

**I.O.S.**

**RRS JOHN MURRAY CRUISE 5/75**

**4-15 APRIL 1975**

**SANDWAVE RESEARCH**

**CRUISE REPORT No 39**

**1975**

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

RRS JOHN MURRAY CRUISE 5/75

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SANDWAVE RESEARCH

Cruise Report No 39

1975

Institute of Oceanographic Sciences  
Crossway  
Taunton  
Somerset

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## SCIENTIFIC STAFF

D N Langhorne	Senior Scientist	4-16 April
R H Wilkinson		4-9 "
Miss P Bowditch		4-7 "
R Gleason		7-10 "
E J Moore		4-16 "
N Frederikson (Denmark)		9-14 "
B D'Olier (City of London Polytechnic)		11-14 "
K Hitchen ( " " " )		11-14 "

On board on Monday 7 April for trial of the Sonardyne Rangemaster acoustic position fixing system:

R L Cloet  
J S Driver  
R A Haine  
T Howard Jones (MATSU)  
N C Kelland (BP)  
J Partridge (SONARDYNE)

## SHIP'S OFFICERS

P Moore (Captain)  
G Long (1st Mate)  
P Tilbury (2nd Mate)  
M Tutman (3rd Mate)  
D Gregory (3rd Mate under training)  
P Byrne (1st Engineer)  
P O'Keefe (2nd Engineer)  
N Walters (3rd Engineer)

## OBJECTIVES

1. To establish a research area in a sandwave field where studies of stability may be made in relation to meteorological conditions, and comparisons made with sandwaves studies at Longsand Head, Outer Thames Estuary.
2. To carry out sea trials of the Sonardyne 'Rangemaster' relative position-fixing system using sea bed transponders.
3. To continue the study of sandwaves and associated dune bedforms at Longsand Head, with particular reference to the reformation of sandwaves in the PLA trial dredged channel.
4. To continue the study of sand ribbons associated with Shipwash Bank in order to determine their relevance as paths of sediment transport.
5. To carry out trials with 'Automatic Gain Control' circuit boards fitted to the EG & G Dual Channel sidescan sonar.
6. To carry out an acceptance trial of the Plessey Scund velocity meter.
7. To observe sandwaves in different environments to study the association of dune bed forms.

## NARRATIVE

Thursday, 3 April

D N Langhorne and E J Moore travelled to Barry to load and set up equipment on board RRS JOHN MURRAY. On arrival (14.30) it was learnt that owing to a break in the oil feed pipe which occurred whilst on trials on the previous day, the ship would not be sailing until 15.00 on Friday, 4th (originally planned for 09.00).

Friday, 4 April

R H Wilkinson and Miss P Bowditch joined the ship. 15.00 sailed from Barry and proceeded to Swansea Bay to carry out sonar observations around Scarweather and Hugo Banks. (Owing to the late sailing it was not possible to get to Barnstaple Bay in time to work that day. It was therefore decided to work in Swansea Bay (for A P Carr) and then proceed on passage overnight to Barnstaple Bay. 22.00 recovered sonar and proceeded to Barnstaple Bay.

Saturday, 5 April

Sandwave observations in Barnstaple Bay.

Good examples of large well formed sandwaves occur in Barnstaple Bay. These however are not considered suitable for detailed research as they occur in deep water (in excess of 20 m) limiting the use of divers and are exposed to adverse weather from the SW preventing the use of a small boat.

Late pm proceeded on passage to the South Coast.

Sunday, 6 April

Sonar observations between Fowey and Dartmouth.

No sandwaves of any significance were detected between Fowey and Hope Cove though small dunes do occur East of Fowey and off Rame Head. A large isolated sandwave was found in deep water off Salcombe. A field of well formed asymmetrical sandwaves (height of up to 12.5 m) occur in the SE side of the Skerries Bank whilst further sandwaves occur on the NE tail of the bank. No significant sandwaves were detected in the inshore (NW) side of the Skerries. The abundance of fishing floats in the Start Bay area makes navigation with the towed sonar transducer very difficult. At 16.05 a float rope was snagged by the sonar causing it to trip and blow the 750 m amp fuse.

19.30 Proceeded to Dartmouth.

Monday, 7 April

R L Cloet, J S Driver, R A Haine and T Howard Jones (MATSU) joined the ship for trials with the Rangemaster relative positioning system. Miss P Bowditch was landed. J Partridge (SONARDYNE) and N C Kelland (BP) proceeded to the trials area off Torcross in J Partridge's boat and then joined JOHN MURRAY

During the period of the trials the opportunity was taken to carry out sonar observations on the west side of the Skerries Bank as well as conducting trials with the Plessey Sound Velocity Meter.

Rangemaster trials were completed at 21.00 when JOHN MURRAY returned to Dartmouth. The day visitors left and R Gleason joined the ship.

Tuesday, 8 April

Sailed from Dartmouth and recovered the transponders. Continued the sonar survey of sandwaves associated with the Skerries Bank. Wind speeds gusting up to 60 knots from the NE made sonar conditions poor in Start Bay.

Wednesday, 9 April

Sailed for Dartmouth. Carried out sonar observations to detect sandwaves from Berry Head through Lyme Bay to Weymouth. No significant sandwaves were found in Lyme Bay, though good examples of sandribbons were found off Chesil Beach. The ribbons run at right angles to the beach, ie transverse to the tidal flow direction, and exhibit secondary dunes with crest lines parallel to the beach.

Owing to strong northerly winds and driving snow causing bad visibility, it was not possible to go sufficiently close to the south side of Shambles bank to detect the large sandwaves which occur in that area. Further sonar observations were made on Adamant Shoal before proceeding to Weymouth Roads. At Weymouth R H Wilkinson left and N Frederikson joined the ship.

Thursday, 10 April

Conducted sonar observations from Weymouth Bay, across Lulworth Banks and Kimmeridge Ledge to Swanage and Bournemouth. R Gleason was landed at Bournemouth. Sonar observations were continued east of Bournemouth and thence off Christchurch Ledge to the area of furrows to the south of the Isle of Wight. Owing to the shallow depth it was not possible to make observations close to Dolphin Bank. Good examples of furrows were detected south of the Isle of Wight by towing the transducer deep, on a long tow cable, and thus being able to use the 250 feet range scale. Attempts were made using the sonar to navigate the ship along courses parallel to individual furrows.

Friday, 11 April

am - On passage to the Thames Estuary

pm - Sonar observations in the Edinburgh Channels before proceeding to Margate Roads for B D'Olier and K Hitchin to join the ship.

Saturday, 12 April

am - Sonar observations off N Foreland and the Drill Stone (large sandwaves).  
pm - Hifix locked in and checked at Sunk Head Tower. Carried out repeat sonar runs on 'standard' sonar track at Longsand Head. Trials with ORE Pinger.  
Late pm - proceeded to Harwich.

Sunday, 13 April

Locked in Hifix at Sunk Head Tower. Proceeded to Longsand Head for repeat sonar run on standard track. Late am and pm sandribbon studies east of Shipwash and thence between Shipwash and Orfordness. Late pm returned to Harwich.

Monday, 14 April

N Frederikson left the ship.

Sailed for Harwich and locked in Hifix at Roughs Tower. Sand ribbon studies from North Shipwash to Alderburgh Napes and to the west of Shipwash.

Tuesday, 15 April

Sailed for Harwich to Longsand Head. Locked in Hifix at South Head Tower. Carries out repeat sonar runs on standard track and across PLA trial dredged channel.  
pm - sonar observations of submarine pre-Flandrian tributary channel off Sunk Head. Late pm returned to Harwich.

Wednesday, 16 April

0800 - D N Langhorne and E J Moore left the ship and returned to Taunton by rail. RRS JOHN MURRAY proceeded to Lowestoft.



## EQUIPMENT PERFORMANCE

### HI FIX

A complete Hi Fix system was set up on board by a Decca engineer prior to sailing for Barry. IOS (T) provided a Track Plotter and spare receiver. In future such assistance by Decca is not necessary particularly as the receiver can only be set up to the nominal frequency of the chain and may have to be adjusted later to the actual frequency on which the chain is operating.

Whilst working in the Thames the Hi Fix performed satisfactorily. Locking in was normally carried out at Sunk Head Tower, but for the latter part of the cruise whilst working off Shipwash Bank it was acceptable to lock in at Roughs Tower.

### EG & G SONAR

The sonar was used extensively throughout the period of the cruise and performed well. The benefit of the new fish with automatic trip device was experienced on two occasions when ropes holding fishing floats were snagged. On both occasions the fish tripped blowing the 750 m amp fuse. On such occasions a period of about 20 minutes is lost before resuming operations. Throughout the cruise automatic gain control circuit boards (on free trial from Underwater Instrumentation) were fitted to the sonar. These circuits generally improved the quality of the record, and in addition made the sonar very much easier to tune making it a more versatile piece of equipment within the Institute. Care has to be taken in the initial setting up of the sonar in that a white line occurs behind a reflector. This white area has to be kept to a minimum.

### MS 36 ECHO SOUNDER

RRS JOHN MURRAY is not fitted with a scientific echo sounder. When required an over-the-side transducer is rigged in the MS 47 bracket (port side - amidships). In this position ship's roll is at its maximum thus distorting the echo trace, and in poor sea conditions signal is lost due to aeration.

### PLESSEY SOUND VELOCITY METER

Trials were carried out satisfactorily in Start Bay. The instrument is simple and easy to use. No attempt was made at calibration.

### RANGEMASTER

Four transponders were laid in 15 m of water in an approximate 500 m square. Each transponder was weighted with 100 lbs of lead and marked on the surface with a recovery float and coding pellets. Rangemaster was initially used in conjunction with a new omni-directional transducer. Owing to a break in the cable this failed to work. The IOS 680 m cable (purchased for Consub) was

attached but the transducer still failed to work. The prototype transducer (as used successfully at Longsand Head in October 1974) was connected to Rangemaster and ranges were obtained from three out of the four transducers. Whilst under way the difficulty in reading the constantly changing ranges emphasised the need for an analogue output.

#### COMMENTS

Owing to poor sonar conditions brought about by strong NW winds the ship returned to Dartmouth at 18.30 on Thursday, 8 April, some four hours earlier than planned. This was the only time lost during the cruise on account of weather.

The start of the cruise was delayed by six hours on account of a broken oil feed pipe which occurred on the previous day's sea trials. A further delay occurred on the 7 April when it was not possible to weigh anchor for several hours because of a hydraulic failure. No other time was lost due to ship defects.

The co-operation and assistance received from the Captain, Officers and ship's company is to be commended.