

I.O.S.

**RRS JOHN MURRAY
Cruise 13/79**

20 August - 6 September 1979

**VFS GAUSS
Recovery of
moorings**

15 October - 24 October 1979

Contribution to the MARSEN experiment

Cruise Report No 84

1979

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

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Institute of Oceanographic Sciences
Bidston Observatory
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NOTE: All times are in GMT

DURATION:

RRS John Murray	sailed from Plymouth	1430	20 August 1979
	arrived at Barry	1730	6 September 1979
VFS Gauss	sailed from Hamburg	0800	15 October 1979
	arrived at Hamburg	1200	24 October 1979

SCIENTIFIC STAFF:

John Murray: I. D. James (Principal Scientist)

N. G. Ballard

A. Banaszek

J. Daniels

D. Flatt

B. Hughes

V. White

Gauss: D. Flatt and B. Hughes joined the scientists of the DHI cruise

SHIP'S OFFICERS:

John Murray:	P. H. Warne	Master
	P. J. McDermott	Chief Officer
	N. Jones	Second Officer
	T. C. Harrison	Third Officer
	J. G. Parkes	Chief Engineer
	P. J. Byrne	Second Engineer
	C. J. Phillips	Third Engineer

SUMMARY OF THE SCIENTIFIC OBJECTIVES OF THE CRUISE

The cruise was a contribution to the international MARSEN (Maritime Remote Sensing Experiment in the North Sea) project. Among the remote sensing techniques which were being used were ground based HF and microwave radar, aircraft mounted radars, radiometers and infrared imagers and satellite infrared and coastal zone colour scanner pictures. The work done on the cruise was to provide a contribution to 'sea truth' for two main interests of the experiment, a study of temperature and salinity structure and fronts and a study of the interactions of wind, waves, currents and storm surges. This was done by a detailed CTD survey and by a deployment of two current meter and two current meter/tide gauge moorings. The moorings were recovered during a cruise of the Deutsches Hydrographisches Institut in which two IOS members participated.

NARRATIVE, JOHN MURRAY CRUISE

RRS John Murray sailed from Plymouth at 1430 on Monday 20 August 1979. Since the automatic steering was giving trouble, the John Murray put into Dover harbour at 1430 on Tuesday 21 August for repairs by a Sperry engineer. The repair was done and the John Murray sailed from Dover at 1955. Course was set for station A. The CTD pump and Simrad fish were put outboard at 0800 on Wednesday 22 August. Shifts began at 1100 and meteorological data collection and surface sampling began at 1200. Station A was reached at 0600 on Thursday 23 August, and deployment of the current meter rig began at 0740. Deployment was completed with a CTD cast at 0900. Station B was reached at 1130 and the deployment of the current meter rig was completed at 1205. The deployment of the bottom mounted current meter/tide gauge rig was completed at 1320. Station C was reached at 1620 and deployment of the bottom mounted current meter/tide gauge rig was completed (in heavy rain), at 1645. The John Murray then proceeded to $55^{\circ} 10'N 8^{\circ}E$ to begin the CTD grid pattern.

Use of Decca chain 9B proved unsatisfactory in this area and a change to 7B was made at 1710. The Decca linked to the CTD unit remained unreliable, however, This was probably due to deficiencies in the aerial system.

CTD stations continued until 2230 on Sunday 26 August when conditions became too rough. The John Murray then hove to. Contact had been made for the first time with the MARSEN Base on Sylt by VHF radio telephone at 0730 and we were able to report crossing frontal zones. Contact was then made nearly every day with the MARSEN base. In the afternoon of Tuesday 28 August conditions had moderated enough for the CTD pattern to be continued. Course was set for CTD station 195 at 1425. This station was completed at 0050 on Wednesday 29 August.

CTD stations then continued until 0005 on Thursday 30 August when a northerly course was set for a refuelling stop at Esbjerg.

The John Murray docked at Esbjerg at 1315 on Thursday 30 August and sailed at 0800 on Friday 31 August. All moorings were inspected (C at 0757 on 30 August, B at 1630 on 31 August (one of the toroids had to be righted) and A at 2010 on 31 August: in the case of A the flashing light was sighted).

CTD stations were continued until 1125 on Monday 3 September. In all, 210 CTD stations were completed. The John Murray then proceeded to Barry. The CTD pump and SIMRAD fish were brought inboard at 1700. The John Murray docked at Barry at 1720 on Thursday 6 September.

The cruise tracks, mooring positions and CTD stations are shown in figures 1 and 2. Surface temperature and conductivity were measured continuously along the cruise track.

LIST OF METEOROLOGICAL DATA COLLECTED:

Continuous : solar radiation, sea surface temperature

Hourly : wet and dry bulb temperatures, wind speed, cloud cover, atmospheric pressure.

From 1300 on 22/8/79 to 1100 on 30/8/79

and

from 0700 on 31/8/79 to 1200 on 3/9/79

NARRATIVE, RECOVERY FROM VFS GAUSS

The object of this voyage was to recover four moorings laid in August 1979 by 'John Murray' in positions as stated elsewhere.

On arrival at Station C, in darkness, on Thursday 18 October 1979 at 0630 the acoustic beacon was switched on and the vessel 'homed' in on the signal. At dawn the pellet floats were sighted but sea conditions were such that no attempt was made at recovery and the vessel hove to awaiting an improvement in the weather conditions.

At 0630 on Sunday 21 October the pellet float line was picked up and recovery of C commenced. When the instrument was clear of the water the lifting line snapped. Dragging for the ground line commenced and the recovery went ahead quite normally after grappling the ground line. Previous to station recovery the toroidal marker buoy had been washed up on Sylt, and had been transported by road to D.H.I. in Hamburg.

On approaching station B, one toroidal buoy was upside down and one correct. The BM CM/TG rig was recovered first at 1150, then the CM mooring was recovered intact at 1210.

On the approach to station A there was no toroidal buoy in sight, and no acoustic signal response. Dragging commenced almost immediately (at 1500) due to deterioration of weather conditions.

On Monday 22 October a further acoustic search was made for station A and after a box search was made the side scan sonar was used in a similar search pattern. The station A was finally located half a nautical mile North of the laid position. On recovery of the CM rig it was found that the acoustic beacon had been badly mutilated during the time the rig had been trawled.

SUMMARY

There were no instrument losses for the voyage and as far as can be ascertained at present all recording apparatus worked well during deployment. Voyage losses were one toroidal buoy (No. 12) with flashing light unit (No. 7274).

Station C

Designated position : 55° 00'N 07° 50'E
Depth : 17m
Bottom mounted current meter/tide gauge rig (Fig. 4)
Surface buoy : toroid No. 9
Rig number : CM/TG Rig 4
Acoustic No. : W5
Gauge position : (chain 9B) I 0.20, C30.12, -
 (chain 7B) - , E38.46, D57.74

Anchor position : (chain 9B) I 0.10, C30.10, -
 (chain 7B) - , E38.46, D57.74

Deployment started : 1625 23/8/79
Deployment finished : 1643 23/8/79

STATION REPORT : RECOVERY

Station A

Recovery position : (chain 9B) E10.95, E31.15, -
($\frac{1}{2}$ n.m. north of deployment position)

First current meter out of water : 1246 22/10/79

Second current meter out of water : 1300 22/10/79

Recovery completed : 1302 22/10/79

Acoustics badly damaged. Surface toroid and
bottom weight missing. No apparent damage to
current meters.

Large amount of marine growth.

Station BCurrent meter rig :

Recovery position : (chain 9B) G03.55, C47.50, -

First current meter out of water : 1210 21/10/79

Second current meter out of water : 1212 21/10/79

Recovery completed : 1212 21/10/79

Toroid upside down. Pellet float line missing.
Much marine growth, but did not seem to impair
movement.

Bottom mounted current meter/tide gauge rig :

Recovery position : (chain 9B) G03.85, C47.50, -

Out of water : 1147 21/10/79

Recovery completed : 1147 21/10/79

Pellet line missing. Much sea weed, causing braking action on rotor and affecting movement of vane past uprights.

Station C

Recovery position : (chain 9B) I 00.40, - , G67.18

Out of water : 0633 21/10/79

" " " : 0804 21/10/79 (rope snapped
first time)

Recovery completed : 0810 21/10/79

Much barnacle growth, increasing threshold for movement of both rotor and vane. Toroid missing (washed up on Sylt).

All recording equipment was recovered in good working order.

LIST OF EQUIPMENT DEPLOYED:

1. Surface Buoys
Toroids Nos. 4, 8, 9, 12. Manufactured by Cosalt Ltd.,
Lowestoft
1.8m diameter, 600kg
buoyancy

2. Subsurface Buoys
Hollow steel spheres Nos. 1,
10. Manufactured to IOS design
0.8m diameter, 175kg
buoyancy

3. Current meters
Nos. 570, 1002, 1139, 4389. Manufactured by Aanderaa,
Bergen, Norway, Type RCM 4

4. Bottom mounted CM/TG
CM/TG Nos. 1, 4. IOS Bidston

- Current meters Nos. 1747,
1506 Manufactured by Aanderaa,
Bergen, Norway, Type RCM 4

- Pressure sensor element
Digiquartz (quartz crystal)
No. 280, 4143. Manufactured by Paroscientific
Washington, U.S.A.
Model 2400A

5. Acoustic command pingers
Nos. W2, W4, W5, W6 IOS Bidston/Wormley

COMMENTS ON THE SHIP AND RVS EQUIPMENT

The John Murray proved adequate for all the tasks except during heavy seas. The Paxman diesel made the Principal Scientist and Scientist No. 1 cabins extremely noisy when it was used for power while docked.

It was hoped to take a spare CTD unit (No. 9400) in case of problems with our own CTD. However, this spare was found to be faulty during the preceding IOS Bidston cruise (Shackleton 7/79) and could not be used. Notice of the special MARSEN frequency (3394 kHz) was given too late for the necessary radio equipment to be installed.

ACKNOWLEDGEMENTS

We would like to thank the Master, officers and crew of the RRS John Murray for their cooperation and assistance during this cruise.

We would also like to thank the Master, officers and crew and the DHI scientific party on the VFS Gauss for their cooperation in the successful recovery of all the instrumentation, and Dr. E. Mittelstaedt for his invaluable assistance.

LIST OF FIGURES

- Fig 1 : CTD stations 99-222 (99-194 : 23-26/8/79,
195-222 : 29-30/8/79)
- Fig 2 : CTD stations 223-308 (31/8 - 3/9/79)
- Fig 3 : Current meter rig
- Fig 4 : Bottom mounted current meter/tide gauge rig

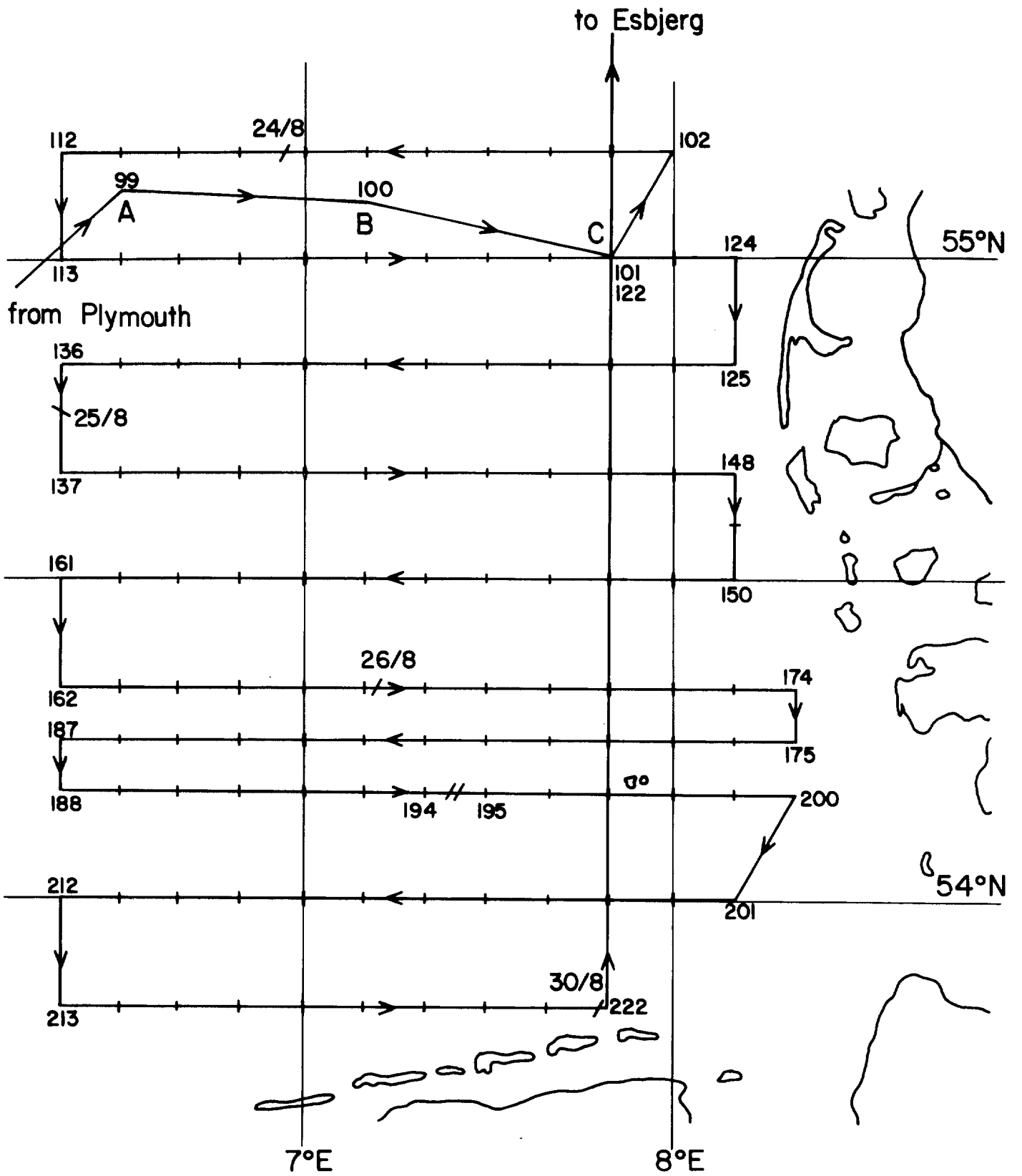


FIGURE I

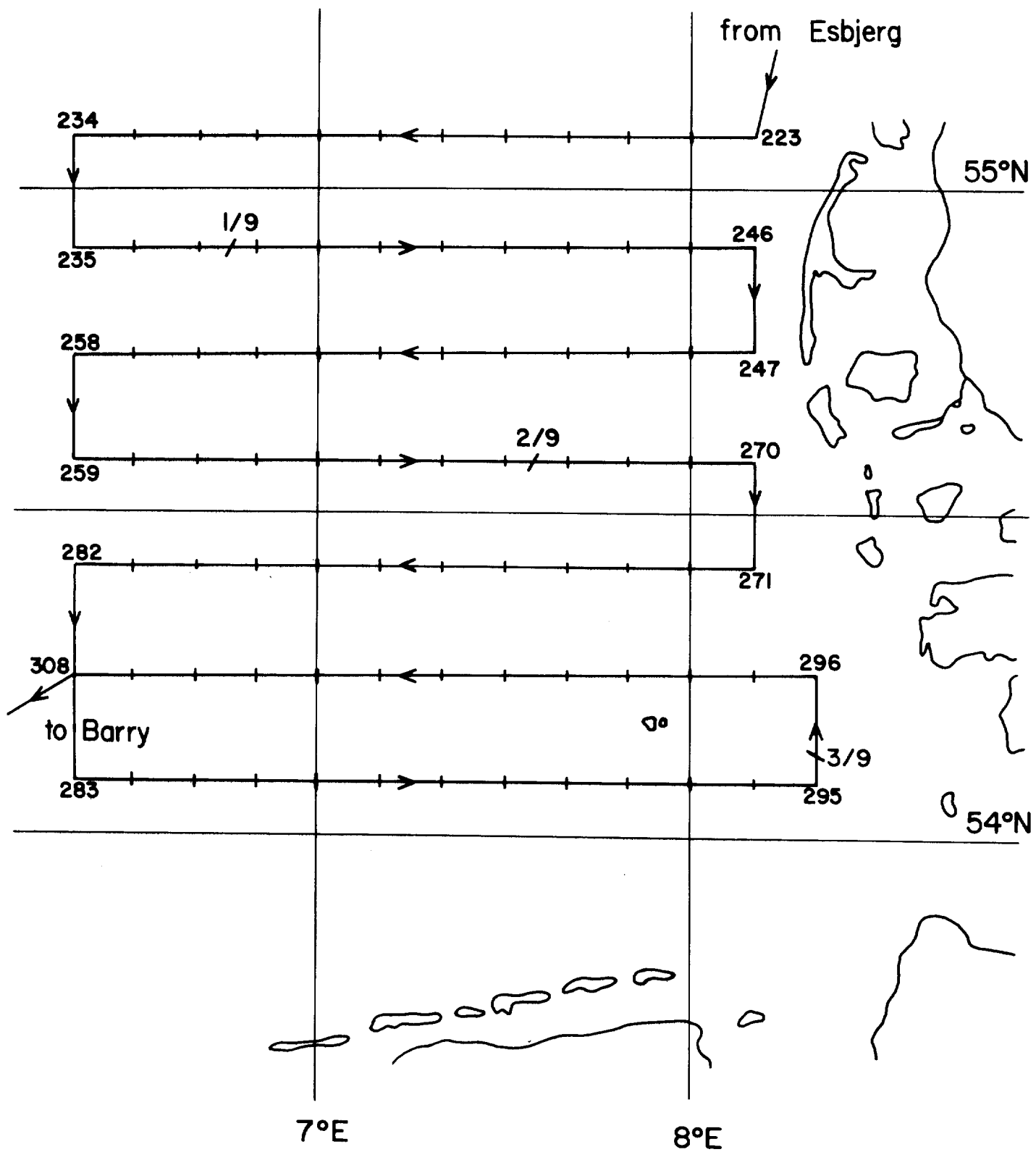


FIGURE 2

CURRENT METER MOORING SYSTEM
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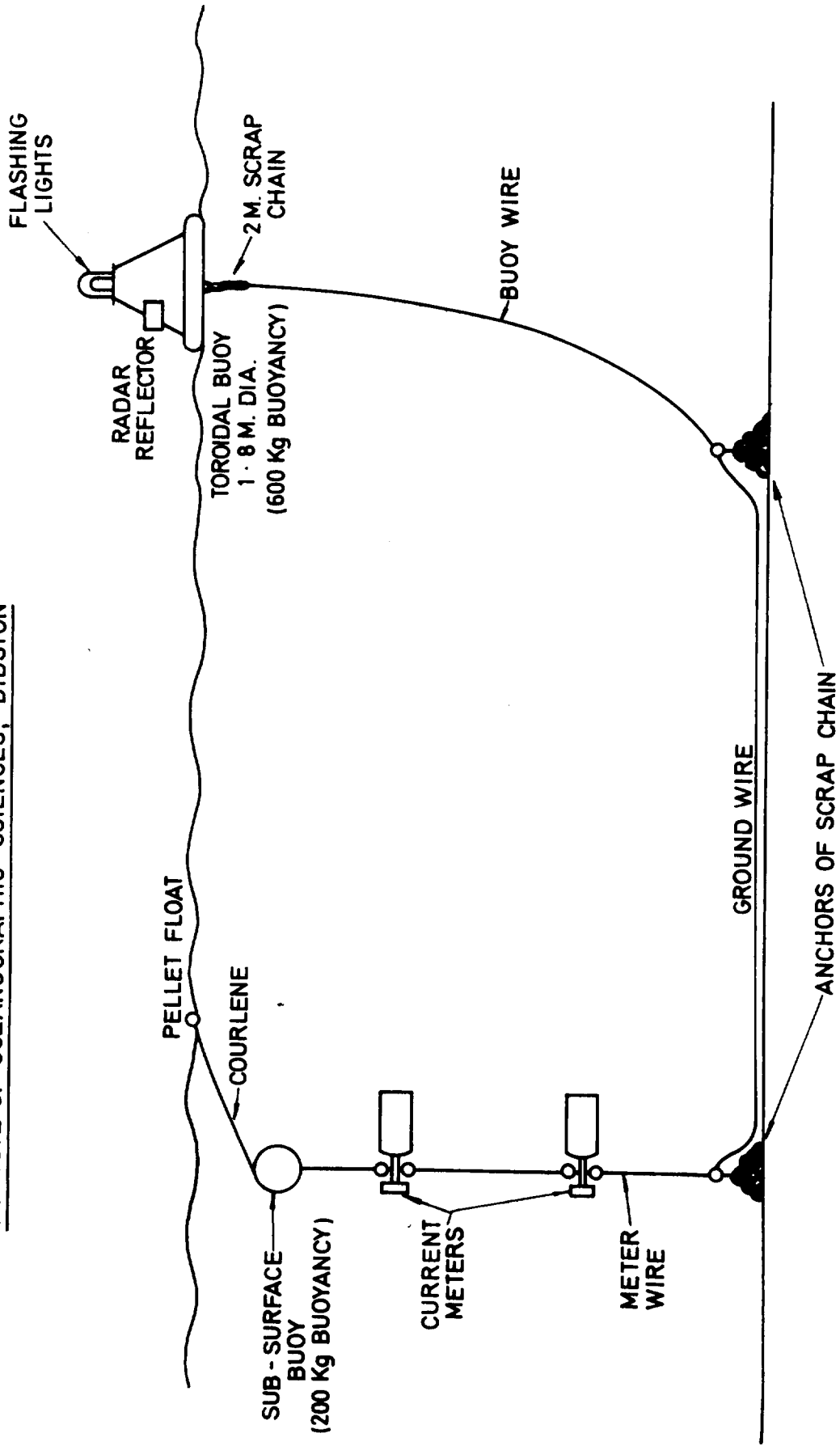


FIGURE 3

BOTTOM MOUNTED CURRENT METER MOORING SYSTEM

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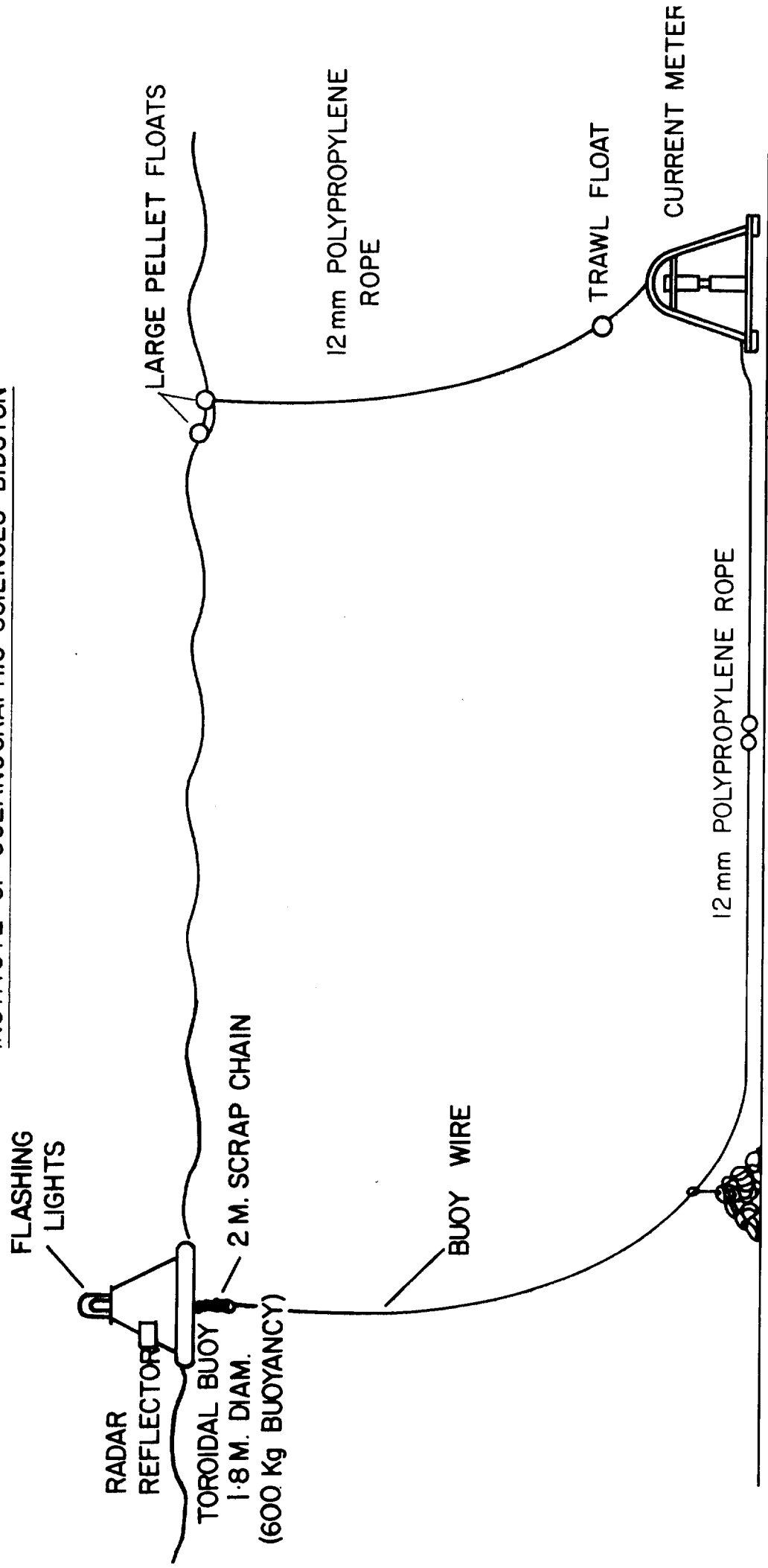


FIGURE 4