

RRB Discovery

NATIONAL INSTITUTE OF OCEANOGRAPHY
WORMLEY, GODALMING, SURREY

NEUTRALLY BUOYANT FLOATS

Serial Nos. 120 - 139
July 1961 - August 1963

TABLES AND DIAGRAMS

G. F. CASTON
and
J. C. SWALLOW

N.I.O. INTERNAL REPORT No. D.8
October 1971

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SERIAL Nos 120 - 139
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Tables of times and positions.
Diagrams showing trajectories
and components of displacement.

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Introduction

This report gives particulars of the trajectories and depths of neutrally buoyant floats tracked by the N.I.O. during the years 1961-63. Following the custom adopted in previous reports in this series, the floats have been re-numbered in chronological sequence. The first eight, Nos. 120-127, were tracked during July 1961 from the 'Discovery II' in the Faroe-Shetland Channel. They were shallow, mostly 300m nominal depth, and the observed depths were obtained either by lowering a pair of vertical hydrophones or from bottom reflections. No. 127 could more properly be described as an acoustic drogue, and its trajectory represented some sort of average of the current in the depth range 0-150m.

The next five floats, Nos. 128-132, were used in the Labrador Sea from the 'Erika Dan' in 1962 (Ref.1). Depths were obtained from bottom reflections in all these cases.

The remainder of the floats described in this volume, except No. 135, were tracked from the 'Discovery' in the Arabian Sea in July and August 1963 (Ref.2). Float No. 135 was the one described by J. Crease (Ref.3), observed from the 'Ernest Holt' in the Faroe Bank Channel in July 1963.

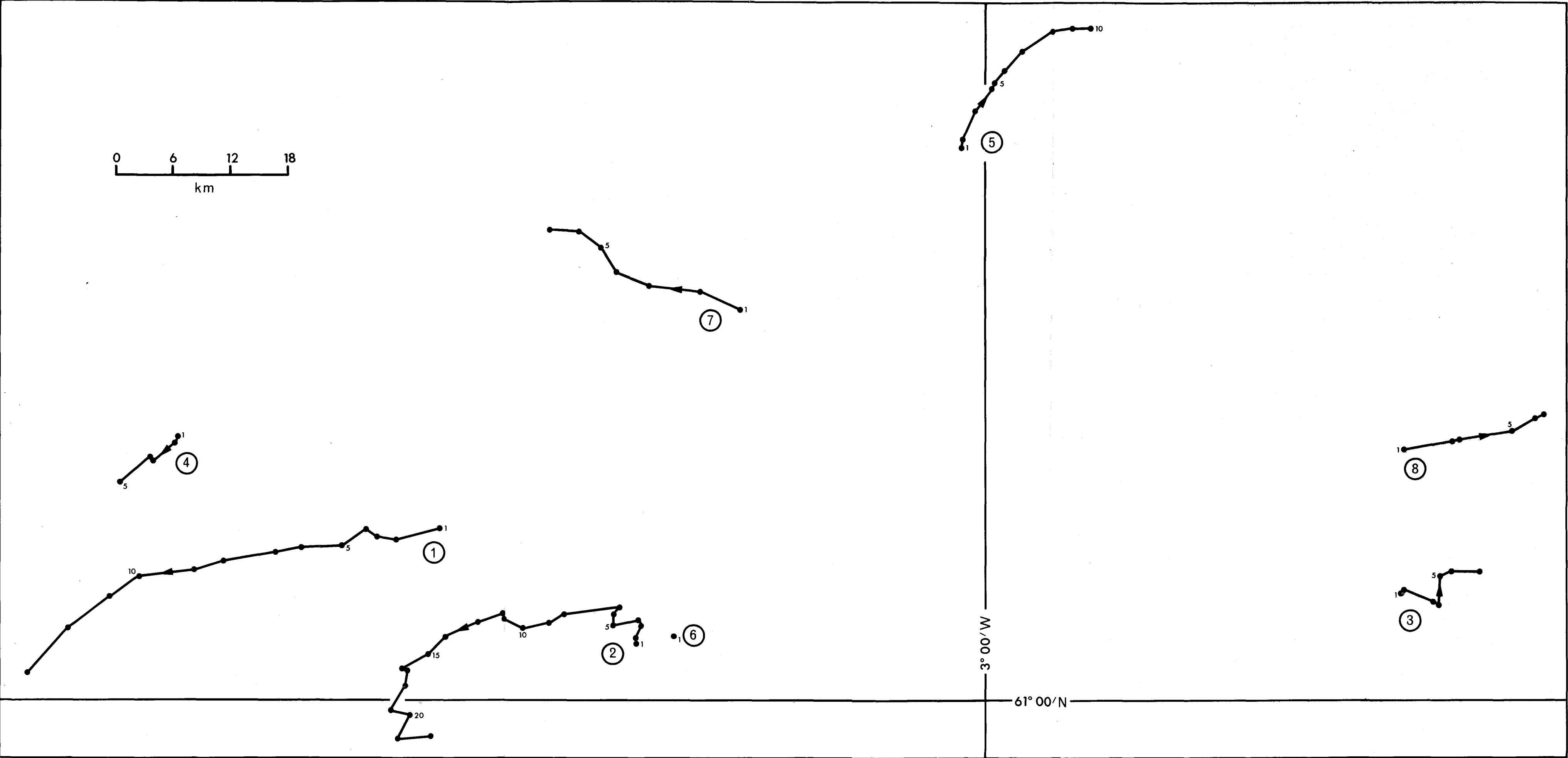
LIST OF FLOATS

Serial No.	Original Designation	Date and Time Laid
120	7	1100/2.VII.61
121	6	1443/4.VII.61
122	2	0931/5.VII.61
123	1	1631/7.VII.61
124	4	1609/9.VII.61
125	5	0230/11.VII.61
126	3	0605/20.VII.61
127	8	0449/21.VII.61
128	1	1330/2.III.62
129	2	0935/3.III.62
130	4	2140/31.III.62
131	5	0928/1.IV.62
132	6	2100/1.IV.62
133	G	1823/14.VII.63
134	K	1004/19.VII.63
135	R	1049/26.VII.63
136	C	1806/3.VIII.63
137	I	0012/5.VIII.63
138	N	1823/5.VIII.63
139	H	0319/14.VIII.63

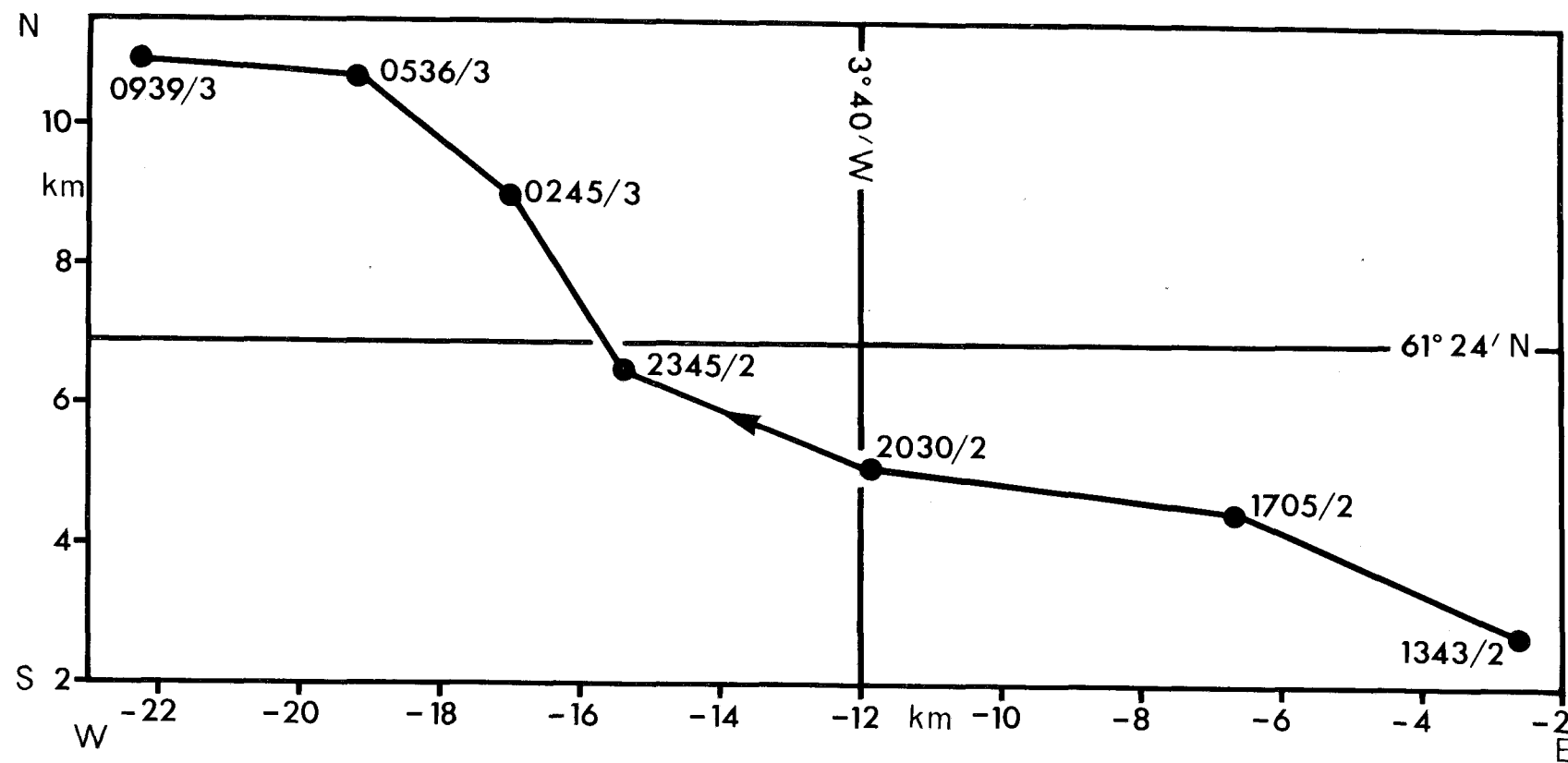
REFERENCES

1. SWALLOW, J.C. and L.V. WORTHINGTON, 1969. Deep-currents in the Labrador Sea. Deep-Sea Research, Vol. 16, pp.77-84
2. ROYAL SOCIETY 1963. Cruise Report R.R.S. 'Discovery' I.I.O.E. Cruise 1.
3. CREASE, J. 1965. The flow of Norwegian Sea Water through the Faroe Bank Channel. Deep-Sea Research, Vol. 12, pp. 143-150.

FLOAT DESIGNATIONS: 7(laid 1100/2.VII.61), 6(laid 1443/4.VII.61), 2(laid 0931/5.VII.61), 1(laid 1631/7.VII.61), 4(laid 1609/9.VII.61), 5(laid 0230/11.VII.61), 3(laid 0605/20.VII.61), 8(laid 0449/21.VII.61).



FLOAT DESIGNATION : 7 Date and time laid : 1100/2.VII.61



SERIAL NO : 120

FLOAT DESIGNATION: 7

Date and time laid: 1100/2.VII.61

Position laid: 61°20'.2N
3°26'.1W

Displacement origin: 61°20'.2N
3°26'.1W

Navigation based on: Decca

Estimated accuracy of positions: ± 0.2 km

Depth(m): Nominal Observed S.D.
300 310* ± 30

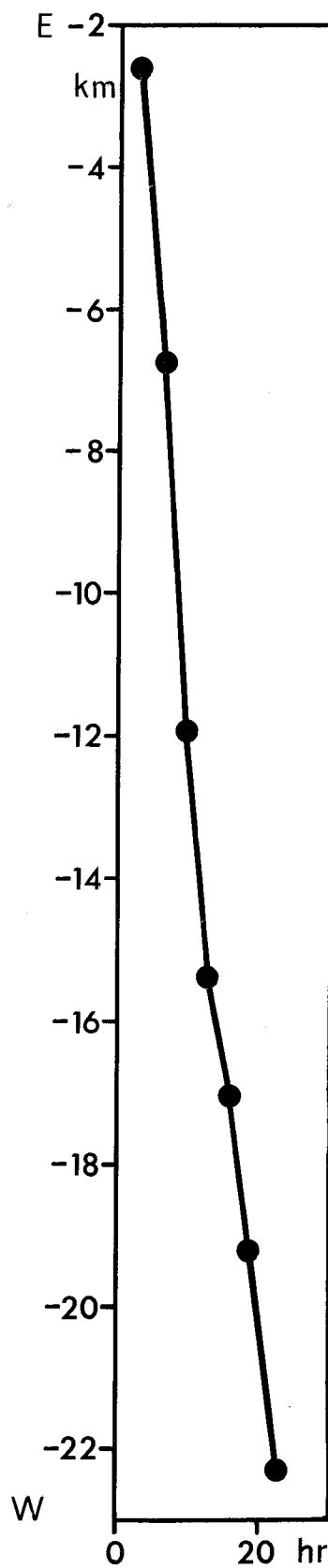
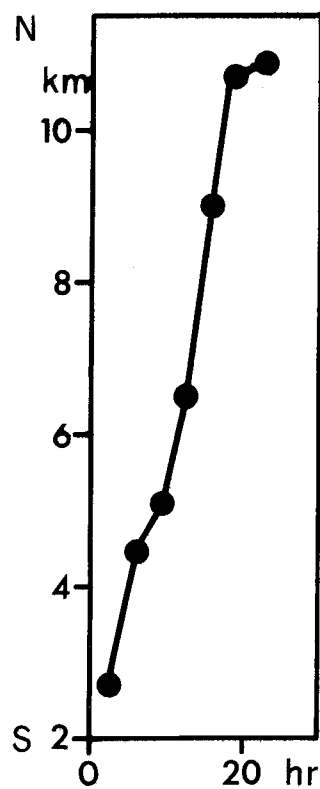
Fix No.	Date	Time GMT +1	Fix Position		Hours Since Laid (t)	Displacement(km)		Velocities between fixes cm/sec °T	
			Lat.N.	Long.W.		+E-W x	+N-S y		
1	2.VII	1343	61°21'.7	3°29'.0	2.7	-2.6	+2.7	38.2	294
2	2.VII	1705	61°22'.7	3°33'.9	6.1	-6.7	+4.5	43.3	276
3	2.VII	2030	61°23'.0	3°39'.8	9.5	-11.9	+5.1	32.5	292
4	2.VII	2345	61°23'.8	3°43'.9	12.75	-15.4	+6.5	28.7	328
5	3.VII	0245	61°25'.2	3°45'.7	15.75	-17.0	+9.0	26.3	307
6	3.VII	0536	61°26'.1	3°48'.2	18.6	-19.2	+10.7	21.3	274
7	3.VII	0939	61°26'.2	3°51'.8	22.65	-22.3	+10.9		

Mean speed along trajectory = 31.6 cm/sec

Mean velocity, fix 1 to fix 7 = 30.0 cm/sec, 293°T

* 1 depth by vertical hydrophones

FLOAT DESIGNATION :7 Date and time laid: 1100/2.VII.61



FLOAT DESIGNATION: 6

Date and time laid: 1443/4.VII.61

Position laid: 61°02'.4N
3°39'.7W

Displacement origin: 61° 02'.4N
3° 39'.7W

Navigation based on: Decca

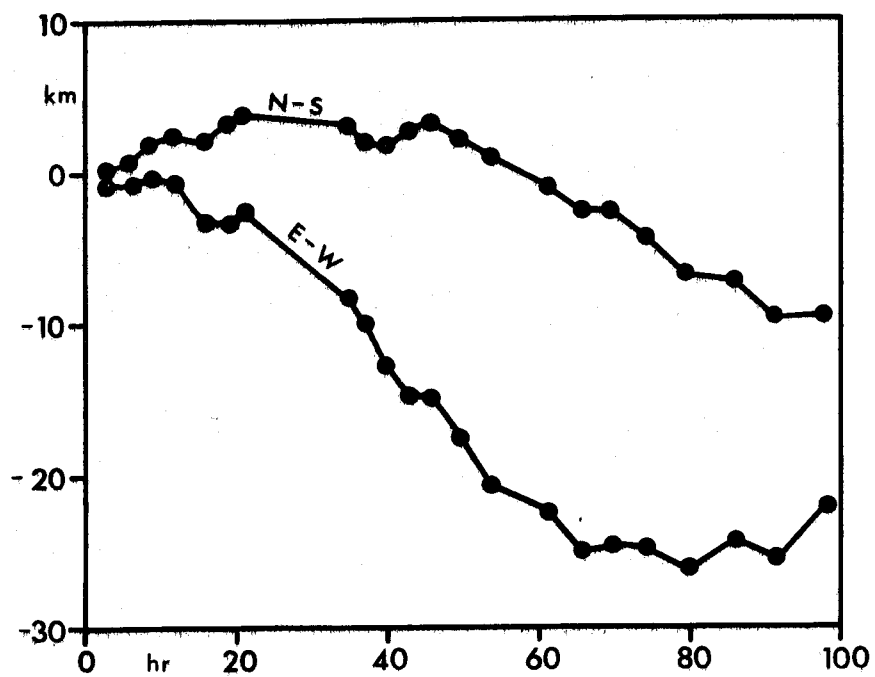
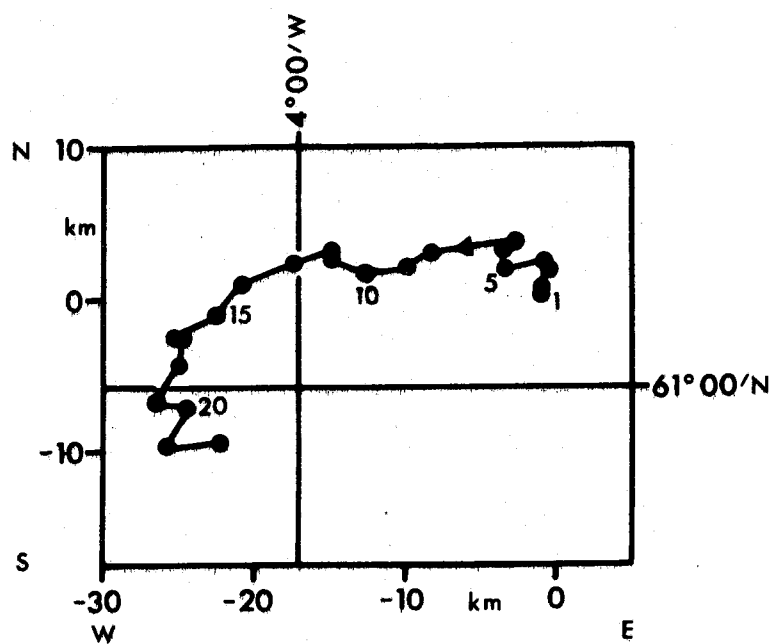
Estimated accuracy of positions: ± 0.2 km.

Depth(m): Nominal Observed S.D.
 300 - -

Fix No.	Date	Time GMT +1	Fix Position		Hours Since Laid (t)	Displacement(km)	
			Lat.N.	Long.W.		+E-W x	+N-S y
1	4.VII	1700	61°03'.5	3°36'.8	2.3	+2.5	+1.9

Mean velocity from laid position to fix 1 = 37.5 cm/sec, 053°T

FLOAT DESIGNATION :2 Date and time laid: 0931/5.VII.61



FLOAT DESIGNATION: 2

Date and time laid: 0931/5.VII.61

Position laid: 61°03'.1N
3°40'.3WDisplacement origin: 61°03'.1N
3°40'.3W

Navigation based on: Decca

Estimated accuracy of positions: ± 0.2 kmDepth (m): Nominal Observed S.D.
300 310* ± 30

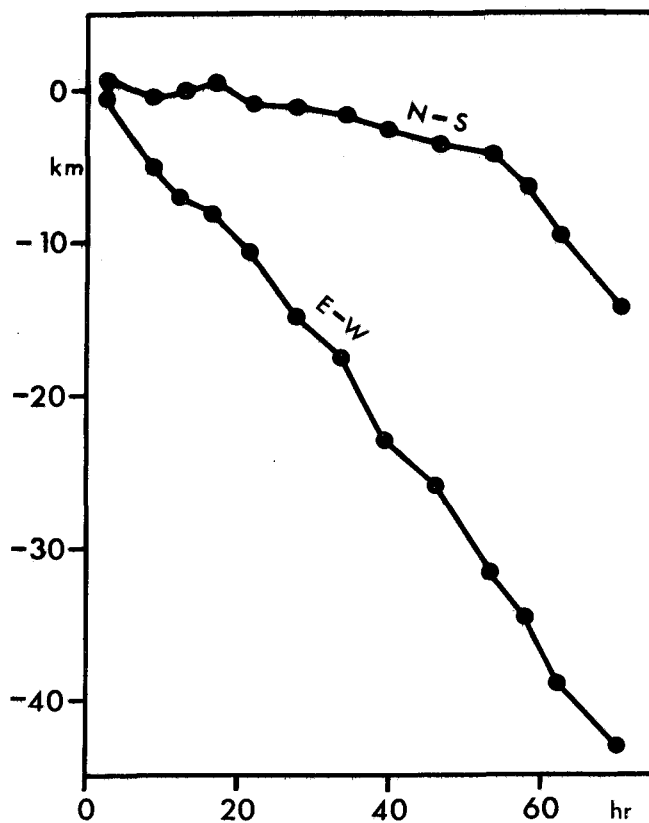
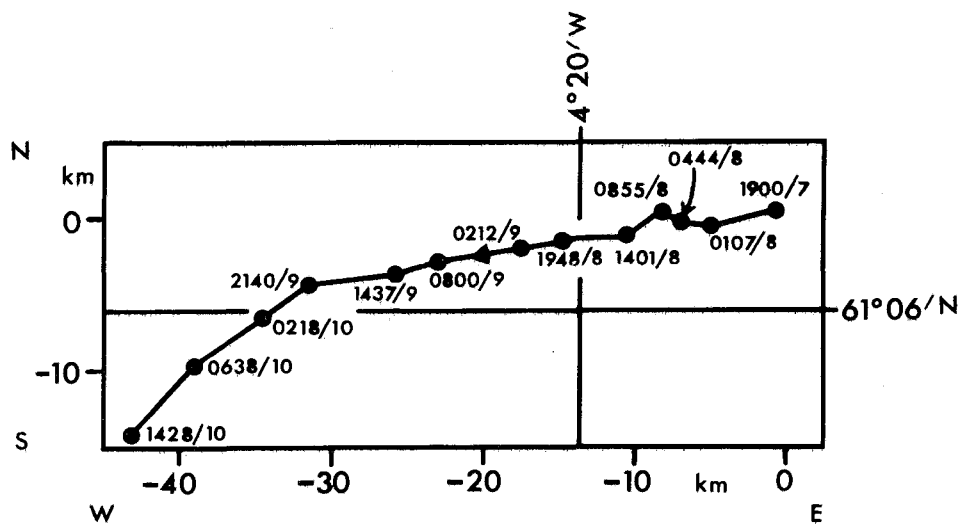
Fix No.	Date	Time GMT +1	Fix Position		Hours Since Laid (t)	Displacement(km)		Velocities between fixes cm/sec °T	
			Lat.N.	Long.W.		+E-W x	+N-S y		
1	5.VII	1155	61°03'.2	3°41'.4	2.4	-1.0	+0.2	4.4	360°
2	5.VII	1503	61°03'.5	3°41'.4	5.55	-1.0	+0.7	14.7	020
3	5.VII	1743	61°04'.2	3°40'.7	8.2	-0.5	+2.0	5.4	324
4	5.VII	2048	61°04'.4	3°41'.2	11.3	-0.8	+2.5	17.1	260
5	6.VII	0111	61°04'.2	3°44'.3	15.65	-3.4	+2.0	10.9	360
6	6.VII	0414	61°04'.9	3°44'.3	18.7	-3.4	+3.2	13.2	043
7	6.VII	0607	61°05'.2	3°43'.5	20.6	-2.8	+3.8	11.4	263
8	6.VII	2001	61°04'.8	3°50'.2	34.5	-8.5	+3.1	23.0	238
9	6.VII	2219	61°04'.3	3°52'.0	36.8	-10.1	+2.1	30.5	262
10	7.VII	0052	61°04'.1	3°55'.1	39.35	-12.8	+1.7	19.1	296
11	7.VII	0405	61°04'.6	3°57'.4	42.55	-14.9	+2.7	4.6	360
12	7.VII	0707	61°04'.8	3°57'.4	45.6	-14.9	+3.2	22.7	250
13	7.VII	1040	61°04'.3	4°00'.7	49.15	-17.6	+2.2	20.6	247
14	7.VII	1508	61°03'.6	4°04'.1	53.6	-20.8	+0.9	9.8	223
15	7.VII	2230	61°02'.6	4°06'.1	61.0	-22.6	-1.0	19.2	241
16	8.VII	0259	61°01'.8	4°09'.3	65.45	-25.3	-2.5	3.5	100
17	8.VII	0655	61°01'.7	4°08'.8	69.4	-24.8	-2.6	10.0	185
18	8.VII	1138	61°00'.8	4°09'.0	74.1	-25.0	-4.3	15.2	212
19	8.VII	1707	60°59'.4	4°10'.8	79.6	-26.5	-6.8	9.0	099
20	8.VII	2320	60°59'.2	4°08'.4	85.8	-24.5	-7.2	14.3	204
21	9.VII	0446	60°57'.8	4°09'.7	91.25	-25.7	-9.7	14.5	085
22	9.VII	1128	60°58'.0	4°05'.7	97.95	-22.3	-9.4		

Mean speed along trajectory = 13.3 cm/sec

Mean velocity, fix 1 - fix 22 = 6.8 cm/sec, 245°T

* 1 depth by vertical hydrophones

FLOAT DESIGNATION :1 Date and time laid: 1631/7.VII.61



FLOAT DESIGNATION: 1

Date and time laid: 1631/7.VII.61

Position laid: 61°09'.2N
4°04'.2W

Displacement origin: 61°09'.2N
4°04'.2W

Navigation based on: Decca

Estimated accuracy of positions: ± 0.2 km

Depth(m): Nominal Observed S.D.
 300 300* ± 20

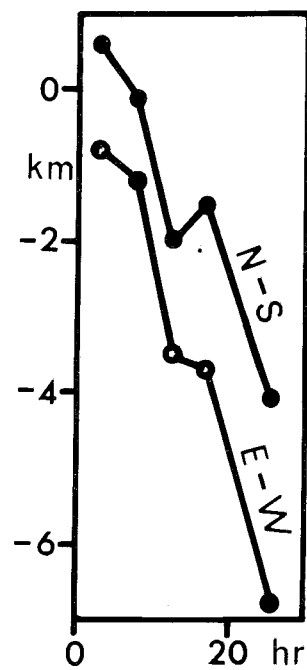
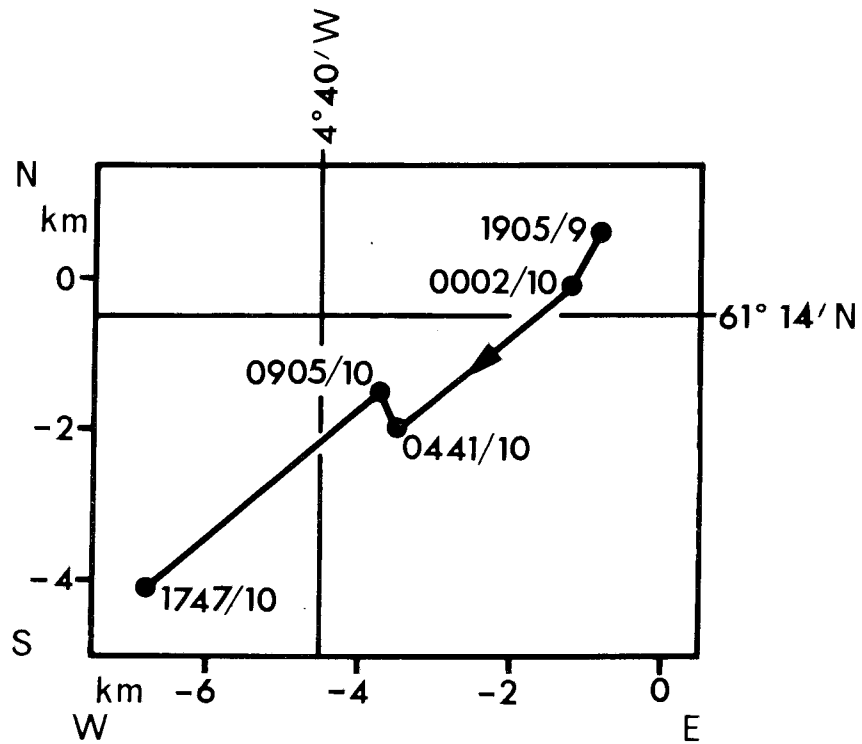
Fix No.	Date	Time GMT +1	Fix Position		Hours Since Laid (t)	Displacement(km)		Velocities between fixes	
			Lat.N.	Long.W.		+E-W x	+N-S y	cm/sec	°T
1	7.VII	1900	61°09'.5	4°04'.9	2.5	-0.6	+0.6	21.0	256
2	8.VII	0107	61°08'.9	4°10'.2	8.6	-5.0	-0.5	15.4	276
3	8.VII	0444	61°09'.0	4°12'.5	12.2	-7.0	-0.2	9.3	308
4	8.VII	0855	61°09'.5	4°13'.7	16.4	-8.1	+0.6	16.9	234
5	8.VII	1401	61°08'.6	4°16'.5	21.5	-10.6	-1.1	20.1	268
6	8.VII	1948	61°08'.5	4°21'.4	27.3	-14.8	-1.3	11.7	259
7	9.VII	0212	61°08'.2	4°24'.4	33.7	-17.5	-1.8	25.4	260
8	9.VII	0800	61°07'.7	4°30'.5	39.5	-22.9	-2.7	13.9	253
9	9.VII	1437	61°07'.2	4°34'.1	46.1	-25.9	-3.6	22.5	263
10	9.VII	2140	61°06'.8	4°40'.7	53.15	-31.7	-4.3	22.1	236
11	10.VII	0218	61°05'.7	4°44'.1	57.8	-34.7	-6.4	33.9	233
12	10.VII	0638	61°04'.0	4°49'.0	62.1	-39.0	-9.6	22.0	223
13	10.VII	1428	61°01'.5	4°53'.8	69.95	-43.2	-14.2		

Mean speed along trajectory = 19.6 cm/sec

Mean velocity, fix 1 to fix 13 = 18.6 cm/sec, 251°T

* 1 depth by vertical hydrophones

FLOAT DESIGNATION : 4 Date and time laid : 1609/9.VII.61



FLOAT DESIGNATION: 4

Date and time laid: 1609/9.VII.61

Position laid: 61°14'.2N
4°34'.8W

Displacement origin: 61°14'.2N
4°34'.8W

Navigation based on: Decca

Estimated accuracy of positions: ± 0.2 km.

Depth(m): Nominal Observed S.D.
 300 240* ± 20

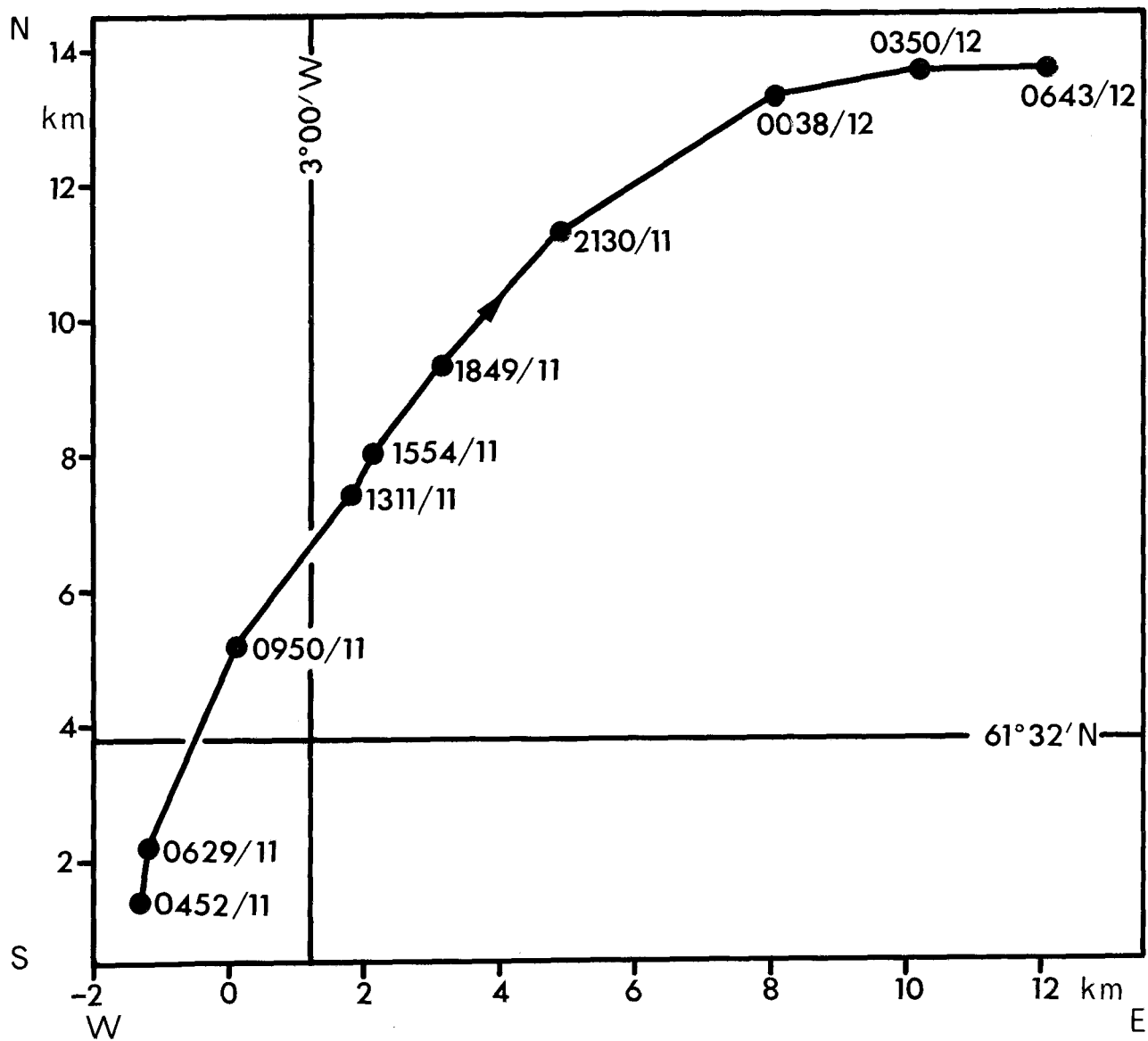
Fix No.	Date	Time GMT +1	Fix Position		Hours Since Laid (t)	Displacement(km)		Velocities between fixes cm/sec °T	
			Lat.N.	Long.W.		+E-W x	+N-S y		
1	9.VII	1905	61°14'.6	4°35'.8	2.95	-0.8	+0.6	3.9	205
2	10.VII	0002	61°14'.2	4°36'.2	7.9	-1.2	-0.1	18.5	230
3	10.VII	0441	61°13'.2	4°38'.8	12.55	-3.5	-2.0	3.8	340
4	10.VII	0905	61°13'.4	4°39'.1	16.95	-3.7	-1.5	12.8	230
5	10.VII	1747	61°12'.0	4°42'.7	25.65	-6.8	-4.1		

Mean speed along trajectory = 10.3 cm/sec

Mean velocity, fix 1 to fix 5 = 9.3 cm/sec, 232°T

* 1 depth by vertical hydrophones

FLOAT DESIGNATION : 5 Date and time laid : 0230/11/VII.61



FLOAT DESIGNATION: 5

Date and time laid: 0230/11.VII.61

Position laid: 61°30'.0N
3°01'.4WDisplacement origin: 61°30'.0N
3°01'.4W

Navigation based on: Decca

Estimated accuracy of positions: ± 0.2 km

Depth(m):	Nominal	Observed	S.D.
	300	445*	± 25

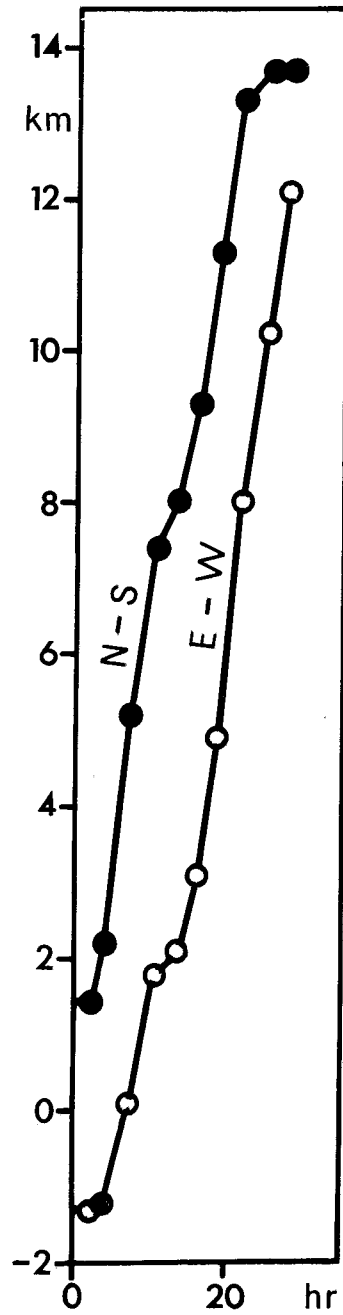
Fix No.	Date	Time GMT +1	Fix Position		Hours Since Laid (t)	Displacement(km)		Velocities between fixes cm/sec °T	
			Lat.N.	Long.W.		+E-W x	+N-S y		
1	11.VII	0452	61°30'.7	3°02'.9	2.35	-1.3	+1.4	15.6	009
2	11.VII	0629	61°31'.2	3°02'.8	4.0	-1.2	+2.2	26.6	022
3	11.VII	0950	61°32'.8	3°01'.3	7.35	+0.1	+5.2	23.2	037
4	11.VII	1311	61°34'.0	2°59'.3	10.7	+1.8	+7.4	7.2	027
5	11.VII	1554	61°34'.3	2°58'.9	13.4	+2.1	+8.0	15.3	035
6	11.VII	1849	61°35'.0	2°57'.7	16.3	+3.1	+9.3	26.8	044
7	11.VII	2130	61°36'.0	2°55'.6	19.0	+4.9	+11.3	32.6	057
8	12.VII	0038	61°37'.2	2°52'.1	22.15	+8.0	+13.3	19.1	078
9	12.VII	0350	61°37'.4	2°49'.6	25.35	+10.2	+13.7	19.2	088
10	12.VII	0643	61°37'.4	2°47'.2	28.2	+12.1	+13.7		

Mean speed along trajectory = 21.2 cm/sec

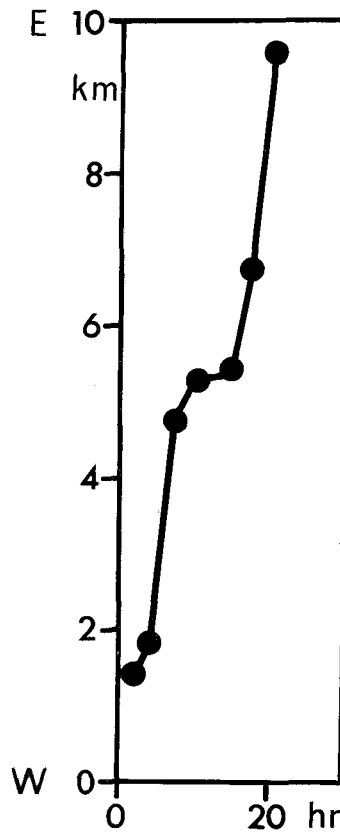
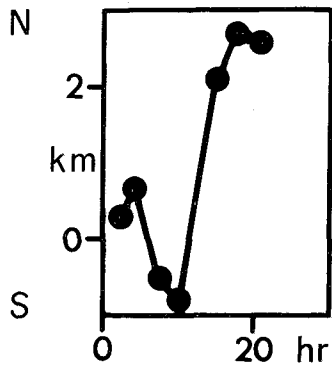
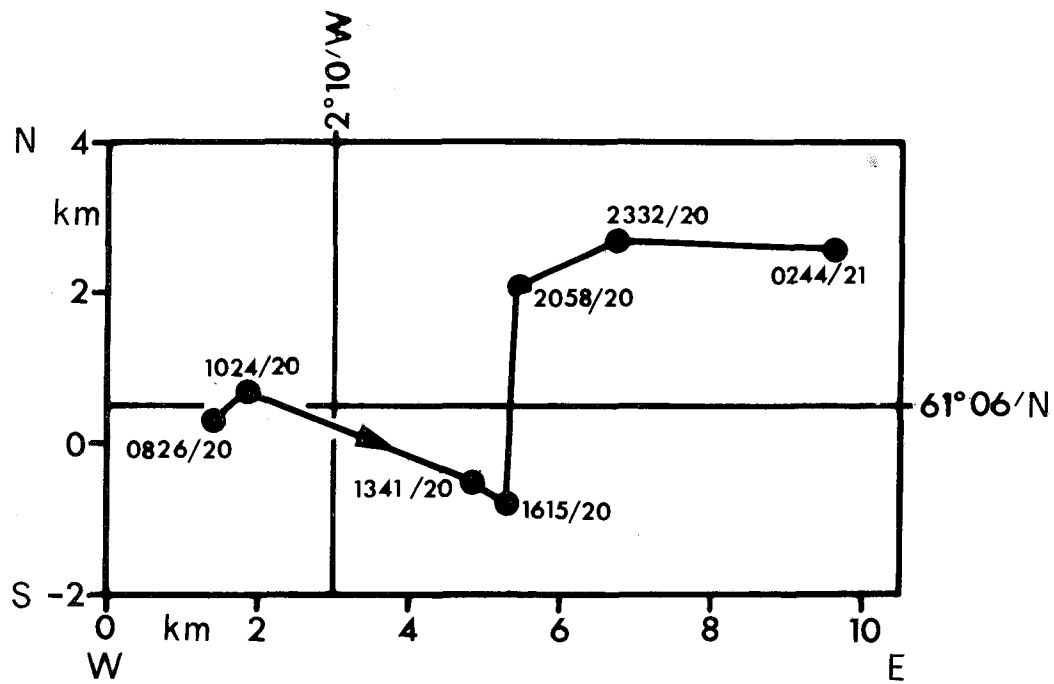
Mean velocity, fix 1 to fix 10 = 19.7 cm/sec, 047°T

* 2 depths by vertical hydrophones

FLOAT DESIGNATION :5 Date and time laid: 0230/11.VII.61



FLOAT DESIGNATION :3 Date and time laid: 0605/20.VII.61



FLOAT DESIGNATION: 3

Date and time laid: 0605/20.VII.61

Position laid: 61°05'.7N
2°13'.3W

Displacement origin: 61°05'.7N
2°13'.3W

Navigation based on: Decca

Estimated accuracy of positions: ± 0.3 km.

Depth(m): Nominal Observed S.D.
 300 442* ± 17

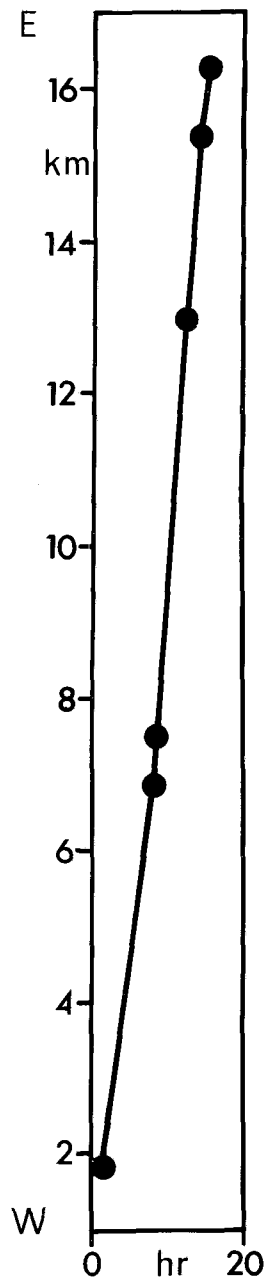
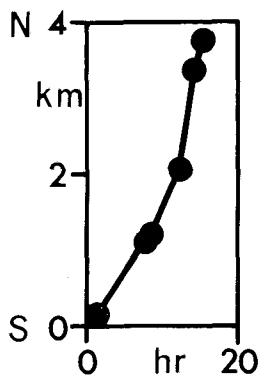
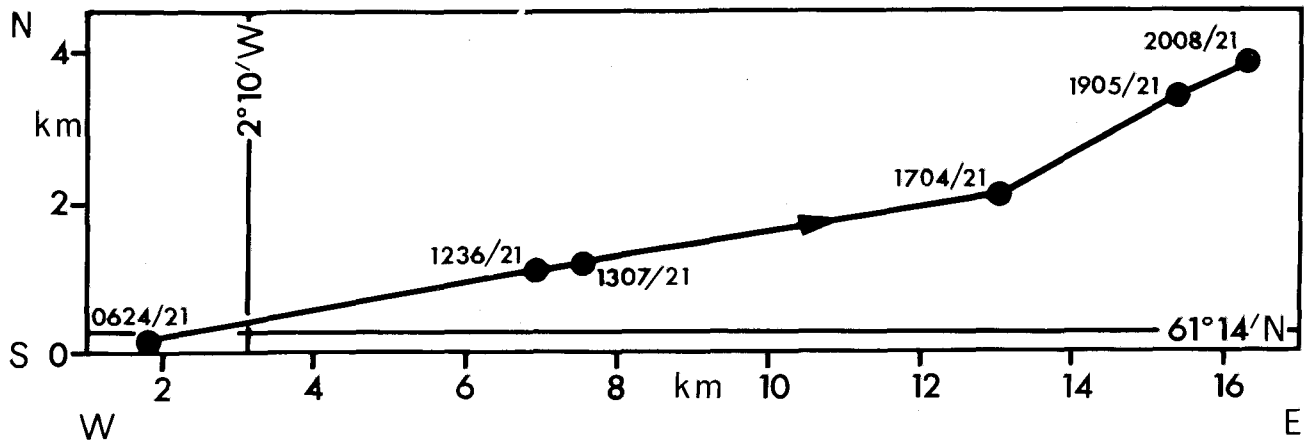
Fix No.	Date	Time GMT +1	Fix Position		Hours Since Laid. (t)	Displacement(km)		Velocities between fixes cm/sec °T	
			Lat.N.	Long.W.		+E-W x	+N-S y		
1	20.VII	0826	61°05'.9	2°11'.8	2.35	+1.4	+0.3	8.6	055
2	20.VII	1024	61°06'.1	2°11'.3	4.3	+1.8	+0.7	27.0	109
3	20.VII	1341	61°05'.5	2°07'.8	7.6	+4.8	-0.5	6.5	120
4	20.VII	1615	61°05'.3	2°07'.3	10.15	+5.3	-0.8	17.2	360
5	20.VII	2058	61°06'.8	2°07'.3	14.9	+5.4	+2.1	17.4	065
6	20.VII	2332	61°07'.2	2°05'.6	17.45	+6.7	+2.7	25.2	092
7	21.VII	0244	61°07'.1	2°02'.4	20.65	+9.6	+2.6		

Mean speed along trajectory = 18.0 cm/sec

Mean velocity fix 1 - fix 7 = 13.1 cm/sec, 075°T

* Mean of 7 estimates from bottom reflections.

FLOAT DESIGNATION :8 Date and time laid: 0449/21.VII.61



FLOAT DESIGNATION: 8

Date and time laid: 0449/21.VII.61

Position laid: 61°13'.8N
2°13'.5W

Displacement origin: 61°13'.8N
2°13'.5W

Navigation based on: Decca

Estimated accuracy of positions: ± 0.3 km

Depth(m): Nominal Observed S.D.
 0 - 150m * -

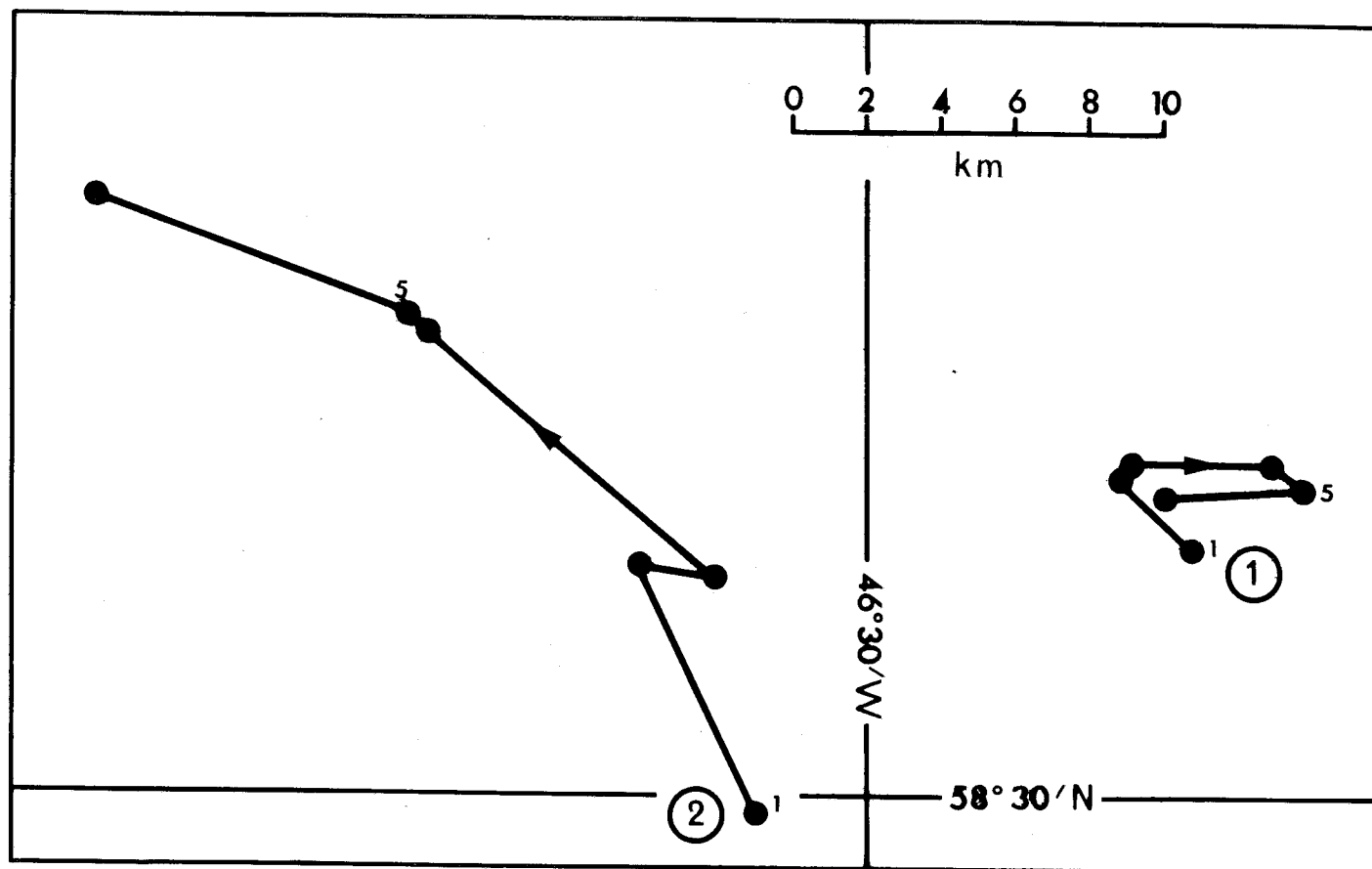
Fix No.	Date	Time GMT +1	Fix Position		Hours Since Laid (t)	Displacement(km)		Velocities between fixes cm/sec °T	
			Lat.N.	Long.W.		+E-W x	+N-S y		
1	21.VII	0624	61°13'.9	2°11'.3	1.6	+1.8	+0.2	23.3	079
2	21.VII	1236	61°14'.4	2°05'.6	7.8	+6.9	+1.1	33.4	075
3	21.VII	1307	61°14'.5	2°05'.0	8.3	+7.5	+1.2	38.7	079
4	21.VII	1704	61°15'.0	1°58'.7	12.25	+13.0	+2.1	37.5	061
5	21.VII	1905	61°15'.6	1°56'.2	14.25	+15.4	+3.4	29.1	063
6	21.VII	2008	61°15'.9	1°55'.0	15.3	+16.3	+3.8		

Mean speed along trajectory = 30.6 cm/sec

Mean velocity, fix 1 to fix 6 = 30.2 cm/sec, 075°T

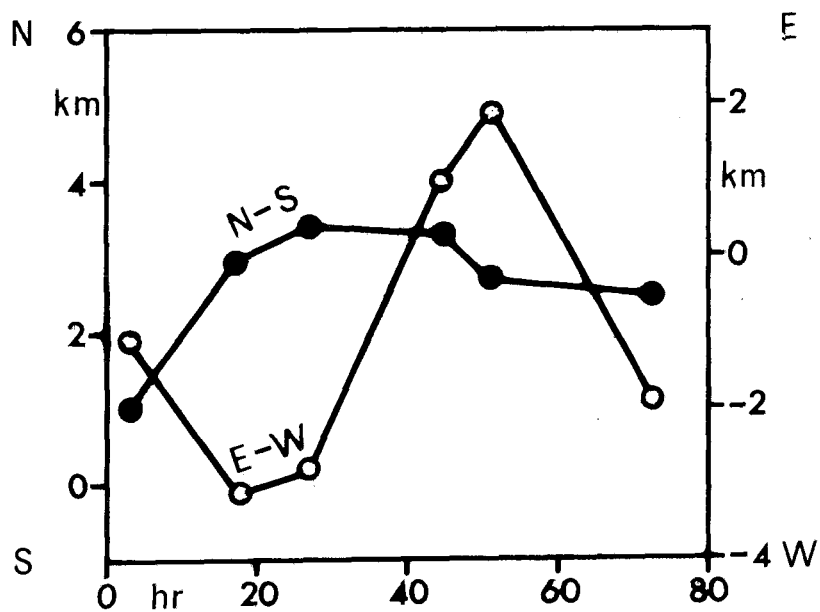
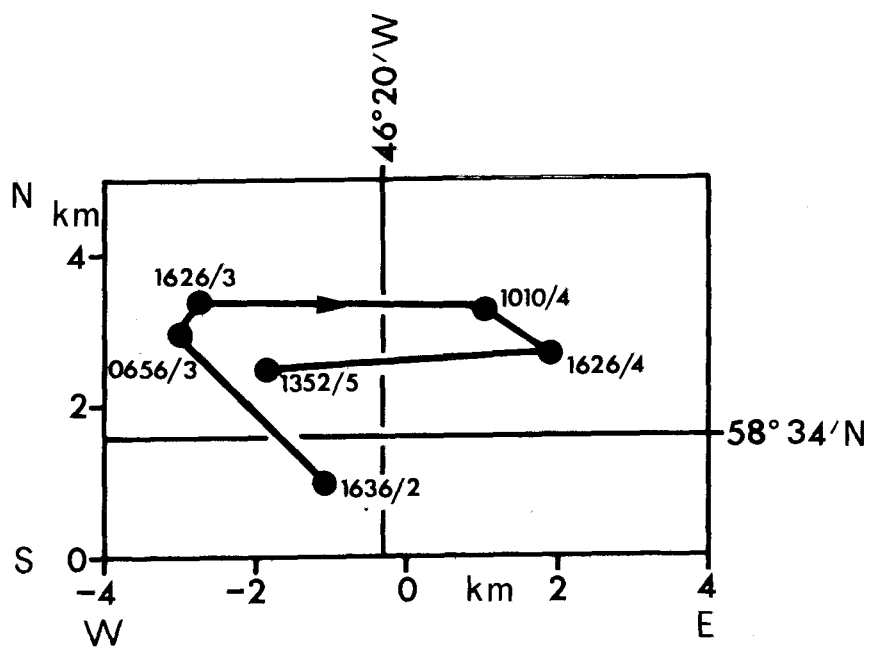
* 2 trawl floats at surface + 150m of 4mm wire + short 1m pinger tube.

FLOAT DESIGNATIONS: 1(laid 1330/2.III.62), 2 (laid 0935/3.III.62)



SERIAL NOS : 128-129

FLOAT DESIGNATION :1 Date and time laid: 1330/2.III.62



FLOAT DESIGNATION: 1

Date and time laid: 1330/2.III.62

Position laid: 58°33'.1N
46°19'.7WDisplacement origin: 58°33'.1N
46°19'.7W

Navigation based on: Loran A

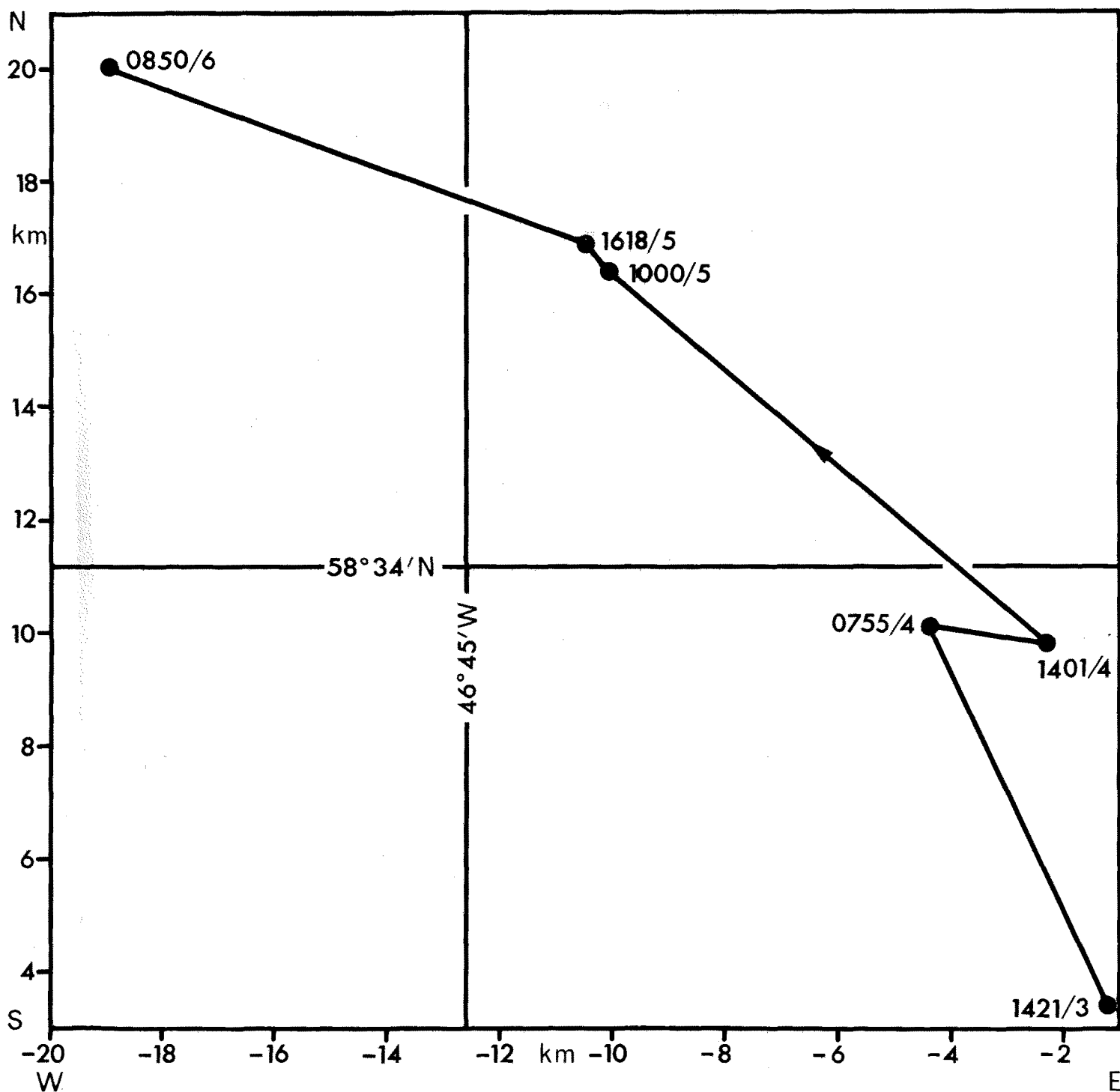
Estimated accuracy of positions: ± 1 km

Depth(m):	Nominal	Observed	S.D.
	2250	1989	± 30

Fix No.	Date	Time GMT -3	Fix Position		Hours Since Laid (t)	Displacement(km)		Residuals	
			Lat.N.	Long.W.		+E-W x	+N-S y	x	y
1	2.III	1636	58°33'.6	46°20'.8	3.1	-1.1	+1.0	+0.8	-1.2
2	3.III	0656	58°34'.8	46°23'.0	17.45	-3.1	+3.0	-1.6	+0.6
3	3.III	1626	58°35'.0	46°22'.7	26.95	-2.8	+3.4	-1.6	+0.9
4	4.III	1010	58°34'.9	46°18'.7	44.65	+1.0	+3.3	+1.8	+0.5
5	4.III	1626	58°34'.6	46°17'.6	50.95	+1.9	+2.7	+2.5	-0.2
6	5.III	1352	58°34'.4	46°21'.8	72.35	-1.9	+2.5	-1.9	-0.6

Fitted lines: $x = +0.028t - 2.0$ $y = +0.013t + 2.2$ Mean velocity = $0.9(\pm 1.0)$ cm/sec, 064 (± 40) °T

FLOAT DESIGNATION : 2 Date and time laid : 0935/3.III.62



Float DESIGNATION: 2

Date and time laid: 0935/3.III.62

Position laid: 58°27'.9N
46°31'.9W

Displacement origin: 58°27'.9N
46°31'.9W

Navigation based on: Loran A

Estimated accuracy of positions: ± 1 km

Depth(m): Nominal Observed S.D.
 2500 2223 ± 30

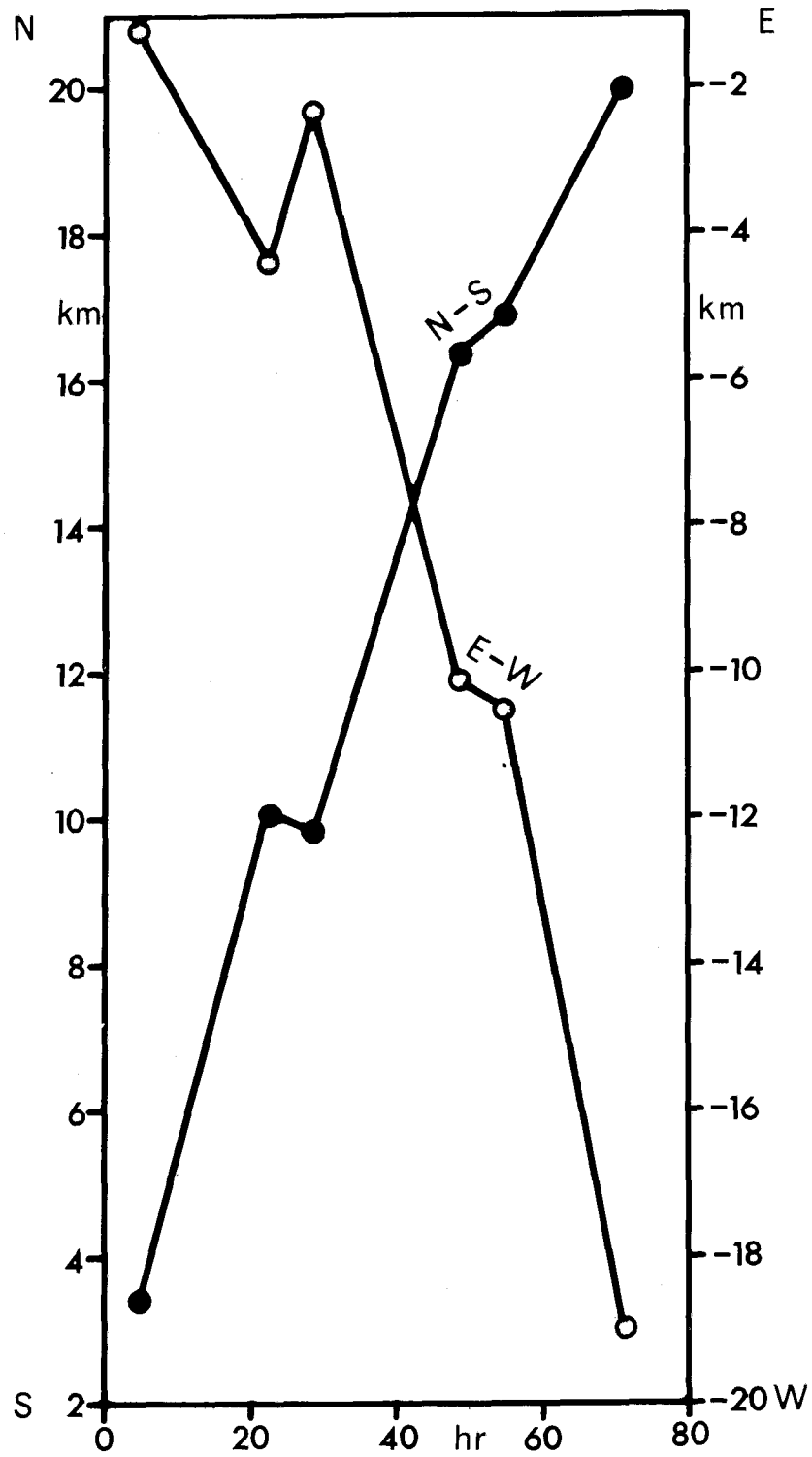
Fix No.	Date	Time GMT -3	Fix Position		Hours Since Laid (t)	Displacement(km)		Residuals	
			Lat.N.	Long.W.		+E-W x	+N-S y	x	y
1	3.III	1421	58°29'.8	46°33'.1	4.75	-1.2	+3.4	-2.1	-1.0
2	4.III	0755	58°33'.5	46°36'.5	22.35	-4.4	+10.1	-0.7	+1.3
3	4.III	1401	58°33'.3	46°34'.4	28.45	-2.3	+9.8	+3.0	-0.5
4	5.III	1000	58°36'.9	46°42'.4	48.4	-10.1	+16.4	+0.5	+1.1
5	5.III	1618	58°37'.1	46°42'.8	54.7	-10.5	+16.9	+1.7	+0.1
6	6.III	0850	58°38'.8	46°51'.6	71.25	-19.0	+20.0	-2.5	-0.9

Fitted lines: $x = -0.261 t + 2.1$

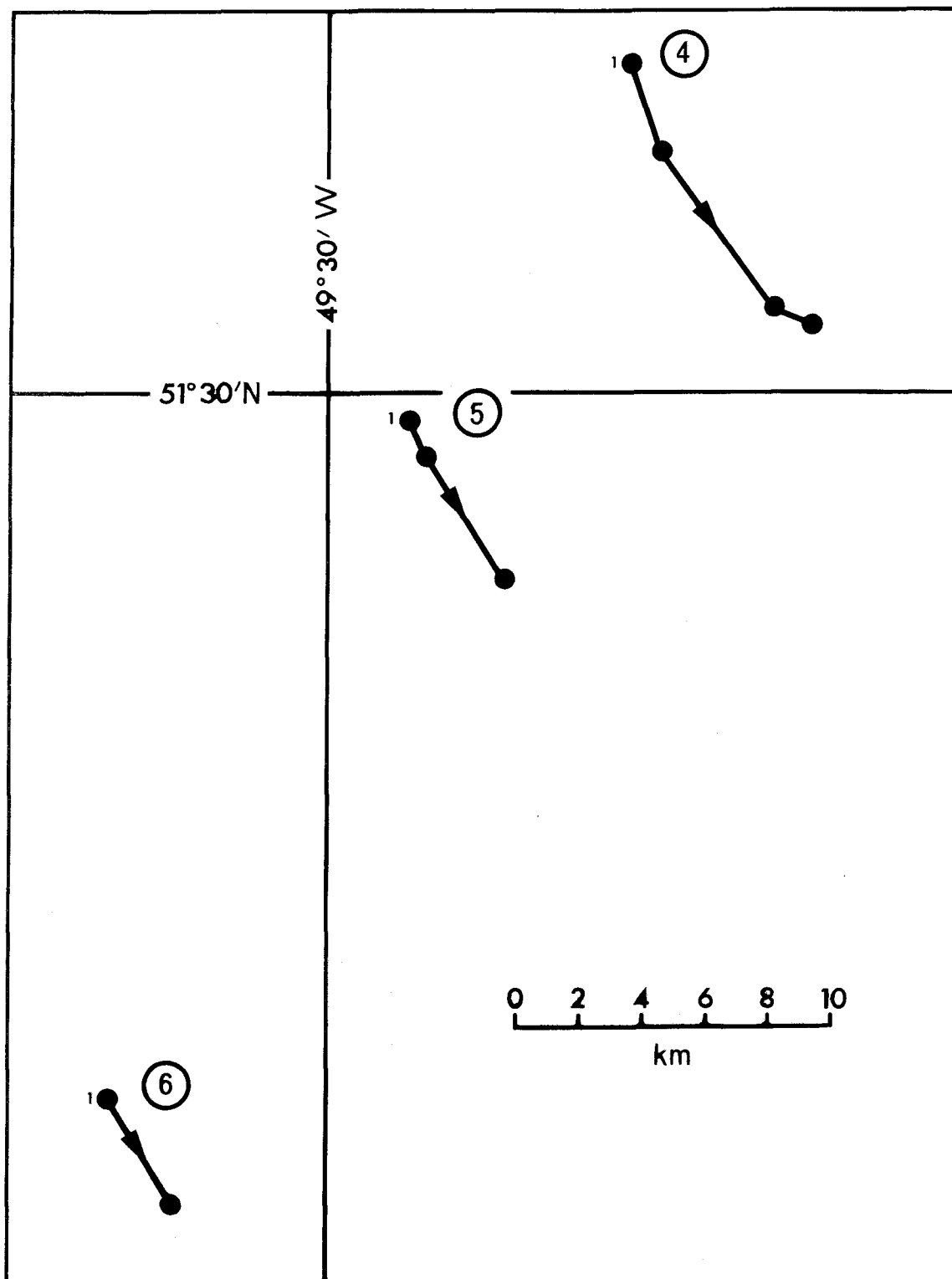
$y = +0.248 t + 3.2$

Mean velocity = $10.0(\pm 1.0)$ cm/sec, $314(\pm 4)^\circ$ T

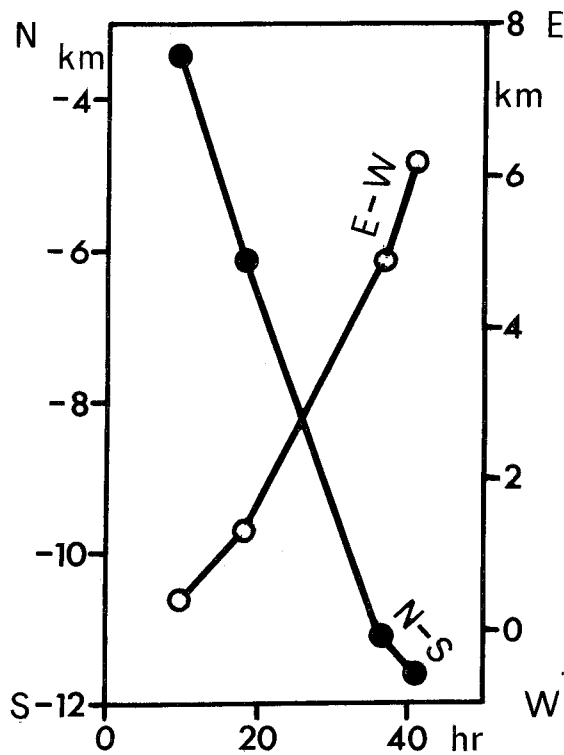
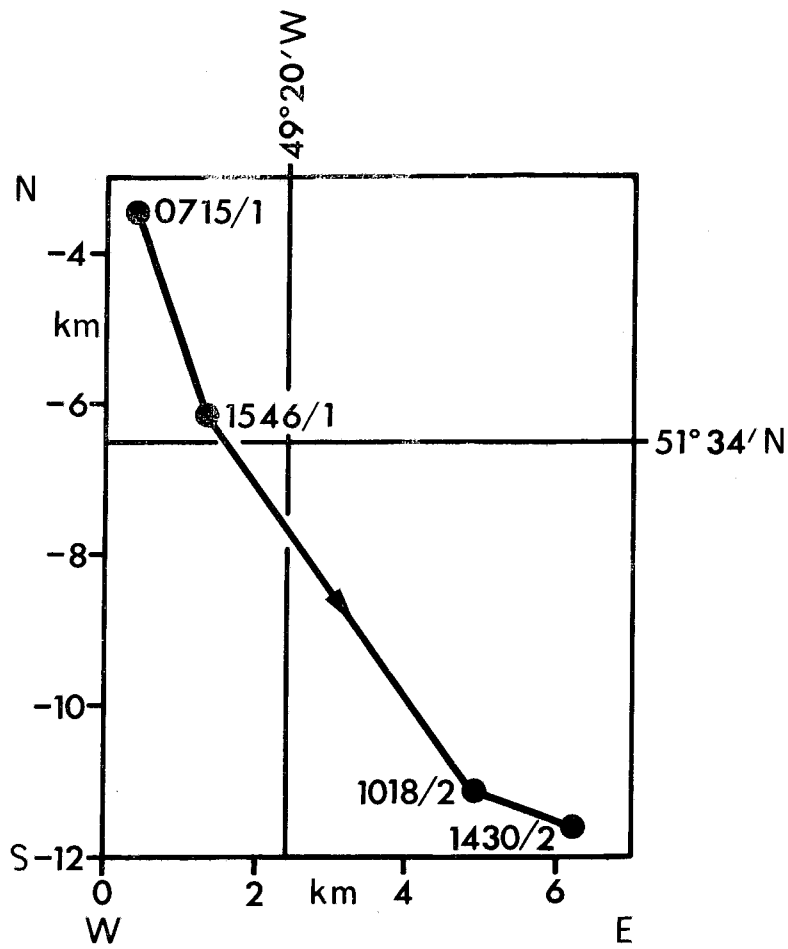
FLOAT DESIGNATION : 2 Date and time laid : 0935/3.III.62



FLOAT DESIGNATIONS : 4(laid 2140/31.III.62),5(laid 0928/1.IV.62),
6(laid 2100/1.IV.62)



FLOAT DESIGNATION : 4 Date and time laid: 2140/31.III.62



FLOAT DESIGNATION: 4

Date and time laid: 2140/31.III.62

Position laid: $51^{\circ}37'.5N$
 $49^{\circ}22'.0W$

Displacement origin: $51^{\circ}37'.5N$
 $49^{\circ}22'.0W$

Navigation based on: Loran A

Estimated accuracy of positions: ± 0.5 km

Depth(m): Nominal Observed S.D.
 2700 2396 ± 30

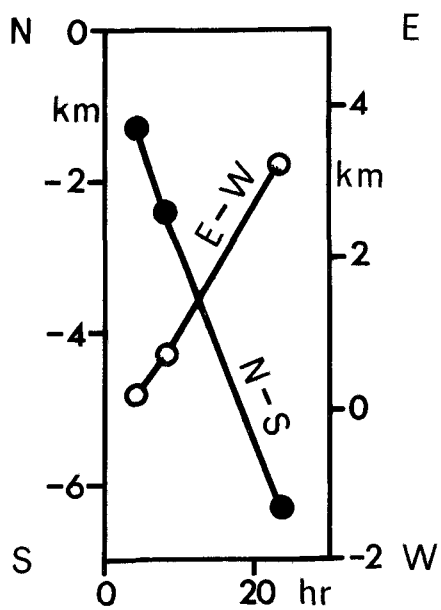
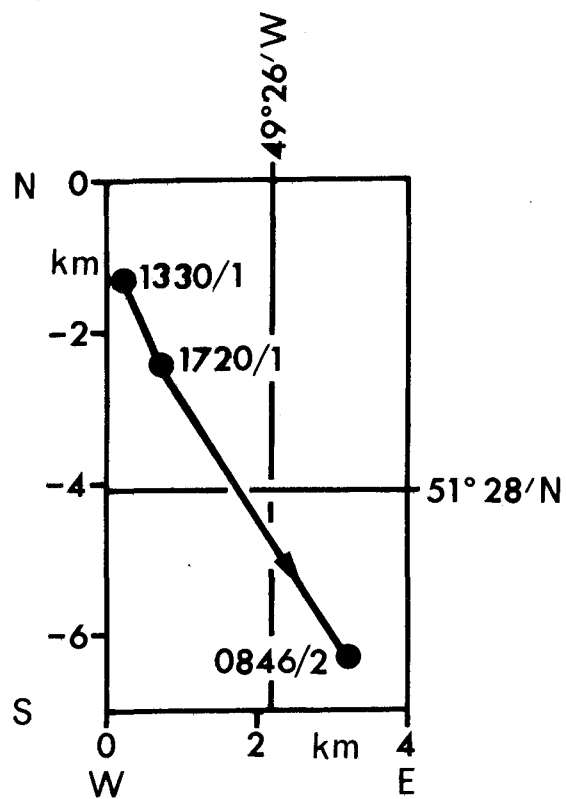
Fix No.	Date	Time GMT -3	Fix Position		Hours Since Laid (t)	Displacement(km)		Residuals	
			Lat.N.	Long.W.		+E-W x	+N-S y	x	y
1	1.IV	0715	$51^{\circ}35'.7$	$49^{\circ}21'.7$	9.6	+0.4	-3.4	+0.3	+0.2
2	1.IV	1546	$51^{\circ}34'.2$	$49^{\circ}20'.9$	18.1	+1.3	-6.1	-0.4	-0.2
3	2.IV	1018	$51^{\circ}31'.5$	$49^{\circ}17'.7$	36.65	+4.9	-11.1	-0.2	-0.3
4	2.IV	1430	$51^{\circ}31'.2$	$49^{\circ}16'.6$	40.85	+6.2	-11.6	+0.3	+0.3

Fitted lines: $x = +0.186 t - 1.7$

$y = -0.266 t - 1.0$

Mean velocity = $9.0(\pm 0.4)$ cm/sec, $145(\pm 2)^{\circ}T$

FLOAT DESIGNATION :5 Date and time laid: 0928/1.IV.62



SERIAL No: 131

FLOAT DESIGNATION: 5

Date and time laid: 0928/1.IV.62

Position laid: $51^{\circ}30'.2N$
 $49^{\circ}27'.9W$

Displacement origin: $51^{\circ}30'.2N$
 $49^{\circ}27'.9W$

Navigation based on: Loran A

Estimated accuracy of positions: ± 0.5 km

Depth(m): Nominal Observed S.D.
 2300 2064 ± 50

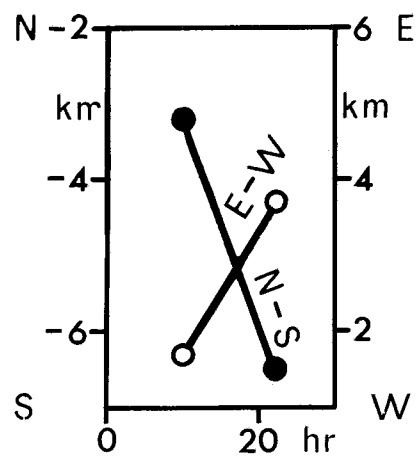
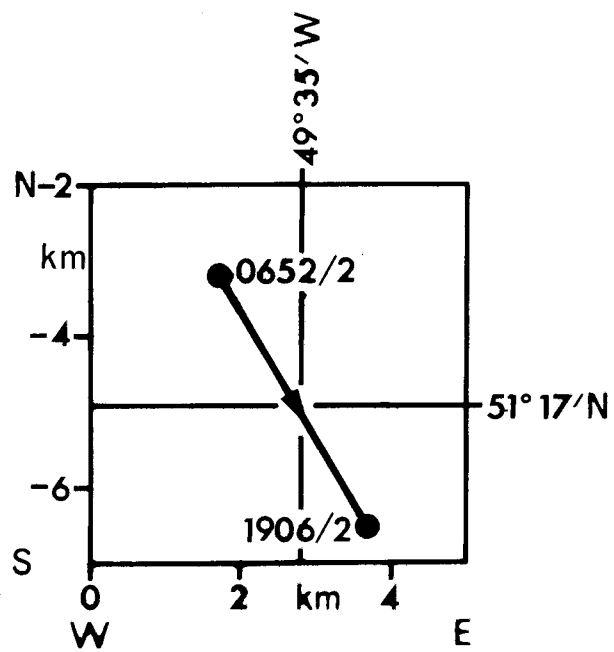
Fix No.	Date	Time GMT -3	Fix Position		Hours Since Laid (t)	Displacement(km)		Residuals	
			Lat.N.	Long.W.		+E-W x	+N-S y	x	y
1	1.IV	1330	$51^{\circ}29'.6$	$49^{\circ}27'.7$	4.05	+0.2	-1.3	0.0	+0.1
2	1.IV	1720	$51^{\circ}28'.9$	$49^{\circ}27'.3$	7.85	+0.7	-2.4	-0.1	-0.1
3	2.IV	0846	$51^{\circ}26'.8$	$49^{\circ}25'.1$	23.3	+3.2	-6.3	0.0	0.0

Fitted lines: $x = + 0.158 t - 0.5$

$y = - 0.258 t - 0.3$

Mean velocity = $8.4(\pm 0.2)$ cm/sec, $149(\pm 1)^{\circ}T$

FLOAT DESIGNATION :6 Date and time laid: 2100/1.IV.62



FLOAT DESIGNATION: 6

Date and time laid: 2100/1.IV.62

Position Laid: 51°19'.7N
49°37'.5W

Displacement origin: 51°19'.7N
49°37'.5W

Navigation based on: Loran A

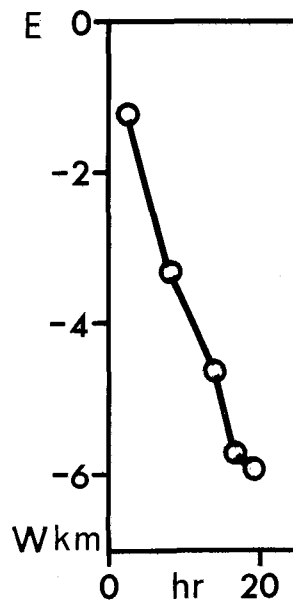
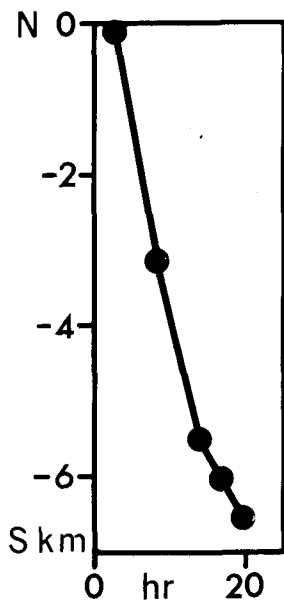
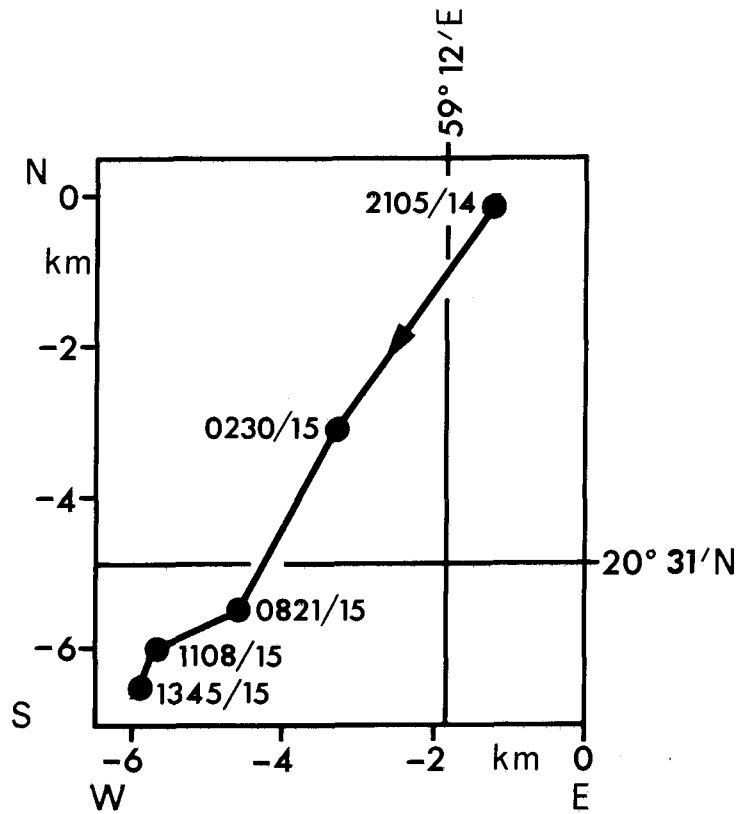
Estimated accuracy of positions: ± 0.5 km

Depth(m): Nominal Observed S.D.
 1750 1664 ± 40

Fix No.	Date	Time GMT -3	Fix Position		Hours Since Laid (t)	Displacement(km)	
			Lat.N.	Long.W.		+E-W x	+N-S y
1	2.IV	0652	51°17'.9	49°35'.9	9.85	+1.7	-3.2
2	2.IV	1906	51°16'.1	49°34'.3	22.1	+3.7	-6.5

Mean velocity, fix 1 to fix 2 = 8.7cm/sec, 151°T

FLOAT DESIGNATION : G Date and time laid : 1823/14.VIL63



SERIAL No: 133

FLOAT DESIGNATION: G

Date and time laid: 1823/14.VII.63

Position laid: 20°33'.7N
59°13'.1E

Displacement origin: 20°33'.7N
59°13'.1E

Navigation based on: Radar on anchored buoy, + land fixes

Estimated accuracy of positions: ± 0.5 km

Depth(m): Nominal Observed S.D.
 200 210* ± 20

Fix No.	Date	Time GMT +4	Fix Position		Hours Since Laid (t)	Displacement(km)		Residuals	
			Lat.N.	Long.E.		+E-W x	+N-S y	x	y
1	14.VII	2105	20°33'.6	59°12'.4	2.6	-1.2	-0.2	+0.2	+0.5
2	15.VII	0230	20°32'.0	59°11'.2	8.0	-3.3	-3.1	-0.3	-0.4
3	15.VII	0821	20°30'.7	59°10'.4	13.9	-4.6	-5.4	+0.1	-0.6
4	15.VII	1108	20°30'.4	59°9'.8	16.65	-5.7	-6.0	-0.3	0.0
5	15.VII	1345	20°30'.2	59°9'.7	19.25	-5.9	-6.5	+0.3	+0.5

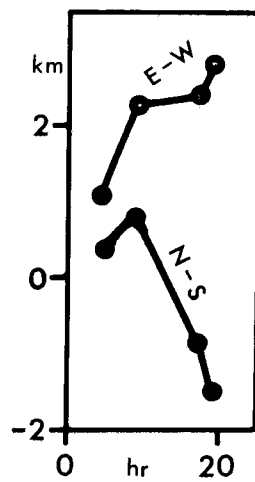
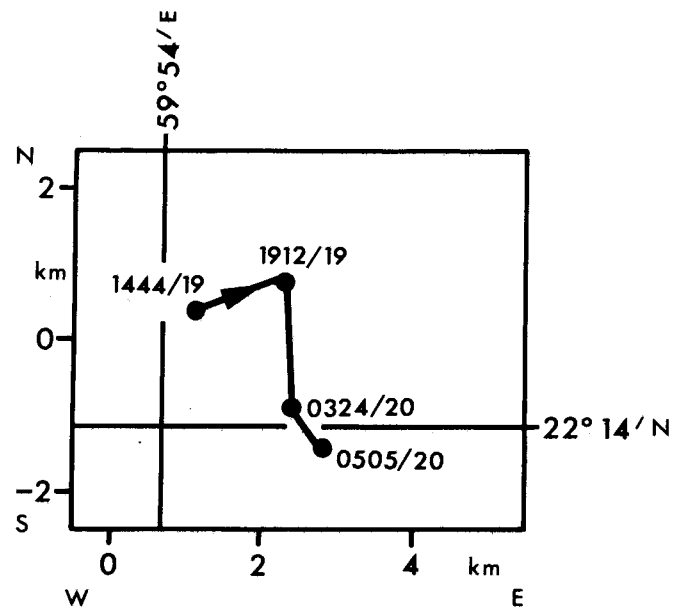
Fitted lines: $x = -0.285 t - 0.7$

$y = -0.387 t + 0.4$

Mean velocity = $13.3(\pm 1)$ cm/sec, $216(\pm 2)$ °T

* by bottom reflections.

FLOAT DESIGNATION :K Date and time laid: 1004/19.VII.63



FLOAT DESIGNATION: K

Date and time laid: 1004/19.VII.63

Position laid: 22°14'.6N
59°53'.6E

Displacement origin: 22°14'.6N
59°53'.6E

Navigation based on: Land fixes

Estimated accuracy of positions: ± 0.5 km

Depth(m): Nominal Observed S.D.
 200 250* ± 50

Fix No.	Date	Time GMT +4	Fix Position		Hours Since Laid (t)	Displacement(km)		Residuals	
			Lat.N.	Long.E.		+E-W x	+N-S y	x	y
1	19.VII	1444	22°14'.9	59°54'.2	4.65	+1.1	+0.4	-0.3	-0.4
2	19.VII	1912	22°15'.1	59°55'.0	9.15	+2.3	+0.8	+0.5	+0.6
3	20.VII	0324	22°14'.2	59°55'.0	17.35	+2.4	-0.9	-0.2	+0.1
4	20.VII	0505	22°13'.8	59°55'.2	19.0	+2.8	-1.5	0.0	-0.3

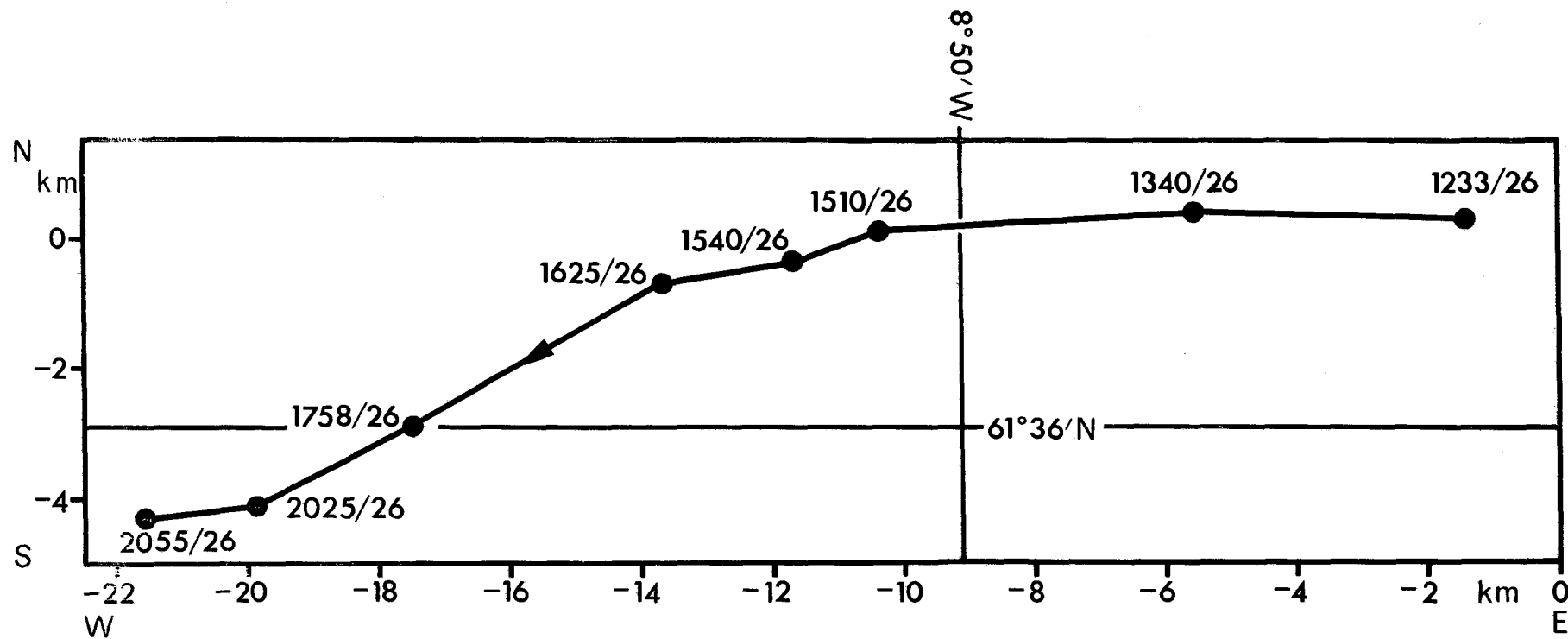
Fitted lines: $x = + 0.095 t + 1.0$

$y = - 0.143 t + 1.5$

Mean velocity = $4.8(\pm 1.2)$ cm/sec, $146(\pm 5)^\circ T$

* by bottom reflections

FLOAT DESIGNATION :R Date and time laid: 1049/26.VII.63



SERIAL NO: 135

FLOAT DESIGNATION: R

Date and time laid: 1049/26.VII.63

Position laid: 61°37'.6N
8°40'.0WDisplacement origin: 61°37'.6N
8°40'.0W

Navigation based on: Loran A

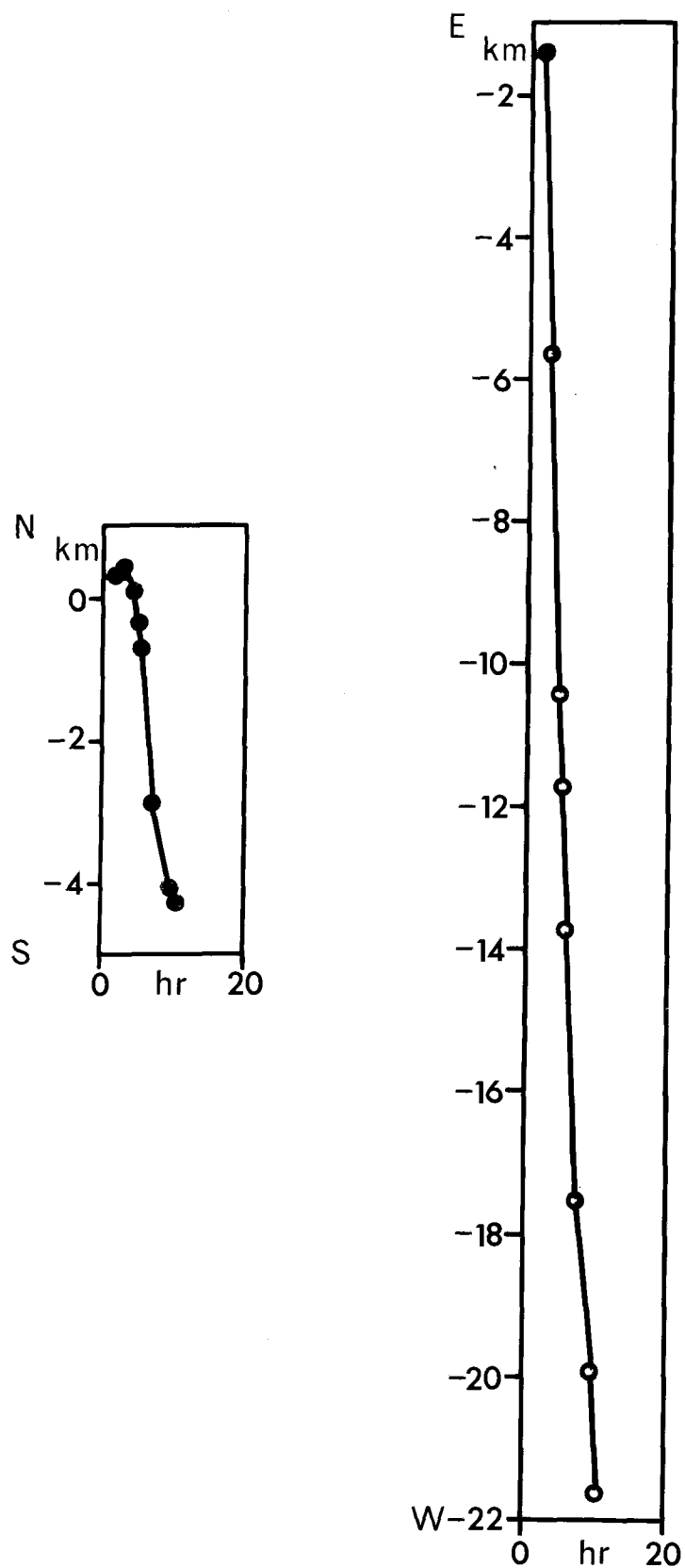
Estimated accuracy of positions: ± 0.5 kmDepth(m): Nominal Observed S.D.
- 760* ± 10

Fix No.	Date	Time GMT	Fix Position		Hours Since Laid (t)	Displacement(km)		Residuals	
			Lat.N.	Long.W.		+E-W x	+N-S y	x	y
1	26.VII	1233	61°37'.8	8°41'.5	1.75	-1.4	+0.3	+2.2	-0.8
2	26.VII	1340	61°37'.8	8°46'.2	2.85	-5.6	+0.4	+0.5	0.0
3	26.VII	1510	61°37'.6	8°51'.4	4.35	-10.4	+0.1	-0.9	+0.6
4	26.VII	1540	61°37'.3	8°52'.9	4.85	-11.7	-0.4	-1.1	+0.5
5	26.VII	1625	61°37'.2	8°55'.1	5.6	-13.7	-0.7	-1.4	+0.6
6	26.VII	1758	61°36'.0	8°59'.3	7.15	-17.5	-2.9	-1.7	-0.6
7	26.VII	2025	61°35'.3	9°01'.9	9.6	-19.9	-4.1	+1.5	-0.2
8	26.VII	2055	61°35'.2	9°03'.9	10.1	-21.6	-4.3	+0.9	-0.1

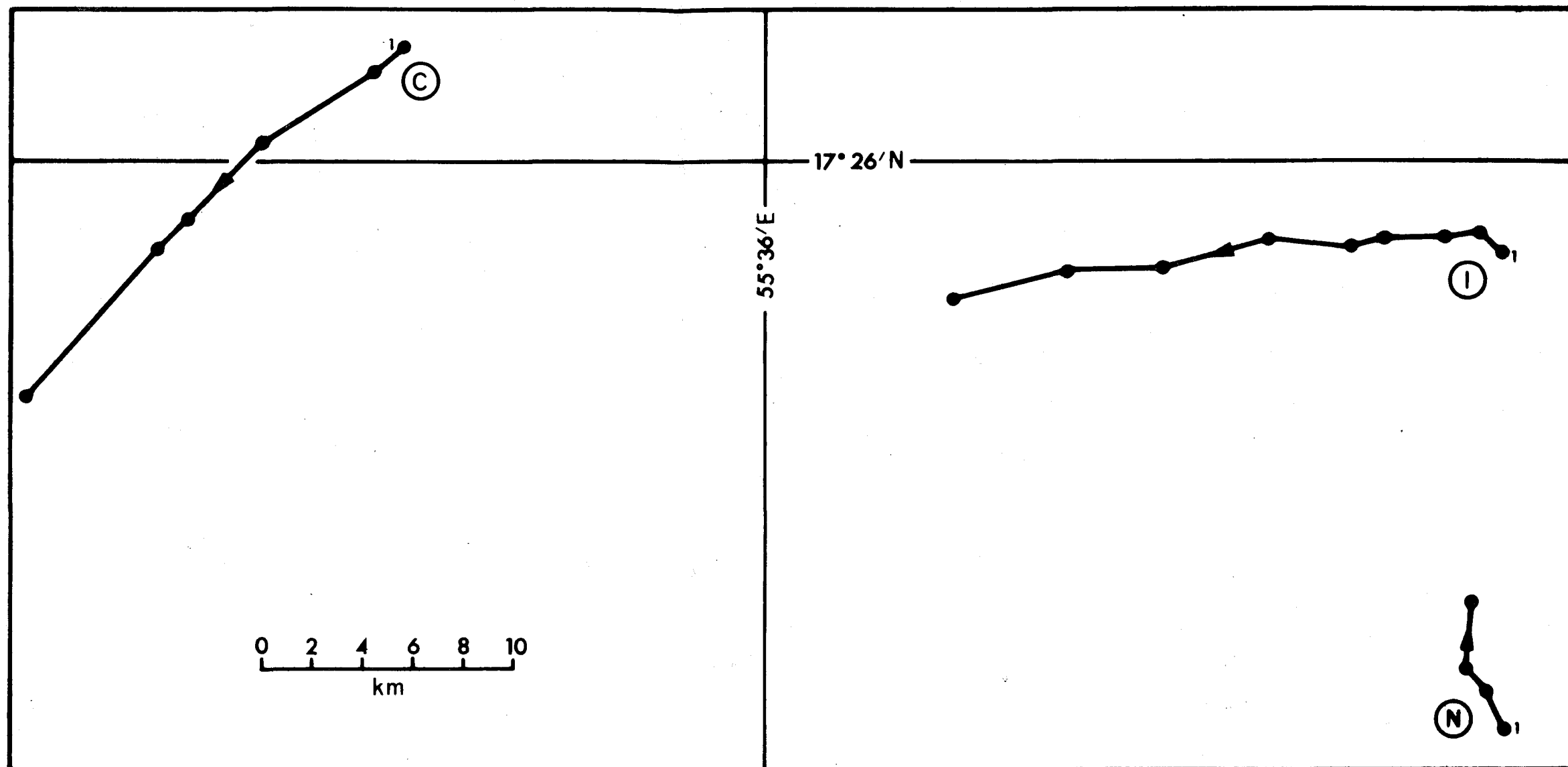
Fitted lines: $x = -2.272 t + 0.4$ $y = -0.639 t + 2.2$ Mean velocity = $65.6(\pm 5.3)$ cm/sec, $254(\pm 1)^\circ$ T

* By bottom reflections

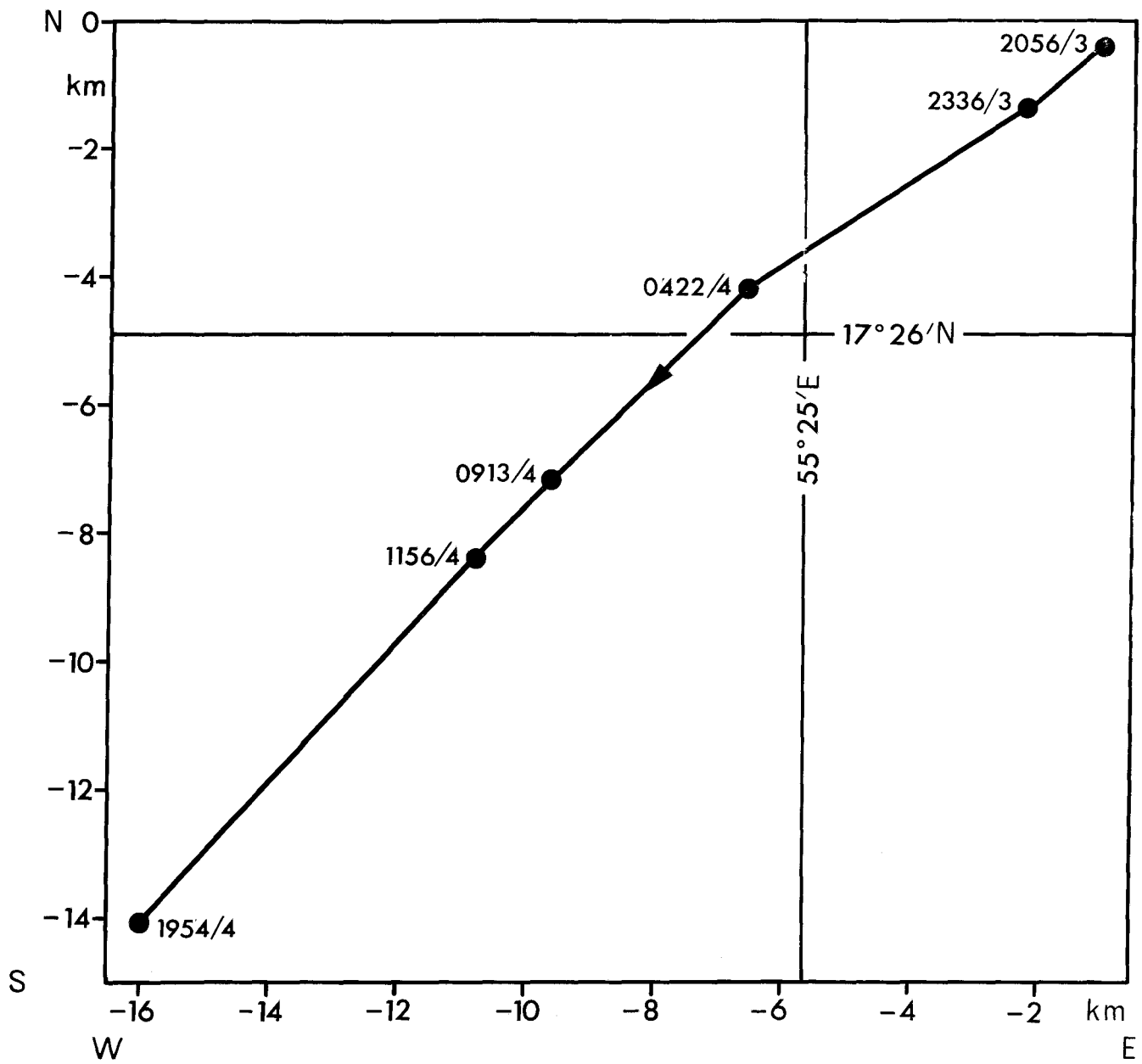
FLOAT DESIGNATION : R Date and time laid : 1049/26.VII.63



FLOAT DESIGNATIONS : C (laid 1806/3.VIII.63), I (laid 0012/5.VIII.63), N(laid 1823/5.VIII.63)



FLOAT DESIGNATION : C Date and time laid : 1806/3.VIIL63



FLOAT DESIGNATION: C

Date and time laid: 1806/3.VIII.63

Position laid: 17°28'.7N
55°28'.2EDisplacement origin: 17°28'.7N
55°28'.2E

Navigation based on: land fixes by radar

Estimated accuracy of positions: ± 0.5 km

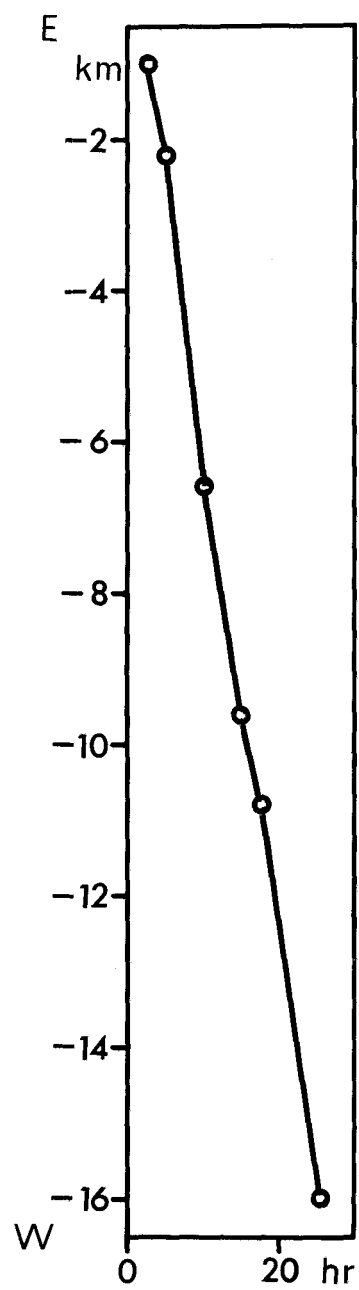
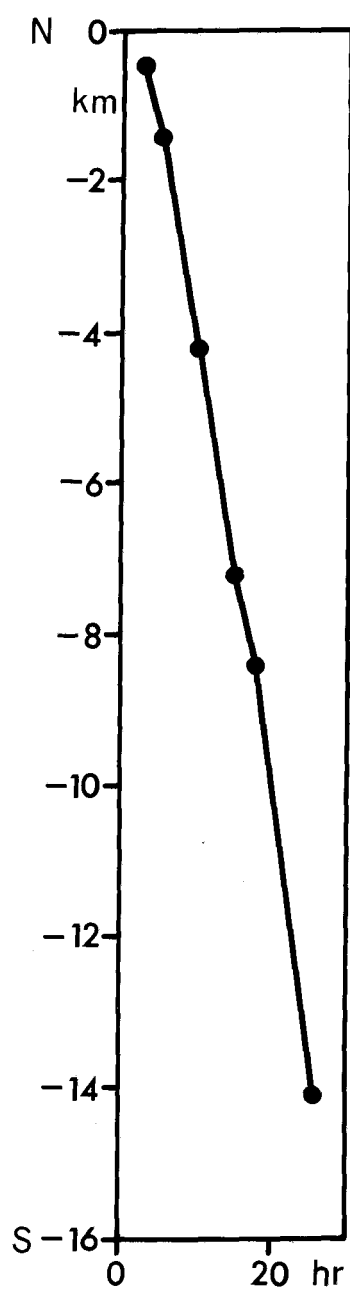
Depth(m):	Nominal	Observed	S.D.
	200	75*	± 10

Fix No.	Date	Time GMT +3 $\frac{1}{2}$	Fix Position		Hours Since Laid (t)	Displacement(km)		Residuals	
			Lat.N.	Long.E.		+E-W x	+N-S y	x	y
1	3.VIII	2056	17°28'.4	55°27'.7	2.85	-1.0	-0.4	0.0	-0.4
2	3.VIII	2336	17°27'.9	55°27'.0	5.5	-2.2	-1.4	+0.6	+0.1
3	4.VIII	0422	17°26'.3	55°24'.5	10.25	-6.6	-4.2	-0.7	+0.2
4	4.VIII	0913	17°24'.7	55°22'.8	15.1	-9.6	-7.2	-0.4	+0.1
5	4.VIII	1156	17°24'.1	55°22'.1	17.85	-10.8	-8.3	+0.2	+0.5
6	4.VIII	1954	17°21'.0	55°19'.1	25.8	-16.0	-14.1	+0.3	-0.4

Fitted lines: $x = -0.662 t + 0.8$ $y = -0.597 t + 1.7$ Mean velocity = $24.8(\pm 0.7)$ cm/sec, $228(\pm 1) \cdot T$

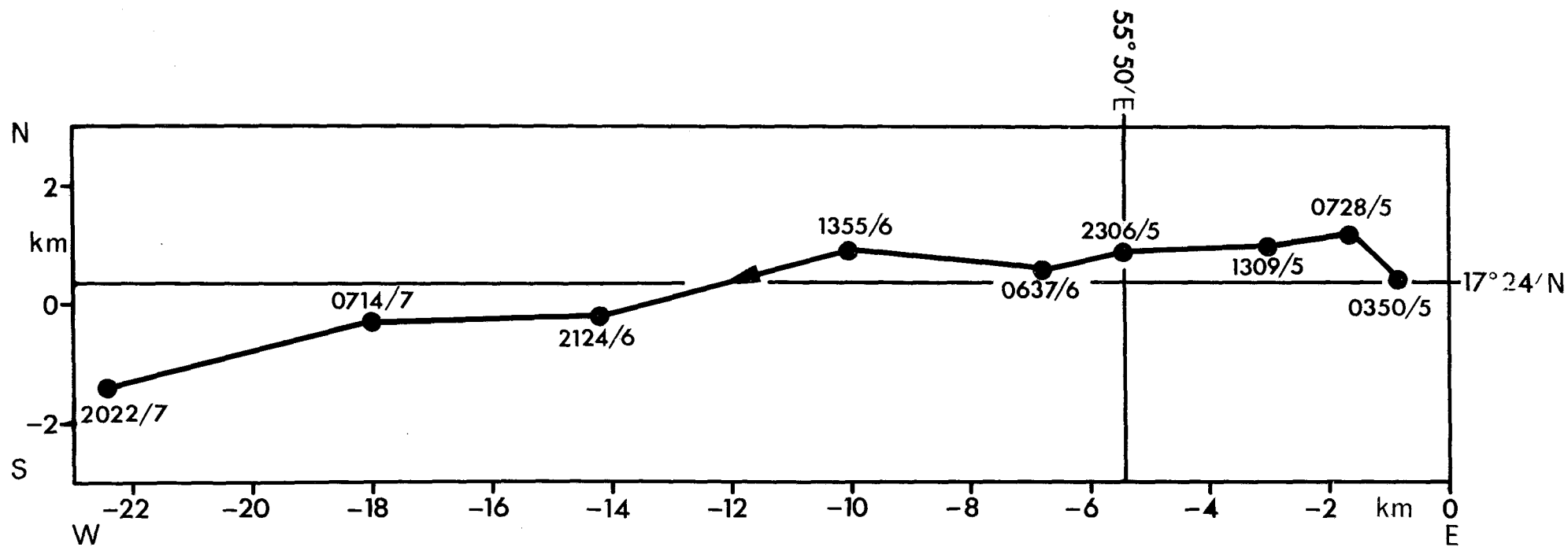
* by bottom reflections

FLOAT DESIGNATION : C Date and time laid : 1806/3.VIII.63



45

FLOAT DESIGNATION :I Date and time laid: 0012/5.VIII.63



SERIAL NO: 137

FLOAT DESIGNATION: I

Date and time laid: 0012/5.VIII.63

Position laid: 17°23'.8N
55°53'.1E

Displacement origin: 17°23'.8N
55°53'.1E

Navigation based on: land fixes

Estimated accuracy of positions: ± 0.5 km

Depth(m): Nominal Observed S.D.
 280 215* ± 20

Fix No.	Date	Time GMT +3½	Fix Position		Hours Since Laid (t)	Displacement(km)		Residuals	
			Lat.N.	Long.E.		+E-W x	+N-S y	x	y
1	5.VIII	0350	17°24'.0	55°52'.6	3.65	-0.8	+0.4	-1.2	-0.8
2	5.VIII	0728	17°24'.5	55°52'.2	7.25	-1.6	+1.2	-0.7	+0.1
3	5.VIII	1309	17°24'.4	55°51'.4	12.95	-3.0	+1.0	-0.2	+0.1
4	5.VIII	2306	17°24'.3	55°50'.0	22.9	-5.4	+0.9	+0.8	+0.3
5	6.VIII	0637	17°24'.2	55°49'.2	30.4	-6.8	+0.6	+2.0	+0.2
6	6.VIII	1355	17°24'.3	55°47'.4	37.7	-10.0	+0.9	+1.3	+0.8
7	6.VIII	2124	17°23'.8	55°45'.0	45.2	-14.2	-0.2	-0.4	-0.1
8	7.VIII	0714	17°23'.7	55°42'.8	55.05	-18.0	-0.3	-0.8	+0.1
9	7.VIII	2022	17°23'.1	55°40'.3	68.15	-22.4	-1.4	-0.8	-0.6

Fitted lines: $x = -0.341 t + 1.6$

$y = -0.031 t + 1.3$

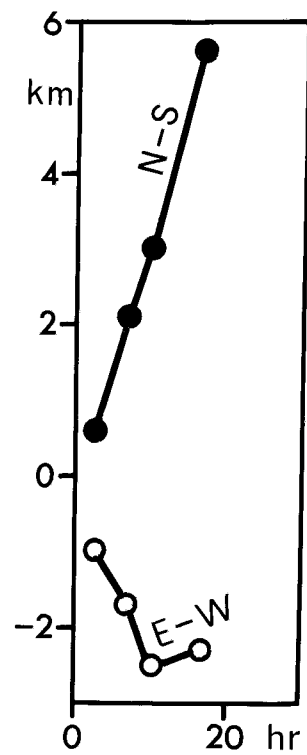
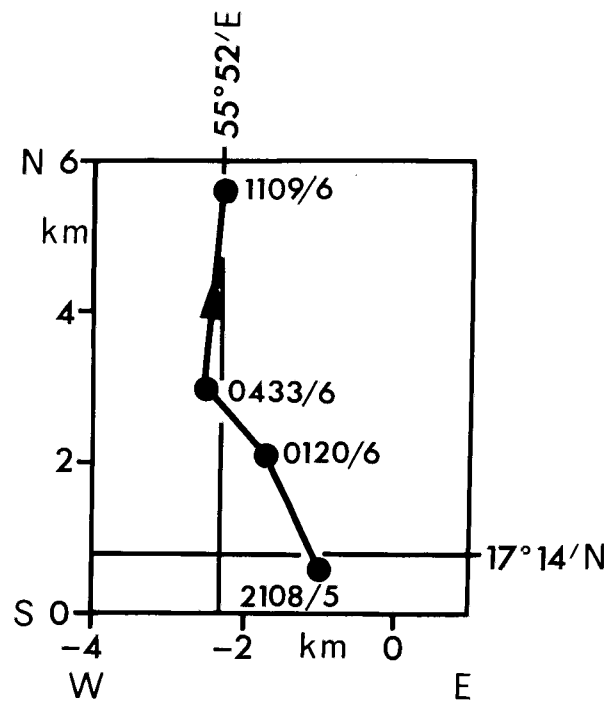
Mean velocity = $9.5(\pm 0.5)$ cm/sec, $265(\pm 1.3)^\circ T$

* by bottom reflections

FLOAT DESIGNATION : I Date and time laid : 0012/5.VIIL63



FLOAT DESIGNATION : N Date and time laid : 1823/5.VIII.63



FLOAT DESIGNATION: N

Date and time laid: 1823/5.VIII.63

Position laid: 17°13'.6N
55°53'.3E

Displacement origin: 17°13'.6N
55°53'.3E

Navigation based on: Radar on anchored buoy, + land fixes

Estimated accuracy of positions: ± 0.5 km

Depth(m):	Nominal	Observed	S.D.	S.D.(mean)
	280	360*	± 40	± 20

Fix No.	Date	Time GMT +3½	Fix Position		Hours Since Laid (t)	Displacement(km)		Residuals	
			Lat.N.	Long.E.		+E-W x	+N-S y	x	y
1	5.VIII	2108	17°13'.9	55°52'.8	2.75	-1.0	+0.6	+0.3	0.0
2	6.VIII	0120	17°14'.7	55°52'.4	6.95	-1.7	+2.1	0.0	+0.1
3	6.VIII	0433	17°15'.2	55°51'.9	10.15	-2.5	+3.0	-0.5	-0.2
4	6.VIII	1109	17°16'.6	55°52'.0	16.75	-2.3	+5.6	+0.3	+0.1

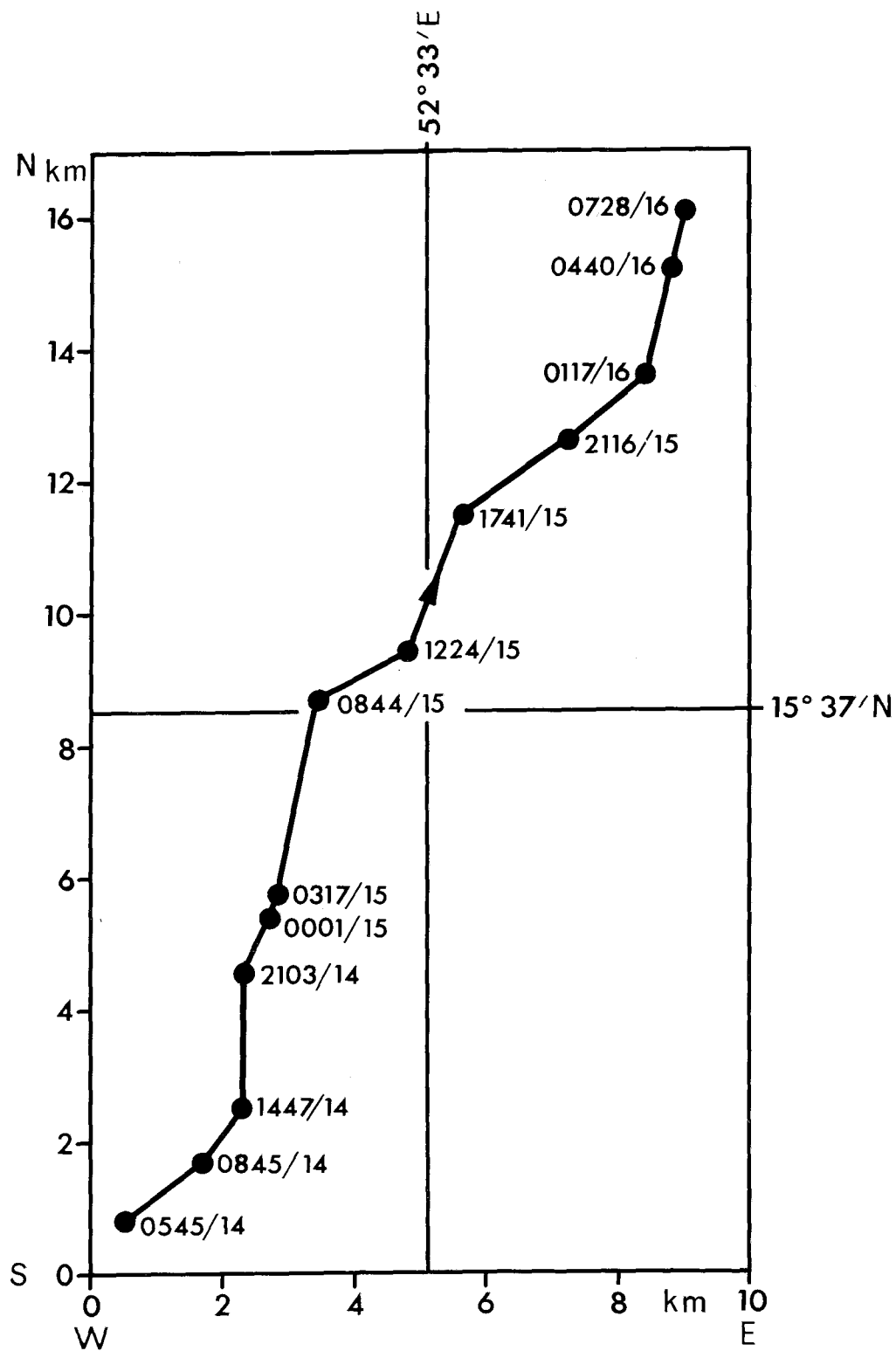
Fitted lines: $x = -0.094 t - 1.0$

$y = +0.355 t - 0.4$

Mean velocity = $10.2(\pm 0.5)$ cm/sec, $345(\pm 7)^{\circ}\text{T}$

* by triangulation, from horizontal ranges

FLOAT DESIGNATION : H Date and time laid : 0319/14.VIII.63



FLOAT DESIGNATION H

Date and time laid: 0319/14.VIII.63

Position laid: 15°32'.3N
52°30'.0EDisplacement origin: 15°32'.3N
52°30'.0E

Navigation based on: land fixes

Estimated accuracy of positions: ± 0.5 km

Depth(m):	Nominal	Observed	S.D.
	280	170*	± 20

Fix No.	Date	Time GMT +3½	Fix Position		Hours Since Laid (t)	Displacement(km)		Residuals	
			Lat.N.	Long.E.		+E-W x	+N-S y	x	y
1	14.VIII	0545	15°32'.8	52°30'.4	2.45	+0.5	+0.8	+0.4	+0.7
2	14.VIII	0845	15°33'.3	52°31'.0	5.45	+1.7	+1.7	+1.1	+0.7
3	14.VIII	1447	15°35'.7	52°31'.4	11.45	+2.3	+2.5	+0.7	-0.4
4	14.VIII	2103	51°34'.9	52°31'.4	17.75	+2.3	+4.6	-0.4	-0.3
5	15.VIII	0001	15°35'.3	52°31'.6	20.7	+2.7	+5.4	-0.5	-0.4
6	15.VIII	0317	15°35'.4	52°31'.7	23.95	+2.8	+5.7	-1.0	-1.1
7	15.VIII	0844	15°37'.1	52°32'.0	29.4	+3.4	+8.7	-1.3	+0.2
8	15.VIII	1224	15°37'.4	52°32'.8	33.1	+4.8	+9.4	-0.5	-0.3
9	15.VIII	1741	15°38'.6	52°33'.3	38.35	+5.6	+11.5	-0.6	+0.1
10	15.VIII	2116	15°39'.2	52°34'.1	41.95	+7.2	+12.6	+0.3	+0.1
11	16.VIII	0117	15°39'.7	52°34'.9	45.95	+8.4	+13.6	+0.9	-0.1
12	16.VIII	0440	15°40'.6	52°35'.1	49.35	+8.8	+15.2	+0.7	+0.4
13	16.VIII	0728	15°41'.1	52°35'.2	52.15	+9.0	+16.1	+0.4	+0.4

Fitted lines: $x = +0.171 t - 0.3$ $y = +0.314 t - 0.7$ Mean velocity = $9.9(\pm 0.3)$ cm/sec, $029(\pm 2)^{\circ}T$

* by bottom reflections

FLOAT DESIGNATION :H Date and time laid: 0319/14.VIII.63

