RRS DISCOVERY

CRUISE 69

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Upwelling off N.W. Africa

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Institute of Oceanographic Sciences,
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IFM Institut für Meereskunde an der Universität Kiel
DAMTP Dept. of Applied Maths and Theoretical Physics, University of Cambridge.
IPO Institute of Physical Oceanography, University of Copenhagen.
MSL Dept. of Physical Oceanography, Marine Science Labs. Menai Bridge.
* First leg (21 Jan. - 18 Feb.) only
+ Second leg (18 Feb. - 18 Mar.) only
X 21 Jan.-30 Jan. and 7 Mar. - 18 Mar.

OFFICERS AND PETTY OFFICERS

Master	G.L. Howe	Chief Engineer	C.S. Storrier
Chief Officer	E.M. Bowen	Second Engineer	D.G. Woodward
Second Officer	A.R. Neil	Third Engineer	W.G. Barrett
Third Officer	W.R. Austin	Fourth Engineer	T. Warburton
Radio Officer	R.I. Hammerton	Fifth Engineer	R.G. Whitton
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Boatswain	L.A. Haggis
Netman	R.G. Burt
Carpenter	L. Cromwell
Bosun's Mate	D.S. Knox

ABBREVIATIONS

RMT 1	1m² Rectangular Midwater Trawl (0.32mm mesh)
RMT 8	8m² " " " (4.5mm mesh)

These nets were always used in combination.

BGN	Paired Vertical Bongo nets (0.5mm and 0.3mm meshes).
NN	Neuston Net.
BN1.5/5C	1.5m² opening/closing epibenthic sledge.
TSD	Temperature, salinity, depth probe.
MS	Multi-sampler.
WB1	1.35l water bottle.
WB7.4	7.4l water bottle.
PUMP	Pump sampler.
FL	Fluorometer.
CM	Current Meter.
PROTAS	Probe recording ocean temperature and shear.
Q-meter	Quanta meter.) Light meters
C-meter	Beam transmittance meter) Light meters

ABBREVIATIONS contd.

β-(θ) - meter	Angular scattering meter	
Colour-meter	Ocean colour index meter	) light meters
B-meter	Integrating scattering meter	)

INTRODUCTION

This was a cruise in conjunction with scientists of the Institut für Meereskunde, Kiel, on board F.S. Meteor. It was organised jointly by the Institute of Oceanographic Sciences, the Department of Oceanography of the University of Liverpool and the Institut für Meereskunde. Scientists from the Marine Science Laboratories, Menai Bridge, the Department of Applied Mathematics and Theoretical Physics of the University of Cambridge and the Institute of Physical Oceanography of the University of Copenhagen also took part in the cruise and there was an interchange of British and German scientists between the two ships.

The aims were to study the physical, biological and chemical processes involved in upwelling off the N.W. African coast with particular emphasis on the measurement of onshore/offshore and longshore water movements and the relationships of phytoplankton, zooplankton and micronekton distribution to them.

Three lines of stations normal to the coast were established with current meter moorings on each. Discovery worked line A in 25°N and line B in 22°40'N and Meteor worked line B and line C in 21°20'N. There were ten nominal station positions on each line. During the 'Discovery' Cruise three TSD and water bottle surveys were made of the A line and four of the B line and nets were fished on two of the surveys of each line.

In addition to the work in the upwelling area a deep sea tide gauge was laid and recovered west of Cape St. Vincent, a current meter mooring was laid on the abyssal plain at 41°N, 13°40'W as part of the Cruise 70 topographic experiment and a series of RMT 1+8 samples were taken at 44°N, 13°W as part of a continuing programme.

ITINERARY

1230/21 January	Sailed from Barry.
2000/24 January	Arrived 44°N, 13°W.
1300/27 January	Laying tide gauge off Cape St. Vincent.
1040-1400/30 January	Anchored off Santa Cruz, Tenerife.
0930/31 Jan.-2000/1 Feb.	Laying current meter moorings, A Line.

1045/2 Feb. - 1100/3 Feb.	Laying current meter moorings, B line.
1900/2 Feb. - 1030/5 Feb.	1st full survey of B line (Stns 8666-8679).
1500/6 Feb. - 0700/8 Feb.	" " " " A " (Stns 8681-8690).
0200/9 Feb. - 0000/11 Feb.	2nd full survey of B line (Stns 8692-8701)
0000/11 Feb. - 1400/12 Feb.	Closely spaced TSD's and RMT 1+8's on B line.
1200/13 Feb. - 0100/15 Feb.	2nd full survey of A line (Stns 8719-8728).
0100/15 Feb. - 0740/16 Feb.	Closely spaced TSD's and RMT 1+8 on A line.
0930/17 Feb. - 0930/20 Feb.	In Santa Cruz, Tenerife.
0100/21 Feb. - 2130/21 Feb.	3rd survey of A line (TSD and WB) (Stns 8738-8747).
1600/22 Feb. - 1100/23 Feb.	" " " B line " " " (Stns 8749-8758).
1100/23 Feb. - 0800/4 Mar.	Detailed studies incl. 4th survey (Stns 8785-8793) of B line.
1400/4 Mar. - 2220/6 Mar.	Recovery of current meter moorings.
1630/7 Mar. - 1115/8 Mar.	In Santa Cruz, Tenerife.
1300/11 Mar.	Recovery of tide gauge.
0600/13 Mar.	Laying topographic experiment mooring.
0340/14 Mar. - 0510/15 Mar.	Repeat RMT series at 44°N, 13°W.
1000/18 Mar.	Arrive Barry.

NARRATIVE

LEG 1

Discovery sailed from Barry at 1200h on 21 January and the PES fish and surface temperature and salinity probe were streamed during the afternoon. On the run to the first station at 44°N, 13°W gale force winds reduced the speed to 6-7 kts and during the night of 22/23 January a surface buoy broke adrift on the boat deck damaging the pure sea water supply header tank and the after rail. At 1400h on 23rd there was enough depth of water to tension the new main warp that had been wound onto the trawl winch in Barry. 8546m of the total 9039m were tensioned and passage was resumed at 1845h. The magnetometer was streamed at 1100h on 24 January. At 2000h on 24 January a position just to the north of 44°N, 13°W was reached. It was intended to fish 3 day and 3 night RMT 1+8 hauls at this position as a continuation of the seasonal sampling done during 1974. Although the weather had moderated slightly, after one net haul further attempts were abandoned as recovery presented considerable difficulty; then the ship proceeded towards 41°N, 13°40'W where a deep current meter mooring was to be laid on the

abyssal plain as part of the topographic experiment to be carried out on Cruise 70. At 1414h on 25 January the deep sea tide gauge was tested to 2000m and at 1900h the same day wire tests were carried out on the acoustic releases to be used on the current meter mooring. The L.U.D.O. TSD was also tested to 300m at this station. As the acoustic releases did not operate at 5000m the mooring could not be laid and a course was set for Cape St. Vincent where the tide gauge was to be sited. The position was reached at 1300h on 27 January; after a box echo-sounder survey the tide gauge was laid (St. 8652) in 1983m and a course was made for Tenerife. At 1100h on 28 January the RMT 1+8 was fished to test a net monitor. The opportunity was taken to test the TSD again and the new integrated circuit net monitor was also tested on the vertical wire. On passage to Tenerife a very slight alteration of course was made to pass over the top of Dacia Bank. A further trial haul with the RMT 1+8 was made at 1400h on 29 January. The net release gear was tested on the vertical wire at 0800h on 30th and at 1047h the ship reached Santa Cruz where she lay off at anchor.

At Santa Cruz Mr. Spencer and Mr. Barrett, the R.V.B. Catering Superintendent, left the ship and Dr. Skinner joined. Discovery sailed from Santa Cruz at 1418h on 30 January for position A9. (The line of stations in 25°N is referred to as the 'A' line and that in 22°40'N as the 'B' line. Predetermined positions on these lines, which were worked several times during the cruise, were numbered from 1-10 inshore to offshore. These nominal station positions are given in Table 1 and are marked on Fig. 2). Wire tests on the acoustic release for the first of the current meter moorings were made during the evening of 30th and the A9 position was reached at 0930h on 31 January. After working an echo-sounder grid the mooring was laid in 3026m one cable from the A9 position. As it was not possible to reach the 500m mooring position at A6 and still have time to lay the mooring during daylight the night was spent working TSD's at A10, A8 and A6, testing the acoustic release for the mooring and doing an echo-sounder survey of the proposed site. As the mooring was to be laid on the slope a dahn buoy was anchored about 3 miles off the mooring position for radar fixes. The mooring was completed by 1330h on 1 February and a course made for the 65m mooring position. A depth of 65m was reached sooner than anticipated so this inshore U-mooring was laid between A2 and A3 and was completed by 2000h on 1 February when a course was made towards the B line keeping approximately to the 100m contour. Two moorings were to be laid one in 500m and one in 65m. The 500m (B5) position was reached at 1045h on 2 February and the echo-sounder

survey and laying the mooring took until 1600h. The 65m mooring at B3 could not be completed in the daytime left and, after a trial haul with the paired Bongo nets, a start was made on the vertical work of the first survey of the B line. The surveys includes TSD's and water sampling at each of the ten stations and RMT 1+8, Bongo and neuston net hauls at alternate stations. During the night of 2/3 February stations B1 - B5 were worked and at 0730h the ship returned to B3 to lay the shallow mooring. When this was completed at 1100h a boat was sent to F.S. Meteor, which had been lying off nearby, to transfer a bathythermograph and to take the netman Mr. R.G. Burt, for treatment to an arm injury. The opportunity was taken for discussions about the programme with Prof. Hempel, the Principal Scientist on board F.S. Meteor. Work on the survey was resumed at 1600h on 3 Feb. and was completed by 1030h on 5 Feb. when a course was set for the A line along approximately the 500m contour. At 1915h on 5 Feb. an RMT 1+8 haul was made in which a strong scattering layer was followed up from 250m to near the surface and the previous course was resumed at 2030h. Although it was intended to work the A line from offshore to inshore it was necessary first to visit the inshore current meter mooring in order to seize a shackle just below the surface buoy which had not been done when it was laid. The first survey of the A line, which included a bottom net haul in 3000m, was started at 1500h on 6 Feb. and completed by 0700h on 8 Feb. Although the sea was calm a long high swell from the NW, and so at right angles to the wind, made station keeping very uncomfortable. The wave recorder showed a maximum height of 24 feet and a period of 12-14 s. On completing the survey the ship returned to the B line again along the 100m contour. During the southerly passage a short test haul was made with the bottom net to confirm that the pinger switching was working correctly. The second survey of the B line started at B10 at 0200h on 9 February and was completed at B1 by 0000h on 11th. The two surveys had shown the steep part of the slope in about 800-200m to be the most interesting physically, chemically and biologically and over the next day and a half two series of TSD's were worked up the slope in soundings of approximately 100m intervals, a daytime 25m layer RMT 1+8 series was worked between 400-15m in a sounding of about 500m and casts of 7.41 water bottles were made. When this work was completed at 1400h on 12 February the ship returned north along the 1000m contour to the A line. At 0900h on 13 Feb. the E.M. logs were calibrated by putting the wind on the starboard beam and maintaining speeds of 10, 8, 6, 4 and 2 kts. for 20 minutes each. The second survey of the A line was started at A10 at 1200h on 13 February and completed at A1 at 0100h on 15 February. The three inshore

stations were worked in rapidly deteriorating weather and at A2 and A1 water bottle casts were done instead of using the TSD. An abbreviated daytime RMT 1+8 series was worked in 500m and this was followed during the night of 15/16 February by a series of TSD casts at closely spaced intervals up the slope. The A line was left at 0700h on 16 Feb. and the ship docked in Santa Cruz at 0930h on 17 Feb.

LEG 2

While in Santa Cruz nine scientists left the ship and ten joined. Meteor occupied a berth next to Discovery and there were helpful informal discussions between the two scientific parties. During the first leg of the cruise Meteor had been providing surface temperature and chlorophyll data to the German research aircraft team for calibration of their instruments during flights over the area. Arrangements were made for Discovery to continue this work during the second leg.

Discovery sailed from Santa Cruz for the second leg of the cruise at 0930h on 20 February heading for A10 which was reached at 0200h on 21 Feb. A third TSD and water bottle survey of the A line was started on arrival and completed by 2130h on 21 Feb. when a course was set so as to arrive in water deep enough to test Protas and Dr. Kullenberg's light meters at 0930h on 22 Feb. These tests were satisfactory and the ship proceeded to the B line, where work was to be concentrated during the second leg, and a third TSD and water bottle survey was made between 1600h on 22 and 1100h on 23 Feb. The light meters, Protas, TSD and RMT 1+8 were worked at B9 in 2000m before moving out again to B10 for water bottle samples for trace metals and to start a series of light meter and fluorescence pump stations at and between B10 and B9 during the night. On 24 February a 13h Protas and TSD time series was worked to 300m with dips every hour. This station was completed with lowerings of the light meters and pump which were then worked at each position from B8 to B5 during the night. Six RMT 1+8 hauls were fished in the vicinity of B5 (about 500m sounding) during day of 25 Feb. with a TSD at the start and finish of the hauls. The colour, 'Q' and 'C' light meters were used at midday to coincide with a flight of the research aircraft and again at 1400h. Again the night was used to work the light meters and the fluorescence pump, this time a repeated series at the same position. At 0630h on 26 Feb. a 13h Protas and TSD time series was started near the 500m current meter mooring; this was completed by 1900h when the ship moved offshore to the 1000m contour between B6 and B7 for a pump time series which was followed by a short

time series with the β θ meter. On 27 February a day and night RMT 1+8 series was worked in the vicinity of the 1000m contour, the day series being preceded by a Protas drop and a TSD. From midnight onwards the pump and light meters were worked at stations in towards the coast finishing at B5 and then the ship moved inshore to the 200m contour where two Protas drops were made. During the morning of 28 February a series of RMT 1+8 hauls were made on the shelf and during the afternoon and evening light meter and pump stations were worked inshore to B1. The fourth TSD and water bottle survey of the B line was started at B1 at 0000h on 1 March and completed at 2230 the same day. The β θ meter was also used at these stations. During this survey it was not possible to work at B4 as there were 50-60 trawlers on the position. A rendevous had been arranged with Meteor between lines B and C to transfer Drs Tomczak and Brockmann for the recovery of current meter moorings and on the run south to the meeting point the opportunity was taken to work an oblique transect of β θ meter stations requested by Dr. Kullenberg. The transfer was completed by 0830h on 2 March with Herr Spychola joining Discovery as Meteor had a full complement. Discovery returned north to B1 and a closely spaced series of TSD's were worked to examine the extent of the bottom mixed layer. During the night of 2/3 March an RMT 1+8 series was worked between B4 and B5 in soundings of 200-350m and this was followed the next morning by a daytime series in the same area. The afternoon and evening of 3 March was devoted to a second detailed survey of the bottom mixed layer near the shelf break using the TSD and β θ meter; Protas was dropped twice at the offshore end of this survey line. In the early morning of 4 March the pump was used for fluorescence and nutrient profiling at two positions between B4 and B5 and the β θ meter was used at B5, B6 and B7. At 1030h on 4 March Drs. Tomczak and Brockmann returned to Discovery having successfully recovered two of the moorings on the C line and the mooring near B9; Herr Spychola returned to Meteor. In the afternoon the moorings near B5 and B3 were recovered and a course was made for the inshore U-mooring on the A line. The surface buoy was sighted at 1400h on 5 March and the mooring recovered by 1530 with the loss of one current meter and the subsurface float. The position of the current meter mooring near A6 was reached at 1820h on 5 March but despite repeated attempts to release the anchor the mooring could not be made to surface. Attempts were abandoned at dusk and the night used for zooplankton sampling with the pump and light meter dips. Further efforts were made to release the mooring in the morning but these and dragging were unsuccessful and the ship moved to the mooring position at A9. Neither the command pinger nor the release could be operated, however, after a good satellite fix the float was sighted just below

the surface and the mooring recovered. Discovery berthed in Santa Cruz at 1630h on 7 March and five of the visiting scientists left the ship and Mr. Spencer joined.

The ship left Tenerife at 1100h on 8 March and set course for Cape St. Vincent to recover the tide gauge laid earlier in the cruise. The weather deteriorated during the passage but had moderated sufficiently by mid-day on 11 March for the tide gauge to be recovered without incident. The ship then made for 41°N, 13°40'W where the topographic experiment current meter mooring was to be laid. Two brief stops were made on 12 March to test the acoustic releases for the mooring and the position was reached at 0600h on 13 March; the mooring (IOS 187) was laid and the ship was on passage again for 44°N, 13°W by 0930h. On 14March the three day and night RMT 1+8 hauls attempted at this position at the start of the cruise were fished and a 32 inch diameter subsurface sphere was pressure tested for Mr. Gaunt; the sphere imploded 10m shallower than the 600m test depth required. The passage to Barry was started at 0550h on 15 March and except for a short RMT haul on the morning of 16 March no more overside work was done. The E.M. log was calibrated during the afternoon of 16 March and the direction finder calibrated north of the Scillies using Round Island Beacon on the morning of 17 March. Discovery docked in Barry at 1000h on 18 March.

I would like to thank all those participating in the cruise for their help and co-operation, particularly Captain G.L. Howe, his officers, petty officers and crew.

PHYSICAL OCEANOGRAPHY

Objectives

The main part of the physical programme consisted of observations of temperature and salinity off Spanish Sahara on two lines A and B shown on the cruise track chart. The purpose of these hydrographic observations was primarily to describe the spatial distributions of T,S and hence density in support of concurrent fixed level current meter mooring data. They were also required for the identification of interesting features where special biological sampling could profitably be carried out.

Hydrographic Observations

The first part of Leg 1 was characterized by unusually calm conditions with little evidence of active coastal upwelling. Of the two sections the southerly one (Section B) appeared to be the most interesting, the TSD traces showing rich structure particularly near hydrographic station B9 where large inversions of temperature and salinity were present to depths greater than 300m suggesting interleaving of the northerly and southerly upper layer water masses. Along the B line the ships drift estimates indicated significant variation of velocity in the surface layer with alternating sectors of northerly and southerly flow. Variability in the T/S structure was particularly clear in the proximity of the shelf break, a region which was covered separately by a series of stations whose positions were chosen by depth rather than their geographical position.

Towards the end of Leg 1 winds more favourable for upwelling developed and provided the prospect of active upwelling conditions on the second part of the cruise.

Equipment

The Bisset Berman TSD system with analogue and digital recording was used at each hydrographic station. Data storage was effected on paper tape and separately on disc in the ship's IBM 1800 computer. There were troublesome faults on the salinity sensor which produced an occasional loss of signal when hauling in. The intermittent nature of the malfunction made it difficult to locate, but the problem was eventually resolved by changing the interconnecting harness between the mixer and sensor units and by making good a suspect connection on a circuit board in the salinity unit. Despite these difficulties TSD casts were made successfully at all the proposed positions. An IOS water sampling bottle with associated reversing thermometers was located as near to the probe as possible on each cast for calibration purposes. Consistent calibrations within the makers specified tolerances were determined.

The rosette multi-sampler was initially used for salinity calibrations and to take samples at standard depths for chemical determinations. Its use was eventually discontinued in favour of separate bottle casts because it suffered from intermittent failures and bottle leakage.

The IOS surface temperature/salinity recorder was in operation whilst the ship was underway to investigate the occurrence of surface fronts and patches of upwelled water. After initial troubles associated mainly with the towing cable the instrument performed well until the end of the first leg.

The aim of the hydrographic work on the second leg was mainly to repeat the stations along lines A and B and thereby provide a comparison with the observations that were made during Leg 1. A preliminary plot of the Leg 1 results did however suggest that line B might be the more interesting from the point of view of observing any short term changes in the hydrographic conditions, and therefore most of the time was spent on this line.

After leaving Tenerife, line A was started at 0145h on 21 Feb. (Stn 8738) and completed by 2126h on 21 Feb. (Stn 8747). TSD observations were made to a depth of 600m at the offshore stations and to within 2m of the bottom on the slope and shelf stations. These were also supplemented by water bottle casts for the chemical determinations. The same procedure was then carried out on line B which was started on 1606h on 22 Feb. (Stn 8749) and completed at 1034h on 23 Feb. (Stn. 8758).

The T-S structure along line B certainly appeared to be more complicated than that on line A, and since it seemed possible that certain changes might be monitored over a comparatively short time period, it was decided to conduct a 13h time series at two stations, B9 (Stn 8765) and B5 (Stn 8772). The TSD was lowered to 300m every hour and synchronised with the Protas measurements of vertical velocity shear. It should be noted that these stations were also in close proximity to current meter moorings on this line. The first TSD/Protas time series was made at B9 between 0630h and 1830h on 24 Feb. and that at B5 between 0630h and 1830h on 26 Feb.

These time series indicated sufficiently large changes in the water mass structure to justify a complete survey of line B yet again. The TSD/water bottle survey was therefore repeated along line B between 0008h (Stn 8785) and 2157h on 1 March (Stn 8793).

Before finally leaving this line to recover the current meter moorings, short periods of time were made available for further hydrographic work. During the

surveys an apparently well developed bottom mixed layer was observed at several of the shelf stations, and it was decided to investigate this feature in more detail. Closely spaced TSD casts were therefore made between B1 (Stn 8798) and B4 (Stn 8805) from 1552h to 2113h on 2 March.

Finally, to complete this more detailed investigation, a series of TSD stations were made in conjunction with Dr. Kullenberg's transparency meter at closely spaced positions at the edge of the continental slope and up on to the shelf. This series (Stns 8811/1 to 8811/4), was made between 1903h and 2223h on 3 March.

P. Hughes and M.R. Howe

CURRENT METER MOORINGS

The study of longshore variations of current in the upwelling area necessitated a comparatively large programme of current measurement using nine moorings of which five (a1, a2, a3, b1, b2)* were set in position by Discovery and four (b3, c1, c2, c3)* by Meteor. The equipment for a1, a2 and a3 was provided by IOS (Barry) and the rest of the instrumentation was provided by IFM Kiel, except for two Bergen meters (Liverpool University) which were sited near the bottom on the shallow German b1 mooring to study shear currents in the bottom mixed layer on the continental shelf.

The mooring operations on Discovery were carried out successfully on 31 Jan. (a3 - IOS 184), 1 Feb. (a2 - IOS 185, a1 - IOS 186) and 2 Feb. (b2, b1) although it is worth remarking that the Plessey meters were much more difficult to handle than the Bergen meters.

Recovery of b2 and b1 was accomplished without incident on 4 March and on the following day a1 (IOS 186) was retrieved. The subsurface float and the top current meter were missing and the available evidence seemed to indicate that this mooring had been damaged by one of the many trawlers fishing in the vicinity. Later the same day (5 March) attempts to trigger the acoustic release mechanism of a2 (IOS 185) on the continental slope were made without success. Release

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* Footnote

These numbers are independent of the numbers given to the nominal positions on the three lines. Positions of the moorings are given in Fig. 2 & Table 2.

procedures were continued as soon as practicable on 6 March but in the absence of any response, dragging was carried out. No contact was made and the mooring was eventually abandoned. At the a3 (IOS 184) mooring site neither the command pinger nor the acoustic release operated and it was extremely fortunate that a visual sighting of the subsurface float was made. All the equipment from this 3000m mooring was retrieved.

There were 17 Plessey meters deployed on the three moorings and of these 10 were recovered. The failure of the moorings is bitterly disappointing because of the sustained effort made by everyone concerned in the preparation of the equipment and in the work at sea.

P. Hughes

TIDE GAUGE

It was proposed to lay a tide gauge capsule 20 miles west of Cape St. Vincent. This position was chosen as part of a line of observations made between southern Portugal and the Azores used to study North Atlantic ocean tides. The capsules' acoustic systems were first tested en route at a depth of 2000m. The gauge was then laid at 36°55.5'N: 09° 42'W at a depth of 1983m, on 27 January. It was recovered on 11 March without difficulty, the capsule being located, released and inboard within 75 minutes. All data channels functioned correctly and should produce a good tidal record.

R. Spencer

OPTICAL STUDIES (Leg 2)

Instruments

1. Angular scattering meter (β (θ)-meter) measuring the light scattering in discrete angles and with the possibility of sweeping the range 7° - 170° so as to obtain a complete scattering function; the measurements were performed in one wavelength, selected by a broad-band glass filter, centred at 650nm. The instrument was operated from the accompanying electro-hydraulic winch with a 12mm 7-conductor wire cable.

2. Integrating scattering meter (b-meter) measuring the total scattering coefficient in one wavelength centred at 650nm. This instrument was lowered on its cable. The reason for measuring the scattering in red light is that there the scattering caused by the water itself and the dissolved salts is insignificant compared to the scattering caused by the suspended particulate matter.

3. Beam transmittance meter (C-meter) measuring the total attenutation in three wavelengths centred at 380, 525 and 650nm. This instrument was operated from the electric hydro winch.

4. Quanta meter (Q-meter) measuring the total number of quanta in the spectral range 350-700nm; it was lowered by hand on its cable.

5. Colour meter measuring the upward irradiance in the top few metres in two wavelengths, 447 and 521nm; the ratio of these two signals defines a significant ocean colour index. The instrument was lowered by hand on its own cable.

Objectives

To study the optical characteristics of the upwelling area and to investigate the distribution of suspended (particulate) matter by optical (scattering) techniques and to furnish ground data for the aerial surveys.

Measurements

During the ten days working period the stations including optical measurements were essentially of two kinds.

i) Daytime stations only where the colour, quanta and beam transmittance were used; in a few cases when time was available one of the scattering meters was also lowered. These stations were generally worked at midday or local noon. In all seven stations of this kind were completed.

ii) Particulate matter distribution stations where one or both of the scattering meters were used. These observations were mainly carried out in conjunction with TSD profiles and were centred at the B line. One complete section was done from B1 to B10 and a number of half-way sections were also obtained. Near-bottom

surveys were made at depths less than 400m. An oblique section, running SSE from B10 to 22°05'N, 17°25'W, with four optical stations was also made. At the A line only one station (A6) could be occupied due to time limitations. In all 58 light scattering profiles were obtained.

The observations appear to be very reasonable. The intention is now to interpret them on their own merit and in the light of the other measurements carried out during the cruise.

The performance of the equipment was satisfactory. Some problems with the β (θ)-meter could be solved but the operational depth of the instrument was limited to 400-450m. Therefore near-bottom observations beyond this range could not be obtained, as was originally intended. All the other instruments worked without any problems.

G. Kullenberg

PROTAS

Protas (Probe Recording Ocean Temperature and Shear) is a free-fall microstructure probe which continually measures temperature, conductivity, pressure and velocity shear in its descent through the ocean.

Objectives

The data may be used for constructing a profile of Richardson number allowing such factors as stability and turbulent mixing to be investigated. It is hoped that data collected on this cruise will be used in a comparison of Richardson number profiles collected in other parts of the ocean under different dynamic conditions.

The Work

In all 32 drops were successfully completed, 30 of these being data collecting drops along the B line. Two 13 hour time series were performed (one at B5 and one at B9) at points where the microstructure looked particularly worthy of study and where current moorings were positioned. By performing the time series it is hoped that a 'dynamic' picture of the development and decay of certain

features of the microstructure may be built up.

Unfortunately trouble was experienced on board in recovering the data from approximately 75% of the drops due probably to mechanical trouble with the Protas cassette tape deck, though analogue traces from the remaining 25% of the drops were obtainable. It is felt that the remaining data can be retrieved on return home where equipment and expertise are available.

Further trouble has been experienced in interfacing the 'good' Protas data with the computer. It is still not clear where the fault lies and work is still continuing in an effort to solve the problem so that some primary analysis may be performed before reaching Barry.

I can make no criticism of either the ship's equipment or personnel arising from our work with Protas. Launch and recovery went as smoothly as possible on all 32 drops, and I would like to express my gratitude to all deck crew, especially to Messrs L. Haggis (Bos'n) and R. Burt (Netman) without whom this statement may not have been possible.

J. Stratford

SURFACE CURRENTS

These remarks refer to surface currents derived from satellite fixes and computer D.R. positions.

In general the surface currents produced by the computer appear to have been very reasonable on this cruise. Often in the past, after a period of plotting them, it has become evident from changes of current with changes of course, or a preponderance of currents from port to starboard or starboard to port, that error existed in the two-component log. There has been no sign of this during Cruise 69.

Assuming that the two-component log is accurate there remain two other sources of error. Scatter of the satellite fixes and gyro error, the latter only becoming significant when steaming at speed.

In the plots in Figs. 4a-e, consecutive currents over periods ranging from 10 to 15 hours are shown at times when the vessel has been hove-to or steaming at low speed in approximately the same geographical position.

Very sharp dog-legs in the plot suggest errors in the satellite fixes, while the general pattern of divergence from and convergence upon the mean direction suggests a tidal cycle.

It is apparent from these plots that a single current observations taken on passage is of doubtful value but when the ship is working at low speed in a small area over a period of 12 or 24 hours an average of the computer currents becomes meaningful. This was demonstrated on Discovery Cruise 61 when the currents were averaged daily.

In Figs. 5 and 6 the current vectors shown are a mxiture, some are single observations, some are the average of half a dozen or more. At the western ends of both Line A and Line B the current is fairly consistent but at the edge of the shelf the picture is by no means clear.

G.L. Howe

CHEMISTRY

The principal objectives of the chemical programme were:-

1. The use of nutrient (Nitrate-Nitrite, Silicate, Phosphate) and dissolved oxygen sections, to help characterise the physical and biochemical processes involved in upwelling.

2. To examine the particulate and dissolved trace metal concentrations in sections along the two lines studied.

3. Particulate nitrate, phosphate, carbon and chlorophyll measurements.

4. Continuous surface fluorescence measurements and continuous autoanalysis of 100m profiles.

1) NUTRIENT AND OXYGEN SECTIONS

Samples were taken from casts made at the ten stations on both lines A and B, at as many of the standard depths as were available. Depths selected were surface, 5, 10, 20, 50, 75, 100, 150, 200, 250, 300, 350, 400, and 500m. Owing to early problems with the Niskin rosette sampler, N.I.O 1.31 bottles were used for all but the first few stations. Two visits were made to each section in Leg 1 and a further visit in Leg 2, together with an additional section along the B line. Providing a total of about 700 samples for analysis.

Silicate and nitrate sampler were membrane filtered immediately upon sampling the bottles, and chloroformtreated to prevent biological activity. Unfiltered phosphate samples were similarly treated with mercuric chloride solution. Simultaneous analyses of samples were carried out within 24 hours, using a triple autoanalyzer system. Chart records were returned to Liverpool University for computer processing.

Oxygen was determined by the conventional Winkler method and concentrations immediately calculated and plotted.

Whilst data is yet to be fully processed, it is reasonable to make a few preliminary observations. There was little or no evidence to suggest that upwelling was the predominant water movement during the first leg of the expedition. However, on the B line, the intense surface layer, nitrogen limited, phytoplanktonic activity was reflected by the considerable depletion of surface dissolved nutrients of the nitrogen cycle, together with extremely low oxygen levels below 150m (reaching a minimum of 1.22 ml O_2/l). Oxygen profiles of the A line revealed a more or less stable and relatively less biologically active regime than that observed on the B line. Nutrient and oxygen profiles of the final visit to the B line suggested an upwelling condition, confirmation awaits further data evaluation.

2) TRACE METALS

The object of this experiment was to examine the general distribution of trace metals including iron, manganese, copper, lead, cadmium, zinc, nickel and cobalt in the sections along the two lines of the expedition and to consider any relationship between their dissolved and particulate forms.

With the exception of surface samples (taken from the laboratory seawater supply), sampler were drawn from 7.41 N.I.O. water bottles. The samples were taken at 5 selected stations from each line, and at the following depths:- surface, 10, 50, 100, 200, 400, 600, 800, 1000, 1200 and 1500m.

Samples were filtered through 0.45μ membrane filters (previously washed, dried and weighed) to separate the particulate fraction. Filters were returned to the laboratory for further analysis.

In order to preconcentrate the trace metals, filtered samples were passed through columns containing the calcium form of a chelating resin which was later acid eluted, the small volume of eluate being stored prior to return to Liverpool University for analysis. Columns were prepared and regenerated at sea.

3) PARTICULATE ANALYSIS

The aim of this study was to interrelate the distribution (surface and with depth) of biochemical particulate material and chlorophylls (as an indicator of phytoplankton).

For the surface series, 151 samples (from the laboratory seawater supply) were taken at 2-hourly intervals on the return passage between the A and B lines along the 50 and 100m depth contours. A particulate section along the B line was made during Leg 1 using 5 bottle casts of 5 x 7.41 NIO bottles (together with surface samples) to a maximum depth of 150m. Further particulate sampling was carried out on three of the pumping stations (see below), in 10m increments to 100m.

Samples were generally taken for particulate components of nitrogen, phosphorus and carbon and for pigment analysis. Filtration utilized laboratory pre-tested glass fibre (GF/C) filters (in the case of pigments, coated with magnesium carbonate).

The refrigerated C, N and P particulates await laboratory analysis. Extraction and determination of chlorophyll pigments was carried out on board. Computation of results was performed by the shipboard computer using the equations of Parsons and Strickland. Highest surface chlorophyll values were found between

stations 8738 and 8739 and attained 7.2mg chlorophyll a/m^3.

4) CONTINUOUS ANALYSIS

Continuous fluorescence measurements were made from the Bay of Biscay to the final visit to Tenerife on the return voyage. The system employed was a Turner Fluorometer incorporating a thermistor and fed by the laboratory seawater supply via a debubbler. The output from the fluorometer and thermistor was fed to a two pen chart recorder. Standardisation (only valid for the species distribution in a particular area) was performed during the surface seawater stations.

Continuous fluorescence/autoanalysis measurements were made during some of the pump profile stations. A large volume peristaltic pump was used to regulate the supply through the debubbler and fluorometer system to bleed-off points for continuous nitrate, phosphate and silicate analysis. Traces are currently being analysed at Liverpool University.

5) OTHER PROJECTS

Various large volume sea water samples were returned to Liverpool for general laboratory use.

A cast of 1.31 bottles was made at station 8761 at 13 depths to 2350m. These were sampled for determinations of nitrate-nitrite, phosphate, silicate, oxygen, organo-phosphorus compounds and organo-metallic compounds. A further series (to 200m) at the same station was used for a light and dark bottle radiocarbon productivity experiment, the bottles being exposed to fixed intensity light in constant temperature conditions.

L. Mee

BIOLOGY

During the two surveys of the A and B lines on the first leg of the cruise biological sampling was done at five of the stations (1,3,5,7 and 9) on each line. At each of these stations Bongo, neuston and RMT nets were fished. The paired 500 and 300 micron Bongo nets were fished vertically from 200m or near the bottom, whichever was the shallower, to the surface using the fo'c'sle winch.

The combination of the length of the nets and the weight required below them made this a somewhat energetic operation. The RMT 1+8 was fished obliquely from approximately 10m down to 500m or to about 10m from the bottom, whichever was the shallower and then closed prior to hauling. In order to avoid very large catches of phytoplankton in the RMT 1 samples, which subsequently would be almost impossible to sort satisfactorily, the nets were opened at a depth of about 10m wherever the surface layers appeared very dark green. Seven horizontal samples were taken at various depths down the slope to augment the oblique samples.

When the second survey of the B line was completed a daytime series of RMT 1+8 hauls was worked between 20m and 400m, in 25m and 50m strata, in the region of the 500m contour (B5). A similar daytime RMT 1+8 series was worked on the A line around A6, this time between 100m and 400m in 50m strata.

The BN1.5 was fished four times during the first leg. In the first haul at A9 in 3000m, although the acoustic signals which indicate that the net is on the bottom and the blind is open were not working properly due to misalignment of the switch, a large sample of grey mud with few animals was collected. The second haul was done in shallow water as a test of the switch setting and produced a small catch. The next two hauls were done on the B line at B9 and B8. During the first of these in 2400m the net turned over and there was no catch and in the second, in 1800m, another large catch of grey mud was taken but again there were few animals.

The RMT samples taken on the B line slope during the first leg were very large and consisted predominantly of euphausiids. On the second leg, when most of the time was spent on the B line, work with the RMT was concentrated on fishing short vertical series in narrow strata on the shelf and at various soundings down the slope. The purpose was to provide vertical distribution data that hopefully could be correlated with the physical data provided by the TSD, current meters and Protas. At the first series, in a sounding of 500-600m, a TSD was lowered first and the RMT horizons chosen to coincide with features on the TSD record. However a second TSD during the early afternoon showed that the depths of some of these features had changed and others had disappeared and arbitrary 25m, or 50m thick strata were fished during subsequent series. In all, six vertical series were worked; a day series on the shelf, a day and a night series over the upper part of the slope (100-300m), a day series at a sounding of 500-700m and a day and a night

series at a sounding of about 1000m. During the first leg F.S. Meteor had worked a night series on the B line in about 850m. These series were concentrated in the upper 300m although a few hauls extended down to 500m. For reference purposes all the RMT 1+8 hauls; including those fished by F.S. Meteor, are listed in Table 4. They are arranged in depth order within broad categories according to the soundings over which they were fished.

The RMT 1+8 was, in general, fished in the manner described in IOS Cruise Report No. 10. However, the oblique hauls on the shelf and over the upper part of the slope were of such short duration that there was little opportunity to adjust the ship's speed to make any necessary correction to the net speed as indicated by the flowmeter. To some extent this also applied to those of the horizontal series hauls where the duration of the tow could be reduced because of the large biomass near the surface at night.

This was the first time that the IOS had fished a closely spaced series of hauls over the steeper upper part of the slope where maintaining approximately the same sounding for all the hauls in a series is difficult. Table 4 and Fig. 3 show that the range of soundings during a series was considerable and this resulted from the inevitable compromise between utilising the maximum ship time for fishing and maintaining a reasonably uniform sounding throughout a series. The relationship between the direction of the wind and that of the bottom contours plays an important part in determining the range of soundings covered, even in one haul, because, when fishing beam on to the wind, the course sometimes crosses the contours at right angles. Thus the ship time used in maintaining position relative to particular soundings is inevitably longer when fishing in the upper slope area than in the area more offshore.

A further, purely practical, compromise also has to be made between keeping a very close watch on the fishing depth of the net and switching the Mufax to echo-sounding so that the depth of the bottom can be observed. It is important that several soundings are taken during each haul.

A de C. Baker

FLUORESCENCE PROFILING

A Turner Model 111 fluorometer was used to estimate the levels of chlorophyll

a present in sea water. Horizontal profiles of the fluorescence, at a depth of ca. 4m, were made during the passage of the ship by passing the ship's clean sea water supply through the machine. The voltage output from the fluorometer was monitored every second by the shipborne computer. Most of this profiling was concentrated in the upwelling region under study but due to problems with the computer and the pumping system it has not been possible yet to analyse the data fully. In general, however, on the B line, the levels of chlorophyll a were low over the shelf region but increased towards the more oceanic stations. Very high levels were sometimes found when the machine itself, even on its most insensitive range, was off scale. The chlorophyll distribution appeared to be fairly patchy at the offshore stations. For instance, the highest levels were found at the B5 and B9 stations with lower levels between and at B10, but even at the individual stations quite large variations were found. The passage between the A and B lines also showed that there was patchiness in the chlorophyll a distribution, and quite high levels were found even over the shelf region.

On the second leg of the cruise the vertical distribution of chlorophyll was also studied using the fluorometer. For these experiments a submersible pump was used. The inlet probe for the pumping system was attached to a TSD probe and was then connected, using varying lengths of 2" bore plastic tubing, to the pump. The maximum depths to which profiling was carried out was 110m, when 400ft of tubing was used. On the positive pressure side of the system, on deck, a small bleed was taken off and fed to the fluorometer and the flow adjusted to ca. 500 ml/min. The TSD and inlet probe were lowered and raised at a rate of about 0.1 m/sec. This slow speed was necessary to overcome the problem of the slight turbulent mixing in the tube and thereby to obtain a reasonable profile of the vertical distribution of chlorophyll. The outputs from the TSD and fluorometer were sampled by the computer.

Thirty-three profiles were obtained in this way, of which thirty were on the B line and encompassed all of the stations on it. The profiles obtained showed that the vertical distribution of chlorophyll a was extremely variable, not only at different stations but also at the same one. In general the levels were highest at the outermost stations. There the thermocline was also more pronounced as was the associated drop in fluorescence. However, the water structure was often complex, with many temperature inversions, and their effects on the fluorescence have yet to be analysed in detail.

It was noted at B5 that the small shallow thermocline disappeared completely during the course of a few hours and so a series of ten dips was made at a station in slightly deeper water in order to assess these changes. Although the overall result was not as dramatic as at B5 there were still considerable changes in the level and magnitude of the thermocline during this series, and similar changes occurred in the fluorescence profiles. Sampling on the shelf showed that not only were the chlorophyll a levels lower, but that the fluorescence profile was often confused and could change considerably even during the course of the down and up parts of a single dip. Quite often the chlorophyll levels were higher in the deeper waters than at the surface and this probably reflects the complex temperature structure of the water in this region.

In addition to the vertical profiling of fluorescence it was found possible to connect the outflow of the fluorometer into an autoanalyser and thereby profiles of the nutrients nitrate, phosphate, and silicate were also obtained. Because of the additional delay time involved in these measurements the data has yet to be interpreted properly.

The main outflow from the pump, ca. 200 l/min, was also used for the collection of other water samples for chemical analyses. Also zooplankton samples were collected from this water. Using a dividing tap system the water could be directed through either one of two 10" netting screens, with mesh size of 320µ. The samples collected on these screens were backwashed onto smaller filters of the same mesh size and these were then stored in tubes of 5% formalin for later analysis. This procedure was primarily developed for use during two 4h experiments to study the spatial pattern of distribution of both the phyto- and zooplankton at a single depth. In these cases the TSD and inlet probe were placed and left at a predetermined depth, dependent on the fluorescent and physical features of the water. The changes in the chlorophyll a fluorescence, temperature and salinity were then monitored continuously while zooplankton samples were collected every minute. Using the two filter system it was thus possible to collect zooplankton samples all the time. The results obtained from these two long "turbulence" experiments were not as good as hoped mainly due to the instability of the water column in this region. In both cases the shallow thermocline into which the probe had been placed at the start of the experiment had completely disappeared by the end. Zooplankton samples were also taken during several of the vertical profiling experiments from the regions just above,

in and below the thermocline.

P.R. Pugh

FISH Leg 1

Preliminary shipboard identification and analysis of the catches on the first leg suggested some interesting differences in the fish fauna found along the A and B lines. The volume of the catches from the B line were, in general, greater than those from the A line. A total of at least 64 species were caught from the upper 500m of both lines, of which the majority were mesopelagic in origin. Species diversity was greater on the B line (c. 51 spp. vs c. 40 spp. on the A line), although admittedly the sampling effort was nearly twice as great. While the B line apparently was richer in myctophids, the A line nevertheless yielded double the number of gonostomatid species. Along the B line, Benthosema glaciale was the ubiquitously dominant species, which appeared to be far from the case on the more northerly A line. If any species did predominate in the A line samples, then it was probably Lampanyctus alatus. The apogonid, Howella, and the alepocephalid, Xenodermichthys, were notably numerous also among the B line catches. A large number of fish eggs and larvae, including clupeoid larvae, were sampled in the area B. In contrast, the A line catches revealed few eggs and larvae, and of the latter the gonostomatid, Maurolicus, appeared to predominate.

A day time vertical series was carried out over the shelf edge-slope break in about 500m depth on both the A and B lines, which sampled the upper 400m. Comparatively large catches were taken in the B series, with B. glaciale again conspicuously dominating. The mesopelagic element of the catches was largely migrant species. The very much more sparse samples from the A line series, however, differed somewhat in that only a few myctophid species were present and a relatively large number of non-migrant gonostomatids, such as M. mulleri and Cyclothone braueri, occurred. The samples were, however, too few for positive conclusions to be drawn.

N.R. Merrett

EUPHAUSIIDS

Very large catches of euphausiids were taken in the RMT 1+8 hauls fished on the slope; in terms of biomass they were probably the dominant group in many of the samples. This high abundance was due almost entirely to two species, Euphausia krohnii (Brandt) and Nematoscelis megalops G.O. Sars. Larger catches of both species were taken on the B line than on the A line. Even though the working area is towards the southern limit of the distribution of these two species the catches were very much larger than those taken at 40°N, 20°W nearer to the supposed centres of their latitudinal ranges.

The daytime vertical series with the RMT 1+8 show that E. krohnii had it's maximum abundance between 50m and 150m whereas N. megalops occurred mostly below 150m and may have extended nearly to the bottom in the vicinity of the 500m contour. Both these vertical distributions are much shallower than at 40°N, 20°W where E. krohnii is centred at 300-400m and N. megalops at 600-700m.

A. de C. Baker

COMPUTER Leg 2

The computer throughout Leg 2 was a constant source of problems. The leg was slow to start up due to the typewriter jamming for several hours thus making it impossible to enter the start functions. Having obtained a working system problems arose due to a fault in the Camac crate power supply.

TSD data was collected throughout the leg with only minor problems, however it proved difficult to draw graphs of the final results, and thus the graph-plotting was left until modifications could be made to the software in the laboratory.

The major problem on the leg was due to the external clock interface which would momentarily power down. The time would go to 0000 hours i.e. midnight, and the internal computer clock would re-synchronise. When the clock interface recovered the internal clock would re-synchronise again to the correct time, but in the process the computer had gained a day. This led to some problems with the satellite fixes and navigation.

Another problem in the navigation was the one which has been occurring for some time now, that is the computer failed to write a record to disc and thus when it updated the DR position after the next 2 minute interval it added the distance travelled to the position shown by the last record. This last 'junk' record was usually of the right format and was in fact the position stored on the disc from a past day or cruise. Thus the navigation jumped to some false position and carried on from there. If the error had not been seen and corrected before the following satellite fix, then the fix was given a bad result and rejected.

Attempts at replaying the Protas tapes failed completely, this was partly due to faults in the interface wiring and partly due to an electronics fault in the Protas monitor box.

The Omega navigation system was tried out and tested. Several faults were found and repaired. It now appears fully operational although no fixes could be obtained due to lack of documentation.

The leg proved as difficult to stop as it was to start, with the end leg program failing. This was due to the RAW 1 file having been moved to DRIVE 2 for the EM log calibration. Restoring this file allowed the leg to end normally.

R. Bentley
P. Hartland

Table 1. Nominal positions for the stations on the A and B lines.

A 1	24°54.5'N, 15°31'W	B 1	22°41' N, 16° 51.5'W
A 2	25°00' N, 15°40'W	B 2	22°42' N, 16°57' W
A 3	25°06' N, 15°49'W	B 3	22°43' N, 17°02' W
A 4	25°10' N, 15°56'W	B 4	22°44' N, 17°08'W W
A 5	25°15' N, 16°03'W	B 5	22°46' N, 17°15' W
A 6	25°19' N, 16°10'W	B 6	22°47' N, 17°20.5' W
A 7	25°25' N, 16°19'W	B 7	22°48' N, 17°27' W
A 8	25°30.5'N, 16°28'W	B 8	22°50.5'N, 17°36.5' W
A 9	25°37.5'N, 16°39'W	B 9	22°53.5'N, 17°47.5' W
A10	25°44' N, 16°49.5'W	B10	22°55' N, 17°58' W

Table 2. Current meter mooring positions.

	A line		B line
a1	25°01.85'N, 15°47.65'W (IOS 186)	b1	22°44.12'N,17°03.60'W
a2	25°19.10'N, 16°11.31'W (IOS 185)	b2	22°47.65'N,17°12.60'W
a3	25°37.37'N, 16°38.90'W (IOS 184)	b3	22°53.8'N,17°45.2'W *

* Deployed by F.S. Meteor.

Table 3. Magnetometer surveys.

Streamed			Recovered		
Time/Date	Position		Time/Date	Position	
1120/24/1	45°04.5'N,	11°47'W	1933/24/1	44°17.8'N,	12°55.5'W
0037/25/1	44°07.2'N,	12°57.0'W	1359/25/1	42°09'N,	13°24'W
0323/26/1	41°51.5'N,	13°28.1'W	1619/26/1	39°55'N,	11°52'W
1732/26/1	39°53.1'N,	11°49.7'W	1259/27/1	36°56'N,	09°43'W
1536/27/1	36°55.3'N,	09°42.0'W	1046/28/1	34°06.5'N,	11°55.1'W
1557/28/1	34°02'N,	11°54'W	1402/29/1	30°28'N,	14°02'W
1802/29/1	30°19.1'N,	14°07.5'W	0712/30/1	28°37.6'N,	15°55.8'W
1415/12/2	22°40'N,	17°16'W	1039/13/2	25°33'N,	16°49'W
0728/16/2	25°09'N,	15°55'W	0700/17/2	28°17.1'N,	16°14.5'W
1018/20/2	28°23.8'N,	16°14.9'W	0122/21/2	25°47.1'N,	16°48.1'W
1348/8/3	28°38'N,	16°00'W	1300/11/3	36°55.5'N,	09°42.3'W
1428/11/3	36°55.5'N,	09°42.3'W	1848/12/3	40°14.5'N,	12°58.2'W
1513/13/3	41°53'N,	13°26'W	0342/14/3	44°00'N,	13°00'W
0522/15/3	44°09.5'N,	12°55'W	0900/16/3	47°37'N,	09°11'W

Positions given are for the start and finish of runs. Consult bridge logs for details of any course alterations between these positions.

Table 4. RMT 1+8 hauls fished on Lines A, B and C by RRS Discovery and F.S. Meteor. Meteor station numbers are underlined.

Stn. No.	Series No.	DAY Depth of Net	Approx. Sounding	Stn. No.	Series No.	NIGHT Depth of Net	Approx. Sounding
A line							
Oblique Hauls							
8690	4	10-30	41(Dawn)				
8726	3	10-60	75(Dusk)	8688	4	20-60	75
8724	4	10-135	173	8686	4	10-195	222
8684	4	10-500	785	8722	6	10-500	1225
				8682	4	10-500	3010
				8720	8	10-500	ca. 2800
Hauls in restricted strata ("Horizontal")							
8729	5	100-150	252				
"	1	150-200	599				
"	2	200-250	410				
"	4	250-300	497				
"	3	300-400	540				
8684	3	210-380	ca. 800				
8720	7	10-200	ca. 2800 (Dusk)				
B line							
Oblique Hauls							
52		5-40	51	8701	4	10-35	53
8672		0-68	68				
8699	4	0-70	72 (Dusk)				
8673		0-86	98				
83		0-350	500	55		0-450	120-550
8697	3	0-500	550	8674	3	0-500	893
8676	4	0-500	1203	8695	4	15-500	ca. 1170
56	5	10-450	1375(Dawn)				
8693	4	0-500	2141(Dawn)	8678	1	20-500	1873
46	1	10-450	2800				
46	2	0-120	2800				

Stn. No.	Series No.	DAY Depth of Net	Approx. sounding		Stn. No.	Series No.	NIGHT Depth of Net	Approx. sounding	
Horizontal hauls									
8780	4	10-20	59						
"	2	15-30	59						
"	1	30-45	53						
8808	3	50-100	247		8806	6	0-10	114	
"	2	100-150	369		"	5	12-25	152	
"	1	150-200	232		"	4	25-50	323	
					"	2	50-100	266	
					"	1	100-150	219	
					"	3	150-200	322	
8697	5	375-475	514		8674	4	25-200	ca.900	
8718	3	18-50	617		8807	1	20-95	830	
8708	4	50-75	454		84	7	10-25	800	
"	2	75-100	450		"	6	24-49	900	
"	1	100-128	540		"	5	50-76	910	
"	3	125-150	570		"	4	50-82	900	RMT I ONLY
"	5	150-200	651		"	3	75-100	900	
"	6	200-250	569		"	2	100-125	900	
8718	1	240-300	492		"	1	115-168	900	
"	2	300-400	557						
8770	12	0-15	751						
"	3	25-55	684						
"	2	100-150	682						
"	7	195-220	550						
"	11	270-300	575						
"	13	300-500	778	(Dusk)					
8807	2	300-500	632	(Dawn)					
8775	10	0-12	905		8776	5	12-25	1278	
"	11	13-50	912		"	4	25-50	1168	
"	5	53-75	720		"	3	50-100	1087	
"	4	75-100	960		"	2	100-150	960	
"	2	100-150	1065		"	1	505-600	912	
"	3	155-200	1210		8695	5	25-200	994	

	DAY				NIGHT		
Stn. No.	Series No	Depth of Net	Approx. Sounding	Stn. No.	Series No.	Depth of Net	Approx. Sounding
8775	12	200-250	923				
"	13	250-300	990				
8676	5	390-500	1153				
				56	4	10-25	1410
				"	3	25-50	1370
				"	2	50-76	1390
				"	1	76-103	1460
				90		100-200	1330
8759	7	80-110	1965	8678	2	35-200	ca. 2200
"	6	180-250	1965	91		100-205	1920
92	2	100-200	2820	93		108-200	2700
"	1	304-450	2800				
C Line							
Oblique hauls							
25		0-22	33				
				23		0-87	99
				62		0-77	84
21	1	15-455	555(RMT 1 only)				
"	2	0-396	ca. 500				
60	3	10-410	420				
58	1	0-450	1785	19		0-450	2038
18		12-555	2800	57		10-425	2850
Horizontal hauls							
33	3	0-140	450	67	5	8-25	750
"	2	220-305	500	"	4	25-50	750
"	1	302-450	630	"	3	50-77	760
60	2	10-105	400-500?	"	2	75-100	740(RMT 8 only)
"	1	302-450	405				
67	7	300-450	600				
58		300-450	1650				

STN.	DATE 1975	POSITION LAT	POSITION LONG	GEAR	DEPTH (M)	FISHING TIME GMT	REMARKS	WATER DEPTH (M)
8649	24/ 1	44 15.3N	12 59.7W	RMT 1	0- 600	2051-0010	NET FAILED TO CLOSE	4979
# 0		44 7.6N	12 57.0W	RMT 8		NIGHT		
8650	25/ 1	42 8.5N	13 23.4W		0-2000	1424-1650	* TIDE GAUGE - ACOUSTIC TEST	
# 0		42 7.2N	13 24.9W			DAY		
8651	25/ 1	41 51.6N	13 27.9W	CM	0-5000	1944-2245	RELEASE SYSTEM TEST	
# 1		41 51.4N	13 28.0W			NIGHT		
8651	25/ 1	41 51.3N	13 27.9W	TSD	0- 300	2342-0011	TEST DIP WB AT 300M.	
# 2		41 51.3N	13 27.8W			NIGHT		
8651	26/ 1	41 51.3N	13 27.8W	CM	0-5000	0028-0320	RELEASE SYSTEM TEST	
# 3		41 51.5N	13 27.0W			NIGHT		
8652	27/ 1	36 55.3N	9 42.0W		1983-1983	1525-	* TIDE GAUGE - TG7 LAID	1983
# 0						DAY		
8653	28/ 1	34 2.8N	11 54.5W	RMT 1	240- 385	1241-1312	NET MONITOR TEST	
# 1		34 2.1N	11 53.8W	RMT 8		DAY		
8653	28/ 1	34 2.1N	11 53.3W	TSD	0- 300	1408-1446	WB AT 10 & 90 M.	4453
# 2		34 2.6N	11 53.5W			DAY		
8654	29/ 1	30 26.5N	14 2.0W	RMT 1	0- 600	1400-1605	TRIAL - NO CATCH	2890
# 1		30 22.6N	14 4.9W	RMT 8		DAY		
8654	29/ 1	30 21.2N	14 5.9W	RMT 1	325- 400	1651-1735	CATCH NOT RETAINED	
# 2		30 20.0N	14 6.8W	RMT 8		DAY	FLOW DIST. 2.35 KM.	
8655	30/ 1	28 34.9N	15 58.6W		0-1200	0830-0912	* NET MONITOR DEPTH CALIBRATION	
# 0		28 34.4N	15 58.7W			DAY		
8656	30/ 1	27 33.7N	16 19.7W	CM	0-1200	2015-2115	RELEASE SYSTEM TEST	
# 0		27 33.9N	16 19.7W			NIGHT		

STN.	DATE 1975	POSITION LAT	POSITION LONG	GEAR	DEPTH (M)	FISHING TIME GMT	REMARKS	WATER DEPTH (M)
8657	30/ 1	27 27.8N	16 20.0W	CM	0-1000	2200-2355	RELEASE SYSTEM TEST	
# 0		27 20.9N	16 20.5W			NIGHT		
8658	31/ 1	25 37.4N	16 38.9W	CM	3026-3026	1651-	A9 MOORING	3026
# 0						DAY		
8659	31/ 1	25 41.8N	16 50.1W	TSD	0- 755	1834-1922	A10 CALIB. WB AT 98M.	
# 0		25 41.4N	16 50.6W			DUSK		
8660	31/ 1	25 31.0N	16 29.2W	TSD	0- 750	2215-2314	A8 CALIB. WB AT 75 & 7M.	
# 0		25 31.0N	16 29.2W			NIGHT		
8661	1/ 2	25 21.6N	16 11.3W	CM	0- 500	0218-0245	RELEASE SYSTEM TEST	510
# 1		25 21.8N	16 11.2W			NIGHT		
8661	1/ 2	25 19.7N	16 9.4W	TSD	0- 385	0329-0409	A6 CALIB. WB AT 100 & 10M.	410
# 2		25 19.8N	16 9.3W			NIGHT		
8662	1/ 2	25 19.1N	16 11.3W	CM	500- 500	1334-	A6 MOORING	500
# 0						DAY		
8663	1/ 2	25 1.9N	15 47.6W	CM	64- 64	1915-	A2 MOORING	64
# 0						DUSK		
8664	2/ 2	22 47.6N	17 12.6W	CM	501- 501	1511-	B5 MOORING	501
# 0						DAY		
8665	2/ 2	22 42.4N	17 3.0W	BGN	0- 50	1747-1748	B3 BONGO NET TRIAL	60
# 0		22 42.5N	17 3.0W			DAY		
8666	2/ 2	22 42.1N	16 54.2W	TSD	0- 42	1924-1945	B1 POSITION DOUBTFUL	47
# 1		22 41.9N	16 54.3W	MS		DUSK		
8666	2/ 2	22 41.6N	16 54.4W	BGN	0- 50	2011-2015	B1 POSITION DOUBTFUL	50
# 2		22 41.6N	16 54.4W			NIGHT		

STN.	DATE 1975	POSITION LAT	POSITION LONG	GEAR	DEPTH (M)	FISHING TIME GMT		REMARKS	WATER DEPTH (M)
8666	2/ 2	22 41.8N	16 54.2W	NN	0- 0	2103-2115	B1	POSITION DOUBTFUL	
# 3		22 42.4N	16 53.4W			NIGHT			
8667	2/ 2	22 42.0N	16 56.3W	TSD	0- 45	2226-2241	B2		54
# 1		22 41.9N	16 56.1W	MS		NIGHT			
8667	2/ 2	22 41.6N	16 55.9W	WB 7.4	0- 40	2300-2305	B2	STANDARD DEPTHS	49
# 2		22 41.5N	16 55.8W			NIGHT			
8668	3/ 2	22 42.8N	17 2.7W	BGN	0- 60	0012-0016	B3		64
# 1		22 42.9N	17 2.8W			NIGHT			
8668	3/ 2	22 42.9N	17 2.8W	TSD	0- 60	0030-0044	B3		64
# 2		22 42.7N	17 2.9W	MS		NIGHT			
8668	3/ 2	22 42.9N	17 2.4W	NN	0- 0	0055-0107	B3		
# 3		22 43.3N	17 1.5W			NIGHT			
8669	3/ 2	22 43.4N	17 7.9W	TSD	0- 75	0200-0235	B4		83
# 1		22 43.2N	17 8.2W	MS		NIGHT			
8669	3/ 2	22 43.1N	17 8.2W	WB 7.4	0- 75	0240-0252	B4	STANDARD DEPTHS	83
# 2		22 43.0N	17 8.0W			NIGHT			
8670	3/ 2	22 45.9N	17 14.6W	BGN	0- 150	0345-0402	B5		686
# 1		22 45.9N	17 14.6W			NIGHT			
8670	3/ 2	22 45.9N	17 14.7W	TSD	0- 500	0414-0500	B5		686
# 2		22 46.2N	17 14.6W	MS		NIGHT			
8670	3/ 2	22 46.2N	17 14.5W	TSD	0- 75	0520-0534	B5		686
# 3		22 46.2N	17 14.7W	MS		NIGHT			
8670	3/ 2	22 46.6N	17 15.0W	NN	0- 0	0707-0719	B5		
# 4		22 46.3N	17 14.0W			DAWN			

STN.	DATE 1975	POSITION LAT	LONG	GEAR	DEPTH (M)	FISHING TIME GMT	REMARKS	WATER DEPTH (M)
8671 # 0	3/ 2	22 44.1N	17 3.6W	CM	68- 68	1105- DAY	B3 MOORING	68
8672 # 0	3/ 2	22 42.4N 22 42.5N	17 6.0W 17 6.6W	RMT 1 RMT 8	0- 68	1631-1641 DAY	B3 TOUCHED BOTTOM FLOW DIST. 0.72 KM.	68
8673 # 0	3/ 2	22 44.1N 22 44.3N	17 10.3W 17 10.8W	RMT 1 RMT 8	0- 86	1745-1754 DAY	B4 FLOW DIST. 0.59 KM.	98
8674 # 1	3/ 2	22 46.6N 22 46.6N	17 15.4W 17 15.4W	TSD	0- 511	1854-1931 DUSK	B5	716
8674 # 2	3/ 2	22 46.8N 22 47.4N	17 16.0W 17 17.1W	RMT 1 RMT 8	0- 60	2017-2020 DUSK	B5 TOW ABORTED	791
8674 # 3	3/ 2	22 48.6N 22 49.3N	17 19.3W 17 21.6W	RMT 1 RMT 8	0- 500	2104-2155 NIGHT	B5 FLOW DIST. 2.34 KM.	893
8674 # 4	3/ 2	22 46.1N 22 45.5N	17 22.0W 17 21.9W	RMT 1 RMT 8	25- 200	2338-2358 NIGHT	B5 FLOW DIST. 1.92 KM.	
8675 # 1	4/ 2	22 47.9N 22 48.1N	17 20.9W 17 21.0W	TSD	0- 500	0049-0127 NIGHT	B6 CALIB. WB.	906
8675 # 2	4/ 2	22 48.3N 22 48.6N	17 21.0W 17 22.2W	WB 7.4	0- 880	0136-0256 NIGHT	B6 STANDARD DEPTHS	946
8675 # 3	4/ 2	22 48.8N 22 49.2N	17 22.6W 17 22.2W	WB 1	0- 500	0340-0425 NIGHT	B6 STANDARD DEPTHS	946
8676 # 1	4/ 2	22 50.2N 22 50.3N	17 28.3W 17 28.9W	WB 1	0- 501	0645-0722 DAWN	B7 STANDARD DEPTHS	
8676 # 2	4/ 2	22 50.3N 22 50.3N	17 29.1W 17 29.1W	BGN	0- 200	0734-0741 DAWN	B7 DEPTH EST.	1203

STN.	DATE 1975	POSITION LAT	POSITION LONG	GEAR	DEPTH (M)	FISHING TIME GMT	REMARKS	WATER DEPTH (M)
8676	4/ 2	22 50.0N	17 29.0W	NN	0- 0	0807-0819	B7	
# 3		22 49.2N	17 28.2W			DAY		
8676	4/ 2	22 49.9N	17 29.1W	RMT 1	0- 500	0848-0953	B7	1203
# 4		22 52.2N	17 31.8W	RMT 8		DAY	FLOW DIST. 4.39 KM.	
8676	4/ 2	22 53.2N	17 33.1W	RMT 1	390- 500	1113-1143	B7	1153
# 5		22 52.3N	17 32.3W	RMT 8		DAY	FLOW DIST. 1.45 KM.	
8676	4/ 2	22 50.0N	17 29.3W	TSD	0- 500	1315-1353	B7	1248
# 6		22 50.1N	17 29.5W			DAY		
8677	4/ 2	22 52.1N	17 37.4W	TSD	0- 500	1456-1540	B8 CALIB. WB AT 262M.	1556
# 1		22 52.2N	17 38.0W			DAY		
8677	4/ 2	22 52.2N	17 38.1W	WB 7.4	0-1500	1908-1948	B8 STANDARD DEPTHS	
# 2		22 52.1N	17 38.2W			DUSK		
8677	4/ 2	22 52.1N	17 38.3W	WB 1	0- 500	2014-2039	B8 STANDARD DEPTHS	
# 3		22 52.0N	17 38.4W			NIGHT		
8678	4/ 2	22 49.3N	17 45.1W	RMT 1	20- 500	2300-2358	B9	1873
# 1		22 50.3N	17 47.4W	RMT 8		NIGHT	FLOW DIST. 3.34 KM.	
8678	5/ 2	22 50.4N	17 51.8W	RMT 1	35- 200	0102-0132	B9	
# 2		22 51.1N	17 53.2W	RMT 8		NIGHT	FLOW DIST. 2.43 KM.	
8678	5/ 2	22 51.7N	17 53.1W	NN	0- 0	0200-0212	B9	2231
# 3		22 51.8N	17 52.2W			NIGHT		
8678	5/ 2	22 51.2N	17 49.5W	TSD	0-1500	0250-0410	B9	2100
# 4		22 51.5N	17 50.3W	MS		NIGHT		
8678	5/ 2	22 51.5N	17 50.3W	WB 1	0- 501	0418-0459	B9 STANDARD DEPTHS	
# 5		22 51.6N	17 50.5W			NIGHT		

STN.	DATE 1975	POSITION LAT	POSITION LONG	GEAR	DEPTH (M)	FISHING TIME GMT		REMARKS	WATER DEPTH (M)
8678	5/ 2	22 51.6N	17 50.5W	BGN	0- 200	0509-0518	B9		
# 6		22 51.6N	17 50.6W			NIGHT			
8679	5/ 2	22 55.4N	17 59.1W	TSD	0- 525	0641-0744	B10	CALIB. WB AT 30M.	2494
# 1		22 55.8N	18 0.0W			DAWN			
8679	5/ 2	22 55.8N	18 0.1W	WB 7.4	0-1505	0750-1034	B10	STANDARD DEPTHS	2494
# 2		22 56.1N	18 0.6W			DAY			
8679	5/ 2	22 55.9N	18 0.3W	WB 1	0- 505	0900-0945	B10	STANDARD DEPTHS	2494
# 3		22 56.0N	18 0.4W			DAY			
8680	5/ 2	23 46.9N	17 0.9W	RMT 1	30- 220	1945-2018			203
# 0		23 49.0N	16 58.0W	RMT 8		NIGHT	FLOW DIST. 2.02 KM.		
8681	6/ 2	25 43.9N	16 48.9W	TSD	0- 101	1506-1543	A10		3299
# 1		25 43.6N	16 49.2W	MS		DAY			
8681	6/ 2	25 43.5N	16 49.3W	TSD	0- 752	1557-1641	A10		3299
# 2		25 43.1N	16 49.7W			DAY			
8681	6/ 2	25 43.0N	16 49.9W	WB 1	0- 500	1700-1732	A10	STANDARD DEPTHS	3299
# 3		25 42.7N	16 50.3W			DAY			
8682	6/ 2	25 36.8N	16 41.5W	TSD	0- 500	1850-1950	A9		3007
# 1		25 35.9N	16 41.5W	MS		DUSK			
8682	6/ 2	25 35.8N	16 41.5W	BGN	0- 200	2005-2011	A9		3052
# 2		25 35.8N	16 41.5W			DUSK			
8682	6/ 2	25 35.9N	16 41.5W	WB 1	0- 75	1957-2014	A9	STANDARD DEPTHS	3052
# 3		25 35.7N	16 41.5W			DUSK			
8682	6/ 2	25 35.0N	16 41.6W	RMT 1	10- 500	2035-2127	A9		3010
# 4		25 32.4N	16 41.6W	RMT 8		NIGHT	FLOW DIST. 3.01 KM.		

STN.	DATE 1975	POSITION LAT	POSITION LONG	GEAR	DEPTH (M)	FISHING TIME GMT		REMARKS	WATER DEPTH (M)
8682	7/ 2	25 33.6N	16 40.1W	BN1.5/5C	3000-3000	0000-0226	A9	EXTENDED DUE TO TELEMETER ERROR	3000
# 5		25 34.1N	16 40.4W			NIGHT			
8682	7/ 2	25 35.9N	16 38.6W	NN	0- 0	0522-0534	A9		
# 6		25 36.9N	16 37.8W			NIGHT			
8683	7/ 2	25 30.7N	16 30.5W	TSD	0- 763	0723-0812	A8	CALIB. WB AT 70M.	2336
# 1		25 30.4N	16 30.9W			DAWN			
8683	7/ 2	25 30.3N	16 31.2W	WB 1	0- 450	0835-0912	A8	STANDARD DEPTHS	2336
# 2		25 30.2N	16 31.4W			DAY			
8684	7/ 2	25 25.8N	16 19.5W	TSD	0- 500	1046-1130	A7	CALIB. WB AT 45M.	1179
# 1		25 25.7N	16 19.6W			DAY			
8684	7/ 2	25 25.7N	16 19.6W	WB 1	0- 509	1135-1208	A7	STANDARD DEPTHS	1179
# 2		25 25.9N	16 19.6W			DAY			
8684	7/ 2	25 24.9N	16 18.6W	RMT 1	210- 380	1249-1334	A7		
# 3		25 23.7N	16 17.2W	RMT 8		DAY		FLOW DIST. 2.98 KM.	
8684	7/ 2	25 22.6N	16 16.0W	RMT 1	10- 500	1407-1441	A7		785
# 4		25 21.7N	16 15.1W	RMT 8		DAY		FLOW DIST. 1.54 KM.	
8684	7/ 2	25 21.1N	16 14.5W	NN	0- 0	1505-1517	A7		
# 5		25 20.4N	16 13.8W			DAY			
8685	7/ 2	25 18.5N	16 11.5W	TSD	0- 488	1547-1635	A6	CALIB. WB AT 60M.	497
# 1		25 18.3N	16 11.7W			DAY			
8685	7/ 2	25 18.3N	16 11.7W	WB 1	0- 450	1639-1719	A6	STANDARD DEPTHS	500
# 2		25 18.1N	16 11.7W			DAY			
8685	7/ 2	25 18.1N	16 11.7W	NN	0- 0	1722-1735	A6		497
# 3		25 17.8N	16 11.4W			DAY			

STN.	DATE 1975	POSITION LAT	POSITION LONG	GEAR	DEPTH (M)	FISHING TIME GMT		REMARKS	WATER DEPTH (M)
8686	7/ 2	25 15.2N	16 4.1W	TSD	0- 202	1853-1921	A5	CALIB. WB AT 42M.	207
# 1		25 15.2N	16 4.2W			DUSK			
8686	7/ 2	25 15.2N	16 4.2W	WB 1	0- 200	1917-1942	A5	STANDARD DEPTHS	206
# 2		25 15.0N	16 4.2W			DUSK			
8686	7/ 2	25 14.9N	16 4.1W	BGN	0- 150	2002-2012	A5		197
# 3		25 14.9N	16 4.1W			DUSK			
8686	7/ 2	25 15.1N	16 4.8W	RMT 1	10- 195	2047-2110	A5		222
# 4		25 15.7N	16 5.8W	RMT 8		NIGHT	FLOW DIST. 1.41 KM.		
8687	7/ 2	25 10.2N	15 56.0W	TSD	0- 89	2256-2309	A4	CALIB. WB AT 89M.	98
# 1		25 10.2N	15 55.9W			NIGHT			
8687	7/ 2	25 10.1N	15 55.8W	WB 1	0- 90	2330-2342	A4	STANDARD DEPTHS	98
# 2		25 10.1N	15 55.8W			NIGHT			
8687	8/ 2	25 9.7N	15 54.9W	NN	0- 0	0002-0014	A4		98
# 3		25 8.9N	15 53.7W			NIGHT			
8688	8/ 2	25 6.1N	15 49.1W	TSD	0- 65	0058-0115	A3	CALIB. WB AT 40M.	75
# 1		25 6.1N	15 49.0W			NIGHT			
8688	8/ 2	25 6.1N	15 49.1W	BGN	0- 65	0103-0107	A3		75
# 2		25 6.1N	15 49.1W			NIGHT			
8688	8/ 2	25 6.1N	15 49.0W	WB 1	0- 50	0117-0123	A3	STANDARD DEPTHS	75
# 3		25 6.0N	15 49.0W			NIGHT			
8688	8/ 2	25 5.9N	15 49.6W	RMT 1	20- 60	0144-0155	A3		75
# 4		25 6.0N	15 50.1W	RMT 8		NIGHT	FLOW DIST. 0.51 KM.		
8688	8/ 2	25 5.6N	15 50.8W	NN	0- 0	0221-0233	A3		75
# 5		25 4.6N	15 50.3W			NIGHT			

STN.	DATE 1975	POSITION LAT	POSITION LONG	GEAR	DEPTH (M)	FISHING TIME GMT		REMARKS	WATER DEPTH (M)
8689 # 1	8/ 2	24 59.9N	15 41.9W	TSD	0- 55	0348-0359 NIGHT	A2	CALIB. WB	64
		24 59.9N	15 42.0W						
8689 # 2	8/ 2	24 59.9N	15 42.0W	WB 1	0- 50	0402-0408 NIGHT	A2	STANDARD DEPTHS	64
		24 59.9N	15 42.1W						
8690 # 1	8/ 2	24 54.3N	15 31.0W	TSD	0- 39	0537-0546 NIGHT	A1	CALIB. WB AT 28M.	41
		24 54.3N	15 31.1W						
8690 # 2	8/ 2	24 54.3N	15 31.1W	BGN	0- 35	0539-0541 NIGHT	A1		45
		24 54.3N	15 31.1W						
8690 # 3	8/ 2	24 54.3N	15 31.1W	WB 1	0- 36	0552-0558 NIGHT	A1	STANDARD DEPTHS	45
		24 54.2N	15 31.1W						
8690 # 4	8/ 2	24 54.5N	15 31.5W	RMT 1	10- 30	0617-0629 DAWN	A1	FLOW DIST. 0.68 KM.	41
		24 54.7N	15 31.9W	RMT 8					
8690 # 5	8/ 2	24 54.8N	15 32.8W	NN	0- 0	0645-0657 DAWN	A1		41
		24 54.6N	15 33.9W						
8691 # 0	8/ 2	23 48.0N	16 36.3W	BN1.5/5C	160- 186	1648-1658 DAY			175
		23 49.1N	16 37.8W						
8692 # 1	9/ 2	22 56.0N	17 57.6W	TSD	0- 750	0218-0303 NIGHT	B10	CALIB. WB AT 742M.	2403
		22 56.0N	17 57.8W						
8692 # 2	9/ 2	22 56.0N	17 57.7W	WB 1	0- 500	0312-0337 NIGHT	B10	STANDARD DEPTHS	2403
		22 56.0N	17 57.6W						
8692 # 3	9/ 2	22 56.0N	17 57.6W	WB 7.4	0- 150	0338-0349 NIGHT	B10	STANDARD DEPTHS	2403
		22 56.0N	17 57.5W						
8693 # 1	9/ 2	22 53.8N	17 49.7W	TSD	0- 750	0455-0537 NIGHT	B9	CALIB. WB AT 10M.	2141
		22 53.7N	17 50.0W						

STN.	DATE 1975	POSITION LAT	POSITION LONG	GEAR	DEPTH (M)	FISHING TIME GMT	REMARKS	WATER DEPTH (M)
8693 # 2	9/ 2	22 53.7N 22 53.6N	17 50.0W 17 49.9W	WB 1	0- 500	0540-0607 NIGHT	B9 STANDARD DEPTHS	2141
8693 # 3	9/ 2	22 53.6N 22 53.7N	17 50.0W 17 50.0W	BGN	0- 200	0620-0626 NIGHT	B9	2141
8693 # 4	9/ 2	22 53.7N 22 53.6N	17 51.5W 17 53.4W	RMT 1 RMT 8	0- 500	0712-0753 DAWN	B9 FLOW DIST. 1.95 KM.	2141
8693 # 5	9/ 2	22 53.6N 22 53.1N	17 55.0W 17 53.8W	NN	0- 0	0826-0838 DAY	B9	
8693 # 6	9/ 2	22 55.5N 22 55.8N	17 57.7W 17 58.7W	BN1.5/5C	2400-2400	1046-1117 DAY	B10 NET TURNED OVER-ABORTIVE HAUL	2400

STN.	DATE 1975	POSITION LAT	POSITION LONG	GEAR	DEPTH (M)	FISHING TIME GMT		REMARKS	WATER DEPTH (M)
8694 # 1	9/ 2	22 50.8N	17 38.1W	TSD	0- 750	1547-1630 DAY	B8	CALIB. WB AT 285M.	1594
		22 50.9N	17 38.5W						
8694 # 2	9/ 2	22 51.0N	17 38.6W	WB 1	0- 500	1644-1715 DAY	B8	STANDARD DEPTHS	1594
		22 51.1N	17 38.8W						
8694 # 3	9/ 2	22 51.1N	17 38.8W	WB 7.4	0- 100	1720-1738 DAY	B8	STANDARD DEPTHS	1594
		22 51.3N	17 39.0W						
8694 # 4	9/ 2	22 48.8N	17 42.4W	BN1.5/5C	1805-1807	2033-2105 NIGHT	B8		1806
		22 49.1N	17 42.3W						
8695 # 1	9/ 2	22 50.1N	17 26.5W	TSD	0- 750	2352-0045 NIGHT	B7	CALIB. WB AT 270M.	1177
		22 50.1N	17 27.5W						
8695 # 2	10/ 2	22 50.1N	17 27.5W	WB 1	0- 500	0045-0215 NIGHT	B7	STANDARD DEPTHS	1177
		22 50.4N	17 27.6W						
8695 # 3	10/ 2	22 50.2N	17 27.7W	BGN	0- 200	0100-0108 NIGHT	B7		1177
		22 50.2N	17 27.6W						
8695 # 4	10/ 2	22 50.2N	17 27.2W	RMT 1	15- 500	0242-0326 NIGHT	B7	FLOW DIST. 2.26 KM.	
		22 49.1N	17 25.2W	RMT 8					
8695 # 5	10/ 2	22 48.0N	17 23.5W	RMT 1	25- 200	0412-0438 NIGHT	B7	FLOW DIST. 1.44 KM.	994
		22 47.4N	17 22.8W	RMT 8					
8695 # 6	10/ 2	22 47.3N	17 23.2W	NN	0- 0	0505-0517 NIGHT	B7		
		22 47.1N	17 22.1W						
8696 # 1	10/ 2	22 47.1N	17 20.7W	TSD	0- 752	0546-0627 NIGHT	B6	CALIB. WB AT 752M.	949
		22 47.1N	17 20.7W						
8696 # 2	10/ 2	22 47.1N	17 20.6W	WB 1	0- 500	0631-0700 DAWN	B6	STANDARD DEPTHS	949
		22 47.3N	17 20.5W						

STN.	DATE 1975	POSITION LAT	LONG	GEAR	DEPTH (M)	FISHING TIME GMT		REMARKS	WATER DEPTH (M)
8697	10/ 2	22 46.7N	17 15.8W	WB 1	0- 500	0751-0830	B5	STANDARD DEPTHS	
# 1		22 47.0N	17 15.8W			DAWN			
8697	10/ 2	22 47.0N	17 15.8W	WB 7.4	0- 90	0835-0846	B5	STANDARD DEPTHS	
# 2		22 47.1N	17 15.9W			DAY			
8697	10/ 2	22 47.0N	17 14.9W	RMT 1	0- 500	0914-0953	B5		550
# 3		22 46.0N	17 13.2W	RMT 8		DAY		FLOW DIST. 2.02 KM.	
8697	10/ 2	22 44.5N	17 12.5W	NN	0- 0	1032-1044	B5		
# 4		22 44.0N	17 13.9W			DAY			
8697	10/ 2	22 42.3N	17 15.8W	RMT 1	375- 475	1149-1215	B5		514
# 5		22 41.9N	17 14.7W	RMT 8		DAY		FLOW DIST. 1.78 KM.	
8697	10/ 2	22 44.9N	17 14.7W	TSD	0- 686	1331-1423	B5	CALIB. WB AT 300M.	696
# 6		22 45.3N	17 15.1W			DAY			
8698	10/ 2	22 44.3N	17 10.0W	TSD	0- 90	1515-1528	B4	CALIB. WB AT 30 M.	103
# 1		22 44.2N	17 10.1W			DAY			
8698	10/ 2	22 44.2N	17 10.1W	WB 1	0- 100	1530-1551	B4	STANDARD DEPTHS	103
# 2		22 44.1N	17 9.9W			DAY			
8698	10/ 2	22 44.1N	17 9.8W	WB 7.4	0- 95	1553-1610	B4	STANDARD DEPTHS	103
# 3		22 44.1N	17 9.9W			DAY			
8699	10/ 2	22 40.2N	17 3.1W	TSD	0- 60	1736-1745	B3		65
# 1		22 40.1N	17 3.2W			DAY			
8699	10/ 2	22 40.1N	17 3.2W	WB 1	0- 50	1750-1759	B3	STANDARD DEPTHS	65
# 2		22 40.0N	17 3.3W			DAY			
8699	10/ 2	22 39.5N	17 3.7W	BGN	0- 56	1845-1851	B3		65
# 3		22 39.4N	17 3.8W			DUSK			

STN.	DATE 1975	POSITION LAT	POSITION LONG	GEAR	DEPTH (M)	FISHING TIME GMT	REMARKS		WATER DEPTH (M)
8699	10/ 2	22 39.0N	17 3.4W	RMT 1	0- 70	1912-1920	B3		72
# 4		22 38.7N	17 3.2W	RMT 8		DUSK	FLOW DIST. 0.35 KM.		
8699	10/ 2	22 38.3N	17 2.5W	NN	0- 0	1940-1952	B3		
# 5		22 37.8N	17 1.2W			DUSK			
8700	10/ 2	22 40.0N	16 59.0W	TSD	0- 46	2035-2048	B2	CALIB. WB AT 46M.	55
# 1		22 39.9N	16 59.0W			NIGHT			
8700	10/ 2	22 39.9N	16 59.0W	WB 1	0- 45	2050-2057	B2	STANDARD DEPTHS	55
# 2		22 39.8N	16 59.1W			NIGHT			
8700	10/ 2	22 39.8N	16 59.1W	WB 7.4	0- 45	2058-2104	B2	STANDARD DEPTHS	55
# 3		22 39.8N	16 59.2W			NIGHT			
8701	10/ 2	22 39.5N	16 53.0W	TSD	0- 48	2203-2214	B1		53
# 1		22 39.5N	16 53.1W			NIGHT			
8701	10/ 2	22 39.4N	16 53.1W	WB 1	0- 45	2219-2225	B1	STANDARD DEPTHS	53
# 2		22 39.4N	16 53.1W			NIGHT			
8701	10/ 2	22 39.3N	16 53.2W	BGN	0- 45	2236-2239	B1		53
# 3		22 39.3N	16 53.2W			NIGHT			
8701	10/ 2	22 39.1N	16 52.7W	RMT 1	10- 35	2302-2321	B1		53
# 4		22 38.8N	16 51.9W	RMT 8		NIGHT	FLOW DIST. 1.26 KM.		
8701	10/ 2	22 38.7N	16 51.0W	NN	0- 0	2336-2348	B1		53
# 5		22 38.7N	16 49.8W			NIGHT			
8702	11/ 2	22 42.8N	17 15.3W	WB 7.4	0- 100	0235-0249	B5	STANDARD DEPTHS	569
# 1		22 42.7N	17 16.3W			NIGHT			
8702	11/ 2	22 43.1N	17 16.7W	WB 1	0- 200	0251-0319	B5	STANDARD DEPTHS	569
# 2		22 44.3N	17 18.3W			NIGHT			

STN.	DATE 1975	POSITION LAT	LONG	GEAR	DEPTH (M)	FISHING TIME GMT	REMARKS	WATER DEPTH (M)
8702	11/ 2	22 44.3N	17 18.3W	WB 7.4	0- 100	0319-0335	B5 STANDARD DEPTHS	569
# 3		22 44.9N	17 19.2W			NIGHT		
8703	11/ 2	22 45.4N	17 19.8W	TSD	0- 750	0406-0514	CALIB. WB AT 415M.	800
# 0		22 44.4N	17 17.7W			NIGHT		
8704	11/ 2	22 44.2N	17 15.1W	TSD	0- 615	0606-0654	CALIB. WB AT 245M.	625
# 0		22 44.3N	17 15.4W			DAWN		
8705	11/ 2	22 44.1N	17 13.8W	TSD	0- 495	0723-0754	CALIB. WB AT 190M.	500
# 0		22 44.2N	17 13.8W			DAWN		
8706	11/ 2	22 43.9N	17 12.3W	TSD	0- 379	0824-0853	CALIB. WB AT 133M.	384
# 0		22 43.9N	17 12.5W			DAY		
8707	11/ 2	22 43.7N	17 11.0W	TSD	0- 141	0927-0944	CALIB. WB AT 84M.	150
# 0		22 43.6N	17 11.0W			DAY		
8708	11/ 2	22 42.3N	17 15.6W	RMT 1	100- 128	1148-1218	B5	540
# 1		22 43.1N	17 14.5W	RMT 8		DAY	FLOW DIST. 1.45 KM.	
8708	11/ 2	22 43.5N	17 13.7W	RMT 1	75- 100	1237-1307	B5 NO FLOW	450
# 2		22 43.8N	17 12.6W	RMT 8		DAY		
8708	11/ 2	22 41.5N	17 16.0W	RMT 1	125- 150	1410-1440	B5 NO FLOW	570
# 3		22 41.7N	17 15.8W	RMT 8		DAY		
8708	11/ 2	22 42.4N	17 14.7W	RMT 1	50- 75	1510-1540	B5	454
# 4		22 43.2N	17 13.8W	RMT 8		DAY	FLOW DIST. 1.70 KM.	
8708	11/ 2	22 41.8N	17 17.3W	RMT 1	150- 200	1639-1709	B5	651
# 5		NOT AVAILABLE		RMT 8		DAY	FLOW DIST. 1.61 KM.	
8708	11/ 2	22 43.6N	17 15.5W	RMT 1	200- 250	1739-1810	B5	569
# 6		22 44.1N	17 14.5W	RMT 8		DAY	FLOW DIST. 1.52 KM.	

STN.	DATE 1975	POSITION LAT	POSITION LONG	GEAR	DEPTH (M)	FISHING TIME GMT	REMARKS	WATER DEPTH (M)
8709	11/ 2	22 46.5N	17 24.4W	TSD	0- 750	2037-2130	CALIB. WB AT 12M.	1011
# 0		22 46.9N	17 24.2W			NIGHT		
8710	11/ 2	22 46.3N	17 16.0W	TSD	0- 600	2307-2343	CALIB. WB AT 193M.	791
# 0		22 46.5N	17 16.0W			NIGHT		
8711	12/ 2	22 46.5N	17 13.8W	TSD	0- 595	0020-0100	CALIB. WB AT 155M.	600
# 0		22 46.8N	17 13.8W			NIGHT		
8712	12/ 2	22 45.4N	17 13.3W	TSD	0- 550	0206-0240	CALIB. WB AT 6M.	557
# 0		22 45.4N	17 13.4W			NIGHT		
8713	12/ 2	22 44.5N	17 12.1W	TSD	0- 407	0311-0345	CALIB. WB AT 7M.	420
# 0		22 44.6N	17 12.2W			NIGHT		
8714	12/ 2	22 44.1N	17 12.0W	TSD	0- 329	0415-0448	CALIB. WB AT 9M.	354
# 0		22 44.1N	17 12.4W			NIGHT		
8715	12/ 2	22 43.2N	17 11.5W	TSD	0- 237	0525-0550	CALIB. WB AT 215M.	251
# 0		22 42.9N	17 11.9W			NIGHT		
8716	12/ 2	22 42.6N	17 10.3W	TSD	0- 94	0645-0658		103
# 0		22 42.5N	17 10.6W			DAWN		
8717	12/ 2	22 45.9N	17 16.4W	TSD	0- 500	0756-0833	CALIB. WB AT 164M.	826
# 0		22 46.1N	17 16.6W			DAY		
8718	12/ 2	22 41.7N	17 15.7W	RMT 1	240- 300	0941-1011	B5	492
# 1		22 42.3N	17 14.2W	RMT 8		DAY	FLOW DIST. 1.85 KM.	
8718	12/ 2	22 43.3N	17 14.1W	RMT 1	300- 400	1112-1142	B5	557
# 2		22 43.5N	17 12.5W	RMT 8		DAY	FLOW DIST. 2.03 KM.	
8718	12/ 2	22 40.6N	17 17.1W	RMT 1	18- 50	1316-1346	B5	617
# 3		22 41.5N	17 16.3W	RMT 8		DAY	FLOW DIST. 1.71 KM.	

STN.	DATE 1975	POSITION LAT	POSITION LONG	GEAR	DEPTH (M)	FISHING TIME GMT	REMARKS	WATER DEPTH (M)
8719 # 1	13/ 2	25 43.8N	16 49.0W	TSD	0- 602	1230-1317 DAY	A10 CALIB. WB AT 85M.	3299
		25 43.7N	16 49.3W					
8719 # 2	13/ 2	25 43.7N	16 49.3W	WB 1	0- 500	1330-1402 DAY	A10 STANDARD DEPTHS	
		25 43.8N	16 49.3W					
8720 # 1	13/ 2	25 37.3N	16 40.3W	TSD	0- 600	1533-1609 DAY	A9 CALIB. WB AT 600M.	3041
		25 37.4N	16 40.4W					
8720 # 2	13/ 2	25 37.4N	16 40.4W	WB 7.4	0-1500	1615-1710 DAY	A9 STANDARD DEPTHS	3041
		25 37.3N	16 40.6W					
8720 # 3	13/ 2	25 37.3N	16 40.6W	WB 1	0- 500	1711-1755 DAY	A9 STANDARD DEPTHS	3041
		25 37.2N	16 40.7W					
8720 # 4	13/ 2	25 37.2N	16 40.7W	WB 7.4	0- 400	1755-1812 DAY	A9 STANDARD DEPTHS	3041
		25 37.1N	16 40.7W					
8720 # 5	13/ 2	25 37.1N	16 40.8W	BGN	0- 200	1820-1831 DAY	A9	2800
		25 37.1N	16 40.7W					
8720 # 6	13/ 2	25 36.7N	16 40.6W	NN	0- 0	1857-1909 DUSK	A9	
		25 35.9N	16 39.9W					
8720 # 7	13/ 2	25 35.2N	16 39.4W	RMT 1	10- 200	1924-1954 DUSK	A9 FLOW DIST. 1.52 KM.	
		25 34.1N	16 38.9W	RMT 8				
8720 # 8	13/ 2	25 33.3N	16 38.5W	RMT 1	10- 500	2017-2100 NIGHT	A9 FLOW DIST. 2.03 KM.	
		25 31.7N	16 37.2W	RMT 8				
8721 # 1	13/ 2	25 30.0N	16 30.1W	TSD	0- 600	2236-2321 NIGHT	A8 CALIB. WB AT 20M.	2300
		25 30.5N	16 29.2W					
8721 # 2	13/ 2	25 30.5N	16 29.1W	WB 1	0- 500	2315-2346 NIGHT	A8 STANDARD DEPTHS	
		25 30.3N	16 29.2W					

STN.	DATE 1975	POSITION LAT	POSITION LONG	GEAR	DEPTH (M)	FISHING TIME GMT		REMARKS	WATER DEPTH (M)
8722 # 1	14/ 2	25 25.3N 25 25.1N	16 20.1W 16 20.3W	TSD	0- 600	0110-0151 NIGHT	A7	CALIB. WB AT 20M.	1272
8722 # 2	14/ 2	25 25.1N 25 25.0N	16 20.3W 16 20.6W	WB 7.4	0-1200	0152-0242 NIGHT	A7	STANDARD DEPTHS	1272
8722 # 3	14/ 2	25 25.0N 25 24.9N	16 20.6W 16 21.1W	WB 1	0- 500	0242-0338 NIGHT	A7	STANDARD DEPTHS	1272
8722 # 4	14/ 2	25 25.0N 25 24.9N	16 20.8W 16 20.9W	WB 7.4	0- 200	0308-0320 NIGHT	A7	STANDARD DEPTHS	1272
8722 # 5	14/ 2	25 24.9N 25 24.9N	16 21.0W 16 21.2W	BGN	0- 200	0336-0344 NIGHT	A7		1200
8722 # 6	14/ 2	25 24.3N 25 22.5N	16 20.7W 16 19.3W	RMT 1 RMT 8	10- 500	0406-0455 NIGHT	A7	FLOW DIST. 2.45 KM.	1255
8722 # 7	14/ 2	25 19.4N 25 18.6N	16 16.8W 16 15.6W	NN	0- 0	0614-0626 NIGHT	A7		824
8723 # 1	14/ 2	25 18.8N 25 18.7N	16 11.2W 16 11.6W	TSD	0- 499	0942-1023 DAY	A6	CALIB. WB AT 451M.	503
8723 # 2	14/ 2	25 18.6N 25 18.7N	16 11.6W 16 12.0W	WB 1	0- 500	1028-1108 DAY	A6	STANDARD DEPTHS	504
8724 # 1	14/ 2	25 14.9N 25 15.0N	16 3.6W 16 3.5W	TSD	0- 180	1233-1256 DAY	A5	CALIB. WB AT 54M.	188
8724 # 2	14/ 2	25 15.0N 25 15.0N	16 3.5W 16 3.3W	WB 1	0- 150	1252-1317 DAY	A5	STANDARD DEPTHS	
8724 # 3	14/ 2	25 15.0N 25 15.0N	16 3.2W 16 3.1W	BGN	0- 150	1329-1334 DAY	A5		178

STN.	DATE 1975	POSITION LAT	LONG	GEAR	DEPTH (M)	FISHING TIME GMT	REMARKS	WATER DEPTH (M)
8724	14/ 2	25 14.2N	16 2.2W	RMT 1	10- 125	1409-1420	A5	173
# 4		25 13.8N	16 1.8W	RMT 8		DAY	FLOW DIST. 0.69 KM.	
8724	14/ 2	25 13.1N	16 1.0W	NN	0- 0	1441-1453	A5	
# 5		25 12.6N	16 0.2W			DAY		
8725	14/ 2	25 11.1N	15 57.8W	TSD	0- 95	1528-1554	A4 CALIB. WB AT 75M.	98
# 1		25 11.1N	15 57.9W			DAY		
8725	14/ 2	25 11.1N	15 58.0W	WB 1	0- 75	1601-1611	A4 STANDARD DEPTHS	102
# 2		25 11.1N	15 58.1W			DAY		
8726	14/ 2	25 6.2N	15 50.5W	TSD	0- 74	1834-1854	A3 CALIB. WB AT 70M.	77
# 1		25 6.2N	15 50.6W			DAY		
8726	14/ 2	25 6.1N	15 50.7W	WB 1	0- 50	1901-1924	A3 STANDARD DEPTHS	
# 2		25 5.6N	15 50.6W			DUSK		
8726	14/ 2	25 5.2N	15 50.5W	RMT 1	10- 60	1934-1939	A3	75
# 3		25 4.9N	15 50.4W	RMT 8		DUSK	FLOW DIST. 0.34 KM.	
8727	14/ 2	24 59.6N	15 41.1W	WB 1	0- 50	2318-2332	A2 STANDARD DEPTHS	55
# 0		24 59.6N	15 41.0W			NIGHT		
8728	15/ 2	24 55.6N	15 32.5W	WB 1	0- 35	0049-0105	A1 STANDARD DEPTHS	41
# 0		24 55.4N	15 32.8W			NIGHT		
8729	15/ 2	25 15.9N	16 12.1W	RMT 1	150- 200	1257-1327	A6	599
# 1		25 15.2N	16 11.3W	RMT 8		DAY	FLOW DIST. 1.85 KM.	
8729	15/ 2	25 14.6N	16 10.4W	RMT 1	200- 250	1357-1427	A6	410
# 2		25 13.6N	16 9.4W	RMT 8		DAY	FLOW DIST. 1.60 KM.	
8729	15/ 2	25 14.8N	16 12.3W	RMT 1	300- 400	1535-1605	A6	540
# 3		25 14.0N	16 11.4W	RMT 8		DAY	FLOW DIST. 1.85 KM.	

STN.	DATE 1975	POSITION LAT	POSITION LONG	GEAR	DEPTH (M)	FISHING TIME GMT	REMARKS	WATER DEPTH (M)
8729	15/ 2	25 12.8N	16 10.1W	RMT 1	250- 300	1645-1715	A6	497
# 4		25 11.8N	16 9.3W	RMT 8		DAY	FLOW DIST. 1.97 KM.	
8729	15/ 2	25 10.8N	16 8.5W	RMT 1	100- 150	1744-1814	A6	252
# 5		25 9.6N	16 7.7W	RMT 8		DAY	FLOW DIST. 2.02 KM.	
8730	15/ 2	25 19.0N	16 17.7W	TSD	0- 600	2043-2126		1053
# 0		25 19.0N	16 18.1W	MS		NIGHT		
8731	15/ 2	25 17.3N	16 15.7W	TSD	0- 600	2206-2248		750
# 0		25 17.4N	16 15.8W	MS		NIGHT		
8732	15/ 2	25 15.2N	16 12.8W	TSD	0- 496	2333-0015		500
# 0		25 15.5N	16 12.9W	MS		NIGHT		
8733	16/ 2	25 12.7N	16 8.6W	TSD	0- 350	0128-0158	CALIB. WB AT 348M.	360
# 0		25 12.9N	16 8.7W	MS		NIGHT		
8734	16/ 2	25 10.4N	16 5.4W	TSD	0- 190	0255-0314	CALIB. WB AT 190M.	196
# 0		25 10.4N	16 5.4W			NIGHT		
8735	16/ 2	25 9.1N	16 5.4W	TSD	0- 152	0402-0418	CALIB. WB AT 152M.	156
# 0		25 9.1N	16 5.5W			NIGHT		
8736	16/ 2	25 8.3N	16 4.3W	TSD	0- 97	0505-0524		102
# 0		25 8.4N	16 4.3W			NIGHT		
8737	16/ 2	25 7.9N	15 55.4W	TSD	0- 82	0654-0707		88
# 0		25 7.8N	15 55.6W			DAWN		

STN.	DATE 1975	POSITION LAT	POSITION LONG	GEAR	DEPTH (M)	FISHING TIME GMT		REMARKS	WATER DEPTH (M)
8738 # 1	21/ 2	25 45.3N	16 48.4W	TSD	0- 600	0155-0242 NIGHT	A10		3326
		25 45.1N	16 47.9W						
8738 # 2	21/ 2	25 45.1N	16 47.9W	WB 1	0- 500	0247-0324 NIGHT	A10	STANDARD DEPTHS	3318
		25 45.1N	16 47.8W						
8739 # 1	21/ 2	25 36.8N	16 39.1W	TSD	0- 600	0443-0525 NIGHT	A 9	CALIB. WB AT 267M.	3007
		25 36.8N	16 39.3W						
8739 # 2	21/ 2	25 36.8N	16 39.3W	WB 1	0- 500	0530-0559 NIGHT	A 9	STANDARD DEPTHS	3007
		25 36.8N	16 39.5W						
8740 # 1	21/ 2	25 30.5N	16 28.6W	TSD	0- 600	0724-0803 DAWN	A 8	CALIB. WB AT 138M.	2120
		25 30.7N	16 28.6W						
8740 # 2	21/ 2	25 30.7N	16 28.6W	WB 1	0- 500	0808-0842 DAWN	A 8	STANDARD DEPTHS	2247
		25 31.1N	16 29.1W						
8741 # 1	21/ 2	25 25.2N	16 19.7W	TSD	0- 600	1000-1044 DAY	A 7	CALIB WB AT 223M.	1138
		25 25.1N	16 19.5W						
8741 # 2	21/ 2	25 25.1N	16 19.5W	WB 1	0- 500	1049-1118 DAY	A 7	STANDARD DEPTHS	1154
		25 24.9N	16 19.6W						
8742 # 1	21/ 2	25 18.7N	16 11.1W	TSD	0- 462	1226-1305 DAY	A 6	CALIB. WB AT 177M.	467
		25 18.8N	16 10.6W						
8742 # 2	21/ 2	25 18.7N	16 10.5W	WB 1	0- 400	1312-1333 DAY	A 6	STANDARD DEPTHS	471
		25 18.8N	16 10.5W						
8743 # 1	21/ 2	25 14.9N	16 3.7W	TSD	0- 192	1431-1449 DAY	A 5	CALIB. WB AT 85M.	196
		25 14.9N	16 3.7W						
8743 # 2	21/ 2	25 15.0N	16 3.7W	WB 1	0- 150	1453-1504 DAY	A 5	STANDARD DEPTHS	196
		25 15.0N	16 3.7W						

STN.	DATE 1975	POSITION LAT	POSITION LONG	GEAR	DEPTH (M)	FISHING TIME GMT		REMARKS	WATER DEPTH (M)
8744 # 1	21/ 2	25 10.3N	15 56.8W	TSD	0- 95	1608-1622 DAY	A 4	CALIB. WB AT 30M.	98
		25 10.4N	15 56.8W						
8744 # 2	21/ 2	25 10.4N	15 56.8W	WB 1	0- 75	1625-1631 DAY	A 4	STANDARD DEPTHS	98
		25 10.4N	15 56.8W						
8745 # 1	21/ 2	25 6.9N	15 50.0W	TSD	0- 76	1747-1759 DAY	A 3	CALIB. WB AT 30M.	79
		25 6.9N	15 50.0W						
8745 # 2	21/ 2	25 6.9N	15 50.0W	WB 1	0- 70	1802-1812 DAY	A 3	STANDARD DEPTHS	79
		25 6.9N	15 50.1W						
8746 # 1	21/ 2	25 0.0N	15 40.5W	TSD	0- 62	1941-1953 DUSK	A 2	CALIB. WB AT 62M.	64
		24 59.9N	15 40.5W						
8746 # 2	21/ 2	24 59.9N	15 40.5W	WB 1	0- 50	1958-2003 DUSK	A 2	STANDARD DEPTHS	64
		24 59.9N	15 40.5W						
8747 # 1	21/ 2	24 54.3N	15 31.7W	TSD	0- 39	2117-2126 NIGHT	A 1	CALIB. WB AT 39M.	40
		24 54.2N	15 31.7W						
8747 # 2	21/ 2	24 54.2N	15 31.7W	WB 1	0- 35	2129-2136 NIGHT	A 1	STANDARD DEPTHS	40
		24 54.2N	15 31.7W						
8748 # 1	22/ 2	23 20.8N	17 10.6W		0- 200	0938-0950 DAY		PROTAS	707
		23 20.7N	17 10.7W						
8748 # 2	22/ 2	23 20.5N	17 10.7W		0- 80	1030-1044 DAY		C-METER	710
		23 20.4N	17 10.8W						
8748 # 3	22/ 2	23 20.4N	17 10.8W		0- 100	1049-1100 DAY		B-METER	720
		23 20.3N	17 10.8W						
8748 # 4	22/ 2	23 20.2N	17 10.8W		0- 30	1108-1129 DAY		B-(O) METER	730
		23 20.0N	17 11.0W						

STN.	DATE 1975	POSITION LAT	POSITION LONG	GEAR	DEPTH (M)	FISHING TIME GMT	REMARKS	WATER DEPTH (M)
8748 # 5	22/ 2	23 20.0N 23 19.9N	17 11.0W 17 11.1W		0- 30	1134-1140 DAY	QUANTA METER	740
8748 # 6	22/ 2	23 19.8N 23 19.8N	17 11.2W 17 11.2W		0- 3	1145-1148 DAY	COLOUR METER	748
8749 # 1	22/ 2	22 41.4N 22 41.3N	16 50.9W 16 50.9W	TSD	0- 45	1616-1624 DAY	B 1 CALIB. WB AT 45M.	49
8749 # 2	22/ 2	22 41.3N 22 41.3N	16 50.8W 16 50.8W	WB 1	0- 40	1631-1636 DAY	B 1 STANDARD DEPTHS	49
8750 # 1	22/ 2	22 42.2N 22 42.1N	16 56.0W 16 56.0W	TSD	0- 51	1723-1733 DAY	B 2 CALIB. WB AT 51M.	57
8750 # 2	22/ 2	22 42.1N 22 42.1N	16 56.0W 16 56.1W	WB 1	0- 50	1737-1742 DAY	B 2 STANDARD DEPTHS	57
8751 # 1	22/ 2	22 42.7N 22 42.6N	17 2.1W 17 2.1W	TSD	0- 70	1831-1842 DUSK	B 3 CALIB. WB AT 70M.	72
8751 # 2	22/ 2	22 42.6N 22 42.7N	17 2.1W 17 2.1W	WB 1	0- 50	1843-1851 DUSK	B 3 STANDARD DEPTHS	72
8752 # 1	22/ 2	22 44.2N 22 44.1N	17 7.8W 17 7.9W	TSD	0- 88	1955-2011 NIGHT	B 4 CALIB. WB AT 27M.	89
8752 # 2	22/ 2	22 44.1N 22 44.2N	17 8.0W 17 8.0W	WB 1	0- 75	2015-2024 NIGHT	B 4 STANDARD DEPTHS	89
8753 # 1	22/ 2	22 46.2N 22 46.3N	17 14.8W 17 14.9W	TSD	0- 600	2115-2205 NIGHT	B 5 CALIB. WB AT 578M.	724
8753 # 2	22/ 2	22 46.3N 22 46.5N	17 14.9W 17 14.9W	WB 1	0- 500	2206-2236 NIGHT	B 5 STANDARD DEPTHS	724

STN. #	DATE 1975	POSITION LAT	POSITION LONG	GEAR	DEPTH (M)	FISHING TIME GMT		REMARKS	WATER DEPTH (M)
8754 # 1	22/ 2	22 48.4N	17 20.6W	TSD	0- 600	2328-0012 NIGHT	B 6	CALIB. WB AT 10M.	908
		22 48.0N	17 20.7W						
8754 # 2	23/ 2	22 48.0N	17 20.7W	WB 1	0- 500	0017-0047 NIGHT	B 6	STANDARD DEPTHS	908
		22 47.9N	17 20.8W						
8755 # 1	23/ 2	22 47.8N	17 27.2W	TSD	0- 600	0148-0233 NIGHT	B 7	CALIB. WB AT 290M.	1188
		22 47.8N	17 27.3W						
8755 # 2	23/ 2	22 47.8N	17 27.3W	WB 1	0- 500	0236-0303 NIGHT	B 7	STANDARD DEPTHS	1177
		22 47.7N	17 27.3W						
8756 # 1	23/ 2	22 49.9N	17 37.6W	TSD	0- 600	0418-0502 NIGHT	B 8	CALIB. WB AT 35M.	1628
		22 49.6N	17 37.9W						
8756 # 2	23/ 2	22 49.6N	17 37.9W	WB 1	0- 500	0507-0542 NIGHT	B 8	STANDARD DEPTHS	1628
		22 49.4N	17 38.0W						
8757 # 1	23/ 2	22 53.7N	17 47.2W	TSD	0- 600	0704-0750 DAWN	B 9	CALIB. WB AT 25M.	2033
		22 53.9N	17 46.9W						
8757 # 2	23/ 2	22 54.0N	17 46.9W	WB 1	0- 500	0754-0836 DAWN	B 9	STANDARD DEPTHS	2018
		22 54.1N	17 46.6W						
8758 # 1	23/ 2	22 55.4N	17 57.4W	TSD	0- 600	0954-1034 DAY	B10	CALIB. WB AT 9M.	2411
		22 55.5N	17 57.3W						
8758 # 2	23/ 2	22 55.5N	17 57.2W	WB 1	0- 500	1039-1118 DAY	B10	STANDARD DEPTHS	2404
		22 55.6N	17 57.2W						
8759 # 1	23/ 2	22 53.0N	17 48.3W		0- 125	1222-1241 DAY	B 9	* C-METER	2062
		22 53.0N	17 48.1W						
8759 # 2	23/ 2	22 53.0N	17 48.1W		0- 3	1244-1248 DAY	B 9	* COLOUR METER	2062
		22 53.0N	17 48.1W						

STN.	DATE 1975	POSITION LAT	LONG	GEAR	DEPTH (M)	FISHING TIME GMT	REMARKS	WATER DEPTH (M)
8759 # 3	23/ 2	22 53.0N 22 53.0N	17 48.1W 17 48.1W		0- 25	1252-1259 DAY	B 9 * QUANTA METER	2062
8759 # 4	23/ 2	22 53.0N 22 53.1N	17 48.1W 17 48.0W		0- 300	1316-1336 DAY	B 9 * PROTAS	2062
8759 # 5	23/ 2	22 53.0N 22 53.1N	17 48.0W 17 48.0W	TSD	0- 300	1319-1344 DAY	B 9 CALIB. WB AT 22M.	2062
8759 # 6	23/ 2	22 52.1N 22 51.1N	17 47.1W 17 46.4W	RMT 1 RMT 8	180- 250	1425-1455 DAY	B 9 FLOW DIST. 1.97 KM.	1965
8759 # 7	23/ 2	22 50.2N 22 49.1N	17 45.6W 17 44.7W	RMT 1 RMT 8	80- 110	1522-1552 DAY	B 9 FLOW DIST. 2.00 KM.	1965
8760 # 1	23/ 2	22 53.5N 22 53.6N	17 47.4W 17 47.3W		0- 300	1654-1715 DAY	B 9 * PROTAS	2044
8760 # 2	23/ 2	22 53.5N 22 53.6N	17 47.3W 17 47.2W	TSD	0- 300	1701-1723 DAY	B 9	2044
8760 # 3	23/ 2	22 53.5N 22 53.6N	17 47.4W 17 47.3W		0- 100	1700-1712 DAY	B 9 * B-METER	2044
8761 # 1	23/ 2	22 56.0N 22 56.2N	17 56.2W 17 55.8W	WB 1	0-2350	1900-2054 NIGHT	B10 TRACE METALS-STANDARD DEPTHS	2355
8761 # 2	23/ 2	22 56.4N 22 56.4N	17 55.6W 17 55.6W		0- 125	2121-2136 NIGHT	B10 * B-(O) METER	2342
8761 # 3	23/ 2	22 56.4N 22 56.5N	17 55.5W 17 55.5W		0- 130	2146-2159 NIGHT	B10 * B-METER	2337
8761 # 4	23/ 2	22 56.5N 22 56.6N	17 55.5W 17 55.4W	WB 1	0- 200	2202-2219 NIGHT	B10 STANDARD DEPTHS	2337

STN.	DATE 1975	POSITION LAT	POSITION LONG	GEAR	DEPTH (M)	FISHING TIME GMT	REMARKS	WATER DEPTH (M)
8761 # 5	23/ 2	22 56.9N 22 57.2N	17 55.4W 17 55.2W	TSD PUMP FL	3- 110	2316-0011 NIGHT	B10 NUTRIENTS AT 10M. INTERVALS	2334
8762 # 1	24/ 2	22 55.0N 22 54.6N	17 53.0W 17 53.0W	TSD PUMP FL	3- 110	0058-0147 NIGHT	B10-9	2233
8762 # 2	24/ 2	22 54.6N 22 54.4N	17 53.0W 17 53.0W		0- 175	0152-0212 NIGHT	B10-9 * B-(0) METER	2227
8763 # 1	24/ 2	22 53.4N 22 53.4N	17 47.8W 17 47.7W	TSD PUMP FL	3- 110	0313-0358 NIGHT	B 9	2042
8763 # 2	24/ 2	22 53.4N 22 53.3N	17 47.7W 17 47.7W		0- 200	0404-0421 NIGHT	B 9 * B-(0) METER	2044
8764 # 1	24/ 2	22 51.3N 22 51.2N	17 42.9W 17 42.9W		0- 275	0512-0525 NIGHT	B9-8 * B-(0) METER	1809
8765 # 1	24/ 2	22 53.5N 22 53.5N	17 48.5W 17 48.3W		0- 300	0636-0659 DAWN	B9 * PROTAS & TSD	2080
8765 # 2	24/ 2	22 53.5N 22 53.5N	17 48.2W 17 48.1W		0- 300	0732-0753 DAWN	B9 * PROTAS & TSD	2066
8765 # 3	24/ 2	22 54.4N 22 54.3N	17 48.3W 17 48.2W		0- 300	0831-0856 DAY	B9 * PROTAS & TSD	2070
8765 # 4	24/ 2	22 54.3N 22 54.3N	17 47.9W 17 47.7W		0- 300	0930-0953 DAY	B9 * PROTAS & TSD	2056
8765 # 5	24/ 2	22 53.9N 22 53.7N	17 48.3W 17 48.1W		0- 300	1031-1054 DAY	B9 * PROTAS & TSD	2074

STN.	DATE 1975	POSITION LAT	POSITION LONG	GEAR	DEPTH (M)	FISHING TIME GMT	REMARKS	WATER DEPTH (M)
8765	24/ 2	22 53.5N	17 48.2W		0- 300	1129-1153	B9 * PROTAS & TSD O,C-& COLOUR METER	2059
# 6		22 53.4N	17 48.2W			DAY		
8765	24/ 2	22 53.9N	17 48.5W		0- 300	1231-1254	B9 * PROTAS & TSD	2078
# 7		22 53.8N	17 48.7W			DAY		
8765	24/ 2	22 53.8N	17 48.9W		0- 300	1330-1356	B9 * PROTAS & TSD	2081
# 8		22 53.6N	17 49.0W			DAY		
8765	24/ 2	22 53.6N	17 48.8W		0- 300	1430-1450	B9 * PROTAS & TSD	2084
# 9		22 53.5N	17 48.7W			DAY		
8765	24/ 2	22 53.4N	17 48.5W		0- 300	1530-1556	B9 * PROTAS & TSD	2082
# 10		22 53.4N	17 48.5W			DAY		
8765	24/ 2	22 53.9N	17 48.4W		0- 300	1630-1653	B9 * PROTAS & TSD	2083
# 11		22 53.9N	17 48.4W			DAY		
8765	24/ 2	22 53.9N	17 48.3W		0- 300	1730-1751	B9 * PROTAS & TSD	2082
# 12		22 53.9N	17 48.3W			DAY		
8765	24/ 2	22 53.9N	17 48.3W		0- 300	1830-1853	B9 * PROTAS & TSD	2078
# 13		22 54.0N	17 48.4W			DAY		
8765	24/ 2	22 53.8N	17 48.0W		0- 250	1927-1944	B9 * B-(O) METER	2062
# 14		22 53.7N	17 48.1W			DUSK		
8765	24/ 2	22 53.7N	17 48.1W	TSD PUMP FL	3- 110	2004-2050	B9	2059
# 15		22 54.0N	17 47.9W			NIGHT		
8766	24/ 2	22 51.0N	17 35.6W		0- 325	2236-2253	B8 * B-(O) METER	1472
# 1		22 51.0N	17 35.5W			NIGHT		
8766	24/ 2	22 51.0N	17 35.5W	TSD PUMP FL	3- 110	2309-2355	B8 AUTOANALYSER FOR NUTRIENTS	1472
# 2		22 51.0N	17 35.4W			NIGHT		

STN.	DATE 1975	POSITION LAT	POSITION LONG	GEAR	DEPTH (M)	FISHING TIME GMT	REMARKS	WATER DEPTH (M)
8767	25/ 2	22 47.8N	17 27.4W		0- 325	0107-0129	B7 * B-(O) METER	1147
# 1		22 47.8N	17 27.5W			NIGHT		
8767	25/ 2	22 47.8N	17 27.5W	TSD	3- 110	0139-0224	B7 AUTOANALYSER FOR NUTRIENTS	1147
# 2		22 47.6N	17 27.8W	PUMP FL		NIGHT		
8768	25/ 2	22 46.0N	17 21.0W		0- 350	0324-0354	B6 * B-(O) METER	912
# 1		22 45.5N	17 20.8W			NIGHT		
8768	25/ 2	22 45.4N	17 20.8W	TSD	3- 110	0402-0448	B6 AUTOANALYSER FOR NUTRIENTS	912
# 2		22 44.7N	17 20.6W	PUMP FL		NIGHT		
8769	25/ 2	22 44.5N	17 15.1W		0- 400	0550-0612	B5 * B-(O) METER	675
# 1		22 44.3N	17 15.0W			NIGHT		
8769	25/ 2	22 44.2N	17 15.0W	TSD	3- 110	0622-0712	B5 AUTOANALYSER FOR NUTRIENTS	675
# 2		22 44.0N	17 14.9W	PUMP FL		DAWN		
8770	25/ 2	22 43.7N	17 14.9W	TSD	0- 300	0750-0812	B5	680
# 1		22 43.7N	17 14.9W			DAY		
8770	25/ 2	22 41.7N	17 15.9W	RMT 1	100- 150	0906-0936	B5	682
# 2		22 42.8N	17 15.6W	RMT 8		DAY	FLOW DIST. 1.45 KM.	
8770	25/ 2	22 44.6N	17 15.3W	RMT 1	25- 55	1103-1133	B5	684
# 3		22 45.5N	17 14.6W	RMT 8		DAY	FLOW DIST. 1.87 KM.	
8770	25/ 2	22 45.9N	17 14.4W		0- 1	1158-1203	B5 * COLOUR METER	684
# 4		22 45.8N	17 14.5W			DAY		
8770	25/ 2	22 45.8N	17 14.5W		0- 20	1203-1211	B5 * QUANTA METER	684
# 5		22 45.7N	17 14.6W			DAY		

STN.	DATE 1975	POSITION LAT	POSITION LONG	GEAR	DEPTH (M)	FISHING TIME GMT	REMARKS	WATER DEPTH (M)
8770	25/ 2	22 45.7N	17 14.6W		0- 10	1215-1221	B5 * C-METER	684
# 6		22 45.7N	17 14.7W			DAY		
8770	25/ 2	22 43.1N	17 15.8W	RMT 1	195- 220	1310-1340	B5	550
# 7		22 44.3N	17 15.3W	RMT 8		DAY	FLOW DIST. 1.58 KM.	
8770	25/ 2	22 44.8N	17 15.1W		0- 35	1359-1408	B5 * QUANTA METER	714
# 8		22 44.8N	17 15.2W			DAY		
8770	25/ 2	22 44.8N	17 15.2W		0- 1	1413-1414	B5 * COLOUR METER	725
# 9		22 44.8N	17 15.2W			DAY		
8770	25/ 2	22 44.8N	17 15.2W	TSD	0- 600	1416-1452	B5	770
# 10		22 45.0N	17 15.1W			DAY		
8770	25/ 2	22 41.9N	17 16.1W	RMT 1	270- 300	1642-1712	B5	575
# 11		22 43.1N	17 15.8W	RMT 8		DAY	FLOW DIST. 1.52 KM.	
8770	25/ 2	22 43.9N	17 15.5W	RMT 1	0- 15	1736-1806	B5	751
# 12		22 44.9N	17 15.2W	RMT 8		DAY	FLOW DIST. 1.92 KM.	
8770	25/ 2	22 44.6N	17 15.8W	RMT 1	300- 500	1910-1941	B5	778
# 13		22 45.7N	17 15.2W	RMT 8		DUSK		
8771	25/ 2	22 47.3N	17 14.6W		0- 200	2030-2048	B5 * B-(O) METER	712
# 1		22 47.9N	17 14.3W			NIGHT		
8771	25/ 2	22 48.3N	17 14.1W		0- 130	2102-2113	B5 * B-METER	720
# 2		22 48.6N	17 13.9W			NIGHT		
8771	25/ 2	22 48.6N	17 14.0W		0- 100	2122-2131	B5 * C-METER	727
# 3		22 48.4N	17 14.1W			NIGHT		
8771	25/ 2	22 46.8N	17 15.3W		0- 100	2139-2156	B5 * C-METER	727
# 4		22 47.0N	17 15.3W			NIGHT		

STN.	DATE 1975	POSITION LAT	POSITION LONG	GEAR	DEPTH (M)	FISHING TIME GMT		REMARKS	WATER DEPTH (M)
8771 # 5	25/ 2	22 47.5N 22 47.8N	17 15.1W 17 15.3W	TSD PUMP FL	3- 110	2237-2317 NIGHT	B5	AUTOANALYSER FOR NUTRIENTS	750
8771 # 6	25/ 2	22 48.0N 22 47.9N	17 15.5W 17 14.1W	TSD PUMP FL	29- 29	2347-0348 NIGHT	B5	TURBULENCE EXPT. -AUTOANALYSER	775
8771 # 7	26/ 2	22 47.8N 22 47.6N	17 14.0W 17 13.3W	TSD PUMP FL	3- 110	0400-0500 NIGHT	B5	AUTOANALYSER FOR NUTRIENTS	591
8771 # 8	26/ 2	22 47.6N 22 47.7N	17 13.2W 17 12.5W		0- 300	0510-0542 NIGHT	B5	* B-(O) METER	510
8771 # 9	26/ 2	22 47.7N 22 47.7N	17 12.4W 17 12.2W		0- 130	0547-0600 DAWN	B5	* B-METER	501
8772 # 1	26/ 2	22 45.7N 22 45.4N	17 14.7W 17 14.8W		0- 300	0639-0655 DAWN	B5	* PROTAS & TSD	683

STN.	DATE 1975	POSITION LAT	LONG	GEAR	DEPTH (M)	FISHING TIME GMT	REMARKS	WATER DEPTH (M)
8772 # 2	26/ 2	22 44.8N 22 44.6N	17 15.0W 17 14.9W		0- 300	0730-0752 DAWN	B5 * PROTAS & TSD	679
8772 # 3	26/ 2	22 45.6N 22 45.8N	17 14.4W 17 14.7W		0- 300	0832-0857 DAY	B5 * PROTAS & TSD	675
8772 # 4	26/ 2	22 45.8N 22 45.9N	17 14.7W 17 14.8W		0- 300	0931-0955 DAY	B5 * PROTAS & TSD	683
8772 # 5	26/ 2	22 45.8N 22 46.0N	17 13.9W 17 14.6W		0- 300	1030-1055 DAY	B5 * PROTAS & TSD	679
8772 # 6	26/ 2	22 45.9N 22 45.9N	17 15.7W 17 16.7W		0- 300	1130-1157 DAY	B5 * PROTAS & TSD	688
8772 # 7	26/ 2	22 46.1N 22 46.2N	17 16.4W 17 16.0W		0- 300	1235-1252 DAY	B5 * TSD ONLY	681
8772 # 8	26/ 2	22 46.4N 22 46.5N	17 16.1W 17 15.9W		0- 300	1330-1348 DAY	B5 * TSD ONLY	740
8772 # 9	26/ 2	22 46.0N 22 45.7N	17 14.7W 17 14.7W		0- 300	1429-1453 DAY	B5 * PROTAS & TSD	683
8772 # 10	26/ 2	22 45.8N 22 45.8N	17 14.6W 17 15.0W		0- 300	1531-1600 DAY	B5 * PROTAS & TSD	696
8772 # 11	26/ 2	22 46.0N 22 45.9N	17 15.1W 17 15.3W		0- 300	1630-1652 DAY	B5 * PROTAS & TSD	714
8772 # 12	26/ 2	22 46.0N 22 46.0N	17 15.4W 17 15.7W		0- 300	1732-1800 DAY	B5 * PROTAS & TSD	722
8772 # 13	26/ 2	22 45.9N 22 45.9N	17 15.9W 17 16.2W		0- 300	1831-1854 DUSK	B5 * PROTAS & TSD	740

STN.	DATE 1975	POSITION LAT	POSITION LONG	GEAR	DEPTH (M)	FISHING TIME GMT	REMARKS	WATER DEPTH (M)
8773 # 1	26/ 2	22 44.8N 22 44.7N	17 18.1W 17 18.2W		0- 225	1948-2003 DUSK	B5 * B-(0) METER	903
8774 # 1	26/ 2	22 47.2N 22 47.5N	17 24.1W 17 24.1W		0- 300	2059-2118 NIGHT	B6-7 *B-(0) METER	1007
8774 # 2	26/ 2	22 47.5N 22 47.6N	17 24.1W 17 24.2W	TSD PUMP FL	3- 110	2143-2228 NIGHT	B6-7 AUTOANALYSER FOR NUTRIENTS	1007
8774 # 3	26/ 2	22 47.6N 22 47.8N	17 24.2W 17 24.2W	TSD PUMP FL	3- 110	2240-2320 NIGHT	B6-7 AUTOANALYSER FOR NUTRIENTS	1007
8774 # 4	26/ 2	22 47.8N 22 48.1N	17 24.2W 17 24.3W	TSD PUMP FL	3- 70	2323-2353 NIGHT	B6-7	1007
8774 # 5	26/ 2	22 48.1N 22 48.2N	17 24.3W 17 24.3W	TSD PUMP FL	3- 70	2358-0027 NIGHT	B6-7	1007
8774 # 6	27/ 2	22 48.2N 22 48.3N	17 24.3W 17 24.2W	TSD PUMP FL	3- 70	0030-0058 NIGHT	B6-7	1007
8774 # 7	27/ 2	22 48.3N 22 48.3N	17 24.2W 17 24.0W	TSD PUMP FL	3- 70	0100-0132 NIGHT	B6-7 AUTOANALYSER FOR NUTRIENTS	1007
8774 # 8	27/ 2	22 48.3N 22 48.2N	17 24.0W 17 23.9W	TSD PUMP FL	3- 70	0136-0203 NIGHT	B6-7	1013
8774 # 9	27/ 2	22 48.2N 22 48.1N	17 23.9W 17 23.7W	TSD PUMP FL	3- 70	0206-0239 NIGHT	B6-7 AUTOANALYSER FOR NUTRIENTS	1009

STN.	DATE 1975	POSITION LAT	POSITION LONG	GEAR	DEPTH (M)	FISHING TIME GMT	REMARKS	WATER DEPTH (M)
8774 # 10	27/ 2	22 48.1N	17 23.7W	TSD	3- 70	0242-0313	B6-7	1002
		22 47.9N	17 23.3W	PUMP FL		NIGHT		
8774 # 11	27/ 2	22 47.9N	17 23.3W	TSD	3- 110	0317-0406	B6-7 CALIB. WB AT 110M.-AUTOANALYSER	979
		22 47.6N	17 23.2W	PUMP FL		NIGHT		
8774 # 12	27/ 2	22 47.5N	17 23.2W		0- 300	0420-0448	B6-7 * B-(0) METER	985
		22 47.4N	17 23.5W			NIGHT		
8774 # 13	27/ 2	22 47.3N	17 23.6W		0- 100	0456-0506	B6-7 * B-(0) METER	996
		22 47.2N	17 23.7W			NIGHT		
8774 # 14	27/ 2	22 47.2N	17 23.8W		0- 100	0512-0518	B6-7 * B-(0) METER	996
		22 47.1N	17 23.9W			NIGHT		
8774 # 15	27/ 2	22 47.1N	17 24.0W		0- 300	0525-0538	B6-7 * B-(0) METER	996
		22 47.0N	17 24.2W			NIGHT		
8774 # 16	27/ 2	22 46.8N	17 24.6W		0- 275	0614-0630	B6-7 * B-(0) METER	996
		22 46.7N	17 24.8W			DAWN		
8774 # 17	27/ 2	22 46.7N	17 24.9W		0- 130	0640-0648	B6-7 * B-METER	1037
		22 46.6N	17 25.0W			DAWN		
8775 # 1	27/ 2	22 46.2N	17 24.1W		0- 300	0712-0736	B6-7 * PROTAS & TSD	1011
		22 46.1N	17 24.3W			DAWN		
8775 # 2	27/ 2	22 46.7N	17 25.9W	RMT 1	100- 150	0835-0905	B6-7	1065
		22 47.2N	17 26.8W	RMT 8		DAY	FLOW DIST. 1.79 KM.	
8775 # 3	27/ 2	22 47.9N	17 28.0W	RMT 1	155- 200	0939-1009	B6-7	1210
		22 48.5N	17 28.8W	RMT 8		DAY	FLOW DIST. 1.65 KM.	
8775 # 4	27/ 2	22 46.5N	17 22.0W	RMT 1	75- 100	1125-1155	B6-7	960
		22 47.2N	17 23.0W	RMT 8		DAY	FLOW DIST. 1.60 KM.	

STN.	DATE 1975	POSITION LAT	POSITION LONG	GEAR	DEPTH (M)	FISHING TIME GMT	REMARKS	WATER DEPTH (M)
8775	27/ 2	22 47.5N	17 22.7W	RMT 1	53- 75	1223-1253	B6-7	720
# 5		22 47.2N	17 21.5W	RMT 8		DAY	FLOW DIST. 1.85 KM.	
8775	27/ 2	22 47.1N	17 20.7W		0- 2	1311-	B6-7 * COLOUR METER	916
# 6						DAY		
8775	27/ 2	22 47.1N	17 20.6W		0- 50	1314-1327	B6-7 * QUANTA METER	916
# 7		22 47.1N	17 20.3W			DAY		
8775	27/ 2	22 47.1N	17 20.1W		0- 245	1332-1342	B6-7 * B-(0) METER	918
# 8		22 47.0N	17 19.9W			DAY		
8775	27/ 2	22 47.0N	17 19.8W	TSD	0- 300	1346-1409	B6-7	918
# 9		22 47.1N	17 19.3W			DAY		
8775	27/ 2	22 47.0N	17 19.5W	RMT 1	0- 12	1429-1449	B6-7	905
# 10		22 46.9N	17 19.9W	RMT 8		DAY	FLOW DIST. 0.98 KM.	
8775	27/ 2	22 46.9N	17 20.7W	RMT 1	13- 50	1513-1543	B6-7	912
# 11		22 47.0N	17 21.4W	RMT 8		DAY	FLOW DIST. 1.56 KM.	
8775	27/ 2	22 47.2N	17 22.3W	RMT 1	200- 250	1610-1640	B6-7	923
# 12		22 47.3N	17 23.4W	RMT 8		DAY	FLOW DIST. 1.52 KM.	
8775	27/ 2	22 46.6N	17 23.0W	RMT 1	250- 300	1721-1751	B6-7	990
# 13		22 45.7N	17 22.0W	RMT 8		DAY	FLOW DIST. 1.89 KM.	
8775	27/ 2	22 45.1N	17 21.2W		0- 110	1823-1836	B6-7 * C-METER	970
# 14		22 45.0N	17 21.3W			DUSK		
8775	27/ 2	22 45.0N	17 21.3W		0- 110	1838-1855	B6-7 * C-METER	970
# 15		22 44.7N	17 21.3W			DUSK		
8775	27/ 2	22 44.6N	17 21.2W		0- 130	1902-1914	B6-7 * B-METER	970
# 16		22 44.4N	17 21.2W			DUSK		

STN.	DATE 1975	POSITION LAT	POSITION LONG	GEAR	DEPTH (M)	FISHING TIME GMT	REMARKS	WATER DEPTH (M)
8776 # 1	27/ 2	22 44.2N	17 22.2W	RMT 1	505- 600	2004-2037 NIGHT	B6-7 FLOW DIST. 1.65 KM.	912
		22 44.1N	17 23.4W	RMT 8				
8776 # 2	27/ 2	22 44.3N	17 24.7W	RMT 1	100- 150	2114-2144 NIGHT	B6-7 FLOW DIST. 1.87 KM.	960
		22 44.3N	17 26.0W	RMT 8				
8776 # 3	27/ 2	22 44.4N	17 26.9W	RMT 1	50- 100	2206-2236 NIGHT	B6-7 FLOW DIST. 1.89 KM.	1087
		22 44.6N	17 28.4W	RMT 8				
8776 # 4	27/ 2	22 44.8N	17 29.2W	RMT 1	25- 50	2253-2323 NIGHT	B6-7 FLOW DIST. 1.70 KM.	1186
		22 45.0N	17 30.4W	RMT 8				
8776 # 5	27/ 2	22 45.2N	17 31.3W	RMT 1	12- 25	2342-2357 NIGHT	B6-7 FLOW DIST. 0.85 KM.	1278
		22 45.4N	17 32.0W	RMT 8				
8776 # 6	28/ 2	22 45.8N	17 33.4W		0- 225	0041-0103 NIGHT	B6-7 * B-(0) METER	1337
		22 45.9N	17 33.5W					
8777 # 1	28/ 2	22 47.3N	17 21.3W		0- 225	0228-0248 NIGHT	B6 * B-(0) METER	923
		22 47.4N	17 21.2W					
8777 # 2	28/ 2	22 47.5N	17 21.1W	TSD PUMP FL	3- 110	0304-0352 NIGHT	B6 AUTOANALYSER FOR NUTRIENTS	923
		22 47.5N	17 20.8W					
8778 # 1	28/ 2	22 46.2N	17 15.6W		0- 225	0446-0505 NIGHT	B5 * B-(0) METER	724
		22 46.2N	17 15.6W					
8778 # 2	28/ 2	22 46.2N	17 15.6W	TSD PUMP FL	3- 110	0505-0604 NIGHT	B5 AUTOANALYSER FOR NUTRIENTS	724
		22 46.2N	17 15.6W					
8779 # 1	28/ 2	22 50.0N	17 9.6W		0- 80	0732-0740 DAWN	B4 * PROTAS	215
		22 50.0N	17 9.6W					
8779 # 2	28/ 2	22 51.6N	17 9.7W		0- 60	0836-0841 DAY	B4 * PROTAS TEST	215
		22 51.6N	17 9.7W					

STN.	DATE 1975	POSITION LAT	POSITION LONG	GEAR	DEPTH (M)	FISHING TIME GMT	REMARKS	WATER DEPTH (M).
8780	28/ 2	22 41.4N	16 59.1W	RMT 1	30- 45	1043-1111	B3	53
# 1		22 42.4N	16 59.2W	RMT 8		DAY	FLOW DIST. 1.65 KM.	
8780	28/ 2	22 43.2N	16 59.4W	RMT 1	15- 30	1131-1201	B3	59
# 2		22 44.1N	16 59.8W	RMT 8		DAY	FLOW DIST. 1.92 KM.	
8780	28/ 2	22 44.7N	17 0.0W		0- 30	1225-1235	B3 * C-METER & COLOUR METER AT 0-2M.	59
# 3		22 44.7N	17 0.0W			DAY		
8780	28/ 2	22 45.8N	17 0.4W	RMT 1	10- 20	1303-1333	B3	76
# 4		22 46.7N	17 0.6W	RMT 8		DAY	FLOW DIST. 1.60 KM.	
8781	28/ 2	22 46.3N	17 9.1W		0- 2	1444-1447	B4 * COLOUR METER	105
# 1		22 46.3N	17 9.2W			DAY		
8781	28/ 2	22 46.3N	17 9.3W		0- 30	1450-1506	B4 * B-(O) METER	105
# 2		22 46.3N	17 9.6W			DAY		
8781	28/ 2	22 46.3N	17 9.7W	TSD	3- 100	1521-1605	B4 AUTOANALYSER FOR NUTRIENTS	105
# 3		22 46.2N	17 10.0W	PUMP FL		DAY		
8782	28/ 2	22 43.9N	17 4.1W		0- 74	1721-1729	B3 * B-(O) METER	74
# 1		22 43.9N	17 4.0W			DAY		
8782	28/ 2	22 43.9N	17 4.1W		0- 74	1736-1747	B3 * B-METER	74
# 2		22 43.9N	17 4.2W			DAY		
8782	28/ 2	22 43.8N	17 4.2W	TSD	3- 70	1758-1824	B3 AUTOANALYSER FOR NUTRIENTS	74
# 3		22 43.8N	17 4.3W	PUMP FL		DAY		
8783	28/ 2	22 42.1N	16 59.8W		0- 60	1928-1935	B3-2 * B-METER	60
# 1		22 42.0N	16 59.9W			DUSK		
8783	28/ 2	22 42.0N	16 59.9W	TSD	3- 57	1950-2016	B3-2 AUTOANALYSER FOR NUTRIENTS	60
# 2		22 42.0N	16 59.8W	PUMP FL		NIGHT		

STN.	DATE 1975	POSITION LAT	POSITION LONG	GEAR	DEPTH (M)	FISHING TIME GMT	REMARKS	WATER DEPTH (M)
8784 # 1	28/ 2	22 41.9N	16 56.9W		0- 55	2052-2100 NIGHT	B2 * B-METER	55
		22 41.8N	16 56.9W					
8784 # 2	28/ 2	22 41.8N	16 56.9W		0- 55	2104-2114 NIGHT	B2 * B-(0) METER	55
		22 41.7N	16 56.9W					
8784 # 3	28/ 2	22 41.6N	16 56.9W	TSD PUMP FL	3- 53	2126-2150 NIGHT	B2 AUTOANALYSER FOR NUTRIENTS	55
		22 41.6N	16 56.9W					
8785 # 1	28/ 2	22 40.8N	16 51.5W		0- 51	2245-2254 NIGHT	B1 * B-METER	52
		22 40.8N	16 51.6W					
8785 # 2	28/ 2	22 40.8N	16 51.6W		0- 49	2257-2310 NIGHT	B1 * B-(0) METER	52
		22 40.8N	16 51.6W					
8785 # 3	28/ 2	22 40.8N	16 51.7W	TSD PUMP FL	3- 49	2326-2347 NIGHT	B1 AUTOANALYSER FOR NUTRIENTS	52
		22 40.8N	16 51.5W					
8785 # 4	1/ 3	22 40.6N	16 51.6W	TSD	0- 51	0008-0018 NIGHT	B1	52
		22 40.5N	16 51.7W					
8785 # 5	1/ 3	22 40.5N	16 51.7W	WB 1	0- 50	0024-0033 NIGHT	B1 STANDARD DEPTHS	52
		22 40.5N	16 51.8W					
8786 # 1	1/ 3	22 41.7N	16 57.6W	TSD	0- 54	0121-0131 NIGHT	B2	54
		22 41.5N	16 57.7W					
8786 # 2	1/ 3	22 41.5N	16 57.7W	WB 1	0- 50	0131-0140 NIGHT	B2 STANDARD DEPTHS	54
		22 41.5N	16 57.8W					
8786 # 3	1/ 3	22 41.5N	16 57.8W		0- 54	0143-0154 NIGHT	B2 * B-(0) METER	54
		22 41.5N	16 57.9W					
8787 # 1	1/ 3	22 43.5N	17 2.0W	TSD	0- 72	0234-0246 NIGHT	B3 CALIB. WB AT 72M.	72
		22 43.5N	17 2.2W					

STN.	DATE 1975	POSITION LAT	POSITION LONG	GEAR	DEPTH (M)	FISHING TIME GMT	REMARKS	WATER DEPTH (M)
8787	1/ 3	22 43.4N	17 2.2W	WB 1	0- 65	0252-0300	B3 STANDARD DEPTHS	71
# 2		22 43.3N	17 2.2W			NIGHT		
8787	1/ 3	22 43.4N	17 2.2W		0- 71	0300-0311	B3 * B-(0) METER	71
# 3		22 43.4N	17 2.0W			NIGHT		
8788	1/ 3	22 45.1N	17 15.6W	WB 1	0- 500	0451-0526	B5 STANDARD DEPTHS	783
# 1		22 45.2N	17 15.8W			NIGHT		
8788	1/ 3	22 45.2N	17 15.9W	TSD	0- 600	0530-0617	B5 CALIB. WB AT 492 M.	789
# 2		22 44.8N	17 17.4W			NIGHT		
8788	1/ 3	22 44.8N	17 17.4W		0- 300	0620-0636	B5 * B-(0) METER	811
# 3		22 44.6N	17 18.0W			DAWN		
8789	1/ 3	22 47.2N	17 19.2W	WB 1	0- 500	0809-0842	B6 STANDARD DEPTHS	892
# 1		22 47.3N	17 19.0W			DAY		
8789	1/ 3	22 47.3N	17 18.9W	TSD	0- 600	0844-0930	B6 CALIB. WB AT 18M.	892
# 2		22 47.1N	17 18.8W			DAY		
8789	1/ 3	22 47.1N	17 18.8W		0- 300	0933-0954	B6 * B-(0) METER	892
# 3		22 47.1N	17 18.8W			DAY		
8790	1/ 3	22 47.8N	17 28.0W	WB 1	0- 500	1044-1118	B7 STANDARD DEPTHS	1141
# 1		22 48.0N	17 28.3W			DAY		
8790	1/ 3	22 48.0N	17 28.3W	TSD	0- 600	1120-1200	B7 CALIB. WB AT 24M.	1141
# 2		22 48.3N	17 28.2W			DAY		
8790	1/ 3	22 48.3N	17 28.2W		0- 300	1207-1226	B7 * B-(0) METER	1141
# 3		22 48.4N	17 28.2W			DAY		
8791	1/ 3	22 51.8N	17 36.8W	WB 1	0- 500	1330-1417	B8 STANDARD DEPTHS	1557
# 1		22 52.0N	17 36.9W			DAY		

STN.	DATE 1975	POSITION LAT	POSITION LONG	GEAR	DEPTH (M)	FISHING TIME GMT	REMARKS	WATER DEPTH (M)
8791	1/ 3	22 52.0N	17 36.9W		0- 300	1419-1440	B8 * B-(0) METER	1557
# 2		22 52.1N	17 36.9W			DAY		
8791	1/ 3	22 52.4N	17 36.9W	TSD	0- 600	1513-1552	B8 CALIB. WB AT 27M.	1557
# 3		22 52.0N	17 36.7W			DAY		
8792	1/ 3	22 52.5N	17 48.8W	WB 1	0- 500	1703-1744	B9 STANDARD DEPTHS	2059
# 1		22 52.4N	17 49.4W			DAY		
8792	1/ 3	22 52.4N	17 49.5W		0- 300	1749-1814	B9 * B-(0) METER	2059
# 2		22 52.4N	17 49.8W			DAY		
8792	1/ 3	22 52.4N	17 49.8W	TSD	0- 603	1818-1852	B9	2059
# 3		22 52.2N	17 48.3W			DAY		
8793	1/ 3	22 54.3N	17 58.0W	WB 1	0- 500	1958-2109	B10 STANDARD DEPTHS	2455
# 1		22 54.2N	17 58.2W			NIGHT		
8793	1/ 3	22 54.2N	17 58.2W	TSD	0- 600	2115-2158	B10	2455
# 2		22 54.0N	17 58.4W			NIGHT		
8793	1/ 3	22 54.0N	17 58.4W		0- 350	2203-2230	B10 * B-(0) METER	2455
# 3		22 54.0N	17 58.3W			NIGHT		
8794	2/ 3	22 25.8N	17 39.9W		0- 350	0204-0231	* B-(0) METER	1984
# 0		22 24.7N	17 40.4W			NIGHT		
8795	2/ 3	22 17.7N	17 34.6W		0- 400	0338-0356	* B-(0) METER	1669
# 0		22 17.8N	17 34.5W			NIGHT		
8796	2/ 3	22 10.8N	17 29.9W		0- 130	0503-0512	* B-METER	1028
# 0		22 10.9N	17 29.9W			NIGHT		
8797	2/ 3	22 6.1N	17 27.4W		0- 130	0647-0655	* B-METER	548
# 0		22 6.1N	17 27.4W			DAWN		

STN.	DATE 1975	POSITION LAT	POSITION LONG	GEAR	DEPTH (M)	FISHING TIME GMT	REMARKS	WATER DEPTH (M)
8798	2/ 3	22 41.3N	16 54.7W	TSD	0- 52	1552-1559	B1	53
# 0		22 41.4N	16 54.7W			DAY		
8799	2/ 3	22 42.0N	16 57.5W	TSD	0- 53	1629-1637	B1-2	53
# 0		22 42.1N	16 57.7W			DAY		
8800	2/ 3	22 42.1N	16 58.0W	TSD	0- 57	1705-1712	B2	57
# 0		22 41.9N	16 58.2W			DAY		
8801	2/ 3	22 41.3N	17 0.3W	TSD	0- 65	1753-1800	B2-3	65
# 0		22 41.4N	17 0.4W			DAY		
8802	2/ 3	22 42.1N	17 1.7W	TSD	0- 72	1825-1834	B3	72
# 0		22 42.0N	17 1.8W			DAY		
8803	2/ 3	22 42.7N	17 5.0W	TSD	0- 76	1902-1912	B3-4	76
# 0		22 42.6N	17 5.1W			DUSK		

STN.	DATE 1975.	POSITION LAT	POSITION LONG	GEAR	DEPTH (M)	FISHING TIME GMT	REMARKS	WATER DEPTH (M)
8804	2/ 3	22 43.2N	17 8.5W	TSD	0- 91	1953-2004	B4 D.R. POSITION	91
# 0		22 43.2N	17 8.5W			DUSK		
8805	2/ 3	22 44.7N	17 10.8W	TSD	0- 160	2051-2113	B4-5,B-0 METER TEST TO 10M. D.R. POS	160
# 0		22 44.6N	17 11.0W			NIGHT		
8806	2/ 3	22 44.3N	17 11.4W	RMT 1	100- 150	2246-2316	B4-5 D.R. POSITION	219
# 1		22 45.2N	17 11.2W	RMT 8		NIGHT	FLOW DIST. 1.85 KM.	
8806	2/ 3	22 46.8N	17 10.6W	RMT 1	50- 100	2343-0013	B4-5 D.R. POSITION	266
# 2		22 48.2N	17 10.1W	RMT 8		NIGHT	FLOW DIST. 1.89 KM.	
8806	3/ 3	22 44.3N	17 11.3W	RMT 1	150- 200	0123-0153	B4-5 D.R. POSITION	322
# 3		22 45.6N	17 11.4W	RMT 8		NIGHT	FLOW DIST. 1.89 KM.	
8806	3/ 3	22 45.9N	17 11.2W	RMT 1	25- 50	0218-0248	B4-5 D.R. POSITION	323
# 4		22 46.9N	17 11.2W	RMT 8		NIGHT	FLOW DIST. 1.85 KM.	
8806	3/ 3	22 47.4N	17 10.8W	RMT 1	12- 25	0307-0322	B4-5	152
# 5		22 47.9N	17 10.5W	RMT 8		NIGHT	FLOW DIST. 0.97 KM.	
8806	3/ 3	22 48.4N	17 10.1W	RMT 1	0- 10	0338-0353	B4-5	114
# 6		22 48.9N	17 9.8W	RMT 8		NIGHT	FLOW DIST. 0.96 KM.	
8807	3/ 3	22 47.9N	17 16.0W	RMT 1	20- 95	0521-0621	B5	830
# 1		22 49.6N	17 15.5W	RMT 8		NIGHT	FLOW DIST. 3.76 KM.	
8807	3/ 3	22 52.0N	17 14.6W	RMT 1	300- 500	0730-0800	B5	632
# 2		22 53.1N	17 14.3W	RMT 8		DAWN	FLOW DIST. 1.71 KM.	
8808	3/ 3	22 45.1N	17 11.0W	RMT 1	150- 200	0953-1023	B4-5	232
# 1		22 46.0N	17 10.2W	RMT 8		DAY	FLOW DIST. 1.89 KM.	
8808	3/ 3	22 42.8N	17 12.2W	RMT 1	100- 150	1125-1155	B4-5	369
# 2		22 43.8N	17 11.8W	RMT 8		DAY	FLOW DIST. 1.71 KM.	

STN.	DATE 1975	POSITION LAT	LONG.	GEAR	DEPTH (M)	FISHING TIME GMT	REMARKS	WATER DEPTH (M)
8808 # 3	3/ 3	22 44.6N 22 45.7N	17 11.4W 17 10.9W	RMT 1 RMT 8	50- 100	1218-1248 DAY	B4-5 FLOW DIST. 1.96 KM.	247
8808 # 4	3/ 3	22 46.1N	17 10.8W		0- 2	1310- DAY	B4-5 * COLOUR METER	270
8808 # 5	3/ 3	22 46.0N 22 46.0N	17 10.9W 17 11.0W		0- 35	1314-1326 DAY	B4-5 * QUANTA METER	295
8808 # 6	3/ 3	22 45.9N 22 45.9N	17 11.1W 17 11.3W		0- 100	1339-1352 DAY	B4-5 * C-METER	299
8809 # 1	3/ 3	22 43.5N 22 43.5N	17 8.3W 17 8.3W	TSD	0- 90	1434-1445 DAY	B4	91
8809 # 2	3/ 3	22 43.5N 22 43.5N	17 8.3W 17 8.3W		0- 91	1446-1458 DAY	B4 * B-(0) METER	91
8810 # 1	3/ 3	22 44.3N 22 44.5N	17 11.0W 17 11.1W	TSD	0- 160	1605-1624 DAY	B4-5	160
8810 # 2	3/ 3	22 44.5N 22 44.5N	17 11.1W 17 11.2W		0- 162	1626-1641 DAY	B4-5 * B-(0) METER	164
8810 # 3	3/ 3	22 44.5N 22 44.4N	17 11.2W 17 11.3W		0- 80	1650-1657 DAY	B4-5 * PROTAS	175
8810 # 4	3/ 3	22 44.5N 22 44.5N	17 11.6W 17 11.7W		0- 120	1756-1813 DAY	B4-5 * PROTAS & TSD TO 290M.	303
8811 # 1	3/ 3	22 44.5N 22 44.1N	17 12.5W 17 12.3W	TSD	0- 359	1903-1925 DUSK	* B-(0) METER (0-364M.)	352
8811 # 2	3/ 3	22 43.3N 22 43.2N	17 11.3W 17 11.3W	TSD	0- 196	2009-2023 DUSK	* B-(0) METER (0-200M.)	200

STN.	DATE 1975	POSITION LAT	POSITION LONG	GEAR	DEPTH (M)	FISHING TIME GMT	REMARKS	WATER DEPTH (M)
8811 # 3	3/ 3	22 42.6N 22 42.6N	17 10.7W 17 10.8W	TSD	0- 107	2108-2119 NIGHT	* B-(0) METER (0-107M.)	107
8811 # 4	3/ 3	22 40.5N 22 40.5N	17 7.0W 17 7.1W	TSD	0- 74	2213-2223 NIGHT	* B-(0) & B-METER (0-74M.)	74
8812 # 1	3/ 3	22 42.5N 22 42.7N	17 11.0W 17 11.3W		0- 120	2336-2347 NIGHT	B4-5 * B-METER	129
8812 # 2	4/ 3	22 42.6N 22 42.5N	17 10.8W 17 11.1W	TSD PUMP FL	3- 110	0028-0119 NIGHT	B4-5 AUTOANALYSER FOR NUTRIENTS	120
8812 # 3	4/ 3	22 42.6N 22 42.7N	17 11.1W 17 11.1W	TSD PUMP FL	3- 110	0151-0241 NIGHT	B4-5 AUTOANALYSER FOR NUTRIENTS	156
8813 # 1	4/ 3	22 45.6N 22 45.3N	17 15.2W 17 15.4W	TSD PUMP FL	3- 110	0344-0427 NIGHT	B5 AUTOANALYSER FOR NUTRIENTS	752
8813 # 2	4/ 3	22 45.1N 22 45.0N	17 15.5W 17 15.6W		0- 375	0440-0502 NIGHT	B5 * B-(0) METER	775
8814 # 1	4/ 3	22 46.1N 22 45.9N	17 21.1W 17 21.3W		0- 300	0556-0613 NIGHT	B6 * B-(0) METER	921
8814 # 2	4/ 3	22 45.8N 22 45.8N	17 21.3W 17 21.3W		0- 50	0617-0623 NIGHT	B6 * B-METER	923
8815 # 0	4/ 3	22 48.1N 22 48.0N	17 27.6W 17 28.1W		0- 350	0739-0759 DAWN	B7 * B-(0) METER	1162
8816 # 1	5/ 3	25 18.7N 25 18.7N	16 10.9W 16 11.0W	TSD PUMP FL	3- 110	2031-2114 NIGHT	A6	467

STN.	DATE 1975	POSITION LAT	POSITION LONG	GEAR	DEPTH (M)	FISHING TIME GMT	REMARKS	WATER DEPTH (M)
8816 # 2	5/ 3	25 18.7N 25 18.7N	16 11.0W 16 11.1W	TSD PUMP FL	3- 110	2119-2205 NIGHT	A6	467
8816 # 3	5/ 3	25 18.7N 25 18.5N	16 11.2W 16 11.1W	TSD PUMP FL	42- 42	2218-0155 NIGHT	A6 TURBULENCE EXPERIMENT	471
8816 # 4	6/ 3	25 18.6N 25 18.6N	16 11.0W 16 10.9W	TSD PUMP FL	3- 110	0213-0306 NIGHT	A6	471
8816 # 5	6/ 3	25 18.6N 25 18.6N	16 10.9W 16 10.8W		0- 120	0321-0330 NIGHT	A6 * B-METER	465
8816 # 6	6/ 3	25 18.7N 25 18.7N	16 10.8W 16 10.6W		0- 400	0340-0425 NIGHT	A6 * B-(0) METER	462
8816 # 7	6/ 3	25 18.6N 25 18.6N	16 10.5W 16 10.3W		0- 425	0511-0539 NIGHT	A6 * B-(0) METER	459
8816 # 8	6/ 3	25 18.6N 25 18.7N	16 10.1W 16 10.0W		0- 450	0606-0631 NIGHT	A6 * B-(0) METER	456
8817 # 0	13/ 3	40 59.9N	13 39.8W	CM	5334-5334	0903- DAY	TOPOGRAPHICAL MOORING	5334
8818 # 1	14/ 3	44 0.7N 44 0.6N	12 58.8W 12 58.4W	TSD	0-1000	0405-0510 NIGHT	CALIB. WB AT 70M.	
8818 # 2	14/ 3	43 57.9N 43 55.2N	12 57.6W 12 57.4W	RMT 1 RMT 8	0-1000	0659-0808 DAWN	REPEAT 11 - OBLIQUE FLOW DIST. 7.00 KM.	4667
8818 # 3	14/ 3	43 51.9N 43 47.3N	12 57.0W 12 56.4W	RMT 1 RMT 8	500- 600	0931-1131 DAY	REPEAT 11 FLOW DIST. 7.00 KM.	4426

STN.	DATE 1975	POSITION LAT	POSITION LONG	GEAR	DEPTH (M)	FISHING TIME GMT	REMARKS	WATER DEPTH (M)
8818	14/ 3	43 43.4N	12 56.2W	RMT 1	400- 500	1255-1455	REPEAT 11	
# 4		43 39.3N	12 56.3W	RMT 8		DAY	FLOW DIST. 7.68 KM.	
8818	14/ 3	43 39.1N	12 56.8W	RMT 1	300- 400	1548-1748	REPEAT 11	
# 5		43 44.0N	12 57.5W	RMT 8		DAY	FLOW DIST. 6.96 KM.	
8818	14/ 3	43 46.0N	12 58.8W	RMT 1	500- 600	2000-2200	REPEAT 11	
# 6		43 51.3N	12 58.6W	RMT 8		NIGHT	FLOW DIST. 8.29 KM.	
8818	15/ 3	43 56.7N	12 57.4W	RMT 1	400- 500	0004-0205	REPEAT 11	
# 7		44 1.3N	12 56.1W	RMT 8		NIGHT	FLOW DIST. 7.08 KM.	
8818	15/ 3	44 3.5N	12 55.8W	RMT 1	300- 400	0255-0455	REPEAT 11	
# 8		44 8.5N	12 54.7W	RMT 8		NIGHT	FLOW DIST. 7.60 KM.	
8819	16/ 3	47 38.2N	9 11.8W	RMT 1	100- 150	0936-1016	DEMONSTRATION HAUL	3319
# 0		47 39.5N	9 12.3W	RMT 8		DAY	FLOW DIST. 2.05 KM.	

Figure 1. Ship's track and station positions between Barry and Canary Is.

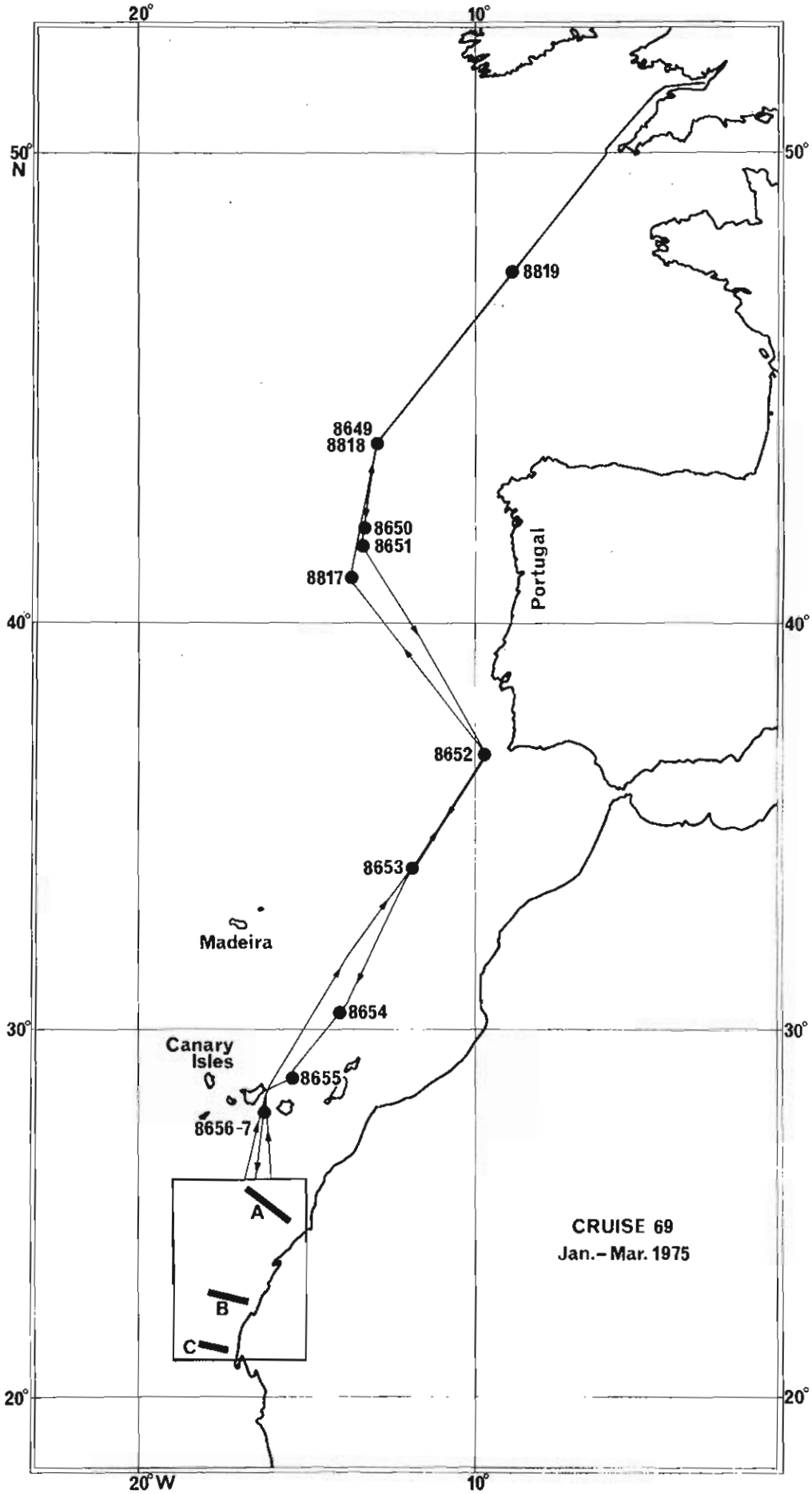
20°
10°
50° N
50°
8819
8649
8818
8650
8651
8817
Portugal
40°
40°
8652
8653
Madeira
8654
30°
30°
Canary Isles
8655
8656-7
A
B
C
CRUISE 69
Jan.– Mar. 1975
20°
20°
20° W
10°

Figure 1

Fig. 2. Working area off NW African coast.

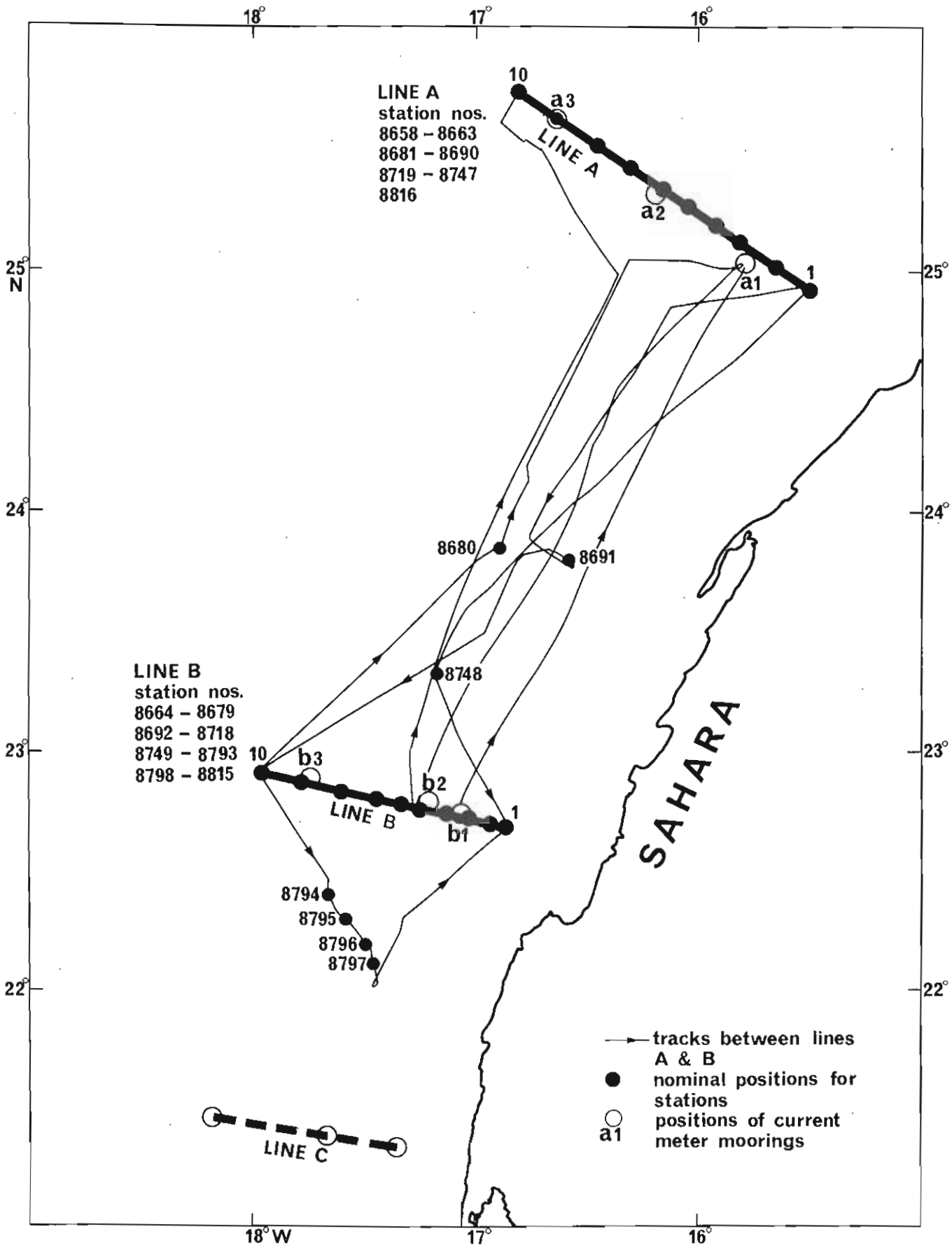
18°
17°
16°
LINE A
station nos.
8658 – 8663
8681 – 8690
8719 – 8747
8816
10
a3
LINE A
a2
a1
1
25° N
25°
24°
24°
8680
8691
8748
LINE B
station nos.
8664 – 8679
8692 – 8718
8749 – 8793
8798 – 8815
10
b3
b2
LINE B
b1
1
23°
23°
SAHARA
8794
8795
8796
8797
22°
22°
tracks between lines A & B
nominal positions for stations
a1 positions of current meter moorings
LINE C
18° W
17°
16°

Figure 2

Fig. 3. Smoothed bottom topography (top) and positions of RMT 1+8 hauls (bottom) on Line B.

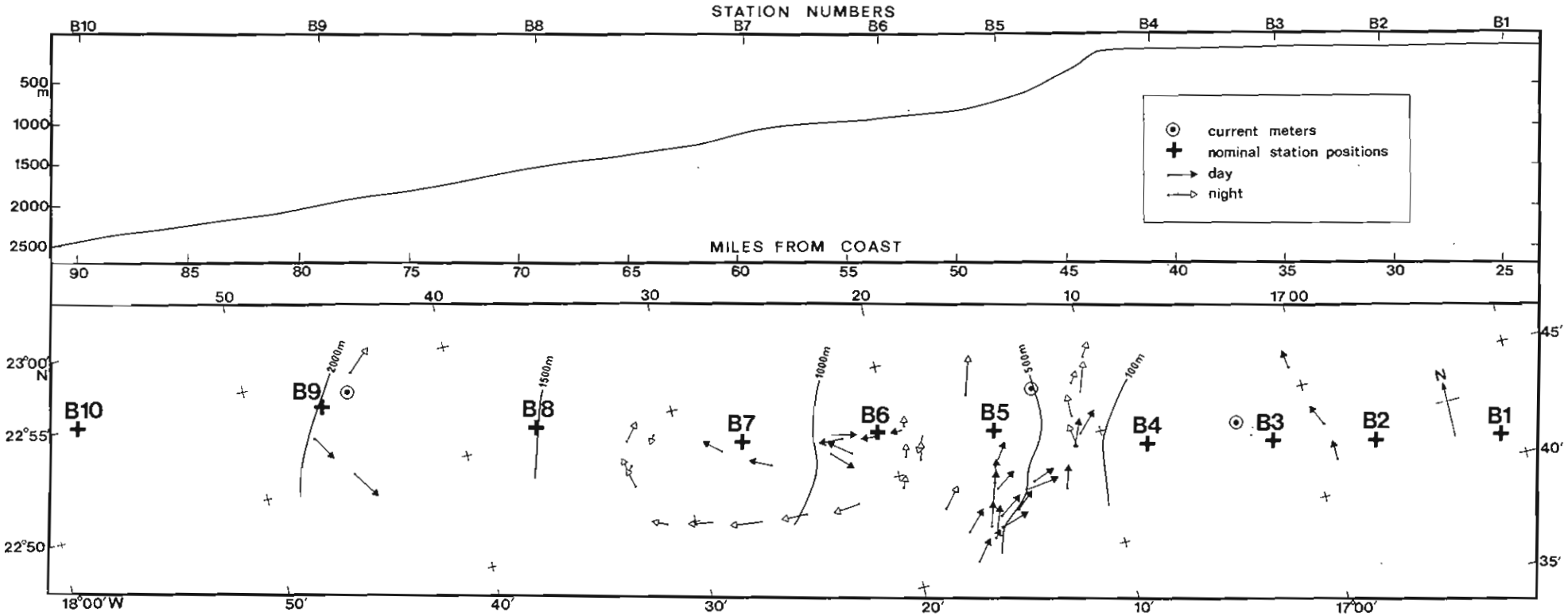
STATION NUMBERS
B10
B9
B8
B7
B6
B5
B4
B3
B2
B1
500 m
1000
1500
2000
2500
current meters
nominal station positions
day
night
MILES FROM COAST
90
85
80
75
70
65
60
55
50
45
40
35
30
25
50
40
30
20
10
17 00
23°00' N
22°55'
22°50'
2000m
1500m
1000m
500m
100m
N
45'
40'
35'
18°00' W
50'
40'
30'
20'
10'
17°00'

Figure 3

Fig. 4. Progressive vectors of surface currents

Fig. 4 (a). 13h Protas series at B 9, Stn 8765, 24 February

Data

Time	Lat. °N	Long. °W	Vel.	Dir'n
0532	22 51.2	17 42.9	-	-
0812	22 53.7	17 48.0	0.42	077.4
0914	22 54.2	17 48.0	0.60	147.9
0958	22 54.4	17 47.6	0.41	094.7
1058	22 53.7	17 48.1	0.54	148.1
1202	22 53.4	17 48.3	0.48	222.1
1226	22 54.0	17 48.4	0.94	084.8
1352	22 53.7	17 49.1	0.79	234.4
1410	22 53.6	17 48.8	0.55	124.8
1530	22 53.4	17 48.6	0.23	187.2
1854	22 54.0	17 48.5	0.11	250.9
1934	22 53.8	17 48.0	0.19	115.1
2042	22 53.9	17 47.9	0.07	108.2

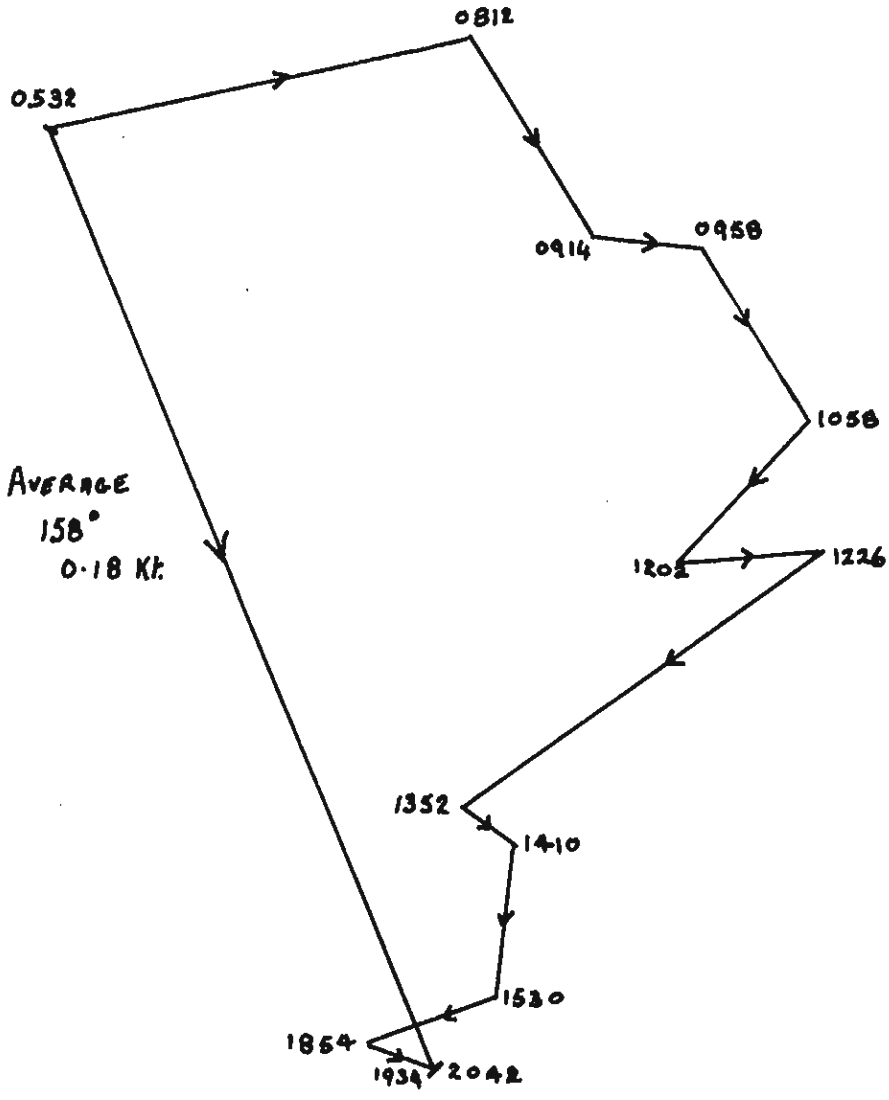
0812
0532
0914
0958
1058
AVERAGE
158°
0·18 Kt.
1202
1226
1352
1410
1530
1854
1934
2042

FIG 4(a)

Fig. 4(b). 13h Protas series at B 5, Stn. 8772, 26 February

Data

Time	Lat. °N	Long. °W	Vel.	Dir'n
0556	22 47.8	17 12.2	-	-
0740	22 44.5	17 15.0	1.45	195.4
0818	22 45.1	17 14.3	1.16	146.7
0846	22 45.7	17 14.7	1.24	253.5
1008	22 45.8	17 14.7	0.81	202.8
1030	22 45.8	17 13.9	1.89	114.5
1212	22 46.0	17 16.9	1.93	262.6
1402	22 46.7	17 16.3	0.72	105.8
1526	22 45.8	17 14.6	0.64	187.7
1716	22 46.0	17 15.2	0.59	248.8
1904	22 45.9	17 16.2	0.73	259.3
1942	22 44.8	17 18.1	1.24	107.1

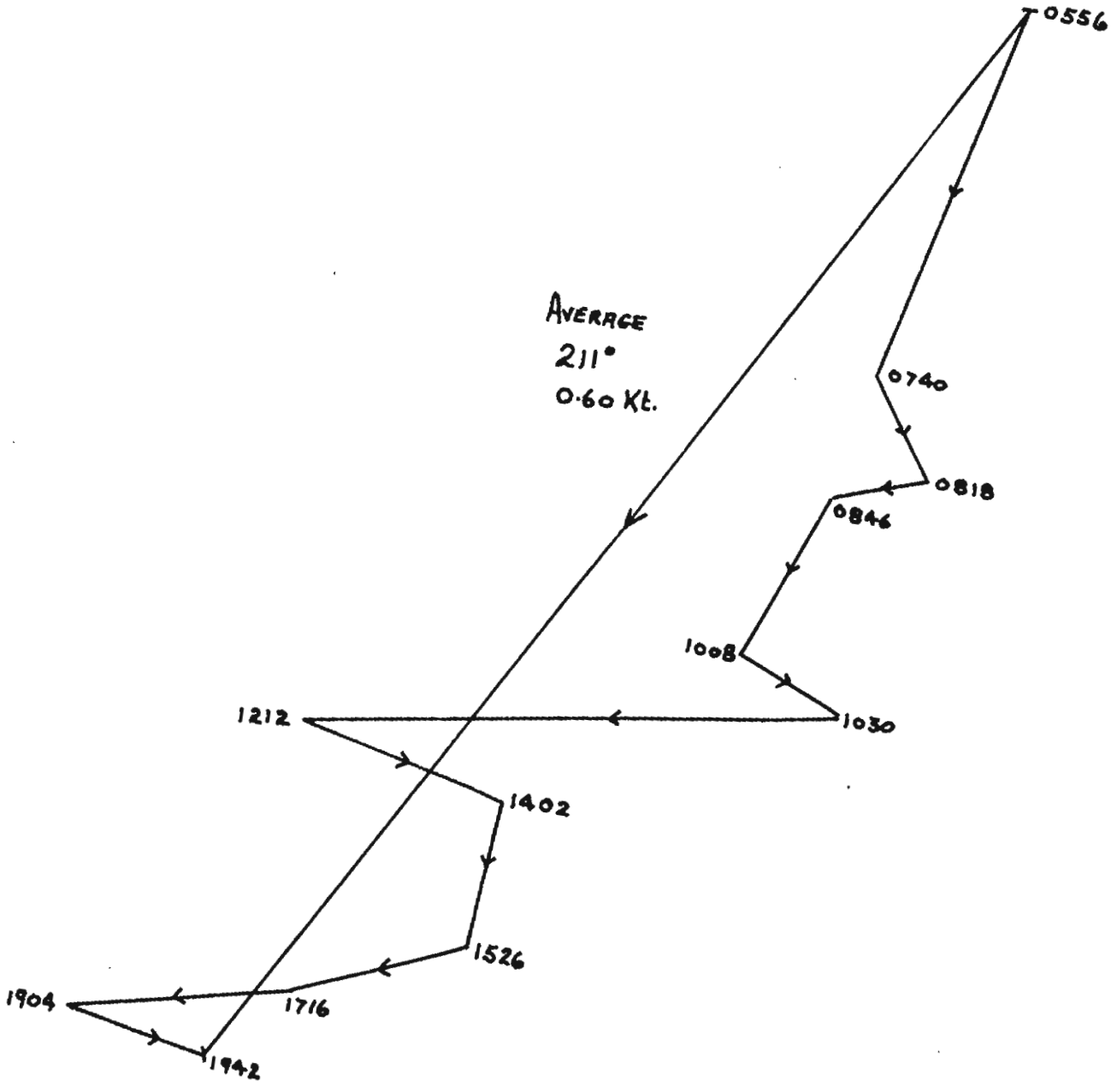
0556
AVERAGE
211°
0·60 Kt.
0740
0818
0846
1008
1030
1212
1402
1526
1716
1904
1942

FIG 4(b)

Fig. 4(c). Pump series at B6 - 7, Stn. 8774, 26/27 February

Data

Time	Lat. °N	Long. °W	Vel.	Dir'n
2054	22 47.2	17 24.0	-	-
2126	22 47.5	17 24.1	0.51	007.2
2212	22 47.5	17 24.2	0.20	175.5
2334	22 47.9	17 24.2	0.18	064.9
0000	22 48.1	17 24.4	0.13	308.7
0120	22 48.4	17 24.1	0.22	086.7
0246	22 48.1	17 23.6	0.43	147.6
0320	22 47.8	17 23.3	0.47	131.0
0432	22 47.5	17 23.2	0.79	147.0
0652	22 46.6	17 25.0	0.79	197.8
0732	22 46.1	17 24.2	0.36	200.7

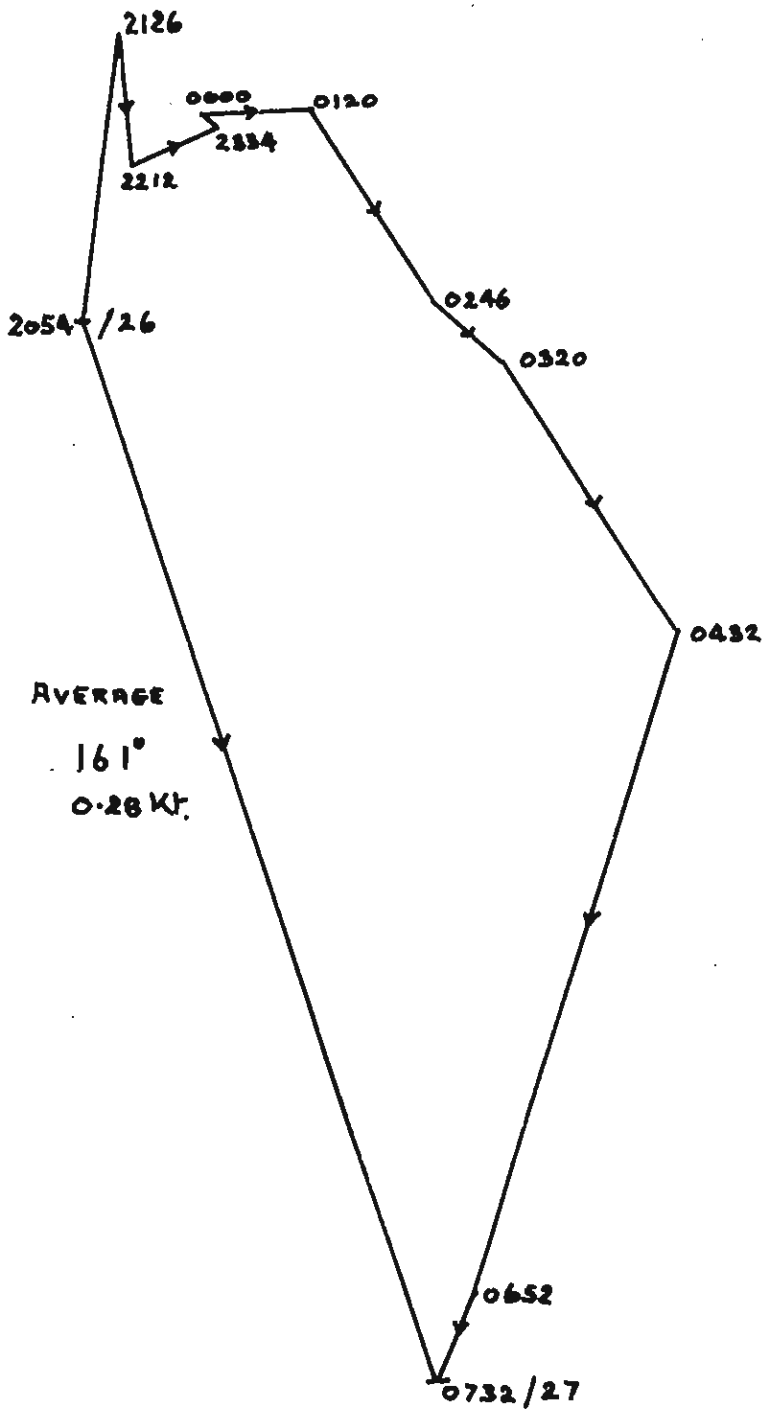
2126
0000
0120
2334
2212
0246
2054 /26
0320
0432
AVERAGE
161°
0·28 Kt.
0652
0732 /27

FIG 4(c)

Fig. 4(d). RMT series at B6 - 7, Stns. 877506, 27 February

Data

Time	Lat. °N	Long. °W	Vel.	Dir'n
0842	22 46.8	17 26.1	-	-
1310	22 47.1	17 20.7	0.73	062.7
1434	22 47.1	17 19.6	1.06	078.0
1508	22 46.8	17 20.6	0.90	152.0
1618	22 47.2	17 22.5	0.99	135.7
1816	22 45.2	17 21.3	0.83	177.1
2002	22 44.2	17 22.1	0.98	155.7
2038	22 44.1	17 23.5	1.52	273.3
2106	22 44.3	17 24.3	0.53	127.4
2226	22 44.5	17 27.8	0.76	193.1

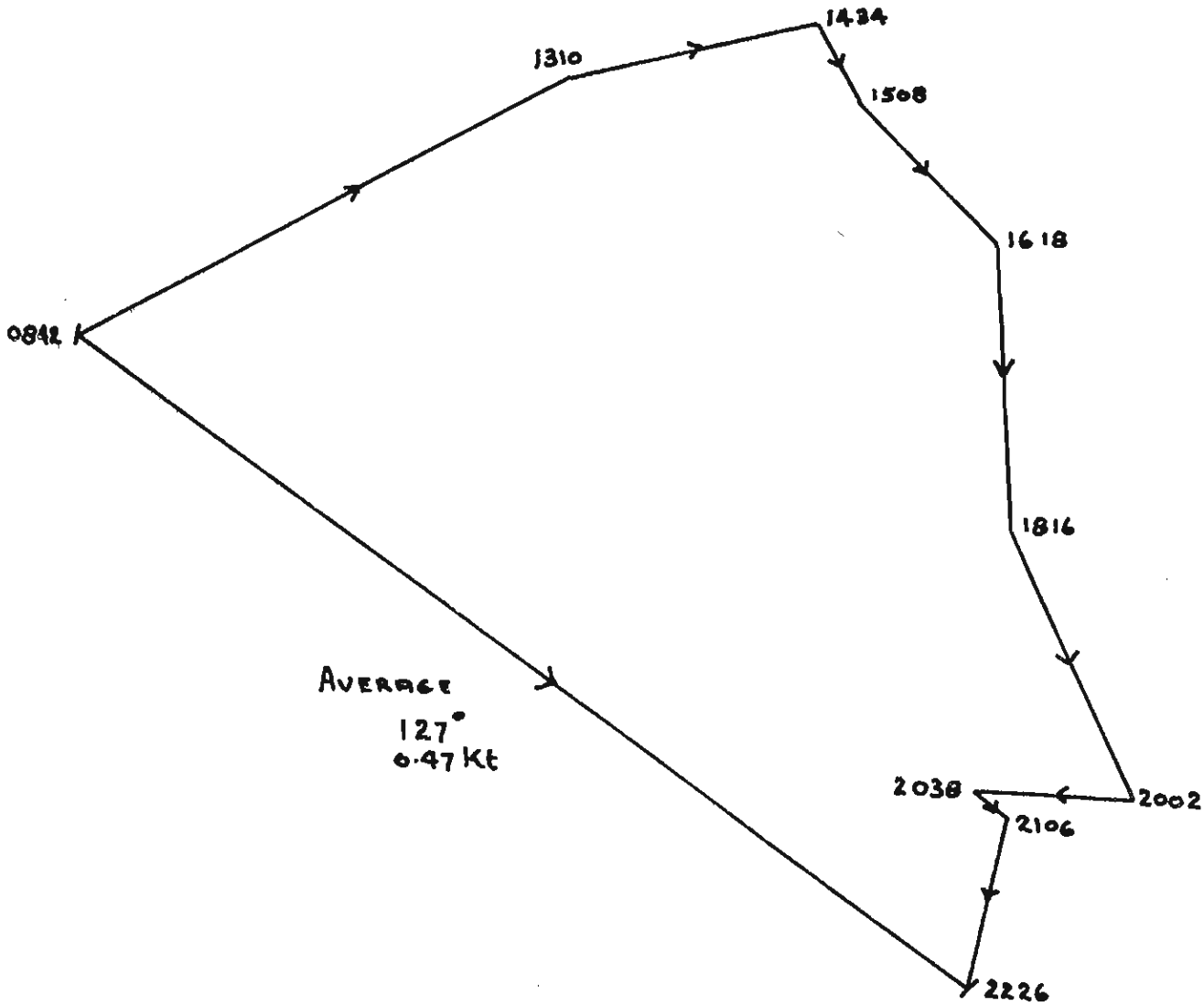
1434
1310
1508
1618
0842
1816
AVERAGE
127°
0·47 Kt
2038
2002
2106
2226

FIG 4(d)

Fig. 4(e). RMT series at 44°N, 13°W, Stn. 8818, 14/15 March

Data

Time	Lat. °N	Long. °W	Vel.	Dir'n
0350	44 00.8	12 58.7	-	-
0454	44 00.5	12 58.7	0.24	264.0
0532	44 00.2	12 58.2	0.66	026.7
0602	43 59.0	12 58.1	0.50	030.3
0640	43 58.4	12 57.8	0.62	044.7
0720	43 57.1	12 57.6	0.19	082.6
0830	43 54.5	12 57.4	0.44	045.5
0934	43 51.8	12 57.0	0.57	088.9
1116	43 47.9	12 56.5	0.36	079.2
1146	43 46.8	12 56.4	0.33	081.1
1300	43 43.2	12 56.2	0.32	077.0
1338	43 42.1	12 56.2	0.37	025.3
1452	43 39.5	12 56.3	0.29	044.0
1508	43 38.7	12 56.3	0.65	166.8
1644	43 41.5	12 57.0	0.20	285.4
1830	43 44.7	12 57.6	0.34	270.0
1854	43 44.6	12 58.0	0.17	254.6
2018	43 46.8	12 58.9	0.42	268.6
2040	43 47.7	12 58.9	0.28	307.7
2108	43 48.9	12 57.8	0.24	040.6
2202	43 51.3	12 58.7	0.26	332.9
2224	43 52.3	12 58.3	0.43	070.0
0008	43 56.8	12 57.4	0.21	077.4
0042	43 58.1	12 57.0	0.28	091.0
0156	44 00.9	12 56.2	0.32	120.3
0356	44 05.9	12 55.4	0.20	159.4
0444	44 08.0	12 55.4	0.17	228.1

Light N to NE winds (6-8 knots)

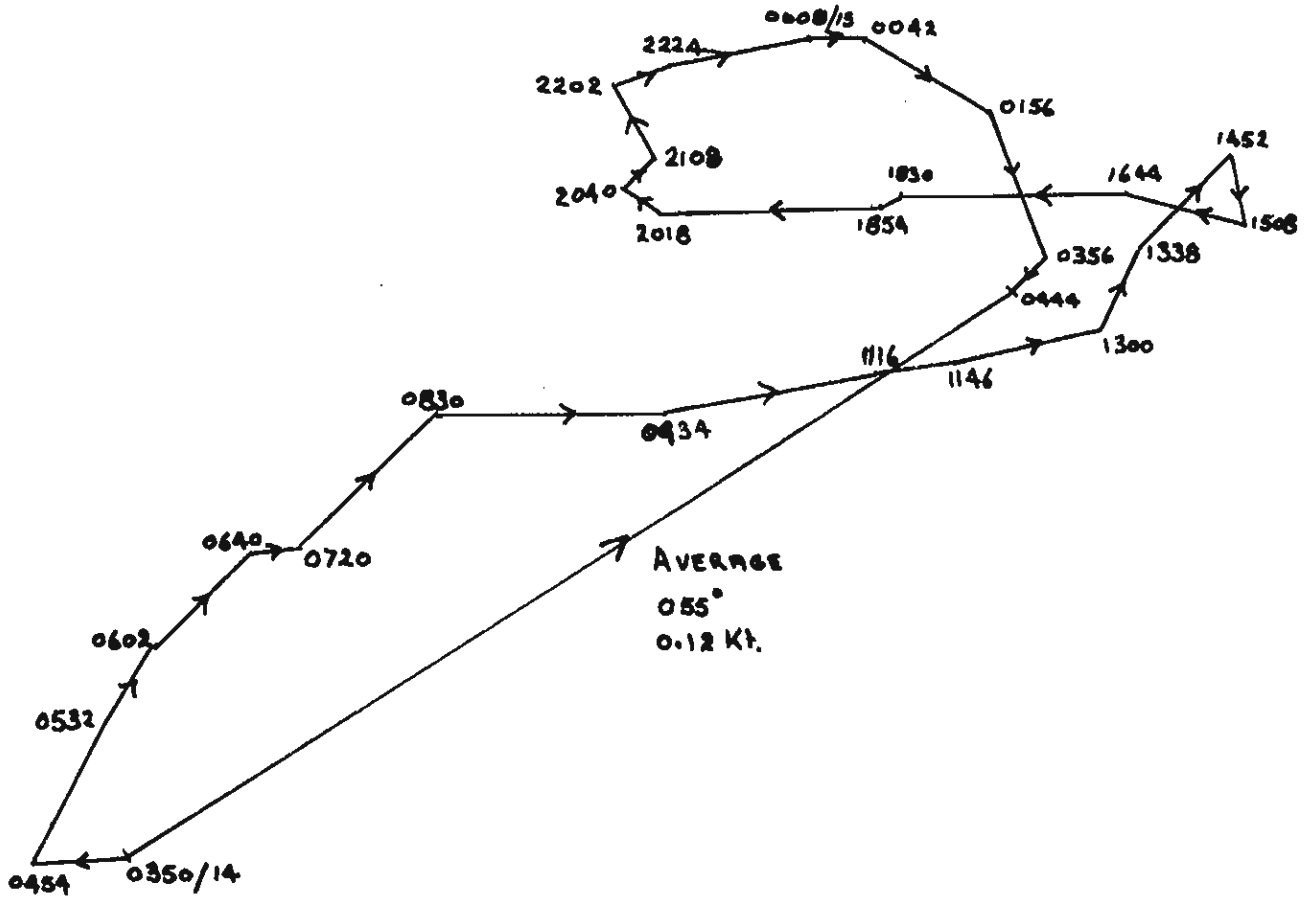
0008/15
0042
2224
2202
0156
1452
2108
1830
1644
2040
1508
2018
1854
0356
1338
0444
1116
1300
1146
0830
0434
0640
0720
AVERAGE
055°
0.12 Kt.
0602
0532
0454
0350/14

FIG 4(e)

Fig. 5. Surface current vectors on A Line.

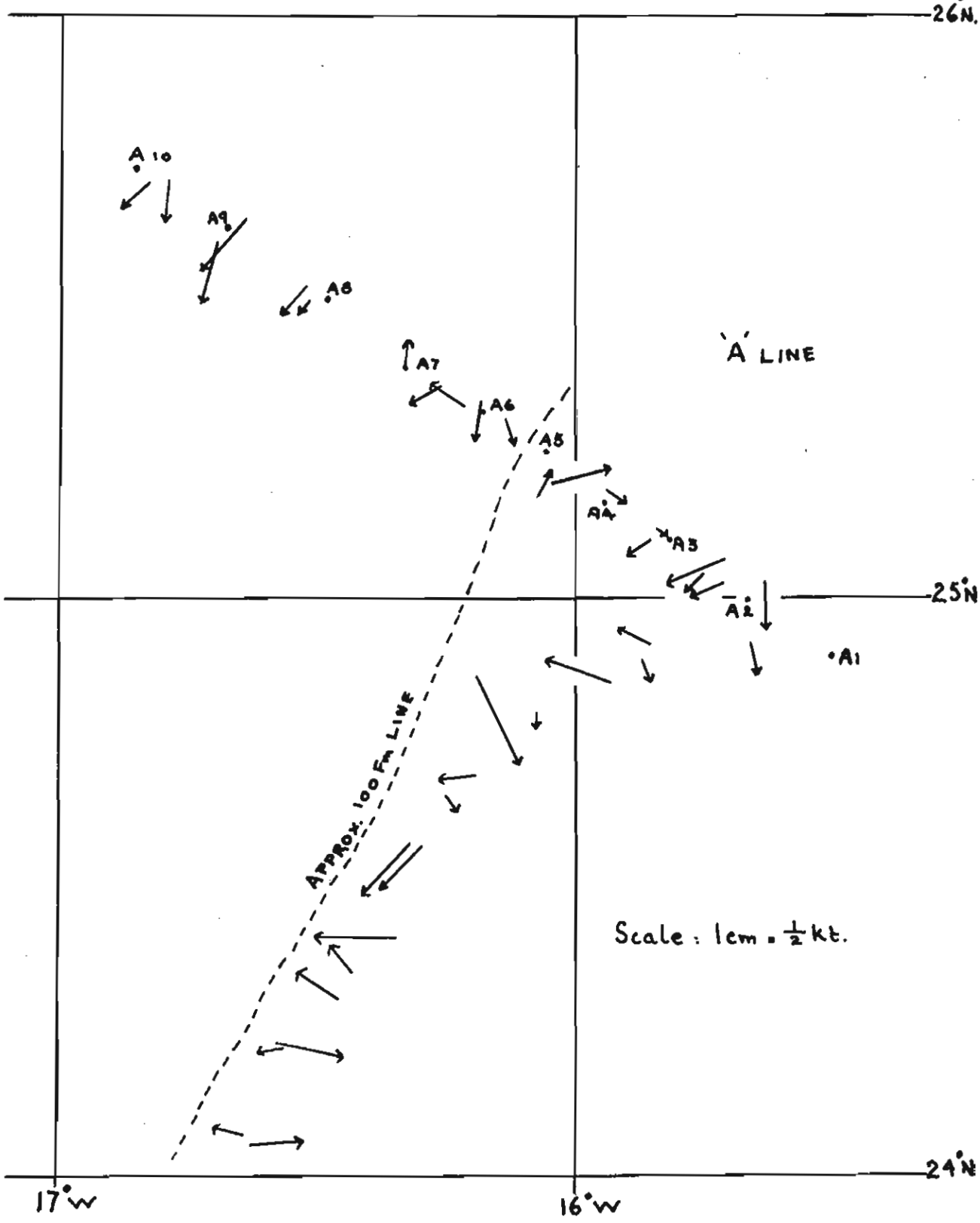

FIG 5

Fig. 6. Surface current vectors on B Line.

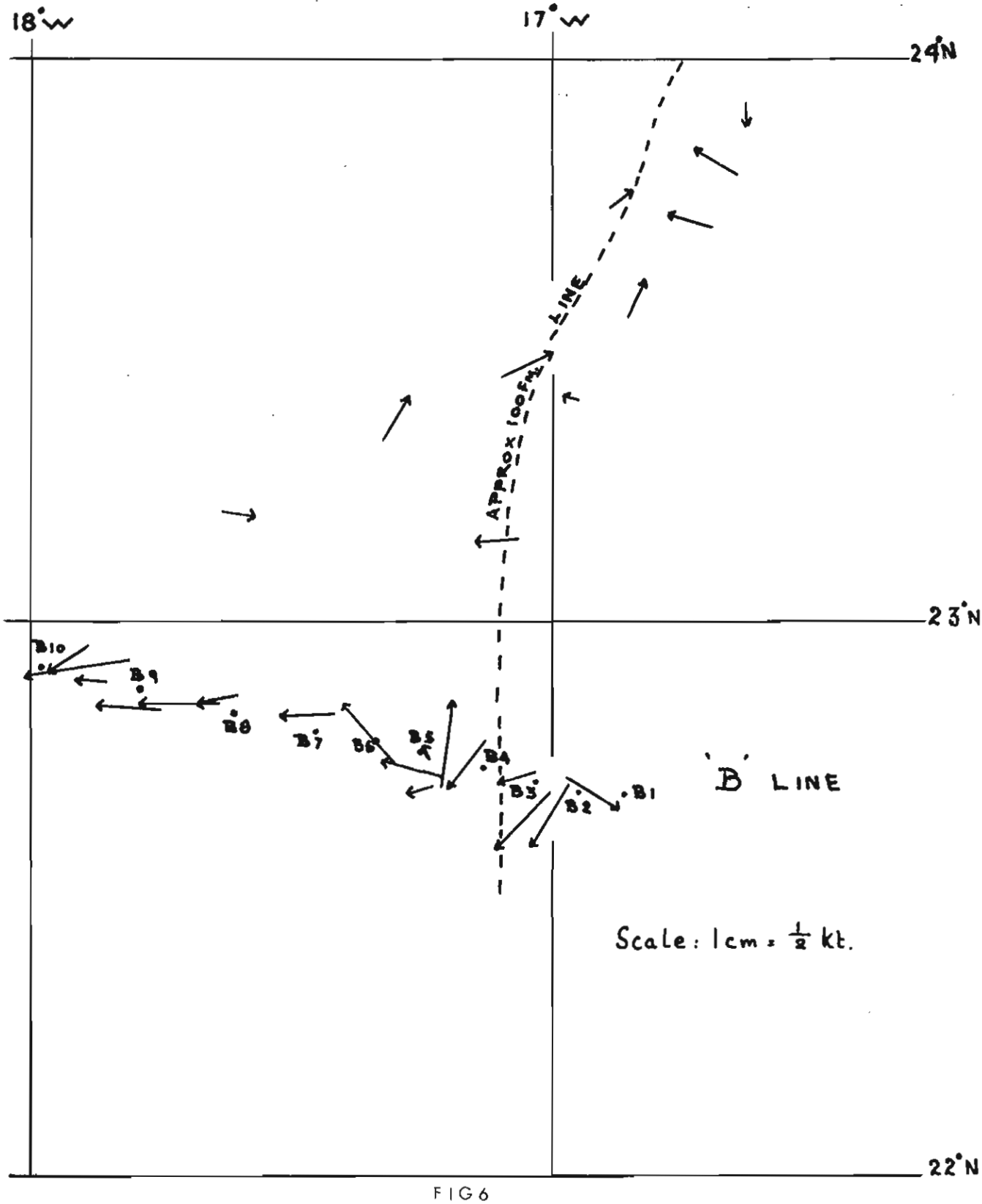

FIG 6

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43 October - November 1971	47
44 December 1971	46
45 February - April 1972	50
46 April - May 1972	55
47 June - July 1972	52
48 July - August 1972	53
49 August - October 1972	57
50 October 1972	56
51 November - December 1972	54
52 February - March 1973	59
53 April - June 1973	58
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54 June - August 1973	2
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60 February - March 1974	8
61 March - May 1974	10
62 May - June 1974	11
63 June - July 1974	12
64 July - August 1974	13
65 August 1974	17
66 August - September 1974	20
68 November - December 1974	16
73 July - August 1975	34
74 Leg 2) Sept.Oct. 1975	33
74 Leg 1 & 3)	35
75 October - November 1975	43

[1]NIO CR — National Institute of Oceanography, Cruise Report
[2]IOS CR — Institute of Oceanographic Sciences, Cruise Report