

I.O.S.

**SURFACE DRIFTING FLOATS
SERIAL NUMBERS 327-352
MARCH 1976**

P G COLLAR and J R PERRETT

**TABLES OF TIMES AND POSITIONS.
DIAGRAMS SHOWING TRAJECTORIES
AND COMPONENTS OF DISPLACEMENT**

DATA REPORT NO 25

1981

**NATURAL ENVIRONMENT
INSTITUTE OF
OCEANOGRAPHIC
SCIENCES
RESEARCH COUNCIL**

INSTITUTE OF OCEANOGRAPHIC SCIENCES

**Wormley, Godalming,
Surrey, GU8 5UB.
(0428 - 79 - 4141)**

(Director: Dr. A.S. Laughton)

**Bidston Observatory,
Birkenhead,
Merseyside, L43 7RA.
(051 - 653 - 8633)**

(Assistant Director: Dr. D.E. Cartwright)

**Crossway,
Taunton,
Somerset, TA1 2DW.
(0823 - 86211)**

(Assistant Director: M.J. Tucker)

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the words UNPUBLISHED MANUSCRIPT.*

SURFACE DRIFTING FLOATS
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WORMLEY, GODALMING, SURREY

Introduction

This report contains tables and diagrams of 26 tracks of surface drifting floats deployed from R.V. Clione during an IOS/MAFF near-surface current meter intercomparison experiment conducted in the vicinity of the UK Data Buoy, DB1, off the East Anglian coast ($52^{\circ}23.8'N$, $1^{\circ}48.2'E$) between March 26th and April 2nd 1976.

The major part of the experiment, a comparison of records from the data buoy current meter with near-surface drifting float displacements, is described in ref. 1. Transponding float positions were deduced from ranges measured acoustically from a shipboard interrogator and a remote interrogator previously mounted on a spar beneath the hull of the data buoy. For each fix the ship position was determined from acoustic ranges to three bottom moored transponders, whose positions (fig. 1) at the time of laying had been obtained by taking sextant bearings from prominent landmarks on the coast, approximately 5 miles distant. During daylight hours this method was also used to supplement acoustic ship fixes while float tracking. The accuracy of individual fixes is estimated to be ~ 20 metres.

The area has very fast, near-rectilinear tidal streams. In the immediate vicinity of the data buoy the depth of water was reasonably uniform at about 20 m, although beyond the northernmost beacon, and inshore, extensive shoals existed. Supplementary current measurements showed the existence of very strong, though variable, vertical shear. The experiment was conducted in light wind conditions, typically 6 m/s.

In order to ascertain the effects of waves, shear and wind on the results, comparisons of displacement were made between the standard cylindrical floats, 4 m in length, and a similar float which was ballasted so as to obtain different heave/pitch characteristics; also with a 2 m float. These showed little difference in their behaviour from the standard floats; and agreement between currents measured by the Data Buoy at 3 metres depth and local float displacement rates was generally very good. Differences between the buoy current meter and floats were found to increase with increasing distance from the buoy, suggesting spatial variability in the tidal current.

Reference

1. Collar, P.G., 1978. Near Surface Current Measurement from a Surface Following Data Buoy (DB1) - I. An intercomparison of records from data buoy current meters and near-surface drifting float displacements. Ocean Engineering, 5, 181-196.

List of Floats

<u>Serial No.</u>	<u>Original Designation Float No. (Deployment No.)</u>	<u>Time and Date Deployed</u>
327	8(1)	17.45 27/3/76
328	8(2)	10.49 28/3/76
329	4(1)	11.39 28/3/76
330	10(1)	11.43 28/3/76
331	18(1)	08.08 29/3/76
332	10(2)	08.39 29/3/76
333	18(2)	17.35 29/3/76
334	10(3)	18.17 29/3/76
335	5(1)*	19.05 29/3/76
336	3(1)	19.16 29/3/76
337	8(3)	20.09 29/3/76
338	16(1)	06.30 30/3/76
339	10(4)	12.43 30/3/76
340	3(2)	13.16 30/3/76
341	8(4)	13.16 30/3/76
342	5(2)*	13.16 30/3/76
343	16(2)	18.05 30/3/76
344	10(5)	18.55 30/3/76
345	4(2)	20.50 30/3/76
346	3(3)	19.02 31/3/76
347	16(3)	19.27 31/3/76
348	10(6)	19.49 31/3/76
349	8(5)	05.02 1/4/76
350	10(7)	13.33 1/4/76
351	16(4)	13.42 1/4/76
352	8(6)	13.53 1/4/76

*Float 5 was 2 m long.

Notes:

1. Displacements are plotted using the UK Ordnance Survey Grid as primary reference.

Key:

Open circles - positions of fixed acoustic beacons used for position fixing.

Asterisk - position of Data Buoy, DB1.

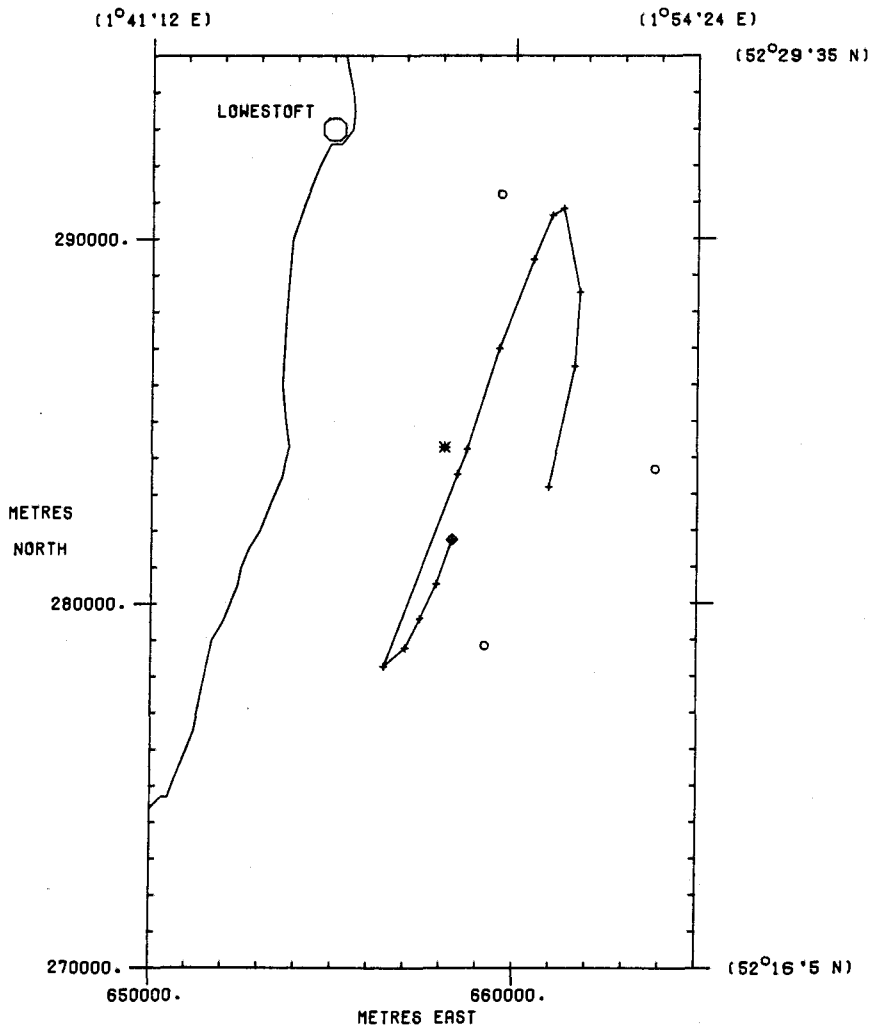
Float tracks are denoted by crosses, with an additional closed symbol at first position.

2. East and North components of displacement of each float are plotted against time in hours after the first position fix. This was not always coincident with the time of deployment.
3. In each table, displacement refers to distance from the first known position; velocities are computed between fixes adjacent in time. Direction is relative to True North.

FLOAT DESIGNATION= 8/1 SERIAL NUMBER= 327
 TIME AND DATE LAID=17:45 27/ 3/76

FIX	TIME		POSITION		DISPLACEMENT		VELOCITY		SPEED (M/S)	DIRN DEG
	HR	MIN	E	N	E	N	E	N		
1	18	33	658280	281760						
2	18	52	657860	280340	-420	-1220	-0.368	-1.070	1.132	199.0
3	19	8	657410	279580	-870	-2180	-0.469	-1.000	1.104	205.1
4	19	22	657010	278780	-1270	-2980	-0.476	-0.952	1.065	206.6
5	0	0	656420	278270	-1860	-3490	0.008	0.007	0.011	49.2
6	1	16	658420	283550	140	1790	0.427	1.128	1.206	20.7
7	1	28	658700	284240	420	2480	0.467	1.150	1.241	22.1
8	2	10	659570	287000	1290	5240	0.345	1.095	1.148	17.5
9	3	2	660500	289440	2220	7680	0.298	0.782	0.837	20.9
10	3	46	661000	290650	2720	8890	0.189	0.458	0.496	22.5
11	4	30	661310	290840	3030	9080	0.117	0.072	0.138	58.5
12	5	36	661770	288550	3490	6790	0.116	-0.578	0.590	168.6
13	6	8	661640	286510	3360	4750	-0.068	-1.063	1.065	183.6
14	6	56	660930	283200	2650	1440	-0.247	-1.149	1.175	192.1

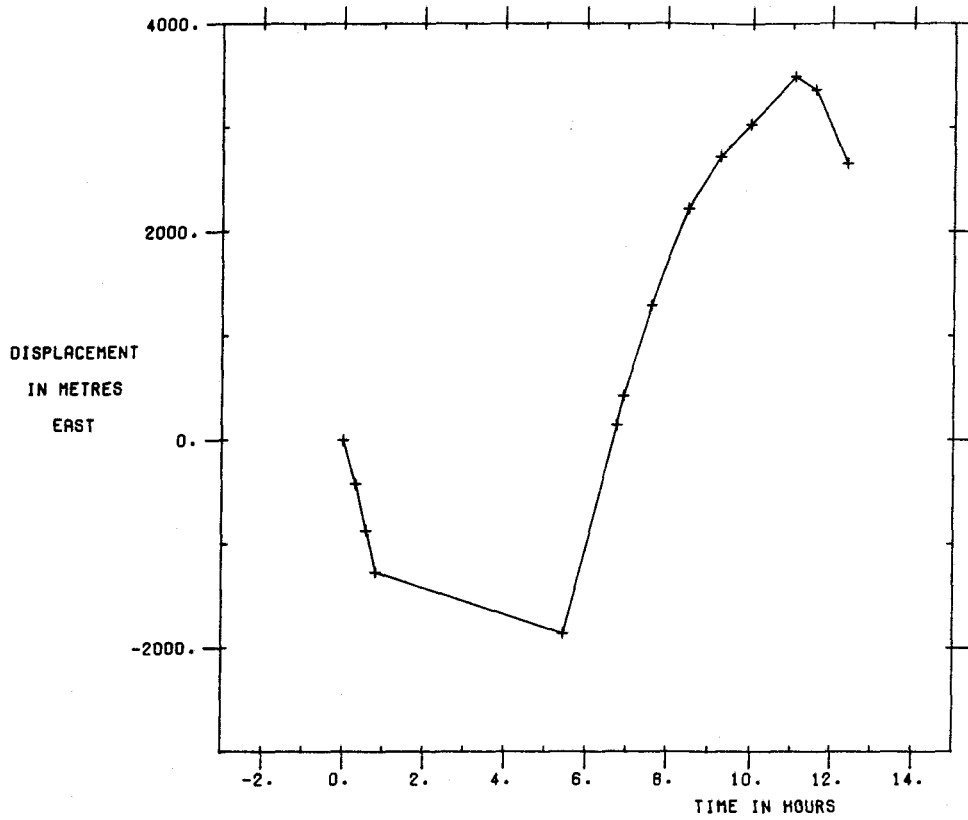
FLOAT RECOVERED 8:25 28/ 3/76



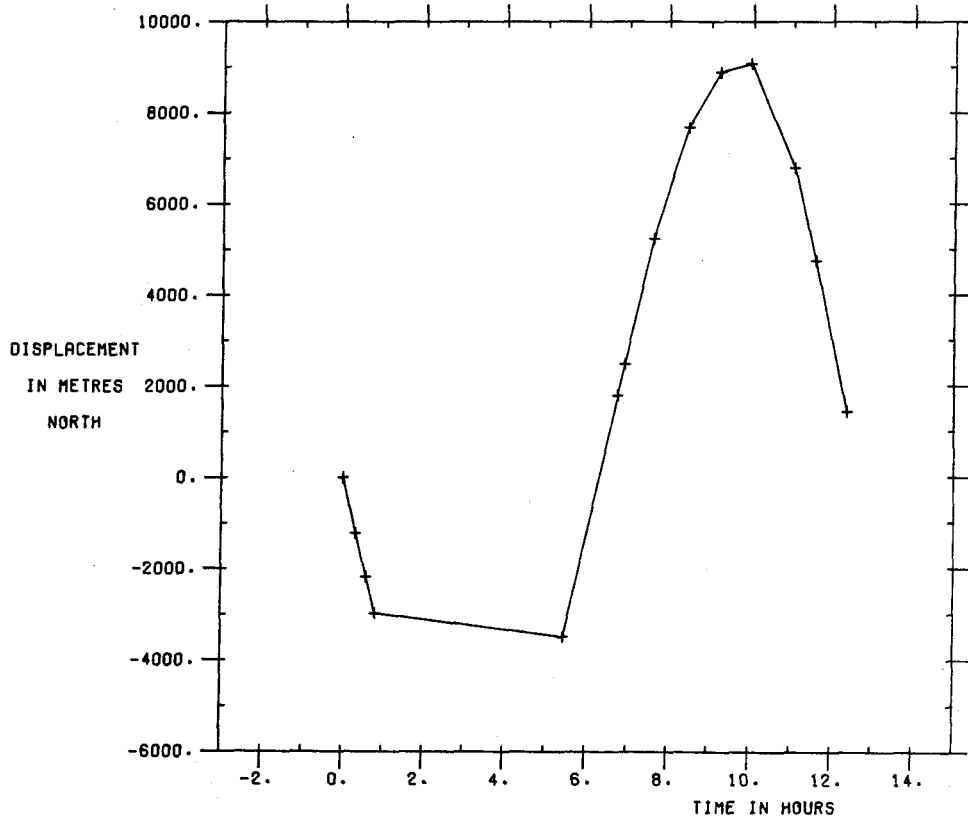
TIME AND DATE LAID=17:45 27/3/76
 FLOAT DESIGNATION=8/1

TIME OF FIRST FIX=18:33
 SERIAL NO=327

4



FLOAT DESIGNATION=8/1
 TIME OF FIRST FIX=18:33
 TIME AND DATE LAID=17:45
 SERIAL NO=327
 27/3/76



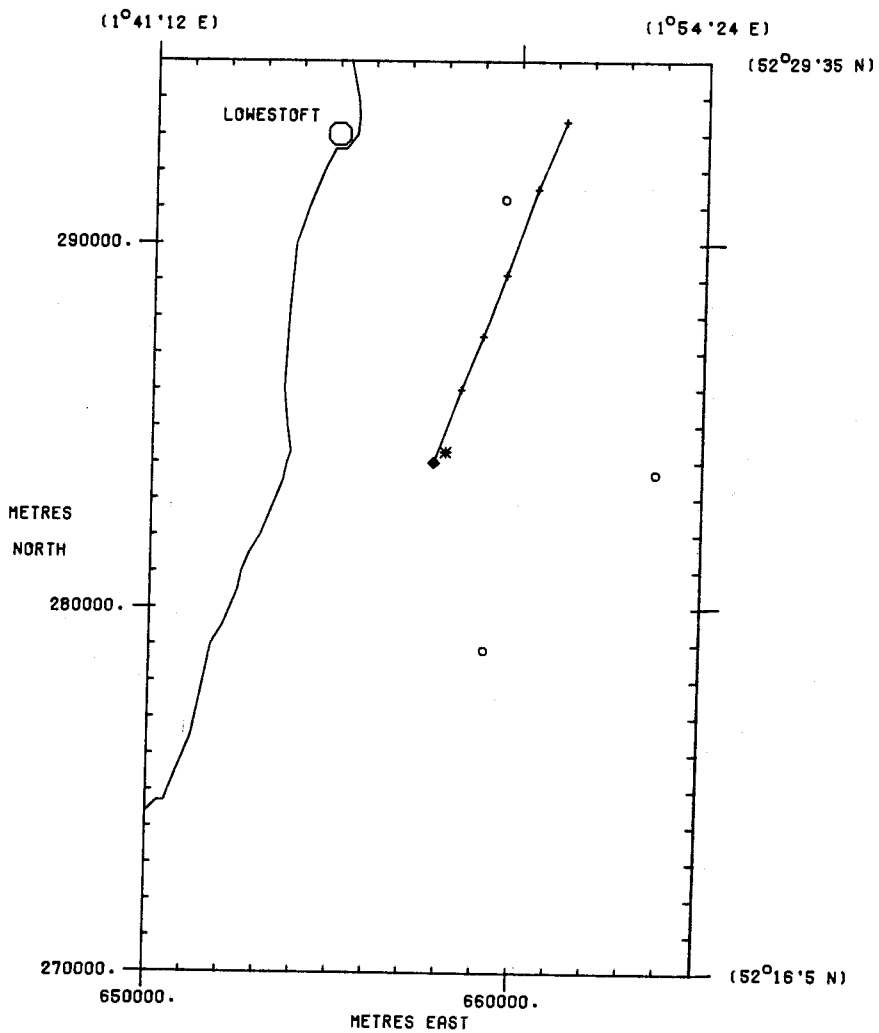
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 TIME OF FIRST FIX=18:33
 TIME AND DATE LAID=17:45
 SERIAL NO=327
 27/3/76

FLOAT DESIGNATION= 8/2

SERIAL NUMBER= 328
 TIME AND DATE LAID=10:49 28/ 3/76

FIX	TIME		POSITION		DISPLACEMENT		VELOCITY		SPEED (M/S)	DIRN DEG
	HR	MIN	E	N	E	N	E	N		
1	11	54	657750	284000						
2	12	26	658480	286000	730	2000	0.380	1.042	1.109	20.1
3	12	48	659060	287470	1310	3470	0.439	1.114	1.197	21.5
4	13	12	659670	289150	1920	5150	0.424	1.167	1.241	20.0
5	13	48	660490	291500	2740	7500	0.380	1.098	1.152	19.2
6	14	14	661250	293360	3500	9360	0.487	1.192	1.288	22.2

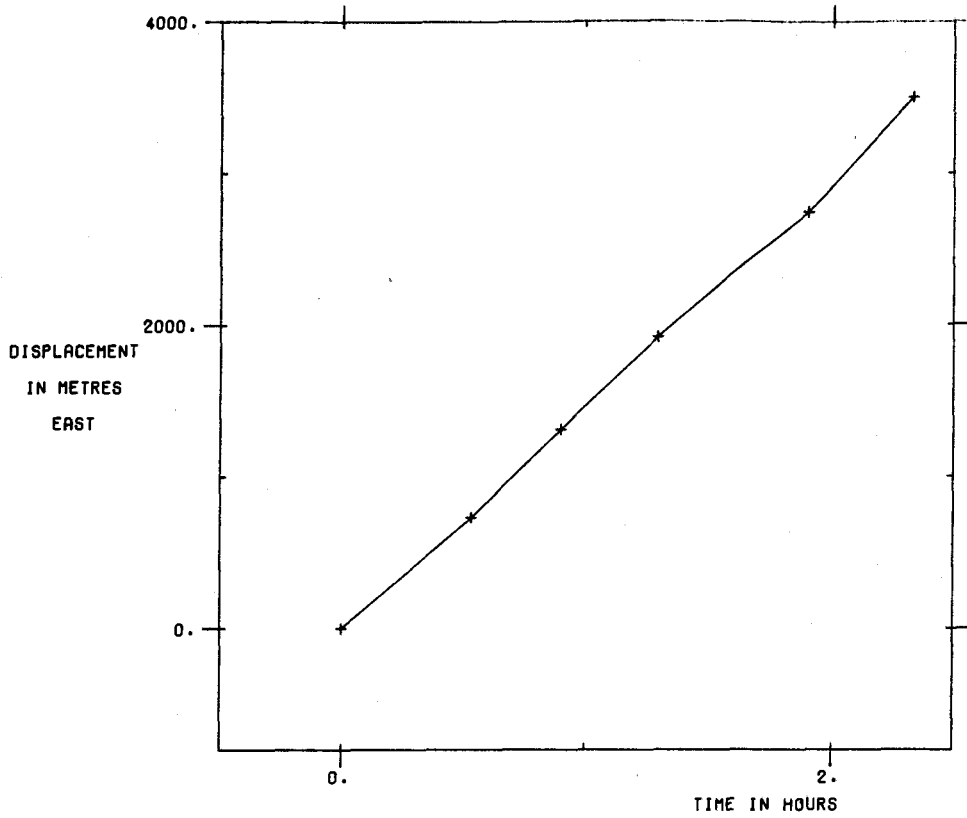
FLOAT RECOVERED 14:16 28/ 3/76



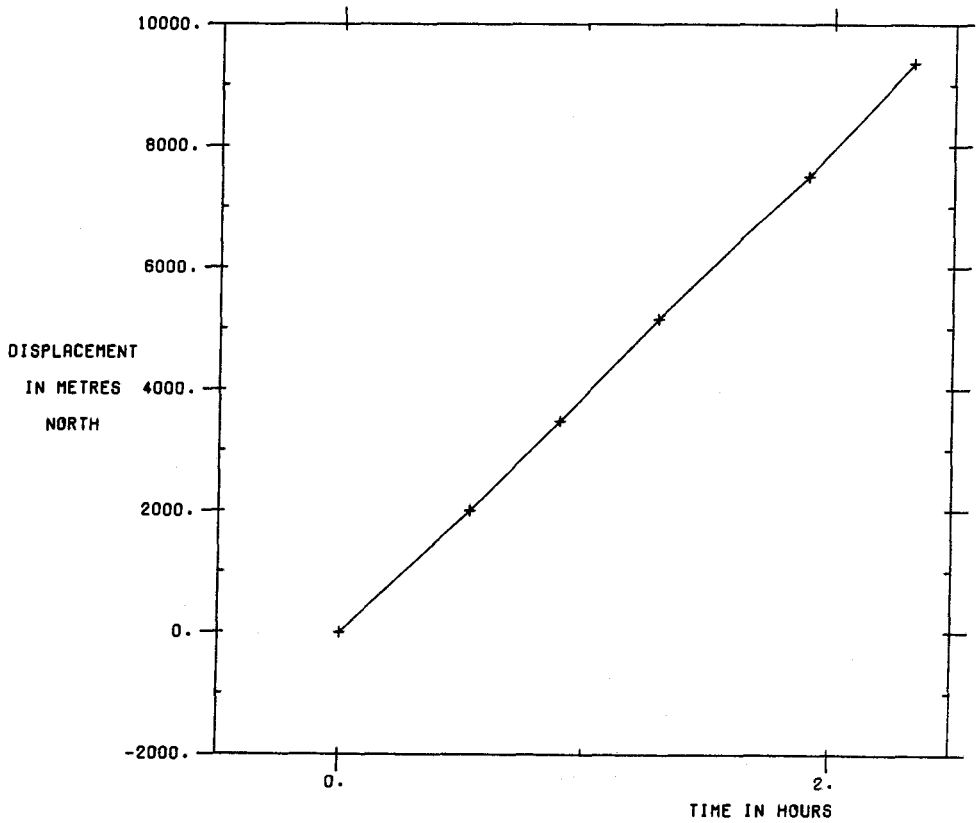
TIME AND DATE LAID=10:49 28/3/76
 FLOAT DESIGNATION=8/2

TIME OF FIRST FIX=11:54
 SERIAL NO=328

6



FLOAT DESIGNATION=8/2
 TIME OF FIRST FIX=11:54
 TIME AND DATE LAID=10:49
 SERIAL NO=328
 28/3/76



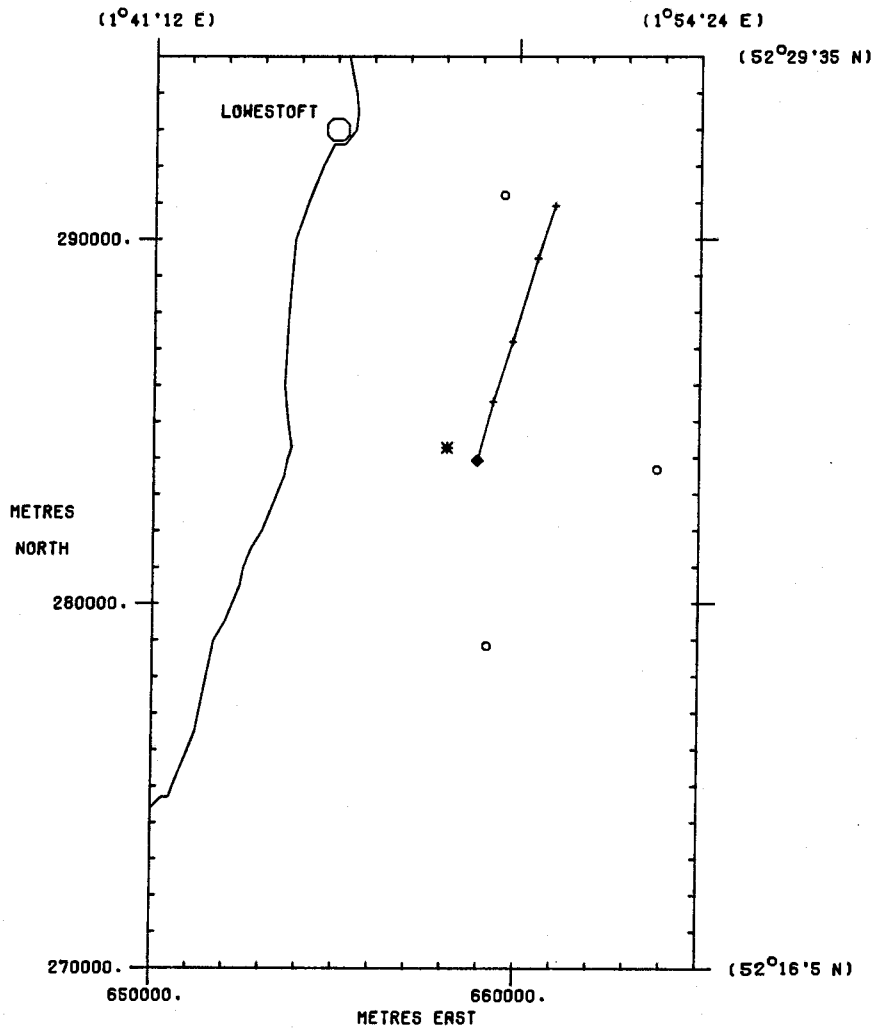
FLOAT DESIGNATION=8/2
 TIME OF FIRST FIX=11:54
 TIME AND DATE LAID=10:49
 SERIAL NO=328
 28/3/76

FLOAT DESIGNATION= 4/1

SERIAL NUMBER= 329
 TIME AND DATE LAID=11:59 28/ 3/76

FIX	TIME	POSITION		DISPLACEMENT		VELOCITY		SPEED (M/S)	DIRN DEG
		HR	MIN	E	N	E	N		
1	12 26	658910	283940						
2	12 48	659330	285550	420	1610	0.318	1.220	1.261	14.6
3	13 12	659860	287200	950	3260	0.368	1.146	1.203	17.8
4	13 48	660530	289480	1620	5540	0.310	1.056	1.100	16.4
5	14 14	661000	290920	2090	6980	0.301	0.923	0.971	18.1

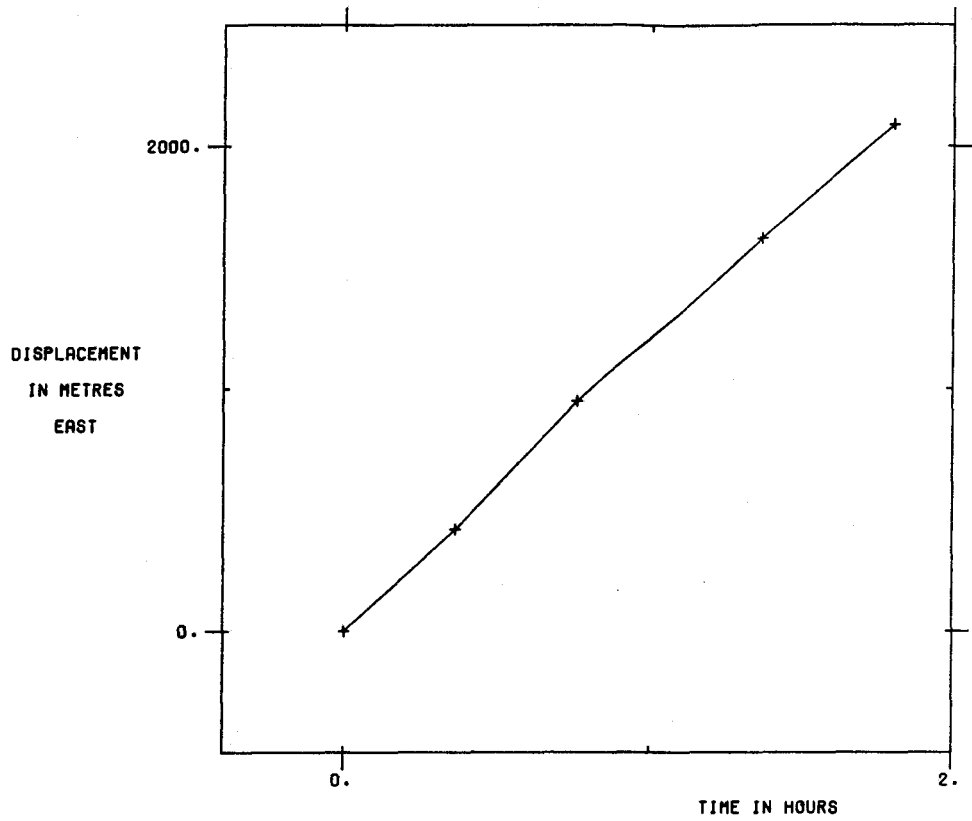
FLOAT RECOVERED 15:27 28/ 3/76



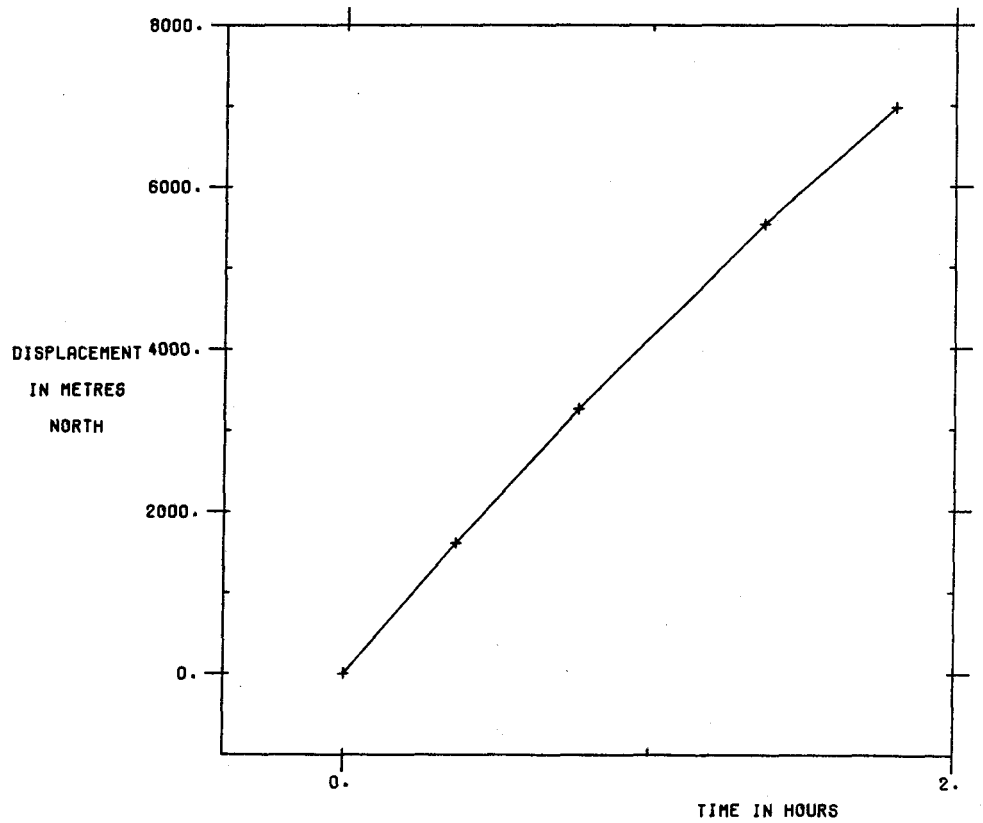
TIME AND DATE LAID=11:39 28/3/76
 FLOAT DESIGNATION=4/1

TIME OF FIRST FIX=12:26
 SERIAL NO=329

8



FLOAT DESIGNATION=4/1
 TIME OF FIRST FIX=12:26
 TIME AND DATE LAID=11:39
 SERIAL NO=329
 28/3/76

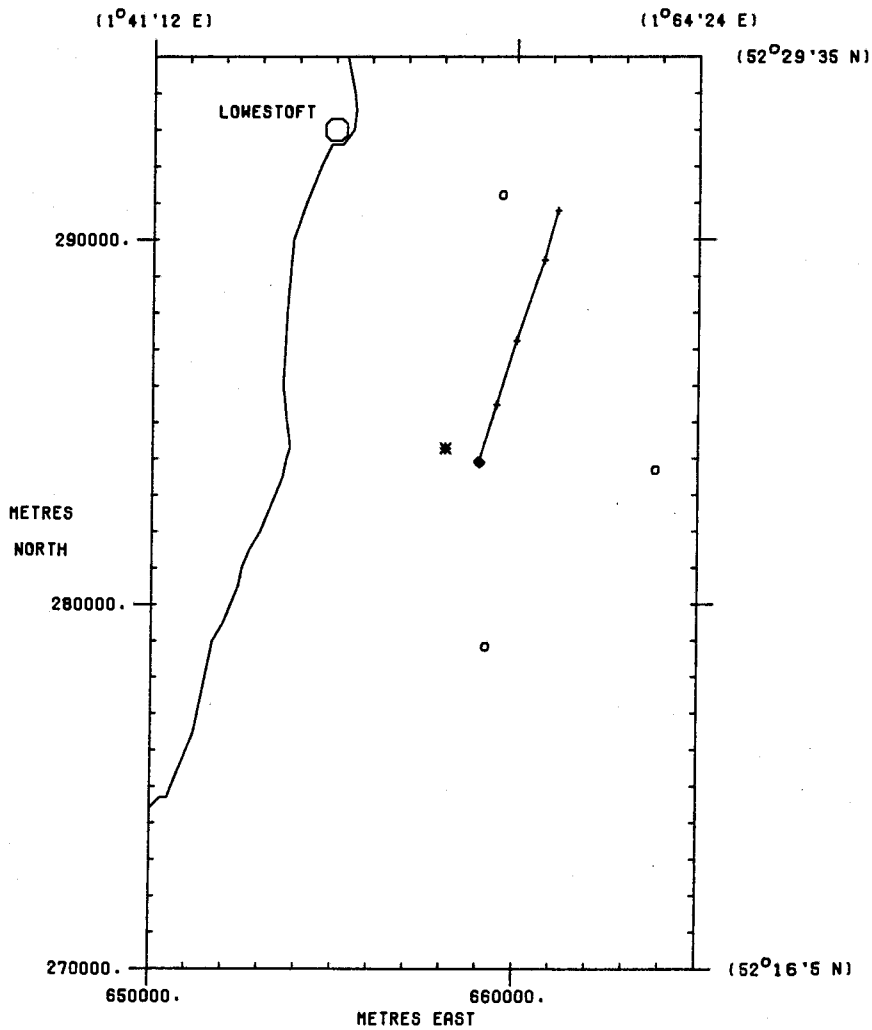


FLOAT DESIGNATION=4/1
 TIME OF FIRST FIX=12:26
 TIME AND DATE LAID=11:39
 SERIAL NO=329
 28/3/76

FLOAT DESIGNATION=10/1 SERIAL NUMBER= 330
 TIME AND DATE LAID=11:43 28/ 3/76

FIX	TIME	POSITION		DISPLACEMENT		VELOCITY		SPEED (M/S)	DIRN DEG
		HH	MIN	E	N	E	N		
1	12 26	659000	283910						
2	12 48	659480	285490	480	1580	0.364	1.197	1.251	16.4
3	13 12	660020	287240	1020	3330	0.375	1.215	1.272	17.1
4	13 48	660780	289440	1780	5530	0.352	1.019	1.078	19.1
5	14 14	661140	290790	2140	6880	0.231	0.865	0.896	14.9

FLOAT RECOVERED 15:30 28/ 3/76

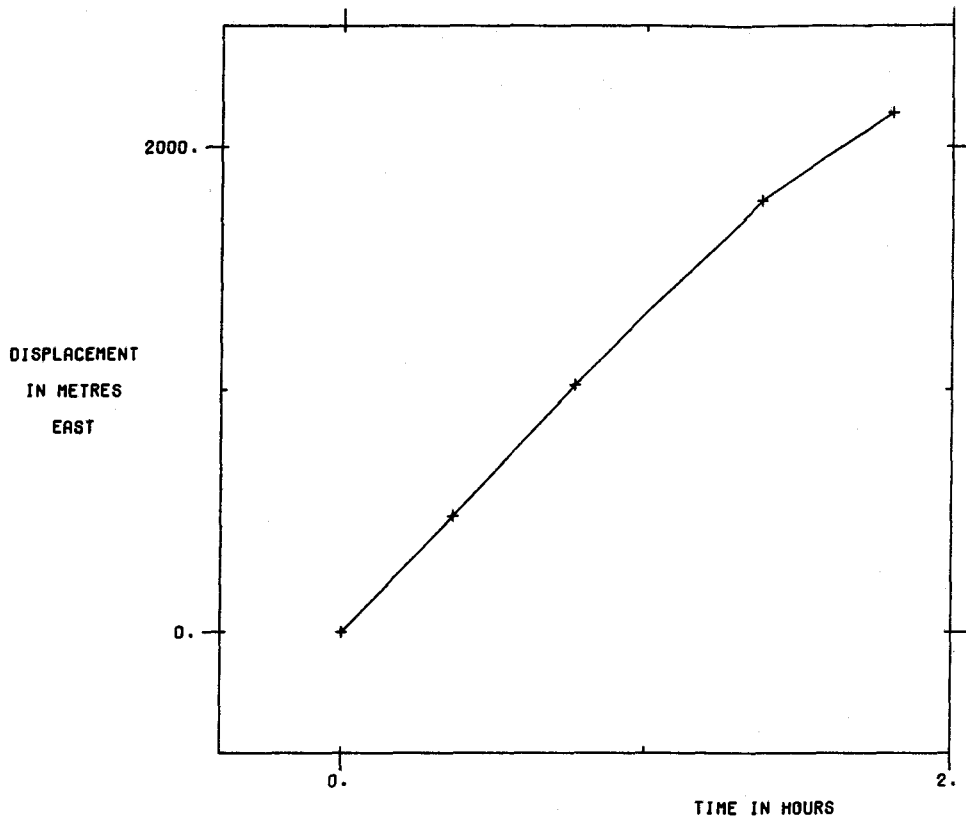


TIME AND DATE LAID=11:43 28/3/76

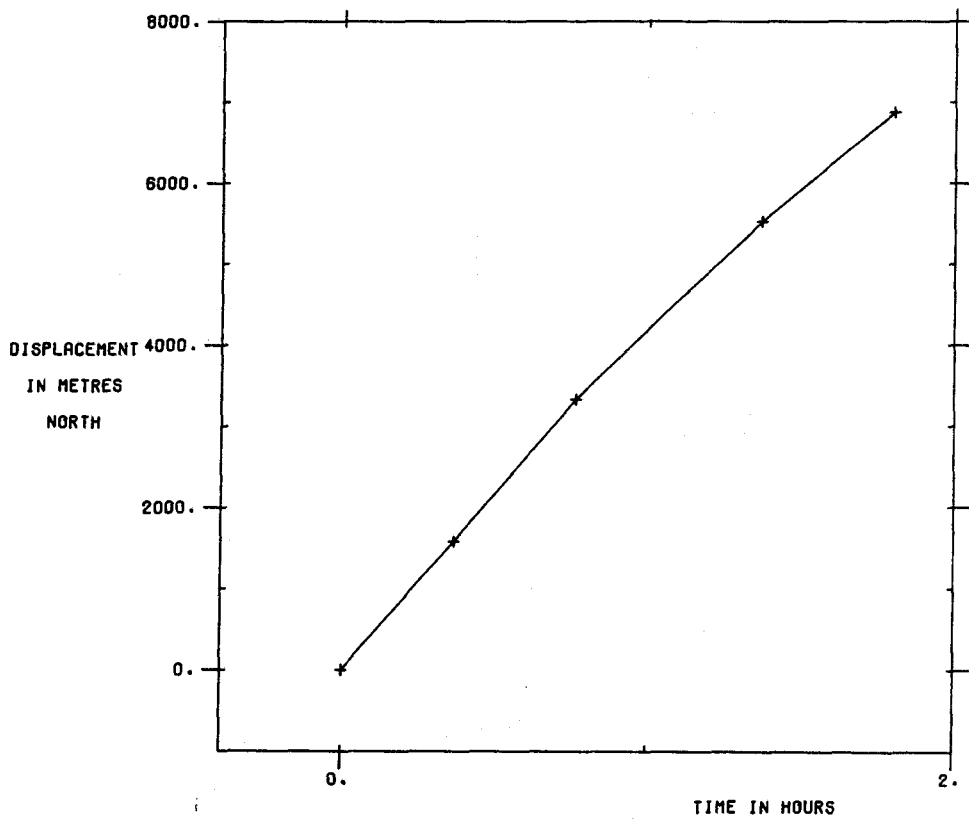
TIME OF FIRST FIX=12:26

FLOAT DESIGNATION=10/1

SERIAL NO=330



FLOAT DESIGNATION=10/1
 TIME OF FIRST FIX=12:26
 TIME AND DATE LAID=11:43 28/3/76
 SERIAL NO=330



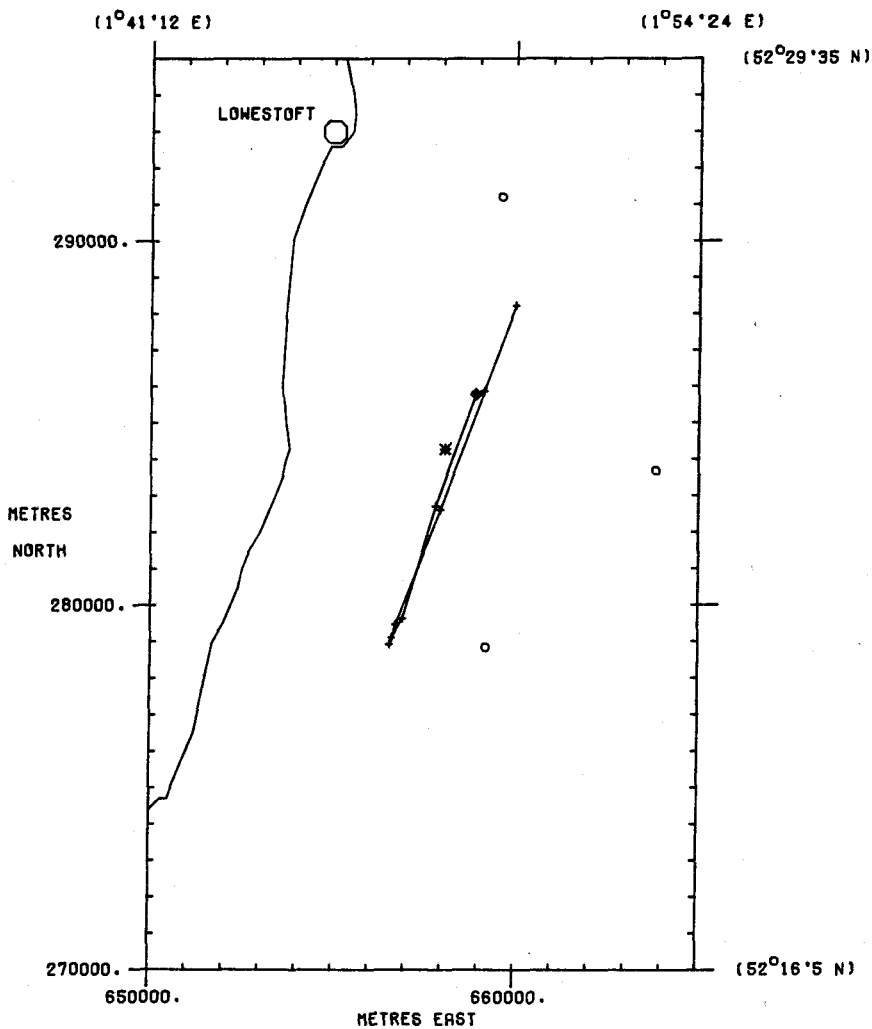
FLOAT DESIGNATION=10/1
 TIME OF FIRST FIX=12:26
 TIME AND DATE LAID=11:43 28/3/76
 SERIAL NO=330

FLOAT DESIGNATION=18/1

SERIAL NUMBER= 331
 TIME AND DATE LAID= 8: 8 29/ 3/76

FIX	TIME		POSITION		DISPLACEMENT		VELOCITY		SPEED (M/S)	DIRN DEG
	HR	MIN	E	N	E	N	E	N		
1	8	8	658910	285795						
2	8	58	657820	282720	-1090	-3075	-0.363	-1.025	1.087	199.5
3	10	6	656930	279640	-1980	-6155	-0.218	-0.755	0.786	196.1
4	10	32	656620	279120	-2290	-6675	-0.199	-0.333	0.388	210.8
5	10	54	656560	278930	-2350	-6865	-0.045	-0.144	0.151	197.5
6	11	34	656740	279480	-2170	-6315	0.075	0.229	0.241	18.1
7	12	40	657950	282620	-960	-3175	0.306	0.793	0.850	21.1
8	13	26	659150	285880	240	85	0.435	1.181	1.259	20.2
9	13	58	660000	288230	1090	2435	0.443	1.224	1.302	14.9

FLUAT RECOVERED 15:10 29/ 3/76

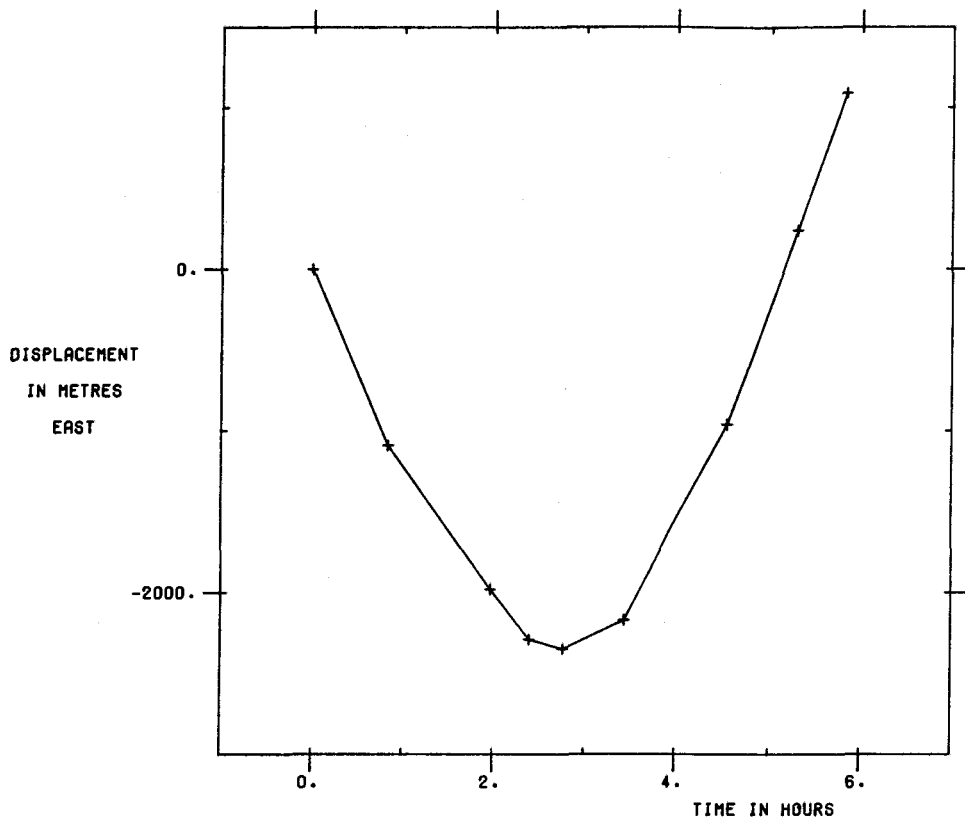


TIME AND DATE LAID=08:08 29/3/76

TIME OF FIRST FIX=8: 8

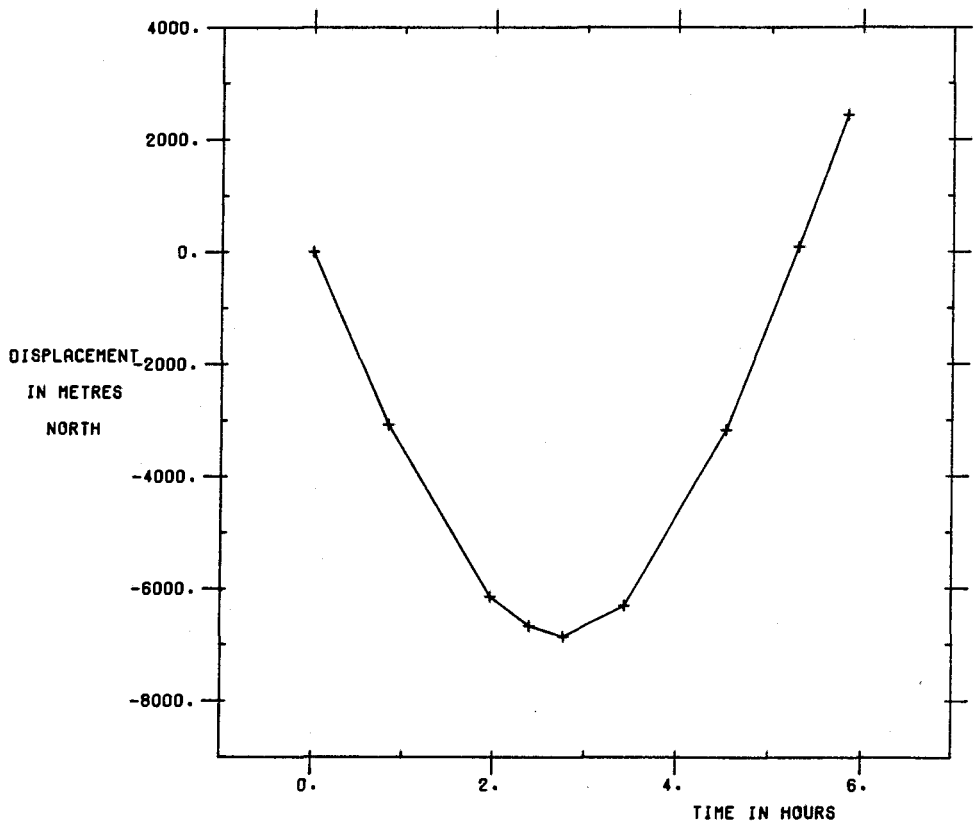
FLOAT DESIGNATION=18/1

SERIAL NO=331



FLOAT DESIGNATION=18/1
 TIME OF FIRST FIX=8: 8
 TIME AND DATE LAID=8: 8

SERIAL NO=331
 29/3/76



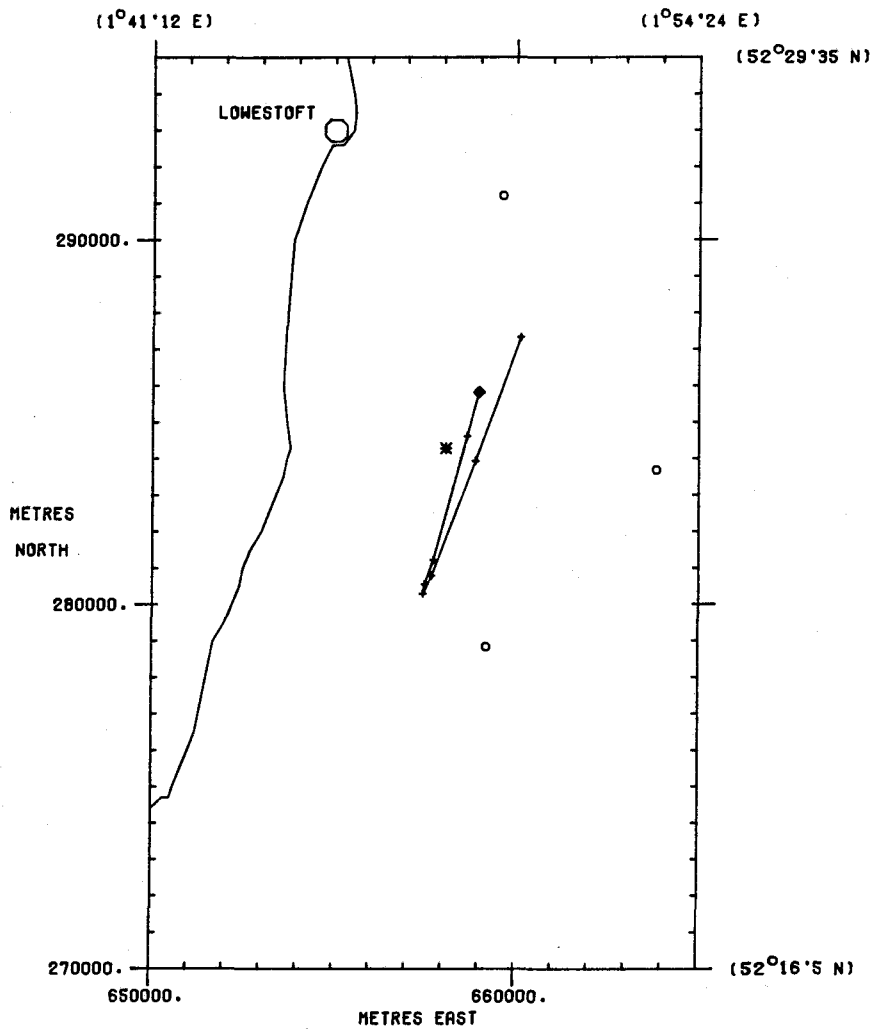
FLOAT DESIGNATION=18/1
 TIME OF FIRST FIX=8: 8
 TIME AND DATE LAID=8: 8

SERIAL NO=331
 29/3/76

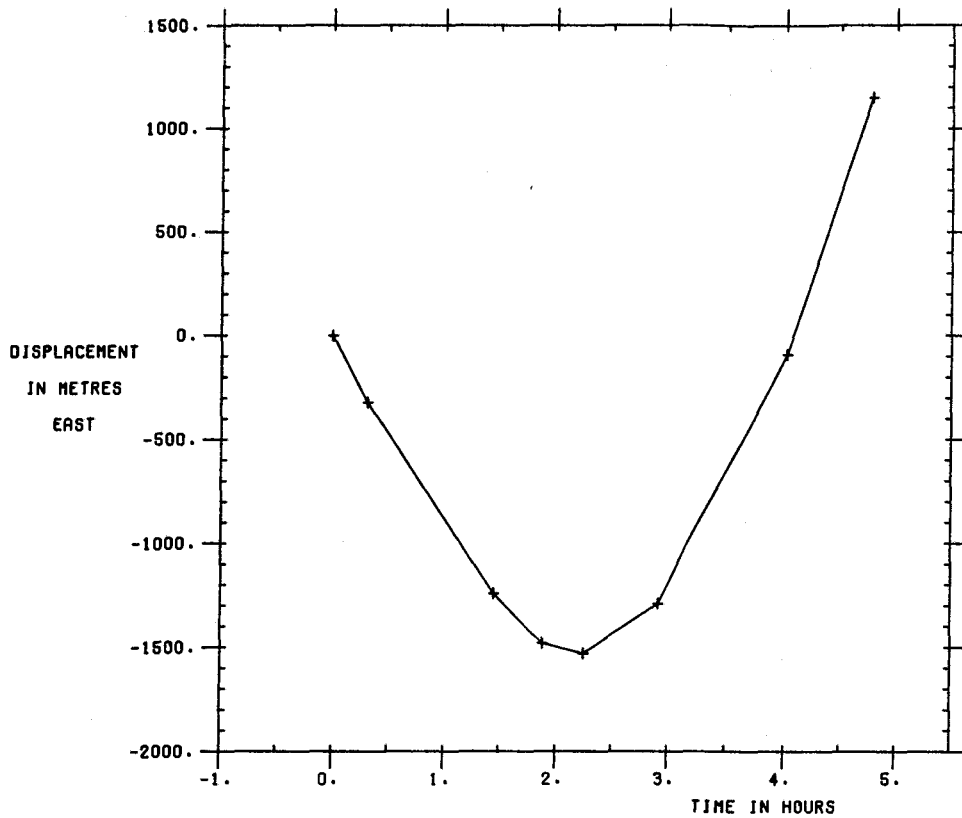
FLOAT DESIGNATION=10/2 SERIAL NUMBER= 332
 TIME AND DATE LAID= 8:39 29/ 3/76

FIX	TIME		POSITION		DISPLACEMENT		VELOCITY		SPEED (M/S)	DIRN DEG
	HR	MIN	E	N	E	N	E	N		
1	8	39	658980	285830						
2	8	58	658660	284620	-320	-1210	-0.281	-1.061	1.098	194.8
3	10	6	657740	281230	-1240	-4600	-0.225	-0.831	0.861	195.2
4	10	32	657500	280560	-1480	-5270	-0.154	-0.429	0.456	199.7
5	10	54	657450	280300	-1530	-5530	-0.038	-0.197	0.201	190.9
6	11	34	657690	280800	-1290	-5030	0.100	0.208	0.231	25.6
7	12	40	658890	283940	-90	-1890	0.303	0.793	0.849	20.9
8	13	26	660130	287340	1150	1510	0.449	1.232	1.311	20.0

FLOAT RECOVERED 14:56 29/ 3/76

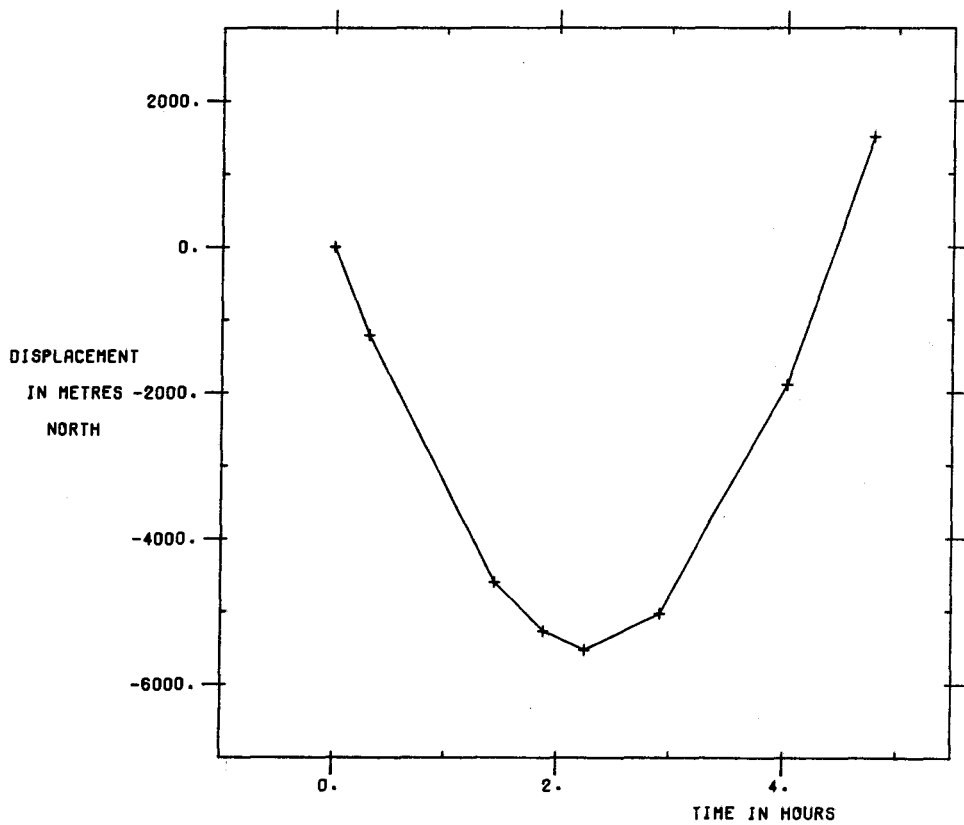


TIME AND DATE LAID=08:39 29/3/76 TIME OF FIRST FIX=8:39
 FLOAT DESIGNATION=10/2 SERIAL NO=332



FLOAT DESIGNATION=10/2
 TIME OF FIRST FIX=8:39
 TIME AND DATE LAID=8:39

SERIAL NO=332
 29/3/76



FLOAT DESIGNATION=10/2
 TIME OF FIRST FIX=8:39
 TIME AND DATE LAID=8:39

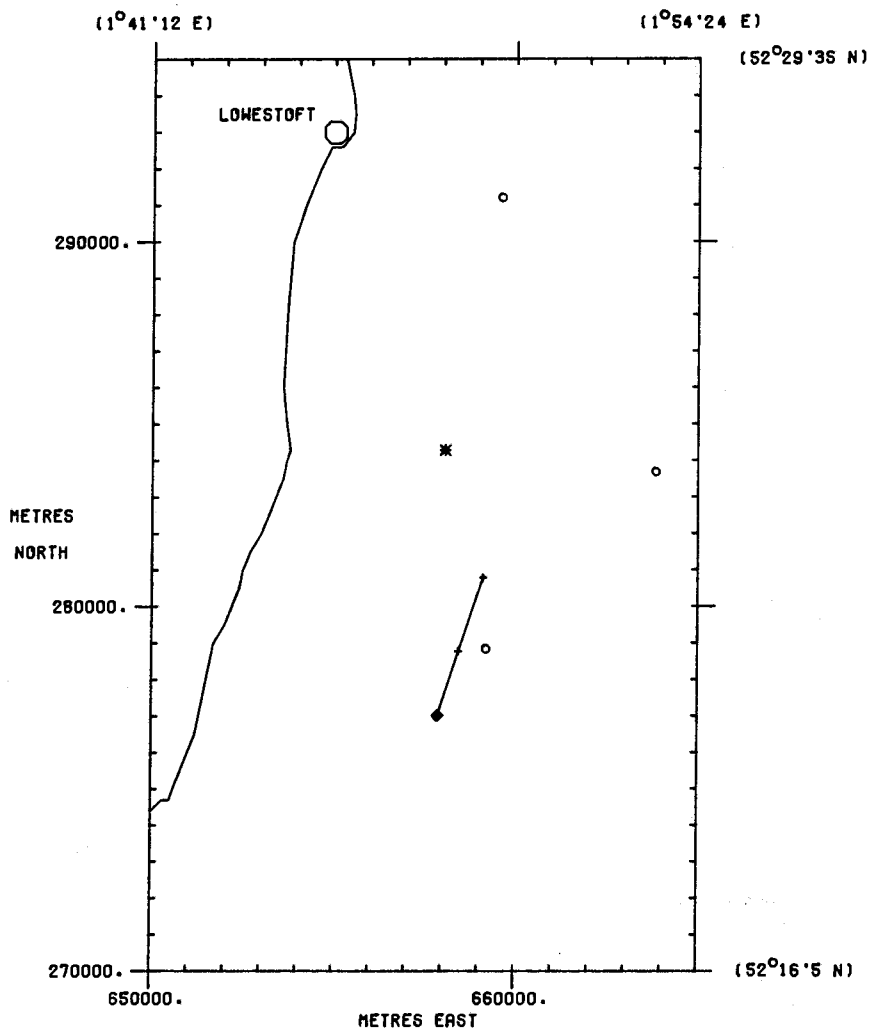
SERIAL NO=332
 29/3/76

FLOAT DESIGNATION=18/2

SERIAL NUMBER= 333
TIME AND DATE LAID=17:35 29/ 3/76

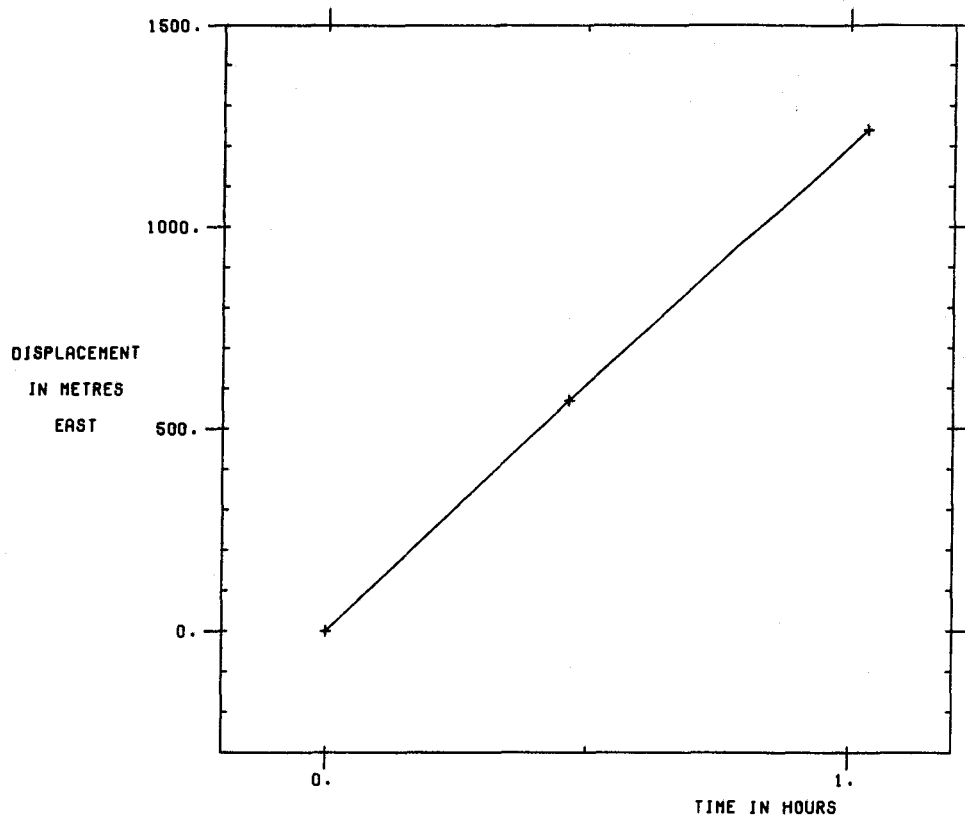
FIX	TIME	POSITION		DISPLACEMENT		VELOCITY		SPEED (M/S)	DIRN DEG
		HR	MIN	E	N	E	N		
1	2 18	657880	277020						
2	2 46	658450	278780	570	1760	0.339	1.048	1.101	17.9
3	3 20	659120	280800	1240	3780	0.328	0.990	1.043	18.3

FLOAT RECOVERED 6: 0 30/ 3/76

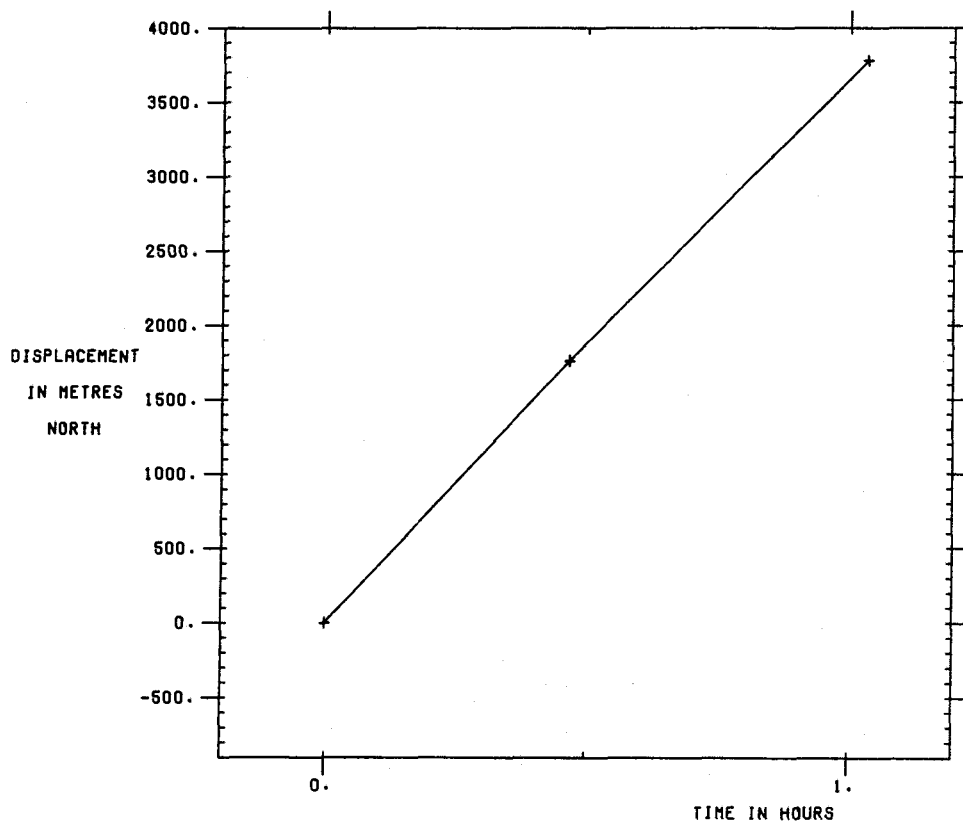


TIME AND DATE LAID=17:35 29/3/76
FLOAT DESIGNATION=18/2

TIME OF FIRST FIX=2:18
SERIAL NO=333



FLOAT DESIGNATION=18/2
 TIME OF FIRST FIX=2:18
 TIME AND DATE LAID=17:35
 SERIAL NO=333
 29/3/76

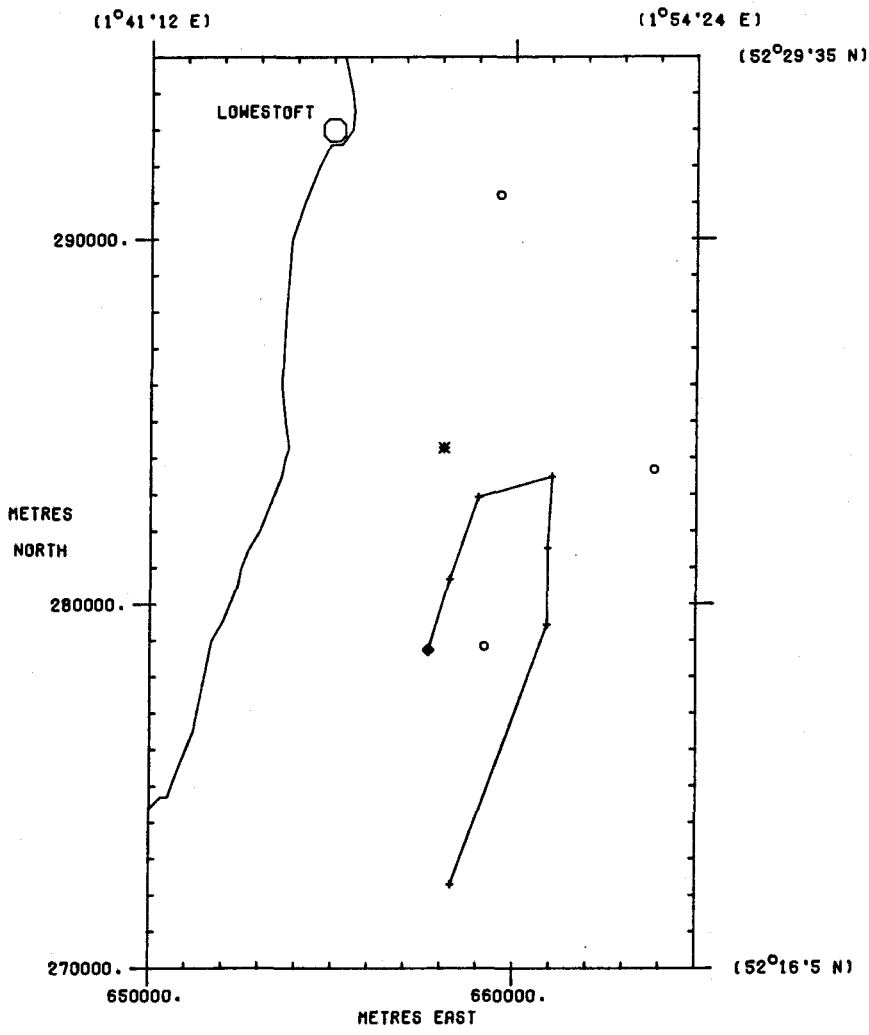


FLOAT DESIGNATION=18/2
 TIME OF FIRST FIX=2:18
 TIME AND DATE LAID=17:35
 SERIAL NO=333
 29/3/76

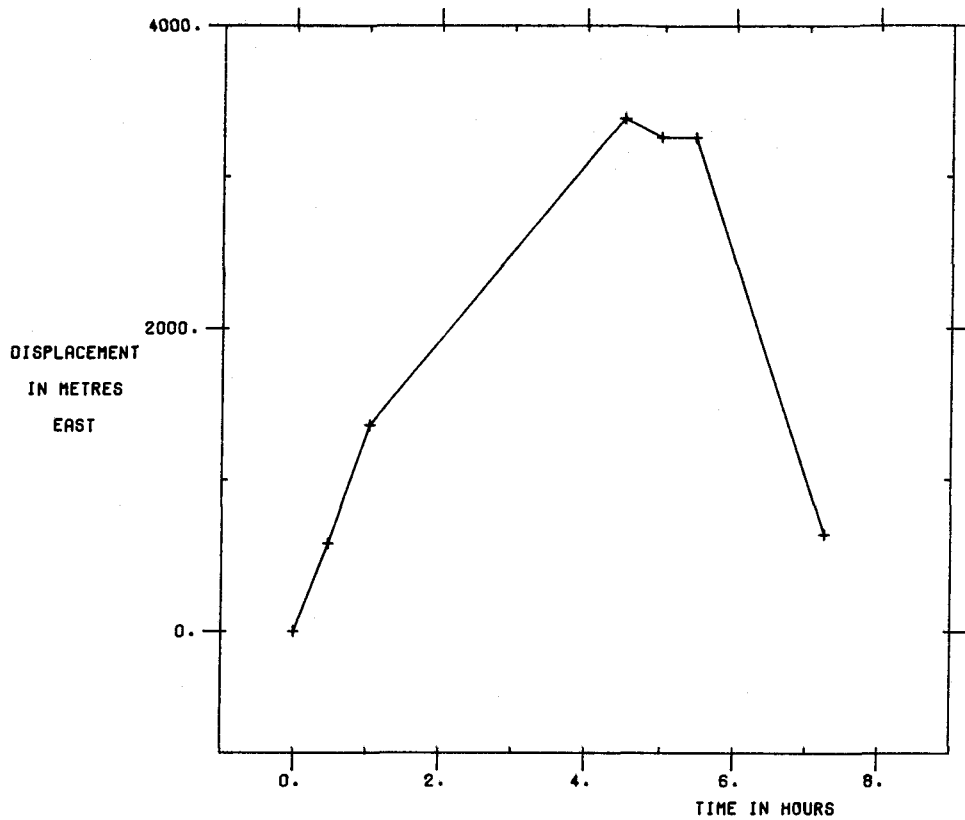
FLOAT DESIGNATION=10/3 SERIAL NUMBER= 334
 TIME AND DATE LAID=18:17 29/ 3/76

FIX	TIME	POSITION		DISPLACEMENT		VELOCITY		SPEED (M/S)	DIRN DEG
		HR	MIN	E	N	E	N		
1	2 18	657660	278740						
2	2 46	658240	280680	580	1940	0.345	1.155	1.205	16.6
3	3 20	659020	282940	1360	4200	0.382	1.108	1.172	19.0
4	6 48	661040	283500	3380	4760	0.162	0.045	0.168	74.5
5	7 16	660920	281540	3260	2400	-0.071	-1.167	1.169	183.5
6	7 44	660920	279430	3260	690	0.	-1.256	1.256	180.0
7	9 33	658300	272300	640	-6440	-0.401	-1.090	1.161	200.2

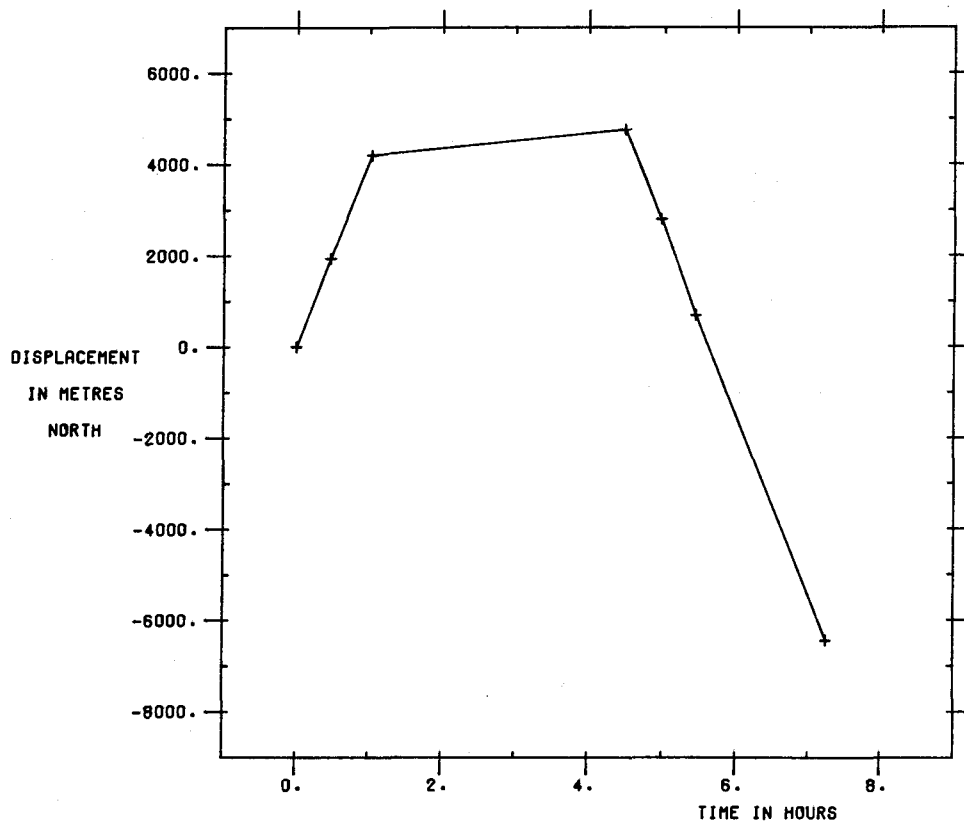
FLOAT RECOVERED 9:33 30/ 3/76



TIME AND DATE LAID=18:17 29/3/76 TIME OF FIRST FIX=2:18
 FLOAT DESIGNATION=10/3 SERIAL NO=334



FLOAT DESIGNATION=10/3
 TIME OF FIRST FIX=2:18
 TIME AND DATE LAID=18:17
 SERIAL NO=334
 29/3/76

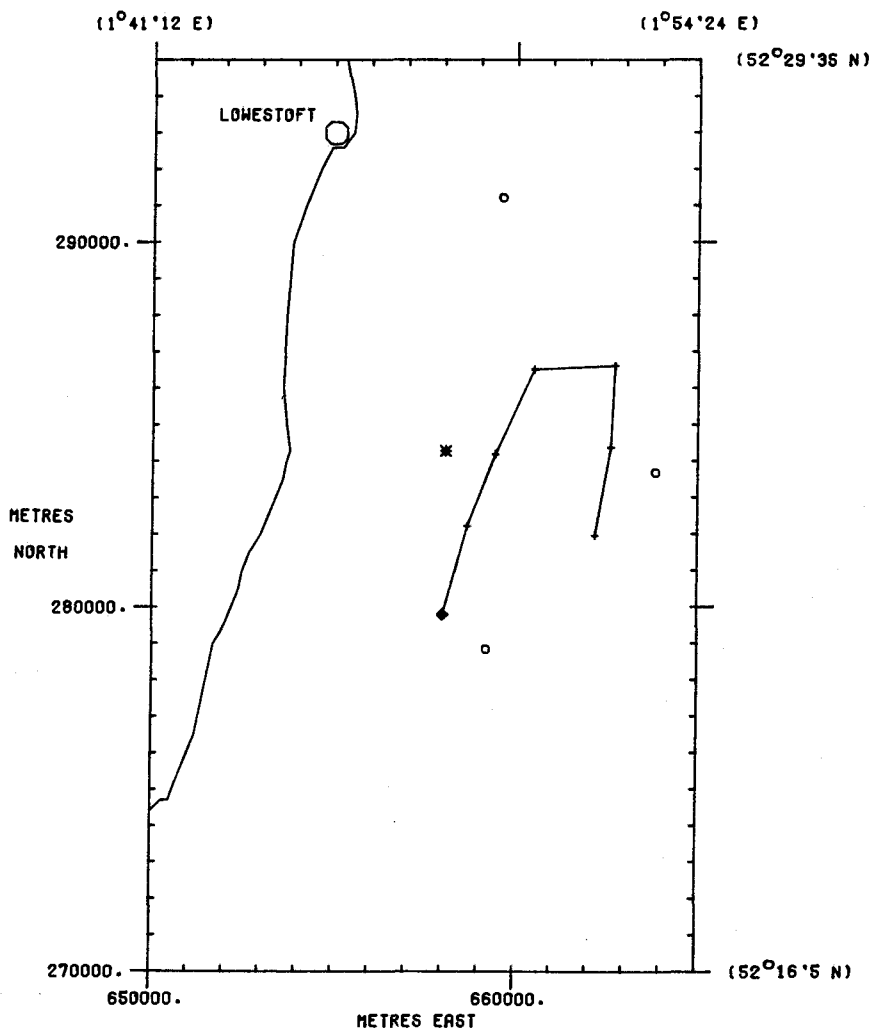


FLOAT DESIGNATION=10/3
 TIME OF FIRST FIX=2:18
 TIME AND DATE LAID=18:17
 SERIAL NO=334
 29/3/76

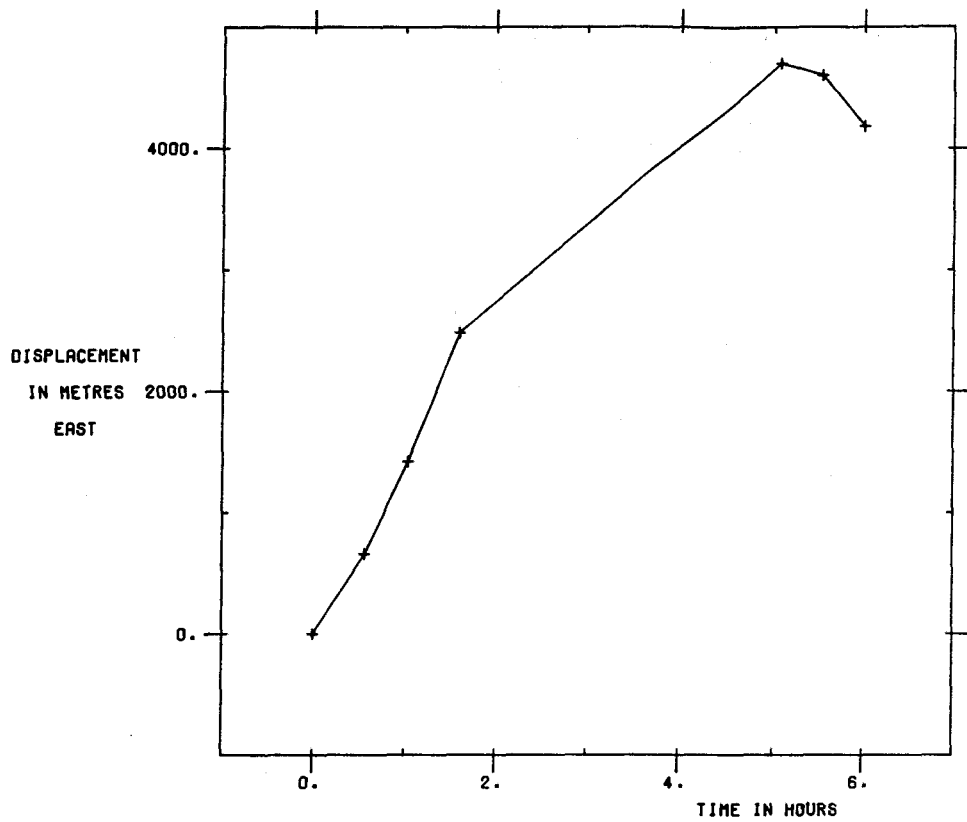
SERIAL NUMBER= 335
 TIME AND DATE LAID=19: 5 29/ 3/76
 FLOAT DESIGNATION= 5/1

FIX	TIME		POSITION		DISPLACEMENT		VELOCITY		SPEED (M/S)	DIRN DEG
	HR	MIN	E	N	E	N	E	N		
1	1	48	658020	279800						
2	2	18	658680	282230	660	2430	0.324	1.191	1.234	15.2
3	2	46	659440	284200	1420	4400	0.452	1.175	1.257	21.1
4	3	20	660500	286520	2480	6720	0.520	1.137	1.250	24.6
5	6	48	662720	286620	4700	6820	0.178	0.008	0.178	87.4
6	7	16	662620	284380	4600	4580	-0.060	-1.333	1.335	182.6
7	7	44	662200	281960	4180	2160	-0.250	-1.440	1.462	189.8

FLOAT RECOVERED 11:44 30/ 3/76

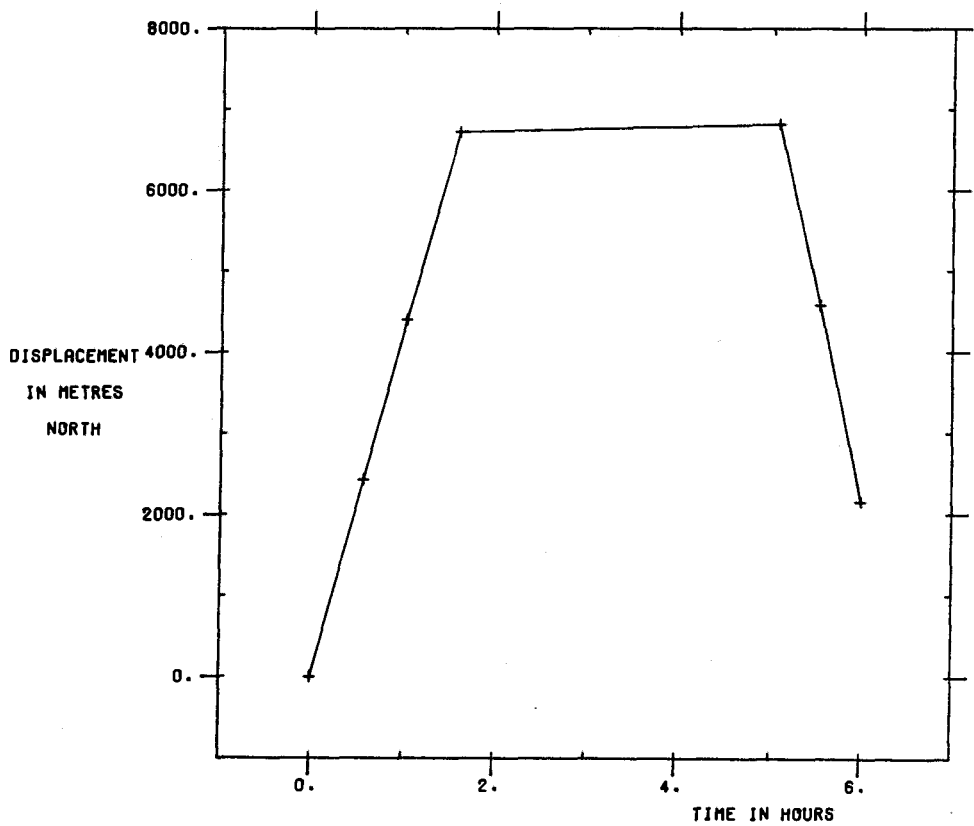


TIME AND DATE LAID=19:05 29/3/76 TIME OF FIRST FIX=1:44
 FLOAT DESIGNATION=5/1 SERIAL NO=335



FLOAT DESIGNATION=5/1
 TIME OF FIRST FIX=1:44
 TIME AND DATE LAID=19: 5

SERIAL NO=335
 29/3/76



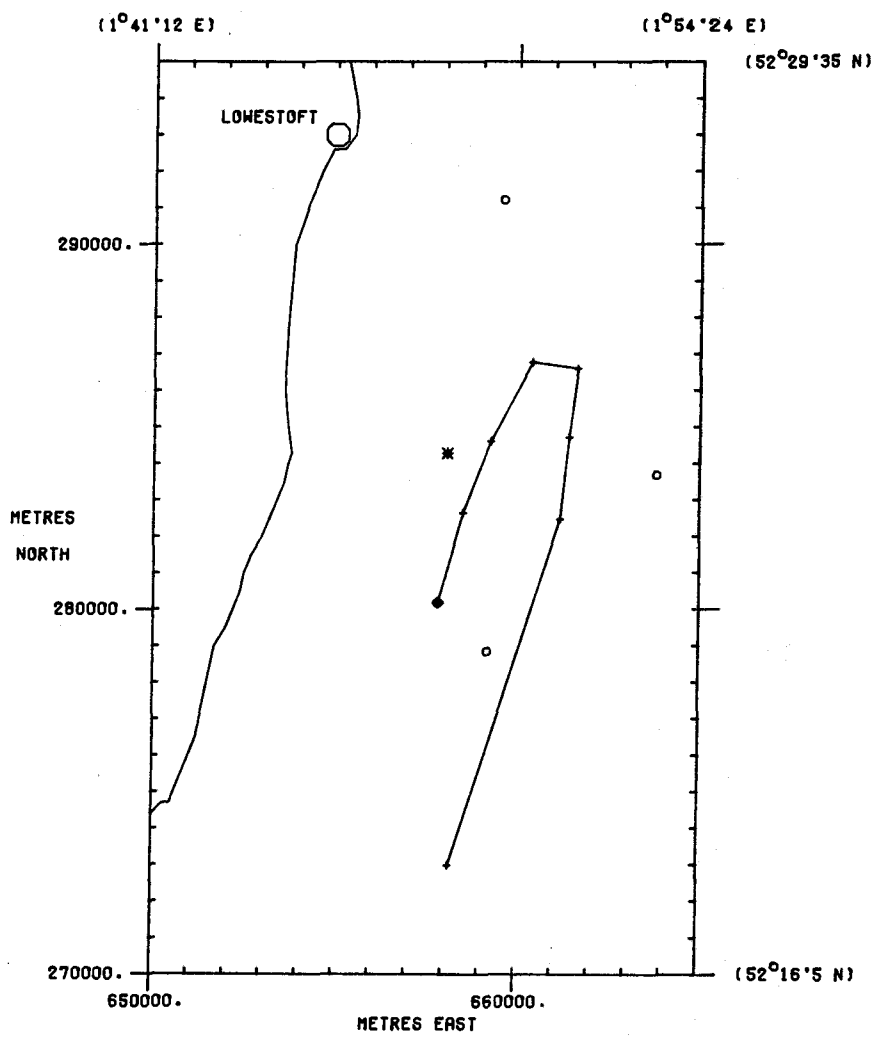
FLOAT DESIGNATION=5/1
 TIME OF FIRST FIX=1:44
 TIME AND DATE LAID=19: 5

SERIAL NO=335
 29/3/76

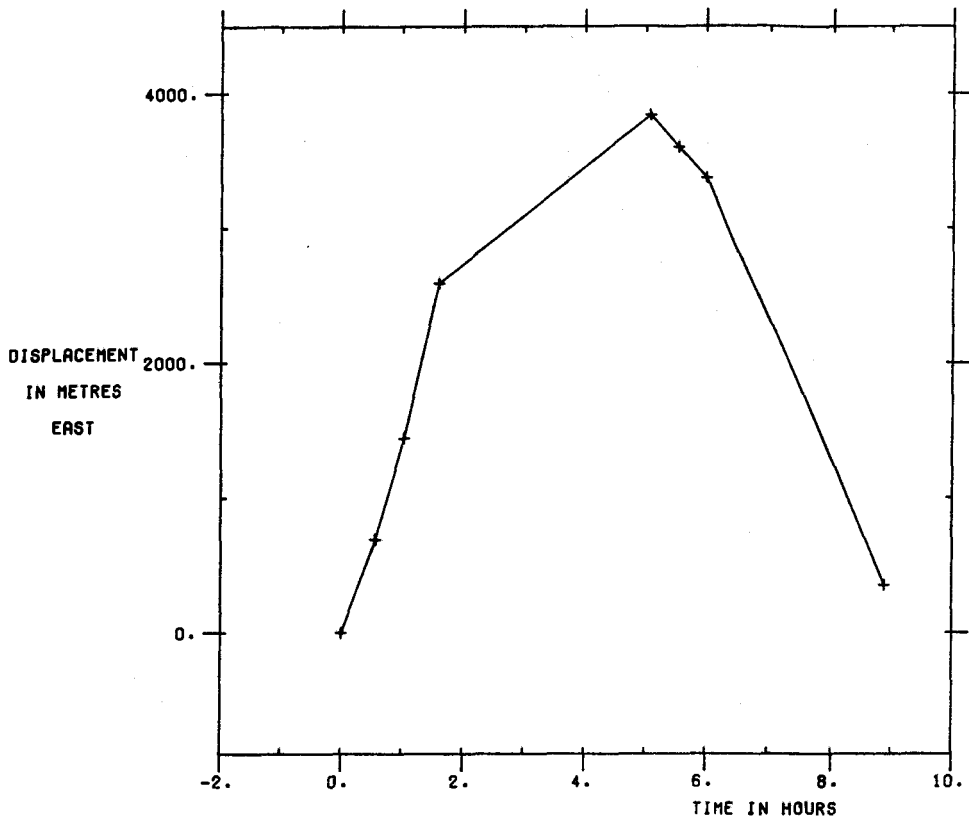
FLOAT DESIGNATION= 3/1 SERIAL NUMBER= 336
 TIME AND DATE LAID=19:16 29/ 3/76

FIX	TIME	POSITION		DISPLACEMENT		VELOCITY		SPEED (M/S)	DIRN DEG
		HR	MIN	E	N	E	N		
1	1 44	657830	280190						
2	2 18	658520	282650	690	2460	0.338	1.206	1.252	15.7
3	2 46	659270	284610	1440	4420	0.446	1.167	1.249	20.9
4	3 20	660420	286780	2590	6590	0.564	1.064	1.204	27.9
5	6 48	661670	286610	3840	6420	0.100	-0.014	0.101	97.7
6	7 16	661430	284720	3600	4530	-0.143	-1.125	1.134	187.2
7	7 44	661200	282480	3370	2290	-0.137	-1.333	1.340	185.9
8	10 37	658180	272990	350	-7200	-0.291	-0.914	0.959	197.7

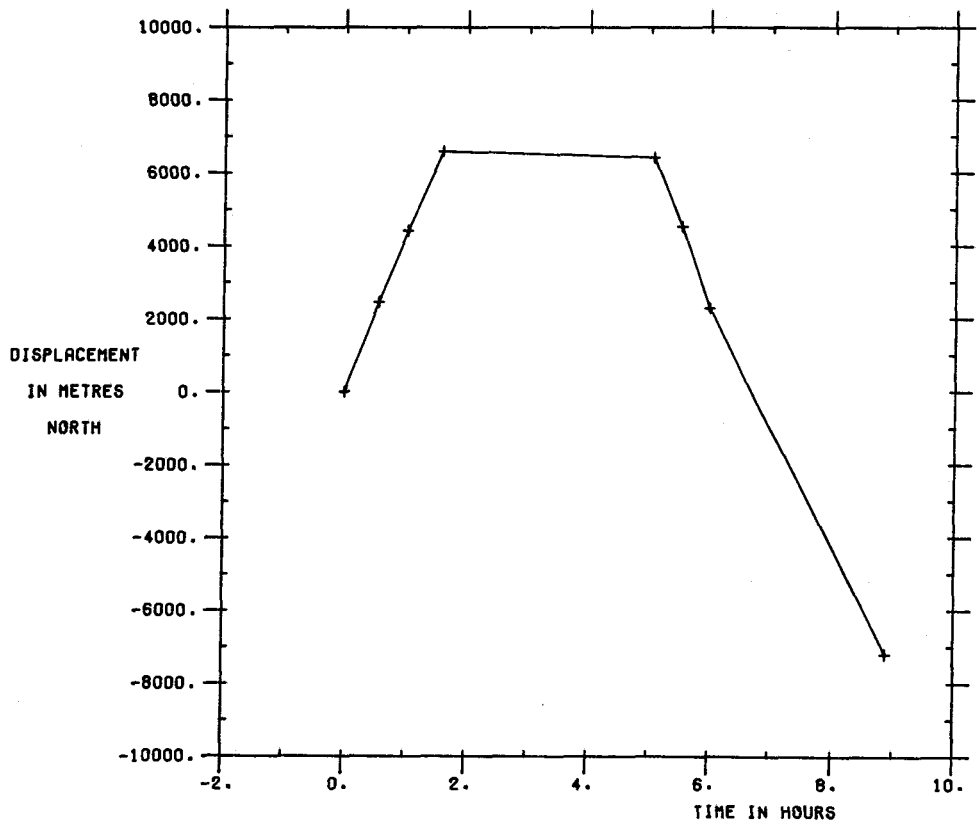
FLOAT RECOVERED 10:37 30/ 3/76



TIME AND DATE LAID=19:16 29/3/76 TIME OF FIRST FIX=1:44
 FLOAT DESIGNATION=3/1 SERIAL NO=336



FLOAT DESIGNATION=3/1
 TIME OF FIRST FIX=1:44
 TIME AND DATE LAID=19:16 SERIAL NO=336
 29/3/76



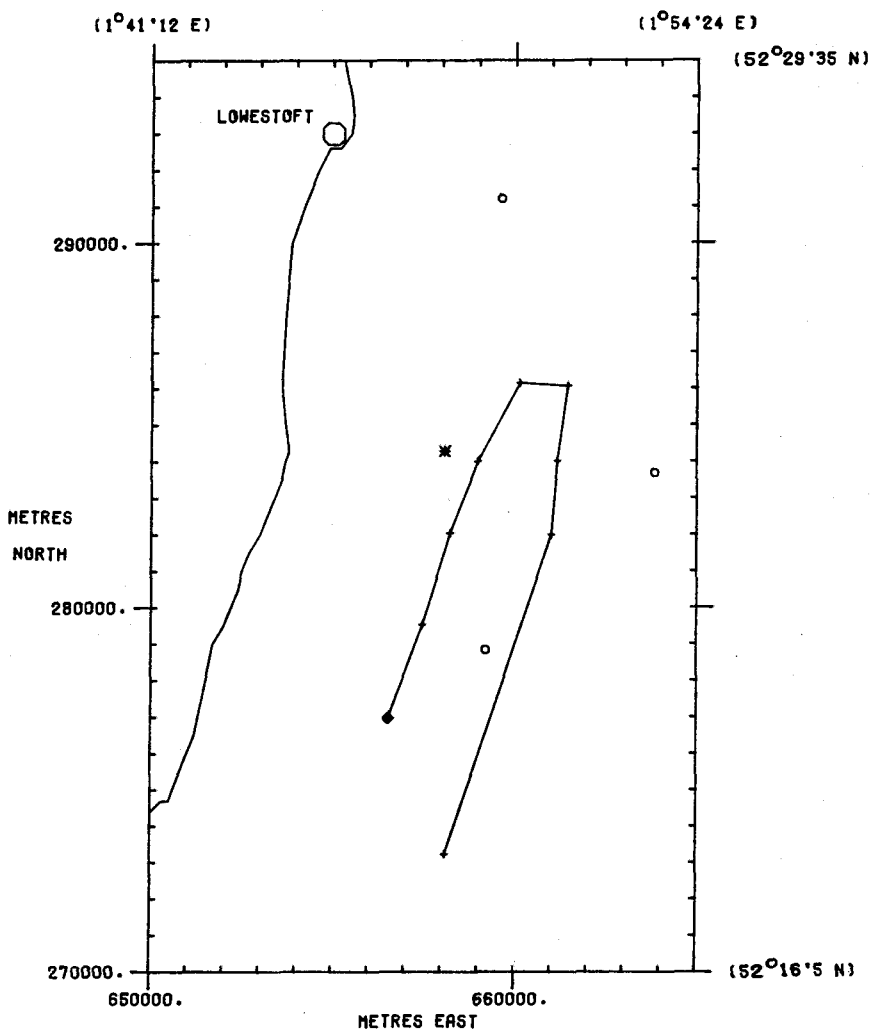
FLOAT DESIGNATION=3/1
 TIME OF FIRST FIX=1:44
 TIME AND DATE LAID=19:16 SERIAL NO=336
 29/3/76

FLOAT DESIGNATION= 8/3

SERIAL NUMBER= 337
 TIME AND DATE LAID=20: 9 29/ 3/76

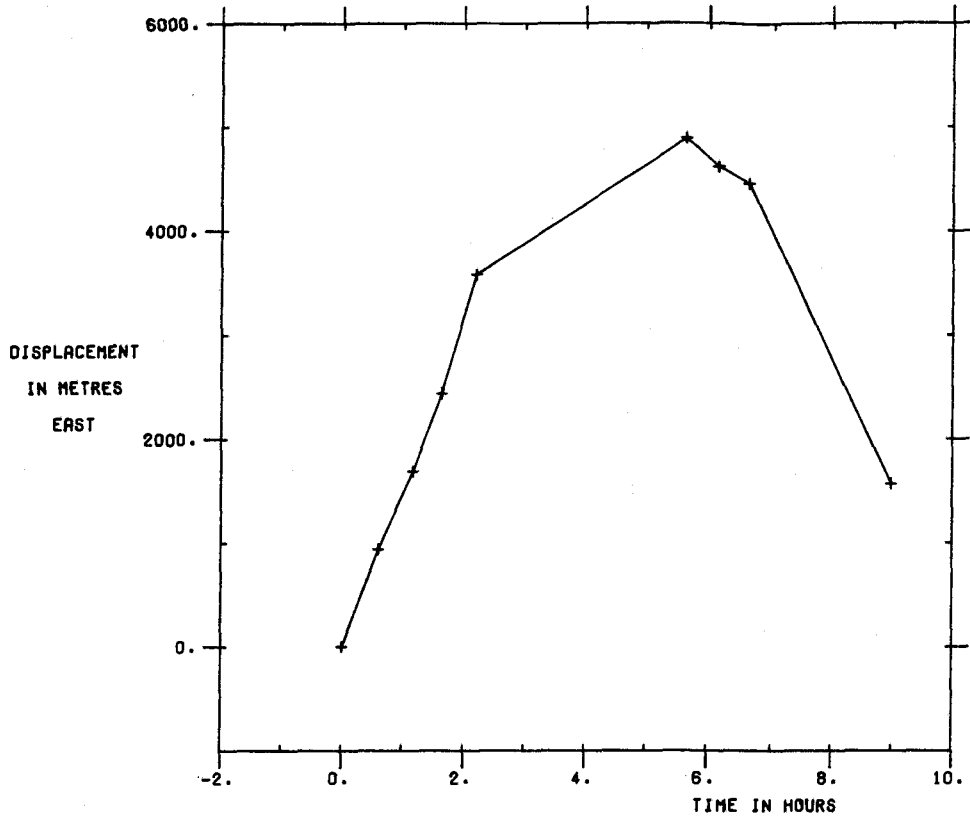
FIX	TIME		POSITION		DISPLACEMENT		VELOCITY		SPEED (M/S)	DIRN DEG
	HR	MIN	E	N	E	N	E	N		
1	1	8	656540	276980						
2	1	44	657480	279540	940	2560	0.435	1.185	1.263	20.2
3	2	18	658230	282050	1690	5070	0.368	1.230	1.284	16.6
4	2	46	658980	284010	2440	7030	0.446	1.167	1.249	20.9
5	3	20	660120	286160	3580	9180	0.559	1.054	1.193	27.9
6	6	48	661430	286080	4890	9100	0.105	-0.006	0.105	93.5
7	7	16	661160	284020	4620	7040	-0.161	-1.226	1.237	187.5
8	7	44	661000	282000	4460	5020	-0.095	-1.202	1.206	184.5
9	10	7	658110	273230	1570	-3750	-0.337	-1.022	1.076	198.2

FLOAT RECOVERED 10: 7 30/ 3/76



TIME AND DATE LAID=20:09 29/3/76
 FLOAT DESIGNATION=8/3

TIME OF FIRST FIX=1: 8
 SERIAL NO=337



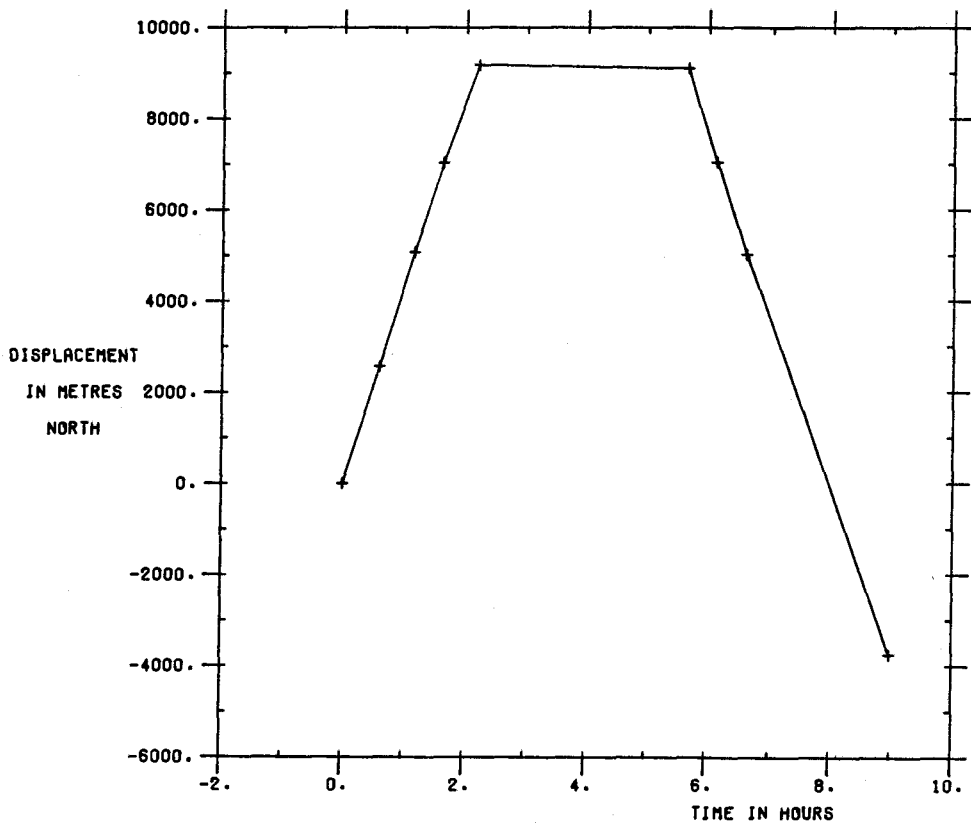
FLOAT DESIGNATION=8/3

TIME OF FIRST FIX=1: 8

SERIAL NO=337

TIME AND DATE LAID=20: 9

29/3/76



FLOAT DESIGNATION=8/3

TIME OF FIRST FIX=1: 8

SERIAL NO=337

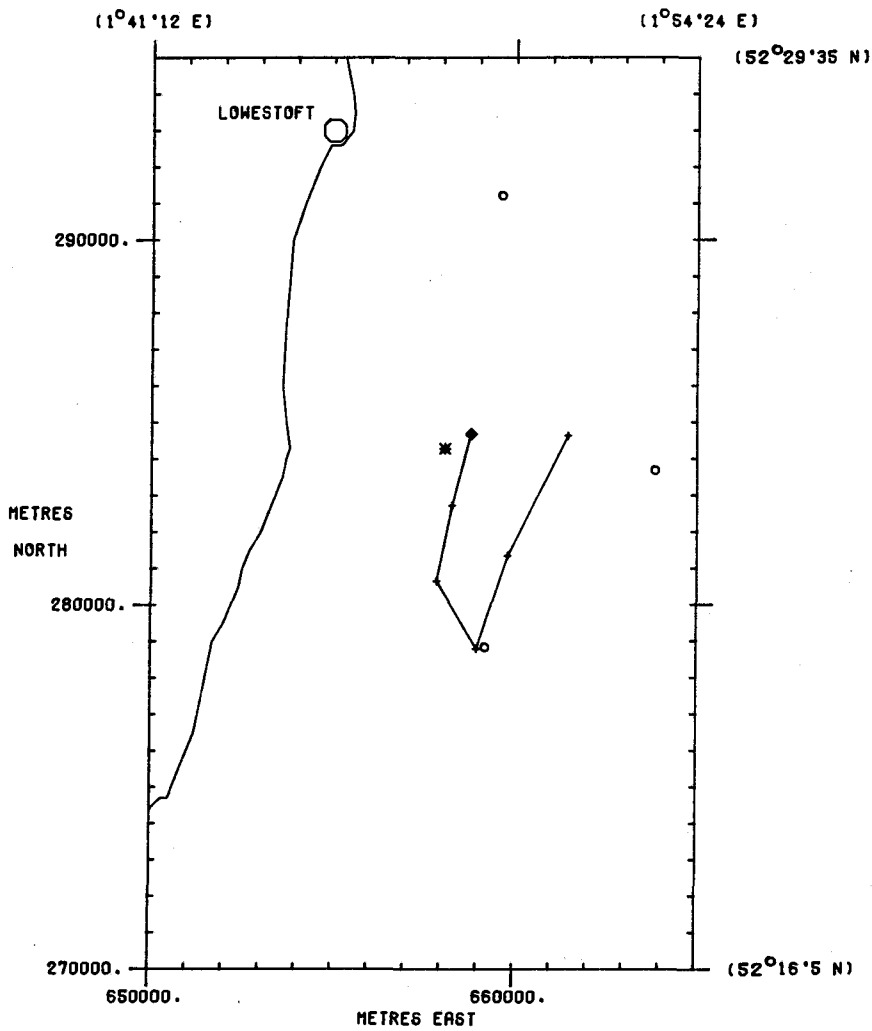
TIME AND DATE LAID=20: 9

29/3/76

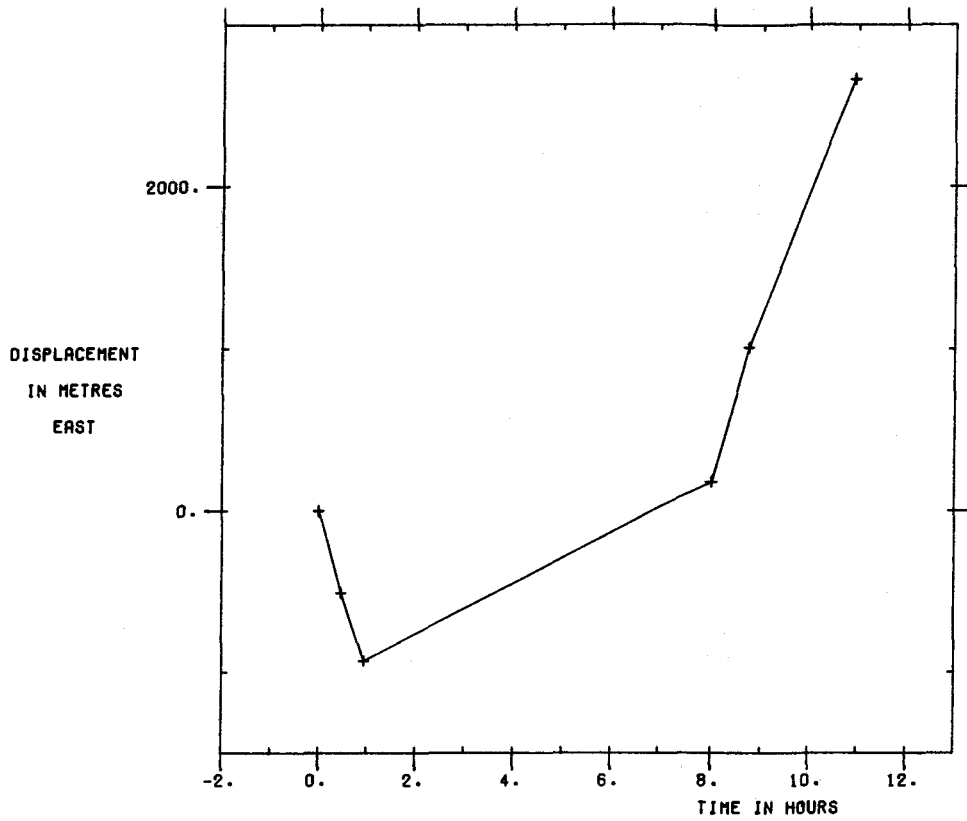
FLOAT DESIGNATION=16/1 SERIAL NUMBER= 338
 TIME AND DATE LAID= 6:30 30/ 3/76

FIX	TIME		POSITION		DISPLACEMENT		VELOCITY		SPEED (M/S)	DIRN DEG
	HR	MIN	E	N	E	N	E	N		
1	6	48	658790	284690						
2	7	16	658280	282730	-510	-1960	-0.304	-1.167	1.206	194.6
3	7	44	657860	280660	-930	-4030	-0.250	-1.232	1.257	191.5
4	14	48	658970	278800	180	-5890	0.044	-0.073	0.085	149.2
5	15	32	659800	281350	1010	-3340	0.314	0.966	1.016	18.0
6	17	44	661450	284640	2660	-50	0.208	0.415	0.465	26.6

FLOAT RECOVERED 17:44 30/ 3/76



TIME AND DATE LAID=06:30 30/3/76 TIME OF FIRST FIX=6:48
 FLOAT DESIGNATION=16/1 SERIAL NO=338



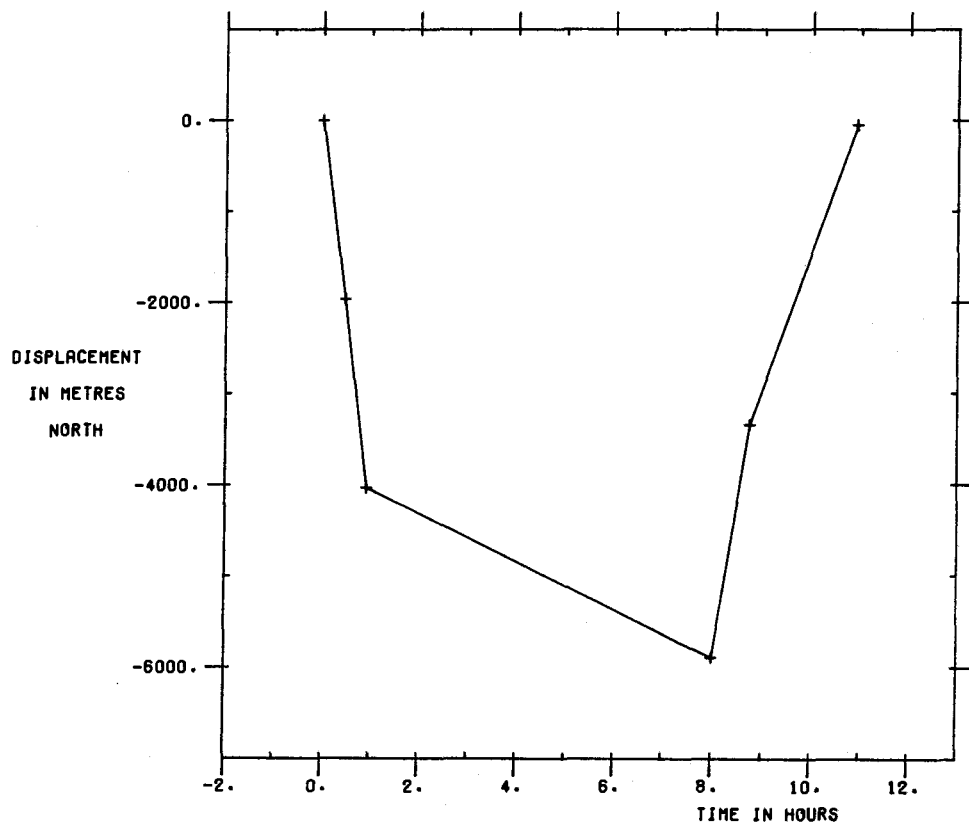
FLOAT DESIGNATION=16/1

TIME OF FIRST FIX=8:48

SERIAL NO=938

TIME AND DATE LAID=6:30

30/3/76



FLOAT DESIGNATION=16/1

TIME OF FIRST FIX=8:48

SERIAL NO=938

TIME AND DATE LAID=6:30

30/3/76

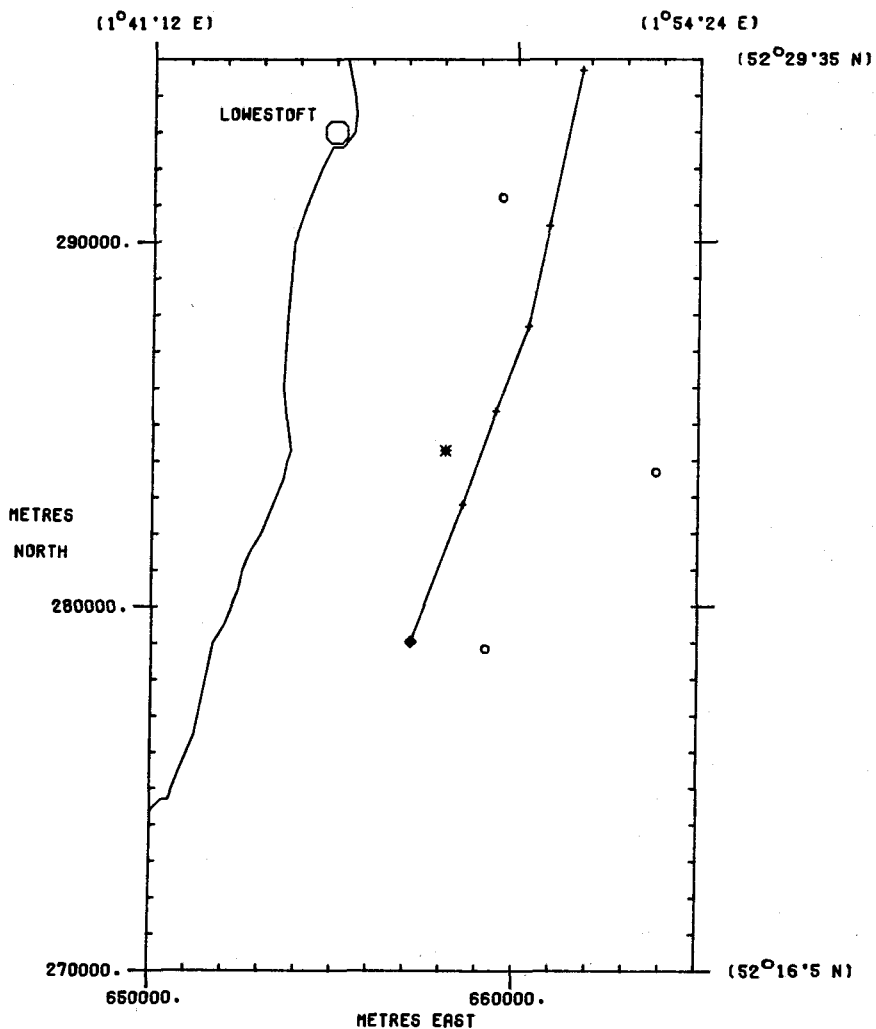
FLOAT DESIGNATION=10/4

SERIAL NUMBER= 339
TIME AND DATE LAID=12:42 30/ 3/76

POSITION LAID=657140,279040

FIX	TIME	POSITION		DISPLACEMENT		VELOCITY		SPEED (M/S)	DIRN DEG	
		HR	MIN	E	N	E	N			
1	12	42	657140	279040						
2	13	42	658560	282800	1420	3760	0.394	1.044	1.116	20.7
3	14	16	659460	285370	2320	6330	0.441	1.260	1.335	19.3
4	14	48	660340	287690	3200	8650	0.458	1.208	1.292	20.8
5	15	32	660900	290440	3760	11400	0.212	1.042	1.063	11.5
6	16	38	661760	294700	4620	15660	0.217	1.076	1.097	11.4

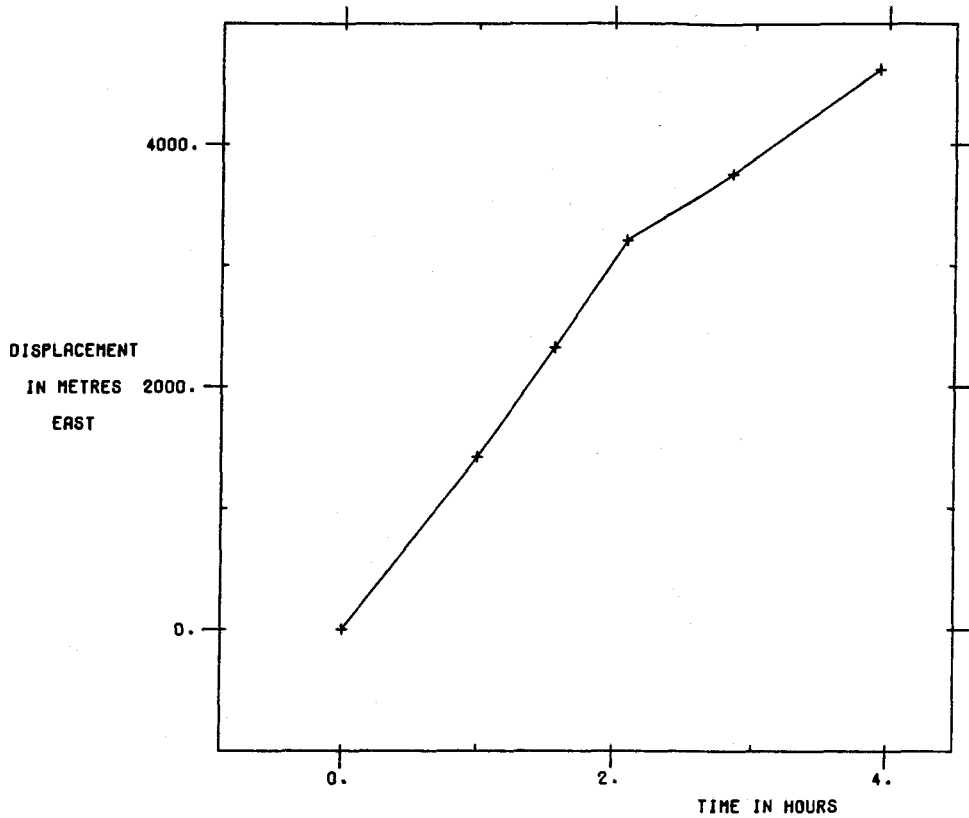
FLOAT RECOVERED 16:38 30/ 3/76



TIME AND DATE LAID=12:42 30/3/76

FLOAT DESIGNATION=10/4

SERIAL NO=339

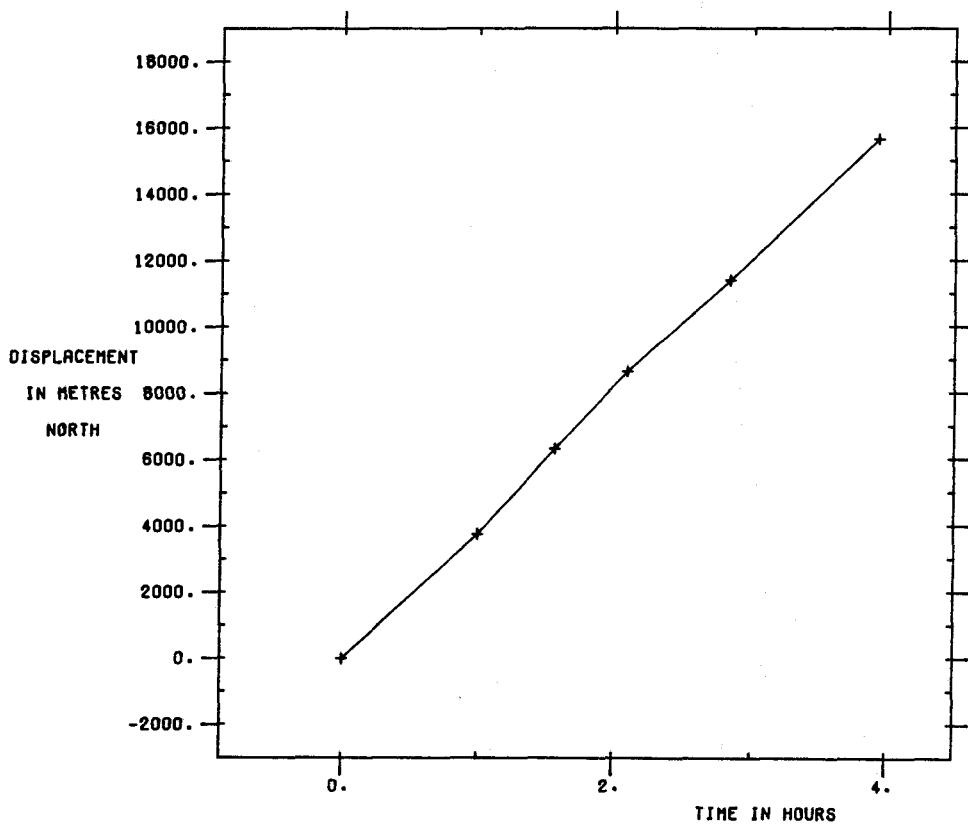


FLOAT DESIGNATION=10/4

SERIAL NO=339

TIME AND DATE LAID=12:42

30/3/76



FLOAT DESIGNATION=10/4

SERIAL NO=339

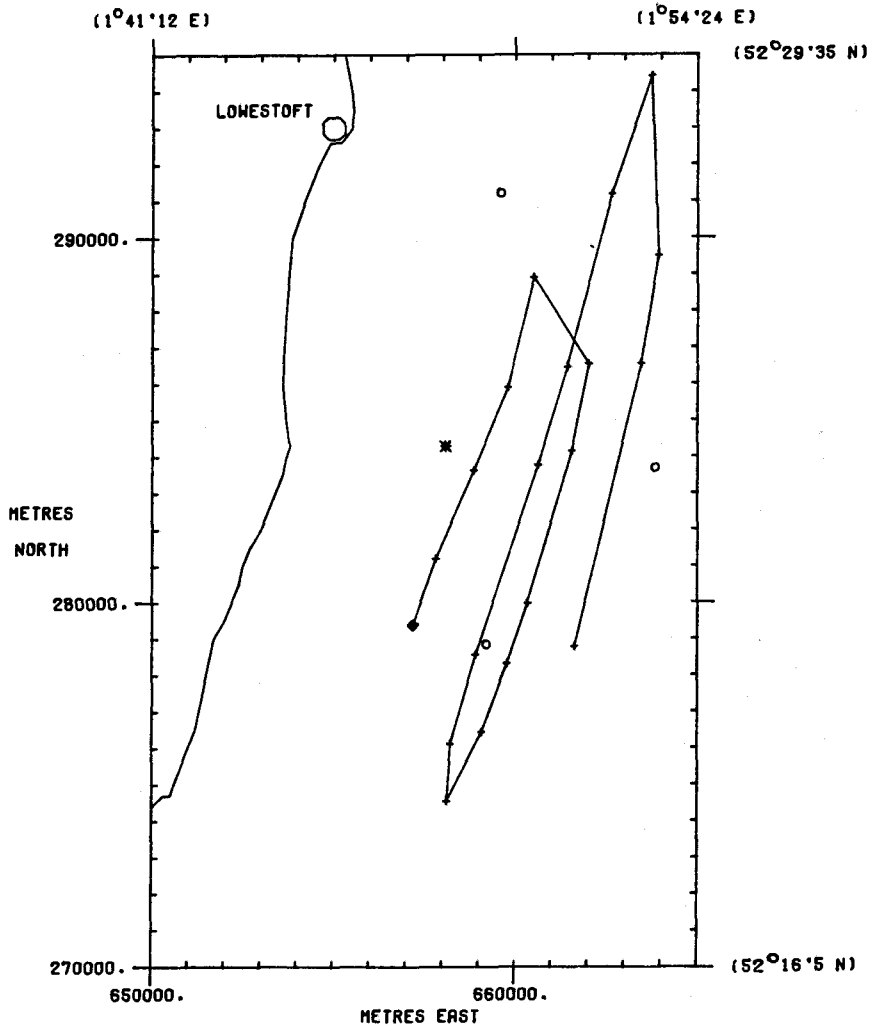
TIME AND DATE LAID=12:42

30/3/76

POSITION LAID=657180,279380

FIX	TIME	POSITION		DISPLACEMENT		VELOCITY		SPEED (M/S)	DIRN DEG
		E	N	E	N	E	N		
1	13 16	657180	279380						
2	13 42	657810	281200	630	1820	0.404	1.167	1.235	19.1
3	14 16	658860	283630	1680	4250	0.515	1.191	1.298	23.4
4	14 48	659800	285910	2620	6530	0.490	1.188	1.280	22.4
5	15 32	660520	288920	3340	9540	0.273	1.140	1.172	13.5
6	19 16	662020	286640	4840	7160	0.112	-0.177	0.209	147.8
7	19 48	661560	284160	4380	4780	-0.240	-1.240	1.263	190.9
8	20 50	660340	279980	3160	600	-0.328	-1.124	1.171	196.3
9	21 20	659780	278320	2600	-1060	-0.311	-0.922	0.973	198.6
10	22 0	659080	276440	1900	-2940	-0.292	-0.783	0.836	200.4
11	23 24	658120	274540	940	-4840	-0.190	-0.377	0.422	206.8
12	0 30	658220	276120	1040	-3260	-0.001	-0.019	0.019	183.6
13	1 10	658910	278560	1730	-820	0.288	1.017	1.057	15.8
14	2 20	660630	283770	3450	4390	0.410	1.240	1.306	18.3
15	2 52	661430	286460	4250	7080	0.417	1.401	1.462	16.6
16	4 0	662660	291190	5480	11810	0.301	1.159	1.198	14.6
17	6 32	663750	294420	6570	15040	0.120	0.354	0.374	18.6
18	7 58	663940	289500	6760	10120	0.037	-0.953	0.954	177.8
19	8 42	663460	286550	6280	7170	-0.182	-1.117	1.132	189.2
20	10 36	661640	278790	4460	-590	-0.266	-1.135	1.165	193.2

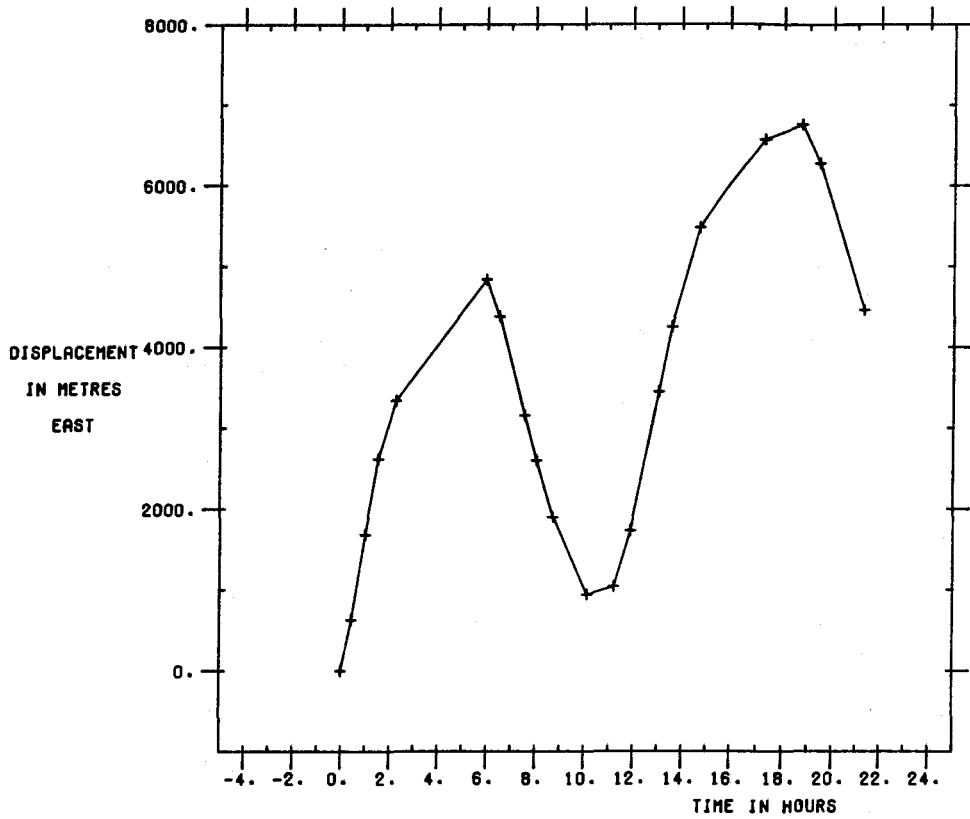
FLOAT RECOVERED 10:36 31/ 3/76



TIME AND DATE LAID=13:16 30/3/76

FLOAT DESIGNATION=3/2

SERIAL NO=340

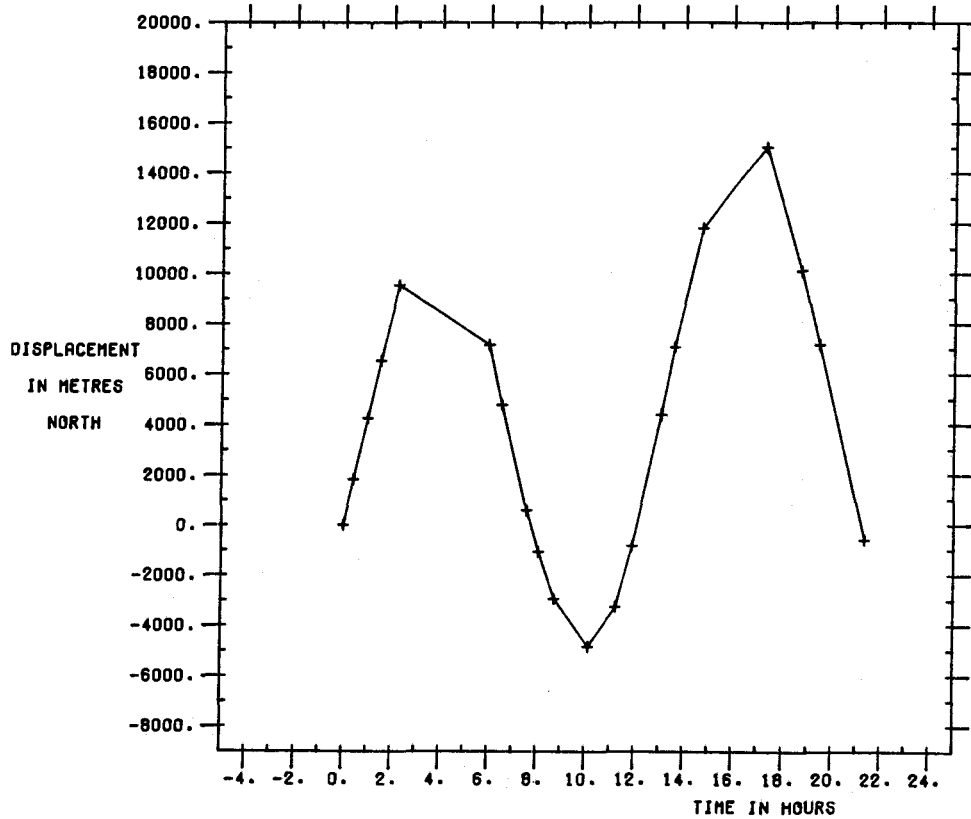


FLOAT DESIGNATION=3/2

SERIAL NO=340

TIME AND DATE LAID=13:16

30/3/76



FLOAT DESIGNATION=3/2

SERIAL NO=340

TIME AND DATE LAID=13:16

30/3/76

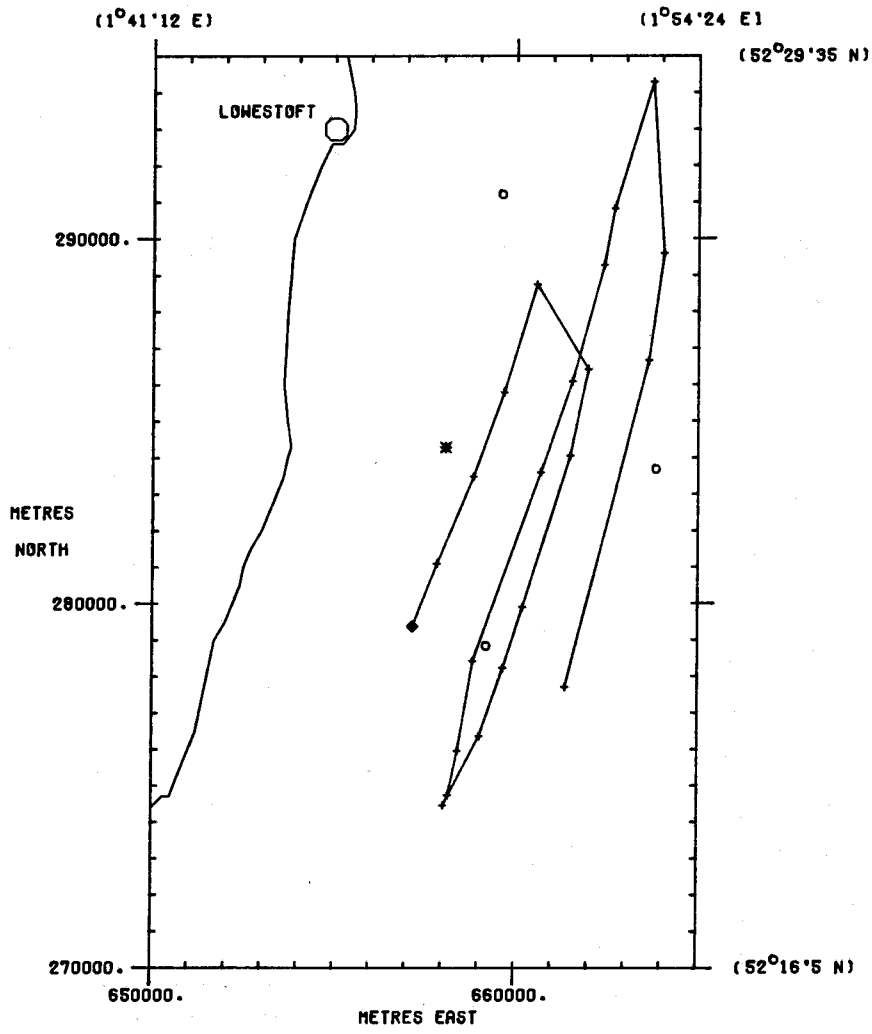
FLOAT DESIGNATION= 8/4

SERIAL NUMBER= 341
TIME AND DATE LAID=13:16 30/ 3/76

POSITION LAID=657180,279380

FIX	TIME		POSITION		DISPLACEMENT		VELOCITY		SPEED (M/S)	DIRN DEG
	HR	MIN	E	N	E	N	E	N		
1	13	16	657180	279380						
2	13	42	657850	281100	670	1720	0.429	1.103	1.183	21.3
3	14	16	658850	283490	1670	4110	0.490	1.172	1.270	22.7
4	14	48	659680	285800	2500	6420	0.432	1.203	1.278	19.8
5	15	32	660570	288750	3390	9370	0.337	1.117	1.167	16.8
6	19	16	661980	286430	4800	7050	0.105	-0.173	0.202	148.7
7	19	48	661500	284060	4320	4680	-0.250	-1.234	1.259	191.4
8	20	50	660200	279900	3020	520	-0.349	-1.118	1.172	197.4
9	21	20	659670	278240	2490	-1140	-0.294	-0.922	0.968	197.7
10	22	0	659030	276370	1850	-3010	-0.267	-0.779	0.824	198.9
11	23	24	658040	274460	860	-4920	-0.196	-0.379	0.427	207.4
12	23	54	658170	274740	990	-4640	0.072	0.156	0.172	24.9
13	0	30	658430	275960	1250	-3420	-0.003	-0.014	0.015	192.0
14	1	10	658840	278420	1660	-960	0.171	1.025	1.039	9.5
15	2	20	660690	283600	3510	4220	0.440	1.233	1.310	19.7
16	2	52	661550	286100	4370	6720	0.448	1.302	1.377	19.0
17	3	35	662400	289280	5220	9900	0.329	1.233	1.276	15.0
18	4	0	662680	290830	5500	11450	0.187	1.033	1.050	10.2
19	6	32	663740	294300	6560	14920	0.116	0.380	0.398	17.0
20	7	58	664050	289600	6870	10220	0.060	-0.911	0.913	176.2
21	8	42	663640	286670	6460	7290	-0.155	-1.110	1.121	188.0
22	10	59	661370	277710	4190	-1670	-0.276	-1.090	1.124	194.2

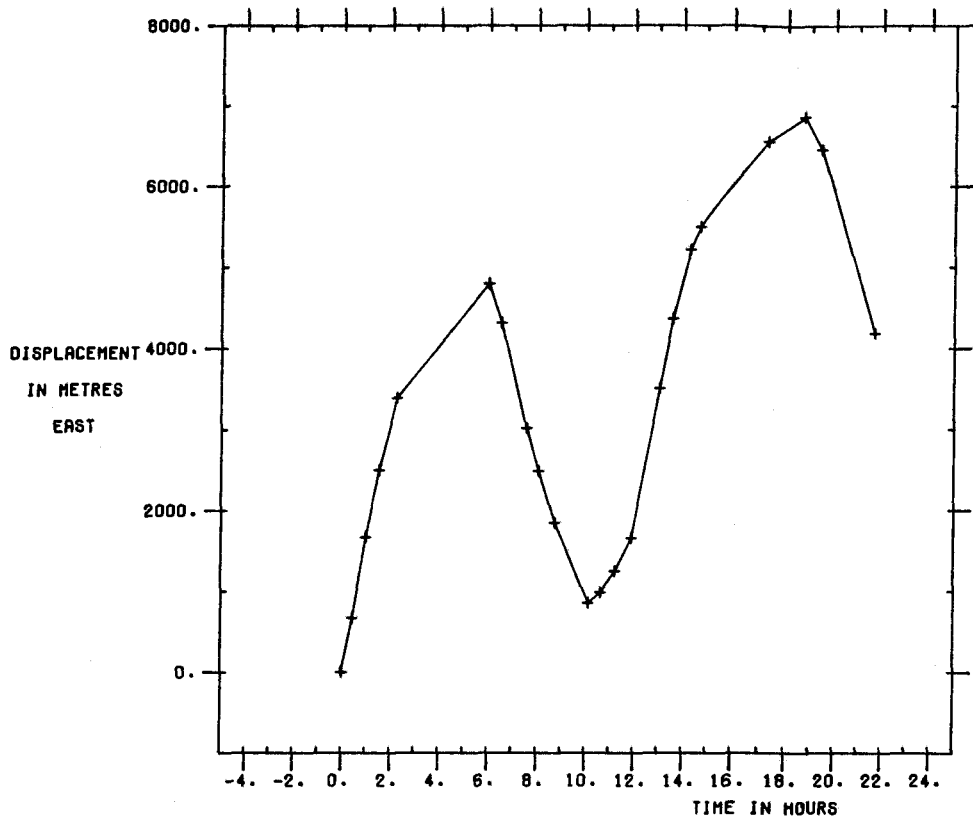
FLOAT RECOVERED 10:59 31/ 3/76



TIME AND DATE LAID=13:16 30/3/76

FLOAT DESIGNATION=8/4

SERIAL NO=341

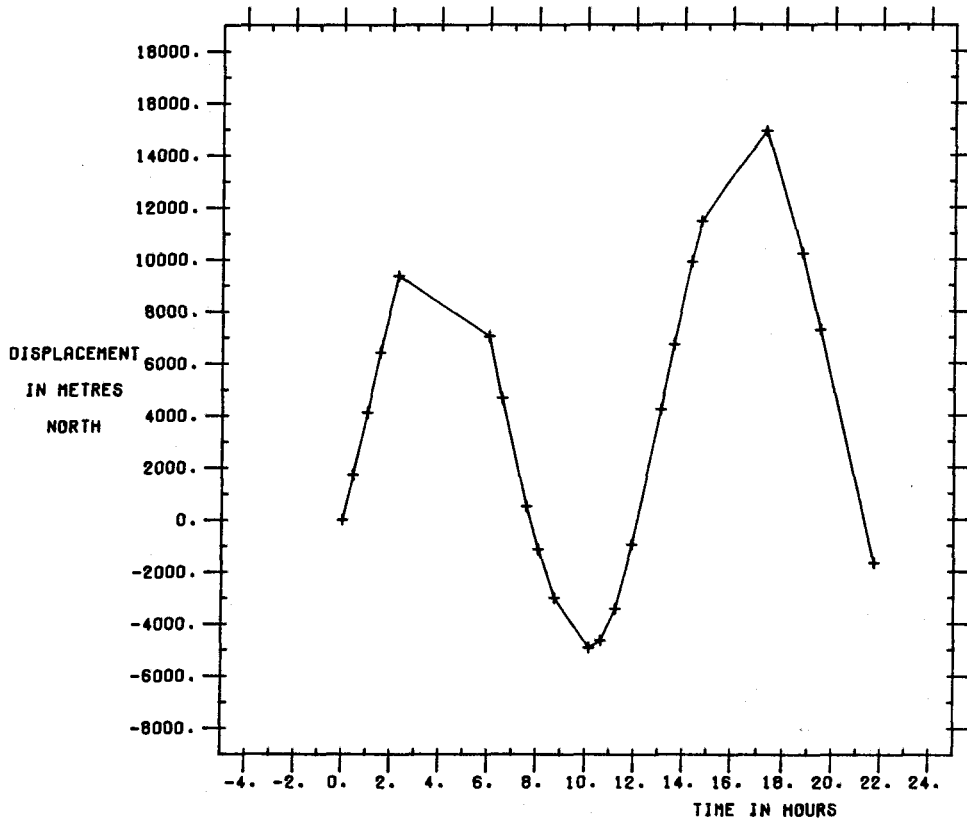


FLOAT DESIGNATION=8/4

SERIAL NO=341

TIME AND DATE LA10=13:16

30/3/76



FLOAT DESIGNATION=8/4

SERIAL NO=341

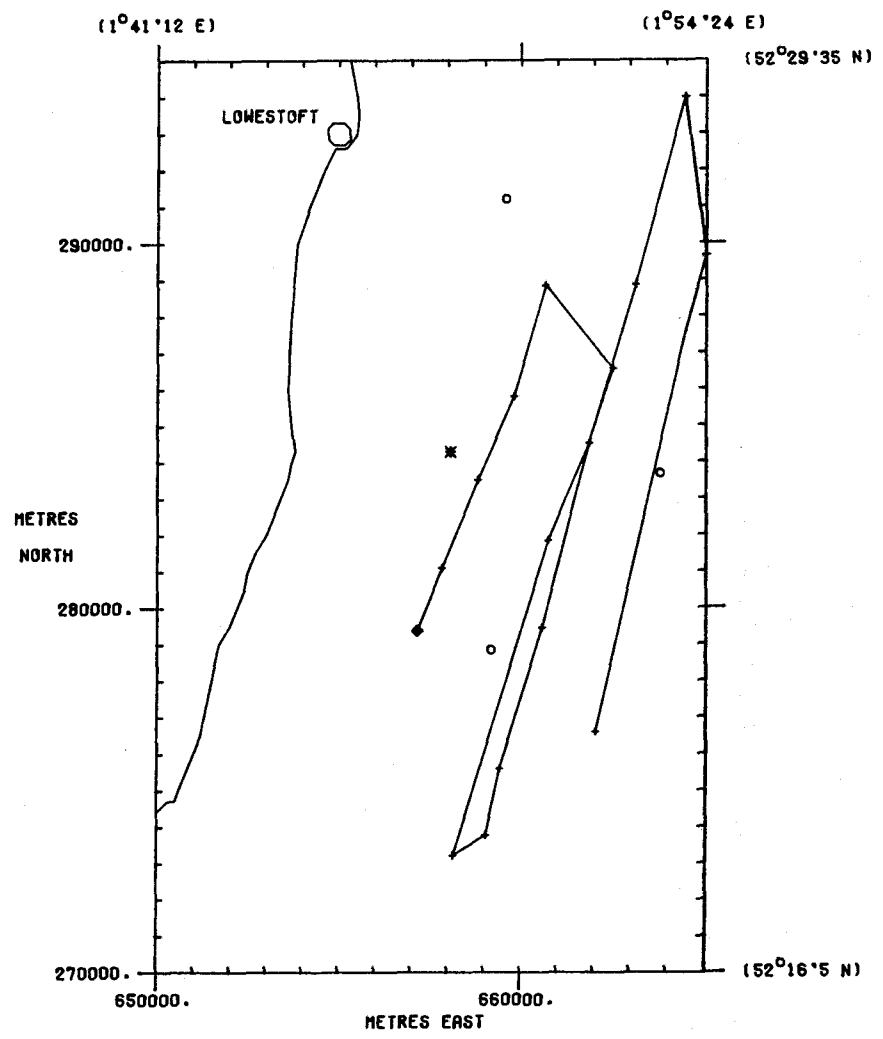
TIME AND DATE LA10=13:16

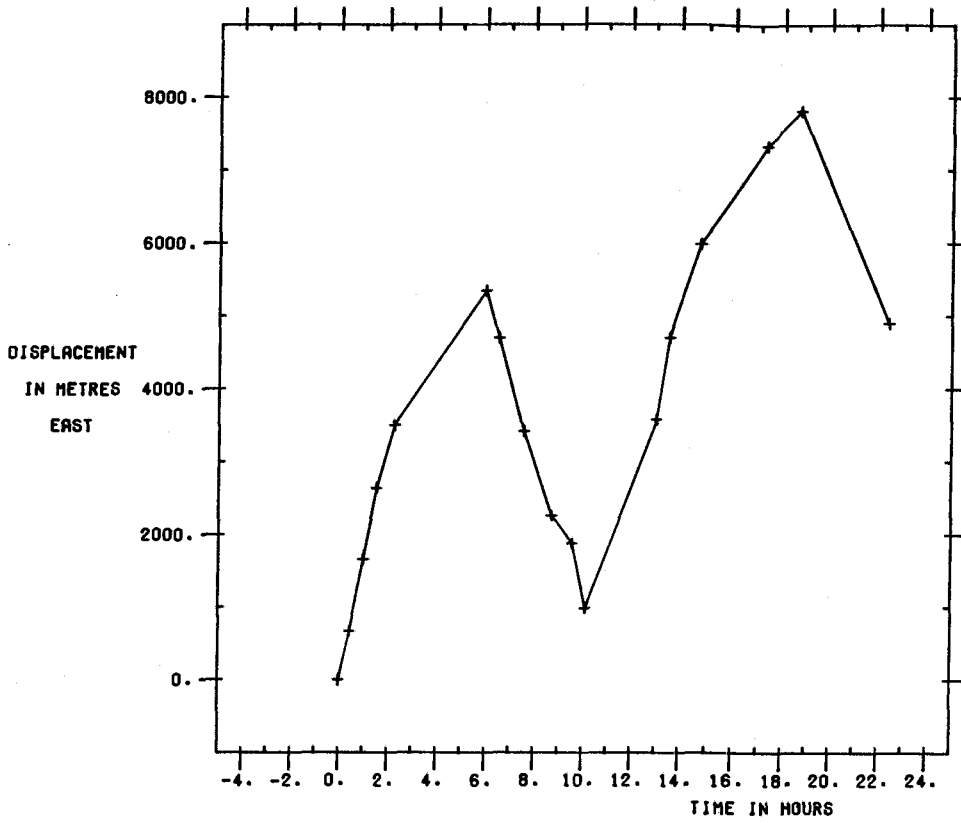
30/3/76

POSITION LAID=657180,279380

FIX	TIME		POSITION		DISPLACEMENT		VELOCITY		SPEED (M/S)	DIRN DEG
	HR	MIN	E	N	E	N	E	N		
1	13	16	657180	279380						
2	13	42	657850	281100	670	1720	0.429	1.103	1.183	21.3
3	14	16	658840	283510	1660	4130	0.485	1.181	1.277	22.3
4	14	48	659820	285810	2840	6430	0.510	1.198	1.302	23.1
5	15	32	660680	288850	3500	9470	0.326	1.152	1.197	15.8
6	19	16	662530	286570	5350	7190	0.138	-0.170	0.218	140.9
7	19	48	661880	284520	4700	5140	-0.339	-1.068	1.120	197.6
8	20	50	660600	279450	3420	70	-0.344	-1.363	1.406	194.2
9	22	0	659440	275600	2260	-3780	-0.276	-0.917	0.957	196.6
10	22	50	659060	273770	1880	-5810	-0.127	-0.610	0.623	191.7
11	23	24	658170	273220	990	-6160	-0.436	-0.270	0.513	238.3
12	2	20	660760	281850	3580	2470	-0.034	-0.114	0.119	196.7
13	2	52	661880	284520	4700	5140	0.583	1.391	1.508	22.8
14	4	0	663170	288870	5990	9490	0.316	1.066	1.112	16.5
15	6	32	664520	294000	7340	14620	0.148	0.563	0.582	14.7
16	7	58	665000	289660	7820	10280	0.093	-0.841	0.846	173.7
17	11	42	662080	276600	4900	-2780	-0.217	-0.972	0.996	192.6

FLOAT RECOVERED 11:42 31/ 3/76



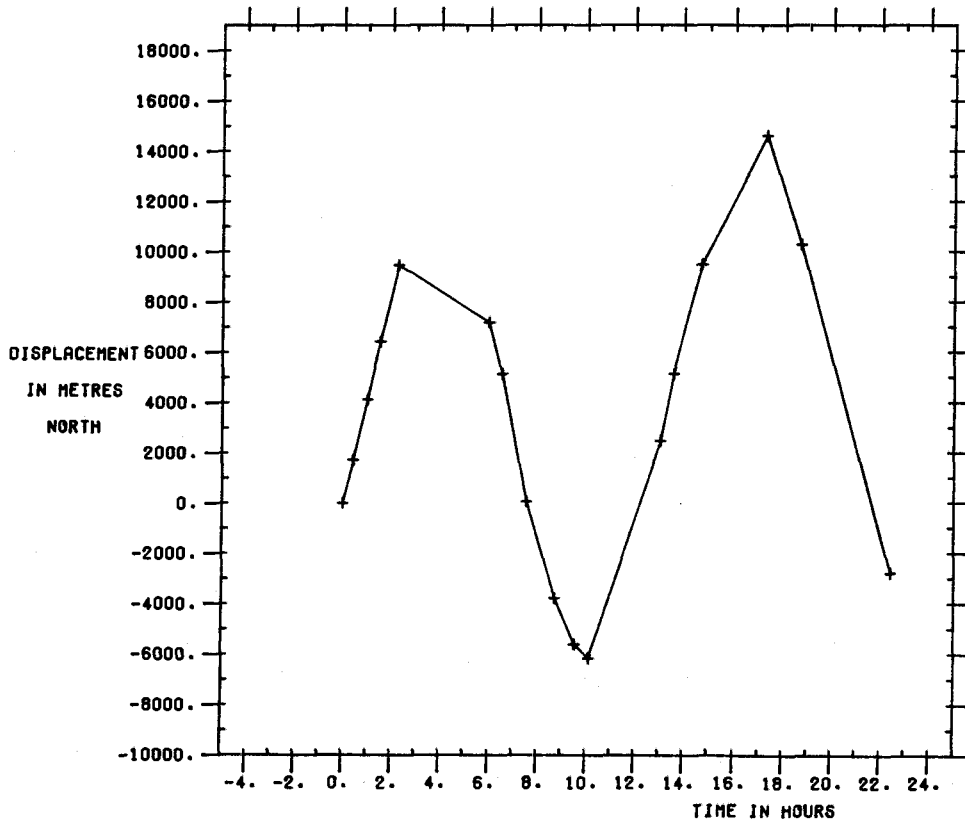


FLOAT DESIGNATION=5/2

SERIAL NO=342

TIME AND DATE LAID=13:16

30/3/76



FLOAT DESIGNATION=5/2

SERIAL NO=342

TIME AND DATE LAID=13:16

30/3/76

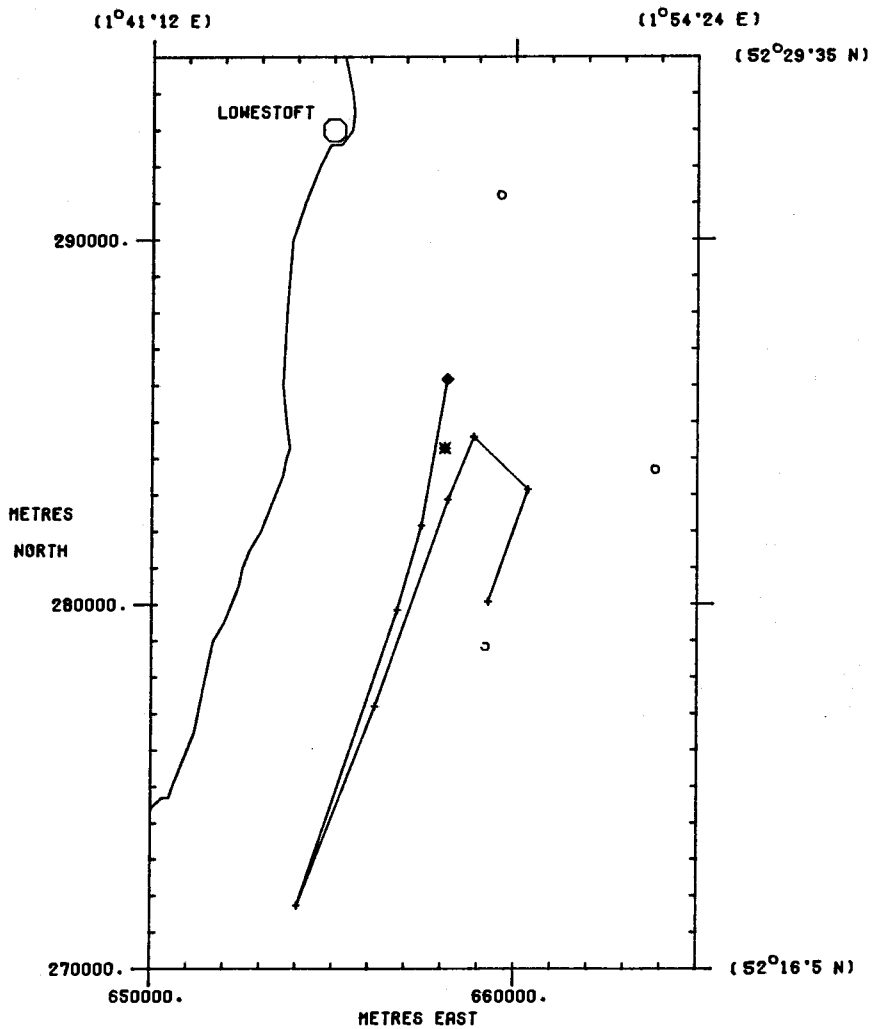
FLOAT DESIGNATION=16/2

SERIAL NUMBER= 343
TIME AND DATE LAID=18: 5 30/ 3/76

POSITION LAID=658140,286180

FIX	TIME	POSITION		DISPLACEMENT		VELOCITY		SPEED (M/S)	DIRN DEG
		E	N	E	N	E	N		
1	18 5	658140	286180						
2	19 16	657440	282170	-700	-4010	-0.164	-0.941	0.956	189.9
3	19 48	656780	279850	-1360	-6330	-0.344	-1.208	1.256	195.9
4	22 0	654000	271740	-4100	-10440	-0.346	-1.024	1.081	198.7
5	2 20	656170	277210	-1970	-8970	-0.030	-0.077	0.083	201.3
6	3 35	658170	282880	30	-3300	0.444	1.260	1.336	19.4
7	4 0	658870	284600	730	-1580	0.467	1.147	1.238	22.1
8	7 58	660360	283150	2220	-3030	0.104	-0.102	0.146	134.2
9	8 42	659280	280080	1140	-6100	-0.409	-1.163	1.233	199.4

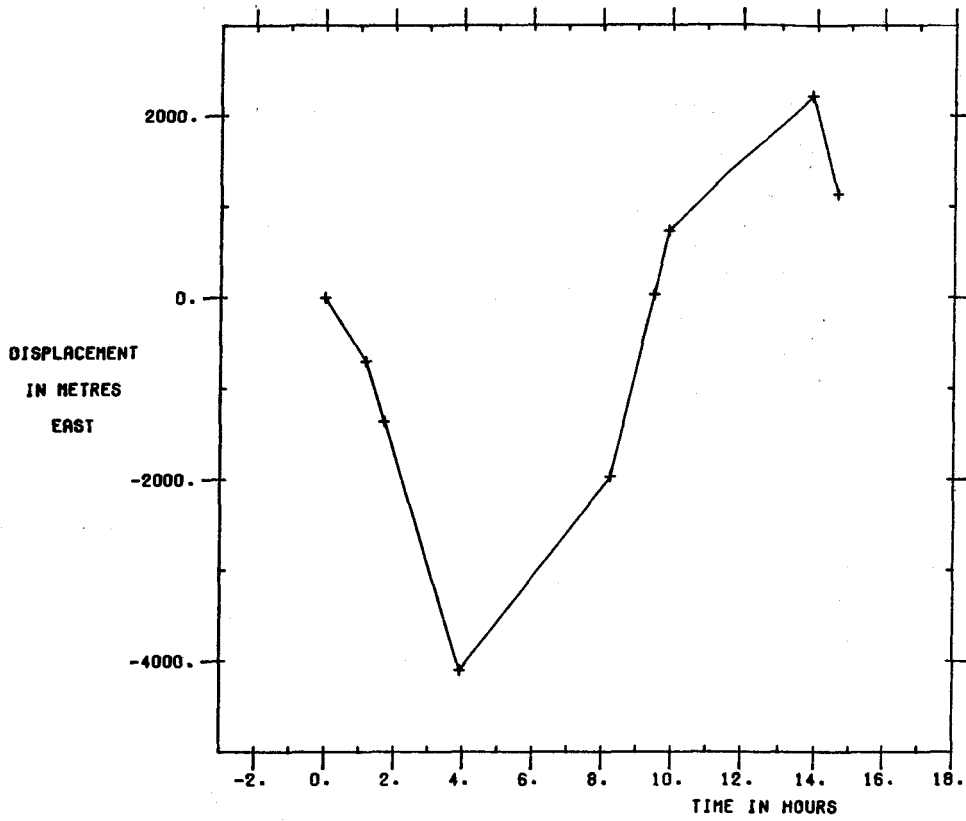
FLOAT RECOVERED 13:33 31/ 3/76



TIME AND DATE LAID=18:05 30/3/76

FLOAT DESIGNATION=16/2

SERIAL NO=343

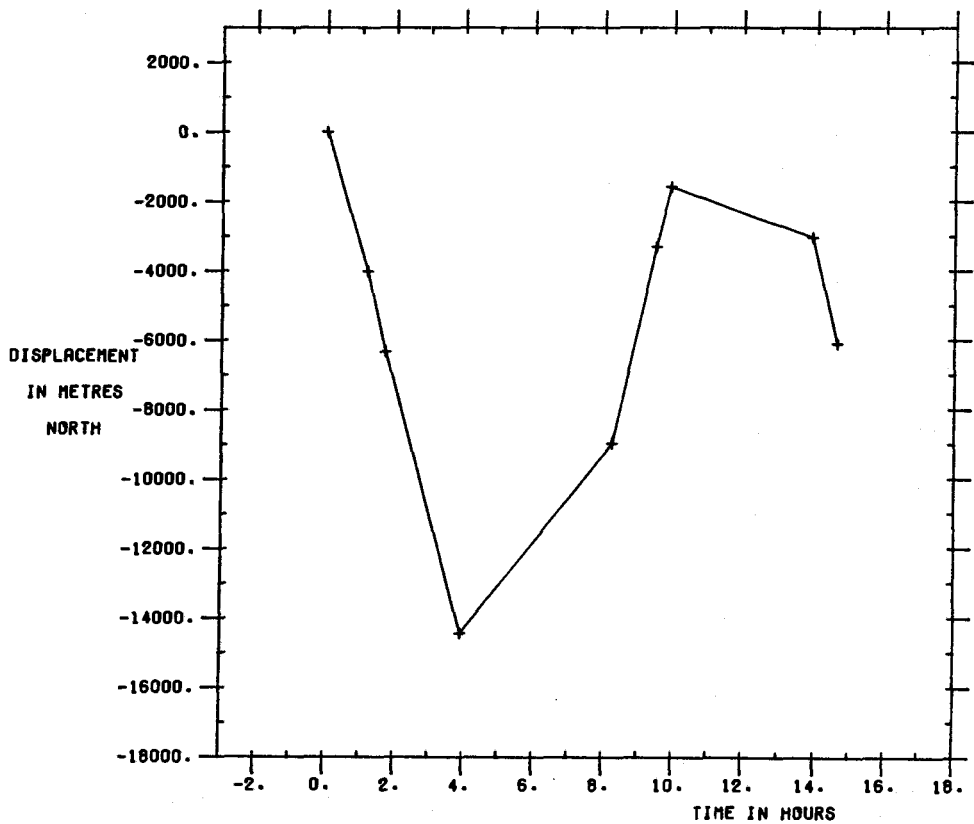


FLOAT DESIGNATION=16/2

SERIAL NO=343

TIME AND DATE LAID=18: 5

30/3/76



FLOAT DESIGNATION=16/2

SERIAL NO=343

TIME AND DATE LAID=18: 5

30/3/76

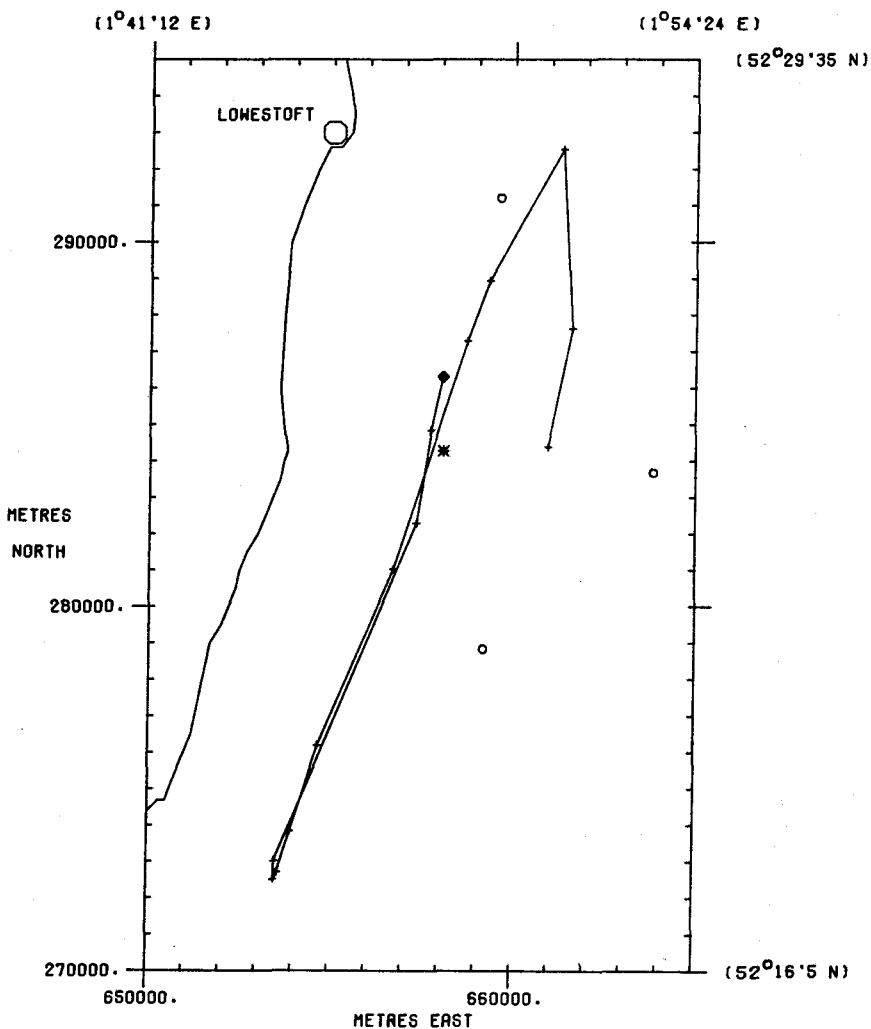
FLOAT DESIGNATION=10/5

SERIAL NUMBER= 344
TIME AND DATE LAID=18:55 30/ 3/76

POSITION LAID=658060,286320

FIX	TIME	POSITION		DISPLACEMENT		VELOCITY		SPEED (M/S)	DIRN DEG
		E	N	E	N	E	N		
1	18 55	658060	286320						
2	19 16	657740	284860	-320	-1460	-0.254	-1.159	1.186	192.4
3	19 48	657350	282300	-710	-4020	-0.203	-1.333	1.349	188.7
4	22 50	653520	273025	-4540	-13295	-0.351	-0.849	0.919	202.4
5	23 24	653510	272520	-4550	-13800	-0.005	-0.248	0.248	181.1
6	23 54	653600	272720	-4460	-13600	0.050	0.111	0.122	24.2
7	0 30	653940	273850	-4120	-12470	-0.004	-0.013	0.014	196.7
8	1 10	654680	276200	-3380	-10120	0.308	0.979	1.027	17.5
9	2 20	656730	281040	-1330	-5280	0.488	1.152	1.251	23.0
10	3 35	658720	287300	660	980	0.442	1.391	1.460	17.6
11	4 0	659320	288950	1260	2630	0.400	1.100	1.170	20.0
12	6 32	661320	292550	3260	6230	0.219	0.395	0.452	29.1
13	7 58	661600	287640	3540	1320	0.054	-0.952	0.953	176.7
14	8 42	660950	284400	2890	-1920	-0.246	-1.227	1.252	191.3

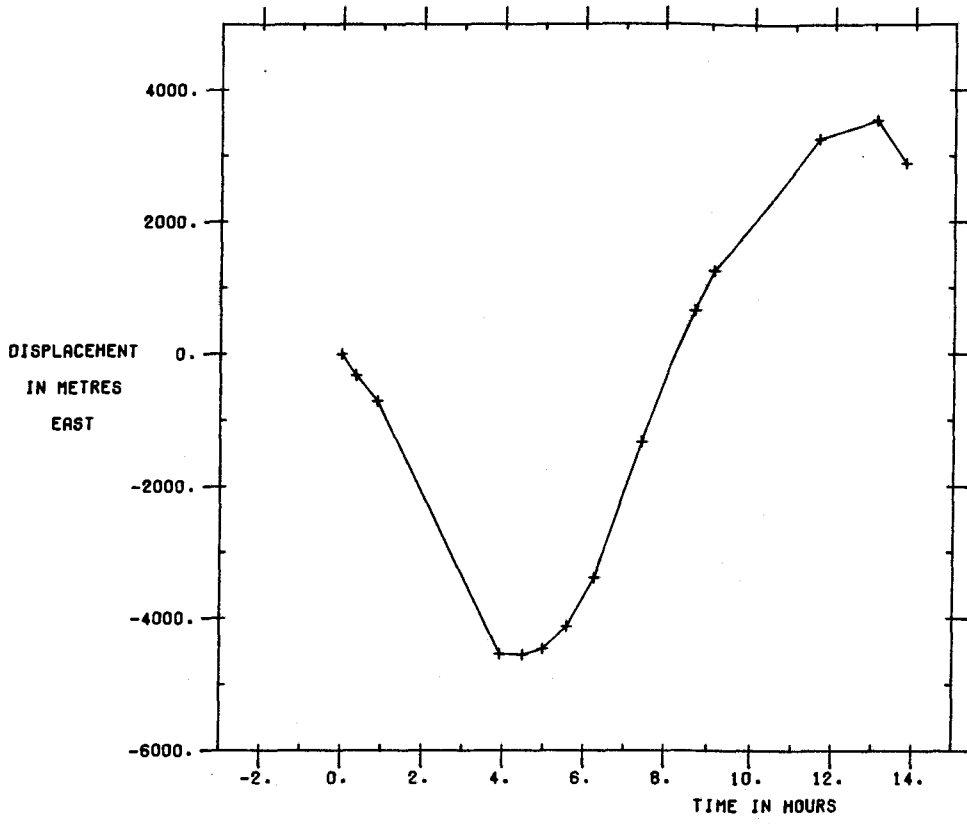
FLOAT RECOVERED 12:40 31/ 3/76



TIME AND DATE LAID=18:55 30/3/76

FLOAT DESIGNATION=10/5

SERIAL NO=344

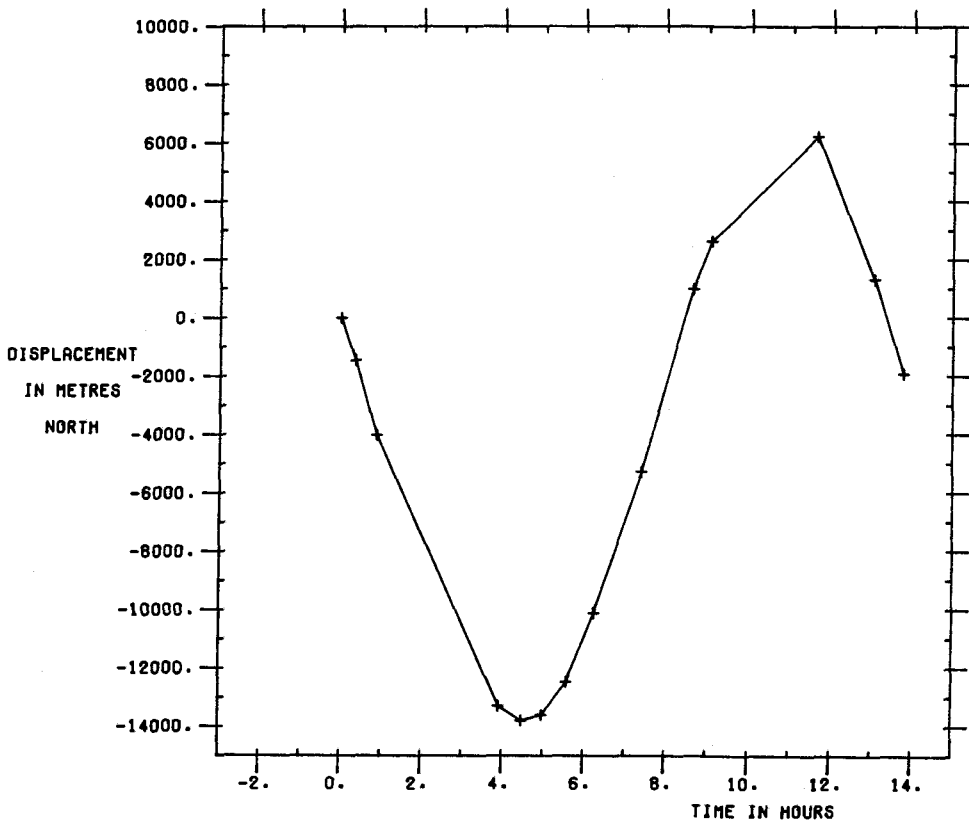


FLOAT DESIGNATION=10/5

SERIAL NO=344

TIME AND DATE LAID=18:55

30/3/76



FLOAT DESIGNATION=10/5

SERIAL NO=344

TIME AND DATE LAID=18:55

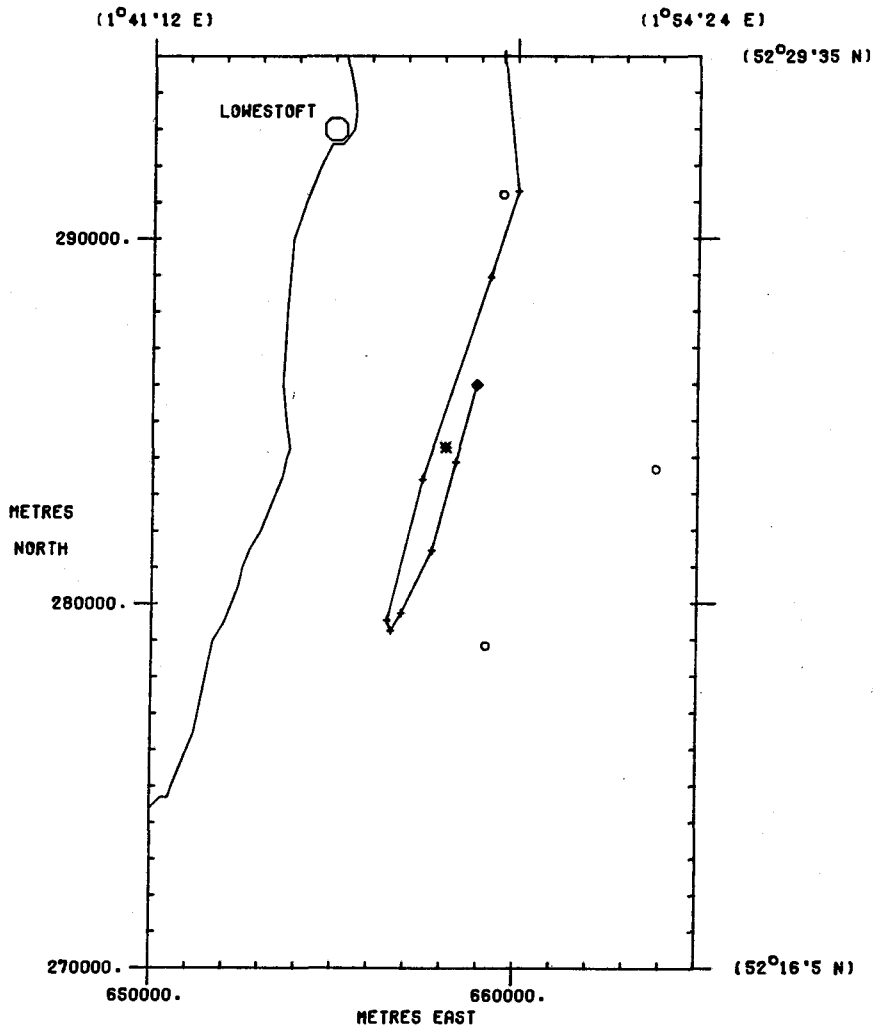
30/3/76

FLDAT DESIGNATION= 4/2 SERIAL NUMBER= 345
 TIME AND DATE LAID=20:50 30/ 3/76

POSITION LAID=658920,286000

FIX	TIME		POSITION		DISPLACEMENT		VELOCITY		SPEED (M/S)	DIRN DEG
	HR	MIN	E	N	E	N	E	N		
1	20	50	658920	286000						
2	21	20	658350	283880	-570	-2120	-0.317	-1.178	1.220	195.0
3	22	0	657710	281460	-1210	-4540	-0.267	-1.008	1.043	194.8
4	22	50	656880	279740	-2040	-6260	-0.277	-0.573	0.637	205.8
5	23	24	656590	279255	-2330	-6745	-0.142	-0.238	0.277	210.9
6	23	54	656490	279550	-2430	-6450	-0.056	0.164	0.173	341.3
7	1	10	657040	283400	-1480	-2600	-0.012	-0.047	0.048	193.9
8	2	20	659280	286950	360	2950	0.438	1.321	1.392	18.3
9	2	52	660020	291310	1100	5310	0.385	1.229	1.288	17.4
10	3	35	659610	295200	690	9200	-0.159	1.508	1.516	354.0

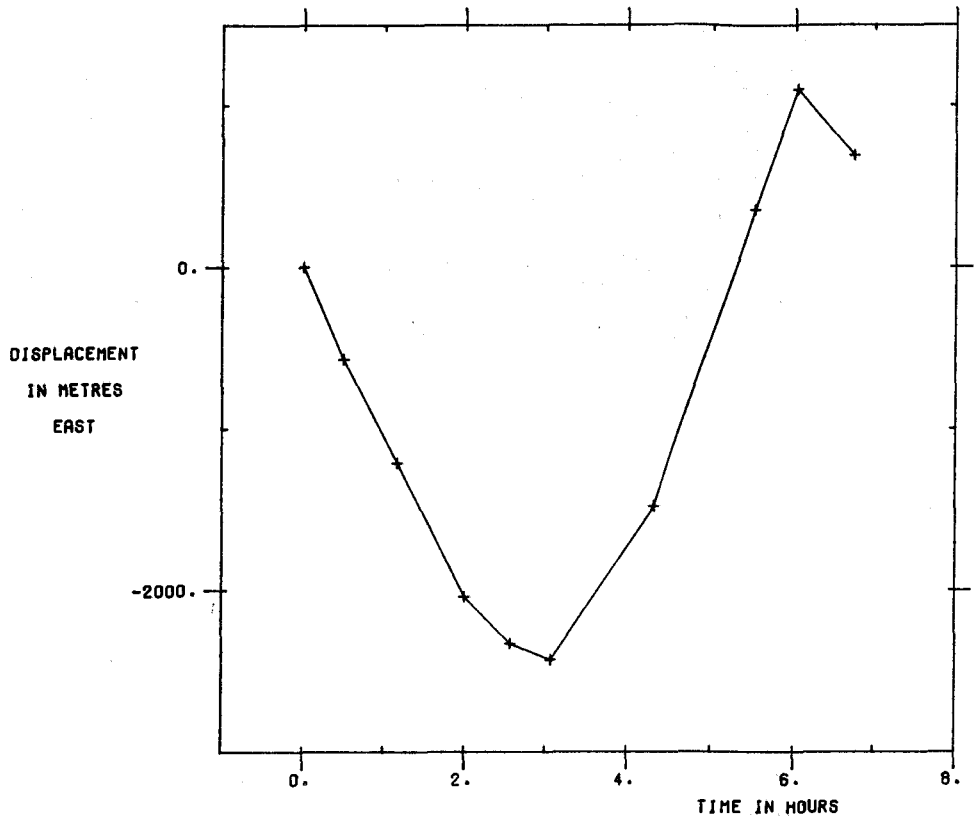
FLOAT RECOVERED 9:44 31/ 3/76



TIME AND DATE LAID=20:50 30/3/76

FLDAT DESIGNATION=4/2

SERIAL NO=345

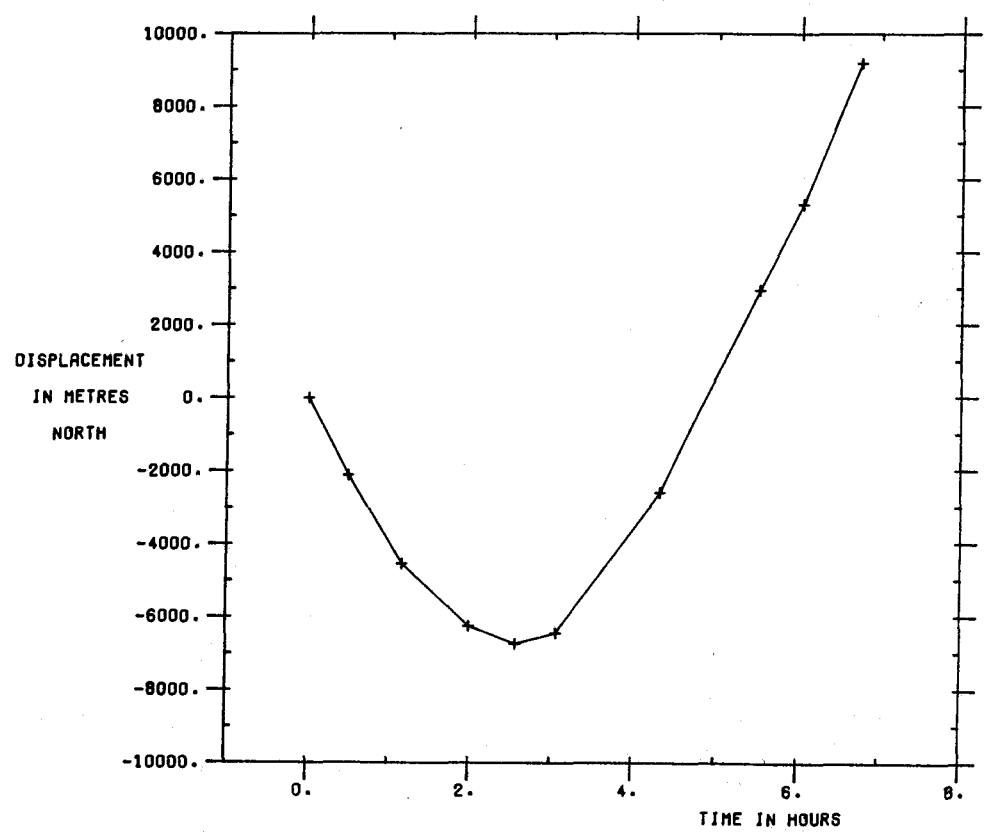


FLOAT DESIGNATION=4/2

SERIAL NO=345

TIME AND DATE LAID=20:50

30/3/76



FLOAT DESIGNATION=4/2

SERIAL NO=345

TIME AND DATE LAID=20:50

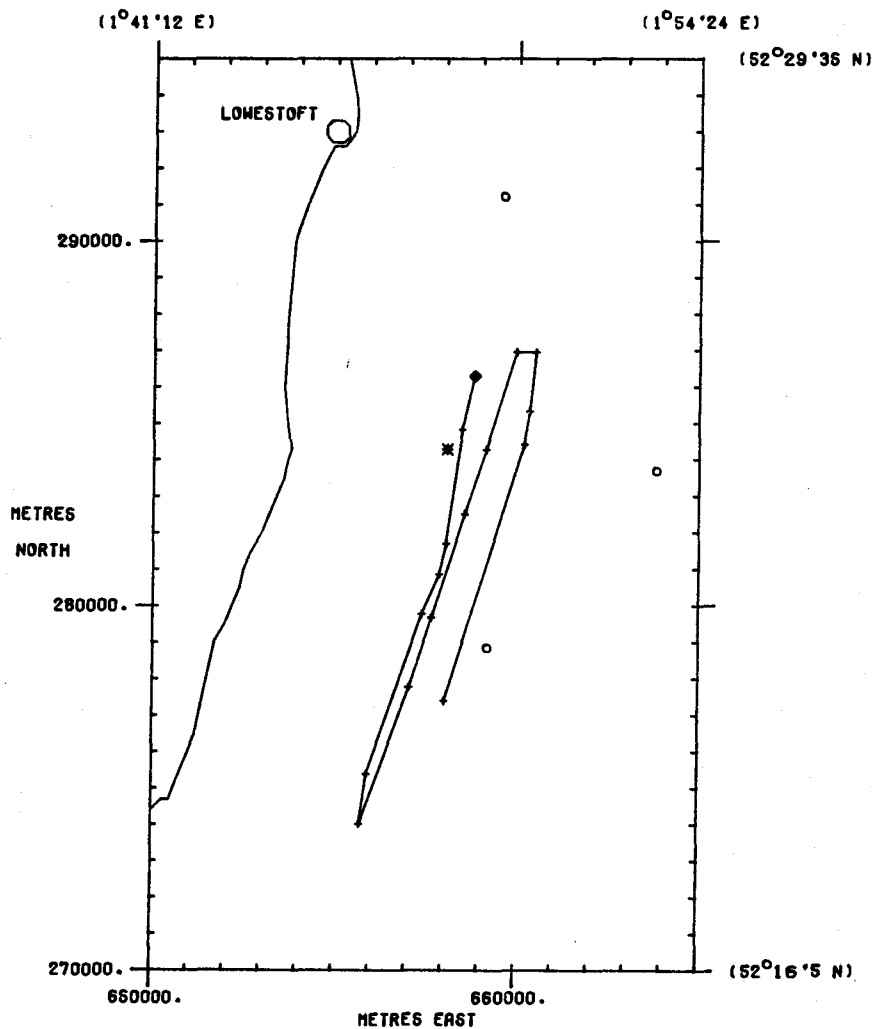
30/3/76

FLOAT DESIGNATION= 3/3

SERIAL NUMBER= 346
TIME AND DATE LAID=19: 2 31/ 3/76

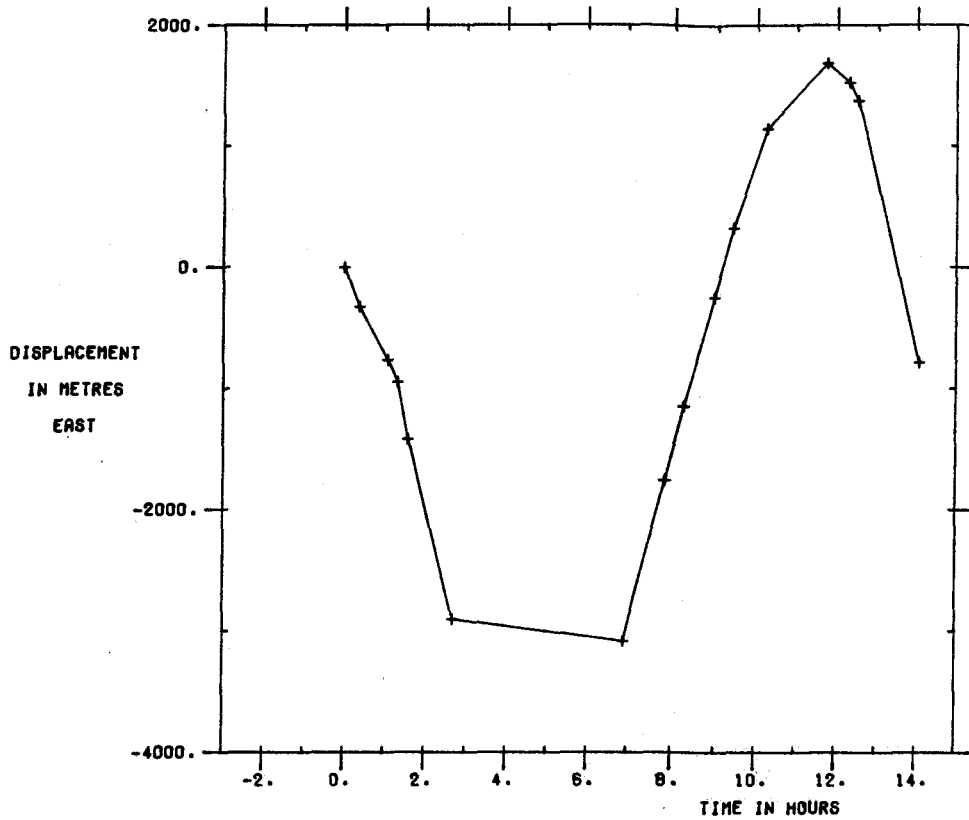
FIX	TIME	POSITION		DISPLACEMENT		VELOCITY		SPEED (M/S)	DIRN DEG
		E	N	E	N	E	N		
1	19 5	658825	286300						
2	19 27	658500	284840	-325	-1460	-0.246	-1.106	1.133	192.5
3	20 10	658060	281705	-765	-4595	-0.171	-1.215	1.227	188.0
4	20 24	657800	280865	-945	-5435	-0.214	-1.000	1.023	192.1
5	20 40	657410	279780	-1415	-6520	-0.490	-1.130	1.232	203.4
6	21 46	655920	275400	-2905	-10900	-0.376	-1.106	1.168	198.8
7	2 0	655740	274025	-3085	-12275	0.003	0.019	0.019	7.5
8	2 55	657070	277780	-1755	-8520	0.403	1.138	1.207	19.5
9	3 20	657680	279680	-1145	-6620	0.407	1.267	1.330	17.8
10	4 2	658580	282520	-245	-3780	0.357	1.127	1.182	17.6
11	4 30	659150	284280	325	-2020	0.339	1.048	1.101	17.9
12	5 20	659970	286960	1145	660	0.273	0.893	0.934	17.0
13	6 50	660510	286960	1685	660	0.100	0.	0.100	90.0
14	7 23	660350	285330	1525	-970	-0.081	-0.823	0.827	185.6
15	7 36	660200	284420	1375	-1880	-0.192	-1.167	1.182	189.4
16	9 9	658040	277400	-785	-8900	-0.387	-1.258	1.316	197.1

FLOAT RECOVERED 9: 9 1/ 4/76

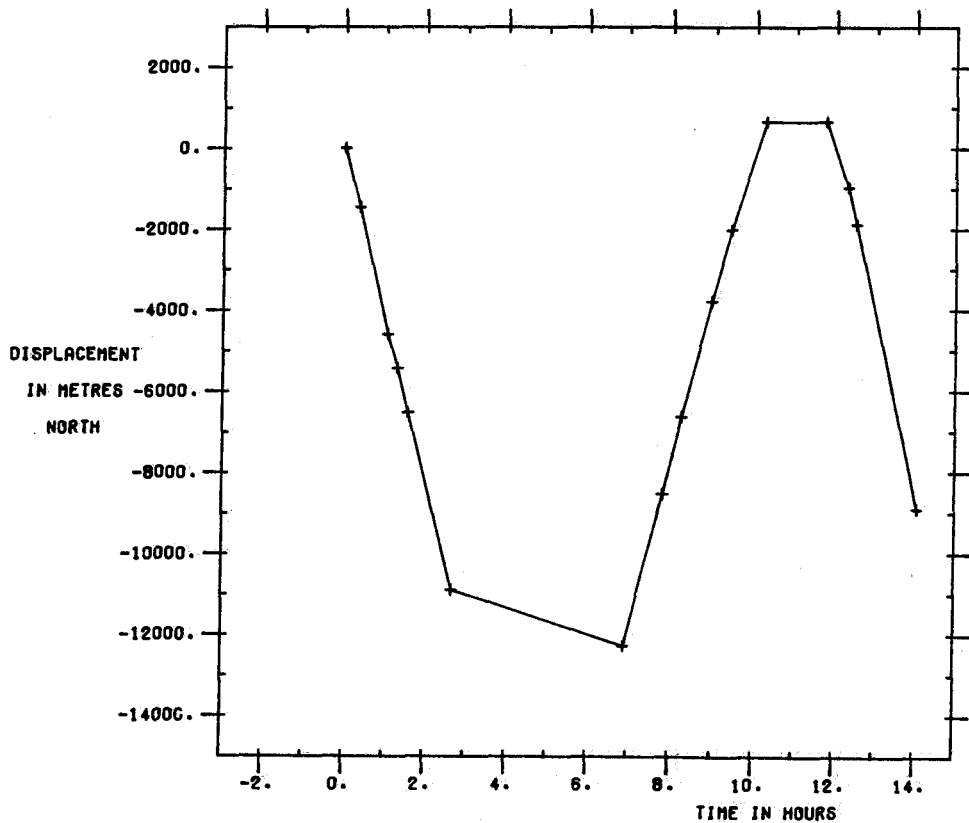


TIME AND DATE LAID=19:02 31/3/76
FLOAT DESIGNATION=3/3

TIME OF FIRST FIX=19: 5
SERIAL NO=346



FLOAT DESIGNATION=3/3
 TIME OF FIRST FIX=19: 5
 TIME AND DATE LAID=19: 2
 SERIAL NO=346
 31/3/76



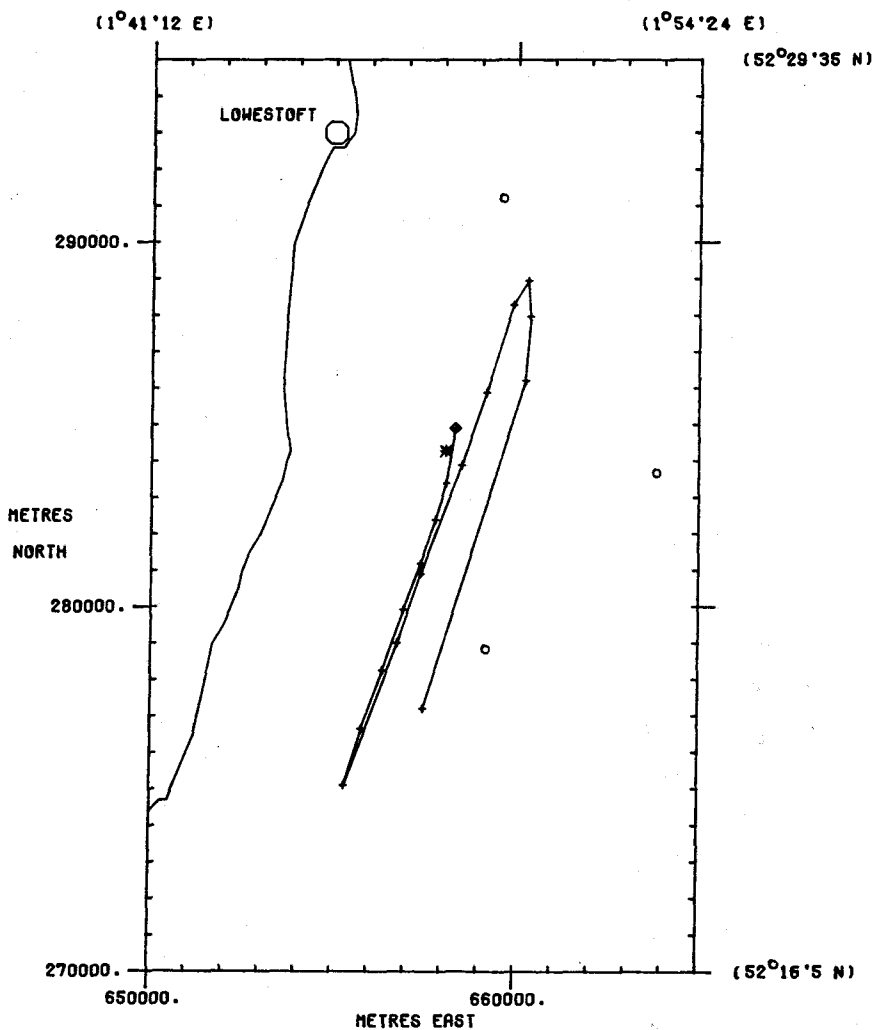
FLOAT DESIGNATION=3/3
 TIME OF FIRST FIX=19: 5
 TIME AND DATE LAID=19: 2
 SERIAL NO=346
 31/3/76

SERIAL NUMBER= 347

FLOAT DESIGNATION=16/3 TIME AND DATE LAID=19:27 31/ 3/76

FIX	TIME	POSITION		DISPLACEMENT		VELOCITY		SPEED (M/S)	DIRN DEG
		E	N	E	N	E	N		
1	19 49	658340	284920						
2	20 10	658100	283400	-240	-1520	-0.190	-1.206	1.221	189.0
3	20 24	657810	282400	-530	-2520	-0.345	-1.190	1.240	196.2
4	20 40	657410	281200	-930	-3720	-0.417	-1.250	1.318	198.4
5	20 58	656950	279940	-1390	-4980	-0.426	-1.167	1.242	200.1
6	21 22	656380	278270	-1960	-6650	-0.396	-1.160	1.225	198.8
7	21 46	655810	276670	-2530	-8250	-0.396	-1.111	1.180	199.6
8	2 0	655350	275110	-2990	-9810	0.006	0.022	0.023	16.4
9	2 55	656780	279020	-1560	-5900	0.433	1.185	1.262	20.1
10	3 20	657410	280920	-930	-4000	0.420	1.267	1.334	18.3
11	4 2	658520	283900	180	-1020	0.440	1.183	1.262	20.4
12	4 30	659180	285900	840	980	0.393	1.190	1.254	18.3
13	5 20	659900	288300	1560	3380	0.240	0.800	0.835	16.7
14	6 1	660300	288960	1960	4040	0.163	0.268	0.314	31.2
15	6 50	660370	287980	2030	3060	0.024	-0.333	0.334	175.9
16	7 23	660240	286220	1900	1300	-0.066	-0.889	0.891	184.2
17	9 22	657500	277215	-840	-7705	-0.384	-1.261	1.318	196.9

FLOAT RECOVERED 9:22 1/ 4/76

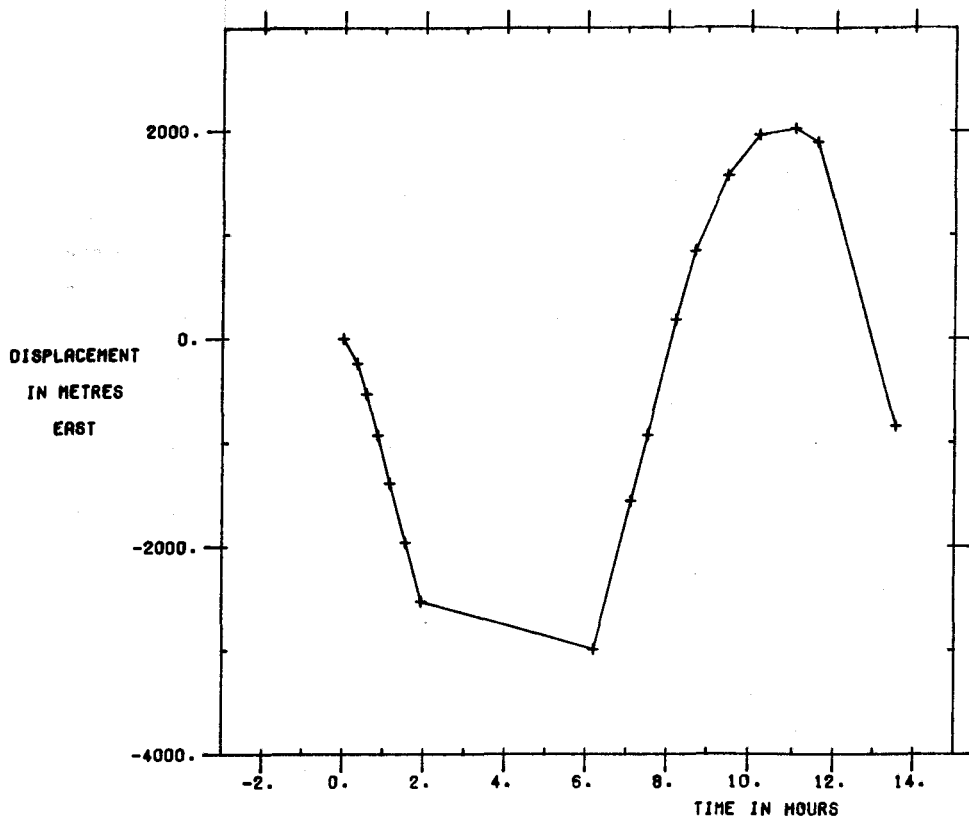


TIME AND DATE LAID=19:27 31/3/76

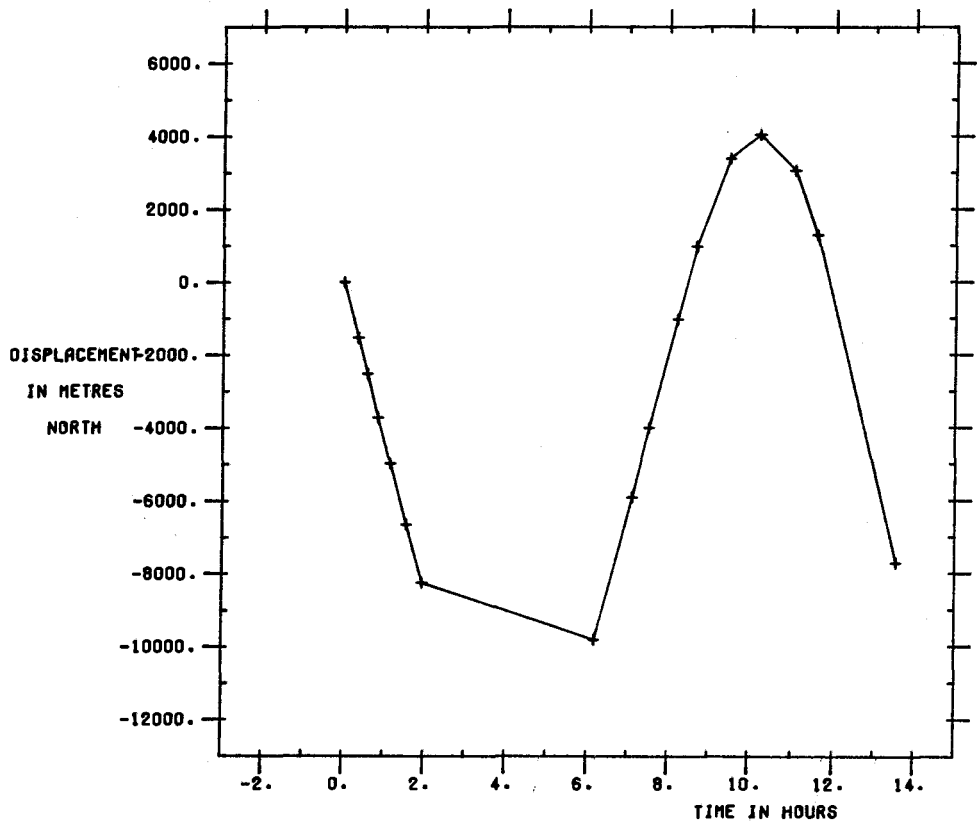
TIME OF FIRST FIX=19:49

FLOAT DESIGNATION=16/3

SERIAL NO=347



FLOAT DESIGNATION=16/3
 TIME OF FIRST FIX=19:49
 TIME AND DATE LAID=19:27
 SERIAL NO=347
 31/3/76



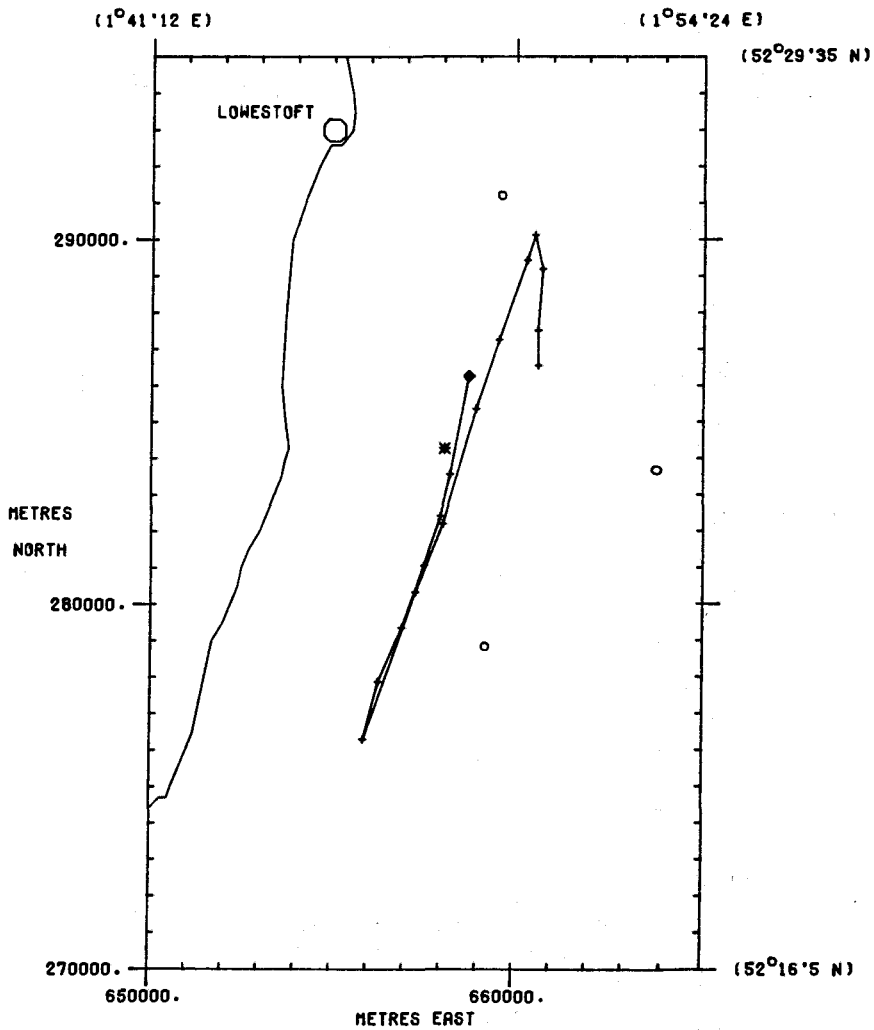
FLOAT DESIGNATION=16/3
 TIME OF FIRST FIX=19:49
 TIME AND DATE LAID=19:27
 SERIAL NO=347
 31/3/76

FLOAT DESIGNATION=10/6 SERIAL NUMBER= 348
 TIME AND DATE LAID=19:49 31/ 3/76

POSITION LAID=658725,286275

FIX	TIME	POSITION		DISPLACEMENT		VELOCITY		SPEED (M/S)	DIRN DEG
		E	N	E	N	E	N		
1	19 49	658725	286275						
2	20 24	658230	283580	-495	-2695	-0.236	-1.283	1.305	190.4
3	20 40	657960	282430	-765	-3845	-0.281	-1.198	1.230	193.2
4	20 58	657520	281080	-1205	-5195	-0.407	-1.250	1.315	198.1
5	21 22	656920	279360	-1805	-6915	-0.417	-1.194	1.265	199.2
6	21 46	656280	277880	-2445	-8395	-0.444	-1.028	1.120	203.4
7	2 0	655885	276305	-2840	-9970	0.006	0.022	0.023	14.1
8	2 55	657295	280350	-1430	-5925	0.427	1.226	1.298	19.2
9	3 20	658030	282220	-695	-4055	0.490	1.247	1.340	21.5
10	4 2	658930	285370	205	-905	0.357	1.250	1.300	15.9
11	4 30	659545	287270	820	995	0.366	1.131	1.189	17.9
12	5 20	660300	289440	1575	3165	0.252	0.723	0.766	19.2
13	6 1	660510	290130	1785	3855	0.085	0.260	0.293	16.9
14	6 50	660720	289200	1995	2925	0.071	-0.316	0.324	167.3
15	7 23	660605	287520	1880	1245	-0.058	-0.648	0.850	183.9
16	7 36	660620	286560	1895	285	0.019	-1.231	1.231	179.1

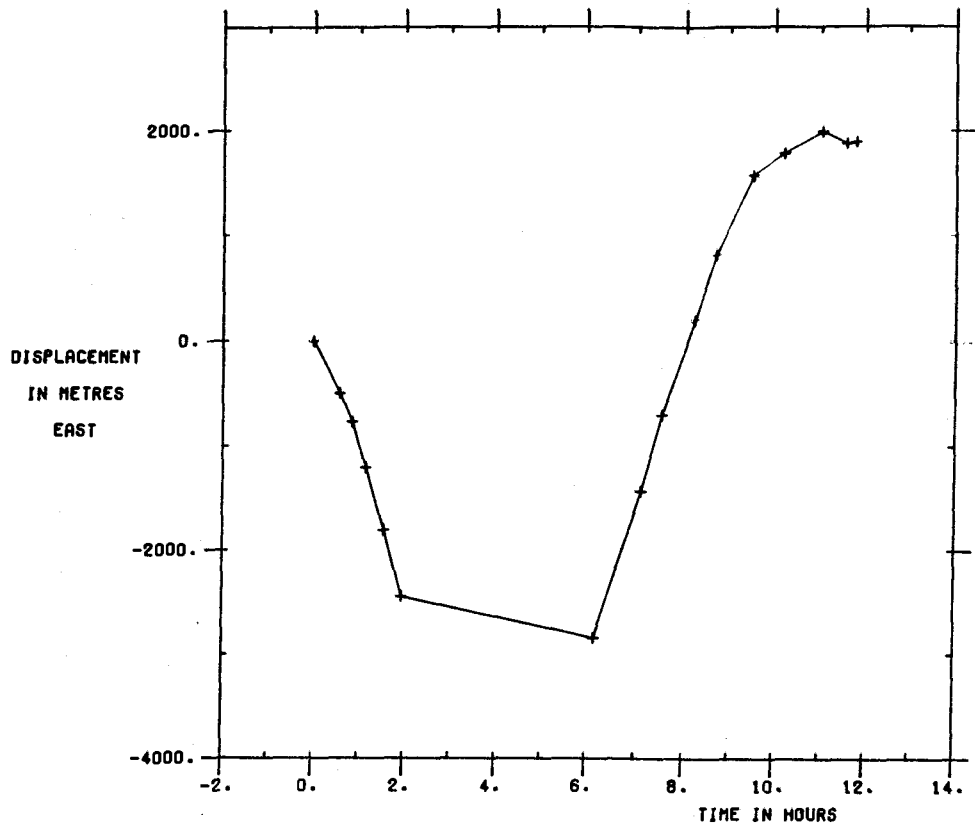
FLOAT RECOVERED 11:55 1/ 4/76



TIME AND DATE LAID=19:49 31/3/76

FLOAT DESIGNATION=10/6

SERIAL NO=348

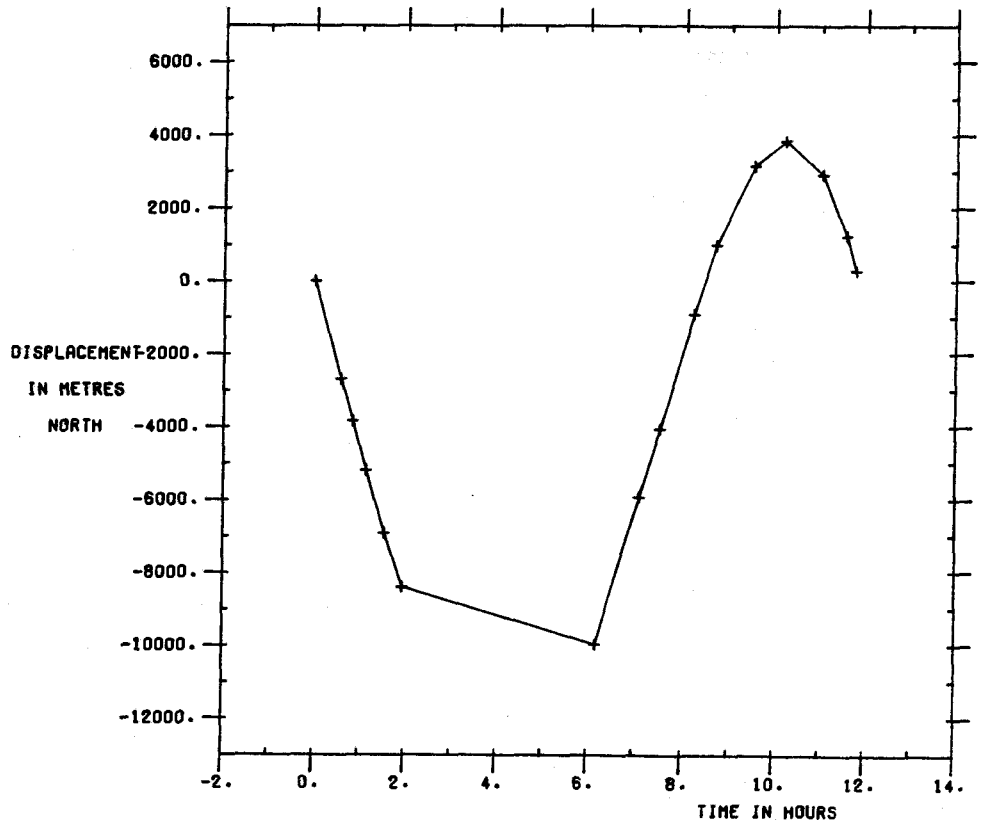


FLOAT DESIGNATION=10/6

SERIAL NO=348

TIME AND DATE LA10=19:49

31/3/76



FLOAT DESIGNATION=10/6

SERIAL NO=348

TIME AND DATE LA10=19:49

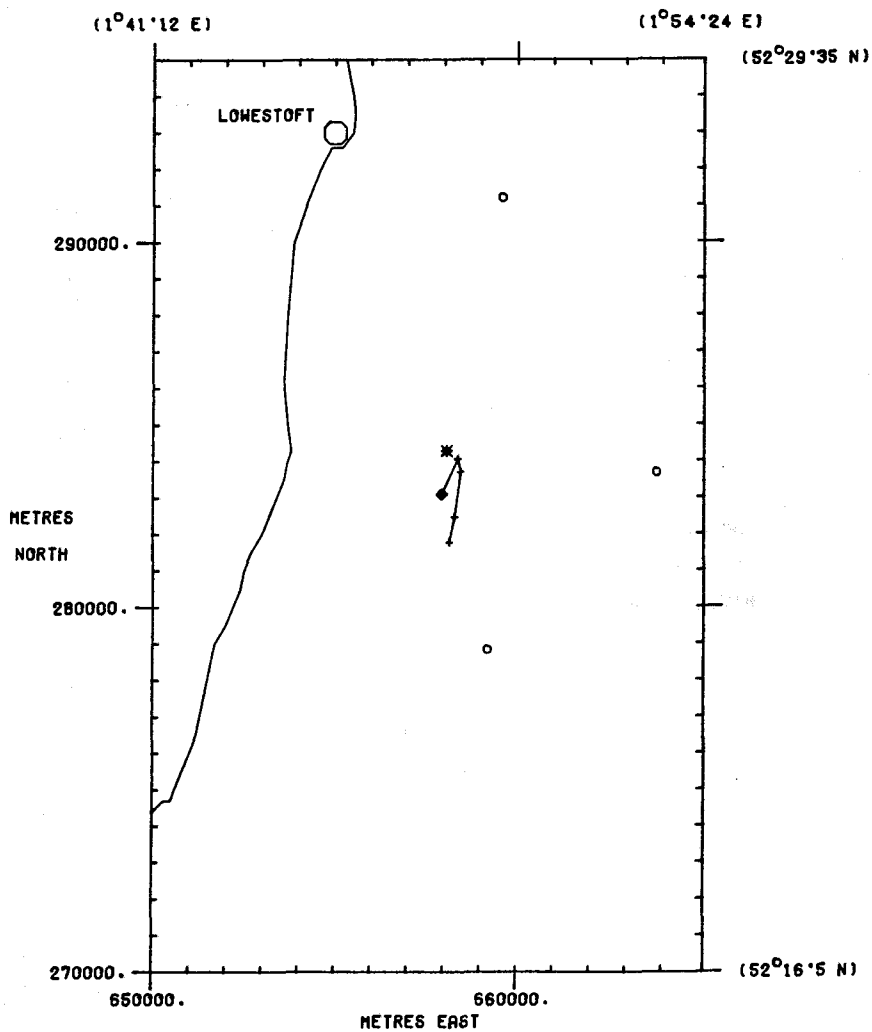
31/3/76

FLOAT DESIGNATION= B/5

SERIAL NUMBER= 349
 TIME AND DATE LAID= 5: 2 1/ 4/76

FIX	TIME	POSITION		DISPLACEMENT		VELOCITY		SPEED (M/S)	DIRN DEG
		HR	MIN	E	N	E	N		
1	5 20	657940	283100						
2	6 1	658380	284070	440	970	0.179	0.394	0.433	24.4
3	6 50	658460	283710	520	610	0.027	-0.122	0.125	167.5
4	7 23	658300	282470	360	-630	-0.081	-0.626	0.631	187.4
5	7 36	658160	281780	220	-1320	-0.179	-0.885	0.903	191.5

FLOAT RECOVERED 8:45 1/ 4/76



TIME AND DATE LAID=05:02 1/4/76

TIME OF FIRST FIX=5:20

FLOAT DESIGNATION=B/5

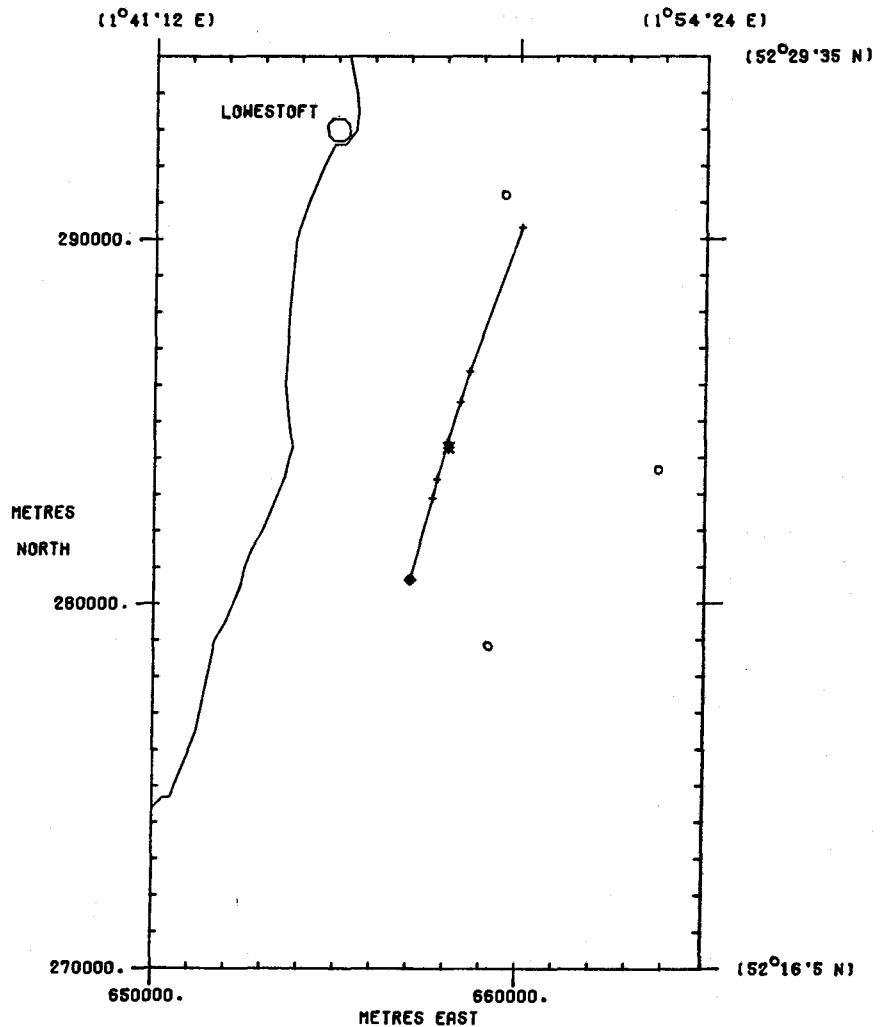
SERIAL NO=349

FLOAT DESIGNATION=10/7 SERIAL NUMBER= 350
 TIME AND DATE LAID=13:33 1/ 4/76

POSITION LAID=657040,280665

FIX	TIME	POSITION		DISPLACEMENT		VELOCITY		SPEED (M/S)	DIRN DEG
		E	N	E	N	E	N		
1	13 33	657040	280665						
2	14 10	657650	282905	610	2240	0.275	1.009	1.046	15.2
3	14 17	657770	283430	730	2765	0.286	1.250	1.282	12.9
4	14 30	658060	284440	1020	3775	0.372	1.295	1.347	16.0
5	14 44	658400	285540	1360	4875	0.405	1.310	1.371	17.2
6	14 54	658650	286380	1810	5715	0.417	1.400	1.461	16.6
7	15 44	660080	290325	3040	9660	0.477	1.315	1.399	19.9

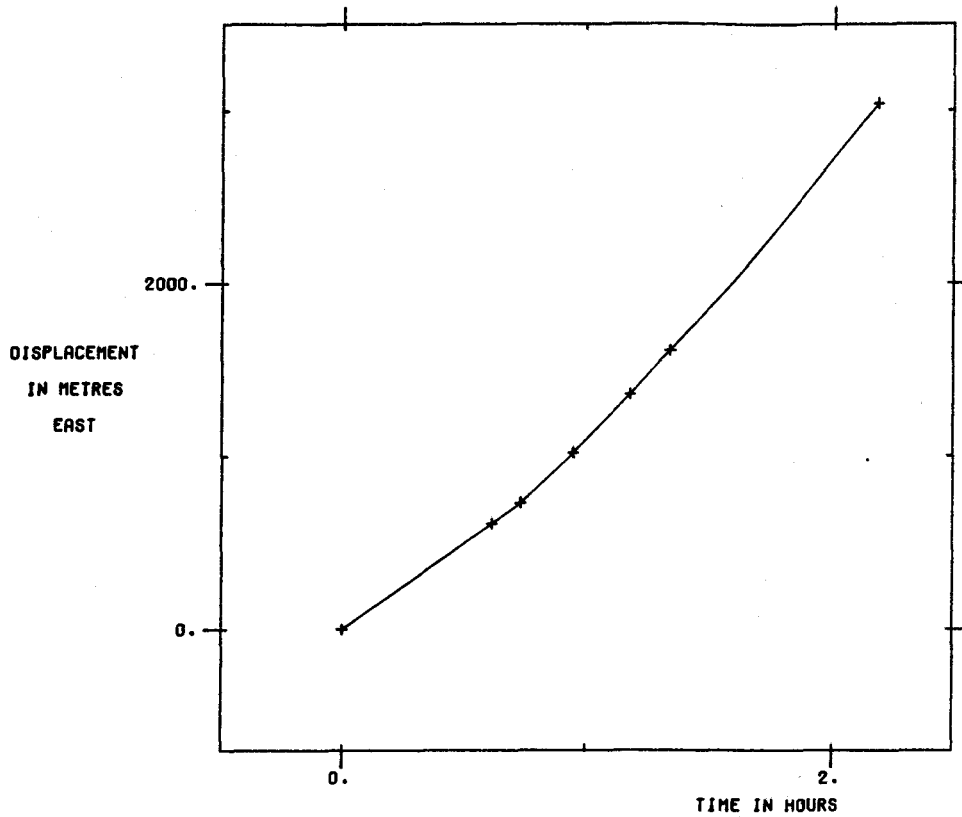
FLOAT RECOVERED 15:44 1/ 4/76



TIME AND DATE LAID=13:33 1/4/76

FLOAT DESIGNATION=10/7

SERIAL NO=350

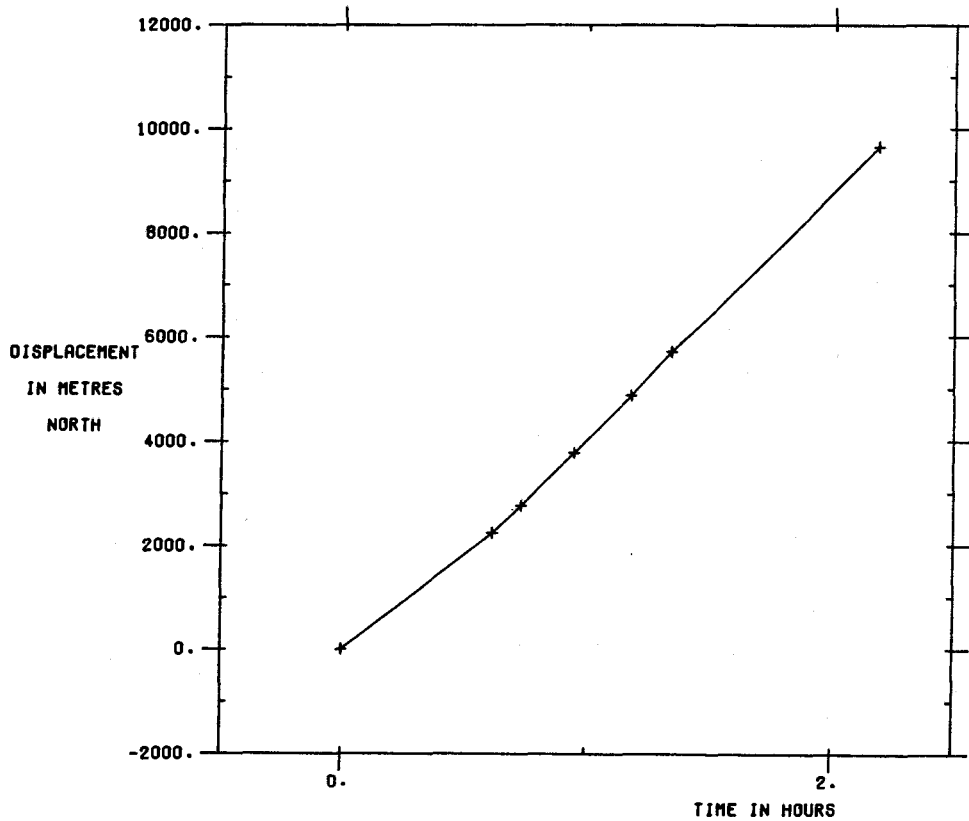


FLOAT DESIGNATION=10/7

SERIAL NO=350

TIME AND DATE LAID=13:33

1/4/76



FLOAT DESIGNATION=10/7

SERIAL NO=350

TIME AND DATE LAID=13:33

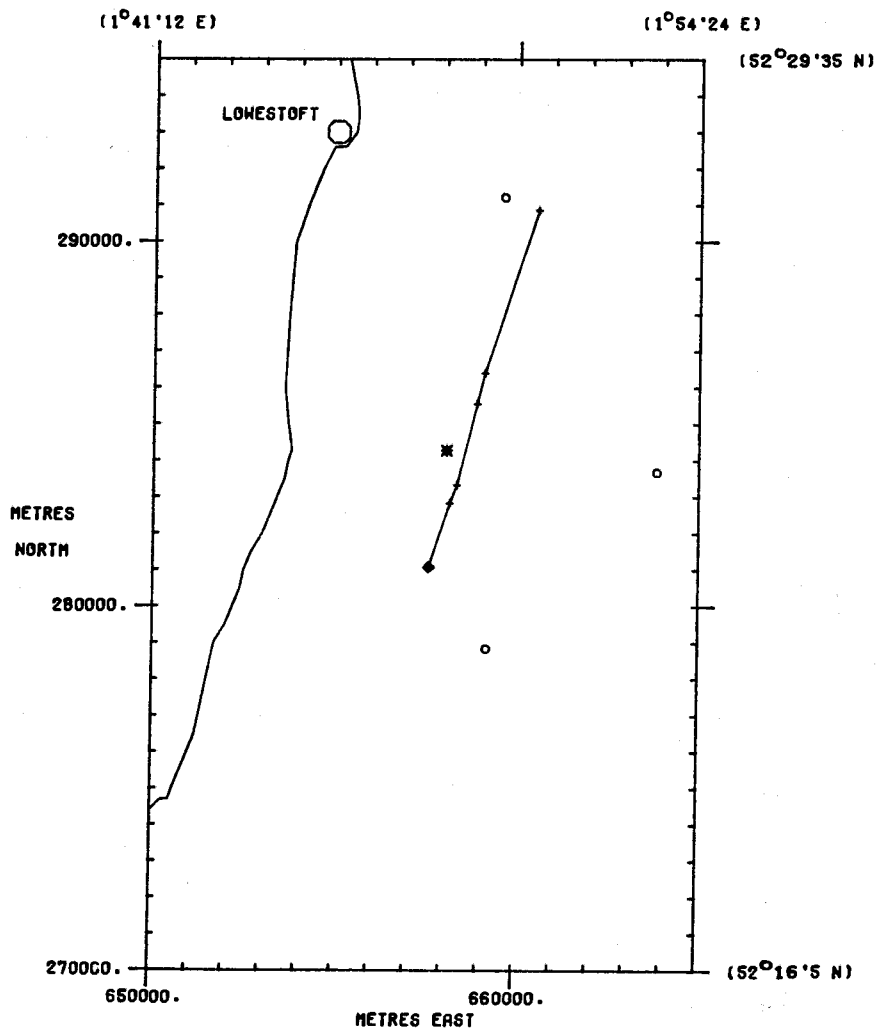
1/4/76

FLOAT DESIGNATION=16/4 SERIAL NUMBER= 351
 TIME AND DATE LAID=13:43 1/ 4/76

POSITION LAID=657600,281090

FIX	TIME	POSITION	DISPLACEMENT	VELOCITY	SPEED	DIRN		
	HR	MIN	E	N	E	N	(M/S)	DEG
1	13	43	657600	281090				
2	14	10	658170	282845	570	1755	0.352	1.083
3	14	17	658360	283340	760	2250	0.452	1.179
4	14	44	658905	285560	1305	4470	0.336	1.370
5	14	54	659105	286405	1505	5315	0.333	1.408
6	15	52	660550	290860	2950	9770	0.415	1.280

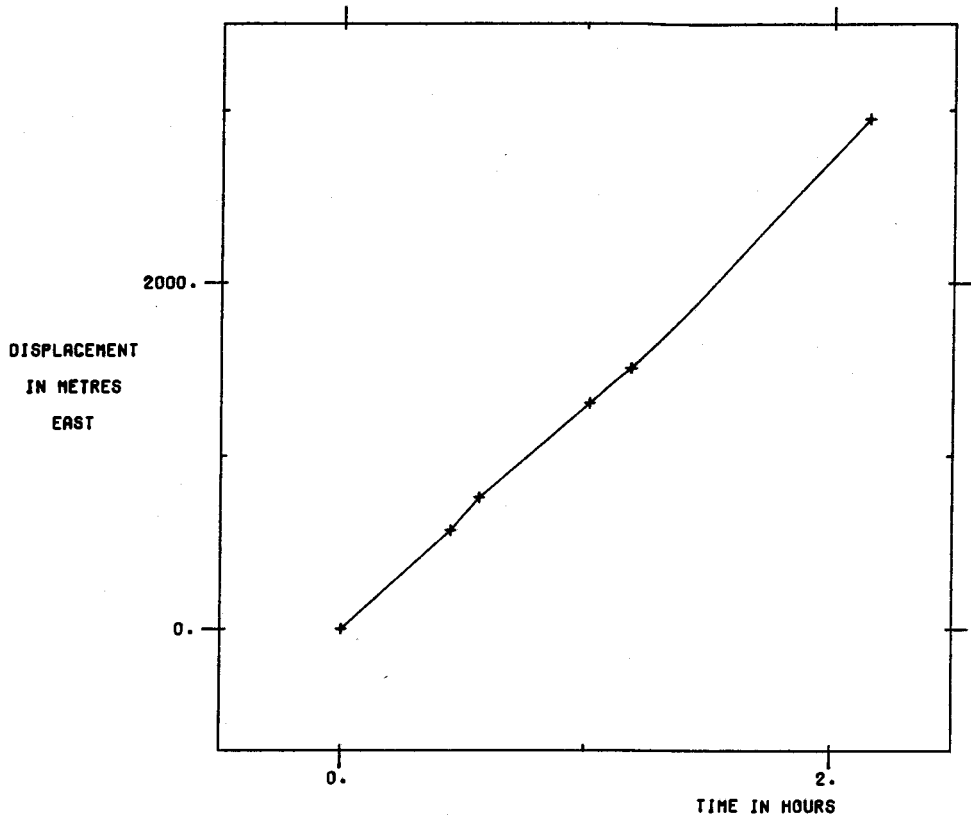
FLOAT RECOVERED 15:52 1/ 4/76



TIME AND DATE LAID=13:43 1/4/76

FLOAT DESIGNATION=16/4

SERIAL NO=351

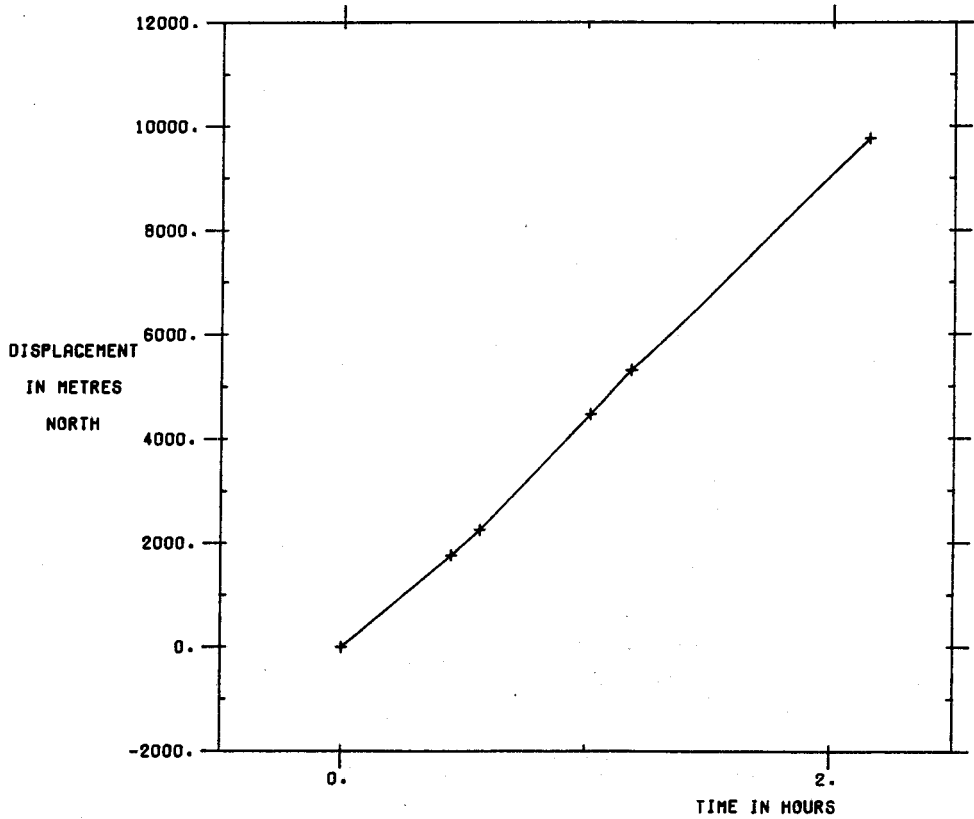


FLOAT DESIGNATION=16/4

SERIAL NO=351

TIME AND DATE LAID=13:43

1/4/76



FLOAT DESIGNATION=16/4

SERIAL NO=351

TIME AND DATE LAID=13:43

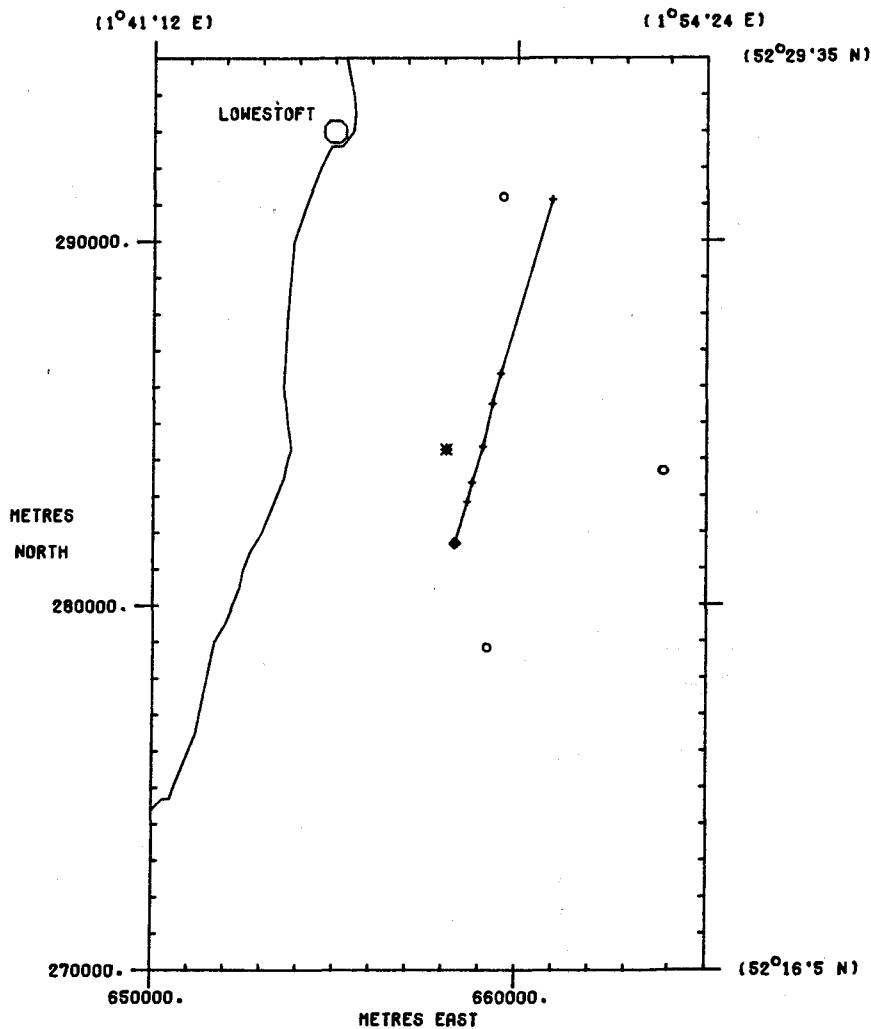
1/4/76

FLOAT DESIGNATION= 8/6 SERIAL NUMBER= 352
 TIME AND DATE LAID=13:53 1/ 4/76

POSITION LAID=658318,281710

FIX	TIME	POSITION		DISPLACEMENT		VELOCITY		SPEED (M/S)	DIRN DEG
		E	N	E	N	E	N		
1	13 53	658318	281710						
2	14 10	658650	282850	332	1140	0.325	1.118	1.164	16.2
3	14 17	658785	283380	467	1670	0.321	1.262	1.302	14.3
4	14 30	659075	284365	757	2655	0.372	1.265	1.316	16.4
5	14 44	659330	285550	1012	3840	0.304	1.411	1.443	12.1
6	14 54	659560	286375	1242	4665	0.385	1.375	1.427	15.6
7	15 57	660950	291135	2632	9425	0.368	1.259	1.312	16.3

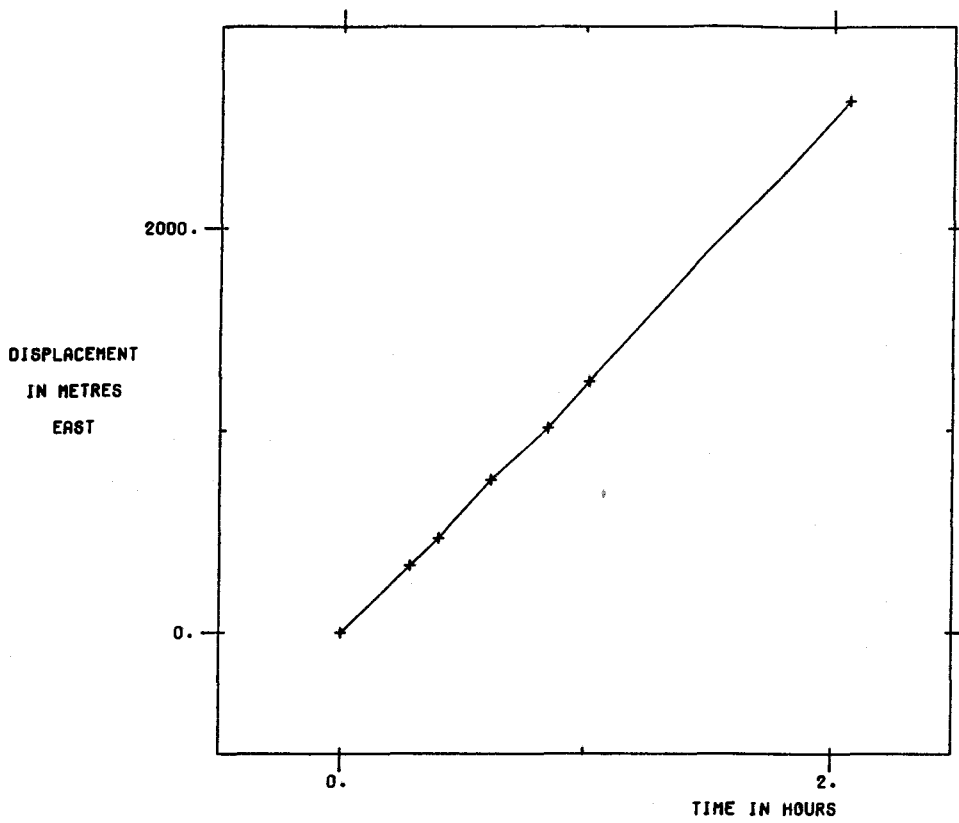
FLOAT RECOVERED 15:57 1/ 4/76



TIME AND DATE LAID=13:53 1/4/76

FLOAT DESIGNATION=8/6

SERIAL NO=352

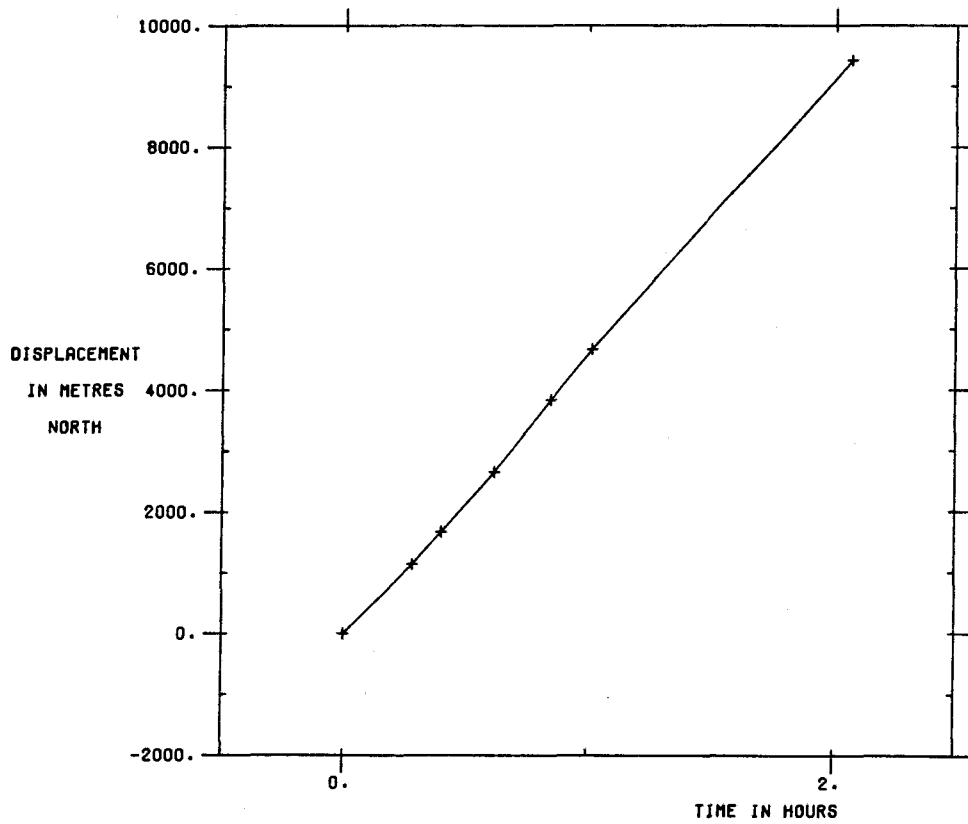


FLOAT DESIGNATION=8/6

SERIAL NO=352

TIME AND DATE LAID=13:53

1/4/76



FLOAT DESIGNATION=8/6

SERIAL NO=352

TIME AND DATE LAID=13:53

1/4/76

