)
7. Pressure (mbars)
8. Temperature (°C)

3.2.4 Polar Histograms

Polar histograms of current velocity are shown in several formats as described below and shown in Figures 3-73 through 3-84.

1. Current rose showing the frequency of occurrence of currents in 22.5° direction sectors with the percent of speed values within each sector indicated by the plotted symbol.
2. Percent time plot showing the frequency of occurrence of currents within 5° direction sectors.
3. Total displacement plot showing the total displacement (speed times sampling interval) of a water parcel apparently resulting from currents within each 5° direction sector.
4. Per mil occurrence plot showing the frequency of occurrence of currents within each 5 cm/sec and 10° speed/direction bin.

3.2.5 Kinetic Energy Spectra

Energy density is plotted on the ordinate and frequency in cycles per hour is plotted on the abscissa in Figures 3-85 through 3-99. The spectra have been computed from fast Fourier transforms of the data using a cosine taper with 50% end-lap. Hourly averaged data were used in this computation and five frequency bands were averaged to obtain each spectral estimate.

Depending on record length, three 15-day segments (NUSC) or five 30-day segments (CMR) with about 50% overlap were used to compute individual spectra which were then averaged to produce the figures presented. Note that the spectra obtained for the NUSC current record is contaminated by noisy data. Ninety percent confidence limits are plotted on each spectrum.

The following spectra are shown for each current record:

1. Total energy, i.e., the sum of the clockwise and anti-clockwise spectra
2. Clockwise component of current velocity
3. Anticlockwise component of current velocity
4. North component of current velocity
5. East component of current velocity
6. Along-isobath component of current velocity
7. Cross-isobath component of current velocity

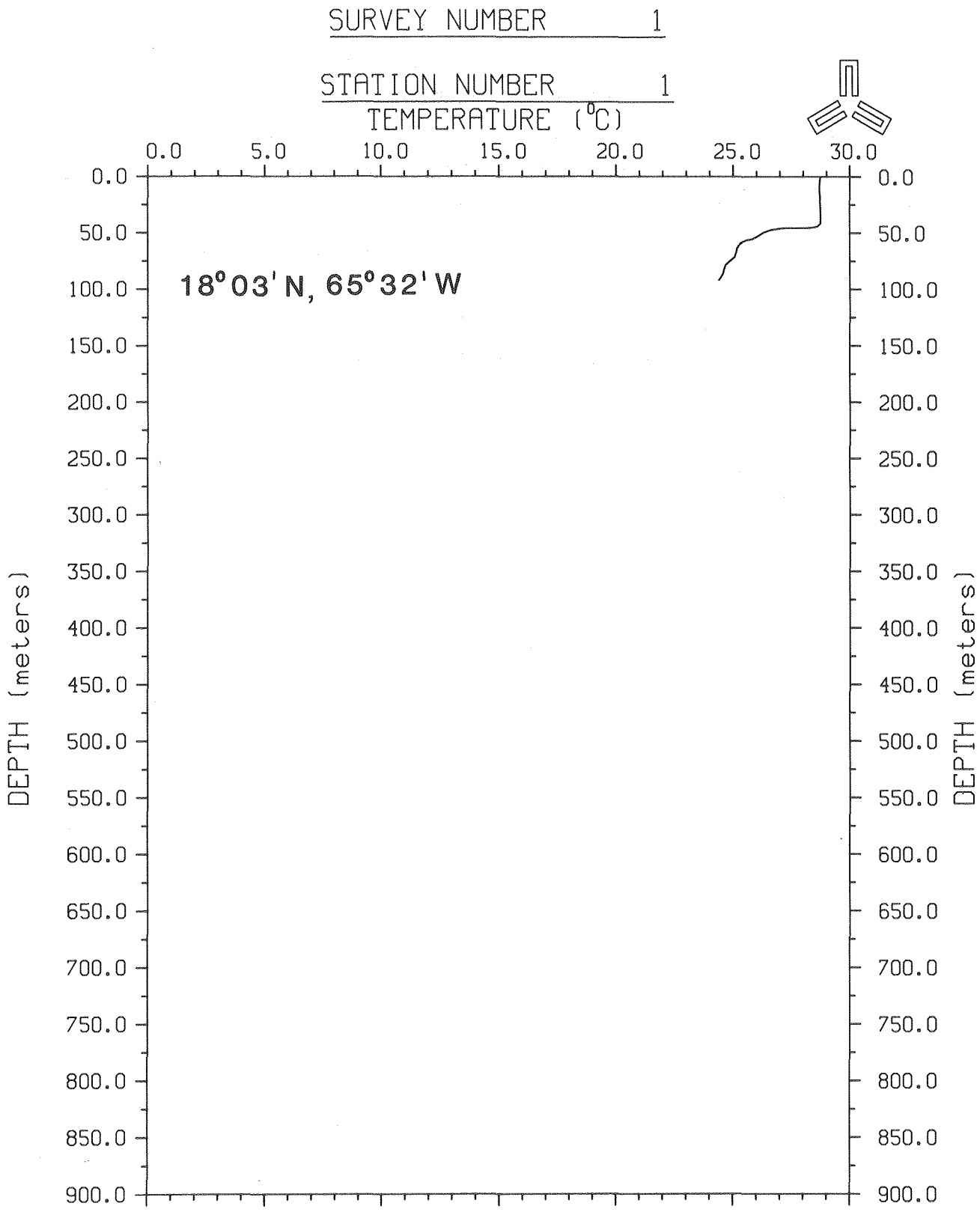

Figure 3-1. Temperature profile (XBT) at Station 1.

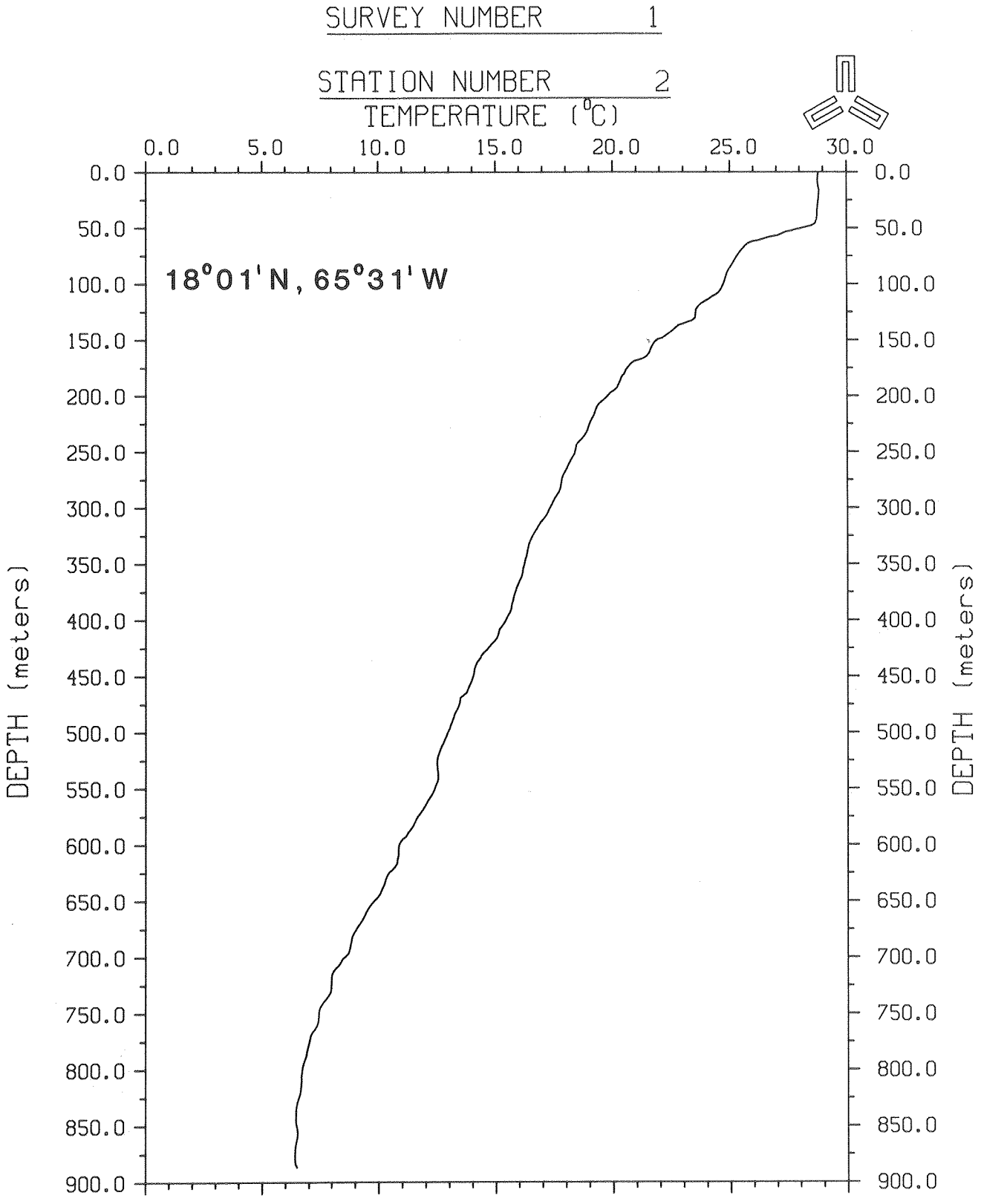

Figure 3-2. Temperature profile (XBT) at Station 2.

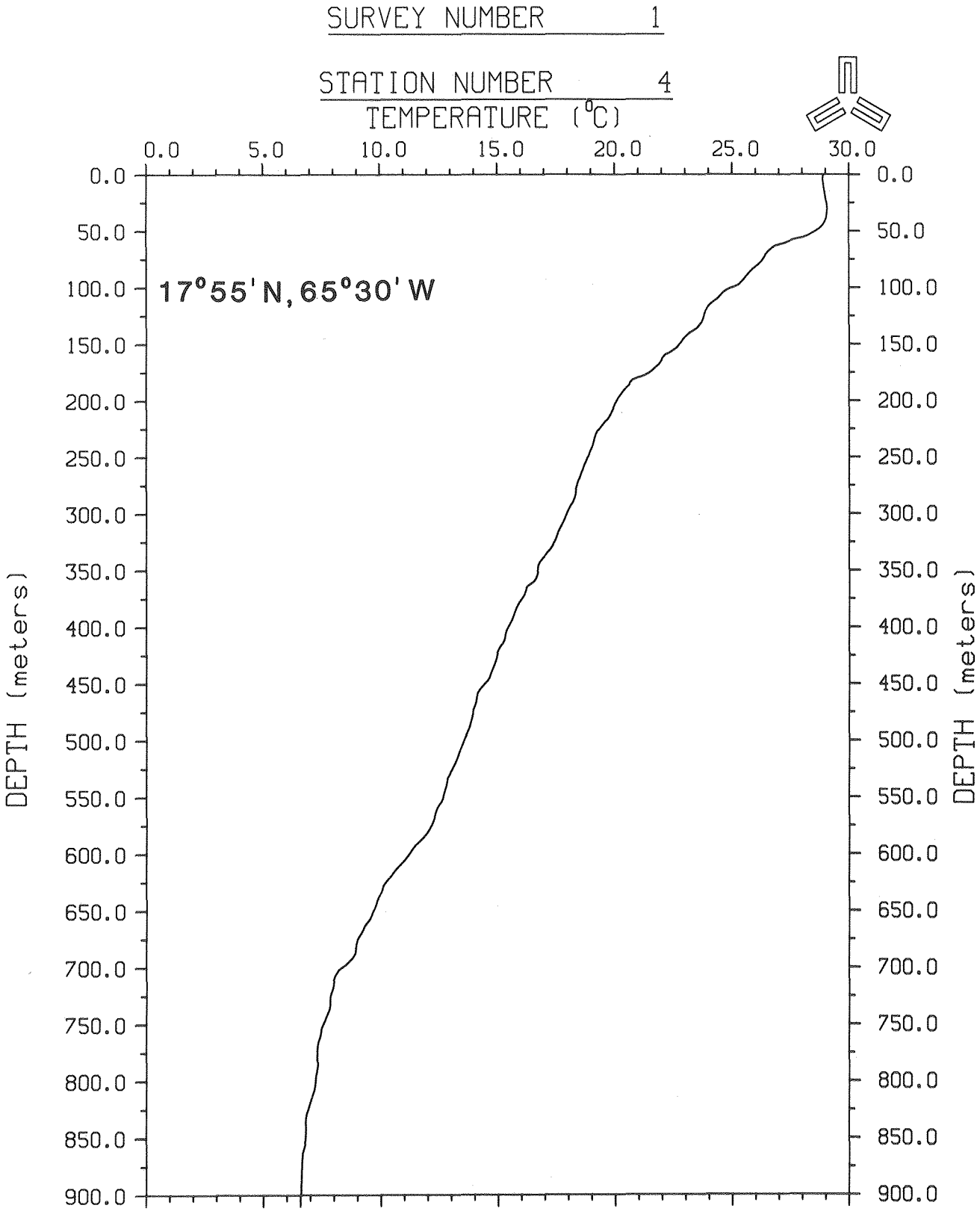

Figure 3-3. Temperature profile (XBT) at Station 4.

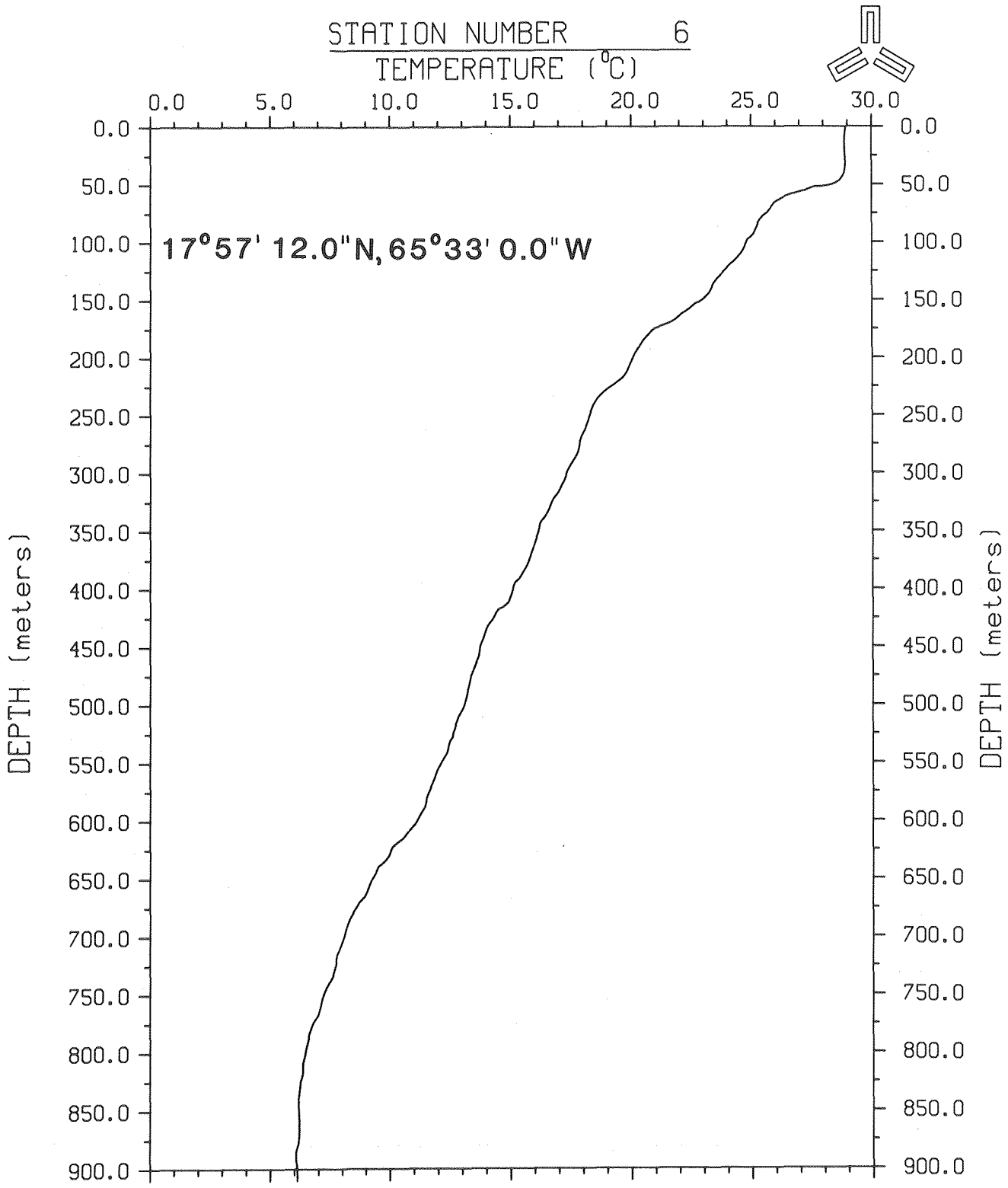

Figure 3-4. Temperature profile (XBT) at Station 6.

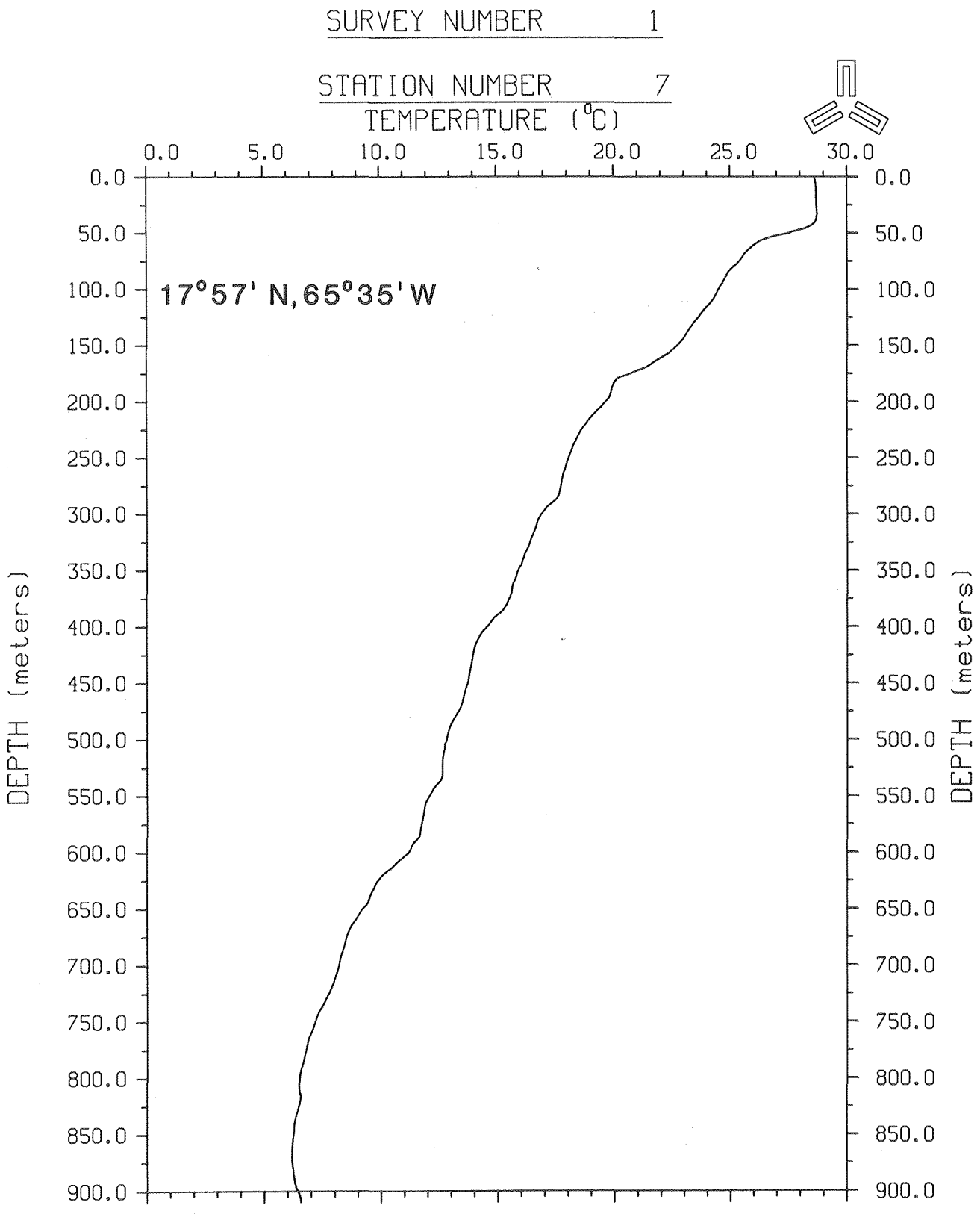

Figure 3-5. Temperature profile (XBT) at Station 7.

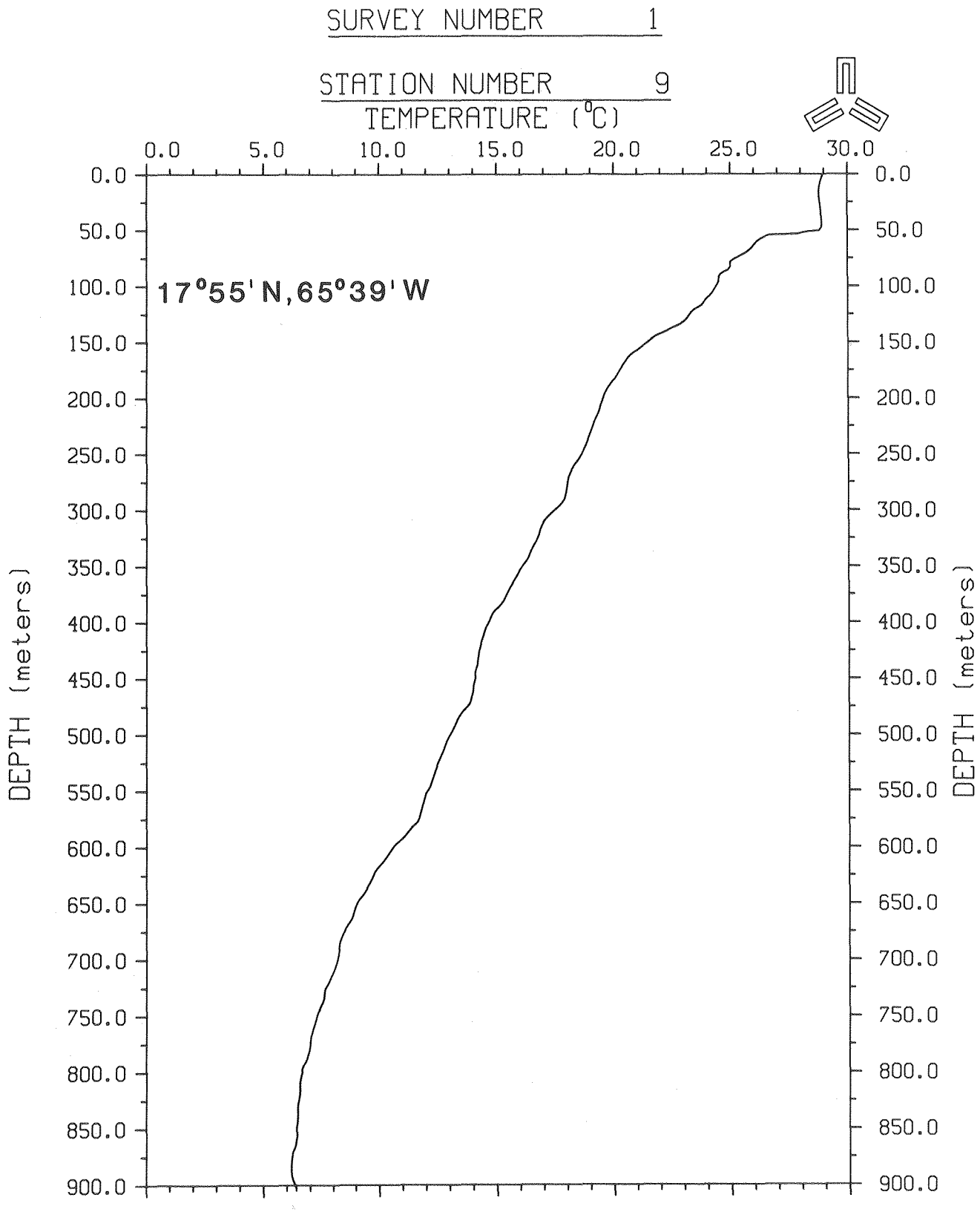

Figure 3-6. Temperature profile (XBT) at Station 9.

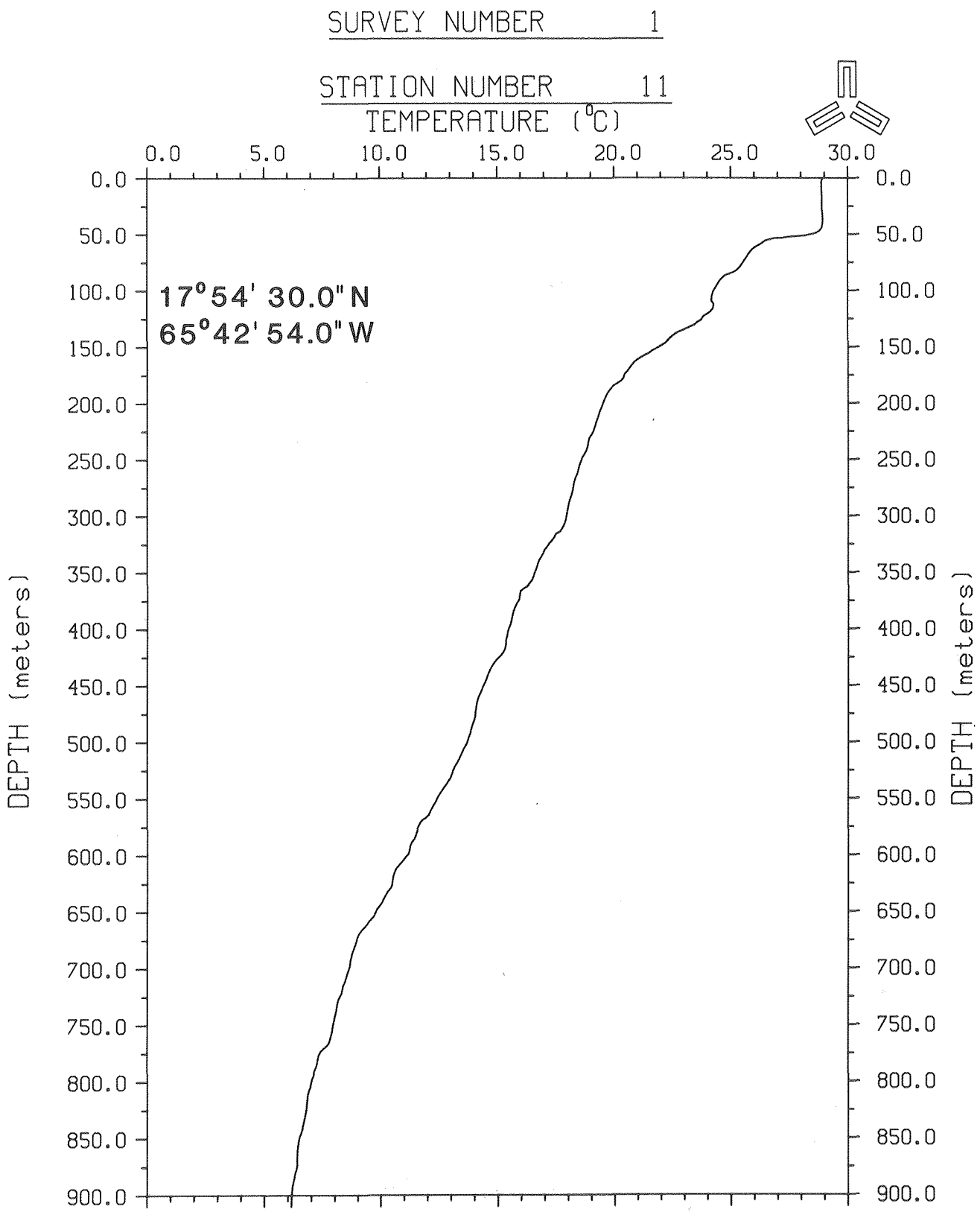

Figure 3-7. Temperature profile (XBT) at Station 11.

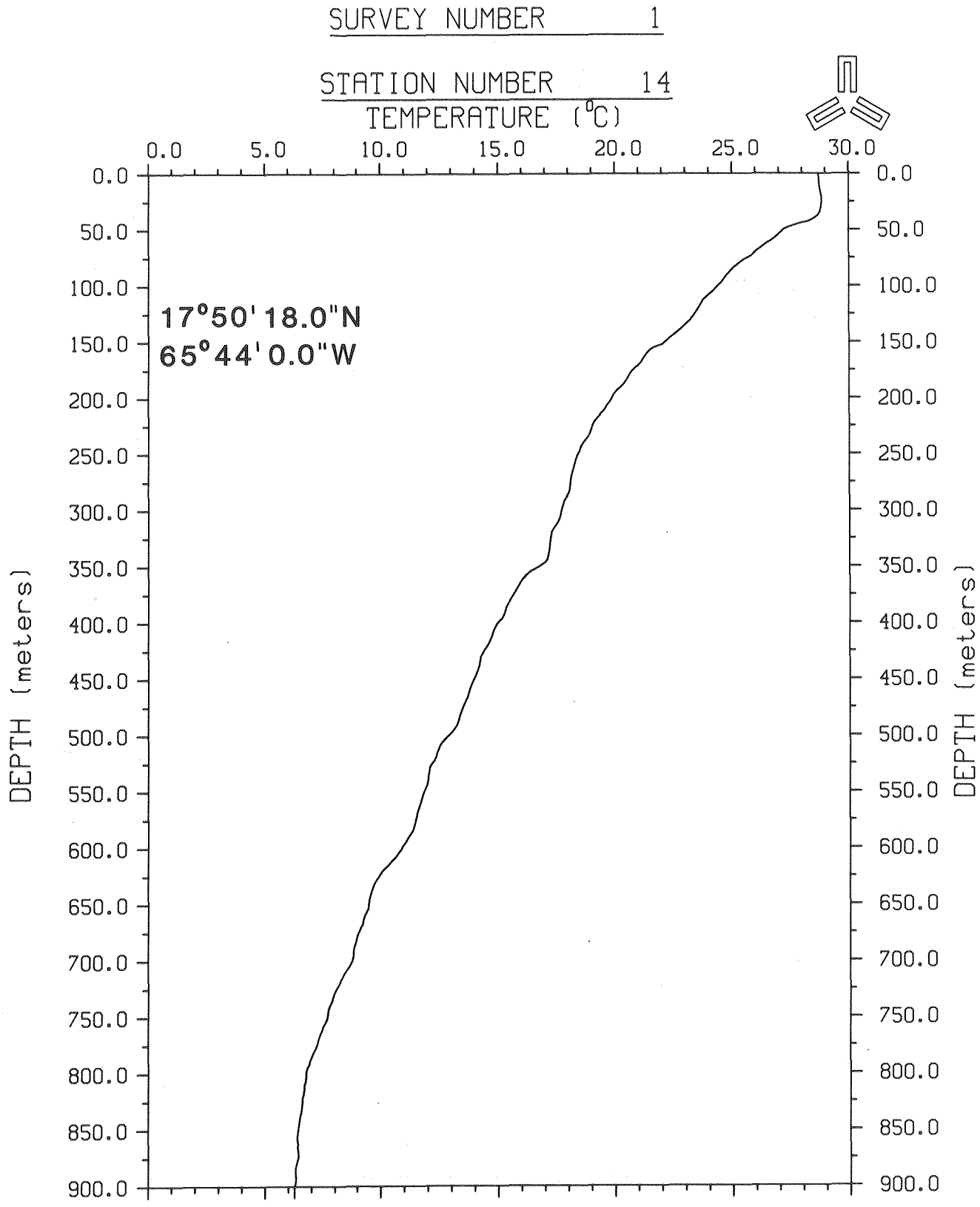

Figure 3-8. Temperature profile (XBT) at Station 14.

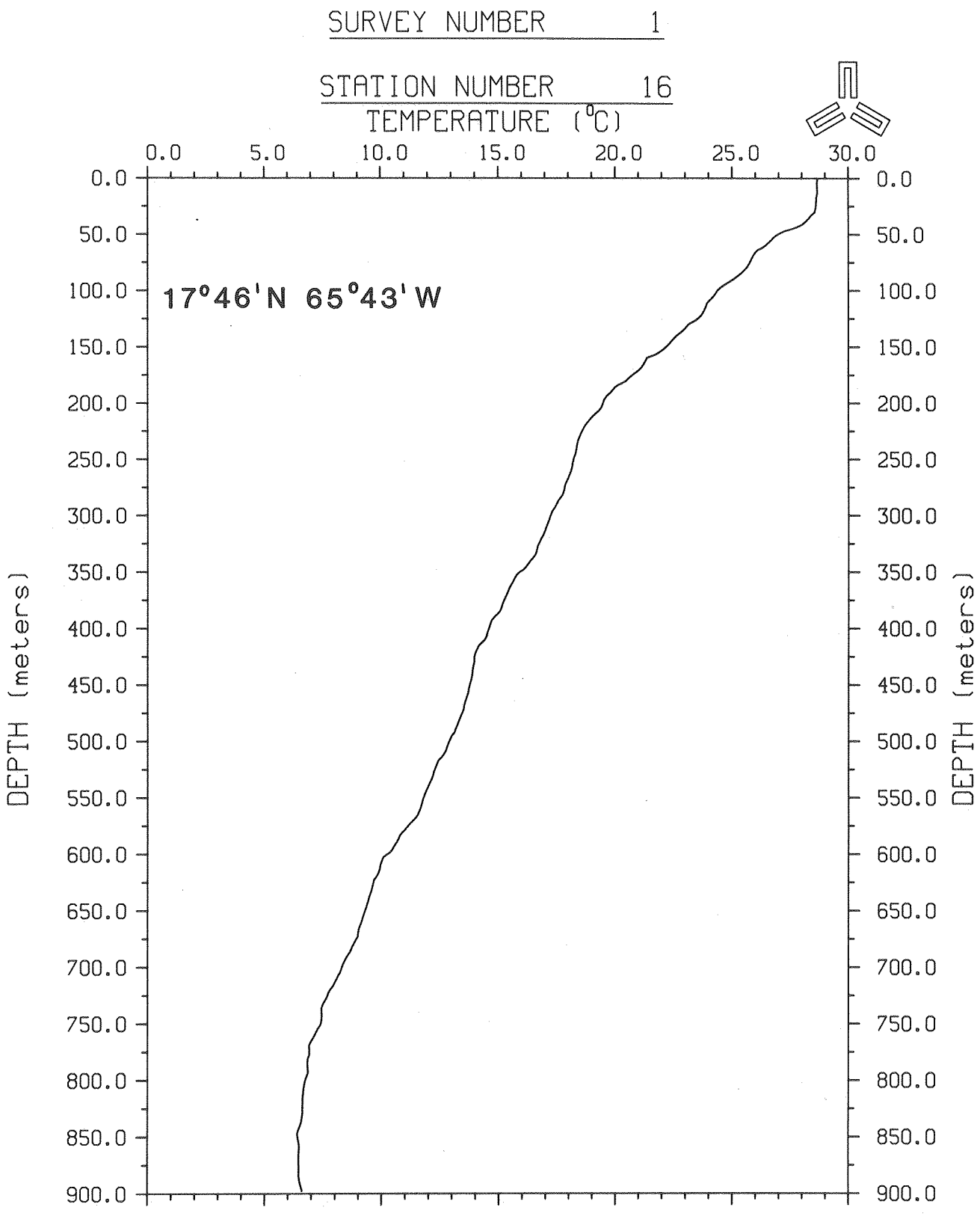

Figure 3-9. Temperature profile (XBT) at Station 16.

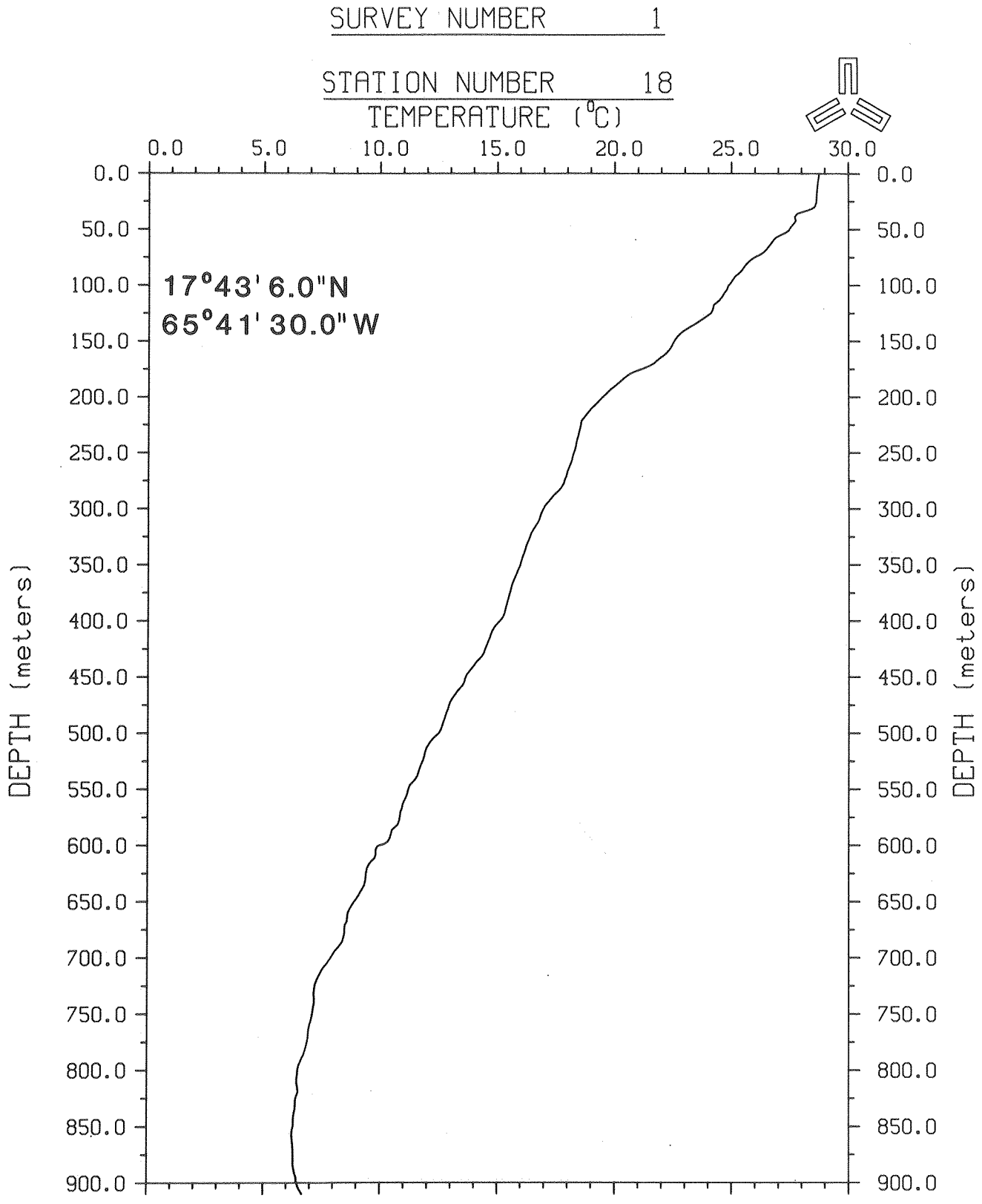

Figure 3-10. Temperature profile (XBT) at Station 18.

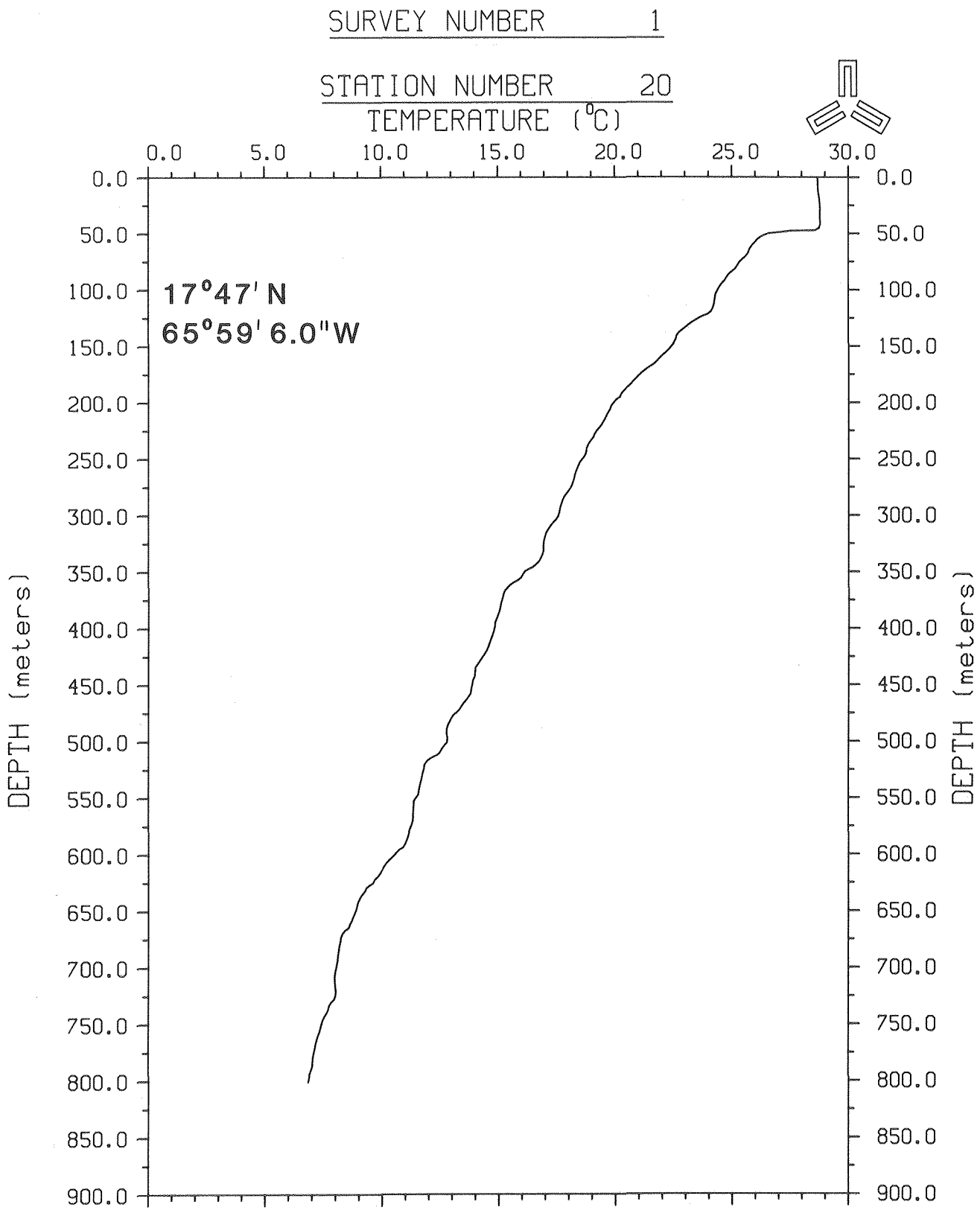

Figure 3-11. Temperature profile (XBT) at Station 20.

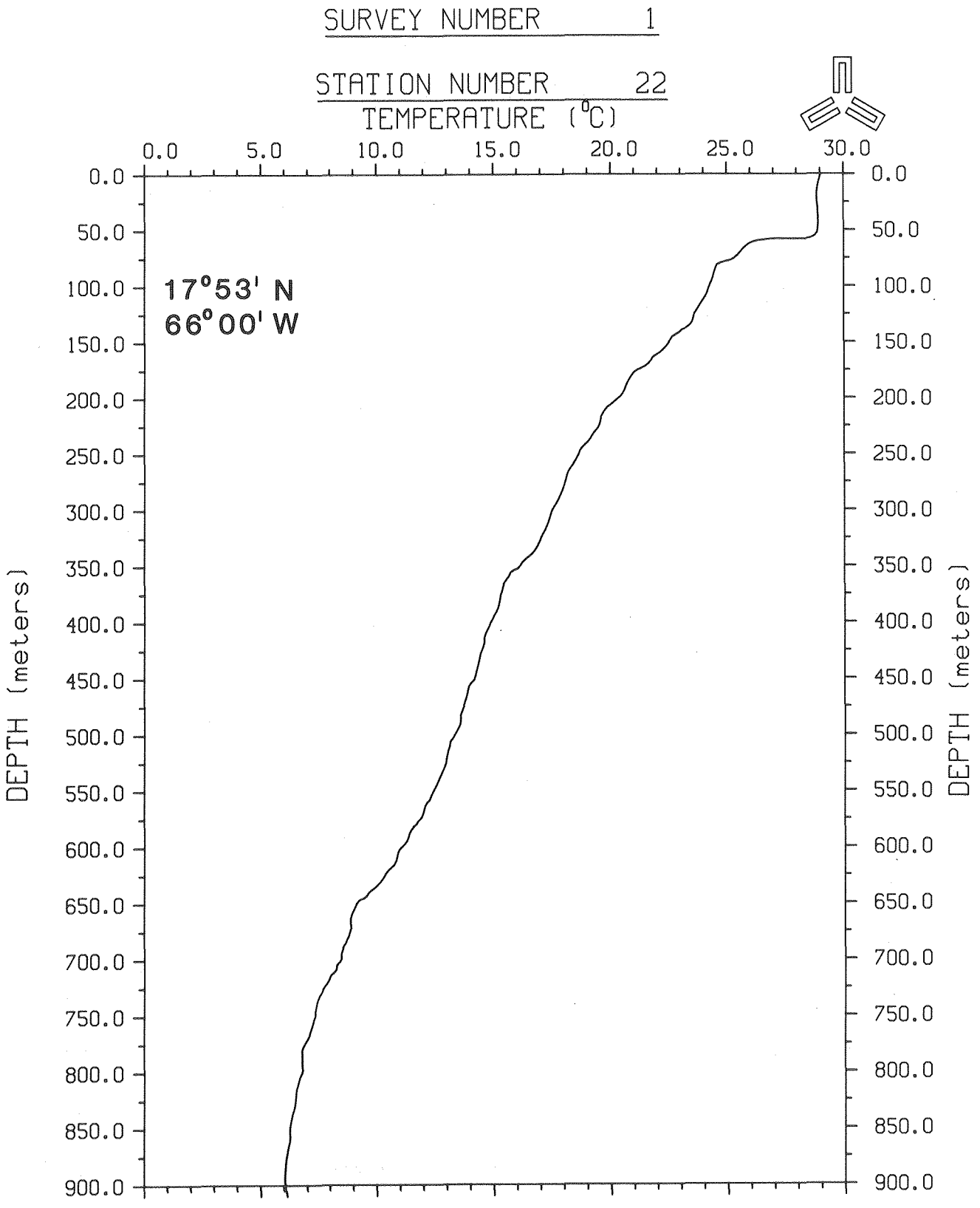

Figure 3-12. Temperature profile (XBT) at Station 22.

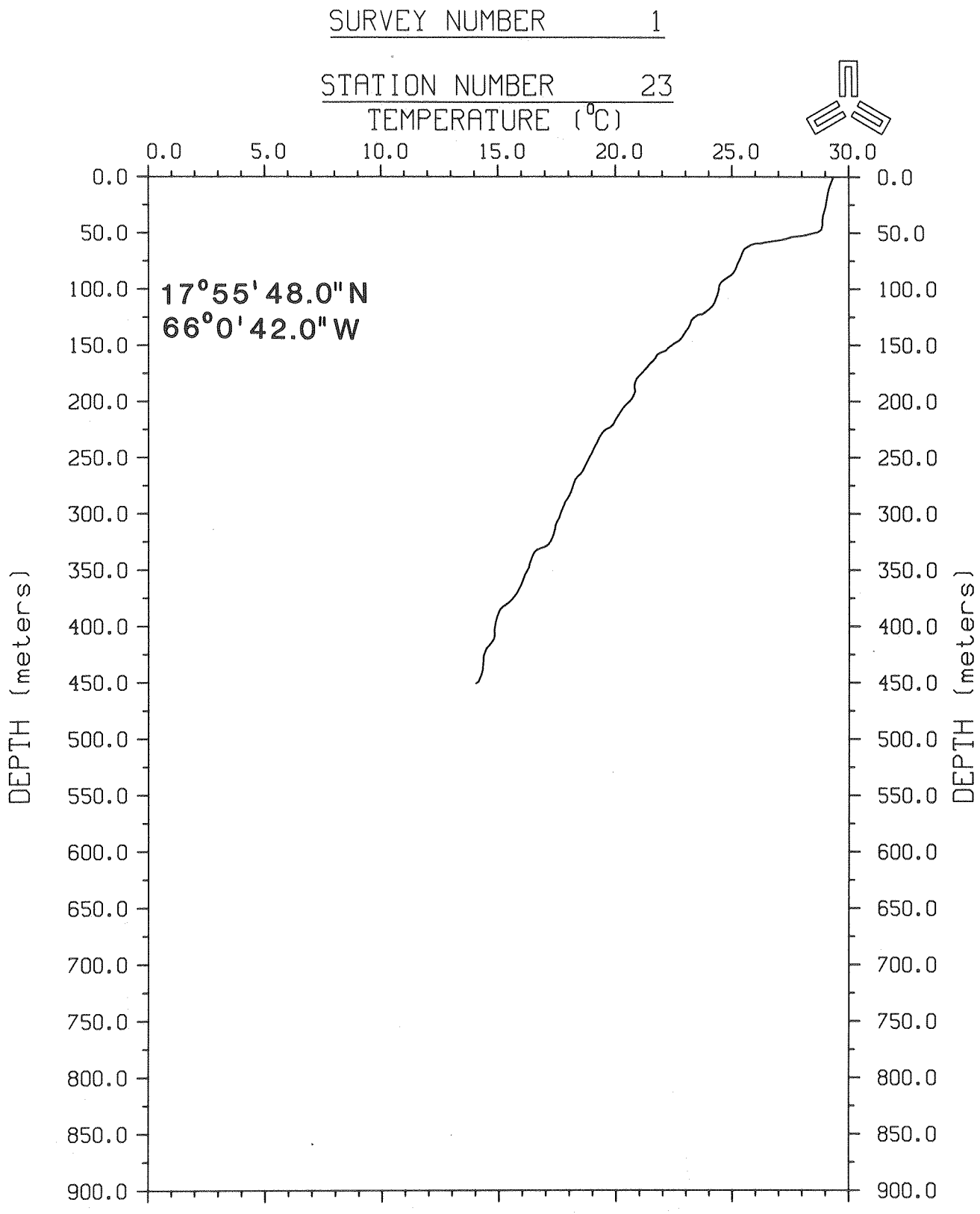

Figure 3-13. Temperature profile (XBT) at Station 23.

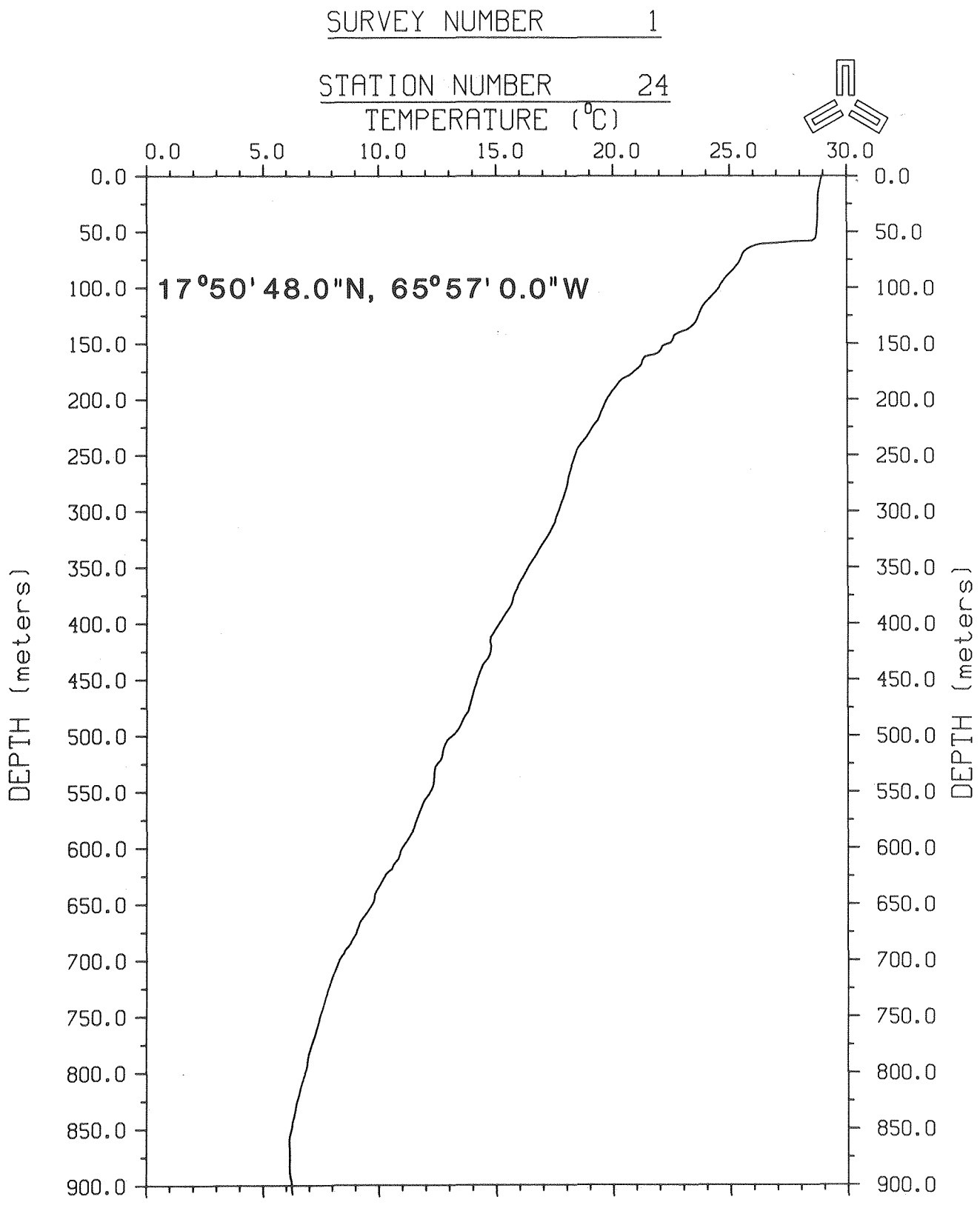

Figure 3-14. Temperature profile (XBT) at Station 24.

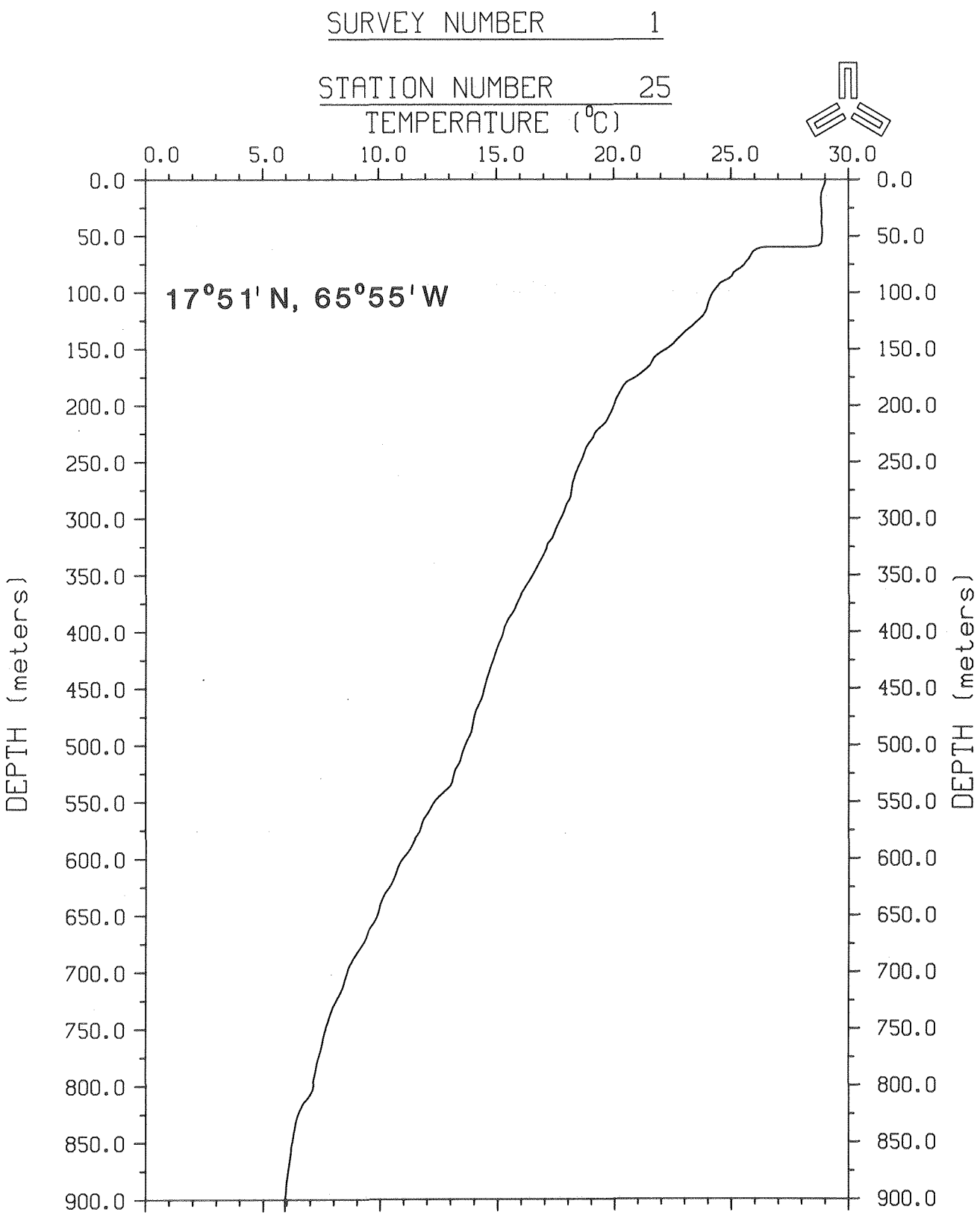

Figure 3-15. Temperature profile (XBT) at Station 25.

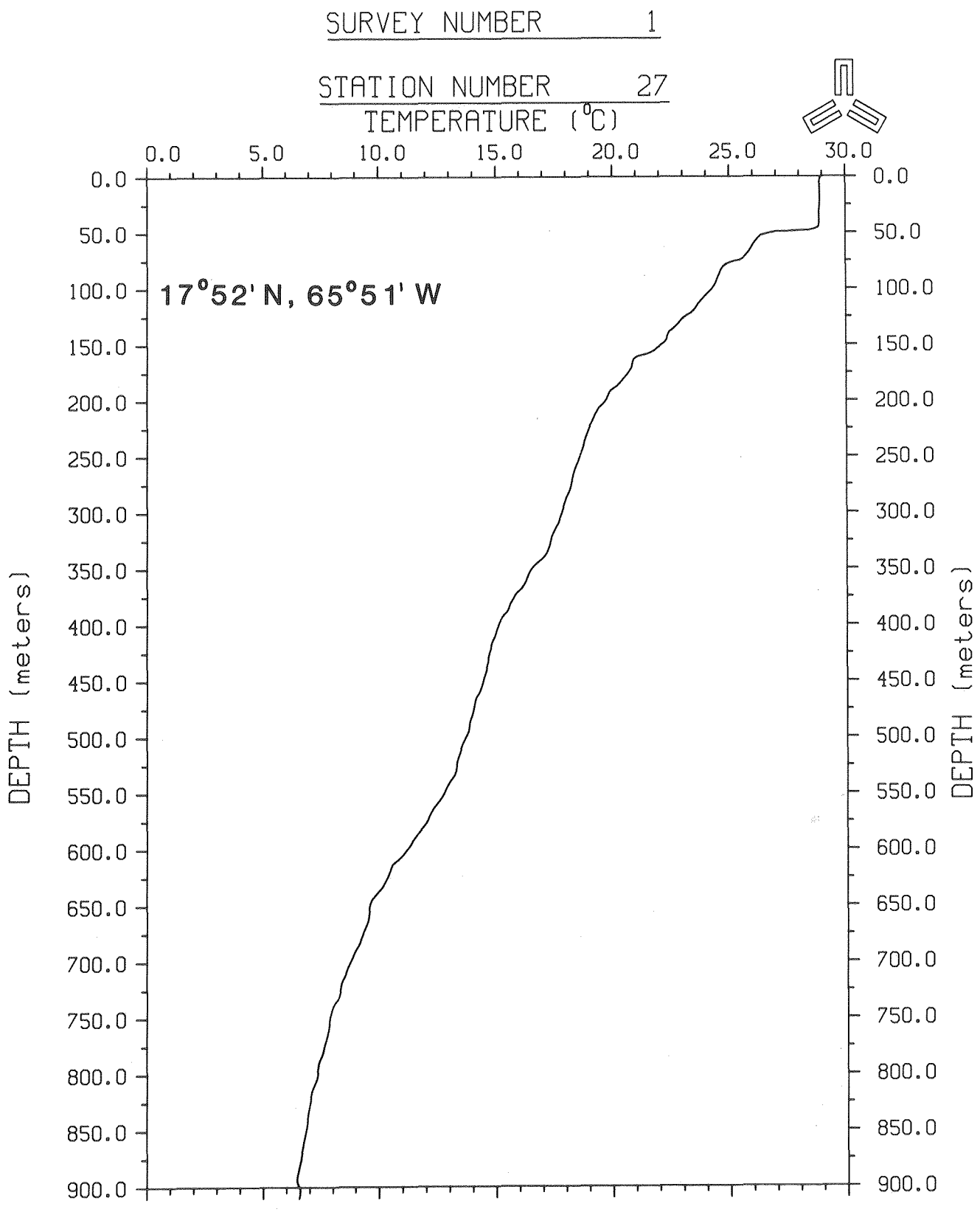

Figure 3-16. Temperature profile (XBT) at Station 27.

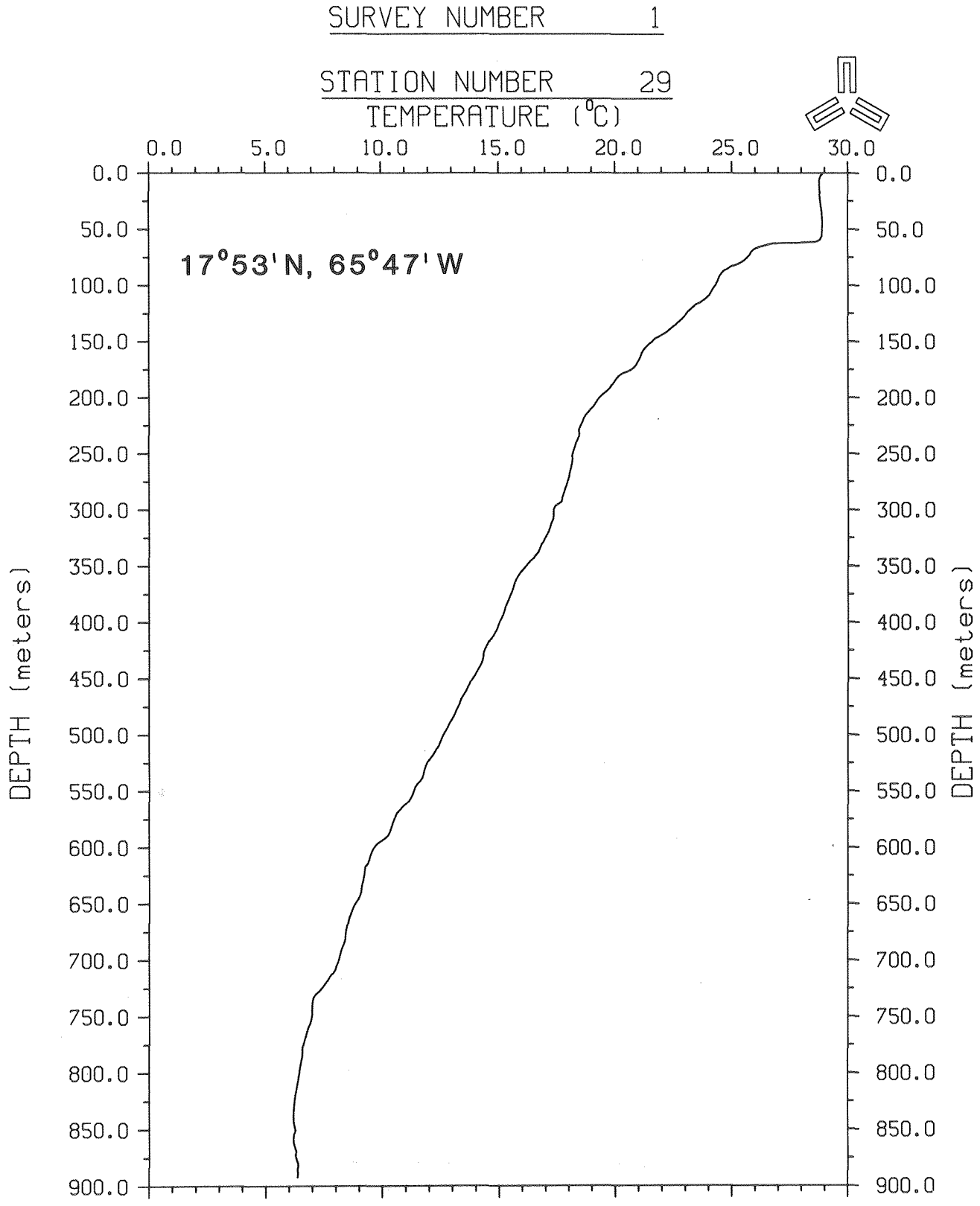

Figure 3-17. Temperature profile (XBT) at Station 29.

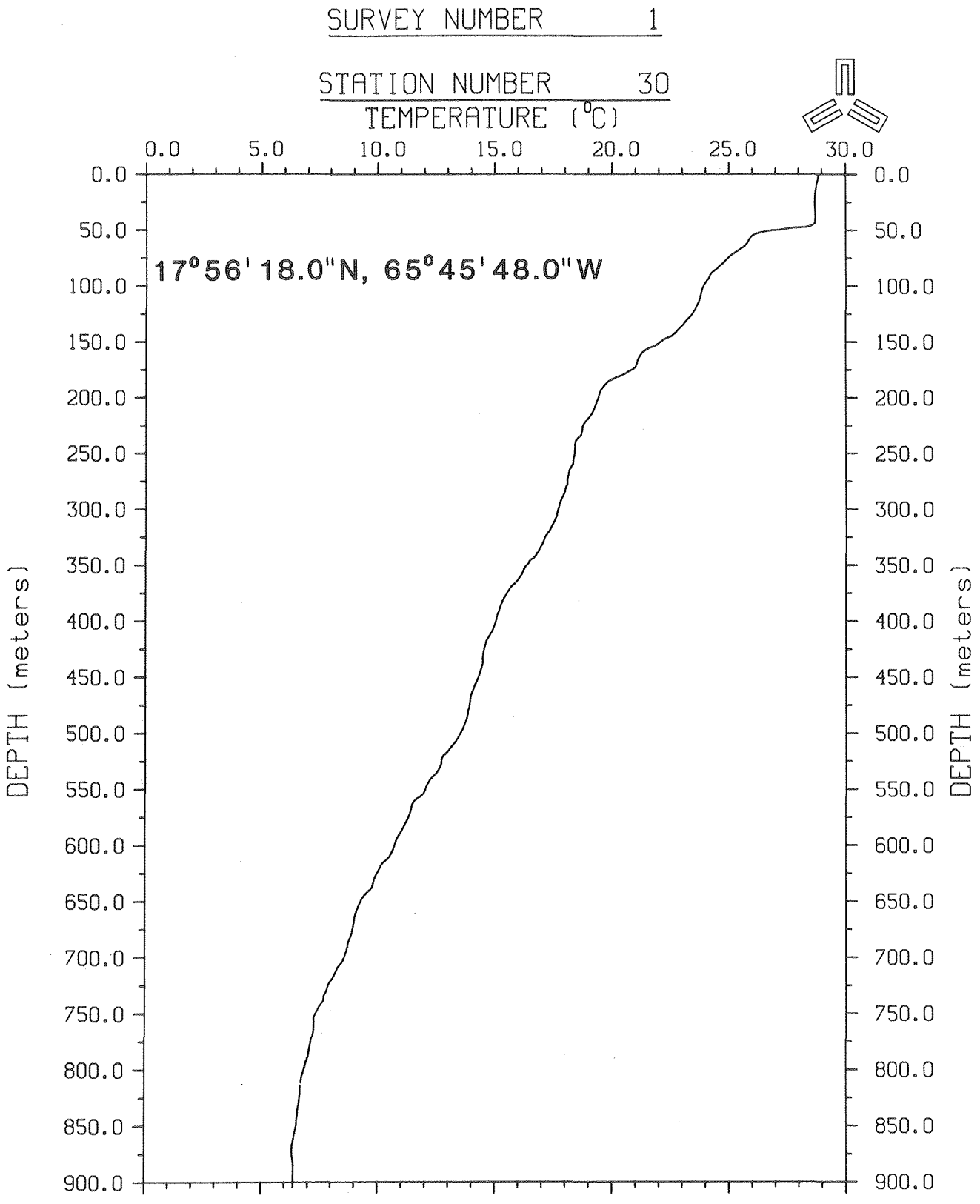

Figure 3-18. Temperature profile (XBT) at Station 30.

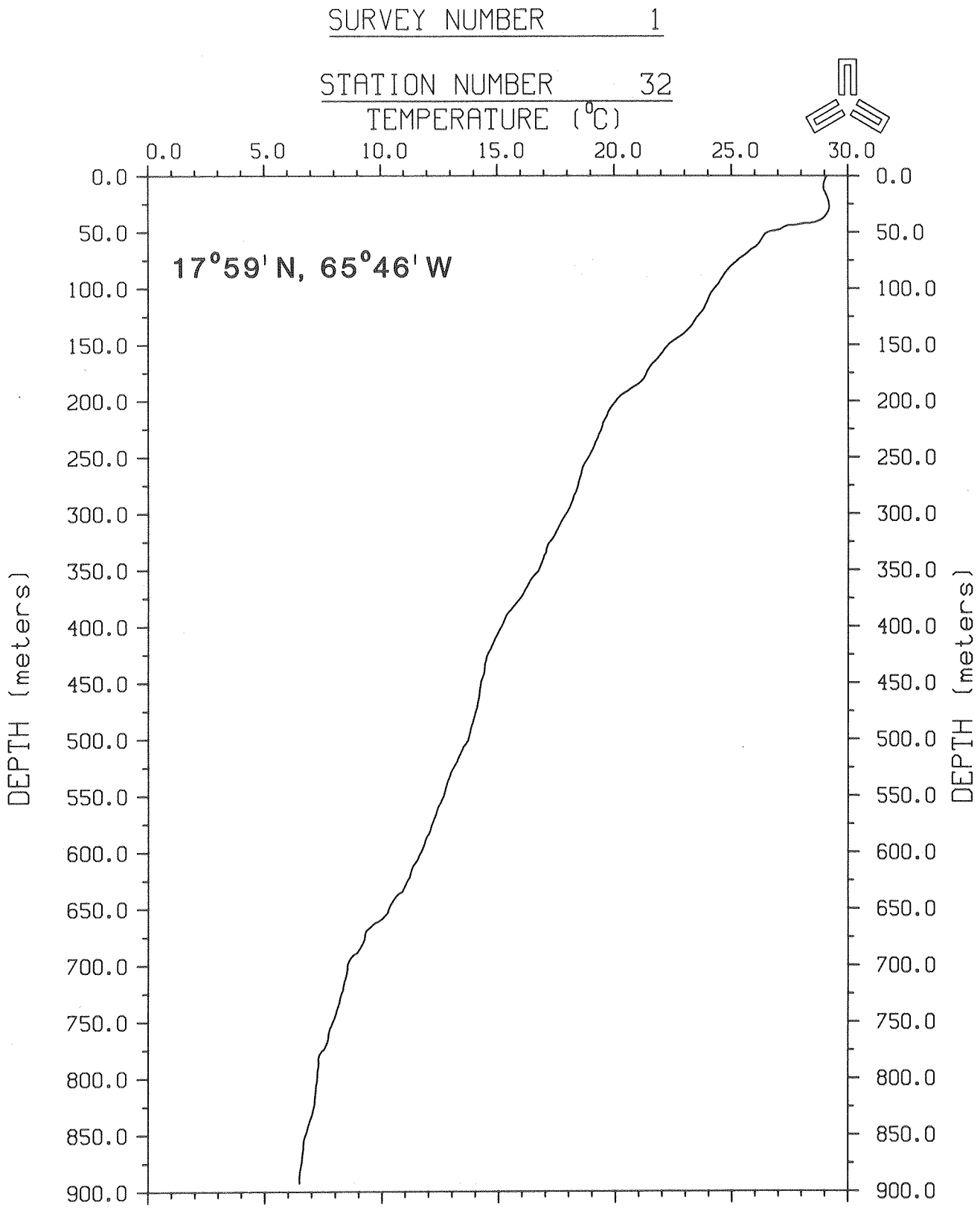

Figure 3-19. Temperature profile (XBT) at Station 32.

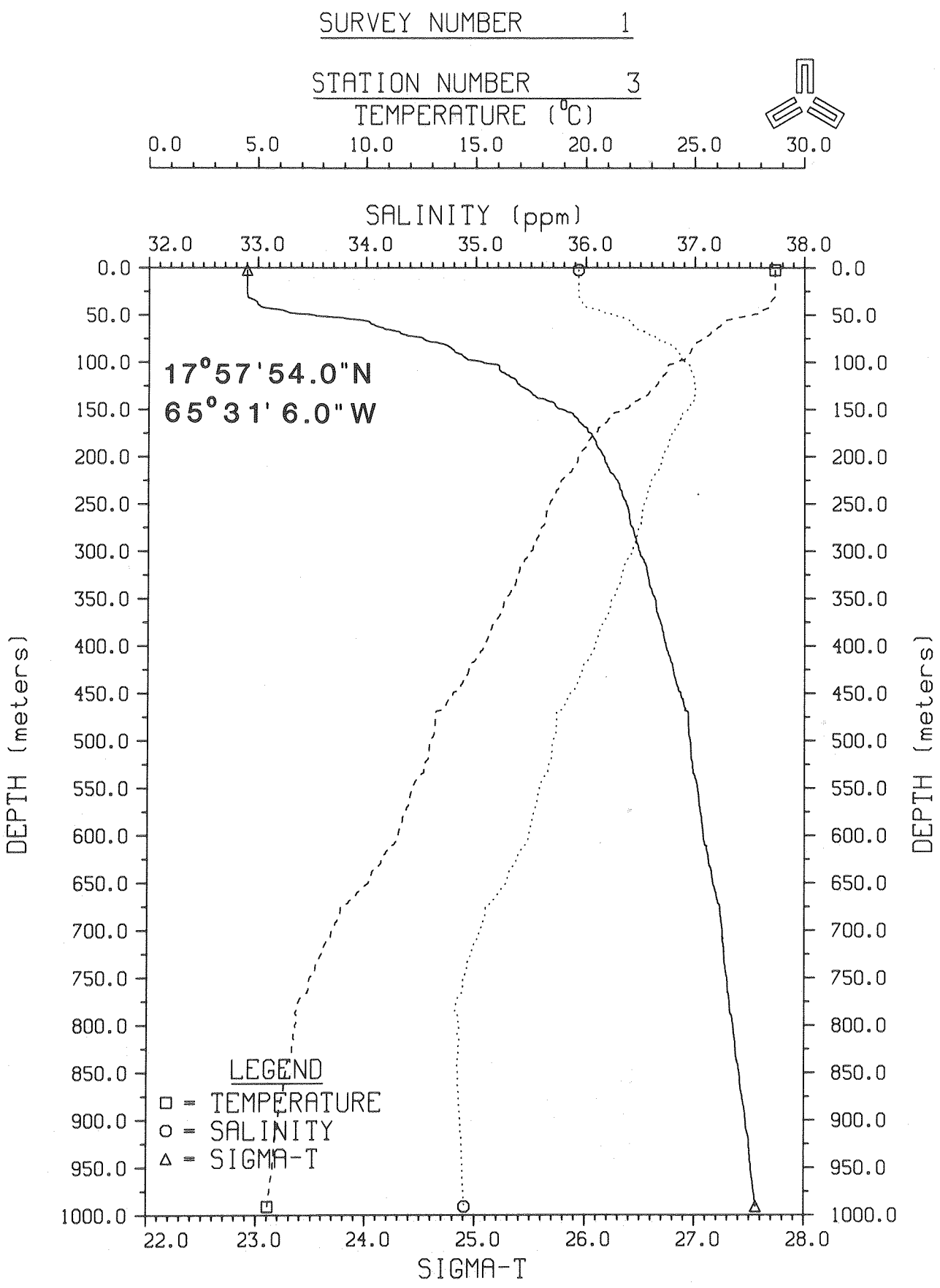

Figure 3-20. Temperature, salinity, σ_t depth profile at Station 3.

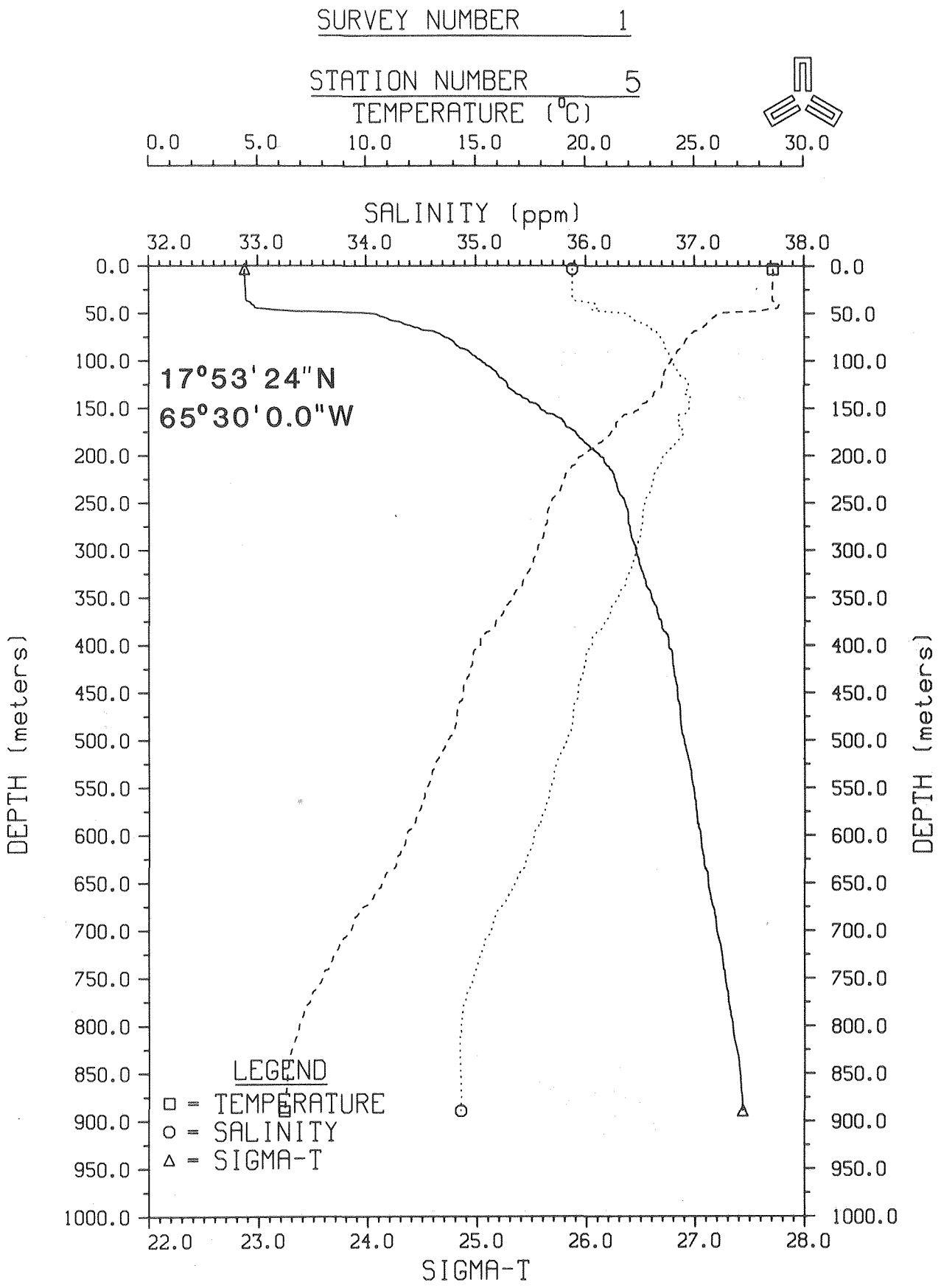

Figure 3-21. Temperature, salinity, σ_t depth profile at Station 5.

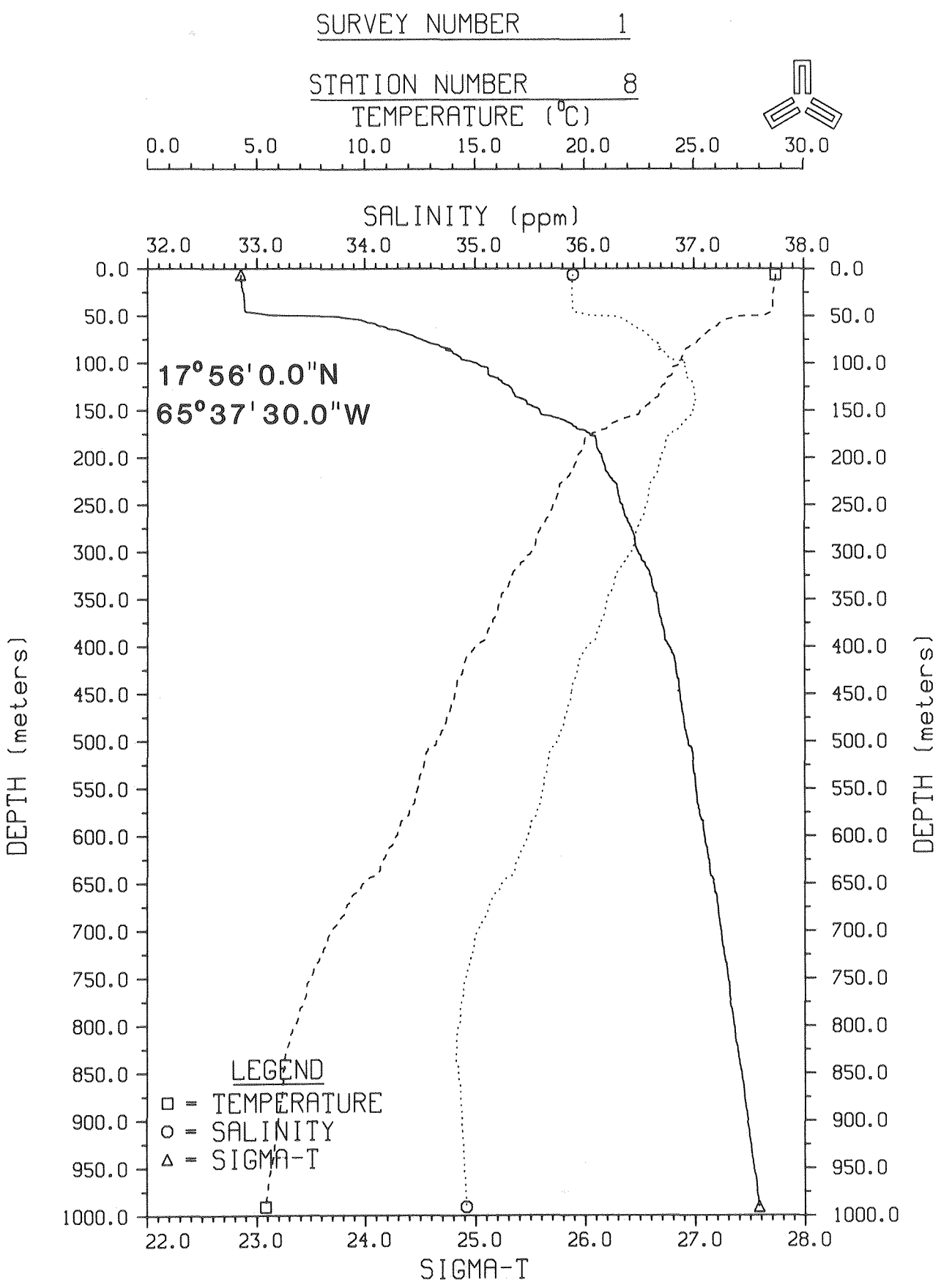

Figure 3-22. Temperature, salinity, σ_t depth profile at Station 8.

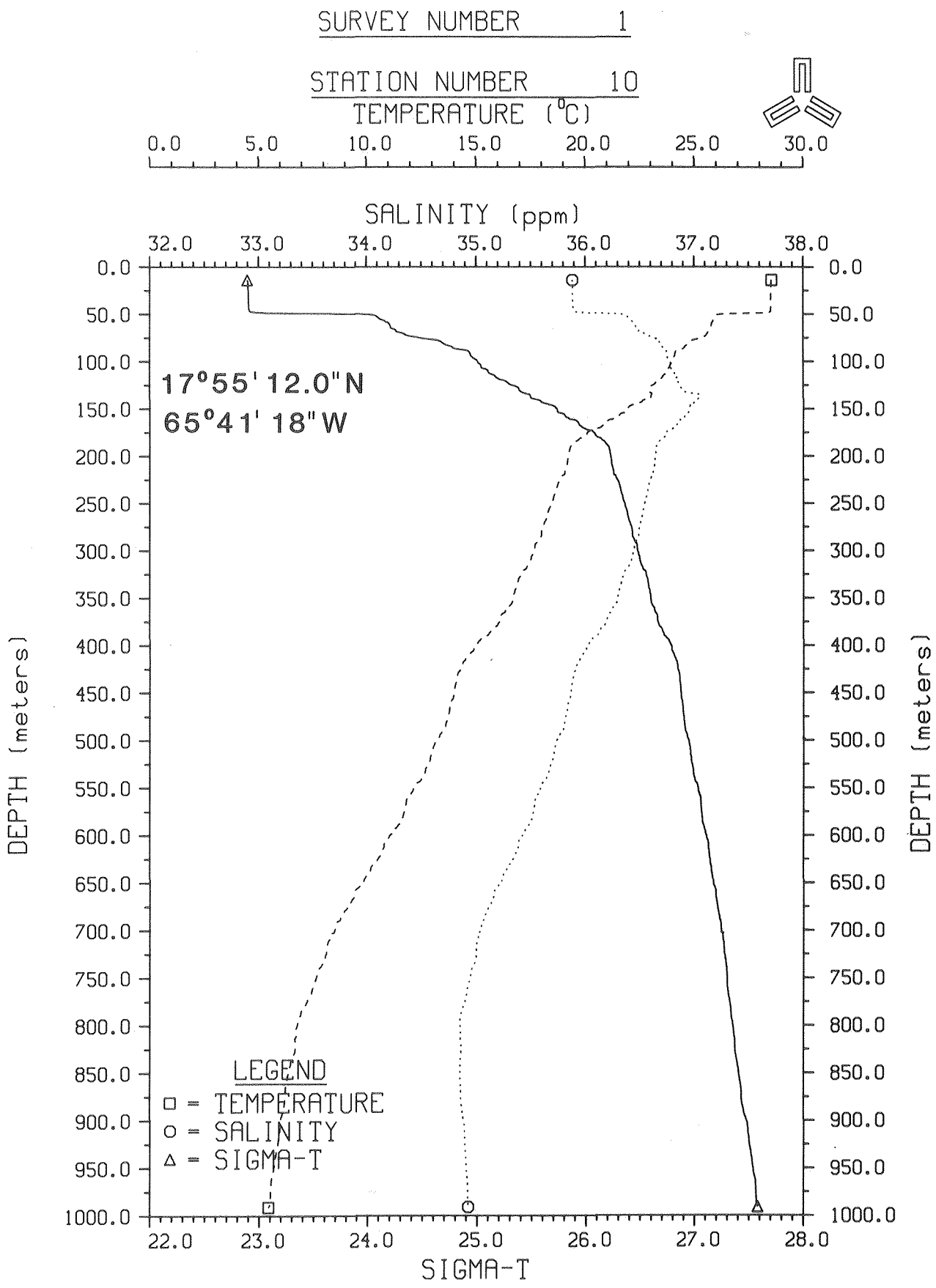

Figure 3-23. Temperature, salinity, σ_t depth profile at Station 10.

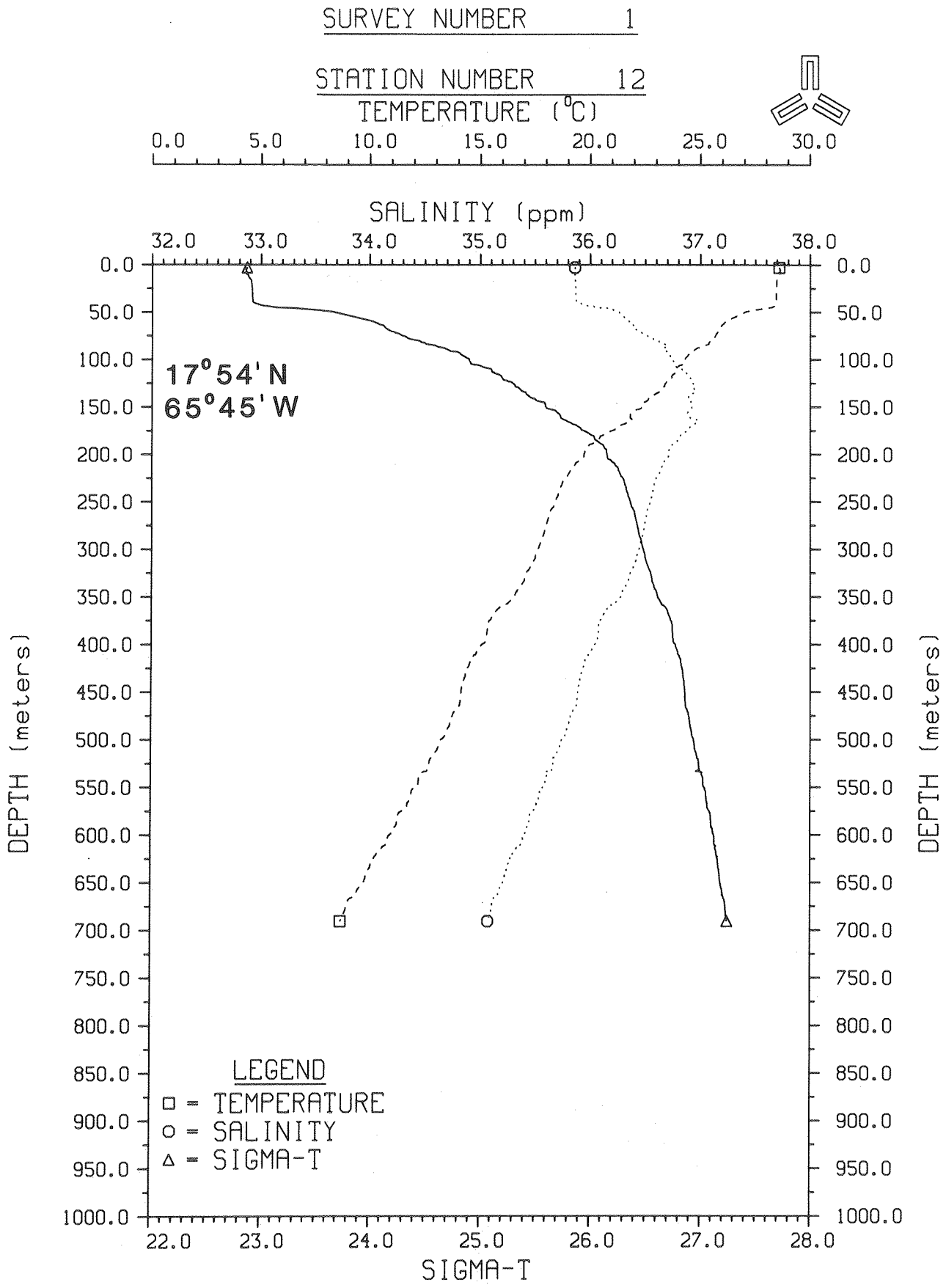

Figure 3-24. Temperature, salinity, σ_t depth profile at Station 12.

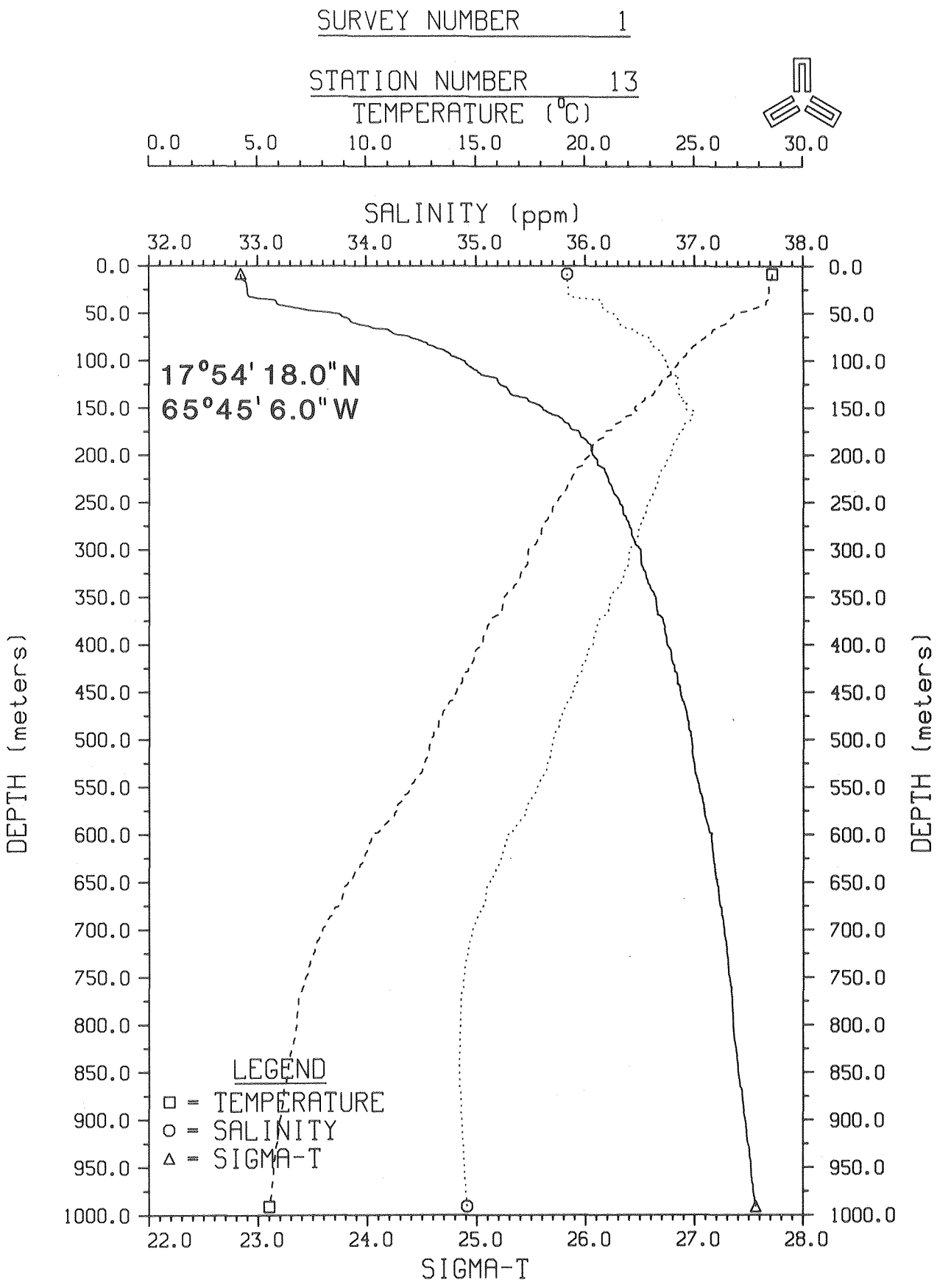

Figure 3-25. Temperature, salinity, σ_t depth profile at Station 13.

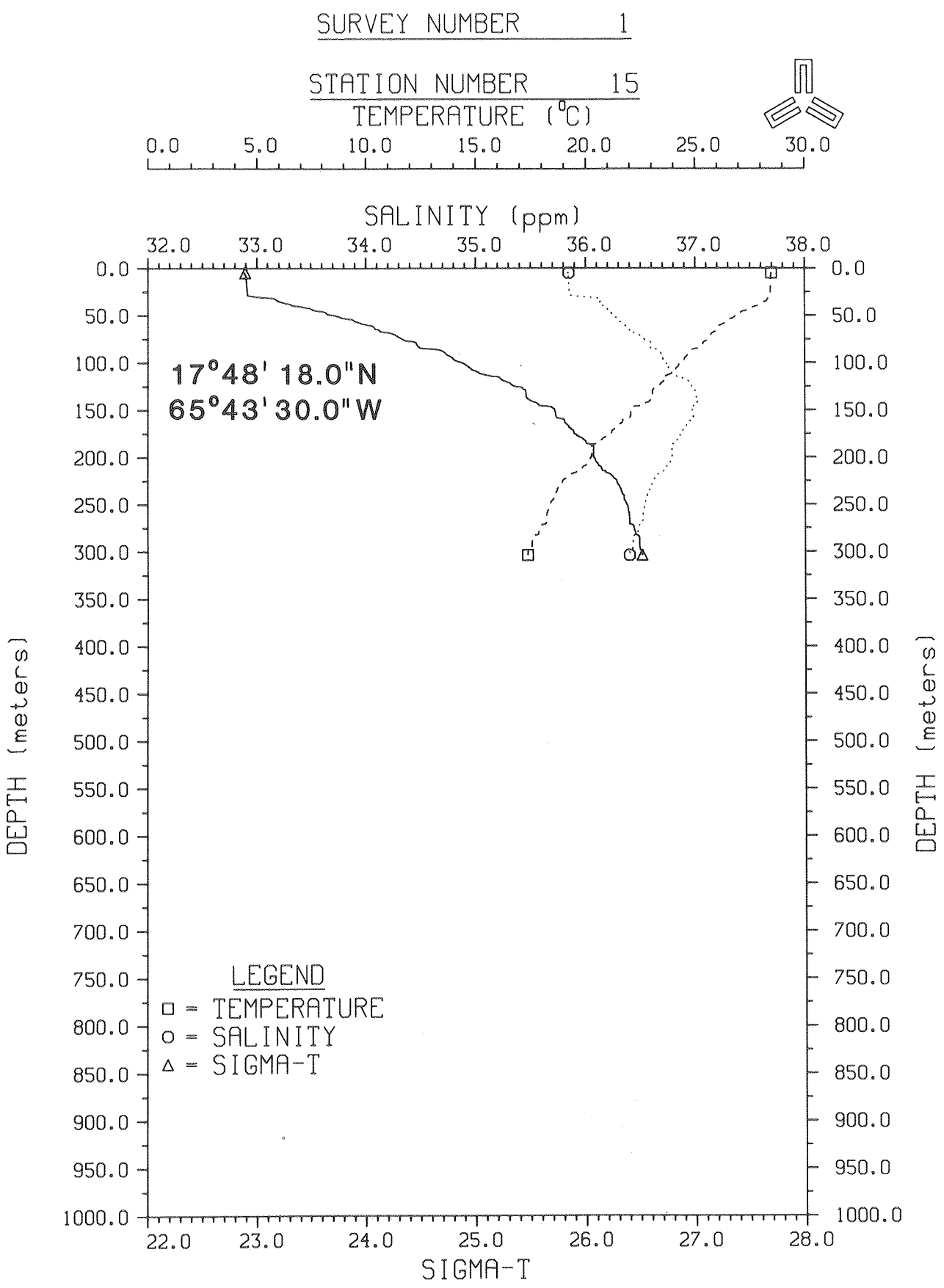

Figure 3-26. Temperature, salinity, σ_t depth profile at Station 15.

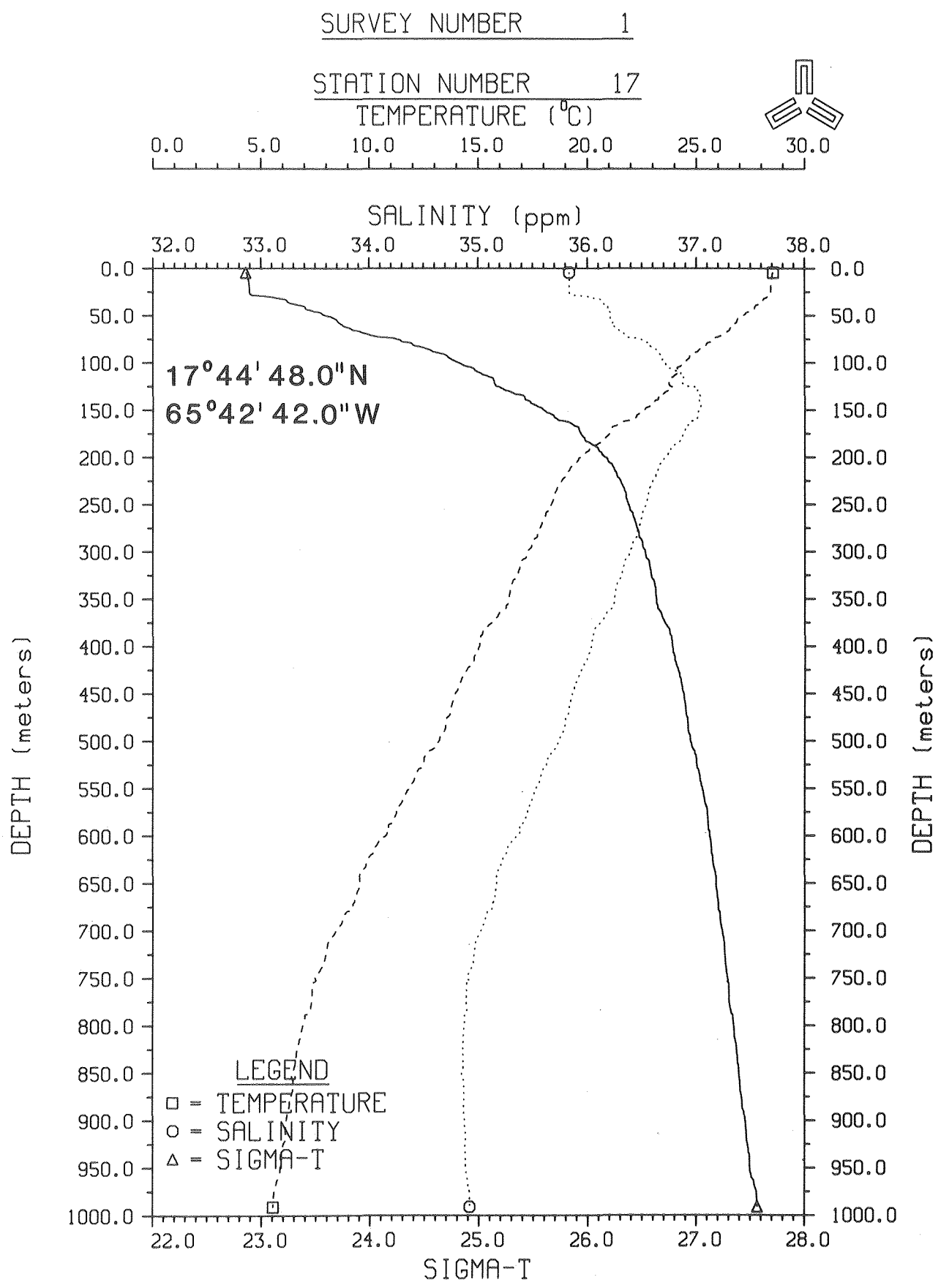

Figure 3-27. Temperature, salinity, σ_t depth profile at Station 17.

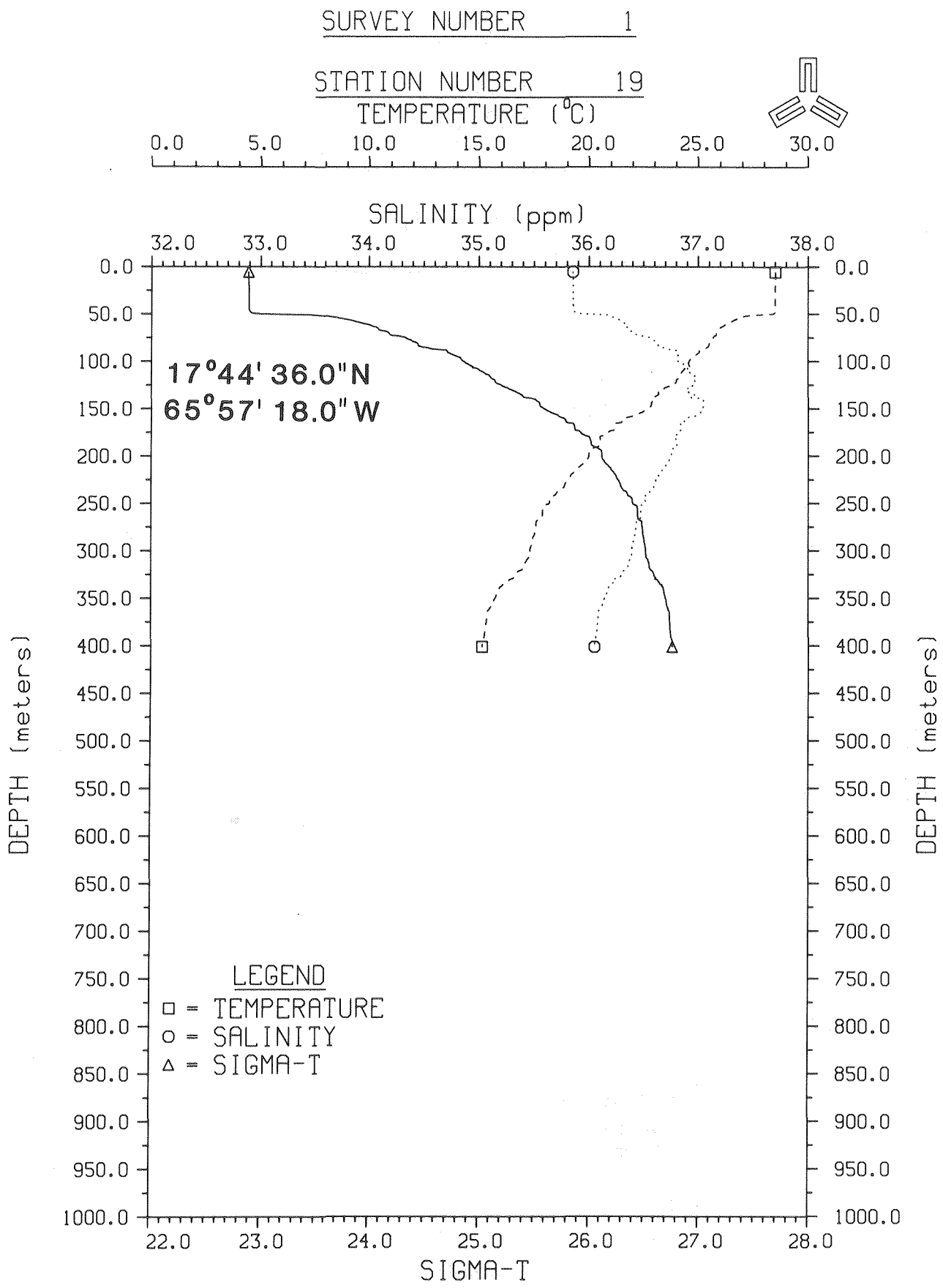

Figure 3-28. Temperature, salinity, σ_t depth profile at Station 19.

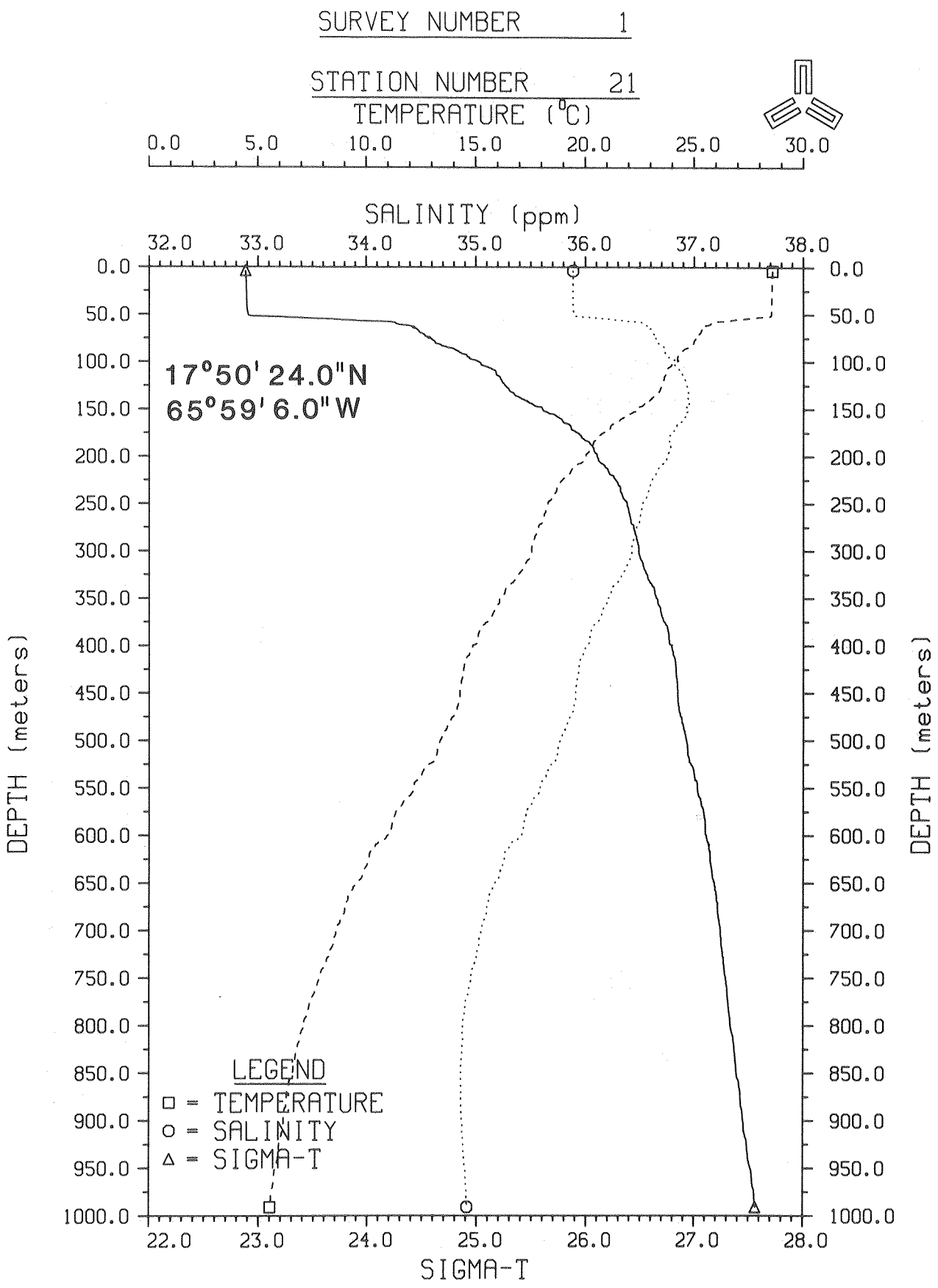

Figure 3-29. Temperature, salinity, σ_t depth profile at Station 21.

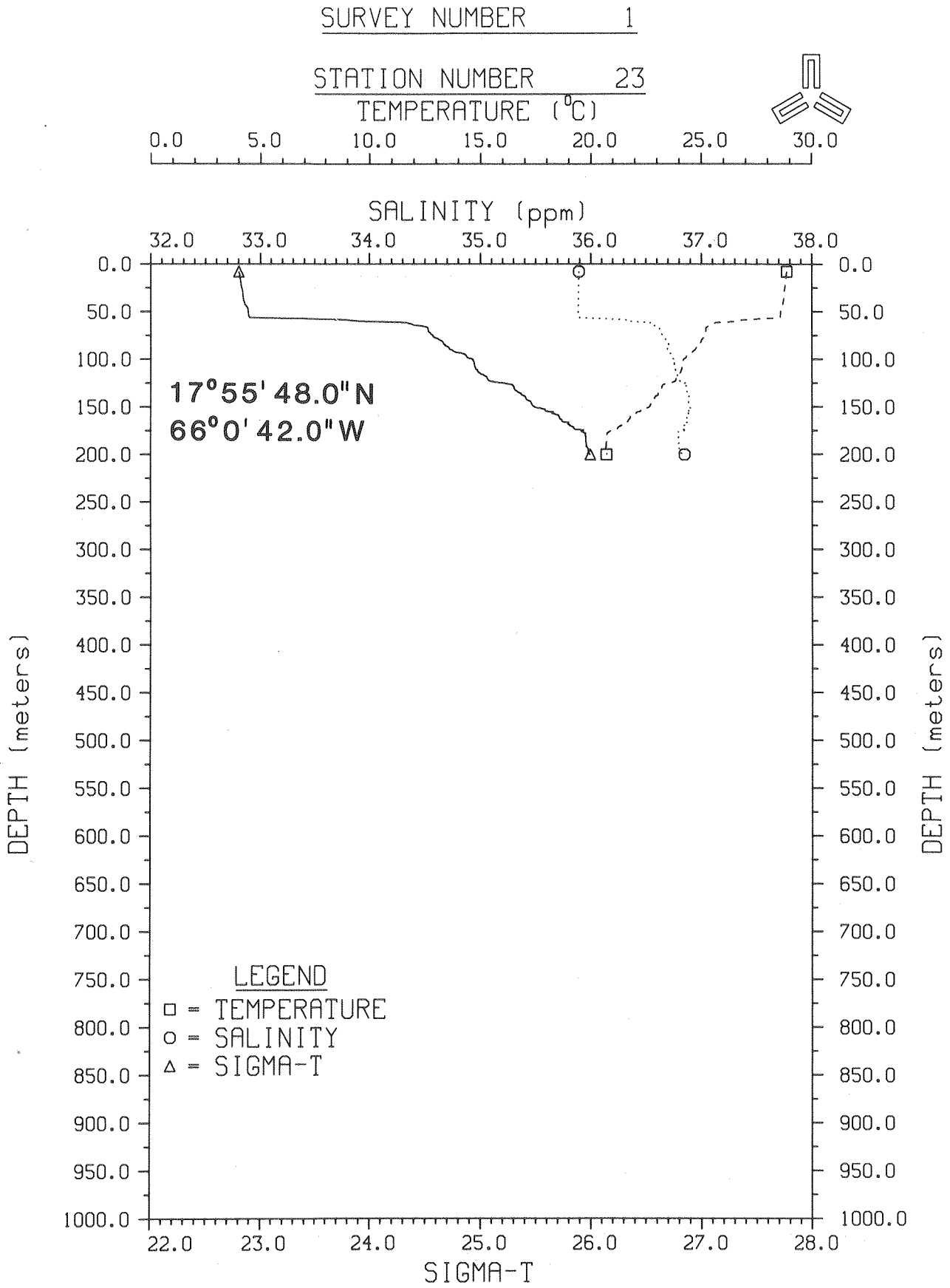

Figure 3-30. Temperature, salinity, σ_t depth profile at Station 23.

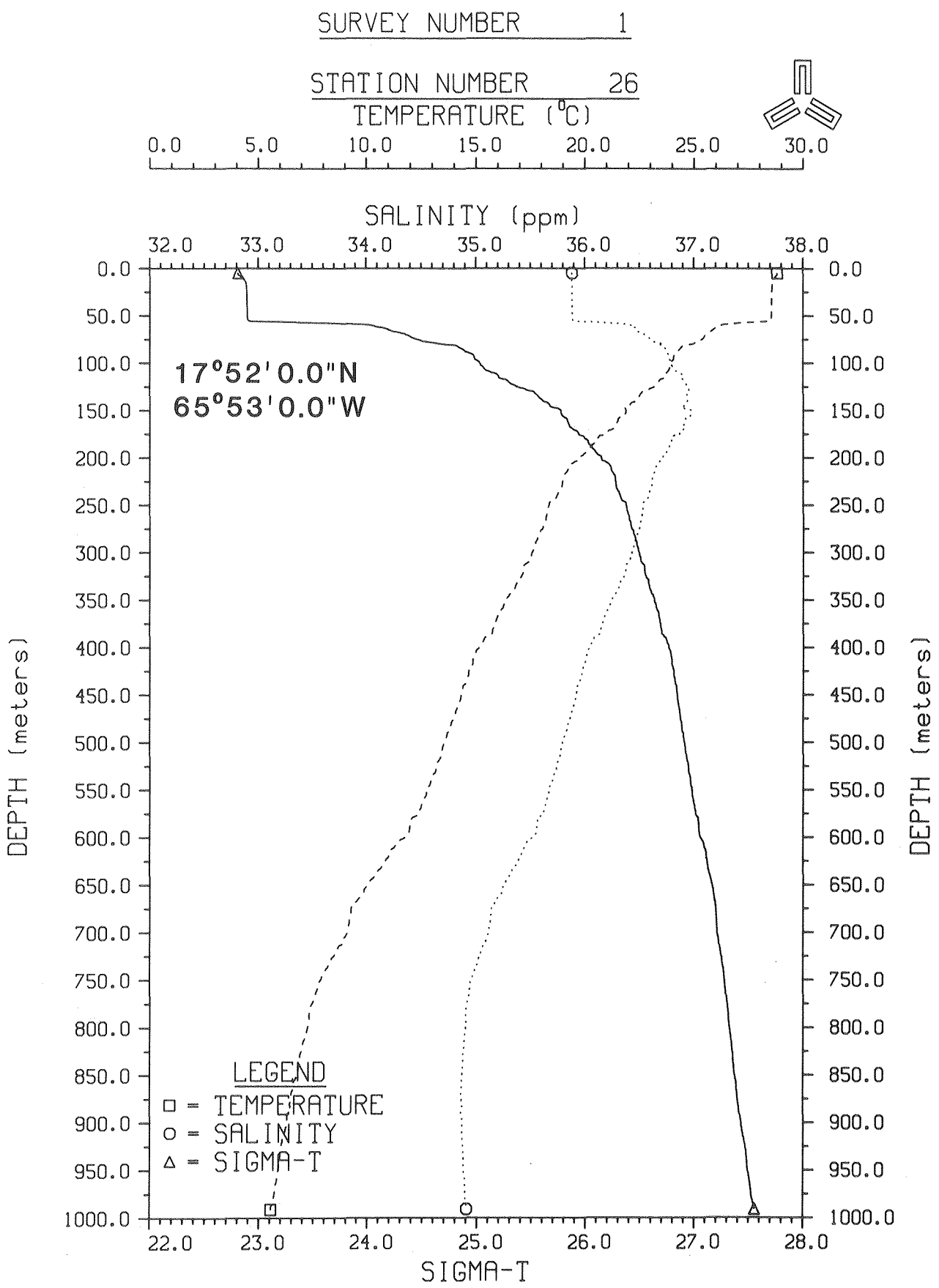

Figure 3-31. Temperature, salinity, σ_t depth profile at Station 26.

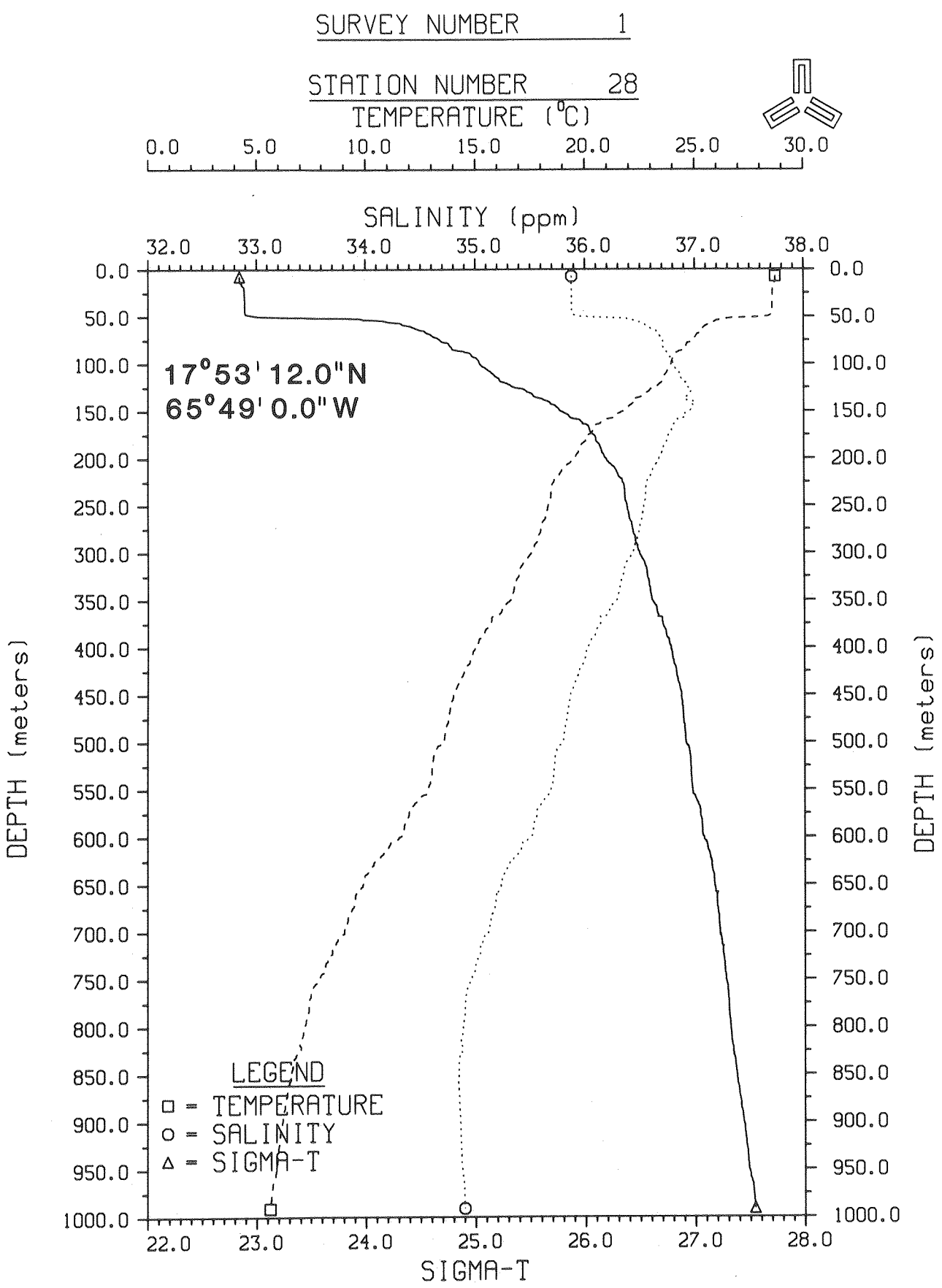

Figure 3-32. Temperature, salinity, σ_t depth profile at Station 28.

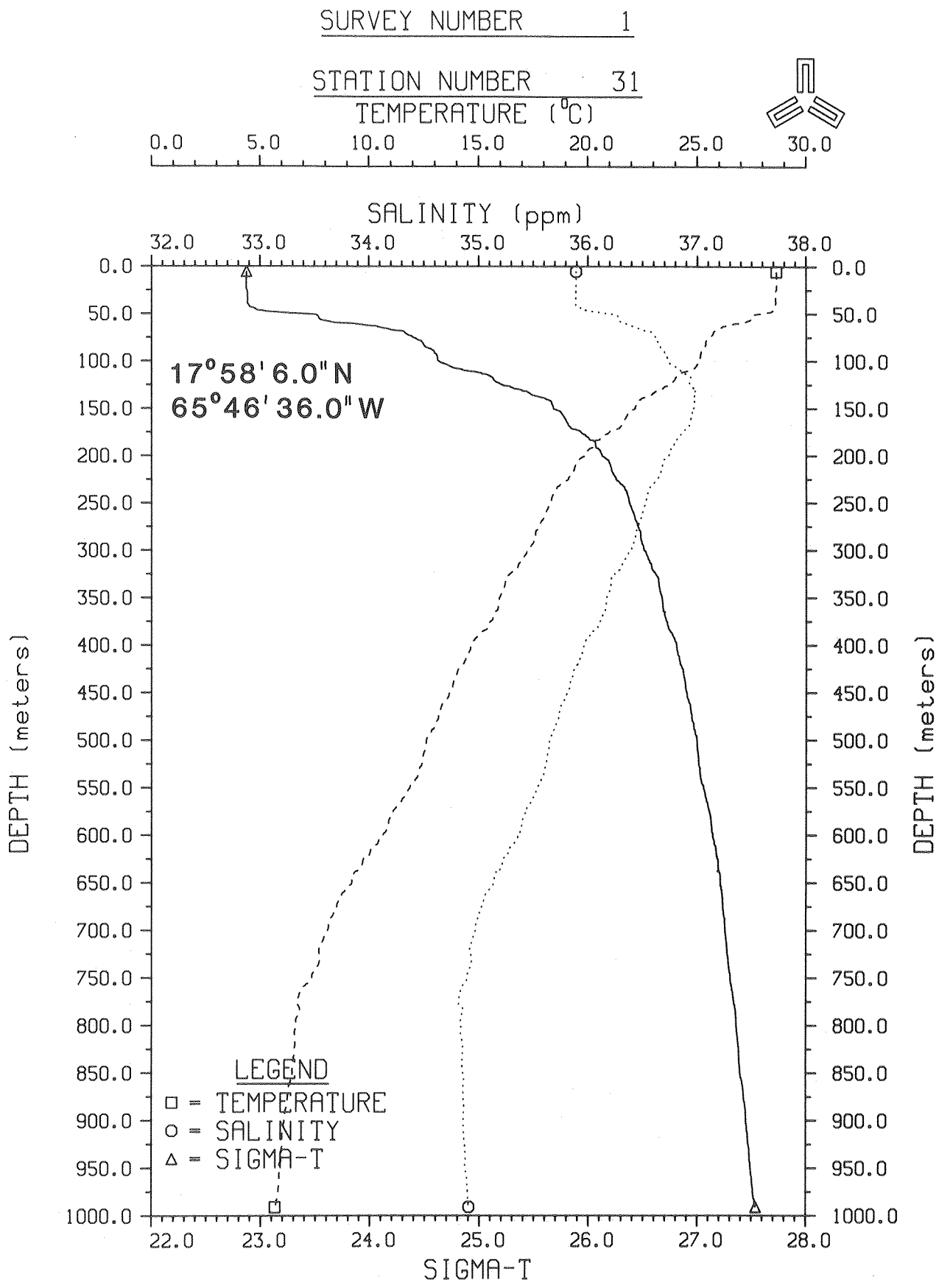

Figure 3-33. Temperature, salinity, σ_t depth profile at Station 31.

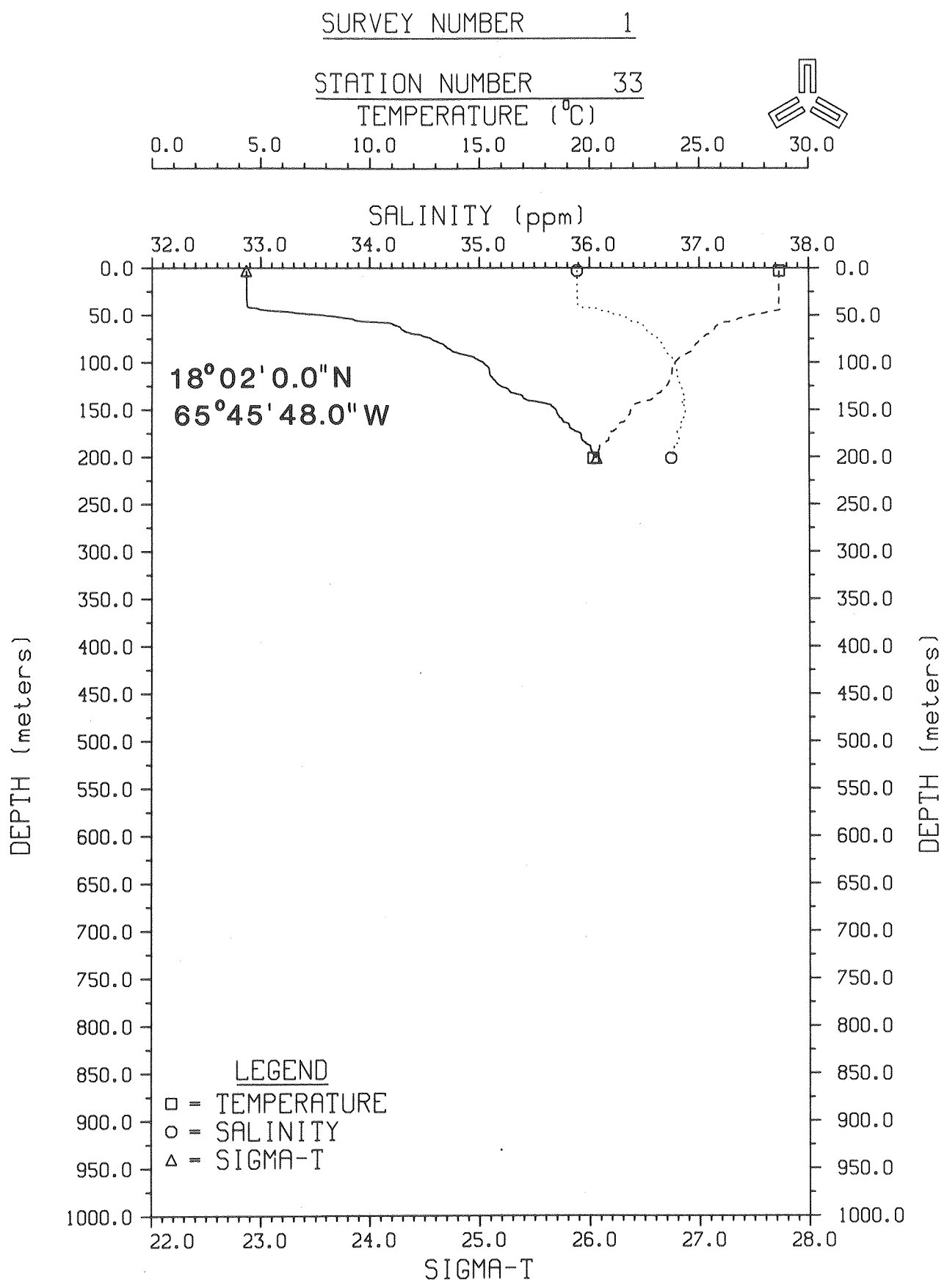

Figure 3-34. Temperature, salinity, σ_t depth profile at Station 33.

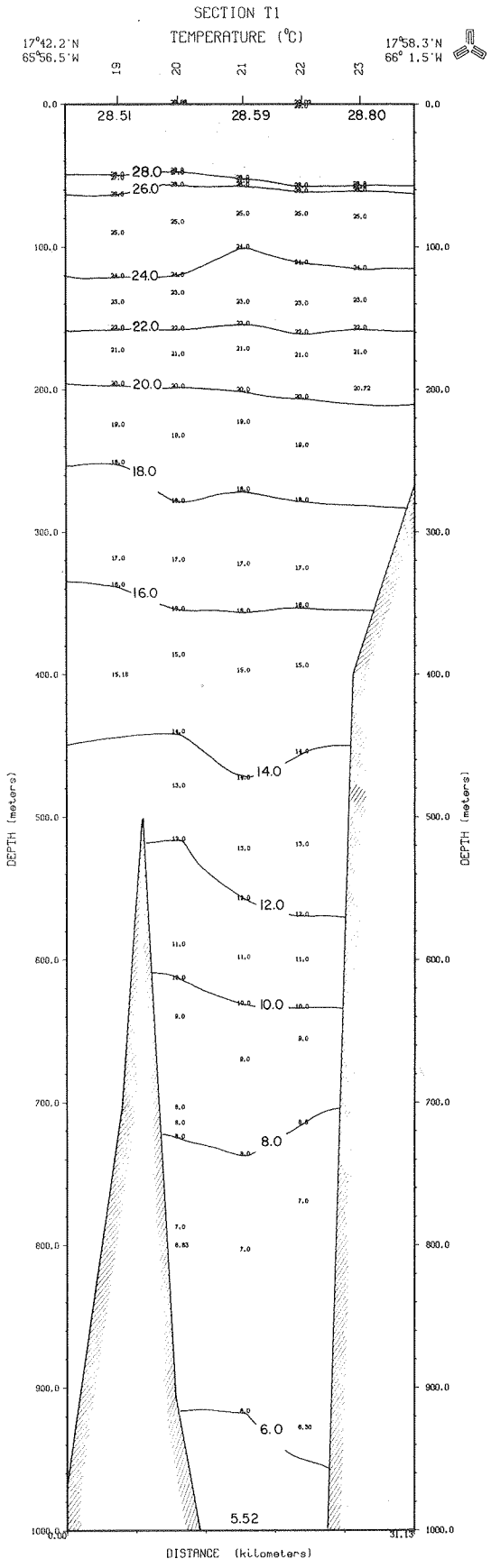

Figure 3-35. Temperature section based on CTD and XBT stations along line 1.

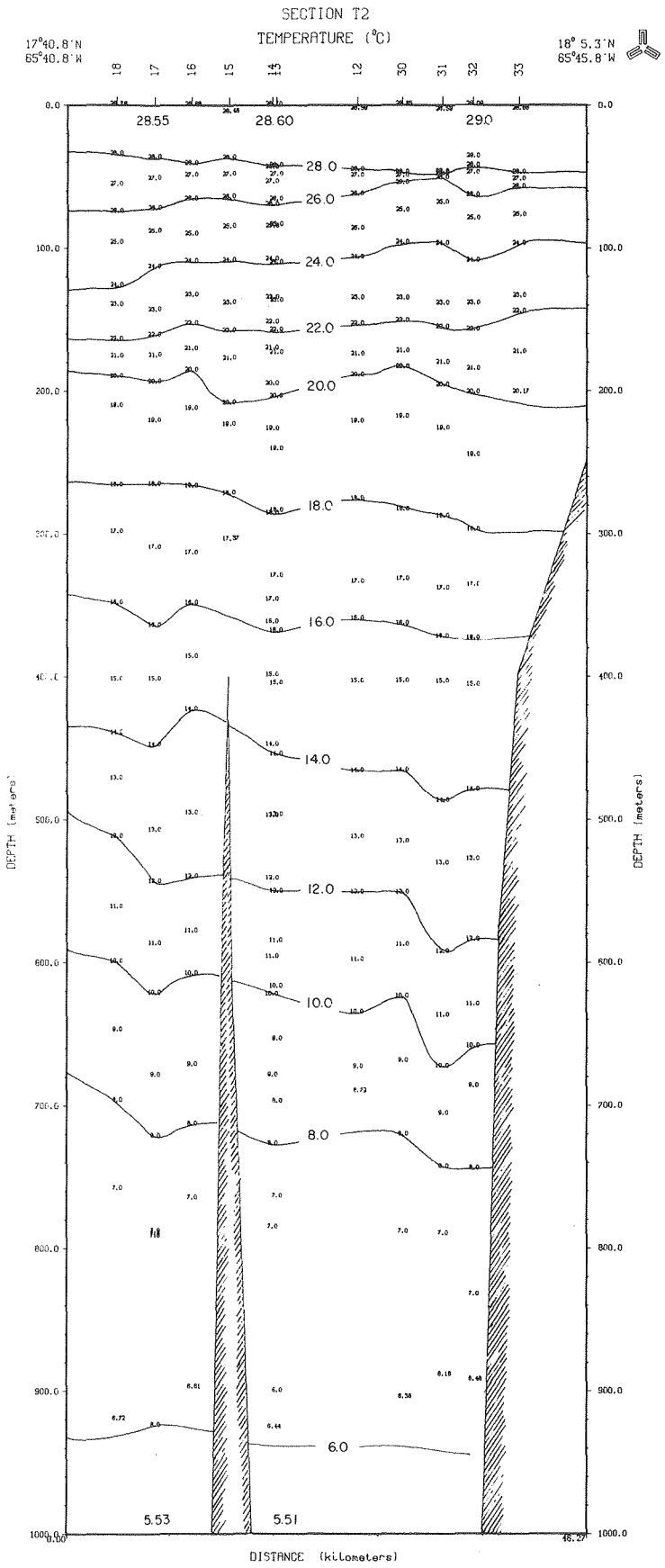

Figure 3-36. Temperature section based on CTD and XBT stations along line 2.

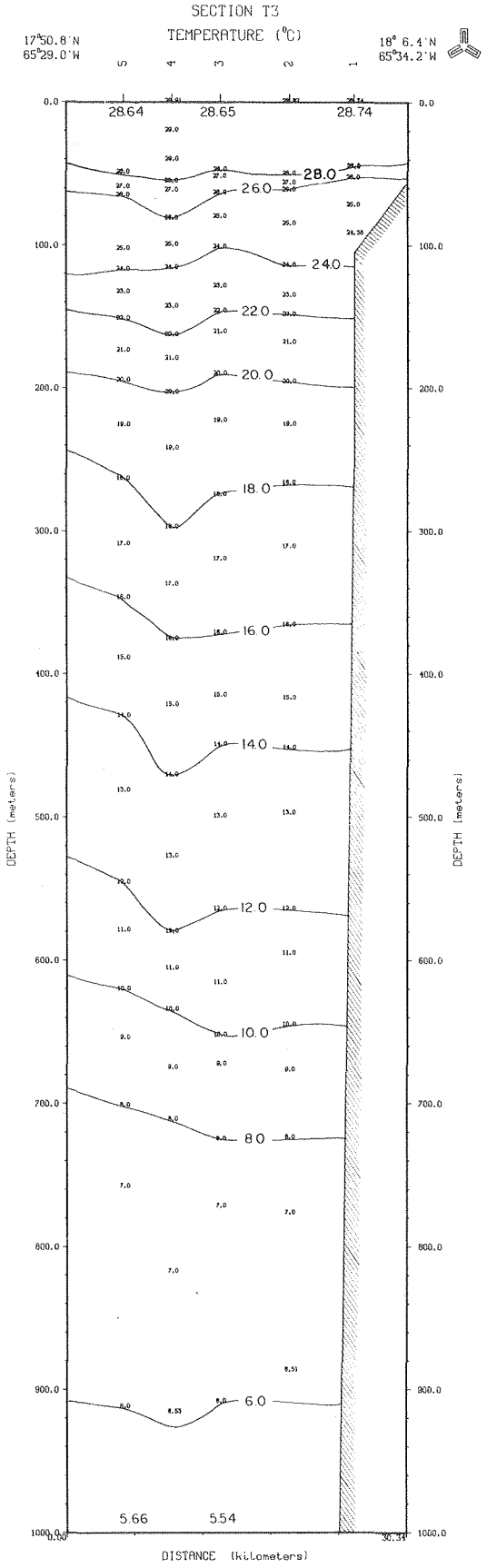

Figure 3-37. Temperature section based on CTD and XBT stations along line 3.

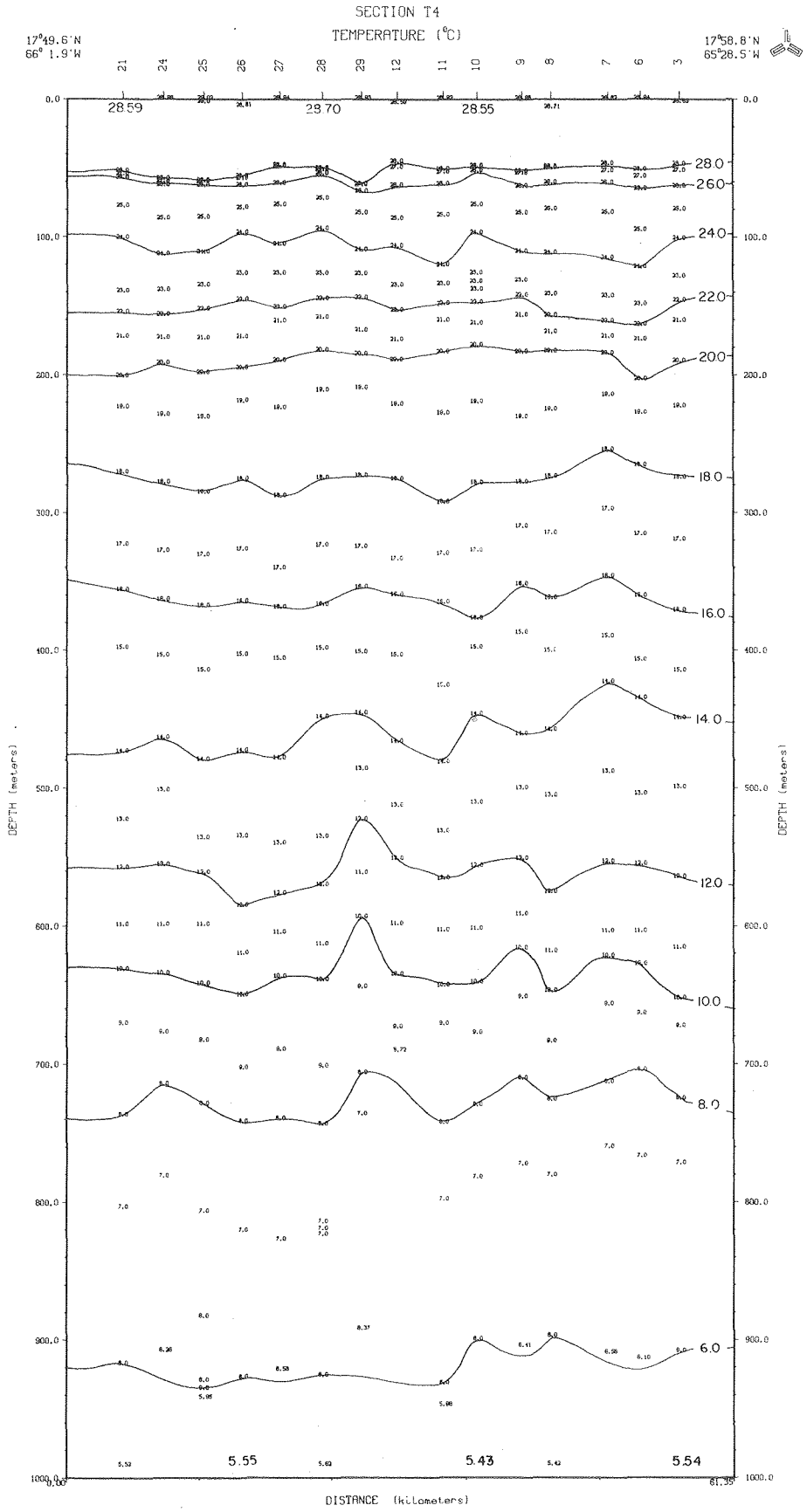

Figure 3-38. Temperature section based on CTD and XBT stations along line 4.

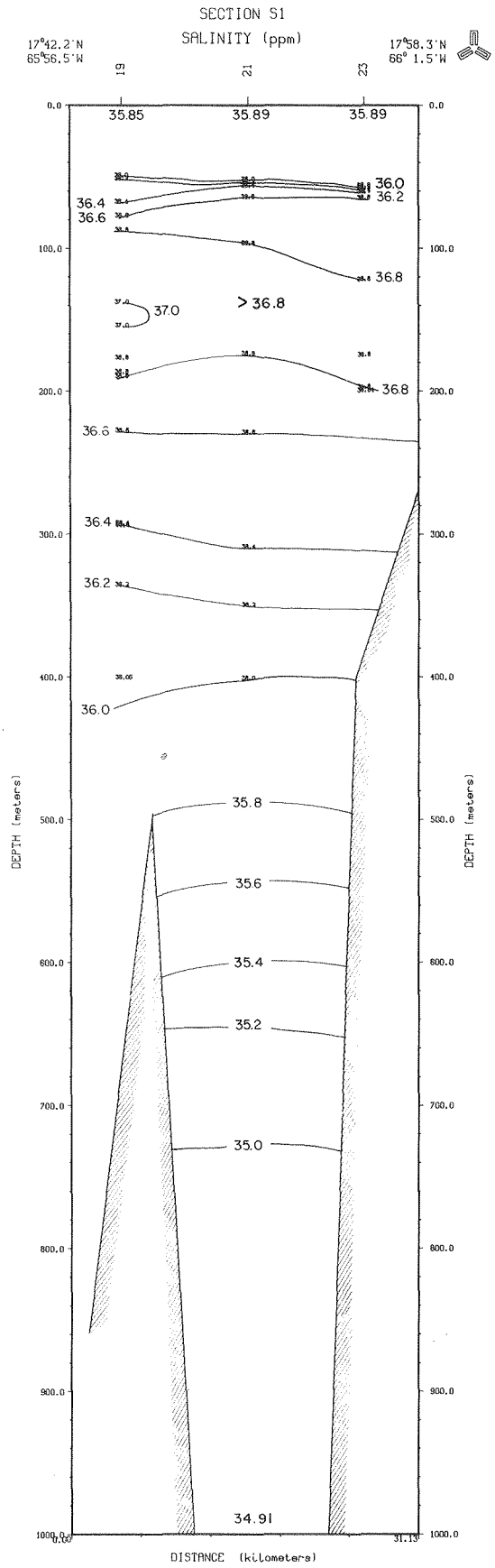

Figure 3-39. Salinity section based on CTD stations along line 1.

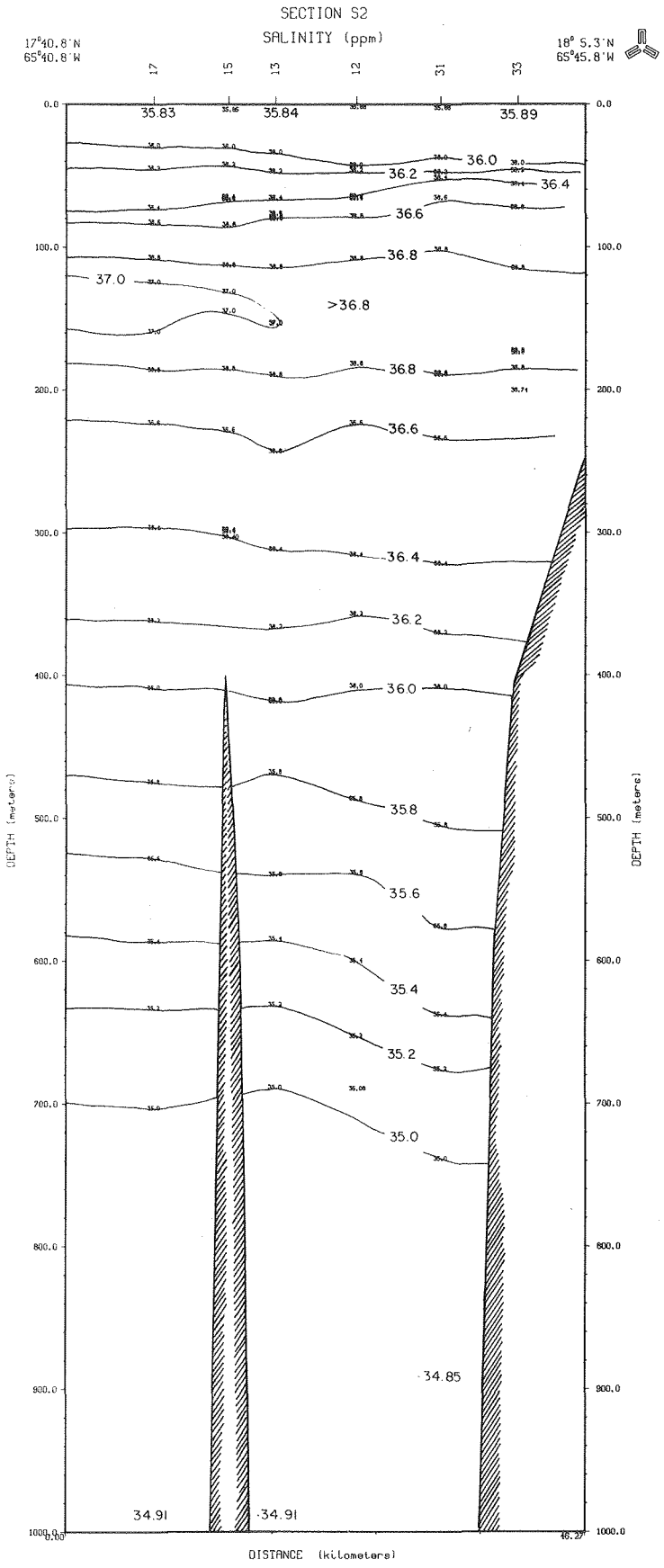

Figure 3-40. Salinity section based on CTD stations along line 2.

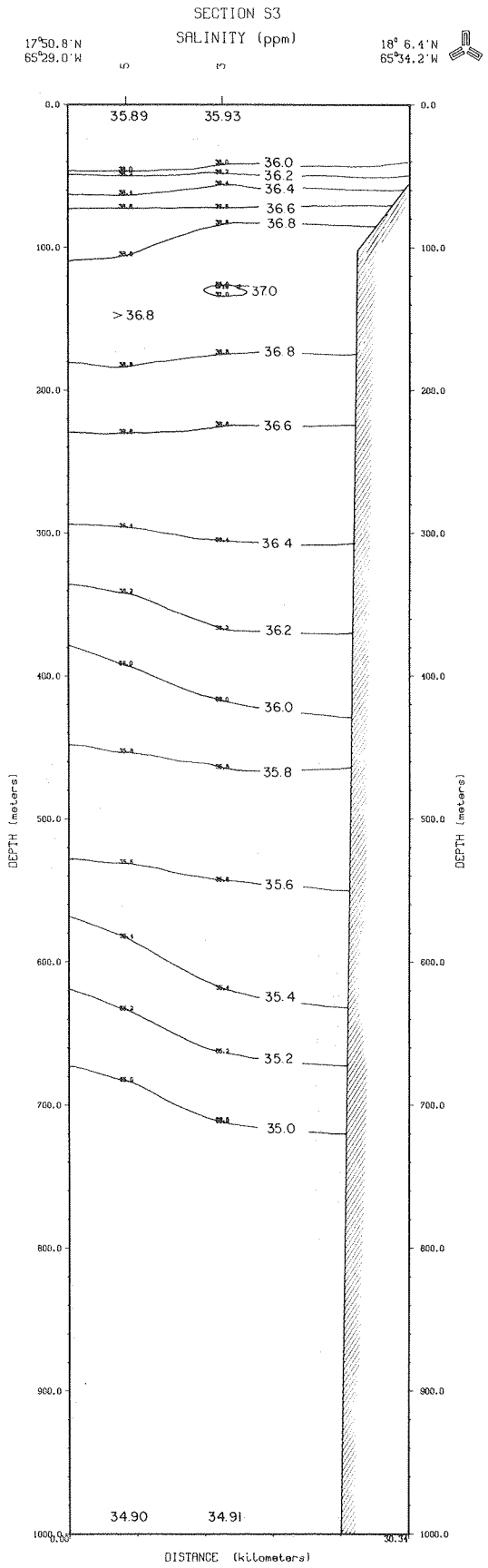

Figure 3-41. Salinity section based on CTD stations along line 3.

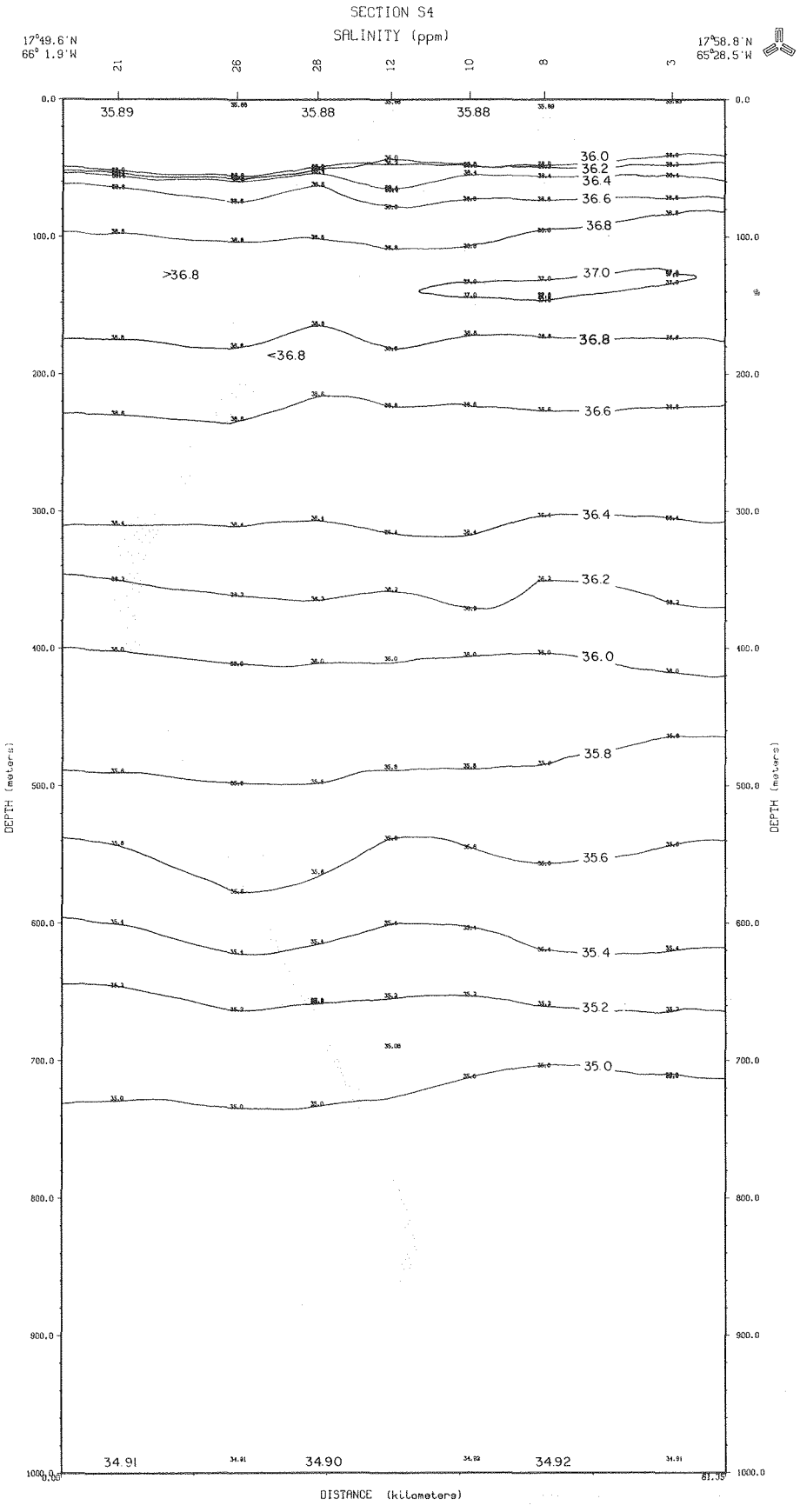

Figure 3-42. Salinity section based on CTD stations along line 4.

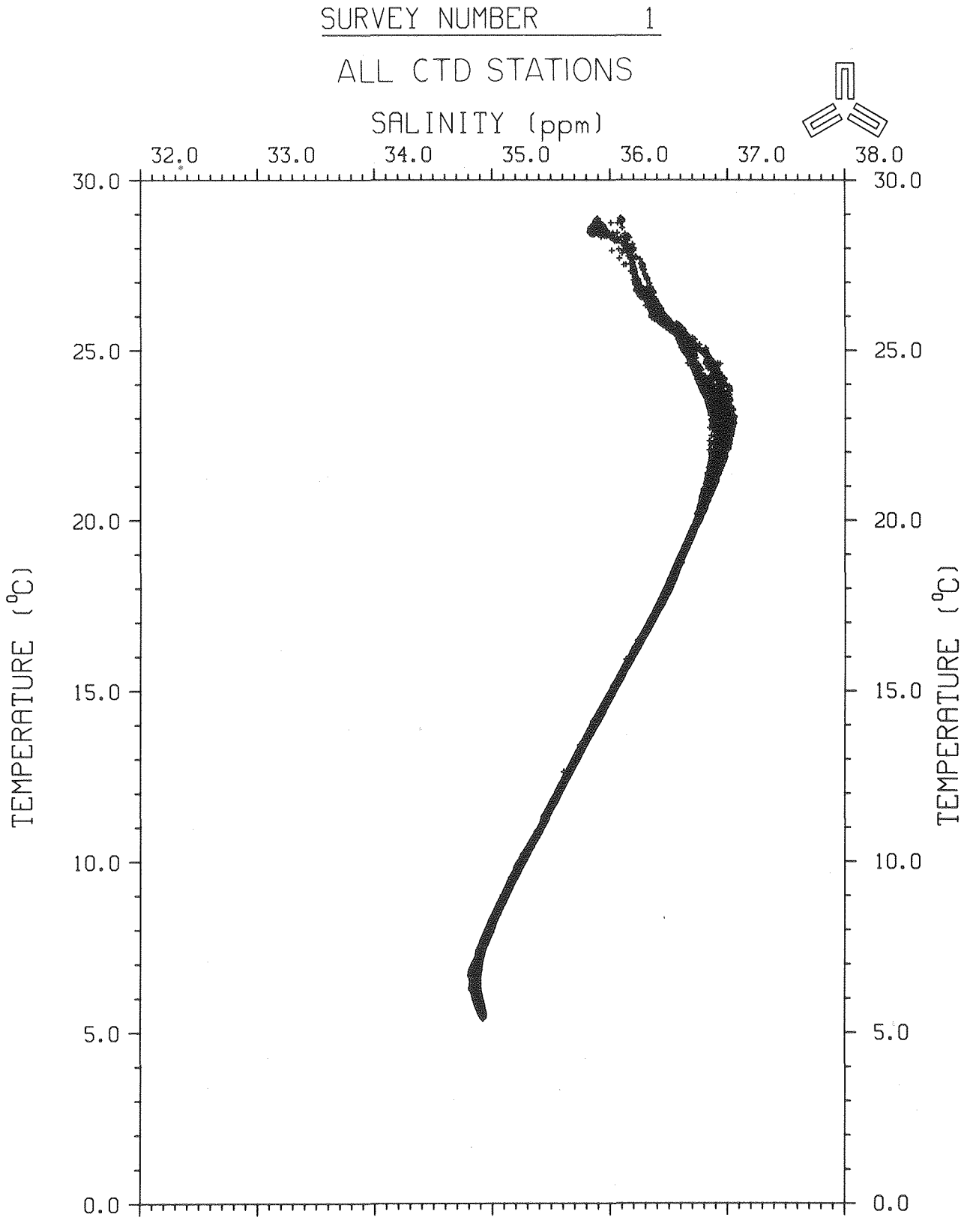

Figure 3-43. T/S relationship for all stations occupied in June 1980 cruise.

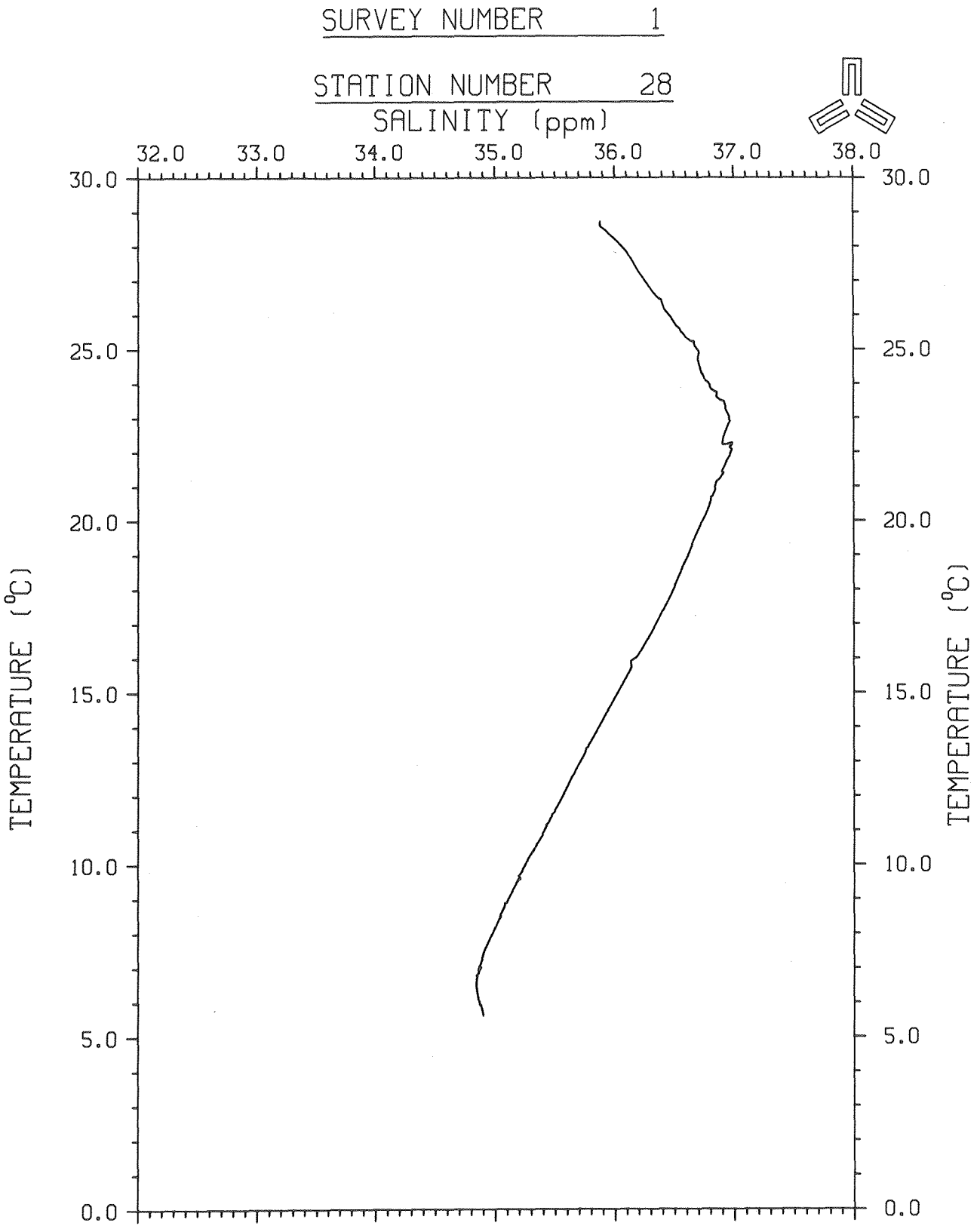

Figure 3-44. T/S relationship for Station 28.

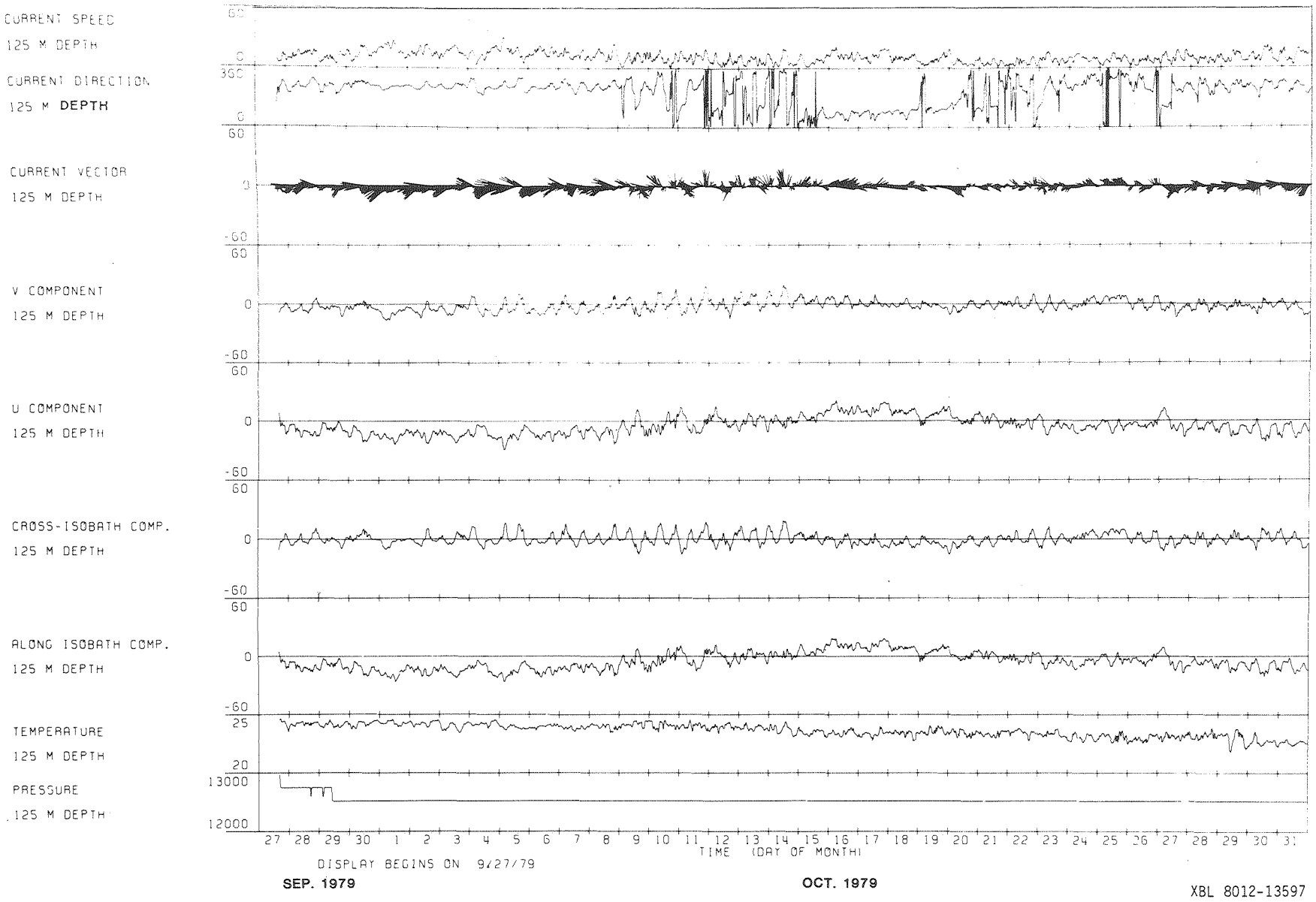

Figure 3-45a. Time series plot of currents, temperatures, and pressure from 125 m depth. at 17° 53' 49" N, 65° 45' 14.5" W

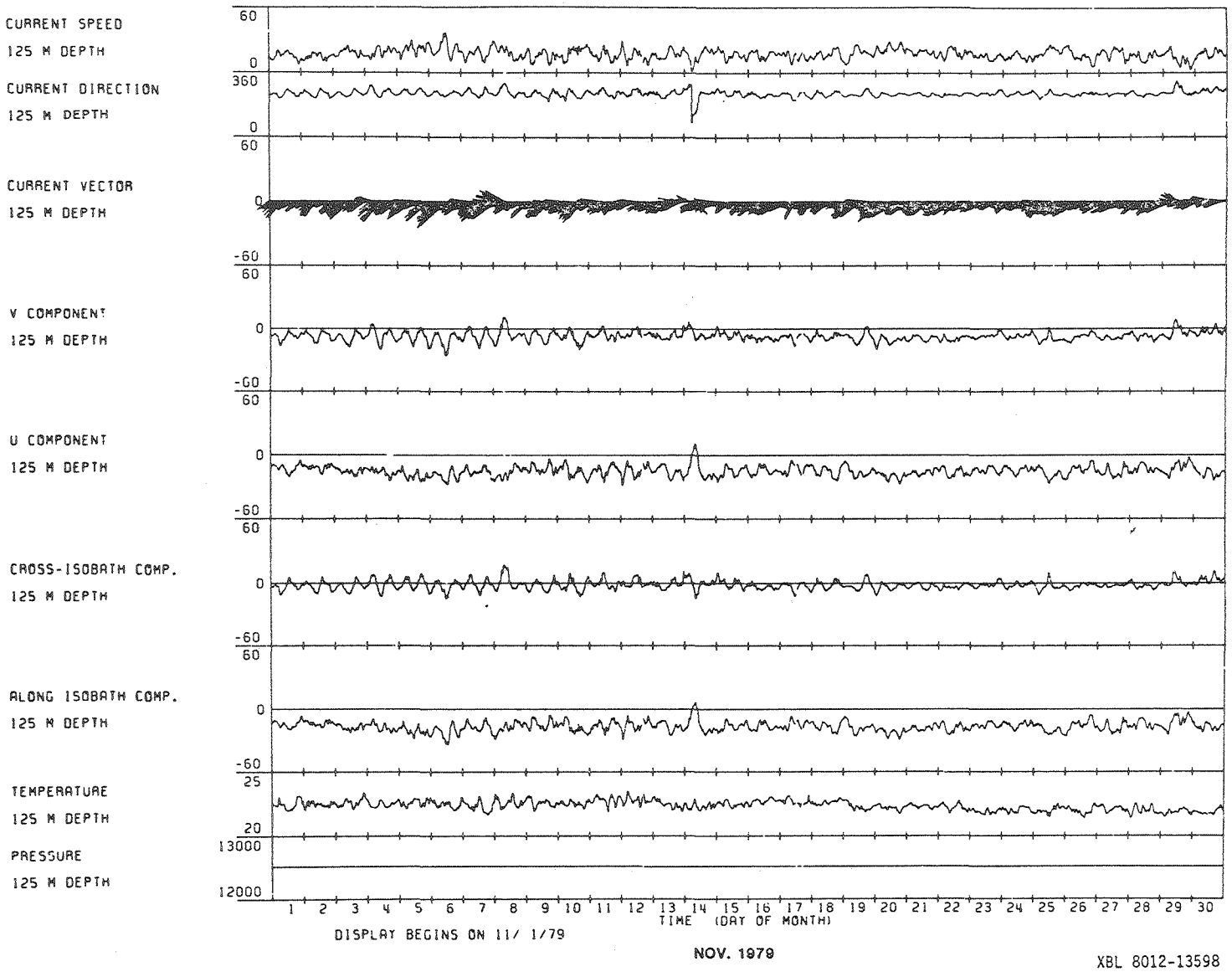

Figure 3-45b. Time series plot of currents, temperatures, and pressure from 125 m depth. at 17° 53' 49" N, 65° 45' 14.5" W

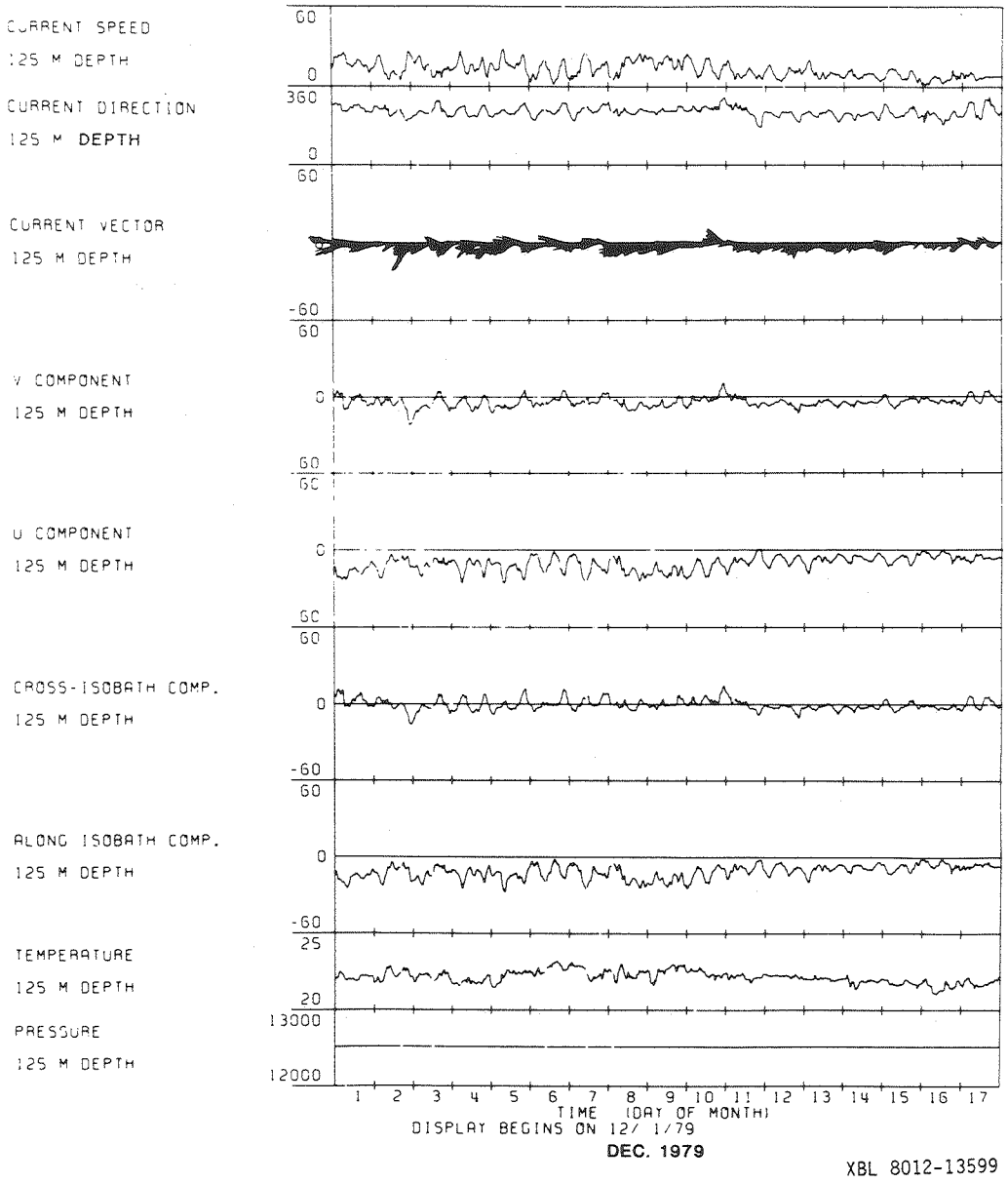

Figure 3-45c. Time series plot of currents, temperatures, and pressure from 125 m depth. at 17° 53' 49" N, 65° 45' 14.5" W

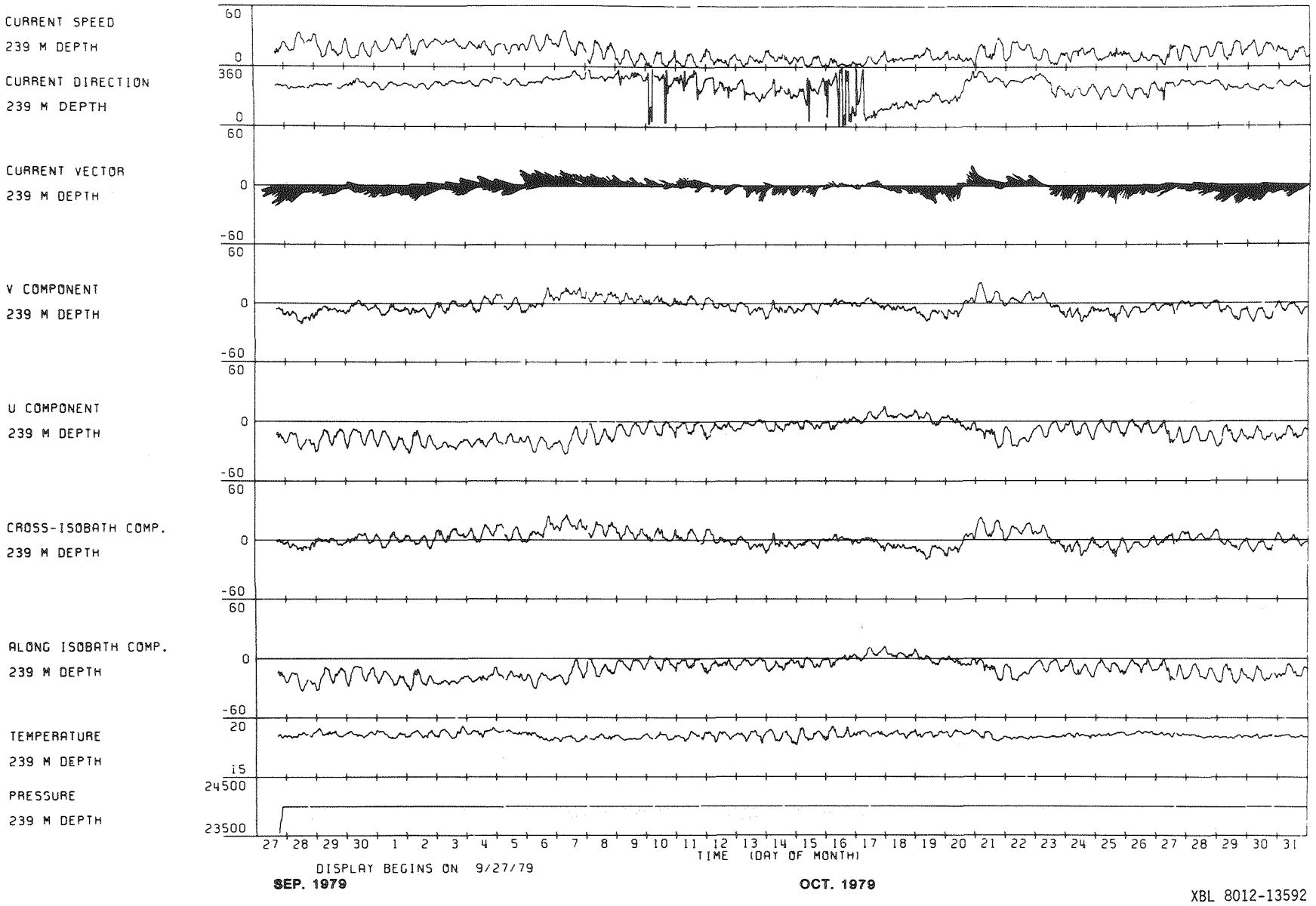

Figure 3-46a. Time series plot of currents, temperatures, and pressure from 239 m depth. at 17° 53' 49" N, 65° 45' 14.5" W

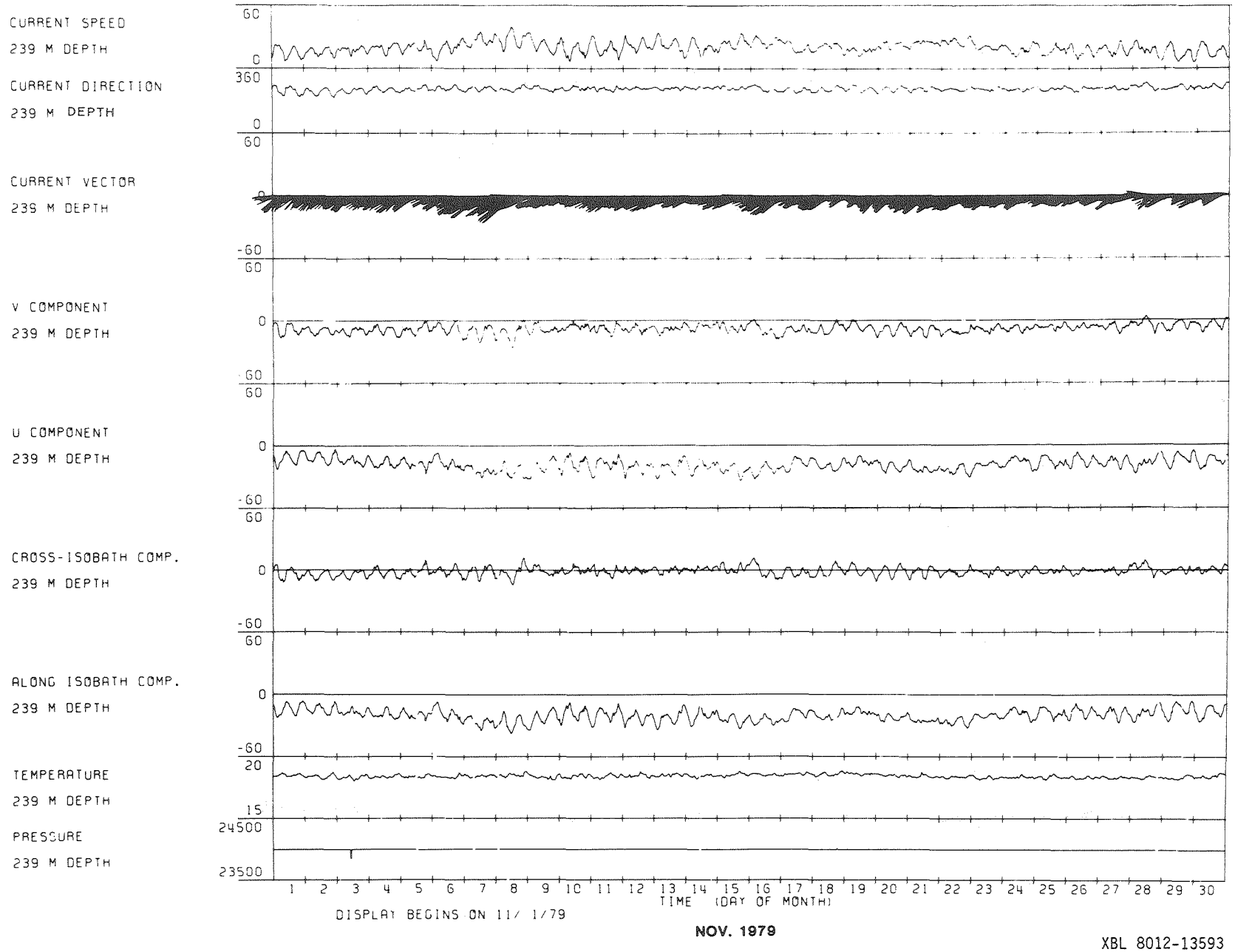

Figure 3-46b. Time series plot of currents, temperatures, and pressure from 239 m depth. at 17° 53' 49" N, 65° 45' 14.5" W

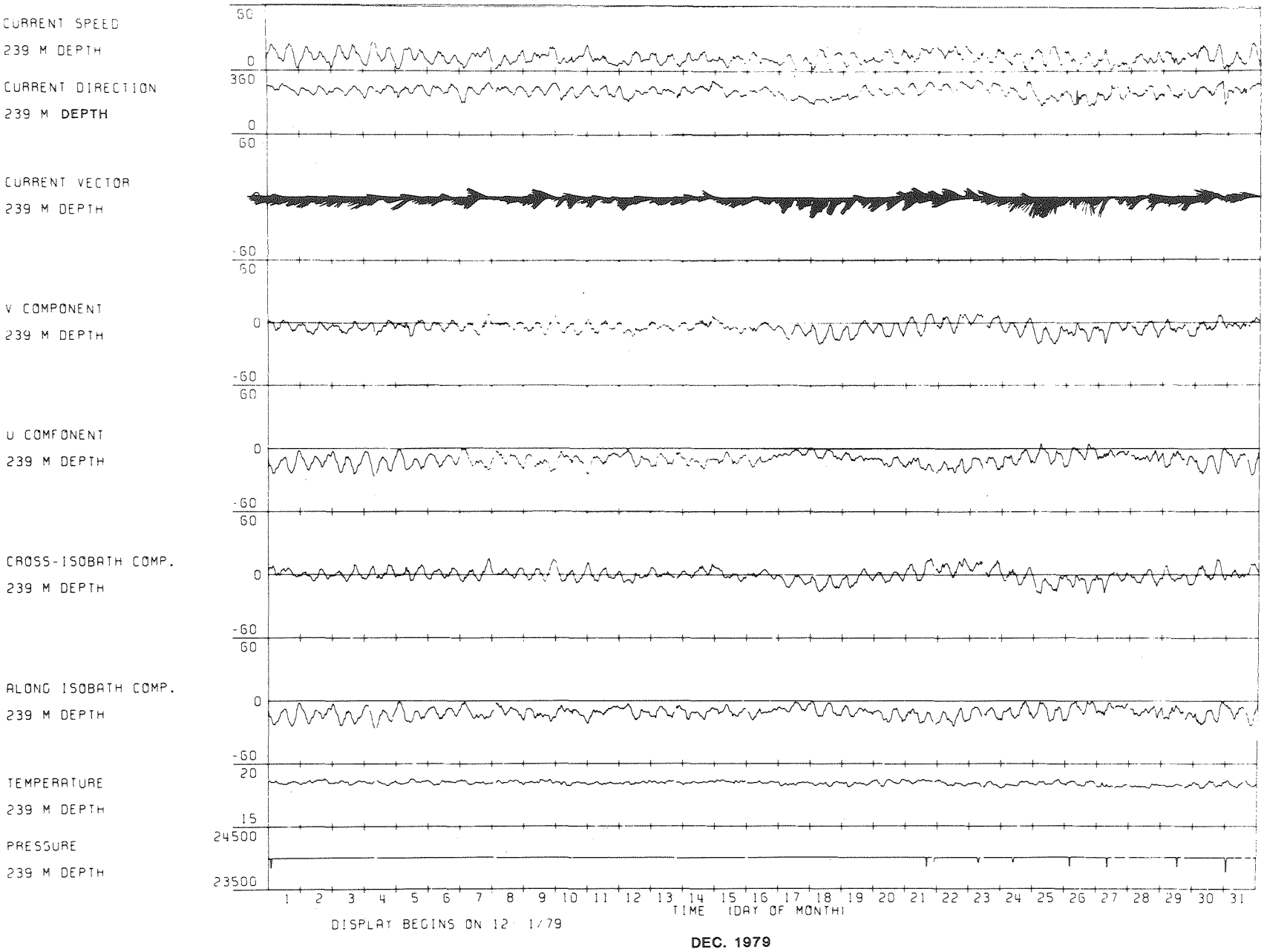

Figure 3-46c. Time series plot of currents, temperatures, and pressure from 239 m depth. at 17° 53' 49" N, 65° 45' 14.5" W

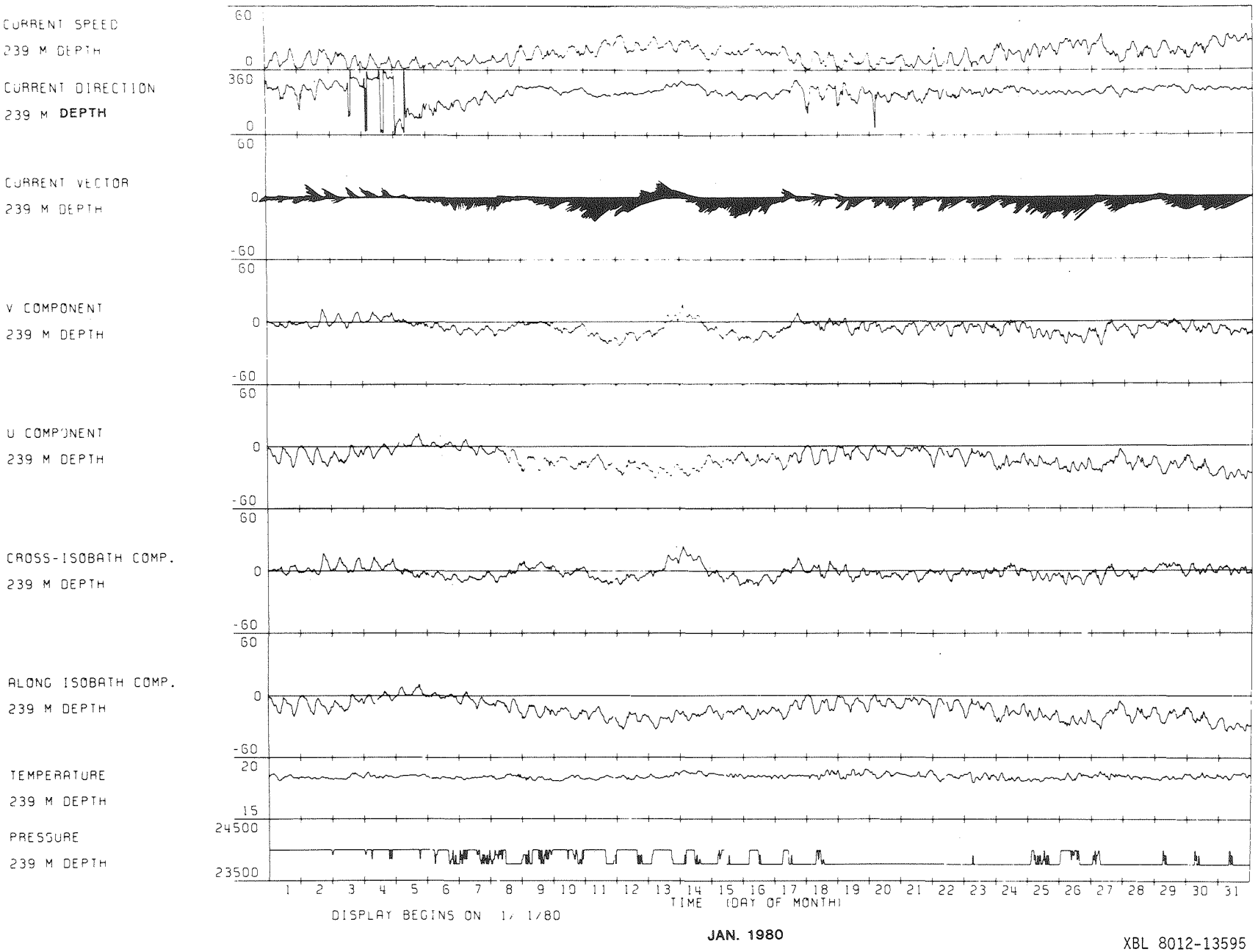

Figure 3-46d. Time series plot of currents, temperatures, and pressure from 239 m depth. at 17° 53' 49" N, 65° 45' 14.5" W

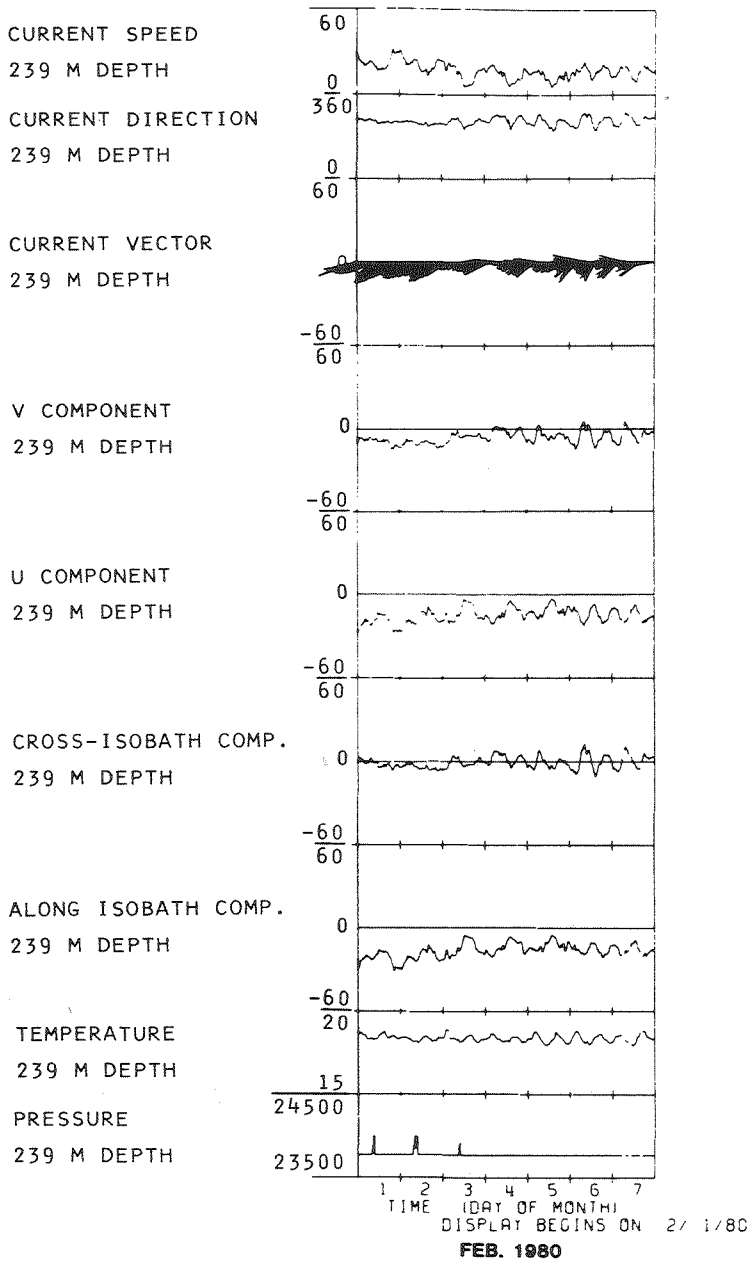

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Figure 3-46e. Time series plot of currents, temperatures, and pressure from 239 m depth. at 17° 53' 49" N, 65° 45' 14.5" W

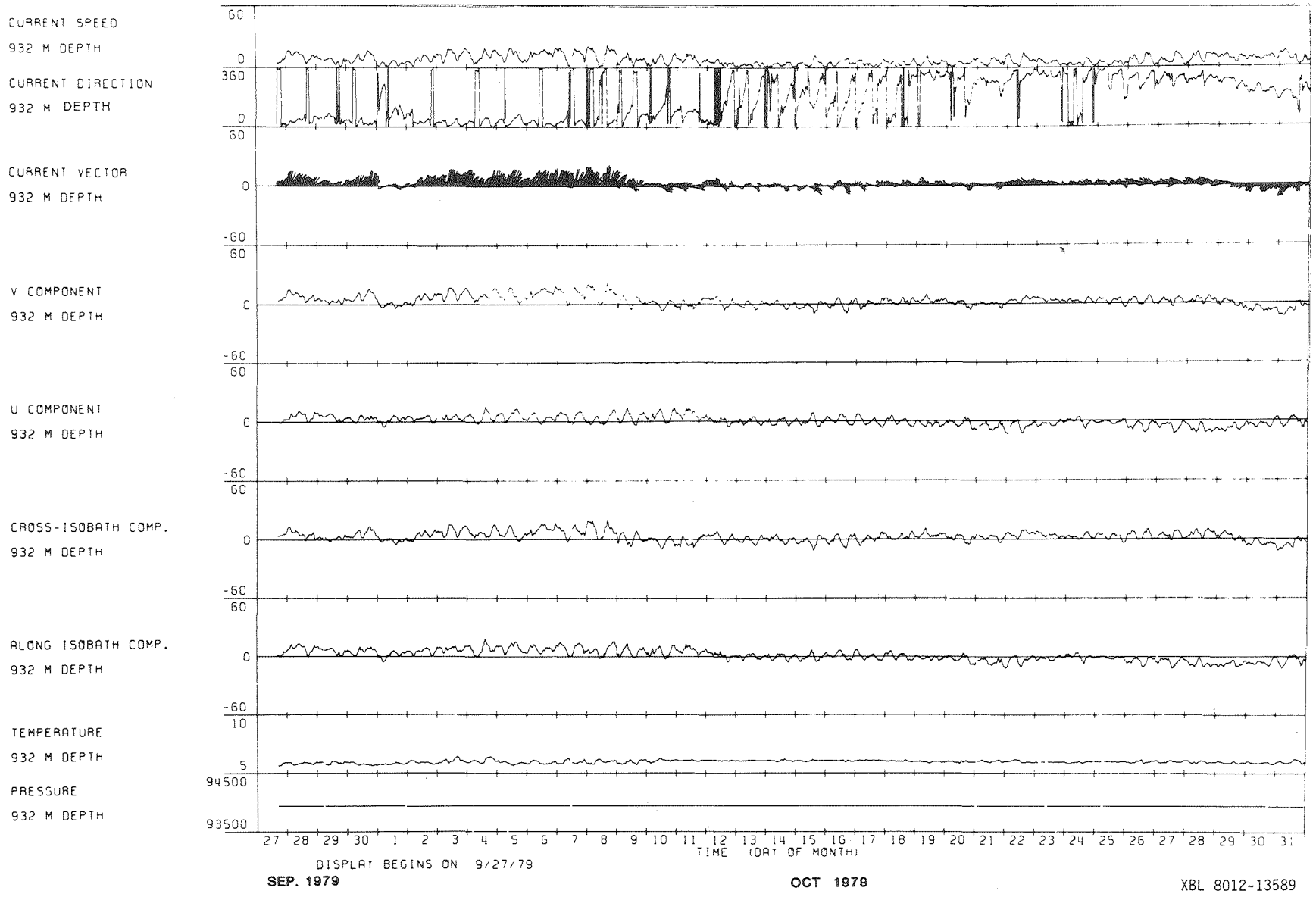

Figure 3-47a. Time series plot of currents, temperatures, and pressure from 932 m depth. at 17° 53' 49" N, 65° 45' 14.5" W

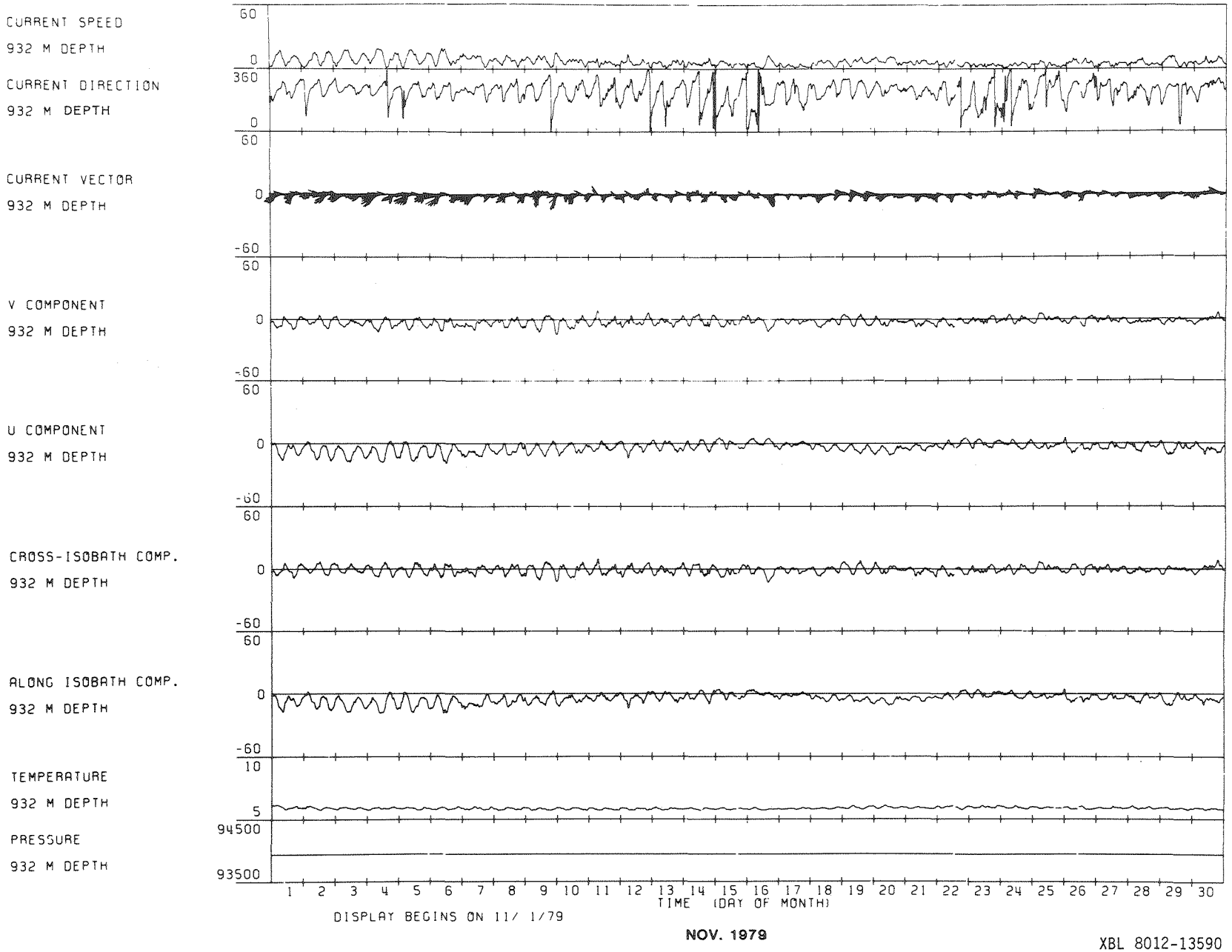

Figure 3-47b. Time series plot of currents, temperatures, and pressure from 932 m depth. at 17° 53' 49" N, 65° 45' 14.5" W

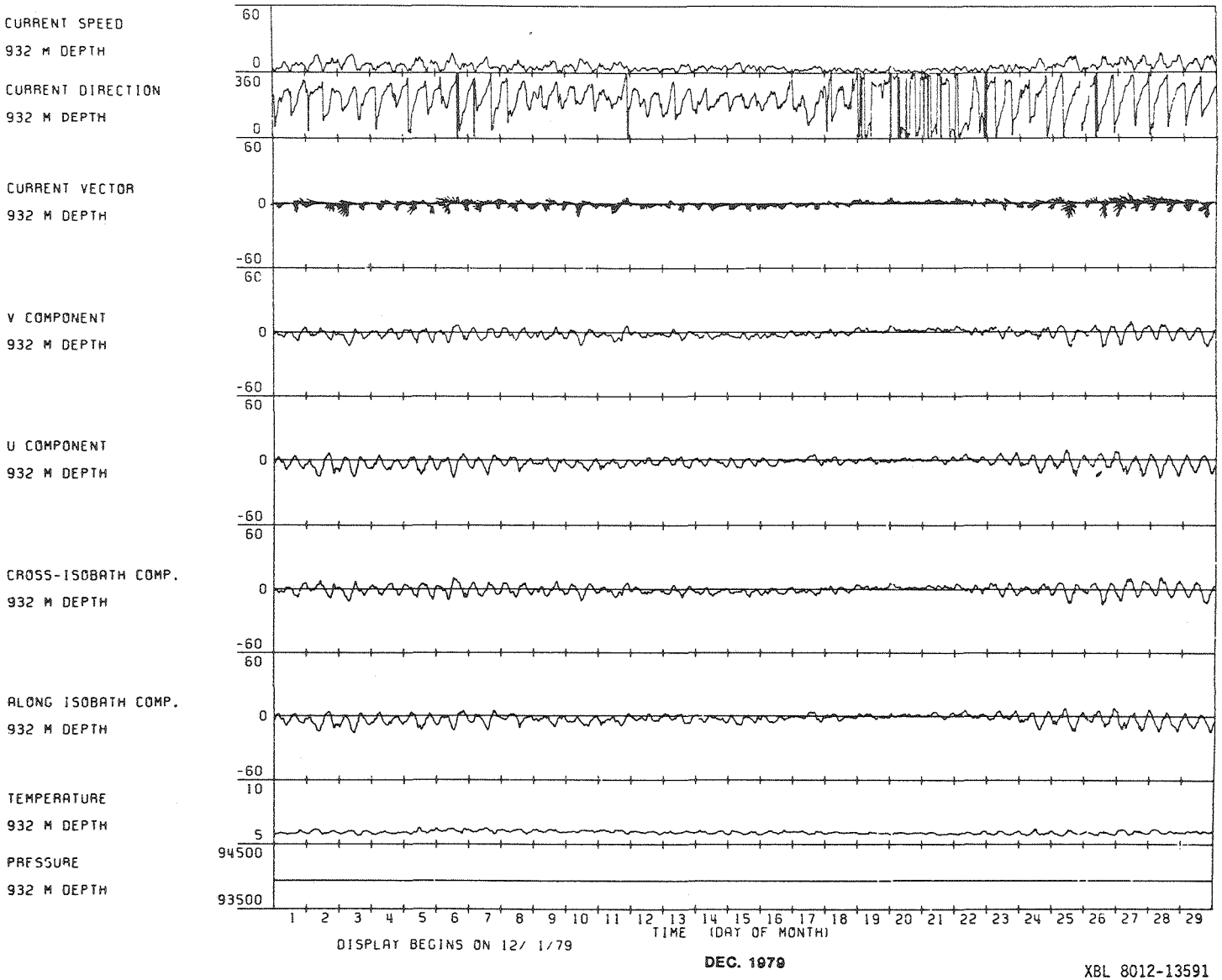

Figure 3-47c. Time series plot of currents, temperatures, and pressure from 932 m depth. at 17° 53' 49" N, 65° 45' 14.5" W

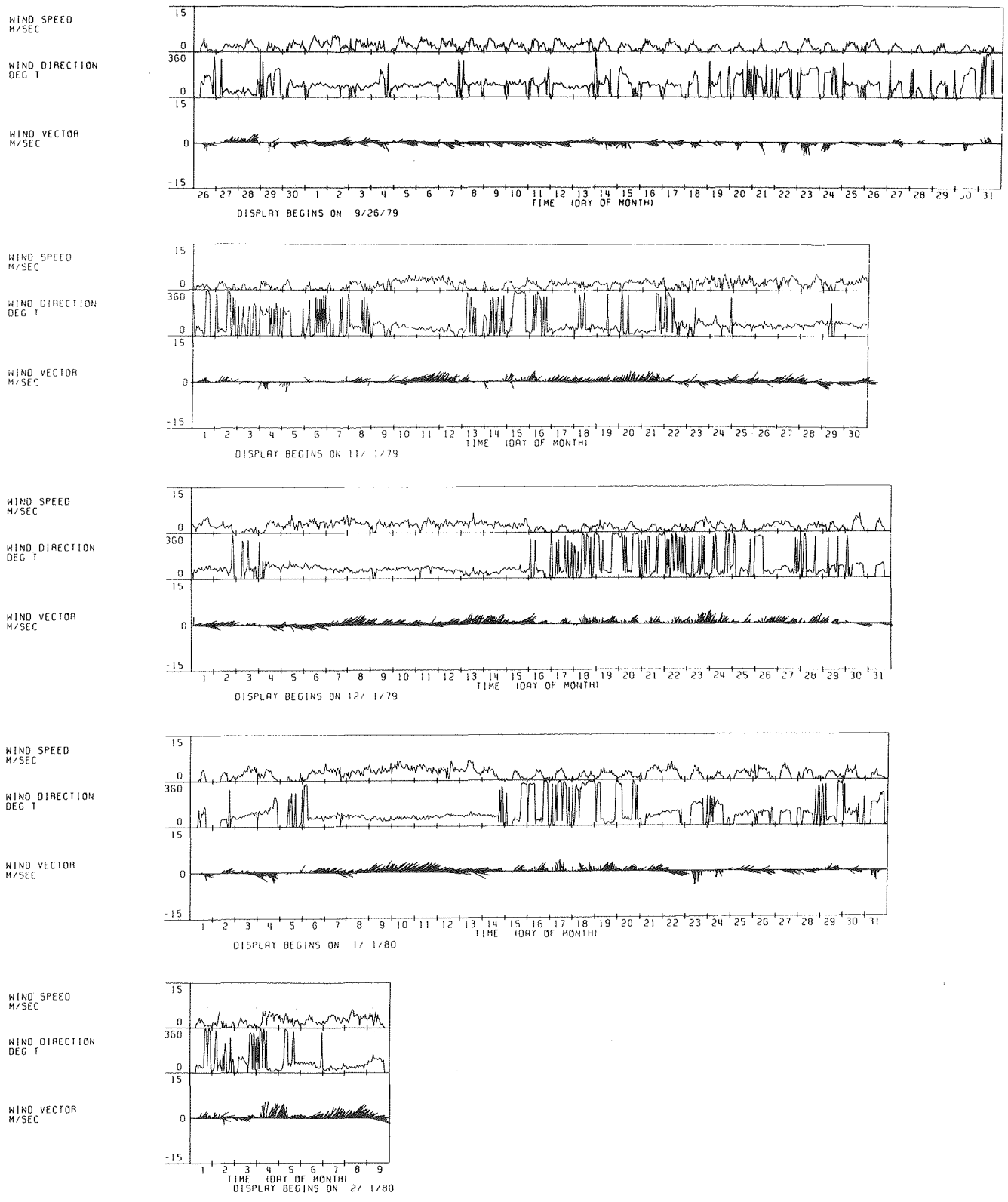

Figure 3-48. Time series plot of wind velocity measured at Roosevelt Roads.

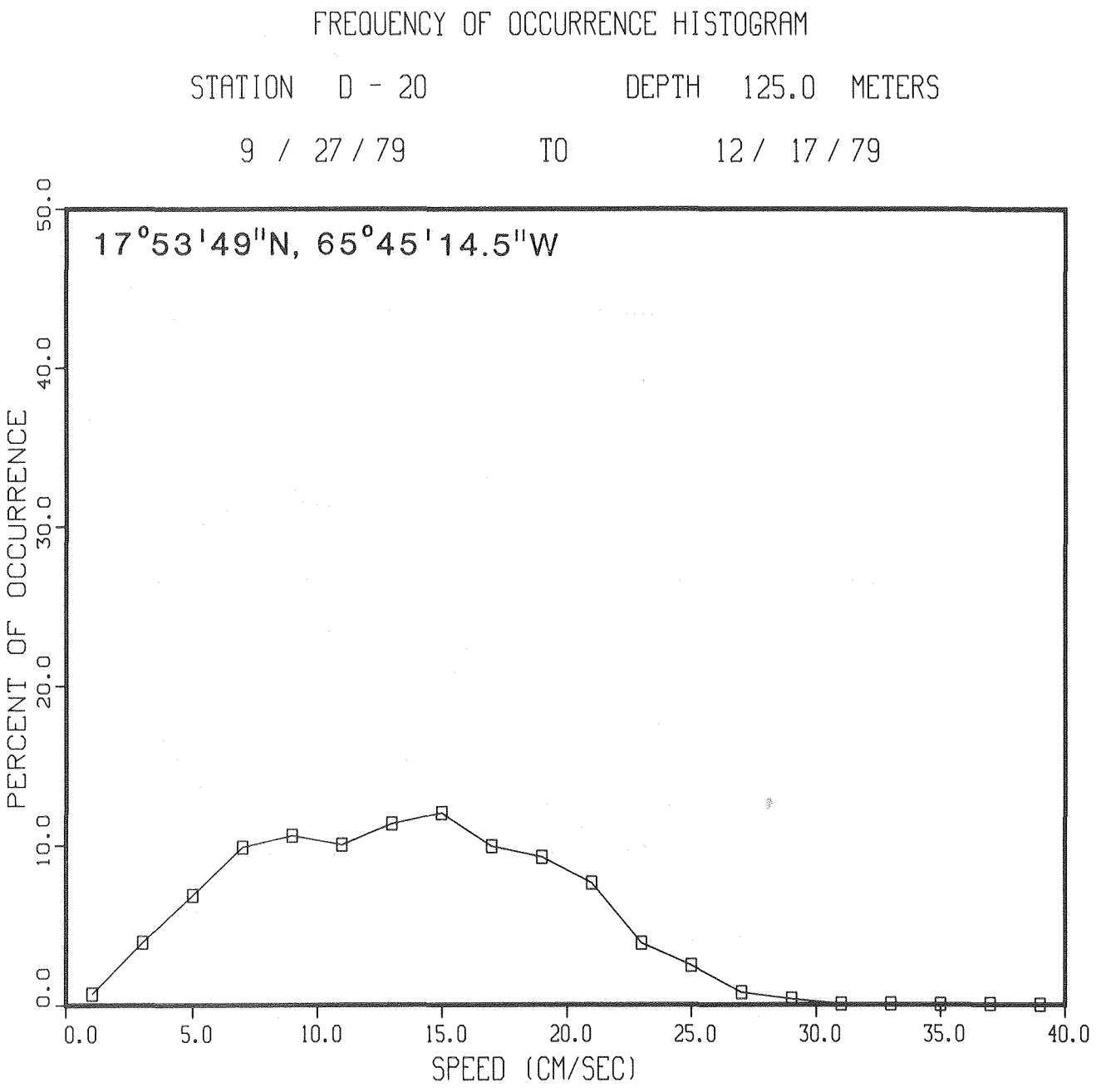

Figure 3-49. Current histogram showing speed versus percent occurrence for 125 m depth.

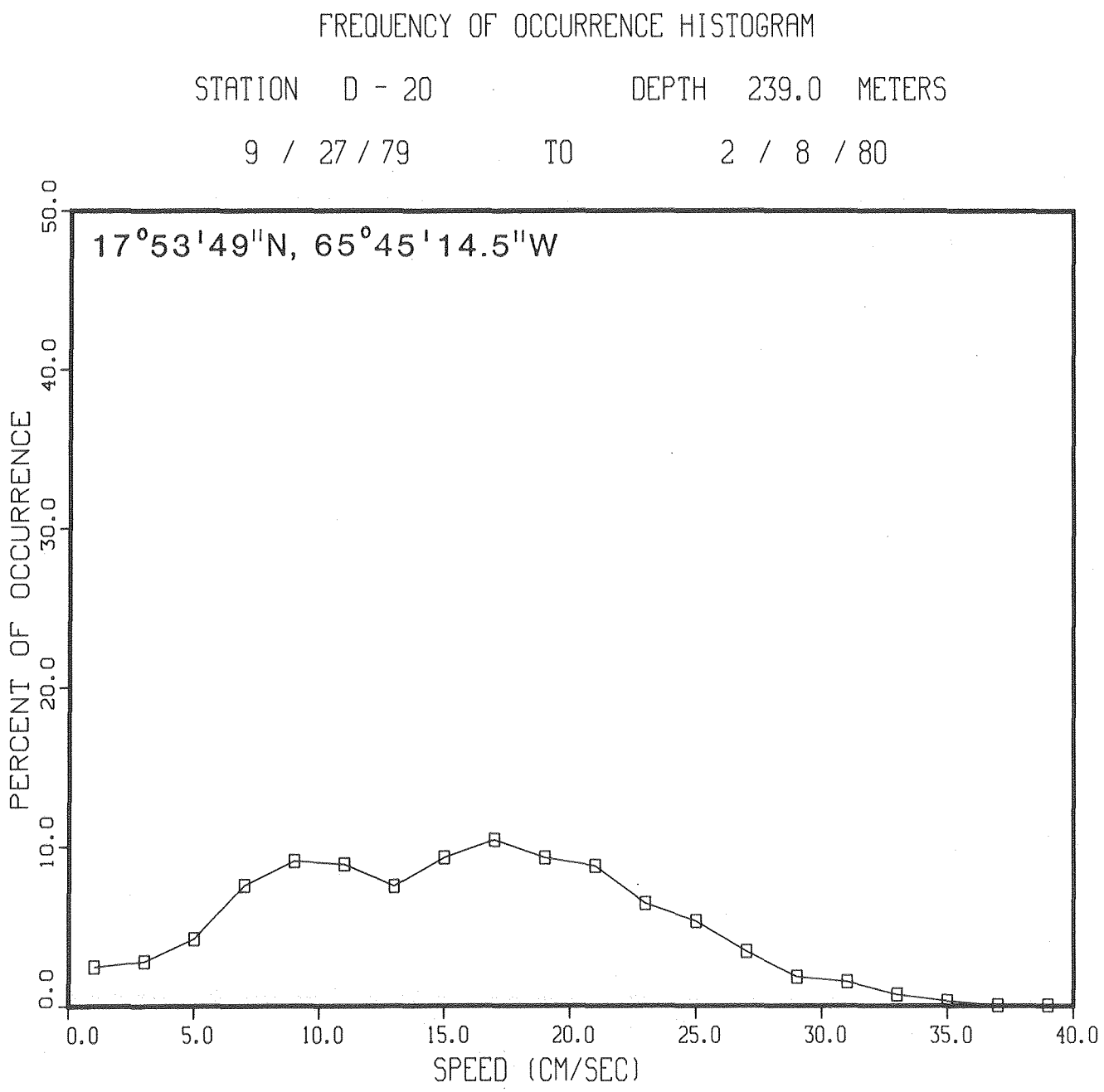

Figure 3-50. Current histogram showing speed versus percent occurrence for 239 m depth.

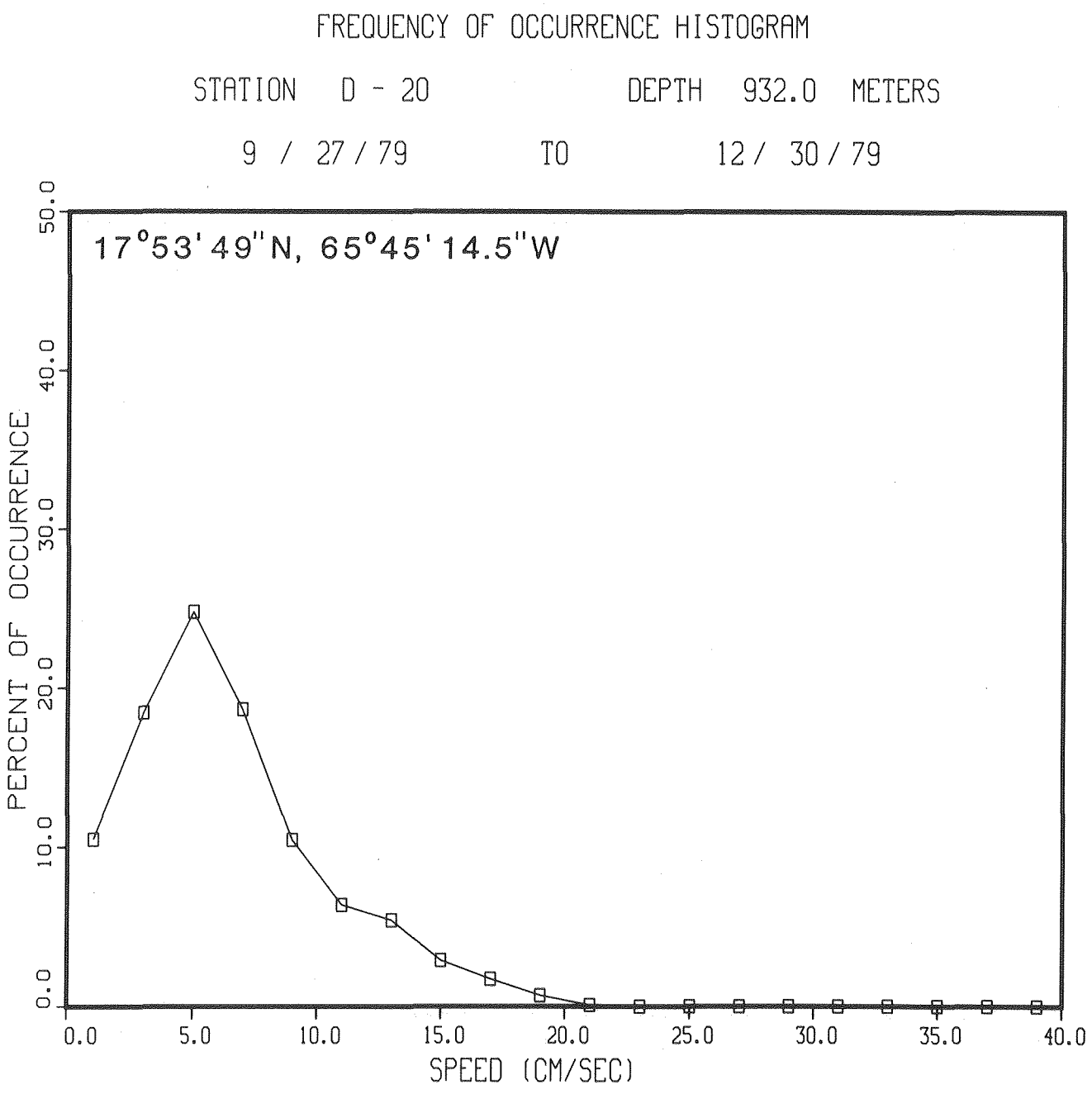

Figure 3-51. Current histogram showing speed versus percent occurrence for 932 m depth.

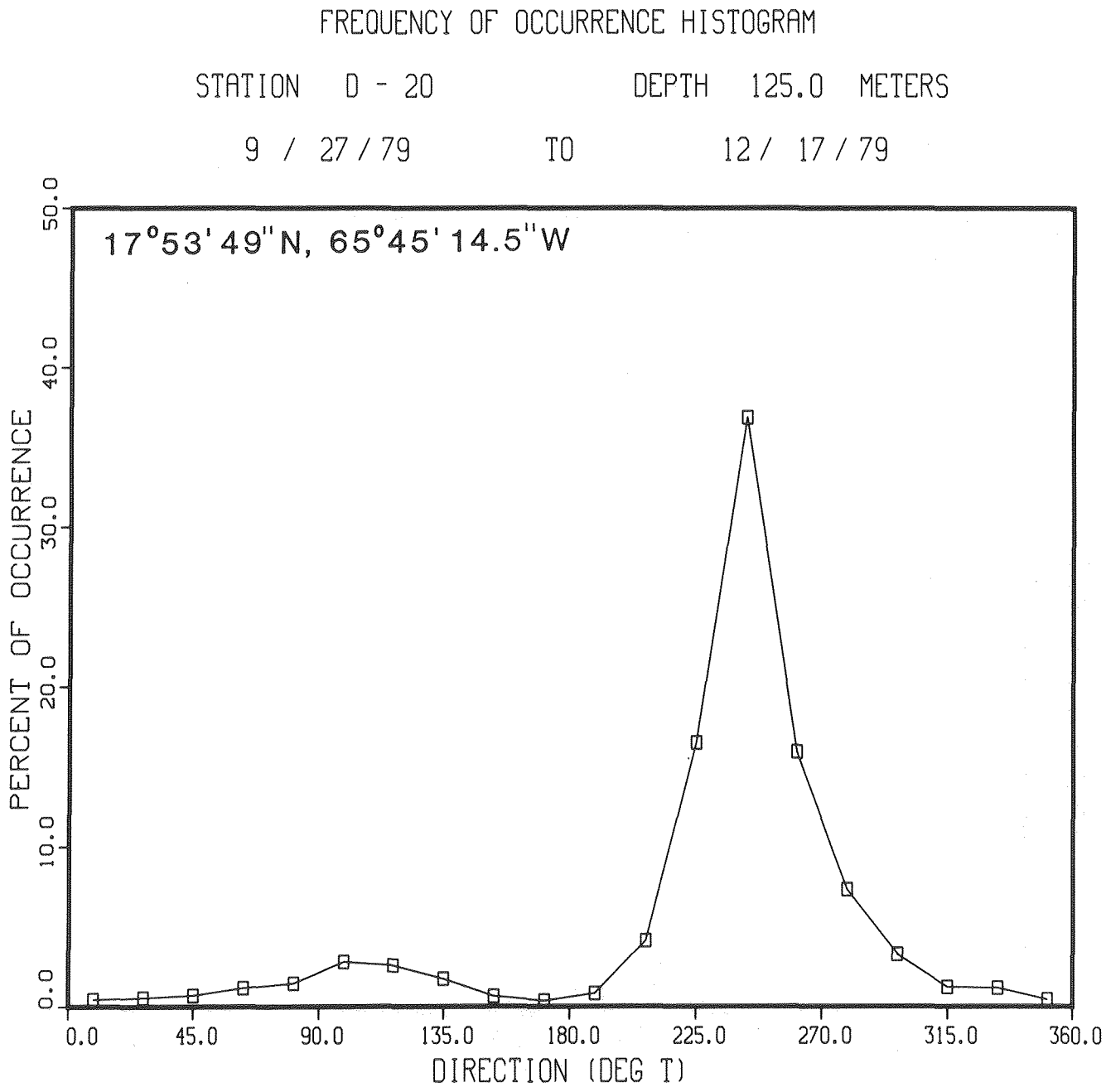

Figure 3-52. Current histogram showing direction versus percent occurrence for 125 m depth.

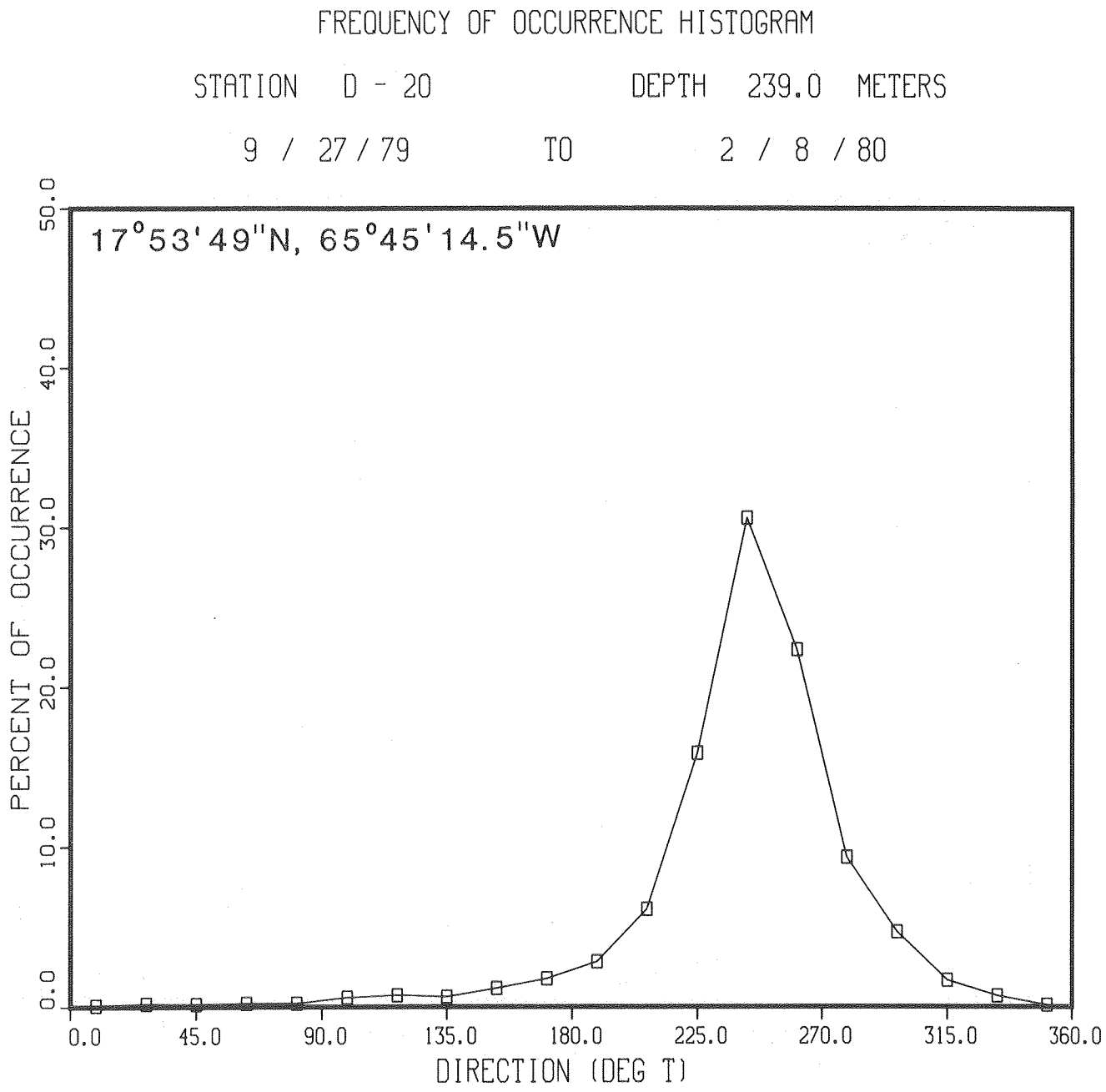

Figure 3-53. Current histogram showing direction versus percent occurrence for 239 m depth.

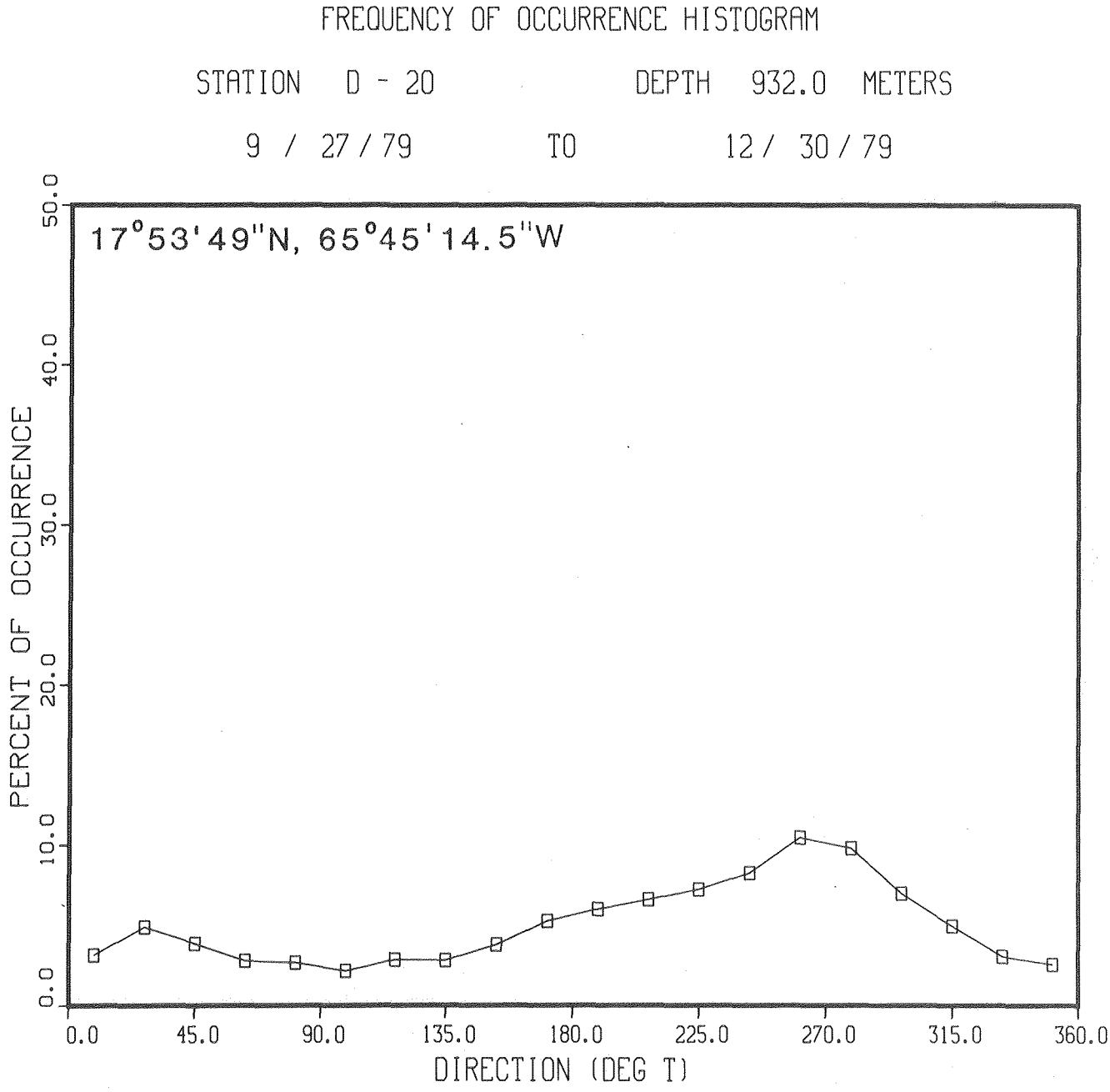

Figure 3-54. Current histogram showing direction versus percent occurrence for 932 m depth.

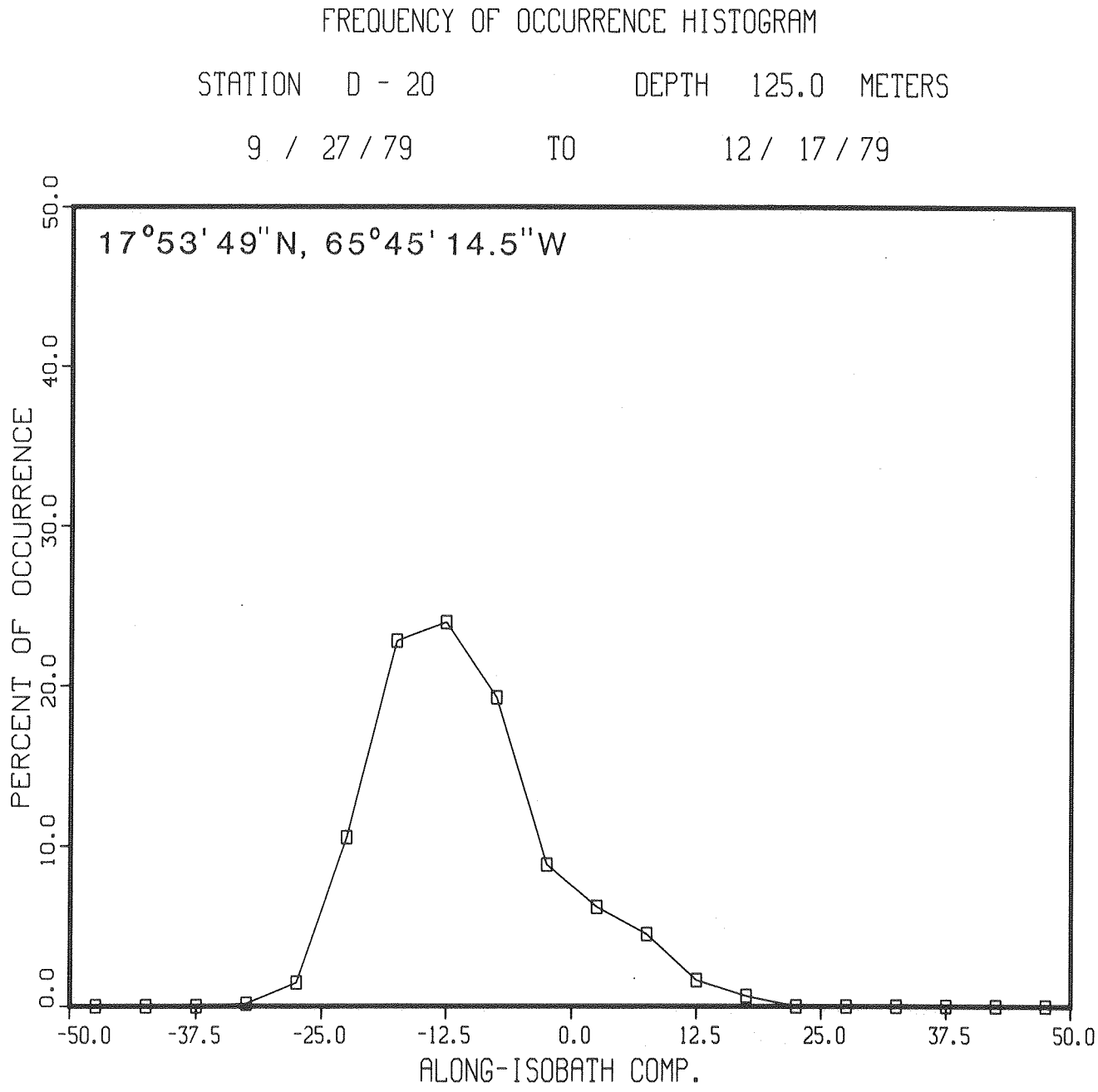

Figure 3-55. Current histogram showing along-isobath component of velocity for 125 m depth.

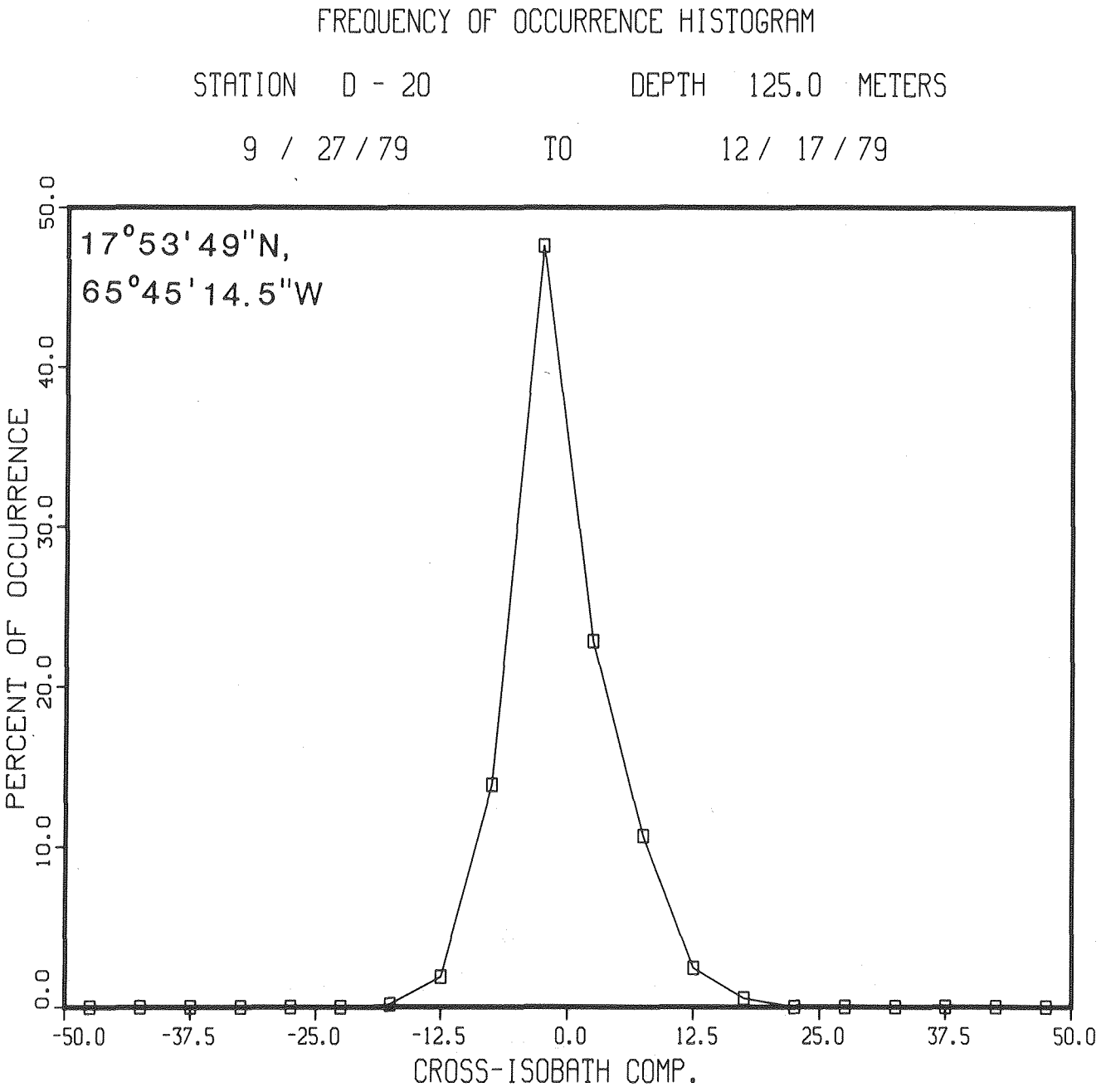

Figure 3-56. Current histogram showing cross-isobath component of velocity for 125 m depth.

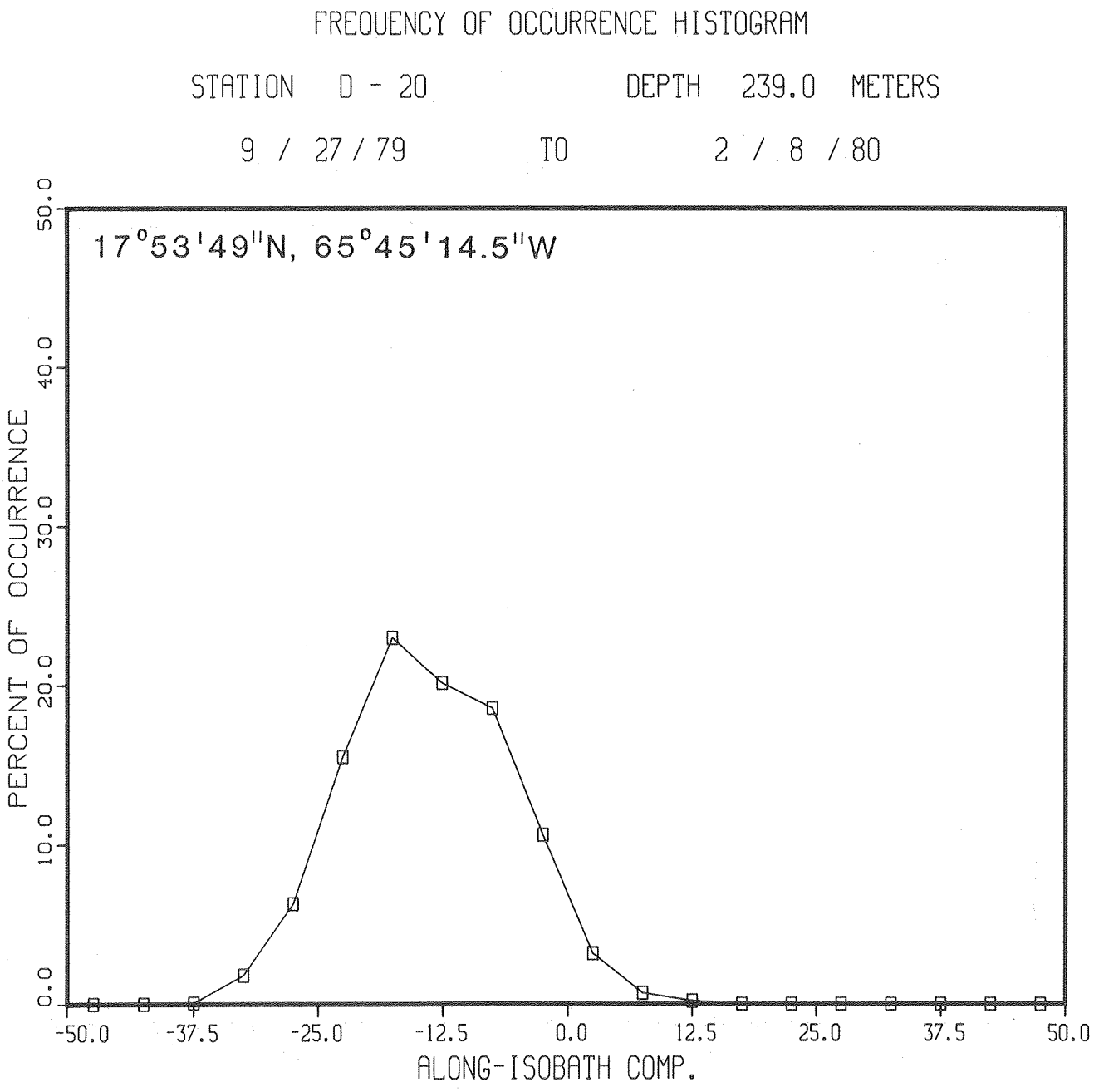

Figure 3-57. Current histogram showing along-isobath component of velocity for 239 m depth.

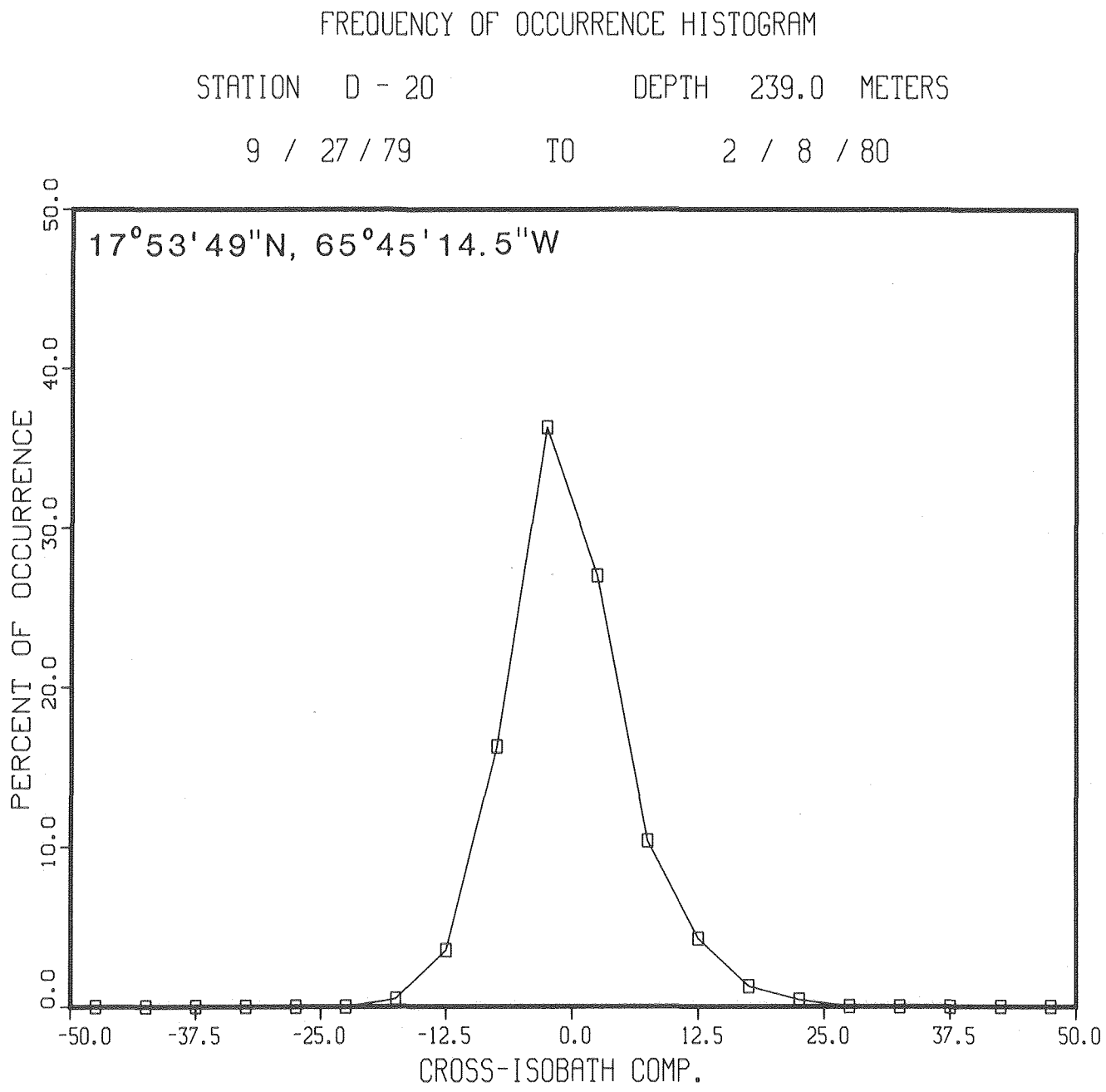

Figure 3-58. Current histogram showing cross-isobath component of velocity for 239 m depth.

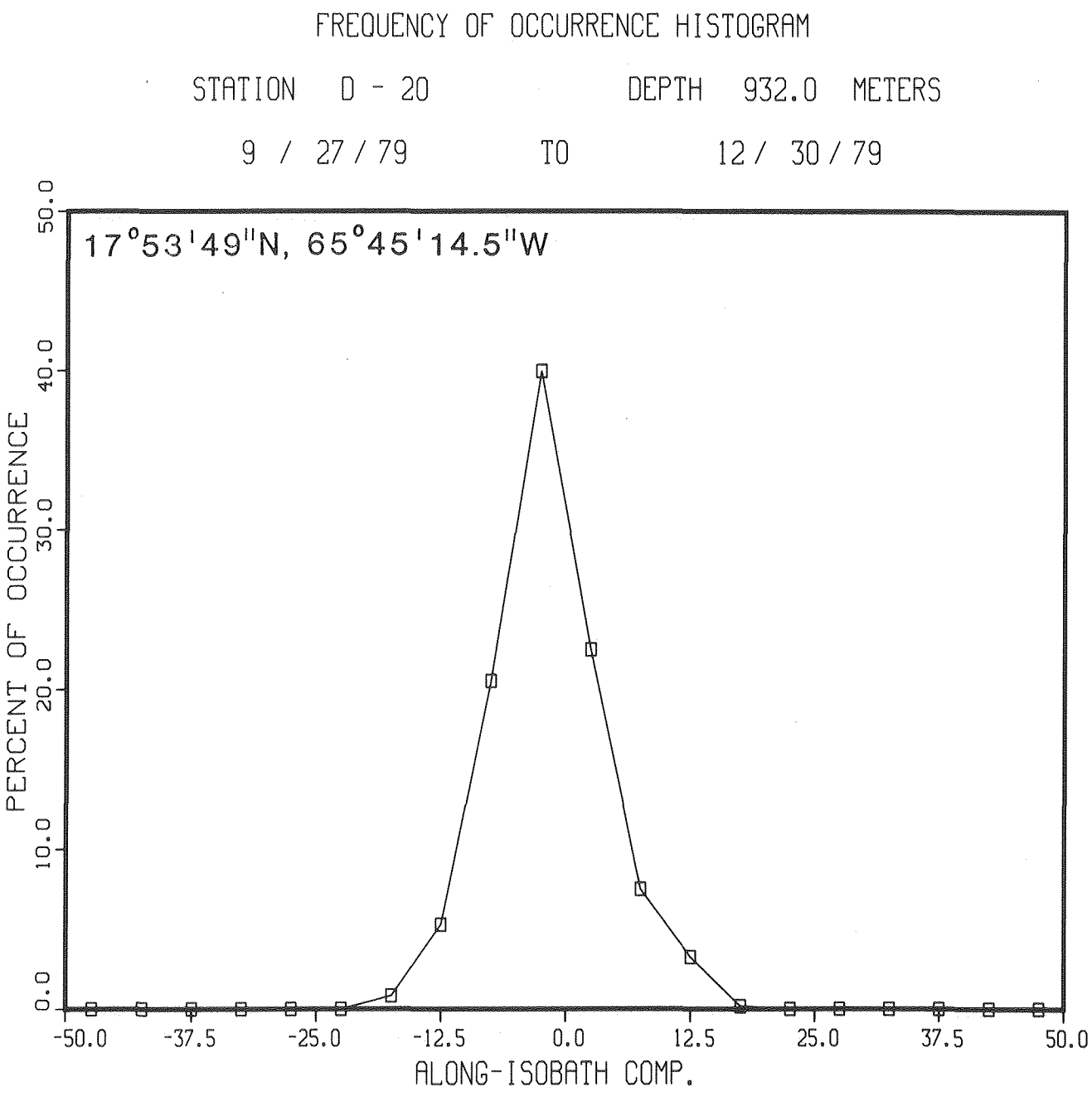

Figure 3-59. Current histogram showing along-isobath component of velocity for 932 m depth.

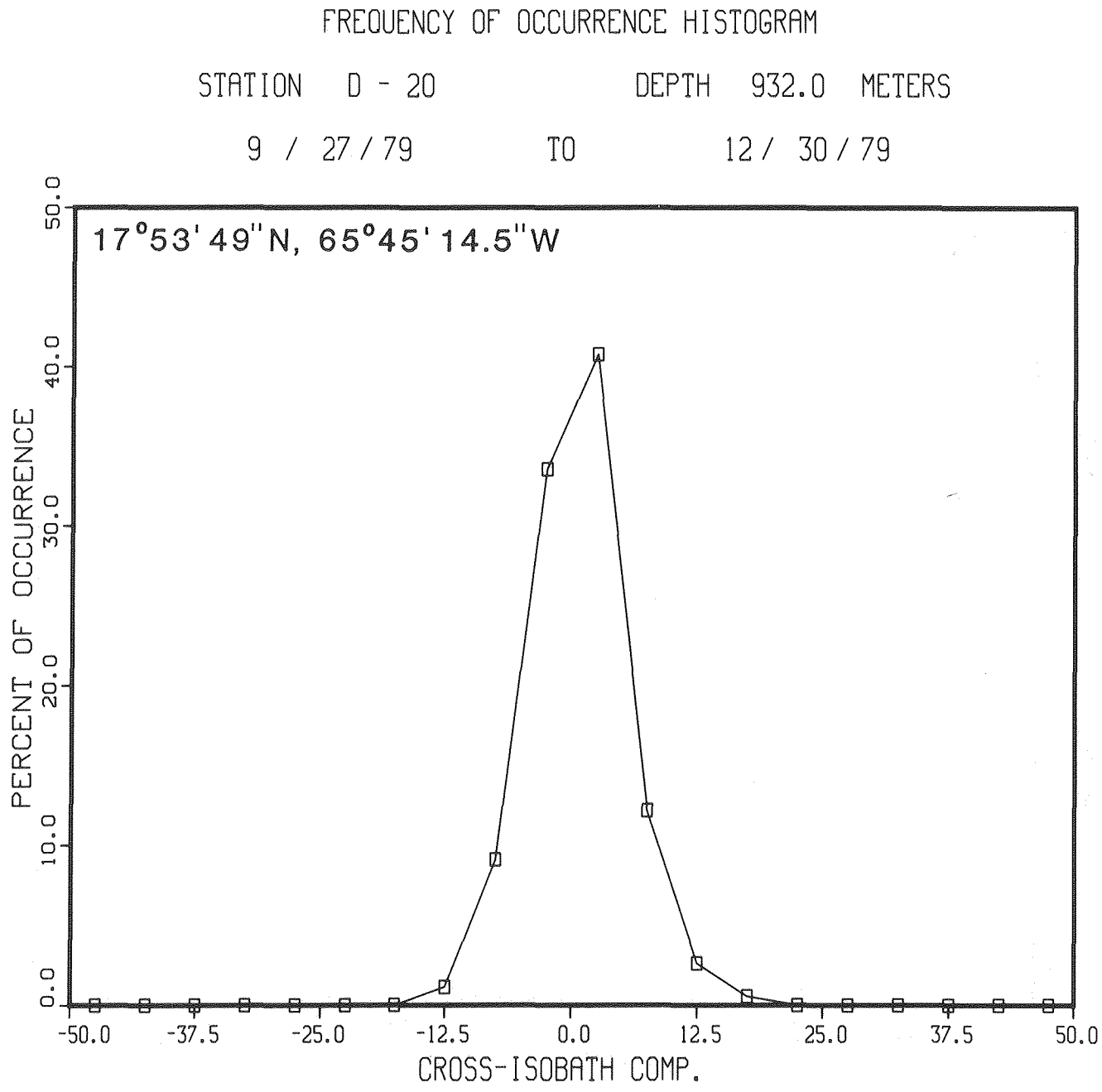

Figure 3-60. Current histogram showing cross-isobath component of velocity for 932 m depth.

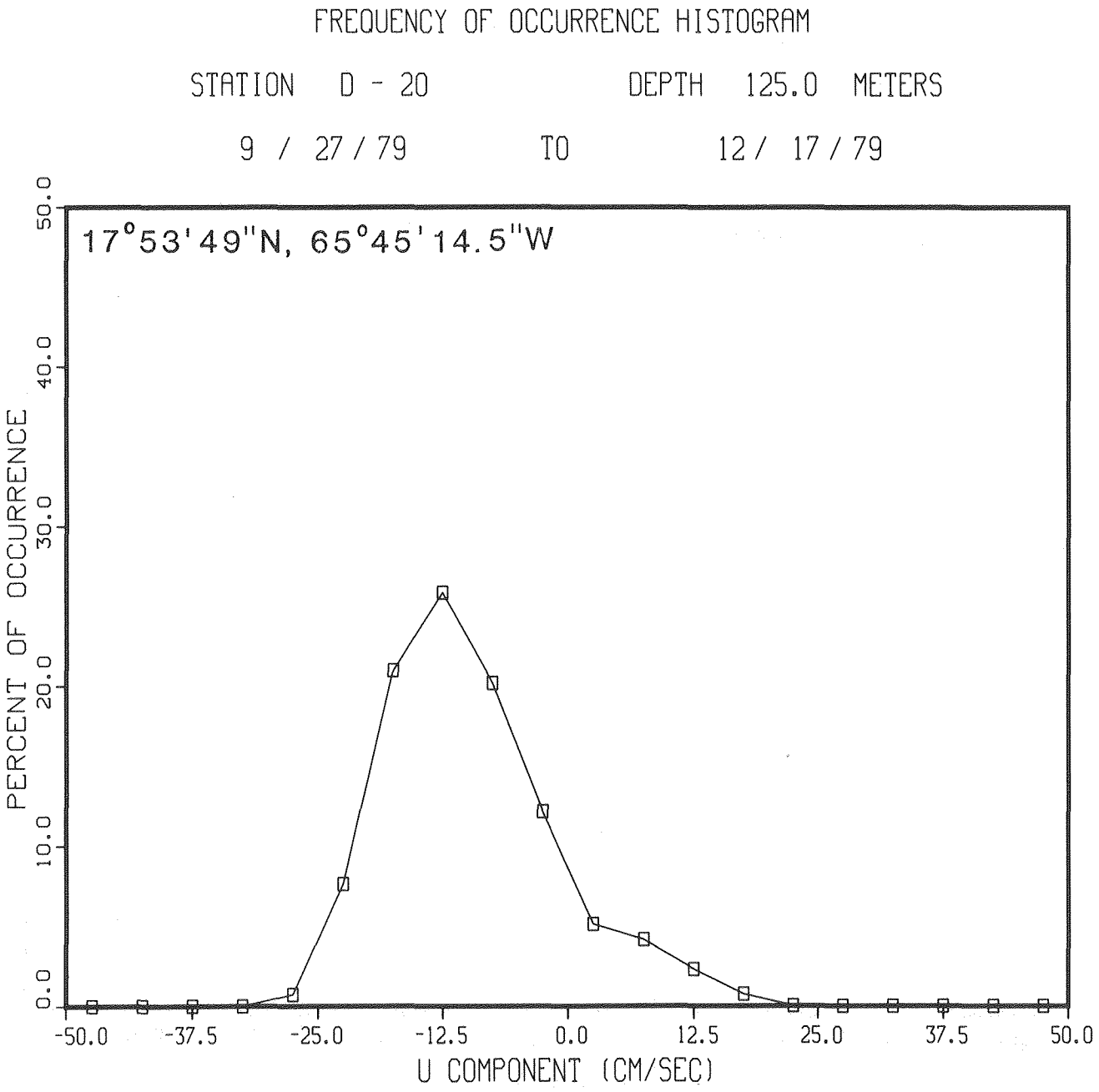

Figure 3-61. Current histogram showing east component of velocity for 125 m depth.

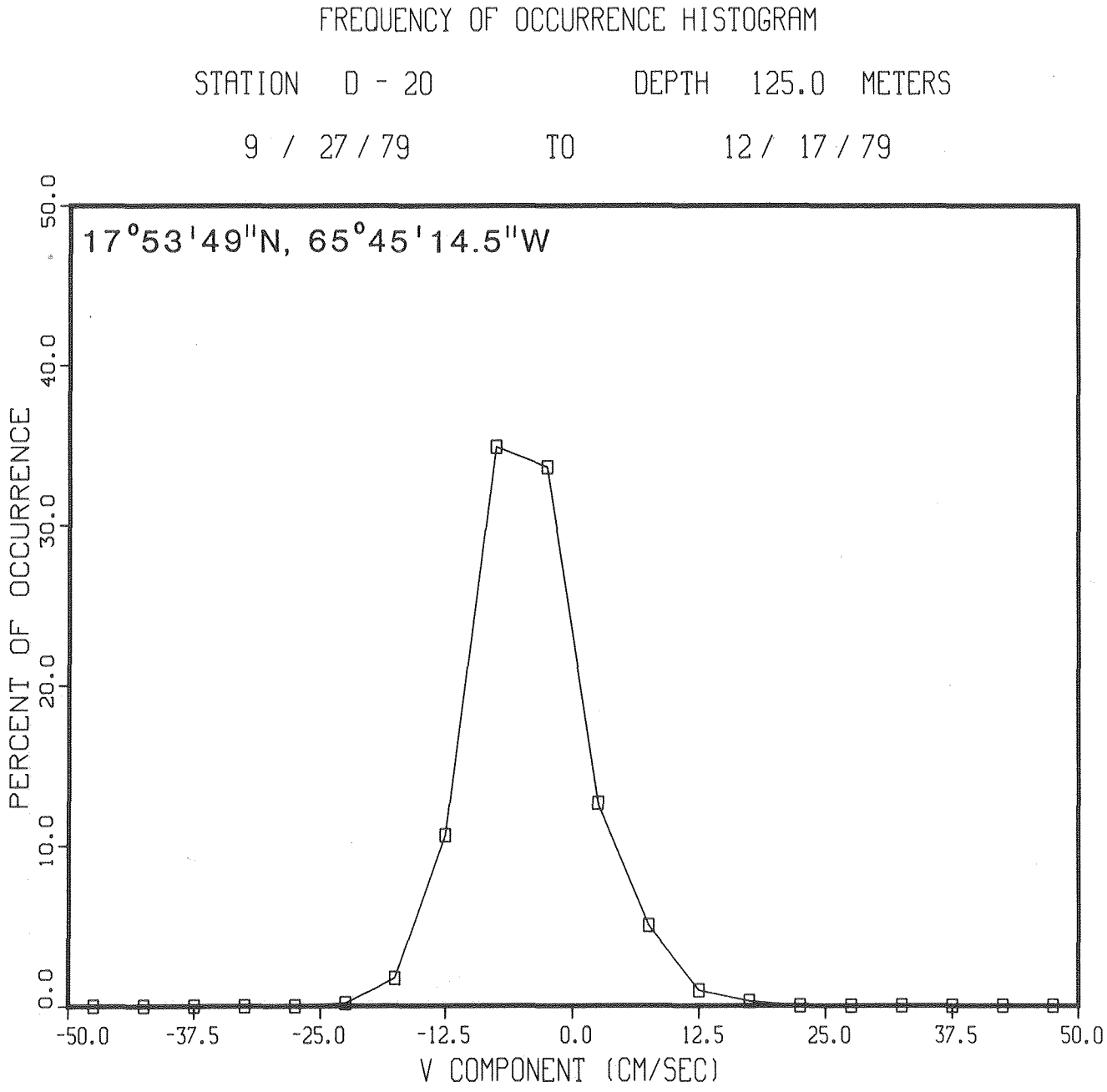

Figure 3-62. Current histogram showing north component of velocity for 125 m depth.

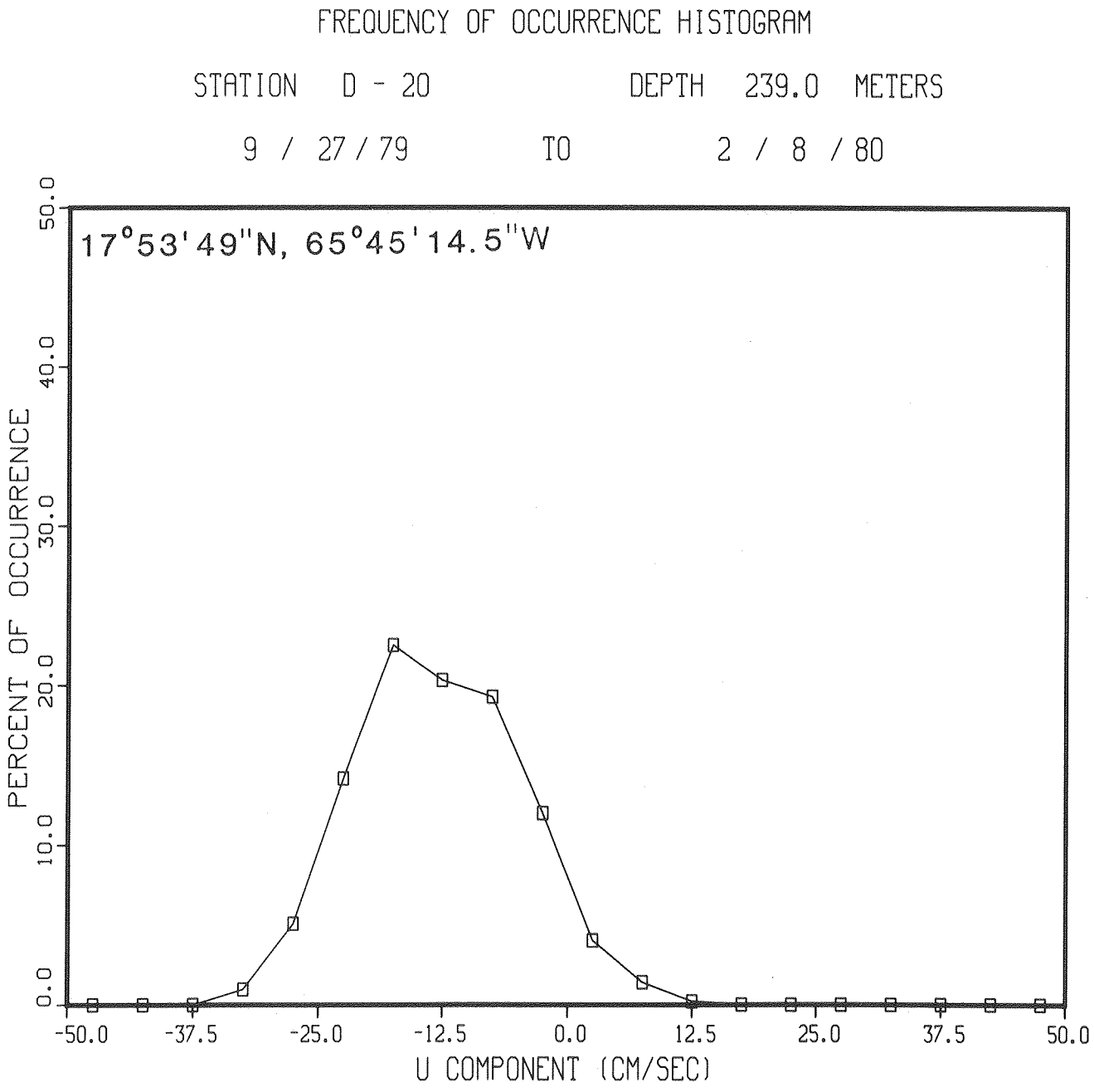

Figure 3-63. Current histogram showing east component of velocity for 239 m depth.

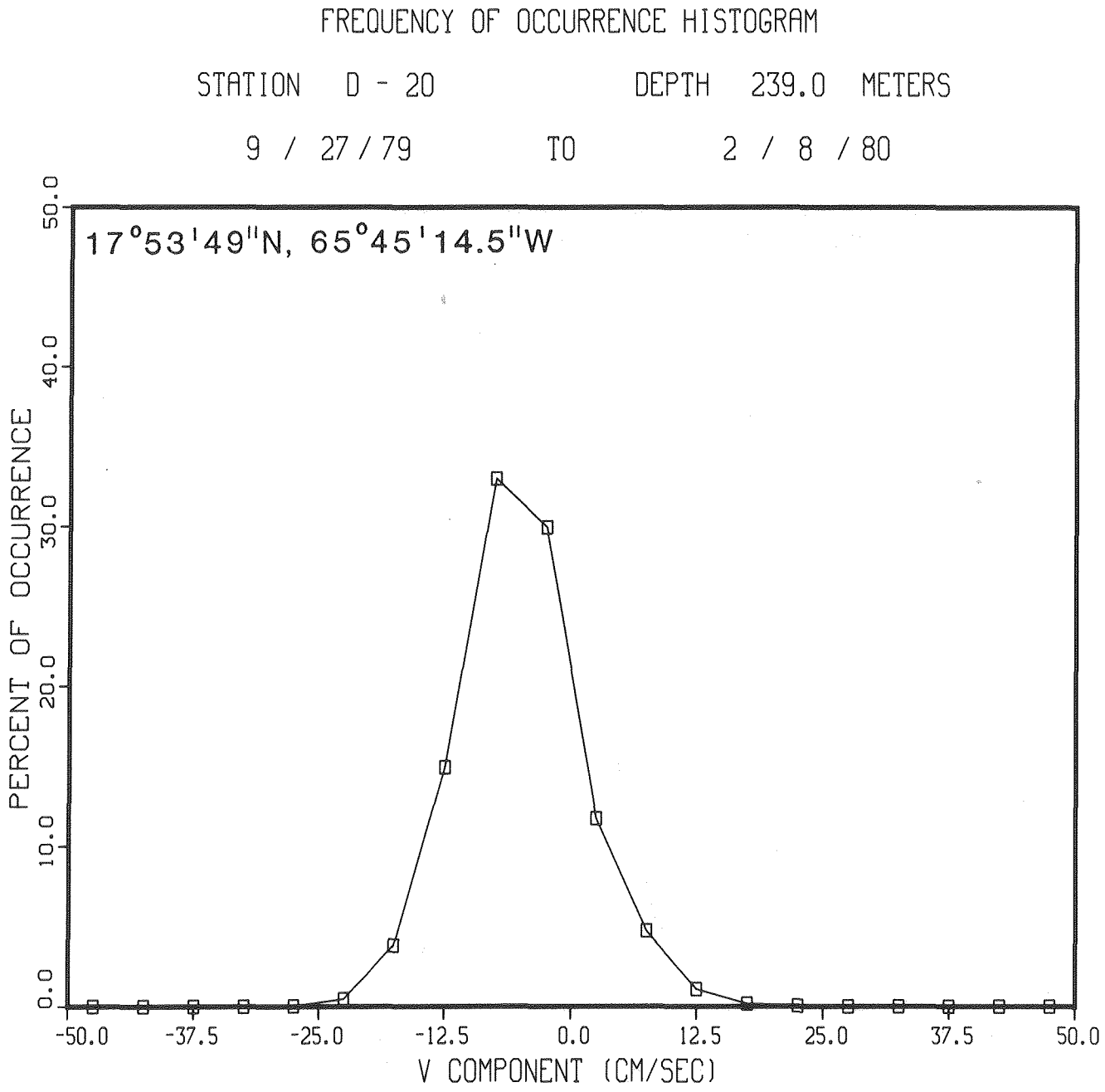

Figure 3-64. Current histogram showing north component of velocity for 239 m depth.

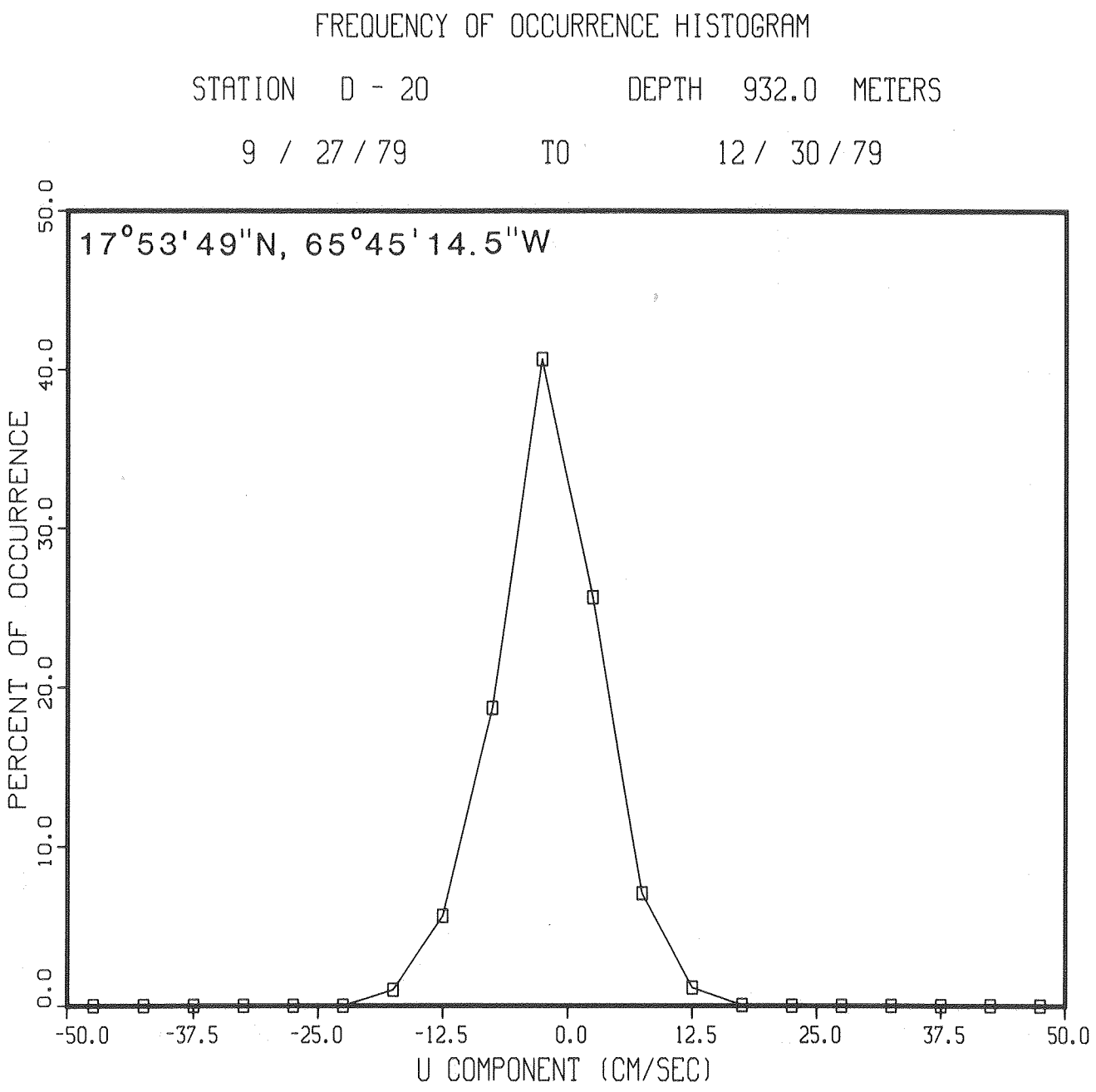

Figure 3-65. Current histogram showing east component of velocity for 932 m depth.

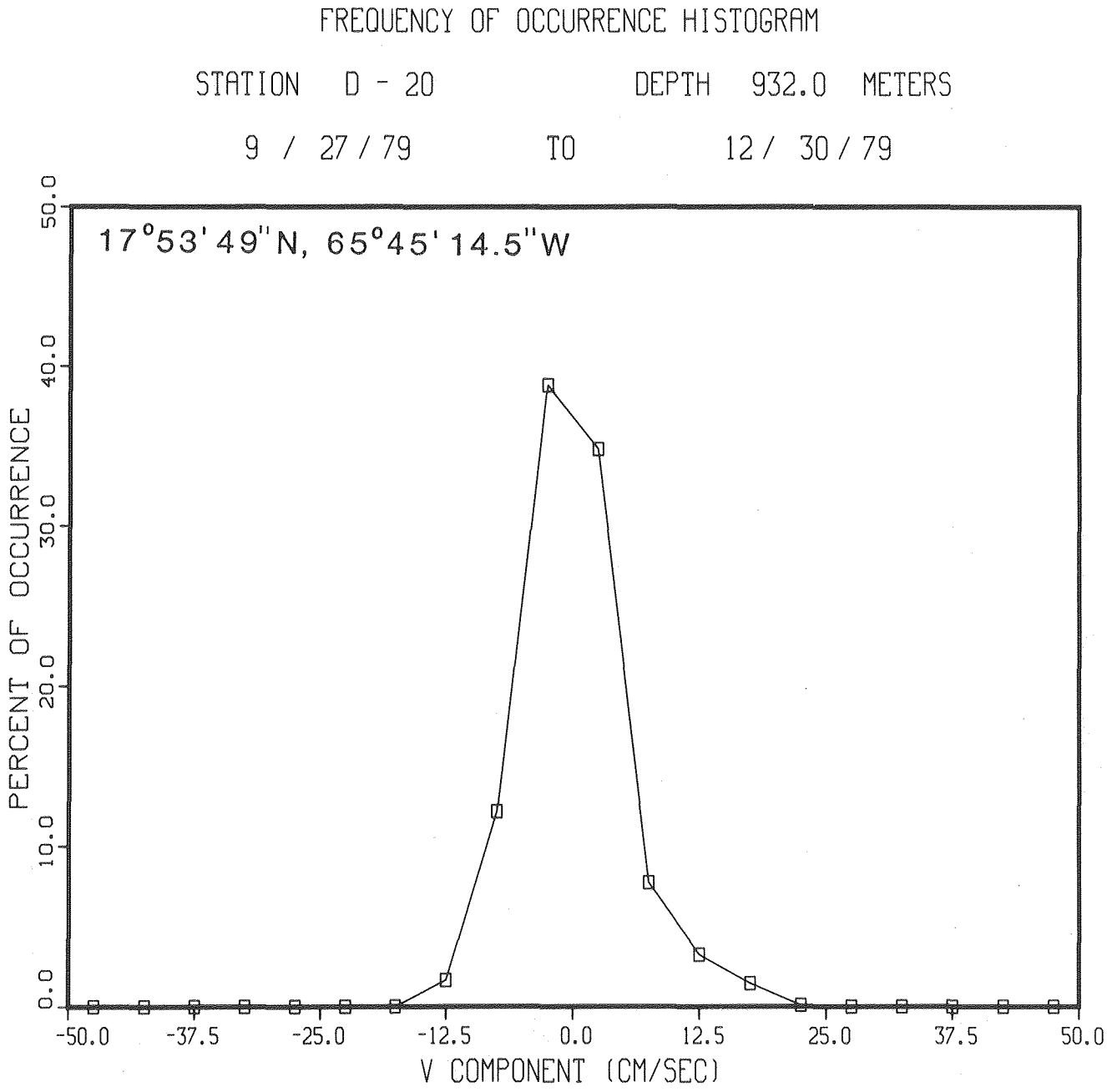

Figure 3-66. Current histogram showing north component of velocity for 932 m depth.

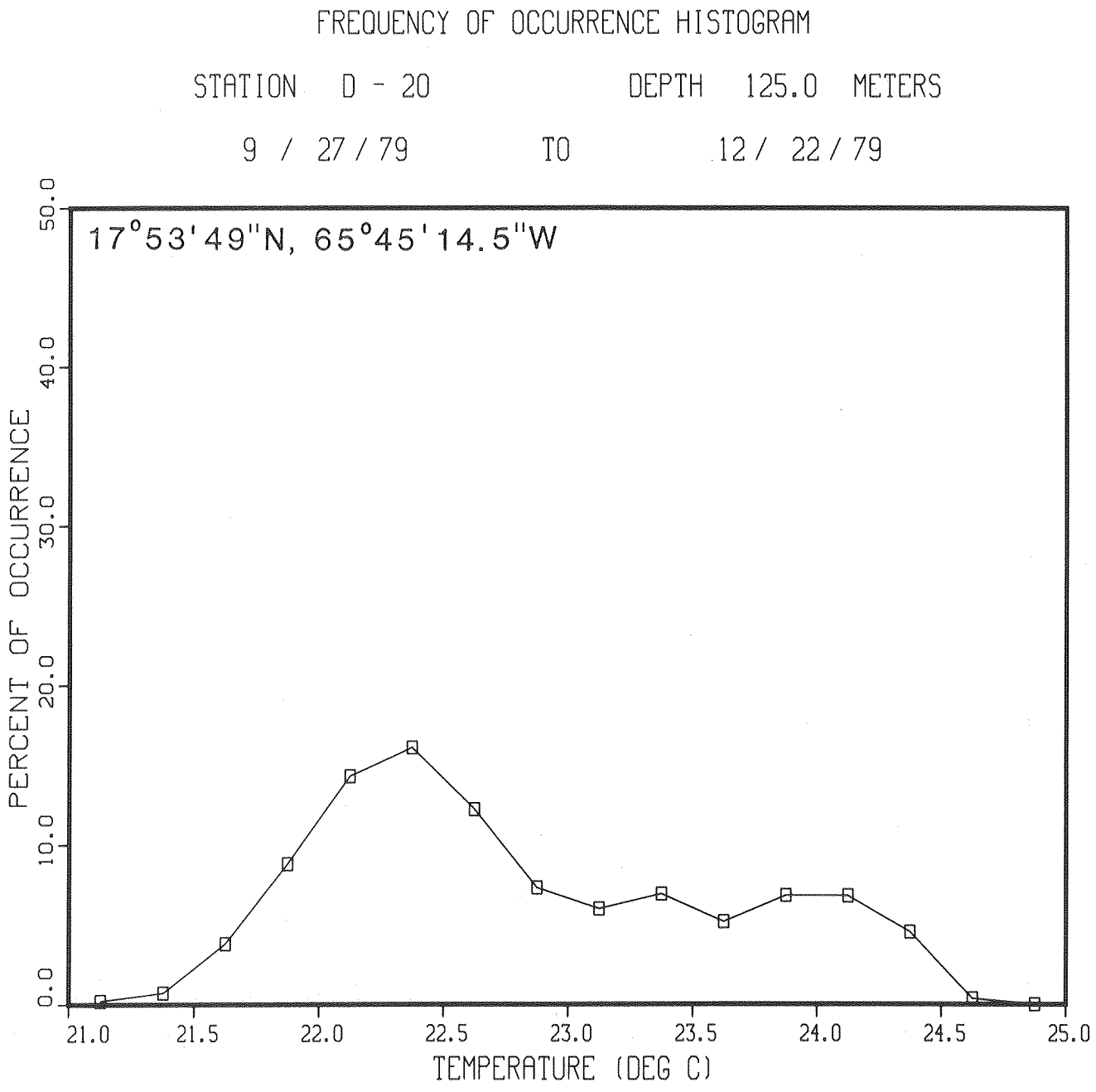

Figure 3-67. Histogram of temperatures measured at 125 m depth.

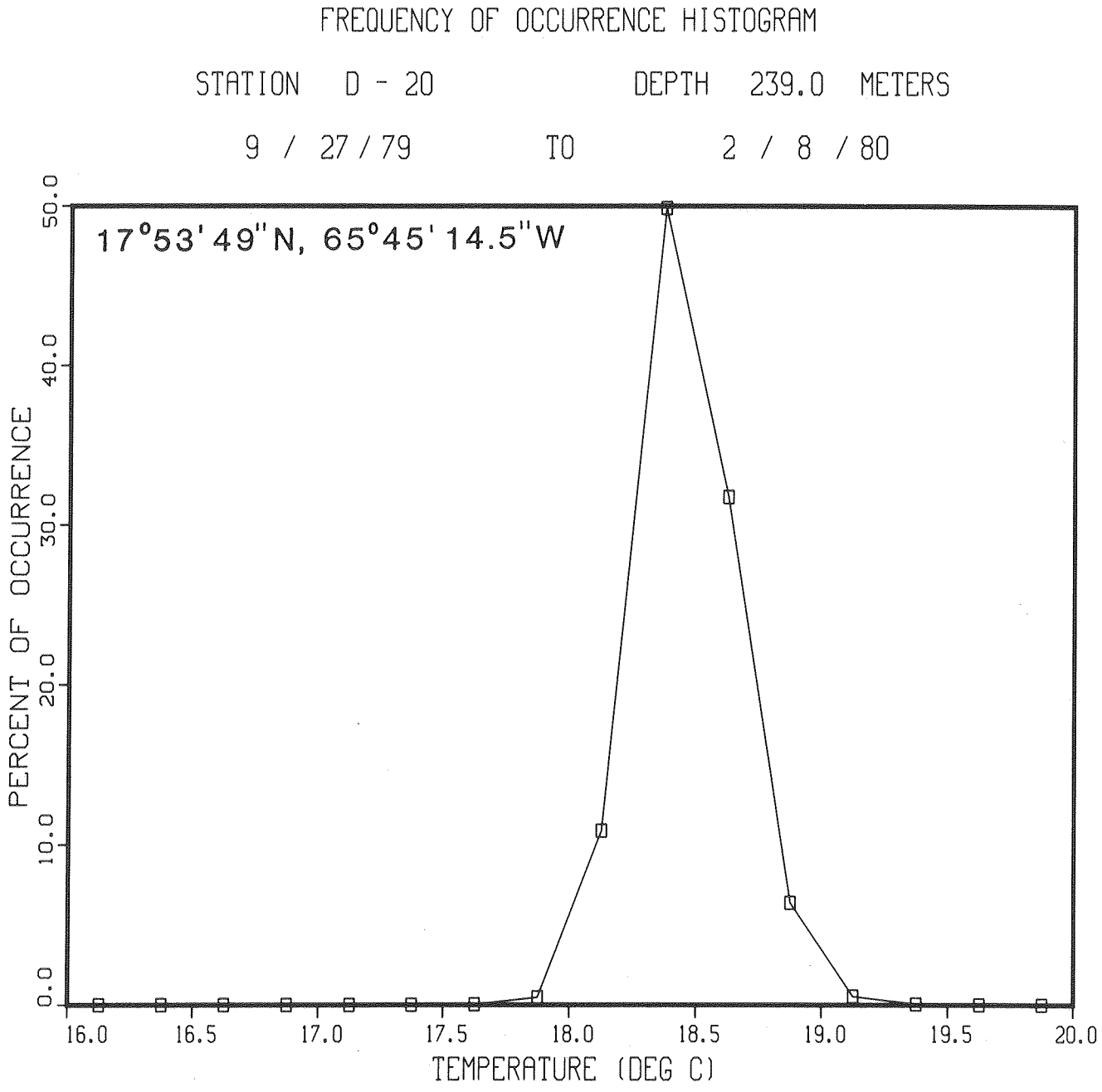

Figure 3-68. Histogram of temperatures measured at 239 m depth.

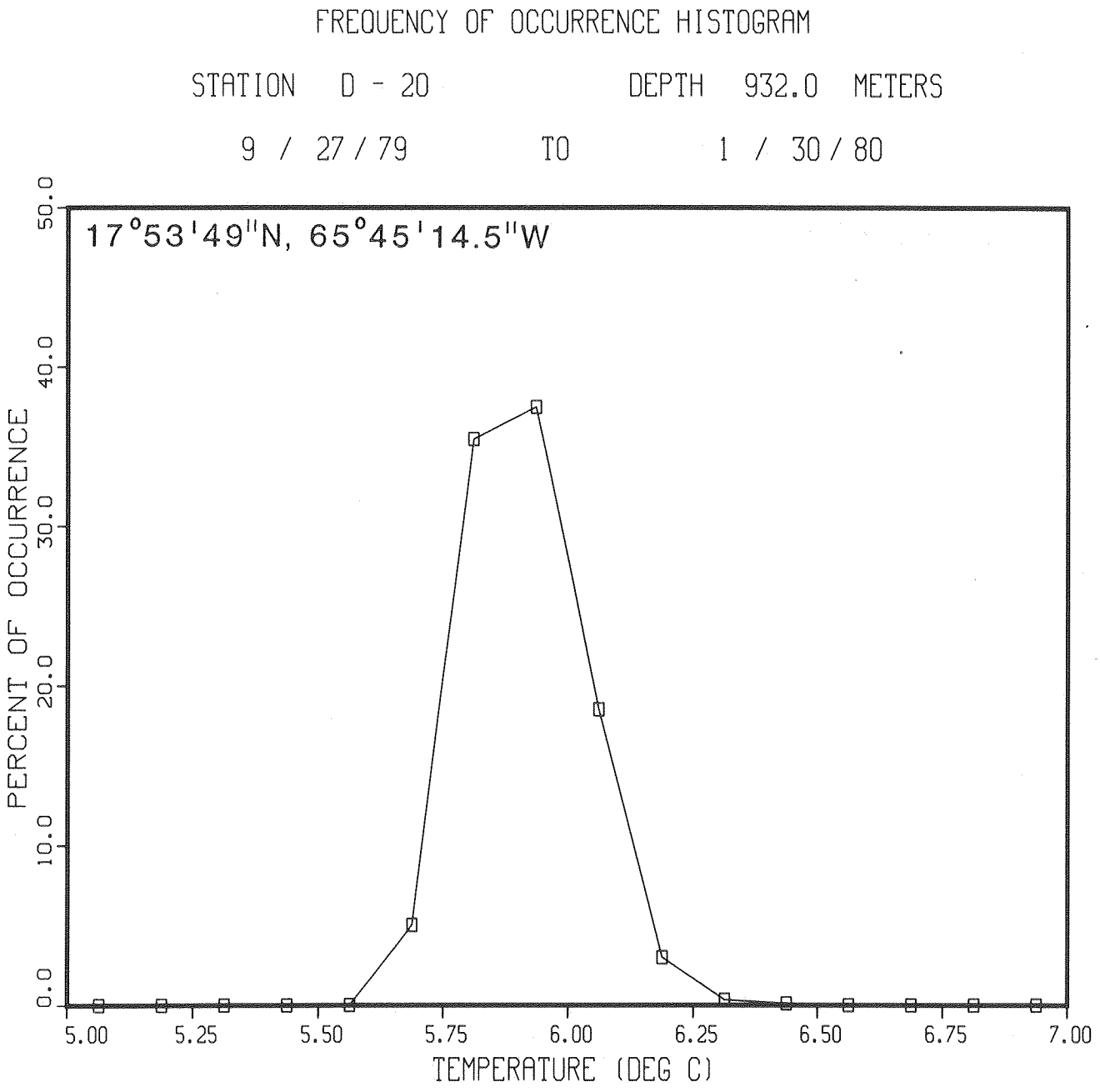

Figure 3-69. Histogram of temperatures measured at 932 m depth.

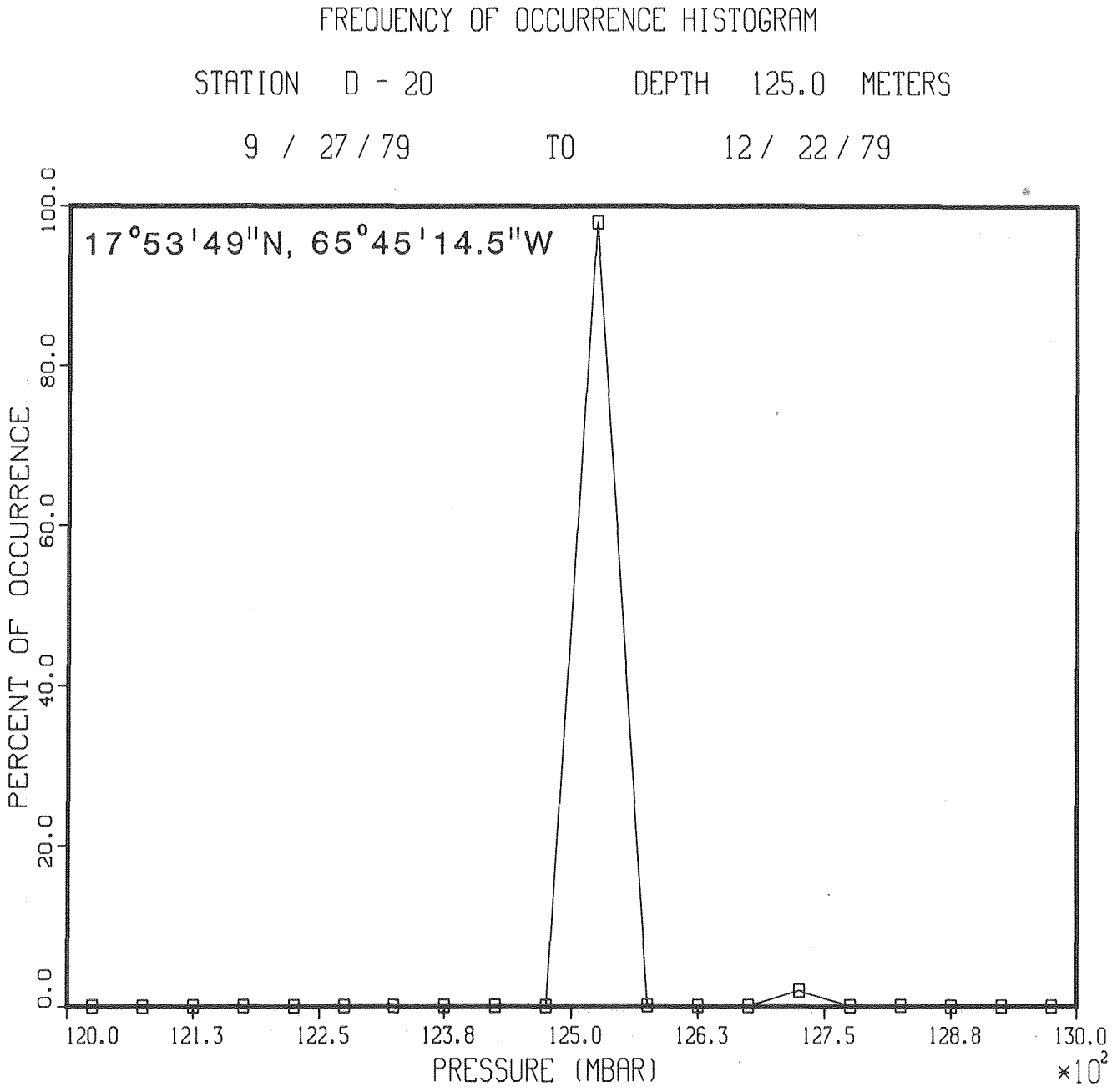

Figure 3-70. Histogram of pressures measured at 125 m depth.

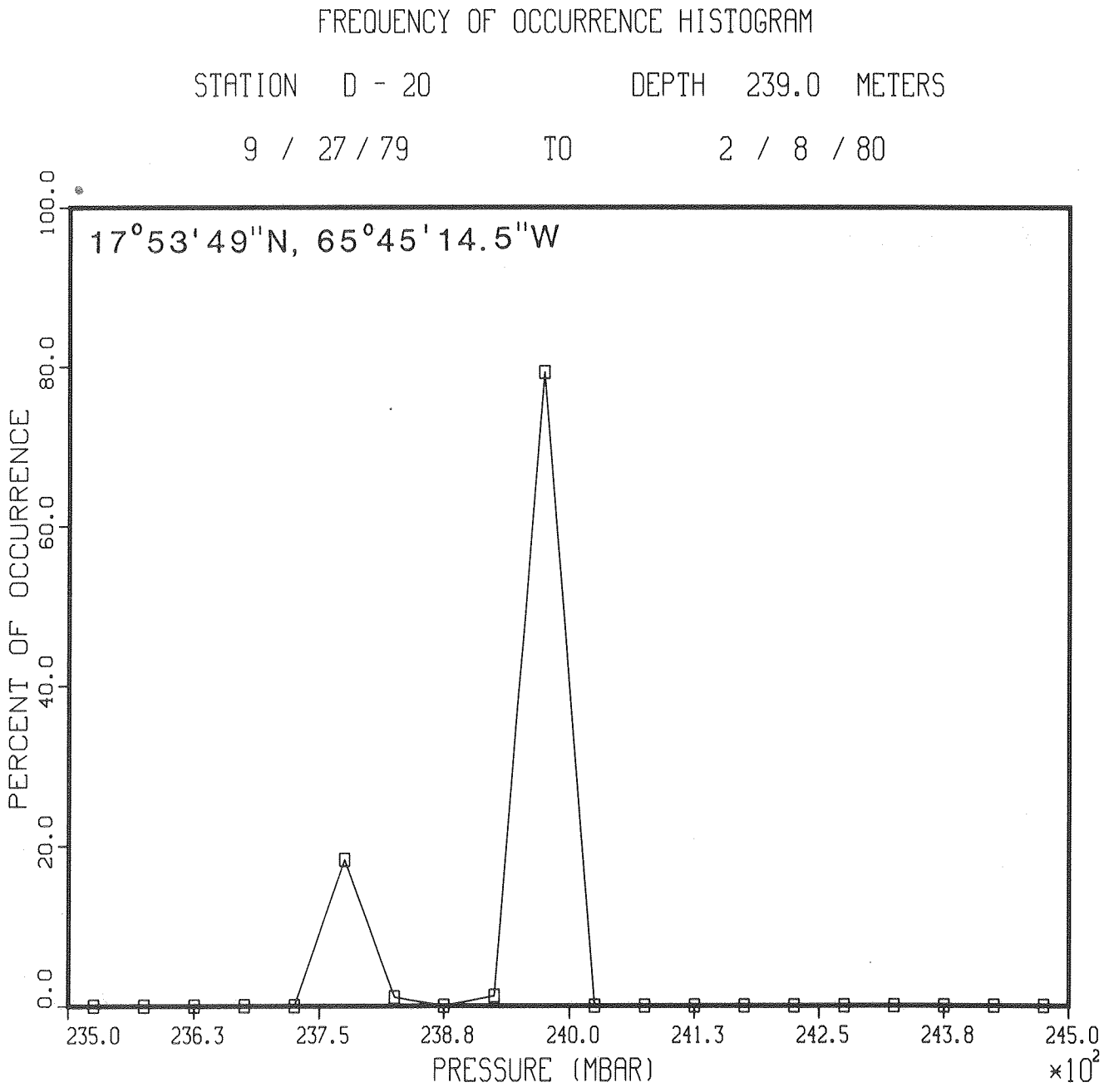

Figure 3-71. Histogram of pressures measured at 239 m depth.

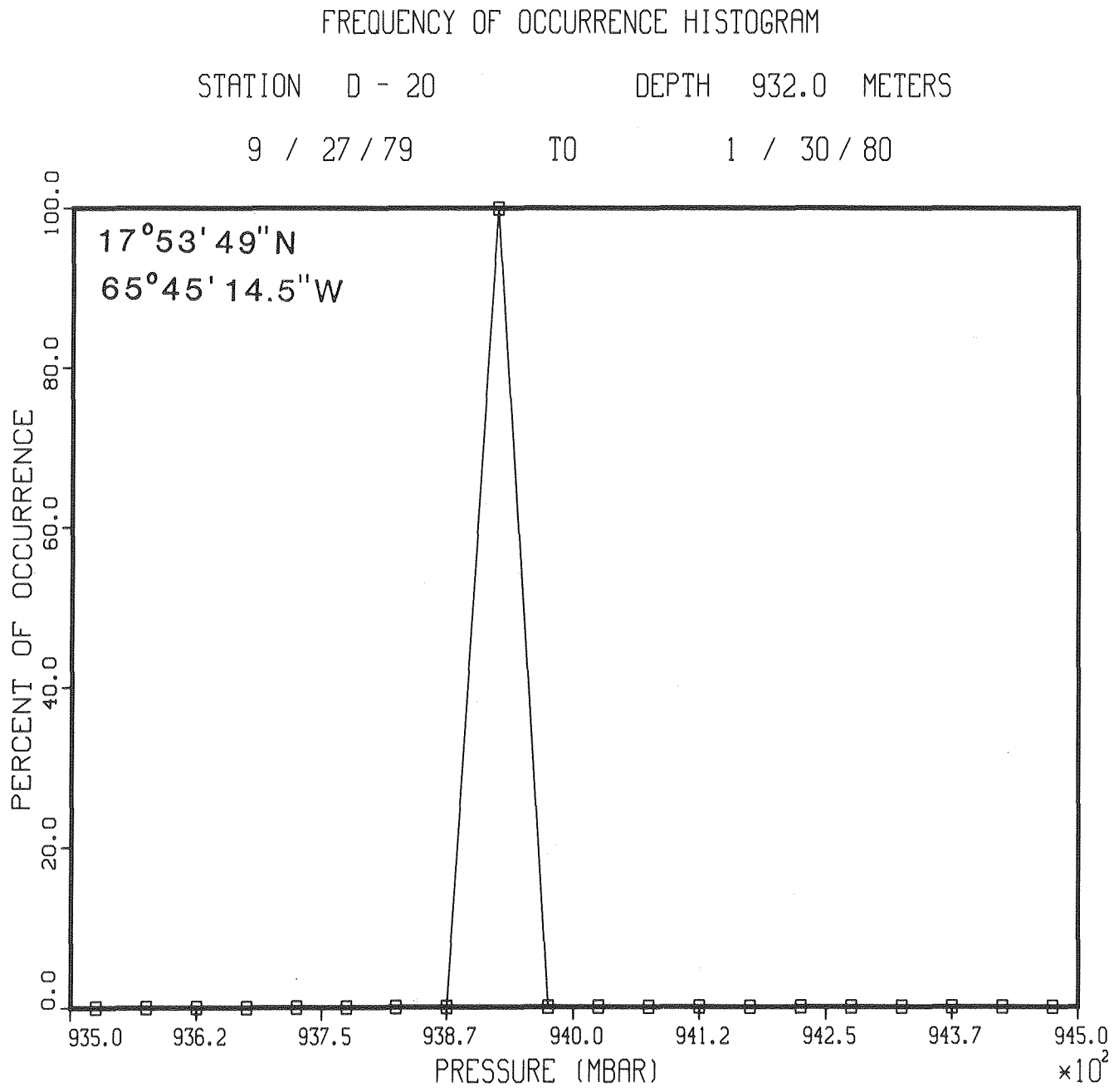

Figure 3-72. Histogram of pressures measured at 932 m depth.

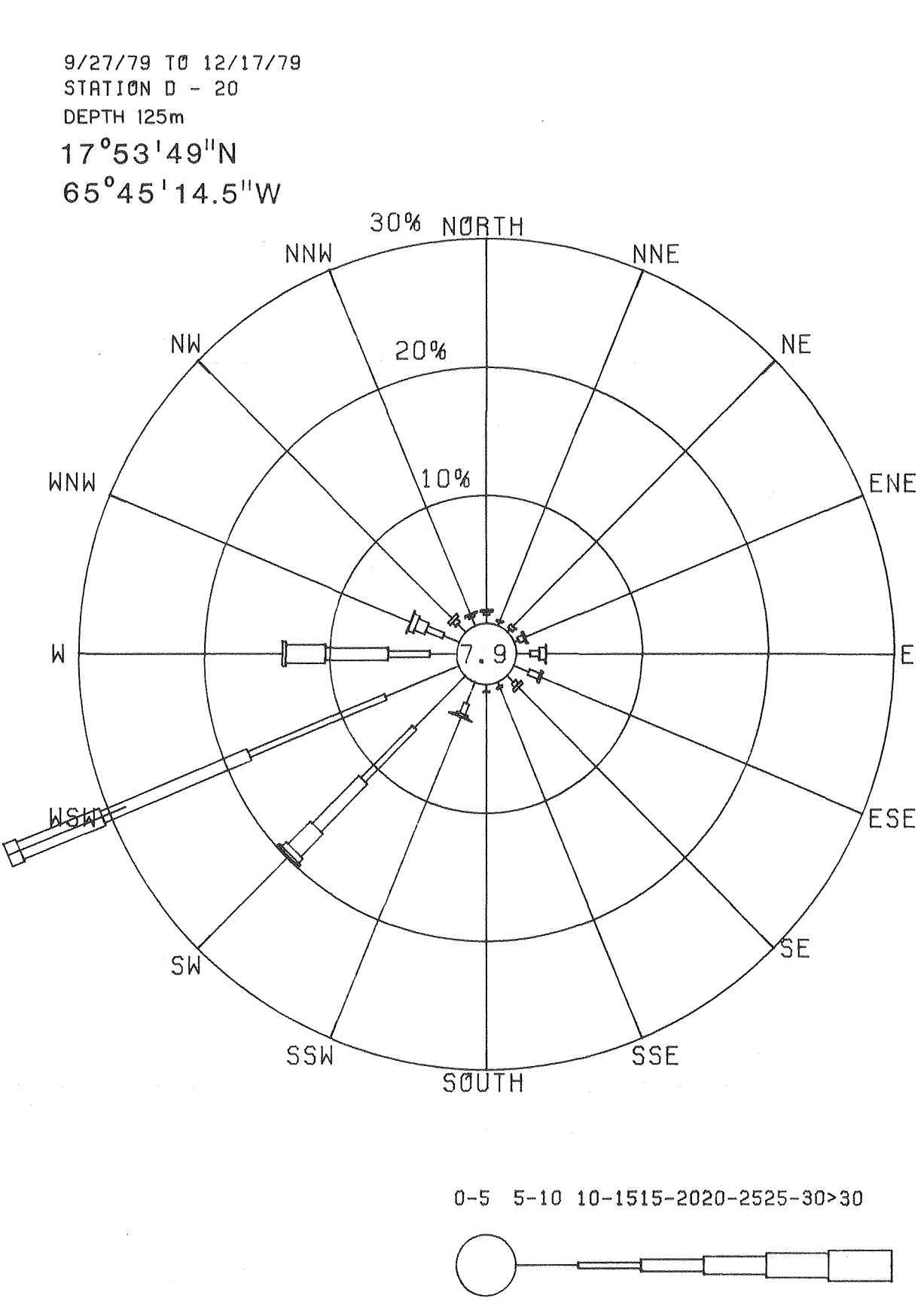

Figure 3-73. Current rose from 125 m depth.

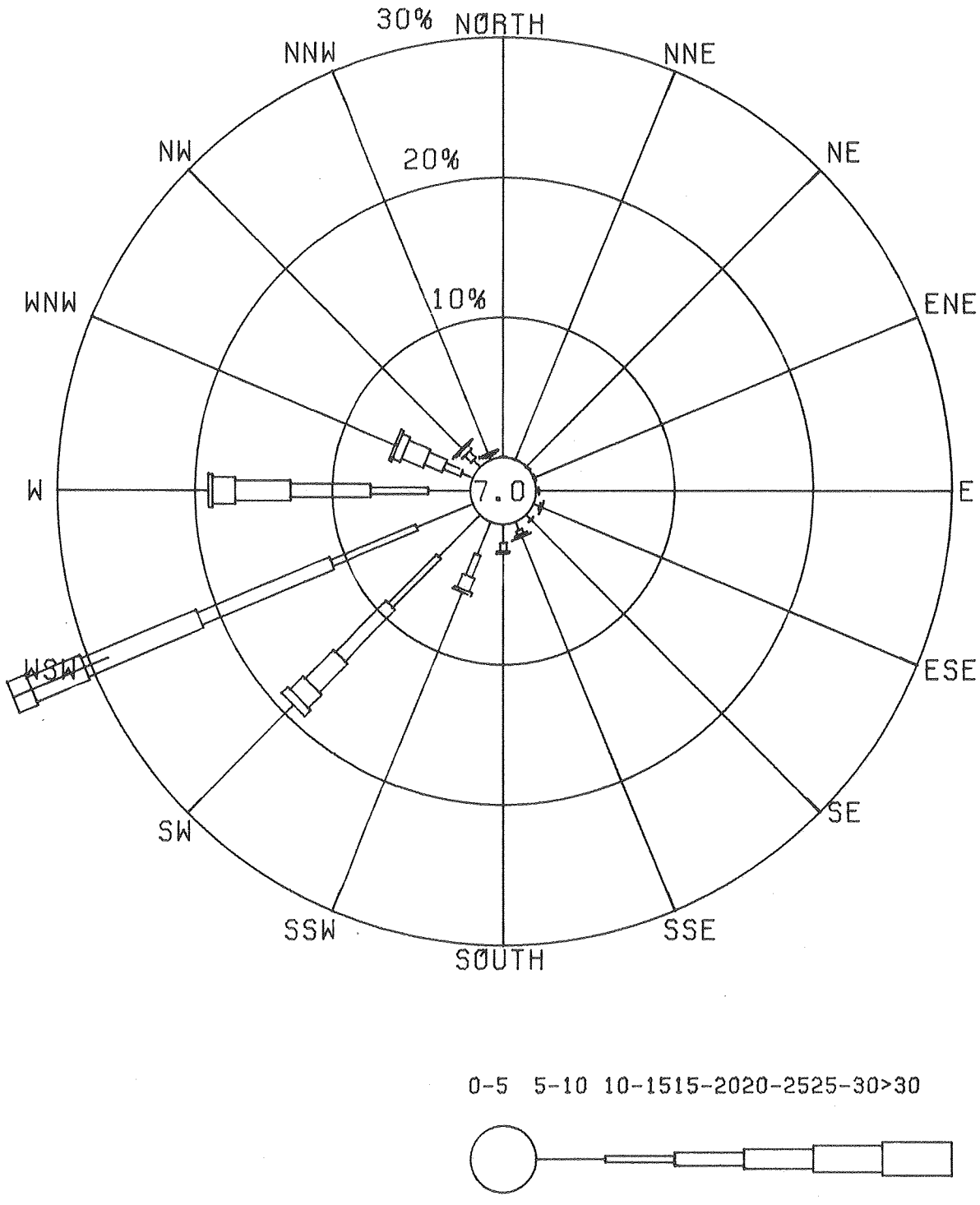

Figure 3-75. Current rose from 239 m depth.

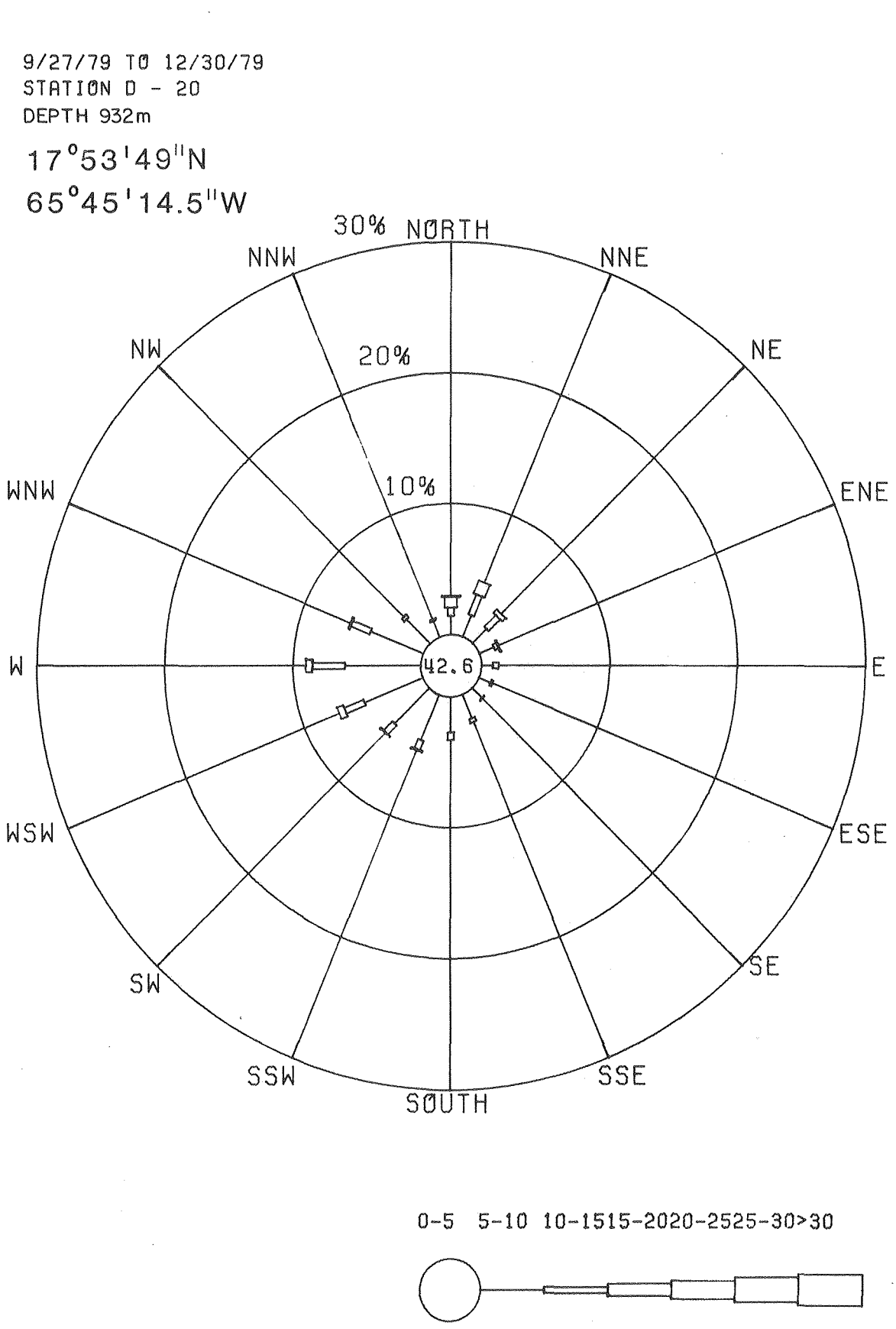

Figure 3-75. Current rose from 932 m depth.

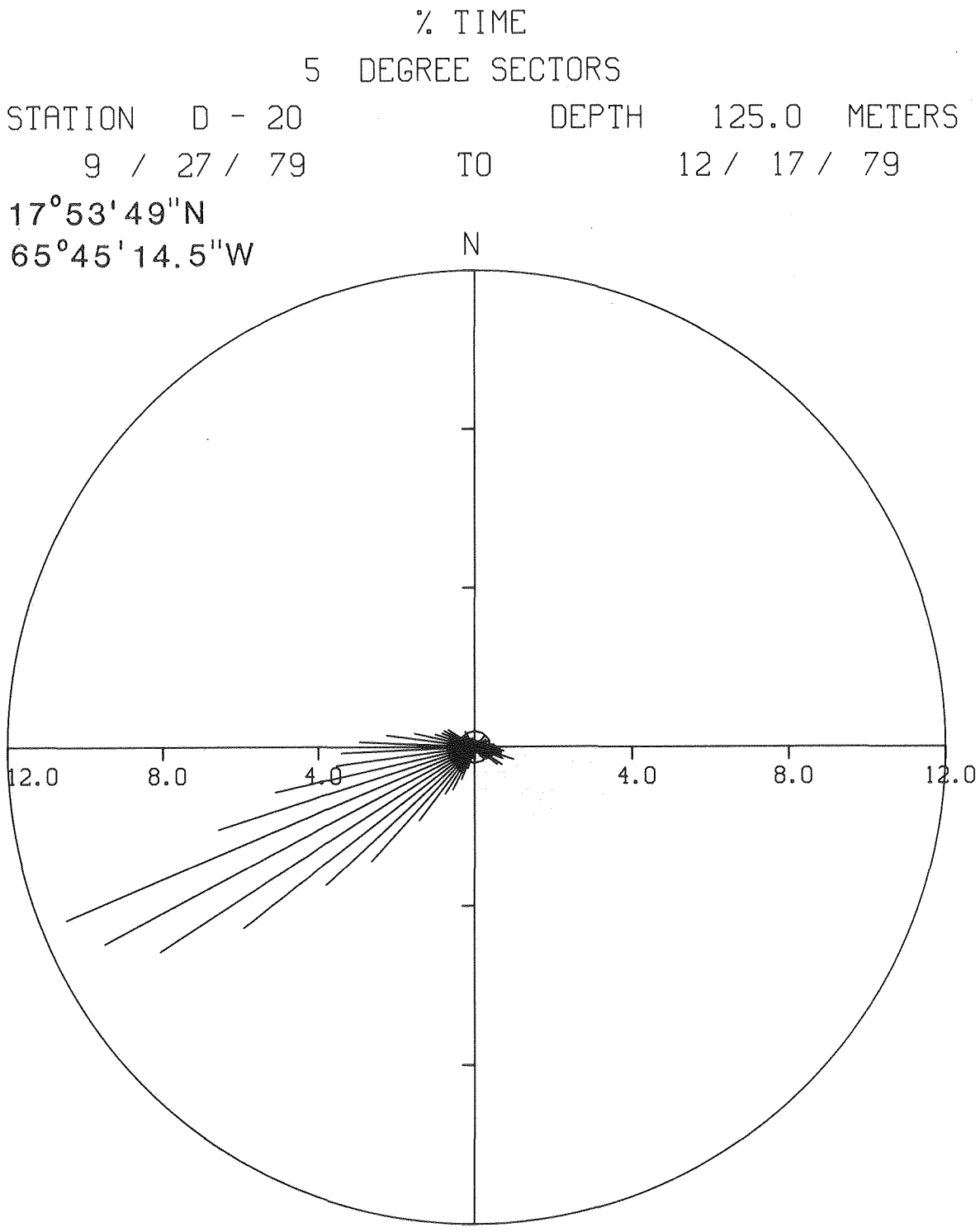

Figure 3-76. Polar histogram showing percent time in each 5° direction sector for 125 m depth.

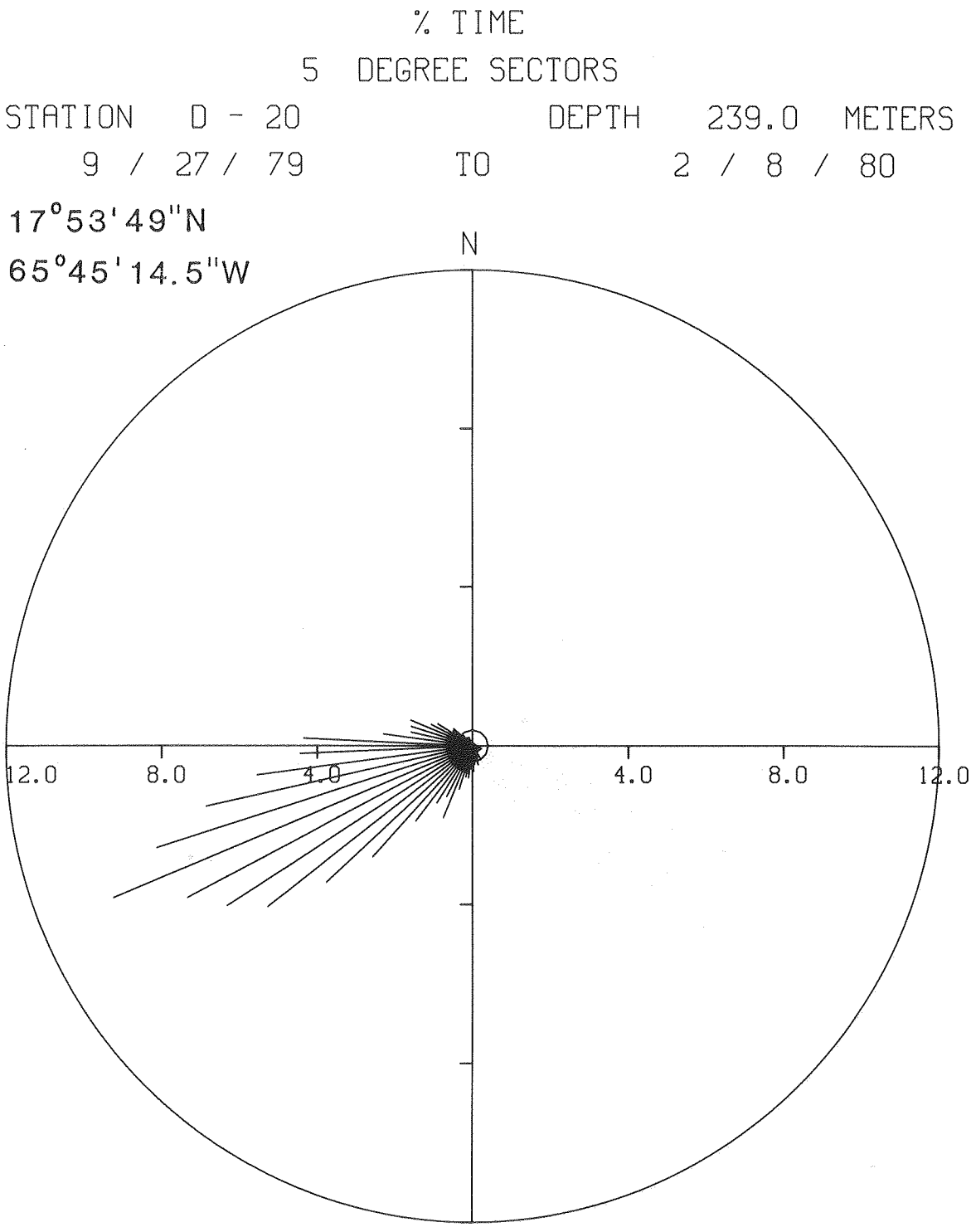

Figure 3-77. Polar histogram showing percent time in each 5° direction sector for 239 m depth.

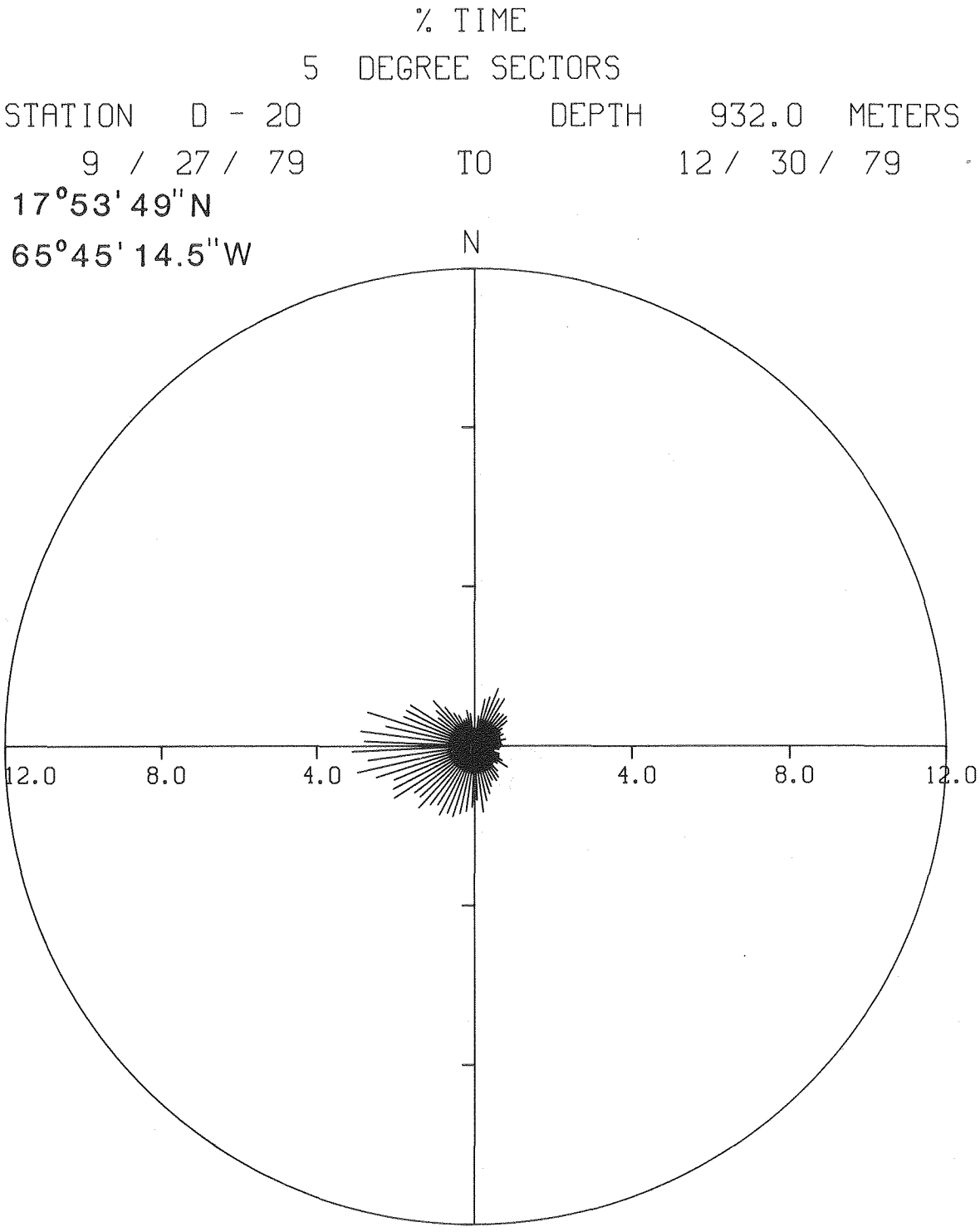

Figure 3-78. Polar histogram showing percent time in each 5° direction sector for 932 m depth.

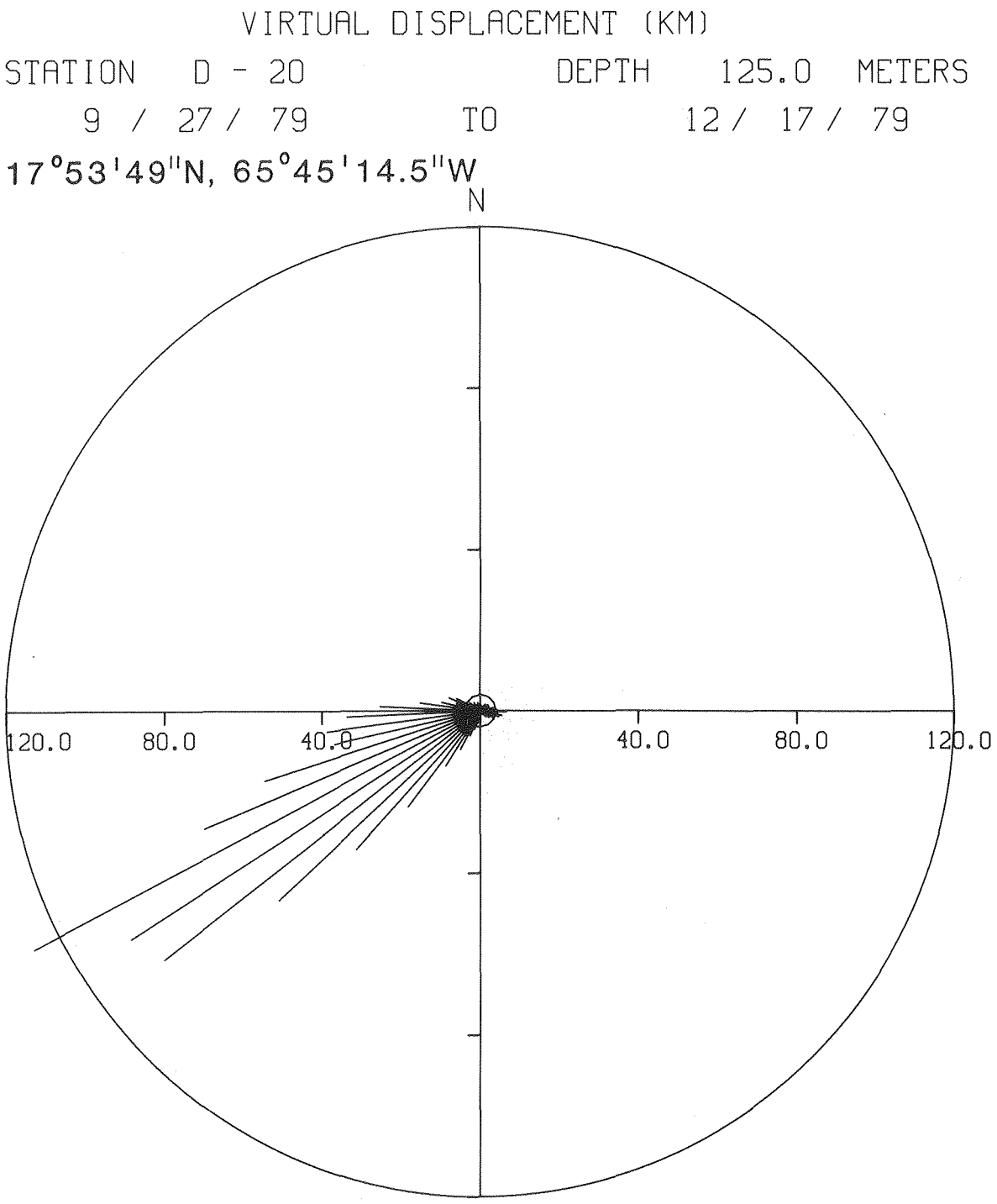

Figure 3-79. Polar histogram showing virtual displacement in each 5° direction sector for 125 m depth.

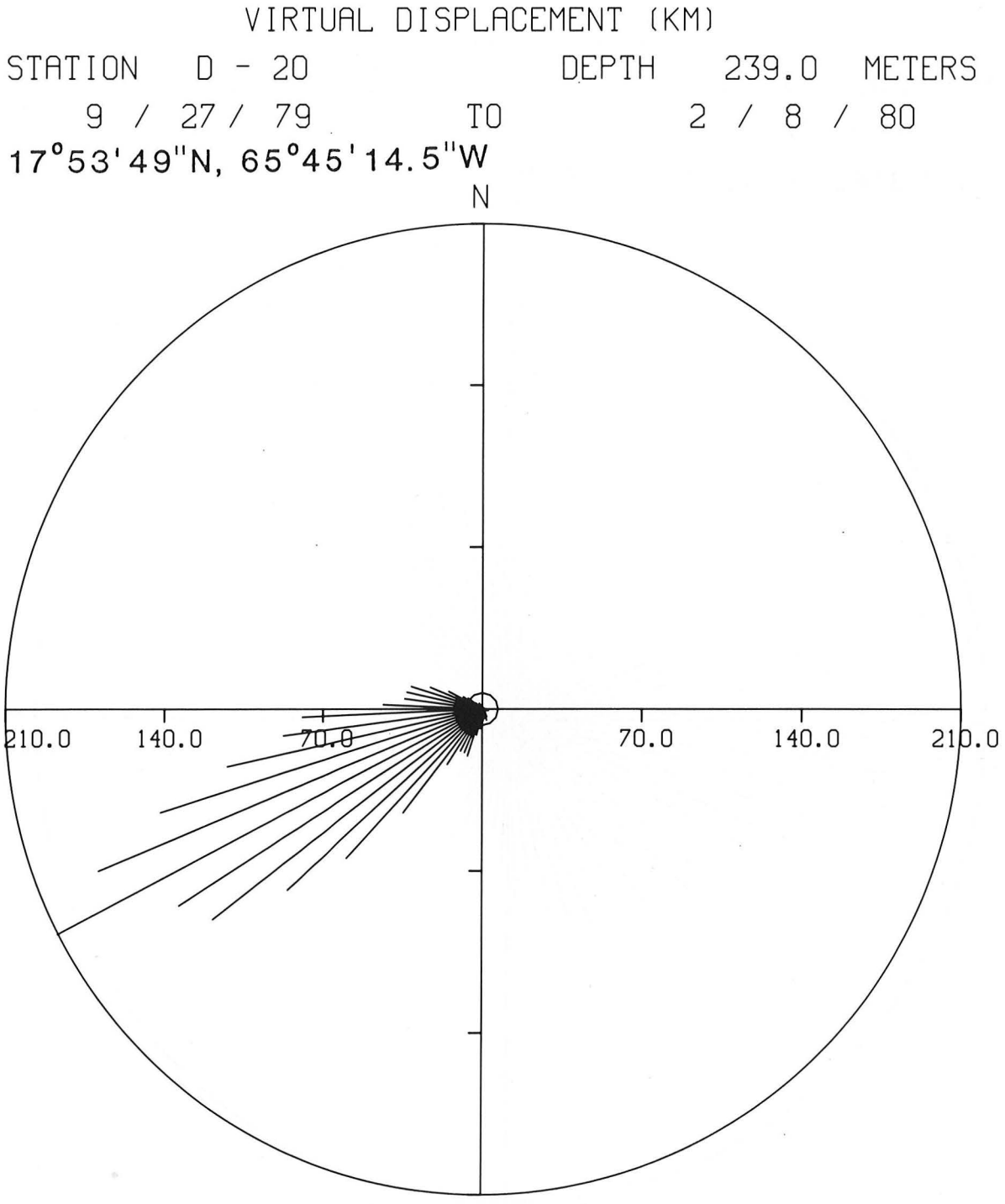

Figure 3-80. Polar histogram showing virtual displacement in each 5° direction sector for 239 m depth.

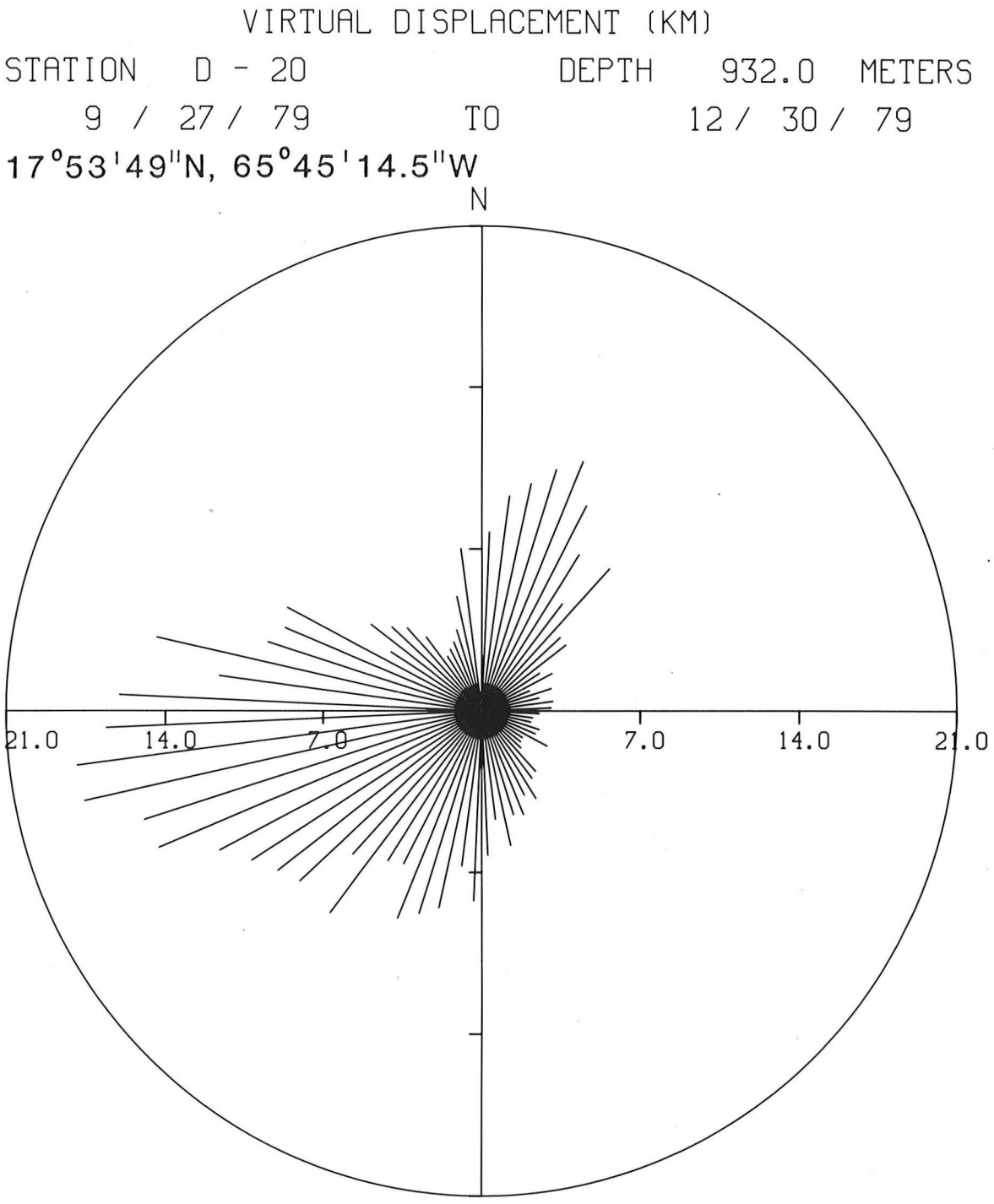

Figure 3-81. Polar histogram showing virtual displacement in each 5° direction sector for 932 m depth.

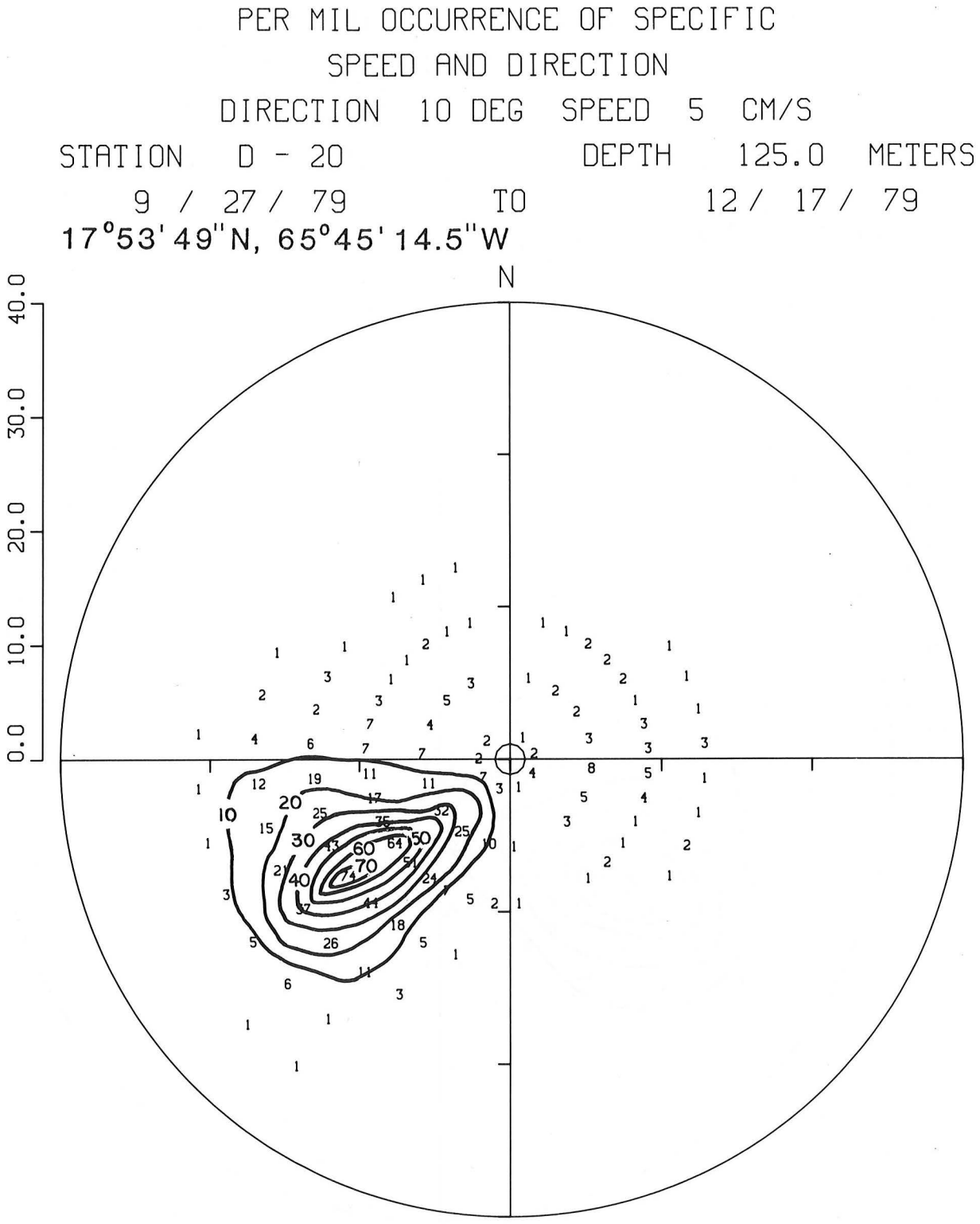

Figure 3-82. Per mil occurrence in each 10° and 5 cm/sec interval for 125 m depth.

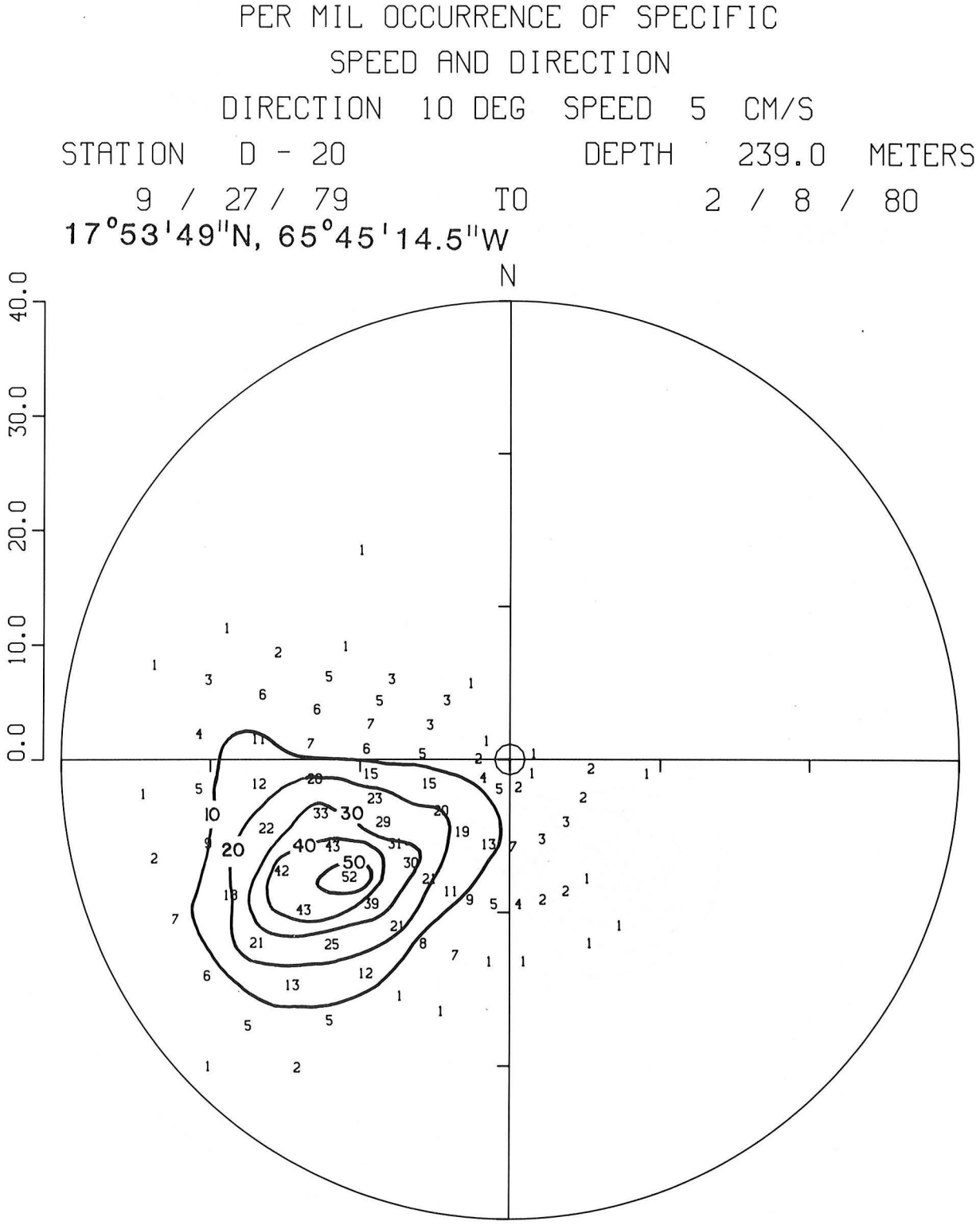

Figure 3-83. Per mil occurrence in each 10° and 5 cm/sec interval for 239 m depth.

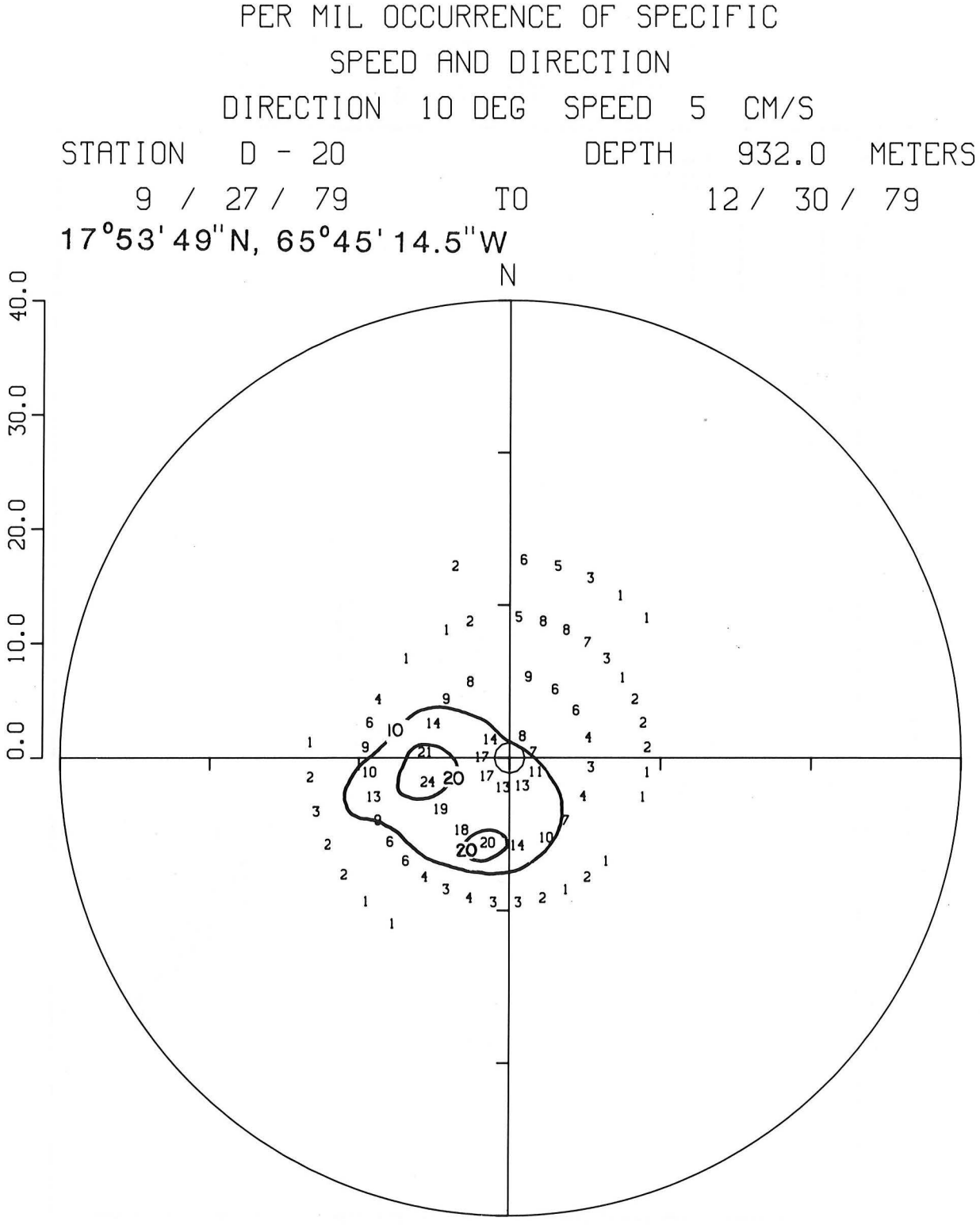

Figure 3-84. Per mil occurrence in each 10° and 5 cm/sec interval for 932 m depth.

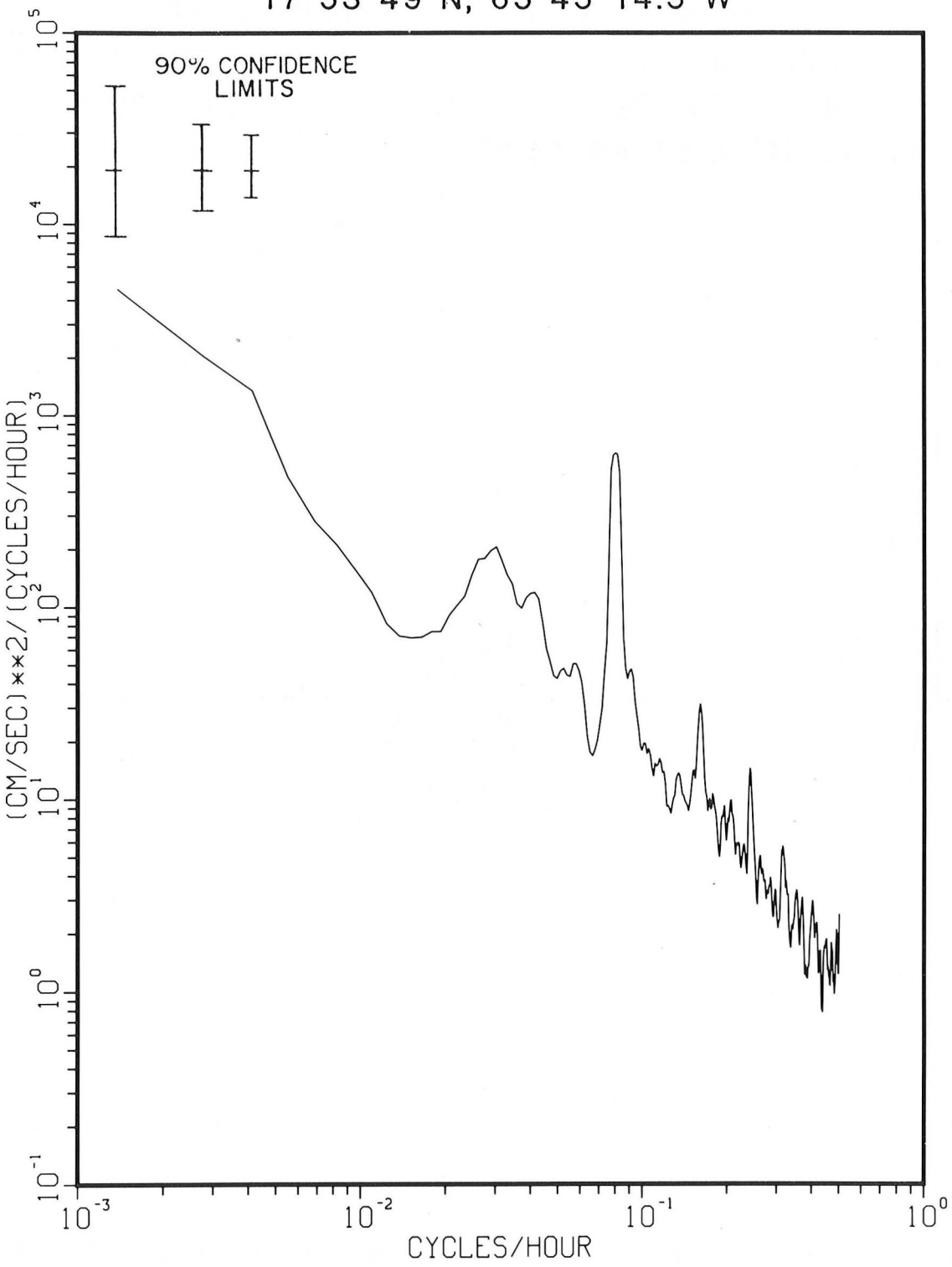

Figure 3-85. Spectra of total energy from 125 m depth.

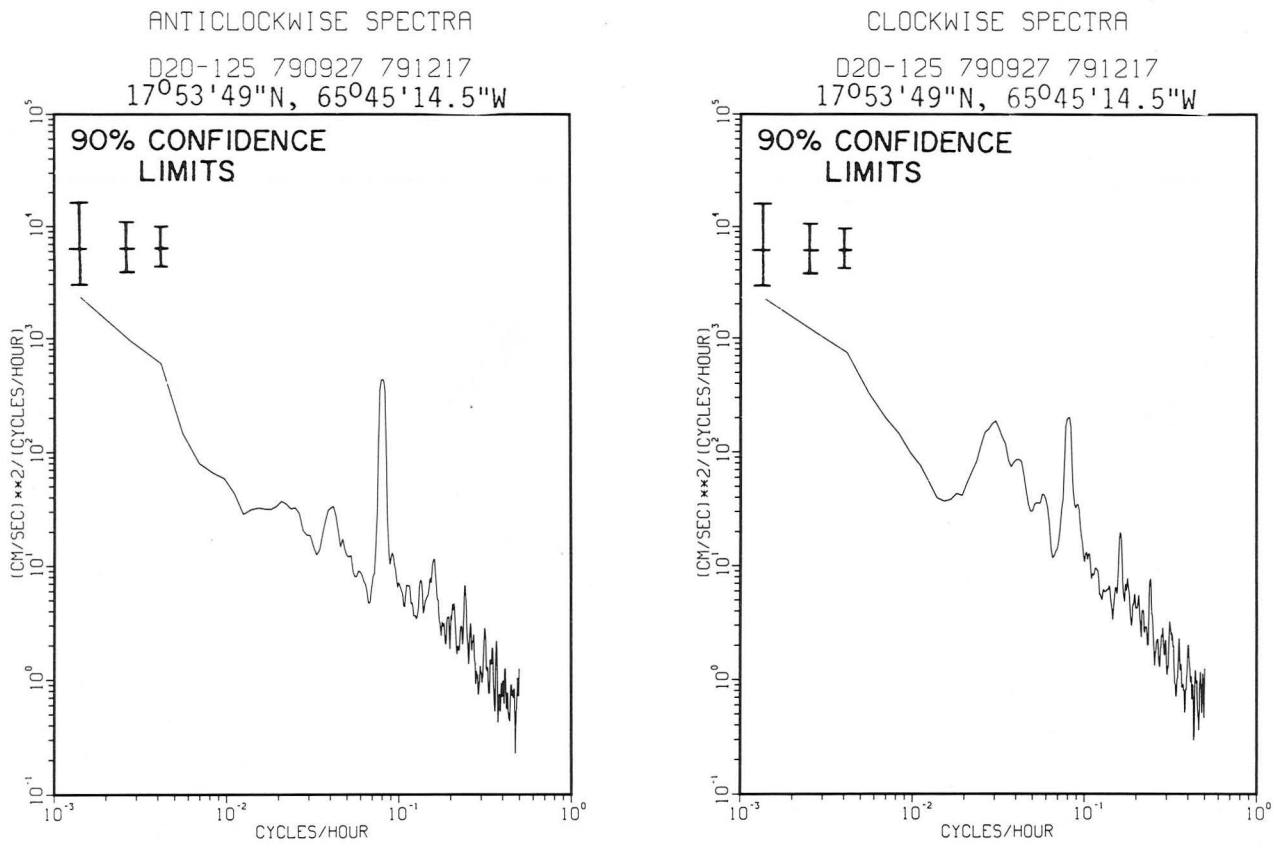

Figure 3-86. Spectra of anticlockwise and clockwise components of current energy from 125 m depth.

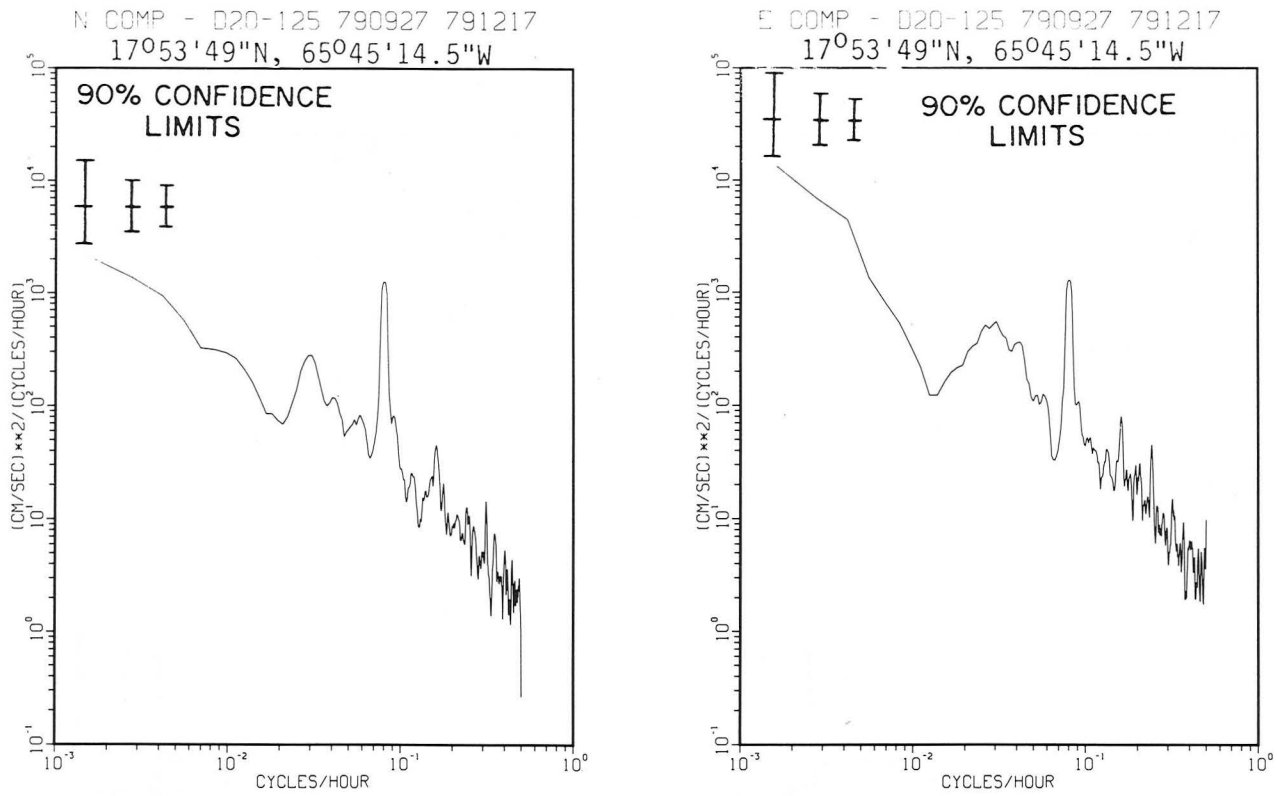

Figure 3-87. Spectra of north and east components of current energy from 125 m depth.

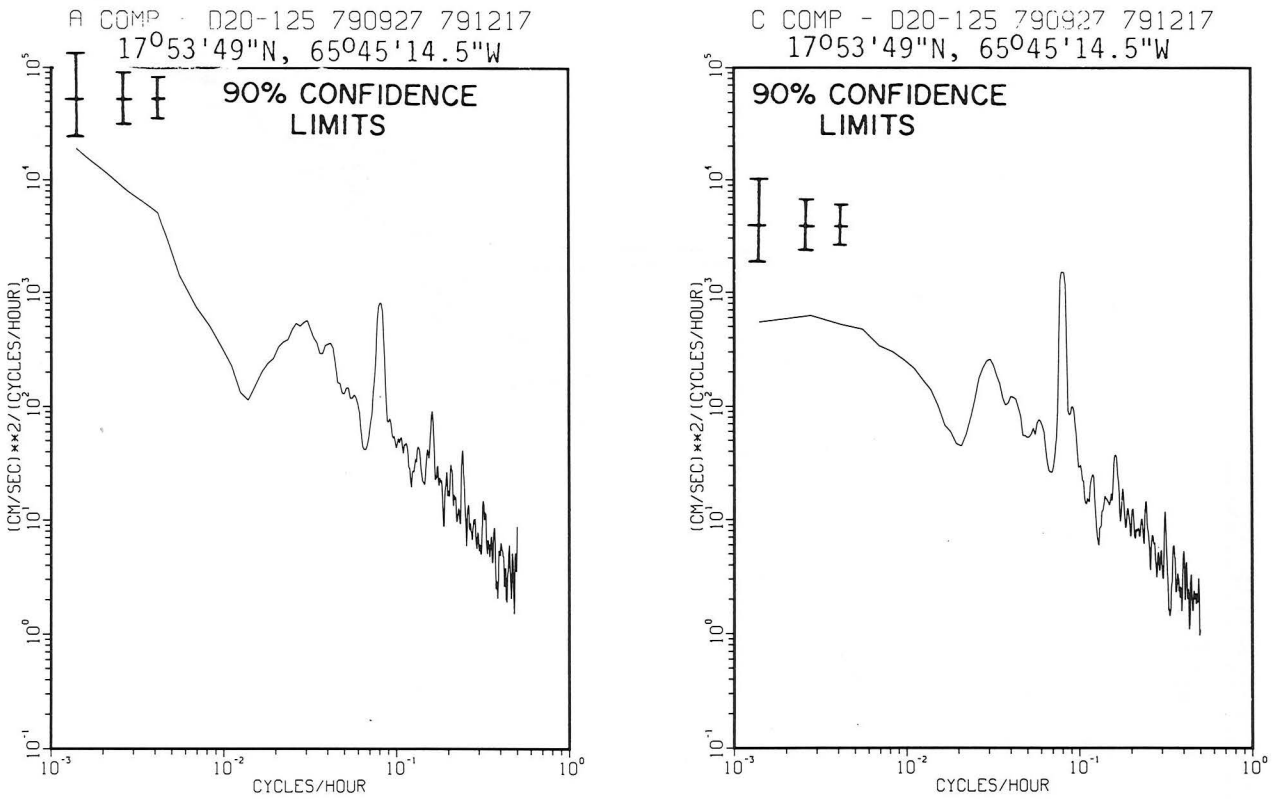

Figure 3-88. Spectra of along-isobath and cross-isobath components of current energy from 125 m depth.

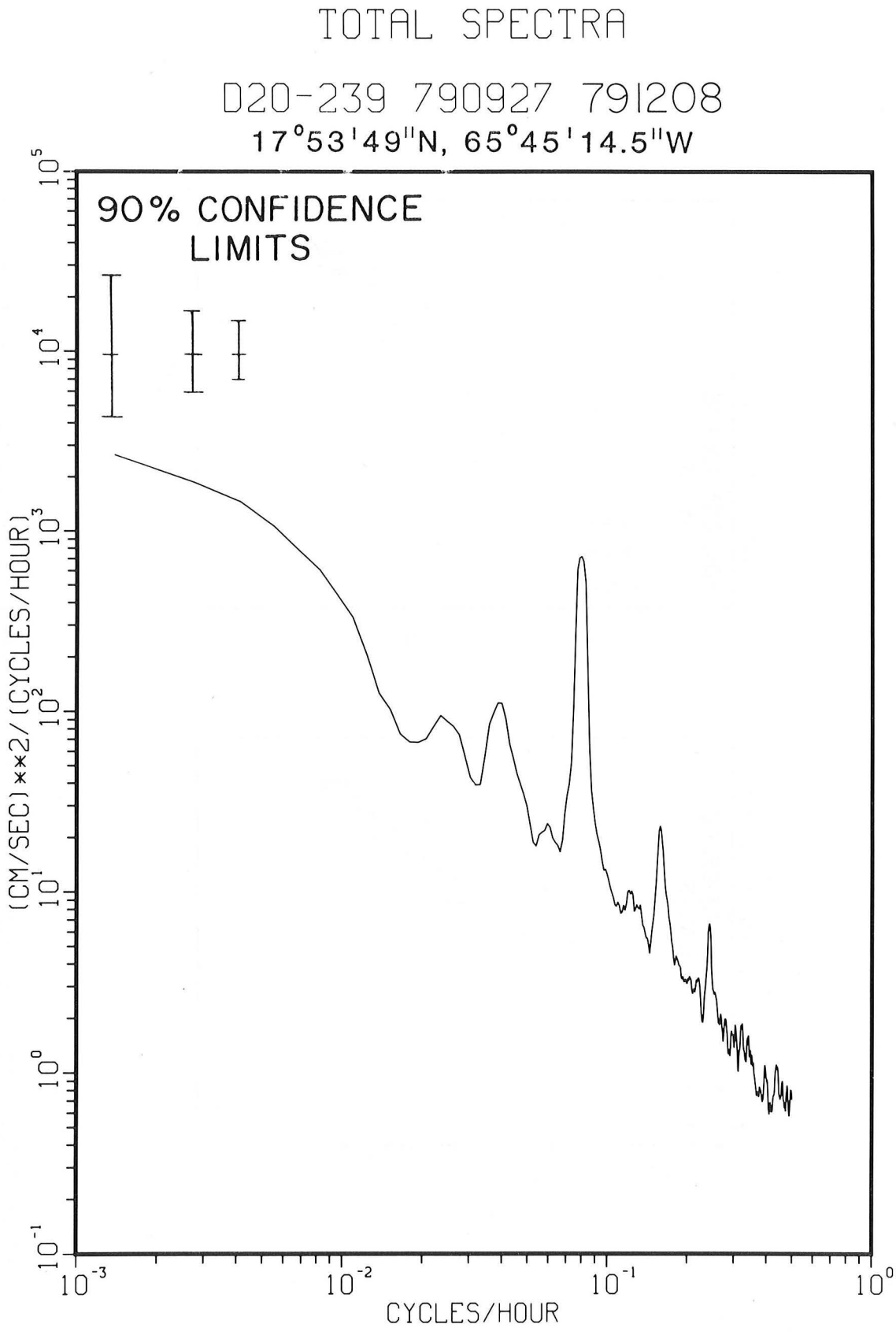

Figure 3-89. Spectra of total energy from 239 m depth.

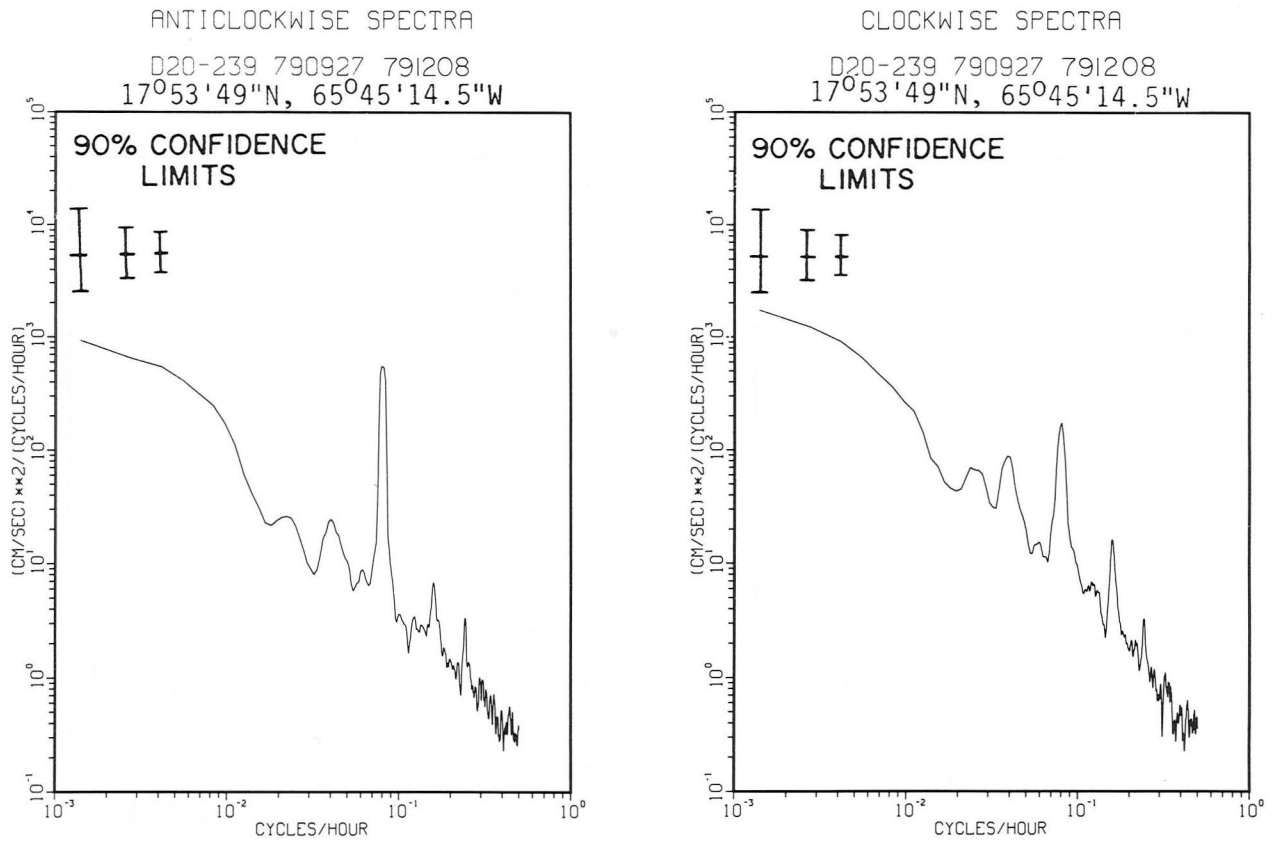

Figure 3-90. Spectra of anticlockwise and clockwise components of current energy from 239 m depth.

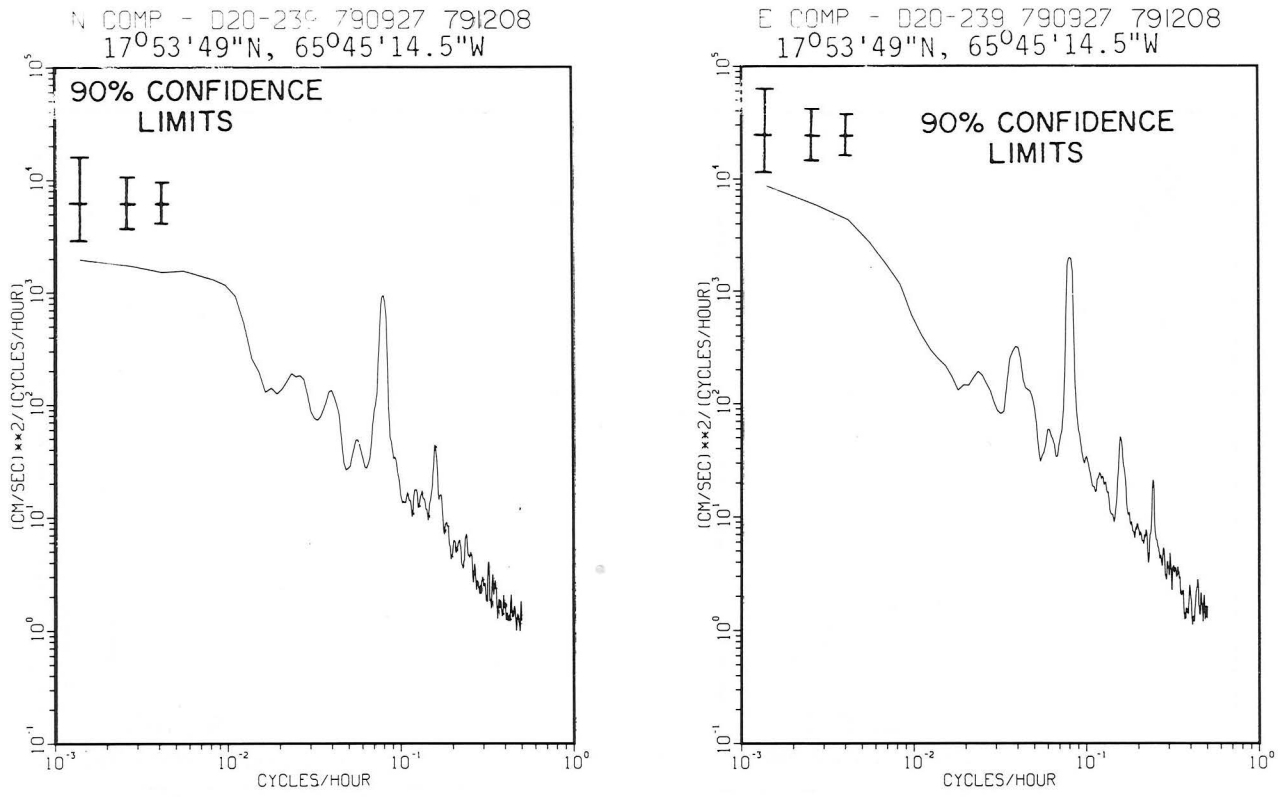

Figure 3-91. Spectra of north and east components of current energy from 239 m depth.

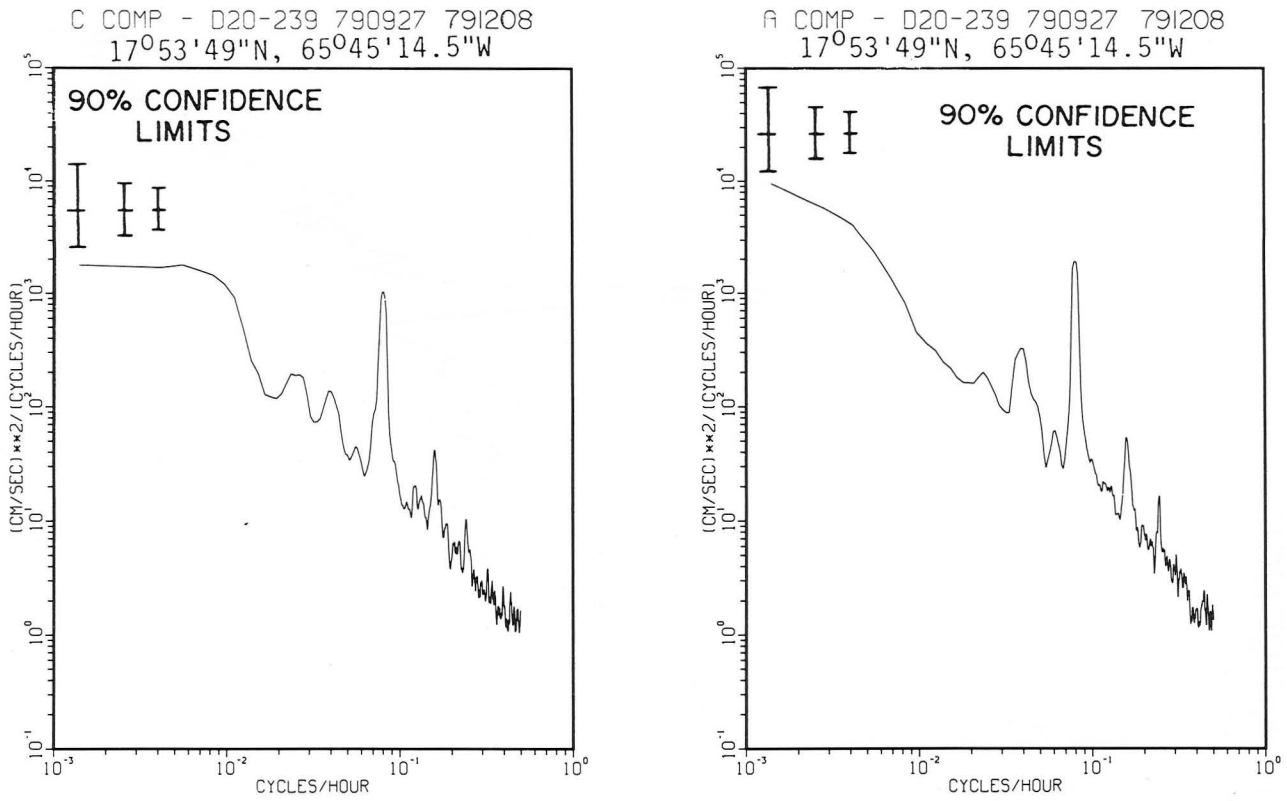

Figure 3-92. Spectra of cross-isobath and along-isobath components of current energy from 239 m depth.

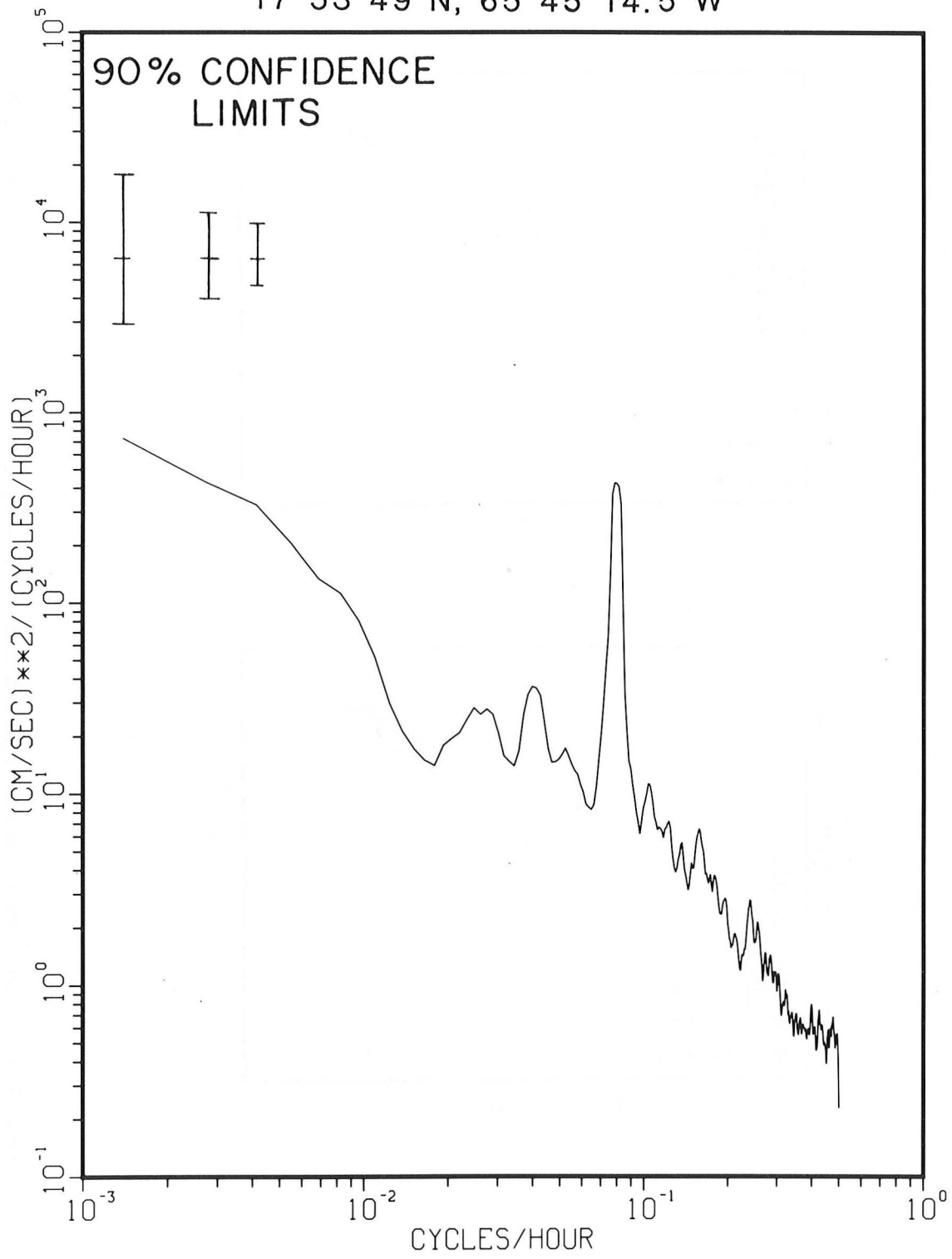

Figure 3-93. Spectra of total energy from 932 m depth.

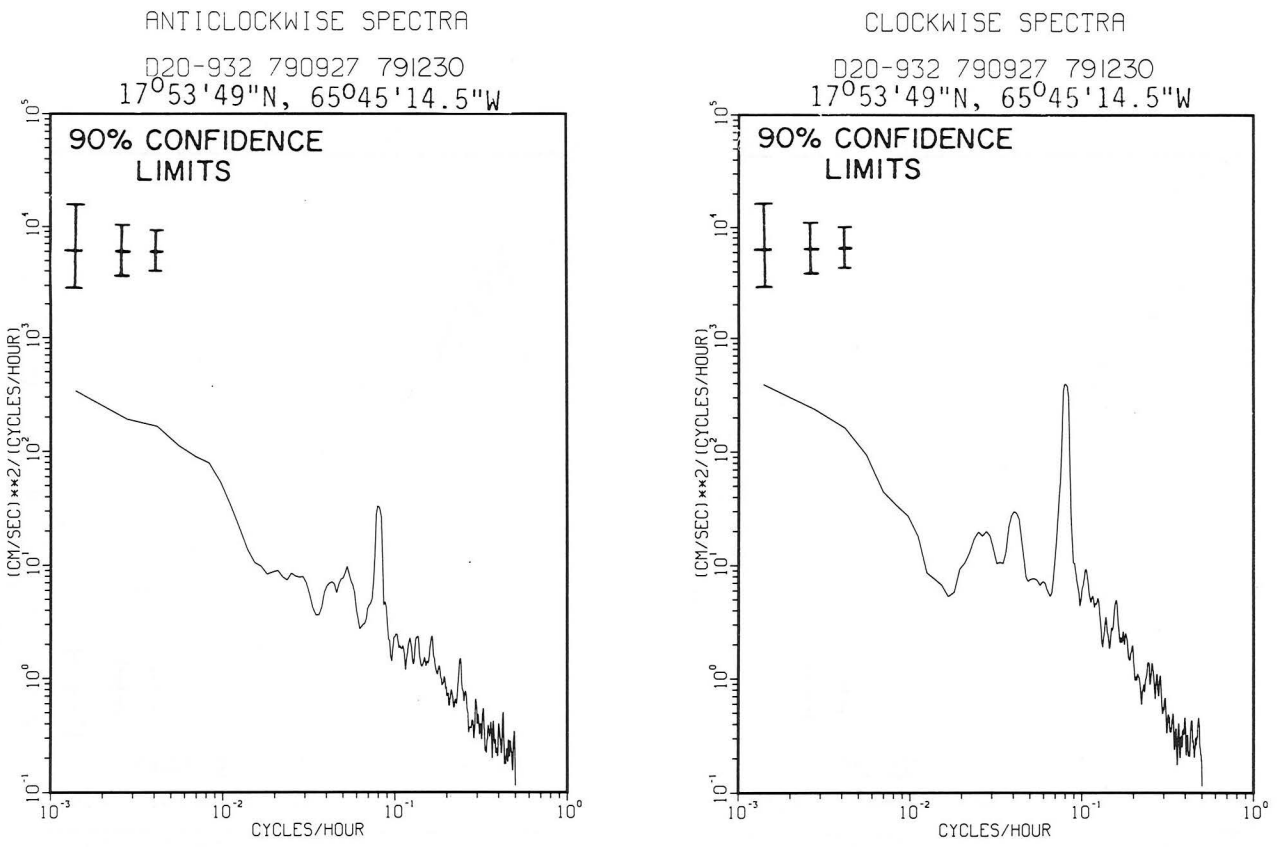

Figure 3-94. Spectra of anticlockwise and clockwise components of current energy from 932 m depth.

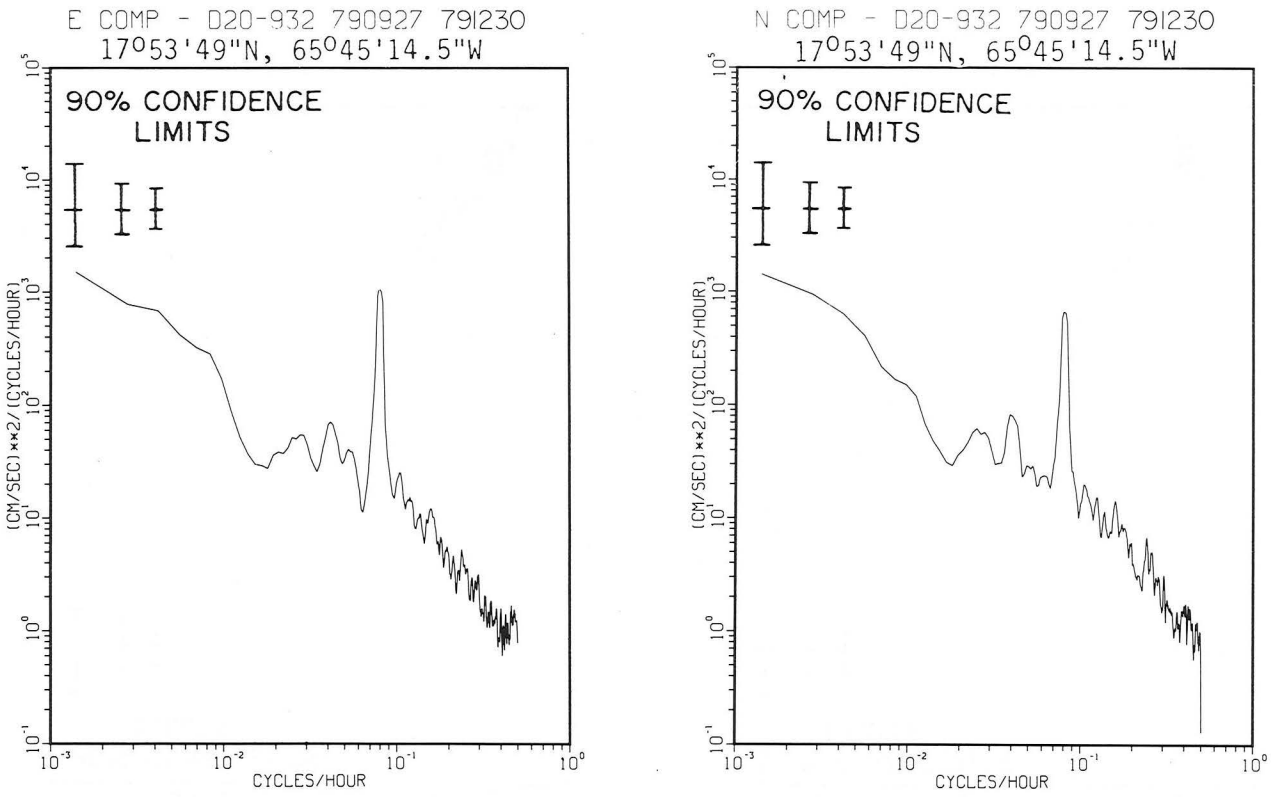

Figure 3-95. Spectra of east and north components of current energy from 932 m depth.

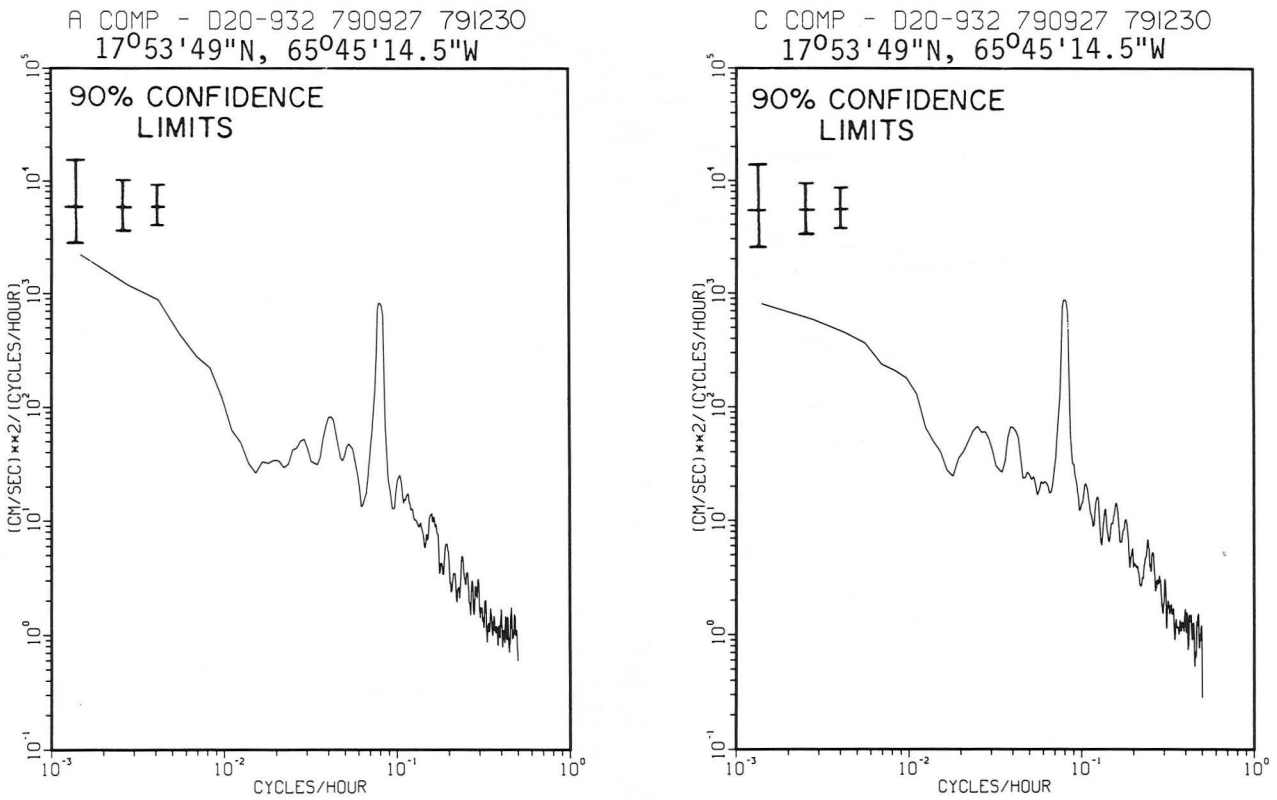

Figure 3-96. Spectra of along-isobath and cross-isobath components of current energy from 932 m depth.

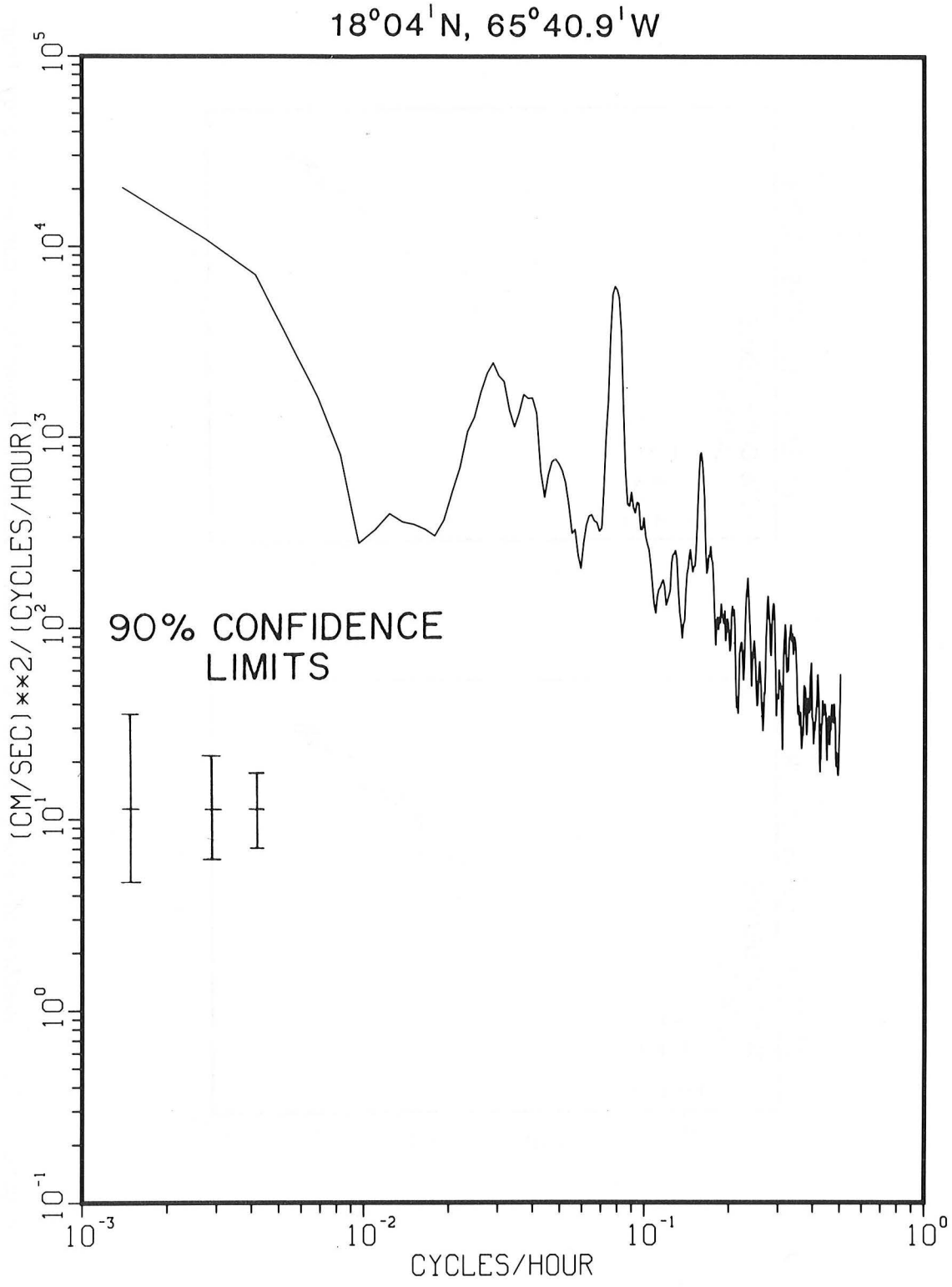

Figure 3-97. Spectra of total energy from 99 m depth (NUSC data).

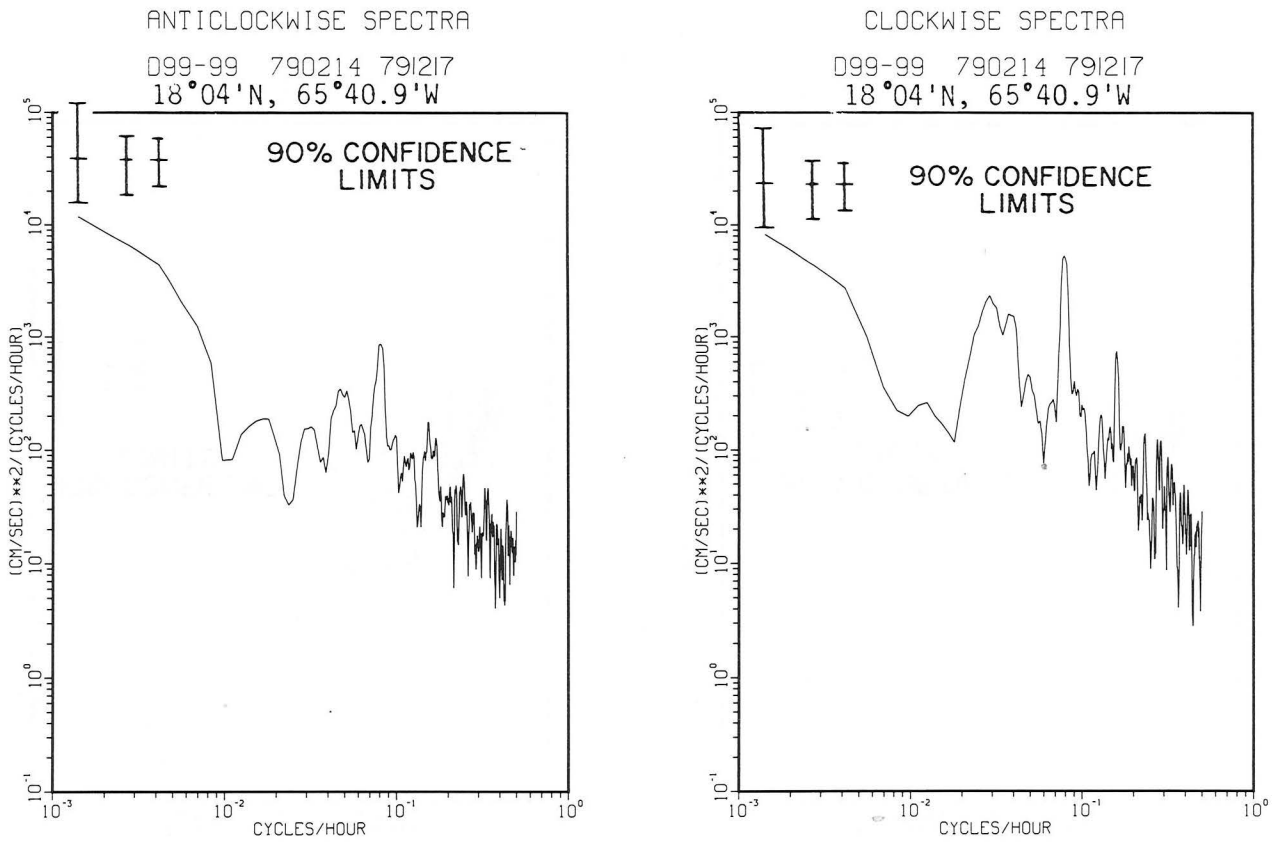

Figure 3-98. Spectra of anticlockwise and clockwise components of current energy from 99 m depth (NUSC data).

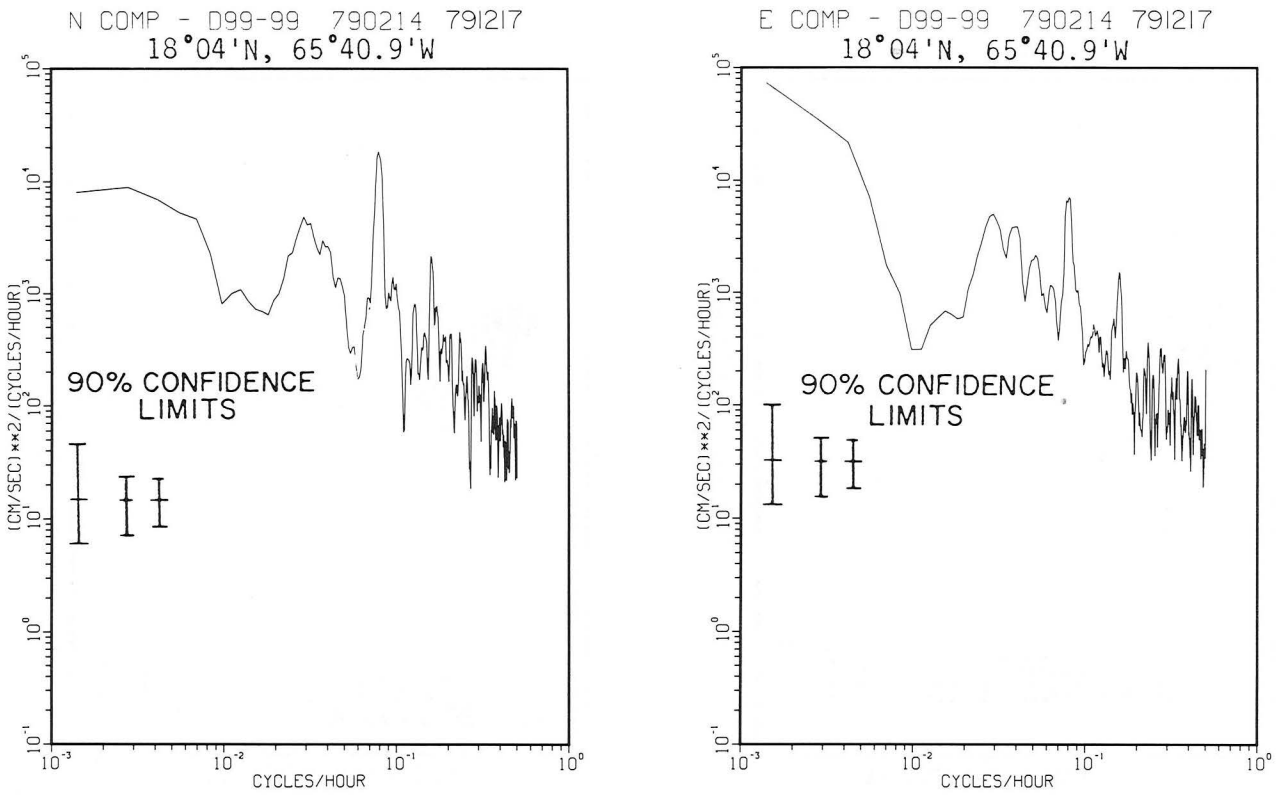

Figure 3-99. Spectra of north and east components of current energy from 99 m depth (NUSC data).

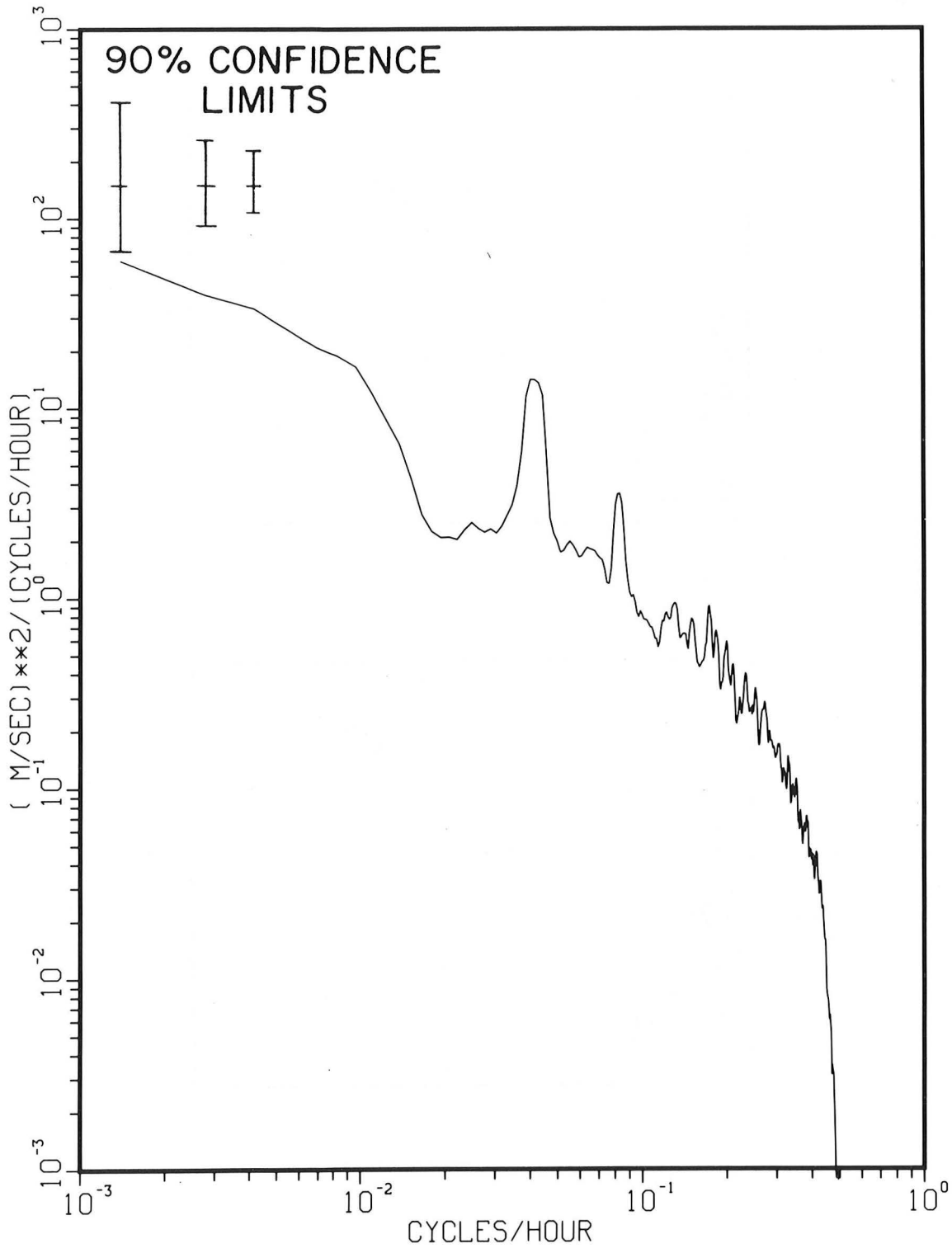

Figure 3-100. Spectra of the total energy in the wind record.

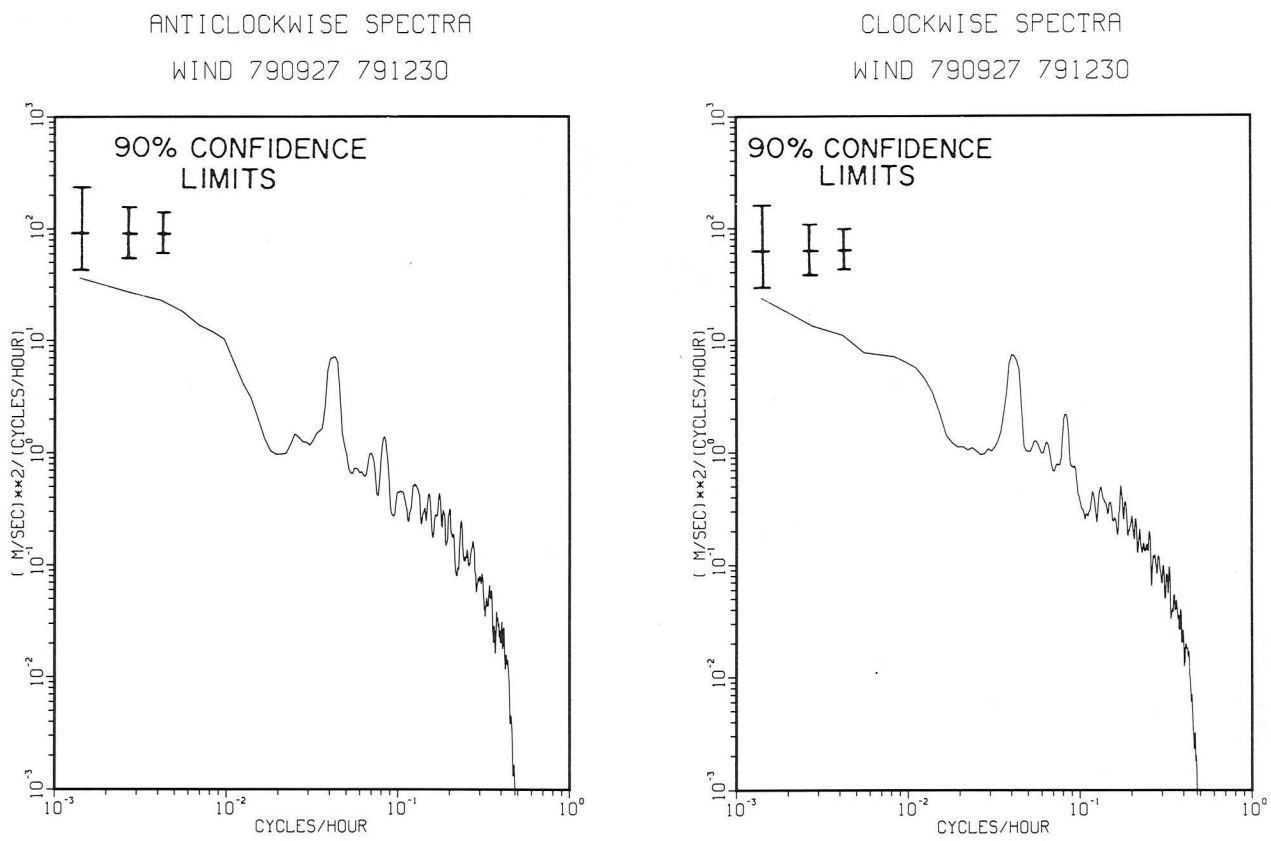

Figure 3-101. Spectra of the anticlockwise and clockwise components of wind energy.

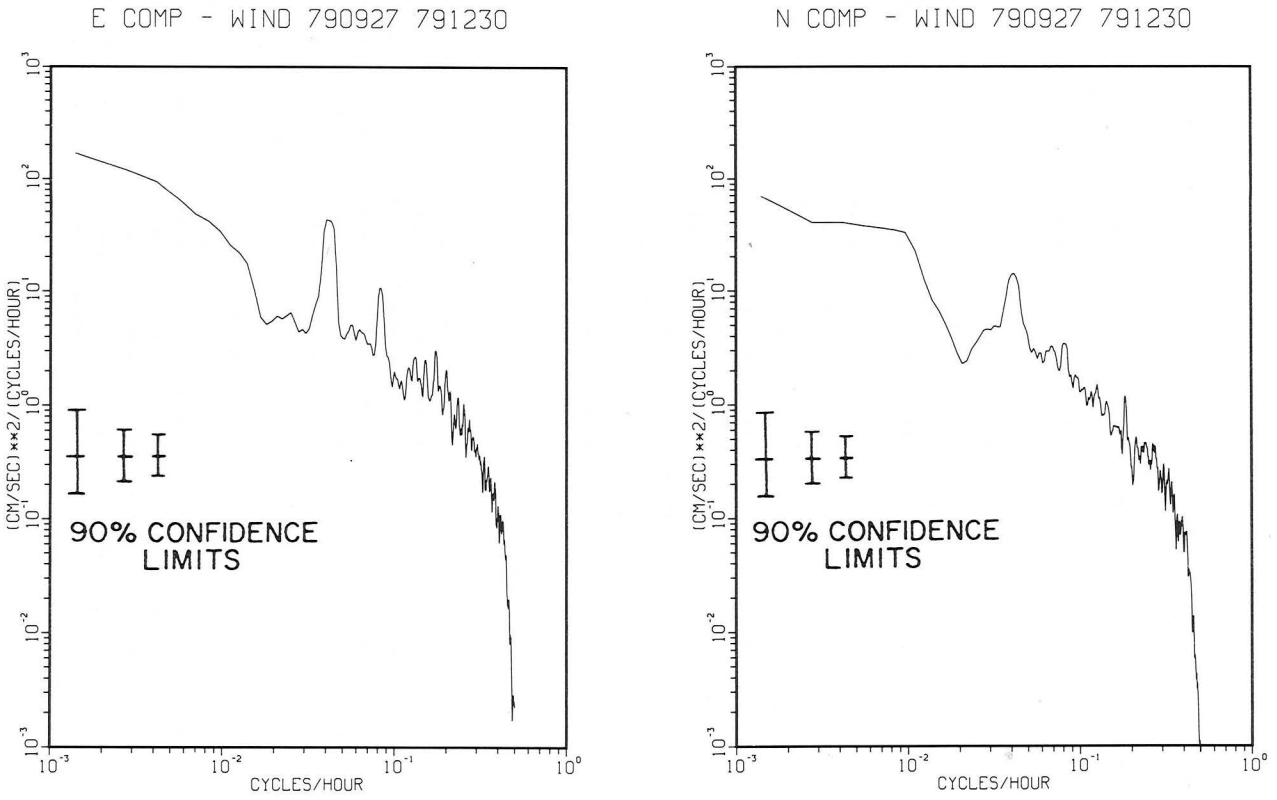

Figure 3-102. Spectra of the east and north components of wind energy.

Table 3-1. Computed values of depth, salinity, σ_t, dynamic height and other related parameters for Station 3.

SHIP	SURVEY	STATION	DATE	TIME(EST)	LAT	LONG
OTEC PR	1	3	6 21 80	1940	17 57 54.0N	65 31 6.0W

TYPE OF CAST	DEEPEST ARCH LVL	SONIC DEPTH	HT ABOVE BOTTM	DSN
CTD	1007.50 DBARS	2100.00 METERS	******* METERS	405741

TAU=0.0375

PRESSURE (DBARS)	DEPTH (M)	TEMP (DEG-C)	COND (MMHO/CM)	SALINITY (O/OO)	SIGMA-T	SPEC-VOL (CM3/GM)	SPV-ANLY (CM3/GM)	TIMET (SEC)	DYNAM-HT (DYN-M)	BV-FREQ (CYC/HR)	SND-VEL (M/SEC)
25.00	24.92	28.655	58.244	35.932	22.900	0.97751	0.00498	0.015	0.1119	1.087390	1544.4
50.00	49.83	27.615	57.586	36.258	23.487	0.97685	0.00443	0.031	0.2331	10.698303	1543.0
75.00	74.72	25.340	55.682	36.667	24.517	0.97576	0.00346	0.047	0.3294	6.566200	1538.7
100.00	99.59	24.190	54.763	36.910	25.049	0.97515	0.00296	0.063	0.4098	11.790249	1536.7
125.00	124.44	23.236	53.847	36.994	25.396	0.97472	0.00264	0.080	0.4788	3.881130	1534.9
150.00	149.28	21.863	52.308	36.942	25.750	0.97428	0.00231	0.096	0.5406	7.714492	1531.8
175.00	174.12	20.507	50.701	36.806	26.020	0.97392	0.00206	0.112	0.5944	3.508370	1528.5
200.00	198.94	19.728	49.768	36.709	26.154	0.97368	0.00194	0.129	0.6442	2.818664	1526.7
225.00	223.76	18.983	48.874	36.608	26.272	0.97347	0.00184	0.145	0.6916	3.275719	1524.9
250.00	248.57	18.389	48.179	36.535	26.367	0.97327	0.00176	0.161	0.7365	2.675152	1523.5
275.00	273.37	18.092	47.837	36.498	26.413	0.97312	0.00172	0.178	0.7799	4.183152	1523.0
300.00	298.17	17.603	47.264	36.432	26.483	0.97295	0.00166	0.194	0.8220	1.545006	1521.9
325.00	322.97	16.959	46.500	36.335	26.565	0.97277	0.00159	0.211	0.8625	4.184682	1520.3
350.00	347.77	16.460	45.913	36.259	26.625	0.97260	0.00154	0.227	0.9017	6.557223	1519.2
375.00	372.56	15.958	45.320	36.177	26.679	0.97245	0.00149	0.243	0.9396	5.165549	1517.9
400.00	397.34	15.433	44.703	36.091	26.733	0.97229	0.00144	0.260	0.9763	4.507494	1516.6
425.00	422.12	14.766	43.921	35.980	26.796	0.97212	0.00139	0.276	1.0118	1.893855	1514.8
450.00	446.90	14.204	43.277	35.895	26.852	0.97196	0.00134	0.293	1.0459	5.011493	1513.3
475.00	471.67	13.204	42.128	35.737	26.940	0.97176	0.00125	0.310	1.0784	1.263033	1510.2
500.00	496.44	13.076	41.994	35.719	26.952	0.97165	0.00125	0.326	1.1097	4.141626	1510.2
525.00	521.21	12.797	41.686	35.677	26.976	0.97152	0.00123	0.343	1.1406	4.044701	1509.6
550.00	545.97	12.239	41.065	35.594	27.022	0.97136	0.00119	0.359	1.1710	2.363891	1508.0
575.00	570.73	11.899	40.695	35.545	27.049	0.97123	0.00117	0.376	1.2004	1.787181	1507.2
600.00	595.48	11.548	40.312	35.493	27.076	0.97110	0.00114	0.392	1.2292	1.263902	1506.3
625.00	620.23	10.863	39.557	35.389	27.122	0.97094	0.00110	0.409	1.2574	4.333126	1504.2
650.00	644.98	10.235	38.875	35.295	27.161	0.97079	0.00106	0.426	1.2843	3.284744	1502.2
675.00	669.72	9.262	37.821	35.149	27.211	0.97062	0.00100	0.442	1.3102	1.999374	1498.9
700.00	694.46	8.629	37.157	35.064	27.247	0.97048	0.00097	0.459	1.3346	2.366052	1496.8
725.00	719.20	8.072	36.566	34.976	27.264	0.97035	0.00095	0.476	1.3586	3.794641	1495.0
750.00	743.93	7.643	36.126	34.919	27.284	0.97021	0.00093	0.492	1.3820	2.898590	1493.7
775.00	768.66	7.099	35.578	34.856	27.312	0.97007	0.00090	0.509	1.4048	3.848057	1491.9
800.00	793.39	6.850	35.357	34.852	27.344	0.96993	0.00087	0.526	1.4268	1.673990	1491.3
825.00	818.11	6.682	35.217	34.856	27.370	0.96980	0.00084	0.543	1.4481	2.001077	1491.1
850.00	842.82	6.387	34.947	34.843	27.399	0.96966	0.00081	0.559	1.4689	1.790074	1490.3
875.00	867.54	6.261	34.850	34.851	27.422	0.96953	0.00079	0.576	1.4889	2.830736	1490.2
900.00	892.25	6.052	34.683	34.866	27.461	0.96938	0.00076	0.593	1.5082	1.415583	1489.8
925.00	916.96	5.891	34.560	34.880	27.493	0.96924	0.00073	0.610	1.5268	2.369063	1489.6
950.00	941.66	5.818	34.511	34.887	27.508	0.96912	0.00071	0.627	1.5448	1.415965	1489.7
975.00	966.36	5.668	34.394	34.897	27.534	0.96899	0.00069	0.643	1.5623	1.675624	1489.6
1000.00	991.06	5.536	34.294	34.908	27.559	0.96885	0.00067	0.660	1.5792	2.003028	1489.4

BOTTOM OF CAST REACHED

Table 3-2. Computed values of depth, salinity, σ_t, dynamic height and other related parameters for Station 5.

SHIP	SURVEY	STATION	DATE	TIME(EST)	LAT	LONG
OTEC PR	1	5	6 21 80	1751	17 53 24.0N	65 30 0.0W

TYPE OF CAST	DEEPEST ARCH LVL	SONIC DEPTH	HT ABOVE BOTTM	DSN
CTD	1010.50 DBARS	2600.00 METERS	******* METERS	405744

TAU=0.0375

PRESSURE (DBARS)	DEPTH (M)	TEMP (DEG-C)	COND (MMHO/CM)	SALINITY (O/OO)	SIGMA-T	SPEC-VOL (CM3/GM)	SPV-ANLY (CM3/GM)	TIMET (SEC)	DYNAM-HT (DYN-M)	BV-FREQ (CYC/HR)	SND-VEL (M/SEC)
25.00	24.91	28.618	58.140	35.887	22.879	0.97753	0.00500	0.013	0.0975	4.697958	1544.3
50.00	49.83	27.876	57.779	36.193	23.353	0.97697	0.00456	0.029	0.2215	25.829269	1543.5
75.00	74.72	25.601	55.899	36.617	24.398	0.97588	0.00357	0.045	0.3217	5.069996	1539.3
100.00	99.59	25.124	55.538	36.727	24.628	0.97555	0.00336	0.061	0.4076	3.721592	1538.7
125.00	124.46	23.728	54.296	36.929	25.201	0.97490	0.00283	0.078	0.4843	7.912448	1536.0
150.00	149.30	22.160	52.661	36.967	25.685	0.97434	0.00237	0.094	0.5477	3.726230	1532.6
175.00	174.14	21.002	51.306	36.869	25.933	0.97400	0.00215	0.110	0.6045	4.586961	1529.9
200.00	198.96	19.914	50.003	36.741	26.130	0.97371	0.00197	0.127	0.6554	2.956166	1527.2
225.00	223.78	19.128	49.066	36.641	26.259	0.97348	0.00185	0.143	0.7029	0.630405	1525.3
250.00	248.59	18.332	48.115	36.532	26.379	0.97326	0.00174	0.157	0.7474	3.453645	1523.4
275.00	273.39	17.797	47.486	36.459	26.456	0.97308	0.00168	0.173	0.7901	5.569843	1522.1
300.00	298.19	17.389	47.005	36.399	26.511	0.97292	0.00163	0.190	0.8315	1.668842	1521.3
325.00	322.99	16.546	45.993	36.262	26.608	0.97272	0.00155	0.206	0.8712	3.732409	1519.0
350.00	347.78	15.988	45.340	36.178	26.673	0.97256	0.00149	0.223	0.9090	3.026176	1517.6
375.00	372.57	15.641	44.937	36.122	26.710	0.97241	0.00146	0.239	0.9459	1.411168	1516.9
400.00	397.36	14.666	43.791	35.963	26.805	0.97221	0.00137	0.256	0.9814	4.507831	1514.0
425.00	422.14	14.185	43.241	35.889	26.852	0.97206	0.00133	0.272	1.0153	3.399771	1512.8
450.00	446.91	13.752	42.748	35.821	26.891	0.97192	0.00130	0.289	1.0480	3.681753	1511.7
475.00	471.68	13.163	42.079	35.728	26.941	0.97176	0.00125	0.305	1.0799	4.189010	1510.1
500.00	496.45	12.638	41.494	35.652	26.988	0.97161	0.00121	0.322	1.1108	3.342208	1508.6
525.00	521.22	12.416	41.255	35.621	27.008	0.97148	0.00120	0.338	1.1409	1.671316	1508.2
550.00	545.98	12.005	40.802	35.560	27.041	0.97134	0.00117	0.355	1.1705	4.685471	1507.2
575.00	570.74	11.225	39.941	35.445	27.099	0.97118	0.00111	0.372	1.1989	3.222063	1504.7
600.00	595.49	10.770	39.450	35.381	27.132	0.97103	0.00108	0.388	1.2262	0.0	1503.4
625.00	620.24	10.008	38.617	35.264	27.175	0.97088	0.00104	0.405	1.2526	1.787827	1500.9
650.00	644.98	9.218	37.762	35.141	27.213	0.97073	0.00100	0.422	1.2780	1.094985	1498.3
675.00	669.73	8.553	37.044	35.031	27.233	0.97059	0.00097	0.438	1.3026	3.740601	1496.1
700.00	694.46	8.108	36.584	34.972	27.255	0.97046	0.00095	0.455	1.3267	1.999711	1494.7
725.00	719.20	7.669	36.135	34.915	27.277	0.97033	0.00093	0.472	1.3502	4.242604	1493.4
750.00	743.93	7.456	35.941	34.905	27.300	0.97020	0.00091	0.488	1.3732	3.347066	1492.9
775.00	768.66	6.752	35.226	34.819	27.331	0.97005	0.00087	0.505	1.3954	1.673787	1490.5
800.00	793.39	6.614	35.120	34.830	27.359	0.96991	0.00085	0.522	1.4168	2.000839	1490.4
825.00	818.10	6.571	35.108	34.848	27.378	0.96979	0.00083	0.539	1.4378	2.192091	1490.6
850.00	842.82	6.452	35.005	34.843	27.391	0.96967	0.00082	0.556	1.4584	2.001347	1490.6
875.00	867.54	6.245	34.834	34.850	27.424	0.96953	0.00079	0.572	1.4786	2.001637	1490.2
900.00	892.25	6.112	34.730	34.858	27.447	0.96940	0.00077	0.589	1.4981	1.096489	1490.1
925.00	916.96	5.979	34.622	34.859	27.465	0.96927	0.00075	0.606	1.5172	1.899423	1489.9
950.00	941.66	5.933	34.603	34.873	27.482	0.96915	0.00074	0.623	1.5358	2.002421	1490.2
975.00	966.37	5.839	34.542	34.889	27.506	0.96902	0.00072	0.639	1.5539	2.902177	1490.2
1000.00	991.06	5.656	34.399	34.903	27.540	0.96887	0.00069	0.656	1.5716	4.739923	1489.9

BOTTOM OF CAST REACHED

Table 3-3. Computed values of depth, salinity, σ_t, dynamic height and other related parameters for Station 8.

SHIP	SURVEY	STATION	DATE	TIME(EST)	LAT	LONG
OTEC PR	1	8	6 21 80	1516	17 56 0.0N	65 37 30.0W

TYPE OF CAST	DEEPEST ARCH LVL	SONIC DEPTH	HT ABOVE BOTTM	DSN
CTD	1014.50 DBARS	1700.00 METERS	******* METERS	405739

TAU=0.0375

PRESSURE (DBARS)	DEPTH (M)	TEMP (DEG-C)	COND (MMHO/CM)	SALINITY (O/OO)	SIGMA-T	SPEC-VOL (CM3/GM)	SPV-ANLY (CM3/GM)	TIMET (SEC)	DYNAM-HT (DYN-M)	BV-FREQ (CYC/HR)	SND-VEL (M/SEC)
25.00	24.91	28.619	58.141	35.888	22.879	0.97753	0.00500	0.012	0.0927	3.970501	1544.3
50.00	49.83	27.918	57.708	36.110	23.277	0.97705	0.00463	0.028	0.2170	32.373611	1543.5
75.00	74.71	25.236	55.492	36.610	24.506	0.97577	0.00347	0.044	0.3117	8.669059	1538.4
100.00	99.58	24.369	54.953	36.906	24.993	0.97521	0.00301	0.061	0.3926	9.969737	1537.1
125.00	124.44	23.539	54.178	36.995	25.308	0.97480	0.00272	0.077	0.4643	6.780425	1535.6
150.00	149.29	22.568	53.130	36.990	25.586	0.97443	0.00247	0.093	0.5299	4.998769	1533.6
175.00	174.12	20.414	50.584	36.792	26.035	0.97390	0.00205	0.110	0.5866	8.866684	1528.2
200.00	198.94	19.687	49.712	36.697	26.156	0.97368	0.00194	0.126	0.6361	0.891343	1526.5
225.00	223.76	19.111	49.029	36.625	26.251	0.97349	0.00186	0.142	0.6839	2.441528	1525.3
250.00	248.57	18.637	48.475	36.566	26.328	0.97331	0.00179	0.159	0.7293	6.336580	1524.3
275.00	273.38	18.044	47.776	36.489	26.418	0.97312	0.00171	0.175	0.7732	4.761203	1522.9
300.00	298.18	17.628	47.292	36.433	26.478	0.97296	0.00166	0.192	0.8153	3.454719	1522.0
325.00	322.98	16.719	46.207	36.294	26.592	0.97274	0.00156	0.208	0.8556	1.784403	1519.6
350.00	347.77	16.179	45.571	36.210	26.653	0.97258	0.00151	0.224	0.8941	1.784707	1518.2
375.00	372.56	15.791	45.118	36.147	26.695	0.97243	0.00147	0.241	0.9314	1.262167	1517.4
400.00	397.34	15.193	44.413	36.047	26.753	0.97227	0.00142	0.257	0.9678	1.785274	1515.8
425.00	422.12	14.466	43.571	35.935	26.827	0.97209	0.00136	0.274	1.0023	1.411641	1513.8
450.00	446.90	14.104	43.159	35.878	26.860	0.97195	0.00133	0.290	1.0358	1.262791	1512.9
475.00	471.68	13.759	42.767	35.822	26.890	0.97181	0.00131	0.307	1.0688	1.412039	1512.1
500.00	496.44	13.340	42.291	35.754	26.925	0.97167	0.00128	0.323	1.1011	4.093079	1511.1
525.00	521.21	12.703	41.578	35.661	26.982	0.97151	0.00122	0.340	1.1322	0.893332	1509.3
550.00	545.97	12.443	41.295	35.624	27.005	0.97138	0.00121	0.357	1.1625	1.547502	1508.7
575.00	570.73	12.121	40.941	35.574	27.030	0.97125	0.00119	0.373	1.1925	1.412860	1508.0
600.00	595.48	11.504	40.263	35.487	27.079	0.97109	0.00114	0.390	1.2214	5.015965	1506.1
625.00	620.24	10.942	39.646	35.400	27.116	0.97095	0.00110	0.406	1.2495	5.363097	1504.5
650.00	644.98	10.170	38.792	35.274	27.156	0.97079	0.00106	0.423	1.2768	1.999025	1501.9
675.00	669.73	9.327	37.881	35.147	27.199	0.97064	0.00102	0.440	1.3026	1.672775	1499.1
700.00	694.47	8.675	37.186	35.050	27.229	0.97049	0.00099	0.456	1.3276	5.691071	1497.0
725.00	719.20	8.104	36.594	34.975	27.259	0.97035	0.00095	0.473	1.3519	1.264871	1495.1
750.00	743.94	7.620	36.109	34.924	27.291	0.97021	0.00092	0.490	1.3753	1.673514	1493.6
775.00	768.66	7.261	35.754	34.886	27.313	0.97008	0.00090	0.506	1.3979	3.225718	1492.6
800.00	793.39	6.882	35.396	34.863	27.348	0.96993	0.00086	0.523	1.4198	3.226203	1491.5
825.00	818.11	6.505	35.031	34.830	27.373	0.96979	0.00084	0.540	1.4410	3.900837	1490.4
850.00	842.83	6.289	34.854	34.840	27.410	0.96965	0.00080	0.557	1.4614	4.338902	1489.9
875.00	867.54	6.182	34.788	34.863	27.442	0.96951	0.00077	0.574	1.4810	0.895176	1489.9
900.00	892.25	6.026	34.665	34.872	27.470	0.96937	0.00075	0.590	1.5001	1.415595	1489.7
925.00	916.96	5.902	34.574	34.884	27.494	0.96924	0.00072	0.607	1.5184	2.610584	1489.7
950.00	941.66	5.732	34.440	34.895	27.525	0.96910	0.00070	0.624	1.5361	1.266500	1489.4
975.00	966.37	5.550	34.298	34.909	27.559	0.96896	0.00066	0.641	1.5531	1.266685	1489.1
1000.00	991.06	5.418	34.195	34.917	27.581	0.96883	0.00064	0.657	1.5694	1.416389	1489.0

BOTTOM OF CAST REACHED

Table 3-4. Computed values of depth, salinity, σ_t, dynamic height and other related parameters for Station 10.

SHIP	SURVEY	STATION	DATE	TIME(EST)	LAT	LONG
OTEC PR	1	10	6 18 80	1547	17 55 12.0N	65 41 18.0W

TYPE OF CAST	DEEPEST ARCM LVL	SONIC DEPTH	HT ABOVE BOTTM	DSN
CTD	1006.00 DBARS	1800.00 METERS	******* METERS	405746

TAU=0.0375

PRESSURE (DBARS)	DEPTH (M)	TEMP (DEG-C)	COND (MMHO/CM)	SALINITY (O/OO)	SIGMA-T	SPEC-VOL (CM3/GM)	SPV-ANLY (CM3/GM)	TIMET (SEC)	DYNAM-HT (DYN-M)	BV-FREQ (CYC/HR)	SND-VEL (M/SEC)
25.00	24.89	28.531	58.041	35.884	22.905	0.97751	0.00498	0.007	0.0547	0.887855	1544.1
50.00	49.81	26.298	56.217	36.302	23.942	0.97641	0.00400	0.023	0.1784	43.899366	1540.1
75.00	74.69	25.364	55.646	36.622	24.475	0.97580	0.00350	0.040	0.2717	11.090745	1538.7
100.00	99.56	23.975	54.353	36.775	25.012	0.97519	0.00300	0.056	0.3509	4.405098	1536.0
125.00	124.42	23.169	53.603	36.861	25.314	0.97480	0.00272	0.072	0.4229	8.328163	1534.6
150.00	149.26	21.969	52.436	36.953	25.729	0.97430	0.00233	0.088	0.4863	4.318199	1532.1
175.00	174.10	20.153	50.257	36.751	26.073	0.97386	0.00201	0.105	0.5412	7.157165	1527.5
200.00	198.92	19.236	49.169	36.642	26.232	0.97361	0.00187	0.121	0.5892	3.335343	1525.2
225.00	223.73	18.900	48.778	36.599	26.286	0.97345	0.00182	0.138	0.6356	3.621494	1524.6
250.00	248.54	18.464	48.294	36.549	26.354	0.97328	0.00177	0.154	0.6803	2.184224	1523.8
275.00	273.35	18.099	47.850	36.503	26.415	0.97312	0.00172	0.170	0.7239	1.891907	1523.1
300.00	298.15	17.680	47.362	36.447	26.477	0.97296	0.00167	0.187	0.7662	0.892004	1522.2
325.00	322.95	17.079	46.651	36.359	26.555	0.97278	0.00160	0.203	0.8073	4.278687	1520.7
350.00	347.74	16.706	46.211	36.299	26.598	0.97263	0.00156	0.220	0.8468	1.092644	1519.9
375.00	372.53	16.112	45.502	36.199	26.661	0.97246	0.00151	0.236	0.8852	1.411098	1518.4
400.00	397.32	15.055	44.258	36.033	26.773	0.97225	0.00140	0.253	0.9218	3.279819	1515.4
425.00	422.10	14.315	43.400	35.916	26.845	0.97207	0.00134	0.269	0.9561	1.670308	1513.3
450.00	446.88	14.001	43.044	35.866	26.873	0.97194	0.00132	0.286	0.9892	1.411861	1512.6
475.00	471.65	13.750	42.763	35.826	26.896	0.97181	0.00130	0.302	1.0219	0.893058	1512.1
500.00	496.42	13.320	42.278	35.760	26.933	0.97167	0.00127	0.318	1.0541	2.679565	1511.0
525.00	521.19	12.894	41.802	35.696	26.971	0.97152	0.00124	0.334	1.0852	1.412465	1509.9
550.00	545.95	12.247	41.078	35.599	27.024	0.97136	0.00119	0.351	1.1157	1.094272	1508.0
575.00	570.71	11.762	40.545	35.528	27.063	0.97122	0.00115	0.367	1.1448	1.767207	1506.7
600.00	595.46	11.210	39.937	35.445	27.102	0.97107	0.00112	0.384	1.1732	2.096004	1505.1
625.00	620.21	10.642	39.316	35.359	27.138	0.97092	0.00108	0.401	1.2006	1.413338	1503.3
650.00	644.96	9.916	38.512	35.235	27.169	0.97078	0.00105	0.417	1.2271	1.788011	1501.0
675.00	669.70	9.248	37.798	35.139	27.206	0.97063	0.00101	0.434	1.2528	2.448709	1498.8
700.00	694.44	8.541	37.054	35.042	27.244	0.97048	0.00097	0.451	1.2776	0.894282	1496.5
725.00	719.17	8.111	36.619	34.995	27.273	0.97034	0.00094	0.467	1.3014	0.632444	1495.2
750.00	743.91	7.696	36.200	34.946	27.297	0.97020	0.00092	0.484	1.3245	1.897595	1493.9
775.00	768.63	7.342	35.841	34.900	27.312	0.97008	0.00090	0.501	1.3473	2.683955	1492.9
800.00	793.36	6.816	35.318	34.844	27.342	0.96993	0.00087	0.517	1.3692	4.818553	1491.2
825.00	818.08	6.675	35.209	34.854	27.369	0.96980	0.00084	0.534	1.3905	0.894909	1491.1
850.00	842.80	6.432	34.989	34.845	27.395	0.96966	0.00082	0.943	1.4113	1.898650	1490.5
875.00	867.52	6.219	34.812	34.852	27.428	0.96952	0.00079	0.560	1.4313	1.790327	1490.1
900.00	892.23	6.096	34.721	34.863	27.453	0.96939	0.00076	0.577	1.4508	2.368703	1490.0
925.00	916.93	5.895	34.568	34.885	27.496	0.96924	0.00072	0.594	1.4692	0.0	1489.6
950.00	941.64	5.727	34.437	34.897	27.527	0.96910	0.00069	0.610	1.4869	0.633252	1489.4
975.00	966.34	5.550	34.300	34.912	27.561	0.96896	0.00066	0.627	1.5038	1.266688	1489.1
1000.00	991.03	5.429	34.207	34.919	27.581	0.96883	0.00064	0.644	1.5202	4.055915	1489.0

BOTTOM OF CAST REACHED

Table 3-5. Computed values of depth, salinity, σ_t, dynamic height and other related parameters for Station 13.

SHIP	SURVEY	STATION	DATE	TIME(EST)	LAT	LONG
OTEC PR	1	13	6 17 80	1656	17 50 10.0N	65 45 6.0W

TYPE OF CAST	DEEPEST ARCH LVL	SONIC DEPTH	HT ABOVE BOTTM	DSN
CTD	1000.50 DBARS	1800.00 METERS	******* METERS	405745

TAU=0.0375

PRESSURE (DBARS)	DEPTH (M)	TEMP (DEG-C)	COND (MMHO/CM)	SALINITY (O/OO)	SIGMA-T	SPEC-VOL (CM3/GM)	SPV-ANLY (CM3/GM)	TIMET (SEC)	DYNAM-HT (DYN-M)	BV-FREQ (CYC/HR)	SND-VEL (M/SEC)
25.00	24.90	28.452	57.909	35.852	22.907	0.97750	0.00497	0.011	0.0824	2.431496	1543.9
50.00	49.82	26.940	56.639	36.248	23.696	0.97665	0.00423	0.027	0.2008	11.027587	1541.5
75.00	74.71	25.508	55.741	36.575	24.395	0.97588	0.00357	0.043	0.2993	9.843069	1539.0
100.00	99.58	24.330	54.684	36.733	24.874	0.97532	0.00313	0.059	0.3828	7.524297	1536.8
125.00	124.44	23.434	53.852	36.832	25.215	0.97489	0.00281	0.076	0.4571	4.175572	1535.2
150.00	149.26	22.269	52.733	36.915	25.609	0.97441	0.00245	0.092	0.5232	6.234696	1532.6
175.00	174.12	20.957	51.254	36.866	25.943	0.97399	0.00214	0.108	0.5806	10.618117	1529.7
200.00	198.95	20.262	50.455	36.792	26.070	0.97376	0.00202	0.125	0.6323	1.543717	1528.3
225.00	223.76	19.397	49.384	36.670	26.212	0.97352	0.00190	0.141	0.6812	3.729347	1526.1
250.00	248.57	18.741	48.607	36.587	26.318	0.97332	0.00180	0.157	0.7276	1.783347	1524.6
275.00	273.38	18.146	47.908	36.511	26.409	0.97313	0.00172	0.174	0.7717	4.547546	1523.2
300.00	298.18	17.476	47.110	36.412	26.499	0.97293	0.00164	0.190	0.8141	5.950527	1521.6
325.00	322.98	17.082	46.649	36.354	26.550	0.97278	0.00160	0.207	0.8548	2.185349	1520.7
350.00	347.78	16.343	45.768	36.236	26.635	0.97259	0.00153	0.223	0.8941	4.506076	1518.8
375.00	372.57	15.674	44.976	36.127	26.706	0.97242	0.00146	0.240	0.9318	1.093081	1517.0
400.00	397.35	15.319	44.570	36.074	26.746	0.97228	0.00143	0.256	0.9679	1.262369	1516.2
425.00	422.13	14.652	43.796	35.971	26.814	0.97210	0.00137	0.273	1.0029	3.571150	1514.4
450.00	446.91	14.127	43.194	35.889	26.864	0.97195	0.00133	0.289	1.0367	2.893425	1513.0
475.00	471.68	13.476	42.450	35.788	26.923	0.97178	0.00127	0.306	1.0692	1.996993	1511.2
500.00	496.45	13.039	41.958	35.720	26.960	0.97164	0.00124	0.322	1.1006	1.671050	1510.0
525.00	521.22	12.701	41.582	35.666	26.987	0.97151	0.00122	0.339	1.1314	0.631684	1509.3
550.00	545.98	12.107	40.913	35.571	27.030	0.97135	0.00118	0.355	1.1614	1.547544	1507.5
575.00	570.74	11.383	40.112	35.463	27.084	0.97119	0.00113	0.372	1.1902	2.895675	1505.3
600.00	595.49	10.596	39.239	35.336	27.128	0.97104	0.00108	0.379	1.2180	1.672088	1502.7
625.00	620.24	9.918	38.503	35.235	27.168	0.97088	0.00104	0.395	1.2443	2.365056	1500.6
650.00	644.99	9.360	37.903	35.149	27.196	0.97075	0.00102	0.412	1.2701	3.631593	1498.8
675.00	669.73	8.832	37.353	35.083	27.230	0.97060	0.00098	0.429	1.2949	1.999421	1497.2
700.00	694.47	8.104	36.594	34.986	27.287	0.97045	0.00094	0.446	1.3188	1.788617	1494.7
725.00	719.20	7.593	36.075	34.926	27.296	0.97031	0.00091	0.462	1.3419	2.828465	1493.1
750.00	743.94	7.290	35.773	34.890	27.311	0.97018	0.00090	0.479	1.3644	1.673556	1492.3
775.00	768.66	6.922	35.422	34.863	27.343	0.97004	0.00086	0.495	1.3864	2.191521	1491.2
800.00	793.39	6.779	35.293	34.854	27.355	0.96992	0.00085	0.512	1.4078	1.265432	1491.1
825.00	818.11	6.622	35.154	34.846	27.372	0.96980	0.00084	0.529	1.4290	2.281584	1490.8
850.00	842.83	6.385	34.943	34.842	27.396	0.96966	0.00081	0.545	1.4496	0.0	1490.3
875.00	867.54	6.174	34.768	34.849	27.432	0.96952	0.00078	0.554	1.4697	2.685502	1489.9
900.00	892.26	6.068	34.690	34.858	27.454	0.96939	0.00076	0.571	1.4889	1.550680	1489.9
925.00	916.96	5.928	34.566	34.871	27.481	0.96925	0.00074	0.588	1.5076	2.262860	1489.7
950.00	941.67	5.749	34.446	34.885	27.515	0.96911	0.00071	0.605	1.5255	4.341294	1489.5
975.00	966.37	5.664	34.386	34.892	27.531	0.96899	0.00069	0.622	1.5430	0.633326	1489.5
1000.00	991.07	5.510	34.273	34.910	27.564	0.96885	0.00066	0.638	1.5599	1.266833	1489.3

BOTTOM OF CAST REACHED

Table 3-6. Computed values of depth, salinity, σ_t, dynamic height and other related parameters for Station 15.

SHIP	SURVEY	STATION	DATE	TIME(EST)	LAT	LONG
OTEC PR	1	15	6 18 80	1100	17 48 18.0N	65 43 30.0W

TYPE OF CAST	DEEPEST ARCH LVL	SONIC DEPTH	HT ABOVE BOTTM	DSN
CTD	306.00 DBARS	500.00 METERS	******* METERS	405737

TAU=0.0375

PRESSURE (DBARS)	DEPTH (M)	TEMP (DEG-C)	COND (MMHO/CM)	SALINITY (O/OO)	SIGMA-T	SPEC-VOL (CM3/GM)	SPV-ANLY (CM3/GM)	TIMET (SEC)	DYNAM-HT (DYN-M)	BV-FREQ (CYC/HR)	SND-VEL (M/SEC)
25.00	24.91	28.436	57.891	35.851	22.912	0.97750	0.00497	0.013	0.0994	1.537820	1543.9
50.00	49.82	26.884	56.781	36.251	23.717	0.97663	0.00421	0.029	0.2149	15.249915	1541.3
75.00	74.71	25.604	55.780	36.526	24.329	0.97594	0.00364	0.045	0.3124	7.904038	1539.2
100.00	99.58	24.339	54.677	36.721	24.862	0.97533	0.00314	0.062	0.3966	10.751832	1536.8
125.00	124.44	23.346	53.928	36.964	25.341	0.97477	0.00269	0.078	0.4696	5.415750	1535.1
150.00	149.28	22.054	52.547	36.968	25.716	0.97431	0.00234	0.094	0.5332	3.726340	1532.3
175.00	174.12	21.176	51.501	36.876	25.891	0.97404	0.00219	0.111	0.5900	2.597732	1530.3
200.00	198.94	20.268	50.433	36.786	26.069	0.97376	0.00202	0.127	0.6418	2.183146	1528.2
225.00	223.76	19.008	48.912	36.618	26.272	0.97347	0.00184	0.143	0.6906	7.160092	1525.0
250.00	248.57	18.410	48.207	36.541	26.366	0.97327	0.00176	0.160	0.7354	3.215128	1523.6
275.00	273.38	17.969	47.693	36.484	26.433	0.97310	0.00170	0.176	0.7788	4.038107	1522.7
300.00	298.18	17.499	47.134	36.412	26.493	0.97294	0.00165	0.192	0.8205	1.092495	1521.6

BOTTOM OF CAST REACHED

Table 3-7. Computed values of depth, salinity, σ_t, dynamic height and other related parameters for Station 17.

SHIP	SURVEY	STATION	DATE	TIME(EST)	LAT	LONG
OTEC PR	1	17	6 18 80	1215	17 44 46.0N	65 42 42.0W

TYPE OF CAST	DEEPEST ARCH LVL	SONIC DEPTH	HT ABOVE BOTTM	DSN
CTD	1010.50 DBARS	1200.00 METERS	******* METERS	405747

TAU=0.0375

PRESSURE (DBARS)	DEPTH (M)	TEMP (DEG-C)	COND (MMO/CM)	SALINITY (O/OO)	SIGMA-T	SPEC-VOL (CM3/GM)	SPV-ANLY (CM3/GM)	TIMET (SEC)	DYNAM-HT (DYN-M)	BV-FREQ (CYC/HR)	SND-VEL (M/SEC)
25.00	24.91	28.449	57.883	35.836	22.896	0.97751	0.00498	0.013	0.1023	0.887647	1543.9
50.00	49.82	27.187	57.051	36.206	23.588	0.97675	0.00433	0.029	0.2180	7.218514	1542.0
75.00	74.72	25.743	55.857	36.472	24.245	0.97602	0.00372	0.046	0.3206	10.079756	1539.4
100.00	99.59	24.489	54.829	36.713	24.811	0.97538	0.00319	0.062	0.4062	8.603623	1537.2
125.00	124.45	23.775	54.310	36.900	25.166	0.97494	0.00286	0.078	0.4808	4.625572	1536.1
150.00	149.30	22.629	53.236	37.021	25.593	0.97443	0.00246	0.095	0.5469	5.343942	1533.8
175.00	174.13	21.035	51.360	36.884	25.936	0.97400	0.00214	0.111	0.6040	4.131639	1530.0
200.00	198.96	19.791	49.851	36.722	26.146	0.97369	0.00195	0.127	0.6552	4.544926	1526.9
225.00	223.77	18.867	48.745	36.601	26.296	0.97344	0.00182	0.144	0.7021	3.729659	1524.6
250.00	248.58	18.381	48.173	36.538	26.371	0.97327	0.00175	0.160	0.7465	2.442079	1523.5
275.00	273.39	17.873	47.581	36.474	26.449	0.97309	0.00168	0.176	0.7894	3.215732	1522.4
300.00	298.19	17.326	46.936	36.393	26.521	0.97291	0.00162	0.193	0.8308	5.046151	1521.1
325.00	322.99	16.839	46.357	36.318	26.581	0.97275	0.00157	0.209	0.8706	1.092709	1520.0
350.00	347.78	16.417	45.859	36.250	26.628	0.97260	0.00153	0.226	0.9093	2.523692	1519.0
375.00	372.57	15.735	45.049	36.137	26.700	0.97243	0.00147	0.242	0.9471	4.233454	1517.2
400.00	397.35	15.062	44.268	36.036	26.773	0.97225	0.00140	0.259	0.9827	1.546124	1515.4
425.00	422.13	14.567	43.695	35.955	26.821	0.97210	0.00136	0.275	1.0174	4.766211	1514.1
450.00	446.91	14.043	43.093	35.874	26.870	0.97194	0.00132	0.292	1.0506	2.445406	1512.7
475.00	471.68	13.700	42.711	35.824	26.904	0.97180	0.00129	0.308	1.0833	0.893064	1512.0
500.00	496.45	13.241	42.188	35.749	26.941	0.97166	0.00126	0.325	1.1152	2.604091	1510.8
525.00	521.22	12.507	41.357	35.634	27.000	0.97149	0.00121	0.341	1.1460	1.766699	1508.6
550.00	545.98	11.946	40.734	35.549	27.044	0.97134	0.00117	0.358	1.1757	1.671563	1506.9
575.00	570.74	11.268	39.991	35.454	27.098	0.97118	0.00111	0.374	1.2042	2.095769	1504.9
600.00	595.49	10.856	39.541	35.390	27.123	0.97104	0.00109	0.391	1.2318	7.424112	1503.7
625.00	620.24	10.065	38.650	35.242	27.149	0.97091	0.00106	0.408	1.2588	2.755150	1501.1
650.00	644.98	9.515	38.062	35.163	27.180	0.97076	0.00103	0.424	1.2849	1.094947	1499.4
675.00	669.73	9.274	37.821	35.137	27.200	0.97064	0.00102	0.441	1.3105	1.999352	1498.9
700.00	694.47	8.603	37.108	35.038	27.231	0.97049	0.00098	0.458	1.3355	3.405278	1498.7
725.00	719.20	8.016	36.500	34.962	27.261	0.97035	0.00095	0.474	1.3595	0.894403	1494.8
750.00	743.94	7.641	36.119	34.914	27.280	0.97022	0.00093	0.491	1.3830	2.097840	1493.7
775.00	768.66	7.326	35.814	34.886	27.304	0.97008	0.00091	0.508	1.4059	1.265219	1492.8
800.00											
825.00	818.11	6.716	35.248	34.856	27.365	0.96980	0.00085	0.543	1.4497	4.051647	1491.2
850.00	842.83	6.537	35.097	34.859	27.392	0.96967	0.00082	0.560	1.4705	1.265760	1490.9
875.00	867.55	6.445	35.030	34.865	27.409	0.96955	0.00081	0.567	1.4909	1.790285	1491.0
900.00	892.26	6.173	34.791	34.863	27.443	0.96940	0.00077	0.583	1.5107	1.096484	1490.3
925.00	916.97	6.099	34.745	34.876	27.463	0.96928	0.00076	0.599	1.5298	0.895392	1490.4
950.00	941.67	5.873	34.550	34.876	27.492	0.96914	0.00073	0.616	1.5483	1.415941	1489.9
975.00	966.37	5.685	34.411	34.898	27.533	0.96899	0.00069	0.633	1.5662	2.533301	1489.6
1000.00	991.07	5.534	34.299	34.914	27.565	0.96885	0.00066	0.650	1.5829	1.416362	1489.5

BOTTOM OF CAST REACHED

Table 3-8. Computed values of depth, salinity, σ_t, dynamic height and other related parameters for Station 19.

SHIP	SURVEY	STATION	DATE	TIME(EST)	LAT	LONG
OTEC PR	1	19	6 19 80	928	17 44 36.0N	65 57 18.0W

TYPE OF CAST	DEEPEST ARCH LVL	SONIC DEPTH	HT ABOVE BOTTM	DSN
CTD	404.00 DBARS	700.00 METERS	******* METERS	405736

TAU=0.0375

PRESSURE (DBARS)	DEPTH (M)	TEMP (DEG-C)	COND (MMO/CM)	SALINITY (O/OO)	SIGMA-T	SPEC-VOL (CM3/GM)	SPV-ANLY (CM3/GM)	TIMET (SEC)	DYNAM-HT (DYN-M)	BV-FREQ (CYC/HR)	SND-VEL (M/SEC)
25.00	24.91	28.497	57.961	35.854	22.893	0.97752	0.00499	0.013	0.0972	0.887845	1544.0
50.00	49.83	28.335	57.913	35.936	23.010	0.97730	0.00489	0.029	0.2219	19.786926	1544.2
75.00	74.72	25.675	55.900	36.558	24.331	0.97594	0.00364	0.044	0.3216	10.255592	1539.4
100.00	99.59	24.592	55.071	36.812	24.855	0.97534	0.00315	0.060	0.4061	5.412604	1537.5
125.00	124.45	23.784	54.379	36.945	25.197	0.97491	0.00283	0.076	0.4806	10.608109	1536.2
150.00	149.30	22.724	53.362	37.040	25.579	0.97444	0.00248	0.093	0.5463	5.737576	1534.1
175.00	174.13	20.927	51.160	36.815	25.913	0.97402	0.00216	0.109	0.6039	8.752970	1529.6
200.00	198.96	19.993	50.100	36.751	26.116	0.97372	0.00198	0.125	0.6553	2.272394	1527.4
225.00	223.77	19.088	49.005	36.625	26.257	0.97348	0.00185	0.142	0.7034	5.160069	1525.2
250.00	248.59	18.204	47.960	36.513	26.397	0.97324	0.00173	0.158	0.7482	1.668301	1523.0
275.00	273.39	17.597	47.248	36.433	26.486	0.97305	0.00165	0.174	0.7902	0.630681	1521.5
300.00	298.19	17.333	46.940	36.392	26.519	0.97292	0.00162	0.191	0.8312	2.600728	1521.1
325.00	322.99	16.762	46.264	36.305	26.589	0.97274	0.00156	0.207	0.8713	3.568798	1519.7
350.00	347.78	15.802	45.124	36.153	26.697	0.97253	0.00147	0.224	0.9090	2.601750	1517.0
375.00	372.57	15.380	44.633	36.085	26.741	0.97238	0.00143	0.240	0.9451	1.411212	1516.0
400.00	397.35	15.175	44.400	36.053	26.761	0.97226	0.00142	0.257	0.9808	2.093434	1515.8

BOTTOM OF CAST REACHED

Table 3-9. Computed values of depth, salinity, σ_t, dynamic height and other related parameters for Station 21.

SHIP	SURVEY	STATION	DATE	TIME(EST)	LAT	LONG
OTEC PR	1	21	6 19 80	1038	17 50 24.0N	65 59 6.0W

TYPE OF CAST	DEEPEST ARCH LVL	SONIC DEPTH	HT ABOVE BOTTM	DSN
CTD	1002.00 DBARS	1500.00 METERS	******* METERS	405743

TAU=0.0375

PRESSURE (DBARS)	DEPTH (M)	TEMP (DEG-C)	COND (MMO/CM)	SALINITY (O/OO)	SIGMA-T	SPEC-VOL (CM3/GM)	SPV-ANLY (CM3/GM)	TIMET (SEC)	DYNAM-HT (DYN-M)	BV-FREQ (CYC/HR)	SND-VEL (M/SEC)
25.00	24.91	28.568	58.082	35.885	22.893	0.97752	0.00499	0.014	0.1047	0.887845	1544.2
50.00	49.83	28.538	58.071	35.892	22.909	0.97740	0.00498	0.030	0.2294	3.819220	1544.6
75.00	74.72	25.118	55.424	36.655	24.575	0.97571	0.00340	0.046	0.3253	7.307957	1538.2
100.00	99.59	24.128	54.597	36.835	25.011	0.97519	0.00300	0.062	0.4055	6.417610	1536.5
125.00	124.44	23.527	54.082	36.931	25.263	0.97485	0.00277	0.079	0.4769	5.769644	1535.5
150.00	149.29	22.381	52.874	36.947	25.607	0.97441	0.00245	0.095	0.5428	3.830920	1533.1
175.00	174.13	20.906	51.127	36.807	25.913	0.97402	0.00217	0.111	0.6001	4.455162	1529.5
200.00	198.95	20.036	50.153	36.757	26.110	0.97373	0.00199	0.128	0.6516	2.183230	1527.6
225.00	223.77	19.004	48.910	36.619	26.275	0.97346	0.00184	0.144	0.6995	3.335838	1525.0
250.00	248.58	18.302	48.083	36.531	26.386	0.97325	0.00174	0.160	0.7442	2.359306	1523.3
275.00	273.38	17.880	47.589	36.474	26.448	0.97309	0.00169	0.177	0.7872	3.153278	1522.4
300.00	298.19	17.556	47.212	36.429	26.493	0.97294	0.00165	0.193	0.8288	1.261503	1521.8
325.00	322.98	17.016	46.573	36.347	26.561	0.97277	0.00159	0.210	0.8695	4.136838	1520.5
350.00	347.78	16.238	45.645	36.223	26.649	0.97258	0.00151	0.226	0.9082	3.732965	1518.4
375.00	372.57	15.633	44.934	36.127	26.715	0.97241	0.00145	0.243	0.9453	1.785011	1516.9
400.00	397.35	15.061	44.266	36.034	26.772	0.97225	0.00140	0.259	0.9807	2.602509	1515.4
425.00	422.13	14.464	43.574	35.939	26.831	0.97209	0.00135	0.276	1.0150	1.893923	1513.8
450.00	446.91	14.277	43.365	35.909	26.848	0.97196	0.00134	0.292	1.0486	1.546575	1513.5
475.00	471.68	14.032	43.090	35.870	26.870	0.97184	0.00133	0.309	1.0821	1.894408	1513.1
500.00	496.45	13.446	42.425	35.781	26.924	0.97168	0.00128	0.325	1.1147	4.141500	1511.5
525.00	521.22	13.079	42.014	35.725	26.956	0.97154	0.00125	0.342	1.1463	1.094072	1510.6
550.00	545.98	12.181	41.002	35.588	27.028	0.97136	0.00118	0.358	1.1766	1.263562	1507.8
575.00	570.74	11.460	40.200	35.477	27.080	0.97120	0.00113	0.375	1.2057	3.895202	1505.6
600.00	595.49	11.117	39.829	35.427	27.105	0.97106	0.00111	0.391	1.2336	1.094606	1504.7
625.00	620.24	10.129	38.725	35.257	27.149	0.97091	0.00106	0.408	1.2607	0.893889	1501.4
650.00	644.99	9.759	38.333	35.204	27.172	0.97077	0.00104	0.425	1.2870	0.632161	1500.4
675.00	669.73	9.076	37.608	35.110	27.211	0.97062	0.00100	0.441	1.3124	2.965557	1498.1
700.00	694.47	8.652	37.170	35.056	27.237	0.97049	0.00098	0.458	1.3372	2.682823	1496.9
725.00	719.21	8.319	36.831	35.014	27.256	0.97036	0.00096	0.475	1.3614	4.049534	1496.0
750.00	743.94	7.859	36.358	34.955	27.280	0.97022	0.00093	0.491	1.3850	2.607944	1494.6
775.00	768.67	7.485	35.989	34.917	27.305	0.97009	0.00091	0.508	1.4080	3.848004	1493.5
800.00	793.39	7.117	35.627	34.880	27.329	0.96995	0.00088	0.525	1.4304	1.414752	1492.4
825.00	818.11	6.837	35.375	34.875	27.363	0.96981	0.00085	0.542	1.4521	4.100945	1491.7
850.00	842.83	6.589	35.145	34.860	27.385	0.96968	0.00083	0.558	1.4731	1.674431	1491.1
875.00	867.55	6.320	34.911	34.859	27.421	0.96953	0.00079	0.575	1.4934	2.001628	1490.5
900.00	892.26	6.155	34.773	34.862	27.445	0.96940	0.00077	0.592	1.5130	2.532226	1490.2
925.00	916.97	6.018	34.669	34.873	27.471	0.96927	0.00075	0.609	1.5321	3.902957	1490.1
950.00	941.67	5.873	34.559	34.885	27.499	0.96913	0.00072	0.626	1.5504	2.831902	1490.0
975.00	966.38	5.677	34.406	34.901	27.537	0.96898	0.00069	0.642	1.5678	1.551330	1489.6
1000.00	991.07	5.522	34.284	34.910	27.563	0.96885	0.00066	0.659	1.5846	2.194218	1489.4

BOTTOM OF CAST REACHED

Table 3-10. Computed values of depth, salinity, σ_t, dynamic height and other related parameters for Station 23.

SHIP	SURVEY	STATION	DATE	TIME(EST)	LAT	LONG
OTEC PR	1	23	6 19 80	1240	17 55 46.0N	66 0 42.0W

TYPE OF CAST	DEEPEST ARCH LVL	SONIC DEPTH	HT ABOVE BOTTM	DSN
CTD	201.50 DBARS	400.00 METERS	******* METERS	405735

TAU=0.0375

PRESSURE (DBARS)	DEPTH (M)	TEMP (DEG-C)	COND (MMHO/CM)	SALINITY (O/OO)	SIGMA-T	SPEC-VOL (CM3/GM)	SPV-ANLY (CM3/GM)	TIMET (SEC)	DYNAM-HT (DYN-M)	BV-FREQ (CYC/HR)	SND-VEL (M/SEC)
25.00	24.91	28.771	58.307	35.889	22.829	0.97758	0.00505	0.011	0.0860	2.511044	1544.6
50.00	49.83	28.581	58.108	35.886	22.890	0.97742	0.00500	0.027	0.2117	2.082391	1544.6
75.00	74.72	25.139	55.435	36.646	24.563	0.97572	0.00341	0.043	0.3129	5.730068	1538.2
100.00	99.59	24.245	54.593	36.735	24.901	0.97529	0.00310	0.059	0.3947	9.226299	1536.6
125.00	124.45	23.710	54.131	36.816	25.122	0.97498	0.00290	0.075	0.4703	8.834484	1535.8
150.00	149.30	22.682	53.119	36.885	25.474	0.97454	0.00258	0.091	0.5373	4.540955	1533.8
175.00	174.14	21.182	51.448	36.829	25.854	0.97407	0.00222	0.108	0.5965	4.960769	1530.3
200.00	198.96	20.683	50.924	36.826	25.988	0.97384	0.00210	0.124	0.6498	5.775580	1529.4

BOTTOM OF CAST REACHED

Table 3-11. Computed values of depth, salinity, σ_t, dynamic height and other related parameters for Station 26.

SHIP	SURVEY	STATION	DATE	TIME(EST)	LAT	LONG
OTEC PR	1	26	6 19 80	1430	17 52 0.0N	65 53 0.0W

TYPE OF CAST	DEEPEST ARCH LVL	SONIC DEPTH	HT ABOVE BOTTM	DSN
CTD	1019.50 DBARS	1800.00 METERS	******* METERS	405742

TAU=0.0375

PRESSURE (DBARS)	DEPTH (M)	TEMP (DEG-C)	COND (MMO/CM)	SALINITY (O/OO)	SIGMA-T	SPEC-VOL (CM3/GM)	SPV-ANLY (CM3/GM)	TIMET (SEC)	DYNAM-HT (DYN-M)	BV-FREQ (CYC/HR)	SND-VEL (M/SEC)
25.00	24.91	28.563	58.069	35.879	22.891	0.97752	0.00499	0.013	0.1001	1.403802	1544.2
50.00	49.83	28.550	58.068	35.881	22.897	0.97741	0.00499	0.029	0.2249	1.403957	1544.6
75.00	74.72	25.375	55.626	36.597	24.453	0.97582	0.00352	0.045	0.3276	8.484157	1538.7
100.00	99.59	23.945	54.339	36.789	25.032	0.97517	0.00298	0.062	0.4064	4.078409	1536.0
125.00	124.45	23.208	53.746	36.939	25.362	0.97475	0.00267	0.078	0.4776	7.913695	1534.8
150.00	149.29	21.854	52.322	36.961	25.767	0.97426	0.00230	0.094	0.5393	7.867396	1531.8
175.00	174.12	20.973	51.268	36.864	25.938	0.97399	0.00214	0.111	0.5952	4.083323	1529.8
200.00	198.95	19.764	49.811	36.712	26.147	0.97369	0.00195	0.127	0.6463	6.989987	1526.8
225.00	223.76	18.976	48.873	36.613	26.277	0.97346	0.00183	0.143	0.6932	1.091913	1524.9
250.00	248.58	18.356	48.143	36.534	26.374	0.97326	0.00175	0.160	0.7384	2.442085	1523.4
275.00	273.38	18.061	47.805	36.497	26.420	0.97312	0.00171	0.176	0.7817	1.668514	1522.9
300.00	298.18	17.598	47.259	36.432	26.485	0.97295	0.00166	0.193	0.8237	3.216190	1521.9
325.00	322.98	17.118	46.694	36.362	26.548	0.97278	0.00160	0.209	0.8645	2.749828	1520.8
350.00	347.78	16.426	45.871	36.253	26.629	0.97260	0.00153	0.225	0.9037	4.968282	1519.0
375.00	372.57	15.901	45.251	36.167	26.685	0.97244	0.00149	0.242	0.9414	2.960011	1517.7
400.00	397.35	15.185	44.411	36.053	26.760	0.97226	0.00142	0.258	0.9779	3.279775	1515.8
425.00	422.13	14.726	43.880	35.980	26.805	0.97211	0.00138	0.275	1.0128	2.751730	1514.6
450.00	446.91	14.363	43.466	35.922	26.839	0.97197	0.00135	0.291	1.0469	2.094053	1513.8
475.00	471.68	14.022	43.079	35.869	26.871	0.97184	0.00133	0.308	1.0804	2.752512	1513.1
500.00	496.45	13.630	42.633	35.806	26.905	0.97170	0.00130	0.324	1.1132	1.997170	1512.1
525.00	521.22	13.240	42.195	35.746	26.940	0.97156	0.00127	0.341	1.1453	4.044542	1511.2
550.00	545.98	12.871	41.781	35.687	26.968	0.97142	0.00125	0.357	1.1767	1.547441	1510.3
575.00	570.74	12.434	41.302	35.628	27.010	0.97127	0.00121	0.374	1.2074	5.686515	1509.1
600.00	595.50	11.929	40.740	35.550	27.048	0.97113	0.00117	0.391	1.2370	2.447457	1507.7
625.00	620.25	11.001	39.713	35.411	27.114	0.97095	0.00111	0.407	1.2653	2.278874	1504.7
650.00	645.00	10.169	38.789	35.272	27.154	0.97080	0.00106	0.424	1.2925	3.519639	1501.9
675.00	669.74	9.436	38.001	35.165	27.195	0.97064	0.00102	0.440	1.3186	1.896739	1499.5
700.00	694.48	9.120	37.668	35.117	27.210	0.97052	0.00101	0.457	1.3439	1.999592	1498.7
725.00	719.21	8.566	37.090	35.044	27.241	0.97038	0.00098	0.474	1.3688	0.894377	1497.0
750.00	743.95	7.946	36.452	34.968	27.276	0.97023	0.00094	0.491	1.3927	2.683540	1494.9
775.00	768.68	7.541	36.040	34.917	27.297	0.97009	0.00092	0.507	1.4159	1.673709	1493.7
800.00	793.40	7.307	35.820	34.900	27.317	0.96997	0.00090	0.524	1.4385	1.898062	1493.2
825.00	818.13	7.015	35.545	34.882	27.344	0.96983	0.00087	0.541	1.4606	0.894881	1492.4
850.00	842.84	6.812	35.360	34.871	27.364	0.96970	0.00085	0.558	1.4821	2.281809	1492.0
875.00	867.56	6.510	35.079	34.854	27.392	0.96956	0.00083	0.574	1.5031	1.898850	1491.2
900.00	892.27	6.307	34.904	34.853	27.418	0.96943	0.00080	0.591	1.5234	1.790503	1490.8
925.00	916.98	6.086	34.724	34.865	27.456	0.96928	0.00076	0.608	1.5430	1.096620	1490.4
950.00	941.69	5.922	34.596	34.877	27.486	0.96914	0.00074	0.625	1.5617	2.283121	1490.1
975.00	966.39	5.775	34.486	34.891	27.516	0.96901	0.00071	0.641	1.5797	2.193863	1490.0
1000.00	991.09	5.552	34.307	34.905	27.555	0.96886	0.00067	0.658	1.5970	1.675846	1489.5

BOTTOM OF CAST REACHED

Table 3-12. Computed values of depth, salinity, σ_t, dynamic height and other related parameters for Station 28.

SHIP	SURVEY	STATION	DATE	TIME(EST)	LAT	LONG
OTEC PR	1	28	6 19 80	1646	17 53 12.0N	65 49 0.0W

TYPE OF CAST	DEEPEST ARCH LVL	SONIC DEPTH	HT ABOVE BOTTM	DSN
CTD	1011.00 DBARS	1800.00 METERS	******* METERS	405740

TAU=0.0375

PRESSURE (DBARS)	DEPTH (M)	TEMP (DEG=C)	COND (MMHO/CM)	SALINITY (O/OO)	SIGMA-T	SPEC-VOL (CM3/GM)	SPV-ANLY (CM3/GM)	TIMET (SEC)	DYNAM-HT (DYN-M)	BV-FREQ (CYC/HR)	SND-VEL (M/SEC)
25.00	24.91	28.572	58.081	35.881	22.890	0.97752	0.00499	0.011	0.0876	0.627799	1544.2
50.00	49.83	28.354	57.959	35.954	23.016	0.97730	0.00488	0.027	0.2123	14.510530	1544.2
75.00	74.71	24.912	55.270	36.707	24.678	0.97561	0.00330	0.043	0.3028	6.686650	1537.8
100.00	99.57	23.928	54.332	36.798	25.043	0.97516	0.00297	0.059	0.3808	4.029610	1535.9
125.00	124.43	23.246	53.777	36.931	25.345	0.97477	0.00269	0.076	0.4518	8.947845	1534.8
150.00	149.27	21.837	52.302	36.959	25.770	0.97426	0.00229	0.092	0.5132	3.085868	1531.7
175.00	174.10	20.253	50.389	36.772	26.063	0.97387	0.00202	0.108	0.5664	5.420732	1527.8
200.00	198.92	19.564	49.560	36.680	26.175	0.97366	0.00192	0.125	0.6155	1.091687	1526.2
225.00	223.74	18.596	48.417	36.564	26.336	0.97340	0.00178	0.141	0.6616	0.630454	1523.7
250.00	248.55	18.337	48.121	36.532	26.378	0.97326	0.00174	0.157	0.7056	3.089032	1523.4
275.00	273.36	18.024	47.761	36.494	26.427	0.97311	0.00171	0.174	0.7488	1.891930	1522.8
300.00	298.16	17.624	47.296	36.441	26.485	0.97295	0.00166	0.190	0.7908	3.216189	1522.0
325.00	322.96	17.006	46.561	36.346	26.562	0.97277	0.00159	0.207	0.8312	0.630864	1520.5
350.00	347.75	16.661	46.156	36.292	26.603	0.97263	0.00156	0.223	0.8706	0.892308	1519.8
375.00	372.54	15.749	45.068	36.142	26.700	0.97242	0.00147	0.240	0.9084	1.093075	1517.2
400.00	397.32	15.088	44.295	36.036	26.768	0.97225	0.00141	0.256	0.9444	2.677950	1515.5
425.00	422.10	14.541	43.664	35.951	26.823	0.97209	0.00136	0.273	0.9790	1.411634	1514.0
450.00	446.88	14.032	43.081	35.872	26.871	0.97194	0.00132	0.289	1.0126	3.341063	1512.7
475.00	471.65	13.817	42.841	35.837	26.890	0.97182	0.00131	0.306	1.0454	1.093760	1512.4
500.00	496.42	13.591	42.591	35.803	26.911	0.97169	0.00129	0.322	1.0779	1.093902	1512.0
525.00	521.19	13.060	41.992	35.721	26.957	0.97154	0.00125	0.339	1.1095	1.786614	1510.5
550.00	545.95	12.880	41.795	35.692	26.971	0.97142	0.00124	0.355	1.1407	1.412616	1510.3
575.00	570.71	11.995	40.804	35.561	27.044	0.97124	0.00117	0.372	1.1710	2.825762	1507.5
600.00	595.47	11.744	40.535	35.525	27.064	0.97111	0.00116	0.388	1.2001	0.631942	1507.0
625.00	620.22	10.687	39.366	35.366	27.136	0.97092	0.00108	0.405	1.2280	3.461945	1503.5
650.00	644.96	9.940	38.541	35.241	27.170	0.97078	0.00105	0.422	1.2546	2.528629	1501.1
675.00	669.71	9.493	38.069	35.179	27.197	0.97064	0.00102	0.438	1.2804	0.632247	1499.8
700.00	694.45	9.103	37.659	35.125	27.218	0.97051	0.00100	0.455	1.3056	2.607172	1498.7
725.00	719.18	8.490	37.016	35.041	27.251	0.97036	0.00097	0.472	1.3302	1.095395	1496.7
750.00	743.92	8.007	36.516	34.976	27.274	0.97023	0.00094	0.488	1.3540	1.789022	1495.2
775.00	768.64	7.490	35.986	34.909	27.298	0.97009	0.00091	0.505	1.3771	1.789274	1493.5
800.00	793.37	7.263	35.770	34.890	27.316	0.96997	0.00090	0.522	1.3998	1.898060	1493.0
825.00	818.09	6.956	35.470	34.858	27.334	0.96984	0.00088	0.539	1.4221	1.898313	1492.2
850.00	842.81	6.640	35.181	34.846	27.368	0.96969	0.00085	0.555	1.4436	1.550196	1491.3
875.00	867.53	6.411	34.981	34.845	27.398	0.96955	0.00082	0.572	1.4644	1.790267	1490.8
900.00	892.24	6.225	34.831	34.856	27.431	0.96941	0.00079	0.589	1.4844	1.415537	1490.5
925.00	916.95	6.052	34.692	34.863	27.459	0.96928	0.00076	0.606	1.5038	2.831470	1490.2
950.00	941.65	5.929	34.597	34.870	27.480	0.96915	0.00074	0.623	1.5225	2.901778	1490.2
975.00	966.36	5.727	34.446	34.895	27.525	0.96900	0.00070	0.639	1.5406	1.266640	1489.8
1000.00	991.05	5.619	34.364	34.901	27.543	0.96887	0.00068	0.656	1.5578	2.002993	1489.8

BOTTOM OF CAST REACHED

Table 3-13. Computed values of depth, salinity, σ_t, dynamic height and other related parameters for Station 31.

SHIP	SURVEY	STATION	DATE	TIME(EST)	LAT	LONG
OTEC PR	1	31	6 17 80	1035	17 38 6.0N	65 46 36.0W

TYPE OF CAST	DEEPEST ARCH LVL	SONIC DEPTH	HT ABOVE BOTTM	DSN
CTD	897.00 DBARS	1600.00 METERS	******* METERS	405748

TAU=0.0375

PRESSURE (DBARS)	DEPTH (M)	TEMP (DEG-C)	COND (MMHO/CM)	SALINITY (O/OO)	SIGMA-T	SPEC-VOL (CM3/GM)	SPV-ANLY (CM3/GM)	TIME (SEC)	DYNAM-HT (DYN-M)	BV-FREQ (CYC/HR)	SND-VEL (M/SEC)
25.00	24.91	26.567	56.070	35.878	22.886	0.97752	0.00499	0.014	0.1073	0.887041	1544.2
50.00	49.83	26.164	56.146	36.359	24.027	0.97633	0.00391	0.030	0.2295	21.616366	1539.6
75.00	74.71	24.746	55.058	36.684	24.711	0.97556	0.00327	0.046	0.3187	6.745761	1537.3
100.00	99.58	23.907	54.294	36.786	25.041	0.97516	0.00297	0.063	0.3966	6.417794	1535.9
125.00	124.45	23.466	54.049	36.940	25.281	0.97483	0.00275	0.079	0.4678	3.019130	1535.4
150.00	149.28	22.465	52.976	36.949	25.585	0.97444	0.00247	0.095	0.5335	3.672250	1533.3
175.00	174.12	21.204	51.560	36.900	25.901	0.97403	0.00218	0.112	0.5914	6.546348	1530.4
200.00	198.94	19.697	49.974	36.731	26.127	0.97371	0.00197	0.128	0.6434	2.521021	1527.2
225.00	223.76	19.034	48.944	36.622	26.269	0.97347	0.00184	0.144	0.6908	4.963853	1525.0
250.00	248.57	18.437	48.237	36.545	26.381	0.97328	0.00176	0.161	0.7360	2.273427	1523.7
275.00	273.38	18.164	47.923	36.508	26.402	0.97313	0.00173	0.177	0.7796	4.135299	1523.3
300.00	298.18	17.812	47.516	36.463	26.456	0.97298	0.00169	0.193	0.8224	2.274124	1522.6
325.00	322.98	17.363	46.987	36.397	26.513	0.97282	0.00164	0.210	0.8640	4.278517	1521.6
350.00	347.77	16.708	46.209	36.296	26.596	0.97263	0.00157	0.226	0.9041	1.669342	1519.9
375.00	372.56	16.040	45.410	36.184	26.666	0.97246	0.00150	0.243	0.9423	0.892461	1518.2
400.00	397.35	15.201	44.430	36.055	26.756	0.97226	0.00142	0.259	0.9787	1.093256	1515.8
425.00	422.13	14.755	43.915	35.985	26.802	0.97211	0.00138	0.276	1.0136	5.988916	1514.7
450.00	446.90	14.396	43.502	35.926	26.835	0.97198	0.00136	0.292	1.0479	1.546555	1513.9
475.00	471.68	14.104	43.172	35.879	26.861	0.97184	0.00134	0.309	1.0815	0.631464	1513.3
500.00	496.45	13.778	42.802	35.827	26.891	0.97171	0.00131	0.325	1.1148	0.631552	1512.6
525.00	521.22	13.204	42.150	35.737	26.940	0.97155	0.00127	0.342	1.1470	2.894594	1511.0
550.00	545.98	12.824	41.730	35.683	26.975	0.97141	0.00124	0.358	1.1783	1.671458	1510.1
575.00	570.74	12.461	41.330	35.630	27.006	0.97128	0.00121	0.375	1.2089	1.695500	1509.2
600.00	595.49	11.859	40.649	35.528	27.044	0.97113	0.00118	0.392	1.2388	4.095364	1507.4
625.00	620.25	11.478	40.228	35.466	27.070	0.97100	0.00115	0.408	1.2680	2.528064	1506.4
650.00	645.00	10.793	39.485	35.372	27.121	0.97083	0.00110	0.425	1.2962	3.344867	1504.3
675.00	669.74	10.138	38.765	35.284	27.153	0.97069	0.00107	0.441	1.3235	1.672683	1502.2
700.00	694.48	9.330	37.892	35.185	27.197	0.97053	0.00102	0.458	1.3493	0.894232	1499.5
725.00	719.22	8.650	37.184	35.081	27.241	0.97038	0.00098	0.475	1.3746	2.449348	1497.3
750.00	743.95	7.997	36.505	34.975	27.274	0.97023	0.00094	0.491	1.3986	0.894512	1495.1
775.00	768.68	7.435	35.933	34.906	27.304	0.97009	0.00091	0.508	1.4218	0.632608	1493.3
800.00	793.40	6.914	35.419	34.857	27.339	0.96994	0.00087	0.525	1.4440	1.414771	1491.6
825.00											
850.00											
875.00											

BOTTOM OF CAST REACHED

Table 3-14. Computed values of depth, salinity, σ_t, dynamic height and other related parameters for Station 33.

SHIP	SURVEY	STATION	DATE	TIME(EST)	LAT	LONG
OTEC PR	1	33	6 17 80	905 18	2 0.0N	65 45 48.0W

TYPE OF CAST	DEEPEST ARCH LVL	SONIC DEPTH	HT ABOVE BOTTM	DSN
CTD	202.50 DBARS	400.00 METERS	******* METERS	405738

TAU=0.0375

PRESSURE (DBARS)	DEPTH (M)	TEMP (DEG-C)	COND (MMHO/CM)	SALINITY (O/OO)	SIGMA-T	SPEC-VOL (CM3/GM)	SPV-ANLY (CM3/GM)	TIMET (SEC)	DYNAM-HT (DYN-M)	BV-FREQ (CYC/HR)	SND-VEL (M/SEC)
25.00	24.92	28.649	58.174	35.888	22.869	0.97754	0.00501	0.014	0.1101	0.887824	1544.4
50.00	49.83	27.407	57.380	36.272	23.566	0.97677	0.00435	0.030	0.2331	20.172913	1542.5
75.00	74.72	25.088	55.344	36.620	24.558	0.97572	0.00342	0.047	0.3277	7.830398	1538.1
100.00	99.59	23.906	54.270	36.769	25.028	0.97517	0.00298	0.063	0.4081	6.324473	1535.8
125.00	124.45	23.527	53.948	36.828	25.185	0.97492	0.00284	0.079	0.4810	5.451388	1535.4
150.00	149.29	21.881	52.230	36.863	25.685	0.97434	0.00237	0.096	0.5464	5.562658	1531.7
175.00	174.13	20.913	51.119	36.794	25.901	0.97403	0.00218	0.112	0.6039	9.238271	1529.5
200.00	198.95	20.229	50.342	36.745	26.049	0.97378	0.00204	0.128	0.6567	4.757953	1528.1

BOTTOM OF CAST REACHED

Table 3-15. Statistics of currents measured at 125 m depth.

DISTRIBUTION FREQUENCY
0.5 HOUR AVERAGES

SPANNING 79/ 9/27 TO 79/12/17
17°53'49"N, 65°45'14.5"W

125m DEPTH

DIRECTION DEGREES TRUE														SUM	PERCENT
0- 15	4	12	12	5	1	2	1							37	1.0
15- 30		4	6	3	2									15	0.4
30- 45	4	6	9	2	6									27	0.7
45- 60	4	6	1	9	5									25	0.6
60- 75	3	10	8	6	7	3	3							40	1.0
75- 90	2	4	12	15	6	1	3							43	1.1
90-105	6	7	25	18	5	10	9							80	2.1
105-120	11	10	25	22	15	4								87	2.2
120-135	5	26	12	8	2	9	1							63	1.6
135-150	6	9	8	8	3	3								37	1.0
150-165		1	3	7	1									12	0.3
165-180	1		8	3	2									14	0.4
180-195	2	4	8	3										17	0.4
195-210	2	27	29	23	13	2	2							98	2.5
210-225	3	44	68	44	36	37	20	9	12					273	7.1
225-240	13	61	102	126	162	141	113	76	24	12	2	4	1	837	21.6
240-255	9	54	92	151	220	246	192	109	42	8				1123	29.0
255-270	6	16	49	63	77	102	103	55	18	1				490	12.7
270-285	6	14	29	34	33	50	54	32	11	3				266	6.9
285-300	2	11	17	33	19	16	9	4	2	1				114	2.9
300-315	1	6	17	14	10	9	5							62	1.6
315-330	4	12	15	13	2	2								48	1.2
330-345	6	4	7	7	4	3	1							32	0.8
345-360	4	4	8	2	5	3	2							28	0.7
														3868	

SPEED CM PER SEC	0. | 3.	3. | 6.	6. | 9.	9. | 12.	12. | 15.	15. | 18.	18. | 21.	21. | 24.	24. | 27.	27. | 30.	30. | 33.	33. | 36.	36. | 39.	39. | 42.	42. | 45.	45. | 48.	48. | 51.	51. | 54.	54. | 57.	57. | 60.	
SUM	104	352	570	619	636	643	518	285	109	25	2	4	1	0	0	0	0	0	0	0	3868	
PERCENT	2.7	9.1	14.7	16.0	16.4	16.6	13.4	7.4	2.8	0.6	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		

SUMMARY STATISTICS

MEAN SPEED = 13.40 CM PER SEC STANDARD DEVIATION = 5.98 CM PER SEC

MAXIMUM = 36.01 CM PER SEC MINIMUM = 0.61 CM PER SEC RANGE = 35.40 CM PER SEC

IN A COORDINATE SYSTEM WHOSE Y AXIS IS POSITIONED 0.0 DEGREES COUNTER-CLOCKWISE FROM TRUE NORTH,

MEAN X COMPONENT = -9.80 CM PER SEC STANDARD DEVIATION = 8.46 CM PER SEC

MEAN Y COMPONENT = -4.26 CM PER SEC STANDARD DEVIATION = 5.44 CM PER SEC

CROSS PRODUCT = 15.40 PRINCIPAL AXES ORIENTATION DEGREES TRUE = 338 - MEAN INCLUDED

Table 3-16. Statistics of currents measured at 239 m depth.

DISTRIBUTION FREQUENCY
0.5 HOUR AVERAGES

SPANNING 79/ 9/27 TO 80/ 2/ 8
17°53'49"N, 65°45'14.5"W

239m DEPTH

DIRECTION DEGREES TRUE															SUM	PERCENT
0- 15	5	2													7	0.1
15- 30	8	3	1												12	0.2
30- 45	3	2													5	0.1
45- 60	7	2	2	4											15	0.2
60- 75	3	8	2	1											14	0.2
75- 90	4	4	3	1											12	0.2
90-105	6	4	7	6	2										25	0.4
105-120	4	7	9	10	2	2									34	0.5
120-135	9	3	14	1	1										28	0.4
135-150	11	2	23	7	2										45	0.7
150-165	12	10	18	12	7	8	5								72	1.1
165-180	10	18	28	19	4	2	2								83	1.3
180-195	13	31	48	27	18	10	3								150	2.4
195-210	17	39	59	61	47	33	17	3							276	4.3
210-225	20	48	96	76	72	78	38	26	13	6	2				475	7.5
225-240	19	52	138	154	148	211	166	125	86	45	20	13	4	1	1182	18.6
240-255	18	45	111	180	166	285	308	252	178	93	55	11			1702	26.8
255-270	14	25	100	156	127	194	205	135	111	39	27	8			1141	17.9
270-285	13	13	56	77	66	90	82	72	47	14	4				534	8.4
285-300	12	9	27	42	33	41	39	48	22	14	5	5			297	4.7
300-315	11	13	16	25	25	26	17	5	7	1	2				148	2.3
315-330	9	12	21	10	4	3	2								61	1.0
330-345	7	6	4	2	3		2	5							29	0.5
345-360	8	1	3												12	0.2
															6359	

SPEED CM PER SEC	0. | 3.	3. | 6.	6. | 9.	9. | 12.	12. | 15.	15. | 18.	18. | 21.	21. | 24.	24. | 27.	27. | 30.	30. | 33.	33. | 36.	36. | 39.	39. | 42.	42. | 45.	45. | 48.	48. | 51.	51. | 54.	54. | 57.	57. | 60.	
SUM	243	359	786	871	727	983	886	671	464	212	115	37	4	1	0	0	0	0	0	0	6359	
PERCENT	3.8	5.6	12.4	13.7	11.4	15.5	13.9	10.6	7.3	3.3	1.8	0.6	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0		

SUMMARY STATISTICS

MEAN SPEED = 15.47 CM PER SEC STANDARD DEVIATION = 7.29 CM PER SEC

MAXIMUM = 39.53 CM PER SEC MINIMUM = 0.0 CM PER SEC RANGE = 39.53 CM PER SEC

IN A COORDINATE SYSTEM WHOSE Y AXIS IS POSITIONED 0.0 DEGREES COUNTER-CLOCKWISE FROM TRUE NORTH.

MEAN X COMPONENT = -12.86 CM PER SEC STANDARD DEVIATION = 8.09 CM PER SEC

MEAN Y COMPONENT = -5.05 CM PER SEC STANDARD DEVIATION = 6.00 CM PER SEC

CROSS PRODUCT = 5.32 PRINCIPAL AXES ORIENTATION DEGREES TRUE = 340 - MEAN INCLUDED

Table 3-17. Statistics of currents measured at 932 m depth.

DISTRIBUTION FREQUENCY
0.5 HOUR AVERAGES

SPANNING 79/ 9/27 TO 79/12/30

932m DEPTH

17°53'49"N, 65°45'14.5"W

DIRECTION DEGREES TRUE									SUM	PERCENT
0- 15	42	44	22	17	17	28	6	2	178	4.0
15- 30	31	39	34	24	35	26	7		196	4.4
30- 45	25	35	32	19	33	16	1		161	3.6
45- 60	27	35	30	18	13	8	1		132	3.0
60- 75	18	28	26	7	2	1			82	1.8
75- 90	26	25	24	8	3				86	1.9
90-105	18	36	17	8	8				87	2.0
105-120	17	31	12	6	3				69	1.5
120-135	28	47	17	4	1				97	2.2
135-150	35	59	24	3					121	2.7
150-165	31	59	29	13	4				136	3.0
165-180	35	85	46	8	5				179	4.0
180-195	32	81	66	13	12				204	4.6
195-210	37	88	77	20	10	3			235	5.3
210-225	41	85	58	31	17	3			235	5.3
225-240	39	92	73	34	21	3	2		264	5.9
240-255	42	100	102	31	28	12	4		319	7.2
255-270	52	126	82	81	32	18	2		393	8.8
270-285	56	104	124	41	34	8			367	8.2
285-300	42	76	77	41	27	3			266	6.0
300-315	40	85	53	19	5				202	4.5
315-330	46	64	40	8					158	3.5
330-345	52	65	18	5					140	3.1
345-360	44	61	27	1	8	6	6		153	3.4
									4460	

SPEED CM PER SEC	0. | 3.	3. | 6.	6. | 9.	9. | 12.	12. | 15.	15. | 18.	18. | 21.	21. | 24.	24. | 27.	27. | 30.	30. | 33.	33. | 36.	36. | 39.	39. | 42.	42. | 45.	45. | 48.	48. | 51.	51. | 54.	54. | 57.	57. | 60.	
SUM	856	1550	1110	460	318	135	29	2	0	0	0	0	0	0	0	0	0	0	0	0	4460
PERCENT	19.2	34.8	24.9	10.3	7.1	3.0	0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	

SUMMARY STATISTICS

MEAN SPEED = 6.40 CM PER SEC STANDARD DEVIATION = 3.89 CM PER SEC

MAXIMUM = 21.38 CM PER SEC MINIMUM = 0.13 CM PER SEC RANGE = 21.25 CM PER SEC

IN A COORDINATE SYSTEM WHOSE Y AXIS IS POSITIONED 0.0 DEGREES COUNTER-CLOCKWISE FROM TRUE NORTH.

MEAN X COMPONENT = -1.91 CM PER SEC STANDARD DEVIATION = 5.14 CM PER SEC

MEAN Y COMPONENT = 0.03 CM PER SEC STANDARD DEVIATION = 5.10 CM PER SEC

CROSS PRODUCT = 6.77 PRINCIPAL AXES ORIENTATION DEGREES TRUE = 324 - MEAN INCLUDED

Table 3-18. Statistics of currents measured at 99 m depth (NUSC data).

DISTRIBUTION FREQUENCY
0.5 HOUR AVERAGES

99m DEPTH

SPANNING 79/ 2/14 TO 79/ 3/18
17°53'49"N, 65°45'14.5"W

DIRECTION DEGREES TRUE																				SUM	PERCENT
0- 15		1			1	1	1	5	10	6	6	3	3		1		1			1	40	2.7
15- 30			1			1	2	3	9	6	2	6	1	2	2	1	1	2			39	2.6
30- 45			1			1	1	7	11	6	5	2	1	3	2		1			1	42	2.8
45- 60				2	1		1	4	9	4	5	3	3	2	2			1	1		38	2.5
60- 75			1			1	2	8	4	3	2	3	6	1					1	1	33	2.2
75- 90				1	1		2	3	5	6	1	3	1	5	1				1		30	2.0
90-105			1	1		1		4	10	4	7		1	2	3	1		1	1	1	38	2.5
105-120			1		1	2	2	2	1	9	3	3	2	1	4				3	2	36	2.4
120-135		1		1				3	4	4	6	2	3	2		3					29	1.9
135-150							3	6	7	6	3	2	2	5	1	2				1	38	2.5
150-165						2	3	6	8	5	3	2	1	2	2			1	1	1	37	2.5
165-180						2	3	7	5	8	6	4	3	2	2			2		2	46	3.1
180-195			1		1	1	1	11	27	9	8	3	3	3	3	1		2		2	76	5.1
195-210				1	2	1	6	5	11	14	9	7	5	5	3		2	2	1	2	76	5.1
210-225							8	16	15	24	8	7	8	5	3		3	1	2	2	102	6.8
225-240			1	1	3	5	13	14	23	28	12	8	13	1	6	3	2	1		3	137	9.2
240-255			2		5	15	20	22	23	21	9	8	5	8	2	2	1		1	1	145	9.7
255-270			1	2	11	21	16	16	25	24	19	11	5	1	4	2	2	1		2	163	10.9
270-285				1	3	5	20	15	18	11	5	5	7	4		1				2	97	6.5
285-300			1	1	1	7	5	10	4	7	2	5	4	1	1		1			1	51	3.4
300-315			2	2		5	6	14	11	4	5	2	2	1	3	1		1		1	60	4.0
315-330						3	3	15	18	2	9	4	1	2	1		1		1		60	4.0
330-345						1	5	6	12	7	3	4	2		2	3		1	1		47	3.1
345-360				1	1	3	1	4	7	3	5	1	1	3	1	1	1			1	34	2.3
																				1494	

SPEED CM PER SEC	0. | 3.	3. | 6.	6. | 9.	9. | 12.	12. | 15.	15. | 18.	18. | 21.	21. | 24.	24. | 27.	27. | 30.	30. | 33.	33. | 36.	36. | 39.	39. | 42.	42. | 45.	45. | 48.	48. | 51.	51. | 54.	54. | 57.	57. | 60.	
SUM	0	2	13	14	31	78	124	206	277	221	143	98	83	61	49	21	16	16	14	27	1494	
PERCENT	0.0	0.1	0.9	0.9	2.1	5.2	8.3	13.8	18.5	14.8	9.6	6.6	5.6	4.1	3.3	1.4	1.1	1.1	0.9	1.8		

SUMMARY STATISTICS

MEAN SPEED = 28.87 CM PER SEC STANDARD DEVIATION = 10.05 CM PER SEC

MAXIMUM = 95.80 CM PER SEC MINIMUM = 3.75 CM PER SEC RANGE = 92.05 CM PER SEC

IN A COORDINATE SYSTEM WHOSE Y AXIS IS POSITIONED 0.0 DEGREES COUNTER-CLOCKWISE FROM TRUE NORTH.

MEAN X COMPONENT = -8.18 CM PER SEC STANDARD DEVIATION = 20.77 CM PER SEC

MEAN Y COMPONENT = -4.23 CM PER SEC STANDARD DEVIATION = 20.47 CM PER SEC

CROSS PRODUCT = 44.16 PRINCIPAL AXES ORIENTATION DEGREES TRUE = 325 - MEAN INCLUDED

4. DISCUSSION

4.1 HYDROGRAPHIC MEASUREMENTS

The general nature of the hydrography of the waters off Punta Tuna in June is illustrated by the figures shown in Section 3. A well-mixed layer with uniform temperature, salinity, and density is present between the surface and about 50 m depth. A very sharp pycnocline occurs between about 50 and 150 m, below which density increases much more slowly. Temperature at the surface is about 28°C. Below 50 m, temperature decreases approximately linearly with depth to about 700 m. At 1000 m depth, water temperature is about 5.5°C.

The salinity profile is characterized by surface values of about 35.8 ppt, a subsurface maximum (37 ppt) at about 150 m, and a mid-water minimum of about 34.85 ppt at 850 to 900 m depth. The T/S relationships observed at each CTD station were quite similar. A small amount of variability in the region of the salinity maximum was observed at several stations.

Results shown in Section 3 regarding the calculation of geostrophic currents suggest that the CTD/XBT measurement grid in use on the program is not optimal for this purpose. Specifically, station spacing is too close to obtain reliable estimates of geostrophic currents. The presence of internal tides contaminates the density measurements while the proximity of the shore and topographic extremes makes the geostrophic assumption less reliable. An attempt was made to minimize the noise in the geostrophic current computations by determining the trend in the dynamic topography across each section. These trend lines were then used to compute the mean current field across the entire section rather than between adjacent pairs of stations. The results of this analysis produced estimates of the geostrophic current field of less than 5

cm/sec directed approximately parallel to the topography. A larger measurement grid may improve the quality of these calculations. It is recommended that this aspect of the measurement program be redefined in order to maximize the efficiency of future cruises.

4.2 CURRENT MEASUREMENTS

Preliminary analysis of the current data collected on the CMR mooring indicates that the upper part of the water column experiences a steady along-isobath (250°) westward drift with net speeds of about 10-15 cm/sec. Net currents are lower at mid-water depths (0-5 cm/sec) with flows to the north and west for significant periods.

Rotary tidal currents at the semidiurnal frequency are present throughout the water column at speeds of 5-15 cm/sec. Considerable energy is also present at the diurnal frequency and at the inertial frequency (0.0258 cy/hr). At the upper two current meter levels, significant amounts of current energy were also present at frequencies corresponding to the first and second harmonics of the semidiurnal tide.

Maximum recorded currents were 36 cm/sec at 125 m, 40 cm/sec at 239 m, and 21 cm/sec at 932 m depth. Mean current speeds over the deployment interval at these depths were 13, 15, and 6 cm/sec, respectively.

Internal tides are present during much of the record as evidenced by temperature fluctuations at the semidiurnal frequency. By comparing these variations with the measured temperature profile, it is estimated that 10 to 20 m internal waves are present throughout at least the upper half of the water column on a frequent basis. The presence of internal tides during the CTD measurement program introduces significant variations in the measured density profiles, resulting in poor estimates of the geostrophic current field.

4.3 RECOMMENDATIONS FOR PROGRAM MODIFICATION

In light of the results presented in this report, two recommendations are made. First, a revised CTD/XBT grid is recommended which reduces the total

number of stations and increases the distance between stations and the size of the area sampled. The exact number of stations and their locations should be determined by examining the specific objectives of the hydrographic measurements and by an assessment of their costs.

The second recommendation concerns the data processing requirements relative to both the hydrographic and the current meter data. In general, an extensive set of data products are required for both these data sets, some of which are not particularly useful. A subset of the required products could be produced considerably more efficiently and with little or no loss in information. Specific deletions in the presently contracted program should be made after review of this report.

5. REFERENCES

Coastal Marine Research. 1980. Final report — Conduct search and recovery operations for deep water ocean current metering array located off Point Tuna, Puerto Rico, at approximate latitude 17°51'46.8"N, longitude 65°46'24"W. Design, fabricate and deploy a deep water ocean current metering array at approximate latitude 17°53'49"N, longitude 65°45' 14.5"W. Submitted to University of California, Lawrence Berkeley Laboratories, Berkeley, California.

Scarlet, R. 1975. A data processsing method for salinity, temperature, depth profiles. Deep Sea Research, 22:509-515.

APPENDIX A
CALIBRATION AND QUALITY ASSURANCE INFORMATION

A program of laboratory calibration and operational checks on all of the equipment used during the study is being performed to ensure the quality of the data collected. The following pages show the calibration and/or operational checks performed on the CTD system, the XBT system, and the Mini-Ranger system. Results of this process are summarized below.

1. Neil Brown CTD System Accuracy

   Salinity — +0.015 ppt relative to salinity samples
   Temperature — 0.00 relative to reversing thermometers
   Pressure — -15 m ±8 m at 1000 m relative to value computed from reversing thermometers.

2. Sippican XBT System Accuracy (Temperature) — +0.2°C ±0.2°C relative to mercury thermometer.

   Note: The XBT system recorded temperatures about 0.2°C higher than temperatures as recorded by mercury thermometers and the CTD temperature sensors.

3. Motorola Mini-Ranger System Accuracy — ±12 m relative to standard.

4. Current Meter Operation

CMR	RCM-5 S.N. 3574.	Good quality data.	9-27-79 to 12-17-79.
	RCM-5 S.N. 3477.	No data recorded.	
	RCM-5 S.N. 3283.	Good quality data.	9-27-79 to 2-8-80.
	RCM-5 S.N. 3195.	Good quality data.	9-27-79 to 12-30-79.

NUSC RCM-5. S.N. 1476 — Speed data unreliable. Direction, temperature, pressure data of good quality. 2-14-79 to 3-18-79.

NBIS INC. MJO 2373
EG&G P.O. No. 56763

29 May 1979

EG&G PRE-CRUISE CALIBRATION
NEIL BROWN CTD SYSTEM

Temperature Channel CT-2	Quad Balanced CTD	ΔT	Time
30.4189	30.418_5		1052
30.4184	30.418_5		1053
30.4188	30.418_5		1055
30.4177	30.418		1056
30.4179	30.417_5		1058
30.4177	30.418_5		1059
30.4188	30.419		1100
15.3319	15.335_5	+3.6	1320
15.3336	15.337	+3.4	1321
15.3336	15.337	3.4	1322
15.3333	15.337	3.7	1324
15.3336	15.337		1325
15.3337	15.337		1326
15.3337	15.337		
			30 May 1979
-0.0013	$+0.001_5$		1353
-0.0013	$+0.001_5$		1354
-0.0012	$+0.001_5$		1355
-0.0012	$+0.001_5$		1357
-0.0012	$+0.001_5$		1400

29 May 1979

EG&G PRE-CRUISE CALIBRATION
NEIL BROWN CTD SYSTEM

Pressure Calibration

FS = 4400 PSI = 3033.7 Decibars
1/2S = 2200 PSI = 1516.85 Decibars

ϕ	+0003.2
1/2S	1521.5
FS	3041.9
1/2S	1523.2
ϕ	+0003.2
1/2S	1521.5
FS	3041.8
1/2S	1523.2
ϕ	+0003.2
1/2S	1521.5
FS	3041.9
1/2S	1522.8
ϕ	+0003.2

T.C.

ϕ	+0002.2
FS	3041.3
ϕ	+0002.1

Zero Offset

FS_{AV}	3041.86	-3.2	3028.66
$1/2FS_{AV}$	1520.93		1519.33
$1/2S_{AV}$	1522.28	-3.2	1519.08
	+1.35		-0.25
	+0.044%		-0.008%

Pressure Recalibration

Readjusted Zero

ϕ = ±0000.0

Readjusted Sensitivity

FS = 3033.7

ϕ	±0000.0
1/2S	1516.0
FS	3034.0
1/2S	1517.5
ϕ	±0000.0
1/2S	1516.1
FS	3034.0
1/2S	1517.5
ϕ	±0000.0
1/2S	1516.1
FS	3034.1
1/2S	1517.5
ϕ	±0000.0

Temperature Compensation

ϕ	-0000.5
FS	3034.1
ϕ	-0000.2

No adjustment made

29 May 1979

EG&G PRE-CRUISE CALIBRATION
NEIL BROWN CTD SYSTEM

Conductivity

CT-2	CTD Reading	CTD Corrected	ΔC	T°C	Time
52.3510	52.361	52.358	+ 7	23.2	0818
52.3448	52.355	52.352	+ 7		0821
52.3430	52.353	52.350	+ 7		0830
52.3342	52.345	52.342	+ 8		0834
52.3306	52.341	52.338	+ 7		0835
39.6542	39.666	39.664	+10	23.2	0855
39.6508	39.662	39.660	+ 9		0857
39.6500	39.661	39.659	+ 9		0858
39.6358	39.645	39.643	+ 7		0907
39.6334	39.643	39.641	+ 7		0910
39.6302	39.640	39.638	+ 8		0911
39.6273	39.637	39.635	+ 7		0912
39.6219	39.632	39.630	+ 8		0915
39.6200	39.630	39.628	+ 8		0917
20.9321	20.944	20.943	+11	22.8	0943
20.9289	20.940	20.939	+10		0944
20.9248	20.936	20.935	+10		0946
20.9201	20.931	20.930	+10		0948
20.9032	20.914	20.913	+10		0955
20.9108	20.920	20.919	+ 8		1017
20.9113	20.921	20.920	+ 9		1018
20.9124	20.922	20.921	+ 8		1019
20.9132	20.922	20.921	+ 8.5		1020
20.9166	20.926[5]	20.925	+ 8		1024

Zero offset of +8.5 μ mho.

29 May 1979

EG&G PRE-CRUISE CALIBRATION
NEIL BROWN CTD SYSTEM

Conductivity Recalibration

CT-2	CTD Reading	CTD Corrected	T°C	Time
20.9200	20.921	20.920	22.8	1027
20.9215	20.922	20.921		1028
20.9230	20.924	20.923		1030
20.9258	20.927	20.926		1032
20.9293	20.930	20.929		1035
51.7563	51.759	51.756	22.9	1059
51.7597	51.763	51.760		1100
51.7649	51.768	51.765		1102
51.7763	51.780	51.777		1105
51.7779	51.781	51.778		1107
39.5860	39.588	39.586	22.9	1130
39.5897	39.591	39.589		1131
39.6531	39.654	39.652		1156
39.6555	39.657	39.655		1157
39.6565	39.658	39.656		1200

Calibration Technician _____ Date _____

OPERATIONAL CHECK OF CTD OPERATION

I. Salinity samples were collected on 10 of the CTD casts with the following results:

Station	Sample Depth	Sample Salinity	CTD Salinity	Difference
33	200 m	33.355*	36.745	----
31	1000 m	34.898	34.89	-0.008
12	1000 m	34.896	N.A.	----
13	1000 m	34.897	34.910	+0.013
17	1000 m	34.902	34.914	+0.012
21	1000 m	34.989	34.910	-0.079
28	1000 m	34.980	34.901	-0.079
8	980 m	34.898	34.909	+0.011
5	990 m	34.880	34.895	+0.015
3	985 m	33.107*	34.902	----

*Error in salinity determination.

II. Reversing thermometers were tripped on 9 CTD casts with the following results:

Station	Protected Therm. 15261	Protected Therm. 15410	Unprotected Therm. 10372	Unprotected Therm. 10374	Computed Depth	CTD Depth	Pressure Difference	Computed Temperature	CTD Temperature	Temperature Difference
31	---	---	15.60/28.7	---	1009.5 db	1000 dbars	- 9.5 db		5.56	---
12	---	---	15.60/28.7	---	1006.3 db	1000 dbars	- 6.3 db		5.59	---
13	5.90/27.5	---	15.58/----	---	1005.3 db	998 dbars	- 7.3 db	5.58	5.51	-0.07°C
17	---	---	15.50/28.5	15.50/27.5	1007.4/1005.9 db	995 dbars	-12.4 db	5.48	----	
6	----/28.6	---	---	15.70/27.6	1002.7 db	1000 dbars	-22.7 db			5.52
26	5.95/30.9	5.95/----	---	15.78/28.8	1027.9 db	1000 dbars	-27.9 db	5.58/5.55	5.55	-0.03/0.00°C
28	----/27.5	----/27.30	---	15.80/26.7	1020.6 db	1000 dbars	-20.6 db		5.62	
8	---	---	---	15.42/26.20	998.5 db	980 dbars	-18.5 db		5.50	---
5	---	---	---	15.60/28.4	1000.6 db	990 dbars	-10.6 db		5.65	---

SIPPICAN XBT/BUCKET TEMPERATURE COMPARISON

The table below shows a comparison between bucket temperatures obtained at each XBT station and the surface reading from each XBT cast.

Station	Bucket Temperature	XBT Temperature	Difference	Mean Difference	Standard Deviation
32	28.65	29.01	+0.36	0.24	0.18
30	28.65	28.84	+0.19		
14	28.55	28.73	+0.18		
16	28.53	28.65	+0.12		
18	28.75	28.73	-0.02		
20	28.40	28.69	+0.29		
22	28.30	28.99	+0.69		
23	28.80	29.28	+0.48		
24	28.50	28.90	+0.40		
25	28.90	28.99	+0.09		
27	28.50	28.90	+0.40		
29	28.40	28.82	+0.42		
11	28.65	28.87	+0.22		
9	28.90	28.91	+0.01		
7	28.60	28.66	+0.06		
6	28.70	28.92	+0.22		
4	28.65	28.88	+0.23		
2	28.70	28.79	+0.09		
1	28.55	28.71	+0.16		

APPENDIX B
SEA TABLES GENERATED FROM XBT DATA

Sea Tables were produced from the XBT data collected at six stations preliminary to production of the geostrophic current profiles shown in Section 3. These Sea Tables are presented here for comparison with the Sea Tables generated from CTD data and shown in Section 3.

Table B-1. Computed values of salinity, pressure, σ_t, and dynamic height for XBT Station 6.

SHIP	SURVEY	STATION	DATE	TIME(EST)	LAT	LONG
JEAN A	1	6	6 21 80	1707	17 57 12.0N	65 33 0.0W

TYPE OF CAST	DEEPEST ARCH LVL	SONIC DEPTH	HT ABOVE BOTTM	DSN
XBT	913.97 METERS	2000.00 METERS	******* METERS	405726

BUCKET TMP=28.7C DIDNT RCH BOTTM

TEMP (DEG-C)	DEPTH (M)	SALINITY (0/00)	PRESSURE (DBARS)	SIGMA-T	DYNAM-HT (DYN-CM)
28.939	0.0	35.760	0.0	22.676	0.0
28.918	24.93	35.768	25.00	22.689	12.9249
28.402	49.85	35.947	50.00	22.995	25.7675
25.678	74.74	36.601	75.00	24.362	35.7374
24.810	99.62	36.717	100.00	24.717	44.3150
23.910	124.48	36.796	125.00	25.047	52.1914
22.999	149.33	36.837	150.00	25.346	59.2621
21.088	174.17	36.810	175.00	25.865	65.4293
20.094	199.00	36.745	200.00	26.085	70.6494
19.286	223.82	36.669	225.00	26.240	75.5434
18.308	248.64	36.556	250.00	26.403	79.9752
17.875	273.45	36.499	275.00	26.468	84.2106
17.376	298.25	36.429	300.00	26.537	88.3216
16.770	323.06	36.338	325.00	26.613	92.2696
16.198	347.85	36.248	350.00	26.678	96.0508
15.814	372.65	36.185	375.00	26.719	99.7240
15.135	397.43	36.071	400.00	26.784	103.2913
14.366	422.22	35.938	425.00	26.851	106.7226
13.795	447.00	35.838	450.00	26.895	110.0011
13.433	471.77	35.775	475.00	26.922	113.2171
13.144	496.55	35.725	500.00	26.942	116.3807
12.677	521.32	35.644	525.00	26.974	119.4922
12.242	546.08	35.570	550.00	27.002	122.5435
11.709	570.85	35.481	575.00	27.036	125.5193
11.244	595.61	35.406	600.00	27.065	128.4303
10.235	620.36	35.252	625.00	27.127	131.2401
9.412	645.11	35.139	650.00	27.179	133.8869
8.755	669.86	35.059	675.00	27.223	136.4171
8.167	694.61	34.996	700.00	27.266	138.8219
7.743	719.35	34.957	725.00	27.298	141.1388
7.334	744.08	34.923	750.00	27.332	143.3860
6.957	768.82	34.897	775.00	27.364	145.5377
6.522	793.55	34.873	800.00	27.405	147.5830
6.364	818.27	34.865	825.00	27.420	149.5667
6.184	843.00	34.858	850.00	27.438	151.5141
6.222	867.72	34.860	875.00	27.434	153.4562
6.095	892.43	34.855	900.00	27.447	155.3913

BOTTOM OF CAST REACHED

Table B-2. Computed values of salinity, pressure, σ_t, and dynamic height for XBT Station 11.

SHIP	SURVEY	STATION	DATE	TIME(EST)	LAT	LONG
JEAN A	1	11	6 21 80	1403	17 54 30.0N	65 42 54.0W

TYPE OF CAST	DEEPEST ARCH LVL	SONIC DEPTH	HT ABOVE BOTTM	DSN
XBT	948.04 METERS	1800.00 METERS	******* METERS	405723

BUCKET TMP=28.7C DIDNT RCH BOTTM

TEMP (DEG-C)	DEPTH (M)	SALINITY (O/OO)	PRESSURE (DBARS)	SIGMA-T	DYNAM-HT (DYN-M)
28.918	0.0	35.768	0.0	22.689	0.0
28.891	24.93	35.778	25.00	22.706	0.1290
28.447	49.85	35.932	50.00	22.969	0.2580
25.533	74.74	36.623	75.00	24.423	0.3546
24.286	99.61	36.768	100.00	24.914	0.4370
23.775	124.47	36.805	125.00	25.094	0.5132
21.976	149.32	36.840	150.00	25.641	0.5796
20.441	174.15	36.771	175.00	26.012	0.6348
19.530	198.98	36.694	200.00	26.195	0.6842
19.114	223.80	36.651	225.00	26.270	0.7310
18.616	248.62	36.594	250.00	26.355	0.7761
18.242	273.43	36.547	275.00	26.413	0.8196
17.957	298.23	36.510	300.00	26.456	0.8622
17.268	323.04	36.413	325.00	26.551	0.9035
16.634	347.83	36.317	350.00	26.629	0.9426
15.923	372.63	36.203	375.00	26.707	0.9801
15.520	397.42	36.136	400.00	26.748	1.0162
15.191	422.20	36.080	425.00	26.779	1.0517
14.480	446.98	35.958	450.00	26.841	1.0860
14.081	471.76	35.888	475.00	26.873	1.1194
13.777	496.54	35.835	500.00	26.897	1.1523
13.204	521.31	35.735	525.00	26.938	1.1846
12.545	546.07	35.621	550.00	26.983	1.2159
11.726	570.84	35.484	575.00	27.035	1.2461
11.238	595.60	35.405	600.00	27.065	1.2751
10.527	620.35	35.295	625.00	27.109	1.3033
9.948	645.10	35.211	650.00	27.145	1.3306
9.040	669.85	35.093	675.00	27.204	1.3566
8.678	694.60	35.051	700.00	27.229	1.3815
8.324	719.34	35.012	725.00	27.254	1.4059
7.990	744.08	34.979	750.00	27.279	1.4295
7.630	768.82	34.947	775.00	27.307	1.4527
7.091	793.55	34.906	800.00	27.353	1.4747
6.808	818.27	34.888	825.00	27.378	1.4958
6.600	843.00	34.877	850.00	27.397	1.5166
6.403	867.72	34.867	875.00	27.416	1.5367
6.196	892.44	34.859	900.00	27.437	1.5565
6.102	917.15	34.855	925.00	27.446	1.5759
5.967	941.86	34.851	950.00	27.460	1.5951

BOTTOM OF CAST REACHED

Table B-3. Computed values of salinity, pressure, σ_t, and dynamic height for XBT Station 14.

SHIP	SURVEY	STATION	DATE	TIME(EST)	LAT	LONG
JEAN A	1	14	6 18 80	1029	17 50 18.0N	65 44 0.0W

TYPE OF CAST	DEEPEST ARCH LVL	SONIC DEPTH	HT ABOVE BOTTM	DSN
XBT	925.90 METERS	1600.00 METERS	******* METERS	405713

BUCKET TMP=28.6C DIDNT RCH BOTTM

TEMP (DEG-C)	DEPTH (M)	SALINITY (0/00)	PRESSURE (DBARS)	SIGMA-T	DYNAM-HT (DYN-M)
28.699	0.0	35.846	0.0	22.821	0.0
28.848	24.93	35.793	25.00	22.731	0.1274
27.217	49.84	36.288	50.00	23.639	0.2501
25.691	74.73	36.598	75.00	24.356	0.3489
24.424	99.60	36.756	100.00	24.863	0.4323
23.432	124.46	36.823	125.00	25.208	0.5062
22.175	149.31	36.843	150.00	25.587	0.5726
20.820	174.15	36.796	175.00	25.928	0.6296
19.897	198.98	36.728	200.00	26.124	0.6812
19.055	223.80	36.645	225.00	26.281	0.7287
18.458	248.61	36.575	250.00	26.380	0.7734
18.111	273.42	36.530	275.00	26.433	0.8164
17.736	298.23	36.480	300.00	26.488	0.8585
17.266	323.03	36.413	325.00	26.551	0.8993
16.922	347.83	36.361	350.00	26.594	0.9391
15.715	372.62	36.169	375.00	26.729	0.9763
15.102	397.41	36.065	400.00	26.787	1.0117
14.485	422.20	35.958	425.00	26.841	1.0458
14.030	446.98	35.879	450.00	26.877	1.0790
13.564	471.75	35.798	475.00	26.912	1.1114
13.057	496.53	35.709	500.00	26.948	1.1432
12.303	521.30	35.580	525.00	26.999	1.1738
11.928	546.06	35.517	550.00	27.022	1.2036
11.554	570.82	35.455	575.00	27.046	1.2329
11.038	595.58	35.373	600.00	27.078	1.2618
10.086	620.34	35.231	625.00	27.136	1.2895
9.542	645.09	35.156	650.00	27.171	1.3159
9.174	669.84	35.109	675.00	27.195	1.3416
8.855	694.58	35.071	700.00	27.216	1.3668
8.228	719.33	35.003	725.00	27.261	1.3913
7.729	744.07	34.956	750.00	27.299	1.4145
7.328	768.80	34.923	775.00	27.332	1.4370
6.854	793.53	34.891	800.00	27.374	1.4585
6.678	818.26	34.881	825.00	27.390	1.4793
6.499	842.98	34.872	850.00	27.407	1.4996
6.428	867.70	34.868	875.00	27.414	1.5197
6.342	892.42	34.864	900.00	27.422	1.5397
6.334	917.13	34.864	925.00	27.423	1.5596

BOTTOM OF CAST REACHED

Table B-4. Computed values of salinity, pressure, σ_t, and dynamic height for XBT Station 18.

SHIP	SURVEY	STATION	DATE	TIME(EST)	LAT	LONG
JEAN A	1	18	6 18 80	1414	17 43 6.0N	65 41 30.0W

TYPE OF CAST	DEEPEST ARCH LVL	SONIC DEPTH	HT ABOVE BOTTM	DSN
XBT	920.00 METERS	1200.00 METERS	******* METERS	405715

BUCKET TMP=28.8C DIDNT RCH BOTTM
EXTRP FRM 917.3M

TEMP (DEG-C)	DEPTH (M)	SALINITY (O/OO)	PRESSURE (DBARS)	SIGMA-T	DYNAM-HT (DYN-M)
28.764	0.0	35.823	0.0	22.782	0.0
28.639	24.92	35.867	25.00	22.856	0.1261
27.480	49.84	36.221	50.00	23.503	0.2431
26.019	74.73	36.543	75.00	24.212	0.3448
24.892	99.60	36.708	100.00	24.684	0.4323
24.119	124.47	36.782	125.00	24.974	0.5116
22.557	149.32	36.844	150.00	25.479	0.5811
21.278	174.16	36.819	175.00	25.820	0.6423
19.559	198.99	36.697	200.00	26.190	0.6934
18.570	223.81	36.588	225.00	26.362	0.7389
18.288	248.62	36.553	250.00	26.406	0.7822
17.895	273.43	36.502	275.00	26.465	0.8246
17.024	298.24	36.377	300.00	26.582	0.8651
16.427	323.04	36.284	325.00	26.653	0.9035
16.012	347.83	36.217	350.00	26.698	0.9406
15.567	372.62	36.144	375.00	26.743	0.9767
15.210	397.41	36.083	400.00	26.777	1.0121
14.538	422.20	35.968	425.00	26.836	1.0463
13.727	446.98	35.826	450.00	26.900	1.0794
12.998	471.75	35.699	475.00	26.952	1.1111
12.595	496.53	35.630	500.00	26.980	1.1418
11.871	521.29	35.508	525.00	27.026	1.1716
11.284	546.06	35.412	550.00	27.062	1.2007
10.871	570.82	35.347	575.00	27.088	1.2289
10.369	595.58	35.271	600.00	27.119	1.2566
9.458	620.33	35.145	625.00	27.176	1.2829
9.083	645.08	35.098	650.00	27.201	1.3085
8.535	669.83	35.035	675.00	27.239	1.3331
8.072	694.57	34.987	700.00	27.273	1.3571
7.289	719.32	34.920	725.00	27.336	1.3796
7.143	744.05	34.910	750.00	27.348	1.4011
6.924	768.78	34.895	775.00	27.367	1.4223
6.555	793.51	34.874	800.00	27.401	1.4430
6.486	818.24	34.871	825.00	27.408	1.4630
6.300	842.96	34.863	850.00	27.426	1.4828
6.276	867.68	34.862	875.00	27.429	1.5024
6.369	892.40	34.866	900.00	27.419	1.5221
6.726	917.12	34.883	925.00	27.385	1.5427

BOTTOM OF CAST REACHED

Table B-5. Computed values of salinity, pressure, σ_t, and dynamic height for XBT Station 24.

SHIP	SURVEY	STATION	DATE	TIME(EST)	LAT	LONG
JEAN A	1	24	6 19 80	1351	17 50 48.0N	65 57 0.0W

TYPE OF CAST	DEEPEST ARCH LVL	SONIC DEPTH	HT ABOVE BOTTM	DSN
XBT	908.04 METERS	1600.00 METERS	******* METERS	405719

BUCKET TMP=28.5C DIDNT RCH BOTTM

TEMP (DEG-C)	DEPTH (M)	SALINITY (0/00)	PRESSURE (DBARS)	SIGMA-T	DYNAM-HT (DYN-M)
28.962	0.0	35.752	0.0	22.662	0.0
28.771	24.93	35.821	25.00	22.777	0.1282
28.706	49.85	35.844	50.00	22.817	0.2555
25.459	74.74	36.634	75.00	24.455	0.3598
24.553	99.62	36.744	100.00	24.815	0.4435
23.681	124.48	36.810	125.00	25.126	0.5191
22.496	149.33	36.844	150.00	25.496	0.5875
20.965	174.17	36.804	175.00	25.894	0.6458
19.764	198.99	36.716	200.00	26.150	0.6968
19.160	223.81	36.656	225.00	26.262	0.7443
18.404	248.63	36.568	250.00	26.388	0.7890
18.047	273.44	36.522	275.00	26.443	0.8318
17.685	298.24	36.473	300.00	26.495	0.8736
17.168	323.05	36.398	325.00	26.564	0.9142
16.421	347.84	36.283	350.00	26.653	0.9529
15.786	372.64	36.180	375.00	26.721	0.9899
15.209	397.43	36.083	400.00	26.777	1.0256
14.769	422.21	36.008	425.00	26.817	1.0600
14.243	446.99	35.916	450.00	26.861	1.0938
13.903	471.77	35.857	475.00	26.887	1.1268
13.293	496.54	35.751	500.00	26.932	1.1591
12.634	521.31	35.636	525.00	26.977	1.1901
12.285	546.08	35.577	550.00	27.000	1.2205
11.689	570.84	35.478	575.00	27.037	1.2502
11.127	595.60	35.387	600.00	27.072	1.2793
10.450	620.36	35.283	625.00	27.114	1.3074
9.812	645.11	35.192	650.00	27.153	1.3343
9.134	669.86	35.104	675.00	27.198	1.3602
8.462	694.60	35.027	700.00	27.244	1.3851
7.928	719.35	34.973	725.00	27.284	1.4088
7.535	744.08	34.939	750.00	27.315	1.4315
7.189	768.82	34.913	775.00	27.344	1.4536
6.905	793.55	34.894	800.00	27.369	1.4749
6.538	818.28	34.873	825.00	27.403	1.4955
6.265	843.00	34.861	850.00	27.430	1.5153
6.138	867.72	34.857	875.00	27.443	1.5347
6.175	892.44	34.858	900.00	27.439	1.5540

BOTTOM OF CAST REACHED

Table B-6. Computed values of salinity, pressure, σ_t, and dynamic height for XBT Station 30.

SHIP	SURVEY	STATION	DATE	TIME(EST)	LAT	LONG
JEAN A	1	30	6 17 80	1329	17 56 18.0N	65 45 48.0W

TYPE OF CAST	DEEPEST ARCH LVL	SONIC DEPTH	HT ABOVE BOTTM	DSN
XBT	905.00 METERS	1980.00 METERS	******* METERS	405711

BUCKET TMP=28.7C DIDNT RCH BOTTM
EXTRP FRM 895.2M

TEMP (DEG-C)	DEPTH (M)	SALINITY (O/OO)	PRESSURE (DBARS)	SIGMA-T	DYNAM-HT (DYN-M)
28.849	0.0	35.793	0.0	22.731	0.0
28.692	24.92	35.849	25.00	22.825	0.1271
27.188	49.84	36.295	50.00	23.653	0.2520
24.970	74.73	36.699	75.00	24.654	0.3428
23.916	99.59	36.796	100.00	25.045	0.4208
23.458	124.45	36.821	125.00	25.200	0.4934
22.137	149.30	36.843	150.00	25.597	0.5601
20.926	174.14	36.802	175.00	25.903	0.6169
19.434	198.96	36.684	200.00	26.213	0.6665
18.803	223.78	36.616	225.00	26.324	0.7127
18.412	248.60	36.569	250.00	26.387	0.7566
18.099	273.41	36.529	275.00	26.435	0.7997
17.734	298.21	36.480	300.00	26.488	0.8417
17.218	323.01	36.406	325.00	26.557	0.8825
16.471	347.81	36.291	350.00	26.648	0.9215
15.610	372.61	36.151	375.00	26.739	0.9584
15.097	397.39	36.064	400.00	26.788	0.9936
14.594	422.18	35.978	425.00	26.832	1.0279
14.367	446.96	35.938	450.00	26.850	1.0616
13.956	471.74	35.866	475.00	26.883	1.0948
13.634	496.51	35.810	500.00	26.907	1.1275
12.773	521.28	35.660	525.00	26.968	1.1592
12.108	546.05	35.547	550.00	27.011	1.1898
11.398	570.81	35.430	575.00	27.055	1.2192
10.812	595.57	35.338	600.00	27.091	1.2476
10.106	620.32	35.233	625.00	27.135	1.2752
9.433	645.07	35.142	650.00	27.178	1.3017
8.997	669.82	35.088	675.00	27.207	1.3271
8.674	694.57	35.050	700.00	27.229	1.3520
8.060	719.31	34.986	725.00	27.274	1.3760
7.490	744.05	34.936	750.00	27.319	1.3989
7.201	768.78	34.914	775.00	27.343	1.4208
6.931	793.51	34.896	800.00	27.367	1.4422
6.694	818.24	34.882	825.00	27.388	1.4631
6.557	842.96	34.874	850.00	27.401	1.4836
6.342	867.69	34.864	875.00	27.422	1.5037
6.386	892.40	34.866	900.00	27.418	1.5236

BOTTOM OF CAST REACHED