MINISTRY OF AGRICULTURE, FISHERIES AND FOOD
FISHERIES LABORATORY, LOWESTOFT, SUFFOLK, ENGLAND

1977 RESEARCH VESSEL PROGRAMME

REPORT: RV CIROLANA: CRUISE 5

STAFF

R C A Bannister
G J Howlett
P Walker
M White
Miss S Austin (S.C.S.)
Miss D Evans (S.C.S.)
R Pipe (IMER)
D Whittaker (Port Staff)
J Williams (Port staff)
J Bedwell (Part-time)
K Medler (Part-time)

DURATION

Left Grimsby 1700h 4 May
Arrived Grimsby 2000h 22 May

LOCALITY

North Sea, Celtic Sea, Porcupine Bank.

AIMS

1. To carry out a mackerel egg and larval survey in the Porcupine Bank, Celtic Sea area.

2. To study the vertical distribution of mackerel eggs and larvae.

3. To study the development rate of scad eggs and larvae.

4. To identify fish concentrations by trawling.

5. To monitor environmental parameters.

6. To service JONSIS stations 1 and 2.

7. To bring back fertilised mackerel eggs (Mrs Thompson).

8. To sample for plankton off Portland, Start Point and Bolt Head in connection with reports that fishing nets in the area are being affected by contact with unidentified organisms.

NARRATIVE

CIROLANA left Grimsby at 1700h 4 May and first proceeded to the North Sea to recover and re-lay JONSIS 2 and JONSIS 1. Acoustic surveys, grappling, and visual search in moderate visibility failed to locate JONSIS 2, which was relaid on position by 1500h 5 May. On 6 May, JONSIS 1 was located at 0600h, but meters were absent, having been severed from the wire. The station was relaid on position by 0930h and CIROLANA proceeded south to the English Channel, taking a 'pup' sample with the

TTN off Portland enroute (aim 8). Mr Williams embarked and RSG staff left the ship at Brixham at 0700h 8 May. Enroute to the start of the main grid, 'pup' sampling (aim 8), TTN testing and systems calibration were performed between Start Point and Dodman Point. The TTN telemetry, servicable on deck, proved defective in the water, owing to saverage of the cable core at the exit point from the armoured cable. Cables were changed.

The mackerel egg and larval survey grid commenced West of Ireland at the 54th parallel at 1325h 10 May, and with the exception of 12 hours dodging on 12 May, proceeded without interruption southward, generally in good weather conditions. The survey comprised the routine mixture of 30" TTN, CPR, LHPR and bottom trawl stations. Midwater trawling was twice attempted but the headline transducer, initially functional on deck, failed in the water, possibly due to power loss along the cable. It was fortunate that in the general absence of pelagic fish-trace this loss was not, in the event, critical.

By 2100h 18 May, various components of the grid had been successfully completed as far south as 48°15'N. With freshening winds and a bad forecast making further southerly work imprudent in the time available, CIROLANA turned north to complete stations along the 49° parallel, terminating the main grid at 2100h 19 May. The main aims having been accomplished, a subsidiary inshore grid was laid off between the Lizard and Start Point, and completed by 0700h 21 May. During this work the original TTN cable was used, having been repaired on board. CIROLANA enjoyed a good passage home, securing alongside Royal Dock, Grimsby at 2000h 22 May.

RESULTS

Aims 1, 2 & 4 Stations were completed successfully as follows:-

	Main Grid	Inshore Grid
T.T.N.	76	9
C.P.R.	70	7
L.H.P.R.	7	-
Bottom Trawl	9	3
Midwater Trawl	1	-

Only one trawl station (St.57, 50°19.4'N 10°27.5'W) produced substantial quantities of scad (50 baskets) and mackerel (3 baskets); a full age length sample was obtained from this. Spanish trawlers were working this area.

Aim 3

Scad eggs from station 33 were artificially fertilised on 16 May and incubated through to hatching over the range of temperature 4-21°C. Photographic records were made, sample material preserved and a satisfactory development curve obtained.

Aim 5

Environmental parameters were monitored throughout the cruise and all chlorophyll extractions completed by the acetone method.

Aim 6 JONSIS 1 and 2 were relaid on position.

Aim 7 No running ripe mackerel were encountered on this cruise.

Aim 8 Completed.

Other Matters

Four large modern Russian factory trawlers were working on the edge of the 200 mile zone at a position 049°12.8'N 011°07.0'W.

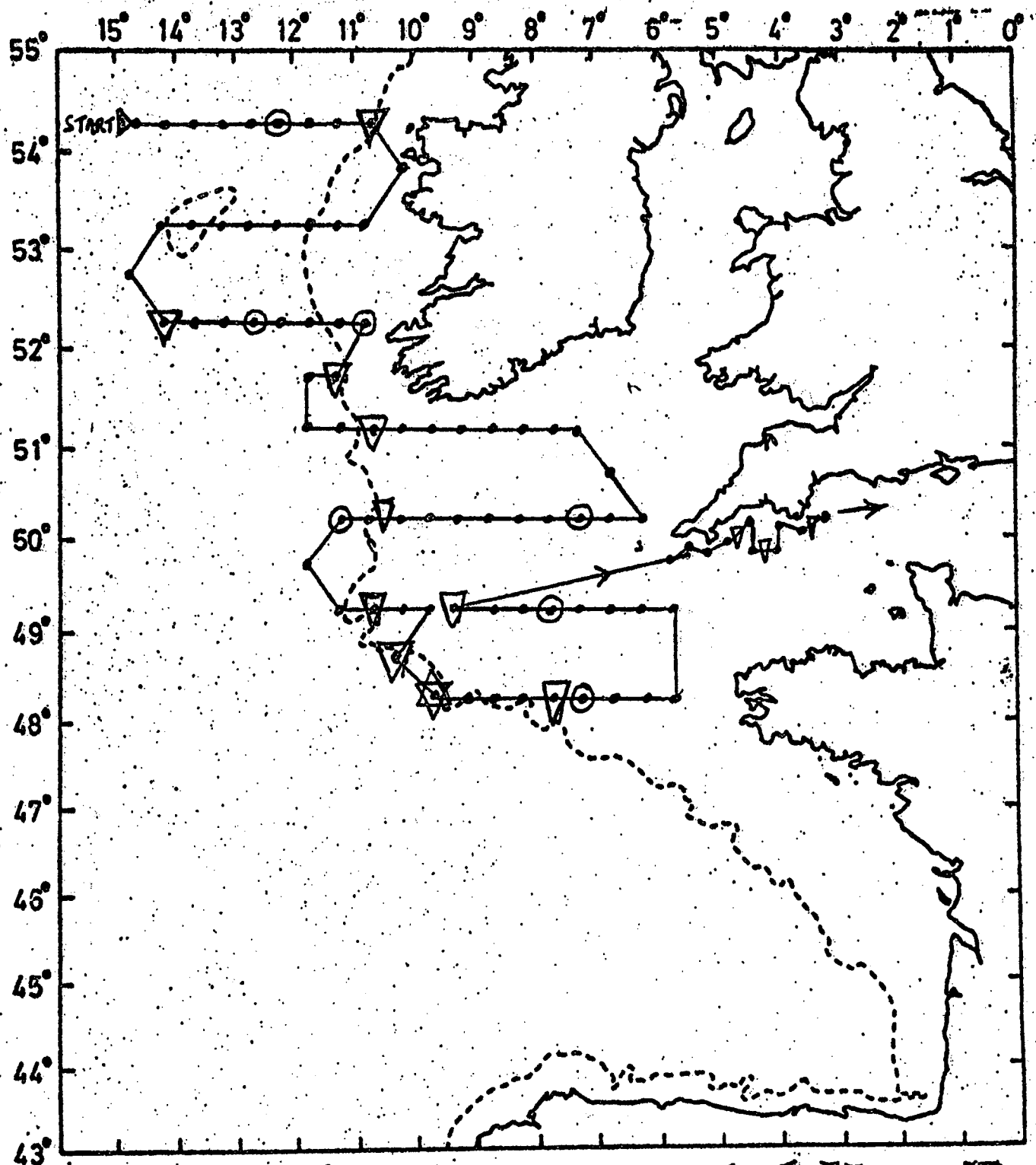
R C A Bannister
1 June 1977

SEEN IN DRAFT: T H Finn - Master
E Pearson - Fishing Skipper

INITIALLED: AJL

DISTRIBUTION:

Basic List
R C A Bannister
G J Howlett
P Walker
M White
Miss S Austin (S.C.S.)
Miss D Evans (S.C.S.)
R Pipe (IMER)
D Whittaker (Port Staff)
J Williams (Port Staff)
J Bedwell
K Medler



R.V. CIROLANA CRUISE 5-77.
TRACK CHART.

T.T.N.
TTN + L.H.P.R.
Bottom Trawl
Midwater Trawl

VESSEL RV CIROLANA. CR. 5

CRUISE PERIOD 4-22 May 1977.

PERSONNEL R K Pipe, IMER, Plymouth
Other scientists from MAFF, Lowestoft.

ITINERARY

3	May		Travel by laboratory vehicle, Plymouth-Grimsby.
4	"	1830	Depart Grimsby for Western Approaches.
9	"	1250	Commence plankton sampling.
14	"	0855	Artificial fertilisation of scad eggs.
18	"	1200	Artificial fertilisation of red gurnard eggs.
21	"	0600	Set course for Grimsby.
22	"	1930	Dock Grimsby.
23	"		Travel by laboratory vehicle, Grimsby-Plymouth.

Details of LHPR and CPR tows are given in Table I.

OBJECTIVES

1. To make investigations of:
   (a) the horizontal and vertical distribution and abundance of the eggs and larvae of the mackerel at various stages of development;
   (b) the relationship between the distribution and abundance of the plankton and the distribution and abundance of fish eggs and larvae;
   (c) the diel distribution of mackerel eggs and larvae;
   (d) the abundance of the total spawned products of the mackerel in relation to their spawning stock;
   (e) the gut contents of myctophiids;
   (f) the development rates of fish eggs, as available.
2. To measure the vertical and horizontal temperature profiles over the survey area.

PROCEDURES AND METHODS

1. Records of the plankton were obtained by:
   (a) Continuous Plankton Recorder towed at 10 m depth along the cruise track shown in Fig. 1 (see also attached station list);
   (b) oblique tows with a Longhurst-Hardy Plankton Recorder at selected stations (Fig. 1 and Table I).
2. Measurements of the horizontal and vertical temperature profiles were obtained (a) using an electronic temperature sensor mounted in the CPR and (b) as part of the LHPR sampling
3. Artificial fertilisation was carried out on the eggs of the scad (Trachurus trachurus) and red gurnard (Aspitrigla cuculus

Additional sampling was carried out as part of the programme of MAFF, Lowestoft. This included:

1. plankton sampling with a Tin Tow Net;
2. measurements of salinity, temperature, turbidity, chlorophyll, oxygen concentration and pH at 3 m throughout the cruise;
3. trawl sampling at selected stations in the survey area.

OPERATIONAL AND EQUIPMENT PROBLEMS

1. Wear of the CPR gearbox caused a progressive decline in the rate of silk advance during the cruise. Valid samples continued to be taken but their spatial resolution became progressively less.

2. Incorrect setting of the torque of the temperature sensor recording unit resulted in a very limited number of valid measurements being taken.

RESULTS

1. The CPR was towed for over 1400 miles; valid records were obtained for over 1300 miles (see Fig. 1).

2. Seven oblique LHPR hauls were made including one double oblique tow (see Fig. 1 and Table I). All tows were valid. Maximum depth of sampling was 850 m.

3. The CPR mounted temperature recorder was towed for over 1400 miles. Only a few isolated measurements were obtained. Vertical temperature profiles were recorded successfully on all LHPR hauls.

4. Eggs of the scad were artificially fertilised and reared through hatching at a series of temperatures. At the termination of the cruise the live larvae were transferred to Lowestoft for further rearing.

   Eggs of the red gurnard were artificially fertilised but failed to develop beyond the earliest embryonic stages.

   Biological observations were made and photographs taken throughout both of the above experiments.

Prepared by : S H Coombs

Approved by : A R Longhurst

Date : 9 June 1977

TABLE I

LHPR STATIONS

Haul No.	Date	Time	Depth m	Latitude	Longitude
LHPR/77/3/1	11/5/77	0016	690-0	54°14.8'N	12°08.0'W
" 2	13 "	1648	630-0	52 14.8	12 39.3
" 3	14 "	0134	0-108-0	52 15.1	10 54.3
" 4	15 "	2310	80-0	50 14.9	07 15.9
" 5	16 "	1940	850-0	50 15.8	11 16.9
" 6	18 "	1327	145-0	48 13.1	07 13.2
" 7	19 "	1331	119-0	49 15.2	07 50.3

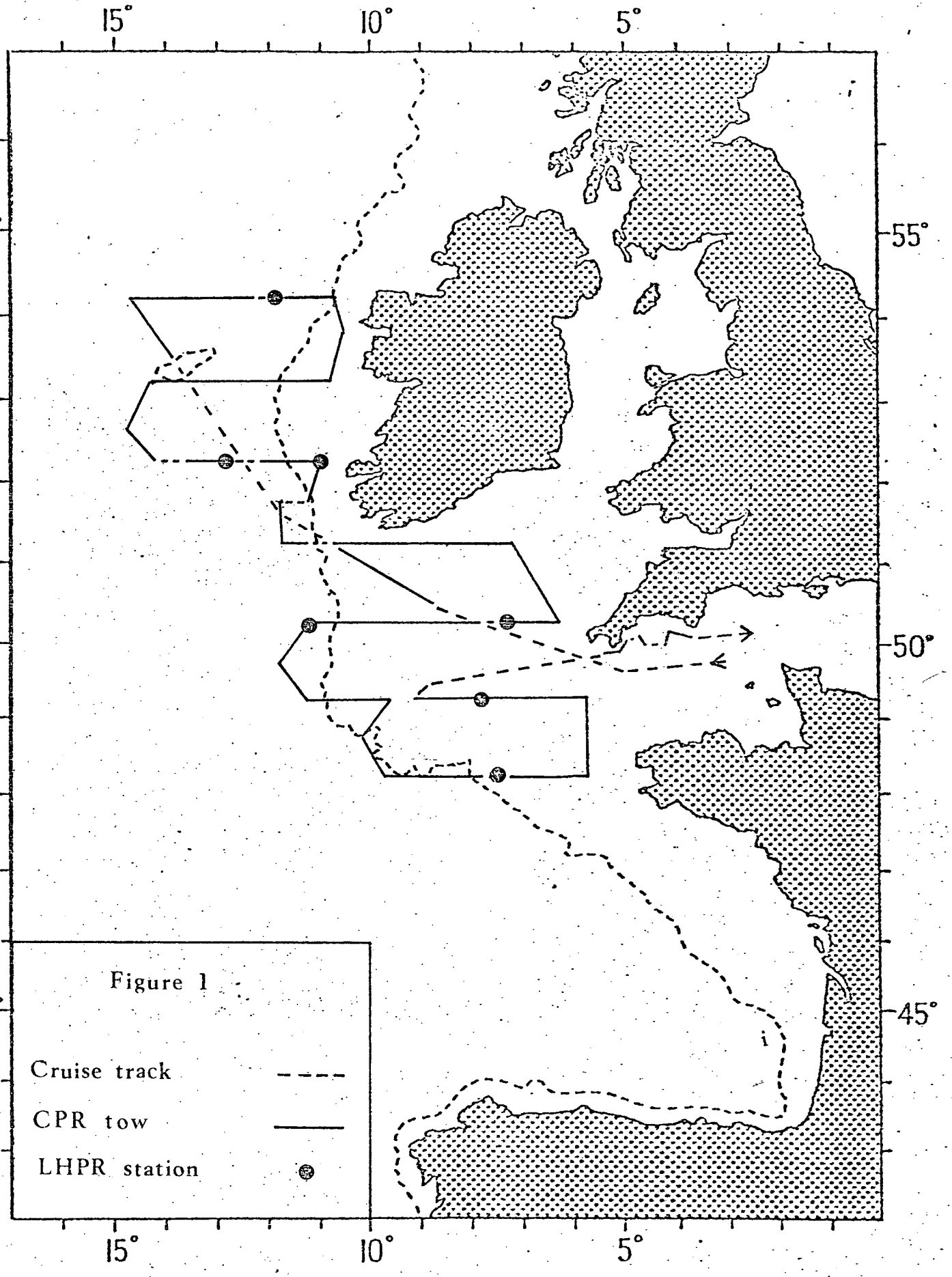
CPR TOW LIST

Tow No.	Date	Operation	Time	Latitude	Longitude
RV/77/3/ 1	8/5/77	Shot	1649	50°00'N	04°24'W
"	8 "	Haul	2014	49 50	05 22
" 2	9 "	Shot	0855	50 30	08 45
"	9 "	Haul	1706	51 15	10 45
" 3	9 "	Shot	1842	51 25	11 12
"	9 "	Haul	2133	51 46	11 47
" 4	10 "	Shot	0845	53 35	13 51
"	10 "	Haul	1304	54 15	14 45
" 5	10 "	Shot	1400	54 15	14 43
"	10 "	Haul	1519	54 15	14 18
" 6	10 "	Shot	1609	54 15	14 09
"	10 "	Haul	1710	54 15	13 48
" 7	10 "	Shot	1756	54 15	13 40
"	10 "	Haul	1908	54 15	13 18
" 8	10 "	Shot	1951	54 14	13 11
"	10 "	Haul	2100	54 15	12 48
" 9	10 "	Shot	2150	54 15	12 42
"	10 "	Haul	2256	54 15	12 18
" 10	11 "	Shot	0344	54 15	11 41
"	11 "	Haul	0452	54 15	11 19
" 11	11 "	Shot	0537	54 15	11 11
"	11 "	Haul	0644	54 15	10 48
" 12	11 "	Shot	1044	54 06	10 46
"	11 "	Haul	1222	53 51	10 27
" 13	11 "	Shot	1305	53 51	10 30
"	11 "	Haul	1647	53 16	10 42
" 14	11 "	Shot	1736	53 13	10 49
"	11 "	Haul	1909	53 14	11 12
" 15	11 "	Shot	1950	53 14	11 18
"	11 "	Haul	2130	53 15	11 42
" 16	11 "	Shot	2214	53 16	11 49
"	11 "	Haul	2348	53 15	12 12
" 17	12 "	Shot	0028	53 15	12 17
"	12 "	Haul	0205	53 15	12 42
" 18	12 "	Shot	0245	53 15	12 48
"	12 "	Haul	0414	53 16	13 08
" 19	12 "	Shot	0522	53 18	13 17
"	12 "	Hau-	0700	53 14	13 43
" 20	12 "	Shot	2022	53 16	13 46
"	12 "	Haul	2153	53 16	14 12
" 21	12 "	Shot	2244	53 17	14 15
"	13 "	Haul	0155	52 46	14 44

RV/77/3/22		13/5/77	Shot	0250	52°42'N	14°47'W
"		13 "	Haul	0554	52 16	14 17
"	23	13 "	Shot	1230	52 16	13 42
"		13 "	Haul	1349	52 15	13 18
"	24	13 "	Shot	1429	52 14	13 12
"		13 "	Haul	1545	52 15	12 48
"	25	13 "	Shot	1956	52 14	12 13
"		13 "	Haul	2112	52 15	11 48
"	26	13 "	Shot	2158	52 15	11 42
"		13 "	Haul	2314	52 15	11 18
"	27	13 "	Shot	2358	52 13	11 12
"		14 "	Haul	0037	52 14	11 00
"	28	14 "	Shot	0236	52 13	10 56
"		14 "	Haul	0507	51 47	11 14
"	29	14 "	Shot	1045	51 47	11 49
"		14 "	Haul	1337	51 16	11 46
"	30	14 "	Shot	1507	51 14	11 37
"		14 "	Haul	1613	51 15	11 18
"	31	14 "	Shot	2025	51 15	10 42
"		14 "	Haul	2146	51 15	10 18
"	32	14 "	Shot	2240	51 16	11 10
"		14 "	Haul	2354	51 15	09 48
"	33	15 "	Shot	0037	51 15	09 41
"		15 "	Haul	0148	51 15	09 17
"	34	15 "	Shot	0232	51 15	09 10
"		15 "	Haul	0345	51 15	08 48
"	35	15 "	Shot	0435	51 15	08 40
"		15 "	Haul	0550	51 15	08 19
"	36	15 "	Shot	0631	51 15	08 13
"		15 "	Haul	0800	51 15	07 48
"	37	15 "	Shot	0840	51 15	07 42
"		15 "	Haul	1009	51 15	07 18
"	38	15 "	Shot	1048	51 13	07 14
"		15 "	Haul	1353	50 46	06 47
"	39	15 "	Shot	1432	50 44	06 44
"		15 "	Haul	1745	50 15	06 16
"	40	15 "	Shot	1818	50 16	06 12
"		15 "	Haul	1953	50 15	06 42
"	41	15 "	Shot	2037	50 15	06 48
"		15 "	Haul	2153	50 15	07 12
"	42	16 "	Shot	0159	50 15	07 48
"		16 "	Haul	0330	50 16	08 13
"	43	16 "	Shot	0416	50 15	08 18
"		16 "	Haul	0541	50 15	08 42
"	44	16 "	Shot	0621	50 15	08 47
"		16 "	Haul	0749	50 15	09 11
"	45	16 "	Shot	0835	50 15	09 18
"		16 "	Haul	0954	50 15	09 42
"	46	16 "	Shot	1041	50 15	09 49
"		16 "	Haul	1159	50 15	10 12
"	47	16 "	Shot	1243	50 15	10 17
"		16 "	Haul	1336	50 19	10 26
"	48	16 "	Shot	1713	50 15	10 47
"		16 "	Haul	1843	50 15	11 13
"	49	16 "	Shot	2122	50 18	11 16
"		17 "	Haul	0029	49 46	11 44
"	50	17 "	Shot	0113	49 43	11 46
"		17 "	Haul	0406	49 16	11 18
"	51	17 "	Shot	0447	49 15	11 13
"		17 "	Haul	0623	49 15	10 48

IMER/MAFF/3/77 - Table I contd...

RV/77/3/52		17/5/77	Shot	0854	49°14'N	10°43'W
"		17 "	Haul	1104	49 15	10 18
"	53	17 "	Shot	1149	49 15	10 11
"		17 "	Haul	1325	49 15	09 47
"	54	17 "	Shot	1408	49 15	09 42
"		17 "	Haul	1720	48 47	10 14
"	55	17 "	Shot	1949	48 46	10 09
"		17 "	Haul	2201	49 22	09 52
"	56	18 "	Shot	0035	48 15	09 43
"		18 "	Haul	0214	48 15	09 18
"	57	18 "	Shot	0256	48 15	09 13
"		18 "	Haul	0427	48 15	08 48
"	58	18 "	Shot	0510	48 15	08 42
"		18 "	Haul	0639	48 14	08 17
"	57	18 "	Shot	0732	48 16	08 13
"		18 "	Haul	0905	48 15	07 48
"	60	18 "	Shot	1434	48 13	07 13
"		18 "	Haul	1614	48 15	06 48
"	61	18 "	Shot	1654	48 15	06 43
"		18 "	Haul	1836	48 16	06 18
"	62	18 "	Shot	1919	48 15	06 12
"		18 "	Haul	2049	48 15	05 49
"	63	18 "	Shot	2134	48 16	05 43
"		19 "	Haul	0056	48 42	05 43
"	64	19 "	Shot	0137	48 46	05 43
"		19 "	Haul	0350	49 14	05 45
"	65	19 "	Shot	0436	49 17	05 46
"		19 "	Haul	0614	49 16	06 12
"	66	19 "	Shot	0657	49 15	06 18
"		19 "	Haul	0822	49 15	06 42
"	67	19 "	Shot	0908	49 15	06 49
"		19 "	Haul	1032	49 14	07 13
"	68	19 "	Shot	1117	49 16	07 18
"		19 "	Haul	1232	49 15	07 43
"	69	19 "	Shot	1438	49 15	07 54
"		19 "	Haul	1541	49 15	08 13
"	70	19 "	Shot	1630	49 17	08 19
"		19 "	Haul	1752	49 15	08 42
"	71	19 "	Shot	1843	49 16	08 47
"		19 "	Haul	2013	49 15	09 12
"	72	20 "	Shot	1126	49 47	05 32
"		20 "	Haul	1221	49 54	05 26
"	73	20 "	Shot	1254	49 54	05 22
"		20 "	Haul	1345	49 54	05 08
"	74	20 "	Shot	1419	49 56	05 05
"		20 "	Haul	1504	50 02	04 56
"	75	20 "	Shot	1843	50 10	04 39
"		20 "	Haul	1934	50 00	04 35
"	76	20 "	Shot	2249	50 02	04 10
"		20 "	Haul	2322	50 08	04 10
"	77	20 "	Shot	2355	50 08	04 06
"		21 "	Haul	0123	50 08	03 43


15°
10°
5°
55°
50°
45°
Figure 1
Cruise track
CPR tow
LHPR station

REGULAR CIRCULATION - CRUISES

Internal

Glover
Longhurst
Robinson
Heath
Plymouth File (2)

External

NERC

Foxton
STS

IOS

Charnock
Edwards (BODS)

RVB

Stobie

DOE

Garnett, London
Wise, London

IOS (Taunton)

Tucker

IGS

Moore

IOS (Bidston)

Cartwright

MBA

Denton

SMBA

Currie

MAFF

Lee, Lowestoft
Cushing, Lowestoft
Wood, Burnham-on-Crouch

DAFS

Parrish, Aberdeen
Holden, Pitlochry

ADDITIONAL CIRCULATION

Plymouth

Coombs
Pipe
Williams
Beatson
Aiken

MAFF

Lockwood
Bannister