

I.O.S.

**R R S CHALLENGER
CRUISE 16/81**

25th OCTOBER – 8th NOVEMBER 1981

**RECOVERY OF MOORINGS I₁, I₂, I₃, I₄
RELAYING OF MOORINGS I₂, I₄
DEPLOYMENT OF NEW MOORINGS, E₂, E₃**

**CRUISE REPORT NO 120
1981**

**NATURAL ENVIRONMENT
INSTITUTE OF
OCEANOGRAPHIC
SCIENCES
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COUNCIL**

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R.R.S. CHALLENGER
CRUISE 16/81

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Relaying of Moorings I₂, I₄
Deployment of New Moorings, E₂, E₃

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Institute of Oceanographic Sciences,
Wormley, Godalming, Surrey, GU8 5UB.

SCIENTIFIC PARTICIPANTS

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M.J. Harris	
N.W. Millard	
R.A. Phipps	
I.P. Rouse	
I. Waddington	

SHIP'S OFFICERS

G. Selby-Smith	Master
D. Coverdale	Chief Officer
A. Brigden	Second Officer
P. Pepler	Third Officer
D. Rowlands	Chief Engineer
I. McGill	Second Engineer
J. Richards	Third Engineer
R. Witton	Fourth Engineer

CRUISE OBJECTIVES

- (a) To deploy V.A.C.M./camera tripod.
- (b) To recover moorings $I_1 - I_4$ and relay I_2 and I_4 .
- (c) To deploy 3 new moorings, E_2 , E_3 and G_3 .
- (d) To carry out profiling current meter sections across the Faeroe-Shetland Channel.
- (e) To test near bottom echo sounder for use on neutrally buoyant floats.

NARRATIVE

R.R.S. Challenger sailed from Ardrrossan at noon, 25th October 1981 and headed for a position west of St Kilda $58^{\circ}05'N$ $09^{\circ}15'W$ in order to start an echo-sounding run across the shelf edge prior to deploying the tripod. At 1400* on 26th October 1981 with the wind increasing and a general weather forecast of Storm Force 10, the ship altered course in order to seek shelter in Village Bay, St Kilda. The weather was true to the forecast and so the ship remained at anchor until 0900, 28th October 1981. Having echo-sounded across the shelf edge, the tripod position was reached. On completion of the wire tests for the acoustic release, the tripod was deployed in 1884 metres of water at position $58^{\circ}21.3'N$ $10^{\circ}02.4'W$. Course was set for I_4 .

I_4 position was reached, the mooring located and recovered by 1100, 29th October. I_4 was then redeployed after completion of acoustic wire tests together with a preliminary test of the near bottom echo-sounder (NBES) by 1510 in position $58^{\circ}49.45'N$ $11^{\circ}37.03'W$. Course was set for I_3 .

After overnight wire work with acoustic releases and NBES, I_3 was located, released and recovered by 0900, 30th October 1981. Course was then set for I_1 .

Again, after overnight wire work, I_1 was located, released and recovered by 0845, 31st October 1981. Course was set for I_2 .

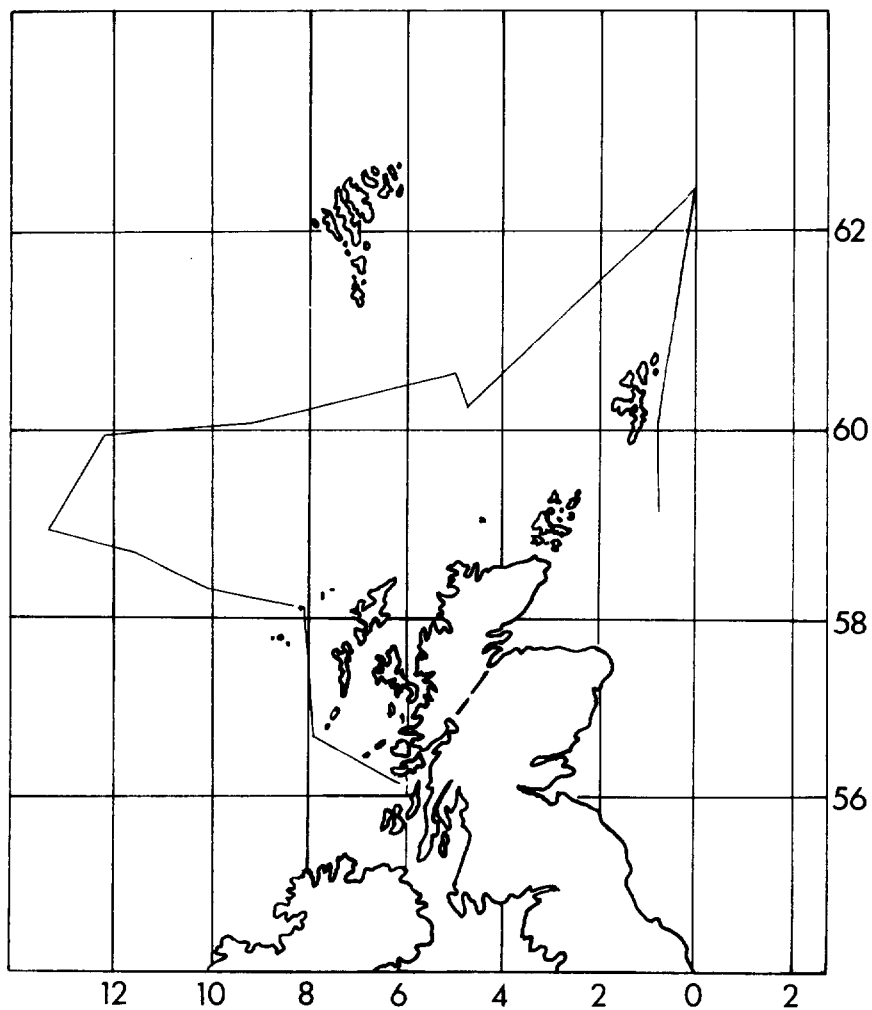
The overnight wire work included a lowering of the profiler to establish the rate of descent which was 6 metres/minute, after which I_2 was located, released and recovered by 0845, 1st November 1981. I_2 was reset by 1100 in a position $60^{\circ}12.1'N$ $09^{\circ}14.1'W$. Course was set for the Faeroe/Shetland Channel.

Having arrived at the E_3 mooring position, acoustic releases were tested, and a small echo-sounding survey was carried out prior to deployment. At 0945 E_3 was deployed in a position $60^{\circ}29.7'N$ $04^{\circ}58.6'W$ on 2nd November 1981 and by 1500 on the same day E_2 was deployed in a position $60^{\circ}12.0'N$ $04^{\circ}34.1'W$. Course was set for G_3 .

*All times GMT.

On 3rd November 1981 at 1100 the ship arrived at the G3 position $62^{\circ}20'N$ $00^{\circ}00'$ where the weather had deteriorated to Force 8. The sea by this time had built up and because of the heavy surging to which the mooring wire would have been subjected, it was decided to postpone the mooring. However, the weather then deteriorated further to Storm Force 10-11. The ship therefore remained hove to until 5th November when the wind veered sufficiently, although still Force 8-9, to allow the Master to turn the ship and run for shelter in the Shetlands.

On 6th November 1981 the weather forecast in the work area was still showing Force 7-8, so course was set for passage to the Tyne, where the ship docked for refit at 1030, 8th November 1981.



PROJECT REPORTS

Moorings

The recovery of all moorings went well without losses and with the exception of G₃ which was abandoned, the deployments were also successful. Deployment of the tripod was achieved during the second attempt, the first attempt resulting in the cross bars holding the V.A.C.M. jumping out of its location guides.

Acoustics(a) Acoustic command releases and transponders

The acoustic releases and transponders that were used on the moorings at I₁, I₂, I₃ and I₄ all responded correctly to their appropriate acoustic command and were instrumental to the successful recovery of these moorings.

The releases and transponders recovered from the I moorings were in good condition except the spring stops on the stainless steel release assemblies of the releases on moorings at I₄ and I₃. These were very badly corroded.

The pyro of the release on I₁ failed to fire. Fortunately the retractor functioned correctly and released the mooring from the anchor.

The seven acoustic releases that were tested on a vertical wire, prior to being used on the moorings, all operated correctly.

One release, incorporating tilt indicators, was used on the tripod. Four other releases were used on moorings laid at I₂, I₄, E₂ and E₃. All five releases operated correctly during deployment.

(b) Testing of 35.5 kHz altimeters with 10 kHz telemetry link

Four altimeters were tested to a depth of 1250 metres using the midships hydrographic winch. Three of the altimeters operated correctly, telemetering the distance of the unit from the sea surface and the seabed up to its maximum range of 300 m. The fourth unit had a fault in the signal processor which created a number of additional spurious range pulses. This fault was corrected, but due to unfavourable sea conditions, this unit was not retested in the water.

Near Bottom Echo SounderTests on near bottom echo sounders to be used with neutrally buoyant floats

Following the unsuccessful trials of the near bottom echo sounders on Discovery Cruise 122 the opportunity was taken on this cruise to carry out further tests as time permitted. A standard set of float electronics along with the extra echo-sounder card was placed in a test tube to permit wire tests to be carried out on

the hydrographic winch. Twelve tests were carried out, in each case the package was lowered to within 100 m of the bottom in about 1400 m of water. The acoustic signals were received on a modified 'dolphin' type fish towed from the after port side of the ship.

Early tests indicated that the echo sounder was not working but after several modifications ranges of 600 m were being obtained.

Time and weather conditions did not allow a new design of neutrally buoyant float to be launched.

I.O.S. Mooring No.		No. of C.M.'s	Expected Data and Condition	Position
305(I ₂)	Recovered	4	3 full tapes + ½ tape, 2 low pressure leaks, ½ speed record lost.	
306(I ₁)	Recovered	3	2 full tapes + 1 part tape due to main battery failure.	
307(I ₄)	Recovered	4	4 full tapes, 1 with partial flooding (¾ good data).	
308(I ₃)	Recovered	4	4 full tapes.	
311(Tripod)	Deployed	1 VACM + Camera		58°21.3'N 10°02.4'W
312(I ₄)	Deployed	4		58°49.45'N 11°37.03'W
313(I ₂)	Deployed	4		60°12.1'N 09°14.1'W
314(E ₃)	Deployed	4		60°29.7'N 04°58.6'W
315(E ₂)	Deployed	3 + Tilt Meter		60°12.0'N 04°34.1'W

ACKNOWLEDGEMENTS

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