P.O.L.

RRS 'James Clark Ross'
RRS 'Bransfield'

7 October 1992 - 4 December 1992

ACCLAIM: Sea level measurements in the Scotia Sea and Drake Passage

Cruise Report No. 17

1993

Natural Environment Research Council

PROUDMAN OCEANOGRAPHIC LABORATORY

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Bidston Observatory
Birkenhead, Merseyside, L43 7RA, UK
Tel: 051 653 8633
Telex: 628591 Ocean B
Fax: 051 653 6269

Director: Dr. B.S. McCartney

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RRS JAMES CLARK ROSS

RRS BRANSFIELD

7 OCTOBER 1992 - 4 DECEMBER 1992

ACCLAIM: sea level measurements in the Scotia Sea and Drake Passage

Principal Scientists

P.R. Foden (RRS James Clark Ross)
J.M. Vassie (RRS Bransfield Leg 1)
R. Spencer (RRS Bransfield Leg 2)

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ABSTRACT

ACCLAIM Bottom Pressure recorders have been in place in the Scotia Sea since December 1988 and recovered/redeployed each year. On this cruise they were recovered for the last time. Two new combined BPR/INVERTED ECHO SOUNDER rigs were redeployed on the ground track of the TOPEX satellite across the DRAKE PASSAGE.

Further, POL's development project MYRTLE was deployed for four years at the southern end of the Drake Passage.

In addition remote island Sea Level Recording stations at Port Stanley - Falkland Islands was upgraded and stations at Signy Island - South Orkneys, and Faraday were serviced.

Apart from winch problems on the James Clark Ross all went very well with the instruments, equipment, ships and weather. A data capsule from MYRTLE was recovered and the data returned from all instruments was 100%.

ISSUING ORGANISATION

Proudman Oceanographic Laboratory
Bidston Observatory
Birkenhead, Merseyside L43 7RA
UK

Director: Dr B S McCartney

TELEPHONE 051 653 8633
TELEX 628591 OCEAN BG
TELEFAX 051 653 6269

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WOCE	ANTARCTIC CIRCUMPOLAR CURRENT	
MYRTLE	BRITISH ANTARCTIC SURVEY	RRS "JAMES CLARK ROSS"

CONTRACT

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CRUISE PERSONNEL

The cruise participants were as follows:

On board RRS James Clark Ross:

Higher Scientific Officer (POL)	Peter Foden
Captain	Nick Beer
Chief Officer	Jerry Burgan
2nd Officer	John Harper
3rd Officer	Geoff Morgan
Chief Engineer	John Donnelly
Radio Officer	Steve Mee
Electrician	Keith Rowe
Bosun	Rob Watson

On board RRS Bransfield:

Senior Scientific Officer (POL)	Peter Foden
Senior Scientific Officer (POL)	Robert Spencer
Grade 7 (POL)	Ian Vassie
Captain	Stuart Lawrence
Chief Officer	Tony Reading
2nd Officer	Rory Jackson
3rd Officer	John Greenspan
4th Officer	Sam Howatt
Chief Engineer	Alan Allison
Radio Officer	Mike Gloistein
Electrician	Alan Jones
Bosun	Tony Gill

ACKNOWLEDGEMENTS

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BACKGROUND

ACCLAIM - Antarctic Circumpolar Current Levels from Altimetry and Island Measurements - is providing real time data from its network of sea level stations in the Southern Ocean as a contribution to the World Ocean Circulation Experiment (WOCE). The associated research work at POL is an integral part of the many other U.K. contributions to Core 2, the Southern Ocean component of WOCE, and interacts with international work from the United States, South Africa, Australia, France and Germany. The principal objective is to study variations in the flow of the ACC on large time and space scales but the ACCLAIM network is also a component of GLOSS and supplies sea level data which has provided a knowledge of tidal behaviour in this remote area.

ACCLAIM Bottom Pressure Recorders have been in place east of the Drake Passage between Port Stanley and Signy island since 1988 and recovered/redeployed in 1989,1990 and 1991. Two BPR's were placed in the western part of the Drake Passage during 1991 (Foden 1992) as part of a Choke Point monitoring array which has U.S. equivalents in the choke points south of Africa and Australia.

POL CRUISE OBJECTIVES:

1) To recover 2 BPR/IES instruments deployed in December 1991 in the western Drake Passage and redeploy these along the Choke Point line between Burdwood Bank and Elephant Island.

2) To recover 2 BPR's from the Scotia Sea.

3) To make a test deployment of the Multi Year Recoverable Tidal Level Equipment (MYRTLE) in the area north of Elephant Island and to recover a releasable capsule if possible.

4) To complete fieldwork on the island stations of the ACCLAIM network at Port Stanley, Signy Island and Faraday and do some provisional work at Rothera with a view to installing a station in 1993/4.

NARRATIVE

Because of the amount of fieldwork and to fit into BAS shiptime requirement to involve staff on different cruise legs on two ships. Most of the work took place on the RRS Bransfield but because it lacked a suitable winch Peter Foden joined the RRS James Clark Ross between Montevideo and Port Stanley to carry out testing of the acoustic releases for MYRTLE to a depth of 3000m. On arrival at Port Stanley he was joined by Bob Spencer and together they spent one week refurbishing the island sea level recorder.

Both personnel and Ian Vassie boarded the RRS Bransfield which sailed Wednesday 4th November 1992 to recover and redeploy the BPR and IES instruments which had been deployed in the Drake Passage one year earlier. The two Scotia Sea instruments were scheduled to be recovered during Leg 2 of the cruise but a recovery was possible at the northern position on Leg 1 because time on the ship became available (see cruise track in

Figure 2). During Leg 1 the ship called at Faraday Base giving an opportunity to examine the sea level recorder which had been constructed the previous year. Finally the ship docked at Port Stanley on Monday 16th November after bunkering overnight in Mare harbour.

Leg 2 of the cruise only involved Bob Spencer and Peter Foden. (Figure 3). The purpose was to recover the Scotia Sea capsule near Signy, deployed in 1991. The island station at Signy was to be serviced and equipment left to enable the data to be forwarded to POL via the BAS computer links. The last aim was to recover a data capsule from MYRTLE which was deployed on the previous leg.

ACOUSTIC WIRE TESTING ON THE JAMES CLARK ROSS

Initial tests

Peter Foden joined the R.R.S. James Clark Ross in Montevideo on October 7th 1992. The purpose of his participation on the voyage from Montevideo to Stanley was to test the acoustic systems that were to be used on MYRTLE. The eventual deployment of MYRTLE was to be carried out on the RRS Bransfield and this ship did not have the winches to pre-test the acoustic systems.

The acoustics consisted of four Benthos release systems. Two with four releases in a 17inch glass sphere, and two with a single release in a 10inch glass housing. The four sets of acoustics were tested on 11th of October 1992 to a depth of 3000 meters using the 10 ton traction winch system with 6mm hydrographic wire. Unfortunately the lowest of the inline acoustics did not perform very well during this test, two of its four channels failed to release.

Retest 18-10-92.

It was thus decided to retest the faulty unit on 18th of October. Weather conditions were good with a light northerly wind and a low to moderate swell, causing the ship to heave and pitch easily. The acoustics in its test cage together with 200Kg of chain slung beneath the frame was lowered to 3000 meters with no problems. The acoustic tests were carried out and the release performed well. Recovery went well and the rate of haul was progressively decreased from approximately 100m of wire out. At around 40m the powered rollers were engaged, and at approximately 11m depth the traction winch began to slip which was not unusual. However due to winch malfunction the acoustic package was lost due to the wire parting when the equipment was nearly inboard (see seperate report by Chief Officer M.J.S. Burgan, R.R.S. James Clark Ross).

The unfortunate loss of the equipment was not due to an operators error, just due to poor design and manufacture of this new specialised equipment.

MYRTLE was modified to accomodate an alternative release system which, while it would not individually release the capsules, would act as a backup to the main system that had been successfully tested. We were fortunate that the wire had not parted during the first test when all four releases had been on the wire.

PREPARATION OF BPR/IES

The RRS Bransfield docked on late Sunday 1st November and was not due to sail until Wednesday which allowed valuable time to prepare the instruments for deployment. Our equipment was located in FIPASS and loaded on board early Monday morning. A start was made to preparing MYRTLE and assembling the ballast frames. It was discovered that the 'C' weights for the Mk4 BPR's would not locate on the main ballast frame and were therefore taken ashore for welding. The battery packs and main frame were assembled during the remainder of Monday.

On Tuesday the sensors were prepared. To use the new Quartztronic sensor the XP35 card had to be modified from 6V to 9V . The MYRTLE logger was started at 1630 (1930Z) and the acoustic units were installed. In the evening a start was made assembling the MYRTLE releasable podules.

On Wednesday the podules were completed, and one IES was assembled. The ship departed Port Stanley at 1600 (1900Z) heading to the first BPR/IES site in the northern Drake Passage.

RECOVERY OF BPR5/IES4 IN NORTHERN DRAKE PASSAGE (POL1)

Friday 6th November 1992
Position 56 29.45S 62 59.13W
Depth 3925m
Conditions Force 6/7 Heavy swell

EVENTS

07:15 GMT Vessel on station, engine declutched, transducer into water.

07:42 GMT BPR/IES released about 1 mile off.

08:45 GMT Instrument on the surface, radio beacon heard immediately. Portable DF gave direction very well.

09:30 GMT Instrument grappled on starboard side, lifted on board with aft crane.

09:45 GMT Overside transducer brought inboard.

Total time on station: 2 hours 30 minutes.

The recovery went very well. Acoustic communication was good once the engine was declutched but was impossible with the propellor running. The RRS Bransfield is a diesel electric (2 diesels, 2 geneators feeding separate windings on the electric motor) with a variable pitch propellor.

During recovery the frame collided with the ship's hull due to the heavy swell, fracturing the stay which supports the acoustic transducer. However it was retained by a securing strop. No lasting damage was done and all equipment was recovered. The instrument had worked well

with no data loss.

RECOVERY OF BPR4/IES3 IN SOUTHERN DRAKE PASSAGE (POL 2)

Sunday 7th November 1992
Position 61 28.43S 61 17.43W
Depth 3946m
Conditions Force 2/3 Slight swell

EVENTS

14:00 GMT On station. Transducer into water. Engine declutched. Instrument detected immediately.

14:09 GMT Instrument released from sea bed.

15:12 GMT BPR/IES on surface. Its position detected by DF radio.

15:45 GMT Instrument inboard.

Total time on station: 2 hours.

Recovery went smoothly with good sea conditions. The sea level recorder and the inverted echo sounder had both operated well with full data recovery.

DEPLOYMENT OF BPR/IES NORTH OF ELEPHANT ISLAND (POL 5)

The ship arrived in the deployment area at 2145 (00:45Z) 12th November and completed a survey of the area by 2230. A position was identified at the critical depth of 1000m close to a ground track of the TOPEX satellite. The BPR/IES was put in the water and allowed to free fall to the bottom (20 minutes). At midnight the transmissions from the IES were monitored to identify if the instrument had modified its lockout time which is automatically adjusted to suit the depth. This was confirmed as the lockout had changed from the value originally set to 1.37 seconds.

13th November 1992
Position 60 50.99S 54 42.88W
Uncorrected depth 1020 metres
Good conditions

00:45 GMT On station. Transducer into the water.

01:36 GMT Instrument into water.

01:39 GMT Acoustics on.

01:52 GMT Instrument on the bottom.

01:58 GMT	Acoustics timed out.
02:57:13 GMT	Single ping heard from the IES.
03:05 GMT	Transducer in board and under way.

DEPLOYMENT OF MYRTLE (POL 7)

MYRTLE was deployed 60 miles north north west of POL4 in much deeper water but sufficiently near to compare signals between the two sites and along the same TOPEX ground track. A suitable position was easily found and MYRTLE was deployed from the aft crane. When first paced in the water it was found impossible to pull the release pin from the special launching attachment used. After 15 minutes MYRTLE was brought inboard and the problem identified as being related to the pin sticking in its locating hole. The pin was straightened and greased and the deployment was continued. This time it was successful although the pin mechanism will need some modification.

13th November 1992
Position Lat. 59' 43.687S Lon. 55' 29.500W
Uncorrected depth 3690 meters

10:45 GMT	Vessel on station, BPR preparation complete.
11:02 GMT	Into the water, calm sea conditions.
11:22 GMT	Released.
12:20 GMT	Myrtle on sea bed.
12:25 GMT	Ship drifted 1.8 miles from lay position. Poor response from acoustics, ship moved to lay position.
12:56 GMT	Range tests of the acoustics used.
13:30 GMT	Transducer brought inboard, ship under way.

Total time on station: 2 hours 45 minutes.

MYRTLE PODULE RECOVERY

The deployment site was revisited by the Bransfield on 2nd of December 1992 in good conditions. It was decided to try and recover one of the four data capsules. The ship was on position at 0940Z and a podule was released at 0958Z from a depth of 3700 meters. The fact that it had been released was readily seen as its transponder was put into operation on leaving the main frame and the transpond depth was seen to decrease with time. At 1110 the ship was manoevered back to the deployment position and the podule was found to be on the surface at 1202Z. It was readily seen and also located by its radio beacon. The podule was safely onboard at 1240Z. Later it was found to contain its full three weeks of data without any

errors, proving that the design of the data transfer system works.

DEPLOYMENT OF BPR/IES SOUTH OF BURDWOOD BANK (POL 7)

This station was at the northern end of the Choke Point section between Elephant Island and Burdwood Bank. It was important to select a depth close to 1000m for the instrument. Prior to deployment the IES was started in the frame at approximately 14:00 (17:00Z) and then went through its startup procedure. At the end of this it was noted that the triple ping, which indicates the lockout time, was only a double ping. We decided to open the instrument and replace some of the circuit boards. This was done but the fault remained and finally the EPROM software was upgraded to version 8. The instrument was assembled and restarted.

Deployment went smoothly but due to acoustic shadowing of the overside transducer it was impossible to hear the lockout timing pings. However the instrument was generally operating correctly and there was no reason to assume that it would not make the correct measurements. As an added precaution the lockout time was set to a value which would work even if the automatic lockout adjustment were not made by the instrument.

14th November 1992
Position Lat. 54' 56.54S Lon. 58' 23.59W
Uncorrected depth 1010 metres

EVENTS 14/11/92

22:00 GMT	Vessel on station.
22:16 GMT	Capsule released into water.
22:31 GMT	On bottom.
22:57:55 GMT	IES No 3 first ping.

Total time on station: 2 hours 31 minutes.

RECOVERY OF BPR (POL 4)

This BPR was recovered just before arriving back at Port Stanley. This was not part of the original schedule but as time was available it was useful to recover this instrument.

Position 53 31.4S 57 01.9W
Uncorrected depth 2800 metres
Acoustics fitted 2517 320/259/1.18
2518 320/278/1.16 (released)

EVENTS 15/11/92

10:30 GMT On station. Overside transducer in water, both releases on.

10:40 GMT Release fired and instrument detached from ballast.
Second release fired on the way up.

11:28 GMT BPR detected on DF radio.

11:40 GMT Sighted.

12:00 GMT Inboard in good condition.

RECOVERY OF BPR (POL 3)

The last BPR to be recovered was just before arriving at Signy.

EVENTS 20/11/92

Position 60 03.1S 47 10.0W
Uncorrected depth 2267 metres
Acoustics fitted 2477 318/240/1.16
2478 321/361/1.16 (released)

16:00 GMT On station. Overside transducer in water, both releases on.

16:07 GMT Release 2478 fired and instrument detached from balast.

17:00 GMT BPR detected on DF radio.

17:30 GMT Inboard in good condition.

SUMMARY

The four deep ocean recovery sites were visited in good sea conditions. All the instruments had recorded their data well and the only damage was to the first inverted echo sounder transducer on recovery due to heavy swell and this was minor. Redeployment of the two Drake Passage sites went well and the deployment of the development project MYRTLE also was a success. The use of RRS Bransfield for this type of work went very well despite its size and difficulty in manoevering, due to kind weather and the excellent seamanship of Captain Lawrence and his officers and crew.

APPENDIX 1 SHORE BASED SEA LEVEL STATIONS.

1. PORT STANLEY SEA LEVEL RECORDER

DETAILED INFORMATION

Major refurbishment

The original sea sensor at Stanley was replaced with a new mechanical arrangement. This contains two pressure sensors, one measuring the full tide and the second measuring the half tide. Also two Tidata boards were fitted to the system. The first connected to the new deep sensor which is at a new fixed level. The second board was fitted to the half tide pressure sensor. Outputs from these two systems are fed to the DCP which was modified to give four transmissions per day. The data logger was modified to enable the extra channels to be recorded and for a faster scanning speed of 8 scans per hour.
The new system was restarted at 150000Z 28/10/92.

NOVEMBER 1991

Battery pack voltages:

Charging voltage	= 19.8 volts
After diode	= 19.1 volts
Logger supply	= 14.25 volts
Motor supply	= 19.1 volts
DCP battery	= 13.94 volts
Channel 1	= 38036 Hz
Channel 2	= 104.8 Hz
Channel 3	= 129.8 Hz

Last scan : 2734 at 11:18:57 GMT (3 mins. 57 secs. slow) 19/12/91
Tape start: 11:45:00 GMT 19/12/91.
Note. The above changes are an interim stage of the new half tide recorder and a new microprocessor system will be fitted next season.

OCTOBER 1992

25/10/92 TIME CHECKS:-
At 134500Z ; TIDATA was 134340 ie 1 min 20 sec slow.
Logger opened at 1355Z scan 29064 at 135500Z, scan 29065 at 140145Z
Last scan 29069 at 150146Z tape removed.
DCP - Time was 3 sec slow (GB POL 3/ 16831188).

2. FARADAY BASE SEA LEVEL RECORDER

The ship arrived at Faraday base on Monday 9th November. Some essential cargo handling was done on Monday and the SLR was examined on the Tuesday. A galvanised steel buffer to protect the stilling well gauge from ice had been constructed at POL and shipped to Faraday during the previous season. The base personnel had made an excellent job of the installation work and obviously put in considerable effort to get it in place in one season. We were pleased to see the care with which the base staff set up and operated the instrument.

The station has a stilling well tide gauge and an ACCLAIM sea level recorder. Both instruments were checked and found to be in good condition. The ACCLAIM sea level recorder was timed against GMT, the tape was changed and the instrument was restarted.

The DCP transmission system had not delivered any data during the previous year because the aerial points directly at Mount Shackleton. It was decided to recalculate the bearing and this was found to be in error by an amount which allowed it to directed to the left of the mountain. It was hoped that this redirection would restore the data link.

As an alternative means of data transmission, the output from the Tidata computer was linked to a Toshiba PC running software which allowed the sea level data to be stored on hard disk as it arrived along the DCP cable. Once a week the data can be transferred to 3.5" floppy disc which can then be used for transmitting the data to the UK through the VAX system at Cambridge.

The ship left Faraday early Wednesday morning 11th November en route for a short visit to Palmer station to collect two passengers. We left Palmer at 1400 and headed for Damoy and the next BPR/IES deployment position.

FARADAY LOGGER

Test Seadata logger tape started 02:00:00 GMT 28/12/91 (N.B. 7.5 min scans).

Pressure frequency	68696 Hz
Temperature frequency	13.5 Hz
Barometer frequency	145.5 Hz (1015A-01 SN 40423)

Tuesday 10th Nov. 92 scan 43717 at 11:59:40Z (tape about 50%full).
Last scan No 43178 at 12:07:10Z
New tape start 12:15:00Z
Farnell battery charger output 19.79 volts.
TIDATA TIME ERROR at 12:19:30Z Tidata was 12:19:22 ie 8 secs slow.
TIME reset at 12:20:15Z.

3. SIGNY BASE SEA LEVEL RECORDER

During the stay at Signy it was decided to calibrate the tide gauge readings against a tide pole to determine the overall drift of the sea sensor since it was installed. This was carried out

between 1500Z on Saturday 21 Nov 1992 and 0930Z on Monday 23 Nov. Half hourly readings of the tide pole were taken and the pole was levelled into a benchmark that had been used during the original installation.

The opportunity to fix the auxillary bench mark relative to the island master levelling position using the NERC GPS system was also taken. Time did not permit a thorough calibration, however this new system was tried and the calculated results are useful.
Servicing of the sea level station was carried out at the same time. The data tape was changed and a new one fitted. Provision was also made to intercept the data that is sent to the satellite data link and to store it on a laptop portable computer. This will then be transfered to Bidston via the VAX computer network.

Signy details:-

Battery voltages:

Tidata and Seadata supply	12.83 volts
Seadata motor supply	17.00 volts
Pressure sensor supply	6.00 volts

SEA SENSOR UNIT - REF.- DQ 33165

Digiquartz Intelligent barometer type 1015A-01. Serial No. 34931. 0-15 psi.

Logger opened 1635Z 21 Nov 93. Scan 6889
Scan 6990 at 164529Z.

Last scan no 7054 at	094529Z 23/11/92
System reset at	100000Z 23/11/93
First scan at	101500Z 23/11/93.

Tidata board clock error 6 secs fast. Date was also 1 day out (Sat 22 Nov, should have been Sat 21 Nov)
Time and date reset to Z time at 170600Z

DCP Time check. DCP was also 6 secs fast, reset at 182800Z.

Tide readings were taken on a tidepole from 1500Z 21/11/92, to 0400Z on 23/11/93, every half hour. The tidepole was vertical with the height of 2.169 meters level with the auxillary bench mark at the end of the jetty.

APPENDIX 2 - DETAILED INFORMATION OF INSTRUMENTS

1. DRAKE NORTH, LOGGER No.5 & IES 4

DEPLOYMENT OF BPR5/IES4 (POL 1)

Into the water	08:07 GMT 22 December 1991
Position	56 29.45 S
	62 59.16 W
Barometric press.	1001.7 millibars
Wind	NE 16 kts
Air temperature	5.2 C
Sea temperature	6.1 C
Corrected depth	3924 metres

Acoustics

No. 2476 P 1.06 Tx 320 Rel 301Hz
No. 2326 P 1.10 Tx 320 Rel 418Hz

Sensors

Channel 1 = QD119016	21,561 Hz
Channel 2 = DQ40190	35,324 Hz
Channel 3 = DQ43122	33,215 Hz
Channel 4 = QT1	32,760 Hz
Channel 5 = Temperature No.3	8,190 Hz

Times

Logger start 001500Z 19/12/91	scan 00000
Logger ends 131504Z 7/11/92	scan 31157

Batteries after recovery.

Motor	= 18.41V
W/BN	= 13.91V
W/O	= 13.99V
W/RD	= 14.00V
G/RD	= 14.24V
0/BN	= 13.91V

Inverted Echo Sounder No 4 (POL 1)

Software version: IESH4 10 NOV1,91

SIGN ON TIME	02:59:07 GMT 22/12/91
LOCK-OUT MOD. TIME	10 hours
FIRST CYCLE	05:00:43 GMT (PEEP ON TOSHIBA)
FIRST PING	05:00:46 GMT
FIRST BURST	05:02:51 GMT
SECOND BURST	05:04:59 GMT
LOCK-OUT TX	05:07:07 GMT

FINISH TIME 6th Nov 1992

	GMT	IES TIME	
	16:57:49	16:55:23	F=214;T=54;W=216391
	16:59:57	16:57:31	F=214;T=55;W=216392
CYCLE	17:02:05	16:59:39	F=214;T=56;W=216393

PULSE 13 Array starts 158900
Array ends 170800 Lockout = 533
Then two bursts of 10 pulses.
Serial box disconnected and magnet put on at 17:17Z 6/11/92.

2. DRAKE SOUTH LOGGER No.2 & IES 3 (POL 2)

DETAILED INFORMATION

LOGGER No.4 :- Sensors fitted:

Channel 1 = DQ38173	33,360 Hz
Channel 2 = DQ41086	32,254 Hz
Channel 3 = DQ43126	33,142 Hz
Channel 4 = QT2	32,760 Hz
Channel 5 = Temperature sen?	8190 Hz

Acoustics 2163 321 438 P1.14
2483 322 342 P1.12

Times

Logger start	01000Z 19/12/91	scan 00000
Logger ends	233148Z 08/11/92	scan 31291

Batteries

Motor = 17.56V
W/BN = 13.86V
W/O = 13.89V
W/RD = 13.96V
G/RD = 14.21V
0/BN = 13.79V

DEPLOYMENT OF BPR2/IES3 (POL 2)

Into the water	16:05 GMT
Position	61 28.43 S
	61 17.43 W
Barometric press.	996.2 millibars
Wind	SE 5 kts
Air temperature	1.2 C
Sea temperature	1.0 C
Corrected depth	3946 metres

Acoustics

No. 2163 P 1.14 Tx 321 Rel 438Hz
No. 2483 P 1.12 Tx 322 Rel 342Hz

Sensors

Channel 1 = DQ 41086 32,247 Hz
Channel 2 = DQ 43126 33,136 Hz
Channel 3 = DQ 38173 33,348 Hz
Channel 4 = QT2 32,747 Hz
Channel 5 = Temperature sensor No.? Hz

Times

Logger start 010000Z 19/12/91 scan 00000
Logger ends 233148Z 8/11/92 scan 31291

Batteries

Motor = 17.56V
W/BN = 13.86V
W/O = 13.89V
W/RD = 13.96V
G/RD = 14.21V
0/BN = 13.79V

Inverted Echo Sounder No 3 (POL 2)

FIRST CYCLE	11:01:14 GMT 23/12/91 (PEEP ON TOSHIBA)
FIRST PING	11:01:16 GMT
FIRST BURST	11:03:26 GMT
SECOND CYCLE PING	13:00:45 GMT
FIRST BURST	13:02:52 GMT

Lock-out time 4.66 seconds.

IES battery voltages before diodes read from left to right:

15.45 volts
15.44 volts
15.44 volts
15.44 volts
15.45 volts

Transponder battery:

16.98 volts
16.97 volts

FINISH TIME 7th Nov 1992

GMT	IES TIME	
18:52:25	18:50:34	F=214;T=52;W=216220
18:54:33	18:52:42	F=214;T=53;W=216221
18:56:41	18:54:50	F=214;T=54;W=216222

PULSE 10 Array starts 122300
Array ends 134200 Lockout = 537
Then two bursts of 10 pulses.
Serial box disconnected and magnet put on at 19:12Z 7/11/92.

3. LOGGER No.6 (POL 3 Signy)

Acoustics
No. 2477 P 1.16 Tx 318 Rel 240Hz
No. 2478 P 1.16 Tx 321 Rel 361Hz

Sensors

Channel 1 = DQ 38175	33,322 Hz
Channel 2 = DQ 36573	32,835 Hz
Channel 3 = DQ 18567	33,580 Hz
Channel 4 = 3T1 (no division)	881 Hz

Times

Logger start	143000Z 7/01/92	scan 00000
Logger ends	201626Z 23/11/92	scan 30840

Batteries
Motor = 18.41V
W/BN = 13.91V
W/O = 13.99V
W/RD = 14.00V
G/RD = 14.24V
0/BN = 13.91V

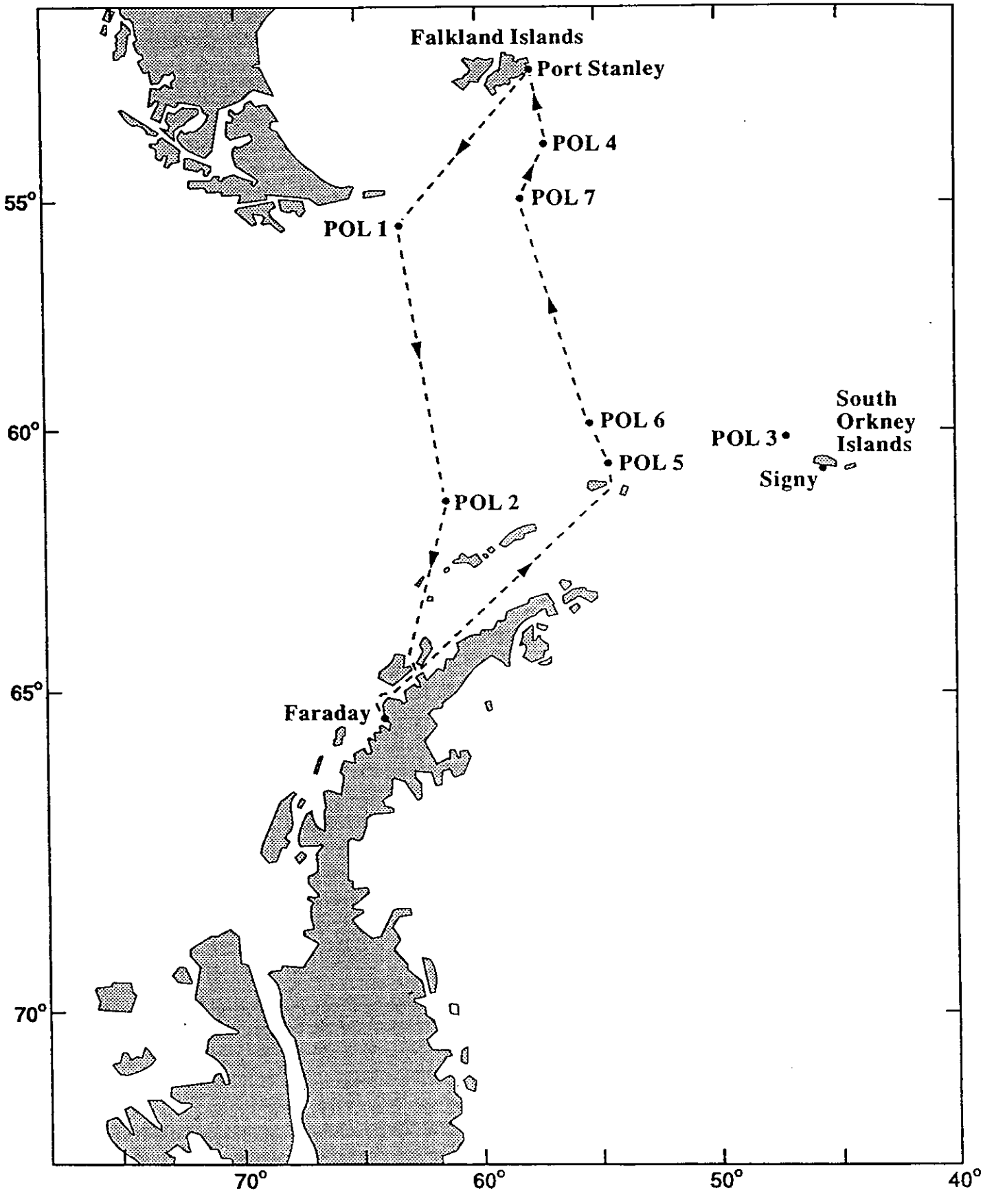
LOGGER No.7 (POL 4 Stanley)

Acoustics
No. 2517 P 1.18 Tx 320 Rel 259Hz
No. 2518 P 1.16 Tx 320 Rel 278Hz

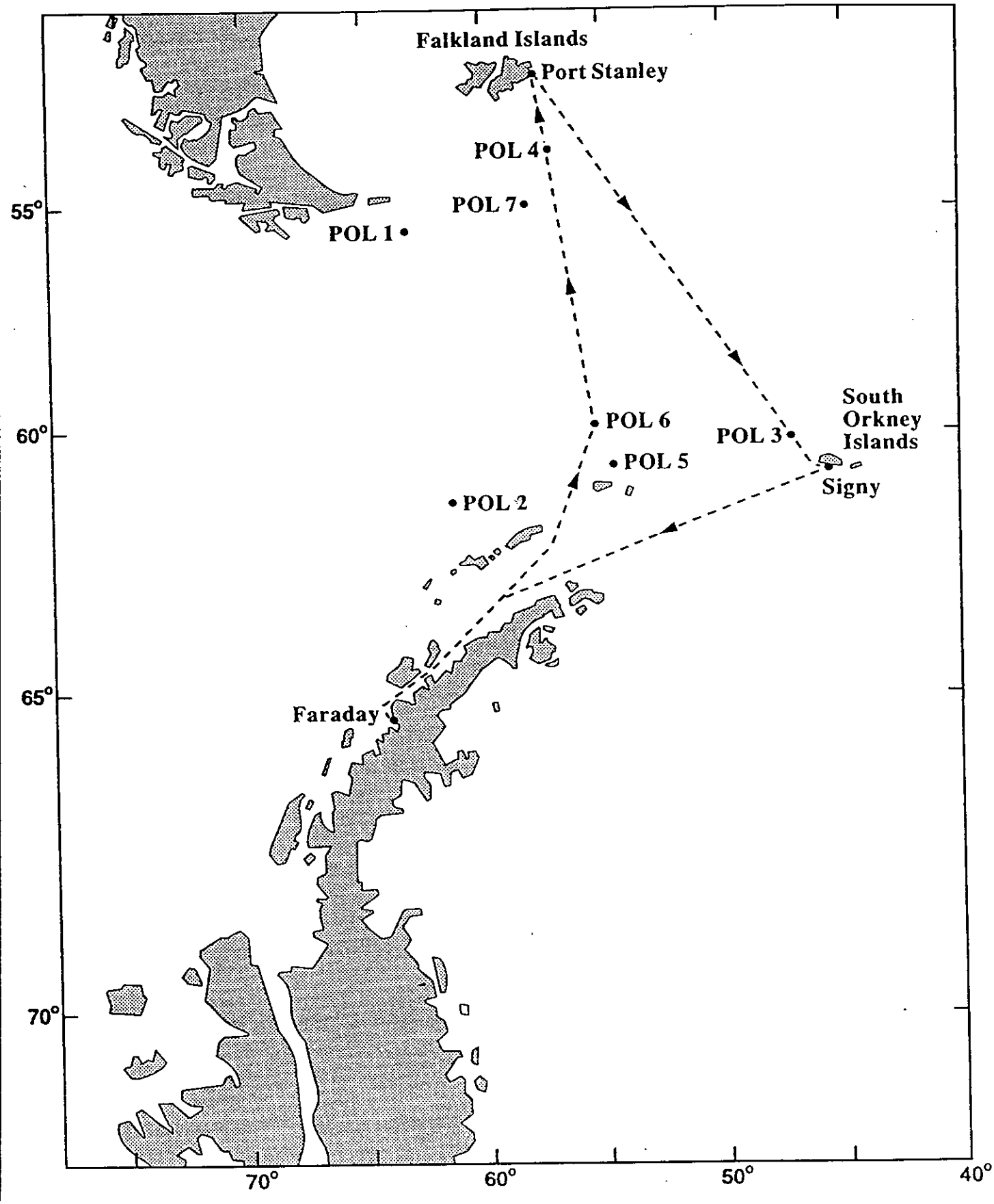
Sensors

Channel 1 = DQ 41079	32,260 Hz
Channel 2 = DQ 41083	32,315 Hz
Channel 3 = DQ 41097	33,299 Hz
Channel 4 = 2T4 (Pre ÷ 128)	3738 Hz

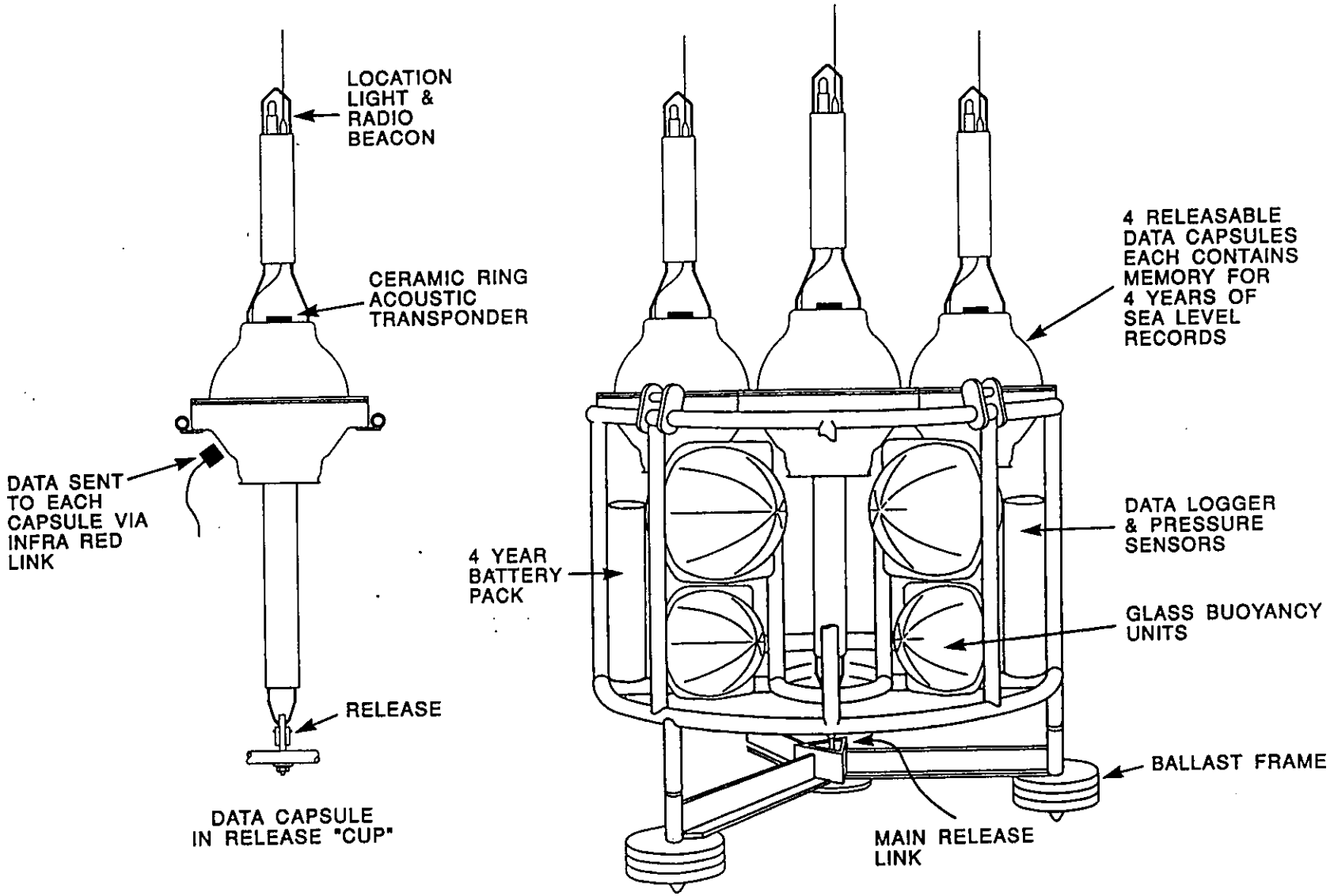
Monday 16 Nov 1992
Instrument opened at 1645Z scan no. 29918
Last scan no.29920 at 17:12:42Z 16/11/92
Batteries;-
Motor = 18.52V
W/BN = 13.88V
W/O = 13.96V
W/RD = 13.96V
G/RD = 9.24V (sensor had a very small leak on lead)
0/BN = 13.90V



BPR/IES/SLR Deployments 1992/93 Season Leg1



BPR/IES/SLR Deployments 1992/93 Season Leg 2



"MYRTLE" - MULTI YEAR RETURN TIDE LEVEL EQUIPMENT