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A COMPILATION OF MOORED CURRENT METER OBSERVATIONS

VOLUME III

by

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TECHNICAL REPORT

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ABSTRACT

Summaries of current measurements made with Richardson current meters in two regions of the Western North Atlantic are presented. Averaged quantities are presented in the form of computer-plotted curves.

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PREFACE

The present volume is the third of a series intended to summarize the results of current measurements collected with moored instruments. The first three volumes cover the interval from the summer of 1963 until the end of 1964. In terms of the evolution of the buoy program at Woods Hole, this period has a distinct identity. During this time, our effort was principally directed towards solving instrumental and engineering problems. Many essential and fundamental improvements were made. While these improvements did not solve all the problems of instruments and moorings, the work done in 1963-64 was necessary as a basis for our present program.

It may be worthwhile to summarize here some of the buoy systems developments which evolved out of the operations in 1963 and 1964. The current meter itself was, at the beginning of this period, basically unchanged from the original design of Richardson (Richardson, Stimson & Wilkins, 1963). Several basic modifications had been made in the instrument by the end of 1964. Among these were:

1. The vane follower was critically damped to eliminate high-frequency resonances. (Vol. I, Station 107).
2. The method of "strobing" was adopted in order to eliminate blurring of high-frequency directional changes (Vol. I, Station 107).
3. External fins were eliminated as instrument stabilizers (Vol. II, film 1612; Fofonoff, 1966).
4. Rapid sampling was adopted, in order to prevent aliasing of high-frequency noise (Webster, 1964).
5. Interval sampling was introduced. With this method of sampling, bursts of rapid sampling are separated by intervals in which no samples are taken. (Webster, 1967). None of the

data in the first three volumes of data summaries were collected by interval-sampling instruments. However, interval sampling was adopted as a standard early in 1965 as a result of the sampling experiments carried out during 1963 and 1964.

During the same period, the mooring system was developed and improved. Some of the developments were:

1. Subsurface floats were used as a means of reducing wave-induced high-frequency mooring noise. (Films 1471 and 1591, Volume II).
2. Multi-line moorings were tested and rejected in favor of single-line moorings. (Station 140, Vol. I).
3. Synthetic-fiber mooring lines were abandoned, at least in upper portions of moorings, in favor of steel lines to reduce cable breaks from fish bites (Station 158, Vol. II; Stimson, 1965; Haedrich, 1965).
4. More realistic estimates of the motion of moored buoys were obtained. (Stations 107, Vol. I, Stations 158, 160, Vol. II; Fofonoff & Garrett).

Throughout the period of development of moorings and instruments, a data-processing system was first developed and then improved through use. A relatively error-free system for machine readout of films evolved, and a system of computer programs for data analysis was developed (Webster, 1964).

In many ways, the scientific results from the 1963-64 period are disappointing. However, the sequence of operations was worthwhile. It furnished a more realistic idea of the effectiveness and limitations of the instrument system; it provided the opportunity for testing, adopting or rejecting many of the apparently arbitrary choices of alternative procedures; it gave us a clear reminder of the fundamental principles of data sampling and sensor design; and it gave us the background of experience for an effective start on today's more ambitious program which, hopefully, will yield significant new insights into ocean processes.

INTRODUCTION

The measurements which are summarized in this volume were collected at seven moored stations in two regions of the Western North Atlantic. The first two stations, 153 and 154, were made near 53°N , 36°W , where overflow water from the Norwegian Sea passes through a gap in the Mid-Atlantic Ridge from the eastern basin of the North Atlantic into the Labrador Basin. The current-meter measurements were made in conjunction with hydrographic stations and Swallow float measurements (Worthington & Volkmann, 1965).

The other five stations, 163 to 167, were made in the southwestern Sargasso Sea, between Bermuda and the Bahamas. Two of the stations, near 24°N , 68°W , were made in conjunction with sound-velocity profiling experiments (Beckerle, et. al., 1966). The remaining three stations, near 29°N , 68°W , were intended to study inertial-period motions near 30°N .

PERSONNEL

The data summarized in the first three volumes of this series were obtained through the combined efforts of many people who participated in the maintenance and preparation of equipment in operations at sea, and in processing and preparation of the data.

Acknowledgement must be made for the assistance of the officers and crews of the research vessels Atlantis II, Chain and Crawford of the Woods Hole Oceanographic Institution, and of the research vessel Panulirus of the Bermuda Biological Station for Research.

Among those participating in preparation of equipment and sea operations were:

Mrs. Henrik Andersen

Godfrey Day

Nick Fofonoff

John Garrett

James Gifford

Robert Heinmiller

Myron Howland

David Rounbehler

Paul Stimson

Robert Walden

Charles Wilkins

Data processing was carried out by:

Marie Andrade

John Maltais

Ferris Webster

The reports were prepared with the assistance of:

Elizabeth Norton

Audrey Williams

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Station No. 153

52° 47'N
latitude

Set: 1915Z - 7 - IV - 64
hour day month year

35° 38'W
longitude

Retrieved: 1430Z - 13 - IV - 64
hour day month year

Set
by: Stimson Ship Atlantis II Cruise 9

MOORING:

Six 500-m. shots of plaited nylon line were used with a 1500-lb. anchor and a surface toroid float. Depth of water was 3140 meters. Six current meters were used, at depths of 1000, 2000, 2500, 2750 (2 meters), and 3000 m.

PURPOSE OF STATION:

To collect direct current measurements of Norwegian Sea overflow water at a gap in the Mid-Atlantic Ridge. These measurements were to be used in conjunction with direct measurements using Swallow floats and dynamic computations.

COMMENTS ON RESULTS:

The station was recovered. Three of the current meters had broken rotors, and gave no speed information. The other three appeared to work well.

The current meter measurements were compared with the Swallow floats and dynamic computations. The results of this comparison are described by Worthington and Volkmann (1965).

Film No. 1531

C.M. No. H-545 Film begins 2140Z-07- IV - 64 Duration of film: 1 : 4 : 55
hour day month year days hours min

C.M. depth 1000 m. Water depth 3140 m. Magnetic variation 27°W Sampling interval 1 sec.

COMMENTS ON RESULTS:

Instrument worked well. Large speeds at beginning of data are probably associated with launching.

The currents appear to have a semi-diurnal tidal modulation. The net direction of flow is 26°. Mean speed is 5.2 cm./sec.

*****	947	0
*****	854	3
*****	804	6
*****	792	8
*****	791	11
*****	798	14
*****	786	17
*****	711	20
*****	745	23
*****	701	25
*****	714	28
*****	782	31
*****	779	34
*****	883	37
*****	969	39
*****	1118	42
*****	1145	45
*****	1327	48
*****	1607	51
*****	1854	53
*****	1989	56
*****	2283	59
*****	2433	62
*****	2572	65
*****	2629	68
*****	2678	70
*****	2640	73
*****	2583	76
*****	2315	79
*****	2164	82
*****	2084	84
*****	2133	87
*****	2036	90
*****	1961	93
*****	1985	96
*****	1916	98
*****	2174	101
*****	2038	104
*****	2151	107
*****	1982	110
*****	1845	113
*****	1291	115
*****	1012	118
*****	721	121
*****	593	124
*****	487	127
*****	439	129
*****	345	132
*****	330	135
*****	258	138
*****	220	141
*****	224	143
*****	181	146
*****	189	149
*****	183	152
*****	168	155
*****	156	158
*****	166	160
*****	160	163
*****	108	166
*****	148	169
*****	129	172
*****	109	174
*****	119	177
*****	109	180
*****	116	183
*****	115	186
*****	109	188
*****	90	191
*****	87	194
*****	93	197
*****	106	200
*****	92	203
*****	81	205
*****	76	208
*****	71	211
*****	76	214
*****	57	217
*****	62	219
*****	42	222
*****	68	225
*****	58	228
*****	67	231
*****	65	233
*****	71	236
*****	67	239
*****	65	242
*****	100	245
*****	96	248
*****	80	250
*****	86	253
*****	103	256
*****	89	259
*****	125	262
*****	115	264
*****	123	267
*****	153	270
*****	155	273
*****	157	276
*****	181	278
*****	209	281
*****	263	284
*****	307	287
*****	348	290
*****	395	293
*****	463	295
*****	602	298
*****	700	301
*****	770	304
*****	894	307
*****	939	309
*****	998	312
*****	1214	315
*****	1220	318
*****	1240	321
*****	1237	323
*****	1214	326
*****	1212	329
*****	1312	332
*****	1372	335
*****	1456	338
*****	1476	340
*****	1422	343
*****	1394	346
*****	1295	349
*****	1220	352
*****	1107	354
*****	1033	357

	NO.	SPD
*****	1	1
*****	1846	2
*****	12882	3
*****	21624	4
*****	20674	5
*****	17222	6
*****	13042	7
*****	8231	8
*****	4126	9
*****	1864	10
*****	909	11
*****	336	12
*****	175	13
*****	85	14
*****	84	15
*****	44	16
*****	57	17
*****	34	18
*****	41	19
*****	36	20
*****	15	21
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*****	106	38
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*****	0	134
*****	0	135
*****	0	136
*****	0	137
*****	0	138
*****	0	139
*****	0	140
*****	0	141
*****	0	142
*****	0	143
*****	0	144
*****	0	145
*****	0	146
*****	0	147
*****	0	148
*****	0	149
*****	0	150

CURRENT METER FILM NO. 101531

VECTOR AVERAGED VALUES 1200 TERMS PER VALUE.

NORTH AND EAST COMPONENTS
VALUE EXCEEDS RANGE

EAST	NORTH	SEQ NO
X	*	
-146	222	600
21	73	1800
53	38	3000
46	47	4200
53	36	5400
45	30	6600
41	15	7800
43	-1	9000
48	0	10200
42	26	11400
47	18	12600
52	3	13800
62	3	15000
50	23	16200
42	16	17400
32	-4	18600
2	-30	19800
-4	-7	21000
-29	17	22200
-30	19	23400
-22	24	24600
-22	24	25800
-27	35	27000
-16	36	28200
-9	37	29400
-9	24	30600
-14	18	31800
-19	18	33000
-12	25	34200
-9	20	35400
-5	34	36600
4	23	37800
22	19	39000
31	6	40200
31	9	41400
35	21	42600
45	30	43800
57	18	45000
49	18	46200
53	18	47400
59	21	48600
62	22	49800
60	-6	51000
64	-19	52200
64	-18	53400
59	-20	54600
60	-4	55800
52	-7	57000
42	-20	58200
34	-2	59400
33	13	60600
17	30	61800
3	28	63000
29	0	64200
20	-12	65400
8	2	66600
-12	1	67800
-6	17	69000
-10	28	70200
-8	37	71400
-17	29	72600
-9	24	73800
-11	26	75000
-6	30	76200
-3	26	77400
-19	23	78600
-23	29	79800
-17	35	81000
2	47	82200
19	47	83400
43	41	84600
55	29	85800
51	30	87000
57	26	88200
65	24	89400
72	21	90600
77	14	91800
77	7	93000
83	9	94200
75	5	95400
64	-5	96600
59	-7	97800
55	-13	99000
38	-15	100200
31	-12	101400
27	-10	102600

MAGNETIC VARIATION OF 0 DEGREES APPLIED.

FILM101531

FIRST INPUT CYCLE NO. = 1

FINAL INPUT CYCLE NO. = 104052

CURRENT METER LISTING AND PLOT, FILM NO. 101531

RESULTANT SPEED AND DIRECTION, MAGNETIC VARIATION INCLUDED

Film No. 1532

C.M. No. H549 Film begins 2140Z-7- IV - 64 Duration of film: 1 : 7 :37
hour day month year days hours min

C.M. depth 2000 m. Water depth 3140 m. Magnetic variation 27°W Sampling interval 1 sec.

COMMENTS ON RESULTS:

Rotor did not work. Possibly bearings were broken during rough sea voyage prior to launching.

Mean direction of flow is 260° T.

CURRENT METER FILM NO. 101532

AVERAGED VALUES, 1200TERMS PER VALUE

RESULTANT SPEED AND DIRECTION, MAGNETIC VARIATION INCLUDED

DIRECTION	SFO DIR	VEL	SPEED (MM/SEC)
	X	V	
	600 315	0 0 V	
	1800 307	0 0 V	
	3000 309	0 0 V	
	4200 315	0 0 V	
	5400 312	0 0 V	
	6600 295	0 0 V	
	7800 290	0 0 V	
	9000 293	0 0 V	
	10200 290	0 0 V	
	11400 295	0 0 V	
	12600 298	0 0 V	
	13800 304	0 0 V	
	15000 309	0 0 V	
	16200 318	0 0 V	
	17400 318	0 0 V	
	18600 307	0 0 V	
	19800 298	0 0 V	
	21000 287	0 0 V	
	22200 295	0 0 V	
	23400 290	0 0 V	
	24600 284	0 0 V	
	25800 287	0 0 V	
	27000 284	0 0 V	
	28200 287	0 0 V	
	29400 290	0 0 V	
	30600 278	0 0 V	
	31800 276	0 0 V	
	33000 273	0 0 V	
	34200 270	0 0 V	
	35400 264	0 0 V	
	36600 259	0 0 V	
	37800 256	0 0 V	
	39000 256	0 0 V	
	40200 259	0 0 V	
	41400 259	0 0 V	
	42600 259	0 0 V	
	43800 253	0 0 V	
	45000 267	0 0 V	
	46200 276	0 0 V	
	47400 262	0 0 V	
	48600 270	0 0 V	
	49800 278	0 0 V	
	51000 284	0 0 V	
	52200 276	0 0 V	
	53400 281	0 0 V	
	54600 284	0 0 V	
	55800 276	0 0 V	
	57000 295	0 0 V	
	58200 301	0 0 V	
	59400 301	0 0 V	
	60600 298	0 0 V	
	61800 276	0 0 V	
	63000 267	0 0 V	
	64200 264	0 0 V	
	65400 264	0 0 V	
	66600 262	0 0 V	
	67800 264	0 0 V	
	69000 267	0 0 V	
	70200 270	0 0 V	
	71400 278	0 0 V	
	72600 301	0 0 V	
	73800 298	0 0 V	
	75000 307	0 0 V	
	76200 304	0 0 V	
	77400 307	0 0 V	
	78600 309	0 0 V	
	79800 304	0 0 V	
	81000 295	0 0 V	
	82200 304	0 0 V	
	83400 309	0 0 V	
	84600 318	0 0 V	
	85800 318	0 0 V	
	87000 315	0 0 V	
	88200 307	0 0 V	
	89400 298	0 0 V	
	90600 295	0 0 V	
	91800 298	0 0 V	
	93000 301	0 0 V	
	94200 295	0 0 V	
	95400 290	0 0 V	
	96600 293	0 0 V	
	97800 295	0 0 V	
	99000 295	0 0 V	
	100200 301	0 0 V	
	101400 304	0 0 V	
	102600 307	0 0 V	
	103800 304	0 0 V	
	105000 293	0 0 V	
	106200 284	0 0 V	
	107400 276	0 0 V	
	108600 278	0 0 V	
	109800 281	0 0 V	
	111000 293	0 0 V	
	112200 293	0 0 V	

MAGNETIC VARIATION OF 0 DEGREES.

FILM101532

94 OUTPUT CYCLES.

FIRST INPUT CYCLE NO. = 1

FINAL INPUT CYCLE NO. =113699

Film No. 1533

C.M. No. H-550 Film begins 2140Z- 7 - IV - 64 Duration of film: 1 : 7 : 38
hour day month year days hours min

C.M. depth 2500 m. Water depth 3140 m. Magnetic variation 27°W Sampling interval 1 sec.

COMMENTS ON RESULTS:

Instrument worked well. Current appears to have a semi-diurnal tidal modulation, with a net direction of flow of 227°. Mean speed is 718 cm./sec.

Erratum:

Above mean speed should read 7.8 cm/sec, not 718.

*	5	0
*	0	3
*	3	6
*	0	8
*	2	11
*	1	14
*	1	17
*	1	20
*	2	23
*	1	25
*	2	28
*	0	31
*	1	34
*	0	37
*	0	39
*	0	42
*	0	45
*	0	48
*	0	51
*	0	53
*	0	56
*	0	59
*	0	62
*	1	65
*	0	68
*	0	70
*	0	73
*	0	76
*	0	79
*	0	82
*	0	84
*	0	87
*	0	90
*	0	93
*	0	96
*	0	98
*	0	101
*	0	104
*	0	107
*	0	110
*	1	113
*	0	115
*	0	118
*	0	121
*	0	124
*	0	127
*	0	129
*	0	132
*	0	135
*	0	138
*	0	141
*	0	143
*	0	146
*	0	149
*	0	152
*	1	155
*	0	158
*	0	160
*	0	163
*	2	166
*	0	169
*	1	172
*	1	174
*	4	177
*	8	180
*	17	183
*	34	186
*	70	188
**	127	191
***	165	194
****	260	197
*****	406	200
*****	614	203
*****	933	205
*****	1564	208
*****	2521	211
*****	3093	214
*****	3124	217
*****	3172	219
*****	3178	222
*****	2903	225
*****	3011	228
*****	3145	231
*****	3290	233
*****	3494	236
*****	3141	239
*****	3422	242
*****	4555	245
*****	4878	248
*****	4733	250
*****	4550	253
*****	3987	256
*****	3786	259
*****	3823	262
*****	3907	264
*****	3667	267
*****	3038	270
*****	3042	273
*****	3846	276
*****	4433	278
*****	3439	281
*****	2536	284
*****	3020	287
*****	3174	290
*****	2798	293
*****	2088	295
*****	1153	298
*****	548	301
*****	268	304
***	113	307
**	85	309
**	57	312
**	66	315
**	81	318
**	62	321
**	69	323
**	93	326
**	75	329
**	120	332
**	111	335
**	73	338
*	47	340
*	25	343
*	20	346
*	12	349
*	11	352
*	3	354
*	5	357

*	1	1
*	47	2
*****	1206	3
*****	7555	4
*****	13974	5
*****	10025	6
*****	7115	7
*****	10242	8
*****	18871	9
*****	21002	10
*****	15022	11
*****	6153	12
*****	2078	13
*****	492	14
*****	97	15
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*	0	147
*	0	148
*	0	149
*	0	150

CURRENT METER FILM NO. 101533

VECTOR AVERAGED VALUES 1200 TERMS PER VALUE.

EAST	NORTH	SEQ NO
X	*	
-54	64	600
-110	23	1800
-107	7	3000
-98	-3	4200
-102	-18	5400
-102	-41	6600
-98	-40	7800
-99	-38	9000
-100	-31	10200
-90	-35	11400
-93	-33	12600
-91	-31	13800
-98	-27	15000
-96	-9	16200
-95	-10	17400
-104	12	18600
-107	26	19800
-104	27	21000
-85	32	22200
-82	37	23400
-94	34	24600
-92	29	25800
-99	33	27000
-77	32	28200
-77	38	29400
-69	35	30600
-58	24	31800
-50	14	33000
-46	9	34200
-44	-1	35400
-43	-7	36600
-40	-23	37800
-44	-36	39000
-43	-40	40200
-46	-53	41400
-49	-71	42600
-49	-83	43800
-47	-81	45000
-52	-81	46200
-49	-75	47400
-49	-75	48600
-53	-78	49800
-50	-79	51000
-53	-83	52200
-60	-83	53400
-60	-78	54600
-65	-69	55800
-71	-65	57000
-76	-57	58200
-79	-52	59400
-83	-47	60600
-89	-35	61800
-94	-18	63000
-92	-6	64200
-94	-2	65400
-92	9	66600
-93	14	67800
-94	14	69000
-82	10	70200
-75	12	71400
-66	14	72600
-63	10	73800
-57	8	75000
-49	1	76200
-42	0	77400
-37	-4	78600
-35	-7	79800
-47	-11	81000
-39	-16	82200
-32	-21	83400
-24	-25	84600
-23	-28	85800
-23	-29	87000
-25	-28	88200
-26	-29	89400
-32	-28	90600
-32	-28	91800
-33	-28	93000
-37	-28	94200
-40	-28	95400
-44	-27	96600
-48	-26	97800
-51	-24	99000
-55	-23	100200
-64	-30	101400
-73	-31	102600
-75	-30	103800
-77	-27	105000
-75	-30	106200
-78	-33	107400
-81	-23	108600
-80	-16	109800
-73	-13	111000
-79	-9	112200

MAGNETIC VARIATION OF 0 DEGREES APPLIED.

FILM101533

FIRST INPUT CYCLE NO. = 1

FINAL INPUT CYCLE NO. = 113819

RESULTANT SPEED AND DIRECTION, MAGNETIC VARIATION INCLUDED

MAGNETIC VARIATION OF 0 DEGREES APPLIED.

Film No. 1534

C.M. No. H-546 Film begins 2140Z-7- IV - 64 Duration of film 1 : 6 :17
hour day month year days hours min

C.M. depth 2750 m. Water depth 3140 m. Magnetic variation 27°W Sampling interval 1 sec.

COMMENTS ON RESULTS:

Instrument worked well. Semi-diurnal tidal variation, which was apparent in measurements at shallower depths, is not indicated. Net direction of flow is 272°. Mean speed is 9.9 cm./sec.

*	1	1
*	0	2
*	0	3
***	76	4
*****	546	5
*****	3583	6
*****	8171	7
*****	13036	8
*****	16156	9
*****	18571	10
*****	15955	11
*****	11706	12
*****	8047	13
*****	5863	14
*****	3427	15
*****	1846	16
*****	1050	17
***	420	18
*	271	19
*	131	20
*	60	21
*	43	22
*	25	23
*	13	24
*	20	25
*	3	26
*	5	27
*	3	28
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*	0	142
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*	0	145
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*	0	148
*	0	149
*	0	150

CURRENT METER FILM NO. 101534

VECTOR AVERAGED VALUES 1200 TERMS PER VALUE.

NORTH AND EAST COMPONENTS

MAGNETIC VARIATION OF 0 DEGREES APPLIED.

FILM101534

FIRST INPUT CYCLE NO. = 1

FINAL INPUT CYCLE NO. = 108941

RESULTANT SPEED AND DIRECTION, MAGNETIC VARIATION INCLUDED

EAST NORTH	SEQ NO	DIRECTION	SEQ DIR	VEL	SPEED(MM/SEC)
X	*		X	V	
-130 65 600	*	X	600 298	145	
-72 59 1800	*	X	1800 309	93	V
-97 76 3000	*	X	3000 309	123	V
-104 82 4200	*	X	4200 309	133	V
-88 36 5400	*	X	5400 292	95	V
-74 24 6600	*	X	6600 287	78	V
-74 45 7800	*	X	7800 301	87	V
-89 63 9000	*	X	9000 306	109	V
-90 67 10200	*	X	10200 306	112	V
-94 60 11400	*	X	11400 301	111	V
-105 75 12600	*	X	12600 306	129	V
-112 71 13800	*	X	13800 304	133	V
-89 76 15000	*	X	15000 309	117	V
-93 86 16200	*	X	16200 312	126	V
-93 78 17400	*	X	17400 309	122	V
-71 45 18600	*	X	18600 301	84	V
-81 45 19800	*	X	19800 298	93	V
-93 62 21000	*	X	21000 304	112	V
-85 41 22200	*	X	22200 295	95	V
-82 28 23400	*	X	23400 290	87	V
-84 15 24600	*	X	24600 281	85	V
-90 26 25800	*	X	25800 287	94	V
-92 14 27000	*	X	27000 278	93	V
-105 13 28200	*	X	28200 276	106	V
-107 23 29400	*	X	29400 281	109	V
-97 12 30600	*	X	30600 275	98	V
-98 3 31800	*	X	31800 273	98	V
-93 8 33000	*	X	33000 276	94	V
-90 -17 34200	*	X	34200 259	92	V
-83 -12 35400	*	X	35400 242	84	V
-73 -10 36600	*	X	36600 242	74	V
-65 -30 37800	*	X	37800 245	71	V
-67 -25 39000	*	X	39000 250	72	V
-67 -13 40200	*	X	40200 259	68	V
-64 -15 41400	*	X	41400 256	66	V
-79 -14 42600	*	X	42600 242	80	V
-74 -16 43800	*	X	43800 259	76	V
-87 -17 45000	*	X	45000 259	89	V
-102 -24 46200	*	X	46200 256	105	V
-119 -31 47400	*	X	47400 256	123	V
-98 -25 48600	*	X	48600 256	101	V
-98 -16 49800	*	X	49800 242	100	V
-98 -6 51000	*	X	51000 247	98	V
-98 5 52200	*	X	52200 273	98	V
-116 25 53400	*	X	53400 281	119	V
-94 27 54600	*	X	54600 287	98	V
-81 39 55800	*	X	55800 295	89	V
-74 46 57000	*	X	57000 301	87	V
-79 55 58200	*	X	58200 304	96	V
-77 53 59400	*	X	59400 304	94	V
-72 43 60600	*	X	60600 301	84	V
-70 48 61800	*	X	61800 304	85	V
-73 55 63000	*	X	63000 306	92	V
-77 51 64200	*	X	64200 304	93	V
-63 49 65400	*	X	65400 306	80	V
-56 45 66600	*	X	66600 309	72	V
-46 47 67800	*	X	67800 315	65	V
-44 42 69000	*	X	69000 312	61	V
-42 39 70200	*	X	70200 312	58	V
-44 40 71400	*	X	71400 312	59	V
-52 45 72600	*	X	72600 312	69	V
-41 56 73800	*	X	73800 323	70	V
-20 61 75000	*	X	75000 343	64	V
-10 64 76200	*	X	76200 352	65	V
-4 63 77400	*	X	77400 357	63	V
-72 27 78600	*	X	78600 290	77	V
-37 31 79800	*	X	79800 309	48	V
-10 58 81000	*	X	81000 349	59	V
-9 52 82200	*	X	82200 352	53	V
-11 50 83400	*	X	83400 349	51	V
-18 41 84600	*	X	84600 338	44	V
-24 9 85800	*	X	85800 292	25	V
-27 -3 87000	*	X	87000 244	27	V
-30 4 88200	*	X	88200 278	31	V
-23 39 89400	*	X	89400 329	45	V
-30 38 90600	*	X	90600 323	48	V
-15 66 91800	*	X	91800 346	68	V
-10 74 93000	*	X	93000 352	75	V
-6 77 94200	*	X	94200 354	78	V
-16 83 95400	*	X	95400 349	84	V
-28 84 96600	*	X	96600 340	89	V
-52 77 97800	*	X	97800 326	93	V
-72 64 99000	*	X	99000 312	96	V
-81 55 100200	*	X	100200 304	98	V
-90 58 101400	*	X	101400 304	107	V
-109 46 102600	*	X	102600 292	118	V
-98 62 103800	*	X	103800 304	116	V
-88 67 105000	*	X	105000 306	111	V
-74 66 106200	*	X	106200 312	99	V
-54 76 107400	*	X	107400 326	93	V

MAGNETIC VARIATION OF 0 DEGREES APPLIED.

****	184	0
*****	261	3
*****	209	6
*****	186	8
*****	230	11
*****	227	14
*****	307	17
*****	266	20
*****	274	23
*****	374	25
*****	657	28
*****	568	31
*****	872	34
*****	831	37
*****	863	39
*****	757	42
*****	654	45
*****	675	48
*****	708	51
*****	629	53
*****	638	56
*****	637	59
*****	601	62
*****	607	65
*****	503	68
*****	568	70
*****	676	73
*****	551	76
*****	588	79
*****	664	82
*****	563	84
*****	590	87
*****	517	90
*****	607	93
*****	662	96
*****	639	98
*****	701	101
*****	648	104
*****	723	107
*****	800	110
*****	754	113
*****	852	115
*****	953	118
*****	893	121
*****	1197	124
*****	1487	127
*****	1546	129
*****	2070	132
*****	2503	135
*****	3045	138
*****	2691	141
*****	2869	143
*****	3133	146
*****	2836	149
*****	3165	152
*****	3458	155
*****	4739	158
*****	3908	160
*****	3731	163
*****	4339	166
*****	3810	169
*****	2948	172
*****	2541	174
*****	3031	177
*****	2255	180
*****	1818	183
*****	1646	186
*****	1961	188
*****	1543	191
*****	1391	194
*****	1259	197
*****	1213	200
*****	1338	203
*****	1083	205
*****	1081	208
*****	1212	211
*****	1107	214
*****	921	217
*****	702	219
*****	698	222
*****	603	225
*****	420	228
*****	322	231
*****	246	233
*****	229	236
*****	147	239
*****	102	242
*****	104	245
*****	73	248
*****	87	250
*****	82	253
*****	64	256
*****	55	259
*****	73	262
*****	65	264
*****	76	267
*****	37	270
*****	89	273
*****	69	276
*****	44	278
*****	84	281
*****	69	284
*****	84	287
*****	73	290
*****	65	293
*****	57	295
*****	101	298
*****	39	301
*****	61	304
*****	72	307
*****	94	309
*****	81	312
*****	54	315
*****	70	318
*****	65	321
*****	74	323
*****	77	326
*****	117	329
*****	93	332
*****	114	335
*****	89	338
*****	128	340
*****	193	343
*****	131	346
*****	206	349
*****	228	352
*****	278	354
*****	225	357

Film No. 1535

C.M. No. H542 Film begins 2140Z- 7 - IV - 64 Duration of film: 1 : 7 : 6
hour day month year days hours min

C.M. depth 2750 Water m. depth 3140 Magnetic variation 27°W Sampling interval 1 sec.

PURPOSE:

This instrument was paired with 1534, for comparison of records over small vertical spacing.

COMMENTS ON RESULTS:

Rotor did not work, possibly because of bearing damage during rough sea voyage prior to launching. Directions do not compare well with 1534; possibly the compass of 1535 may have been sticking. Mean direction of flow is 130°.

CURRENT METER FILM NO. 101535

AVERAGED VALUES, 1200 TERMS PER VALUE

RESULTANT SPEED AND DIRECTION, MAGNETIC VARIATION INCLUDED

MAGNETIC VARIATION OF 0 DEGREES.

FILM 101535

90 OUTPUT CYCLES.

FIRST INPUT CYCLE NO. = 1

FINAL INPUT CYCLE NO. = 111051

*****	2506	0
*****	1605	3
*****	1793	6
*****	1780	8
*****	1727	11
*****	1918	14
*****	1378	17
*****	824	20
*****	711	23
*****	674	25
*****	630	28
*****	612	31
*****	548	34
*****	810	37
*****	750	39
*****	775	42
*****	690	45
*****	610	48
*****	648	51
*****	678	53
*****	735	56
*****	719	59
*****	632	62
*****	592	65
*****	584	68
*****	468	70
*****	444	73
*****	442	76
*****	413	79
*****	329	82
*****	344	84
*****	316	87
*****	270	90
*****	265	93
*****	266	96
*****	251	98
*****	282	101
*****	272	104
*****	276	107
*****	261	110
*****	258	113
*****	241	115
*****	338	118
*****	270	121
*****	292	124
*****	285	127
*****	281	129
*****	276	132
*****	214	135
*****	209	138
*****	194	141
*****	154	143
*****	133	146
*****	142	149
*****	97	152
*****	79	155
*****	81	158
*****	66	160
*****	83	163
*****	99	166
*****	134	169
*****	104	172
*****	128	174
*****	146	177
*****	140	180
*****	131	183
*****	109	186
*****	105	188
*****	91	191
*****	111	194
*****	108	197
*****	98	200
*****	133	203
*****	98	205
*****	102	208
*****	92	211
*****	129	214
*****	93	217
*****	120	219
*****	117	222
*****	87	225
*****	111	228
*****	124	231
*****	145	233
*****	134	236
*****	141	239
*****	252	242
*****	217	245
*****	159	248
*****	169	250
*****	198	253
*****	239	256
*****	256	259
*****	288	262
*****	348	264
*****	370	267
*****	471	270
*****	444	273
*****	413	276
*****	494	278
*****	509	281
*****	576	284
*****	559	287
*****	611	290
*****	636	293
*****	622	295
*****	790	298
*****	1042	301
*****	1150	304
*****	1025	307
*****	1133	309
*****	1209	312
*****	1500	315
*****	2914	318
*****	3637	321
*****	3779	323
*****	4414	326
*****	5273	329
*****	4751	332
*****	3795	335
*****	2365	338
*****	2284	340
*****	1240	343
*****	1041	346
*****	1095	349
*****	2594	352
*****	2554	354
*****	2796	357

Film No. 1536

C.M. No. H540 Film begins 2140Z-7- IV - 64 Duration of film 1 : 2 : 54
hour day month year days hours min

C.M. depth 3000 m. Water depth 3140 m. Magnetic variation 27°W Sampling interval 1 sec.

COMMENTS ON RESULTS:

Rotor did not work, possibly because of bearing damage on rough sea voyage prior to launching. Mean direction of flow is 300°.

RESULTANT SPEED AND DIRECTION, MAGNETIC VARIATION INCLUDED

DIRECTION	SFO	DIR	VEL	SPEED (MM/SEC)
		X	V	
	6000	321	0	0
	18000	51	0	0
	30000	45	0	0
	42000	53	0	0
	54000	53	0	0
	66000	53	0	0
	78000	48	0	0
	90000	45	0	0
	102000	315	0	0
	114000	312	0	0
	126000	321	0	0
	138000	354	0	0
	150000	340	0	0
	162000	329	0	0
	174000	332	0	0
	186000	336	0	0
	198000	326	0	0
	210000	309	0	0
	222000	307	0	0
	234000	318	0	0
	246000	318	0	0
	258000	315	0	0
	270000	315	0	0
	282000	315	0	0
	294000	323	0	0
	306000	326	0	0
	318000	329	0	0
	330000	332	0	0
	342000	335	0	0
	354000	332	0	0
	366000	329	0	0
	378000	329	0	0
	390000	323	0	0
	402000	301	0	0
	414000	346	0	0
	426000	357	0	0
	438000	6	0	0
	450000	357	0	0
	462000	335	0	0
	474000	329	0	0
	486000	321	0	0
	498000	315	0	0
	510000	323	0	0
	522000	321	0	0
	534000	318	0	0
	546000	323	0	0
	558000	326	0	0
	570000	301	0	0
	582000	298	0	0
	594000	287	0	0
	606000	315	0	0
	618000	315	0	0
	630000	248	0	0
	642000	239	0	0
	654000	239	0	0
	666000	270	0	0
	678000	65	0	0
	690000	53	0	0
	702000	51	0	0
	714000	53	0	0
	726000	62	0	0
	738000	65	0	0
	750000	70	0	0
	762000	70	0	0
	774000	70	0	0
	786000	59	0	0
	798000	70	0	0
	810000	53	0	0
	822000	25	0	0
	834000	37	0	0
	846000	8	0	0
	858000	3	0	0
	870000	354	0	0
	882000	352	0	0
	894000	357	0	0
	906000	6	0	0
	918000	0	0	0
	930000	8	0	0
	942000	20	0	0
	954000	14	0	0

MAGNETIC VARIATION OF 0 DEGREES.

BU OUTPUT CYCLES.

FINAL INPUT CYCLE NO. = 95760

Station No. 154

52° 50'N	Set:	1555Z - 8 - IV - 64
latitude		hour day month year

35° 38'W	Retrieved: 1230Z - 9 - IV - 64
longitude	hour day month year

Set by	Stimson	Ship	Atlantis II	Cruise	9
-----------	---------	------	-------------	--------	---

MOORING:

Six 500-m. shots of plaited nylon line were used with a 1500-lb. anchor and a surface toroid float. Depth of water was 3274m. Three current meters were used, at depths of 2000, 2500 and 3000 m.

PURPOSE OF STATION:

To collect direct current measurements of Norwegian Sea overflow water at a gap in the Mid-Atlantic Ridge. These measurements were to be used in conjunction with direct measurements using Swallow floats and dynamic computations.

COMMENTS ON RESULTS:

A few hours after the mooring was set, the mooring appeared to have gone adrift. It was retrieved before significant records could be obtained to carry out the comparison with other current-measuring techniques. Although the data were unsuited to the needs of Worthington and Volkmann, they are summarized here for the record.

One of the current meters had a rotor broken and consequently collected no speed measurements.

Film No. 1541

C.M. No. H-543 Film begins 2155Z-8- IV - 64 Duration of film: 12 :53
hour day month year hours min

C.M. depth 2000 m. Water depth 3274 m. Magnetic variation 27°W Sampling interval 1 sec.

COMMENTS ON RESULTS:

Instrument worked well. Record is too short for intended purpose. Mean speed is 11.3 cm./sec. Net direction of flow is 302°.

395	0
280	3
226	6
112	8
66	11
41	14
23	17
8	20
0	23
0	25
0	28
0	31
0	34
0	37
0	39
0	42
0	45
0	48
0	51
0	53
0	56
0	59
0	62
0	65
0	68
0	70
0	73
0	76
0	79
0	82
0	84
0	87
0	90
0	93
0	96
0	98
0	101
0	104
0	107
0	110
0	113
0	115
0	118
0	121
0	124
0	127
0	129
0	132
0	135
0	138
0	141
0	143
0	146
0	149
0	152
0	155
1	158
0	160
0	163
0	166
0	169
0	172
0	174
1	177
0	180
0	183
0	186
0	188
0	191
0	194
0	197
0	200
0	203
0	205
0	208
0	211
0	214
0	217
0	219
0	222
0	225
0	228
0	231
0	233
0	236
0	239
0	242
0	245
0	248
0	250
0	253
0	256
0	259
0	262
0	264
0	267
0	270
0	273
0	276
0	278
2	281
6	284
11	287
33	290
83	293
204	295
391	298
809	301
1511	304
2404	307
3398	309
3721	312
4260	315
4464	318
4985	321
4900	323
4440	326
2776	329
1598	332
1152	335
695	338
741	340
480	343
319	346
364	349
475	352
501	354
500	357

1	1
0	2
0	3
0	4
46	5
630	6
2715	7
4928	8
6623	9
6550	10
5813	11
7610	12
3918	13
2406	14
1280	15
421	16
135	17
83	18
90	19
128	20
94	21
152	22
92	23
192	24
237	25
205	26
231	27
206	28
210	29
194	30
98	31
179	32
121	33
155	34
76	35
82	36
131	37
73	38
80	39
74	40
66	41
36	42
4	43
6	44
0	45
3	46
2	47
0	48
2	49
1	50
0	51
1	52
0	53
0	54
0	55
0	56
0	57
0	58
0	59
0	60
0	61
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0	68
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0	131
0	132
0	133
0	134
0	135
0	136
0	137
0	138
0	139
0	140
0	141
0	142
0	143
0	144
0	145
0	146
0	147
0	148
0	149
0	150

CURRENT METER FILM NO. 101541

VECTOR AVERAGED VALUES 1200 TERMS PER VALUE.

NORTH AND EAST COMPONENTS

EAST NORTH SEQ NO

X	*	
-6	100	600
-2	75	1800
-26	59	3000
-40	53	4200
-47	53	5400
-66	66	6600
-61	87	7800
-58	87	9000
-52	75	10200
-52	75	11400
-56	73	12600
-52	61	13800
-47	53	15000
-54	56	16200
-59	53	17400
-66	55	18600
-72	54	19800
-72	53	21000
-71	60	22200
-64	59	23400
-68	62	24600
-72	69	25800
-80	77	27000
-85	89	28200
-88	100	29400
-87	110	30600
-82	111	31800
-78	86	33000
-79	84	34200
-79	78	35400
-79	81	36600
-79	83	37800
-73	88	39000
-63	94	40200
-63	97	41400
-54	121	42600
-121	205	43800
-130	266	45000

VALUE EXCEEDS RANGE
VALUE EXCEEDS RANGE

MAGNETIC VARIATION OF 0 DEGREES APPLIED.

FILM101541

FIRST INPUT CYCLE NO. = 1

FINAL INPUT CYCLE NO. = 46280

RESULTANT SPEED AND DIRECTION, MAGNETIC VARIATION INCLUDED

	DIRECTION	SEQ DIR	VEL	SPEED(MM/SEC)
*		X 600 357	100	
T		X 1800 335	75	
*		X 3000 323	65	
*		X 4200 318	66	
*		X 5400 315	71	
*		X 6600 323	94	
*		X 7800 326	106	
*		X 9000 326	105	
*		X 10200 326	91	
*		X 11400 326	92	
*		X 12600 323	92	
*		X 13800 321	81	
*		X 15000 318	71	
*		X 16200 315	77	
*		X 17400 312	79	
*		X 18600 309	86	
*		X 19800 306	90	
*		X 21000 306	89	
*		X 22200 309	93	
*		X 23400 312	87	
*		X 24600 312	92	
*		X 25800 315	99	
*		X 27000 315	111	
*		X 28200 315	123	
*		X 29400 318	133	
*		X 30600 321	140	
*		X 31800 323	138	
*		X 33000 318	116	
*		X 34200 318	115	
*		X 35400 315	111	
*		X 36600 315	113	
*		X 37800 315	115	
*		X 39000 321	113	
*		X 40200 326	116	
*		X 41400 326	116	
*		X 42600 335	133	
*		X 43800 329	238	
*		X 45000 335	296	

MAGNETIC VARIATION OF 0 DEGREES APPLIED.

KILOMETERS

Film No. 1542

C.M. No. H-548 Film begins 2155Z-8- IV - 64 Duration of film: 14 : 0
hour day month year hours min

C.M. depth 2500 m. Water depth 3274 m. Magnetic variation 27°W Sampling interval 1 sec.

COMMENTS ON RESULTS:

Instrument worked well. Record is too short for intended purpose.

High speeds at beginning of measurements were produced during the launching of the mooring. Net direction of flow is 261° and mean speed is 9.0 cm./sec.

*****	336	0
*****	389	3
*****	404	6
*****	340	8
*****	306	11
*****	356	14
*****	354	17
*****	308	20
*****	258	23
*****	176	25
*****	193	28
*****	128	31
*****	124	34
*****	97	37
*****	115	39
*****	90	42
*****	80	45
*****	59	48
*****	53	51
*****	59	53
*****	34	56
*****	39	59
*****	27	62
*****	30	65
*****	22	68
*****	15	70
*****	25	73
*****	16	76
*****	12	79
*****	9	82
*****	15	84
*****	19	87
*****	6	90
*****	8	93
*****	10	96
*****	13	98
*****	10	101
*****	12	104
*****	7	107
*****	11	110
*****	13	113
*****	8	115
*****	15	118
*****	18	121
*****	9	124
*****	19	127
*****	25	129
*****	33	132
*****	27	135
*****	38	138
*****	42	141
*****	61	143
*****	94	146
*****	118	149
*****	163	152
*****	186	155
*****	244	158
*****	246	160
*****	256	163
*****	300	166
*****	305	169
*****	318	172
*****	400	174
*****	409	177
*****	366	180
*****	420	183
*****	414	186
*****	422	188
*****	451	191
*****	486	194
*****	538	197
*****	527	200
*****	464	203
*****	618	205
*****	632	208
*****	592	211
*****	632	214
*****	749	217
*****	852	219
*****	790	222
*****	751	225
*****	717	228
*****	755	231
*****	704	233
*****	647	236
*****	566	239
*****	564	242
*****	557	245
*****	493	248
*****	462	250
*****	511	253
*****	565	256
*****	558	259
*****	531	262
*****	546	264
*****	613	267
*****	511	270
*****	477	273
*****	498	276
*****	517	278
*****	619	281
*****	767	284
*****	947	287
*****	1418	290
*****	1621	293
*****	1712	295
*****	1744	298
*****	1892	301
*****	1809	304
*****	1501	307
*****	1074	309
*****	814	312
*****	660	315
*****	485	318
*****	350	321
*****	247	323
*****	246	326
*****	252	329
*****	242	332
*****	301	335
*****	336	338
*****	259	340
*****	396	343
*****	644	346
*****	717	349
*****	353	352
*****	268	354
*****	293	357

	NO.	SPD
*	1	1
*	0	2
***	251	3
*****	1036	4
*****	7092	5
*****	9608	6
*****	9681	7
*****	8135	8
*****	5075	9
*****	3125	10
*****	924	11
**	140	12
**	72	13
**	105	14
**	105	15
**	67	16
**	130	17
**	136	18
**	121	19
**	131	20
**	143	21
**	112	22
**	134	23
**	136	24
**	194	25
**	184	26
**	175	27
**	126	28
**	124	29
**	169	30
*	92	31
***	202	32
**	123	33
**	142	34
*	59	35
*	74	36
*	78	37
*	95	38
**	109	39
*	67	40
*	69	41
**	105	42
**	95	43
**	121	44
**	132	45
**	122	46
**	109	47
**	79	48
**	117	49
**	114	50
**	121	51
*	59	52
*	72	53
*	25	54
*	27	55
*	13	56
*	0	57
*	8	58
*	13	59
*	0	60
*	0	61
*	0	62
*	0	63
*	0	64
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*	0	92
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*	4	94
*	0	95
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*	0	100
*	0	101
*	0	102
*	0	103
*	0	104
*	0	105
*	0	106
*	0	107
*	0	108
*	0	109
*	0	110
*	0	111
*	0	112
*	0	113
*	0	114
*	0	115
*	0	116
*	0	117
*	1	118
*	0	119
*	0	120
*	0	121
*	0	122
*	0	123
*	0	124
*	0	125
*	0	126
*	0	127
*	0	128
*	0	129
*	0	130
*	0	131
*	0	132
*	0	133
*	0	134
*	0	135
*	0	136
*	0	137
*	0	138
*	0	139
*	0	140
*	0	141
*	0	142
*	0	143
*	0	144
*	0	145
*	0	146
*	0	147
*	0	148
*	0	149
*	0	150

CURRENT WATER FIL NO. 101342

VECTOR AVERAGED VALUES 1200 TERMS PER VALUE.

NORTH AND EAST COMPONENTS

VALUE EXCEEDS RANGE
VALUE EXCEEDS RANGE
VALUE EXCEEDS RANGE

MAGNETIC VARIATION OF 0 DEGREES APPLIED.

EAST	NORTH	SEQ NO
X	*	
29	49	600
13	48	1800
15	44	3000
2	56	4200
-16	45	5400
-37	33	6600
-48	29	7800
-57	27	9000
-63	30	10200
-62	32	11400
-62	34	12600
-59	35	13800
-61	32	15000
-65	39	16200
-67	54	17400
-73	52	18600
-80	42	19800
-81	34	21000
-83	24	22200
-84	5	23400
-78	-5	24600
-72	-16	25800
-68	-25	27000
-56	-37	28200
-45	-45	29400
-40	-45	30600
-35	-45	31800
-32	-45	33000
-31	-42	34200
-27	-49	35400
-25	-47	36600
-13	-43	37800
-13	-43	39000
-11	-42	40200
-13	-40	41400
-12	-42	42600
-9	-40	43800
-28	-33	45000
-191	-1	46200
-165	225	47400
-104	402	48600

FILE 101342

FIRST INPUT CYCLE NO. = 1

FINAL INPUT CYCLE NO. = 50283

SLOW STROKE, 1200 TERMS BETWEEN STROKES

RESULTANT SPEED AND DIRECTION, MAGNETIC VARIATION INCLUDED

***	152	0
***	149	3
***	159	6
***	126	8
***	135	11
***	124	14
***	143	17
***	170	20
***	154	23
***	136	25
***	146	28
***	152	31
***	151	34
***	172	37
***	174	39
***	195	42
***	165	45
***	163	48
***	210	51
***	173	53
***	220	56
***	211	59
***	255	62
***	309	65
***	539	68
***	641	70
***	758	73
***	606	76
***	499	79
***	416	82
***	481	84
***	617	87
***	569	90
***	546	93
***	473	96
***	528	98
*****	7144	101
*****	2803	104
*****	1917	107
*****	2986	110
*****	1144	113
*****	1304	115
*****	961	118
*****	824	121
*****	801	124
*****	473	127
*****	411	129
*****	359	132
*****	369	135
*****	336	138
*****	368	141
*****	388	143
*****	280	146
*****	215	149
*****	188	152
*****	130	155
*****	93	158
*****	89	160
*****	77	163
*****	57	166
*****	69	169
*****	60	172
*****	68	174
*****	80	177
*****	83	180
*****	75	183
*****	66	186
*****	79	188
*****	98	191
*****	93	194
*****	92	197
*****	65	200
*****	95	203
*****	62	205
*****	64	208
*****	47	211
*****	59	214
*****	48	217
*****	43	219
*****	56	222
*****	50	225
*****	55	228
*****	68	231
*****	56	233
*****	43	236
*****	38	239
*****	26	242
*****	23	245
*****	26	248
*****	18	250
*****	23	253
*****	29	256
*****	24	259
*****	18	262
*****	28	264
*****	26	267
*****	34	270
*****	24	273
*****	25	276
*****	28	278
*****	44	281
*****	31	284
*****	47	287
*****	46	290
*****	44	293
*****	57	295
*****	67	298
*****	96	301
*****	106	304
*****	104	307
*****	131	309
*****	157	312
*****	185	315
*****	486	318
*****	199	321
*****	213	323
*****	200	326
*****	214	329
*****	210	332
*****	166	335
*****	164	338
*****	164	340
*****	133	343
*****	168	346
*****	126	349
*****	161	352
*****	161	354
*****	130	357

Film No. 1543

C.M. No. H544 Film begins 2155Z-8- IV - 64 Duration of film: 11 : 9
hour day month year hours min

C.M. depth 3000 m. Water depth 3274 m. Magnetic variation 27°W Sampling interval 1 sec.

COMMENTS ON RESULTS:

Rotor did not work, possibly because of damage to bearings during rough sea voyage prior to launching. Mean direction of flow shown by data is 73°. This value is questionable because the compass of the current meter may have been sticking and therefore not recording the true value.

ND. DIR

CURRENT METER FILM NO. 101543

AVERAGED VALUES, 1200 CYCLES PER VALUE

RESULTANT SPEED AND DIRECTION, MAGNETIC VARIATION INCLUDED

152 0
149 3
159 6
126 8
135 11
124 14
143 17
170 20
154 23
136 25
146 28
152 31
151 34
172 37
174 39
195 42
165 45
203 48
210 51
173 53
220 56
211 59
255 62
309 65
539 68
641 70
758 73
606 76
499 79
416 82
481 84
617 87
569 90
546 93
473 96
528 98
7144 101
2503 104
1917 107
2986 110
1144 113
1304 115
961 118
824 121
801 124
473 127
411 129
359 132
369 135
336 138
368 141
388 143
280 146
215 149
188 152
130 155
93 158
89 160
77 163
57 166
69 169
60 172
68 174
80 177
83 180
75 183
66 186
79 188
98 191
93 194
92 197
65 200
95 203
62 205
64 208
47 211
59 214
48 217
43 219
56 222
50 225
55 228
68 231
56 233
43 236
38 239
26 242
23 245
26 248
18 250
23 253
29 256
24 259
18 262
28 264
26 267
34 270
24 273
25 276
28 278
44 281
31 284
47 287
46 290
44 293
57 295
67 298
96 301
106 304
104 307
131 309
157 312
185 315
486 318
199 321
213 323
200 326
214 329
210 332
166 335
164 338
164 340
133 343
168 346
126 349
161 352
161 354
130 357

DIRECTION

SEQ DIR

VEL

SPEED (MM/SEC)

X
600 23 0 0 V
1800 110 0 0 V
3000 110 0 0 V
4200 110 0 0 V
5400 104 0 0 V
6600 104 0 0 V
7800 101 0 0 V
9000 101 0 0 V
10200 101 0 0 V
11400 101 0 0 V
12600 101 0 0 V
13800 82 0 0 V
15000 73 0 0 V
16200 115 0 0 V
17400 124 0 0 V
18600 113 0 0 V
19800 110 0 0 V
21000 96 0 0 V
22200 79 0 0 V
23400 45 0 0 V
24600 59 0 0 V
25800 68 0 0 V
27000 70 0 0 V
28200 93 0 0 V
29400 104 0 0 V
30600 115 0 0 V
31800 124 0 0 V
33000 129 0 0 V
34200 197 0 0 V
35400 287 0 0 V
36600 323 0 0 V
37800 335 0 0 V
39000 121 0 0 V

MAGNETIC VARIATION OF 0 DEGREES.

FILM 101543

30 OUTPUT CYCLES.

FIRST INPUT CYCLE 47. = 1

FINAL INPUT CYCLE 47. = 40040

Station No. 163

23° 42'.0 N Set: 1520Z - 21 - VII - 64

latitude hour day month year

67° 50'.0 W	Retrieved	0730Z	- 26	- VII	- 64
longitude		hour	day	month	year

Set
by: Day Ship Atlantis II Cruise 11

MOORING:

Surface toroid with eleven 500 m. shots of plaited nylon cable and a 1500-lb. anchor. Depth of water was 5700 meters. Two current meters were used, at depths of 192 and 692 meters. A timed release was used in the mooring, just above the anchor.

PURPOSE OF STATION:

The first of two moorings in the southern Sargasso Sea intended to study the relationship between patterns of sound-velocity contours and currents. The depths of the current meters were chosen to match contouring levels of sound-velocity.

COMMENTS ON RESULTS:

Timed release worked properly, and mooring was recovered on schedule. Both current meters worked, and results were obtained for comparison with sound velocity contours (Beckerle, et. al., 1966).

Station No. 1631

1960 - VI - 21 - 10:00 AM

1960 - VI - 21 - 10:00 AM

1960 - VI - 21 - 10:00 AM

1960 - VI - 21 - 10:00 AM

1960 - VI - 21 - 10:00 AM

1960 - VI - 21 - 10:00 AM

Film No. 1631

C.M. No. H-533 Film begins 1531Z-21- VII - 64 Duration of film: 4 : 15 : 0
hour day month year days hours min

C.M. depth 192 m. Water depth 5700 m. Magnetic variation 7°W Sampling interval 20 min

COMMENTS ON RESULTS:

Instrument encoding lights became dim and consequently film record was too faint for machine readout. The film was spot-read by eye at twenty-minute intervals. (The instrument was set to collect one measurement per second.)

Except for the faint lights, the instrument operated well.

Some of the variations in the currents may be inertial oscillations (30-hour period) but the interpretation is unclear.

Net direction of flow is 74° and mean speed is 8.3 cm./sec.

VECTOR AVERAGE VALUES 3 TERMS PER VALUE.

NORTH AND EAST COMPONENTS

VALUE EXCEPTS RANGE

EAST	NORTH	SEQ	NO
X	*		
-129	-8	2	
-398	133	5	
-136	39	8	
-33	-31	11	
18	41	14	
51	28	17	
62	8	20	
94	23	23	
72	19	26	
59	48	29	
45	42	32	
44	71	35	
63	79	38	
42	64	41	
64	57	44	
36	88	47	
66	76	50	
73	78	53	
89	53	56	
76	38	59	
77	29	62	
37	63	65	
66	60	68	
36	73	71	
42	97	74	
45	105	77	
61	106	80	
76	100	83	
60	134	86	
59	140	89	
93	102	92	
108	65	95	
114	62	98	
95	61	101	
90	40	104	
75	-22	107	
77	-21	110	
91	-34	113	
110	-44	116	
60	-50	119	
61	-37	122	
41	-72	125	
66	-49	128	
17	-83	131	
16	-81	134	
29	-78	137	
14	-87	140	
5	-58	143	
21	-50	146	
-40	31	149	
-7	-17	152	
29	31	155	
32	28	158	
38	31	161	
42	51	164	
55	1	167	
89	6	170	
100	-1	173	
90	-25	176	
62	-32	179	
58	-28	182	
40	-56	185	
36	-31	188	
8	-10	191	
19	32	194	
62	-28	197	
56	-23	200	
27	-48	203	
46	-41	206	
53	-19	209	
68	-24	212	
33	-37	215	
31	-37	218	
41	-29	221	
53	20	224	
59	4	227	
67	35	230	
71	19	233	
87	-1	236	
96	-8	239	
80	-21	242	
82	-49	245	
69	-57	248	
67	-43	251	
44	-49	254	
61	-41	257	
27	-36	260	
-12	-44	263	
-22	32	266	
17	35	269	
1	11	272	
50	26	275	
72	2	278	
66	10	281	
72	-9	284	
43	-43	287	
18	-41	290	
6	28	293	
40	29	296	
53	4	299	
55	11	302	
76	1	305	
74	15	308	
84	18	311	
96	16	314	
86	-9	317	
69	-32	320	
61	-54	323	
62	-60	326	
29	-59	329	
28	-58	332	

MAGNETIC VARIATION 0 DEGREES APPLIED.

FILM101631

FIRST INPUT CYCLE NO. = 1

FINAL INPUT CYCLE NO. = 0

Film No. 1632

C.M. No. H-538 Film begins 1731Z-21- VII - 64 Duration of film: 4 : 12 : 0
hour day month year days hours min

C.M. depth 692 m. Water depth 5700 m. Magnetic variation 7°W Sampling interval 20 min.

COMMENTS ON RESULTS:

Film record was faint and could not be machine-read.

The variations in current direction near the end of the data record may be inertial oscillations (30-hour period); the duration of the record is too short for clear identification. The directions may not be trustworthy since possibly the compass and vane were sticking.

Net direction of flow is 76° and mean speed is 6.9 cm./sec.

VECTOR AVERAGED VALUES 3 TERMS PER VALUE.

NORTH AND EAST COMPONENTS

EAST NORTH SEQ NO

X	*	
-21	1	2
-11	24	5
8	54	8
16	72	11
38	78	14
47	92	17
36	58	20
48	79	23
69	85	26
79	81	29
93	76	32
102	57	35
90	62	38
81	38	41
73	45	44
57	46	47
45	32	50
46	38	53
51	37	56
50	43	59
49	45	62
48	55	65
54	64	68
61	70	71
61	70	74
22	15	77
50	68	80
41	63	83
31	91	86
28	75	89
29	92	92
43	97	95
4	44	98
26	38	101
51	30	104
78	14	107
63	-7	110
92	-10	113
77	-31	116
65	-46	119
44	-34	122
36	-48	125
44	-67	128
37	-63	131
32	-69	134
41	-61	137
24	-56	140
26	-39	143
17	-41	146
12	-43	149
-30	-19	152
-33	-8	155
-19	10	158
-40	25	161
-35	42	164
-27	51	167
-9	59	170
23	55	173
50	38	176
49	33	179
63	50	182
70	51	185
81	31	188
89	15	191
89	13	194
85	-12	197
86	-26	200
65	-39	203
58	-44	206
45	-54	209
31	-51	212
24	-58	215
3	-40	218
24	2	221
29	-16	224
21	-11	227
37	-20	230
39	-21	233
45	-24	236
56	-30	239
62	-33	242
71	-38	245
79	-42	248
91	-49	251
100	-53	254
85	-46	257
91	-49	260
88	-47	263
82	-44	266
79	-42	269
73	-39	272
71	-38	275
59	-31	278
62	-33	281
54	-29	284
41	-22	287
44	-24	290
21	-11	293
19	-10	296
29	-16	299
19	-10	302
24	-13	305
24	-13	308
28	-15	311
32	-17	314
29	-16	317
49	-26	320
63	-34	323

MAGNETIC VARIATION OF 0 DEGREES APPLIED.

FILM101632

FIRST INPUT CYCLE NO. = 1

FINAL INPUT CYCLE NO. = 0

RESULTANT SPEED AND DIRECTION, MAGNETIC VARIATION INCLUDED

Station No. 164

23° 50'.5 N Set: 1833Z - 21 - VII - 64
 latitude hour day month year

67° 49'.0 W	Retrieved	1048Z	- 26	-	VII	-	64
longitude		hour	day		month		year

Set
by Day Ship Atlantis II Cruise 11

MOORING:

Surface Toroid with eleven 500-m. shots of plaited nylon cable and 1500-lb. anchor. Depth of water was 5790 m. Two current meters were used, at depths of 192 and 692 m. A timed release was used in the mooring, just above the anchor.

PURPOSE OF STATION:

To study the relationships between patterns of sound-velocity contours and currents.

COMMENTS ON RESULTS:

The timed release worked properly, and the mooring was completely recovered on schedule. The results of the comparison between the sound-velocity profiles and the currents have been given by Beckerle, et. al. (1966).

This mooring is one of the deepest set and recovered by the W.H.O.I. buoy program.

Station No. 164

Set	Day	Month	Year
1953	VII	-	21
1953	VII	-	21
1953	VII	-	21
1953	VII	-	21
1953	VII	-	21
1953	VII	-	21
1953	VII	-	21
1953	VII	-	21
1953	VII	-	21
1953	VII	-	21

Surface Trawl with eleven 500 ft. hauls. Depth 0-100 m. Two current meters were used, at depths of 100 and 200 m. A timed release was used in the morning. Just above the surface.

PURPOSE OF STATION:

To study the relationship between patterns of sound-velocity contours and currents.

COMMENTS ON RESULTS:

The timed release worked properly, and morning was completely recovered on schedule. The results of the comparison between the sound-velocity profiles and the currents have been given by Beardsley, et al. (1956).

This morning is one of the deepest yet recovered by the W.N.O.I. buoy program.

Film No. 1641

C.M. No. H-534 Film begins 1946Z-21- VII - 64 Duration of film 4 : 14 : 20
hour day month year days hours min

C.M. septh 192 m. Water depth 5790 m. Magnetic variation 7°W Sampling interval 20 min

COMMENTS ON RESULTS:

The film record was faint and could not be machine-read.

Net direction of flow is 105° and mean speed is 10.4 cm./sec.

CURRENT METER FILM NO. 101641

VECTOR AVERAGED VALUES 3 TERMS PER VALUE.

NORTH AND EAST COMPONENTS

EAST	NORTH	SEQ NO
X	*	
-149	-130	2
-129	23	5
59	-42	8
-11	-89	11
-5	-95	14
-9	-63	17
33	-5	20
48	21	23
53	37	26
56	50	29
70	52	32
89	41	35
98	21	38
92	39	41
103	8	44
73	-27	47
93	10	50
106	36	53
142	25	56
134	10	59
126	27	62
117	38	65
140	28	68
143	2	71
133	-2	74
126	3	77
130	6	80
89	-35	83
94	-33	86
100	-33	89
116	-29	92
122	-33	95
133	-6	98
101	28	101
101	31	104
96	27	107
82	8	110
74	10	113
61	-7	116
6	-46	119
-24	-64	122
7	-61	125
73	-15	128
110	16	131
115	43	134
120	24	137
132	-11	140
133	11	143
161	5	146
156	4	149
123	-56	152
134	-35	155
126	-52	158
105	-70	161
91	-77	164
81	-87	167
91	-55	170
74	-28	173
72	-60	176
71	-28	179
22	-65	182
71	-34	185
51	-43	188
74	-40	191
68	-40	194
32	-79	197
59	-59	200
86	-34	203
85	-53	206
116	-31	209
107	-54	212
122	-64	215
130	-57	218
108	-58	221
107	-63	224
76	-81	227
49	-74	230
35	-74	233
-6	-86	236
-4	-67	239
-8	-72	242
8	-56	245
14	-54	248
36	-57	251
50	-44	254
65	-40	257
84	-14	260
67	-26	263
82	-56	266
111	-20	269
93	-51	272
118	-35	275
101	-17	278
103	-26	281
101	-22	284
83	-32	287
75	-45	290
79	-59	293
101	-51	296
63	-85	299
67	-86	302
44	-91	305
43	-80	308
-4	-78	311
5	-74	314
59	-63	317
55	-47	320
30	-52	323
35	-41	326
10	-42	329

MAGNETIC VARIATION OF 0 DEGREES APPLIED.

FILM101641

FIRST INPUT CYCLE NO. = 1

FINAL INPUT CYCLE NO. = 0

RESULTANT SPEED AND DIRECTION, MAGNETIC VARIATION INCLUDED

Film No. 1642

C.M. No. H-539 Film begins 2200Z-21- VII - 64 Duration of film: 4 : 12 : 20
hour day month year days hours min

C.M. depth 692 m. Water depth 5790 m. Magnetic variation 7°W Sampling interval 20 min

COMMENTS ON RESULTS:

The film record was faint and could not be machine-read.

Inertial period variations (of about 30-hour period) can be observed in the data.

Net direction of flow is 30° and mean speed is 7.9 cm./sec.

VECTOR AVERAGED VALUES 3 TERMS PER VALUE.

NORTH AND EAST COMPONENTS

EAST NORTH SEQ NO

X		
-19	18	2
12	-13	5
21	2	8
34	20	11
50	22	14
61	34	17
66	18	20
68	20	23
71	-9	26
43	25	29
41	13	32
27	18	35
29	20	38
24	24	41
0	42	44
12	55	47
4	50	50
24	65	53
0	77	56
18	91	59
43	94	62
46	89	65
55	98	68
53	91	71
51	84	74
73	71	77
66	83	80
58	80	83
63	69	86
78	73	89
95	97	92
94	80	95
101	82	98
100	60	101
100	77	104
96	77	107
80	40	110
53	28	113
54	39	116
71	44	119
66	39	122
58	47	125
54	24	128
45	28	131
51	21	134
33	53	137
24	52	140
10	71	143
10	69	146
23	90	149
14	92	152
25	97	155
15	78	158
20	74	161
36	79	164
45	108	167
57	116	170
68	126	173
93	100	176
99	73	179
86	50	182
63	38	185
65	36	188
61	43	191
62	45	194
72	48	197
73	39	200
56	30	203
42	37	206
56	47	209
63	43	212
42	43	215
29	56	218
3	74	221
10	99	224
18	88	227
3	80	230
18	68	233
19	50	236
16	65	239
37	74	242
38	71	245
48	80	248
67	65	251
73	56	254
59	54	257
75	49	260
73	40	263
52	27	266
50	33	269
41	39	272
42	47	275
46	53	278
47	46	281
22	36	284
30	76	287
22	83	290
21	77	293
6	72	296
2	73	299
4	85	302
4	65	305
14	79	308
38	81	311
34	60	314
30	53	317
44	54	320
65	51	323

MAGNETIC VARIATION OF 0 DEGREES APPLIED.

FILM101642
FIRST INPUT CYCLE NO. = 1
FINAL INPUT CYCLE NO. = 2452

RESULTANT SPEED AND DIRECTION, MAGNETIC VARIATION INCLUDED

Station No. 165

28° 50'.0 N
latitude

Set: 1125Z - 28 - VII - 64
hour day month year

68° 49'.0 W
longitude

Retrieved: 2141Z - 4 - VIII - 64
hour day month year

Set
by: Day Ship Atlantis II Cruise 11

MOORING:

Surface toroid, with eleven shots of 500-m. plaited nylon cable, hydrostatic release, and 1500-lb. anchor. Four current meters were used, at depths of 55, 56, 620 and 3240 m. in a total depth of water of 5290 m.

PURPOSE OF STATION:

Intended to study inertial-period motions in a region near 30° N. An array of three moorings was set for this study (Moorings 165, 166 and 167), with latitudes chosen to detect possible diurnal resonant inertial-period motions.

COMMENTS ON RESULTS:

The mooring was successfully recovered.

The inertial-period resonances which were expected were not found. Some of the data did show inertial-period motions, but the occurrences do not form any clear pattern. The records are too short to employ statistical methods for estimating the inertial-period amplitudes and phases.

CURRENT METER FILM NO. 101651

AVERAGED VALUES, 3TURNS PER VALUE

RESULTANT SPEED AND DIRECTION, MAGNETIC VARIATION INCLUDED

MAGNETIC VARIATION OF 0 DEGREES.

FILM 101651 177 OUTPUT CYCLES.
FIRST INPUT CYCLE NO. 1
FINAL INPUT CYCLE NO. 0

Film No. 1651

C.M. No. H-534 Film begins 1225Z-28- VII - 64 Duration of film: 7 : 6 :40
hour day month year days hours min

C.M. depth 55 m. Water depth 5290 m. Magnetic variation 9° W Sampling interval 20 min.

PURPOSE:

One instrument in an array intended to study inertial-period motions near 30° N.

COMMENTS ON RESULTS:

When the current meter was recovered, the rotor was found to be out of its bearings; examination of the record showed that the rotor failed after the first nineteen hours.

Mean direction of flow is 150°. Mean speed before rotor failure is 7.0 cm./sec. (Speeds may be unreliable before rotor fails completely.)

Film No. 1652

C.M. No. H-524 Film begins 1135Z-28- VII - 64 Duration of film: 2 : 3 : 32
hour day month year days hours min

C.M. depth 56 m. Water depth 5290 m. Magnetic variation 9°W Sampling interval 4 min.

PURPOSE:

One instrument in an array intended to study inertial-period motions near 30° N.

COMMENTS ON RESULTS:

The current meter appears to have functioned properly.

There is no clear indication of inertial-period motions.

Net direction of flow is 100° and mean speed is 13.4 cm./sec.

CURRENT WETTER FILE NO. 101652

VECTOR AVERAGED VALUES 5 TERMS PER VALUE.

NORTH AND EAST COMPONENTS

X
VALUE EXCEEDS RANGE
VALUE EXCEEDS RANGE
VALUE EXCEEDS RANGE

EAST NORTH SEQ NO

X	*	
-144	-205	3
-181	-109	5
-60	-120	13
-223	-54	18
-606	-108	23
-736	-200	28
-404	-215	33
-82	-126	38
-47	-158	43
-31	-130	48
13	-128	53
72	-113	58
95	-77	63
60	-89	68
64	-42	73
36	-85	78
12	-61	83
62	-44	88
90	42	93
85	-70	98
98	-34	103
92	-19	108
101	-52	113
41	-35	118
110	-19	123
100	-35	128
88	-19	133
100	-45	138
98	-45	143
95	-78	148
65	-87	153
52	-107	158
96	-68	163
89	-37	168
104	-48	173
84	19	178
97	-33	183
42	-65	188
68	-69	193
111	-26	198
59	-26	203
102	-19	208
90	-46	213
104	6	218
102	1	223
95	34	228
42	-9	233
102	-4	238
65	4	243
107	-17	248
94	-52	253
104	-14	258
101	17	263
89	8	268
81	59	273
86	49	278
88	-12	283
62	31	288
85	78	293
116	52	298
123	-22	303
130	-31	308
133	-34	313
127	-31	318
129	-54	323
139	-53	328
121	-46	333
113	-55	338
125	-42	343
134	-9	348
123	-47	353
101	-68	358
113	-58	363
80	-80	368
81	-75	373
59	-77	378
38	-61	383
76	-28	388
79	-58	393
84	-69	398
74	-22	403
108	-26	408
86	-37	413
76	-30	418
47	32	423
68	-29	428
78	-77	433
73	-62	438
96	-45	443
75	-25	448
94	-22	453
103	-54	458
10	-7	463
116	-34	468
102	58	473
114	47	478
62	55	483
97	16	488
103	20	493
101	3	498
49	36	503
91	-5	508
91	3	513
90	17	518
92	3	523
105	-12	528
63	-28	533
90	4	538
97	-16	543
82	-23	548
97	20	553
105	4	558
112	-11	563
122	2	568
105	24	573
88	60	578
124	30	583
133	7	588
126	5	593
118	21	598
104	18	603
98	-20	608
69	-38	613
122	5	618
124	5	623
120	15	628
107	-16	633
104	-43	638
118	-9	643
119	-15	648
127	35	653
138	12	658
123	10	663
130	-18	668
118	4	673
121	10	678
118	23	683
116	-2	688
101	-57	693
57	-79	698
80	-31	703
82	-64	708
97	-44	713
96	-15	718
82	-28	723
58	-33	728
60	37	733
39	74	738
62	28	743
34	44	748
7	23	753
68	41	758
71	51	763
80	51	768

MAGNETIC VARIATION OF 0 DEGREES APPLIED.

FILM101452

FIRST INPUT CYCLE NO. = 1

FINAL INPUT CYCLE NO. = 0

Film No. 1653

C.M. No. H-539 Film begins 1349Z-28- VII - 64 Duration of film 6 : 10 :20
hour day month year days hours min

C.M. depth 620 m. Water depth 5290 m. Magnetic variation 9° W Sampling interval 20 min

PURPOSE:

One instrument in an array intended to study inertial-period motions near 30° N.

COMMENTS ON RESULTS:

The current meter appears to have worked properly. There is no clear indication of the presence of inertial-period motions on the progressive-vector diagram, but they can be detected in the cartesian-component plot.

Net direction of flow is 72° and mean speed is 7.4 cm./sec.

CURRENT METER FILM NO. 101653

VECTOR AVERAGED VALUES 3 TERMS PER VALUE.

NORTH AND EAST COMPONENTS

EAST NORTH SEQ NO

X	*	
26	-89	2
44	-35	5
53	-34	8
76	-22	11
65	-8	14
62	-11	17
68	-27	20
68	-34	23
73	-34	26
43	-26	29
46	-24	32
46	-20	35
33	-2	38
46	2	41
44	-13	44
51	-19	47
42	-12	50
44	-7	53
44	13	56
49	26	59
64	18	62
42	23	65
57	8	68
49	15	71
50	25	74
18	20	77
61	16	80
80	27	83
102	-1	86
107	2	89
107	3	92
113	-7	95
96	-13	98
86	5	101
74	-38	104
64	9	107
52	-11	110
22	1	113
40	5	116
36	0	119
36	13	122
35	40	125
55	56	128
63	54	131
63	40	134
93	26	137
33	5	140
80	18	143
80	44	146
93	22	149
106	-12	152
96	-8	155
87	0	158
86	-2	161
90	-4	164
80	-8	167
62	1	170
47	3	173
42	-3	176
30	-3	179
43	-1	182
33	-9	185
36	4	188
52	9	191
53	7	194
61	12	197
64	11	200
57	6	203
79	9	206
106	-5	209
74	-8	212
72	-16	215
74	-13	218
90	-3	221
93	0	224
90	1	227
96	7	230
82	-4	233
96	-6	236
80	-3	239
84	-4	242
63	-6	245
63	-8	248
53	-7	251
40	-6	254
35	-5	257
35	-19	260
47	-4	263
57	6	266
63	9	269
72	13	272
76	10	275
93	6	278
106	4	281
83	3	284
77	1	287
93	0	290
71	-1	293
77	-3	296
83	1	299
96	0	302
103	3	305
100	3	308
93	-1	311
80	-3	314
70	-7	317
60	-14	320
54	-14	323
34	-5	326
35	-7	329
36	-5	332
36	15	335
21	21	338
28	25	341
38	32	344
33	32	347
50	52	350
66	74	353
84	80	356
67	29	359
60	51	362
49	17	365
29	23	368
67	49	371
75	43	374
81	58	377
89	76	380
122	80	383
127	65	386
138	74	389
141	73	392
131	24	395
87	0	398
113	-4	401
70	-4	404
50	-4	407
59	-1	410
43	7	413
49	9	416
45	11	419
49	7	422
64	48	425
54	39	428
44	21	431
43	55	434
62	22	437
51	24	440
59	-5	443
56	59	446
92	60	449
89	82	452
115	75	455
123	85	458
94	85	461

MAGNETIC VARIATION OF 0 DEGREES APPLIED.

FILM101653

FIRST INPUT CYCLE NO. = 1

FINAL INPUT CYCLE NO. = 0

RESULTANT SPEED AND DIRECTION, MAGNETIC VARIATION INCLUDED

Film No. 1654

C.M. No. H-538 Film begins 1258Z-28- VII - 64 Duration of film: 4 : 5 :20
hour day month year days hours min

C.M. depth 3240 m. Water depth 5290 m. Magnetic variation 9° W Sampling interval 20 min

PURPOSE:

One instrument in an array intended to study inertial-period motions near 30° N.

COMMENTS ON RESULTS:

The current meter appears to have functioned properly. The progressive vector diagram does not show clear indications of inertial-period motions, but there is some suggestion of them in the plot of cartesian components.

Net direction of flow is 308° and mean speed is 2.4 cm./sec.

CURRENT METER FILM NO. 101654

VECTOR AVERAGE VALUES 3 TERMS PER VALUE.

NORTH AND EAST COMPONENTS

VALUE EXCEEDS RANGE

EAST NORTH SEQ NO

X	*	
28	48	2
15	60	5
-12	47	8
-15	33	11
-21	24	14
-25	20	17
-30	25	20
-33	30	23
-37	33	26
-37	37	29
-34	34	32
-31	35	35
-29	27	38
-30	26	41
-30	23	44
-29	27	47
-29	24	50
-34	27	53
-31	33	56
-26	30	59
-24	30	62
-20	35	65
-13	25	68
-12	18	71
-14	12	74
-14	15	77
-11	12	80
-13	14	83
-8	12	86
-6	16	89
-5	8	92
-6	6	95
-6	6	98
-11	13	101
-12	11	104
-16	12	107
-16	10	110
-17	15	113
-11	11	116
-9	7	119
-11	9	122
-8	11	125
-6	15	128
-6	15	131
-8	18	134
-8	18	137
-6	16	140
-12	15	143
-14	11	146
-16	11	149
-18	11	152
-17	8	155
-19	5	158
-14	4	161
-16	1	164
-15	-1	167
-14	4	170
-14	14	173
-9	18	176
-14	20	179
-13	14	182
-12	16	185
-17	13	188
-16	6	191
-18	10	194
-16	10	197
-13	15	200
-12	18	203
-11	18	206
-12	23	209
-13	24	212
-12	22	215
-15	28	218
-21	24	221
-19	12	224
-19	18	227
-10	19	230
-10	13	233
-15	16	236
-17	10	239
-9	6	242
-12	6	245
-9	5	248
-11	7	251
-18	9	254
-18	9	257
-20	9	260
-21	10	263
-14	9	266
-16	10	269
-14	10	272
-14	15	275
-15	15	278
-16	16	281
-17	17	284
-12	16	287
-16	13	290
-11	13	293
-6	7	296
-6	3	299
-5	3	302

MAGNETIC VARIATION OF 0 DEGREES APPLIED.

FILM101654

FIRST INPUT CYCLE NO. = 1

FINAL INPUT CYCLE NO. = 0

RESULTANT SPEED AND DIRECTION, MAGNETIC VARIATION INCLUDED

Configuration of station 166 (not to scale).

Station No. 166

29° 11'.3 N
latitude

Set: 0036Z - 29 - VII - 64
hour day month year

68° 21'.0 W
longitude

Retrieved: 1512Z - 4 - VIII - 64
hour day month year

Set
by: Day Ship Atlantis II Cruise 11

MOORING:

Surface toroid, with nine shots of 500-m. plaited nylon cable, hydrostatic release, and 1500-lb. anchor. Total depth of water, 5200 m. Three current meters were used, at depths of 55, 56 and 617 m.

PURPOSE OF STATION:

One of an array of stations intended to study inertial-period motions in a region near 30° N.

COMMENTS ON RESULTS:

Although the mooring line parted 400 m. below current meter H-533, all recording instruments were recovered.

The upper two current meters (55 and 56 meters depth) did not detect inertial-period motions. The lower instrument recorded over four days of clear inertial-period motions before the mooring went adrift.

Set: 000000 - 000000
 Date: 1961
 Month: 11
 Day: 11

Set: 000000 - 000000
 Date: 1961
 Month: 11
 Day: 11

Set: 000000 - 000000
 Date: 1961
 Month: 11
 Day: 11

Set: 000000 - 000000
 Date: 1961
 Month: 11
 Day: 11

Set: 000000 - 000000
 Date: 1961
 Month: 11
 Day: 11

Set: 000000 - 000000
 Date: 1961
 Month: 11
 Day: 11

Set: 000000 - 000000
 Date: 1961
 Month: 11
 Day: 11

Set: 000000 - 000000
 Date: 1961
 Month: 11
 Day: 11

Set: 000000 - 000000
 Date: 1961
 Month: 11
 Day: 11

Set: 000000 - 000000
 Date: 1961
 Month: 11
 Day: 11

Set: 000000 - 000000
 Date: 1961
 Month: 11
 Day: 11

Set: 000000 - 000000
 Date: 1961
 Month: 11
 Day: 11

Set: 000000 - 000000
 Date: 1961
 Month: 11
 Day: 11

Set: 000000 - 000000
 Date: 1961
 Month: 11
 Day: 11

Film No. 1661

C.M. No. H-522 Film begins 0111Z-29-VII - 64 Duration of film: 3 : 19 : 40
hour day month year days hours min

C.M. depth 55 m. Water depth 5185 m. Magnetic variation 9° W Sampling interval 20 min.

PURPOSE:

One instrument in an array intended to study inertial-period motions near 30° N.

COMMENTS ON RESULTS:

The current meter worked properly. There is good agreement with film no. 1662 which was recorded one meter below 1661.

Net direction of flow is 348° and mean speed is 18.0 cm./sec.

VECTOR-AVERAGED VALUES 3 TERMS PER VALUE.

NORTH AND EAST COMPONENTS
VALUE EXCEEDS RANGE
VALUE EXCEEDS RANGE

EAST	NORTH	SEQ NO
X	*	2
-255	-35	5
-501	-40	8
-54	81	11
-81	80	14
-54	83	17
-8	123	20
-17	100	23
-73	102	26
-87	95	29
-69	112	32
-64	88	35
-51	119	38
-63	115	41
-101	124	44
-66	173	47
-72	186	50
-25	176	53
27	159	56
-2	149	59
15	153	62
39	141	65
12	146	68
35	152	71
30	158	74
19	219	77
35	209	80
3	187	83
8	163	86
41	183	89
6	185	92
28	167	95
42	157	98
7	210	101
23	210	104
29	221	107
11	217	110
52	205	113
38	211	116
24	205	119
29	197	122
46	198	125
15	181	128
38	177	131
49	176	134
18	188	137
-51	148	140
23	200	143
41	214	146
27	208	149
50	201	152
33	199	155
37	189	158
19	189	161
7	200	164
8	179	167
65	155	170
46	165	173
56	155	176
40	139	179
-14	167	182
-38	152	185
-16	165	188
-62	184	191
-43	202	194
-34	224	197
3	203	200
-33	199	203
-32	227	206
41	225	209
75	196	212
67	181	215
34	179	218
34	170	221
20	170	224
48	180	227
12	157	230
26	153	233
-6	176	236
4	170	239
-40	151	242
-17	184	245
-49	183	248
38	197	251
37	169	254
11	161	257
27	112	260
68	91	263
-6	100	266
-30	114	269
-78	88	272
-74	156	275
-62	161	

MAGNETIC VARIATION OF 0 DEGREES APPLIED.

FILM101661

FIRST INPUT CYCLE NO. = 1

FINAL INPUT CYCLE NO. = 0

RESULTANT SPEED AND DIRECTION, MAGNETIC VARIATION INCLUDED

Film No. 1662

C.M. No. H-532 Film begins 0045Z-29- VII - 64 Duration of film: 2 : 2 :20
hour day month year days hours min

C.M. depth 56 m. Water depth 5185 m. Magnetic variation 9° W Sampling interval 20 min

PURPOSE:

One instrument in an array intended to study inertial-period motions near 30° N. This was paired with 1661 for comparison of results from current meters over short vertical separation.

COMMENTS ON RESULTS:

Instrument worked properly, and results compare well with those from film 1661. Neither indicate any inertial-period modulation of the current.

Net direction of flow is 334° and mean speed is 19.4 cm./sec.

VECTOR AVERAGED VALUES 1 TERMS PER VALUE.

NORTH AND EAST COMPONENTS

VALUE EXCEEDS RANGE
VALUE EXCEEDS RANGE
VALUE EXCEEDS RANGE

EAST NORTH SEQ NO

X	*	
130	-314	3556
-99	166	3557
-108	-72	3558
-126	-114	3559
-434	-322	3560
-624	-295	3561
-660	-200	3562
-198	-50	3563
-149	53	3564
-132	47	3565
61	128	3566
-103	93	3567
-110	46	3568
-120	43	3569
-140	-7	3570
-75	101	3571
-118	56	3572
62	131	3573
-28	142	3574
37	122	3575
-85	85	3576
19	130	3577
-88	-97	3578
-103	62	3579
-6	129	3580
-98	98	3581
-123	101	3582
-79	97	3583
-111	101	3584
-89	81	3585
-39	125	3586
-107	119	3587
54	129	3588
-115	77	3589
-96	87	3590
72	108	3591
23	156	3592
-83	112	3593
-160	24	3594
-113	124	3595
-82	153	3596
-126	103	3597
-49	161	3598
-79	131	3599
-147	109	3600
-159	118	3601
-141	141	3602
-68	223	3603
-108	203	3604
-140	171	3605
-166	136	3606
-9	193	3607
8	165	3608
43	173	3609
-92	170	3610
-8	165	3611
97	146	3612
-44	144	3613
-22	148	3614
-8	160	3615
-108	131	3616
-31	158	3617
-23	167	3618
-8	160	3619
-68	128	3620
-91	122	3621
101	111	3622
-21	138	3623
57	158	3624
-61	169	3625
90	121	3626
-60	167	3627
-37	186	3628
-57	160	3629
-50	164	3630
-23	237	3631
-20	199	3632
-21	215	3633
-81	172	3634
-101	168	3635
-18	363	3636
-31	208	3637
-23	158	3638
-106	117	3639
-60	146	3640
-35	177	3641
-41	165	3642
20	204	3643
-49	194	3644
39	196	3645
-49	194	3646
-46	184	3647
-8	160	3648
-52	146	3649
23	158	3650
-29	147	3651
51	141	3652
18	179	3653
-29	193	3654
21	214	3655
35	237	3656
0	225	3657
23	236	3658
-11	233	3659
-22	219	3660
-44	224	3661
0	238	3662
-34	228	3663
-11	233	3664
-76	214	3665
61	243	3666
-12	240	3667
74	207	3668
56	223	3669
-32	213	3670
0	217	3671
-45	226	3672
35	237	3673
-116	175	3674
-39	196	3675
100	188	3676
-97	206	3677
-22	224	3678
0	220	3679
38	193	3680
39	196	3681
107	160	3682
41	165	3683
170	43	3684
-27	184	3685
-19	189	3686
-113	153	3687
9	180	3688
93	213	3689
38	191	3690
-64	179	3691
111	166	3692
-20	199	3693
-21	217	3694
-66	185	3695
-21	214	3696
-23	229	3697
-73	239	3698
64	210	3699
-52	207	3700
-13	255	3701
49	194	3702
20	204	3703
41	206	3704
-30	203	3705
-71	198	3706
-80	194	3707

MAGNETIC VARIATION OF 0 DEGREES APPLIED.

FILM101662

FIRST INPUT CYCLE NO. = 1

FINAL INPUT CYCLE NO. = 3707

MAGNETIC VARIATION OF 0 DEGREES APPLIED.

Film No. 1663

C.M. No. H-533 Film begins 0152Z-29- VII - 64 Duration of film: 4 : 13 :20
hour day month year days hours min

C.M. depth 617 Water m.depth 5185 Magnetic m.variation 9° W Sampling interval 20 min

PURPOSE:

One instrument in an array intended to study inertial-period motions near 30° N.

COMMENTS ON RESULTS:

Instrument worked well. Inertial-period motions are more clearly evident in this record than in any other collected over the array. That the strongest inertial-period motions should be found so far below the surface was surprising. Note that although inertial-period motions were observed at 617 m. (1663), none were observed at 56 m. (1662) or 55 m. (1661).

Net direction of flow is 302° and mean speed is 618 cm./sec.

VECTOR AVERAGED VALUES 3 TERMS PER VALUE.

NORTH AND EAST COMPONENTS

EAST NORTH SEQ NO

X	*	
-63	-31	2
-43	-26	5
-59	-36	8
-51	-15	11
-59	-6	14
-54	3	17
-38	-3	20
-38	15	23
-47	16	26
-63	48	29
-54	68	32
-36	56	35
-28	53	38
-31	47	41
-28	53	44
-14	72	47
-5	65	50
26	44	53
21	42	56
31	31	59
32	29	62
25	2	65
-12	-25	68
-25	-12	71
-36	3	74
-49	-2	77
-57	3	80
-59	22	83
-63	23	86
-62	22	89
-59	23	92
-49	31	95
-53	41	98
-55	43	101
-33	76	104
-17	75	107
-17	57	110
-7	67	113
-1	58	116
13	62	119
16	49	122
27	33	125
34	11	128
37	1	131
33	-17	134
-7	-38	137
-29	-22	140
-30	-22	143
-52	-29	146
-68	-12	149
-92	-12	152
-102	14	155
-93	26	158
-72	41	161
-86	64	164
-85	64	167
-66	75	170
-64	89	173
-50	108	176
-23	137	179
-8	123	182
13	99	185
19	88	188
43	54	191
60	48	194
61	16	197
49	-14	200
31	-29	203
3	-36	206
-25	-44	209
-51	-47	212
-70	-17	215
-70	0	218
-86	7	221
-85	17	224
-94	17	227
-99	26	230
-80	39	233
-77	45	236
-53	59	239
-62	25	242
-68	46	245
-48	92	248
-34	101	251
-22	94	254
-25	90	257
18	78	260
29	66	263
36	41	266
41	23	269
25	36	272
34	6	275
23	-19	278
-11	-41	281
-39	-23	284
-42	5	287
-51	-12	290
-64	-13	293
-64	-17	296
-76	3	299
-72	15	302
-60	19	305
-65	12	308
-67	19	311
-65	33	314
-58	50	317
-34	61	320
-18	68	323
-74	30	326

MAGNETIC VARIATION OF 0 DEGREES APPLIED.

FILM101663

FIRST INPUT CYCLE NO. = 1

FINAL INPUT CYCLE NO. = 0

RESULTANT SPEED AND DIRECTION, MAGNETIC VARIATION INCLUDED

MAGNETIC VARIATION OF 0 DEGREES APPLIED.

Station No. 167

29° 39'.5 N
latitude

Set: 1219Z - 29 - VII - 64
hour day month year

67° 54'.0 W
longitude

Retrieved: 0105Z - 6 - VIII - 64
hour day month year

Set
by: Day Ship Atlantis II Cruise 11

MOORING:

Surface toroid, with nine 500-m. shots and one 120-m. shot of plaited nylon cable, hydrostatic release and 1500-lb. anchor. Depth of water, 5200 m. Five current meters were used, at depths of 55, 56, 620, 740 and 3240 m.

PURPOSE OF STATION:

One of an array of stations intended to study inertial-period motions near 30° N latitude.

COMMENTS ON RESULTS:

Line parted about 150 m. below the surface. The mooring went adrift and was found by luck about 140 miles away (29° 58' N, 65° 42' W). Only the upper two current meters were left on the drifting mooring. Most of their data was recorded while adrift.

Film No. 1671

C.M. No. H-518 Film begins 1222Z-29- VII - 64 Duration of film: 3 : 22 :40
hour day month year days hours min

C.M. depth 55 m. Water depth 5180 m. Magnetic variation 10° W Sampling interval 20 min

PURPOSE:

One instrument of an array intended to study inertial-period motions near 30° N.

COMMENTS ON RESULTS:

The current meter appears to have worked properly. Apparently the mooring failed after about 3 1/2 hours, and most of the data shown here is from a drifting instrument. The net relative flow past the current meter is in the direction 270° and the mean relative speed is 12.5 cm./sec.

The progressive vector diagram shows only the first 46 hours of the data, corresponding to the period of data collected on film 1672.

VECTOR AVERAGED VALUES 3 TERMS PER VALUE.

MAGNETIC VARIATION OF 0 DEGREES APPLIED.

FILM101671
FIRST INPUT CYCLE NO. = 1
FINAL INPUT CYCLE NO. = 2368

RESULTANT SPEED AND DIRECTION, MAGNETIC VARIATION INCLUDED

Film No. 1672

C.M. No. H-549 Film begins 1234Z-29- VII - 64 Duration of film: 1 : 23 :28
hour day month year days hours min

C.M. depth 56 m. Water depth 5180 m. Magnetic variation 10° W Sampling interval 4 min

PURPOSE:

One instrument of an array intended to study inertial-period motions near 30° N.

COMMENTS ON RESULTS:

The currents observed are similar in gross pattern to those collected on film 1671, directly above. Apparently the mooring failed after about 3 1/2 hours, and most of the data shown here is from a drifting instrument. The net relative flow past the current meter is in the direction 261° and the mean relative speed is 16.3 cm./sec.

VECTOR AVERAGED VALUES 5 TERMS PER VALUE.

NORTH AND EAST COMPONENTS

EAST NORTH SEQ NO

X	*	
-77	-88	3
-120	-118	8
-108	-91	13
-140	-73	18
-306	-477	23
-246	-687	28
-119	-374	33
-62	-138	38
101	-27	43
123	76	48
79	113	53
157	98	58
184	89	63
164	65	68
170	-25	73
170	15	78
75	48	83
158	-39	88
66	-95	93
137	-87	98
127	-93	103
129	-97	108
15	-137	113
47	-133	118
126	-50	123
13	-128	128
-58	-135	133
26	-74	138
-38	-83	143
-20	-84	148
90	7	153
36	80	158
-36	116	163
-73	14	168
-39	42	173
17	-38	178
-71	-17	183
-79	-69	188
-33	-59	193
-48	-104	198
-23	-70	203
27	-14	208
40	-68	213
91	-92	218
52	-95	223
-61	35	228
-91	9	233
-66	-52	238
-92	-28	243
-81	-15	248
-85	6	253
-81	74	258
-91	0	263
-100	38	268
-81	58	273
-63	70	278
-60	55	283
-81	-50	288
-59	94	293
-7	87	298
-67	84	303
-66	95	308
-36	157	313
-59	144	318
-17	145	323
-36	101	328
6	165	333
-12	175	338
39	136	343
32	159	348
64	153	353
46	163	358
64	178	363
87	162	368
55	163	373
92	91	378
109	139	383
129	123	388
154	79	393
97	47	398
77	59	403
91	-41	408
105	-49	413
98	-106	418
101	-96	423
36	-80	428
89	-74	433
30	-103	438
-20	-105	443
-4	-131	448
-30	-144	453
-68	-135	458
-75	-114	463
-69	-103	468
-78	-83	473
-106	-49	478
-133	-10	483
-93	-11	488
-106	-2	493
-97	44	498
-149	11	503
-166	-5	508
-149	-50	513
-205	-15	518
-191	4	523
-114	125	528
-180	-7	533
-217	10	538
-186	73	543
-150	43	548
-100	148	553
-137	73	558
-78	82	563
-59	99	568
-114	91	573
-75	112	578
-33	106	583
-65	109	588
-105	74	593
-96	68	598
-122	68	603
-74	82	608
-154	-18	613
-121	93	618
-107	122	623
-76	93	628
-18	165	633
-134	-8	638
-52	72	643
16	-33	648
-117	44	653
-38	86	658
-146	19	663
-51	14	668
16	52	673
-73	-37	678
-76	26	683
18	-71	688
-14	-73	693
-19	-33	698
-48	-21	703
-36	-38	708

MAGNETIC VARIATION OF 0 DEGREES APPLIED.

FILM101672

FIRST INPUT CYCLE NO. = 1

FINAL INPUT CYCLE NO. = 0

RESULTANT SPEED AND DIRECTION, MAGNETIC VARIATION INCLUDED

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13. ABSTRACT

Summaries of current measurements made with Richardson current meters in two regions of the Western North Atlantic are presented. Averaged quantities are presented in the form of computer-plotted curves.

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Set
by: Stimson Ship Atlantis II Cruise 9

MOORING:

Six 500-m. shots of plaited nylon line were used with a 1500-lb anchor and a surface toroid float. Depth of water was 3140 meters. Six current meters were used, at depths of 1000, 2000, 2500, 2750 (2 meters), and 3000 m.

PURPOSE OF STATION:

To collect direct current measurements of Norwegian Sea overflow water at a gap in the Mid-Atlantic Ridge. These measurements were to be used in conjunction with direct measurements using Swallow floats and dynamic computations.

COMMENTS ON RESULTS:

The station was recovered. Three of the current meters had broken rotors, and gave no speed information. The other three appeared to work well.

The current meter measurements were compared with the Swallow floats and dynamic computations. The results of this comparison are described by Worthington and Volkmann (1965).

<p>Woods Hole Oceanographic Institution Reference No. 67-66</p> <p>A COMPILATION OF MOORED CURRENT METER OBSERVATIONS by Ferris Webster and Nick P. Fofonoff. Volume III. 103 pages. November 1967. Contract Nos. Nonr-3351(00) NR 083-501 and Nonr-2196(00) NR 083-004.</p> <p>Summaries of current measurements made with Richardson current meters in two regions of the Western North Atlantic are presented. Averaged quantities are presented in the form of computer-plotted curves.</p>	<ol style="list-style-type: none">1. Ocean current measurements2. Oceanographic data processing <ol style="list-style-type: none">I. Webster, FerrisII. Fofonoff, Nick P.III. Nonr-3351(00) NR 083-501IV. Nonr-2196(00) NR 083-004 <p>This card is UNCLASSIFIED</p>	<p>Woods Hole Oceanographic Institution Reference No. 67-66</p> <p>A COMPILATION OF MOORED CURRENT METER OBSERVATIONS by Ferris Webster and Nick P. Fofonoff. Volume III. 103 pages. November 1967. Contract Nos. Nonr-3351(00) NR 083-501 and Nonr-2196(00) NR 083-004.</p> <p>Summaries of current measurements made with Richardson current meters in two regions of the Western North Atlantic are presented. Averaged quantities are presented in the form of computer-plotted curves.</p>	<ol style="list-style-type: none">1. Ocean current measurements2. Oceanographic data processing <ol style="list-style-type: none">I. Webster, FerrisII. Fofonoff, Nick P.III. Nonr-3351(00) NR 083-501IV. Nonr-2196(00) NR 083-004 <p>This card is UNCLASSIFIED</p>
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