WHOI-74-52

A COMPILATION OF MOORED CURRENT METER AND WIND OBSERVATIONS
VOLUME VII (1968 MEASUREMENTS)

By

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July 1974 :

TECHNICAL REPORT

*Prepared for the Office of Naval Research
under Contract N00014-66-C0262; NR 083-004.*

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ABSTRACT

Summaries of wind and current measurements made with wind recorders and current meters by the Woods Hole Oceanographic Institution during the year 1968 are presented.

Averaged quantities are presented in computer-generated output as basic statistics, spectra diagrams, progressive vector diagrams, and east-north component plots.

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PREFACE

This volume is the seventh of a series of Data Reports intended to present, in summarized form, measurements collected from moored ocean stations. Volumes 1, 2 and 3 (Webster and Fofonoff, 1965, 1966 and 1967) cover the period from the summer of 1963 through the end of 1964. Volume 4 (Pollard, 1970) summarizes the data from 1965 and Volume 5 (Tarbell and Webster, 1971) covers 1966. Volume 6 (Tarbell, 1974) covers 1967. The data presented here are the records collected in 1968 which had no known instrument malfunction or other problem that might bias scientific interpretation of the data.

The emphasis in 1968 was on the recoverability of moorings. A back-up recovery system was designed and used successfully. All moorings, both scientific and engineering, were set near Site D with the exception of 3 'Alvin' moorings at 39° 52'N 69° 12'W. The scientific moorings were all-synthetic moorings as a series of tests in 1967 determined that there was no fish bite problem north of the Gulf Stream.

ACKNOWLEDGMENTS

The collection of large amounts of data over an extended period of time requires the cooperation of a wide assortment of people. The scientists and engineers who planned the experiments and examined the results, the technicians who prepared, repaired and modified the instruments for the particular experiments, the seagoing personnel who maintained the mooring components and set and retrieved the moorings and the people who programmed and processed the resultant data all have important roles in the successful collection of data.

This sixth report was prepared with the help of Audrey Williams who typed the text.

Introduction

The year 1968 was a year of change in all sections of the Buoy Project. One major change was the installation in April of a new computer system. This change enabled us to create a more versatile data format (Maltais, 1969) and more sophisticated data handling systems. The new computer system also allowed increasingly complex scientific problems to be designed and tested. Another major change was the transition from film recording to magnetic tape recording current meters. The magnetic tape instruments underwent continuous testing and modification during the year to improve their reliability and data quality. Data from the new instruments can be processed entirely within the Woods Hole Oceanographic Institution. The resulting reduction in processing time allows results obtained from one cruise to affect the configuration of the next. The final major change was the development of the back-up recovery system (Berteaux, Heinmiller, 1969) which made possible the partial recovery of failed moorings. This system not only provides a clue to the reason of failure but also reduces loss of instrumentation and data.

All the moorings presented in this report were set in the Site D area ($39^{\circ} 20'N$, $70^{\circ}W$) shown in Figure 1. A Time vs. Depth display of the data to be presented is shown in Figure 2.

Instrumentation

In 1968 twenty-seven moorings were set by the Buoy Project. Ten of the moorings set were set for scientific experiments. The other 17 were engineering test moorings. A total of 53 current meters were set of which 2 were lost, and 8 had been modified to measure other parameters. Twenty-two current meters had records that were either too short or had some other failure which prevented their being classed as good data. The following Table shows what types of instruments were set and how many yielded data good enough to be included in this report.

	<u>Set</u>	<u>Reported</u>
Film wind recorder	4	1
Magnetic tape wind recorder	8	5
Film current meter	6	1
Magnetic tape current meter	33	15
Digitizer	<u>2</u>	<u>-</u>
Totals	53	22

Data Reduction

The films from the film recording instruments were first developed, then checked for film contrast. If the contrast was good enough for machine read out, the films were sent to Geodyne Corporation (now a part of EG&G International) for transcription onto computer compatible magnetic tape. If the contrast on the film was too low for automatic read out, then the film was read by eye and the data keypunched onto cards by hand. Usually only one strobe (set of values) per recording interval was punched. The resultant card deck was then transferred onto computer compatible magnetic tape in Maltais format.

The data from the newer instruments were recorded on 1/4" magnetic tape. The data from the 1/4" magnetic tapes were first transcribed onto computer compatible 7-track magnetic tape then converted to Maltais format on 9-track magnetic tape.

Data Editing

Once the data is on tape in Maltais format, various types of editing can be done such as replacing values that are obviously bad or removing systematic instrument 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 which is used as the basic 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, 2641WE900:

- 264 - 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.
- E - 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

Only data from wind and current instruments are presented in this report. The selected data are preceded by a two page mooring summary the first of which contains basic information about the mooring; when, where, why and what. A diagram of the mooring is presented on the second page.

Mooring Summary

The mooring summary indicates which data are presented by an asterisk (*) following the data name. The instrument type column uses the following key:

FCM	Film recording current meters
MCM	Magnetic tape recording current meters
FWR	Film recording wind recorder
MWR	Magnetic tape recording wind recorder
TEL. TENS.	Telemetry tensiometer
TENS	Tensiometer
DCM	Digitizing current meter
DR	Depth recorder
TEMP	Temperature recorder

Data Summary

There is a four page data summary for each presented file following the mooring information.

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 usable data. All times are Greenwich Mean Time. If the instrument did not work properly, detailed 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 are described below as well as descriptions of the various plots which are displayed on the following three pages.

A complete description of the moorings set in 1968 is included in W.H.O.I. Ref. No. 69-35 by Gordon H. Volkmann. A report on the Back-up Recovery System was published in the Marine Technology Society Journal, Volume 7, No. 3 under the title of "Back-Up Recovery of Deep Sea Moorings" by Henri O. Berteaux and Robert H. Heinmiller, Jr.

The instruments used in 1968, instrument testing techniques, and instrument changes are discussed in W.H.O.I. Ref. No. 69-14 by J. R. McCullough and G. H. Tupper.

A description of the Maltais format which is a basis for all our programs is written in W.H.O.I. Ref. No. 69-55 by John Maltais. A copy of the programs used to plot the data may be obtained by writing to John Maltais care of the Woods Hole Oceanographic Institution.

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 ,

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

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

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

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

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

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

The program also calculates "East and North" statistics,

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

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

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

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

The program also calculates 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 .

SPECTRUM

Spectra are plotted in log-log format, the scale being 1" per decade. (A log-log grid suitable for overlaying is inserted in the back of the report for convenience.) The program uses the Fast Fourier Transform algorithm (Singleton, 1969) and is restricted to the set of numbers that can be factored by 2, 3, 4 or 5. Thus the time range is usually shorter than the length of good record. The number of degrees of freedom (d.f.) for the plotted points for low-frequency values on the plot is given by (4 x number of pieces x number of frequency bands averaged over). Since the log-log plot bunches points closer together as the frequency increases, averaging over more frequency bands is done for larger values of the frequency. This smooths the plot and increases the number of degrees of freedom for the larger frequency values. It has the further advantage of resolving the low-frequency peaks (usually inertial and semidiurnal) as finely as possible while increasing the number of degrees of freedom in the internal wave region of the spectra. The algorithm is as follows: counting from the left of the plot, the first 40 plotted points are averaged as stated in the label, the next 15 points are averaged over twice as many frequency bands, the next 6 points over 5 times as many, the next 30 over 10 times as many, the next 15 points over 20 times as many, the next 6 points over 50 times as many, and further points, if any, over 100 times as many.

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 SPEED and DIRECTION values which were derived from the 1-hour vector averaged data. The plot begins with an asterisk (*) on a day boundary. All following day boundaries are indicated with a (+) except the few cases where the data was less than 1-day long. 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.

EAST and NORTH vs. TIME PLOT:

This is a diagram of EAST and NORTH components plotted as a function of TIME. The plot is usually generated from the 1-hour 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.

FIGURES

Figure 1. Location of Site D

Figure 2. Time-depth diagram of the data in this report

Figure 1

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SITE D (39°20'N, 70°00'W) 1968

Figure 2.

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A compilation of moored current meter observations

Volume III. W.H.O.I. Ref. 67-66 (unpublished manuscript).

Mooring No. 264

Set 68 April 20 39° 09.3 N 70° 01.8 W
Year Month Day Latitude Longitude

Set by R. Heinmiller Ship USCG LAUREL Cruise 2

Retrieved 68 June 9
Year Month Day

Retrieved by J. Gifford Ship R.V. CRAWFORD Cruise 167

Purpose of Mooring: Wire test at Site D

Mooring Type: Surface

<u>Data Number</u>	<u>Instrument Number</u>	<u>Type</u>	<u>Depth Meters</u>	<u>Comments</u>
2641*	W-101X	MWR	0	
2642	# 7	TEL TENS	2	
2643	M-172	MCM	13	Stuck compass
2644	1012	TENS	1513	
2645	1010	TENS	2613	

Water Depth: 2680

COMMENTS ON MOORING:

Data number 2641

Instrument No.: W-101 X

Type: Magnetic tape wind recorder

Depth: -0-

Water depth: 2680 m

Start time: 68-04-20 20.13.30

Stop time: 68-05-14 00.43.30

Duration: 23 das. 4 hrs. 30 mins.

Sampling scheme: Interval

time between strobes = 5 seconds

no. of strobes per interval = 31

interval time = 900 seconds

COMMENTS:

The 12 hour mechanical clock failed, so rearm circuit never actuated, causing instrument to record past shut off point and overwrite the first part of channel B.

STATS

DATA/ 2641WE900

	EAST	NORTH	SPEED	*****	EAST & NORTH	*****
MEAN	= 5.65	-14.07	78.14	=	COVARIANCE	= 1134.30
STD. ERR.	= 1.28	1.22	.72	=	STD. ERR. OF COVARIANCE	= 75.21
VARIANCE	= 3702.28	3321.11	1148.10	=	STD. DEV. OF COVARIANCE	= 3549.17
STD. DEV.	= 60.85	57.63	33.88	=	CORRELATION COEFFICIENT	= .323
KURTOSIS	= 2.07	2.99	2.78	=	VECTOR MEAN	= 15.17
SKEWNESS	= -.17	.52	.33	=	VECTOR VARIANCE	= 3511.70
				=	STD. DEV.	= 59.26

UNITS OF RAW DATA VARIABLES = CM/SEC

SAMPLE SIZE = 2227 POINTS

SPANNING RANGE

FROM 68- IV -20 20.13.30
TO 68- V -14 00.43.30

AUTO SPECTRUM

2641WE900 EAST COMP

2641WE900 NORTH COMP

WIND

68-IV-20 TO 68-V-13

1 PIECES WITH 1080 ESTIMATES

PER PIECE. AVERAGED OVER

8 ADJACENT FREQUENCY BANDS

Mooring No. 265

Set 68 April 24 39° 10.9 N 69° 55.0 W
Year Month Day Latitude Longitude

Set by R. Heinmiller Ship USCG LAUREL Cruise 2

Retrieved 68 June 15
Year Month Day

Retrieved by J. Gifford Ship R.V. CRAWFORD Cruise 167

Purpose of Mooring: Long term bottom measurements

Mooring Type: Subsurface

<u>Data Number</u>	<u>Instrument Number</u>	<u>Type</u>	<u>Depth Meters</u>	<u>Comments</u>
2651*	H-877	FCM	2578	

Water Depth 2678

COMMENTS ON MOORING:

STATION 265

Data number 2651

Instrument No.: H-877

Type: Film recording current meter

Depth: 2578 m

Water depth: 2678 m

Start time: 68-04-24 23.23.30

Stop time: 68-06-15 08.38.30

Duration: 51 das. 9 hrs. 15 mins.

Sampling scheme: Interval

time between strobes = 5 seconds

no. of strobes per interval = 31

interval time = 900 seconds

COMMENTS:

Film was light struck so film was read by eye by Dolores Chausse.
Sampling scheme on tape is one sample, unaveraged, every 900 seconds.

STATS

DATA/ 2651YF900

	EAST	NORTH
MEAN	-7.87	-60
STD. ERR.	.46	.55
VARIANCE	1025.77	1485.23
STD. DEV.	32.03	38.54
KURTOSIS	4.07	3.78
SKEWNESS	-.31	.47

	EAST & NORTH
SPEED	40.49
COVARIANCE	43
STD. ERR. OF COVARIANCE	834.06
STD. DEV. OF COVARIANCE	30.56
CORRELATION COEFFICIENT	3.40
VECTOR MEAN	.84
VECTOR VARIANCE	1255.50
STD. DEV.	35.43

UNITS OF RAW DATA VARIABLES = MM/SEC

SAMPLE SIZE = 4938 POINTS

SPANNING RANGE

FROM 68- IV -24 23.23.30
TO 68- VI -15 08.38.30

AUTO SPECTRUM
 2651YF900 EAST COMP
 2651YF900 NORTH COMP
 2578 METERS

68-IV-24 TO 68-VI-14
 2 PIECES WITH 1215 ESTIMATES
 PER PIECE. AVERAGED OVER
 16 ADJACENT FREQUENCY BANDS

Mooring No. 268

Set 68 June 14 39° 09.7 N 69° 51.7 W
Year Month Day Latitude Longitude

Set by J. Gifford Ship R.V. CRAWFORD Cruise 167B

Retrieved 68 Sept 26
Year Month Day

Retrieved by J. Gifford Ship R.V. ATLANTIS II Cruise 46

Purpose of Mooring: 4 month bottom measurements

Mooring Type: Bottom mooring with syntactic foam float

<u>Data</u> <u>Number</u>	<u>Instrument</u> <u>Number</u>	<u>Type</u>	<u>Depth</u> <u>Meters</u>	<u>Comments</u>
2681*	M-175	MCM	2558	

Water Depth 2658

COMMENTS ON MOORING:

STATION 268

Data number 2681

Instrument No.: M-175

Type: Magnetic tape current meter

Depth: 2558 m

Water depth: 2658 m

Start time: 68-06-15 22.03.00

Stop time: 68-09-26 15.03.00

Duration: 102 das. 17 hrs.

Sampling scheme: Interval

time between strobes = 5 seconds

no. of strobes per interval = 15

interval time = 1800 seconds

COMMENTS:

STATS

DATA/ 2681F1800

MEAN	=	EAST	NORTH	SPEED	*****	EAST & NORTH	*****
STD. ERR.	=	-30.98	11.41	58.73	*****	COVARIANCE	= 251.66
VARIANCE	=	.48	.74	.53	*****	STD. ERR. OF COVARIANCE	= 47.87
STD. DEV.	=	1158.85	2707.85	1386.65	*****	STD. DEV. OF COVARIANCE	= 3368.28
KURTOSIS	=	34.01	52.04	37.24	*****	CORRELATION COEFFICIENT	= .142
SKEWNESS	=	3.81	4.02	5.86	*****	VECTOR MEAN	= 33.02
		-.66	.18	1.44	*****	VECTOR VARIANCE	= 1932.35
					*****	STD. DEV.	= 43.96

UNITS OF RAW DATA VARIABLES = MM/SEC

SAMPLE SIZE = 4931 POINTS

SPANNING RANGE

FROM 68- VI -15 22.03.00
TO 68- IX -26 15.03.00

AUTO SPECTRUM
 2681F1800 EAST COMP
 2681F1800 NORTH COMP
 2558 METERS
 68-VI-15 TO 68-IX-25
 2 PIECES WITH 1215 ESTIMATES
 PER PIECE. AVERAGED OVER
 16 ADJACENT FREQUENCY BANDS

Mooring No. 269

Set 68 June 15 39° 09.6 N 70° 01.6 W
Year Month Day Latitude Longitude

Set by J. Gifford Ship R.V. CRAWFORD Cruise 167

Retrieved 68 Aug 23
Year Month Day

Retrieved by R. Heinmiller Ship R.V. ATLANTIS II Cruise 44

Purpose of Mooring: Engineering wire test mooring

Mooring Type: Surface

<u>Data Number</u>	<u>Instrument Number</u>	<u>Type</u>	<u>Depth Meters</u>	<u>Comments</u>
2691*	W-101 X	Wind	0	
2692	1013	TEL.TENS	1	
2693	M-174	MCM	13	No rotor data until Aug 6 '68
2694	1014	TENS	1513	
2695	1015	TENS	2556	
2696	1016	TENS	2654	

Water Depth 2679

COMMENTS ON MOORING: August 14 toroid bumped by ship

STATION 269

Data number 2691

Instrument No.: W-101 X

Type: Magnetic tape wind recorder

Depth: -0-

Water depth: 2679 m

Start time: 68-06-15 21.56.30

Stop time: 68-08-02 00.41.30

Duration: 47 das. 2 hrs. 45 mins.

Sampling scheme: Interval

time between strobes = 5 seconds

no. of strobes per interval = 31

interval time = 900 seconds

COMMENTS:

STATS

	EAST	NORTH
MEAN	15.70	10.43
STD. ERR.	.56	.56
VARIANCE	1441.06	1442.39
STD. DEV.	37.96	37.98
KURTOSIS	2.46	2.57
SKEWNESS	-.21	-.57

DATA/ 2691B900

SPEED	*****	EAST & NORTH	*****
53.24	* COVARIANCE	=	406.58
.30	* STD. ERR. OF COVARIANCE	=	20.46
404.20	* STD. DEV. OF COVARIANCE	=	1376.20
20.10	* CORRELATION COEFFICIENT	=	.282
2.78	* VECTOR MEAN	=	18.85
.37	* VECTOR VARIANCE	=	1441.72
	* STD. DEV.	=	37.97

UNITS OF RAW DATA VARIABLES = CM/SEC

SAMPLE SIZE = 4524 POINTS

SPANNING RANGE

FROM 68- VI -15 21.56.30
TO 68-VIII-02 00.41.30

AUTO SPECTRUM
 2691B900 EAST COMP
 2691B900 NORTH COMP
 WIND
 68-VI-15 TO 68-VIII-01
 2 PIECES WITH 1125 ESTIMATES
 PER PIECE. AVERAGED OVER
 16 ADJACENT FREQUENCY BANDS

269181H

Mooring No. 272

Set 68 Aug 15 39° 09.1 N 70° 05.7 W
Year Month Day Latitude Longitude

Set by R. Heinmiller Ship R.V. ATLANTIS II Cruise 44

Retrieved 68 Aug 22
Year Month Day

Retrieved by R. Heinmiller Ship R.V. ATLANTIS II Cruise 44

Purpose of Mooring: Shallow current and temperature shear measurements

Mooring Type: Surface

<u>Data Number</u>	<u>Instrument Number</u>	<u>Type</u>	<u>Depth Meters</u>	<u>Comments</u>
2721*	W-125 X	MWR	-0-	
2722*	M-177	MCM	10	
2723*	M-124	MCM	20	Thermister #1
2724	D-172	DCM	27	Thermistor #2, no rotor
2725	M-127	MCM	30	Thermister #3, no data
2726	M-122	MCM	40	

Water Depth 2705

COMMENTS ON MOORING:

STATION 272

Data number 2721

Instrument No.: W-125X

Type: Magnetic tape wind recorder

Depth: -0-

Water depth: 2705 m

Start time: 68-08-15 17.38.56

Stop time: 68-08-22 23.08.56

Duration: 7 das. 5 hrs. 30 mins.

Sampling scheme: Continuous

time between samples = 5 seconds

COMMENTS: The data is too short for a spectral plot.

STATS

		EAST	NORTH
MEAN	=	16.83	-6.20
STD. ERR.	=	1.60	1.72
VARIANCE	=	1768.35	2065.49
STD. DEV.	=	42.05	45.45
KURTOSIS	=	2.06	1.83
SKEWNESS	=	-.44	.51

DATA/ 2721WD900

SPEED	* *****	EAST & NORTH	*****
61.34	* COVARIANCE	=	996.65
.75	* STD. ERR. OF COVARIANCE	=	74.61
392.48	* STD. DEV. OF COVARIANCE	=	1967.03
19.81	* CORRELATION COEFFICIENT	=	.521
2.35	* VECTOR MEAN	=	17.94
.19	* VECTOR VARIANCE	=	1916.92
	* STD. DEV.	=	43.78

UNITS OF RAW DATA VARIABLES = DM/SEC

SAMPLE SIZE = 695 POINTS

SPANNING RANGE

FROM 68-VIII-15 17.38.56
TO 68-VIII-22 23.08.56

2721WD1H

N

0 150
KILOMETERS

2721WD900

WIND

68-VIII-16 TO 68-VIII-22

2721WD1H

Data number 2722

Instrument No.: M-177

Type: Magnetic tape current meter

Depth: 10 m

Water depth: 2705 m

Start time: 68-08-15 17.48.49

Stop time: 68-08-22 23.18.49

Duration: 7 das. 5 hrs. 30 mins.

Sampling scheme: Continuous

time between samples = 5 seconds

COMMENTS: The data is too short for a spectral plot.

STATS

DATA/ 2722C900

	EAST	NORTH
MEAN	-50.28	48.58
STD. ERR.	6.81	7.15
VARIANCE	32238.12	35578.18
STD. DEV.	178.55	188.62
KURTOSIS	2.84	2.16
SKEWNESS	.16	.10

SPEED	*****	EAST & NORTH	*****
244.95	* COVARIANCE	=	93.85
4.28	* STD. ERR. OF COVARIANCE	=	1218.29
12704.98	* STD. DEV. OF COVARIANCE	=	32117.50
112.72	* CORRELATION COEFFICIENT	=	.003
2.16	* VECTOR MEAN	=	69.92
.14	* VECTOR VARIANCE	=	33908.15
	* STD. DEV.	=	184.14

UNITS OF RAW DATA VARIABLES = MM/SEC

SAMPLE SIZE = 695 POINTS

SPANNING RANGE

FROM 68-VIII-15 17.48.49
TO 68-VIII-22 23.18.49

2722C1H
10 M

2722C1H

10 M

Data number 2723

Instrument No.: M-124

Type: Magnetic tape current meter

Depth: 20 m

Water depth: 2705 m

Start time: 68-08-15 17.50.24

Stop time: 68-08-19 20.20.24

Duration: 4 das. 2 hrs. 30 mins.

Sampling scheme: Continuous

time between samples = 5 seconds

COMMENTS: The data is too short for a spectral plot.

STATS

DATA/ 2723B900

	EAST	NORTH
MEAN	-17.77	39.21
STD. ERR.	8.06	8.49
VARIANCE	25635.27	28458.69
STD. DEV.	160.11	168.70
KURTOSIS	3.46	2.19
SKEWNESS	-.54	-.02

SPEED	* *****	EAST & NORTH	*****
213.65	* COVARIANCE	=	-138.23
5.11	* STD. ERR. OF COVARIANCE	=	1190.48
10302.51	* STD. DEV. OF COVARIANCE	=	23660.28
101.50	* CORRELATION COEFFICIENT	=	-.005
3.18	* VECTOR MEAN	=	43.05
.42	* VECTOR VARIANCE	=	27046.98
	* STD. DEV.	=	164.46

UNITS OF RAW DATA VARIABLES = MM/SEC

SAMPLE SIZE = 395 POINTS

SPANNING RANGE

FROM 68-VIII-15 17.50.24
TO 68-VIII-19 20.20.24

2723B1H
20 M

0 6
KILOMETERS

27238900

20 M

68-VIII-16 TO 68-VIII-19

68-08-16

16
AUG
68

2723B1H

20 M

Instrument No.: M-122Type: Magnetic tape current meterDepth: 40 mWater depth: 2705 mStart time: 68-08-15 17.41.58Stop time: 68-08-22 23.11.58Duration: 7 das. 5 hrs. 30 mins.Sampling scheme: Continuous

time between samples = 5 seconds

COMMENTS: The data is too short for a spectral plot.

STATS

DATA/ 27268900

	EAST	NORTH	SPEED	* * * * *	EAST & NORTH	* * * * *
MEAN	= -104.61	42.01	171.48	* COVARIANCE	=	-2913.97
STD. ERR.	= 4.01	4.20	3.11	* STD. ERR. OF COVARIANCE	=	643.36
VARIANCE	= 11154.68	12272.48	6730.45	* STD. DEV. OF COVARIANCE	=	16960.83
STD. DEV.	= 105.62	110.78	82.04	* CORRELATION COEFFICIENT	=	-.248
KURTOSIS	= 4.29	2.17	2.79	* VECTOR MEAN	=	112.73
SKEWNESS	= .57	-.01	.17	* VECTOR VARIANCE	=	11713.58
				* STD. DEV.	=	108.23

UNITS OF RAW DATA VARIABLES = MM/SEC

SAMPLE SIZE = 695 POINTS

SPANNING RANGE

FROM 68-VIII-15 17.41.58
 TO 68-VIII-22 23.11.58

2726B1H
40 M

2726B1H
40 M

Mooring No. 274

Set 68 Aug 22 39° 10.2 N 70° 04.2 W
Year Month Day Latitude Longitude

Set by R. Heinmiller Ship R.V. ATLANTIS II Cruise 44

Retrieved 68 Oct 02
Year Month Day

Retrieved by J. Gifford Ship R.V. ATLANTIS II Cruise 46

Purpose of Mooring: Routine long term scientific

Mooring Type: All nylon surface moorings

<u>Data</u> <u>Number</u>	<u>Instrument</u> <u>Number</u>	<u>Type</u>	<u>Depth</u> <u>Meters</u>	<u>Comments</u>
2741	1006	TEL.TENS	1	
2742*	M-172	MCM	14	
2743*	M-173	MCM	54	
2744*	M-135	MCM	105	

Water Depth 2685

COMMENTS ON MOORING:

**ALL-NYLON
MOORING**

STATION 274

BACK-UP
RECOVERY
SECTION

9/16" NYLON

5/8" NYLON

85 m

12 m

3 m

10 m

NO. 13

LIGHT
RADIO

TELEMETERING TENSIO METER - 2741

30 FT. CHAIN

CURRENT METER - 2742

40 m 9/16" NYLON

CURRENT METER - 2743

50 m 9/16" NYLON

CURRENT METER - 2744

500 m

500 m

500 m

500 m

18 16" GLASS SPHERES,
1 BENTHOS LIGHT, EQUALLY
SPACED, AS SHOWN, 3
METERS APART

22 STOPPER KNOTS INCLUD-
ING 3 SPARES

ACOUSTIC BEACON

20 m 5/8" NYLON

ACOUSTIC RELEASE

15 m 5/8" NYLON

10 FT. CHAIN

3000 LB. STIMSON ANCHOR

Data number 2742

Instrument No.: M-172

Type: Magnetic tape current meter

Depth: 14 m

Water depth: 2685 m

Start time: 68-08-22 16.05.30

Stop time: 68-10-02 22.20.30

Duration: 41 das. 6 hrs. 15 mins.

Sampling scheme: Interval

time between strobes = 5 seconds

no. of strobes per interval = 23

interval time = 900 seconds

COMMENTS:

STATS

	EAST	NORTH
MEAN	= -158.01	82.81
STD. ERR.	= 2.82	3.47
VARIANCE	= 31421.38	47614.84
STD. DEV.	= 177.26	218.21
KURTOSIS	= 2.47	3.51
SKEWNESS	= .09	-.70

DATA/ 2742A900

SPEED	*****	EAST & NORTH	*****
287.97	* COVARIANCE	=	-7600.42
2.36	* STD. ERR. OF COVARIANCE	=	856.42
22075.06	* STD. DEV. OF COVARIANCE	=	53907.06
148.58	* CORRELATION COEFFICIENT	=	-.196
2.30	* VECTOR MEAN	=	178.40
.23	* VECTOR VARIANCE	=	39518.11
	* STD. DEV.	=	198.79

UNITS OF RAW DATA VARIABLES = MM/SEC

SAMPLE SIZE = 3962 POINTS

SPANNING RANGE

FROM 68-VIII-22 16.05.30
TO 68- X -02 22.20.30

AUTO SPECTRUM
 2742A900 EAST COMP
 2742A900 NORTH COMP
 14 METERS
 68-VIII-22 TO 68-X-02
 1 PIECES WITH 1944 ESTIMATES
 PER PIECE. AVERAGED OVER
 8 ADJACENT FREQUENCY BANDS

KINETIC ENERGY DENSITY
 CM^2/SEC^2
 C/T.U.

274291H
IN M

Data number 2743

Instrument No.: M-173

Type: Magnetic tape current meter

Depth: 54 m

Water depth: 2685 m

Start time: 68-08-22 17.00.30

Stop time: 68-10-03 00.00.30

Duration: 41 das. 7 hrs.

Sampling scheme: Interval

time between strobes = 5 seconds

no. of strobes per interval = 23

interval time = 900 seconds

COMMENTS:

Clock may have gained up to 40 minutes from August 8th to October 7th.

STATS

		EAST	NORTH
MEAN	=	-117.10	58.06
STD. ERR.	=	1.78	2.78
VARIANCE	=	12578.98	30544.65
STD. DEV.	=	112.16	174.77
KURTOSIS	=	2.41	2.60
SKEWNESS	=	.06	-.80

DATA/ 2743C900

SPEED	* *****	EAST & NORTH	*****
230.50	* COVARIANCE	=	-2780.72
1.34	* STD. ERR. OF COVARIANCE	=	417.67
7077.79	* STD. DEV. OF COVARIANCE	=	26300.01
84.13	* CORRELATION COEFFICIENT	=	-.142
2.72	* VECTOR MEAN	=	130.70
-.03	* VECTOR VARIANCE	=	21562.31
	* STD. DEV.	=	146.84

UNITS OF RAW DATA VARIABLES = MM/SEC

SAMPLE SIZE = 3965 POINTS

SPANNING RANGE

FROM 68-VIII-22 17.00.30
TO 68- X -03 00.00.30

AUTO SPECTRUM
 2743C900 EAST COMP
 2743C900 NORTH COMP
 54 METERS

68-VIII-22 TO 68-X-02
 1 PIECES WITH 1944 ESTIMATES
 PER PIECE. AVERAGED OVER
 8 ADJACENT FREQUENCY BANDS

Data number 2744

Instrument No.: M-135

Type: Magnetic tape current meter

Depth: 105 m

Water depth: 2685 m

Start time: 68-09-11 12.19.30

Stop time: 68-10-03 00.49.30

Duration: 21 das. 12 hrs. 30 mins.

Sampling scheme: Interval

time between strobes = 5 seconds

no. of strobes per interval = 23

interval time = 900 seconds

COMMENTS:

The compass is stuck for entire record

STATS

DATA/ 27440900

	EAST	NORTH	SPEED	EAST & NORTH	
MEAN	-58.57	7.86	201.47	COVARIANCE	4665.41
STD. ERR.	1.86	4.15	1.65	STD. ERR. OF COVARIANCE	376.23
VARIANCE	7119.72	35629.12	5653.73	STD. DEV. OF COVARIANCE	17104.82
STD. DEV.	84.38	188.76	75.19	CORRELATION COEFFICIENT	.203
KURTOSIS	2.71	1.84	2.60	VECTOR MEAN	59.11
SKEWNESS	.23	-.41	.11	VECTOR VARIANCE	21374.42
				STD. DEV.	146.20

UNITS OF RAW DATA VARIABLES = MM/SEC

SAMPLE SIZE = 2067 POINTS

SPANNING RANGE

FROM 68- IX -11 12.19.30
TO 68- X -03 00.49.30

AUTO SPECTRUM
 2744D900 EAST COMP
 2744D900 NORTH COMP
 105 METERS

68-IX-11 TO 68-X-02
 1 PIECES WITH 1000 ESTIMATES
 PER PIECE. AVERAGED OVER
 8 ADJACENT FREQUENCY BANDS

Mooring No. 275

Set 68 Aug 23 39° 10.4 N 70° 02.0 W
Year Month Day Latitude Longitude

Set by R. Heinmiller Ship R.V. ATLANTIS II Cruise 44

Retrieved 68 Sept 27
Year Month Day

Retrieved by J. Gifford Ship R.V. ATLANTIS II Cruise 46

Purpose of Mooring: Long term engineering wire test

Mooring Type: Surface

<u>Data Number</u>	<u>Instrument Number</u>	<u>Type</u>	<u>Depth Meters</u>	<u>Comments</u>
2751*	W-174	FWR	0	
2752	1004	TEL.TENS	2	
2753	M-145	MCM	10	No data on tape
2754	1005	TENS	1512	
2755	1012	TENS	2500	
2756	1010	TENS	2590	

Water Depth 2677

COMMENTS ON MOORING:

STATION 275

9/32" 1 x 41 GALVAN-
IZED VECTOR CABLE
WITH JACKET AND
MOLDED BOOTS

LIGHT
RADIO
WIND RECORDER - 2751

RECORDING & TELEM. TENSIO METER - 2752

MILLER SWIVEL
10 m CHAIN

CURRENT METER - 2753

500 m

500 m

500 m

TENSIO METER - 2754

500 m PLAITED NYLON, 5/8"

422 m " " "

TENSIO METER - 2755

30 GLASS BALLS PLACED AS
SHOWN AND SPACED 2
METERS APART

1 GLASS BENTHOS LIGHT
IN No. 8 POSITION

ACOUSTIC BEACON
1 m CHAIN

TENSIO METER - 2756

1 m CHAIN

AMF ACOUSTIC RELEASE

15 m 5/8" NYLON

3 m CHAIN

3200 LB. STIMSON ANCHOR

Data number 2751

Instrument No.: W-174

Type: Film wind recorder

Depth: 0

Water depth: 2677 m

Start time: 68-08-24 03.25.30

Stop time: 68-09-27 20.55.30

Duration: 34 das. 17 hrs. 30 mins.

Sampling scheme: Interval

time between strobes = 5 seconds

no. of strobes per interval = 18

interval time = 900 seconds

COMMENTS:

Film was read by eye by Dolores Chausse. Sampling rate is one strobe every 900 seconds.

STATS

MEAN	=	EAST	NORTH
	=	-5.82	-20.16
STD. ERR.	=	.70	.80
VARIANCE	=	1613.57	2138.37
STD. DEV.	=	40.17	46.24
KURTOSIS	=	3.56	2.22
SKEWNESS	=	.37	-.09

DATA/ 2751WYE900

SPEED	*****	EAST & NORTH	*****
57.63	=	COVARIANCE	= 386.44
.51	=	STD. ERR. OF COVARIANCE	= 30.25
871.44	=	STD. DEV. OF COVARIANCE	= 1746.68
28.52	=	CORRELATION COEFFICIENT	= .208
2.21	=	VECTOR MEAN	= 20.98
.32	=	VECTOR VARIANCE	= 1875.97
	=	STD. DEV.	= 43.31

UNITS OF RAW DATA VARIABLES = DM/SEC

SAMPLE SIZE = 3335 POINTS

SPANNING RANGE

FROM 68-VIII-24 03.25.30
TO 68-IX-27 20.55.30

AUTO SPECTRUM
 2751WYE900 EAST COMP
 2751WYE900 NORTH COMP
 WIND
 68-VIII-24 TO 68-IX-26
 1 PIECES WITH 1620 ESTIMATES
 PER PIECE. AVERAGED OVER
 8 ADJACENT FREQUENCY BANDS

N
↑
0 1000.
KILOMETERS
2751WYE900
WIND
68-VIII-24 TO 68-IX-27

Mooring No. 279

Set 68 Oct 6 39° 08.8 N 70° 01.5 W
Year Month Day Latitude Longitude

Set by J. Gifford Ship R.V. ATLANTIS II Cruise 46

Retrieved 68 Dec 11
Year Month Day

Retrieved by R. Heinmiller Ship R.V. GOSNOLD Cruise 139

Purpose of Mooring: Long term engineering

Mooring Type: Surface

<u>Data</u> <u>Number</u>	<u>Instrument</u> <u>Number</u>	<u>Type</u>	<u>Depth</u> <u>Meters</u>	<u>Comments</u>
2791*	W-101 X	MWR	0	
2792	1013	TENS	1	
2793	M-127	MCM	10	
2794	1015	TENS	1512	
2795	1016	TENS	2561	
2796	1017	TENS	2665	

Water Depth 2685

COMMENTS ON MOORING:

LONG-TERM MOORING

STATION 279

1/4" 1 x 50 GAC

LIGHT
RADIO
WIND RECORDER - 2791

REC. & TEL. TENSIOMETER - 2792

MILLER SWIVEL
10 m CHAIN

CURRENT METER - 2793

500 m

500 m

500 m

TENSIOMETER - 2794

527 m 5/8" PLAIED NYLON

347 m " " "

TENSIOMETER - 2795

32 GLASS BALLS PLACED AS
SHOWN AND SPACED TWO
METERS APART

1 BENTHOS LIGHT IN No. 25
POSITION

ACOUSTIC BEACON
1 m CHAIN

TENSIOMETER - 2796
1 m 5/8" PLAIED NYLON

AMF ACOUSTIC RELEASE

15 m 5/8" PLAIED NYLON

3 m CHAIN

3600 LB. STIMSON ANCHOR

Instrument No.: W-101 XType: Magnetic tape wind recorderDepth: 0Water depth: 2685 mStart time: 68-10-01 21.09.55Stop time: 68-11-12 21.09.55Duration: 42 das.Sampling scheme: Interval

time between strobes = 5 seconds

no. of strobes per interval = 23

interval time = 900 seconds

COMMENTS:

Anemometer blew away; therefore record is short.

STATS

DATA/ 2791W0900

	EAST	NORTH	SPEED	EAST & NORTH	
MEAN	= 17.69	-1.77	63.16	* COVARIANCE	= -199.02
STD. ERR.	= .80	.66	.41	* STD. ERR. OF COVARIANCE	= 33.18
VARIANCE	= 2591.01	1762.61	680.75	* STD. DEV. OF COVARIANCE	= 2107.14
STD. DEV.	= 50.90	41.98	26.09	* CORRELATION COEFFICIENT	= -.093
KURTOSIS	= 2.54	2.91	3.30	* VECTOR MEAN	= 17.78
SKEWNESS	= -.34	.12	.68	* VECTOR VARIANCE	= 2176.81
			* STD. DEV.		= 46.66

UNITS OF RAW DATA VARIABLES = DM/SEC

SAMPLE SIZE = 4033 POINTS

SPANNING RANGE

FROM 68- X -01 21.09.55

TO 68- XI -12 21.09.55

AUTO SPECTRUM
 2791WD900 EAST COMP
 2791WD900 NORTH COMP
 WIND
 68-X-01 TO 68-XI-12
 2 PIECES WITH 1000 ESTIMATES
 PER PIECE. AVERAGED OVER
 16 ADJACENT FREQUENCY BANDS

0 1250
KILOMETERS

2791WD900

WIND

68- X -02 TO 68- XI -12

2791WD1H

Mooring No. 280

Set 68 Oct 02 39° 10.0 N 70° 02.8 W
Year Month Day Latitude Longitude

Set by J. Gifford Ship R.V. ATLANTIS II Cruise 46

Retrieved 68 Dec 11
Year Month Day

Retrieved by R. Heinmiller Ship R.V. GOSNOLD Cruise 139

Purpose of Mooring: Routine current measurements at Site D

Mooring Type: Surface

<u>Data Number</u>	<u>Instrument Number</u>	<u>Type</u>	<u>Depth Meters</u>	<u>Comments</u>
2801*	W-125 X	MWR	0	
2802	1006	TEL.TENS	1	
2803*	M-122	MCM	12	
2804	M-142	MCM	51	Electronic problems
2805*	M-159	MCM	104	

Water Depth 2685

COMMENTS ON MOORING:

Toroid lying on side prior to recovery

ALL-NYLON
MOORING

STATION 280

BACK-UP
RECOVERY
SECTION

9/16" NYLON

LIGHT
RADIO
WIND RECORDER - 2801

TELEMETERING TENSIO METER - 2802

30 FT. CHAIN

CURRENT METER - 2803

40 m 9/16" NYLON

CURRENT METER - 2804

50 m 9/16" NYLON

CURRENT METER - 2805

500 m

500 m

500 m

500 m

45 m

18 16" GLASS SPHERES,
1 BENTHOS LIGHT, EQUALLY
SPACED, AS SHOWN, 3
METERS APART

22 STOPPER KNOTS INCLUD-
ING 3 SPARES

ACOUSTIC BEACON

20 m 5/8" NYLON

ACOUSTIC RELEASE

15 m 5/8" NYLON

10 FT. CHAIN

3000 LB. STIMSON ANCHOR

Data number 2801

Instrument No.: W-125 X

Type: Magnetic tape wind recorder

Depth: 0

Water depth: 2685 m

Start time: 68-10-02 18.16.30

Stop time: 68-11-20 02.01.30

Duration: 48 das. 7 hrs. 45 mins.

Sampling scheme: Interval

time between strobes = 5 seconds

no. of strobes per interval = 23

interval time = 900 seconds

COMMENTS:

STATS

	EAST	NORTH
MEAN	= 24.22	-7.53
STD. ERR.	= .85	.69
VARIANCE	= 3328.68	2184.39
STD. DEV.	= 57.69	46.74
KURTOSIS	= 2.52	2.75
SKEWNESS	= -.08	.24

DATA/ 2801WJ900

SPEED	* *****	EAST & NORTH	*****
70.24	* COVARIANCE	=	-395.68
.51	* STD. ERR. OF COVARIANCE	=	45.66
1222.99	* STD. DEV. OF COVARIANCE	=	3110.21
34.97	* CORRELATION COEFFICIENT	=	-.147
2.80	* VECTOR MEAN	=	25.36
.56	* VECTOR VARIANCE	=	2756.54
	* STD. DEV.	=	52.50

UNITS OF RAW DATA VARIABLES = CM/SEC

SAMPLE SIZE = 4640 POINTS

SPANNING RANGE

FROM 68- X -02 18.16.30
TO 68- XI -20 02.01.30

AUTO SPECTRUM
 2801WJ900 EAST COMP
 2801WJ900 NORTH COMP
 WIND
 68-X-02 TO 68-XI-19
 2 PIECES WITH 1152 ESTIMATES
 PER PIECE. AVERAGED OVER
 16 ADJACENT FREQUENCY BANDS

Data number 2803

Instrument No.: M-122

Type: Magnetic tape current meter

Depth: 12 m

Water depth: 2685 m

Start time: 68-10-02 15.00.57

Stop time: 68-11-29 04.00.57

Duration: 57 das. 13 hrs.

Sampling scheme: Interval

time between strobos = 5 seconds

no. of strobos per interval = 23

interval time = 900 seconds

COMMENTS:

STATS

DATA/ 2803G900

MEAN	=	EAST	NORTH	SPEED	* *****	EAST & NORTH	*****
STD. ERR.	=	-120.49	44.20	299.06	* COVARIANCE	=	1121.92
VARIANCE	=	2.46	3.43	2.13	* STD. ERR. OF COVARIANCE	=	747.95
STD. DEV.	=	33233.91	64605.14	24873.81	* STD. DEV. OF COVARIANCE	=	55489.75
KURTOSIS	=	182.30	254.18	157.71	* CORRELATION COEFFICIENT	=	.024
SKEWNESS	=	3.85	2.90	3.55	* VECTOR MEAN	=	128.34
		-.06	.14	.74	* VECTOR VARIANCE	=	48919.52
					* STD. DEV.	=	221.18

UNITS OF RAW DATA VARIABLES = MM/SEC

SAMPLE SIZE = 5504 POINTS

SPANNING RANGE

FROM 68- X -02 15.00.57

TO 68- XI -29 04.00.57

AUTO SPECTRUM
 2803G900 EAST COMP
 2803G900 NORTH COMP
 12 METERS

68-X-02 TO 68-XI-27
 2 PIECES WITH 1350 ESTIMATES
 PER PIECE. AVERAGED OVER
 16 ADJACENT FREQUENCY BANDS

2803E1H

Data number 2805

Instrument No.: M-159

Type: Magnetic tape current meter

Depth: 104 m

Water depth: 2685 m

Start time: 68-10-02 18.28.30

Stop time: 68-12-05 12.28.30

Duration: 63 das. 18 hrs.

Sampling scheme: Interval

time between strobes = 5 seconds

no. of strobes per interval = 23

interval time = 900 seconds

COMMENTS:

STATS

DATA/ 2805A900

	EAST	NORTH	SPEED	EAST & NORTH
MEAN	-131.78	21.84	270.98	5426.89
STD. ERR.	1.55	3.11	1.73	555.62
VARIANCE	14778.37	58111.83	18307.62	43470.09
STD. DEV.	121.57	243.13	135.31	.184
KURTOSIS	2.77	3.15	3.70	133.58
SKEWNESS	.07	-.01	.98	36945.60
				192.21

UNITS OF RAW DATA VARIABLES = MM/SEC

SAMPLE SIZE = 6121 POINTS

SPANNING RANGE

FROM 68- X -02 18.28.30
TO 68- XII-05 12.28.30

AUTO SPECTRUM

2805A900 EAST COMP
2805A900 NORTH COMP

104 METERS

68-X-02 TO 68-XII-04
2 PIECES WITH 1500 ESTIMATES
PER PIECE. AVERAGED OVER
16 ADJACENT FREQUENCY BANDS

Mooring No. 283

Set 68 Dec 10 39° 10.2 N 70° 04.6 W
 Year Month Day Latitude Longitude

Set by R. Heinmiller Ship R.V. GOSNOLD Cruise 139

Retrieved 68 Dec 18
 Year Month Day

Retrieved by R. Heinmiller Ship R.V. CHAIN Cruise 86

Purpose of Mooring: Current and temperature shear measurements

Mooring Type: Subsurface mooring

<u>Data Number</u>	<u>Instrument Number</u>	<u>Type</u>	<u>Depth Meters</u>	<u>Comments</u>
2831	215	DR	490	
2832	M-198	MCM	492	Therm #1; tape tangled
2833*	M-177	MCM	501	
2834	D-172	DCM	510	Electronic problems
2835	M-192	MCM	512	Therm #2; instrument flooded
2836	M-195	MCM	522	Compass and vane are stuck
2827*	M-196	MCM	531	Therm #3

Water Depth 2675

COMMENTS ON MOORING:

Echo sounder shows sphere depth at 88 meters, corrected. Release would not release. Mooring hauled, line broke @ 100 m below bottom current meter.

SHEAR MOORING

STATION 283

Data number 2833

Instrument No.: M-177 Type: Magnetic tape current meter

Depth: 501 m Water depth: 2675 m

Start time: 68-12-11 02.05.04

Stop time: 68-12-18 18.45.04

Duration: 7 das. 16 hrs. 40 mins.

Sampling scheme: Continuous

time between samples = 5 seconds

COMMENTS:

STATS

	EAST	NORTH
MEAN	= -42.86	20.92
STD. ERR.	= 2.18	2.38
VARIANCE	= 5336.02	6282.40
STD. DEV.	= 73.05	78.26
KURTOSIS	= 2.18	2.41
SKEWNESS	= .01	-.05

DATA/ 2833B600

SPEED	*****	EAST & NORTH	*****
108.33	* COVARIANCE	=	-339.28
1.47	* STD. ERR. OF COVARIANCE	=	184.78
2386.96	* STD. DEV. OF COVARIANCE	=	6486.84
48.96	* CORRELATION COEFFICIENT	=	-.058
2.25	* VECTOR MEAN	=	52.27
.24	* VECTOR VARIANCE	=	5809.21
	* STD. DEV.	=	76.22

UNITS OF RAW DATA VARIABLES = MM/SEC

SAMPLE SIZE = 1109 POINTS

SPANNING RANGE

FROM 68- XII-11 02.05.04
TO 68- XII-18 18.45.04

2833B1H
501 M

2833B1H

501 M

Data number 2837

Instrument No.: M-196

Type: Magnetic tape current meter

Depth: 531 m

Water depth: 2675 m

Start time: 68-12-11 02.05.03

Stop time: 68-12-18 18.45.03

Duration: 7 das. 16 hrs. 40 mins.

Sampling scheme: Continuous

time between samples = 5 seconds

COMMENTS:

STATS

DATA/ 2837A600

	EAST	NORTH	SPEED	*****	EAST & NORTH	*****
MEAN	-44.26	29.99	106.09	* COVARIANCE	=	-116.95
STD. ERR.	2.18	2.20	1.43	* STD. ERR. OF COVARIANCE	=	182.60
VARIANCE	5260.59	5388.88	2252.83	* STD. DEV. OF COVARIANCE	=	6080.84
STD. DEV.	72.53	73.41	47.47	* CORRELATION COEFFICIENT	=	-.022
KURTOSIS	2.37	2.43	2.56	* VECTOR MEAN	=	53.48
SKEWNESS	-.04	-.03	.43	* VECTOR VARIANCE	=	5324.74
				* STD. DEV.	=	72.97

UNITS OF RAW DATA VARIABLES = MM/SEC

SAMPLE SIZE = 1109 POINTS

SPANNING RANGE

FROM 68- XII-11 02.05.03

TO 68- XII-18 18.45.03

2837A1H
531 M

2837A1H

531 M

Mooring No. 284

Set 68 Dec 19 39° 09.8 N 70° 03.6 W
Year Month Day Latitude Longitude

Set by R. Heinmiller Ship R.V. CHAIN Cruise 86

Retrieved 69 April 17
Year Month Day

Retrieved by R. Heinmiller Ship R.V. CHAIN Cruise 90

Purpose of Mooring: Routine current measurements at Site D

Mooring Type: Surface

<u>Data Number</u>	<u>Instrument Number</u>	<u>Type</u>	<u>Depth Meters</u>	<u>Comments</u>
2841	1003	TENS	2	
2842*	M-173	MCM	12	Rotor missing
2843*	M-145	MCM	54	Rotor out of bearings
4844	452	TEMP	56.5	
4845*	M-124	MCM	106	

Water Depth 2690

COMMENTS ON MOORING:

ALL-NYLON
MOORING

STATION 284

Data number 2842

Instrument No.: M-173

Type: Magnetic tape current meter

Depth: 12 m

Water depth: 2690 m

Start time: 68-12-19 16.31.57

Stop time: 69-01-01 05.01.57

Duration: 12 das. 12 hrs. 30 mins.

Sampling scheme: Interval

time between strobes = 5 seconds

no. of strobes per interval = 23

interval time = 1800 seconds

COMMENTS:

Rotor failed on Jan. 1st.

STATS

DATA/ 2842B1800

MEAN	=	EAST	NORTH	SPEED	* *****	EAST & NORTH	*****
STD. ERR.	=	-173.90	92.88	267.95	* COVARIANCE	=	2298.15
VARIANCE	=	6.04	6.52	4.84	* STD. ERR. OF COVARIANCE	=	1578.82
STD. DEV.	=	21007.94	25828.48	14608.48	* STD. DEV. OF COVARIANCE	=	38739.81
KURTOSIS	=	148.32	180.09	121.23	* CORRELATION COEFFICIENT	=	.087
SKEWNESS	=	2.76	2.87	2.73	* VECTOR MEAN	=	197.15
		.07	-.04	.33	* VECTOR VARIANCE	=	23813.21
					* STD. DEV.	=	154.32

UNITS OF RAW DATA VARIABLES = MM/SEC

SAMPLE SIZE = 602 POINTS

SPANNING RANGE

FROM 68- XII-19 16.31.57
TO 69- I -01 05.01.57

2842B1H
12 M

20 DEC 68 25 30

2842B1H
12 M

Data number 2843

Instrument No.: M-145

Type: Magnetic tape current meter

Depth: 54 m

Water depth: 2690 m

Start time: 68-12-19 15.45.00

Stop time: 69-03-07 13.45.00

Duration: 77 das. 22 hrs.

Sampling scheme: Interval

time between strobes = 5 seconds
no. of strobes per interval = 23
interval time = 1800 seconds

COMMENTS:

Rotor out of bearings on recovery. Data looks good.

STATS

DATA/ 2843M1800

	EAST	NORTH	SPEED	EAST & NORTH	
MEAN	-82.76	36.32	189.42	COVARIANCE	-2075.08
STD. ERR.	1.88	2.34	1.44	STD. ERR. OF COVARIANCE	346.88
VARIANCE	13283.68	20474.02	7802.17	STD. DEV. OF COVARIANCE	21216.56
STD. DEV.	115.25	143.09	88.33	CORRELATION COEFFICIENT	-.126
KURTOSIS	3.14	2.41	2.34	VECTOR MEAN	99.62
SKEWNESS	.28	-.21	.17	VECTOR VARIANCE	16878.85
				STD. DEV.	129.92

UNITS OF RAW DATA VARIABLES = MM/SEC

SAMPLE SIZE = 3741 POINTS

SPANNING RANGE

FROM 68- XII-19 15.45.00
TO 69- III-07 13.45.00

AUTO SPECTRUM
 2843H1800 EAST COMP
 2843H1800 NORTH COMP
 54 METERS

68-XII-19 TO 69-III-04
 1 PIECES WITH 1800 ESTIMATES
 PER PIECE. AVERAGED OVER
 8 ADJACENT FREQUENCY BANDS

102

2843H1H
54 M

Data number 2845

Instrument No.: M-124

Type: Magnetic tape current meter

Depth: 106 m

Water depth: 2690 m

Start time: 68-12-19 16.07.45

Stop time: 69-02-07 08.37.45

Duration: 49 das. 16 hrs. 30 mins.

Sampling scheme: Interval

time between strobes = 5 seconds

no. of strobes per interval = 23

interval time = 1800 seconds

COMMENTS:

Rotor fails February 7th.

STATS

DATA/ 2845J1800

	EAST	NORTH
MEAN	-130.93	-11.53
STD. ERR.	2.55	3.48
VARIANCE	15403.38	28036.38
STD. DEV.	124.47	168.81
KURTOSIS	3.10	2.28
SKEWNESS	.10	.18

SPEED	EAST & NORTH
229.45	COVARIANCE = -10229.66
1.94	STD. ERR. OF COVARIANCE = 617.89
8858.12	STD. DEV. OF COVARIANCE = 30172.22
94.65	CORRELATION COEFFICIENT = -.484
3.84	VECTOR MEAN = 131.44
.61	VECTOR VARIANCE = 22164.88
	STD. DEV. = 148.88

UNITS OF RAW DATA VARIABLES = MM/SEC

SAMPLE SIZE = 2386 POINTS

SPANNING RANGE
FROM 68- XII-19 16.07.45
TO 69- II -07 08.37.45

AUTO SPECTRUM
 2845J1800 EAST COMP
 2845J1800 NORTH COMP
 106 METERS

68-XII-19 TO 69-II-05
 1 PIECES WITH 1152 ESTIMATES
 PER PIECE. AVERAGED OVER
 8 ADJACENT FREQUENCY BANDS

Mooring No. 287

Set 68 Dec 19 39° 10.7 N 70° 02.1 W
Year Month Day Latitude Longitude

Set by R. Heinmiller Ship R.V. CHAIN Cruise 86

Retrieved 69 June 8
Year Month Day

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

Purpose of Mooring: 6 month bottom measurements

Mooring Type: Bottom mooring

<u>Data</u> <u>Number</u>	<u>Instrument</u> <u>Number</u>	<u>Type</u>	<u>Depth</u> <u>Meters</u>	<u>Comments</u>
2871*	M-175	MCM	2580	

Water Depth 2680 m

COMMENTS ON MOORING:

Instrument No.: M-175Type: Magnetic tape current meterDepth: 2580 mWater depth: 2680 mStart time: 68-12-19 22.09.00Stop time: 69-01-31 05.39.00Duration: 42 das. 7 hrs. 30 mins.Sampling scheme: Interval

time between strobes = 5 seconds

no. of strobes per interval = 15

interval time = 1800 seconds

COMMENTS:

Rotor reed switch failed January 31st.

STATS

DATA/ 2871B1800

	EAST	NORTH
MEAN	-10.33	2.64
STD. ERR.	.99	1.20
VARIANCE	1077.16	2040.87
STD. DEV.	44.47	54.31
KURTOSIS	3.37	3.12
SKENNESS	-.16	-.21

SPEED	*****	EAST & NORTH	*****
61.75	COVARIANCE	=	-681.63
.78	STD. ERR. OF COVARIANCE	=	53.42
1227.72	STD. DEV. OF COVARIANCE	=	2408.26
35.04	CORRELATION COEFFICIENT	=	-.202
2.91	VECTOR MEAN	=	10.86
.70	VECTOR VARIANCE	=	2463.52
	STD. DEV.	=	49.63

UNITS OF RAW DATA VARIABLES = MM/SEC

SAMPLE SIZE = 2032 POINTS

SPANNING RANGE

FROM	68- XII-19	22.09.00
TO	69- I -31	05.39.00

AUTO SPECTRUM

2871B1800 EAST COMP

2871B1800 NORTH COMP

2580 METERS

68-XII-19 TO 69-I-30

1 PIECES WITH 1000 ESTIMATES

PER PIECE. AVERAGED OVER

8 ADJACENT FREQUENCY BANDS

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11. CONTROLLING OFFICE NAME AND ADDRESS Office of Naval Research Code 480		12. REPORT DATE July 1974
		13. NUMBER OF PAGES 130
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