

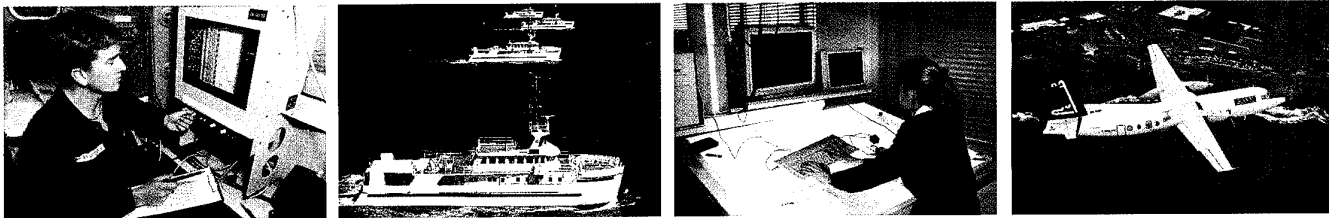
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HYDROGRAPHIC SERVICE ANNUAL REPORT

1994 - 1995

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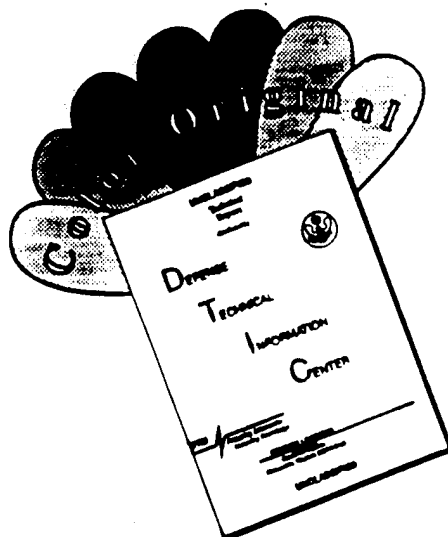


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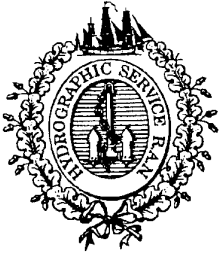


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HYDROGRAPHIC SERVICE Royal Australian Navy

ANNUAL REPORT 1994 - 1995

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**THE
HYDROGRAPHIC OFFICE
ROYAL AUSTRALIAN NAVY**

was officially opened on

7 April 1995

by

Senator The Honourable Robert Ray
Minister of Defence

Hydrographer's Foreword



Commodore Leech was appointed head of the RAN Hydrographic Service in November 1990. A career naval officer, he has completed 25 years of naval service, ten of those in the United Kingdom. Recent senior appointments have included Director Hydrographic Office, Deputy Director Hydrographic Development and Commanding Officer HMAS MORESBY.

This is the 31st Annual Report of the RAN Hydrographic Service. It continues the record of the surveying and charting of the Australian Coast and the evolution of the service. Of note, this edition is published during the Hydrographic Service's 75th year.

One of the main events of FY 94/95 was the relocation of the national hydrographic office from North Sydney to Wollongong. The new office provides a modern working environment with significantly improved automated chart compilation facilities.

Another important event has been the passage of Project Sea 1430 'Digital Hydrographic Data Centre' through the senior Defence Department committees to achieve the status of an approved project. Significant progress has been made with development work for this data centre, to a point where Australian data management concepts have been proven throughout the data lifecycle. An interim raster chart service has been initiated to meet urgent demands for digital data.

Good progress has also been made with Project Sea 1401 'New Hydrographic Ships' which will provide two ships to replace HMA Ships MORESBY and FLINDERS. At the time of writing tenders are being evaluated, and the new ships are expected to enter service in 1997 and 1998.

The Hydrographic Service has again received attention in new policy proposals, being mentioned in the Great Barrier Reef Shipping Study and the Commonwealth Coastal Policy. There are clear indications of an emerging marine navigation regime requiring more precise navigation in time and place, and of the important role that the Hydrographic Service will play in the implementation of that regime. There is also a much clearer appreciation in government of the value of hydrographic data in supporting sustainable development and management of the coastal zone.

In operations an impressive survey program has been achieved, including a post-eruption survey of Rabaul Harbour by HMAS FLINDERS, extensive surveys by the LADS Unit of hitherto uncharted portions of the northern Great Barrier Reef, 17 new charts and new editions have been published.

1994/95 has been a difficult year of transition in both technology and location, and yet much has been achieved. Our staff in survey, nautical charting and development have responded magnificently to these difficult transitional challenges.

A handwritten signature in black ink, appearing to read 'J.W. Leech'.

J.W. Leech

Commodore RAN

Corporate Overview

Background: The RAN Hydrographic Service is the Commonwealth Government Agency responsible for the publication of nautical charts and other information required for the safety of ships navigating in Australian waters.

The Hydrographic Service has its origins in the British Admiralty Hydrographic Office, which was established in 1795. The Admiralty carried out surveys and published charts of the Australian coast throughout the 19th century in support of the defence and commercial development of the colonies. The RAN assumed responsibility for hydrographic surveys in 1920, and for the publication of charts in 1942. In 1946 the Federal Cabinet made the Commonwealth Naval Board responsible for the surveying and charting of Australian waters. This responsibility was confirmed in 1988 after a review of Commonwealth mapping activities.

Roles of the Hydrographic Service RAN:

- ◆ To provide information to the Australian Defence Forces for military operations, as part of the National Defence Infrastructure.
- ◆ To provide navigation services to facilitate maritime trade for the economic benefit of Australia, as part of the National Transport Infrastructure.
- ◆ To provide navigation services in response to International Conventions for the Safety of Life at Sea and the Protection of the Marine Environment.
- ◆ To manage the National Hydrographic Data Base, and to provide data services to assist in the management and sustainable development of the maritime Australia's maritime zones, as part of the National Spatial Data Infrastructure.
- ◆ To co-ordinate Australia's hydrographic policy and services, both nationally and internationally.

Objectives:

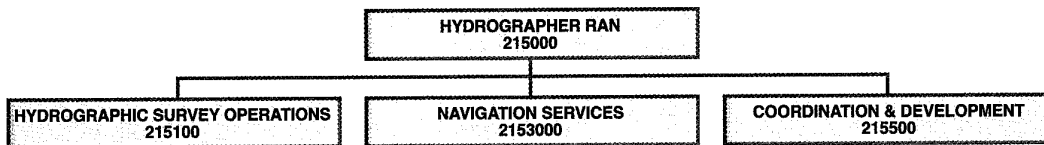
- ◆ To carry out hydrographic surveys.
- ◆ To publish, maintain and distribute official nautical charts and other nautical publications.
- ◆ To manage the national hydrographic data base.
- ◆ To develop capabilities to provide new and improved services.
- ◆ To participate in the international co-ordination and development of hydrographic services.

**GEOGRAPHIC AND HYDROGRAPHIC SUPPORT
Component 215000**

Manager: Hydrographer RAN

Under Program Management and Budgeting, the responsibilities of the RAN Hydrographic Service for national and defence hydrography fall within the Geographic and Hydrographic Support Component of Navy's Combat Forces (Maritime Operations) Sub-Program. This Sub-Program is managed by the Maritime Commander Australia.

**GEOGRAPHIC AND HYDROGRAPHIC SUPPORT
(215000)**



REPORTS

1. Hydrographic Survey Operations

Manager: Director Hydrographic Operations



Captain Geraghty joined the Royal Australian Navy in 1969 He served in HMA Ships PARRAMATTA, DUCHESS, SUPPLY, SYDNEY and TORRENS until mid 1976 when he selected the RAN Hydrographic Service as a sub-specialisation, and subsequently served in HMA Ships FLINDERS and MORESBY. In 1982 he was selected for the Royal Navy Long Hydrographic Course and exchange service. He has attended the RAN Staff College and has commanded HMAS FLINDERS and the New Zealand survey ship HMNZS MONOWAI. He has served in the areas of development and hydrographic ship operations in the Hydrographic Office until taking up the post of Director Hydrographic Operations in 1994.

Role

The acquisition and assessment of hydrographic data from field activities of the Hydrographic Survey Force and from other agencies

Objectives

Achievement of 10,000 square nautical miles of survey per annum of which 4,000 square nautical miles will be in the 0 - 50 metre depth band.

Elements

Hydrographic Office Operations and Survey Hydrographic Ships and Survey Units.

Performance Indicators

The rate of effort stated in the objectives is set to achieve a full survey of all tasks which have been assigned through the HYDROSCHEME. The priority areas are to the north of Australia and adjacent PNG. The sub-component is therefore evaluated in terms of square nautical miles of survey to specification per annum.

Hydrographic Survey Operations

Survey Program 1994/95.

The RAN surveying and charting plan HYDROSCHEME, is developed through consultation with the Department of Defence and various international and national maritime authorities. This plan is currently revised on an annual basis and promulgates the Service's proposed survey plan for the immediate future. The following figures indicate the work undertaken during the financial year. They do not reflect any loss of productivity due to mechanical defects or adverse weather conditions that precluded effective survey operations for the period 1994/95. The achievement of surveys against HYDROSCHEME is outlined at Annex B and depicted in Figure 1.

HMAS MORESBY.

HMAS Moresby commenced work in Arnhem Land and off Alyangula in June 1994. These were the first surveys undertaken by Moresby using DGPS as the primary navaid. Moresby returned to Fleet Base West in August and sailed again in September to resume work.

At the end of October, Moresby made a highly successful visit to Surabaya in Indonesia. The ship returned to Fleet Base West on 8 December. This brought Moresby's surveying tasks for the financial year to a close as a major maintenance at Transfield Shipbuilding (WA) commenced in February 1995, and the ship was in dockyard hands until the end of June.

HMAS FLINDERS.

At the beginning of the year HMAS FLINDERS' ageing main engines were replaced. In mid September, FLINDERS sailed for the Whitsunday Islands to re-survey the waters in the vicinity of Hamilton Island and Solway passage. FLINDERS returned to Cairns in October for defect rectification and SMB DUYFKEN was re-deployed to Hamilton Island. FLINDERS returned to the Whitsundays in December recovering DUYFKEN and the deployed survey equipment.

In January and February 1995 FLINDERS conducted survey operations between Stephens Island and Bligh Entrance in the north eastern approaches to Torres Strait. During this survey a new Klein 595 side scan sonar system was employed.

FLINDERS deployed to Rabaul, Papua New Guinea in February to re-survey Simpson Harbour in the wake of the volcanic eruptions of September 1994. A combination of ship and SMB work was used to sound and side scan sweep the harbour completely, including positioning in excess of 70 wrecks and accurately plotting the new coastline.

FLINDERS deployed tidal equipment at Raine Island to support future LADS operations before returning to Cairns at the beginning of April to commence what is scheduled to be the ship's last docking period.

HMA Ships MERMAID and PALUMA.

At the beginning of July 1994 HMA Ships MERMAID and PALUMA were establishing shore infrastructure to support a major survey in the south west corner of the Gulf of Carpentaria. The survey was to open up two deep draught approach routes passing to the east and west of Groote Eylandt leading to an anchorage in the vicinity of the Sir Edward Pellew Group.

In November and December the ships undertook a survey in the Great Barrier Reef between Port Douglas and Cooktown as part of a continuing effort to upgrade charting in the Two Way Route. In December, MERMAID and PALUMA were awarded the Hydrographic Shield for operational excellence. MERMAID was also awarded the Fleet Element Group efficiency award for Hydrographic ships, for efficiency across all departments within the ship. The ships returned to sea in mid January 1995 to continue the 1994 survey in the south west corner of the Gulf of Carpentaria.

Both ships undertook an Extended Contract Maintenance Availability (refit) from the beginning of April to the end of May with harbour, and sea acceptance trials and work up kept the ships in the Cairns area until late June. At the end of June MERMAID and PALUMA commenced a survey in the Great Barrier Reef in the vicinity of Lizard Island, north of Cooktown.

HMA Ships SHEPPARTON and BENALLA.

At the beginning of the period both ships were sounding in Torres Strait in the vicinity of Great North East Channel. BENALLA deviated from the survey grounds for a visit to Ambon, Indonesia, for a logistics and recreational visit before returning to Cairns in company with SHEPPARTON for routine maintenance.

In September both ships proceeded to Manus Island, Papua New Guinea. This survey was to sound the approaches to Southwest Bay to find a suitable shipping channel for merchant vessels using the area. Both ships left Manus Island in December and proceeded to the Solomon Islands to conduct a small survey in Buena Vista Passage, Florida Isles.

A survey off the Amhem Land coast followed in January 1995 that tasked the ships to sound from North East Crocodile Island to Castlereagh Bay, extending work previously undertaken by HMA Ships MORESBY and FLINDERS. The ships used the newly installed 'Hypro' survey data processing system, and after initial teething problems, were able to use the system with confidence.

Laser Airborne Depth Sounder (LADS) Unit.

The Laser Airborne Depth Sounder (LADS) Unit continued the survey of a new route in the northern section of the Great Barrier Reef along Fairway Channel between Cape Melville and Cape Weymouth. Survey operations were also conducted concurrently in Torres Strait west of Warrior Reefs. The aircraft generally operated from Cairns, but also forward deployed through Weipa and Port Moresby to reduce transit times to the survey areas. A number of smaller tasks were also conducted: the wreck site of HMS PANDORA was surveyed for the Queensland Museum and a survey in the western approaches to the Prince of Wales Channel was conducted in the vicinity of a reported grounding. The aircraft also deployed to Darwin to conduct a survey of the territorial sea baseline at Ashmore Reef, and to Eastern Victoria to survey The Bar at Lakes Entrance.

Between December and April major anti-corrosion aircraft maintenance was conducted which included a complete repaint. Survey operations were recommenced in May. The survey of the Fairway Channel was extended to the west to the Two Way Route off Cape Weymouth and a northern extension to Raine Island was also commenced. Concurrent survey operations were also commenced off Cairns between Trinity Opening and Cooks Passage and in northern Torres Strait between Gabba and Saibai Islands.

LADS is producing very high quality data in reef areas which in many cases have never been surveyed. This will be of interest to scientist and administrators as well as to navigators.

Hydrographic Office Detached Survey Unit (HODSU)

HODSU completed Operation Beachcomber 1994 in July. During September HODSU conducted a two week operational assistance visit to the Solomon Islands Hydrographic Unit (SIHU)

Proposed unit deployment onboard RSV Aurora Australis for the Antarctic 1994/95 season was curtailed owing to other Hydrographic commitments with Voyages 2 and 7 being cancelled. HODSU participated in voyage 3 in November / December with reduced personnel and without the Antarctic Survey Vessel (ASV) WYATT EARP embarked.

Preparation and reconnaissance for Beachcomber 1995 was undertaken during the period March and April with the operational phase conducted during May and June of 1995.

Tidal Section

The Section's work includes production of Australian National Tide Tables, as well as Solomon Islands and Vanuatu National Tide Tables, support for cartographic work and survey operations and special projects.

In addition to printed tide tables, the digital edition of the ANTT has been developed in form of a "Windows" program. This electronic version of tide tables provides more information needed by the navigators and in a more accessible form than the printed version. The biggest improvement over the printed version of the ANTT is the provision of a prediction facility for the secondary ports. The 1995 and 1996 editions are now being marketed.

Tidal Section is now working intensively on incorporating information on tides and other time varying objects into the Electronic Navigational Chart. The Section also continues to work on the "Australian Tidal Manual" and other tidal publications.

The Section cooperates closely with the National Tidal Facility at the Flinders University in Adelaide in all aspects of tidal theory and practice. A cooperative project with James Cook University of Townsville and with the Australian Institute of Marine Science is being developed with an aim of producing a definitive model of tidal stream circulation in North Queensland.

RAN Hydrographic School

The Hydrographic School has conducted a total of five major courses. One of these was the pilot Intermediate Marine Science Course which provides the specialised knowledge necessary for promotion to Leading Seaman. In addition, the school has conducted a number of short courses for Clearance Diving, Navigation and Mine Warfare personnel. A total of 40 students, including four overseas personnel, have attended major courses.

The most significant equipment change during the year has been the introduction of SERCEL DGPS. Instruction on this equipment has now been fully integrated into all major courses. The documentation of all courses in accordance with the RAN Training System has essentially been completed, the task now becoming one of maintenance rather than development.

In an effort to attract better informed uniformed personnel into the Branch, an open day was held at Pittwater in October 1994. This open day attracted many enquires, some of which have resulted in transfers into the Branch. Recruiting visits have also been made to Junior Officer training establishments.

Assessment Against Performance Indicators

Unit	Days at sea as a % of days away from base port	Miles sounded as a % of miles steamed	Area completed as a % of area allocated
MORESBY	81 %	53 %	81%
FLINDERS	99 %	61 %	50%
MERMAID	83 %	45 %	84%
PALUMA	82 %	54 %	84%
SHEPPARTON	78 %	22 %	96%
BENALLA	78 %	24 %	96%
LADS	NA	NA	72%
HODSU	72 %	N/A	N/A
Average	72%	37%	70%

The total area surveyed during 1994/95 was 7440 square nautical miles. Actual activities were less than those planned due to:

- a. Extension of HMAS MORESBY's refit
- b. Delays in HMAS FLINDERS engine changeover.
- c. HMAS FLINDERS retasking from Bligh Entrance to Rabaul.
- d. Time lost through poor weather particularly in the case of HMA Ships MERMAID and PALUMA

2. Navigation Services

Manager: Director Hydrographic Operations

Role

The provision of marine navigation information, and the delivery of customer services and products related to safety of navigation at sea.

Objectives

To provide timely delivery of services and products to the Australian Defence Force (ADF) and maritime community.

To produce sufficient products and services to a standard that will meet Australia's needs for safe navigation in Australian and Papua New Guinea waters.

Elements

Nautical Charting.
Navigational Services.
Information Services.
Chart Distribution.

Performance Indicators

The extent to which products and services are supplied to satisfy the ADF and maritime community's navigation needs.

Nautical Charting

The Nautical Charting Element was able to overcome the disruption of the Hydrographic Office relocation to Wollongong during the closing months of 1994 and is now functioning as an effective unit. It is meeting its responsibilities in regards to new chart production and the revision of existing published charts, together with providing other products relating to Fleet and maritime community needs.

The major setback which affected the Element during the year was the loss of experienced cartographic staff in the lead up to the relocation. The Element's staff numbers fell from a peak of 36 in July 1994 to a low of 22 in December 1994. However, the new facility and the enthusiasm displayed by the staff has permitted a rapid return to normal operations.

Highlights of the year included the following:

- ◆ Production of 10 New charts and 7 New Editions.
- ◆ Reprinting of 287 charts, of which 192 needed revision.
- ◆ Recruitment of 7 new cartographic staff .
- ◆ Installation of a new large format camera.
- ◆ Installation of a new Barco electronic plotter.
- ◆ Installation of new ChartStation chart compilation equipment and software .

ChartStation is a Geographical Information System (GIS) for the storage and management of navigation data. The GIS databases will be used for the production of the electronic chart as well as providing a base for the traditional paper chart. Training of staff and the formulation of procedures for ChartStation is scheduled to commence in July 1995 and will be an ongoing project throughout 1995/96.

With regards to the printing of charts, a private company has been contracted to supply normal stock replenishment from April 1995, while the Army Survey Regiment facility at Bendigo is undergoing refurbishment including installation of a new large format printing press. The contract is expected to be in place until September 1995.

Navigational Services

Maintaining up-to-date charts continues via the weekly issue of Notices to Mariners (see Annex D). The Element has also responded to queries from authorities and the public on a range of issues from place names and maritime features, to general depth data. Progress towards a national set of Sailing Directions is continuing. An increasing demand on the section is the support required for data associated with maritime boundaries.

Information Services

The period FY 94/95 is significant for change within the Information Section. Including changes to staffing, the element has commenced implementation of a new records management and filing system.

Information Services received 586 items of information from RAN hydrographic units and other sources. Primarily, this information affected 114 navigational charts. A total of 74 requests for the supply of RAN data, of which 34 were for digital data were received in the period. See Annex E for contributions and acknowledgments.

The Hydrographic Service wish to publicly acknowledge the contributions made by the Port and Marine authorities of the Australian States in providing survey information for the charts of all the major ports in Australia.

Chart Distribution

A major exhibit was held as part of the 1994 Sydney Boat Show (July 1994) over a seven day period, and was staffed by civilian and service personnel of the Hydrographic Office. Display material was provided by the Hydrographic School, Navy Public Relations and LADS Unit.

The Chart Distribution Centre ceased operation in Sydney on Friday 4 November and commenced operations in the Wollongong facility on Monday 7 November 1994. A smooth transition was achieved without the need to degrade the availability of nautical products during the move.

A conference involving the major Charts Agents from around Australia was held in May 1995. The conference was to discuss a variety of developments which would effect the larger chart agents. No new chart agents were appointed during FY 1994/95.

In addition to sales of Australian charts by the Hydrographic Office, under individual charting agreements, the Defence Mapping Agency (USA) and the U.K. Hydrographic Office has been authorised to reprint charts of the Australian series (Annex A).

Assessment Against Performance Indicators

Ten new charts and seven new editions were produced during the FY 94/95. Additionally the ADF was supported with the production of seventeen charts and a number of miscellaneous graphics.

The inter-services arrangement and program for chart printing was maintained with a slight increase in the number of charts reprinted during the period. Of 287 charts involved, 192 required revision and 95 went unrevised (direct reprinting for restocking purposes).

The Nautical Charting Element has maintained support to Navigational Services through the preparation of 23 block chartlets issued in weekly Notices to Mariners. Cartographically prepared overlays for screen printing purposes has been an on-going commitment during the year.

595 Notices to Mariners were issued over the period.

3. Co-ordination And Development

Manager: Director Co-ordination and Development



Ken Burrows joined the Hydrographic Office as a cartographer in the late 1950s. He compiled many of the more complex charts around Australia and was responsible for introducing computers into hydrography in the mid 1970s. He was also largely responsible for the successful concept implemented as AUTOCHART, the chart production system still in use today. His ideas on hydrographic information, and initiatives for progressing the development of an electronic chart display and information system, have resulted in Australia being a world leader in the development of electronic charting. In 1993 Ken Burrows was awarded an O.A.M. for his services to marine cartography.

Role

Component wide aspects of planning, resourcing and co-ordination of hydrographic, surveying and cartographic operations and information management. Servicing and promoting the national activities of the Component.

Objectives

Supply the long-term planning and co-ordination of resources for tasks necessary to meet strategic guidance and national responsibilities.

Promote the Hydrographer's national and international role in hydrography.

Provide development and investigation services to meet specific program requirements with minimum disruption to operational areas.

Activities

Hydrographic Development.
Branch Development.
Corporate Services.
National and International Affairs.

Performance Indicators

The number of development initiatives successfully implemented.

The ability to meet international commitments affecting the national role of providing maritime geographic and hydrographic information.

The degree to which essential planning and project tasks can be performed without impinging on resources available to the operating areas.

The ability to provide management information on resource utilisation and control.

Hydrographic Development

Hydrographic Development activities primarily focus on uniform manpower, ship and system resources, and operating standards and procedures required to support the through life management of hydrographic data.

In the manpower arena new methods of crewing are being developed which aim to improve the quality of life of seagoing personnel whilst maximising productivity at sea. To this end, a multi crewing philosophy has been developed primarily for the new hydrographic ships planned for introduction in 1997 with the aim of achieving 300 days at sea per year.

The tender evaluation of the new replacement hydrographic ship submissions consumed much of the Section's resources in the six months to June 1995. These new vessels are expected to increase hydrographic capability by the utilisation of state-of-the-technology including integrated multi-beam and side-scan sonars, full sensor, navigation and computer system integration, and tailored data processing functionality and man-machine interfaces.

Other system developments during the period have included the new HyPro Survey Motor Launches (SML) survey data processing system, upgrades to processing systems in the major ships and Hydrographic Office, and specification development of a new SML control system that integrates hydrographic data logging, ECDIS data base and display functions.

Development work has also progressed on the use of remotely sensed satellite imagery and Geographic Information Systems (GIS) for coastline delineation and shallow water charting. The use of other remotely sensed data, such as electro magnetic and multi spectral data have also been examined as possible hydrographic data gathering tools which might meet the standards of depth and position accuracy necessary for marine navigation.

Procurement of Klein side scan sonars, differential GPS and a multimedia system for the Office have been achieved. While two Optus MobileSat communications systems have been acquired for the Survey Motor Lauche's, GPS tracking systems have been examined for applications such as rapid coastline and feature positioning.

LADS development activities have included forward planning for a 'half-life' system modernisation. The aim of this would be to increase system performance, by continuing bias model and sea-swell correction investigations, improving data processing and validation techniques in the GASS and providing options to fly at different heights and in full daylight.

Procedures for assessment and display of hydrographic data quality have also been thoroughly reviewed and a new concept, termed Zones of Confidence (ZOC) has been developed. Draft international standards have been produced and assessment software trialed. With the recent completion of display formats, which will replace the Reliability Diagrams on the paper chart and become the standard for electronic charts, ZOCs should first appear on published charts during 1996.

The RAN Hydrographic Service has been an active participant in the review of the International Hydrographic Organisation (IHO) Standards for Hydrographic Surveys (SP-44) and considerable effort continues to be applied to have this document reflect Australia's views and interests.

Branch Development

The Branch Development Group has concentrated on consolidating its position with respect to the Electronic Chart Display Information System (ECDIS) development following the relocation to Wollongong at which time it lost several key and experienced staff. Nevertheless, the ECDIS development has progressed with design being tested and proven through several afloat sessions in conjunction with the RAN Hydrographic Service industry partner, Hydrographic Sciences Australia Pty. Ltd. Opportunities have been taken to demonstrate the system while afloat to senior Australian Defence and government personnel as well as some foreign visitors. Some data has been released for public use and the volume is expected to grow during the ensuing year.

Policy with respect to digital data has seen the development of the concept of officially released data that complies with the international standards while meeting quality requirements. This will be known as Standard Authorised Navigation Data (SAND). Following a decision to produce raster data of chart information, SAND will become available in a raster, as well as vector format. Initial priority will be given to Queensland waters, reflecting national maritime safety priorities.

In seeking funding for the provision of the underpinning data bases Defence has initiated a new Major Capability Proposal - Project SEA 1430 'Digital Hydrographic Data Centre'. The project was considered by higher Defence committees in early 1995. It is expected that the financial approval will be granted in the May 1996 Budget. A project officer from the Naval Materiel Division is located at the Hydrographic Office and together with the Development Section has commenced work on the statement of requirements for the project.

Through the Branch Development group, the Service has continued its significant contribution to the development and use of international standards, and continues to provide the secretariat for the ECDIS Presentation Library working through the IHO. Australia has also contributed to the harmonisation process between civilian and defence standards.

Implementation of the concept of the Australian Hydrographic Data Centre (AHDC) has continued. Within the AHDC, the Navigational Aids Data Centre (NADC) has been established with the population of the base for Port Phillip, Westernport, Jervis Bay and Wollongong completed. Operational procedures and quality assurance processes for the data are being finalised. Also, the Sounding Data Centre (SDC) development has concentrated on the Master Archive. This component is now operational for the storage of digital survey data. Manuscript data management has been placed onto a digital database.

Another important activity has been the development of new business and institutional arrangements for the digital era. There has been considerable interaction with the Offices of Commercial Law and International Law in the Attorney General's Department. Provision of digital data under licence to new customer groups eg. scientists , coastal zone managers, has required considerable resources.

Computer Services

The group has continued to concentrate on the provision of computing services for the maintenance and improvement of the local network and has continually liaised with the Information Systems Agency responsible for implementation of the Navy Information Network. The Chart Information System has been maintained throughout the year and a contribution has been made to the requirements of some field survey systems. The Computer Services group experienced significant downsizing as a result of loss of staff during the relocation, and a management decision to reassign these positions to other sections.

Corporate Services

The relocation of the Hydrographic Office placed a heavy load on the Corporate Services group with respect to managing personnel needs for the period leading up to the relocation, and for some months after. Some minor establishment variations have been effected and a general review of the civilian positions will be carried out through the consultative processes with preliminary work commenced for staff development and training. Contacts have been made with the local TAFE College and informal visits have been made by some University of Wollongong staff. Some staff have commenced studies at the University and TAFE college.

The component overspent it's funding allocation for the year by 1.5%. Managers integrated the tasks of financial management with their normal activities and generally achieved their objectives with limited funds. The Hydrographic Office has developed better financial management skills as it has embraced Program Management and Budgeting.

The establishment of procedures for contracted facilities management has also been a significant innovation following relocation.

National and International Affairs

During the year there have been some important international and national policy initiatives concerning hydrographic services. In November 1994, the Navigation Safety Sub-Committee of the International Maritime Organisation endorsed a new draft regulation concerning the responsibilities of Government for the provision of hydrographic services (SOLAS V8). This important new regulation is reproduced in full at Annex G of this report.

Interest in ECDIS services has also grown. IMO Circular letter MSC 637 of June 1994 urged member governments to expedite the production of ECDIS services. Within Australia, both the Great Barrier Reef Shipping Study of March 1995, and the Commonwealth Coastal Policy of May 1995 have strongly supported the establishment of ECDIS services, as a means of improving safety of navigation and prevention of pollution of the marine environment. ECDIS services are also contributing to improved commercial performance of shipping companies in North America. The RAN Hydrographic Service has continued to be active in national and international forums, dealing with the introduction of ECDIS services.

During the year the Australia New Zealand Land Information Council began to promote a National Spatial Data Infrastructure to optimise the use and economic benefits of spatial data collected in the public interest. The Hydrographer, through the Commonwealth Spatial Data Committee, has been involved in this development, which will make hydrographic data more accessible to scientists, engineers and coastal zone administrators.

Hydrographic Service personnel participated in the activities of the following national bodies during the year:

- ◆ Inter-Governmental Advisory Committee on Surveying and Mapping
- ◆ Maritime Service Advisory Committee - Navigation Safety
- ◆ Permanent Committee on Tides and Mean Sea Level*
- ◆ Steering Committee for the National Tidal Facility *
- ◆ Co-ordinating Committee of Commonwealth Marine Science Agencies
- ◆ Commonwealth Spatial Data Committee, and its sub-committees
- ◆ Standards Australia Users Panel on ECDIS
- ◆ Hydrographic Commission, Institution of Surveyors Australia / Australian Hydrographic Surveyors Accreditation Panel*
- ◆ The Hydrographer Service provides secretariate services for committees marked *

Throughout the year RAN Hydrographic Service staff continued to take an active role in the various activities of the International Hydrographic Organisation (IHO), making significant contributions in the work being carried out by a number of IHO committees and working groups., viz. the Committee on ECDIS (COE), the Committee for the Exchange of Digital Data (CEDD), Permanent Working Group on Cooperation in Antarctica, the Working Group on Standards for Hydrographic Survey and the Tidal Working Group. Visit details associated with these are outlined below:

26-30 Sep 94	Meeting of IHO Working Group on Standards for Hydrographic Survey - S-44, Monaco.
20-25 Nov 94	IHO COE Colours & Symbols Working Group meetings, on board ferry 'Finnjet' between Helsinki, Finland and Travemunde, Germany
28 Nov- 1 Dec 94	IHO Committee on ECDIS and Committee for the Exchange of Digital Data , Monaco
29 Jan- 2 Feb 95	Meeting of International Electrotechnical Commission Working Group on ECDIS, on board ferry 'Finnjet' between Travemunde, Germany and Helsinki, Finland
3-8 Feb 95	IHO COE Product Specifications Workshop, COE Data Base and CEDD Transfer Standard Maintenance Working Groups Meetings, Hamburg, Germany
8-14 Mar 95	1st meeting of the IHO Committee on World Wide Electronic Navigational Chart Data Base, IHO Legal Advisory Committee Meeting, 2nd International Conference on Maritime Law and the Electronic Chart, New Orleans, U.S.A.
28-31 Mar 95	6th Conference of The East Asia, Hydrographic Commission, Kuala Lumpur, Malaysia
29 May - 2 June 95	IHO COE Data Base and CEDD Transfer Standard Maintenance Working Groups meetings, Norrkopping, Sweden.

Opportunity was taken during attendance at the above meetings to visit national hydrographic offices to discuss issues of mutual and regional interest. After attending the meetings in New Orleans in March 1995, Hydrographer held discussions on ECDIS and copyright issues with the US National Ocean Services (NOS), Washington USA. This was followed by a visit to the UK Hydrographic Office, Taunton. Similarly, on his way to Monaco in November 1994, Director Coordination and Development called on the Port of Singapore Authority Hydrographic Department and discussed with its officials matters pertaining to the development and regional co-ordination of internationally standardised

electronic chart data. Following the meetings of the COE Working Groups in June 1995, Mr Roberts visited the Danish Hydrographic Office, Copenhagen and the French Hydrographic Office (EPSHOP), Brest and discussed matters relating to electronic chart data and associated information management systems. In June 1995 the Tidal Officer held discussions on tidal matters with the NOS and Defence Mapping Agency in Washington, USA.

Assessment Against Performance Indicators

The ECDIS development and transition toward the implementation of an Australian Hydrographic Data Centre (AHDC) again dominated the years efforts with a number of significant milestones being achieved. The first fully compliant ECDIS data sets have been prepared and a business plan for an Australian Chart Raster Data Product was approved. The AHDC model was progressed to the stage of initial implementation.

All International commitments affecting the national role of providing marine geographic and hydrographic information were met during the period , including the significant support requirements of Project Sea 1430.

Planning and project tasks impacted positively on operational areas with the introduction of Chart Station 2000 which accelerates the capability to transfer extant digital AUTOCHART files into basic ECDIS compliant files.

All requirements by management for information were met.

National and international policy developments in the areas of maritime safety and protection have continued to support the work of hydrographic programs.

Increasing demand for digital data from various sources, including environmental demands, have placed great pressure on coordination and development resources. Defence of the Commonwealth's copyright in charts has been vigorously pursued.

Statement of Income and Expenditure

Expenditure		\$ M
Executive		0.1
Hydrographic Survey		
Operations and Surveying	6.7	
HSF Vessels and Aircraft	47.1	53.7
Navigation Services		3.0
Co-ordination and Development		5.6
Total:		62.4
Income		
Net Sales Revenue		1.5
Department of Defence Appropriation		60.9
Total:		62.4

Annex A.

Finance And Accounts

Chart Revenue

DISTRIBUTION OF CHARTS AND ASSOCIATED PUBLICATIONS

		1992-93	1993-94	1994-95
Australian	Issued	25,739	25,350	28,055
	Sold	113,275	103,845	106,032
British Admiralty	Issued	12,554	10,828	11,477
	Sold	5,554	5,262	3,877
New Zealand	Issued	1,748	1,451	2,367
	Sold	407	426	384
Total:		159,152	147,212	152,192

VALUE OF CHARTS AND ASSOCIATED PUBLICATIONS SOLD

(Exclusive of Sales Tax)

		1992-93	1993-94	1994-95
Australian		\$1,255,705	\$1,317,808	\$1,333,267
British Admiralty		\$130,070	\$132,088	\$98,991
New Zealand		\$5,490	\$6,291	\$5,703
Total:		\$1,391,621	\$1,456,312	\$1,437,961

REVENUE SUMMARY

		1992-93	1993-94	1994-95
Net Sales		\$1,391,621	\$1,456,312	\$1,439,827
Sales Tax		\$81,283	\$89,555	\$95,864
Freight & Sundries		\$118	\$262	\$246
Total:		\$1,473,022	\$1,546,129	\$1,535,937
Value of Issued Stock		\$665,097	\$635,281	\$754,752

Charts sold by the Defence Mapping Agency:

165 Australian charts reprinted within the DMA series, with 1,564 charts sold

Charts sold by the UK Hydrographic Office

220 Australian charts reprinted by UK Hydrographic Office, with 44,953 charts sold

Annex B.

Activities

Surveys Undertaken (July 1994 - June 1995)

Unit(s)	Instruction	Location	Area Sounded (nm ²)
HMA Ships SHEPPARTON and BENALLA	HI 205	Bismark Sea, PNG	939
	HI 218	NE Crocodile Island to Castlereagh Bay, NT	346
	HI 228	Approaches to Karumba	Commenced
HMA Ships MERMAID and PALUMA	HI 208	Bing Bong, NT (Macarther River)	1094
	HI 216	Cairns, QLD	195
	HI 231	One Mile Opening, QLD	Commenced
HMAS FLINDERS	HI 212	Whitsunday Islands, QLD	87
	HI 217	Bligh Entrance to Pandora Passage, QLD	378
	HI 224	Simpson Harbour, Rabaul, PNG	19
HMAS MORESBY	HI 210	Approaches to Alyanguala, NT	206
	HI 211	NE Crocodile Island to N Crocodile Reef, NT	1635
LADS Unit	HI 193	Bunker Reef to Fairway Channel, QLD	1003
	HI 206	Torres Strait, QLD	524
	HI 220	Cooks Passage to Trinity Opening, QLD	In progress 546
	HI 221	Cape Weymouth to Blackwood Channel, QLD	In progress 340
	HI 222	Torres Strait, QLD	In progress 100
HODSU	Beachcomber 1994	NW Coast Australia	16
	Antarctica	ANARE Programme	Nil in 94/95
	Beachcomber 1995	NW Coast Australia	12
TOTAL			7440

Annex B.**Activities****Chart Production And Maintenance**

	1992-93	1993-94	1994-95
New Chart Production			
New charts published	6	13	10
New editions published	11	10	7
New charts/diagrams for RAN use	9	11	17
Miscellaneous charts	1	5	5 Note 1
Chart Maintenance			
Modified reproductions of BA charts	4	0	0
Notice to Mariners block corrections	22	23	17
Revisions by reprinting	147	178	192
Revisions by screen printing	110	83	30
Miscellaneous graphics	41	9	17

Note 1. These are charts which are not identified in the chart programme. ie Index charts

Annex B.**Activities****Description Of New Charts Published**

The information shown on all new charts is contained in the Hydrographic chart digital database.

Aus 742 Rosemary Island to Barrow Island (WA), 1:150 000

This coastal navigational chart replaces former chart Aus 742 published in 1970 (New Edition 1980). Limits have been reschemed and calculated to a common mid latitude for this scale series so that the adjoining chart scales are compatible. Modern horizontal and vertical datums have been applied.

Aus 615 Plans in the Coral Sea

This new chart based on modern vertical and horizontal datums replaces the former Aus 612 of imperial units published in 1887 (Mod Rep 1984). These plans are derived from RAN surveys of 1985 - 91 and national bathymetric survey data.

Aus 280 Eden Rf to Magpie Rf, Flinders Group (Qld), 1:75 000

Includes Magpie Reef to Eden Reef 1:75 000 and Flinders Group 1:50 000

A new chart produced for pilotage through the Two-Way Routes at larger scales than were previously available on Aus 833. The new deep water route from Magpie Reef and Hannah Island continuing south-east to between Grub Reef and Eden Reef is also depicted. Modern horizontal and vertical datums have been applied.

Aus 150 Western Port (Vic), 1:75 000

A new chart which covers Western Port and its approaches, including plans of the Eastern Entrance, The Narrows and Rhyll. This chart incorporates the recently published Aus 151 and is based on modern horizontal and vertical datums. This new chart recognises the requirements of the local community for navigation in the Narrows.

Aus 28 Plans in Port of Darwin (NT)

A new chart based on modern horizontal and vertical datums. It forms part of the rescheme of the charts within the Darwin area and replaces the current Aus 28 published 1973 (New Edition 1985), and reflects the requirements of commercial shipping in the port.

Aus 26 Approaches to Port Darwin (NT), 1:50 000

A new chart based on modern vertical and horizontal datums. It forms part of the rescheme of the charts within the Darwin area and replaces the current Aus 27 published 1973.

Aus 303 Nassau River to Wellesley Islands (Qld), 1:300 000

A new chart based on modern horizontal and vertical datums, which replaces the former Aus 303 of imperial units published in 1971. The completion of this chart sees the RAN (Flinders) 1974 survey of Approaches to Sweers Island and Albert River compiled to the chart, which also includes Queensland Harbours & Marine and Transport surveys to 1994. Division of National Mapping bathymetric surveys of 1987-89 are included.

Aus 609 Norfolk Island

A new chart based on modern horizontal and vertical datums, which replaces the current Aus 609 of imperial units (Mod Rep 1992). The new chart is a complete new scheme and consists of Approaches to Norfolk Is 1:300 000, a plan of Norfolk and Phillip Islands and 3 large scale plans of the main bays

of Norfolk Island. The majority of data came from the RAN (Flinders) survey of 1993 with additional data from a RNZN survey of 1980 and soundings on passage.

Aus 608 Approaches to Christmas Island, 1:100 000

A new chart based on modern horizontal and vertical datums, which replaces the current Aus 608 of imperial units (Mod Rep 1992). The chart was compiled from RAN surveys 1966-1984, Australian Hydrographic Survey surveys of 1964 and soundings on passage.

Aus 514 Woodlark Island (PNG), 1:150 000

A new chart based on modern horizontal and vertical datums, produced under a Memorandum of Understanding for charting in Papua New Guinea waters. It consists of a main chart and 2 plans in the vicinity of Kwaiapan Bay. Data used is from RAN surveys of 1943-95 with additional data from soundings on passage. The chart is required to support the growing timber exports from this locality.

New Editions Published

Aus 700 Western Approaches to Torres Strait (Qld), 1:150 000

A new edition with slightly amended limits to the current Aus 700 published in 1979 (NE 1983), to incorporate charts Aus 292, 293, 294, 296, 289 and 701 published 1988 - 90. Modern horizontal and vertical datums have been applied.

Aus 601 Approaches to Casey (ANT), 1:50 000

A new edition of the existing chart which incorporates the 1993 Hydrographic Office Detached Survey Unit (HODSU) survey. This survey extended beyond the survey area of 1991 to the north, west and south into Vincennes Bay, upgrading the approach area to Casey. This is part of the Australian contribution to the International Antarctic Charting Programme.

Aus 715 Cape Arnhem to Cape Wessels (NT), 1:150 000

A new edition of the existing chart based on modern horizontal and vertical datums, incorporating RAN surveys 1987-93. The chart is produced principally for defence requirements.

Aus 143 Port Phillip (Vic), 1:100 000

New Edition of the existing chart incorporating new survey data and extensive changes to navigational aids in South Channel.

Aus 15 Plans in Northern Territory, Wessel Islands,

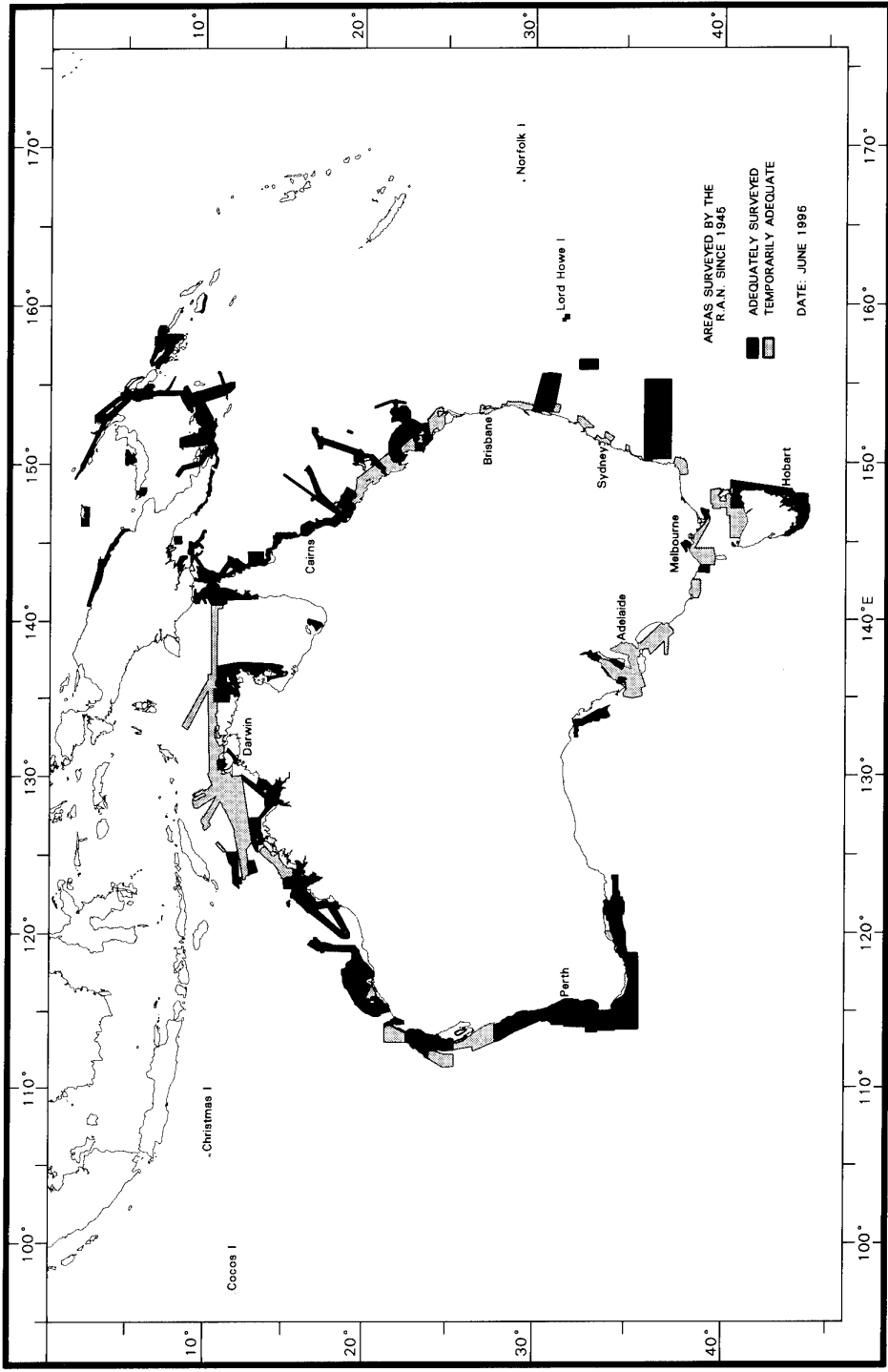
This new edition was required due to incorrect tidal adjustments in the previous edition in the vicinity of the south western entrance to Cadell Strait.

Aus 821 Hydrographers Passage (Qld), 1:150 000

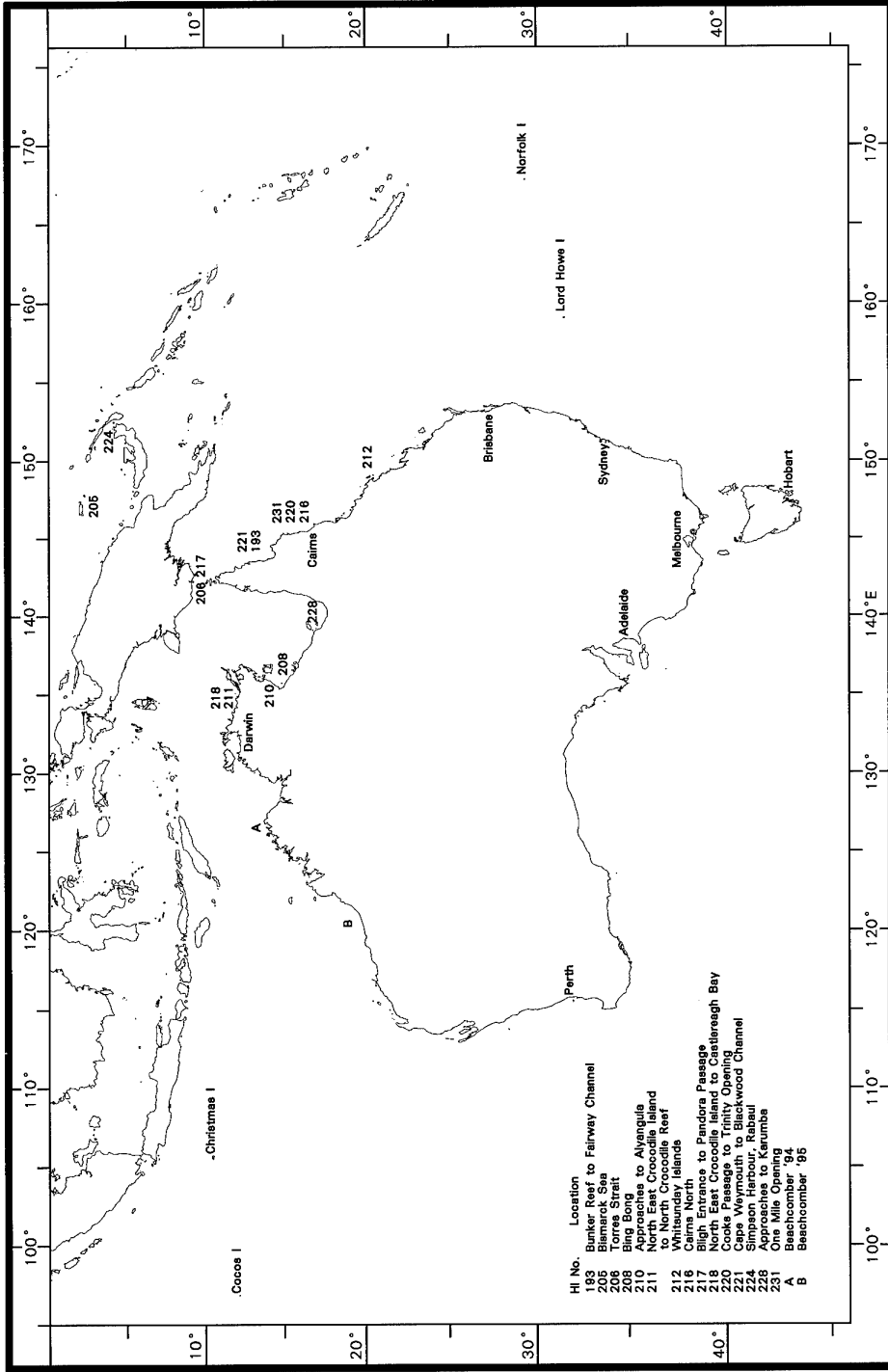
A new edition of the current chart to incorporate information from the 1992 new edition of Aus 249 and Division of National Mapping bathymetric surveys to 1991.

Aus 744 Exmouth Gulf and Approaches (WA), 1:150 000

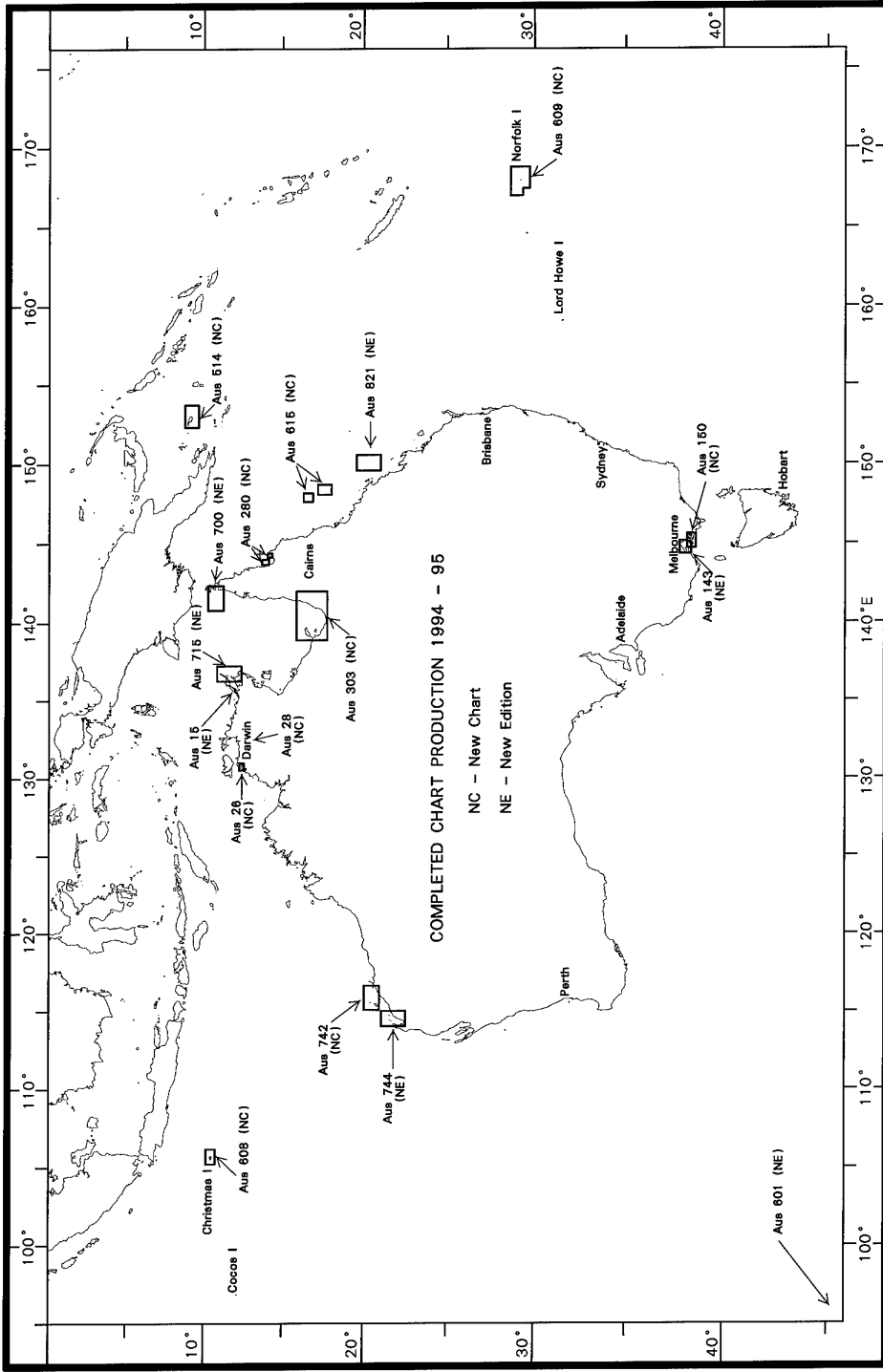
This new edition action required for conformity with the New Chart Aus 743 published October 1993 and the inclusion of the new wellheads and pipelines in the vicinity of Thevenard Island.



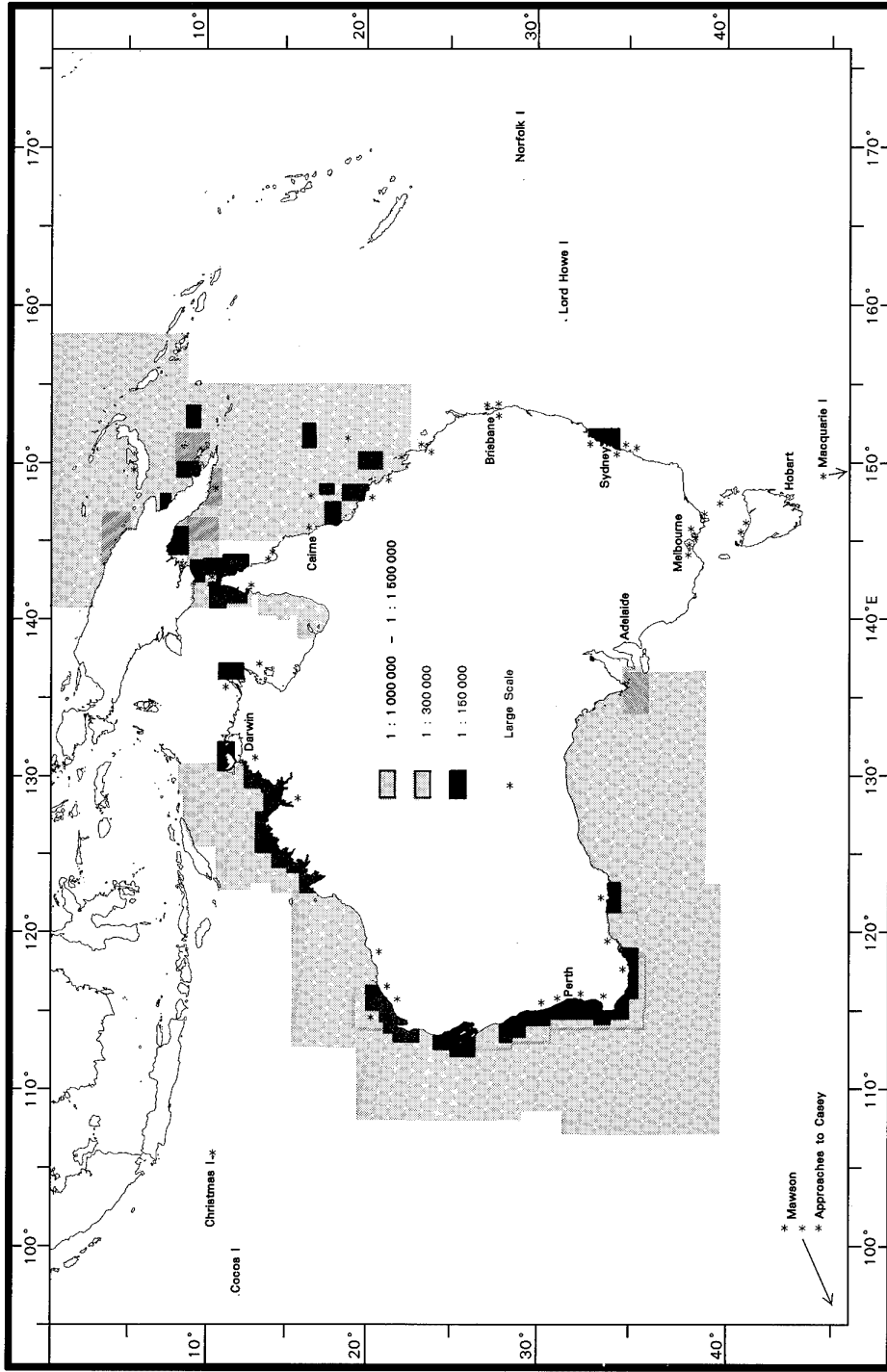
Survey Coverage



Surveys Undertaken 1994-1995



Charts Published 1994-1995



Digital Chart Coverage

Annex C.

Chart Scheme Statistics At 30 June 95

Category/Scale	Published Imperial	Published Metric	Total Published	Planned Total
Small scale 1:150 000 to 1:1 000 000				
1:150 000 Aus, PNG	25	65	90	195
1:300 000 Aus, PNG	51	31	82	99
1:1 000 000 Aus, PNG, Antarctica	11	3	14	34
1:500 000 and smaller Aus, PNG, Antarctica	6	3	9	21
Large scale 1:5 000 to 1:100 000				
Aus	20	100	120	202
PNG	28	2	30	40
Antarctica	1	5	6	6
Territories & Reefs	3	7	10	16
International charts				
1:1 500 000	0	4	4	20
1:3 500 000	0	6	6	6
1:10 000 000	0	3	3	3
Other charts				
Recreational charts PC (Pleasure Craft) series	2	5	7	12
RAN Fleet series	9	14	23	40
Diagrams	17	5	22	30
<hr/>				
Total:	173	253	426	724

Chart Datum Statistics

Horizontal Datum - Number of charts published

Pre AGD 66	107
AGD 66	202
WGS 84	52
INT series charts	13

Vertical Datum - Number of charts published

Port Datum	7
Indian Spring Low Water	210
LAT	117
Miscellaneous	40

Note: Charts published pre AGD 66 are generally unsuited to navigating using satellite based positioning techniques

Annex D.

Notices To Mariners

Notices to Mariners key indicators for the 1994-95 period were:

	1992-93	1993-94	1994-95
Notices to Mariners issued	685	640	595
Block corrections for charts	22	23	23
Notes for charts	83	91	28
Reproduction of BA blocks/diagrams	nil	1	5
Reproduction of BA notes	24	11	9
Reproduction of NZ blocks/diagrams	nil	nil	8
Reproduction of NZ notes	11	48	64
Hydrographic notes from HMA Ships	115	108	96
Hydrographic notes from other sources	35	30	27

Vessels (excluding Hydrographic Survey Force ships) rendering Hydrographic Notes during the year were:

HMAS DARWIN	MV GLENDA LEE
HMAS HOBART	HM PORT HEADLAND
HMAS WOLLONGONG	MV PACOFIC SENTINEL
HMAS WESTRALIA	MV IRON BARON
HMAS BENDIGO	RV AURORA AUSTRALIS
HMAS BUNBURY	MV MAERSK TUKANG
HMAS GEELONG	HM GLADSTONE
HMAS TARAKAN	MR G.B. STAHN
MV WAVI	MV LA LOMA
ACV SIR AUSTIN CHAPMAN	MV KAPTIAN KHLEBNIKOV
MV REEF ESCAPE	MR J. STEWART
MV KOWULKA	CS FLEXSERVICE 3
HM BARK ENDEAVOUR	MV FRANCIS BAY
PORT DEVONPORT AUTHORITY	MV CORAL CHIEF
MV BRITISH SKILL	MV ERA
MV ALONDA	MV IRON NEWCASTLE

Annex E.

Contributions And Acknowledgments

Acknowledgment is made to the following organisations which supplied data to the Hydrographic office on an exchange or voluntary basis:

NEW SOUTH WALES	Federal Airport Corporation Maritime Services Board
AUSTRALIAN CAPITAL TERRITORY	AUSLIG
NORTHERN TERRITORY	Department of Transport and Works TELSTRA Thiess
QUEENSLAND	Bundaberg Port Authority Cairns Port Authority Hamilton Island Enterprises Mapping and Hydrographic Services P/L North Queensland Cruising Yacht Club Port of Brisbane Authority Queensland Transport Authority South Bank Corporation SUNMAP T.W. Gately World Geoscience Corporation
SOUTH AUSTRALIA	S.A. Government Marine and Harbors Agency
TASMANIA	Australian Paper Ltd Burnie Port Authority Marine Board of Hobart
VICTORIA	Lands Port of Melbourne Authority
WESTERN AUSTRALIA	AAM Surveys Western Australia Petroleum Pty Ltd TELSTRA Department of Transport Koolyanobbing Iron Pty Ltd BHP Pty Ltd Western Mining Corp Woods Hole Oceanographic Institute Woodside Petroleum Pty Ltd Fremantle Port Authority
PAPUA NEW GUINEA	Transport Mutual Services Pty Ltd

Annex F**Key Staff****Hydrographer**

CDRE J.W. Leech, RAN

Operations and Survey

Director Hydrographic Operations
 Head Operations and Surveying

CAPT G. Geraghty, RAN
 CMDR M. Hudson, RAN

Charting Services

Head Nautical Charting
 Head Navigational Services
 Manager Information Services
 Manager Chart Distribution

Mr I.P. Kennedy
 Mr M.A. Bolger
 Mr A. Larden
 Mr N.J. Gillin

Co-ordination and Development

Director Co-ordination and Development
 Head Branch Transition
 Manager Corporate Services
 Manager Hydrographic Development
 Manager Branch Development
 Head Computing Services
 Manager National and International Affairs
 Manager Financial Resources
 Human Resource Manager

Mr K.G. Burrows, OAM
 Mr R.A. Furness
 Mr A. Hodges / Mr K. Reid
 CMDR P.A. Spencer, RAN
 Mr B. Rowland
 Mr B. Westaway
 Mr J. Randhawa
 Mr A. Philpott
 Mr J. O'Brien / Miss C. Shepherd

Canberra

Hydrographic Projects Officer

LCDR C. Ellis RAN

Hydrographic Survey Force

HMAS MORESBY
 HMAS FLINDERS
 HMAS PALUMA
 HMAS MERMAID
 HMAS SPEPPARTON
 HMAS BENALLA
 LADS UNIT
 HODSU

CMDR R.E. Ward RAN
 CMDR R.R. Nairn RAN
 LCDR D. Wyatt RN / LEUT G.R. Cann RAN
 LCDR M.E. Prince RAN
 LCDR C.J. Hardy RAN
 LDCR G. Altham RAN / LCDR N.S. Lemon RAN
 LCDR M.J. Sinclair RAN
 LEUT K.D. Slade RAN / LEUT M. Matthews RAN

Naval Training Command

Hydrographic School HMAS PENGUIN

LCDR K. Mc Gregor RAN



INTERNATIONAL MARITIME ORGANISATION

CONVENTION ON SAFETY OF LIFE AT SEA 1974

CHAPTER V

PART B UNDERTAKINGS BY CONTRACTING GOVERNMENTS

REGULATION 8 HYDROGRAPHIC SERVICES (DRAFT)

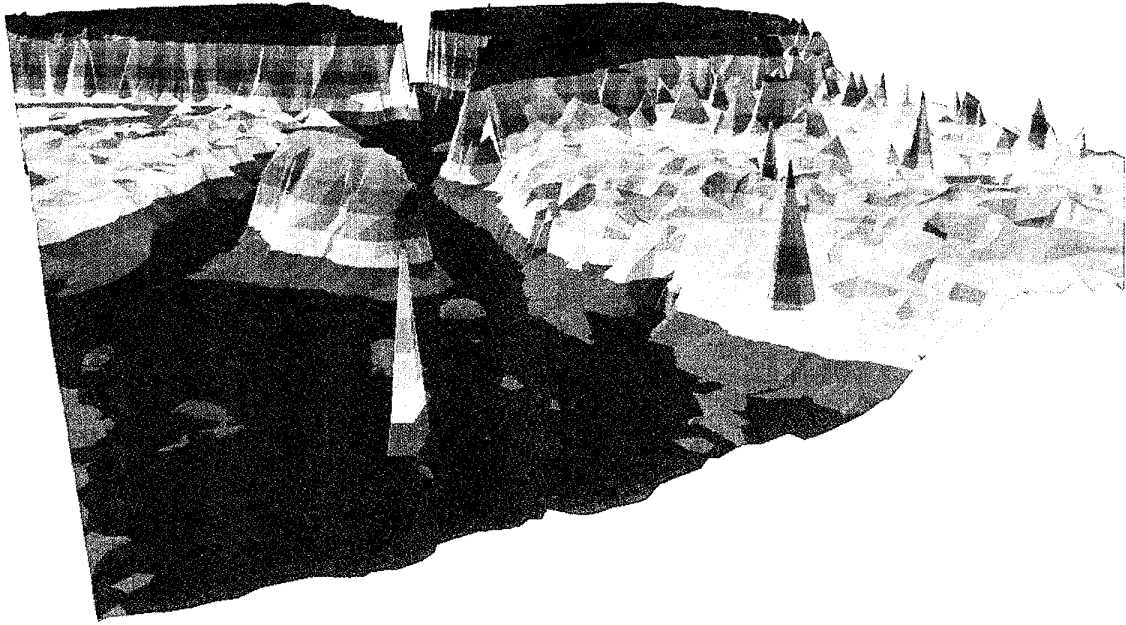
Contracting Governments undertake to arrange for the collection, compilation, publication, and dissemination of nautical and hydrographical data and information necessary for safe navigation and environmental protection.

In particular, Contracting Governments undertake to cooperate in carrying out, as far as possible, the following nautical and hydrographic services, in the manner most suitable for the purpose of aiding navigation:

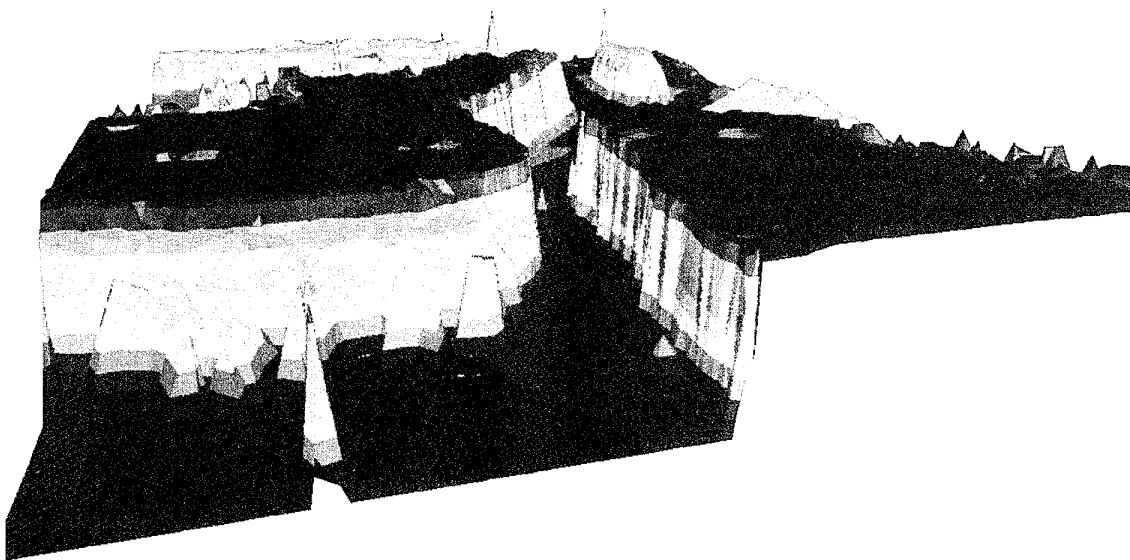
- (i) To provide for hydrographic surveying, as far as possible, adequate to the requirements of safe navigation.
- (ii) To prepare and to issue official nautical charts, sailing directions, lists of lights, notices to mariners, tide tables and other nautical publications, where applicable, satisfying the needs of safe navigation.
- (iii) To promulgate notices to mariners in order to keep nautical charts and publications, as far as possible, up to date.

To obtain the greatest possible uniformity in nautical charts and publications and, as far as is practical, to conform to the resolutions and recommendations made by the International Hydrographic Organisation.

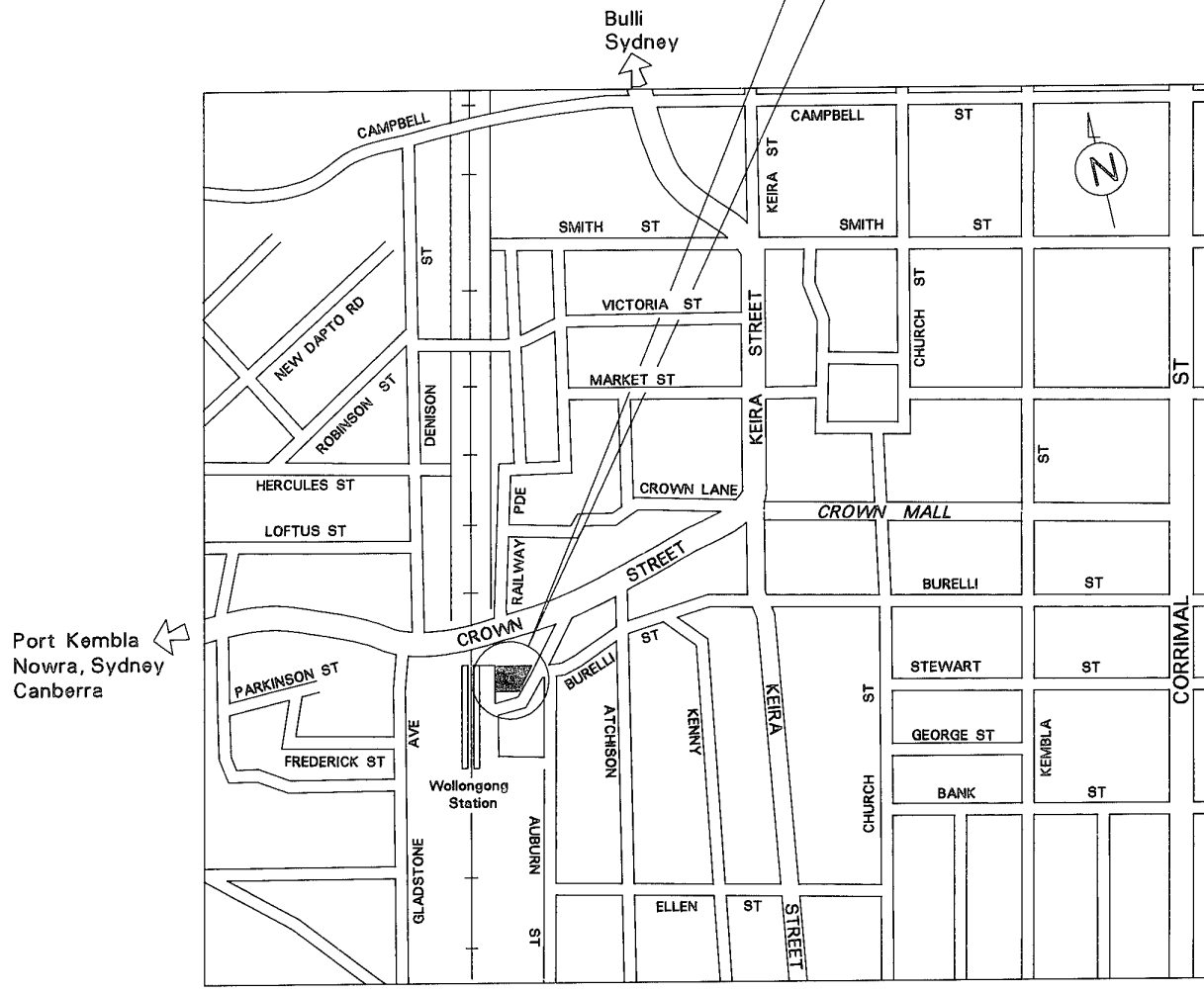
The Contracting Governments undertake to co-ordinate their activities to the greatest possible degree in order to ensure that nautical and hydrographic information is made available on a worldwide scale as timely, reliably, and unambiguously as possible.



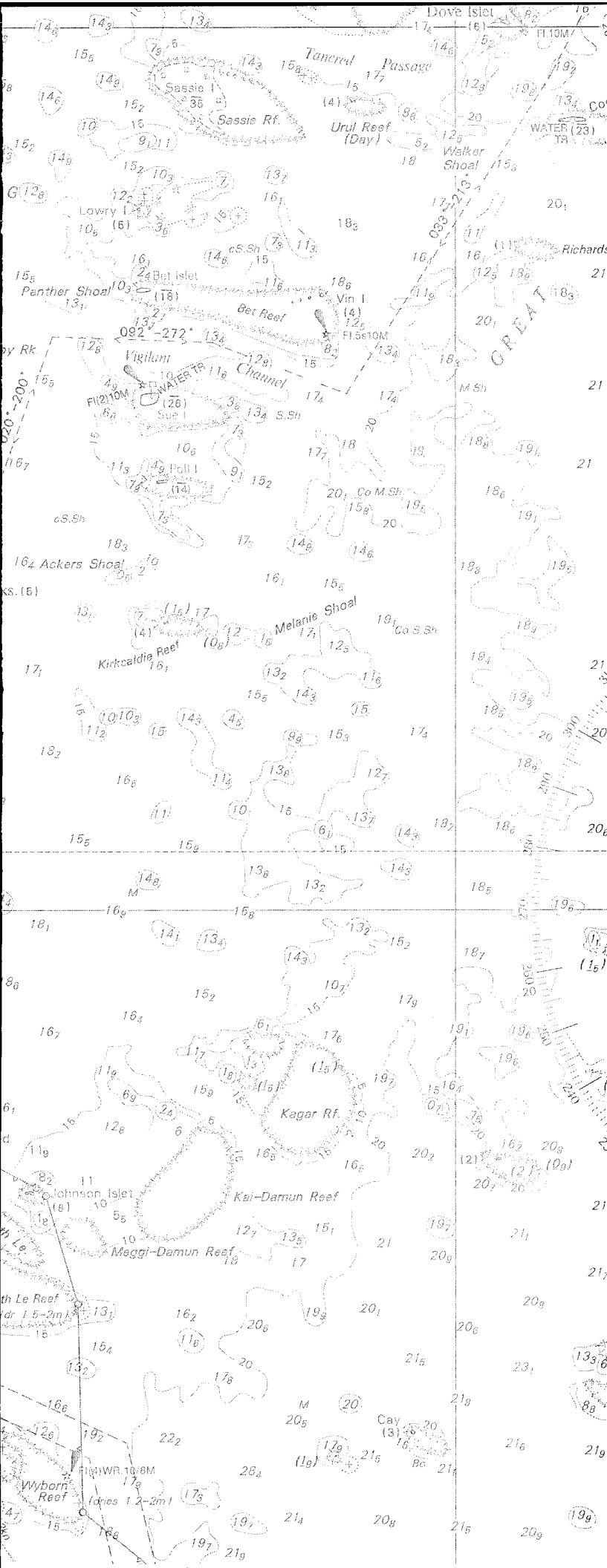
3D Models of Laser Airborne Depth Sounder Data from Bligh Boat Entrance
North Queensland. Processed by Hydrographic Service RAN,
DSTO and MAPTECH



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US

