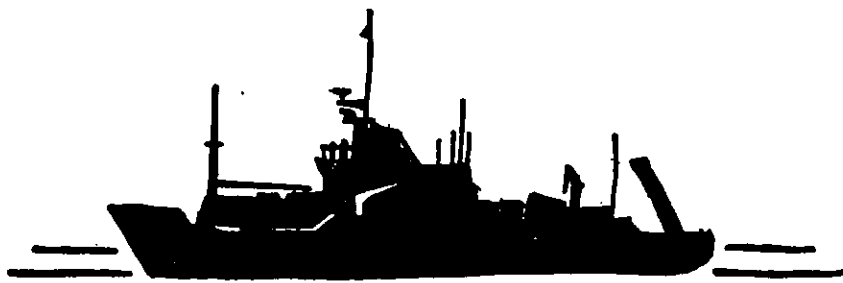


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***Scottish Marine Biological Association***

***Dunstaffnage Marine Research Laboratory***



# **CRUISE REPORT**

R.R.S. FREDERICK RUSSELL

Cruise 7B/1986

21-29 August 1986

***S.M.B.A., P.O. Box No. 3, Oban, Argyll, Scotland.***

R.R.S. FREDERICK RUSSELL, Cruise 7/1986

Duration of cruise: 1902 h 21 August - 1000 h 29 August 1986.  
All times GMT.

Locality: Irish Sea, Firth of Clyde and Sea of the Hebrides.

Staff:  
D.J. Ellett  
A. Edwards  
D.T. Meldrum  
Dr J.M. Graham  
C.R. Griffiths  
N. MacDougall  
J. Robson (Fisheries Laboratory, to 25 August)  
M. Fulcher (Fisheries Laboratory, to 25 August)

Aims:

- (1) To service seven MAFF current meter moorings and one tetrapod mooring in the eastern Irish Sea and to make complementing CTD observations.
- (2) To service three SMBA current meter moorings in the outer Firth of Clyde and work CTD and radiocaesium sampling stations in the North Channel - Clyde area.
- (3) To recover three Menai Bridge/RVS current meter moorings to the west of the Firth of Lorne.
- (4) To collect radiocaesium samples between Barra Head and the Sound of Mull for the Fisheries Radiobiological Laboratory.
- (5) To service the SMBA current meter mooring in the Tiree Passage.

Narrative:

FREDERICK RUSSELL sailed from Barry at 1902 h 21 August in force 5 southerly winds and made good passage to mooring Y, north of Anglesey by 1630 h 22 August. After a CTD lowering and radiocaesium sampling the toroid buoy was grappled at 1850 h, but whilst it was being hoisted inboard the buoy wire parted at a splice, leaving the mooring unmarked. Tows were made with a Gifford grapnel between 2035 and 2217 h, but failed to catch the groundline. Winds had become force 7-8 north-easterly, with a moderate swell. Overnight the ship steamed to the Solway Firth to recover the tetrapod assembly, which was approached in quieter weather at 0530 h 23 August. The pick-up line was released acoustically, and grappled at 0600 h but as a result of the mistaken assumption that the instrument had become free-floating, the pick-up line passed under the ship's stern and was parted. Acoustic interrogation confirmed that the tetrapod remained upright in about 15 m depth, and as the site was well protected by three guard toroids, it was agreed that the safest course was to postpone recovery to a MAFF September CLIONE cruise, when divers could attach a pick-up line.

Moorings P and Q, off the Cumbrian coast, were raised and redeployed between 0810 and 1259 h, with CTD lowerings and caesium

sampling at each. Recovery of mooring R began at 1453 h, but a corroded buoy strop parted at an early stage. A Gifford grapnel tow recovered the ground line, and the mooring was aboard and redeployed by 1905 h. Recovery of mooring S was deferred until daylight, but a CTD lowering and caesium sampling were completed at this site and at five other positions between the Isle of Man and Anglesey overnight. A replacement mooring was laid at Y between 0530 and 0600 h 24 August and the ship steamed to mooring V in fine weather with force 4-5 easterly winds. At this mooring the buoy wire parted at its join with the buoy chain shortly after pick-up began at 0852 h. The second of two grapnel tows caught the bottom of the meter wire, and recovery was complete by 1044 h. With time running short, it was agreed not to redeploy B, and we proceeded to the remaining two moorings, S and M, which were recovered and redeployed between 1319 h and 1830 h. Four CTD stations, two with radiocaesium sampling, were worked between Burrow Head and the Point of Ayre by 2109 h and course was set for the North Channel. Here stations Z2 to Z6 were worked between 0117 and 0615 h 25 August before steaming for the Firth of Clyde.

DAFS moorings C1 and 2 were visually checked en route for Troon in freshening northeasterly winds. FREDERICK RUSSELL berthed at 1418 h and the exchange of SMBA gear for MAFF gear was effected. Water and fuel were taken on board, but in view of forecast force 9 winds it was decided to remain alongside overnight. The ship sailed at 0730 h 26 August and proceeded to the site of mooring C6, off Pladda, in force 8 northerly winds. This mooring, from which the subsurface float and upper current meter had previously come ashore in Kintyre, was not sighted, and a CTD section of six stations (AB17-22) was worked from Davaar to Girvan between 1128 and 1528 h. Winds had by now dropped to forces 5-6, and a new mooring C6 was laid between 1649 and 1701 h. During the deployment the spar-buoy of the previous mooring had been sighted about 3½' off position, and this was recovered complete with anchors, ground line and the bottom current meter by 1800 h. Mooring C4 was next brought aboard at 1936 to 1949 h, and C5 at 2042 to 2052 h. The latter was redeployed between 2157 h and 2203 h, after which the ship returned to lay C4 at 2316 to 2326 m. The mooring recovered at C4 had been interfered with, as a rope attached to the subsurface float showed. The upper current meter had been badly damaged and was found to be flooded when opened.

Courses were set for the westernmost Menai Bridge mooring (M3) by way of the Mull of Kintyre and the Rhinns of Islay, but by 0800 h 27 August it became apparent that the heavy swell and the forces 7-8 northerly winds would preclude recovery. FREDERICK RUSSELL steamed for the Firth of Lorne, where CTD stations 1-5E and FL13-15 were worked between 1209 and 1900 h. The ship steamed via the Sound of Mull to Ardmore Point, where CTD and radiocaesium stations were begun at Station 1G at 2125 h. The section was worked westwards to 9G by 0605 h 28 August, when it was necessary to return to the Tthree Passage to reach mooring Y at slack water. This mooring was successfully raised and redeployed between 1010 and 1201 h, and course was set for the easternmost Menai mooring, M1. Recovery of this, between 1622 and 1632 h was straightforward, but M2 had been laid without a pick-up line to the spar buoy. The latter was grappled at 1737 h and brought aboard, but the buoy wire parted when heaving began. It was not possible to obtain sufficient slack rope from the sub-surface pellets to pick up the current meters from the opposite

end of the mooring, and it was decided to attempt a Gifford grapnel haul before nightfall. The meter wire was caught and both current meters recovered by 2041 h. Lack of daylight and time precluded any attempt to raise mooring M3, and course was set for Dunstaffnage, where the ship hove to at 0530 h 29 August. All gear was transferred to CALANUS and SEOL MARA, and at 1000 h FREDERICK RUSSELL left for Aberdeen.

Results:

Aim (1): The seven MAFF current meter moorings were serviced during 22-24 August. At Y, off Anglesey, the meters of the previous deployment were not recovered due to the corrosion of a splice in the buoy tow, and Gifford grapnel hauls failed to catch the ground line. The meter wire should be upright and may be recoverable by trawling. A replacement mooring was laid at the site. At V the existing mooring was recovered complete by grappling after another wire failure, but was not re-laid because of the delays which would have arisen in clearing the winch and winding on a new mooring. It was agreed that the limited time available would be better used in recovery and deploying moorings S and M, which remained to be attempted on the same day.

At the tetrapod site, AA, the recovery line was released acoustically, but was parted due to a pardonable misunderstanding of the nature of the instrument. The tetrapod was upright and guarded by its three toroids, and attachment of a new pick-up line should not be difficult for divers in soundings of 15 m.

CTD lowerings were made at all moorings, and large volume water samples were collected at surface and near-bottom levels for radiocaesium analysis. Additional CTD lowerings were made in order to complete sections between Anglesey - Isle of Man, St. Bees Head - Maughold Head and Burrow Head - Point of Ayre.

Aim (2): All three SMBA Clyde current meter moorings were recovered and redeployed. At C4 the upper current meter had been badly damaged and was flooded, and the spar buoy and bottom current meter of C6 were almost four miles out of position. DAFS moorings C1 and C2 were inspected in passing and appeared to be complete.

Due to the shortage of time only two CTD sections were worked in this area; stations Z2 to Z6 of the Copeland-Portpatrick section in the North Channel, where radiocaesium samples were collected for analysis at the Scottish Universities Reactor Centre, and stations AB17-22 across the northern flank of the Firth of Clyde sill. Further north, a section was worked between Mull and Jura (stations E1-5) with caesium sampling at two stations. Four CTD stations were worked in the inner Firth of Lorne and Sound of Mull.

Aim (3): Two of the three Menai Bridge moorings were successfully recovered. At M2 the near-bottom Aanderaa current meter had recorded for the early part of the deployment only. Lack of time prevented the recovery of mooring M3, which will be attempted in September, during Cruise 9.

Aim (4): Stations 1 to 7G of the section between Mull and the shelf-edge were worked on 27-28 August, with CTD lowerings and surface, mid-water and bottom radiocaesium sampling at six standard positions.

Aim (5): The Tiree Passage current meter mooring was serviced on 28 August.

Miscellaneous: Test lowerings were made with the SMBA Irradiance Profiler at three stations. Profiles were successfully obtained, although noise levels and drift were found to exceed those specified for the sensors by their manufacturers.

Acknowledgements:

The need to carry out the essential requirements of a 16-day CHALLENGER cruise within 7½ days aboard FREDERICK RUSSELL provided some interesting constraints to which Captain Jonas and his officers and crew proved more than equal. The willingness of all to work literally from dawn to beyond dusk in mooring operations meant that 23 out of 26 planned recoveries or deployments were successfully completed, and other important aims were attained during the remaining hours of the day. We are also appreciative of the efforts made at Barry to return the ship to service for our cruise.

D.J. ELLETT

3 September 1986.

Table 1. Mooring recoveries during Cruise 7B/1986

Mooring	Institute	Depth m.	Lat. °	N	Long. °	N	Deployment dates 1986	No. of current meters	Remarks
Y	MAFF	67	56	36.0	4	38.0	Jul. - 22 Aug.	2	Buoy wire parted: spar only recovered.
AA	MAFF	16	54	38.8	3	45.5	Jul. 23 Aug.	Tetrapod	Pick-up line parted: left for recovery with diver assistance.
P	MAFF	22	54	29.5	3	42.0	Jul. - 23 Aug.	2	
Q	MAFF	27	54	27.3	3	49.0	Jul. - 23 Aug.	2	
R	MAFF	29	54	22.6	4	03.2	Jul. - 23 Aug.	2	
V	MAFF	44	53	58.3	4	40.0	Jul. - 24 Aug.	2	Buoy strop parted: recovered by grapnel tow.
S	MAFF	22	54	19.3	4	14.2	Jul. - 24 Aug.	2	Buoy wire parted: recovered by grapnel tow.
M	MAFF	49	54	35.0	4	22.0	Jul. - 24 Aug.	2	
C6	SMBA	117	55	26.4	5	01.6*	7 June - 26 Aug.	1	Damaged by trawling: sub-surface float and 1 C/M previously recovered.
C4	SMBA	51	55	19.7	5	21.0	8 June - 26 Aug.	2	Damaged by trawling: upper C/M wrecked and flooded.
C5	SMBA	41	55	21.9	5	27.0	8 June - 26 Aug.	1	
Y	SMBA	48	56	37.4	6	24.2	14 June - 28 Aug.	1	
M1	MSL	65	56	11.1	6	40.7	16 May - 28 Aug.	2	
M2	MSL	74	56	09.7	7	00.5	16 May - 28 Aug.	2	Buoy wire parted: recovered by grapnel tow.

\* 3.3 n.m1 from deployment position

MAFF = Fisheries Laboratory, Lowestoft

MSL = Marine Science Laboratory, Menai Bridge

Table 2. Mooring deployments during Cruise 7B/1986

Mooring	Institute	Depth m.	Lat. °	N '	Long. °	W '	Date deployed 1986	No. of current meters	Remarks
P	MAFF	22	54	29.4	3	41.1	23 Aug.	2	Surface toroid
Q	MAFF	27	54	27.7	3	49.0	23 Aug.	2	Surface toroid
R	MAFF	29	54	23.1	4	02.7	23 Aug.	2	Surface toroid
Y	MAFF	67	53	33.7	4	36.8	24 Aug.	2	Surface toroid
S	MAFF	22	54	19.4	4	13.6	24 Aug.	2	Surface toroid
M	MAFF	49	54	35.2	4	21.7	24 Aug.	2	Surface toroid
C6	SMBA	88	55	23.4	5	05.9	26 Aug.	2	Surface spar
C5	SMBA	41	55	21.7	5	27.1	26 Aug.	1	Surface spar
C4	SMBA	49	55	19.7	5	29.9	26 Aug.	2	Surface spar
Y	SMBA	48	56	37.7	6	23.8	28 Aug.	1	Surface spar

Table 3. Stations worked, Cruise 7B/1986

Station	CTD Dip No.	Date 1986	Start time GMT	Lat. °	N '	Long. °	W '	Observations
<u>Eastern Irish Sea</u>								
<u>Disc 013</u>								
Y	F786.001	22 Aug.	1653	53	35.7	04	38.9	CTD, Cs 0, 72 m.
P	002	23 Aug.	0957	54	29.6	03	41.4	CTD, Cs 0, 15 m.
Q	003	"	1120	54	27.2	03	49.2	CTD, Cs 0, 28 m.
Q1	004	"	1356	54	24.7	03	57.4	CTD. Irr.
R	005	"	1756	54	22.6	04	03.5	CTD, Cs 0, 35 m.
S	006	"	2013	54	19.2	04	13.3	CTD, Cs 0, 25 m.
V	007	"	2344	53	58.5	04	37.5	CTD, Cs 0, 50 m.
V1	008	24 Aug.	0053	53	52.8	04	39.0	CTD.
W	009	"	0149	53	47.0	04	39.0	CTD, Cs 0, 80 m.
W1	010	"	0254	53	41.5	04	38.5	CTD.
Y	011	"	0347	53	36.0	04	38.0	CTD.
M	012	"	1724	54	34.8	04	23.2	CTD, Cs 0, 40 m.
MA	013	"	1912	54	38.6	04	22.7	CTD, Cs 0, 50m, Ir
M1	014	"	2013	54	31.9	04	22.4	CTD.
M2	015	"	2057	54	29.0	04	21.2	CTD.
<u>North Channel</u>								
<u>Disc 013</u>								
2Z	F786.016	25 Aug.	0120	54	41.0	05	25.0	CTD, Cs 0, 50, 105
3Z	017	"	0247	54	43.0	05	20.0	CTD, Cs 0, 75, 145
4Z	018	"	0329	54	44.0	05	15.0	CTD, Cs 0, 130, 260
5Z	019	"	0520	54	46.0	05	10.0	CTD, Cs 0, 65, 135
6Z	020	"	0608	54	48.0	05	05.0	CTD, Cs 0 m.
<u>Firth of Clyde</u>								
<u>Disc 013</u>								
AB17	F786.021	26 Aug.	1136	55	27.0	05	28.0	CTD.
AB18	022	"	1234	55	23.9	05	19.9	CTD
AB19	023	"	1320	55	22.1	05	12.0	CTD
AB20	024	"	1402	55	20.1	05	08.1	CTD
AB21	025	"	1428	55	19.1	05	05.2	CTD
AB22	026	"	1518	55	16.3	04	55.7	CTD
AB24	027	"	1631	55	23.1	05	05.6	CTD



Table 3 (continued)

Station	CTD Dip No.	Date 1986	Start time GMT	Lat. °	N '	Long. °	W '	Observations
<u>Firth of Lorne - Sound of Mull</u>								
<u>Disc 013</u>								
5E	F786.028	27 Aug.	1214	56	15.5	06	05.5	CTD, Cs 0 m, Irr
4E	029	"	1307	56	14.1	06	02.2	CTD
3E	030	"	1347	56	11.0	05	58.9	CTD, Cs 0, 100 m
2E	031	"	1442	56	08.0	05	55.8	CTD
1E	032	"	1518	56	05.5	05	53.0	CTD, Cs 0 m
FL13	033	"	1655	56	17.5	05	50.0	CTD
FL14	034	"	1753	56	20.0	05	41.5	CTD
FL15	035	"	1847	56	25.0	05	36.4	CTD
SM1	036	"	2005	56	31.7	05	50.3	CTD
<u>Mull - Barra Head</u>								
<u>Disc 013</u>								
1G	F786.037	27 Aug.	2126	56	40.0	06	07.0	CTD, Cs 0, 30, 60 m
2G	038	"	2242	56	41.0	06	17.0	CTD, Cs 0, 25 m
3G	-	"	2323	56	42.4	06	22.0	Surface S <sub>σ<sub>t</sub></sub>
4G	039	"	2355	56	44.0	06	27.0	CTD, Cs 0, 40, 80 m
5G	-	28 Aug.	0212	56	44.0	06	36.0	Surface S <sub>σ<sub>t</sub></sub>
6G	040	"	0205	56	44.0	06	45.0	CTD, Cs 0, 20, 40 m
7G	041	"	0408	56	44.0	07	00.0	CTD, Cs 0, 70, 140 m
8G	-	"	0452	56	43.9	07	10.0	Surface S <sub>σ<sub>t</sub></sub>
9G	042	"	0529	56	44.0	07	20.0	CTD, Cs 0, 80, 158 m

CTD = Conductivity-temperature-depth profile

Cs = Radiocaesium sample

Irr. = Irradiance profile

R.R.S. FREDERICK RUSSELL

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