


Scottish Marine Biological Association

Dunstaffnage Marine Research Laboratory

Cruise Report

R.R.S. CHALLENGER


Cruise 2/1982

26 January - 9 February 1982

RRS CHALLENGER, Cruise 2/1982

Duration of cruise: 1636 h 26 January - 0927 h 9 February 1982.

All times GMT.

Locality: Rockall Channel, 56° - 58° N, and Scottish continental shelf.

Staff:

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Aims:

- (1) To service SMBA current meter moorings R (57° N, 9° W), M ($57^{\circ}18'$ N, $10^{\circ}23'$ W), F ($57^{\circ}30'$ N, $12^{\circ}15'$ W), A1 ($52^{\circ}30'$ N, $14^{\circ}46'$ W) and A2 ($52^{\circ}30'$ N, $14^{\circ}56'$ W), and to lay moorings Y (Tiree Passage, $56^{\circ}37'$ N, $6^{\circ}24'$ W) and Z (CPCM W of S. Uist, $57^{\circ}19'$ W, $7^{\circ}39'$ W).
- (2) To service MAFF current meter moorings A3 ($52^{\circ}30'$ N, $15^{\circ}16'$ W) and A4 ($52^{\circ}30'$ N, $15^{\circ}26'$ W) and IOS Bidston pressure gauge TG282 ($56^{\circ}41'$ N, $11^{\circ}32'$ W) and to check TG285 ($57^{\circ}10'$ N, $10^{\circ}06'$ W).
- (3) To work the Anton Dohrn CTD section and other CTD sections across the southern Rockall Channel as time permits
- (4) To collect 50 litre water samples for radiocaesium determination at 10 standard positions between the Sound of Mull and the shelf-edge, with associated CTD profiling and collection of large volume Niskin bottle samples.

- (5) To make Agassiz trawl and benthic sledge hauls to the east of Anton Dohrn Seamount and, if time permits, at the benthos site in $54^{\circ}30'N$.
- (6) To work CTD sections in the Sea of the Hebrides to provide a winter comparison with summer surveys of the area.
- (7) To collect surface temperature and salinity samples throughout the cruise in view of their enhanced value during a cold winter.

Narrative:

Sailing from Ardrossan was delayed from Monday 25 January until 26 January due to the suppliers' difficulties in delivering bunkers, and further put back to late afternoon by the need to obtain generator fuel from alternative suppliers. CHALLENGER sailed at 1636 h and made the passage to the first radiocaesium station (C1) via the Sound of Islay and Sound of Mull. The force 7-8 northerly winds decreased and backed to westerly during the forenoon of 27 January, and after sampling C1 at 1100 h the ship proceeded to the Tیره Passage to lay mooring Y between 1241 and 1337 h. CTD stations were worked at C2 to C5, but during hauling at C5 the newly-added metering gear siezed. The CTD was recovered after disconnecting the winding-on gear, but the main scroll shaft was discovered to be bent and other items in the assembly were distorted. This ruled out further CTD work and C6 was sampled at the surface only. Course was set for C7, off Barra Head, but the south-westerly wind increased to force 8 and at 2315 h it was decided to seek a lee inside the Outer Hebrides.

With no prospect of an improvement in the weather, at 0720 h 28 January CHALLENGER ran for the Sound of Mull and anchored at 1449 h in Scallastle Bay, where the work of dismantling the hydrographic metering gear could proceed.

With continuing gales, it was agreed to call at Oban to allow Barry engineers to examine the winch and to obtain medical advice for the 3rd Engineer. Accordingly, the ship berthed at Railway Pier, Oban from 1249 to 1509 h 29 January. The 3rd Engineer entered the West Highland Hospital for observation and the ship returned to Scallastle Bay overnight, re-berthing at Oban at 1013 h, 30 January to land the metering gear and bent scroll shaft, and to take aboard a late delivery of mooring wire. Force 8 winds continued, and sailing at 1512 h shortly after the arrival of the replacement 3rd Engineer, CHALLENGER returned to Scallastle Bay at 1755 h.

With a moderation to force 6 on the following morning, the ship weighed anchor at 0617 h 31 January. In the absence of a CTD winch, surface and bottom water-bottles were worked from stations C6 to C10, the latter being completed at 0110 h 1 February. Course was set for Bidston pressure recorder TG285, south-east of mooring M, but a heavy swell and south-westerly winds gusting to force 9 resulted in the ship being hove-to at 0430 h. A moderation to force 5 in the late evening allowed progress to be made into the swell towards mooring F.

Mooring F was reached at 0515 h 2 February. The acoustic release was contacted at 0530 h and the ship stood by until daybreak. Recovery of the mooring took place between 0936 and 1058 h, and after steaming off position to dump the used mooring wires, re-laying occupied from 1447 to 1555 h. Course was set for the second Bidston pressure gauge (TG282), but by evening the south-east winds were again gusting to force 9, and we hove-to at 2216 h. Similar conditions prevailed on 3 & 4 February, but with a better forecast in the evening of 4 February, the ship ran northward down-swell at 2330 h, arriving at the pressure recorder position at 0300 h 5 February. Although

a heavy swell remained, the wind had fallen to force 6 and the release was activated at 0838 h. The low profile of the recorder made it difficult to spot, and it was not located until 1054 h. After being grappled, the instrument was being passed aft when a loose bight of the rope leader, the result of a turn caught at the quarter, was drawn into the Kort nozzle. The flotation spheres broke loose and the recorder sank, leaving a length of the leader and the instrument's recovery line attached to the nozzle. The ship steamed for mooring M at 1130 h and the trailing ropes appeared to have become detached during the afternoon.

Bigston recorder TG285 was contacted en passant and appeared to be undisturbed. The epibenthic sledge was shot 5 miles to the north-west of mooring M at 2051 h and recovered at 0110 h 6 February. By this time the southerly wind had risen to forces 9-10 and the ship remained hove-to throughout the day. By 0715 h 7 February winds were westerly and had dropped to force 6, but it was apparent that the improvement would be short-lived and that recovery of the deep mooring at M would have been risky in the heavy swell. It was therefore decided to run for mooring R, at the shelf-edge, in the hope of recovering this. Despite the difficulties of, manoeuvring in the swell, recovery was effected between 1530 and 1604 h and after re-rigging the gear, it was found possible to re-lay the mooring between 1741 and 1806 h. In view of an adverse forecast and a Barry request for a return to Ardrossan on the morning of 9 February, it was agreed to set course for the Sound of Mull. Winds were again force 8, gusting to 10 in squalls as CHALLENGER passed Oban at 1000 h 8 February, but the pilot was picked up at the Cumbraes at 0748 h 9 February and the ship berthed at Ardrossan at 0927 h.

Results:

Aim (1): The Tیره Passage current meter mooring was laid by 1337 h 27 January. The single Plessey current meter was at a depth of 44 m in soundings of 54 m. Mooring F, in 1800 m depth, was retrieved on 2 February after a deployment of 113 days. The four Aanderaa meters, at nominal depths of 100, 500, 1000 and 1250 m, had all recorded successfully and the mooring was re-laid by 1555 h 2 February. Mooring R, close to the shelf-edge, was recovered on 7 February. The upper Aanderaa meter, at 45 m depth, had leaked and had records for only 12 days, but the lower meter at 110 m in soundings of 136 m, had acquired data through the 113 days of deployment. R was re-laid by 1806 h 7 February.

Moorings M and Z, the west of Scotland, were not serviced due to bad weather and lack of time, and there was no opportunity to steam south to Porcupine Bank to service A1 and A2 on that area.

Aim (2): As with moorings A1 and A2, there was no opportunity to service MAFF moorings A3 and A4.

Bidston pressure gauge TG282 was raised on 5 February, but as described in the narrative, was lost when the assembly was hit by the screw. New standing orders for handling equipment overside have since been framed and should prevent a repetition. As the flotation frame had been lost it was not possible to re-lay a recorder at this site.

Pressure gauge TG285 was contacted in the correct position on 5 February and its acoustics responded satisfactorily.

Aim (3): No deep CTD profiles could be obtained because the winch drum was out of action due to the damage to the winding-on gear caused by the new metering equipment. The small amount of good weather allowed no time for water-bottle observations from the other winch barrel.

Aim (4): Water samples for radiocaesium were collected at stations C1 to C10 and also at the Tیره Passage mooring. A 30 litre Niskin bottle was lowered at C3 to 70 m depth (15 m from bottom) to obtain a sub-surface sample. CTD profiles were obtained at C2 to C5 before the metering gear collapsed. Water-bottle samples at near-surface and near-bottom depths were subsequently taken at stations C6 to C10. The outer shelf stations and the shallow inshore stations were well mixed, but C3 and C5-C7 had marked stratification, amounting in the case of C5 and C6 to bottom minus surface differences exceeding 1.25 deg. C and 1.10‰ in 140-150 m depth.

Aim (5): The weather gave little opportunity for benthic sampling until 5 February, when the epibenthic sledge was streamed near mooring M. Unfortunately the wind increased during the haul, gusting to 50 kt, and although a good catch was obtained it was not possible to shoot the Agassiz trawl. Mesdames Pearson and Petre gallantly attached themselves to lifelines in order to sort the catch during the night in the wild conditions on the after deck.

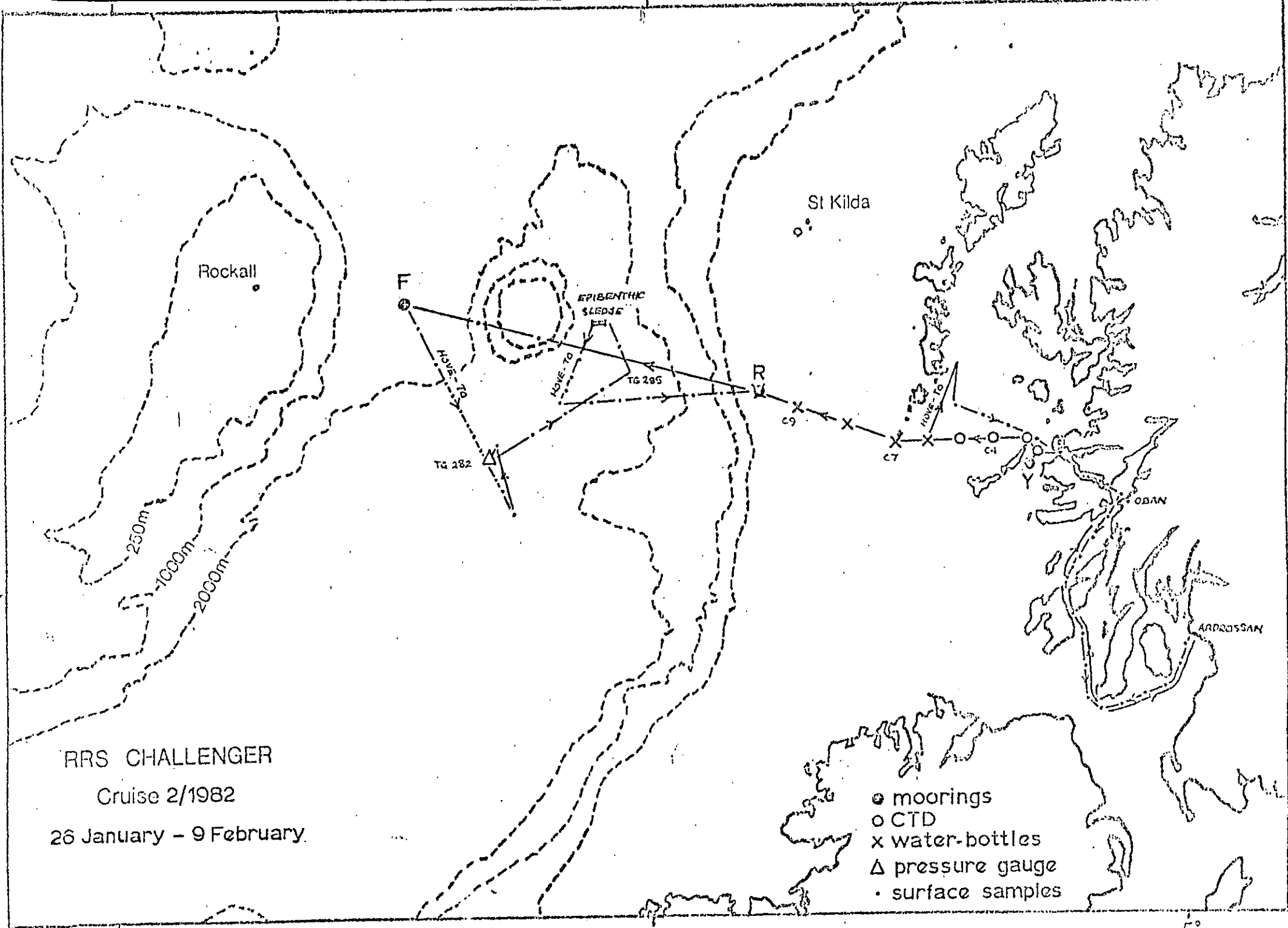
Aim (6): No CTD work was carried out in the Sea of the Hebrides except as noted above under Aim (4).

Aim (7): Surface temperature and salinity samples were taken at frequent intervals throughout the cruise. The ship's hull thermometer was mostly used for temperature observations, but readings have been calibrated against bucket thermometer readings taken over the ship's side. The hull thermometer was 0.5 to 0.6 deg. C higher than the bucket values.

In the coastal waters between the Firth of Clyde and the Sound of Mull temperatures were between 6.25^o and 7.0^oC: Offshore, in the North Channel and Sea of the Hebrides they were between 7^o and 8^o C: Over the deep water of the Rockall Channel they ranged from 9.5^o to 10.2^oC. Salinity values over the deep water were slightly lower than in February 1981, suggesting that the general rise in salinity of the Rockall Channel from its minimum in 1976 may now be checked.

D.J. ELLETT

26 March, 1982.



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- moorings
- CTD
- x water-bottles
- △ pressure gauge
- surface samples

15°W

10°

5°