NOAA TR ERL 260-POL 17

A UNITED STATES DEPARTMENT OF COMMERCE PUBLICATION

NOAA Technical Report ERL 260-POL 17

U.S. DEPARTMENT OF COMMERCE
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION
Environmental Research Laboratories

CIRCULATING COPY
Sea Grant Depository

Observations of Currents in Puget Sound, 1976

GLENN A. CANNON

BOULDER, COLO.
MARCH 1973

U.S. DEPARTMENT OF COMMERCE
Frederick B. Dent, Secretary

NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION
Robert M. White, Administrator
ENVIRONMENTAL RESEARCH LABORATORIES
Wilmot N. Hess, Director

NOAA TECHNICAL REPORT ERL 260-POL 17

Observations of Currents in Puget Sound, 1970

GLENN A. CANNON

BOULDER, COLO.
March 1973

For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C. 20402

NOTICE

"The NOAA Environmental Research Laboratories does not approve, recommend or endorse any proprietary product or proprietary material mentioned in this publication. No reference shall be made to the NOAA Environmental Research Laboratories, or to this publication furnished by the NOAA Environmental Research Laboratories, in any advertising or sales promotion which would indicate or imply that the NOAA Environmental Research Laboratories approves, recommends or endorses any proprietary product or proprietary material mentioned herein, or which has as its purpose an intent to be used or purchased because of this NOAA Environmental Research Laboratories publication."

TABLE OF CONTENTS

LIST OF FIGURES

OBSERVATIONS OF CURRENTS IN PUGET SOUND, 1970

Glenn A. Cannon

Description is given of experiments and of the current measurements made in Puget Sound in 1970. Reference is given to sources of auxiliary tide, wind, runoff, and water-property data obtained at the same time.

1. INTRODUCTION

During the summer of 1970, while the author was at the University of Washington (UW), several current-meter arrays were deployed in the northern region of Puget Sound between Possession Point and Deception Pass (fig. 1). One series of measurements was made in June in Port Susan (fig. 2); a second series was made in July in the central channel going north from Saratoga Passage to Deception Pass (fig. 3); and a third series was made in August and September on the deeper sill entering Port Susan (fig. 2). A general description of the observations is given here in order that they may be made available for other uses.

The current meters were rotor-vane internally recording on film (Braincon model 381). Continuous samples of speed and histograms of direction were recorded during each 10- or 20-min sampling intervals. The meters have relatively large vanes making them fairly insensitive to high-frequency direction fluctuations, and the vane and instrument case are free to swivel about the main support rod which is an integral part of the mooring. Table 1 summarizes the mooring instrumentation and data

return. Pacific Daylight Time (+7) is given. Depths below mean lower low water of the subsurface moorings are given. Mean depths would be about 2 m deeper and the variation about mean depth would be about ± 2 m. Buoyancy was provided by 0.91-m diameter steel spheres (surplus submarine net floats). Buoyancy for the two relatively deep moorings with detailed vertical sampling (M and SA) was provided by a float made up of three of the spheres whelded together with triangular plates top and bottom. The moorings were launched buoy first from an anchored ship, and the final cable lengths were calculated and made such that the scope of the surface moorings would be about 1.02 ±.01 at higher high water and that the depths of subsurface floats would be below danger of being hit by local shipping. The anchors (railroad wheels) were lowered to the bottom and released by a pelican-type hook when the lowering cable became slack. Moorings M, SA, PSS1, and PSS2 were retrieved using a Braincon timed release of the anchor, and the others were retrieved by diving and cutting the cable below the lowest instrument.

These data so far have been discussed in student investigations (Holbrook, 1971; Litteken, 1971; and O'Niel, 1972) and have been presented at one meeting (Cannon and Holbrook, 1972). Other descriptions and discussions are in preparation. Auxiliary tide, wind, runoff, and water property data which were obtained along with these data are reported in the above student investigations and in Lincoln and Collias (1970).

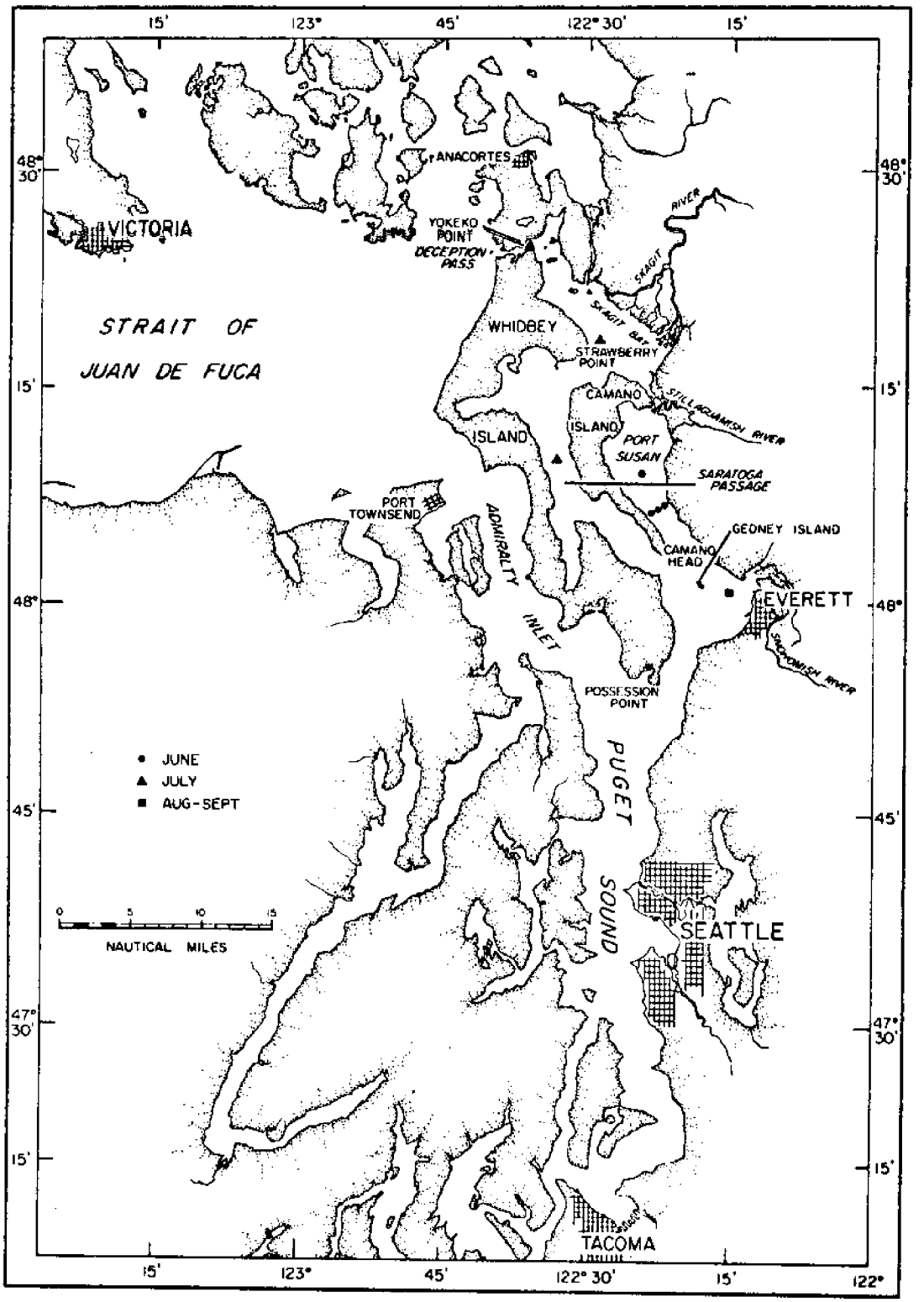


Figure 1. Puget Sound region showing station locations.

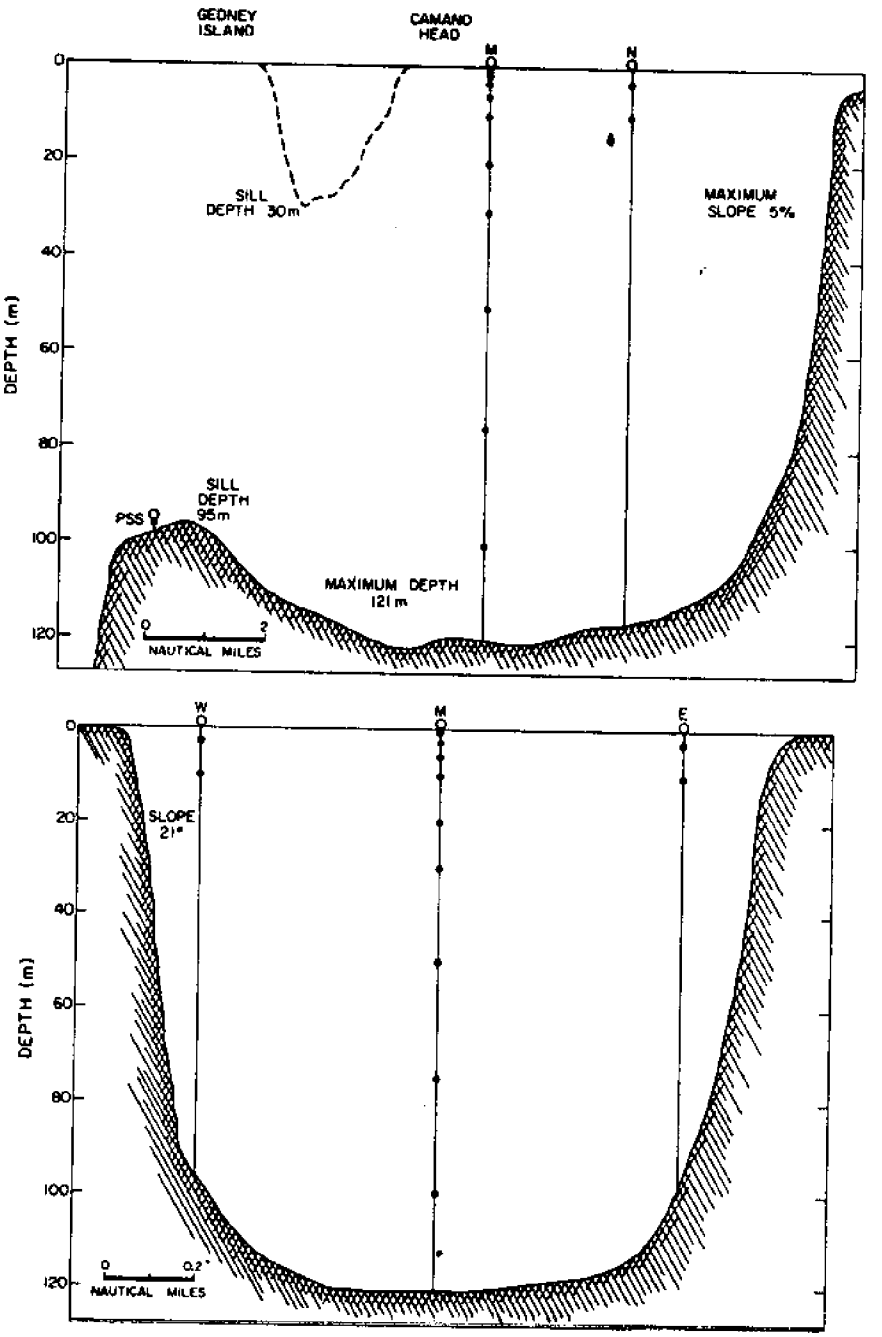


Figure 2. Instrument deployment on moorings in Port Susan. Moorings PSS, M, and N are along axis from south to north (top), and Moorings W, M, and E are across channel from west to east (bottom). Current meters (●) and flotation (⊙) are shown.

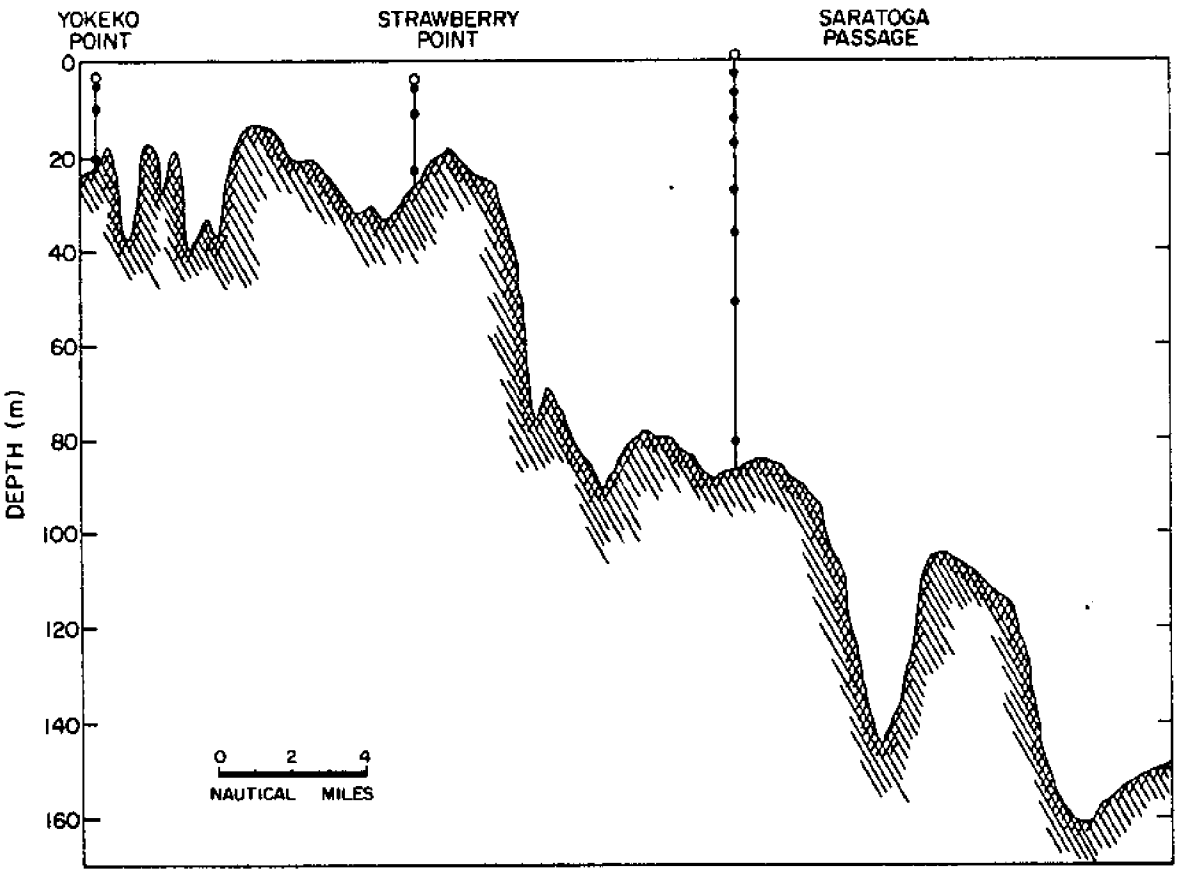


Figure 3. Instrument deployment on moorings in Saratoga Passage, at Strawberry Point, and at Yokeko Point.

Table 1. Summary of Mooring Instrumentation

Mooring	Location (lat,long)	Meter (#)	Depth (m)	Sampling (min)	Origin (hr/day/mo)	Length (hrs)
M	48°05.2'N 122°21.3'W	129	1	10	2000/16/VI	374
		130	3	10		374
		131	6	10		374
		132	10	10		375
		152	20	20		374
		153	30	20		375
		154	50	20		375
		128	75	20		375
		156	100	20		375
E	48°05.6'N 122°20.5'W	118	3	10	1900/16/VI	375
		075	10	10		375
N	48°07.8'N 122°23.6'W	137	3	10	1600/16/VI	377
		054	10	20		377
W	48°04.9'N 122°22.1'W	074	10	10	1730/16/VI	376
SA	48°10.0'N 122°33.2'W	152	1	20	1500/7/VII	481
		153	5	20		481
		154	10	20		481
		155	15	20		481
		054	25	20		482
		074	35	10		481
		075	50	10		481
		118	80	10		481
ST	48°18.0'N 122°29.2'W	128	5	20	1640/7/VII	482
		129	10	10		482
		137	22	10		482
Y	48°24.7'N 122°36.7'W	130	5	10	1850/7/VII	549
		131	10	10		549
		132	20	10		502
PSS1	48°00.3'N 122°16.3'W	156	100	20	1330/27/VII	850
PSS2	38°00.3'N 122°16.3'W	156	100	20	1430/1/IX	578

2. DATA REDUCTION AND PRESENTATION

The current-meter data were read from the films, digitized, and processed using data reduction programs developed at the UW (Hopkins, 1971). The average speed was calculated from the number of rotor revolutions during each sampling interval, and the direction was chosen as the most frequently occurring direction during the interval. The digitizing process results in a current speed resolution of about $\pm$ 0.3 cm/s. Calibration curves for the current meters was from combined sources provided by manufacturers and those performed by UW personnel in the Bonneville Power Commission tow tank. The resulting data consisted of time series of speed and direction (to which the current is flowing). All data are presented as data summaries at the end of the report. The presentations are grouped so the user may asses variations throughout the water column by examining one kind of information from all instruments in each mooring, or in relatively nearby moorings in the case of Port Susan.

2.1 Histograms

The current-meter data have been displayed as histograms of direction and speed. Directions were grouped in 3° intervals, and speeds were grouped in 1 cm/s intervals. The data are presented as actual numbers of observations in each group and as a percentage of the maximum number of observations in any one group. The percentage distribution is represented by 100 *'s for the group with the maximum number of observations and by a number of *'s for each of the other groups equal to the ratio of the number of observations in the group to the maximum number.

The middle direction or speed is given in the right-hand column, and the number of observations is given in the next column to the left.

2.2 Progressive Vector Diagrams

Progressive vector diagrams were constructed by vector addition of hourly vector averages of currents. The diagrams do not represent real particle trajectories, but they give an indication of the longer period fluctuations in the motion at a single point. Because of the complexity of some of the diagrams, the scales vary. Start times are given, the axes are north and east, and ✳'s are at 12-hr intervals.

2.3 Time Series

The original time-series have been plotted on a common time scale for each set of morings. For moorings M, E, W, N, SA, ST, and Y the first 276 hrs of the records are plotted on a left-hand page and the remainder of the record is on the right-hand page. For moorings PSS1 and PSS2 each of the records is cut at 10-day (240 hrs) intervals and is placed all on one page. Note that 864 hrs for PSS1 corresponds to 0 hrs for PSS2. The +u direction was taken, roughly, along the axis of the estuary entering Deception Pass and then going to the south. The u axis was chosen along the direction of maximum variance (Cannon, 1969). The +v direction was 90° to the left of +u for all cases. Table 2 summarizes some of the statistics. The means ($\bar{u}$ and $\bar{v}$) and variances were calculated for 15 days (approximately 29 M_2 cycles) except for 30 days for mooring PSS1.

Table 2. Summary Statistics of the Current-Meter Records

Mooring	Depth (m)	Direction of +u (°T)	$\bar{u}$ (cm/s)	$\bar{v}$ (cm/s)	Variance u (cm^2/s^2)	Variance Total (cm^2/s^2)
M	1	155	10.7	-2.6	618	725
	3	157	4.3	-0.3	370	575
	6	155	0.4	-2.6	315	468
	10	159	0.0	-2.4	241	363
	20	156	-3.4	-1.9	136	192
	30	156	-1.2	-0.9	67	86
	50	154*	-0.5	0.4	41	57
	75	153	2.8	0.4	118	153
	100	155*	1.4	0.6	90	184
E	3	144	-8.0	-0.2	335	468
	10	137	-4.0	-0.8	101	137
W	10	152	5.0	0.1	126	143
N	3	157	1.7	-0.4	131	179
	10	149	-1.2	0.6	55	98
SA	1	171	19.6	1.7	608	717
	5	162	3.9	1.6	414	534
	10	165	-1.9	-0.4	291	365
	15	159	-2.9	-0.1	266	325
	25	156	-1.9	0.5	144	171
	35	164	-1.0	0.3	147	164
	50	168	-0.2	0.0	160	175
	80	183	0.2	-0.6	186	261
ST	5	172	7.1	-0.4	1217	1408
	10	162	14.5	3.5	1976	2029
	22	159	2.1	-0.3	269	271
Y	5	53	0.1	-9.4	9748	9865
	10	48	-2.0	-6.6	8948	9005
	20	53	-3.4	3.3	5885	6000
PSS1	100	154	0.3	-2.4	269	288
PSS2	100	156	0.1	-2.8	301	322

*Direction of +u is not that of maximum variance because of small variation with direction

2.4 Fourier Representations

A fast Fourier transform algorithm (FFT) was used to compute the Fourier coefficients for the time-series of u and v components of velocity using programs outlined in Cannon (1969, 1971). The calculations were made using record lengths of 15 days (29 M_2 cycles), except for PSS1 where a 30 day was used. There actually were 1080 coefficients (2160 for 30-day record), but only the first 45 coefficients (90) are listed. Periods less than 7.2 hrs have been omitted, because they were small. If all of the amplitudes for any component were squared and divided by two, the resulting series would be a representation called the periodogram. The sum of all of the values in the periodogram equals the variance (table 2). Amplitudes are in cm/s, and phases for each mooring are in hours relative to the start time given in table 1.

The phases between moorings in either of the series (M, E, W, and N; SA, ST, and Y) can be compared by converting them to a common reference, e.g., the earliest start time in the series (see table 1). The new phase $\phi_n' = \phi_n + \tau_i$ where: ϕ_n is the phase (deg) given in the data summaries and τ_i is the number of hours between the earliest start time and the start time of the mooring to be compared.

3. ACKNOWLEDGEMENTS

Financial support for this work was provided to the author at the University of Washington by the Sea Grant program which was then part of the National Science Foundation (now in the National Oceanic and Atmospheric Adminfstration). The author is grateful to Dr. Clifford Barnes at UW for many fruitful discussions regarding these experiments and Puget Sound circulation in general.

4. REFERENCES

Cannon, Glenn A., 1969: Observations of motion at intermediate and large scales in a coastal plain estuary. Johns Hopkins Univ., Chesapeake Bay Inst., Tech. Rep. 52, 114 p.

Cannon, Glenn A., 1971: Statistical characteristics of velocity fluctuations at intermediate scales in a coastal plain estuary. J. Geophys. Res., 76, 5852-5858.

Cannon, Glenn A., and James R. Holbrook, 1972: Observations of bottom-water flushing in a fjord-like estuary (Abstract). Trans. Am. Geophys. Union, 53, 395.

Holbrook, James R. 1971: Some aspects of circulation in Port Susan estuary. Masters degree report, Univ. Washington, Dept. Oceanogr., 44 p. (unpublished manuscript).

Hopkins, Thomas S., 1971: Velocity, temperature, and pressure observations from moored meters on the shelf near the Columbia River mouth, 1967-1969. Univ. Washington, Dept. Oceanogr., Spec. Rep. 45, 143 p.

Lincoln, John, and Eugene E. Collias, 1970: Skagit Bay study. Progress Report No. 3. Presentation and review of data obtained between 11 February and 8 October 1970. Univ. Washington, Dept. Oceanogr. Ref. M70-111, 88 p.

Litteken, Arnold H., 1971: Some aspects of the circulation in Deception Pass and Saratoga Passage. Masters degree report, Univ. Washington, Dept. Oceanogr., 54 p. (unpublished manuscript).

O'Niell, Joseph, 1972: Tidal interaction in an estuary with some fjord-like characteristics. Masters degree report. Univ. Washington, Dept. Oceanogr., 10 p. plus figures (unpublished manuscript).

5. DATA SUMMARIES

5.1 Moorings M, E, W, and N

Direction Histograms

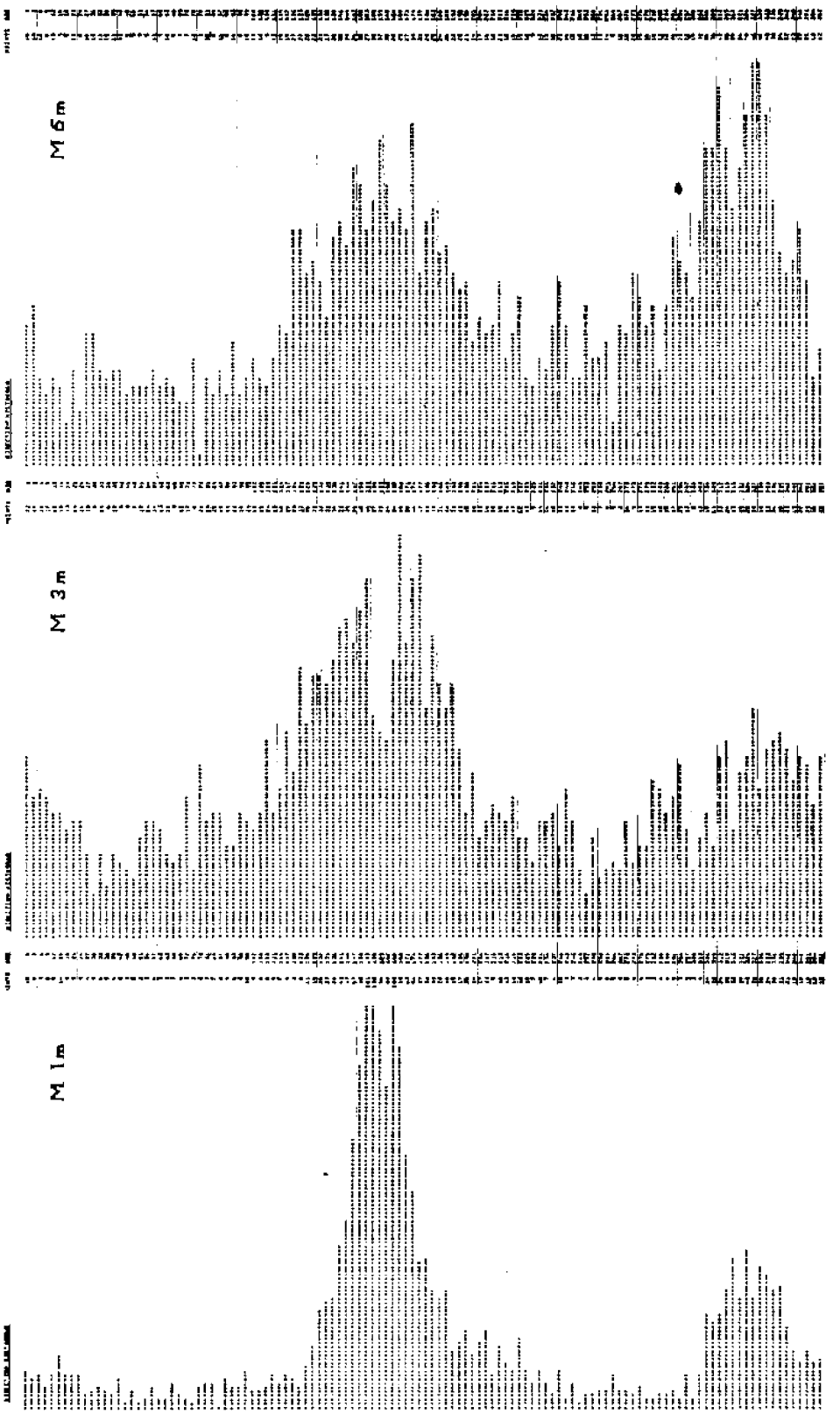
Histograms of Speed

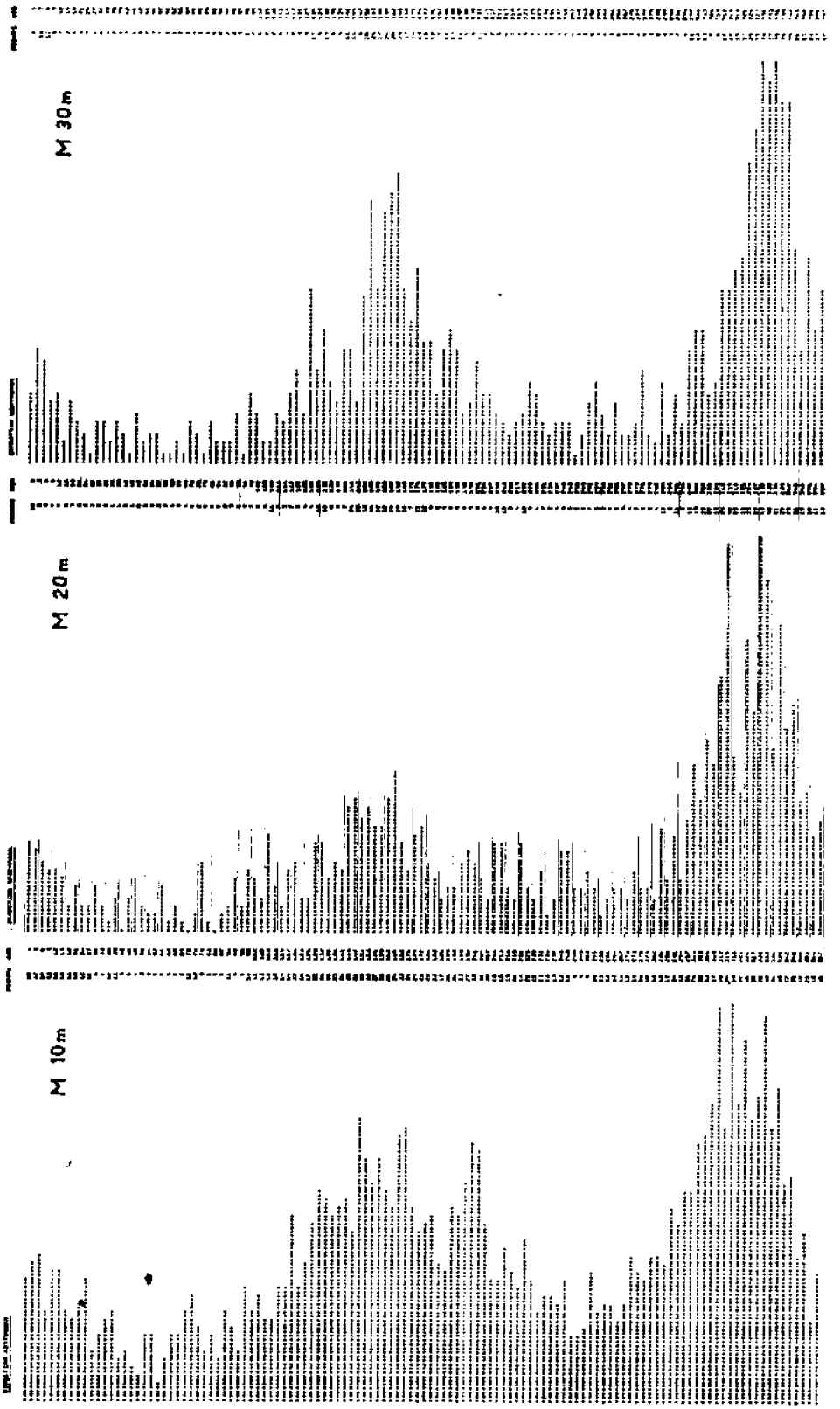
Progressive Vector Diagrams

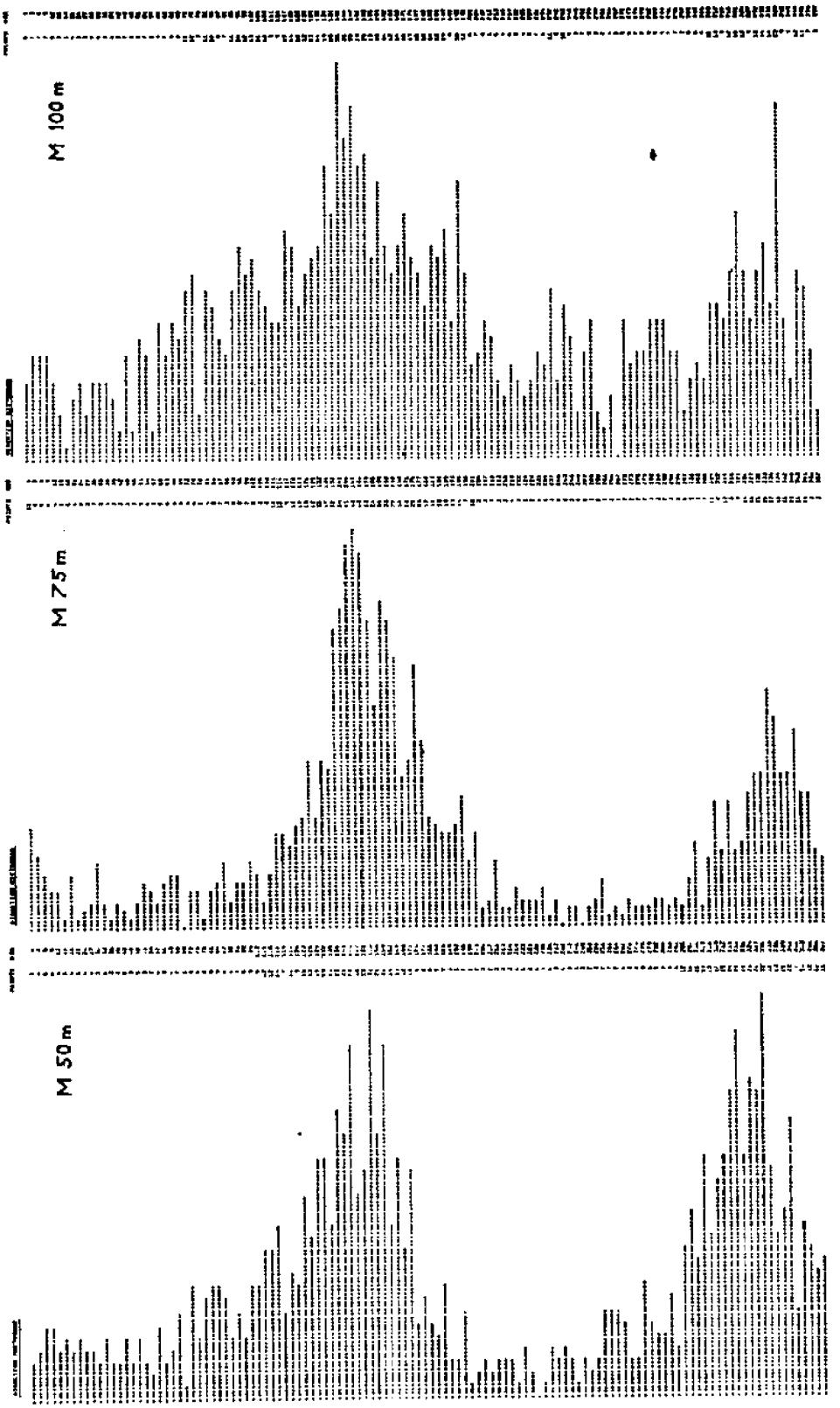
Time Series

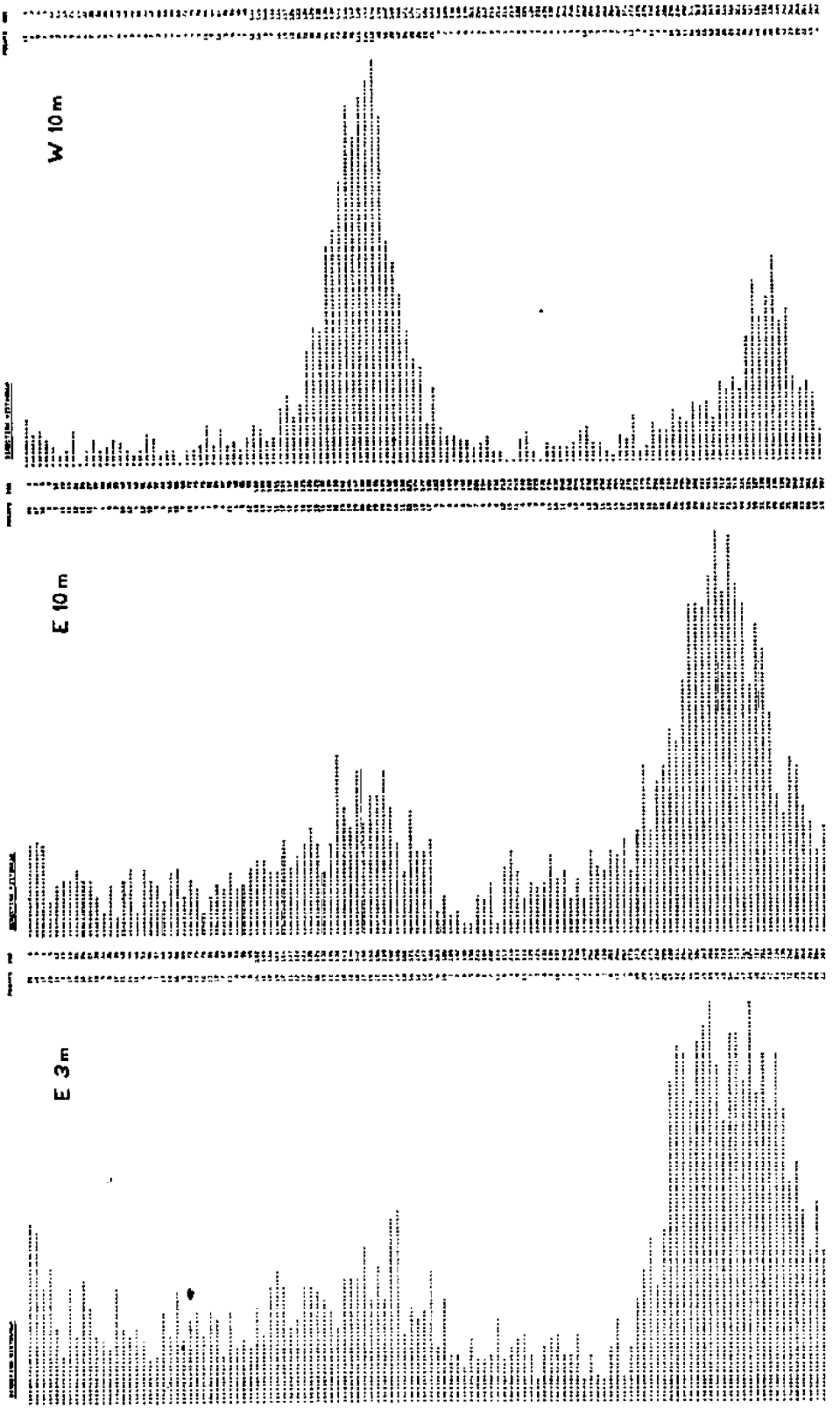
Fourier Coefficients

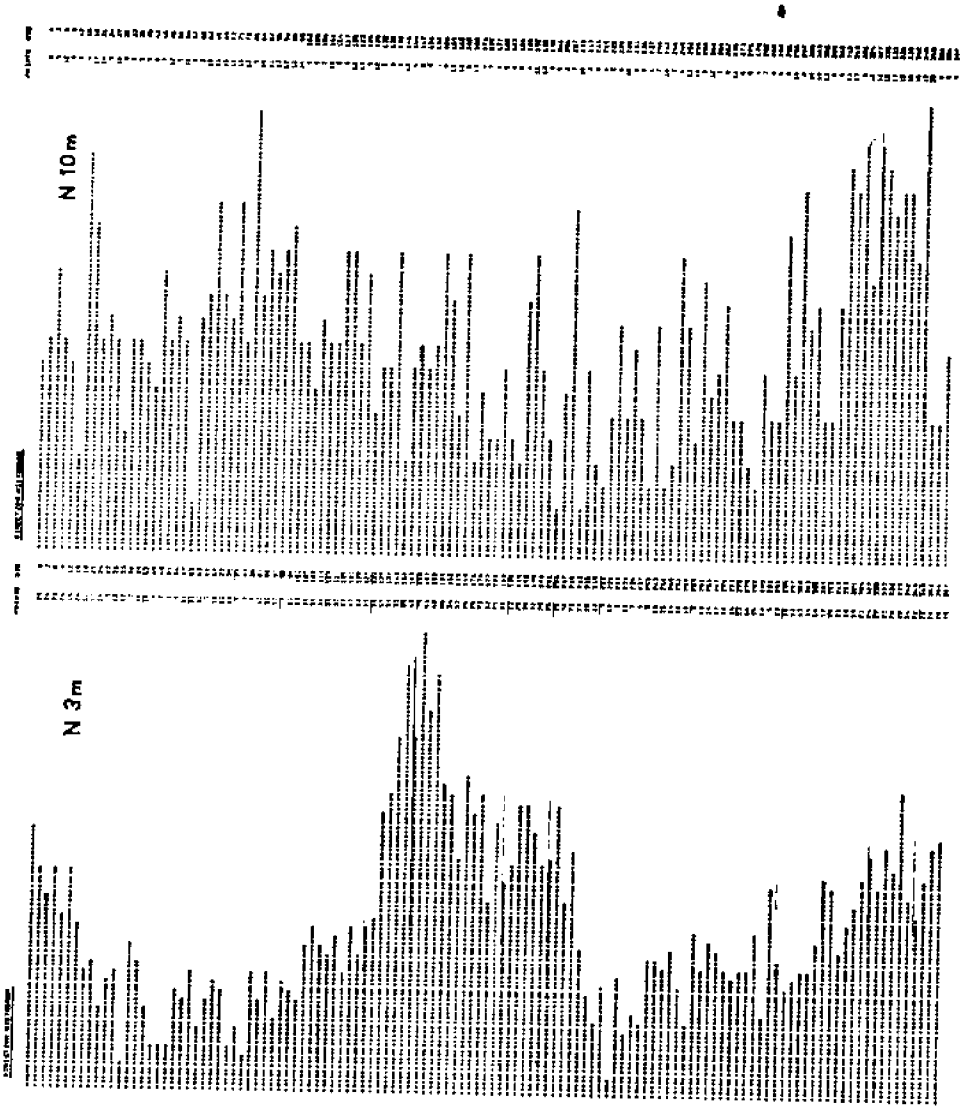
(See section 2 for complete description.)

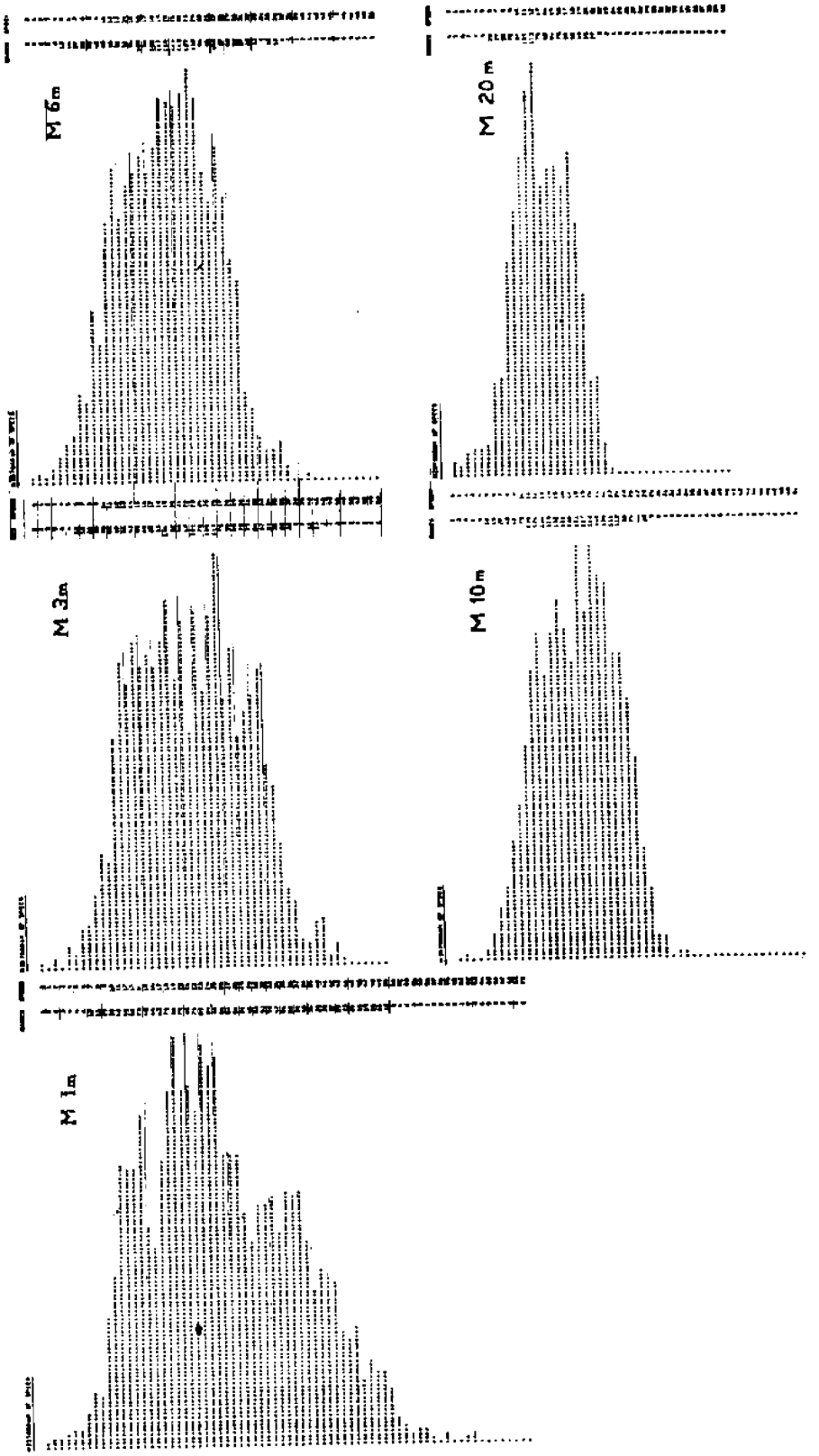

M 6m
M 3m
M 1m

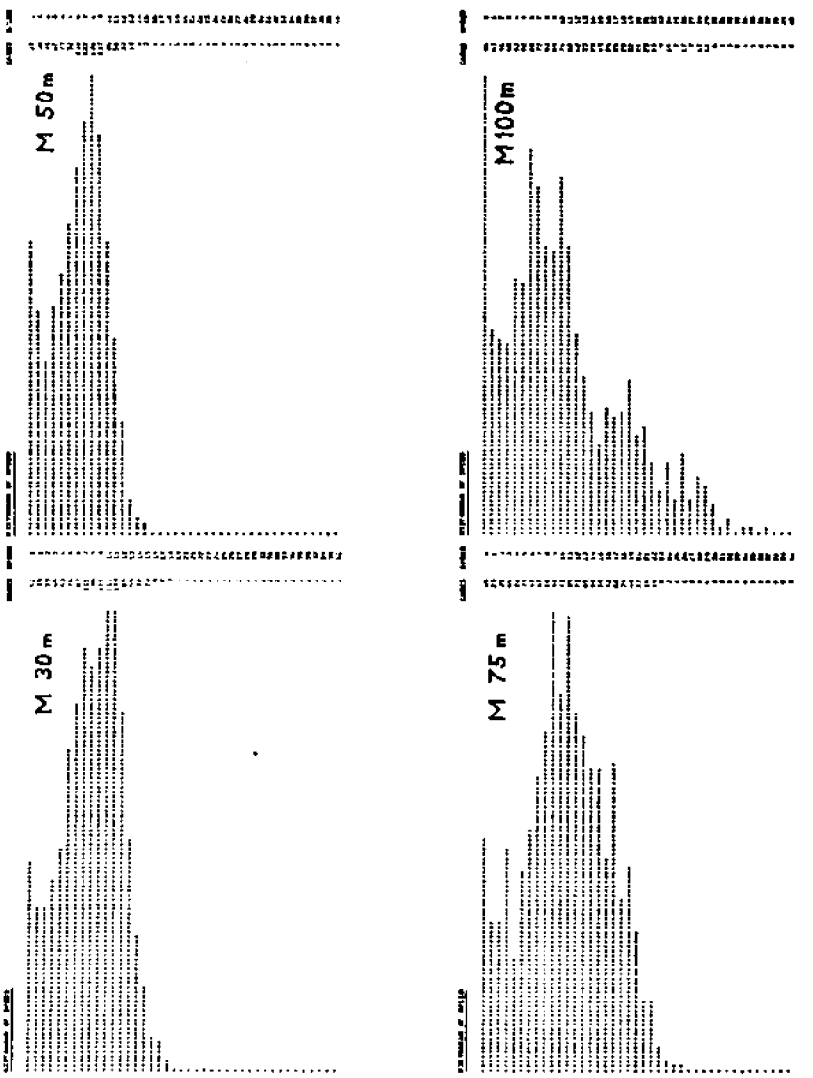

M 30 m
M 20 m
M 10 m

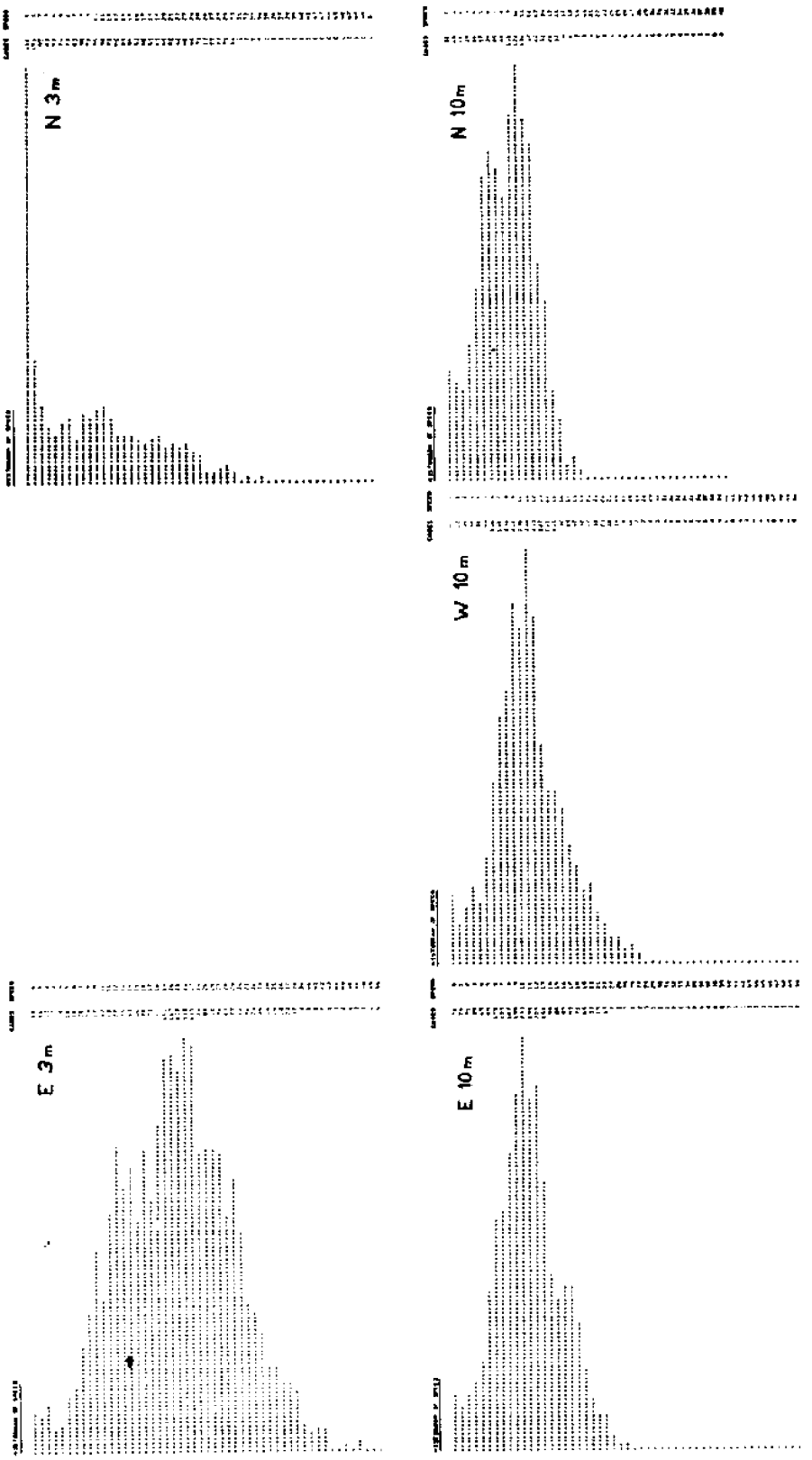

M 100 m
M 75 m
M 50 m

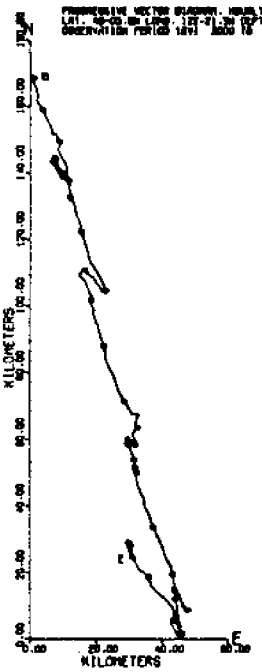

W 10 m
E 10 m
E 3 m

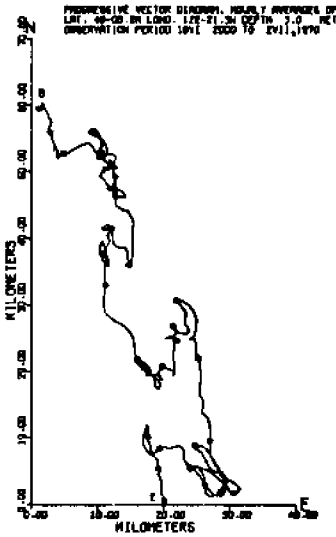

N 10m
N 3m

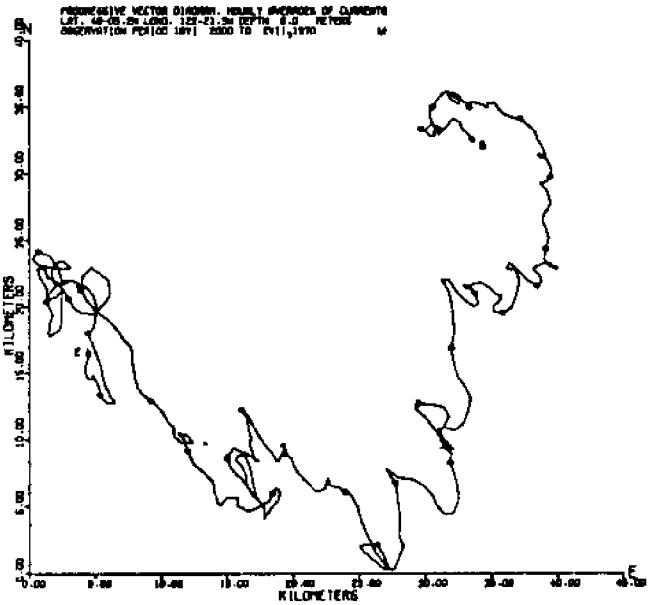

M 6m
M 20 m
M 3m
M 10m
M 1m

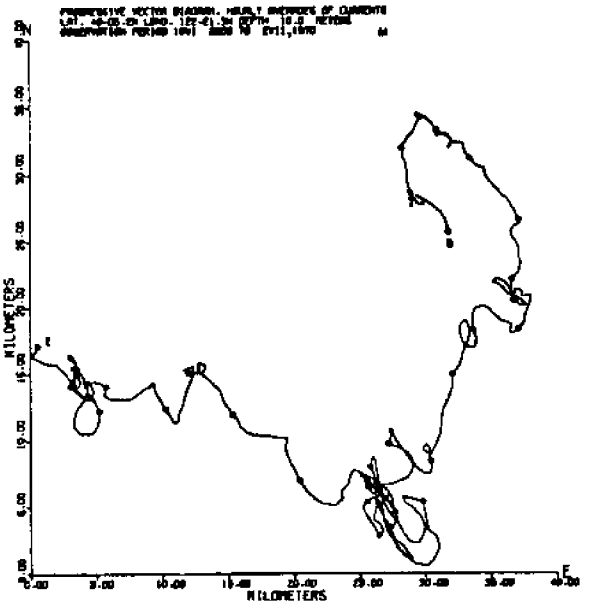

M 50 m
M 100 m
M 30 m
M 75 m

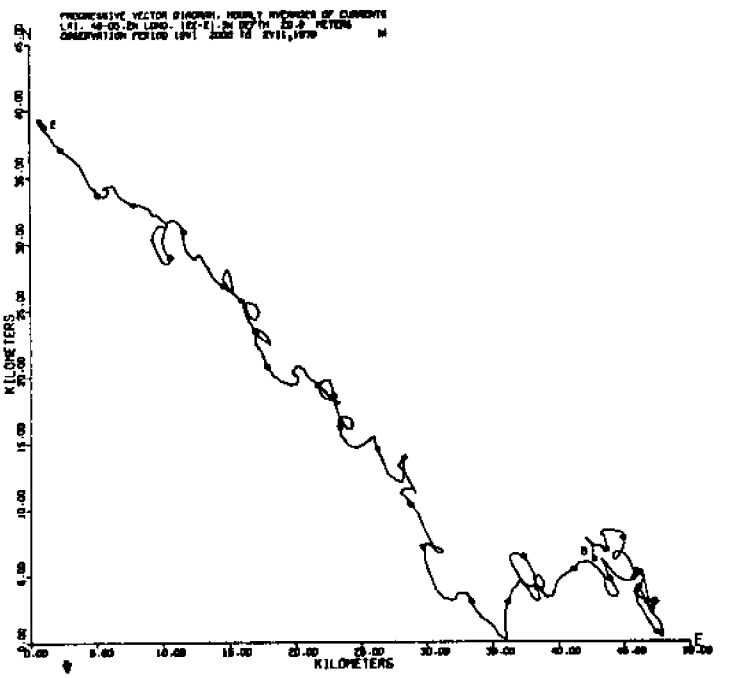

N 3m
N 10m
W 10m
E 3m
E 10m

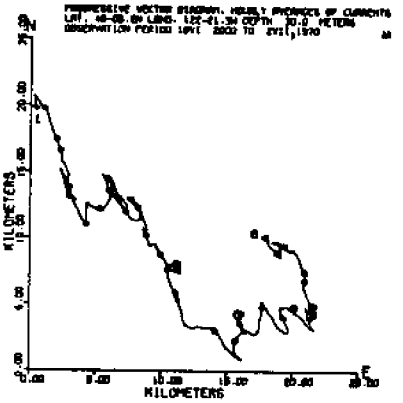

KILOMETERS
KILOMETERS

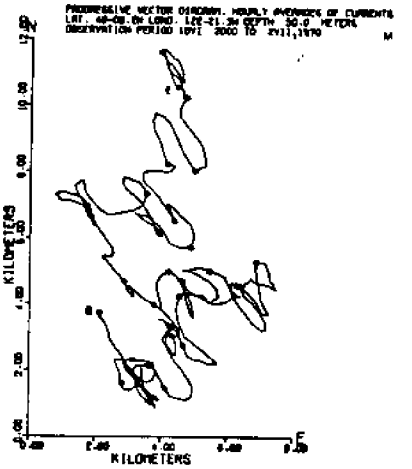

KILOMETERS
KILOMETERS

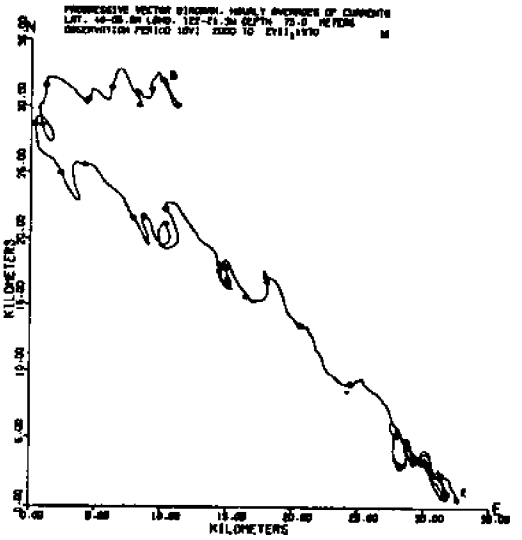

KILOMETERS
KILOMETERS

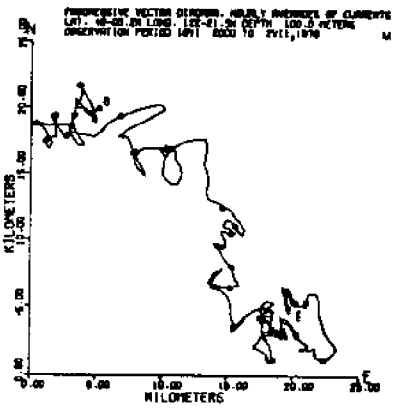

KILOMETERS
KILOMETERS

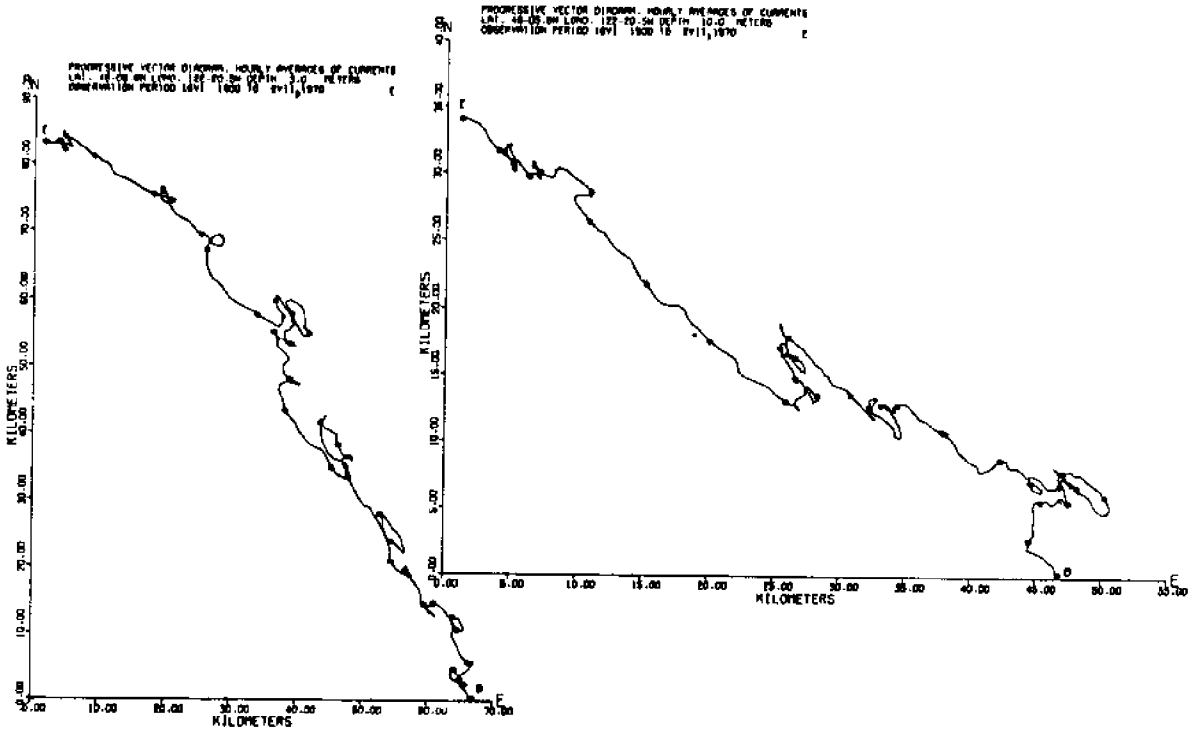

KILOMETERS
KILOMETERS

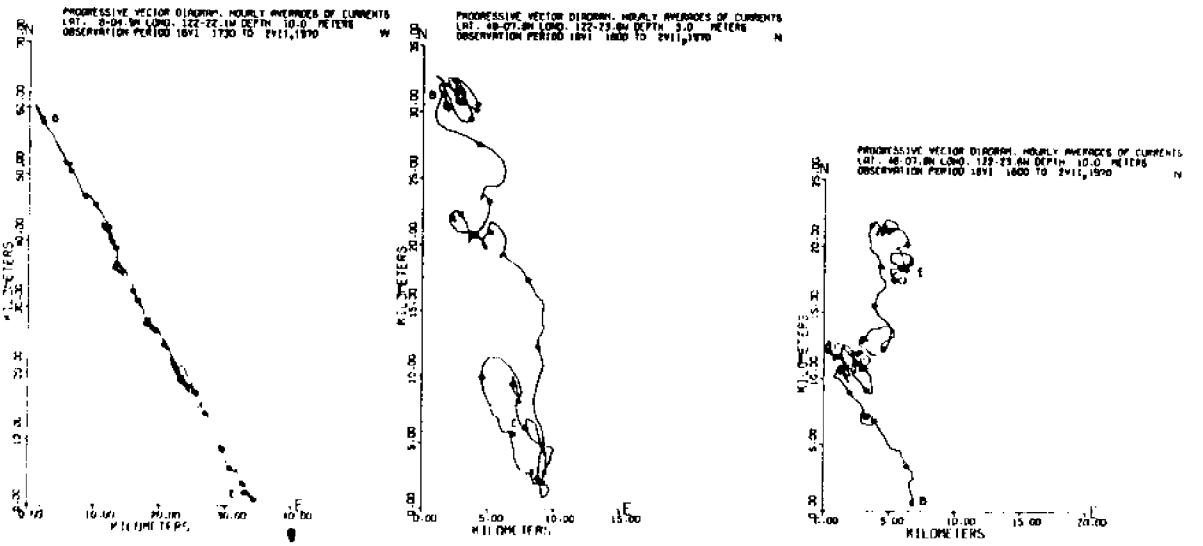

KILOMETERS
KILOMETERS

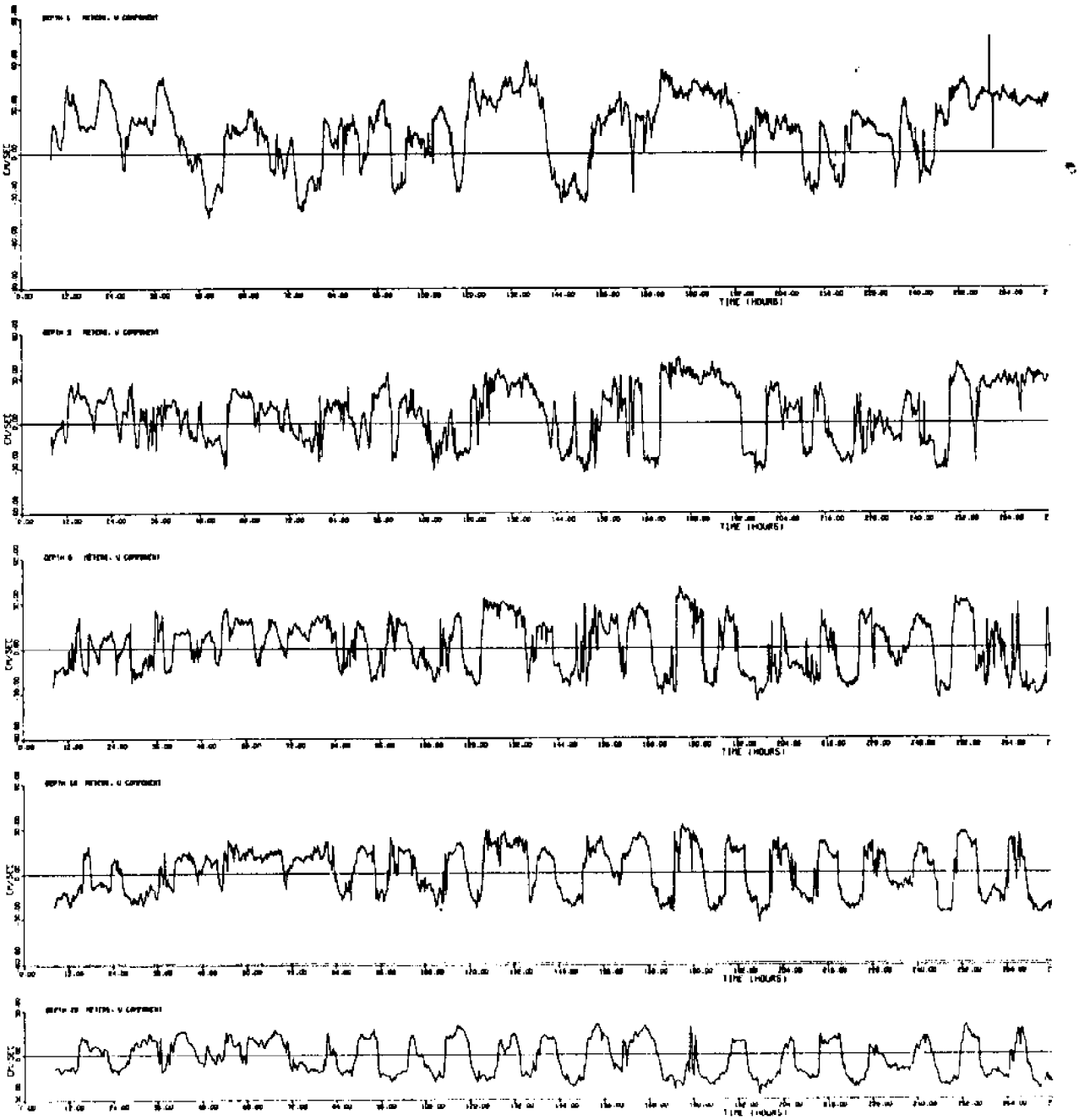

KILOMETERS
KILOMETERS

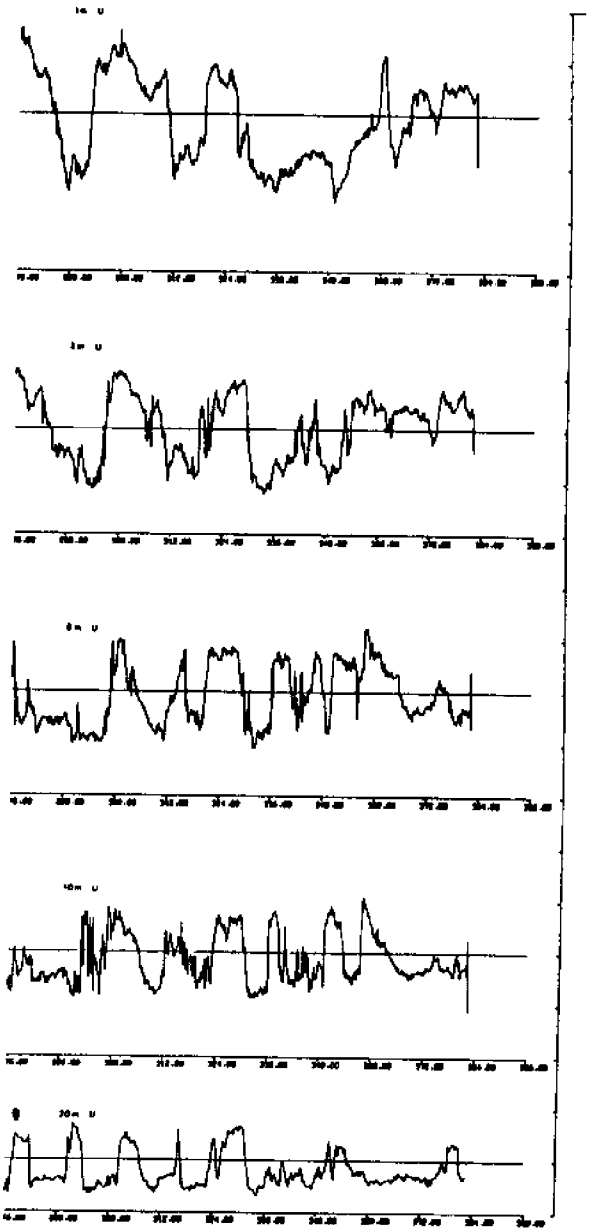

KILOMETERS
KILOMETERS

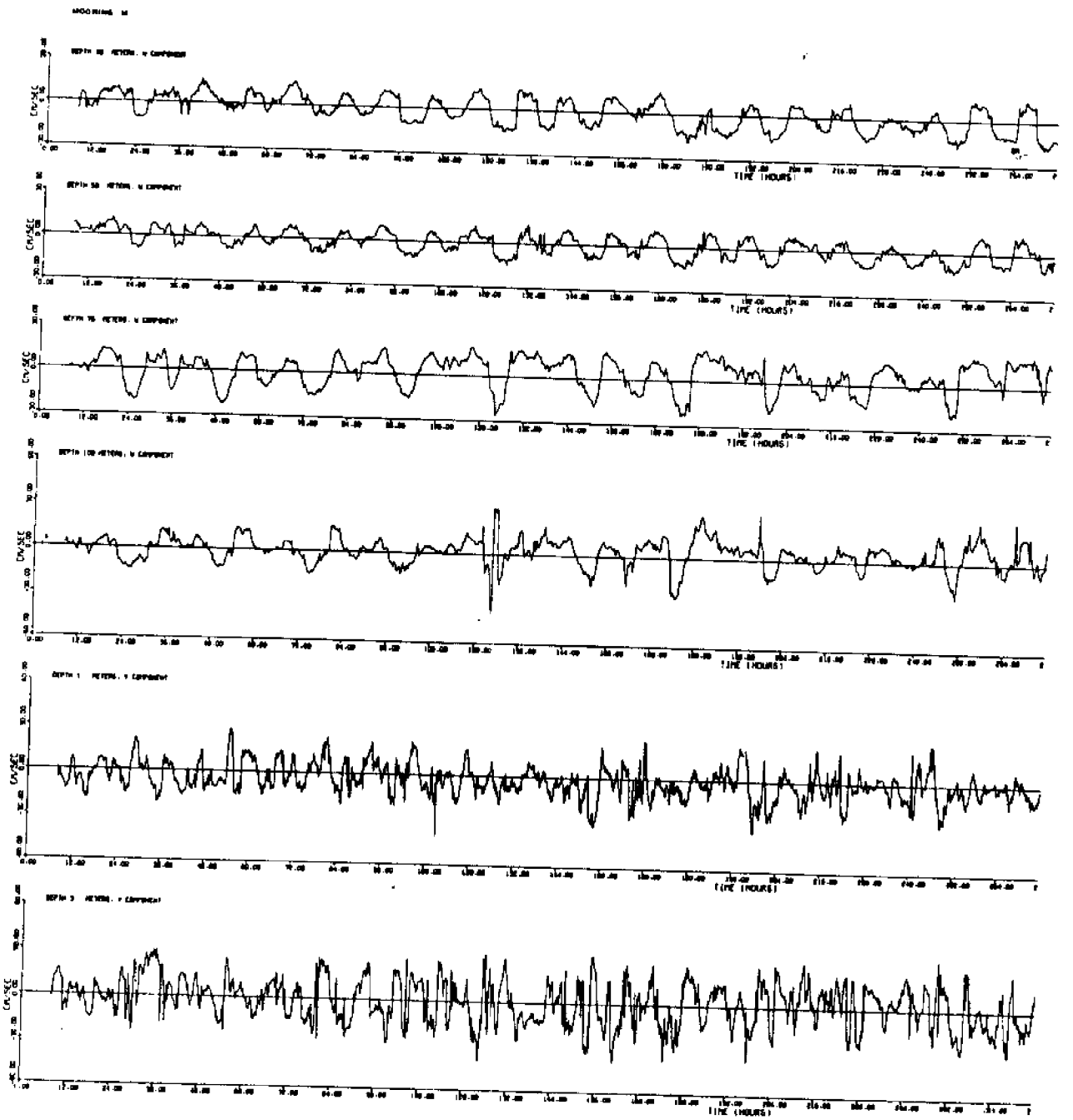

KILOMETERS
KILOMETERS

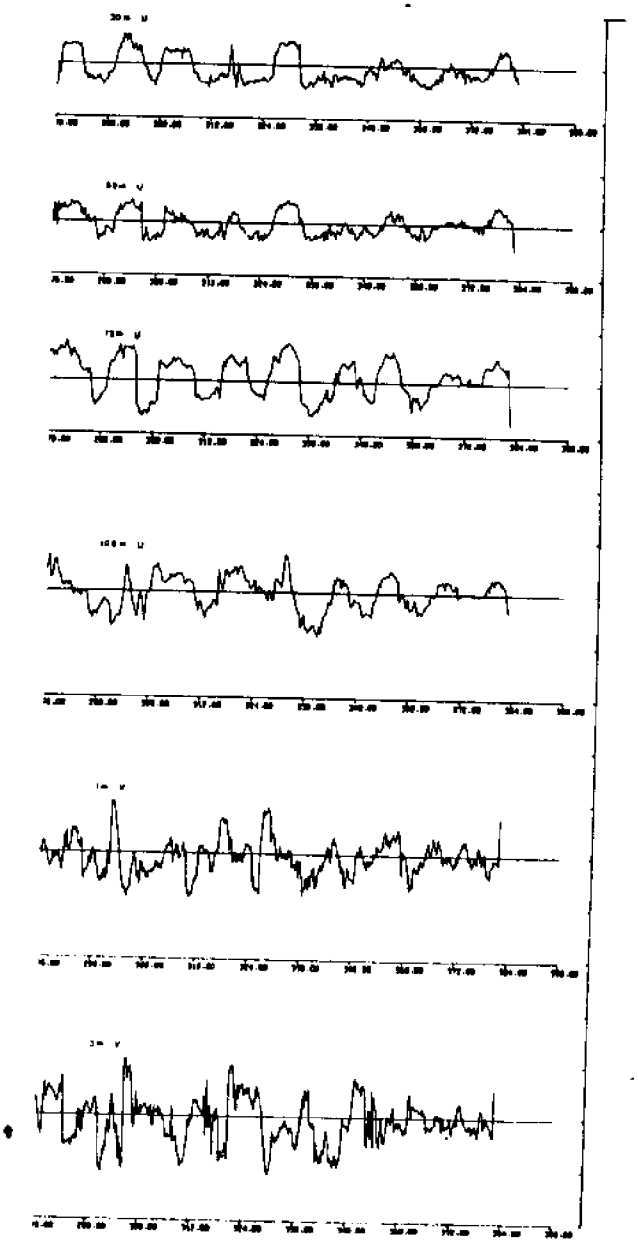

PROGRESSIVE VECTOR DIAGRAM, HOURLY AVERAGES OF CURRENTS
KILOMETERS
KILOMETERS

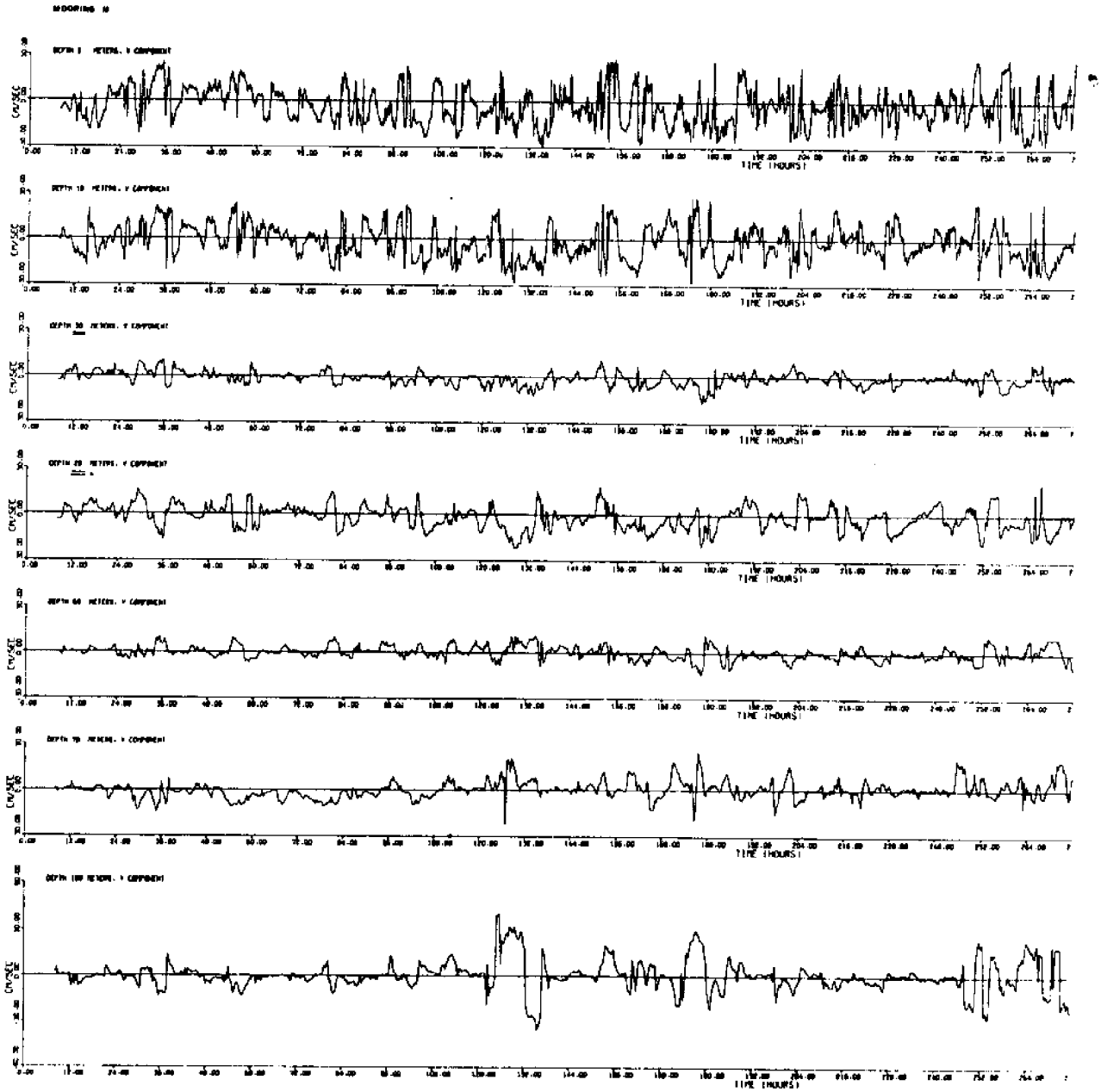

PROGRESSIVE VECTOR DIAGRAM, HOURLY AVERAGES OF CURRENTS
PROGRESSIVE VECTOR DIAGRAM, HOURLY AVERAGES OF CURRENTS
PROGRESSIVE VECTOR DIAGRAM, HOURLY AVERAGES OF CURRENTS

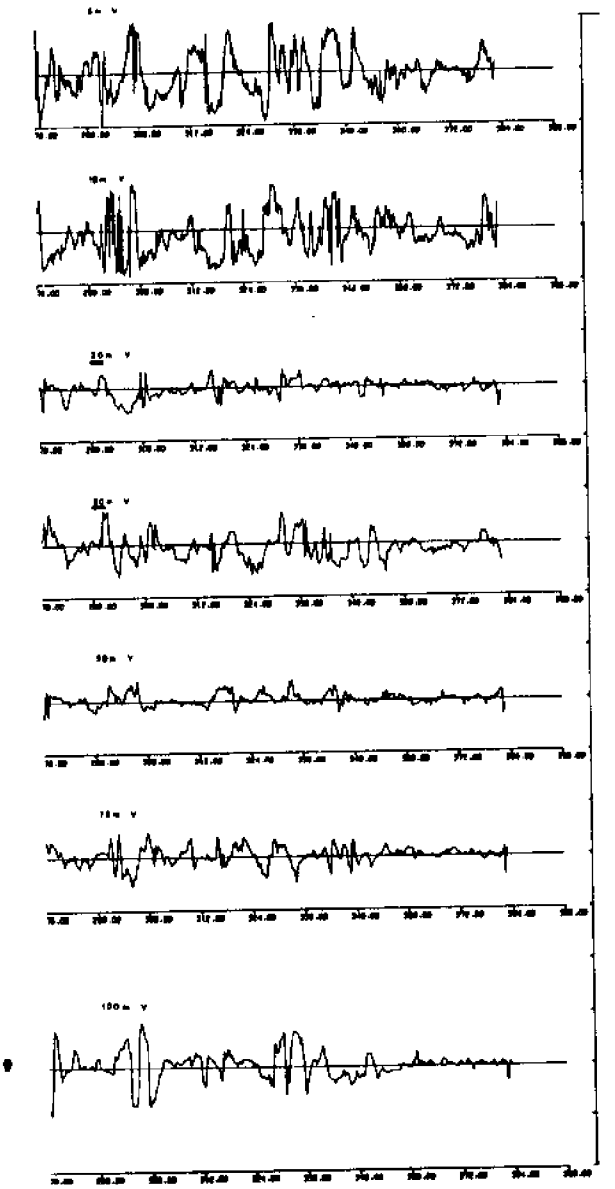


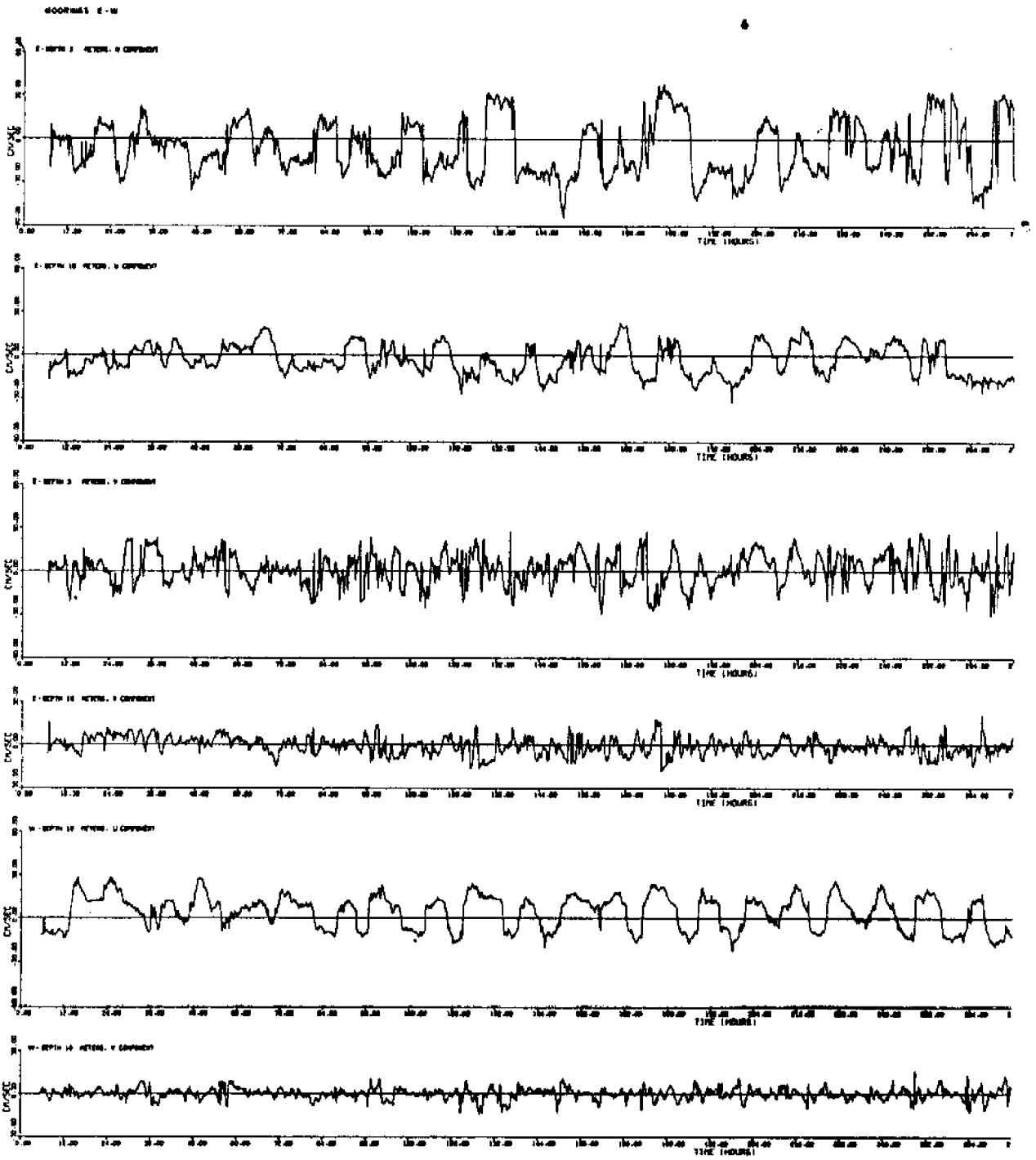


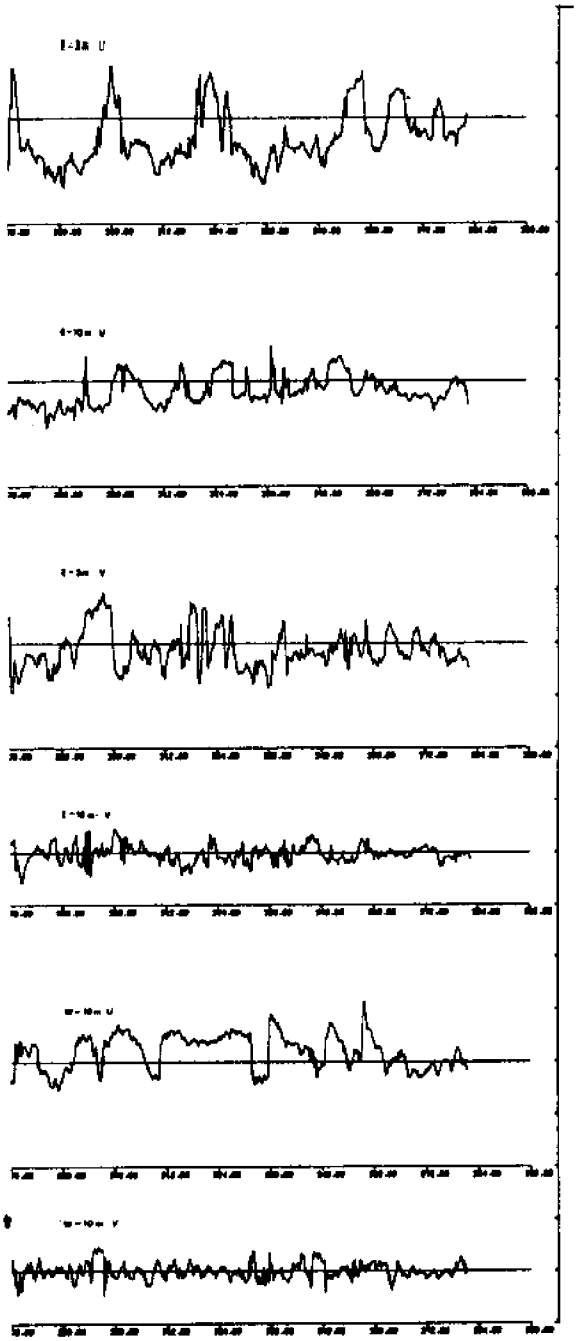


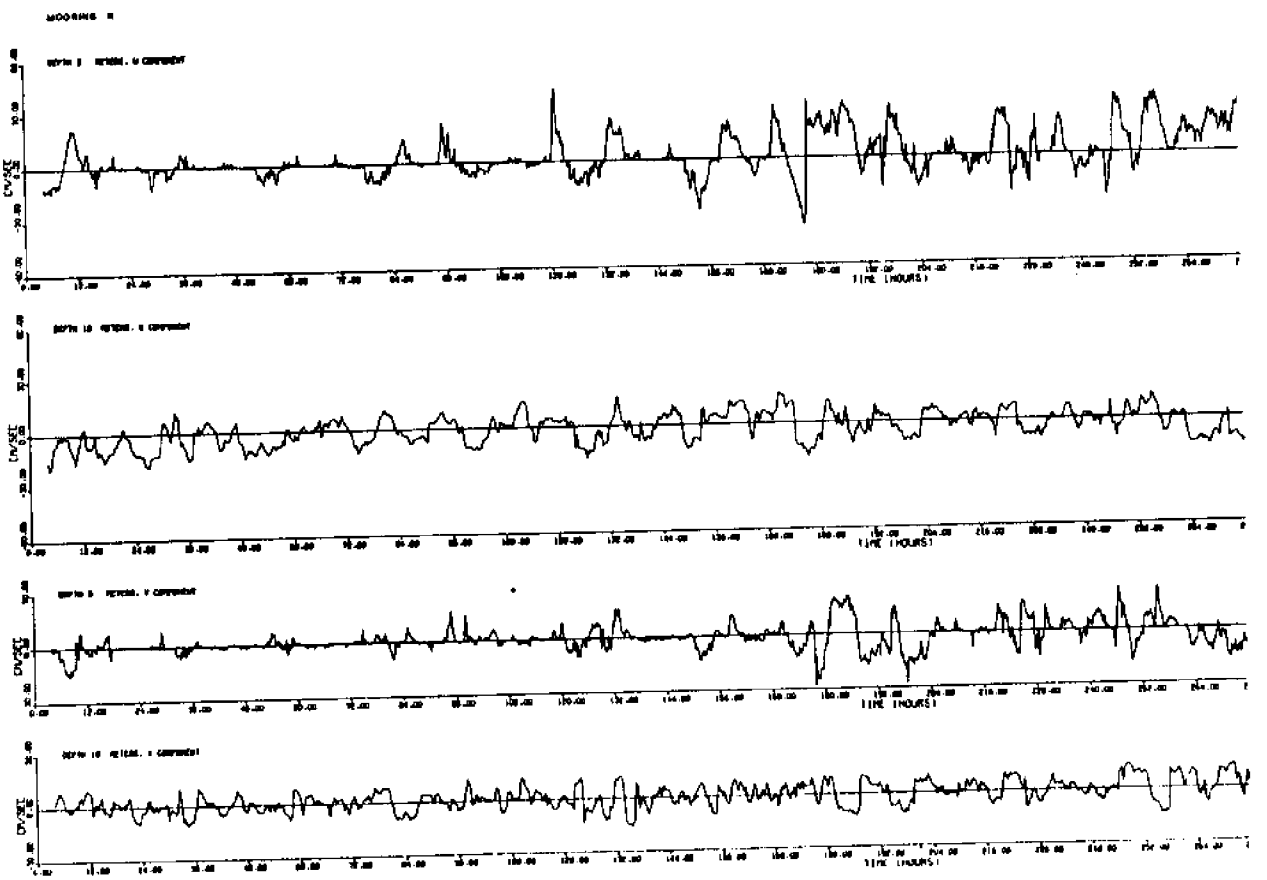


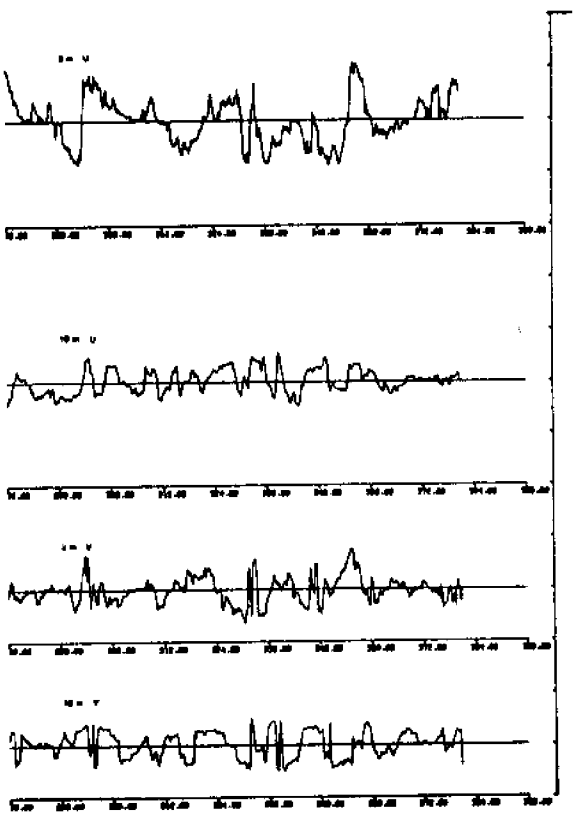












FOURIER COEFFICIENTS FOR PORT SUSAN - MOORING M

U-COMPONENTS

	1 M		3 M		6 M		10 M		20 M		30 M		50 M		75 M		100 M	
HRS	AMP	PHASE	AMP	PHASE	AMP	PHASE	AMP	PHASE	AMP	PHASE	AMP	PHASE	AMP	PHASE	AMP	PHASE	AMP	PHASE
3.60000E+02	11.54	175.86	2.94	173.28	6.06	77.01	5.60	102.82	3.73	66.51	2.28	54.56	.63	56.23	2.51	-144.45	2.56	-174.34
1.80000E+02	4.85	57.38	1.09	63.97	1.47	-6.86	.72	-77.71	1.29	53.01	1.24	71.15	.28	31.16	2.62	-74.87	.48	65.67
1.20000E+02	12.78	24.85	6.41	27.18	2.33	-11.64	1.52	-58.48	2.38	38.66	1.85	34.23	1.18	32.88	1.79	18.25	.98	31.19
9.00000E+01	8.73	8.84	6.57	-3.58	8.79	-31.94	4.17	-35.78	2.69	44.98	1.15	38.91	1.27	7.71	1.79	-1.48	.32	-42.58
7.20000E+01	8.59	26.81	3.96	35.76	.78	25.02	.48	-11.83	.41	19.34	1.83	-2.94	.66	-11.77	1.95	-31.69	1.87	33.63
6.00000E+01	8.82	4.06	6.05	5.45	4.44	-5.33	3.55	-5.41	1.32	-26.93	.73	27.78	1.07	20.32	1.29	12.25	2.83	3.82
5.14286E+01	4.95	11.40	3.26	8.38	.73	14.52	1.23	-6.73	1.19	.66	.83	-5.86	.50	5.87	.66	17.38	.88	1.96
4.50000E+01	6.79	-12.06	7.12	-8.97	3.40	-12.88	1.98	-17.23	1.78	16.75	1.87	16.47	.60	8.52	2.20	-3.11	2.72	-6.83
4.00000E+01	3.65	9.19	3.76	11.08	1.88	-2.12	2.87	3.21	.85	-1.86	.94	.27	.59	2.85	1.16	-19.78	.98	-16.71
3.60000E+01	4.58	12.72	3.64	16.76	1.86	-17.48	.86	18.72	.42	14.48	.84	3.65	.58	.37	.68	.78	.69	-.85
3.27273E+01	8.92	-7.45	4.81	-6.39	3.48	-11.68	2.95	-8.67	1.94	-18.81	1.89	-8.81	.24	-7.18	.32	-19.96	.34	19.69
3.00000E+01	2.86	-3.85	4.76	-4.61	.76	1.23	.78	-8.49	.76	-3.94	.19	-7.41	.54	-9.55	1.89	-14.01	.47	-18.19
2.76923E+01	1.73	-18.72	5.08	12.36	4.58	13.25	4.36	12.48	1.38	-11.26	.69	13.80	.24	-4.44	.31	13.76	1.16	-8.36
2.57143E+01	3.48	7.11	2.56	-8.59	3.52	-8.26	2.09	-9.88	2.20	4.96	1.47	5.44	1.11	3.66	2.18	1.66	2.86	4.51
2.40000E+01	12.72	5.66	8.98	6.75	4.55	6.14	2.68	7.51	4.78	18.89	3.22	9.28	3.84	9.62	9.51	8.86	4.32	7.78
2.25000E+01	3.23	-5.89	2.38	-.15	2.25	-.99	.86	-8.42	1.34	6.26	.74	5.75	.28	-2.48	.26	-2.84	1.48	1.67
2.11765E+01	8.91	-5.39	2.39	-5.28	2.86	-9.97	.73	-4.87	.98	1.49	.12	8.91	.57	6.58	.87	8.38	.71	6.81
2.00000E+01	5.82	-7.92	5.10	-6.17	4.16	-7.45	2.46	-8.32	1.32	4.87	1.17	3.53	.51	3.81	1.40	4.93	1.35	-6.95
1.89474E+01	3.26	-7.18	2.28	-4.88	2.78	-7.36	2.34	-4.54	.92	-4.73	.18	1.73	.68	2.52	.17	7.67	.97	8.88
1.80000E+01	.81	6.87	2.62	-8.70	1.62	-8.08	.73	-8.31	.34	-5.26	.73	-2.08	.52	-.71	1.27	-3.49	.81	-4.94
1.71429E+01	2.18	-6.15	1.93	+8.51	.85	4.65	1.88	3.02	1.67	7.81	.86	6.75	.27	5.48	1.89	7.68	.74	8.24
1.63636E+01	2.37	2.59	2.32	3.28	1.48	6.07	1.04	-4.74	.35	-4.64	.51	-4.36	.87	-4.68	.89	-3.66	.48	-3.79
1.56522E+01	3.77	6.21	2.68	-6.96	1.78	-1.58	1.43	-5.31	.77	7.13	.98	-6.47	.35	6.65	.67	4.59	.97	.69
1.50000E+01	4.14	1.38	4.22	3.48	2.25	4.48	3.00	5.34	1.80	5.65	.83	3.86	.74	6.07	.59	-4.44	1.38	-4.62
1.44000E+01	3.47	1.39	1.92	4.71	1.44	3.51	1.04	-.43	.68	-1.89	.72	-1.68	.34	-1.88	.84	6.85	1.46	3.84
1.38462E+01	1.82	-6.20	1.98	1.39	.78	-1.71	1.33	-1.34	1.80	-3.59	.45	-4.92	.44	-6.50	1.72	-6.58	.84	5.76
1.33333E+01	2.98	-6.18	2.52	-4.79	2.92	-1.62	2.25	-3.38	.15	2.16	.91	4.94	.84	5.85	2.18	4.44	.84	1.72
1.28571E+01	2.77	.77	4.44	-.18	3.46	2.98	5.41	3.32	3.28	3.48	1.97	3.66	1.95	4.44	1.82	5.26	1.58	5.78
1.24138E+01	4.78	3.28	3.39	-4.31	18.51	-3.68	11.69	-3.25	10.82	-2.28	8.24	-1.88	6.38	-1.89	18.25	-.86	6.98	-.82
1.20000E+01	3.13	2.88	3.65	3.48	5.89	3.96	4.62	4.34	.88	3.95	.19	4.46	.11	-4.35	1.26	-1.11	1.25	-.21
1.16129E+01	1.42	-.73	1.24	-1.62	1.81	2.66	1.95	4.34	1.98	4.62	1.56	4.78	.47	-4.05	1.44	-1.23	.77	.64
1.12500E+01	1.78	-5.45	2.56	-3.93	2.12	3.99	2.88	4.58	.62	-4.43	.54	.14	.46	1.83	.44	-.68	.21	.48
1.09091E+01	.97	1.67	1.14	-1.18	2.14	+5.37	1.59	4.81	1.49	1.28	.88	1.15	.33	-4.19	.28	-4.48	1.99	-2.61
1.05882E+01	.57	-4.21	.88	-1.21	2.42	.18	1.58	1.34	.38	1.28	.81	4.22	.29	2.77	.46	-.38	.96	-4.82
1.02857E+01	1.74	4.85	1.18	-4.58	1.98	-2.98	1.65	.34	.98	2.62	.48	.62	.58	.87	.79	-3.42	.72	4.88
1.00000E+01	.45	-1.86	1.19	-2.44	.93	.10	.79	-4.19	1.86	4.76	.50	3.11	.47	-4.85	.58	-4.24	.76	-.77
9.72973E+00	.68	-4.89	3.26	.55	1.13	4.60	.71	.48	.52	-3.18	.45	-1.98	.30	-.17	.82	3.27	.85	-3.37
9.47368E+00	1.58	1.55	2.81	-3.31	1.83	-1.44	.61	-.85	.61	-.29	.57	-.85	.81	2.55	.68	-.89	.22	2.31
9.23077E+00	1.48	-4.28	2.32	-4.65	1.44	-3.61	.88	-.59	.45	-3.53	.16	1.88	.41	-.35	.18	-2.89	.81	.47
9.00000E+01	.89	-3.51	2.19	-3.62	2.18	.88	2.19	.68	.78	.46	.32	-2.72	.87	-3.33	.79	-4.28	.61	2.23
8.78049E+00	.48	-1.84	1.17	-1.84	1.41	-3.74	.39	-3.48	.96	-1.96	.49	-2.67	.24	-3.35	1.18	-4.84	.59	-3.92
8.57143E+00	1.35	3.01	2.01	3.48	2.56	-4.24	1.84	-3.41	.64	-3.86	.87	-4.18	.83	4.02	.45	2.99	.52	1.93
8.37209E+00	4.88	-2.42	2.58	-1.41	2.78	.86	3.48	.41	.38	.46	.36	.38	.46	-.76	1.88	3.52	1.49	4.16
8.18182E+00	3.14	-.64	.38	.84	1.64	2.48	1.98	1.48	.94	.95	.55	-.34	.27	-.38	2.01	-1.11	1.72	.86
8.88586E+00	2.88	-.81	.77	.32	2.91	3.82	.31	2.85	1.23	3.84	.51	2.85	.41	2.12	.55	3.29	1.44	-3.89
7.82609E+00	1.59	3.58	1.88	1.54	1.69	1.48	1.84	.21	.42	1.18	.18	1.71	.38	-3.86	.61	1.98	.81	3.16
7.65957E+00	2.36	.89	1.92	-1.18	.79	-.87	.88	.89	1.28	.87	.25	.84	.22	3.82	.24	3.33	1.82	2.42
7.50000E+00	2.87	-.41	2.38	-1.46	2.75	-1.26	.92	-1.78	.39	-1.49	.28	-1.35	.61	1.17	1.16	.52	.54	-.69
7.34654E+00	1.48	1.43	1.29	2.84	1.92	-1.31	1.65	-.78	.57	-.97	.57	-1.63	.21	-.71	.29	.88	.29	-.29
7.20000E+00	1.33	-.54	2.44	-.94	.98	.88	.47	-2.16	.76	-3.41	.40	-.98	.17	.19	.54	-.33	.31	.72

(CONTINUED) FOURIER COEFFICIENTS FOR PORT SUSAN - MOORING M

V-COMPONENTS

	1 M		3 M		6 M		10 M		20 M		30 M		50 M		75 M		100 M	
HRS	AMP	PHASE	AMP	PHASE	AMP	PHASE	AMP	PHASE	AMP	PHASE	AMP	PHASE	AMP	PHASE	AMP	PHASE	AMP	PHASE
3.600000E+02	1.20	28.59	.58	118.19	2.75	-10.39	1.43	47.43	1.09	5.16	1.03	-15.80	.55	15.22	2.44	-139.52	.53	166.25
1.800000E+02	1.03	66.56	3.75	36.43	1.61	31.11	4.24	25.84	1.62	41.51	1.25	21.36	1.27	-74.09	1.60	-43.37	2.25	-52.03
1.200000E+02	1.19	-38.82	.51	-35.56	1.04	35.26	.68	-50.82	.83	55.64	.36	-19.75	.54	1.85	1.63	5.74	.56	14.37
9.000000E+01	.86	-11.27	2.83	25.52	2.34	-44.53	1.49	-35.23	.83	12.30	.15	-29.34	.34	36.83	.14	1.61	.64	18.74
7.200000E+01	.43	20.76	1.08	16.46	1.19	-30.31	.71	19.60	.51	4.74	.32	-25.95	.53	-23.86	.71	35.06	1.32	30.69
6.000000E+01	.82	9.88	.41	-19.35	1.65	-26.75	2.41	-22.62	1.16	15.91	1.27	19.41	.77	17.77	.66	-3.62	.47	-4.84
5.142866E+01	1.03	13.84	.30	-18.67	2.42	-17.24	1.44	-18.35	1.28	-20.42	.50	-14.98	.28	25.09	.43	6.43	1.33	8.89
4.500000E+01	1.62	-1.08	.74	-2.47	1.51	12.52	1.10	17.42	2.28	9.43	.92	8.89	.38	-7.73	.96	-8.57	.46	-19.81
4.000000E+01	.63	-13.85	2.10	-7.56	.99	-15.69	1.51	4.48	.31	-11.76	1.12	-11.77	.17	5.77	.49	-.60	.55	-8.47
3.600000E+01	1.84	-13.08	2.63	-9.06	.71	1.44	.96	-13.58	.58	-2.76	.23	-16.79	.21	.32	.58	14.74	1.68	1.78
3.272736E+01	2.28	-12.75	.31	-6.75	2.38	15.21	.71	-12.78	1.07	8.94	.54	5.88	.22	-6.05	.50	9.36	1.08	-8.38
3.000000E+01	.38	14.35	1.73	-4.97	.84	1.21	1.42	-5.55	1.03	-5.08	.14	-2.06	.31	-10.19	.97	-2.24	1.04	-5.58
2.769230E+01	1.69	-11.67	1.34	13.04	1.12	-6.01	2.15	-3.50	.31	.32	.40	.80	.58	10.19	.63	8.76	2.06	6.66
2.571430E+01	1.00	-.76	1.35	4.61	.68	.25	1.49	9.35	.89	12.56	.18	-.45	.61	3.14	1.36	11.03	1.94	-7.41
2.400000E+01	1.39	-18.63	2.15	4.52	1.22	-1.61	1.69	-8.41	1.81	-10.13	.73	-7.66	.19	-.91	.46	1.61	1.17	-6.24
2.250000E+01	1.14	2.47	2.25	2.88	1.88	-1.71	1.87	4.43	.61	-2.35	.22	6.11	.22	-10.60	1.31	-7.95	2.07	9.62
2.117656E+01	.91	5.75	.76	-6.83	1.31	-7.85	.71	9.36	.26	-8.32	.53	8.73	.16	-9.58	.74	-3.73	.77	-5.41
2.000000E+01	.23	-7.41	.32	-.94	1.27	5.11	1.84	4.62	1.25	6.69	.59	-.63	.78	6.55	.23	2.51	1.22	.39
1.894746E+01	1.11	-5.01	2.87	7.40	.85	-.71	.91	-2.54	.46	7.40	.35	-7.45	.38	-8.81	.40	-5.39	.58	6.55
1.800000E+01	1.20	4.21	1.03	.75	.67	-.73	.56	-.34	1.58	1.14	.24	7.58	.32	-3.04	.24	-8.26	.29	-7.02
1.714296E+01	1.19	-3.16	1.58	3.52	.98	-4.25	1.70	-6.35	1.33	7.83	.55	6.33	.42	5.58	.43	2.65	2.52	-.36
1.636366E+01	.77	4.16	.85	-3.53	.49	-1.79	.29	1.55	1.52	.84	.69	-.64	.66	-5.76	.98	5.55	1.45	4.51
1.565226E+01	.41	4.62	.38	-3.67	1.33	-3.79	.83	4.01	.45	-4.37	.49	5.81	.43	-2.85	.34	-2.65	2.28	-5.02
1.500000E+01	.60	-7.16	2.08	-.57	.73	-4.62	2.05	-5.52	.91	-4.74	1.01	-3.88	.20	5.82	.87	-1.87	1.67	.81
1.440000E+01	.63	-5.43	1.05	-.36	1.17	3.60	.29	1.14	.65	-4.46	.27	-6.31	.61	1.55	1.24	5.84	.41	-2.00
1.384626E+01	1.77	2.48	1.66	-2.33	.41	-1.86	1.09	3.97	1.59	5.79	.36	-2.91	.89	6.02	.46	3.45	1.60	-5.81
1.333336E+01	.99	4.42	1.20	-1.16	1.51	-4.08	1.21	-4.24	1.04	4.87	.68	3.06	.23	5.07	.71	.89	.55	-2.34
1.285716E+01	.54	2.66	3.45	-4.61	.74	5.15	2.34	2.31	.74	-.40	.48	.22	.90	4.52	.77	-1.58	2.83	3.68
1.241386E+01	4.17	-.32	2.78	-1.98	1.54	4.40	.60	-6.18	1.79	-5.23	.82	-4.41	1.98	-.39	1.49	4.08	2.24	-2.85
1.200006E+01	1.92	-1.56	3.50	3.59	2.87	1.94	2.22	1.75	.78	-3.57	.27	3.63	.30	-1.05	.15	-4.75	1.63	.45
1.161296E+01	.42	.28	3.35	4.38	1.81	3.70	1.56	-1.23	.59	.15	.85	2.25	.41	3.81	.40	-2.05	1.52	5.35
1.125006E+01	2.28	-5.34	2.36	4.20	3.09	-.26	1.19	-.18	.76	.31	.25	.24	.24	2.80	.49	-3.23	1.83	-1.24
1.090916E+01	1.52	-1.55	1.13	-2.13	.43	4.49	1.55	4.57	1.39	-2.19	.55	-1.76	.49	4.01	.90	-.84	1.18	4.11
1.058826E+01	.83	.67	.26	1.52	2.44	-4.59	.52	-4.05	.36	-3.82	.46	3.69	.09	-2.33	1.12	-5.14	1.00	2.05
1.028576E+01	1.30	.62	.30	-4.39	1.95	-4.98	1.04	-5.10	1.63	1.79	.10	-2.38	.35	-1.84	.85	-4.92	1.01	5.62
1.000000E+01	.87	-1.41	1.45	3.61	.95	3.27	.58	-.78	.54	2.61	.39	-3.55	.23	-4.54	1.22	2.85	.91	-.41
9.729736E+00	1.89	2.71	2.72	-1.43	1.13	-3.24	.31	3.72	1.00	2.35	.83	2.71	.74	-2.55	.62	-.68	2.23	3.50
9.473686E+00	1.11	-.14	2.91	4.59	.49	3.90	1.16	.94	.85	2.18	.39	-3.64	.39	-.40	.61	-.39	1.29	-1.03
9.230776E+00	.92	4.03	2.65	1.45	.29	-4.38	1.67	-.67	.53	-1.20	.51	-4.40	.26	4.36	.81	-2.83	.21	1.59
9.000006E+00	.95	-4.09	1.96	1.29	1.79	.13	.66	-2.02	.64	-1.49	.48	-4.40	.78	2.21	.12	3.80	.33	-2.49
8.780496E+00	.38	-.21	2.39	-2.39	1.66	3.74	.56	3.60	1.19	3.51	.32	1.06	.65	.19	.27	2.77	.95	-.32
8.571436E+00	1.14	3.18	1.59	-.42	1.07	-1.61	.51	-1.33	.44	-3.44	.08	-3.38	.47	2.67	.52	-1.35	.81	-.57
8.372096E+00	.86	3.82	1.58	-2.20	2.21	-1.82	.31	-2.56	.42	4.16	.36	.18	.68	-3.67	.62	3.58	1.54	-4.17
8.181826E+00	1.91	-2.13	2.59	2.15	2.14	1.93	1.30	.85	.50	2.56	.51	-4.00	.49	-.52	.48	-3.31	1.14	-1.66
8.000006E+00	2.15	-2.19	1.26	3.57	3.87	2.24	2.38	2.68	1.39	-.19	.38	-1.22	1.19	-1.56	1.07	1.79	1.45	1.83
7.826096E+00	.45	1.81	.47	-1.04	1.89	-.41	.65	-1.32	.13	-.91	.16	2.39	.78	2.82	.42	2.56	1.29	-2.42
7.659576E+00	1.34	-1.15	1.27	-2.70	1.09	-.40	1.92	.80	.23	.04	.33	.50	.81	-3.17	.89	1.16	.92	.86
7.500006E+00	1.91	-1.16	.33	-2.46	.92	-3.53	1.29	3.33	.46	.65	.19	-3.65	.31	.85	1.05	-1.02	.89	2.62
7.346946E+00	.36	3.54	.72	3.28	2.17	-2.39	1.02	-1.43	.89	-1.86	.38	-2.69	.24	-3.64	.28	2.50	1.16	.14
7.200006E+00	1.34	3.57	1.19	-1.15	1.19	-2.29	1.30	3.80	2.04	1.80	.32	2.11	.45	2.00	1.00	-2.04	.89	-3.45

FOURIER COEFFICIENTS FOR PORT SUSAN - ROCAINGS E, W, AND N

U-COMPONENTS

	E - 3 M		E - 10 M		W - 10 M		N - 3 M		N - 10 M	
HRS	AMP	PHASE	AMP	PHASE	AMP	PHASE	AMP	PHASE	AMP	PHASE
3.60000E+02	1.66	92.91	2.07	71.39	1.98	15.23	3.85	-139.45	1.06	-178.14
1.80000E+02	3.89	42.79	3.43	28.98	2.32	-8.91	2.31	72.67	1.77	-36.56
1.20000E+02	2.62	6.22	3.10	-20.83	1.48	-46.95	2.73	31.66	2.16	-33.48
9.00000E+01	1.99	-17.62	3.56	-39.23	3.12	44.46	2.80	4.28	2.13	-38.07
7.20000E+01	2.88	24.15	2.54	15.47	2.15	17.75	1.48	-34.19	.94	19.08
6.00000E+01	4.07	-1.58	2.88	-17.20	.78	-8.33	2.09	8.63	.78	-16.77
5.14286E+01	3.58	11.55	1.73	-4.04	1.03	16.08	.87	18.59	.96	-4.32
4.50000E+01	5.42	-9.68	2.01	21.84	1.87	-20.59	2.37	-3.36	1.88	-20.84
4.00000E+01	2.18	7.69	.38	2.45	.97	13.12	1.17	18.21	1.09	-2.23
3.60000E+01	3.93	-11.75	2.52	-13.74	1.66	-16.72	1.79	5.38	1.59	-3.56
3.27273E+01	2.14	-6.88	.97	-9.16	1.74	-11.48	1.46	-3.33	.65	-3.89
3.00000E+01	3.15	-6.98	2.40	-5.06	.33	-14.72	1.64	.92	.37	2.16
2.76923E+01	1.29	-12.23	.65	6.26	3.84	13.84	2.71	-6.03	1.13	-3.61
2.57143E+01	2.81	-7.40	1.10	7.59	3.39	-8.00	2.11	12.53	1.58	10.12
2.40000E+01	12.28	5.92	3.58	9.38	.31	-3.53	3.34	-11.15	2.63	-10.63
2.25000E+01	3.50	-4.45	1.10	-.56	1.68	-2.10	2.19	1.32	.60	2.54
2.11765E+01	3.58	-4.54	.36	-.62	1.25	-2.96	.31	10.33	.78	-2.55
2.00000E+01	3.29	-8.50	.75	-5.07	1.68	-7.85	1.20	-4.55	.67	-7.72
1.89474E+01	.67	-2.45	.12	5.21	.78	-4.54	.62	7.52	.57	9.45
1.80000E+01	.72	-5.89	.54	-4.41	1.55	-8.88	1.34	-2.88	1.19	2.87
1.71429E+01	1.21	-6.56	1.13	5.85	.73	1.81	1.79	-6.22	.53	-7.84
1.63636E+01	3.41	5.58	.77	-3.71	1.53	-6.96	1.49	-3.51	.38	6.28
1.56522E+01	3.77	.58	1.07	1.23	1.94	-3.15	2.35	-6.58	1.36	-2.37
1.50000E+01	1.83	-6.32	.76	-3.33	2.61	6.38	2.76	-6.09	.84	-5.75
1.44000E+01	1.49	1.23	.26	.79	.73	2.00	2.20	6.59	.72	3.81
1.38462E+01	4.89	1.97	.43	2.63	1.51	-1.43	1.58	5.17	.34	-3.82
1.33333E+01	1.12	-.66	2.12	-.55	.48	4.19	2.84	-6.56	1.29	-3.67
1.28571E+01	2.69	-2.69	3.13	5.65	4.91	5.37	2.32	.15	2.21	-.34
1.24138E+01	6.24	1.10	6.21	-1.18	8.11	-1.31	5.94	-5.77	2.98	5.02
1.20000E+01	5.41	4.71	1.63	5.06	2.68	-4.31	.55	-2.24	1.51	-3.61
1.16129E+01	3.43	.30	1.53	4.12	.64	-2.34	1.38	4.90	1.36	5.25
1.12500E+01	1.19	-.73	1.35	5.52	.85	-3.92	1.22	3.53	1.42	-3.56
1.09091E+01	1.67	3.03	1.38	3.23	.87	3.73	.42	2.38	1.25	4.29
1.05882E+01	1.45	.24	.52	2.00	1.17	1.09	1.80	-3.43	.54	4.69
1.02857E+01	1.43	-5.14	.39	-1.48	1.18	4.09	1.07	3.87	1.82	4.77
1.00000E+01	1.79	-4.10	.40	-1.92	.37	-3.68	1.31	4.36	1.45	-1.66
9.72973E+00	1.66	3.58	1.40	-4.39	.94	4.35	1.55	.92	.89	4.34
9.47368E+00	3.47	-.52	.55	1.70	.64	1.73	1.90	-3.61	1.00	.46
9.23077E+00	3.88	-3.27	1.10	4.46	1.61	.88	.30	-2.44	1.07	.04
9.00000E+00	1.11	-2.74	.91	-4.20	1.37	1.42	1.58	2.84	.33	-2.64
8.78049E+00	3.73	-.17	.51	1.16	.16	-3.74	1.03	.38	1.02	1.21
8.57143E+00	1.38	-2.74	.48	-.81	1.90	-.75	1.32	-4.25	.14	3.11
8.37209E+00	1.70	.06	1.80	1.60	3.07	1.99	1.80	.08	.99	.72
8.18182E+00	1.85	-3.67	1.49	3.28	1.48	3.89	.35	-2.81	1.55	2.95
8.00000E+00	1.39	-2.75	1.19	-2.27	.78	3.48	.54	1.56	1.30	2.33
7.82609E+00	1.72	-2.47	.39	3.23	1.27	2.63	.91	1.93	.79	.04
7.65957E+00	1.94	.95	.35	2.34	.77	.56	2.28	.25	.89	-1.21
7.50000E+00	.82	.67	.44	2.53	.62	1.06	.26	-.77	.82	-2.36
7.34694E+00	1.42	-2.23	.76	.51	1.23	.60	.81	-.89	.64	-2.99
7.20000E+00	.52	-1.60	1.18	-.50	.31	-1.65	1.80	.89	.33	-.89

(CONTINUED) FOURIER COEFFICIENTS FOR PORT SUSAN - MOORINGS E, W, AND N

N-COMPONENTS

	E - 3 M		E - 18 M		W - 18 M		N - 3 M		N - 18 M	
HRS	AMP	PHASE	AMP	PHASE	AMP	PHASE	AMP	PHASE	AMP	PHASE
3.600000E+02	1.86	146.91	1.68	8.69	.26	-36.32	.68	72.13	.93	-115.59
1.800000E+02	2.31	40.13	1.46	28.84	.26	24.51	.49	68.75	.84	78.13
1.200000E+02	.98	5.84	1.02	41.81	.22	93.34	1.15	-11.24	.37	88.74
9.000000E+01	2.99	32.46	.93	24.78	.14	8.74	1.04	-37.27	.97	-2.55
7.200000E+01	1.37	11.13	.47	11.18	.35	-6.78	1.18	15.64	.36	12.11
6.000000E+01	.51	-7.58	.71	-20.76	.28	-14.81	1.16	-6.60	.42	-18.35
5.142856E+01	2.17	-8.78	.88	-22.51	.60	-8.02	.56	-15.64	.99	5.88
4.500000E+01	1.38	19.02	.44	18.90	.58	14.57	.92	-9.47	.61	15.04
4.000000E+01	1.43	-1.73	.56	14.14	.48	19.88	.49	14.06	.43	5.84
3.600000E+01	.32	11.28	.61	12.28	.39	-8.68	1.47	-7.78	.69	-2.91
3.272728E+01	1.45	-9.58	.27	18.88	.38	-13.85	2.81	-12.63	.68	5.21
3.000000E+01	1.66	-8.82	1.14	-8.36	.38	-9.51	.79	11.58	.21	-13.60
2.769230E+01	2.25	9.61	.96	-6.85	.27	3.64	1.34	-13.20	.78	11.06
2.571430E+01	1.58	7.26	.77	4.47	.58	9.87	1.84	.78	1.17	9.27
2.400000E+01	3.38	.69	.86	-5.44	.41	.11	1.24	-9.59	1.28	3.43
2.250000E+01	1.36	-2.25	.46	1.82	.47	.36	.83	-.81	.69	-.58
2.117650E+01	.74	8.26	1.83	1.48	.46	-9.16	.89	-7.81	.29	-6.38
2.000000E+01	.66	9.33	.90	-6.65	.38	-9.95	1.01	-4.94	.13	3.24
1.894740E+01	1.79	7.94	1.11	-3.58	.17	7.41	1.88	-7.87	.73	-1.87
1.800000E+01	.84	-6.44	.34	-8.67	.24	-.11	.26	6.24	.22	-2.11
1.714290E+01	1.89	-8.16	.86	-4.64	.41	-2.71	1.33	-8.36	.58	3.06
1.636360E+01	1.41	-3.22	.35	1.63	.36	-8.18	.76	7.73	.74	-7.63
1.563220E+01	.88	4.95	.29	5.73	.42	-6.11	1.28	5.16	1.14	-4.48
1.500000E+01	1.52	1.43	.53	-4.11	.61	-5.10	.48	2.58	.81	5.70
1.440000E+01	.95	1.28	.07	-6.86	.46	-7.19	.45	6.53	1.64	-.79
1.384620E+01	1.78	-1.47	.71	3.58	.25	-.66	1.88	.17	.75	-6.36
1.333330E+01	1.32	-.77	.48	-4.43	.34	-.28	.98	-6.19	.18	-1.27
1.285710E+01	.79	9.38	.25	.31	.38	6.11	1.22	-1.52	1.19	-3.58
1.241380E+01	1.34	-.18	1.87	4.64	.66	4.98	2.14	4.83	1.49	-3.88
1.200000E+01	1.76	3.54	.62	1.65	.81	3.81	1.70	.88	1.65	5.54
1.161290E+01	1.42	-1.49	.38	1.98	.32	-1.23	.66	4.71	.91	2.36
1.125000E+01	1.66	-3.58	1.11	1.59	.51	3.71	1.23	.44	2.88	-5.49
1.090910E+01	1.81	2.93	.84	1.97	.95	5.45	.43	3.85	.81	8.15
1.058820E+01	.98	4.96	.39	-3.43	.54	-3.82	.94	-.71	1.38	2.47
1.028570E+01	.93	.77	.26	-1.37	.42	1.48	.87	-4.54	1.88	2.17
1.000000E+01	.82	-.23	.34	-.99	.59	-1.43	1.55	1.37	1.44	-3.68
9.729730E+00	1.52	.21	.33	1.28	.48	-2.82	.73	-2.63	1.36	2.78
9.473680E+00	1.49	-4.28	.37	4.78	.25	-4.73	.59	.25	.59	.87
9.230770E+00	.29	3.78	1.44	1.47	.95	-.51	.74	-3.27	.78	-1.34
9.000000E+00	1.72	2.48	.94	-2.9	.68	1.12	.78	1.28	.99	3.81
8.780490E+00	2.13	-2.61	.99	4.	.31	2.84	.27	3.38	.37	-2.61
8.571430E+00	2.17	2.22	.58	-1	.25	-3.58	1.24	.67	.68	-.54
8.372090E+00	1.90	-1.46	.37	1.26	.38	.25	.81	-1.31	1.03	.54
8.181820E+00	2.49	3.93	.28	3.34	.65	3.68	1.24	.89	.52	-1.09
8.000000E+00	1.97	-2.69	.91	-3.34	.87	-2.84	.41	.88	.94	.74
7.826089E+00	1.56	.62	.42	1.92	.45	.79	.68	-.71	.71	-3.18
7.659570E+00	2.10	-1.49	.14	1.98	.23	.64	1.17	-1.25	.75	3.23
7.500000E+00	.57	-.52	.73	-1.27	.49	-2.34	.67	-2.56	.82	2.44
7.346940E+00	1.62	3.88	.24	.74	.23	-3.53	.23	3.57	.88	.76
7.200000E+00	1.68	.74	.81	-3.10	.66	2.26	1.85	-.98	.34	.27

5.2 Mooring SA

Direction Histograms

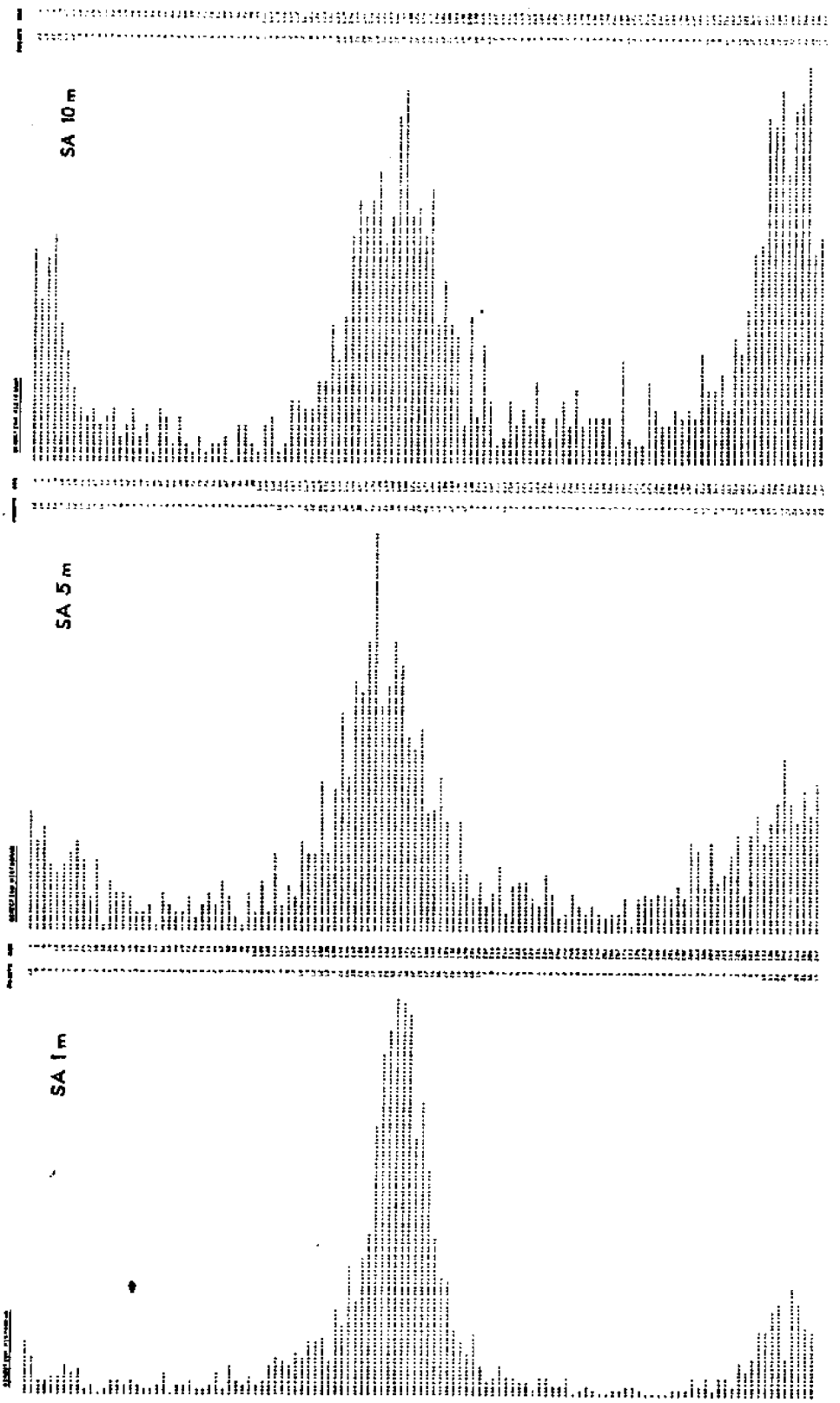
Histograms of Speed

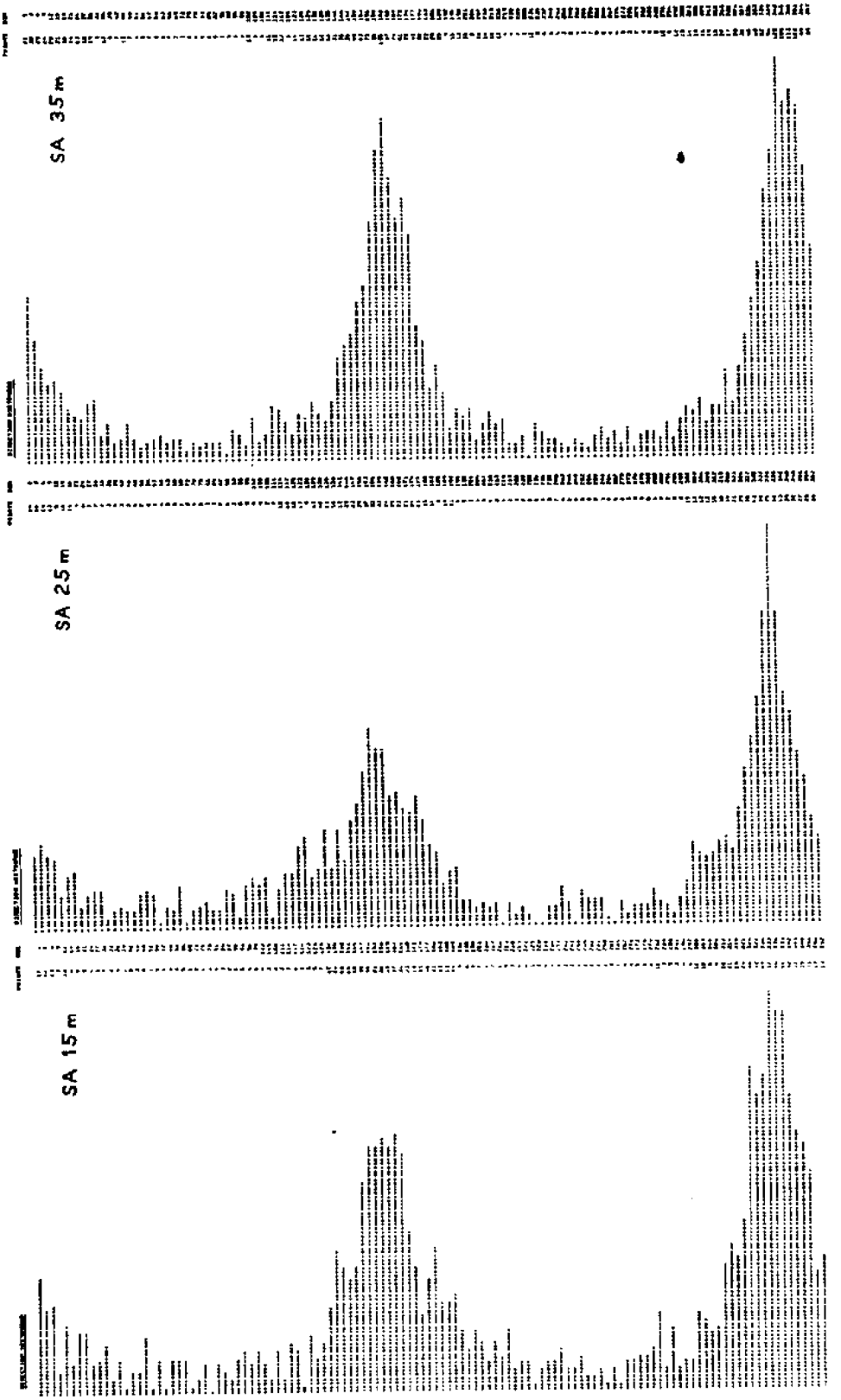
Progressive Vector Diagrams

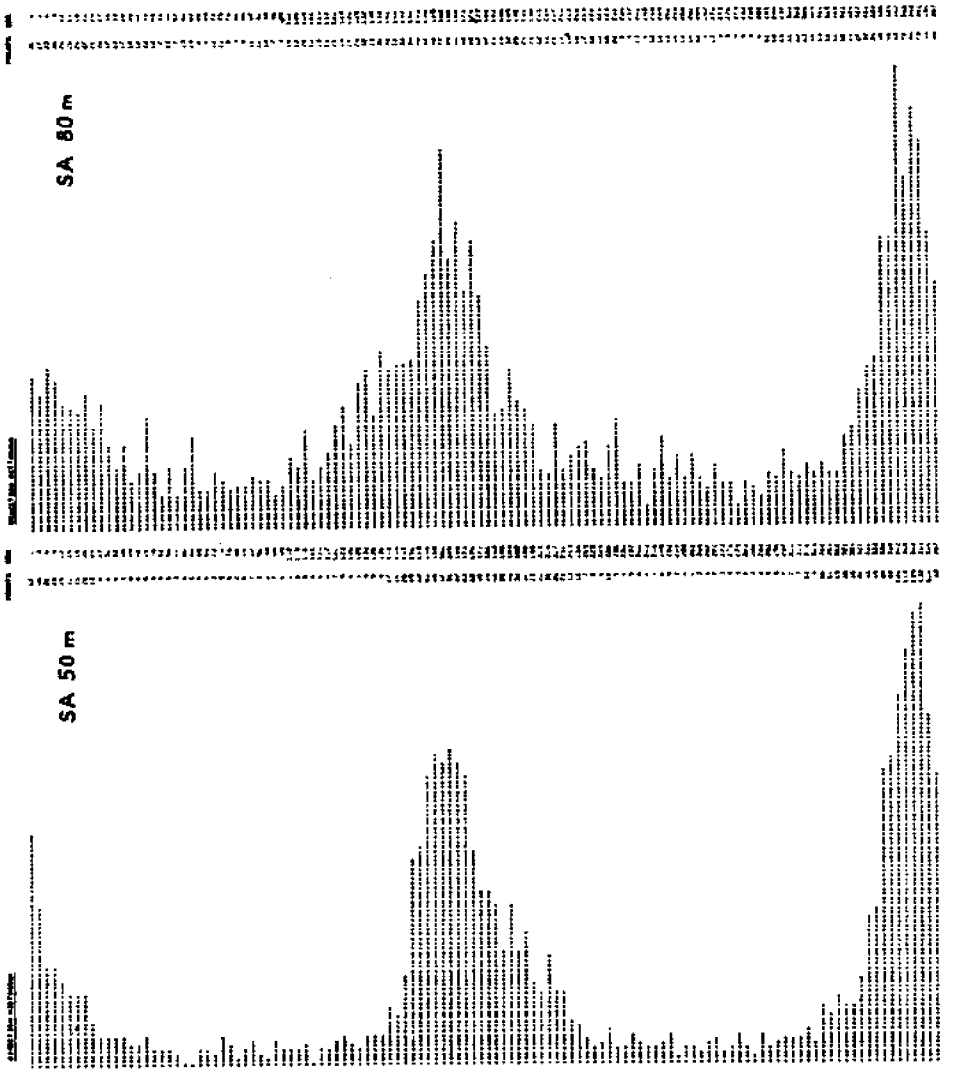
Time Series

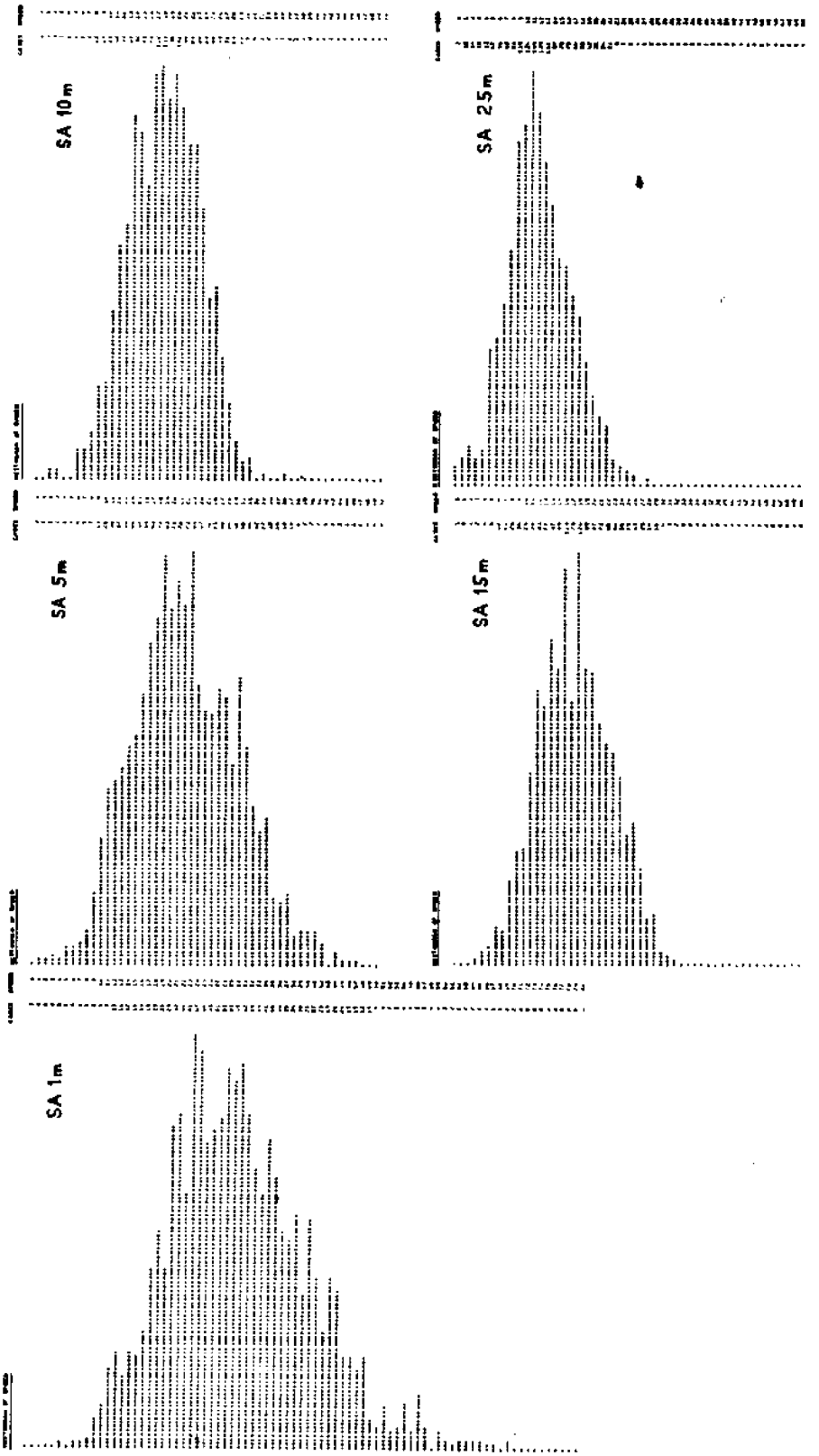
Fourier Coefficients

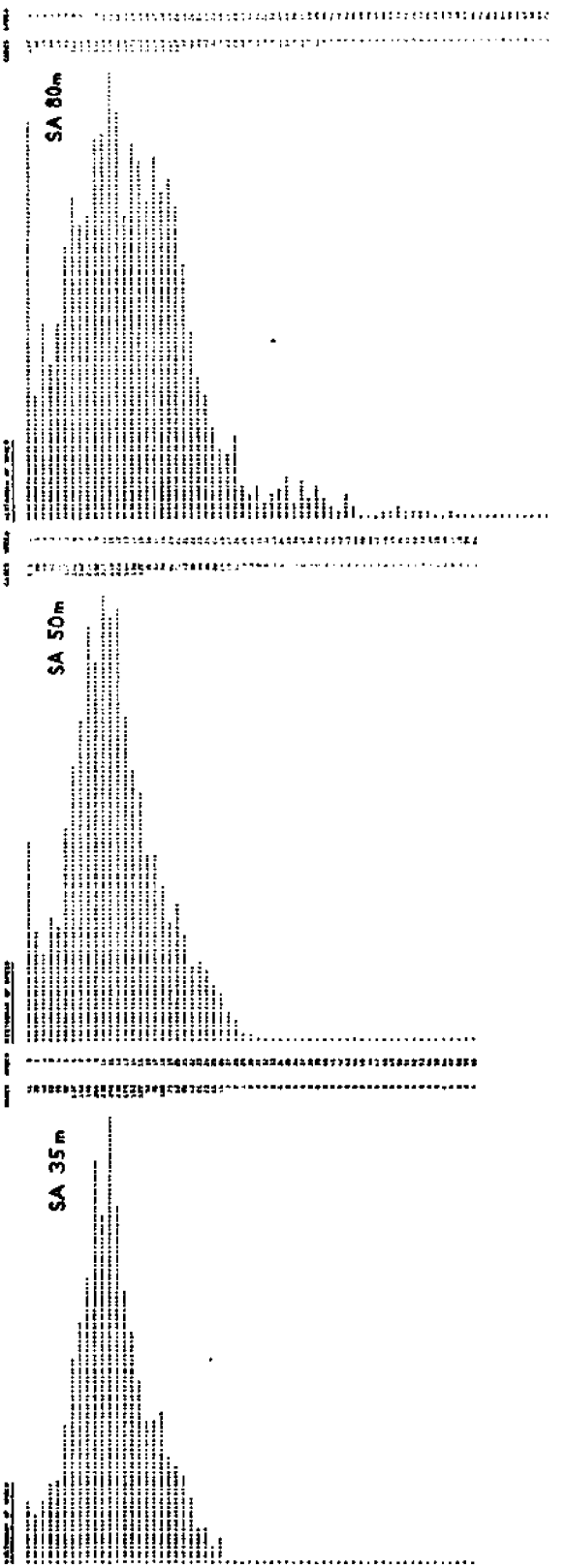
(See section 2 for complete description.)

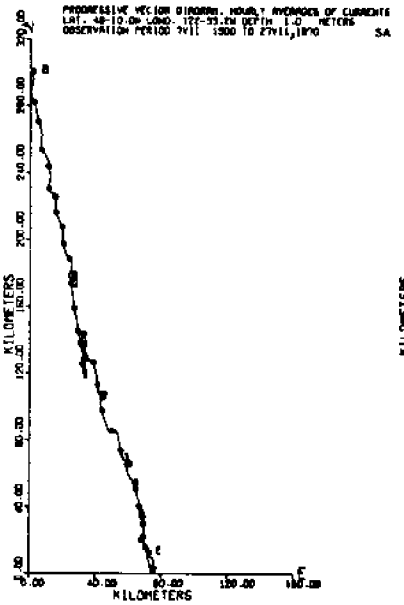

SA 10 m
SA 5 m
SA 1 m

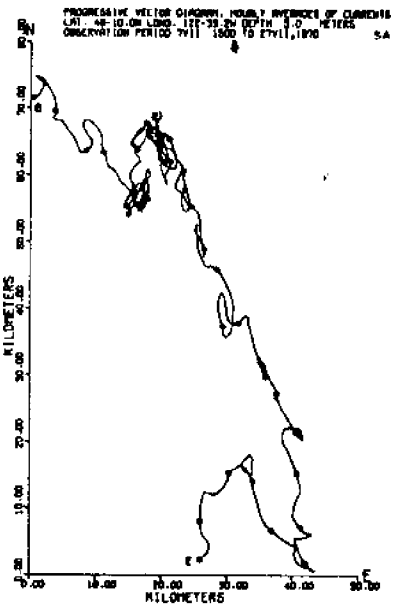

SA 35 m
SA 25 m
SA 15 m

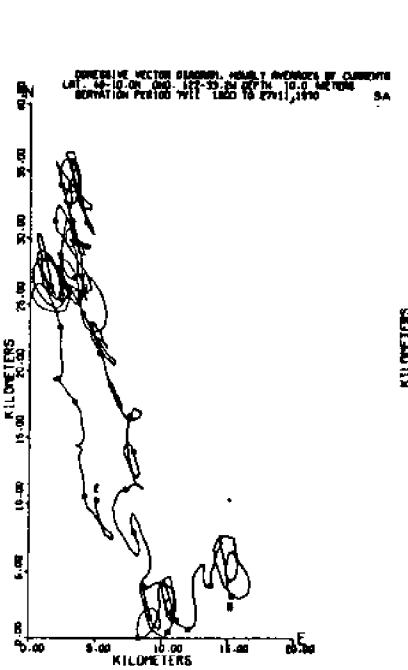

SA 80 m
SA 50 m

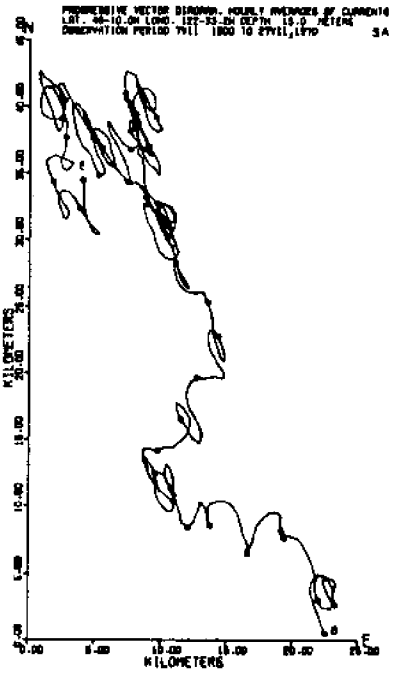

SA 10m
SA 25m
SA 5m
SA 15m
SA 1m

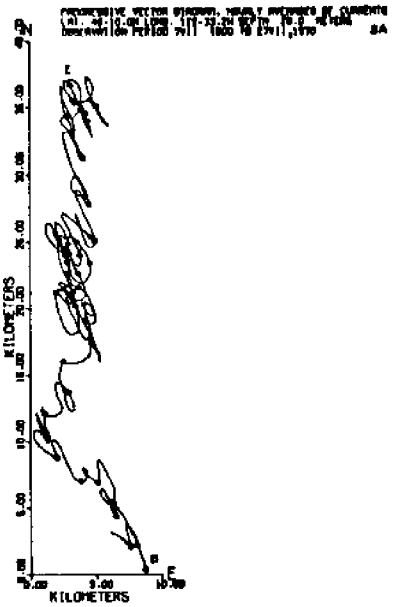

SA 80m
SA 50m
SA 35m

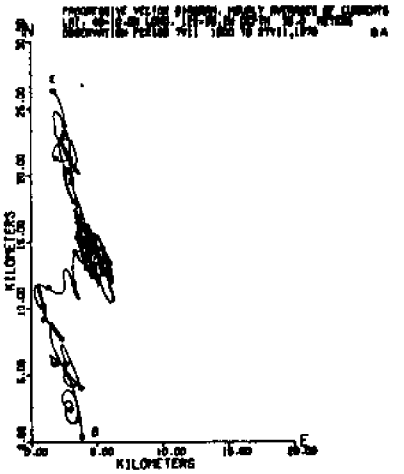

KILOMETERS
KILOMETERS

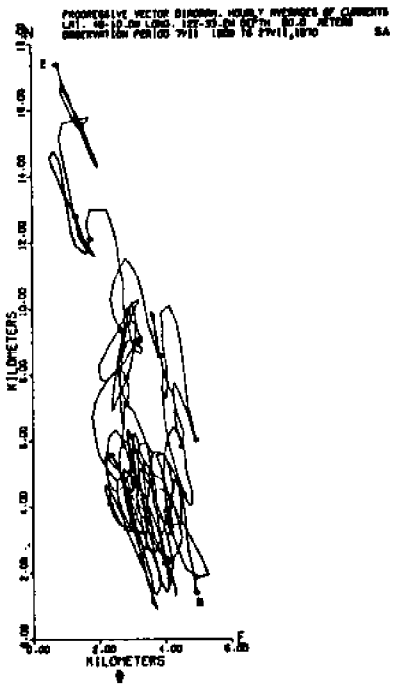

KILOMETERS
KILOMETERS

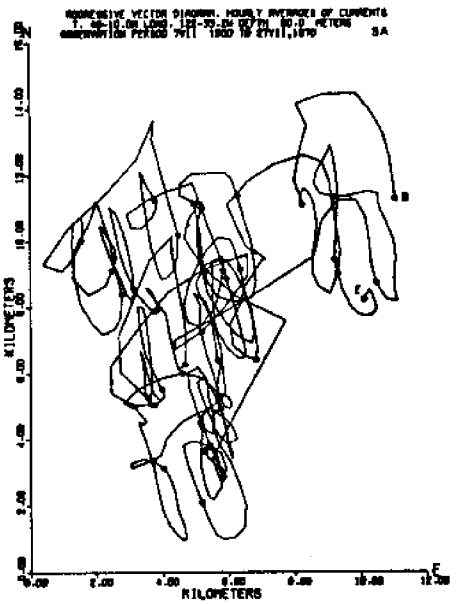

KILOMETERS
KILOMETERS

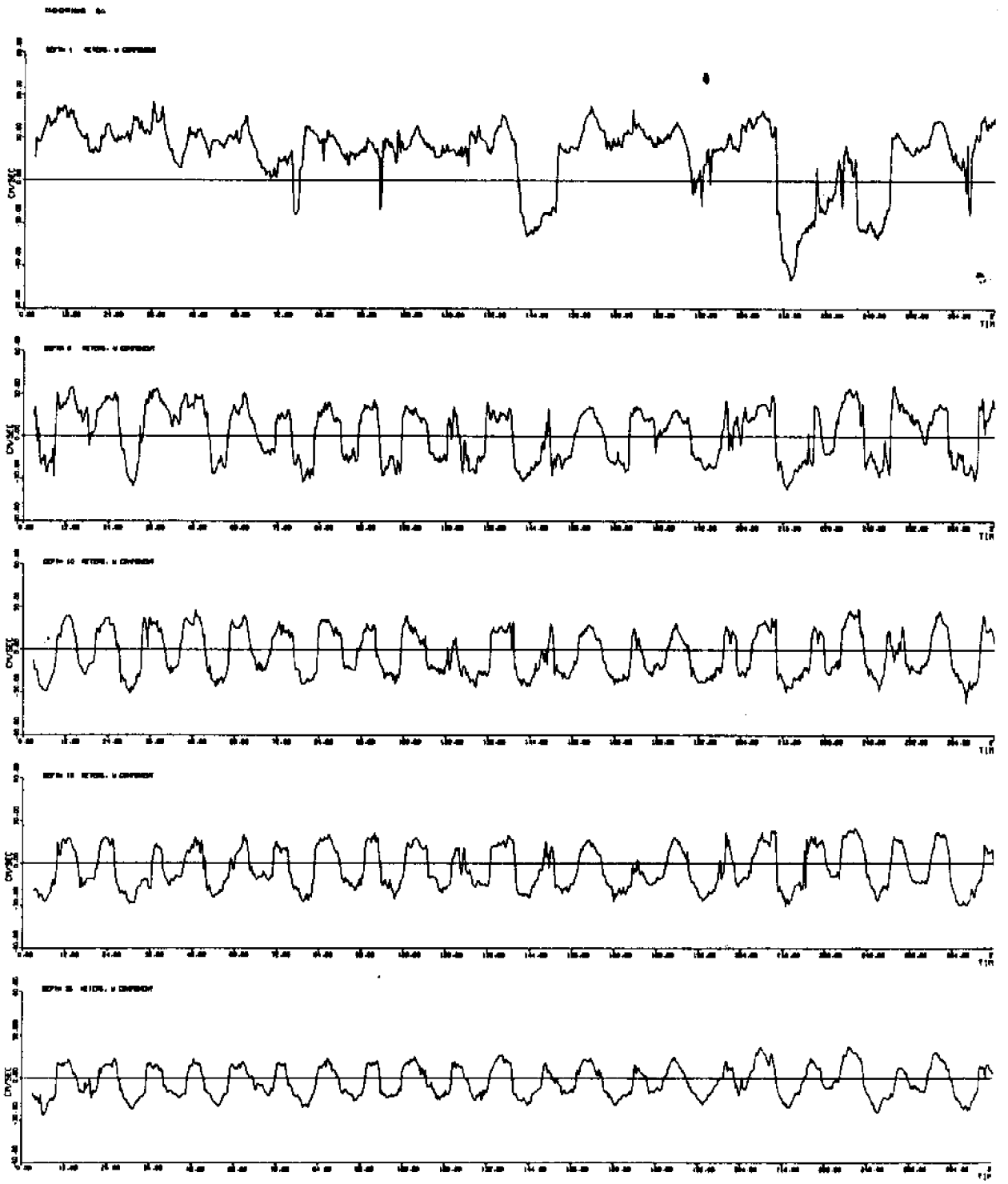

KILOMETERS
KILOMETERS

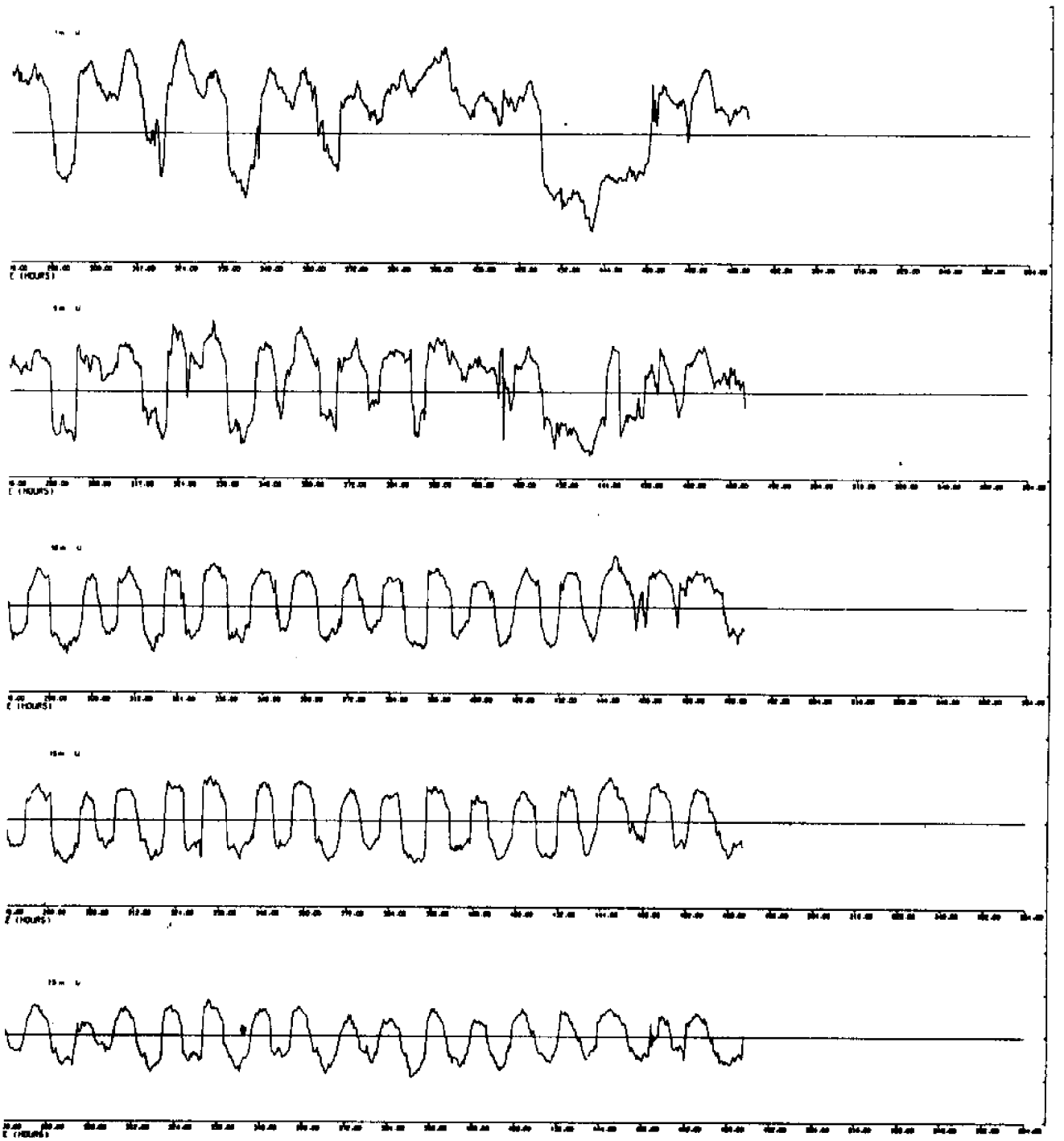

KILOMETERS
KILOMETERS

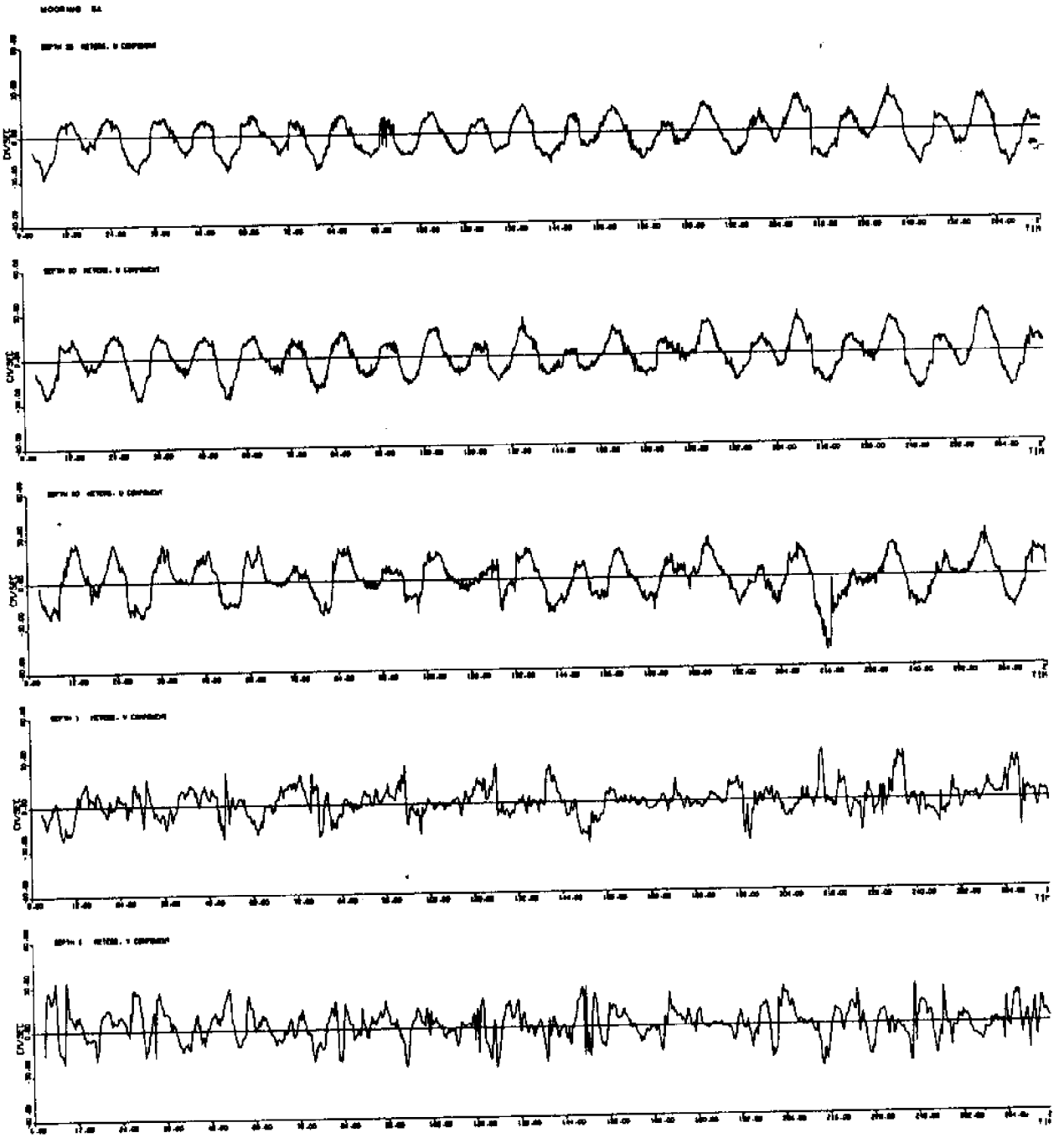

KILOMETERS
KILOMETERS

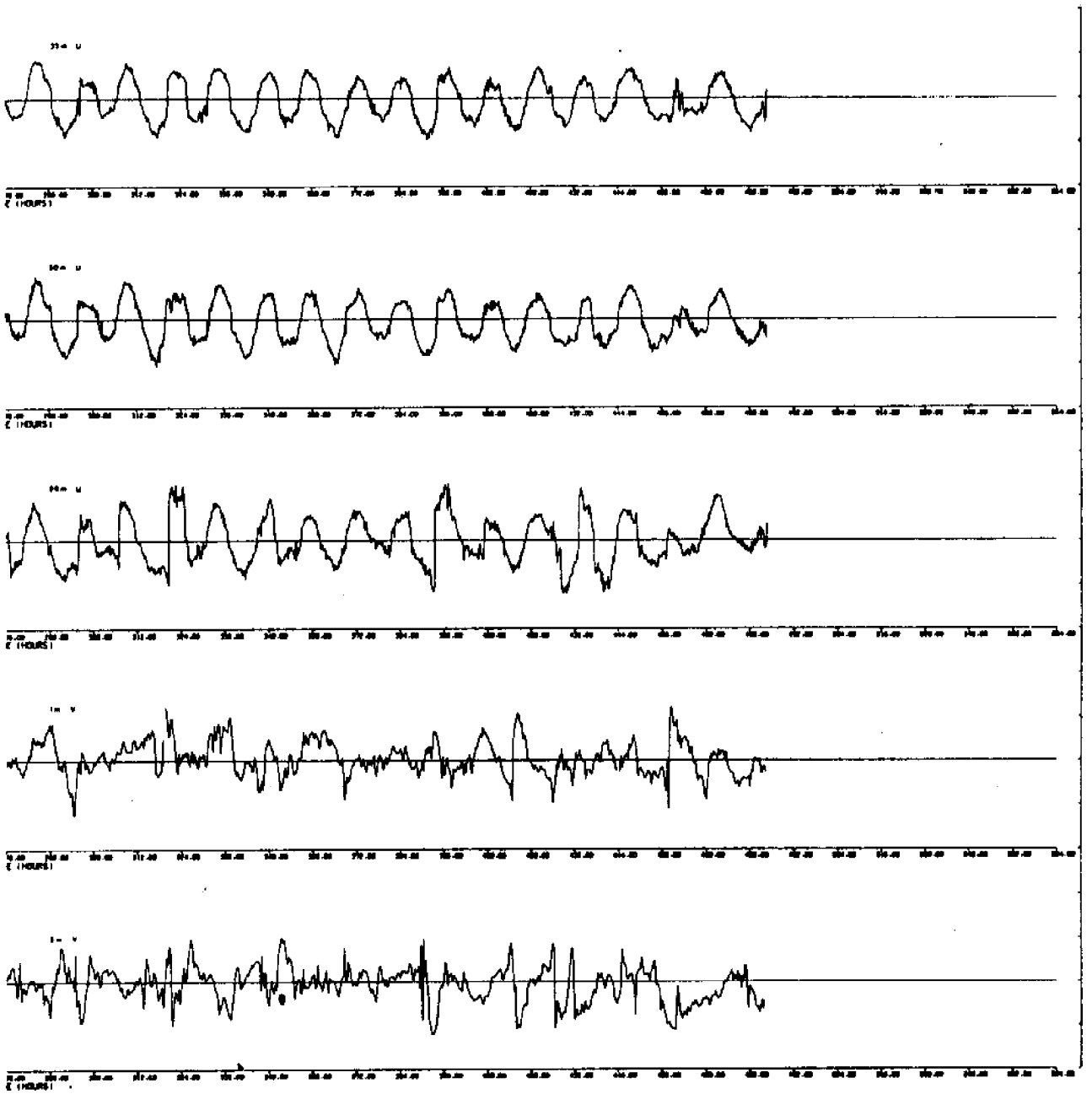

KILOMETERS
KILOMETERS

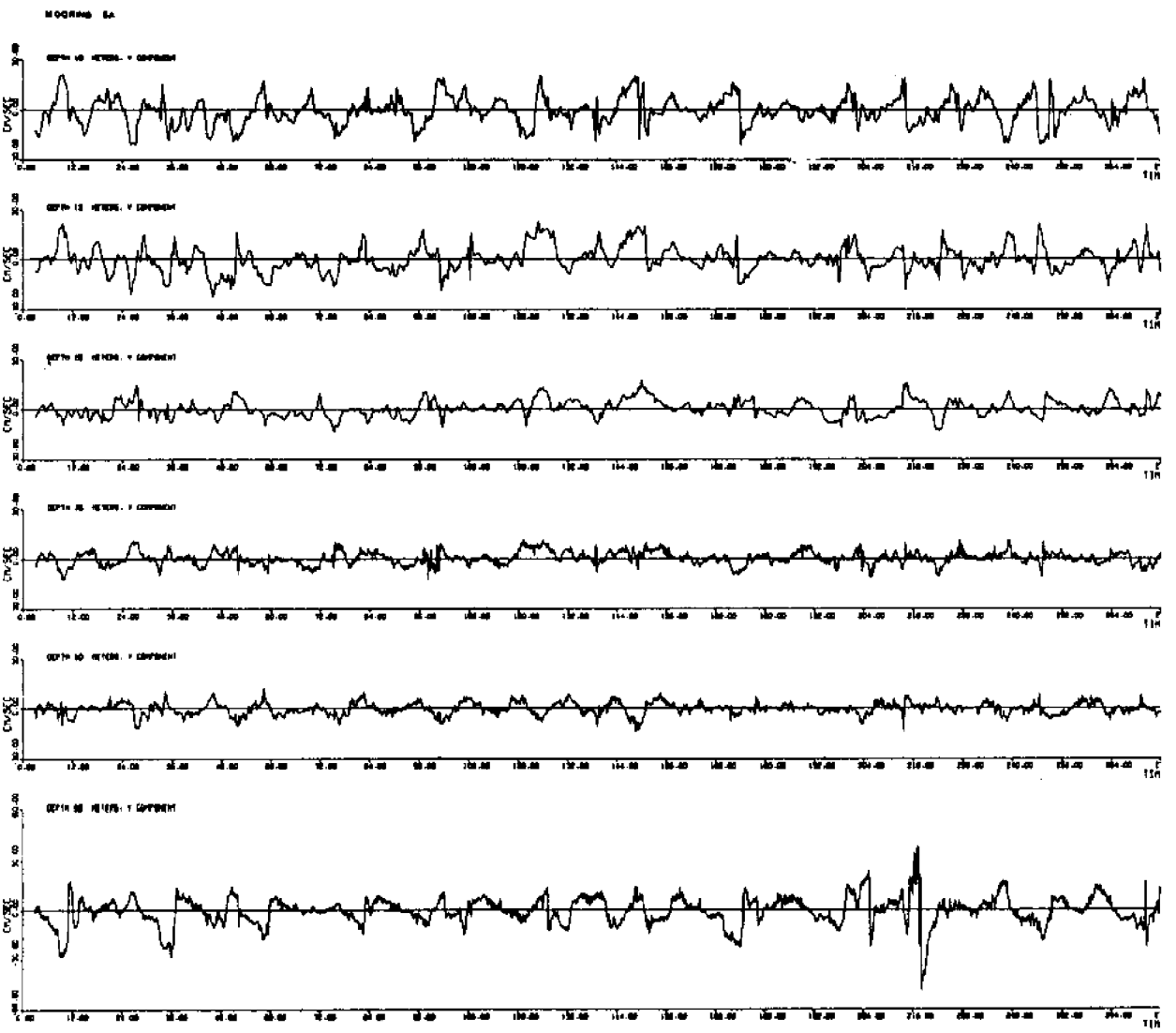

KILOMETERS
KILOMETERS

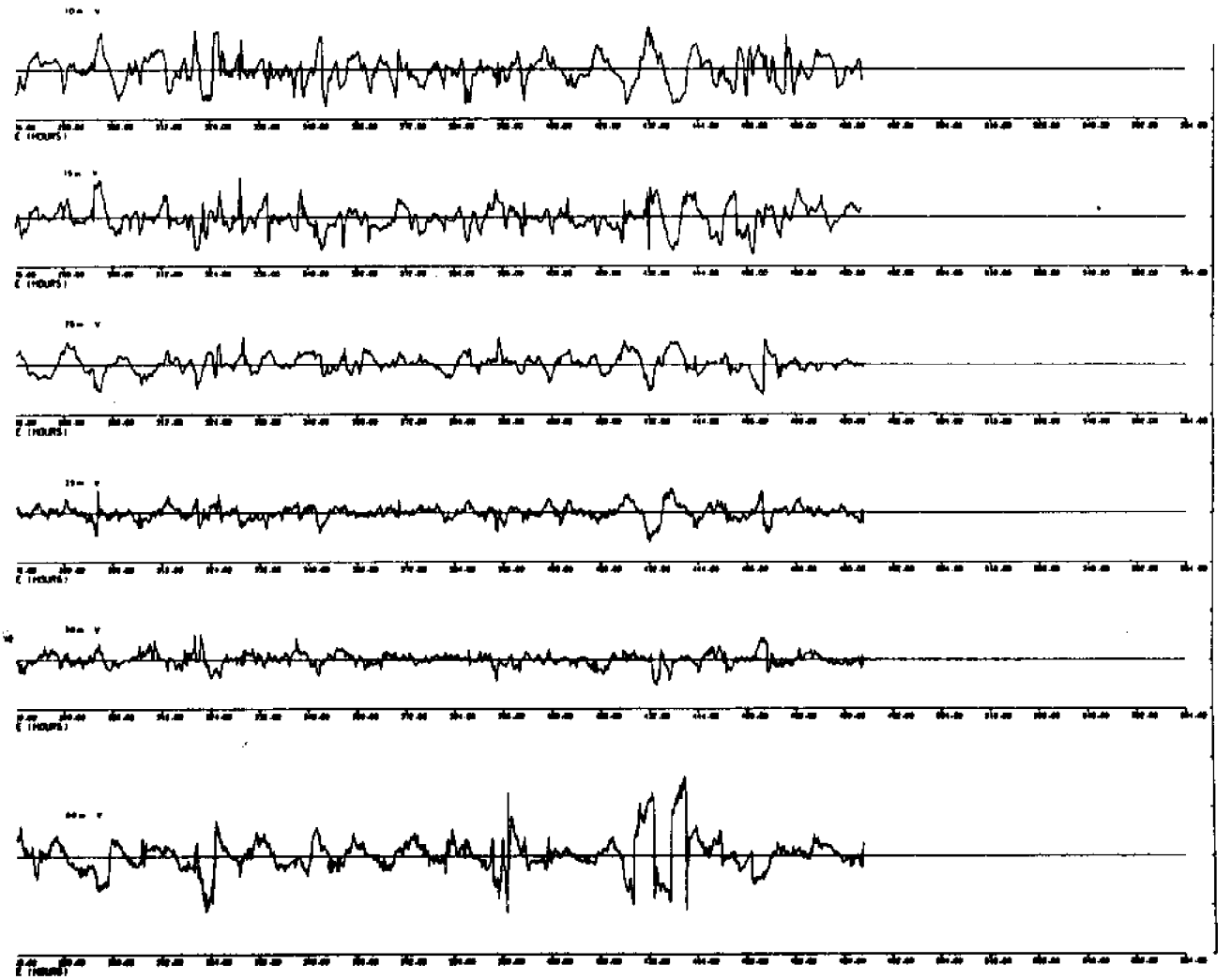












FOURIER COEFFICIENTS FOR SARATOGA PASSAGE - MOORING SA

U-COMPONENTS

	1 M		5 M		10 M		15 M		25 M		35 M		50 M		68 M	
HRS	AMP	PHASE	AMP	PHASE	AMP	PHASE	AMP	PHASE	AMP	PHASE	AMP	PHASE	AMP	PHASE	AMP	PHASE
3.600000E+00	8.99	62.22	7.54	-21.97	3.90	6.91	1.77	-37.91	1.18	-92.36	1.40	-117.48	1.10	-145.07	2.09	45.20
1.200000E+02	4.14	-30.49	2.44	11.62	1.13	32.14	.30	-43.88	.35	-26.20	.47	6.84	.30	37.84	.51	-83.82
1.200000E+02	8.54	43.63	1.01	52.86	1.71	-26.63	3.21	-19.44	1.01	-23.59	.46	-38.64	.64	58.48	1.08	33.36
9.000000E+01	9.88	6.64	.59	18.85	1.31	-24.56	1.35	-35.59	.66	33.28	.75	37.88	.25	17.63	1.45	-18.44
7.200000E+01	8.57	-34.90	2.99	31.37	.49	25.88	.98	6.65	.60	-6.14	.38	-9.61	.64	35.40	2.94	35.89
6.000000E+01	4.86	10.92	1.65	-4.34	.88	-18.77	1.06	-6.38	.56	-16.13	.29	-3.90	.15	6.13	1.23	6.18
5.142857E+01	6.74	4.42	.87	-.55	.91	-6.08	.19	-15.40	.52	18.46	.36	18.84	.59	16.17	.68	18.61
4.500000E+01	3.06	-11.19	1.44	4.29	.47	8.49	1.38	7.89	.47	14.47	.58	16.21	.13	-1.45	.95	3.40
4.000000E+01	7.63	2.28	3.49	3.28	.56	-5.05	.82	4.21	.38	-13.61	.33	-6.95	.51	-18.99	.36	4.95
3.600000E+01	4.78	-15.46	1.28	-18.91	1.18	-14.71	.26	-17.97	.43	-14.59	.43	11.17	.33	9.57	.88	13.23
3.272727E+01	4.99	-.48	2.11	5.26	.93	7.23	.42	-14.48	.37	-5.85	.28	-9.76	.25	6.48	.26	4.37
3.000000E+01	2.95	-3.72	1.84	-1.36	.61	-13.79	.78	12.34	.42	-14.98	.34	13.59	.75	14.63	.25	-13.47
2.769231E+01	3.06	-3.99	1.29	-7.76	.93	12.17	.32	-13.66	.84	9.48	1.48	10.68	1.19	7.44	1.69	9.58
2.571429E+01	7.38	-3.54	7.00	-3.59	2.81	-2.67	3.64	-2.63	3.39	-2.19	3.56	-2.78	3.12	-2.80	2.90	-4.61
2.400000E+01	16.18	11.78	14.11	-18.36	8.34	-9.36	8.24	-9.33	6.09	-9.84	6.65	-9.88	6.57	-9.74	8.85	-10.75
2.250000E+01	3.62	5.69	.76	-2.42	1.86	-2.42	1.21	-2.51	.32	-5.86	.85	-6.18	1.82	-1.75	.93	-2.12
2.117647E+01	2.83	8.94	.28	-3.28	.99	4.74	.34	18.43	.32	3.84	.44	-.39	.33	2.67	.85	-2.15
2.000000E+01	3.65	8.14	.84	-7.04	.25	-4.61	1.46	2.19	.24	1.77	.64	.66	.73	-.18	1.02	5.59
1.894737E+01	2.39	1.69	1.62	1.23	.85	-4.45	.42	-4.11	.18	5.13	.47	-2.08	.49	.53	1.03	-.71
1.800000E+01	4.99	7.77	1.01	5.87	.75	8.11	.75	-8.96	.35	-5.58	.31	-2.66	.15	-8.32	.89	.72
1.714286E+01	1.91	2.93	.68	2.99	.41	4.71	.63	-7.52	.58	-5.48	.29	-3.51	.28	-2.71	.55	-2.98
1.636364E+01	2.08	-.03	1.55	-1.87	.41	2.98	.66	-.39	.51	6.85	.44	3.78	.16	-6.27	.56	-6.18
1.565522E+01	.81	-5.39	1.58	-1.19	.56	3.62	1.24	3.83	.86	4.23	.45	2.15	.81	3.97	1.18	3.13
1.500000E+01	1.09	2.79	1.94	-6.43	1.44	-.81	.40	-5.13	.36	-1.82	.39	-.69	.49	3.91	1.07	-3.24
1.440000E+01	3.29	4.82	1.75	1.01	1.28	-.46	.64	-3.09	.59	2.61	.43	3.31	.34	-.46	.61	4.76
1.384615E+01	1.78	.56	.95	-6.04	.91	4.99	1.66	-.19	1.06	-1.35	.16	-2.68	.52	-.33	.37	-3.93
1.333333E+01	1.97	1.33	1.48	-1.25	.85	.82	1.34	.79	.95	-.66	.81	-1.23	.70	.55	1.15	1.35
1.285714E+01	4.42	-.31	1.86	6.85	.84	4.32	.44	3.63	.42	-.61	1.34	-.84	1.43	.83	1.78	-2.84
1.241379E+01	11.18	-3.23	17.19	-3.14	10.67	-3.18	17.95	-2.87	13.83	-2.82	14.81	-2.97	14.80	-3.15	14.16	-3.80
1.200000E+01	4.24	-5.73	5.26	-3.64	4.27	-3.73	4.62	-3.97	2.91	-3.53	2.46	-4.41	4.08	-3.59	2.59	-4.21
1.161290E+01	1.56	-3.58	1.52	1.24	.93	-3.13	1.10	5.73	.57	-5.09	.96	4.41	.48	2.36	1.48	-3.65
1.125000E+01	1.26	2.89	1.71	-5.11	.83	-4.66	1.48	-2.89	.71	-4.46	.69	-4.64	.66	-4.68	.54	2.68
1.090891E+01	1.48	3.85	.57	-4.26	.27	4.48	.75	5.14	.48	3.38	.41	5.17	.41	1.38	.15	-1.23
1.058462E+01	1.17	-4.69	.36	.82	1.67	-.84	.39	-2.71	.68	4.61	.51	-4.46	.54	4.41	.89	2.28
1.028657E+01	1.39	4.88	.72	3.24	1.81	1.42	.88	-1.22	.36	3.81	.32	1.68	.29	-4.71	1.49	1.41
1.000000E+01	.44	1.87	1.23	2.80	.58	-.93	1.02	-2.65	.15	-2.39	.35	-2.76	.54	4.92	.69	.43
9.729730E+00	.32	-2.86	.56	1.59	1.68	-1.56	.75	-1.18	.84	-2.55	.51	-3.35	.46	4.23	.63	-.56
9.473684E+00	1.17	1.18	.24	3.59	.94	-2.88	.38	-1.65	.35	-2.55	.56	-1.47	.33	-1.56	.62	-2.87
9.230677E+00	2.11	-3.12	1.26	-3.84	1.48	4.81	.93	-2.88	.68	-3.39	.31	-2.82	.79	-4.39	.29	3.89
9.000000E+00	.86	-3.74	1.05	4.12	1.81	.31	.93	-1.18	.28	-2.67	.89	.88	.41	.24	.29	.48
8.780049E+00	.72	.86	1.78	-4.34	1.86	-3.16	.86	-3.88	.38	-3.39	.48	4.13	.43	-4.16	.32	-4.88
8.571429E+00	1.38	3.56	.75	1.43	.74	.71	1.48	3.28	.74	2.82	.67	2.90	.95	.99	1.23	3.48
8.372093E+00	2.15	1.72	.98	3.62	1.30	-3.65	2.62	3.88	1.66	-3.62	1.40	-3.79	1.14	-2.87	1.88	-4.89
8.181822E+00	3.15	3.96	.41	.41	1.84	2.18	1.57	2.63	.79	4.51	.97	1.85	.62	.79	2.21	1.88
8.000000E+00	1.91	-2.73	2.32	.23	1.28	.54	.95	1.11	.77	.85	.63	.88	.87	.13	1.38	1.38
7.826087E+00	.45	2.38	1.48	.80	.26	-.76	.14	2.23	.41	1.38	.24	.98	.23	1.11	.98	-1.26
7.659574E+00	1.18	1.52	.72	1.38	.41	-2.66	.83	-2.19	.23	-3.84	.16	3.58	.11	-.61	.42	-3.16
7.500000E+00	.91	-1.13	.85	-.56	.62	-2.87	.15	-.62	.58	1.11	.22	-2.67	.32	2.78	.68	-.87
7.346939E+00	1.45	-4.37	.68	2.68	.82	1.91	.36	1.17	.29	2.42	.19	1.29	.15	1.67	.47	-3.82
7.200000E+00	1.84	-.32	.65	-.01	.59	3.46	.38	.67	.38	-3.48	.36	2.43	.19	-1.87	.15	3.54

(CONTINUED) FOURIER COEFFICIENTS FOR SARATOGA PASSAGE - MOORING SA

V-COMPONENTS

	1 M		5 M		10 M		15 M		25 M		35 M		50 M		60 M	
HRS	AMP	PHASE	AMP	PHASE	AMP	PHASE	AMP	PHASE	AMP	PHASE	AMP	PHASE	AMP	PHASE	AMP	PHASE
3.00000E+00	1.77	-49.49	1.46	33.71	1.84	-135.87	1.78	-160.37	.59	176.68	.81	142.61	.19	-57.99	.78	177.04
1.80000E+02	1.44	-74.76	1.34	9.54	1.28	-51.66	2.05	-47.71	1.25	-37.83	.37	-51.34	.51	-36.19	.31	63.99
1.20000E+02	1.17	-35.65	1.85	44.40	.26	-5.82	1.80	9.91	1.44	11.82	.83	12.38	.41	-15.74	.98	-15.32
9.00000E+01	.82	-44.91	.85	7.52	.92	5.34	.79	24.72	.83	-34.48	.73	40.77	.15	24.98	.42	-9.35
7.20000E+01	1.75	-33.87	.17	-21.68	1.04	10.00	.97	1.23	.56	-26.79	.19	-14.64	.28	.90	.98	-16.76
6.00000E+01	1.20	20.45	.49	-27.04	.51	29.51	.88	11.74	.87	-23.04	.41	14.55	.24	-18.14	.49	20.18
5.14286E+01	2.07	14.37	.89	-2.55	1.11	5.55	.62	-22.64	.16	10.84	.71	-20.02	.03	8.06	.52	-14.95
4.50000E+01	1.99	-3.25	.60	-.91	1.24	11.51	1.82	13.61	.14	-1.44	.17	3.36	.57	-11.85	.35	20.10
4.00000E+01	.74	-5.26	.48	-14.91	.87	-18.20	.46	1.06	.48	18.89	.95	-4.78	.27	-19.91	.84	-14.65
3.60000E+01	.52	-9.38	1.36	-15.63	.22	5.61	1.13	9.47	.29	2.17	.33	8.88	.28	9.83	.78	17.01
3.27273E+01	.96	-1.21	.82	-7.36	.66	-.72	.26	4.14	.88	-13.41	1.16	-12.62	.59	-13.41	.73	14.26
3.00000E+01	.78	11.60	2.14	-5.35	.57	-11.11	1.51	2.01	.62	-2.42	.15	14.41	.49	11.68	.31	-10.51
2.76923E+01	1.14	11.82	.66	-8.63	.98	4.22	1.13	8.08	.66	-12.78	.66	-13.46	.04	-3.57	.15	4.85
2.57143E+01	1.46	-2.81	.63	-6.95	.61	-1.78	.38	9.79	.46	-3.21	.93	-.87	.86	1.24	2.96	-2.27
2.40000E+01	5.94	-4.77	2.43	6.28	.62	9.73	1.45	1.58	1.48	.73	.51	1.73	.82	-7.49	4.42	-8.24
2.25000E+01	1.18	-.33	.46	-3.44	1.18	-9.04	.71	11.64	.59	9.32	.68	8.85	.55	-6.06	1.89	-3.48
2.11765E+01	.66	9.66	2.51	5.80	1.66	-4.52	.94	-7.02	.85	-.45	.48	-2.99	.22	-.88	.22	-4.96
2.00000E+01	1.50	-5.43	1.59	4.61	1.48	9.42	.69	1.54	1.18	6.66	.68	2.65	.25	-4.55	.98	-1.19
1.89474E+01	.69	4.08	.17	-8.82	.37	6.80	1.06	8.87	.70	1.69	.45	4.44	.28	-.24	.93	7.66
1.80000E+01	3.33	-5.16	1.34	1.89	.47	1.73	1.17	1.45	.49	1.25	.46	-6.48	.07	1.36	.57	.73
1.71429E+01	.88	-8.53	.99	-1.76	.53	-.38	.18	-3.02	.24	-6.31	.19	-4.92	.11	-1.80	.36	3.40
1.63636E+01	2.39	4.85	.13	3.38	.85	.48	.71	-4.72	.48	.63	.41	-1.93	.26	-6.69	.85	2.69
1.56522E+01	1.96	-1.89	1.33	.15	1.83	5.76	.84	-1.24	.69	3.67	.91	-3.51	.07	-1.30	.48	.89
1.50000E+01	.36	-.34	1.29	7.19	.91	-5.52	.62	2.58	.70	3.78	.51	-3.26	.54	.95	.43	-6.19
1.44000E+01	2.81	-2.59	1.48	1.36	1.65	-4.80	3.32	-6.94	1.06	-3.11	.29	-6.89	.22	-5.75	.85	-3.16
1.38462E+01	2.13	-1.36	2.02	6.84	2.95	2.89	1.84	-4.55	1.19	-5.16	.14	6.72	.18	2.59	.83	-4.31
1.33333E+01	1.55	-.92	1.84	-6.57	.93	.57	1.58	-.82	.74	-3.24	.17	-6.60	.38	.07	.68	-1.54
1.28571E+01	1.27	.57	2.12	3.35	.68	-1.17	1.08	1.12	1.55	4.34	.62	6.30	.43	-.52	.90	4.69
1.24138E+01	2.13	-1.94	2.56	4.15	2.48	-5.87	.93	-3.27	2.53	-.02	1.08	.14	2.48	5.78	4.49	-.87
1.20000E+01	1.72	-4.11	1.92	-.82	2.53	4.24	1.08	3.87	1.77	-2.21	1.24	-1.05	1.78	-5.53	1.56	-.73
1.16129E+01	.78	4.84	2.15	-1.58	1.59	-4.47	1.25	4.01	.14	5.33	.96	1.85	.65	.13	1.31	2.66
1.12500E+01	1.92	-5.42	2.53	1.46	2.16	-2.65	1.36	-3.59	.39	-6.45	.44	5.30	.75	3.73	1.36	-1.01
1.09091E+01	1.19	.49	.06	-.82	1.35	2.33	2.13	4.64	.61	4.52	.83	2.16	.91	-.58	1.17	3.41
1.05882E+01	.78	-.76	.48	-6.18	2.75	-3.36	2.00	-3.44	.25	3.87	.78	3.61	.72	1.41	1.17	-3.57
1.02857E+01	.66	-6.95	1.59	1.26	1.38	-4.13	.45	3.05	.18	-.80	.59	1.80	.25	2.98	.84	-3.38
1.00000E+01	.49	4.86	2.09	-1.33	1.51	-3.06	1.54	-4.99	.38	-4.51	.71	3.43	.58	1.86	.91	-4.55
9.72973E+00	.78	2.65	1.02	-1.42	1.98	-2.92	.67	1.27	.14	-1.48	1.02	2.85	.48	3.21	.92	-1.69
9.47368E+00	.41	-2.91	.08	2.39	.88	1.65	.69	.31	.24	-.83	.60	-3.59	.29	3.82	1.29	2.49
9.23077E+00	.68	3.62	.79	-2.33	.48	-.44	.72	-3.51	1.33	2.81	.27	3.18	.72	2.66	1.02	-.70
9.00000E+00	.32	.68	.61	2.35	1.84	-1.86	.30	-3.98	.76	4.45	.25	1.40	.83	-4.12	1.80	1.84
8.78049E+00	.99	3.36	1.66	-1.60	.57	2.29	.75	-2.68	.24	-2.18	.29	2.09	.66	1.68	.59	.54
8.57143E+00	.97	1.49	2.93	-1.74	.47	3.20	.34	1.01	.68	1.54	.27	2.86	.28	1.45	.84	-.43
8.37209E+00	1.71	4.46	.42	.55	1.59	-3.11	.73	1.44	.39	3.43	.17	-1.10	.86	.88	2.47	-2.57
8.18182E+00	.36	-2.84	.77	1.62	1.12	-2.87	.94	-.78	.81	1.24	.67	2.12	.24	-3.76	.84	3.47
8.00000E+00	.19	-3.58	.77	.55	.54	-1.72	.79	-1.83	.33	-2.87	.41	-1.45	.95	-2.67	2.12	3.04
7.82609E+00	1.79	-2.87	1.21	.83	1.80	-3.48	1.10	3.41	.48	-.14	.25	3.42	.12	-.20	.87	2.69
7.65957E+00	1.14	3.57	1.94	2.16	.59	1.25	.82	.02	.88	.55	.38	2.59	.26	-3.33	.59	-2.12
7.50000E+00	1.63	1.17	1.68	3.19	1.05	1.25	.42	-2.85	.20	-2.29	.25	2.23	.11	.95	1.31	2.89
7.34694E+00	.55	-2.89	1.79	2.44	.78	-.42	1.56	-.39	.92	-2.26	.26	.88	.24	-.92	.26	.53
7.20000E+00	1.56	1.89	.07	.81	.13	-2.93	1.41	-1.60	.17	-1.44	.33	-.41	.06	-2.87	.39	1.99

5.3 Mooring ST

Direction Histograms

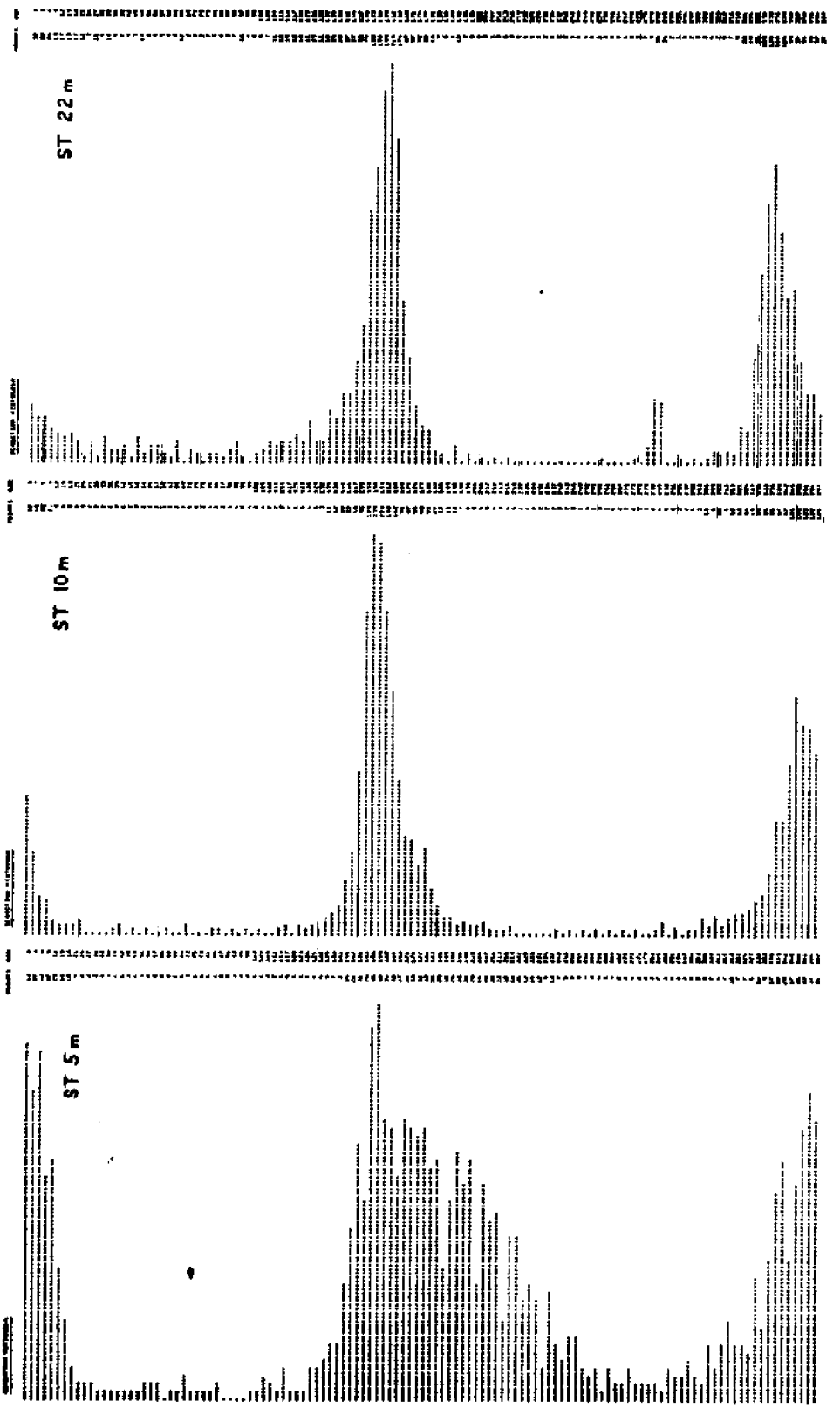
Histograms of Speed

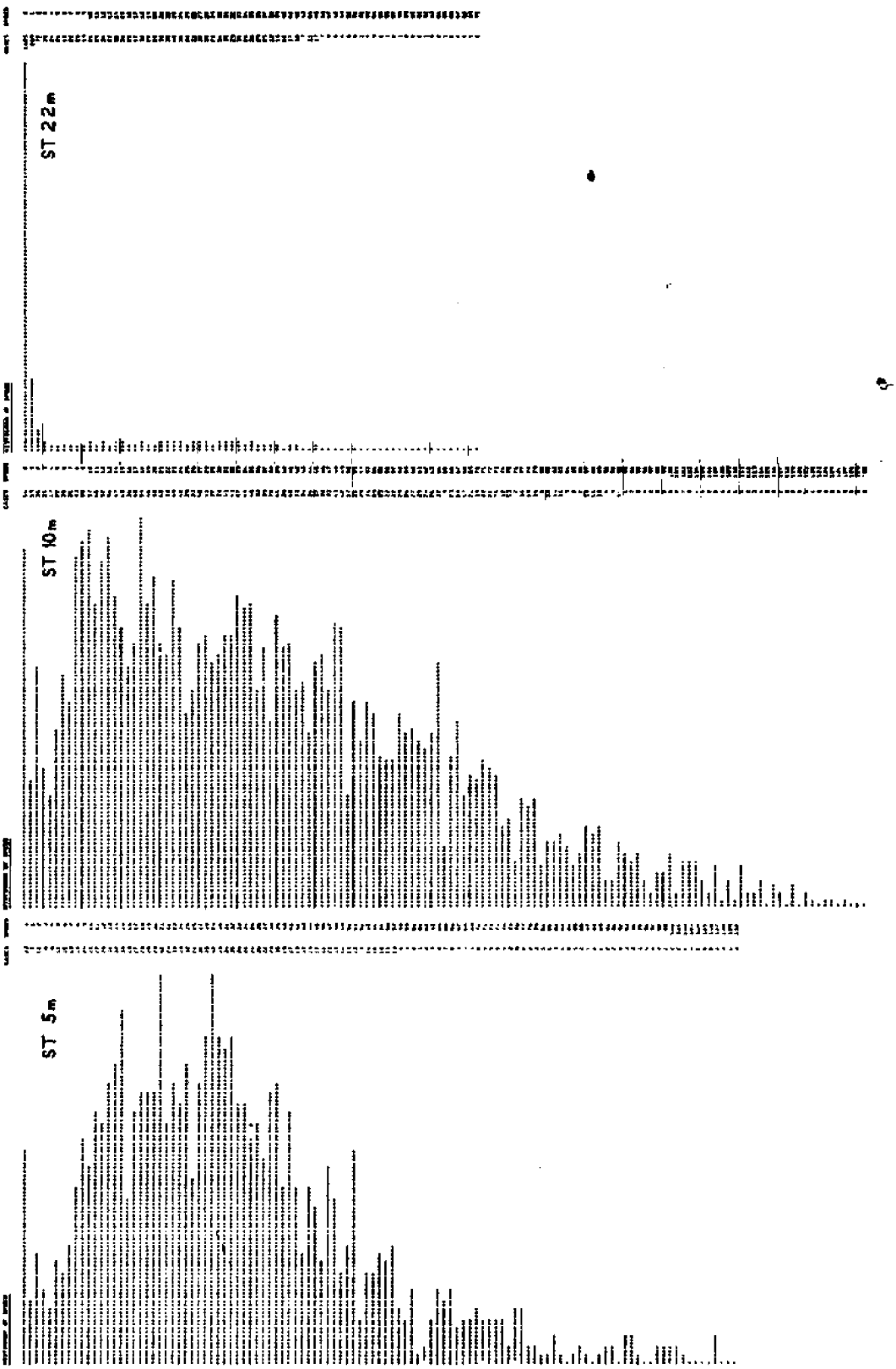
Progressive Vector Diagrams

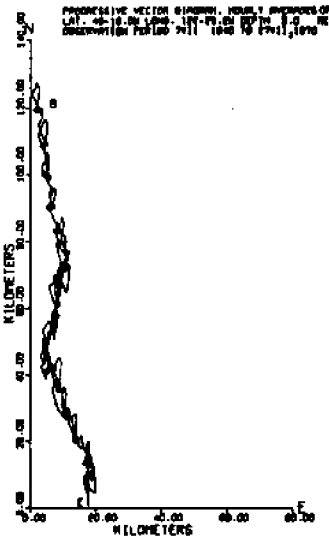
Time Series

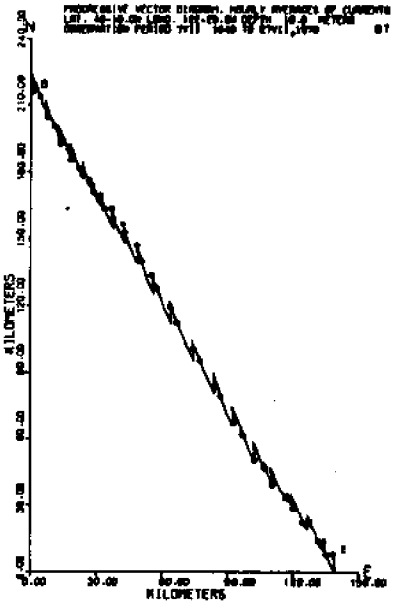
Fourier Coefficients

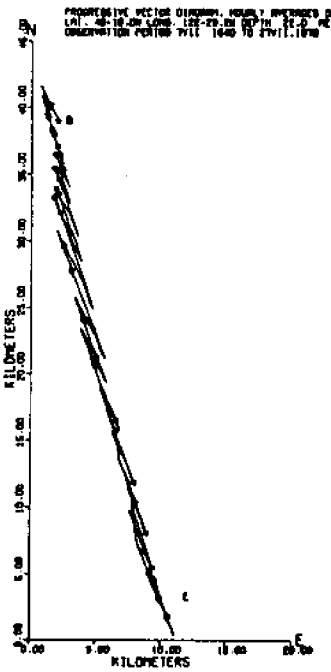
(See section 2 for complete description.)

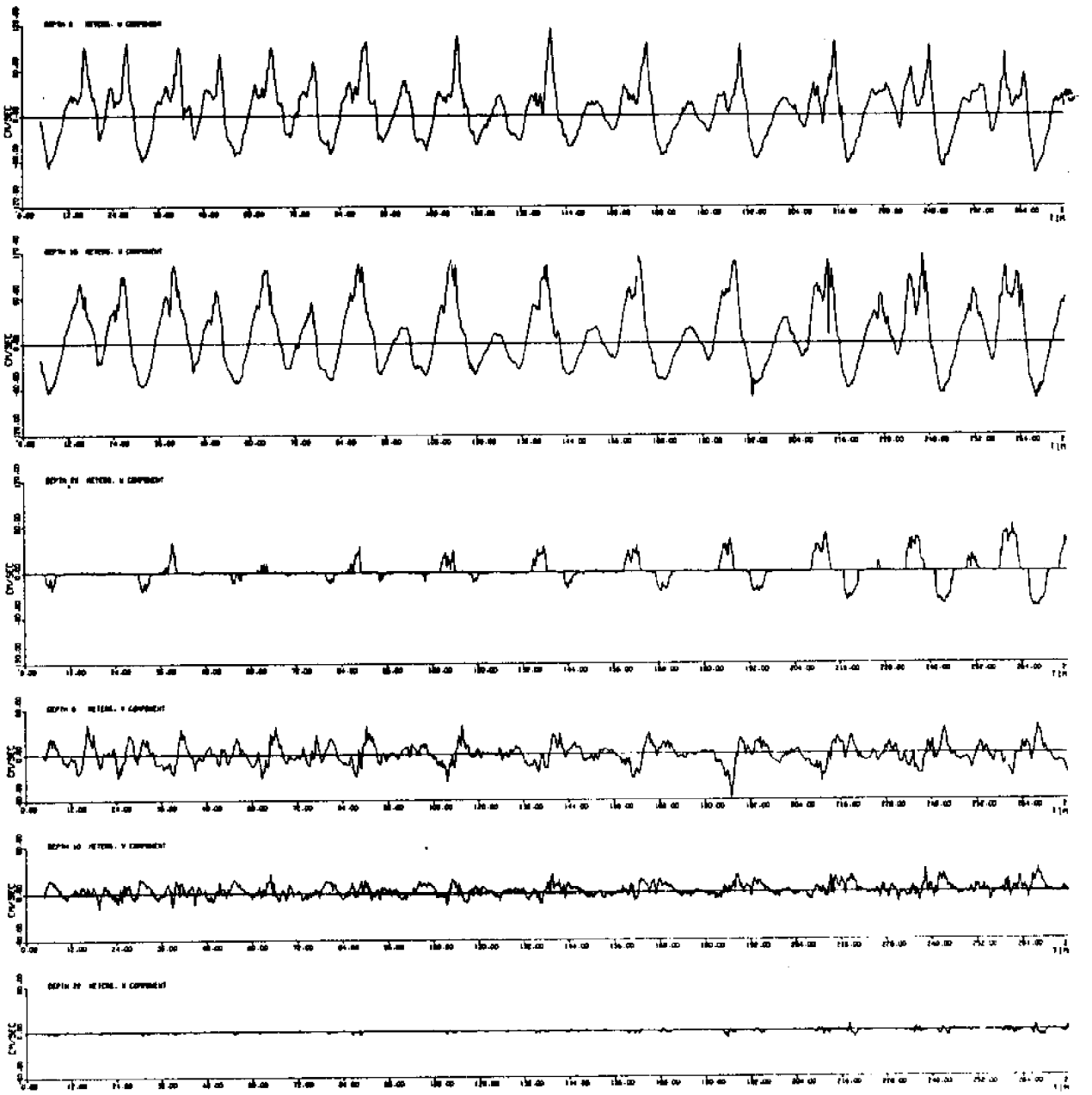

ST 22 m
ST 10 m
ST 5 m

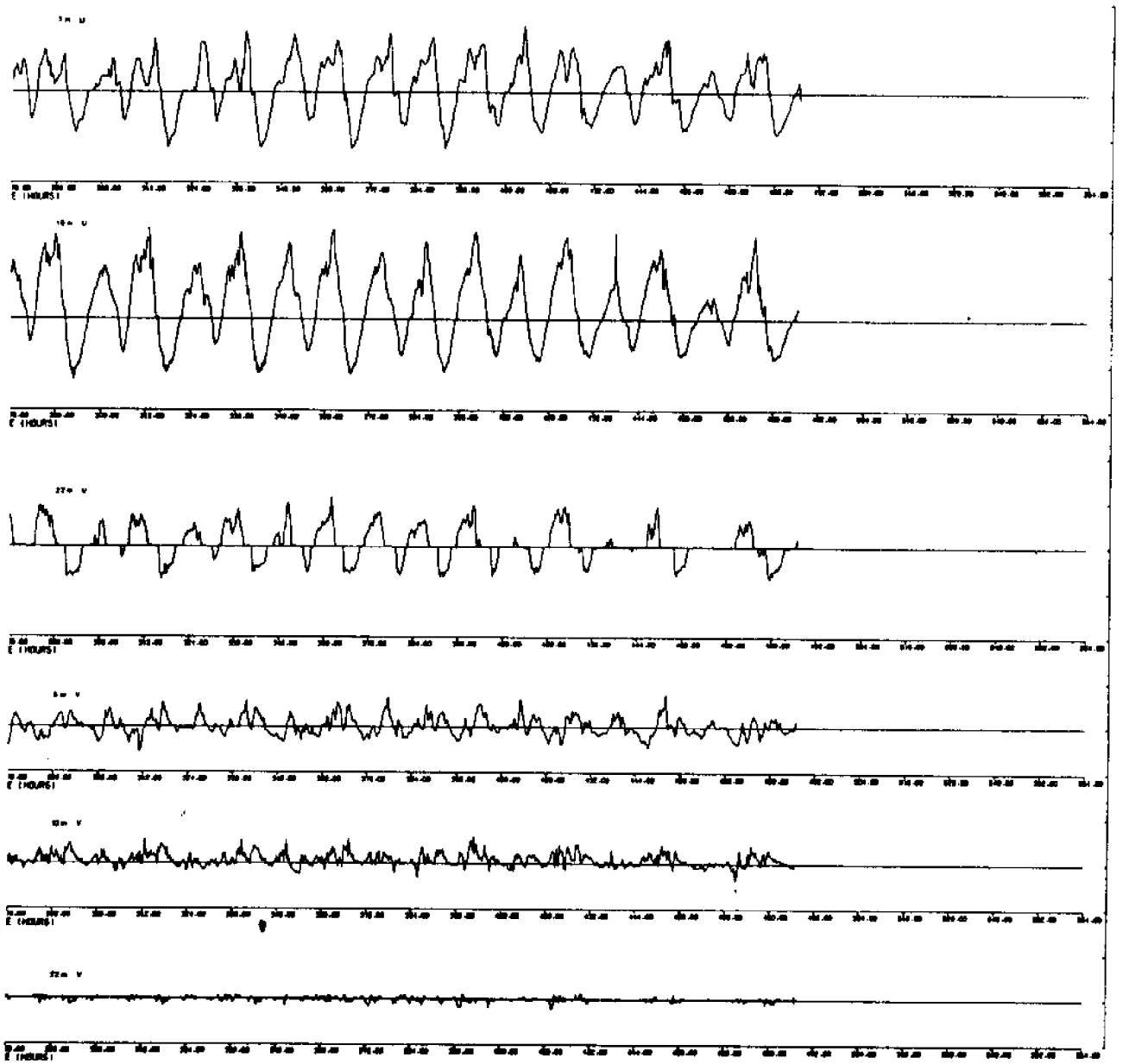

ST 22m
ST 10m
ST 5m


KILOMETERS
KILOMETERS


KILOMETERS
KILOMETERS


KILOMETERS
KILOMETERS





FOURIER COEFFICIENTS FOR STRAWBERRY POINT - MOORING ST

	U-COMPONENTS						V-COMPONENTS					
	5 M		10 M		22 M		5 M		10 M		22 M	
HRS	AMP	PHASE	AMP	PHASE	AMP	PHASE	AMP	PHASE	AMP	PHASE	AMP	PHASE
3.600000E+02	5.42	42.05	6.21	-51.47	1.87	-69.66	1.67	-34.77	1.14	-64.76	.24	75.60
1.800000E+02	2.95	48.55	.28	66.37	1.14	-50.82	1.01	-42.31	.35	-55.65	.05	-3.69
1.200000E+02	1.21	.88	.36	3.25	.66	-11.78	.65	-38.88	.31	-58.41	.05	-11.08
9.000000E+01	.54	-38.89	.23	33.95	.72	-8.12	.34	-43.86	.42	-3.53	.05	41.54
7.200000E+01	2.39	5.39	1.12	-.36	1.09	-16.66	.68	14.17	.28	-3.73	.03	-6.79
6.000000E+01	1.27	-<1.54	1.00	-25.12	.53	-22.74	.46	26.92	.26	-18.33	.03	4.25
5.142800E+01	.68	-23.11	.69	-<3.51	.42	-5.96	.79	13.53	.35	-7.35	.04	-17.83
4.500000E+01	.45	16.42	.21	-2.41	.67	-3.44	.69	7.94	.30	-8.19	.12	11.16
4.000000E+01	.67	-10.61	.39	-7.72	.76	-.28	.87	8.88	.16	12.28	.05	2.84
3.600000E+01	.36	6.23	1.18	.74	1.05	-1.46	.32	2.43	.07	-15.64	.07	-9.67
3.272730E+01	1.52	-10.28	1.90	-15.46	.27	-2.27	.80	1.49	.16	11.95	.09	6.31
3.000000E+01	1.46	13.16	1.24	4.94	.94	2.45	.24	-10.23	.45	8.17	.10	5.15
2.769230E+01	.72	.81	2.78	1.31	1.93	2.03	.99	-1.56	.70	-3.21	.21	.77
2.571430E+01	4.20	-5.37	8.02	-1.97	7.86	-3.44	2.82	10.82	3.71	4.30	.45	-7.65
2.400000E+01	21.71	-10.25	30.31	-10.63	18.08	-10.83	5.55	-.81	2.70	-2.23	.11	11.54
2.250000E+01	3.96	-1.72	4.47	-3.77	1.84	5.54	.35	-2.75	.28	9.31	.05	8.10
2.117650E+01	.88	-3.53	1.79	-2.18	1.88	-.25	.69	-2.98	1.00	-6.87	.01	7.34
2.000000E+01	.66	9.34	.75	-1.23	.62	-4.34	.56	-1.16	.56	-1.84	.02	1.58
1.894740E+01	.70	3.89	1.17	-1.51	.52	-2.76	1.16	-.56	.22	6.76	.07	-4.38
1.800000E+01	.72	.76	.87	-.40	.62	-1.36	1.28	-6.95	.33	-5.08	.10	-8.99
1.714290E+01	1.25	-1.91	1.53	-.10	1.18	-.61	.53	6.41	.52	.76	.07	3.72
1.634360E+01	.89	-2.53	.56	-.43	.59	-.25	.40	-3.31	.26	3.29	.05	-7.67
1.560220E+01	.27	-6.40	.74	-1.19	.76	2.38	.38	-4.98	.57	-3.21	.06	4.97
1.500000E+01	.26	-2.45	.36	.75	1.00	.78	.72	-3.34	.47	-2.57	.03	-2.45
1.440000E+01	1.01	-.15	.45	-1.15	1.32	-1.38	.36	3.40	.37	-5.53	.07	2.56
1.384620E+01	1.16	.02	1.10	.88	.83	-2.34	1.29	-.25	.28	3.75	.07	4.37
1.333330E+01	1.27	-.41	1.49	-1.52	1.41	.22	.62	-.78	.64	-3.22	.15	.82
1.285710E+01	3.34	-5.45	3.52	-.86	6.24	-.78	1.95	-5.16	.58	-2.22	.14	-1.11
1.241380E+01	34.29	-2.45	49.88	-3.85	13.84	-4.78	10.52	1.88	2.69	.46	.38	-2.18
1.200000E+01	4.44	-2.62	7.57	-3.71	4.42	5.77	1.95	-.47	.24	-.37	.33	-5.26
1.161930E+01	2.25	-.22	.72	5.07	1.00	4.66	.63	4.78	.25	5.52	.07	-2.85
1.125000E+01	1.81	-2.84	.83	5.37	.79	-3.66	.94	-4.58	.37	4.36	.09	-5.55
1.090910E+01	1.53	-4.24	.98	-3.19	1.15	-4.26	.64	1.37	.35	-5.82	.06	2.20
1.058820E+01	.94	-5.15	1.49	-3.19	.89	-5.28	.89	-4.58	.19	-4.57	.84	5.87
1.028570E+01	.98	3.91	1.57	-4.51	.58	4.12	.93	3.58	.28	-2.28	.11	3.65
1.000000E+01	.46	-4.91	1.22	-4.30	.61	-4.31	.41	.74	.38	-4.82	.12	.38
9.729730E+00	1.85	-4.76	.81	2.31	1.29	-4.21	.56	-4.14	.89	-1.42	.01	.64
9.473680E+00	1.82	3.75	.69	3.28	.95	-3.98	.45	-1.79	.47	2.87	.07	2.95
9.230770E+00	1.17	-4.46	.28	-1.18	.92	-3.88	.48	-3.13	.13	-2.78	.12	1.32
9.000000E+00	.48	-2.13	1.48	2.41	.63	-3.11	.85	-3.66	.87	1.98	.07	-1.71
8.780490E+00	.28	.63	.68	.69	.78	-3.46	.27	2.82	.32	3.76	.05	.92
8.571430E+00	1.73	-4.56	.74	3.29	1.07	-3.50	.43	1.04	.91	-2.18	.06	4.12
8.372090E+00	4.93	3.38	4.13	-3.84	1.84	-2.77	2.83	2.18	.54	1.44	.26	.58
8.181820E+00	9.88	-2.59	5.65	3.97	1.78	2.78	4.32	-3.97	3.26	1.98	.45	-2.23
8.000000E+00	1.68	-.87	2.67	-2.36	.61	2.88	1.15	-2.99	.39	.78	.84	-3.48
7.826090E+00	1.34	.84	1.22	-1.88	.97	-2.38	.27	-1.06	.43	-1.98	.84	-.92
7.659570E+00	.67	3.72	.42	-1.68	.74	3.41	.64	.42	.42	-1.18	.03	2.27
7.500000E+00	.61	1.13	.18	.47	.55	2.83	.85	-1.64	.12	2.48	.84	.23
7.346940E+00	.22	1.38	.42	-1.57	.89	2.78	.72	.74	.39	-1.48	.04	-1.87
7.200000E+00	.61	.96	.64	1.57	.23	-3.38	.23	3.88	.32	1.44	.89	2.76

5.4 Mooring Y

Direction Histograms

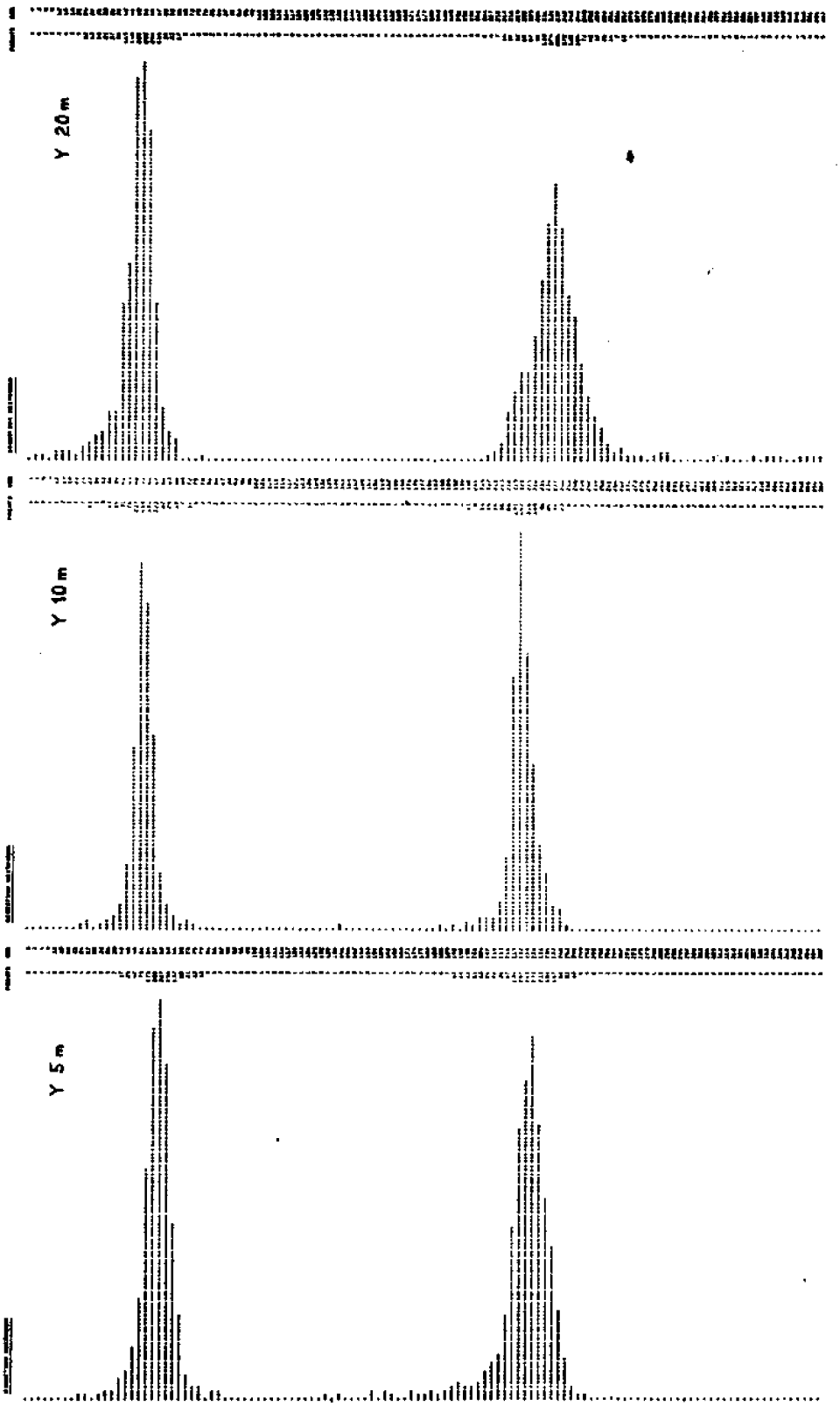
Histograms of Speed

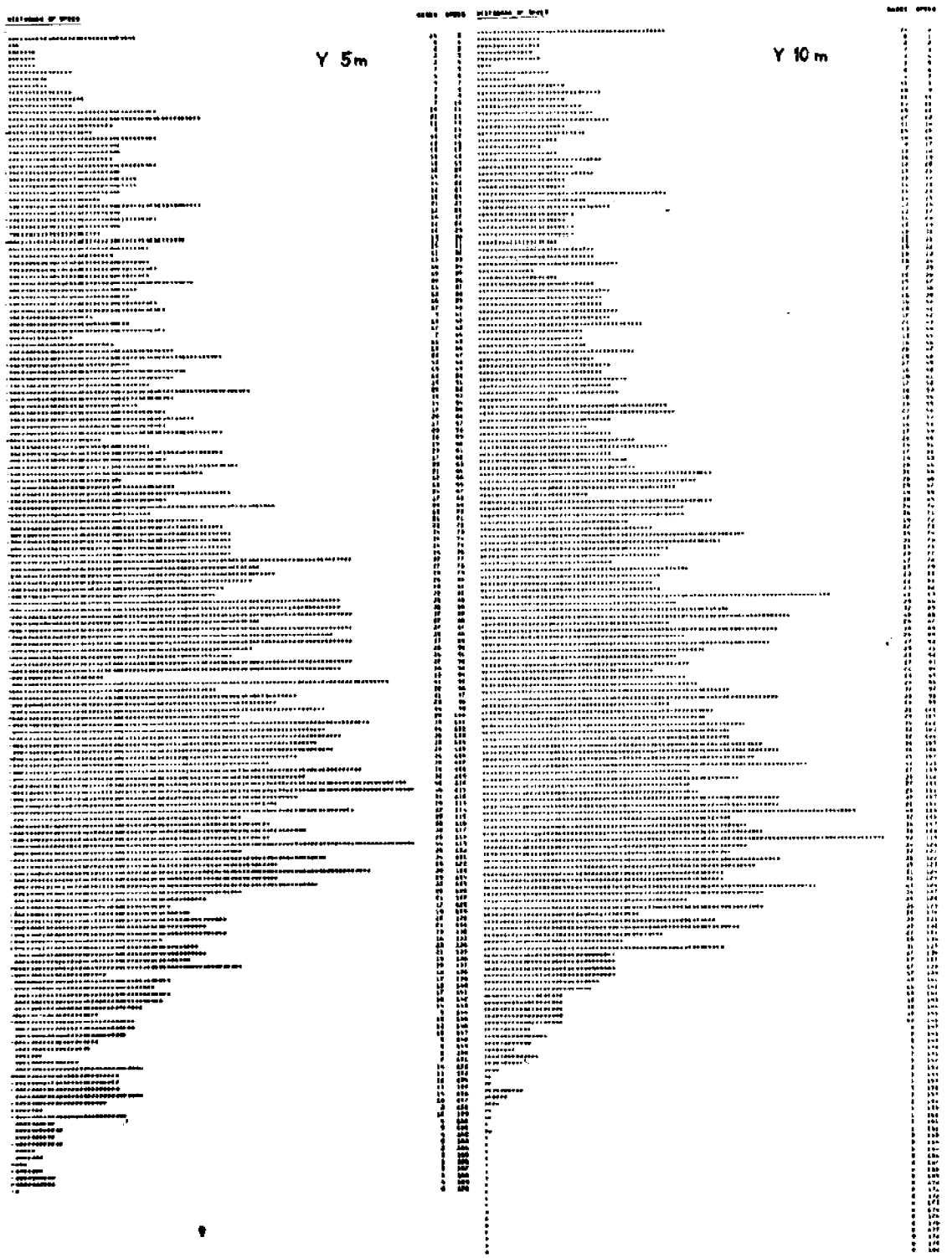
Progressive Vector Diagrams

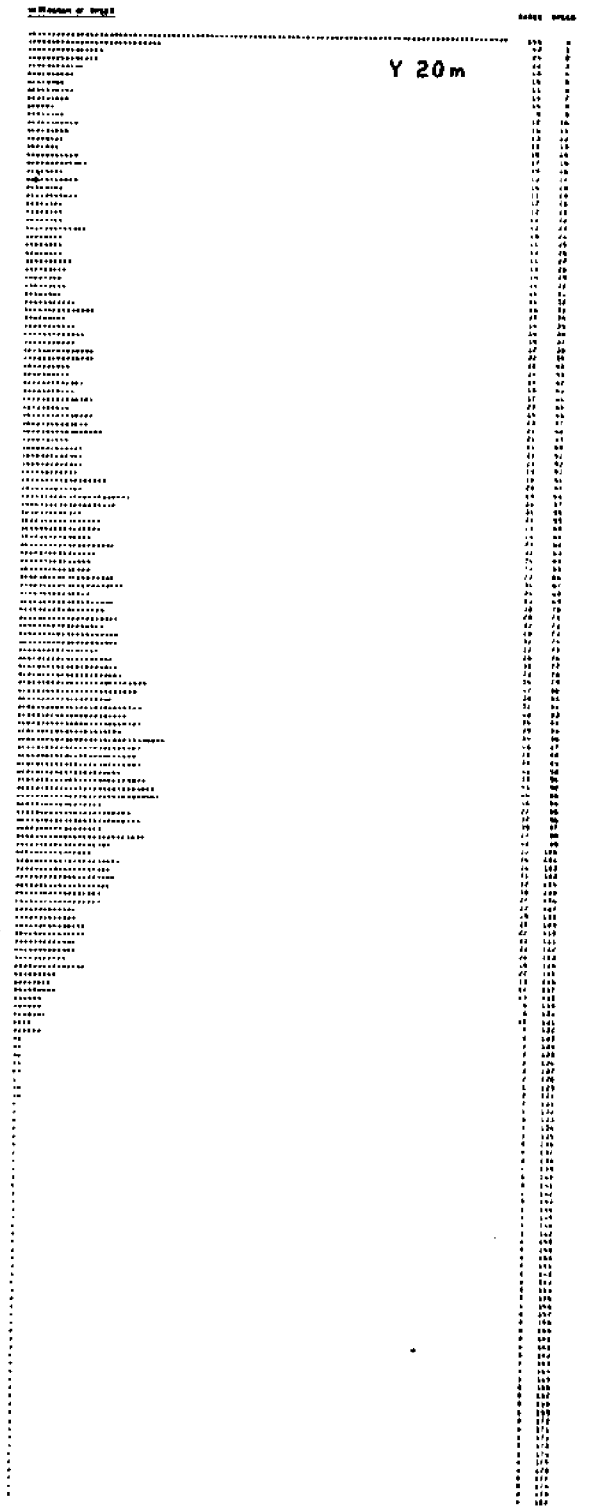
Time Series

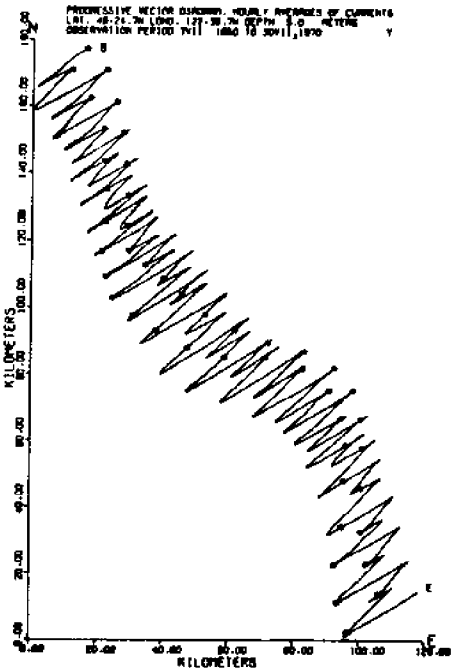
Fourier Coefficients

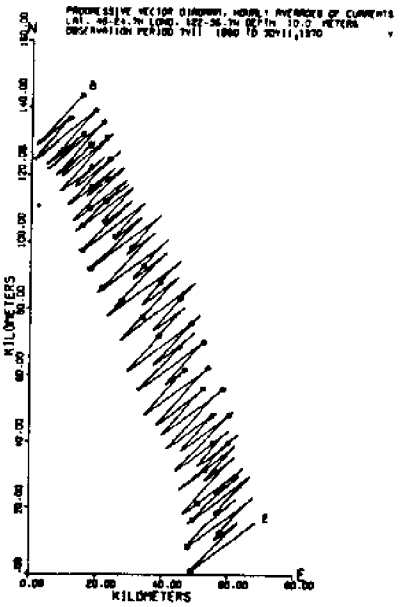
(See section 2 for complete description.)

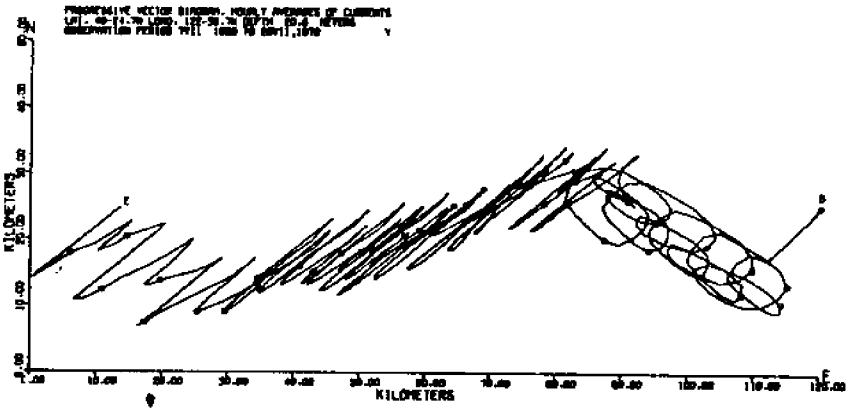

Y 20 m
Y 10 m
Y 5 m

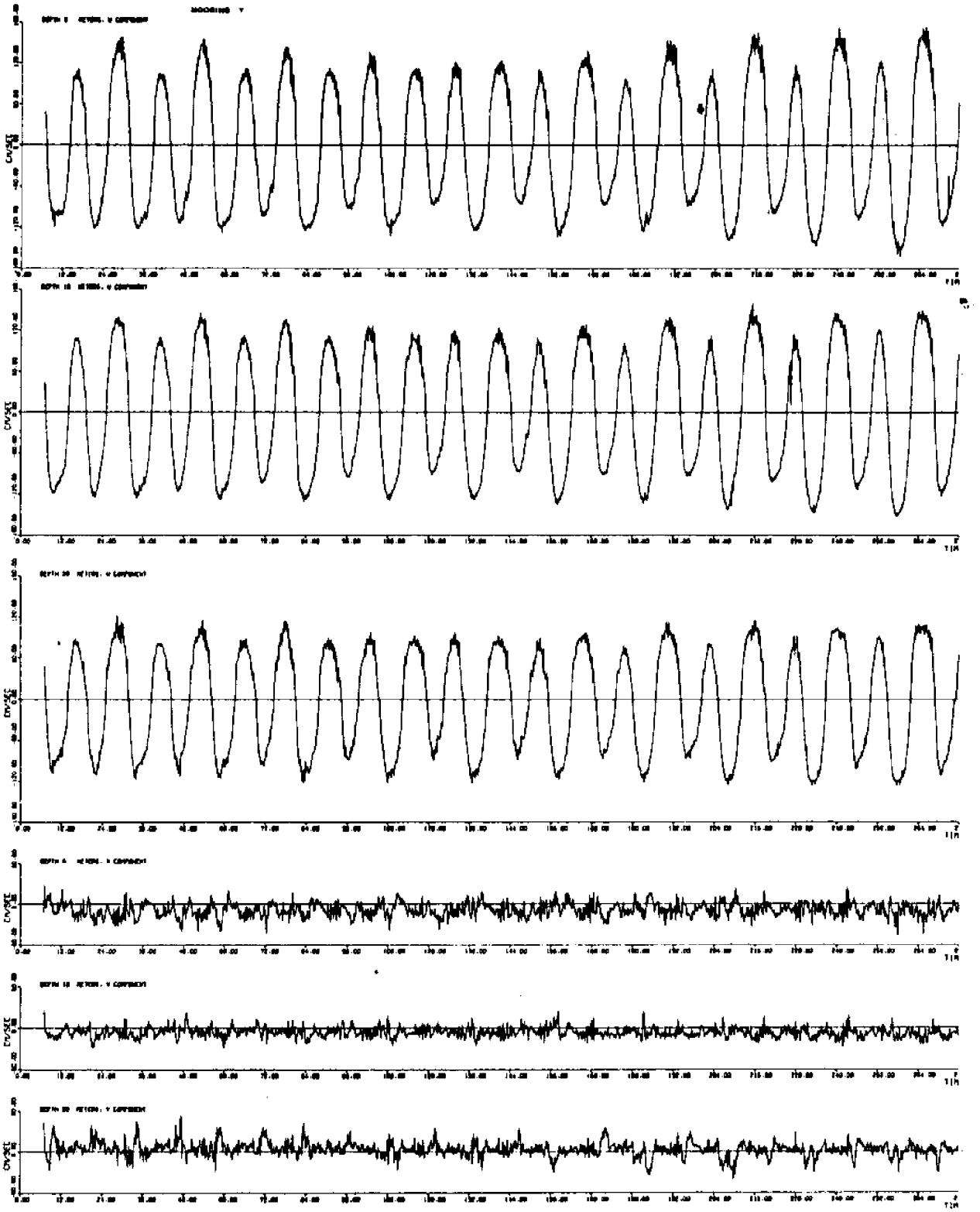

Y 5m
Y 10 m

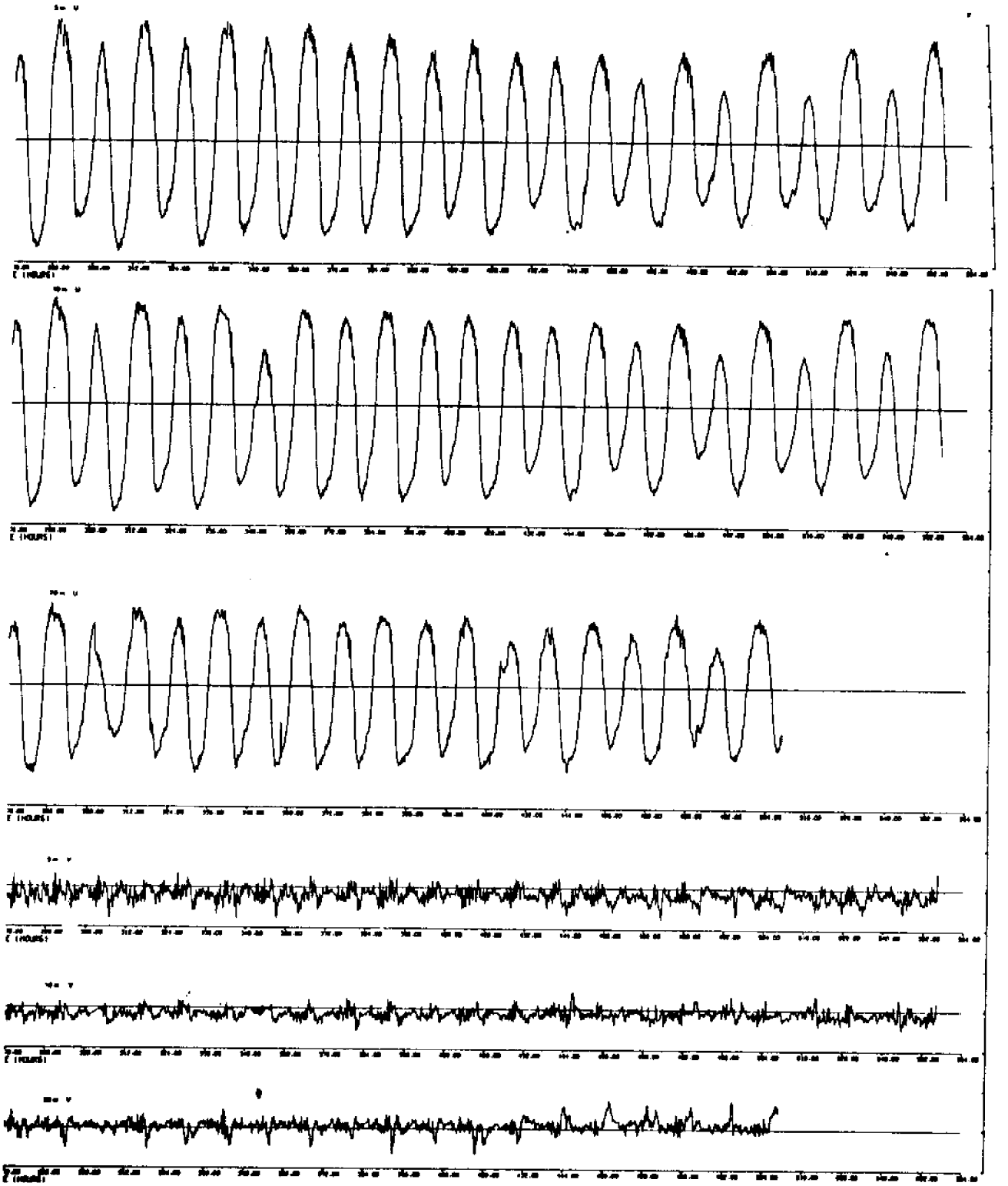

Y 20m


KILOMETERS
KILOMETERS


KILOMETERS
KILOMETERS


KILOMETERS
KILOMETERS





FOURIER COEFFICIENTS FOR YOKEKO POINT - MOORING Y

	U-COMPONENTS						V-COMPONENTS					
	5 M		18 M		28 M		5 M		18 M		28 M	
HRS	AMP	PHASE	AMP	PHASE	AMP	PHASE	AMP	PHASE	AMP	PHASE	AMP	PHASE
3.630000E+02	2.56	-57.93	1.79	112.96	1.81	43.24	1.57	165.82	2.03	104.91	2.98	59.55
1.800000E+02	1.56	-29.14	1.30	48.69	1.27	-47.79	.60	-12.68	.26	3.17	1.11	49.78
1.200000E+02	1.29	-34.93	.62	38.62	.35	59.13	.62	-28.35	.19	42.46	.81	32.41
9.000000E+01	.15	31.60	.57	24.64	.94	32.49	.04	-24.56	.67	-36.93	.51	-15.34
7.200000E+01	.18	32.64	.67	-31.76	.44	19.93	.53	8.66	.41	-25.12	.86	10.95
6.000000E+01	.39	-1.21	1.01	26.34	1.02	1.03	.44	1.65	.37	-26.87	.68	1.61
5.142857E+01	.18	-11.97	.55	9.32	1.38	-6.94	.23	-12.93	.47	-4.20	.27	12.41
4.500000E+01	.52	4.89	1.16	8.17	1.00	-14.81	.58	7.55	.57	11.45	.23	-4.39
4.000000E+01	.39	11.69	1.15	4.33	1.28	-15.22	.65	-1.74	.31	-8.02	.51	3.47
3.600000E+01	.96	-6.86	.88	-6.63	.85	10.41	.46	-2.23	.38	.10	.37	15.96
3.272727E+01	1.41	-13.46	1.05	14.13	1.57	11.72	.34	.80	.40	15.60	.45	3.18
3.000000E+01	.67	-11.54	.34	1.26	.95	.46	.60	3.69	.35	1.42	.85	18.31
2.769231E+01	4.62	-13.26	3.17	-13.42	1.10	-13.81	.85	13.24	1.29	9.59	1.09	-2.02
2.571429E+01	17.49	3.59	15.18	3.65	10.50	4.59	1.80	2.41	1.16	-12.20	2.74	18.73
2.400000E+01	33.97	-4.50	33.10	-4.77	29.89	-4.97	3.28	7.06	.64	8.67	2.09	-3.82
2.250000E+01	5.23	-.59	5.12	-1.37	3.34	-.89	.60	-5.35	.57	-2.63	.94	10.89
2.117647E+01	.91	1.15	.60	-5.62	1.59	5.77	.92	4.43	.44	5.51	.94	-2.83
2.000000E+01	.04	.96	.59	.33	1.52	1.61	.49	0.53	.43	3.66	.37	-6.99
1.894737E+01	1.14	3.90	.68	-1.64	1.69	-1.56	.25	9.19	.42	4.03	.75	-1.54
1.800000E+01	.74	2.69	.58	-4.41	.85	-2.43	.29	.77	.43	5.54	.66	4.18
1.714286E+01	1.61	2.67	.31	-4.84	.57	-8.18	.18	1.49	.25	3.18	.43	1.35
1.636364E+01	1.48	2.23	.92	-7.00	1.81	6.37	.30	3.28	.29	4.16	.25	-3.95
1.565422E+01	2.07	4.48	1.37	7.42	1.27	3.49	.09	1.44	.33	-2.45	.41	1.92
1.500000E+01	2.21	1.45	1.41	5.48	1.92	1.36	.30	1.82	.49	-4.44	.55	2.48
1.440000E+01	1.82	1.99	1.03	3.86	1.99	-.49	.17	-5.59	.20	4.97	.18	5.19
1.384615E+01	1.65	2.47	2.48	2.76	1.46	-1.06	.48	1.30	.42	3.49	.50	-.14
1.333333E+01	5.42	2.36	4.26	2.19	.93	2.07	1.03	2.01	.68	5.63	.83	-2.53
1.285714E+01	12.49	2.22	10.78	2.74	7.99	3.10	.39	5.26	.56	-2.60	2.78	.23
1.241379E+01	128.64	-2.78	124.05	-2.77	140.99	-2.81	1.26	4.55	.78	-1.62	1.67	-5.39
1.200000E+01	24.74	-3.28	19.09	-3.49	13.89	-3.37	.88	-4.13	.78	-3.29	2.37	4.39
1.161290E+01	3.26	-1.96	2.15	.36	2.58	-.66	.11	2.93	.36	-2.52	.65	9.72
1.125000E+01	2.51	-3.29	1.46	.45	2.02	-2.72	.58	.23	.43	-3.10	1.42	4.98
1.090910E+01	1.28	-4.36	.75	.20	1.58	-4.44	.44	4.51	.68	-1.46	.47	3.72
1.058824E+01	1.48	-2.96	1.10	1.37	1.98	5.11	.61	1.45	.16	3.79	.55	4.91
1.028571E+01	1.69	-3.73	1.49	.09	1.67	2.73	.42	-5.13	.35	-1.61	.81	1.81
1.000000E+01	1.29	-3.65	1.73	-.19	2.16	1.11	.83	3.05	.28	1.47	.29	-3.48
9.729730E+00	.41	5.66	2.27	-.42	1.34	-.33	.66	2.26	.24	2.78	.29	-.35
9.473684E+00	.87	-1.39	2.42	-1.08	2.06	-2.65	.59	.36	.30	3.40	.12	-.68
9.230770E+00	.76	-1.12	1.82	-1.63	1.24	-3.50	.24	2.18	.35	3.35	.56	-2.64
9.000000E+00	.59	-3.48	1.34	-2.44	1.40	1.92	.28	-4.30	.19	-1.68	.67	2.01
8.780490E+00	.94	-2.88	1.77	-2.53	.50	3.43	.56	1.48	.66	1.55	.57	-2.78
8.571430E+00	1.34	-1.11	1.47	-.98	2.56	.52	.51	-3.54	.87	-3.69	1.04	1.40
8.372093E+00	8.73	2.97	10.00	2.99	8.66	2.84	1.72	2.96	.80	3.32	1.31	-2.97
8.181820E+00	2.19	.56	3.63	.17	3.83	-.17	2.16	-1.19	1.53	.58	1.04	1.73
8.000000E+00	.78	.14	1.72	-2.47	1.84	-2.51	1.03	1.18	.39	-1.52	.44	-3.69
7.826090E+00	.69	.83	1.56	3.55	1.69	3.67	.18	1.78	.34	.30	.49	3.02
7.659570E+00	.43	-1.43	1.36	3.57	.59	2.64	.30	.31	.32	3.45	.56	-.72
7.500000E+00	.75	-3.50	.54	3.19	.80	.16	.23	-.58	.24	-1.44	.24	2.91
7.346940E+00	.16	.98	.43	-3.14	.46	-1.40	.48	2.26	.21	3.46	.61	-1.03
7.200000E+00	.79	-3.08	.98	3.25	1.21	-1.71	.35	1.23	.34	-1.22	.43	3.07

5.5 Moorings PSS1 and PSS2

Direction Histograms

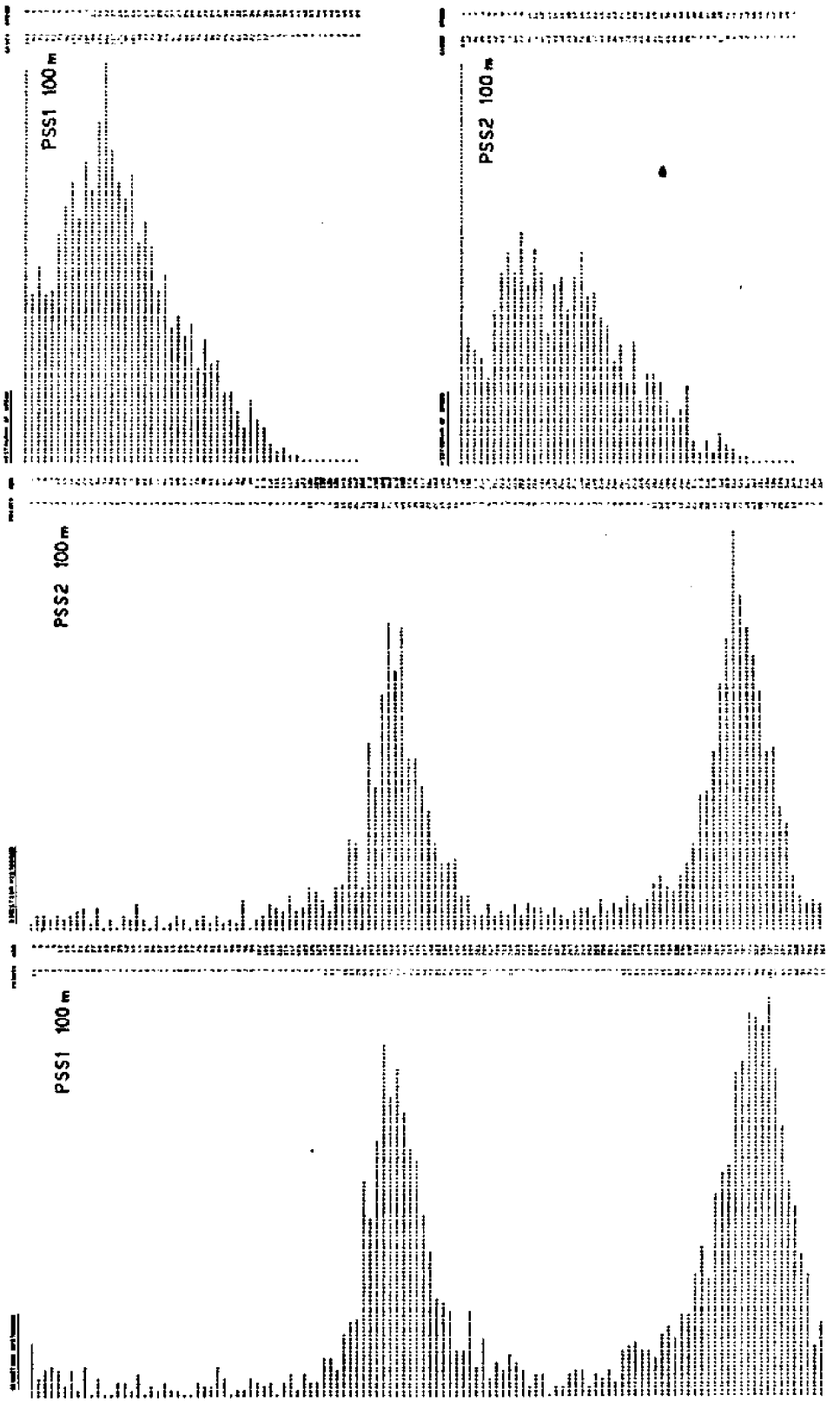
Histograms of Speed

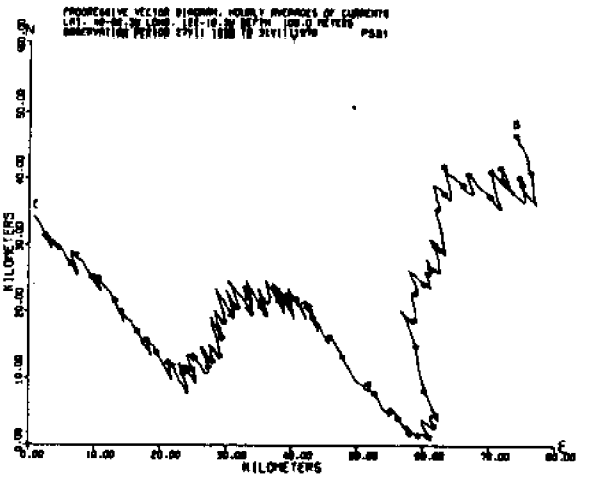
Progressive Vector Diagrams

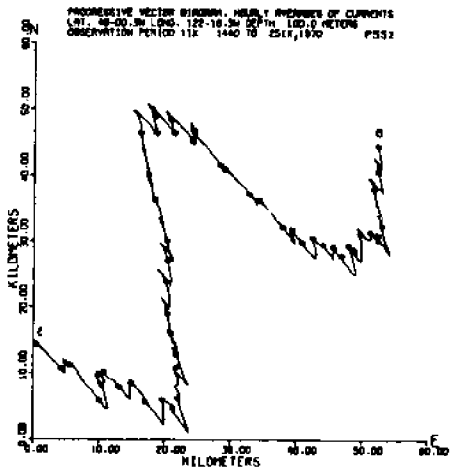
Time Series

Fourier Coefficients

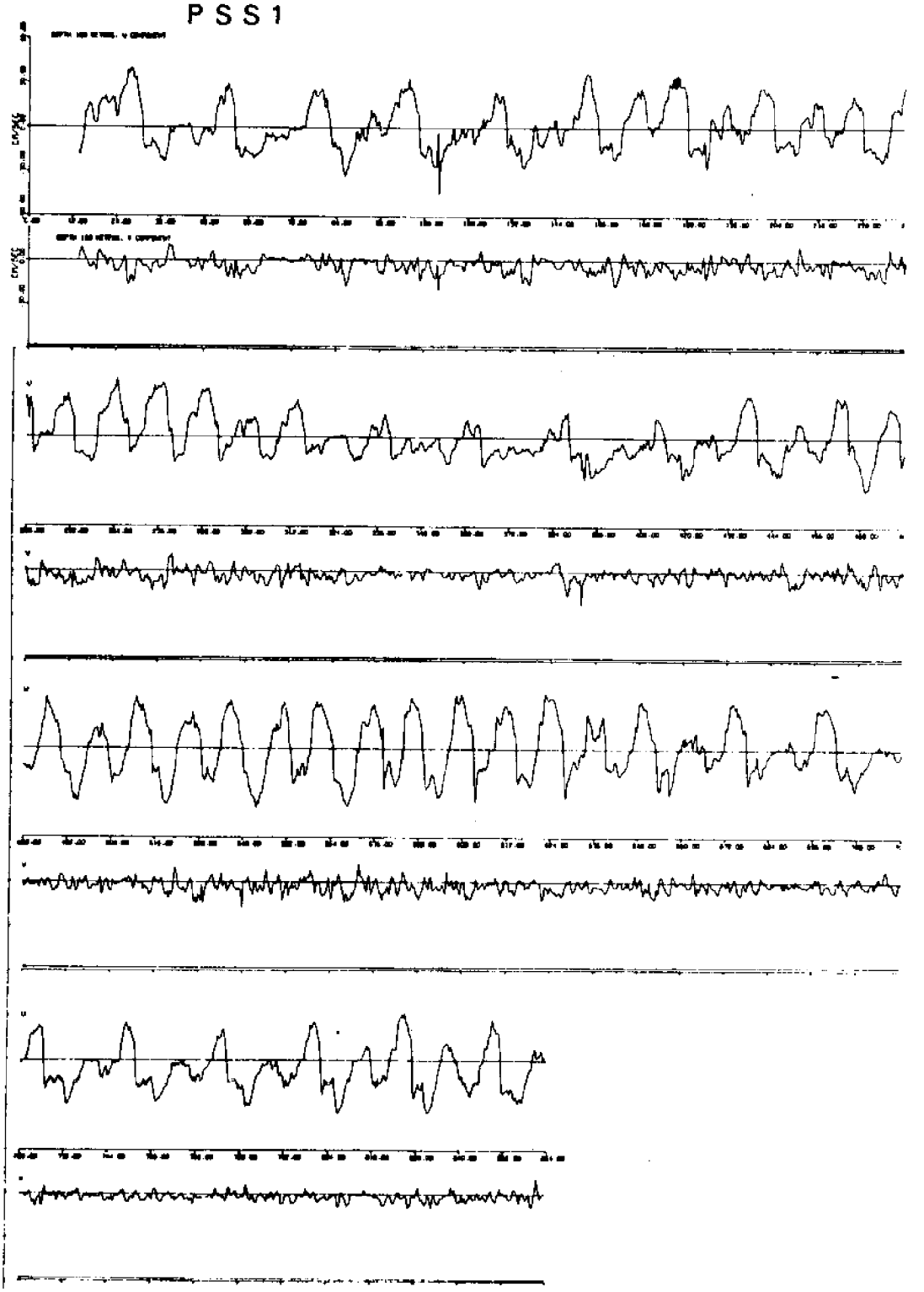
(See section 2 for complete description.)


PSS1 100 m
PSS2 100 m
PSS2 100 m
PSS1 100 m

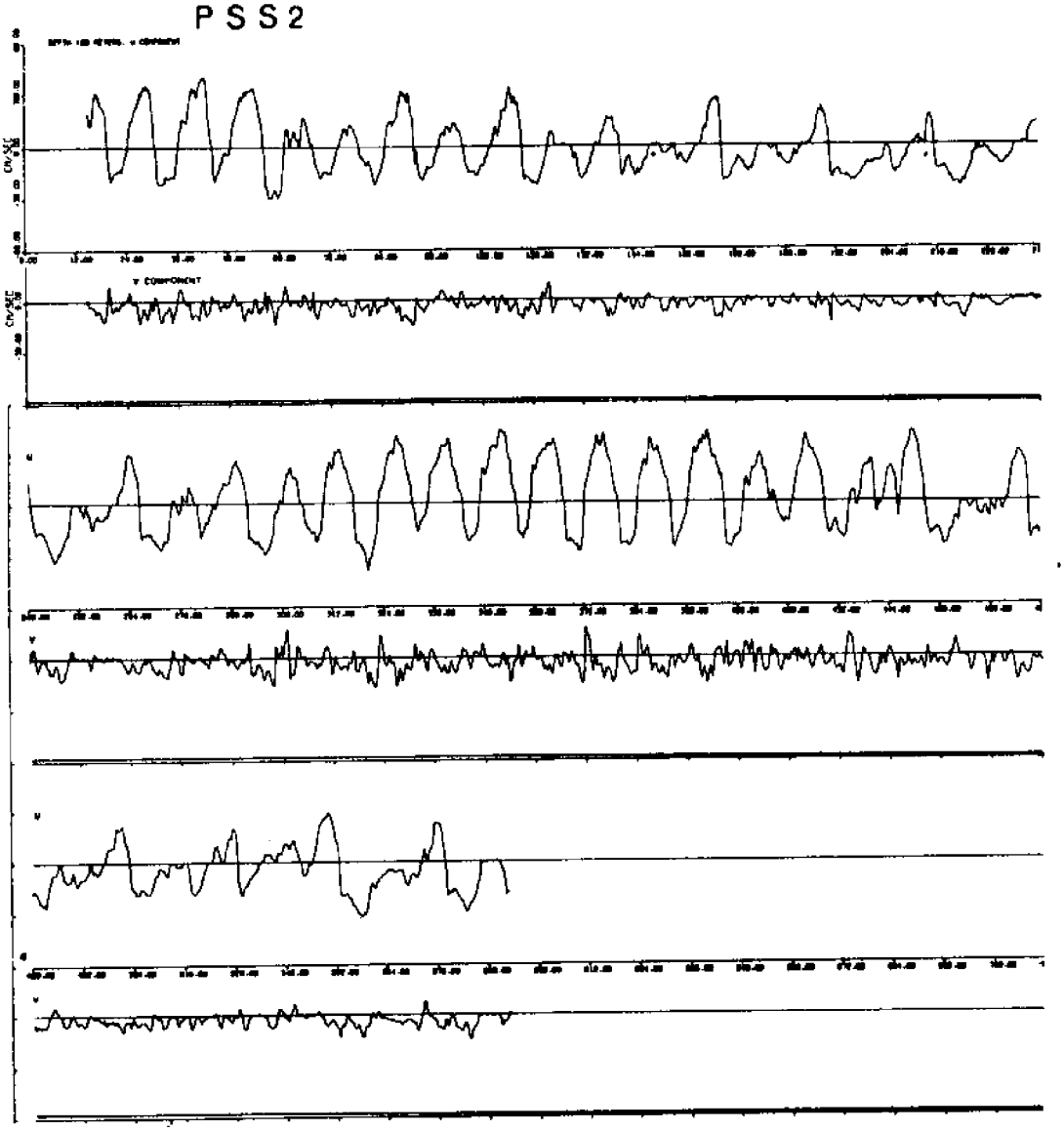

KILOMETERS
KILOMETERS


KILOMETERS
KILOMETERS

PSS1



PSS2



FOURIER COEFFICIENTS FOR PORT SUSAN SILL - MOORING S1. COEFFICIENTS WERE COMPUTED FROM 30-DAY RECORD.

	U-COMPONENT 100 M		V-COMPONENT 100 M			U-COMPONENT 100 M		V-COMPONENT 100 M	
HRS	AMP	PHASE	AMP	PHASE	HRS	AMP	PHASE	AMP	PHASE
7.20000E+02	2.48	116.60	.54	-229.92	1.41176E+01	.89	-3.60	.35	-3.29
3.60000E+02	3.69	-131.53	.75	26.02	1.38462E+01	1.24	-2.02	.33	-4.29
2.40000E+02	2.84	3.52	.62	-4.28	1.35849E+01	.41	2.74	.28	-6.29
1.80000E+02	1.29	82.33	.01	48.09	1.33333E+01	1.69	-3.59	.32	-3.14
1.44000E+02	1.83	6.98	.08	27.46	1.30909E+01	.81	.09	.35	-1.27
1.20000E+02	1.43	23.47	.26	-50.83	1.28571E+01	2.53	-5.27	.38	3.64
1.02857E+02	.84	-46.33	.20	-33.89	1.26316E+01	5.32	5.46	.43	1.96
9.00000E+01	1.66	-12.45	.17	-8.25	1.24138E+01	15.20	2.14	.73	-1.07
8.00000E+01	1.39	14.14	.18	24.62	1.22034E+01	1.39	1.63	.33	5.78
7.20000E+01	1.17	11.79	.53	-19.18	1.20000E+01	5.47	-3.84	.41	-5.66
6.54545E+01	1.56	14.36	.29	1.21	1.18033E+01	1.49	2.76	.23	4.85
6.00000E+01	1.15	13.25	.29	3.42	1.16129E+01	.39	-5.78	.40	-.75
5.53846E+01	.87	21.82	.09	-2.97	1.14286E+01	1.29	2.36	.28	3.82
5.14286E+01	1.82	3.02	.21	20.64	1.12500E+01	.43	3.59	.36	-2.98
4.80000E+01	.29	15.45	.18	22.69	1.10769E+01	.72	-1.63	.13	2.49
4.50000E+01	.84	11.12	.18	-.77	1.09091E+01	.22	-2.52	.49	5.28
4.23529E+01	.35	8.44	.18	-13.79	1.07463E+01	.62	3.69	.89	-4.39
4.00000E+01	.20	10.80	.31	15.46	1.05882E+01	.66	5.00	.31	.52
3.78947E+01	1.88	6.60	.40	-10.08	1.04348E+01	.92	4.29	.35	5.15
3.60000E+01	1.25	10.00	.36	-7.91	1.02857E+01	.46	-.66	.30	-2.42
3.42857E+01	.54	-14.98	.17	-5.97	1.01408E+01	.28	-2.28	.25	4.05
3.27273E+01	.58	5.45	.13	2.58	1.00000E+01	.29	2.01	.11	-4.37
3.13043E+01	.31	8.79	.20	-6.91	9.86301E+00	.20	-2.64	.42	-1.44
3.00000E+01	.54	3.47	.61	-.75	9.72973E+00	.38	-.55	.21	3.04
2.88000E+01	.10	-5.66	.09	-5.32	9.60000E+00	.37	2.63	.21	-.66
2.76923E+01	.76	8.29	.55	1.04	9.47368E+00	.30	4.15	.08	-1.46
2.66667E+01	1.35	12.28	.19	4.88	9.35065E+00	.84	2.30	.16	.76
2.57143E+01	4.62	9.44	.67	3.77	9.23077E+00	.20	4.01	.38	-1.69
2.48276E+01	2.32	-11.23	1.07	4.12	9.11392E+00	.04	-1.68	.20	4.25
2.40000E+01	8.78	-10.29	.74	9.48	9.00000E+00	.52	-2.63	.16	-.97
2.32258E+01	.21	-4.60	.47	-7.13	8.88889E+00	.56	-3.68	.35	-.15
2.25000E+01	1.58	3.60	.52	.75	8.78849E+00	.44	3.85	.28	1.93
2.18182E+01	.36	6.27	.28	-4.17	8.67470E+00	.54	1.28	.62	-1.65
2.11765E+01	.35	8.82	.26	5.24	8.57143E+00	.33	-1.70	.05	-1.77
2.05714E+01	.64	7.08	.24	4.54	8.47059E+00	.93	-.58	.73	.63
2.00000E+01	.99	6.26	.34	7.12	8.37209E+00	.35	-3.55	.52	.19
1.94595E+01	.38	7.66	.38	-1.47	8.27586E+00	1.54	-1.84	.19	3.65
1.89474E+01	.53	8.49	.08	7.44	8.18182E+00	1.68	-1.76	.81	3.66
1.84615E+01	.36	5.51	.24	5.52	8.08989E+00	.30	-.36	.24	-3.23
1.80000E+01	.78	-7.81	.31	-.64	8.00000E+00	.80	2.97	.26	-.47
1.75610E+01	.39	1.18	.49	3.25	7.91209E+00	.74	-3.07	.28	-.57
1.71429E+01	.38	-3.34	.27	-7.05	7.82609E+00	.08	-1.44	.43	3.41
1.67442E+01	.17	-2.95	.11	-3.15	7.74194E+00	.45	-1.42	.17	.81
1.63636E+01	.88	3.77	.20	7.77	7.65957E+00	.42	2.64	.18	1.68
1.60000E+01	.29	-6.14	.22	1.41	7.57895E+00	.36	3.79	.11	1.58
1.56522E+01	1.17	-3.87	.38	7.26	7.50000E+00	.12	-.43	.09	-.46
1.53191E+01	.48	-5.92	.27	4.89	7.42268E+00	.08	1.49	.32	2.32
1.50000E+01	.87	3.51	.20	-4.36	7.34694E+00	.37	-1.20	.39	3.56
1.46939E+01	.56	-5.49	.53	4.67	7.27273E+00	.39	-.98	.85	2.77
1.44000E+01	.26	5.62	.51	-4.73	7.20000E+00	.12	-1.45	.12	.78

FOURIER COEFFICIENTS FOR PORT SUSAN SILL - MOORING S2

	U-COMPONENT		V-COMPONENT	
	100 M		100 M	
HRS	AMP	PHASE	AMP	PHASE
3.00000E+02	7.97	6.26	.19	158.69
1.00000E+02	3.12	-26.26	.14	-84.32
1.20000E+02	.83	-13.78	.22	.81
9.00000E+01	.88	-23.89	.16	-16.32
7.20000E+01	1.43	28.92	.29	-26.81
6.00000E+01	2.53	27.81	.74	-17.13
5.14286E+01	.78	-22.15	.29	-20.04
4.50000E+01	1.33	-15.24	.23	2.34
4.00000E+01	.61	-9.84	.58	7.63
3.60000E+01	1.43	-4.42	.44	15.16
3.27273E+01	.60	5.29	.38	-2.53
3.00000E+01	1.28	8.50	.54	-4.56
2.76923E+01	.53	2.12	.49	-2.96
2.57143E+01	3.71	-11.31	1.21	10.57
2.40000E+01	6.71	5.03	.58	3.38
2.25000E+01	.28	3.45	.91	-2.22
2.11765E+01	1.51	-5.13	.40	9.26
2.00000E+01	.95	-4.71	.35	7.48
1.89474E+01	.19	5.84	.36	-8.14
1.80000E+01	.70	7.15	.18	-6.37
1.71429E+01	1.01	5.71	.15	-1.58
1.63636E+01	.92	4.98	.18	-3.76
1.56522E+01	1.08	6.12	.78	4.36
1.50000E+01	1.71	-4.13	.18	3.98
1.44000E+01	1.65	-1.51	.76	-2.39
1.38462E+01	.45	6.00	.11	.98
1.33333E+01	.84	4.78	.44	-2.75
1.28571E+01	3.62	3.07	.84	-5.58
1.24138E+01	17.11	.73	.99	-2.93
1.20000E+01	8.55	1.06	1.16	-2.29
1.16129E+01	.74	1.36	.51	5.51
1.12500E+01	.62	.54	.33	-5.34
1.09091E+01	.26	5.48	.50	3.20
1.05882E+01	.33	-3.15	.48	.65
1.02857E+01	.62	.46	.47	-.09
1.00000E+01	.39	-.28	.39	-.36
9.72973E+00	.65	-4.01	.48	1.25
9.47368E+00	.13	-3.72	.23	3.75
9.23077E+00	.84	.63	.27	-2.65
9.00000E+00	.89	3.10	.25	2.98
8.78049E+00	.83	-3.14	.86	-3.24
8.57143E+00	.38	-3.61	.21	-3.78
8.37209E+00	.97	-2.29	.85	-.51
8.18182E+00	.79	2.32	1.16	-.75
8.00000E+00	1.09	-3.66	.61	-1.67
7.82609E+00	1.06	-.51	.10	1.36
7.65957E+00	.08	2.99	.18	2.06
7.50000E+00	.68	-3.64	.25	.41
7.34694E+00	.61	-1.01	.93	-.16
7.20000E+00	.31	-2.38	.41	-.30