CSIRO

MARINE LABORATORIES

Division of Fisheries Research
Division of Oceanography

A Division of the Institute of Animal and Food Sciences
A Division of the Institute of Physical Sciences

Castray Esplanade Hobart Tas 7000

GPO Box 1538 Hobart Tas 7001
Telephone (002) 20 6222 Telex AA 57182
Facsimile (002) 23 7125

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CRUISE SUMMARY
R.V. FRANKLIN
FR 3/85

Itinerary

Depart Hobart	1030 hours Saturday June 8, 1985
Arrive Brisbane	0900 hours Monday June 17, 1985
Depart Brisbane	1200 hours Tuesday June 18, 1985
Arrive Cairns	1500 hours Thursday June 27, 1985

Scientific Programs

1. Time and Space Variability of the Great Barrier Reef Undercurrent.
2. Coastal Circulation due to Alongshore Pressure Gradients.
3. Sea mounts of the Tasman Sea: Geochronology, Geochemistry and Origin (seamount dredging).

Principal Investigators

1. Dr J.A. Church
   Division of Oceanography
   CSIRO Marine Laboratories
   GPO Box 1538
   HOBART Tas 7001
   Tel: (002) 206 207

2. Dr J.H.F Middleton
   University of New South Wales
   P.O. Box 1
   KENSINGTON NSW 2033
   Tel:

3. Dr I. McDougall
   Research School of Earth Sciences
   Australian National University
   Tel:

Associate Investigators

1. Mr F.M. Boland (CSIRO)
   Dr J.C. Andrews (AIMS)

2. Dr J.A. Church (CSIRO)

3. Professor D.H. Greene
Dr R. Varne
Dr A. Crawford
Dr T. Falloon
Mr N. Olding
all of Geology Department
University of Tasmania
GPO Box 252C
HOBART Tas 7001
Dr M.T. McCulloch (RSES-ANU)

Cruise Objectives

For Scientific Program 1

(a) To deploy 5 current meter moorings at the section offshore from Townsville

For Scientific Program 1 and 2

(b) To complete CTD sections on the sections indicated on Figure 1. These sections comprise a total of 66 CTD stations (all to within 50m of the bottom).

(c) To obtain Acoustic Doppler current profiler (ADCP) sections for the period after departing from Heron Island. This includes several ADCP sections into the entrance of Hydrographers Passage.

For Scientific Program 2

(d) To deploy 3 pressure gauge moorings at the outer edge of the Great Barrier Reef.

For Scientific Program 3

(e) To complete seamount dredging on as many of the seamounts between Gascoyne Seamount and Recorder Guyot (inclusive) as is possible.

The sections outlined in (b) and (c) are to be repeated on RV Franklin Cruise FR 6/85. The equipment deployed in objectives (a) and (d) is to be recovered on FR 6/85.

Cruise Narrative

The cruise track together with various station positions are shown in Figure 2.

R.V. 'Franklin' sailed at 1030. Graeme Taylor (DEC Engineer) worked out that the problem with the VAX computer was a bad section on the disk. Unfortunately, the replacement disc drive gave an error on self test but was judged sufficently reliable to be used for the remainder of the cruise. Graeme Taylor went ashore at Louisville and we received an extra terminal for use on the ship. The VAX gave no problems throughout the cruise and continued to work on the UPS through all of the power failures.

After leaving Louisville, a trial CTD station and a trial dredging station were completed east of Maria Island. The dredge was successful but the pressure channel on the CTD was faulty.

The first real dredging was completed on Gascoyne Seamount on 10 June. The dredging technique proved successful and basalt samples were recovered from Gascoyne, Taupo, Derwent Hunter and Britannia seamounts. No basalt was recovered from Recorder Seamount despite 12 hours of dredging. On one occasion, the dredge was jammed on Derwent Hunter Seamount and could not be freed by the winch. The dredge was finally freed by slowly steaming into deeper water. While the weak links deformed during this operation, they did not break. 40 m of wire was discarded from the main towing wire due to damage sustained during the dredging.

The TAC system gave problems during the dredging and after consultation with the Master and the Chief Engineer it was decided to go to Brisbane to flush out the hydraulics. The ship arrived in Brisbane at 0900 on 26 June and departed at 1200 on 27 June. This delay and the extra steaming time meant that about one days work was lost from the first and second sections of the cruise. To allow for this lost time, dredging on Recorder Seamount was curtailed and a number of CTD stations deleted from the cruise plan.

The first few CTD stations offshore from the Great Barrier Reef took longer than anticipated because of a) lack of familiarity with the system, b) problems with the spooling gear and c) power failures. On the second CTD station, the protective covers for the sensors were left in place as a result the oxygen sensor was damaged. After these early problems, a smooth routine was established. The CTD hit the bottom near the end of the cruise but no obvious damage was sustained.

The three pressure gauge moorings were deployed on the 175 m isobath on the seaward side of the Great Barrier Reef. The five current meter moorings were deployed on the section between Flinders Reefs and Palm Passage. All of the moorings were deployed in a very professional manner.

On completion of the last CTD station, 'Franklin' steamed north to Cairns and calibration checks on the Doppler log were completed. Noise level tests were also completed before picking up the pilot outside Cairns Harbour at 1400 27 June.

<u>Work Completed</u>

For Scientific Program 1.

(a) All 5 current meter moorings were deployed offshore from Townsville.

For Scientific Program 1 and 2.

(b) Of the planned 66 CTD stations 50 were completed. 12 stations were deleted when the cruise was shortened and the remaining 4 stations were too close to the reef to be attempted.

(c) There is only very limited ADCP data available (see notes on equipment). No ADCP sections into the entrance of Hydrographers Passage were completed because of time constraints.

For Scientific Program 2.

(d) The 3 pressure gauge moorings at the outer edge of the Great Barrier Reef were deployed.

For Scientific Program 3.

(e) Dredging was completed on 5 Seamounts. A full report on the dredging is attached. (Attachment 1)

Equipment

A complete report on the equipment is attached. (Attachment 2)

Scientific Personnel

Hobart - Heron Island

CSIRO Divison of Oceanography
- John Church (Chief Scientist)
- Neil White
- Len Zedel
- Robert Beattie
- Ron Plaschke
- Alan Poole
- Jan Peterson
- Eric Madsen

Australian National University
- Ian McDougall

Oregon State University - U.S.A.
- Robert Duncan

University of Tasmania
- Trevor Falloon

Engineer from DEC
- Graeme Taylor (Hobart - Louisville)

Heron Island - Cairns

CSIRO Division of Oceanography
- John Church (Chief Scientist)
- Neil White
- Len Zedel
- Robert Beattie
- Ron Plaschke
- Alan Poole
- Frederick Boland
- Kevin Miller
- Dan McLaughlan
- Vito Dirita
- Jan Peterson

General Comments

Even though the ship left under prepared for a scientific cruise, I personally feel the cruise was reasonably successful. The data logging and analysis system is sophisticated but when fully operational will be a pleasure to use. I'd like to thank all those that worked so hard during the cruise and in preparation for the cruise.

I would also like to thank the ships officers and crew for their assistance during the cruise

This report was compiled with the assistance of the participants.

John Church
Chief Scientist

Attachment 1

Cruise Report - R.V. 'Franklin' FR 3/85, 1st Segment

Itinerary

Depart Hobart	1030 hours, Saturday, 8th June, 1985.
Arrive Brisbane	0900 hours, Monday, 17th June, 1985.

Scientific Program

The main program during this segment of the cruise was concerned with dredging of samples for the Tasmantid seamount chain in the Tasman Sea. This volcanic lineament extends over more than 1400 km in a north-south direction (figure 1). The individual mountains, considered to be of volcanic origin, are built on seafloor that is more than 4000 m below sealevel. The volcanoes are mainly submarine, but previously extended above sealevel. Subsequently they were bevelled by erosion and have subsided so that the relatively flat summits are now at depths ranging from 90 m for Gascoyne to more than 400 m for Recorder Guyot in the north.

The primary aim was to obtain samples of volcanic rocks from the seamounts in order to study the origin and evolution of the volcanoes, and the nature of the upper mantle source regions for the magmas. Isotopic dating of samples will help to test the hypothesis that the seamount chain is registering the passage of the Australian crustal plate over a magma source or hot spot situated in the mantle below.

Staff

Those concerned specifically with the dredging were Ian McDougall (Research School of Earth Sciences, Australian National University), Robert A Duncan (Oregon State University, currently visiting A.N.U., later to visit University of Tasmania), and Trevor Falloon (Geology, University of Tasmania).

CSIRO staff Jan Peterson, Ron Plaschke, Alan Poole and Eric Madsen all ably assisted at various times with the dredging.

The enthusiasm and professionalism of the crew of R.V. 'Franklin' were major factors contributing to the success of the dredging operation.

The Chief Scientist, John Church, contributed in important ways to the achievement of the aims of the expedition.

Dredge Stations and Results

About 4 days were spent on station undertaking dredging operations in water depths ranging from ~ 2000 m to ~300 m, but mainly at depths > 500 m.

Dredging was carried out on the flanks of 5 seamounts, with the following results:

Gascoyne:

7 dredge attempts; 3 were empty, 3 recovered calcareous material, and

one at f900 m depth yielded about 12 rounded basalt cobbles ranging up to 12 cm in diameter.

Taupo: 6 dredge attempts, all of which yielded some calcareous samples, and one at depth of 500 m brought up a very large (45 x 25 x 18 cm; > 20 kg) block of basalt.

Derwent Hunter:
4 dredge attempts, one of which provided no recovery. Two produced minor calcareous material and a basalt clast. The last dredge attempt brought up a large block of conglomerate (45 x 25 x 25 cm) consisting of water worn basalt clasts of up to 15 cm across embedded in an indurated, sandy, but basaltic, matrix.

Britannia:
3 dredge attempts were made, with very little recovery of samples. Two produced small basalt chips, one only calcareous material.

Recorder:
3 dredge attempts; no material recovered from 2 of them, but with a large haul of Mn-coated, pink, dense limestone in the other attempt.

Overall we regard the dredging operations as an outstanding success, with appropriate recovery of basalt samples from Gascoyne, Taupo and Derwent Hunter, as well as a few small basalt chips from Britannia. The samples will provide an excellent basis for initiating laboratory studies on the seamounts in order to answer the major geological questions posed. Such studies will be undertaken over the next year at the Australian National University and the University of Tasmania.

Comment on Dredging Facilities and Operations

The success of the dredging was particularly gratifying in the absence of certain equipment intended to facilitate control of the operations.

Major factors in this success were:

(a) Excellent cooperation of all concerned with the dredging.

(b) The jury-rigged tensiometer system (provided by Andrew Forbes) for monitoring the relative tension on the cable.

(c) The good communication, using the headphone system, between the various stations (bridge, PDR, tensiometer, winch, and wire angle monitoring).

(d) The superb station-holding ability of the ship.

The planned provision of a block system on the A-frame on the main aft working deck to read wire out and tension should provide much finer control and better information than was available on this cruise. Similarly, the installation of a pinger on the cable about 100 m above the dredge should materially assist in positioning the dredge on the seafloor.

To facilitate station-holding it is strongly recommended that a log repeater be installed on the bridge at the TAC station overlooking the winches and the main aft deck working area. During dredging operations, the speed of the vessel through the water needed to be relayed continuously to the deck officer at the TAC station. Despite this difficulty, control of the ship during dredging using both the thrusters and main engine was extremely good.

Ian McDougall

Attachment 2

Equipment Report on Cruise FR 3/85

CTD

The pressure channel was faulty on CTD unit 1. The CTD wire splices were good to 4000 m. The altimeter on CTD unit 1 worked but the alarm did not work.

CTD unit 2 worked faultlessly but all of the sensors need calibration. The oxygen sensor was damaged during the cruise.

There needs to be a foolproof system to ensure sensor caps are always removed prior to each station. There need to be spare oxygen (and other) sensors aboard. There also needs to be a cradle such that the underwater unit can be worked on at sea.

Software for the CTD is virtually complete. The programs are "user friendly" and produce real time listings and plots (T,S,O_2 profiles and a T/S plot). Not all of the CTD displays are automatically set up due to an unresolved problem. The tape drive also gave some problems during the cruise. Documentation for the software should be complete by the start of FR04/85.

The remote display for the CTD pressure does not work. It is important to rectify this as after a power failure the wire out meter gets reset to zero.

The two CTD underwater units and the rosettes need to be permanently labelled.

Rosette No. 2 was occasionally misfiring at the start of the cruise. It was stripped down and reassembled and gave no further problems.

The deployment procedure is good. To assist in repositioning the rosette after a cast, an additional raised area on the wet lab floor would be useful.

Two trial stations should be done at the start of each cruise. The first to check leaking bottles (fire all bottles at the salinity minimum) and the second to check that the salinity sensor is OK (fire 12 bottles through the water column).

Satnav

The program for logging the SATNAV DR data worked well. However, the DR positions provided by the SATNAV were not always very accurate. Some notes prepared on this subject are reprinted below.

I feel that the navigation data from R.V. 'Franklin' is very important. It pertains to ALL other scientific data and poor quality navigation data prejudices the quality of all other data. We should attempt to get the highest quality navigation data possible.

The present situation on R.V. 'Franklin' is that the ships gyro and the ships Doppler log are both interfaced with the Intech Satnav. The ships Doppler log has two forms of output: a) a distance run output consisiting of 200 pulses/nm, and b) a speed output as a 16 bit series BCD code. I think the former of these two is interfaced with the Satnav. One of the Micro 11s is interfaced with the Satnav and accepts: a) the dead reckoning position (once per minute) calculated by the Satnav and b) the satellite fix positions that are accepted by the Satnav.

I feel there are a number of problems with the present arrangements. These problems include:

(a) the ships officers don't have access to the printer on the Satnav.

(b) the Satnav does not allow the ships officers to reject a fix that has a large RMS error. (They can only reject fixes on the basis of distance from their DR position.)

(c) the Satnav displays (and uses) forward speeds while the ship is going astern on station. (The speeds observed are usually less than 1 knot but speeds as high as 10 knots have been noted.) and

(d) there is no estimate of the sideways motion caused by the large windage of R.V. 'Franklin'.

The ships Doppler log was calibrated before it left Cairns. Tests (on 27/6) over a measured distance offshore from Cairns indicated a calibration error of between 2% and 3%. (Note that this calibration error is just above the size of the errors involved in the tests completed.)

These problems result in inaccurate DR positions during a cruise. Only when the ships officers have an independent position estimate (such as a new satellite fix or a radar position) can the occurence of significant inaccuracies be detected. On cruise FR03/85, the largest inaccuracies of the Satnav were 20 nm when the ship was offshore from Cairns and 7 nm when approaching the first mooring location. There were numerous other inaccuracies of the order of 4 nm in the DR positions. I suspect that these inaccuracies were not caused by ocean currents. These inaccuracies make it difficult to complete a network of stations and preclude the use of the Satnav to obtain good estimates of surface currents.

The errors may also cause errors in positions where moorings are placed and create the potential for loss of a mooring.

There are a number of ways we can attempt to overcome these problems. I suggest the following should be pursued:

(a) the gyro and the ships Doppler log should be interfaced directly with the navigational Micro. We already have a working interface for the gyro and the ships Doppler log has output in the form of a 16 bit series BCD code. The Doppler log has a filter applied to the display and I am unsure whether the BCD data would be similarly filtered.

(b) use the Micro to do the dead reckoning based on ships speed and heading and on satellite fixes. We would have the flexibility to reject fixes with a high RMS error. The dead reckoning should allow for sideways motion of the ship. In the long term, we could measure this sideways motion with a two component log, but at present, we should estimate it from the observed wind. We should be able to make some estimates of the wind induced drift from the ADCP data collected during this cruise.

(c) in the longer term, we should consider purchase of at two component log to measure the sideways motion. There are a number of reasons why a separate unit to the ADCP should be considered.

These include :i) the output from the two component log would be available to the ships officers, ii) the ADCP will generally be used with a large bin length to get maximum depth penetration and not to measure the speed relative to the water immediately under the ship. The ships present Doppler log measures the speed between 1.8 m and 3 m below the ship. iii) the ADCP does not appear to work well for the first couple of bins, and iv) a ships component log would be well maintained by the ships crew and would be available on all cruises (whereas the ADCP may not be run on all cruises).

We should continue to do the back calculations after each new satellite fix but we would include the above data in the back calculation. Besides giving us better real time estimates of position, the above procedures would free the Satnav printer for use by the ships officers. We would only require that the Satnav be set up to print all satellite fixes. Procedures a) and b) should be pursued whether or not a GPS system is bought. They will be essential for estimating surface currents even after purchase of the GPS system.

We need to complete calibration checks on the Doppler log. These calibration checks should be maintained until we are confident with the Doppler log calibration and, just like standard CTD stations, need to be a regular component of cruises.

The next generation of navigation aids is Global Positioning System (GPS). This system is already available for a limited number of hours each day and is to be complete in a couple of years. GPS will provide accuracies of the order of a few tens of meters (continuously) as well as direct speed estimates. GPS navigation systems are already being used by USA research ships. My understanding is that on completion of the GPS network, the present system of transit satellites will no longer be supported. Note that while GPS can be used to estimate speed over the ground it does not provide relative speed through the water. In the next year to 18 months, we should purchase the most suitable GPS system for our purposes. We need to immediately pursue what systems are available and the possibility of our long term access to the precision codes of the GPS. Alex Papij has suggested that David Edwards should be given the job of investigating the GPS system and its availability.

ADCP

The ADCP is a sophisticated instrument that must be controlled by a host computer through the use of a large number of commands. Inadequate documentation is provided on these commands in the manual and this caused great difficulty in operating the ADCP. Also, RD Instruments have just informed us of a fault in their software which explains some of the problems encountered on the cruise.

Despite these problems, some ADCP data were collected and we did establish that the ADCP works and can probably obtain profiles to 400 m.

The evaluation of ADCP performance was hampered by the absence of real time graphics output and hard copy. Post data collection displays on the one colour graphics VDU on board 'Franklin' clearly demonstrated the advantages of graphics display for the evaluation of Doppler data. The usefulness of these post data collection displays was restricted because with no hard copy graphics device, comparisons between various operating modes was nearly impossible. Both a colour graphics terminal and some hard copy graphics device are required in order to develop and use the ADCP to its full potential.

At present communication between the ADCP and the host micro PDP-11 is through a serial RS-232 port. This interface is not well suited to transferring the large quantities of data produced by the ADCP. Among other minor problems associated with this interface, the system overheads involved using the RS-232 serial link cause data over runs to occur whenever the micro-11 has the DECNET communications package enabled.

Since inter-computer communication is fundamental to our objective of an integrated data logging environment, inhibiting DECNET on the Doppler logging Micro-11 is not a solution to this difficulty. A solution to this problem is to use the parallel Direct Memory Access (DMA) interface which is also available on the ADCP. In order to use this facility, we must acquire a DMA, GPIB interface for the Micro-PDP. As well as solving the data over run problems, this interface will solve some of the other communication problems caused by using the RS-232 interface.

Our understanding of the ADCP is not yet at the stage where useful service can be provided to external users. At the present time, I recommend that outside users can use the existing software but that CSIRO will do no data processing.

Scientific Sounder

The EK 400 worked well as long as the 0-5000 m range was not used.

Thermosalinagraph

The digital output from the thermosalinograph worked flawlessly when the pump was working. However, the analog recorder gave problems a couple of times.

For part of the cruise, the data was logged by one micro and written to tape on a separate micro. The value of this data is questionable until a reliable time base is supplied.

The thermosalinograph pump takes in air in the slightest headsea.

Met Station

The software for data logging is nearing completion. However, several sensors do not appear to be providing realistic data.

Intercom

The operations room speaker was faulty but was repaired during the cruise.

There needs to be a non head-phone intercom at the wet lab entrance.

The mooring group require to be able to listen to any communications between the rear deck and the bridge. To do this from any point on the rear deck requires a FM intercom system. These are commercially available at less then $200 /pair.

XBT

The XBT system was not used but the stern launcher has a slight leak at the hull mount.

Computer System

A complete report by Bob Beattie is attachment 3.

There is a shortage of teminals and graphics capability on the new ship. (See attachment 4)

The time needs to be sent round the computer network. Again, this is an urgent problem.

The program for entering the rosette data works well, but I have suggested some modifications. This program should be used immediately and cruise leaders (Chief Scientists/Cruise Manager) should ensure that all rosette data is entered as it becomes available.

Inmarsat

The telex facility is very useful. The antenna does not allow for changes in ships heading and this requires attention. There needs to be a definite policy about telex communications. I suggest that there sould be telexes sent to Hobart every Monday, Wednesday and Friday regardless of whether there is anything to say or not.

Moorings

I was impressed with the professional way in which the moorings were prepared and deployed.

Miscellaneous Items

There is an urgent need for a 24 hour (UTC) time display in the operations room.

There needs to be pen holders distributed in work areas (for biros, pencils and plotter pens).

There needs to be a boot for the salinity sensors on CTD unit 1.

A vent pipe for the PDR recorder is desirable.

Need Max/Min thermometers for operations and computer room.

Need a large piece of carpet (that does not move) at entrances from main deck. This item is **urgent** as otherwise there will be serious accident at some time.

A quality control program was implemented for the hydrology data. Quality control programs should be regularly used on the ship and in the lab.

The CTD winch speed indicator needs a light and should be rotated such that the correct speed is attained with the needle in the upright position. Test indicate the real speed is 54 m/min for a dial reading of 60 m/min. The winch should not be operated above a real speed of 60 m/min (70 m/min dial reading). We operated at a dial reading of 65 m/min.

10" rather than 7" Analog tapes for the CTD would be desirable.

One of the spotlights obscures the winch drivers view of the CTD coming out of the water.

"No Wet Gear" signs should be placed on electronics and computer room doors.

Bookshelves accessible from the bunks are desirable.

There needs to be a small stationary store on the ship.

The two filing cabinet drawers in the Chief Scientists cabin should be fitted with hanging files. One of these could be used as a temporary store for copies of event logs etc.

A filing cabinet for storage of scientific information is required. Possible locations are the drawing office and the store room attached to the scientists laundry.

A basic set of charts should be provided aboard the ship as well as a place for safe temporary storage of personal charts etc.

Attachment 3

Computing Report Cruise FR 3/85

A Hardware

1. The VAX performed faultlessly after the Head-disk assembly was replaced by the DEC engineer. It was unaffected by the 100 Hz noise on the UPS and kept near perfect timing throughout the cruise.

2. The Micro-11's performed well, with 2 notable exceptions.

   (a) The bridge micro suffered progressive corruption of data on one of the disk drives, to the point that it was almost unuseable. It was replaced with a micro from the computer room and by the end of the cruise this unit had suffered a similar fate. The cause is unknown - but it is probably some form of interference via power leads or the serial interface cables. (The initial MICRO could not be faulted after the software was re-built on the disk.)

   (b) Of the 3 Micro-11 tape drives on 'Franklin' at the end of the cruise, one had snapped a tape and another was giving intermittent hardware errors. DEC Cairns will be checking them over.

3. Peripherals

All printers, terminals, plotters etc, should be connected to the UPS where possible. There were at least 3 black outs on the cruise, one of which damaged the plotter. The DEC engineer also told us that VT220 terminals tend to 'blow up' terminal ports when they are switched on.

4 General

(a) I have been disappointed with the reliability of the Micro-11's and their peripherals especially the tendency for CPU boards to 'lose' terminal ports.

(b) It is important that the 50 Hz references for the micros be completed ASAP, in order to minimize the chance of equipment failures during black outs and to provide a reliable time base. (The ships supply ran at about 51 Hz)

(c) More terminals, especially graphics terminals, are required. See letter from Self, John Church and Neil White.

Software

1. CTD

Neil has extensively re-written the CTD software which is now 'user friendly', and reasonably 'crash proof'. It does have a tendency to 'hang up' the CTD when setting up the display parameters on the DECK unit.

Little further development is required on this system except to get position etc. automatically, when this is available.

2. Satnav

Apart from minor fine tuning and the hardware problems with the bridge MICRO, the Satnav programs performed flawlessly. We have raw dead reckoning (DR data) for approximately 85-90% of cruise. Back interpolated positions should be available for the Truk cruise. (David is not convinced that the back interpolated data will be that accurate, as the set, drift, ships speed etc. sent by the Satnav now are rounded to the first decimal point. For this, and other reasons, to be expounded by John Church, it is ESSENTIAL that we be able to log ships speed and heading independently so we can perform our own dead reckoning calculations.

3. Thermosalinograph

A rudimentary TSG logging and file transfer program was operational. It demonstrated the feasability of logging data on 1 micro and sending it to a second micro for recording on tape and to the VAX. We have semi-complete TSG data for approximately 2/3 cruise but it is of limited value owing to the inacurate time-base. TSG logging was suspended due to a terminal breakdown and the unreliability of the TSG pumping system.

4. Met Station

Jan's Met programs are more or less complete except for the transfer of files to tape and the display section.

Black Holes

The most critical areas in need of attention are the provision of an accurate and consistent time base throughout the network and the provision of an integrated display of position, met data etc. I envisage that the latter would provide:

(a) A means of making such data available to all programs on the network.

(b) Display of selected items.

(c) Monitoring of logging programs on network and raising the alarm in the event of a failure.

Hardware and Software Maintenance and Operation

It became apparent on the cruise that some one with a degree of familiararity with RSX and VMS will be required to manage the operation of the computers, especially in Non CSIRO cruises. It is also apparent that the one person cannot be expected to provide this service on every cruise.

In the short term, eg. AIMS cruise, Peter Richards would be an ideal candidate provided Fisheries is willing. He is not an RSX expert but has sufficient VAX experience and inate intelligence to solve most problems.

We have been building up a degree of in-house expertise for CSIRO cruises - eg. Len Zedel and Neil White could be expected to provide some assistance. However, I feel the best long term solution is to train selected OMS and

Electronics personnel for the job. Alan Poole was a computer maintenance engineer with Telecom and is interested in getting training with the DEC hardware. He also said he was interested in learning about the computer operations, Jenni Pragnell is also another likely candidate.

To this end, I am thinking of running a 3 or 4 day course on RSX sometime after the Truk cruise. It would be open to potential sea going operators and to anyone else who felt they should know about it.

Bob Beattie

Attachment 4

Terminals on R.V. 'Franklin'

There is a shortage of visual display units (VDUs) on R.V. 'Franklin'. There are currently six, which are being used as follows:

(a) one terminal in the operations room for the CTD computer. At present (16/6), this terminal is in use about 12+ hours a day for program development. Next week, I expect this terminal to be in use for a similar period each day for CTD data logging. I presume this terminal will also have to be available for XBT data logging. This terminal must be left logged in to the CTD account or else the subsequent processing and writing of data to magnetic tape will not occur.

(b) a second terminal in the operations room for the ADCP. Again this terminal is presently being used 12+ hours a day for program development. In the longer term, I expect that one terminal will be necessary to run the ADCP on a cruise. It may be possible to rack mount this terminal.

(c) a terminal in the computer room attached to the data logging micro. This terminal has been used intermittently for program development and for checking the status of various programs.

(d) a second terminal in the computer room connected to the VAX. This terminal has been used by myself for developing the cruise planning program and for cruise plannng through the first stage of the present cruise. It has also been used by Alan Poole and Eric Madsen for electronics work and by Ron Plashke for OMS work.

(e) there are also a terminals in the communications room and on the bridge. I suspect that one of these terminals could be eliminated in the longer term. At present, both of these terminals are in use for program development and for displaying information.

All of the above terminals have been used for remote display of position at various stages. However, there is often not a free terminal available for this purpose. We have been using terminals for simultaneously doing program development and for running data logging programs. While this may be satisfactory when not much data is being logged, it will be unsatisfactory on a normal cruise as the data logging programs will abort (with some loss of data) if someone inadvertantly logs off.

The VAX has given no problems during the cruise and I (JC) personally have used it for cruise planning purposes. Despite the embryo state of this program, I have found it invaluable during our current problems on this cruise and also for determing how much dredging time is available for the geologists. I expect the VAX will become more and more useful as software becomes avaiable.

To fully utilise the potential of the VAX for processing data, cruise planning, and altering cruise plans bases on the analysis of data and the developing situation of the cruise, it is ESSENTIAL for there to be more terminals connected directly to the VAX.

Obvious places for extra terminals are (a) the chemstry lab, (b) the electronics lab, (c) the GP lab and d) the Cruise Leaders cabin. The scientists cabins also provide a quiet working environment when the other occupant is absent.

It would be difficult to put more easily accessible terminals in the operations room and the computer room is most unsatisfactory for extended operation because of the noise level. (The noise level seems loud enough to be injurious to hearing. Even if this is not the case, it causes a considerable drop in concentration and efficiency after an hour or so.)

There is also a need for a slave VDU in the operations rooms to display position, heading, speed and met data. This VDU should also monitor the status of all the data logging micros and sound an alarm as soon as a failure occurs.

The second point of this memo is

RE-GRAPHICS CAPABILITY

The only graphics hardware on the R.V 'Franklin' is the ZETA plotter connected to the VAX and one colour graphics terminal (VT241) that is in a temporary rack mount.

I have used the ZETA plotter and it works well. As more software becomes abailable, this plotter will become a vital part of oceanographic work on board R.V. 'Franklin'.

The graphics terminal is presently being used by BOTH the CTD micro and also the ADCP micro. The real time plotting of CTD data is very good. Not only are profiles of temperature, salinity and oxygen plotted, but a TS curve is plotted and the calibration values are plotted. I expect the real time display of ADCP data to reach a similar stage. The switching is done by switching plugs in the back of the terminal. I consider this an undesirable mode of operation, particularly for non CSIRO users who will be less familiar with the equipment. It will also be necessary to display information from both the CTD and the ADCP simultaneously. This need is not satisfied at present.

It appears to me that the initial estimate of four colour graphics terminals for the ship may not be far wide of the mark. One graphics display would be for the CTD and one for the ADCP. Both should be rack mounted in the operations room and both NEED to be colour displays. There should also be a colour display for the VAX. This terminal could also be rack mounted and would double as infrequently used terminal for the VAX. I (JC) consider that there should be a colour graphics terminal in the Chief Scientists cabin so that he can analyse data and do cruise planning without the distractions of other staff. There is lots of other equipment for R.V. 'Franklin' and I am sure there are other needs for colour graphics displays.

At the present time, if the VT241 breaks down there is NO graphics terminal of any sort on board.

I do not think the above stated requirements replace the need for drum plotters. Hard copy plots are still very useful for studying during the cruise and also could be taken with the Chief Scientist at the end of the cruise before the final data is available. Also, when processing data for outside users, a hardcopy of the plots produced during the cruise will be, in some instances, essential.

J. Church
N. White
R. Beattie

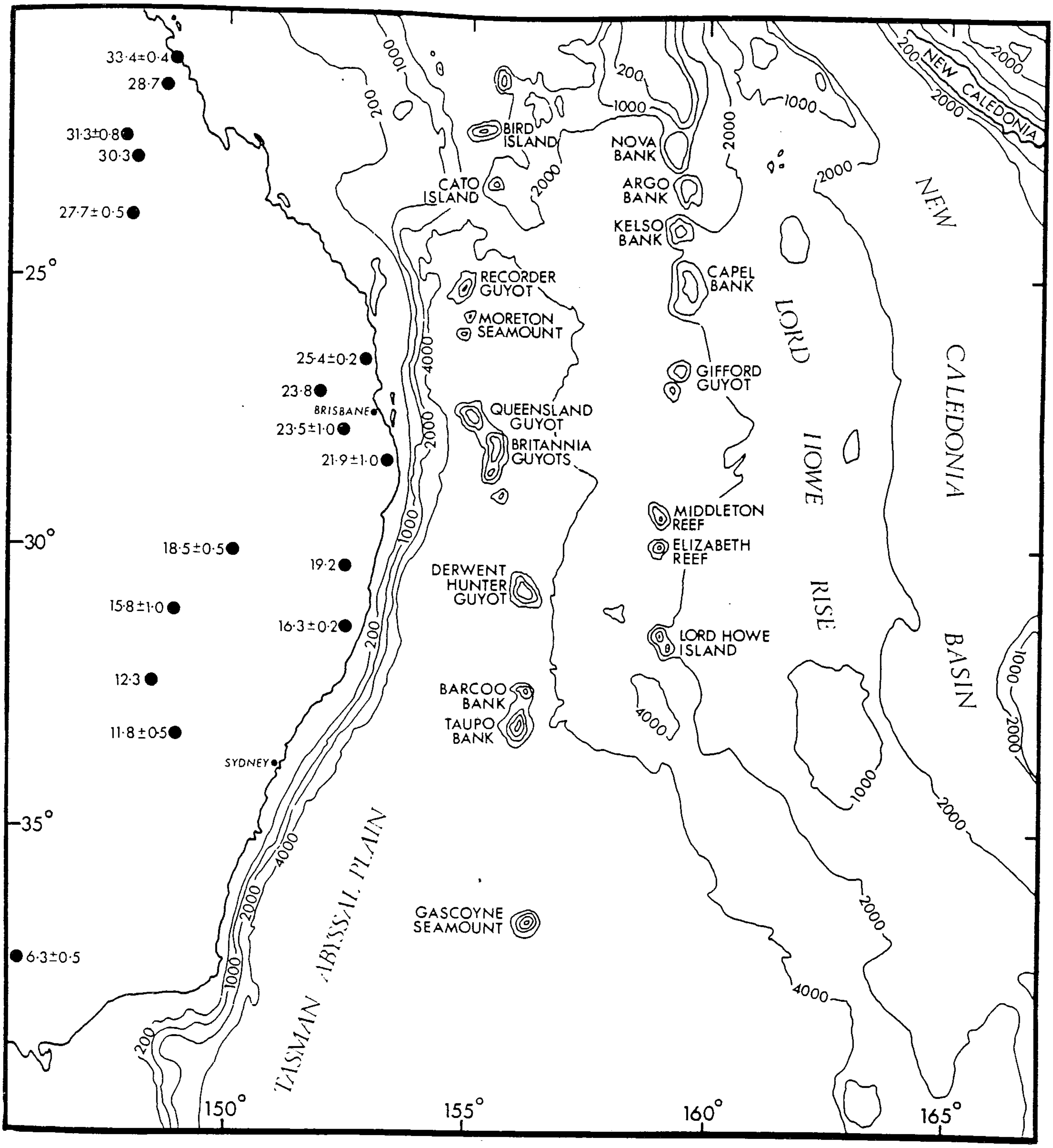

Figure 1. Bathymetric map of the Tasman Sea showing the Tasmantid and Lord Howe Seamount chains. Isobaths in metres. Filled circles in eastern Australia show locations of central volcanoes and their average K-Ar ages.

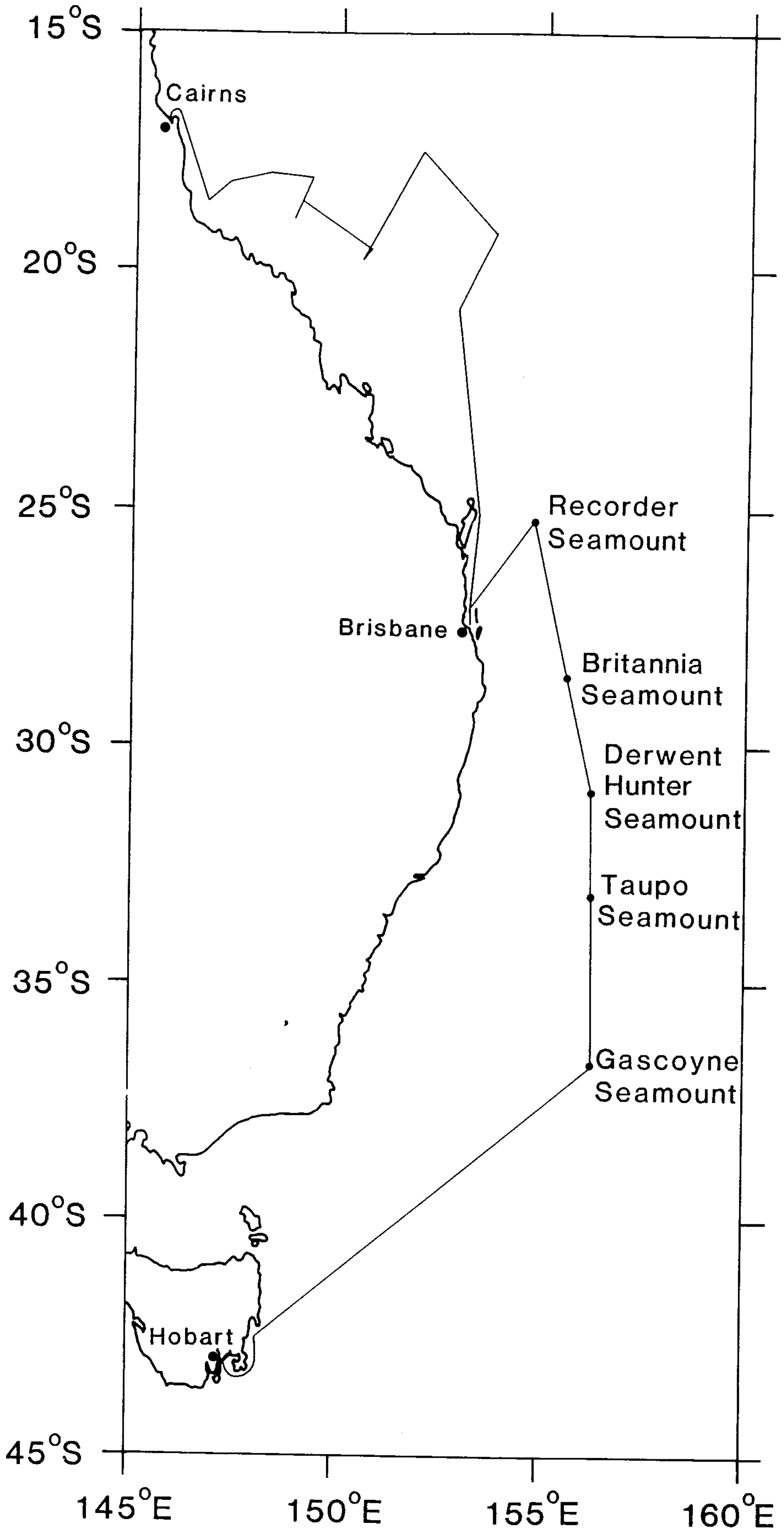

FIGURE 1

CRUISE TRACK RV FRANKLIN CRUISE FR 3/85

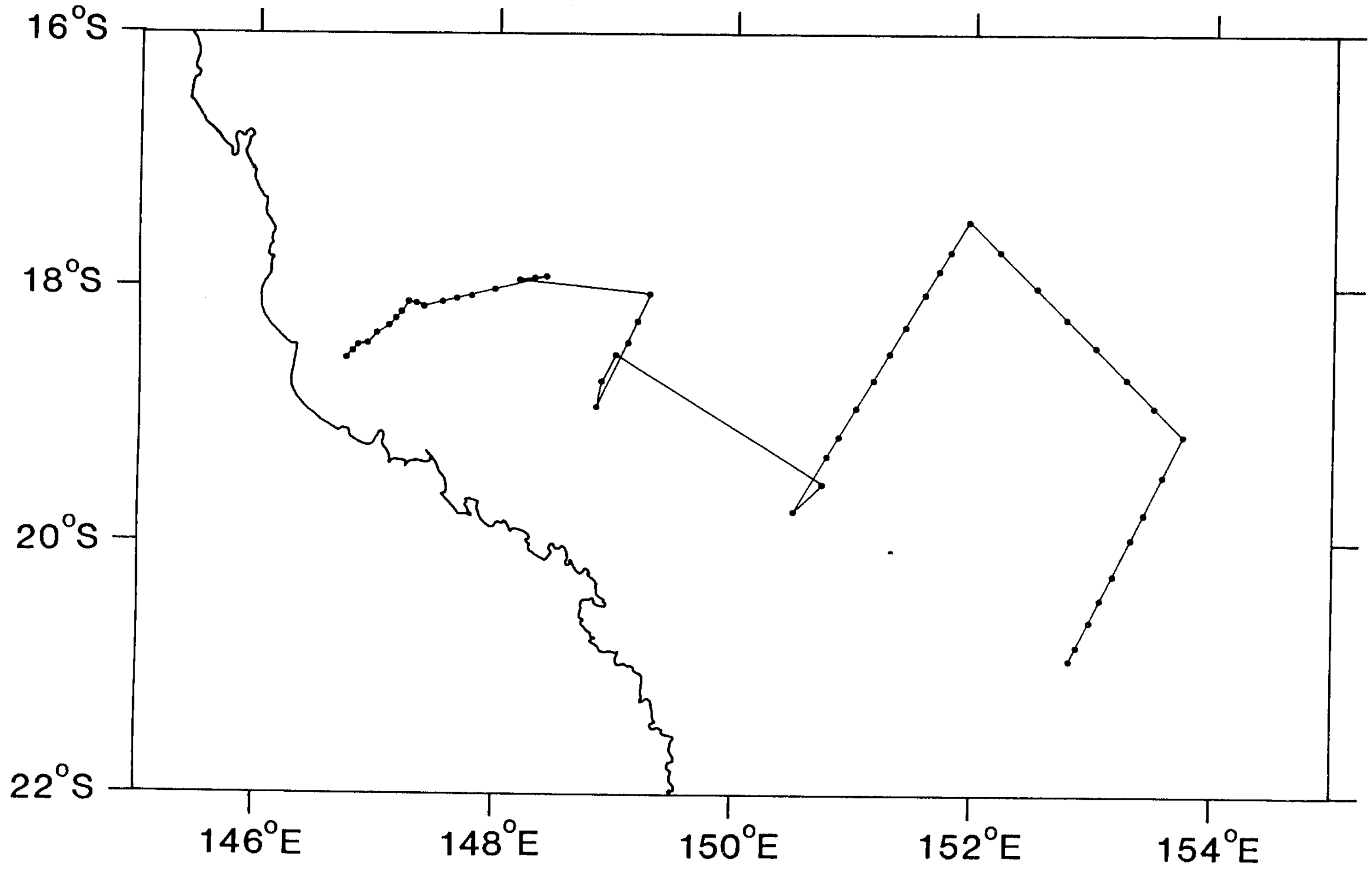

FIGURE 2

CORAL SEA CRUISE TRACK AND STATION POSITIONS RV FRANKLIN CRUISE 3/85