I.O.S.

CRUISES UNDERTAKEN BY THE INSTITUTE OF OCEANOGRAPHIC SCIENCES TAUNTON

1981

CRUISE REPORT NO. 133
1982

NATURAL ENVIRONMENT RESEARCH COUNCIL

INSTITUTE OF OCEANOGRAPHIC SCIENCES

INSTITUTE OF OCEANOGRAPHIC SCIENCES

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INSTITUTE OF OCEANOGRAPHIC SCIENCES

TAUNTON

Cruises undertaken by the Institute of Oceanographic Sciences Taunton 1981

I.O.S. Cruise Report No. 133

1982

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Natural Environment Research Council

Institute of Oceanographic Sciences
Crossway, Taunton, Somerset. TA1 2DW

PROVISIONAL CRUISE REPORT

VESSEL: M.T. REUL NA MAIDNE

OWNER: D.B. MACLEOD
Oiteag na Mara,
Bruernish,
North Bay,
Barra,
Outer Hebrides,
Scotland.

Tel: North Bay (08715) 384

LOCATION: Waverider sites, West of S Uist, Hebrides.

CRUISE PERIOD: 1755 on 17/1/81 to 0400 on 18/1/81.

PERSONNEL:

J.D. Humphery	H.S.O. Senior Scientist
E.J. Moore	P. and T.O. III

OBJECTIVES:

To recover current offshore Waverider.
To deploy new Offshore Waverider on new mooring.
To perform survey lines to SW of Inshore Waverider position.
To investigate reasons for non-reception of Inshore Waverider at receiving station.

PROCEDURE AND METHODS:

17/1/81

Reul na Maidne sailed to Lochboisdale from North Bay, Barra, arriving 1700. Started loading 90 cm Waverider and mooring onto Reul na Maidne. Reeled lowering-wire onto trawl-winch and slung anchor-chain from after-gallows. Sailed from Lochboisdale at 1755.

Sailed for Offshore Waverider position via Sound of Barra, setting up complete mooring in calm water. Wind N 0-1.

Arrived at Offshore position, lifted old 70 cm Waverider with jilson; recovered rubbercord by hand and by using winch. Cut mooring below rubbercord-mooring lost.

Lowered new 90 cm Waverider over side by hand, paid out mooring while moving gently ahead. Dropped sub-surface float over side, ensuring that mooring did not foul. Paid out riser chain to end, then lowered anchor clump on wire rope from winch. When clump on bottom, moved slightly ahead and cut wire, allowing end to fall free and clear. Wind N 1, no sea, but swell 3-4 m from W. Deployment effected at 2129.

Steamed S to survey start-point. Performed echo-sounder survey NE towards Inshore Waverider position. Start of line at 2206. At Inshore Waverider approximately 2320, noted whip aerial missing.

Lifted Waverider onto deck, maintaining ship in position. Removed old aerial stub, fitted new whip aerial. Lowered Waverider into water, watched buoy as mooring accumulation was taken up.

Checked buoy-transmission on portable D/F receiver. Performed survey towards SW away from Inshore Waverider position, finishing at 0043 on 18.1.81. Returned to Lochboisdale via Sound of Barra, arriving approximately 0400. Unloaded equipment, and Reul na Maidne sailed for North Bay, Barra.

EQUIPMENT PERFORMANCE:

Old Offshore Waverider had been giving large intermittent deviations from the mean line - this is the reason why it was replaced. New Waverider was energised at 1457 on 17.1.81, and is clocked on every three hours. Transmission monitored OK at 1457 on 18.1.81. Buoy and mooring were prepared at IOS Taunton and deployment was achieved in about 3 minutes.

Old Inshore Waverider had lost its aerial (fibreglass whip had pulled out of brass end-fitting). Replacement aerial was fitted easily - transmissions thereafter were received at full strength.

Decca Navigator, Furuno radar and Furuno echo sounder on Reul na Maidne worked well throughout.

Note: Inshore Waverider was washed up on South Uist Beach near Drimsdale Rock on 20.1.81. Although the mooring appeared intact on releasing the Waverider, it must be assumed that severe mooring damage was caused during the lifting operation to replace the aerial.

ITINERARY:

17.1.81.

1700 Rendezvous with Reul na Maidne at Lockboisdale. Started loading equipment.
1755 Sailed for Waverider positions via Sound of Barra and Washington Channel.
2115 approximately. Old Offshore Waverider recovered.
2129 New Offshore Waverider deployed.
2205 Started echo-sounder survey NE towards Inshore Waverider position.
2311 End of first survey line.
2330 approximately. Replaced Inshore Waverider aerial.
2335 Redeployed Inshore Waverider
2341 Started second echo-sounder survey line towards SW from Inshore Waverider position.

18.1.81.

0043 End of second survey line. Started for Lochboisdale.
0400 approximately. Arrived Lochboisdale. Unloaded equipment. Reul na Maidne sailed for North Bay, Barra.

WEATHER

Weather forecasts and weather reports from Prestwick Meteorological Office had been monitored closely prior to a departure decision being made. At departure from Lochboisdale, calm conditions prevailed, outside a light Northerly air was blowing. Conditions

remained the same until about midnight when a SW breeze (~force 3) started to blow; this increased slowly but steadily to a full SW gale by midday following. A 3-4 m swell prevailed throughout the cruise period.

POSITIONS: Offshore Waverider

Decca chain 8E/MP (Hebridean)
Green D 32.30
Purple A 58.96
Time: 2129 on 17.1.81.
Depth: 48.7 m mid-tide

Inshore Waverider

Decca chain 8E/MP (Hebridean)
Green D 37.25
Purple A 53.6
Time: 2335 on 17.1.81.
Depth: 24 m approximately mid-tide

PREPARED BY: (J D HUMPHERY)

APPROVED BY: A P Salkield (A P SALKIELD)

DATE: 27/1/81

ECHO SOUNDER SURVEY, WEST OF SOUTH UIST, 17-18 January 1981

Echo Sounder - Furuno

Decca Navigator Mk 21

Station List. Run I, Decca Chain 8E/MP (Hebridean)

Fix	Time GMT	Green	Purple	Comments
1	2205	C 37.7	A 62.8	SOL
2	2208	C 38.4	A 62.4	
3	2211	C 38.1	A 61.9	
4	2214	C 39.8	A 61.6	
5	2217	C 40.7	A 61.4	
6	2220	C 41.5	A 60.9	
7	2223	C 42.4	A 60.6	
8	2226	C 43.3	A 60.3	
9	2229	C 44.2	A 59.8	
10	2232	C 44.8	A 59.5	
11	2235	C 45.6	A 59.1	
12	2238	C 46.2	A 58.8	
13	2241	C 46.8	A 58.5	
14	2244	C 47.7	A 58.0	
15	2247	D 30.3	A 57.5	
16	2250	D 30.9	A 56.8	Fix doubtful
17	2253	D 31.8	A 56.9	
18	2256	D 32.5	A 56.7	
19	2258	D 33.3	A 56.4	
20	2301	D 34.0	A 56.1	
21	2305	D 34.9	A 55.8	
22	2308	D 35.6	A 55.5	
23	2311	D 36.4	A 55.0	EOL

Station List. Run II, Decca Chain 8E/MP (Hebridean)

24	2341	D 37.2	A 53.8	SOL
25	2343	D 36.8	A 53.9	
26	2346	D 36.0	A 54.1	
27	2349	D 35.3	A 54.2	
28	2352	D 34.7	A 54.5	
29	2354	D 34.3	A 54.9	
30	2357	D 33.7	A 55.2	
31	2359	D 33.1	A 55.5	
32	0003	D 32.2	A 55.8	
33	0007	D 31.0	A 56.0	
34	0011	D 30.0	A 56.3	
35	0014	C 47.0	A 56.5	
36	0018	C 46.0	A 56.9	
37	0022	C 45.0	A 57.3	
38	0026	C 44.0	A 57.5	
39	0030	C 43.0	A 57.9	
40	0034	C42.0	A 58.4	
41	0038	C 41.0	A 58.9	
42	0043	C 40.0	A 59.6	EOL

Echo Sounder transducer depth approximately 3 m
Speed approximately 6 kt
Engine RPM = 800

Natural Enviroment Research Council

Institute of Oceanographic Sciences
Crossway, Taunton, Somerset. TA1 2DW

PROVISIONAL CRUISE REPORT

VESSEL: John Stephenson

OWNER: Cheverton Industrial and Marine Services Ltd, Whitegates Yard. Arctic Road, Cowes, Isle of Wight - Telephone: Cowes (0983) 297111

CRUISE LOCATION: West Solent

CRUISE PERIOD: 26-30 January 1981

PERSONNEL: D N Langhorne (Senior Scientist)
A D Heathershaw
E J Moore
P M Hooper
D J Corns

OBJECTIVES: To carry out a detailed survey of the different hydrodynamic bedforms (primarily gravel waves) on the south side of the West Solent, between Yarmouth and Hampstead Ledge.

PROCEDURE AND METHODS: Trisponder remote stations were set up on the yacht racing staging at the entrance to Lymington river (43485E, 93528N) and on the roof of the hut at the seaward end of Yarmouth pier (43543E, 90002N). Batteries were provided for the former whilst mains power was used for the latter.

The Raytheon echo sounder transducer and EG & G sidescan sonar fish were pole mounted on the starboard side of MV John Stephenson.

The survey craft was navigated using the Trisponder Track Plotter (scale: 1:5000)

EQUIPMENT PERFORMANCE: 1. Sidescan sonar: Good. Using the new hull mounted configuration it was possible to obtain good data to both port and starboard. The former transmitting beneath the vessel.

2. Echo sounder: Good.

3. Trisponder: Good. Minor interference occurred on the second day. Probably as a result of a second system operating in the area (?FSL Waterwitch). Remote No 3 was set up replacing No 2.

RESULTS: Good sonar records were obtained which showed the contrasting bedform morphology. Zones of long wavelength ($\simeq$ 15 m) short wavelength ($\simeq$ 5 m) gravel waves and featureless gravel with well defined boundaries were delineated.

ITINERARY: 25.1.81. E J Moore and PMH travelled to Lymington.

26.1.81. E J Moore: familiarization and boat instruction from Cowes. PMH: setting up Trisponder remote stations.

27.1.81. DNL, ADH and DJC to Lymington. PM: setting up equipment on board vessel in Lymington.

28.1.81. Echo sounding and sidescan sonar survey in West Solent.

29.1.81. Continuation of survey.

30.1.81. Operations delayed due to fog. PM: operations cancelled. Proceeded to Yarmouth, using radar, to recover Trisponder remote station. PMH: returned to Taunton in hired van. DJC: to Southampton by car. DNL, ADH and EJM: returned vessel to Cowes and thence by ferry to Southampton. Staff returned to Taunton.

Prepared by: D N LANGHORNE

Approved by: K R DYER

Date: 29.4.81

Natural Environment Research Council

Institute of Oceanographic Sciences
Crossway, Taunton, Somerset. TA1 2DW

PROVISIONAL CRUISE REPORT

VESSEL: MFV 777 'Devonian'

OWNER: John J McGuire
5 Swan Court
DARTMOUTH
Devon

Tel: Dartmouth (080 43) 3639

LOCATION OF WORK: Start Bay, Devon and Eddystone Rock

CRUISE PERIOD: 12-15 February 1981

PERSONNEL:

J D Humphery	HSO (Senior Scientist)
A J Marks	SSO
G N Crisp	HSO
E J Moore	P + TO IV
B M Norman	ASO

OBJECTIVES: To determine the float-track of a trial buoy for the SAR experimental buoy to be deployed in Start Bay in the summer of 1981. To perform in-date training dives. To replace the Eddystone Waverider.

PROCEDURES AND METHODS: 12.2.81 Loaded Waverider, spar buoy and associated equipment onto Devonian using new IOS(T) inflatable. Assembled spar buoy on deck, and lowered it over side while still at mooring in River Dart. Buoy sank. Made weight adjustments until buoy floated with only spar showing. Recovered buoy on board, and sailed for Start Bay at 1300.

Deployed spar buoy approximately 1 km NW of bell buoy; made several weight adjustments until approximately 60 cm of scaffold pole showed above surface. Allowed buoy to drift, plotting Decca positions periodically.

Recovered spar buoy with some difficulty at 1830, and returned to Dartmouth. Wind S 4-5, some chop. GNC returned to Taunton.

13.2.81 Sailed approximately 1000 into SE breeze 6-7. Steep seas in harbour entrance, 2 m sea and swell outside. Proceeded to position slightly sheltered by Start Point and Skerries Bank. Performed in-date training dive 1145-1210 in 21 m water. Returned to Dartmouth, as weather precluded any possibility of performing Eddystone Waverider work.

14.2.81 Sailed from Dartmouth 1000 after obtaining weather forecast of E 3-5, decreasing E 2-3 later at Eddystone, from Plymouth meteorological office. Assembled Waverider mooring on deck. Arrived at Eddystone Waverider station in good conditions

(wind E 2) at 1430. Tide completely slack on arrival. Lowered inflatable over side, loaded Waverider, diving equipment and divers. Moored inflatable to old Waverider. Used a line from a surface marker buoy to the Waverider mooring sub-surface float. Exchanged new Waverider and mooring for the old ones, and released the surface marker buoy. Returned to Devonian, recovered all equipment and sailed for Dartmouth, arriving 2200.

15.2.81 Rendezvous with Devonian 0900. Unloaded all equipment with inflatable, returned to IOS (T), arriving 1400.

EQUIPMENT PERFORMANCE:

Calculated weight required for spar buoy proved too great during trials in Dartmouth Harbour. Considerable weight adjustment was made. Buoy did not drift in direction or at rate anticipated; SE breeze might have upset neap tidal flow or drift characteristics of buoy.

The Waverider and mooring were prepared in the laboratory prior to departure, and assembled on deck during the run to the Eddystone. Recordings made since deployment have been satisfactory.

Radar, Decca Navigator and VHF Radiotelephone used on board Devonian performed satisfactorily.

ITINERARY:

12.2.81

0900 - Rendezvous with GNC and Devonian. Started to load equipment.

1300 - Sailed for Skerries Bank Bell Buoy.

1430 approx - Deployed spar buoy and made weight adjustments.

1830 - Recovered spar buoy, returned to Dartmouth.

1930 - Moored in Dartmouth.

13.2.81

1000 - Sailed for Skerries Bank.

1145 - Performed in-date dive.

1210 - Surfaced from dive; returned to Dartmouth.

1400 - Moored in Dartmouth.

14.2.81

1000 - Sailed for Eddystone.

1430 - Arrived Eddystone.

1630 - New Waverider deployed, old one recovered.

1730 - Sailed for Dartmouth.

2200 - Moored in Dartmouth.

15.2.81 0900 Rendezvous with Devonian. Unload all equipment with inflatable. Return to Taunton.

Prepared by: J D HUMPHERY

Approved by: A P SALKIELD

Date: 2/3/81

STATION LIST

Decca Chain IB/MP (SW British)

Fix	Time	Red	Purple	Comments
1	1540	B 9.54	B 59.35	First recorded position
2	1551	B 9.40	B 59.46	
	1555	-	-	Added more lead to buoy
3	1641	B 8.73	B 59.22	
4	1644	B 8.69	B 59.12	
5	1657	B 8.26	B 58.83	
6	1720	B 8.04	B 58.24	
7	1737	B 7.63	B 57.49	
8	1751	B 7.42	B 56.90	
9	1809	B 7.05	B 56.13	
10	1825	B 6.75	B 55.18	Buoy then recovered

Waverider Details: (Eddystone)

Waverider No:- 67042

Roofhatch No:- L-119

Sensitivity:- 1.816 Hz m^{-1} on 4.6.80

Position:- Decca Chain IB/MP (SW British)

Red	A	11.7
Green	C	46.85
Purple	A	71.72

Depth of Sub-surface float - 22 m (at high tide)

Water Depth: 43m

Frequency: 26.990 MHz

Date: 14.2.81

Time: 16.12

EDDYSTONE WAVERIDER DEPLOYMENT, FEBRUARY 1981

Buoy No:- 67042

Roofhatch No:- L-119

Calibration:- 4.6.80

Sensitivity:- 1.816 Hz m^{-1}

Position:- Decca Chain IB/MP (SW British)

Red	A	11.7
Green	C	46.85
Purple	A	71.72

Date deployed:- 14.2.81

Time deployed:- 1612 GMT

Frequency:- 26.990 MHz

Output meter reading:- 6.3

New batteries fitted:- 3.2.81

Battery voltage:- 20.6 and 20.7 V

Water depth:- 41 m mid tide

Natural Environment Research Council

Institute of Oceanographic Sciences
Crossway, Taunton, Somerset. TA1 2DW

PROVISIONAL CRUISE REPORT

VESSEL: MT Reul na Maidne

OWNER: D B Macleod, Oiteag na Mara, Bruernish, North Bay, Barra, Outer Hebrides, Scotland Telephone: North Bay (08715) 384

LOCATION: Waverider Sites, west of South Uist, Hebrides

CRUISE PERIOD: 0830-1900 on 1 March 1981

PERSONNEL: J D Humphery HSO (Senior Scientist)
R Gleason HSO

OBJECTIVES: To investigate poor performance of Offshore Waverider.
To recover old mooring from Inshore (II) site.
To deploy Inshore (III) Waverider.
To survey around Inshore (III) site as time and conditions permit.

PROCEDURE AND METHODS: Reul na Maidne sailed to Lochboisdale from North Bay, Barra, arriving 0830. Loaded new Inshore Waverider and mooring, and associated equipment. Sailed from Lochboisdale approximately 0900.

Prepared new Waverider and mooring while passing through Sound of Barra. Headed straight for Offshore Waverider position. Noted 2 (SMBA?) spar buoys approximately 1 km W and NW of Offshore Waverider.

Offshore Waverider had lost rubber fender, but paintwork was undamaged. Buoy floated with approximately 100 mm of lower hemisphere above surface, and was suffering considerable pitch, roll and spin motions in the short sea. Aerial was tight in its socket, and undamaged, and a wavemeter test indicated considerable radiated power during 1200 hours transmission period. Buoy was left on mooring since no replacement had been brought.

Headed for old Inshore (II) position. Found and recovered old 'buoyant chain' mooring. Anchor had lost stock. Mooring had failed because rubber cord had pulled out of end-fitting. Steamed to new Inshore (III) position.

Lowered buoy over side by hand, paid out rubber cord and chain with trawlfloats. Lowered 50 kg fisherman's anchor to bottom on rope bight, recovered rope by winch and by hand. Noted depth, time and Decca position.

Steamed approximately 1 km N of Inshore (III) positon, performed box survey to N, W and S of buoy. Returned to buoy, and surveyed due W (magnetic) to a point approximately SE of Offshore buoy.

Monitored 1500 hours transmission from Offshore buoy with radio direction finder - received satisfactorily.

Sailed for Lochboisdale, via Sound of Barra, arriving approximately 1830. Unloaded equipment; Reul na Maidne sailed for North Bay, Barra.

EQUIPMENT PERFORMANCE: Transmissions from Offshore Waverider were only occasionally being received at the Range Control Building, despite the buoy being fitted with a transmitter-output amplifier. This was due to heavy long-range interference signals producing 2-20 μV of noise at the receiver during the day. Those transmissions received satisfactorily produced a straight line down the centre of the chart, with occasional long-period variations and violent deviations from the mean line. These faults have not been identified. Short-range transmissions (up to about 2 km) were received on the OAR hand-held direction finder during the cruise period, but even these were subject to interference.

The Inshore (II) mooring failed because the rubber cord had pulled out of the lower end fitting during or shortly after the service visit on 17 January 1981. Anchor-stock was found to be missing on mooring recovery.

Inshore (III) Waverider and mooring had been prepared at IOS Taunton prior to departure, and were assembled on deck during passage through the Sound of Barra. Buoy and mooring laid without trouble, and good signals were received at the RA Range Control Building later. Furuno radar, Decca Navigator and Furuno echo-sounder all worked satisfactorily during cruise period.

ITINERARY: 1.3.81

0830: Rendezvous with Reul na Maidne at Lochboisdale. Loaded equipment.

0900: Departed Lochboisdale for Offshore Waverider position.

1200: Alongside Offshore Waverider. Checked buoy. Sailed for Inshore (II) position.

1300 approx: Recovered Inshore (II) mooring. Sailed for Inshore (III) position.

1332: Laid Inshore (III) Waverider.

1350: Commenced survey.

1522: Finished survey, sailed for Lochboisdale.

1830 approx: Arrived Lochboisdale, unloaded equipment; Reul na Maidne sailed for Barra.

WEATHER: Forecasts were obtained from Benbecula and Prestwick meteorological offices on 28 February 1981 and from Prestwick at 0550 on 1 March 1981 prior to sailing. Forecasts generally 4-6 ENE to SE. However at 0600 on 1.3.81. wind blew E4. During work on west side, wind ENE 4, slight sea, no swell. No difficulty experienced coming alongside Waveriders and moorings, and there was little ship motion to reduce value of echo-sounding traces. However on return trip to Lochboisdale from Sound of Barra, wind NE 6 with steep seas approximately 1.5-2m.

POSITIONS: Inshore (II) mooring recovered from position:-

Decca Chain 8E/MP (Hebridean)
Green D 37.2
Purple A 53.6
Time and date: 1300 on 1.3.81.

Inshore (III) Waverider laid in position:-

Decca Chain 8E/MP (Hebridean)
Green D 31.40
Purple A 53.42
Time and date: 1332 on 1.3.81.

Depth - 24.9 m approximately, mid-tide

Prepared by: J D Humphery J D HUMPHERY

Approved by: A P Salkield. A P Salkield

Date: 26.3.81

ECHO SOUNDER SURVEY W OF SOUTH UIST, 1 March 1981

Vessel: Reul na Maidne
Echo Sounder: Furuno
Decca Navigator Mk 21
Decca Chain 8E/MP (Hebridean)

Station List

Fix	Time (GMT)	Green	Purple	Course °magnetic	Comments
1	1350	D 32.97	A 53.09	-	SOL
2	1352	D 32.99	A 53.20	310	
3	1354	D 33.12	A 53.40	311	
4	1357	D 33.22	A 53.66	300	
5	1359	D 33.26	A 53.80	303	
6	1401	D 33.27	A 54.00	297	
7	1402	D 33.30	A 54.20	304	
8	1404	D 33.32	A 54.40	298	
9	1405	D 33.35	A 54.50	-	Turning to Port End Run 1
10	1406	D 33.10	A 54.63	186	Run 2
11	1407	D 32.70	A 54.66	178	
12	1409	D 32.30	A 54.65	176	
13	1410	D 32.00	A 54.63	181	
14	1412	D 31.60	A 54.62	181	
15	1413	D 31.30	A 54.61	179	
16	1413	D 30.94	A 54.60	180	
17	1415	D 30.60	A 54.60	183	
18	1416	D 30.30	A 54.61	182	
19	Fix does not exist. Purple lane rolling				
20	1418	C 47.50	A 54.74	182	Turning to Port End Run 2
21	1420	C 47.12	A 54.71	118	Run 3
22	1422	C 47.00	A 54.50	121	
23	1424	C 46.90	A 54.30	121	
24	1425	C 46.83	A 54.10	122	
25	1427	C 46.74	A 53.90	120	
26	1429	C 46.65	A 53.70	119	
27	1431	C 46.58	A 53.50	121	
28	1433	C 46.45	A 53.30	119	Turning to Port End Run 3
29	1436	C 46.90	A 53.29	009	Run 4
30	1438	C 47.30	A 53.33	020	
31	1439	C 47.60	A 53.35	025	
32	1440	D 30.00	A 53.36	027	
33	1442	D 30.50	A 53.38	029	
34	1443	D 30.80	A 53.40	029	
35	1444	D 31.00	A 53.39	019	Turning to Port End Run 4
36	1445	D 31.37	A 53.43	-	Run 5. Passing I/S Waverider 50 m to Port
37	1447	D 31.15	A 53.60	271	
38	1449	D 30.95	A 53.80	263	
39	1451	D 30.72	A 54.00	269	
40	1453	D 30.58	A 54.20	267	

Fix	Time (GMT)	Green	Purple	Course °magnetic	Comments
41	1455	D 30.40	A 54.40	275	
42	1457	D 30.27	A 54.60	265	
-		Purple lane rolling		265	
43	1500	D 30.00	A 54.82	263	Fix suspect
44	1501	C 47.86	A 55.20	265	
45	1503	C 47.67	A 55.40	270	
46	1505	C 47.44	A 55.60	275	
47	1507	C 47.24	A 55.80	270	
48	1509	C 47.05	A 56.00	275	
49	1511	C 46.92	A 56.20	270	
50	1514	C 46.72	A 56.40	270	Purple lane rolling
51	1516	C 46.56	A 56.80	270	Purple lane rolling
52	1517	C 46.48	A 57.00	265	
53	1518	C 46.40	A 57.20	270	
54	1519	C 46.32	A 57.50	270	
55	1520	C 46.27	A 57.60	270	
56	1521	C 46.18	A 57.80	265	
57	1522	C 46.06	A 58.00	280	End Run 5

ABRIDGED DETAILS OF HEBRIDES VISIT FEBRUARY/MARCH 1981

Waverider Deployment:

Buoy No 67201	Calibrated 13 November 1979
Sensitivity:	1. 826 Hz m^{-1}
Position:	57° 17' 30" N 07° 29' 12" W
Decca readings:	Chain 8E/MP (Hebridean)
	Green D 31.40 Purple A 53.42
Date laid:	1 March 1981
Time laid:	1322
Depth:	24.9 m mid-tide
Distance to receiver:	9.8 km approximately
Frequency:	26.990 MHz
Output meter reading:	7.5 on buoy
Battery voltages:	20.4 and 20.4 on 1 February 1981
Personnel:	J D Humphery; R Gleason

Receiving system calibrations:

Inshore system:

Eddystone Receiver No	964/7C/409
Working to:	Microdata logger 1036 (2-channel)
System calibrated:	2 March 1981
Sensitivity:	-64 Hz^{-1}
Unlocked Display:	-0000
Logged readings prefixed by:	-
Microdata display channel:	6

Deepwater system:

Eddystone Receiver No	964/7C/458
Working to:	Microdata logger 1036 (2-channel)
System calibrated:	2 March 1981
Sensitivity:	-64 Hz^{-1}
Unlocked Display:	+ 0000
Logged readings prefixed by:	+
Microdata display channel:	5

Offshore system:

Eddystone Receiver No	964/7C/553
Working to:	Microdata logger 1029 (single channel)
System calibrated:	2 March 1981
Sensitivity:	-64 Hz^{-1}
Unlocked display:	-0000
Logged readings prefixed by:	-
Microdata display channel:	6

Natural Environment Research Council

Institute of Oceanographic Sciences
Crossway, Taunton, Somerset. TA1 2DW

PROVISIONAL CRUISE REPORT

VESSEL: MV WESSEX EXPLORER (Wessex Water Authority)

CRUISE PERIOD: 15-20 March 1981

PERSONNEL:

Dr A D Heathershaw (Senior Scientist)	15-20 March
Mrs D J Corns	15-17 and 19-20 March
Mr A A Read	15-17 March
Mr P M Hooper	15-17 March
Mr D N Langhorne	18-20 March
Mr E J Moore (Diving Officer)	18-20 March
Mr B M Norman	18-20 March
Mr A J Marks	18-20 March
Mr P Bird	18-20 March

OBJECTIVES: In connection with a study of the mobility of sea-bed gravels in the W Solent area (DOE Commission, Project No S26) to carry out the following:

(a) routine sediment sampling at various locations (see attached copy of Admiratly Chart L(DI) 2040) to establish possible relationships between bedforms and gravel characteristics;

(b) at selected sites to carry out comparisons of Shipek grab samples and those obtained by divers.

PROCEDURE AND METHODS: Following echo sounding and sidescan sonar observations of gravel wave bedforms in the W Solent in January 1981, routine sediment sampling was carried out in the survey area using a Shipek grab operated from a gantry on the stern of the 'Wessex Explorer'. Position fixing was accomplished using a Decca Trisponder system with units set up on the end of Yarmouth Pier and the Royal Lymington Yacht Club staging at the entrance to the Lymington River. The receiver on the boat was mounted within approximately 1.5 m of the gantry.

At selected sites comparisons were made between samples collected by divers and those obtained with the Shipek grab. For this work the ship was anchored about 1 hour before slack water. Five closely spaced grab samples were then taken and a sinker and marker buoy dropped in the immediate vicinity of these samples. The ship then weighed anchor and on the slack water sediment samples were collected by divers swimming down a rope to the sinker weight. At each site a total of five diver samples were collected with a small plastic scoop and each sample placed in a plastic bag before being brought to the surface. The scoop volume was similar to that of the Shipek grab although the scoop gave greater penetration into the sediments.

EQUIPMENT PERFORMANCE:

All sediment sampling and position fixing equipment operated satisfactorily although in some cases several attempts were needed to obtain a good sample with the Shipek grab. No difficulty was experienced with the diving operations or with any of the diving equipment.

RESULTS:

A total of 167 sediment samples were obtained in the survey area of which 17 were collected by divers. Initial results suggest that there may be some correlation between sediment size and bedforms with coarse gravel deposits being associated with large bedforms and smaller to medium side size gravels being found on the smaller gravel waves.

The diver samples showed very clearly that the sea-bed in this area was armoured by a layer of gravel overlying a more erodable fine to coarse sand substrate. In general the diver samples showed a much higher proportion of fine sediments than the grab samples although the latter, presumably taking a surface skim, probably gave a reasonable sample of the gravel size particles on the bed.

Both grab and diver samples demonstrated the importance of organic growths on the sediments which in some cases cemented the gravel particles on the surface together thereby increasing its armouring potential. The organic growths appear to be restricted to an area of short wavelength bedforms.

ITINERARY:

Sunday 15 March Travel to Lymington. Set up equipment on 'Wessex Explorer'.

Monday 16 March Sailed 0800. Set up Trisponder units on Yarmouth Pier and Lymington Yacht Club staging. Commenced sediment sampling. Berthed Lymington 1800.

Tuesday 17 March Sailed 0830. Continued sediment sampling. Berthed Lymington 1600.

Wednesday, 18 March Unloaded sediment samples. Set up diving equipment. Sailed 1215 for diver and grab sampling stations. Berthed Lymington 1715.

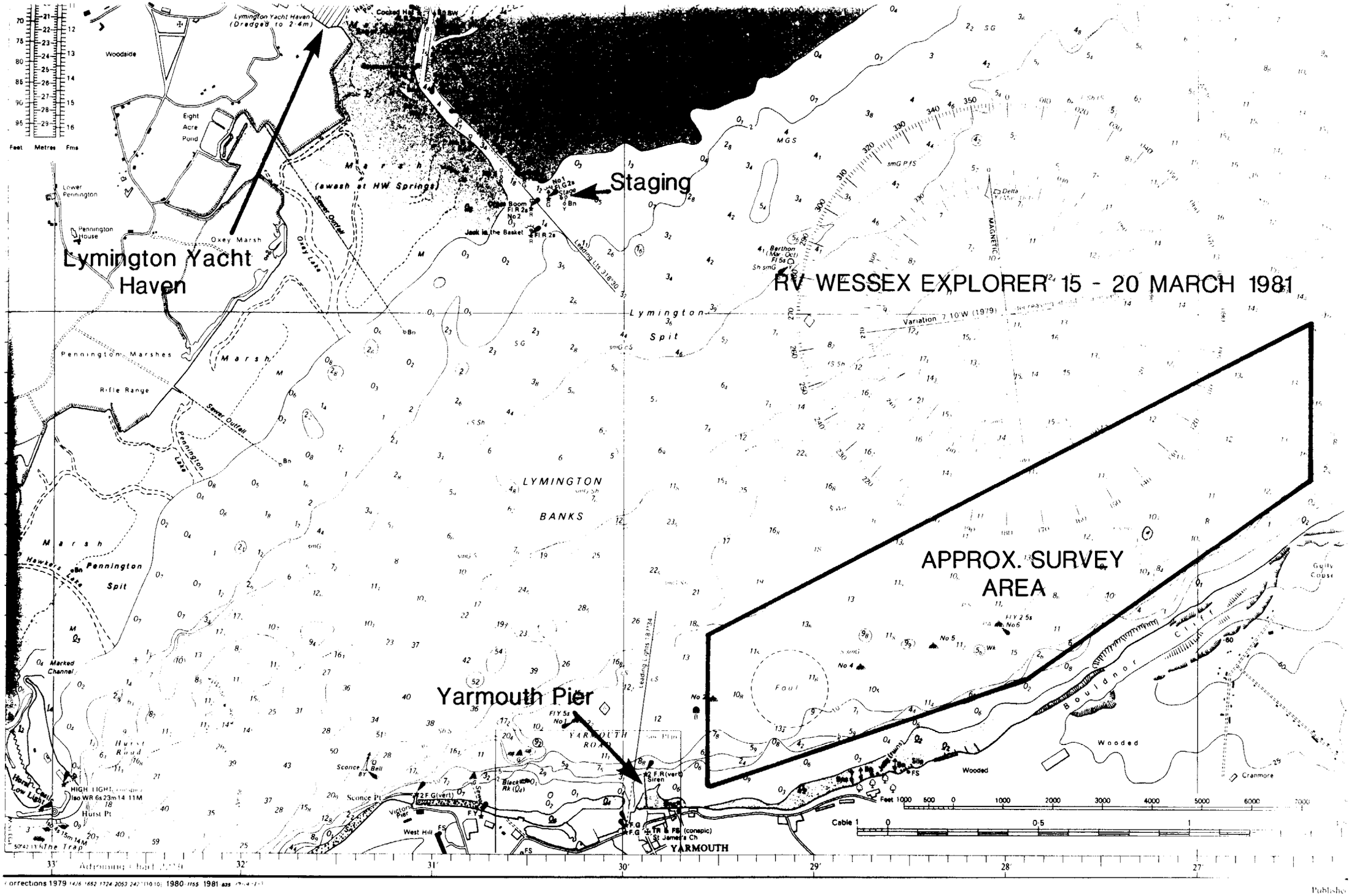
Thursday 19 March Sailed 0800. Steering gear failure on ship. Proceeded to Cowes for repairs. Sailed Cowes 1200 for Yarmouth Roads and continued diver and grab sampling programme. Berthed Lymington 1800.

Friday 20 March Sailed 0810. Continued diver and grab sampling. Removed Trisponder units from Yarmouth Pier and Lymington Yacht Club staging. Returned Lymington 1230. Unloaded equipment and samples and returned to Taunton.

PREPARED BY: (A D HEATHERSHAW)

APPROVED BY: (K R DYER)

DATE: 24 MARCH 1981



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PROVISIONAL CRUISE REPORT

VESSEL: MFV Devonian

LOCATION: Between Dartmouth and Mevagissey

CRUISE PERIOD: 11 April - 14 April 1981

PERSONNEL:

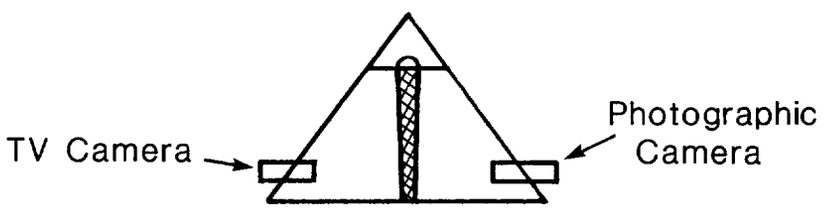
R H Wilkinson	Principal Scientist
E J Moore	Diving Officer
J D Humphery)	
A J Marks)	Diving Team
P D Bird (Contract))	

OBJECTIVES

Wave boundary layer flow visualization by time exposure photography of neutrally buoyant paricles oscillating near the sea bed under the action of surface waves in the absence of significant tidal current. It is intended to deduce near-bed velocity profiles from the photographs.

PROCEDURES AND METHODS:

A light weight pyramidal frame, holding a TV camera, photographic camera and lights mounted in a parabolic reflector, is lowered



to the sea bed and oriented by divers so that the oscillatory water motion is perpendicular to the optical axis of the cameras. The parabolic reflector produces a fan of light, so that only the particles in this plane are visible, and so measurements can be taken from a single photograph. Neutrally buoyant particles (chopped polystyrene rod) are introduced into the flow in small quantities by the attendant divers. The TV camera is then used as a viewfinder and, when the particles are suitably distributed, time exposure photographs are remotely triggered on the camera.

EQUIPMENT PERFORMANCE:

Two malfunctions caused delay:

i) a clear plastic mounting plate in the U/W casing for the photographic camera stripped a thread, rendering the casing not watertight. A replacement plate was made the following day at Fort Bovisand.

ii) The focussing system of the TV camera ran off its adjusting screw. The gears were re-engaged after advice from the laboratory, and this part of the focussing range was then avoided.

RESULTS

No time exposure photographs of the neutrally buoyant particles were obtained, but the following conclusions can be drawn:-

i) As anticipated, easterly winds do not produce suitable waves for this experiment within practical reach of Devonian from Dartmouth.

ii) of the sites investigated, Whitesand Bay (4) appeared to have the most suitable bottom, which was a fine to medium sand with very little mud to reduce visibility. Westerly or south-westerly waves are needed for this site.

iii) The rig handled well and Devonian is a most suitable vessel from which to do this experiment. The parabolic light appears very satisfactory.

iv) The experiment is basically a laboratory type technique taken into the field. As such, the required conditions of waves and visibility are quite critical. However, the results obtained would be quite unique and their potential justifies at least another attempt.

ITINERARY:

11 April Loaded and assembled scientific equipment at Kingswear Jetty. Sailed 1100 hrs. Investigated sites at Bolt Head (1) and Bolt Tail (2), but could find no suitable sandy bottom with sufficient sea room. Very suitable conditions found in Wembury Bay (3). Equipment failure led to abandonment of experiment. Put into Plymouth for repairs.

12 April Equipment repaired at Fort Bovisand workshops. Proceeded to Wembury Bay (3). Arrived on station at 1400 hrs. Visibility deteriorated drastically, which was confirmed by divers. Focussing mechanism on TV camera failed. Put into Plymouth for repairs.

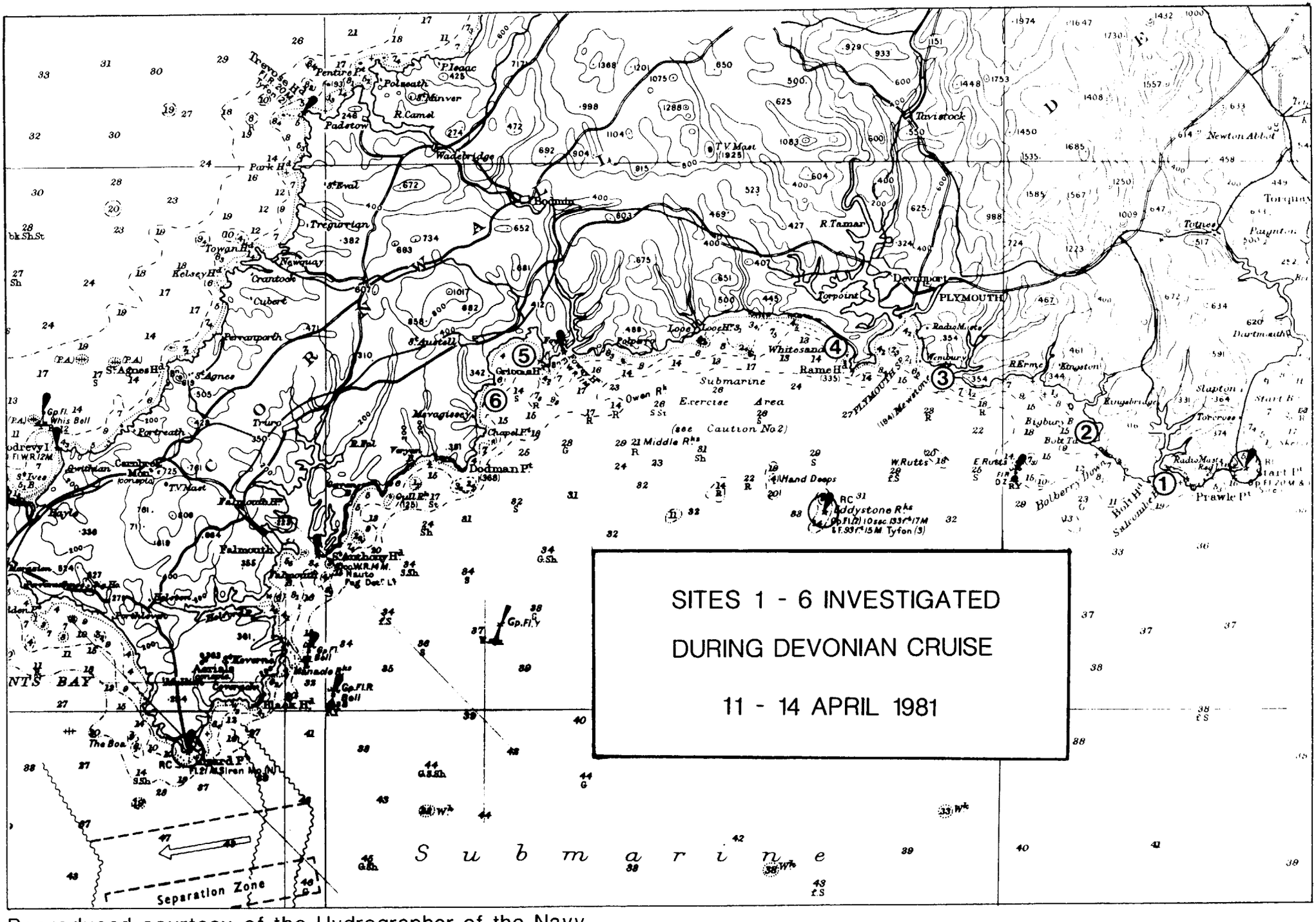
13 April Set sail at 1200 hrs after effecting repairs to TV camera. Investigated site in Whitesand Bay (4). Very good visibility, no evidence of mud, but no wave activity due to lee. Put into Fowey because of gale warnings.

14 April Wind dropped but waves still running. Sites in St Austell (5) and Mevagissey (6) Bays investigated. Visibility very poor (< 1 m). Returned to Dartmouth.

PREPARED BY: R H Wilkinson

APPROVED BY: K R DYER

DATE: 8 May 1981



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PROVISIONAL CRUISE REPORT

VESSEL: Reul Na Maidne

OWNER:
D B MacLeod
Oiteag na Mara
Bruernish
North Bay
Barra
Outer Hebrides
Scotland

Telephone: North Bay (08715) 384

LOCATION: Offshore Waverider Site west of South Uist, Hebrides

CRUISE PERIOD: 0930 - 1830 on 25 April 1981

PERSONNEL:

J D Humphery	HSO (Senior Scientist)
E J Moore	P and TO 3
M A Scott	Student

OBJECTIVES: To recover defective Offshore Waverider, complete with sub-surface float mooring if possible. To deploy a new Offshore Waverider on a new sub-surface float mooring.

PROCEDURE AND METHOD: Met D B MacLeod on Castlebay jetty at approximately 0830. Reeled 13 mm lowering wire onto port side of trawl winch, and pulled approximately 900 kg anchor clump into port gallows using 13 mm chain strop. Reeled 75 m x 13 mm recovery wire onto starboard side of trawl winch (attached to end of trawl-warp). Reeved wire through deck-sheaves and gallows, and attached 115 kg chain grapnel. Loaded rest of equipment by hand and by using jilson.

Sailed from Castlebay approximately 0930 for Offshore Waverider position, via Sound of Vatersay.

Energised new Waverider while still in sheltered water; tested output with absorption wavemeter.

Arrived alongside Offshore Waverider approximately 1230. Its condition appeared the same as on the visit of 1 March 1981.

Lifted Waverider onto deck using jilson, recovered rubbercord using winch. Attached A4-size Polyform float to rope of mooring, and freed mooring.

Lowered grapnel on recovery wire, and made several unsuccessful attempts to recover mooring. Snagged rope above sub-surface float at each attempt.

Shortened rope so that mooring was marked "straight up and down". Lowered grapnel onto bottom and steamed approximately 400° around mooring paying out recovery wire and more than 75 fathoms of trawl warp. Hauled on winch, grapnel snagged riser chain, recovered complete mooring (including anchor clump) using jilson, at approximately 1330.

New mooring was assembled; all galvanised shackles were greased and moused with wire; stainless shackles were not

greased, but were moused with nylon twine.

Waverider was lowered over side by hand, rubber-cord and rope were paid out.

Sub-surface float was dropped overboard and riser chain paid out, ensuring that no shackles were left upset or that any mooring components were twisted together. Anchor clump was lowered to bottom on wire, and wire was cut when moving slowly away from mooring position. Noted time, depth and Decca position.

Returned to Castlebay via Sound of Vatersay, and unloaded equipment. Left ship at approximately 1830.

EQUIPMENT PERFORMANCE:

The Offshore Waverider was a 90 cm shell buoy, number 67406/9, installed on 17 January 1981. It contained an internal clock which initiated transmissions (power-boosted to a full 200 mW at the aerial) every three hours. Very shortly after installation a fault developed within the buoy which caused a straight-line output (ie constant sub-carrier frequency) at the receiver. This fault has still to be identified.

The new Offshore Waverider was energised and tested on deck prior to deployment, after being prepared in the laboratory at IOS(T). The buoy and mooring were deployed faultlessly using the trawl winch.

Signals from the new buoy were monitored at the receiver sometime later; good signals were being received and logged.

All equipment aboard the Reul na Maidne performed satisfactorily during the cruise period.

ITINERARY:

25.4.81

0830 Rendezvous with Reul na Maidne at Castlebay jetty. Loaded equipment.

0930 Sailed for Offshore Waverider position, passing through Sound of Vatersay.

1230 Alongside Offshore Waverider. Recovered buoy and complete mooring.

1445 New Offshore Waverider and mooring deployed. Sailed for Castlebay.

1730 Arrived Castlebay, offloaded equipment.

WEATHER:

A favourable forecast for the 25th was obtained from Prestwick meteorological office on 24th April, and a better forecast was broadcast to shipping at 0630 on 25th.

During the whole of the cruise period, the wind was N, 3-4 with some sea and some swell. Maximum ship motion during

the cruise period was approximately 1.5 m. Visibility very good (>25 miles), sunny.

POSITIONS: Old Offshore Waverider recovered:

Decca readings (Chain 8E/MP (Hebridean))

Red	A	15.0
Green	D	32.20
Purple	A	58.80

Time: approximately 1245 on 25.4.81.

New Offshore Waverider laid:

Decca readings:

Green	D	32.04
Purple	A	58.90

Depth: 42.5 m approximately mid-tide

Time: 1445 on 25.4.81.

PREPARED BY: J D HUMPHERY

APPROVED BY: A P SALKIELD

DATE: 21/5/81

Abridged Details of Hebrides Visit, April/May 1981

Waverider deployment:

Buoy No:	67041
Calibrated:	27.11.80
Sensitivity:	1.825 Hz m^{-1}
Position:	057° 18' 21" N
	007° 38' 12" W
Decca readings:	Chain 8E/MP (Hebridean)
	Green D 32.04
	Purple A 58.90
Date laid:	25.4.81
Time laid:	1445
Depth:	42.5 m mid-tide approximately
Battery voltages:	18.8 + 18.8 V on 16.4.81
Personnel:	J D Humphery E J Moore M A Scott

Waverider Recovery:

Buoy No:	67406/9
Decca readings:	Chain 8E/MP (Hebridean)
	Red A 15.0
	Green D 32.20
	Purple A 58.80
Time:	1245 approximately
Date:	25.4.81

New Offshore Receiving System:

Eddystone receiver number: 964/7c/455

Working to: Microdata logger no: 1029 (single channel)

System calibrated: 29.4.81 at 1520 approximately

Sensitivity:	64.00 Hz^{-1}
Unlocked display:	-0000
Logged readings prefixed by:	-
Microdata display channel:	6

Note: Transmission-initiated logging facility removed on 29.4.81, since transmissions from new buoy are continuous.

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PROVISIONAL CRUISE REPORT

VESSEL: I.O.S. (T) survey launch Sand Pebbler.

LOCATION: Skerries Bank, Start Bay, South Devon.

CRUISE PERIOD: 13th - 15th May 1981.

PERSONNEL: A.P. Salkield, E.J. Moore, P.M. Hooper, A.J. Marks.

OBJECTIVES: To establish a suitable launch point for the SAR 580 buoy in similar conditions as for the fly past day, and obtain a track plot and depth profile over a period of about 3 hours drift. As a separate exercise the wave staff and echo sounder to be used in SAR 580 to be installed in Sand Pebbler and tested in the vicinity of Dartmouth.

EQUIPMENT PERFORMANCE: All equipment satisfactory apart from a suspected dry joint in the SAR 580 Echo Sounder later found to be a solder whisker.

RESULTS: Track and depth profile of the buoy satisfactory. Equipment trials satisfactory.

ITINERARY:

13/5/81	0830	To Dartmouth with Sand Pebbler.
	1130	Launch Sand Pebbler.
	1400	Launch mock up buoy.
	1530	Set up Trisponder Shore Stations.
	1700	Install equipment in Sand Pebbler.
	1900	Moor up buoy.
14/5/81	0600	Tow buoy out to Skerries.
	0800	Release and track buoy.
	1130	Recover and tow back to Dartmouth.
	1500	Equipment checks in vicinity of Dartmouth.
15/5/81	0830	Berth Sand Pebbler and recover equipment.
	1400	Return to Taunton.

REPORT PREPARED BY: A.J.MARKS

APPROVED BY: A.P. SALKIELD

DATE: 31 JULY 1981

Natural Environment Research Council

Institute of Oceanographic Sciences
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PROVISIONAL CRUISE REPORT

VESSEL: MFV 777 DEVONIAN, Plus I.O.S. (T) launch Sand Pebbler.

OWNER: Lt. Com. J.J. McGuire, Swan Court, Dartmouth.

CRUISE PERIOD: 29th, 30th and 31st May 1981.

PERSONNEL: A.P. Salkield, E.J. Moore, P.M. Hooper, G.N. Crisp, D.H. Joyce, B.M. Norman, J.L. Whellock, A.J. Marks.

OBJECTIVES: Full trial of SAR 580 buoy and instrumentation.

PROCEDURE: To set up and ballast the buoy. Tow to previously established launch point. Release at predicted run time, and monitor its progress until recovery.

EQUIPMENT PERFORMANCE: Buoy difficult to trim. One Trisponder channel inoperative due to water penetrating a cable. Data logger failed to start, transit vibration suspected, causing record button to drop out.

RESULTS: The track confirmed that the launch point was correct. Modifications to external buoyancy were indicated by the poor trim response. Handling and deployment proceedures may be revised as a result of the experience gained on this trial. Shore equipment was satisfactory.

ITINERARY:

28/5/81	2230	A.P.S., E.J.M., G.N.C., B.M.N., D.H.J. and A.J.M. to Dartmouth with buoy.
29/5/81	0800	Assemble and launch buoy.
	1400	Ballast and trim in harbour. J.L.W. and P.M.H. to Dartmouth. Partially set up shore stations at Strete and Start Point.
	1630	Adjust trim outside Harbour.
	2030	Moor up buoy to Devonian.
30/5/81	0600	A.P.S., G.N.C., E.J.M., D.H.J., B.M.N. and A.J.M. tow buoy out to site.
	0700	J.L.W. and P.M.H. to man shore stations.
	0800	Final trim of buoy.
	0900	Release buoy.
	1100	Recover buoy, both buoy and Sand Pebbler in tow of Devonian.
	1200	Stop recording at shore stations.

31/5/81	0800	P.M.H. and J.L.W. to recover shore sites equipment and to negotiate for radar reflector sites at Slapton and Beesands.
	1230	Return to Taunton.

REPORT PREPARED BY:	A Marks	A.J.MARKS
APPROVED BY:	A.P. Salkield	A.P. SALKIELD
DATE:	14.8.81	31 JULY 1981

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PROVISIONAL CRUISE REPORT

VESSEL: MFV 777 Devonian plus I.O.S. launch Sand Pebbler.

OWNER: Lt. Com. J.J. McGuire, Swan Court, Dartmouth.

LOCATION: Skerries Bank, Start Bay, South Devon.

CRUISE PERIOD: 10th - 14th June 1981.

PERSONNEL: A.P. Salkield, G.N. Crisp, D.N. Langhorne, B.M. Norman, E.J. Moore, J.L. Whellock, T.F. Bartlett, P.M. Hooper, D.H. Joyce, A.J. Marks.

OBJECTIVE: To release the spar buoy just prior to the aircraft pass. To set up radar reflectors for the aircraft. To lay and recover current meters. To side scan sonar the buoy track.

PROCEDURE: Install current meters at the crest and trough of a suitable sand wave along the buoy's track. Install radar reflectors on Slapton and Bee Sands Leys. Set up position recording stations at Start Point and Strete. Release the spar buoy on the ebb tide on notification of the aircraft's E.T.A.. Monitor the buoy progress for approximately 2 hours, then recover equipment and perform a side scan survey of the buoy's track.

EQUIPMENT PERFORMANCE: Shore sites, radar reflectors, side scan sonar, and meteorological equipments satisfactory. One trisponder channel non operational due to faulty reed switch. Buoy data logger inoperative due to electro static damage.

RESULTS: Only very low resolution aircraft pictures available as yet. Buoy track at reduced rate, but satisfactory. Ground truth radar reflectors in very good positions. Side scan sonar satisfactory apart from low resolution positional control. No usable results obtained from wave staff or buoy echo sounder.

ITINERARY:

10/6/81	0600	D.H.J. to Barry to pick up current meters.
	1800	A.P.S., E.J.M., G.N.C.,D.H.J., A.J.M. to Dartmouth.
	1930	D.N.L., T.F.B., B.M.N., P.M.H., J.L.W. To Dartmouth.

11/6/81	0600	A.P.S., E.J.M., G.N.C., D.H.J., T.F.B., B.M.N., P.M.H., J.L.W., D.N.L. and A.J.M. unload and assemble buoy.
	1300	E.J.M., B.M.N., J.L.W., D.N.L. and A.J.M. to Skerries Bank to lay current meters.
12/6/81	0800	P.M.H., D.N.L., T.F.B., B.M.N. to Slapton and Beesands to repair and set up radar reflectors.
	0800	A.P.S., E.J.M., G.N.C., J.L.W.and A.J.M. final assembly and testing of buoy.
	2000	D.N.L., T.F.B. return to Taunton.
13/6/81	0430	E.J.M., B.M.N., D.H.J., A.J.M. tow buoy to site, final trim.
	0700	A.P.S., G.N.C., P.M.H., J.L.W. man shore stations.
	1000	Release buoy.
	1200	Recover buoy return to Dartmouth.
	1600	G.N.C., D.H.J. to Plymouth with Meteorological instruments for Eddystone fly past.
	2000	D.N.L. to Dartmouth.
	2300	G.N.C., D.H.J. return to Dartmouth.
14/6/81	0800	E.J.M., D.N.L., B.M.N., A.J.M. recover current meters and side scan survey.
	0800	A.P.S., G.N.C., P.M.H., D.H.J., J.L.W. recover radar reflectors at Slapton.
	1300	J.L.W. to Plymouth to leave P.M.H. for the Eddystone fly past.
	1700	J.L.W. return to Dartmouth.
	1900	G.N.C., D.N.L. to Taunton via Start Point to collect Trisponder stations.
	1900	D.H.J., A.J.M., A.P.S., J.L.W. to Taunton.
	1930	B.M.N., E.J.M. to Taunton.

REPORT PREPARED BY: A.J.MARKS

APPROVED BY: A.P. SALKIELD

DATE: 31 JULY 1981

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PROVISIONAL CRUISE REPORT

VESSEL:	RV Squilla
OPERATED BY:	Marine Biological Association, Plymouth
LOCATION:	English Channel in the vicinity of the Eddystone Lighthouse
CRUISE PERIOD:	13 June to 16 June 1981
PERSONNEL:	C H Clayson PSO
	P R Hancock Industrial Craftsman - Mechanic
	E G Pitt PSO
	N D Smith PSO
	C H Woodley SO

OBJECTIVES:

All times BST

To make directional measurements of the surface waves and the concurrent wind-speed and direction to the South of the Eddystone as part of experiment number 32GB in the European SAR-580 campaign.

PROCEDURE AND METHOD:

13 June 1981 Loading of the Squilla took place on Saturday afternoon in Sutton Harbour, Plymouth.

14 June 1981 On Sunday morning at 0930, the anemometer was fitted and a preliminary deployment of the Cloverleaf buoy was made while the ship was still at the mooring. Squilla then left Sutton Harbour at about 1030 to a position just to seaward of the breakwater. After some experimentation it was found best to carry the buoy resting on and suspended between the starboard gunwale and a board which was lashed between the main winch and a stanchion further aft. From here it was a simple matter to deploy and recover the buoy over the starboard side using the main derrick.

Made a trial deployment, checked that buoy electrics were functioning correctly, recovered buoy and returned to Sutton Harbour. Checked that anemometer was recording successfully on the way. Arrived Sutton Harbour at 1330.

15 June 1981 Rejoined Squilla at 0830 on Monday morning, left Sutton Harbour 0850. Arrived at Position 2 (see chart) at 1030. Preliminary checks on the cloverleaf buoy revealed that gyro was not operating correctly. Central compartment was opened and it was found that the integrated circuit voltage regulator supplying the gyro motor had failed. Problem solved by supplying motor with unsmoothed full-wave rectified A/C.

Cloverleaf deployed by 1130 and recording starting 1133, anemometer record started 1135. Information received on Sunday from the SAR-580 project manager was that aircraft would be over the area from 1100 to 1600, however a message was received at 1230 which informed us that the SAR-580 aircraft had not yet taken off, and ETA over Eddystone was now 1400. Stopped recording waves and wind at 1245. Buoy inboard by 1255.

Proceeded to position 3 which was reached at 1405. Buoy deployed by 1410 and recording by 1415; anemometer recording started at 1408. Buoy recording and anemometer recording stopped at 1535. Buoy inboard at 1550. Further message received informing of revised ETA for SAR-580 aircraft of 1745, and ETD of about 2100.

Decided to proceed back to a position midway between positions 2 and 3: position 2½. Buoy in water at position 2½ at 1625; buoy and anemometer recording 1628. Stopped recording 1806, buoy inboard 1810. Aircraft sighted at about 1800.

Proceeded to position 2. Buoy deployed at 1855. Anemometer recording at 1859; buoy recording from 1904. Buoy record ended 1943; anemometer recording ended 1944. Buoy inboard by 1950.

Proceeded back to Plymouth. Berthed in Sutton Harbour at 2130.

16 June 1981. Squilla was unloaded in the morning.

EQUIPMENT PERFORMANCE:
Difficulties with buoy gyro power supply noted above, otherwise all scientific equipment performed well. All equipment on board Squilla performed well, and in the prevailing conditions launching and recovery were comparatively simple operations. We felt that we could have carried on in more severe conditions, up to Force 5 at least.

ITINERARY ON 15 JUNE 1981:

0850 : Left Sutton Harbour, Plymouth

1030 : Position 2 (see chart)

1405 : Position 3

1620 : Position 2½

1850 : Position 2

2130 : Berthed in Sutton Harbour

WEATHER:

The day started overcast with moderate-poor visibility. Weak cold front crossed area at about 1030. Thereafter visibility improved and cloud decreased to give bright sunny afternoon. Wind veered gradually after cold front to just North of West by afternoon, Force 4.

STATIONS:

Station Number	Position Number	Time (BST)	Decca Co-ordinates		Visual Observations Wind	Sea	Remarks
1	2	1030	A15.0	C44.0	W'N F3-4	½-1m 4sec W'ly swell	
2	3	1405	B9.5	D43.5	WNW F3	½-1m 4sec W'ly swell 1m	Swell period difficult to observe
3	2½	1620	B1.0	D33.5	W'N F3-4	1m 4sec Some swell	Sea short and steep
4	2	1850	A15.0	C44.5	W'N F3-4	1m 4sec	

Notes: 1 Times are times of arrival at each station.

2 Decca co-ordinates are those recorded as buoy was deployed. Some drifting on tidal current occurred during each run.

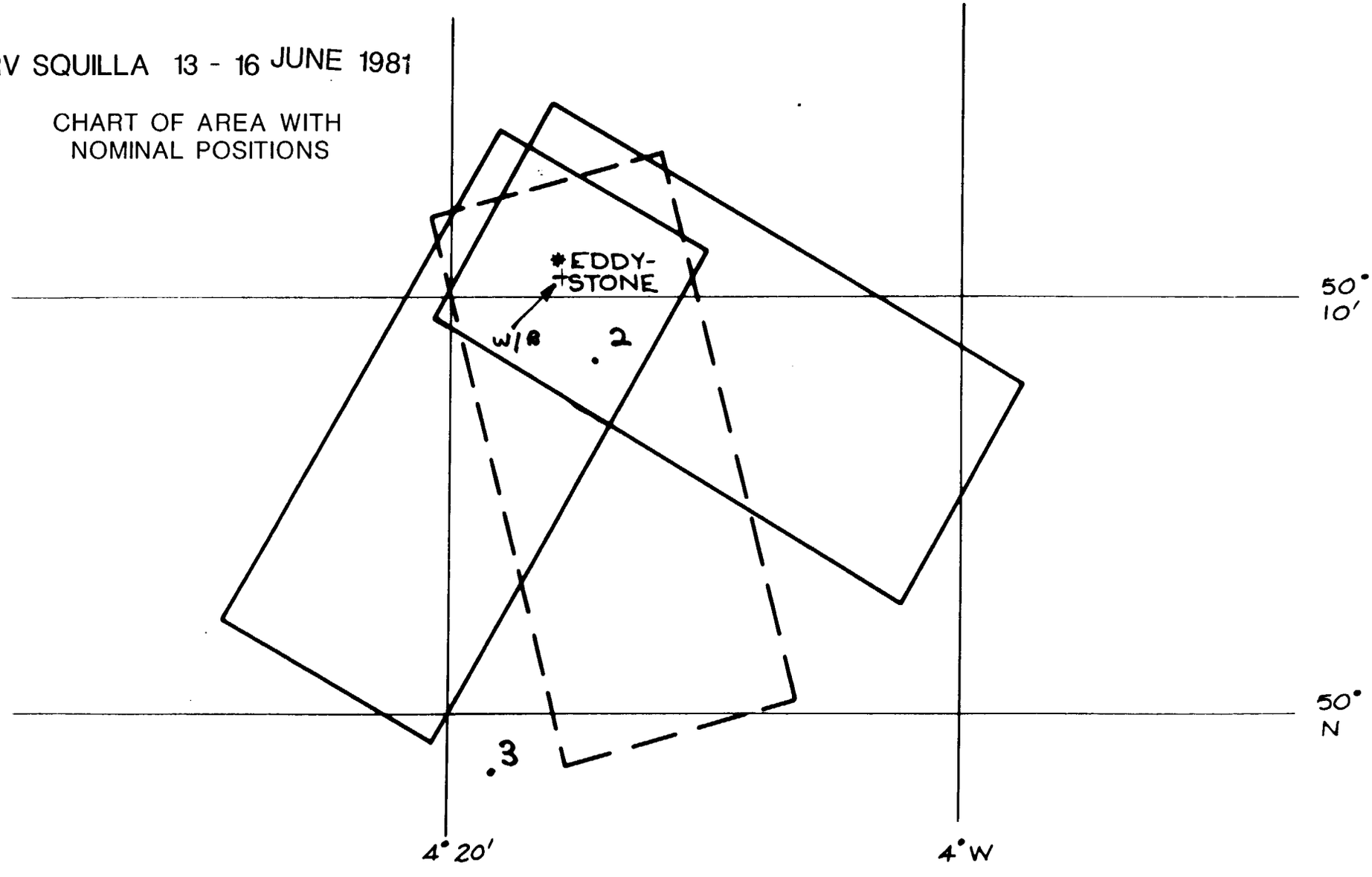
PREPARED BY: E G PITT 23 JUN 81

APPROVED BY:

SCALE 1:250,000

RV SQUILLA 13 - 16 JUNE 1981

CHART OF AREA WITH
NOMINAL POSITIONS



Natural Environment Research Council

Institute of Oceanographic Sciences
Crossway, Taunton, Somerset. TA1 2DW

PROVISIONAL CRUISE REPORT

VESSEL: RV Squilla
(Marine Biological Association, Plymouth)

CRUISE LOCATION: West Solent

CRUISE PERIOD: 25-30 June 1981

PERSONNEL:
D N Langhorne (Senior Scientist)
R A Haine
G P Le Good
D J Corns
A A Read

OBJECTIVES: To measure the threshold and rates of movement of gravel in relation to boundary layer tidal flow (DOE Commission, No S26).

PROCEDURE AND METHODS: Following extensive surveys of sea bed morphology (MV John Stephenson, 26-30 January 1981) and sediment distribution (MV Wessex Explorer, 15-20 March 1981) experiments were carried out in specific locations in Yarmouth Roads to observe and trap mobile gravel and at the same time record velocity profiles in the boundary layer. A special bottom rig was designed and built to carry 4 Ott velocity sensors, at heights of 10, 22, 46, 100 cm above the sea bed; TV camera (RT Labs SIT camera); and sediment trap.

In order to hold the ship at anchor a 5 CWT anchor was carried and deployed from the stern gantry. After deployment the anchor wire was transferred to the bow. No secondary anchors were used. Horizontal position control was by Decca Trisponder with remotes at Lymington yacht staging and Yarmouth Pier.

EQUIPMENT PERFORMANCE: 1. Ott velocity meters: On the first deployment three out of the four meters failed to work. This was found to be due to ingress of water into the cable glands. These were resealed and no further trouble was experienced. The experiments were hampered by the large quantities of drifting weed. This made it necessary to raise the rig and clear the rotors at frequent intervals.

2. TV: Good results were obtained without the need to use lights. Marked corrosion occurred on the camera casing.

3. Sediment trap: It was necessary to put a large tail fin onto the rig to improve orientation. Certain redesign requirements of the prototype are required to overcome recirculation within the trap and reduce erosion at the sidewalls.

4. Trisponder: Good.

EQUIPMENT PERFORMANCE: (Contd)

5. Ship; anchording performance: Initially the ship was anchored from the Starboard quarter using the 5 CWT anchor. This proved to be unsatisfactory particularly when lying in a cross wind. The method was changed by transferring the anchor cable to the bow, but with no winch or capstan facilities on the bow, this meant that the ship's position could not be changed by adjusting the cable. When anchored from the bow, no stern anchors were used.

RESULTS:

Good boundary layer velocity profiles were obtained for most of the cruise. The results were only interrupted by drifting weed. Observation of gravel movement and trapping was very dependent upon the rigs position on the gravel bedforms. Significant gravel movement appeared to be restricted to the crestal areas of gravel waves. In such areas, at high flow velocities, all the gravel particles moved, regardless of grain size.

ITINERARY:

24.6.81: RV Squilla sailed from Plymouth for Yarmouth with an overnight stop at Weymouth.

25.6.81: IOS staff travelled to Yarmouth. Set up equipment on board and Trisponder remote stations.

26.6.81: Sailed 0830. Anchored in area of large gravel waves ($\lambda \simeq 15$ m). Conducted gravel mobility studies. Returned to Yarmouth Pier 1900.

27.6.81: Sailed 0700. Continued studies. Berthed 1930.

28.6.81: Sailed 0730. Continued studies. Berthed 2000.

29.6.81: Sailed 0800.AM Continued studies in area of large gravel waves. PM re-anchored in area of featureless gravel. Berthed 1930. Off loaded equipment and dismantled Trisponder remote stations.

30.6.81: RV Squilla sailed for Plymouth. IOS staff returned to Taunton.

PREPARED BY: (D N LANGHORNE)

APPROVED BY: (K R DYER)

DATE: 8 July 1981

Natural Environment Research Council

Institute of Oceanographic Sciences
Crossway, Taunton, Somerset. TA1 2DW

PROVISIONAL CRUISE REPORT

VESSEL: M.L.Flying Eagle plus I.O.S. launch Sand Pebbler.

OWNER: Mr. J. Paul, Taunton.

CRUISE PERIOD: 11th - 16th July 1981.

LOCATION: Skerries Bank, Start Bay, South Devon.

PERSONNEL: A.P. Salkield, G.N. Crisp, D.N. Langhorne, B.M. Norman, E.J. Moore, D.H. Joyce, P.M. Hooper, J.A. Crabb, D.J. Corns, A.J. Marks.

OBJECTIVE: To release the spar buoy just prior to the aircraft from a predetermined launch point. To set up radar reflectors as reference points for the radar system. If possible perform side scan and echo sounding survey at predetermined sites.

PROCEDURE: Install radar reflectors on Slapton and Beesands leys and survey their positions. Set up recording stations at Start Point and Strete. Release the spar buoy on the ebb tide on notification of the aircrafts E.T.A.. Monitor the buoys progress during the run. Recover buoy and reconfigure equipment for the survey.

EQUIPMENT PERFORMANCE: Shore sites, radar reflectors, echo sounder, side scan sonar (not used) satisfactory. Trisponder equipment satisfactory for the buoy run, but borrowed master unit found to be incorrectly coded which held up the survey until the I.O.S. unit could be recoded to compensate. Buoy equipment appears satisfactory (prior to analysis). Faulty plug caused wave staff and echo sounder battery to become discharged, repairs were effected before the aircraft pass.
The aircraft was delayed by two days due to technical problems.

RESULTS: Position data, buoy data, and aircraft data appear satisfactory prior to detailed checks and analysis. Limited but useful echo sounding lines obtained.

ITINERARY:

11/7/81	1400 BST	A.P.S., E.J.M., P.M.H., D.H.J., A.J.M., B.M.N., G.N.C. to Dartmouth with buoy and Sand Pebbler.
12/7/81	0800 BST	A.P.S., G.N.C., A.J.M. assemble buoy. E.J.M., P.M.H., B.M.N., D.H.J. to lay radar reflectors at Slapton Ley.
	1500 BST	A.P.S., G.N.C., A.J.M. to assist with radar reflectors. E.J.M., B.M.N. driven to Salcombe by P.M.H. to collect Flying Eagle.
	1630 BST	A.P.S., G.N.C., A.J.M., D.H.J. to Beesands Ley to lay radar reflector.
	1700 BST	Flying Eagle (E.J.M, B.M.N.) lays marker on the spar buoy launch point. P.M.H. returns to Beesands.
13/7/81	0800 BST	Launch buoy and complete assembly and testing on the navy pontoon. D.N.L., J.A.C. to Dartmouth.
	1430 BST	Provisionalballasting and sea checks off Mew Stone with Sand Pebbler.
	1730 BST	Buoy brought to horizontal position in order to moor up to Navy water barges over night.
14/7/81	0800 BST	Aircraft delayed. Box survey to be attempted.
	0900 BST	P.M.H. driven to Taunton by D.H.J.
	1000 BST	E.J.M., B.M.N., D.N.L., A.J.M. on Flying Eagle. A.P.S., G.N.C., J.A.C. to man shore stations.
	1600 BST	D.H.J. and D.J.C. to Dartmouth.
15/7/81	0500 BST	E.J.M., B.M.N., D.H.J., A.J.M., D.J.C. tow out buoy to site with Flying Ealge and Sand Pebbler. A.P.S., G.N.C., J.A.C., D.N.L.to man shore stations.
	0830 BST	Flight cancelled return buoy to Dartmouth.

	0900 BST	G.N.C., J.A.C. check radar reflector sites.
	1200 BST	A.P.S., D.H.J., A.J.M. recharge buoy battery.
	1230 BST	B.M.N. to Taunton to pick up replacement plug.
	1700 BST	B.M.N. return to Dartmouth. Refit new plug to buoy. Moor up on "Devonian's" berth.
16/7/81	0530 BST	E.J.M., B.M.N., D.H.J., D.J.C., A.J.M. tow out buoy with Flying Eagle. A.P.S., G.N.C., J.A.C., D.N.L. to man shore stations.
	1232 BST	Release buoy and monitor progress.
	1345 BST	Recover buoy and return to Dartmouth.
	1700 BST	E.J.M., B.M.N. return Flying Eagle to Salcombe. G.N.C. to Salcombe to pick up E.J.M. and B.M.N., D.N.L., J.A.C. to recover shore site equipment. A.P.S., D.H.J., A.J.M. load equipment and return to Taunton.

REPORT PREPARED BY: A.J. MARKS

APPROVED BY: A.P. SALKIELD

DATE: 14.8.81. 31 JULY 1981

Natural Environment Research Council

Institute of Oceanographic Sciences
Crossway, Taunton, Somerset. TA1 2DW

PROVISIONAL CRUISE REPORT

VESSEL: RV Squilla

CRUISE LOCATION: West Solent

CRUISE PERIOD: 28 July to 3 August 1981

PERSONNEL:

D N Langhorne	(Senior Scientist)	29 July-2 August
R A Haine		" " -" "
P D Thorne		" " -" "
G P Le Good		" " -31 July
A A Read		" " -" "
A P Salkield		31 July-2 August
D J Corns		" " -" "

OBJECTIVES:

a) To continue the measurements of the threshold and rates of movement of gravel in relation to boundary layer flow. (DOE Commission Project S26).

b) To carry out preliminary field trials to ascertain the noise levels and frequency spectra produced by gravel movement.

PROCEDURE AND METHODS:

Observations were concentrated in the area of long wavelength (12-16 m) gravel waves which occur on the south side of the West Solent. Measurements of boundary layer flow and gravel movement were made from a bottom rig which was deployed from the vessel at anchor. The rig was the same as that used on the previous cruise (RV Squilla, 25-30 June 1981) except that certain modifications had been made to the sediment trap and tail fin. In addition, pitch and roll sensors and a hydrophone assembly were fitted to the rig. As on the previous occasion boundary layer flow data was obtained from 4 Ott flow sensors and gravel movement was recorded from underwater TV.

The measurements of noise produced by gravel moving was made using the LCT 10 hydrophone assembly and associated amplifiers. Preliminary analysis was performed using an Hewlett Packard Spectrum Analyser (HP 3580).

EQUIPMENT PERFORMANCE:

1. a. Sediment trap: The sediment trap was modified before the cruise by

i. redesigning the leading edges of the side walls.
ii. extending the length of the catchment tray.
iii. reducing the height of the collecting box.
iv. fitting baffle plates on the catchment tray to reduce circulation.
v. fitting a larger tail fin.

As a result of these modifications better samples were obtained than those on the previous cruise. It was considered that less of the fine sediment was lost from the trap.

b. Ott flow sensors: Good.

c. Pitch and roll sensors: Good. On some occasions the tilt of the rig exceeded the 20° pitch limit on the sensors.

EQUIPMENT PERFORMANCE: (Contd)

d. Underwater TV: During the cruise, periods of very poor seabed observations occurred. These were initially thought to be due to suspended sediments (cf: previous cruise when no such results were obtained). Later in the cruise it became apparent that the automatic focus on the camera system was not operating correctly. It remains uncertain as to whether the poor results were due to bad underwater visibility or camera malfunction.

e. Trisponder: Good.

2. Self generated noise: Satisfactory preliminary results were obtained.

3. Ship performance: Generally good. Owing to ship movement with a single anchor it would be an advantage if there was a longer wire on the main boom.

Because of the large quantitites of drifting weed, it was necessary to shut down the generators from time to time to clean the filters on the water cooling system.

RESULTS:

Reliable boundary layer flow measurements were obtained for most of the cruise. The results were only interrupted by drifting weed. The observations of gravel movement were often spoilt by poor TV performance. The modified sediment trap proved to be very successful and good samples were obtained. When positioned close to the crest, under strong flow conditions it was possible to obtain adequate samples at five minute intervals.

Self generated noise: Sufficient data were obtained to provide the necessary information for further development of the technique.

ITINERARY:

27.7.81 IOS equipment was transported to RV Squilla at Plymouth.

28.7.81 RV Squilla sailed for Yarmouth (Isle of Wight) with an overnight stop at Weymouth.

29.7.81 IOS staff travelled to Yarmouth and set up equipment on board and Trisponder remote stations on Yarmouth Pier and Lymington Yacht staging.

30.7.81 Sailed for Yarmouth Pier 0830. Anchored in area of gravel waves for mobility studies. Returned and berthed on Yarmouth Pier 2030.

31.7.81 Sailed 0830. Continued gravel studies. Berthed 1800.

1.8.81 Sailed 0830. Continued gravel studies. Berthed 1945.

2.7.81 Sailed 0830 . Continued gravel studies. Recovered equipment 1800. Berthed 2030.

ITINERARY: (Contd)	3.8.81	RV Squilla sailed for Plymouth. IOS staff returned to Taunton

PREPARED BY: . (D N LANGHORNE)

APPROVED BY: (K R DYER)

DATE: 3.9.81

Natural Environment Research Council

Institute of Oceanographic Sciences
Crossway, Taunton, Somerset. TA1 2DW

PROVISIONAL CRUISE REPORT

VESSEL: Reul na Maidne

OWNER: D B MacLeod
Oiteag Na Mara
Bruernish
Barra
Outer Hebrides
Scotland

Tel: North Bay (08715) 384

LOCATION: All Waverider sites to west of South Uist, Hebrides, Scotland.

CRUISE PERIOD: 0900 on 1 August 1981 to 1130 on 2 August 1981.

PERSONNEL:

J D Humphery	HSO	Senior Scientist
R Gleason	HSO	
B M Norman	ASO	

OBJECTIVES: To recover Waverider buoys and moorings if possible, from the Deepwater, Offshore and Inshore III positions to the West of South Uist. To deploy three replacement Waveriders on new moorings in the same positions. To perform an echo sounder survey between and around the Inshore positions I and II, as time and conditions permit.

PROCEDURES AND METHODS: Met D B Macleod at his home to collect 1 ton of anchor chain left there after the previous visit. Drove to Castlebay jetty, met the other crew on the Reul na Maidne at 0900. Tide was high, loaded the smaller equipment by hand; used the jilson to load the Waveriders and other heavy gear. Reeled 75 m x 13 mm wire for offshore mooring recovery onto starboard winch-drum, with 115 kg grapnel shackled to end. Reeled 75 m x 13 mm wire for offshore mooring deployment onto port winch-drum, with 1 ton of anchor chain shackled to end on chain strop. Sailed for deepwater site at approximately 1030, via Sound of Vatersay.

Arrived at deepwater site at approximately 1400. Waverider (deployed 11.8.80) appeared in good condition, but had lost rubber fender. Lifted buoy onto deck using jilson, recovered rubbercord by hand, and 200 m of rope using winch. Recovered anchor and chain by "stopping off", and using jilson.

New deepwater mooring had been prepared on the port side-deck while steaming to site. Anchor and chain were paid out on the 200 m rope and lowered to the bottom on the winch; (anchor could be deployed first as the mooring is approximately twice as long as the water depth). Some tension was maintained to pull the chain out straight and then the buoy was lowered over the side by hand. Position, depth and time were noted.

PROCEDURE AND METHODS: (Contd)

While steaming to the offshore site, the new offshore mooring was made up and laid out on deck. Came alongside offshore Waverider - appeared in good condition (deployed 25.4.81). Recovered buoy on jilson and rubbercord by hand. Marked rope with A4 Polyform buoy, and unshackled rope from rubbercord and allowed it to drop free. Paid out 75 m recovery wire and grapnel, and approximately 150 m trawl warp, while steaming round marker. Stopped the ship and hauled on the winch - grapnel caught riser chain at first attempt - lifted sub-surface float onto deck with jilson. Recovered chain and anchor by stopping off and using jilson.

Lowered replacement offshore buoy over side by hand, paid out rubbercord and rope. Dropped sub-surface float over side and paid out riser chain, ensuring that mooring did not twist. Lowered anchor weight to bottom on 75 m wire; when weight on bottom, moved clear and cut wire, allowing it to drop free. Noted depth, position and time. Steamed for Inshore III position, making up inshore mooring on deck.

Arrived alongside inshore buoy, which was in good condition (deployed 1.3.81). Recovered buoy and rubbercord on deck using jilson and winch. Hooked buoyant chain from the water using the jilson, and recovered the 50 m length by stopping off and using the jilson.

Lowered replacement buoy over side by hand, paid out rubbercord. Paid out buoyant chain, allowing it to fall free. Lowered anchor to bottom on a long bight in 18 mm rope, pulling the end free and recovering the rope when anchor on bottom. Noted position, depth and time.

Colour (negative) photographs of interesting biological growth on all buoys and moorings were taken immediately after recovery, for use by SMBA, Dunstaffnage.

Proceeded to Inshore II position. Commenced echo sounder survey of area between and around Inshore II and Inshore I positions. Conditions good. Engine speed - 700 rpm.

Proceeded to Castlebay via Sound of Sandray, arriving alongside 0130 on 2 August.

Rendezvous with D B MacLeod and crew at the Reul na Maidne at Castlebay at 0900, taking advantage of the high tide. Unloaded the light equipment by hand, used the jilson for the heavy gear and the buoys. Loaded van. Took some items of heavy gear to D B MacLeod's home for his retention until the next deployment (1 ton anchor clump, chain and 2 x 112 lb fisherman's anchors).

WEATHER:

A good weather forecast (NW-NE 3) was obtained from Prestwick meteorological office on the evening of 31 July. The 1 August dawned fair, wind N, 2. During the day, wind was very variable, N-SW, generally force 2, but increasing force 3 during occasional

showers. Sea was slight (50 cm max) with a low underlying swell (~ 70 cm max) which decreased to virtually nothing during the day. Ship motion while surveying was probably less than .5 m.

EQUIPMENT PERFORMANCE: The Waveriders had been prepared and tested prior to leaving IOS(T). They were energised and sealed on deck before going out of the Sound of Vatersay, and emission tested with an absorption wavemeter. Moorings were made up and flaked out on deck from components brought from IOS(T).

The Furuno radar, Decca navigator and Furuno echo sounder on board the Reul na Maidne all worked well, as did all deck equipment.

ITINERARY:

1.8.81	0830	Collect chain anchor from D B MacLeod.
	0900	Rendezvous with Reul na Maidne at Castlebay.
	1030	Sailed for Deepwater site via Sound of Vatersay.
	1400	Alongside Deepwater Waverider - recovered buoy.
	1415	Deployed replacement Deepwater Waverider.
	1550	Alongside Offshore Waverider - recovered buoy.
	1648	Deployed replacement Offshore Waverider.
	1724	Alongside Inshore III Waverider - recovered buoy.
	1759	Deployed replacement Inshore III Waverider.
	1828	Start of survey near Inshore II position.
	2144	End of survey. Sailed for Castlebay.
2.8.81	0130	Arrived Castlebay.
	0900	Rendezvous with Reul na Maidne at Castlebay.
	1130	Finished offloading equipment. Departed Castlebay.

POSITIONS: Deepwater Buoy deployed:

Waverider No:	67043
Decca chain:	8E/MP (Hebridean)
Green:	D 30.06
Purple:	A 73.90
Depth:	100.3 m mid-tide approx.
Time:	14.15 BST

Offshore Buoy deployed:

Waverider No:	67214
Decca chain:	8E/MP (Hebridean)
Green:	D 32.32
Purple:	A 58.80
Depth:	47.6 m mid-tide approx.
Time:	1648 BST

Inshore III Buoy deployed:

Waverider No:	67213
Decca chain:	8E/MP (Hebridean)
Green:	D 31.44
Purple:	A 53.40
Depth:	25.0 m mid-tide approx.
Time:	1759 BST

Please see over for survey listings.

PREPARED BY: J D HUMPHERY

APPROVED BY: A P SALKIELD

DATE: 21.8.81.

ECHO SOUNDER SURVEY REUL NA MAIDNE 1.8.81

Furuno echo sounder

Decca Navigator Mk 21

Decca chain 8E/MP (Hebridean)

Station List:

Fix	Time BST	Green	Purple	Ship's Head ° magnetic	Comments
1	1828	D36.84	A53.84	088	
2	1832	D37.18	A53.56	092	
3	1834	D37.49	A53.28	092	
4	1836	D37.75	A53.08	090	
5	1839	D38.00	A53.00	085	
6	1841	D38.25	A52.92	088	
7	1842	D38.50	A52.84	090	
8	1844	D38.75	A52.76	085	
9	1846	D39.00	A52.67	085	
10	1847	D39.25	A52.55	090	
11	1849	D39.50	A52.41	082	
12	1851	D39.75	A52.30	083	
13	1852	D40.00	A52.15	088	
14	1856	D40.00	A52.22	287	
15	1900	D40.00	A52.50	306	
16	1903	D40.02	A52.75	305	
17	1907	D39.99	A53.00	305	
18	1914	D38.96	A53.25	092	
19	1918	D38.93	A53.00	107	
20	1922	D39.02	A52.75	112	
21	1925	D38.94	A52.50	112	
22	1929	D39.00	A52.24	108	
23	1935	D38.02	A52.38	303	
24	1937	D38.03	A52.50	310	
25	1942	D38.06	A52.75	304	
26	1947	D38.03	A53.00	307	

Fix	Time BST	Green	Purple	Ship's Head ° magnetic	Comments
27	1951	D38.06	A53.25	307	
28	1955	D38.10	A53.50	305	
29	1957	D38.14	A53.75	301	Purple lane rolling
30	2004	D37.54	A53.74	114	
31	2007	D37.56	A53.50	103	
32	2009	D37.60	A53.25	107	
33	2013	D37.52	A53.00	117	
34	2016	D37.48	A52.75	111	Purple lane rolling
35	2019	D37.02	A52.75	301	
36	2024	D37.04	A53.00	303	
37	2027	D37.03	A53.25	305	
38	2030	D37.01	A53.50	303	
39	2033	D37.03	A53.75	307	
40	2036	D37.10	A54.00	302	
41	2039	D37.10	A54.25	299	
42	2045	D36.00	A54.20	100	
43	2048	D36.04	A54.00	110	
44	2051	D35.96	A53.75	111	
45	2054	D35.91	A53.50	108	
46	2057	D35.98	A53.25	103	
47	2059	D36.00	A53.00	105	
48	2102	D36.50	A52.80	062	
49	2104	D37.25	A52.74	045	
50	2107	D38.00	A52.75	042	
51	2108	D38.50	A52.75	047	
52	2110	D39.00	A52.70	048	
53	2126	D39.25	A52.75	255	
54	2127	D39.00	A52.80	253	
55	2129	D38.64	A52.90	262	Fix doubtful
56	2131	D38.25	A52.98	262	
57	2134	D37.83	A53.10	267	
58	2136	D37.50	A53.29	279	
59	2139	D37.22	A53.50	276	
60	2141	D37.00	A53.70	282	
61	2144	D36.60	A54.00	276	

Note: No track plot of this survey is included in this report. The survey was of a small area, and no Admiralty chart is of a large enough scale to show the plot clearly.

The survey was performed to provide topographical information to help to explain the large energy disparity between wave measurements taken at the Inshore I and Inshore II locations. The survey showed no major topographical discontinuity which might explain the disparity.

ABRIDGED DETAILS OF HEBRIDES VISIT, AUGUST 1981

Waverider deployments:

Deepwater Site:	Buoy No:	67043
	Calibrated:	7.10.80
	Sensitivity:	1.842 Hz m^{-1}
	Position:	057° 17' 48"N
		007° 53' 54"W
	Decca readings:	Chain 8E/MP (Hebridean)
		Green D 30.06
		Purple A 73.90
	Date:	1.8.81
	Time:	1415 BST
	Depth:	100.3 m mid tide approx.
	Battery volts:	20.4 + 20.4 V in July 1981
	Frequency:	29.725 MHz
	Output meter reading:	8.9
Offshore Site:	Buoy No:	67214
	Calibrated:	27.11.80
	Sensitivity:	1.862 Hz m^{-1}
	Position:	057° 18' 21"N
		007° 38' 09"W
	Decca readings:	Chain 8E/MP (Hebridean)
		Green D 32.32
		Purple A 58.80
	Date:	1.8.81
	Time:	16.48 BST
	Depth:	47.6 m mid tide approx.
	Battery volts:	19.8 + 19.8 on 22.7.81
	Frequency:	29.825 MHz
	Output meter reading:	8.7

Inshore III Site:	Buoy No:	67213
	Calibrated:	23.1.80
	Sensitivity:	1.871 Hz m^{-1}
	Position:	057° 17' 24"N
		007° 29' 09"W
	Decca readings:	Chain 8E/MP (Hebridean)
		Green D 31.44
		Purple A 53.40
	Date:	1.8.81
	Time:	1759 BST
	Depth:	25.0 m mid tide approx.
	Battery volts:	20.5 + 20.3 V on 17.7.81
	Frequency:	26.990 MHz
	Output meter reading:	8.6

Waverider recoveries:

Deepwater Site:	Buoy No:	6851
	Deployed:	10.8.80
Offshore Site:	Buoy No:	67041
	Deployed:	25.4.81
Inshore III Site:	Buoy No:	67201
	Deployed:	1.3.81

Receiving Systems:

	Calibrated:	5.8.81
Deepwater System:	Frequency:	29.725 MHz
	Eddystone receiver:	EC964/7c/458, inventory number 1090
	Microdata logger No:	1036
	Recording channel:	5
	Readings prefixed by:	+
	Unlocked display:	+0000
	Sensitivity:	-64 Hz^{-1}

Offshore System:	Frequency:	29.825 MHz
	Eddystone receiver:	EC964/7c/553, inventory number 1106
	Microdata logger no:	1029
	Recording channel:	6
	Readings prefixed by:	-
	Unlocked display:	-0000
	Sensitivity:	$-64\ Hz^{-1}$
Inshore III System:	Frequency:	26.990 MHz
	Eddystone receiver:	EC964/7c/409, inventory number 999
	Microdata logger no:	1036
	Recording channel:	6
	Readings prefixed by:	-
	Unlocked display:	-0000
	Sensitivity:	$-64\ Hz^{-1}$

Natural Environment Research Council

Institute of Oceanographic Sciences
Crossway, Taunton, Somerset. TA1 2DW

PROVISIONAL CRUISE REPORT

VESSEL: MFV Devonian

LOCATION: Channel Islands

CRUISE PERIOD: 19-28 September 1981

PERSONNEL:
R H Wilkinson (Principal Scientist)
E J Moore (Diving Officer)
B M Norman)
A J Marks) Diving Team
L Whitlock (Wormley))

OBJECTIVES: Wave boundary layer flow vizualisation by time exposure photography of neutrally buoyant particles oscillating near the seabed under the action of surface waves in the absence of significant tidal current. The near bed velocity profile will be deduced from the lengths of the streaks on the photographs.

PROCEDURES AND METHODS: A lightweight pyramidal frame, holding a TV camera, photographic camera and lights mounted in a parabolic reflector is lowered to the sea bed and oriented by divers so that the water motion is perpendicular to the optical axis of the cameras. The parabolic reflector produces a fan of light so that only particles in this plane are visible, and so measurements can be taken from a single photograph. Neutrally buoyant particles (chopped polystyrene rod) are introduced into the flow in small quantities by the attendant divers. The TV camera is then used as a view finder and, when the particles are suitably distributed, time exposure photographs are remotely triggered on the other camera.

EQUIPMENT PERFORMANCE: The new U/W light bulbs blew when the rig hit the side of the ship. As they are physically stronger when cold, it is recommended that they are switched off on raising or lowering the rig.

The picture on the 'Sony' TV monitor lost contrast, but was fully repaired.

RESULTS : Twenty four 12 frame films were exposed under a variety of conditions. At times, the relative sizes of the tidal current and the wave action were about the same - undesirable for wave boundary layer studies. The opportunity was taken for some preliminary wave current interaction investigations. The sea conditions were not ideal for the wave boundary layer investigations, as the waves were too local (and thus short and steep) & hence the sea surface became unworkable before there was a great deal of action at the sea bed. A swell sea provides ideal conditions.

The Channel Islands proved to be a very successful area for this type of experiment, providing the very good U/W visibility anticipated, together with a great variety of bottom types and bays exposed to different wave directions. The bottom type observed on the U/W television did not always correspond to that marked on the chart.

RESULTS: (Contd)

As previous experience had shown that the parabolic reflector produced a slit of light bright enough for the contrast between the illuminated phase and the surrounding region to be sufficient to be able to take photographs in day light, activities were confined to daylight hours and nights were spent in port. Both St Peterport,Guernsey and St Helier, Jersey, were used as bases, the former being far more satisfactory from considerations of accessibility to suitable experimental sites. The best sites found were La Grande Grève on Sark (4) and Belvoir Bay (3) on Herm, though the latter is prone to tidal effects also.

ITINERARY:

19 September: Transferred scientific equipment etc via inflatable from Upper Ferry Slip, Dartmouth to Devonian mid river. Torrential rain and gale force winds prolonged loading and prevented departure.

20 September: Wind abated. Made passage to St Peterport, Guernsey. Tied up at 2330 hours.

21 September: Rig assembled and tested on deck. Proceeded to Fermaign Bay (Station 1) and performed experiment, exposing 3 films. Conditions not good, as sea bed is a fine, not very clean, sand which took some time to clear after diver disturbance. Little wave action at bed. Night at St Peterport.

22 September: Proceeded to Icart Bay (Station 2) and performed experiment. Depth (18 m) greater than indicated by chart (12 m). Poor visibility due to plankton and little water motion at this depth. One film exposed. No safe, shallower anchorage.

Proceeded to Belvoir Bay, Herm (Station 3). Very good visibility (~ 10 m) resulting from medium clean shelly sand, but little water motion at bed. Two films exposed.

Proceeded to La Grande Grève , Sark (Station 4). Ideal conditions; considerable bottom motion (possibly as a result of standing waves) giving intermittent suspension of medium sand bed with good visibility. Six films exposed.

Put into St Peterport overnight.

23 September: Proceeded to St Ouen Bay, Jersey (Station 5) in order to perform experiment. The fine sand bed marked on the chart transpired to be a kelp bed. Considerable bottom water motion, but diver and echo sounder surveys revealed no flat sand bed.

Proceeded to St Audin Bay (Station 6). Medium visibility (~ 3 m), some bottom wave action, but also tidal stream whose strength was about twice the wave surge. Nine films exposed at various rig orientations to waves and tide as both decayed.

Put into St Helier overnight.

24 September: Gale bound. Attempted to return to Guernsey in evening, but turned back by heavy weather. TV monitor found to be unservicable.

25 September: Returned to Guernsey. Put into St Peterport for TV repairs. Proceeded to Belvoir Bay (Station 3). Quite a rough sea at anchorage, but very short and hence little bottom action. Three films exposed.

Put into St Peterport overnight.

26 September: Wind dropped after very stormy night, but unsuitable for return to Dartmouth. Proceeded to Belvoir Bay (3) to catch end of swell, but conditions unsafe for anchoring. Returned to St Peterport.

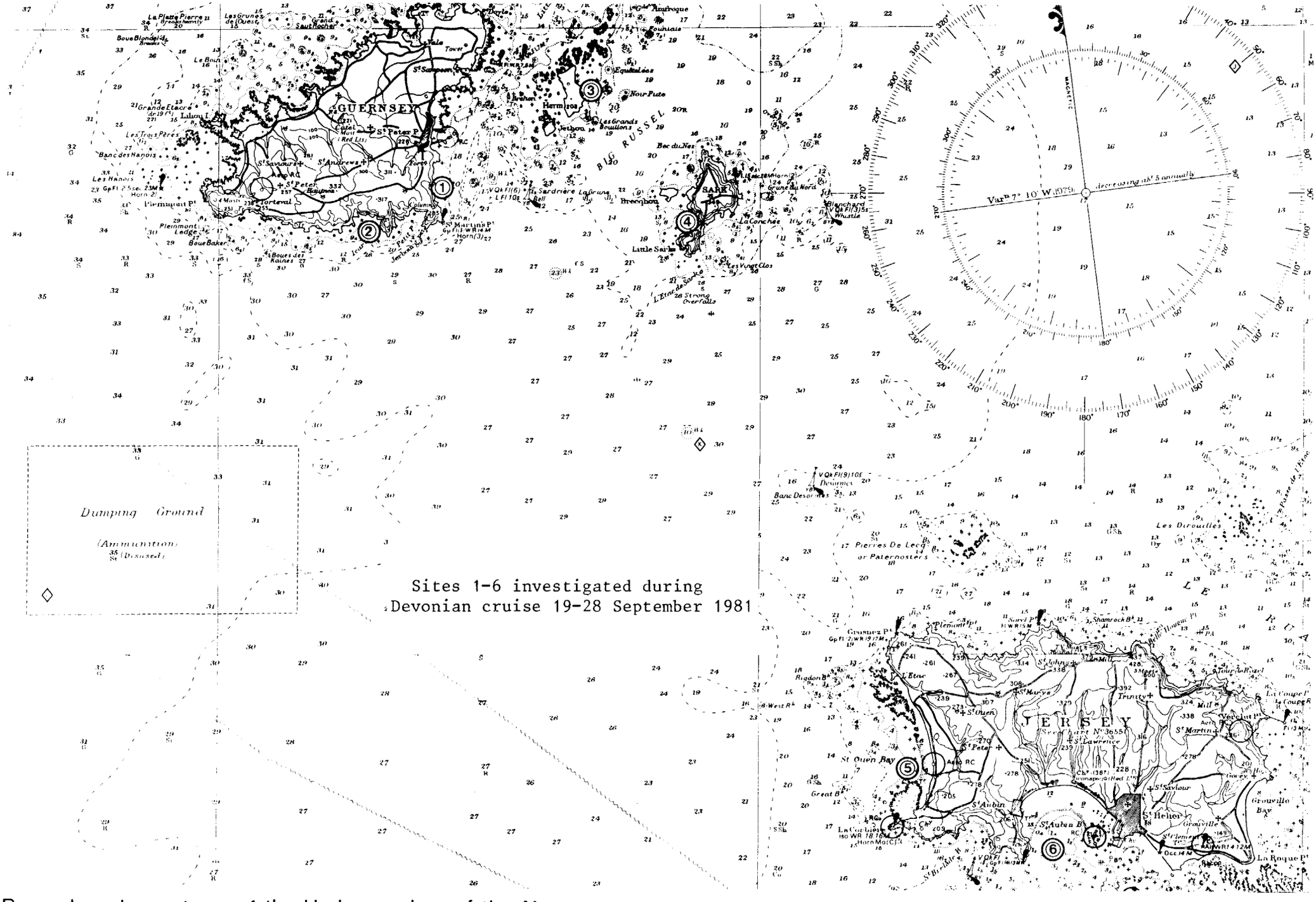
27 September: Returned to Dartmouth, arriving 1945 hours.

28 September: Unloaded equipment and returned to Taunton.

PREPARED BY: R H WILKINSON

APPROVED BY: A P CARR

DATE: 2/11/81



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PROVISIONAL CRUISE REPORT

VESSEL: RV Frederick Russell

CRUISE PERIOD: 6 October-14 October 1981

PERSONNEL:

R L Soulsby	SSO	(Principal Scientist)	6-11 October
R H Wilkinson	HSO	(Principal Scientist, 11-14 Oct)	6-14 October
G P Le Good	HSO		6-14 October
R A Haine	HSO		6-14 October
Mrs B L S A Wainwright	ASO		6-14 October
J S Chappell	Student		6-14 October
A P Salkield	SSO		10-11 and 13-14 October
P D Thorne	HSO		10-14 October

ITINERARY:

6 Oct Travelled to Plymouth, unloaded and set up equipment. Sailed 2000 for Start Bay and anchored overnight.

7 Oct Three-point anchored at Stn M. Tested raising and lowering of rig supported on electric cable. Fitted instruments to rig and tested them with rig at midwater.

8 Oct Made improvements to rig handling and instruments. Commenced profiling experiment at 1400, and continued through night.

9 Oct Continued profiling experiment until 1600. Weather too bad to continue working (SW9), so sailed to Dartmouth and moored to buoy overnight.

10 Oct Attempted to anchor bow and stern at Stn 8 in R Dart to obtain turbulence profiles with no ship motion, but position unsuitable for anchoring. Anchored off Pilchard Cove while instruments were got ready for ripple shadow experiment. APS and PDT came out on MV Devonian to join Frederick Russell at 1200. Three-point anchored at Stn 1 at 1800 and commenced ripple shadow experiment, which continued overnight.

11 Oct Ripple shadow experiment (RSE) continued until 0800. APS and PDT conducted trials of the Sand Transport Probe (STP) during daytime. MV Devonian came alongside at 1700 and took APS and RLS to Dartmouth, and thence to Taunton. RSE recommenced at 1830 and continued throughout the night.

12 Oct RSE finished at 0730 and recommenced at 1800. STP trials during day.

13 Oct RSE finished at 0730 and recommenced at 1830. STP trials during day. APS returned to ship via MV Devonian at 1000.

14 Oct RSE finished at 0530. Grab sample taken at Stn 1. Anchor weighed at 0545. Echo sounder survey over Stn 1 and M, with grab sample at M prior to returning to Plymouth. Docked at 1015 hours. RHW, BSLAW, JSC and APS returned to Taunton.

OBJECTIVES: The cruise was made as part of the DoE funded programme of research into the processes of sand movement by tidal currents. The aims were:

(a) To make measurements of the tidal variation in the vertical profile of turbulent kinetic energy, in order to elucidate the dynamics of the tidal boundary layer.

OBJECTIVES: (Contd)

(b) To measure the tidal variation in the shape of sea bed sand ripples, and the simultaneous variation in the near bottom velocity profile. This will help determine whether previously noted temporal variation in the sea bed roughness length is caused by the changing ripple asymmetry.

(c) Field trials of the Sand Transport Probe for measuring suspended sediment concentration.

PROCEDURE AND METHODS:

Objective (a)

Measurements of turbulent kinetic energy profiles have not been made previously, so this experiment was largely concerned with trying out techniques and obtaining a limited data set for developing the analysis methods. Two 5 cm diameter electromagnetic current meter (EMCM) heads were mounted orthogonally on a rig so as to measure all 3 components of the fluctuating current velocity. The rig was hung over the ship's side suspended from an electric strain cable and profiled up and down through the water column. A cycle of measurements was taken every hour, consisting of a 10 min measurement with the rig on the bed followed by consecutive 6 min measurements at each of six heights above the bed. An echosounder mounted on the rig gave its height above the bed, and the water depth was periodically read from the ship's echosounder. Because the rig is moving due to ship motion relative to a fixed coordinate frame, it was necessary to measure its own motion so that this can besubtracted from the EMCM outputs. Three out of the six degrees of freedom were measured, namely heave velocity obtained from an accelerometer, pitch and roll. These, together with the EMCM data, were recorded every 0.2s on a microprocessor controlled digital data logger, and also on a back-up analogue tape recorder. The rig also carried a rigidly mounted Braystoke Direct Reading Current Meter and two Ott current meters, and these, together with a Braystoke DRCM hung separately at a constant 7 m below the water surface, were recorded every minute on the data logger. A method of raising and lowering the rig without requiring a break in the electric cable was used. This involved winding the cable onto the dredge winch with the load taken at the cable's midpoint, so that two ends of cable came off the drum, one leading to the rig and the other to the lab. A specially fabricated wooden jacket was fitted over the wire on the winch drum to protect and guide the electric cable.

Objective (b)

The shape of the sand ripple was monitored optically by obliquely casting the shadow of a horizontal rod (pointing into the flow) onto the sea bed. The shape of the shadow was recorded photographically using a remotely triggered Hasselblad 550 EL/M. An U/W television camera was directed at approximately the same field of view and was used as a viewfinder to detect when significant change in the ripple shape had occurred, and thus the photographs could be taken at the optimum moments.

The mean velocity profile was measured using 6 Ott propellor current meters mounted at approximately logarithmic spacing above the bed. The counts from these were recorded every minute on the data logger.

Objective (c)
Measurements of suspended load were conducted using the STP, which was calibrated on site against pumped samples. The analogue signal was digitised using a threshold detector and recorded on a digital data logger.

EQUIPMENT PERFORMANCE:

Objective (a)
The system of lowering the rig proved successful and allowed rapid changes to be made in its height above the bed. All the instruments on the rig worked well, except for one of the Ott current meters which was subsequently dismantled and repaired. The digital data logger, which had not previously been tested in the field, worked well and gave no problems. The TV camera suffered from a faulty plug, but it was not essential for experiment (a), so it was removed and repaired in readiness for the ripple shadow experiment.

Objective (b)
The operation of the Hasselblad 500 EL/M with the 70 exposure magazine proved intermittently unreliable but thorough deck testing of both the camera and the remote triggering system failed to locate the fault. The use of 12 exposure magazines with the original timer box was finally resorted to, even though this necessitated raising the frame every hour to change films.

Four out of six Ott current meters could be seen on the television, so any fouling by weed etc could be noted. Apart from the fouling their reliability seemed better than 95%, with occasional stickiness caused by sand in their bearings. Provided that only one meter was affected in this way at a time, the rotor was overhauled the next time the rig was on deck.

A two pump system had been arranged for the pumped sampling, which alleviated the previous priming difficulties. It transpired, however, that the flow rate obtained was sufficient to collapse the valve tube in the manifold box, whereas a smaller flow rate was insufficient from the sampling point of view. The manifold was abandoned, and samples just taken from one level.

Objective (c)
Damage to the STP on 12 Oct caused a decrease in operational performance and this seriously impeded the investigation with the STP.

RESULTS:

(a) The main purpose of the experiment was achieved, namely to test out the feasibility of making turbulence profiles from an anchored ship. The system of handling the rig and the hourly sequence of operations proved to be workable. The heave velocities due to ship motion could be seen qualitatively to be mirrored in the EMCM traces, but surprisingly the pitch and roll were both steady to within $\pm 0.1^\circ$ at all times, and rapid logging of them could be dispensed with in the future. It is still not known how important yaw, surge and sway are, as these were not measured. Although the weather was poor during the experiment so that there was both appreciable ship motion and wave orbital motion superimposed on the velocities, a useful data set was obtained, and analysis of

this will show how successfully the motion can be removed, as well as giving a first impression of the behaviour of the turbulent kinetic energy in an oscillatory tidal boundary layer.

Because of the weather, data could only be obtained at Stn M (shallow water, fast currents) and not at Stn 7 (deeper water, slower currents). Nor could they be obtained at Stn 8 where it was hoped that ship motion would be negligible, because of the anchoring difficulties.

Future experiments must be planned at sites and dates where wave activity can be expected to be minimal, but granted this they should be capable of yielding valuable results.

(b) The intermittent malfunction of the Hasselblad prevented us obtaining full sets of ripple and velocity profiles during the first three nights, but some data was obtained during this period which together with 'guesstimates' of the shadow shape on the TV screen copied on acetate sheet should progress the investigation considerably. A full set of both types of profile was obtained on the last night (equinoctial spring). Sediment concentrations at 10 cm above the bed and mean velocity profiles were obtained on all four nights, totalling about 35 hours of data in all.

(c) Initial measurements with the STP appeared satisfactory up to the time of its damage.

STATION LIST:

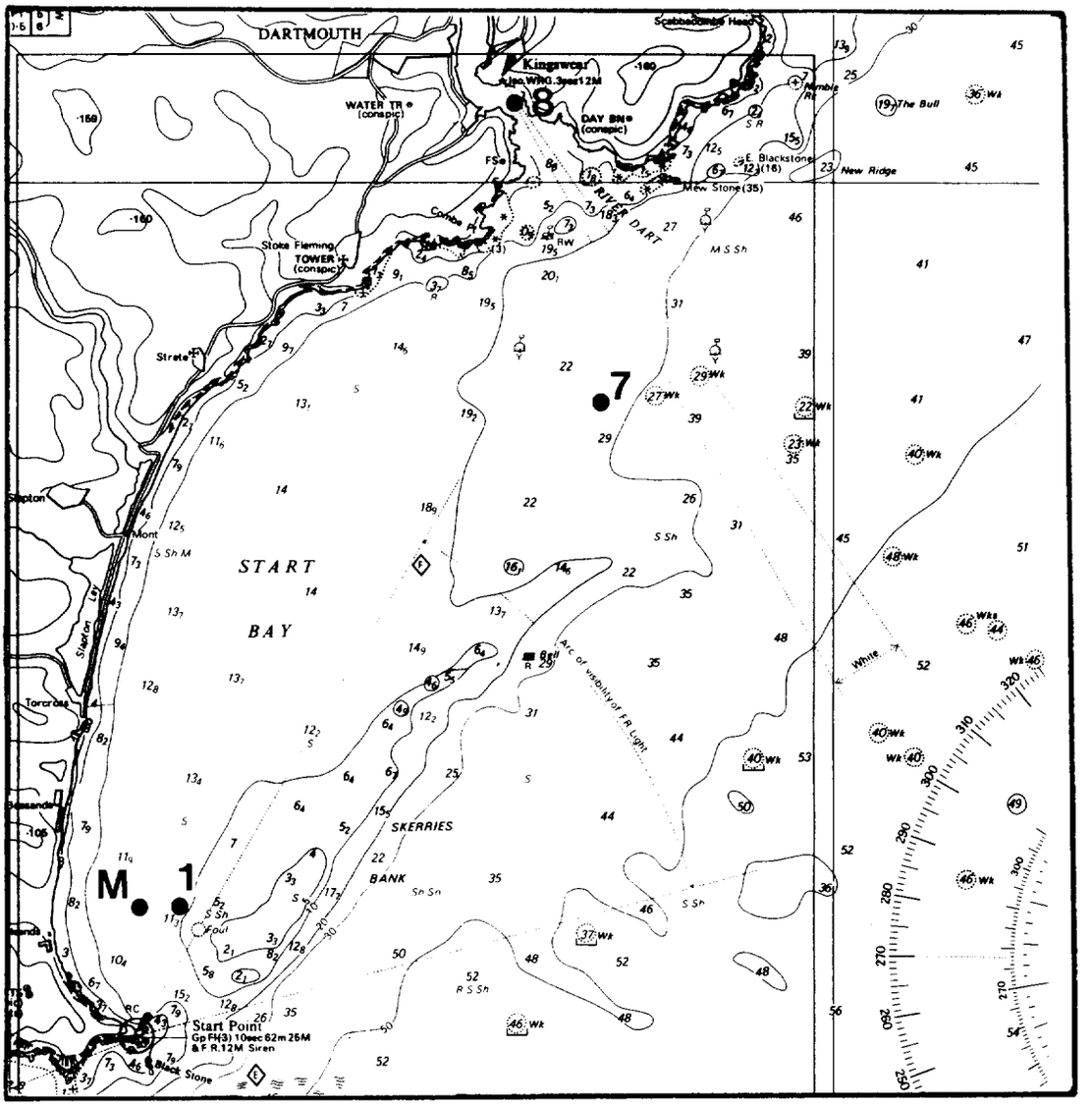
1	50° 14.3'N	3° 37.9'W
7	50° 18.2'N	3° 32.8'W
8	River Dart off One Gun Point	
M	50° 14.4'N	3° 38.2'W

PREPARED BY: R L SOULSBY
R H WILKINSON

APPROVED BY: A P CARR

DATE: 6 November 1981.

RV FREDERICK RUSSELL 6 - 14 OCT 1981



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PROVISIONAL CRUISE REPORT

VESSEL: RV Frederick Russell
Cruise No 81/14 Second leg

CRUISE LOCATION: West Solent

CRUISE PERIOD: 14-22 October 1981

PERSONNEL:

D N Langhorne (Principal Scientist)	14-21 October
A D Heathershaw	14-21 October
R A Haine	14-18 October
G P Le Good	14-22 October
E J Moore	14-22 October
D J Corns (Mrs)	14-22 October
A A Read	14-18 October
P D Thorne	14-21 October
A P Salkield	18-21 October

OBJECTIVES:

a) To conduct boundary layer flow measurements on the different gravel bedform types in the West Solent.

b) To study gravel movement using underwater TV, a sediment trap and an acoustic probe to record self generated noise (see appendix).

c) If time and environment conditions permitted, to conduct preliminary observations of gravel movement under waves.

The cruise was part of a DoE Commission. Project S26.

PROCEDURE AND METHODS:

a) Trisponder remote stations were set up on the yacht club staging at the entrance to Lymington river (43485E, 93528N). and in the roof of the hut at the end of Yarmouth Pier (43543E, 90002N).

b) It was intended to operate two boundary layer flow rigs simultaneously with the ship anchored by three anchors. On the first day this proved to be unsatisfactory and for the remainder of the cruise a single rig was used. Owing to the limited lifting ability of the Hiab crane, the rig was deployed from the stern anchor. In addition, because the rig was deployed astern of the ship, it was not possible to locate its position using a traversing echo sounder as intended.

c) Mid-water tidal flow data were obtained using a Braystoke direct reading current meter.

EQUIPMENT PERFORMANCE:

a) Trisponder - good.

b) Boundary layer rig - the design of the rig proved to be good. Six Otts flow sensors were mounted on the vertical mast at heights 10, 25, 40, 65, 100, 180 cm above the bed. These instruments were reliable and only failed to provide good data when fouled by drifting weed. Turbulence data were obtained from 2 E/M flow sensors for the period 19-20 October. In order to study gravel movement it was necessary to position the underwater TV camera within 50 cm of the bed. Underwater lighting was required. Using pan and tilt, care had to be taken not to influence the flow reaching the flow sensors and cause gravel to move.

Owing to the difficulties of operating two bottom rigs, no data was obtained from the second rig which incorporated a sediment trap.

For performance of the self generate noise probe, see Appendix.

c) Bedform measurement and rig positioning: Trials were conducted using a traversing echo sounder transducer mounted on a taut wire running from bow to stern beneath the water surface. The wire was tensioned using 4 x 50 kg lead weights and sag on the wire was minimised by adding floatation to the transducer carriage. Good results were obtained by moving the transducer at fixed intervals (1 m) along the taut wire.

SHIP PERFORMANCE: The ship provided adequate accommodation, laboratory space, deck space and winch facilities. It was not possible to deploy the bottom rigs over the Port side using the hydrographic davit and Hiab crane because of the limitations of their safe working loads. Winch tensions of up to 8 tonnes were experienced when the large rig was dragged sideways across the sea bed when the ship swung away from the lowering position. For these reasons the large rig was deployed from the stern; this prevented the use of a stern anchor. Without the use of a stern anchor the ship swung and it was therefore not possible to use two rigs. Using one rig the swing of the ship was usually acceptable, but a period of a flood tide (East going) was lost on 17 October when opposing NE winds of Force 7 occurred.

It was not possible to position the rig with reference to the gravel bedforms using the taut wire/echo sounding system because the rig was deployed from the stern.

RESULTS: Reliable boundary layer flow measurements and TV observations of sediment movement were obtained for most of the cruise. The results were normally only interrupted by drifting weed. Turbulence data was obtained from E/M flow sensors for the last two days of the cruise. The results are summarised as follows:

DATE	AREA BEDFORM TYPE	TIME (BST)	EBB/FLOOD TIDE	TIDAL RANGE
16 Oct	Flat bed gravel	1239-1305	Flood	4.5 m
		1410-1840	Ebb	4.5 m
		1939-2315	Flood	4.4 m
17/18 Oct	Long wave length gravel	0833-1008	Flood	4.2 m
		1409-1940	Ebb	4.2 m
		2035-0100	Flood	4.0 m
18 Oct	Short wave length gravel	0850-1349	Flood	3.7 m
		1458-1953	Ebb	3.7 m
19/20 Oct	Flat bed gravel	0914-1530	Flood	3.1 m
		1738-1837	Ebb	3.1 m
		2242-0346	Flood	2.9 m

RESULTS:
(Contd)

DATE	AREA BEDFORM	TIME (BST)	EBB/FLOOD TIDE	TIDAL RANGE
20 Oct	Transition zone sand/gravel	1043-1501	Flood	2.4 m
	Long wavelength gravel	1721-2200	Ebb	2.4 m

ITINERARY:

6.10.81 Equipment delivered to ship at Plymouth.

14.10.81 IOS Staff travelled to Plymouth. Set up equipment onboard.
2100 sailed for West Solent.

15.10.81 0915 arrived West Solent. Set up Trisponder remote stations. Anchored with three anchors in gravel area.
1400 recovered anchors (two bow anchors fouled by power cable, stern anchor caught on heavy chain).
1830 anchors cleared, moored to mooring buoy.

16.10.81 0630 anchored in flat bed gravel area.
0915 started logging boundary layer flow data.
1005 two bottom rigs tangled. Both rigs recovered.
1239 large rig redeployed.
2315 studies completed.

17.10.81 0710 anchored in area of long wave length gravel waves.
0833 started boundary layer flow measurements.
0100 studies completed.

18.10.81 0630 anchored in area of short wave length gravel waves.
0850 started boundary layer flow measurements.
1953 studies completed.

19.10.81 0700 anchored in flat bed gravel area.
0914 started boundary layer flow measurements.
0346 studies completed.

20.10.81 0630 anchored in transition area between long wave length and flat bed gravel.
1043 started boundary layer flow measurements.
1550 reanchored ship in area of long wave length gravel.
1721 started observations.
2200 studies completed.

21.10.81 0730 recovered Trisponder remote stations.
1145 landed IOS staff at Yarmouth Pier to return to Taunton. Ship on passage to Plymouth.
2150 arrived Plymouth.

22.10.81 Off loaded equipment and returned to Taunton.

PREPARED BY: (D N LANGHORNE)

APPROVED BY: (K R DYER)

DATE: 18 NOV 1981

APPENDIX: Self Generated Noise

OBJECTIVE: Bedload transport of mixed gravel sizes acts as a broadband acoustic source, which if sufficiently intense registers above ambient noise, and can be utilised to detect gravel movement. This "self generated acoustic noise" was to be monitored and compared with visual observations of gravel movement, to ascertain the possibility of detecting the threshold of gravel movement and estimating, in broad term, the quantity of material moving from the acoustic information obtained.

PROCEDURE AND METHODS: The approach adopted was to mount a directional hydrophone 30 cm above the seabed and "listen" to the gravel moving along the bed. The maximum receiving sensitivity of the hydrophone was directed towards an area on the seabed which was simultaneously observed with an underwater TV camera. A low noise amplifier increased the hydrophone signal level before driving it through the cable to the head electronics, where a threshold detector registered gravel movement. Digital recordings of the detector output was conducted using a data logger.

RESULTS: On site visual observations of gravel movement using the underwater TV camera correlated with increased signal levels detected by the hydrophone. Preliminary comparisons of video recordings of the pebble movement and digitised logger data gave encouraging results which indicate that self generated noise can be used to detect the threshold of gravel movement, and broadly estimate the quantity of mobile material.

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Institute of Oceanographic Sciences
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PROVISIONAL CRUISE REPORT

VESSEL: RV Squilla

LOCATION: Eddystone Rocks

CRUISE PERIOD: 2 November-5 November 1981

PERSONNEL:
B M Norman
J D Humphery
D H Joyce

OBJECTIVES: To recover old Waverider and mooring system. To deploy new Waverider and Wavecrest buoys in order to continue data collection from the Eddystone site and also to run comparative tests between the two types of buoy. To install and commission receiving and logging systems at HMS Cambridge.

PROCEDURE AND METHODS: The Waverider buoy was deployed by allowing the buoy and sub surface float to drift away from the vessel to ensure that no twists or kinks existed in the mooring. The anchor clump was then lowered to the sea bed on a steel wire. The lowering wire was then unshackled and allowed to drop free.

The Wavecrest buoy was deployed in an identical manner.

The old Waverider was recovered using boathook and jilson. The buoy was detached from the rubber cord and replaced with a large marker buoy. A large grapnel was lowered and several runs were made past and around the buoy in an attempt to snag the riser chain between the sub surface float and the anchor clump.

Eventually the grapnel or the wire caught fast, probably on a rocky outcrop, and after several attempts to free it the wire was cut and the grapnel abandoned.

EQUIPMENT PERFORMANCE: The failure to recover the Waverider mooring and the consequent loss of the grapnel was the only problem encountered during the cruise. The grapnel that was lost had been used very successfully on other occasions and it is thought that the extremely rocky conditions present at the Eddystone site rendered the grapnel unrecoverable using the winch and equipment available on the vessel.

ITINERARY: Monday, 2 November:
Travelled to Plymouth.

Tuesday, 3 November:
AM Loaded Squilla and prepared both moorings. Weather conditions caused postponed sailing.
PM Installed two more receivers and two track microdata logger at HMS Cambridge.

Wednesday, 4 November:
Vessel sailed 0900.
AM Deployed Waverider buoy and Wavecrest buoy.
PM Recovered old Waverider buoy and attempted to recover old Waverider mooring. Returned to Plymouth.

Thursday, 5 November:
AM DHJ unloaded Squilla and returned to Taunton. BMN and JDH commissioned new receiving system at HMS Cambridge.
PM Returned to Taunton.

PREPARED BY: B. M. Norman B M NORMAN

APPROVED BY: A P Salkield A P SALKIELD

DATE: 30.11.81

ABRIDGED DETAILS

Eddystone Wavecrest Buoy

Buoy No	104
Inventory No	1134
Frequency	27.015 MHz
Battery voltages	23.9 V + 23.8 V Top
	23.8 V + 23.9 V Bottom on 14.10.81
Position	Red A 11.8
	Green C 46.7
	Purple A 70.95
	Depth 40.5 m
Deployed	1140 GMT 4.11-81
Calibrated	14.10.81
Sensitivity	1.7777 Hz m^{-1}
Eddystone Rx	Type No 964/7c
	Serial No 499
Microdata logger	Inventory No 1097
	Serial No 5266
Logger and Rx calibrated	3.11.81
Sensitivity	-64.00 Hz^{-1}
Readings prefixed by	Negative symbol
Recording channel	5

Eddystone Waverider Buoy

Buoy No	67201
Frequency	26.990 MHz
Battery voltages	19.10.81 20.5 V + 20.5 V
Position	Red A 11.7
	Green C 46.3
	Purple A 70.8
	Depth 40.4 m MWD
Deployed	1100 GMT 4.11.81
Calibrated	14.10.81
Sensitivity	1.8523 Hz m^{-1}
Eddystone Rx	Type No 964/7c
	Serial No 447
Microdata logger	Inventory 1097
	Serial No 5266
Logger and Rx calibrated	3.11.81
Sensitivity	-64.00 Hz^{-1}
Readings prefixed by	Positive symbol
Recording channel	6

NB: The data from both of the buoys is being recorded on a 2 channel Microdata Logger.

RV SQUILLA 2 - 5 NOVEMBER 1981

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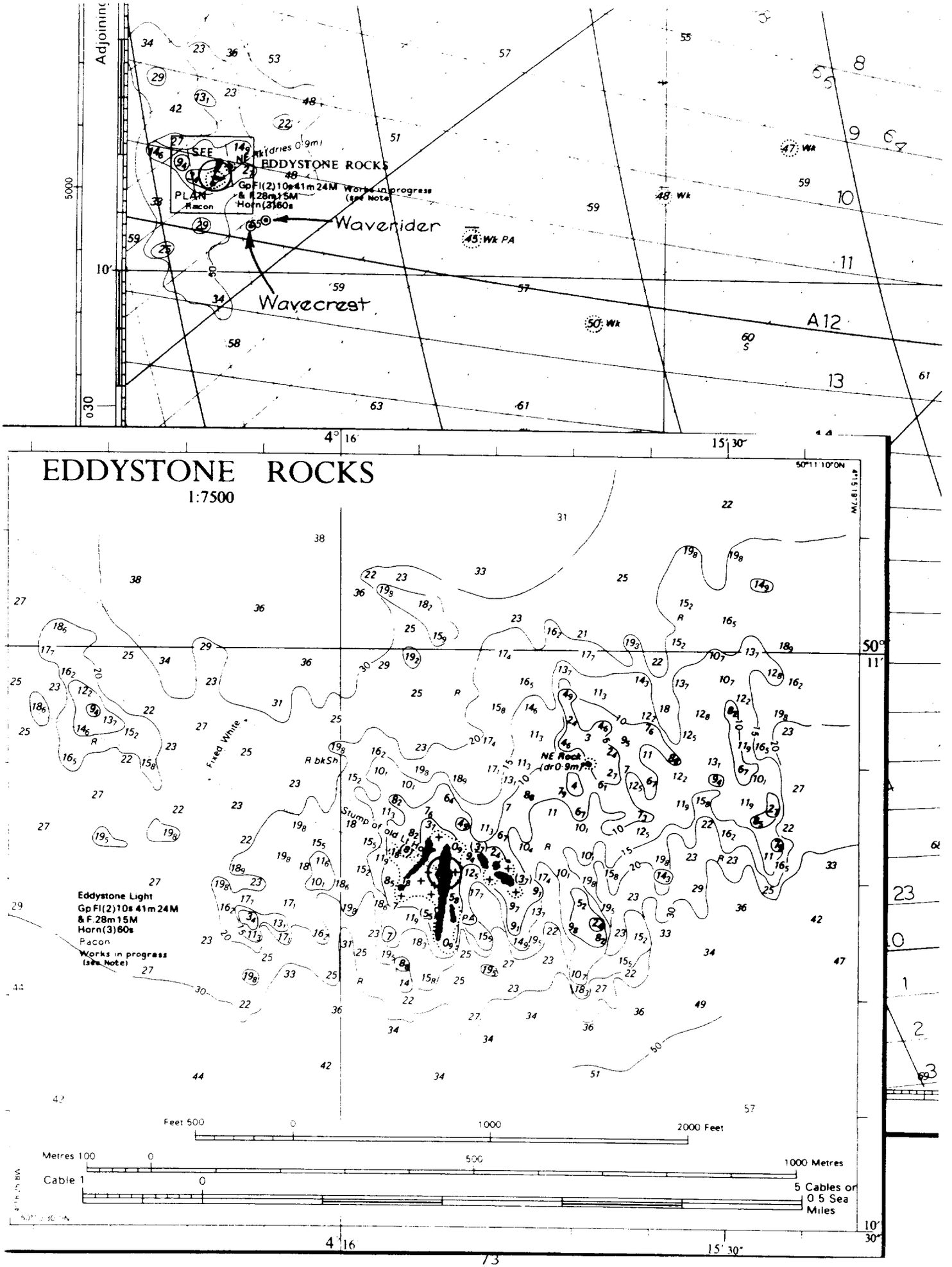

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PROVISIONAL CRUISE REPORT

VESSEL: RV Squilla

LOCATION: Eddystone Rocks

CRUISE PERIOD: 30 November-2 December 1981

PERSONNEL:
B M Norman
J D Humphery
J M Codd

OBJECTIVES: To deploy Waverider buoy in position approximately 3 miles south of Eddystone Lighthouse.

To install stabilizing chain beneath Wavecrest buoy.

PROCEDURE AND METHODS: BMN swam from the Squilla to the Wavecrest buoy and attached the stabilizing chain to a shackle at the base of the buoy. JDH acted as standby.

When laying the Waverider buoy, the buoy itself was streamed astern. The anchor was lowered on the mooring rope, using the drum of the winch. A bight of the mooring rope was retained, and was used to pull the anchor and anchor chain straight before finally setting free.

EQUIPMENT PERFORMANCE: All equipment performed satisfactorily.

ITINERARY:

Monday, 30 November 1981
am Loaded van.
pm Travelled to Plymouth.

Tuesday, 1 December 1981
0830 Load equipment onto RV Squillla.
0930 Departed for Eddystone Rocks.
1100 Attached stabilizing chain to Wavecrest buoy.
1200 Deployed Deepwater Waverider. Returned to Plymouth.

Wednesday, 2 December 1981
am Commission Wavecrest receiving and logging system at HMS Cambridge.
pm Returned to Taunton.

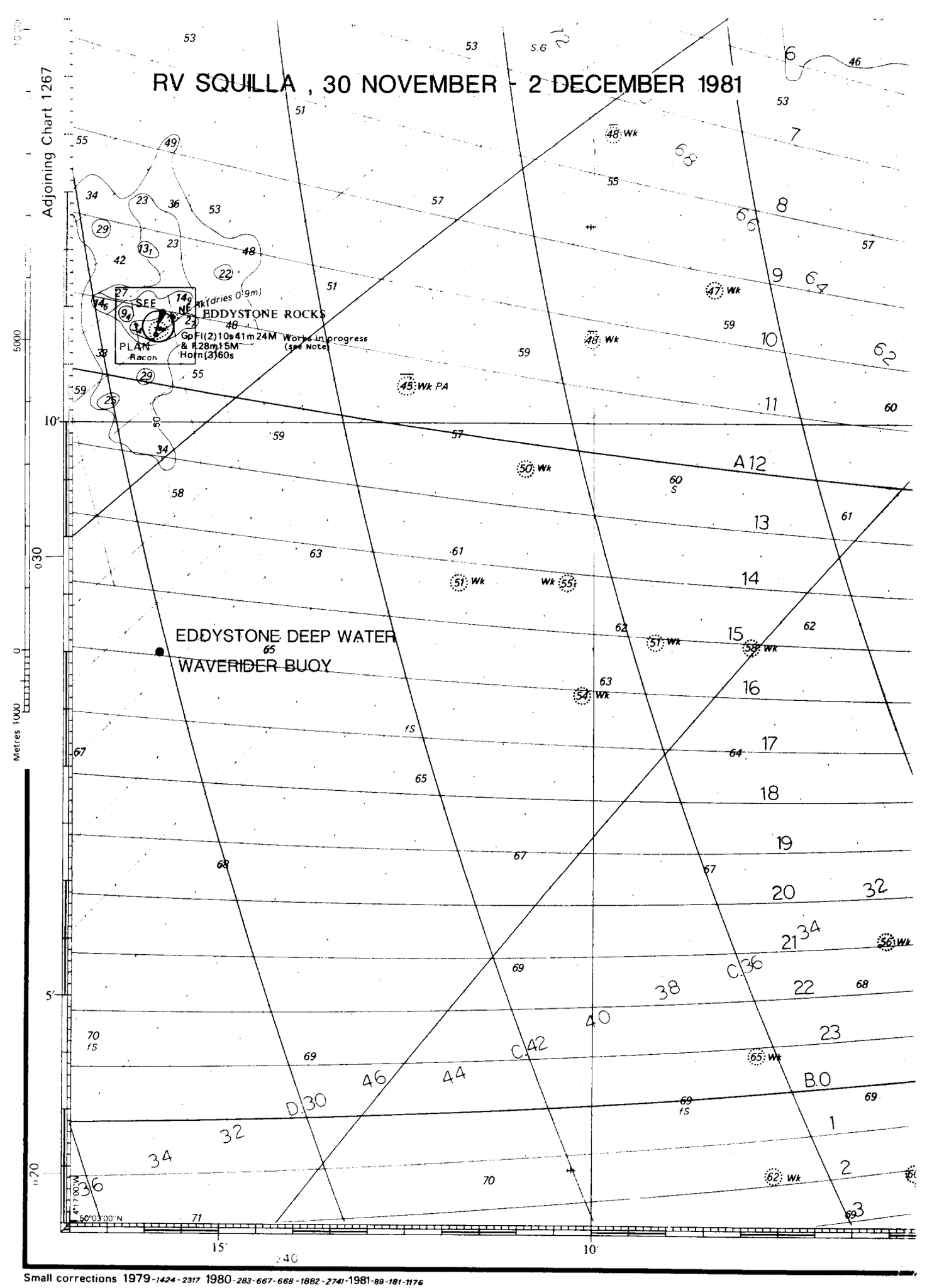
PREPARED BY: B M Norman — B M NORMAN

APPROVED BY: A P Salkield — A P SALKIELD

DATE: 21/12/81

ABRIDGED DETAILS

Eddystone Deepwater	Waverider buoy
Buoy No	6851
Frequency	29.725 MHz
Output Power	8.8
Battery Voltages	21.5 + 21.5 Volts
Position	Red A 15.93 Green D 30.20 Depth 64 m MWD
Deployed	1200 GMT 1.12.81
Calibrated	18.8.81
Sensitivity	1.872 Hz m^{-1}
Eddystone Rx	Type No 964/7C Serial No 456
Microdata Logger	Inventory No 1037 Serial No 5152
Logger and Rx Calibrated	3.11.81
Sensitivity	-64.00 Hz^{-1}
Readings prefixed by	positive symbol
Display channel	6



Small corrections 1979-1424-2317 1980-283-667-668-1882-2741-1981-89-181-1176

•AB. AC. AD.•

DECCA CHAIN 1B/MP (South West British)

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