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GIBRALTAR EXPERIMENT CURRENT MEASUREMENTS IN THE STRAIT OF GIBRALTAR OCTOBER 1985 - OCTOBER 1986

by

R. Dale Pillsbury, D. Barstow, J. S. Bottero, C. Millelro, B. Moore, G. Pittock, D. C. Root, J. Simpkins III, R. E. Still and H. L. Bryden

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As a part of the Gibraltar Experiment, eight subsurface moorings equipped with twenty-eight current meters were installed in the Strait of Gibraltar from October 1985 to April 1986. Another four moorings with fifteen current meters were installed from May 1986 to October 1986. Velocity, temperature, pressure, and conductivity were recorded at half-hourly intervals. Statistics and various time plots of the time series are presented in this report.

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The Gibraltar Experiment is a many faceted study of the dynamics and kinematics of the exchange between the Atlantic and Mediterranean through the Strait of Gibraltar (Bryden and Kinder, 1986). Net evaporation over the Mediterranean basin forces a surface inflow of Atlantic water and a nearly compensating deep outflow of saltier Mediterranean water through the Strait which together maintain the water and salt budgets for the Mediterranean Sea (Lacombe and Richez, 1982). The central hypothesis of the Gibraltar Experiment is that the narrowness and shallowness of the Strait combined with the dynamics of a two-layer flow controls the amount of exchange through the Strait. The Gibraltar Experiment field program was designed to measure the exchange between the Atlantic and Mediterranean and to diagnose the dynamical processes dominating the two-layer flow through the Strait of Gibraltar.

A central component of the Gibraltar Experiment was the year-long moored array of current meters whose measurements are described in this report. Current meter moorings were maintained from October 1985 to October 1986 at a total of 9 locations in the Strait of Gibraltar. The purposes of these moored current meter measurements were to provide a year-long time series of the exchange across the sill section in order to examine its temporal variability over tidal to seasonal time scales; to determine the cross-strait structure of the velocity in both the inflowing Atlantic layer and the outflowing Mediterranean layer, and of the interface between the layers; to examine the along-strait propagation characteristics of the fluctuations in each layer; and to investigate the roles of friction,

mixing, rotation and nonlinear processes in the dynamics of the flow through the Strait of Gibraltar.

In October 1985, eight current meter moorings (Figure 1, numbers C-1 through C-8) were deployed on a cruise aboard the Spanish naval vessel MALASPINA. Three moorings (C-1, C-2, C-3) across the sill section were densely instrumented in the vertical (Figure 2) in order to measure the inflow of Atlantic water and the outflow of Mediterranean water across this transect of minimum cross-sectional area. Five additional moorings (C-4,C-5,C-6,C-7 and C-8) were deployed along the axis of the Strait (Figure 3) in order to measure the characteristics of the flow at representative locations throughout the Strait. Mooring 4 is at a secondary sill, sometimes called Spartel sill, which is the last obstacle to the Mediterranean outflow before it cascades down into the Atlantic; mooring 6 is at the narrowest section of the Strait, sometimes called Tarifa narrows; mooring 5 is between the sill and the narrows; mooring 7 is at the eastern entrance of the Strait; and mooring 8 is in the deep Tangier basin between the sill section and the secondary Spartel sill. On each of these alongstrait moorings a current meter was deployed in the Atlantic layer at a nominal depth of 75 m and a current meter in the Mediterranean layer at a nominal depth of 230 m. Because of the rugged bottom topography, particularly on the sill section, and the strong currents, actual instrument deployment depths were often different from their intended depths (Table 1).

The Strait of Gibraltar is a harsh environment for current meter moorings with its high currents, high salinity and high oxygen

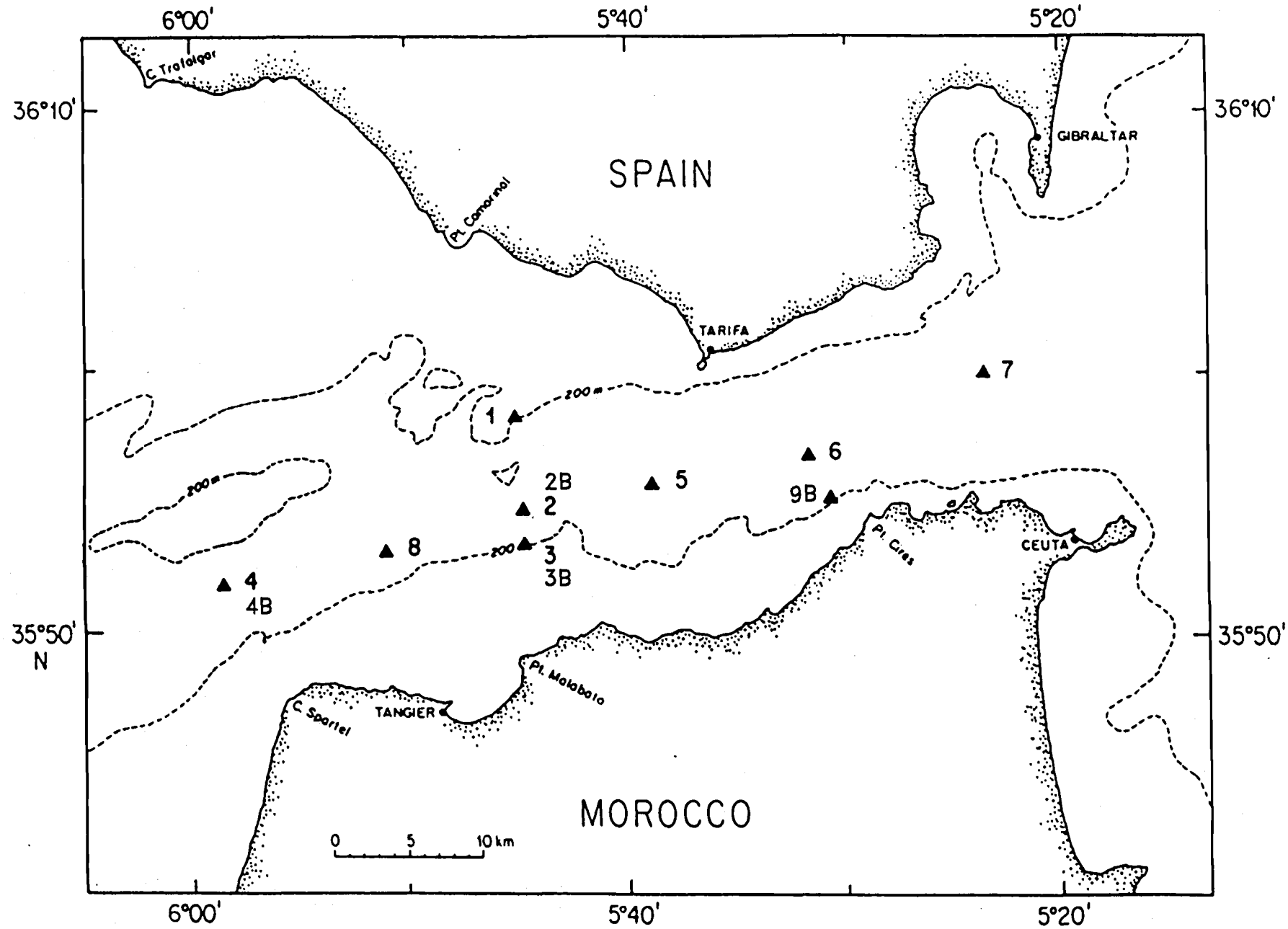


Figure 1. Site location of current meter moorings during the Gibraltar experiment, October 1985 to October 1986. Duration of each mooring given in Figure 4.

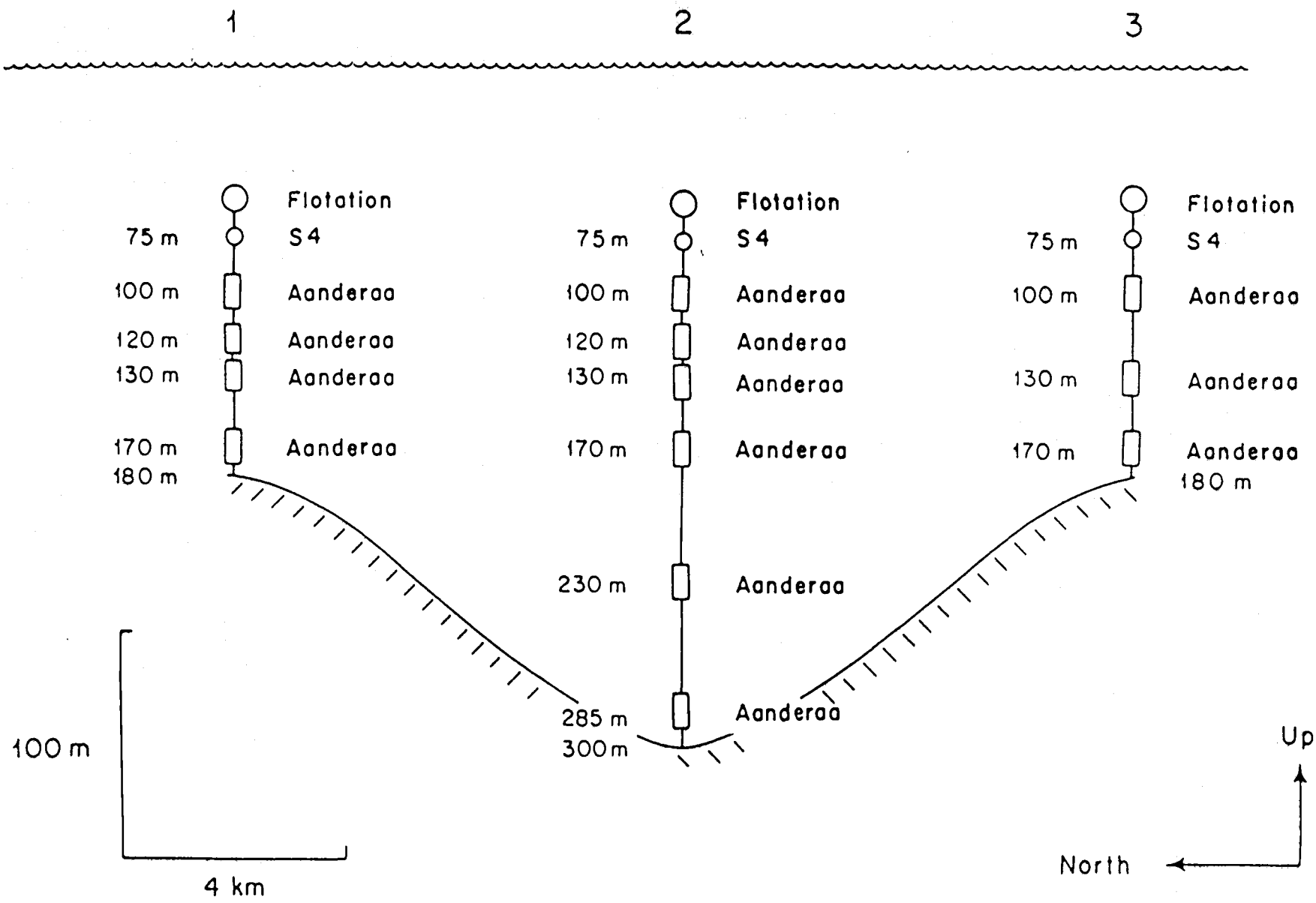
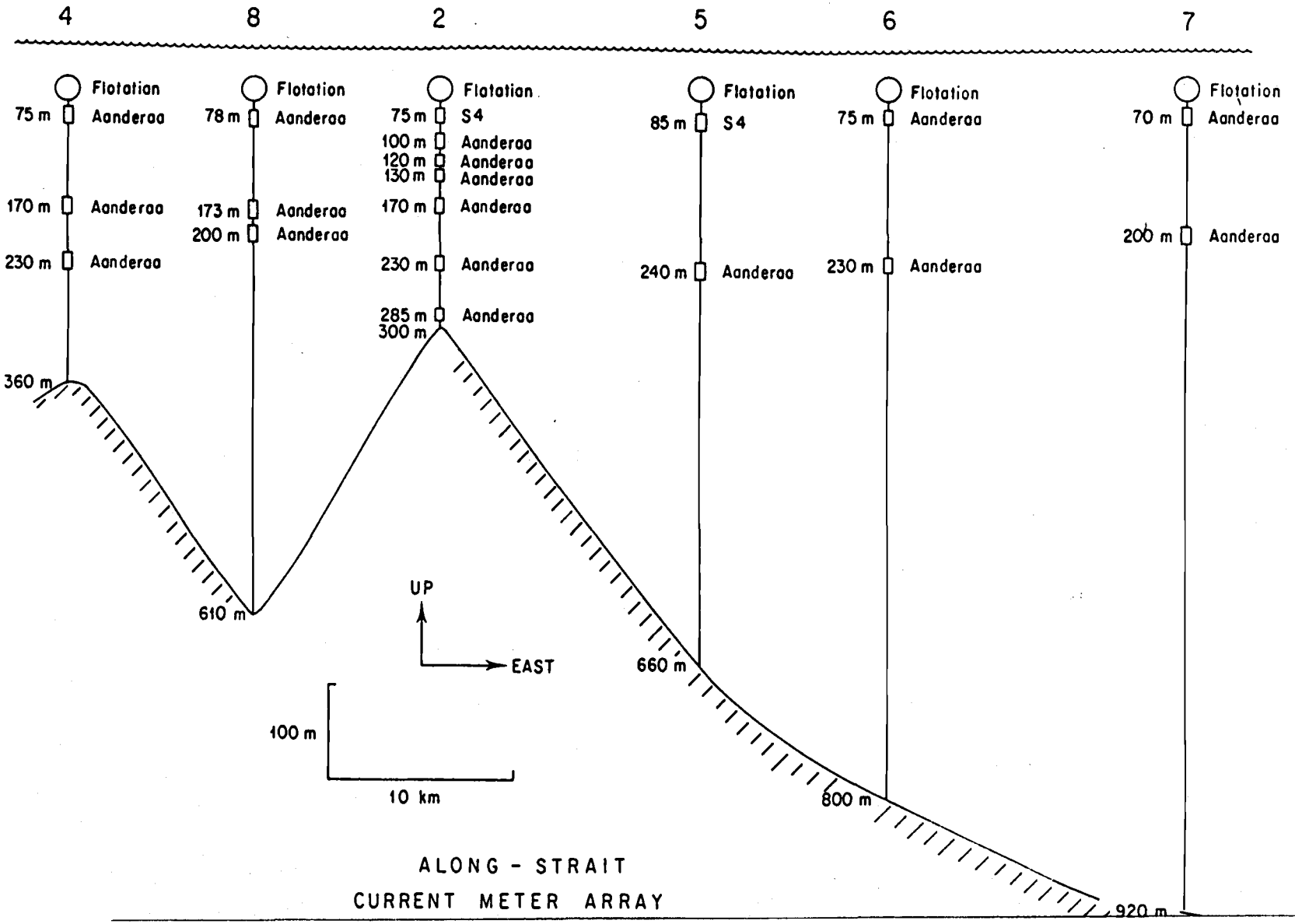


Figure 2. Mooring schematics of current meter moorings installed along the sill section of the Strait. Depths given are intended depths.

Figure 3. Mooring schematics of current meter moorings installed along the axis of the Strait. Depths given are intended depths.



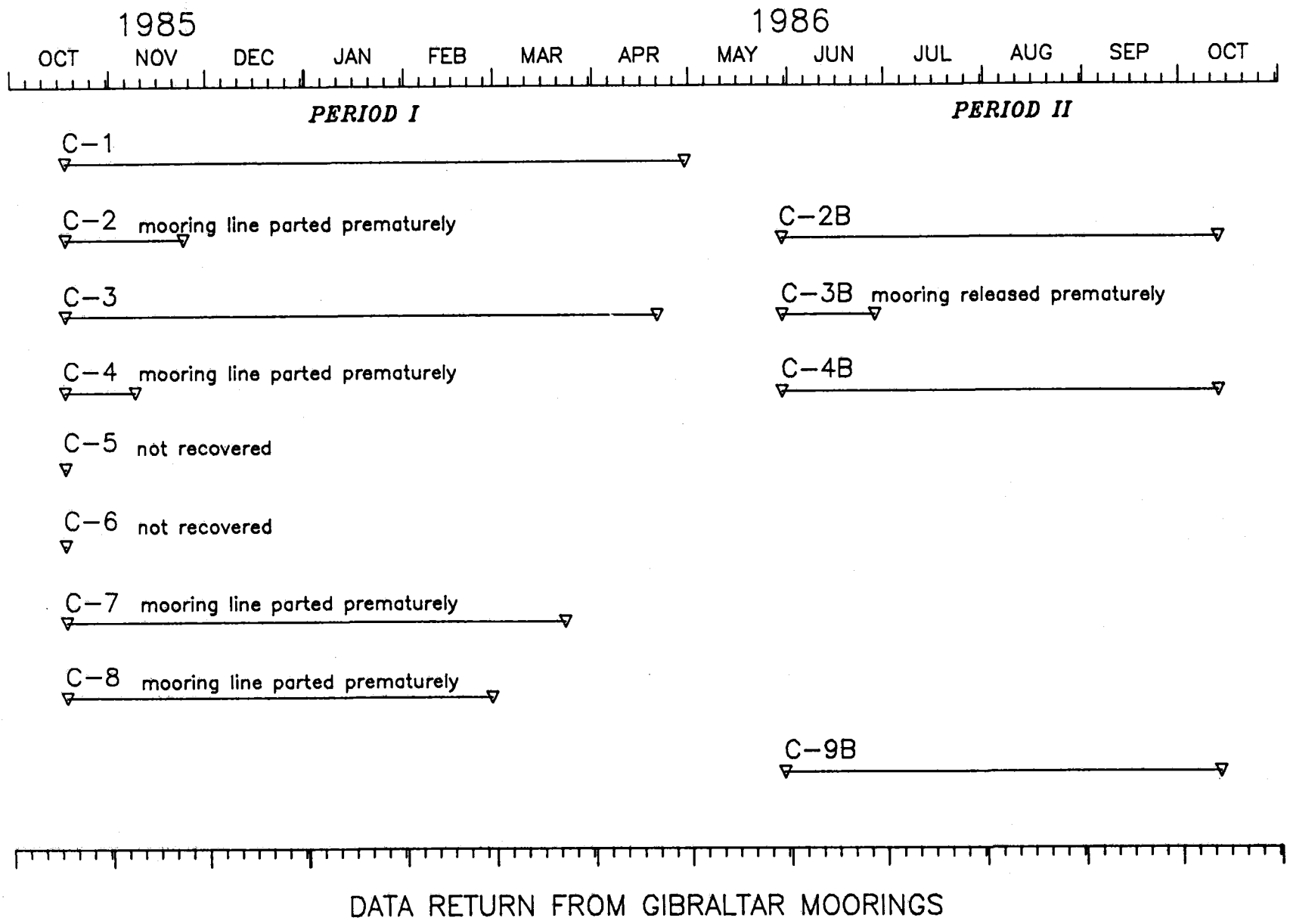


Figure 4. Timeline showing maximum duration of good data from each mooring.

Mediterranean water, and active fishing, shipping and naval operations. Typical water velocity is 200 cm s^{-1}, with tidal fluctuations appearing to be relatively depth-independent. The maximum measured current speed was 307 cm s^{-1}. To help design current meter moorings for the Strait of Gibraltar, the Woods Hole Oceanographic Institution's Buoy Group carried out a two-week pilot experiment in Spring 1984 near the site of mooring C-1 on the northern side of the sill section. Based on their experience, it was concluded that six-month moorings were feasible; that the mooring wire should be faired above 230 m depth; that buoyancy elements should be isolated large spheres rather than the more standard clusters of small glass balls to reduce drag; and that smaller, low-drag current meters should be used in the upper parts of the moorings whenever possible. The initial moored array (Figures 2 and 3) reflects these considerations.

Despite the care in mooring design, only 3 of the 8 initial moorings (moorings C-1,C-2 and C-3) were recovered completely by the end of the initial six-month deployment (Figure 4). Parts of the other five moorings were recovered by Spanish and Moroccan fisherman and by the USNS LYNCH on the recovery cruise in April 1986. A detailed account of each mooring's history is given in the Appendix. The principal problem appears to have occurred in the lower part of the mooring wire which was unfaired and unjacketed: high currents cause mooring wire vibration which flakes off the wire's galvanizing material and a galvanic action then corrodes the wire until it breaks under tension.

In May 1986, four moorings (Figure 1, moorings C-2B, C-3B, C-4B,

and C-9B) were deployed for the second half of the year-long experiment on a cruise aboard Spanish naval vessel TOFINO. The problems from the first six-month deployment limited the size of the array for the second half to only four moorings. This second array was designed to be complemented by two Doppler acoustic profiling current meters deployed by Dr. Neal Pettigrew on the northern side of the sill section (extending the line of moorings C-3B and C-2B across the sill section) and on the northern side of Tarifa narrows across from mooring C-9B. For these current meter moorings, jacketed wire without fairing was used throughout each mooring. Of these moorings, only C-3B failed prematurely due to stress fracture of the tension bar on the S4 current meter at the top of the mooring. The final three moorings were recovered aboard USNS LYNCH (Figure 4) in October 1986, although extreme vibration limited the duration of some of the instrument time series.

Nearly all of the current meters deployed in the Gibraltar Experiment were Aanderaa model RCM4 or RCM5 units which measured temperature, pressure and conductivity in addition to current speed and direction. Pressure is important for monitoring mooring motion and temperature and conductivity are important for determining the salinity which identifies whether the current meter is in the Atlantic water, Mediterranean water, or the interfacial region between them. A few of the new Inter Ocean model S4 electromagnetic current meters were deployed on the upper parts of the moorings. The first scientific deployment of an S4 current meter had occurred during the pilot experiment in Spring 1984. As with all new instruments, there is a

learning phase in which unexpected problems occur. The four S4 current meters deployed in Ocotober 1986 were all programmed for rapid sampling intervals. In contrast with standard current meters, such rapid sampling in an electromagnetic current meter consumes much battery power and, as a result, these S4 current meters were basically out of power shortly after deployment in the Strait. The single S4 current meter deployed in the second half of the experiment suffered a break in its tension bar about three weeks after deployment and the S4 was lost. Hence, the S4 current meters yielded essentially no usable data during the Gibraltar Experiment.

The Gibraltar Experiment is one of the first field programs in which conductivity and hence salinity measurements constitute a central component of the moored time series. A scatter plot of east velocity versus salinity for the current meter at 110 m depth on mooring C-3 (Figure 5) shows the importance of salinity measurements. This location near the interface between Atlantic and Mediterranean waters has a small time-averaged eastward velocity of 8.6 cm s^{-1}; however, the interface between Atlantic and Mediterranean layers regularly moves up and down past this location at a semidiurnal period, and there are substantial velocities when the current meter is in either of the layers. The scatter plot shows that when the current meter is in the Atlantic water, S<36.5 ppt, the typical velocity is eastward at 50 cm s^{-1}; when the current meter is in the Mediterranean water, S>38.0 ppt, the typical velocity is westward at 125 cm s^{-1}; in the interfacial region, velocities may be either eastward or westward. The salinity measurements allow us to profile both the Atlantic inflow

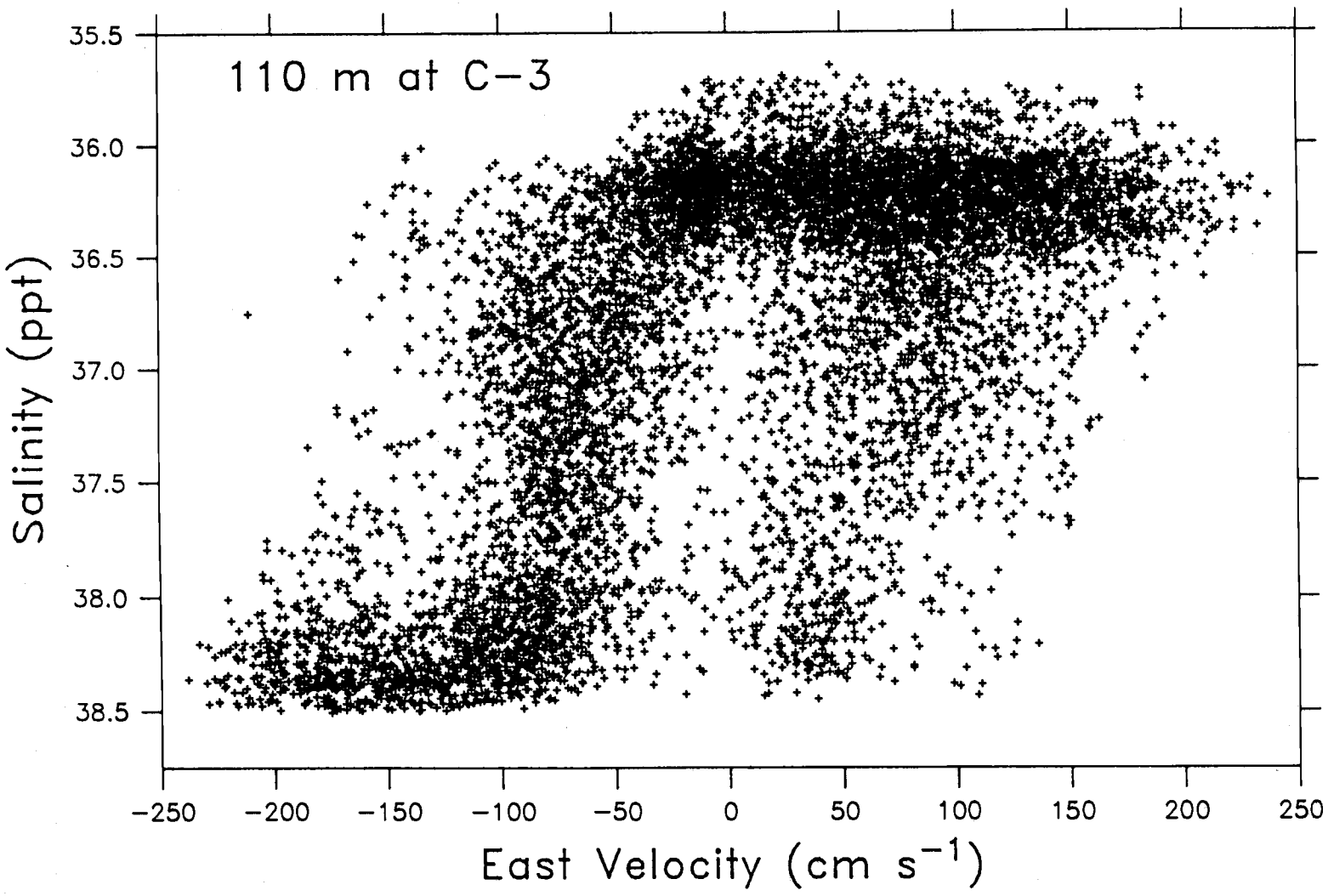


Figure 5. Scatter plot of East velocity (u-component) versus Salinity taken from 110 meters at Mooring c-3, 22 October 1985 to 21 April 1986.

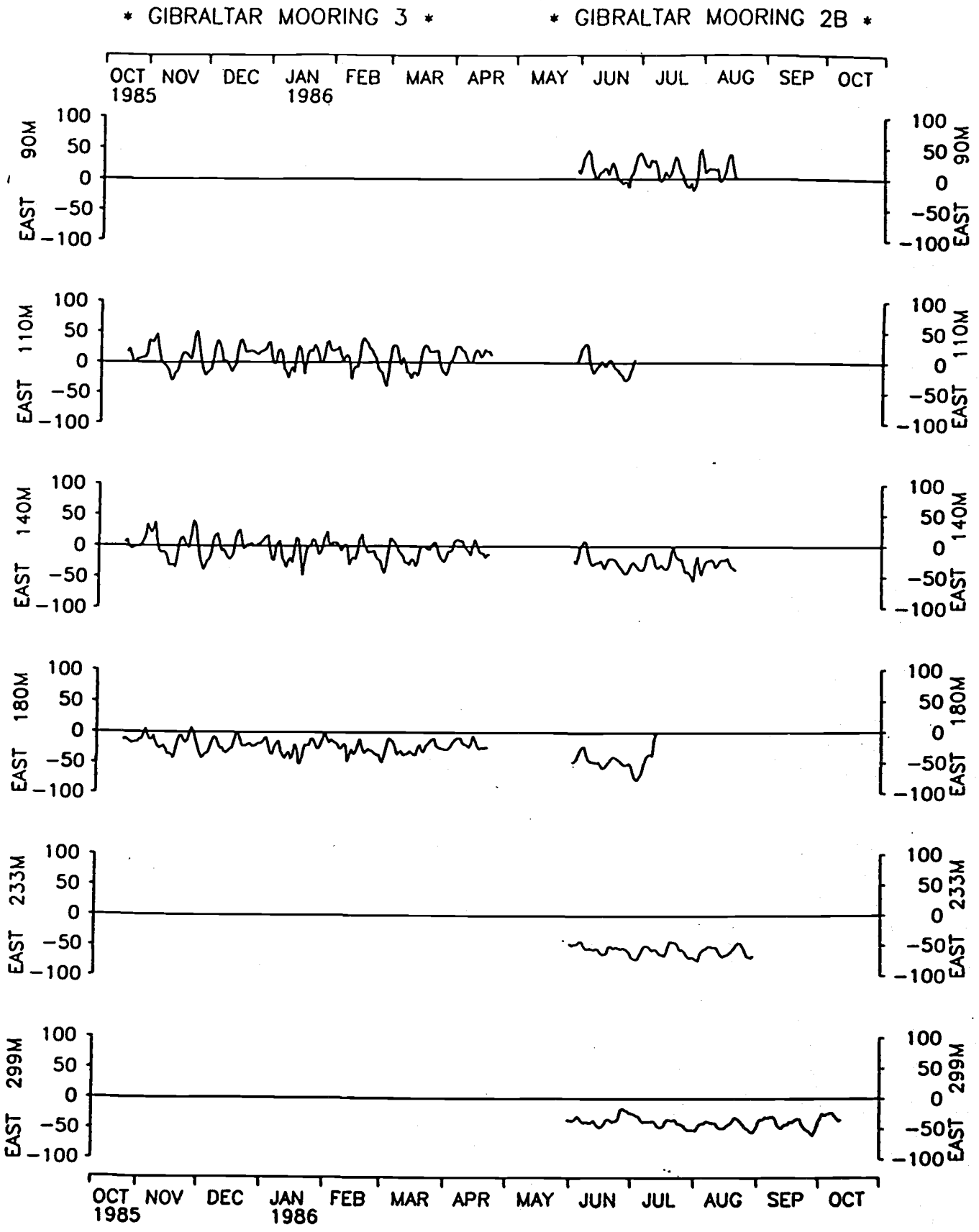


Figure 6. Time series of LLP filtered u-component from Moorings C3 & C-2B.

MOORING	RCM #	DEPTH (M)	N	PRINCIPAL AXIS DIRECTION (deg true)	MAJOR AXIS MEAN (cm/sec)	MAJOR AXIS VAR (cm^2/sec^2)	MINOR AXIS MEAN (cm/sec)	MINOR AXIS VAR (cm^2/sec^2)
C-1	5646/25	143	9315	98.5	-11.1	5465.6	11.0	282.1
	1968/44	156	9315	111.4	-15.0	4831.1	11.3	252.6
	5647/27	167	9298	100.5	-15.5	4451.5	13.3	246.8
	5649/19	215	9315	106.8	-11.4	1533.1	1.0	158.2
C-2	6590/16	123	1533	77.9	-5.2	10215.1	8.4	359.8
	751/61	143	1532	78.3	-15.4	8337.9	5.2	391.9
	6593/14	153	1532	75.2	-25.7	9895.0	8.4	398.0
	5886/19	191		(no speed record)				
	5648/27	254	1532	60.7	-54.1	4753.6	1.7	376.1
	1241/37	306	1533	48.6	-38.9	2818.6	3.9	342.6
C-2B	5649/20	90	3948	80.7	13.7	10361.5	4.1	1019.1
	6590/17	112	1500	76.2	-1.5	9696.3	-0.6	852.3
	6593/15	135	3966	73.8	-29.2	9527.9	5.4	311.4
	5886/20	181	1979	70.2	-51.0	6678.3	2.2	549.8
	5648/28	233	4413	64.3	-60.5	3748.6	-5.6	502.0
	1241/38	299	6563	50.0	-46.2	2296.1	-5.5	264.6
C-3	5643/26	110	8715	82.0	9.9	9269.9	-9.0	344.2
	5644/28	140	8717	79.8	-3.9	7550.0	-4.9	359.4
	5645/25	179	8717	68.9	-24.7	3485.7	0.8	362.5
C-3B	5643/27	102	1263	85.9	13.8	7756.0	-8.6	277.6
	5644/29	127	1091	81.7	10.0	5577.0	-5.3	420.9
	5645/26	172	1374	74.7	-6.9	1921.7	0.5	270.1
C-4	1541/48	67	1075	73.3	25.4	1316.0	-1.3	53.4
C-4B	1541/49	218	456	66.3	-41.4	2802.0	-7.0	402.7
	1968/45	296	333	59.9	-91.0	417.4	-13.0	312.0
	6879/2	340	6548	65.1	-86.0	770.9	-19.9	104.6
C-7	755/58	54	7616	79.2	54.2	2088.6	3.4	278.4
	1236/45	193	7617	63.6	-22.4	949.8	0.8	73.9
C-8	6877/1	30	6332	74.6	36.6	3088.6	1.7	157.1
C-9B	5647/28	58	4139	76.1	57.9	2252.6	6.2	737.1
	5646/26	159	6633	74.8	28.3	3051.7	-9.2	272.2

Table 1. Principal axis direction, orientation and variance of unfiltered half-hourly data for each record in the Gibraltar Experiment.

MOORING	RCM #	DEPTH	N	PRINCIPAL AXIS DIRECTION	MAJOR AXIS MEAN	MAJOR AXIS VAR	MINOR AXIS MEAN	MINOR AXIS VAR
		(M)		(deg true)	(cm/sec)	(cm^2/sec^2)	(cm/sec)	(cm^2/sec^2)
C-1	5646/25	143	766	96.1	-11.5	238.3	10.6	9.9
	1968/44	156	766	109.2	-15.4	186.1	10.8	11.9
	5647/27	167	765	99.7	-15.8	169.8	12.9	12.0
	5649/19	215	766	112.2	-11.3	46.7	2.1	5.5
C-2	6590/16	123	117	78.2	-5.6	568.6	8.5	14.8
	751/61	143	117	87.4	-14.5	309.2	7.7	8.3
	6593/14	153	117	82.1	-24.4	355.0	11.7	9.2
	5886/19	191		(no speed record)				
	5648/27	254	117	64.0	-53.1	80.7	4.5	20.2
	1241/37	306	117	66.9	-35.1	53.5	15.4	34.7
C-2B	5649/20	90	318	75.3	13.1	330.1	5.2	52.2
	6590/17	112	114	71.6	-3.4	314.9	-0.3	30.7
	6593/15	135	320	79.6	-28.8	170.0	8.5	7.0
	5886/20	181	154	80.6	-50.7	162.5	11.3	17.1
	5648/28	233	357	45.8	-55.5	110.3	-24.8	24.4
	1241/38	299	536	51.1	-46.4	126.1	-4.7	6.7
C-3	5643/26	110	717	99.3	6.7	397.4	-11.6	30.5
	5644/28	140	717	92.7	-4.7	320.4	-3.9	41.2
	5645/25	179	717	71.7	-24.6	166.2	2.1	13.4
C-3B	5643/27	102	95	94.7	11.9	187.2	-9.9	5.4
	5644/29	127	81	99.3	8.2	105.6	-7.0	7.5
	5645/26	172	105	80.3	-6.7	54.6	1.4	6.2
C-4	1541/48	67	80	66.9	24.9	20.9	1.1	2.1
C-4B	1541/49	218	28	67.9	-34.2	676.1	-6.5	13.1
	1968/45	296	18	44.3	-84.3	35.4	-37.3	20.2
	6879/2	340	538	78.5	-88.3	116.9	0.5	3.9
C-7	755/58	54	625	79.3	54.1	734.1	3.3	25.6
	1236/45	193	625	54.4	-22.3	57.3	-2.8	9.6
C-8	6877/1	30	518	62.8	35.6	100.3	9.1	14.8
C-9B	5647/28	58	335	69.0	56.4	140.8	13.3	61.0
	5646/26	159	543	72.2	28.5	161.7	-8.2	7.8

Table 2. Principal axis direction , orientation and variance of Filtered six six-hourly data for each record in the Gibraltar experiment.

and the Mediterranean outflow and to examine the nature of the exchange through the Strait.

Despite all of the mooring problems and instrument malfunctions, a remarkable set of moored current meter measurements has been made in the Strait of Gibraltar. Statistics for the 31 current meter records summarize these year-long, three-dimensional measurements of the inflowing Atlantic water and the outflowing Mediterranean water, across the sill section and along the axis of the Strait (Tables 1 and 2). The year-long time series at the Gibraltar sill exhibit vertically coherent, low-frequency fluctuations in the Mediterranean outflow (Figure 6) as well as strong tidal fluctuations. Further analysis of these current meter records should enable detailed investigation of the physical processes which dominate the dynamics of the two-layer exchange through the Strait of Gibraltar.

SAMPLING AND PROCESSING INFORMATION

All moorings consisted of Aanderaa RCM 4 or RCM 5 current meters equipped to record speed, direction, temperature, conductivity, and pressure. The speed record from Aanderaa meters is based on the rotor count during the sampling interval, thirty minutes. The nominal threshold of the Aanderaa speed sensor is 1.75 cm s^{-1}. In processing, a zero in the speed sensor is set equal to 0.8 cm s^{-1}, i.e., half the threshold. Direction, temperature, pressure, and conductivity are instantaneous measurements at the end of the sampling interval.

Data from the current meter tapes are translated into bit numbers and each data record is assigned a time in Universal Coordinated Time (UCT). This product is known as the dated raw file. The sensors are

routinely calibrated before and after deployment. The dated raw file, together with the calibration information, is then processed into metric units. Smith, et al, (1986) reviewed the calibration procedure used with Aanderaa current meters. To form the LLP (6-hourly) records, the half-hourly data were first converted to low-passed (LP) data (hourly values, half-power at 2.9 hours). These data were interpolated to give data points on the hour. The LP data records were then used to form low-low passed (LLP) files with a program that low pass filters (half-power at 46.6 hours) the hourly data to remove the diurnal and shorter period tidal energy and any inertial frequency energy. Denbo, et al, (1984).

Each current meter recorded temperature, pressure, and conductivity (in addition to current speed and direction). From these, salinity time series were calculated using an algorithm from Fofonoff and Millard (1983). The resulting salinities were them compared with values obtained by other means. It is known that salinities in the Strait of Gibraltar range up to a maximum of about 38.4 ppt in the heavier Mediterranean outflow water. The numbers obtained from the current meter data occasionally exceeded this value, and in other cases were much too low. We attribute the discrepancies mostly to drift in the response of the Aanderaa conductivity sensors. All of the sensors were calibrated shortly before the experiment, but many of them appear to have drifted out of calibration, either before deployment or in situ.

Our remedy was to adjust each affected salinity series so that its maxima lay at about 38.4 ppt. The first step in the procedure was

to divide the series into consecutive 4-day segments. Second, the maximum salinity in each segment was identified. Third, a second-degree curve - salinity as a function of time - was fit to the maxima, using a least-squares technique. Fourth, at each point of the salinity series the difference between this curve and 38.4 was subtracted from the series. The result is a series whose maxima are close to 38.4 ppt. We believe these salinities are sufficiently accurate for many purposes. Records with corrected salinities are noted on the plots and statistic pages.

Depths of the meters were obtained by from the unfiltered data by converting meters to decibars using a relationship developed by Professor J. L. Reid of Scripps:

$$z(m) = (0.992446)P - (2.28717\times10^{-6})P^2 + (2.08213\times10^{-11})P^3$$

This equation is based on a world ocean average density profile. Minimum, rather than average, depths were used.

Occasional problems appear in the data as repeated bit numbers, isolated spikes, absence of data,or short runs of unexplainably erratic data. Problem areas of only a few cycles are corrected by linear interpolation; those longer than a few hours are bridged. The data gaps were bridged using Anderson's (1974) algorithm for a predictive filter which utilizes the spectral characteristics of the preceding data (Smylie et al., 1973; Ulrych et al., 1973).

All questionable data have been eliminated unless a note to the contrary is included on the statistics page. In general the data gaps of a few days or less are filled and those of greater duration are

left as missing values.

DATA PRESENTATION

In this report, each of the current meter records is described to give the reader an overview of the duration of the measurements, the statistics for each variable, the frequency content of the variability, and some representative time series of the current, temperature, pressure and salinity observations.

The data are organized by mooring location. Each section begins with a timeline showing the instrument depths for each mooring period, and the duration of good data from each sensor: speed (s), direction (o), temperature (T), pressure (P), and conductivity (C).

The page of statistics gives the mean, variance, and extrema for speed (s), eastward (u) and northward (v) components of the current, temperature (T), pressure (P), conductivity (C), amd sainity (S). It also includes information about location, dates of installation and recovery, bottom depth, notes about the quality of each record, and unusual events that may have happened to the whole mooring. Separate pages for unfiltered, and filtered (LLP) information are provided.

The presentation of the half-hourly unfiltered data begins with histograms, scatterplots, and progressive vector diagrams. The histograms of speed, direction, temperature, pressure and salinity show the frequency of occurrence versus amplitude. The scatter diagrams show the distribution of hourly or half-hourly values of speed and direction. For clarity, the low speeds (< 1.5 cm s^{-1}) have been excluded from these plots. The progressive vector diagrams are obtained by placing the velocity vectors tail-to-head to show the path

that a particle would travel in a perfectly homogenous flow. The squares mark the beginning of each month. Kinetic energy spectra of u and v; variance density spectra of pressure, temperature, and salinity conclude the presentation of unfiltered half-hourly data. Spectra from 156m, 167m, and 211m at Mooring C-1 have an apparent spike at high frequency. This is really only a variation of one bit in an otherwise nearly constant time series. It is low amplitude, high frequency noise inherent in the measurement aparatus, and should not be interpreted as significant.

LLP and LP filtered data are presented next as time series plots. There are two plots for each current meter: all variables (velocity vectors, u, v, temperature, pressure, conductivity and salinity) at each depth on the mooring, and each variable (with the exclusion of conductivity) at all depths.

The velocity vectors were all rotated 90 degrees counterclockwise, North is indicated on the plot. Every other stick was plotted. The horizontal scale is the same for both periods. An effort has been made to keep the vertical scales the same, but it was not always possible to do so and still present the data in a reasonable manner.

The records from Moorings C-2, C-3B, and C-4 were too short to present on the time-scale chosen for the LLP filtered time-series data. Therefore, the time-series data from these moorings have only been converted to the LP (hourly) format for the plots. Data from the remainder of the moorings are all from six-hourly LLP filtered records.

ACKNOWLEDGEMENTS

Dr. Dennis Conlon, Program Manager at the Office of Naval Research, provided constant encouragement and invaluable logistical help in carrying out the moored array measurements. The officers and crews aboard the Spanish Naval vessels MALASPINA and TOFINO, and the USNS LYNCH enthusiastically participated whenever necessary in the mooring operations at sea. Dr. Thomas Kinder selflessly organized the two cruises aboard the USNS LYNCH. Dr. Khribeche of the National Society for the Study of the Strait (SNED) and CMD Tanari of the Royal Moroccan Navy were instrumental in returning the equipment recovered by Moroccan fisherman. U. S. Military personnel at the Navy Base in Rota, Spain provided logistical support for staging the cruises.

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APPENDIX

GIBRALTAR EXPERIMENT MOORING HISTORY

Eight current meter moorings were deployed from the Spanish vessel B.H. TOFINO between 16 and 23 October 1985, in the Strait of Gibraltar. The positions of the eight current meter moorings are as follows:

C1 35 58.26N 05 44.62W
C2 35 54.79N 05 44.41W
C3 35 53.42N 05 44.20W
C4 35 51.68N 05 58.64W
C5 35 55.70N 05 38.40W
C6 35 56.84N 05 31.04W
C7 35 59.98N 05 22.75W
C8 35 53.16N 05 50.55W

A description of the moorings follows:

C1
48" steel sphere - S4 s/n 04410760@75 m - RCM 5646@100m -RCM 1968@120m - RCM 5647@130m - 37" steel sphere - RCM 5649@170m - DACS 202601 ,D = 180m.

C2
48" steel sphere - S4 s/n 04410762@75m - RCM 6590@100m - RCM 751@120m - RCM 6593@130m - RCM 5886@170m - 41" steel sphere - RCM 5648@230m - RCM 1241@285m - 6 17" glass spheres - DACS 202801, D = 300m.

C3
48" steel sphere - S4 s/n 04410763@75m - RCM 5643@100m - RCM 5644@130m - 37" steel sphere - RCM 5645@170m - DACS 200303, D = 180m.

C4
48" steel sphere - RCM 1541@75m - RCM 6881@170m - RCM 4045@230m - 7 17" glass spheres - DACS 102407, D = 360m.

C5
48" steel sphere - S4 s/n 04410764@75m - RCM 1237@230m - 9 17" glass spheres - DACS 102307, D = 650m.

C6
48" steel sphere - RCM 1543@75m - RCM 3615@230m - 9 17" glass spheres - DACS 102007, D = 800m.

C7
48" steel sphere - RCM 755@75m - RCM 1236@230m - 10 17" glass spheres - DACS 102507, D = 950m.

C8
48" steel sphere - RCM 6877@75m - RCM 6878@170m - RCM 6876@195m - 9 17" glass spheres - DACS 201403, D = 600m.

Harry Bryden was informed by the Spanish navy on 26 or 27 November 1985 that Moroccon fishermen had recovered parts of moorings C2 and C4. Due to the similarity of some of the instrument serial numbers, we did were not sure what parts they had until the equipment was recovered in Al Medeq, Morocco, aboard the B.H. ANTARES, 18-19 February 1986. A list of the equipment recovered follows:

C2
48" steel sphere - S4 s/n 04410762 - RCM 6590 - RCM 751 - RCM 6593 - RCM 5886 - 41" steel sphere - RCM 5648

C4
48" steel sphere - RCM 1541

The remainder of mooring C2 was released, and recovered aboard the ANTARES on 20 February 1986.

C2
RCM 1241 - 6 17" glass spheres - DACS 202801

Sometime during the week of 10 March 1986, T. Kinder et.al., aboard the USNS LYNCH, released DACS 102407 at mooring C4. The remainder of the mooring would not come up.

On 18 March 1986, the Spanish navy recovered the 48" steel sphere - RCM 6877 from mooring C8, near Ceuta.

The Gibraltar mooring recovery cruise was aboard the USNS LYNCH, 21-25 April 1986. The results are listed below:

C1
Released, would not come up
C3
Released, all recovered
C4
Rereleased, RCM 6881 - RCM 4045 - 7 17" glass spheres - DACS 102407, still on position.
C5
Released, would not come up. Three days after release, DACS 102307 - 9 17" glass spheres - 283m 1/4" wire rope, were recovered near Ceuta.
C6
Released, release came up 5 or 6 meters.
C7
Released, recovered DACS 102507 - 10 17" glass spheres - 428m 1/4" wire rope.
C8
Released, release began to come up. DACS came up about 80m.

The reinstallation cruise aboard the B.H. MALASPINA was scheduled for 15-31 May 1986. On 25 May 1986, while waiting for the ship to get fixed and go to sea, the Spanish navy delivered to the MALASPINA all of the instruments from mooring C1, excluding S4 s/n 04410760.

The positions of the four current meter moorings installed are as follows:

C2B	35 54.74N	05 44.55W
C3B	35 53.42N	05 44.21W
C4B	35 52.07N	05 58.03W
C9	35 55.23N	05 29.98W

A description of the moorings follows:

C2B
48" steel sphere - RCM 5649@75m - RCM 6590@100m - RCM 6593@130m - 6 17" glass spheres - RCM 5886@170m - 41" steel sphere - RCM 5648@230m - 6 17" glass spheres - RCM 1241@290m DACS 202801, D =300m.

C3B
48" steel sphere - S4 s/n 04410762@75m - RCM 5643@100m - 6 17" glass spheres - RCM 5644@130m - 37" steel sphere - RCM 5645@170m - DACS 200303, D = 180m.

C4B
48" steel sphere - RCM 1541@220m - 6 17" glass spheres - RCM 1968@300m - 2 17" glass spheres - RCM 6879@340m - 6 17" glass spheres - DACS 102307, D = 360m.

C9
48" steel sphere - RCM 5647@75m - 41" steel sphere - RCM 5646@170m - DACS 102507, D =180m.

A letter from Malaga dated 18 June 1986 states that a 17" glass sphere s/n 27939 was found on the beach near Malaga. The s/n indicates that the sphere was the top sphere in the cluster of 7 glass spheres above the release at mooring C4.

On 24 June 1986, while on a hydrographic cruise in the Strait on the USNS LYNCH, T. Kinder, et.al., recovered the 48" steel sphere and the S4 s/n 04410762 titanium mooring rod from mooring C3B. He and his company were asked to recover the remainder of the mooring. The recovery was made on 26 June 1986.

Returning from his hydrographic cruise, T. Kinder returned the 3 RCM data tapes from C3B to OSU along with data tapes from RCMs 755 and 1236 from mooring C7, which the Spanish navy had recovered.

1 September 1986 - As of this date equipment accounting is listed below:

At sea as placed: C2B, C4B, C9

In Corvallis: S4 s/n 04410763

At Rota Base:
48" steel sphere, 41" steel sphere, 37" sphere, 6 17" glass spheres, RCM 751, 5643, 5644, 5645, DACS 200303, 202601

In Rota/Cadiz c/o Spanish Navy:
C1
48" steel sphere - S4 s/n 04410760 - 37" steel sphere
C5
48" steel sphere - S4 s/n 04410764
C7
48" steel sphere - RCM 755 - RCM 1236

29 September 1986. As of this date equipment accounting is listed below.

At Rota Base:
3-48" and 1-37" steel spheres
At IHM, Cadiz:
RCMs 755, 1236 from C7,and S4 S/N 04410764 from C5. They do not have S4 S/N 04410760 from C1, strange since all of the other instruments and flotation from C1 have been returned.

Somewhere in Malaga:
17" glass sphere s/n 27939 top of 7 from mooring C4

Presumed to be on position:
C6
48" steel sphere - RCM 1543 - RCM 3615 - 9 17" glass spheres - DACS 102007
C8
RCM 6878 - RCM 6876 - 9 17" glass spheres - DACS 201403

Missing:
C4
RCM 6881 - RCM 4045 - 6 17" glass spheres - DACS 102407

Lost:
S4 s/n 04410762 - RCM 1237

27 October 1986

The Gibraltar Experiment recovery cruise was aboard the USNS LYNCH, 12-17 October 1986. C2B, C4B, C9 were recovered on 13 October 1986. Observable vibration wear was present in all moorings.

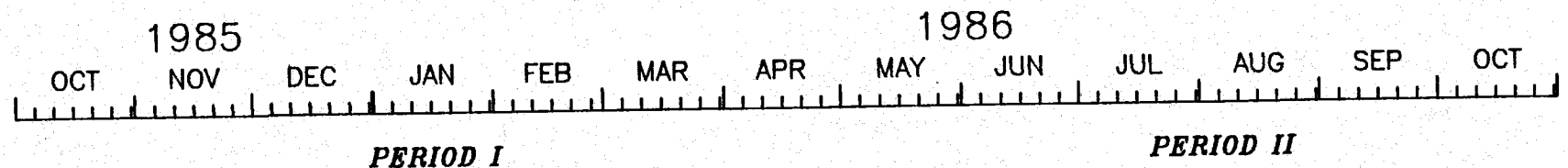
Equipment recovered by the Spanish navy with the exception of S4 s/n 04410760, was returned to Rota base on 21 October 1986.

Mooring failure dates as determined from recovered RCMs are listed below:

C1 4 May 1986
C2 23 November 1985
C3 OK
C4 9 November 1985
C5 ?
C6 DACS on position
C7 27 March 1986
C8 26 February 1986
C3B 23 June 1986

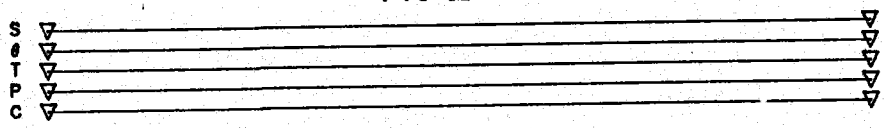
20 May 1987, S4 s/n 04410760 is at IHM, Cadiz, Spain. A shipping container was delivered to IHM during the final recovery period, October 1986, and can be shipped to OSU via Rota base.

Mooring C - 1

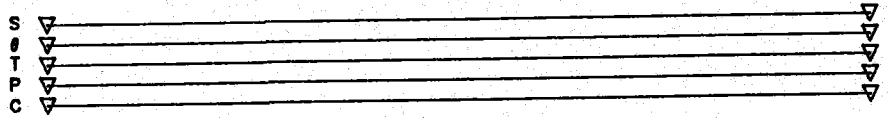


PERIOD I ***PERIOD II***

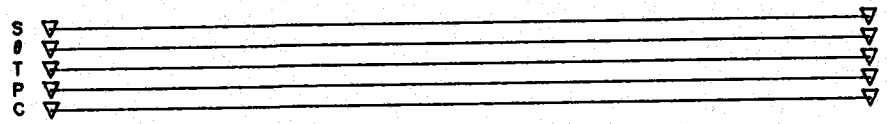
143 M



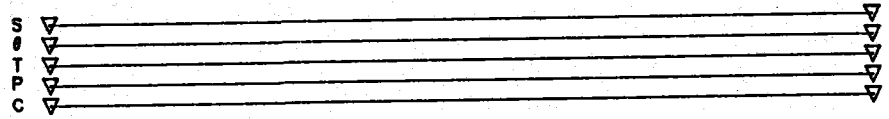
156 M

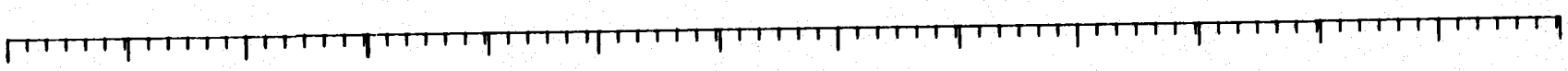


167 M



215 M





DATA RETURN FROM GIBRALTAR C–1.

STATISTICS HALF-HOURLY UNFILTERED DATA
MOORING GIBRALTAR C-1 PERIOD I 35°58.26'N, 5°44.62'W
22 OCT 85 - 4 MAY 86 Bottom depth: 222

		MEAN	SD	MIN	MAX	LENGTH	
5646/25	s	65.84	40.70	2.10	204.40	9315	COMMENTS
143 m	u	-12.57	73.17	-200.50	198.00	9315	
	v	-9.25	19.86	-122.30	65.00	9315	
	T	13.39	0.58	12.89	17.13	9315	
	P	147.29	0.75	144.40	154.90	9315	
	C	44.37	0.41	42.03	47.03	9315	
	S	37.93	0.61	35.83	38.46	9315	
1968/44	s	62.52	39.08	0.80	191.30	9315	
156 m	u	-18.08	64.96	-176.10	176.60	9315	
	v	-5.05	29.40	-141.30	161.60	9315	
	T	13.36	0.45	12.58	16.12	9315	
	P	166.03	0.97	157.70	173.40	9315	
	C	44.61	0.22	42.93	46.04	9315	
	S	38.01	0.48	36.04	38.45	9315	
5647/27	s	60.34	38.40	2.70	196.40	9298	This record was cut at 0738 4 MAY 86 when
167 m	u	-17.70	65.66	-193.40	168.50	9298	all channels began to show zeros.
	v	-10.18	19.69	-111.50	125.90	9298	
	T	13.22	0.41	12.78	16.05	9298	
	P	172.32	0.70	168.80	178.70	9298	
	C	44.49	0.42	42.43	46.18	9298	
	S	38.03	0.44	36.15	38.52	9298	
5649/19	s	36.24	22.56	0.80	122.90	9315	Due to a malfunction of the conductivity sensor
215 m	u	-11.20	37.65	-96.70	103.00	9315	lines 224 - 618 (0640 27 Oct 85 - 1140 4 Nov 85)
	v	2.36	16.54	-122.80	76.10	9315	have been set to zero, & lines 6177 - 6183 (0610
	T	13.14	0.25	12.92	15.02	9315	28 Feb 86 - 1010 28 Feb 86) have been bridged.
	P	218.09	0.18	216.70	221.70	9315	
	C	44.41	0.13	43.00	45.56	8920	
	S	38.23	0.25	36.59	38.44	8920	

(speed, u, and v are given in cm/sec; Temperature in °C; Pressure in decibars; Conductivity in mmho/cm; and Corrected Salinity in ppt. The sampling rate is 30 min.)

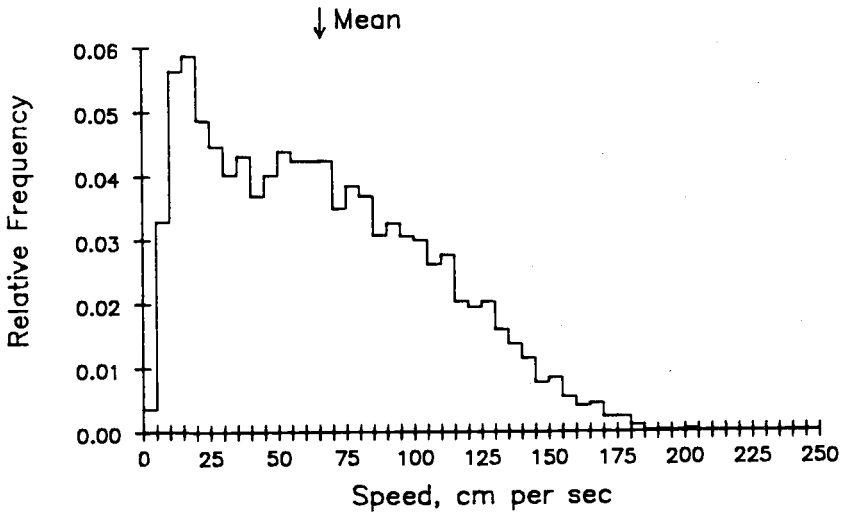
STATISTICS
MOORING GIBRALTAR C-1 PERIOD I
24 OCT 85 - 3 MAY 86

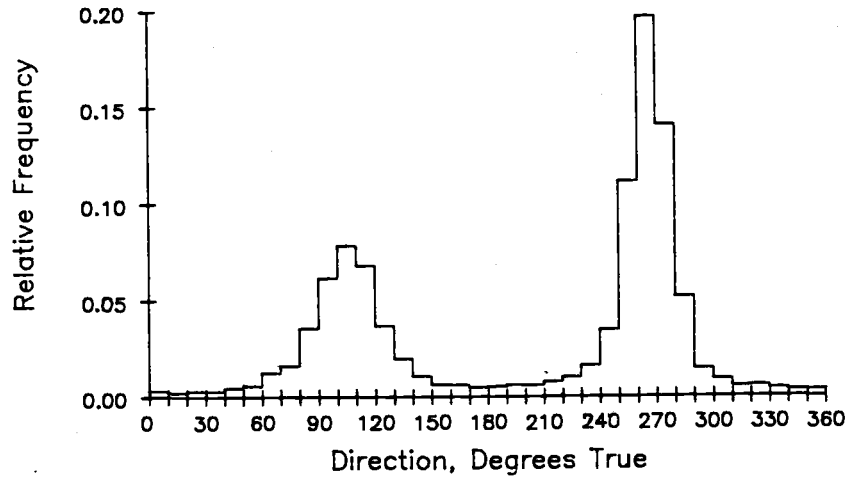
LLP FILTERED DATA
35°58.26'N, 5°44.62W
Bottom depth 222 m

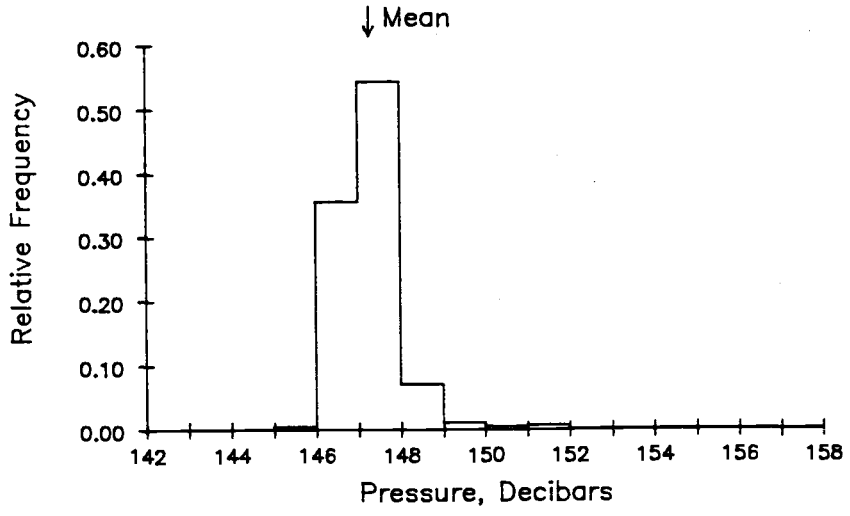
		MEAN	SD	MIN	MAX	LENGTH	COMMENTS
5646/25	u	-12.52	15.35	-61.66	25.22	766	
143 m	v	-9.28	3.54	-18.40	4.32	766	
	T	13.39	0.22	13.01	14.32	766	
	P	147.30	0.38	46.69	149.04	766	
	C	44.37	0.32	43.58	45.12	766	
	S	37.93	0.19	37.28	38.35	766	
1968/44	u	-18.06	12.93	-53.05	14.53	766	
156 m	v	-5.09	5.55	-23.29	14.50	766	
	T	13.36	0.16	13.11	14.03	766	
	P	166.05	0.49	164.57	167.79	766	
	C	44.61	0.11	44.32	44.97	766	
	S	38.01	0.14	37.56	38.32	766	
5647/27	u	-17.69	12.87	-57.57	15.77	765	See note on half-hourly statistics page.
167 m	v	-10.20	4.01	-23.67	1.54	765	
	T	13.22	0.15	12.99	13.93	765	
	P	172.33	0.31	171.64	173.54	765	
	C	44.49	0.37	43.86	45.42	765	
	S	38.03	0.13	37.50	38.32	765	
5649/19	u	-11.21	6.39	-27.59	6.78	766	See note on bridges in half-hourly file. The
215 m	v	2.35	3.37	-8.20	12.75	766	first 58 lines in the conductivity and salinity
	T	13.15	0.08	12.98	13.64	766	records have been eliminated due to a malfunction
	P	218.09	0.07	217.73	218.38	766	of the conductivity sensor.
	C	44.39	0.24	43.83	44.92	708	
	S	38.24	0.09	37.81	38.41	708	

(u and v are given in cm/sec; Temperature in °C; Pressure in db; Conductivity in mmho/cm; and Corrrected Salinity in ppt. The sampling rate for LLP data is 360 min.)

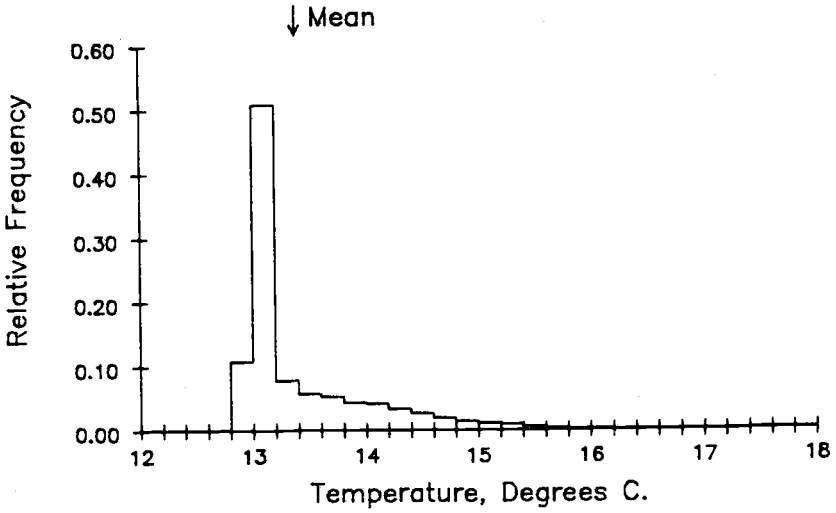
143 m at Gibraltar C–1. 22 Oct 85 – 4 May 86. Tape 5646/25.

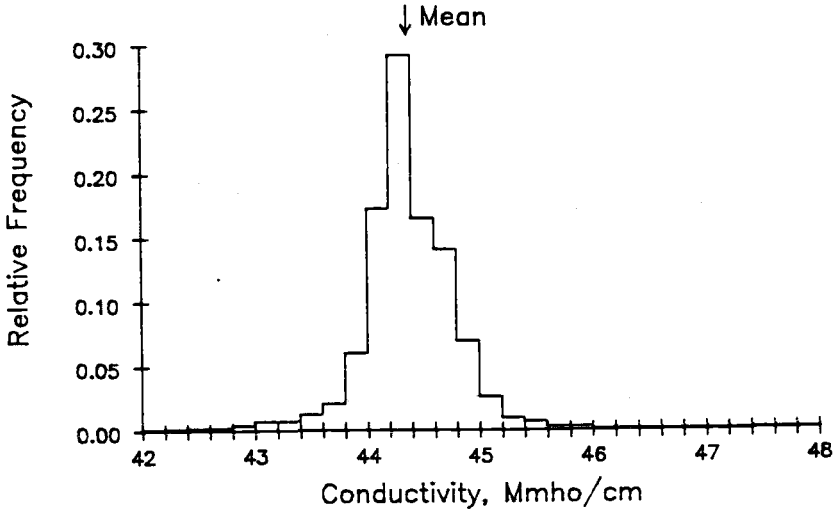


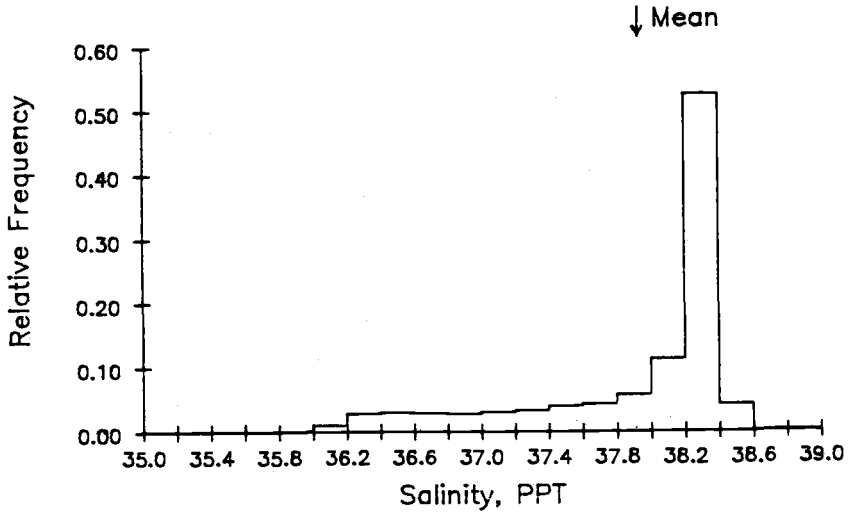




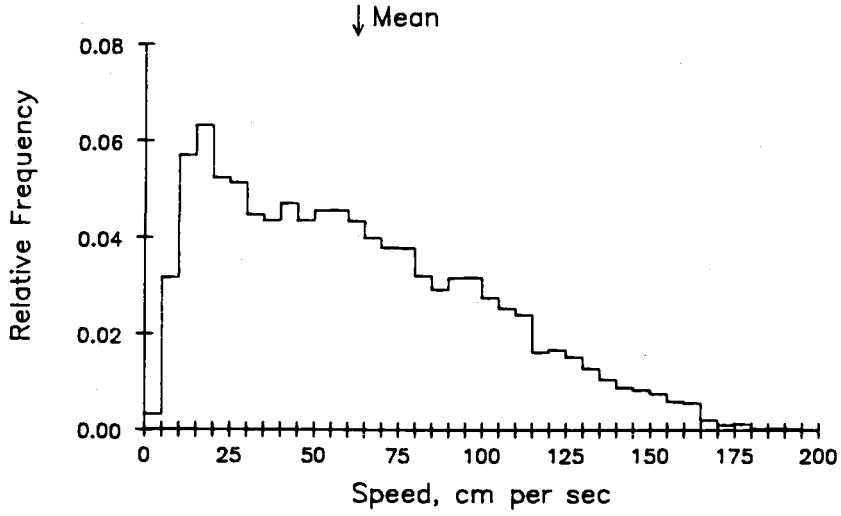
143 m at Gibraltar C–1. 22 Oct 85 – 4 May 86. Tape 5646/25.

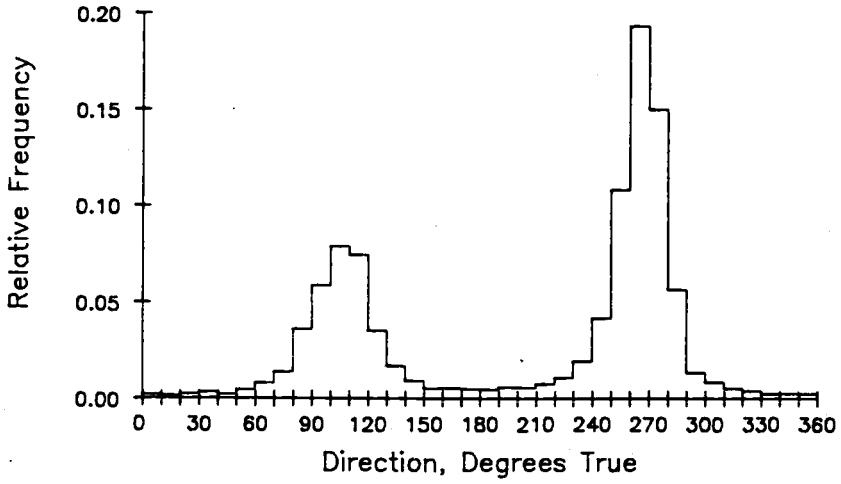


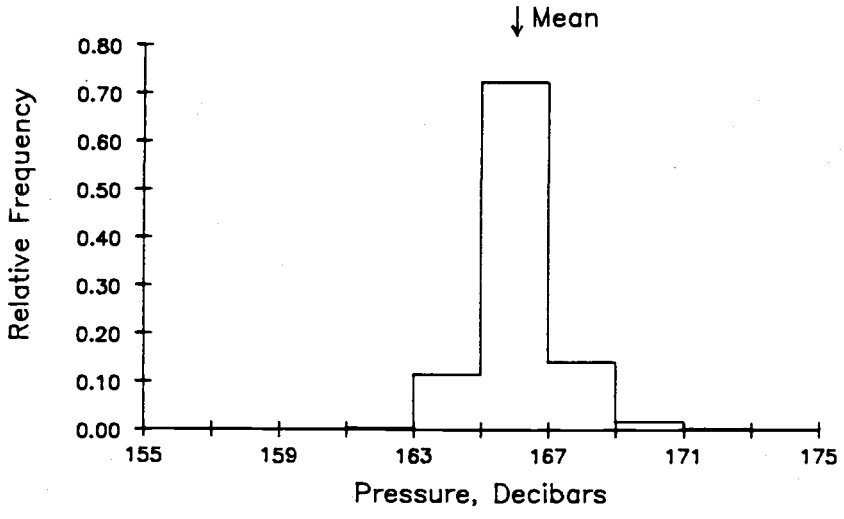




156 M AT GIBRALTAR C-1. 22 OCT 85 - 4 MAY 86. TAPE 1968/44.







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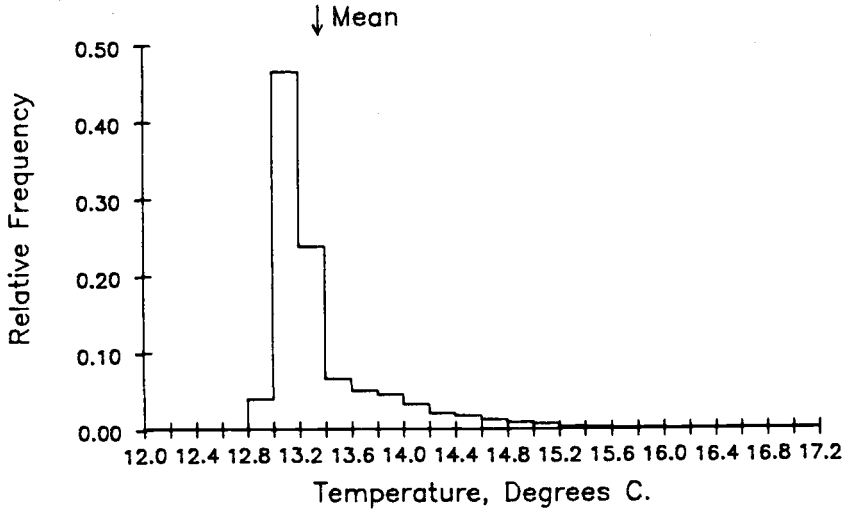
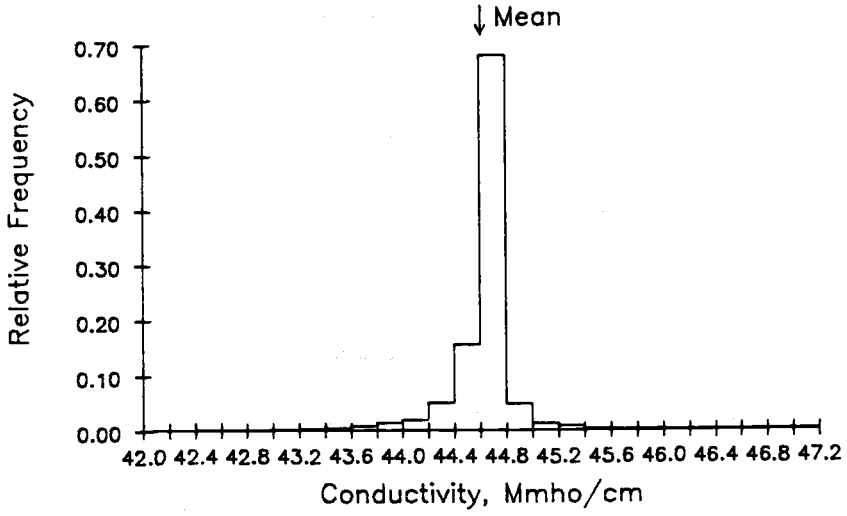
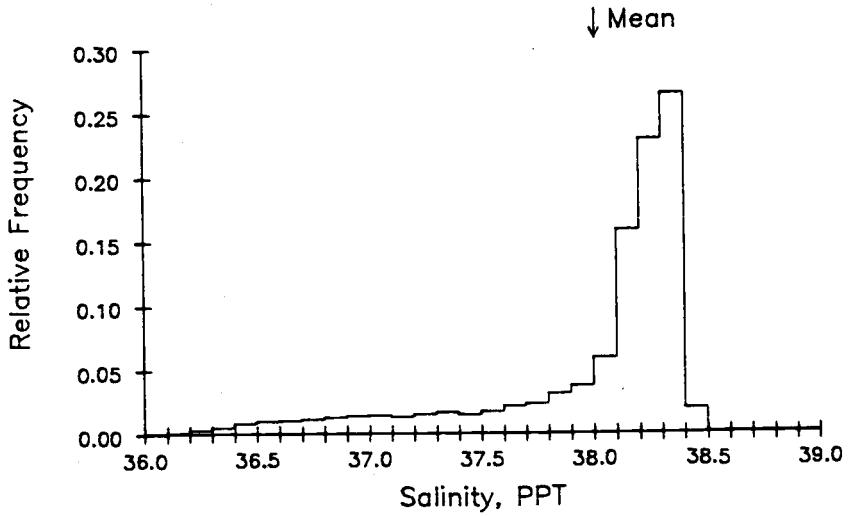
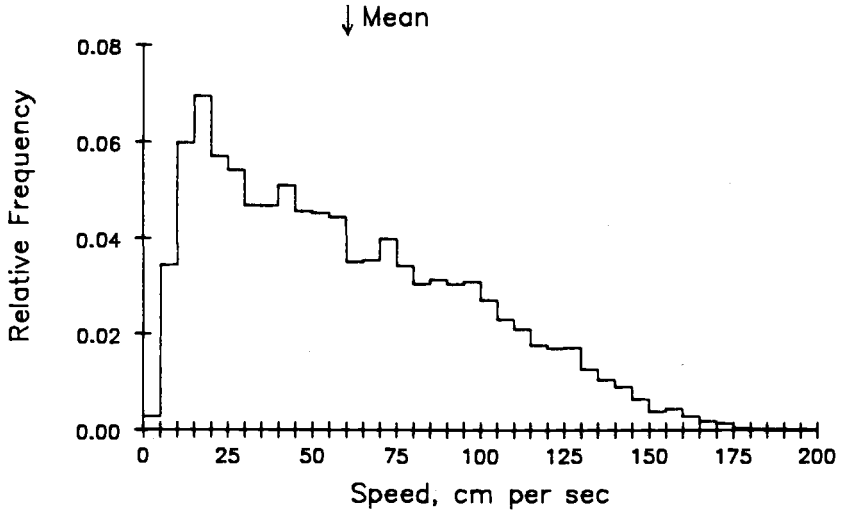
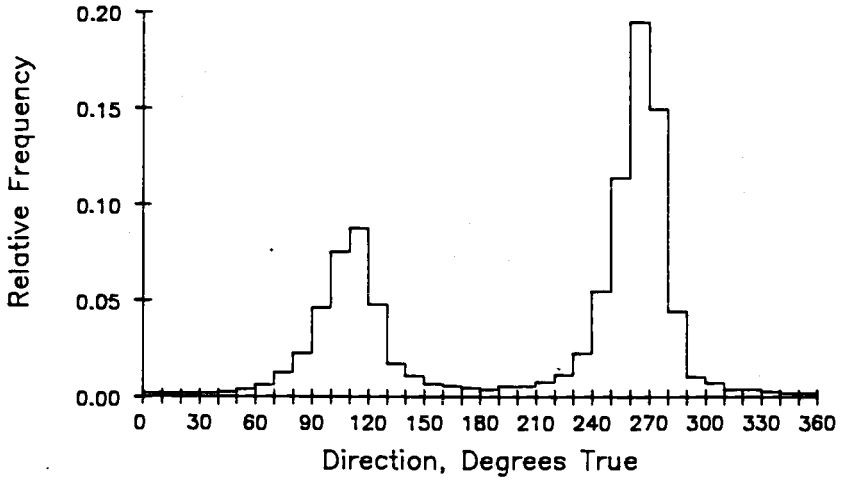


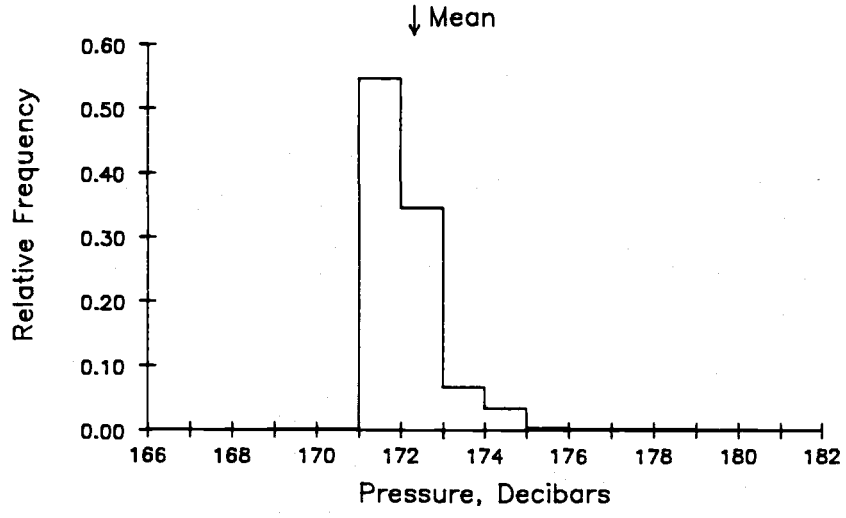




167 M AT GIBRALTAR C-1. 22 OCT 85 - 4 MAY 86 TAPE 5647/27.







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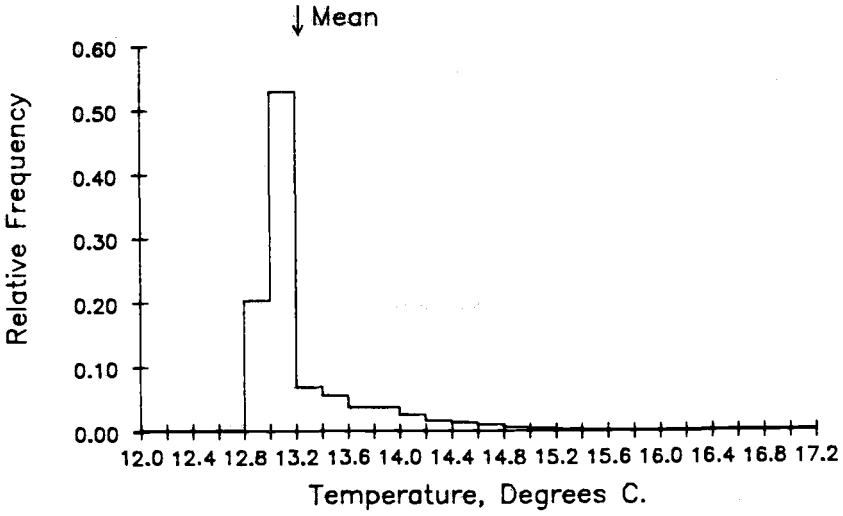
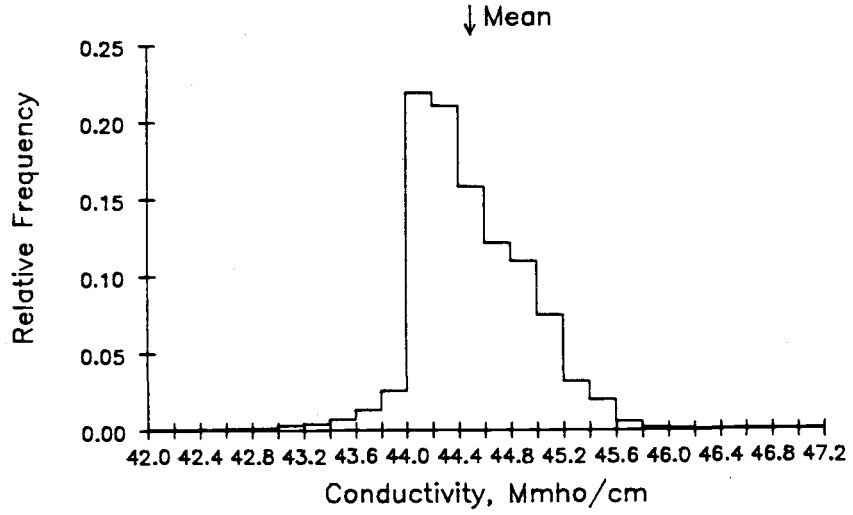
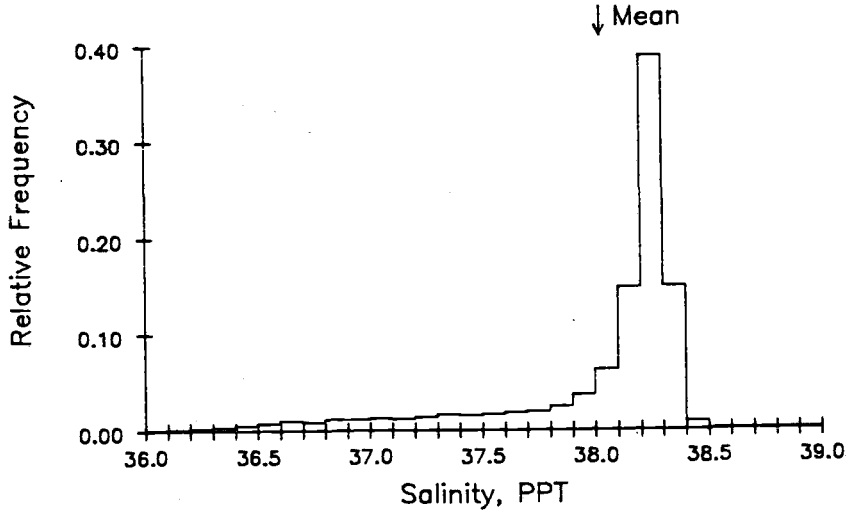
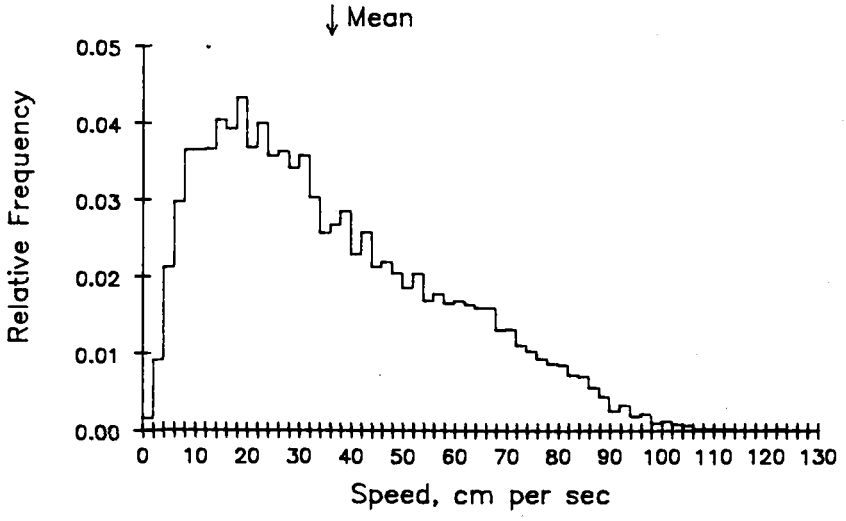
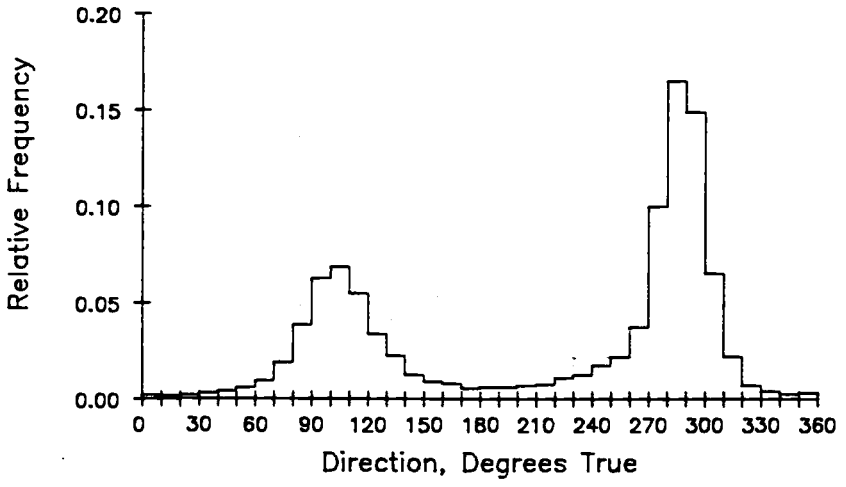


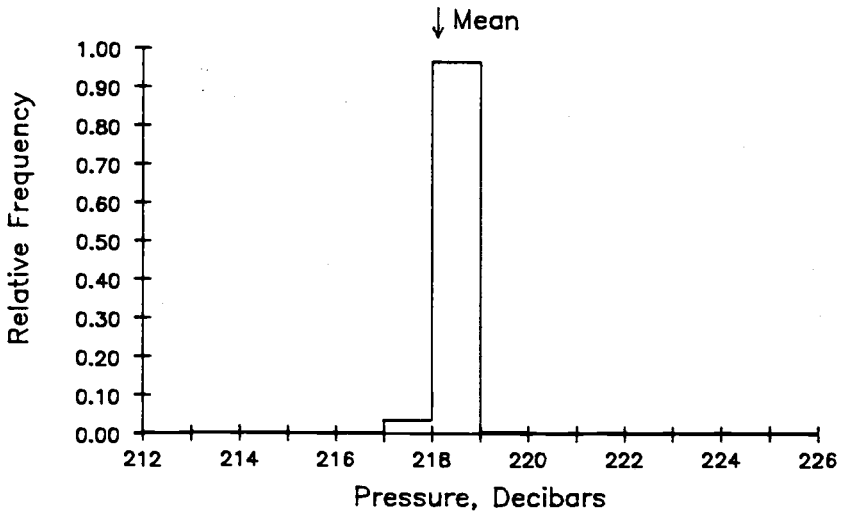




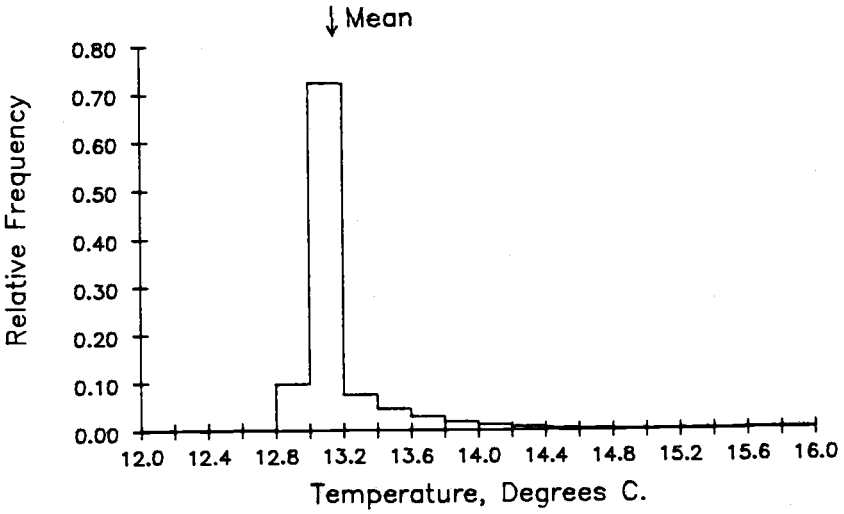
215 M AT GIBRALTAR C-1. 22 OCT 85 - 4 MAY 86 TAPE 5649/19.

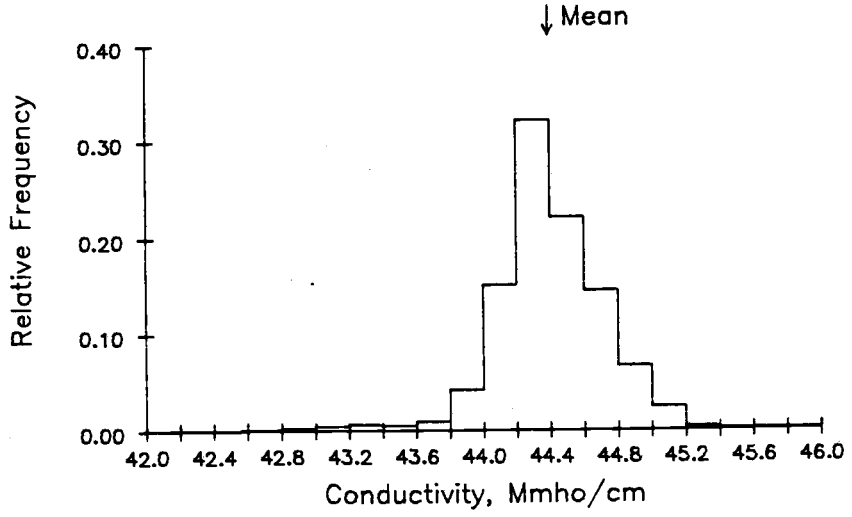


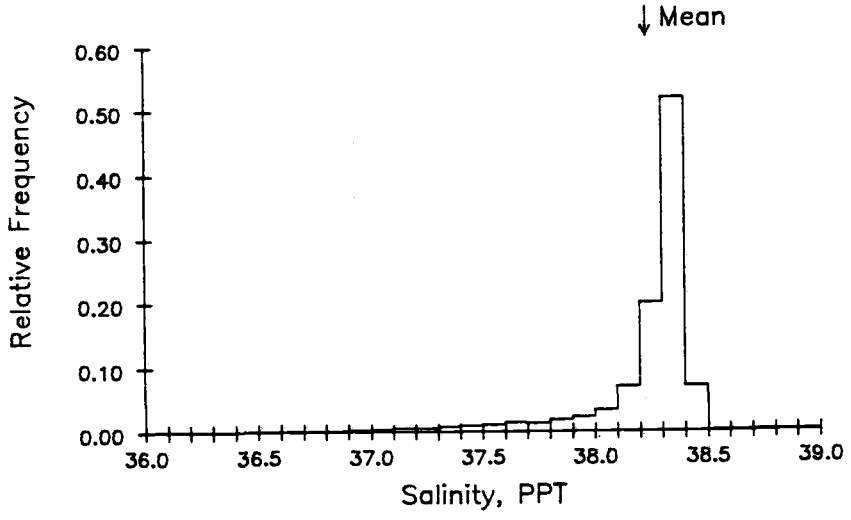




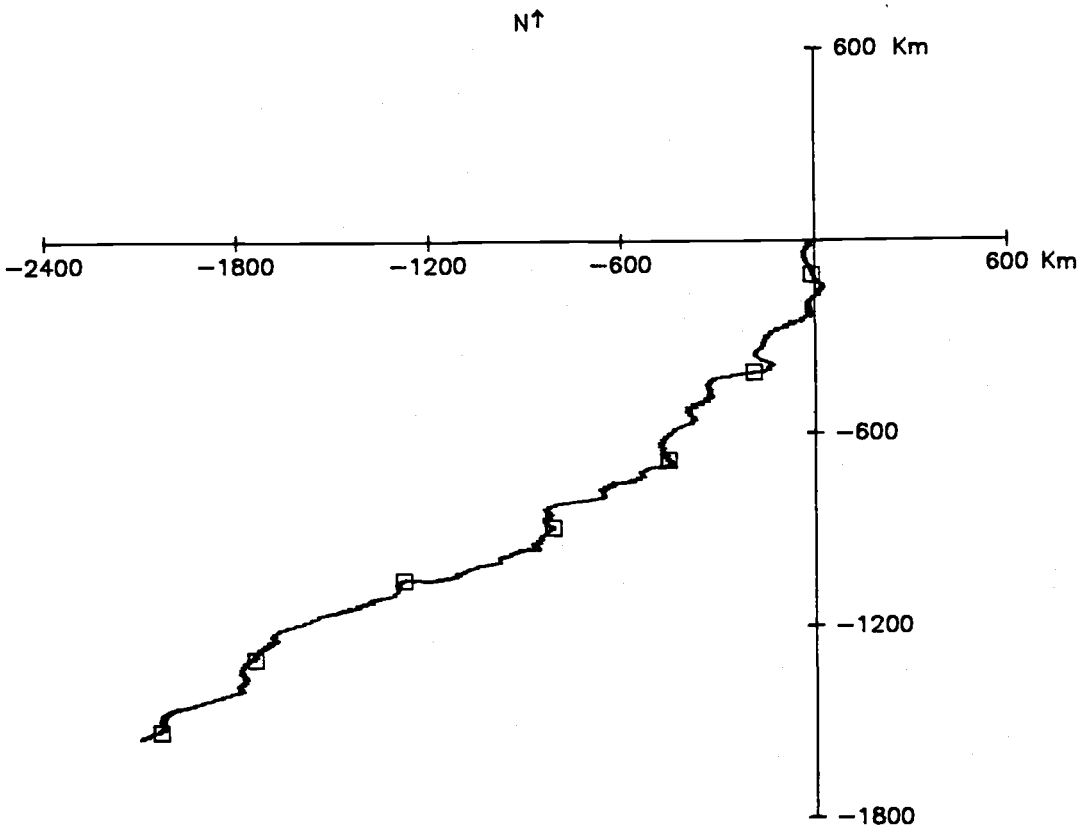
215 M AT GIBRALTAR C–1. 22 OCT 85 – 4 MAY 86. TAPE 5649/19.

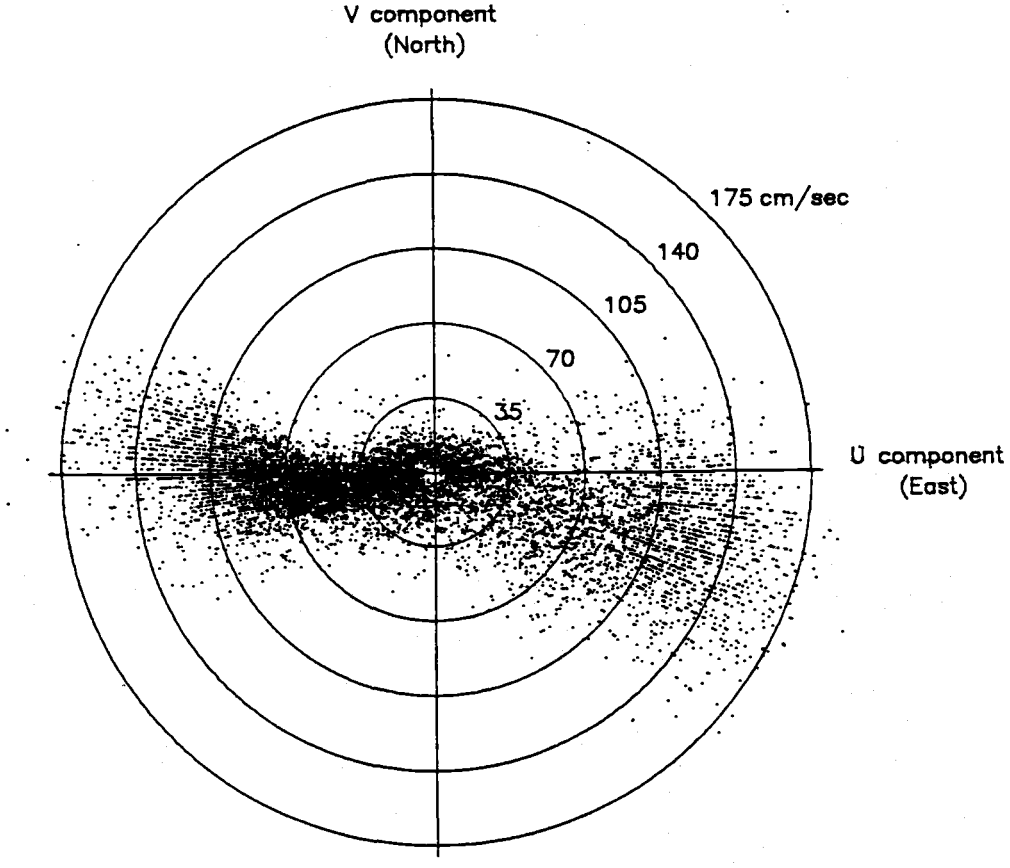




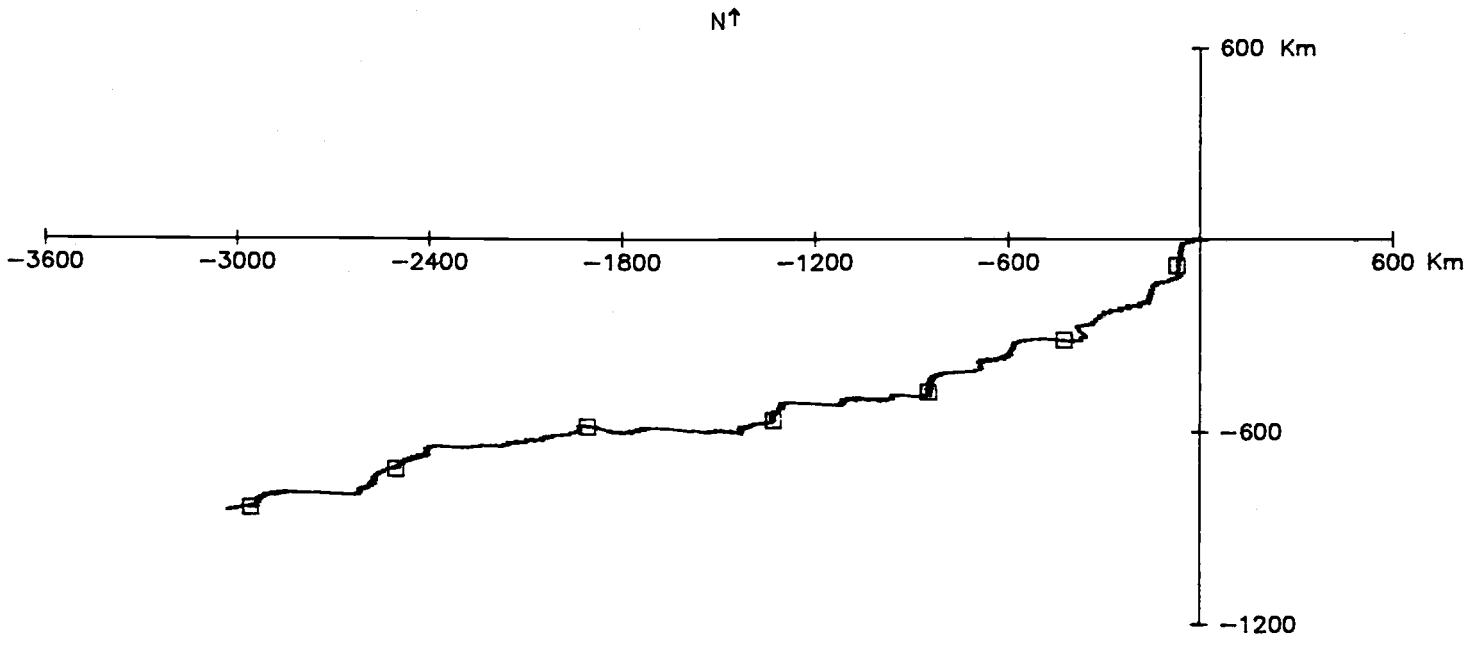


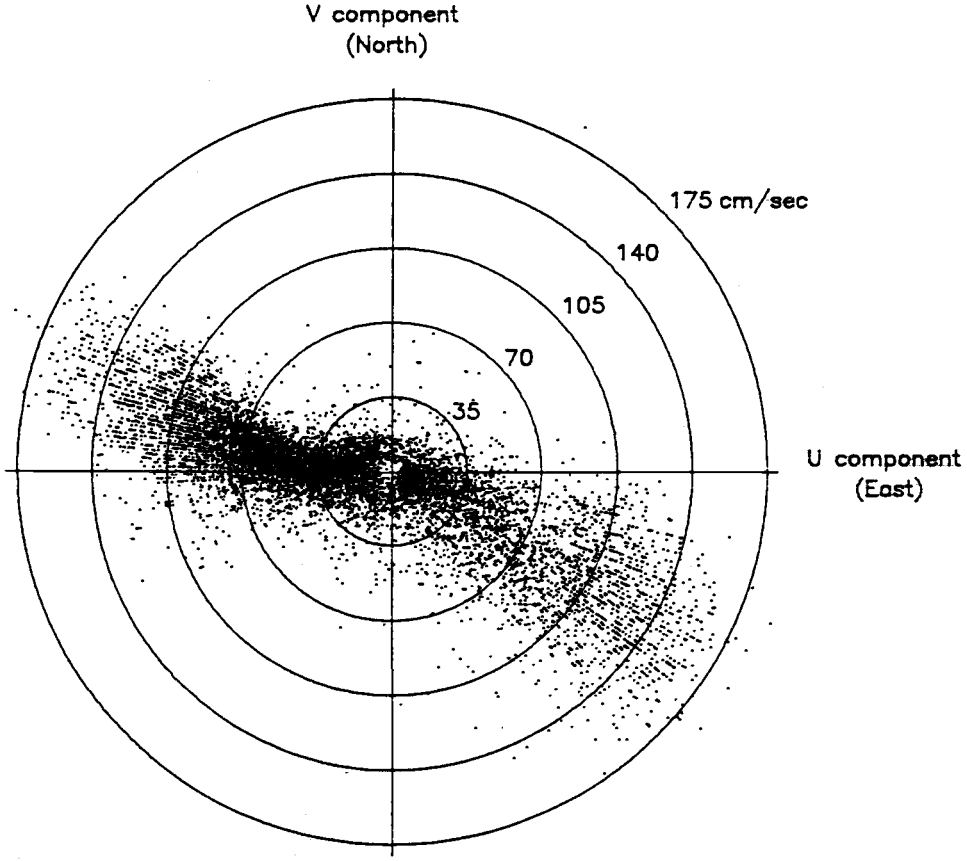
143 M AT GIBRALTAR C-1. 22 OCT 85 - 9 MAY 86. TAPE 5646/25.



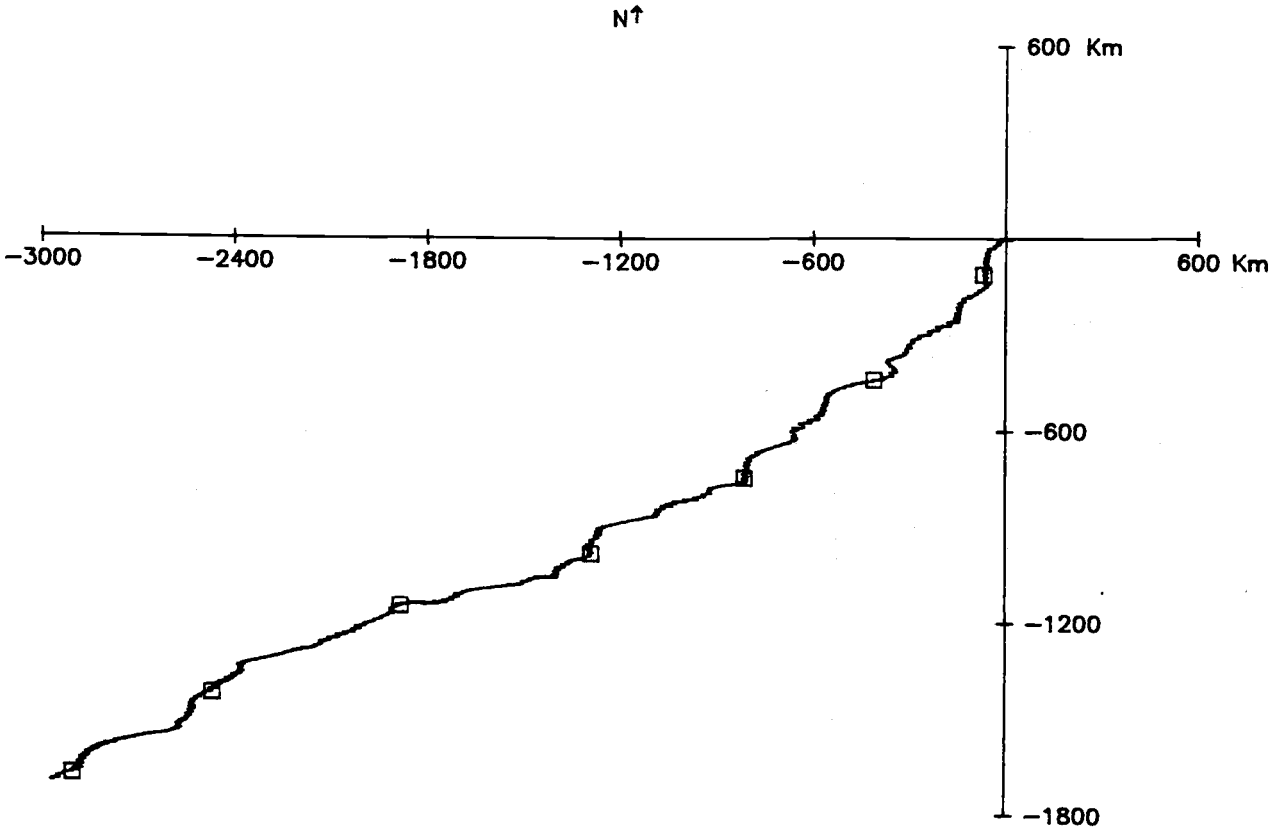


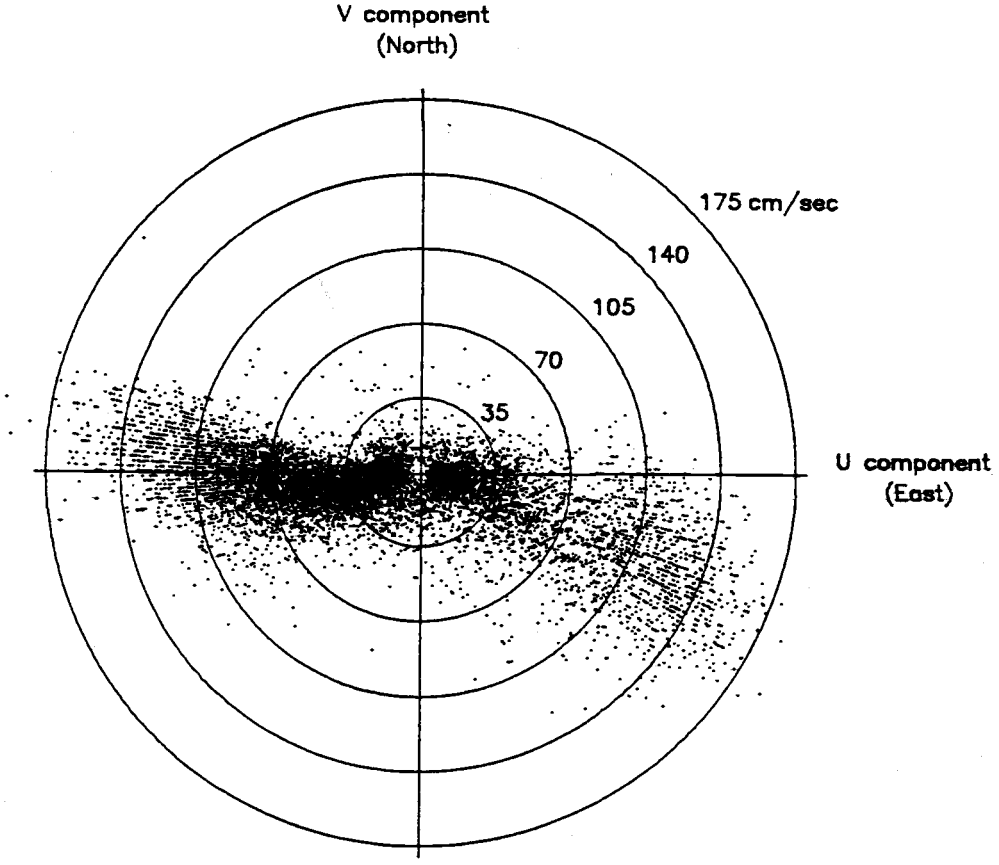
156 M AT GIBRALTAR C–1. 22 OCT 85 – 4 MAY 86. TAPE 1968/44.



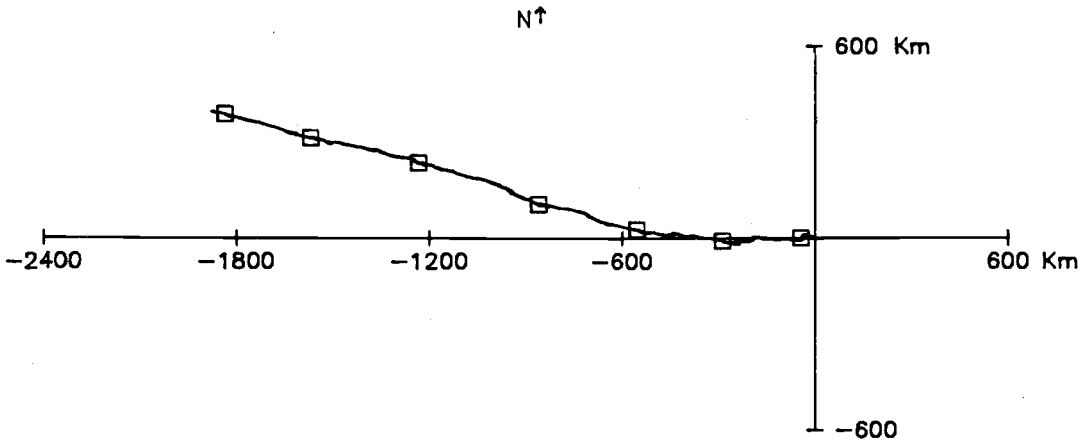


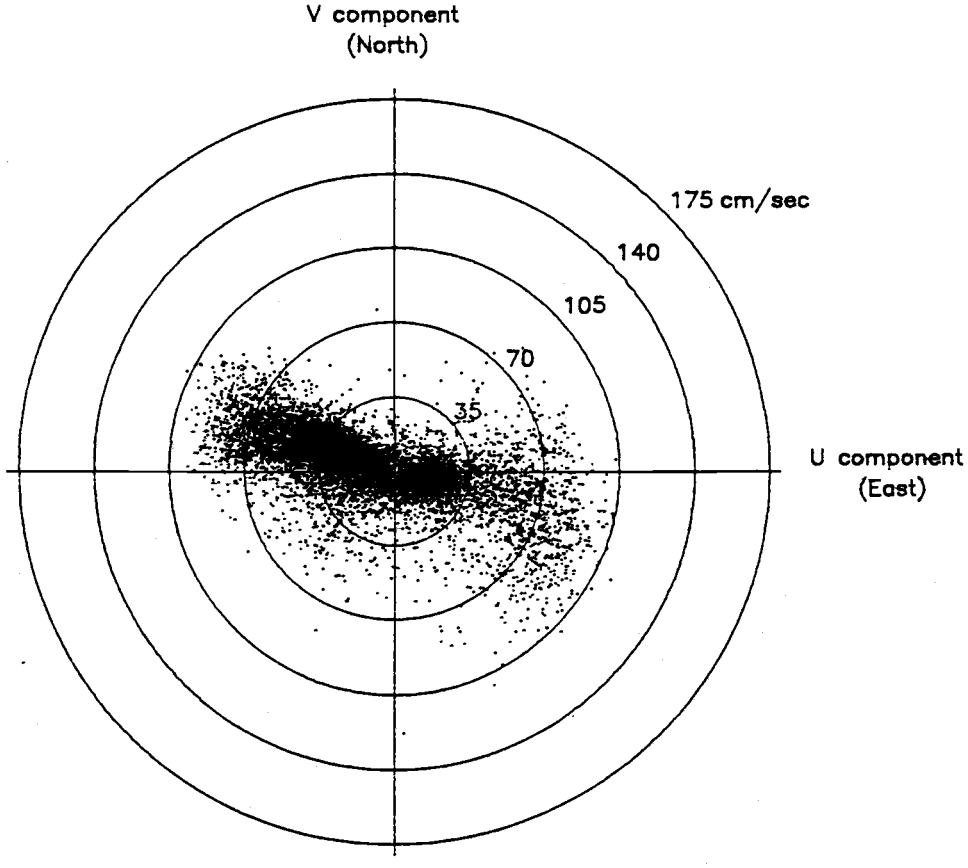
167 M AT GIBRALTAR C-1. 22 OCT 85 - 4 MAY 86. TAPE 5647/27.



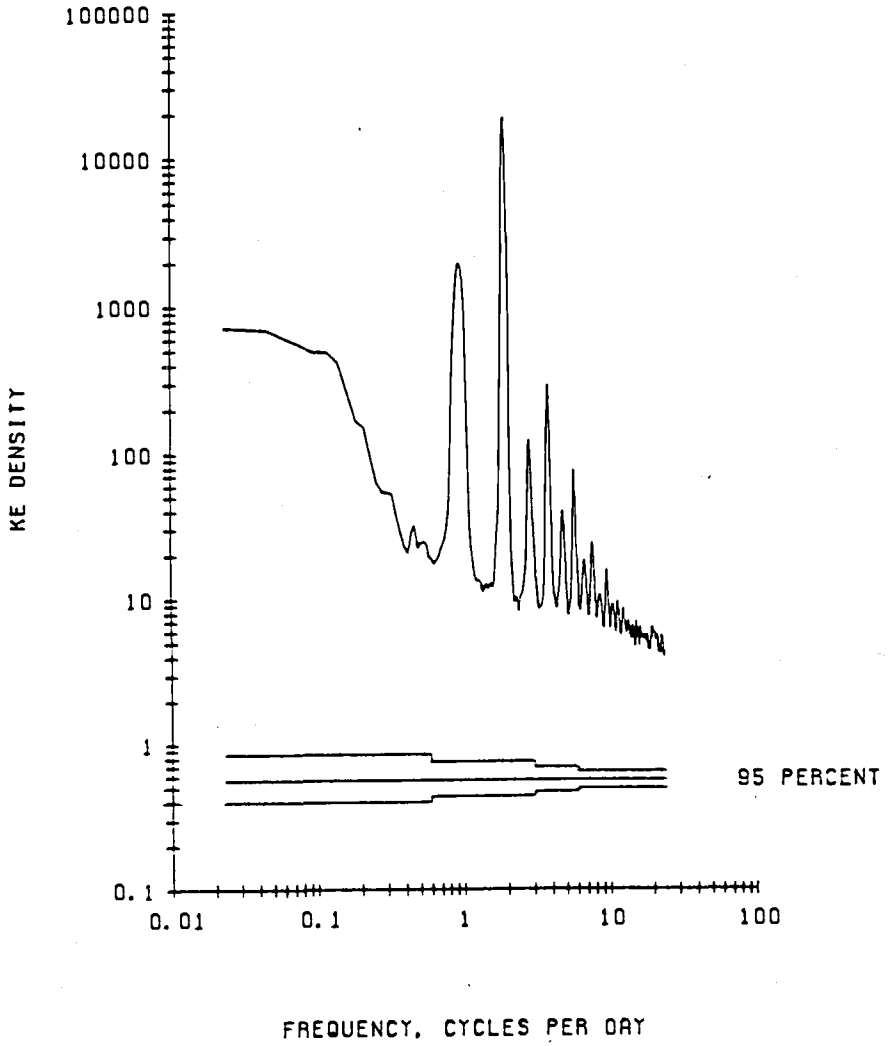


215 M AT GIBRALTAR C-1. 22 OCT 85 - 4 MAY 86. TAPE 5649/19.

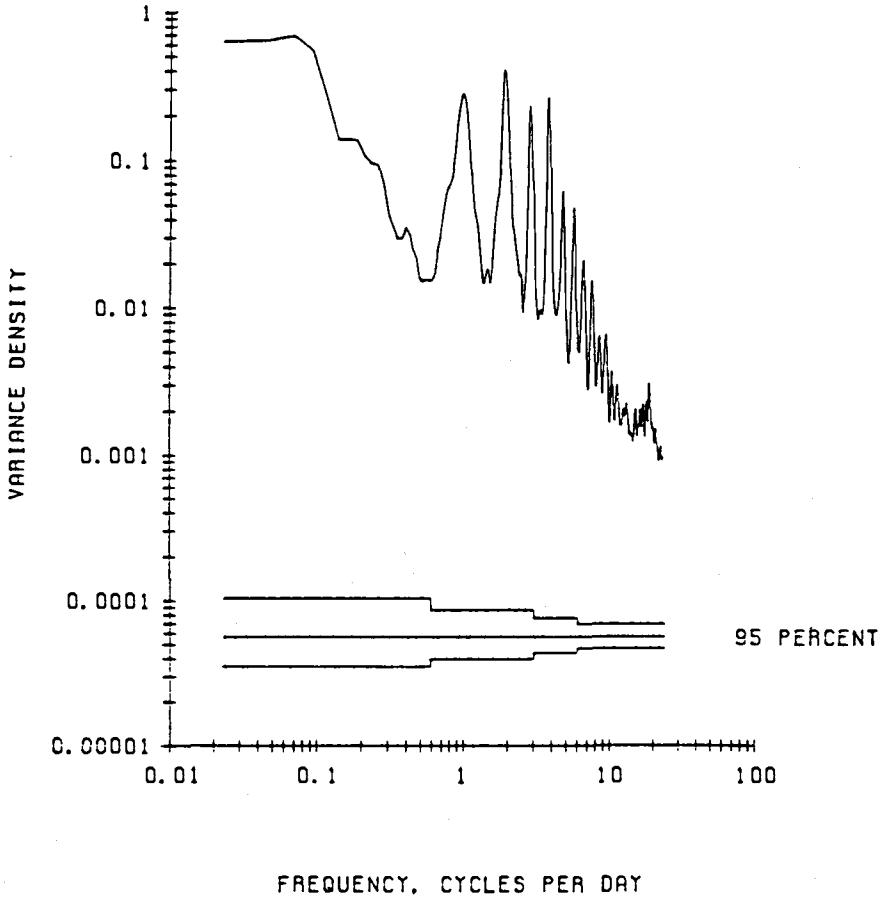




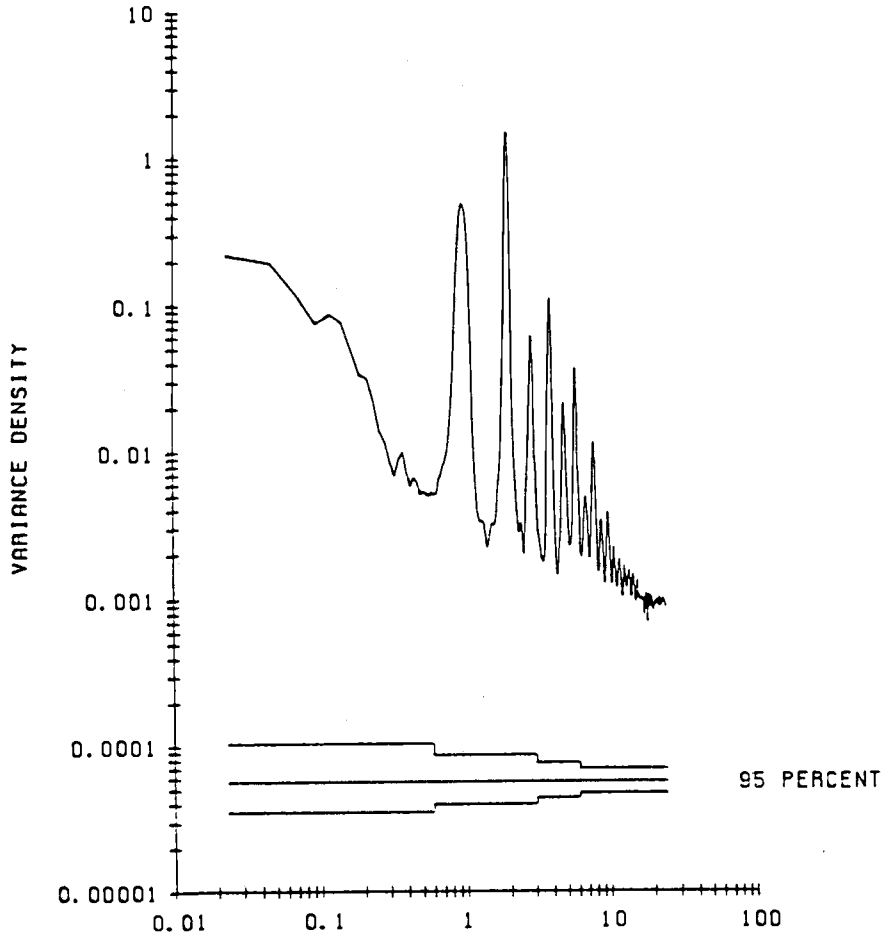
UNFILTERED CURRENT 143 M AT GIBRALTAR C-1.



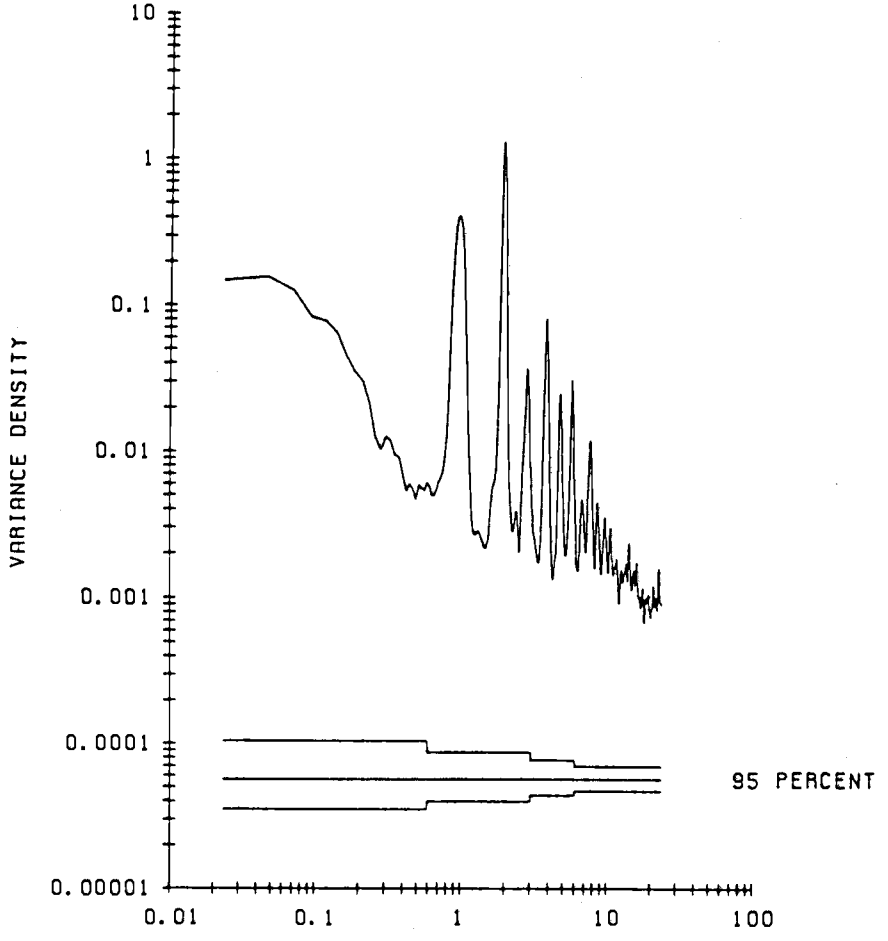
UNFILTERED PRESSURE 143 M AT GIBRALTAR C-1.



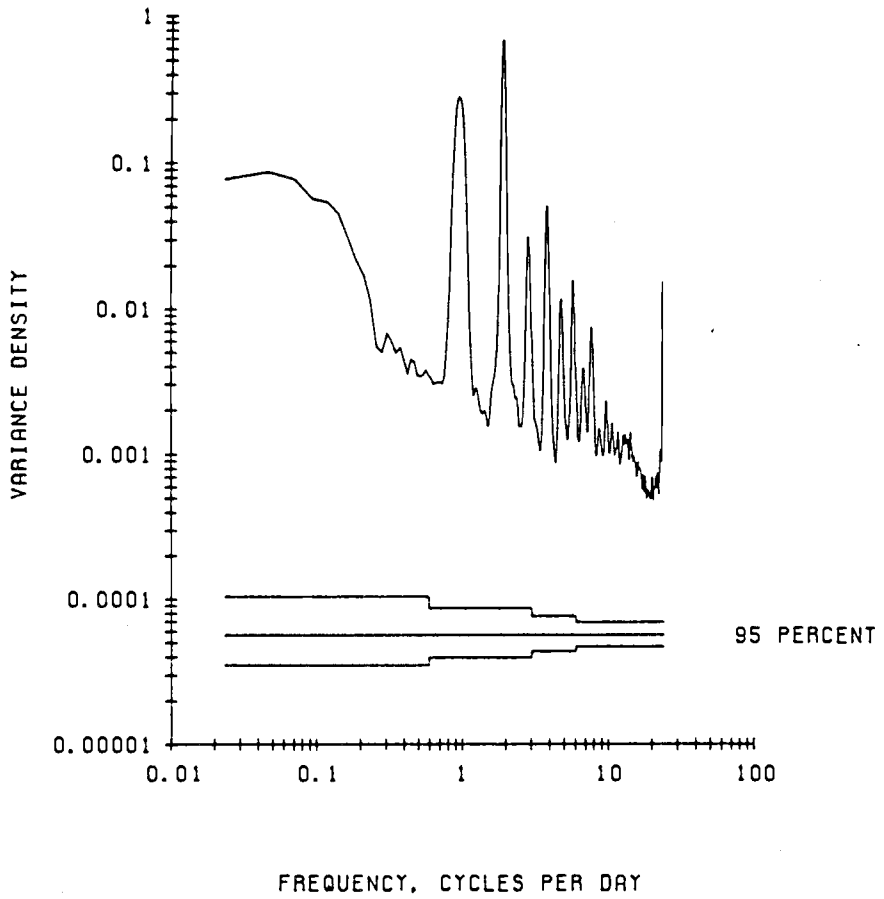
UNFILTERED SALINITY 143 M AT GIBRALTAR C-1.



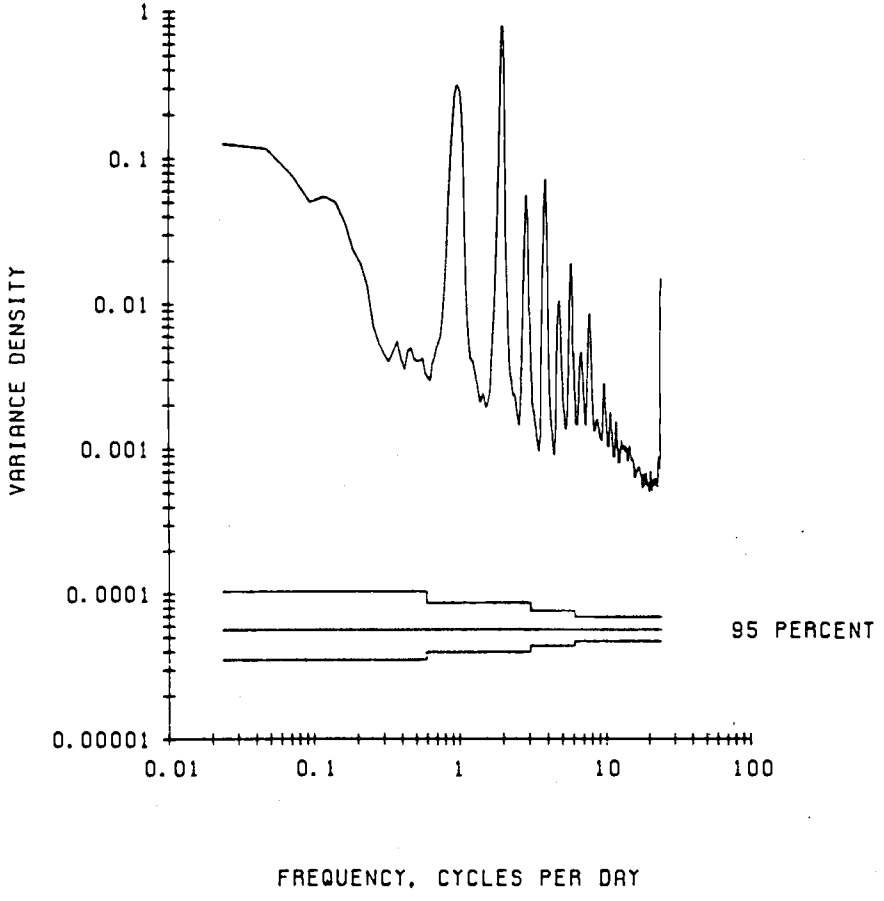
UNFILTERED TEMPERATURE 143 M AT GIBRALTAR C-1.



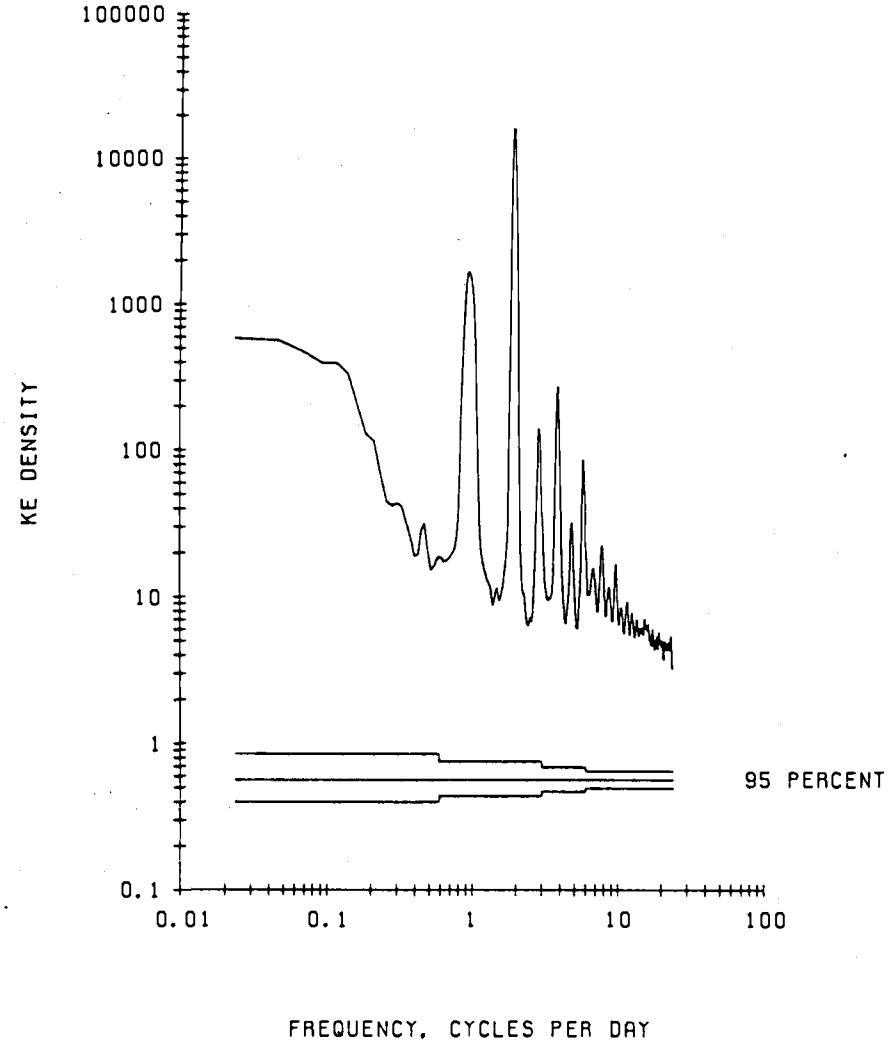
UNFILTERED TEMPERATURE 156 M AT GIBRALTAR C-1.



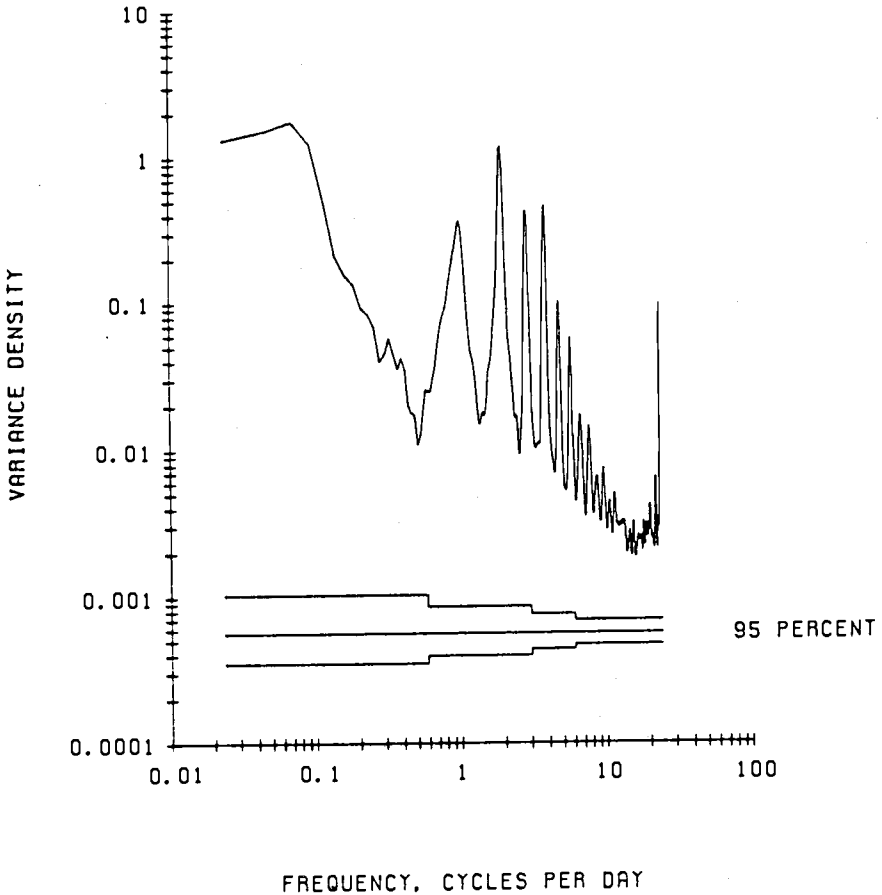
UNFILTERED SALINITY 156 M AT GIBRALTAR C-1.



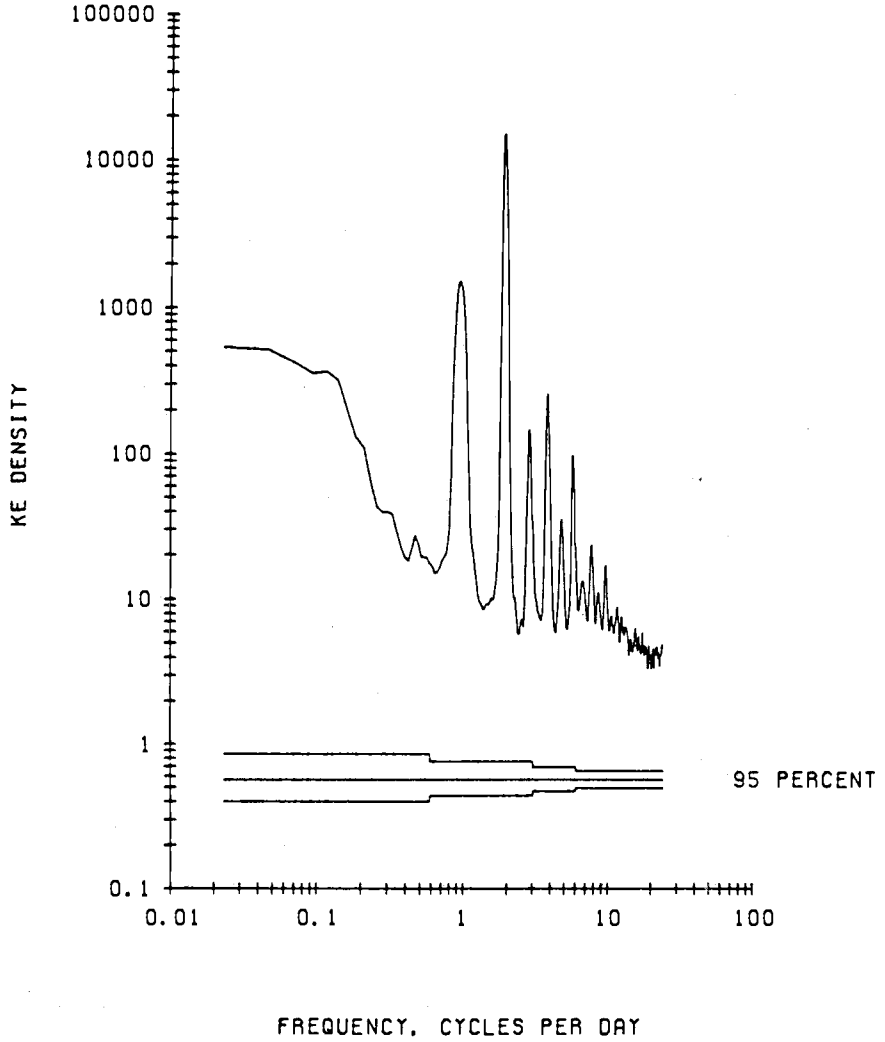
UNFILTERED CURRENT 156 M AT GIBRALTAR C-1.



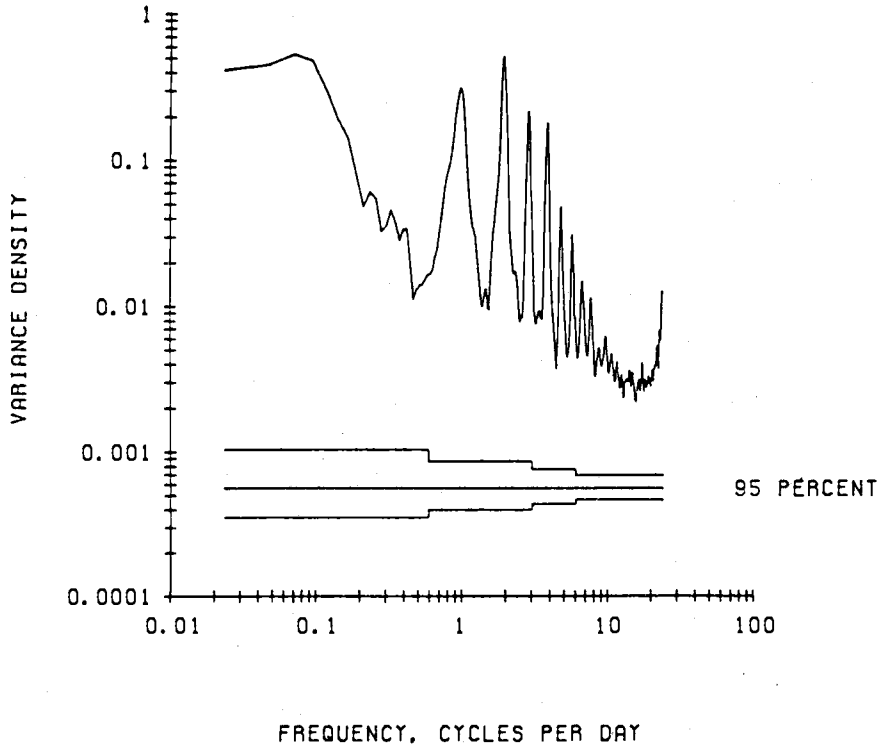
UNFILTERED PRESSURE 156 M AT GIBRALTAR C-1.



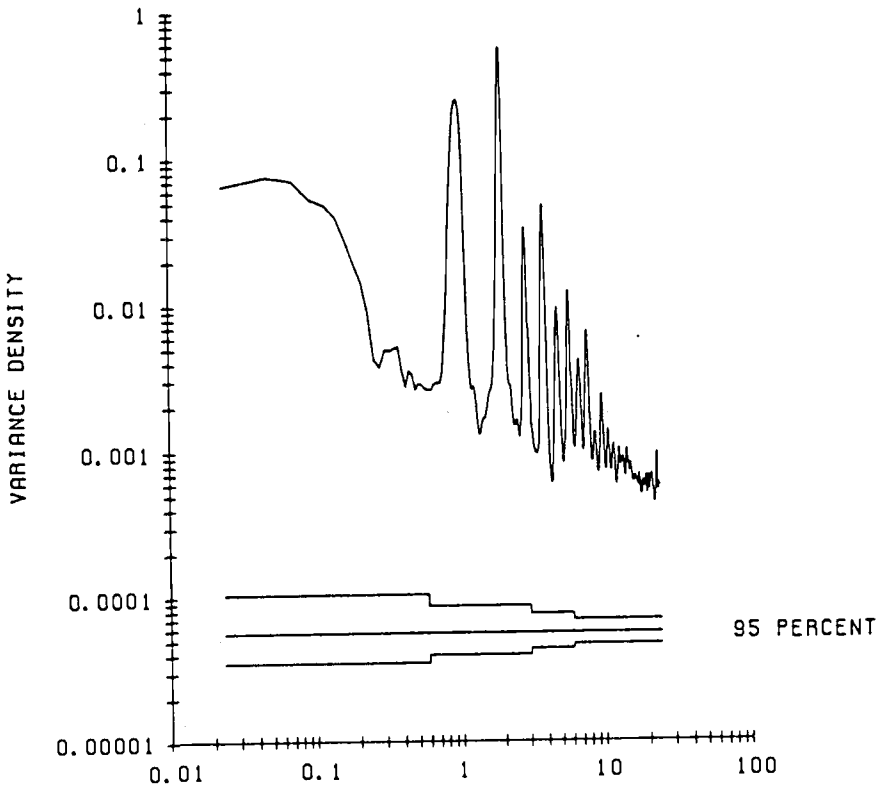
UNFILTERED CURRENT 167 M AT GIBRALTAR C-1.



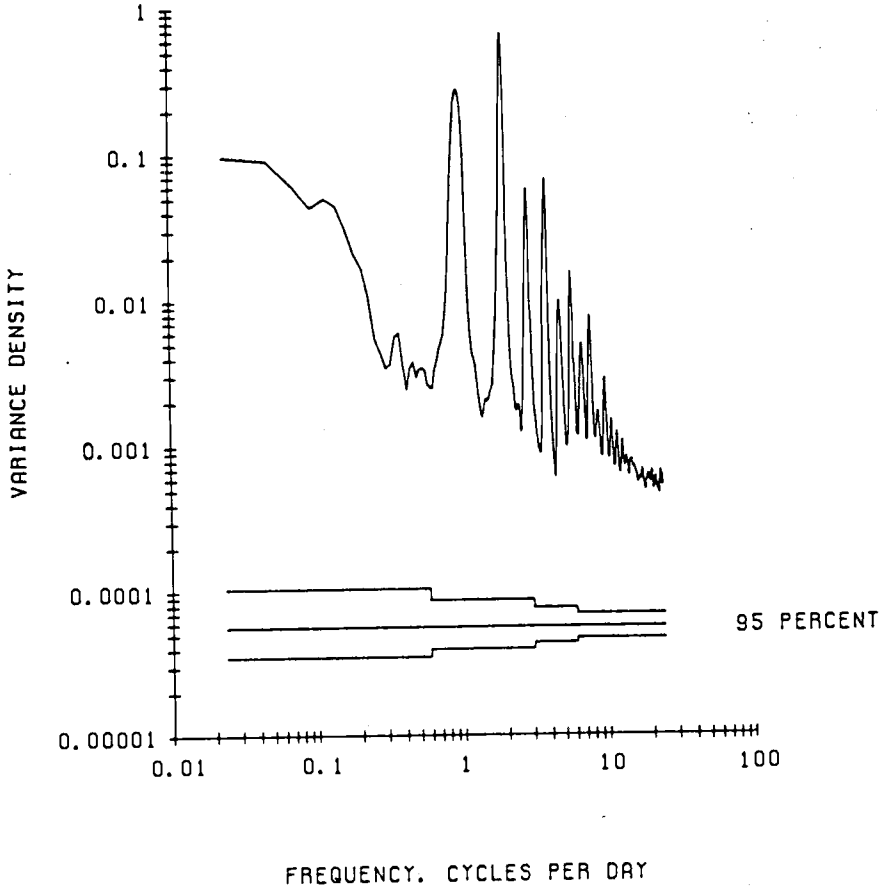
UNFILTERED PRESSURE 167 M AT GIBRALTAR C-1.



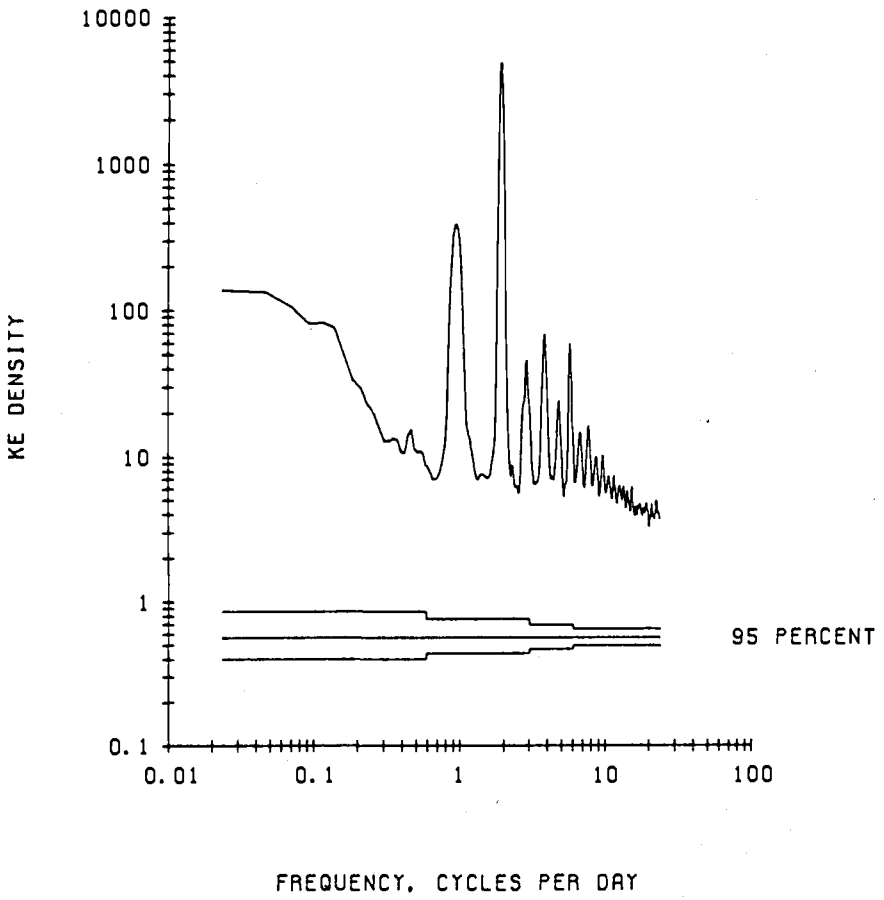
UNFILTERED TEMPERATURE 167 M AT GIBRALTAR C-1.



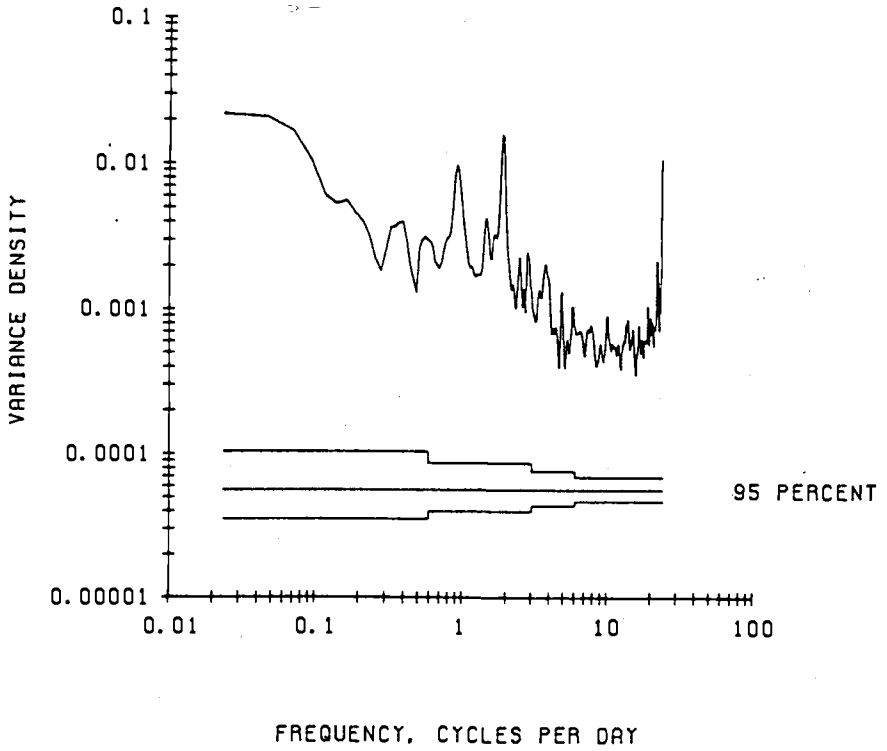
UNFILTERED SALINITY 167 M AT GIBRALTAR C-1.



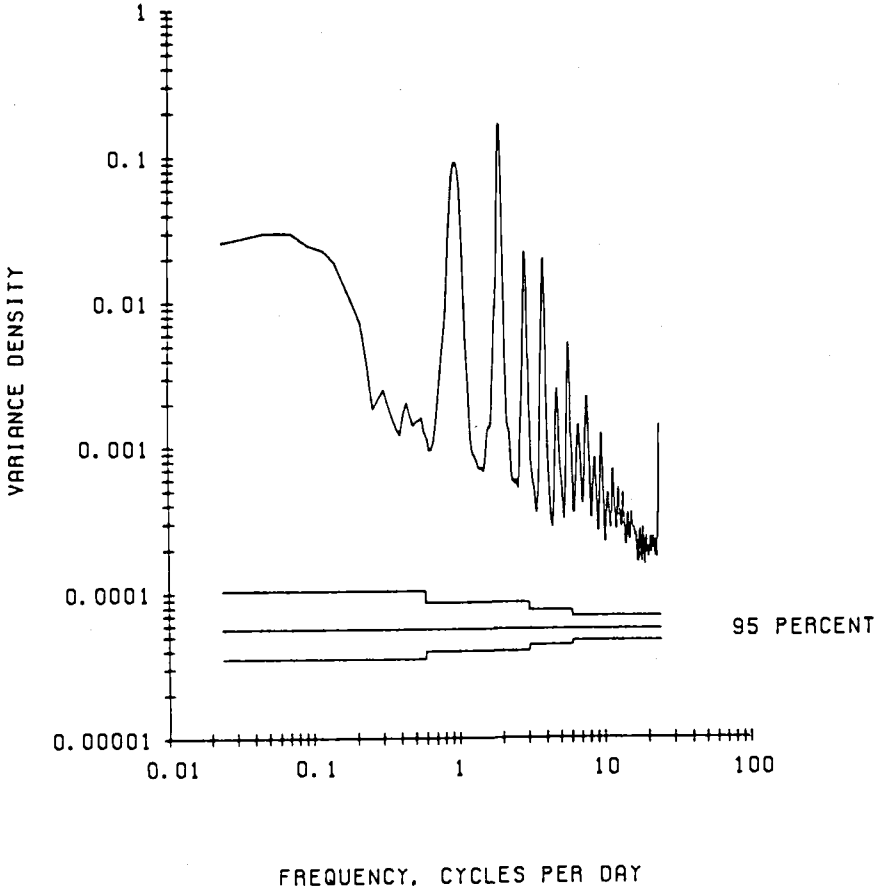
UNFILTERED CURRENT 215 M AT GIBRALTAR C-1.



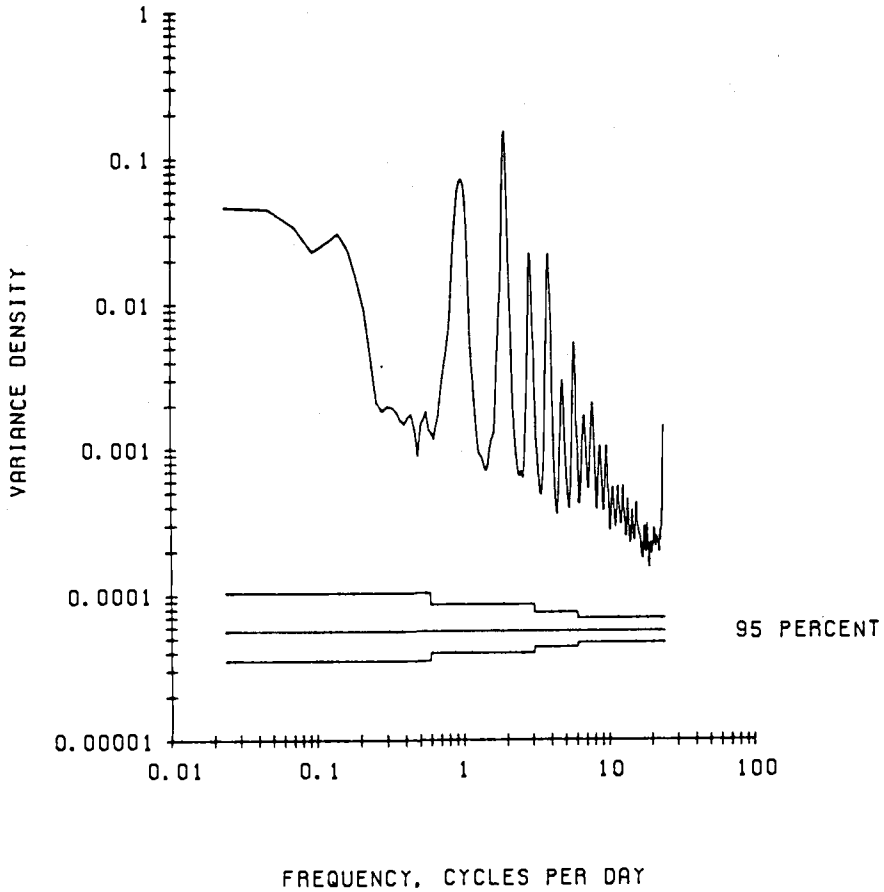
UNFILTERED PRESSURE 215 M AT GIBRALTAR C-1.

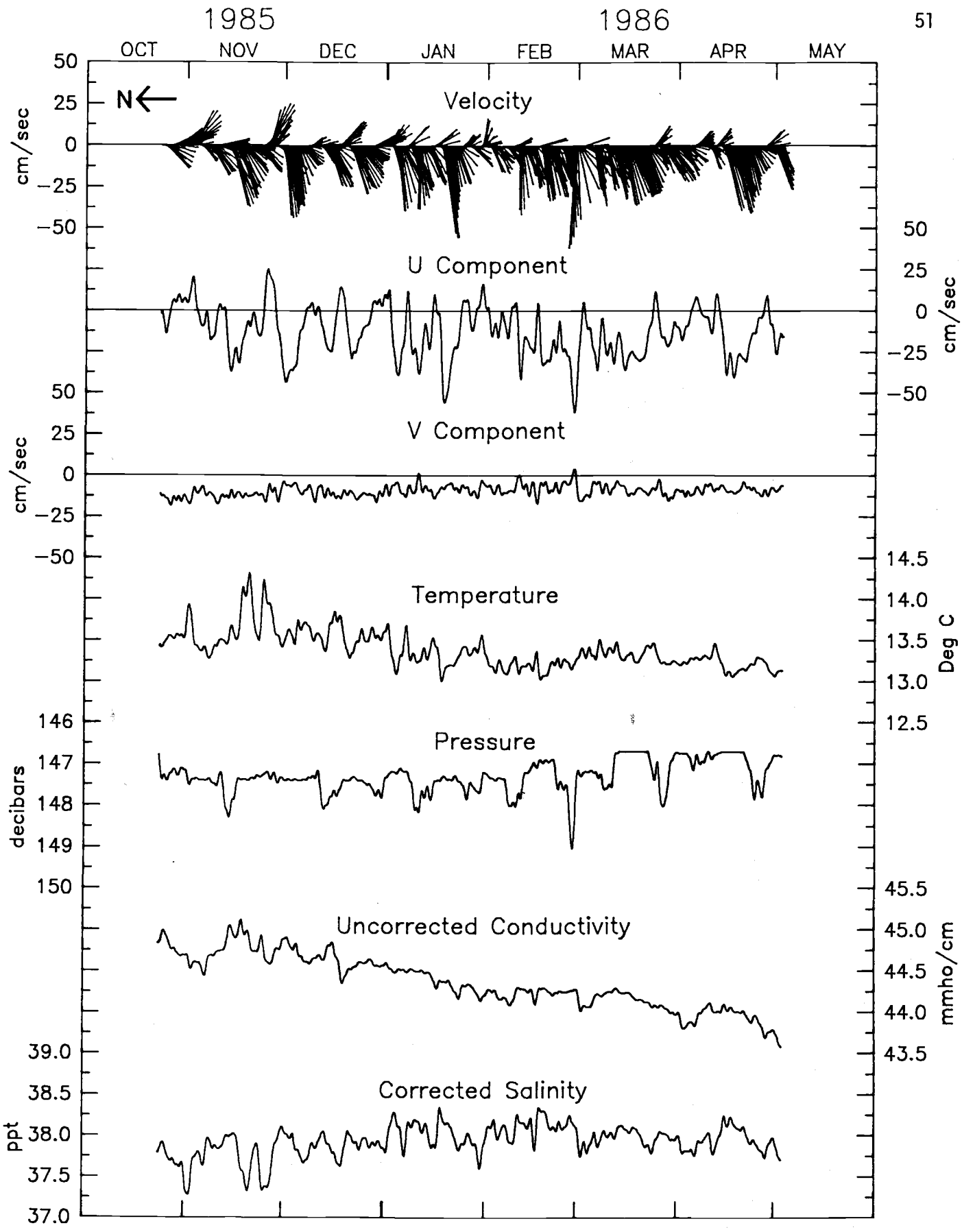


UNFILTERED TEMPERATURE 215 M AT GIBRALTAR C-1.

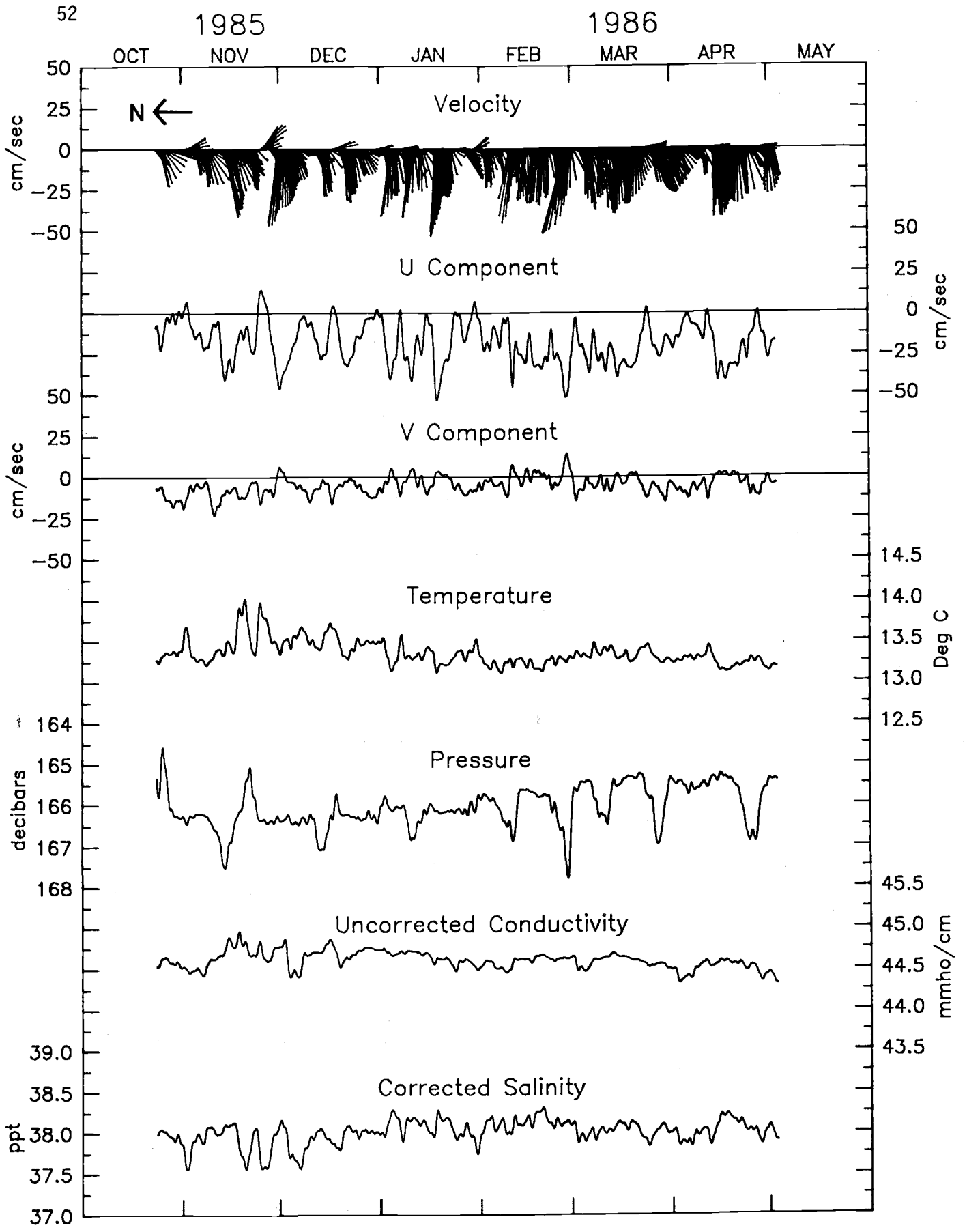


UNFILTERED SALINITY 215 M AT GIBRALTAR C-1.

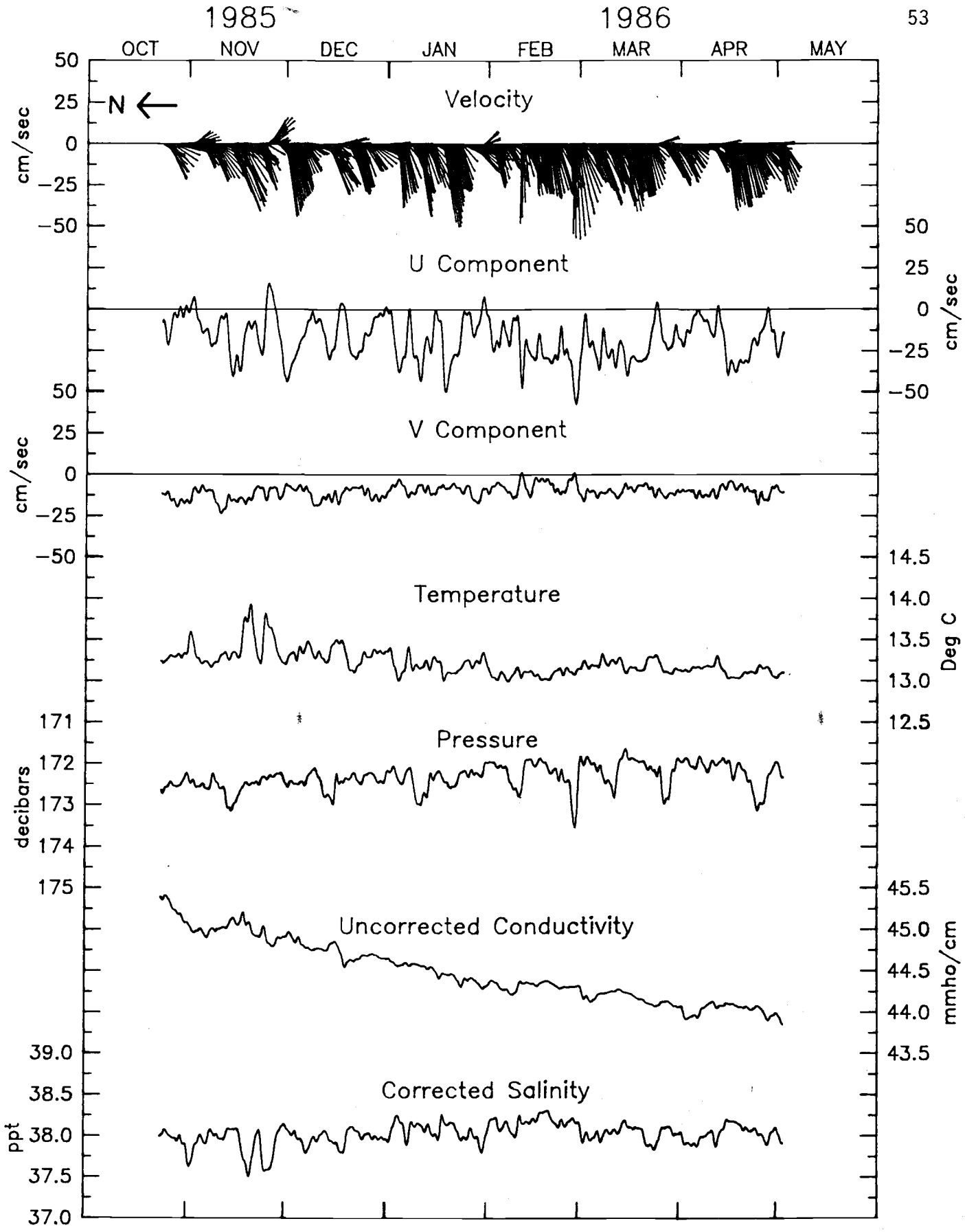




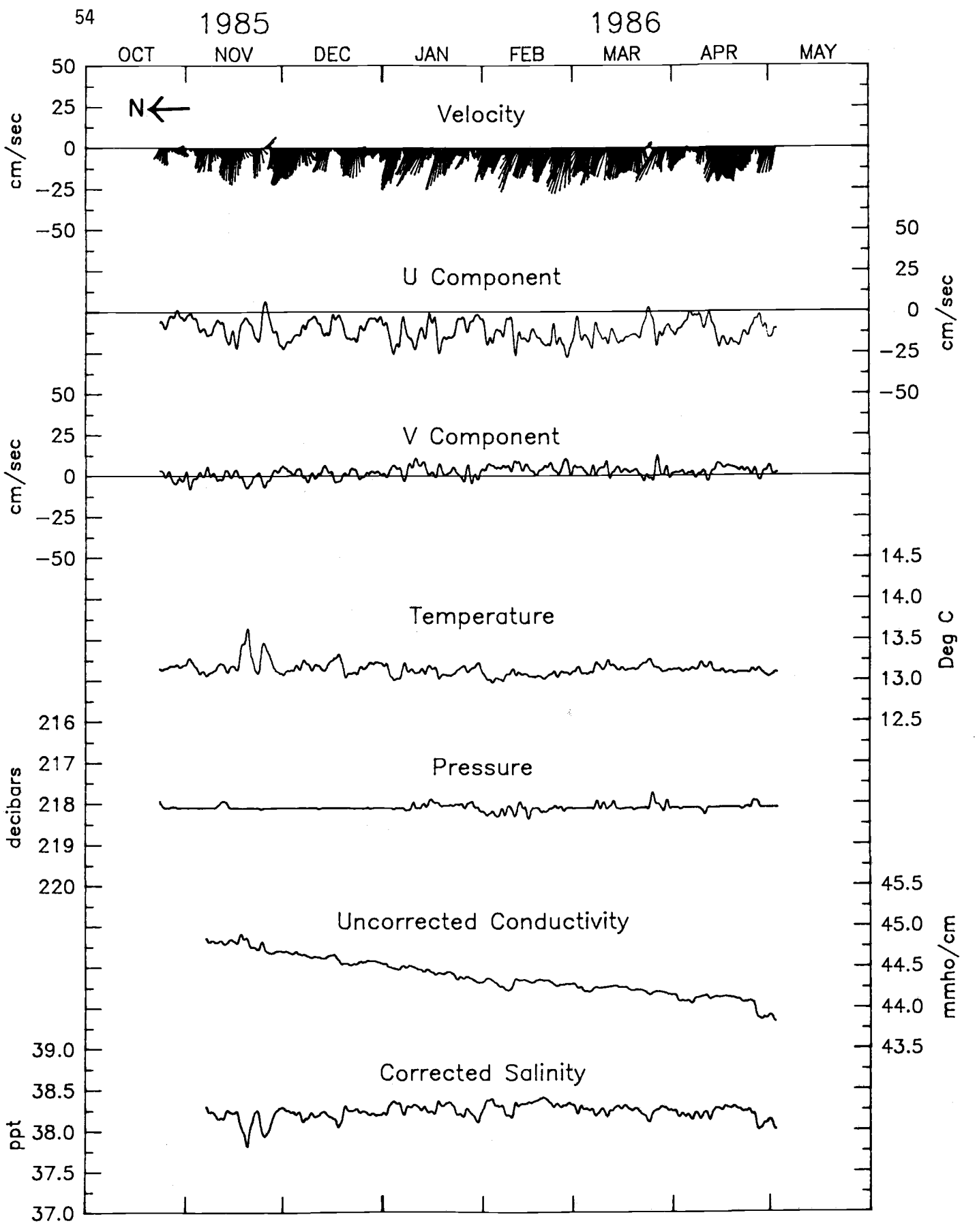
143 m at Gibraltar C−1.



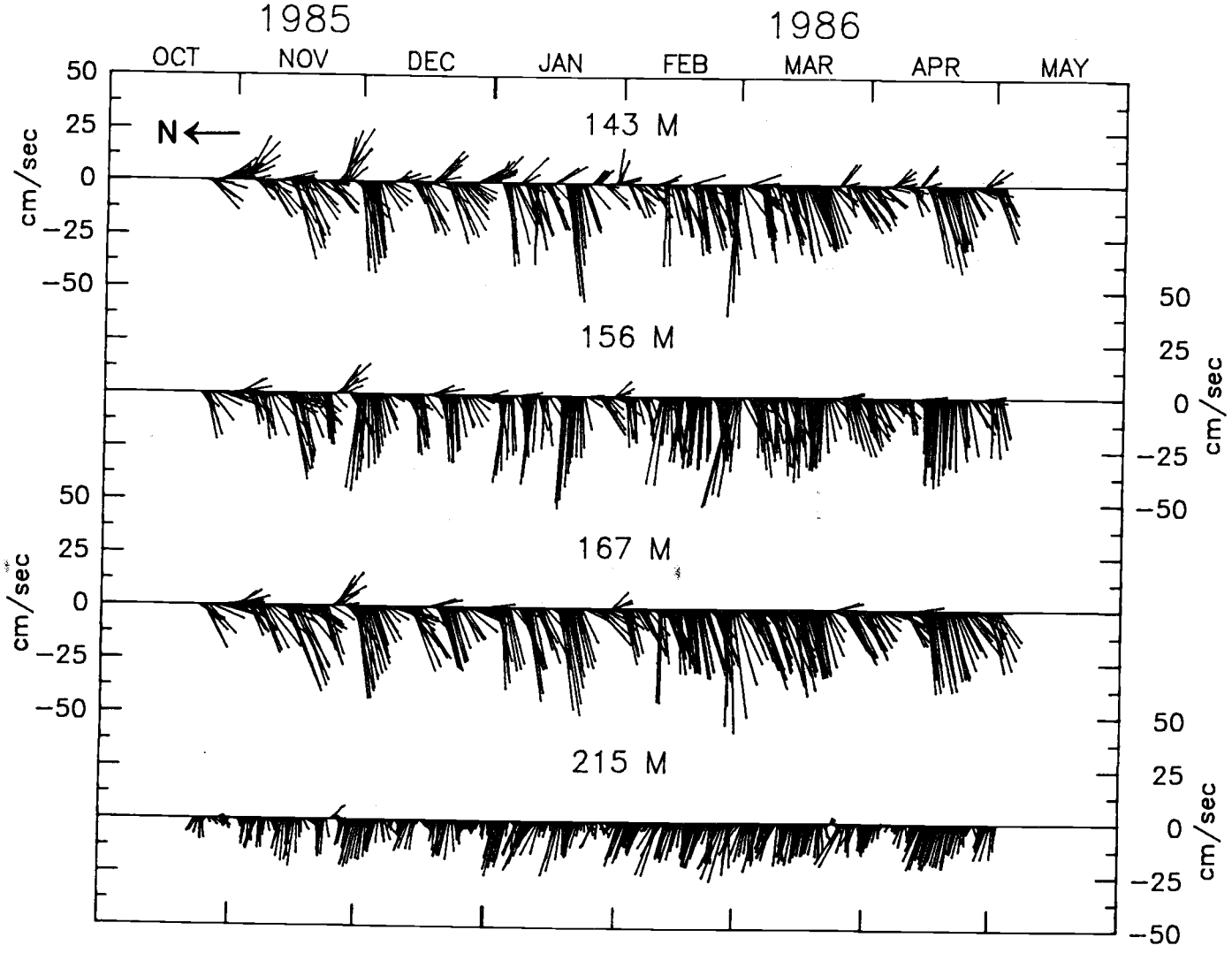
156 m at Gibraltar C−1.



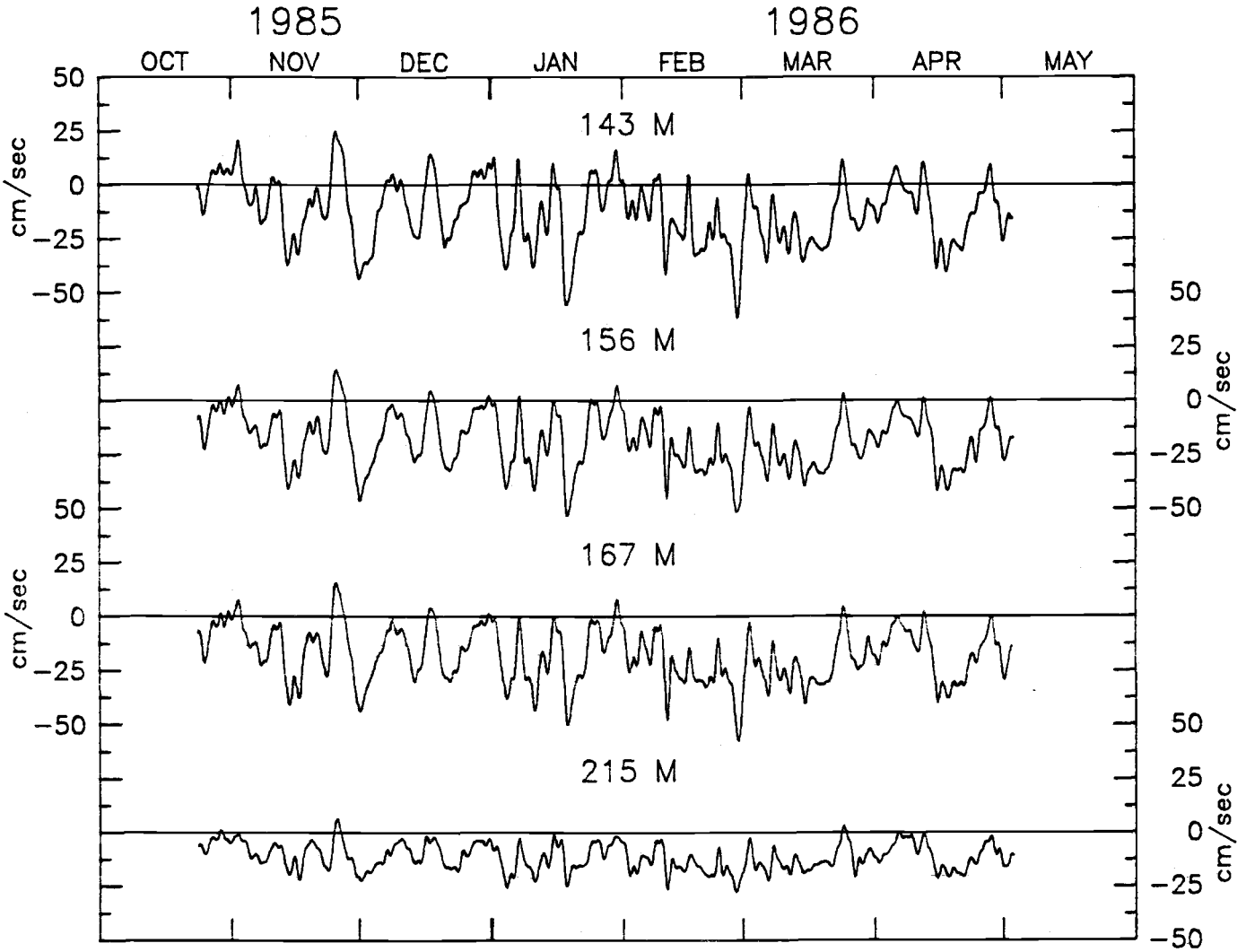
167 m at Gibraltar C−1.



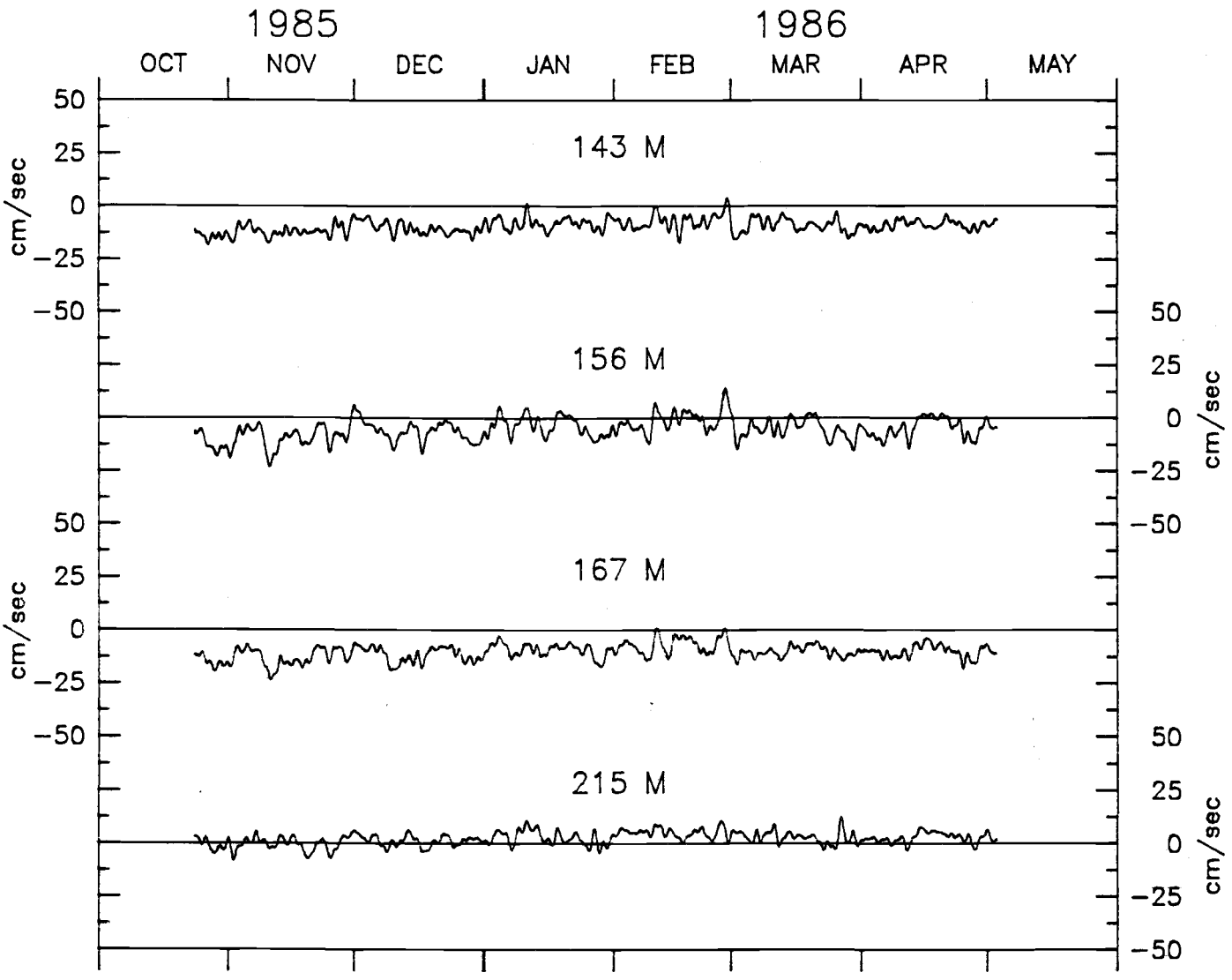
215 m at Gibraltar C−1.



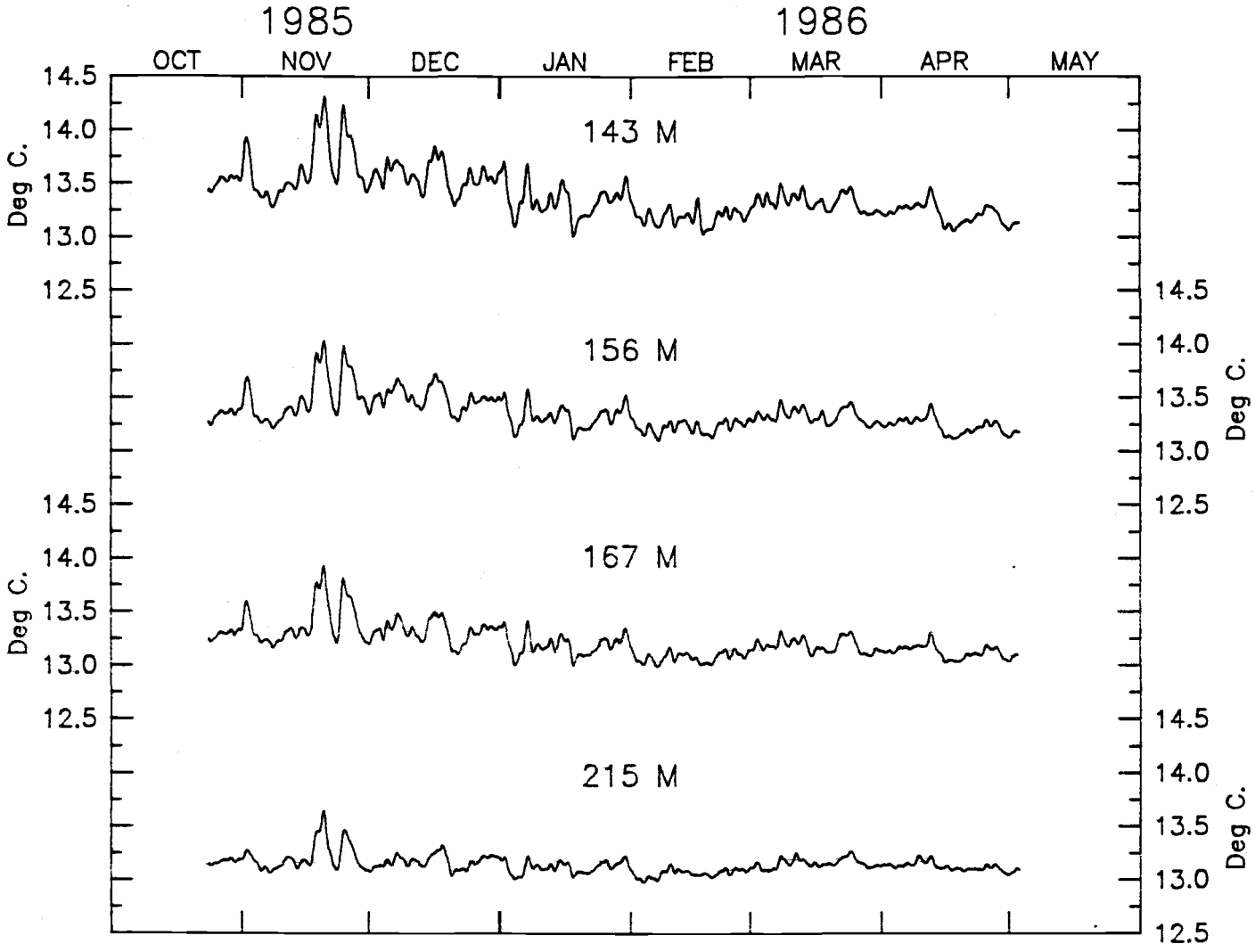
Velocity at Gibraltar Mooring C−1.



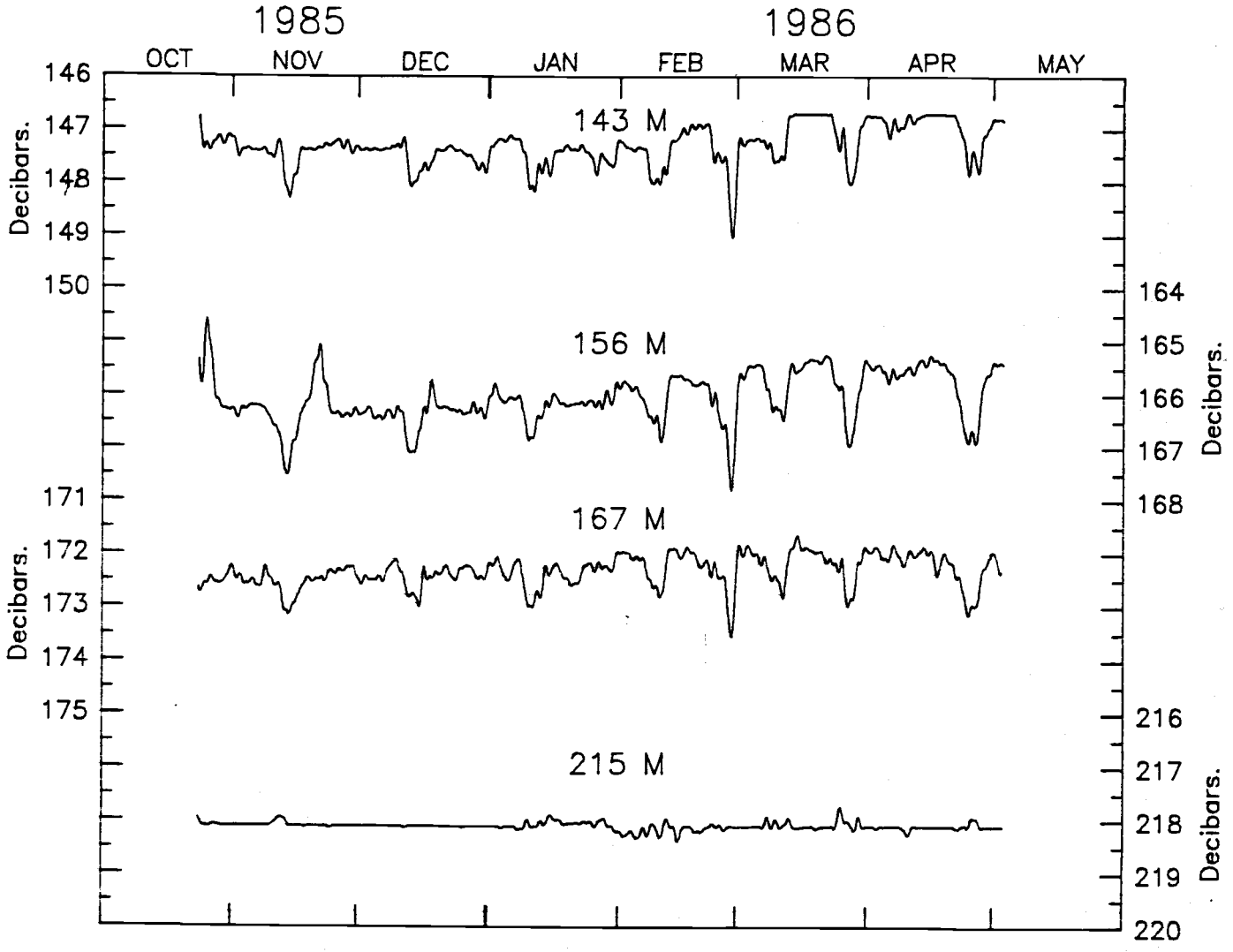
U Component at Gibraltar Mooring C—1.



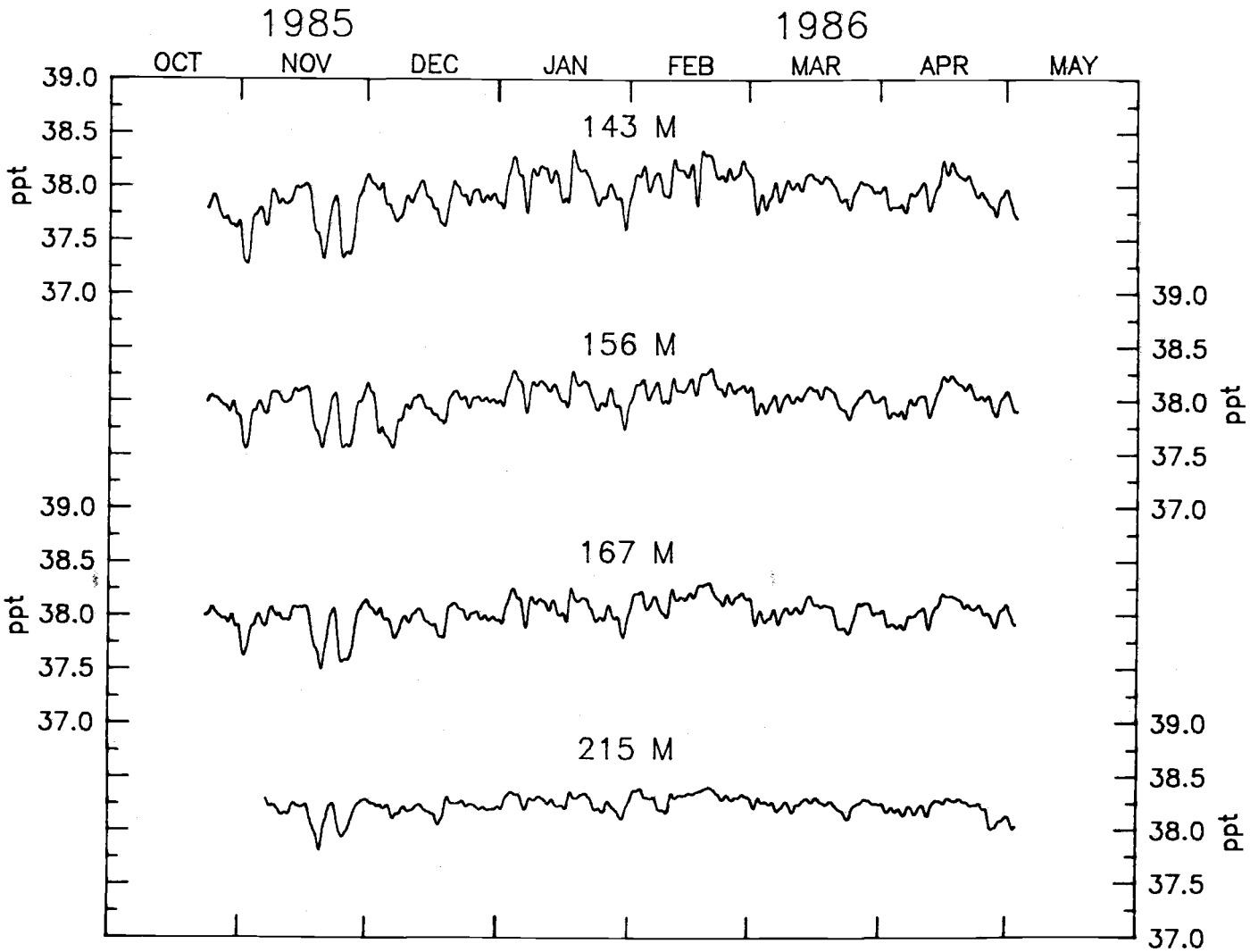
V Component at Gibraltar Mooring C−1.



Temperature at Gibraltar Mooring C–1.

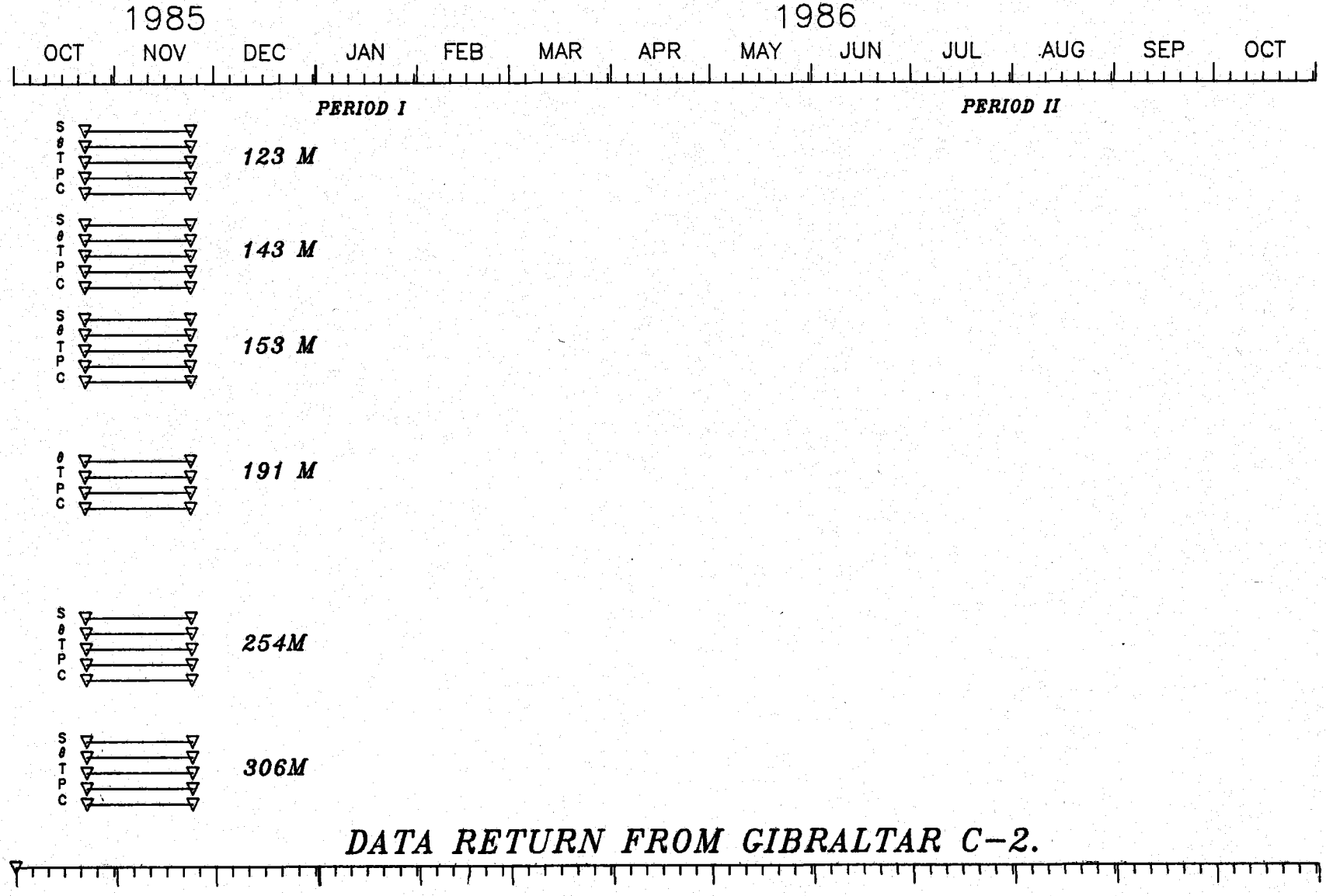


Pressure at Gibraltar Mooring C–1.



Corrected Salinity at Gibraltar C–1.

Mooring C - 2



DATA RETURN FROM GIBRALTAR C–2.

STATISTICS HALF-HOURLY UNFILTERED DATA
MOORING GIBRALTAR C-2 PERIOD I 35°54.79'N, 5°44.41'W
22 OCT 85 - 23 NOV 85 Bottom depth: 321 m

		MEAN	SD	MIN	MAX	LENGTH	COMMENTS
6590/16	s	90.15	50.45	7.90	246.90	1533	
123 m	u	-3.35	98.89	-242.40	177.00	1533	
	v	-9.27	28.22	-121.00	78.40	1533	
	T	14.29	0.92	12.85	16.77	1533	
	P	127.21	3.32	124.00	152.50	1533	
	C	44.60	0.59	42.83	47.19	1533	
	S	36.94	0.92	35.57	38.46	1533	
751/61	s	85.10	41.87	5.50	191.50	1532	
143 m	u	-14.06	89.49	-185.80	147.10	1532	
	v	-8.19	26.86	-101.70	103.30	1532	
	T	13.94	0.82	12.85	16.38	1532	
	P	148.61	3.57	144.30	189.20	1532	
	C	44.34	0.55	42.47	46.36	1532	
	S	37.18	0.94	35.42	38.48	1532	
6593/14	s	92.76	49.20	8.50	252.10	1532	
153 m	u	-22.69	96.29	-247.50	172.80	1532	
	v	-14.76	31.97	-112.00	66.30	1532	
	T	13.83	0.77	12.88	16.14	1532	
	P	157.94	3.56	154.60	197.90	1532	
	C	44.51	0.54	42.51	46.34	1532	
	S	37.33	0.93	35.54	38.41	1532	

		MEAN	SD	MIN	MAX	LENGTH	
5886/19	T	13.34	0.59	12.83	15.86	1532	No speed record. The rotor evidentally
191 m	P	196.23	3.41	192.30	216.10	1532	fell off during installation
	C	44.69	0.39	43.01	46.06	1532	
	S	37.86	0.76	35.75	38.41	1532	
5648/27	s	81.10	38.53	8.50	192.30	1532	
254 m	u	-46.35	60.85	-185.60	128.60	1532	
	v	-27.98	37.77	-129.50	63.80	1532	
	T	13.03	0.24	12.86	14.87	1532	
	P	260.55	2.10	256.00	273.80	1532	
	C	44.99	0.12	43.71	45.73	1532	
	S	38.26	0.23	36.33	38.43	1532	
1241/37	s	62.57	27.89	4.50	150.10	1533	
306 m	u	-26.63	41.65	-134.90	92.50	1533	
	v	-28.67	37.77	-108.10	79.00	1533	
	T	12.96	0.09	12.88	13.92	1533	
	P	312.36	0.57	308.90	314.80	1533	
	C	44.68	0.04	44.49	45.05	1533	
	S	38.35	0.08	37.58	38.41	1533	

Mooring found on beach near Al Mediq Morocco in December 1985, cable corroded just above deepest instrument. According to our records the deepest meter stopped functioning at the same time. The lower portion of the mooring was recovered 20 Feb 86.

(speed, u, and v are given in cm/sec; Temperature in °C; Pressure in decibars; Conductivity in mmho/cm; and Corrected Salinity in ppt. The sampling rate is 30 min.)

STATISTICS
MOORING GIBRALTAR C-2 PERIOD I
24 OCT 85 - 22 NOV 85

6-HOURLY LLP FILTERED DATA
35°54.79'N, 5°44.41'W
Bottom depth: 321 m

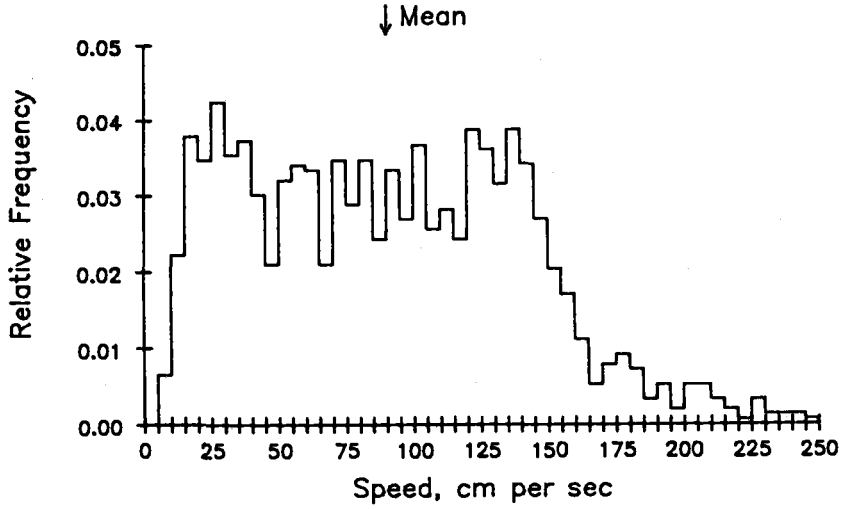
		MEAN	SD	MIN	MAX	LENGTH	COMMENTS
6590/16	u	-3.76	23.35	-54.97	40.45	117	
123 m	v	-9.43	6.17	-19.33	3.75	117	
	T	14.30	0.41	13.71	15.28	117	
	P	127.37	1.79	125.45	131.84	117	
	C	44.63	0.37	44.02	45.34	117	
	S	36.96	0.45	36.28	37.74	117	
751/61	u	-14.10	17.57	-53.47	22.76	117	
143 m	v	-8.36	2.98	-15.11	-1.53	117	
	T	13.95	0.35	13.51	14.85	117	
	P	148.77	1.81	146.50	153.06	117	
	C	44.35	0.29	43.85	44.91	117	
	S	37.19	0.40	36.54	37.87	117	
6593/14	u	-22.54	18.67	-63.29	20.42	117	
153 m	v	-14.89	3.96	-22.96	-8.47	117	
	T	13.84	0.31	13.42	14.68	117	
	P	158.09	1.65	155.82	162.01	117	
	C	44.52	0.28	44.06	45.04	117	
	S	37.34	0.36	36.64	37.96	117	

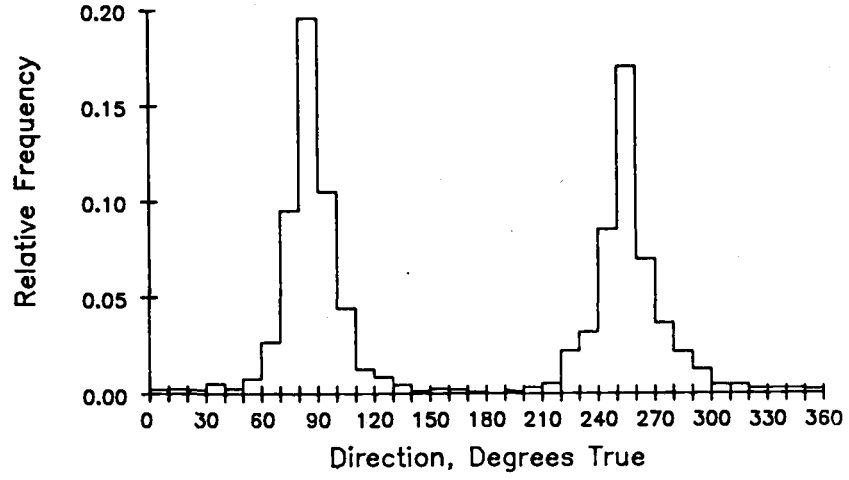
		MEAN	SD	MIN	MAX	LENGTH	COMMENTS
5886/19	T	13.35	0.14	13.13	13.71	117	No speed record. The rotor apparently fell
191 m	P	196.35	1.87	194.04	200.48	117	off during installation.
	C	44.69	0.11	44.47	44.94	117	
	S	37.85	0.18	37.45	38.15	117	
5648/27	u	-45.79	8.31	-62.74	-31.66	117	
254 m	v	-27.28	5.64	-38.05	-15.54	117	
	T	13.04	0.06	12.95	13.22	117	
	P	260.69	0.93	259.43	262.93	117	
	C	44.99	0.06	44.89	45.12	117	
	S	38.26	0.06	38.10	38.35	117	
1241/37	u	-26.21	7.11	-41.06	-14.42	117	
306 m	v	-27.98	6.13	-41.10	-17.30	117	
	T	12.96	0.03	12.92	13.07	117	
	P	312.40	0.16	311.98	312.63	117	
	C	44.68	0.02	44.64	44.72	117	
	S	38.35	0.02	38.30	38.37	117	

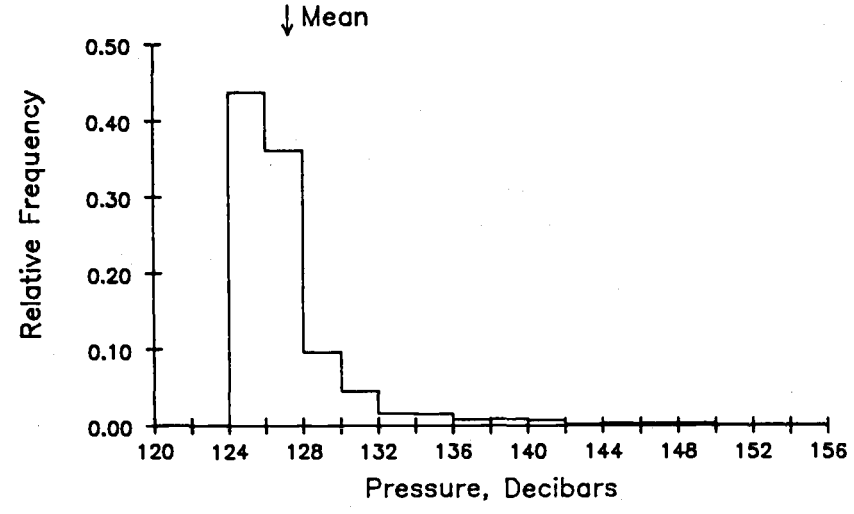
Mooring found on beach near Al Mediq Morocco in December 1985, cable corroded just above deepest instrument. According to our records the deepest meter stopped functioning at the same time. The lower portion of the mooring was recovered 20 Feb 86.

(speed, u, and v are given in cm/sec; Temperature in °C; Pressure in decibars; Condin mmho/cm; and Corrected Salinity in ppt. The sampling rate is 360 min.)

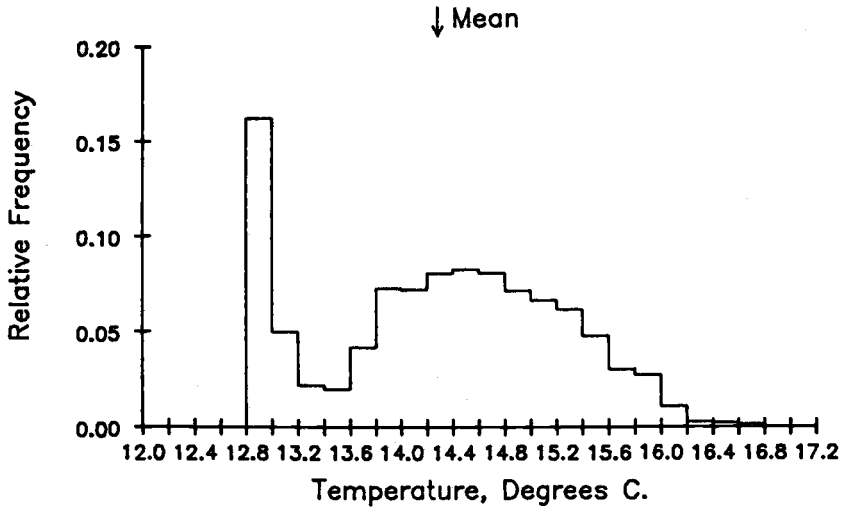
123 M AT GIBRALTAR C-2. 22 OCT 85 - 23 NOV 86. TAPE 6590/16.

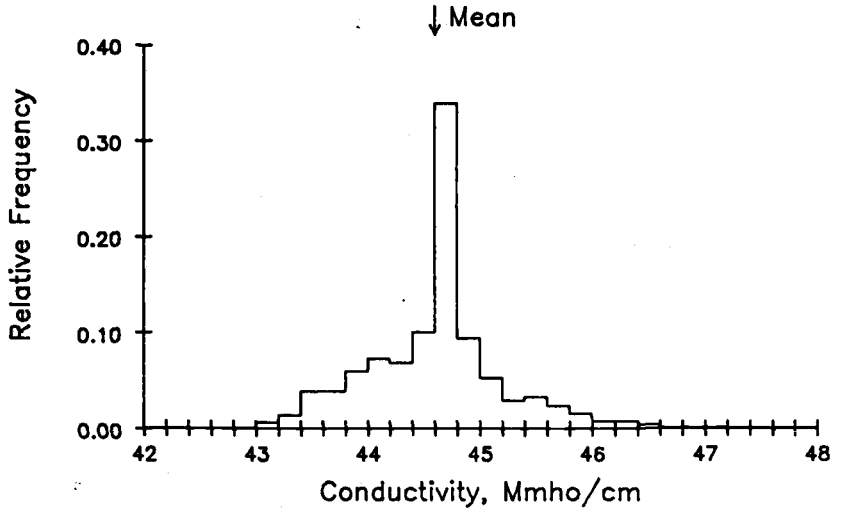


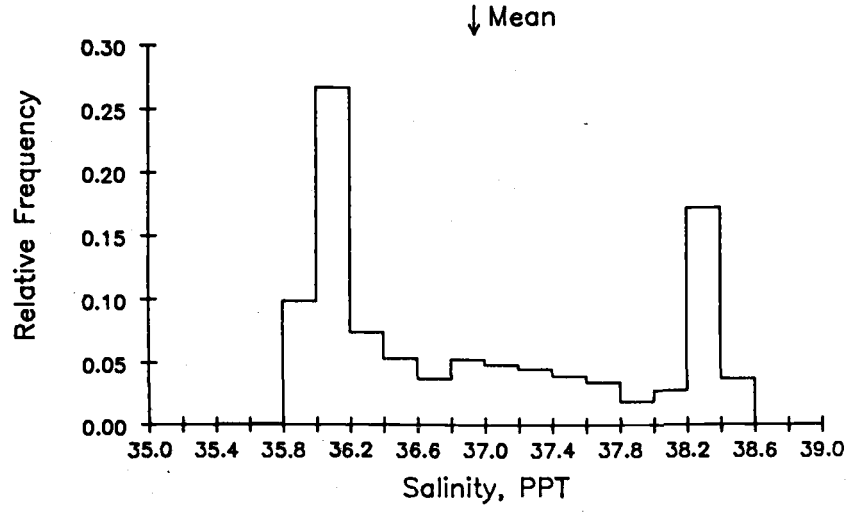




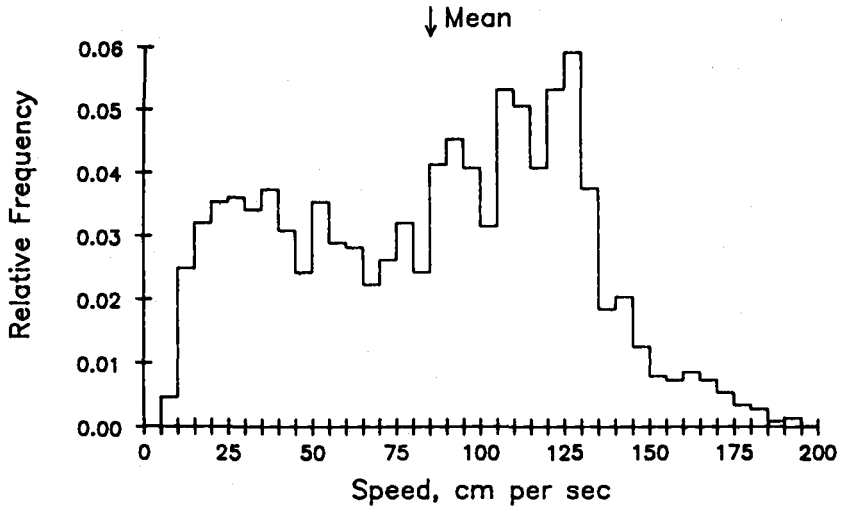
123 M AT GIBRALTAR C-2. 22 OCT 85 - 23 NOV 86. TAPE 6590/16.

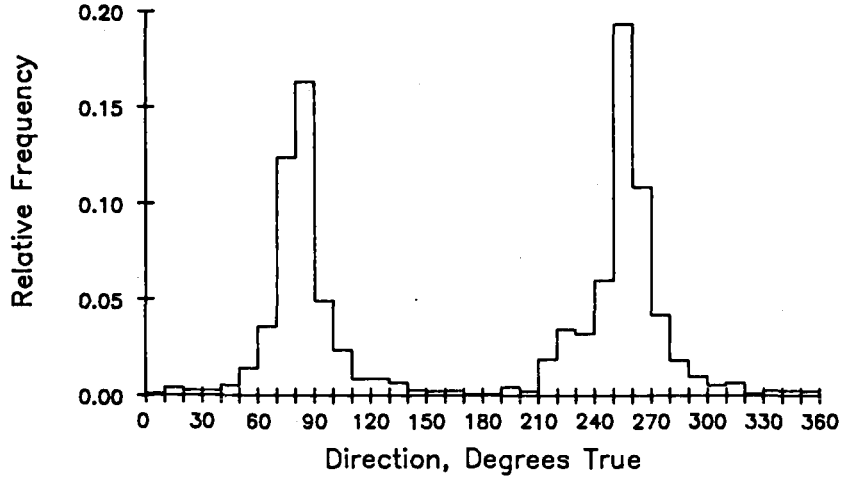


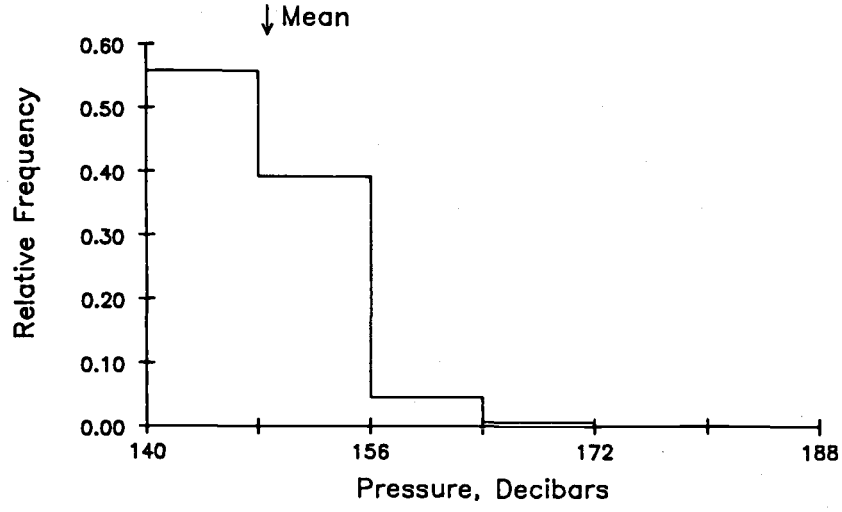




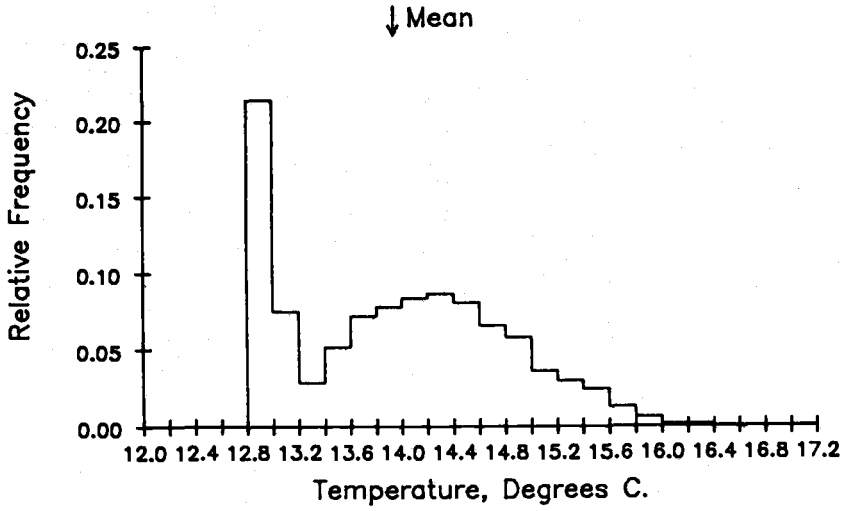
143 M AT GIBRALTAR C-2. 22 OCT 85 - 23 NOV 85. TAPE 751/61.

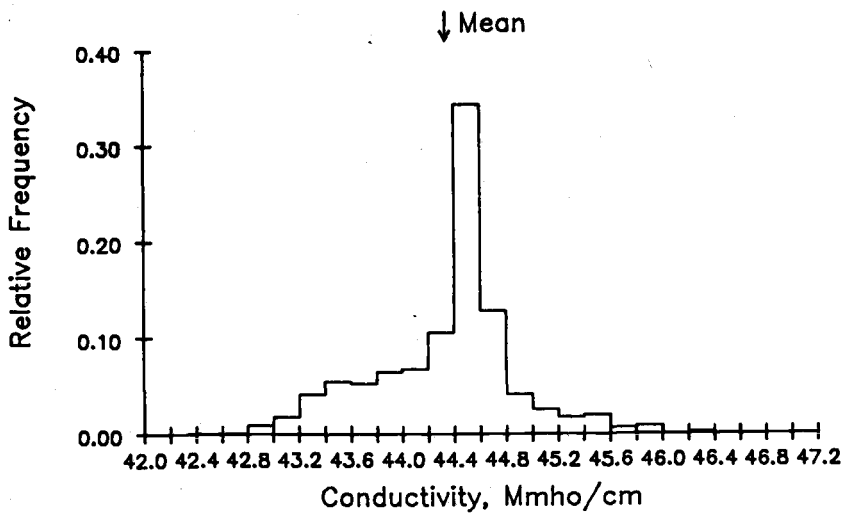


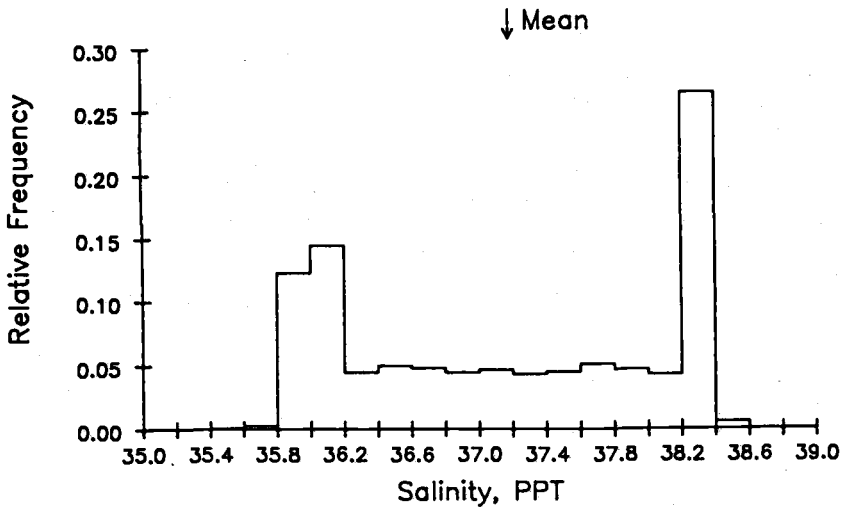




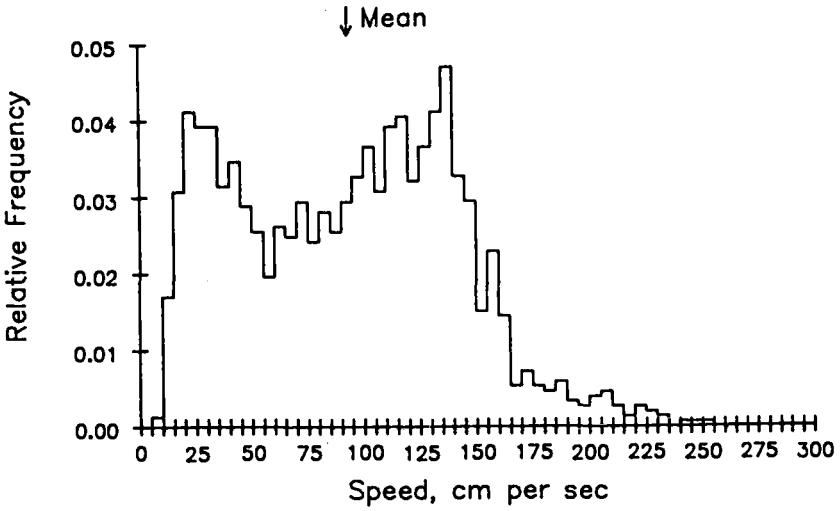
143 M AT GIBRALTAR C–2. 22 OCT 85 – 23 NOV 85. TAPE 751/61.

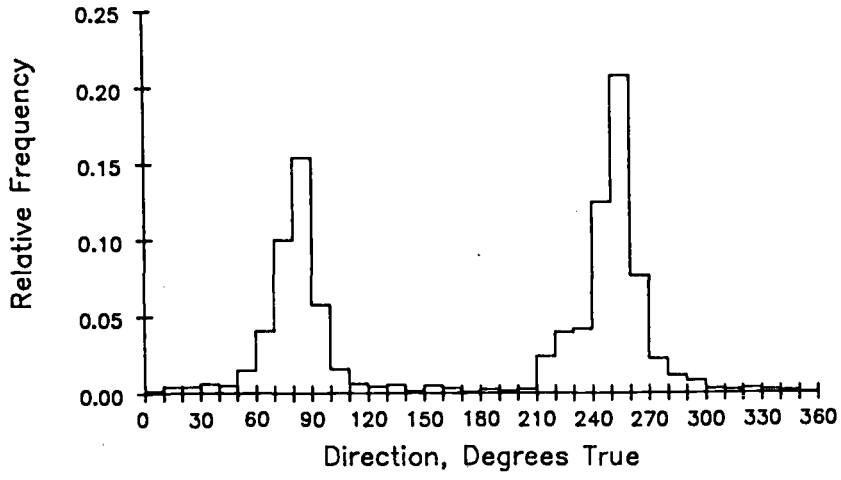


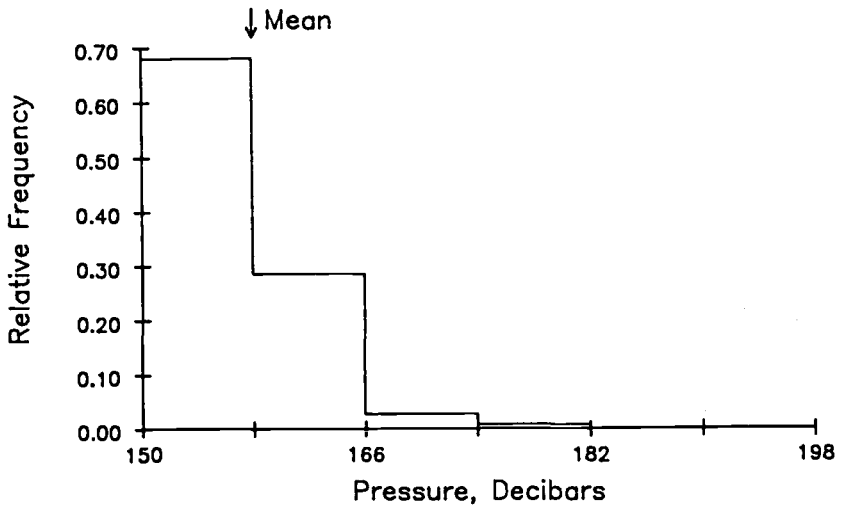




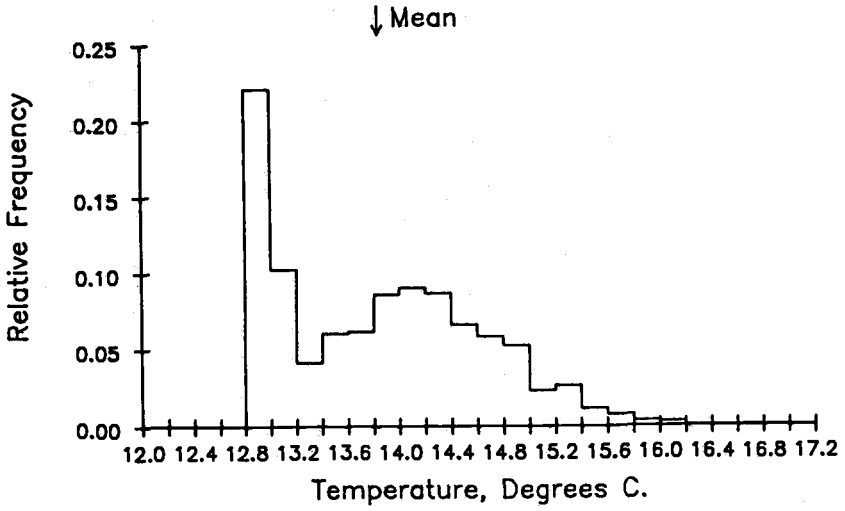
153 M AT GIBRALTAR C–2. 22 OCT 85 – 23 NOV 85. TAPE 6593/14.

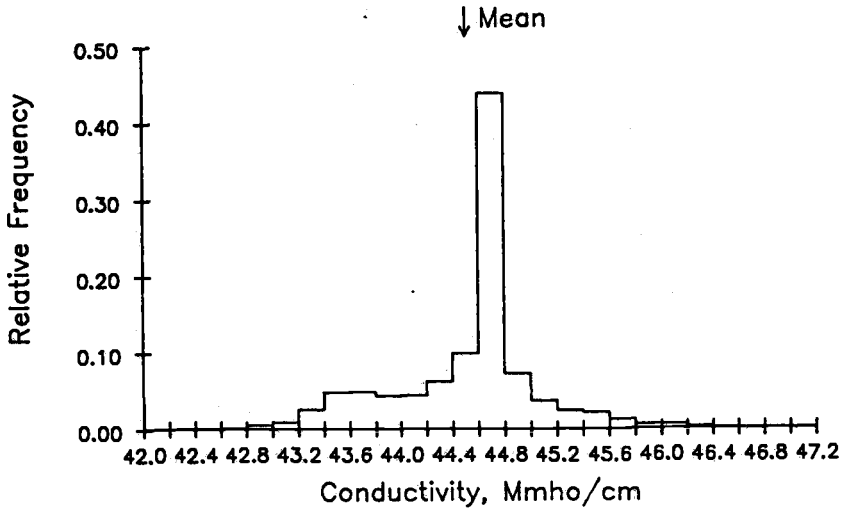


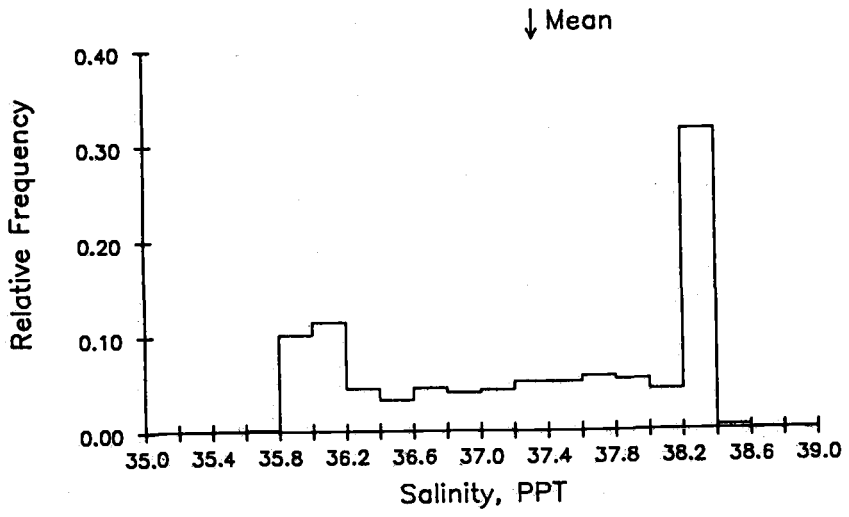




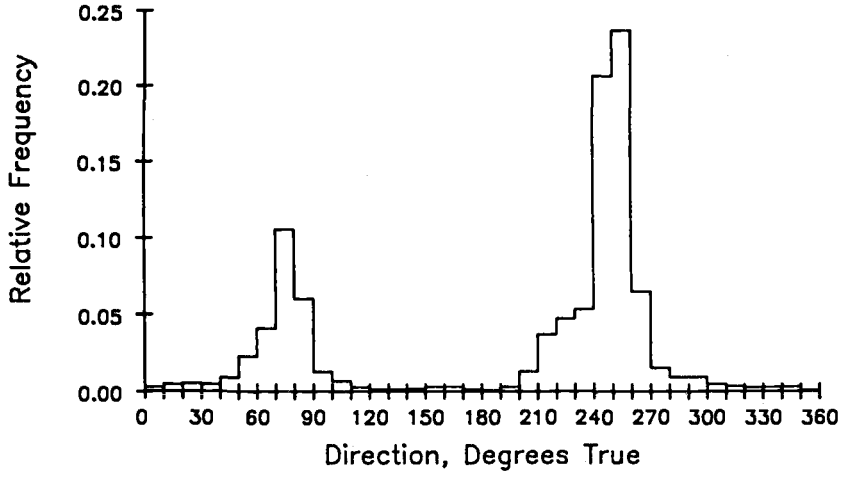
153 M AT GIBRALTAR C-2. 22 OCT 85 - 23 NOV 85. TAPE 6593/14.

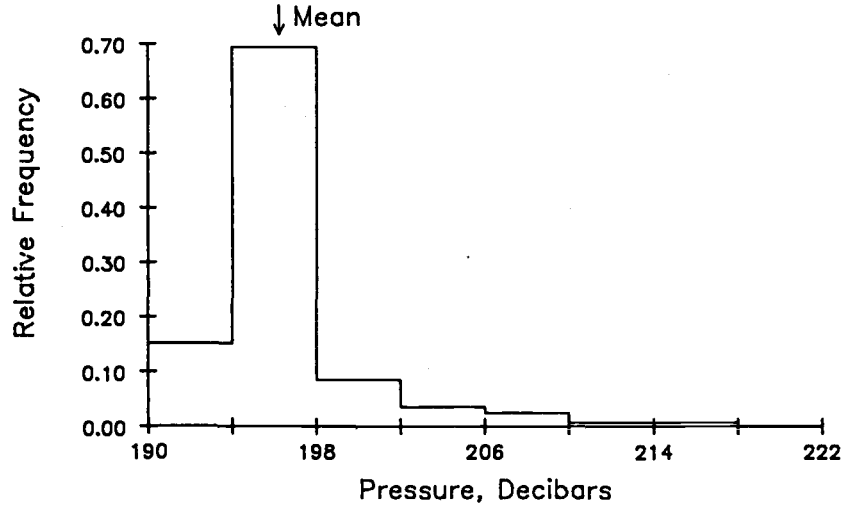




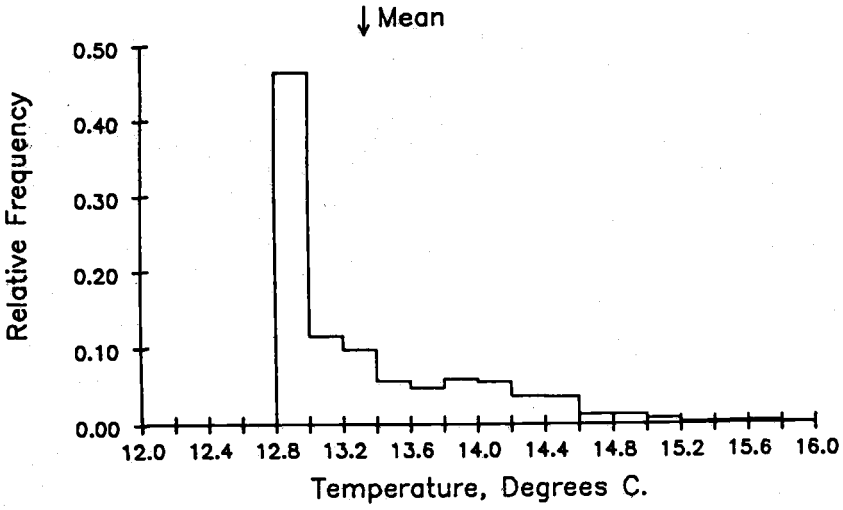


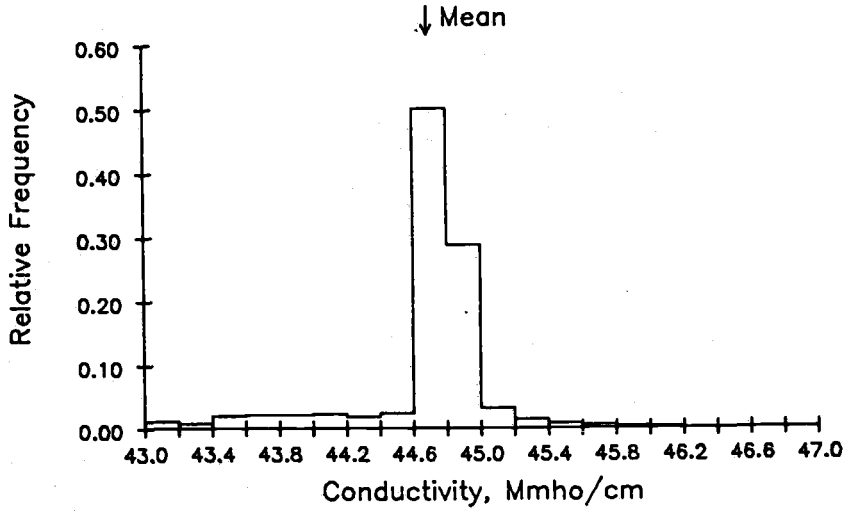
191 M AT GIBRALTAR C–2. 22 OCT 85 – 23 NOV 85. TAPE 5886/19.

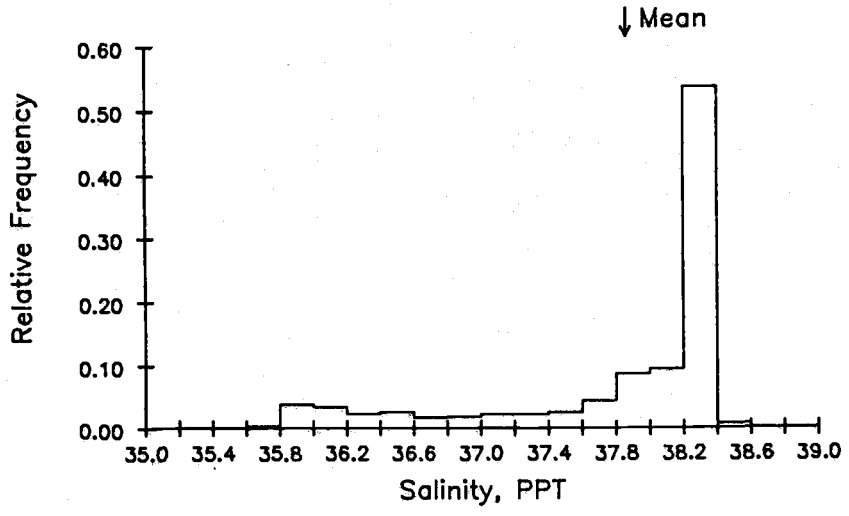




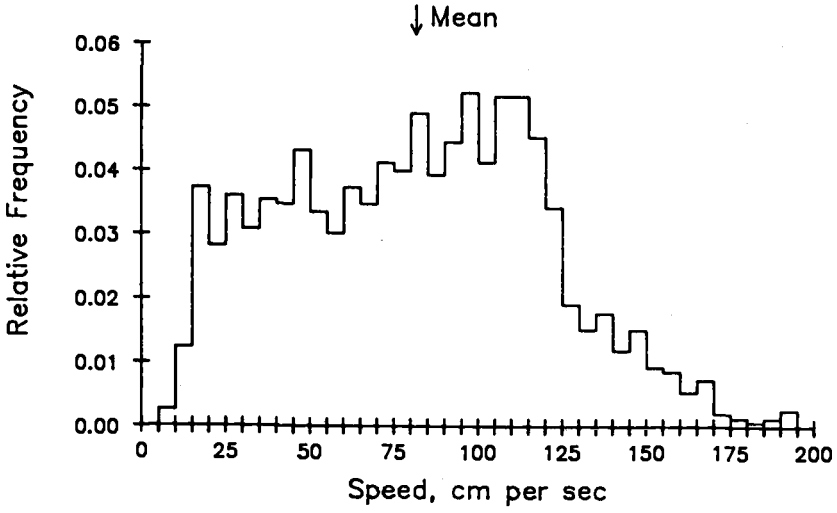
191 M AT GIBRALTAR C-2. 22 OCT 85 - 23 NOV 85. TAPE 5886/19.

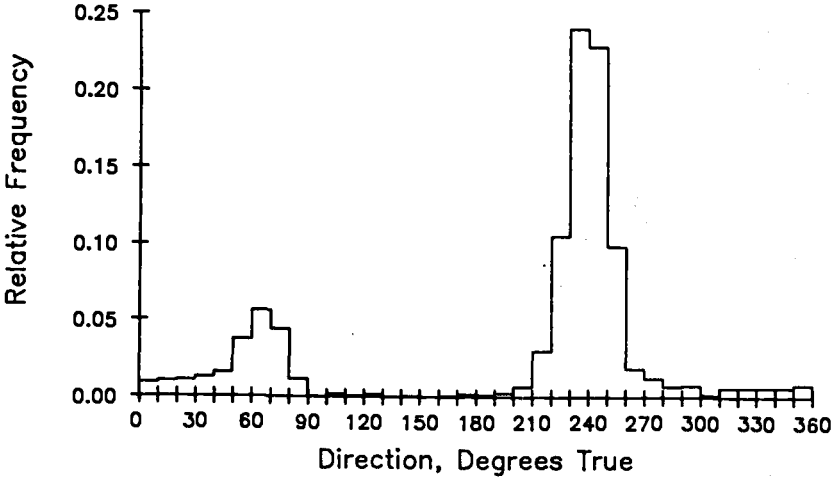


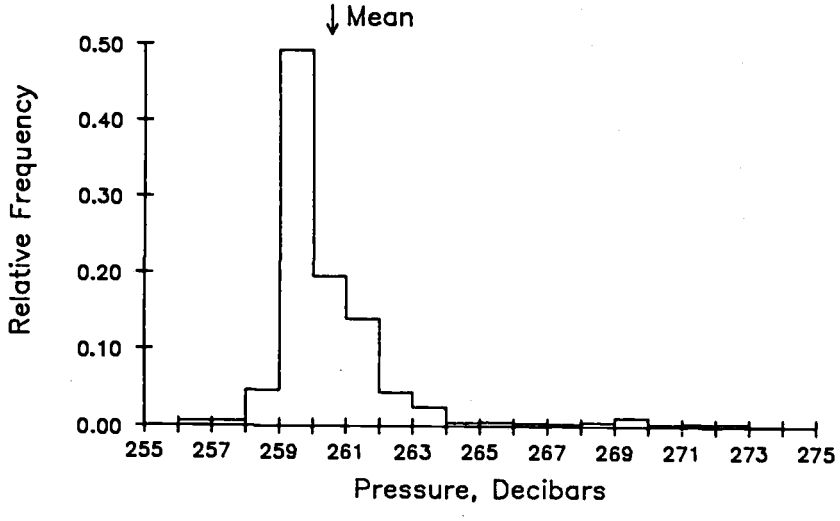




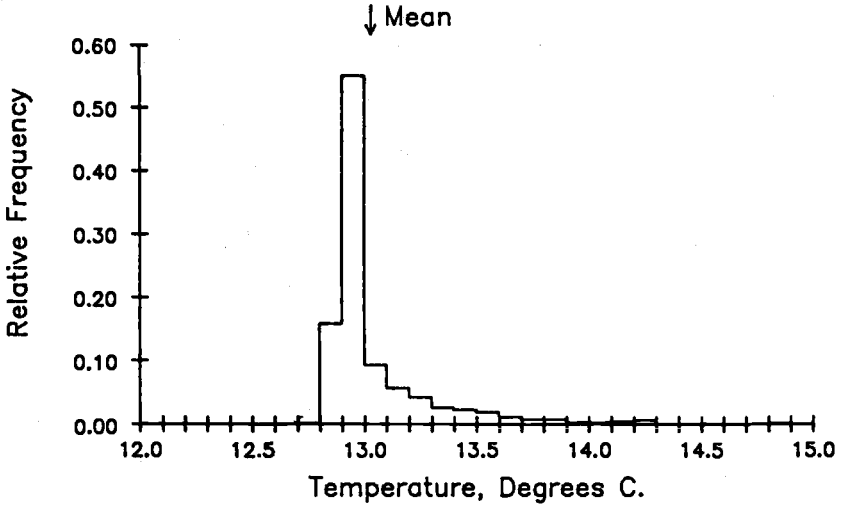
254 M AT GIBRALTAR C-2. 22 OCT 85 - 23 NOV 85. TAPE 5648/27.

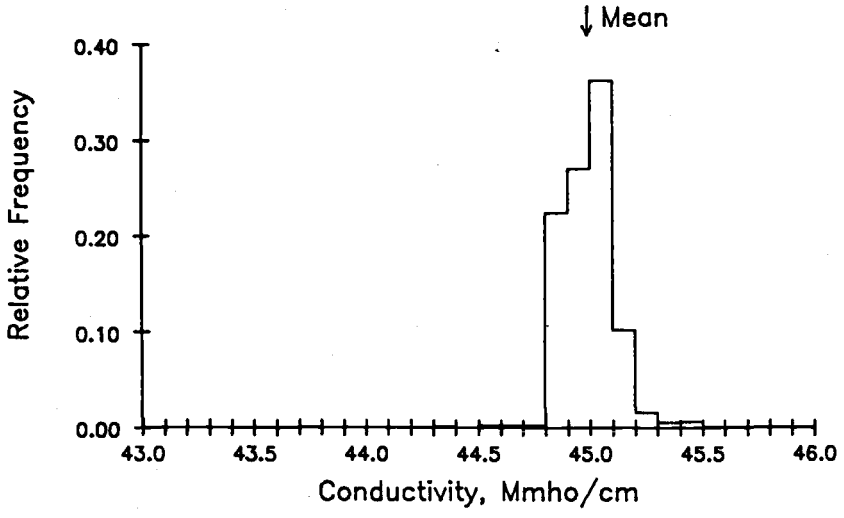


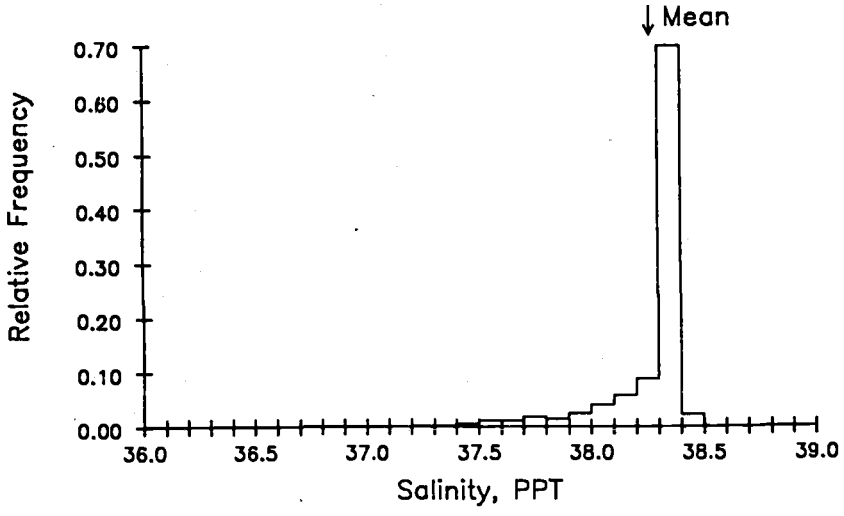




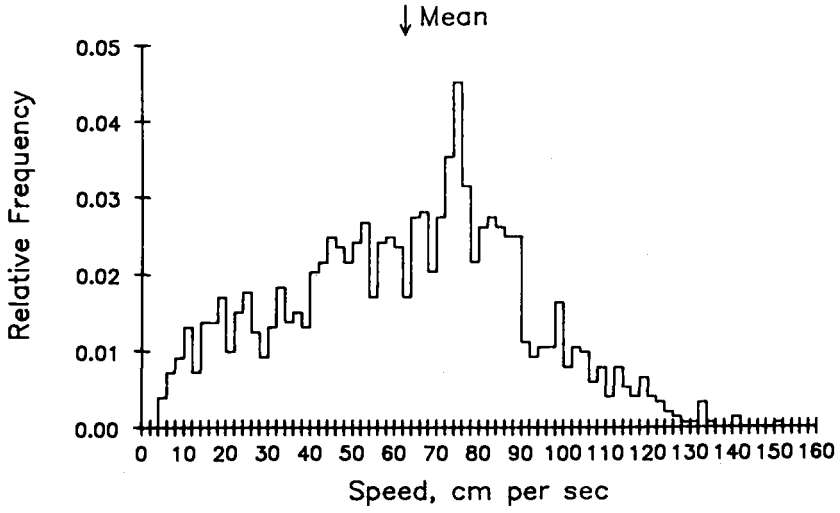
254 M AT GIBRALTAR C–2. 22 OCT 85 – 23 NOV 85. TAPE 5648/27.

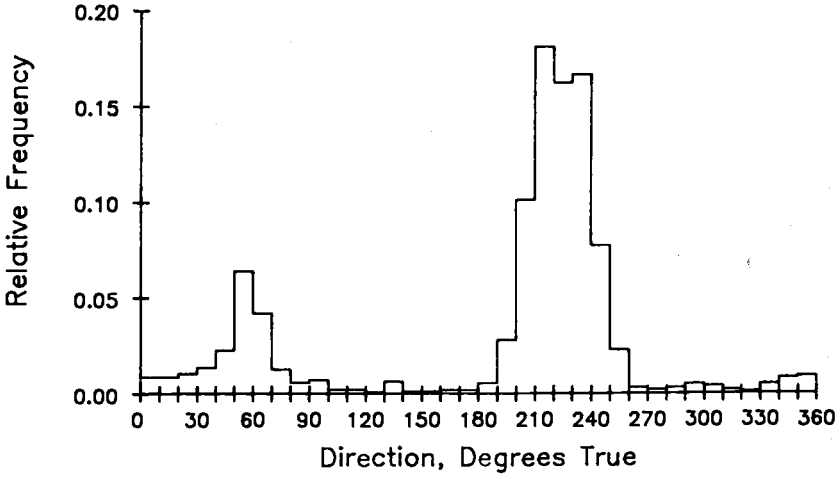


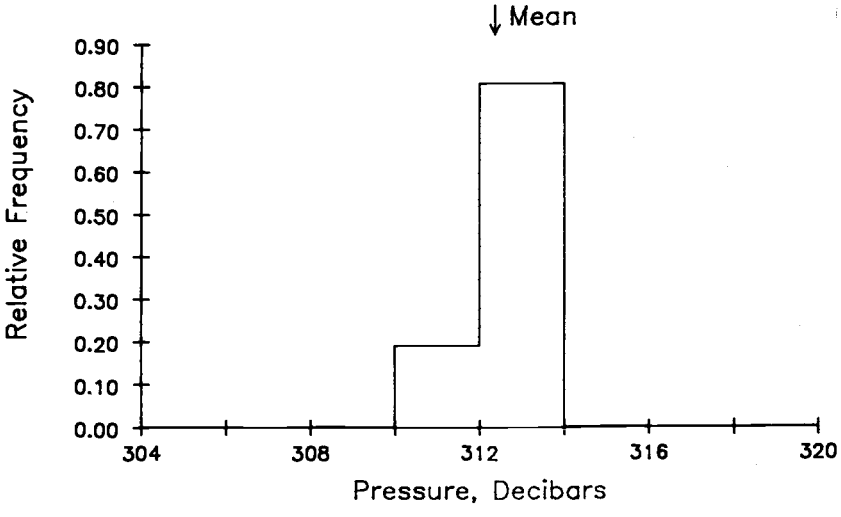




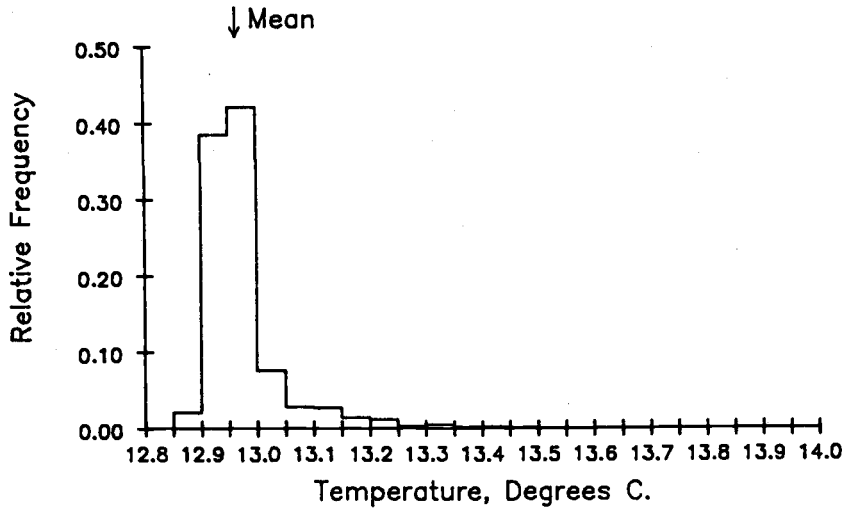
306 M AT GIBRALTAR C-2. 22 OCT 85 - 23 NOV 85. TAPE 1241/37.

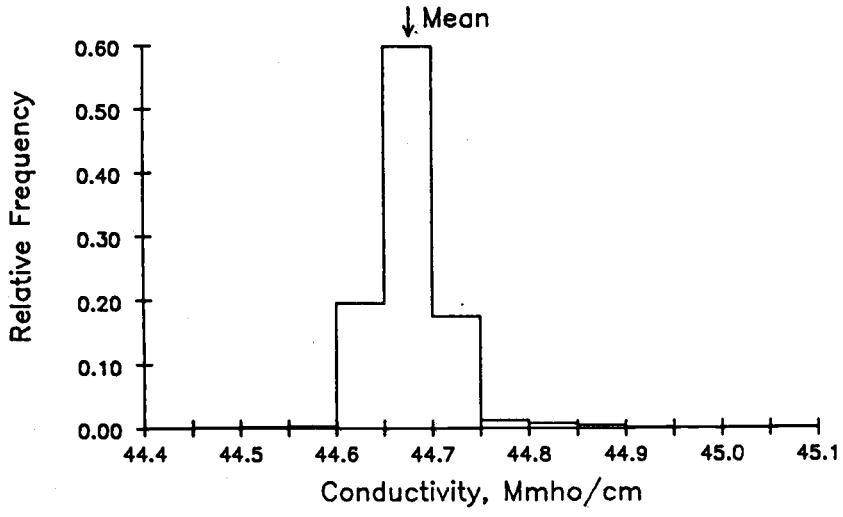


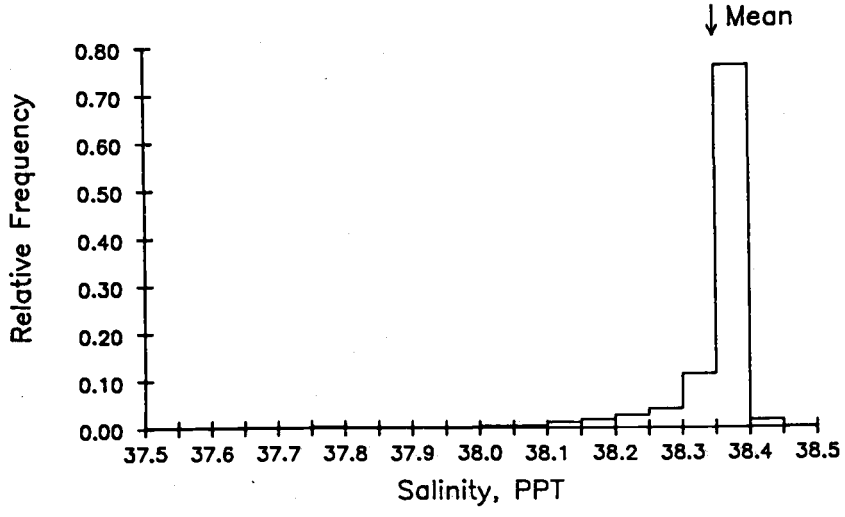




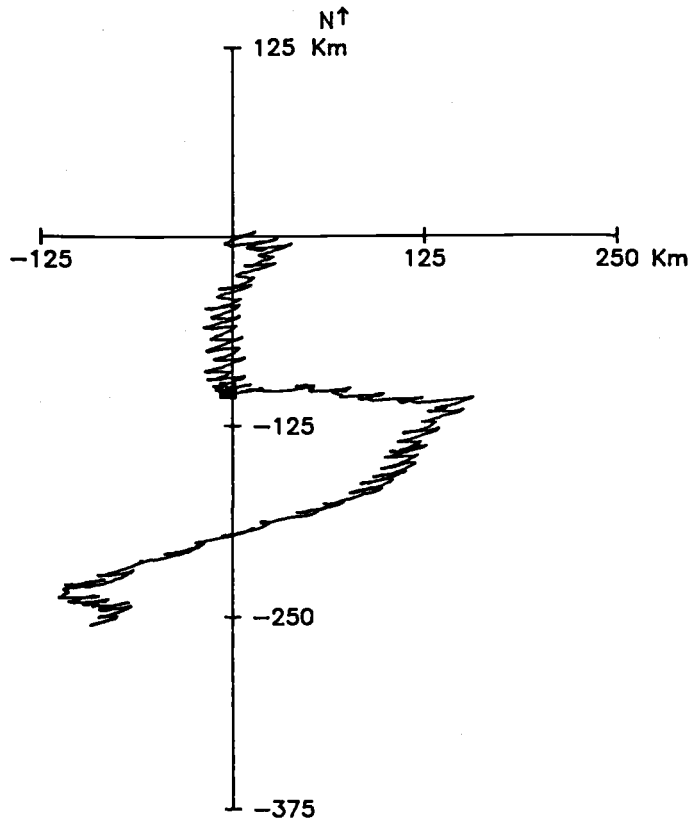
306 M AT GIBRALTAR C-2. 22 OCT 85 - 23 NOV 85. TAPE 1241/37.

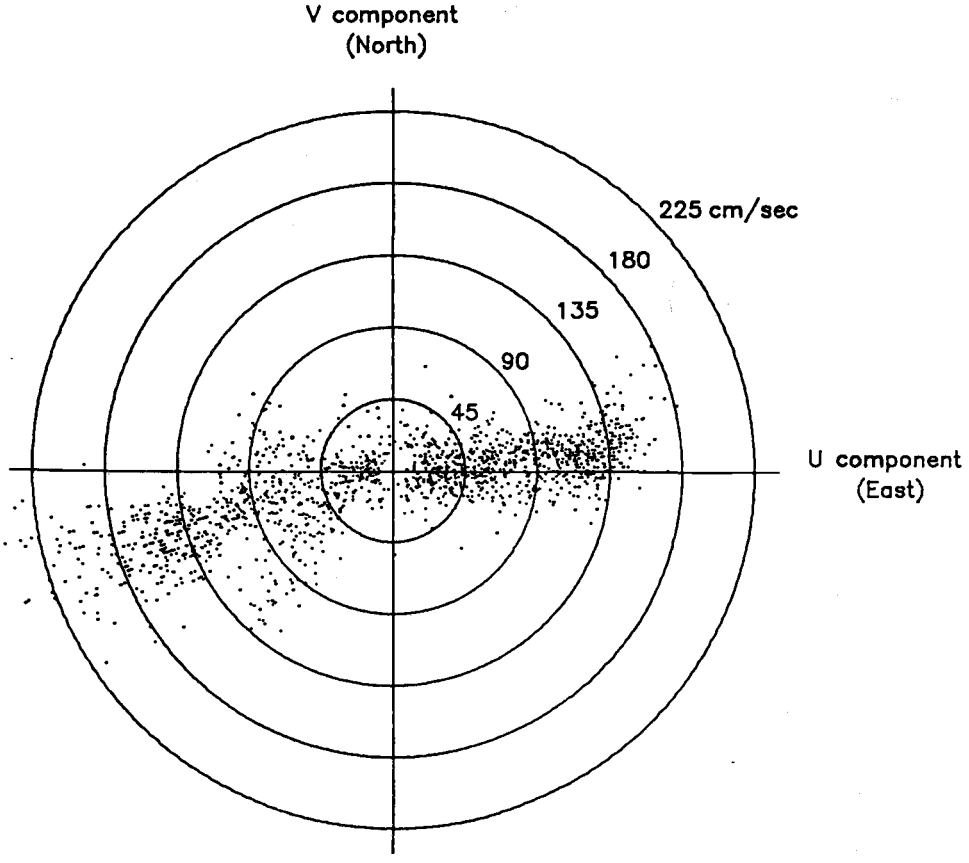




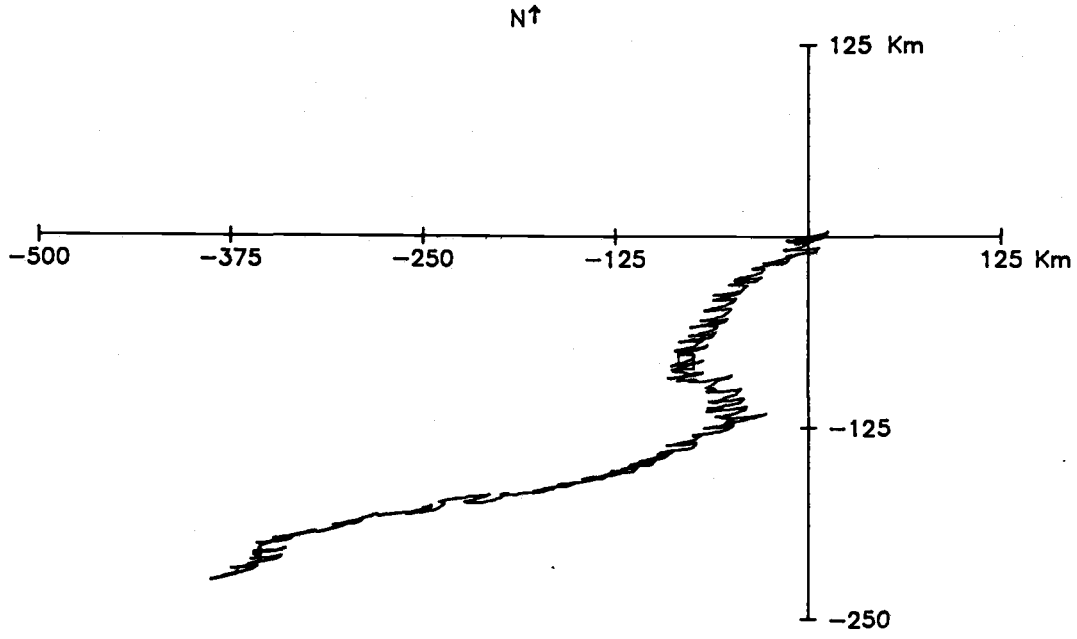


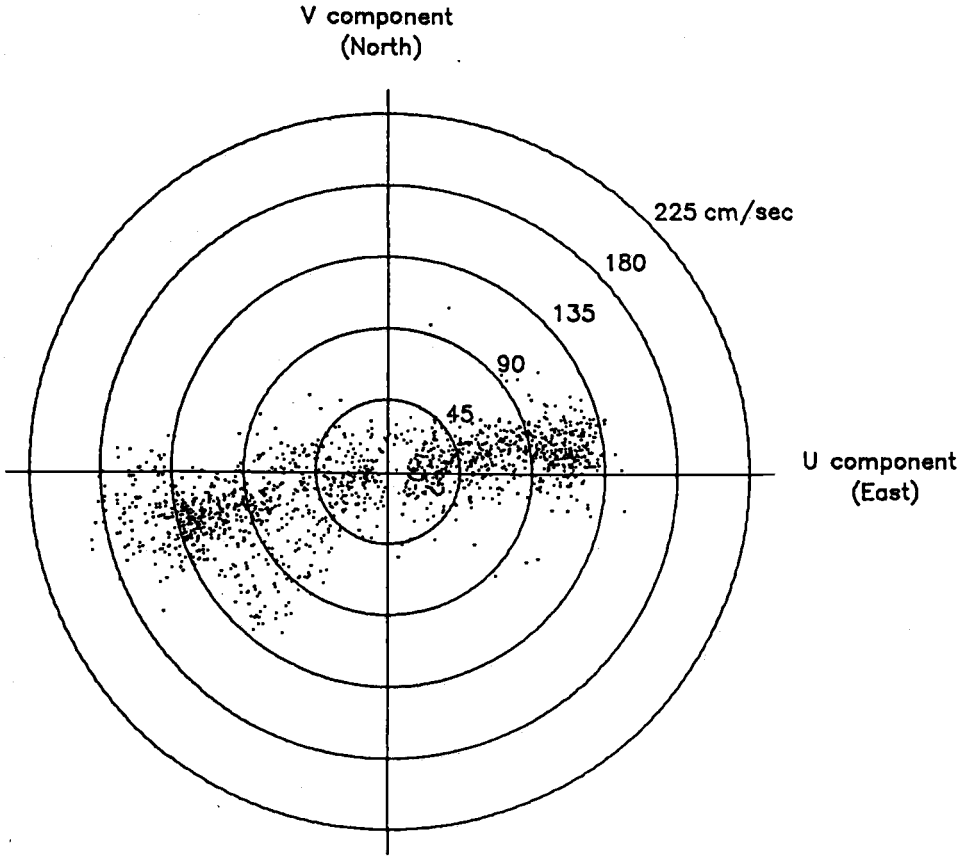
123 M AT GIBRALTAR C-2. 22 OCT 85 - 23 NOV 85. TAPE 6590/16.



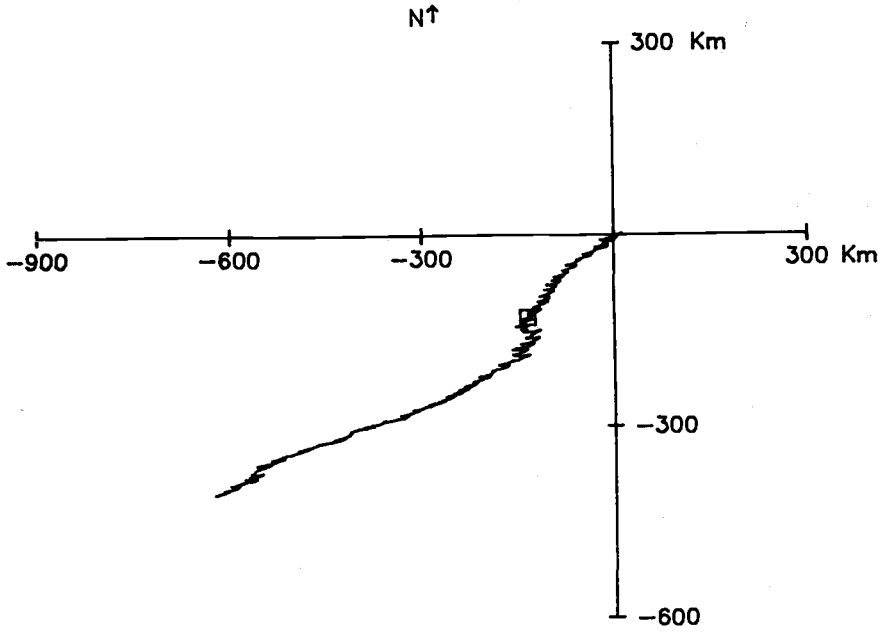


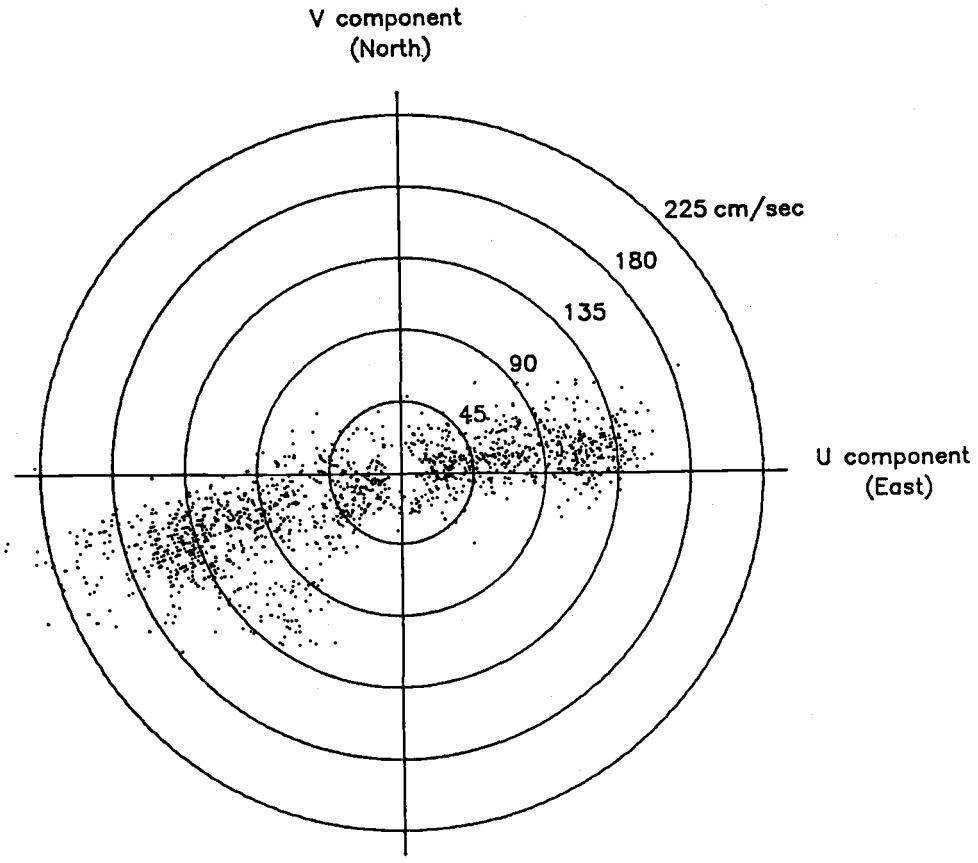
143 M AT GIBRALTAR C–2. 22 OCT 85 – 23 NOV 85. TAPE 751/61.



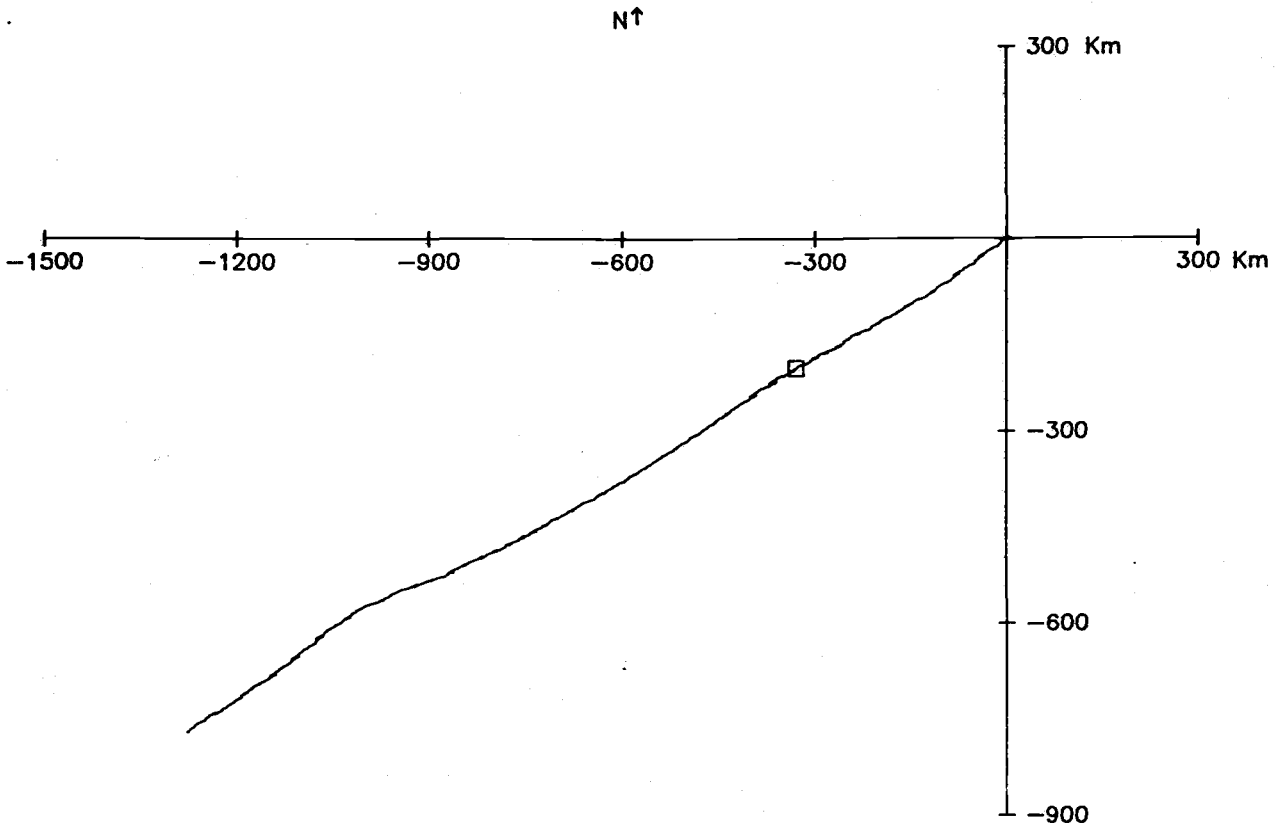


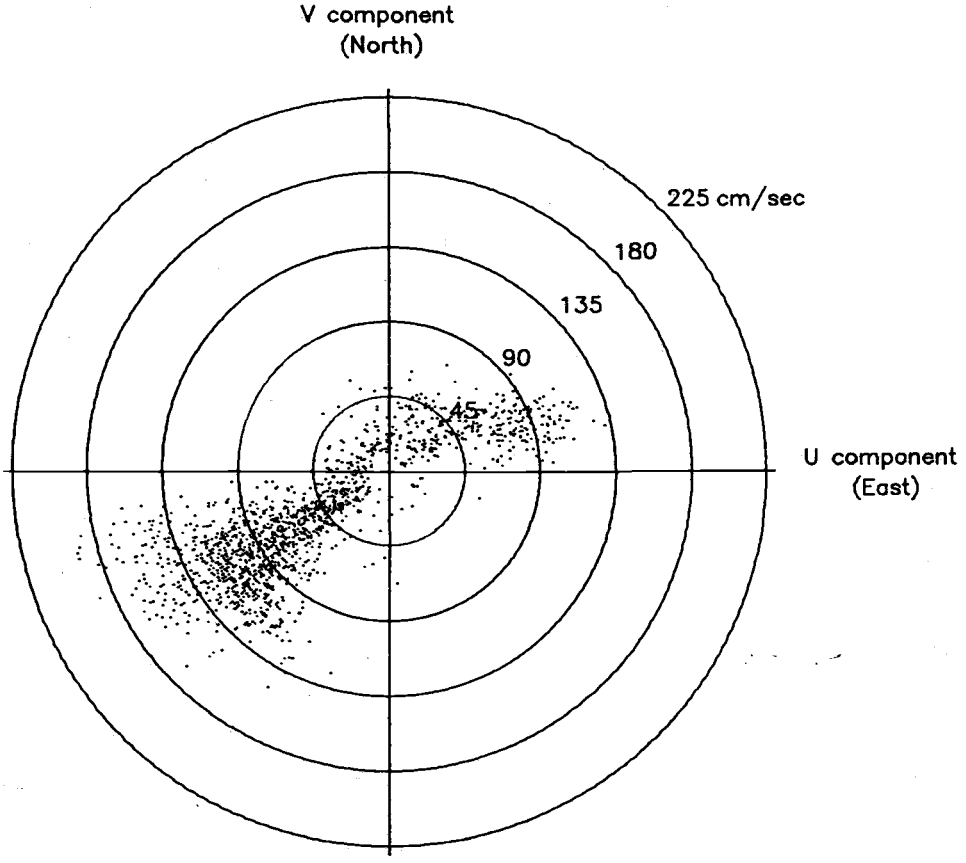
153 M AT GIBRALTAR C-2. 22 OCT 85 - 23 NOV 85. TAPE 6593/14.



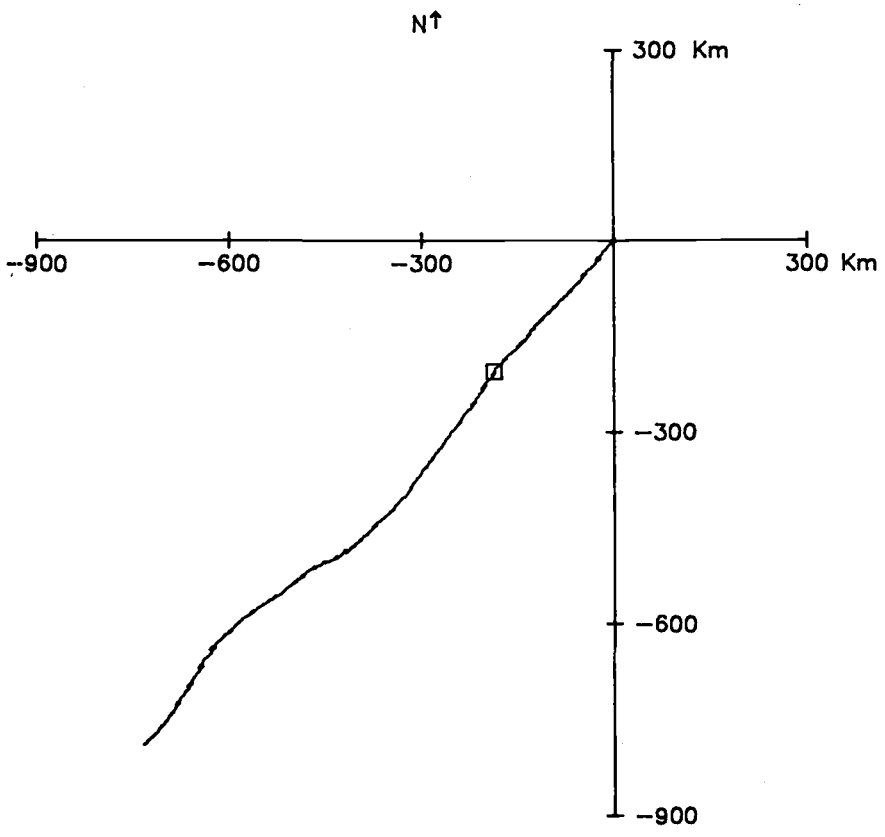


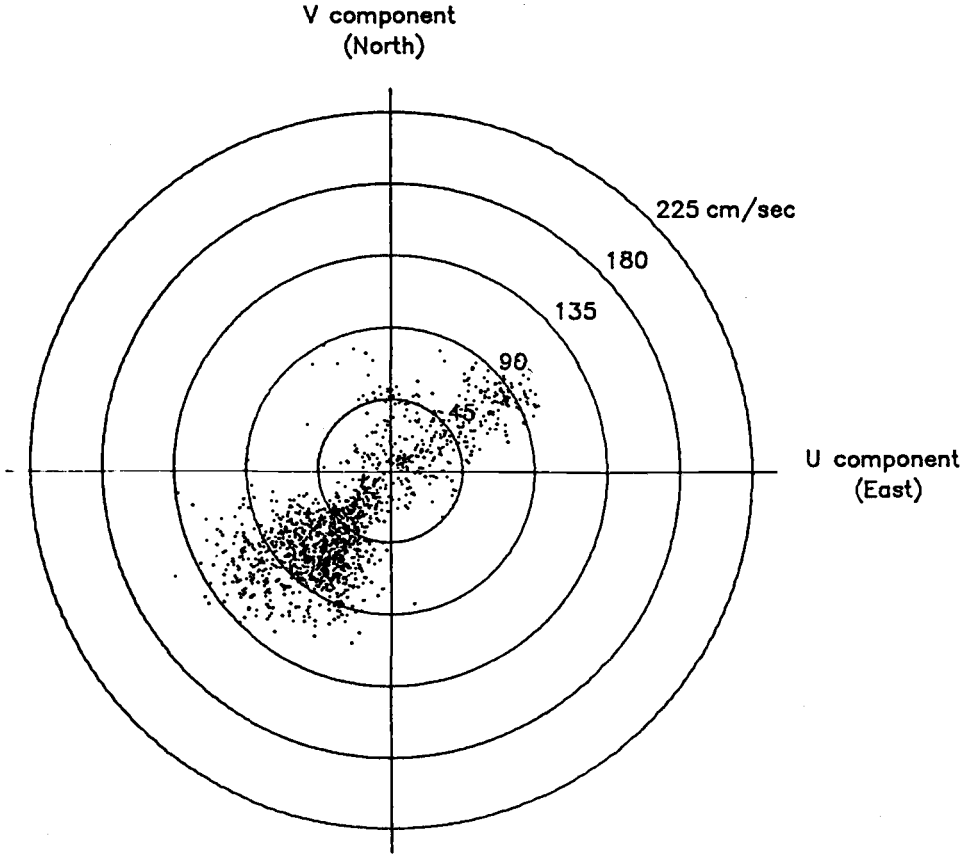
254 M AT GIBRALTAR C-2. 22 OCT 85 - 23 NOV 85. TAPE 5648/27.



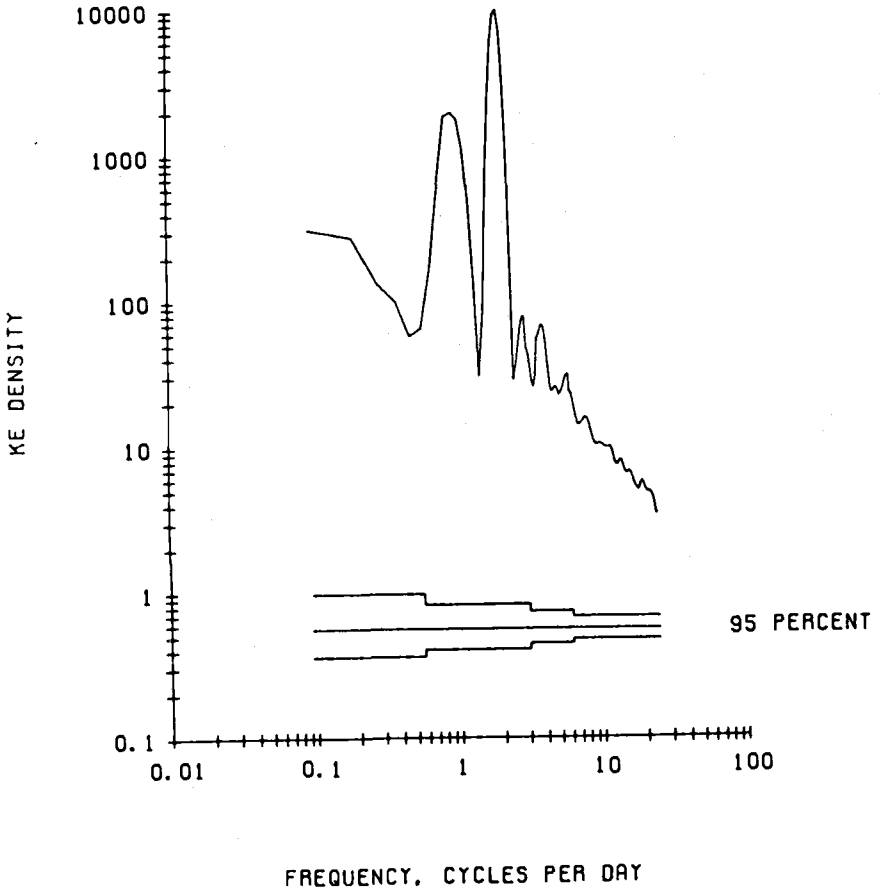


306 M AT GIBRALTAR C-2. 22 OCT 85 - 23 NOV 85. TAPE 1241/37.

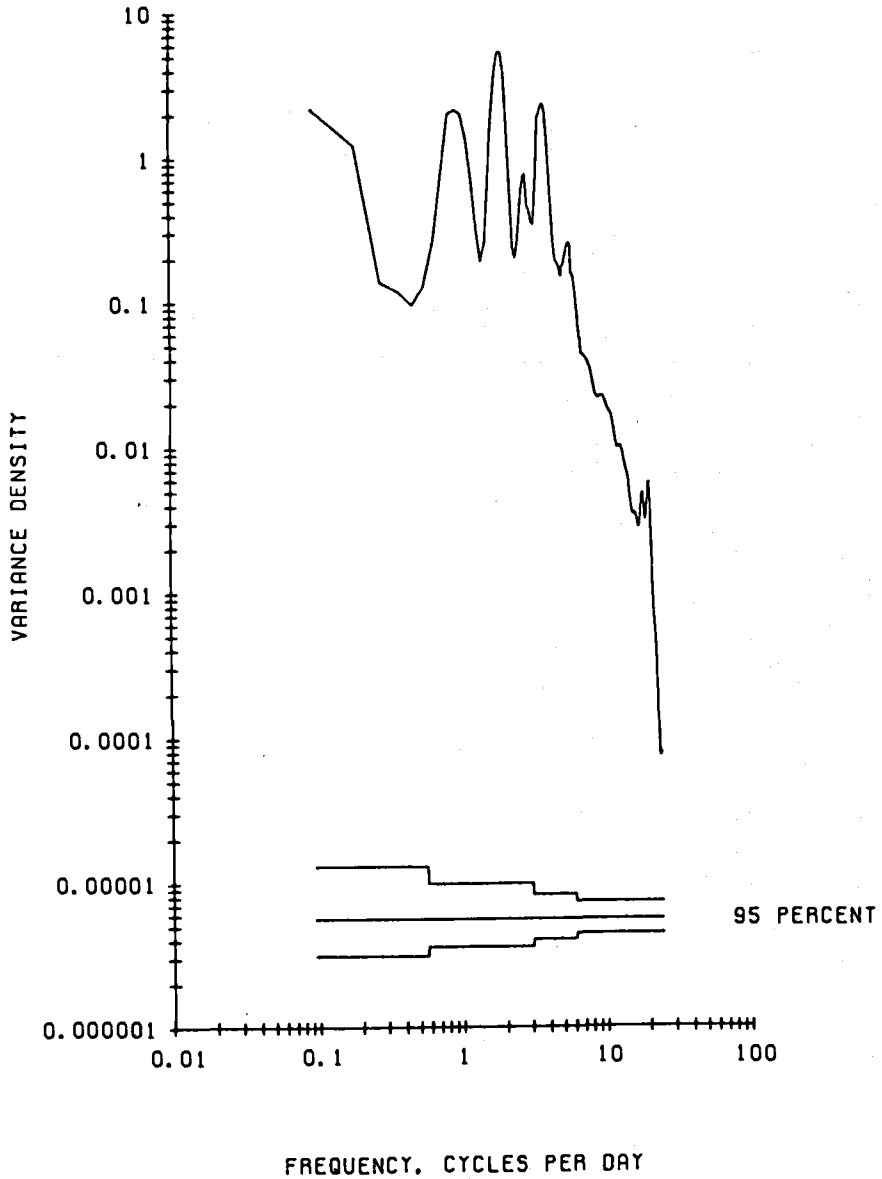




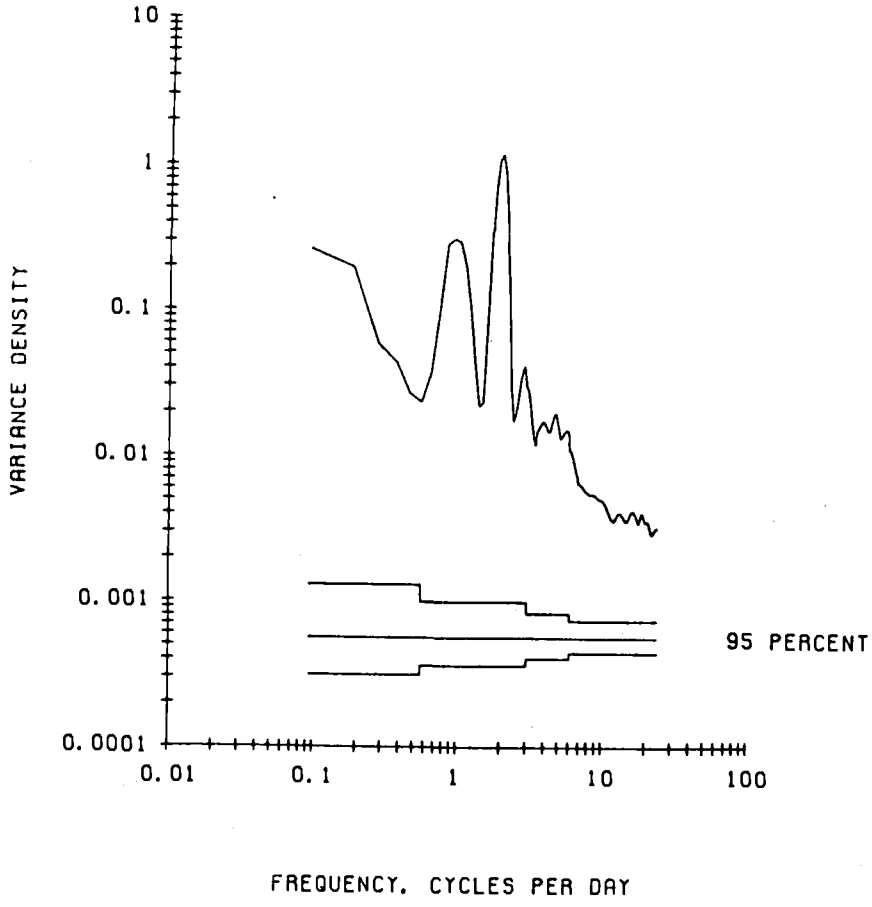
UNFILTERED CURRENT. 123 M AT GIBRALTAR C-2.



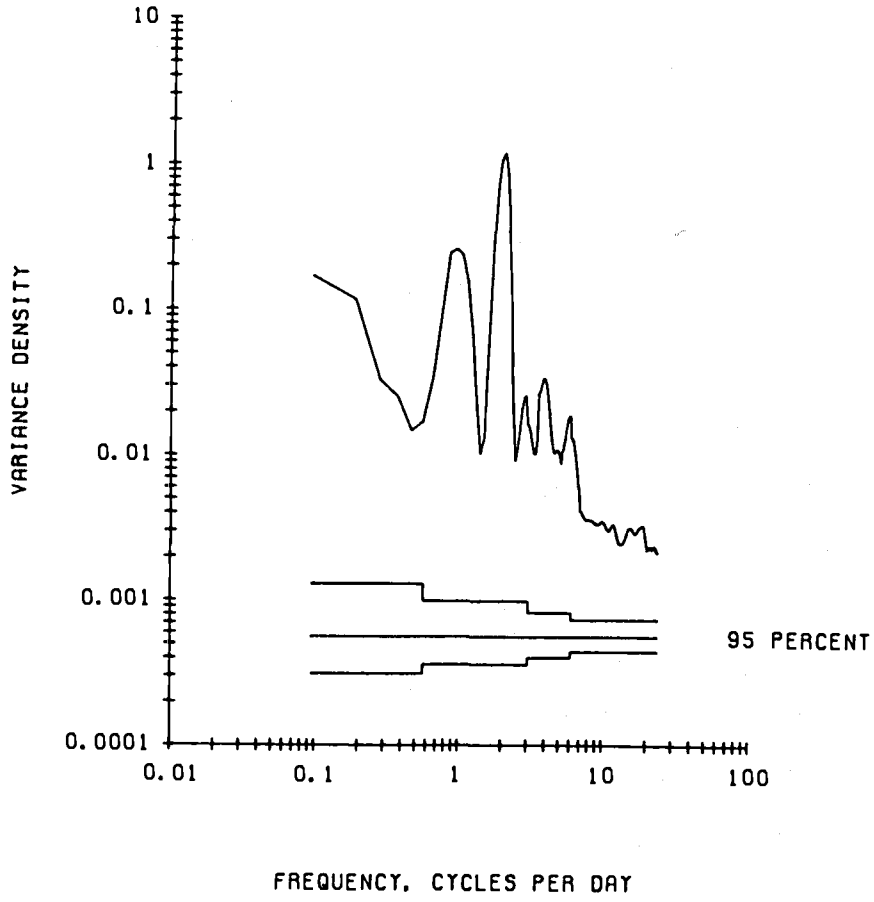
UNFILTERED PRESSURE. 123 M AT GIBRALTAR C-2.



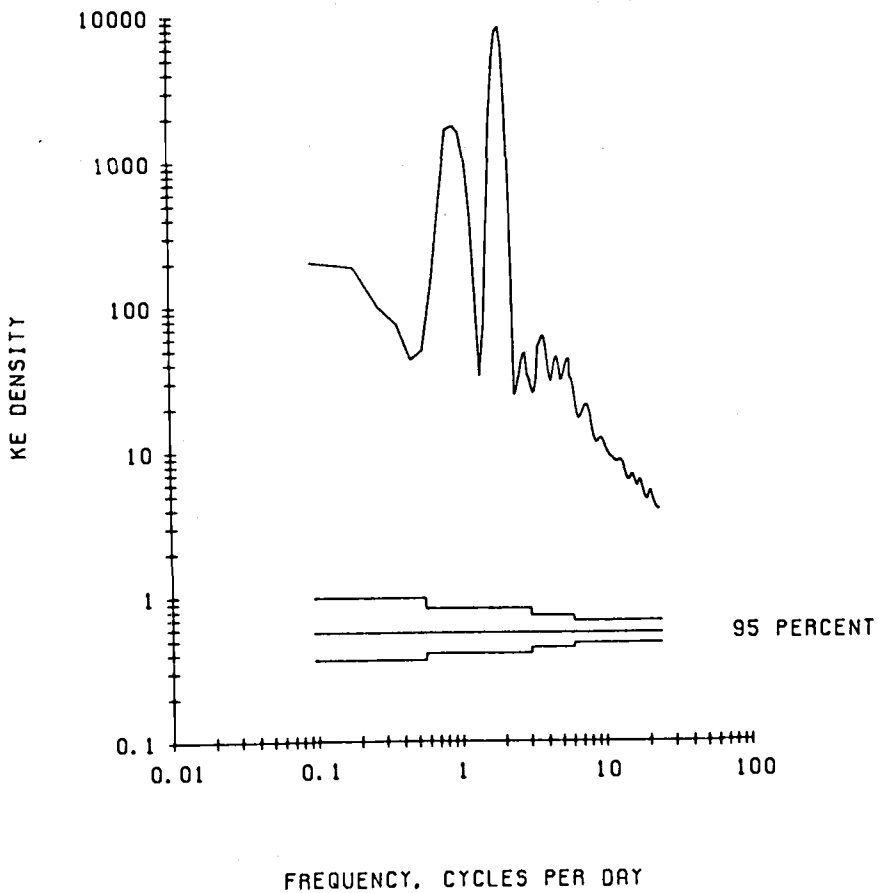
UNFILTERED TEMPERATURE. 123 M AT GIBRALTAR C-2.



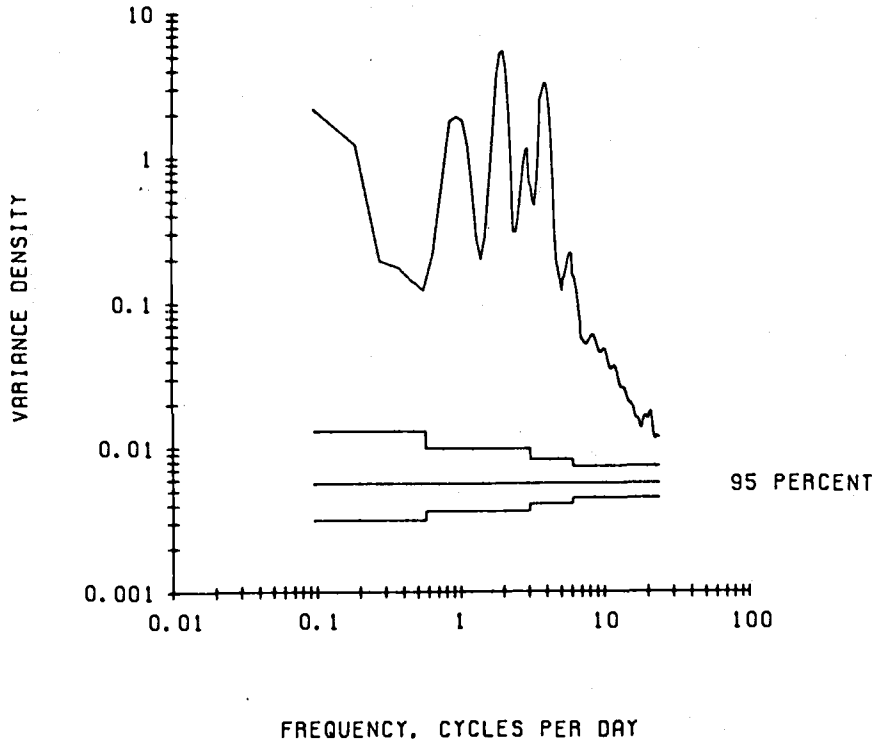
UNFILTERED SALINITY. 123 M AT GIBRALTAR C-2.



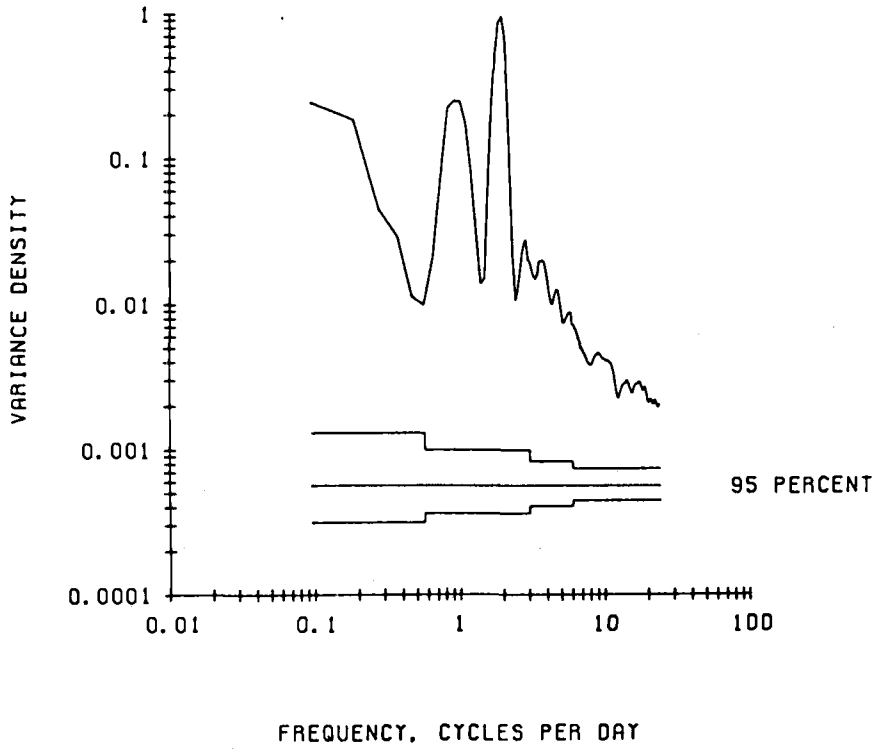
UNFILTERED CURRENT. 143 M AT GIBRALTAR C-2.



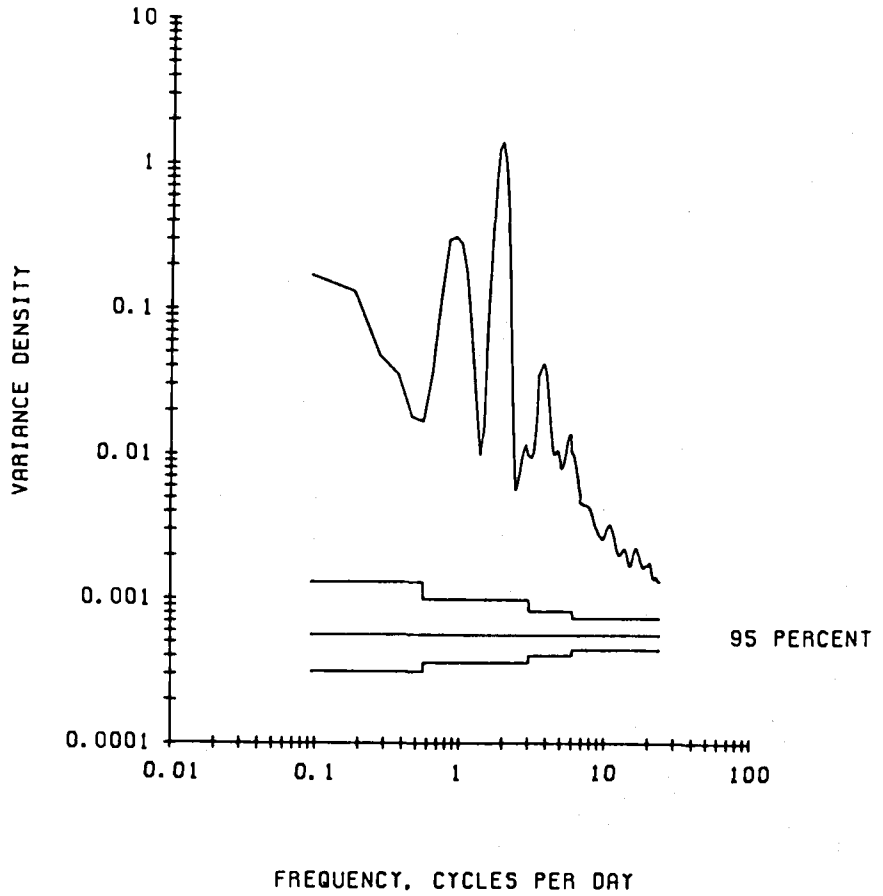
UNFILTERED PRESSURE. 143M AT GIBRALTAR C-2.



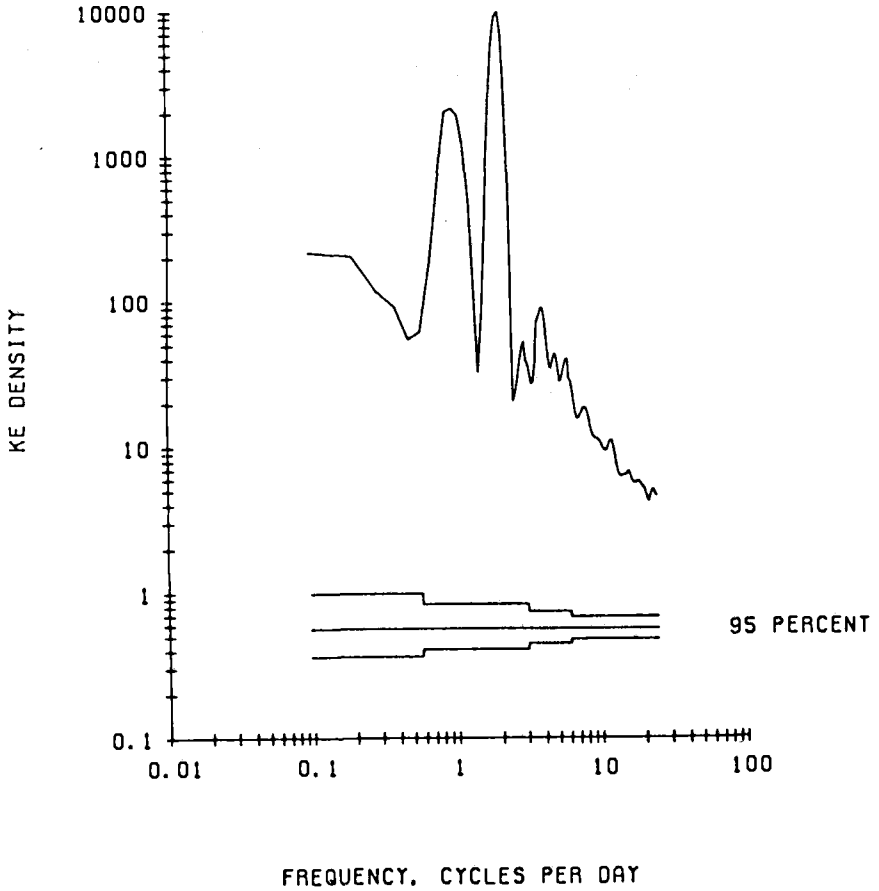
UNFILTERED TEMPERATURE. 143 M AT GIBRALTAR C-2.



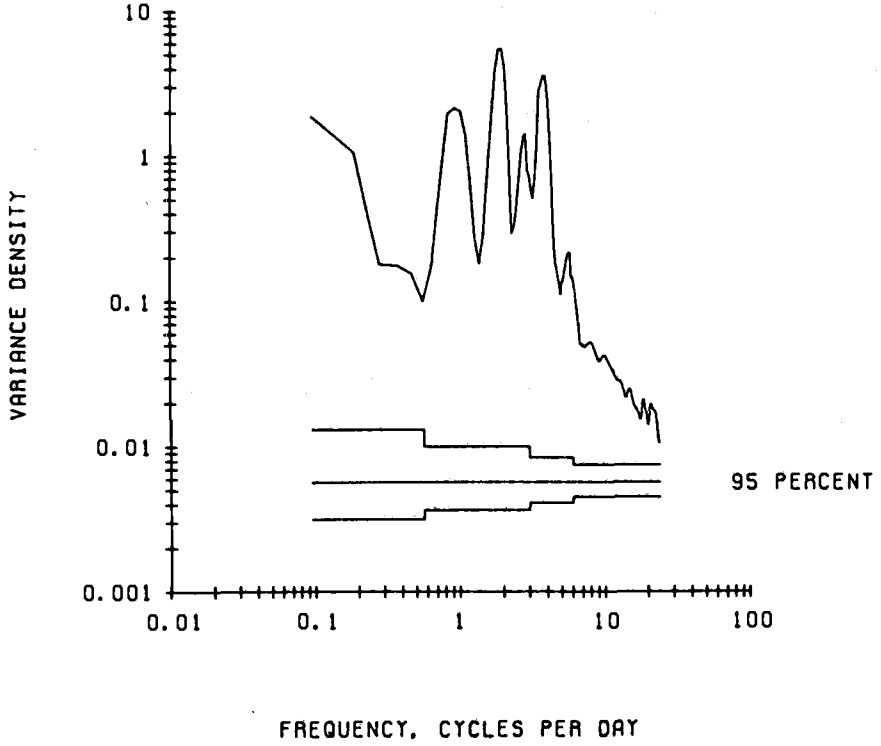
UNFILTERED SALINITY. 143 M AT GIBRALTAR C-2.



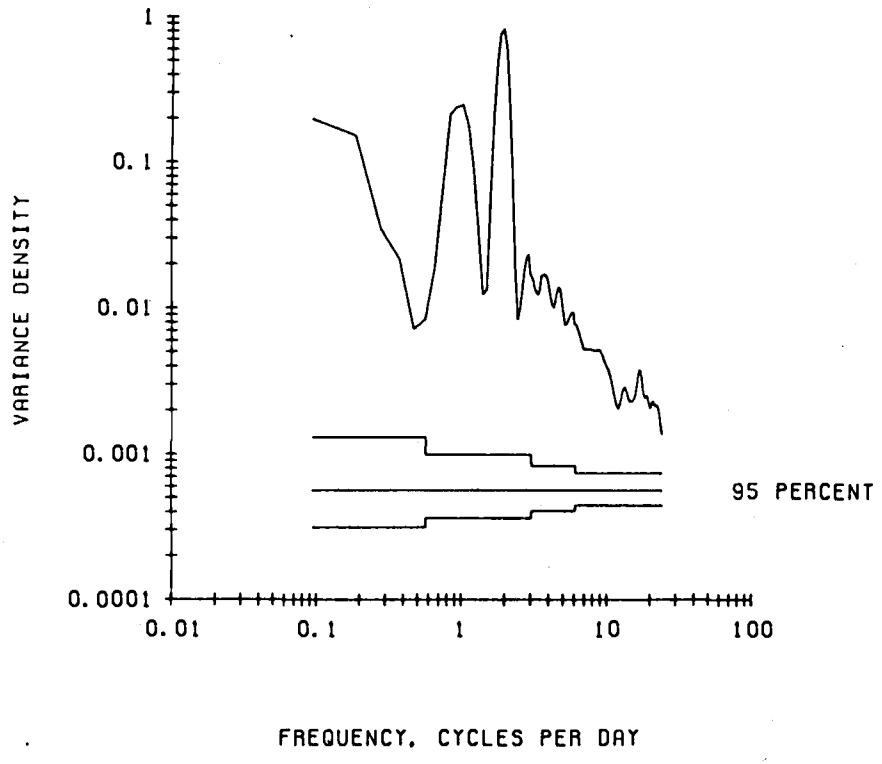
UNFILTERED CURRENT. 153 M AT GIBRALTAR C-2.



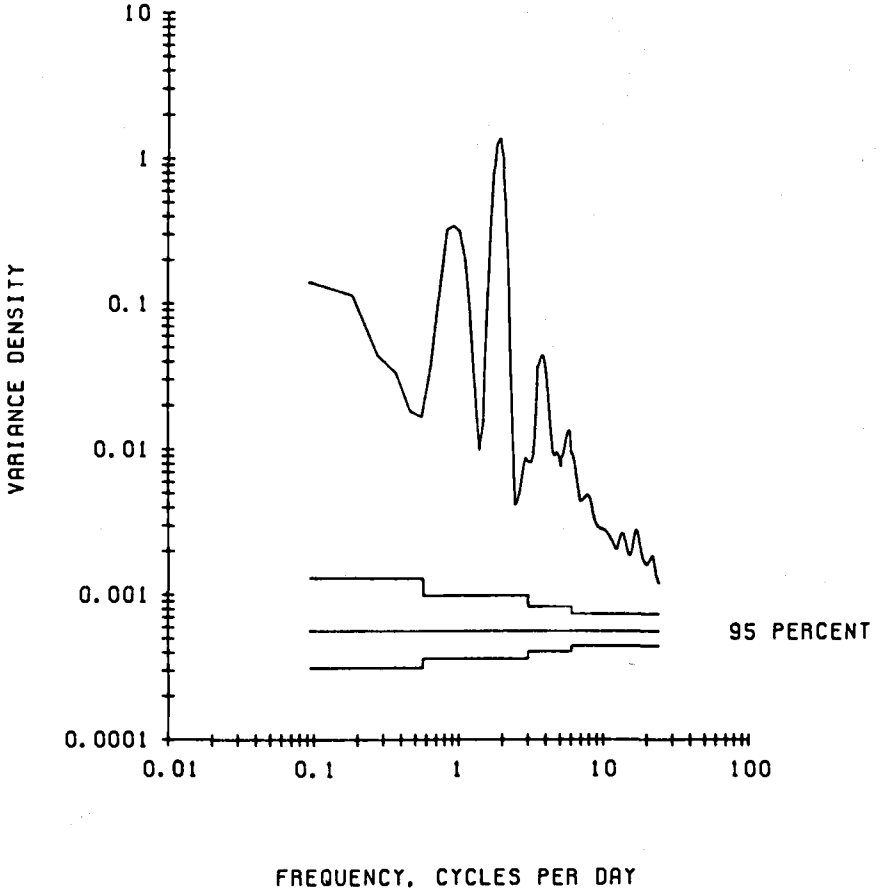
UNFILTERED PRESSURE. 153M AT GIBRALTAR C-2.



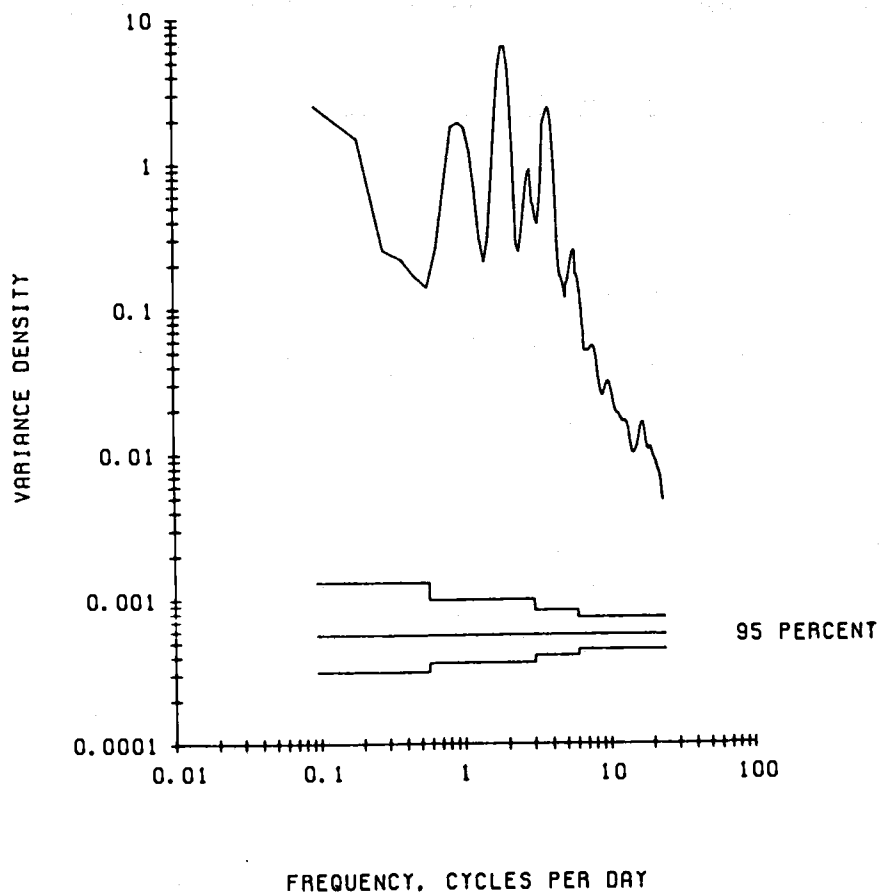
UNFILTERED TEMPERATURE. 153 M AT GIBRALTAR C-2.



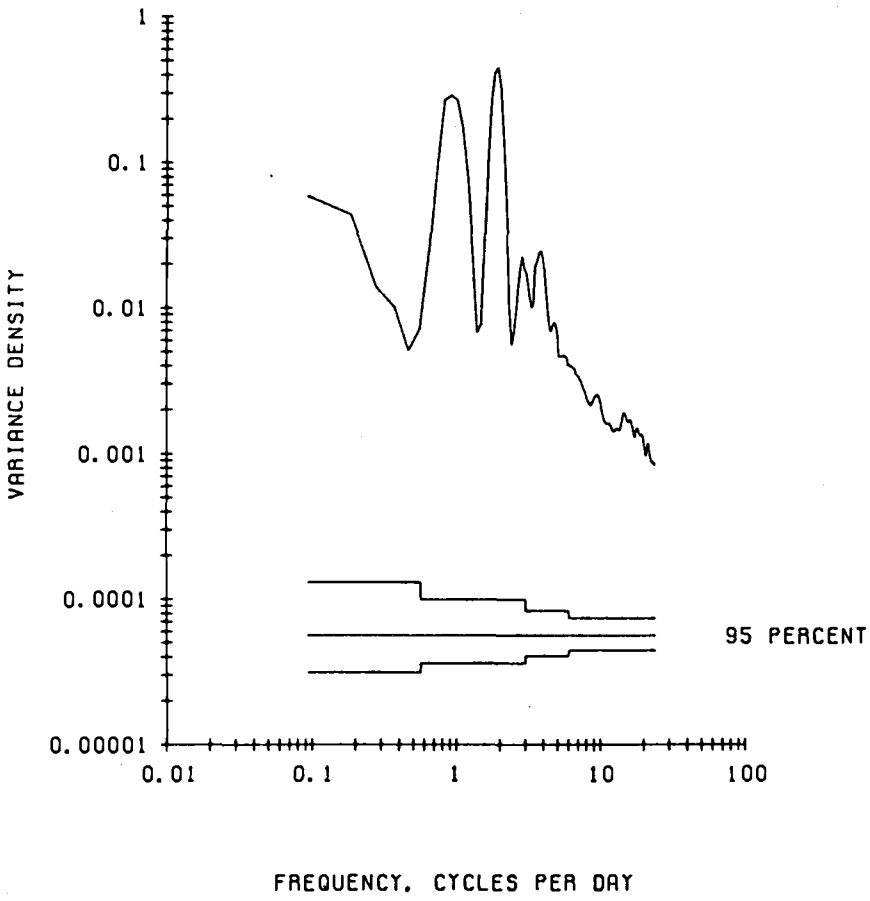
UNFILTERED SALINITY. 153 M AT GIBRALTAR C-2.



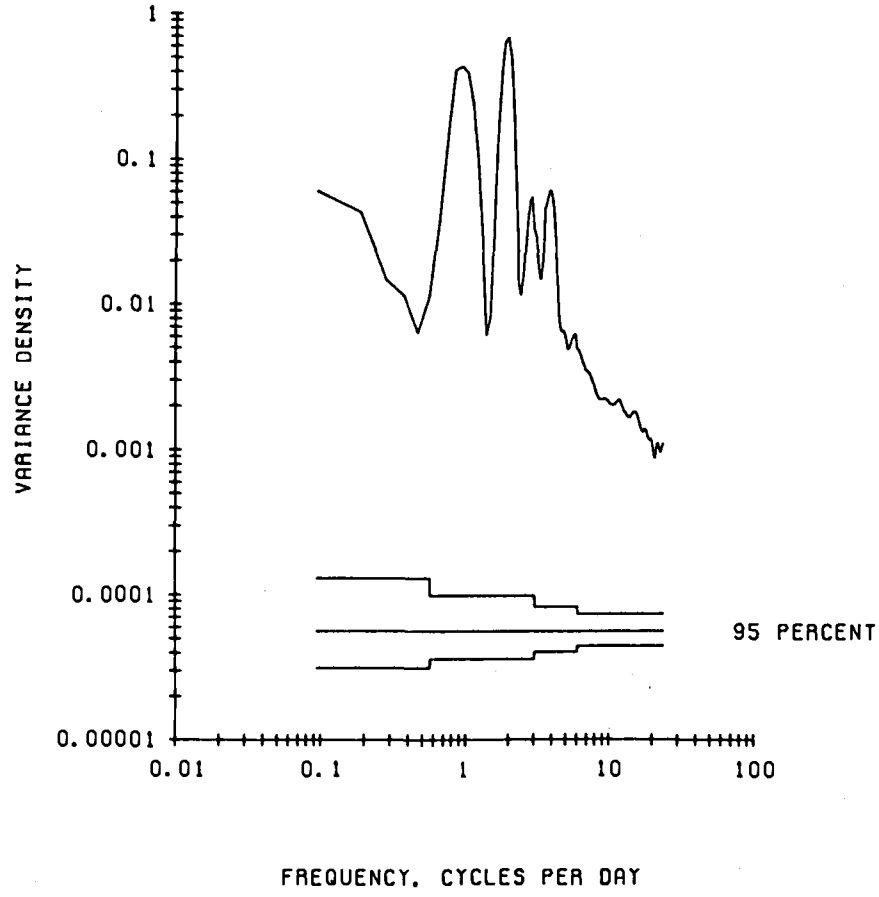
UNFILTERED PRESSURE. 191 M AT GIBRALTAR C-2.



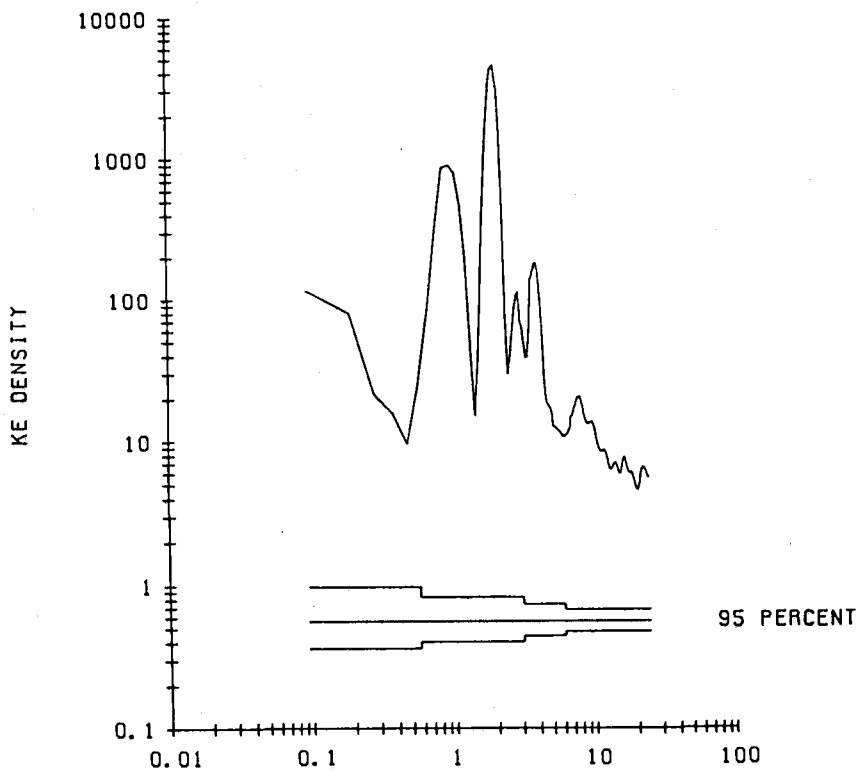
UNFILTERED TEMPERATURE. 191 M AT GIBRALTAR C-2.



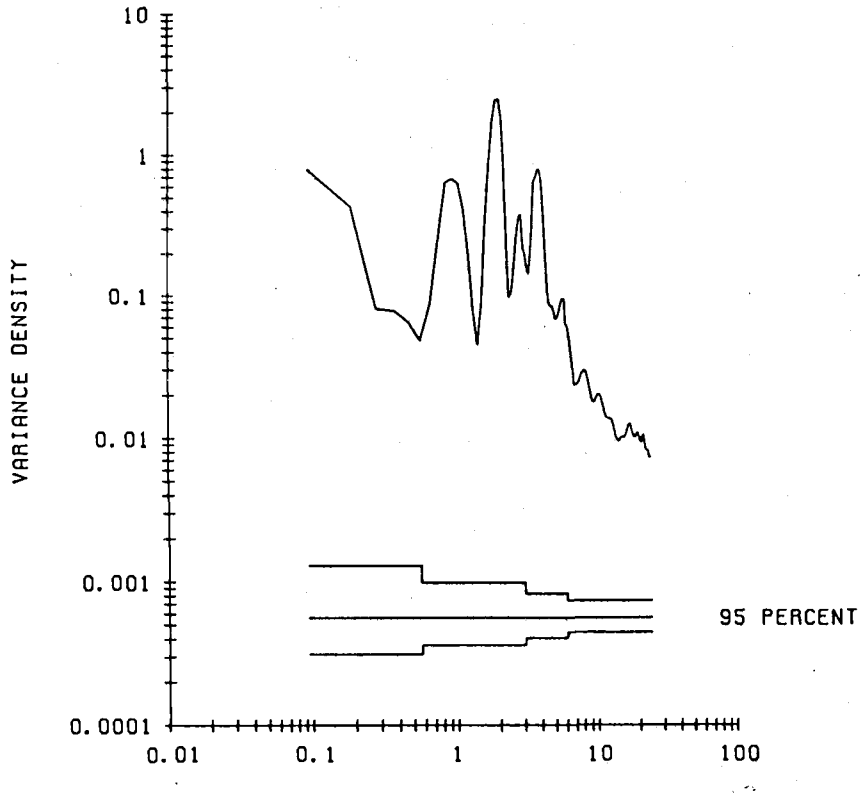
UNFILTERED SALINITY. 191 M AT GIBRALTAR C-2.



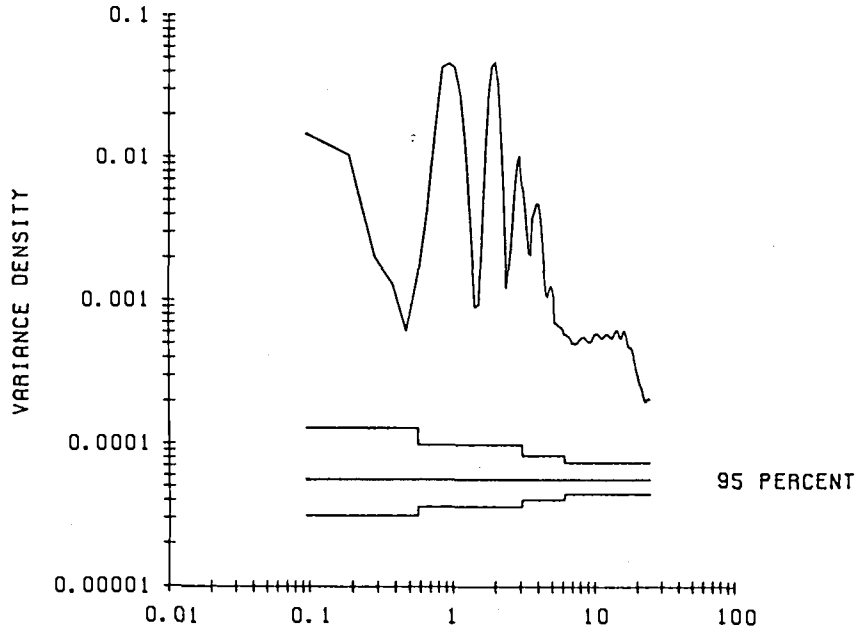
UNFILTERED CURRENT. 254 M AT GIBRALTAR C-2.



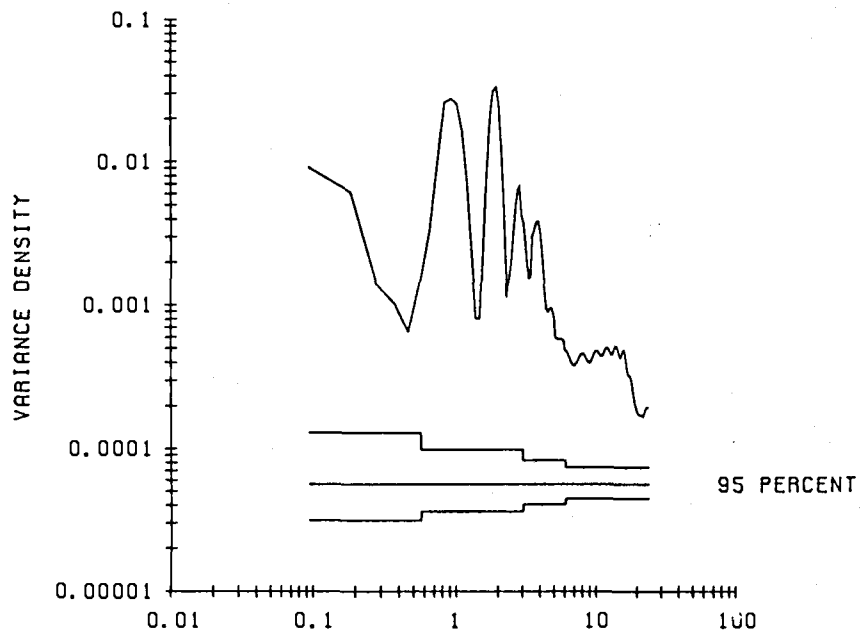
UNFILTERED PRESSURE. 254 M AT GIBRALTAR C-2.



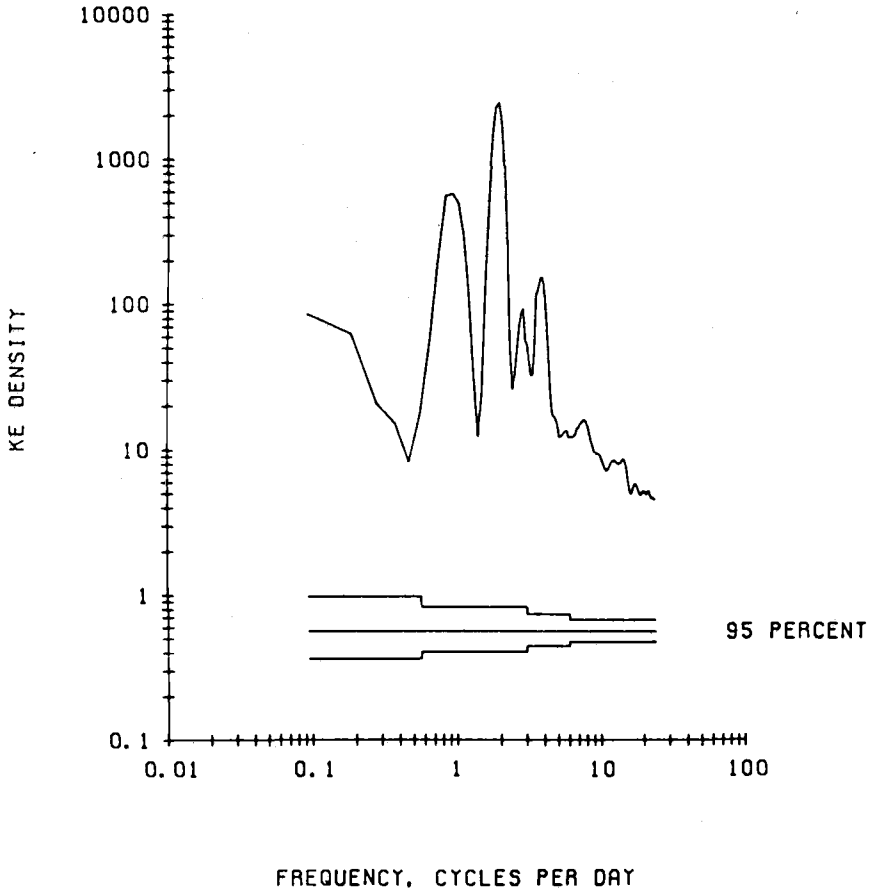
UNFILTERED TEMPERATURE. 254 AT GIBRALTAR C-2.



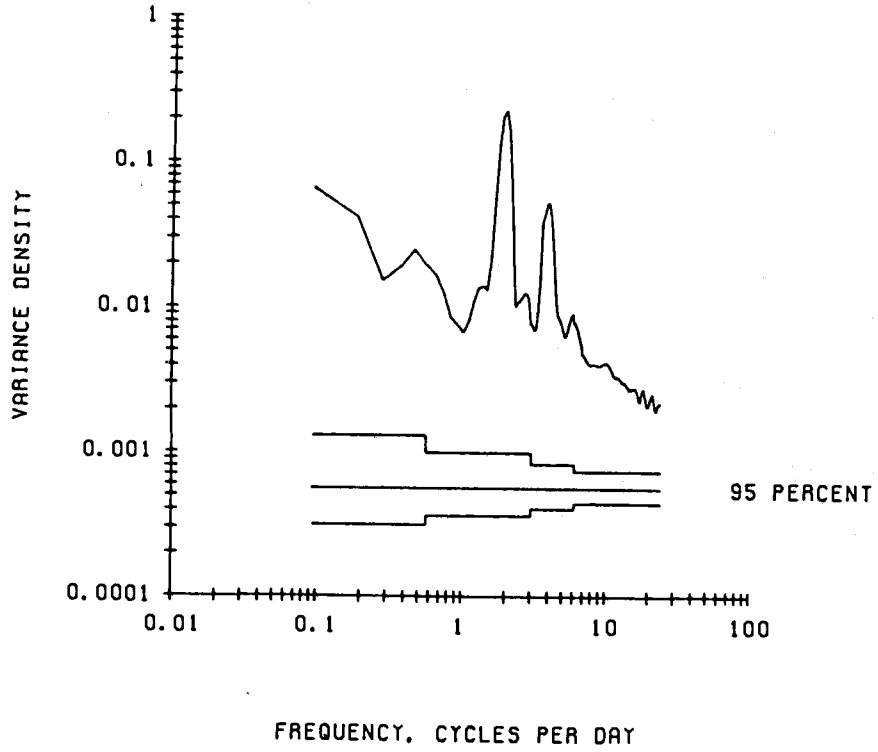
UNFILTERED SALINITY. 254 M AT GIBRALTAR C-2.



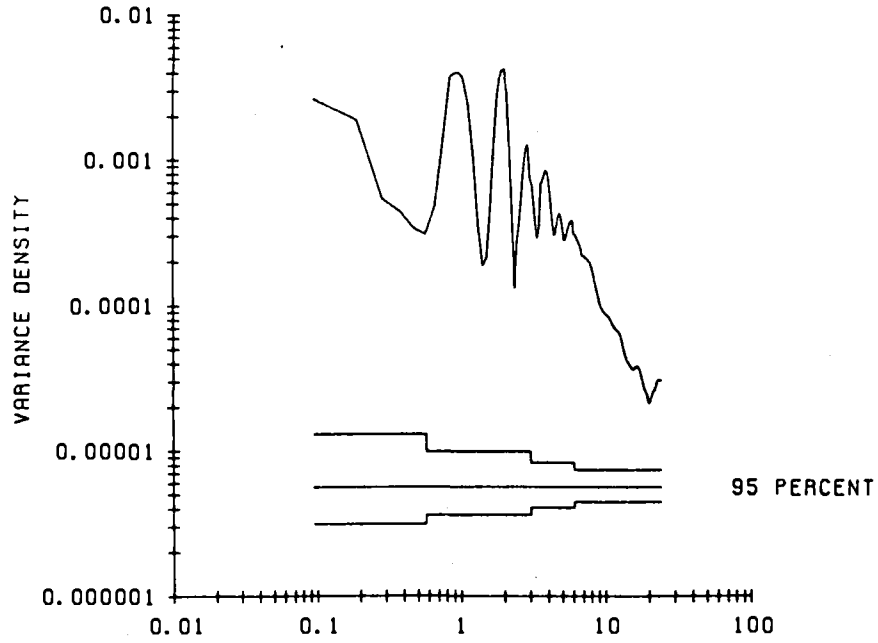
UNFILTERED CURRENT. 306 M AT GIBRALTAR C-2.



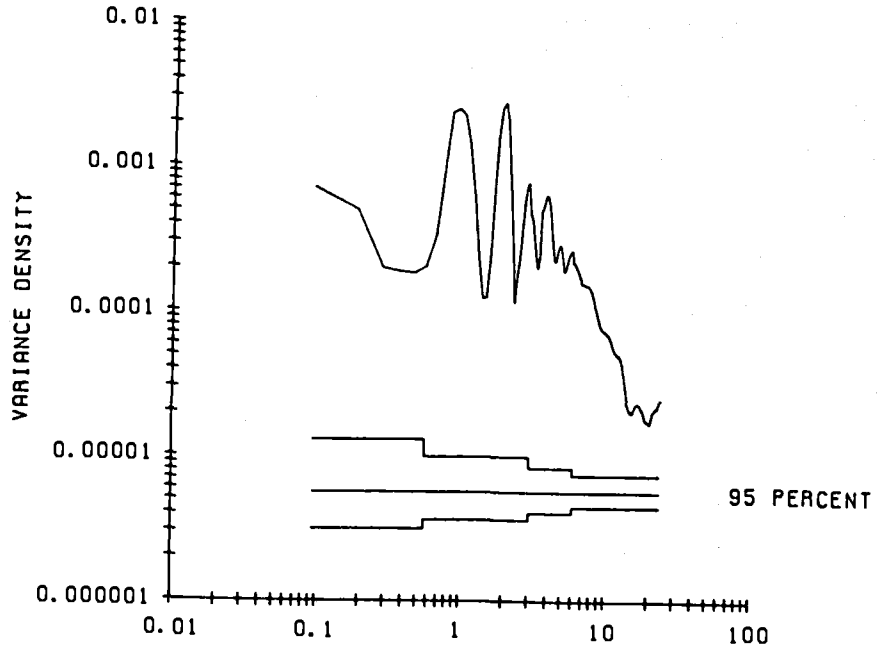
UNFILTERED PRESSURE. 306 M AT GIBRALTAR C-2.

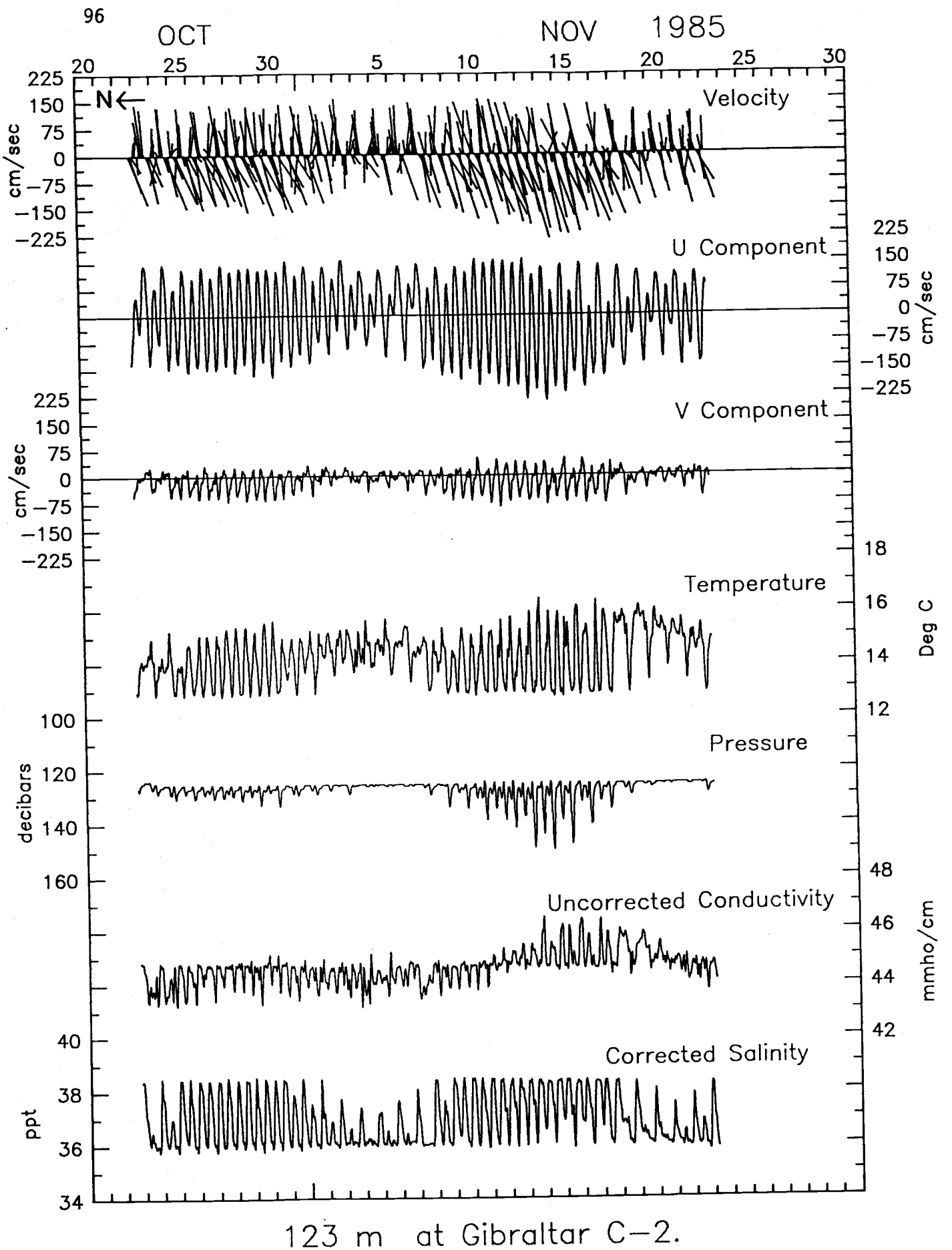


UNFILTERED TEMPERATURE. 306 M AT GIBRALTAR C-2.

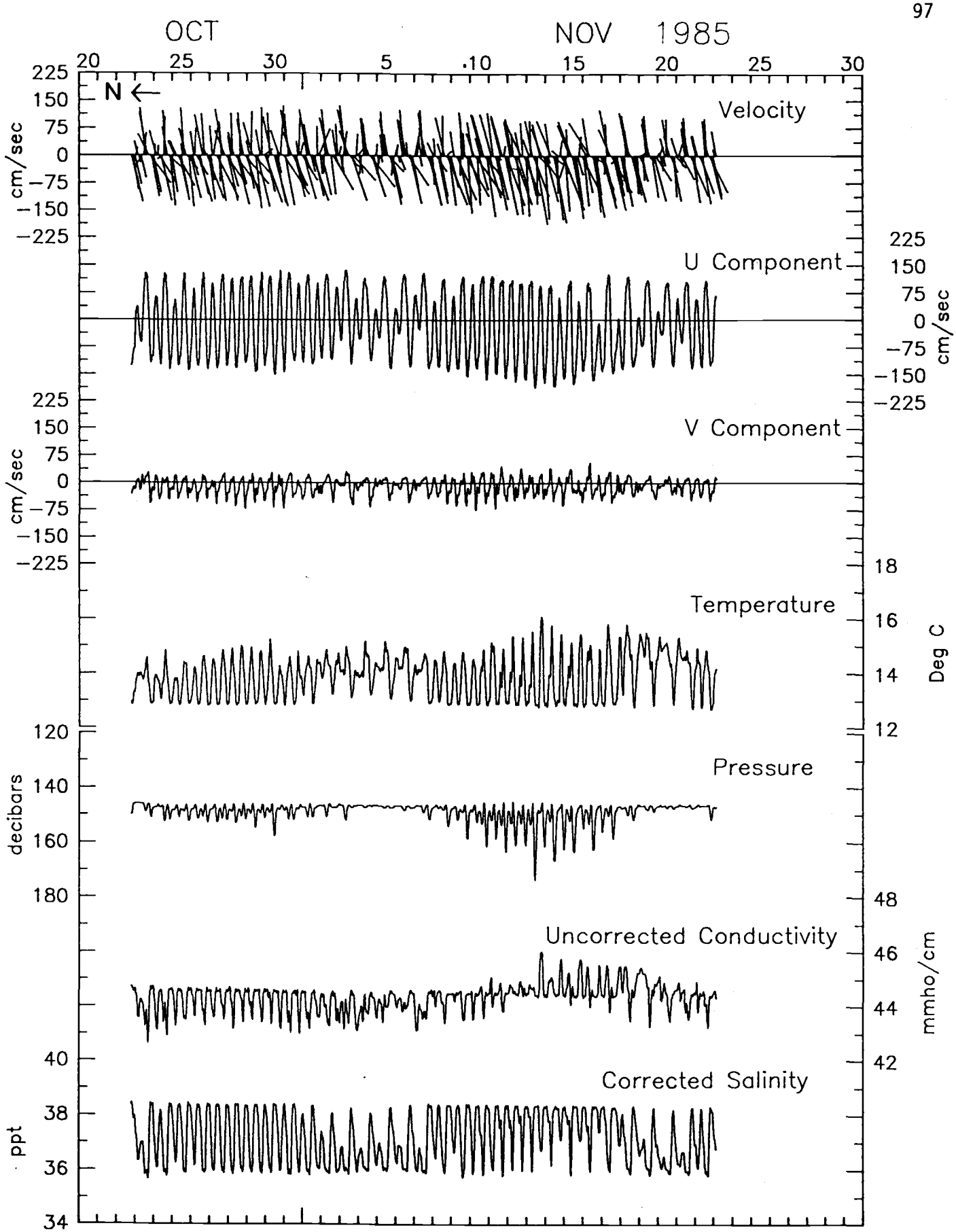


UNFILTERED SALINITY. 306 M AT GIBRALTAR C-2.

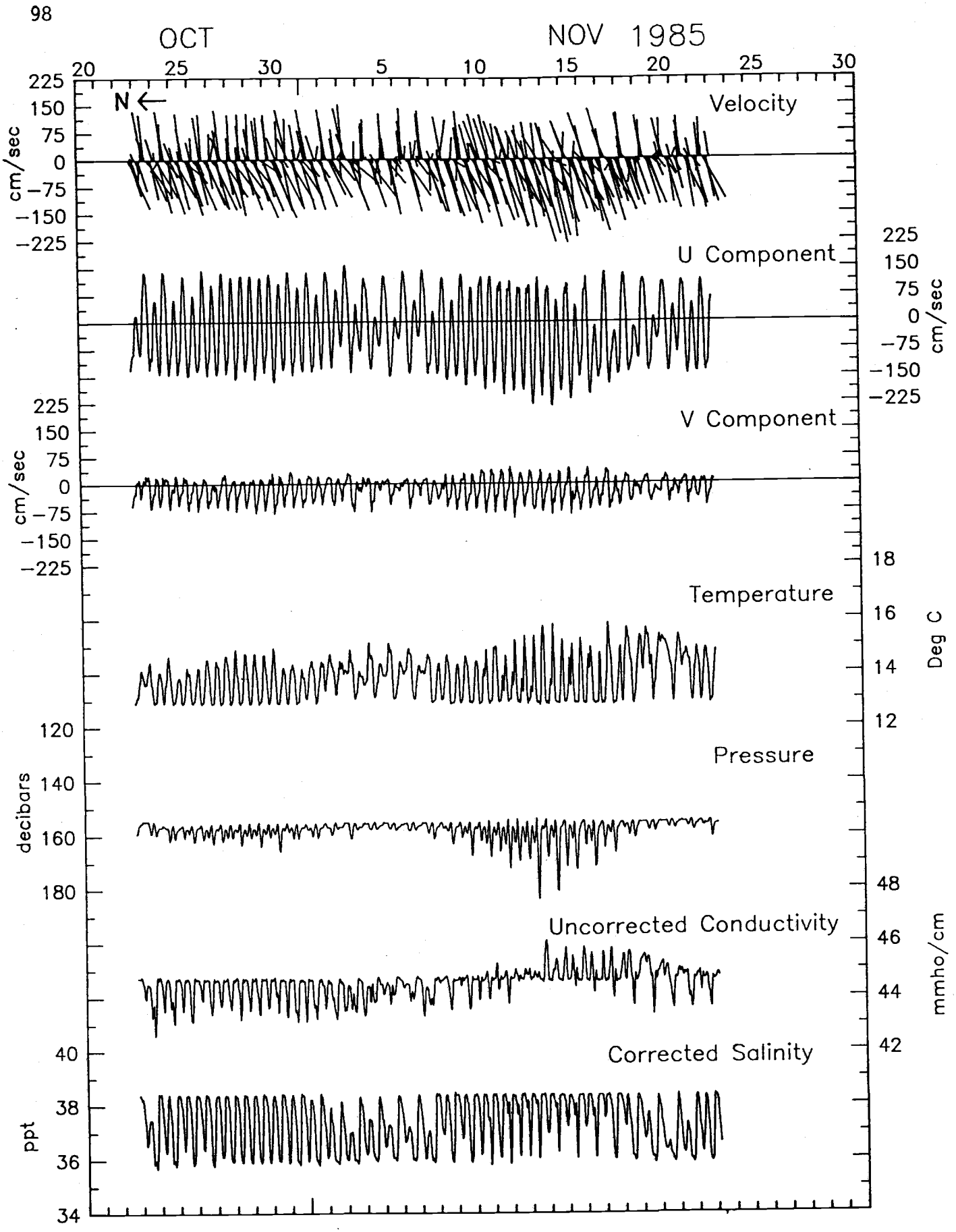




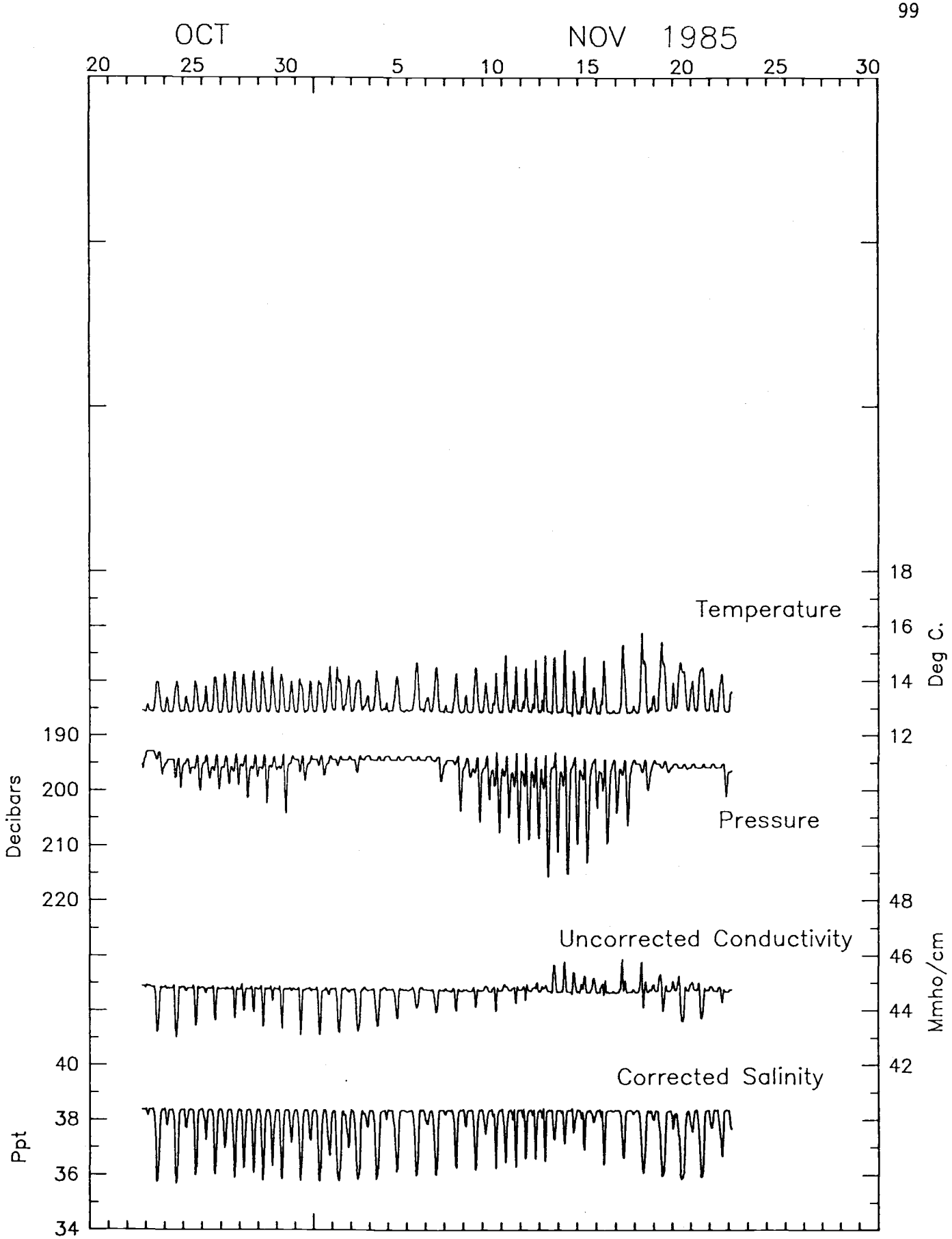
123 m at Gibraltar C−2.



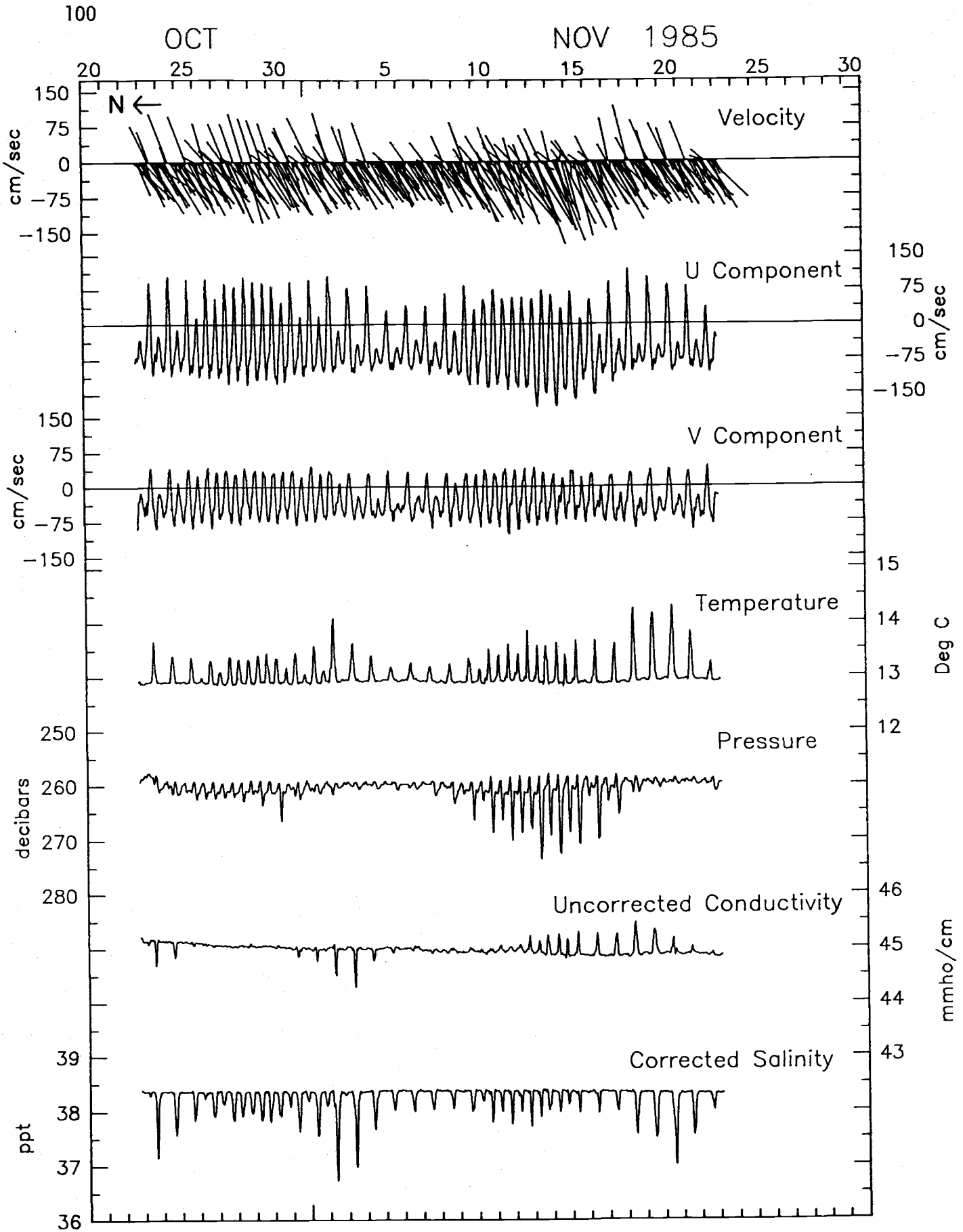
143 m at Gibraltar C−2.



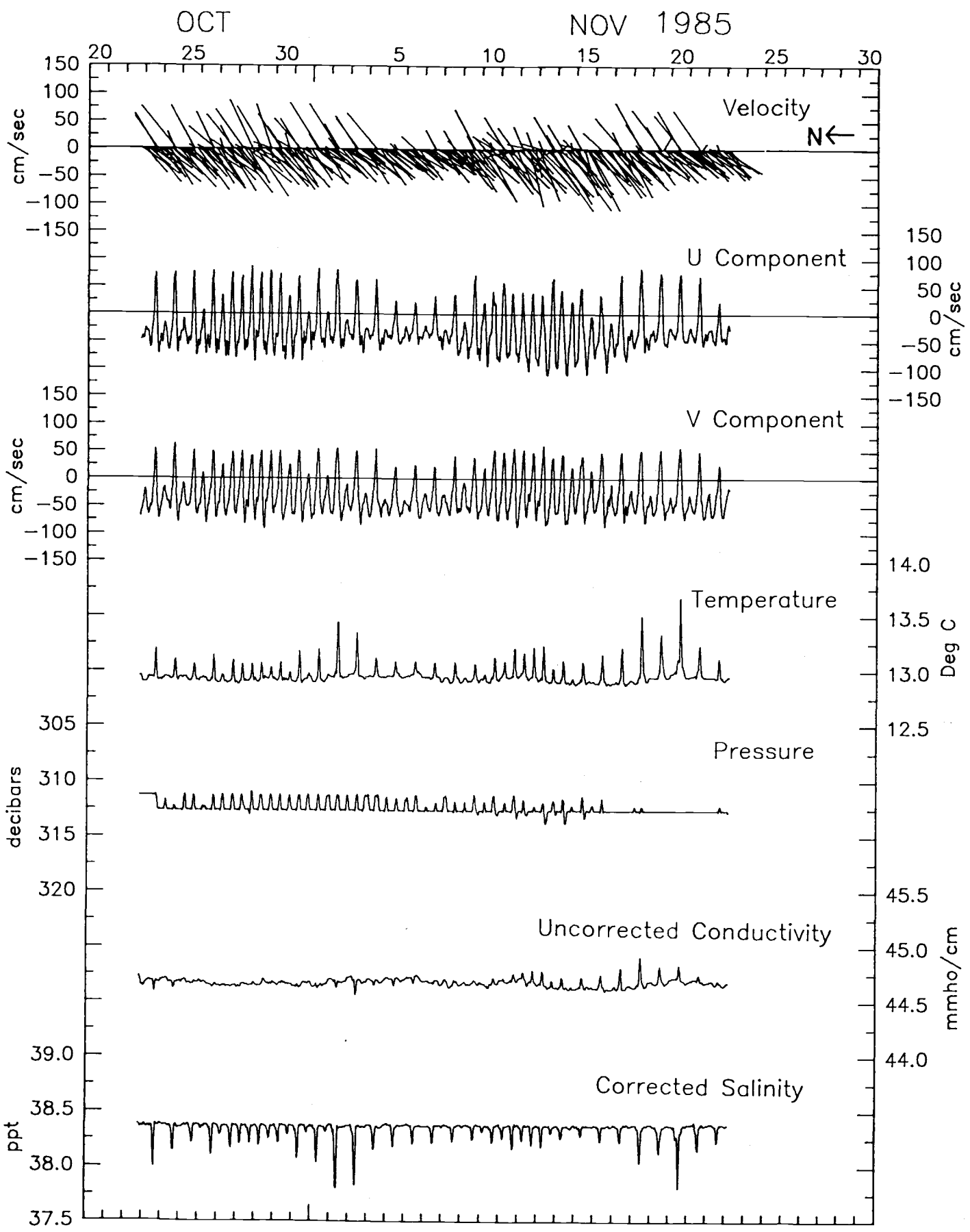
153 m at Gibraltar C−2.



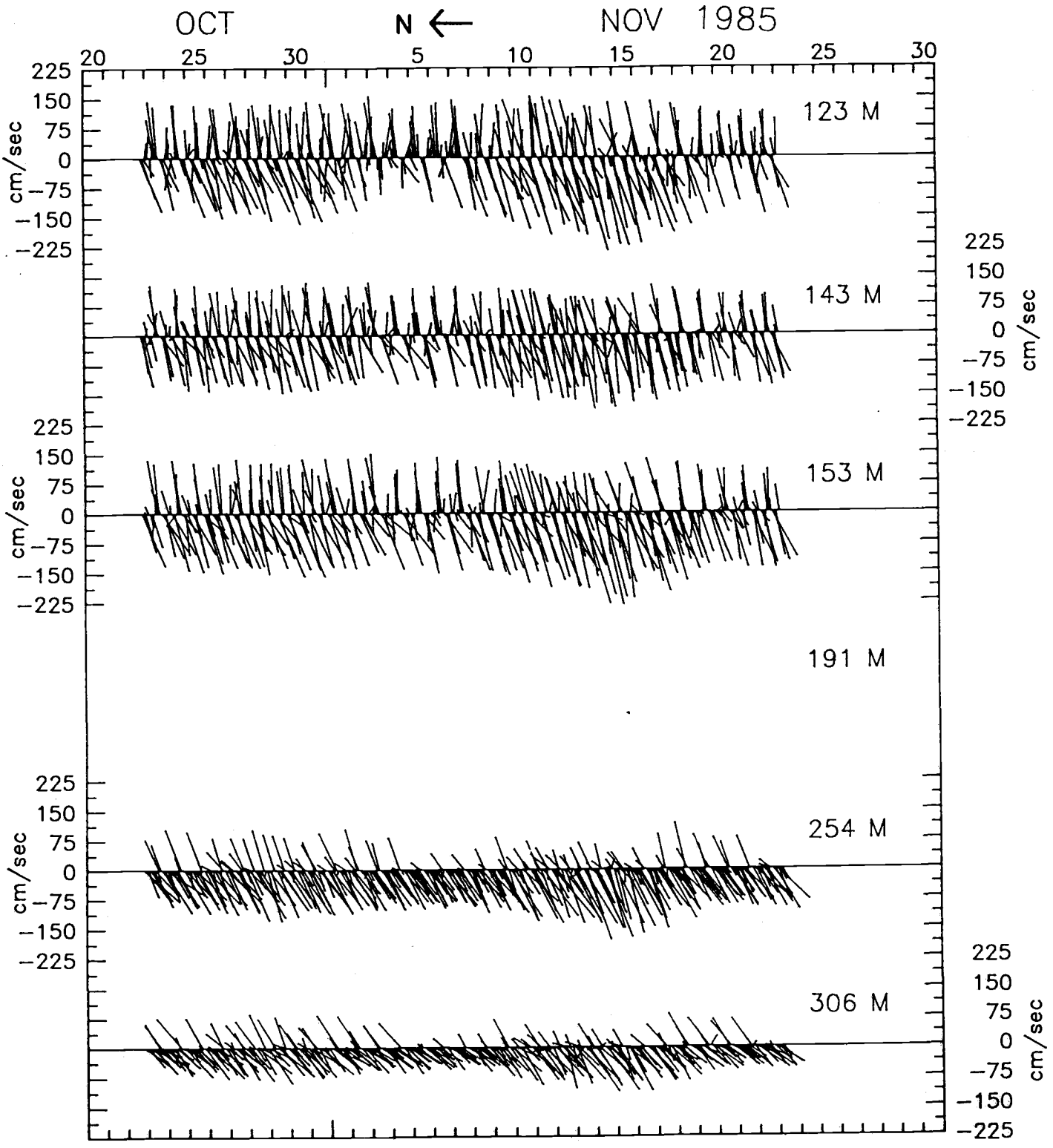
191 m at Gibraltar C–2.



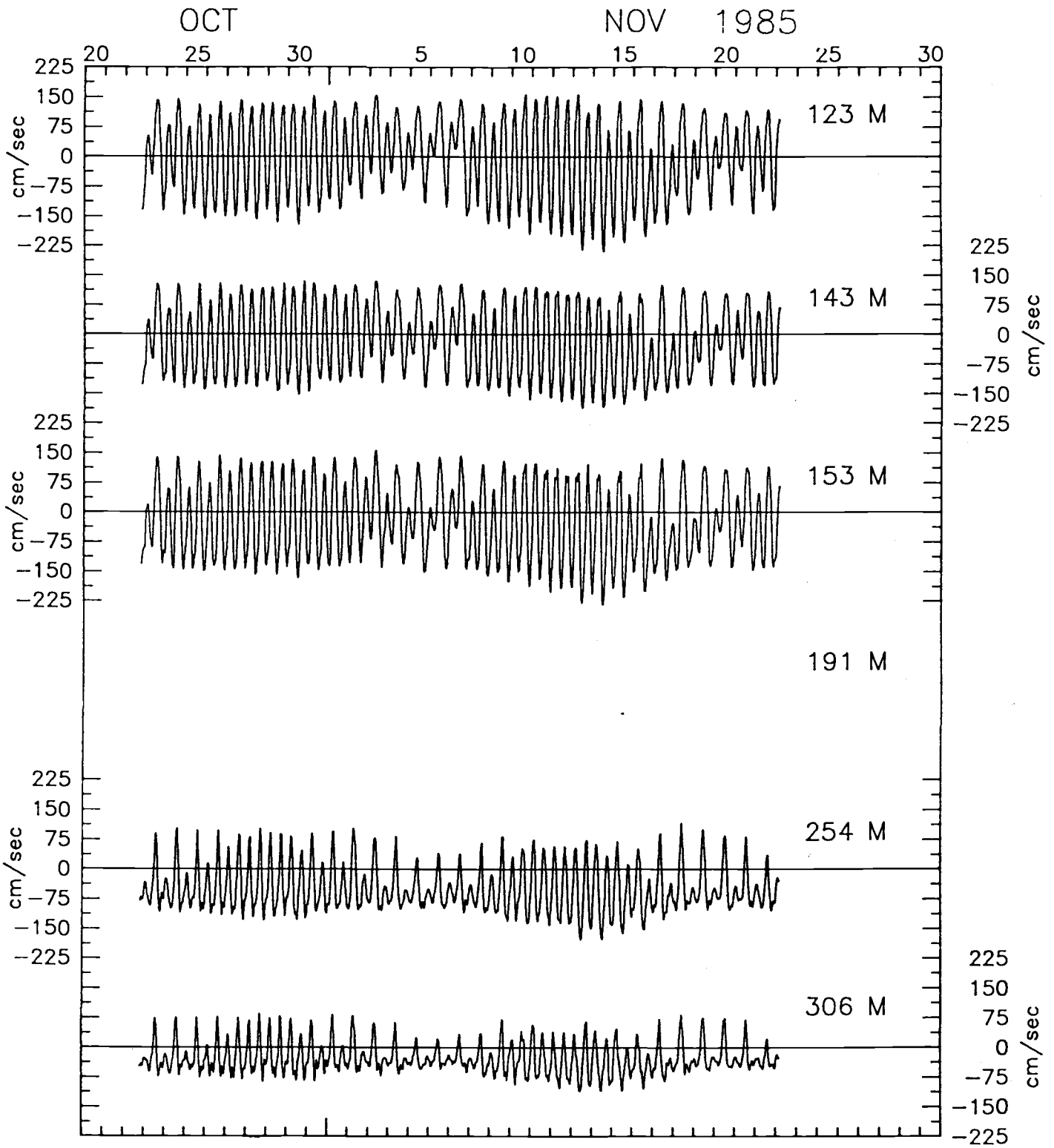
254 m at Gibraltar C−2.



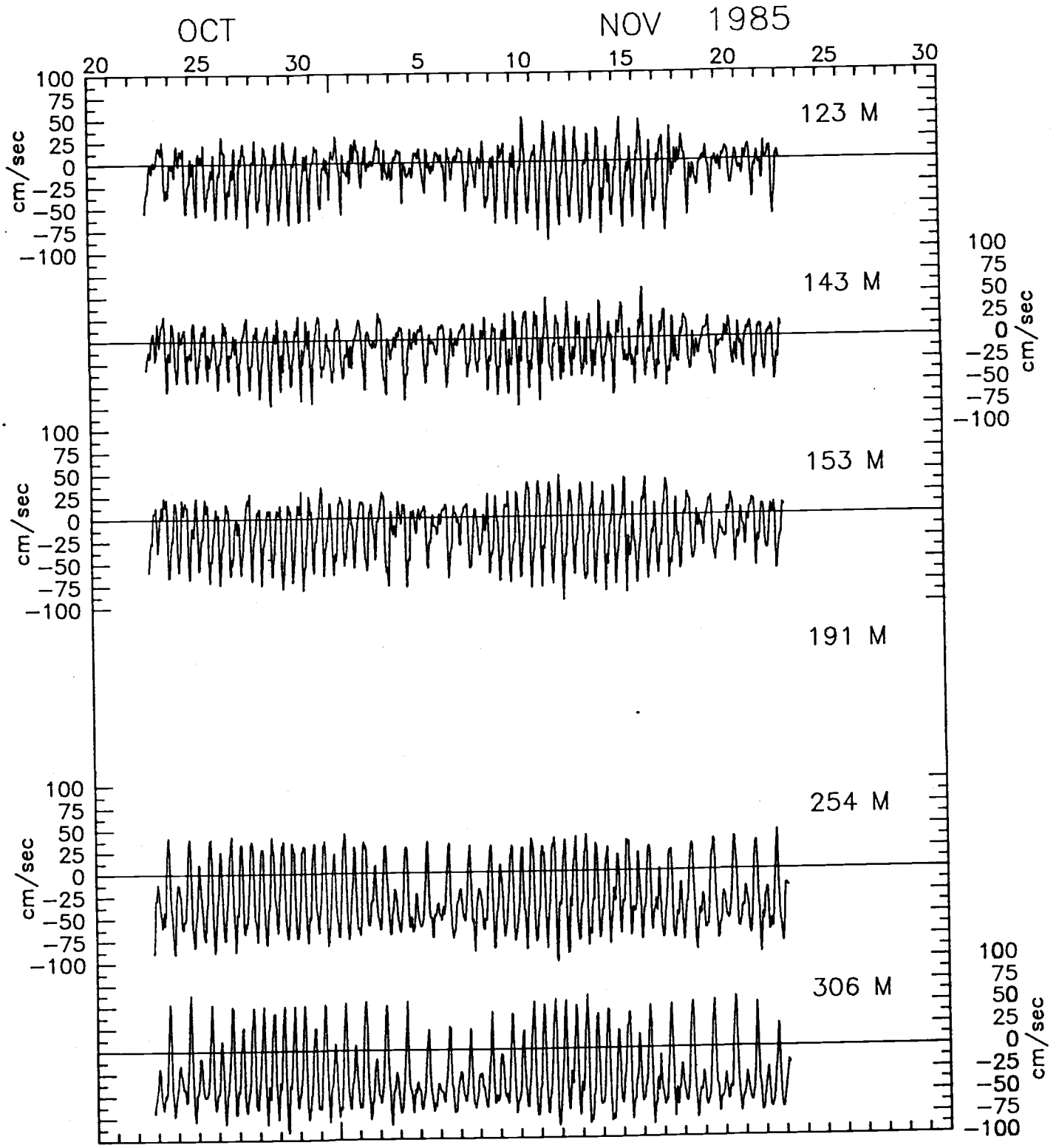
306 m at Gibraltar C−2.



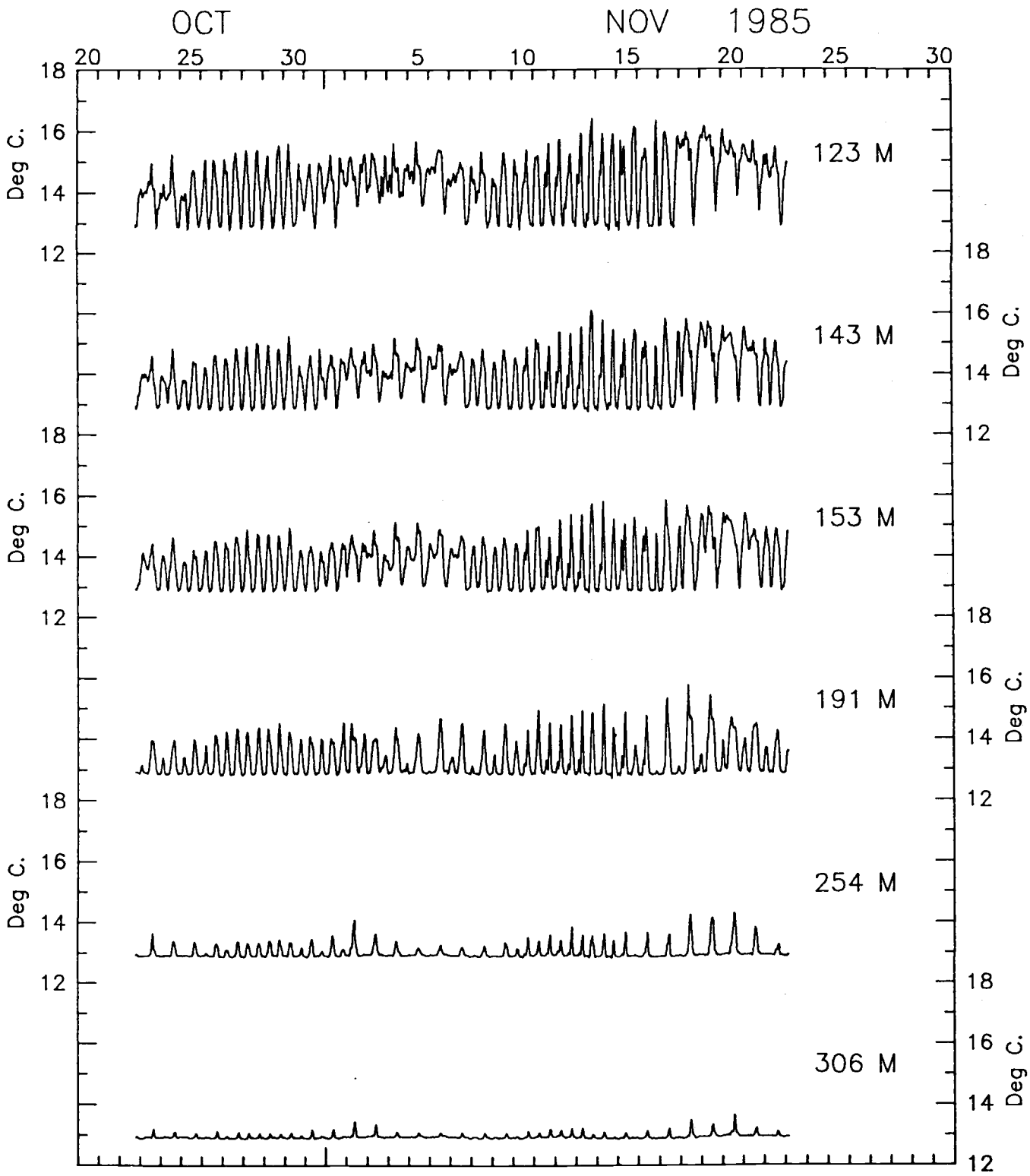
Velocity at Gibraltar Mooring C−2.



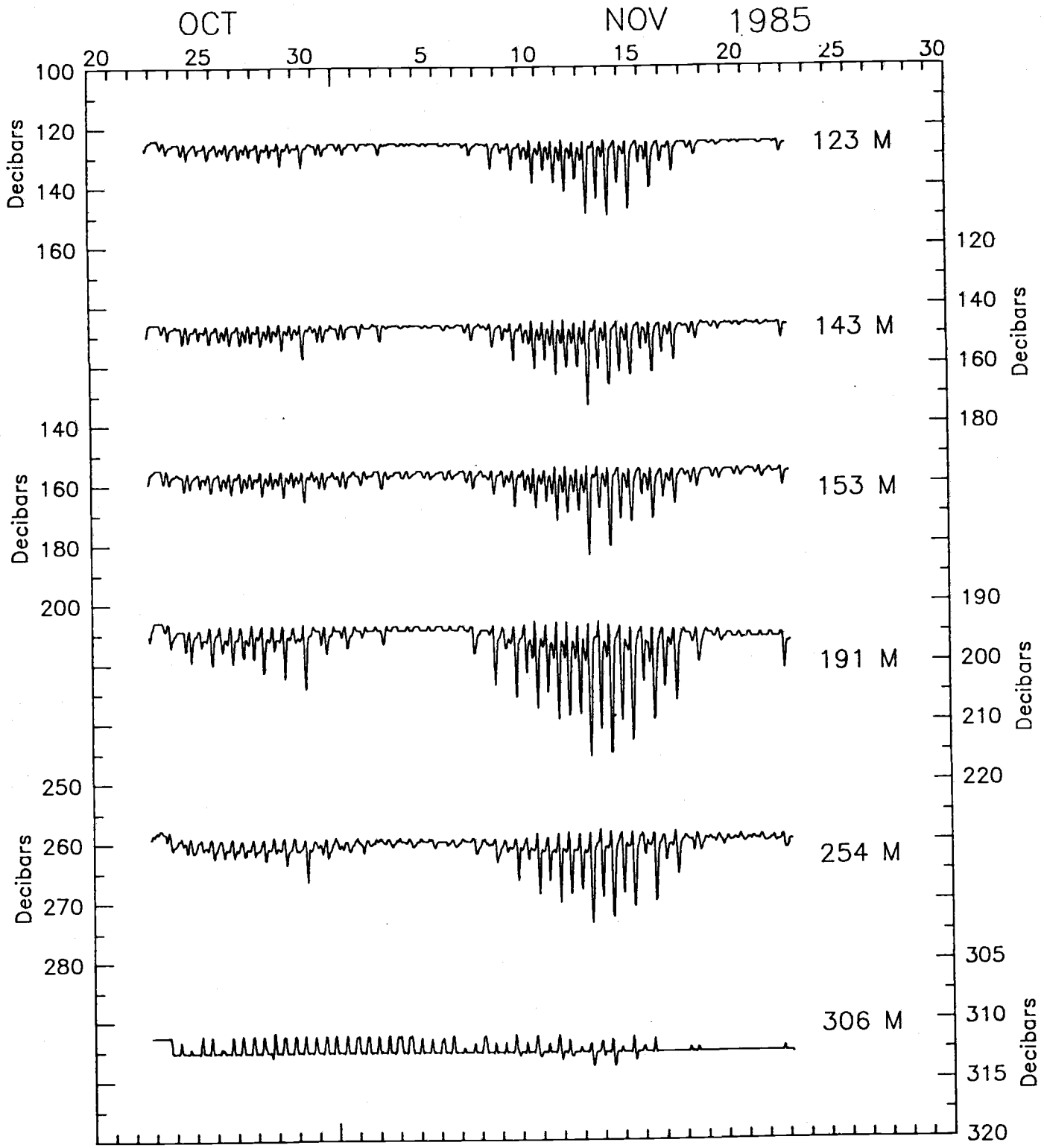
U Component at Gibraltar Mooring C−2.



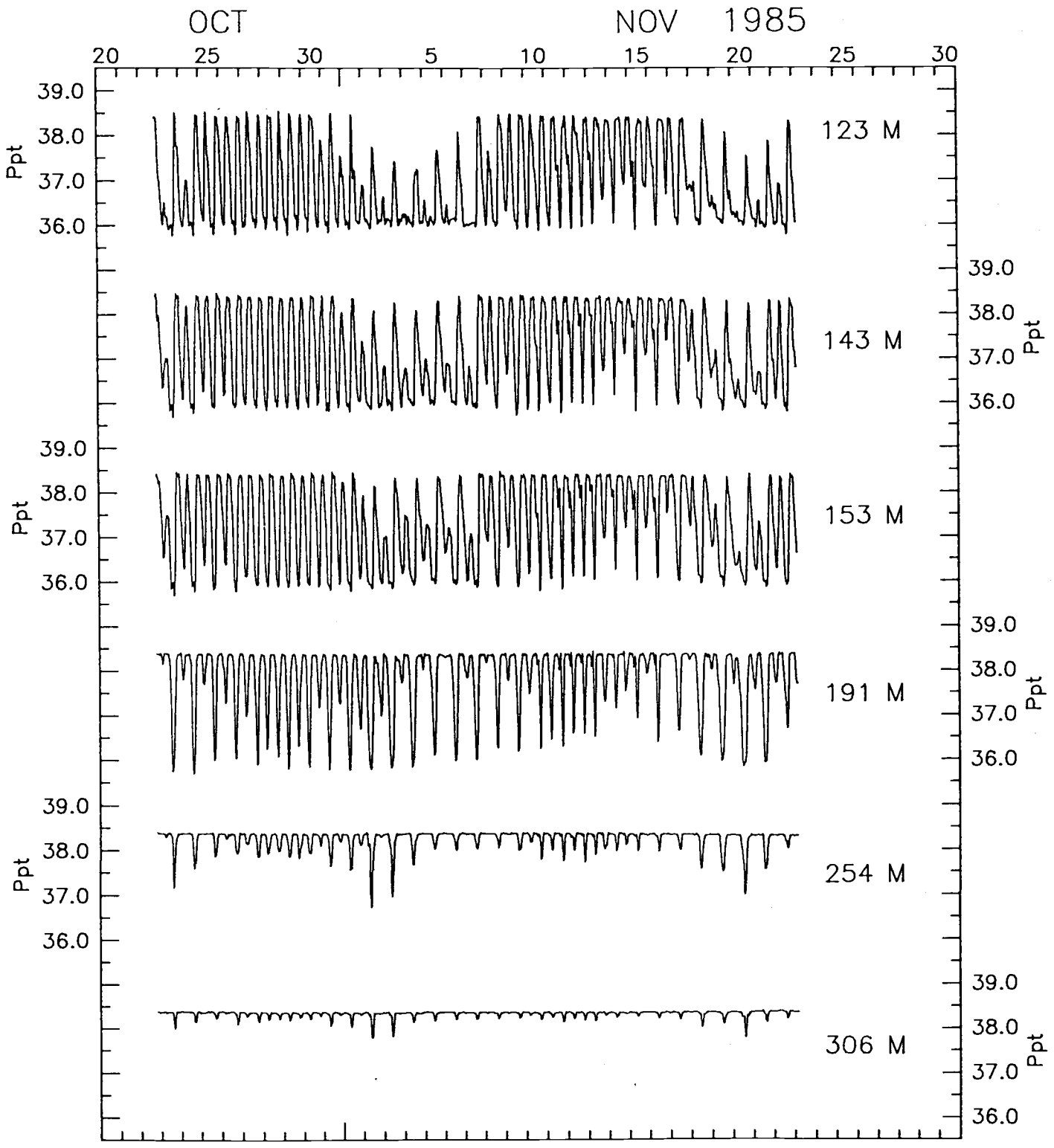
V Component at Gibraltar Mooring C−2.



Temperature at Gibraltar Mooring C–2.

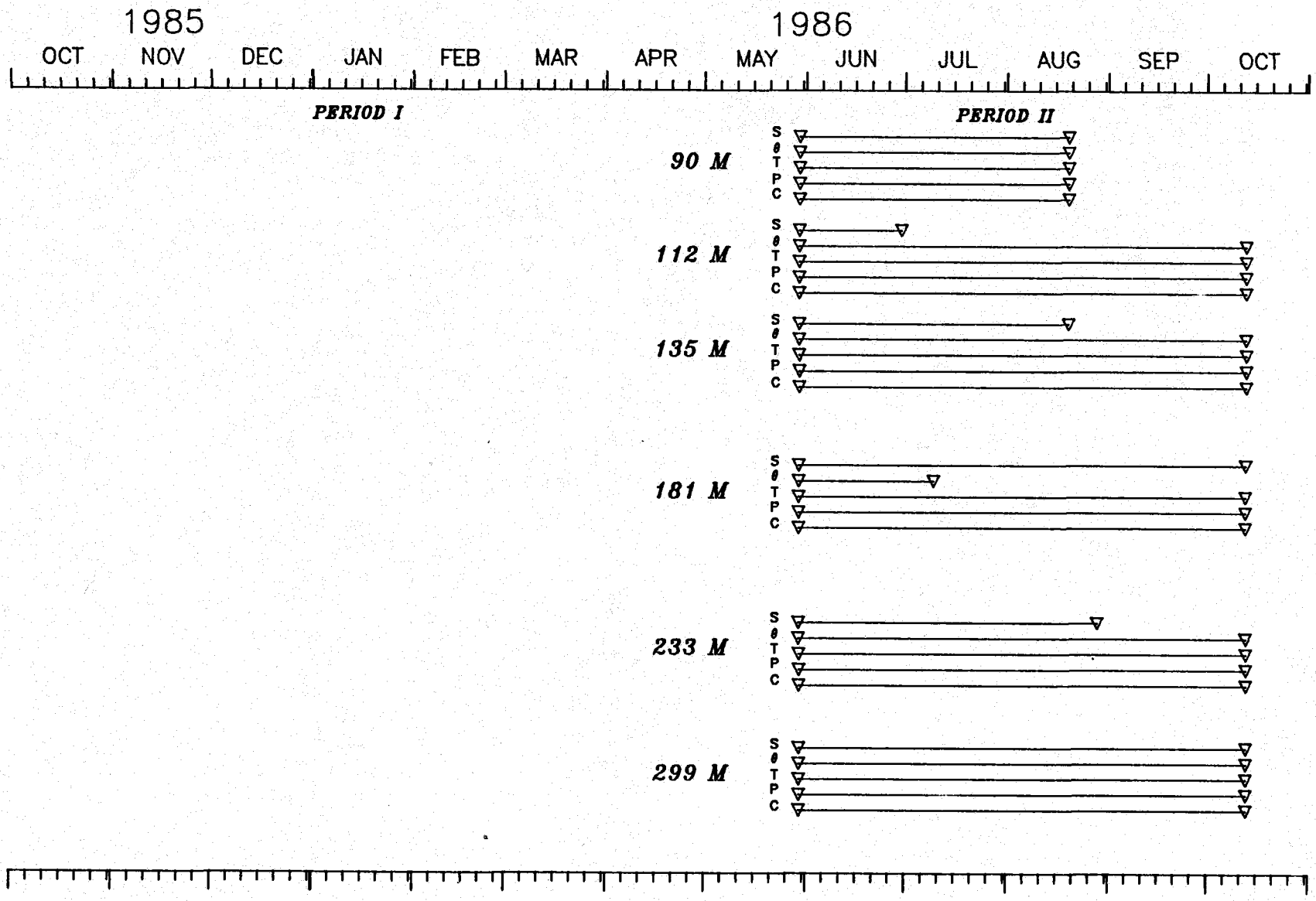


Pressure at Gibraltar Mooring C–2.



Corrected Salinity at Mooring C—2.

Mooring C - 2B



DATA RETURN FROM GIBRALTAR C–2B.

STATISTICS
MOORING GIBRALTAR C-2B PERIOD II
29 MAY 86 - 13 OCT 86

HALF-HOURLY UNFILTERED DATA
35°54.74'N, 5°44.55'W
Bottom depth: 310 m

		MEAN	SD	MIN	MAX	LENGTH	COMMENTS
5649/20	s	93.06	54.04	7.50	307.10	3948	A cycling problem, probably caused by line vibration, created repeated cycles in all paramaters. The additional cycles were identified by repeated constant speed values and were eleminated. The rotor fell off 19 AUG and the record was terminated then; without the speed record it was impossible to identify the spurious cycles. The very low salinities are a result of high temperatures 14 AUG 86 (0844 to 1044). The suspicious points have been retained.
90 m	u	14.03	100.63	-248.00	253.50	3948	
	v	-1.94	35.42	-219.00	184.70	3948	
	T	14.43	0.84	12.72	17.52	3948	
	P	101.60	10.31	91.20	169.70	3948	
	C	43.60	0.53	41.19	45.22	3948	
	S	36.63	0.84	33.45	39.02	3948	
6590/17	s	90.98	47.68	12.30	279.40	1500	This meter lost its rotor after 0003 30 Jun 86.
112 m	u	-1.64	95.87	-216.10	188.40	1500	
	v	0.24	36.86	-199.30	191.20	1500	
	T	13.92	0.71	12.67	16.53	6566	
	P	122.86	10.73	112.60	186.90	6566	
	C	44.12	0.58	41.70	45.87	6566	
	S	36.95	0.93	35.20	38.57	6566	
6593/15	s	92.85	45.85	9.90	223.40	3966	A speed dropout has been bridged in lines 2603 - 2615 (2321 22 JUL 86 - 0521 23 JUL 86). The meter lost its rotor after 0851 20 AUG 86.
135 m	u	-26.56	93.87	-221.30	169.70	3966	
	v	-13.37	32.07	-126.20	132.00	3966	
	T	13.55	0.59	12.59	15.68	6566	
	P	150.51	11.12	135.60	206.00	6566	
	C	44.41	0.62	41.70	46.08	6566	
	S	37.41	0.92	35.36	38.46	6566	

(speed, u, and v are given in cm/sec; Temperature in °C; Pressure in decibars; Conductivity in mmho/cm; and Corrected Salinity in ppt. The sampling rate is 30 min.)

		MEAN	SD	MIN	MAX	LENGTH	COMMENTS
5886/20	s	80.55	36.90	7.30	188.50	6566	Direction, u, and v have been eleminated beyond
181 m	u	-47.27	77.31	-186.20	126.90	1979	line 1979 (2302 9 JUL 86). The meters direction
	v	-19.36	35.37	-119.70	70.20	1979	vane evidently broke off at this point.
	T	13.20	0.41	12.83	15.29	6566	Conductivity has been bridged in lines 1366 - 1376
	P	191.91	9.55	182.80	243.00	6566	(0432 27 JUN 86 - 0932 27 JUN 86).
	C	44.47	0.43	41.76	45.35	6566	
	S	37.91	0.68	34.98	38.47	6566	
5648/28	s	80.22	38.84	6.20	193.30	4413	Speed has been bridged in lines 1049 - 1060 (1426
233 m	u	-56.94	56.01	-190.90	105.10	4413	20 JUN 86 - 1956 20 JUN 86). Speed, u, and v
	v	-21.25	33.36	-125.70	85.80	4413	have been zeroed after line 4413 (1626 29 AUG
	T	12.98	0.17	12.85	14.53	6564	86) when the meter lost its rotor.
	P	247.23	6.70	235.20	275.30	6564	
	C	44.75	0.19	43.24	45.33	6564	
	S	38.28	0.22	36.22	38.48	6564	
1241/38	s	62.07	29.58	0.80	136.10	6563	Speed dropouts were bridged at the following locations:
299 m	u	-38.94	38.19	-125.40	103.10	6563	lines 1256 - 1309 (2153 24 JUN - 0023 26 JUN); 2541 -
	v	-25.51	33.20	-109.30	80.50	6563	2548 (1623 21 JUL - 1953 21 JUL); 2657 - 2669 (0223 24
	T	12.95	0.08	12.86	13.87	6563	JUL - 0823 24 JUL); 4017 - 4025 (1023 21 AUG - 1423 21
	P	305.63	1.20	301.60	309.80	6563	AUG); and 5285 - 5297 (2023 16 SEP - 0223 17 SEP).
	C	44.60	0.08	43.61	44.82	6563	Conductivity was bridged in lines 1936 - 1951 (0153 9
	S	38.33	0.11	36.96	38.42	6563	JUL - 0923 9 JUL) & 2489 - 2500 (1423 20 JUL - 1953 20 JUL). There are suspicious changes in the level of the conductivity record on 25 JUN and 9 JUL. The file is about 1 hour short, the clock appears accurate within two minutes, so two cycles may have been lost within the file.

(speed, u, and v are given in cm/sec; Temperature in °C; Pressure in decibars; Conductivity in mmho/cm; and Corrected Salinity in ppt. The sampling rate is 30 min.)

STATISTICS
MOORING GIBRALTAR C-2B PERIOD II
31 MAY 86 - 12 OCT 86

6-HOURLY FILTERED DATA
35°54.74'N, 5°44.55'W
Bottom depth: 310 m

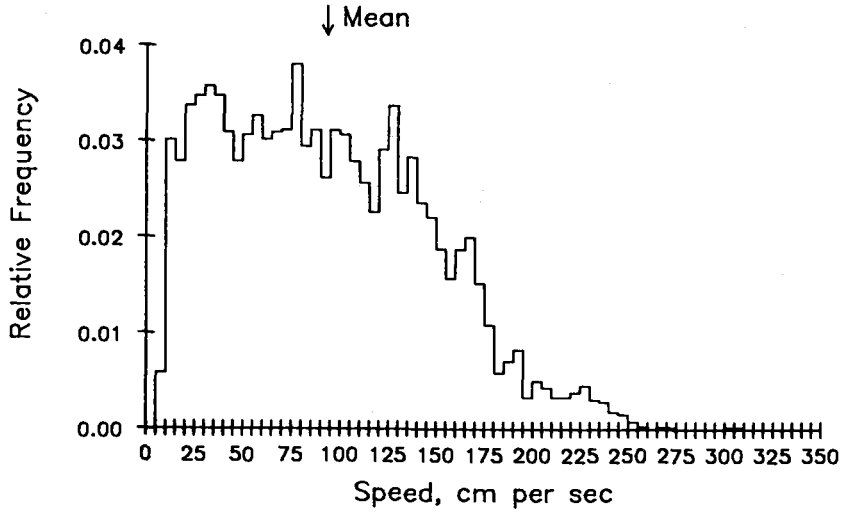
		MEAN	SD	MIN	MAX	LENGTH	COMMENTS
5649/20	u	14.02	17.67	-22.31	55.13	318	(see comments on half-hourly statistics page)
90 m	v	-1.75	8.37	-32.87	29.19	318	
	T	14.44	0.32	13.89	15.49	318	
	P	101.48	3.61	95.88	111.70	318	
	C	43.60	0.27	42.80	44.08	318	
	S	36.62	0.37	35.52	37.43	318	
6590/17	u	-3.32	16.93	-32.36	35.96	114	(see comments on half-hourly statistics page)
112 m	v	-0.74	7.69	-13.76	17.82	114	
	T	13.92	0.20	13.52	14.58	537	
	P	122.89	3.83	115.91	130.96	537	
	C	44.13	0.34	43.11	44.68	537	
	S	36.95	0.37	36.00	37.65	537	
6593/15	u	-26.75	12.83	-61.80	12.13	320	(see comments on half-hourly statistics page)
135 m	v	-13.51	3.51	-21.09	-1.55	320	
	T	13.55	0.14	13.25	13.92	537	
	P	150.55	4.23	140.22	159.85	537	
	C	44.41	0.26	43.55	44.86	537	
	S	37.42	0.26	36.72	37.94	537	

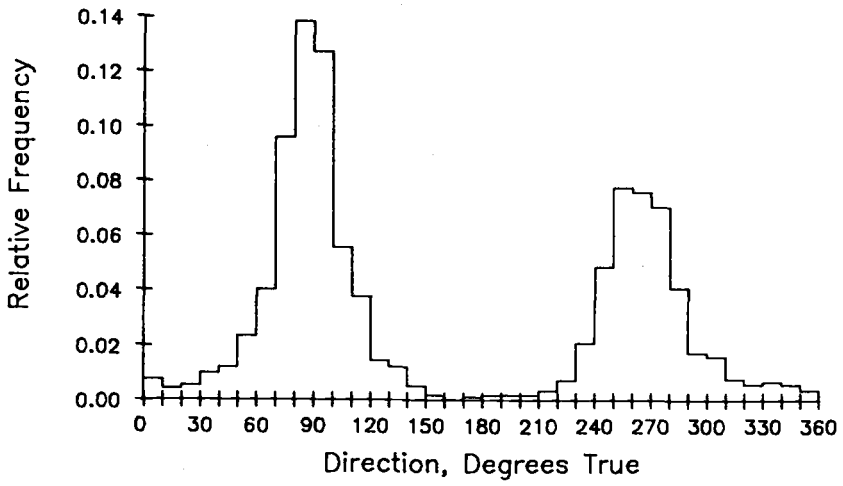
(speed, u, and v are given in cm/sec; Temperature in °C; Pressure in decibars; Conductivity in mmho/cm; and Corrected Salinity in ppt. The sampling rate is 360 min.)

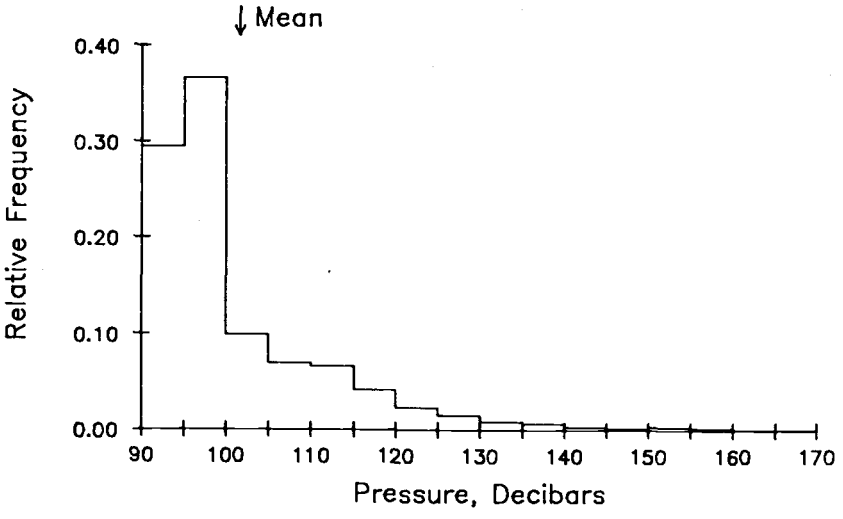
		MEAN	SD	MIN	MAX	LENGTH	COMMENTS
5886/20	u	-48.13	12.59	-78.62	-20.72	154	(see comments on half-hourly statistics page)
181 m	v	-19.49	4.59	-29.85	-10.39	154	
	T	13.20	0.10	12.96	13.57	537	
	P	191.95	3.20	185.79	198.85	537	
	C	44.47	0.13	44.00	44.69	537	
	S	37.91	0.16	37.31	38.29	537	
5648/28	u	-57.06	8.28	-77.70	-39.27	357	(see comments on half-hourly statistics page)
233 m	v	-20.89	8.13	-40.62	-0.40	357	
	T	12.98	0.06	12.88	13.16	536	
	P	247.26	2.00	243.43	252.03	536	
	C	44.75	0.16	44.54	45.24	536	
	S	38.28	0.07	38.11	38.46	536	
1241/38	u	-39.06	8.89	-63.06	-13.65	536	(see comments on half-hourly statistics page)
299 M	v	-25.50	7.33	-43.76	-7.59	536	
	T	12.95	0.03	12.88	13.03	536	
	P	305.62	0.74	304.27	307.14	536	
	C	44.60	0.07	44.31	44.75	536	
	S	38.33	0.07	38.02	38.39	536	

(speed, u, and v are given in cm/sec; Temperature in °C; Pressure in decibars; Conductivity in mmho/cm; and Corrected Salinity in ppt. The sampling rate is 360 min.)

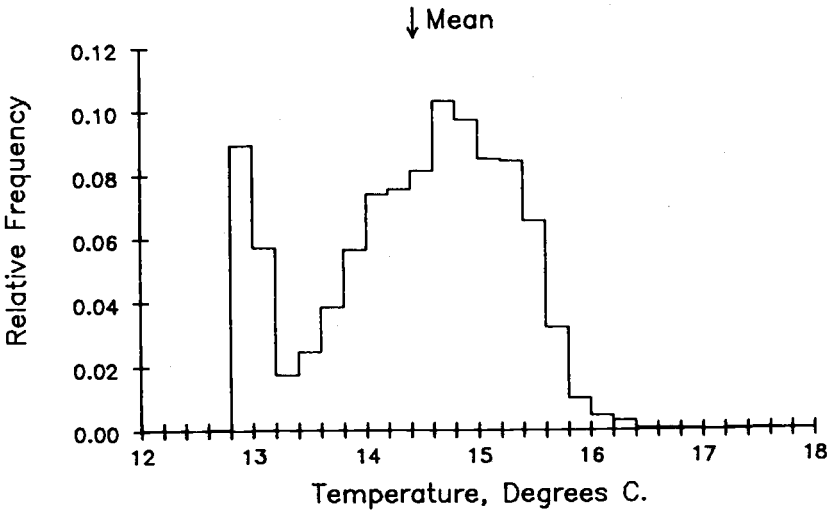
90 M AT GIBRALTAR C–2B. 29 MAY 86 – 19 AUG 86. TAPE 5649/20.

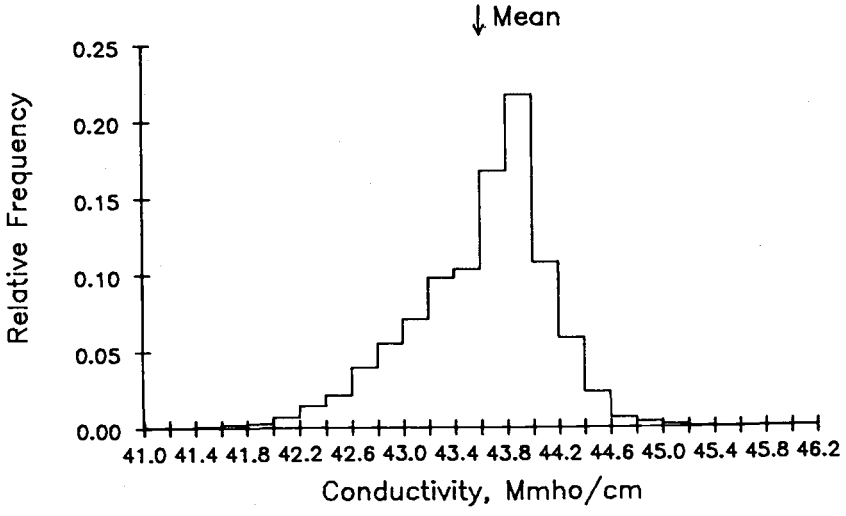


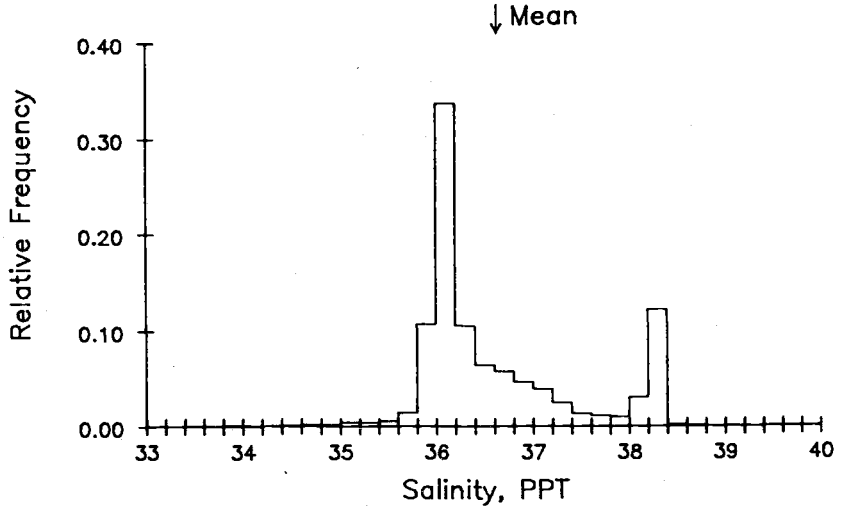




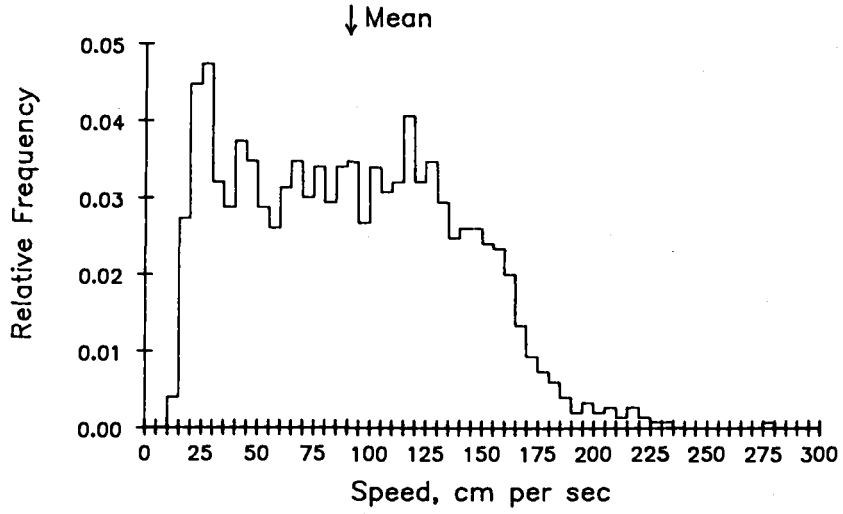
90 M AT GIBRALTAR C–2B. 29 MAY 86 – 19 AUG 86. TAPE 5649/20.

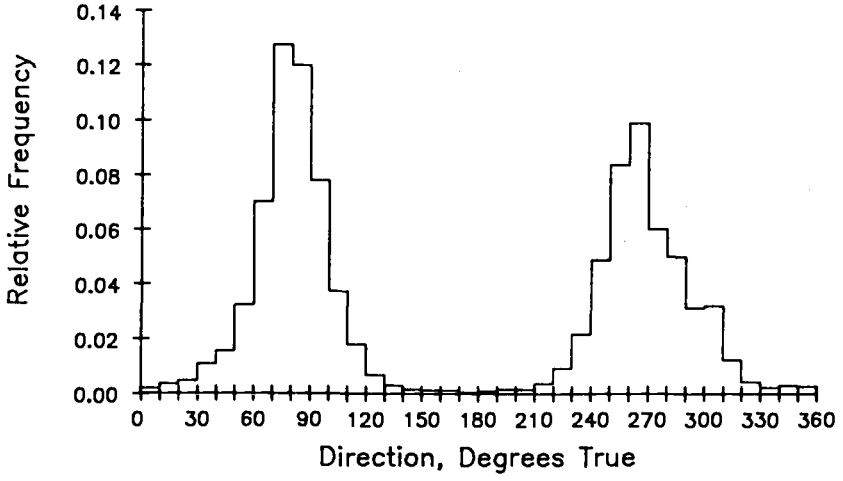


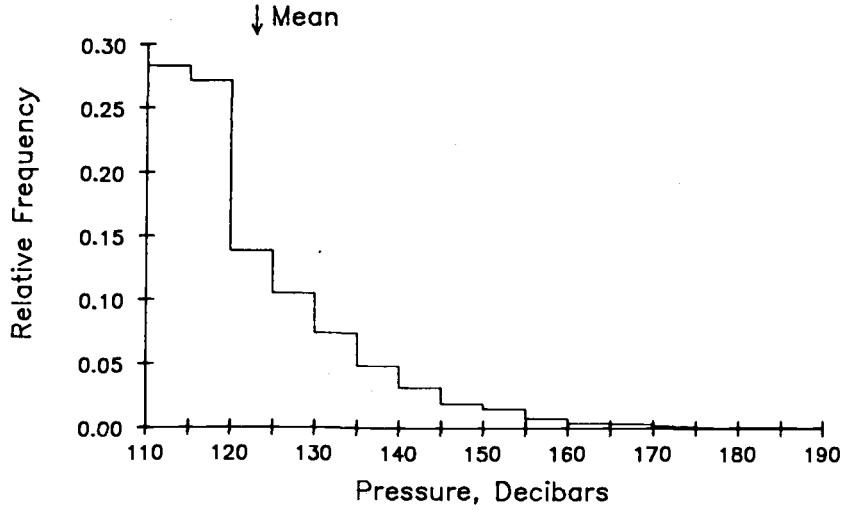




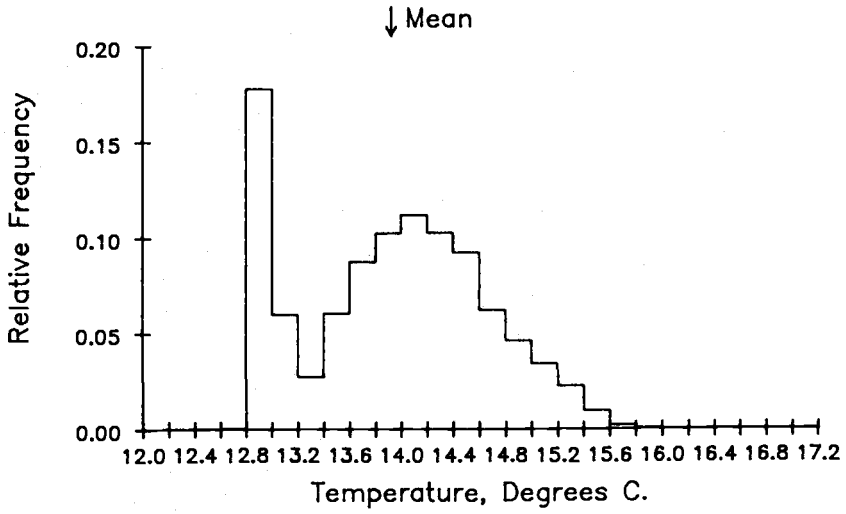
112 M AT GIBRALTAR C-2B. 29 MAY 86 - 13 OCT 86. TAPE 6590/17.

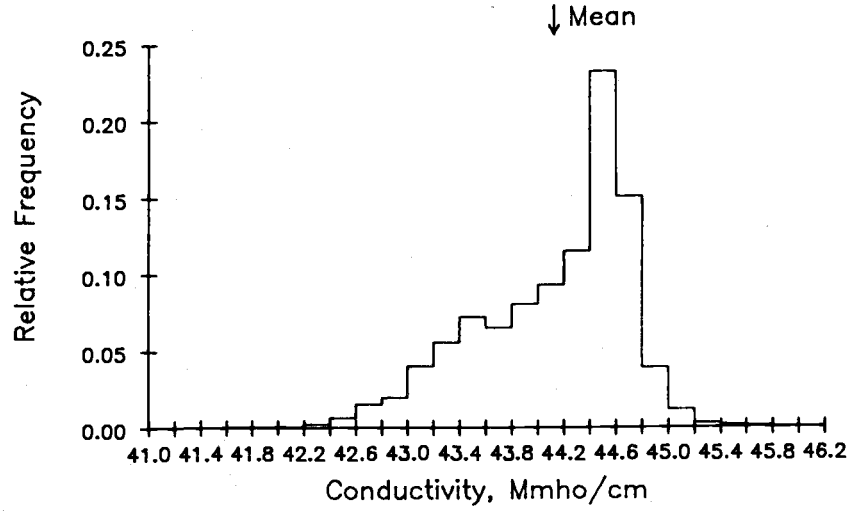


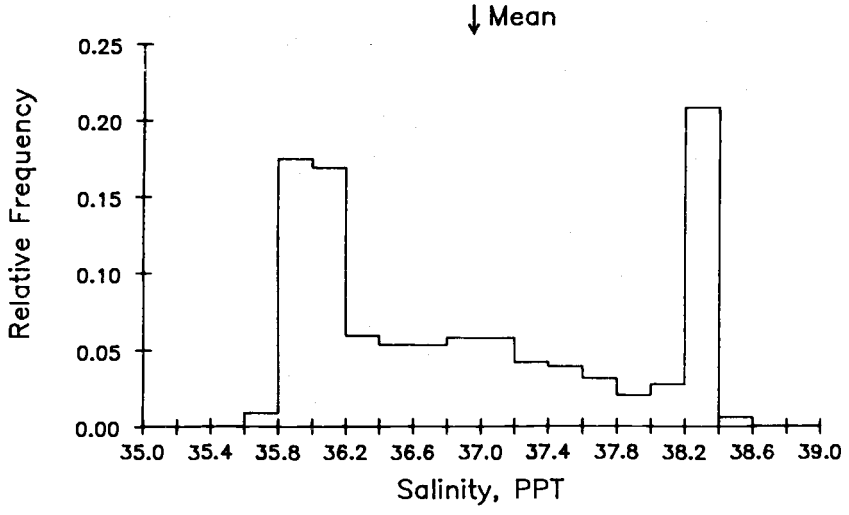




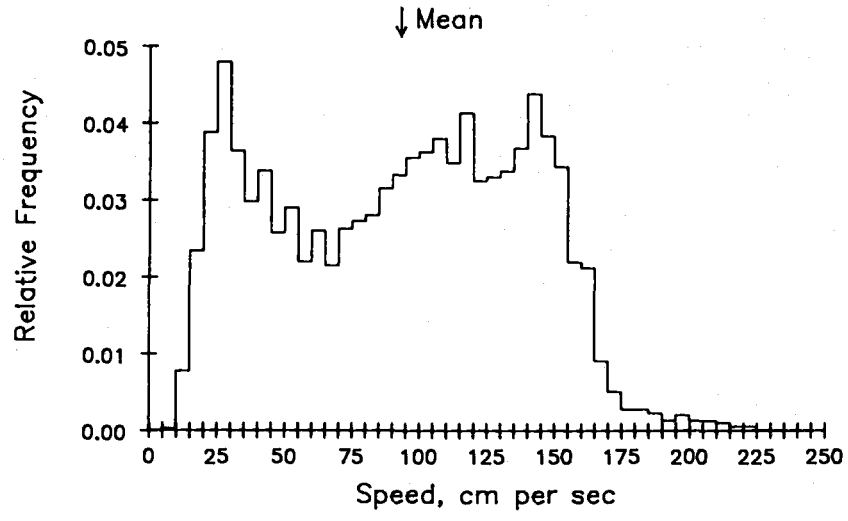
112 M AT GIBRALTAR C-2B. 29 MAY 86 - 13 OCT 86. TAPE 6590/17.

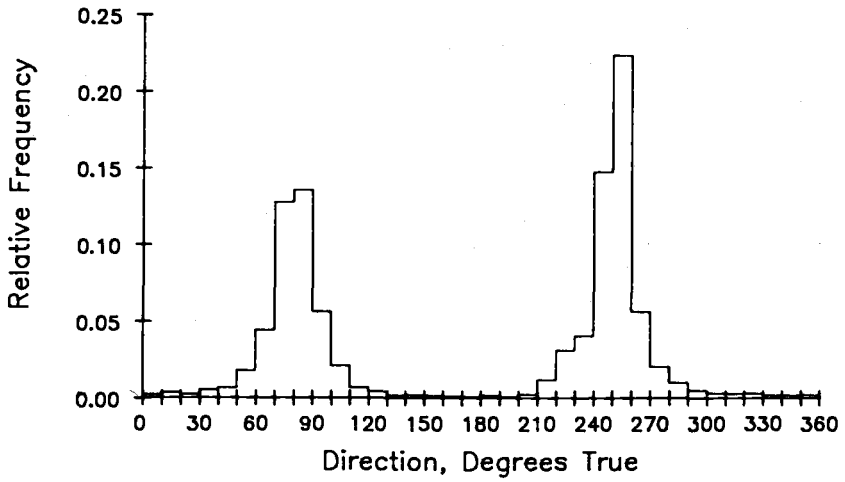


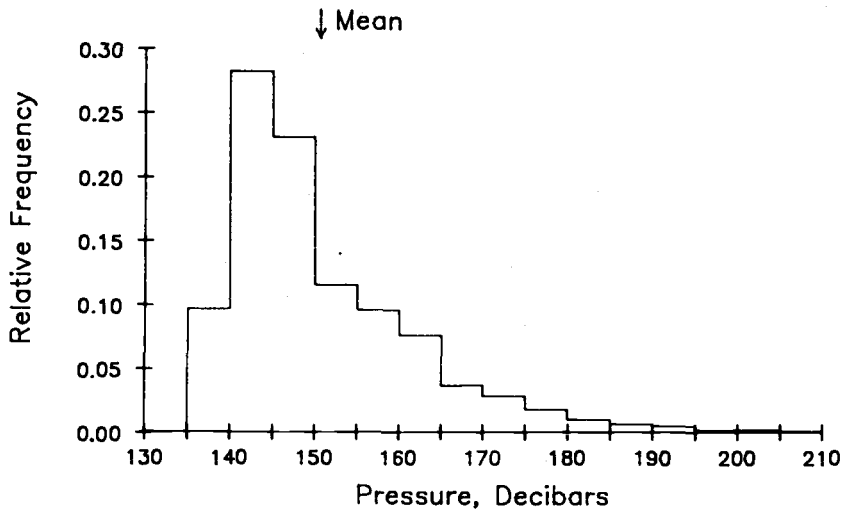




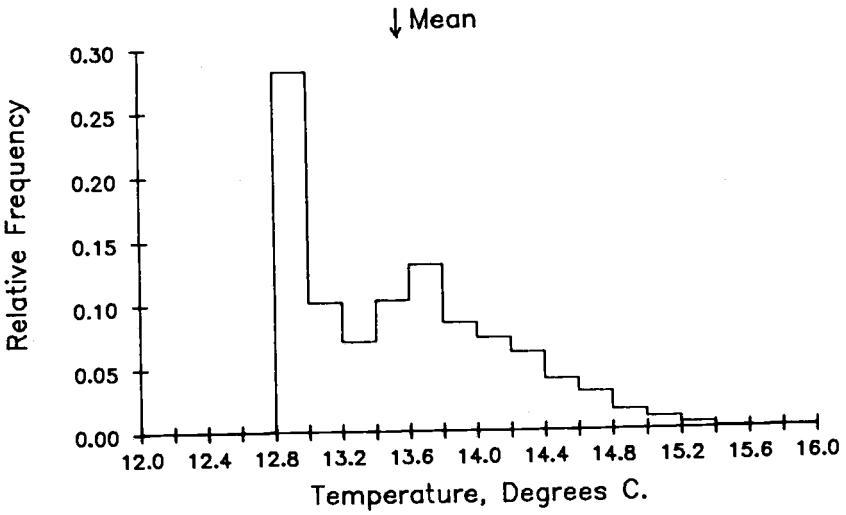
135 M AT GIBRALTAR C-2B. 29 MAY 86 - 13 OCT 86. TAPE 6593/15.

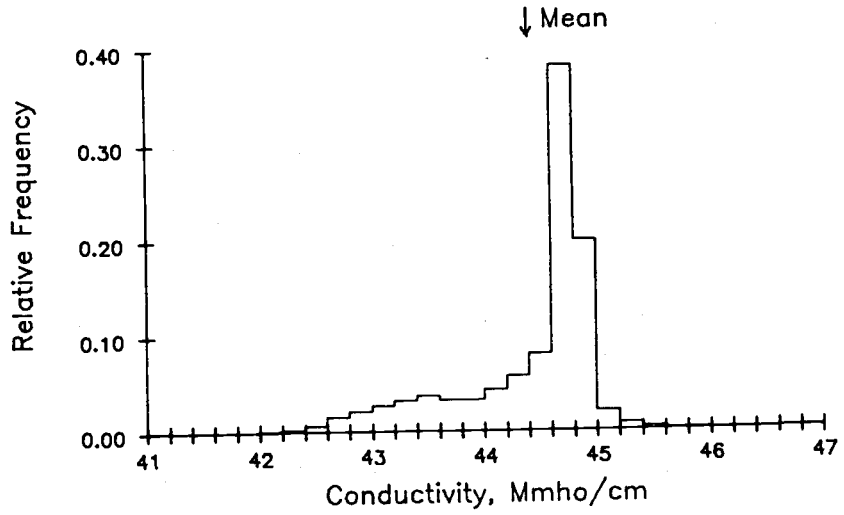


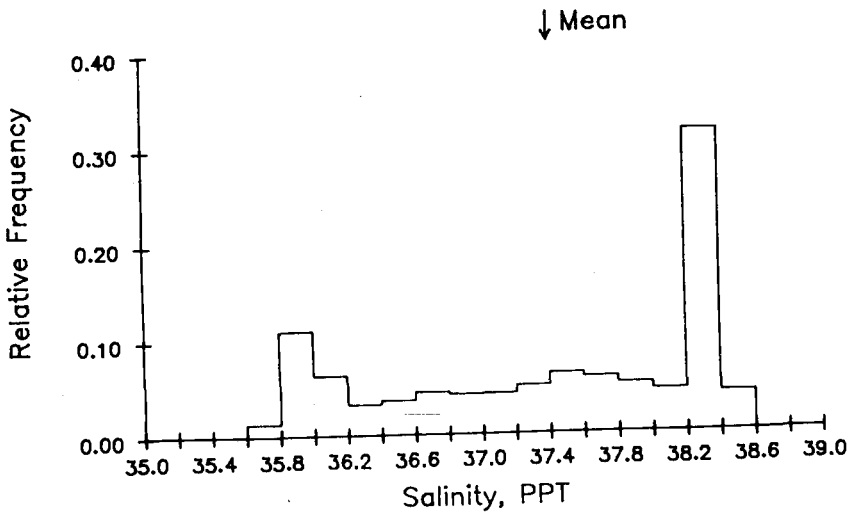




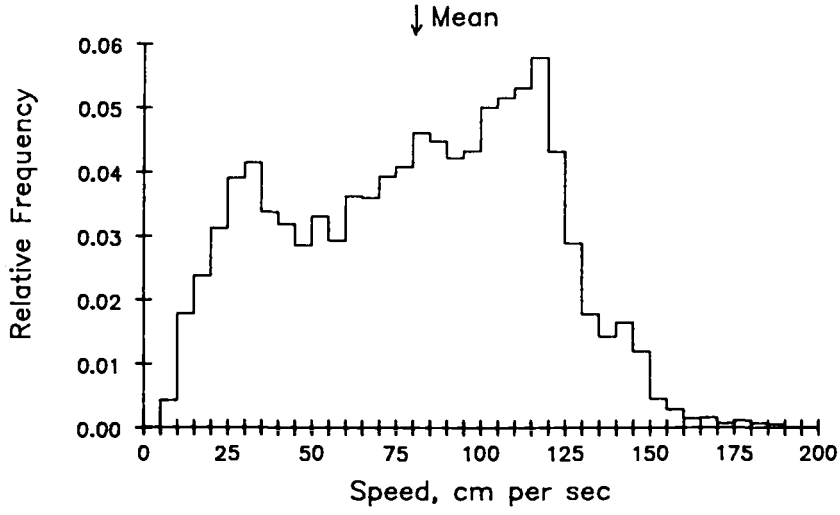
135 M AT GIBRALTAR C-2B. 29 MAY 86 - 13 OCT 86. TAPE 6593/15.

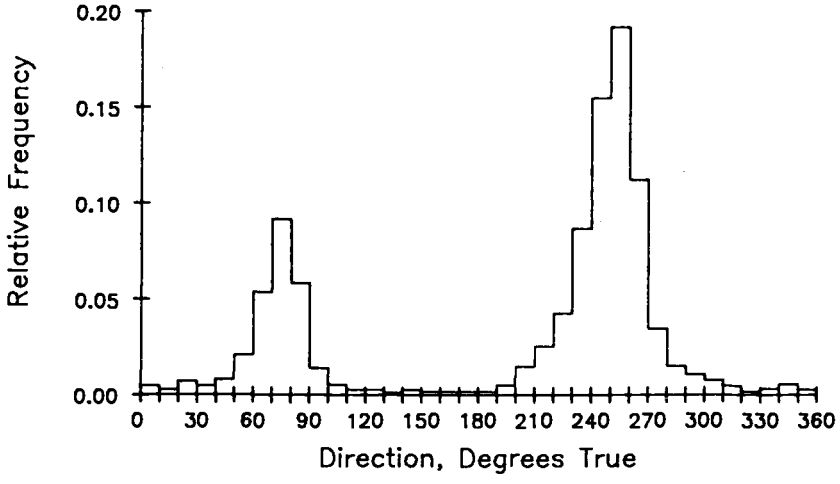


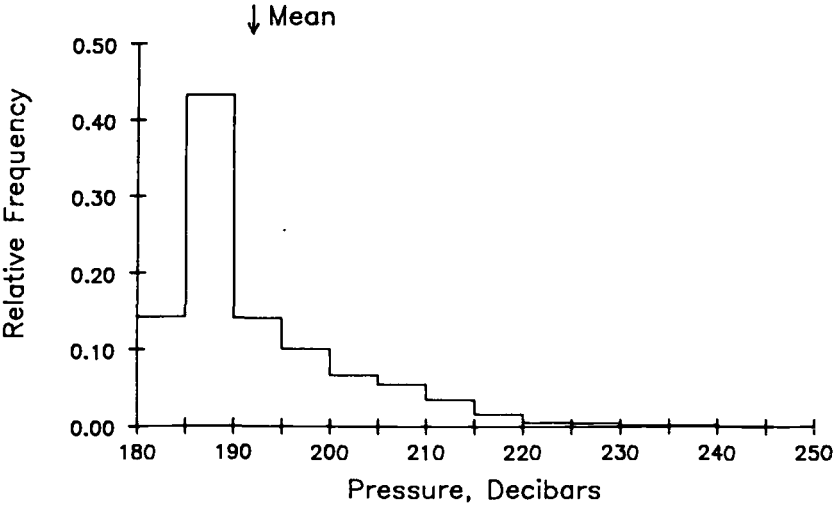




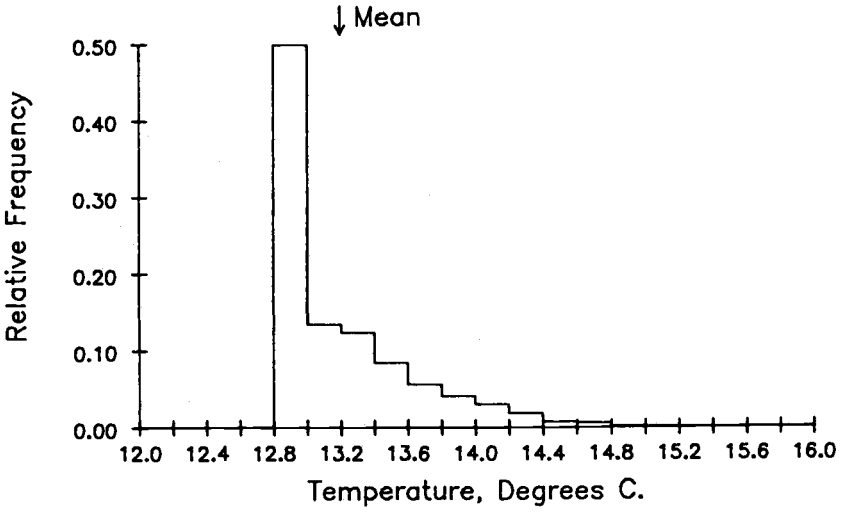
181 M AT GIBRALTAR C-2B. 29 MAY 86 - 13 OCT 86. TAPE 5886/20.

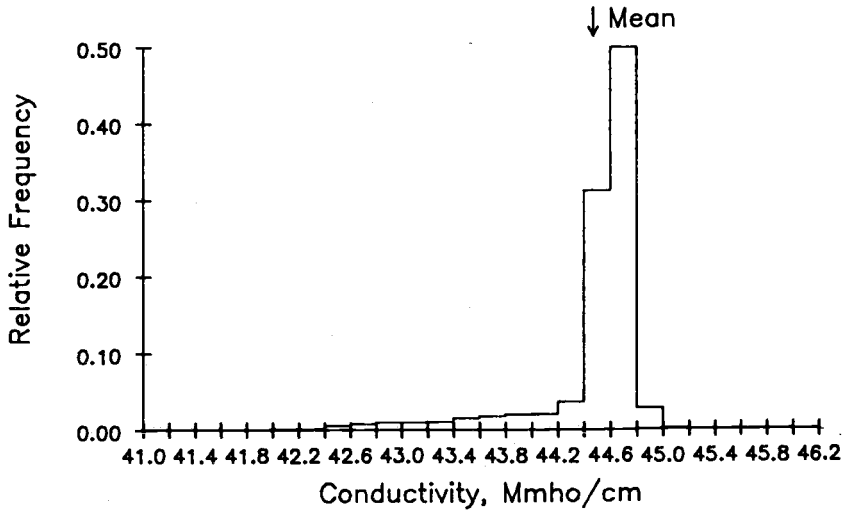


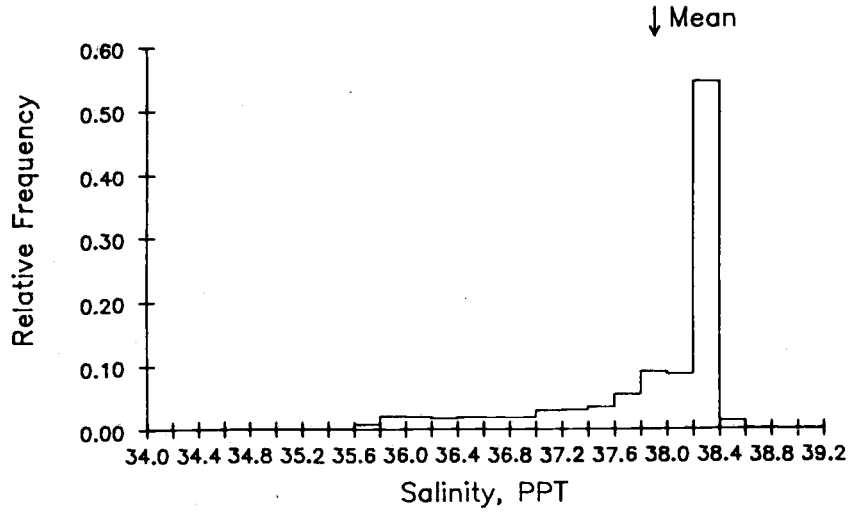




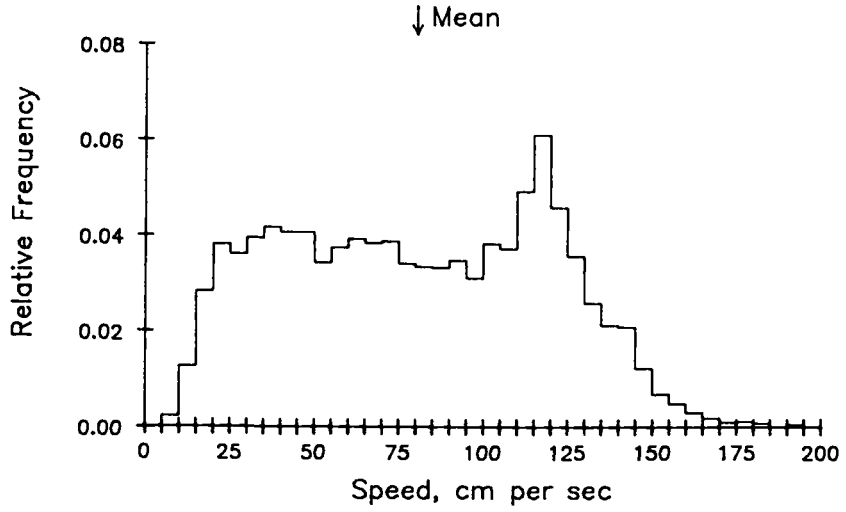
181 M AT GIBRALTAR C-2B. 29 MAY 86 - 13 OCT 86. TAPE 5886/20.

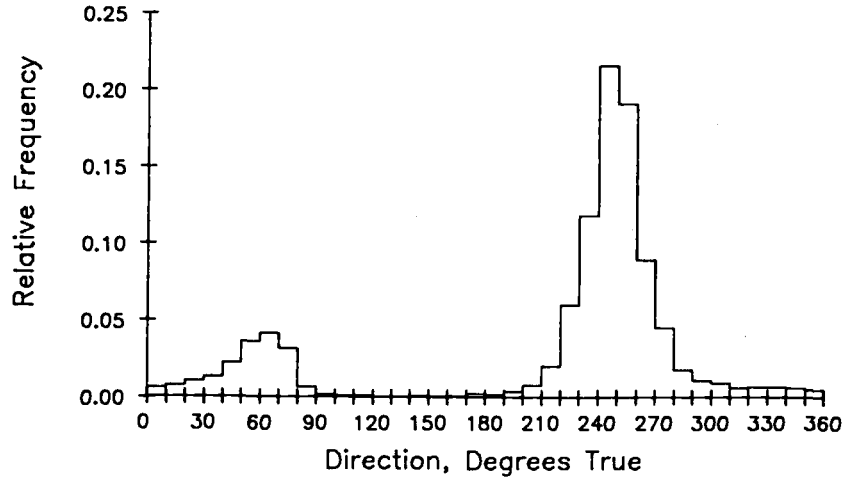


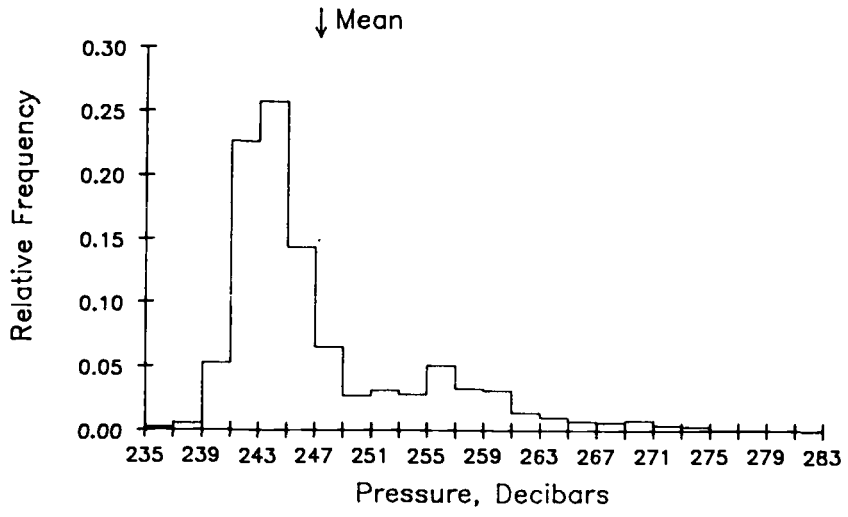




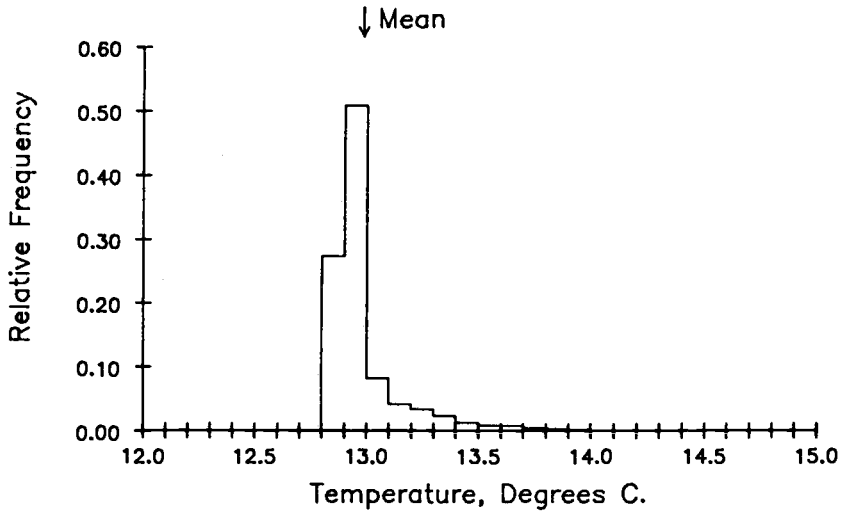
233 M AT GIBRALTAR C–2B. 29 MAY 86 – 13 OCT 86. TAPE 5648/28.

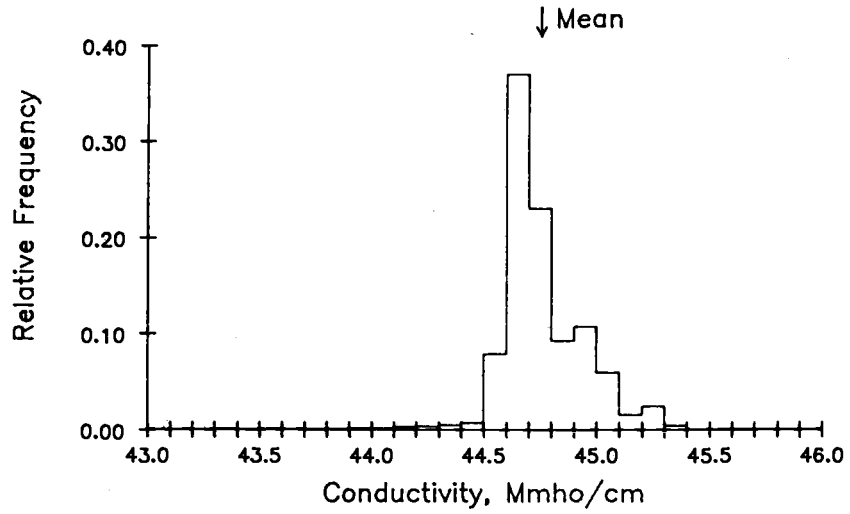


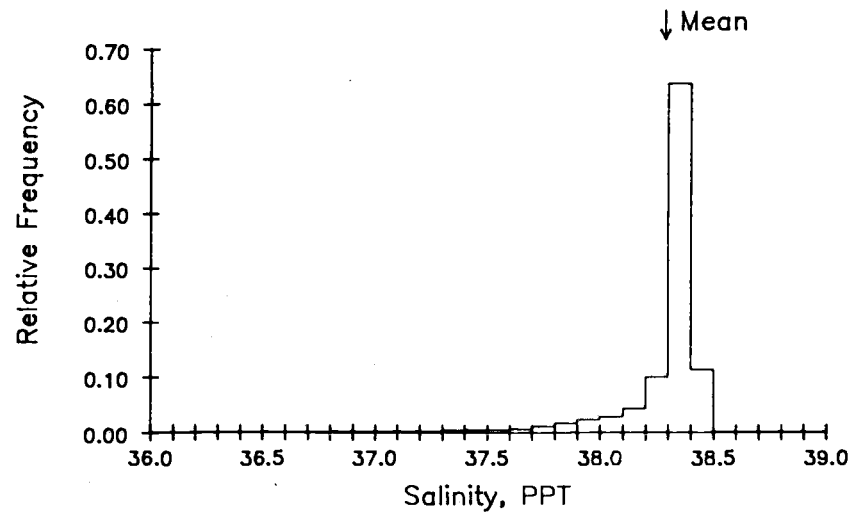




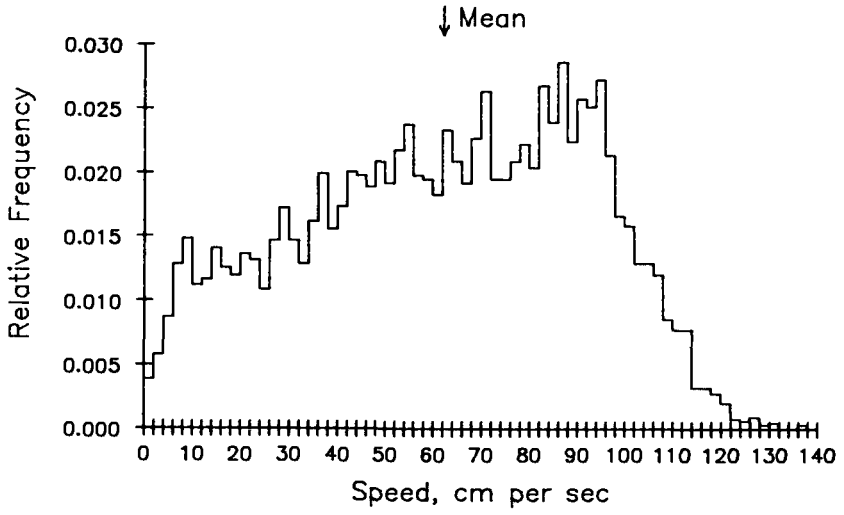
233 M AT GIBRALTAR C–2B. 29 MAY 86 – 13 OCT 86. TAPE 5648/28.

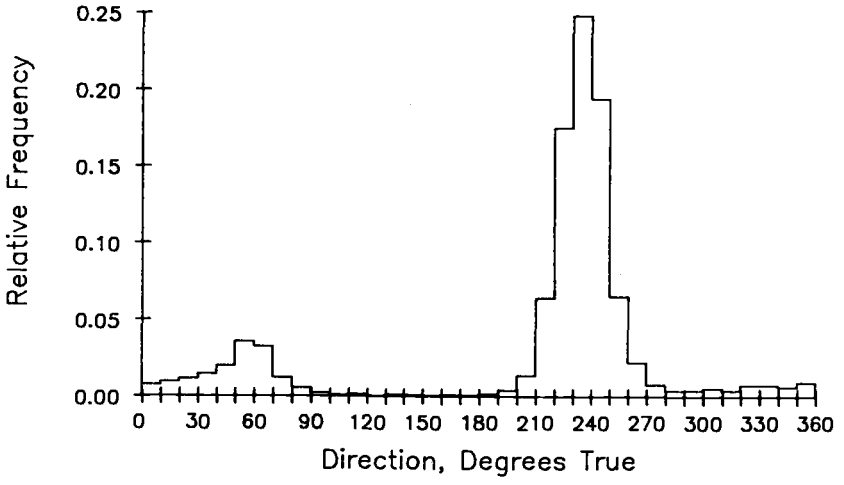


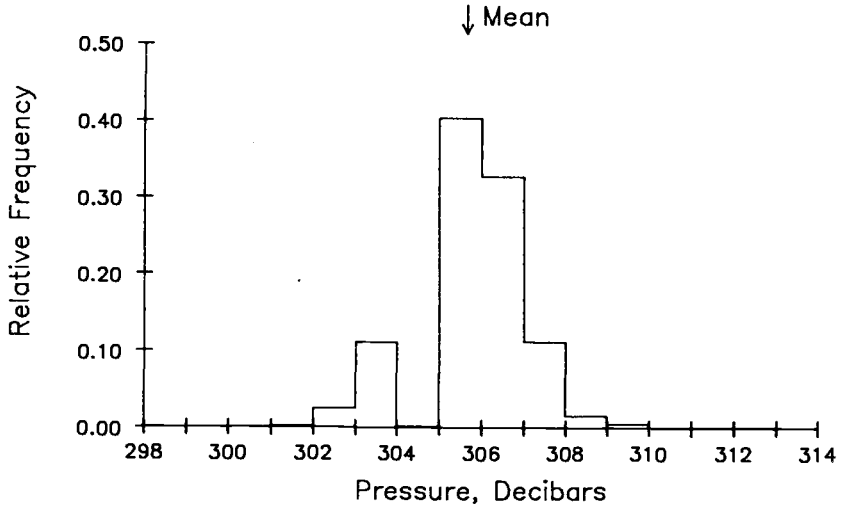




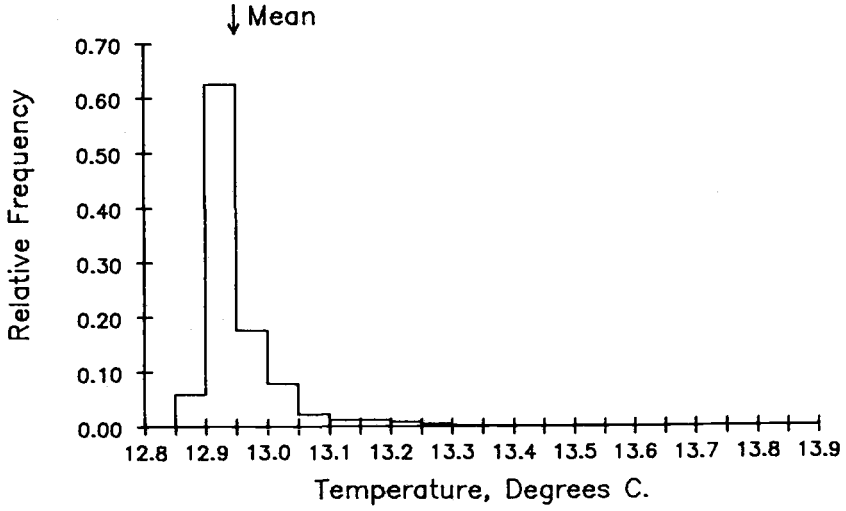
299 M AT GIBRALTAR C–2B. 29 MAY 86 – 13 OCT 86. TAPE 1241/38.

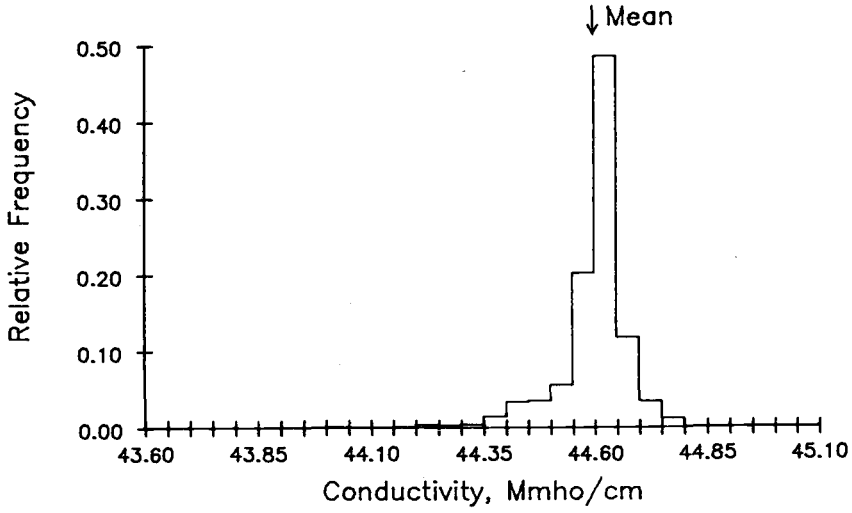


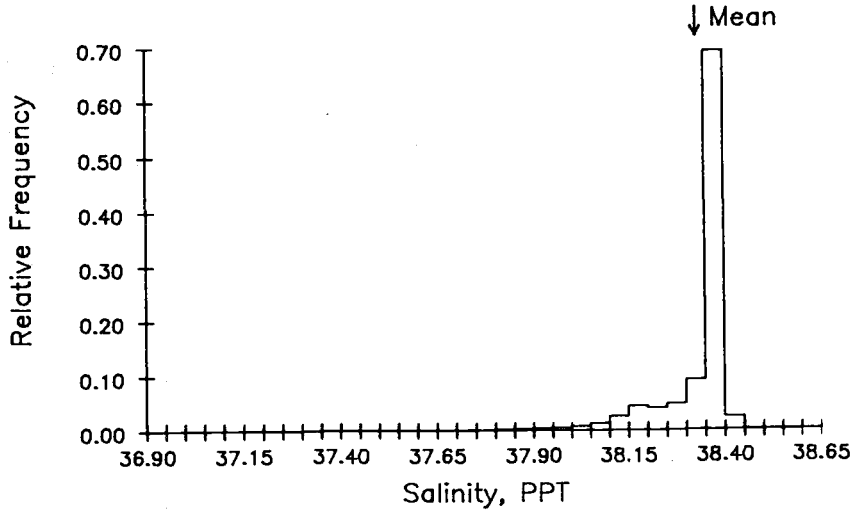




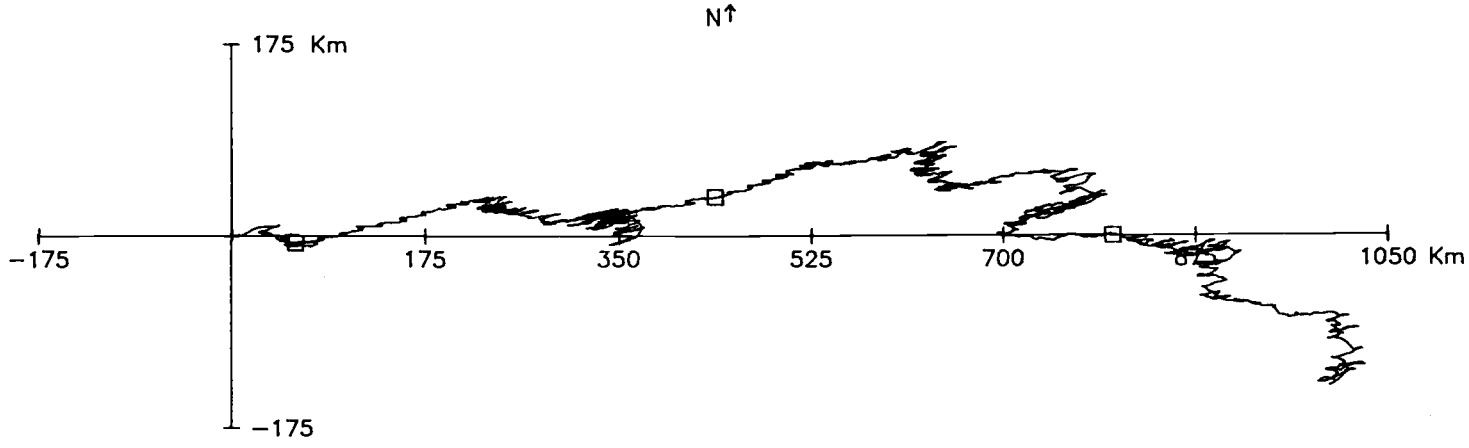
299 M AT GIBRALTAR C–2B. 29 MAY 86 – 13 OCT 86. TAPE 1241/38.

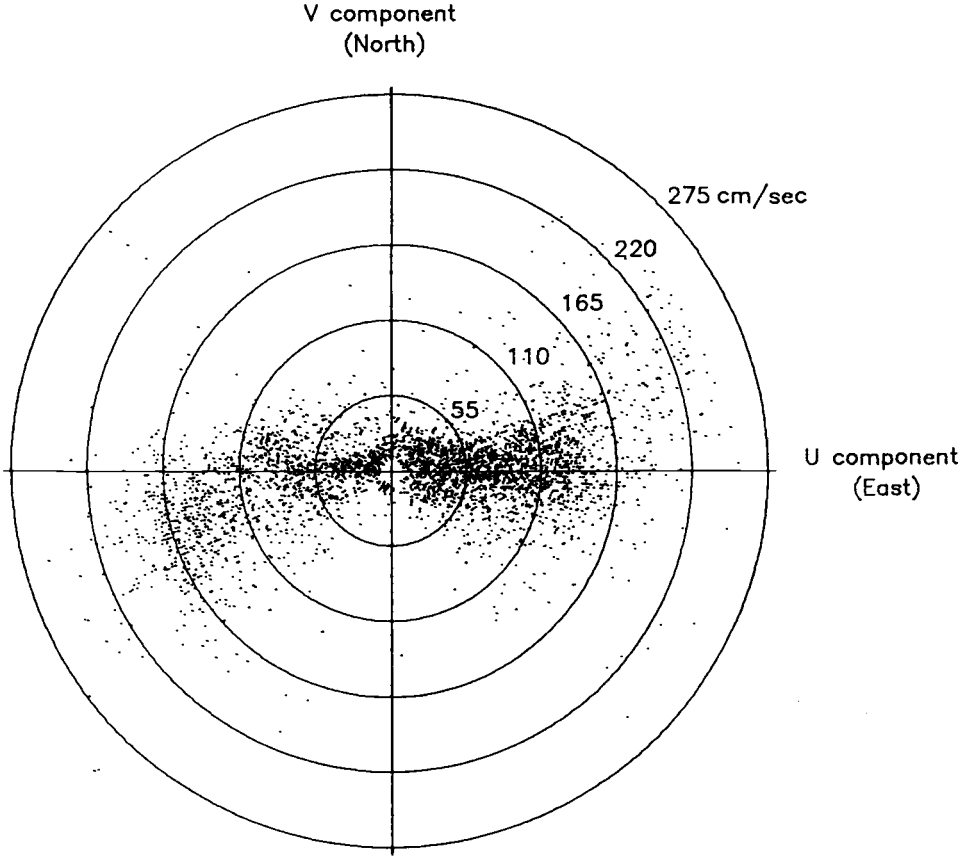




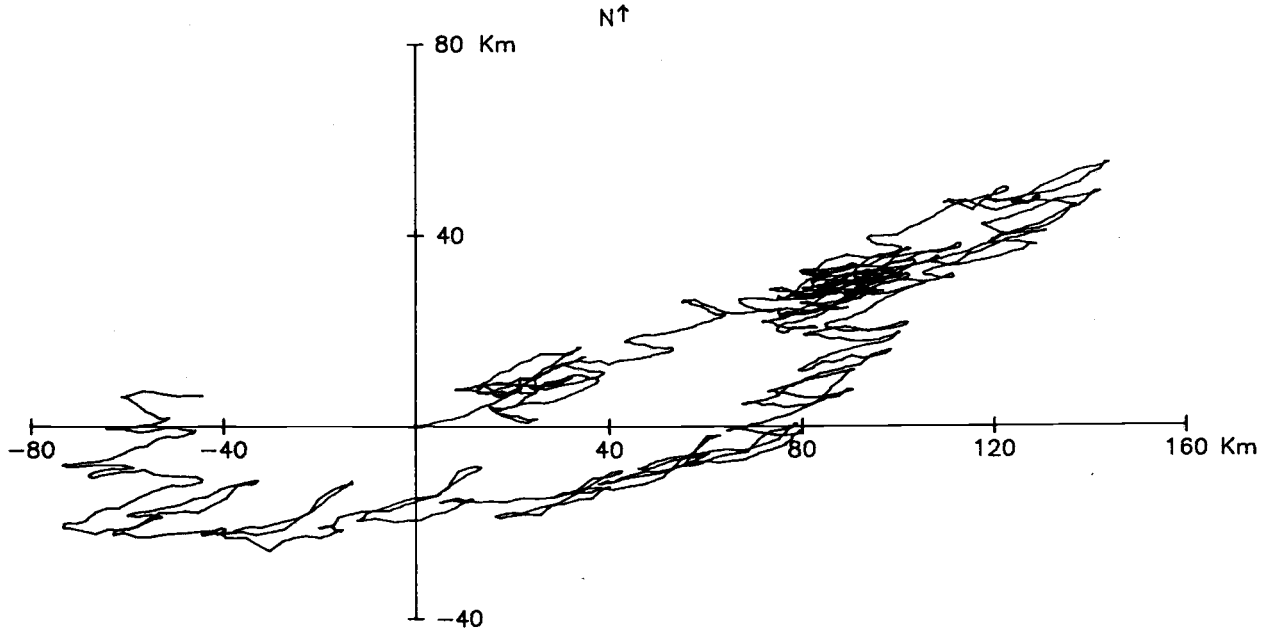


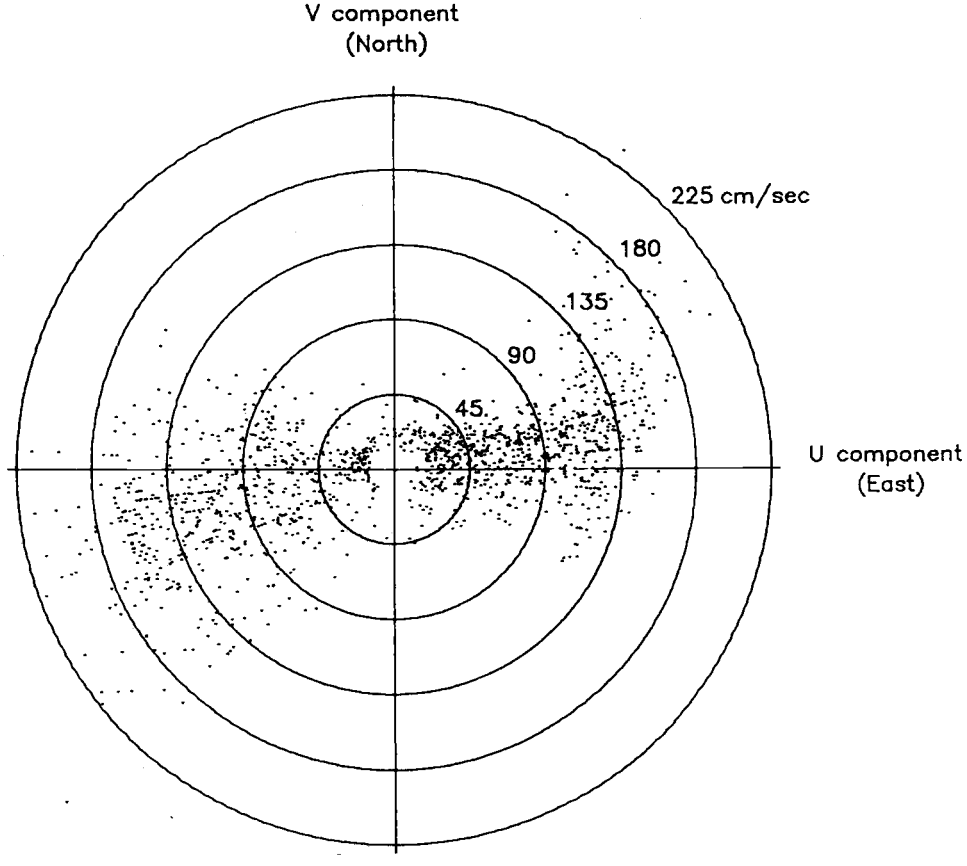
90 M AT GIBRALTAR C-2B. 29 MAY 86 - 19 AUG 86. TAPE 5649/20.



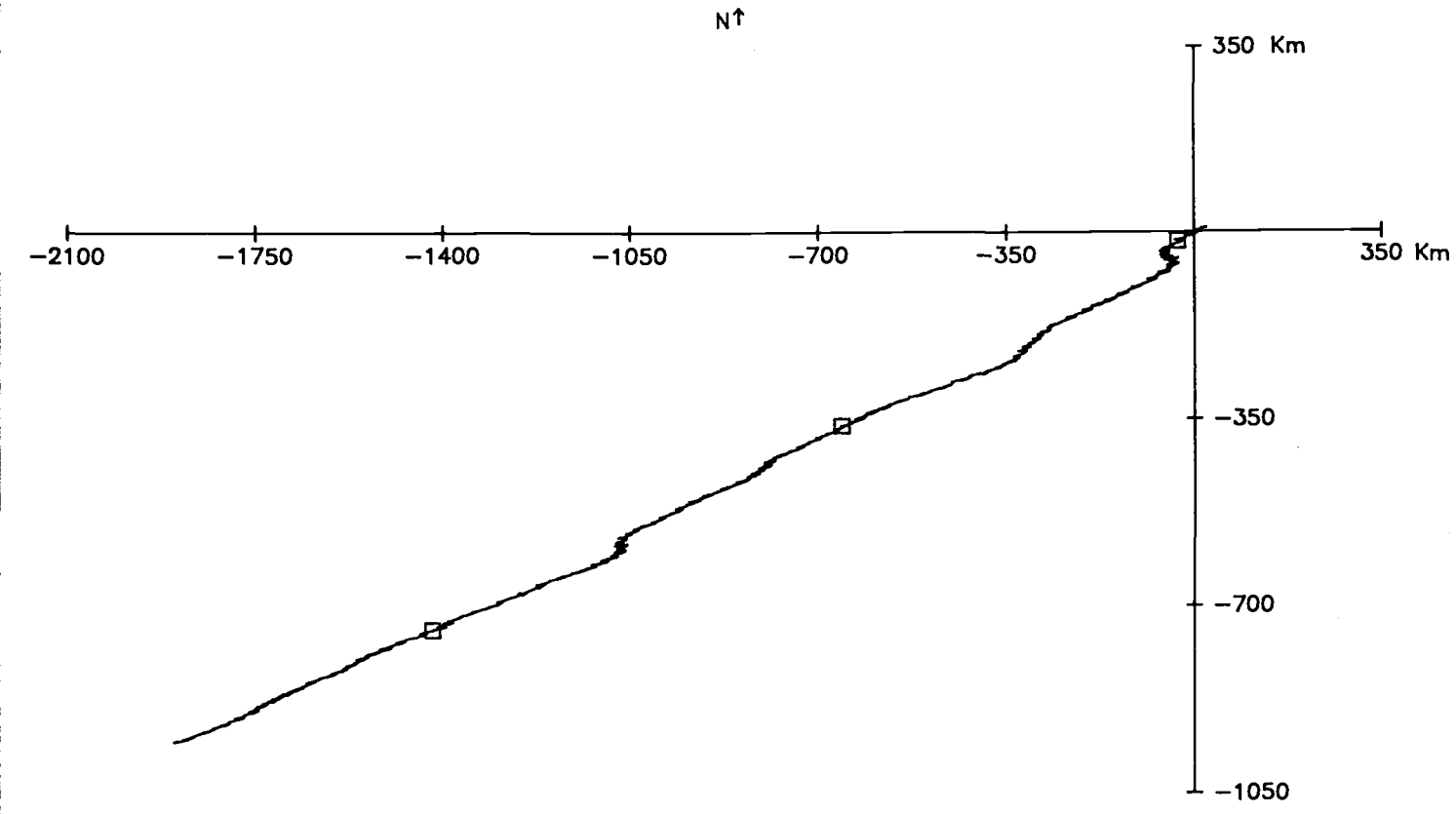


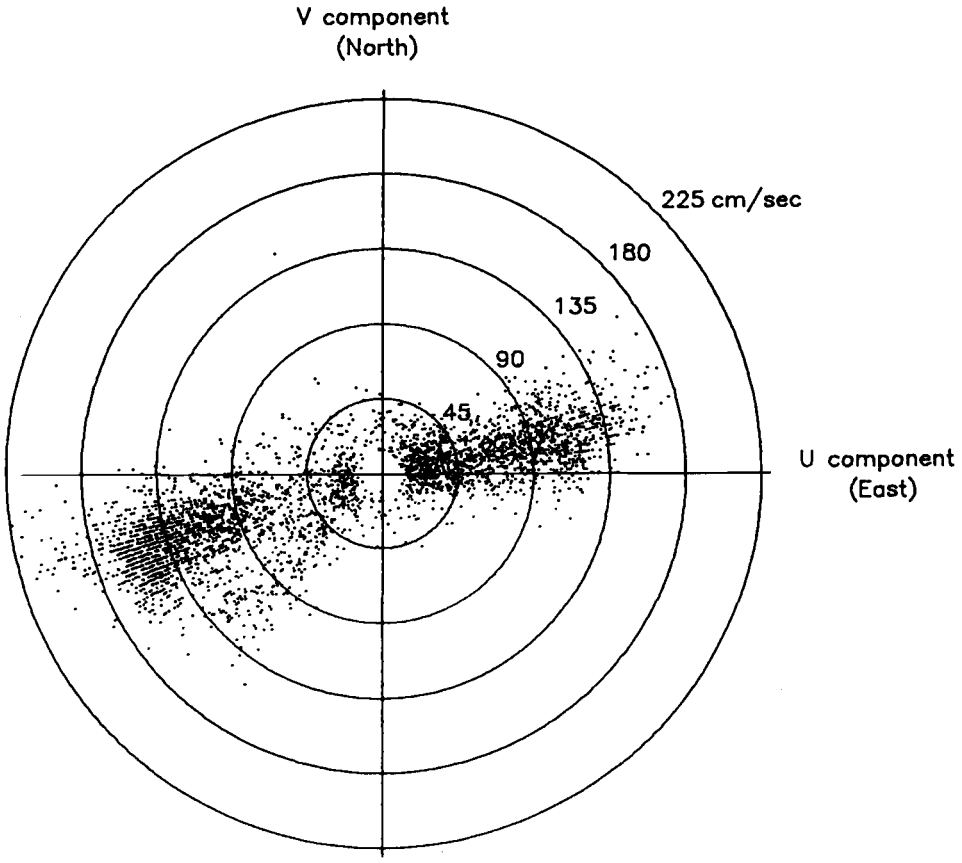
112 M AT GIBRALTAR C-2B. 29 MAY 86 - 30 JUN 86. TAPE 6590/17.



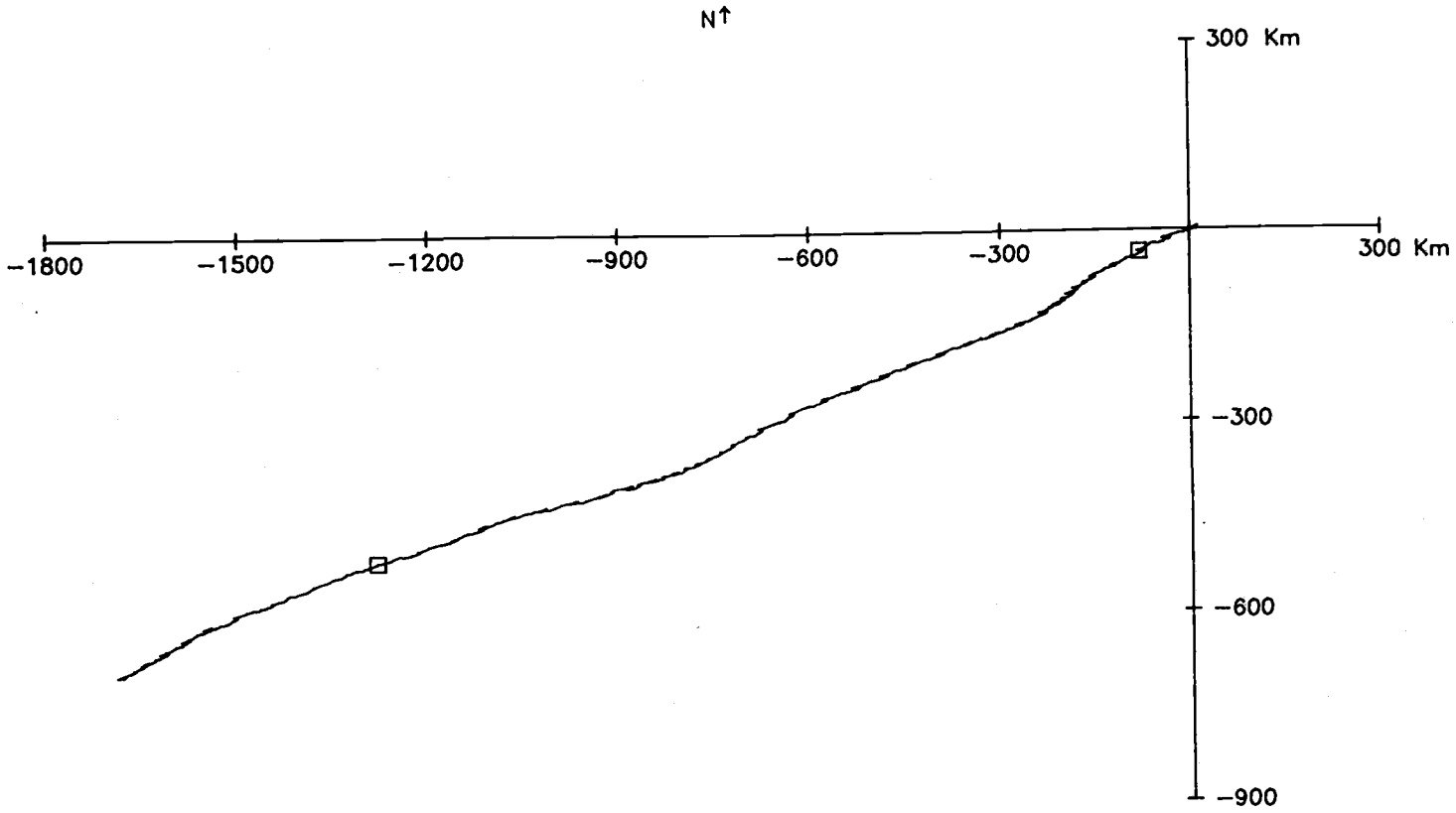


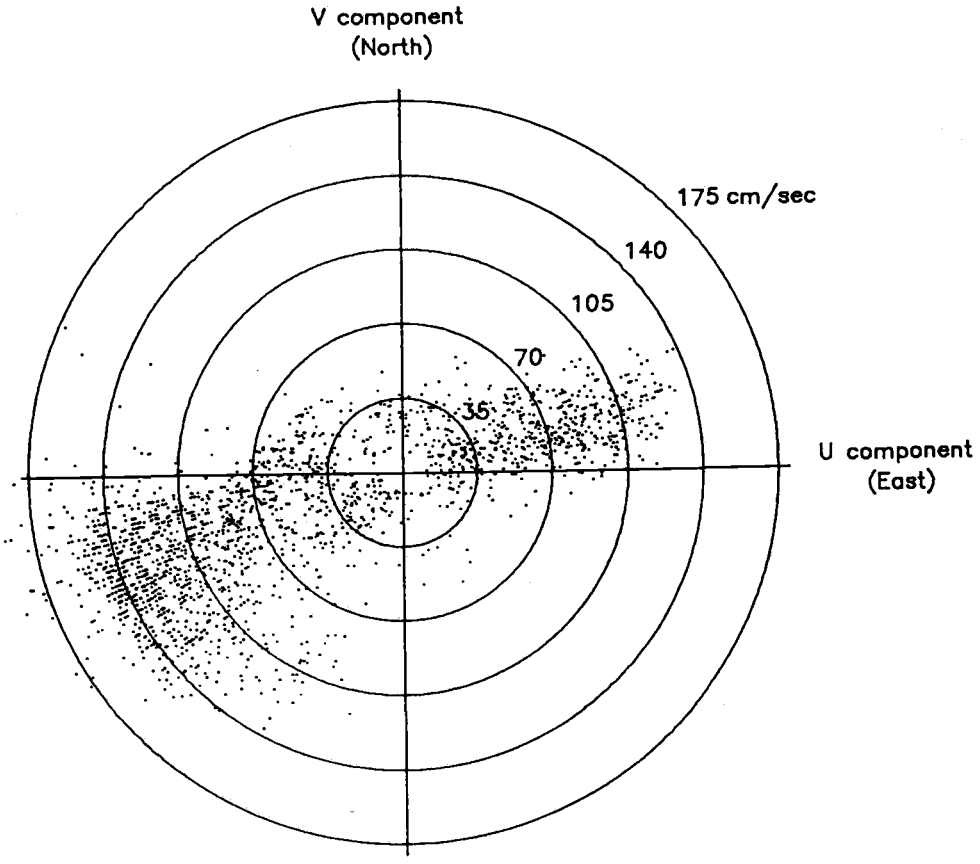
135 M AT GIBRALTAR C-2B. 29 MAY 86 - 20 AUG 86. TAPE 6593/15.



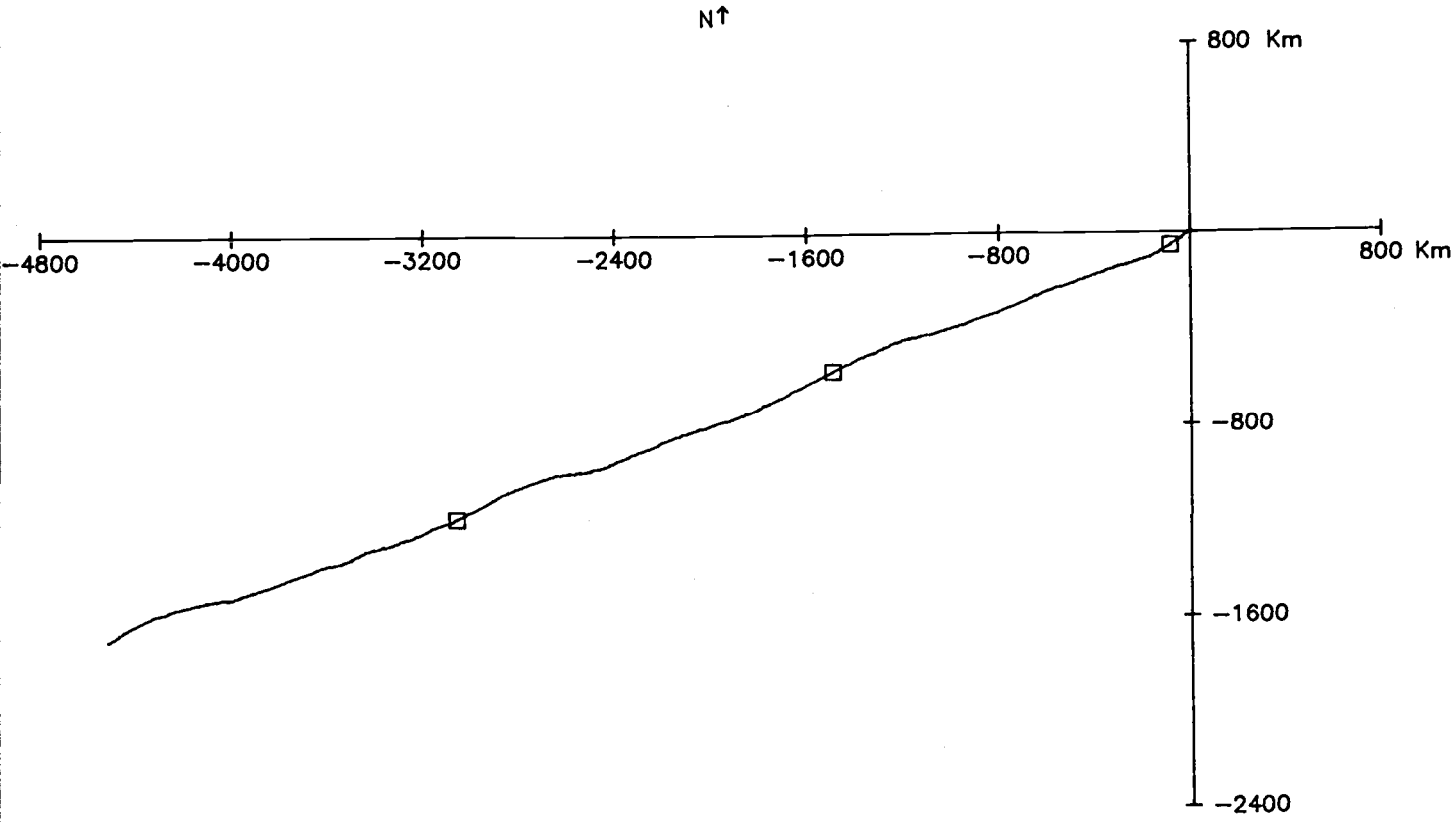


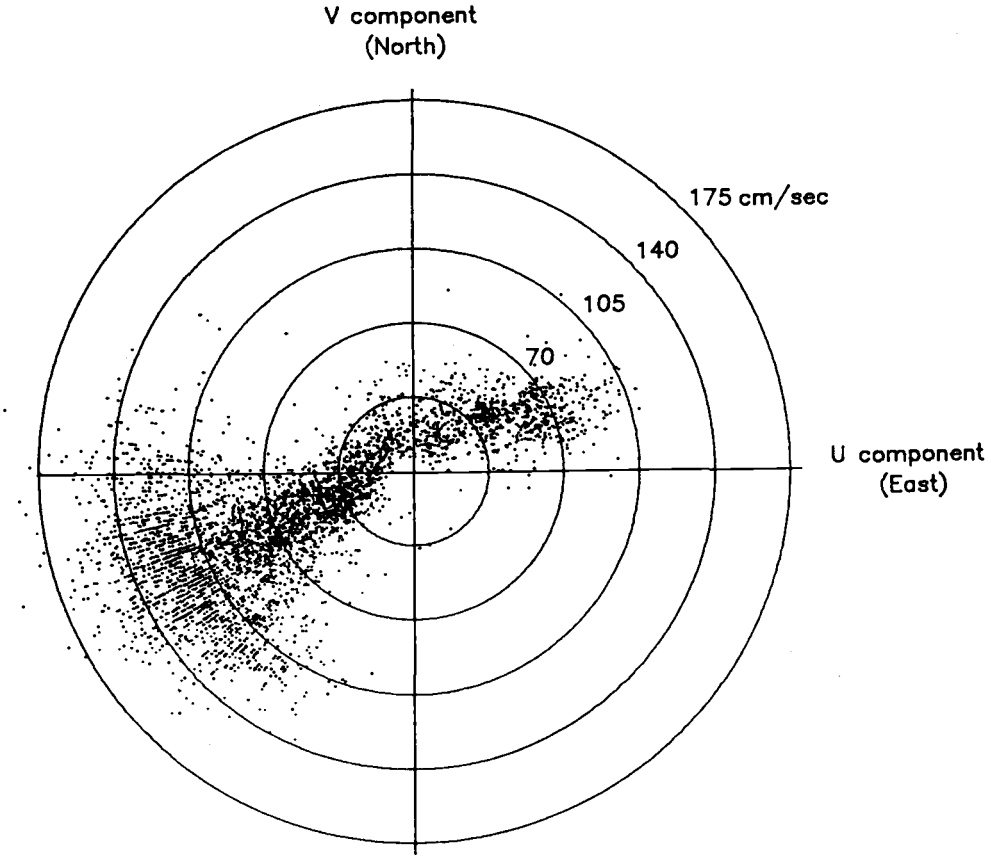
181 M AT GIBRALTAR C-2B. 29 MAY 86 - 9 JUL 86. TAPE 5886/20.



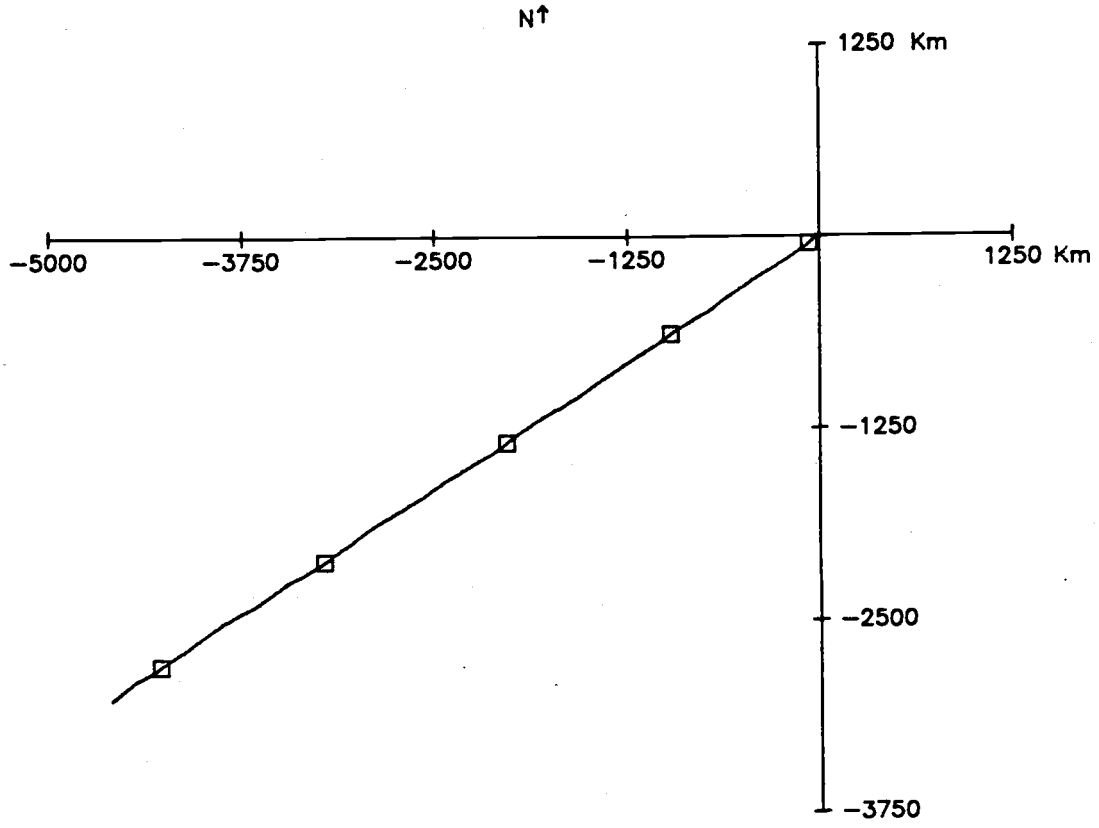


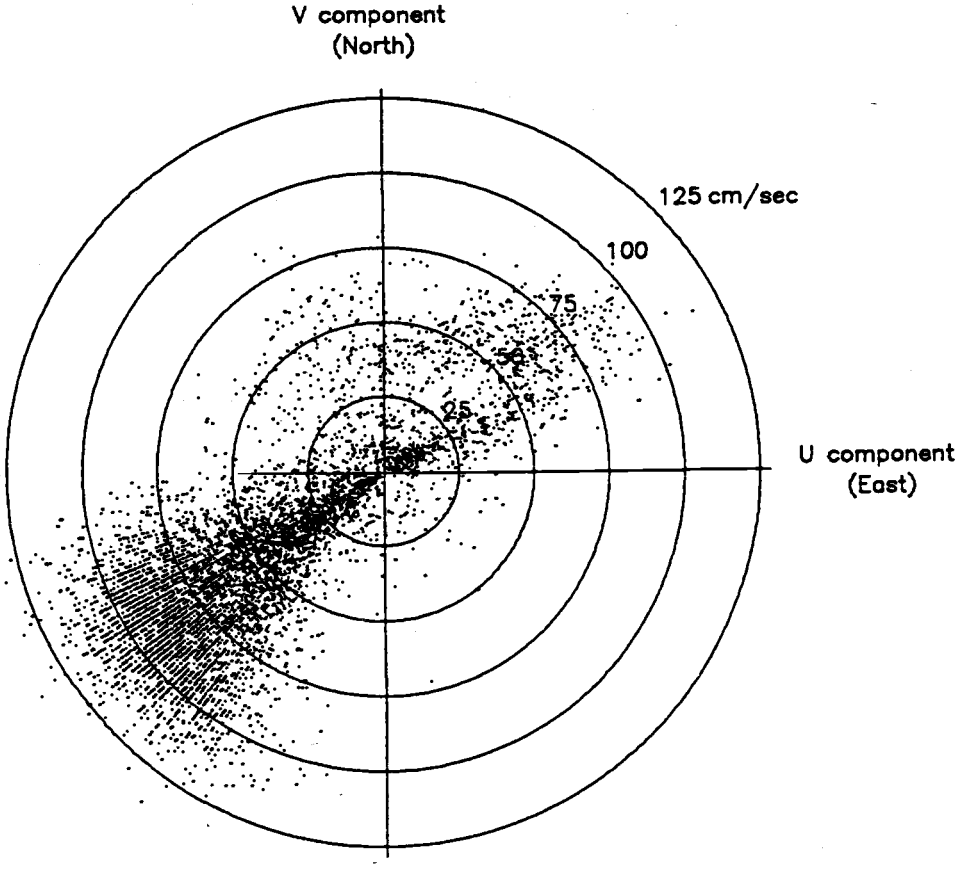
233 M AT GIBRALTAR C-2B. 29 MAY 86 -- 29 AUG 86. TAPE 5648/28.



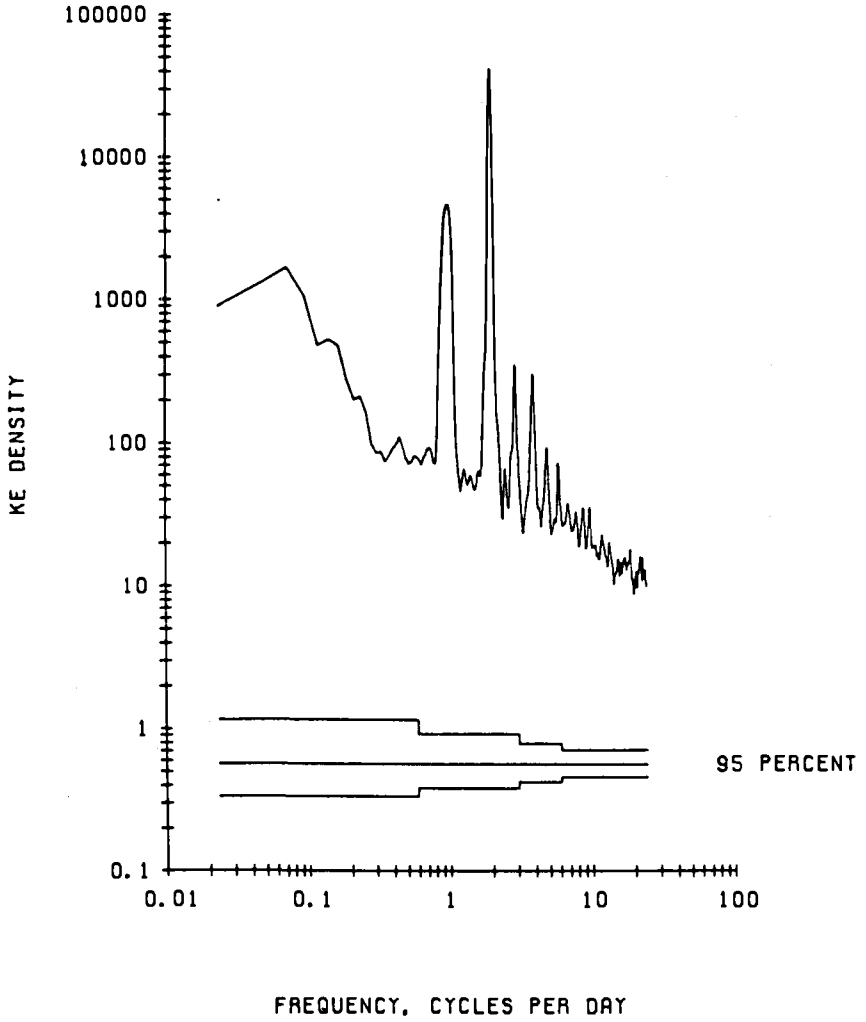


299 M AT GIBRALTAR C-2B. 29 MAY 86 - 13 OCT 86. TAPE 1241/38.

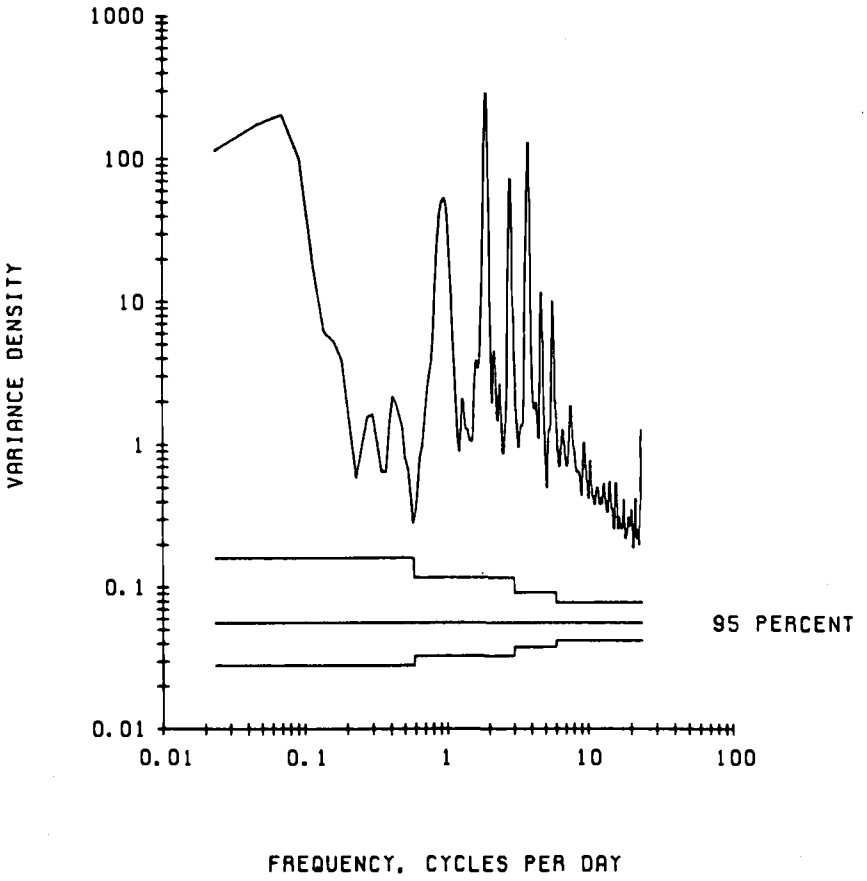




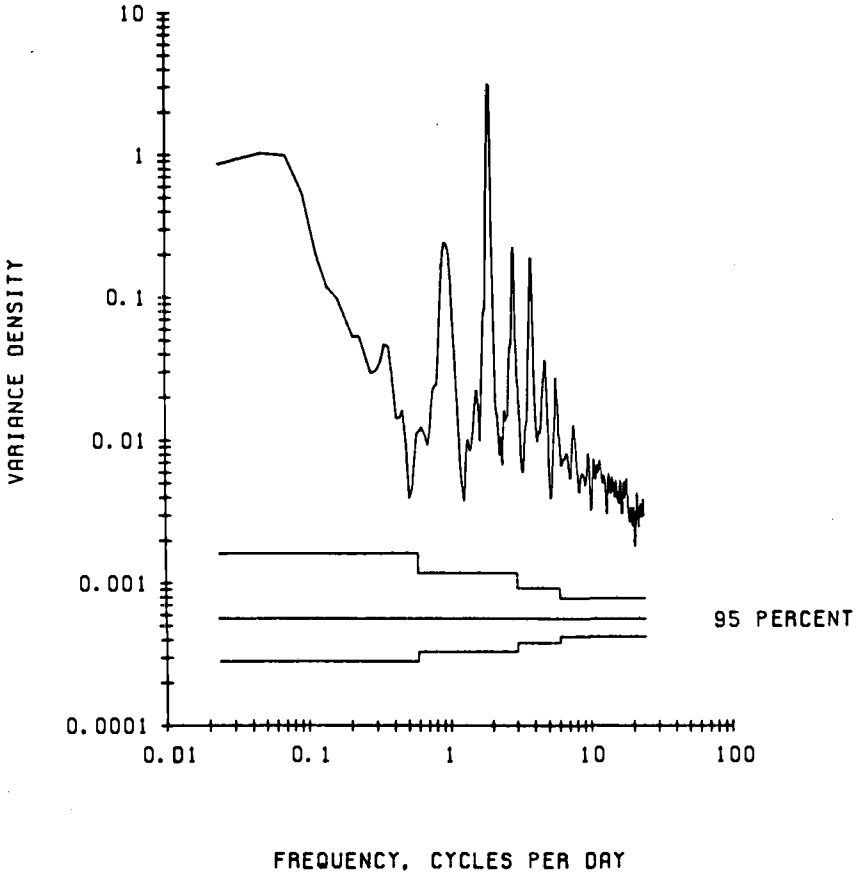
UNFILTERED CURRENT. 90 M AT GIBRALTAR C-28.



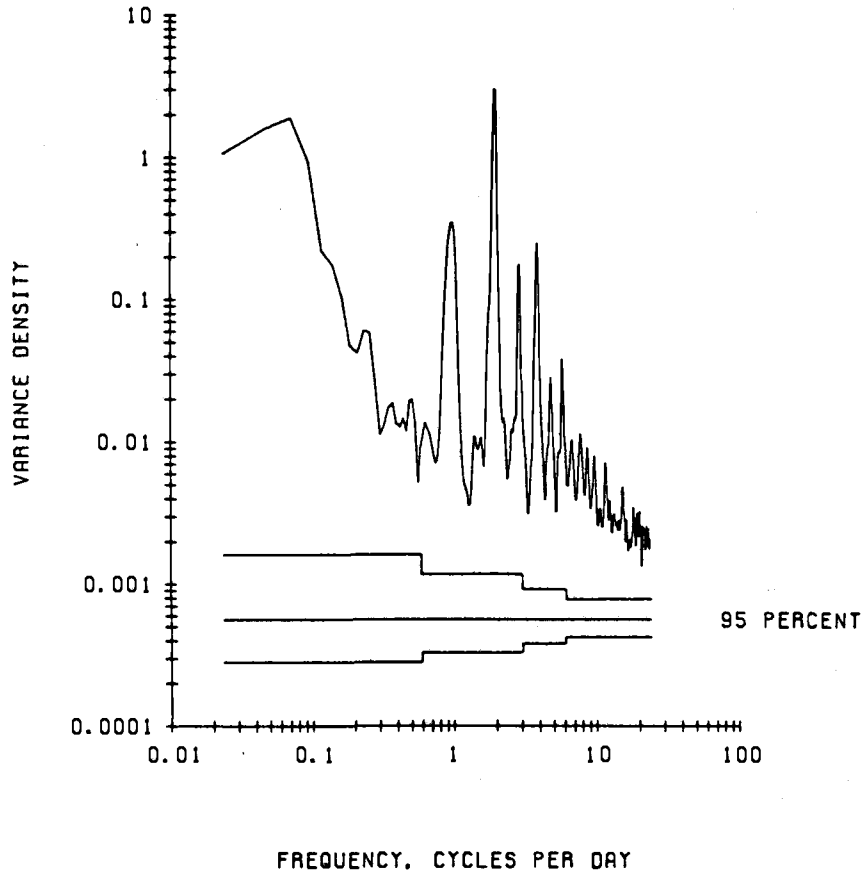
UNFILTERED PRESSURE. 90 M AT GIBRALTAR C-28.



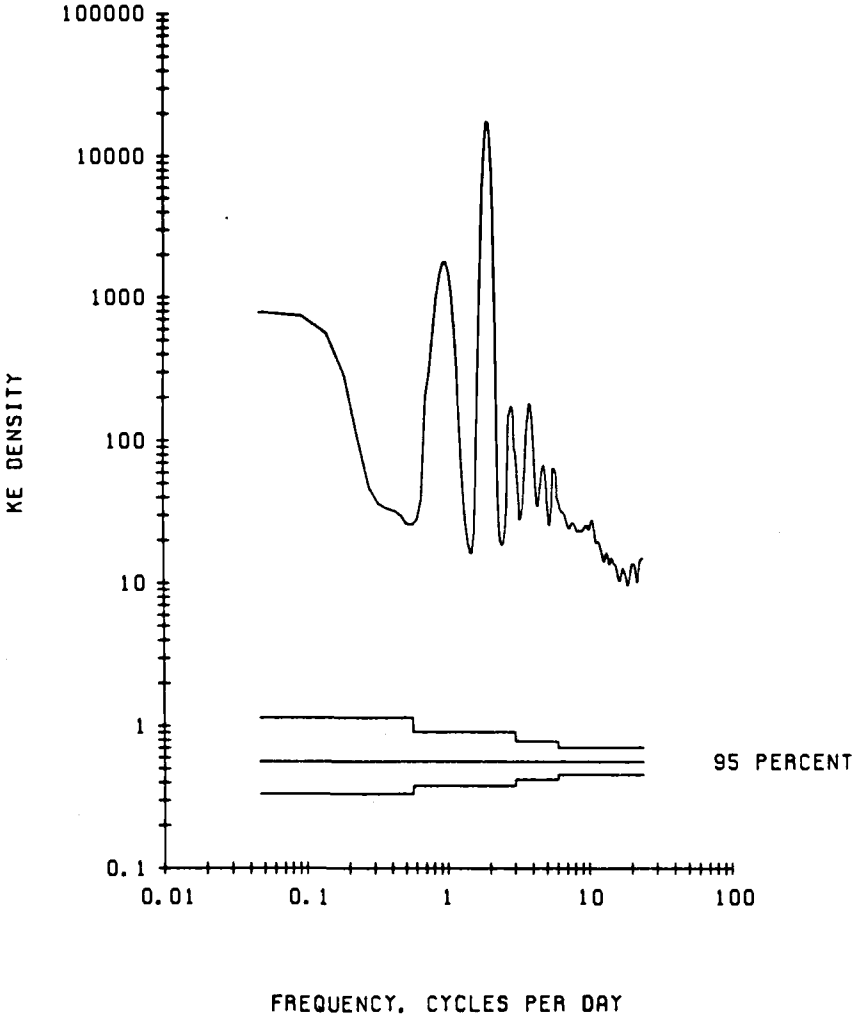
UNFILTERED TEMPERATURE. 90 M AT GIBRALTAR C-2B.



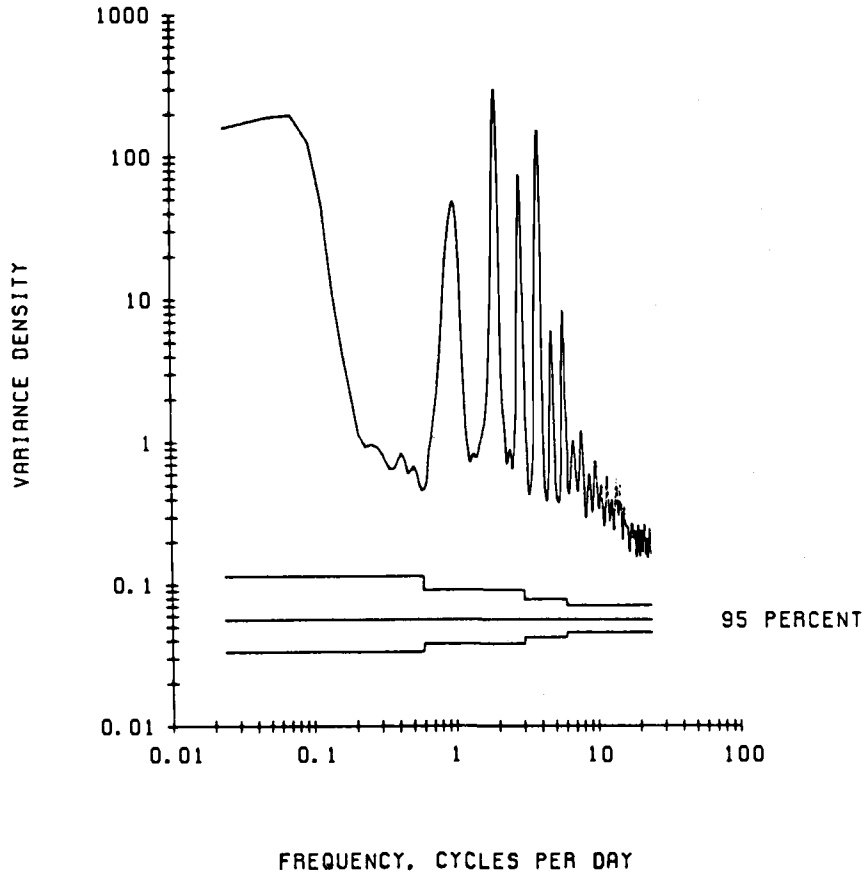
UNFILTERED SALINITY. 90 M AT GIBRALTAR C-2B.



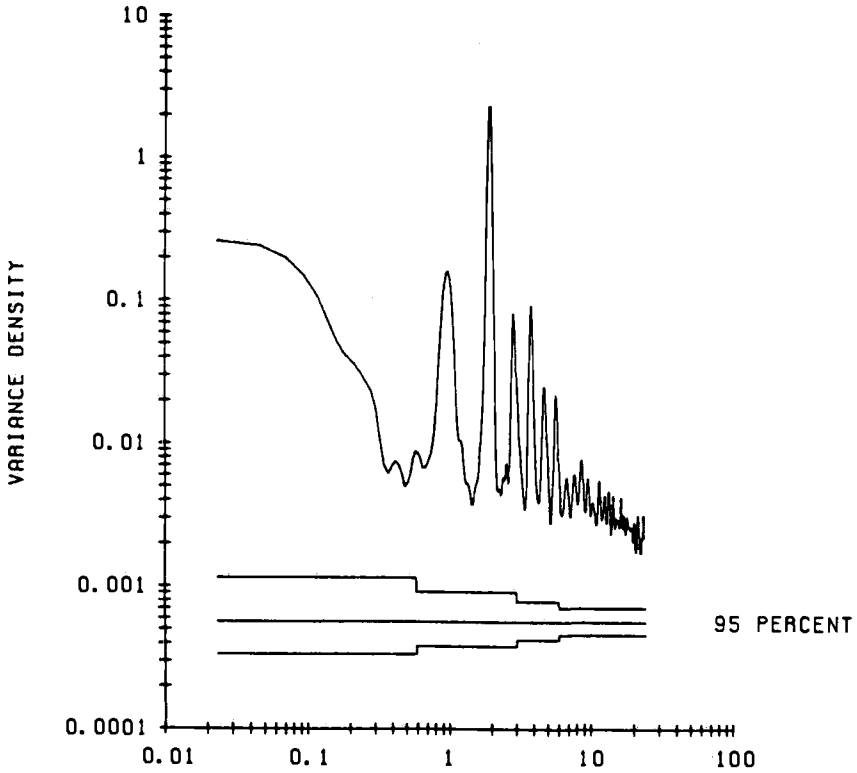
UNFILTERED CURRENT. 112 M AT GIBRALTAR C-28.



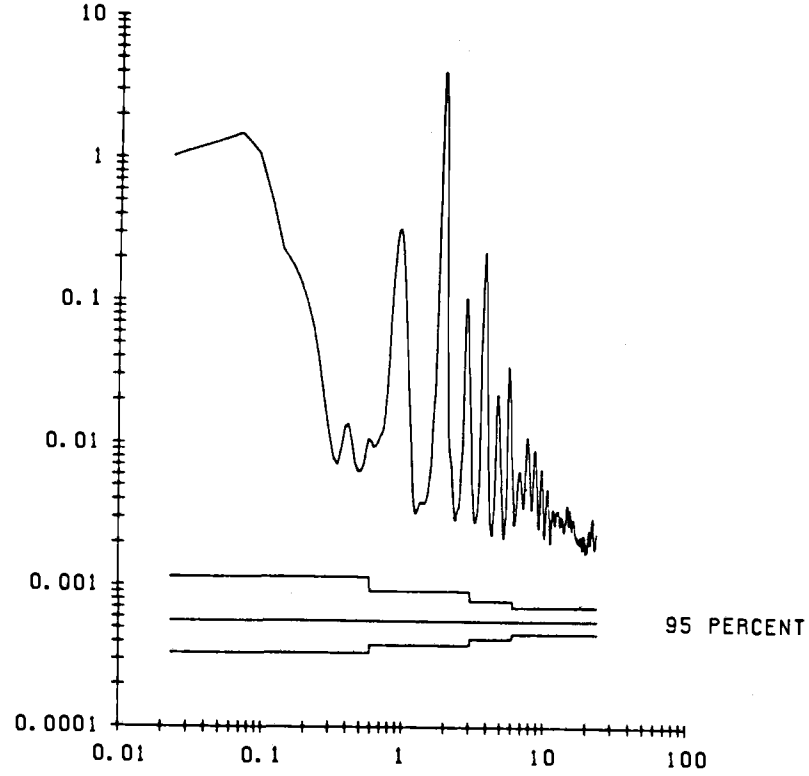
UNFILTERED PRESSURE. 112 M AT GIBRALTAR C-28.



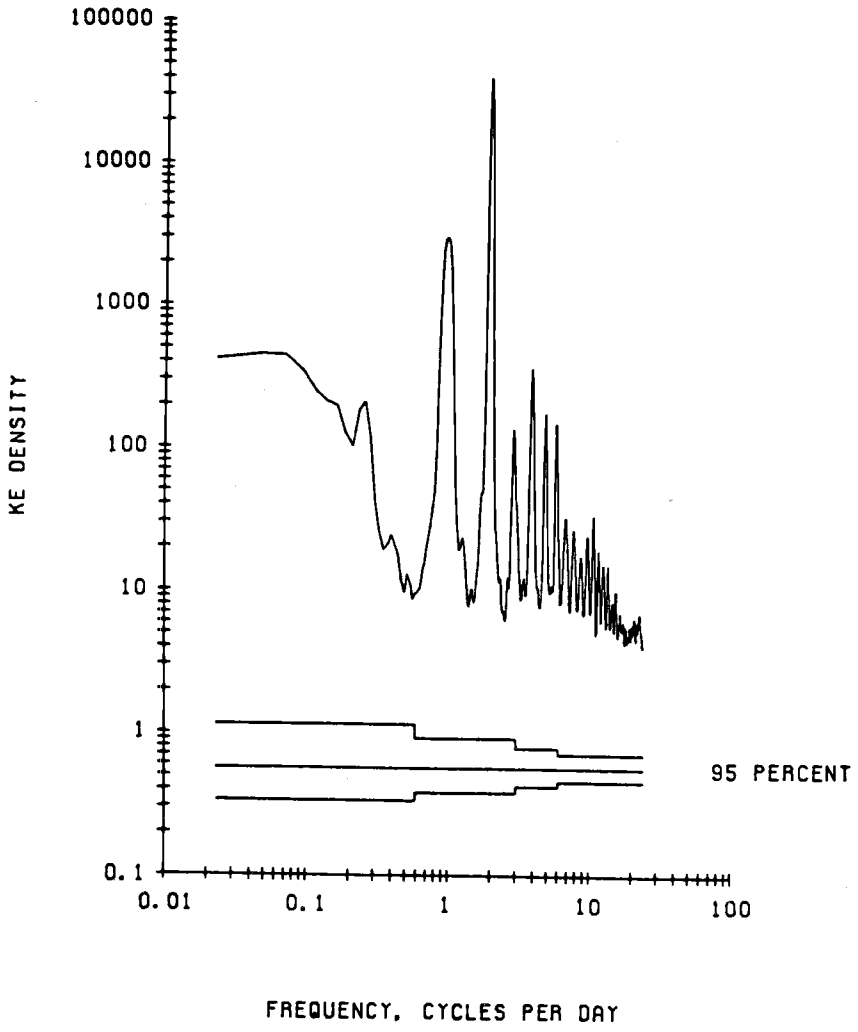
UNFILTERED TEMPERATURE. 112 M AT GIBRALTAR C-28.



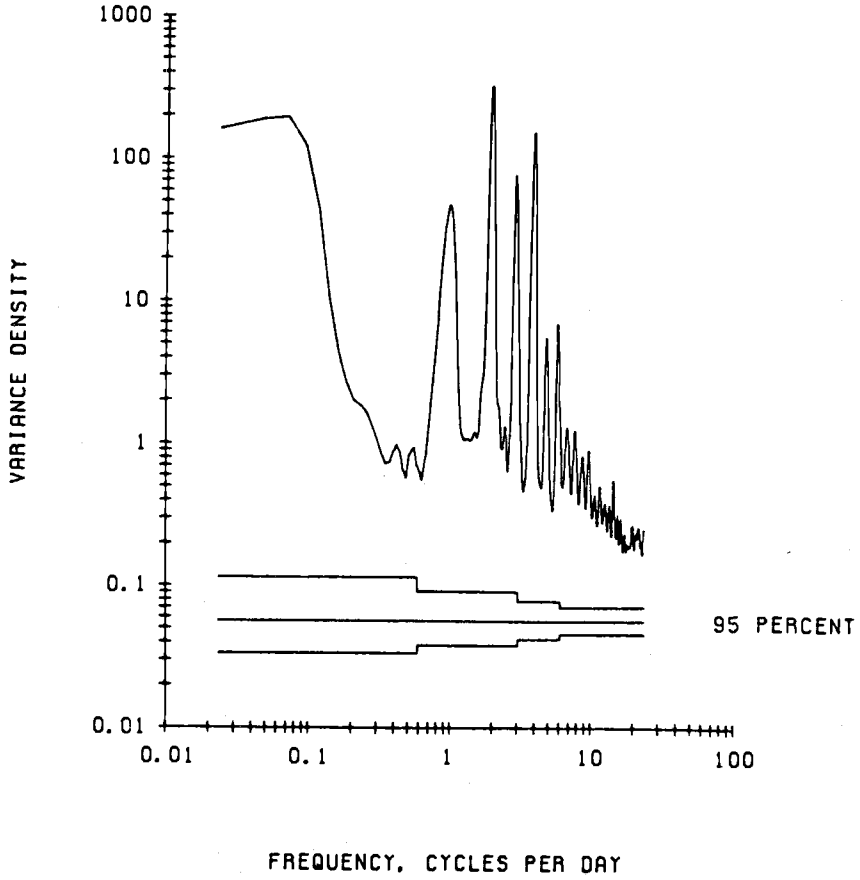
UNFILTERED SALINITY. 112 M AT GIBRALTAR C-28.



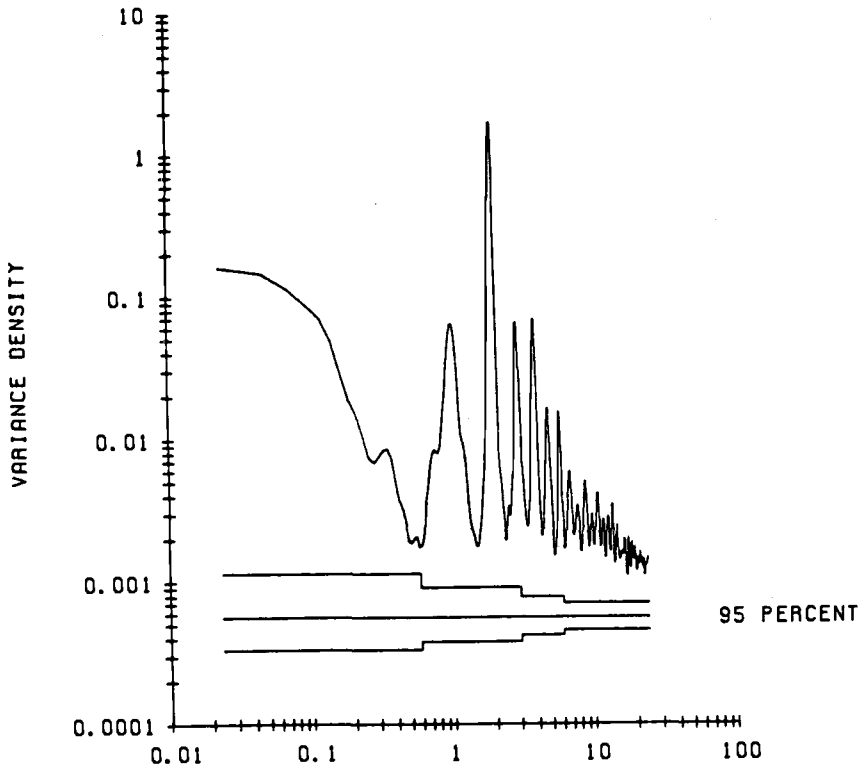
UNFILTERED CURRENT. 135 M AT GIBRALTAR C-2B.



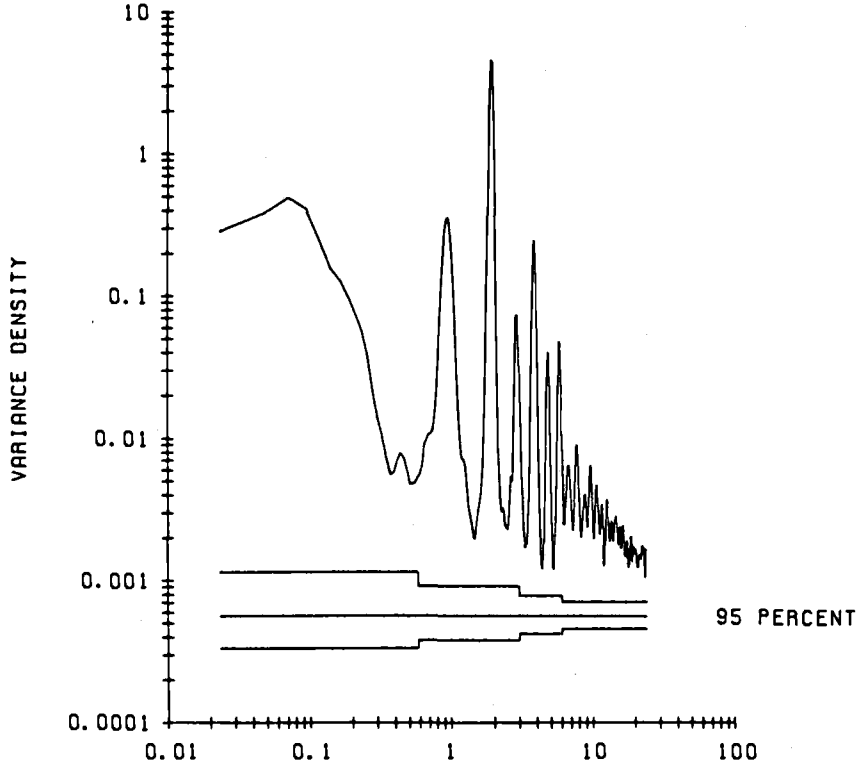
UNFILTERED PRESSURE. 135 M AT GIBRALTAR C-2B.



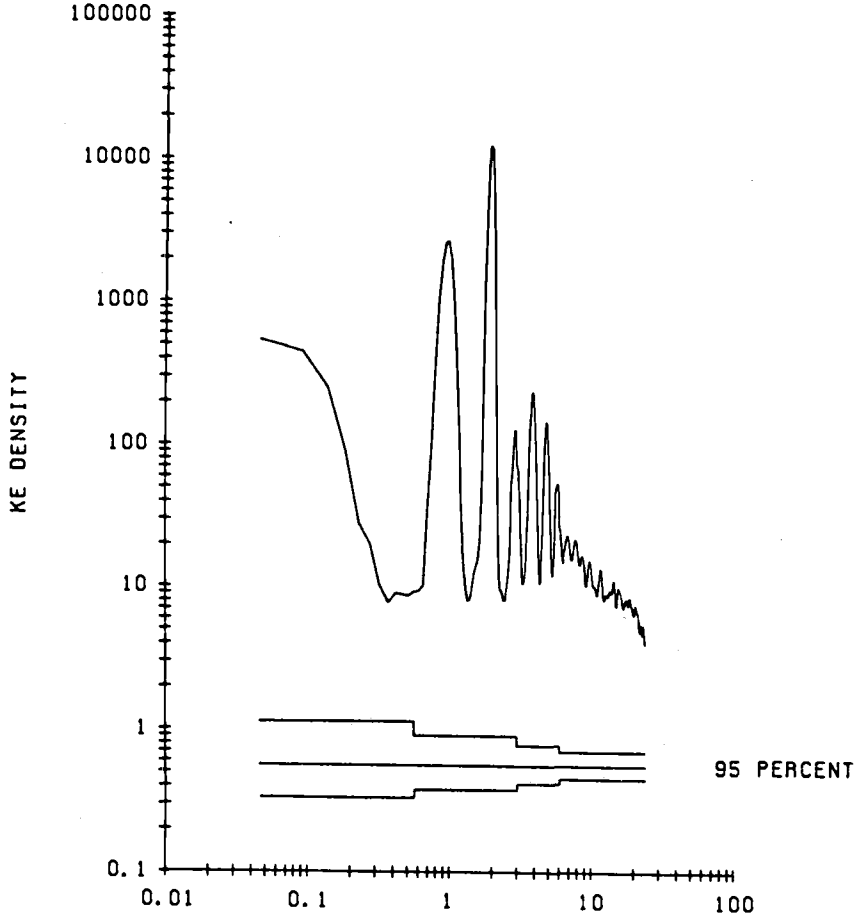
UNFILTERED TEMPERATURE. 135 M AT GIBRALTAR C-2B.



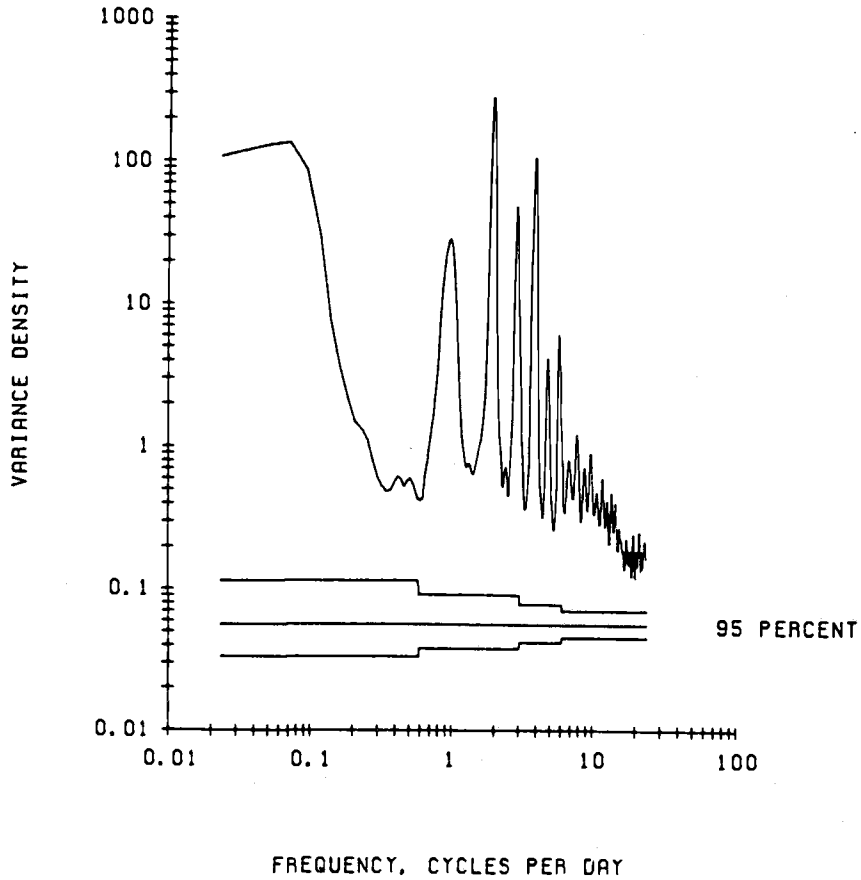
UNFILTERED SALINITY. 135 M AT GIBRALTAR C-2B.



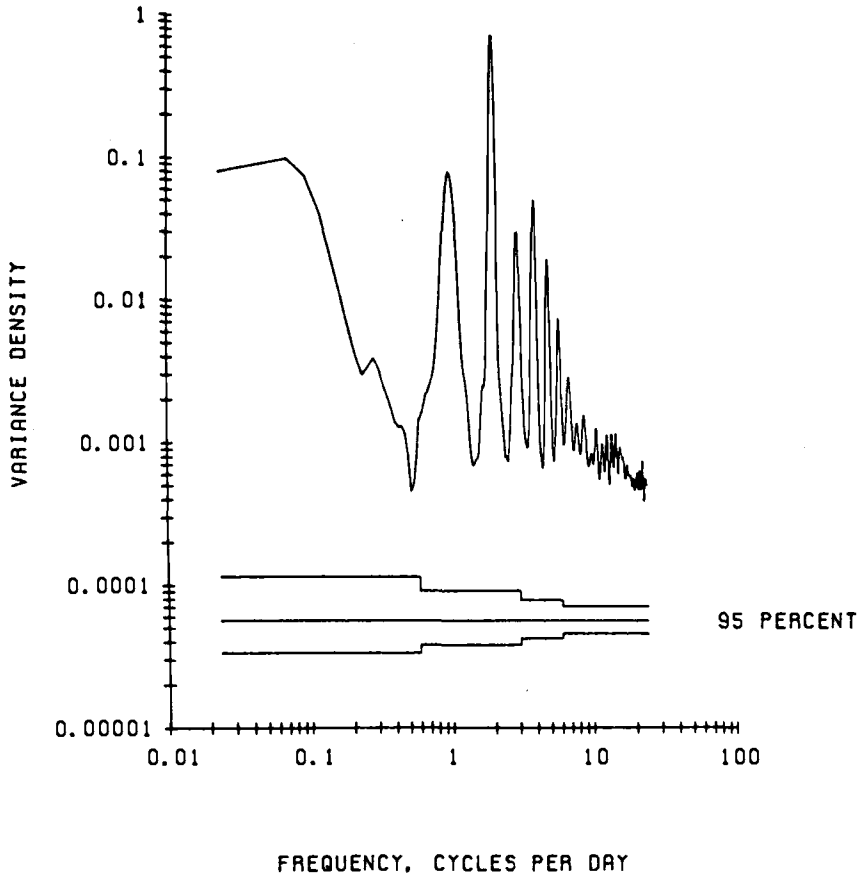
UNFILTERED CURRENT. 181 M AT GIBRALTAR C-28.



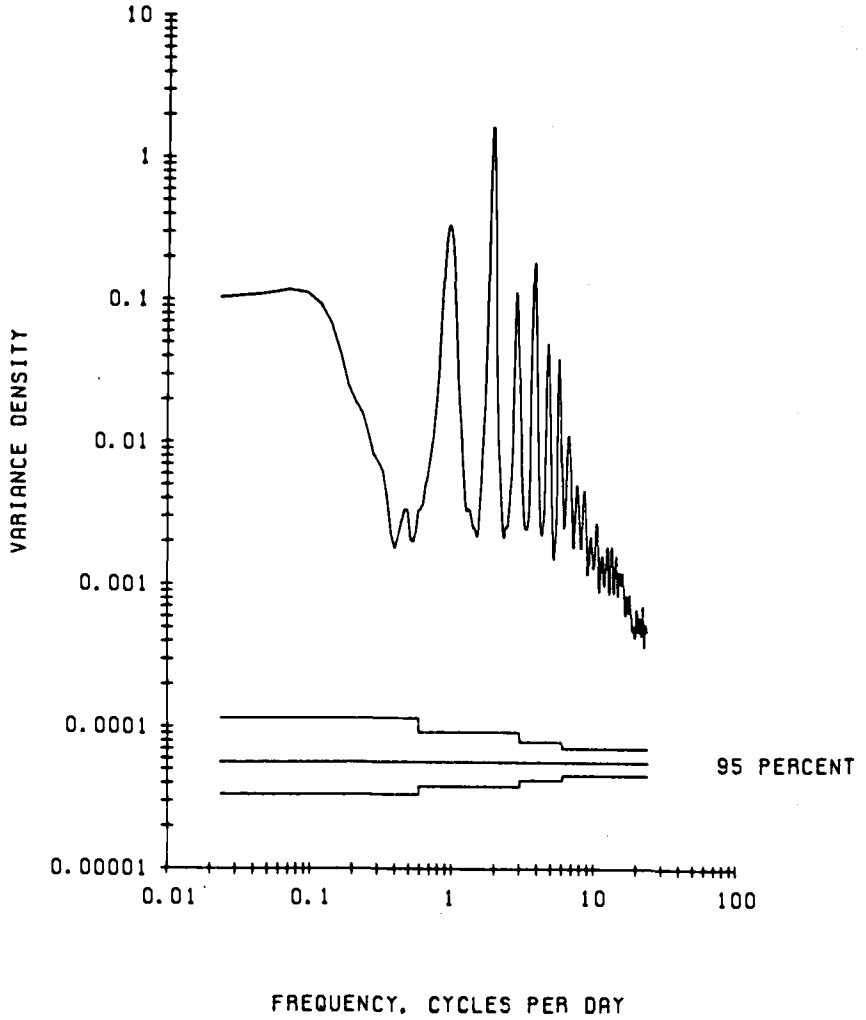
UNFILTERED PRESSURE. 181 M AT GIBRALTAR C-28.



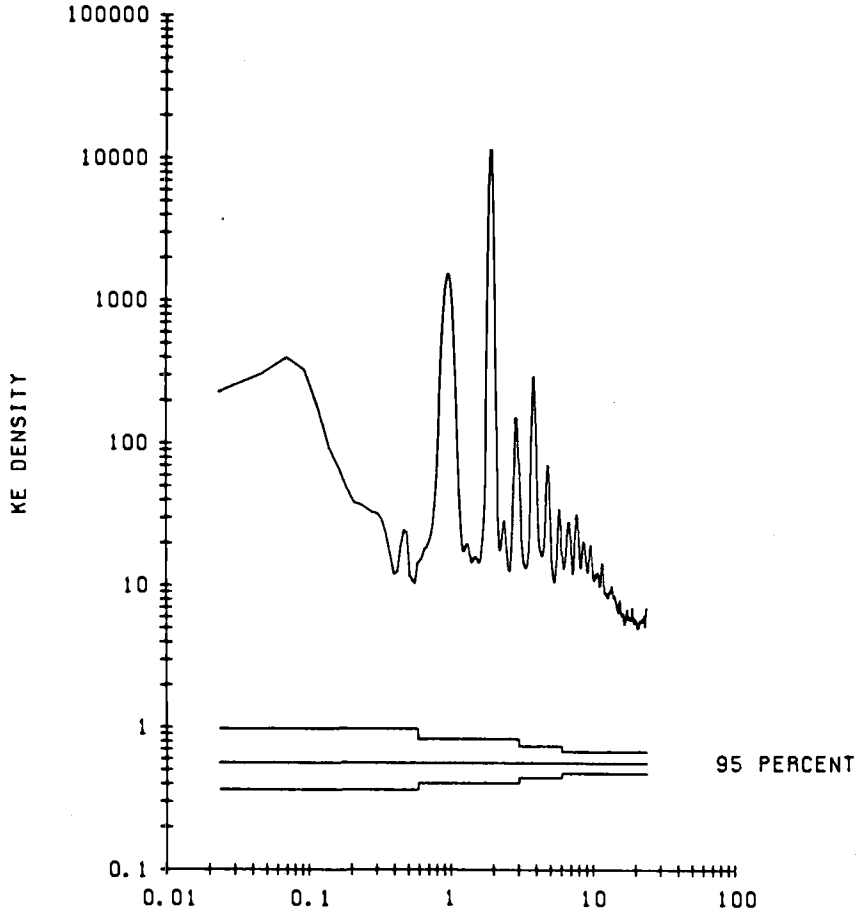
UNFILTERED TEMPERATURE. 181 M AT GIBRALTAR C-2B.



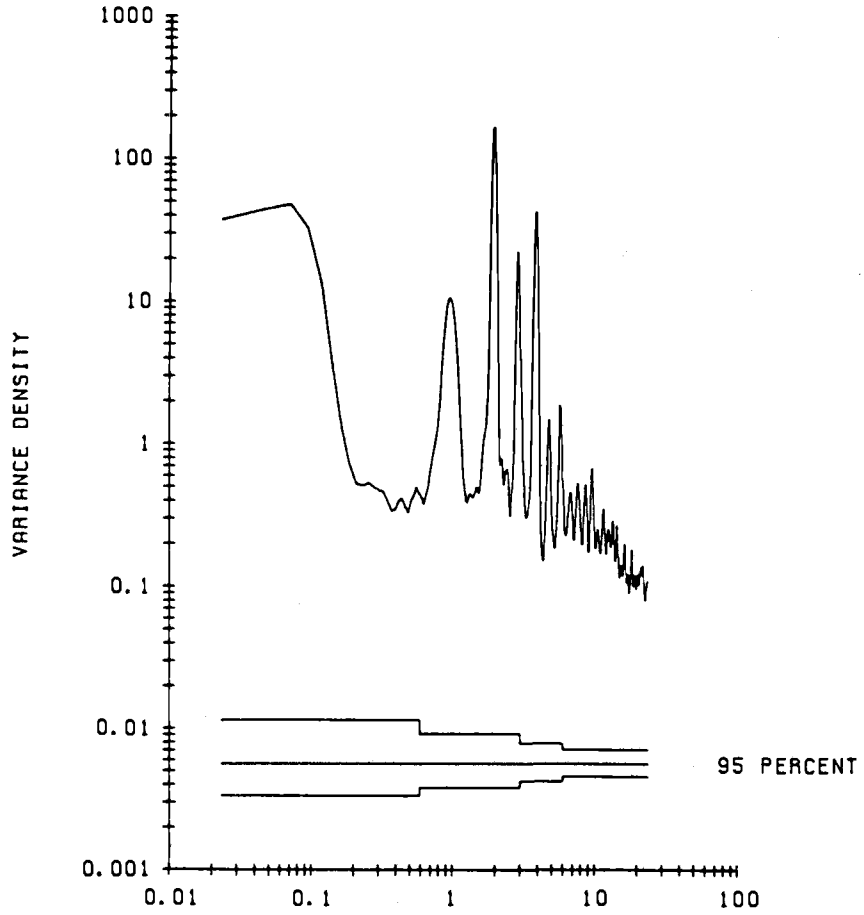
UNFILTERED SALINITY. 181 M AT GIBRALTAR C-2B.



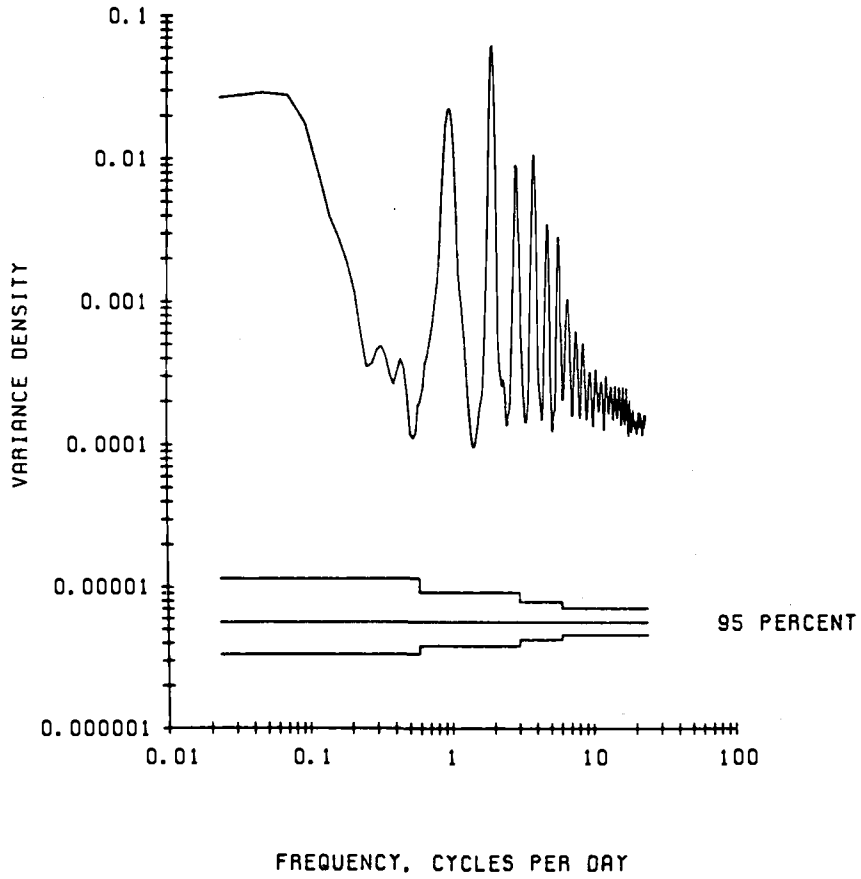
UNFILTERED CURRENT. 233 M AT GIBRALTAR C-2B.



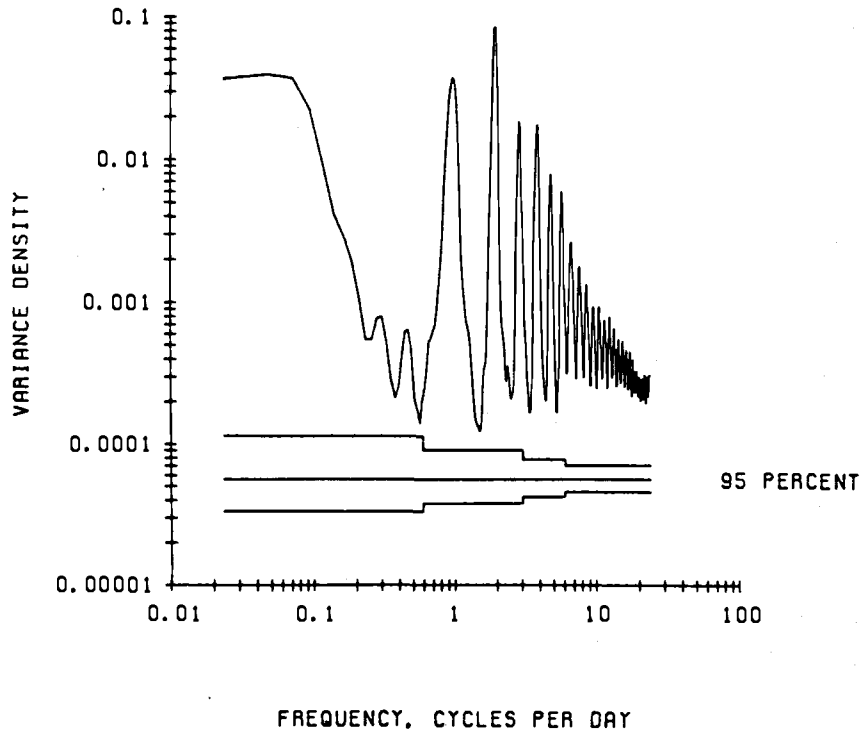
UNFILTERED PRESSURE. 233 M AT GIBRALTAR C-2B.



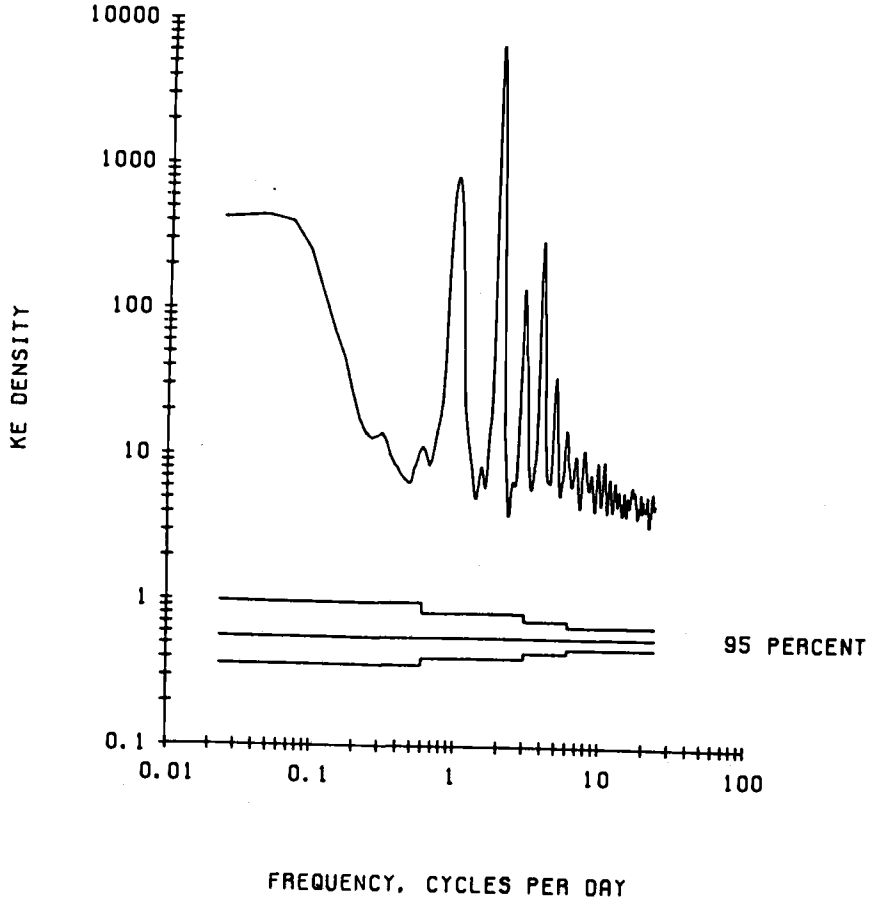
UNFILTERED TEMPERATURE. 233 M AT GIBRALTAR C-2B.



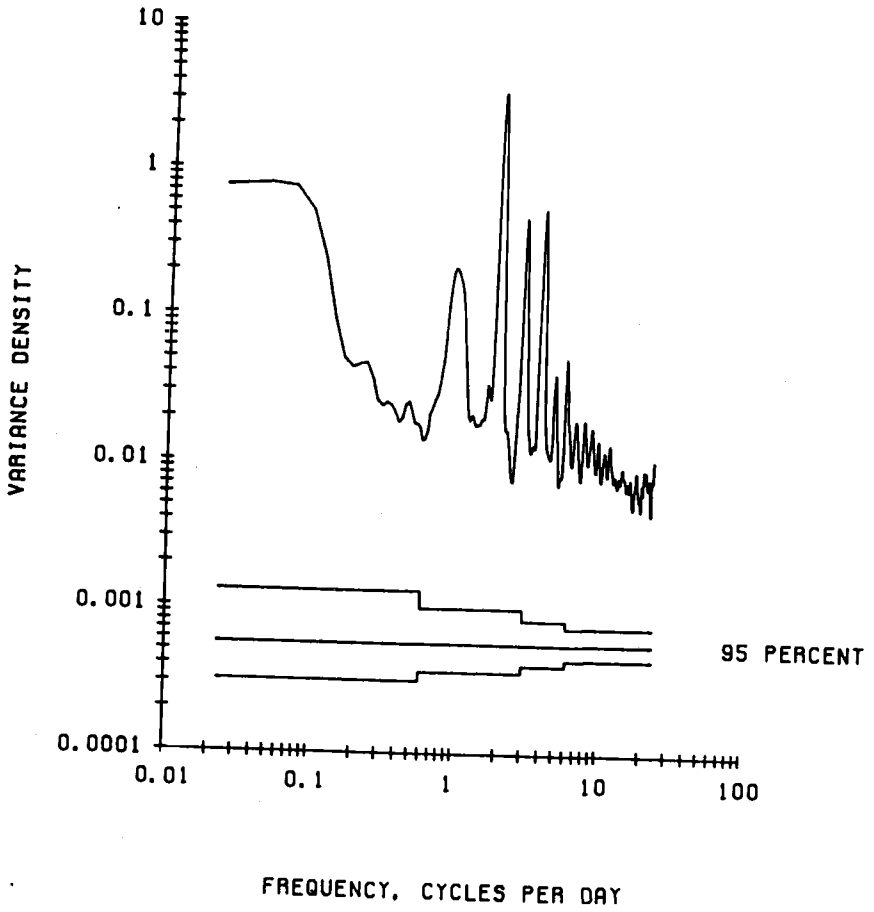
UNFILTERED SALINITY. 233 M AT GIBRALTAR C-2B.



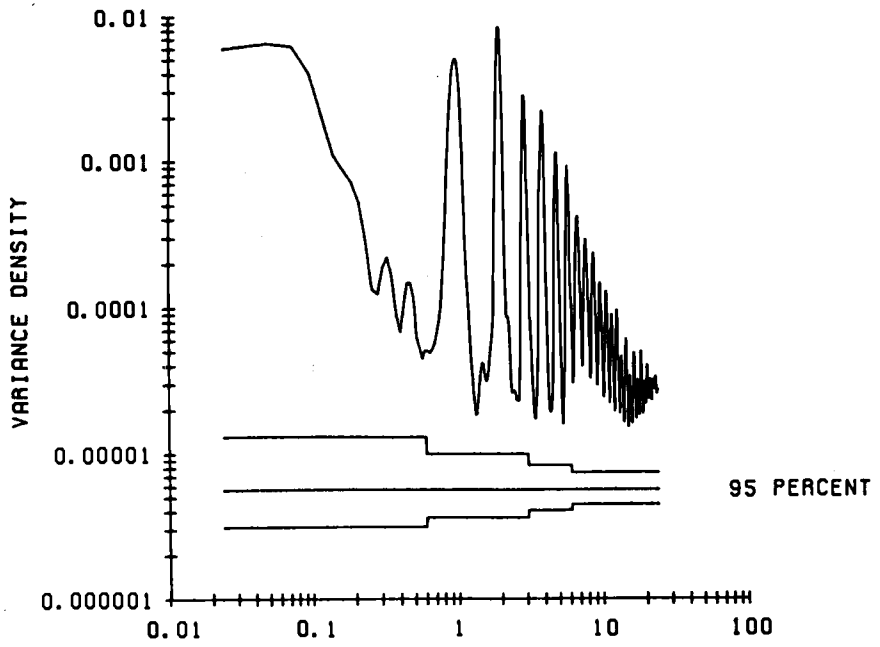
UNFILTERED CURRENT. 299 M AT GIBRALTAR C-2B.



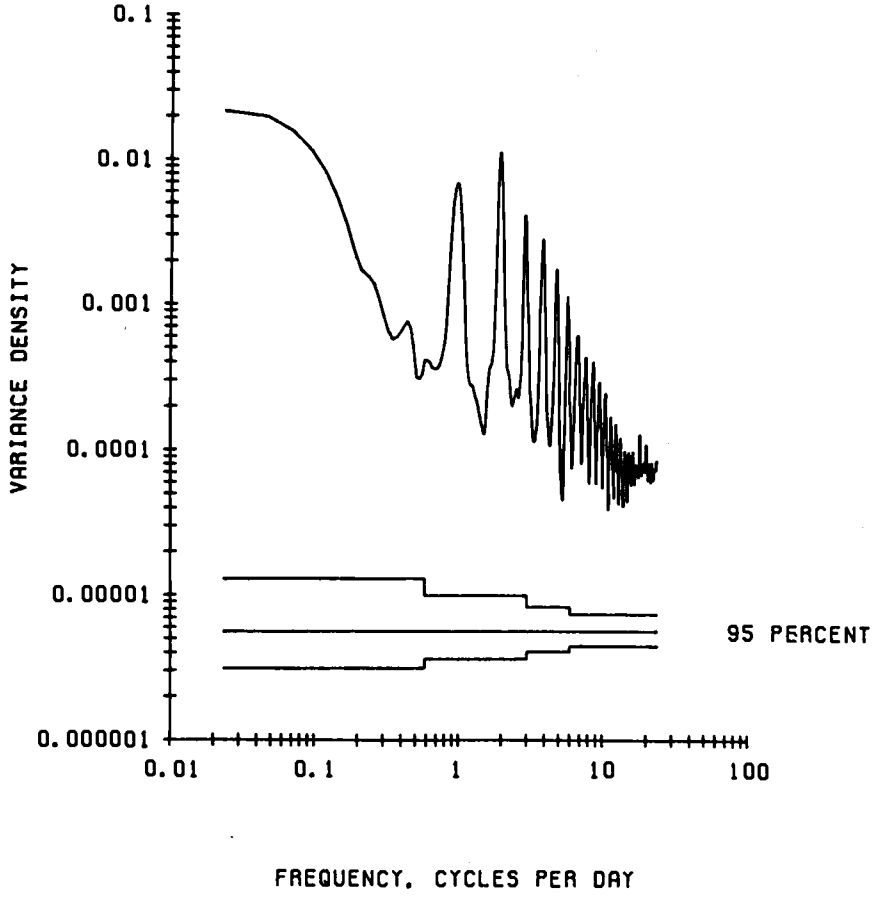
UNFILTERED PRESSURE. 299 M AT GIBRALTAR C-2B.

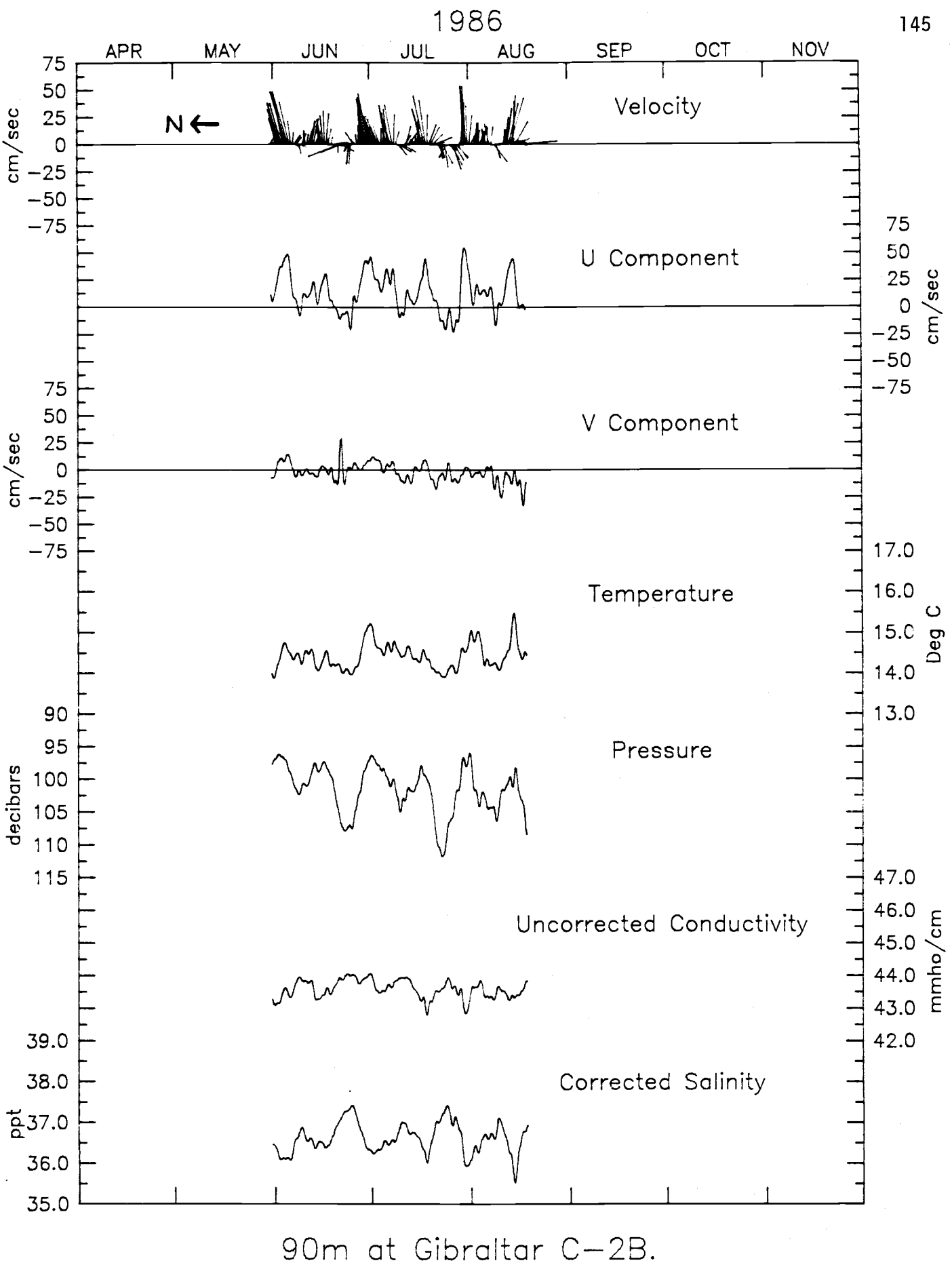


UNFILTERED TEMPERATURE. 299 M AT GIBRALTAR C-2B.

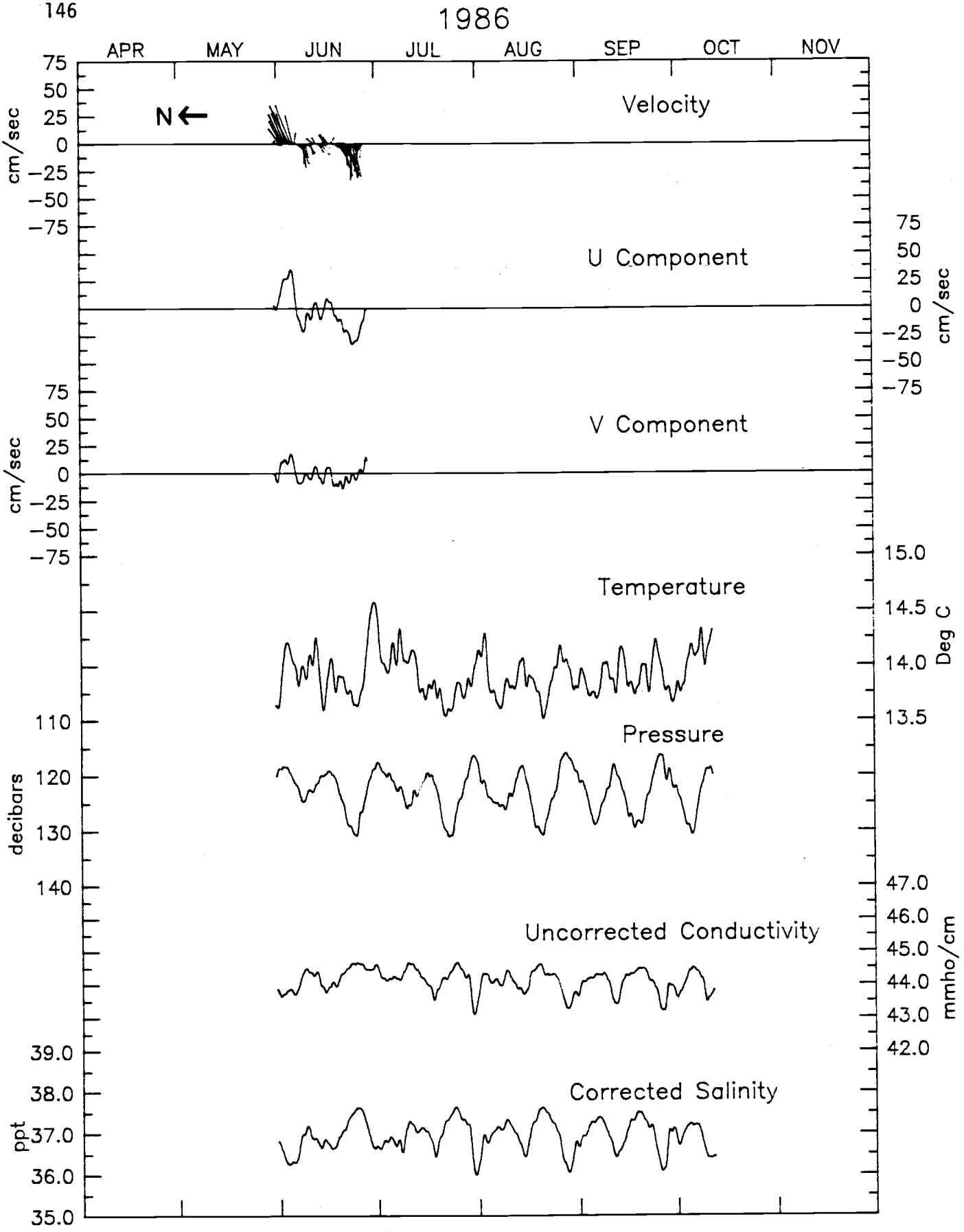


UNFILTERED SALINITY. 299 M AT GIBRALTAR C-2B.

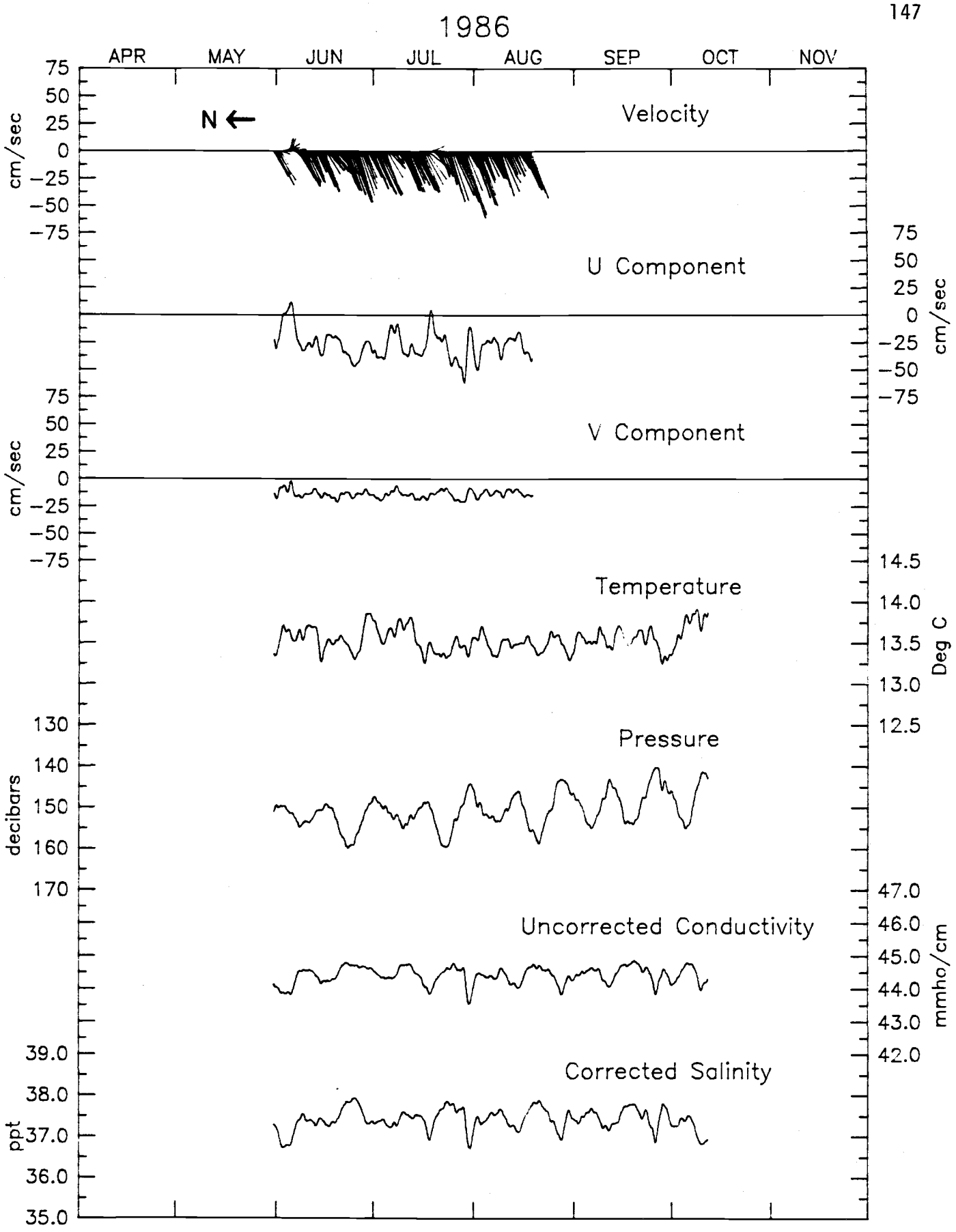




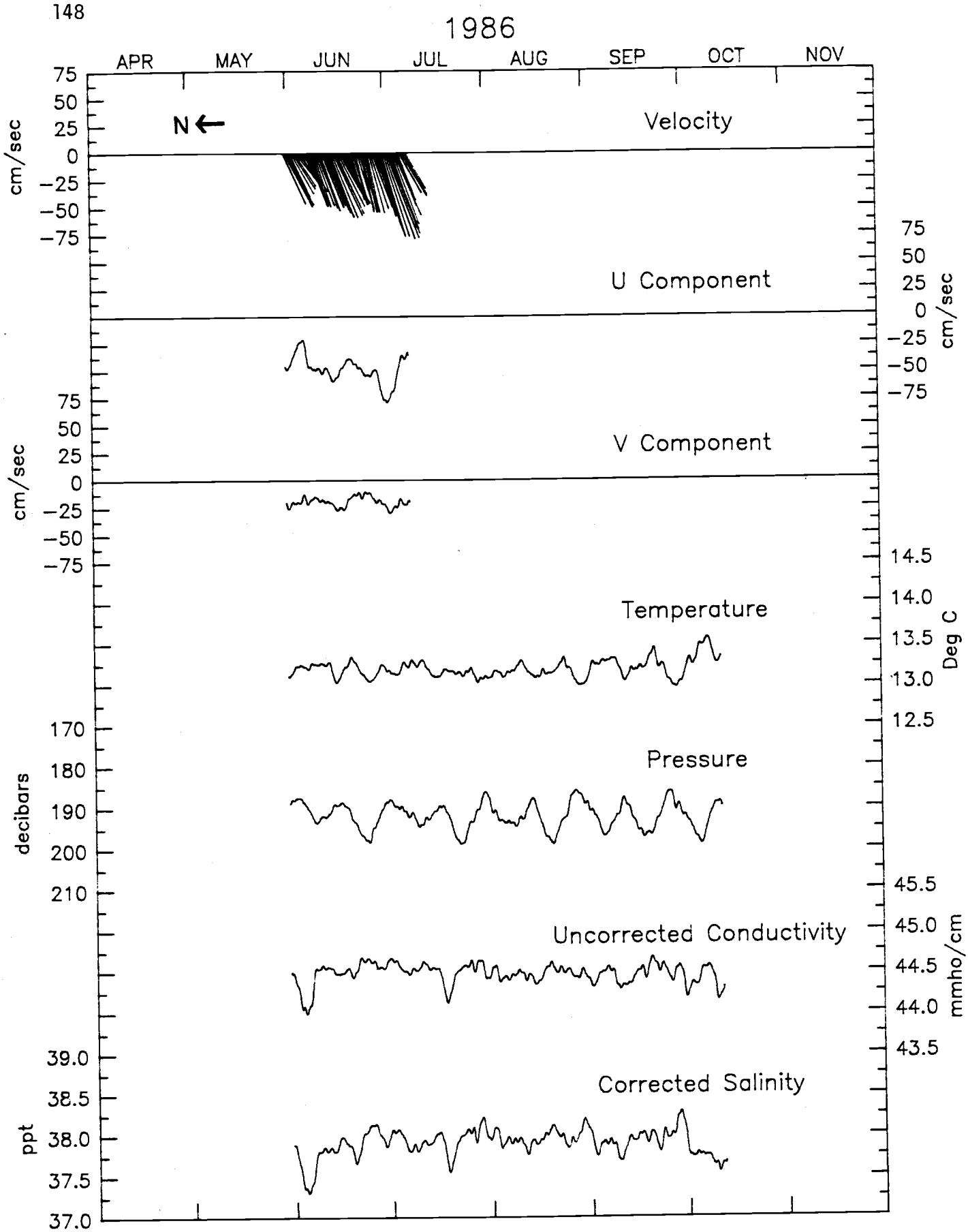
90m at Gibraltar C–2B.



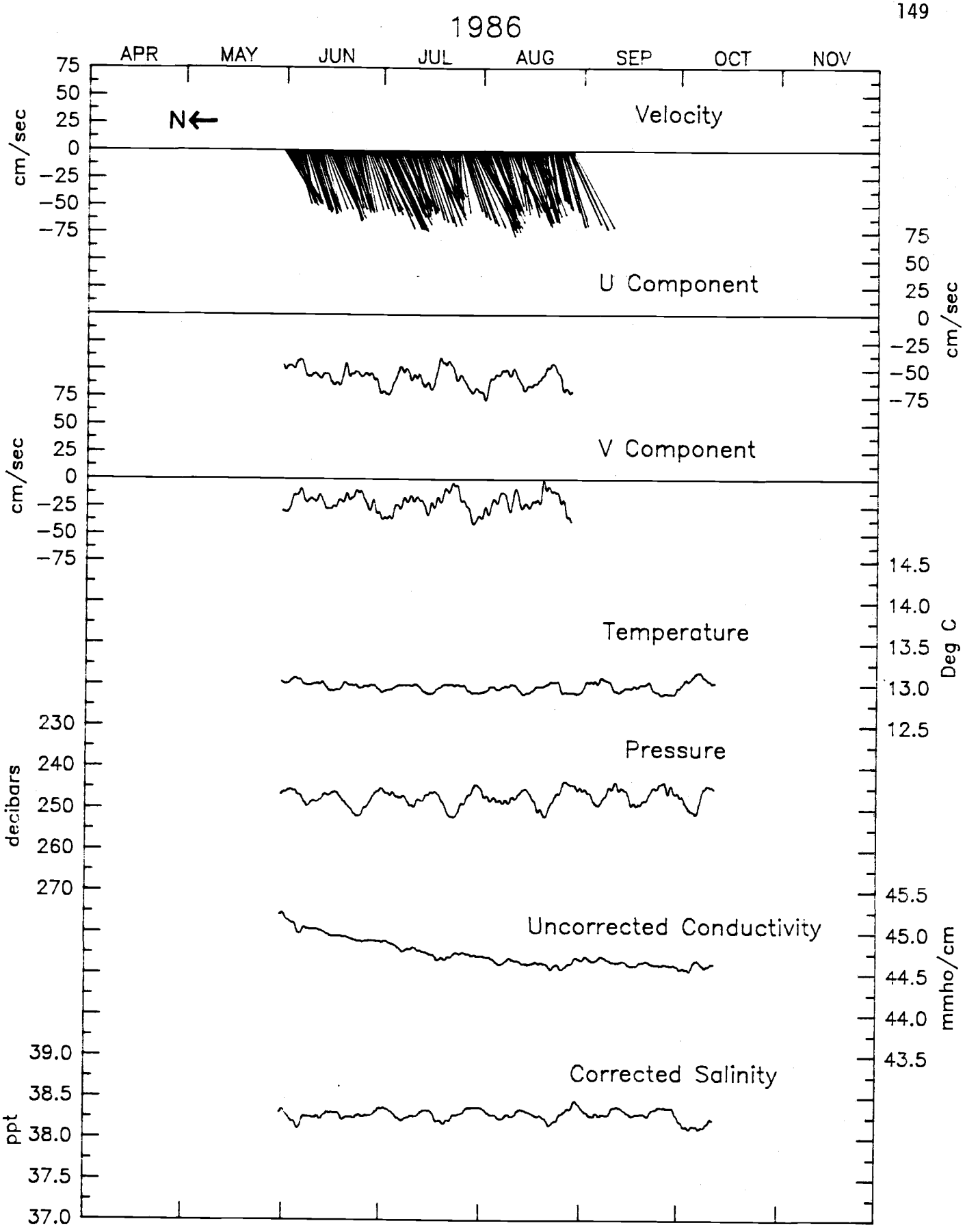
112m at Gibraltar C−2B.



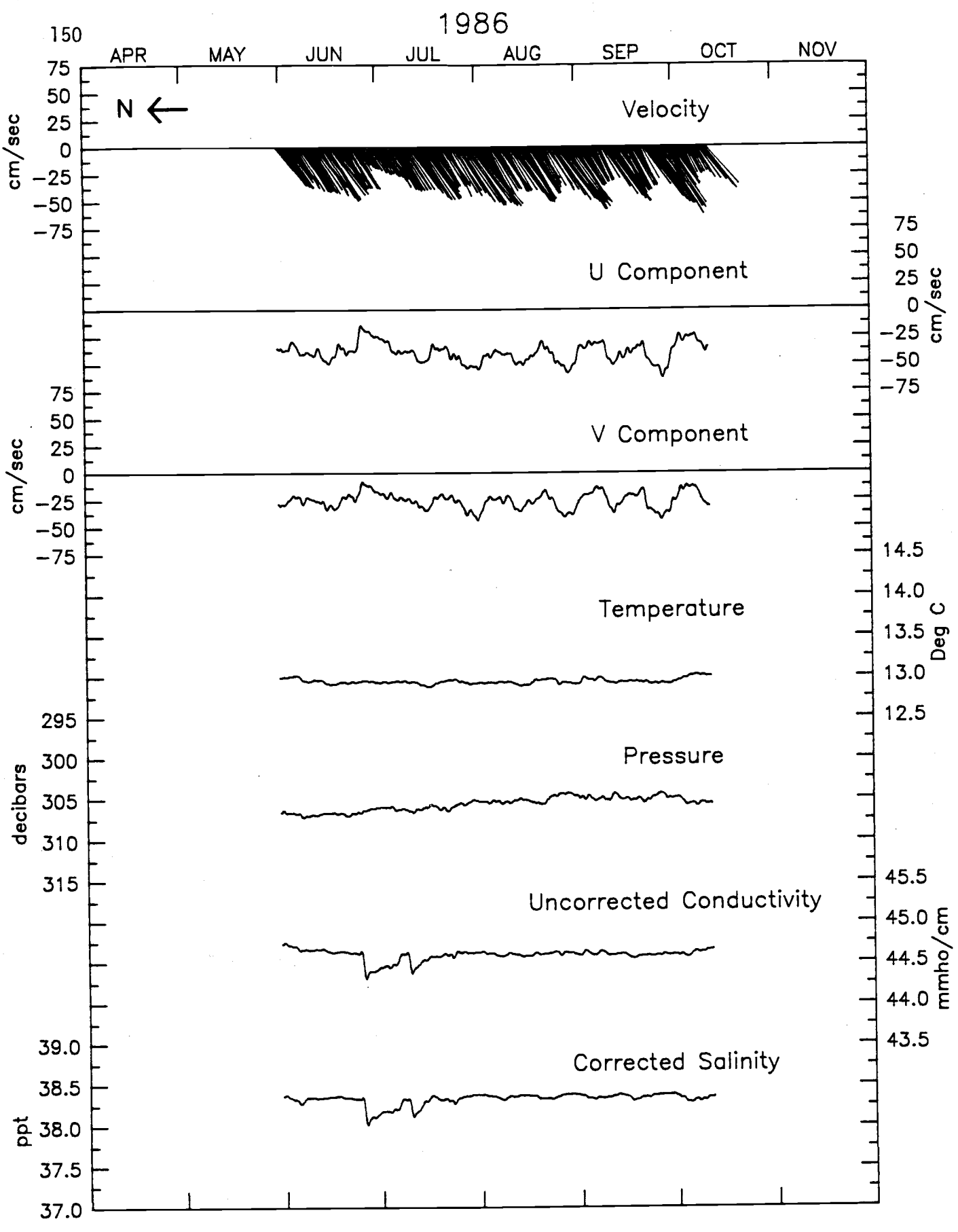
135m at Gibraltar C−2B.



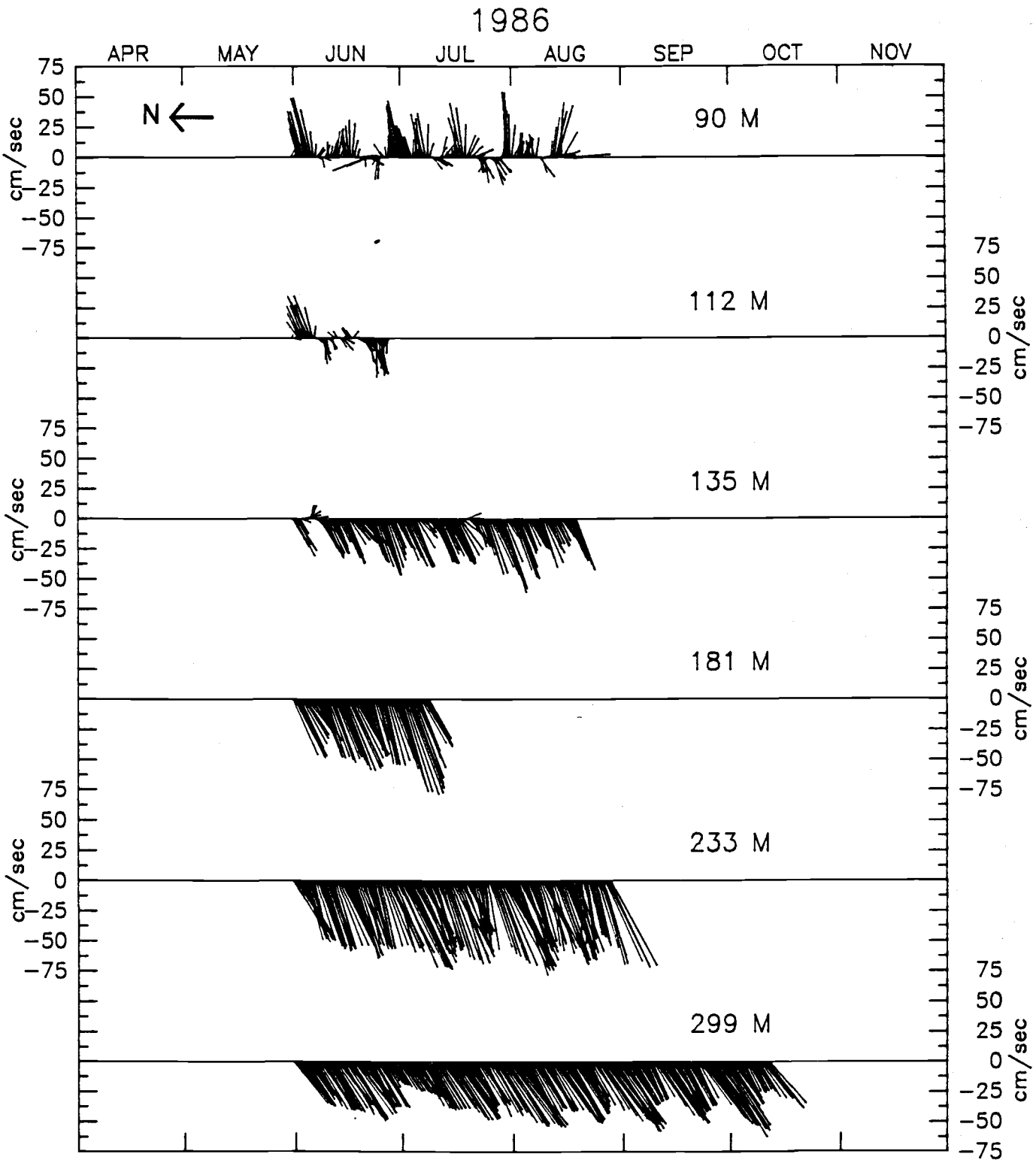
181m at Gibraltar C−2B.



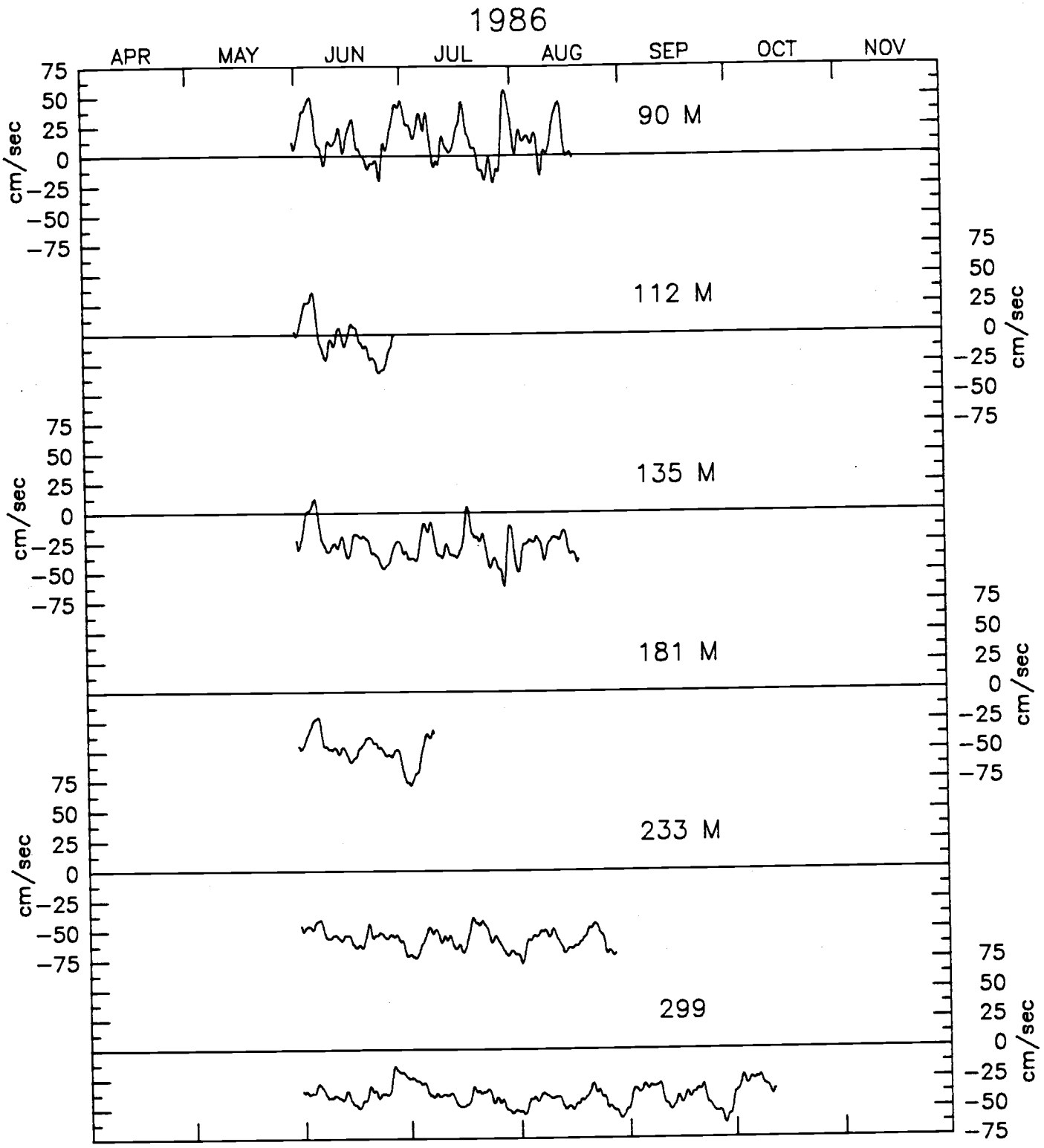
233m at Gibraltar C−2B.



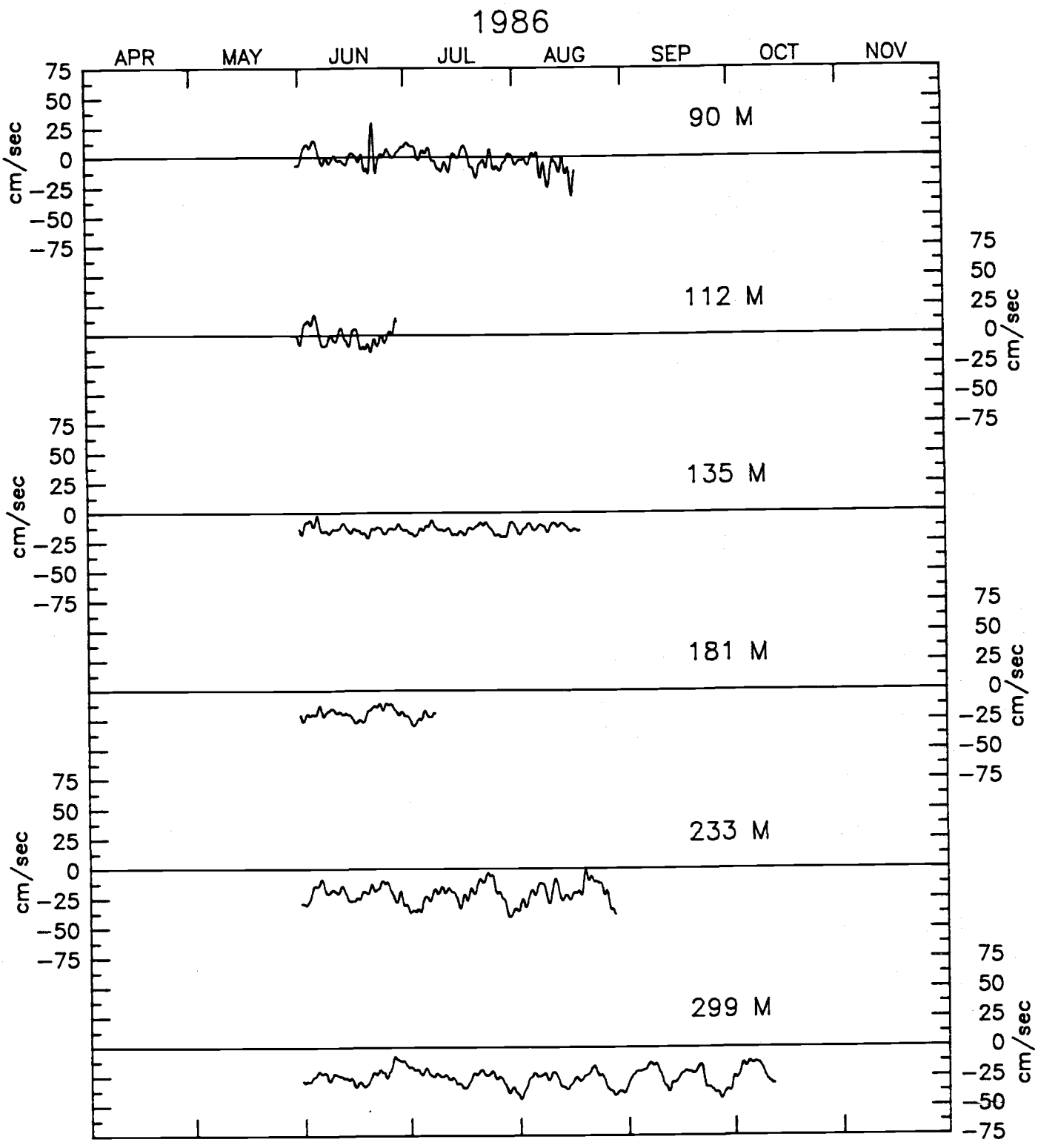
299 m at Gibraltar C–2B.



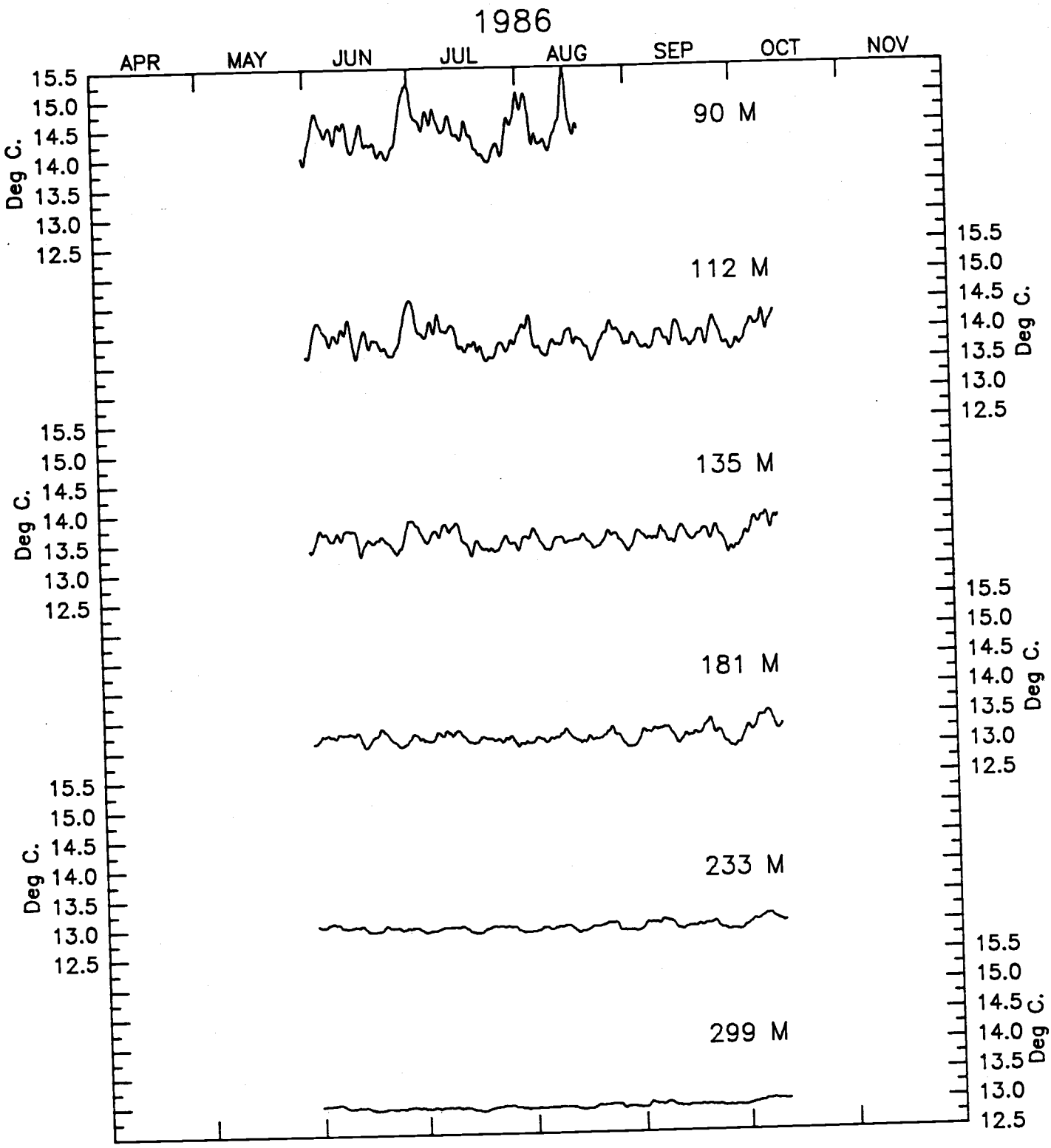
Velocity at Gibraltar C−2B.



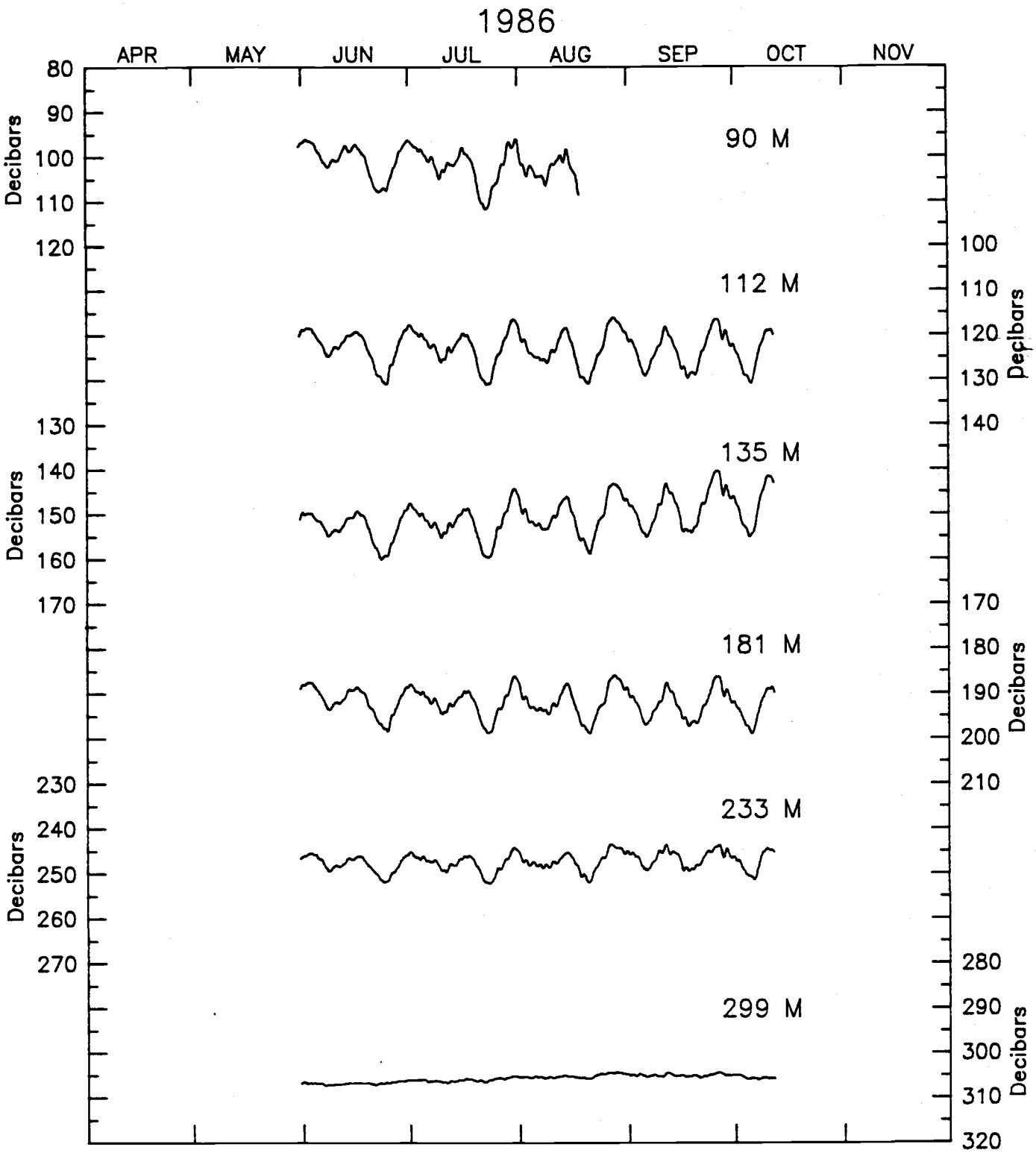
U Component at Gibraltar C−2B.



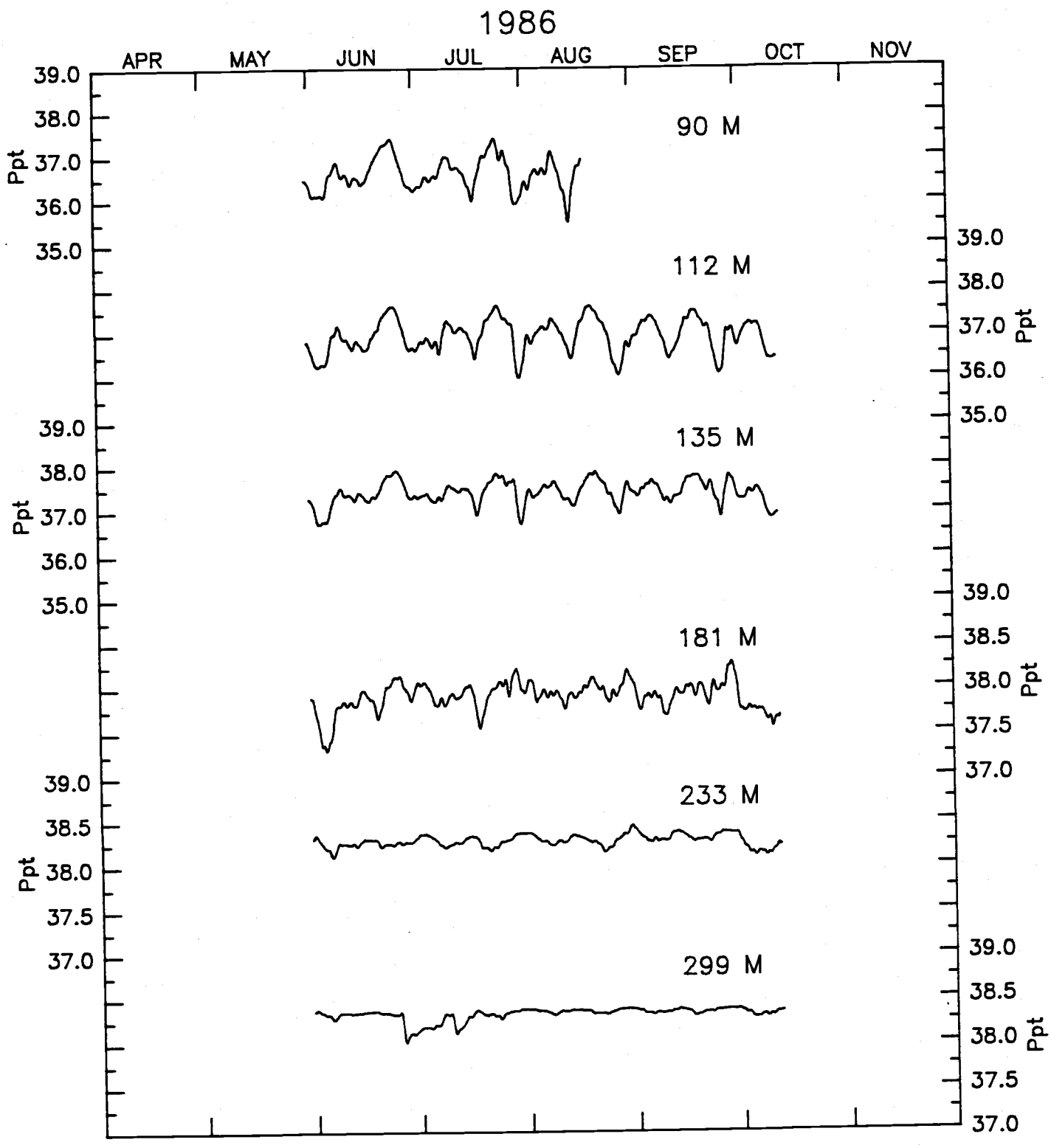
V Component at Gibraltar C−2B.



Temperature at Gibraltar C–2B.

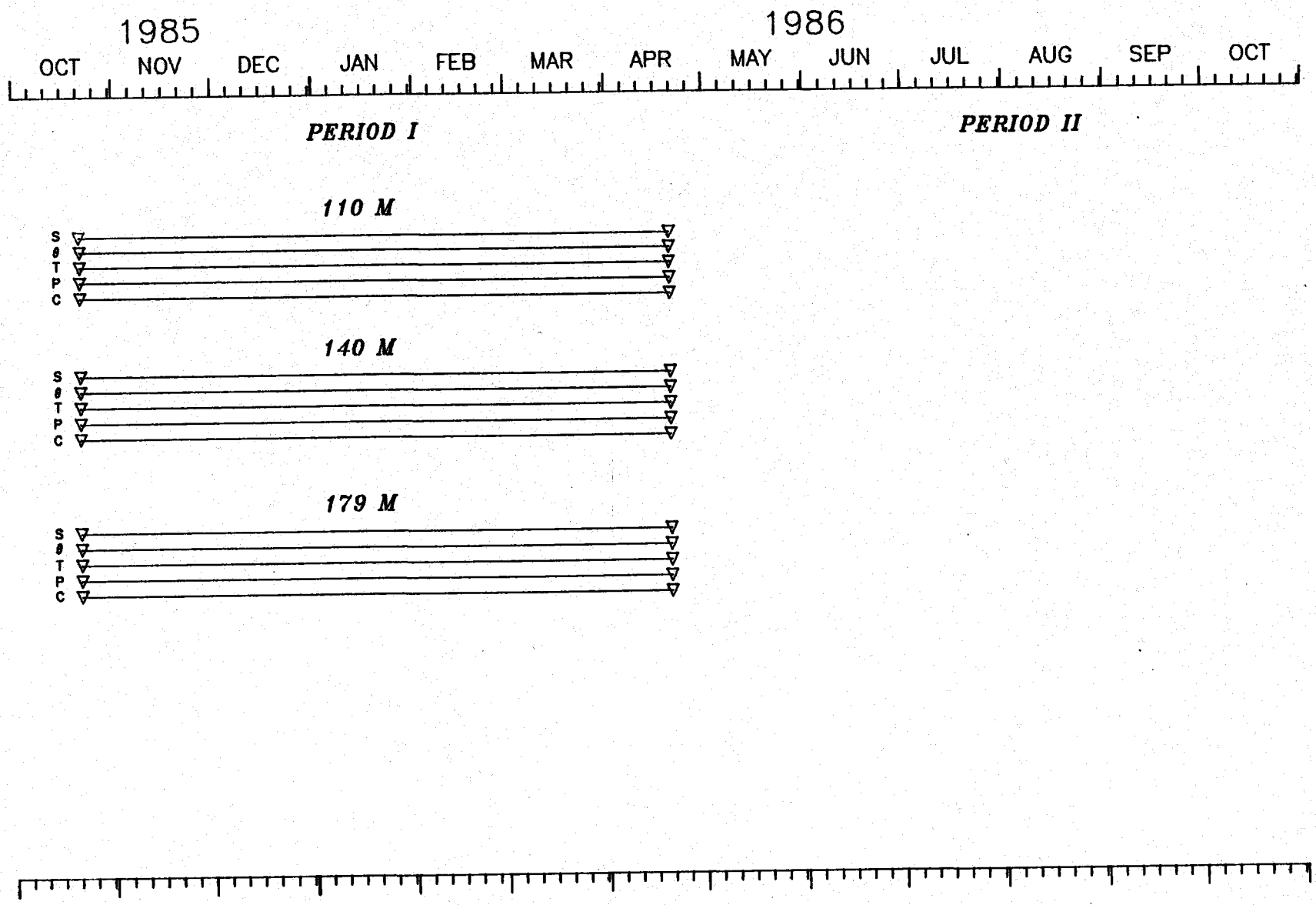


Pressure at Gibraltar C–2B.



Corrected Salinity at Gibraltar C–2B.

Mooring C - 3



DATA RETURN FROM GIBRALTAR C–3.

STATISTICS
MOORING GIBRALTAR C-3 PERIOD I
22 OCT 85 - 21 APR 86

HALF-HOURLY UNFILTERED DATA
35°53.42'N, 5°44.20'W
Bottom depth: 190 m

		MEAN	SD	MIN	MAX	LENGTH	COMMENTS
5643/26	s	85.41	49.99	2.40	247.90	8717	
110 m	u	8.61	95.39	-237.90	237.10	8717	
	v	10.26	22.70	-133.50	107.70	8717	
	T	14.83	1.13	12.83	18.13	8717	
	P	113.02	1.03	111.00	120.00	8717	
	C	44.72	0.85	41.68	47.88	8717	
	S	36.85	0.80	35.65	38.50	8717	

		MEAN	SD	MIN	MAX	LENGTH	
5644/28	s	78.36	42.53	0.80	222.90	8717	Two gaps in the speed record have been
140 m	u	-4.66	85.58	-215.70	221.30	8717	bridged: (0925 2 Jan 86 - 1625 2 Jan 86)
	v	4.12	24.21	-93.40	160.90	8717	and (1525 4 Mar 86 - 0455 9 Mar 86).
	T	14.29	1.08	12.79	18.01	8717	
	P	142.92	1.09	135.20	148.20	8717	
	C	44.73	0.63	42.19	47.73	8717	
	S	37.78	0.66	35.86	38.49	8717	

		MEAN	SD	MIN	MAX	LENGTH
5645/25	s	53.93	39.35	0.80	247.90	8717
179 m	u	-22.69	55.49	-247.90	165.90	8717
	v	-9.68	27.73	-172.90	103.60	8717
	T	13.56	0.76	12.68	17.12	8717
	P	182.28	0.46	180.90	184.10	8717
	C	44.13	0.45	42.24	46.88	8717
	S	37.78	0.66	35.86	38.49	8717

Mooring C-3 recovered when the release was fired 21 April 1985.)

(Speed, u, and v are given in cm/sec; Temperature in °C; Pressure in decibars; Conductivity in mmho/cm; and Corrected Salinity in ppt. The sampling rate is 30 min.)

STATISTICS SIX-HOURLY LLP FILTERED DATA
MOORING GIBRALTAR C-3 PERIOD I 35°53.42'N, 5°44.20'W
23 OCT 85 - 20 APR 86 Bottom depth: 190 m

		MEAN	SD	MIN	MAX	LENGTH
5643/26	u	8.69	19.69	-46.11	56.79	717
110 M	v	10.29	6.33	-2.88	25.27	717
	t	14.83	0.55	13.43	16.30	717
	P	113.03	0.54	112.11	114.63	717
	C	44.72	0.72	42.79	46.31	717
	S	36.85	0.36	35.95	37.72	717

		MEAN	SD	MIN	MAX	LENGTH
5644/28	u	-4.54	17.88	-56.13	45.25	717
140 m	v	4.13	6.47	-12.23	20.33	717
	T	14.29	0.39	13.24	15.47	717
	P	142.93	0.61	141.68	144.33	717
	C	44.73	0.49	43.52	45.98	717
	S	37.21	0.32	36.39	38.06	717

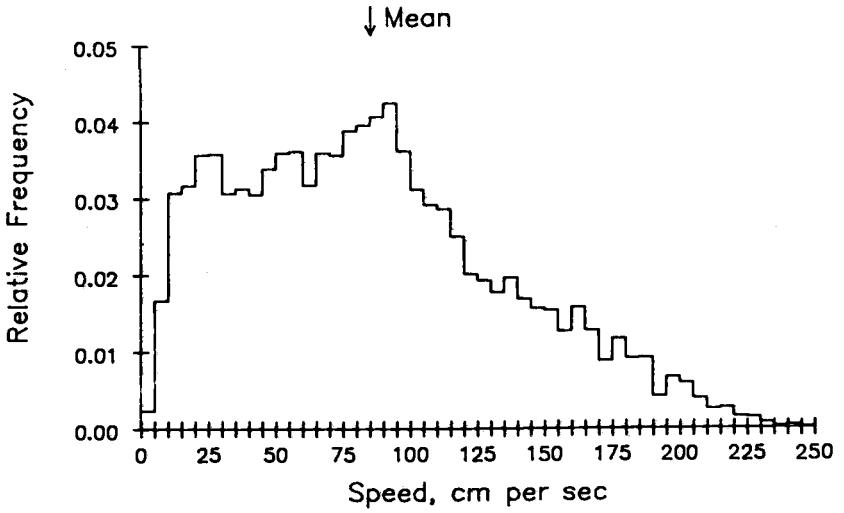
(see note on half-hourly statistic page)

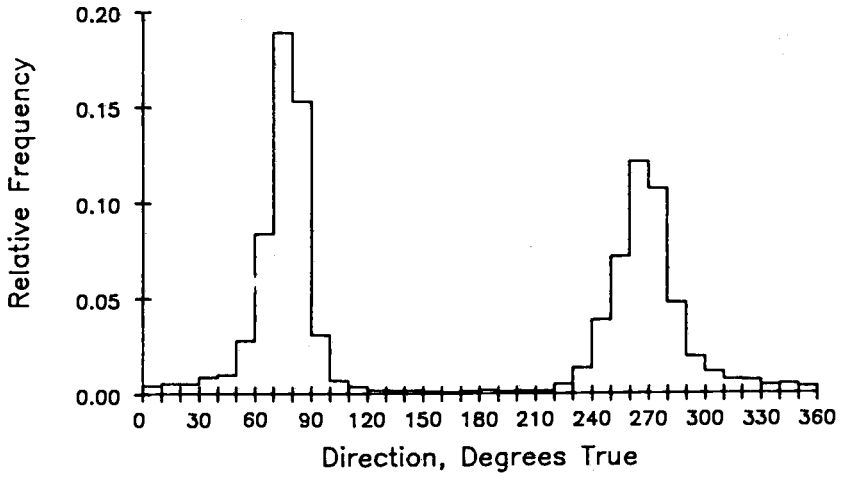
		MEAN	SD	MIN	MAX	LENGTH
5645/25	u	-22.66	12.29	-66.76	8.90	717
179 m	v	-9.67	5.34	-30.94	3.15	717
	T	13.56	0.23	12.92	14.25	717
	P	182.29	0.24	181.70	182.97	717
	C	44.13	0.38	43.35	44.87	717
	S	37.78	0.23	37.03	38.34	717

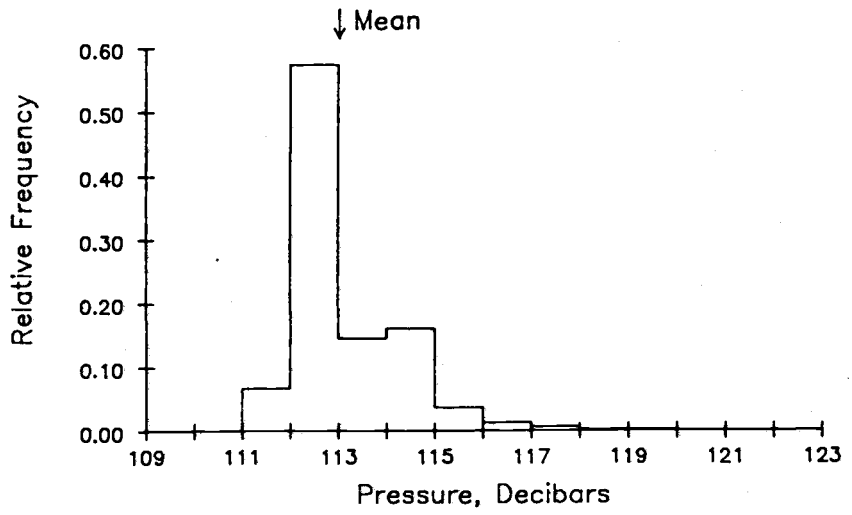
Mooring c-3 was recovered when the release was fired 21 April 1986.

(U, and v are given in cm/sec; Temperature in °C; Pressure in decibars; Conductivity in mmho/cm; and Corrected Salinity in ppt. The sampling rate is 360 min.)

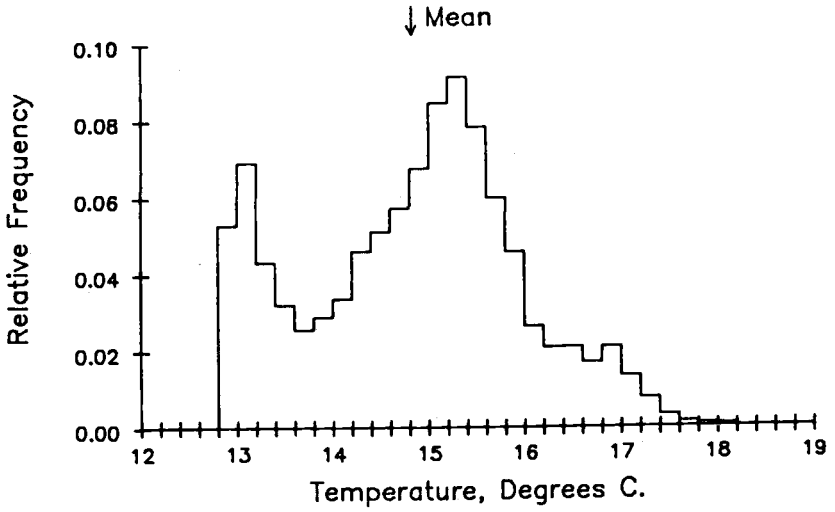
110 M AT GIBRALTAR C-3. 21 OCT 85 - 21 APR 86. TAPE 5643/26.

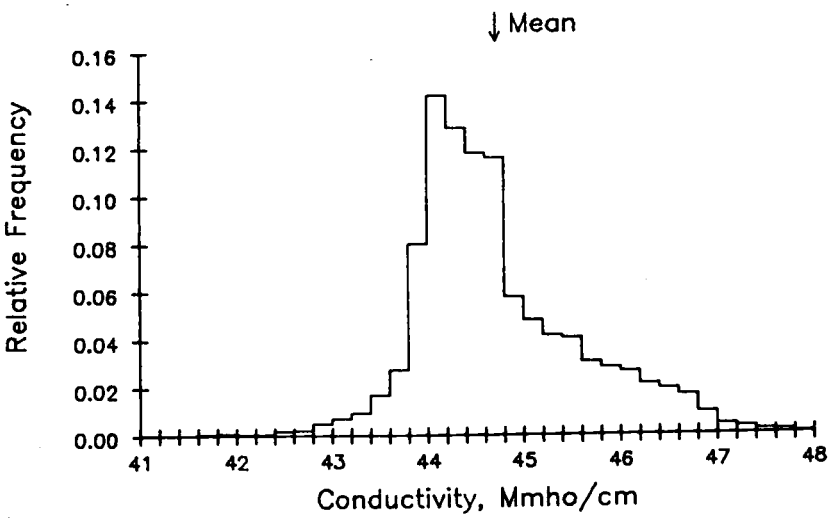


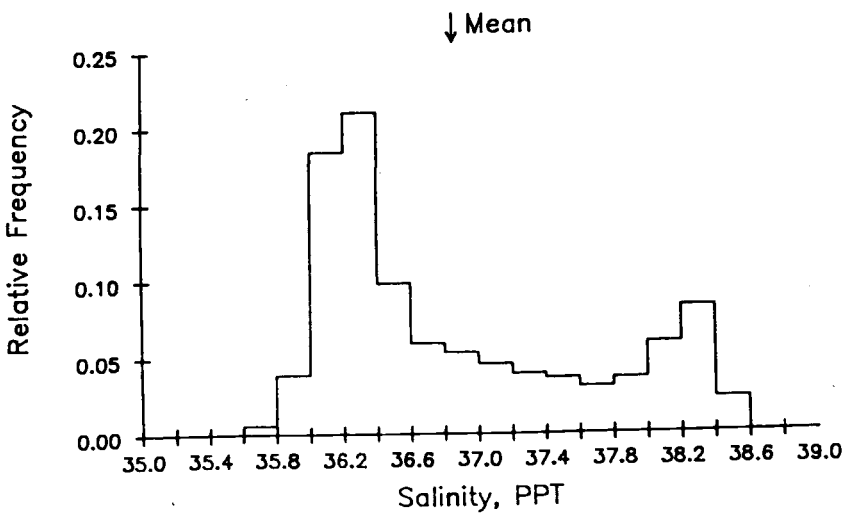




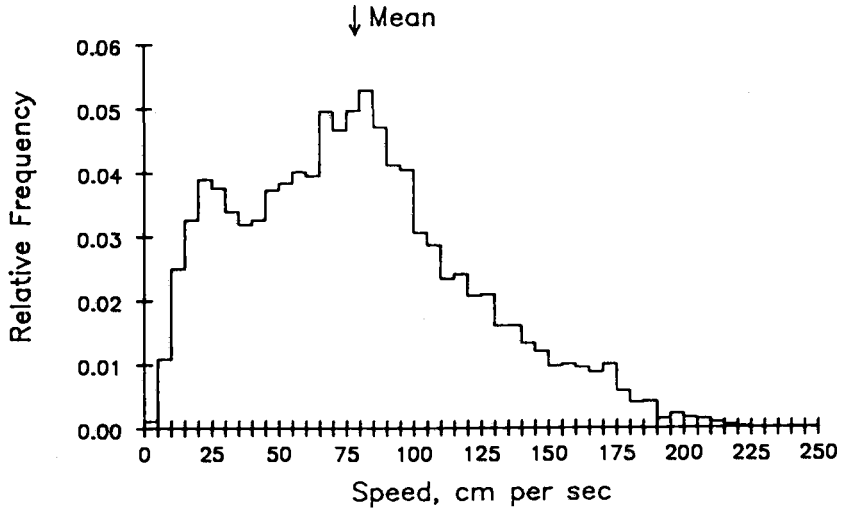
110 M AT GIBRALTAR C-3. 21 OCT 85 - 21 APR 86. TAPE 5643/26.

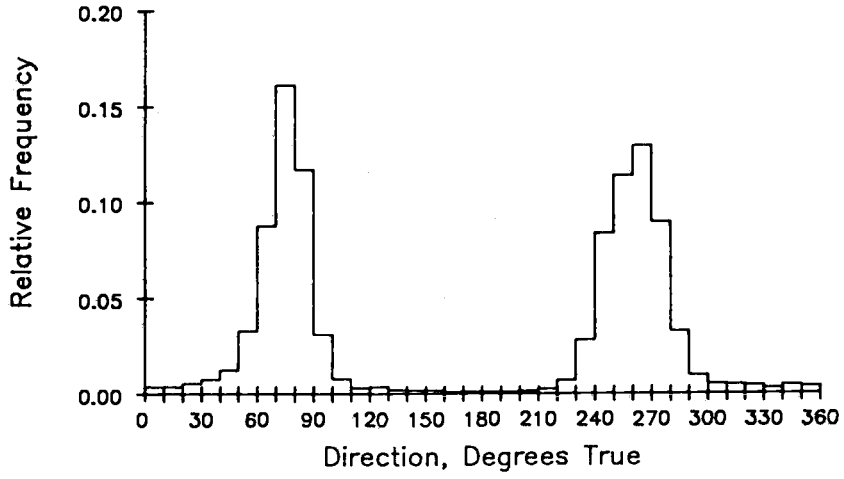


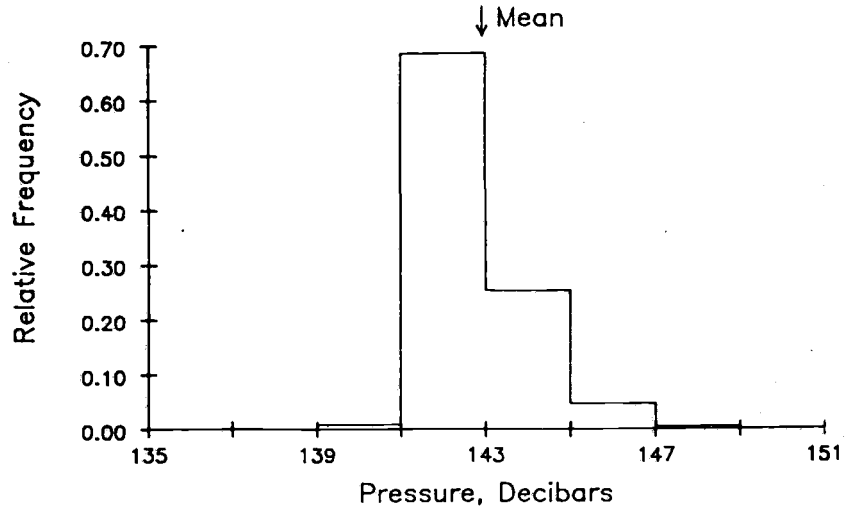




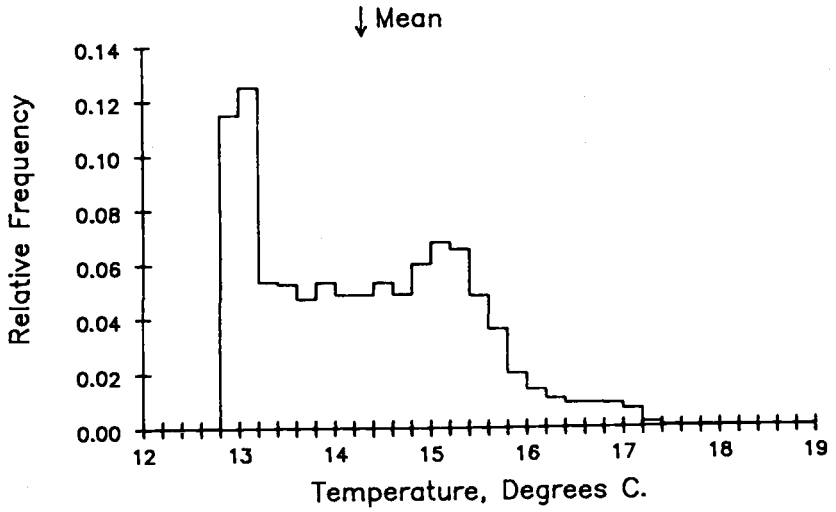
140 M AT GIBRALTAR C–3. 21 OCT 85 – 21 APR 86. TAPE 5644/28.

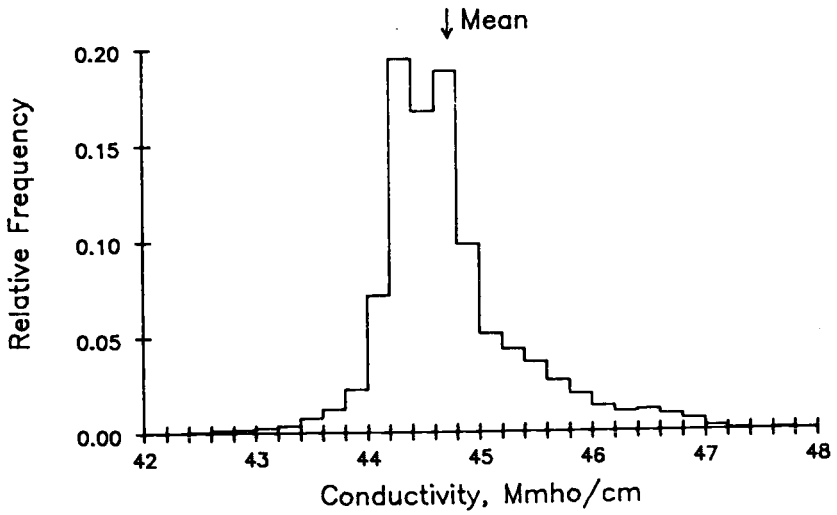


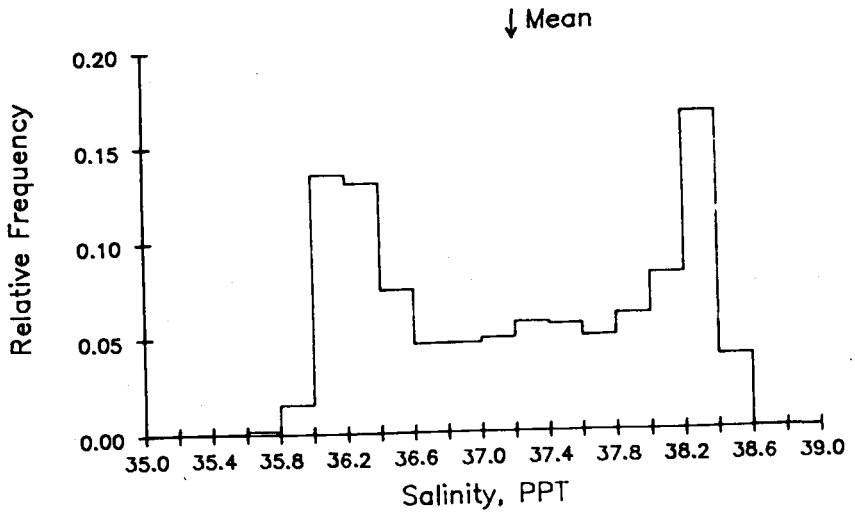




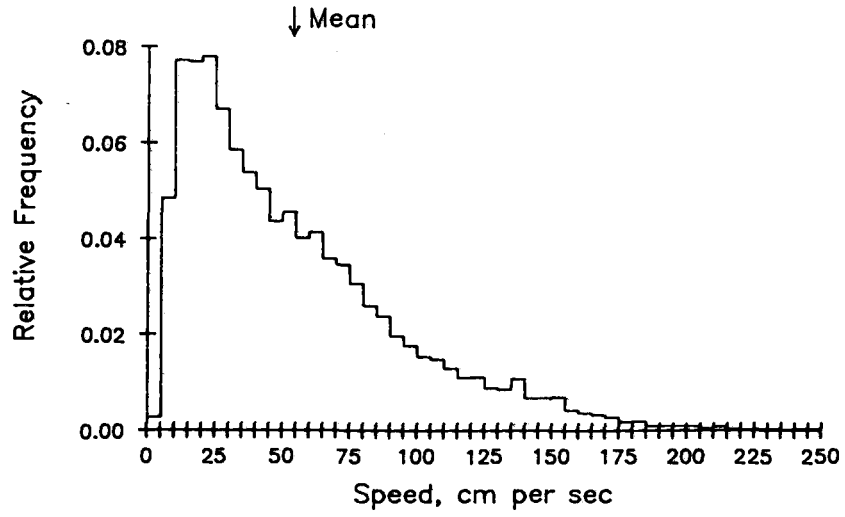
140 M AT GIBRALTAR C-3. 21 OCT 85 - 21 APR 86. TAPE 5644/28.

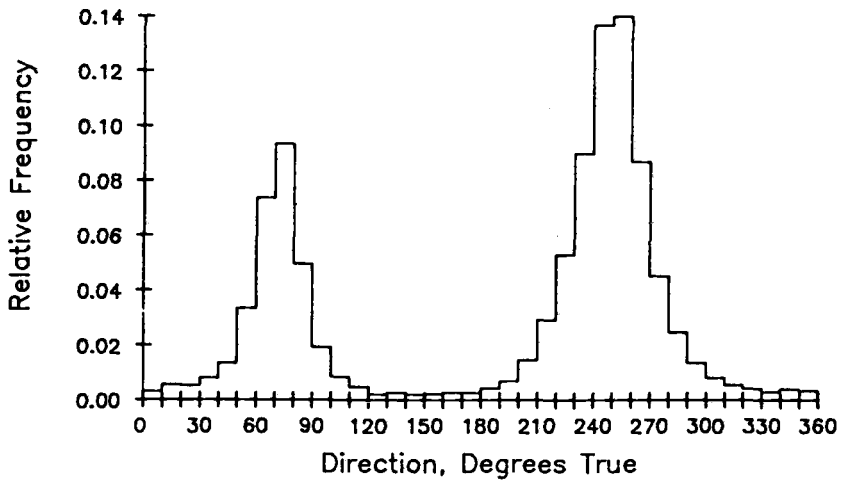


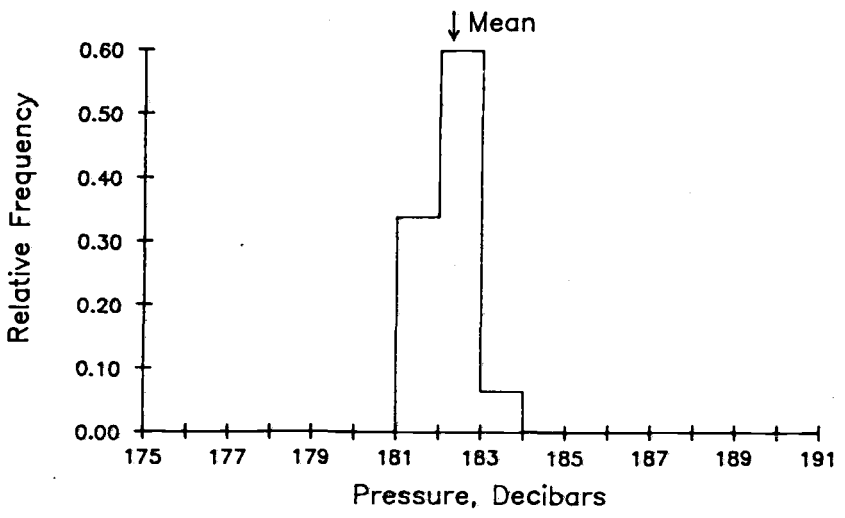




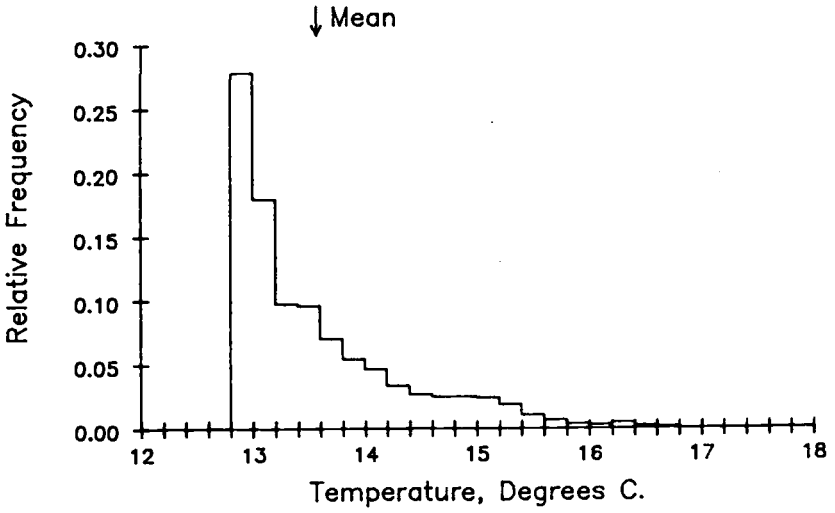
179 M AT GIBRALTAR C-3. 21 OCT 85 - 21 APR 86. TAPE 5645/25.

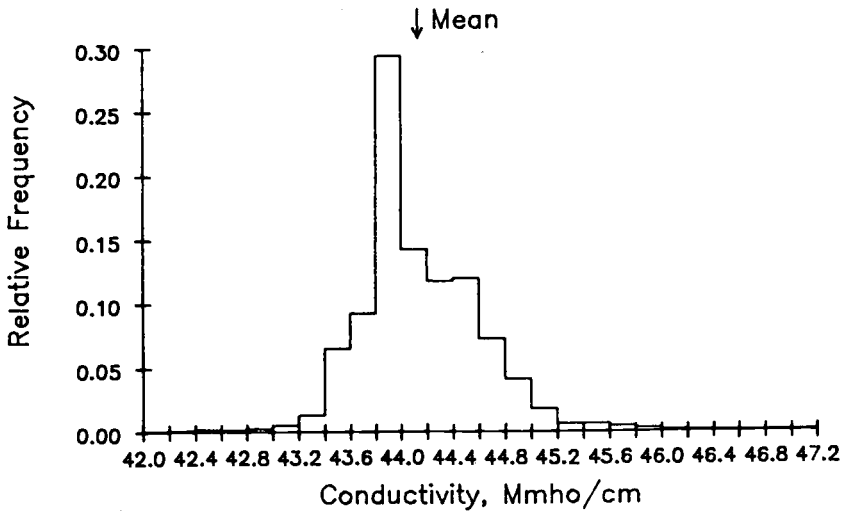


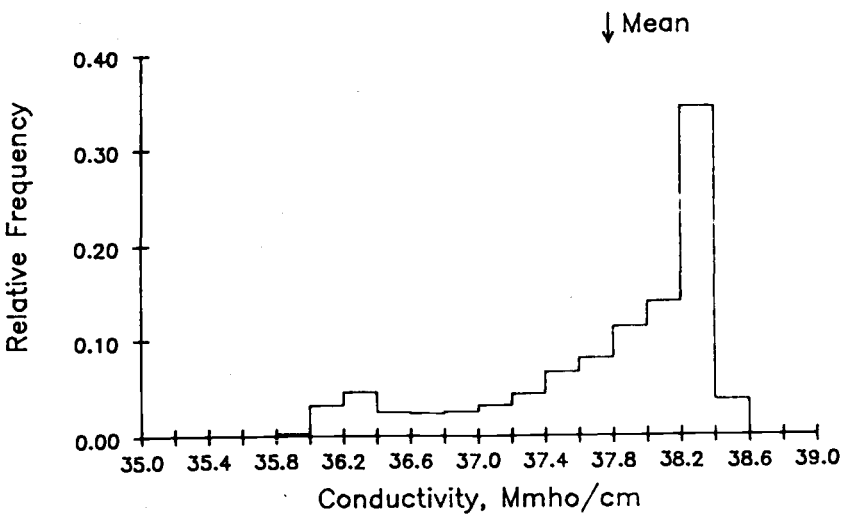




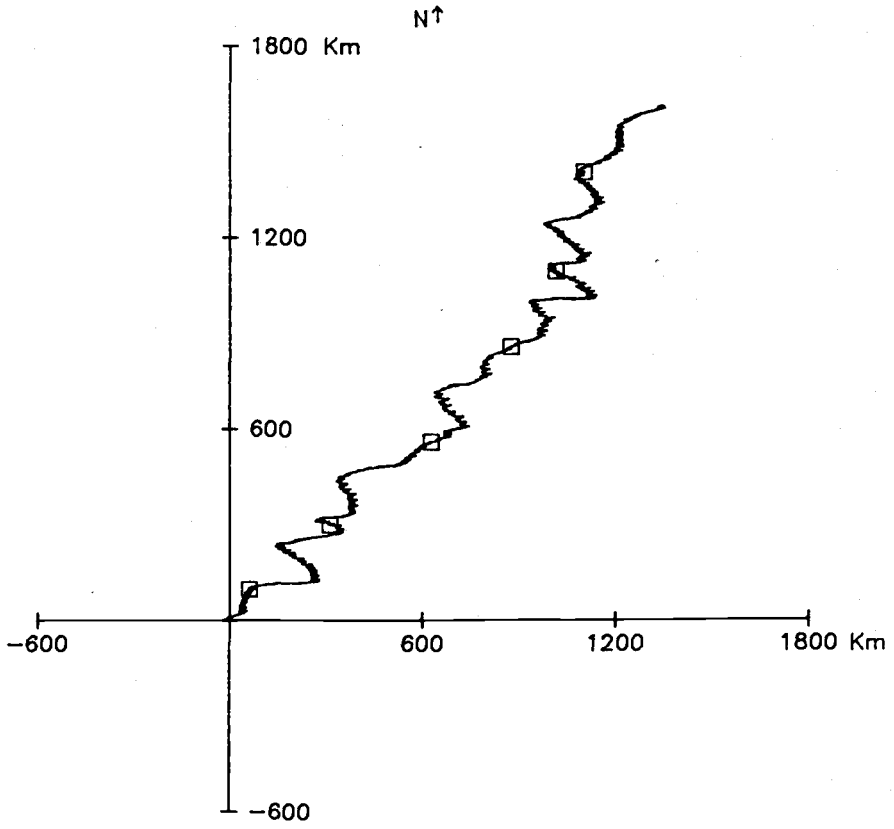
179 M AT GIBRALTAR C–3. 21 OCT 85 – 21 APR 86. TAPE 5645/25.

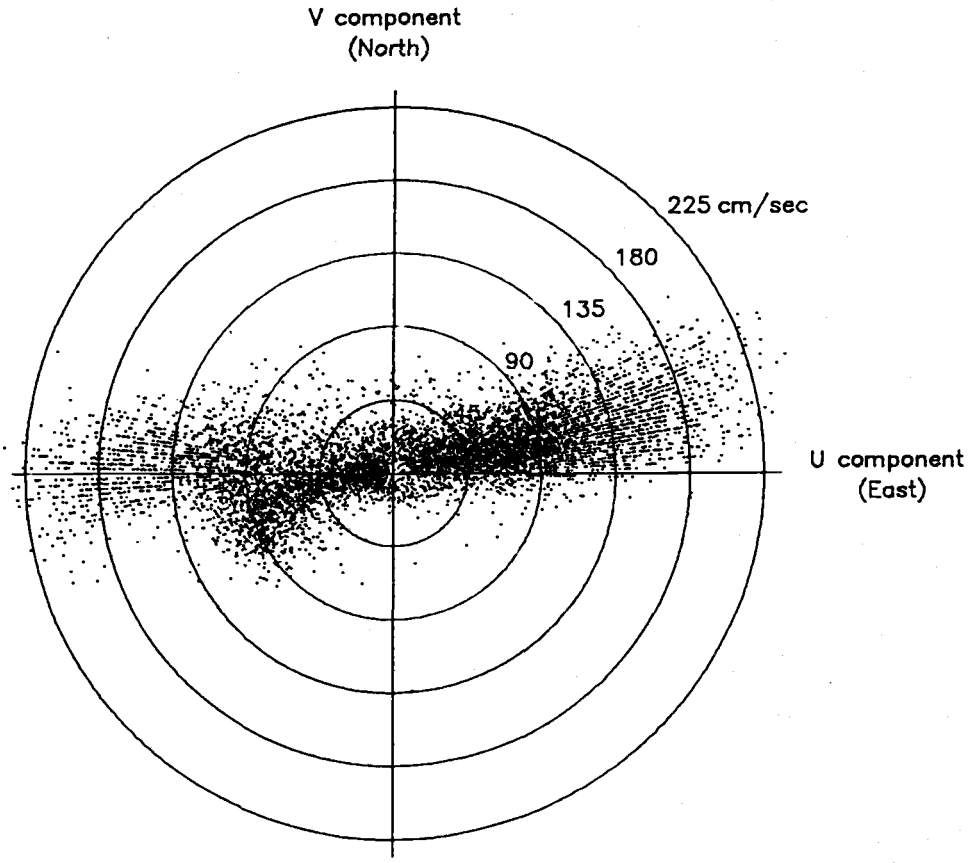




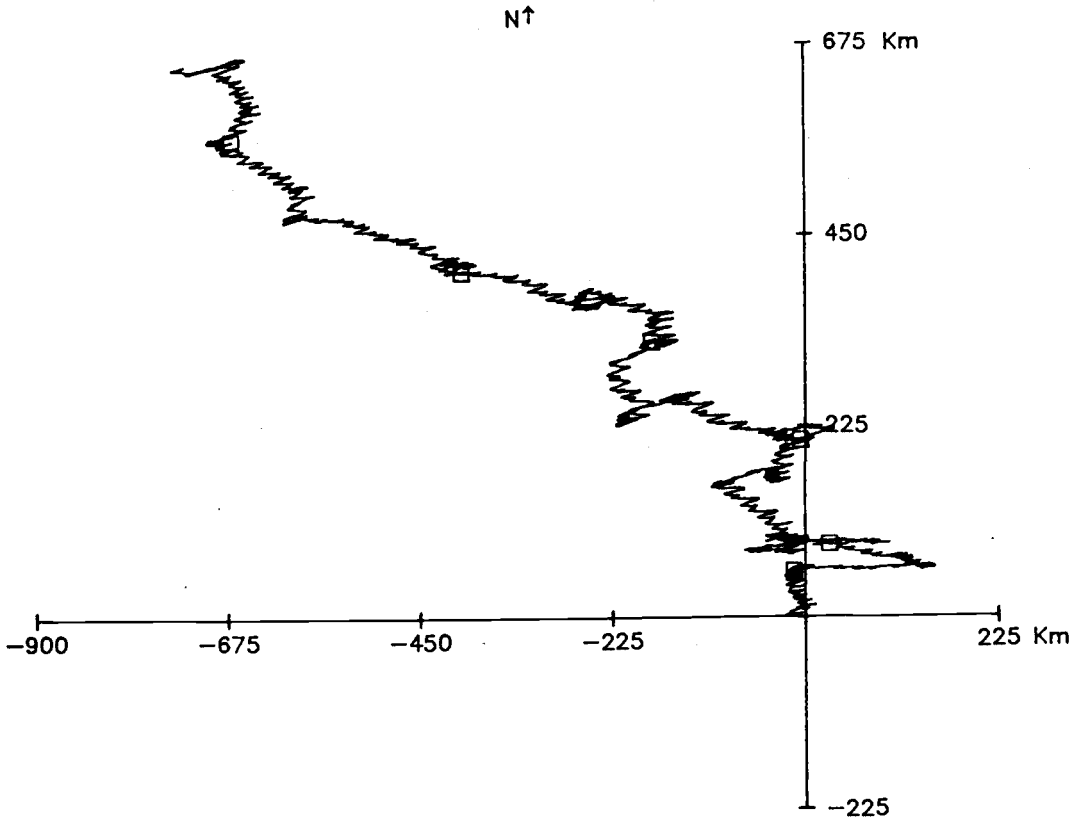


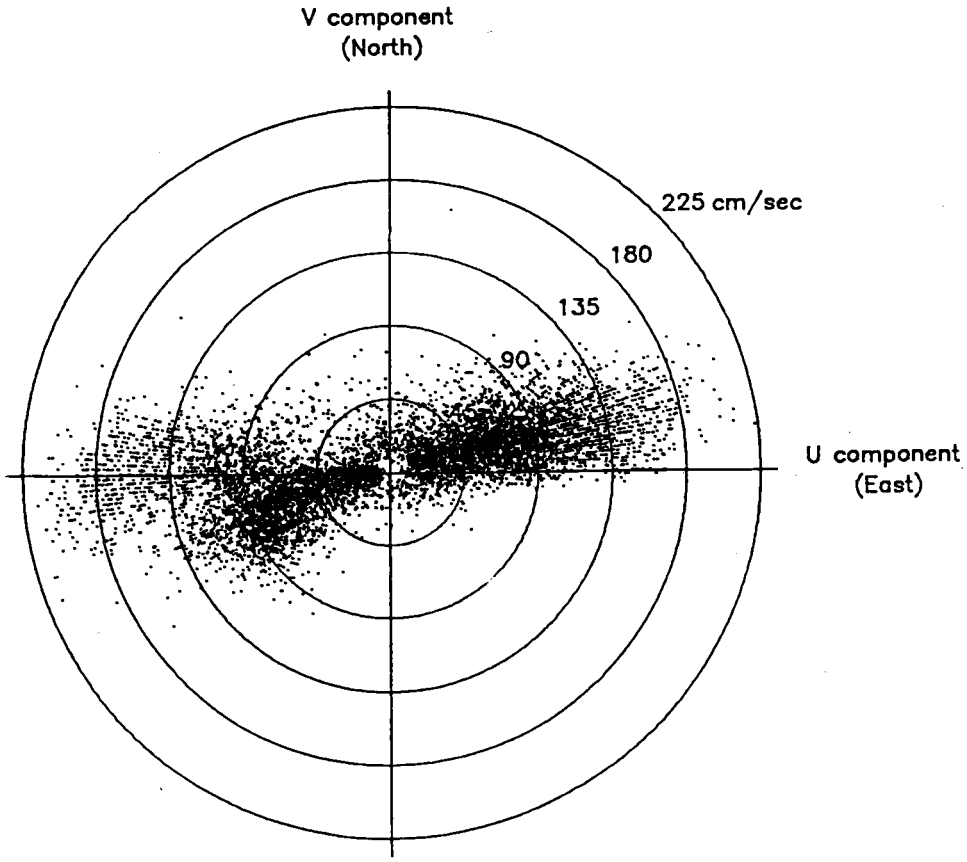
110 M AT GIBRALTAR C-3. 21 OCT 85 - 21 APR 86. TAPE 5643/26.



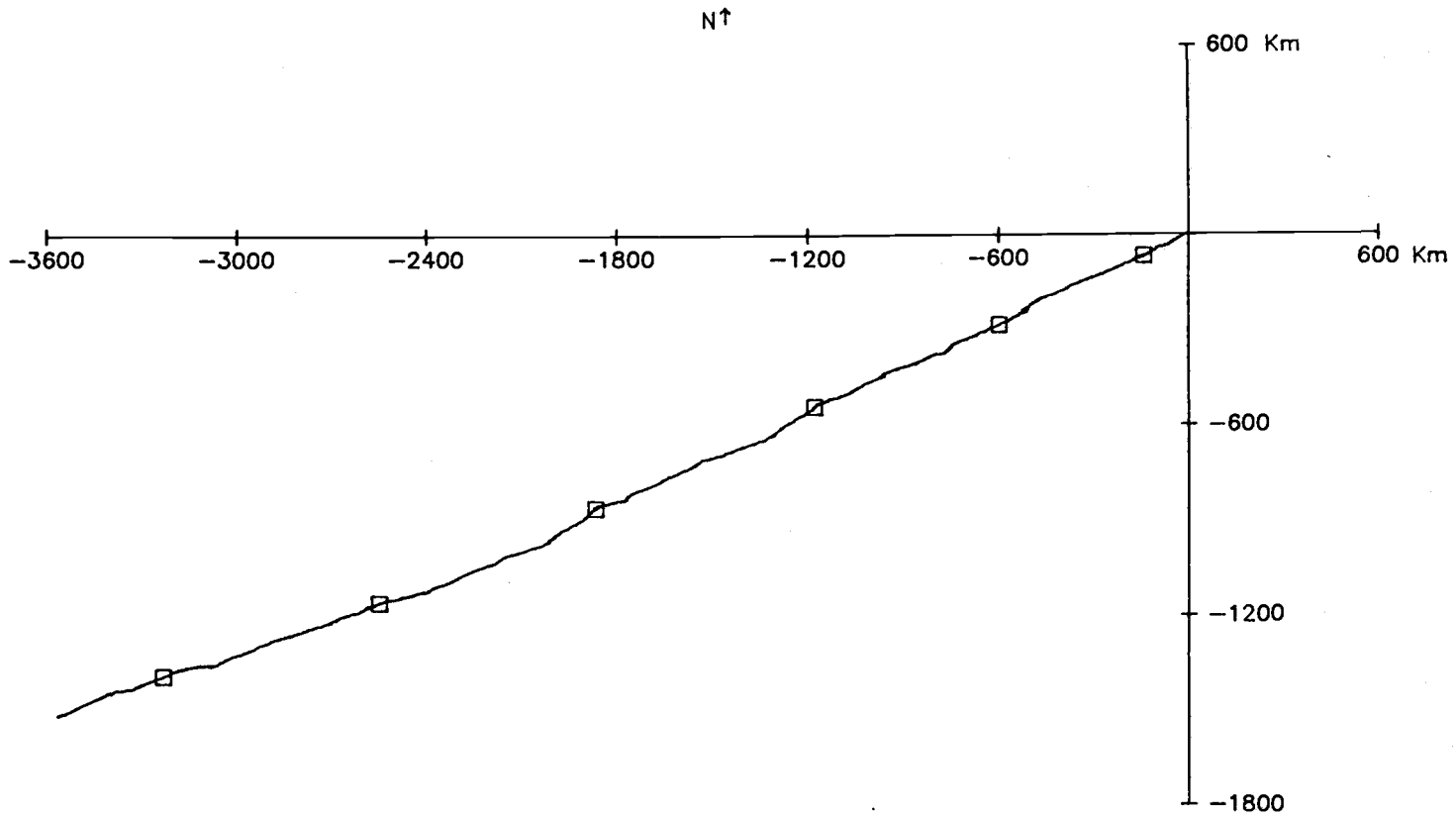


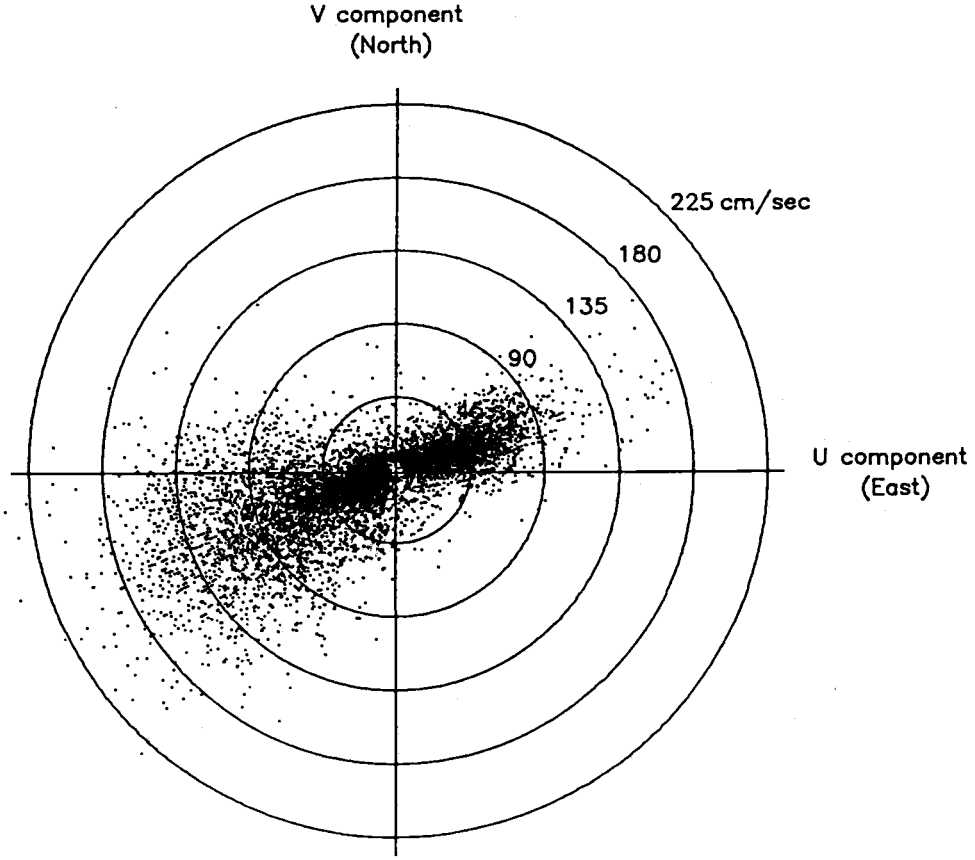
140 M AT GIBRALTAR C–3. 21 OCT 85 – 21 APR 86. TAPE 5644/28.



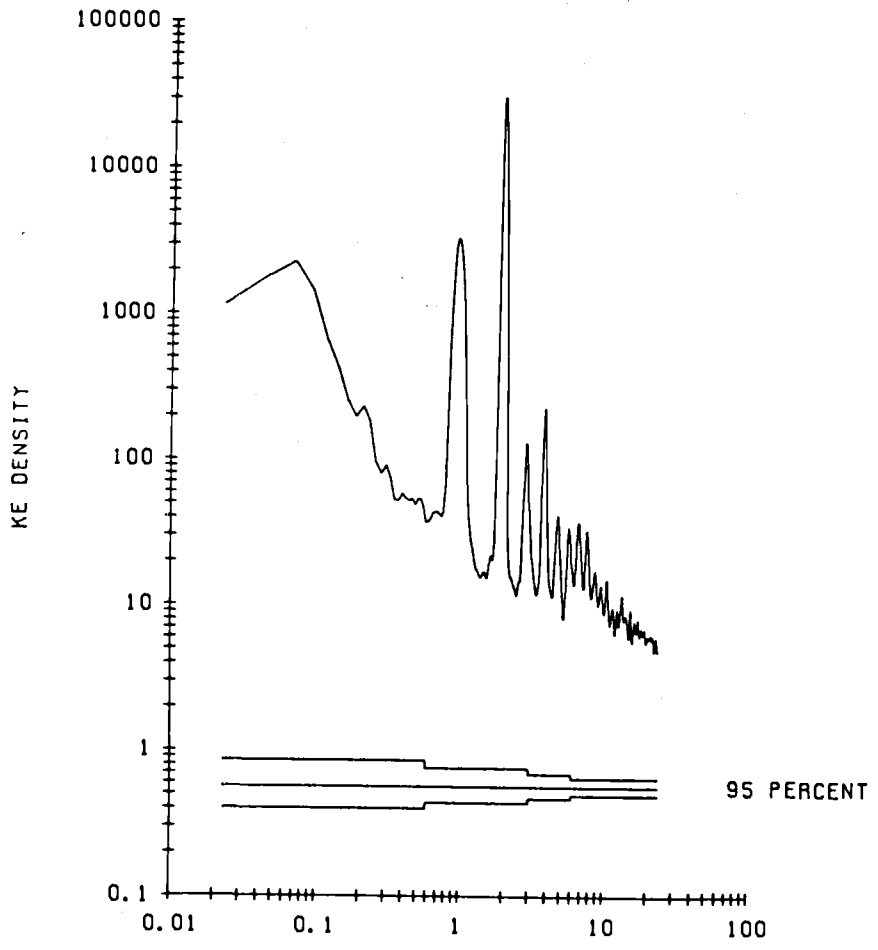


179 M AT GIBRALTAR C-3. 21 OCT 85 - 21 APR 86. TAPE 5645/25.

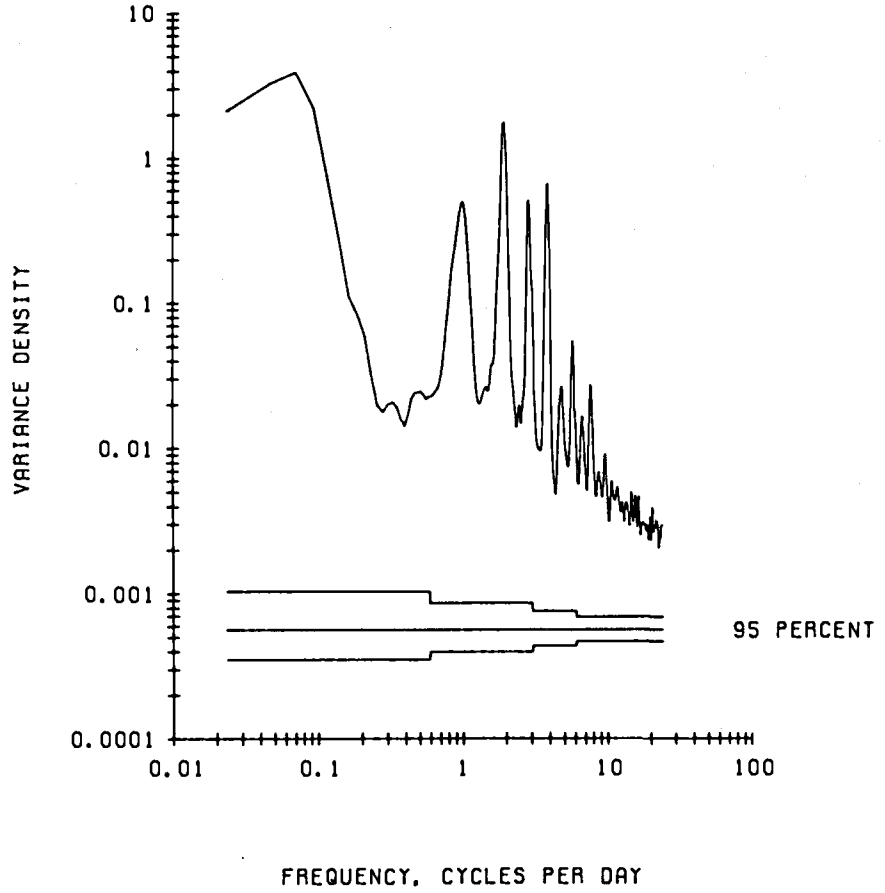




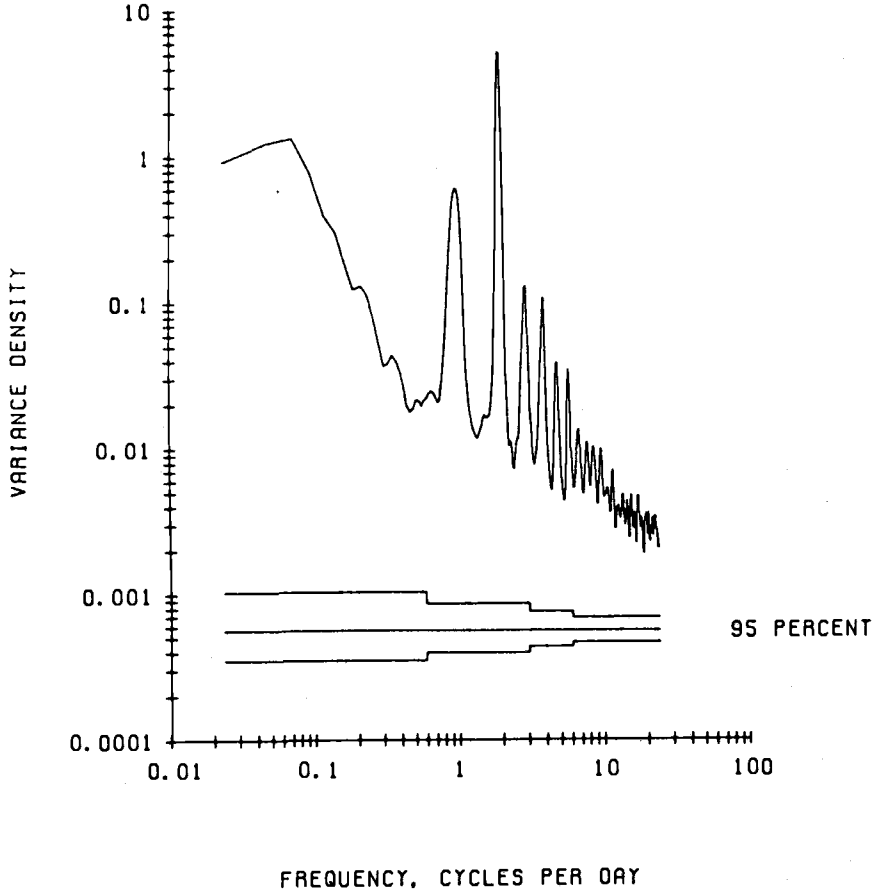
UNFILTERED CURRENT. 110 M AT GIBRALTAR C-3.



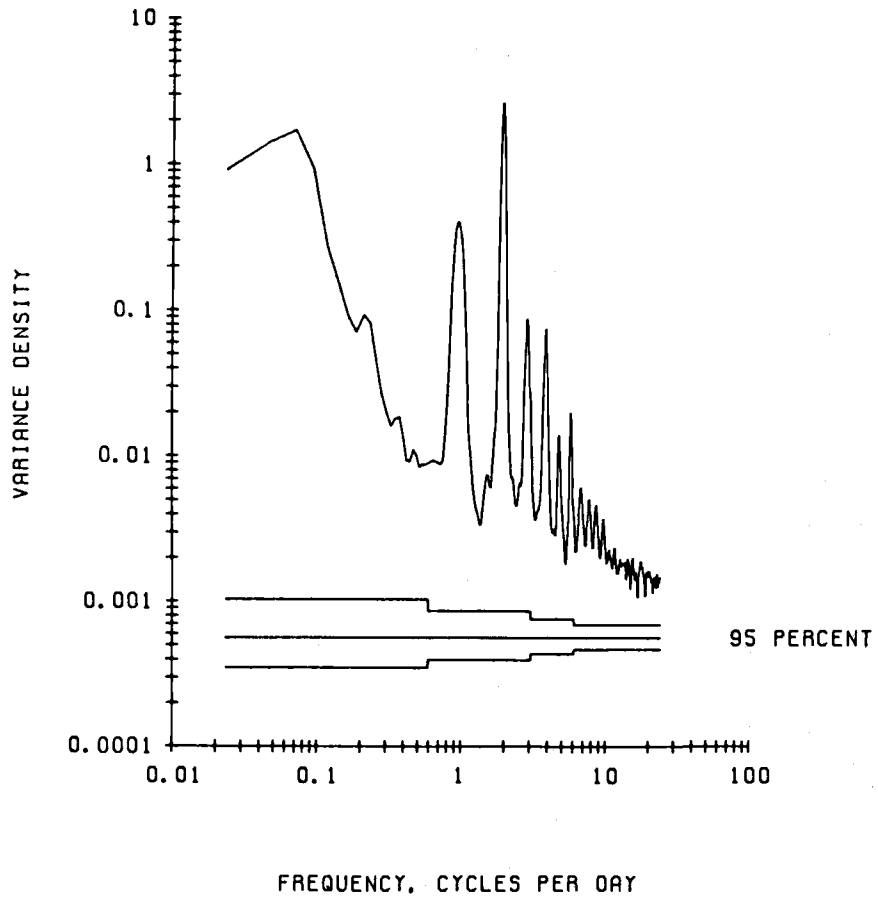
UNFILTERED PRESSURE. 110 M AT GIBRALTAR C-3.



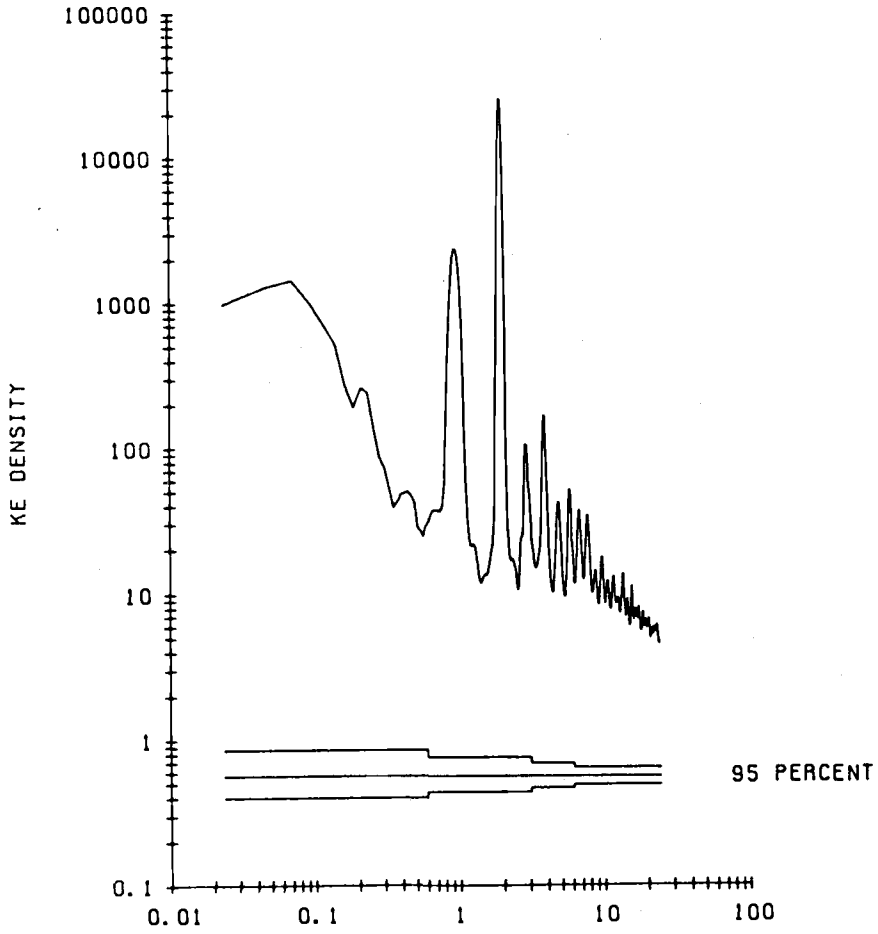
UNFILTERED TEMPERATURE. 110 M AT GIBRALTAR C-3.



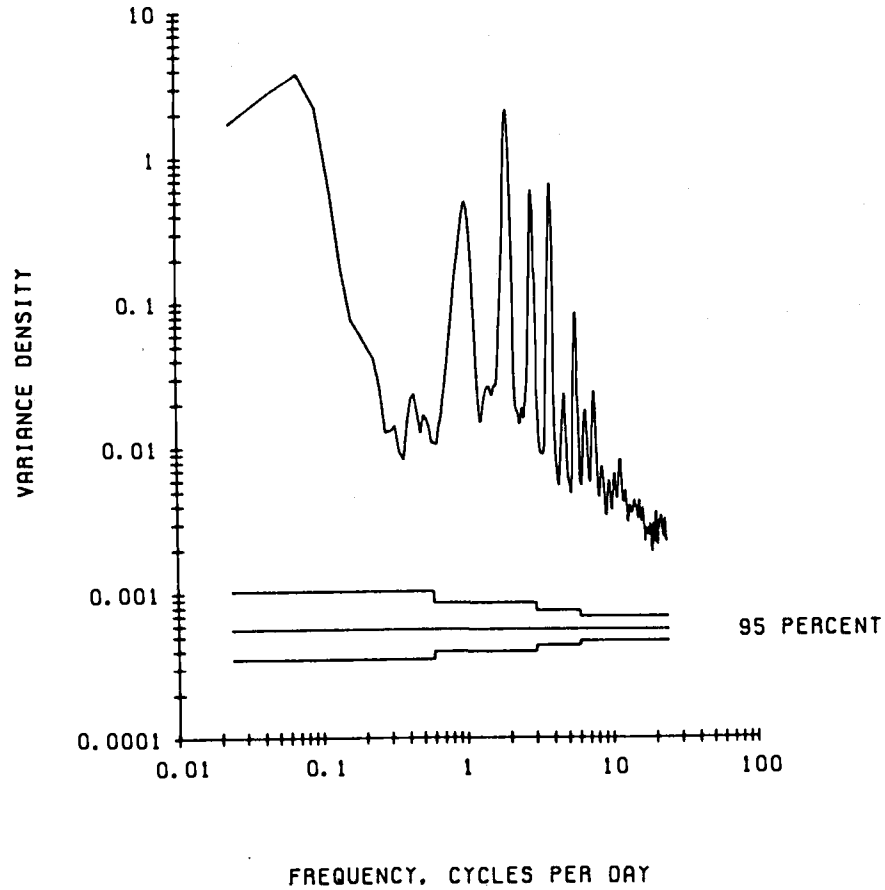
UNFILTERED SALINITY. 110 M AT GIBRALTAR C-3.



UNFILTERED CURRENT. 140 M AT GIBRALTAR C-3.



UNFILTERED PRESSURE. 140 M AT GIBRALTAR C-3.



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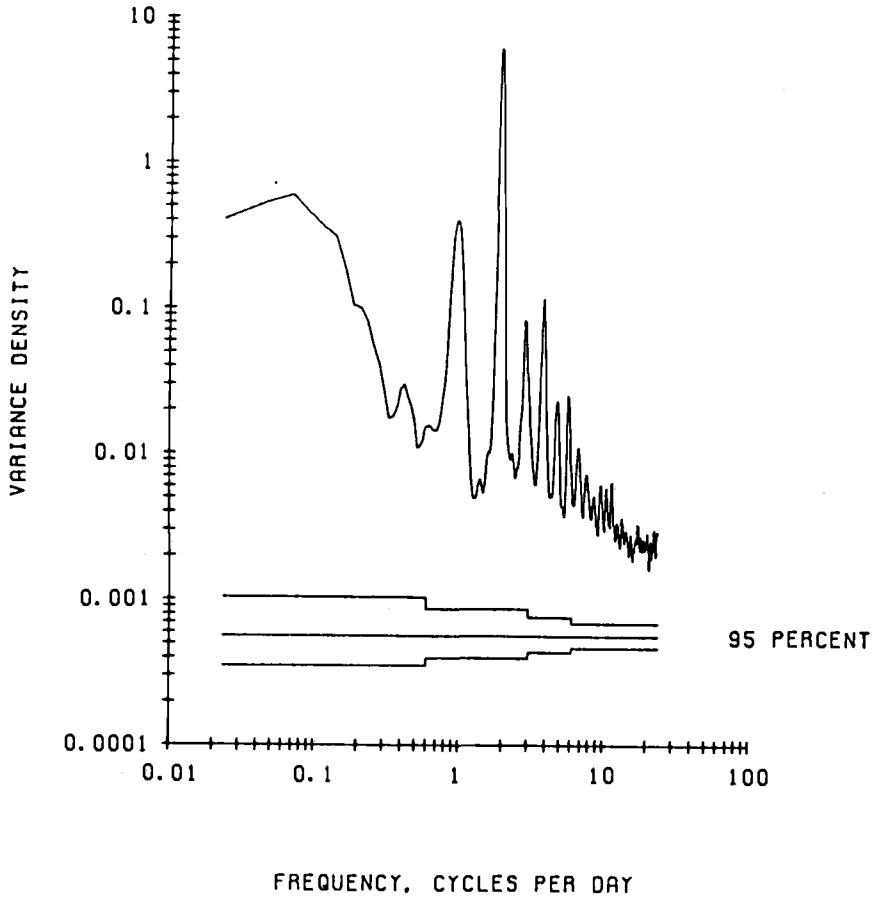
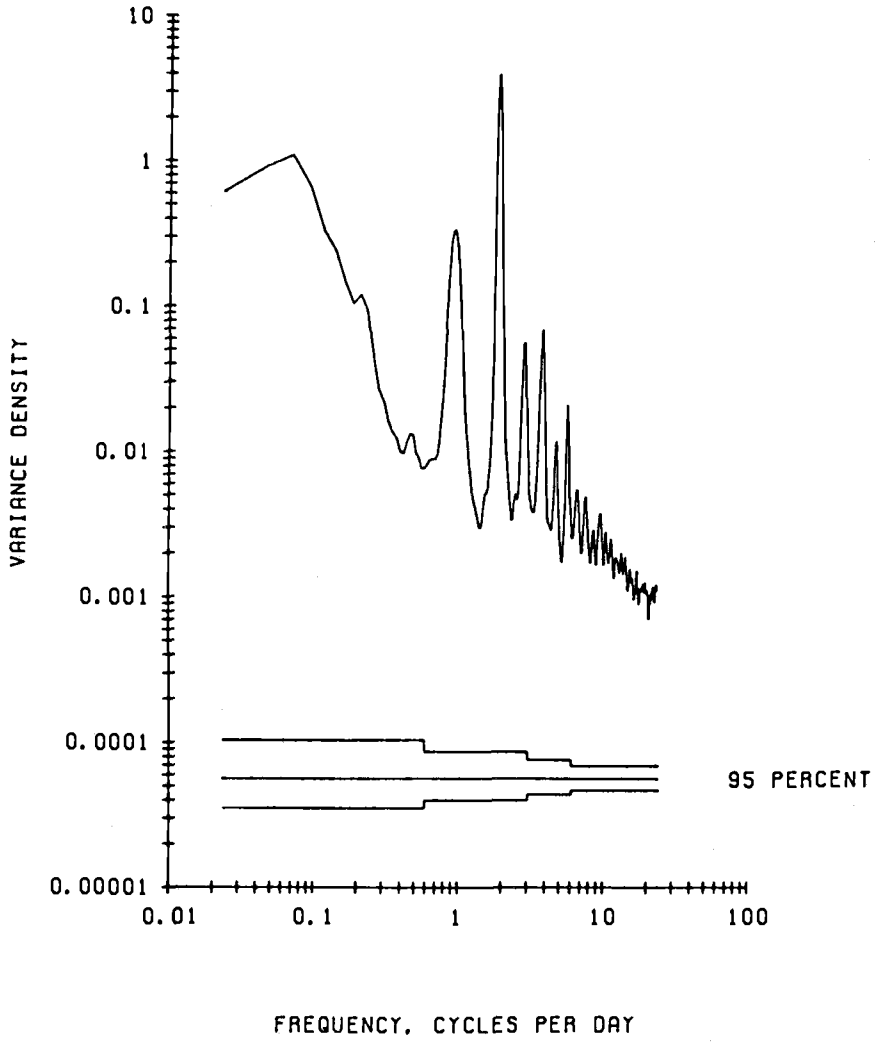
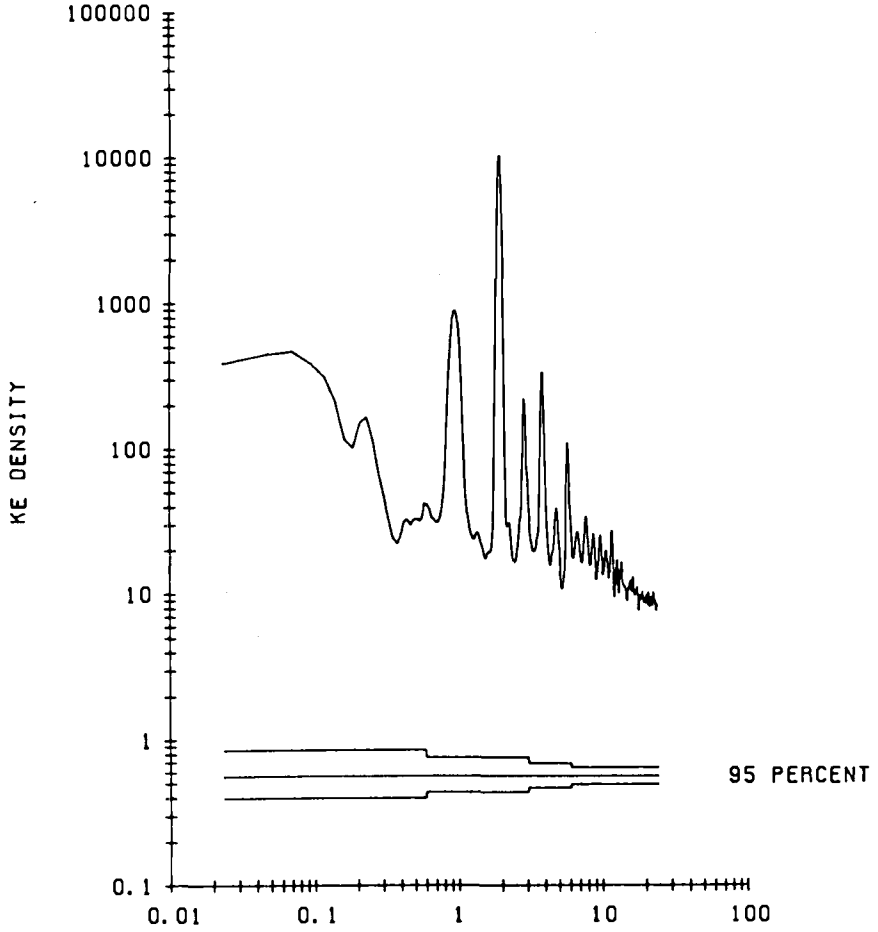


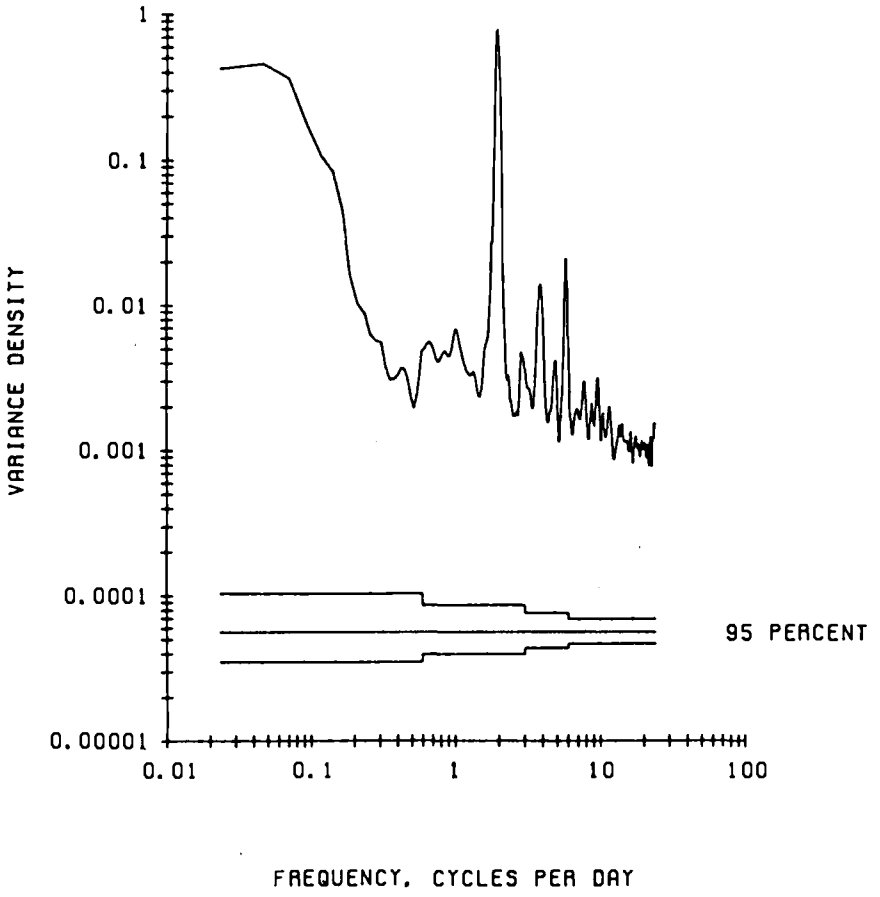
UNFILTERED SALINITY. 140 M AT GIBRALTAR C-3.



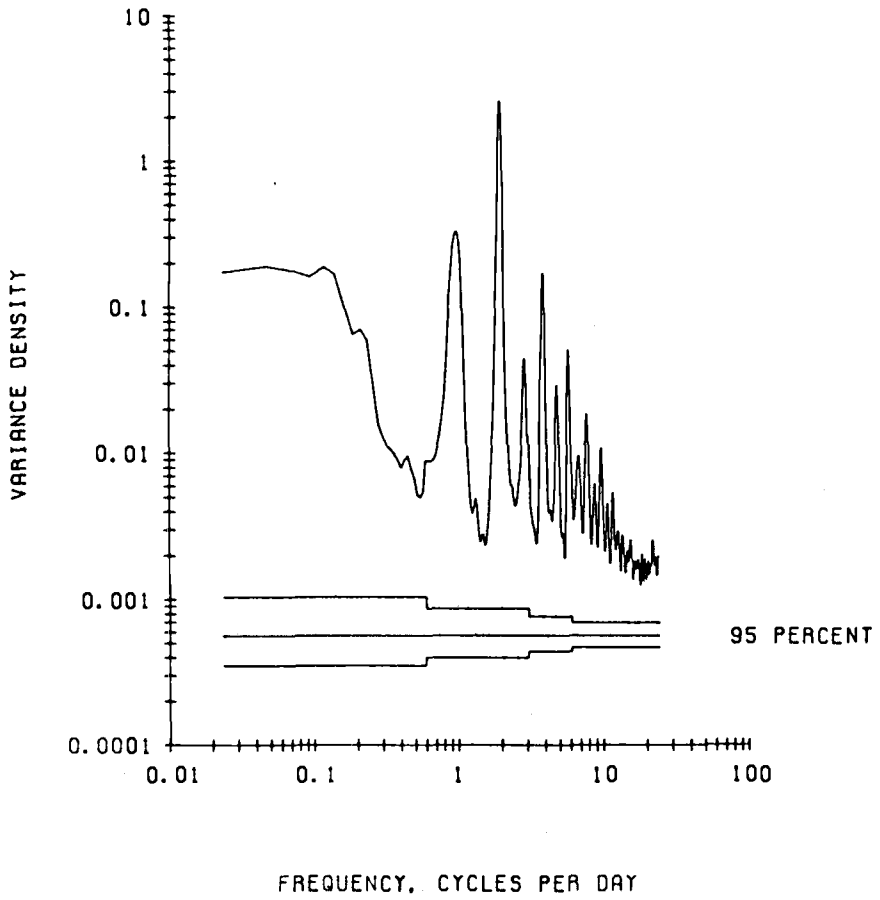
UNFILTERED CURRENT. 179 M AT GIBRALTAR C-3.



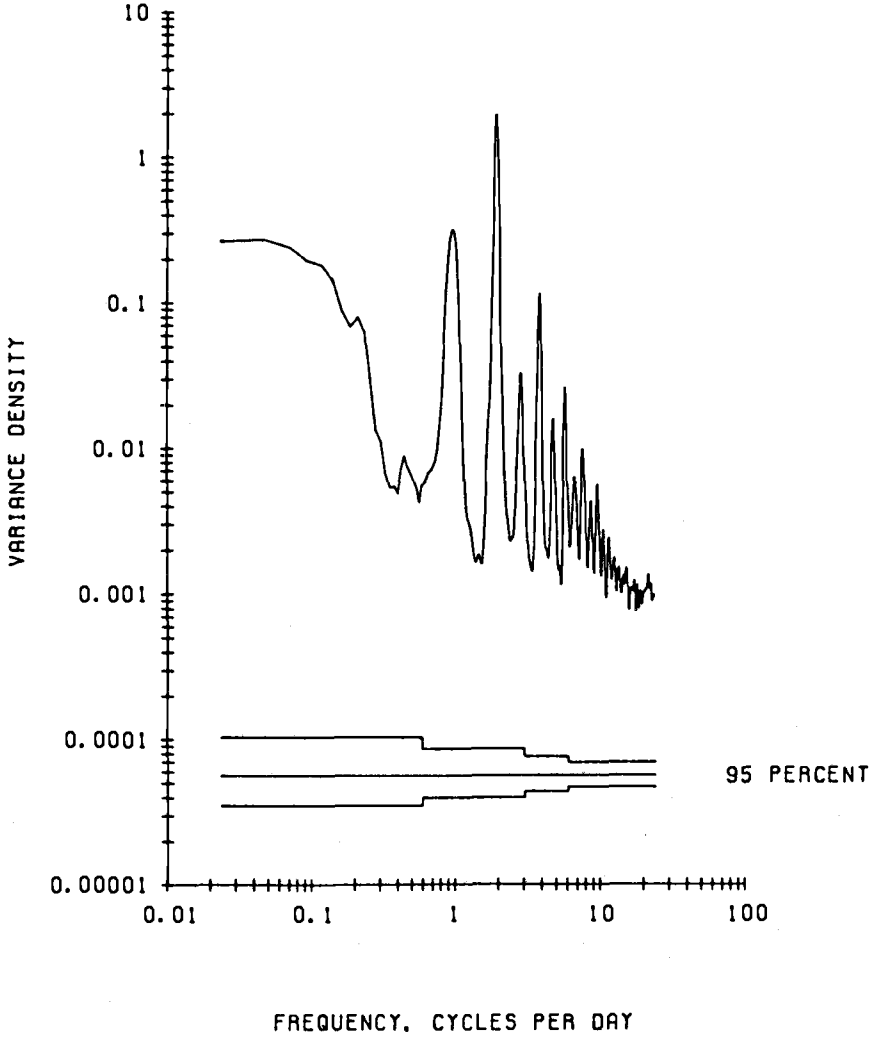
UNFILTERED PRESSURE. 179 M AT GIBRALTAR C-3.

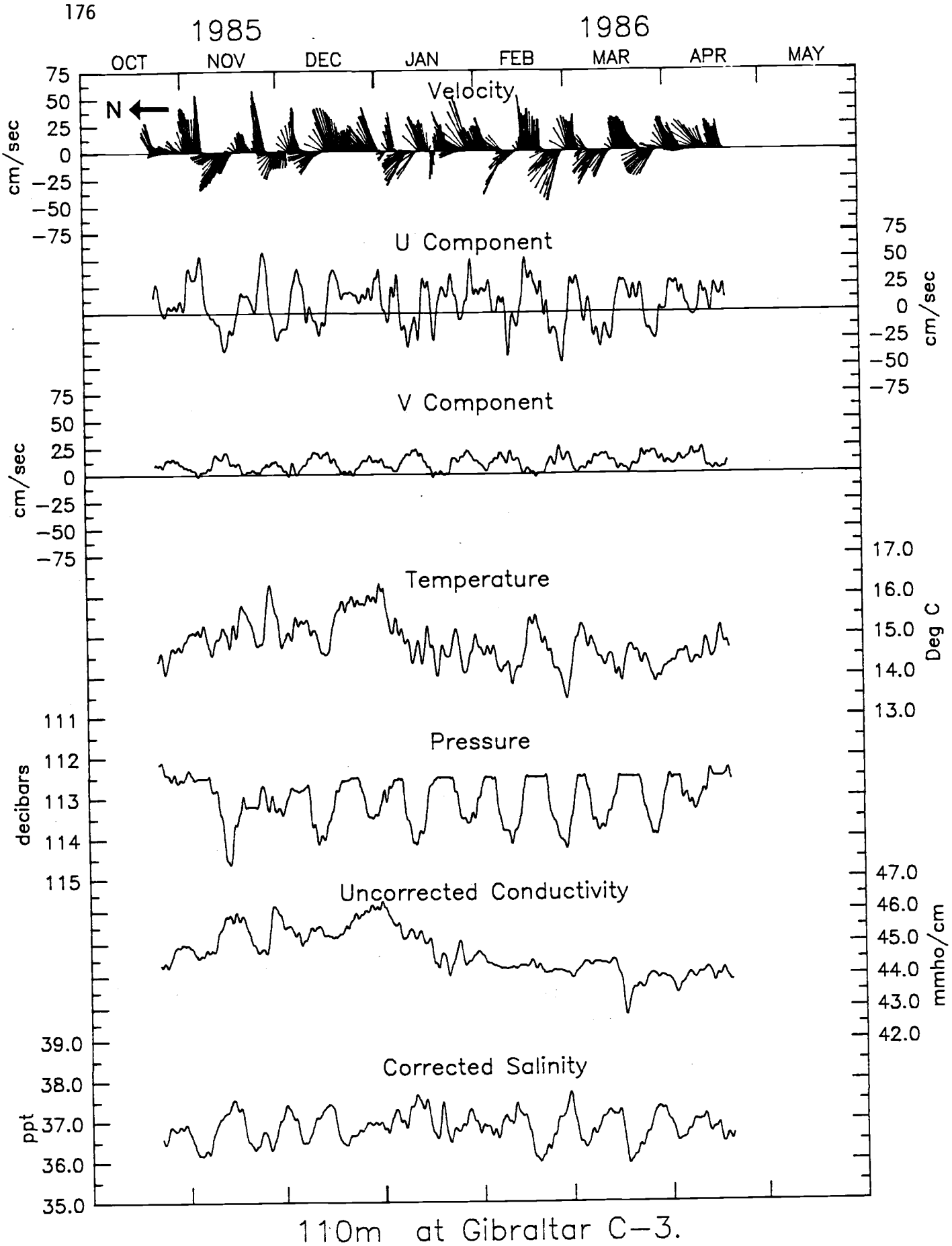


UNFILTERED TEMPERATURE. 179 M AT GIBRALTAR C-3.

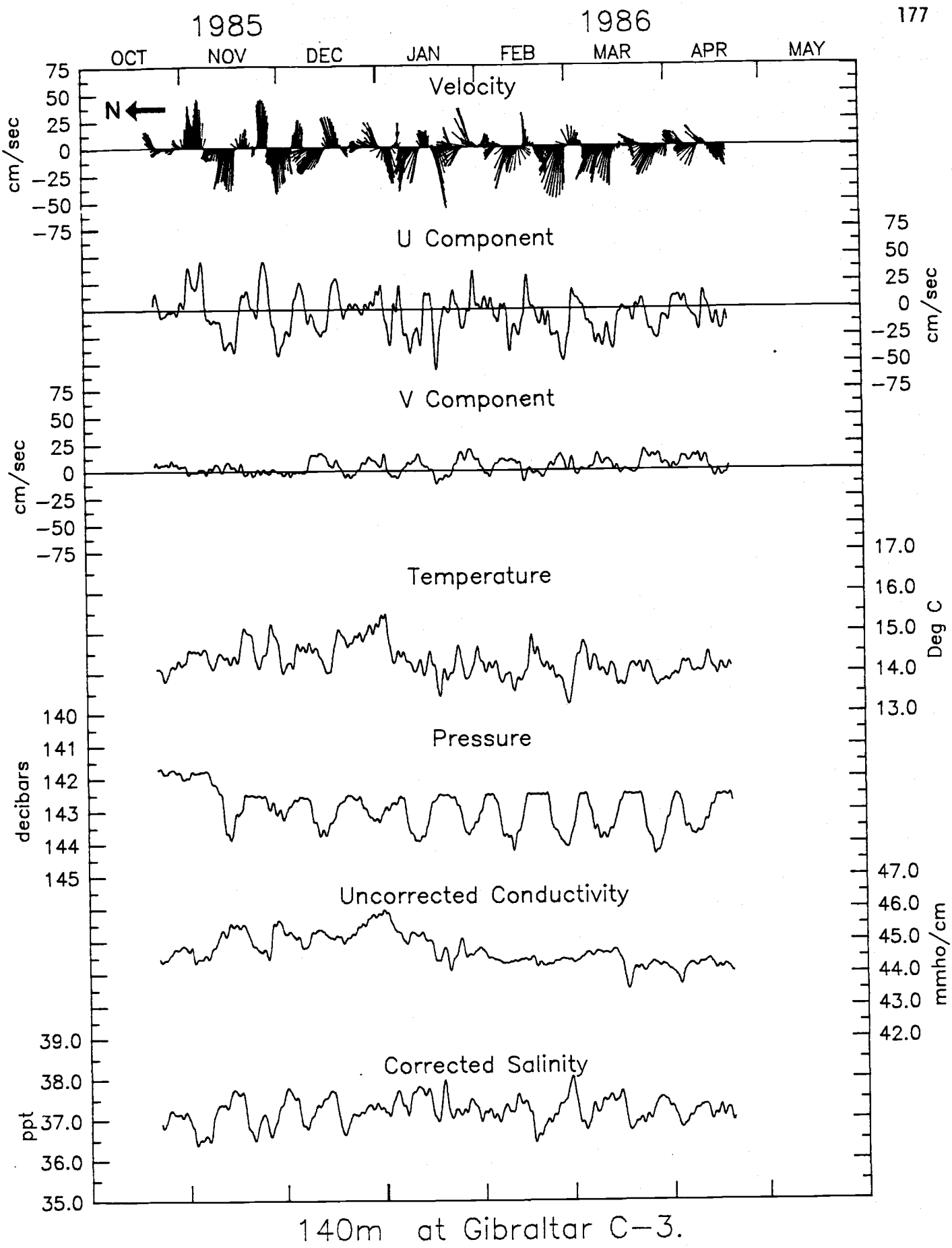


UNFILTERED SALINITY. 179 M AT GIBRALTAR C-3.

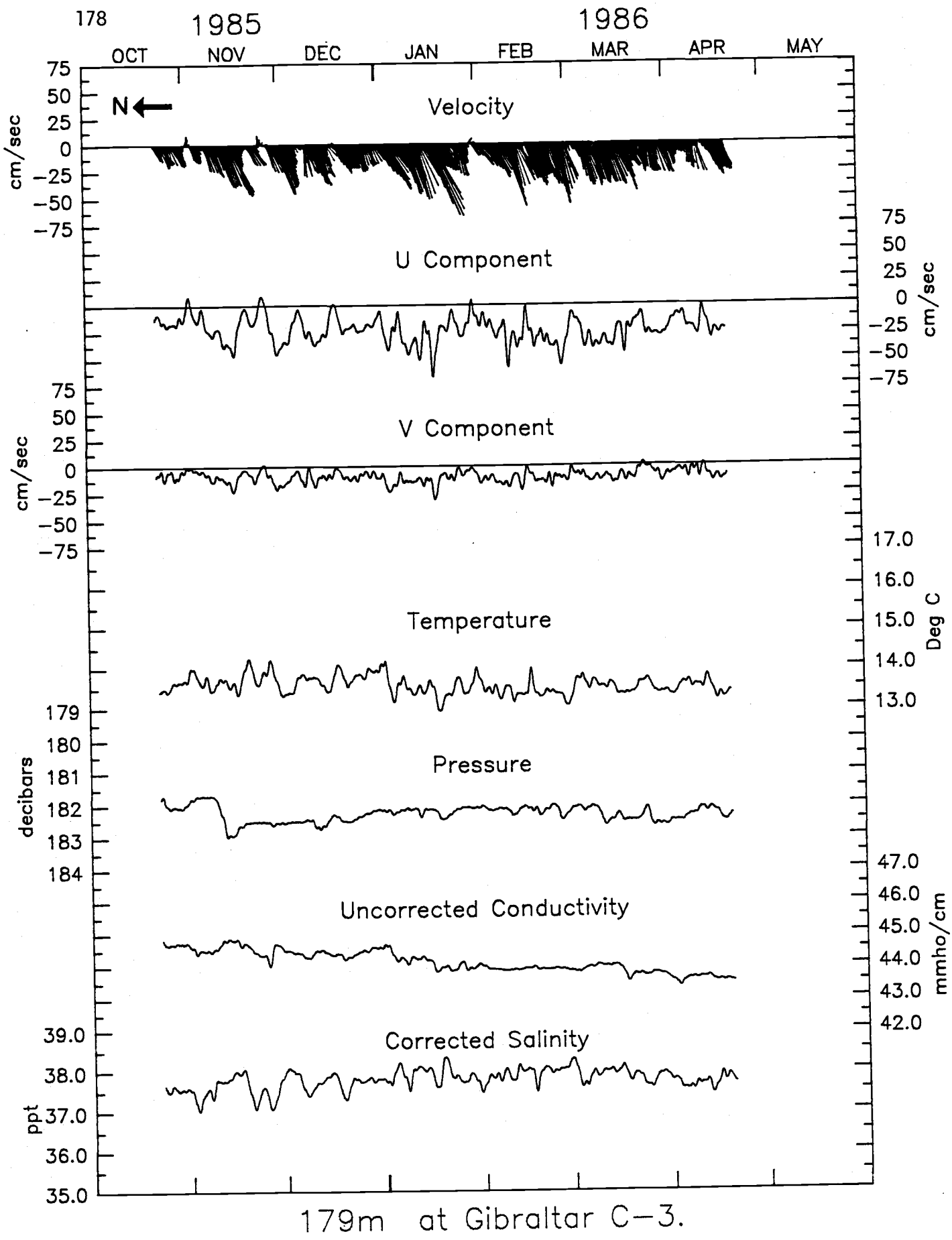




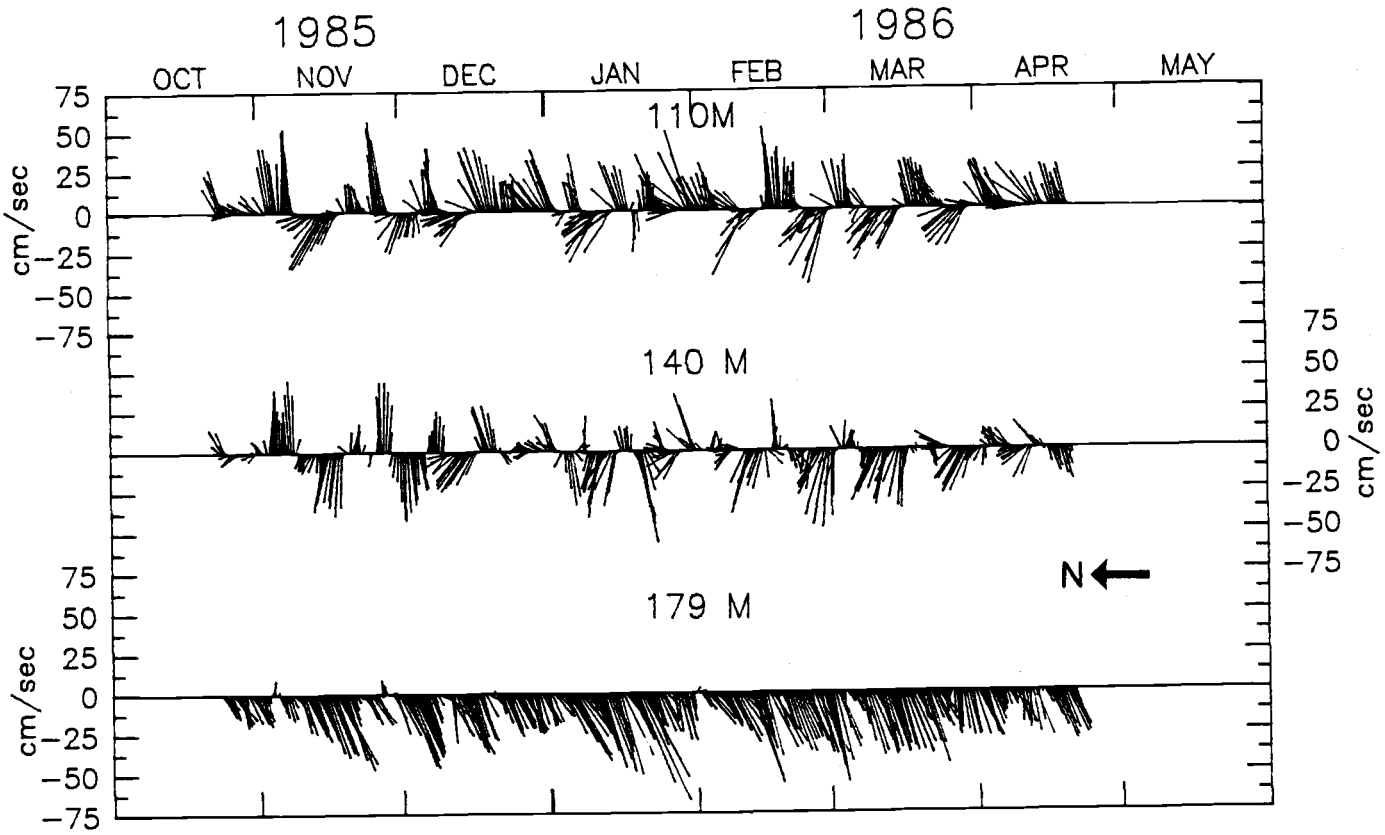
110m at Gibraltar C−3.



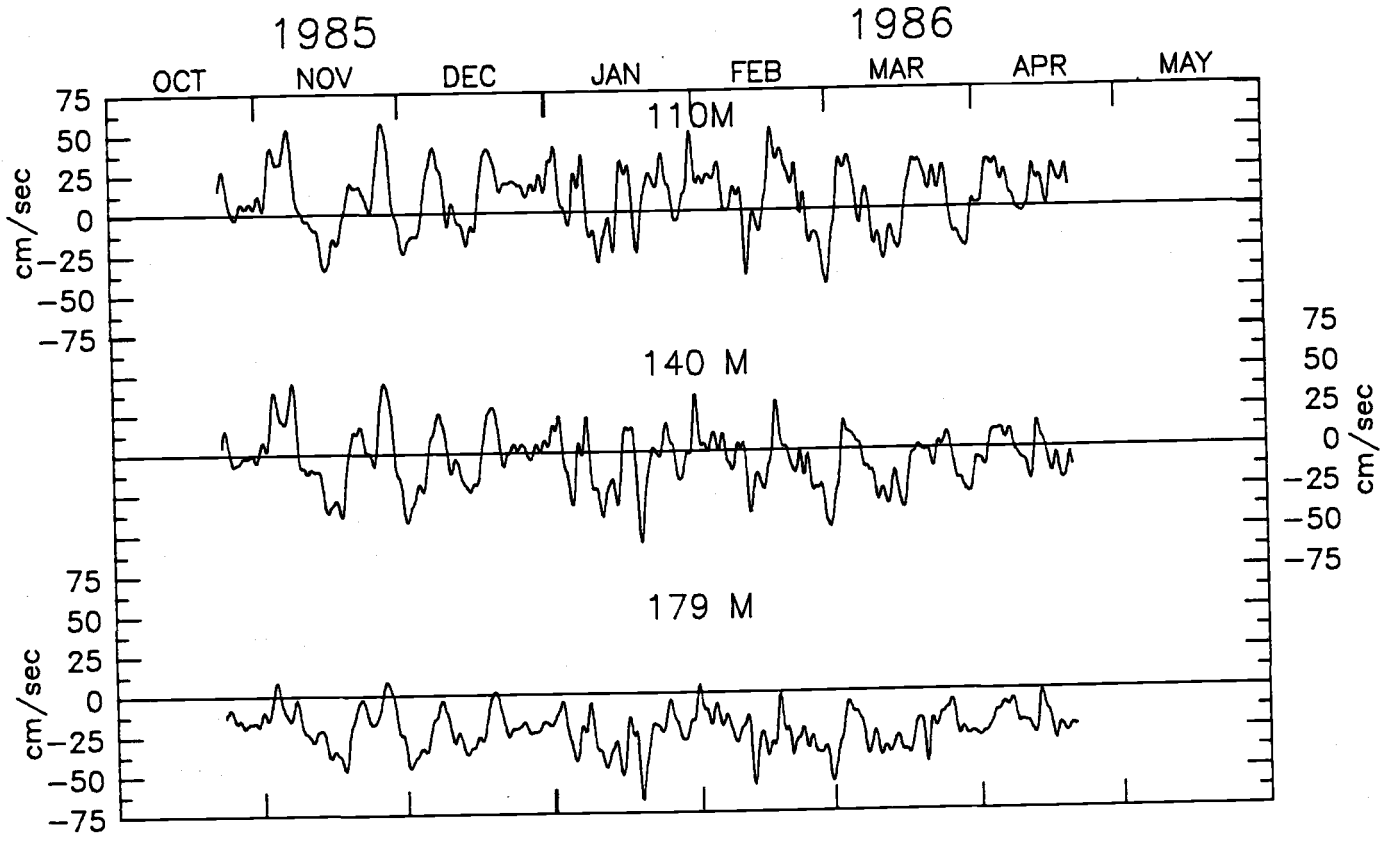
140m at Gibraltar C−3.



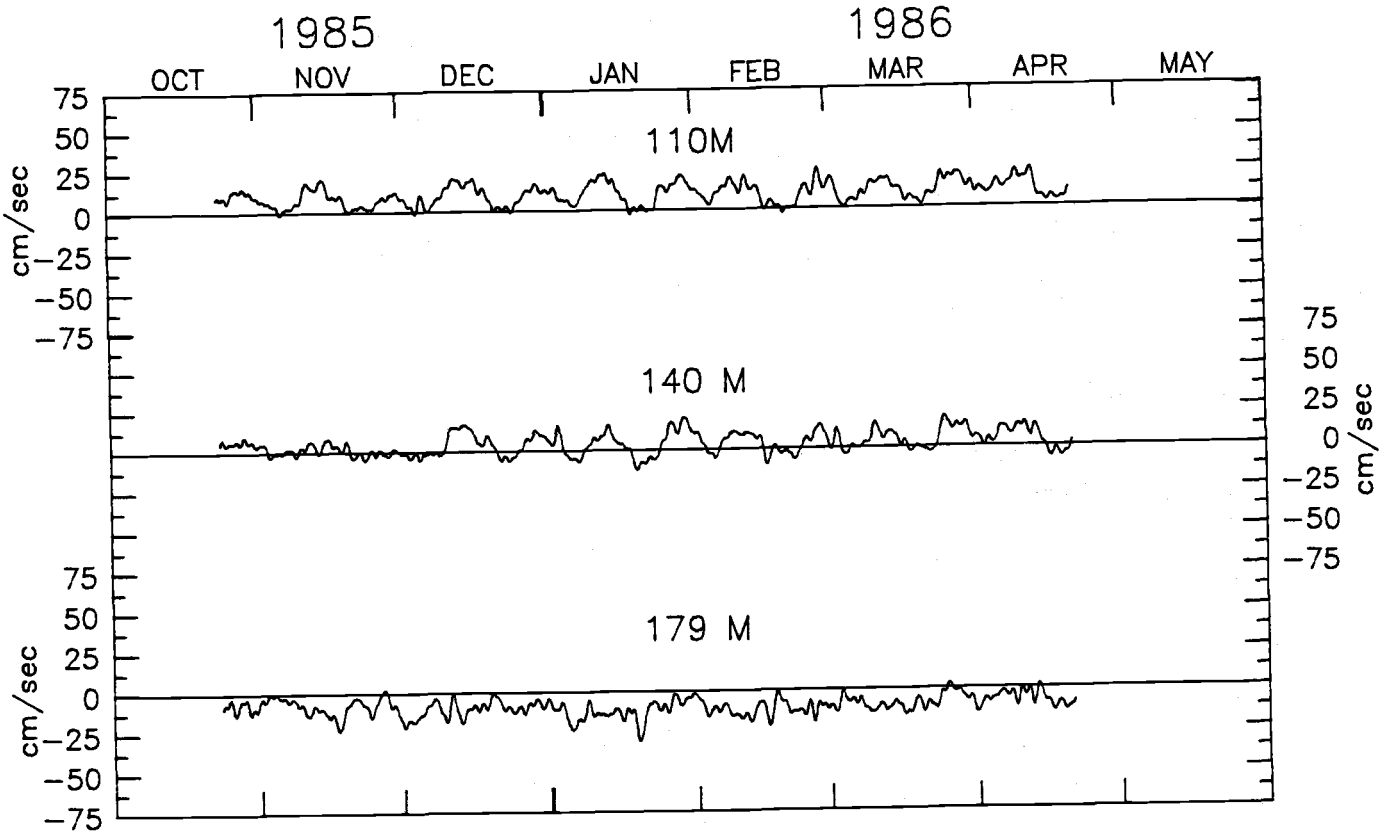
179m at Gibraltar C−3.



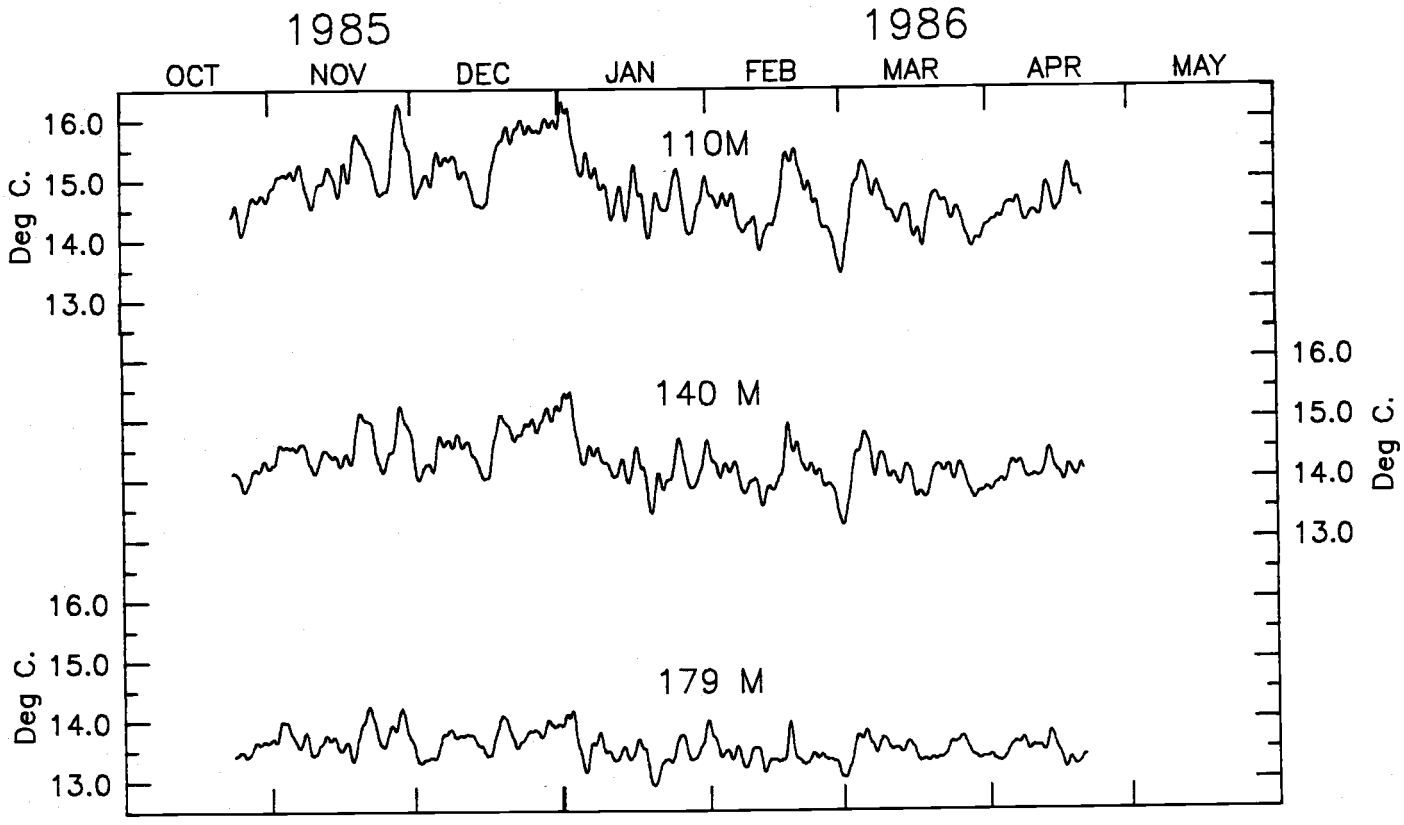
Velocity at Gibraltar Mooring C−3.



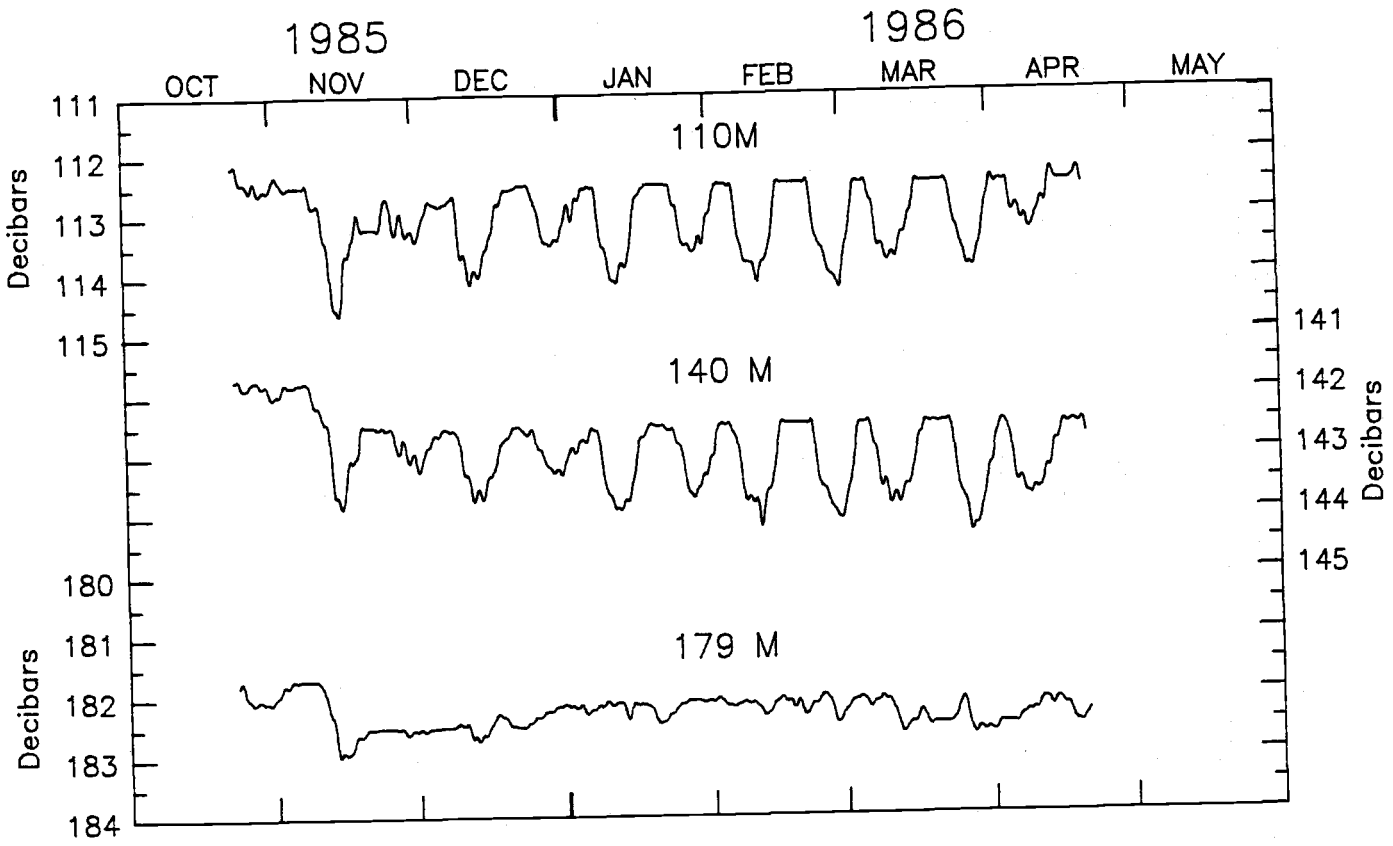
U Component at Gibraltar Mooring C−3.



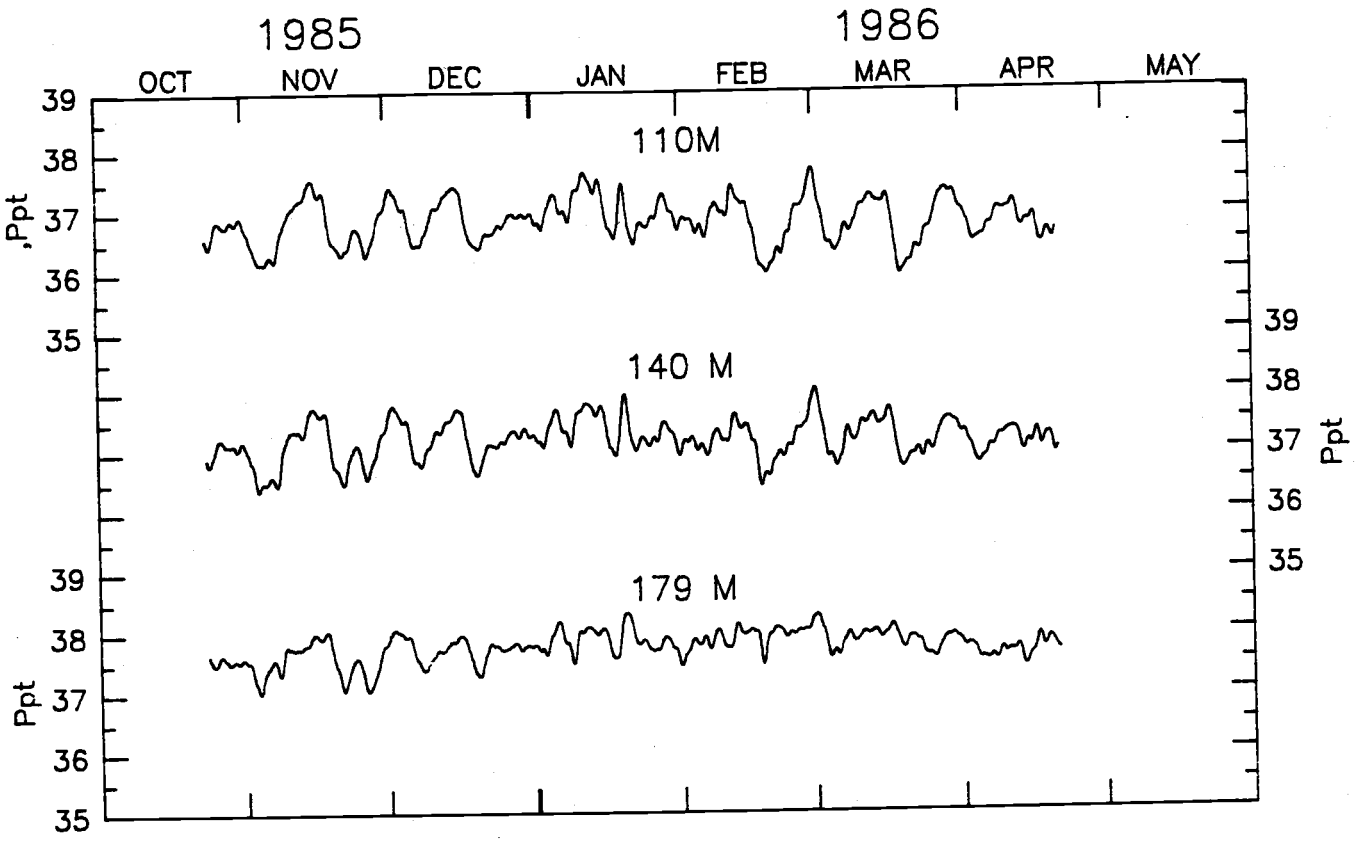
V Component at Gibraltar Mooring C−3.



Temperature at Gibraltar Mooring C–3.

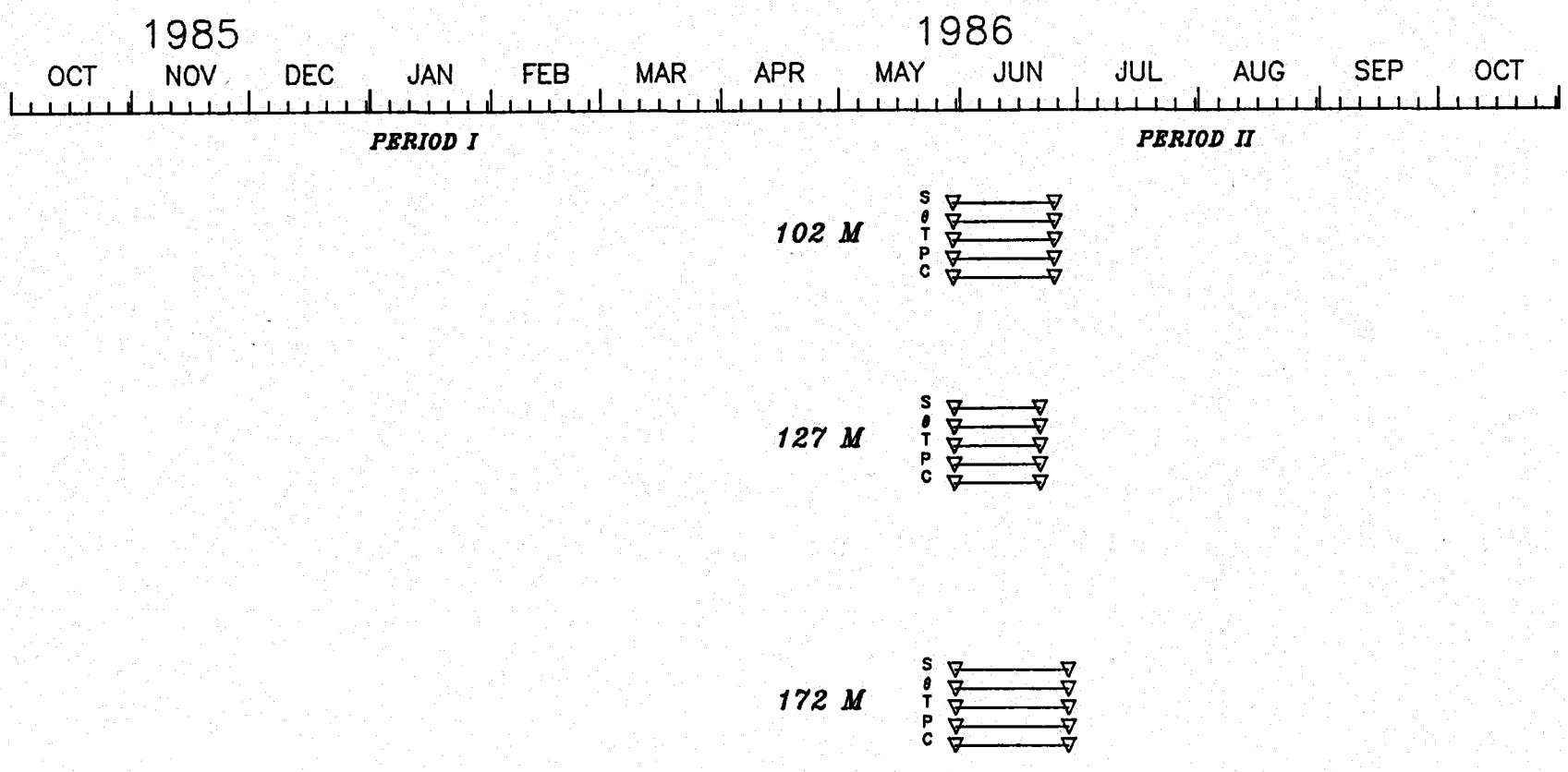


Pressure at Gibraltar Mooring C–3.



Corrected Salinity at Gibraltar Mooring C–3.

Mooring C - 3B



DATA RETURN FROM GIBRALTAR C–3B.

STATISTICS
MOORING GIBRALTAR C-3B PERIOD II
28 MAY 86 - 26 JUN 86

HALF-HOURLY UNFILTERED DATA
35°53.42'N, 5°44.22'W
Bottom depth: 183 m

		MEAN	SD	MIN	MAX	LENGTH	COMMENTS
5643/27	s	78.72	45.85	4.50	213.90	1263	The pressure record from meters 5643 shows a
102 m	u	13.20	87.85	-208.10	213.10	1263	significant depth increase at 2330 23 JUN
	v	9.54	17.75	-95.60	96.20	1263	86. This is probably the time that the tension
	T	14.54	0.77	12.86	16.86	1263	bar of the S-4 broke, releasing the tension at the
	P	105.62	1.79	102.60	115.40	1263	top of the mooring.
	C	44.43	0.56	42.71	46.62	1263	
	S	36.54	0.69	35.26	38.47	1263	
5644/29	s	68.98	37.00	4.90	170.30	1091	Kelp was wrapped around the rotor and vane
127 m	u	9.14	73.96	-165.80	167.20	1091	at recovery. This record was terminated 20 JUN
	v	6.73	22.97	-72.00	110.90	1091	when the speed record went to zero and the
	t	14.15	0.72	12.86	15.62	1091	direction record became erratic.
	P	133.14	1.30	127.90	140.80	1091	
	C	44.22	0.42	42.30	44.98	1091	
	S	36.87	0.82	35.40	38.42	1091	
5645/26	s	41.01	23.62	0.80	136.80	1374	None of the variables at this meter show a
172 m	u	-6.55	42.51	-131.20	119.40	1374	change on 23 JUN. The buoyancy immediately above
	v	-2.28	19.61	-84.40	59.00	1374	RCM 5645 was apparently sufficient to keep the
	T	13.59	0.66	12.85	16.39	1374	line below the meter taut.
	P	174.97	0.40	173.10	175.50	1374	
	C	44.06	0.36	42.55	45.77	1374	
	S	37.52	0.79	35.82	38.47	1374	

Shortly after installation, the tension bar broke on the S-4, which was at the top of the mooring. The meter floated to the surface and was spotted by the crew of the LYNCH. The mooring was then released prematurely.

(speed, u, and v are given in cm/sec; Temperature in °C; Pressure in decibars; Conductivity in mmho/cm; and Corrected Salinity in ppt. The sampling rate is 30 min.)

STATISTICS
MOORING GIBRALTAR C-3B PERIOD II
30 MAY 86 - 25 JUN 86

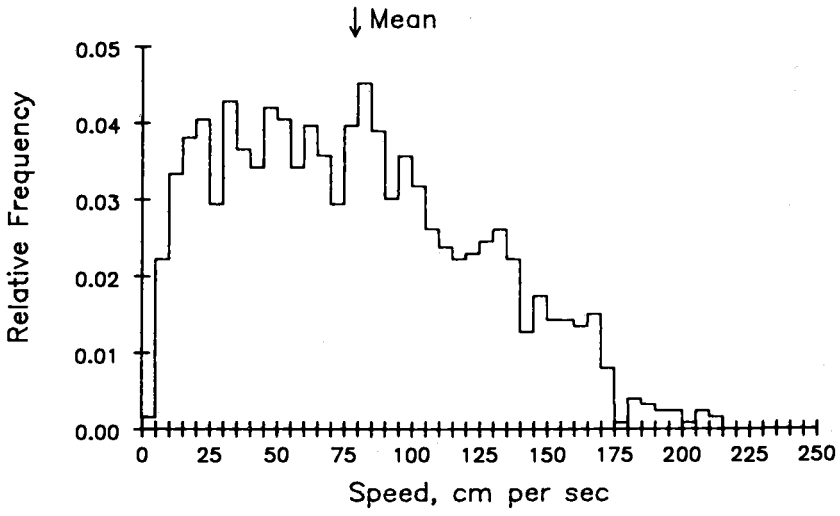
6-HOURLY FILTERED DATA
35°53.42'N, 5°44.22'W
Bottom depth: 183 m

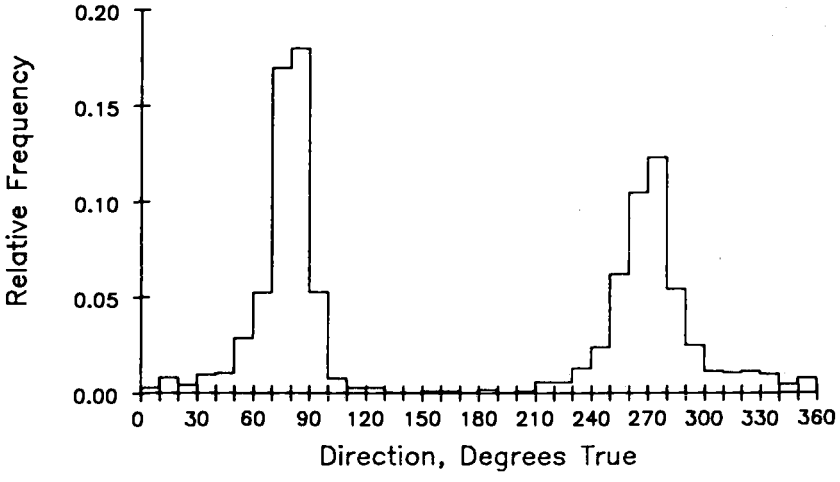
		MEAN	SD	MIN	MAX	LENGTH	COMMENTS
5643/27	u	12.70	13.64	-30.21	41.99	95	(See comments on half-hourly statistics page.)
102 m	v	8.91	2.57	3.56	16.07	95	
	T	14.51	0.23	13.92	14.96	95	
	P	105.55	0.57	104.83	107.87	95	
	C	44.38	0.39	43.67	45.41	95	
	S	36.53	0.20	36.18	37.13	95	
5644/29	u	9.24	10.15	-7.45	32.48	81	(See comments on half-hourly statistics page.)
127 m	v	5.63	3.17	0.36	15.44	81	
	T	14.12	0.18	13.71	14.47	81	
	P	133.15	0.34	132.56	133.72	81	
	C	44.19	0.22	43.81	44.58	81	
	S	36.86	0.16	36.61	37.21	81	
5645/26	u	-6.41	7.30	-16.36	12.41	105	(See comments on half-hourly statistics page.)
172 m	v	-2.48	2.76	-10.02	2.45	105	
	T	13.58	0.11	13.29	13.83	105	
	P	174.98	0.17	174.68	175.25	105	
	C	44.04	0.17	43.76	44.51	105	
	S	37.52	0.22	37.06	37.78	105	

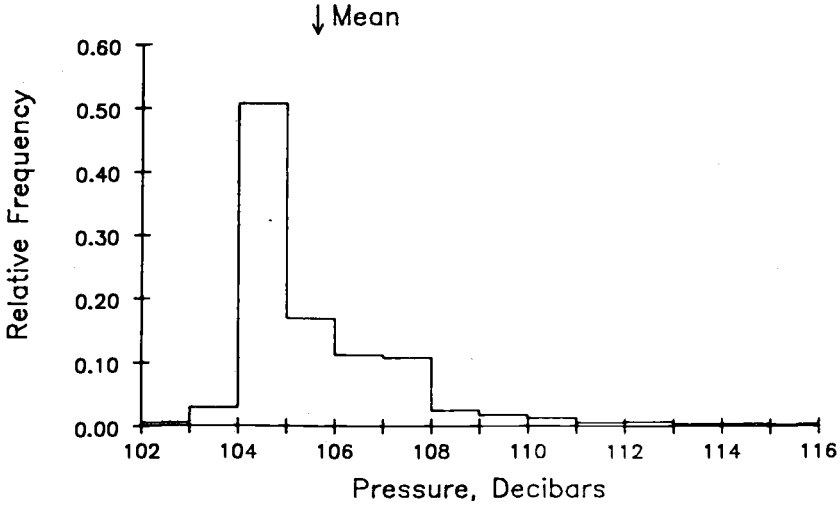
Shortly after installation, the tension bar broke on the S-4, which was at the top of the mooring. The meter floated to the surface and was spotted by the crew of the LYNCH. The mooring was then released prematurely.

(speed, u, and v are given in cm/sec; Temperature in °C; Pressure in decibars; Conductivity in mmho/cm; and Corrected Salinity in ppt. The sampling rate is 360 min.)

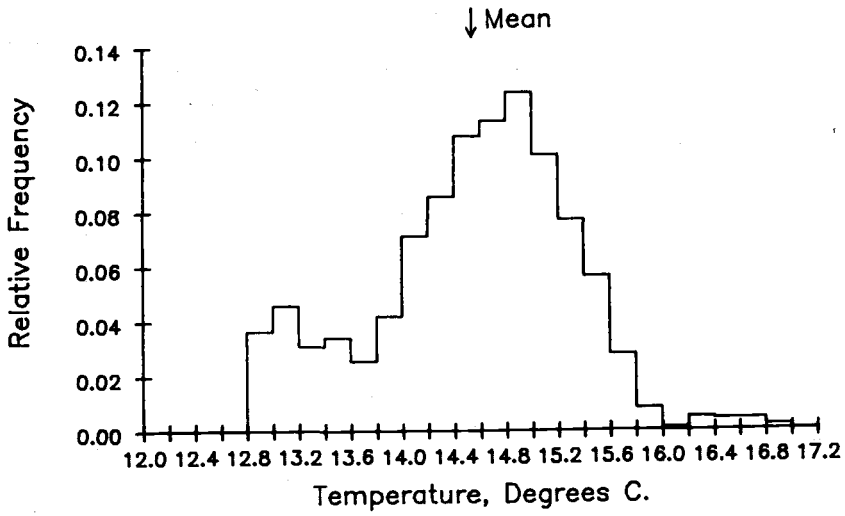
102 M AT GIBRALTAR C-3B. 28 MAY 86 - 23 JUN 86. TAPE 5643/27.

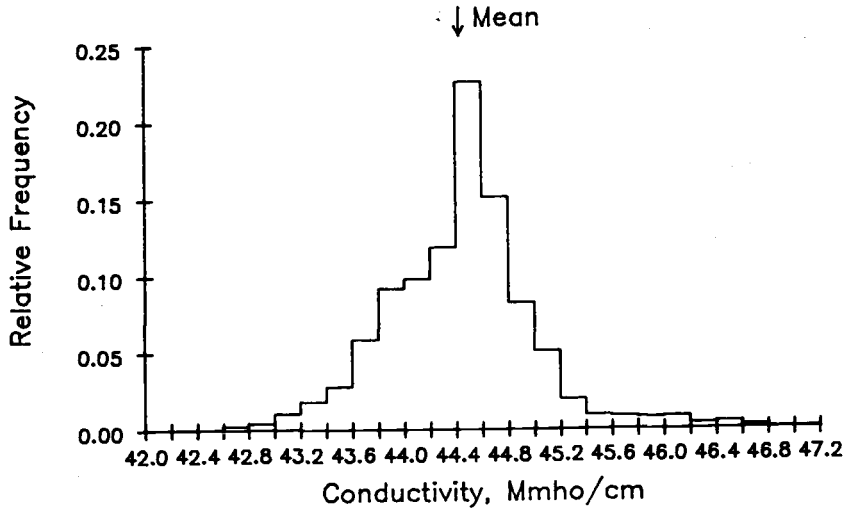


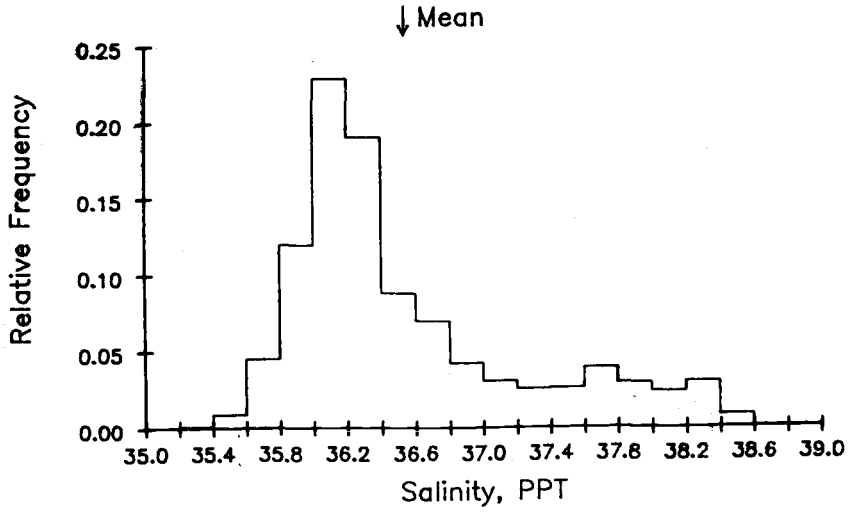




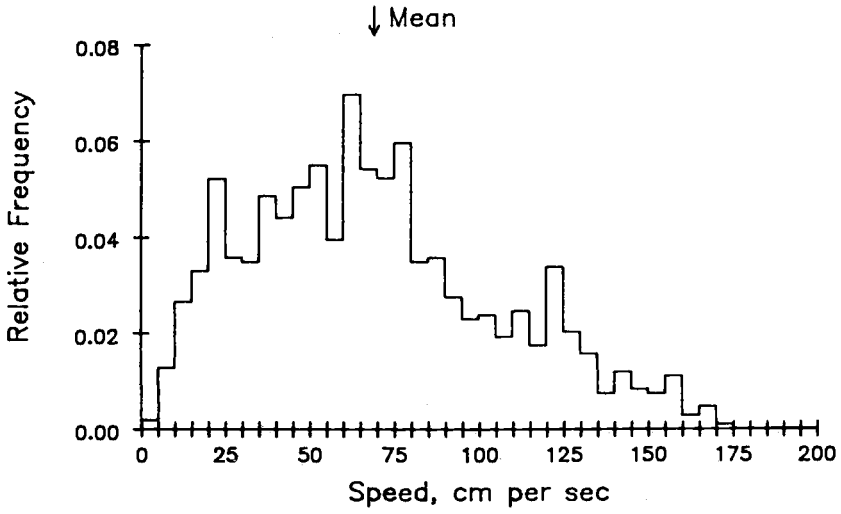
102 M AT GIBRALTAR C-3B. 28 MAY 86 - 23 JUN 86. TAPE 5643/27.

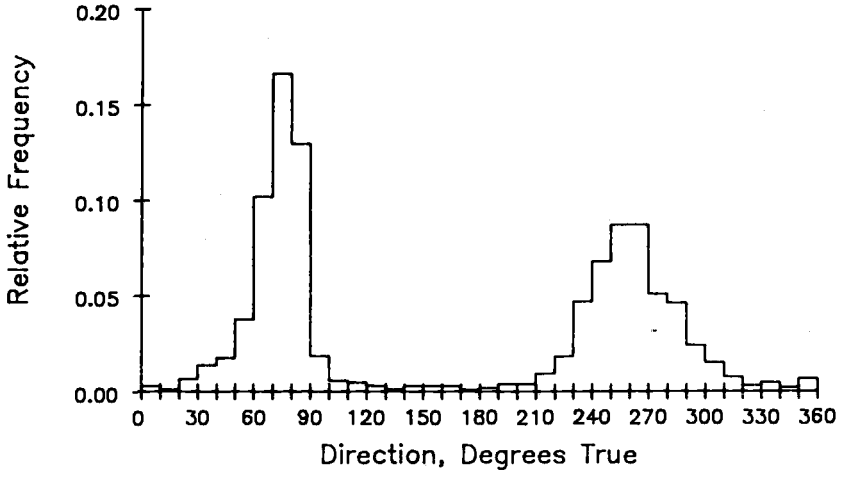


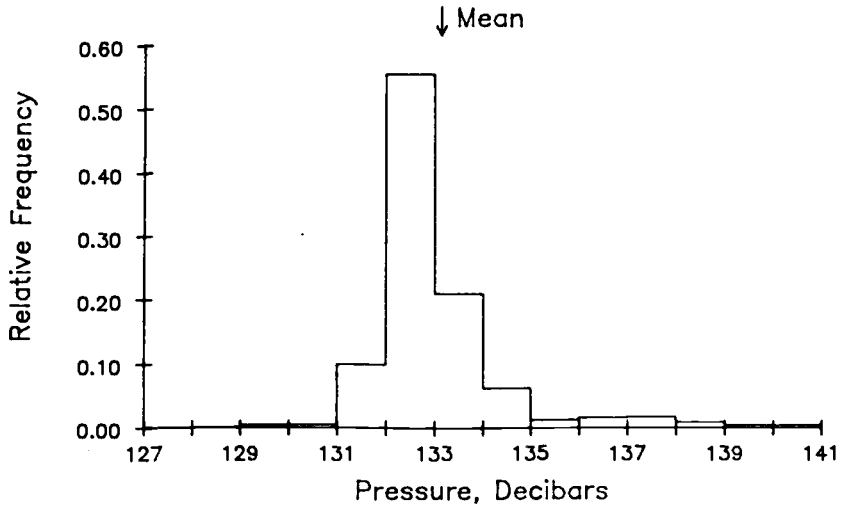




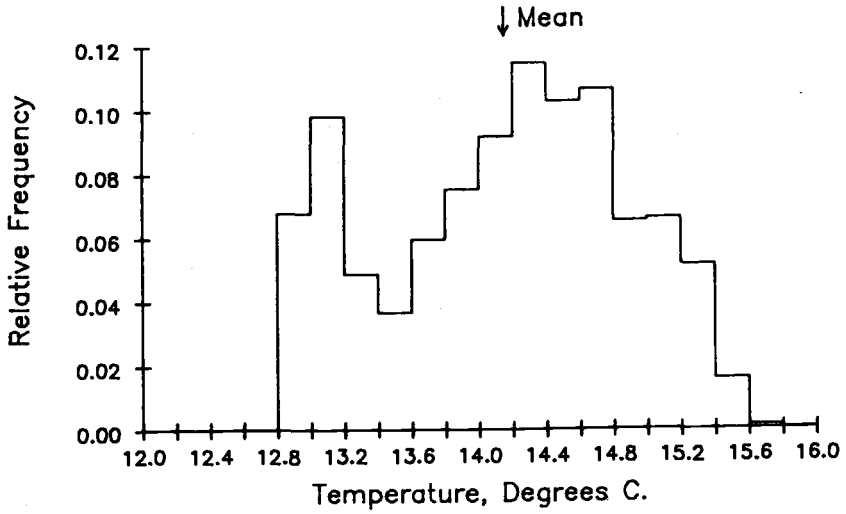
127 M AT GIBRALTAR C-3B. 28 MAY 86 - 20 JUN 86. TAPE 5644/29.

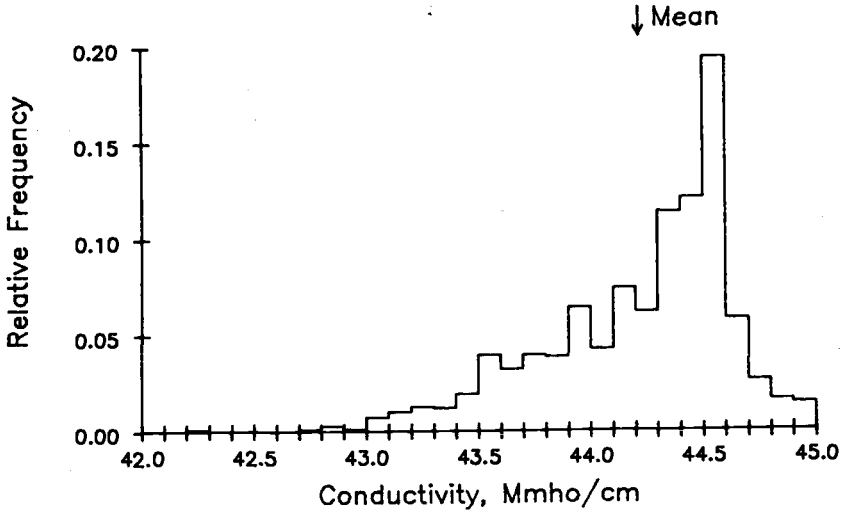


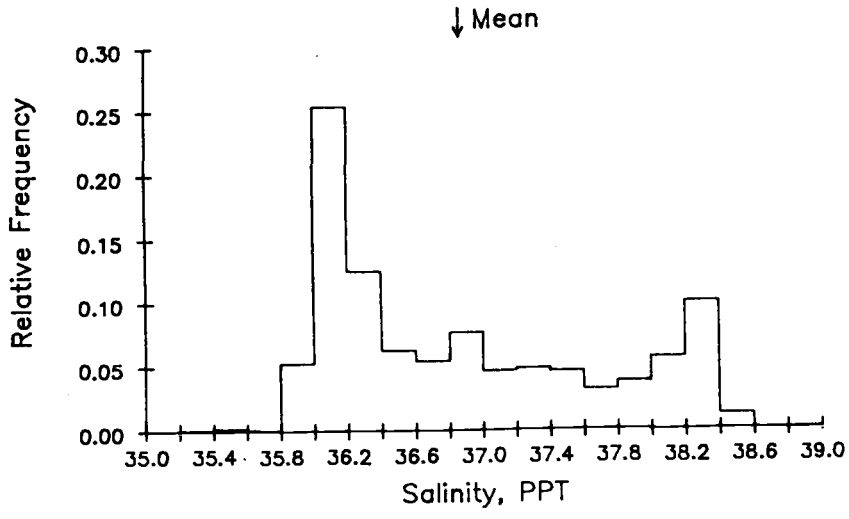




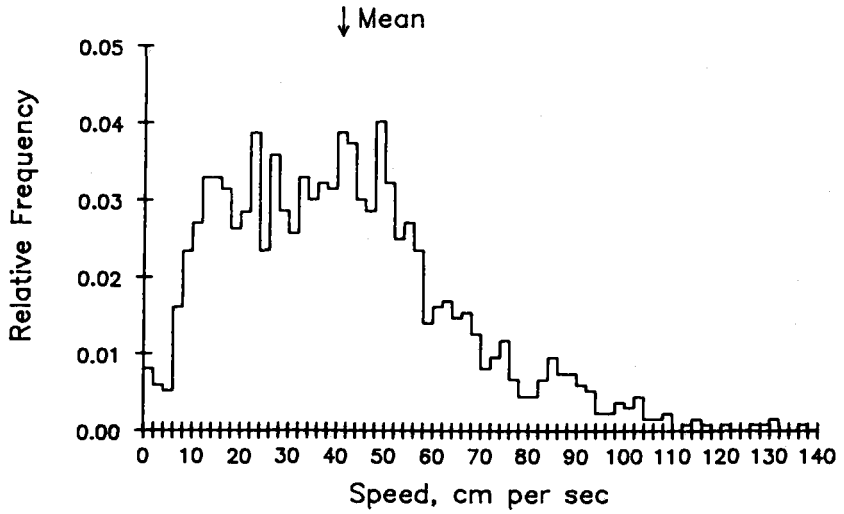
127 M AT GIBRALTAR C–3B. 28 MAY 86 – 20 JUN 86. TAPE 5644/29.

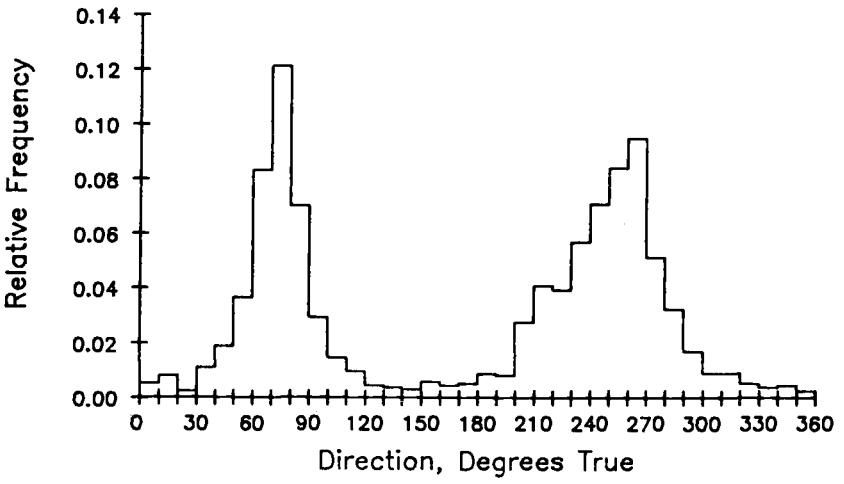


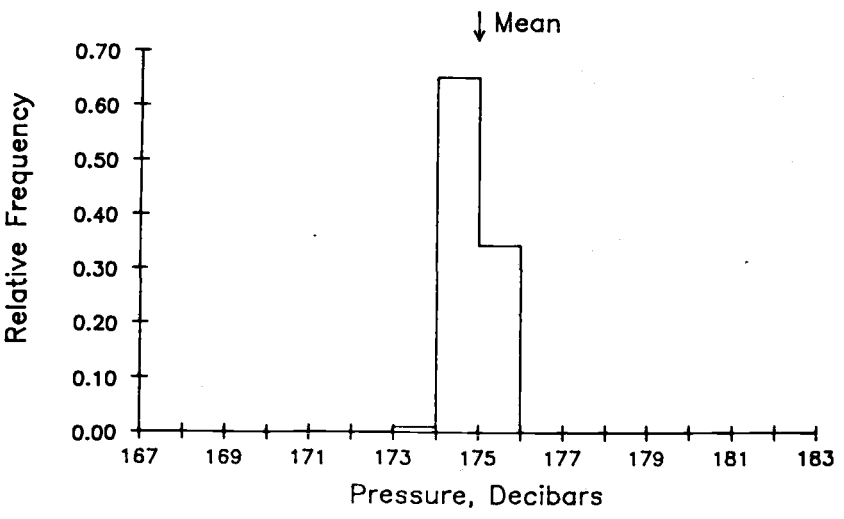




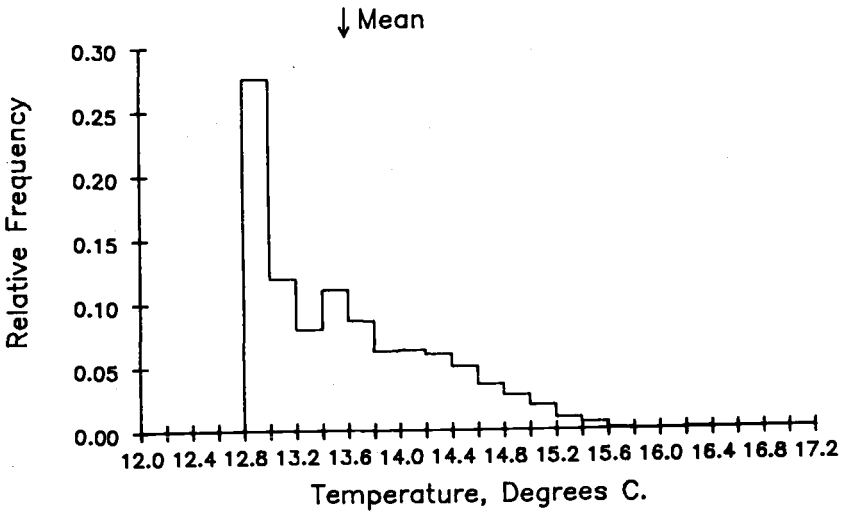
172 M AT GIBRALTAR C-3B. 28 MAY 86 - 26 JUN 86. TAPE 5645/26.

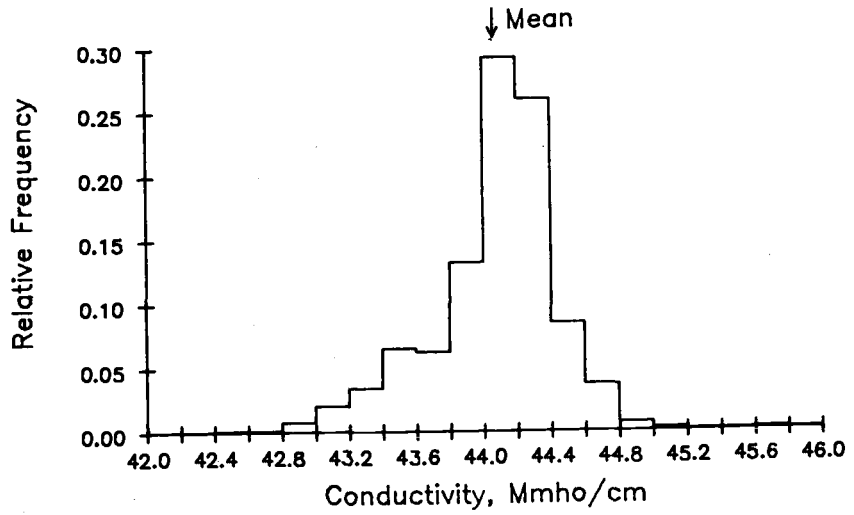


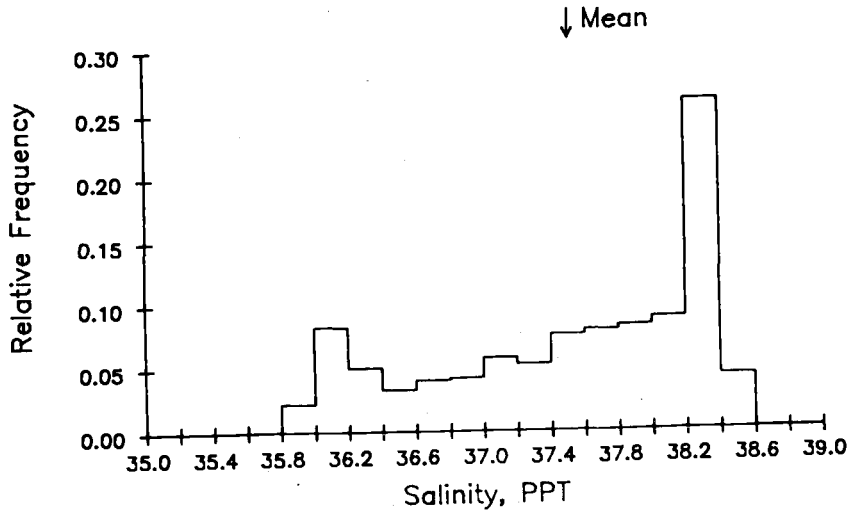




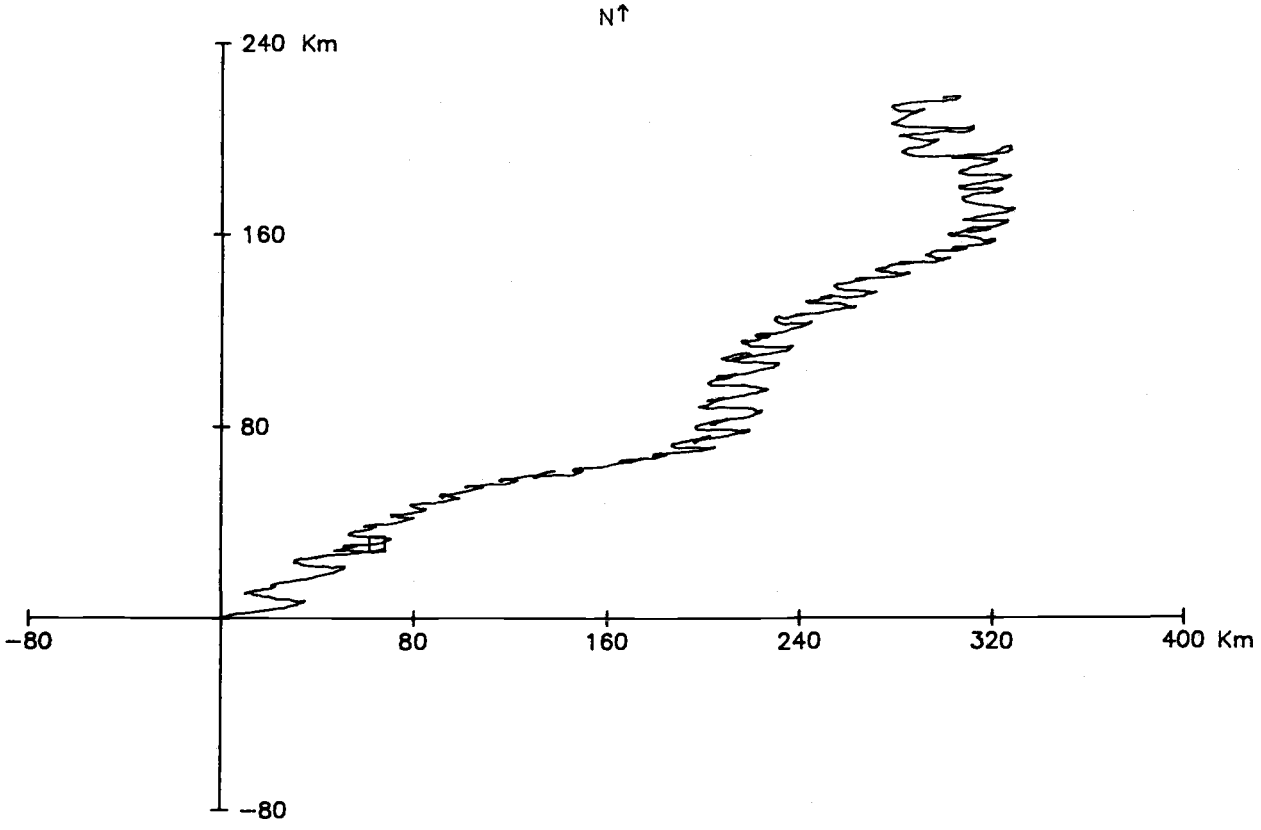
172 M AT GIBRALTAR C-3B. 28 MAY 86 - 26 JUN 86. TAPE 5645/26.

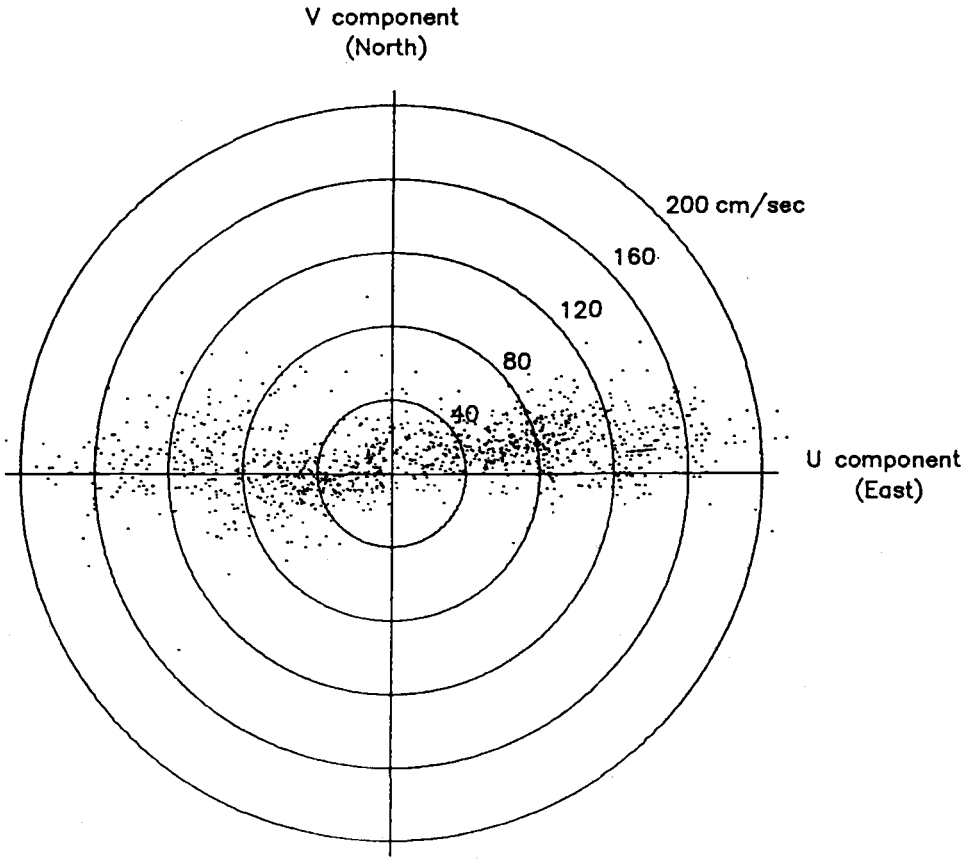




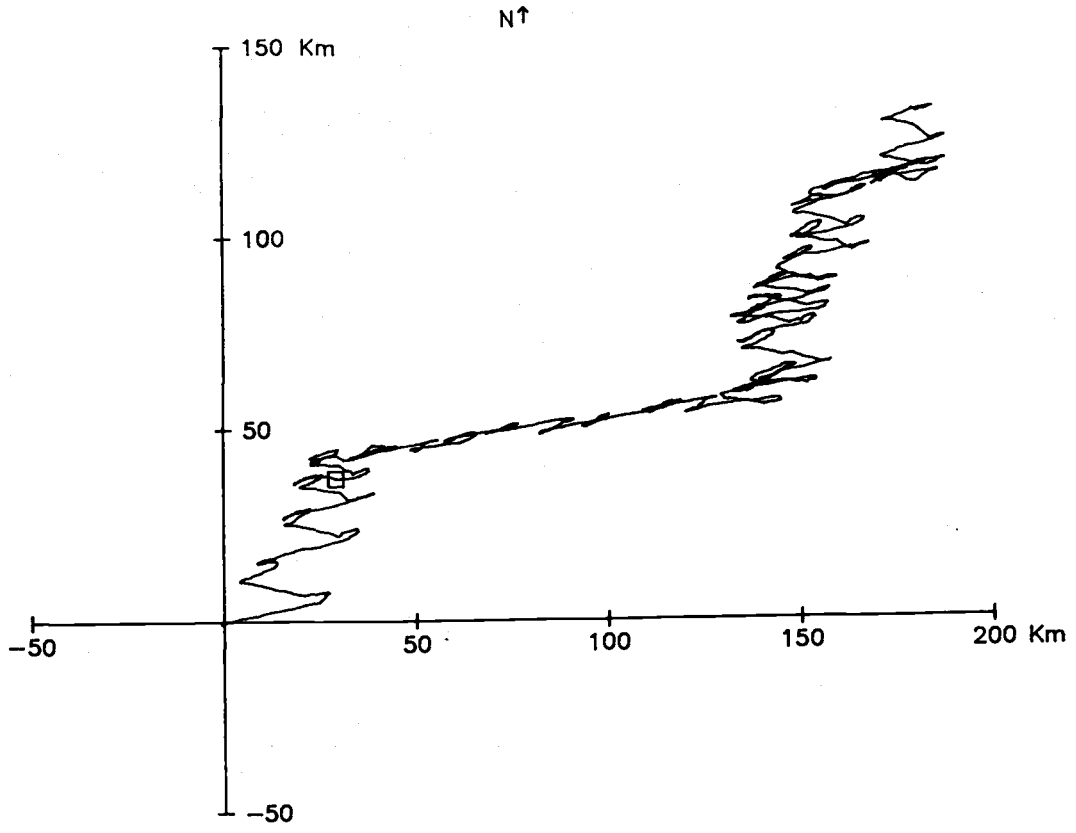


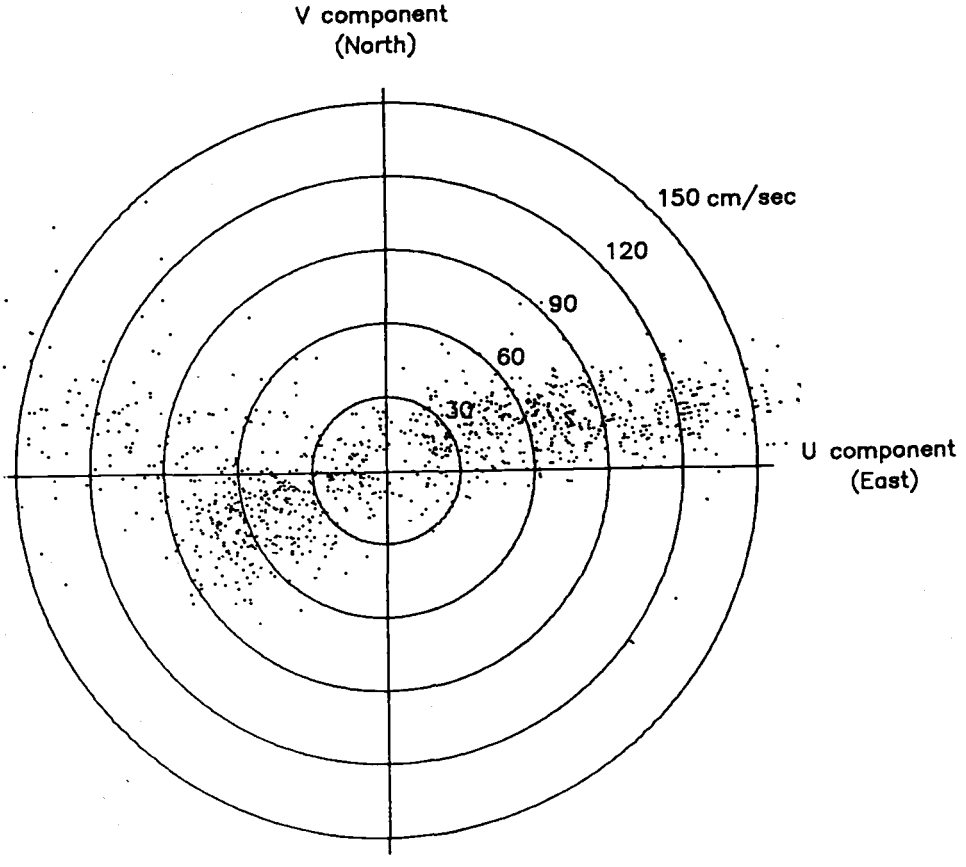
102 M AT GIBRALTAR C-3B. 28 MAY 86 - 23 JUN 86. TAPE 5643/27.



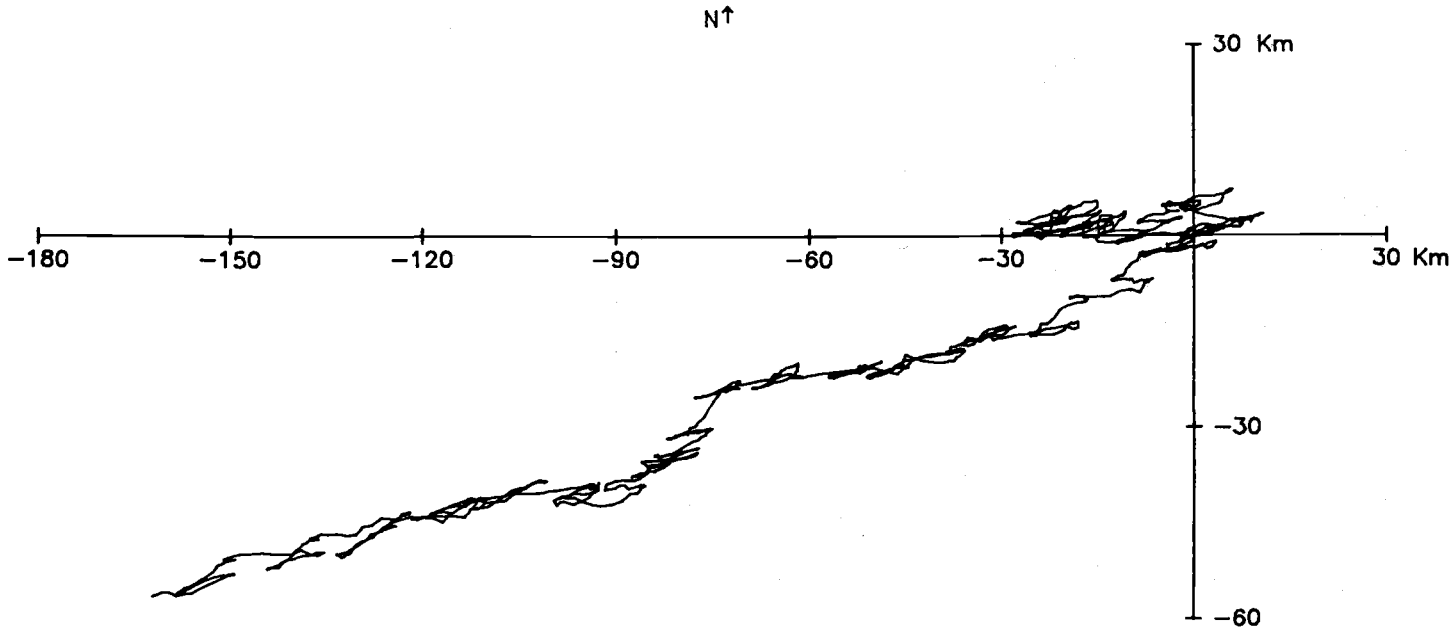


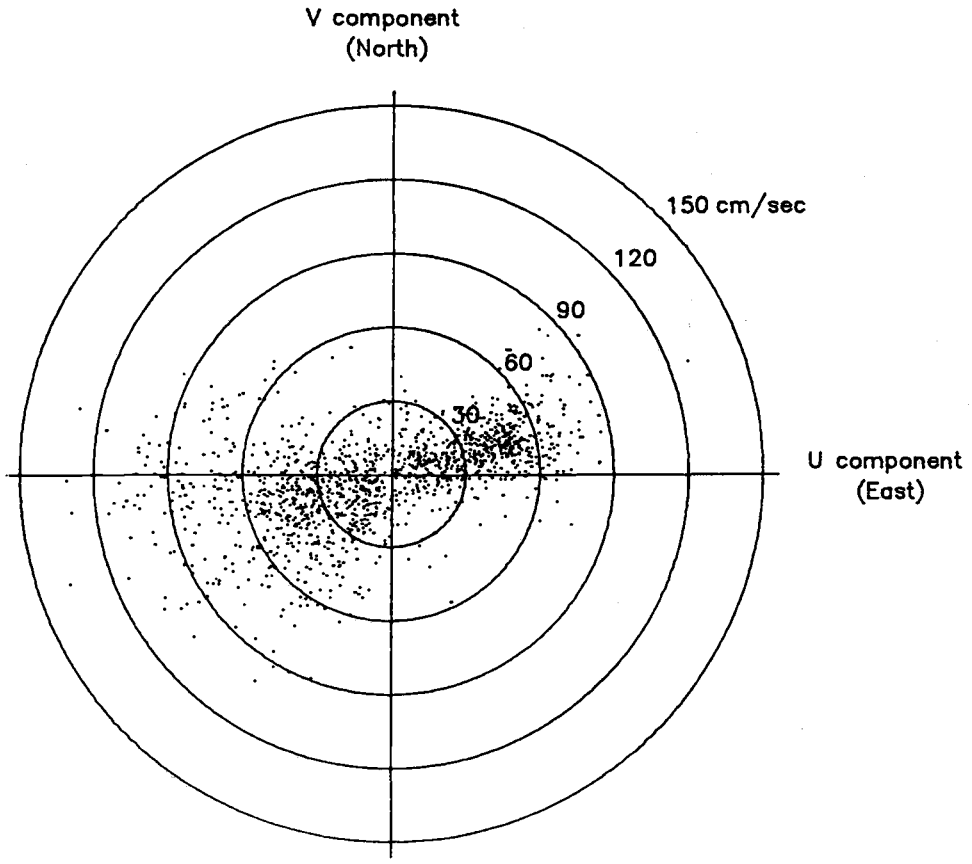
127 M AT GIBRALTAR C-3B. 28 MAY 86 - 20 JUN 86. TAPE 5644/29.



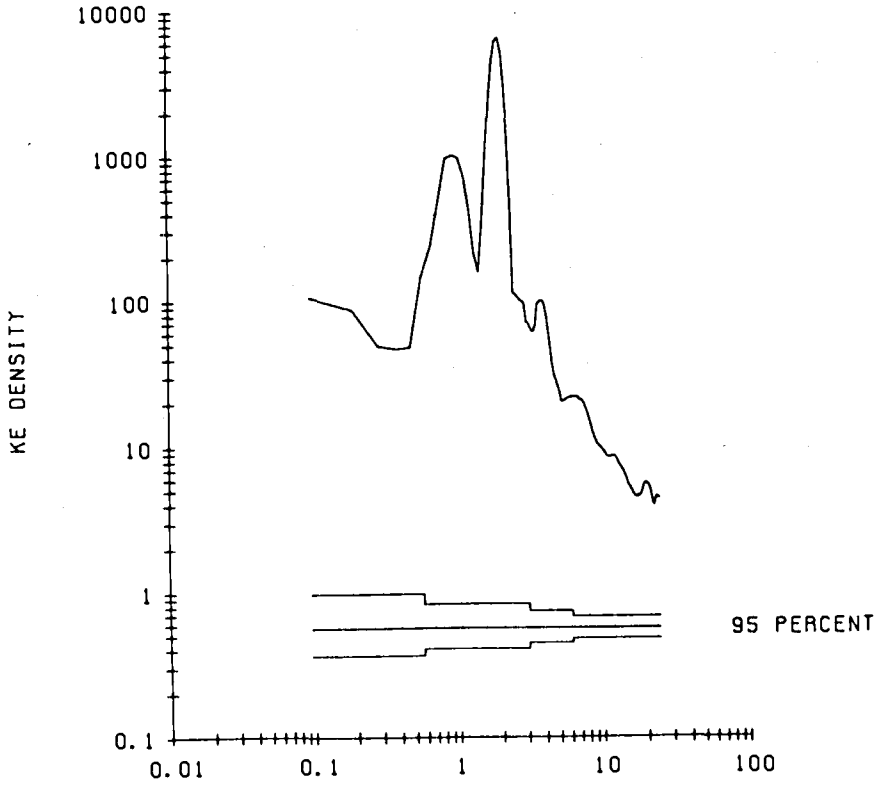


172 M AT GIBRALTAR C–3B. 28 MAY 86 – 26 JUN 86. TAPE 5645/26.

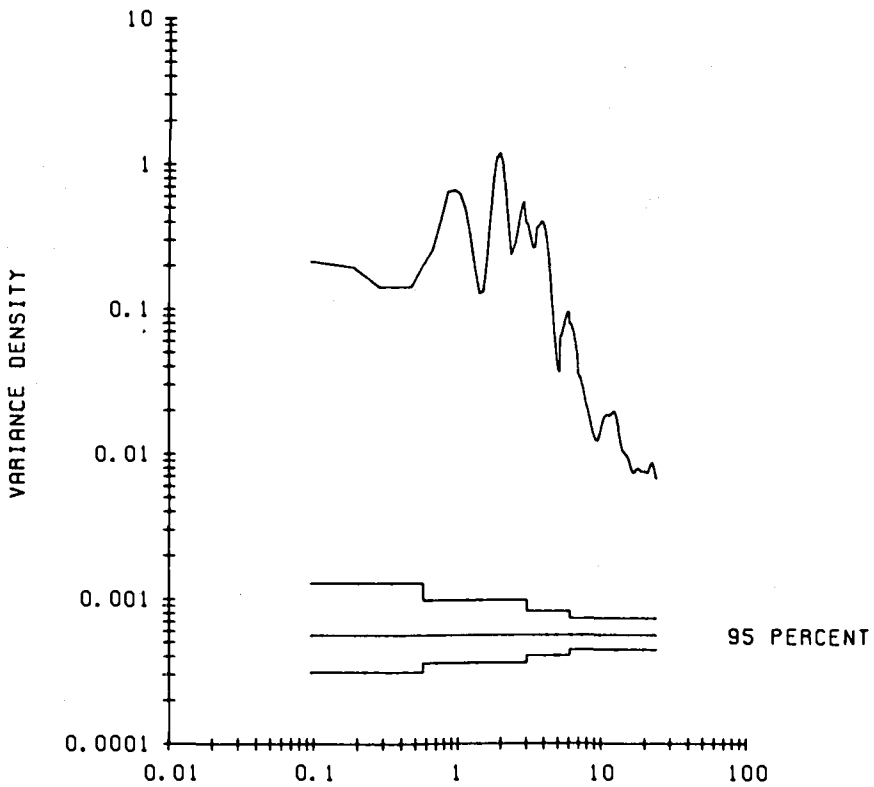




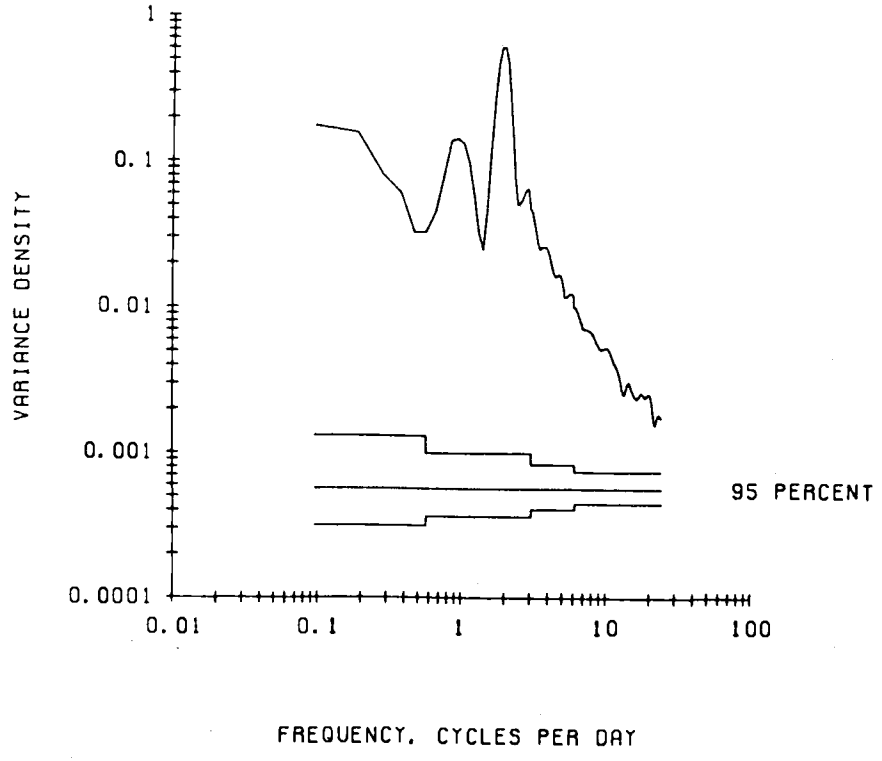
UNFILTERED CURRENT. 102 M AT GIBRALTAR C-3B



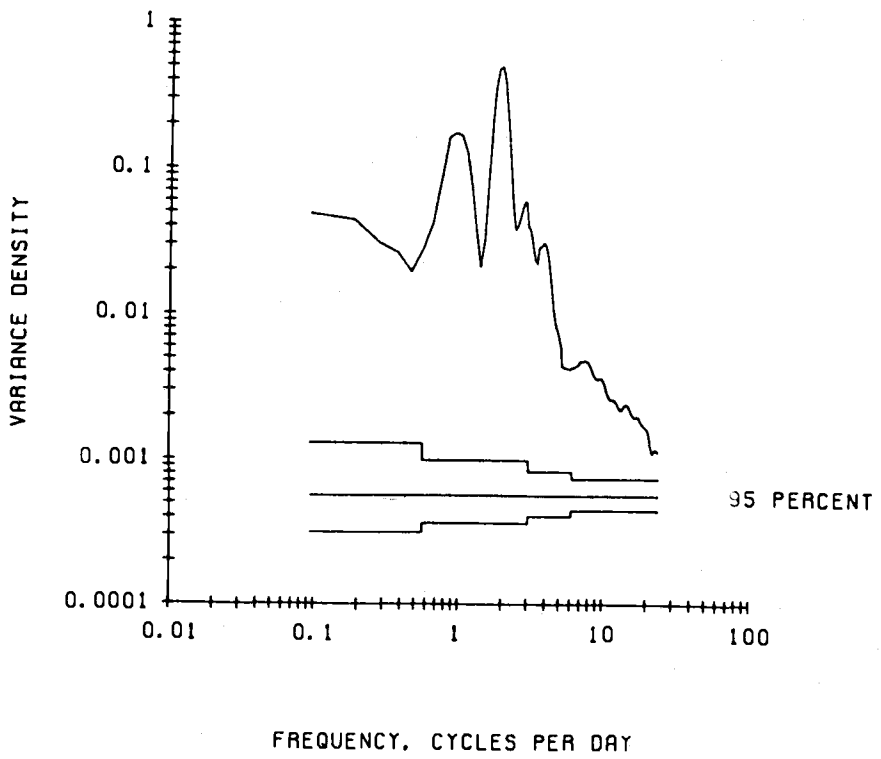
UNFILTERED PRESSURE. 102 M AT GIBRALTAR C-3B.



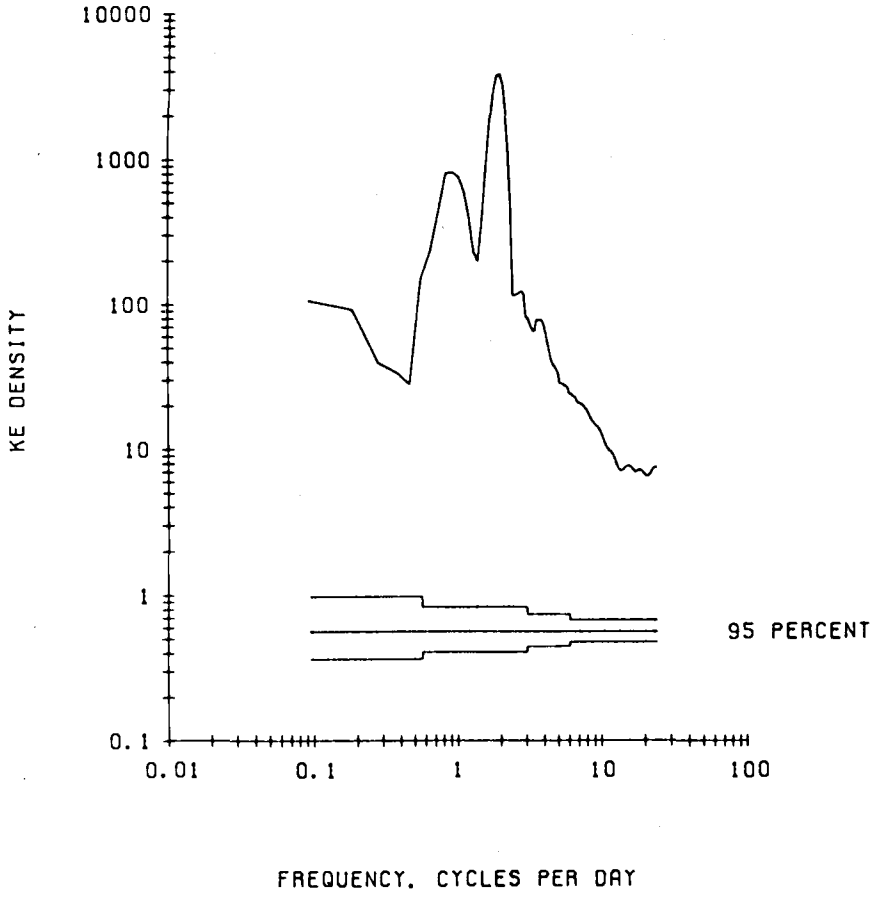
UNFILTERED TEMPERATURE. 102 M AT GIBRALTAR C-3B.



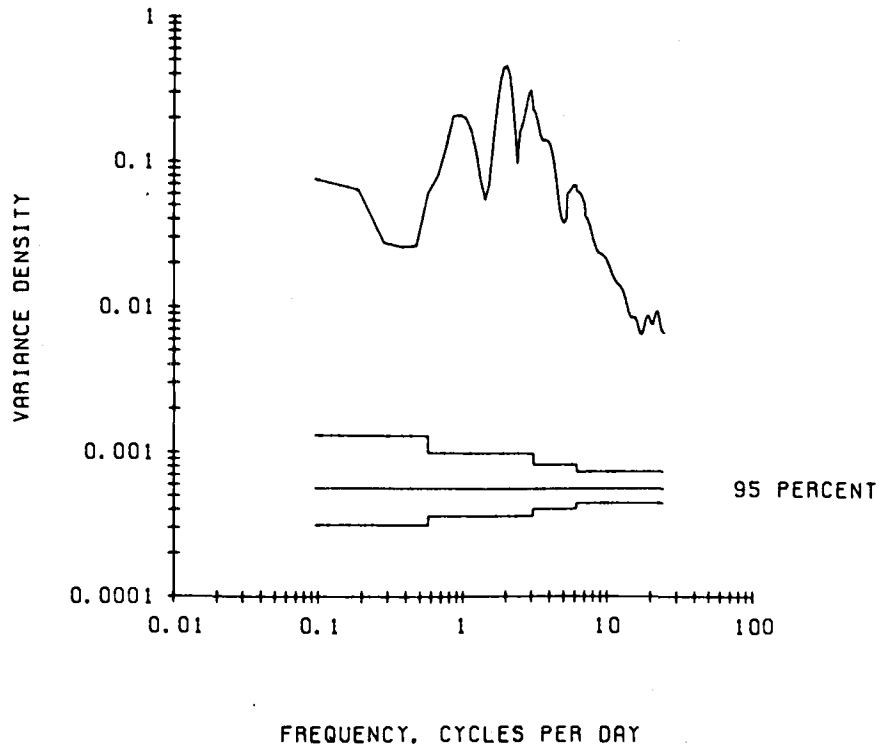
UNFILTERED SALINITY. 102 M AT GIBRALTAR C-3B.



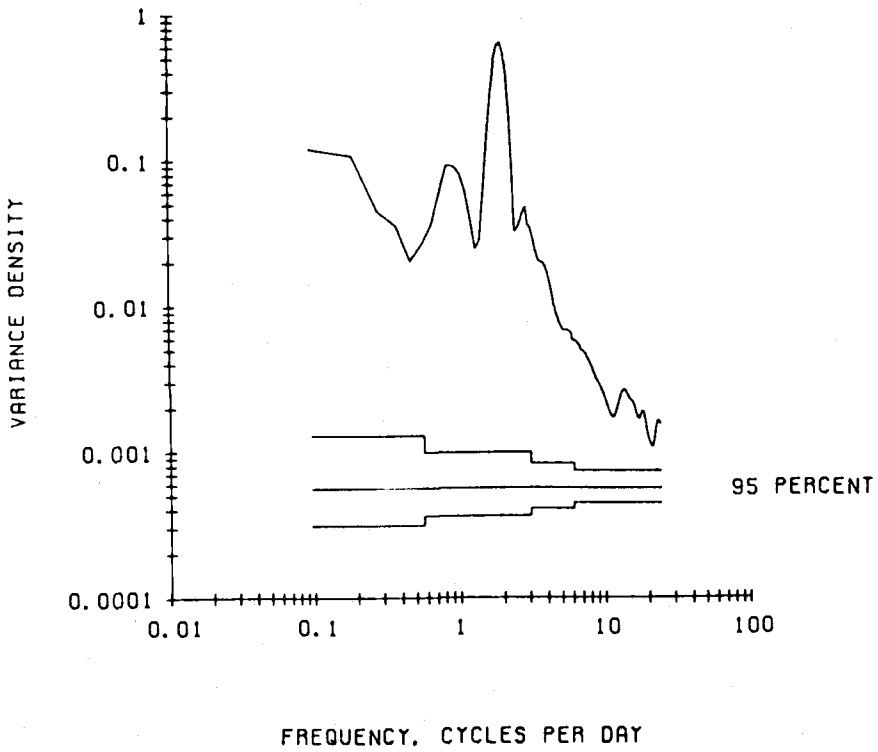
UNFILTERED CURRENT. 127 M AT GIBRALTAR C-38.



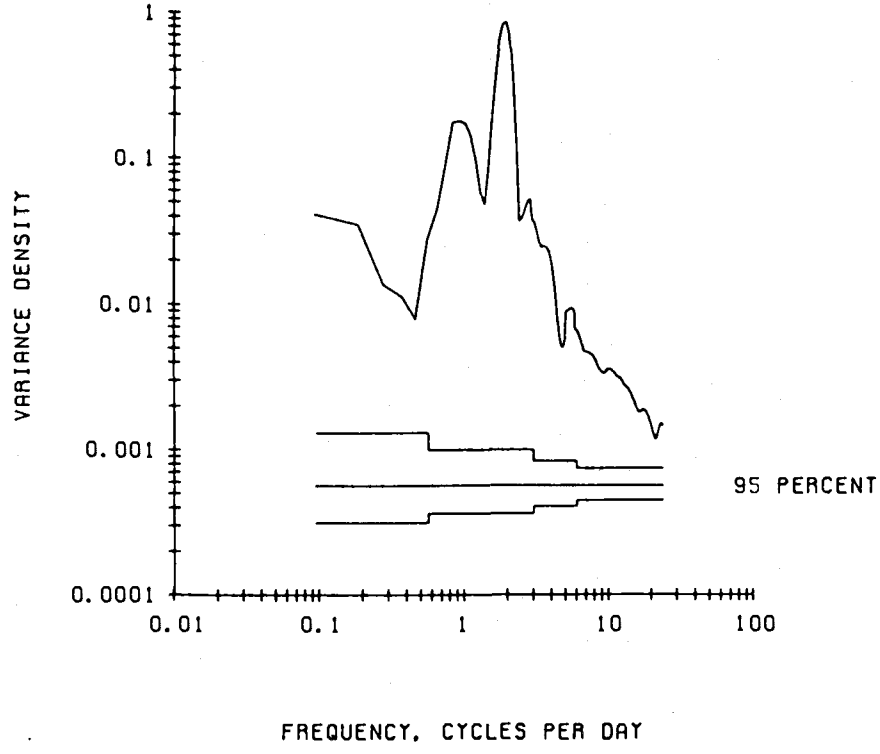
UNFILTERED PRESSURE. 127 M AT GIBRALTAR C-38.



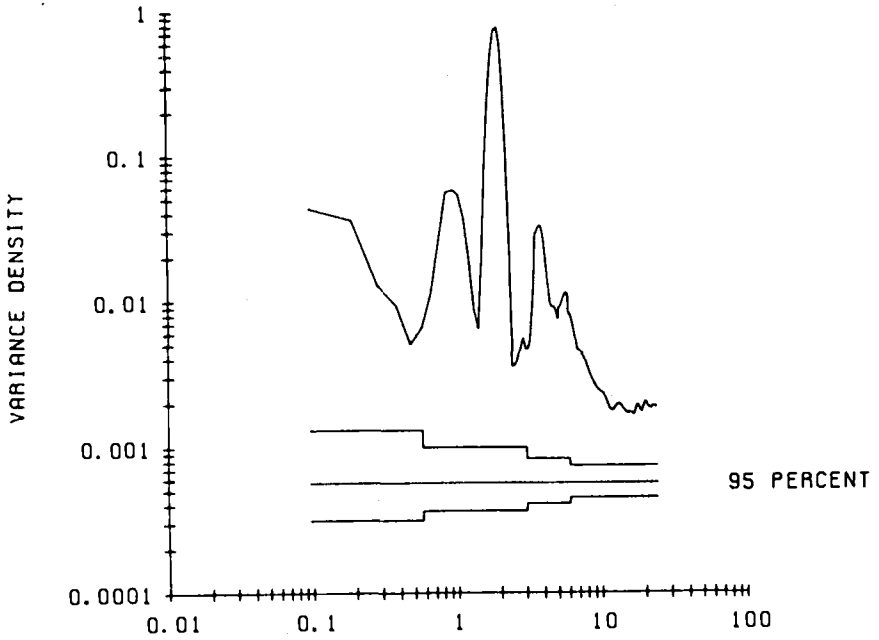
UNFILTERED TEMPERATURE. 127 M AT GIBRALTAR C-3B .



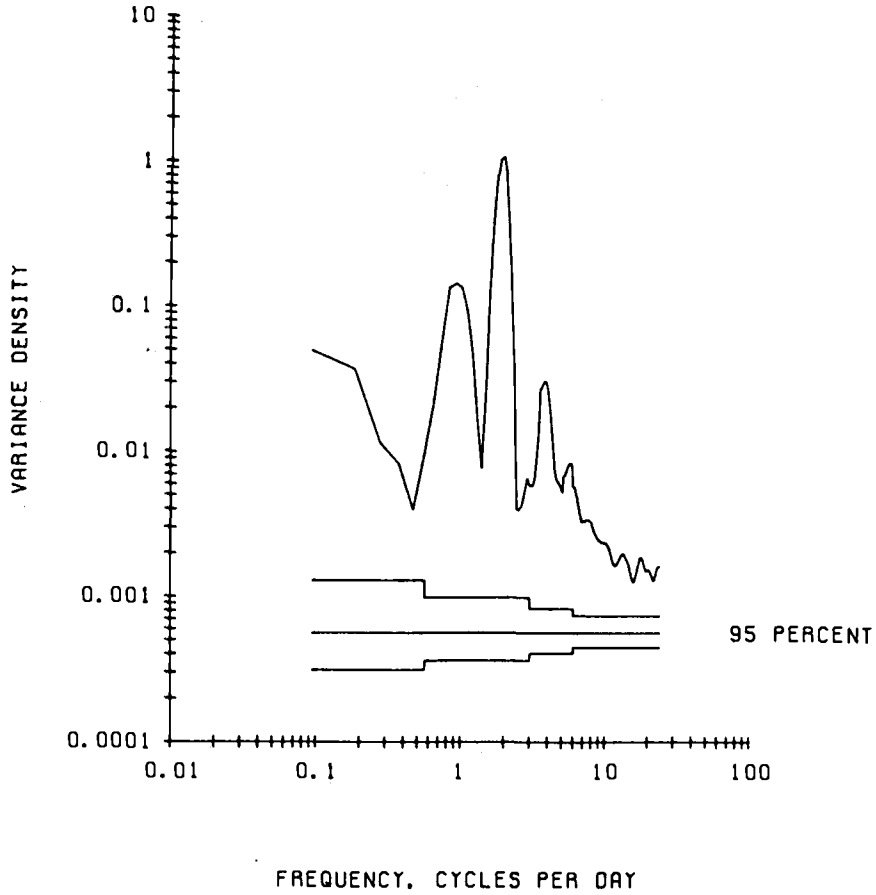
UNFILTERED SALINITY. 127 M AT GIBRALTAR C-3B.



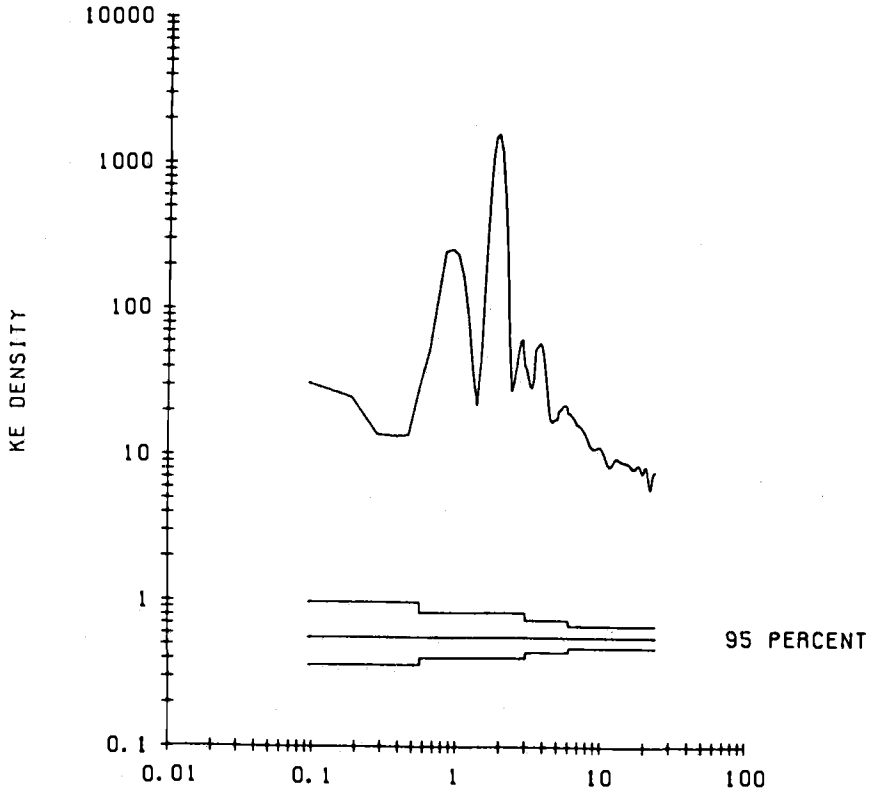
UNFILTERED TEMPERATURE. 172 M AT GIBRALTAR C-3B.



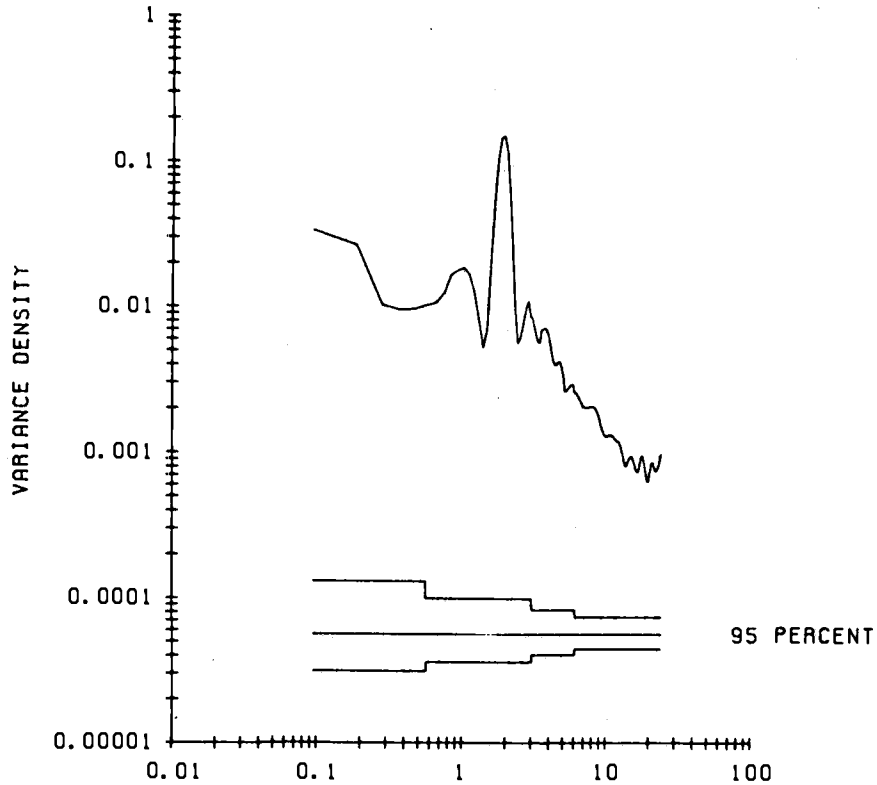
UNFILTERED SALINITY. 172 M AT GIBRALTAR C-3B.

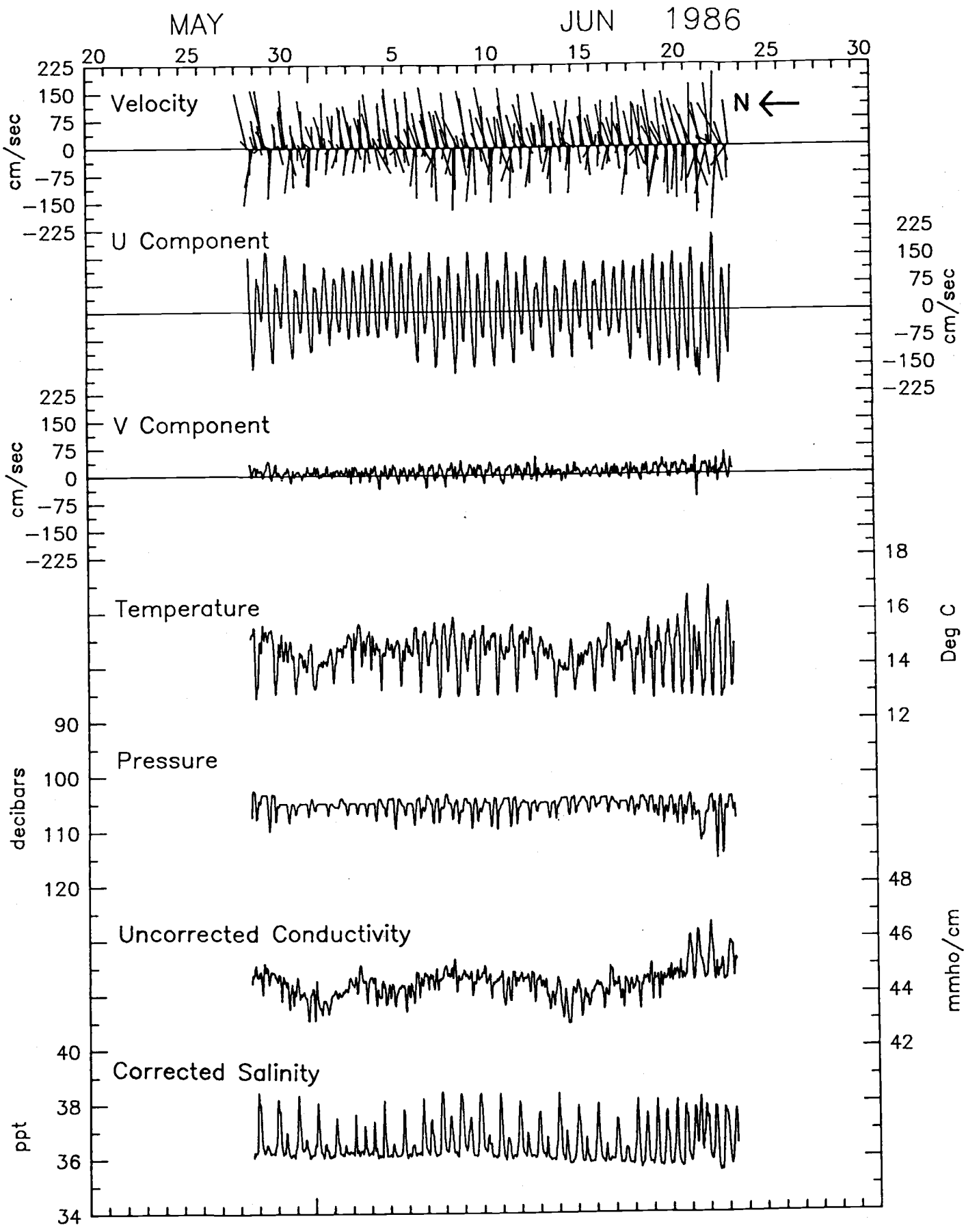


UNFILTERED CURRENT. 172 M AT GIBRALTAR C-3B.

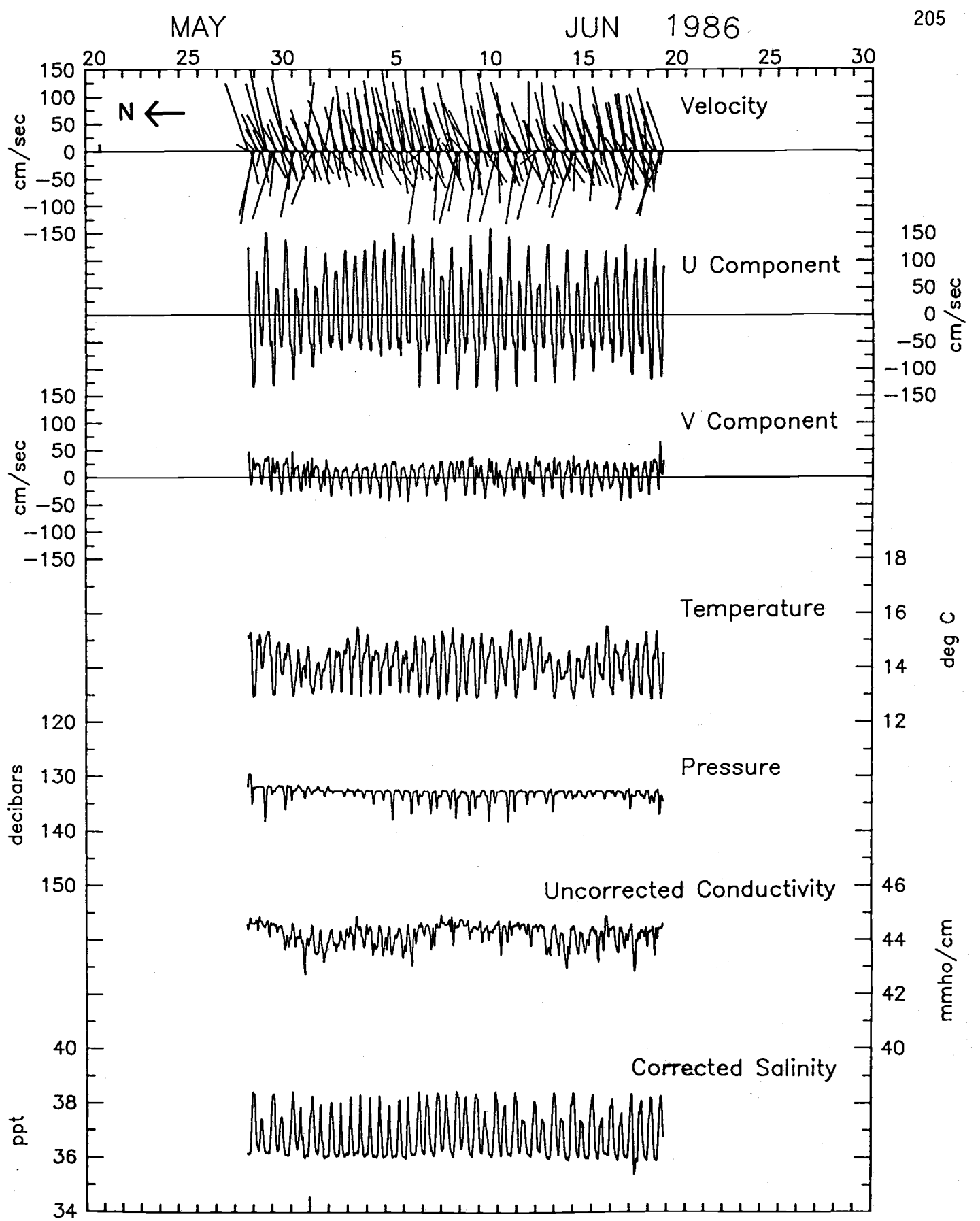


UNFILTERED PRESSURE. 172 M AT GIBRALTAR C-3B.

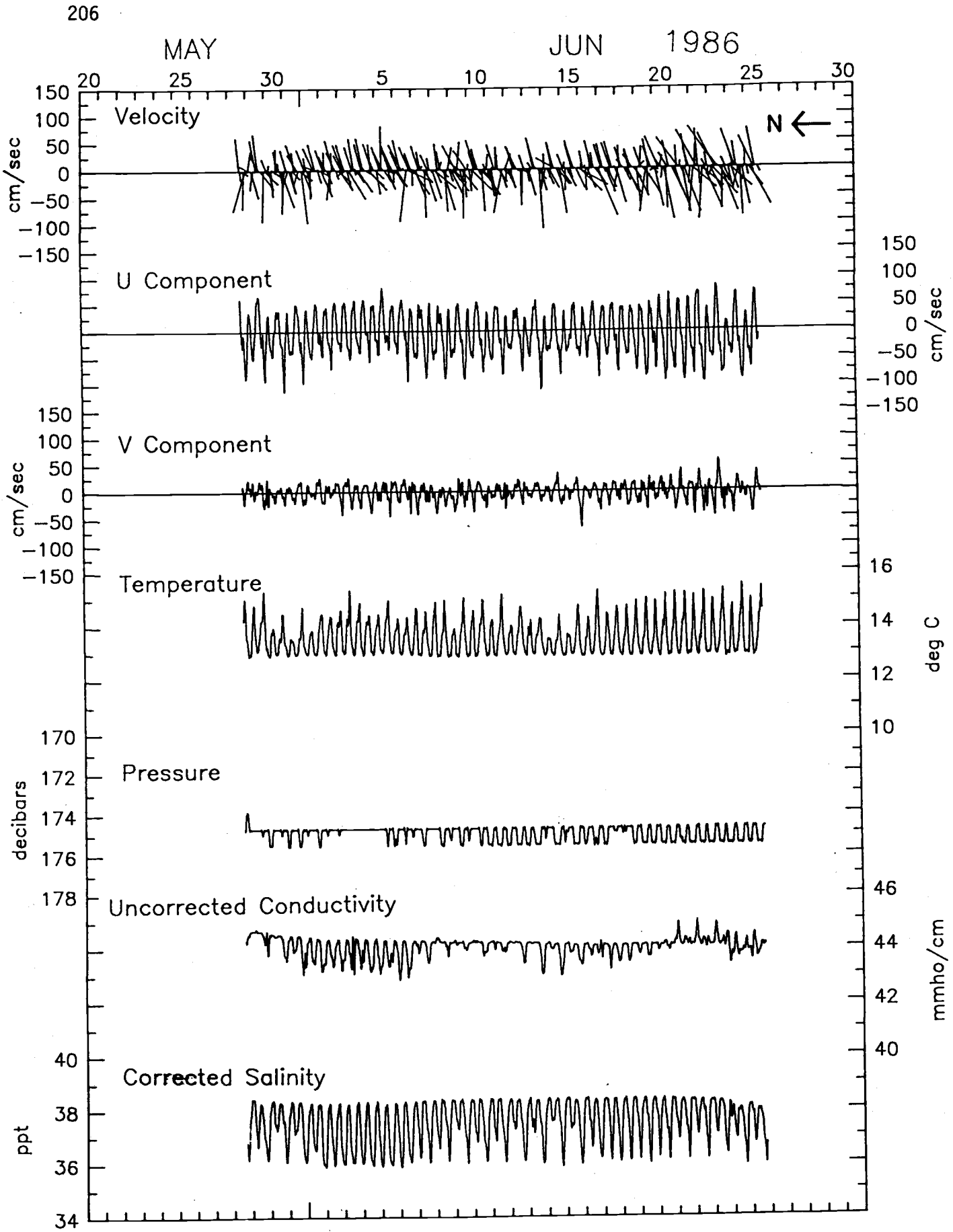




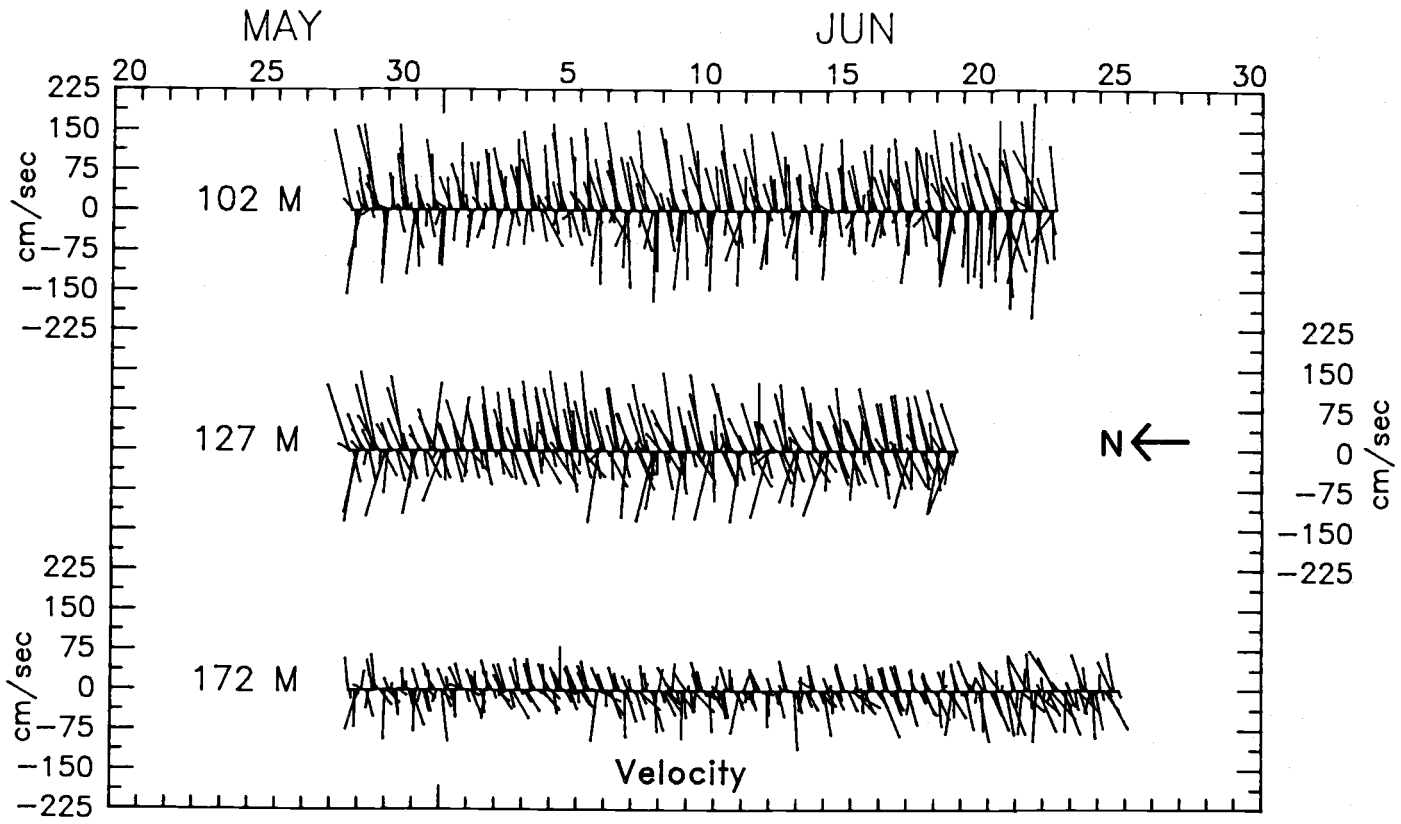
102m at Gibraltar C−3B.

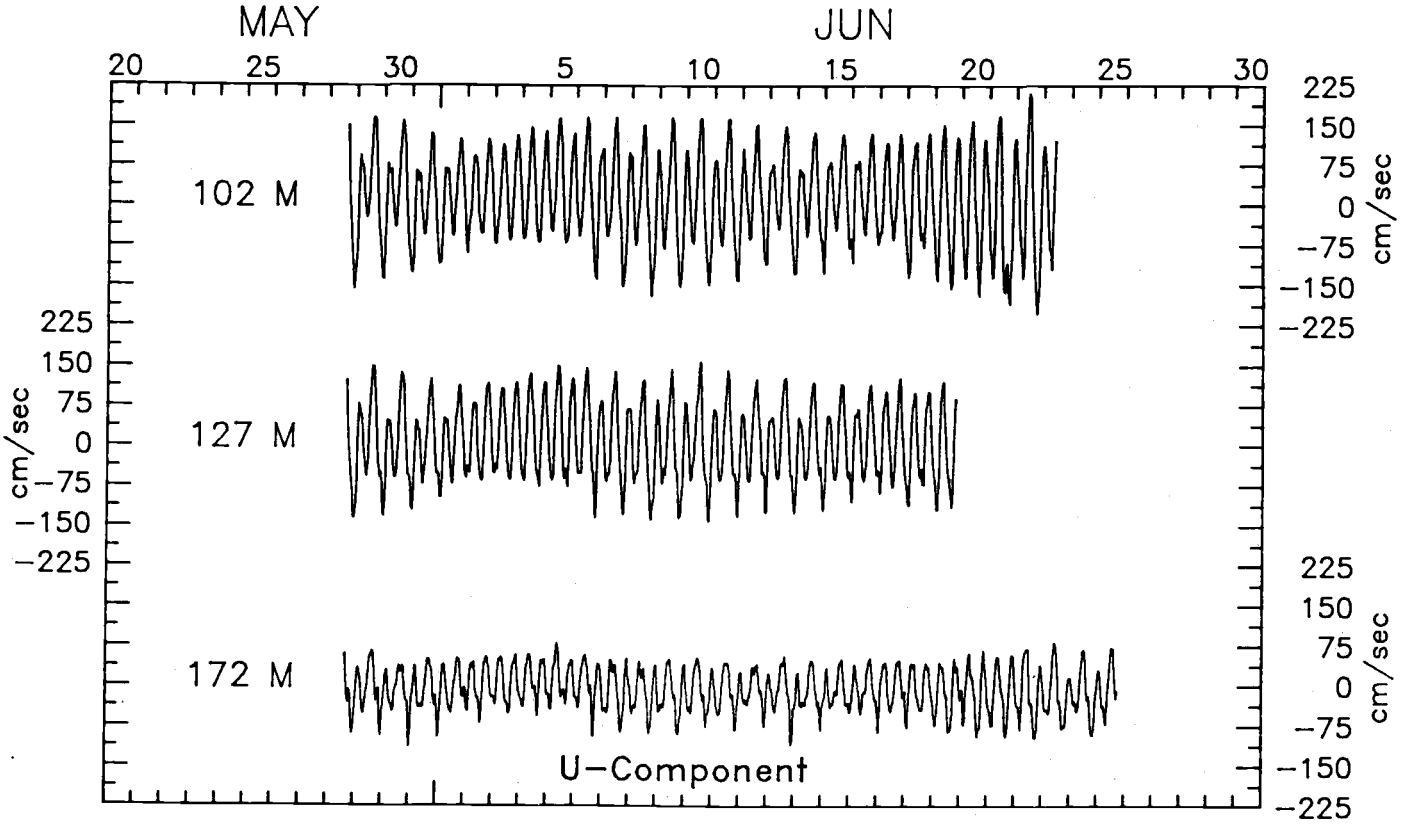


127 m at Gibraltar C−3B.

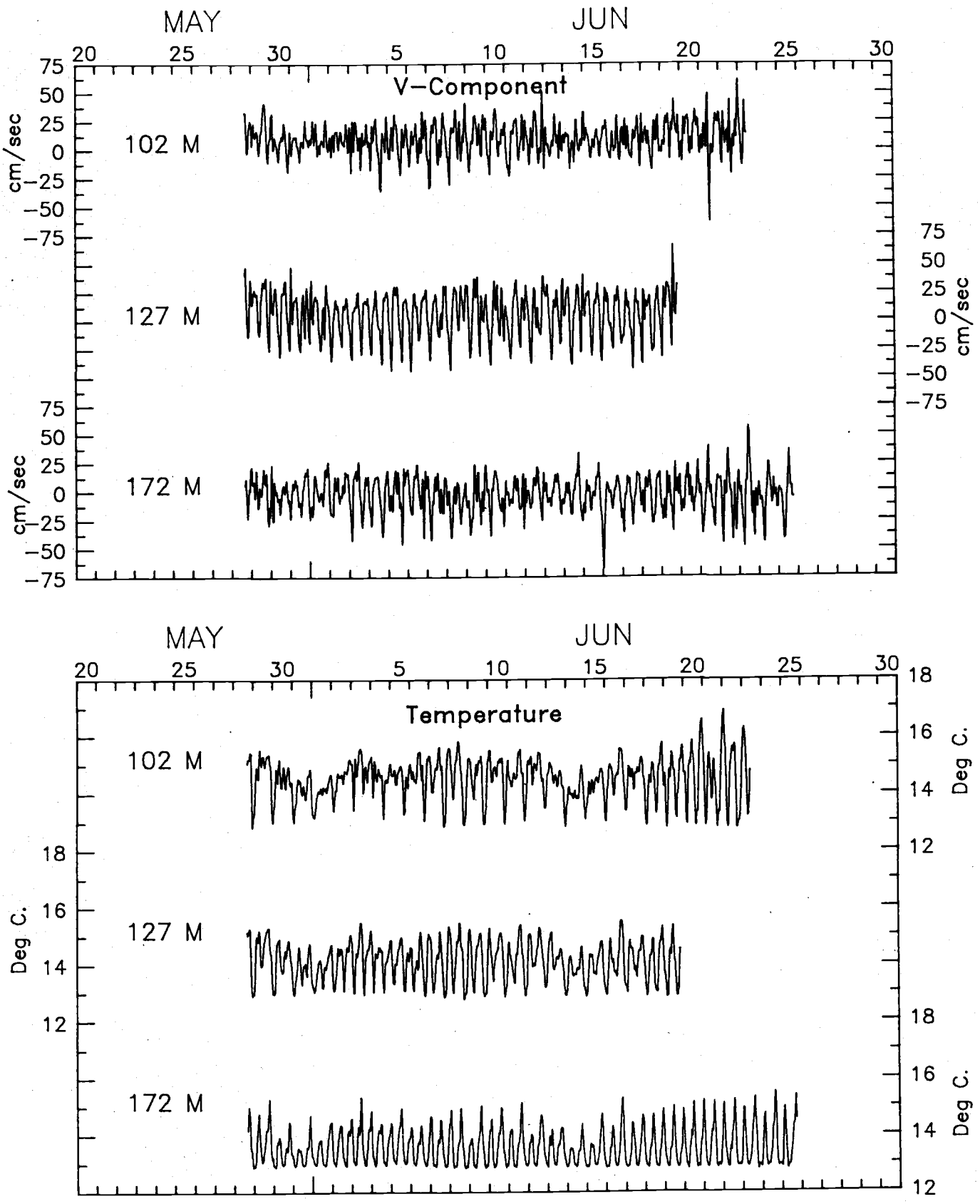


172 m at Gibraltar C−3B.

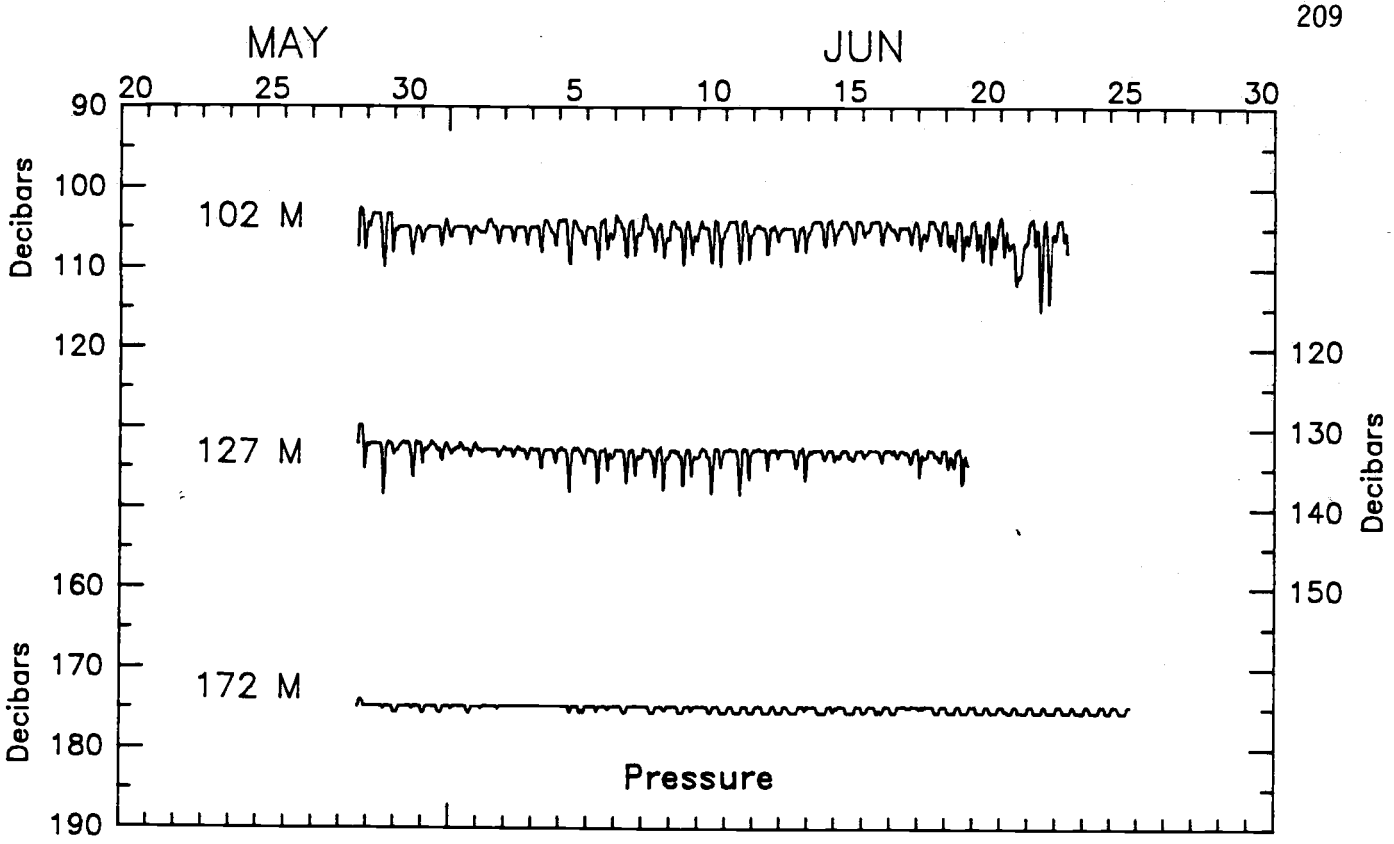


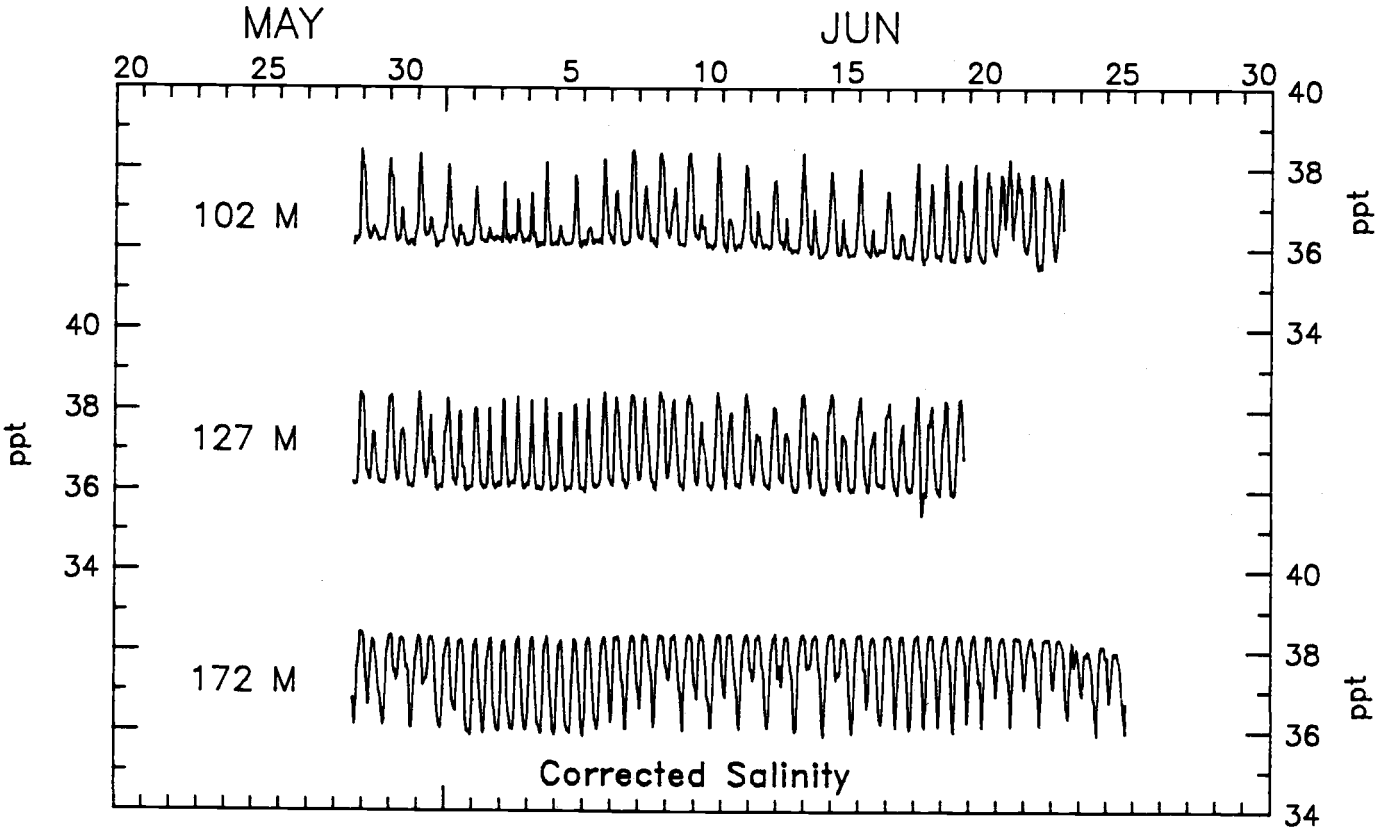


Gibraltar Mooring C3−B. 1986



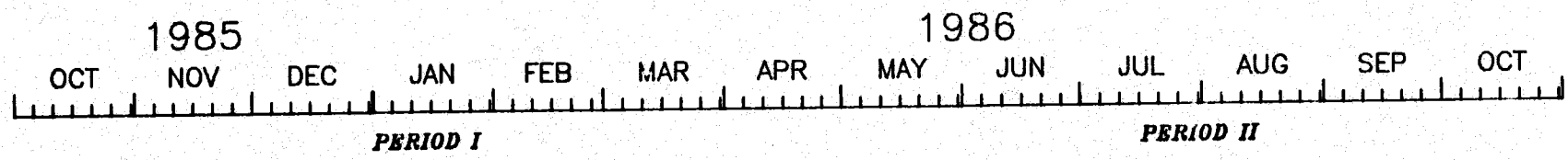
Gibraltar Mooring C3–B. 1986

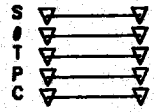




Gibraltar Mooring C3–B. 1986

Mooring C - 4



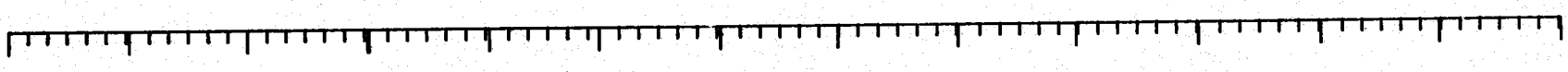


67 M

* *170 M*

* *230 M*

* meter not recovered



DATA RETURN FROM GIBRALTAR C–4.

STATISTICS
MOORING GIBRALTAR C-4. PERIOD I
17 OCT 85 - 9 NOV 85

HALF-HOURLY UNFILTERED DATA
35°51.68'N, 5°58.64'W
Bottom Depth: 358 m

		MEAN	SD	MIN	MAX	LENGTH	COMMENTS
1541/48	s	36.43	26.24	2.50	111.10	1075	The mooring line parted just below RCM 1541
67 m	u	23.96	34.81	-61.70	105.70	1075	at about 0300 9 Nov 85.
	v	8.52	12.57	-26.40	61.10	1075	
	T	15.79	0.38	14.47	17.36	1075	
	P	69.92	1.36	67.70	75.30	1075	
	C	45.16	0.43	43.58	46.86	1075	
	S	36.29	0.05	36.07	36.42	1075	
6881/							(not recovered)
4045/							(not recovered)

The top of this mooring was found by Moroccan fishermen and taken to Al Mediq, Morocco. The remainder of the mooring was not recovered.

(speed, u, and v are given in cm/sec; Temperature in °C; Pressure in decibars; Conductivity in mmho/cm; and Uncorrected Salinity in ppt. The sampling rate is 30 min.)

STATISTICS
MOORING GIBRALTAR C-4. PERIOD I
19 OCT 85 - 8 NOV 85

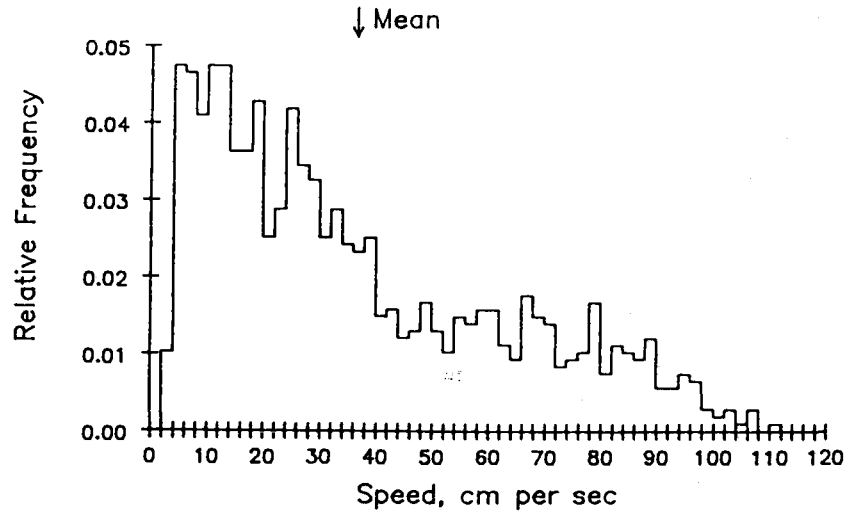
6-HOURLY FILTERED DATA
35°51.68'N, 5°58.64'W
Bottom Depth 358 m

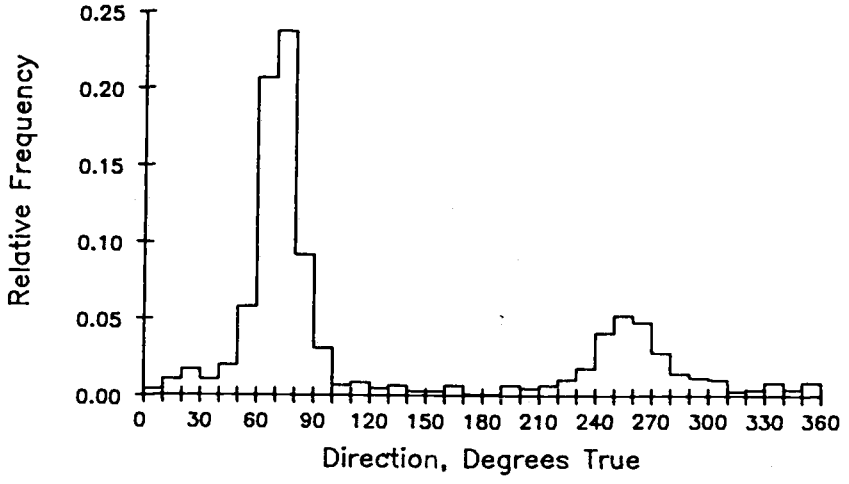
		MEAN	SD	MIN	MAX	LENGTH	COMMENTS
1541/48	u	23.33	4.25	14.61	33.29	80	The mooring line parted just below RCM 1541
67 m	v	8.76	2.24	4.30	15.68	80	at about 0300 9 Nov 85.
	T	15.79	0.23	15.32	16.16	80	
	P	69.84	0.68	68.53	71.22	80	
	C	45.15	0.25	44.61	45.57	80	
	S	36.29	0.02	36.23	36.33	80	
6881/							(not recovered)
4045/							(not recovered)

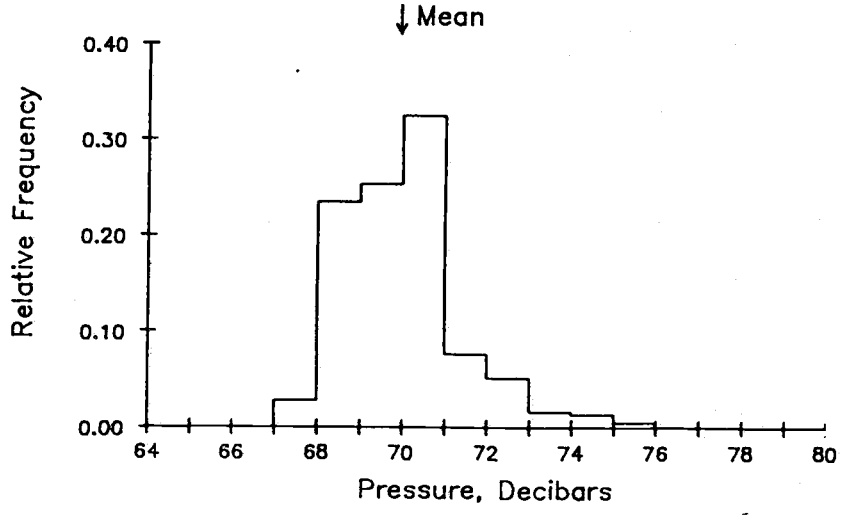
The top of this mooring was found by Moroccan fishermen and taken to Al Mediq, Morocco. The remainder of the mooring was not recovered.

(speed, u, and v are given in cm/sec; Temperature in °C; Pressure in decibars; Conductivity in mmho/cm; and Uncorrected Salinity in ppt. The sampling rate is 360 min.)

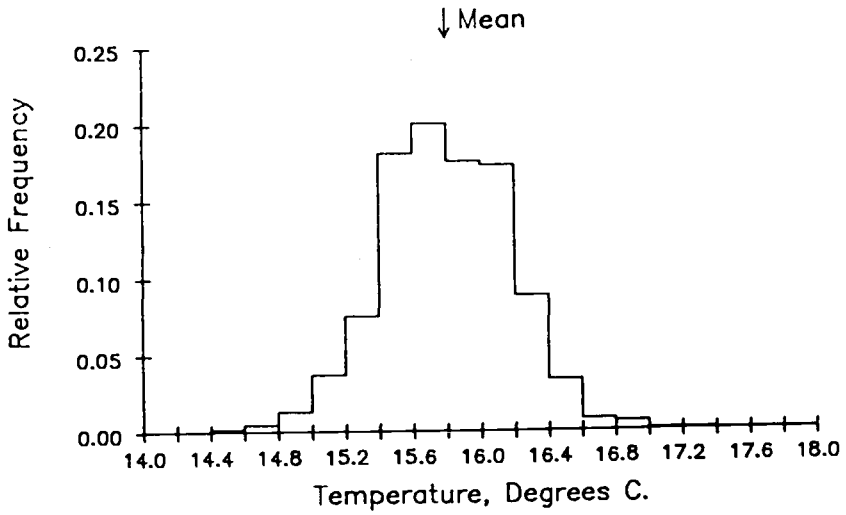
67 M AT GIBRALTAR C-4. 17 OCT 85 - 9 NOV 85. TAPE 1541/48.

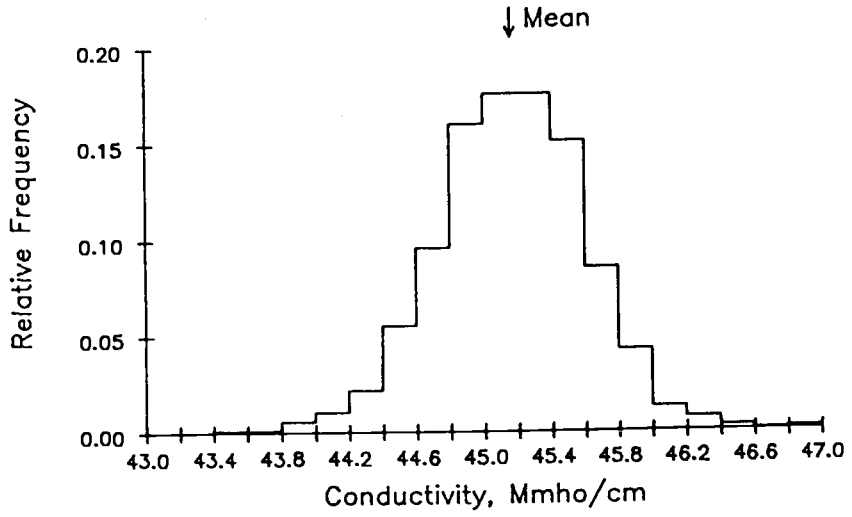


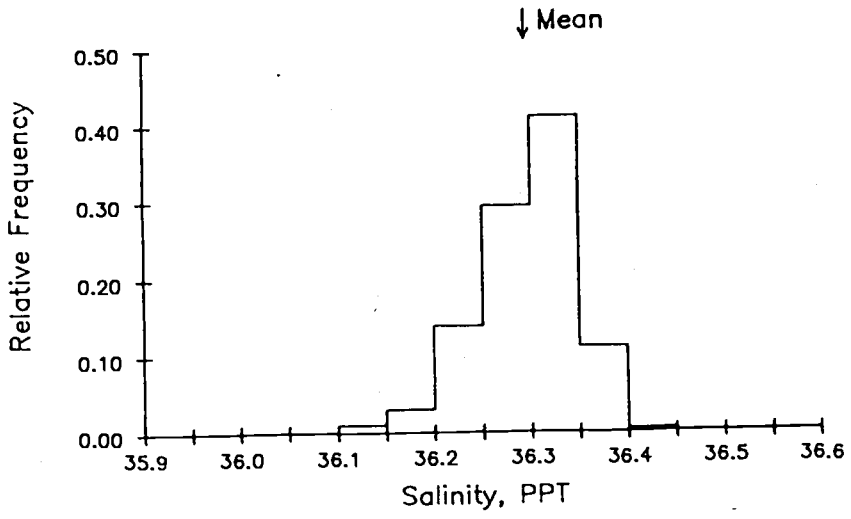




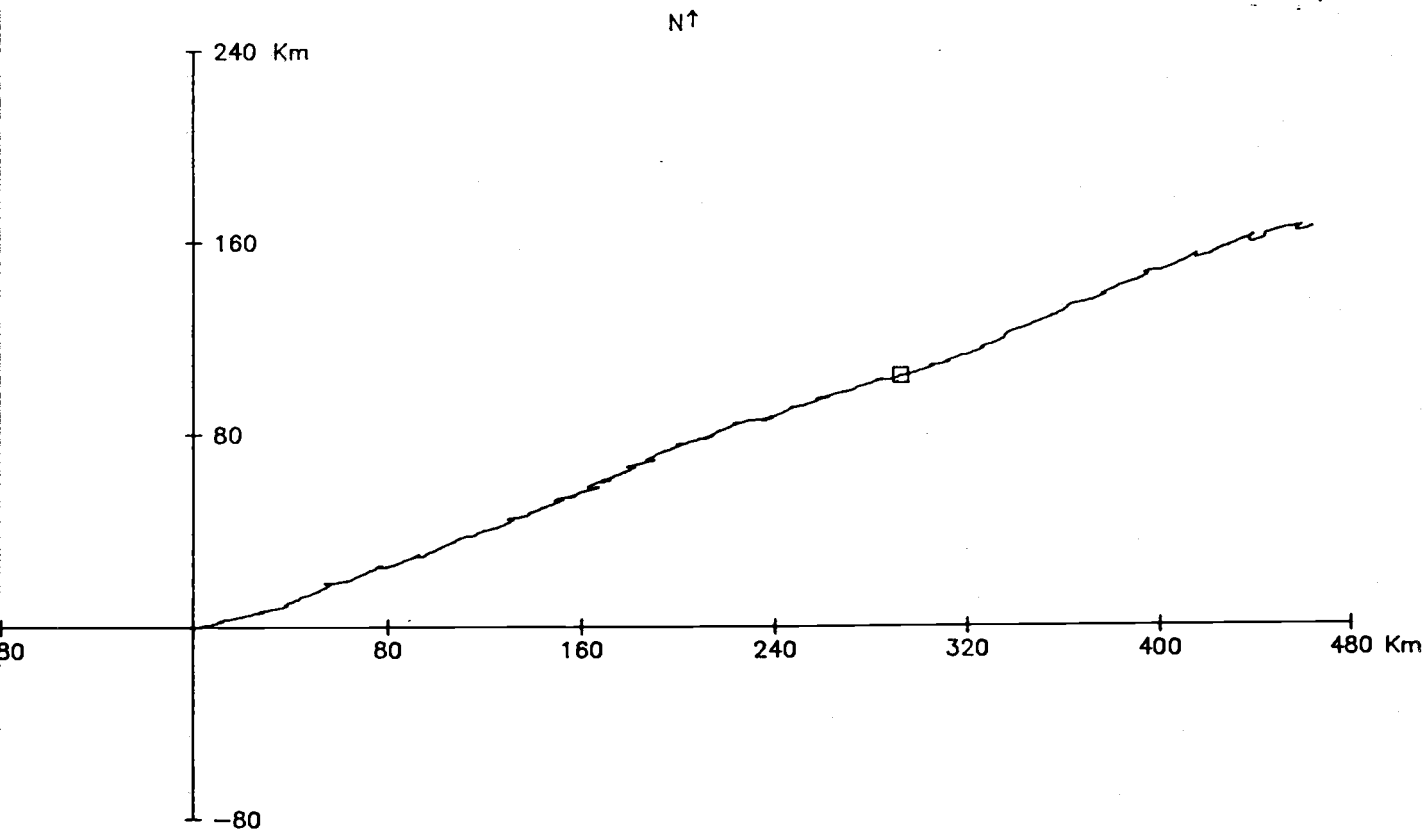
67 M AT GIBRALTAR C-4. 17 OCT 85 - 9 NOV 85. TAPE 1541/48.

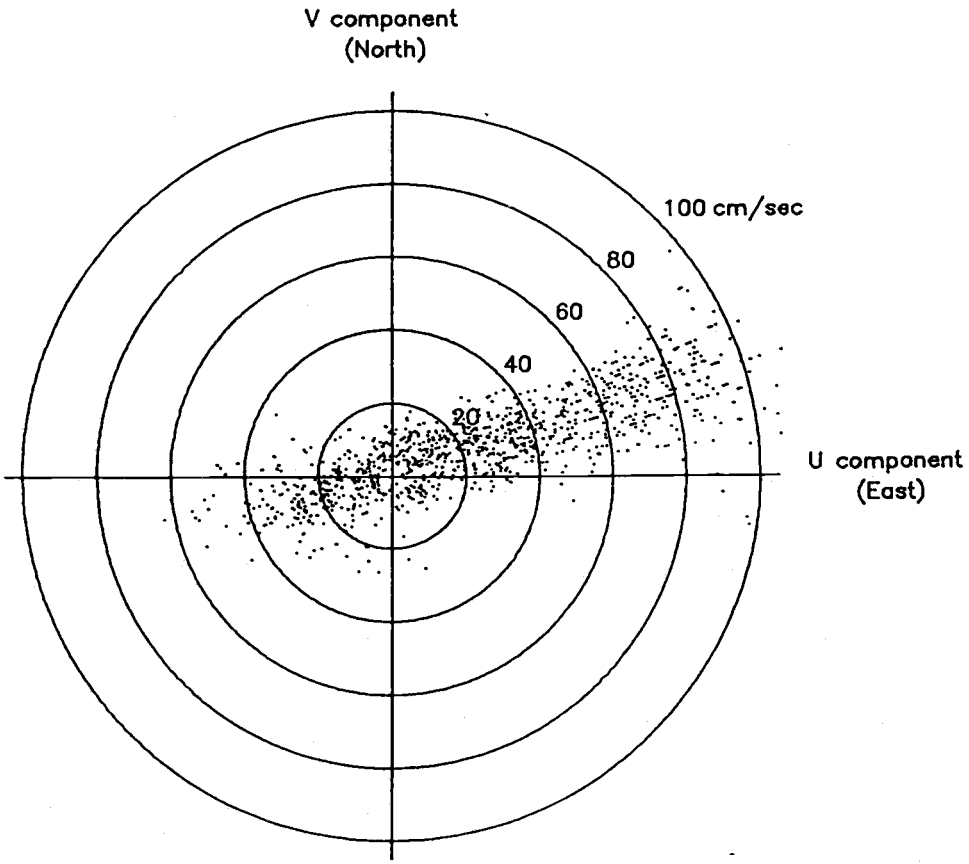




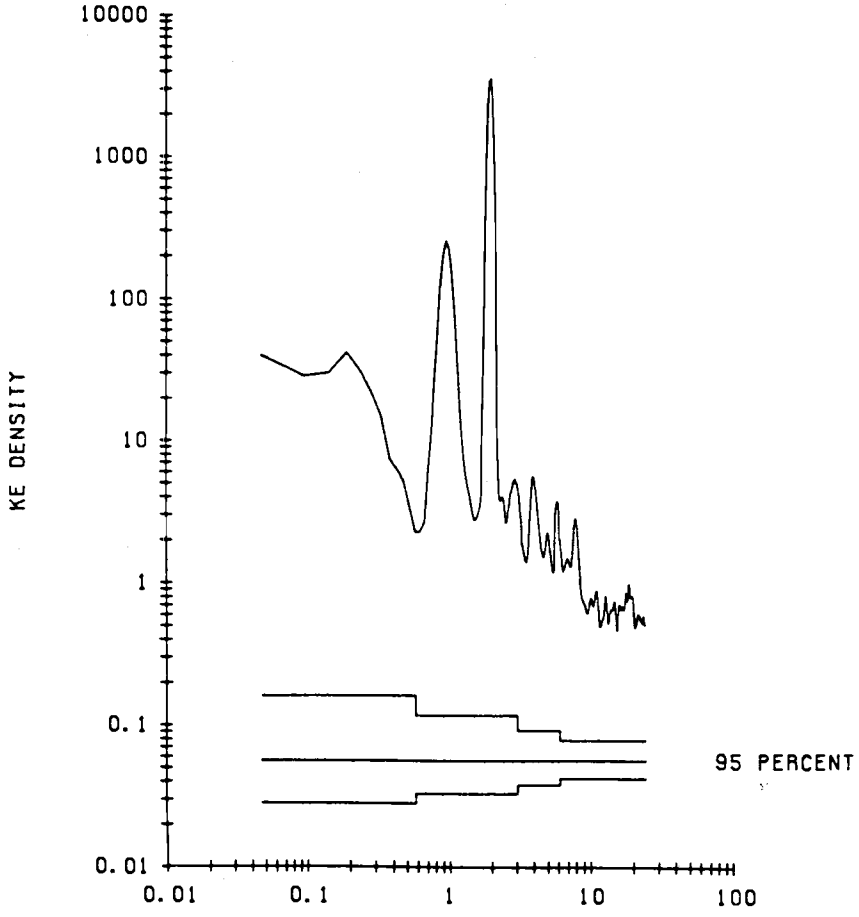


67 M AT GIBRALTAR C-4. 17 OCT 85 – 9 NOV 85. TAPE 1541/48.

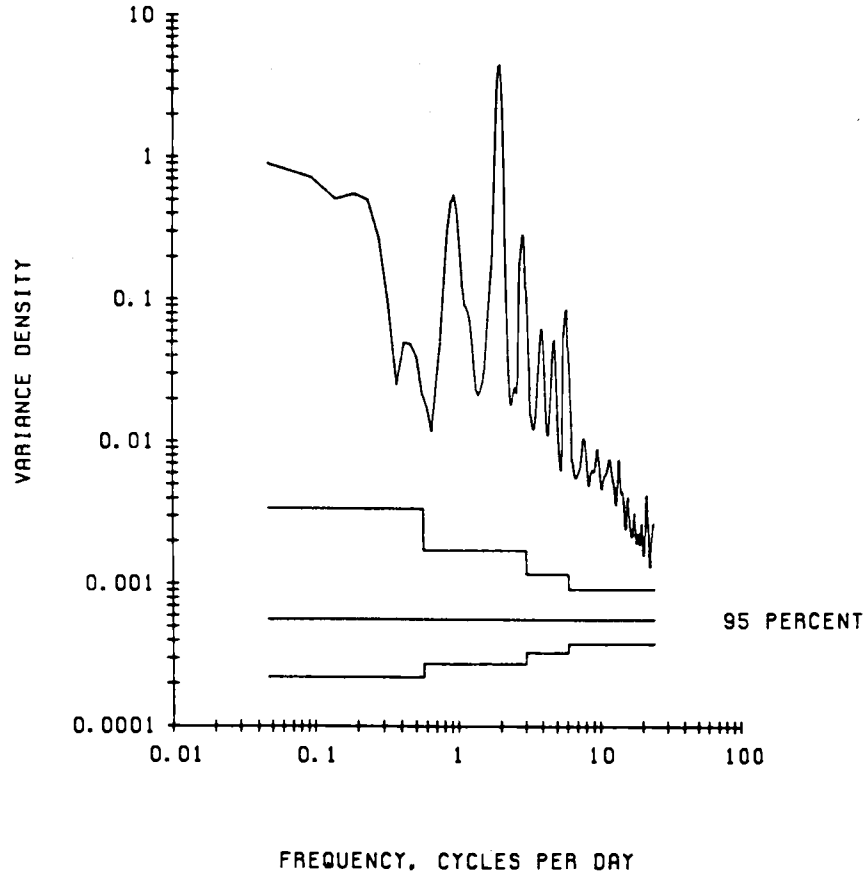




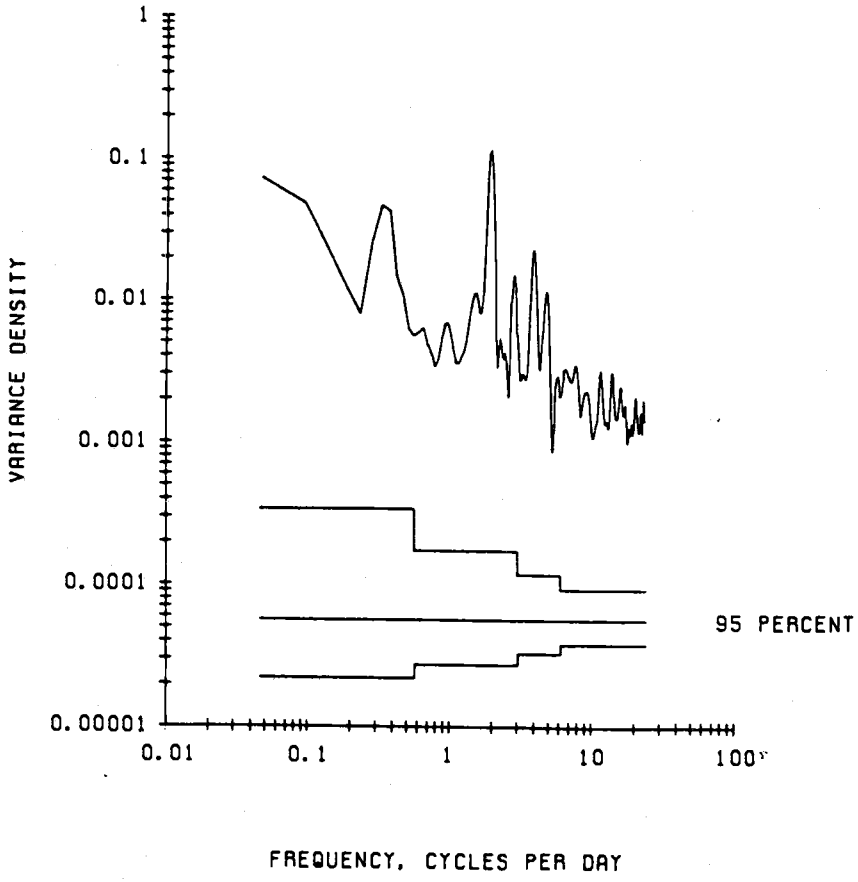
UNFILTERED CURRENT. 67 M AT GIBRALTAR C-4.



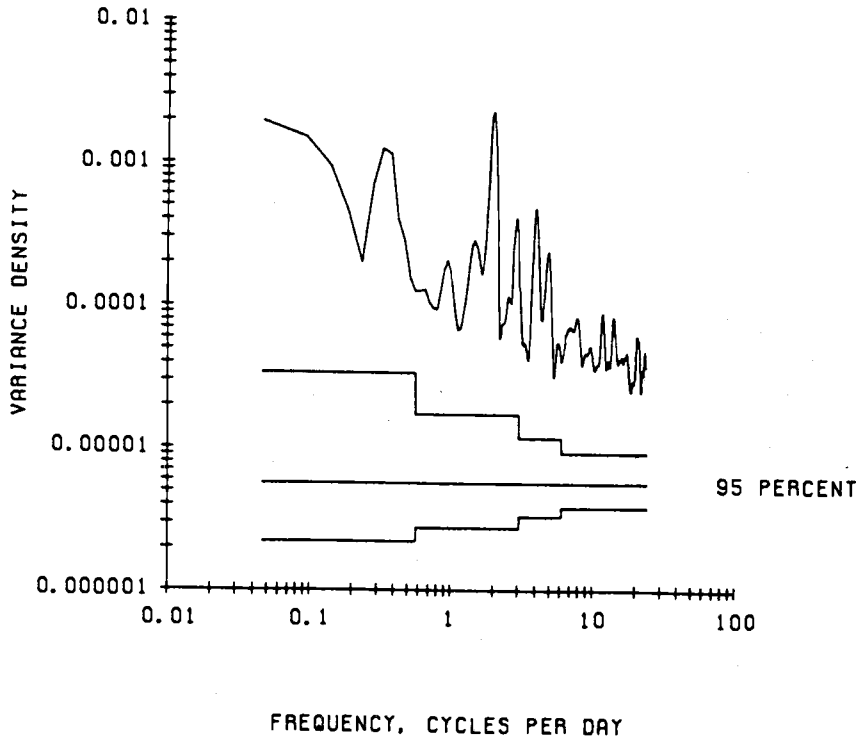
UNFILTERED PRESSURE. 67 M AT GIBRALTAR C-4.

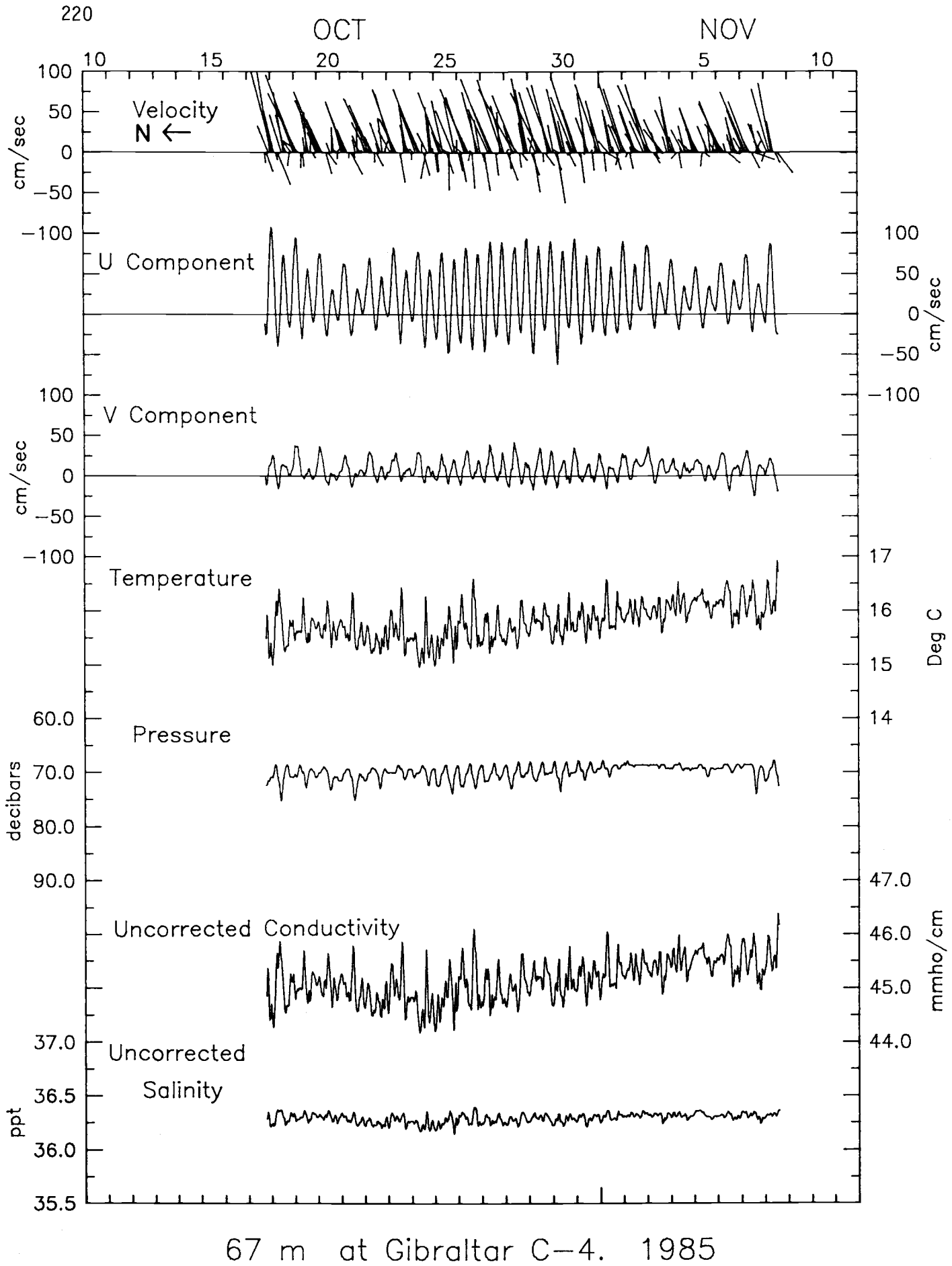


UNFILTERED TEMPERATURE. 67 M AT GIBRALTAR C-4.



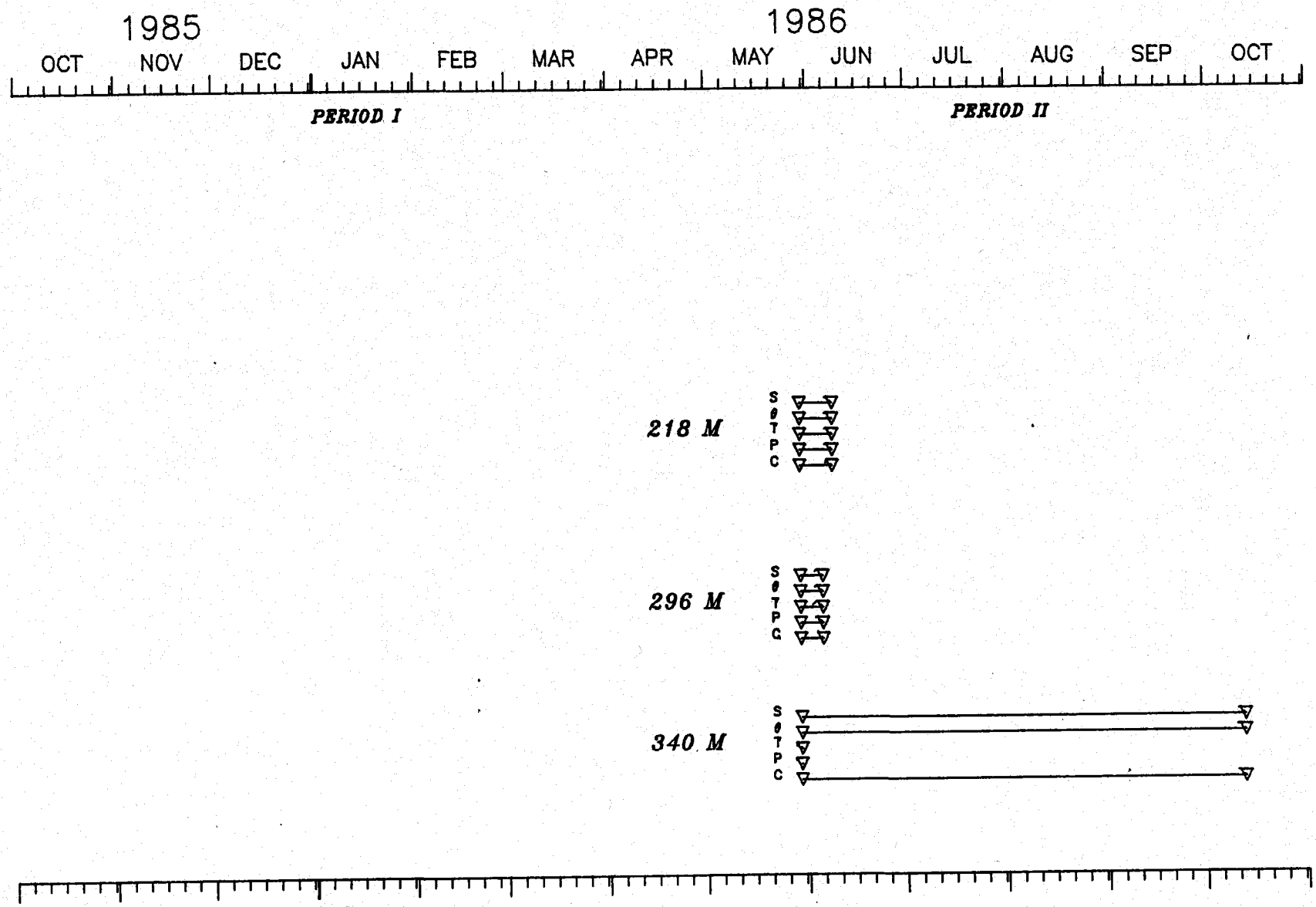
UNFILTERED SALINITY. 67 M AT GIBRALTAR C-4.





67 m at Gibraltar C−4. 1985

Mooring C - 4B



DATA RETURN FROM GIBRALTAR C–4B.

STATISTICS
MOORING GIBRALTAR C-4B. PERIOD II
29 MAY 86 - 13 OCT 86

HALF-HOURLY UNFILTERED DATA
35°52.07'N, 5°57,03'W
Bottom Depth: 354 m

		MEAN	SD	MIN	MAX	LENGTH	COMMENTS
1541/49	s	59.91	37.09	5.00	151.80	456	The instruments on this mooring were subject
218 m	u	-40.70	49.15	-150.60	81.00	456	to extreme vibration. This record is short
	v	-10.20	28.09	-112.30	102.90	456	due to instrument malfunction.
	T	13.13	0.29	12.30	13.86	456	
	P	222.80	2.04	219.90	232.00	456	
	C	43.09	0.91	41.27	44.52	456	
	S	38.82	0.66	35.79	38.08	456	
1968/45	s	93.48	21.16	21.30	138.00	333	The data recorded by this machine were of
296 m	u	-85.28	19.77	-121.90	-16.60	333	poor quality. The first week has been
	v	-34.41	18.40	-121.40	4.60	333	processed and saved. Seventeen percent of the
	T	13.06	0.04	13.00	13.20	333	speeds and a lesser proportion of the other
	P	301.05	0.95	298.50	303.40	333	channels were corrected with interpolation.
	C	44.48	0.07	44.32	44.63	333	Data should be used with caution.
	S	38.19	2.72	37.92	38.39	333	
6879/2	s	89.17	26.92	0.80	146.30	6548	Temperature offscale entire record. No
340 m	u	-86.43	25.55	-145.20	-0.30	6548	calibrations available factory calibrations used.
	v	-18.18	14.93	-67.20	23.20	6548	Speed bridged 1048 9 AUG 86 - 0348 16 AUG 86).
	C	44.21	0.13	43.15	44.48	6548	Conductivity bridged 2218 22 AUG 86 - 1248 27 AUG
							86. The raw direction histogram has zero frequency
							over the range 0 - 696. This is very unusual and
							the direction record should be used with caution.

Spectra were not calculated for the top two meters on this mooring. The instruments on this mooring were subjected to extreme vibrations, some of the instruments had been ground to dust by the time of recovery.

(speed, u, and v are given in cm/sec; Temperature in °C; Pressure in decibars; Conductivity in mmho/cm. The sampling rate is 30 min.)

STATISTICS
MOORING GIBRALTAR C-4B. PERIOD II
31 MAY 86 - 10 OCT 86

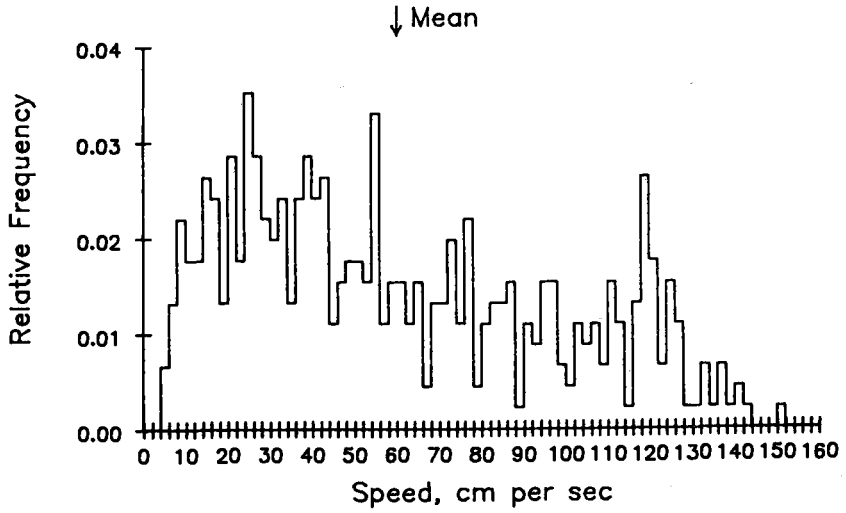
6-HOURLY FILTERED DATA
35°52.07'N, 5°57,03'W
Bottom Depth: 354 m

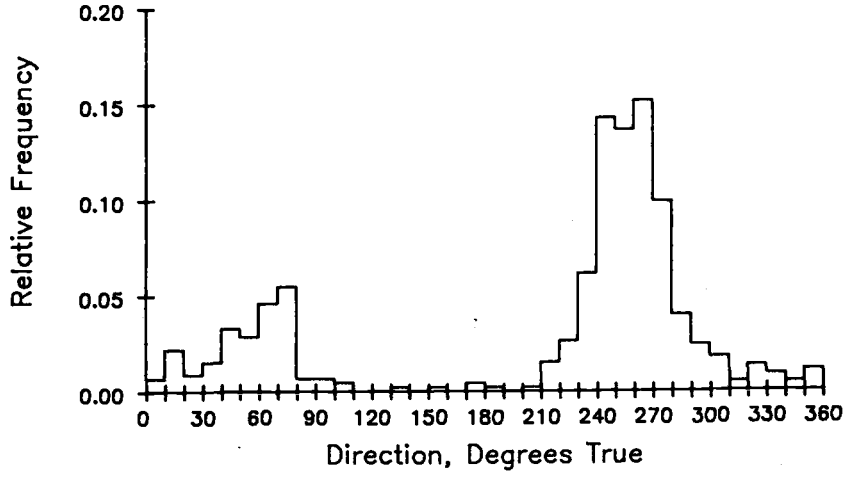
		MEAN	SD	MIN	MAX	LENGTH	COMMENTS
1541/49	u	-34.16	24.13	-72.19	-3.82	28	(See notes on half-hourly statistics page.)
218 m	v	-6.89	10.35	-27.23	3.37	28	
	T	13.04	0.17	12.81	13.26	28	
	P	222.44	0.90	221.46	223.88	28	
	C	42.83	0.67	42.10	43.90	28	
	S	36.66	0.49	36.17	37.48	28	
1968/45	u	-85.51	5.25	-95.04	-76.04	18	(See notes on half-hourly statistics page.)
296 m	v	-34.39	5.29	-45.05	-27.55	18	
	T	13.05	0.02	13.04	13.09	18	
	P	301.36	0.40	300.73	301.92	18	
	C	44.49	0.05	44.42	44.55	18	
	S	38.20	0.06	38.11	38.27	18	
6879/2	u	-86.41	10.60	-103.30	-47.72	536	(See notes on half-hourly statistics page.)
340 m	v	-18.17	2.91	-26.97	-9.57	536	
	C	44.21	0.12	43.37	44.45	536	

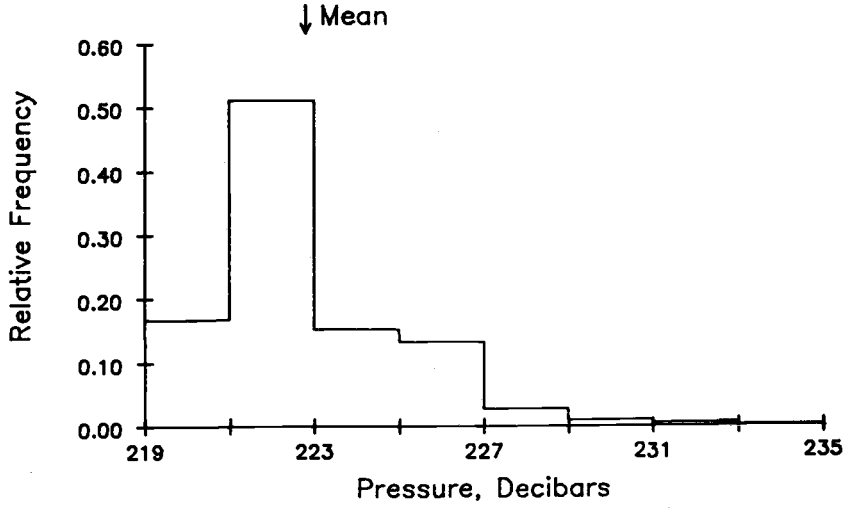
The meters on this mooring were subject to extreme vibrations, some of their parts had been ground to dust by the time of recovery.

(speed, u, and v are given in cm/sec; Temperature in °C; Pressure in decibars; Conductivity in mmho/cm. The sampling rate is 360 min.)

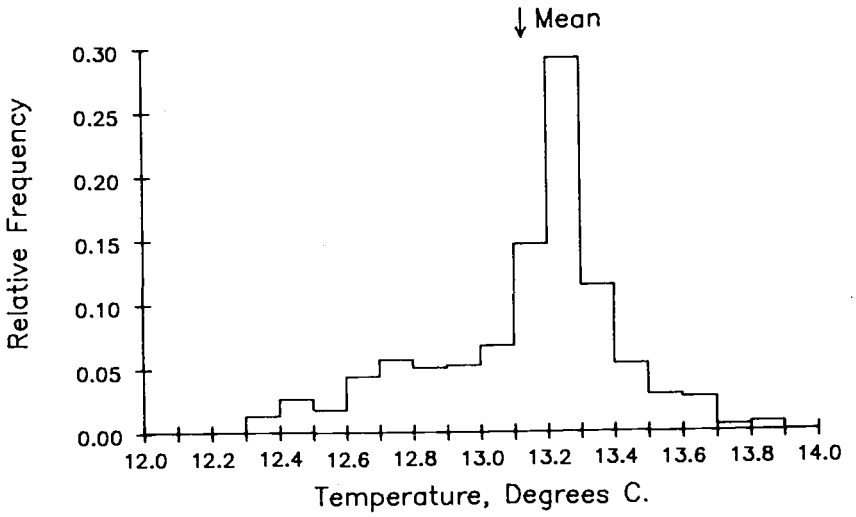
218 M AT GIBRALTAR C-4B. 29 MAY 86 - 8 JUN 86. TAPE 1541/49.

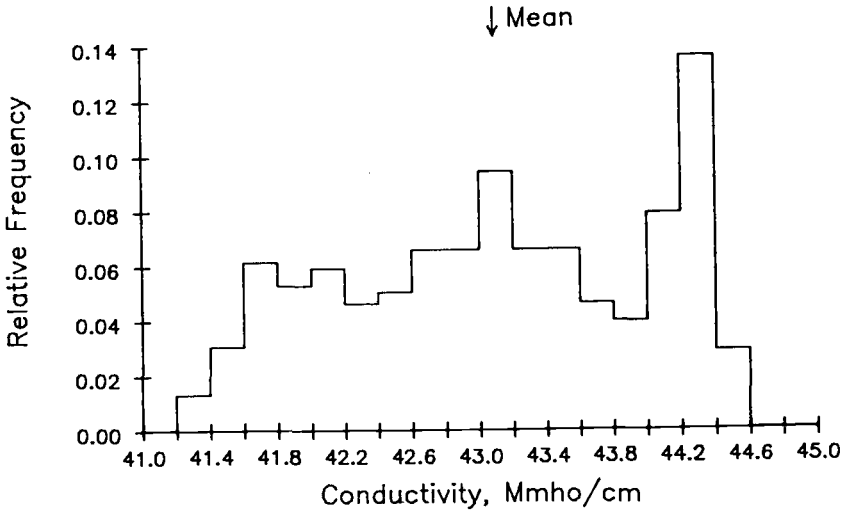


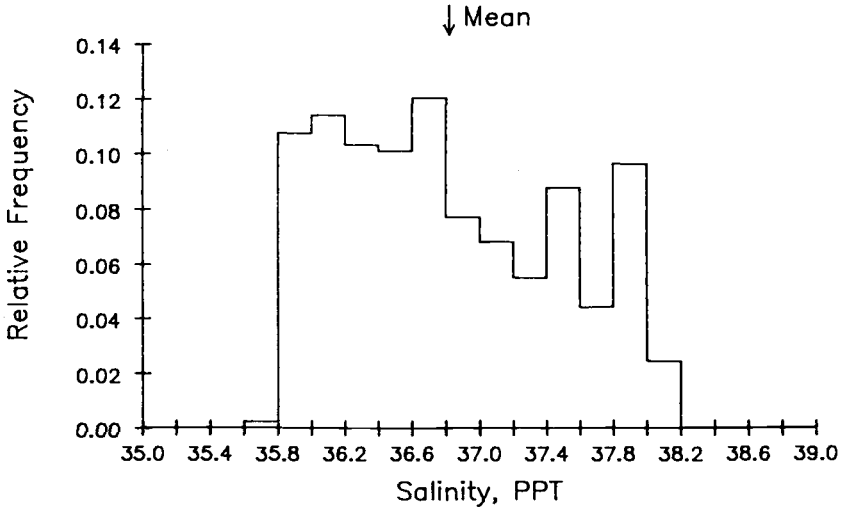




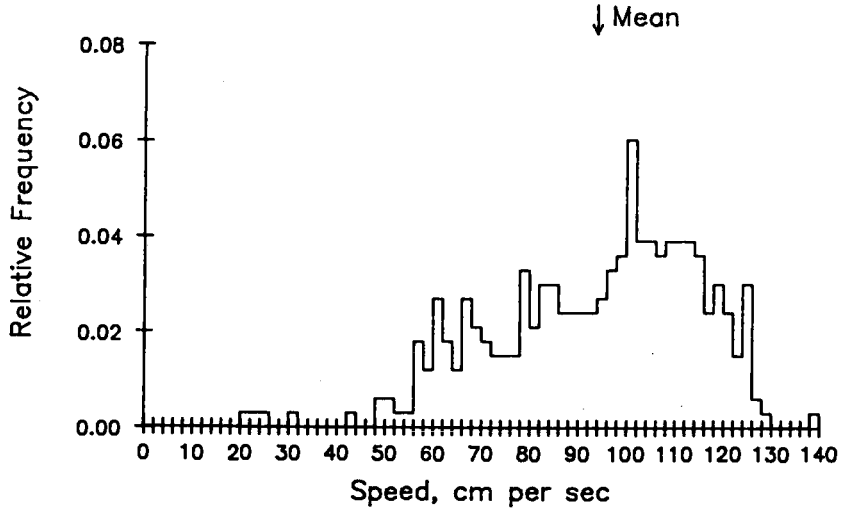
218 M AT GIBRALTAR C-4B. 29 MAY 86 - 8 JUN 86. TAPE 1541/49.

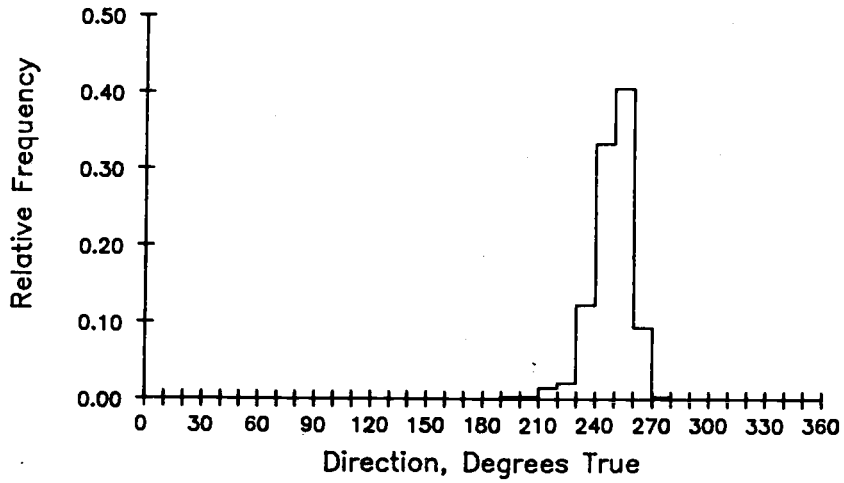


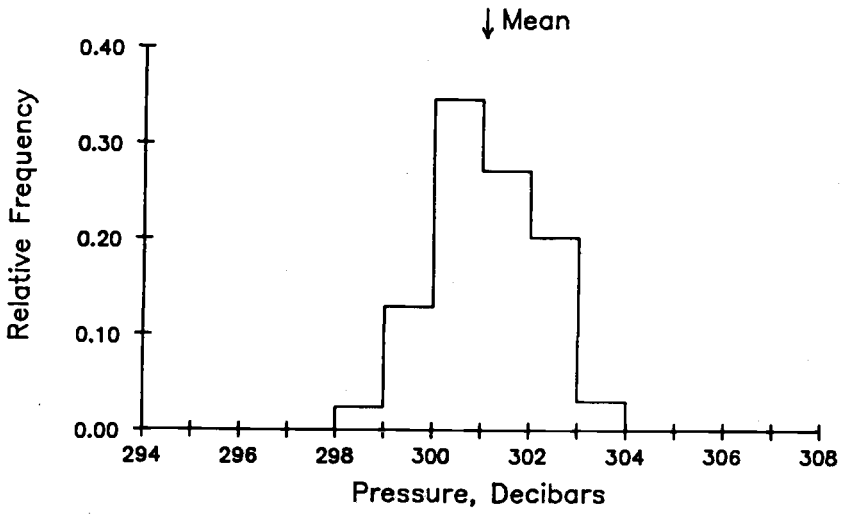




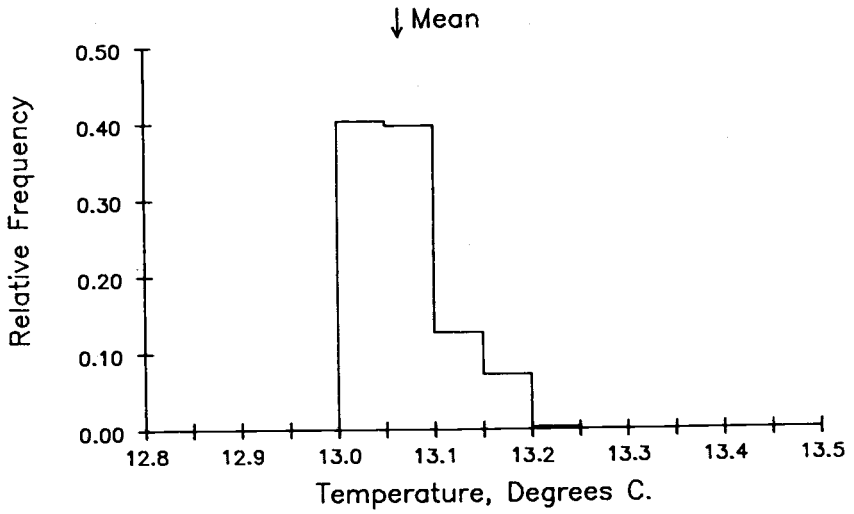
296 M AT GIBRALTAR C-4B. 29 MAY 86 - 5 JUN 86. TAPE 1968/45

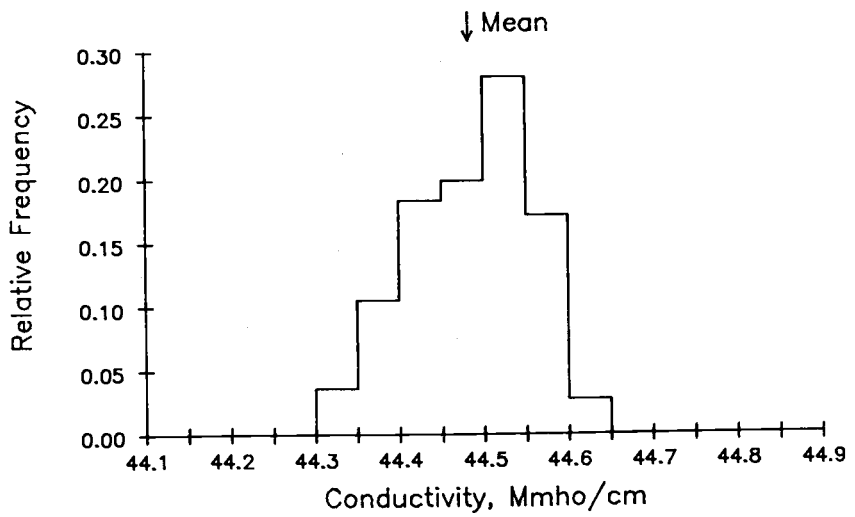


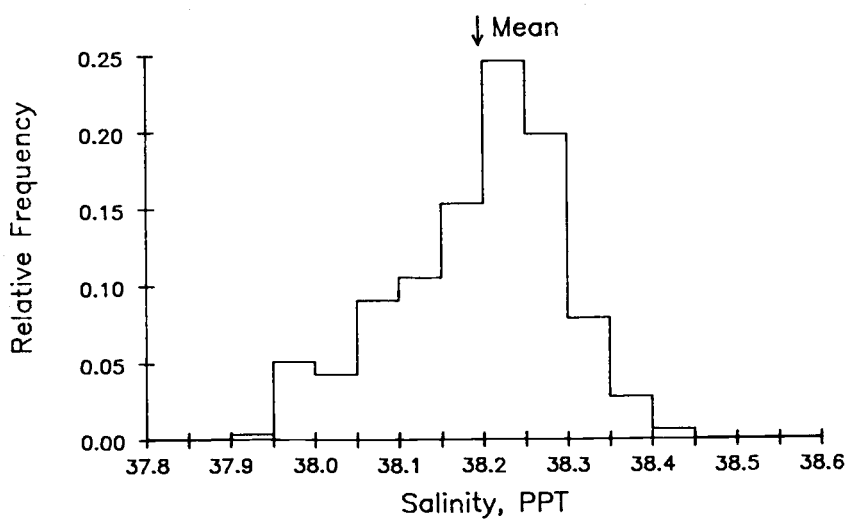




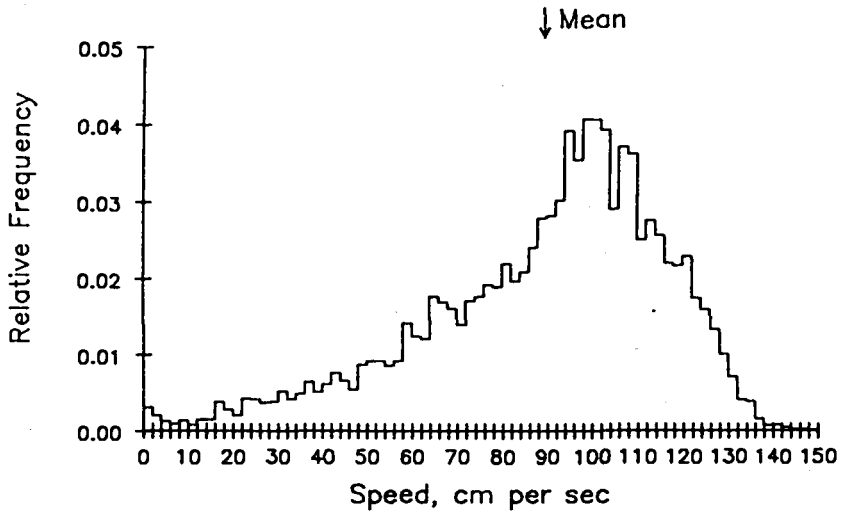
296 M AT GIBRALTAR C-4B. 29 MAY 86 5 JUN 86. TAPE 1968/45.

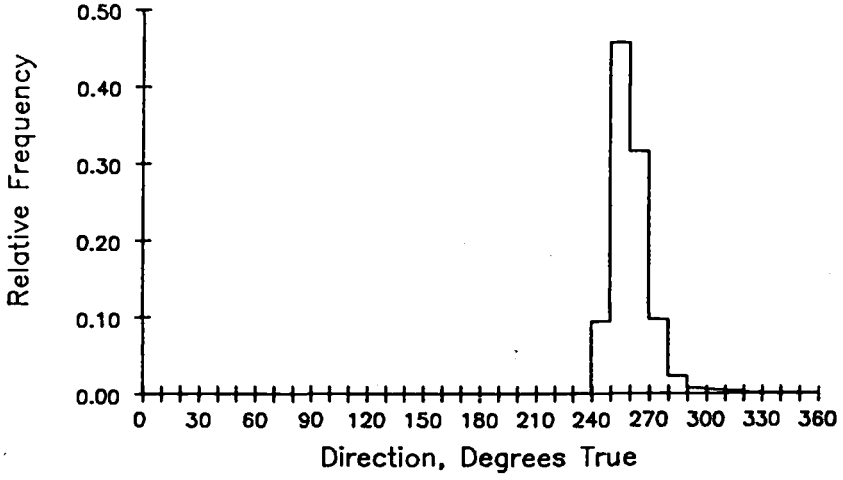


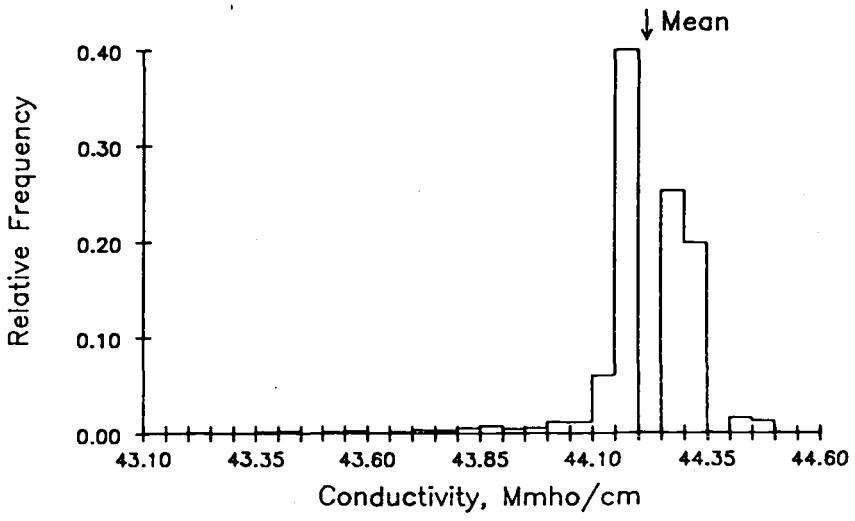




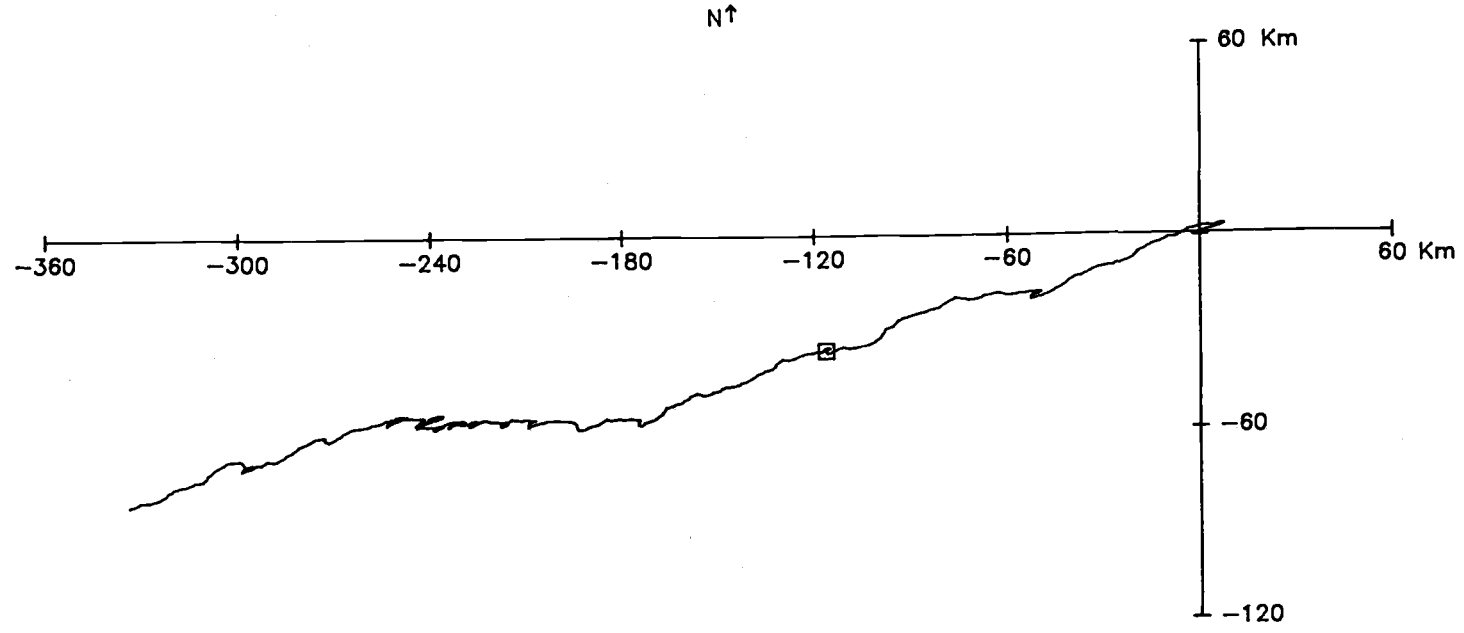
340 M AT GIBRALTAR C-4B. 29 MAY 86 - 13 OCT 86. TAPE 6879/2.

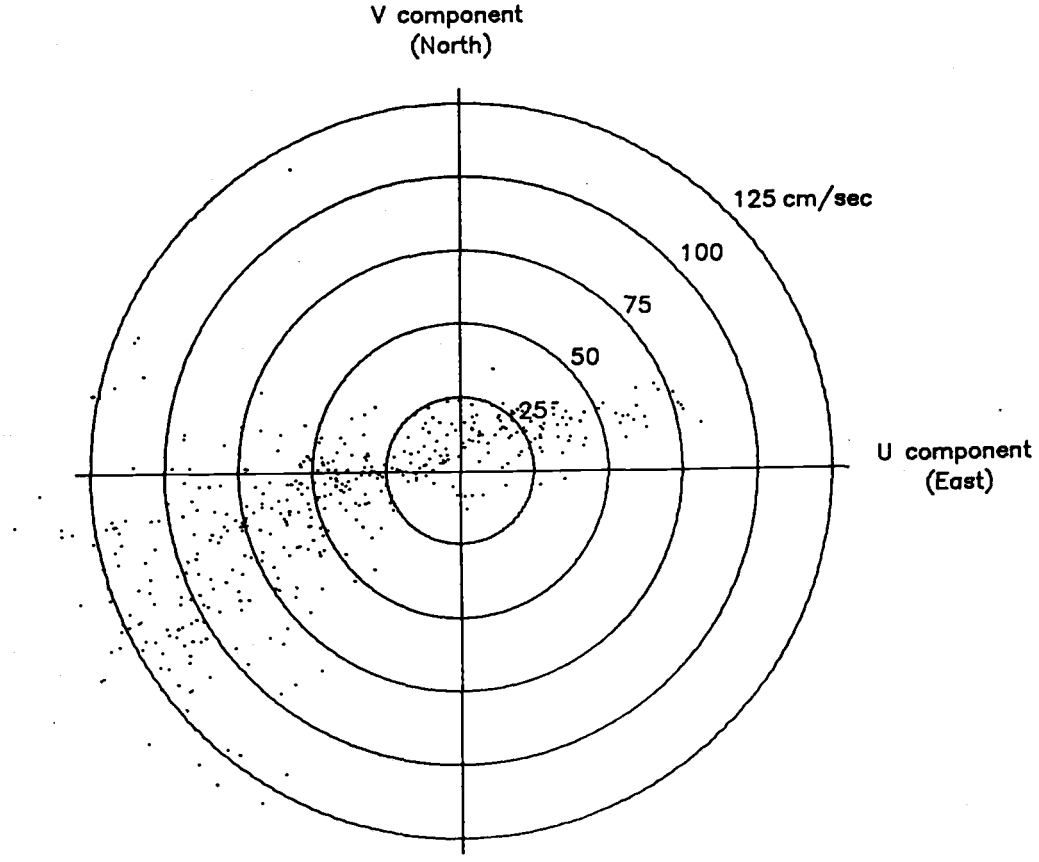




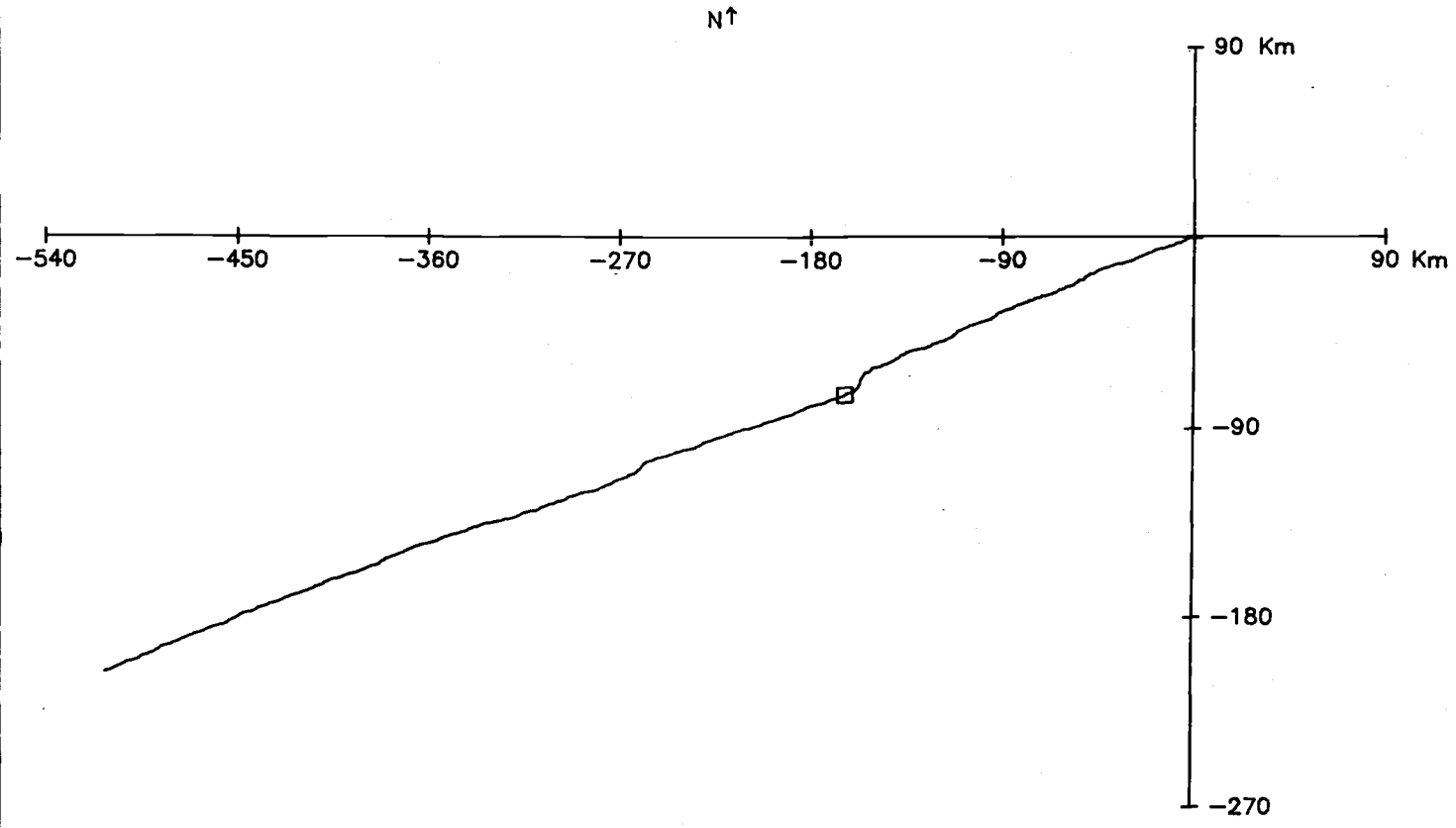


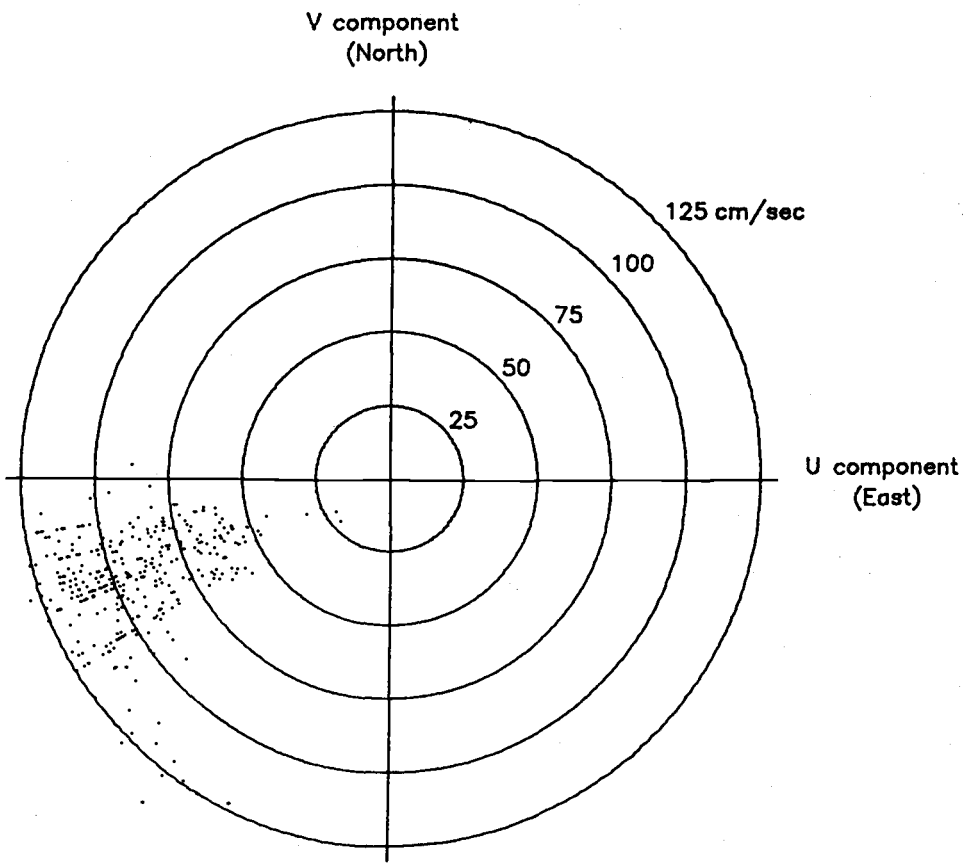
218 M AT GIBRALTAR C-4B. 29 MAY 86 - 8 JUN 86. TAPE 1541/49.



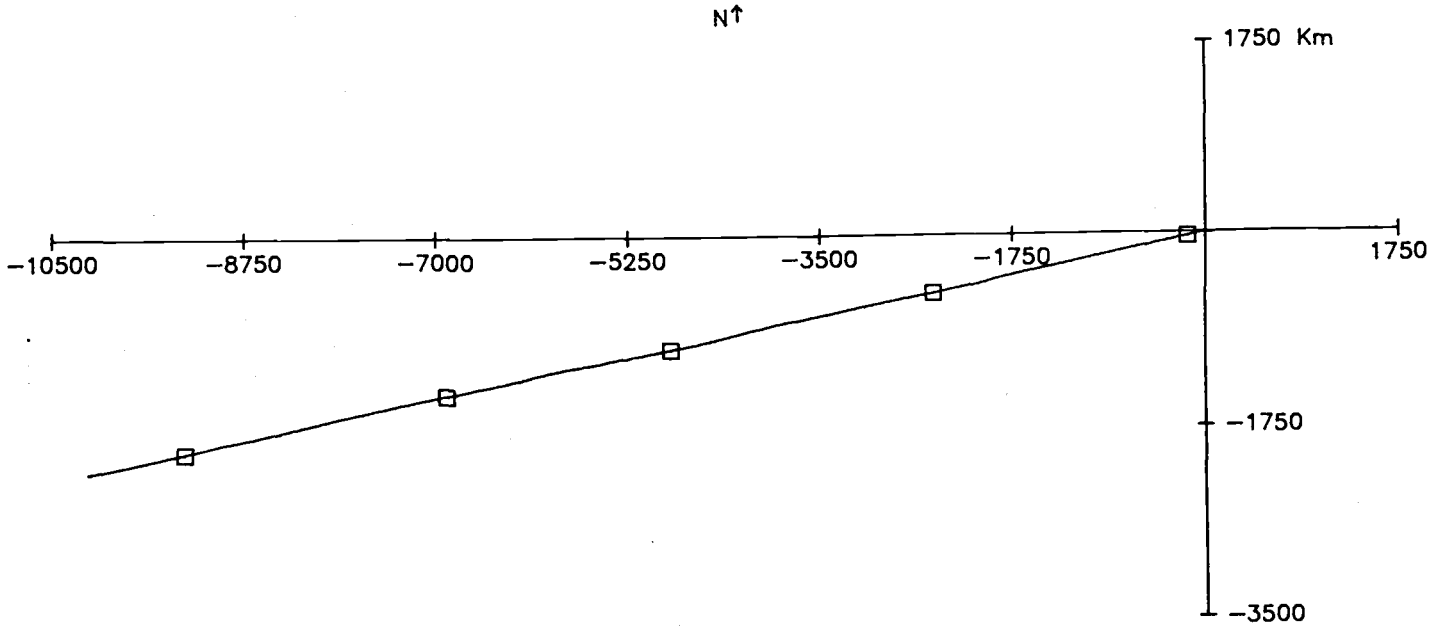


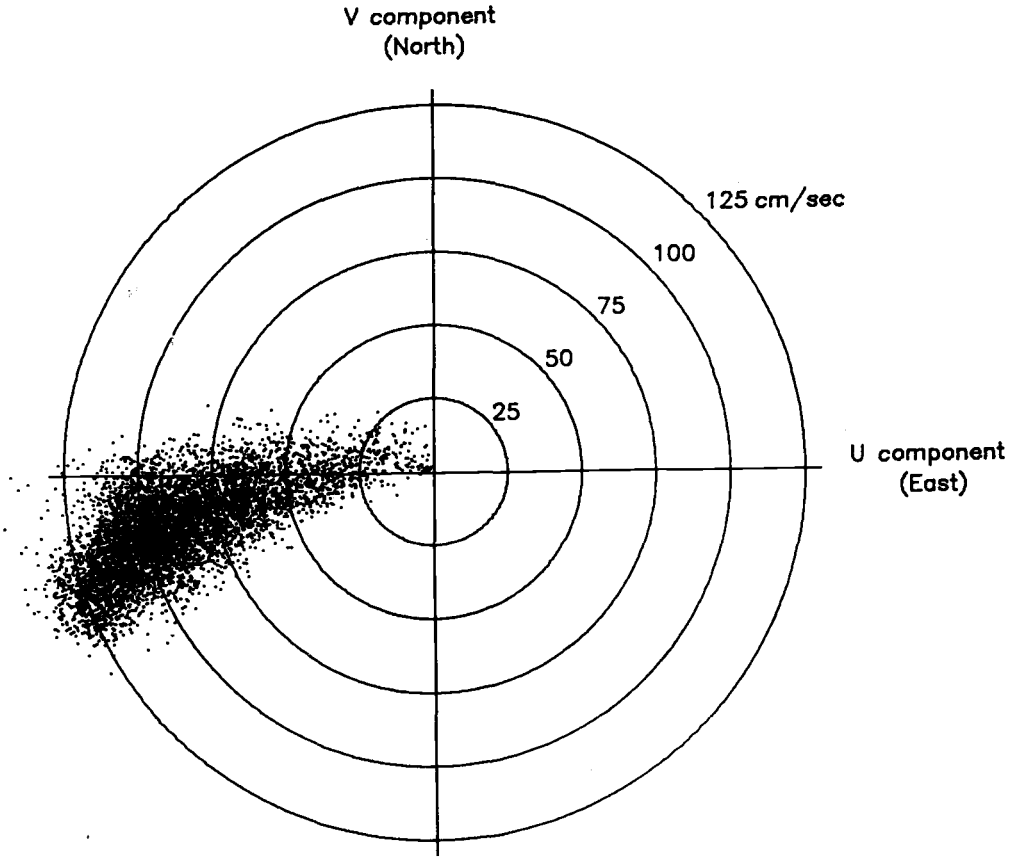
296 M AT GIBRALTAR C-4B. 29 MAY 86 - 5 JUN 86. TAPE 1968/45.



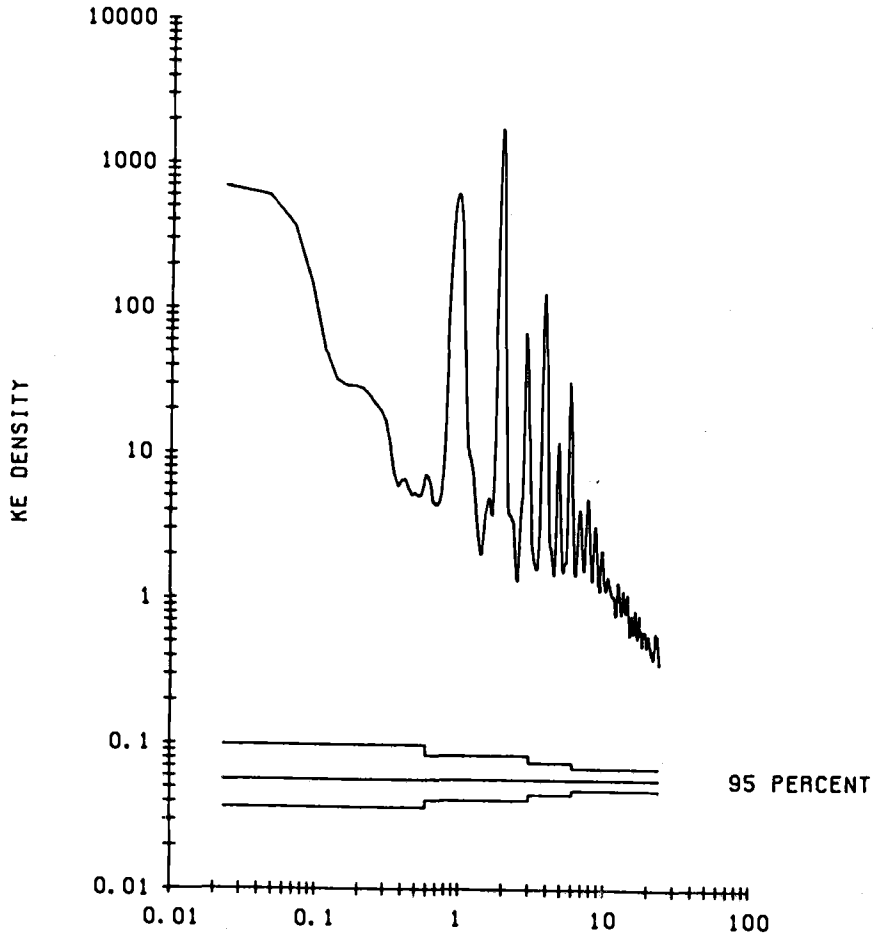


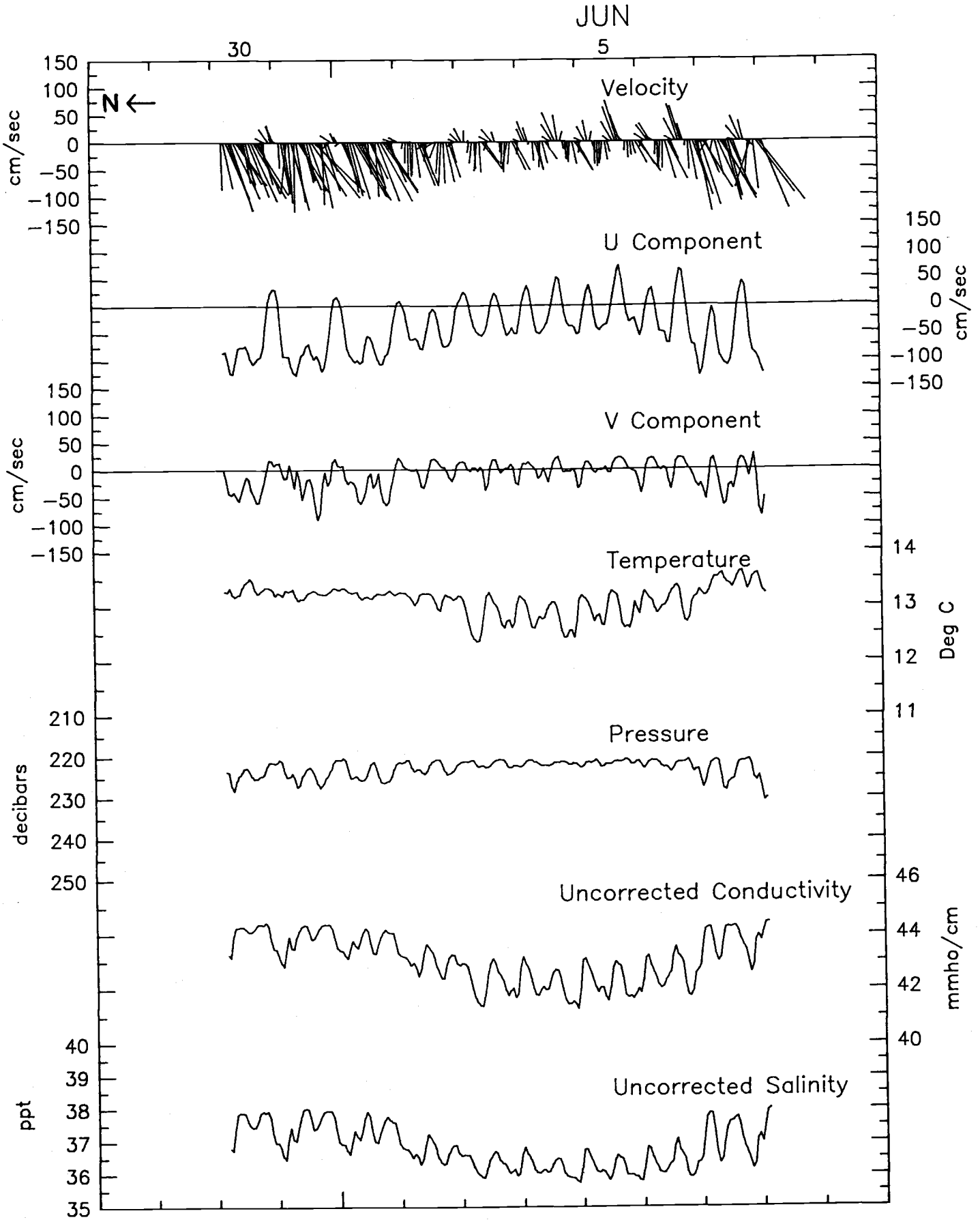
340 M AT GIBRALTAR C-4B. 29 MAY 86 - 13 OCT 86. TAPE 6879/2.



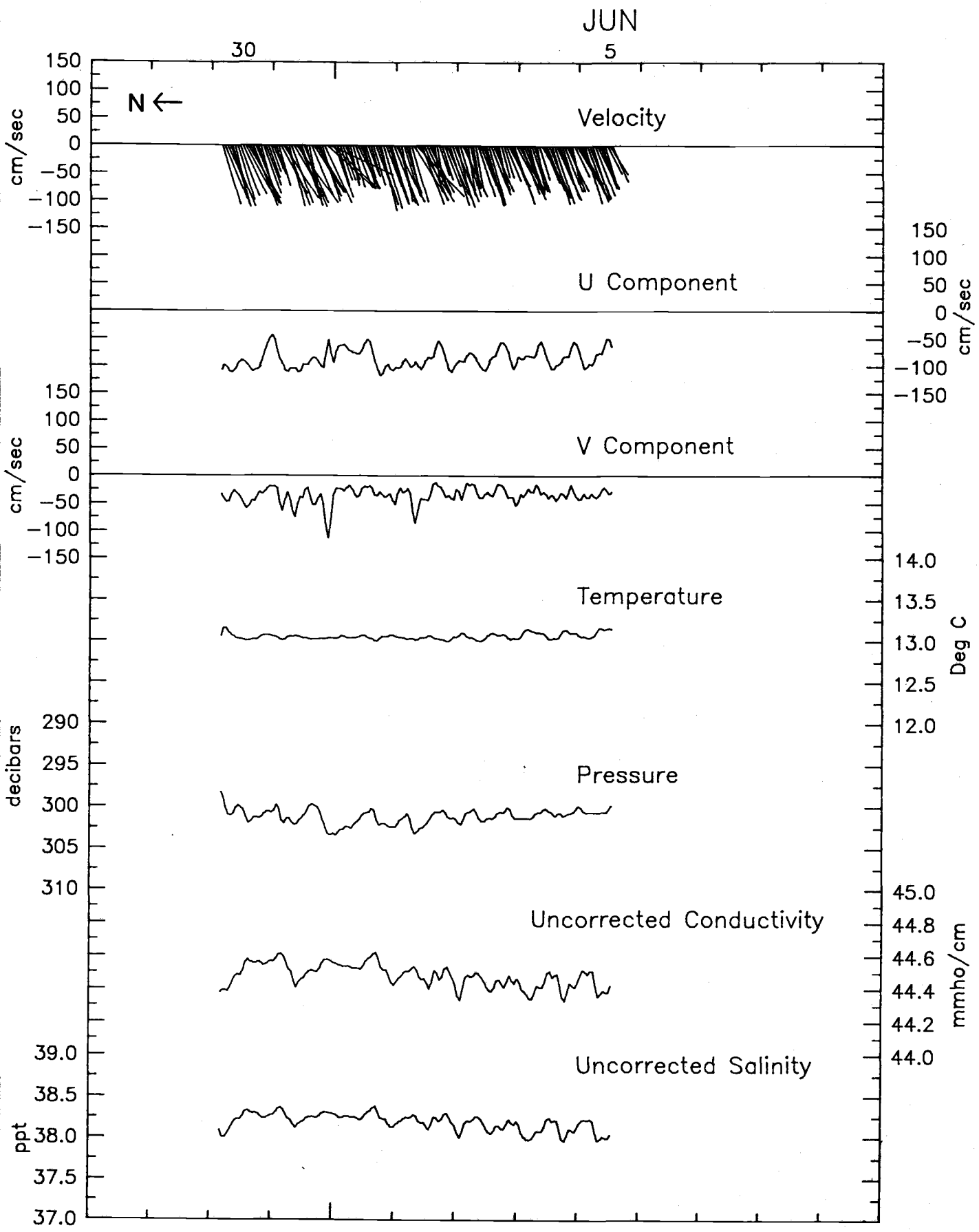


UNFILTERED CURRENT. 340 M AT GIBRALTAR C-4B.

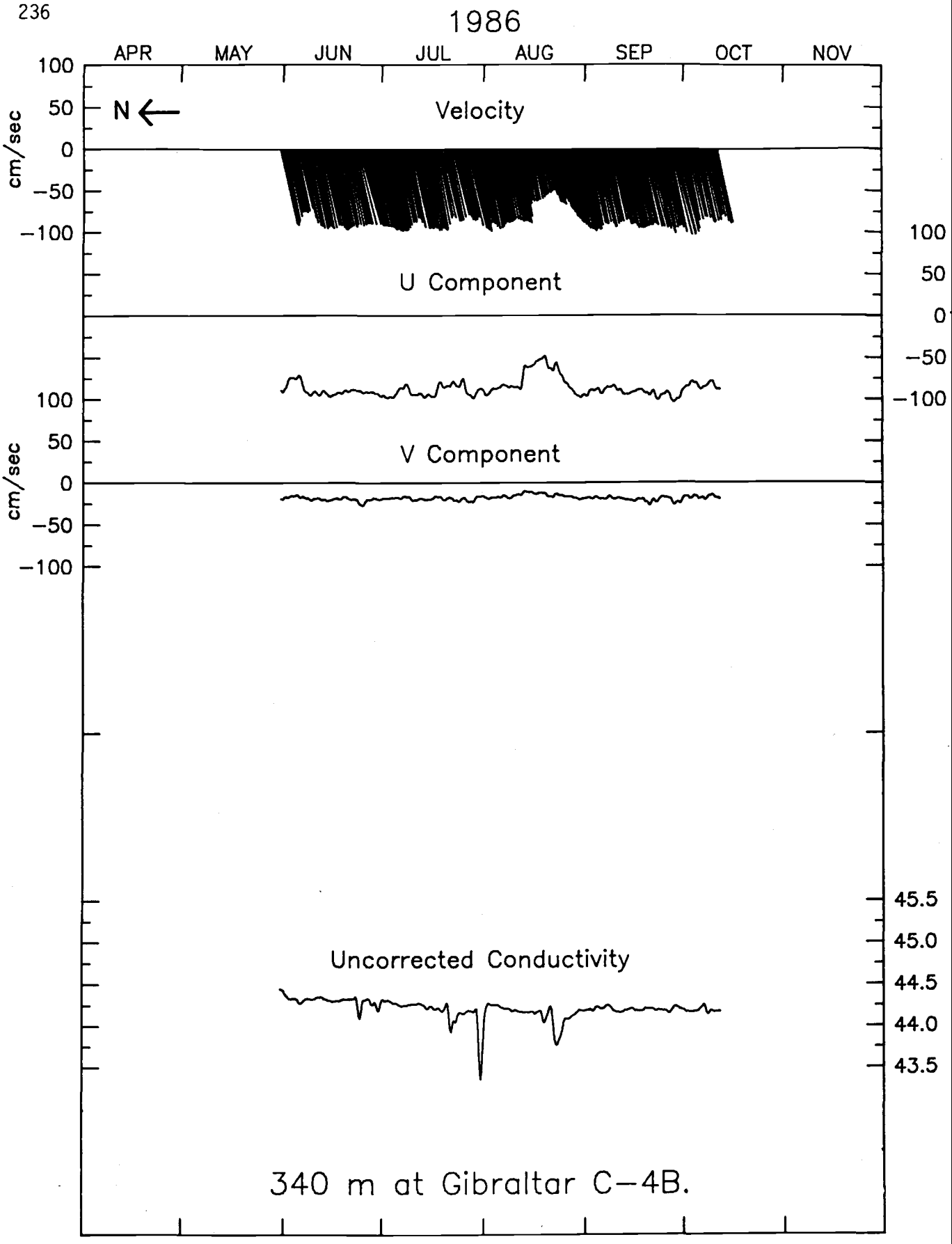


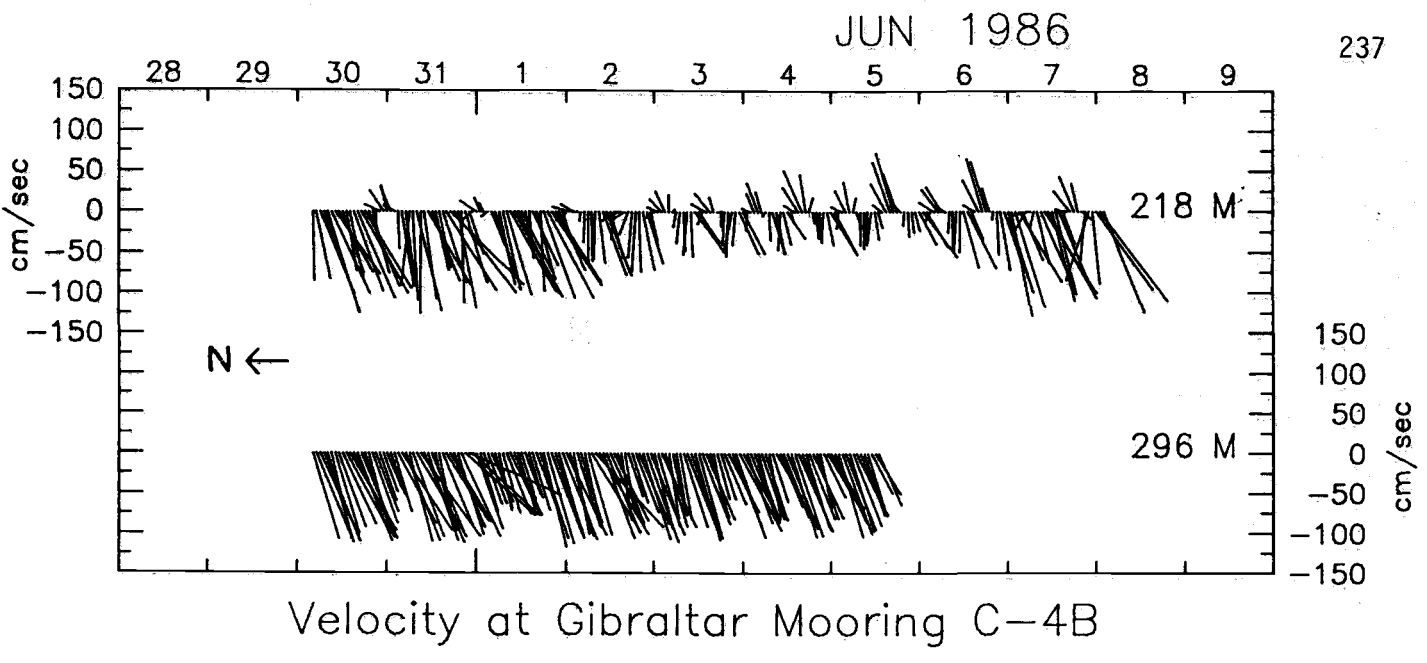


218m at Gibraltar C−4B. 1986.

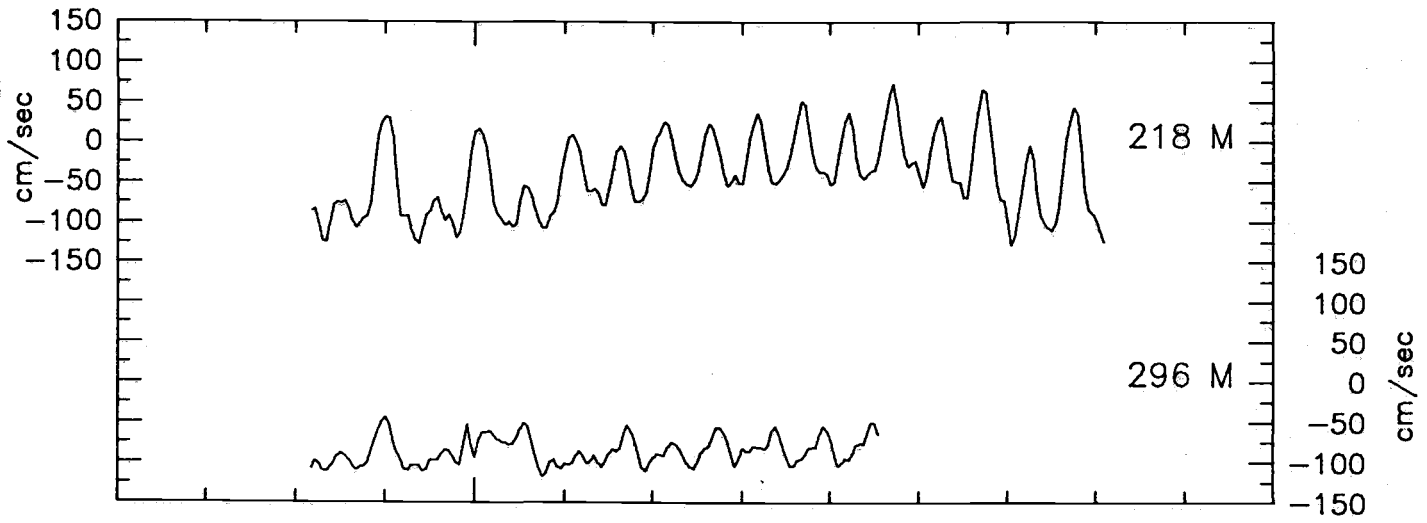


296m at Gibraltar C−4B. 1986.

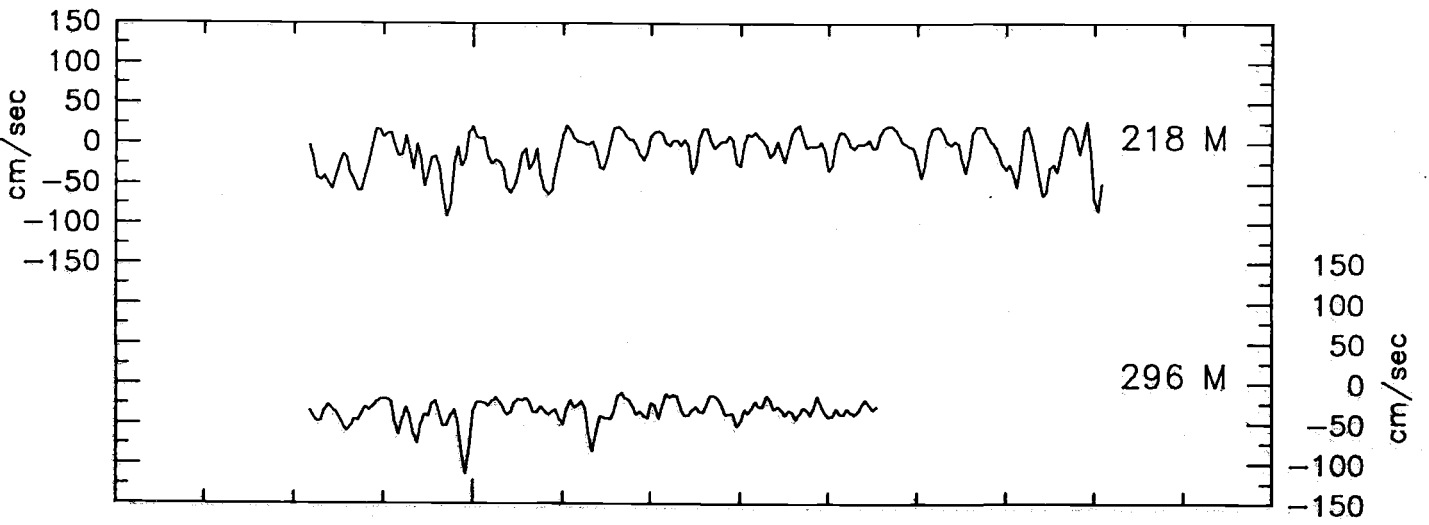

1986
APR
MAY
JUN
JUL
AUG
SEP
OCT
NOV
100
50
0
−50
−100
cm/sec
N ←
Velocity
U Component
V Component
Uncorrected Conductivity
45.5
45.0
44.5
44.0
43.5
340 m at Gibraltar C−4B.



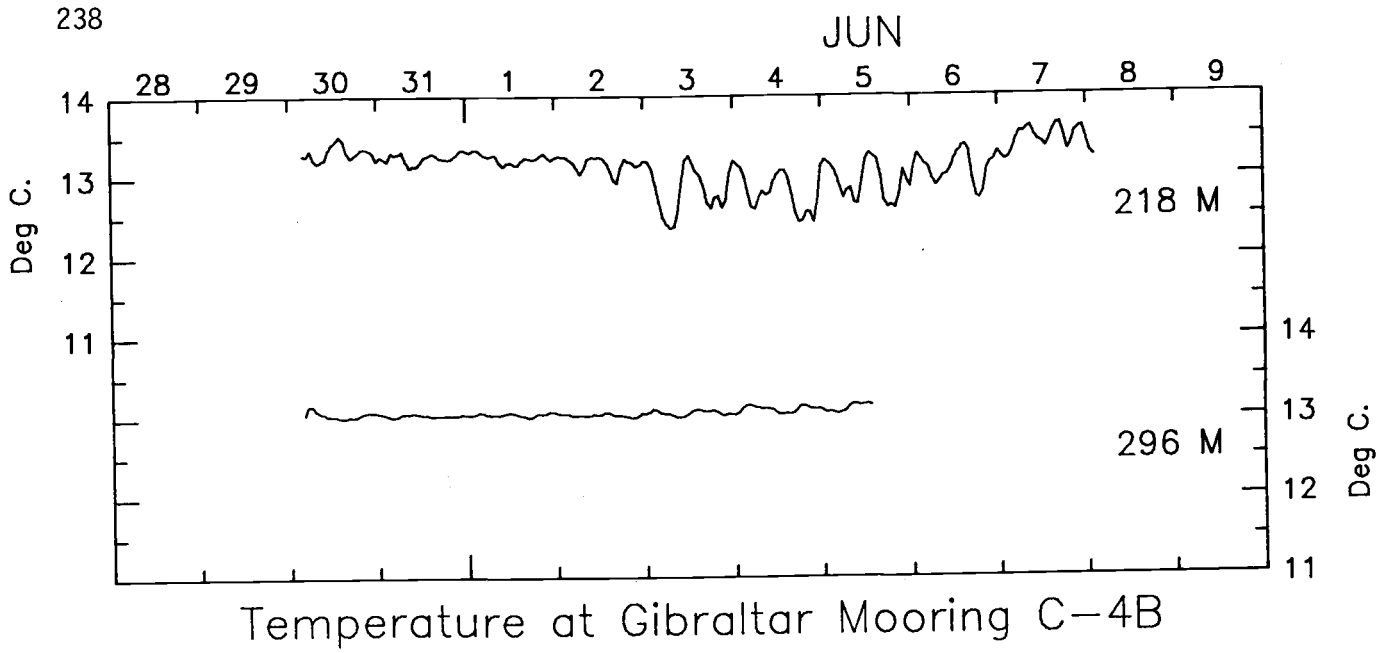
Velocity at Gibraltar Mooring C−4B



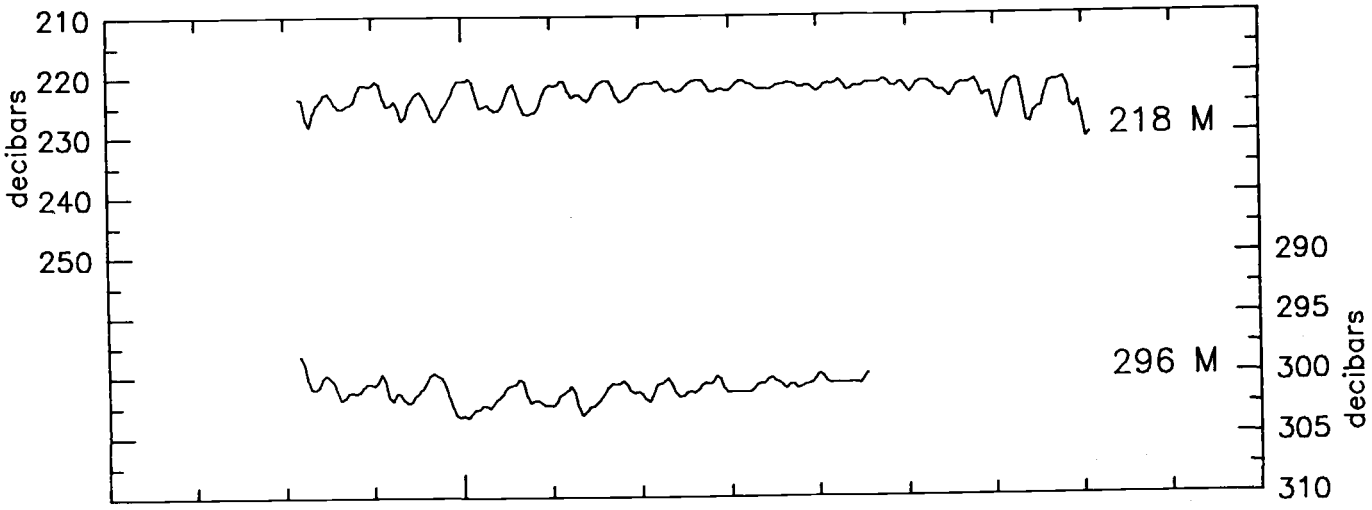
U Component at Gibraltar Mooring C−4B



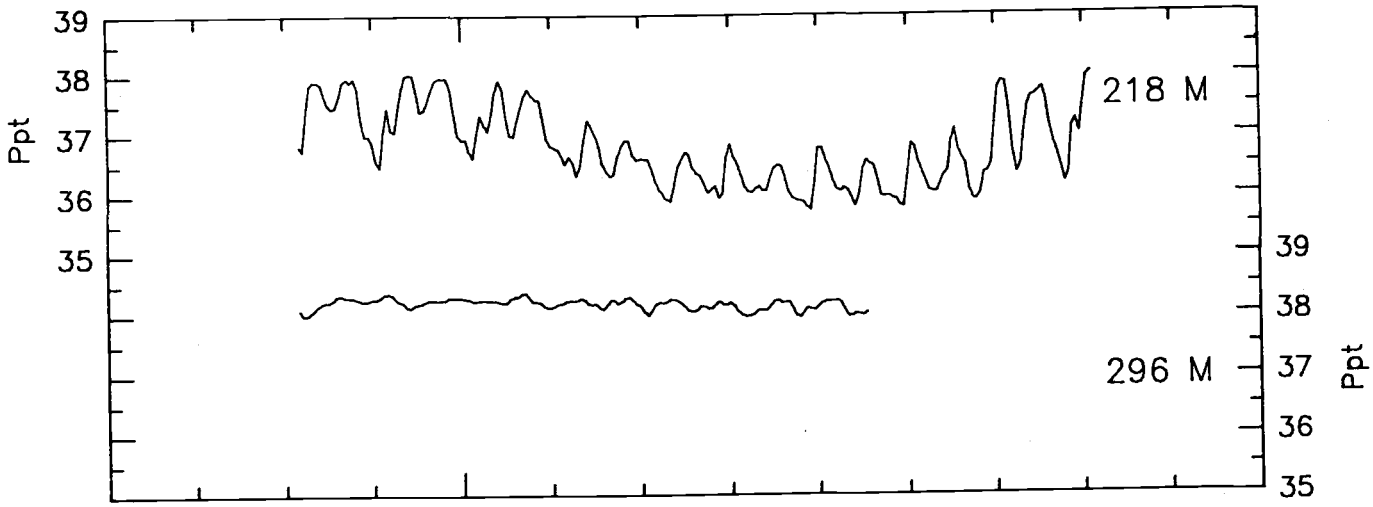
V Component at Gibraltar Mooring C−4B



Temperature at Gibraltar Mooring C–4B

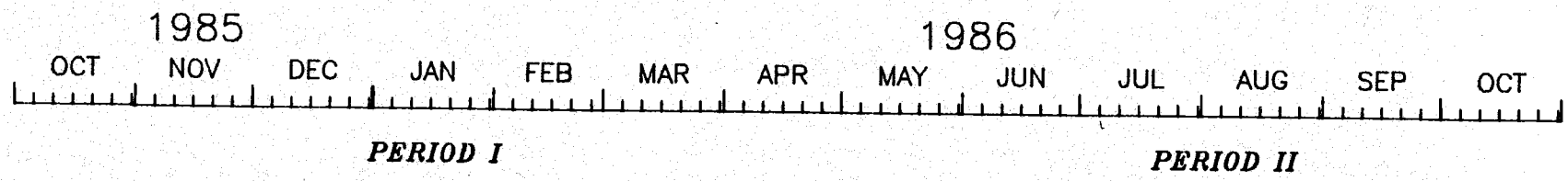


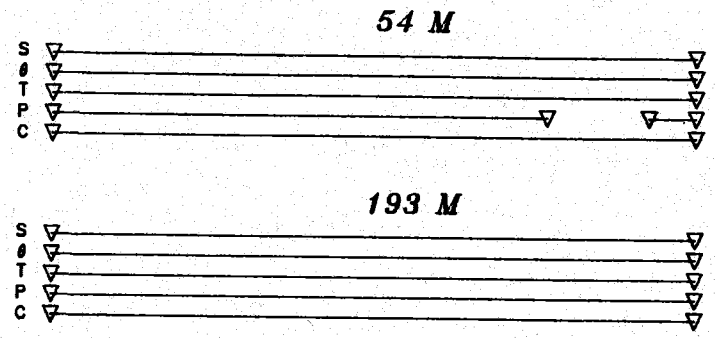
Pressure at Gibraltar Mooring C–4B

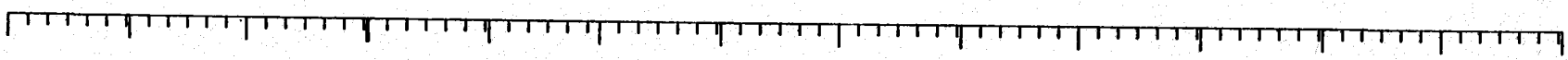


Salinity at Gibraltar Mooring C–4B 1986

Mooring C - 7







DATA RETURN FROM GIBRALTAR C–7.

STATISTICS
MOORING GIBRALTAR C-7 PERIOD I
19 OCT 85 - 27 MAR 86

HALF-HOURLY UNFILTERED DATA
35°59.98'N, 5°22.75'W
Bottom depth: 916 m

		MEAN	SD	MIN	MAX	LENGTH	COMMENTS
755/58	s	62.60	37.36	2.90	178.80	7616	Pressure has been zeroed in lines
54 m	u	53.86	45.00	-87.10	178.70	7616	5778 - 6881 (0006 17 Feb 86 - 2236
	v	6.83	18.50	-110.40	98.20	7616	11 Mar 86) due to an apparent failure
	T	14.43	0.80	12.94	18.16	7616	of the pressure sensor. The salinity
	P	62.50	9.55	54.20	144.40	6512	record is uncorrected.
	C	44.68	0.55	43.32	47.87	7616	
	S	37.15	0.51	-35.61	38.36	7616	
1236/45	s	32.68	21.42	2.10	111.80	7617	Conductivity and salinity have been
193 m	u	-19.70	27.88	-92.70	55.50	7617	bridged in lines 1019 - 1026 (2003
	v	-10.71	15.70	-62.50	41.50	7617	9 Nov 85 - 2333 9 Nov 85). The
	T	13.15	0.13	12.96	14.26	7617	conductivity sensor failed during this
	P	201.48	9.85	194.40	280.70	7617	interval. The salinity record is corrected.
	C	44.50	0.13	44.18	44.94	7617	
	S	38.29	0.11	37.45	38.49	7617	

This mooring was found by the Spanish near Almeria, Spain in May 1986.

(Speed, u, and v are given in cm/sec; Temperature in °C; Pressure in decibars; Conductivity in mmho/cm; and Salinity in ppt. The sampling rate is 30 min.)

STATISTICS
MOORING GIBRALTAR C-7 PERIOD I
21 OCT 85 - 26 MAR 86

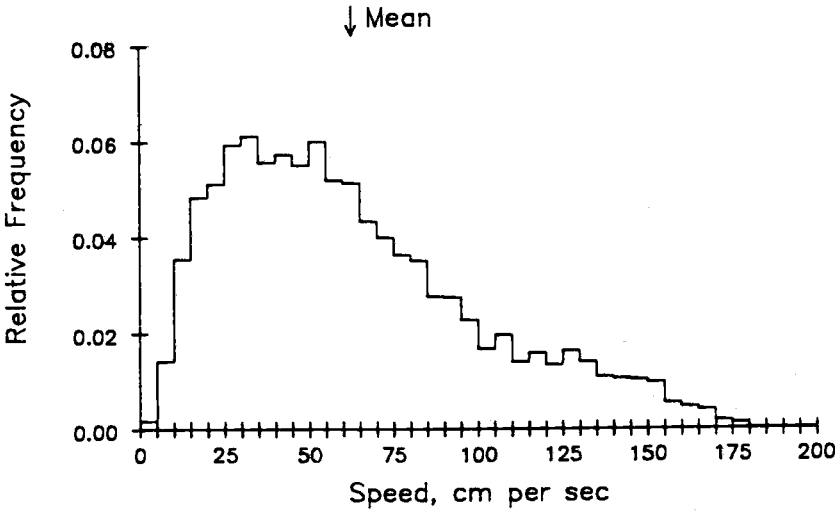
6-HOURLY FILTERED DATA
35°59.98'N, 5°22.75'W
Bottom depth: 916 m

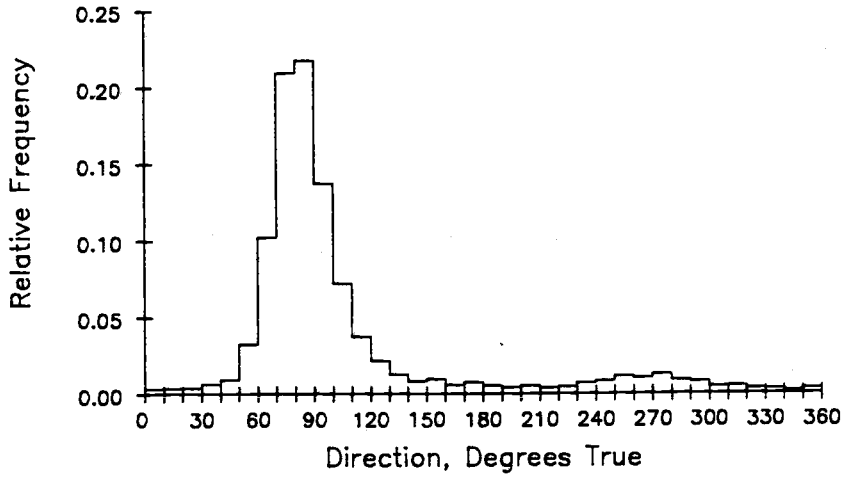
		MEAN	SD	MIN	MAX	LENGTH	
755/58	u	53.73	26.64	-28.86	123.07	625	See note on half-hourly statistics page.
54 m	v	6.82	7.0	-15.44	25.22	625	The salinity record is uncorrected.
	T	14.44	0.63	13.44	16.16	625	
	P	62.52	3.91	56.64	76.28	525	
	C	44.69	0.46	43.94	46.10	625	
	S	37.15	0.37	36.33	37.88	625	
1236/45	u	-19.80	6.41	-39.42	-4.33	625	See note on half-hourly statistics page.
193 m	v	-10.74	5.08	-26.59	5.85	625	The salinity record is corrected.
	T	13.15	0.10	13.00	13.78	625	
	P	201.45	4.06	195.59	215.71	625	
	C	44.50	0.12	44.21	44.76	625	
	S	38.29	0.08	37.80	38.43	625	

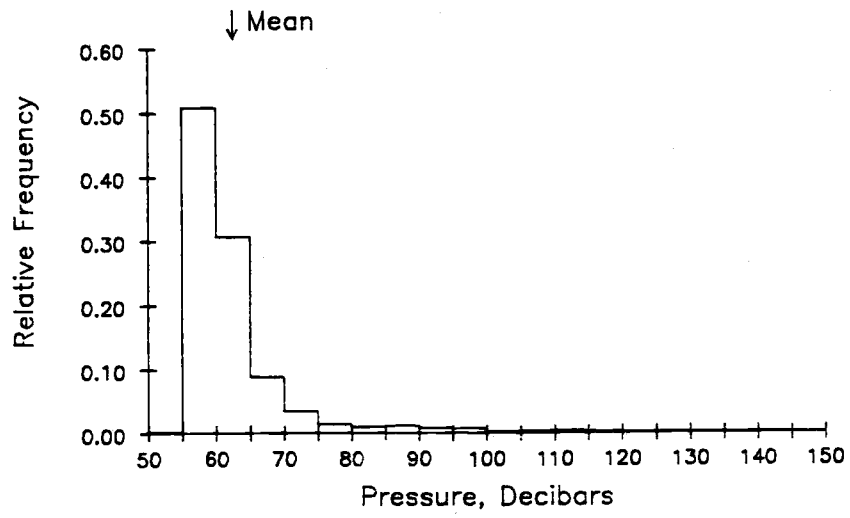
This mooring was found by the Spanish near Almeria, Spain in May 1986.

(U, and v are given in cm/sec; Temperature in °C; Pressure in decibars; Conductivity in mmho/cm; and Salinity in ppt. The sampling rate is 360 min.)

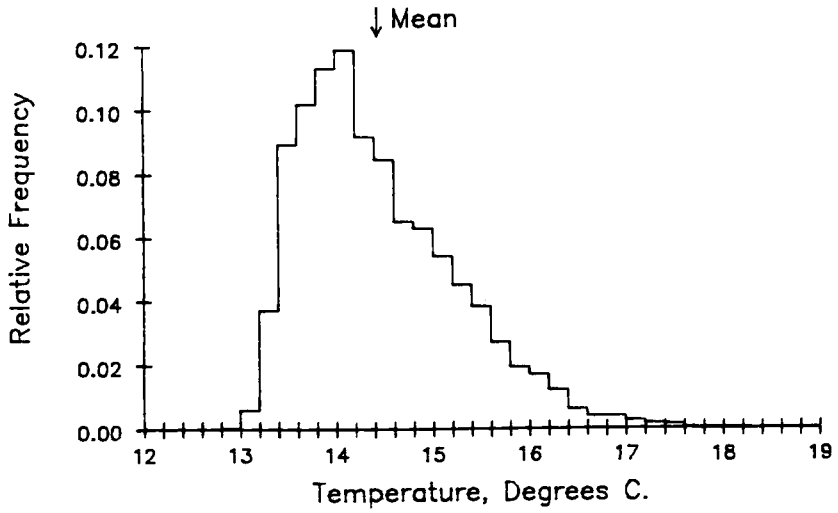
54 M AT GIBRALTAR C-7. 19 OCT 85 - 27 MAR 86. TAPE 755/58.

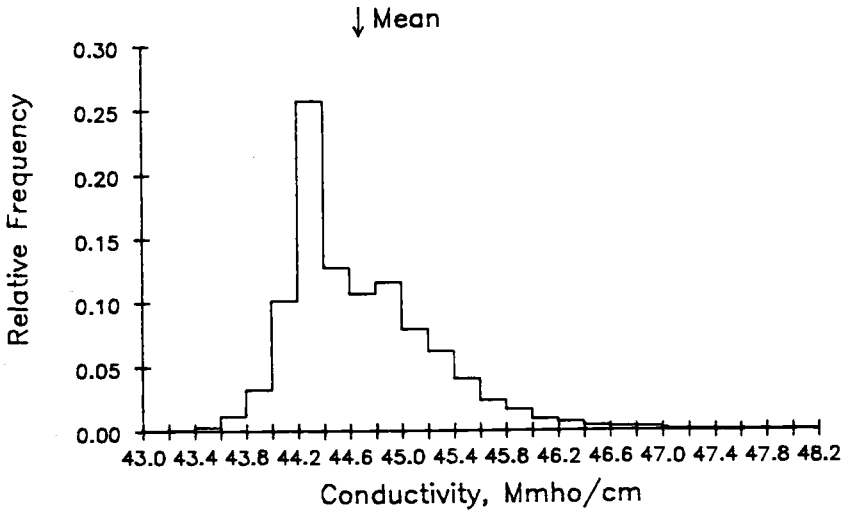


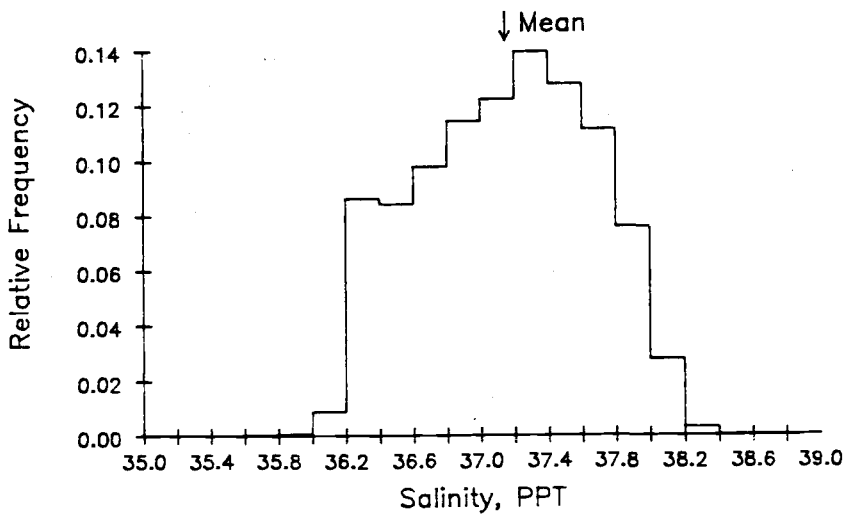




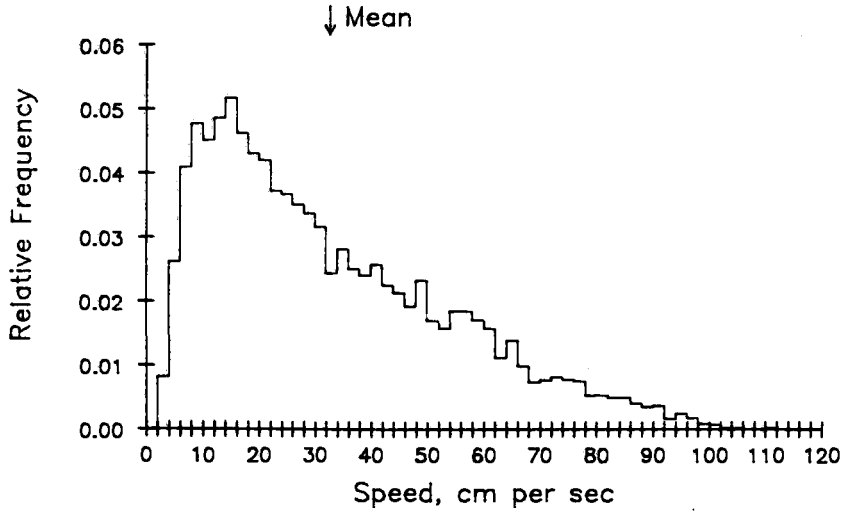
54 M AT GIBRALTAR C-7. 19 OCT 85 - 27 MAR 86. TAPE 755/58.

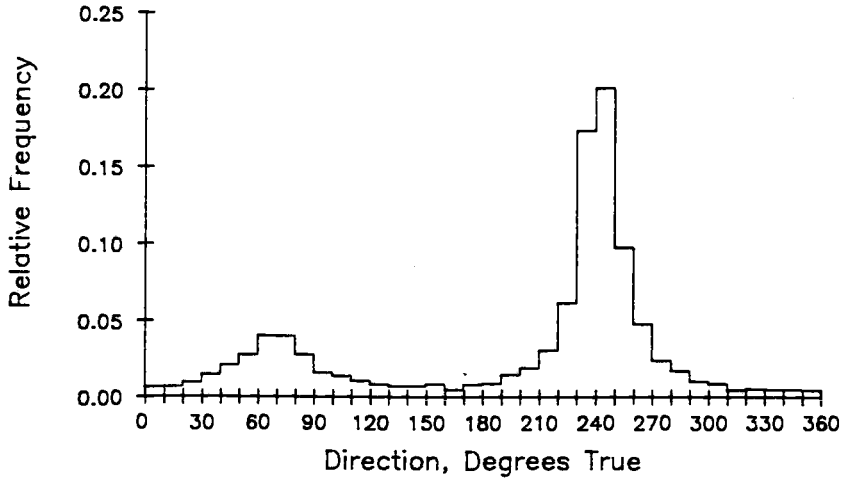


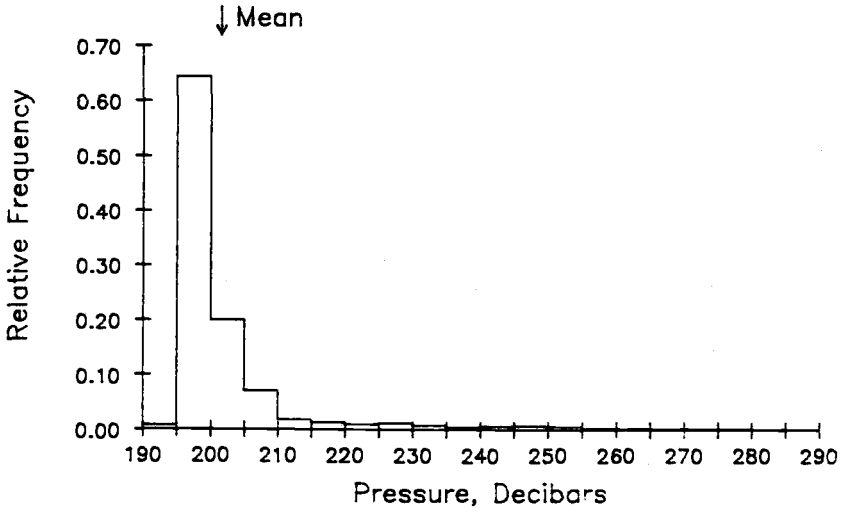




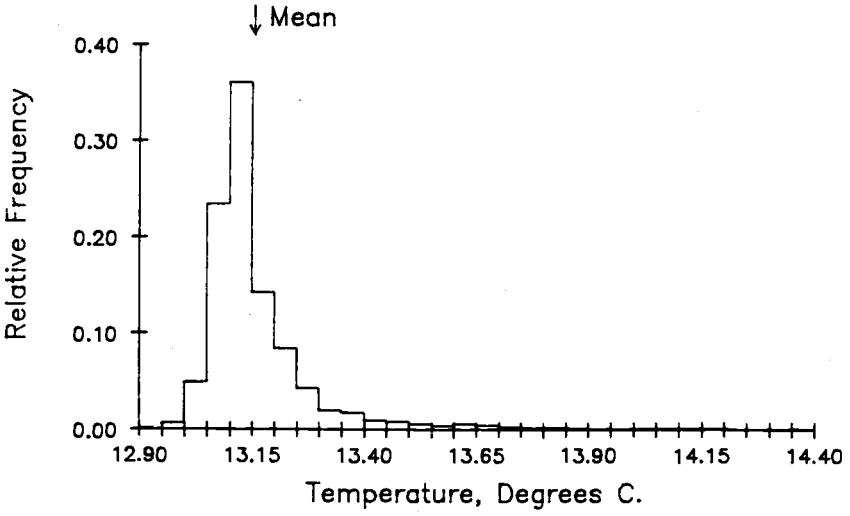
193 M AT GIBRALTAR C-7. 19 OCT 85 - 27 MAR 86. TAPE 1236/45.

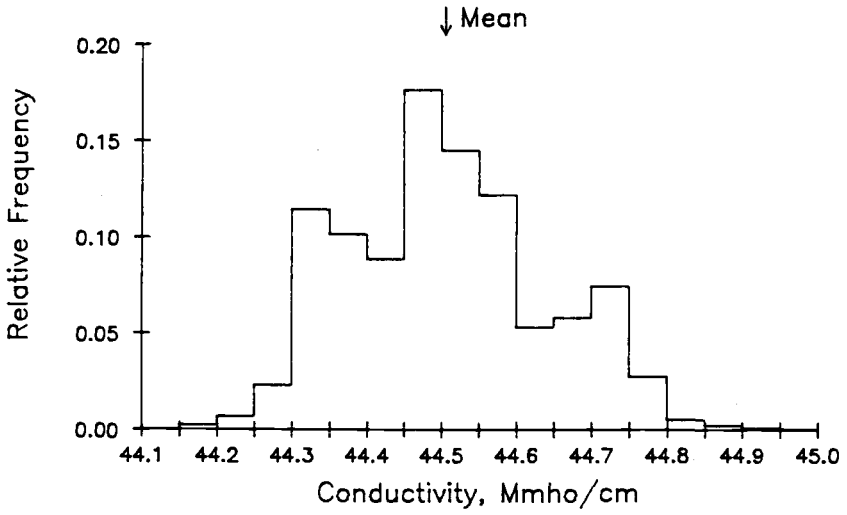


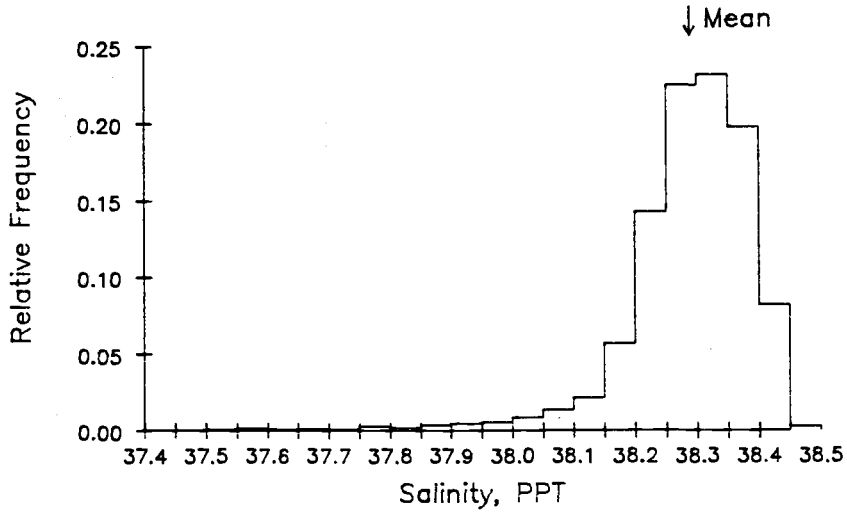




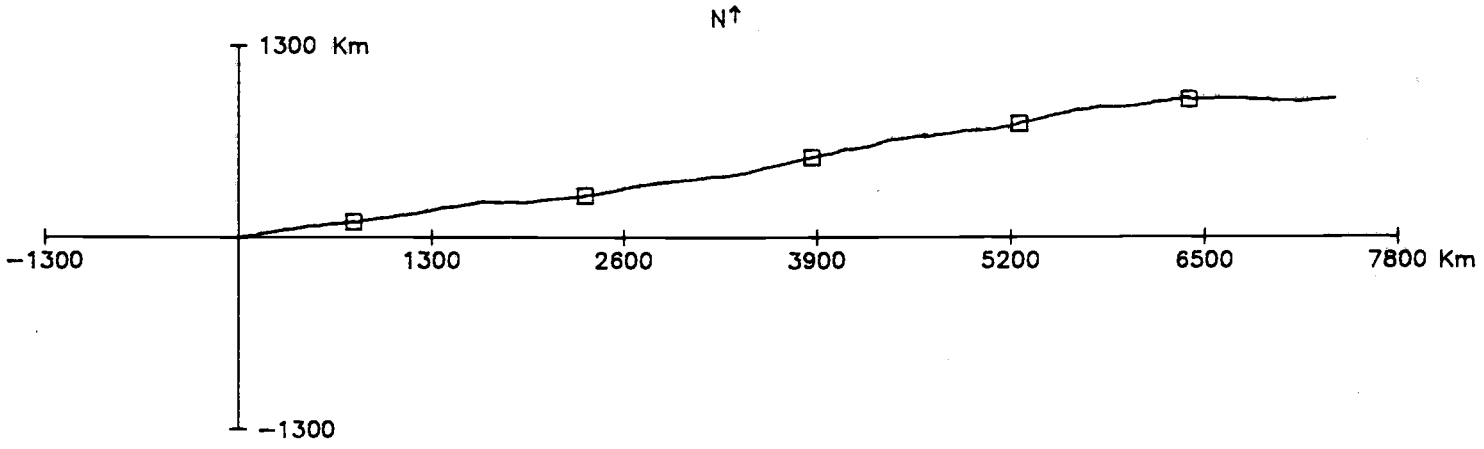
193 M AT GIBRALTAR C-7. 19 OCT 85 - 27 MAR 86. TAPE 1236/45.

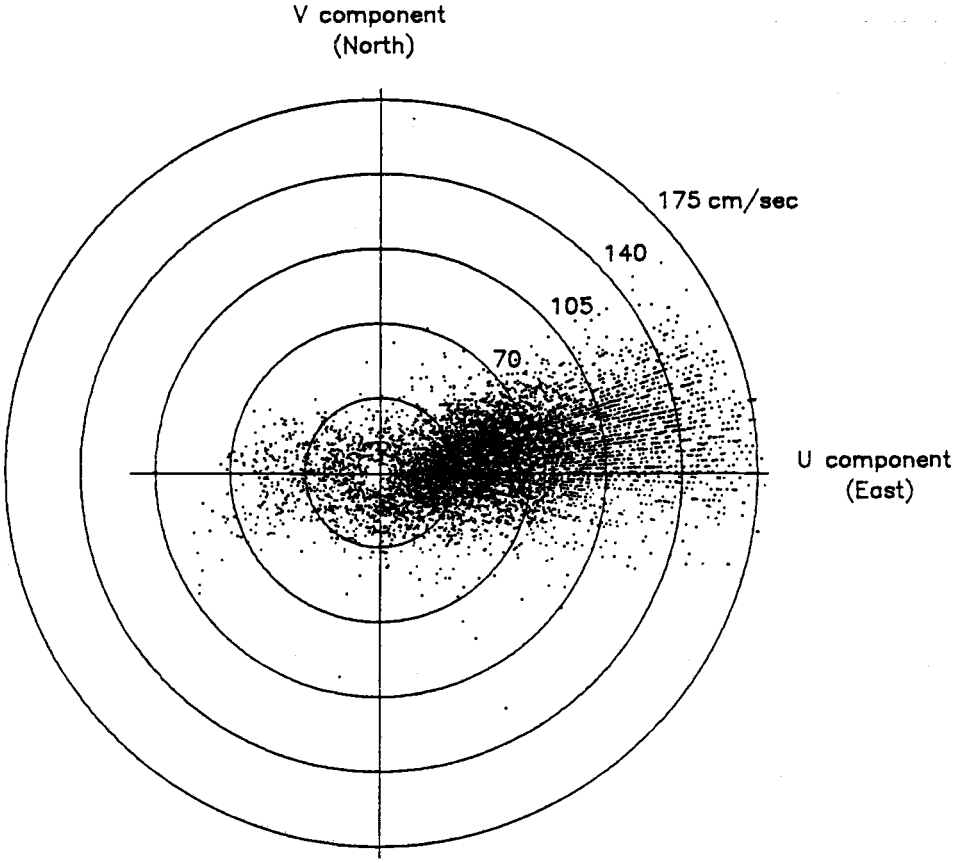




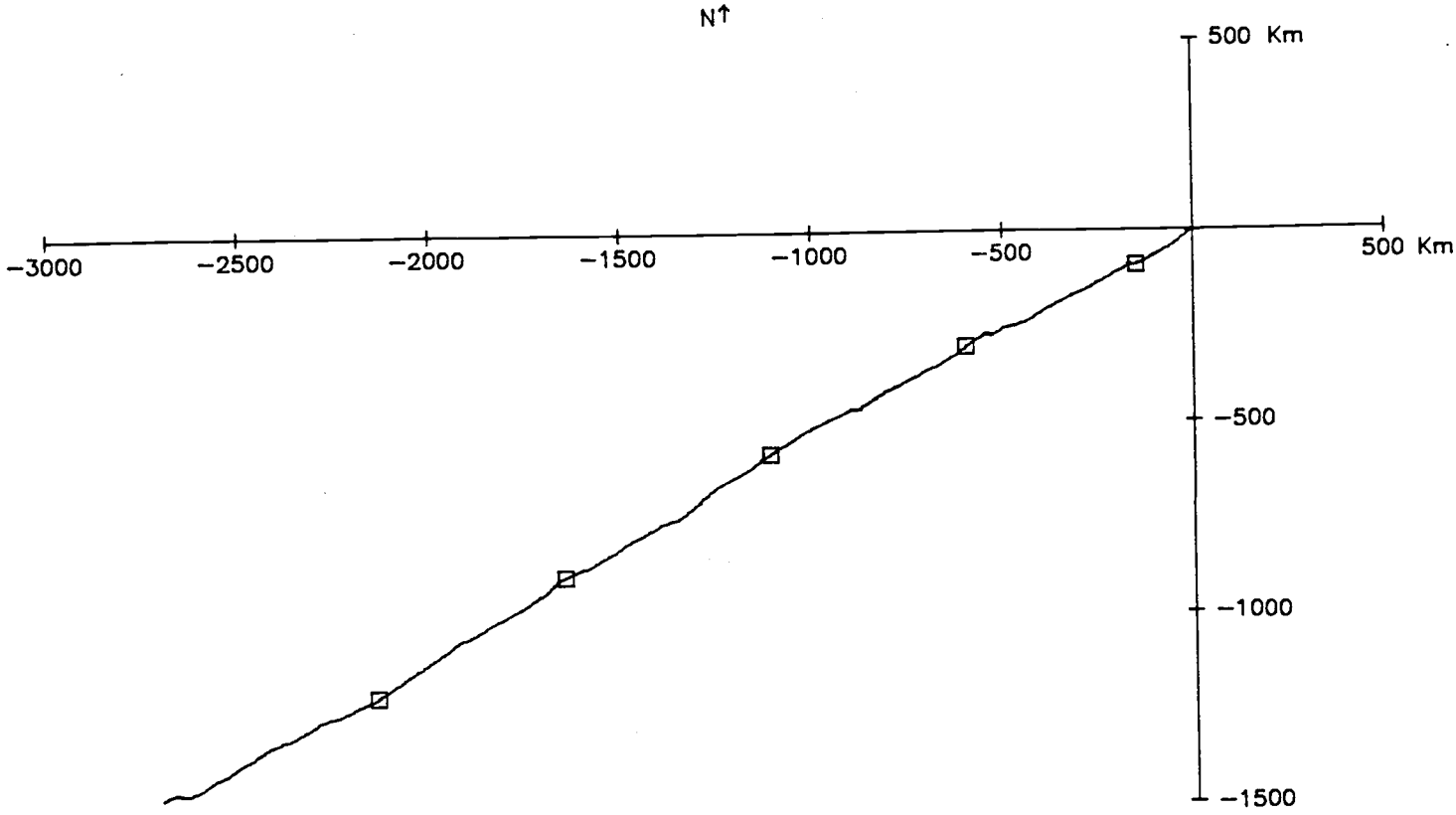


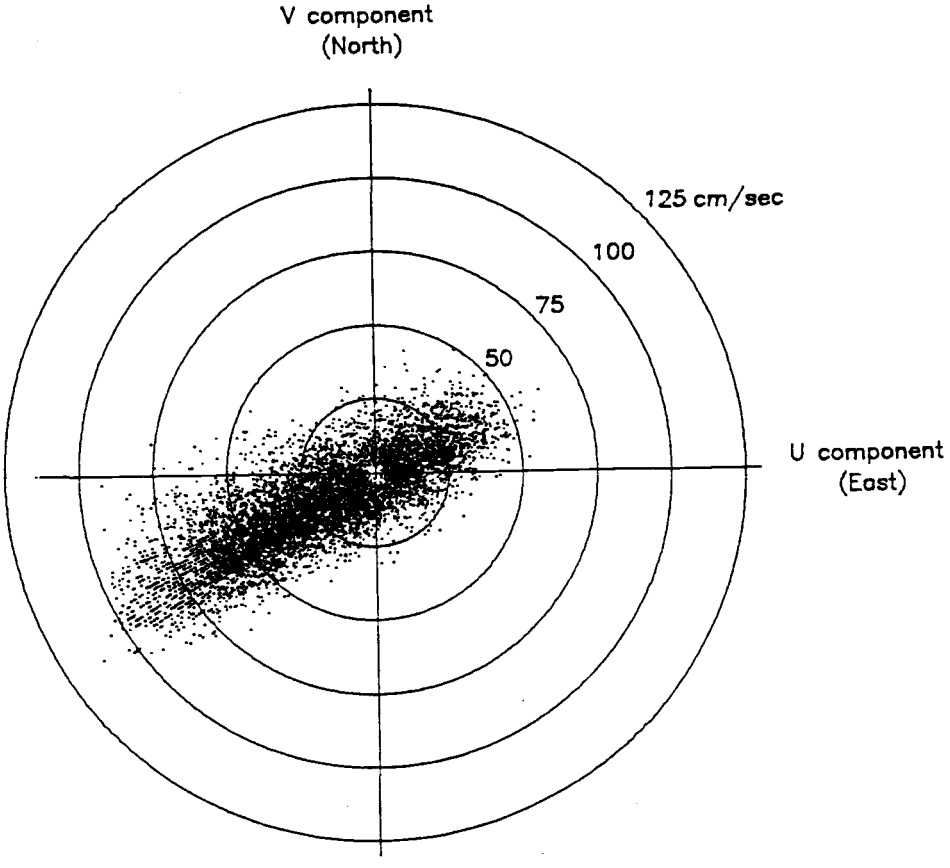
54 M AT GIBRALTAR C–7. 19 OCT 85 – 27 MAR 86. TAPE 755/58.



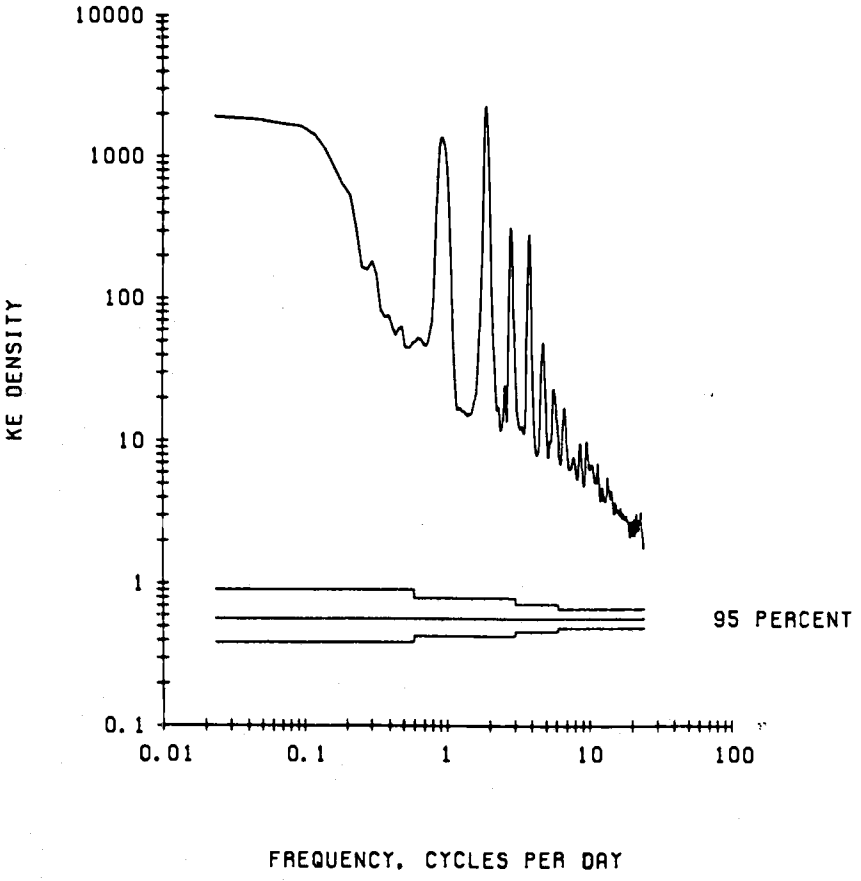


193 M AT GIBRALTAR C-7. 19 OCT 85 - 27 MAR 86. TAPE 1236/45.

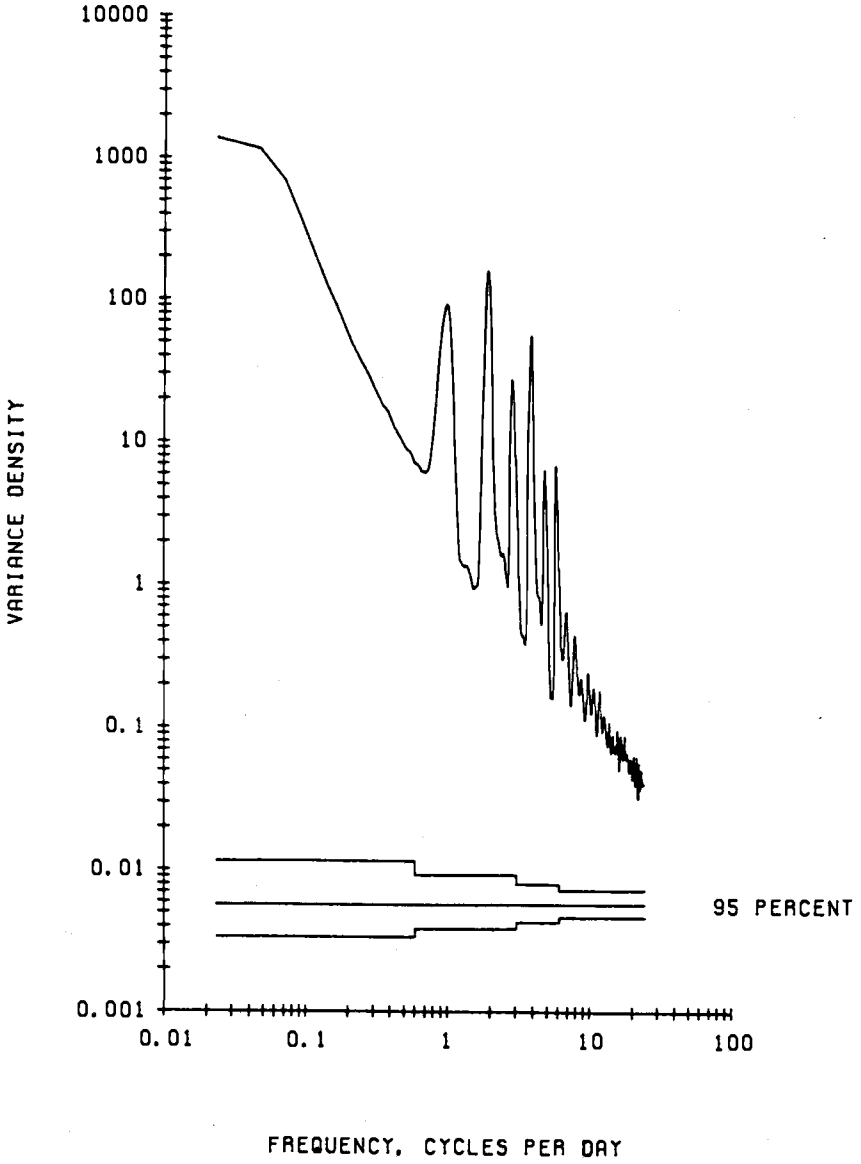




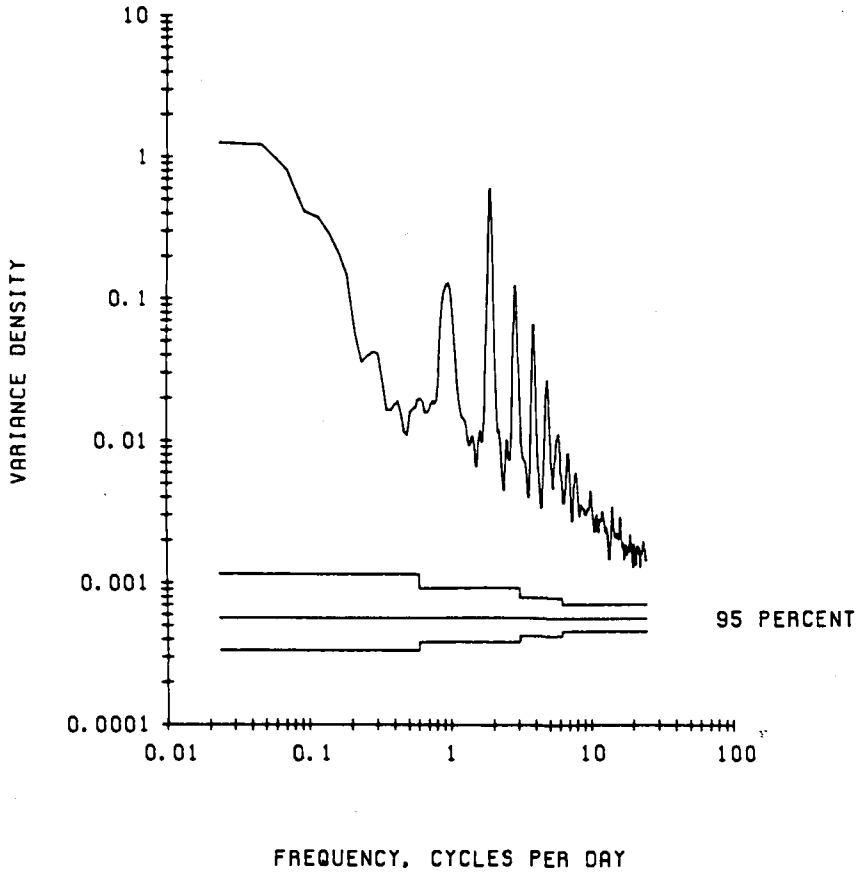
UNFILTERED CURRENT. 54 M AT GIBRALTAR C-7.



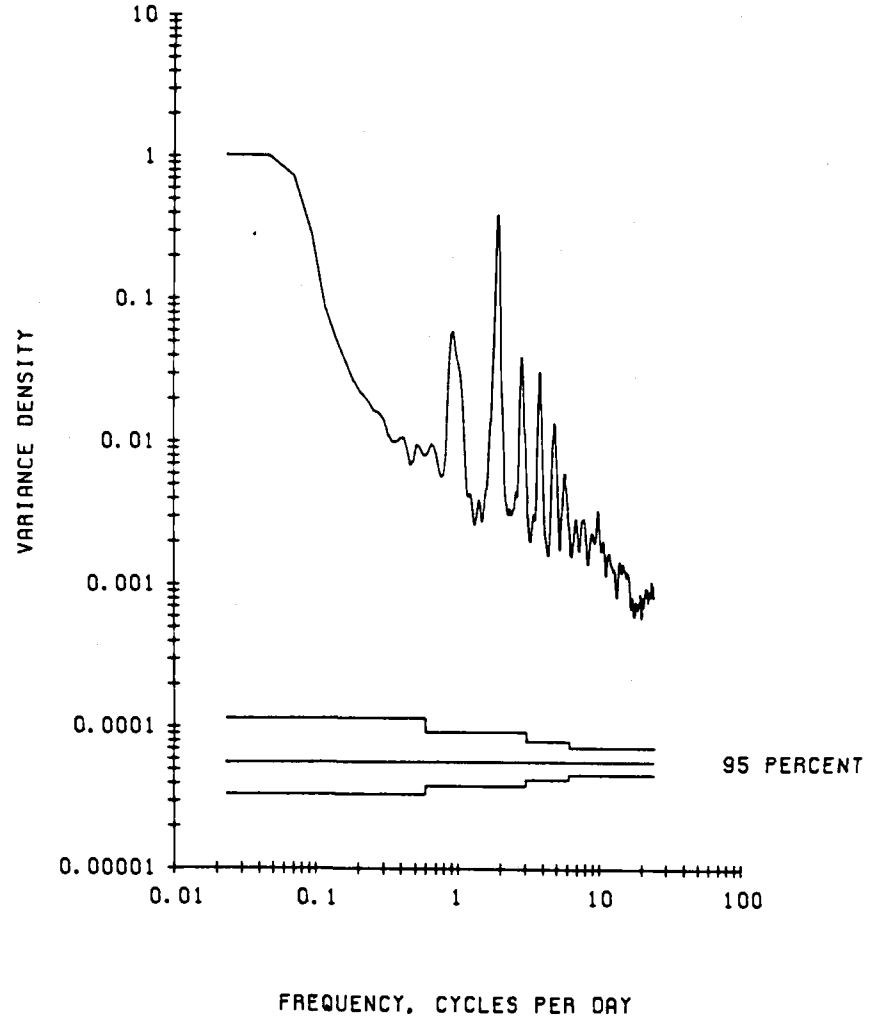
UNFILTERED PRESSURE. 54 M AT GIBRALTAR C-7.



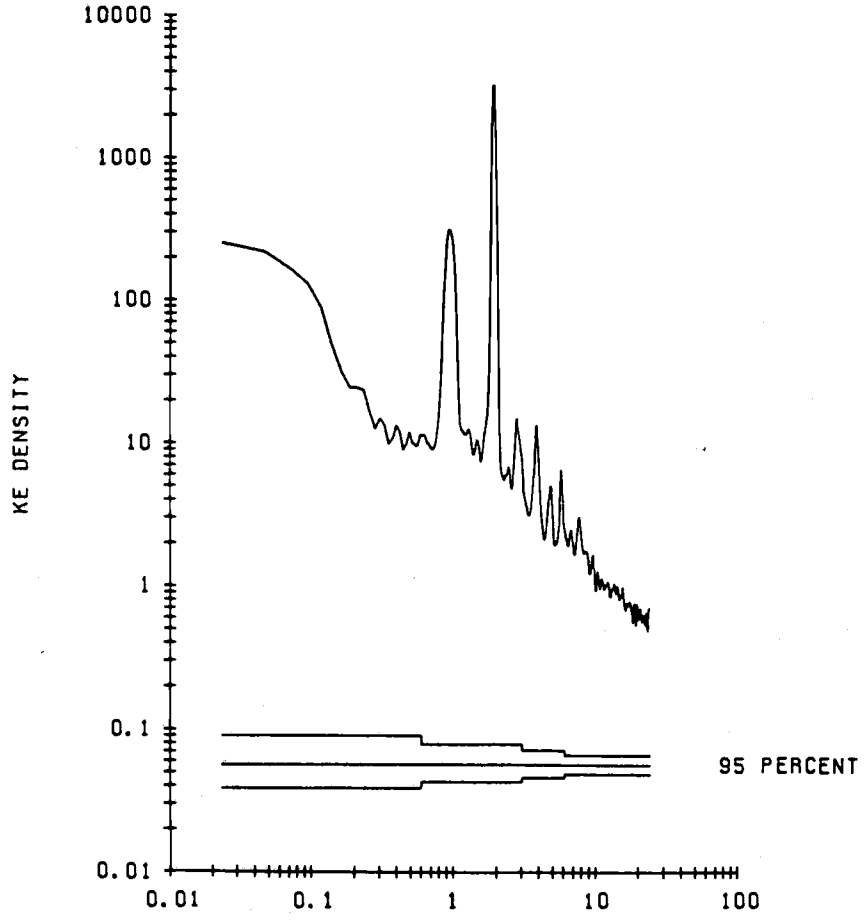
UNFILTERED TEMPERATURE. 54 M AT GIBRALTAR C-7.



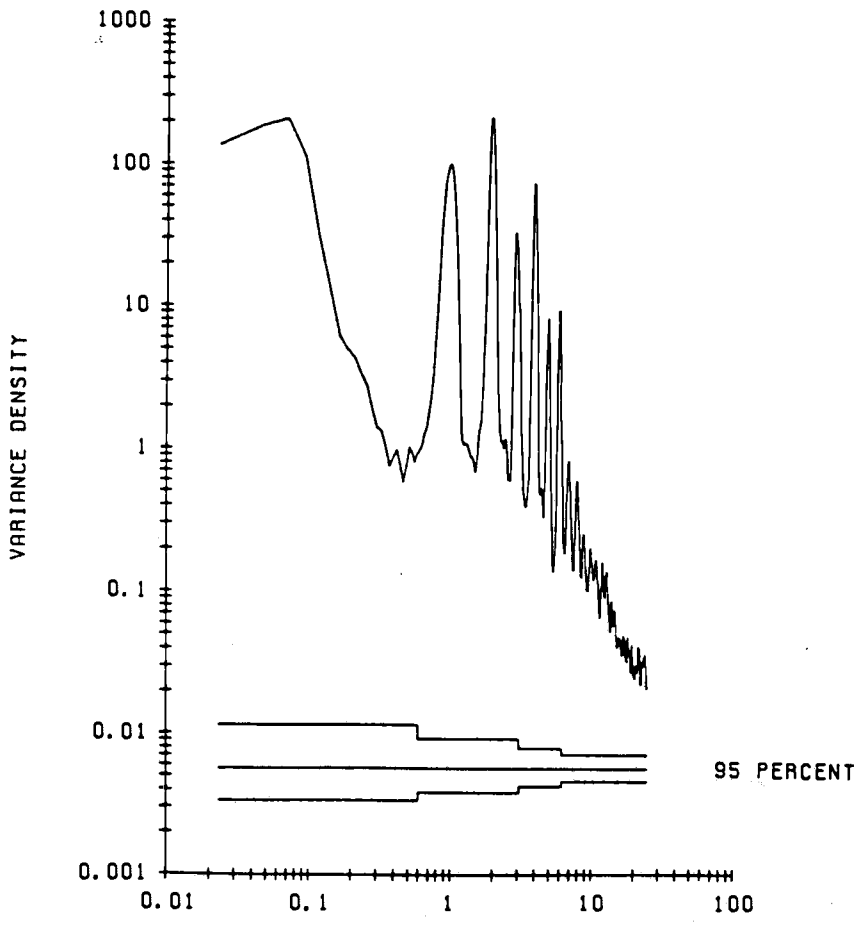
UNFILTERED SALINITY. 54 M AT GIBRALTAR C-7.



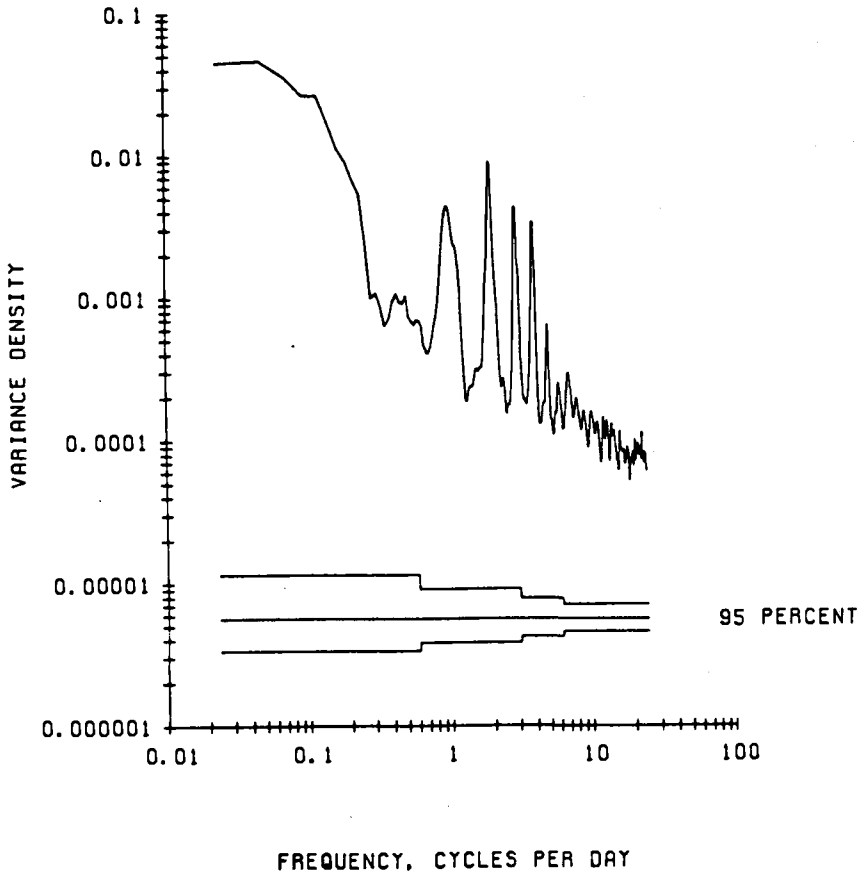
UNFILTERED CURRENT. 193 M AT GIBRALTAR C-7.



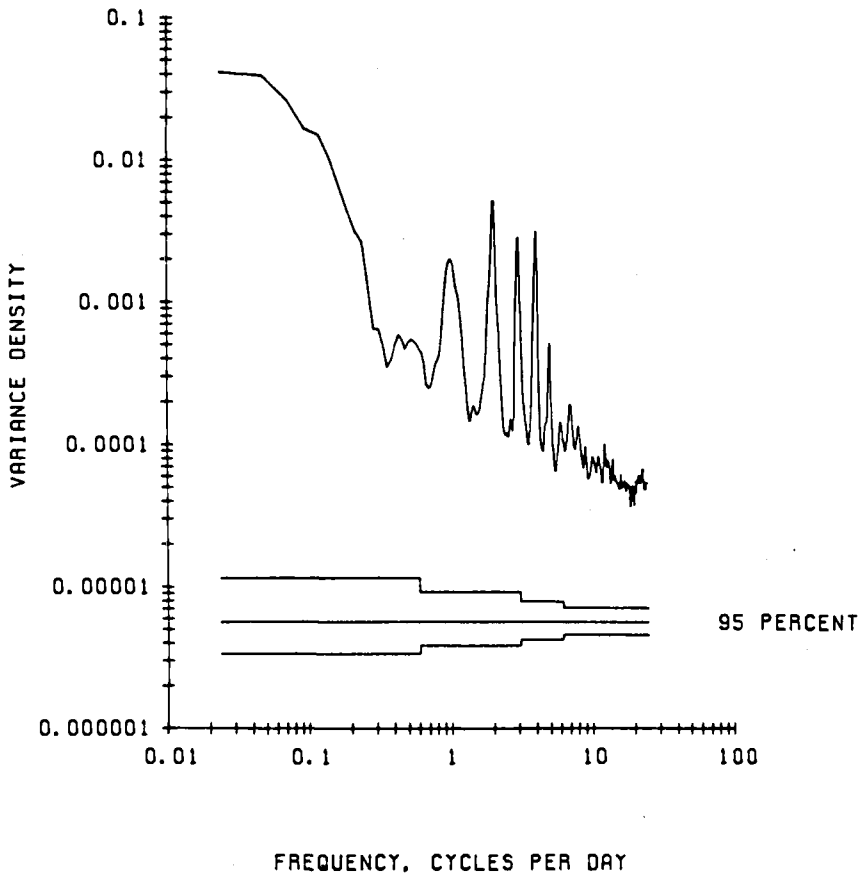
UNFILTERED PRESSURE. 193 M AT GIBRALTAR C-7.

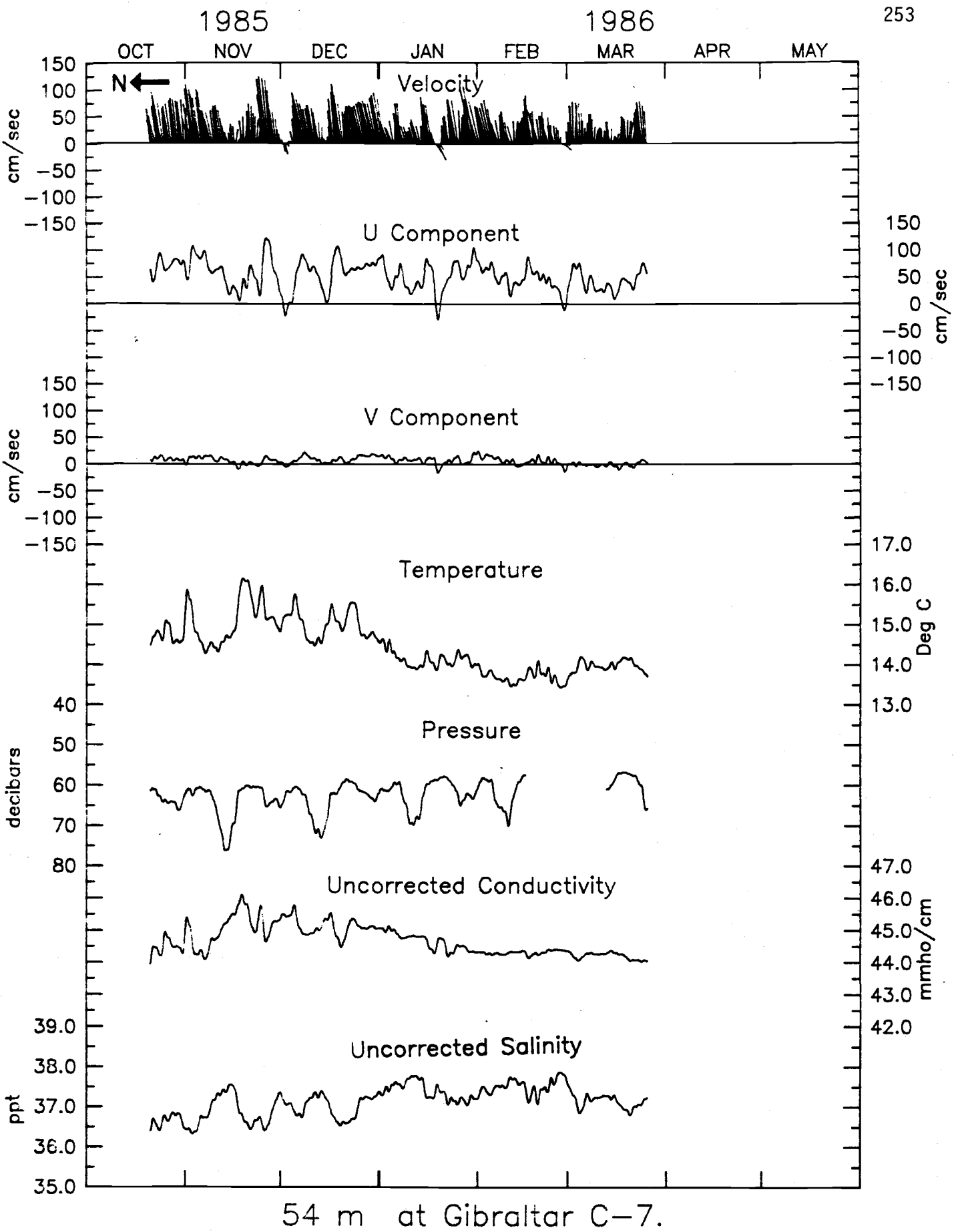


UNFILTERED TEMPERATURE. 193 M AT GIBRALTAR C-7.

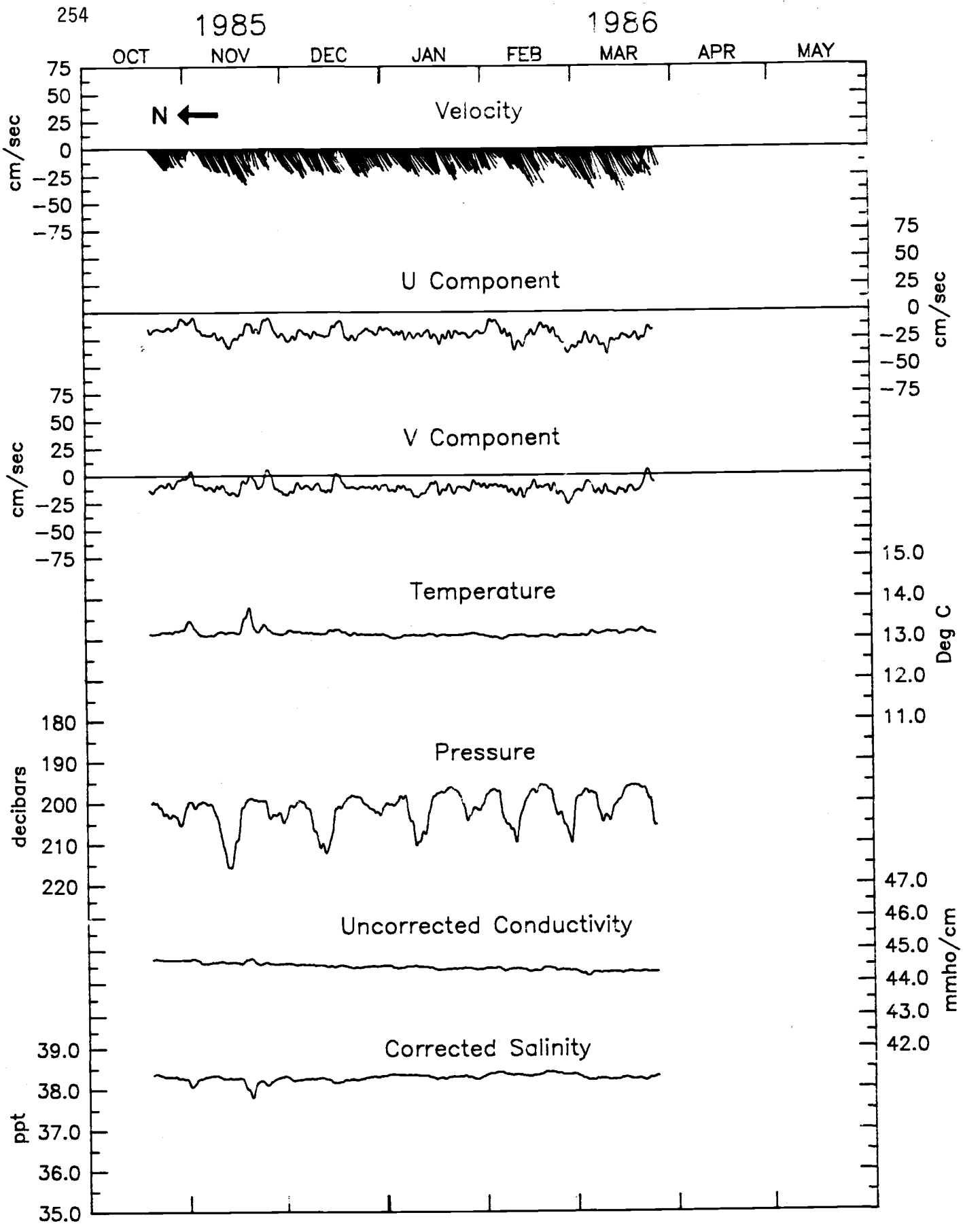


UNFILTERED SALINITY. 193 M AT GIBRALTAR C-7.

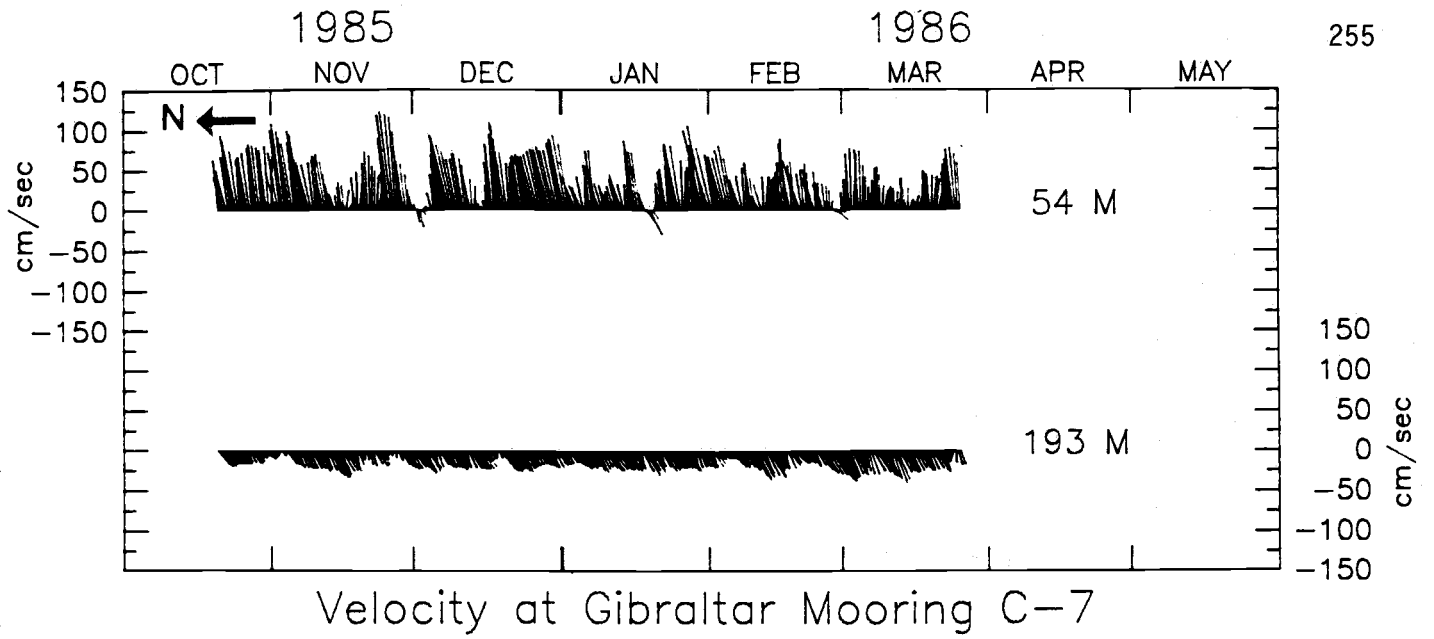




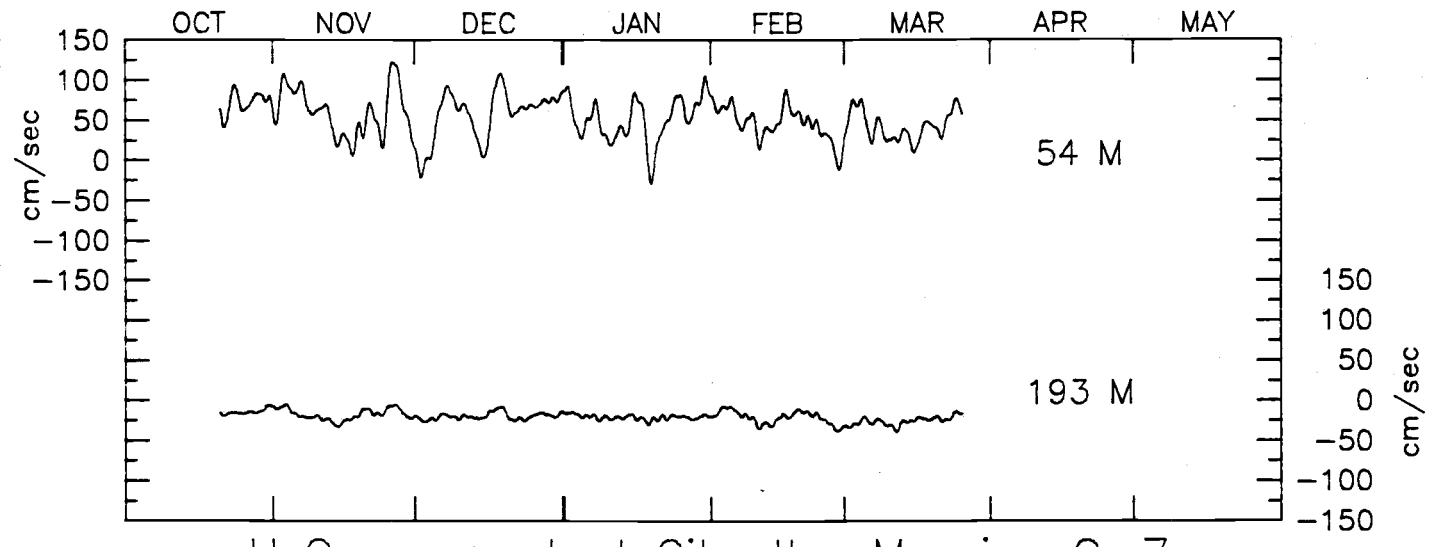
54 m at Gibraltar C−7.



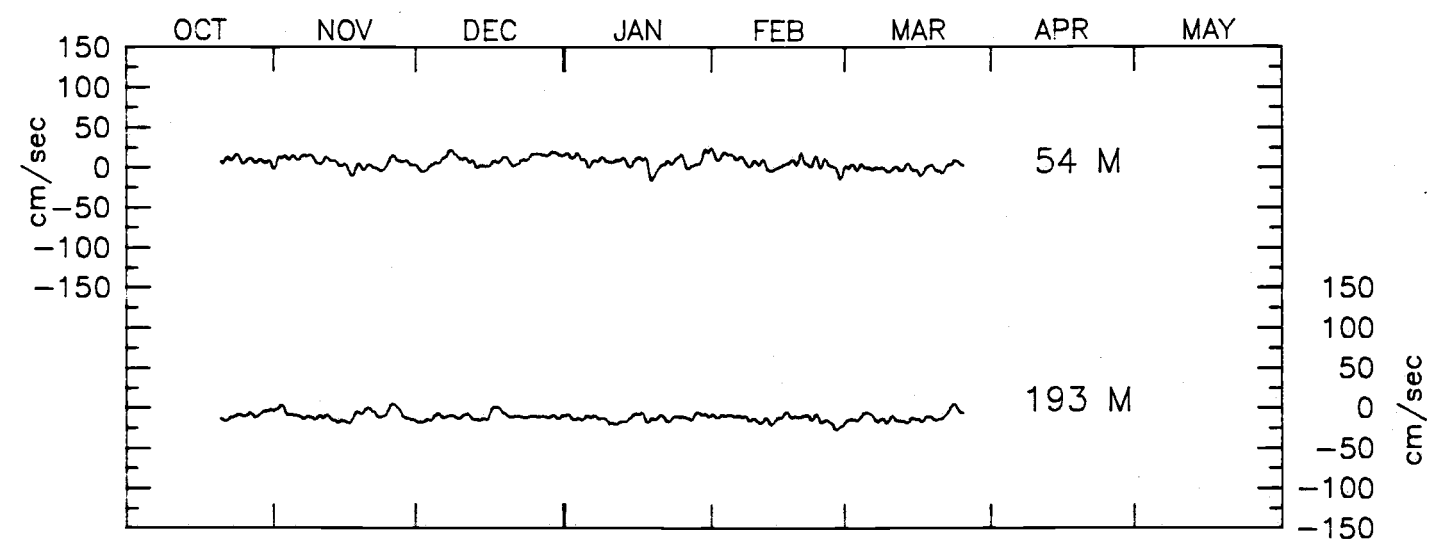
193 m at Gibraltar C−7.



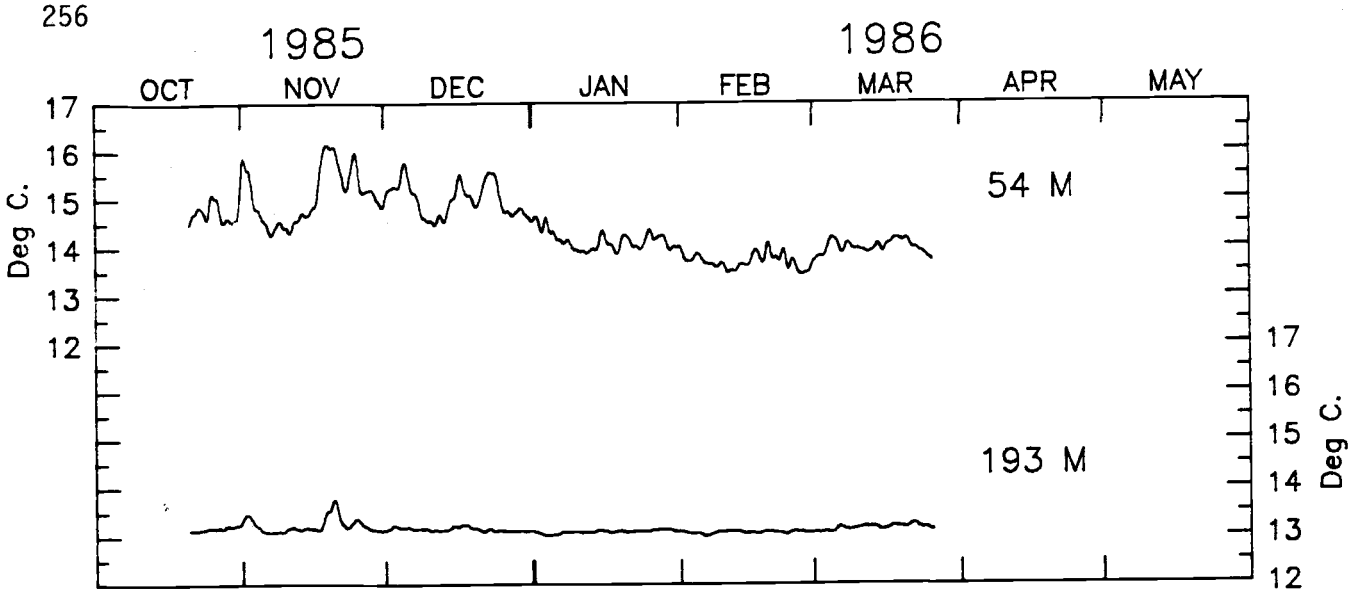
Velocity at Gibraltar Mooring C−7



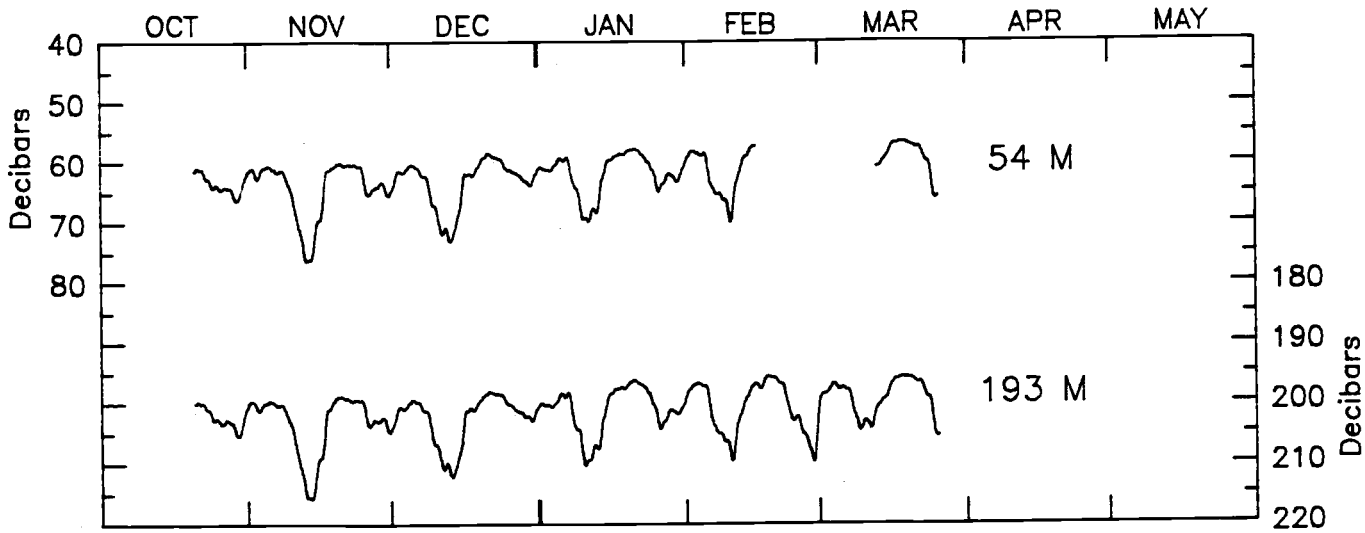
U Component at Gibraltar Mooring C−7



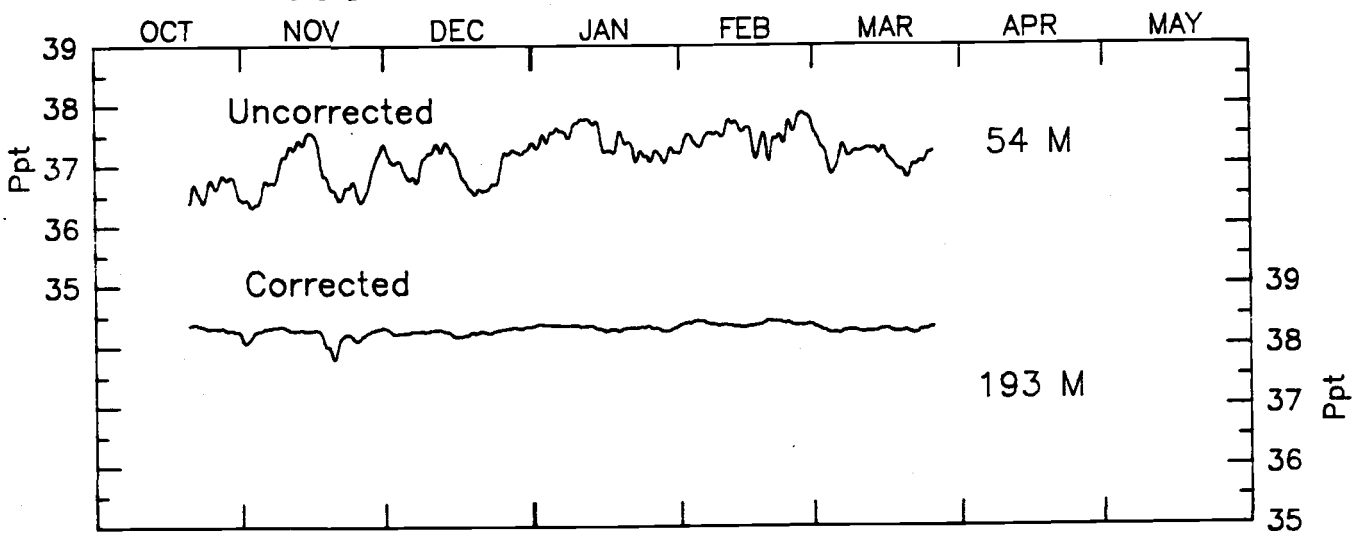
V Component at Gibraltar Mooring C−7



Temperature at Gibraltar Mooring C–7

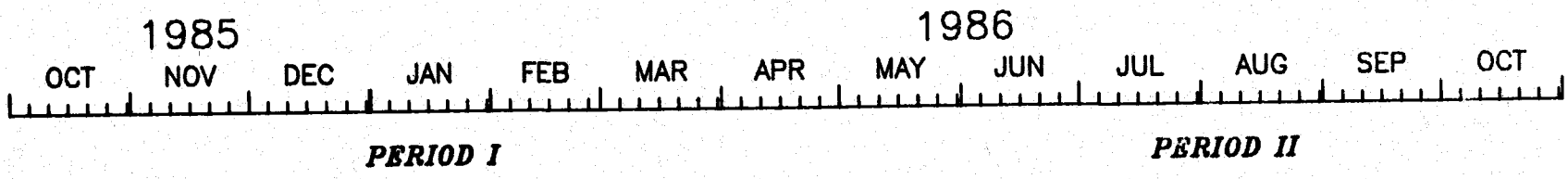


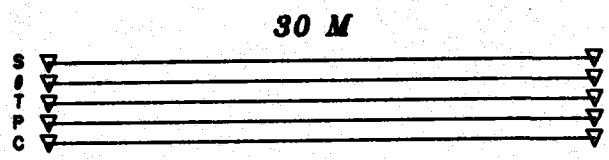
Pressure at Gibraltar Mooring C–7



Salinity at Gibraltar Mooring C–7.

Mooring C - 8

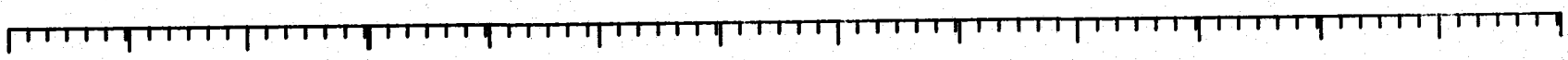




170 M *

195M *

* meter not recovered



DATA RETURN FROM GIBRALTAR C–8.

STATISTICS
MOORING GIBRALTAR C-8 PERIOD I
17 OCT 85 - 26 FEB 86

HALF-HOURLY UNFILTERED DATA
35°53.16'N, 5°50.55'W
Bottom depth: 610 m

		MEAN	SD	MIN	MAX	LENGTH	COMMENTS
6877/1	s	55.03	39.52	2.90	244.50	6332	The maximum pressure shown in these statistics
30 m	u	35.76	53.69	-223.40	173.80	6332	reflects mooring blow-over that occurred Nov 14
	v	8.08	19.05	-119.70	72.60	6332	1985, Dec 13, 14, & 15 1985, and Jan 10 & 11
	T	16.08	0.86	12.98	19.32	6332	1986.
	P	35.74	10.90	28.40	203.90	6332	
	C	44.35	1.28	40.59	48.77	6332	
	S	35.31	0.57	33.05	37.65	6332	
6878/ 170 m							not recovered
6876/ 195 m							not recovered

These data are from a meter owned and prepared by the Instituto Hydrographico of Cadiz. The mooring was cut on 26 February 1986; and RCM 6877 drifted until it was recovered. The bottom two meters were not recovered.

(Speed, u, and v are given in cm/sec; Temperature in °C; Pressure in decibars; Conductivity in mmho/cm; and Uncorrected Salinity in ppt. The sampling rate is 30 min.)

STATISTICS
MOORING GIBRALTAR C-8 PERIOD I
19 OCT 85 - 25 FEB 86

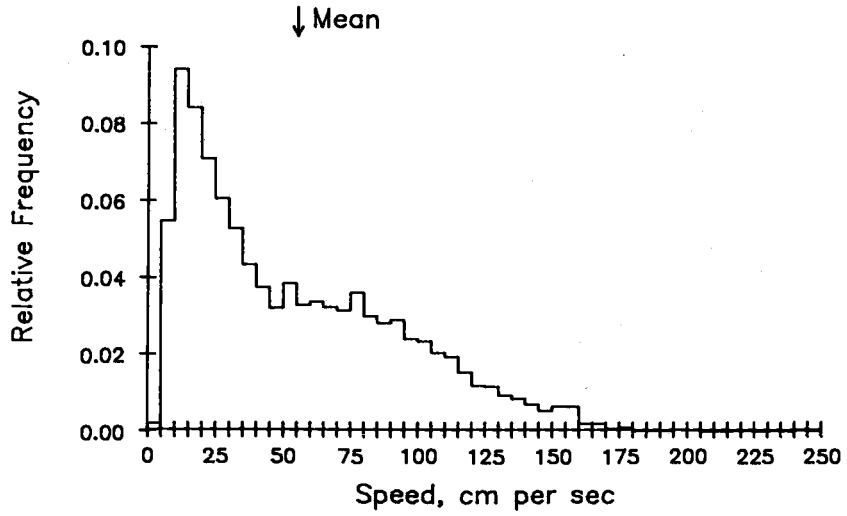
6-HOURLY FILTERED DATA
35°53.16'N, 5°50.55'W
Bottom depth: 610 m

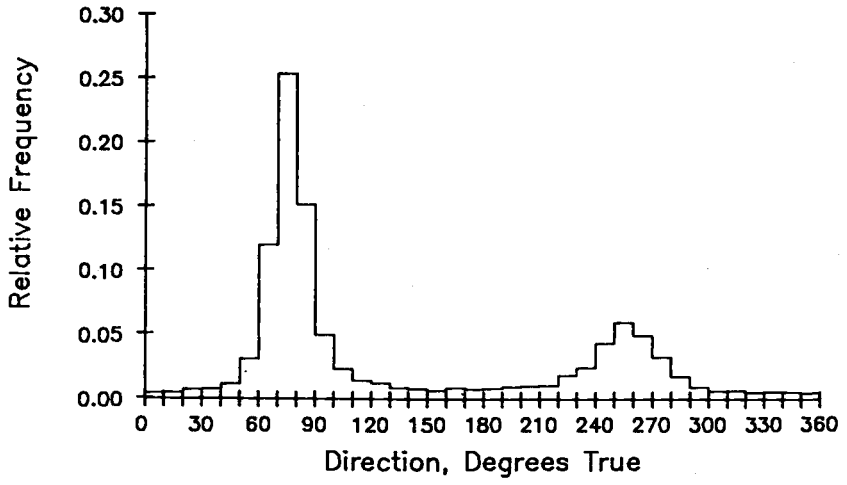
		MEAN	SD	MIN	MAX	LENGTH	COMMENTS
6877/1	u	35.81	9.08	6.49	66.46	518	
30 m	v	8.14	5.72	-10.69	19.61	518	
	T	16.09	0.70	14.87	17.64	518	
	P	35.67	4.24	29.94	51.59	518	
	C	44.38	1.14	41.39	46.40	518	
	S	35.33	0.52	33.41	36.07	518	
6878/ 170 m							not recovered
6876/ 195 m							not recovered

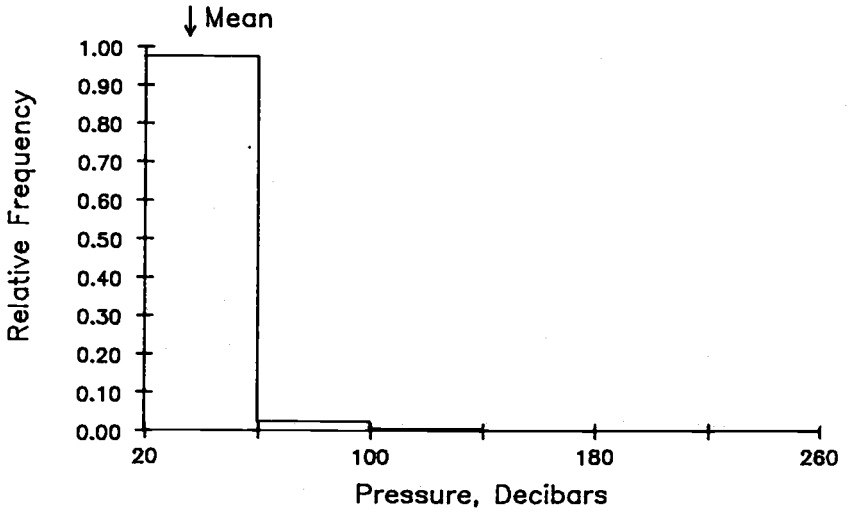
These data are from a meter owned and prepared by the Instituto Hydrographico of Cadiz. The mooring was cut on 26 February 1986; and RCM 6877 drifted until it was recovered. The bottom two meters were not recovered.

(U, and v are given in cm/sec; Temperature in °C; Pressure in decibars; Conductivity in mmho/cm; and Uncorrected Salinity in ppt. The sampling rate is 360 min.)

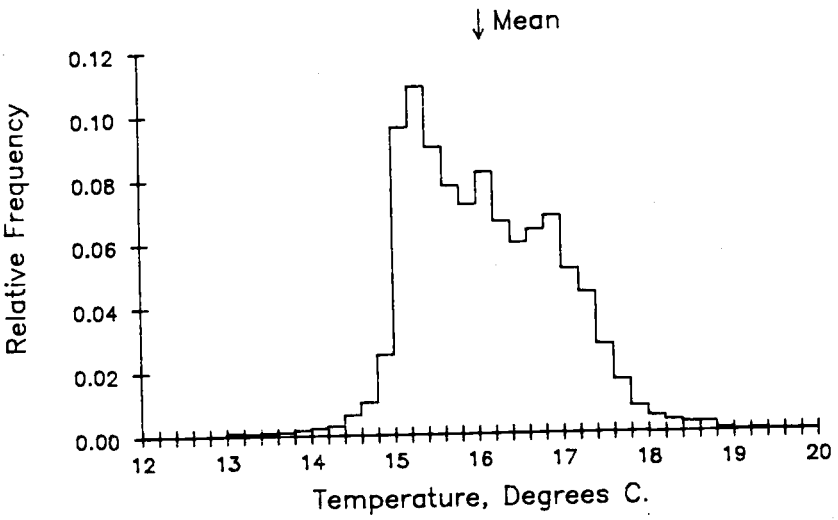
30 M AT GIBRALTAR C-8. 17 OCT 85 - 26 FEB 86. TAPE 6887/1.

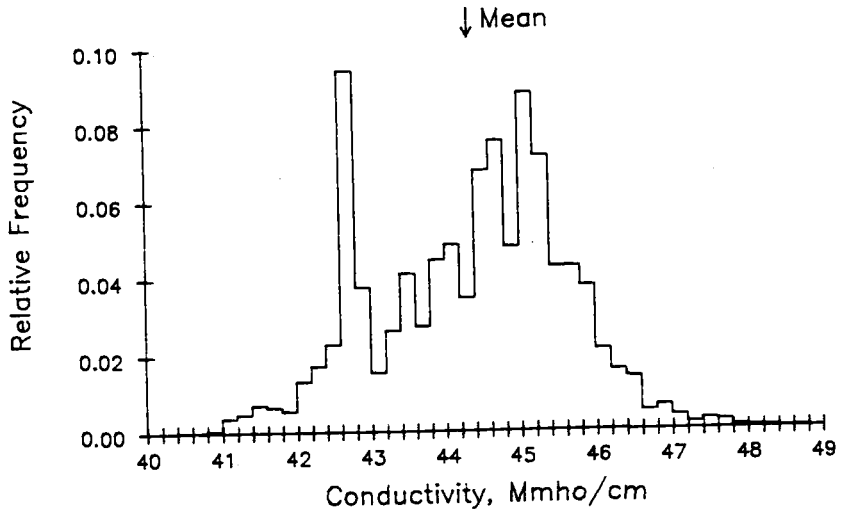


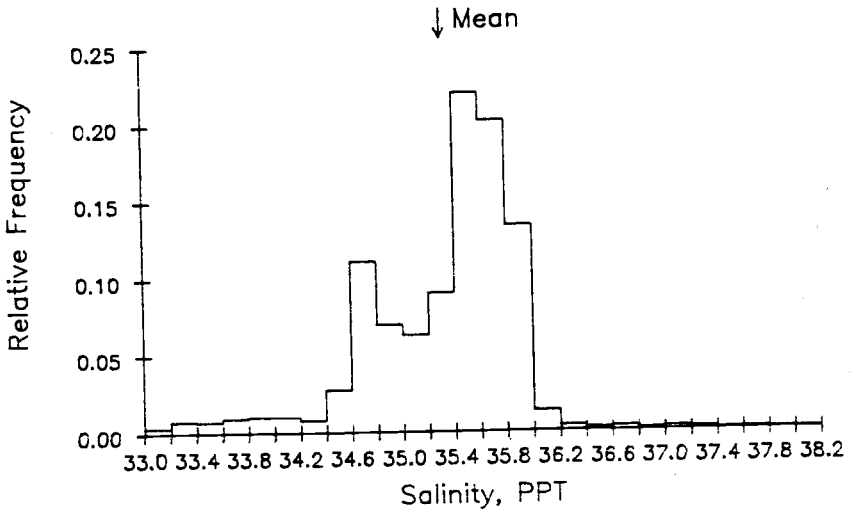




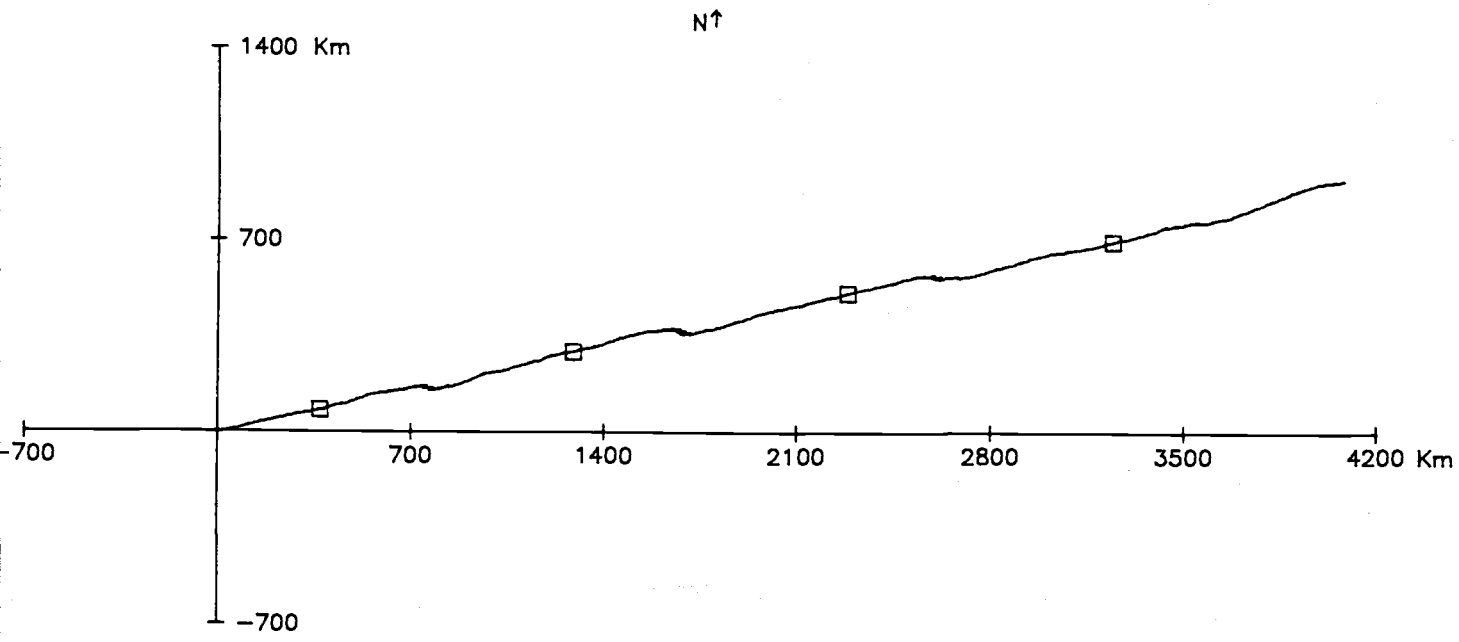
30 M AT GIBRALTAR C-8. 17 OCT 85 - 26 FEB 86. TAPE 6877/1.

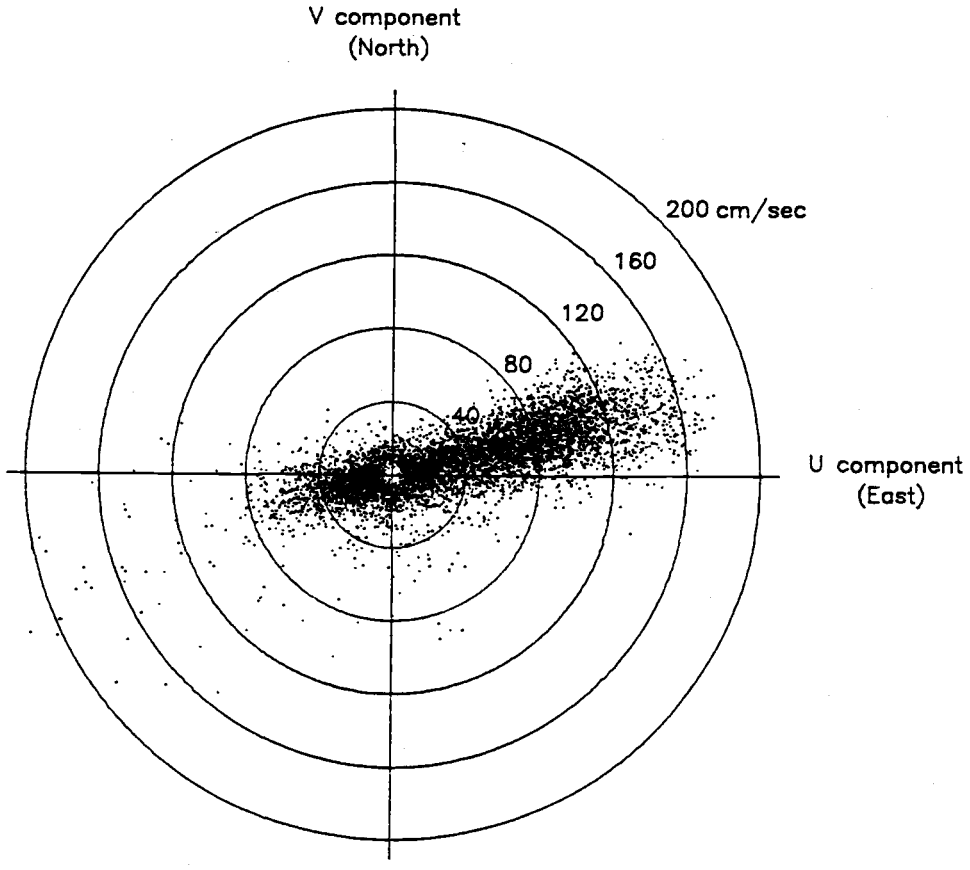




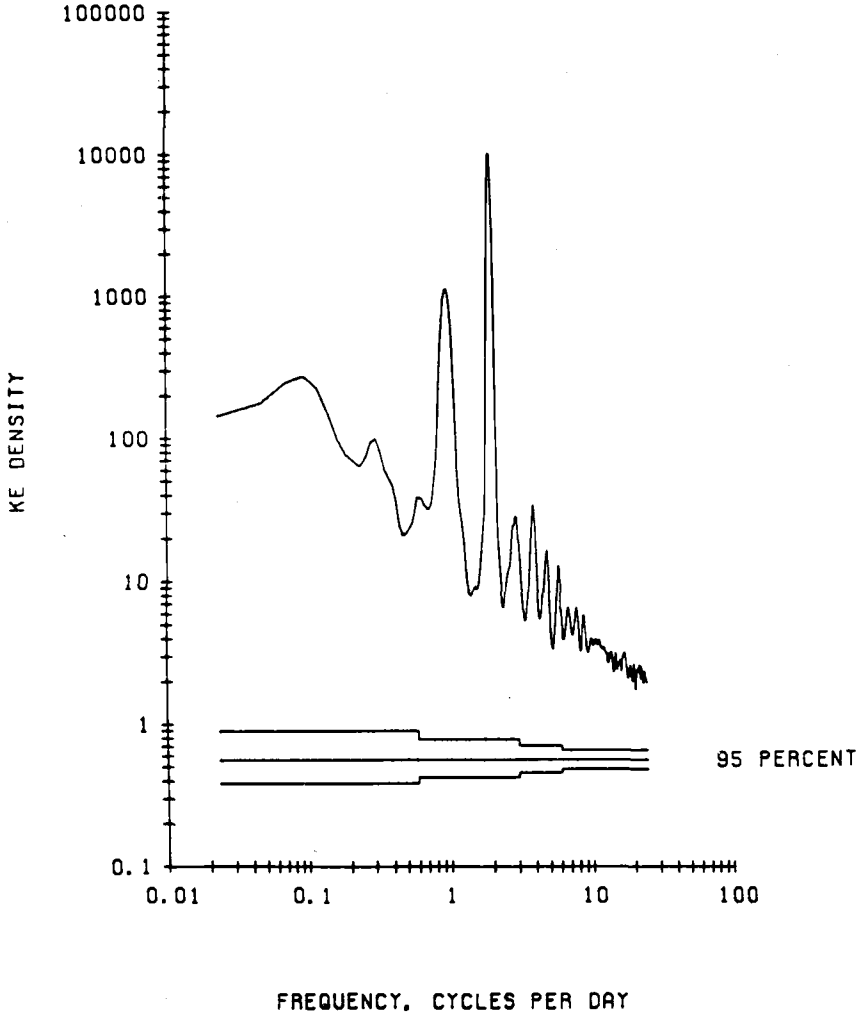


30 M AT GIBRALTAR C-8. 17 OCT 85 - 26 FEB 86. TAPE 6877/1.

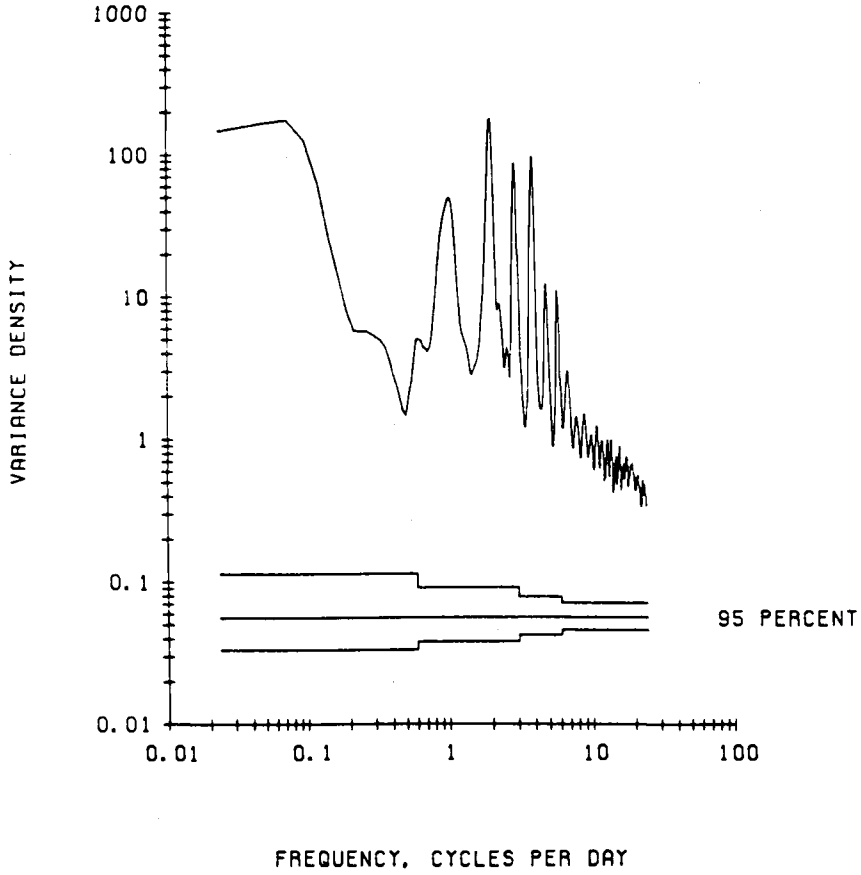




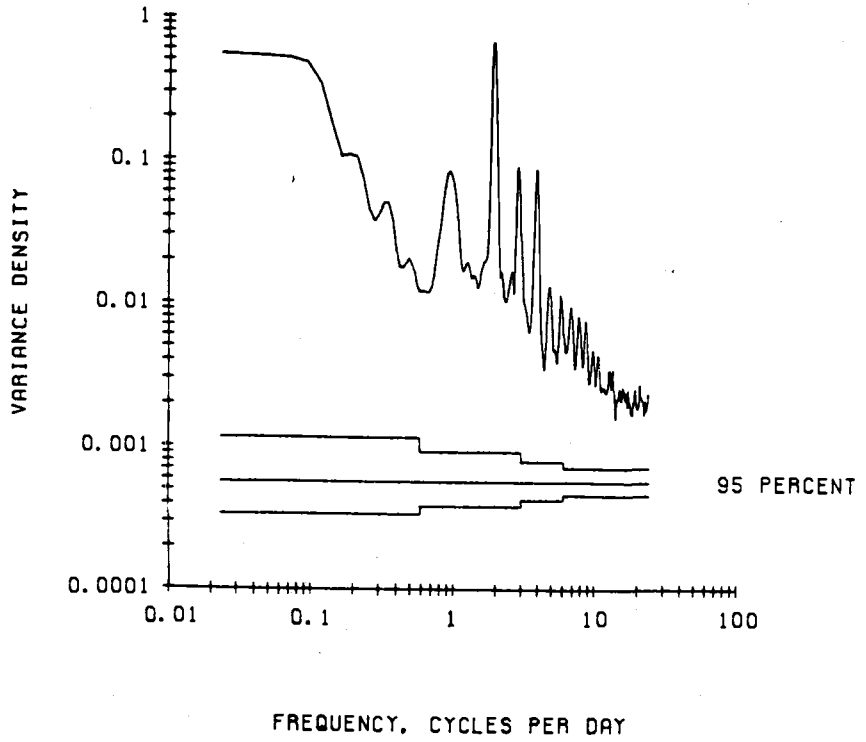
UNFILTERED CURRENT. 30 M AT GIBRALTAR C-8.



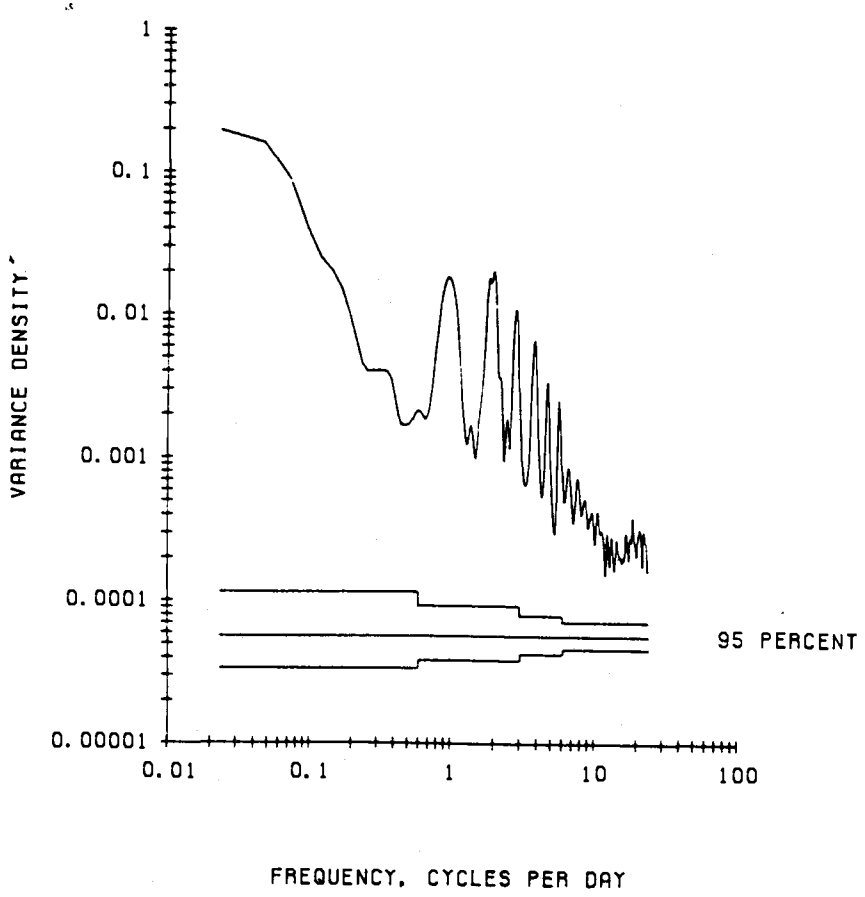
UNFILTERED PRESSURE. 30 M AT GIBRALTAR C-8.

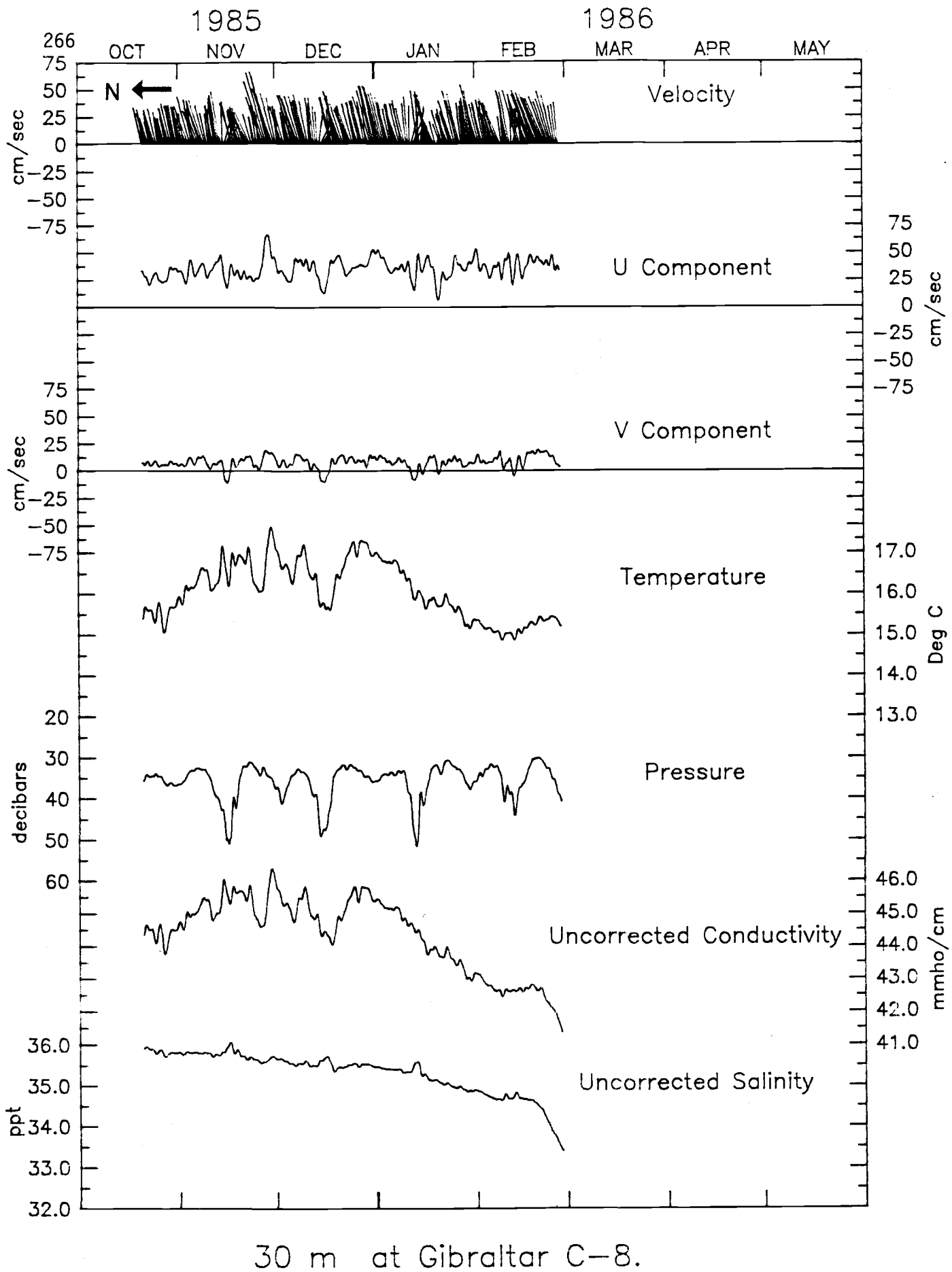


UNFILTERED TEMPERATURE. 30 M AT GIBRALTAR C-8.



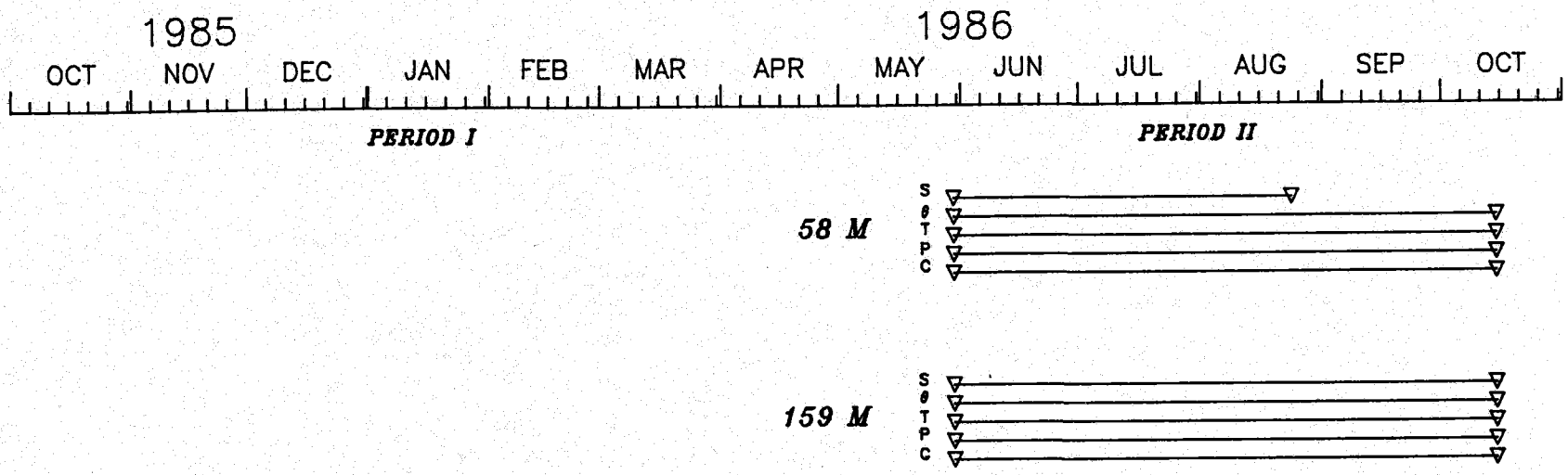
UNFILTERED SALINITY. 30 M AT GIBRALTAR C-8.





30 m at Gibraltar C−8.

Mooring C - 9B



DATA RETURN FROM GIBRALTAR C–9B.

STATISTICS
MOORING GIBRALTAR C-9B PERIOD II
28 MAY 86 - 13 OCT 86

HALF-HOURLY UNFILTERED DATA
35°55.23'N, 5°29.98'W
Bottom depth: 170 m

		MEAN	SD	MIN	MAX	LENGTH	COMMENTS
5647/28	s	64.69	46.86	0.80	238.90	4139	The meter lost its rotor after 1648 22 Aug 86. The pressure sensor appears to have drifted about 10 decibars. The salinity record is uncorrected.
58 m	u	57.70	46.53	-181.70	238.30	4139	
	v	7.87	28.72	-153.70	177.50	4139	
	T	15.04	0.87	13.03	19.69	6633	
	P	64.45	3.98	58.10	90.00	6633	
	C	44.13	0.80	41.34	48.32	6633	
	S	36.06	0.52	34.67	38.03	6633	
5646/26	s	55.74	33.24	0.80	191.30	6633	The following areas in the speed record were bridged: 1720 6 Jul - 1720 7 Jul; 1950 11 Jul - 1020 12 Jul; 1120 13 Jul - 1620 13 Jul; 1720 18 Jul - 2320 18 Jul; 1220 28 Jul - 1820 28 Jul; 0350 7 Aug -1050 8 Aug; 0620 18 Aug - 0759 19 Aug. Conductivity was bridged: 2020 11 Jul - 0920 12 Jul; 1420 26 Jul - 0550 2 Aug; & 1950 8 Aug - 0920 9 Aug. The salinity record is corrected.
159 m	u	24.80	53.48	-104.80	191.10	6633	
	v	16.52	21.53	-88.90	141.00	6633	
	T	13.51	0.79	12.83	16.72	6633	
	P	161.65	0.30	160.00	163.70	6633	
	C	44.15	0.29	42.95	46.42	6633	
	S	37.79	0.65	35.27	38.55	6633	

(speed, u, and v are given in cm/sec; Temperature in °C; Pressure in decibars; Conductivity in mmho/cm; and Salinity in ppt. The sampling rate is 30 min.)

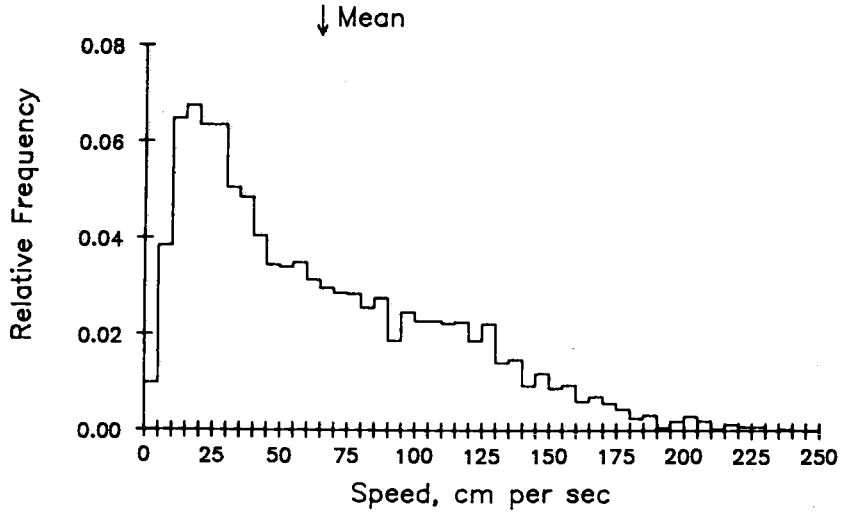
STATISTICS
MOORING GIBRALTAR C-9B PERIOD II
29 MAY 86 - 12 OCT 86

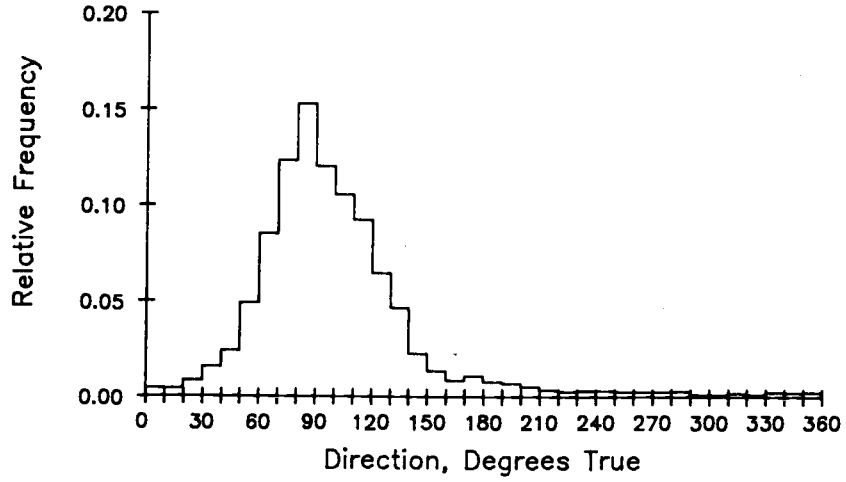
6-HOURLY FILTERED DATA
35°55.23'N, 5°29.98'W
Bottom depth: 170 m

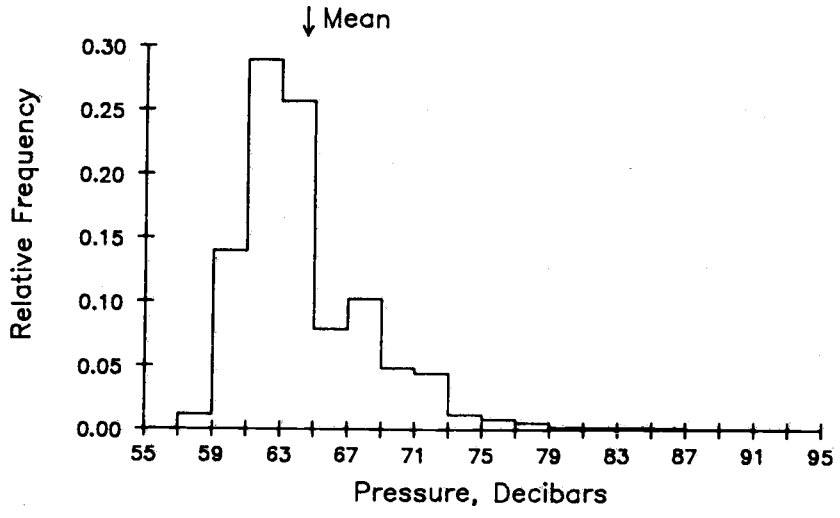
		MEAN	SD	MIN	MAX	LENGHT	COMMENTS
5647/28	u	57.39	11.42	25.22	76.58	335	See note on half-hourly file.
58 m	v	7.83	8.45	-13.71	25.59	335	The salinity record is uncorrected.
	T	15.04	0.37	14.19	15.83	543	
	P	64.41	2.99	59.84	72.50	543	
	C	44.14	0.51	42.89	45.05	543	
	S	36.06	0.34	35.26	36.65	543	
5646/26	u	24.60	12.14	-16.07	54.75	543	See note on half-hourly file
159 m	v	16.51	4.71	4.38	28.20	543	The salinity record is corrected.
	T	13.50	0.24	12.89	14.19	543	
	P	161.66	0.27	161.46	162.31	543	
	C	44.15	0.15	43.77	44.50	543	
	S	37.79	0.21	37.14	38.35	543	

(speed, u, and v are given in cm/sec; Temperature in °C; Pressure in decibars; Conductivity in mmho/cm; and Salinity in ppt. The sampling rate is 360 min.)

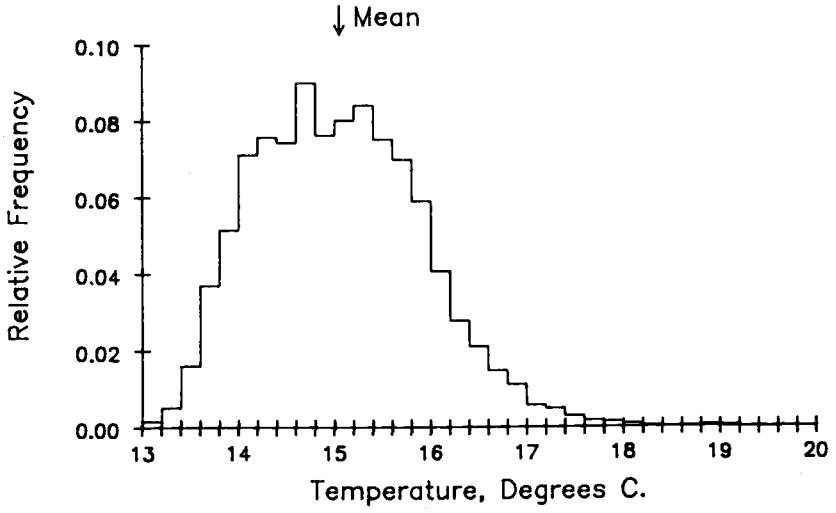
58 M AT GIBRALTAR C-9B. 28 MAY 86 - 13 OCT 86.

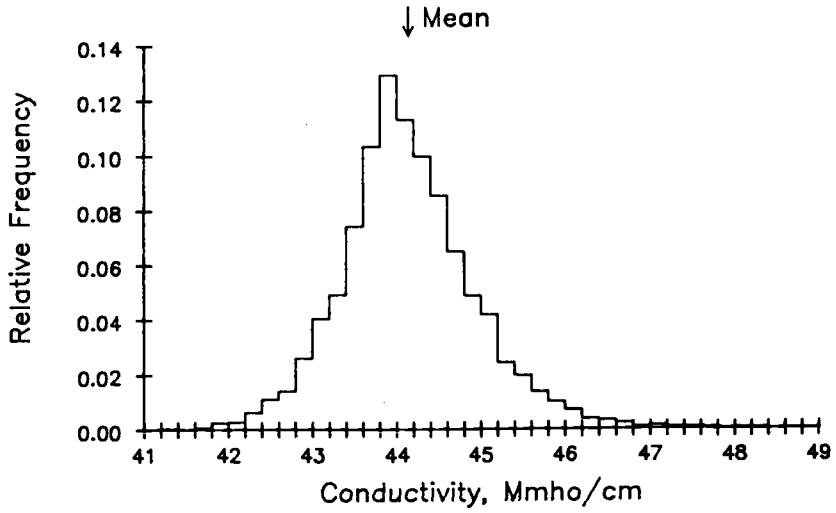


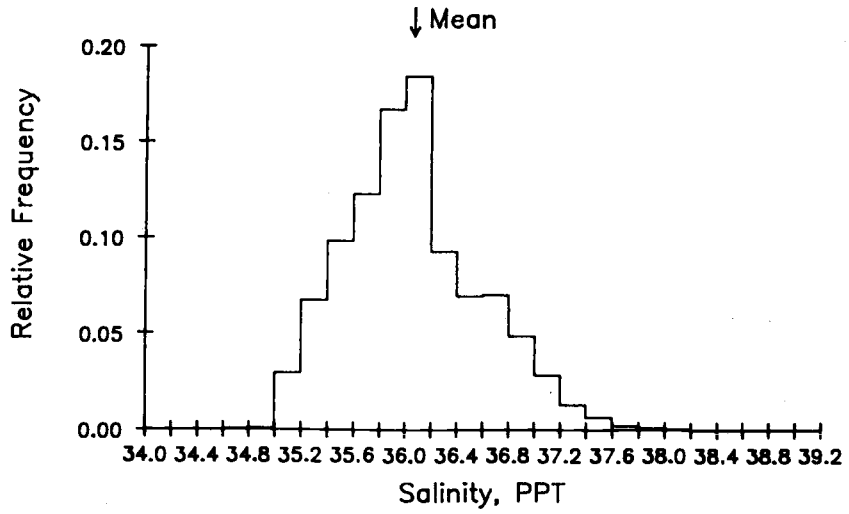




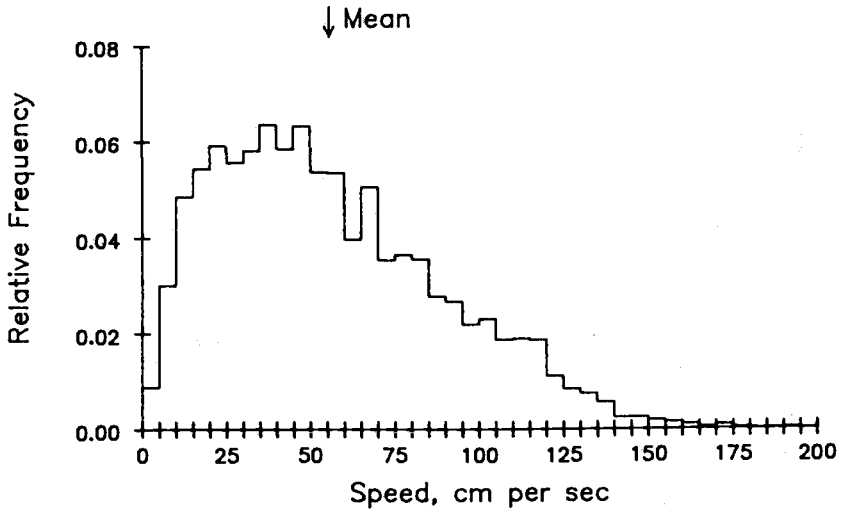
58 M AT GIBRALTAR C-9B. 28 MAY 86 - 13 OCT 86.

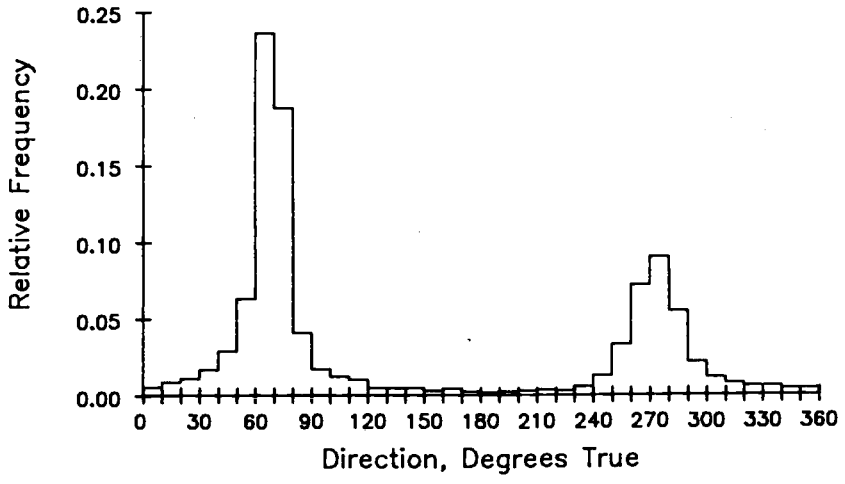


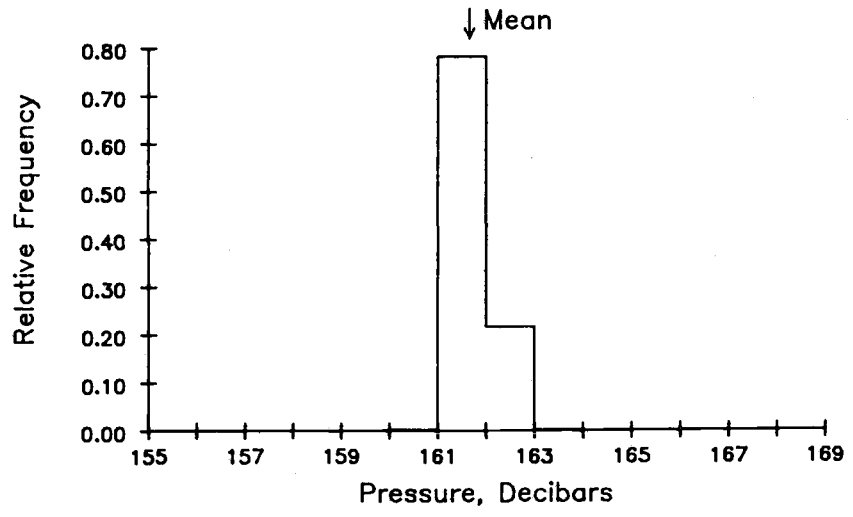




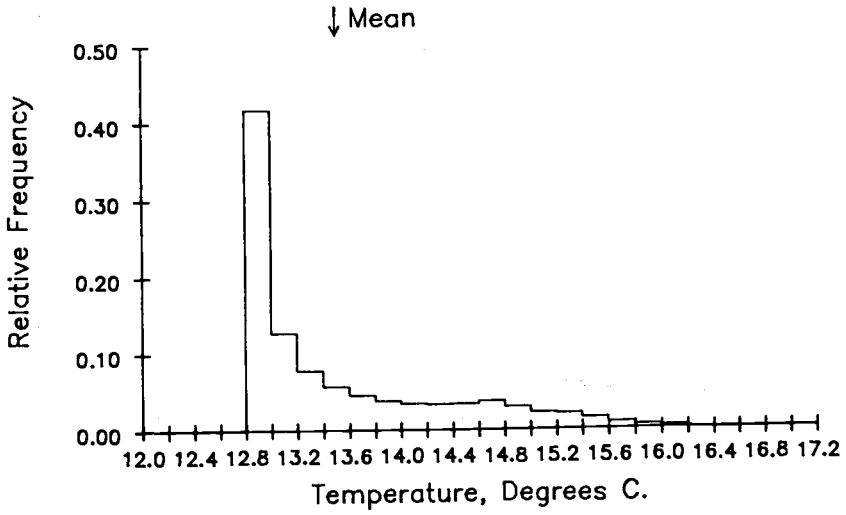
159 M AT GIBRALTAR C-9B. 28 MAY 86 - 13 OCT 86. TAPE 5646/26.

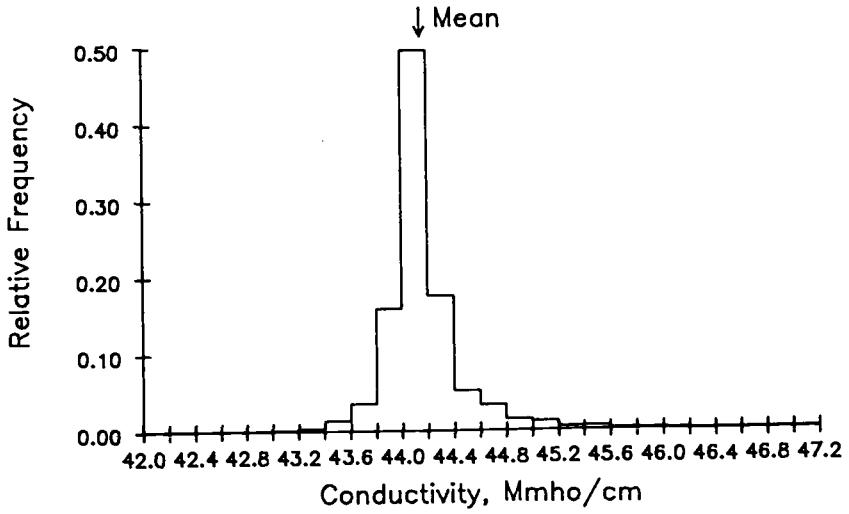


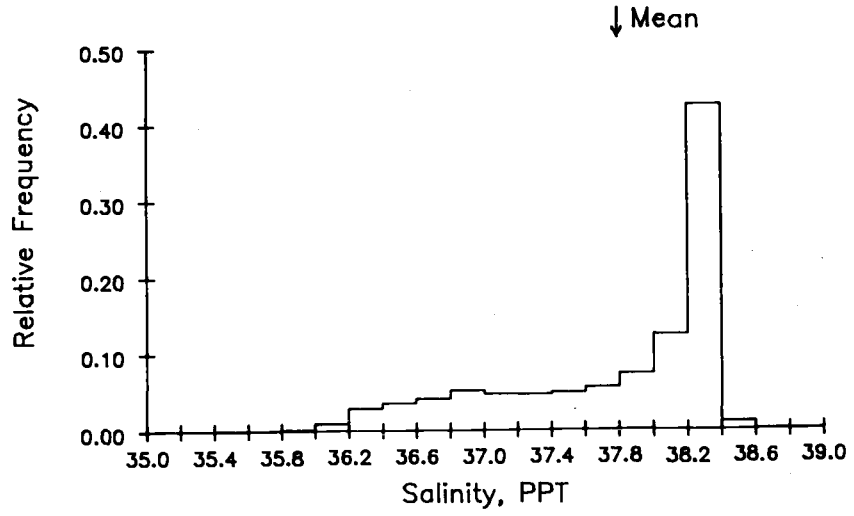




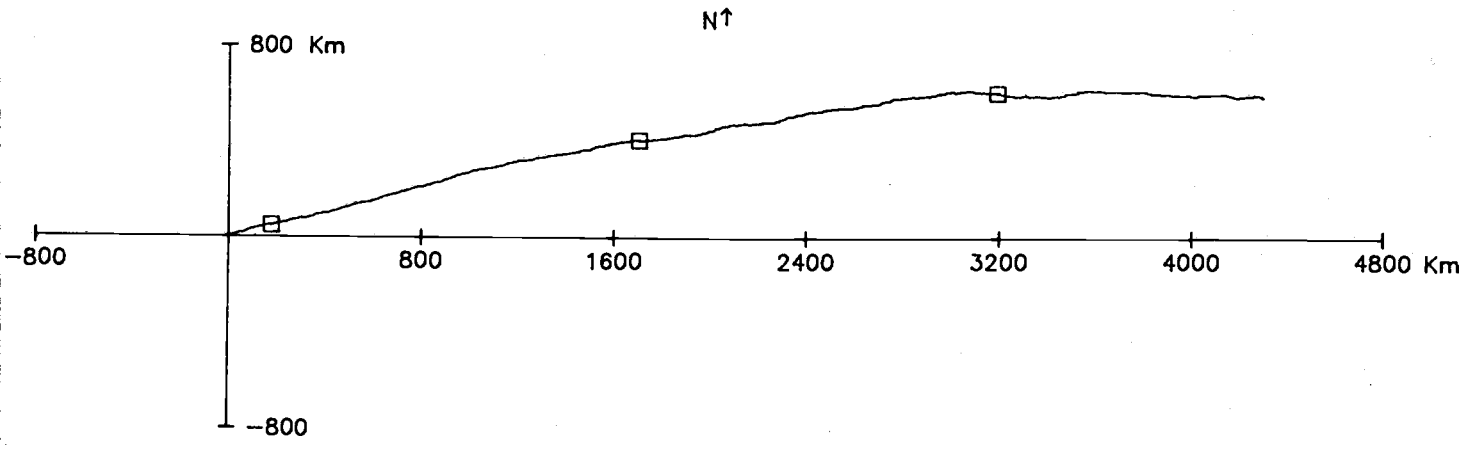
159 M AT GIBRALTAR C-9B. 28 MAY 86 - 13 OCT 86. TAPE 5646/26.

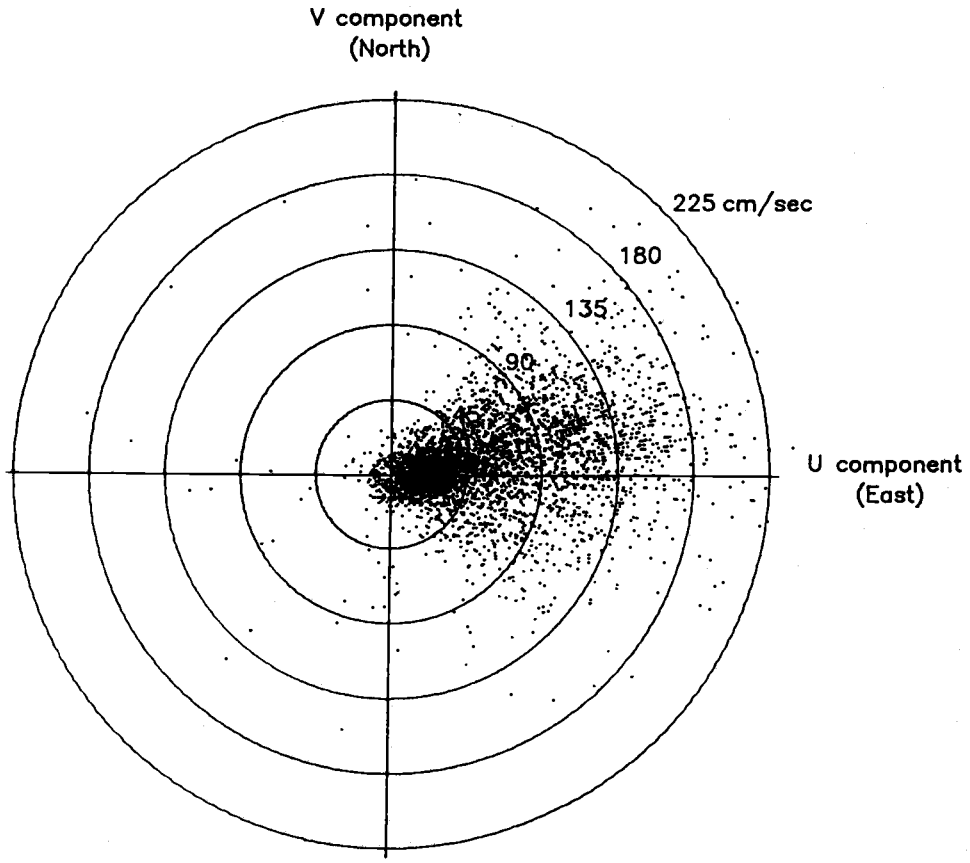




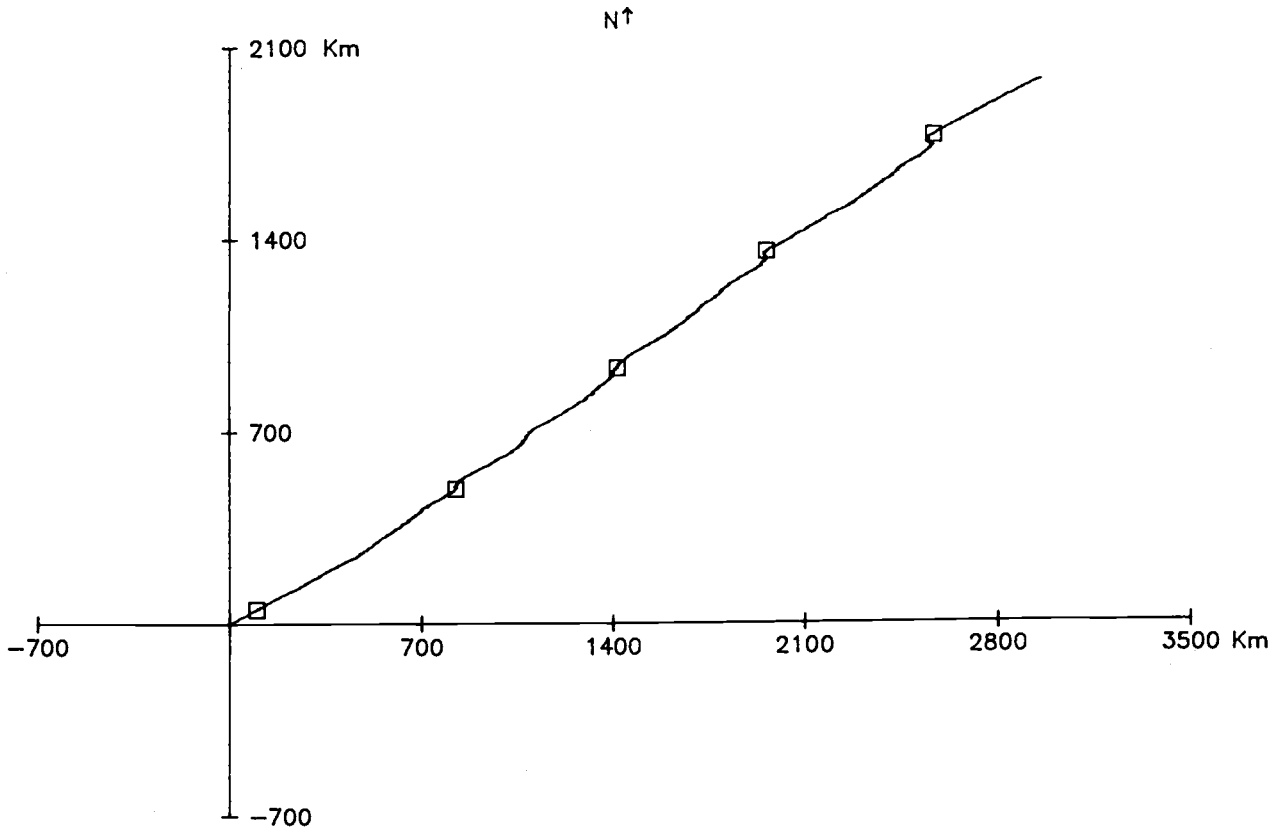


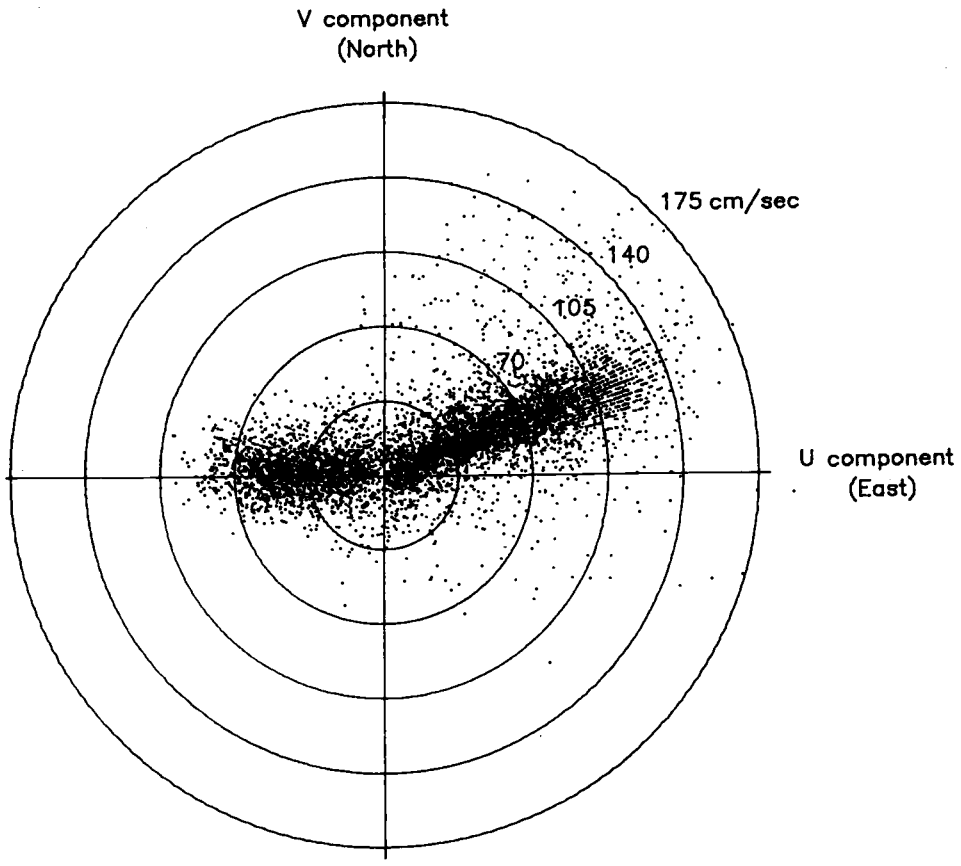
58 M AT GIBRALTAR C-9B. 28 MAY 86 - 22 AUG 86. TAPE 5647/28.



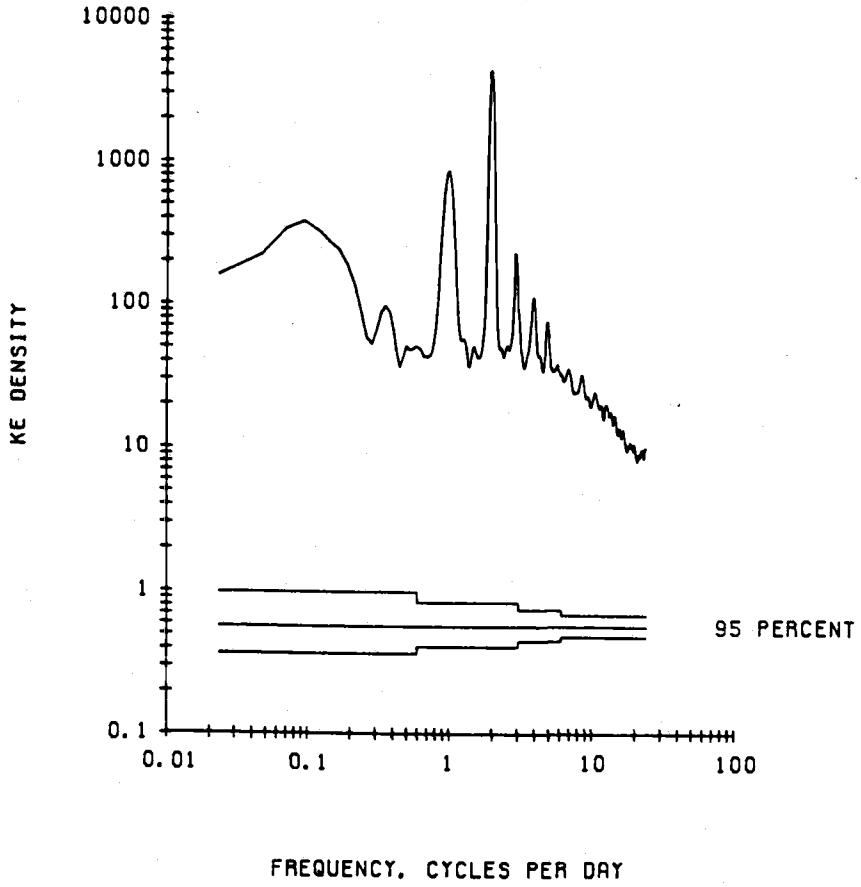


159 M AT GIBRALTAR C-9B. 28 MAY 86 - 13 OCT 86. TAPE 5646/26.

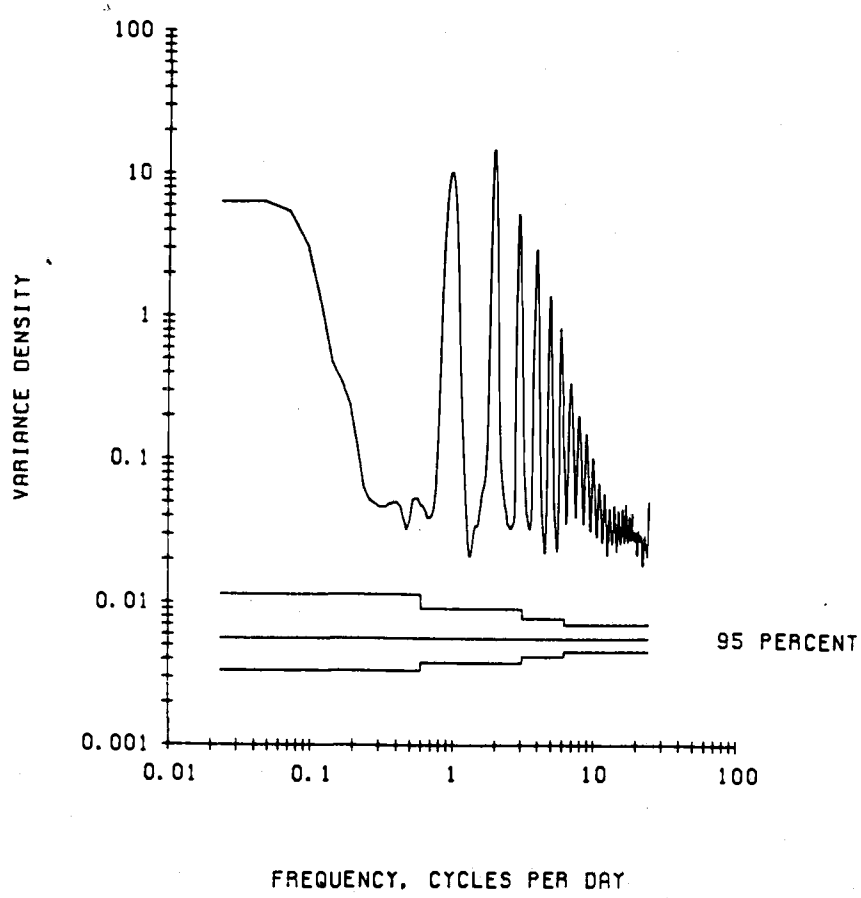




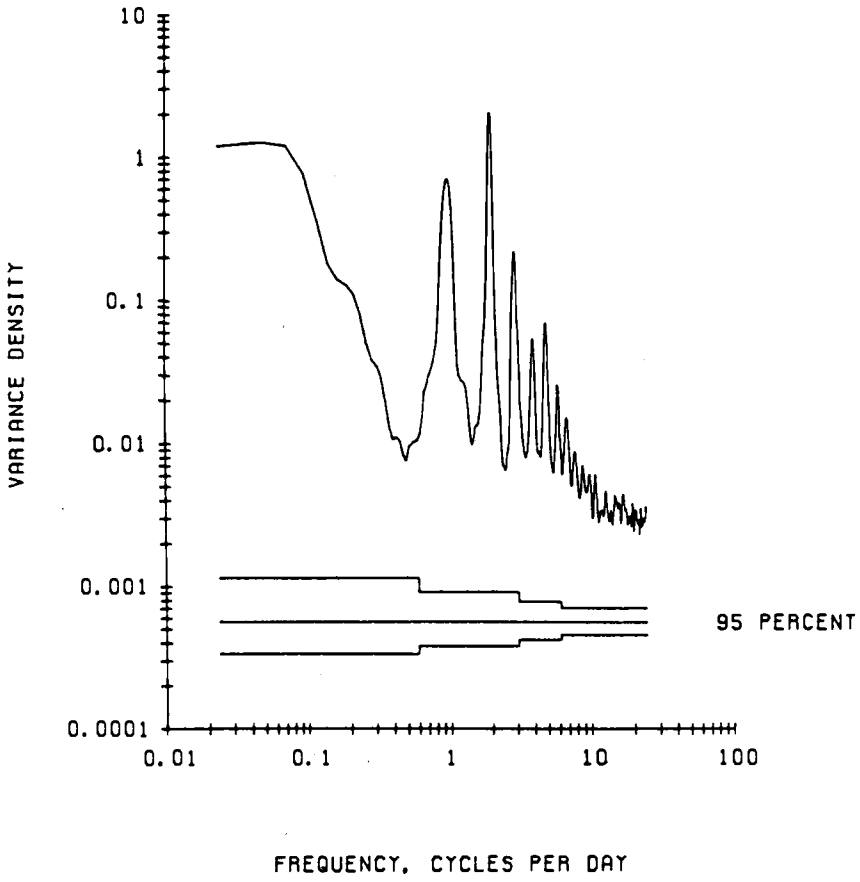
UNFILTERED CURRENT. 58 M AT GIBRALTAR C-98.



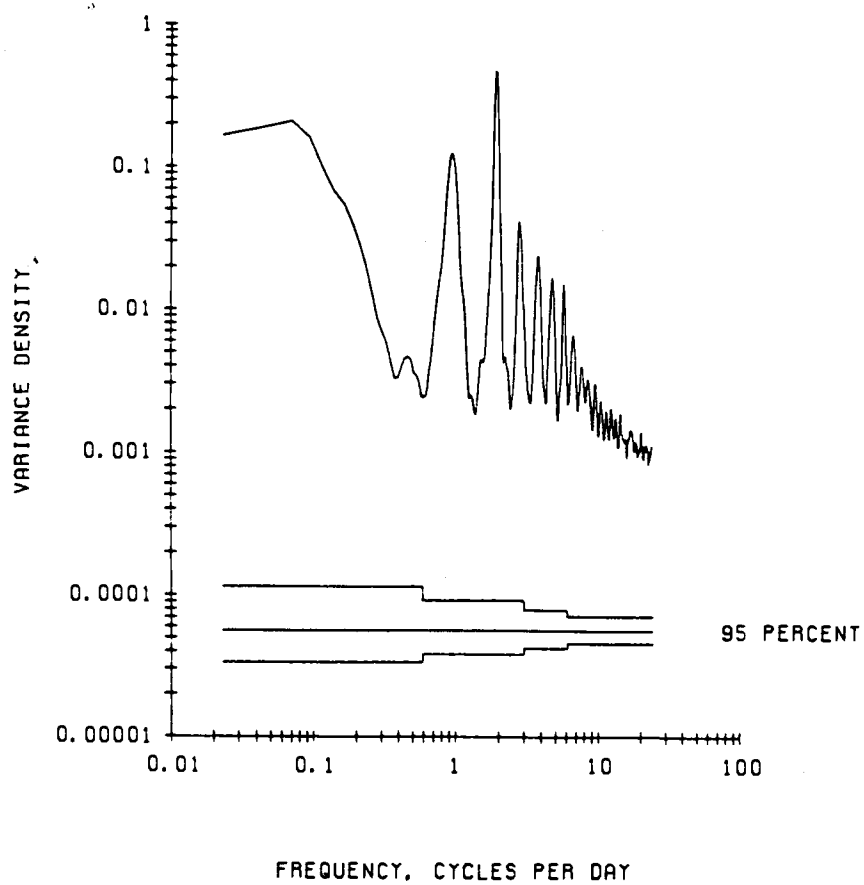
UNFILTERED PRESSURE. 58 M AT GIBRALTAR C-98.



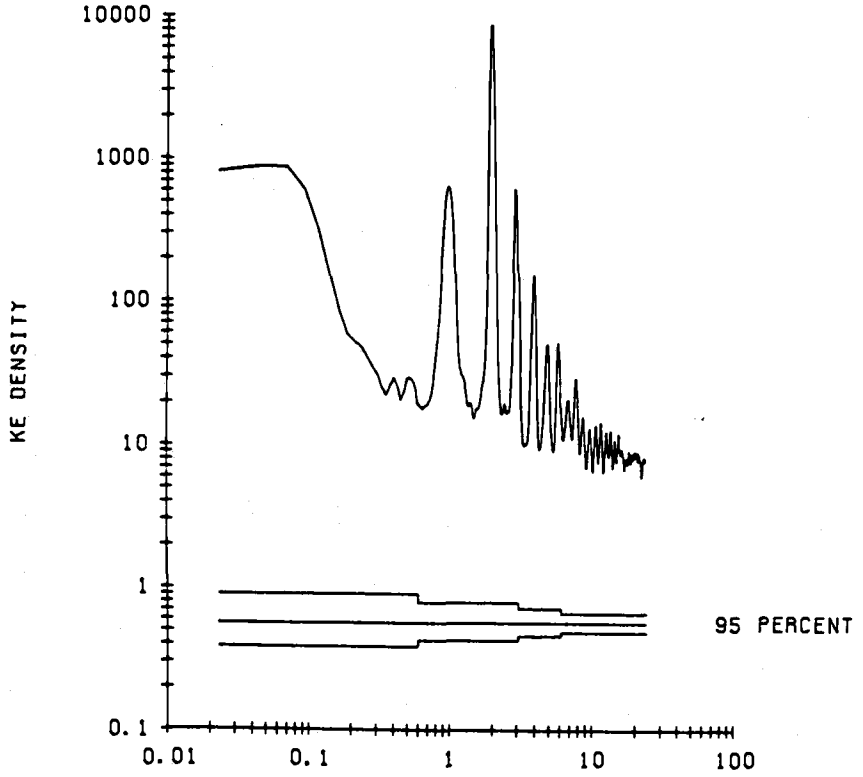
UNFILTERED TEMPERATURE. 58 M AT GIBRALTAR C-98.



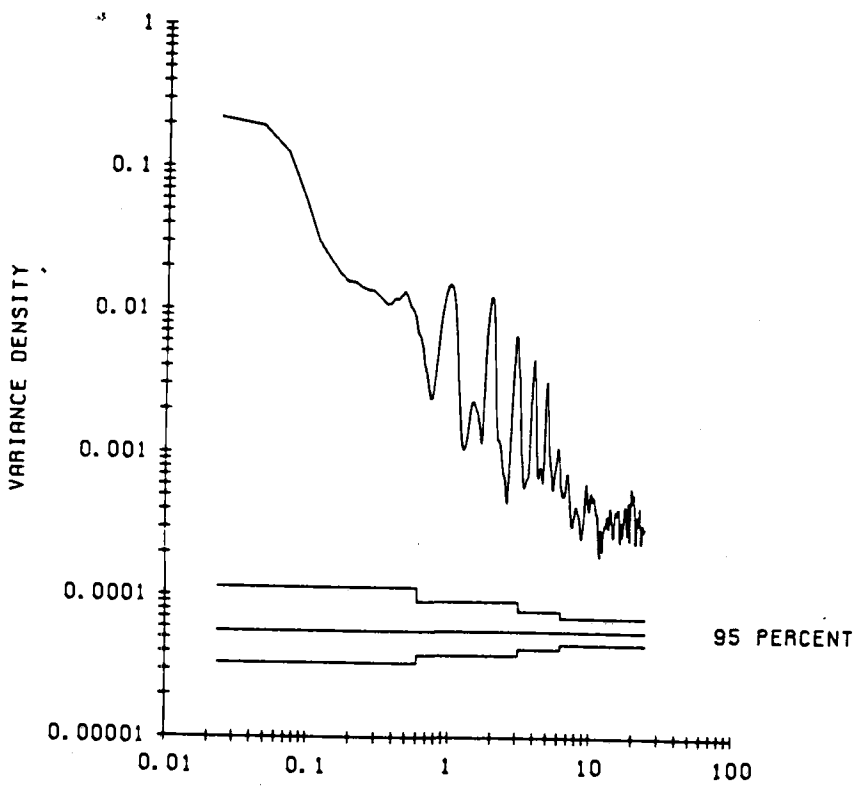
UNFILTERED SALINITY. 58 M AT GIBRALTAR C-98.



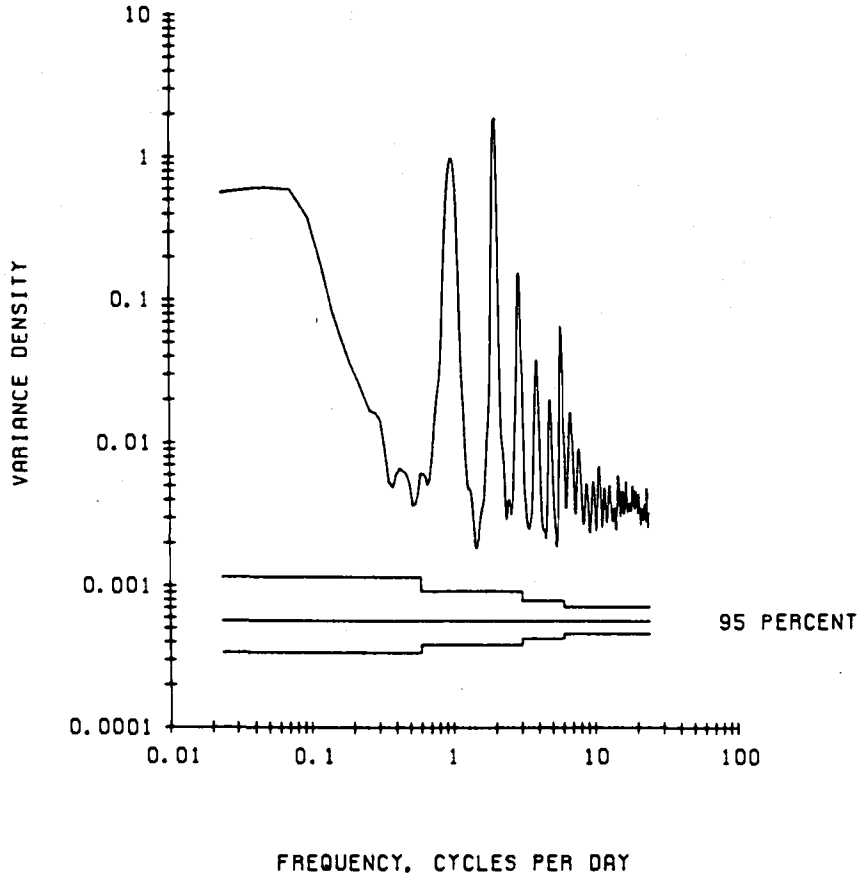
UNFILTERED CURRENT. 159 M AT GIBRALTAR C-9B.



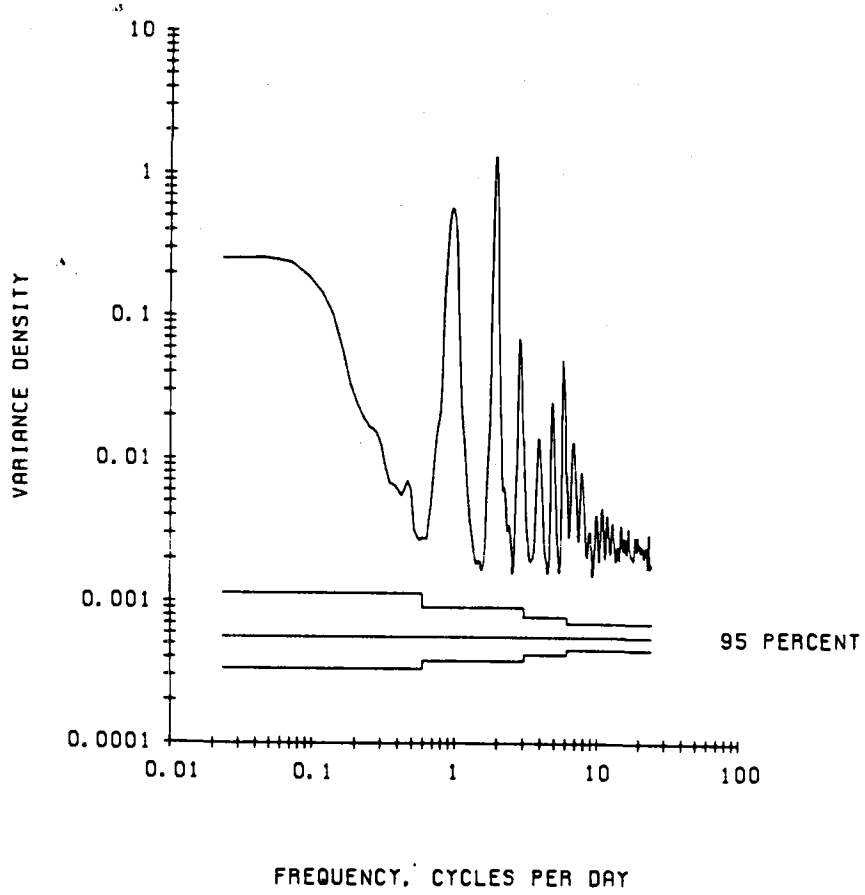
UNFILTERED PRESSURE. 159 M AT GIBRALTAR C-9B.

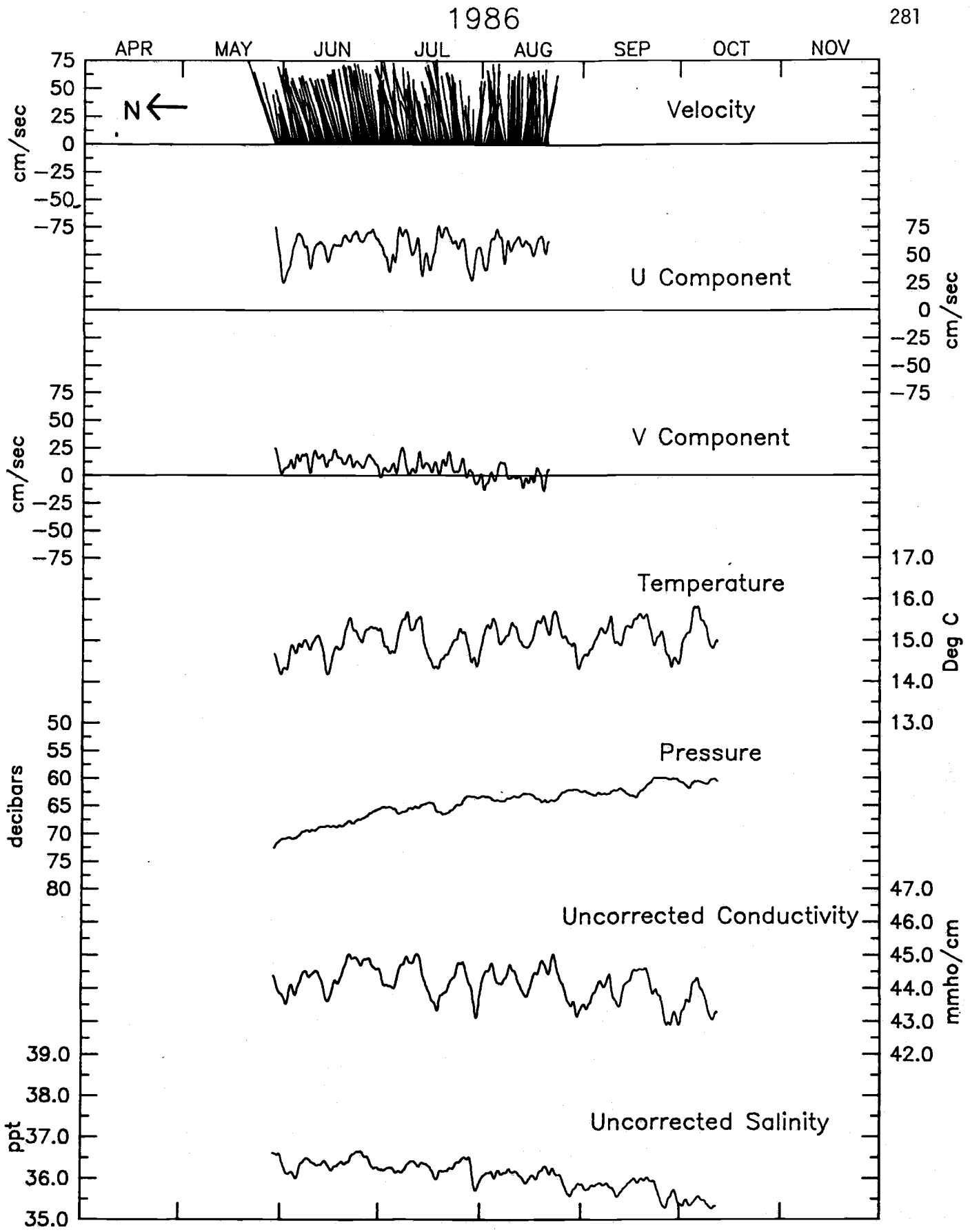


UNFILTERED TEMPERATURE. 159 M AT GIBRALTAR C-9B.

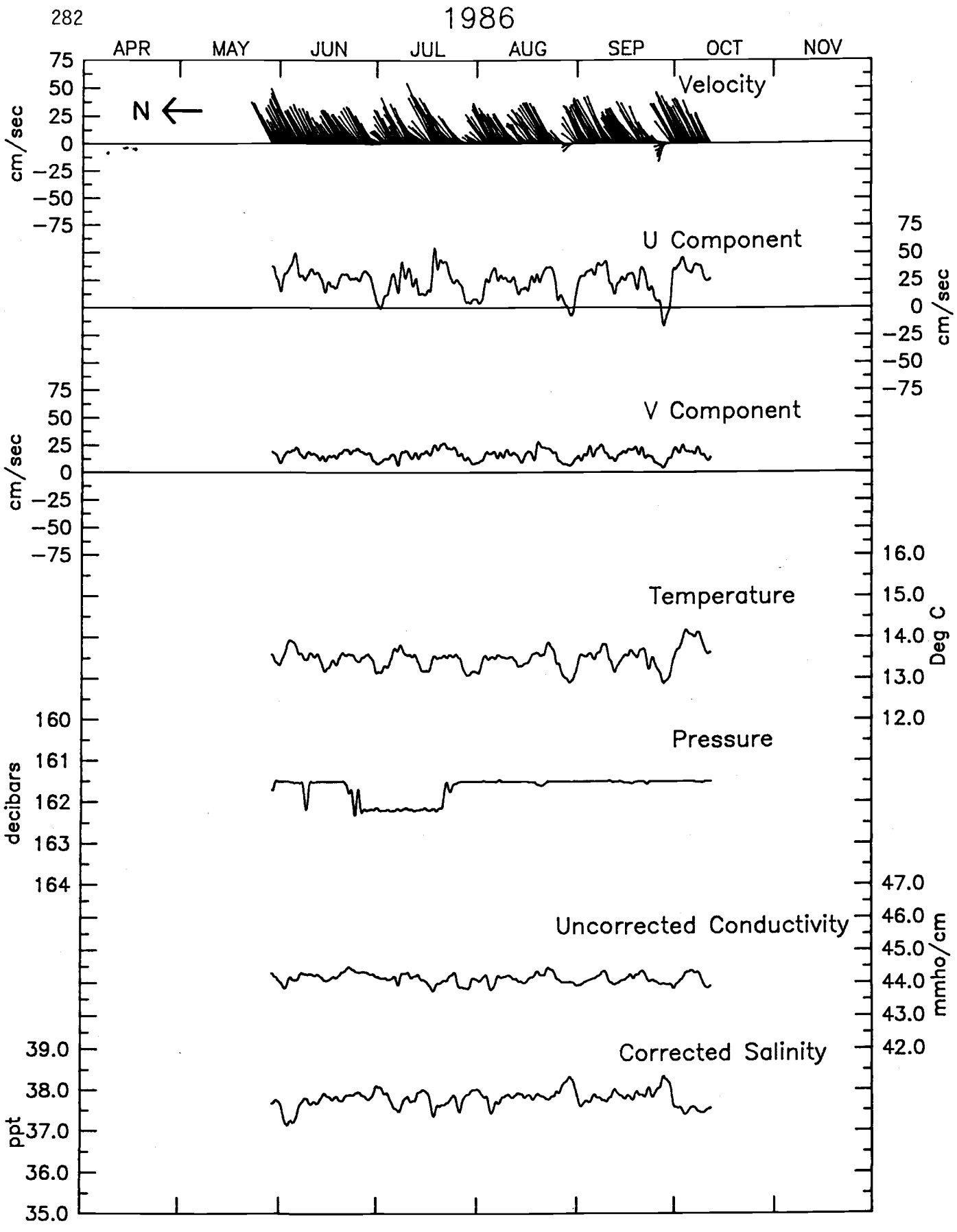


UNFILTERED SALINITY. 159 M AT GIBRALTAR C-9B.

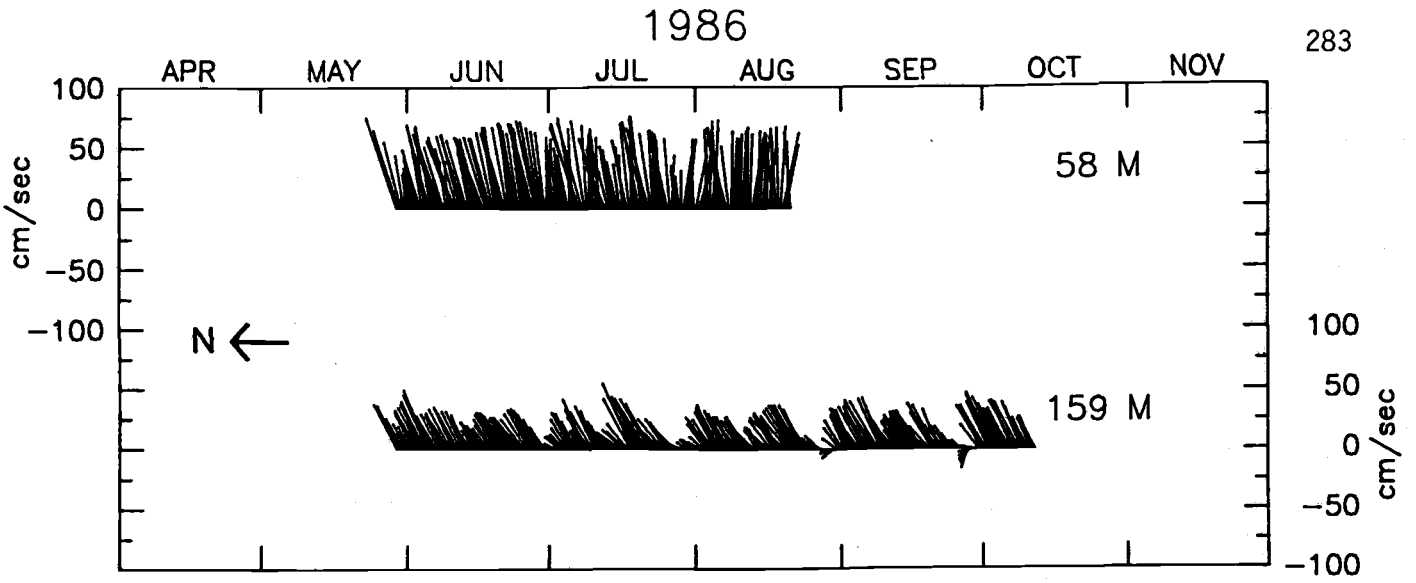




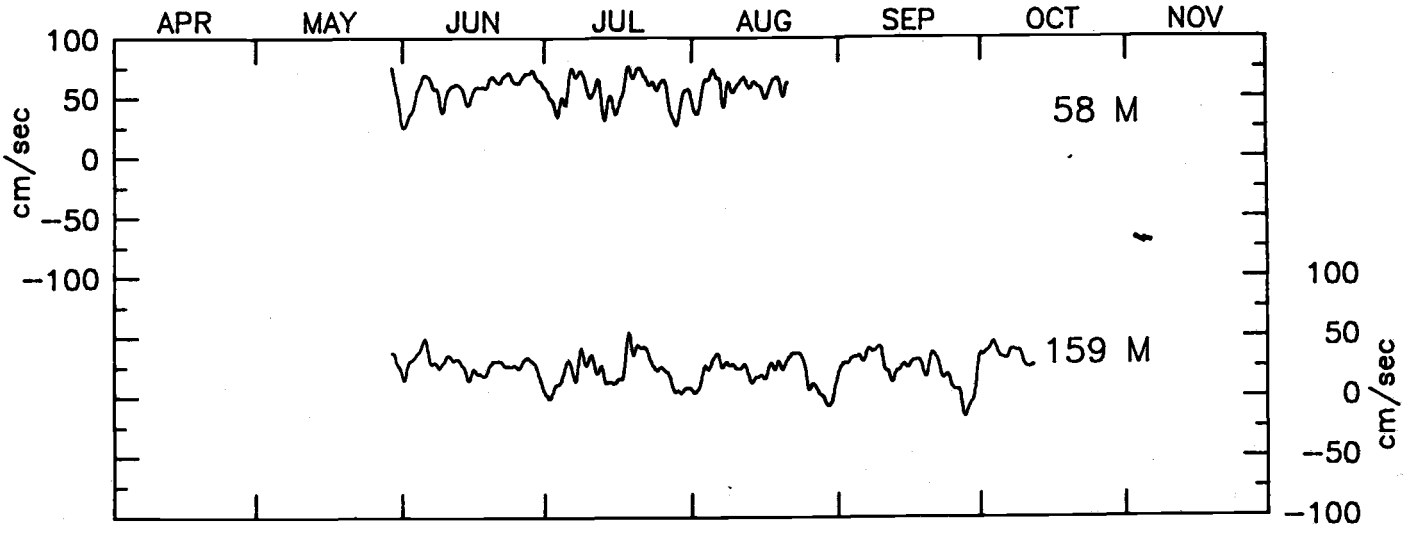
58 m at Gibraltar C–9B.



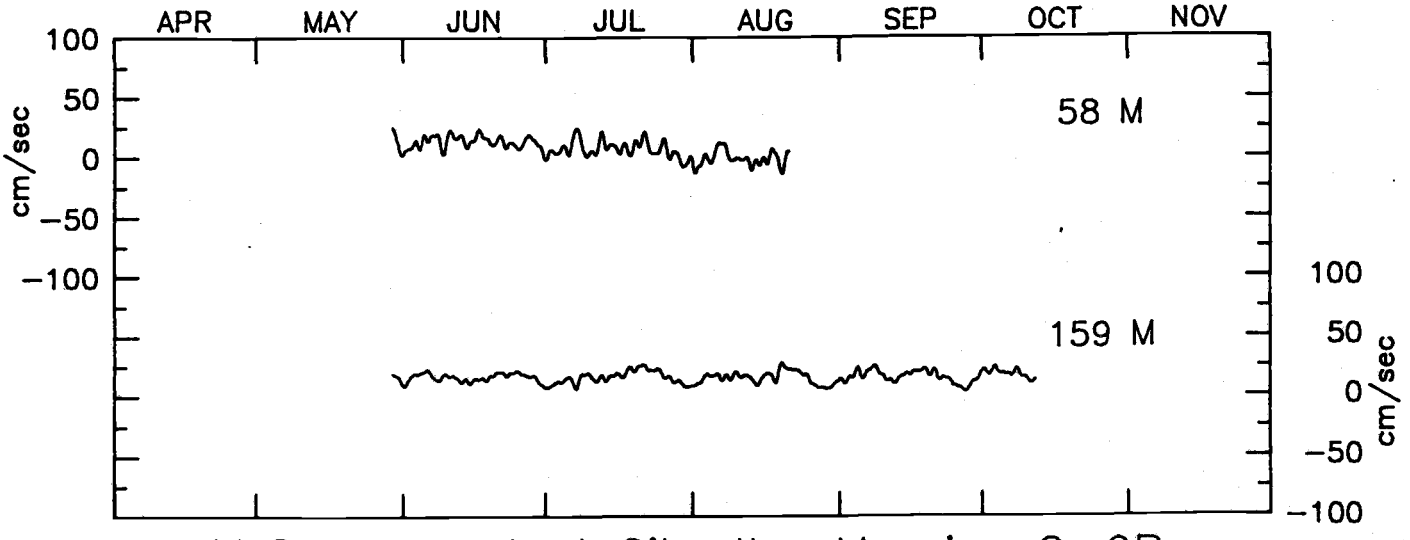
159 m at Gibraltar C−9B.



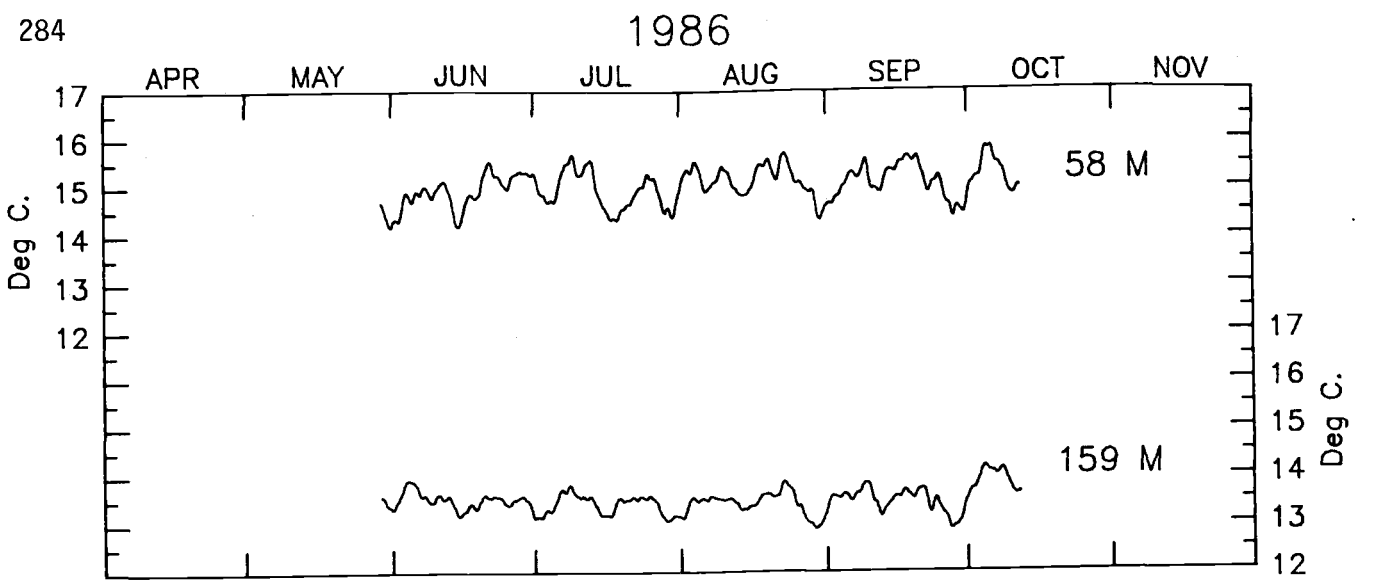
Velocity at Gibraltar Mooring C−9B



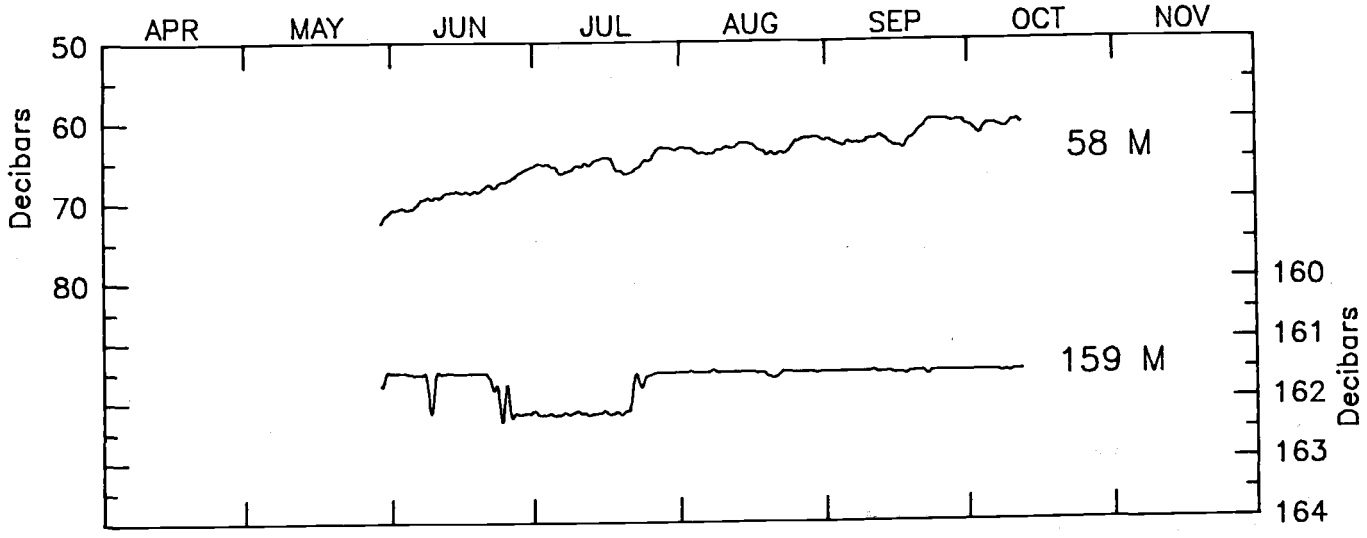
U Component at Gibraltar Mooring C−9B



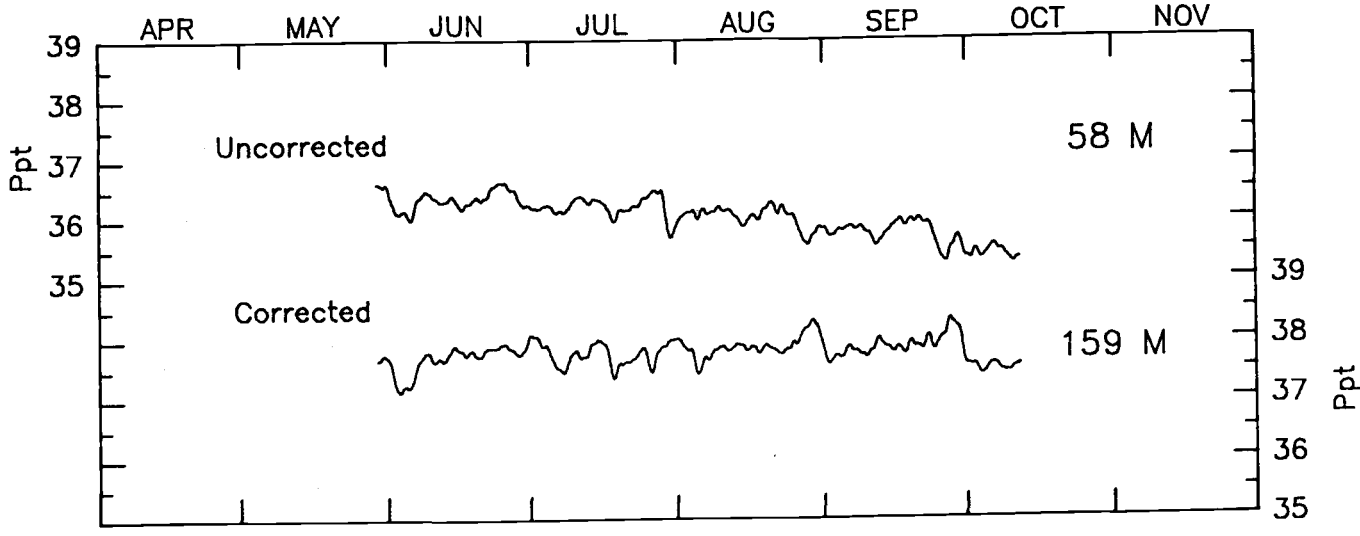
V Component at Gibraltar Mooring C−9B



Temperature at Gibraltar Mooring C–9B



Pressure at Gibraltar Mooring C–9B



Salinity at Mooring C–9B