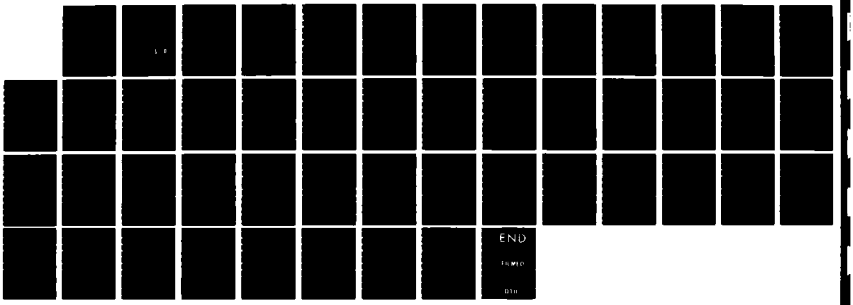
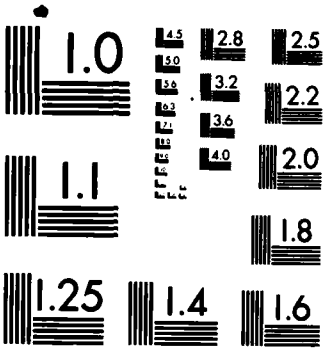




MICROCOPY RESOLUTION TEST CHART
NATIONAL BUREAU OF STANDARDS-1963-A

1984-85

DEPARTMENT OF DEFENCE (NAVY OFFICE)

12

AR-004-405

AD-A162 023

REPORT

of the

HYDROGRAPHIC SERVICE

ROYAL AUSTRALIAN NAVY

for the year ended 30th June 1985

Issue number 21

APPROVED

FOR PUBLIC RELEASE

CONTENTS

HYDROGRAPHIC SERVICE

ANNUAL REPORT 1984-85

1. INTRODUCTION

This report describes in brief terms the work of the Hydrographic Service, Royal Australian Navy.

The period covered by this report, 1 July 1984 to 30 June 1985, is selected to provide an up to date account for the annual meeting of the National Mapping Council which will be held in October 1985.

J S. COMPTON
CAPTAIN RAN
HYDROGRAPHER RAN

2. GENERAL

The RAN Hydrographic Service, the national authority for hydrographic surveying and charting in the area of Australian responsibility, also manages the Australian Oceanographic Data Centre. The meteorological functions required by the RAN also form part of the Hydrographic Service.

The year 1984-85 has been one of change. At sea, the first of the Interim Survey Ships, HMAS BETANO, has been transferred and is currently conducting surveys on the Queensland coast. Ashore, a review of the organisation and establishment of the Hydrographic Office has been implemented.

The Defence Co-operation Programme sponsored deep water survey in Vanuatuan waters was completed in 1984. A similarly sponsored survey in Western Samoa has been commenced. A detached party also visited Antarctica waters during the southern summer.

There has been progress with various projects. A fully staffed Project Team for the Laser Airborne Depth Sounder has been established in Canberra and tenders have been received for the Hydrographic Information System.

Hydrographic and oceanographic data is received in the Hydrographic Office from a wide range of sources. The manner in which this information is freely given by private companies and government authorities is appreciated for it is from this data that the understanding of the marine environment is improved to the benefit of all.

3. HYDROGRAPHIC SURVEY OPERATIONS AND PLANS

A. SHIP REPORTS

HMAS MORESBY

Commander P.A. Hardy R.A.N.	1 July 84 - 4 December 84
Commander J.W. Leech R.A.N.	5 December 84-

MORESBY celebrated her 21st year in commission on 6 March 1985 having steamed a total distance of 736758 miles in that period. The ship commenced an extensive refit in August which, with lengthy post – refit trials, carried through to mid March 1985. Despite this period in dockyard hands MORESBY has made good progress with surveys on the Western Australian coast.

The following surveys were commenced, or completed by MORESBY during the period covered by this report:

Point Cloates to Cape Cuvier.

The month of July 1984 was spent in the continuation of the survey from Point Cloates to Cape Cuvier on the mid-west coast north of Shark Bay. This survey was bedevilled by external interference to the Argo position – fixing system; the origin of these problems remains unidentified. Despite these difficulties the featureless nature of the sea-bed in this area allowed rapid progress to be made and, by completion of sounding on 26 July, the survey had progressed south to latitude 24°24'S.

Prior to her return to her home port for the major refit MORESBY made a brief visit to Christmas Island in the N.E. Indian Ocean where she carried out a small amount of deep-water sounding in the south-west approaches to the island.

LADS Trials.

Patrol Craft HMAS GERALDTON was used to carry out a large scale survey of small extent in depths of 45 metres off Rottnest I. This survey provided comparative data to validate the depth-bias model being developed for the Laser Airborne Depth Sounder project.

HMAS FLINDERS

Lieutenant Commander M.A. Bolger R.A.N. 1 July 84 - 9 January 85

Lieutenant Commander D.C. Holliday R.A.N. 10 January 85-

The period of this report has been a highly successful and productive one for FLINDERS with two major surveys and numerous minor surveying tasks completed. A main engine failure in February was speedily rectified by the efficient interaction of Naval Stores, RAAF Transport, CAIRNS-Base and Ship's engineers.

The following surveys were commenced or completed by FLINDERS in the period of this report:

Weipa South.

The first three weeks of July 1984 were spent completing this survey which extended modern sounding south from Weipa to the Archer River on the eastern side of the Gulf of Carpentaria.

Simpson Channel.

In an attempt to determine the navigability of passages through Torres Strait and possibly develop an alternative route to Prince of Wales channel, FLINDERS carried out a detailed reconnaissance of Simpson and Dayman Channels in the last week of July 1984.

Although plagued by poor weather and the complex tidal regime of the area FLINDERS did prove Simpson channel to be navigable albeit very constricted at its western end. A large-scale survey of this channel and its eastern and western approaches is planned for 1987.

Brooke Isles to Albino Rock.

This survey, in one of the most picturesque areas of the Australian coast, involved the sounding of the main Inner-Reef shipping route to the east of Hinchinbrook Island and the Palm Islands. It was undertaken between September and November 1984. A secondary task was the checking of shoals and reef positions in and around Palm Passage; this passage is now regularly used by vessels in the coal trade to and from Queensland ports.

Low Isles to Lizard Island.

In January 1985 FLINDERS commenced sounding at the northern limit of a large area covering the Inner Reef shipping route from Lizard Island to Low Isles north of Cairns. This is the last section of the Inner Route not surveyed by modern methods. Sounding coverage will be extended into the outer reef in the Ribbon Reef and Cruiser Pass areas.

Provision of control for this survey has proved difficult due to the elongated shape of the area and the paucity of geodetic control on the coastline south of Cooktown. Extensive use of the Magnavox 1502 geoceiver has been made for the first time by the RAN Hydrographic Service and this has greatly facilitated what would have been a major geodetic operation.

In late February/early March FLINDERS used Side Scan Sonar and her diving team to find, and determine the least depths over, the wrecks SAFARI and ERICA J lying on the sea-bed in the main shipping route near Berwick I.

FLINDERS commenced a major refit in Cairns in April 1985.

HYDROGRAPHIC OFFICE DETACHED SURVEY UNIT (H.O.D.S.U.)

Lieutenant Commander R.E. WARD, RAN

Defence Co-operation Programme (D.C.P.) – Ocean Bathymetric Survey – Vanuatu

A naval party of seven was assembled and embarked in the Department of Transport motor vessel "CAPE PILLAR" from May to September 1984.

The ship, which was funded by the Australian Development Assistance Bureau (A.D.A.B.) was fitted out with a deep water echo sounder and Omego/Satnav fixing system.

Over 26000 miles were steamed in surveying approximately twenty-five percent of the Vanuatuan Exclusive Economic Zone. 43 Seamounts were discovered and a significant number of others found to support less water over them than was previously known.

Three inshore surveys were also carried out in selected bays and anchorages in the island group using the ship's boats.

The data collected from the survey has been forwarded to Vanuatu and the U.K. Hydrographer who will use it to update charting of the area.

Survey Reconnaissance – Australian Antarctic Territory – (A.A.T.)

The Detached Surveys Officer was accompanied by a Chief Petty Officer Survey Recorder when he took passage to Antarctica in M.V. ICEBIRD in January and February 1985. ICEBIRD is chartered by the Antarctic Division of the Australian Department of Science and is used to carry stores and personnel to the Australian Antarctic bases.

Survey reconnaissance was undertaken at Davis and Mawson stations using both ships boats and a jury-rigged amphibious vehicle operated by the army. Additional information was provided by both the mariners engaged in operations in Antarctica and the scientific community.

ICEBIRD herself struck an isolated rock upon departure from MAWSON, dramatically illustrating the need for further surveys in the area. Similar occurrences have taken place with other ships in previous years.

A report has been produced identifying the requirement for improvements to charting in A.A.T. and suggested options to achieve this. This report is now being considered.

Manning

Until very recently the Officer-in-Charge has been the only permanent member of the Detached Survey Unit; the remainder of personnel being loaned temporarily without relief from other ships and establishments. This practice has resulted in a reduction of the capabilities and versatility of the Unit in a number of cases.

In April 1985 approval was given for a Petty Officer Survey Recorder and an Able Seaman to be permanently attached to the Unit heralding an improvement to the situation.

Current Deployment

The Detached Survey Unit is currently embarked in M.V. CAPE PILLAR, surveying the Exclusive Economic Zone of Western Samoa under the Defence Co-operation Programme and is due to return to Australia in September 1985.

B. HYDROSCHEME/SURVEYS PLANNED

Hydroscheme.

Hydroscheme 86 is the document which promulgates the RAN's surveying and charting programme for the period 1986-1990 (inclusive) to meet Defence and other National requirements.

The concept of a 5 year forward plan for RAN hydrographic surveying activities was introduced in 1960. Early Hydroschemes were developed by the Hydrographer after direct consultation with maritime commercial interests and maritime authorities.

In 1975 this concept was modified as it was considered that the Marine Operations Division of the Department of Transport was best placed to ascertain the commercial viewpoint and to evaluate the economic advantages that might accrue from hydrographic surveying activities.

Because any programme involving ships and the environment is susceptable to delays, and because, as time goes by, new requirements for surveys and charting can arise which may alter priorities previously allocated, it has been found that Hydroschemes become out-dated well before their planned 5-year time-frame has come to an end. To overcome this, it is intended that the Hydroschemes will be brought up-to-date and re-issued annually, thereby becoming a 5-year rolling programme.

Copies of Hydroscheme 86 will be available on request to those organisations not included in the automatic distribution of the publication.

Surveys Planned.

The following surveys are planned for the period July 1985 to June 1986:

HMAS MORESBY

a. Steep Pt to Shoal Pt, (north of the Abrolhos Is. W.A.),

b. Sahul Banks,

c. S.E. Approaches to Esperance,

d. N.E. Joseph Bonaparte Gulf.

HMAS FLINDERS

a. Cairns North, (Low Isles to Lizard I),

b. Coral Sea Reefs, (Holmes Rf to Lihou Rf),

c. Papua/New Guinea, (Ward Hunt Strait to Star Reefs. Shipping route east of Woodlark I.)

HMAS BETANO

a. Cairns North, (with HMAS FLINDERS),

b. Shoalwater Bay.

HMAS BRUNEI

a. Shoalwater Bay,

b. Arnhem and Coburg Pen to C. Wessel, (reconnaissance for major surveys commencing in 1987).

HYDROGRAPHIC OFFICE DETACHED SURVEY UNIT.

a. Western Samoa (continuation),

b. Antarctic,

c. Further S.W. Pacific DCP survey.

4. OCEANOGRAPHIC OPERATIONS

A. SHIP REPORTS

HMAS COOK

Commander T.E. Lewis, RAN 10.3.84-

Data Logging System

The highlight of the past year has been the installation and trialling of the ship's long awaited Data Logging System. Development of the Data Logger was completed at the Advanced Engineering Laboratory at the Defence Research Centre, Salisbury, during July and was installed in the ship's Data Centre whilst alongside at Port Adelaide in July and August. Harbour acceptance trials and two phases of sea acceptance trials in St Vincents Gulf and on the return passage to Sydney completed the installation package. The system was accepted from AEL by The Commanding Officer, HMAS COOK, on behalf of DGNP, on Thursday 6 September. AEL was contracted to provide support for a further 12 months after delivery and during this period they will clear all outstanding concessions and rectify any faults occurring due to design deficiencies.

Oceanographic Work

HMAS COOK led a 'white flotilla' out of Sydney on 10 September as she proceeded to the vicinity of the Derwent Hunter Seamount to carry out Slope Enhancement Trials (SET 1) with HMNZ Ships MONOWAI and TUI. SET 1 was an investigation into the effect of the continental slope on acoustic propagation and the 'white ships' were joined for a time by HMAS KIMBLA. Four sorties were also flown by P3C Maritime Patrol Aircraft during the trials.

October 1984 through to February 1985 was spent undergoing COOK's first refit; four years after commissioning. By late February the ship was underway again conducting shakedown, trials and workup off the NSW coast between Coffs Harbour and Port Kembla. An inoperative active rudder resulted in another docking; this time in Fitzroy Dock, Cockatoo Island, for the first 10 days of March. The ship sailed on RANRL Cruise 3/85 departing 11 March.

Cruise 3/85 – Sydney to Fremantle

First stop was Darling Harbour to load RANRL stores from their new home at Pyrmont. The remainder of 3/85 involved XBT sections and coring in Bass Strait and XBT sections on the continental slopes south of Portland and Esperance. A vigia investigation, in position 34°30'S, 121°01'E, was carried out enroute to Fremantle; no evidence of the shoal, reported by HMAS GERALDTON, was found.

Cruise 11/85 – Fremantle to Singapore

RANRL 11/85, which commenced on sailing from Fremantle, was multi-national with four scientists from the Institute of Physical Oceanography, University of Copenhagen (IPO-UC), personnel from the West Australian Institute of Technology (WAIT) and RANRL on board. A three day passage to the NE Indian Ocean was followed by the 'big drift', eight days of drifting on hot sunny days, balmy nights and light winds, interrupted only by repositioning buoys and moving upwind to drift past once again.

The drift was required as part of the detailed study into the air-sea interface; the primary aim of the cruise. RANRL and IPO-UC concentrated on studying the formation of transient thermoclines (afternoon effect). IPO-UC also measured phytoplankton in the near surface layer and the resultant water colour. The total biological matter was extremely low and the water was some of the cleanest and clearest ever documented in the world's oceans. WAIT measured sea surface temperatures and radiosonde balloons were released to correspond with passes by NOAA 7 and NOAA 9 satellites as part of the development of a new algorithm to compute sea surface temperatures from satellite observations.

On completion of the 'big drift' COOK sailed to Broome for Easter. Enroute an unsuccessful search for the wreck of the SS KOOMBANA, sunk during a cyclone on 20 March 1912, was carried out in an area where the RAAF had reported a magnetic anomaly earlier this year.

After sampling the delights of Broome and experiencing the 10m tidal range, an experiment on

acoustic propagation was conducted with HMAS IPSWICH. On completion of this experiment the ship steamed back into the North East Indian Ocean for the 'little drift', of three days duration. Tropical Cyclone MARGOT cut short the 'little drift' as it threatened to pass within 120 miles of the ship. With winds at 35kts and increasing, a plummeting barometer and increasing swell, COOK set course for Sunda Strait and Singapore. At 2000(H) on 18 April the ship entered the Northern Hemisphere for the first time and berthed at Sembawang the following forenoon.

Singapore to Melbourne

COOK left Singapore on Friday 26 April and steamed via the Malacca Straits to investigate a seamount feature 75 miles south east of Cocos Island. Passage to Melbourne including a brief stop at HMAS STIRLING was then undertaken with routine sounding and XBT drops enroute.

Cruise WSRL 1/85 – Melbourne to Sydney

Research staff from the Weapons System Research Laboratory, DRCS, were embarked in Melbourne and during the ensuing period work concerning towed array technology was carried out; mainly in the waters off the south coast of NSW.

HMAS KIMBLA

Lieutenant Commander A.E. Vidler RAN,	9.6.83-6.1.85
Lieutenant D.S. Plumner	6.1.85-15.2.85

Although not purpose designed for oceanographic tasks KIMBLA continued as a very productive unit in the Marine Science Force. Her busy oceanographic programme took her from the South Coast of Queensland to 300NM southeast of Adelaide and then to decommissioning in Sydney 15 February 1985.

The period commenced with a research cruise involving personnel from the Australian Museum. The aim of the cruise was to collect bottom samples of marine invertebrates from the continental shelf and slope in the Capricorn Channel. Later in July KIMBLA commenced a transit of the Bass Strait area where she deployed current meters and conducted bathymetric and XBT surveys. This was followed by buoy maintenance in Twofold Bay, recovery of an anchor and length of cable in Jervis Bay and assessment of sonar acoustic performance.

After a valuable but final AMP in GI during August/September, KIMBLA sailed to continue assessment of acoustic performance of sensors. Due to main engine defects departure was delayed by six hours.

During mid to late September 1985, KIMBLA assisted in tasks carried out by WSRL and Sydney University which involved the deployment and monitoring of horizontal arrays and the measurement of surface bubbles by underwater cameras.

In conjunction with the launching of the Space Shuttle 'Columbia', KIMBLA assisted RANRL scientist in 'ground truthing' the positions of oceanic fronts off the NSW coast which had been indicated by the Shuttle Imagery Radar – B onboard 'Columbia'. Departure for this task was delayed by four days once again due to main engine problems.

On 29 October 1985 KIMBLA sailed for her final deployment which was to consist mainly of assistance to the Bureau of Meteorology in their Cold Fronts Research Programme. En-route to the area a bathymetric survey was carried out on behalf of RANRL, although no RANRL personnel were embarked.

The Cold Fronts Research Programme was the largest meteorological field study ever mounted in Australia and involved the participation of a number of institutions and organisations that are interested in the study of Australian meteorology. The aims of the study were to examine the physical structure of summertime cold fronts in southeast Australia, to examine the relationship between upper level features and frontal systems in the lower troposphere and to provide a data base to permit numerical modelling of fronts. One POMET and a Bureau observer were embarked to operate the Vaisala Omegasonde system which had been installed by BUMET technicians.

Both the Bureau of Meteorology and Monash University personnel were very appreciative of the contribution made by KIMBLA in the programme.

KIMBLA berthed in Garden Island 19 December 1984 and commenced paying off availability 14 January, 1985.

Her decommissioning Friday 15 February 1985 marked the loss of a fine ship which has made a major contribution to the Marine Science Force.

5. OCEANOGRAPHY AND METEOROLOGY

RAN AIR STATION NOWRA

General

The title of the Meteorological Department, RAN Air Station, Nowra, has been changed in order to reflect the broader scope of the Department's responsibilities. From the mid to late 70's, the environmental support services required by Fleet Units and Naval Operating Authorities has increased to such an extent that aviation meteorological requirements is now less than 20 per cent of the total services provided.

The Meteorological Department's new title is the 'Naval Weather Centre', responsible for the provision of meteorological and oceanographic services.

Meteorological Forecasting

During 1984, the number of signals promulgated in actioning requests for environmental services totalled 9989. The number is an increase of 19 per cent compared to the number of signals promulgated in 1983.

Electromagnetic Atmospheric Refraction forecasts recommenced 1 May 1985 and are appended to all weather forecasts provided to major Fleet Units. The purpose of the service is to provide Fleet units with an indication of radar and radio coverage on occasions where no evaporative duct is present. The Navigator's Yeoman in each unit is tasked with measuring at regular intervals, the surface wind speed, air temperature, relative humidity and sea surface temperature. Based on these measurements the height of any evaporative duct and the critical trapping frequency can be calculated. Where no evaporative duct is present or where the duct does not extend to the height of the ship's sensors, the Naval Weather Centre product is used to assess radio and radar coverage.

Meteorological Training

The training load in the RAN School of Meteorology remains at a high level and continues to place heavy demands on the forecasting staff. This problem is not expected to be alleviated until the billet of Meteorological Training Officer is filled early 1986.

Oceanography

Oceanographic services provided by the Naval Weather Centre consists of:

a. Australian Sonar Range Acoustic Prediction (AUSRAP) services, and

b. oceanographic analysis of the Western Tasman.

Demand for the AUSRAP service has increased steadily and the number of requests has almost doubled compared to the previous 12 months. Streamlining of the process has now cut delays in the request/receipt of information to a minimum.

Weekly analyses of Sea Surface Temperature (SST), Mixed Layer Depth and 250m temperature continue to be forwarded to AODC for distribution as IGOSS products. The products are also relayed via AXM facsimile on a weekly basis.

One bi-product of the 250m temperature analysis is an assessment of surface currents over ocean waters East of the continental shelf. The Coastal Surveillance Centre, Canberra continues to rely on this information during search and rescue operations.

A major source of concern is the large reduction in 'deep' data since the loss of the fixed wing element of the Fleet Air Arm and the data now available for the area off the continental shelf is very limited. In an attempt to alleviate this problem the RAAF have been requested to provide a monthly AXBT flight over the area as a national task. A decision on this matter has not yet been made.

Oceanographic Training

Oceanographic training is carried out by the Officer in Charge of the Applied Oceanography Centre (OIC AOC), based at the Australian Joint Antisubmarine School (AJASS), a lodger unit in HMAS ALBATROSS. OIC AOC is:

a. Staff Officer Meteorology and Oceanography at AJASS,

b. responsible for oceanographic training in the RAN, and

c. responsible for meteorological inspections of HMA Ships.

Recognition of the important role that the environment plays in maritime warfare has made the design and conduct of RAN oceanographic courses a priority. The following courses are under development:

a. Stage III, Standard and Advanced UCSM,

b. Submarine Sonar Officers Acquaint,

c. Basic, standard and advanced UC,

d. Seaman Officers Stage III

e. CO/XO Designate

f. Direct Entry Instructor Officers, and

g. RAN Tactical Course.

6. PERSONNEL

General

The overall personnel structure of the Hydrographic Office was reviewed during the year. The Management Advisory Services Branch of the Defence Regional Office (NSW) are completing a full investigation into the structure and functions of the Chart Distribution Centre. A final report is expected shortly. An Establishment Review Team from Navy Office (Canberra) reviewed all other positions, both uniformed and civilian, late in 1984. The Inspection Report of the Review Team was submitted on 19 December 1984. This report was accepted and implementation has progressed with the establishment of new positions and billets.

The new organisation of personnel within the Hydrographic Office was introduced as from 1 April 1985 with a Captain being appointed Director of the Hydrographic Office with six functional sections below him. These sections are described below.

Uniformed.

The previous uniformed sections, Survey Operations and Support and Survey Planning have been melded into the new sections of Survey Operations and Plans, (responsible for programming and planning field operations, equipment and detached surveys) and Survey Support (responsible for Quality Control and the mainly civilian staffed subsections of Notice to Mariners, Sailing Directions and Tides).

The previous position of Laser Airborne Staff Officer has been transferred to the LADS Project Team located in Canberra.

There has been an overall increase of 2 in the number of hydrographic specialist officers during the year. Although another officer has been promoted to Captain, there is a shortage of officers at the Commander/Lieutenant Commander level resulting in established billets not being filled or filled at a lower rank level. The transfer of HMAS BETANO to surveying duties has required the posting of suitably qualified personnel to that ship.

Captain J.A.L. Myres RN returned to the United Kingdom on completion of Loan Service. He was relieved as Hydrographer by Captain J.S. Compton RAN on 26 June 1985.

One Commander is employed out of branch as Naval Officer Commanding South Australia.

One Lieutenant Commander and one Lieutenant left the service at their own request.

Civilian.

The new organisation in the Hydrographic Office has four civilian manned sections. Cartography and Supplies (responsible for all cartographic functions, chart maintenance, chart distribution and survey records), Science (responsible for AODC), Computer Systems (responsible for development of software and managing installed computer systems) and Administration.

The establishment for civilian employees within the Hydrographic Office has been raised to 100. At the 30 June 1985, the Terminal Staffing Level was 80 positions of which only 74 were filled. 18 restaffing applications were being processed.

During the year the Administration Section has been brought up to strength and stability in the manning of the Chart Distribution Centre has been achieved. The Establishment Review recognised the weakness of the Support System section and suitable strength is now allowed.

A Senior Draftsman completed a 12 month exchange with the RNZN Hydrographic Office in January 1985. The exchange organised under the Nareen Agreement, was of great benefit to the RAN Hydrographic Office.

B. SUPPORT SERVICES

Sonar Range Prediction

A RANRL study into the Navy's range prediction systems has been completed and is to be presented to the RAN Oceanographic Committee. Recommendations include the eventual acquisition of onboard computing facilities to enable more accurate in-situ predictions.

Updated FACT models are being provided by the USN and will be incorporated into HYDROCOMP. The models should extend the range of frequencies and include a shallow water component thereby extending the AUSRAP product.

Environmental Briefs

Briefs are produced in support of naval and joint exercises, deployment and training requirements. In 1984/85 major briefs were prepared for Sandgroper 84 and Sea Eagle 85. Minor briefs were produced for individual units and personnel.

Education and Training

Refresher courses in the use of AUSRAPS for Fleet personnel continued into 1985. These courses will be included as part of ASW work-up requirements for fleet units. Instructors are made available for a range of specialist courses at HMAS WATSON, PLATYPUS, PENGUIN and ALBATROSS.

The oceanographic and meteorological modules of the Phase 1 SWOT Course have been successfully completed and development of the Phase 2 (ASW specialist) course is well underway.

Joint Projects

Co-operation with outside organizations was extended during the year. The RAN and CSIRO are pooling some of their expertise to collect data in Western Australian waters and a similar project is being carried out with AIMS in northern Queensland. These co-operative ventures need to be extended in future so that all organizations interested in the marine environment may make maximum use of limited development and data collecting resources.

The drifting buoy project to monitor the EAC comes into operation as this report goes to print. The first of 30 buoys will be deployed in the Western Tasman Sea and data will be available to operational and scientific users.

Navy continues to support the Ships of Opportunity program whereby merchant ships deploy XBT probes along specific routes of interest. All such information is to be incorporated into AODC data banks. DCP deployments are also involved in gathering oceanographic data of use to Navy.

Civilian

The establishment of Trainee Draftsperson was reduced from 4 to 1 during the period. The other 3 positions were transferred to Public Service Act positions in order to ensure that ceiling cover was available to employ the trainees on completion of their course.

Staff have been encouraged to avail themselves of the opportunity of undertaking part time training at educational institutions and to attend Departmental Development Courses. Staff members have also taken the opportunity to see other Naval Establishments during organized familiarization visits.

In house training has continued in both manual and digital chart compilation methods.

Visits by students undertaking cartographic related courses at various educational institutions have been made to the Hydrographic Office during the period.

Places have been made available for secondary school students to attend the Hydrographic Office for work experience in the fields of administration, oceanography and cartography. It is expected that there will be an increase in the number of students requesting work experience in the future.

7. TRAINING

Uniformed.

The major part of the Hydrographic School's training activity over the past year has been directed towards the running of H4 and ADVSR courses. However recruiting is now picking up and more SMNSR courses are expected to be run next year.

DCP countries have provided 40% of the students on the three major courses over the past year. As a result of this the School has acquired some modern surveying equipment from DCP funds, specifically:

1 Tellurometer MRA7 EDM

1 Wild D120 Distomat EODM

1 Wild Level

1 HP 41CV portable computer

1 HP 85(B) desktop computer plus printer plotter

In June 1985 the Officer-in-Charge (now LCDR P. HOBSON RN) again visited Malaysia under the auspices of DCP to monitor training at the Royal Malaysian Navy Hydrographic School.

As well as conducting the courses listed below the Hydrographic School has undertaken small surveys of PLATYPUS wharf, Bolt Wharf and Spectacle Island for the Hydrographic Office.

Details of Students Trained at the Hydrographic School during the period are:

COURSE	DATE	DURATION	STUDENTS
H4	16JUL-7DEC 84	21 weeks	5 RAN Officers 1 RNZN
H4 (DCP)	10FEB-12JUL 84	21 weeks	2 Malaysian 1 Solomon Is. 1 Vanuatu
ADVSR	13AUG-23NOV 84	15 weeks	2 RAN 1 Fiji 1 Indonesia
Basic SR	18FEB-10MAY 85	12 weeks	5 RAN 1 Fiji
UNSW	08JUL-19JUL 84	2 weeks	10 Hydrographic elective students 1 S/LT RANR
RAN Long Navigation Course	05NOV-07NOV 84	3 days	8 RAN Officers
Surveying Refresher	03DEC-14DEC	2 weeks	1 LSSR
	08JAN-8FEB	2 weeks	1 LSSR
	04MAR-08MAR	4 days	1 ABSR
	25MAR-05APR	2 weeks	1 POSR
	06MAY-17MAY	2 weeks	1 POSR
	10JUN-13JUN	3 days	2 ABSR
Sidescan Sonar	27MAY-30MAY	4 days	Principal of Surveying Dept. of Australian Maritime College, Launceston, Tas.

During the period three RANR specialist officers each undertook 10 days Active Continuous Training in the Hydrographic Office.

8. CHART PRODUCTION AND MAINTENANCE

New requirements and the changing priorities of both commercial and naval shipping has again dictated the schedule of maintenance of existing charting and the production of new charts and new editions. An example of this reaction to the needs of shipping is chart Aus 821, "Hydrographers Passage". The new chart had to be available and distributed on a world wide basis prior to the opening of the passage for daylight transits in December 1984. On completion of the installation of the navigation aids, a new edition had to be distributed in April 1985. Similarly, new charts or new editions were produced for Abbot Point, Port of Gladstone, Brisbane River, Port Adelaide, Port Jackson etc. in support of commercial shipping. A variety of graphics were also produced to support Fleet requirements on both the east and west coasts.

The output of this section has been curtailed by staff shortages arising from staff ceilings, long service leave and other absences, promotions and transfers. As this section is the largest source of manpower within the Hydrographic Office, its personnel have to react to cover critical shortfalls in other areas which resulted in only between a 50-60% manning level being achieved throughout the year.

With increasing use of the AUTOCHART facility, it has been necessary to bring manual compilation to completion before digitizing. The introduction of the interactive graphic terminals have improved productivity.

AUTOCHART has been used increasingly to digitize existing repromat which has deterioriated to unacceptable standards. That is influenced by the short run reprint programme, which, whilst keeping updated information before the mariner, has taken a heavy toll on the quality of the repromat.

However, during the year, the short run reprint programme has been adjusted to reduce the volume of copies reprinted each year. The effect is seen in the figures of Appendix 1.

Chart correction services have been maintained for British Admiralty and New Zealand charts. Selected Australia port charts which are subject to frequent corrections have also been maintained in this manner but it remains a matter of concern that the majority of Australian charts must be sold uncorrected with only an updating correction slip attached. In 1983/84 93,615 impressions of 2298 charts were corrected, whilst in the current period 123,500 impressions of 2338 charts were maintained.

9. CHART DISTRIBUTION

1984/85 has been a period of relative stability for the Chart Distribution Centre. There has been a turnover of 4 staff members. Mr. K. Reid took up his appointment as Superintendent in October 1984.

Management Advisory Services Branch is completing a review of the Section with an aim to rationalize the functions of staff and to ensure the optimum utilization of the HYDROSTOK facility. A report is expected shortly.

HYDROSTOK is now supporting issue, sales, stock control and financial functions of the section. However some aspects of the system have yet to be implemented. The introduction of preprinted invoice and statement forms in early 1985 facilitated the distributions of both sales and issues. No adverse reaction to this introduction has been received from customers. It has been noted that an improvement in settling accounts has occurred.

On 30th June 1985 there were 78 Agencies in Australia and 12 overseas. This is an overall increase of 11 over the period.

During the financial year 1984/85 the total sales of charts and publications was $784,593 an increase of $134,436 over the previous year.

10. NOTICES TO MARINERS

The number of Australian Notices to Mariners issued during the period ending 28 June 1985 (Weekly Edition 26) was smaller than that issued during the corresponding period 1983/84.

The reduced number of Notices to Mariners issued reflects, in part, a large reduction in the number of Hydrographic Notes received during the period.

Statistics for the period are as follows (1983/84 figures in brackets)

*	Hydrographic Notes from HMA Ships	156 (280)
	Hydrographic Notes from other sources	100 (150)
	Notices to Mariners issued	820 (853)
	Blocks for charts	21 (27)
	Blocks for Cautions	37 (33)

* Additional details are contained in Appendix VI

11. SAILING DIRECTIONS, NOMENCLATURE AND MARITIME BOUNDARIES

Sailing Directions:

Amendments to the Sailing Directions received from RAN Survey Ships and Detached Parties have been reviewed and forwarded to the Hydrographer of the Navy, United Kingdom, for incorporation into the Admiralty Sailing Directions.

Progress has been made in the preparation of a new edition of "Supplementary Sailing Directions for Papua New Guinea and for Torres Strait North from 10°30′ South". The cooperation of Cairns based patrol boats and of the Papua New Guinea Defence Forces has been sought in order to obtain additional material for this new edition.

Nomenclature:

The section responds to a large number of queries on the origin of maritime or other names. These queries originate from the general public or other authorities. It is apparent that the approach of the Bicentenary has generated a great deal of interest in the history, and origin of names in local areas. The research required to respond to such queries becomes a valuable part of the historical documentation within the Hydrographic Office.

Liaison with state nomenclature bodies has continued. All new charts are submitted to these bodies before printing to ensure that correct geographical names have been used. The Sailing Directions, Light Lists and other associated navigational publications are then amended, if necessary, thus ensuring that a feature has a unique name.

Maritime Boundaries:

Consultation, on the location of the Lowest Astronomical Tide baselines, with the Division of National Mapping continued throughout the period and is now complete. These baselines will be shown on a special series of 1:100 000 maps covering the mainland and Tasmania which will be published by the Division of National Mapping.

12. TIDES

Personnel

From April to December 1984, the duties of Tides Officer were performed by Mr P. Kelly, who is gazetted to the position. From January 1985 onwards, Mr A. Marshall has relieved Mr Kelly who is on extended leave.

Australian National Tide Tables (ANTT)

2200 copies of the 1985 edition were printed for the Hydrographic Service. An additional 1300 copies were printed by the Australian Government Publishing Service for distribution through its own outlets.

Predictions for inclusion in the 1985 ANTT were produced by the Flinders Institute for Atmospheric and Marine Sciences (FIAMS), Flinders University, South Australia (20 ports), the Institute of Oceanographic Sciences (IOS) Bidston, UK (30 Ports), Harbours and Rivers Branch, Public Works Department of Western Australia (7 ports) and Associated Surveys (1 port). The UK Hydrographic Department provided predictions for three ports in Papua New Guinea, together with the astronomical arguments appearing in the front of the ANTT. The Hydrographer RAN greatly appreciates the cooperation of these organisations from which the data for the ANTT are collated for publication.

The 1986 edition of the ANTT will include 68 standard ports and 1 entry for predicted tidal stream, as well as a small increase in the number of secondary ports. A major revision of Part II, as well as the instructions and examples is underway.

RAN Tidal Prediction Facility

The RAN uses the IOS (Canada) prediction program. As well as being used for RAN charting, it has been used, in special circumstances, to provide predictions to outside organisations. During 1985/86 a new computer system (Hydrocomp) will be installed. This will be shared by the Tides Section and the Australian Oceanographic Data Centre, and should overcome the limitations of using commercial facilities. It will also have an analysis capability.

Hydrographic Survey Support

Tidal support, particularly with regard to advice on sounding datum for RAN Hydrographic Survey Ships, has continued throughout the year.

Cartographic Support

Tidal height and stream information for RAN charts together with Lowest Astronomical Tide (LAT) datum computed using the above program has continued to be provided.

Liaison with Other Authorities

Consultation and data exchange with members of the National Mapping Council Permanent Committee on Tides and Mean Sea Level and other organisations continue. Work on a national inventory of tidal stream data has commenced.

13. EQUIPMENT

Hydrographic Data Logging Processing System (HYDLAPS)

Tenders for a Project Definition Study are expected to be called in the latter part of 1985. The study will be conducted and evaluated during 1986.

Laser Airborne Depth Sounder (LADS)

The Phase One Project Definition study has been prolonged because of delays in developing the Airborne Data Acquisition System. A complete review of Phase One documentation is in progress and a further contract is expected to be issued to complete the Study. Phase One should now complete by mid 1986.

HMAS Cook Data Logger

HMAS COOK was fitted with its data logger in July 1985. Successful harbour and sea trials were completed in August and September. Further trials are programmed in July 1985 prior to acceptance of the system into naval service.

Echo Sounder

Thirteen Atlas Deso 20 echo sounders were delivered in January and May 1985 to replace the Atlas Deso 10s. All survey ships including HMAS BETANO are now fitted with Atlas 20s.

Electronic Distance Measuring Equipment

Advantage was taken of the delay in this project to upgrade the equipment specification and to further examine tenderers proposals. Approval has been given to purchase equipment in 1985/86 and 1986/87.

Geoceivers

Two Magnavox MX 1502 geoceivers were delivered in September 1984 and have since been in constant use.

14. RECORDS AND LIBRARY

The Hydrographic Office Records and Library Section holds both survey records – including hydrographic surveys from navy and non-navy sources, geodetic information, aerial photos – and the more traditional library material such as books, periodicals and reports.

As part of the Hydrographic Office, the library has a unique role to play in supporting hydrographic and oceanographic activities in Australia and overseas. Being part of the Defence Information Services Network, the library specialises in Oceanography, Hydrographic surveying, cartography and related disciplines. The library has received new books valued at $2625 since July 1984, enabling a more effective service both within the Hydrographic Office and the Defence Information Services Network.

Sixteen surveys have been received from RAN Surveying Ships including HMAS's COOK, KIMBLA, MORESBY and FLINDERS and the Hydrographic Office Detached Survey Unit. Three surveys have also been received from the Solomon Islands Hydrographic Unit.

A variety of data has also been received from other sources including:

a. National Mapping Council members

b. International Authorities on hydrography, oceanography & marine sciences

c. State and Federal Government Departments

d. Harbour authorities and commercial maritime agencies

e. Private individuals.

Appendix II lists hydrographic information received during the year from non-service sources.

15. SYSTEM SUPPORT

General

System Support provides computer programming expertise and advice to management and users of the seven comp..ter based projects of the Hydrographic Service. These systems are Autochart, Hydrocomp, Hydrostock, LADS, Hydlaps, Cook Data Logger and the Desktop Survey System.

The cell consists of a pool of computing professionals who are allocated to projects on a priority basis.

Personnel

During the 84/85 FY the branch lost the services of two very capable programmers – Mr J. Mund and Mrs R. Veal. Despite lengthy delays in the restaffing of these positions (with a correspondingly lengthy interruption to the effectiveness of the System Support Cell) the programming, analysis and procurement efforts have progressed. Jenny Von Thomann and Garry Hopwood were recruited in February and March 1985.

The 1984 Establishment Review identified the requirement for a further increase in programming personnel and the establishment of a Data Base Administration Cell which will control the operators.

Autochart

The introduction of colour raster graphics in July 1984 has upgraded the editing power of the Autochart system. Users have been generally slow to take advantage of the new technology and an inordinate amount of teething problems were encountered. Numerous enhancements have been added to the graphics workstations to aid the users in their charting tasks.

The office can now input digital data from other agencies through one of the versions of Australian Standard 2482 (Digital Data Exchange). A digitized area of Westernport Bay (Vic), obtained from a contractor, was successfully incorporated into an Autochart file, signalling the commencement of a new era of data transfer.

HMAS COOK Data Logger

Control of HMAS COOK Data Logger software (assembled by DRCS) will transfer to the Hydrographic Service in September 1985. Indications are that the programming content is robust and that quality maintenance can be effected.

Hydrocomp

Design and analysis work on the Hydrocomp project was started in April by Software Sciences. Staff have recently completed a PRIME System Administrator's course and an Introductory SIR Database Design course and are currently liaising with the supplier to provide detailed system analysis and design requirements for the specialised oceanographic system provided by Hydrocomp. The flexibility and report generation capabilities of the data base management system combined with advanced graphics facilities provided by raster graphics will enable the AODC to provide an upgraded range of products and services.

Future Projects

Tender evaluation for the Hydrographic Information System will progress through 1985. Magnetic storage for future digital hydrographic data is the prime objective of this procurement. The proposed Hydlaps and LADS systems, along with data recording devices belonging to other agencies, will provide source data for the Hydrographic Information System.

1. CHART AND DRAWING OFFICE PRODUCTION

	1982/83	1983/84	1984/85
New charts published for general use.	9	8	8
New editions for general use.	28	10	16
Modified facsimiles of BA charts.	1	3	3
New charts/diagrams for Naval use.	1	3	10
Stock replenishment (Reprints & Revision).	480	470	334*

Note: 1. During the year, 96 work orders were processed by the drawing office for the Department of Defence and the Fleet. These include, reproductions of charts and diagrams, graphics, forms, grids, publication reproductions and miscellaneous products.

2. There were 17 facsimile reproductions of Aus. published charts printed by the United Kingdom Hydrographic Department.

2. CHART PRINTING

	June 1984*	FY 1984/85
New charts	0	8
New Editions	0	16
Revised charts	31	167
Reprinted charts	42	94
Facsimile reproductions	0	0
Modified reproductions	0	3
Charts for Fleet purposes	0	3

Chart printing by Survey Regiment Bendigo, Victoria. 364 charts 199010 copies*

* June 1984 figures are included to allow for a change in accounting periods.

3. DESCRIPTION OF NEW CHARTS

Aus 255 – A large scale chart providing approach and access to the recently developed Abbot Point and coal loading facility. A plan of the wharf head is also shown.

Aus 821 – Hydrographers Passage. This chart was added to the 1:150 000 scale series following HMAS Flinders 1982 survey which established a safe access through the outer Great Barrier Reef, between Creal and White Tip Reefs. This significant passage provides a more direct route for large bulk carriers making the round trip between Japan and the coal loading facilities at Hay Point.

Aus 336 – Following the publication of series charts Aus 757, Aus 758 and Aus 759 at 1:150 000 scale, this smaller scale chart, extending into the southern Ocean, covers the southern coastline of Western Australia between Cape Leeuwin and Albany.

Aus 245 – The second of three large scale charts covering the Port of Gladstone area. The first, Aus 244 was published in 1984. Area coverage affords direct navigation through Gatcombe, Auckland, Clinton and Tanginie Channels to the port facilities shown in plan form on Aus 244.

Aus 246 – This chart completes the coverage of the Port of Gladstone area. It covers the approach channels and the outer boundary limits of the Port. A plan of Turkey Beach at the same scale is included.

Aus 744 – This metric chart replaces the former Aus 744 published in 1955. Area coverage is from Exmouth Gulf north eastward to Thevenard Island and adjoins metric chart Aus 743.

Aus 745 – Adjoins Aus 744 and provides 150 000 scale coverage from Point Maud to the northward.

Aus 752 – Another chart in the 150 000 scale series covering the Western Australian coast.

4. DESCRIPTION OF NEW EDITIONS

The allocation of programme priorities for new editions has been determined by the volume of new information received from local area port authorities. The following charts were considered to be in need of total revision. Aus 237 Brisbane River, Aus 137 Port Adelaide, Aus 202 Port Jackson (Central sheet), Aus 154 Port Melbourne, Aus 208 Newcastle Harbour. All of these charts were subjected to major recompilation adjustment because of the complexity of information received. Minor revision was made to new editions of the following charts:

Aus 249 – Hay Point to Penrith Island, recommended tracks and hydrographic survey alterations.

Aus 259 – Hinchinbrook Channel, general update and redesign of Lucinda plan.

Aus 5060 – Australian Fishing Zone Limits, inclusion of insets covering Australia's offshore territories.

Aus 5020A & B – Index of Australian charts and Publications, general update.

Aus 154 – Port Melbourne, following the previous major revision a further new edition was required because of extensive alterations to navigational aids.

Aus 831 – Low Islets to Cape Flattery. Plan of Port of Cooktown was removed from Aus 262 and revised compilation incorporated on Aus 831.

Aus 112 – Inclusion of PWD surveys.

Aus 821 – Inclusion of lights and sectors through Hydrographers Passage.

Aus 4708 (INT 708) – This new Australian edition of International chart 708 incorporated data that had been included in the United Kingdom new edition.

Aus 105 – This new edition of the Lancelin chart was produced in conjunction with the new edition of the bombardment chart (Aus 5041).

5. DESCRIPTION OF OTHER PRODUCTS

Australian modified reproduction of British Admiralty Charts (3)

Aus 373 (former BA 2344) 1:300 000 Frankland Island to Lizard Island.

Aus 374 (former BA 2355) 1:300 000 Lizard Island to Cape Sidmouth.

Aus 375 (former BA 2354) 1:300 000 Cape Sidmouth to Cape York.

Fleet charts (3)

Aus 5044 COP Western Australia.

Aus 5035 NE East Australian Exercise Area.

Aus 5041 NE Bombardment Chart (Lancelin)

Publications (5)

Australian National Tide Tables (1984) AHPI1.

Annual Summary of Australian Notices to Mariners, Jan 85.

Report of the Hydrographic Service RAN for the year ending 30 June 1984.

Department of Defence (Navy Office) Hydroscheme 85 and 86.

Fleet charting tasks	(8)
Departmental cartographic tasks	(62)
Chart blocks produced for Notice to Mariners promulgation.	(21)

Number	*Title and Limits*	*Scale*	*Published Date*
Aus 255	Queensland – Approaches to Abbot Point	1:25000	31.8.84
	Lat. 19°43'29".8S 19°57'30".0S Long. 148°01'00".0E 148°10'21".1E		
	Plan – Abbot Point Wharf	1:12500	
	Lat. 19°50'44".1S 19°57'30".0S Long. 148°05'50".0E 148°03'45".0E		
Aus 821	Queensland – Hydrographers Passage	1:150000	5.10.84
	Lat. 19°33'24".4S 21°02'00".0S Long. 149°35'00".0E 150°34'22".4E		
Aus 336	Western Australia – Cape Leeuwin to King George Sound	1:300000	16.8.84
	Lat. 34°15'30".0S 35°53'08".0S Long. 115°07'00".0E 118°14'49".0E		
Aus 245	Queensland – Port of Gladstone	1:125000	16.1.85
	Lat. 23°44'54".3S 23°53'45".0S Long. 151°08'47".8E 151°24'00".0E		
Aus 246	Queensland – Approaches to Port of Gladstone	1:37500	29.3.85
	Lat. 23°50'54".6S 24°04'10".6S Long. 151°18'04".5E 151°40'54".0E		
	Inset – Turkey Beach	1:37500	
	Lat. 24°03'30".0S 24°07'00".0S Long. 151°38'00".0E 151°41'30".0E		
Aus 744	Western Australia – Exmouth Gulf and Approaches	1:150000	30.10.84
	Lat. 21°07'20".4S 22°35'00".0S Long. 114°00'00".0E 114°59'22".4E		
	Plan – Point Murat Wharf	1:25000	
	Lat. 21°48'12".0S 21°50'00".0S Long. 114°10'24".0E 114°12'24".0E		
	Plan – Learmonth	1:75000	
	Lat. 22°10'00".0S 22°19'00".0S Long. 114°04'00".0E 114°11'30".0E		
Aus 745	Western Australia – Northwest Cape to Pt Maud	1:150000	31.5.85
	Lat. 21°41'00".0S 23°08'18".6S Long. 113°13'37".6E 114°13'00".0E		
Aus 752	Pelsaert Island to Beagle Islands	1:150000	12.6.85
	Lat. 28°58'30".8S 29°50'30".0S Long. 113°42'05".7E 115°16'00".0E		

7. LIMITS OF NEW EDITIONS PUBLISHED

Number	*Title and Limits*	*Scale*	*New Edition date*
Aus 237	Queensland – Brisbane River	1:12500	13.7.84
	Lat. 27°18′45″.0S 27°25′44″.7S Long. 153°07′51″.2E 153°12′48″.0E		
Aus 137	South Australia – Port Adelaide	1:12500	7.8.84
	Lat. 34°45′13″.0S 34°52′12″.0S Long. 138°26′07″.0E 138°31′28″.5E		
Aus 202	New South Wales – Port Jackson (Central Sheet)	1:7500	25.9.84
	Lat. 33°50′15″.6S 33°52′38″.0S Long. 151°09′39″.2E 151°15′03″.1E		
Aus 249	Queensland – Hay Point to Penrith Island	1:75000	29.10.84
	Lat. 20°52′42″.0S 21°20′33″.0S Long. 149°09′14″.0E 149°56′12″.0E		
	Plan – Hay Point	1:12000	
	Lat. 21°14′42″.0S 21°16′48″.0S Long. 149°17′12″.0E 149°19′24″.0E		
Aus 259	Queensland – Hinchinbrook Channel	1:50000	25-10-84
	Lat. 18°14′02″.0S 18°31′45″.0S Long. 146°00′00″.0E 146°29′18″.0E		
	Plan – Port of Lucinda	1:20000	
	Lat. 18°28′48″.0S 18°32′00″.0S Long. 146°17′54″.0E 146°23′36″.0E		
Aus 5060	Australian Fishing Zone Limits	1:10,000,000	14.11.84
	Lat. 2°36′16″.0S 51°00′00″.0S Long. 104°00′00″.0E 167°57′55″.0W		
	Plan – Cocos and Christmas Islands	1:10,000,000	
	Lat. 6°00′00″.0S 16°00′00″.0S Long. 92°00′00″.0E 11°00′00″.0E		
	Plan – Heard Island		
	Lat. 49°00′00″.0S 58°36′13″.0S Long. 67°00′00″.0E 79°30′00″.0E		
	Plan – Macquarie Island	1:10,000,000	
	Lat. 49°30′00″.0S 59°00′00″.0S Long. 152°30′00″.0E 165°00′00″.0E		
Aus 154	Victoria – Port Melbourne	1:7500	13.8.84
	Lat. 37°48′16″.2S 37°42′48″.0S Long. 144°53′33″.6E 144°56′54″.0E		
Aus 208	New South Wales – Newcastle Harbour	1:7500	21.12.84
	Lat. 32°52′42″.0S 32°56′53″.6S Long. 151°45′24″.0E 151°48′32″.4E		

Aus 831	Queensland – Low Islets to Cape Flattery	1:150000	10.12.84
	Lat. 14°56'36".0S 16°27'36".0S Long. 145°09'30".0E 146°08'56".0E		
	Plan – Port of Cooktown	1:10000	
	Lat. 15°26'53".9S 15°28'00".3S Long. 145°14'23".1E 145°15'45".6E		
Aus 112	Western Australia – Approaches to Fremantle	1:37500	15.3.85
	Lat. 31°51'30".0S 32°04'30".0S Long. 115°25'30".0E 115°52'00".0E		
Aus 154	Victoria – Port Melbourne	1:7500	21.12.84
	See limits above.		
Aus 821	Queensland – Hydrographers Passage	1:150000	26.4.85
	Lat. 19°33'24".4S 21°02'00".0S Long. 149°35'00".0E 150°34'22".4E		
Aus 5020A	Australia – Northern Portion Index of Nautical Charts and Publications	–	Jan 1985
Aus 5020B	Australia – Southern Portion Index of Nautical Charts and Publications	–	Jan 1985
Aus 4708	Indian Ocean – Australia West Coast	1:3500000	10.5.85
	Lat. 5°30'00".0S 36°20'00".0S Long. 96°05'00".0E 117°30'00".0E		
Aus 105	Western Australia – Wedge Island to Lancelin	1:50000	24.5.85
	Lat. 30°47'09".6S 31°04'49".3S Long. 114°54'00".0E 115°26'23".2E		

8. CHARTS IN PRODUCTION (30th June 1985)

NC – New chart
NE – New edition

Chart No.	*Category*	*Title*	*Scale*	*State*
Aus 754	NC	Lancelin to Cape Peron	1:150000	Western Aust.
Aus 751	NC	Houtman Abrolhos to Geelvink Channel	1:150000	Western Aust.
Aus 835	NE	Cape Weymouth to Cairncross Islets	1:150000	Queensland
Aus 415	NC	Cape Leveque to NW Cape	1:1,000,000	Western Aust.
Aus 752	NC	Pelsart Island to Beagle Island	1:150000	Western Aust.
Aus 753	NC	Beagle Island to Lancelin	1:150000	Western Aust.
Aus 238	NE	Brisbane River	1:12500	Queensland
Aus 220	NE	Plans in NSW north coast	Various	New South Wales
Aus 32	NE	Cambridge Gulf	1:7500	Western Aust.
Aus 59	NC	Plans in Port Dampier	Various	Western Aust.
Aus 115	NE	Port of Bunbury	1:50000	Western Aust.
Aus 314	NC	Sahul Banks	1:300000	Timor Sea
Aus 116	NE	Plans in Western Australia	Various	Western Aust.
Aus 416	NC	Montebello Islands to Geraldton	1:1,000,000	Western Aust.
Aus 377	NC	Blight Entrance to Eastern Fields	1:300000	Queensland/PNG
Aus 299	NC	Approaches to Thursday Island	1:12500	Queensland
Aus 417	NC	Geraldton To Cape Leeuwin	1:1,000,000	Western Aust.
Aus 58	NC	Approaches to Port of Dampier	1:37500	Western Aust.
Aus 195	NE	Port Kembla and Wollongong	1:25000	New South Wales
Aus 193	NE	Jervis Bay and Approaches	1:37500	New South Wales
Aus 293	NE	Prince of Wales Channel	1:37500	Queensland
Aus 613	NC	Marion Reef	1:150000	Coral Sea
Aus 55	NE	Approaches to Port Walcott	1:50000	Western Aust.
Aus 56	NE	Port Walcott	1:12500	Western Aust.
Aus 740	NE	Port Hedland to Port Walcott	1:150000	Western Aust.
Aus 155	NE	Approaches to Melbourne	1:37500	Victoria
Aus 113	NE	Port of Fremantle	1:7500	Western Aust.
Aus 236	NE	Moreton Bay	1:75000	Queensland
Aus 60260	NC	Broad Sound and Shoalwater Bay	1:75000	Queensland

HYDROGRAPHIC INFORMATION FROM NON-SERVICE SOURCES

General Locality	*Title or Location of Survey*	*Source*
NEW SOUTH WALES		
Sydney/South of Sydney	Bottom Types	NSW Divn of Fisheries
South of Newcastle	Burwood Beach	Hunter District Water Board
Port Jackson	Garden Island	Maritime Services Board
" "	Darling Point	" " "
Newcastle	Within Harbour	" " "
Wollongong/Port Kembla	Within Harbour	Public Works Department
Sydney Coastal Study	Malabar, Kurness, Batemans Bay	" " "
Port Hacking	Entrance to Port Hacking	" " "
North of Coffs Harbour	Clarence River	" " "
NORTHERN TERRITORY		
Darwin	Within Port	Darwin Port Authority
Darwin	Channel Island	Northern Territory Electric Comm.
QUEENSLAND		
Great Barrier Reef	Rib, Carter Reefs	Australian Institute
" " "	Myrmidon Reef	of Marine Science
" " "	Davies Reef	" " "
SE of Ingham	Pandora Reef	" " "
Great Barrier Reef	Lizard Reef	Australian Survey Office
NE of Ingham	Palm Island	" " "
Great Barrier Reef	Arab Reef	Great Barrier Reef
" " "	Davies Reef	Marine Park Authority
Hay Point	Within Port	Dept. of Harbours & Marine
NE Brisbane	Pumicestone Passage	" " "
Brisbane and Surrounds	Hydrographic Survey	" " "
Gladstone	Boyne Island	" " "
North of Bowen	Abbott Point	" " "
Townsville	Hydrographic Survey	" " "
Moreton Island	Hydrographic Survey	" " "
Weipa	Hydrographic Survey	" " "
Bowen	Whitsunday Passage	" " "
North Moreton Bay	Redcliffe	" " "
SE Rockhampton	Keppel Bay	" " "
S of Maroochydore	Mooloolaba	" " "
Brisbane	North West Channel	Port of Brisbane Auth.
SOUTH AUSTRALIA		
East of Whyalla	Stony Point	Harborworks Clough
Port Pirie	Port Pirie River	Depart. of Marine
Port Lincoln	Within Port	and Harbours
SW of Adelaide	Cape Jervis	" " "
" "	Penneshaw	" " "
TASMANIA		
SE Tasmania	Derwent River/Bowen Bridge	Marine Board of Hobart
Flinders Island	Leads and Sectors	Port of Launceston Authority
VICTORIA		
Port Phillip Bay	Within Bay	Ports and Harbours Division Queenscliff

Westernport	Within Westernport	Public Works Dept.
Port of Melbourne	Hobsons Bay	Port of Melbourne Authority

WESTERN AUSTRALIA

North of Carnarvon	Cape Cuvier and approaches	Associated Osiris Surveys
Dampier Archipelago	Cohen Island	Australian Survey Office
" "	Rosemary Island	" " "
South of Fremantle	Cockburn Sound	" " "
Port of Fremantle	Outer Harbour	Fremantle Port Authority
Port Hedland	Within Port	Port Hedland Port Authority
Esperance	Within Harbour	Public Works Department
Shark Bay	Denham	" " "
Geraldton	Within Port	" " "
Bunbury	Within Harbour	" " "
Exmouth Gulf	Hydrographic Survey	" " "
Cervantes	Hydrographic Survey	" " "
Coral Bay	" "	" " "
Duke of Orleans Bay	" "	" " "
West of Esperance	Hopetoun	" " "
Fremantle	Hydrographic Survey	" " "
NW of Perth	Green Head	" " "
Jurien Bay	Within Bay	" " "
Fremantle	Boat Harbours	" " "
Wyndham	Port Area	" " "
Dampier	Approaches to/within Port	Woodside Offshore
Mermaid Sound	Bathymetric Contour compilation sheets	" "

General

The Department of Transport forwarded the results of survey work carried out by MV Cape Moreton in Hydrographers Passage – White Tip Reef – and various reefs, cays and islets around Townsville, Cairns, Mackay and Rockhampton.

A large amount of Rectified Landsat Imagery has been received from the Australian Survey Office.

DISTRIBUTION AND SUPPLIES

Volume of sales and distribution of charts and associated publications

	1982–83	1983–84	1984–85
Australian	162522	142082	156966
British Admiralty	32975	24409	27226
New Zealand	1203	1603	1534
Canadian	193	117	89
	196593	168211	185815

Value of sales of charts and and associated publications. Not including Sales Tax.

Australian	582343	579012	686194
British Admiralty	110542	70363	96326
New Zealand	1139	480	1468
Canadian	965	302	605
	$694989	$650157	$784593

Financial Resume	1983/84	1984–85
Value of goods sold	650158	784523
Sales Tax recovered	33986	35793
Postage and Freight recovered	9908	9965
Total return to Commonwealth on year's transactions	$694052	$830051

Retail Chart Prices as at 30 6 85

	1982–83	1983–84	1984–85
		Includes Sales Tax	
Australian	$8-20	$9-00	$9-81
British Admiralty	$10-93	$12-25	$14-53
New Zealand	$5-90	$6-34	$6-70
Canadian	$5-00	$5-91	$7-10

MANPOWER

UNIFORMED

Hydrographic Surveying Specialists

The numbers of hydrographic specialists in the Hydrographic Service on 30th June 1985 were:

Captain	2	
Commander	2	(note 1)
Lieutenant Commander	10	(note 2)
Lieutenant	15	(note 3)
Sub Lieutenant	6	(note 3)
WOSR	1	
CPOSR	5	(note 4)
POSR	9	
LSSR	19	
ABSR/SMSR	36	
TOTALS		
OFFICERS	35	(33)
SAILORS	70	(71)

Notes 1. One Commander employed out of Branch
2. One LCDR RAN/RN exchange
3. One LEUT and two SBLT undertaking fulltime civilian schooling.
4. One CPOSR is Advisor to Solomon Islands Hydrographic Unit.
5. There is a total of 12 Reserve Officers with hydrographic qualifications.

Meteorological/Oceanographic Specialists

The numbers of METOC specialists on 30th June 1985 were:

Captain	1	(Note 1)
Commander	2	
Lieutenant Commander	8	(Note 2)
Lieutenant	4	
CPOM	2	
POM	6	
LSM	13	
ABM	30	
TOTAL OFFICERS		(14)
15		
SAILORS	51	(49)

Notes 1. Captain employed in non METOC billet
2. One LCDR RAN/RN exchange.

CIVILIAN

The following civilian members were employed in the Hydrographic Service on 30th June 1985.

The groupings reflect the organisation introduced after the 1984 Establishment Review (Bracketed figures reflect the staffing levels in 1983/84)

	Establishment	Terminal Staffing Level	Manning
Cartographic	57	43	43
Cartographic Trainee	1	1	1
System Support	10	4	5
Distribution	13	13	8
Administration	7	7	7
Survey Branch	6	6	4
Science Branch	4	4	4
Naval Defence Act	2	2	2
	100 (92)	80 (81)	74 (75)

HYDROGRAPHER
CAPTAIN J.S. COMPTON
062 65 5009

STAFF OFFICER HYDROGRAPHY
LCDR R J WILLIS
062 65 2599

CANBERRA OFFICE

POSTAL ADDRESS
A [illegible]
DEPARTMENT OF DEFENCE (NAVY OFFICE)
RUSSELL OFFICES
CANBERRA ACT 2600

TELEX AA 62112 FOR HYDRO RAN
SIGNAL HYDRO RAN

DIRECTOR, OCEANOGRAPHY & METEOROLOGY
COMMANDER I. BOFFINGER
062 65 5006

HYDROGRAPHIC OFFICE
161 WALKER STREET
NORTH SYDNEY NSW 2060

POSTAL ADDRESS PO BOX 1332 NORTH SYDNEY NSW 2060
TELEX ADDRESS AUSHYD AA 72669
SIGNAL ADDRESS HYDROSYD
TELEPHONE SWITCH (02) 925 4800 (TO CALL EXTENSIONS 9254 EXT)

DIRECTOR
HYDROGRAPHIC OFFICE
CAPTAIN J J DOYLE
EXT 801

OCEANOGRAPHIC STAFF OFFICER
LCDR P J QUIRKE
EXT 873

ADMINISTRATION
MR G CLARK
EXT 809

SYSTEM SUPPORT
MR J DEAN
EXT 833

SCIENCE
MR B SEARLE
EXT 870

SURVEY OPERATIONS AND PLANS
LCDR G J BOND RAN EXT 805

DETAILED SURVEYS — LCDR R E WARD EXT 808
OPERATIONS — LEUT J MASCHKE EXT 817
PLANS — VACANT
EQUIPMENT — WOSR C T HILLSDON EXT 812

CARTOGRAPHY AND SUPPLIES
MR K G BURROWS EXT 803

PRODUCTION — MR B LEONARD EXT 831
SYSTEM SUPPORT — MR R FURNESS EXT 854
INVESTIGATIONS — MR I KENNEDY EXT 853
RECORDS AND LIBRARY — MRS R McKOY EXT 852
DISTRIBUTION — MR K REID EXT 880

SURVEY SUPPORT
LCDR M A BOLGER EXT 802

NOTICE TO MARINERS — MR A J MARDSTAFF EXT 850
SAILING DIRECTIONS — MR G McINTOSH EXT 820
TIDES — MR A MARSHALL EXT 872
QUALITY CONTROL — VACANT

HMAS MORESBY
COMMANDER J W LEECH

HMAS COOK
COMMANDER T E LEWIS

HMAS FLINDERS
LCDR D C HOLLIDAY

HMAS BETANO
LCDR M A HUDSON

METEOROLOGICAL OFFICE
NAS NOWRA
COMMANDER K C HANCOCK

HMAS BRUNEI
LCDR [illegible] (Designated)

APPENDIX V

HYDROGRAPHIC NOTES

The following RAN ships rendered five or more Hydrographic Notes during the course of the year:

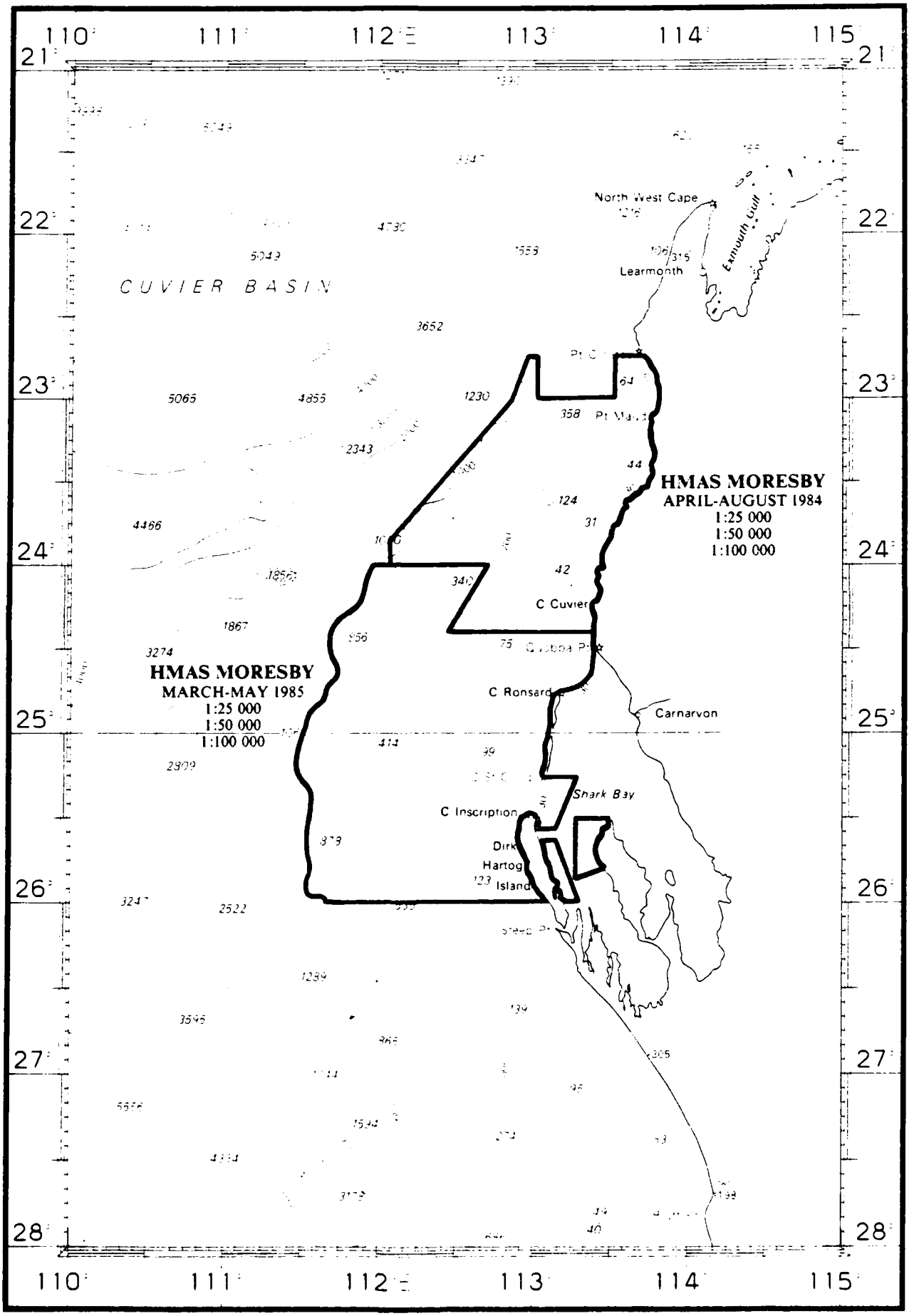
Assail	6
Balikpapan	10
Bendigo	27
Cessnock	18
Dubbo	13
Gladstone	13
Moresby	7
Tarakan	5
Tobruk	7
Wewak	10
Total	116

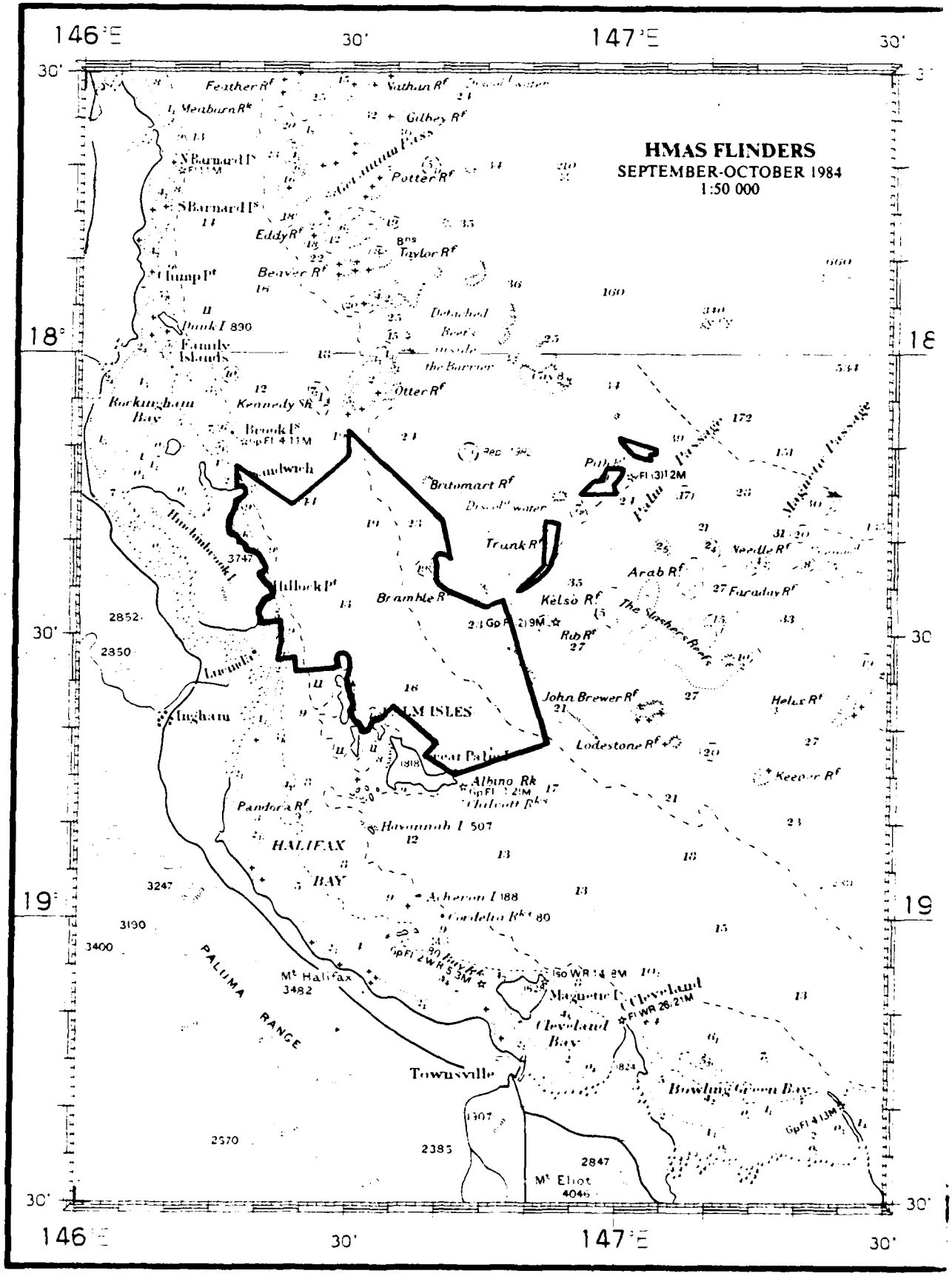
The remaining 40 Hydrographic Notes rendered by naval sources were supplied by 24 ships and establishments making a total of 156 individual Hydrographic Notes – a reduction of 44% over the previous year's outstanding input.

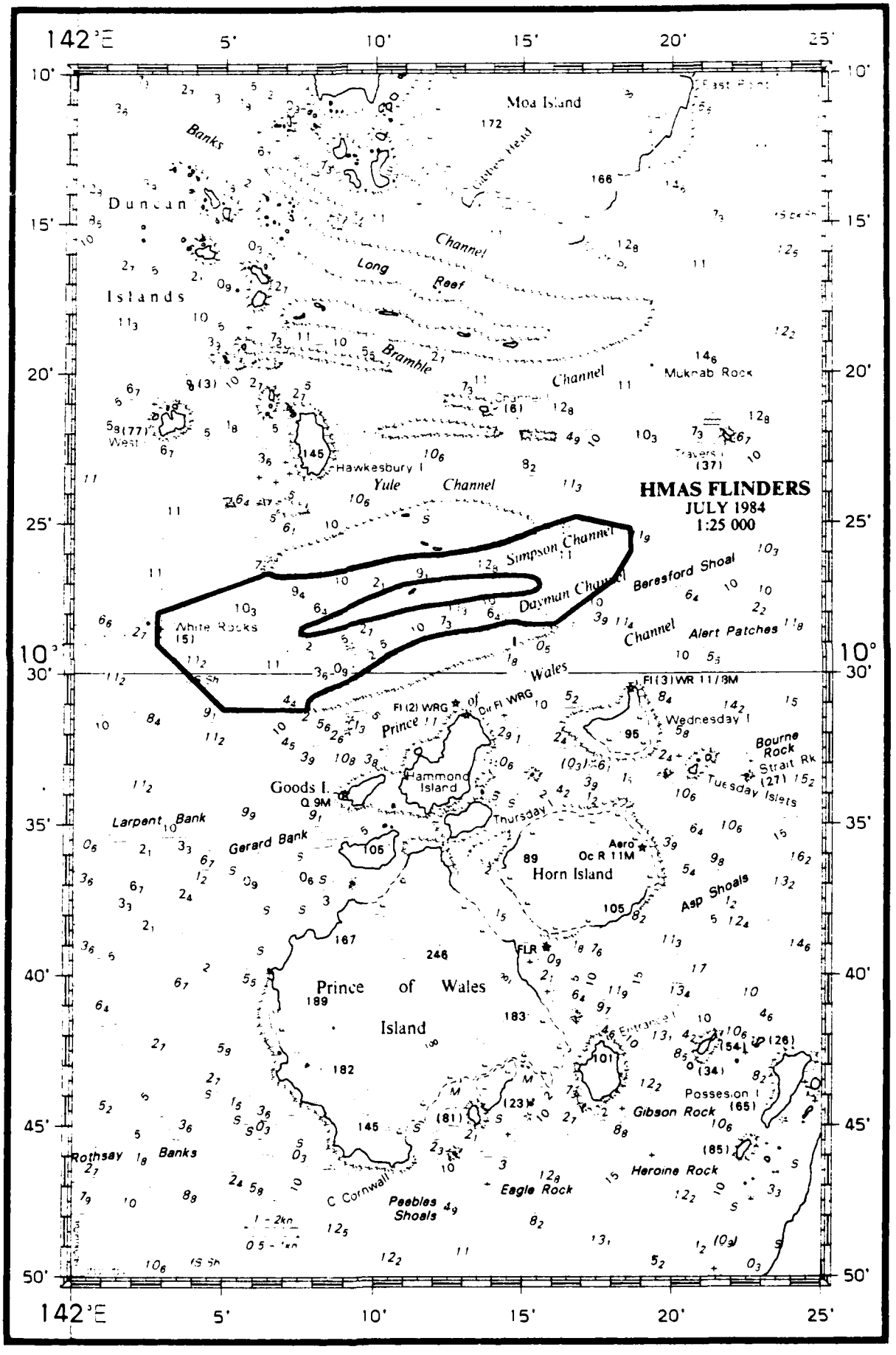
APPENDIX VII

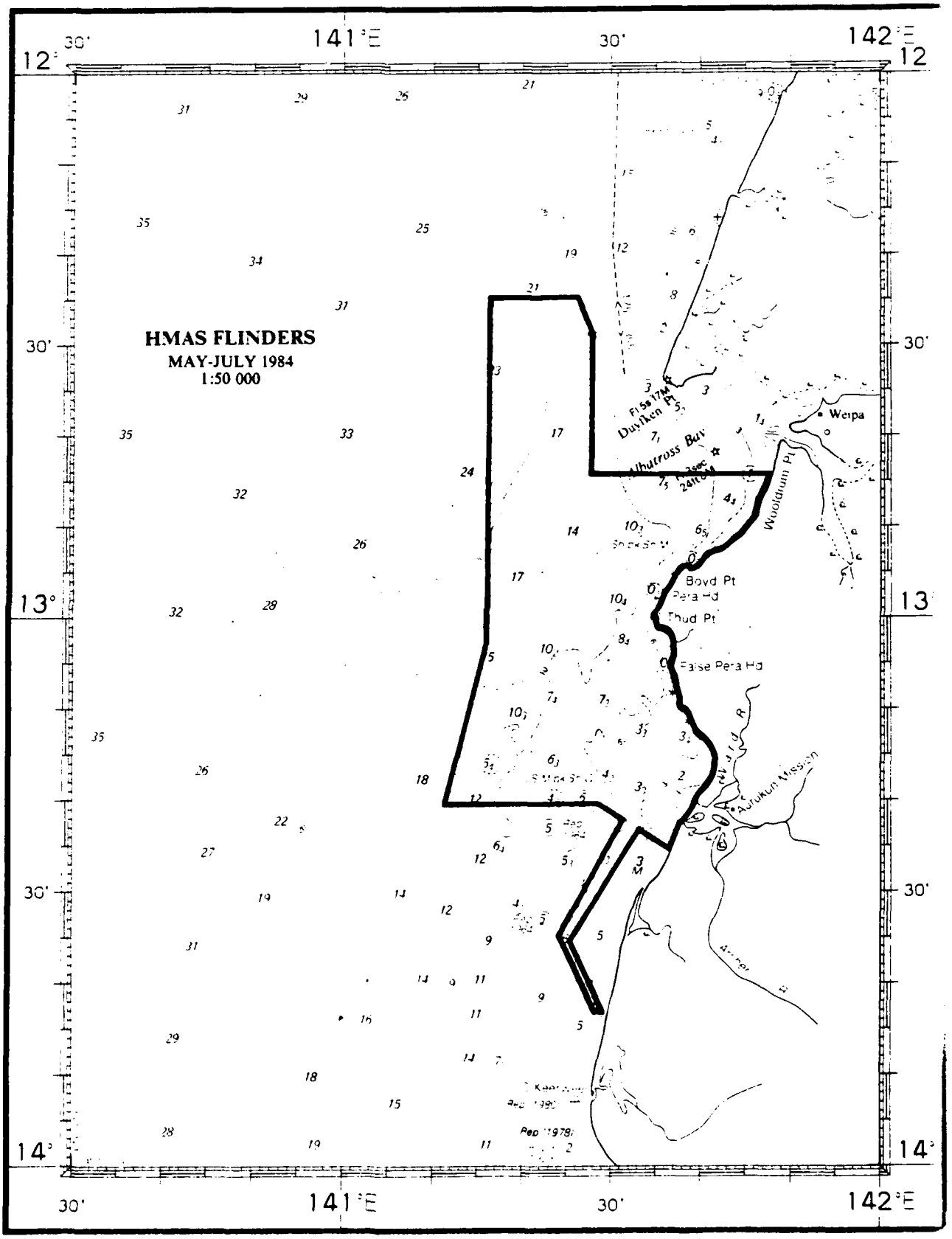
EXPENDABLE BATHYTHERMOGRAPH DEPLOYMENT JULY 84 TO JUNE 85

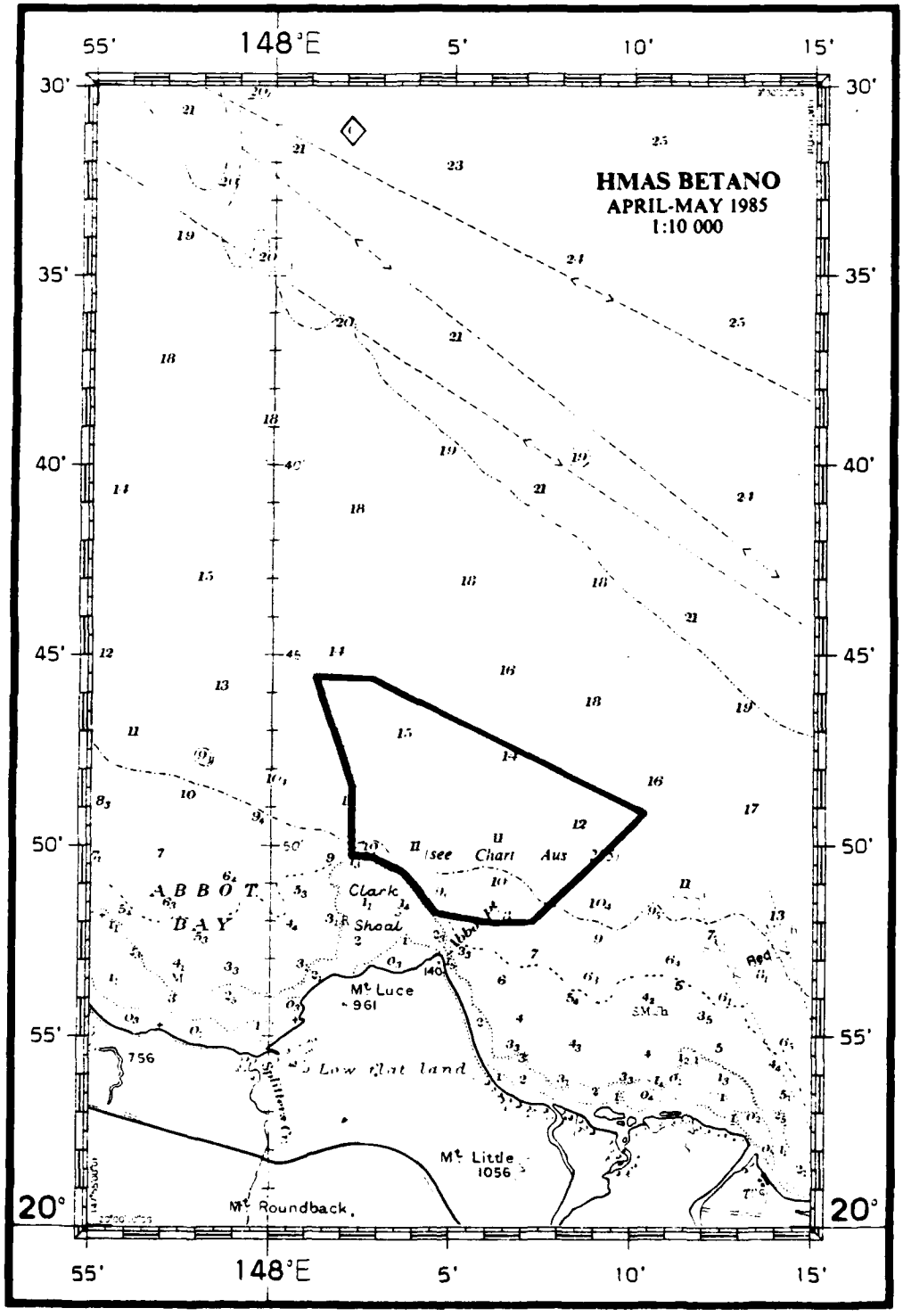
	DEPLOYED	ACCEPTED	SUCCESS
Fleet Units Surface			
ADELAIDE	478	383	80%
BRISBANE	280	181	64%
CANBERRA	393	297	76%
COOK	452	148	32%
DARWIN	127	68	53%
HOBART	144	105	73%
JERVIS BAY	55	41	75%
KIMBLA	125	104	83%
MORESBY	102	76	74%
PARRAMATTA	173	162	94%
PERTH	311	223	72%
STUART	359	311	87%
SYDNEY	277	218	79%
TORRENS	238	193	81%
VAMPIRE	168	73	43%
YARRA	472	411	87%
TOTALS	4,154	2,994	72%
Fleet Units Submarines			
OTWAY	10	3	30%
OVENS	15	1	6%
OXLEY	27	7	26%
TOTALS	52	11	21%
Submarine Velocimeter Traces			
ONSLOW	320		
ORION	60		
OTWAY	424		
OVENS	515		
OXLEY	435		
TOTALS	1,754		
Miscellaneous			
	DEPLOYED	ACCEPTED	SUCCESS
CAPE PILLAR	125	113	91%

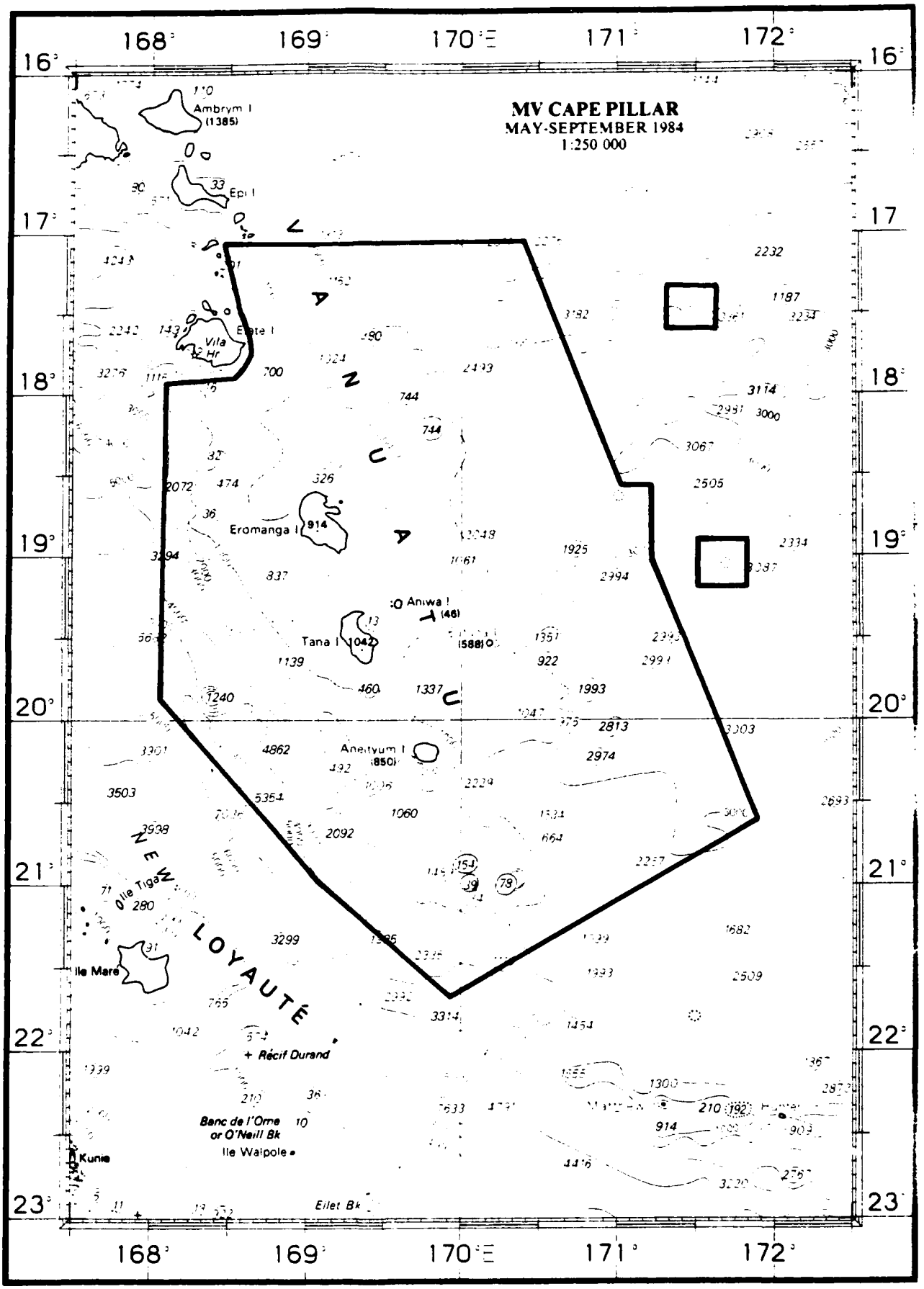

110°
111°
112°E
113°
114°
115°
21°
22°
23°
24°
25°
26°
27°
28°
North West Cape
Exmouth Gulf
Learmonth
CUVIER BASIN
Pt C
Pt Ma
C Cuvier
C Ronsard
Carnarvon
Shark Bay
C Inscription
Dirk Hartog Island
HMAS MORESBY
APRIL-AUGUST 1984
1:25 000
1:50 000
1:100 000
HMAS MORESBY
MARCH-MAY 1985
1:25 000
1:50 000
1:100 000


HMAS FLINDERS
SEPTEMBER-OCTOBER 1984
1:50 000
146°E
147°E
30'
18°
19°
Feather Rf
Nathan Rf
Meaburn Rk
Gilbey Rf
N Barnard Is
S Barnard Is
Potter Rf
Eddy Rf
Taylor Rf
Beaver Rf
Clump Pt
Hunk I 890
Family Islands
Rockingham Bay
Kennedy Rf
Otter Rf
Brook Is
Brook I 411M
Britomart Rf
Trunk Rf
Arab Rf
Faraday Rf
Kelso Rf
Rob Rf
Bramble Rf
Hillock Pt
Lucinda
Ingham
PALM ISLES
John Brewer Rf
Lodestone Rf
Albino Rk
Pandora Rf
Havannah I 507
HALIFAX BAY
Acheron I 188
Mt Halifax 3482
PALUMA RANGE
Townsville
Cleveland Bay
Magnetic I
Bowling Green Bay
Mt Elliot 4046
2852
2850
3247
3190
3400
2570
2385
2847
3747
1307


142°E
5'
10'
15'
20'
25'
10°
30'
35'
40'
45'
50'
Moa Island
Banks
Duncan
Islands
Channel
Long
Reef
Bramble
Mukhab Rock
Hawkesbury I
Yule
Channel
HMAS FLINDERS
JULY 1984
1:25 000
Simpson Channel
Dayman Channel
Beresford Shoal
White Rocks
Wales
Alert Patches
Prince
of
Wales
Island
Goods I.
Hammond Island
Wednesday I
Thursday I
Horn Island
Larpent Bank
Gerard Bank
Asp Shoals
Bourne Rock
Strait Rk
Tuesday Islets
Rothsay Banks
C Cornwall
Peebles Shoals
Eagle Rock
Gibson Rock
Heroine Rock
Possession I
Entrance I


HMAS FLINDERS
MAY-JULY 1984
1:50 000
141°E
142°E
12°
13°
14°
30'
Weipa
Albatross Bay
Duyfken Pt
Wuoldrum Pt
Boyd Pt
Pera Hd
Thud Pt
False Pera Hd
Aurukun Mission
Archer R


HMAS BETANO
APRIL-MAY 1985
1:10 000
148°E
55'
5'
10'
15'
30'
35'
40'
45'
50'
20°
ABBOT BAY
Clark Shoal
Mt Luce
961
Mt Little
1056
Mt Roundback
Low flat land
see Chart Aus
756


MV CAPE PILLAR
MAY-SEPTEMBER 1984
1:250 000
168°
169°
170°E
171°
172°
16°
17°
18°
19°
20°
21°
22°
23°
Ambrym I
(1385)
Epi I
Efate I
Vila Hr
Eromanga I
914
Aniwa I
(46)
Tana I
1042
(588)
Aneityum I
(850)
Ile Tiga
Ile Mare
LOYAUTÉ
NEW CALEDONIA
Récif Durand
Banc de l'Orne
or O'Neill Bk
Ile Walpole
Kunie
Eilet Bk

AMSTAT, Canberra
Bureau of Meteorology, Melbourne
Hydrographer of Navy, U.K. (6)
Hydrographer, Royal New Zealand Navy
Dominion Hydrographer, Canadian Hydrographic Service
Director, National Oceanic and Atmospheric Administration, U.S.A.
Director, Hydrographic Topographic Centre, Defence Mapping Agency U.S.A.
Oceanographer, U.S.N. Oceanographic Office
International Hydrographic Bureau, Monaco
O.I.C. Hydrographic Unit RFMF
Advisor, Hydrographic Unit, Solomon Is.
Port of Brisbane Authority
Bundaberg Harbour Board, Queensland
Cairns Harbour Board, Queensland
Gladstone Harbour Board, Queensland
Mackay Harbour Board, Queensland
Rockhampton Harbour Board, Queensland
Townsville Harbour Board, Queensland
Portland Harbour Trust, Victoria
Albany Port Authority, W.A.
Marine Board of King I. Tasmania
Port of Launceston Authority, Tasmania
Marine Board of Devonport, Tasmania
Marine Board of Burnie, Tasmania
Bunbury Port Authority, West Australia
Geraldton Port Authority, Western Australia
Port Hedland Port Authority, Western Australia
Marine Board of Victoria
Navigation & Survey Authority of Tasmania
Maritime Services Board of New South Wales
Port of Melbourne Authority
Geelong Harbour Trust
Public Works Department, Victoria
Department of Harbours and Marine, Brisbane
Department of Marine and Harbors, Adelaide
Habour and Light Department, Fremantle
Fremantle Port Authority
Public Works Department, Perth
Marine Board of Hobart
Northern Territory Port Authority
Department of Public Works, N.S.W.
Department of Transport, Division of Marine, P.N.G.
Papua New Guinea Harbours Board
Central Mapping Authority, New South Wales
Surveyor General, New South Wales
Surveyor General, Victoria
Surveyor General, Queensland
Surveyor General, South Australia
Surveyor General, Western Australia
Surveyor General, Tasmania
Surveyor General, Northern Territory
Surveyor General, Papua New Guinea
Australian Steamship Owners Federation
Queensland Coast and Torres Strait Pilot Service
Overseas Shipping Representatives' Association
The Hydrographic Society
Victorian Institute of Marine Science
Australian Institute of Marine Science, Townsville
Australian Institute of Cartographers
Association of Australian Marine and Port Authorities
Institution of Surveyors, Australia

DISTRIBUTION

Department of Defence (16 copies)

for attention: Chief of Naval Staff
Deputy Chief of Naval Staff
Chief of Naval Operational Requirements and Plans
Chief of Naval Material
Chief of Naval Personnel
Director General, Naval Plans & Policy
Assistant Secretary, Resources Planning – Navy
Hydrographer RAN (3)
Director General Joint Operations and Plans
Director, Joint Intelligence Organisation
First Assistant Secretary, Strategic and International Policy Division
First Assistant Secretary, Financial Services and Internal Audit Division
Assistant Secretary, Defence Information Services Branch
Director of Public Information

Flag Officer Commanding, H.M. Australian Fleet
Flag Officer Naval Support Command
Naval Officer Commanding, West Australia Area
Naval Officer Commanding, Victoria Area
Naval Officer Commanding, Queensland Area
Naval Officer Commanding, North Australia Area
Naval Officer Commanding, South Australia Area
Naval Officer Commanding, Tasmania Area
Naval Officer-in-Charge, Cairns
Commander Australian Mine Warfare and Patrol Boat Forces
Commander Australian Amphibious Squadron
Commanding Officer, H.M.A.S. MORESBY
Commanding Officer, H.M.A.S. COOK
Commanding Officer, H.M.A.S. FLINDERS
Commanding Officer, H.M.A.S. BETANO
Commanding Officer, H.M.A.S. BRUNEI
Master MV CAPE PILLAR
Commandant, ADFA
R.A.N. College, Jervis Bay
Navigation School, H.M.A.S. WATSON
Hydrographic School, H.M.A.S. PENGUIN
R.A.N. Staff College, H.M.A.S. PENGUIN
R.A.N. Liaison Officer, Bendigo
RANR Hydrographic Officers (20)
RAN Chart Agents
Joint Services Staff College, Canberra
Director of Survey (Army) (5)
Defence Research Centre, Salisbury
R.A.N. Research Laboratory
Commonwealth Surveyor General
Director of National Mapping for National Mapping Council (22)
Bureau of Mineral Resources, Geology and Geophysics
C.S.I.R.O Division of Fisheries and Oceanography
Department of Administrative Services, Canberra
Secretary, Senate Standing Committee for Trade and Commerce
Department of Primary Industry, Fisheries Division
Great Barrier Reef Marine Park Authority, Canberra
Department of Foreign Affairs
Australian Parks and Wildlife Service
Federal Sea Safety and Surveillance Centre
Department of Science and Technology
Australian Bureau of Statistics
Department of Transport (Maritime Safety Division)
Department of Local Government and Administrative Services, Aust.
Survey Office, Queensland
O.I.C. C.S.I.R.O. North Eastern Regional Laboratory

New South Wales	Sydney University University of New South Wales Macquarie University University of New England Newcastle University Wollongong University New South Wales Institute of Technology
Victoria	Melbourne University Monash University Latrobe University Deakin University Royal Melbourne Institute of Technology
Queensland	Queensland University The James Cook University of North Queensland Griffith University Queensland Institute of Technology
South Australia	Adelaide University Flinders University South Australian Institute of Technology
Western Australia	Western Australia University Murdoch University Western Australian Institute of Technology
A.C.T.	Australian National University
Tasmania	University of Tasmania Australian Maritime College, Launceston
P.N.G.	University of Technology

Libraries

National Library, Canberra
Parliamentary Library, Canberra
O.I.C. Document Exchange Centre, Canberra (18)
Defence Regional Library, (Remington Centre) N.S.W.
Defence Regional Library, (Victoria Barracks) N.S.W.
Defence Regional Library, Victoria
Defence Regional Library, South Australia
Defence Central Library, (Campbell Park) Canberra
Defence Central Library, (Russell Offices) Canberra
State Library of N.S.W.
State Library, Victoria
State Library of South Australia
State Library of Western Australia
State Library of Queensland
State Library of Tasmania
British Library, United Kingdom

END

FILMED

1-86

DTIC