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A COMPILATION OF MOORED CURRENT DATA AND ASSOCIATED OCEANOGRAPH--ETC(U)
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UNCLASSIFIED WHOI-76-41 NL

1 OF 2
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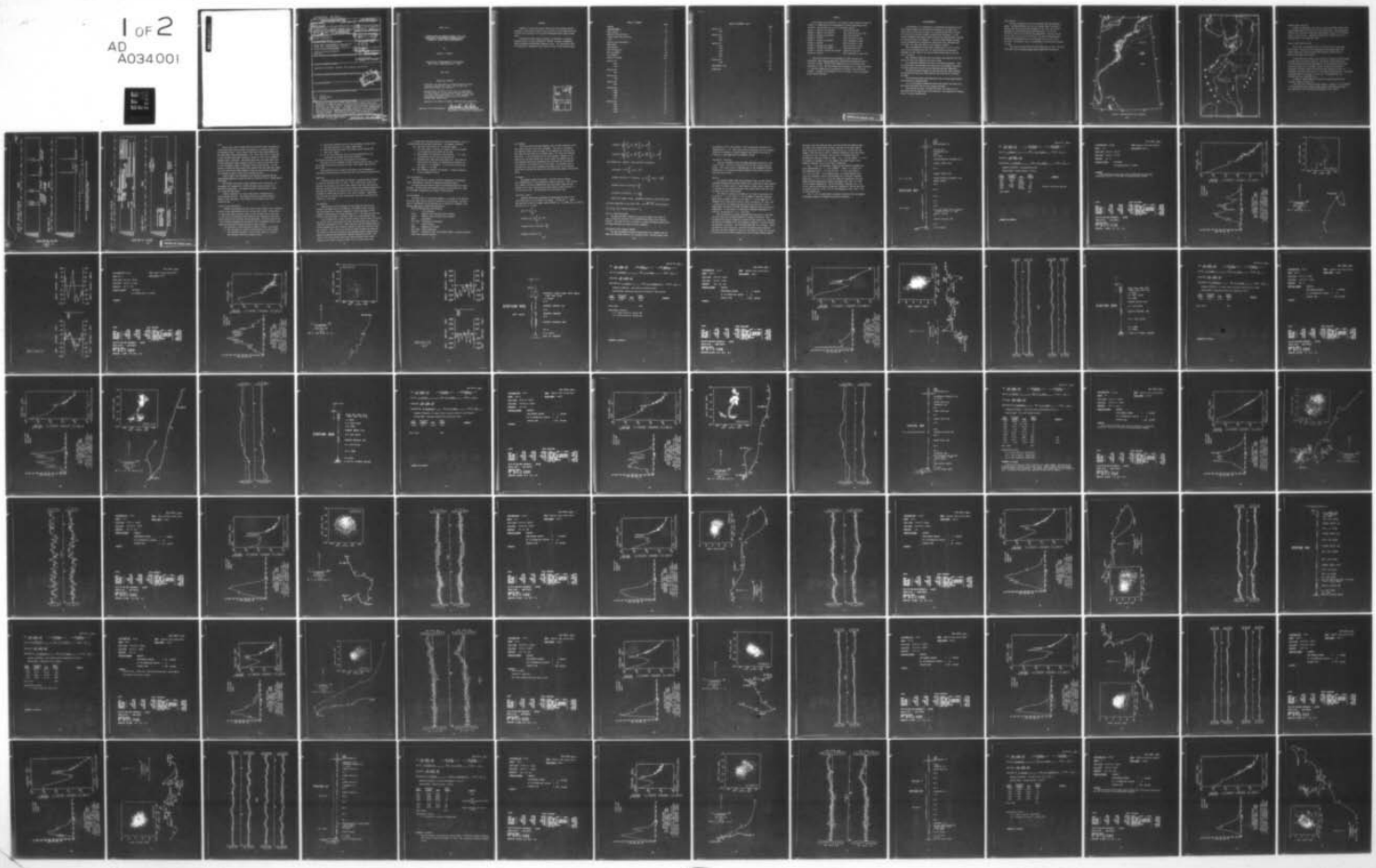

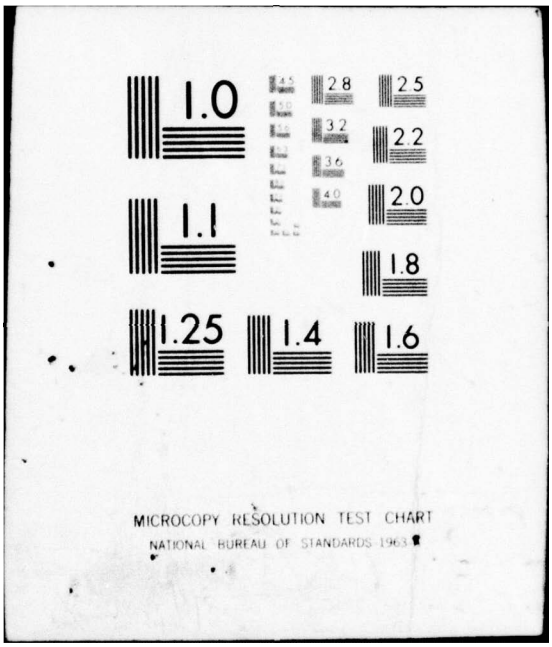
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MICROCOPY RESOLUTION TEST CHART
NATIONAL BUREAU OF STANDARDS 1963

ADA034001

UNCLASSIFIED MAY 1976

SECURITY CLASSIFICATION OF THIS PAGE (When Data Entered)

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2. Current Data
3. Moorings

20 ABSTRACT (Continue on reverse side if necessary and identify by block number)

Summaries of wind and current measurements from moored stations gathered by magnetic tape recording current meters and wind recorders, in late 1969 are presented also selected hydrostation data from the same areas. Averaged wind and current quantities are presented in computer generated output as basic STATISTICS, SPECTRA diagrams, PROGRESSIVE VECTOR diagrams and EAST-NORTH component plots. The hydrostation data are presented as temperature and salinity values plotted against pressure.

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WHOI-76-41

A COMPILATION OF MOORED CURRENT DATA AND ASSOCIATED OCEANOGRAPHIC OBSERVATIONS, VOLUME XI (LATE 1969 MEASUREMENTS)

by

Susan A. Tarbell

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Woods Hole, Massachusetts 02543

May 1976

TECHNICAL REPORT

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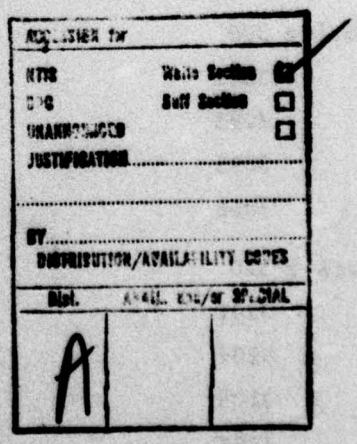
Approved for Distribution: Valentine Worthington, Chairman
Department of Physical Oceanography

ABSTRACT

Summaries of wind and current observations from moored stations gathered in late 1969 by magnetic tape recording current meters and wind recorders are presented, also selected hydrostation data from the same areas.

Averaged wind and current variables are presented in computer generated output as basic STATISTICS, SPECTRA diagrams, PROGRESSIVE VECTOR diagrams and EAST-NORTH component plots. The hydrostation data are presented as temperature and salinity values plotted against depth.



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PREFACE

This volume is the eleventh of a series of Data Reports intended to present, in summarized form, measurements collected from moored ocean stations. The following is a list of preceding reports.

Volume 1 - Webster and Fofonoff	Data from mid 1963
Volume 2 - Webster and Fofonoff	Data from XII-'63 to V-'64
Volume 3 - Webster and Fofonoff	Data from mid 1964
Volume 4 - Pollard	Data collected in 1965
Volume 5 - Tarbell and Webster	Data collected in 1966
Volume 6 - Tarbell	Data collected in 1967
Volume 7 - Chausse and Tarbell	Data collected in 1968
Volume 8 - Pollard and Tarbell	Array data from 1970
Volume 9 - Tarbell, Briscoe and Chausse	IWEX data from 1973
Volume 10- Tarbell	Data collected in early 1969

The back-up recovery system designed in 1968 (Berteaux and Heinmiller, 1969, W.H.O.I. Ref. 69-7 (unpublished manuscript)) proved its worth in 1969. Tests of wire samples and wire in moorings were continued in 1969. The Gulf Stream went through Site D in April resulting in fish bite damage and a re-evaluation of mooring lines and anchor weights. A change from mechanical clocks to crystal clocks was started at the end of the year.

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ACKNOWLEDGMENTS

Unfortunately it is impossible to acknowledge individually everyone who gave support to the Moored Buoy Program in any given year. Ideas from any source are valuable to a growing project and of course the skills of the project support personnel are invaluable. As the Project expanded, more people became involved and specialization started to divide the group into segments. The basic groups became oriented around Instrumentation, Engineering, Operations, Data Processing and of course, the glue that holds us all together, Science.

The instrumentation group became responsible not only for maintaining the instruments but also for improving them and designing equipment to test them for the various malfunctions seen in the lab and in the data.

The engineers design and test new mooring configurations and components to meet more demanding scientific needs.

The operations personnel are also the sea-going personnel. They set and retrieve the moorings and maintain all the equipment necessary for these operations as well as the individual mooring components.

The data processors decode the data and edit out known problems, then arrange the data into forms used by the scientists to interpret the data.

The scientists devise the experiments that the Buoy Group handles and evaluate the returning data.

It is the splendid cooperation among these groups that makes the Buoy Group successful and this Data Report necessary.

The patience and skill of Audrey Williams, who typed the text and tables for this report and of Ann Whitlatch, who prepared the computer plots, is greatly appreciated.

Data Location

The data collected in 1969 were gathered from four different sites: the Mediterranean Sea, the Gulf Stream, Site L and Site D. Mooring 289 was set in the Mediterranean at 38° 01'N, 04° 59.9'E; moorings 304 and 305 were Gulf Stream moorings at 36° 23.4'N, 70° 00.2'W and 36° 43'N, 70° 00.3'W respectively. Mooring 314 was set at Site L at 34° 02.7'N, 70° 02'W. The rest of the data were collected from moorings set in the vicinity of Site D, 39° 10'N, 70° 00'W. See figures 1 and 2 for positions of the moorings relative to land.

This report presents data from the later part of 1969. For data from early 1969 see W.H.O.I. Ref. 76-40 (unpublished manuscript).

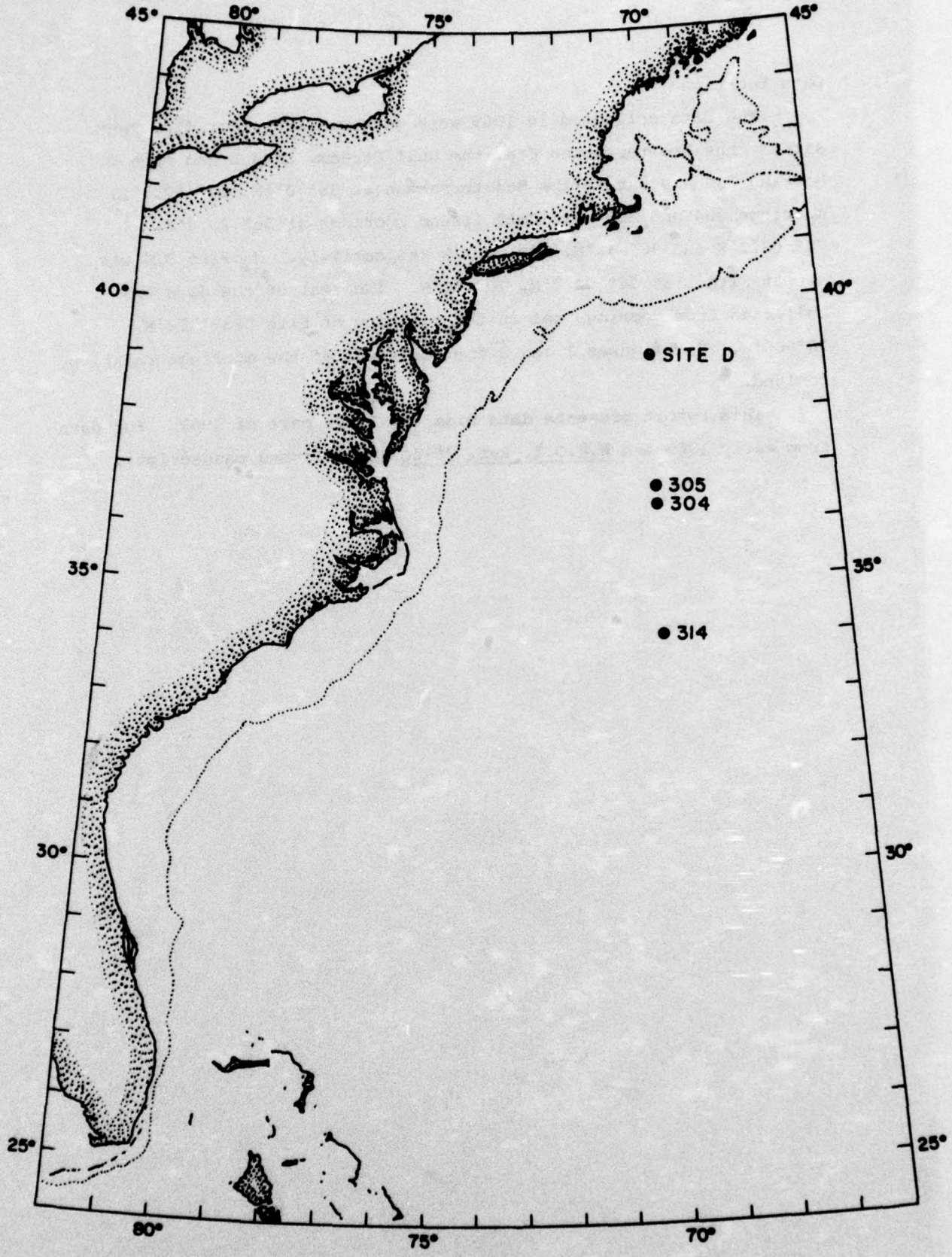

Figure 1 Mooring Sites in N.W. Atlantic

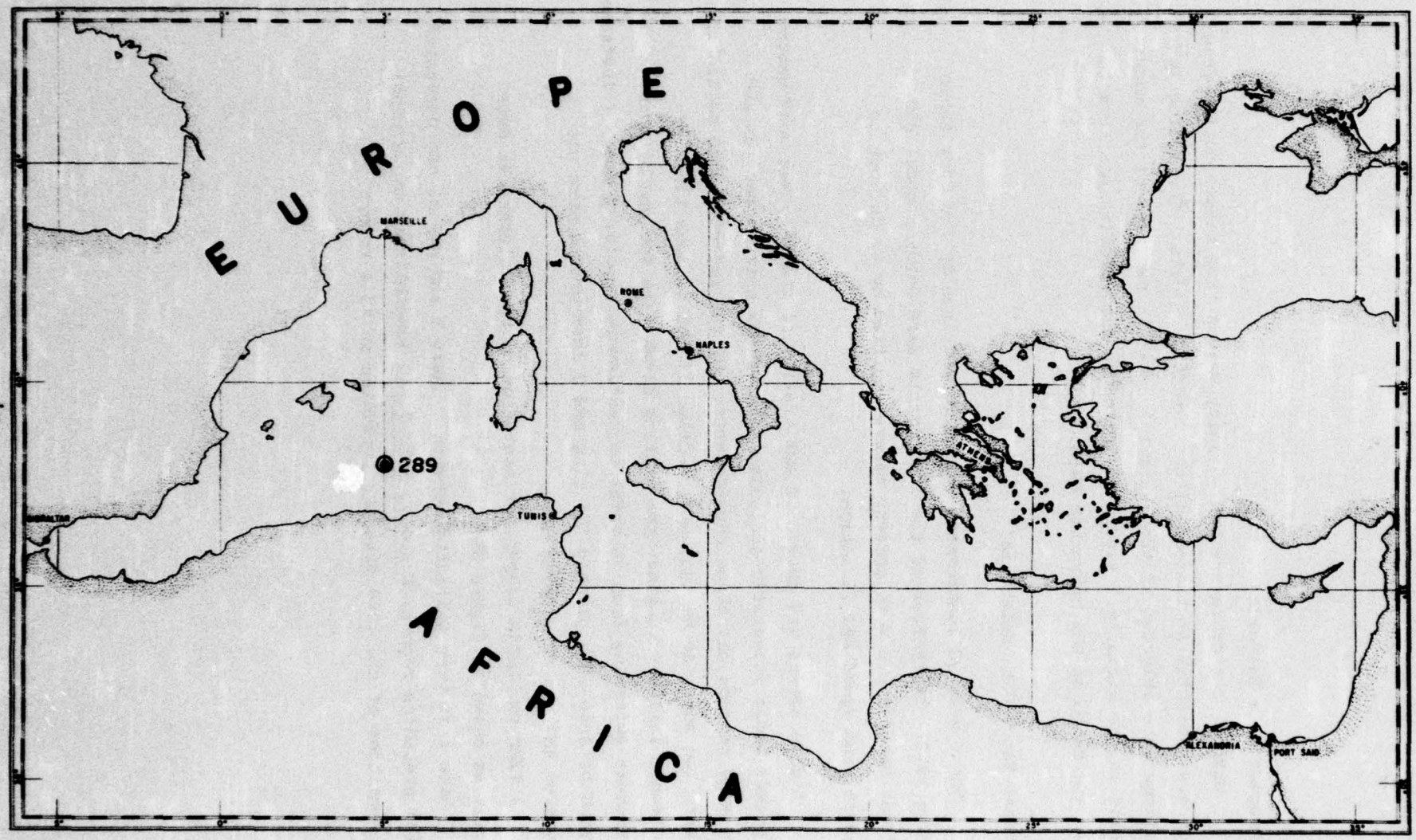

Figure 2 Mooring Site in Mediterranean Sea

Hydrocast Data Selection

Graphs of temperature and salinity values from Nansen bottle readings are presented at the end of the directional data. The hydrographic stations were selected if they were taken within two days of the mooring period in the vicinity. Figure 3A indicates the relative position in time and depth of the hydrocast data.

Current Meter Data Selection

There were 72 instruments set on 35 moorings by the Buoy Group during 1969. Sixty-four of the instruments were Geodyne model 850 current meter and 8 were current meters modified by Woods Hole to measure wind speed and direction.

A data series was chosen if the quality of the data was good enough to permit basic scientific analysis. Thirty-six current records and five wind records met these requirements. Of the rejected data series, 12 were too short to be included; another 11 had various kinds of electronic failures ranging from writing blank tape for one bits to instrument switching from interval to continuous recording mode; 1 instrument flooded because of a pinched 'O' ring and 7 instruments were not recovered and are considered lost.

A TIME vs. DEPTH graphic presentation of the selected 41 data records is shown in figure 3B.

Data that were initiated between January 1 and May 31 are presented in the preceding report, W.H.O.I. Ref. 76-40 (unpublished manuscript). The remainder of the 1969 data are presented in this report.

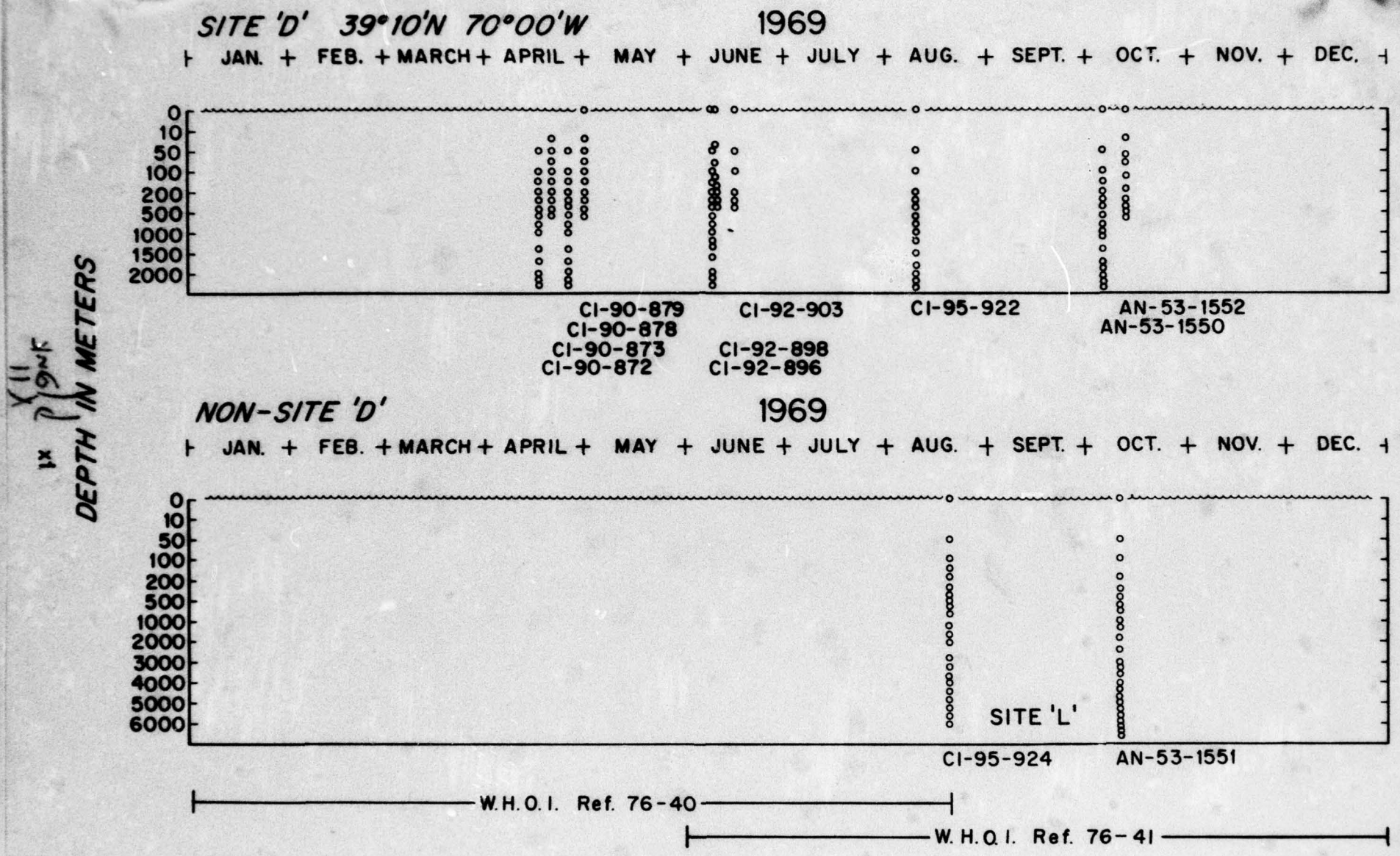

Figure 3A Selected Hydro Stations Collected near Mooring and Plotted According to Date and Sensor Depth

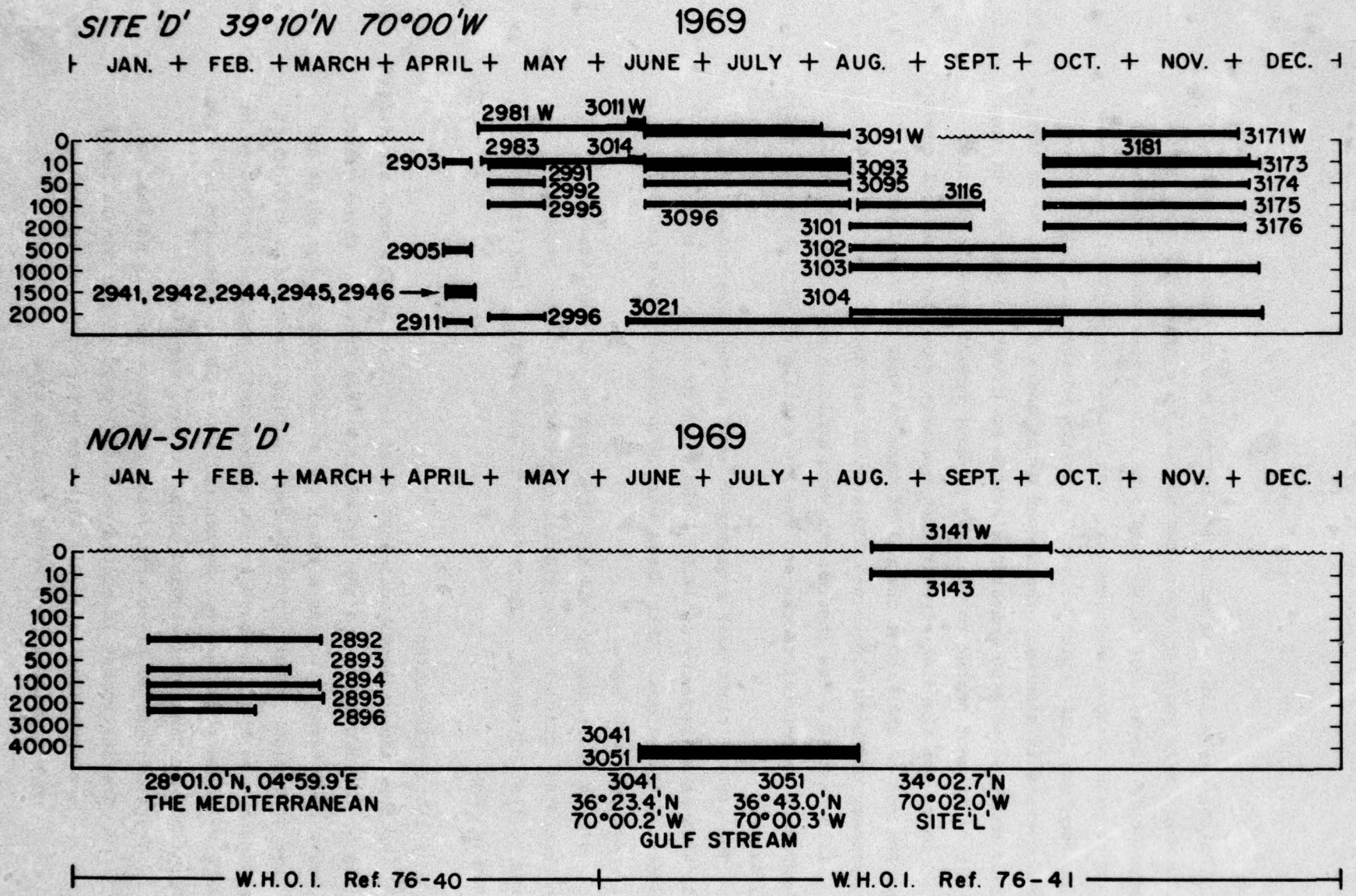

Figure 3B Wind and Current Meter Data Duration Plotted According to Time and Sensor Depth

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Clock

During early 1969 the model 850 current meters used two mechanical clocks which were wound up every two minutes by a solenoid, similar to an automobile clock. One of these clocks made 1-hour measurements and the other made 12-hour measurements. The 1-hour clock had a 4 lobe cam on the one-hour shaft which actuated a switch to turn on the recording sequence every 15 minutes. The second clock had a one lobe cam on the 12-hour shaft which also actuated a switch to insert in the data train, a 4 bit instrument number to identify 12-hour record cycles. It also served to re-arm the stop circuit that operates when the tape foil comes up at the end of the second channel of tape to shut off the instrument. The accuracy of these clocks was ±10 seconds per day.

Late in 1969 a few instruments were modified replacing the two asynchronous mechanical clocks and one R-C oscillator with a single quartz oscillator.

The crystal clock uses a quartz crystal as the time source. It oscillates at a frequency of 74.5654 kHz which drives a chain of 42 divide-by-2 flip-flops. This makes available output pulses at rates up to once per 2048 hours.

Time is indicated by a 14 bit time word at the beginning of each recording interval. The digital clock also provides clocking pulses to the instrument. The accuracy of the digital clock is ±1 second per day.

Back-up Clock Information

Another time-related activity, first tried in April, puts artificial events at the beginning and the end of each data record. These events, at known real times, provide a check on the accuracy of the clock and in case of a clock problem provide back-up time information with which the accuracy of the time base can be determined. This has proved to be a very valuable procedure for mechanical clock instruments and has also simplified the task of assigning times to data records.

The procedure to place artificial events on tape is as follows:

A) The instrument is turned on and allowed to run for at least two recording intervals with its rotor taped so it cannot move causing a zero rotor speed on tape.

B) During the recording cycles of two succeeding records untape the rotor and spin it to cause a speed spike.

C) Tape the rotor again until just before launch causing more zero rotor speeds.

D) Do not turn either the clock or the recording part of the instrument off between events and launching.

The reverse procedure applies to the recovery of instruments.

The time when the instrument started recording and the times of the rotor spins are recorded according to radio time signals from stations WWV or CHU.

This procedure also is useful with digital clock instruments in cases where the oscillator is correct but the clock word is malfunctioning.

SHEAR TIME

A program called SHEAR TIME was devised to establish best estimates of time for continuous 850 C. M. data. First, provisional linear corrections for the large clock drift rates (minutes per day) were applied, then the intervals between clock switch closures were displayed graphically. The time rate could then be adjusted with as many linear rate changes as needed to smooth the variations in the switch closures. SHEAR TIME was only used on continuous 850 current meter data which used mechanical clocks for a time base.

Data Editing

Data from both the old mechanical clock model 850 and the new crystal clock model 850 are recorded on 1/4" magnetic tape. The data were transcribed onto computer compatible 7-track tape using a PDP-5 computer (manufactured by Digital Equipment Co.). The data were then converted to Maltais format (J. Maltais, 1969) on 9-track magnetic tape.

Once the data are on tape in Maltais format, various types of editing can be done such as replacing values that are obviously bad or removing systematic instrumental errors. After the data have been edited they are vector averaged over each recording interval to give one velocity vector per interval. These vectors are listed in terms of speed and direction. The launch and retrieval transients are truncated and any remaining bad points are deleted and replaced by linearly interpolated values. The result is an evenly spaced time series called the best basic vector averaged series which is used as input for all further processing.

To insure that each data series has a unique identifier, a set of informal guidelines has been established. For example, 2981WL900

298 - The first three digits are the mooring number.

1 - The fourth digit indicates the position of the instrument on the mooring counting from the top down.

W - When present "W" signifies a wind recorder, a "Y" would signify that the data has been read by eye.

L - Indicates that some editing has been done. The amount of editing done can usually be inferred by the position of the letter in the alphabet. If no editing has been done the symbol $ is used.

900 - The averaging interval, 900 seconds. 1H would indicate a 1-hour averaging interval.

Data Presentation

Data from wind and current recording instruments are presented first, followed by a section of selected hydrostation data.

The data from each mooring follow a two-page description of that mooring. The data from each selected series are presented with 1 page of instrument information and 3 pages of data displays.

Mooring Summary

The first page of the mooring summary is a diagram of the mooring. The second page contains general information on the mooring. For more detailed information on the moorings set in 1969 see G. Volkmann, 1970, W.H.O.I. Ref. 70-37 (unpublished manuscript).

The mooring page uses the following:

*	data presented
M.C.M.	magnetic tape recording current meters
M.W.R.	magnetic tape recording wind recorders
Tens.	tensiometer
Tel. Tens.	telemetering tensiometer
D.R.	depth recorder
Temp.	temperature recorder
Volt. Dig.	voltage digitizer
Vib/Ten	tensiometer with accelerometer added to measure vibration
Press. Rec.	pressure recorder

Data Summary

The first page of the data summary lists the main features of the data series collected from that instrument. The type of instrument, the sampling scheme, and the timing of the sampling are listed as are the start and stop times of the useable data. All times are Greenwich Mean Time. If the instrument did not work properly, comments on its behavior and the data quality are written under the comments section. Some standard statistical parameters are calculated for the data and are presented on the bottom of the first page. The formulas used to calculate the statistical parameters and descriptions of the various plots used to present the data on the following three pages are described below.

Histograms

Histograms of speed are plotted. The plots may be thought of as approximations to the probability density functions. The vertical axis labeled "relative frequency per unit cell width" shows the percentage of the total record that occurred within a given interval of the horizontal axis. The area under the curve equals 100%.

Statistics (STATS)

Standard statistical parameters are calculated for data in the time range given at the bottom of the table. If there are n speed and direction values in a sample, and we define $E_i = s_i \sin\theta_i$, $N_i = s_i \cos\theta_i$, then for $A = E, N,$ and s,

$$\text{mean, } \bar{A} = \frac{1}{n}\sum_{i=1}^{n} A_i$$

$$\text{variance, } \sigma_A^2 = \frac{1}{n}\sum_{i=1}^{n} A_i^2 - \bar{A}^2$$

$$\text{standard error of the mean} = \frac{\sigma_A}{\sqrt{n}}$$

$$\text{standard deviation} = \sigma_A$$

$$\text{skewness} = \frac{1}{\sigma_A^3}\left[\frac{1}{n}\sum_{i=1}^{n} A_i^3 - \frac{3\bar{A}}{n}\sum_{i=1}^{n} A_i^2 + 2\bar{A}^3\right]$$

$$\text{kurtosis} = \frac{1}{\sigma_A^4}\left[\frac{1}{n}\sum_{i=1}^{n} A_i^4 - \frac{4\bar{A}}{n}\sum_{i=1}^{n} A_i^3 + \frac{\overline{6A}^2}{n}\sum_{i=1}^{n} A_i^2 - 3\bar{A}^4\right]$$

The program also computes "East and North" statistics,

$$\text{covariance, } M = \frac{1}{n}\sum_{i=1}^{n} E_i N_i - \bar{E}\,\bar{N}$$

$$\text{standard deviation of covariance, } \sigma_m = \frac{1}{n}\sum_{i=1}^{n} (E_i N_i)^2 - \overline{E_i N_i}^2$$

$$\text{standard error of covariance} = \frac{\sigma_m}{\sqrt{n}}$$

$$\text{correlation coefficient, } M' = \frac{M}{\sigma_E \sigma_N}.$$

STATS also computes these parameters related to vector quantities: the scalar amplitude of the vector mean, $V_m = \sqrt{\bar{E}^2 + \bar{N}^2}$; vector variance, $V_v^2 = \frac{1}{2}(\sigma_E^2 + \sigma_N^2)$; standard deviation = V_v.

East vs. North Scatterplot

The EAST and NORTH components are plotted against each other to give a pictorial indication of the DIRECTION and SPEED of the velocity vectors. This type plot can be helpful in finding instrument malfunctions and characteristics not easily noticed elsewhere.

Progressive Vector Diagram (PROVEC)

The EAST and NORTH progressive displacements are computed from the SPEED and DIRECTION values of one recording cycle. The plot begins with

an asterisk (*) on a day boundary. All following day boundaries are indicated with a (+). This type of plot accentuates very low frequency events at the expense of higher frequency oscillations which may be hidden by a large amplitude low-frequency current.

Variable vs. Time Plot

This is a diagram of EAST and NORTH components plotted as a function of TIME. The plot is generated from the basic vector averaged series. This type of plot is complementary to the PROGRESSIVE VECTOR diagram since it accentuates higher frequency events such as inertial and tidal oscillations.

Spectra

The program TIMSAN (Time Series Analysis) uses the Fast Fourier Transform algorithm of Singleton (1969) and is restricted to data segments of length N points, where N must contain no prime factor larger than 5, and must be less than 8000 points; data series longer than this must be broken into two or more pieces.

The number of degrees of freedom for the first 40 plotted points is given by $\nu = a\ m\ s$ where m is the number of adjacent frequency bands being averaged as stated in the label, s is the number of independent data pieces being averaged, again as stated in the label, and a should be two for temperature spectra and for Horizontal Kinetic [HKE] spectra for which the EAST and NORTH components seem statistically independent. In the absence of information regarding NORTH-EAST correlation, one should use $a = 2$ to be safe.

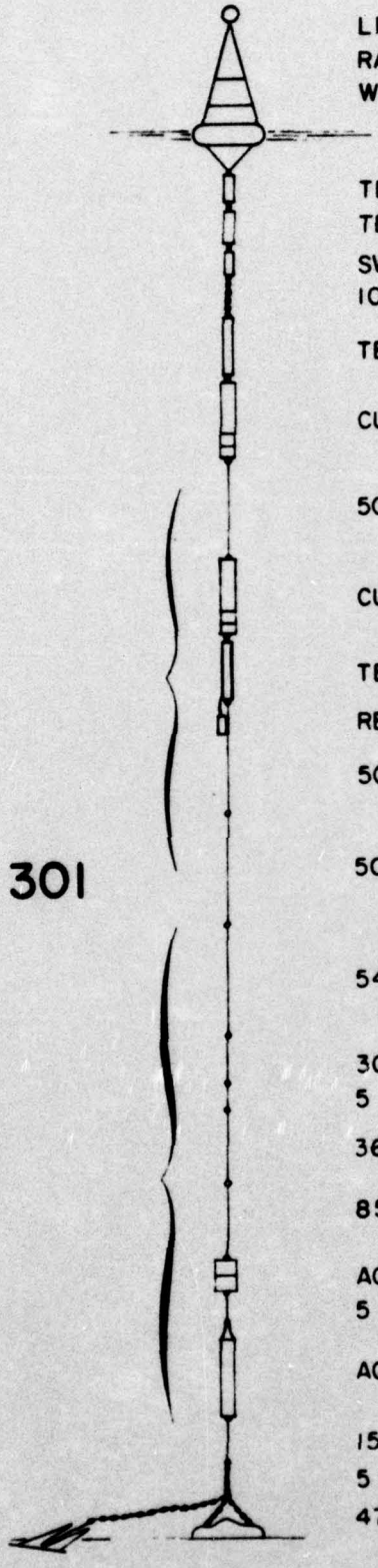
The log-log plot is further averaged during plotting so that more and more points are averaged together as frequency increases. This eliminates the bunching together of points at high frequencies, increases the degrees of freedom of the high frequency estimates, and still permits low-frequency resolution. The averaging algorithm is as follows: counting from the left of the plot, the first 40 plotted points represent data that has been averaged as stated in the label; the data for the next 15 plotted points has been averaged over twice as many frequency bands;

the next 6 over five times as many, the next 40 over ten times as many, the next 15 over twenty times as many, the next 6 over fifty times as many, the next 40 over 100 times as many and so on. In this way, for example, 7900 data points with no averaging indicated in the label would be plotted as only 176 points, and the last 14 estimates would be averaged over 200 basic frequency bands. The m in the formula $\nu = a\ m\ s$ for degrees of freedom is, in this example, 200 times larger at the highest frequencies than at the lowest frequencies.

For $\nu > 30$, the confidence limits for the spectral estimates are given approximately by $(1 - 2/9\nu \pm Z\sqrt{2/9\nu})^{1/3}$ where $Z = 1.28375$ for 80% confidence limits, $Z = 1.645$ for 90%, $Z = 1.96$ for 95% and $Z = 2.5757$ for 99%. In the example above, if the HKE spectral plot label had indicated 2 pieces and averaging over 8 adjacent frequency bands then $\nu = 2 \times 2 \times 8 = 32$ for the lowest 40 frequencies (assuming NORTH and EAST components are highly correlated) and $200 \times 32 = 6400$ for the highest frequencies. The 95% confidence intervals (i.e., 95% of the time one would expect the spectral estimates to vary no more than this much) would be (0.57, 1.55) at low frequencies, and (0.97, 1.03) at high frequencies.

For $\nu \leq 30$, one must obtain confidence intervals from Chi-Squared distribution tables in standard statistical references.

STATION 301



LIGHT
RADIO
WIND RECORDER - *3011*

TENSION CELL
TENSIOMETER - *3012*
SWIVEL
10 m CHAIN

TENSION/VIBRATION RECORDER - *3013*

CURRENT METER - *3014*

500 m

CURRENT METER - *3015*

1/4" 1 x 19 GAC

TENSION/VIBRATION RECORDER - *3016*
REMOTE SENSOR

500 m

500 m

549 m

30 m
5 m

361 m

5/8" NYLON

85 m 5/8" NYLON WITH 30 GLASS SPHERES SPACED 2 m APART

ACOUSTIC BEACON
5 m

ACOUSTIC RELEASE, ORE

15 m
5 m
4750 STIMSON

Mooring No. 301

Set 69 June 07 — 39° 09.9N — 69° 56.0W
Year Month Day — Latitude — Longitude

Set by J. Gifford Ship R. V. Chain Cruise 92

Retrieved 69 June 11
Year Month Day

Retrieved by J. Gifford Ship R. V. Chain Cruise 92

Purpose of Mooring: Instrumentation test

Mooring Type: Surface mooring - toroid

Data Number	Instrument Number	Type	Depth Meters	Comments
3011*	W-169X	M.W.R.	0	
3012	2001	Tens.	2	
3013	2	Vib/Ten	13	
3014*	M-198	M.C.M.	16	
3015	M-212	M.C.M.	517	No data, electronic problems
3016	3	Vib/Ten	518	
Water depth			2680	

COMMENTS ON MOORING:

Data number 3011

Instrument No.: W-169X

Type: Magnetic tape wind recorder

Depth: 0 m

Water depth: 2680 m

Start time: 69-VI-07 121735

Stop time: 69-VI-11 171735

Duration: 4d 5h

Sampling scheme: Continuous

one reading every 5 seconds

COMMENTS:

Wind direction follows ocean current conventions to facilitate comparisons; add 180° to direction for meteorological reading.

STATS DATA/ 3011WE300

	EAST	NORTH
MEAN =	-4.80	-24.04
STD. ERR. =	.81	1.42
VARIANCE =	783.37	2458.67
STD. DEV. =	28.17	49.58
KURTOSIS =	2.30	2.30
SKEWNESS =	-.50	.88

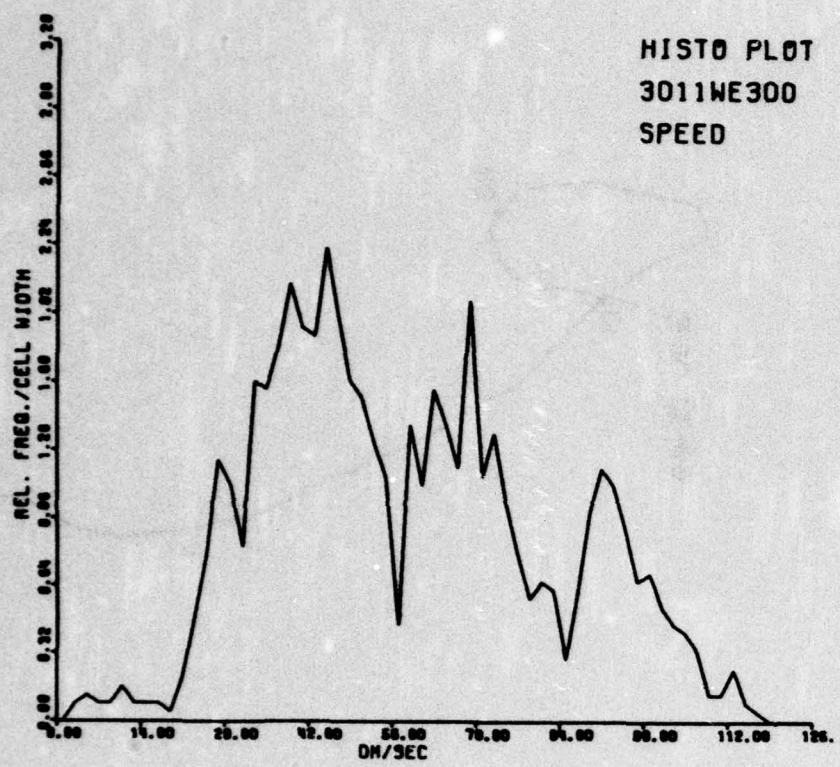
SPEED =	*****	EAST & NORTH	*****
57.90	= COVARIANCE	=	403.50
.67	= STD. ERR. OF COVARIANCE	=	47.05
543.83	= STD. DEV. OF COVARIANCE	=	1100.01
23.32	= CORRELATION COEFFICIENT	=	.353
2.31	= VECTOR MEAN	=	25.30
.94	= VECTOR VARIANCE	=	1020.02
	= STD. DEV.	=	40.32

UNITS OF RAW DATA VARIABLES = CM/SEC

SAMPLE SIZE = 1213 POINTS

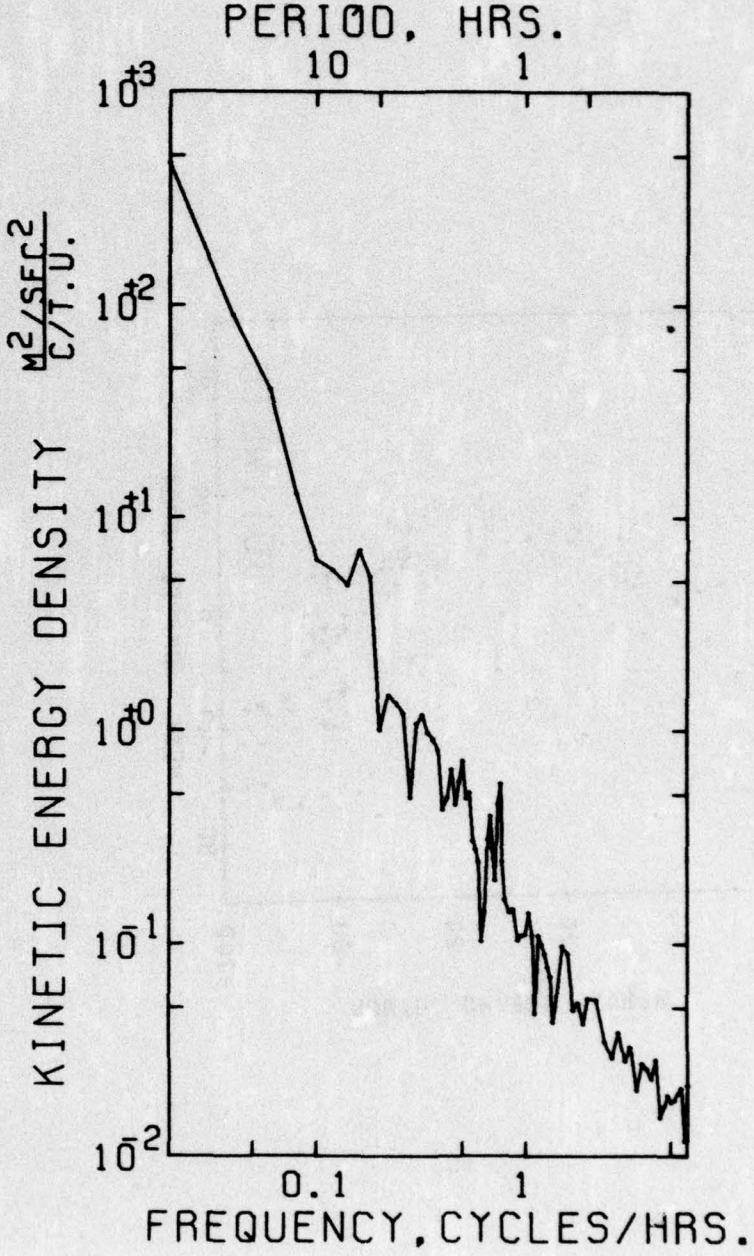
SPANNING RANGE
FROM 69- VI -07 12.17.35
TO 69- VI -11 17.17.35

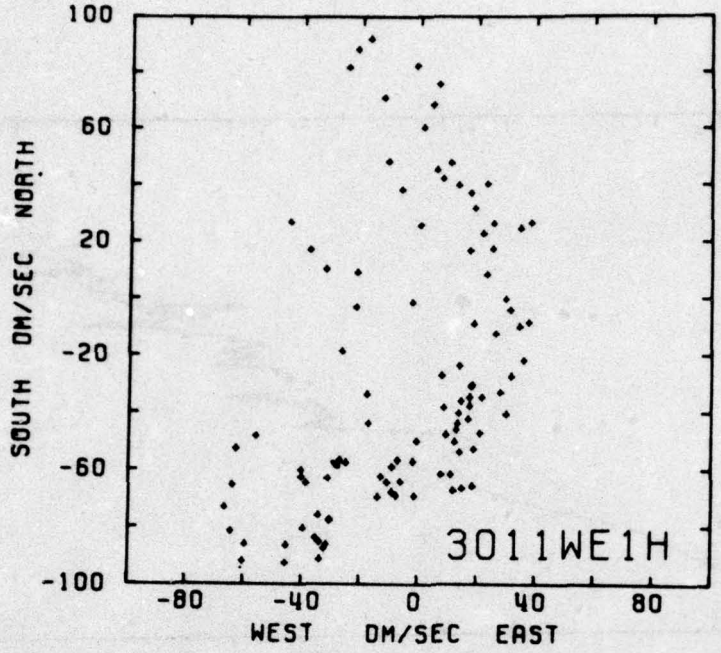
DURATION 4 DAYS 5 H 0 M 0 S

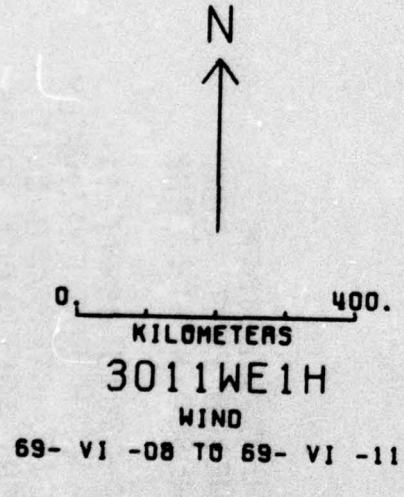


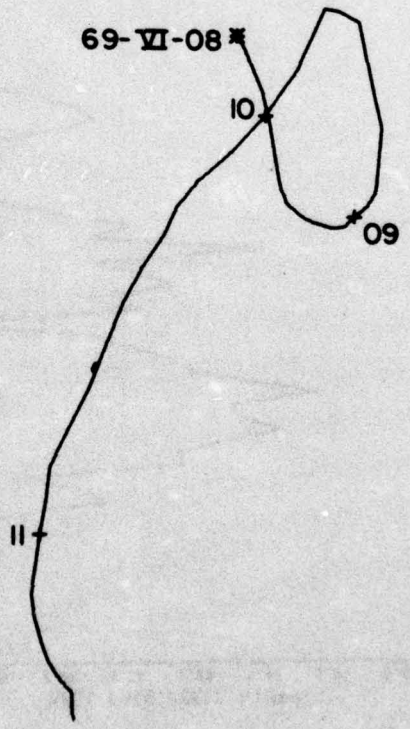
AUTO SPECTRUM
3011WE300 EAST COMP
3011WE300 NORTH COMP

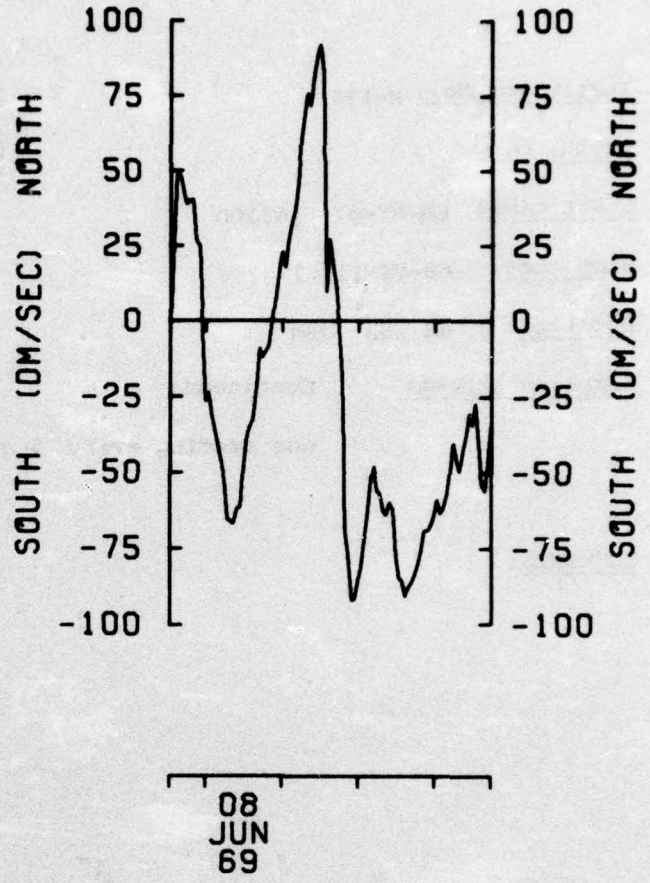
69-VI-07 TO 69-VI-11
1 PIECES WITH 600 ESTIMATES
PER PIECE. AVERAGED OVER
2 ADJACENT FREQUENCY BANDS




100
60
20
-20
-60
-100
SOUTH DM/SEC NORTH
-80
-40
0
40
80
WEST DM/SEC EAST
3011WE1H


N
0
400.
KILOMETERS
3011WE1H
WIND
69- VI -08 TO 69- VI -11


69-VI-08
10
09
11


100
75
50
25
0
-25
-50
-75
-100
SOUTH (DM/SEC) NORTH
08
JUN
69
WEST (DM/SEC) EAST

3011WE1H

Data number 3014

Instrument No.: M-198

Type: Magnetic tape current meter

Depth: 16 m

Water depth: 2680 m

Start time: 69-VI-07 165200

Stop time: 69-VI-11 172200

Duration: 4d 0h 30m

Sampling scheme: Continuous

one reading every 5 seconds

COMMENTS:

STATS DATA/ 3014C300

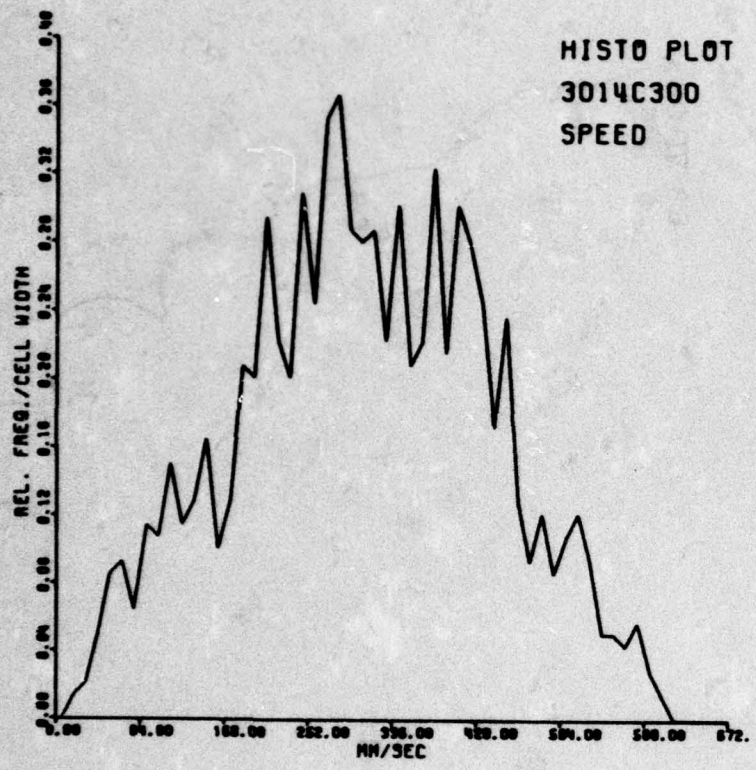
	EAST	NORTH	SPEED	EAST & NORTH	
MEAN =	-114.87	-224.76	307.46	COVARIANCE =	-4820.66
STD. ERR. =	4.22	4.74	3.71	STD. ERR. OF COVARIANCE =	1180.46
VARIANCE =	20868.65	26074.17	15839.71	STD. DEV. OF COVARIANCE =	40528.16
STD. DEV. =	143.79	161.47	126.29	CORRELATION COEFFICIENT =	-.212
KURTOSIS =	2.68	2.69	2.49	VECTOR MEAN =	252.45
SKEWNESS =	-.21	.29	-.02	VECTOR VARIANCE =	23388.41
				STD. DEV. =	152.96

UNITS OF RAW DATA VARIABLES = MM/SEC

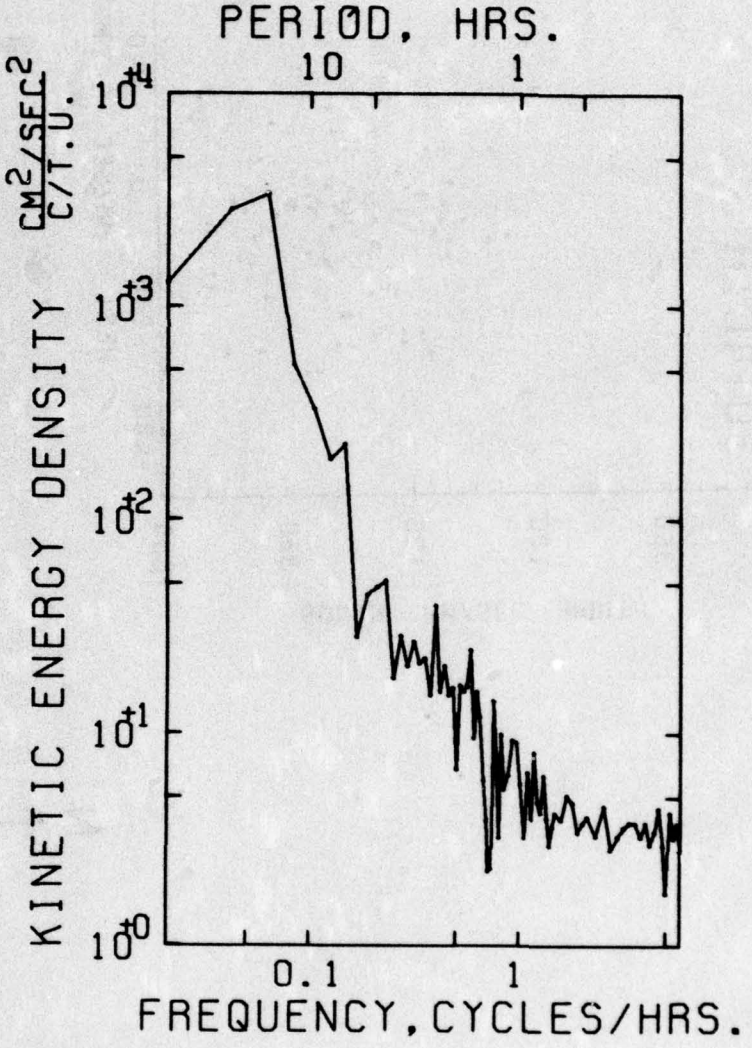
SAMPLE SIZE = 1160 POINTS

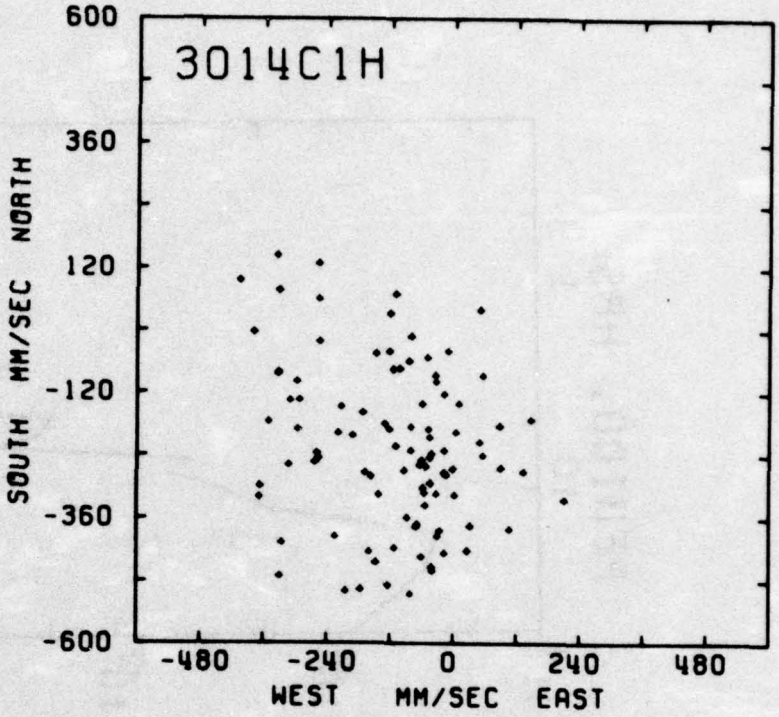
SPANNING RANGE
FROM 69- VI -07 16.52.00
TO 69- VI -11 17.22.00

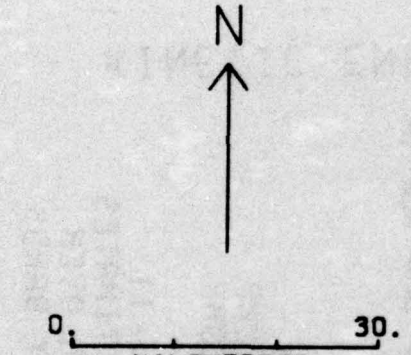
DURATION 4 DAYS 0 H 30 M 0 S



AUTO SPECTRUM
3014C300 EAST COMP
3014C300 NORTH COMP
16 METERS
69-VI-07 TO 69-VI-11
1 PIECES WITH 576 ESTIMATES
PER PIECE. AVERAGED OVER
2 ADJACENT FREQUENCY BANDS



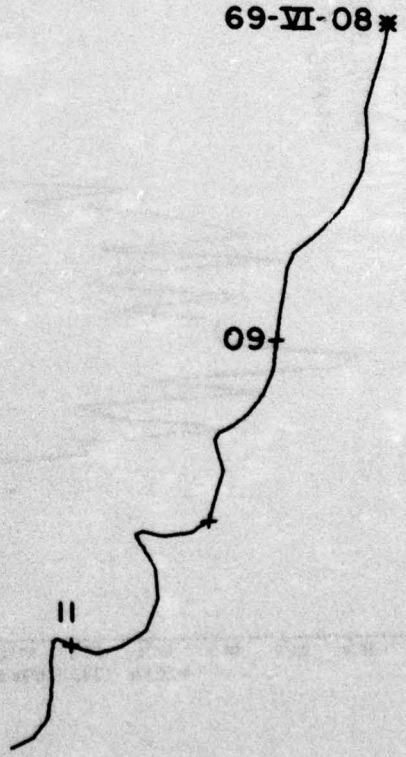


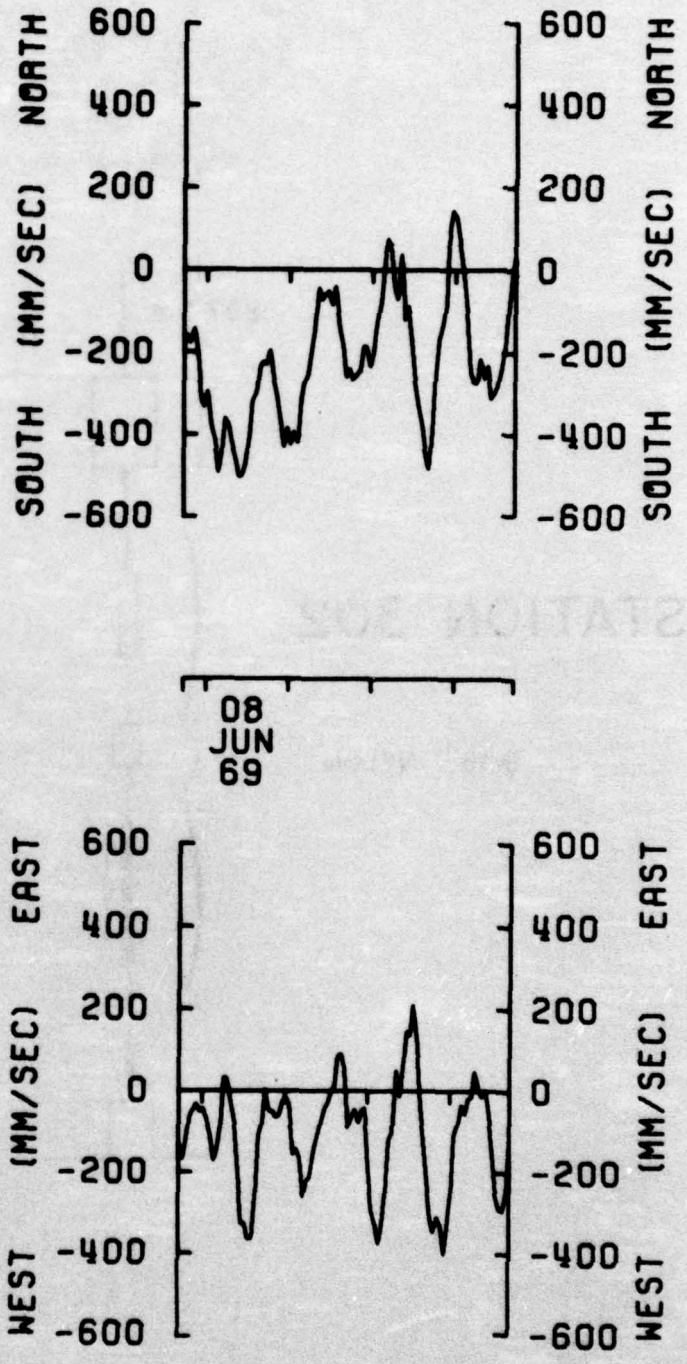


3014C1H

16 M

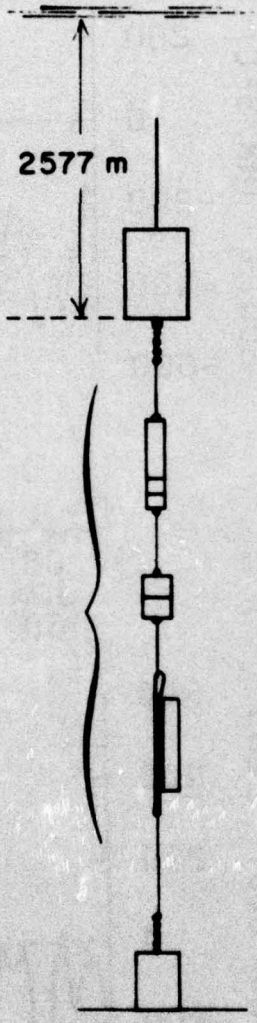
69- VI -08 TO 69- VI -11




600
400
200
0
-200
-400
-600
SOUTH (MM/SEC) NORTH
08
JUN
69
WEST (MM/SEC) EAST

3014C1H
16 M

STATION 302



SYNTACTIC FOAM FLOAT WITH RADIO, LIGHT AND FLAG

1 m CHAIN

10 m

CURRENT METER - *3021*

10 m

ACOUSTIC BEACON

10 m

ACOUSTIC BEACON, AMF

74 m

3 m CHAIN

800 LB. ANCHOR

Mooring No. 302

Set 69 June 07 (Year Month Day) 39° 05.9N (Latitude) 69° 59.5W (Longitude)

Set by J. Gifford Ship R. V. Chain Cruise 92

Retrieved 69 Oct 11 (Year Month Day)

Retrieved by J. Gifford Ship R. V. Atlantis II Cruise 53

Purpose of Mooring: Long term near-bottom mooring.

Mooring Type: Subsurface mooring with syntactic foam cylinder.

Data Number	Instrument Number	Type	Depth Meters	Comments
3021*	M-159	M.C.M.	2586	

Water depth 2685

Hydrographic Stations

R. V. Chain cruise 92 Station 896

R. V. Chain cruise 92 Station 898

COMMENTS ON MOORING:

Data number 3021

Instrument No.: M-159 **Type:** Magnetic tape current meter

Depth: 2586 m **Water depth:** 2685 m

Start time: 69-VI-08 183305

Stop time: 69-X-11 170305

Duration: 124d 22h 30m

Sampling scheme: Interval

time between strobes = 5 seconds

no. of strobes per interval = 16

interval time = 1800 seconds

COMMENTS:

STATS DATA/ 3021J1800

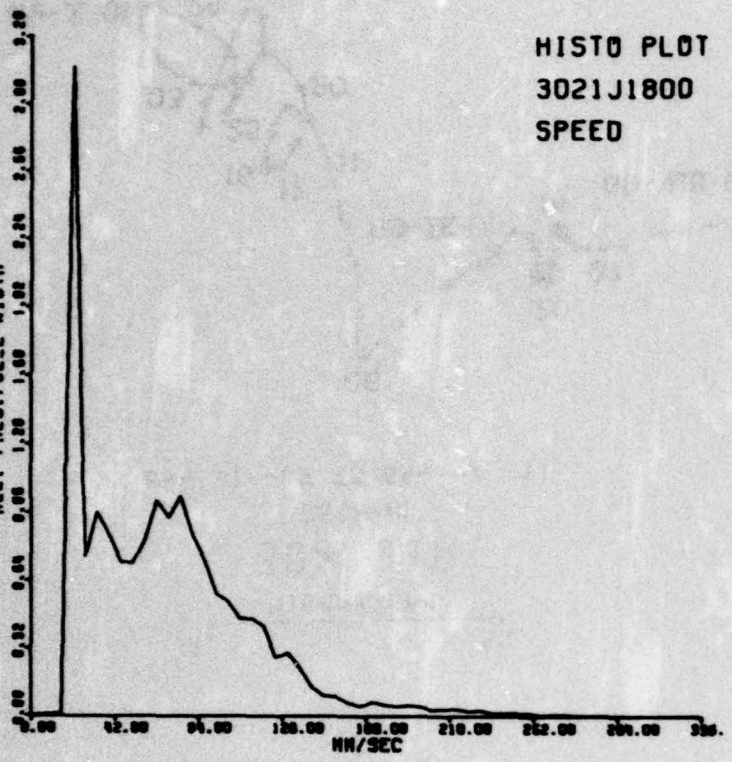
	EAST	NORTH	SPEED	EAST & NORTH	
MEAN =	-22.30	-3.41	66.00	COVARIANCE =	-706.20
STD. ERR. =	.55	.79	.39	STD. ERR. OF COVARIANCE =	45.54
VARIANCE =	1780.86	3787.23	1712.12	STD. DEV. OF COVARIANCE =	3620.82
STD. DEV. =	42.43	61.58	41.38	CORRELATION COEFFICIENT =	-.284
KURTOSIS =	3.21	3.80	4.45	VECTOR MEAN =	22.63
SKEWNESS =	.18	-.08	1.06	VECTOR VARIANCE =	2703.58
				STD. DEV. =	52.76

UNITS OF RAW DATA VARIABLES = MM/SEC

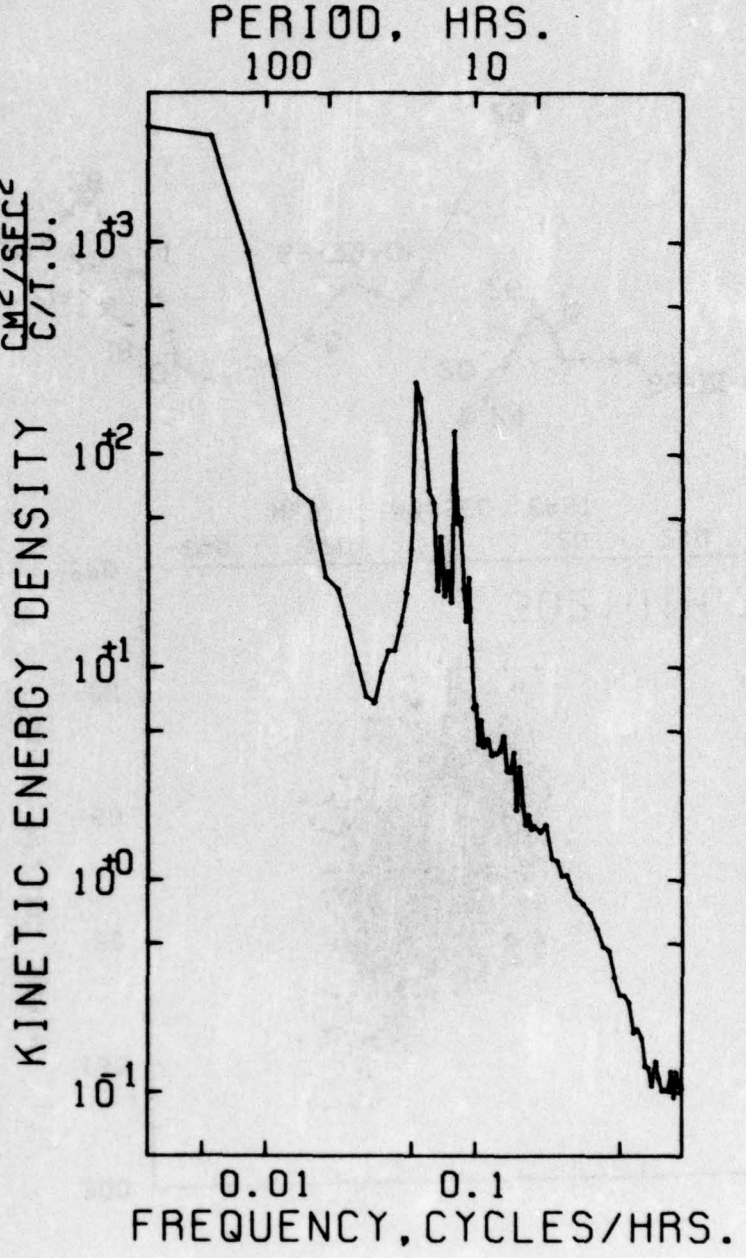
SAMPLE SIZE = 5000 POINTS

SPANNING RANGE
FROM 69- VI -08 18.33.06
TO 69- X -11 17.03.06

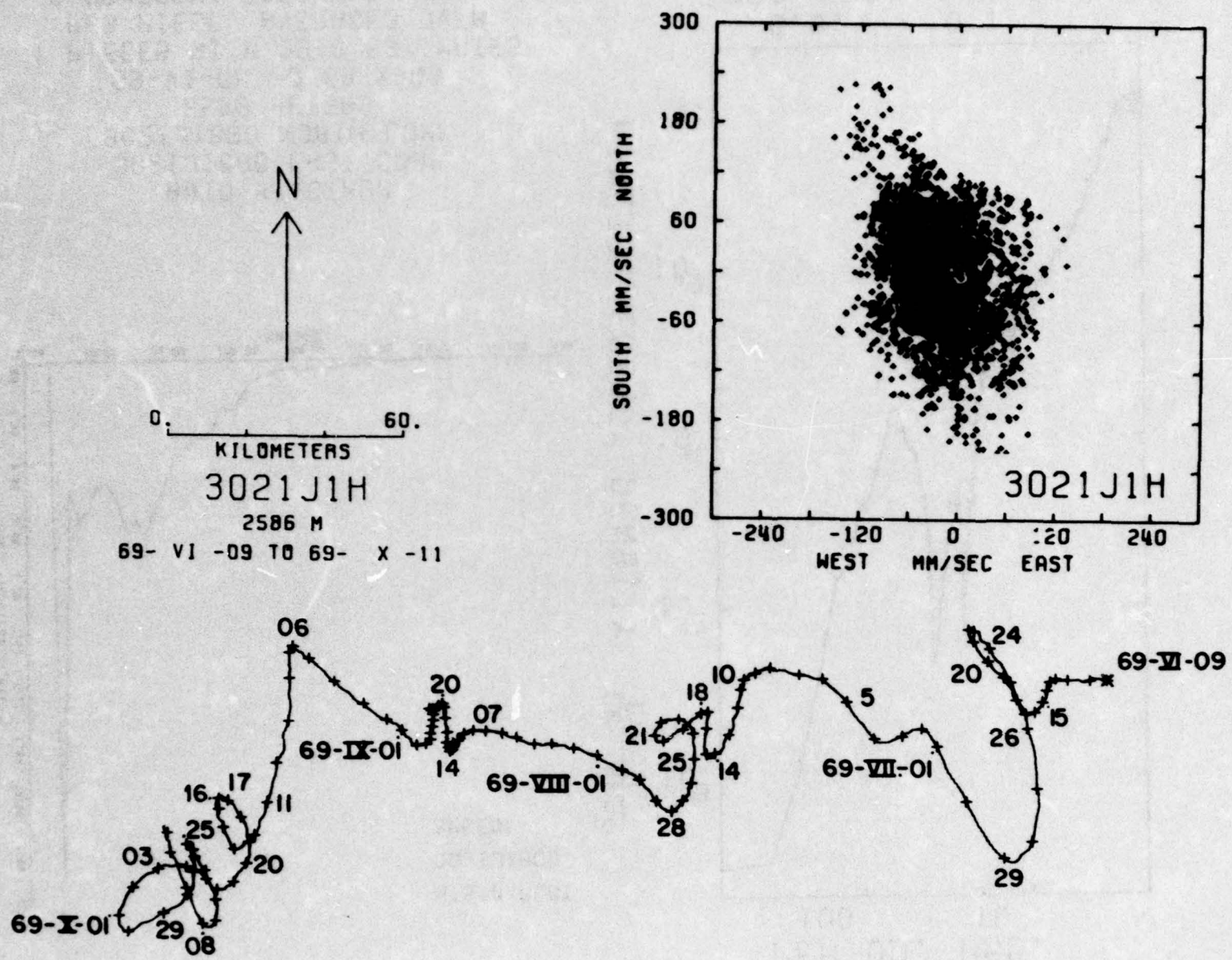
DURATION 124 DAYS 22 H 30 M 0 S



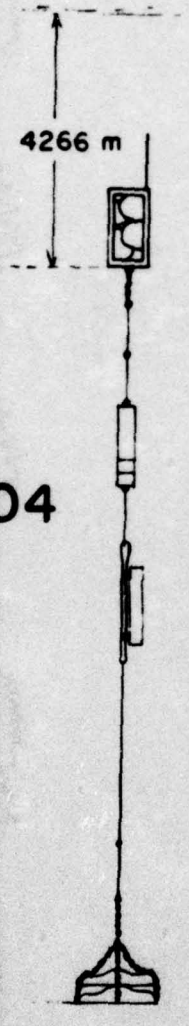
HISTO PLOT
3021J1800
SPEED



AUTO SPECTRUM
3021J1800 EAST COMP
3021J1800 NORTH COMP
2586 METERS
69-VI-08 TO 69-X-08
1 PIECES WITH 2916 ESTIMATES
PER PIECE. AVERAGED OVER
8 ADJACENT FREQUENCY BANDS


N
0.
60.
KILOMETERS
3021J1H
2586 M
69- VI -09 TO 69- X -11
300
180
60
-60
-180
-300
SOUTH MM/SEC NORTH
-240
-120
0
120
240
WEST MM/SEC EAST
3021J1H
06
20
07
69-IX-01
14
69-VIII-01
28
21
25
18
10
14
5
69-VII-01
29
20
24
26
15
69-VI-09
16
17
11
25
03
20
69-X-01
29
08

STATION 304



GLASS BALL BUOY WITH RADIO, LIGHT AND FLAG

1 m CHAIN

10 m 9/16" NYLON

10 m SAME

CURRENT METER - *3041*

10 m 9/16" NYLON

ACOUSTIC RELEASE, AMF

172 m 9/16" NYLON

12 m SAME

3 m CHAIN

2 400 LB. STIMSON ANCHORS

Mooring No. 304

Set 69 June 12 (Year Month Day) 36° 23.4N (Latitude) 70° 00.2W (Longitude)

Set by J. Gifford Ship R. V. Chain Cruise 92

Retrieved 69 Aug 14 (Year Month Day)

Retrieved by R. Heinmiller Ship R. V. Chain Cruise 95

Purpose of Mooring: To study current structure under the Gulf Stream.

Mooring Type: Subsurface mooring with glass ball float.

Data Number	Instrument Number	Type	Depth Meters	Comments
3041*	M-122	M.C.M.	4287	

Water depth 4486

COMMENTS ON MOORING:

Data number 3041

Instrument No.: M-122 Type: Magnetic tape current meter

Depth: 4287 m Water depth: 4486 m

Start time: 69-VI-12 204825

Stop time: 69-VIII-14 034825

Duration: 62d 7h

Sampling scheme: Interval

time between strobes = 5 seconds

no. of strobes per interval = 16

interval time = 1800 seconds

COMMENTS:

STATS DATA/ 3041J1800

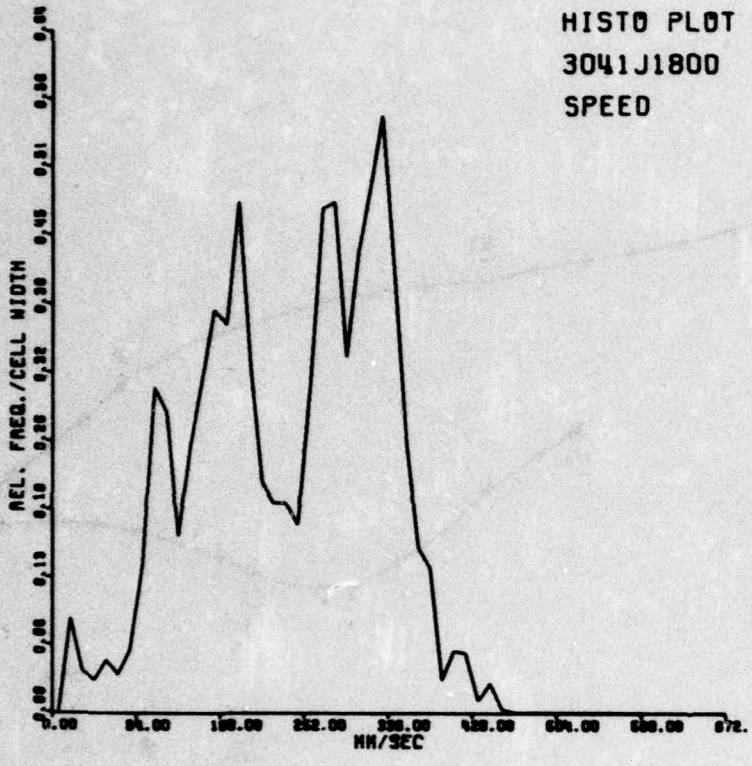
	EAST	NORTH	SPEED	#####	EAST & NORTH	#####
MEAN =	44.03	88.42	237.36	# COVARIANCE	=	11115.89
STD. ERR. =	1.60	3.86	1.66	# STD. ERR. OF COVARIANCE	=	370.76
VARIANCE =	7686.45	46830.23	8214.13	# STD. DEV. OF COVARIANCE	=	20276.85
STD. DEV. =	87.67	216.63	90.63	# CORRELATION COEFFICIENT	=	.505
KURTOSIS =	6.22	2.21	2.17	# VECTOR MEAN	=	99.67
SKEWNESS =	-1.45	-.78	-.25	# VECTOR VARIANCE	=	27908.94
				# STD. DEV.	=	165.25

UNITS OF RAW DATA VARIABLES = MM/SEC

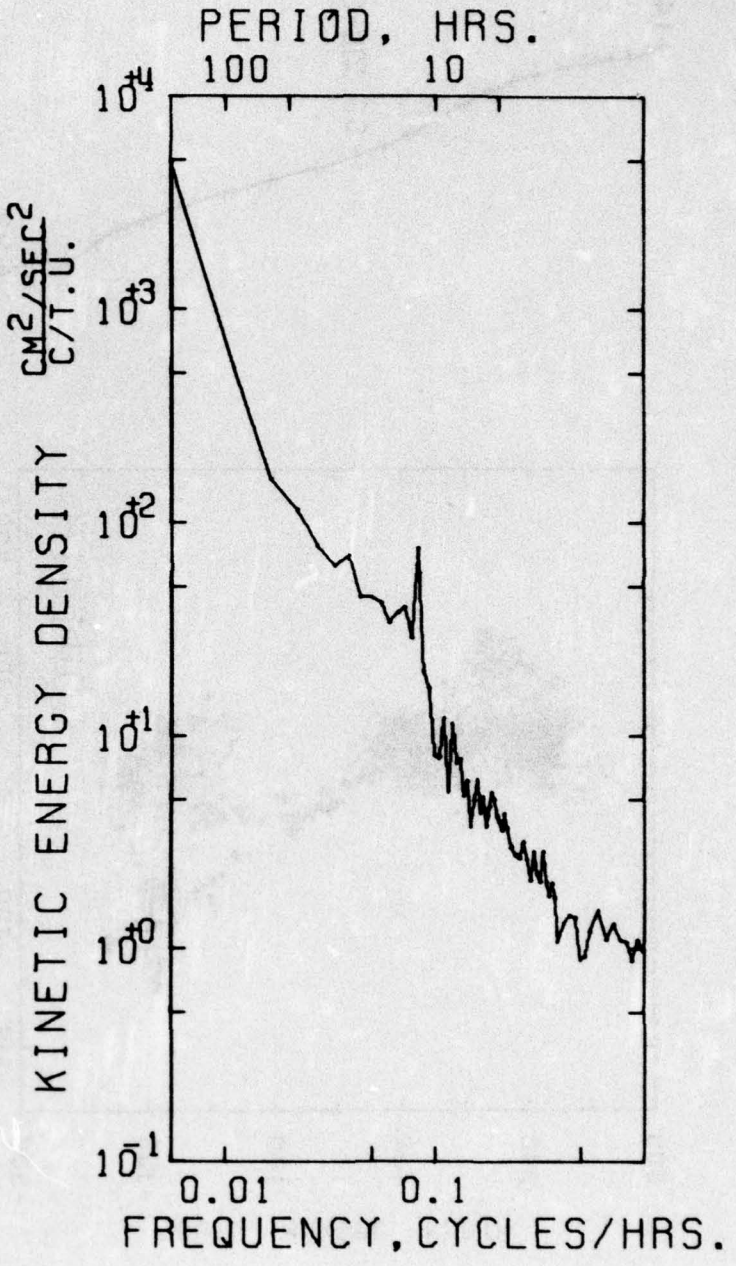
SAMPLE SIZE = 2881 POINTS

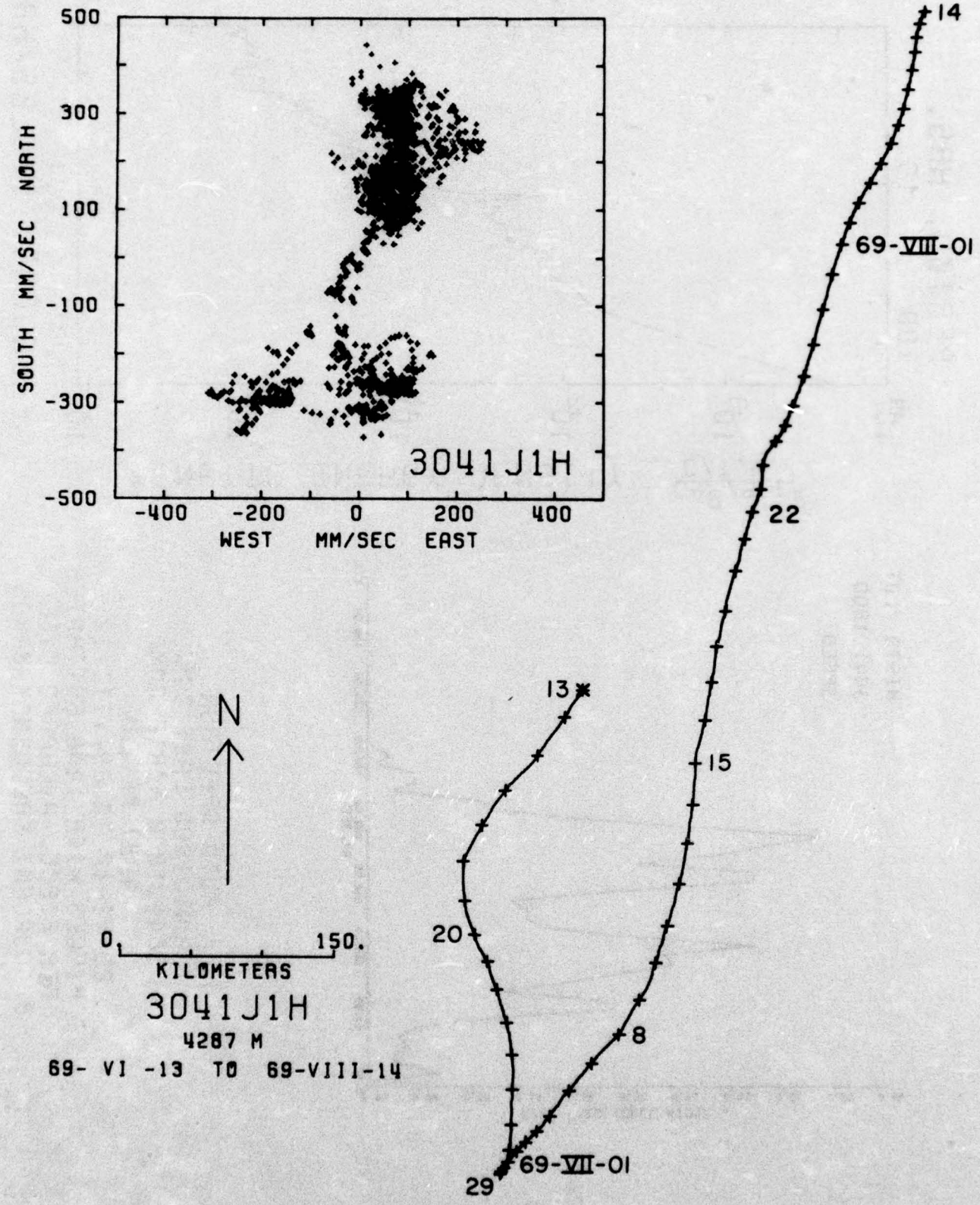
SPANNING RANGE
FROM 69- VI -12 20.48.25
TO 69-VIII-14 03.48.25

DURATION 62 DAYS 7 H 0 M 0 S

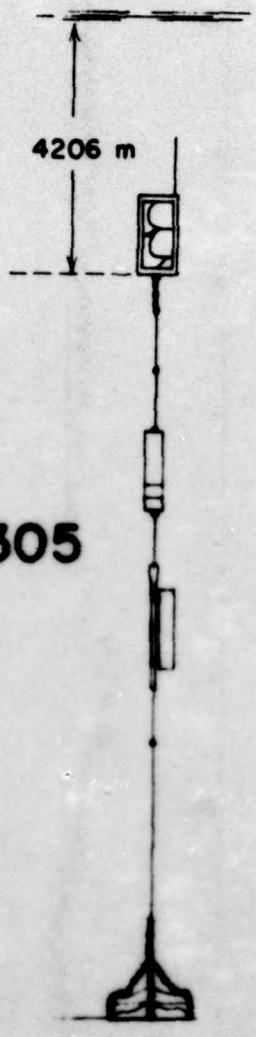


AUTO SPECTRUM
3041J1800 EAST COMP
3041J1800 NORTH COMP
4287 METERS
69-VI-12 TO 69-VIII-12
1 PIECES WITH 1458 ESTIMATES
PER PIECE. AVERAGED OVER
8 ADJACENT FREQUENCY BANDS




500
300
100
-100
-300
-500
SOUTH MM/SEC NORTH
-400
-200
0
200
400
WEST MM/SEC EAST
3041J1H
14
69-VIII-01
22
15
13
20
8
29
69-VII-01
N
0
150.
KILOMETERS
3041J1H
4287 M
69- VI -13 TO 69-VIII-14

STATION 305



GLASS BALL BUOY WITH RADIO, LIGHT AND FLAG

1 m CHAIN

10 m 9/16" NYLON

10 m SAME

CURRENT METER - 3051

10 m 9/16" NYLON

ACOUSTIC RELEASE, AMF

12 m 9/16" NYLON

172 m SAME

3 m CHAIN

2 400 LB STIMSON ANCHORS

Mooring No. 305

Set 69 June 12 (Year Month Day) 36° 43.0N (Latitude) 70° 00.3W (Longitude)

Set by J. Gifford Ship R. V. Chain Cruise 92

Retrieved 69 Aug 14 (Year Month Day)

Retrieved by R. Heinmiller Ship R. V. Chain Cruise 95

Purpose of Mooring: To study current structure under the Gulf Stream.

Mooring Type: Subsurface mooring with glass ball float.

Data Number	Instrument Number	Type	Depth Meters	Comments
3051*	M-127	M.C.M.	4227	

Water depth 4426

COMMENTS ON MOORING:

Data number 3051

Instrument No.: M-127 **Type:** Maghetic tape current meter

Depth: 4227 m **Water depth:** 4426 m

Start time: 69-VI-12 183355

Stop time: 69-VIII-14 093355

Duration: 62d 15h

Sampling scheme: Interval

time between strobes = 5 seconds

no. of strobes per interval = 16

interval time = 1800 seconds

COMMENTS:

STATS DATA/ 305101800

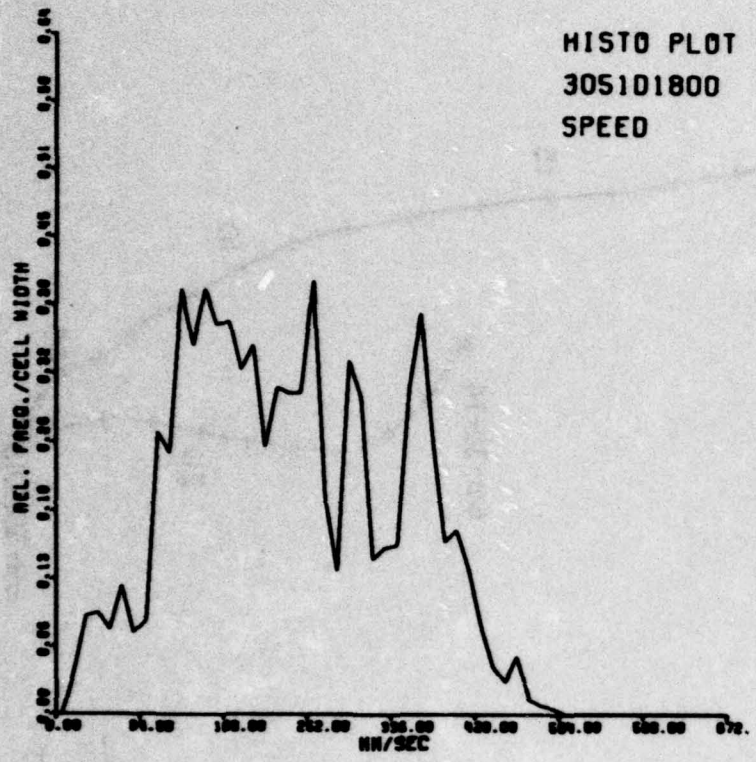
	EAST	NORTH	SPEED	#####	EAST & NORTH	#####
MEAN =	22.86	103.80	239.56	# COVARIANCE	=	10206.47
STD. ERR. =	1.74	3.87	1.81	# STD. ERR. OF COVARIANCE	=	344.38
VARIANCE =	9076.88	45087.72	10947.59	# STD. DEV. OF COVARIANCE	=	10884.46
STD. DEV. =	85.27	212.36	104.63	# CORRELATION COEFFICIENT	=	.504
KURTOSIS =	8.08	2.51	2.14	# VECTOR MEAN	=	108.41
SKEWNESS =	-1.53	-.85	.18	# VECTOR VARIANCE	=	27087.30
				# STD. DEV.	=	164.58

UNITS OF RAW DATA VARIABLES = MM/SEC

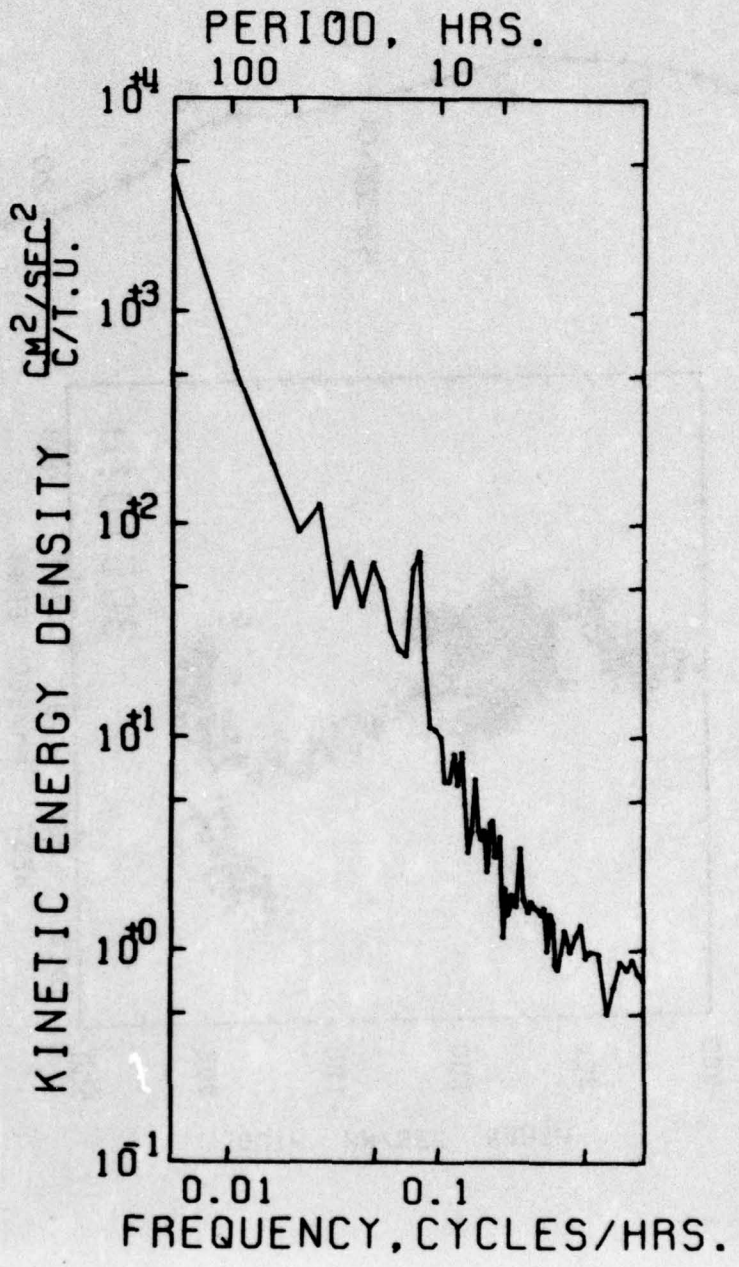
SAMPLE SIZE = 3007 POINTS

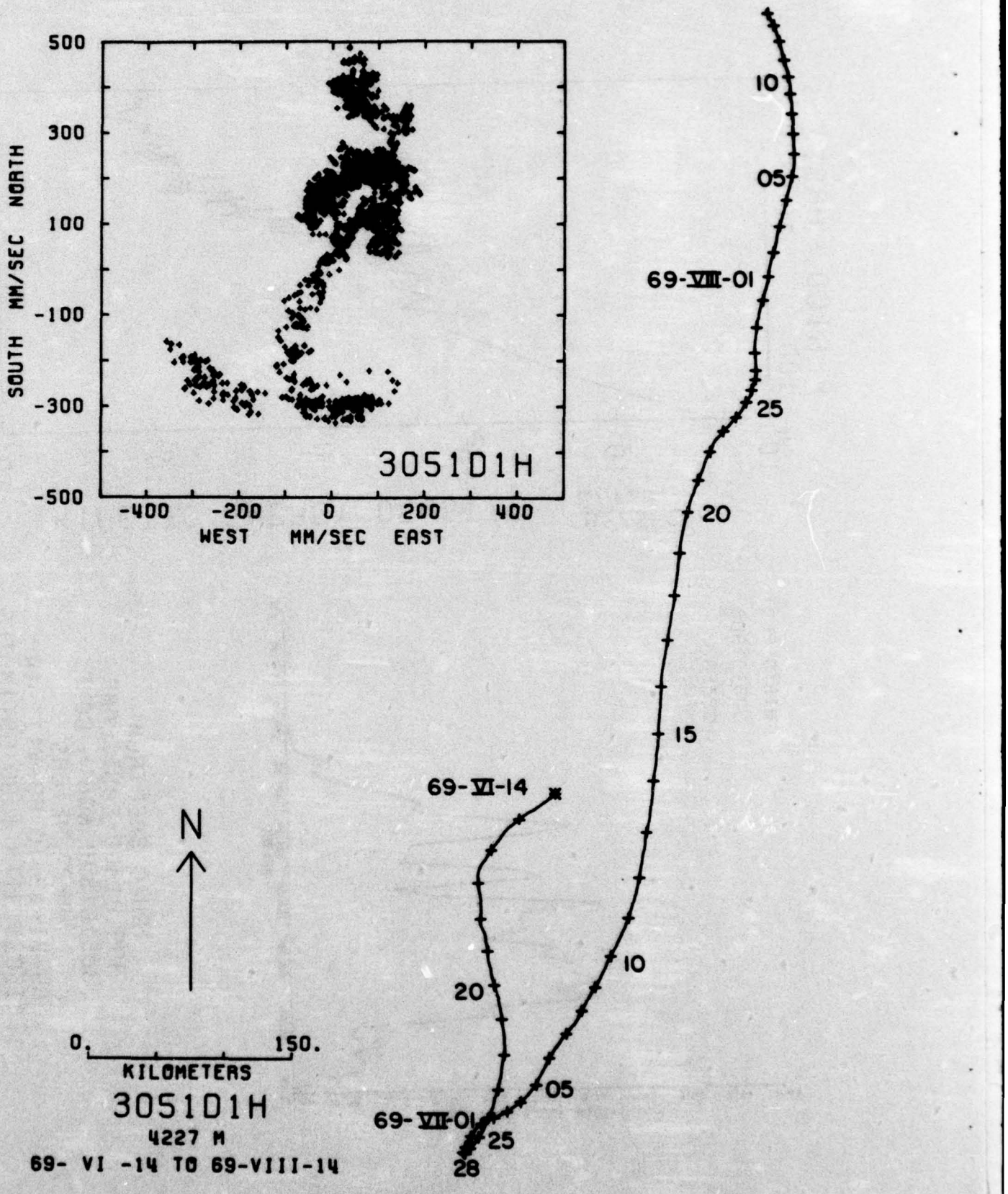
SPANNING RANGE
FROM 69- VI -12 18.33.55
TO 69-VIII-14 09.33.55

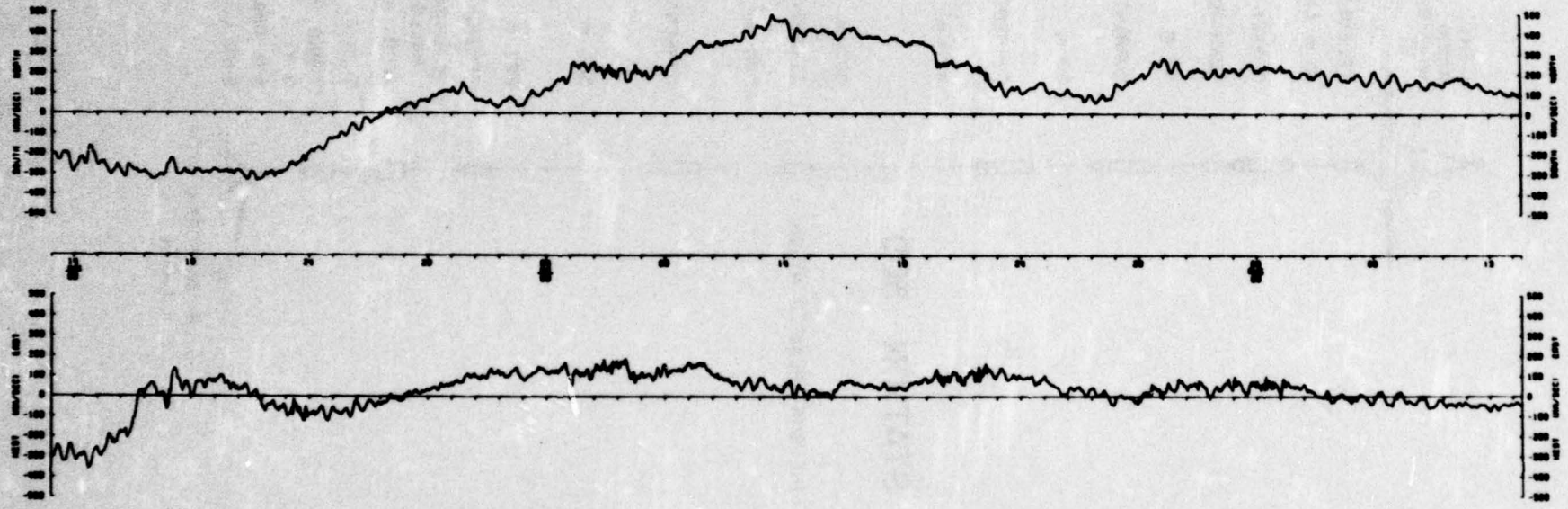
DURATION 62 DAYS 15 H 0 M 0 S



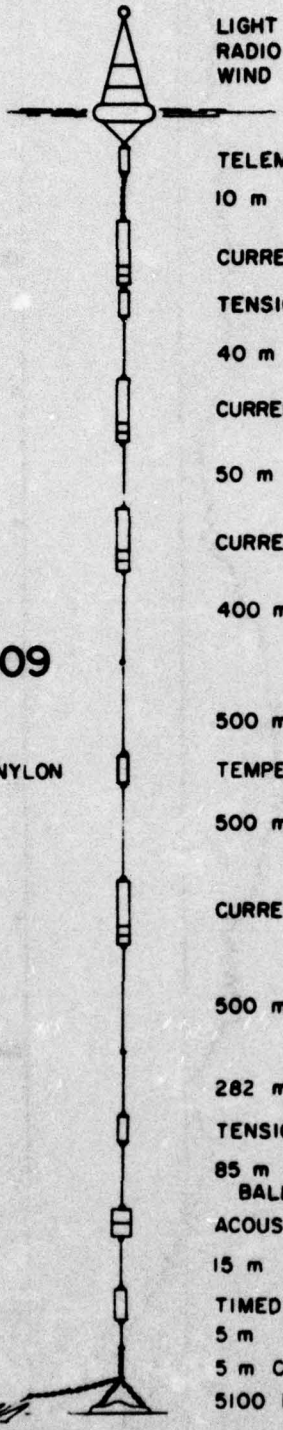
AUTO SPECTRUM
3051D1800 EAST COMP
3051D1800 NORTH COMP
4227 METERS
69-VI-12 TO 69-VIII-14
1 PIECES WITH 1500 ESTIMATES
PER PIECE. AVERAGED OVER
8 ADJACENT FREQUENCY BANDS




500
300
100
-100
-300
-500
SOUTH MM/SEC NORTH
-400
-200
0
200
400
WEST MM/SEC EAST
3051D1H
69-VIII-01
10
05
25
20
15
69-VI-14
10
20
05
69-VII-01
25
28
N
0.
150.
KILOMETERS
305101H
4227 M
69- VI -14 TO 69-VIII-14



305101M



LIGHT
RADIO
WIND RECORDER - *3091*

TELEMETERING TENSIOMETER - *3092*

10 m CHAIN

CURRENT METER - *3093*

TENSIOMETER - *3094*

40 m

CURRENT METER - *3095*

50 m

CURRENT METER - *3096*

400 m

STATION 309

500 m

ALL LINE 9/16" PLAITED NYLON

TEMPERATURE RECORDER - *3097*

500 m

CURRENT METER - *3098*

500 m

282 m

TENSIOMETER - *3099*

85 m 9/16" NYLON WITH 20 GLASS BALLS SPACED 2 m APART

ACOUSTIC BEACON

15 m

TIMED RELEASE, GEODYNE

5 m

5 m CHAIN

5100 LB. STIMSON ANCHOR

65 LB DANFORTH WITH
3 m CHAIN

Mooring No. 309

Set 69 June 13 (Year Month Day) | 39° 09.0N (Latitude) | 70° 00.2W (Longitude)

Set by J. Gifford | Ship R. V. Chain | Cruise 92

Retrieved 69 Aug 11 (Year Month Day)

Retrieved by R. Heinmiller | Ship R. V. Chain | Cruise 95

Purpose of Mooring: Long term current measurements at Site D.

Mooring Type: All nylon surface mooring.

Data Number	Instrument Number	Type	Depth Meters	Comments
3091*	W-101X	M.W.R.	0	
3092	2001	Tel. Tens.	2	
3093*	M-203	M.C.M.	13	
3094	1023	Tens.	14	
3095*	M-214	M.C.M.	56	
3096*	M-213	M.C.M.	108	
3097	T-452	Temp.	1000	Lost
3098	M-211	M.C.M.	1692	Lost
3099	1024	Tens.	2565	Lost
Water depth			2678	

Hydrographic Station

R. V. Chain cruise 92 Station 896

R. V. Chain cruise 92 Station 903

R. V. Chain cruise 95 Station 922

COMMENTS ON MOORING:

Surface toroid seen on July 6, 1969 by U.S.S. WALDO COUNTY. The mooring was hauled on August 11 because of hurricane threat. During recovery the line parted around 500 meters down the mooring. The release timer should have fired on August 12 1200. On August 29 the beacon was indicating it was still on station.

Data number 3091

Instrument No.: W-101X

Type: Magnetic tape wind recorder

Depth: -0-

Water depth: 2678 m

Start time: 69-VI-13 203640

Stop time: 69-VIII-11 210640

Duration: 59d 0h 30m

Sampling scheme: Interval

time between strobes = 5 seconds

no. of strobes per interval = 24

interval time = 1800 seconds

COMMENTS:

Wind direction follows ocean current conventions to facilitate comparisons; add 180° to direction for meteorological reading.

STATS DATA/ 3091WH800

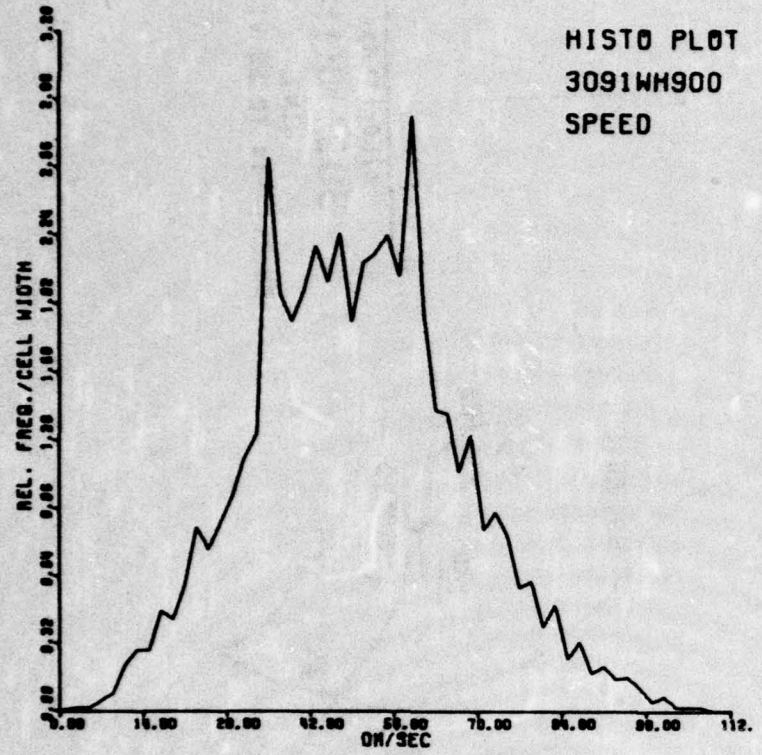
	EAST	NORTH	SPEED		EAST & NORTH	
MEAN =	8.09	11.70	40.50	COVARIANCE =		417.81
STD. ERR. =	.43	.51	.23	STD. ERR. OF COVARIANCE =		15.27
VARIANCE =	1048.26	1487.19	305.07	STD. DEV. OF COVARIANCE =		1140.57
STD. DEV. =	32.38	38.56	17.47	CORRELATION COEFFICIENT =		.935
KURTOSIS =	2.89	1.87	3.31	VECTOR MEAN =		14.82
SKEWNESS =	-.30	-.31	.25	VECTOR VARIANCE =		1287.79
				STD. DEV. =		35.61

UNITS OF RAW DATA VARIABLES = CM/SEC

SAMPLE SIZE = 5867 POINTS

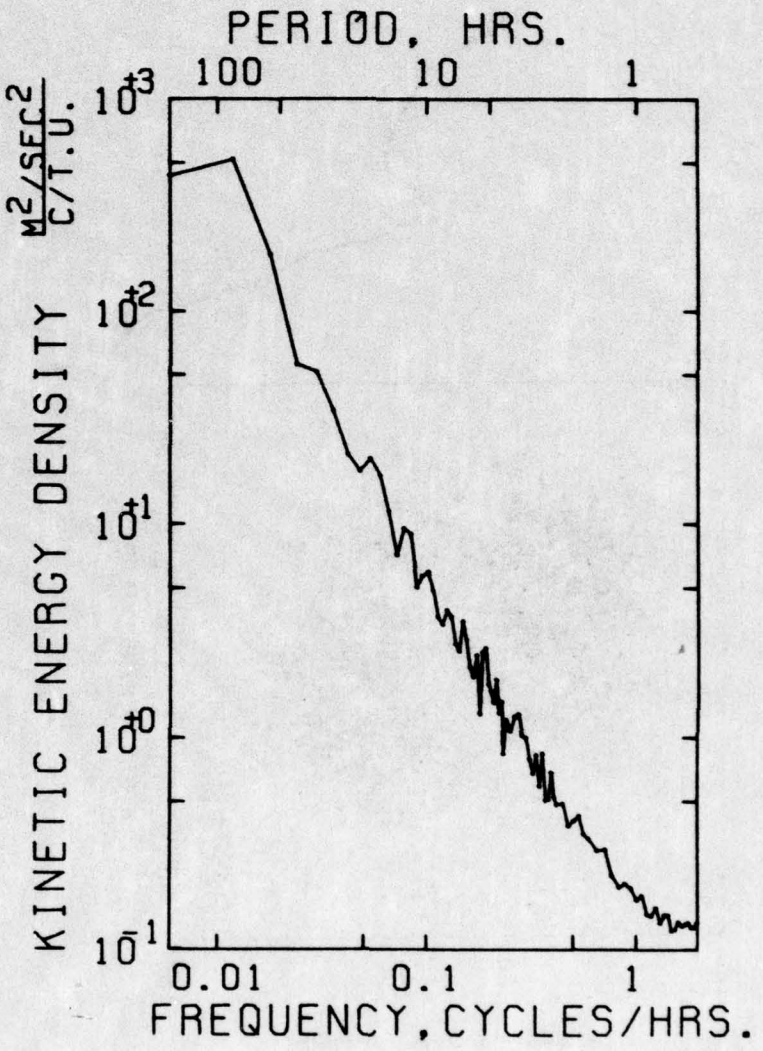
SPANNING RANGE
FROM 69- VI -13 20.30.40
TO 69-VIII-11 21.00.40

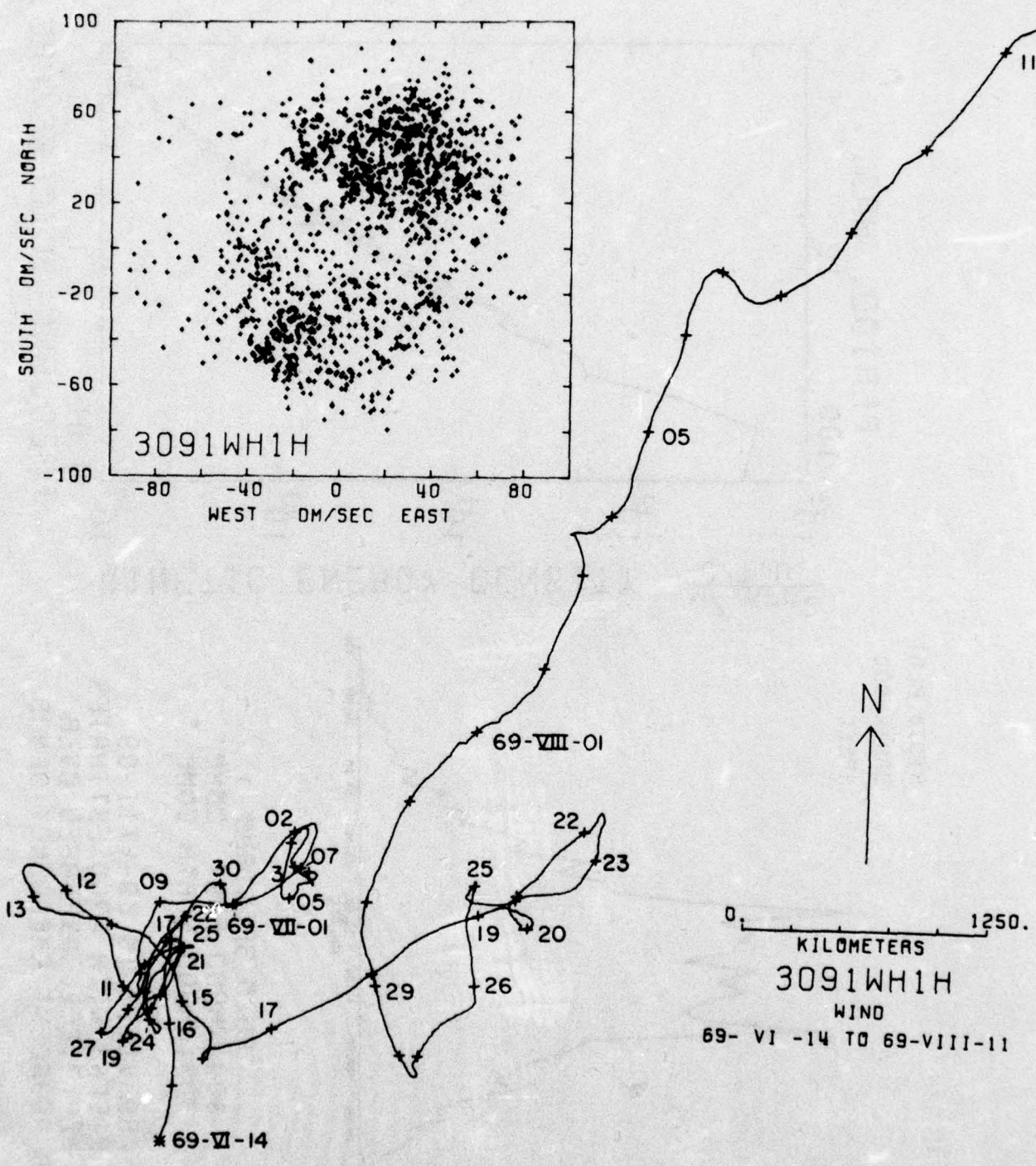
DURATION 58 DAYS 0 H 30 M 0 S



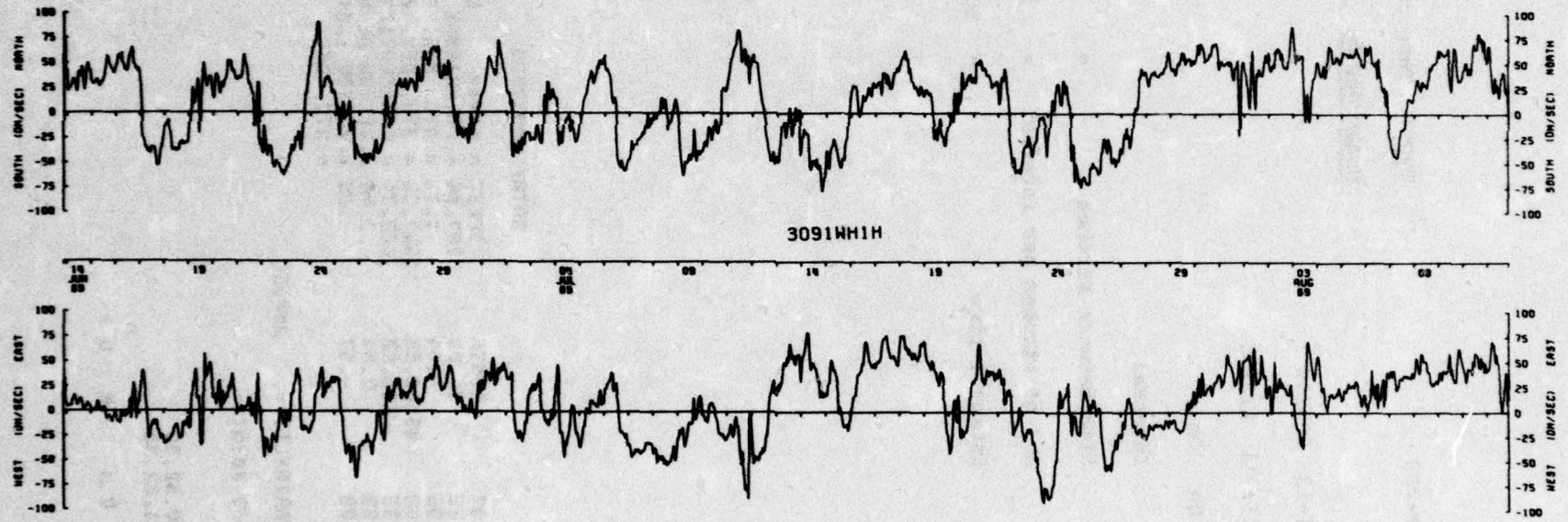
AUTO SPECTRUM
3091WH900 EAST COMP
3091WH900 NORTH COMP

69-VI-13 TO 69-VIII-09
1 PIECES WITH 2700 ESTIMATES
PER PIECE. AVERAGED OVER
8 ADJACENT FREQUENCY BANDS





100
60
20
-20
-60
-100
SOUTH DM/SEC NORTH
-80
-40
0
40
80
WEST DM/SEC EAST
3091WH1H
11
05
69-VIII-01
N
0.
1250.
KILOMETERS
3091WH1H
WIND
69- VI -14 TO 69-VIII-11
02
07
3
05
30
09
12
13
17
22
25
69-VII-01
21
11
15
16
27
19
24
17
29
26
25
19
20
22
23
69-VI-14


3091WH1H
SOUTH (DH/SEC) NORTH
WEST (DH/SEC) EAST
100
75
50
25
0
-25
-50
-75
-100

Data number 3093

Instrument No.: M-203 **Type:** Tape recording current meter

Depth: 13 m **Water depth:** 2678 m

Start time: 69-VI-13 205235

Stop time: 69-VIII-11 212235

Duration: 59d 0h 30m

Sampling scheme: Interval

time between strobes = 5 seconds

no. of strobes per interval = 24

interval time = 900 seconds

COMMENTS:

STATS DATA/ 3093D800

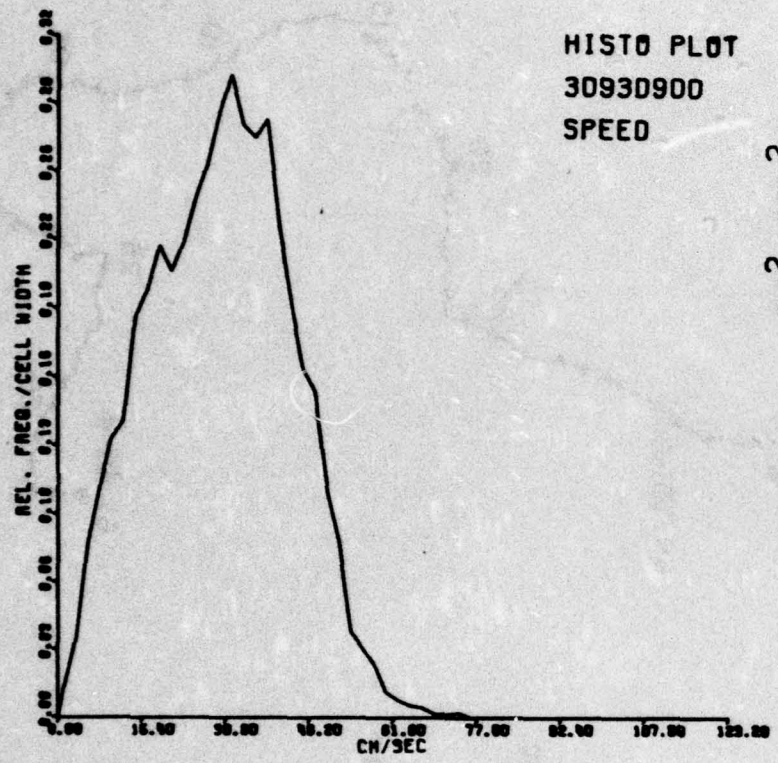
	EAST	NORTH	SPEED	#####	EAST & NORTH	#####
MEAN =	.55	88.80	287.64	= COVARIANCE	=	-3888.04
STD. ERR. =	3.02	2.84	1.71	= STD. ERR. OF COVARIANCE	=	609.23
VARIANCE =	51680.00	45560.88	18587.00	= STD. DEV. OF COVARIANCE	=	45862.85
STD. DEV. =	227.35	213.45	128.71	= CORRELATION COEFFICIENT	=	-.080
KURTOSIS =	2.82	2.87	2.48	= VECTOR MEAN	=	88.80
SKEWNESS =	-.02	-.57	.05	= VECTOR VARIANCE	=	48825.94
				= STD. DEV.	=	220.51

UNITS OF RAW DATA VARIABLES = MM/SEC

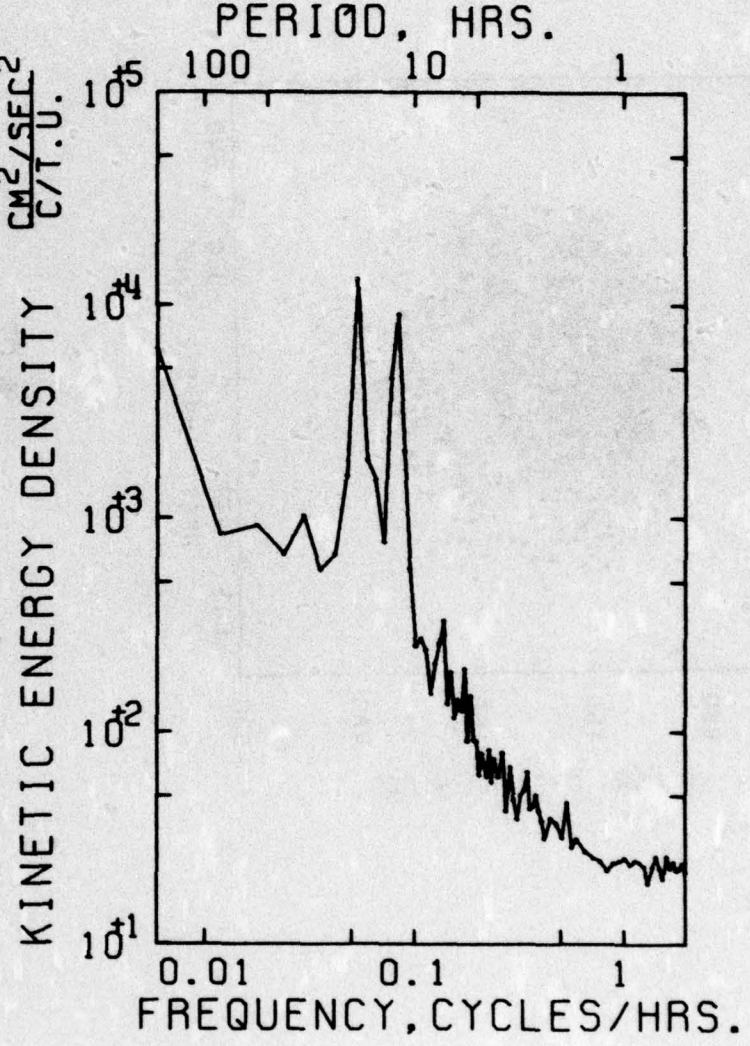
SAMPLE SIZE = 5667 POINTS

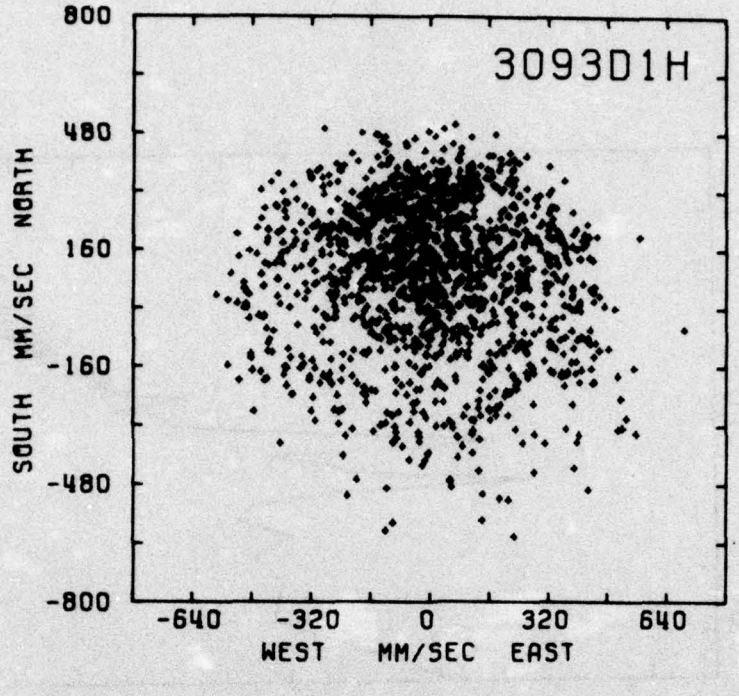
SPANNING RANGE
FROM 69- VI -13 20.52.35
TO 69-VIII-11 21.22.35

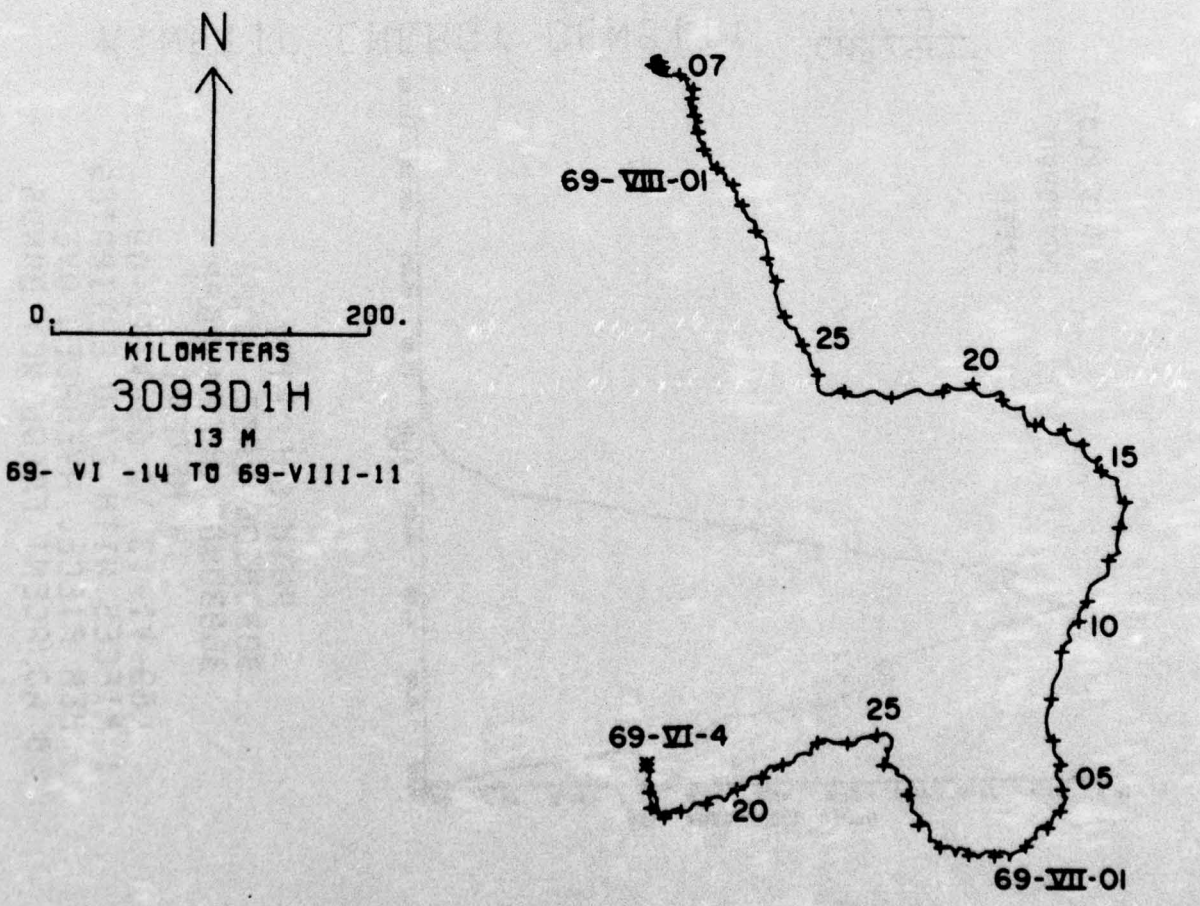
DURATION 59 DAYS 0 H 30 M 0 S

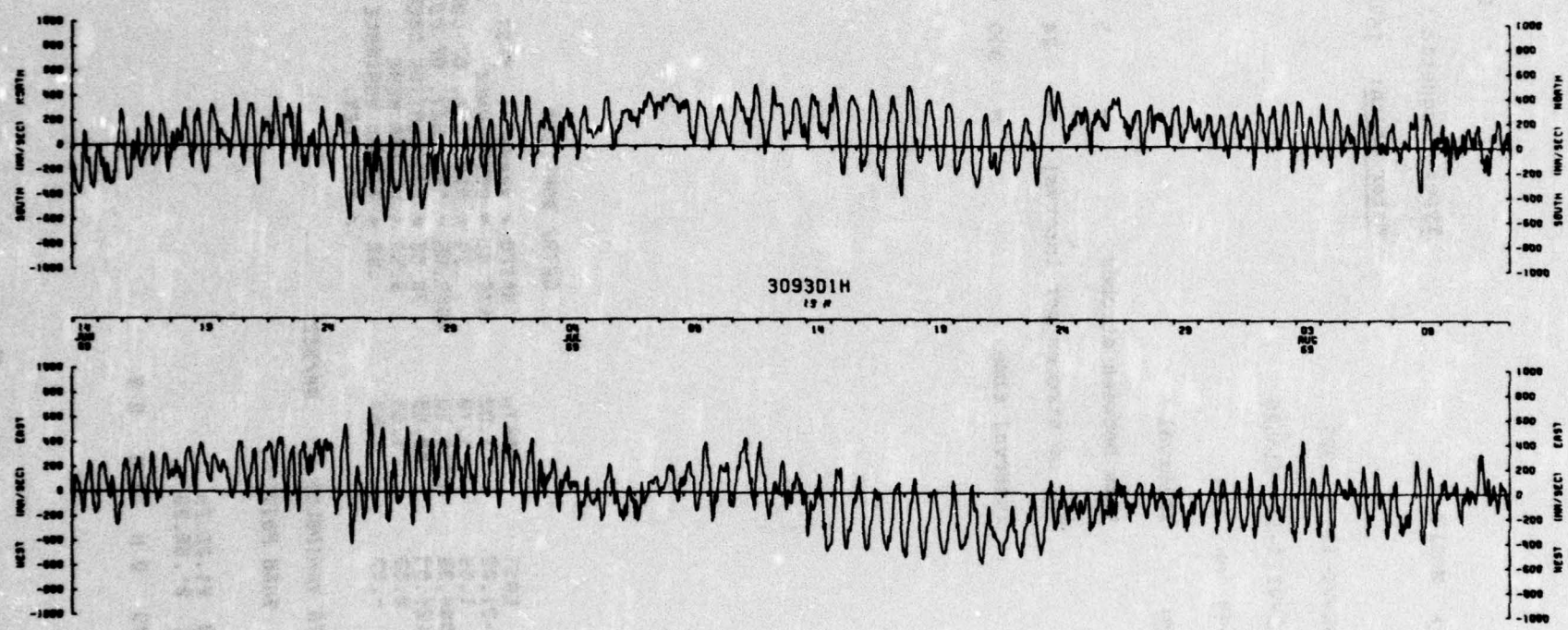


AUTO SPECTRUM
3093D900 EAST COMP
3093D900 NORTH COMP
13 METERS
69-VI-13 TO 69-VIII-09
1 PIECES WITH 2700 ESTIMATES
PER PIECE. AVERAGED OVER
8 ADJACENT FREQUENCY BANDS




3093D1H
800
480
160
-160
-480
-800
SOUTH MM/SEC NORTH
-640
-320
0
320
640
WEST MM/SEC EAST


N
0.
200.
KILOMETERS
3093D1H
13 M
69- VI -14 TO 69-VIII-11
07
69-VIII-01
25
20
15
10
25
69-VI-4
20
05
69-VII-01


309301H
SOUTH (MM/SEC) NORTH
WEST (MM/SEC) EAST
1000
800
600
400
200
0
-200
-400
-600
-800
-1000
14 JUN 69
19
24
29
04 JUL 69
09
14
19
24
29
03 AUG 69
09

Data number 3095

Instrument No.: M-214 **Type:** Magnetic tape current meter

Depth: 56 m **Water depth:** 2678 m

Start time: 69-VI-13 212025

Stop time: 69-VIII-11 213525

Duration: 59d 0h 15m

Sampling scheme: Interval

time between strobes = 5 seconds

no. of strobes per interval = 24

interval time = 900 seconds

COMMENTS:

STATS DATA/ 3095E800

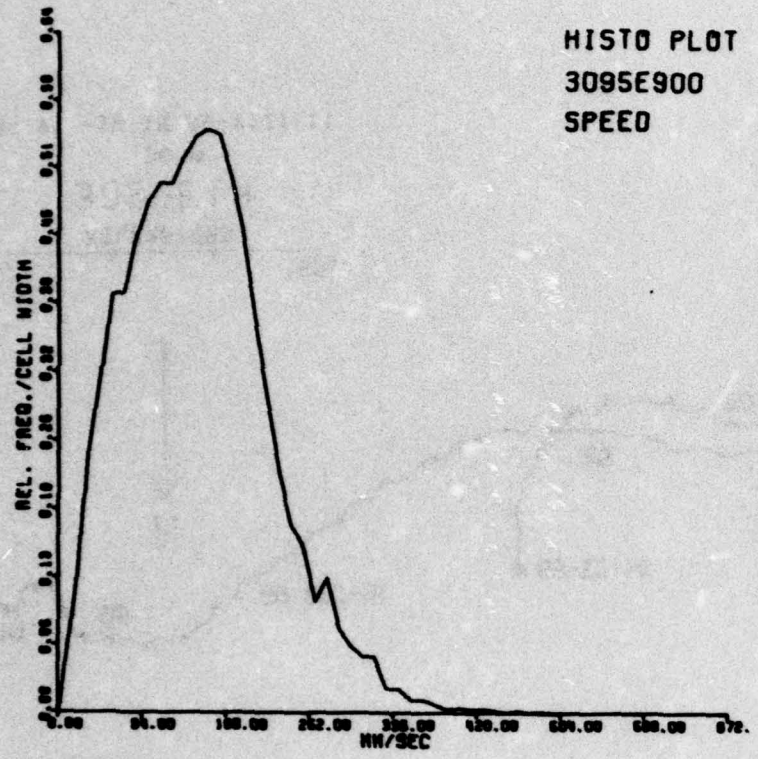
	EAST	NORTH	SPEED		EAST & NORTH	
MEAN =	-21.02	1.02	138.81	= COVARIANCE	=	-3424.17
STD. ERR. =	1.68	1.18	.84	= STD. ERR. OF COVARIANCE	=	145.68
VARIANCE =	16886.36	8008.10	4887.85	= STD. DEV. OF COVARIANCE	=	10865.84
STD. DEV. =	128.89	89.48	70.63	= CORRELATION COEFFICIENT	=	-.302
KURTOSIS =	2.52	9.09	9.30	= VECTOR MEAN	=	21.05
SKEWNESS =	-.09	-.44	.55	= VECTOR VARIANCE	=	12048.29
				= STD. DEV.	=	109.76

UNITS OF RAW DATA VARIABLES = MM/SEC

SAMPLE SIZE = 5666 POINTS

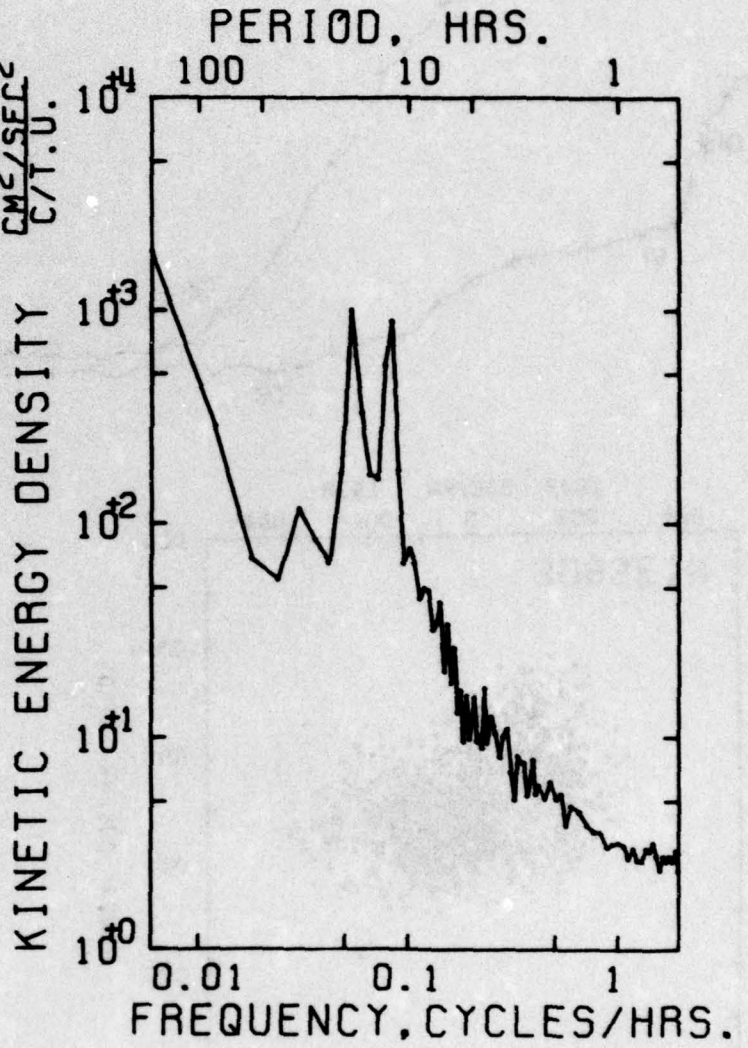
SPANNING RANGE
FROM 69- VI -13 21.20.25
TO 69-VIII-11 21.35.25

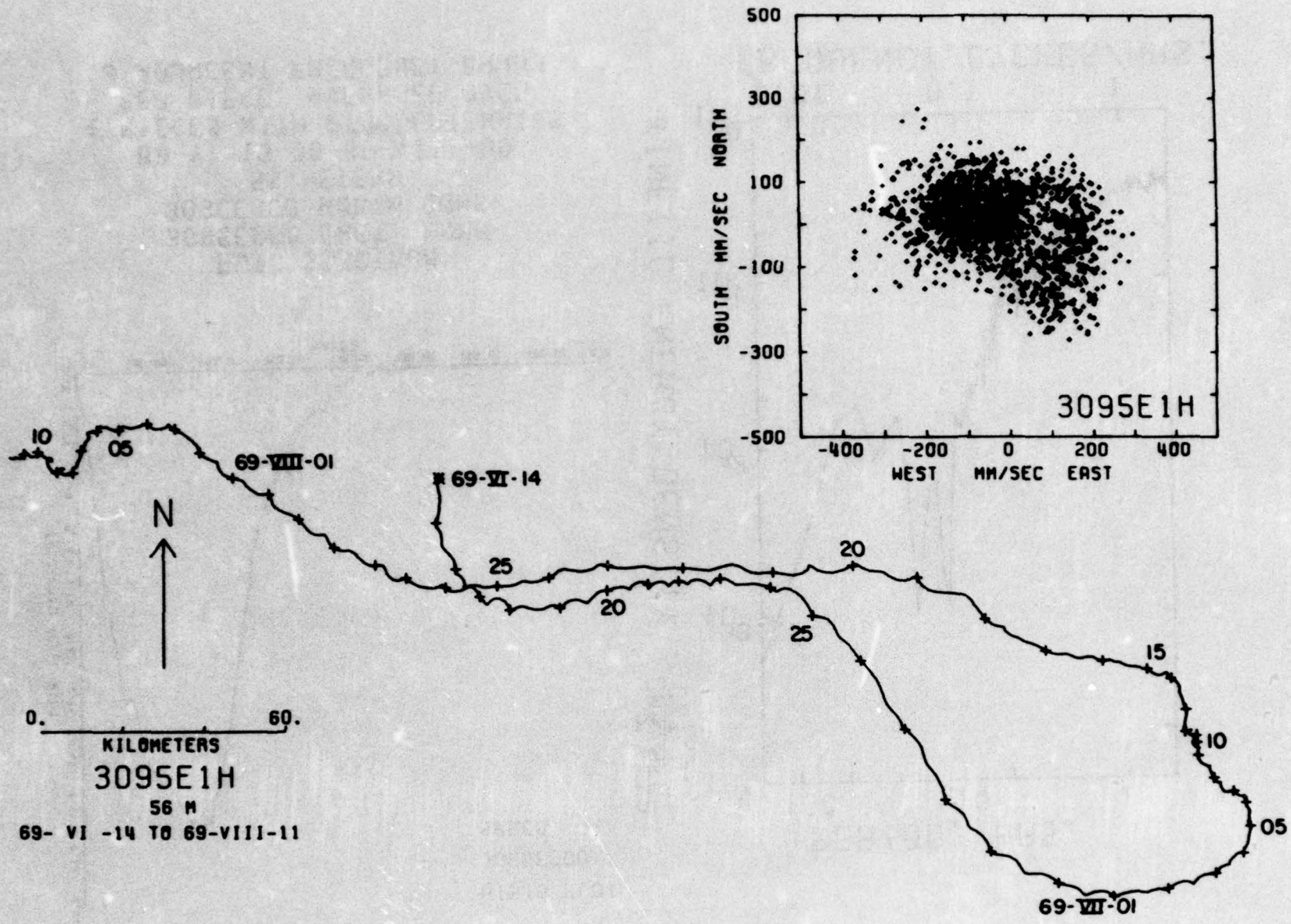
DURATION 59 DAYS 0 H 15 M 0 S

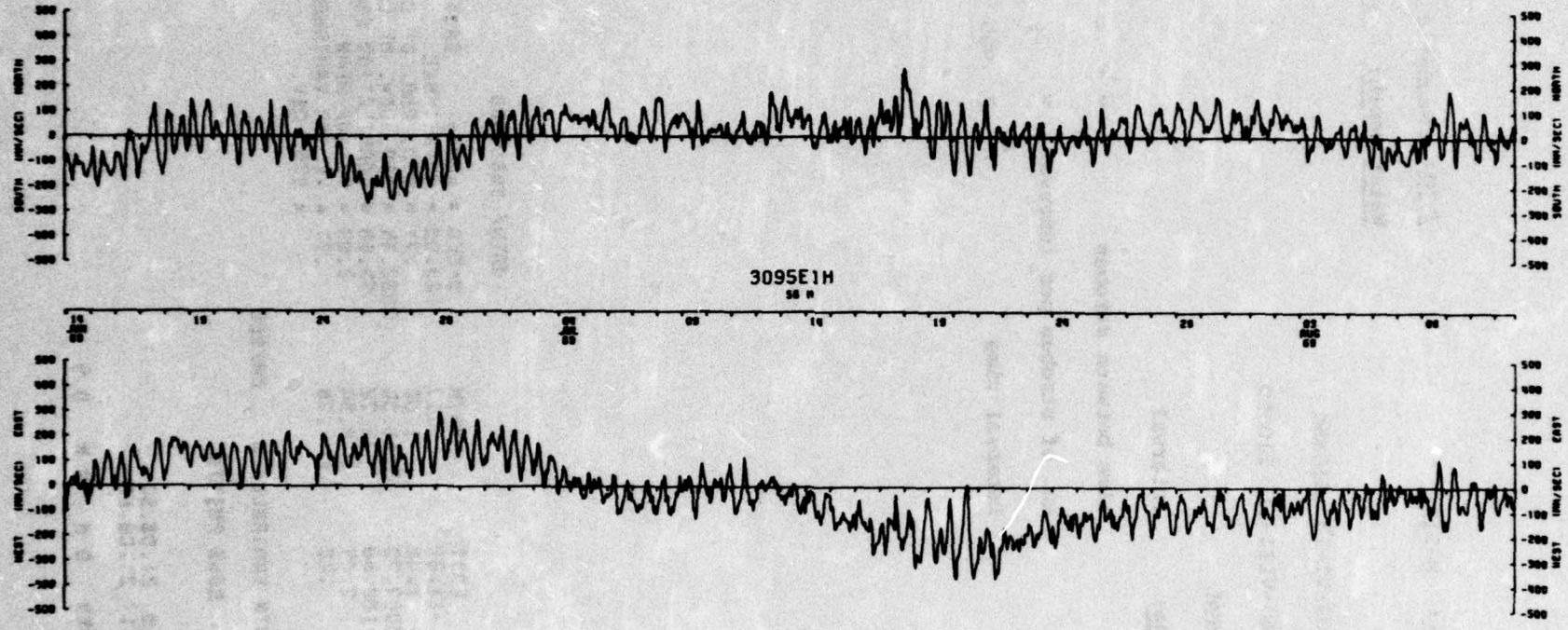


HISTO PLOT
3095E900
SPEED

AUTO SPECTRUM
3095E900 EAST COMP
3095E900 NORTH COMP
56 METERS
69-VI-13 TO 69-VIII-09
1 PIECES WITH 2700 ESTIMATES
PER PIECE. AVERAGED OVER
8 ADJACENT FREQUENCY BANDS




500
300
100
-100
-300
-500
SOUTH MM/SEC NORTH
-400
-200
0
200
400
WEST MM/SEC EAST
3095E1H
10
05
69-VIII-01
69-VI-14
N
25
20
20
25
15
10
05
69-VII-01
0.
60.
KILOMETERS
3095E1H
56 M
69- VI -14 TO 69-VIII-11


3095E1H

Data number 3096

Instrument No.: M-213 **Type:** Magnetic tape current meter

Depth: 108 m **Water depth:** 2678 m

Start time: 69-VI-13 210850

Stop time: 69-VIII-11 210850

Duration: 59d

Sampling scheme: Interval

time between strobes = 5 seconds

no. of strobes per interval = 24

interval time = 900 seconds

COMMENTS:

STATS DATA/ 3096C900

	EAST	NORTH
MEAN =	-11.21	-.17
STD. ERR. =	1.48	1.02
VARIANCE =	12907.73	5085.34
STD. DEV. =	109.58	78.72
KURTOSIS =	2.84	3.34
SKEWNESS =	.42	-.78

SPEED = ##### EAST & NORTH #####

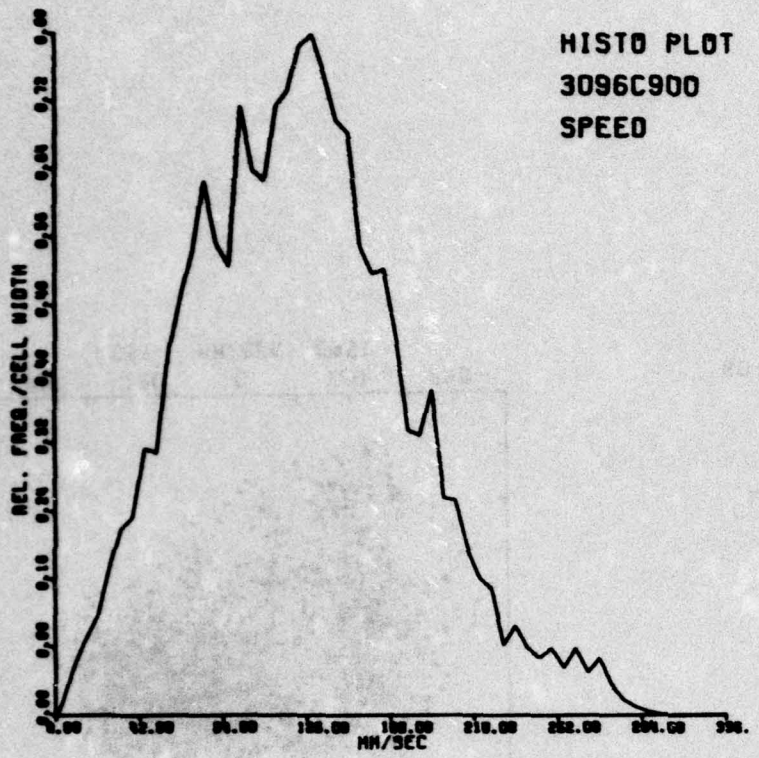
123.03	= COVARIANCE	=	-3056.57
.71	= STD. ERR. OF COVARIANCE	=	107.01
2682.44	= STD. DEV. OF COVARIANCE	=	8054.28
53.88	= CORRELATION COEFFICIENT	=	-.384
2.89	= VECTOR MEAN	=	11.21
.37	= VECTOR VARIANCE	=	8948.53
	= STD. DEV.	=	94.58

UNITS OF RAW DATA VARIABLES = CM/SEC

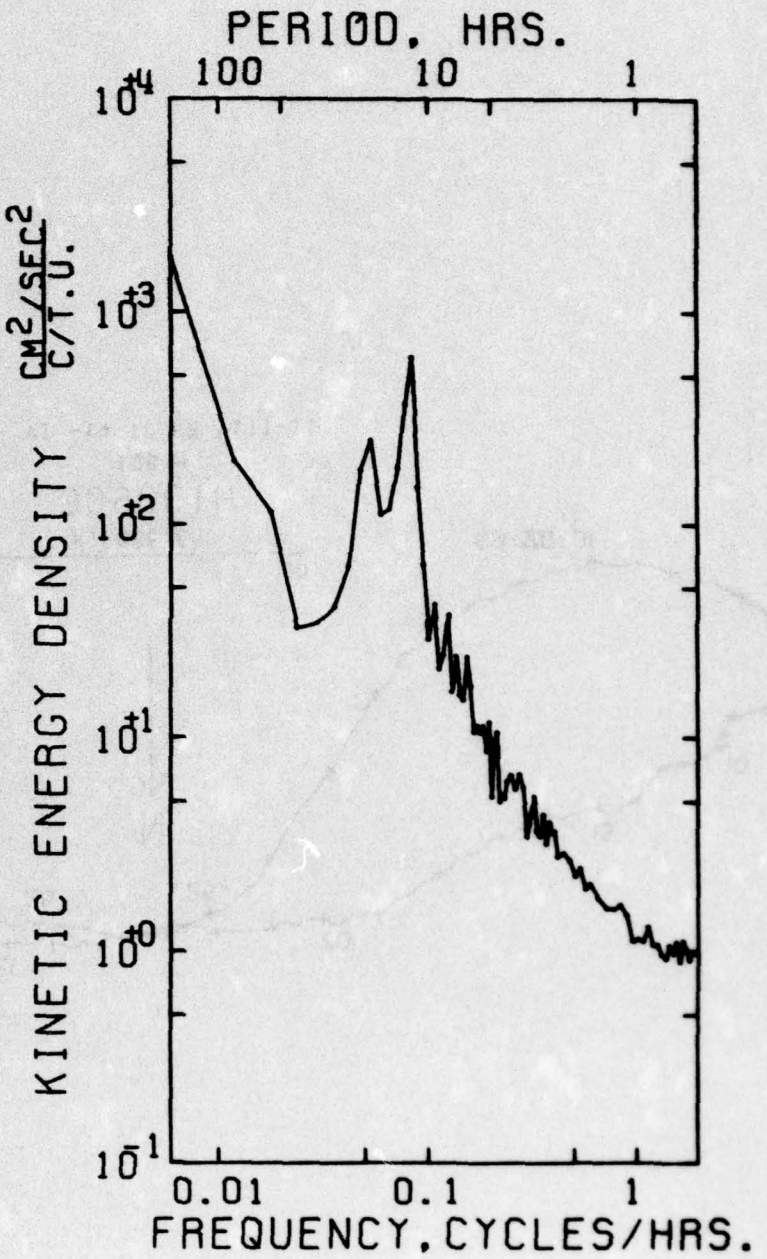
SAMPLE SIZE = 5885 POINTS

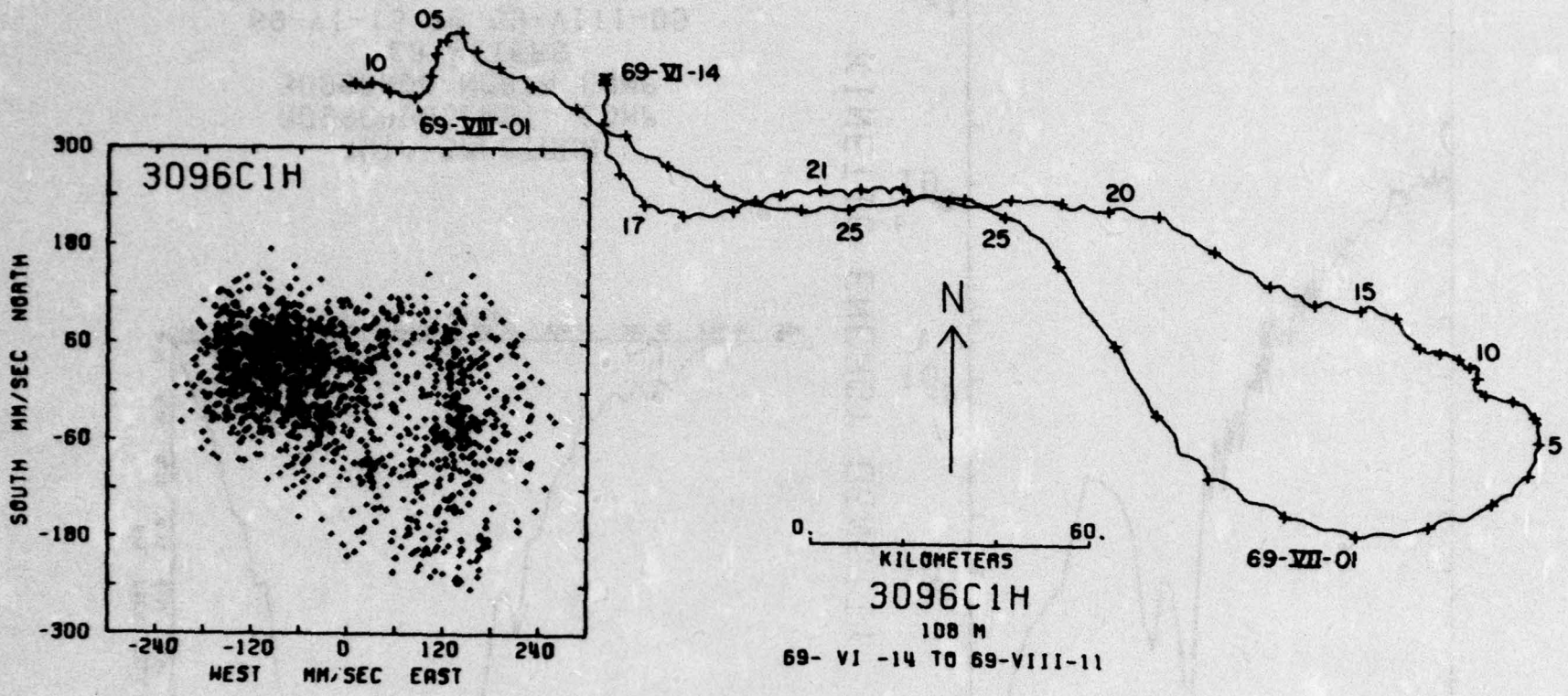
SPANNING RANGE
FROM 69- VI -13 21.00.50
TO 69-VIII-11 21.00.50

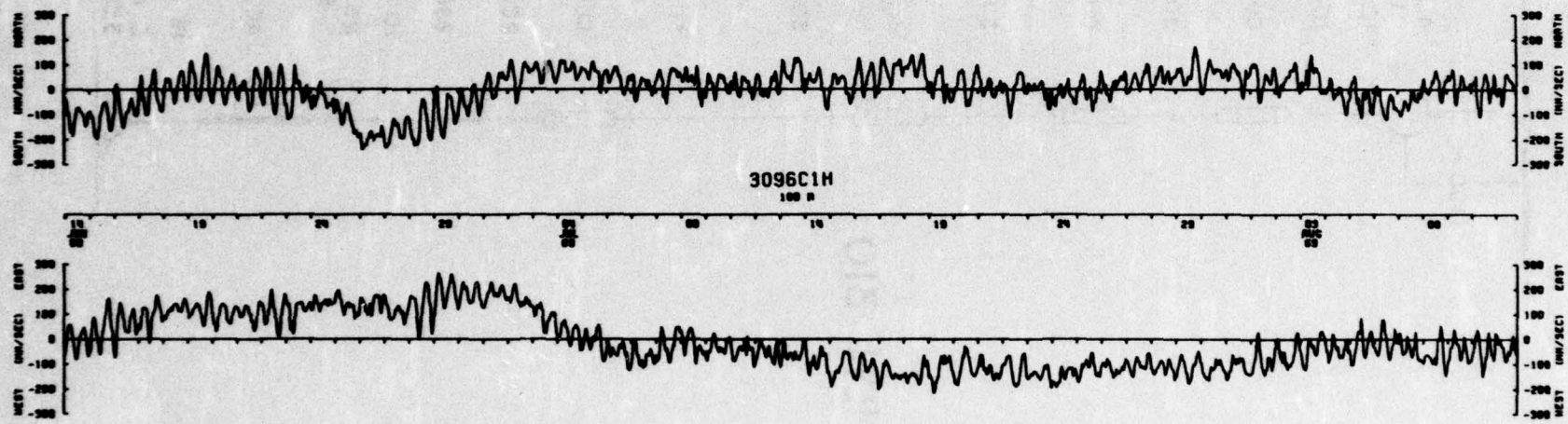
DURATION 59 DAYS 0 H 0 M 0 S



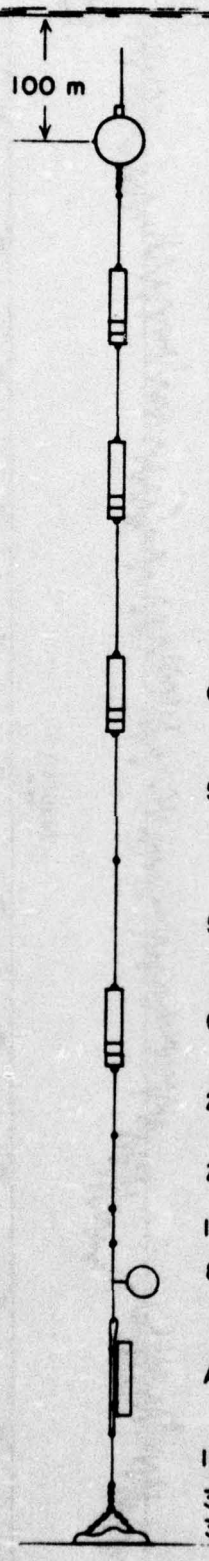
AUTO SPECTRUM
3096C900 EAST COMP
3096C900 NORTH COMP
108 METERS
69-VI-13 TO 69-VIII-09
1 PIECES WITH 2700 ESTIMATES
PER PIECE. AVERAGED OVER
8 ADJACENT FREQUENCY BANDS




3096C1H
300
180
60
-60
-180
-300
SOUTH MM/SEC NORTH
-240
-120
0
120
240
WEST MM/SEC EAST
05
10
69-VI-14
69-VIII-01
17
21
25
25
20
15
10
5
69-VII-01
N
0.
60.
KILOMETERS
3096C1H
108 M
69- VI -14 TO 69-VIII-11


3096C1H
100 m

STATION 310



4 FT. SPHERE WITH LIGHT AND RADIO
10 m CHAIN
100 m 3/8" DACRON
CURRENT METER - *3101*
300 m 1/2" NYLON
CURRENT METER - *3102*
500 m 3/8" DACRON
CURRENT METER - *3103*
500 m 3/8" DACRON
500 m 3/8" DACRON
CURRENT METER - *3104*
200 m 1/2" NYLON
280 m 1/2" NYLON
10 m 5/8" NYLON
85 m OF 5/8" NYLON WITH 20 GLASS BALLS EVENLY SPACED
ACOUSTIC RELEASE, AMF
15 m 5/8" NYLON
3 m CHAIN
3,000 LB STIMSON ANCHOR

Mooring No. 310

Set 69 (Year) Aug (Month) 11 (Day) — 39° 10.0N (Latitude) — 70° 02.5W (Longitude)

Set by R. Heinmiller Ship R. V. Chain Cruise 95

Retrieved 70 (Year) Jan (Month) 04 (Day)

Retrieved by R. Heinmiller Ship R. V. Chain Cruise 97

Purpose of Mooring: Four months current measurements at Site D.

Mooring Type: Subsurface 4 foot sphere.

Data Number	Instrument Number	Type	Depth Meters	Comments
3101*	M-142	M.C.M.	200	
3102*	M-175	M.C.M.	532	
3103*	M-215	M.C.M.	1044	
3104*	M-204	M.C.M.	2066	
Water depth			2683	

Hydrographic Stations

R. V. Chain cruise 95 Station 922

COMMENTS ON MOORING:

Data number 3101

Instrument No.: M-142 **Type:** Magnetic tape current meter

Depth: 200 m **Water depth:** 2683 m

Start time: 69-VIII-11 154600

Stop time: 69-IX-15 174600

Duration: 35d 2h

Sampling scheme: Interval

time between strobes = 5.27 seconds

no. of strobes per interval = 24

interval time = 1800 seconds

COMMENTS:

Digital clock - clock lost 1 minute 48 seconds over 5 month period.

Data becomes noisy after a month.

STATS DATA/ 3101A1800

	EAST	NORTH
MEAN =	4.88	24.57
STD. ERR. =	1.03	1.58
VARIANCE =	6284.84	4271.87
STD. DEV. =	79.28	65.36
KURTOSIS =	9.80	2.65
SKEWNESS =	.85	.22

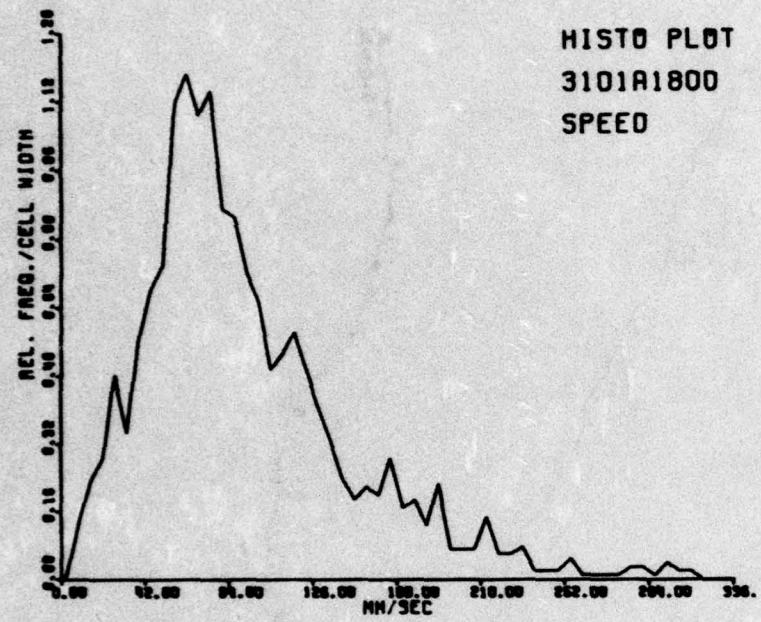
SPEED =	*****	EAST & NORTH	*****
81.88 =	COVARIANCE	=	2370.48
1.28 =	STD. ERR. OF COVARIANCE	=	143.47
2741.41 =	STD. DEV. OF COVARIANCE	=	5888.23
52.36 =	CORRELATION COEFFICIENT	=	.457
4.89 =	VECTOR MEAN	=	25.07
1.24 =	VECTOR VARIANCE	=	5278.40
	STD. DEV.	=	72.65

UNITS OF RAW DATA VARIABLES = MM/SEC

SAMPLE SIZE = 1685 POINTS

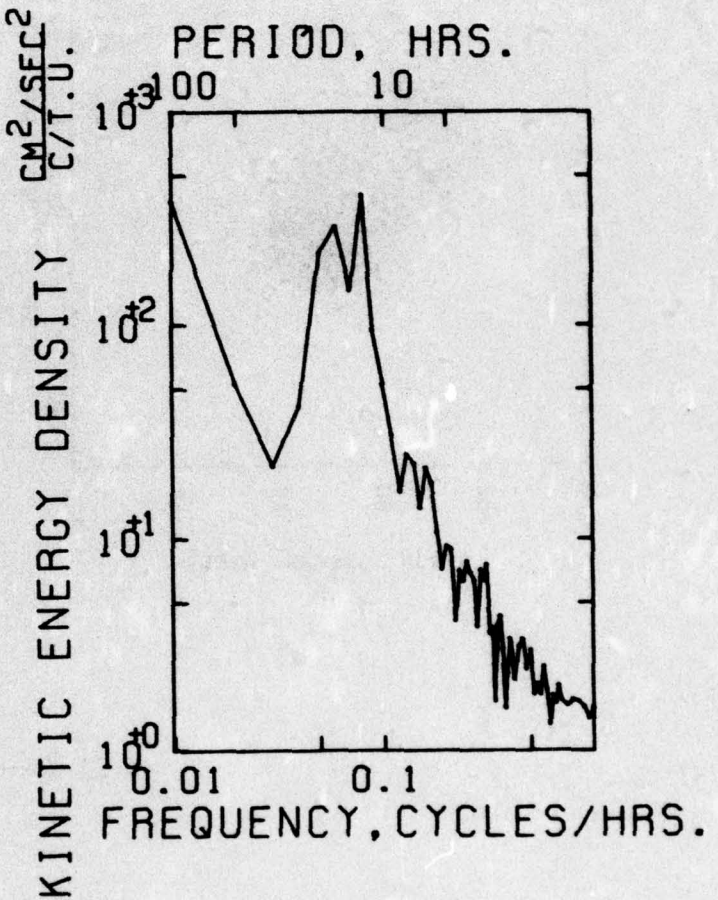
SPANNING RANGE
FROM 69-VIII-11 15.46.00
TO 69- IX -15 17.46.00

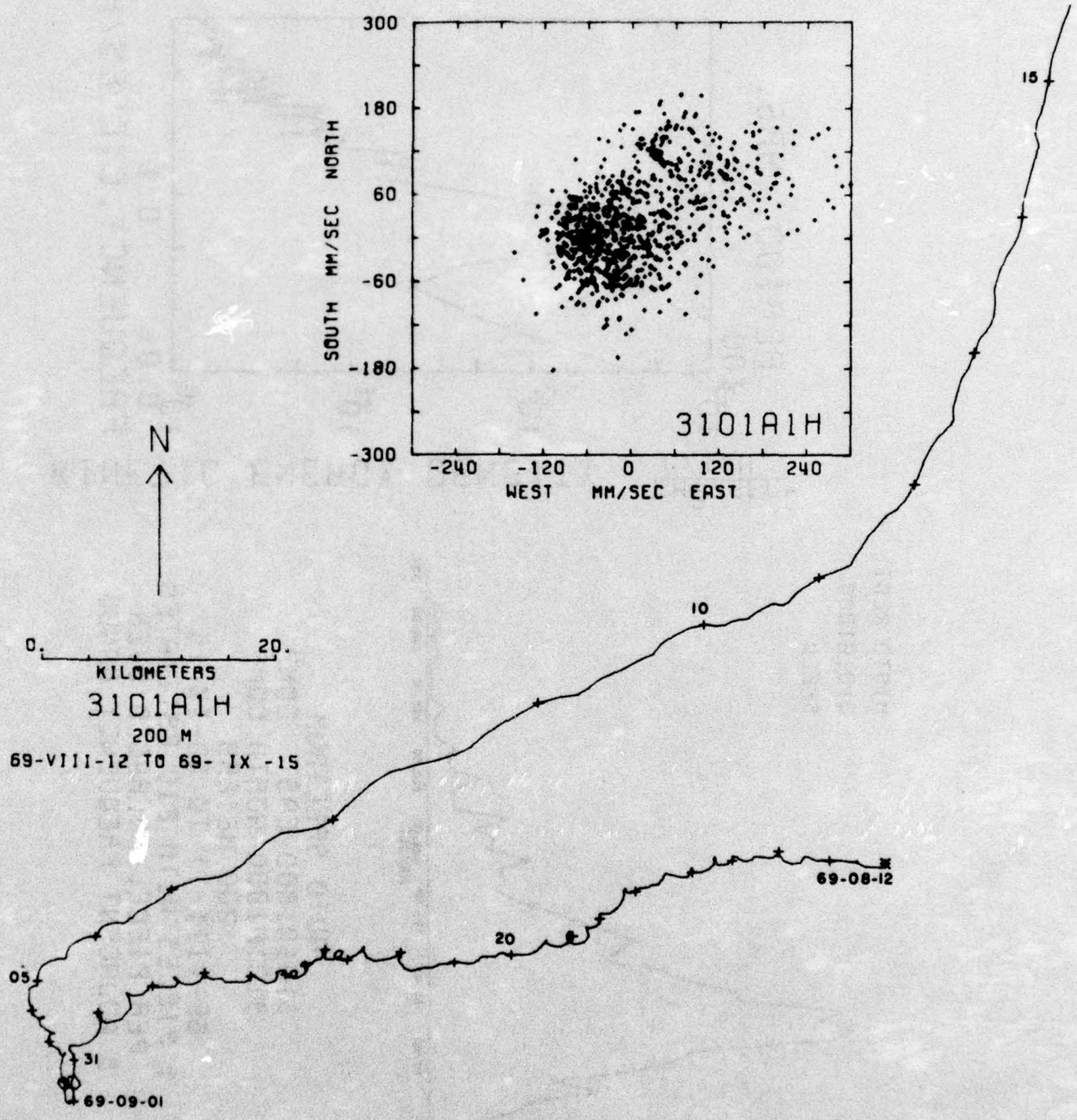
DURATION 35 DAYS 2 H 0 M 0 S

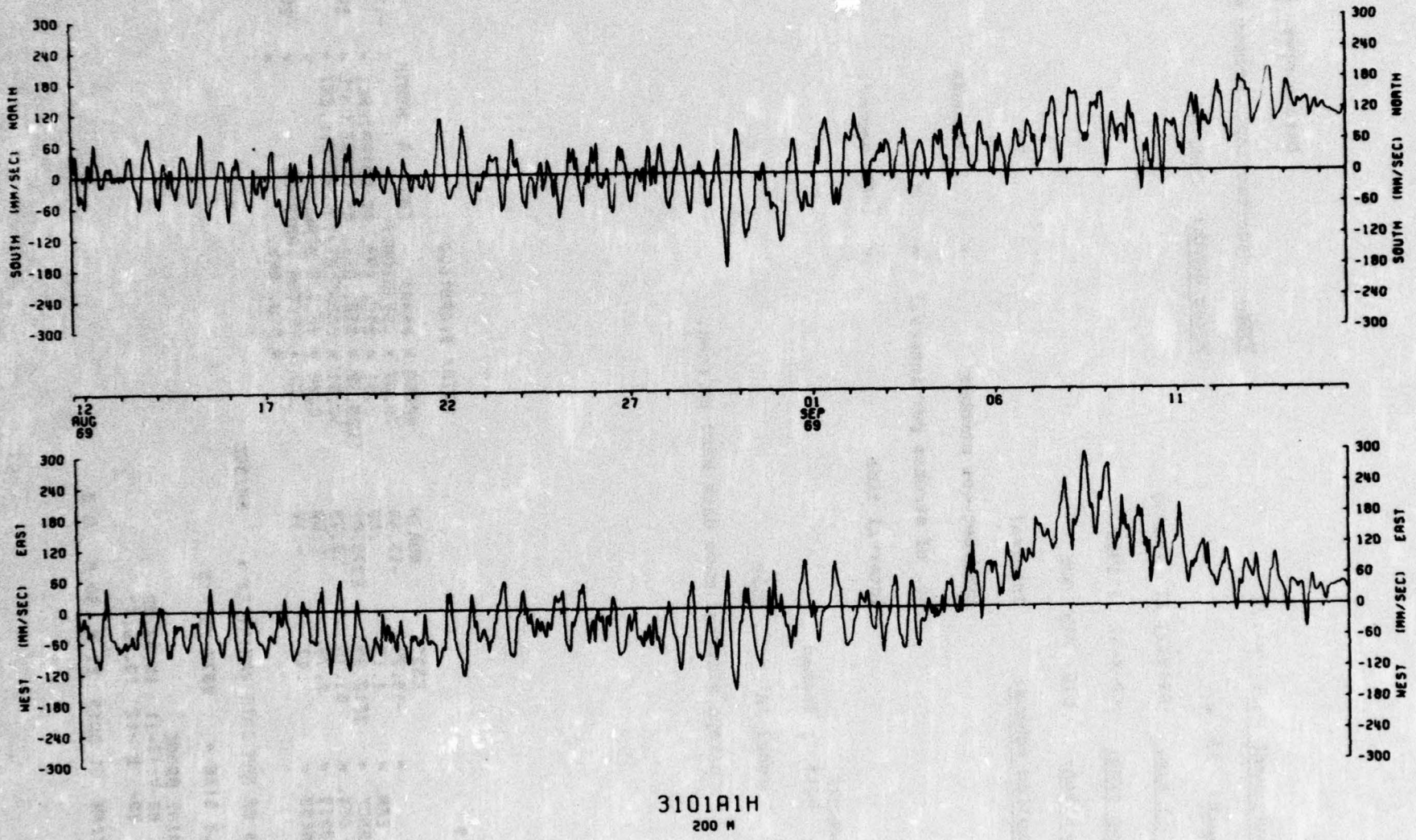


HISTO PLOT
3101A1800
SPEED

AUTO SPECTRUM
3101A1800 EAST COMP
3101A1800 NORTH COMP
200 METERS
69-VIII-11 TO 69-IX-14
1 PIECES WITH 810 ESTIMATES
PER PIECE. AVERAGED OVER
8 ADJACENT FREQUENCY BANDS




300
180
60
-60
-180
-300
SOUTH MM/SEC NORTH
-240
-120
0
120
240
WEST MM/SEC EAST
3101A1H
N
0.
20.
KILOMETERS
3101A1H
200 M
69-VIII-12 TO 69- IX -15
15
10
20
05
31
69-08-12
69-09-01



3101A1H
200 M

Data number 3102

Instrument No.: M-175 **Type:** Magnetic tape current meter

Depth: 532 m **Water depth:** 2683 m

Start time: 69-VIII-11 154900

Stop time: 69-X-12 131900

Duration: 61d 21h 30m

Sampling scheme: Interval

time between strobes = 5 seconds

no. of strobes per interval = 24

interval time = 1800 seconds

COMMENTS:

Battery leaked

Channel 'A' data only

Much tape slippage made data hard to read.

STATS DATA/ 3102011800

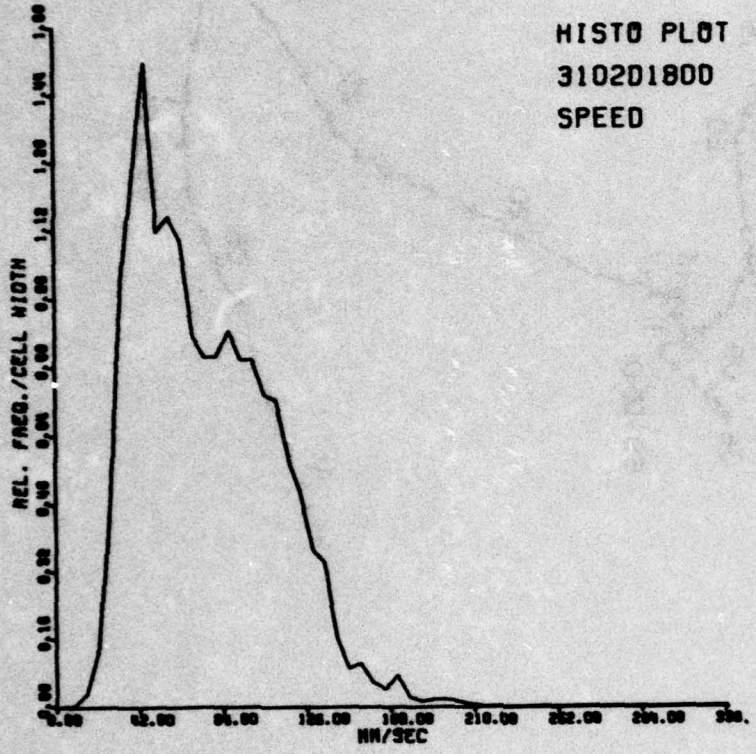
	EAST	NORTH	SPEED	#####	EAST & NORTH	#####
MEAN =	-10.24	-15.44	75.07	= COVARIANCE	=	-1360.68
STD. ERR. =	1.13	.88	.61	= STD. ERR. OF COVARIANCE	=	55.06
VARIANCE =	3012.68	2375.01	1129.12	= STD. DEV. OF COVARIANCE	=	3050.62
STD. DEV. =	61.75	48.73	33.51	= CORRELATION COEFFICIENT	=	-.454
KURTOSIS =	2.73	2.58	2.84	= VECTOR MEAN	=	23.80
SKEWNESS =	.42	-.14	.81	= VECTOR VARIANCE	=	3083.85
				= STD. DEV.	=	55.62

UNITS OF RAW DATA VARIABLES = MM/SEC

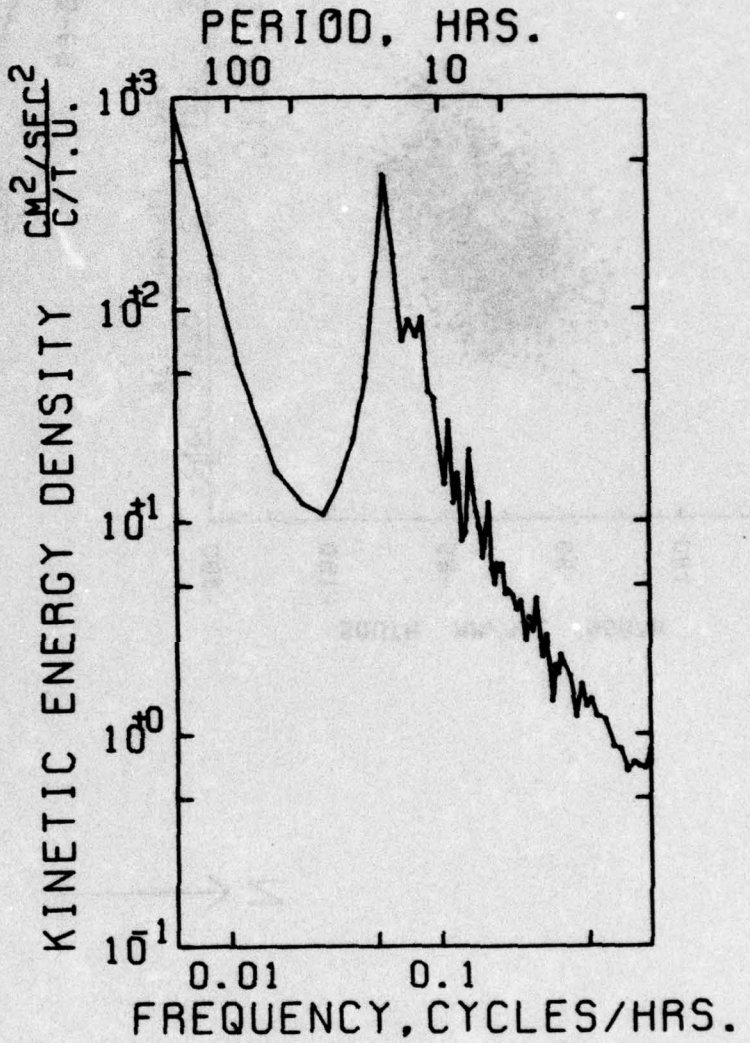
SAMPLE SIZE = 2872 POINTS

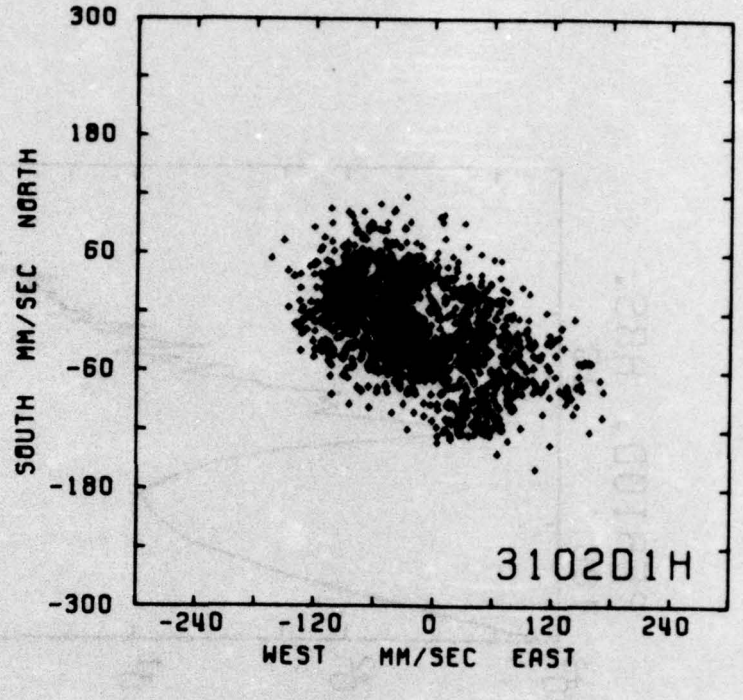
SPANNING RANGE
FROM 69-VIII-11 15.48.00
TO 69- X -12 13.18.00

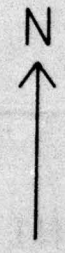
DURATION 61 DAYS 21 H 30 M 0 S



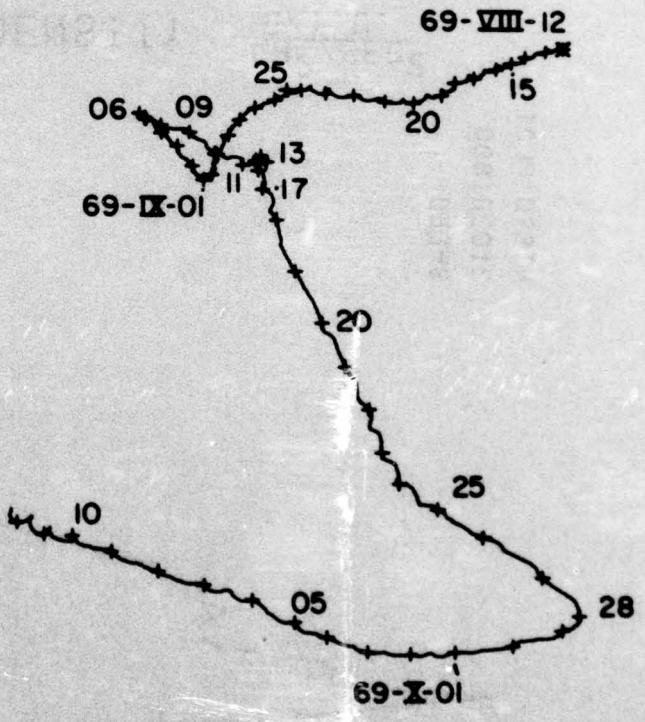
AUTO SPECTRUM
3102D1800 EAST COMP
3102D1800 NORTH COMP
532 METERS
69-VIII-11 TO 69-X-11
1 PIECES WITH 1458 ESTIMATES
PER PIECE. AVERAGED OVER
8 ADJACENT FREQUENCY BANDS

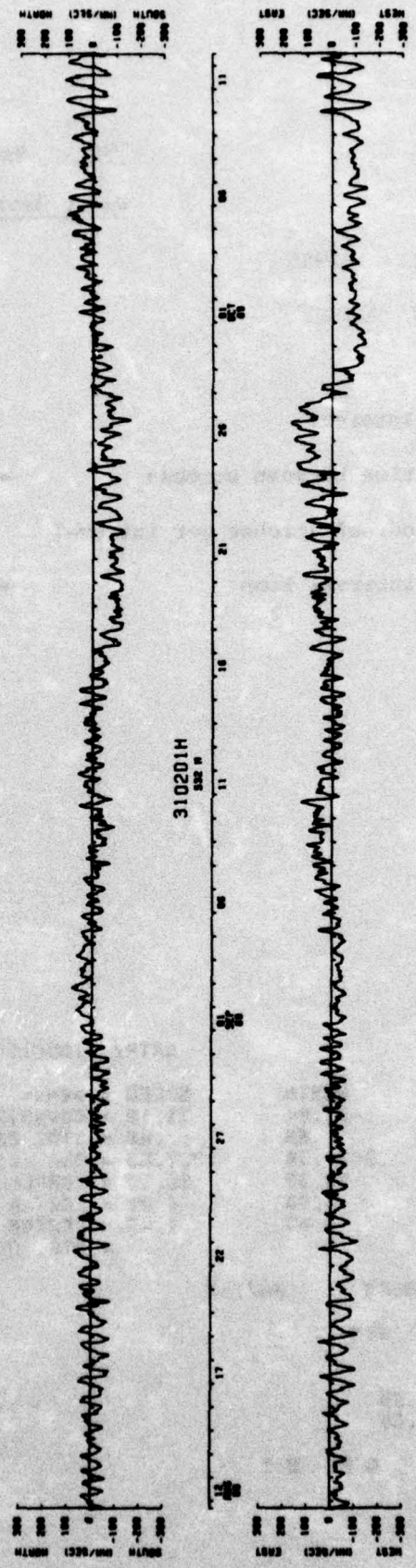






3102D1H
532 M
69-VIII-12 TO 69- X -12




3102D1H
532 M
SOUTH (MM/SEC) NORTH
WEST (MM/SEC) EAST
NORTH
EAST
SOUTH (MM/SEC) NORTH
WEST (MM/SEC) EAST

Data number 3103

Instrument No.: M-215 **Type:** Magnetic tape current meter

Depth: 1044 m **Water depth:** 2683 m

Start time: 69-VIII-11 182955

Stop time: 69-XII-07 012955

Duration: 117d 7h

Sampling scheme: Interval

time between strobes = 5 seconds

no. of strobes per interval = 24

interval time = 1800 seconds

COMMENTS:

STATS DATA/ 3103C1800

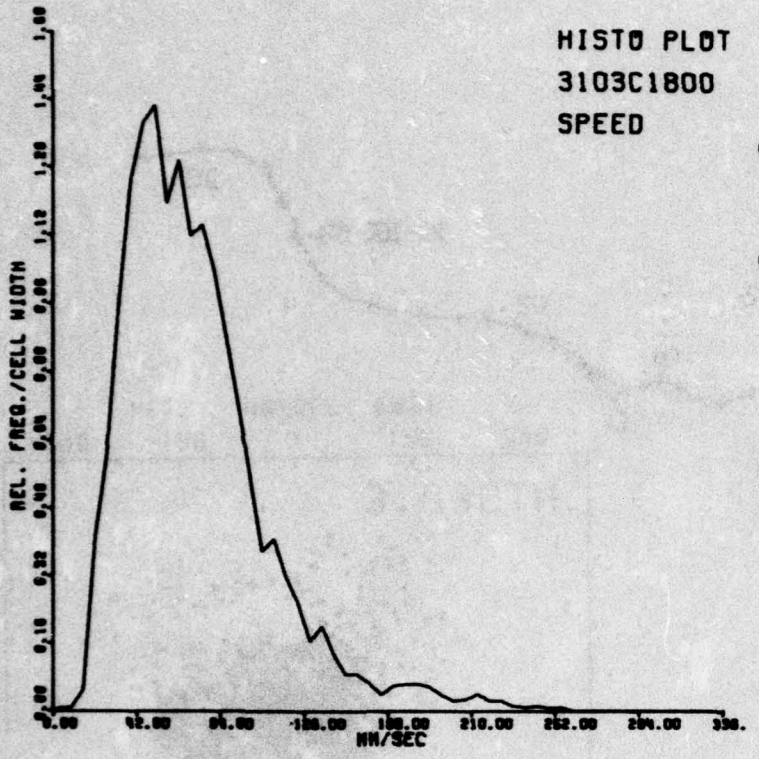
	EAST	NORTH	SPEED	EAST & NORTH
MEAN	-30.88	-17.84	71.12	COVARIANCE = -717.54
STD. ERR.	.67	.68	.48	STD. ERR. OF COVARIANCE = 48.21
VARIANCE	2540.78	2588.74	1327.43	STD. DEV. OF COVARIANCE = 3682.86
STD. DEV.	50.41	50.88	36.43	CORRELATION COEFFICIENT = -.281
KURTOSIS	9.10	9.00	8.01	VECTOR MEAN = 35.71
SKEWNESS	.98	-.87	1.45	VECTOR VARIANCE = 2555.28
				STD. DEV. = 50.55

UNITS OF RAW DATA VARIABLES = CM/SEC

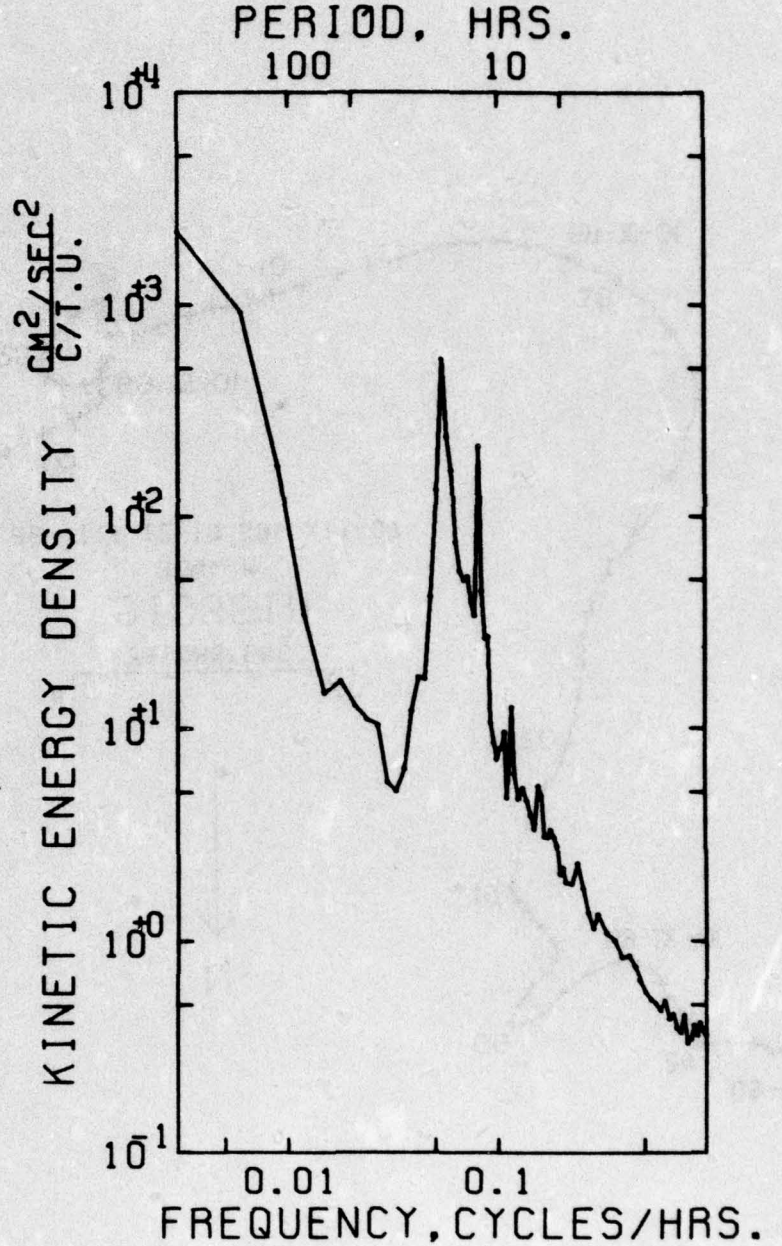
SAMPLE SIZE = 5631 POINTS

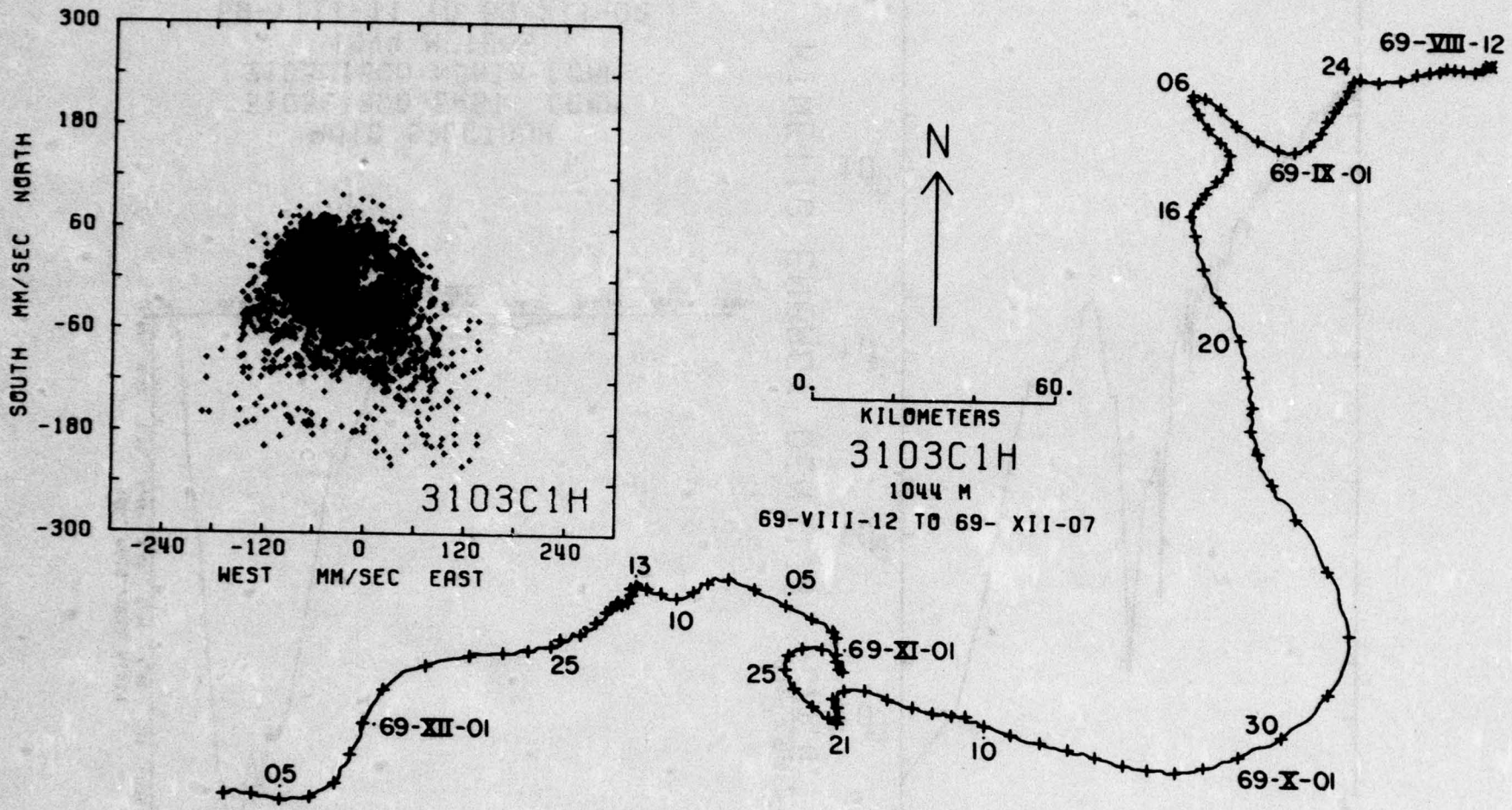
SPANNING RANGE
FROM 69-VIII-11 18.29.55
TO 69- XII-07 01.29.55

DURATION 117 DAYS 7 H 0 M 0 S



AUTO SPECTRUM
3103C1800 EAST COMP
3103C1800 NORTH COMP
1044 METERS
69-VIII-11 TO 69-XII-02
1 PIECES WITH 2700 ESTIMATES
PER PIECE. AVERAGED OVER
8 ADJACENT FREQUENCY BANDS




300
180
60
-60
-180
-300
SOUTH MM/SEC NORTH
-240
-120
0
120
240
WEST MM/SEC EAST
3103C1H
N
0.
60.
KILOMETERS
3103C1H
1044 M
69-VIII-12 TO 69- XII-07
69-VIII-12
24
06
69-IX-01
16
20
05
69-XI-01
25
21
10
30
69-X-01
13
10
25
69-XII-01
05

3103C1H

Data number 3104

Instrument No.: M-204 **Type:** Maghetic tape current meter

Depth: 2066 m **Water depth:** 2683 m

Start time: 69-VIII-11 154110

Stop time: 69-XII-08 124110

Duration: 118d 21h

Sampling scheme: Interval

time between strobes = 5 seconds

no. of strobes per interval = 24

interval time = 1800 seconds

COMMENTS:

STATS DATA/ 310401800

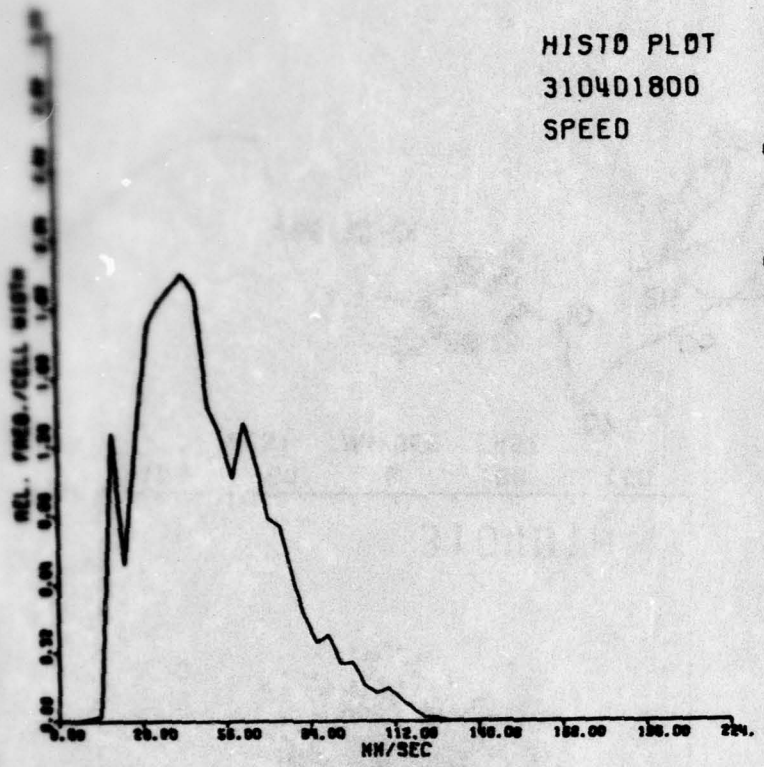
	EAST	NORTH	SPEED	EAST & NORTH	
MEAN =	-16.73	.07	48.70	COVARIANCE =	-374.70
STD. ERR. =	.48	.48	.28	STD. ERR. OF COVARIANCE =	10.43
VARIANCE =	1358.40	1281.37	458.24	STD. DEV. OF COVARIANCE =	1467.66
STD. DEV. =	36.86	35.84	21.43	CORRELATION COEFFICIENT =	-.283
KURTOSIS =	2.72	2.55	3.11	VECTOR MEAN =	16.73
SKEWNESS =	.37	-.01	.72	VECTOR VARIANCE =	1324.88
				STD. DEV. =	36.40

UNITS OF RAW DATA VARIABLES = MM/SEC

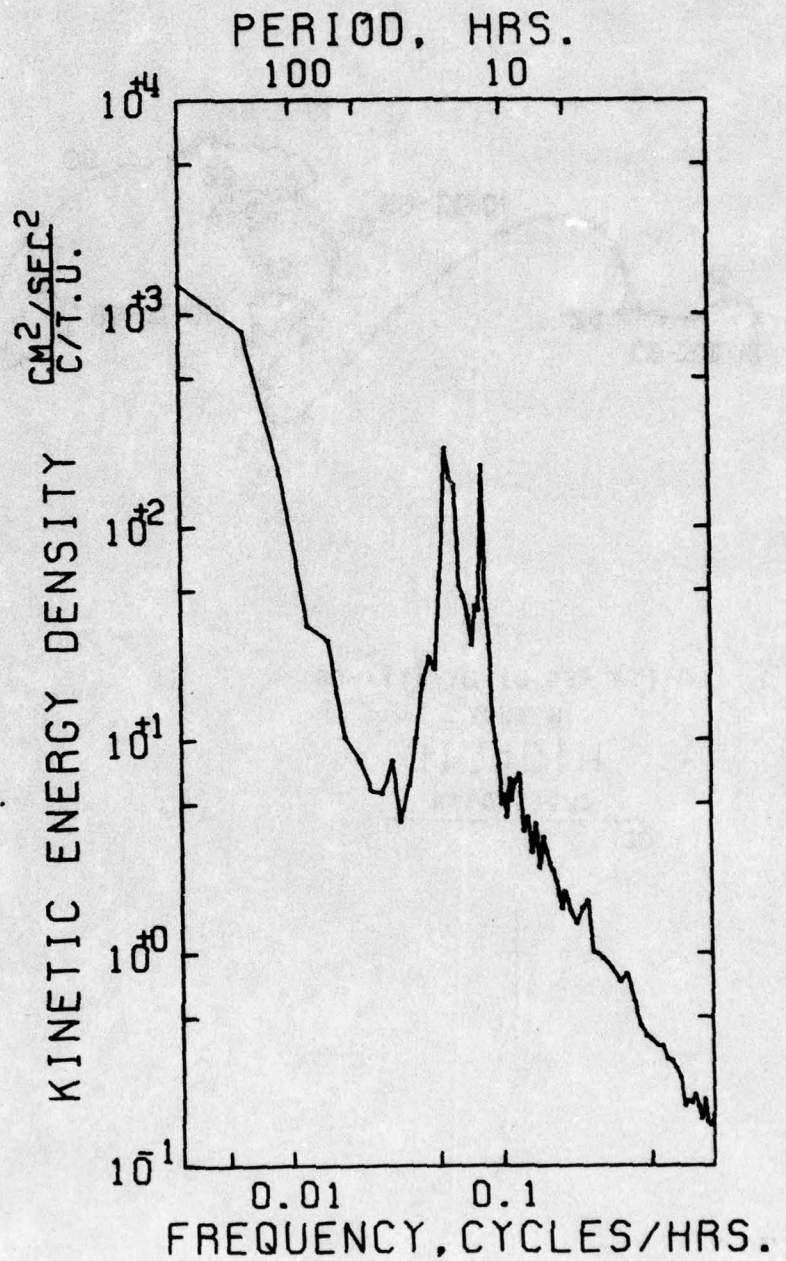
SAMPLE SIZE = 5707 POINTS

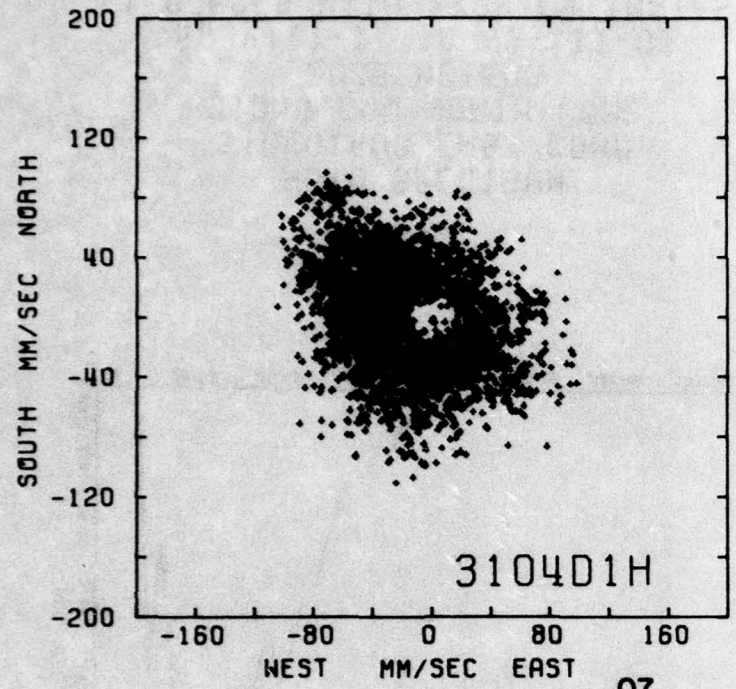
SPANNING RANGE
FROM 69-VIII-11 15.41.10
TO 69- XII-08 12.41.10

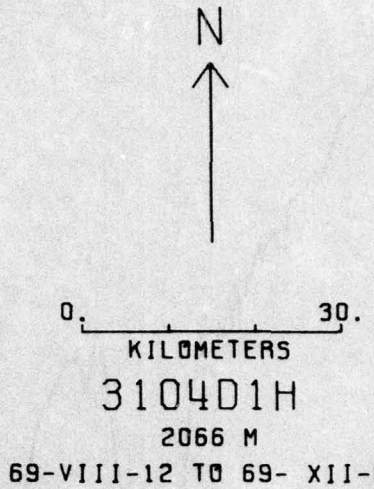
DURATION :118 DAYS 21 H 0 M 0 S

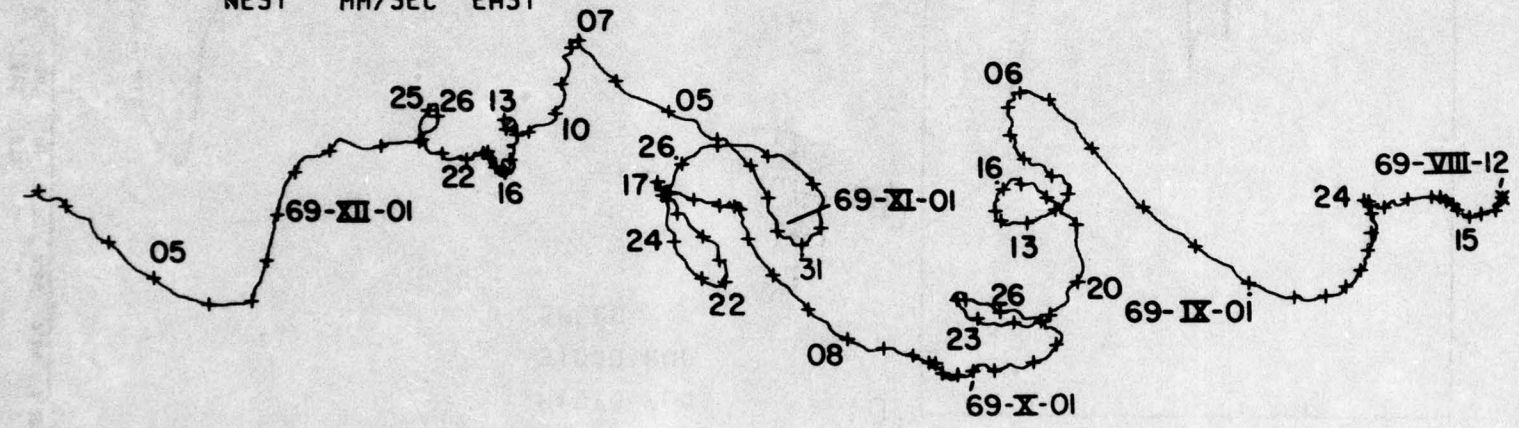


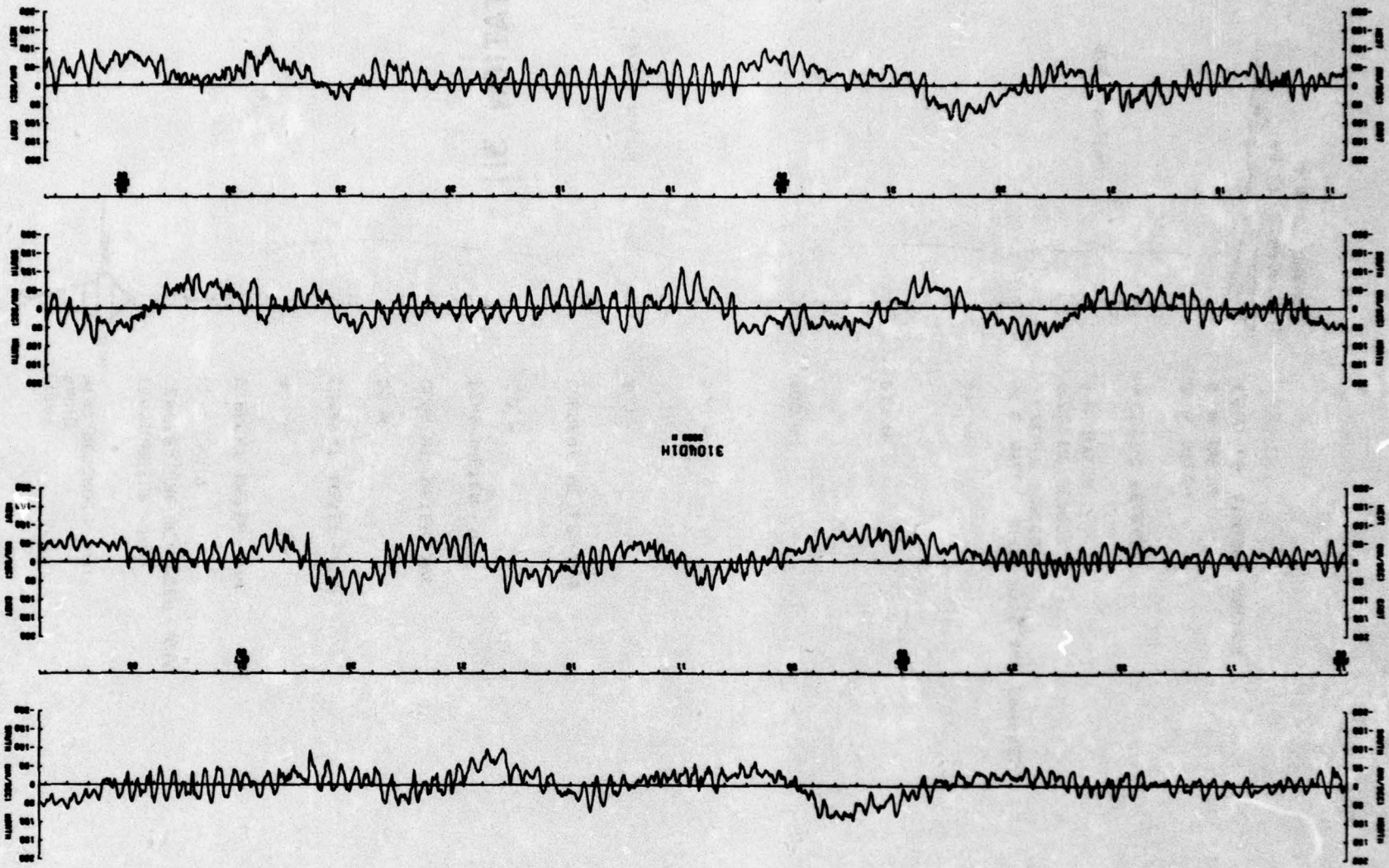
AUTO SPECTRUM
3104D1800 EAST COMP
3104D1800 NORTH COMP
2066 METERS
69-VIII-11 TO 69-XII-02
1 PIECES WITH 2700 ESTIMATES
PER PIECE. AVERAGED OVER
8 ADJACENT FREQUENCY BANDS



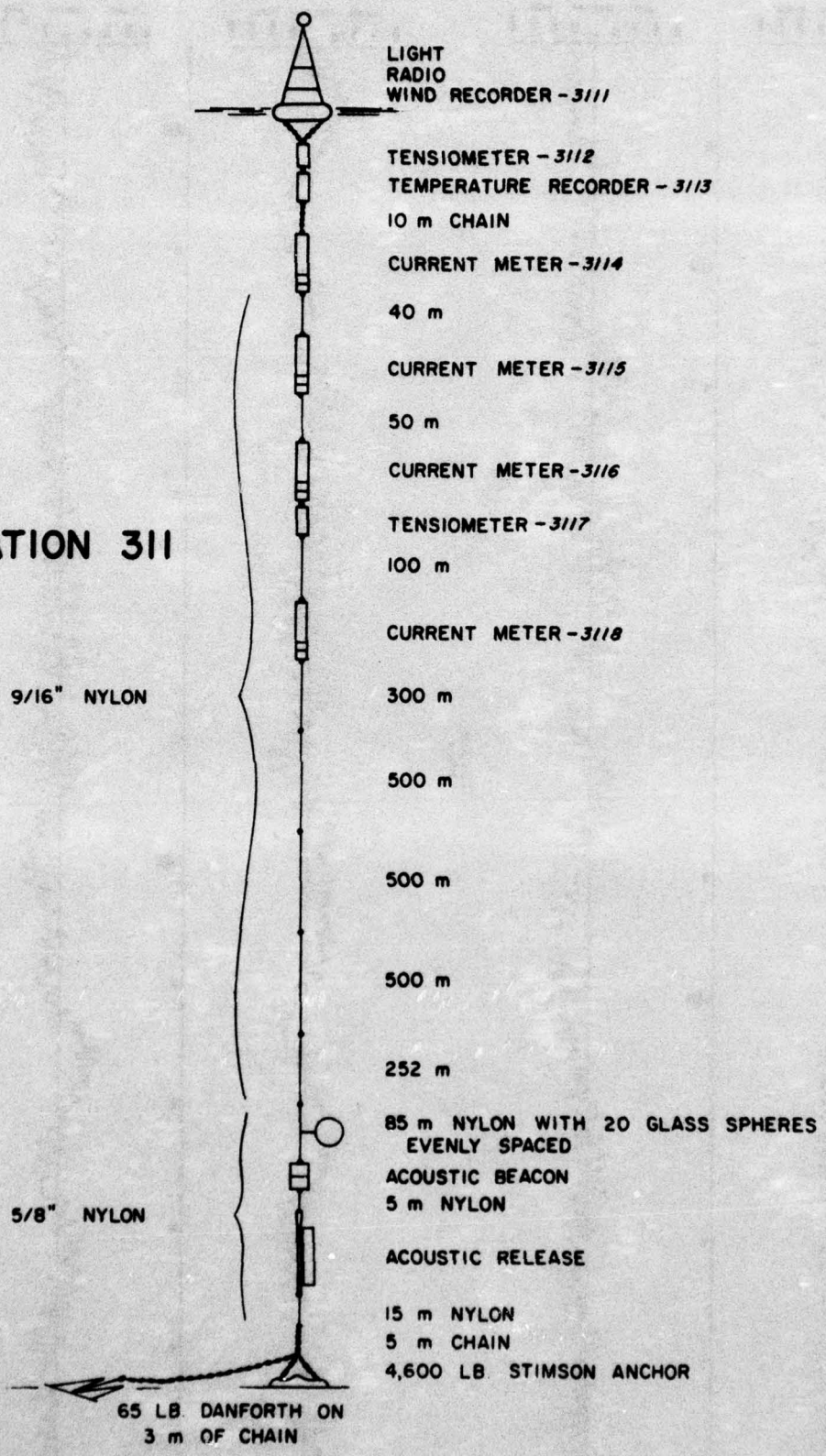

200
120
40
-40
-120
-200
SOUTH MM/SEC NORTH
-160
-80
0
80
160
WEST MM/SEC EAST
3104D1H


N
0.
30.
KILOMETERS
3104D1H
2066 M
69-VIII-12 TO 69- XII-08


07
25
26
13
10
05
26
22
16
17
69-XI-01
69-XII-01
05
24
22
31
06
16
13
69-VIII-12
24
15
20
26
69-IX-01
23
08
69-X-01



STATION 311


LIGHT
RADIO
WIND RECORDER - 3111
TENSIOMETER - 3112
TEMPERATURE RECORDER - 3113
10 m CHAIN
CURRENT METER - 3114
40 m
CURRENT METER - 3115
50 m
CURRENT METER - 3116
TENSIOMETER - 3117
100 m
CURRENT METER - 3118
9/16" NYLON
300 m
500 m
500 m
500 m
252 m
85 m NYLON WITH 20 GLASS SPHERES EVENLY SPACED
ACOUSTIC BEACON
5 m NYLON
5/8" NYLON
ACOUSTIC RELEASE
15 m NYLON
5 m CHAIN
4,600 LB STIMSON ANCHOR
65 LB DANFORTH ON 3 m OF CHAIN

Mooring No. 311

Set 69 (Year) Aug (Month) 11 (Day) — 39° 11.2N (Latitude) — 70° 04.9W (Longitude)

Set by R. Heinmiller — Ship R. V. Chain — Cruise 95

Retrieved 69 (Year) Oct (Month) 06 (Day)

Retrieved by J. Gifford — Ship R. V. Atlantis II — Cruise 53

Purpose of Mooring: Current measurements at Site D.

Mooring Type: Surface mooring - toroid

Data Number	Instrument Number	Type	Depth Meters	Comments
3111	W-119X	M.W.R.	0	Lost
3112	1016	Tens.	3	
3113	T-456	Temp.	3	
3114	M-208	M.C.M.	15	Lost
3115	M-191	M.C.M.	56	Instrument was recording double records
3116*	M-206	M.C.M.	108	
3117	1014	Tens.	109	
3118	M-220	M.C.M.	210	Compass and vane zero after 3 weeks
Water depth			2685	

Hydrographic Station

R. V. Atlantis II cruise 53 Station 1550

COMMENTS ON MOORING:

Mooring recovered using back-up recovery system. Tensiometer reading indicates great strain on mooring September 16, 1969. Top 50 meters of mooring considered stolen.

Data number 3116

Instrument No.: M-206

Type: Magnetic tape current meter

Depth: 108 m

Water depth: 2685 m

Start time: 69-VIII-11 224800

Stop time: 69-IX-17 121800

Duration: 36d 13h 30m

Sampling scheme: Interval

time between strobes = 5 seconds

no. of strobes per interval = 24

interval time = 1800 seconds

COMMENTS:

STATS

DATA/ 3116C1800

	EAST	NORTH
MEAN =	12.28	41.24
STD. ERR. =	2.51	2.26
VARIANCE =	11084.16	9008.57
STD. DEV. =	105.33	94.91
KURTOSIS =	2.69	2.46
SKEWNESS =	.53	.11

SPEED = ****** EAST & NORTH ******

131.70 = COVARIANCE = 4329.61

1.62 = STD. ERR. OF COVARIANCE = 235.61

4808.84 = STD. DEV. OF COVARIANCE = 9873.35

87.89 = CORRELATION COEFFICIENT = .432

2.69 = VECTOR MEAN = 43.09

.52 = VECTOR VARIANCE = 10061.98

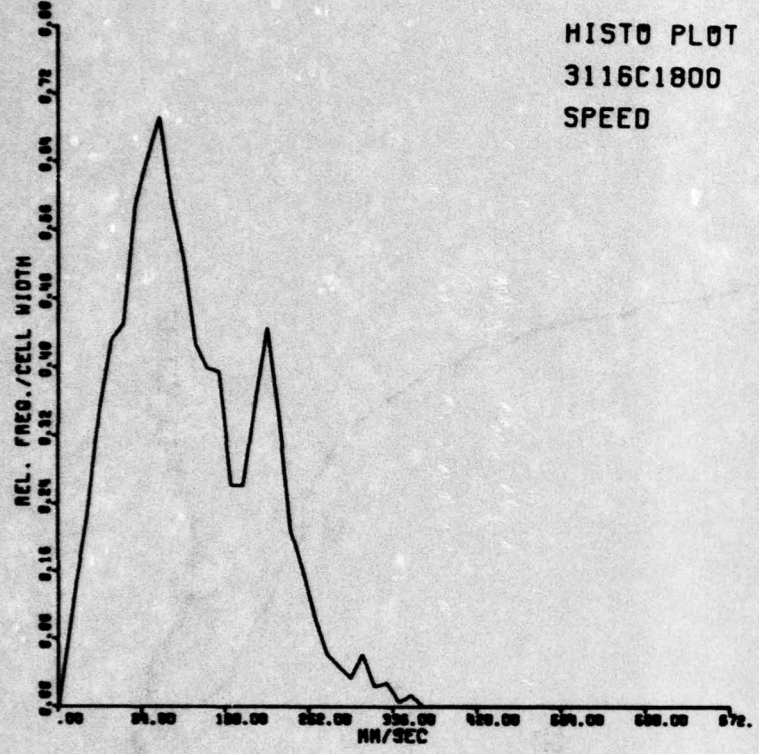
= STD. DEV. = 100.26

UNITS OF RAW DATA VARIABLES = MM/SEC

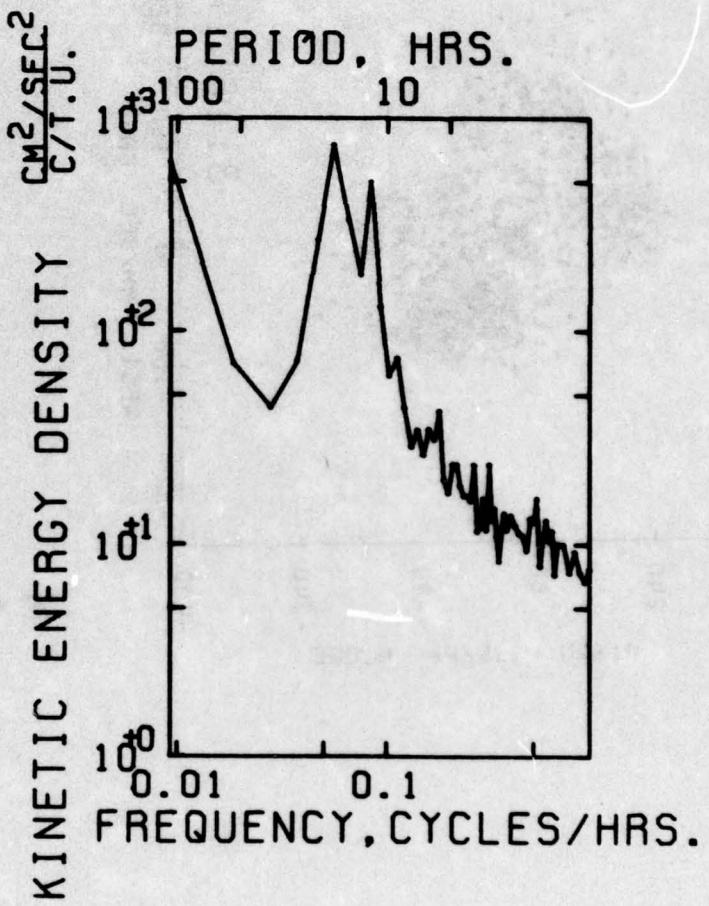
SAMPLE SIZE = 1756 POINTS

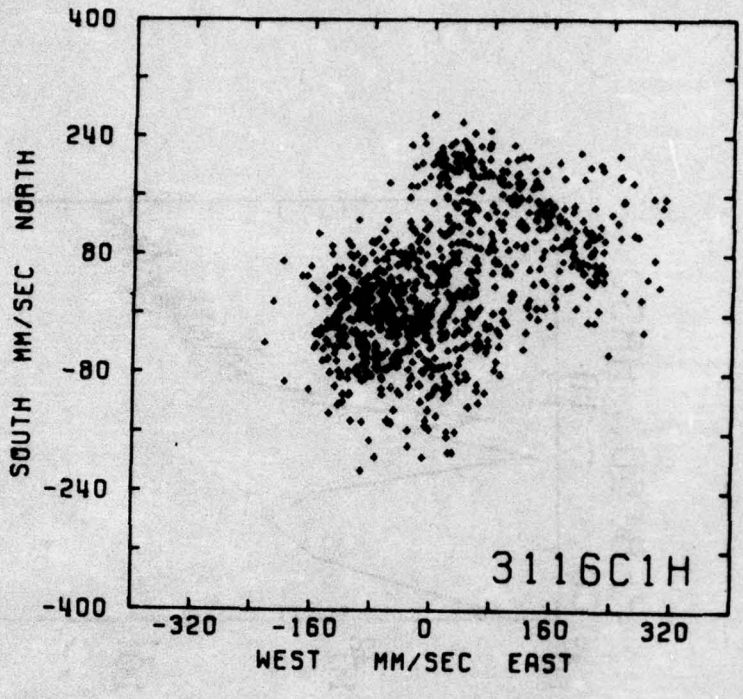
SPANNING RANGE
FROM 69-VIII-11 22.48.00
TO 69- IX -17 12.18.00

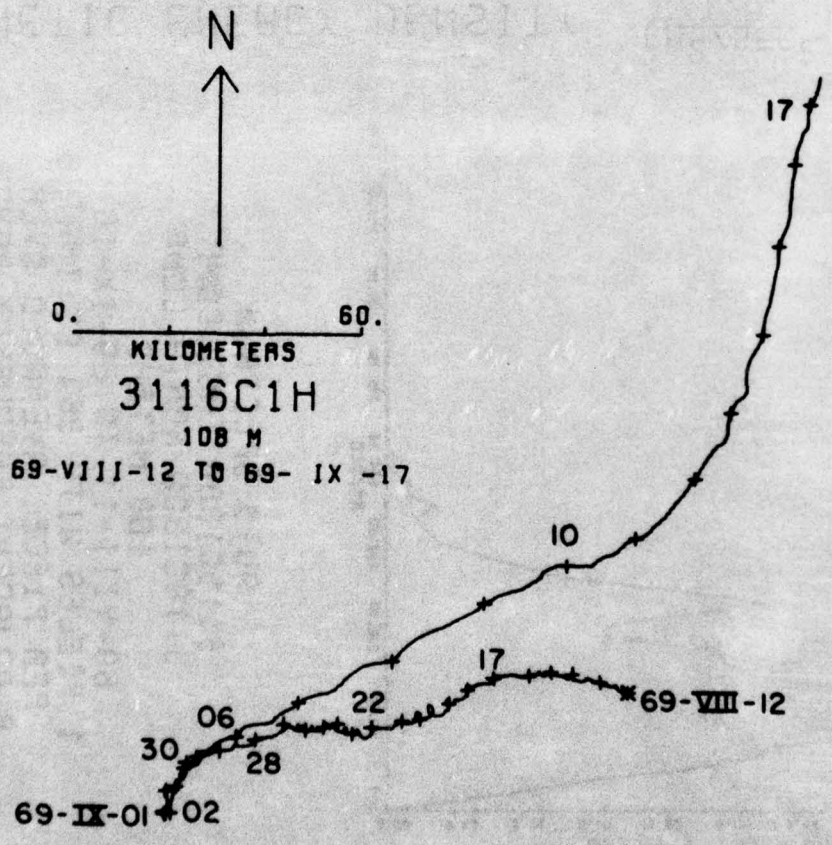
DURATION 36 DAYS 13 H 30 M 0 S

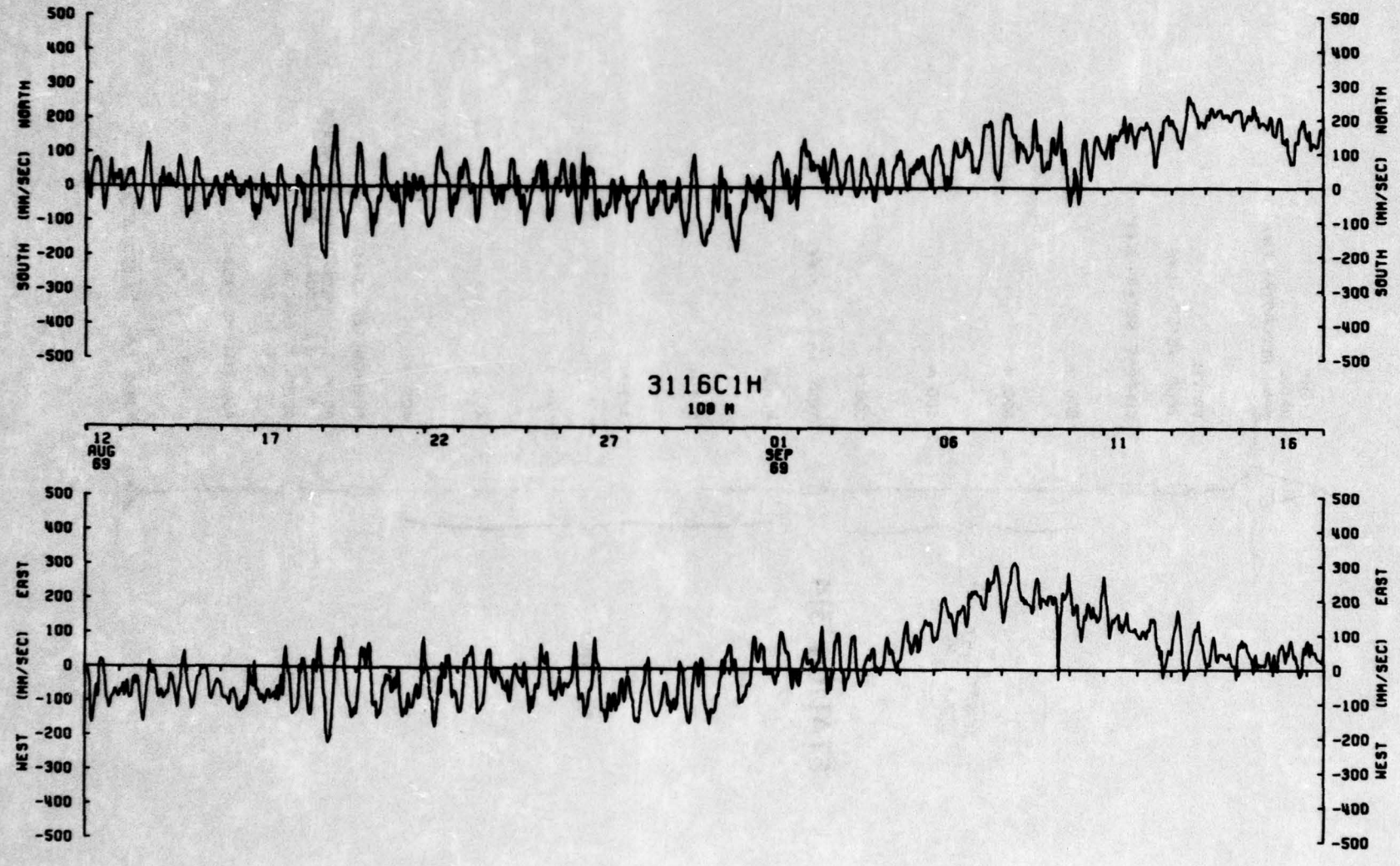


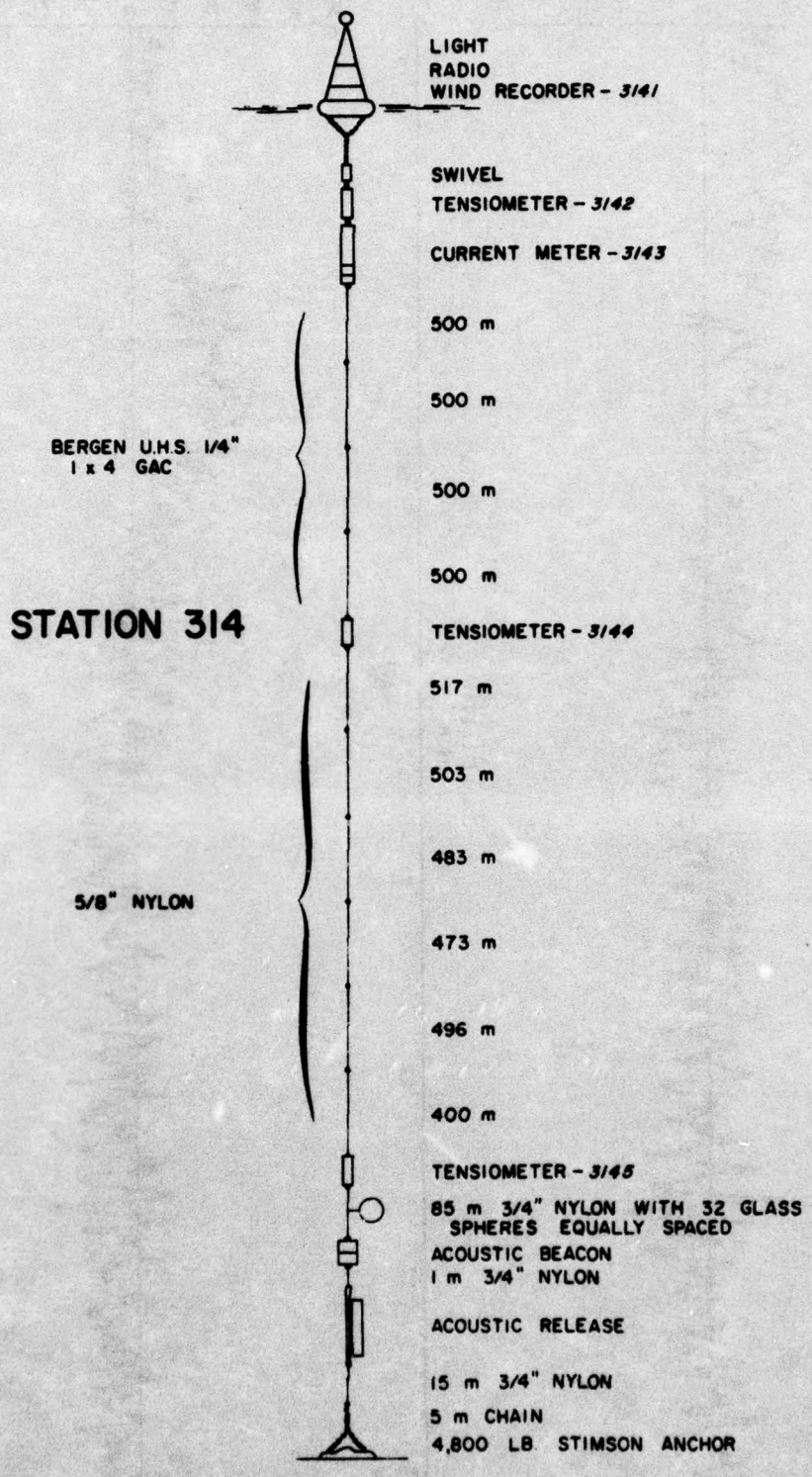
AUTO SPECTRUM
3116C1800 EAST COMP
3116C1800 NORTH COMP
108 METERS
69-VIII-11 TO 69-IX-16
1 PIECES WITH 864 ESTIMATES
PER PIECE. AVERAGED OVER
8 ADJACENT FREQUENCY BANDS




400
240
80
-80
-240
-400
SOUTH MM/SEC NORTH
-320
-160
0
160
320
WEST MM/SEC EAST
3116C1H


N
0.
60.
KILOMETERS
3116C1H
108 M
69-VIII-12 TO 69- IX -17
17
10
17
06
22
30
28
69-VIII-12
69-IX-01
02


SOUTH (MM/SEC) NORTH
500
400
300
200
100
0
-100
-200
-300
-400
-500
3116C1H
108 M
12 AUG 69
17
22
27
01 SEP 69
06
11
16
WEST (MM/SEC) EAST


LIGHT
RADIO
WIND RECORDER - 3141
SWIVEL
TENSIOMETER - 3142
CURRENT METER - 3143
500 m
500 m
BERGEN U.H.S. 1/4"
1 x 4 GAC
500 m
500 m
STATION 314
TENSIOMETER - 3144
517 m
503 m
483 m
5/8" NYLON
473 m
496 m
400 m
TENSIOMETER - 3145
85 m 3/4" NYLON WITH 32 GLASS SPHERES EQUALLY SPACED
ACOUSTIC BEACON
1 m 3/4" NYLON
ACOUSTIC RELEASE
15 m 3/4" NYLON
5 m CHAIN
4,800 LB STIMSON ANCHOR

Mooring No. 314

Set 69 (Year) Aug (Month) 18 (Day) — 34° 02.7N (Latitude) — 70° 02.0W (Longitude)

Set by R. Heinmiller Ship R. V. Chain Cruise 95

Retrieved 69 (Year) Oct (Month) 8 (Day)

Retrieved by J. Gifford Ship R. V. Atlantis II Cruise 53

Purpose of Mooring: Two month wire test at Site L.

Mooring Type: Surface mooring - toroid.

Data Number	Instrument Number	Type	Depth Meters	Comments
3141*	W-169X	M.W.R.	-0-	
3142	1025	Tens	13	
3143*	M-198	M.C.M.	14	
3144	1026	Tens	2015	
3145	1027	Tens	5259	
Water depth			5368	

Hydrographic Station

R. V. Chain cruise 95 Station 924

R. V. Atlantis II cruise 53 Station 1551

COMMENTS ON MOORING:

Data number 3141

Instrument No.: W-169X **Type:** Magnetic tape wind recorder

Depth: -0- **Water depth:** 5368 m

Start time: 69-VIII-18 095950

Stop time: 69-X-09 014450

Duration: 51d 15h 45m

Sampling scheme: Interval

time between strobes = 5 seconds

no. of strobes per interval = 24

interval time = 900 seconds

COMMENTS:

Wind direction follows ocean current conventions to facilitate comparisons; add 180° to direction for meteorological readings.

STATS DATA/ 3141WF900

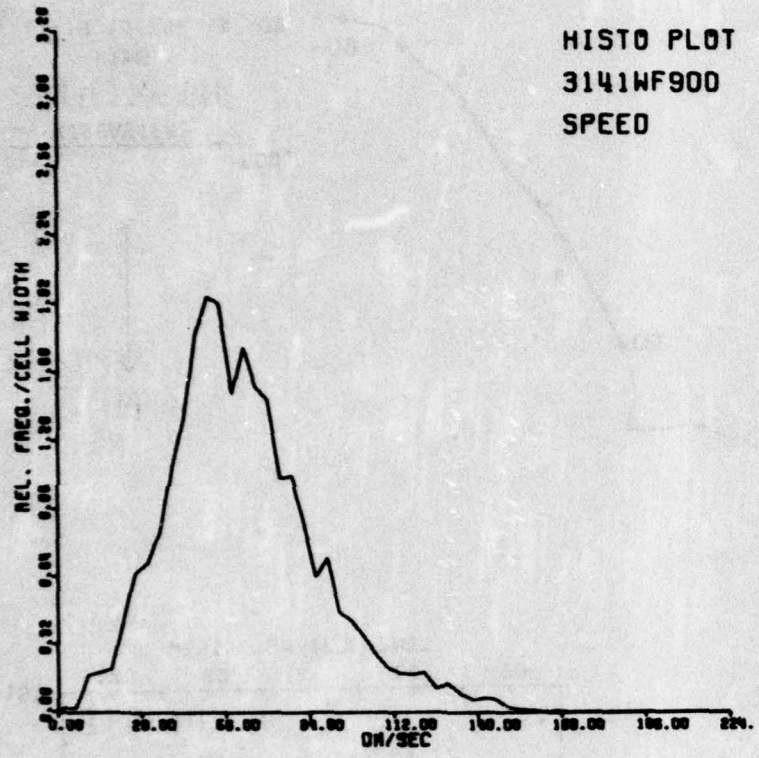
	EAST	NORTH	SPEED		EAST & NORTH	
MEAN =	-13.96	-14.50	61.30	= ######		######
STD. ERR. =	.61	.66	.36	= COVARIANCE	=	409.18
VARIANCE =	1818.25	2181.72	825.19	= STD. ERR. OF COVARIANCE	=	30.30
STD. DEV. =	42.62	46.48	25.00	= STD. DEV. OF COVARIANCE	=	2139.87
KURTOSIS =	2.53	2.85	3.68	= CORRELATION COEFFICIENT	=	.207
SKEWNESS =	.81	.11	.68	= VECTOR MEAN	=	20.19
				= VECTOR VARIANCE	=	1988.99
				= STD. DEV.	=	44.60

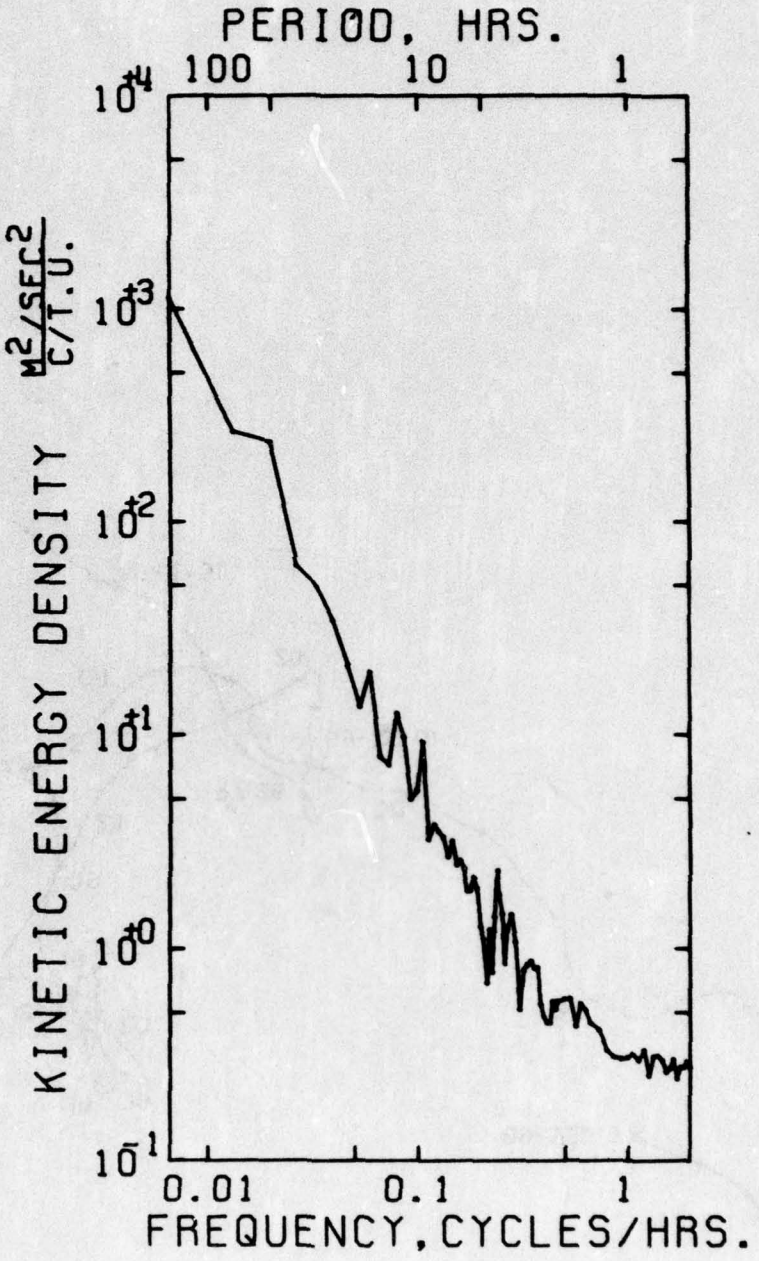
UNITS OF RAW DATA VARIABLES = CM/SEC

SAMPLE SIZE = 4960 POINTS

SPANNING RANGE
FROM 69-VIII-18 09.59.50
TO 69- X -09 01.44.50

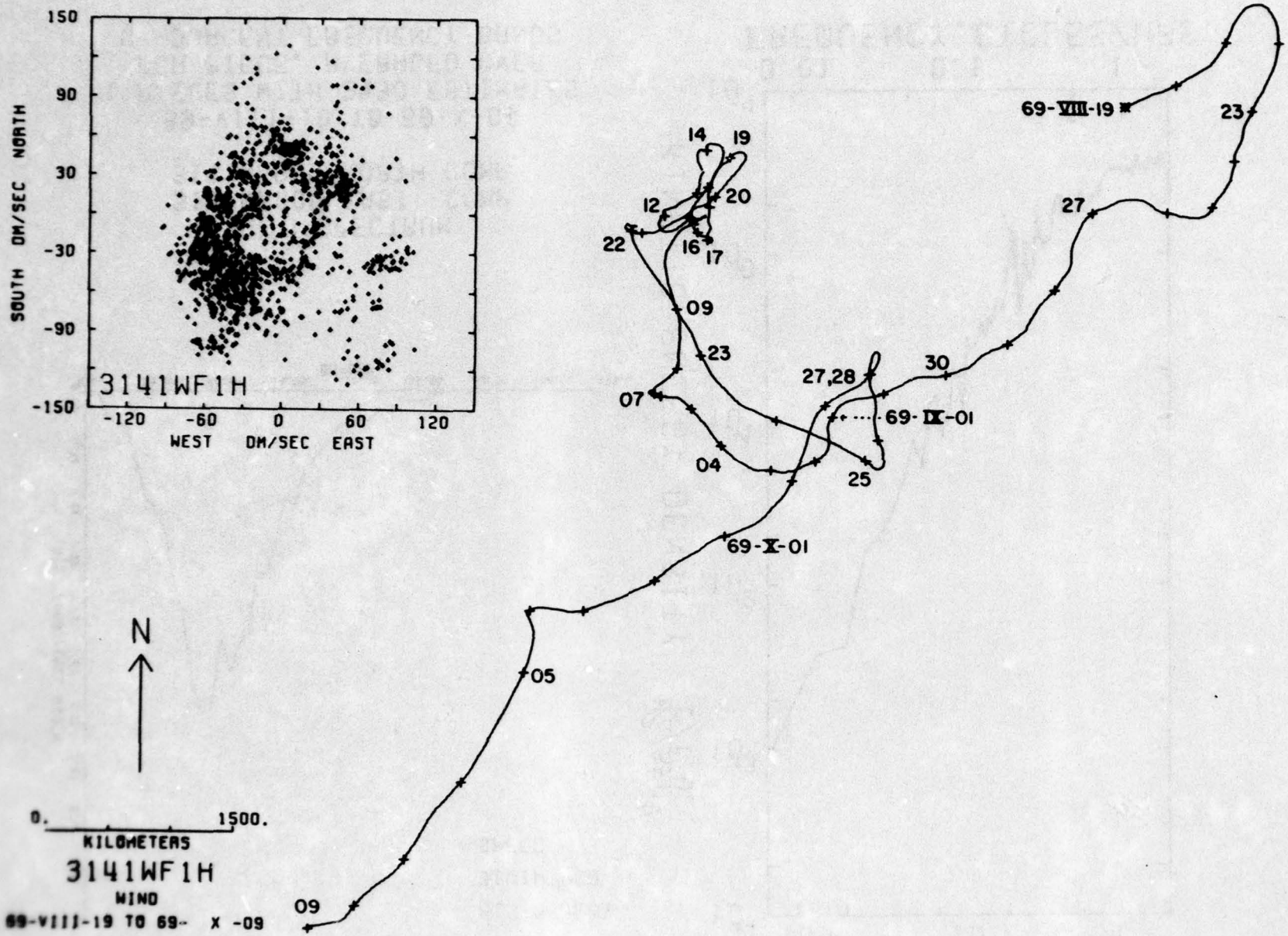
DURATION 51 DAYS 15 H 45 M 0 S





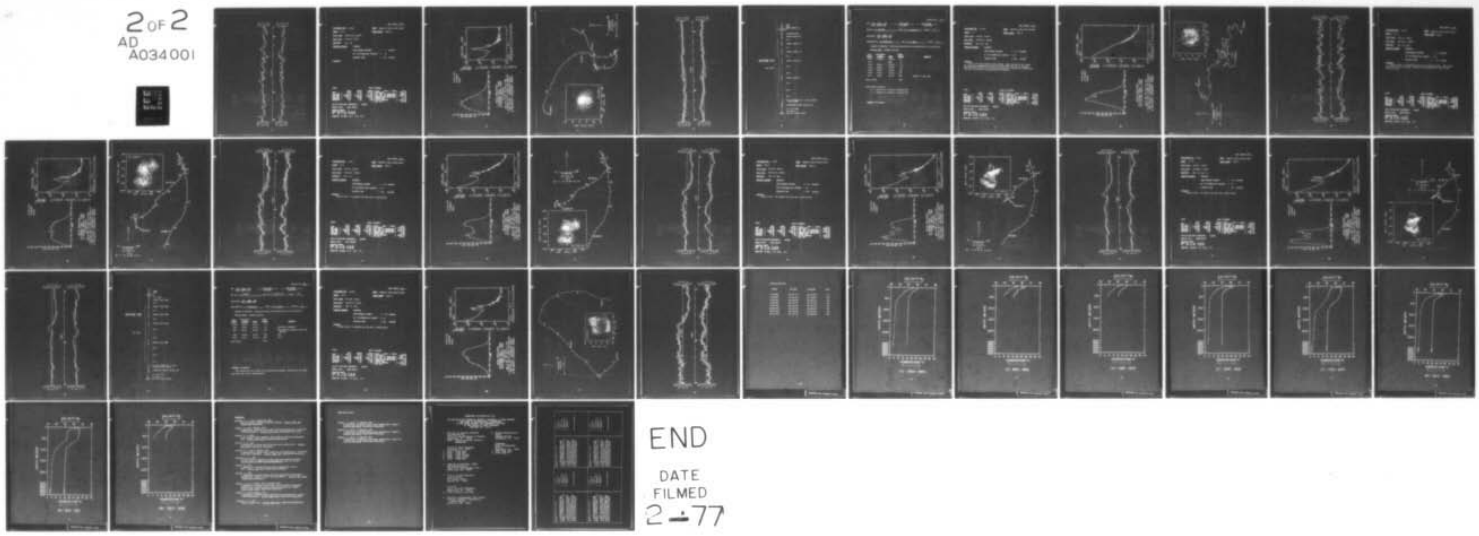
AUTO SPECTRUM
3141WF900 EAST COMP
3141WF900 NORTH COMP

69-VIII-18 TO 69-X-08
1 PIECES WITH 2430 ESTIMATES
PER PIECE. AVERAGED OVER
8 ADJACENT FREQUENCY BANDS


150
90
30
-30
-90
-150
SOUTH DM/SEC NORTH
-120
-60
0
60
120
WEST DM/SEC EAST
3141WF1H
69-VIII-19
23
14
19
12
20
27
22
16
17
09
23
27,28
30
07
69-IX-01
04
25
69-X-01
N
05
0.
1500.
KILOMETERS
3141WF1H
WIND
69-VIII-19 TO 69- X -09
09

AD-A034 001 WOODS HOLE OCEANOGRAPHIC INSTITUTION MASS F/G 8/3
A COMPILATION OF MOORED CURRENT DATA AND ASSOCIATED OCEANOGRAPH--ETC(U)
MAY 76 S A TARBELL N00014-66-C-0241
UNCLASSIFIED WHOI-76-41 NL

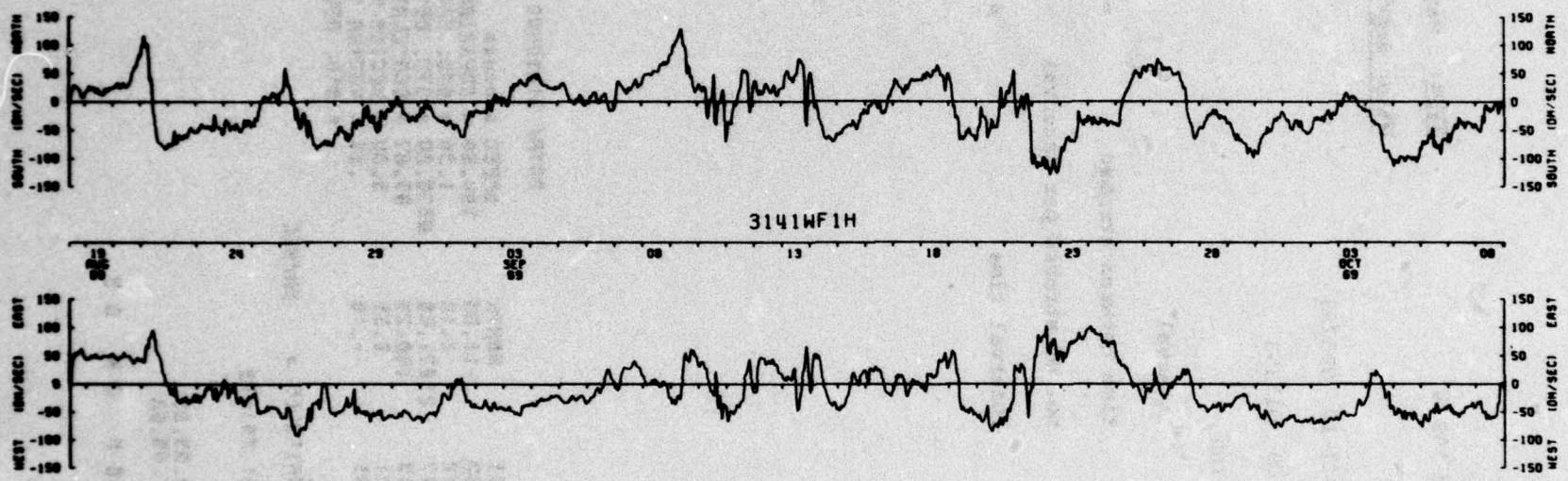
2 OF 2
AD
A034001



END

DATE
FILMED
2-77

1.0
1.1
1.25
1.4
1.6
1.8
2.0
2.2
2.5
2.8
3.2
3.6
4.0
4.5
5.0
MICROCOPY RESOLUTION TEST CHART
NATIONAL BUREAU OF STANDARDS 1963


3141WF1H
SOUTH (DM/SEC) NORTH
WEST (DM/SEC) EAST
150
100
50
0
-50
-100
-150
19 AUG 68
24
29
03 SEP 69
08
13
18
23
28
03 OCT 69
08

Data number 3143

Instrument No.: M-198 **Type:** Magnetic tape current meter

Depth: 14 m **Water depth:** 5368 m

Start time: 69-VIII-18 095353

Stop time: 69-X-09 015353

Duration: 51d 16h

Sampling scheme: Interval

time between strobes = 5 seconds

no. of strobes per interval = 24

interval time = 900 seconds

COMMENTS:

STATS DATA/ 31430800

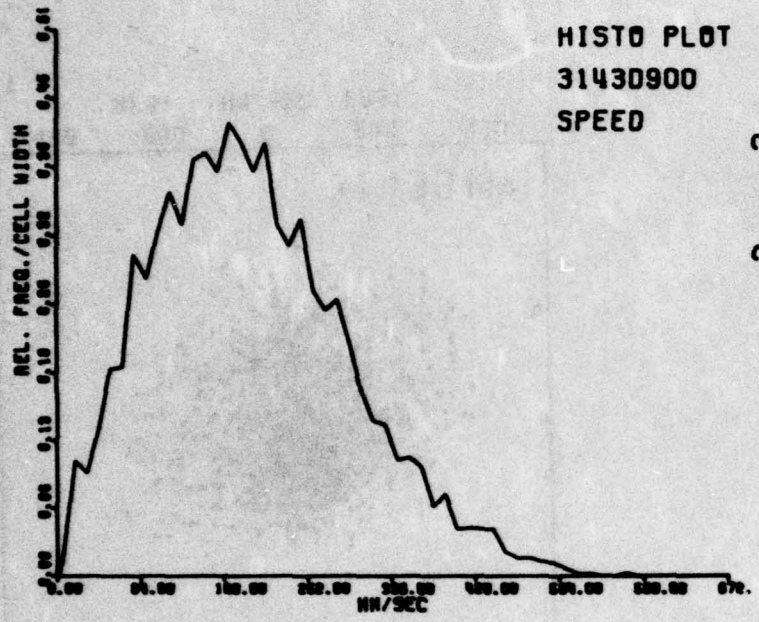
	EAST	NORTH	SPEED	#####	EAST & NORTH	#####
MEAN	55.89	-11.50	104.68	COVARIANCE		-2560.70
STD. ERR.	2.12	2.10	1.38	STD. ERR. OF COVARIANCE		335.61
VARIANCE	22230.47	21871.40	9570.20	STD. DEV. OF COVARIANCE		29830.45
STD. DEV.	140.13	140.23	97.87	CORRELATION COEFFICIENT		-.118
KURTOSIS	9.01	8.55	9.90	VECTOR MEAN		57.16
SKEWNESS	-.01	-.16	.55	VECTOR VARIANCE		22104.88
				STD. DEV.		148.68

UNITS OF RAW DATA VARIABLES = MM/SEC

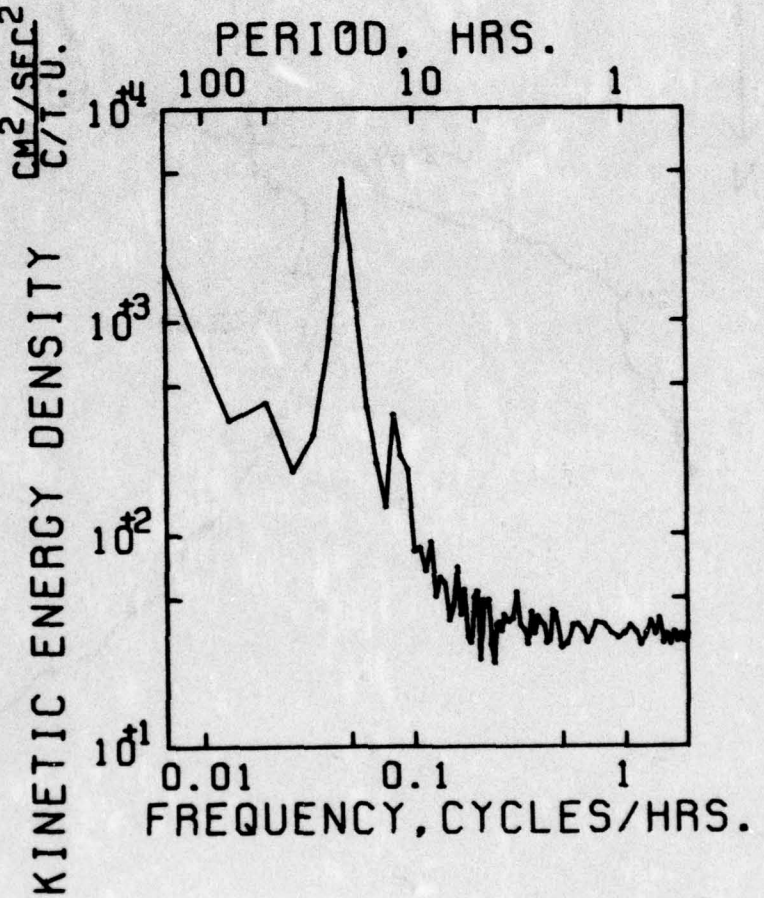
SAMPLE SIZE = 4861 POINTS

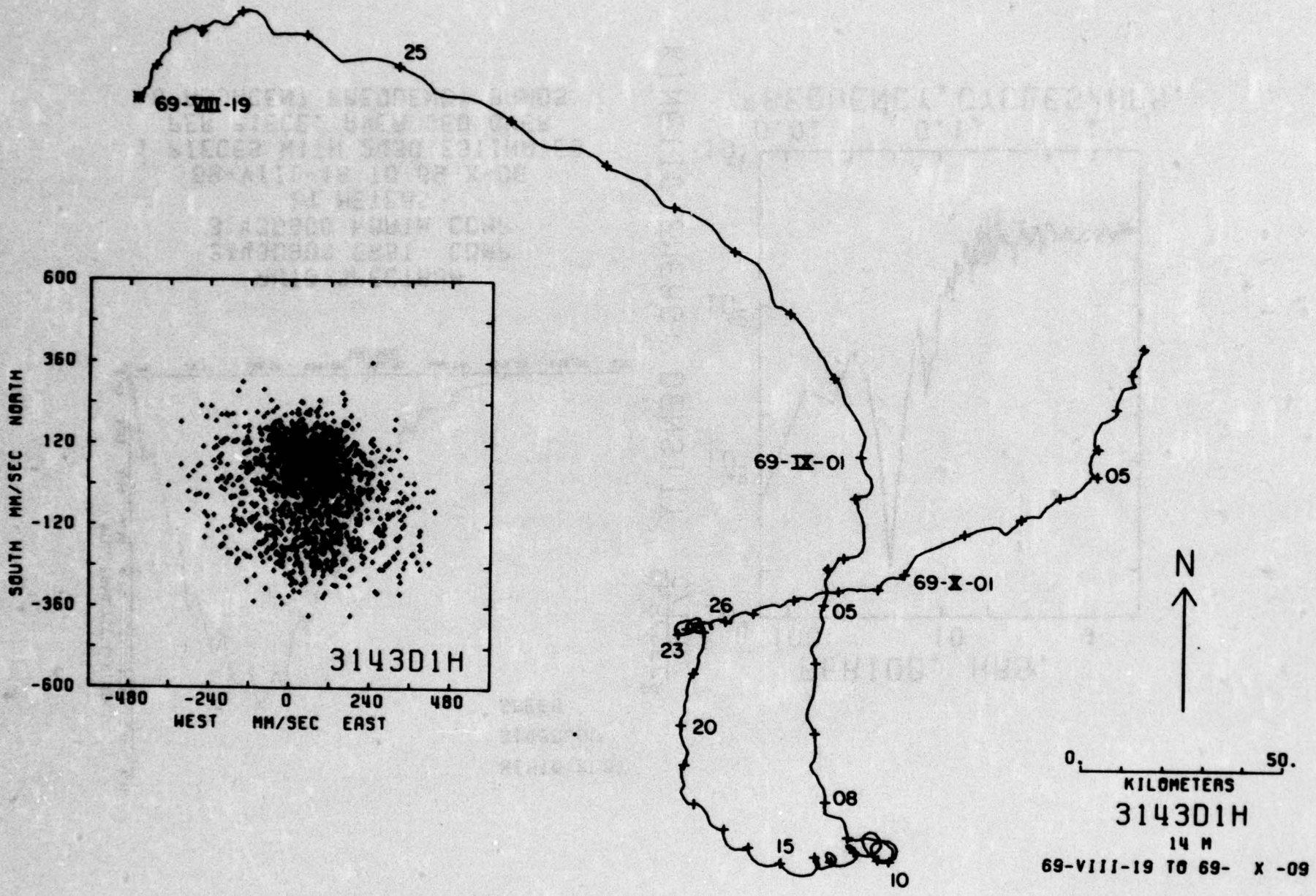
SPANNING RANGE
FROM 69-VIII-18 09.53.53
TO 69- X -09 01.53.53

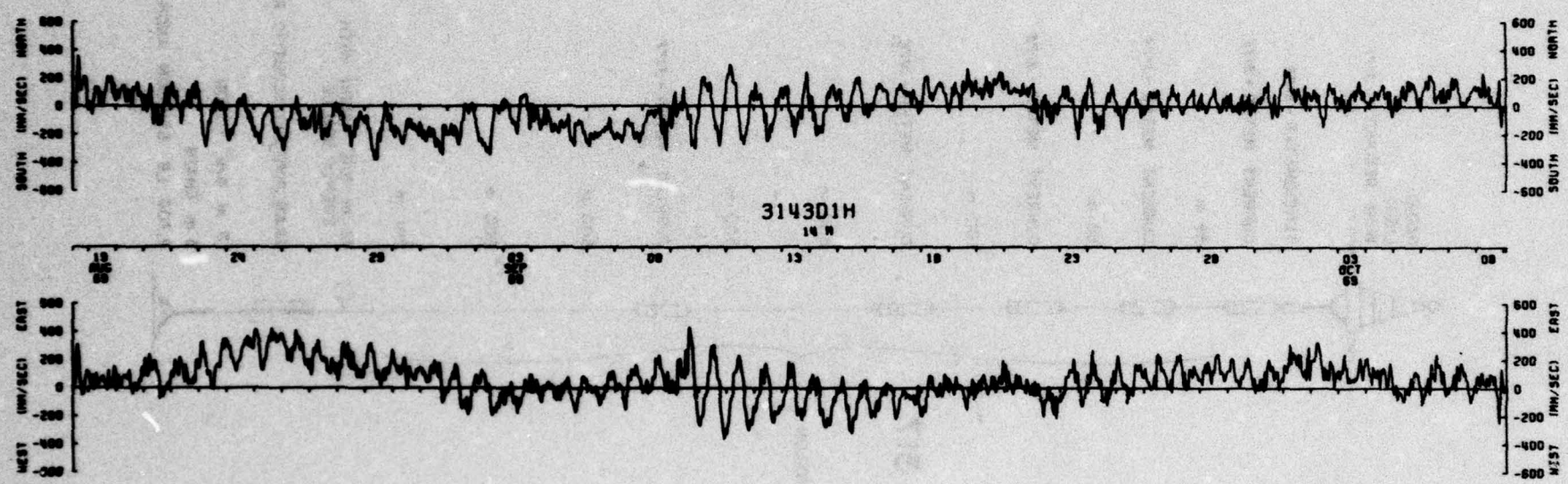
DURATION 51 DAYS 16 H 0 M 0 S

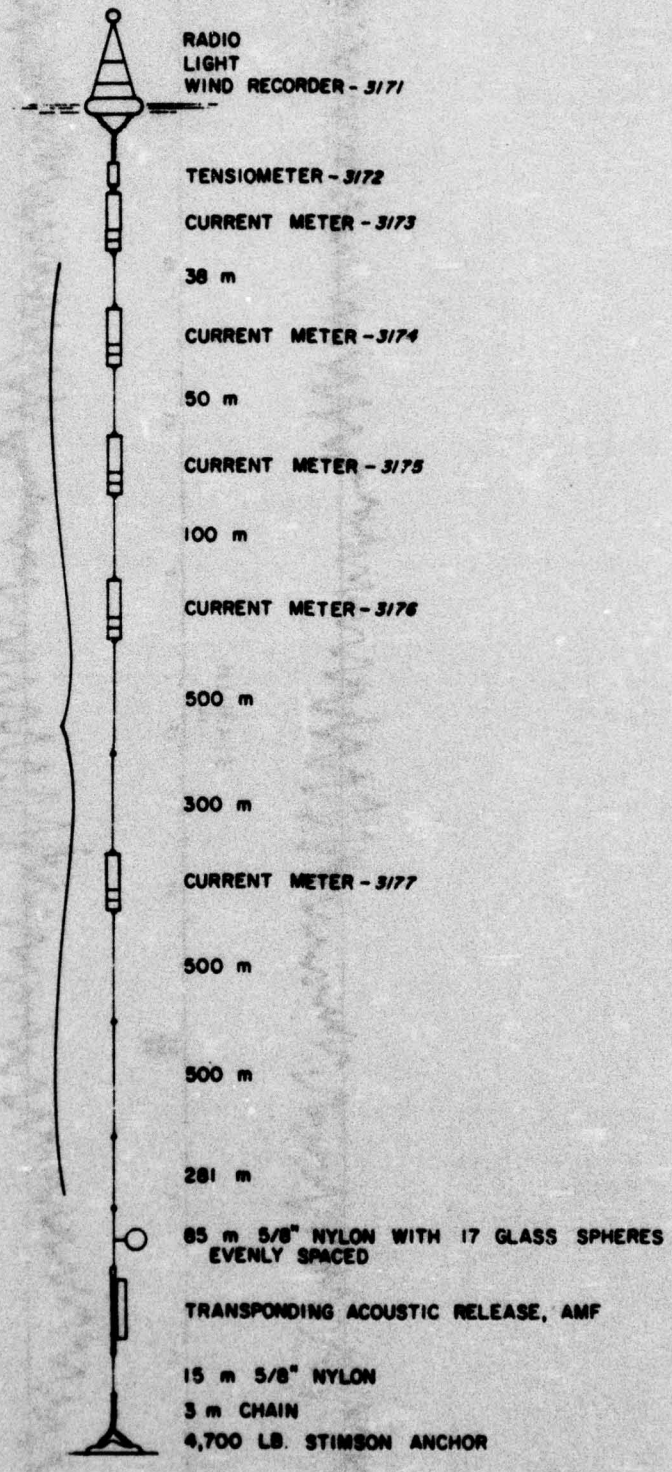


AUTO SPECTRUM
3143D900 EAST COMP
3143D900 NORTH COMP
14 METERS
69-VIII-18 TO 69-X-08
1 PIECES WITH 2430 ESTIMATES
PER PIECE. AVERAGED OVER
8 ADJACENT FREQUENCY BANDS




69-VIII-19
25
69-IX-01
05
69-X-01
05
26
23
20
08
15
10
600
360
120
-120
-360
-600
SOUTH MM/SEC NORTH
-480
-240
0
240
480
WEST MM/SEC EAST
3143D1H
N
0
50.
KILOMETERS
3143D1H
14 M
69-VIII-19 TO 69- X -09


3143D1H
14 M
SOUTH (MM/SEC) NORTH
WEST (MM/SEC) EAST
600
400
200
0
-200
-400
-600
13
18
23
28
03
OCT
69
08



STATION 317

9/16" NYLON

Mooring No. 317

Set 69 Oct 06 (Year Month Day) 39° 12.0N (Latitude) 70° 02.8W (Longitude)

Set by J. Gifford Ship R. V. Atlantis II Cruise 53

Retrieved 70 Jan 05 (Year Month Day)

Retrieved by R. Heinmiller Ship R. V. Chain Cruise 97

Purpose of Mooring: Horizontal mooring array with moorings no. 318 and 310.

Mooring Type: Surface mooring.

Data Number	Instrument Number	Type	Depth Meters	Comments
3171*	W-101X	M.W.R.	-0-	
3172		Temp	11	
3173*	M-122	M.C.M.	13	
3174*	M-212	M.C.M.	53	
3175*	M-213	M.C.M.	105	
3176*	M-203	M.C.M.	207	
3177	M-129	M.C.M.	1000	Unable to read tape
Water depth			2681	

Hydrographic Stations

R. V. Atlantis II cruise 53 Station 1550

R. V. Atlantis II cruise 53 Station 1552

COMMENTS ON MOORING:

Data number 3171

Instrument No.: W-101X **Type:** Maghetic tape wind recorder

Depth: -0- **Water depth:** 2681 m

Start time: 69-X-06 145330

Stop time: 69-XII-01 050830

Duration: 55d 14h 15m

Sampling scheme: Interval

time between strobes = 5.27 seconds

no. of strobes per interval = 24

interval time = 900 seconds

COMMENTS:

One of the first digital clock records. Near the end of the record the data gets progressively worse then dies before the end of the tape. Wind direction follows ocean current conventions to facilitate comparisons; add 180° to direction for meteorological readings.

STATS DATA/ 3171WJ800

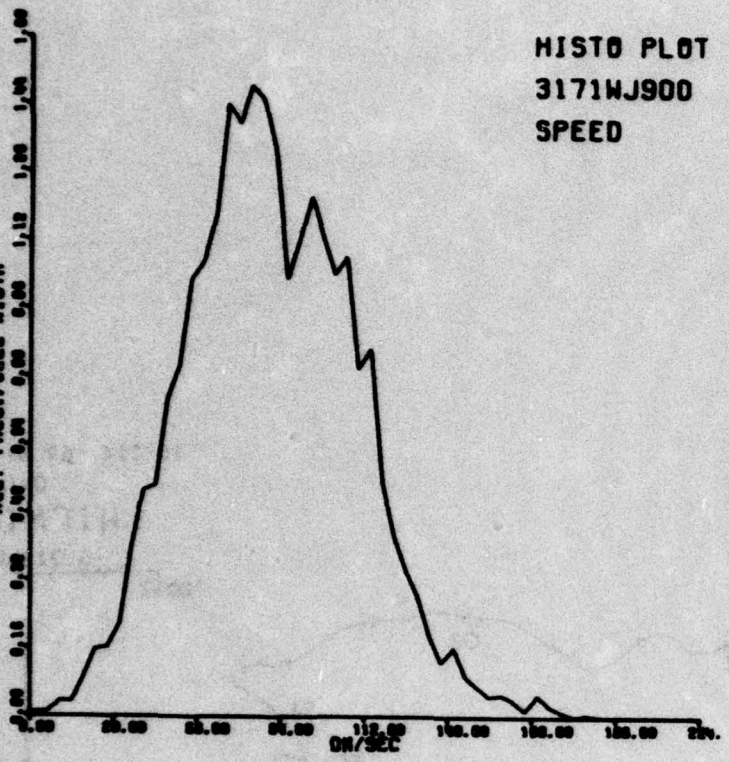
	EAST	NORTH			
MEAN =	18.14	-13.41	SPEED = ######	EAST & NORTH	######
STD. ERR. =	.88	.72	88.27 = COVARIANCE	=	251.68
VARIANCE =	3041.71	2790.88	.38 = STD. ERR. OF COVARIANCE	=	43.74
STD. DEV. =	82.78	52.28	774.84 = STD. DEV. OF COVARIANCE	=	3185.77
KURTOSIS =	1.85	2.40	27.84 = CORRELATION COEFFICIENT	=	.877
SKEWNESS =	-.15	.18	2.87 = VECTOR MEAN	=	23.97
			.24 = VECTOR VARIANCE	=	9938.98
			= STD. DEV.	=	57.78

UNITS OF RAW DATA VARIABLES = CM/SEC

SAMPLE SIZE = 5338 POINTS

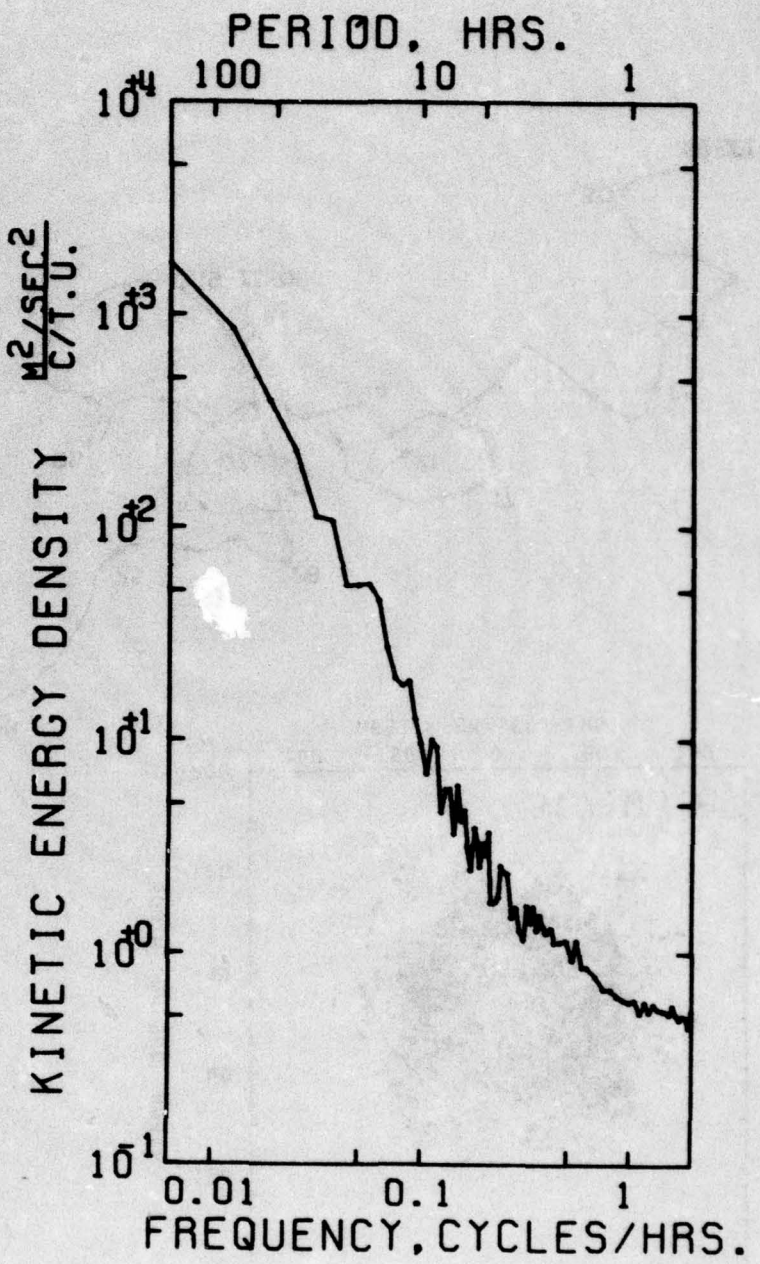
SPANNING RANGE
FROM 68- X -08 14.53.38
TO 68- XII-01 05.08.38

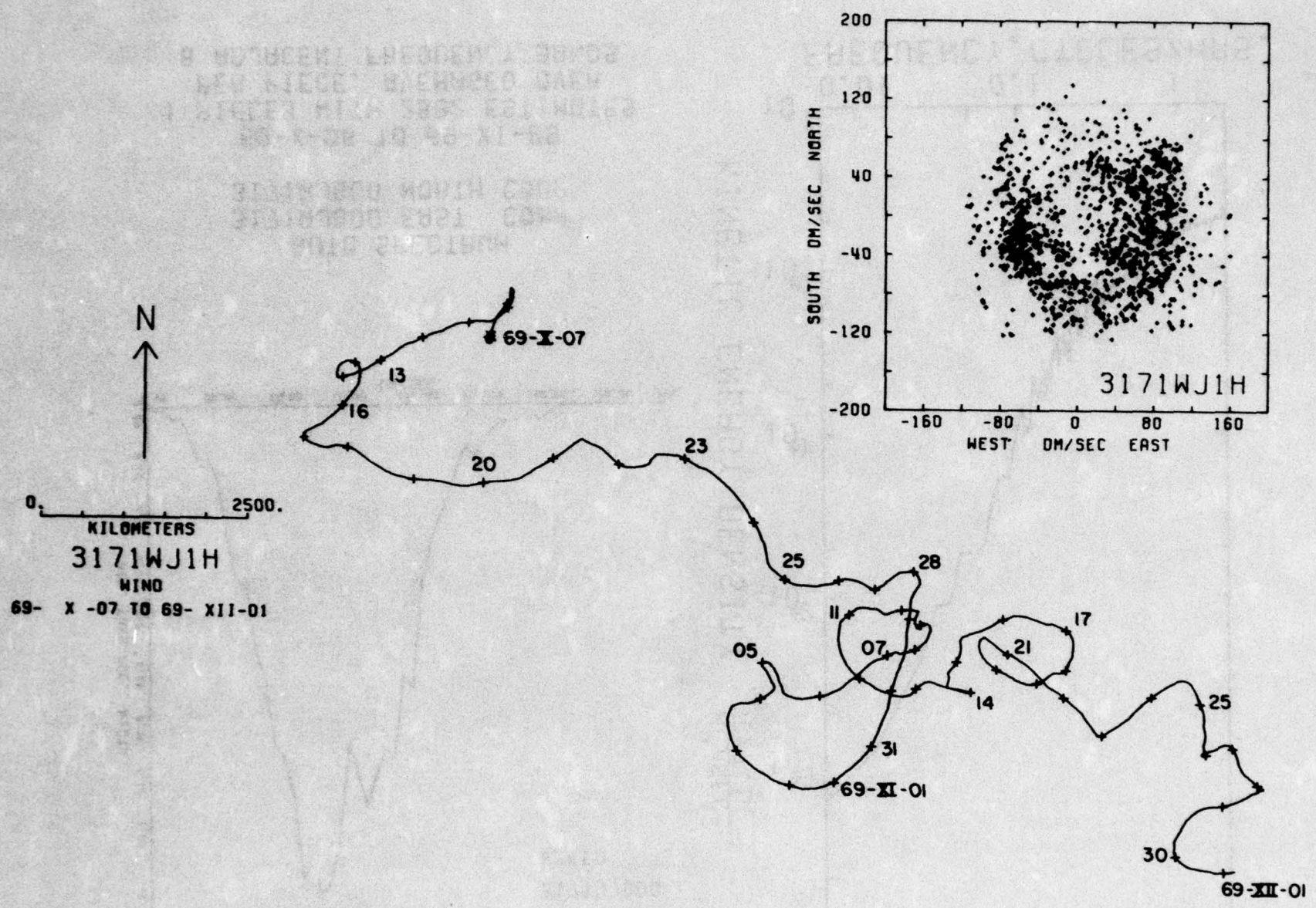
DURATION 55 DAYS 14 H 15 M 0 S

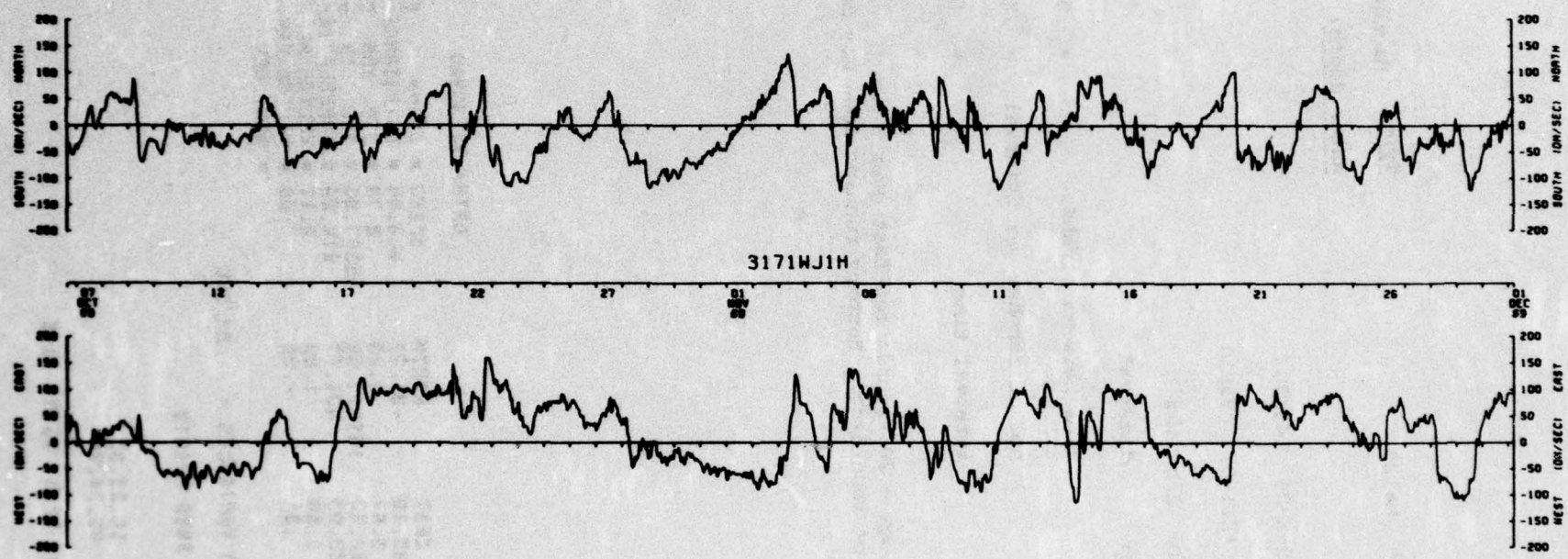


AUTO SPECTRUM
3171WJ900 EAST COMP
3171WJ900 NORTH COMP

69-X-06 TO 69-XI-29
1 PIECES WITH 2592 ESTIMATES
PER PIECE. AVERAGED OVER
8 ADJACENT FREQUENCY BANDS




N
0
2500.
KILOMETERS
3171WJ1H
WIND
69- X -07 TO 69- XII-01
69-X-07
13
16
20
23
25
28
11
07
05
31
69-XI-01
17
21
14
25
30
69-XII-01
200
120
40
-40
-120
-200
SOUTH DM/SEC NORTH
-160
-80
0
80
160
WEST DM/SEC EAST
3171WJ1H


3171WJ1H
SOUTH (DM/SEC) NORTH
WEST (DM/SEC) EAST
200
150
100
50
0
-50
-100
-150
-200
07 OCT 89
12
17
22
27
01 NOV 89
06
11
16
21
26
01 DEC 89

Data number 3173

Instrument No.: M-122 **Type:** Magnetic tape current meter

Depth: 13 m **Water depth:** 2681 m

Start time: 69-X-06 145330

Stop time: 69-XII-07 033830

Duration: 61d 12h 45m

Sampling scheme: Interval

time between strobes = 5.27 seconds

no. of strobes per interval = 24

interval time = 900 seconds

COMMENTS:

Digital clock - 20 seconds too fast over 3 month period. Good record until near end of recording. Battery running down may be cause of bad records at end.

STATS DATA/ 31730900

	EAST	NORTH	SPEED
MEAN	43.10	-31.22	444.84
STD. ERR.	3.67	5.23	2.78
VARIANCE	78542.80	161417.88	45807.83
STD. DEV.	282.03	401.77	214.26
KURTOSIS	2.80	1.83	2.11
SKEWNESS	.91	-.28	.08

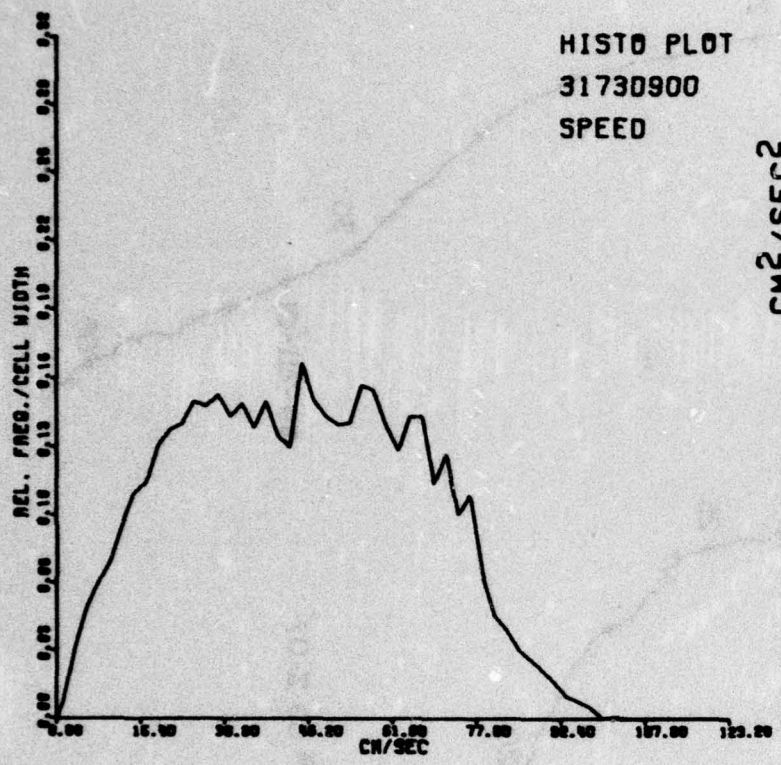
##### EAST & NORTH	#####
COVARIANCE	42038.86
STD. ERR. OF COVARIANCE	1425.65
STD. DEV. OF COVARIANCE	108580.35
CORRELATION COEFFICIENT	.370
VECTOR MEAN	53.22
VECTOR VARIANCE	120480.35
STD. DEV.	347.10

UNITS OF RAW DATA VARIABLES = MM/SEC

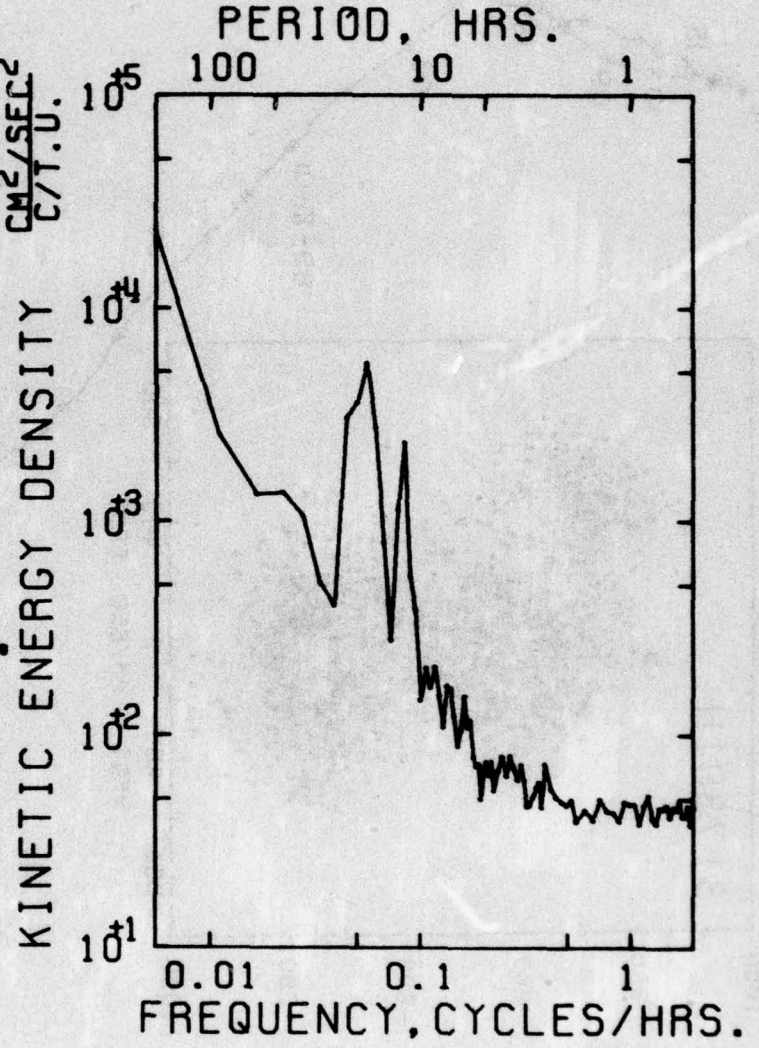
SAMPLE SIZE = 5808 POINTS

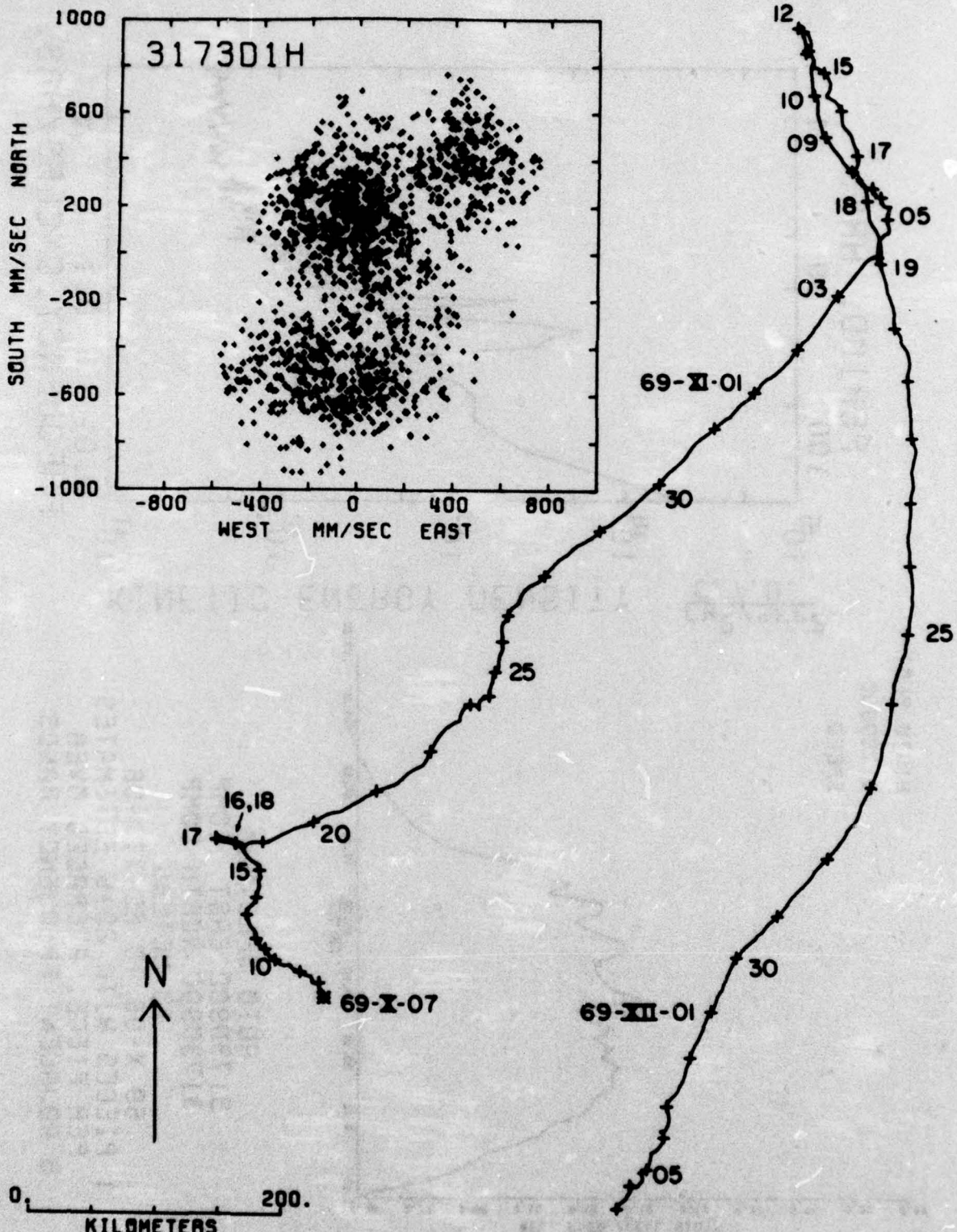
SPANNING RANGE
FROM 69- X -06 14.53.30
TO 69- XII-07 03.38.30

DURATION 61 DAYS 12 H 45 M 0 S



AUTO SPECTRUM
3173D900 EAST COMP
3173D900 NORTH COMP
13 METERS
69-X-06 TO 69-XII-06
1 PIECES WITH 2916 ESTIMATES
PER PIECE. AVERAGED OVER
8 ADJACENT FREQUENCY BANDS





317301H

13 M

69- X -07 TO 69- XII-07

SOUTH (MM/SEC) NORTH
WEST (MM/SEC) EAST
317301H
SOUTH (MM/SEC) NORTH
WEST (MM/SEC) EAST

Data number 3174

Instrument No.: M-212

Type: Magnetic tape current meter

Depth: 53 m

Water depth: 2681 m

Start time: 69-X-06 145330

Stop time: 69-XII-04 075330

Duration: 58d 17h

Sampling scheme: Interval

time between strobes = 5.27 seconds

no. of strobes per interval = 24

interval time = 900 seconds

COMMENTS:

Digital clock - 16 seconds too fast over 3 month period.

STATS DATA/ 3174E800

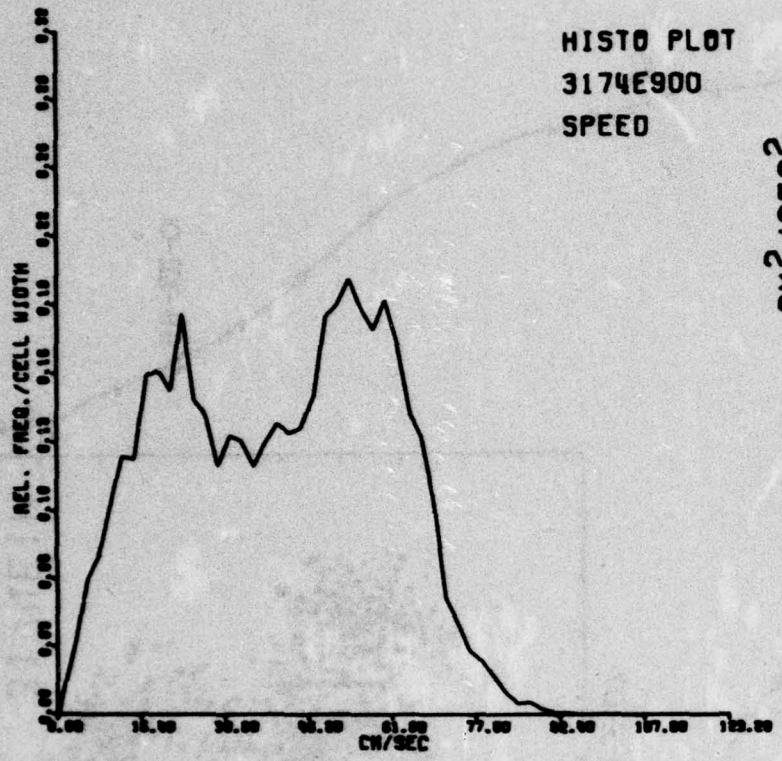
	EAST	NORTH	SPEED	EAST & NORTH
MEAN =	44.87	-70.43	407.94	COVARIANCE = 41700.80
STD. ERR. =	3.45	4.70	2.60	STD. ERR. OF COVARIANCE = 1107.48
VARIANCE =	67285.85	120485.80	30141.53	STD. DEV. OF COVARIANCE = 83140.23
STD. DEV. =	259.24	350.00	185.30	CORRELATION COEFFICIENT = .447
KURTOSIS =	2.43	1.74	1.84	VECTOR MEAN = 80.83
SKEWNESS =	.38	-.31	-.07	VECTOR VARIANCE = 80350.72
				STD. DEV. = 313.61

UNITS OF RAW DATA VARIABLES = MM/SEC

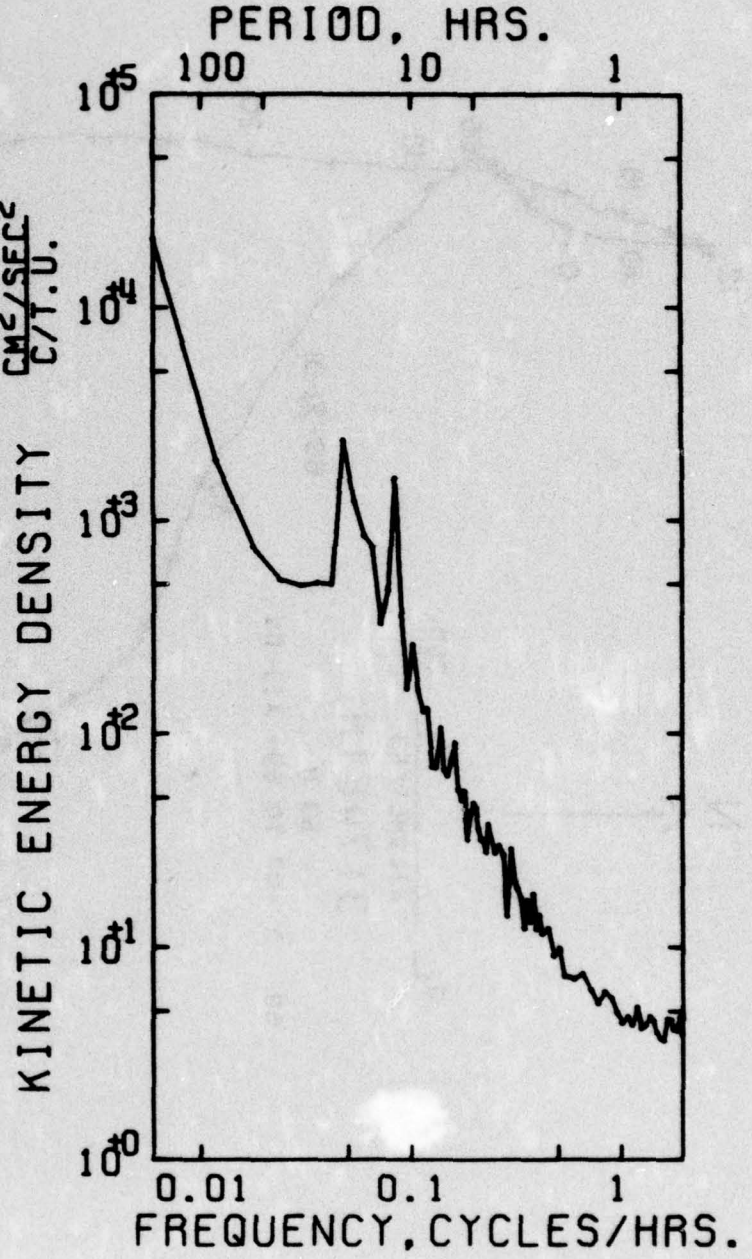
SAMPLE SIZE = 3837 POINTS

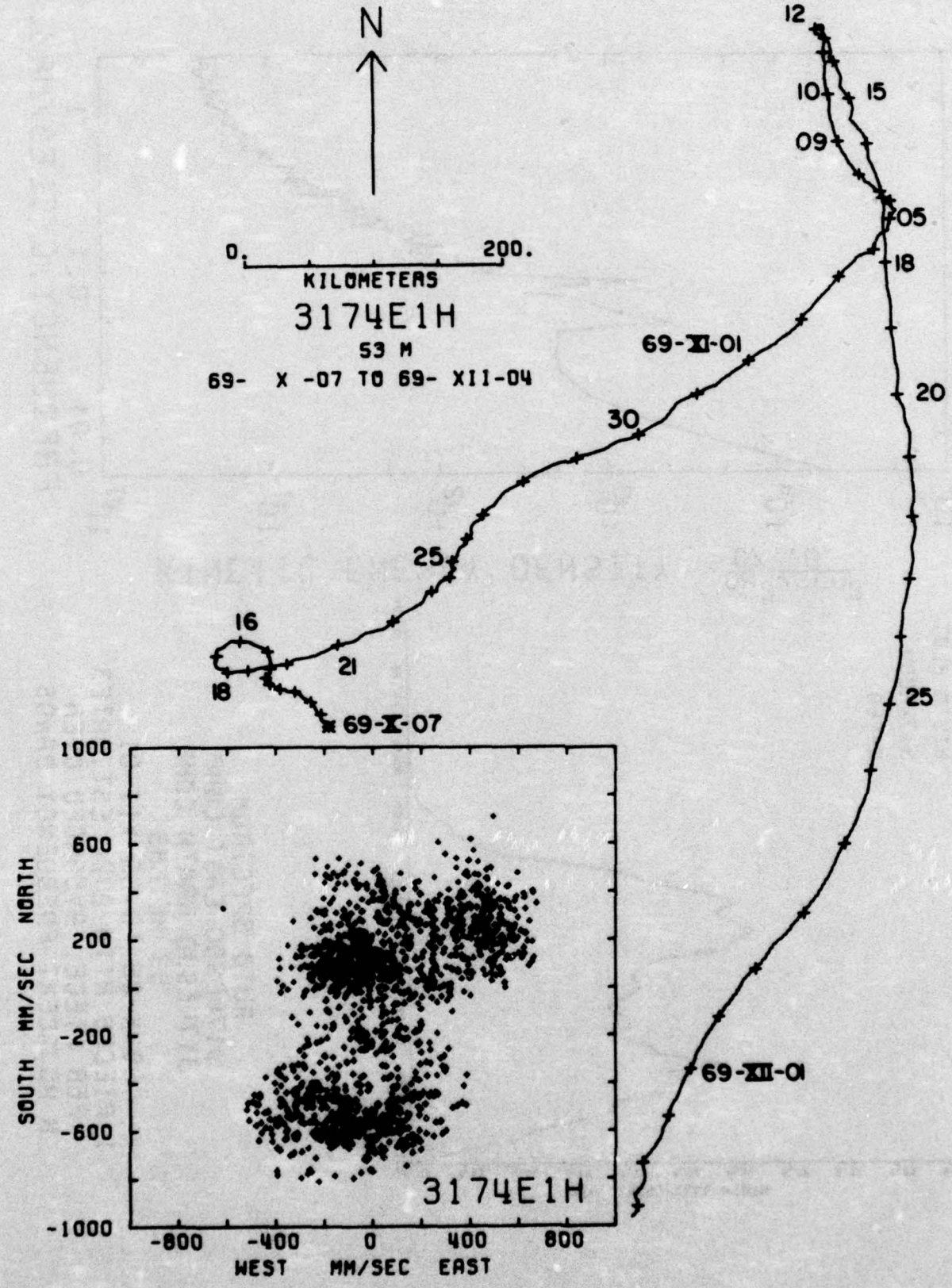
SPANNING RANGE
FROM 69- X -06 14.53.30
TO 69- XII-04 07.53.30

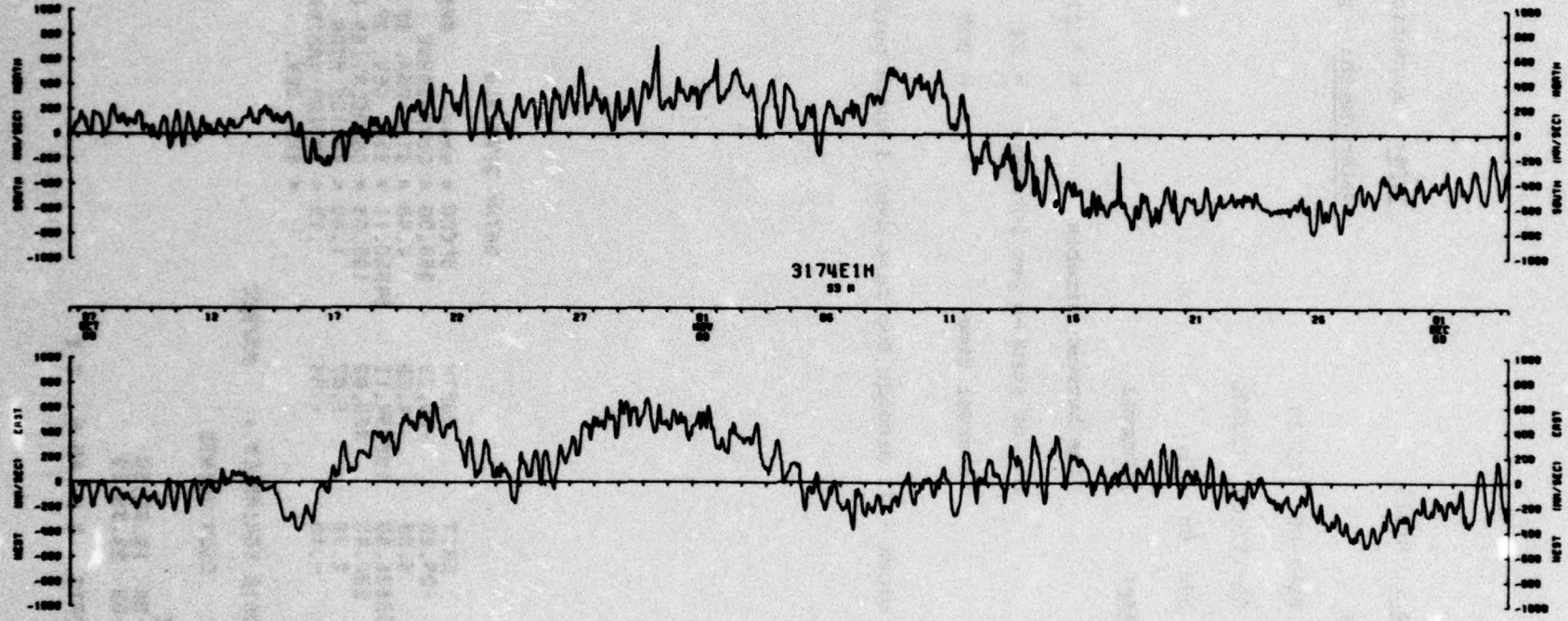
DURATION 58 DAYS 17 H 0 M 0 S



AUTO SPECTRUM
3174E900 EAST COMP
3174E900 NORTH COMP
53 METERS
69-X-06 TO 69-XII-01
1 PIECES WITH 2700 ESTIMATES
PER PIECE. AVERAGED OVER
8 ADJACENT FREQUENCY BANDS




N
0.
200.
KILOMETERS
3174E1H
53 M
69- X -07 TO 69- XII-04
69-XI-01
69-X-07
69-XII-01
12
10
15
09
05
18
20
30
25
16
21
18
25
1000
600
200
-200
-600
-1000
SOUTH MM/SEC NORTH
-800
-400
0
400
800
WEST MM/SEC EAST
3174E1H


3174E1H
SOUTH (MM/SEC) NORTH
WEST (MM/SEC) EAST

Data number 3175

Instrument No.: M-213 **Type:** Maghetic tape current meter

Depth: 105 m **Water depth:** 2681 m

Start time: 69-X-06 145330

Stop time: 69-XII-03 233830

Duration: 58d 8h 45m

Sampling scheme: Interval

time between strobes = 5.27 seconds

no. of strobes per interval = 24

interval time = 900 seconds

COMMENTS:
Digital clock - 23 seconds too fast over 3 month period.

STATS DATA/ 3175A800

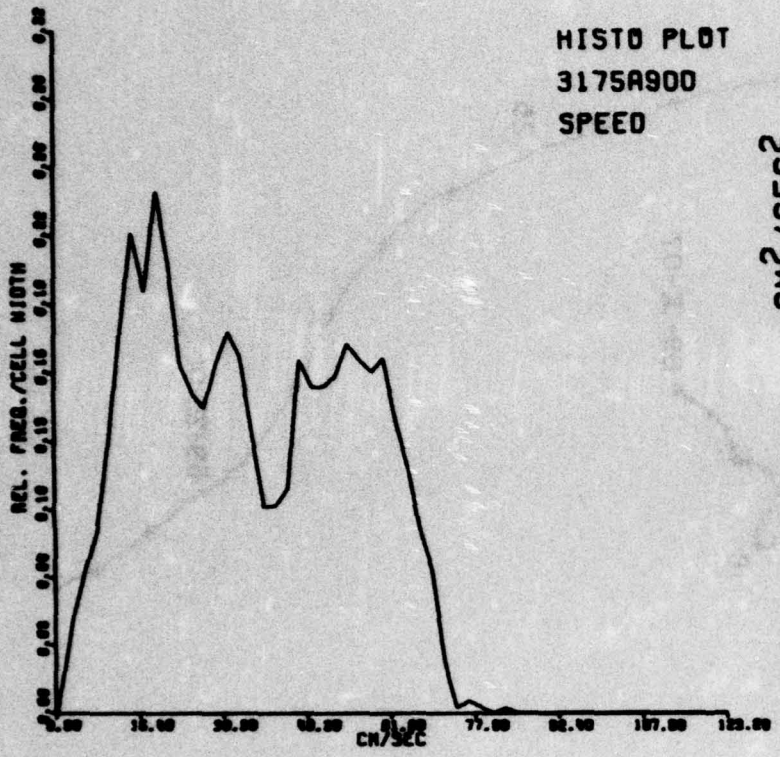
	EAST	NORTH	SPEED	##### EAST & NORTH	#####
MEAN =	-25.25	-80.30	350.06	COVARIANCE =	30040.60
STD. ERR. =	3.06	4.20	2.40	STD. ERR. OF COVARIANCE =	875.88
VARIANCE =	52620.60	109094.11	94550.11	STD. DEV. OF COVARIANCE =	65560.20
STD. DEV. =	229.40	320.80	185.00	CORRELATION COEFFICIENT =	.410
KURTOSIS =	2.70	1.87	1.00	VECTOR MEAN =	84.25
SKEWNESS =	-.19	-.33	.13	VECTOR VARIANCE =	77830.35
				STD. DEV. =	278.80

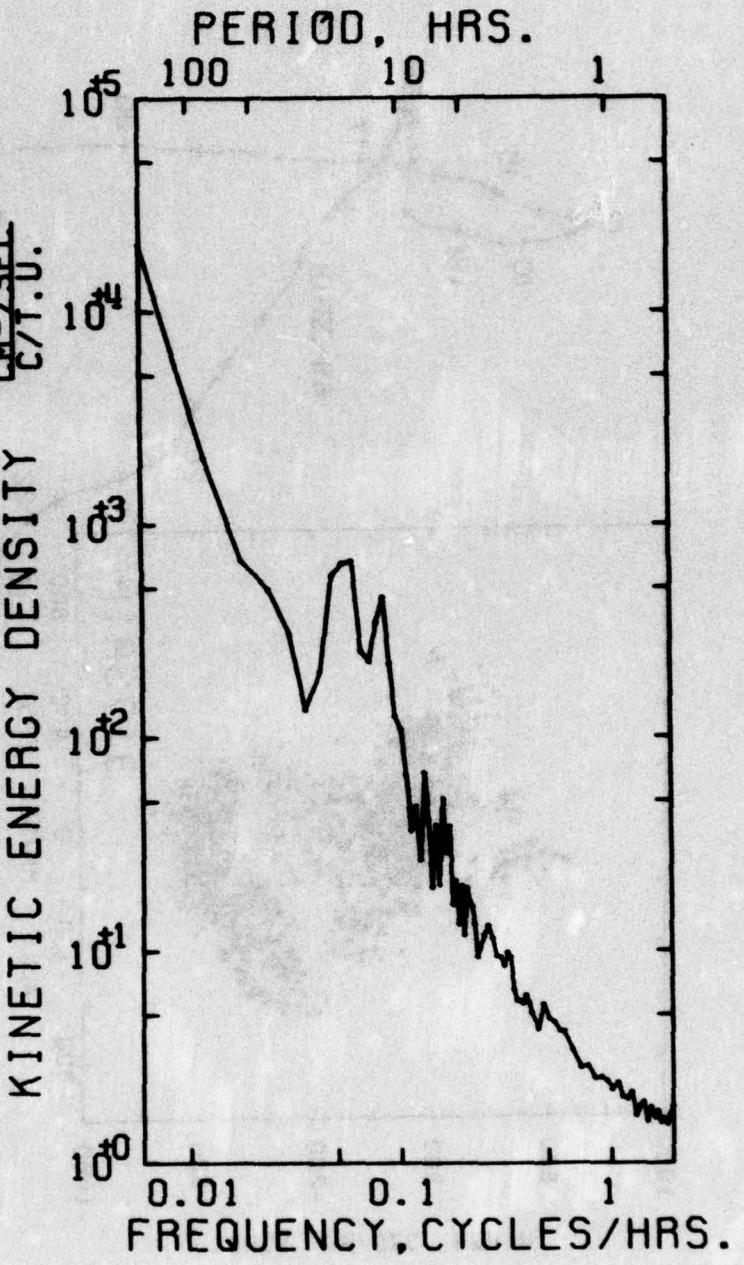
UNITS OF RAW DATA VARIABLES = MM/SEC

SAMPLE SIZE = 5804 POINTS

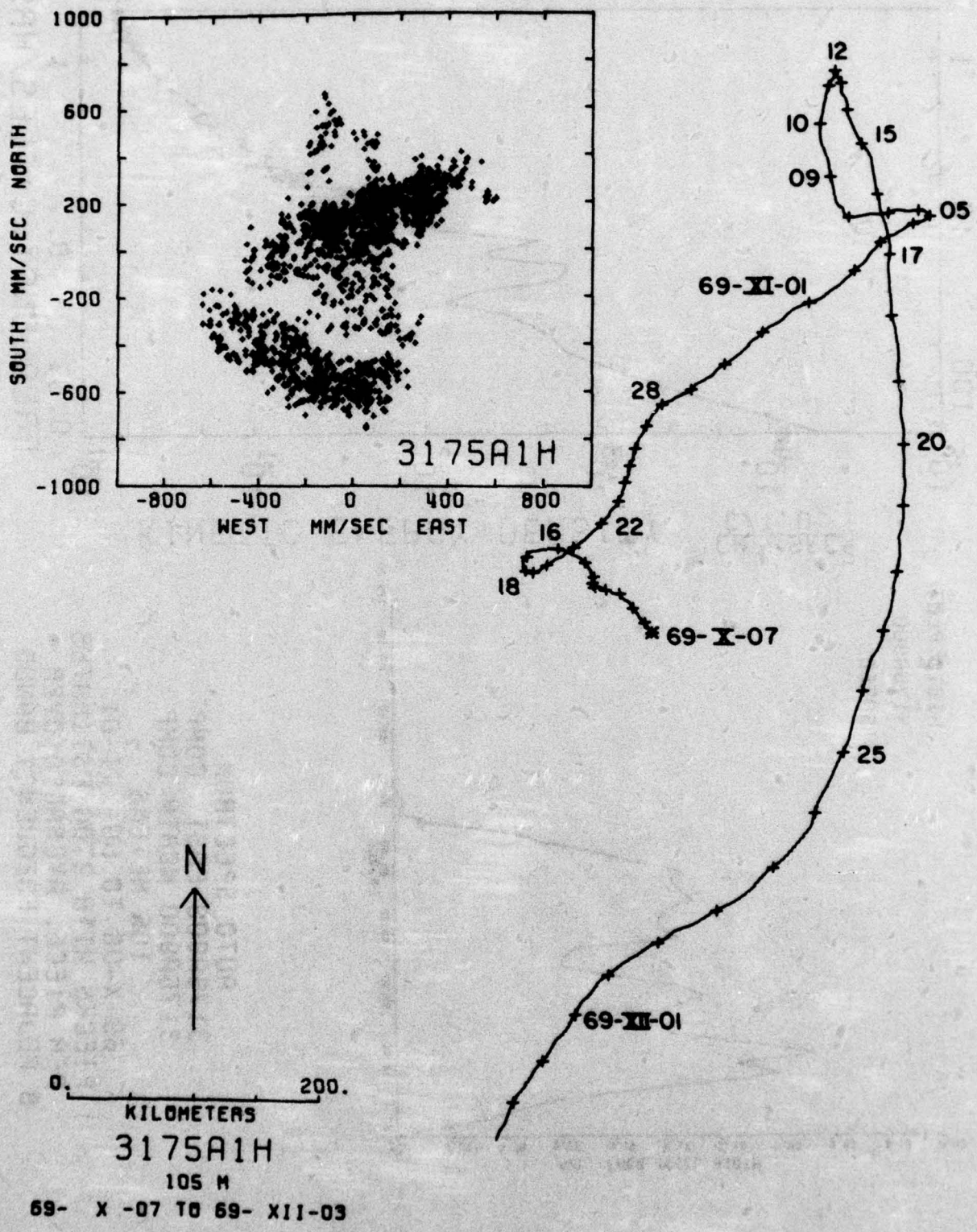
SPANNING RANGE
FROM 69- X -06 14.53.30
TO 69- XII-03 23.38.30

DURATION 58 DAYS 8 H 45 M 0 S





AUTO SPECTRUM
3175A900 EAST COMP
3175A900 NORTH COMP
105 METERS
69-X-06 TO 69-XII-01
1 PIECES WITH 2700 ESTIMATES
PER PIECE. AVERAGED OVER
8 ADJACENT FREQUENCY BANDS


1000
600
200
-200
-600
-1000
SOUTH MM/SEC NORTH
-800
-400
0
400
800
WEST MM/SEC EAST
3175A1H
12
10
15
09
05
17
69-XI-01
28
20
16
22
18
69-X-07
25
69-XII-01
N
0.
200.
KILOMETERS
3175A1H
105 M
69- X -07 TO 69- XII-03

3175RIN

Data number 3176

Instrument No.: M-203 **Type:** Magnetic tape current meter

Depth: 207 m **Water depth:** 2681 m

Start time: 69-X-06 145330

Stop time: 69-XII-03 173830

Duration: 58d 2h 45m 0s

Sampling scheme: Interval

time between strobes = 5.27 seconds

no. of strobes per interval = 24

interval time = 900 seconds

COMMENTS:
Digital clock - 15 seconds too slow over 3 month period.

STATS DATA/ 3176A800

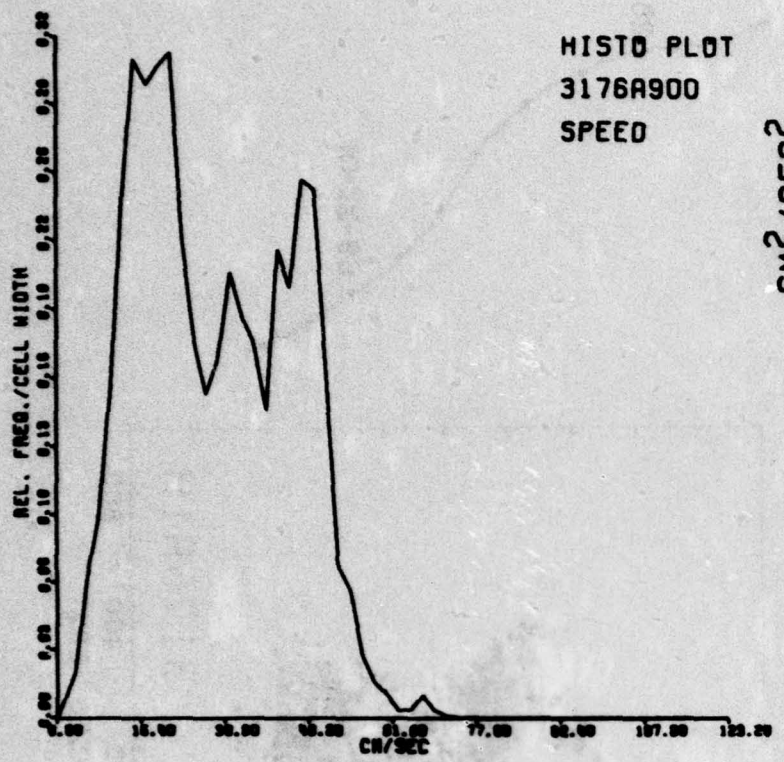
	EAST	NORTH	SPEED		EAST & NORTH	
MEAN =	-19.21	-84.43	289.02	= COVARIANCE	=	10724.52
STD. ERR. =	2.30	3.45	1.85	= STD. ERR. OF COVARIANCE	=	587.21
VARIANCE =	31668.48	66585.87	18060.24	= STD. DEV. OF COVARIANCE	=	43864.51
STD. DEV. =	177.98	258.06	134.36	= CORRELATION COEFFICIENT	=	.234
KURTOSIS =	2.30	1.82	2.01	= VECTOR MEAN	=	85.77
SKEWNESS =	-.15	-.30	.24	= VECTOR VARIANCE	=	48132.18
				= STD. DEV.	=	221.66

UNITS OF RAW DATA VARIABLES = MM/SEC

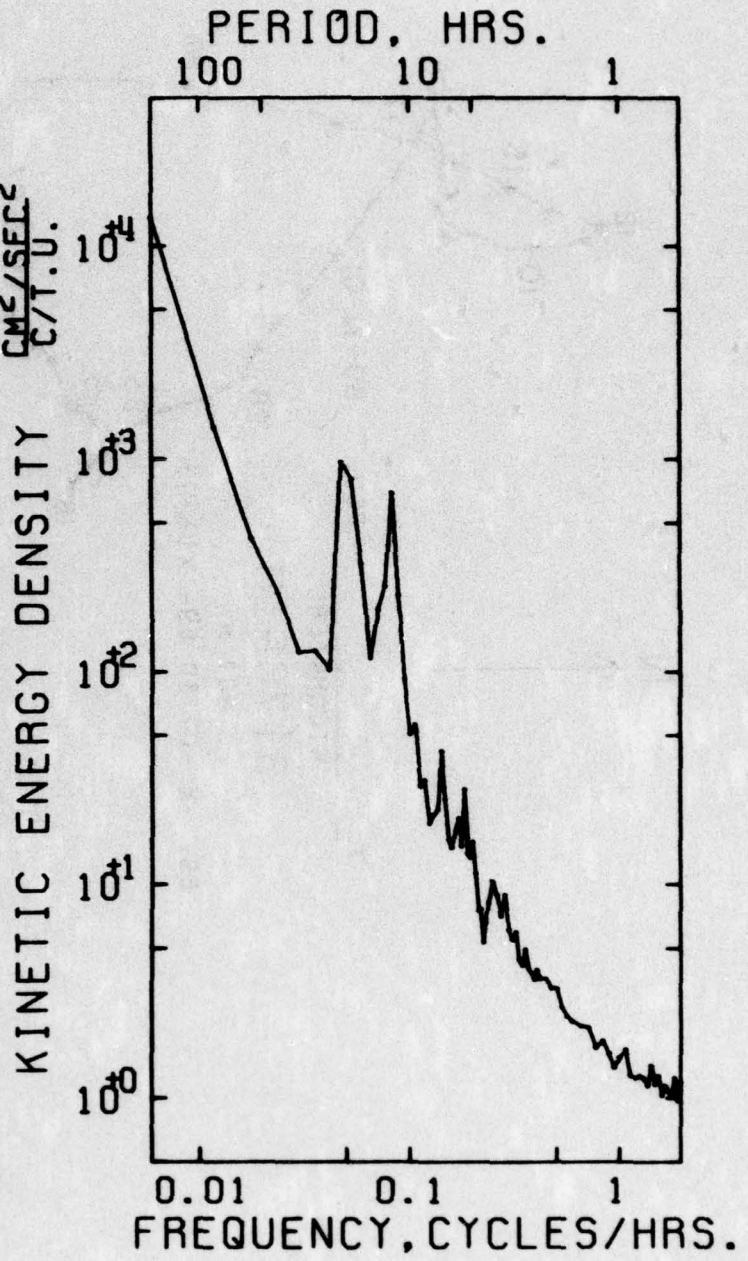
SAMPLE SIZE = 5580 POINTS

SPANNING RANGE
FROM 69- X -06 14.59.30
TO 69- XII-03 17.38.30

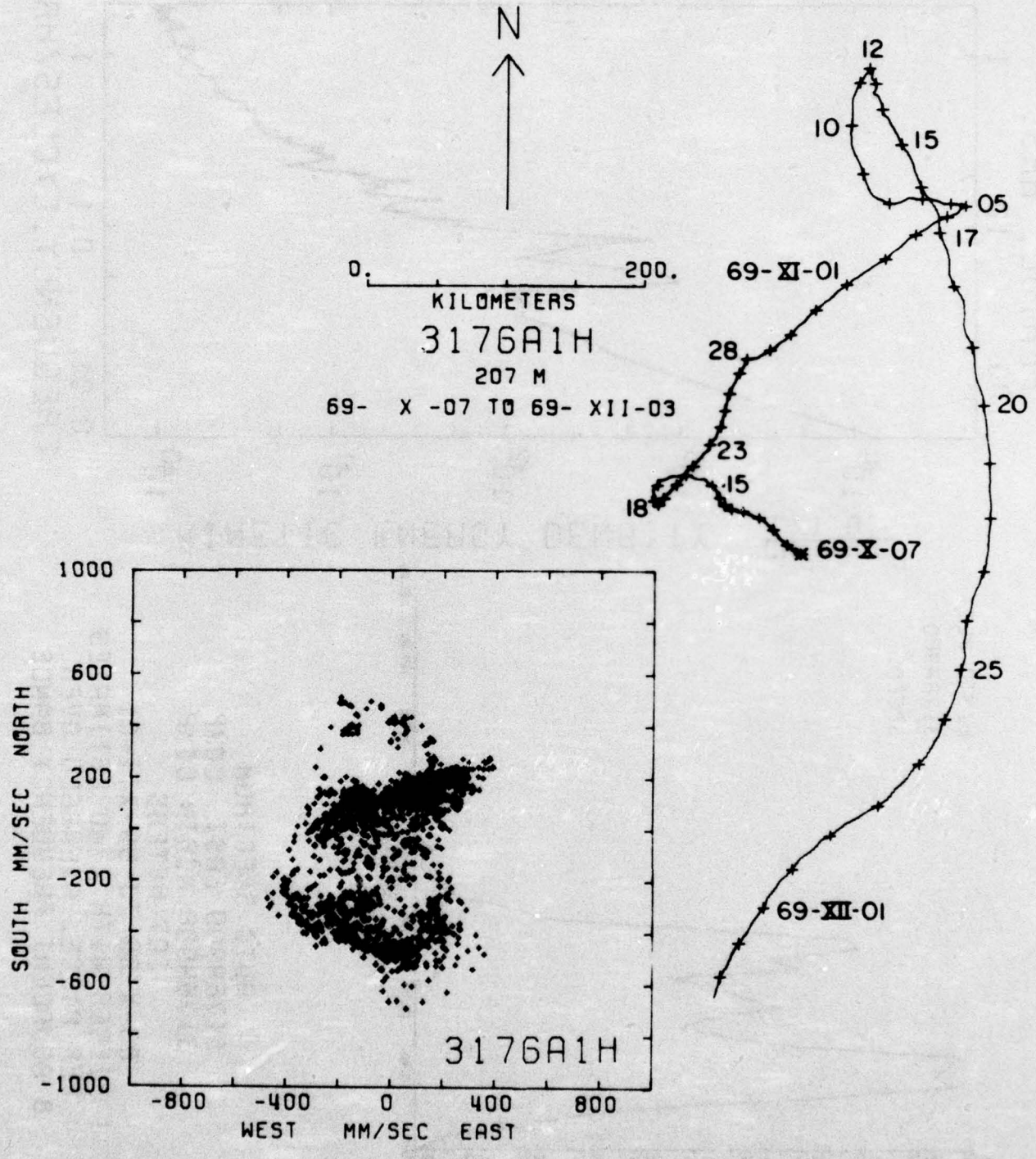
DURATION 58 DAYS 2 H 45 M 0 S

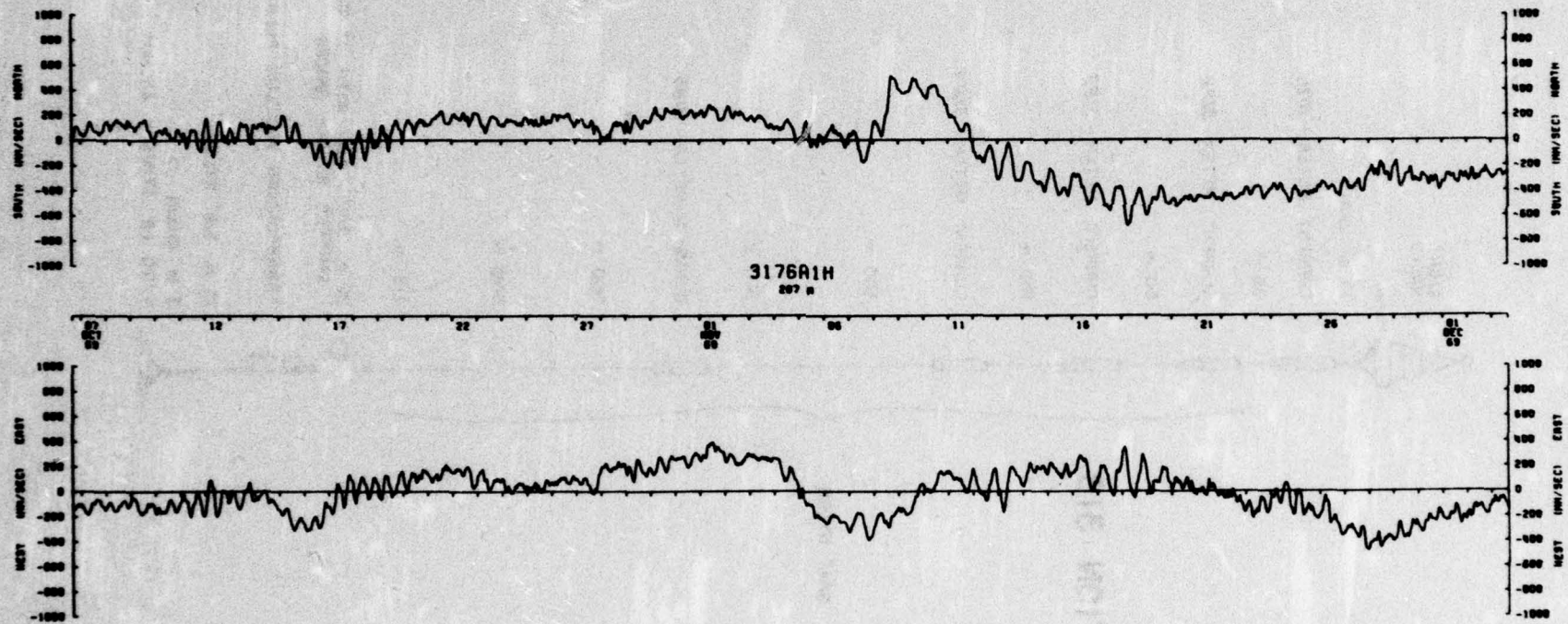


AUTO SPECTRUM
3176A900 EAST COMP
3176A900 NORTH COMP
207 METERS
69-X-06 TO 69-XII-01
1 PIECES WITH 2700 ESTIMATES
PER PIECE. AVERAGED OVER
8 ADJACENT FREQUENCY BANDS

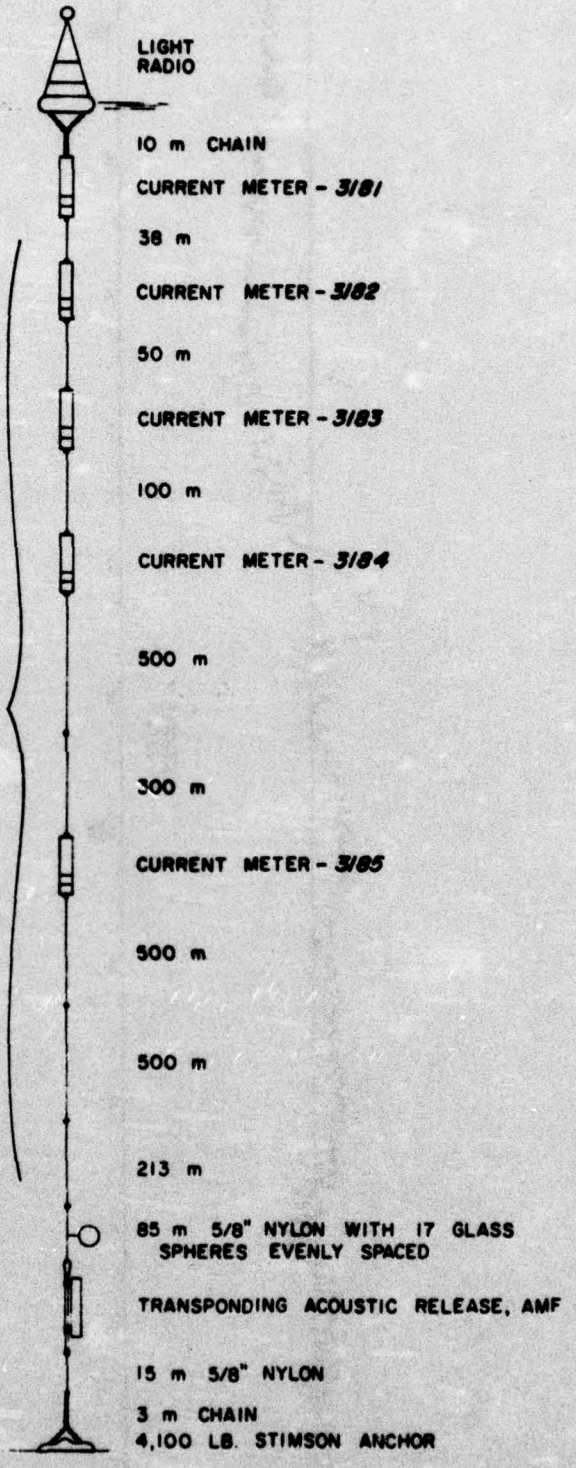


100


N
0.
200.
KILOMETERS
3176A1H
207 M
69- X -07 TO 69- XII-03
12
10
15
05
17
69-XI-01
28
20
23
15
18
69-X-07
25
69-XII-01
1000
600
200
-200
-600
-1000
SOUTH MM/SEC NORTH
-800
-400
0
400
800
WEST
MM/SEC
EAST
3176A1H


3176A1H
207 g
SOUTH (MM/SEC) NORTH
WEST (MM/SEC) EAST
1000
800
600
400
200
0
-200
-400
-600
-800
-1000

STATION 318


LIGHT
RADIO
10 m CHAIN
CURRENT METER - 3181
38 m
CURRENT METER - 3182
50 m
CURRENT METER - 3183
100 m
CURRENT METER - 3184
500 m
9/16" NYLON
300 m
CURRENT METER - 3185
500 m
500 m
213 m
85 m 5/8" NYLON WITH 17 GLASS SPHERES EVENLY SPACED
TRANSPONDING ACOUSTIC RELEASE, AMF
15 m 5/8" NYLON
3 m CHAIN
4,100 LB. STIMSON ANCHOR

Mooring No. 318

Set 69 (Year) Oct (Month) 06 (Day) — 39° 19.7N (Latitude) — 70° 02.8W (Longitude)

Set by J. Gifford — Ship R. V. Atlantis II — Cruise 53

Retrieved 70 (Year) Jan (Month) 06 (Day)

Retrieved by R. Heinmiller — Ship R. V. Chain — Cruise 97

Purpose of Mooring: Horizontal array with station 317 and 310 at Site D.

Mooring Type: Surface mooring.

Data Number	Instrument Number	Type	Depth Meters	Comments
3181*	M-209	M.C.M.	12	
3182	M-205	M.C.M.	52	Electronic problems
3183	M-127	M.C.M.	104	Tape advance problems, also vane missing
3184	M-196	M.C.M.	206	Lost
3185	M-214	M.C.M.	1008	Lost
Water depth			2545	

COMMENTS ON MOORING:

The release did not release so the mooring was hauled. The mooring line broke below the first three current meters.

Data number 3181

Instrument No.: M-209 **Type:** Magnetic tape current meter

Depth: 12 m **Water depth:** 2545 m

Start time: 69-X-06 182330

Stop time: 69-XII-04 015330

Duration: 58d 7h 30m

Sampling scheme: Interval

time between strobes = 5.27 seconds

no. of strobes per interval = 24

interval time = 900 seconds

COMMENTS:

Digital clock - 8 seconds too slow over 3 month period.

STATS DATA/ 3181A800

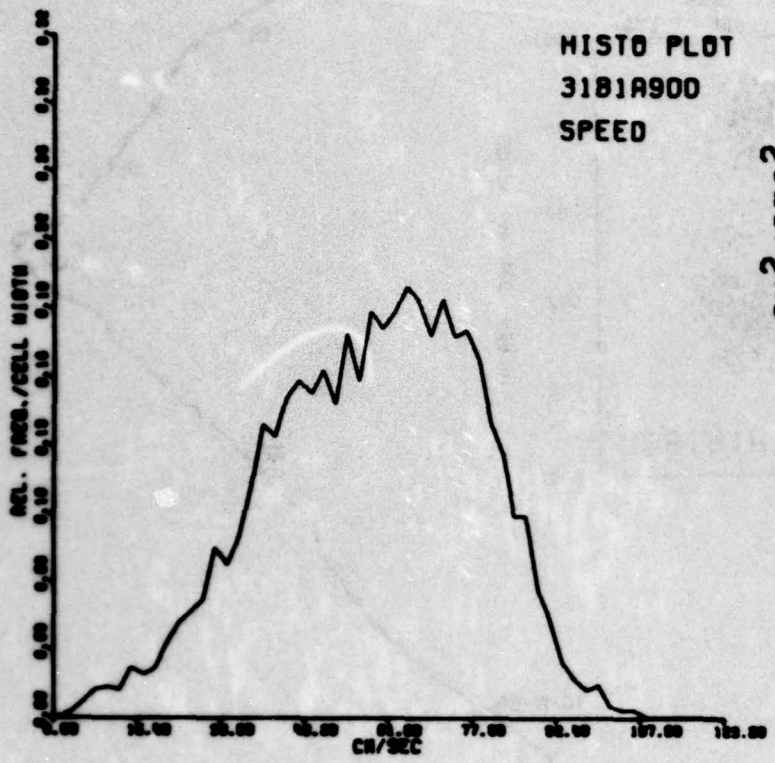
	EAST	NORTH	SPEED	##### EAST & NORTH	#####
MEAN =	160.13	22.78	564.32	= COVARIANCE =	33862.34
STD. ERR. =	4.78	8.34	2.55	= STD. ERR. OF COVARIANCE =	2211.11
VARIANCE =	126627.28	225000.33	30357.11	= STD. DEV. OF COVARIANCE =	185440.55
STD. DEV. =	355.85	474.34	180.80	= CORRELATION COEFFICIENT =	.201
KURTOSIS =	1.05	1.75	2.50	= VECTOR MEAN =	181.75
SKEWNESS =	-.15	-.41	-.20	= VECTOR VARIANCE =	175819.80
				= STD. DEV. =	418.30

UNITS OF RAW DATA VARIABLES = MM/SEC

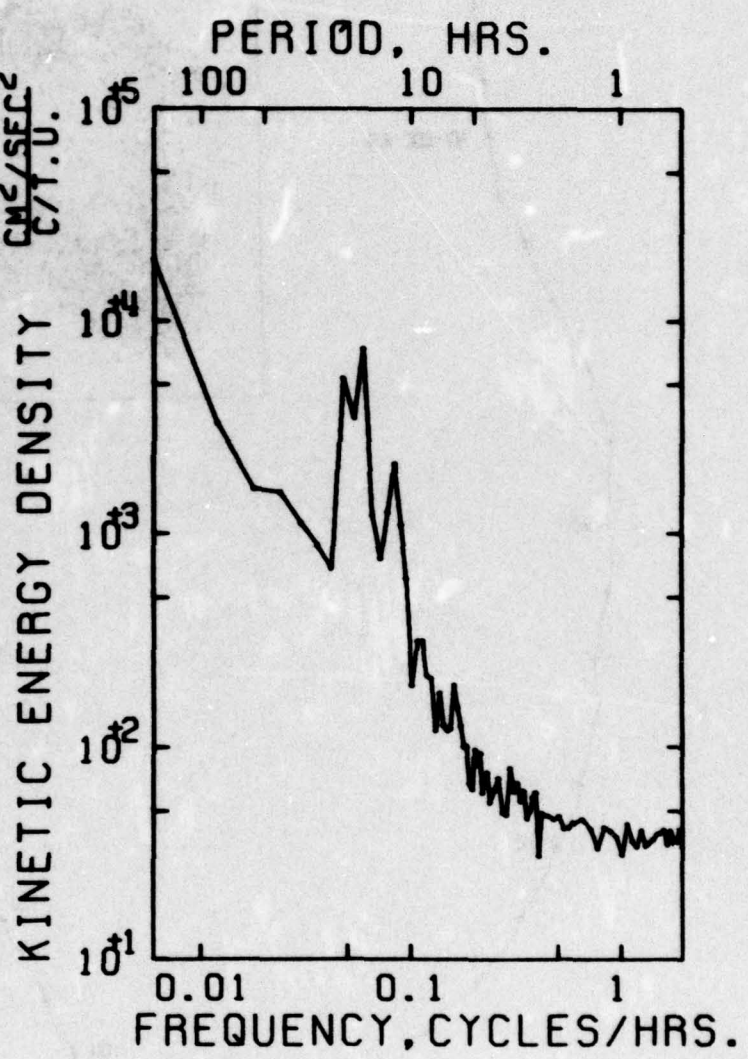
SAMPLE SIZE = 5588 POINTS

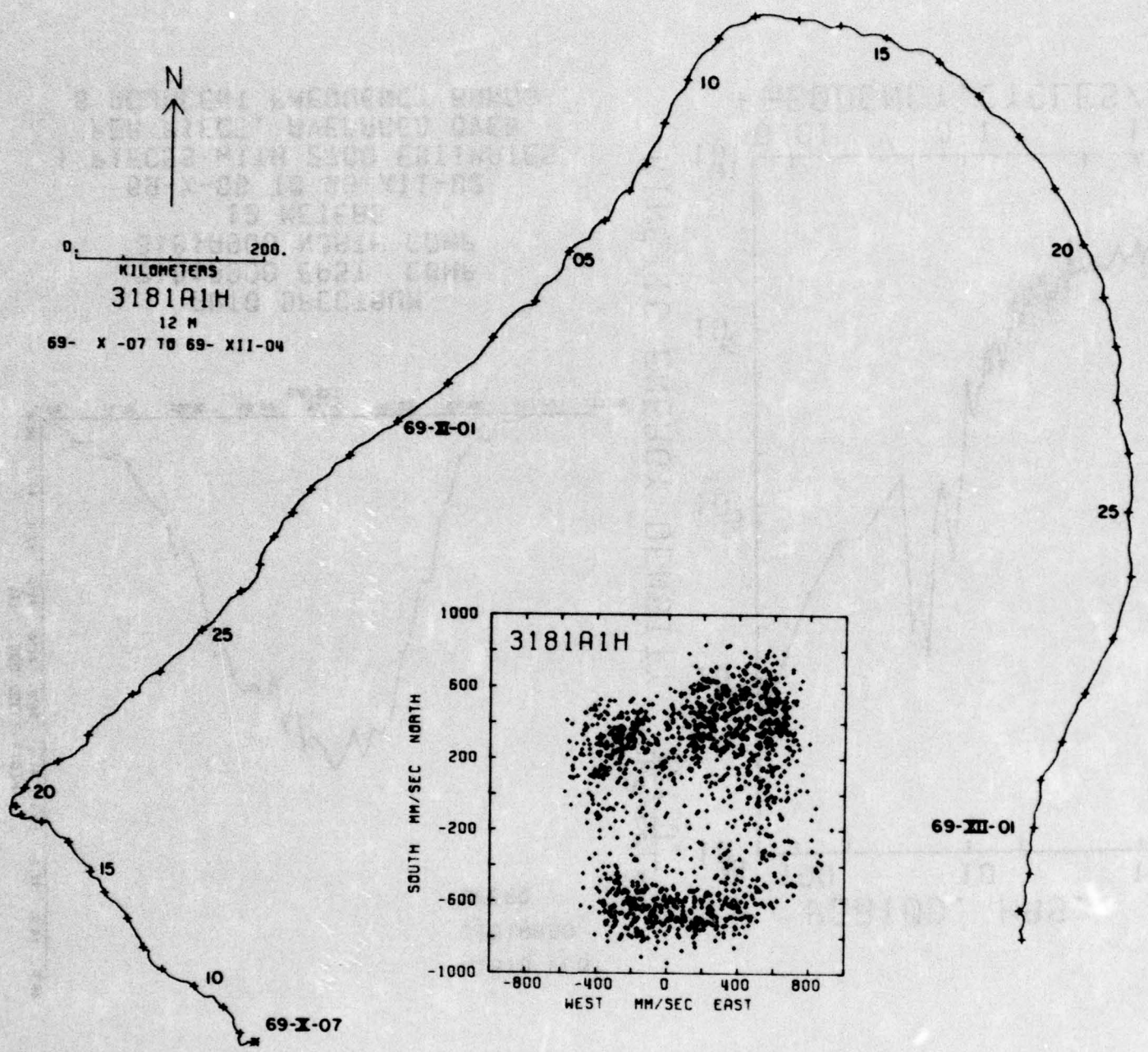
SPANNING RANGE
FROM 69- X -08 18.29.30
TO 69- XII-04 01.59.30

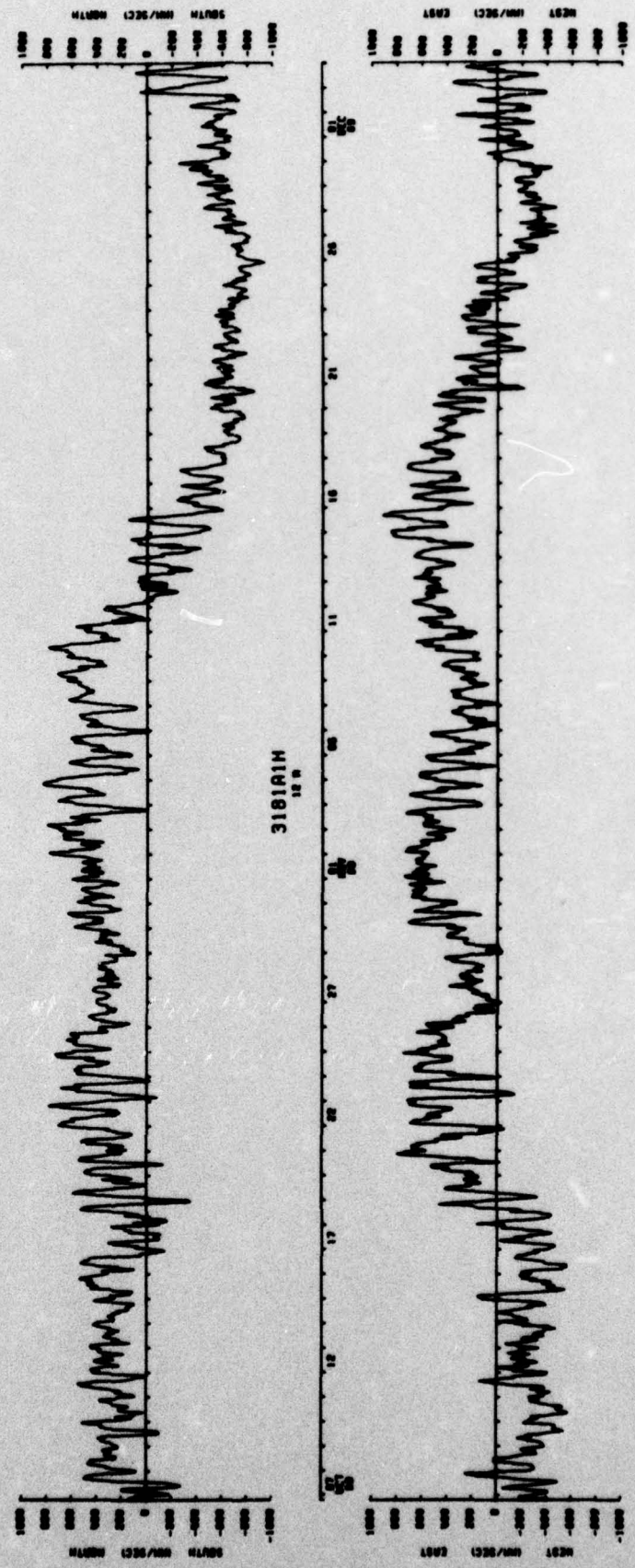
DURATION 58 DAYS 7 H 30 M 0 S



AUTO SPECTRUM
3181A900 EAST COMP
3181A900 NORTH COMP
12 METERS
69-X-06 TO 69-XII-02
1 PIECES WITH 2700 ESTIMATES
PER PIECE. AVERAGED OVER
8 ADJACENT FREQUENCY BANDS




N
0.
200.
KILOMETERS
3181A1H
12 M
69- X -07 TO 69- XII-04
69-XI-01
69-X-07
69-XII-01
05
10
15
20
25
3181A1H
SOUTH MM/SEC NORTH
WEST MM/SEC EAST
1000
600
200
-200
-600
-1000
-800
-400
0
400
800


SOUTH (MM/SEC) NORTH
WEST (MM/SEC) EAST
31B1A1H
12 M

Hydrostation Data

Number	Latitude	Longitude	Page
CI-92-896	39° 07.0'N	70° 00.0'W	112
CI-92-898	39° 02.3'N	70° 02.8'W	114
CI-92-903	39° 09.4'N	70° 06.5'W	116
CI-95-922	39° 10.5'N	70° 01.2'W	118
CI-95-924	34° 01.0'N	70° 04.7'W	120
AN-53-1550	39° 09.0'N	70° 03.0'W	122
AN-53-1551	39° 59.0'N	70° 02.0'W	124
AN-53-1552	39° 12.5'N	70° 05.0'W	126

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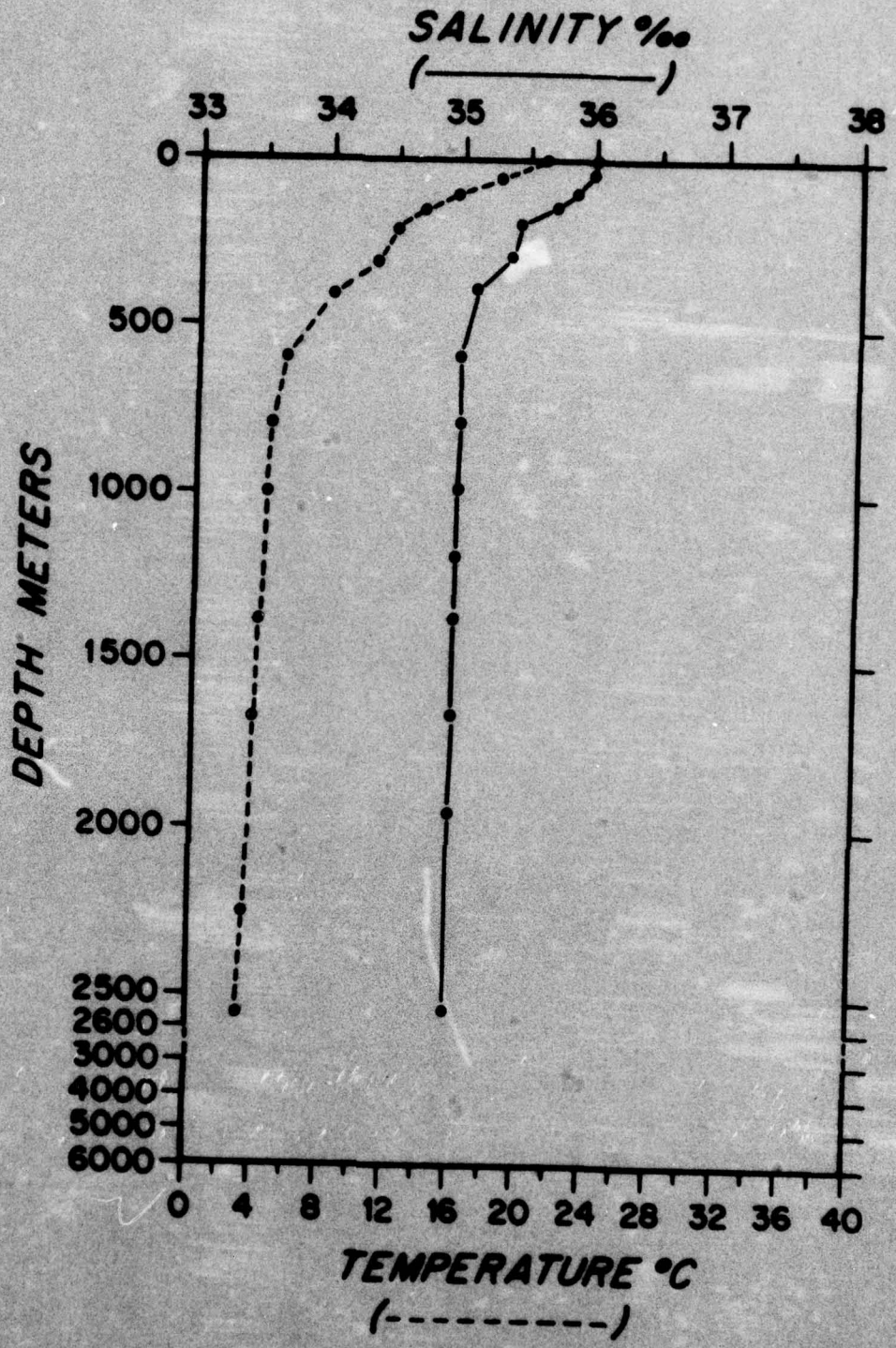

CI-092-896

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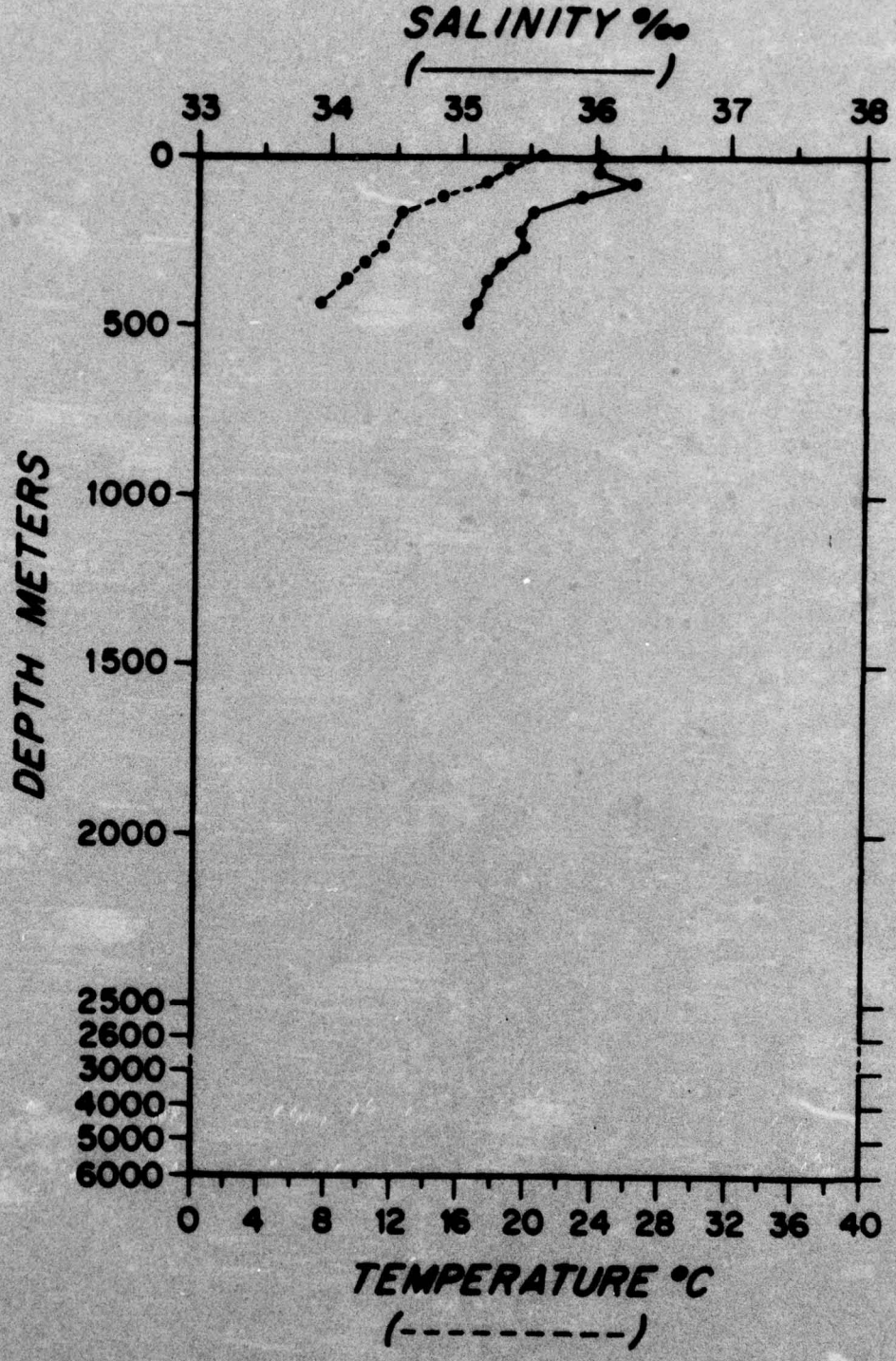

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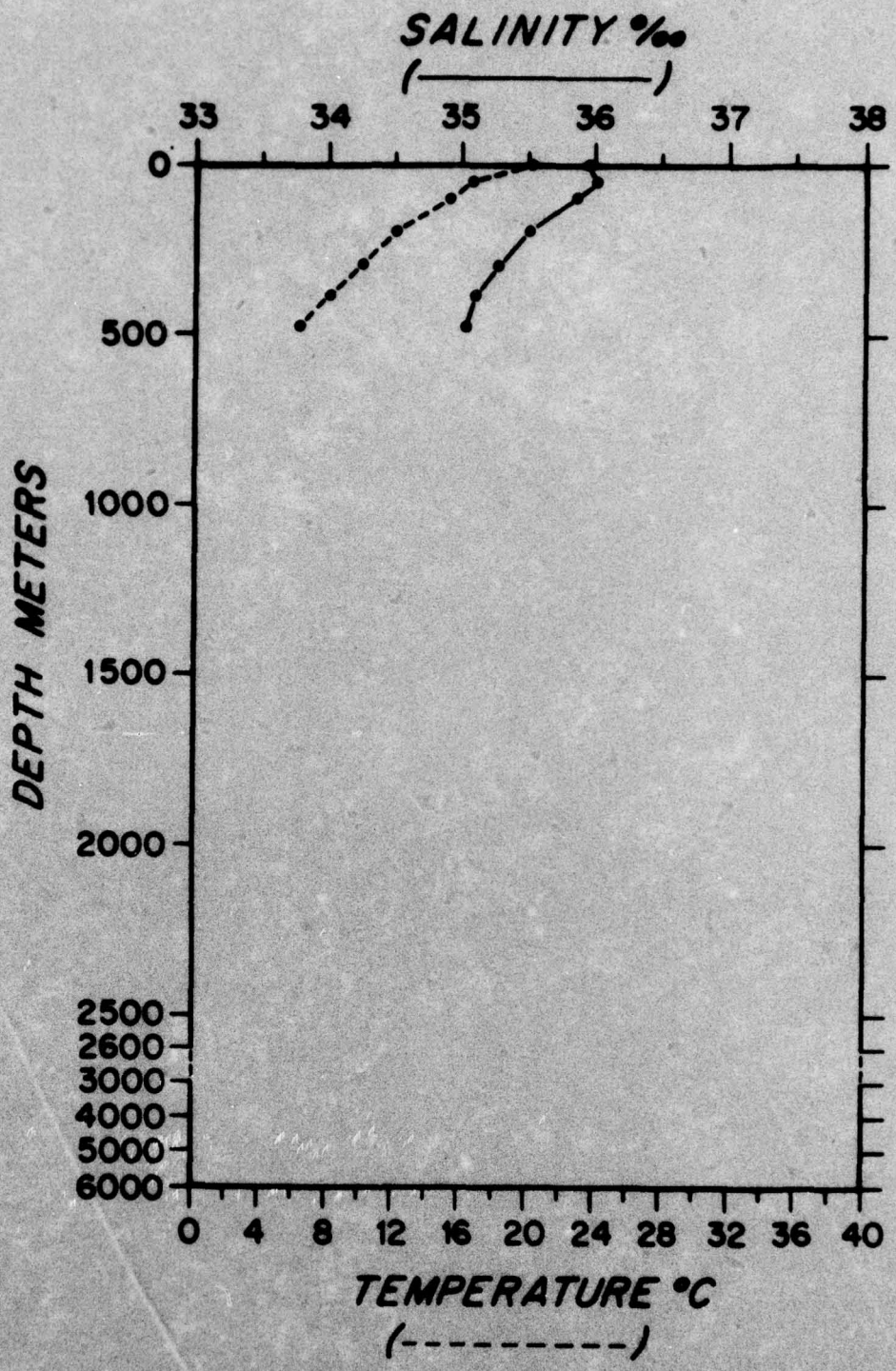

CI-092-903

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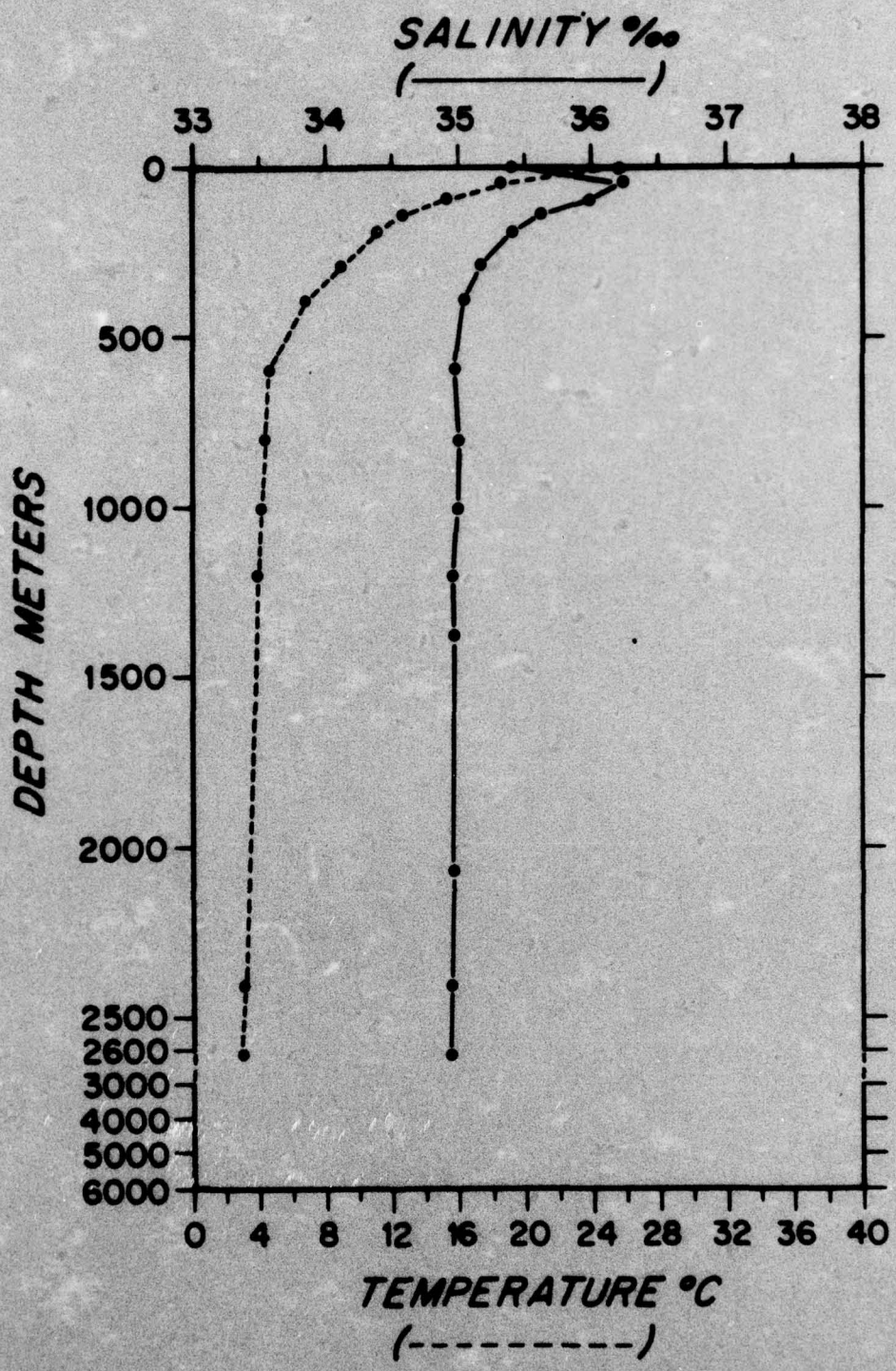

CI - 095 - 922

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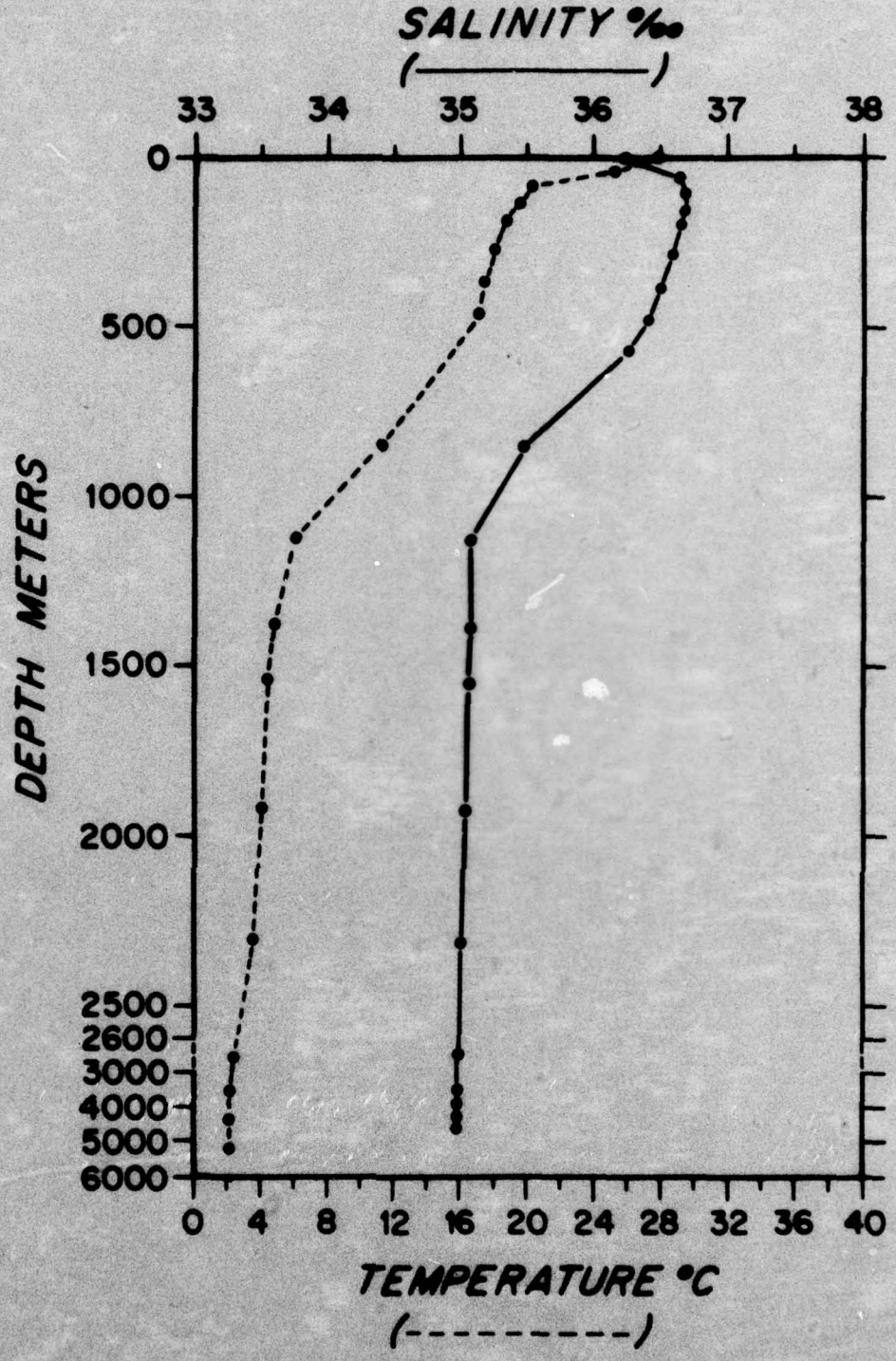

CI-095-924

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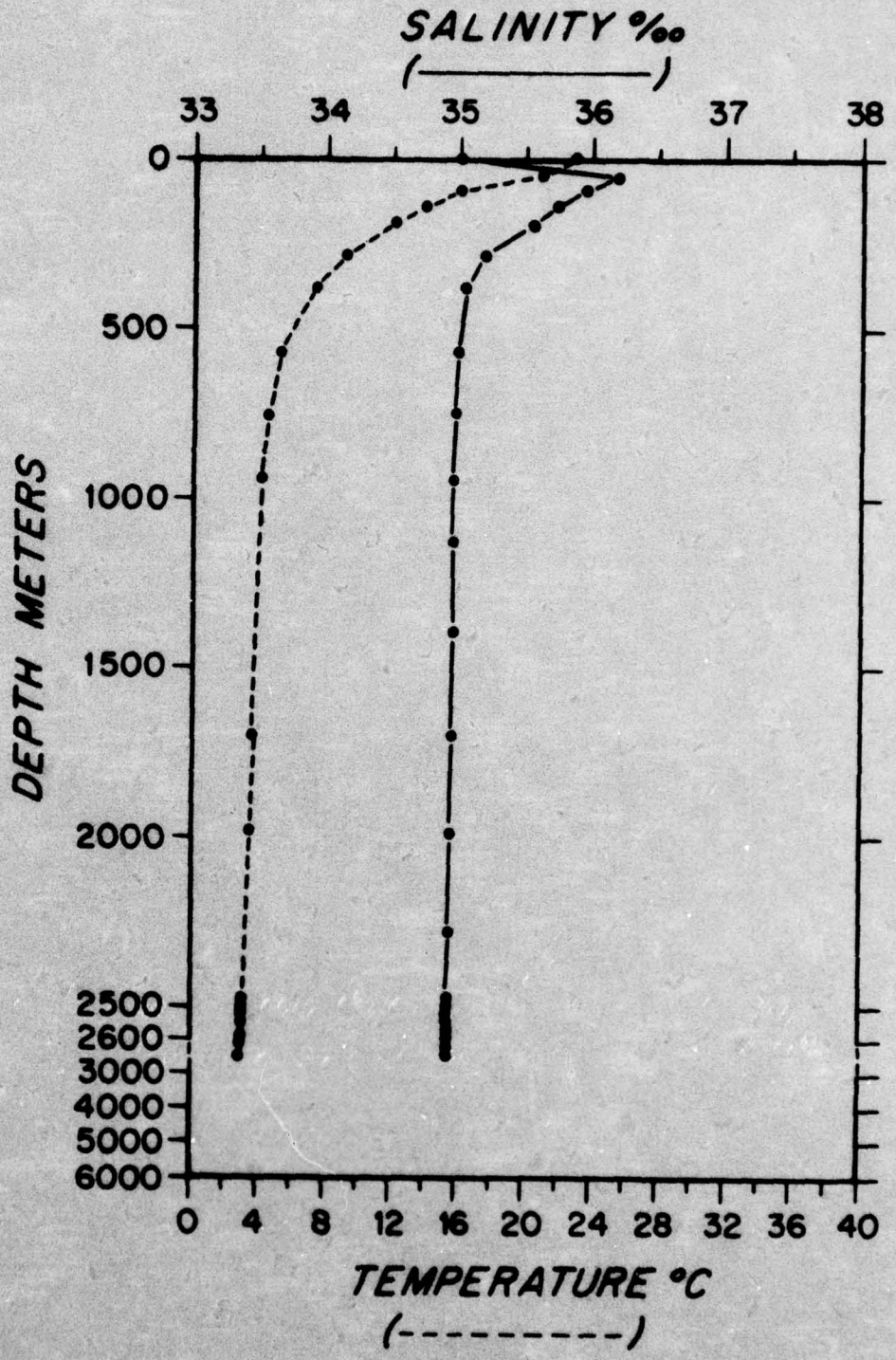

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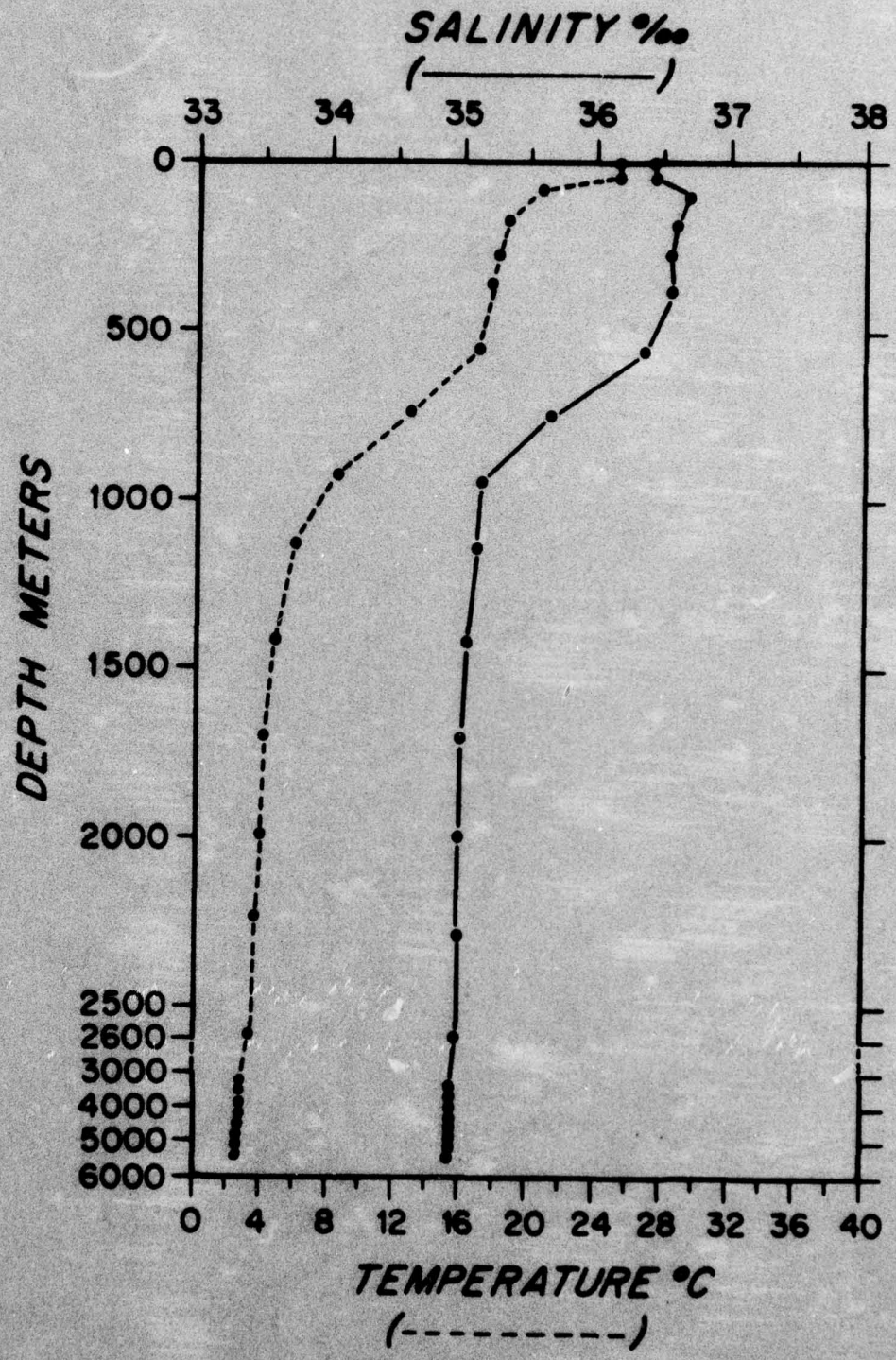

AN - 053 - 1551

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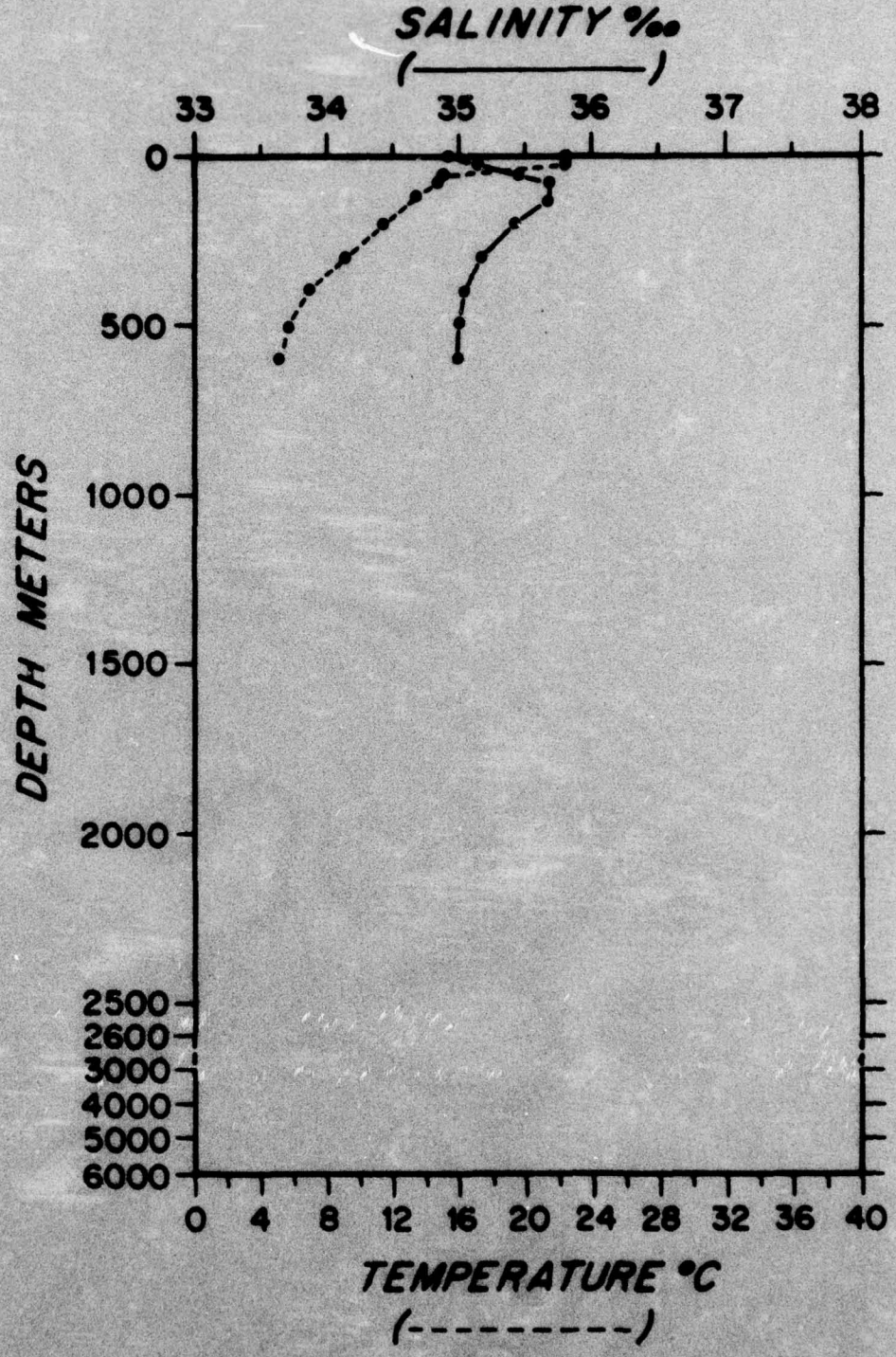

AN - 053 - 1552

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Averaged wind and current quantities are presented in computer generated output as basic STATISTICS, SPECTRA diagrams, PROGRESSIVE VECTOR diagrams and EAST-NORTH component plots. The hydrostation data are presented as temperature and salinity values plotted against pressure.

1. Site D
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