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

INSTITUTE OF
OCEANOGRAPHIC
SCIENCES

NATURAL ENVIRONMENT RESEARCH COUNCIL

INSTITUTE OF OCEANOGRAPHIC SCIENCES

Wormley, Godalming,
Surrey, GU8 5UB.
(0428 - 79 - 4141)

(Director: Dr. A.S. Laughton)

Bidston Observatory,
Birkenhead,
Merseyside, L43 7RA.
(051 - 653 - 8633)

(Assistant Director: Dr. D.E. Cartwright)

Crossway,
Taunton,
Somerset, TA1 2DW.
(0823 - 86211)

(Assistant Director: M.J. Tucker

On citing this report in a bibliography the reference should be followed by the words UNPUBLISHED MANUSCRIPT.

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

Institute of Oceanographic Sciences
Bidston Observatory
Birkenhead
Merseyside, L43 7RA

Contents

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^{o} 10'N 8^{o}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 REPORT : DEPLOYMENT (Decca coordinates in sequence R, G, P).

Station A

Designated position : 55°06'N 06° 30'E
Depth : 41 m
Current meter rig (Figure 3) ; meters 10m and 25m above bottom
Surface buoy : Toroid No. 12
Meters : top 1139, bottom 4389
Subsurface buoy : spheroid No. 1
Flasher No. : 7274
Acoustic No. : W4
Subsurface buoy position : (chain 9B) E10.4, E 31.2, E 57.8
(chain 7B) - , D 44.48, E 77.26
Surface buoy position : (chain 9B) E9.94, E 31.22, E 57.62
(chain 7B) - , D 44.51, E 77.25
Deployment started : 0740 23/8/79
Deployment finished : 0816 23/8/79

Station B

Designated position : 55° 05'N 07°10' E
Depth : 29m
Current meter rig (Fig. 3) : meters 5m and 15m above bottom
Surface buoy : Toroid No. 4
Meters = top 1002, bottom 570
Subsurface buoy : spheroid No. 10
Flasher No. : 5714
Acoustic No. : W6
Subsurface buoy position : (chain 9B) G3.55, C47.50, F59.80
(chain 7B) - , E30.30, E56.00
Surface buoy position : (chain 9B) G3.48, C47.52, F59.73
(chain 7B) - , E30.40, E55.88
Deployment started : 1145 23/8/79
Deployment finished : 1205 23/8/79
Bottom mounted current meter/tide gauge rig (Fig. 4)
Surface buoy : Toroid No. 8
Rig Number : CM/TG Rig 1
Acoustic No. : W2
Gauge position : (chain 9B) G3.72, C47.59, F59.80
(chain 7B) - , E30.27, E56.00
Anchor position : (chain 9B) G3.80, C47.50, F60.00
(chain 7B) - , E30.27, E56.00
Deployment started : 1300 23/8/79
Deployment finished : 1320 23/8/79

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, -
(½ 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 B

Current 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

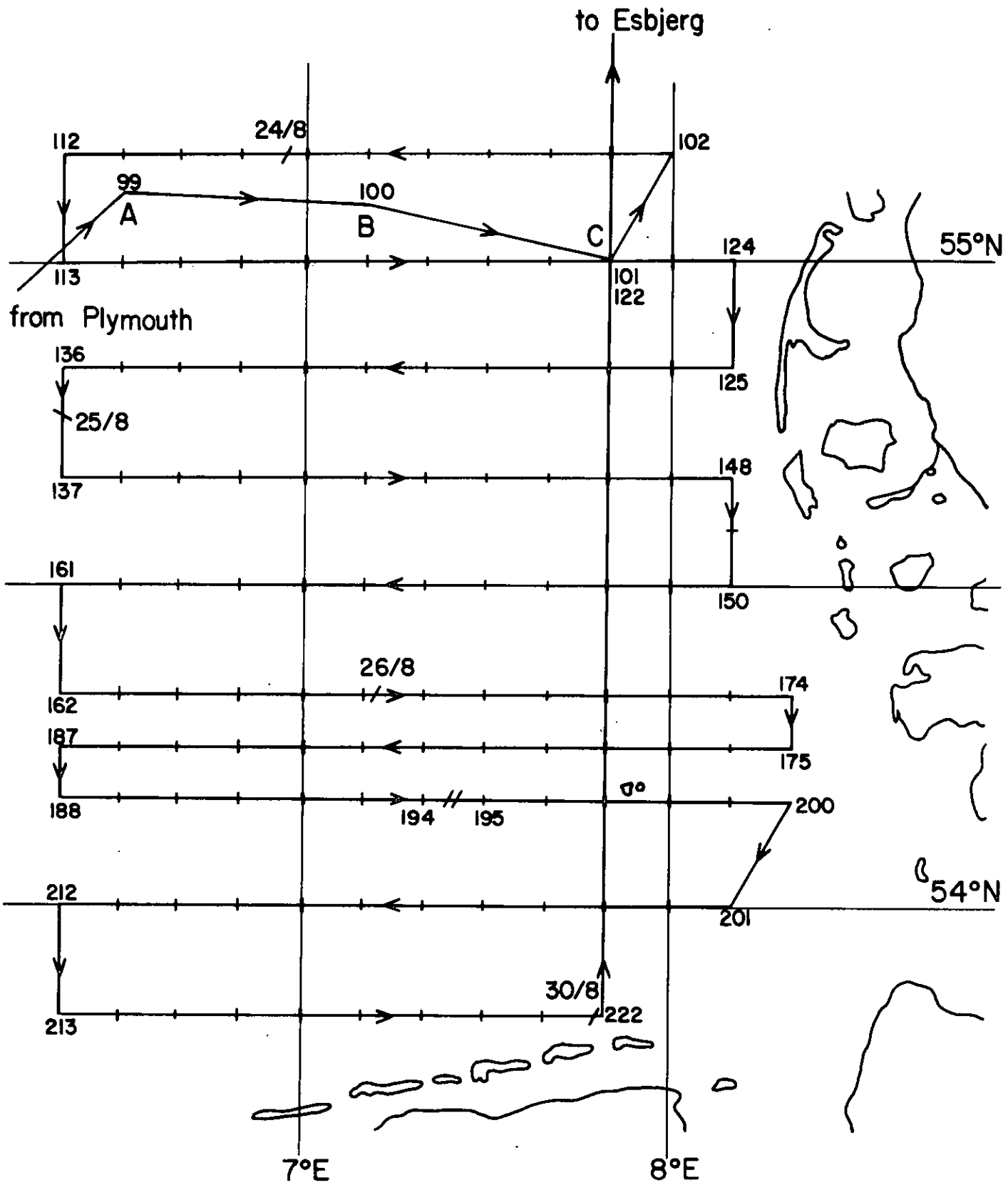
to Esbjerg
112
24/8
102
99
A
100
B
C
124
55°N
113
101
122
from Plymouth
136
125
25/8
148
137
161
150
26/8
162
174
187
175
188
194
195
200
54°N
212
201
30/8
213
222
7°E
8°E

FIGURE 1

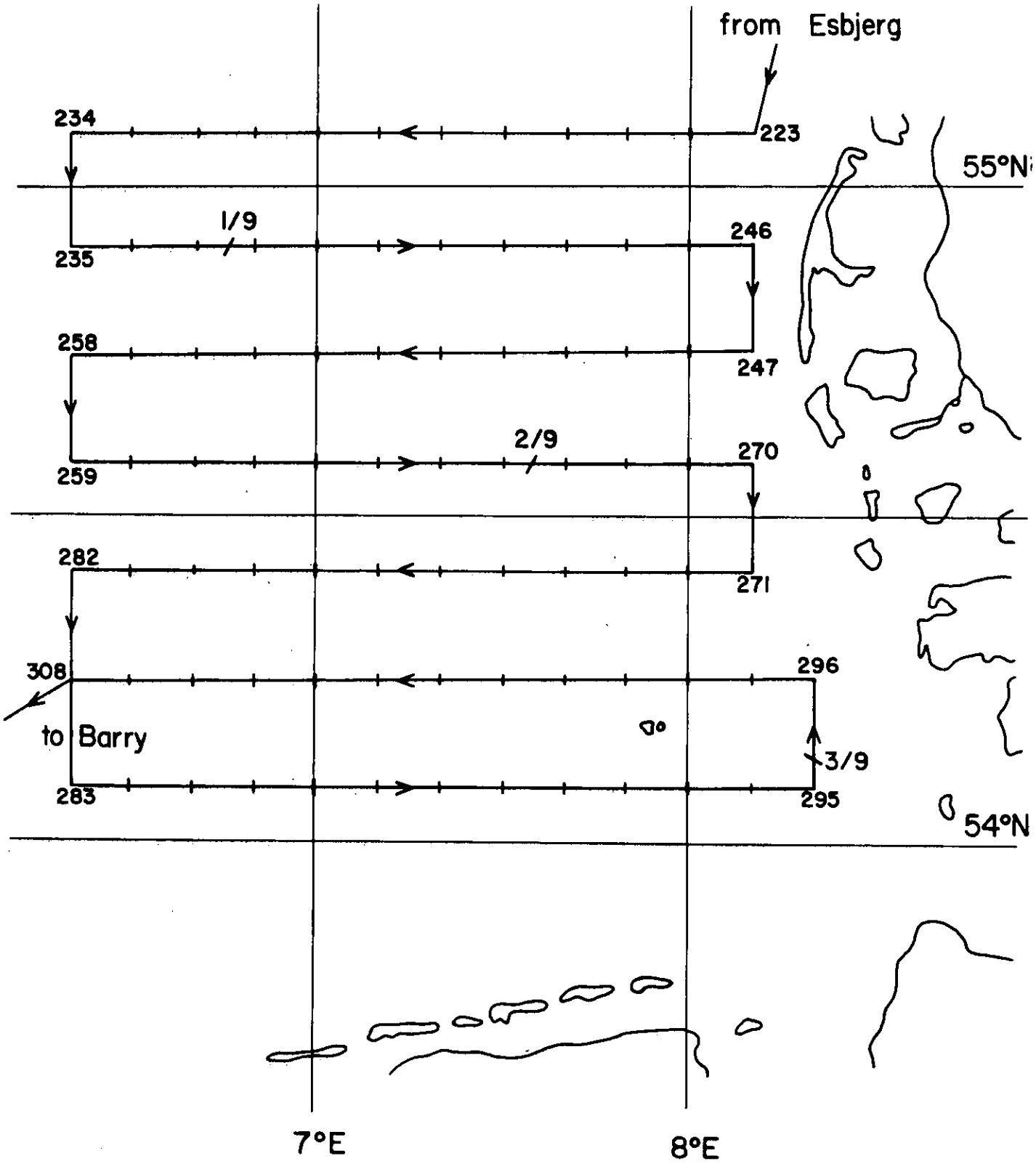
from Esbjerg
234
223
55°N
1/9
235
246
258
247
2/9
259
270
282
271
308
296
to Barry
3/9
283
295
54°N
7°E
8°E

FIGURE 2

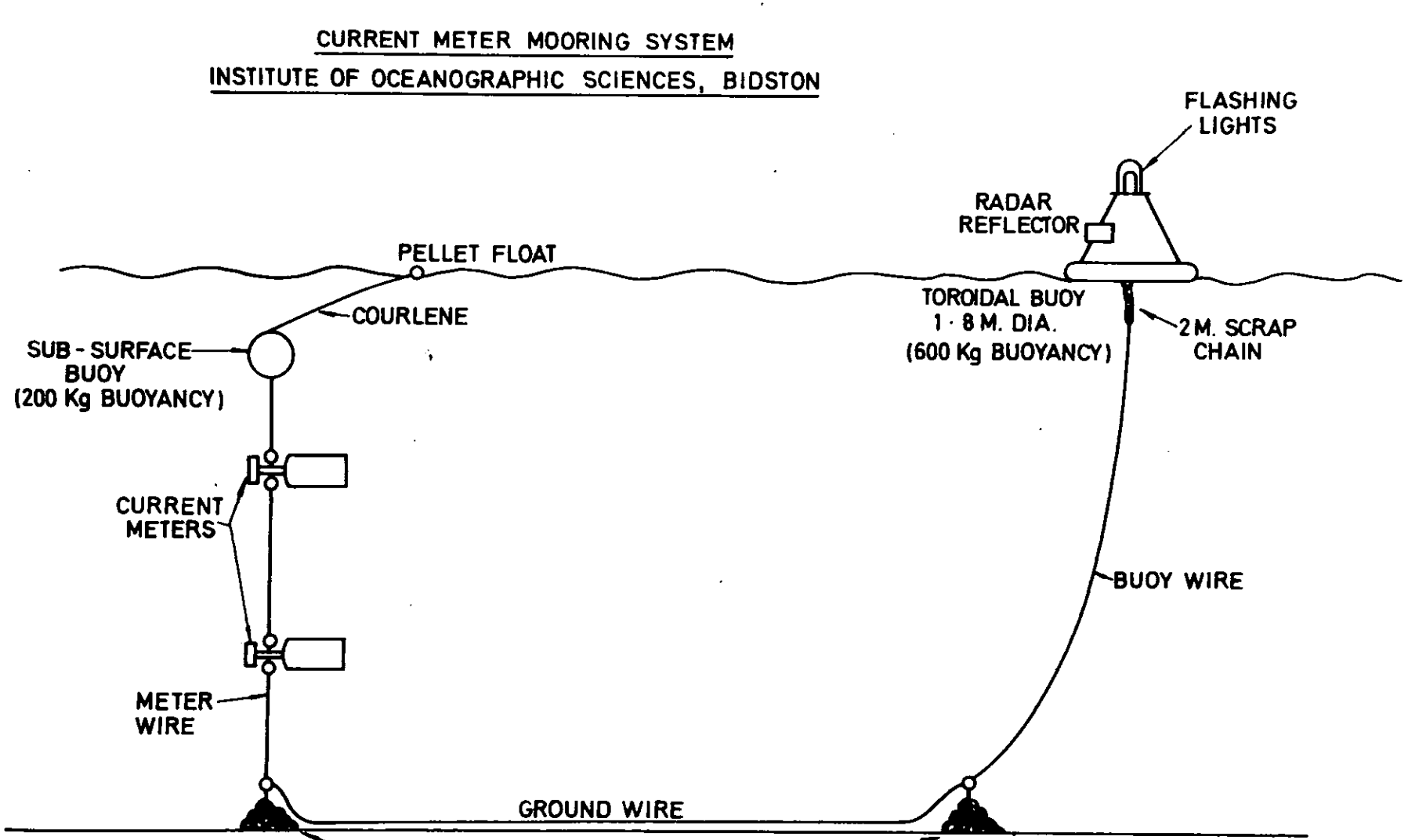
CURRENT METER MOORING SYSTEM
INSTITUTE OF OCEANOGRAPHIC SCIENCES, BIDSTON
FLASHING LIGHTS
RADAR REFLECTOR
PELLET FLOAT
COURLENE
TOROIDAL BUOY
1·8 M. DIA.
(600 Kg BUOYANCY)
2 M. SCRAP CHAIN
SUB-SURFACE BUOY
(200 Kg BUOYANCY)
CURRENT METERS
BUOY WIRE
METER WIRE
GROUND WIRE
ANCHORS OF SCRAP CHAIN

FIGURE 3

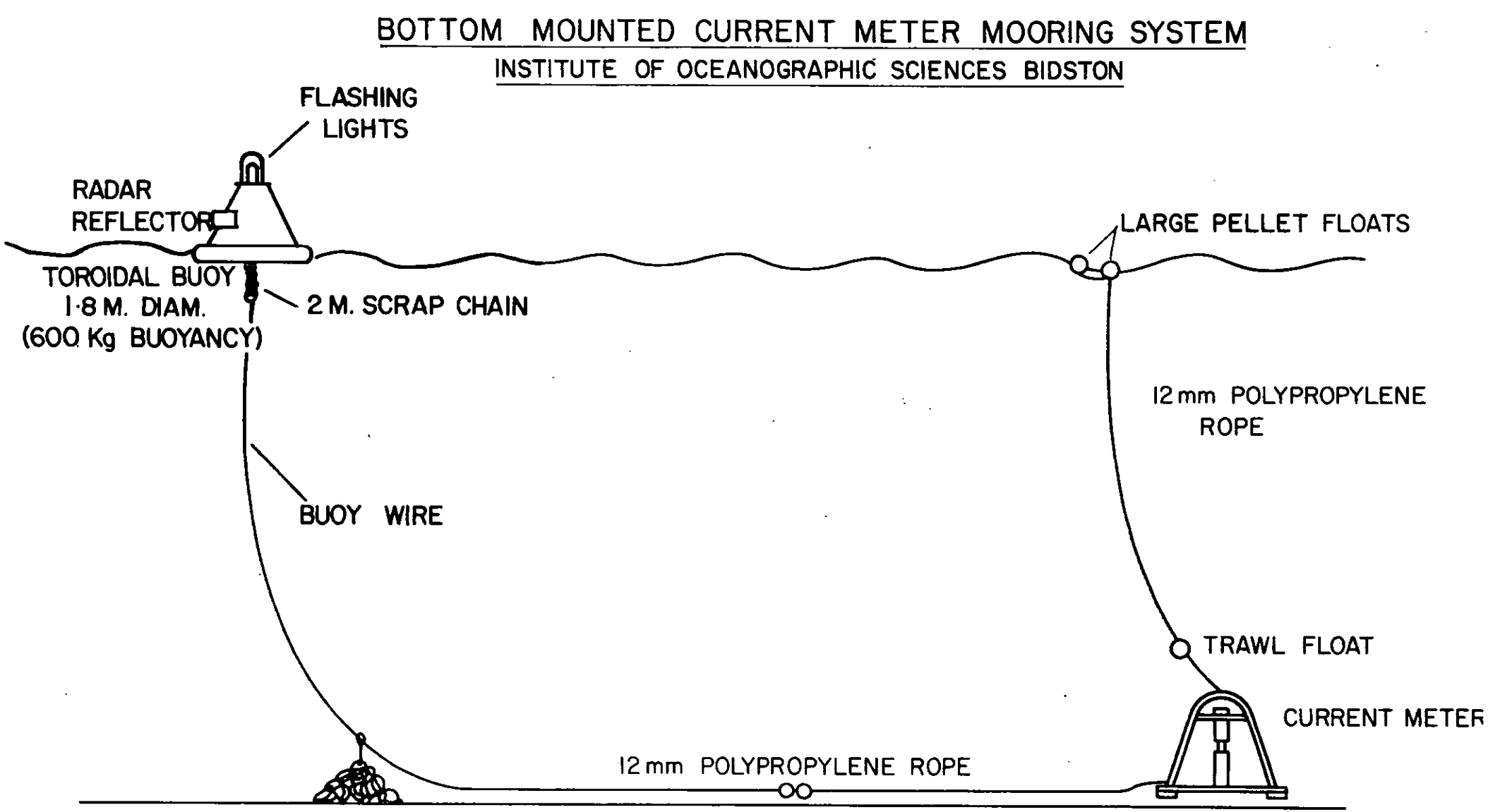
BOTTOM MOUNTED CURRENT METER MOORING SYSTEM
INSTITUTE OF OCEANOGRAPHIC SCIENCES BIDSTON
FLASHING LIGHTS
RADAR REFLECTOR
TOROIDAL BUOY 1·8 M. DIAM. (600 Kg BUOYANCY)
2 M. SCRAP CHAIN
LARGE PELLET FLOATS
12 mm POLYPROPYLENE ROPE
BUOY WIRE
TRAWL FLOAT
CURRENT METER
12 mm POLYPROPYLENE ROPE

FIGURE 4