THE Navy

FEBRUARY-MARCH-APRIL, 1974

Registered for posting as a periodical — Category A

30 CENTS

THE NAVY

The magazine of the Navy League of Australia
Registered for posting as a periodical — Category A

Vol 36 **FEBRUARY-MARCH-APRIL, 1974** **No 1**

CONTENTS

PLUS SUNDRY STORIES AND PHOTOGRAPHS

All correspondence should be directed to the Editor, Box C178, Clarence Street Post Office, Sydney, NSW, 2000, Australia
Telephone Enquiries — 64 7188 (evenings only).

Published by the Navy League of Australia, Box 1719, GPO, Sydney, NSW, 2001; Phone: 241 1008

ADVERTISING AND PUBLICATION: PERCIVAL PUBLISHING CO PTY LTD

SYDNEY	MELBOURNE	ADELAIDE	BRISBANE	PERTH	HOBART
862 Elizabeth St	Greenan Publications	17 Currie St	72 Eagle St	194 St George s Tce	152 Collins St
Waterloo	Pty Ltd	Adelaide, 5000	Brisbane, 4000	Perth, 6000	Hobart, 7000
NSW, 2017	374 Little Collins St	Phone: 51 6225	Phone: 31 2531	Phone: 22 4072	Phone: 34 4096
Phone: 699 2600	Phone: 67 1334				

THE NAVY LEAGUE OF AUSTRALIA

PATRON: His Excellency the Governor-General
FEDERAL COUNCIL
President: Commander F. G. Evans, MBE, VRD, RANVR
Vice-President: Captain L. F. Vickridge, OBE, VRD, RANR
Deputy Vice-President: Lieut Cmdr A. W. Grazebrook, RD, RANVR
Secretary: Lieut Cmdr O. V. Dimmitt, VRD, RANR

New South Wales Division
Patron: His Excellency, the Governor of New South Wales
President: Lieut Cmdr E. Bryden-Brown, VRD, RANR
Honorary Secretary: Lieut Cmdr A. A. Andrews, MBE, RAN (Ret'd), 28 Royal Street, Chatswood, 2067

Victorian Division
Patron: His Excellency, the Governor of Victoria
President: Lieut Cmdr A. H. Burrows, VRD, RANVR
Hon Secretary: Lieut Cmdr O. V. Dimmitt, VRD, RANR

Queensland Division
Patron: His Excellency, the Governor of Queensland
President: Surgeon Commander A. H. Robertson, VRD, RANVR
Hon Secretary: Colonel P. V. O. Fleming, ED, 39 Pinecroft Street, Camp Hill, Queensland, 4152.

Australian Capital Territory Division
President: Commander J. B. Howse, VRD, RANVR
Hon Secretary: Commander D. M. Blake, RD, RANVR, 12 Darmody Street, Weetangera, ACT, 2614

South Australian Division
Patron: His Excellency, the Governor of South Australia
President: Geoffrey Ashton, Esq
Hon Secretary: Miss Robyn Wallace, Box 1529M, GPO, Adelaide, 5001

Tasmanian Division
Patron: Vice-Admiral Sir Guy Wyatt, KBE, CB.
President: Commander J. G. B. Campbell, DFC, RANEM.
Hon Secretary: Lieut D. J. Heath, 3 Winmarleigh Street, Taroona, 7006

West Australian Division
Patron: His Excellency, the Governor of Western Australia
President: Captain L. S. W. Vickridge, OBE, VRD, RANR.
Hon Secretary: K. M. Johnson, Esq, Box 578, PO, Fremantle, 6160

STRATEGIC ERRORS and MARITIME DEFENCE

The Honourable Lance Barnard, Australia's Minister for Defence.

By A. W. Grazebrook, Federal Vice-President, The Navy League of Australia.

At a time when Australia's own higher national strategy is under review, it is of interest to students of maritime defence affairs to examine the significance of, and potential errors in, a review of national strategy. Too often, in the past, democracies have used strategic reviews as excuses, as distinct from reasons, for reductions in defence. Some fundamental inconsistencies in recent Australian Government statements and actions, on defence, indicate that the Government may be making the same error.

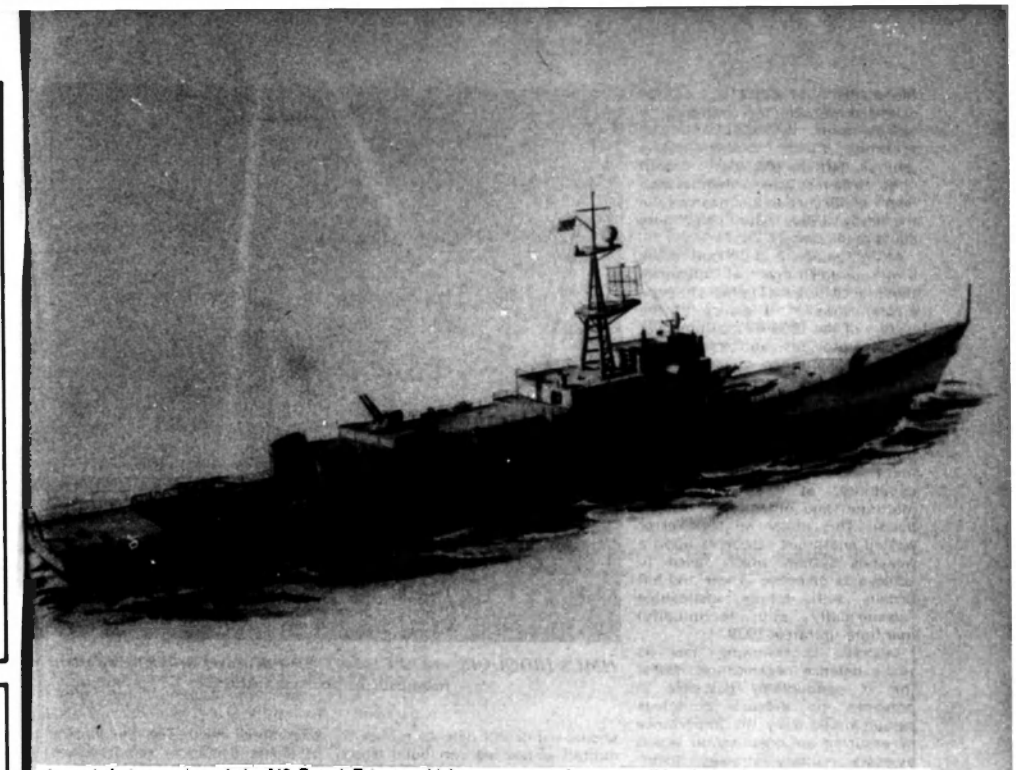
Von Clausewitz defined strategy as "the employment of the battle as the means towards the attainment of the object of the war". In more recent times, national strategy has come to mean "the linking together of a series of economic, diplomatic and military acts to achieve major national objectives in the best interests of the national population". It is vital to realise that all three types of act are inextricably interwoven. In the case of the military act, the availability of the means to act, or to prevent a military act by another nation, is the vital point. Recent long and short term cuts in Australia's defences are indicative of a failure to recognise that defence is inescapably a part of Australia's national strategy.

In these circumstances, it is of interest to examine some of the strategic errors of the past and the lessons Australia can learn from them, with particular reference to their effect upon maritime matters.

Strategic errors range from a failure by a nation to appreciate the effects of its own strategy upon another nation and the resulting reaction (eg a resources diplomacy has an effect upon other nations), through the wrong application of technical and tactical intelligence about another country's armed forces, through wrongly assessing another nation's potential for military growth or action, through failure to establish or maintain the necessary armed forces or supporting administrative or logistic structure, through failure to optimise a defence industrial base, to simple wishful thinking (such as that of the Belgians in 1940). Perhaps the worst strategic errors have arisen from failing to perceive changes or potential changes in the strategic or tactical methods of other nations or groups of people.

As part of her national strategy, Australia is embarking upon a resources diplomacy. Whilst some sort of limitation upon the use of irreplaceable raw materials may well be wise, it is essential to recognise that other nations, who may depend upon supplies of raw materials from Australia, may not accept limitations and take action. We must be prepared for such action. Not only history, but also events today in the Middle East, demonstrate that the primary producing nation who dabbles in resources diplomacy must be able to defend himself. Japan had no option but to go to war in 1941 as a result of other countries' resources diplomacy (the cutting off of oil supplies).

Britain and France went to war in 1956 over resources vital to their



An artist's impression of the U.S Patrol Frigate which was suggested as a possible alternative for Australia's DDL Programme.

economic survival (oil through the Suez Canal). Mr Wilson's British Government and General de Gaulle's France were supplying arms and encouragement to Nigeria and Biafra respectively (Nigerian crude oil) in the 1960s. Today, Russia and the United States are supplying arms and encouragement to Middle Eastern nations (again oil). In each case, the local population of the area of conflict suffered severely.

The Shah of Iran, who had coupled resources diplomacy with the development of an ability to defend his nation against all comers, has increased greatly the prosperity of his nation. His example is one from the study of which Australia would benefit greatly.

Major industrial nations are dependent absolutely upon raw materials and their safe transport (in most cases necessarily by sea) to the point of use, to ensure prosperity. These raw materials can be threatened, in Australia's case, without a total conventional or nuclear war, and either at the point of shipment or enroute from Australia to their destination. Necessarily, such a threat must come by maritime means — by submarine, mine or sabotage attack.

The supply of raw materials can also be threatened by the producer nation (conserving raw materials for his own use or demanding exorbitant prices), or by a third party wishing to injure either the supplier or the user of raw materials. It is manifestly unsound to argue, as has been done by the present Government as grounds for reducing Australia's defences, that major industrial nations would not allow interference by third parties in supplies of raw materials from Australia, when Australia herself is about to practice just such interference (in the form of a resources diplomacy). Indeed, a resources diplomacy makes the Government's argument one for strengthening defence.

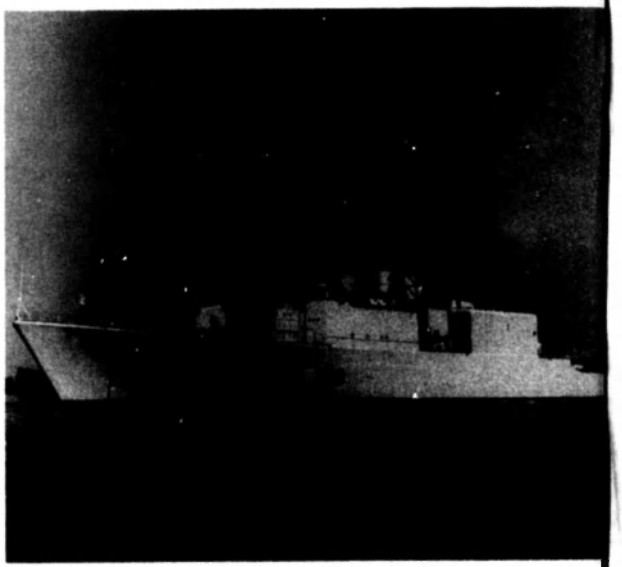
Wrong application of technical intelligence is another potential source of strategic errors. Whilst it may be true that some of our neighbours have the warships, but not the logistic support, to operate in Australian waters, it is dangerous to develop our own assessments of threats or defence pressure without recognising that such logistic support can be developed from scratch in a matter of months. The Indians gave their carrier task group

the ability to operate at sea for extended periods by chartering a tanker (now INS DEEPAK) and making minor modifications (pumps, derricks etc) over a month or so. Britain supplemented her own fleet's endurance in a similar way in the early 1960s. Our neighbours could so the same.

At first glance, it is difficult to see how administrative or organisational decisions can father strategic errors. However, a glance at the history of the 1939-45 maritime war quickly provides an example. In 1918, unlike other major powers, Britain decided to establish an independent air force. This, coupled with a lack of strong political administration, resulted in the over application of resources to the development of a strategic bombing capability, at the expense of maritime (and other types of) airpower. This major strategic error wasted enormous resources upon a weapons system which failed to achieve its objective in war and left Britain with totally inadequate (numerically and technically) maritime aircraft in 1939.

Australia is reviewing now its whole defence organisation. Whilst this is undoubtedly desirable in principle, no defence conscious person would deny the importance of ensuring an organisation which assesses military strategy accurately, fits in with the other arms of the national strategy, provides optimum use of defence resources, and includes the necessary support echelons. However, care must be taken to ensure that the organisation provides the appropriate balance between personnel with operational experience (the user) and administrators. This balance will not be achieved by the new organisation.

The strategic significance of an industrial base is not in dispute. Indeed our technological manufacturing ability is one of our strengths in our Indian Ocean neighbourhood. The extent to which further defence resources should be allocated to additional development of this industrial base is a matter for fine judgment. However, it is clear that we must have a total capability in a particular area. It would be of no help to us, in war, if we could build (say) wings of aircraft, but not their fuselages. From a strictly defence viewpoint, we



HMCS IROQUOIS, one of Canada's latest destroyer helicopter escorts is fitted with Sea Sparrow missiles.

should not devote defence money to aircraft unless we can build whole aircraft. A similar situation applies to warships or tanks. If the provision of employment is a major factor influencing the deployment of additional defence resources in the industrial base, then the cost should be charged to social security.

In an enormous, sparsely developed, country such as Australia, the strategic significance of a logistic system is manifest. The planned change from a forward to a continental defence system will require the devotion of additional defence resources to logistics. Our forces will have to be capable of being moved to, supplied in, or operating in, any part of Australia. This is in sharp contrast with the much simpler problems of operating overseas as an integral part of much larger forces.

Logistics is one area of defence administration which the Government has scheduled for drastic change. It must be ensured that the right balance is achieved between operational needs (eg the location of stores depots in remote areas) and administrative economics and convenience. It must be said that the planned virtual exclusion of naval supply operational experience from the Supply Area of the Defence Department does not augur well for the achievement of this balance.

When he said that "we always seem to try to start fighting the next war where the last one left off", Prince Philip, Duke of Edinburgh, was highlighting a serious strategic error — the failure to appreciate changes in strategic and tactical thinking. For example, France failed to observe that by the 1930s the 1918 dominance of the defensive had given way to mobility. France devoted enormous resources to the construction of the Maginot Line. These resources were wasted in that they failed totally to prevent the defeat and hostile occupation of almost the whole of France.

To develop national strategy, great breadth of outlook and concept is

essential — frequently greater than is available in one man or particularly one specialist expert. For example, a nation cannot assume that, because no nation used gas in World War II's total war conditions, it will not be used in a limited war in 1980. Nor can the converse be assumed. Similarly, Australia must not assume that, because action against merchant shipping was regarded as a high degree of escalation in the Viet Nam war in the 1960s, it will be ruled out in 1975-85, in different circumstances by different nations. Such pressure was applied in many parts of the world, for centuries, often without war being declared.

Maritime pressure against Australia has immense strategic attractions to Australia's neighbours, once their national strategy indicates the desirability of applying such pressure. The inherent disadvantage of a defensive posture for a huge sparsely populated island continent, the fact that maritime pressure involves physical danger to a minimum number of civilians, the ability to control the degree of maritime pressure, the large diversion of defence resources that maritime pressure would require of Australia and, most important, the fact that a number of our neighbours have now the necessary naval hardware, all make maritime pressure against Australia attractive.

Another example of faulty strategic thinking is the Australian Government's persistent reference to "threat" or "no threat" situations in terms of there being no possible danger except massive armed invasion of Australia. There are many other feasible dangers. There is real possibility that these other threats, or forms of maritime pressure, will become a reality in 1975-85. The naval hardware to apply such pressure is in the hands of our neighbours now. Continued failure to recognise this, and develop defence resources to combat it, would be a serious strategic error. Our maritime trade is particularly vulnerable to such pressure, as we are still heavily dependent on exports of primary products and imports of specialised equipment, raw materials, and sophisticated manufactured goods.

Finally, and perhaps of most danger to a democracy such as Australia, there is the danger of strategic error by default — by Governmental failure to face up to facts, by ignoring unwelcome developments in the vain hope that they will go away, by naively believing that nations will not attack nations of similar political or religious ideology. Some sectors of the community fail, or are unwilling, to recognise that armed conflicts develop because it is in the interests of one party or the other to attack. There is no better way of ensuring that one's neighbours remain friends than to make sure that it will cost them more than they will gain to attack you.

CONTRIBUTIONS INVITED

Periscope on Australia

by Grommet

PLESSEY MONITORING EQUIPMENT

The Royal Australian Navy has contracted for supply of a Plessey Radio PVS 1100A multibeam antenna array and ancillary equipment.

The system, which is used in both a civilian and military context, possesses very considerable advantages over conventional methods particularly with respect to performance and the ground area required for operation.

• • •

DUKE OF GLOUCESTER'S CUP

The River-class destroyer escort, HMAS STUART, has been awarded the Duke of Gloucester's Cup for the ship with the best all-round performance in the Royal Australian Navy in 1973.

STUART, (see photograph) this year took part in the RIMPAC international exercise near Hawaii and the ANZUK exercise in the South China Sea.

The Duke of Gloucester's Cup is awarded to the ship which has been foremost in general efficiency, cleanliness, seamanship and technical training during the year.

The winner is entitled to paint a 24-inch star on the outboard sides of her bridge.

• • •

CANADIAN NATIONAL DEFENCE COLLEGE

Staff and members of the Canadian National Defence College visited Australia from 6th to 10th February as part of a field study tour to Asia and Africa.

The group led by the Commandant, Rear Admiral S. Mathwin Davis, comprised senior Service officers as well as Federal and Provincial public servants, businessmen, and academics.

HMAS STUART at sea.

The group also included officers of the British and United States Diplomatic Service and Service officers from Australia, Britain and the United States.

• • •

DESTROYERS FOR THE RAN

Decisions to maintain the destroyer capability of the RAN, and to keep abreast of rapidly advancing technology, were announced during December, 1973, by the Deputy Prime Minister and Minister for Defence, Mr Lance Barnard.

Mr Barnard said approval had been given for the modernisation and extensive refitting of three of the RAN's River Class destroyer escorts, including gunfire, anti-submarine weapons, hull and machinery. A fourth destroyer escort would be modernised so as to give all four ships an additional ten years of operational life after the modernisation had been completed. The updating of the destroyers would bring about significant savings in manpower.

The first modernisation would start at Williamstown in the second half of 1976 and the last would finish late in 1980. Depending on where the modernisations were carried out the total programme could cost up to $61m at 1973 prices.

The Minister said the decision to extensively modernise existing destroyers would not remove the need to proceed with planning to acquire new destroyers for the RAN. The Government had endorsed the need for a new destroyer acquisition programme for the Navy. He had indicated this in his statement to Parliament on 22nd August. Further investigations were being undertaken into designs to satisfy the requirement. Ships ranging from 800 tonnes to about 4500 tonnes were being considered and some 50 world-wide ship designs were included in the initial assessment.

Mr Barnard said the consideration of alternatives would be based on the latest strategic assessment, and an established design or a close derivative would be preferred in the new investigations. It was expected that the Government would make a provisional decision on a programme to acquire new destroyers next year and final approval was anticipated by mid-1975.

Mr Barnard said he had also approved continued development of an Australian designed and produced sonar equipment, code-named MULLOKA. This sonar would possess novel features that would make it uniquely suitable for use in Australian waters.

Provided the development phase concludes successfully, it was planned to incorporate MULLOKA into the extensive refit of the three destroyer escorts. Other MULLOKA equipment would also be provided for on-shore training, and possibly in due course for the two latest destroyer escorts, HMA Ships SWAN and TORRENS.

The production order for the proven MULLOKA system would be placed with Australian industry and was expected to involve expenditure of several millions of dollars. Tenders would be called during early 1974 for pre-production engineering and documentation.

• • •

SEA KING HELICOPTERS AND SIMULATOR

The RAN is to definitely get the 10 Westland Sea King helicopters on order for the Fleet Air Arm (see photograph).

When the new helicopters enter service in 1975 they would be rotated to share the planned annual flying programme, but only seven would be in use at one time.

Ten of these Sea King Mk 50 anti-submarine cargo helicopters are to be bought by the RAN. Westland Helicopters Ltd of Yeovil, UK, will build the aircraft for $2 million each. Each will have a crew of four — two pilots, an observer and an aircrewman. As well as becoming the Navy's anti-submarine helicopter, the Sea King can also be used for replenishing ships at sea or for troop movements.

Ground-based training equipment, which simulates the flight and tactical roles of the new Westland Sea King helicopter, will be purchased at a cost of $2.5m for the RAN.

It is planned to put the simulator into service at the Naval Air Station, Nowra, NSW, in late 1975.

• • •

NAVY DEPARTMENT ABOLISHED

Important changes affecting Defence administration in Australia were approved by the Executive Council on 30th November, 1973.

As announced by the Prime Minister on that date the Departments of Navy, Army and Air were abolished and their functions merged with the Department of Defence.

With the abolition of the Departments of Air, Army and Navy, the associated Ministerial portfolios ceased to exist.

The public service positions in the three departments were also abolished, and corresponding positions created in the Department of Defence to which staff were being transferred.

• • •

DEFENCE COMMUNICATIONS EQUIPMENT

A Defence Communications Automatic Relay station (known as DEFCOMMARS) was officially handed over to the Defence Department in Canberra on 29th November, 1973.

The new station, installed in the Russell Hill Defence Complex, is managed by the Navy for the Defence Department. It uses computers to link all points in the Australian defence signals network, enabling the three armed services to communicate with their units in a matter of minutes.

Introduction of the new system is the first stage of a long term programme to rationalise Defence communications.

Equipment for the station was supplied and installed by Sperry Univac Computer Systems under a $1.1 million Defence Department contract.

• • •

HMAS CAIRNS

The RAN Patrol Boat Facility at Cairns, North Queensland, was commissioned on 1st February, 1974, as a Patrol Boat Base.

The Navy's newest ship, the hydrographic survey ship HMAS FLINDERS, has commenced operations from her home port of Cairns, Queensland. The 750 ton FLINDERS has replaced a converted frigate HMAS PALU'MA and carries modern equipment for accurate survey tasks.

The base, named HMAS CAIRNS, has an initial complement of four officers and 29 sailors under the Command of Commander J. M. Yates.

A squadron of three patrol boats, HMA Ships BAYONET, BARRICADE and BARBETTE, plus the new survey vessel HMAS FLINDERS, will be permanently attached to the base.

HMAS CAIRNS grew from a small naval facility established on 31st January, 1971. The squadron of patrol boats was attached to the facility on September 1st, 1972, and the facility became the refitting centre for the RAN Patrol Boat Squadrons from Darwin and Papua New Guinea in June, 1973.

* * *

HELICOPTER FOR SURVEY DUTIES

The RAN has taken delivery of a Bell 206B-1 helicopter manufactured by the Commonwealth Aircraft Corporation, Port Melbourne.

The aircraft, the Navy version of the Army light observation helicopter, will replace the RAN's Westland Scout survey helicopter which will soon reach the end of its economic life.

From early 1974 the new helicopter will be carried in the RAN hydrographic survey ship HMAS MORESBY, (see photograph) and will initially be used in survey operations off the west coast of Tasmania. This is the first of two Bell 206B-1 helicopters being provided to support HMAS MORESBY.

* * *

ROYAL COLLEGE OF DEFENCE STUDIES

Six senior officers from the Australian Services have been selected to attend the 1974 12-month course at the Royal College of Defence Studies in the United Kingdom.

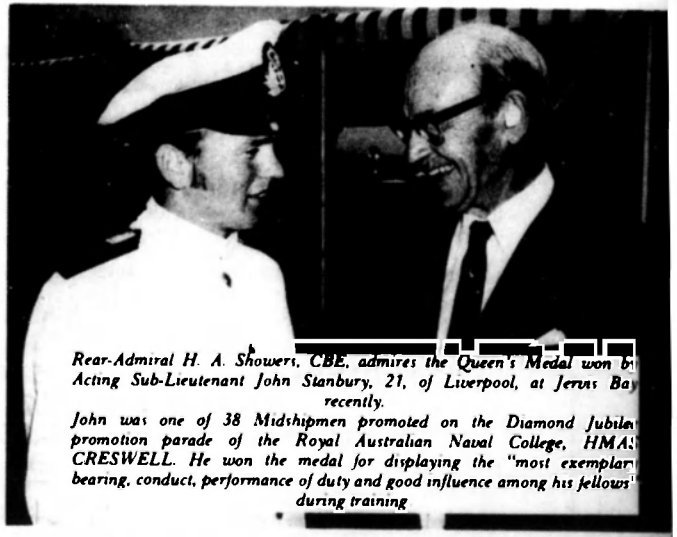
The officers selected are:

Navy: Commodore A. A. Willis, OBE; Captain W. J. Rourke.

Army: Brigadier J. R. Salmon, CBE; Brigadier D. D. Weir, CBE.

RAAF: Group Captain R. J. McKimm, CBE, AFC; Group Captain H. K. Parker.

The purpose of the course is to give selected senior officers of the Commonwealth and allied nations the opportunity to study problems of national and international strategy and security, international relations and those aspects of public policy which are related to defence and security.



Rear-Admiral H. A. Showers, CBE, admires the Queen's Medal won by Acting Sub-Lieutenant John Stanbury, 21, of Liverpool, at Jervis Bay recently.

John was one of 38 Midshipmen promoted on the Diamond Jubilee promotion parade of the Royal Australian Naval College, HMAS CRESWELL. He won the medal for displaying the "most exemplary bearing, conduct, performance of duty and good influence among his fellows" during training.

NAVAL COLLEGE CELEBRATION

The Royal Australian Naval College, HMAS CRESWELL, celebrated its Diamond Jubilee and the promotion of 38 midshipmen at a full ceremonial parade on 6th December.

It was one of the most colourful occasions in the 60 years since the college opened at Osborne House, Geelong, on 1st March, 1913.

More than 250 guests from many parts of Australia went to Jervis Bay to see the Governor-General, Sir Paul Hasluck, review the parade (see photograph) and present Acting Sub-Lieutenant's epaulettes to the Midshipmen.

They included the Chairman of the Chiefs of Staff Committee, Admiral Sir Victor Smith, the Chief of Naval Staff, Vice Admiral H. D. Stevenson, three other Service members of the Naval Board, and the Chief of the Air Staff, Air Marshal C. F. Read.

A special guest was a member of the 1913 college entry, Rear-Admiral H. A. Showers, 74, (see photograph) who is a former Captain of the college and the first college graduate to become a member of the Naval Board.

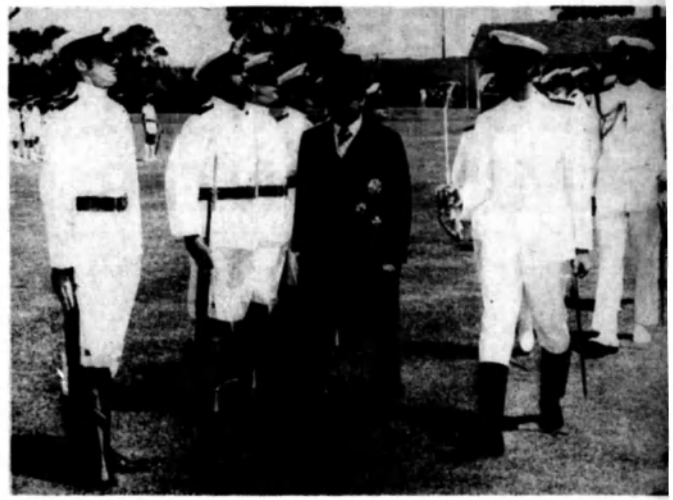
Relatives and friends of the Midshipmen came from as far away as Perth to see the parade.

* * *

CIVIL RECOGNITION FOR RAN APPRENTICE TRAINING

RAN apprentices will in future be awarded civil trade certificates on successfully completing their courses.

Agreement on civil trades recognition for RAN apprentices has been reached by the NSW Apprenticeship Board, the NSW Department of Technical Education and the Department of the Navy.



The Governor-General, Sir Paul Hasluck, escorted by Midshipman Robert Davison, inspects this year's promotion class at the Royal Australian Naval College, HMAS CRESWELL.

RAN trade courses will now be more closely aligned with trade courses of the Department of Technical Education.

In future, fourth year RAN apprentices will sit for final examinations set by the Department of Technical Education. If successful, they will be awarded civil craftsmen's certificates by the Apprenticeship Board. Depending on their RAN category, navy trainees will be awarded the civil certificate as fitter and turner, shipwright, electrical fitter (power), electrical fitter (electronics), electrical fitter (communications) and fitter.

NSW apprenticeship qualifications are recognised in all States of Australia.

In the past RAN apprentices who qualified as tradesmen were awarded the Naval Trade Certificate. Although RAN training did not formally qualify for civil recognition, navy trained tradesmen were much sought after by industry when they completed their naval service, and this demand is expected to continue. Civil recognition will be an additional attraction to young men thinking of undertaking naval apprenticeships.

In July 1972 the RAN reduced the length of its apprenticeships from five years to four, following the trend to shorter apprenticeships in industry.

OUR COVER

Rear Admiral Rudy Purwana, Commander of the Indonesian Fleet, (left) with Rear Admiral A. M. Synnot, the Flag Officer Commanding the Australian Fleet, during Exercise Southern Cross off the New South Wales south coast. It was the first time that Indonesian warships had taken part in joint exercises in Australian waters.

Two Indonesian frigates, RI JOS SOEDARSO and RI LAMBUNG MANGKURAT, supported by the oiler RI SORONG, took part in the four day exercise.

Australia's task group comprised the destroyer tender HMAS STALWART, the destroyer HMAS VAMPIRE, the destroyer escort HMAS SWAN and the submarine HMAS OXLEY. RAAF maritime patrol aircraft from the Edinburgh base in South Australia also took part.

MODERN ECONOMICAL MINEHUNTER

An impression of the new Vosper Thornycroft 47-metre minehunter at sea.

The latest warship design to be announced by Vosper Thornycroft Limited is for a 47-metre minehunter in glass reinforced plastics.

Drawing on past experience as the parent company for the construction of the "-ton" class coastal minesweepers of which over 100 were built for the Royal Navy and overseas services, and a number later converted to the minehunting role, together with the more recent construction of HMS WILTON, the experimental glass reinforced plastics minehunter for the Ministry of Defence, the warship specialists have designed a modern but economical vessel aimed at the large world market for minehunters and minesweepers. This is a rather smaller and simpler ship than the projected Royal Navy mine countermeasures vessels (MCMVs) on which the company is working with the Ministry of Defence.

Glass-reinforced plastics are becoming accepted as the best available class of materials for the construction of minehunters and minesweepers, because they are non-magnetic, highly resistant to shock loadings, and give a very high strength for their weight. They also promise to bring about savings in maintenance, when compared with timber and steel, because they are not subject to corrosion or decay. The navies of a number of countries have expressed interest in minehunters or minesweepers in the material. As the builders of the first glass reinforced plastic (GRP) minehunter (HMS WILTON), with the necessary specialised production facilities at their Woolston, shipyard, Vosper Thornycroft are in a unique position to design and build a new class of vessel in the material.

The new minehunter will have a length of 47m (154ft), a beam of 9.8m (32ft), and a displacement of some 480 tonnes. The system of GRP hull construction will be as for HMS WILTON, that is a single laminated shell moulding of woven rovings and specially developed polyester resin, supported by transverse framing of top-hat section laminated in the same materials over polyurethane foam core formers.

Air-conditioned accommodation will be provided for five officers, six senior and 27 junior sailors.

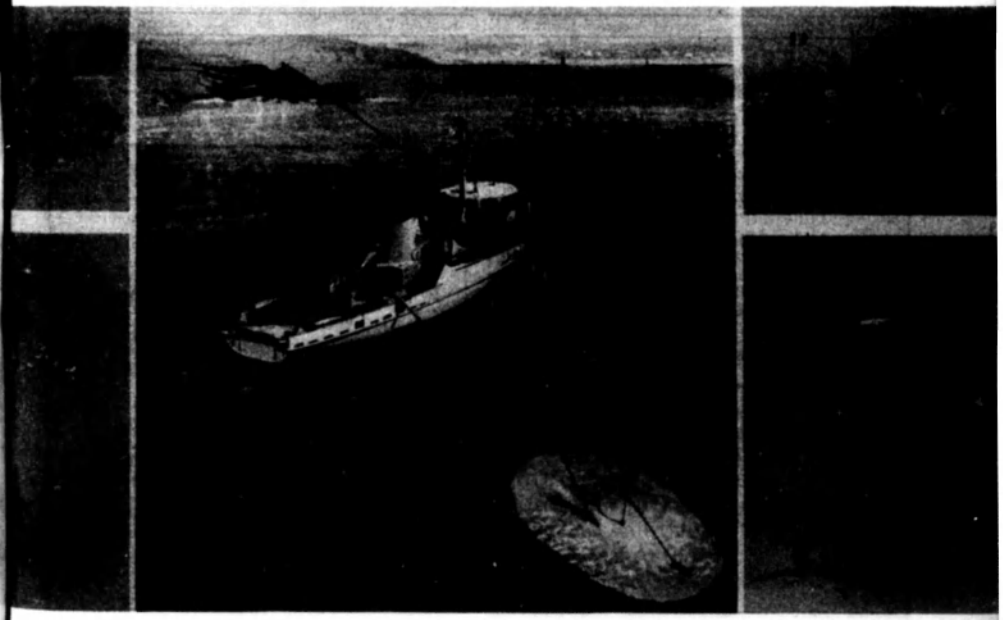
The main propulsion machinery will consist of a twin-screw arrangement with either Deltic or MTU diesel engines of low magnetic permeability. Four Foden low-magnetic-permeability diesel engines will drive AC generators capable of delivering 120kW to the ship's supplies or 195kW for twin Pleuger active rudders. These are used for accurate manoeuvring at speeds of up to six knots when mine-hunting, and consist of small propellers driven by AC submersible electric motors mounted on the lower ends of the rudder stocks so that their thrust axes are aligned with the rudder blades. Main and active rudder machinery controls are duplicated, control being from either the machinery control room or the bridge.

The ship has been designed, in consultation with the British Ministry of Defence (Navy), primarily as a minehunter, but with provision for operation as a minesweeper, and suitable for routine patrol duties as well. The armament scheme has been chosen mainly to provide self-defence against aircraft, while occupying as little space as possible and having little effect on the ship's magnetic signature. A BLOWPIPE short-range missile system will be installed forward, and two Hispano Suiza 20mm guns fitted aft. These are manually controlled and visually aimed. If increased emphasis on the patrol craft role is envisaged, automatic weapons and stabilisation equipment can be fitted.

To equip the new ship for its main role as a minehunter, Vosper Thornycroft have developed a scheme of equipment to cover the four main phases of minehunting operations: navigation and position fixing, plotting, mine detection, and mine disposal. The scheme is selected to give the best available combination of effectiveness and economy, but variations to meet special requirements can of course be made.

The main Decca position fixing system consists of a shipbourne interrogator/receiver working with two or more miniature transponder beacons set up on land, or if necessary on buoys. The information from the system, which depends on range only and gives higher accuracy than is possible with bearing data, is fed automatically into a digital calculator which operates a miniature automatic

Artist's impression of the new Vosper Thornycroft 47-metre minehunter in action. In the centre the ship's position is fixed and plotted by reference to Decca trisponder beacons on shore and on short-scope dan buoys (details shown upper and lower left). The target mine has been detected and classified by the Plessey 193M sonar. The Sperry mine destruction system, consisting of an unmanned radio-controlled catamaran (remote controlled mine destruction vehicle) towing the mine destruction weapon carrier, is being directed towards the target. The operations room view (upper right) shows the Decca plot on the right, the sonar and catamaran control console on the left. When the weapon and the mine are shown by the sonar to be in juxtaposition, the weapon is released (lower right), and detonated when the catamaran has been brought back to the ship for recovery or re-arming.



plot. The calculator can also generate helm orders to enable the helmsman to steer the ship on a predetermined line.

Decca I-band navigational radar is fitted, with true-motion displays on the bridge and in the operations room. Although not the main minehunting aid, the navigational radar can drive the plot in an emergency. The operations room display has a number of artificial markers for use when minehunting. For azimuth references an SG Brown low magnetic gyro compass is fitted.

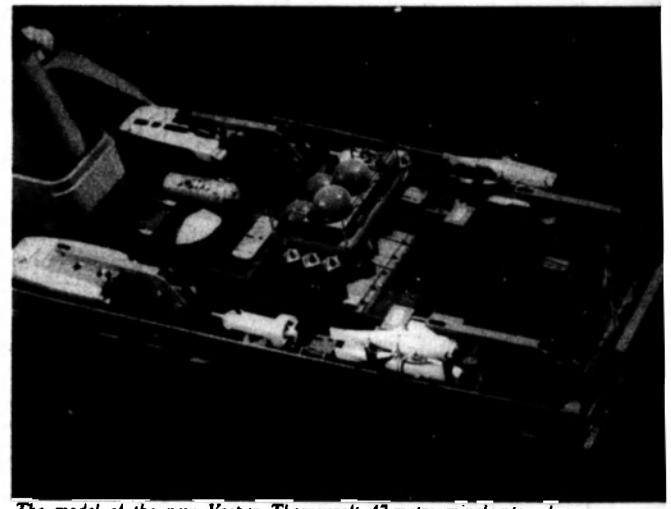
A Doppler sonar log provides displays of ship's speed over the ground, both along and at right angles to her heading. A full Doppler sonar navigation system can be fitted as an alternative to the secondary radar system.

The miniature automatic plot which the calculator drives has a continuous roll of paper on which ship's position is plotted automatically, together with sonar contacts as they occur. The calculator automatically orientates the plot in the direction of the "lap". Channel boundaries, landmarks, positions of known objects on the sea bed, and other information, can be displayed by using charts specially prepared in advance.

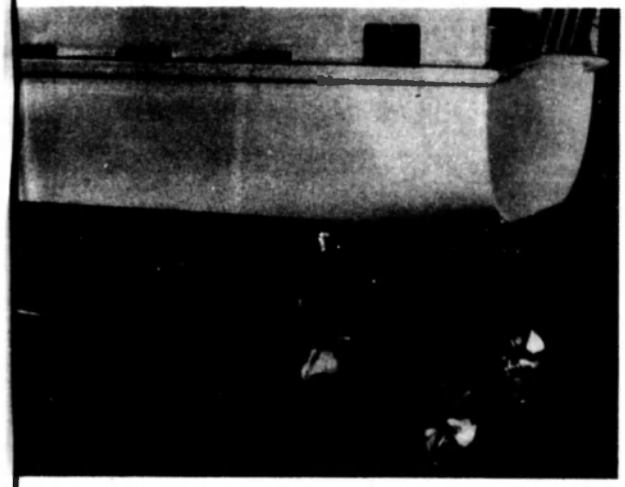
Type 193M sonar, the modern, miniaturised, solid-state version of the existing Type 193, well proven by the Royal Navy in the roles of mine detection and classification, will be fitted.

For disposing of mines once they have been detected and classified, the minehunter will carry a Sperry catamaran, un-manned and radio controlled, powered by a low magnetic diesel engine. This will be controlled remotely by an operator watching the sonar screen, which ensures high accuracy, while not putting members of the crew at risk. The mine-destroying weapon, and, if required, closed-circuit television equipment, is slung below the catamaran on a special carrier. The catamaran can also be used as a diving tender or ship's boat.

An alternative mine disposal system which can be carried consists of a wire-guided underwater vehicle. Whichever type is carried it is handled by hydraulically actuated "nodding" davits on either side of the sweep deck. These are arranged to lower through doors in the bulwarks to reduce the length of wire between davit and vehicle, and so



The model of the new Vosper Thornycroft 47-metre minehunter shows details of the sweep deck and the equipment carried there. Sperry catamarans are stowed to port and starboard abaft the funnel, with inflatable boat and decompression chamber amidships. The two nodding davits are shown in the stowed position. Mine disposal weapon carriers in their cradles come next astern, while a platform amidships, over the sweep winch, accommodates the console which provides for control of the winch from above, and houses dan buoys and radar reflectors. Wire sweeping gear and two more nodding davits are mounted just inboard of the rail aft, leaving a clear working space amidships.



Details of the Pleuger active rudders used for accurate manoeuvring at slow speeds (0-6 knots) are shown on this view of the model of the new Vosper Thornycroft 47-metre minehunter.

keep it under closer control. Vehicles can be handled or re-armed on both sides of the sweep deck at the same time.

For wire sweeping of moored mines a hydraulically driven winch and double oropesa sweep are fitted. The beam of the ship is carried well aft to provide a broad working space amidships clear of other deck fittings.

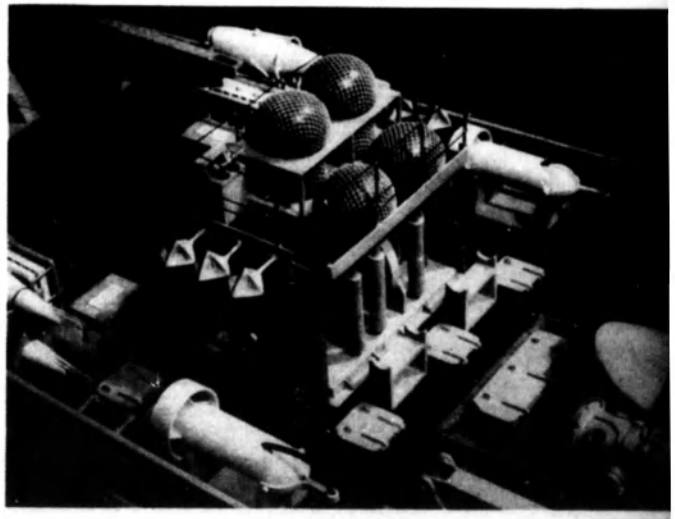
The ship can readily be converted to a minesweeper by removing the mine disposal equipment from the sweep deck to make room for a hydraulically powered magnetic sweep reel. Stowage is also provided on one side of the sweep deck for an Osborn acoustic sweep and 3-ton davit, and on the other side for the Gemini dinghy. The pulse generator for the magnetic sweep can be accommodated in the main machinery space, with its control gear in the adjacent compartment. Removing the motor units from the active rudders would complete the conversion.

In the event of vessels being built to the new Vosper Thornycroft design primarily for use as minesweepers the trunk for the 193M sonar would be moulded into the structure to facilitate later conversion to minehunters if required.

The combination of its GRP construction with the elimination of virtually all ferro-magnetic material from the ship gives the minehunter a very low magnetic signature. With a sophisticated, modern de-Gaussing system, it will be considerably safer from magnetic mines than a conventional coastal minesweeper.

To reduce the noise signature the machinery installation has been designed to minimize air-borne and water-borne noise. Acoustic protection and intake and exhaust silencers are fitted to reduce air-borne noise. To limit water-borne noise main and generating engines are raft-mounted, rotating machinery fitted on flexible mounts with flexible pipe connectors, and exhaust systems are resiliently mounted. The size and displacement of the ship is such as to provide good self-protection against pressure mines.

Detail of the 47-metre Vosper Thornycroft minehunter model, showing the winch control console and short-scope dan buoy and radar reflector stowages over the sweep winch.



"The Civilian Arm of the Navy"

The principal objective of the Navy League of Australia is to stress the vital importance of Sea Power to the Commonwealth of Nations and the important role played by the Royal Australian Navy.

The League supports the Naval Reserve Cadets who are administered by the Royal Australian Navy, which Service provides technical sea training for boys who intend to serve in the Naval or Merchant Services, also to those sea-minded boys, who do not intend to follow a sea career, but who given this knowledge will form a valuable reserve for the Naval Service.

We invite you to swell our ranks and so keep up to date with Maritime Affairs to help to build an ever-increasing weight of informed public opinion. The Navy League will then become widely known and exercise an important influence in the life of the Australian Nation.

The League consists of Fellows and Associates. All British subjects who support the objectives of the League are eligible for membership. Members receive copies of the League's magazine "The Navy".

DIVISIONS

New South Wales — Box 1719, GPO, Sydney, 2001.

Victoria — Room 6, 2nd Floor, 528 Collins Street, Melbourne, 3000.

Queensland — 39 Pinecroft Street, Camp Hill, Queensland, 4152.

Tasmania — 3 Winmarleigh Street, Taroona, 7006.

South Australia — Box 1529M, GPO, Adelaide, 5001.

Western Australia — Box 578, PO, Fremantle, 6160.

Australian Capital Territory — 12 Darmody Street, Weetangera, ACT 2614.

THE NAVY LEAGUE OF AUSTRALIA
Application for Membership

To: The Secretary,
The Navy League of Australia,
(..... Division).

Sir,

I am desirous of becoming a Member of the Navy League of Australia with whose objects I am in sympathy.

(Mr)
Name (Mrs).....
(Miss)
(Rank)

Please Print Clearly.

Street..... Suburb.....

State..... Postcode.....

Signature..... Date.....

Enclosed is a remittance for $4.20 being my first annual subscription.

AFTER COMPLETION, THIS FORM SHOULD BE DISPATCHED TO YOUR DIVISIONAL SECRETARY — NOTE LIST OF ADDRESSES ABOVE

CHANGE OF ADDRESS

Important notice to Subscribers to "The Navy" and Fellows of the Navy League of Australia.

It would be helpful to the Editor and Post Office if you would kindly complete the form provided below prior to moving from the postal address registered with the Navy League, thereby ensuring that "The Navy" reaches you on time. Fellows of the Navy League should also advise their Divisional Secretary of any change in status or postal address.

Tear off here.

NOTICE OF CHANGE OF ADDRESS

To: The Editor,
"The Navy" magazine,
Box C178, Clarence Street Post Office,
Sydney, N.S.W. 2000, Australia.

(PLEASE PRINT CLEARLY)

Name: Mr. Mrs. Miss Rank .....

Present address: .....

.....

I will be moving from the above postal address on

..... to reside at:
(date)

New address: .....

.....

(please include your postcode)

I am a *Subscriber or *Fellow of the ( ) Division of the Navy League.
(* delete inapplicable words)

Signature: .....

FELLOWS OF THE NAVY LEAGUE! DON'T FORGET TO ALSO ADVISE CHANGE OF ADDRESS TO YOUR DIVISIONAL SECRETARY.

INITIAL SEA TRAINING OF OFFICERS IN THE NAVY

By Lieutenant Commander P. M. S. Paffard, RAN

Midshipmen undergoing sea training.

The training time for naval officers of the Royal Australian Navy has changed over the years from sea going to mainly shore side. From practical work and experience to an emphasis on theory and education at a tertiary level. In this sophisticated age it is essential that officers have a good grounding in technical training and tertiary education but at the same time they must not lose the basics of their profession — namely a deep and proper understanding of the sea.

The aim of this paper is to study the basic qualities required by a naval officer and how he should learn them, then to discuss that the best medium in which to train him is under sail.

Before arguing the case it is appropriate and interesting to quote an editorial from the Times Newspaper in 1899 at the time the Royal Navy gave up sail training. It should be noted that the reasons given in those days for retaining sail training are even greater now for re-introducing sail training due to the increased sophistication of our ships.

"The accidental extinction of the old Training Squadron by the side wind of a temporary emergency may be sound policy for the moment, nor are we in the least concerned to question the decision of the Admiralty in such a matter. But the real issues involved are far too important to be foreclosed in this way. Professional opinion is, as we know, sharply divided on the question . . . The bluejacket in a modern man-of-war is admirably trained in the duties appertaining to his position. But they are largely mechanical duties, making little or no demand on his self reliance and resource. What he learns is to do as he is told, to do it well, willingly, and maybe, intelligently. He has very little concern with the result of what he does, which is for the most part mechanically fore-ordained.

"But in the handling of masts and sails a man begins by learning that on his individual efforts and skill depend his own safety, and that of his shipmates. Whatever of fearlessness, of resource, of quick observation, of instant helpfulness reside in his nature is evoked by self-interest and quickened by comradeship; and the dullest cannot but realise that on the exercise of qualities such as these depend his success, his happiness, very often even his life.

"The same stimulating influence, heightened by an early and urgent sense of responsibility, is brought to bear on the young officer. The moment he takes up his duty every quality he has must be ready for ir .tant service. He knows that men's lives depend on the quickness of his eye and the steadyness of his nerve.

"He is dealing with forces, inconstant and incalculable, which may at any moment entail mishap or even disaster unless his is swift to perceive and prompt to remedy what has gone amiss. He learns too to understand men, because after all it is in emergency and not in routine that human nature comes to the front, and by understanding them in this common comradeship of danger he learns how to rule them.

"In a modern man of war such opportunities as these are far less frequent both for officers and men, even if they exist at all. Whatever officers and men learn there they learn admirably, and, with great zeal, goodwill and good sense that animate the whole Service, they learn much more than might be expected. But the question still remains: do they and can they learn all that the discipline of masts and sails teaches them as a matter of course? If they do, well and good. If they do not, can we afford to discard this invaluable disciple from training of our future bluejackets and naval officers?"

The young men joining the Royal Australian Navy between the world wars and for some years after, spent the majority of their formal naval training period at sea firstly in a ship of the Royal Australian Navy then in a Royal Navy training cruiser. Those who joined the Navy at 13 or 14 years spent 3 to 4 years in a college but this was primarily academic and secondly naval training. The sea time totalled about twelve months. Since the early sixties the emphasis has shifted to shore-based training, nowadays including university education, with a short period of sea training lasting ten weeks. In past days midshipmen (as they became on completion of initial sea training) went to sea in ships of the fleet as

You can be a ank manager by the tim you're 30 working f the CBA!

If you've got the talents, we've got th opportunities. Ability is more important thar age with the CBA. We appoint a new Manage every 6 days and an Accountant every 5 days

We offer a wide variety of career to match your particular talent. We'll help you develop those talents too, with financial assistance and study leave for secondary and tertiary education including University degrees.

THE COMMERCIAL BANK OF AUSTRALIA LIMITED

To: The Manager, Recruiting
The Commercial Bank of Australia Ltd,
335-339 Collins St, Melbourne, 3000
Please send me your booklet
"Advice for School Leavers"

NAME .....

ADDRESS .....

..... **POSTCODE** .....

members of a gunroom (junior officers' mess) where their education was a direct enlargement of that carried out in the training ship. Today they are members of a wardroom (officers' mess) in ships varying in size from an aircraft carrier to a patrol boat. Here training is technical with little emphasis on the basics of their trade or on development of the required qualities.

Why do we require sea training for the young officer? Because he is being trained as an officer in a service whose business it is to keep ships at sea for the protection and well being of this country. The sea is a powerful force that can wreck man's works however sophisticated they may be. Naval officers must know how to survive the sea and its onslaughts otherwise all the sophisticated knowledge and abilities given them will be of no avail. These points are well illustrated by the following story of shipwreck in our day. It happened to a new and powerful New Zealand inter-island ferry as recently as 1968. The WAHINE was a stern door vehicular ferry of 8964 tons displacement powered by turbo alternators producing 18,000 shaft horsepower on twin screws. She was fitted with twin rudders, side thrusters fore and aft and the latest in navigational radar. A powerful and very manoeuvrable modern ship commanded by an experienced master mariner, Captain Robertson. The description taken from the book "Hazards of the Sea" by Captain John Noble is a good illustration of the power of the elements, wind and sea, over the best that man can devise.

The PAMIR being towed to an anchorage in the Thames.

During the night (the **Wahine** was on passage Port Lyttleton to Wellington) a southerly gale had developed and the **Wahine** was running before a high sea and heavy swell whipped by a 50 knot wind. Baring Head light could be seen through a misty murk to starboard; the leading lights marking the passage between Pencarrow and Barretts reef were obscured by rain, but a glance at the radar screen told him (Captain Robertson) that the ship was right on course. The barometer was falling rapidly. It was still dark, Baring Head light was abeam. Pencarrow Light could then be seen on the starboard bow, but increasing rain was restricting visibility to about one mile. Nothing could be seen ahead and the Captain prudently reduced speed. He was almost into the 1200 yard wide channel which would not allow him enough room to turn and head seawards even if he considered this necessary. Wind was now approaching hurricane force from right astern: in the narrow waters of the channel the seas steepened curling under the **Wahine's** square stern and occasionally causing her to sheer violently off course. At 6.20 am the main engines were used in an endeavour to maintain a proper course.

Barretts Reef buoy was abeam to port; a particularly violent squall was raging and 30 degrees off course to port, the **Wahine** was heading for the reef about 700 yards away. The **Wahine** refused to respond to her twin rudders with the wheel hard a starboard. Sea and swell were now broad on the port side and the ship heeled heavily to starboard. Taken unawares by the violent roll, Captain Robertson, with others on the bridge, was thrown off his feet and picked himself up in the starboard wing of the bridge. Recovering his position in the wheelhouse, he decided that the ship must now be too close to the reef for the turn to starboard to be safely made. But the **Wahine** was unmanageable in the extreme weather conditions.

At about this critical moment the radar failed, with only instinct to tell him his position, he juggled the engines and side thrusters in an effort to turn the ship right round. But each time the bows came into the wind a violent squall countered his efforts, holding the ship broadside to the wind and sea, pushing her northwards.

Realising his chances of a safe passage rested upon keeping the ship in mid channel, but without visual or radar bearings to determine his position, he ordered the engines ahead and astern to maintain the mid channel position. The wind was gusting to 100 knots.

By 6.40 am the ship was heading seawards when Barretts Reef buoy was again sighted, almost ahead. Simultaneously rocks were reported astern "Full Ahead" was telegraphed but the **Wahine's** starboard quarter touched Outer Rock as the bows grounded in the shoal waters further south. Both engines were going full ahead when the starboard propeller fouled the rock and was shorn off. Rocky pinacles were already ripping holes in the bottom."

The tragedy ended in the loss of the **Wahine** and 51 lives some hours later despite the efforts of Captain Robertson and his crew.

What do we want to achieve, by a basic training system? We try to mould naval officers into possessing self-reliance, self discipline, powers of leadership, a spirit of service, seamanship and sea sense. All these qualities are difficult to teach or learn shut up in a classroom, they all have either a definite practical application or are characteristics developed while performing practical tasks. All specialist subjects can be taught in a classroom but some of them for example navigation, pilotage, shiphandling, ship husbandry and fleet manoeuvres can only be perfected by practical training at sea!

Let us now examine each of the main items in greater detail, what they mean and how they can be learnt. Self reliance is that quality, a man has, to know what he can do and how best he can do it, how far he can push his physical and mental capabilities before they commence to crack up. Often he will have fears physical and mental, a fear of the unknown but rarely will he get the chance to overcome these through real challenges and so become self reliant.

The youth of today are encouraged to think for themselves but in doing so they come into conflict with rules and regulations on a family and bureaucratic level. These conflicts are the very qualities in our society upon which they are so reliant. This reliance on our form of society prevents most of us from ever using our capabilities to their fullest, we depend on someone, some law or something to make decisions for us.

When a young man joins the navy he is conditioned by our society, he seldom has to make an important decision concerning other people's lives. By giving him mental and physical challenges and expecting him to make decisions under these conditions is when he will begin to learn the real meaning of self reliance.

These objectives can only be reached easily and well when pitted against the forces of nature, be it mountain climbing, jungle trekking or sailing. Perhaps it is hard to understand how this could be achieved in a sailing vessel. Young men are required to stand watches in the open, often cold and wet, with sloping slippery decks, new and tricky tasks to perform, a wheel to man at full concentration for long periods and the final test, up the mast and out on the yard to stow sails. There can be few better ways to overcome fears, indecision or the unknown than having to edge out on a swaying yard many feet above the deck and sea, to stow a wildly flapping sail. Just the mental and physical effort required to carry out this task will build self reliance in a young man, he will know himself better than ever before.

Self discipline in many ways is tied to self reliance for in gaining self reliance many aspects of self discipline are brought home with force, the effort made to overcome fear and trepidation in going up a mast and out on a spar or climbing a rock face is self discipline. Self discipline is required to give the young officer the capacity to take charge of himself, to do things not just for himself but for the good of others. Self discipline covers a multitude of small attributes such as keeping clothes neat, tidy and properly stowed. What better place to learn self discipline than the small, seldom horizontal confines of a sailing ship where he is living cheek by jowl with his fellow cadets?

Powers of leadership must be developed in any young officer, it can be manifest in many ways, and the form displayed depends on the make up of each individual character. To some young men it comes naturally to others it must be cultivated. Leadership must be tied to an ability to obey and know why one obeys faster and more willingly to some people than to others. Men will obey because of fear; but once the fear is removed obeyance will cease.

Obeyance must be generated by a willingness or a desire to obey and leadership will foster this. Leadership is an intangible subject but embraces such attributes as being able to carry out the tasks ordered as well, if not better, than the obeyer, being cheerful in adversity, having understanding of the problems of the obeyer, a thorough knowledge of the subject and confidence in his ability. Again like the other requirements this can only be fostered by being both the receiver and giver of orders at different times.

A spirit of service is not just the enthusiasm for one's job, it embraces a wider field including such attributes as helping one's fellow men with their problems, giving extra time or effort to a problem even if it is not officially required. How can it be learnt? This is very difficult. In some it is born, in others it can be learnt by teaching and example. Normal modern life does not require or encourage a sense of service. The young officer must be placed in an environment where his actions or those of his fellow officers will affect his and /or their lives. Life and conditions should be a challenge to him to develop his self discipline and self reliance, and a group challenge to bring out spirit of service.

Seamanship, a science, skill, common sense, or art, be it what it may, is dying a slow death. Modern technology has lessened the need

for seamanship, the average naval sailor or officer can get through his whole career without ever completing a good grounding in seamanship. This is dangerous, for the seaman specialist, there are many times when modern technical equipment will fail and he will have cause to resort to the old commonsense basic seamanship to save the day. Seamanship is not just knowing how to tie a few bends and hitches, but covers many aspects from rope-work, boat handling, ship stowage, safety, berthing and fendering. It can only be thoroughly understood and fully learnt by practice at sea in a vessel, especially in one that is basic and subject to the will and skill of man over the force of nature.

The final quality on the list is sea sense; a naval officer in his early training needs a sharp introduction to the sea and its power. The need to acquire and exercise sea sense arises from the fact that the sea's surface (or sub-surface) is not man's natural habitat and the conditions experienced at sea differ, widely, from those ashore.

Perhaps the simplest example of what is meant by sea sense concerns the problem of relative motion. The comfort and safety of us all depend on our ability to avoid collision with other moving bodies, be they motor cars, other people or even raindrops. Children, although they may not possess it at birth, rapidly acquire in their first walking years the ability to work out by eye quite complicated problems of relative motion (triangles of velocity).

The problems become more complicated when we forsake the dry land and venture into the sea or air. These problems are influenced by elements of wind and current. The seaman's problem may be to avoid or gain contact with another moving ship or with an object on land or underwater.

The wind or current, unseen, will influence his own ship's motion; if the other object in the problem is a moving ship, they will be affecting her motion too, though not necessarily to the same degree. If the object is on land, like a jetty, or underwater, like a rock or shoal, the wind and current will be affecting only his own ship.

This is the kind of problem that constantly confronts the seaman and requires a special knowledge for successful results. But sea sense

Midshipmen at sea measuring the altitudes of the celestial bodies.

is not only this ability to cope with these special problems of relative velocity. For the safety and movements of the ship it requires a constant awareness of present and future weather patterns so, as to interpret their effect on the ship.

It is the ability to sense the stresses a ship is subjected to in rough seas and the ability to know when to relieve these stresses before they become critical.

It is concerned with the sea's overwhelming power when in an angry mood, and the ability to react in a crisis with coolness and good judgment; it is concerned with thinking ahead and acting prudently, for example, lashing and fastening loose objects so that they are not only safe now but will remain safe in a few hours time when night comes, the tide turns or the wind rises; in short doing things in a **seamanlike manner**. These qualities and many more make up **sea sense.** The sea is the teacher, what type of ship should we put in the school?

A shore side classroom situation will not achieve all the desired qualities listed in the aforementioned subjects. Some qualities can be achieved in shore type practical training, for instance, assault courses or mountain climbing. Some such as seamanship can only be put to practical experience at sea; sea sense can only be learnt at sea. A ship is needed to fulfil this training role, not just any ship but a ship built or converted for the role. The ship can be modern or old, power driven or sail; whichever is chosen it requires to be not only cost effective but able to carry out the role to its greatest effect.

Cost is an ever present bogey; the cost to build or the cost to convert a ship, followed then by the running and refit costs. These factors of cost must all be weighed carefully against each other. As an illustration it may cost $X to build a new ship and $1/8X per year to run and refit as against $1/2X to convert one but $1/4X per year to run and refit. In treasury eyes the initial costs favour a converted ship but over an extended period say ten years the new ship will only have cost a total of $2 1/4X whereas the old converted ship will have cost $3X. Size of crew has considerable effect on the running costs and will therefore play a part in the choice of ship. The type of ship, its motive power, its time required in refit (therefore time out of the training role) must be weighed in terms of cost one against the other. A sailing ship for example will be cheap to run as its normal motive power, wind, is free, its refits are relatively simple and short.

Size, layout and therefore cost will depend on numbers of trainees alone, whether they are extra to crew required to work ship or whether they form an integral part of the crew. Consideration must be given to the habitability standards acceptable for the trainees, either spartan and economical or lavish modern luxury. Hand in hand with cost consideration, thought must be given to the ship which can best achieve the training goals previously set out. We must study in what way each ship type contributes to teaching and developing the qualities we require in a naval officer. It is doubtful that any one ship can fulfil every ideal that the training aims require but one ship should be way ahead of the others. When making these deductions it must not be forgotten that the young officer later spends a year or more training at sea in a fleet ship as a midshipman. It is during this time that he can study all the other aspects of being a naval officer including the specialist subjects.

In the Royal Australian Navy there could be three main choices of ship; namely a converted destroyer escort, a converted or new ship built on merchant ship lines, or a sail training vessel. Each type has its merits and its disadvantages.

A converted destroyer escort initially seems the best when viewed through the Treasury department's eyes, it is cheap because it is using an existing ship, but in the long term it can be costly to keep an old hull and equipment in full running order (for example **HMAS Anzac** cost about $1 1/4 million for a refit in 1972).

An old destroyer escort is stated as being a good training ship because it familiarises the cadets with the type of equipment they will meet in operational ships. This is a fallacy because the equipment is usually out of date and unlikely to be found in any other ship. An old destroyer escort can have subsidiary functions and a minor role in time of war, but again due to age and obsolescence of the equipment this is of little significance.

This type of ship is often difficult to convert into suitable configuration for training without further detracting from its possible operational role. Some weapons systems usually require to be removed to make way for navigational classrooms, other equipment may be removed because the accommodation required for maintenance sailors has to be used for cadets.

A new or converted small merchant ship type, (for example a hull similar to HMAS **Moresby**) is a second alternative. It could be built new far more cheaply than an escort ship. Or a second hand hull could be converted the cost depending on its previous configuration. By building a training ship on merchant ship lines the crew required to run the ship would be much smaller and therefore increase cost effectiveness.

The savings in crew come mainly from a simplified engineering package, the main engines can be diesel. The design could include properly built and set up classrooms, a lecture hall, charthouses, practical areas and plenty of boats.

The designers could also keep in their minds, and even build in, special features so that in time of war the ship could be converted into a hospital ship, troop transport or amphibious headquarters ship. The disadvantages would lie in its dissimilar machinery, weapons and other systems to fleet ships.

Also due to its different speed and manoeuvring characteristics it would be unsuited for fleet or OOW manoeuvres, and underway replenishments; even so it should be fitted with the appropriate highpoints and fuel connections. The training aims would be hard to achieve in this type of ship.

The third type of ship that could be used is a sailing ship. There are still many in full use amongst the navies of the world (full list in annexure "A" to this paper) varying from 40 tons to 4000 tons displacement. Such a ship would require only a limited crew compared with a equivalent sized power driven vessel. This would be due to the limited machinery and the cadets can be used from their first day onboard as full working members of the ship's company. They are there to learn and the quickest way to learn is by practical experience. A sailing ship would be far cheaper to run, no fuel with exception of that required for emergencies, berthing and running the electrical generators, no expensive and complex electrical, electronic or mechanical weapons systems. The cadets would get full value for money in comparison with the other two types of ship by covering all the training aims listed earlier.

Navigation might at times prove difficult during rough weather especially if the ship chosen was too small. Obviously a sailing ship cannot be used to teach fleet manoeuvres or underway replenishment; this can be learnt during fleet time as a midshipman.

Each of the vessels has its good and bad points. In the case of the old escort it is a nice theory to be able to study the systems or parts thereof but it doesn't work well in practice. The merchant ship is a good idea but it falls between the other two in ability to cover all the syllabus. The best fit for a training requirement is a sailing ship.

A sailing ship can be built new to the size required to carry out the task of giving continuous initial sea training to the young officers of the navy. It can be continuous because all refit work could be undertaken with ease during the leave periods and other short gaps in the training cycle.

Having deduced that a sailing ship is the best answer we must now decide on the size of ship best suited to fulfil the role in the Royal Australian Navy. Firstly a ship of over 1500 tons, similar to the Chilean navy training ship, **Esmereida**, or the Federal German Navy **Gorch Fock**, which would be capable of training from 50 up to 150 cadets with a permanent crew of about 10 officers and fifty sailors. Secondly a medium sized ship of about 300 to 800 tons, similar to the United Kingdom Sail Training Association Schooner, **Sir Winston Churchill** capable of training up to fifty cadets with a crew of 12 to 15 officers and sailors. Or thirdly, a small ship (yacht) of only 20-120 tons, such as the Netherlands schooner **Urania**, capable of training 10 to 15 cadets with only a few instructors and crew.

Each of this type of ship can perform and provide training to fulfil all the desired qualities listed earlier. The large ship can cruise world wide, provide an awesome challenge to trainees in mast and yard work aloft, but there would be some loss of personal contact between cadet and instructor due to the large numbers of cadets. The third type, a small ship or yacht, provides the youngman with a very close association with the sea but is too small to provide good facilities for the teaching and practice of navigation in all weathers and by several cadets concurrently. The medium sized vessel is small enough for cadets to gain close association with the sea but

large enough to get reasonable work aloft, good practical navigation and be capable of extended voyages.

The Royal Australian Navy sends young officers to sea in batches of between twenty and forty. Therefore the ship need only be large enough to cope with such numbers. Obviously the smaller size vessel would be too small, and also does not provide work aloft or good navigation facilities. The ships of the **Gorch Fock** size are too big, therefore the best size is in the 300-800 ton bracket. The ship should be a three masted schooner with square sails on the foremast, carrying a permanent crew of about 15, she could cruise almost anywhere and fulfil all the basic training aims leaving weapons systems, manoeuvres and specialist subjects to be absorbed during midshipman's time in the fleet.

A question that will be asked by those considering training will be, is sail training safe? That very question arose during the period when the Federal German Navy was considering building its sail training ship, the **Gorch Fock;** the protagonists against sail training were helped in their cause by the tragic loss of the famous clipper **Pamir** on 21 September, 1957. Despite the loss of all apprentices on board and an uproar in the world press the Bundesmarine signed the contract.

The **Pamir** was owned by a merchant shipping line, she was used as she was designed, to carry bulk cargo. Public opinion after her loss prevented her sister ship the **Passat** from sailing again, thereby ending the great tea and wool clipper ship era. Both these ships carried cargo, which is a threat to a ship heeled over underway because it can shift.

The **Gorch Fock** or any other sail training ship was not designed or built for cargo carrying. She was modified following the **Pamir** disaster by the addition of greater ballast and more bulkheads. A ship designed for training has no holds, no cargo to shift therefore no changes to her draught and stability.

A training ship can be built undercanvassed, but a merchant man of similar displacement whose main aim is to achieve the fastest possible passage can be overcanvassed. Finally she will have an adequate crew to enable sail to be reduced in a hurry. A square rigger or for that matter any sailing vessel is acknowledged to be steadier than an equivalent sized power driven vessel. Naturally, a sail training ship would be fitted with an auxiliary engine and the latest navigational aids and such a ship can be regarded as one of the safest ships afloat.

Having argued the case for a sail training ship in the Royal Australian Navy let us now examine the reasons why another navy trains its officers under sail followed by a look at the views on the subject by a well known master mariner (sail) and writer. The navy chosen is the Chilean Navy, an old (founded 1812) and respected navy, with a long tradition of efficiency. Her training ship is the well known visitor to Sydney the four masted schooner **Esmeralda**.

The Chilean Navy's reasons for retaining a sail training vessel are listed by the Chilean Naval Attache to Australia, Captain Jorgebaeza, as, I quote:

"We think that the young officer, before becoming a technician in his profession, must be a seaman and it is considered that a sailing ship is the best school.

Living together is very important in the Navy especially in small ships and submarines. Long periods of navigation help to know the reaction these young officers will have in front of a career that will demand a lot of sacrifice and being away from their families for a long time. It is considered also a way of measuring the character and to observe if they are really fit for the future demands of life onboard.

The tranquility of this scene, with SIR WINSTON CHURCHILL in the foreground and Poland's DAR POMORZA (left) and Germany's GORCH FOCK (right), on the eve of the Tall Ships' Race, 1972.

"We think that the sailing ship is less expensive than a conventional ship because they have much simpler propulsion and they need less spare parts regarding the motor, which is only used to enter and leave port.

"During the training period on board the young officer has a chance to practice all sorts of manoeuvres and we think that the errors he makes due to lack of experience are less harmful than if he makes the same one in a conventional ship, damaging perhaps complicated and expensive equipment and machinery.

"Considering the era we are living in, undoubtably any kind of sailing ship is looked upon with interest by the people everywhere and this contributes greatly to the country she represents, its people, education and habits. Our training ship, **Esmeralda** has been able to achieve all the above mentioned and she is widely known throughout the countries she has visited. The sailing ship is in itself an important embassy. As an example I can tell you that in her last trip to Sydney the ship was visited by more than 20,000 people.

"In a sailing ship the young officer is always very close in contact and works physically just the same as the crew, a very important fact that makes him appraise the work that is done by the men whom later he will command."

Now another view of the problem by Alan J. Villiers, a well known and respected master mariner.

"No really evil thought ever originated at sea", said the master of a big sailing school-ship to me recently — a sweeping statement, surely, for some horrible mutinies have taken place in a good many vessels down the course of maritime history. But I saw what my friend meant, as I looked along the clean decks of his beautiful full-rigger and glanced aloft at the sun-tanned boys working the rigging. (As for those mutinies, most of those which I have had a chance to look into obviously originated in the gross and miserable mismanagement of a few ships.) The life of that Danish full rigged ship was essentially a pleasant and fulfilling experience for the youths who had the good fortune to help man her, and the impact of the sea as they experienced it could do nothing but good both to themselves and the seafaring nation which had the sense to run the school ship for them.

"There are a good many of these sailing school-ships still in commission in the modern world, as the 1956 Tor Bay to Lisbon race for such ships testified ((1) note: article written in 1957). Most of the great seafaring nations ((2) except our own) still think it worthwhile to maintain such ships officially. The majority are for **all initio** training for the merchant service, but several are exclusively for the naval service of their countries, such as the Portuguese naval training barque **Sagres**, the Spanish (3)**Gelatea**, (4)Brazilian **Almirante Saldanha** and the Italian **Amerige Vespucci**.

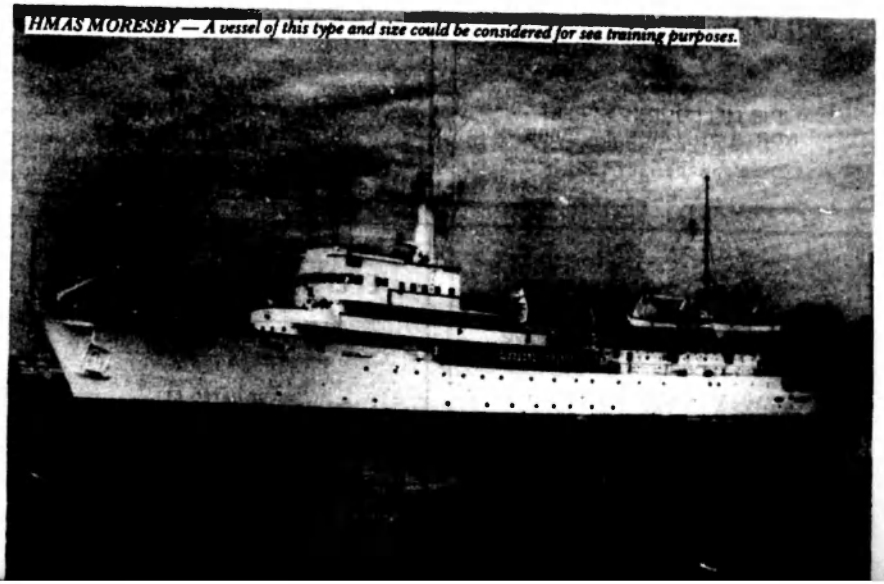
(1,2) UK and of course Australia.

(3) has now been disposed of.

(4) re-classified as an Oceanographic ship, 1959. Completely remodelled by 1964 to conventional motorised vessel resembling older type steam yacht and classified a survey ship.

One, the United States Coast Guard barque **Eagle**, is attached as a sort of seamanship school plus character builder to the US Coast Guard officers' academy at New London, and several others (including a pair of Japanese four masted barques) work closely in with the curricula of training academies ashore.

"I confess that, when I was a working seaman in big sailing-ships myself, trying to serve my time under sail to qualify to sit for the second mate's certificate (and finding the process woefully diffi-



HMAS MORESBY — A vessel of this type and size could be considered for sea training purposes.

cult because of the lack of ships). I had no high opinion of these rather crowded school ships. It seemed to me that the real worth of sail training must be lost aboard them, because of the very profusion of youth they carried. How could sail handling by drill or by numbers serve any useful purpose, apart from presenting an unnecessarily tidy picture and a beautifully stowed suit of sails? I was a 'cadet' myself at first, in an old 'Scots' barque of 750 tons or so. There were six cadets, signed on the ship's articles for ten shillings a month, and we were a very real part of the crew though we had a half deck to ourselves and were forbidden to the forecastle.

We had the exclusive handling of the lighter sails — the gaff topsail, the flying jib, the two royals. With us it was one boy to a royal, and get a good stow on it too. We laughed to see a great school ship come into Sydney with six boys to each royal, spaced tidily so far apart, and a crowd swarming into her rigging to stow the other canvas like a great flock of starlings. With us, too, we did usual two hour turns at the open wheel, and plenty of them. We helped the able seamen at the sailorizing jobs. We had no instruction as such: it was the sea that taught us — the ship and the sea. We thought that sufficent, for there were so few of us that there were practical lessons enough to go round. Too many indeed.

"Yet I went aboard that big school ship while she lay at anchor, and I was not so sure about the superiority of our kind of training. By then, my barque was in the sales lists, anyway, and I was no longer sure of a berth in her; at least the school ship gave continuity of training. I liked what I saw aboard the school ship, for all the crowd. Instruction of all kinds was going on fore and aft, practical and theoretical, and though it was in a language I could not understand, I listened with great interest.

"In that fine ship a couple of hundred well selected boys were receiving instruction in their chosen calling from officers who were interested in them, whose job it was to see that they received the best instruction, in a ship that was specially designed for them. I saw a crowd of uniformed boys manhandling a big course which they were about to bend, to replace a blown out sail, and they were going about their work expertly and with ease. It was obvious that there were advantages in having numbers of them and I could see the school ship idea must work very well — a lesson I learnt again years afterwards, when I sailed in several such ships — Danish, American, Portuguese."

In conclusion I hope that I have shown that the best form of initial sea training for officers in the Royal Australian Navy should be concentrated on the basics of their profession — self reliance, self discipline, powers of leadership, a spirit of service, seamanship and sea sense, and that it can best be taught in a sail training ship.

It is recommended that the Royal Australian Navy should immediately design and build a sail training schooner of about 400 tons displacement to replace the present ageing training ship. Thereafter all initial sea training to be conducted under sail.

ANNEXURE "A" TO INITIAL SEA TRAINING OF OFFICERS IN THE NAVY

SAIL TRAINING SHIPS OF THE WORLD

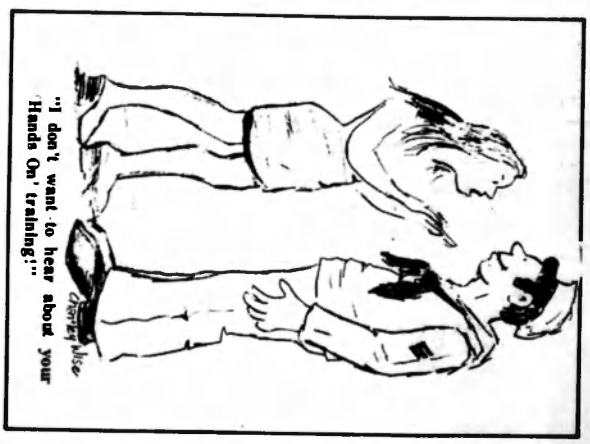
(Naval Training Only — Incomplete)

COUNTRY	SHIP	BUILT	RIG	FULL LOAD DISPLACEMENT (TONS)	DIMENSIONS (FEET)	OFFICERS	SAILORS	CADETS	TOTAL CREW
ARGENTINA	LIBERTAD	1956	Ship	3,765	301 x 47 x 21.8	20	200	150	370
COLUMBIA	GLORIA	1968	Barque	1,300	212 x 34.8 x 21.7				NK
EAST GERMANY	WILHELM PIECK plus 4 smaller yachts	1951	Brigantine	200	NK				NK
GERMANY (Federal Republic)	GORCH FOCK NOROWIND plus 70 smaller vessels	1958 NK	Barquentine Ketch	1,870 100	257 x 39 x 15.8 78.8 x 22 x 9	10	56	140	206 NK
INDONESIA	DEWARUTJI	1953	Barquentine	1,500	191 x 31 x 14	6	26	78	110
ITALY	AMERIGO VESPUCCI PALINURO STELLA POLARE CORSARO II	1931 1920 1964-65 1959-60	Ship Barquentine Yawl Yacht	4,146 1,450 47 41	270 x 51 x 22 226 x 32 x 18.7 69 x 15.4 x 9.8 68.6 x 15.4 x 9.5	20	380	150 10 10	550 NK 14 NK
NETHERLANDS	HENDRICK KARSSEN HOBEIN URANIA	1939 1938 1938	Schooner Schooner Schooner	185 132 38	137 x 20 x 5.5 92 x 19 x 5.5 72 x 16 x 10	4 2	14 8	30 20	48 30 15
POLAND	ISKRA * DAR POMORZA	1917 1909	3 masted Schooner Ship	560 1,560	128 x 25 x 10 240 x 41 x 21	6	24	40	70 NK
PORTUGAL	SAGRES	1938	Barquentine	1,869	249 x 39 x 17				153
ROMANIA	MIRCEA	1939	Ship	1,604	239 x 39 x 16.5	8	75	140	223
[illegible]	[illegible]	1948	Schooner	220	129 x 23 x 13.5				NK
US COAST GUARD	EAGLE	1936	Barquentine	1,816	295 x 39 x 17	12	68	200	280
USSR	* TOVARISCH plus 10 schooner types	1933 NK	Ship Schooner	1,350 300app	242 x 39 x 15 NK	10	50	200	260 NK
YUGOSLAVIA	ISTRANKA	NK	Schooner	230	NK				NK

Note: There are other ships such as Norwegian SORLANDET, UK SIR WINSTON CHURCHILL, which are private or merchant marine ventures.
NK: Not Known.
*: Provides personnel and training for the Navy, but is not on the Navy list.

ANNEXURE "B" TO INITIAL SEA TRAINING OF OFFICERS IN THE NAVY
Bibliography

The following publications have been consulted:
Janes Fighting Ships 1972-73 — Sampson Low Ltd
Outward Bound — David James — Routledge and Kegan Paul.
Hazards of the Sea — Captain J. Noble — Angus and Robertson.
History of Seamanship — D. Philips-Birt — G. Allen and Unwin.
Training under Sail — A. Villiers — (not known).
The Naval Review — January, 1958; January, 1959; October, 1962, October 1968.
Assistance was also received from:
Captain Jorgebaeza — Chilean Naval Attache, Chilean Embassy, Canberra.
The Sailing Training Association of Great Britain.



Nautical Notes from all Compass Points

By "Sonar"

BRAZIL

Two further "Schutze"-class mine sweepers have been ordered by the Brazilian Navy from Abeking & Rasmussen.

It is also announced that negotiations have been completed for the purchase of a destroyer, the second in two years, and a further submarine from the United States.

* * *

PLESSEY TO EQUIP BRAZILIAN WARSHIPS

The Brazilian Navy's newest ship, the missile destroyer "Niteroi", due to be launched at the Woolston, Southampton yard of Vosper Thornycroft is to be fitted with Plessey Radar's latest version of the AWS-2 naval surveillance radar, together with an automatic IFF Mark 10 system of Plessy manufacture.

"Niteroi", the first of four general purpose escort vessels under construction by Vosper Thornycroft, has a full load displacement of nearly 4000 tons. Each ship will be armed with guided missiles as well as conventional weapons and will carry a Lynx helicopter. The Plessey Radar equipment to be fitted to these ships will have a total contract value well in excess of 1,000,000 pounds.

Two similar ships, with a weapon system modified to include IKARA anti-submarine missile systems, are under construction in Brazil, with technical assistance from Vosper Thornycroft. These powerful anti-submarine destroyers will also be fitted with the same Plessey Radar package of AWS-2 radar with IFF Mark 10, bringing the total value of Brazilian Navy contracts to Plessey Radar to between 1,500,000 pounds and 2,000,000 pounds.

The Plessey Radar package has been designed to provide all the information on air and surface targets for the computerised action information and weapon control system on these heavily armed ships. The radar is a dual transmitter frequency diversity system incorporating a fully stablished antenna of high performance, ensuring consistent and accurate detection of both air and surface targets. The IFF system, which is fully integrated with the radar, is designed to operate under computer control, enabling the identification to be precisely correlated with the primary radar information.

* * *

CANADA

FOURTH "TRIBAL"

HMCS ALGONQUIN, the fourth Canadian Forces' new Tribal class helicopter-destroyer has completed sea trials and was commissioned into the fleet on 3 November last at Lauzon.

Completely designed and built in Canada, the ALGONQUIN, considered one of the world's most modern warships, surpassed design specifications during exacting trials by her builders, Davie Shipbuilding Ltd.

This latest addition to Canada's maritime force will be commanded by Cdr R. L. McClean, 45 of Sarnia, Ont, and is scheduled to join three sister ships at Halifax following her commissioning. Other ships in the Tribal class are the IROQUOIS, HURON and ATHABASKAN.

A Canadian Forces Tracker aircraft flies past an iceberg during a routine patrol of northern waters. Maritime Command aircraft regularly patrol Canadian coastal and northern areas on ice reconnaissance, surface and sub-surface surveillance flights as well as fisheries and pollution patrols and search and rescue duties.

CAF PILOT TRAINING

Pilot training for the Canadian Armed Forces is to be expanded and re-organised this year, and it is claimed this can be achieved, at lower individual cost, by directing students to specialised courses (fighter, multi-engined transport, or helicopter piloting) at an earlier stage than previously.

Student pilot intakes are to be stepped up from 130 a year to 200; there will be increased use of the basic jet trainer, the Canadair CL-41 Tutor, and the CF-5 will replace the T-33 advanced trainer.

Pilot selection and ab initio training will be continued at CFB Portage la Prairie, Manitoba, employing single-engine Musketeers; basic training on Tutors, to Wins standard, will be at CFB Moose Jaw.

Those assigned to be combat jet pilots will get advanced training on CF-5s at CFB Cold Lake, Alberta, before being assigned to an operational squadron. But pilots assigned to multi-engine training will be posted to a multi-engine conversion squadron immediately for "on-the-job" training but remain students until this is completed when they become squadron pilots.

Helicopter pilots, after graduation at Moose Jaw, return to Portage la Prairie for about 70 hours training, initially on Bell Kiowa LOHs; they, too, complete their training at an OTU before squadron assignment.

Of the intakes, on average, 39% will be combat jet pilots, 25% multi-engine transport pilots and 36% helicopter pilots.

Canada's Defence Minister Richardson claims under the new system $Can13,000 will be cut from the present $296,000 cost of training a CF-104 pilot; $132,000 from the present $315,000 cost of training a CF-101 pilot; $147,000 from the $282,000 cost of training a multi-engine transport pilot; and $162,000 from the present $351,500 of training a helicopter pilot! These, however, are estimates, to be proved in the process, like the scheme's disadvantages.

* * *

POLLUTION CONTROL

Treasury board has approved a capital expenditure of $540,000 to investigate, develop and evaluate equipment which will minimize pollutants from Canadian Forces ships and auxiliary vessels.

Assisting the department of the environment is an Inter-departmental Working Committee through which the department of national defence is intensifying it's efforts to meet the stated aims.

This project consolidates three existing programmes with additional programmes involving research, testing and study of pollutants undertaken by defence research establishment scientists from the Atlantic, Pacific, Suffield and Ottawa regions.

Scientists will monitor and analyse wastes from ships and carry out liaison with technical representatives from other nations about existing systems.

HMCS Margaree was fitted with a "pollution abatement suit" prior to her cruise in the Great Lakes last summer. The suit contained a sewage handling system, an oily-water separator, and a soft-garbage compactor.

Adding to the experience gained with **HMCS Margaree**, DND is increasing research into areas of oil-in-water monitoring, multi-purpose incinerators, wash and laundry water treatment and the origins of bilge waters.

GERMANY (Federal Republic)

MRCA

First flight of the Panavia MRCA (multi-role combat aircraft) will take place from the Messerschmitt-Bolkow-Blohm flight test centre, Manching, West Germany, early this year.

The first prototype (P.01) of the Anglo-German-Italian co-operative venture aircraft was transported from MBB's Ottobrunn development centre to Manching (80km away) in November for final testing of sub-systems: installation of the Turbo-Union (Rolls-Royce, MTU and Fiat), RB199-34R engines, and ground running and taxiing trials.

Nine prototypes are at various stages of construction or assembly, four in the UK, three in Germany and two in Italy; P.02 and P.03, from BAC, Warton, UK, will be next in the air, followed by P.04 (Ottobrunn) and P.05 (from Aeritalia, Turin, Italy).

Deliveries to the RAF, the German air force and navy, and the Italian air force will begin in the second half of this decade.

* * *

FAST PATROL BOATS

The seventh of a series of 20 "Combattante II"-class fast patrol boats, the S47, to be built for the Bundesmarine by Constructions Mechaniques de Normandy at Cherbourg, was launched on September 20. The keels of pennant numbers S54 and S53 were laid on September 6 and 11 respectively.

These FPBs are 47m craft having a full-load displacement of 265 tons and powered for 35 knots by four MTU type MD872 3000hp diesel engines. Armament comprises an OTO Melara C31 Compact 76/62 gun forward, a Bofors 40/70 aft and four launchers for MM38 Exocet surface-to-surface missiles.

INDONESIA

PATROL BOAT GIFT

The Minister for Defence, the Honourable Lance Barnard, officially handed over an Australian Navy Patrol Boat to the Indonesian Navy — the first gift under an Australian/Indonesian Defence Co-operation project — on 16 November.

The patrol boat, formerly HMAS **Bandolier** (see photograph), was renamed RI **Sibar**au and commissioned into the Indonesian Navy at a ceremony at **HMAS Waterhen**.

It was accepted by the Indonesian Ambassador to Australia, Mr Her Tasning, and shortly after the handing over and commissioning an Indonesian Navy crew marched on board to formally take possession.

The first vessel is to be followed up with another Attack class patrol boat next year, two further patrol boats of a similar type, six 51 feet patrol boats and at least four Nomad aircraft.

* * *

IRAN

NEW SUPPORT SHIP

The Imperial Iranian Navy Support Ship **Hengam** (see photograph), named by Princess Fatemeh Pahlavi, sister of the Shah of Iran, was launched at Yarrow's Scotstoun, Glasgow, shipyard on Thursday, 24th September, 1973.

Hengam is the first of a series of two ordered in 1972; she is scheduled for delivery in March 1974 and her sister later that year.

The RAN patrol boat HMAS BANDOLIER (formerly number 95) has new markings in readiness for transfer to the Indonesian Navy. She is the first of two Australian patrol boats to be transferred under a programme to develop Indonesia's maritime patrol capacity. The BANDOLIER was built in Queensland in 1968 and is to be known as RI SIBARAU.

The support ships have been designed as multi-purpose vessels with the capability of undertaking disaster relief operations, and even the shipment of general cargo, in addition to a variety of naval duties.

With lengths of 300ft, the vessels will have a displacement of some 2500 tons; they will be powered by twin medium-speed diesel-engine installations turning controllable-pitch propellers.

The disaster relief role, in particular, will be served by a hospital and dormitory complex and a helicopter landing-pad.

* * *

PAPUA-NEW GUINEA

NEW SHIPS FOR CONSTRUCTION

Following consultations with the PNG Government, the Australian Government has decided to provide two landing craft to the Papua New Guinea Defence Force.

The PNG Government has welcomed the offer of the two vessels which will provide the PNG Defence Force with improved maritime mobility, for which there is an established requirement.

Displacing about 310 tonnes, the landing craft are some 44.5 metres in length and could be used for loading and unloading across beaches, the discharge of reasonably heavy cargo from ships off-shore, and transport on the major rivers of PNG. The normal complement of 16 includes two officers.

It is expected the two landing craft will be available for delivery to PNG early in 1975.

* * *

NATO

NEW SEA COMMANDER

NATO's Commander-in-Chief, Eastern Atlantic Area, has announced that a Canadian naval officer, Commodore G. M. de Rosenroll, will command the Standing Naval Force Atlantic in 1974.

This multi-national force is composed of ships of member nations.

Commodore de Rosenroll's appointment began on 19 January, 1974, when he succeeded Commodore J. W. H. Wevers, of the Netherlands.

* * *

PERU

CONVERTED "DARINGS" FROM UNITED KINGDOM

The **Ferre** (see photograph), first of the former Royal Navy "Daring"-class destroyers **Decoy** and **Diane** (now named **Palacios**) brought by the Peruvian Navy to complete major refit and modernisation by Cammel-Laird (Ship Repairers), was recently photographed on trials.

Of particular note is the "mack", modified foremast/exhaust, carrying the newly-installed Plessey ASW-Z radar scanner and the ramps for the Exocet SSM launchers which replace the DCT on the aft superstructure.

* * *

UNITED KINGDOM

NEW MINE COUNTERMEASURES VESSELS

Contracts valued at over 2½ million pounds have been placed with Vosper Thornycroft Limited by the Ministry for Defence (Navy) for studies in connection with the design of the projected new class of Mine Countermeasures Vessels (MCMVs) for the Royal Navy including machinery controls, and for the construction of the necessary building facilities. The design work includes the construction of a full-scale wooden mock-up of the ship.

The construction work includes the erection of the building to house the mock-up, which is being carried out by Dibben Structural Engineers Ltd of Southampton, and the construction of a new building berth and panel shops, which is being carried out by Holst and Co Ltd of Watford, both firms working under the direction of the Construction Department of Vosper Thornycroft.

ROYAL NAVY HAS NEW TORPEDO

A new anti-submarine torpedo, code-named "Tigerfish", has entered service with submarines of the Royal Navy. It will provide a highly effective capability against submarines of all types.

The development programme has included hundreds of successful test firings, using experimental, pre-production and finally production models of the new weapon.

Tigerfish is some 21 feet long and 21 inches in diameter, and is propelled by low noise, contra-rotating propellers, designed at the Admiralty Research Laboratory, Teddington. Its electric propulsion system is powered by batteries of advanced design.

During its run to the target, Tigerfish remains connected to the firing submarine by a wire link, which is paid out both from the torpedo and the submarine. This method allows the wire to remain stationary and free from strain.

The wire link enables the course of the torpedo, its depth and an appropriate mode of acoustic homing to be selected or changed as necessary while the torpedo is on its way. When its sonar equipment has made acoustic contact with the target, the final phase of the attack is entirely automatic, the weapon homing on to the target in the already selected mode.

Explosion of the torpedo's powerful warhead is initiated either

FERRE was purchased from Britain in 1969 and refitted by Cammel-Laird for service with the Peruvian Navy.

HMS AMAZON on sea trials.

by a conventional impact fuse, or by a proximity fuse developed initially at the Admiralty Underwater Weapons Establishment, Portland. In the event of a near miss, the proximity fuse ensures the detonation of the warhead at the nearest point to the target.

Lead contractor for Tigerfish was Marconi Space and Defence Systems Ltd, under the direction of a special team in the Navy Department of the Ministry of Defence. Scientific support came from the Admiralty Underwater Weapons Establishment.

Significant design and development work was also carried out by the Plessey Company and other contractors, and Plessey is sharing in the assembly of the torpedoes. Final preparation for issue has been carried out by the Navy's armament depot at Coulport.

There are three variants of Tigerfish — the warshot, the exercise and the dummy. The warshot is the fully operational battle weapon. The batteries in this version were developed and manufactured by Chloride Industrial Batteries Ltd. The exercise version becomes buoyant at the end of its run for ease of recovery, and this version contains special instrumentation and recording equipment for post-exercise analysis. It is powered by a rechargeable battery made by SOGEA Batteries Ltd. The dummy is used to prove handling, stowage and discharge arrangements, as necessary, in advance of the deployment of the other, more expensive versions.

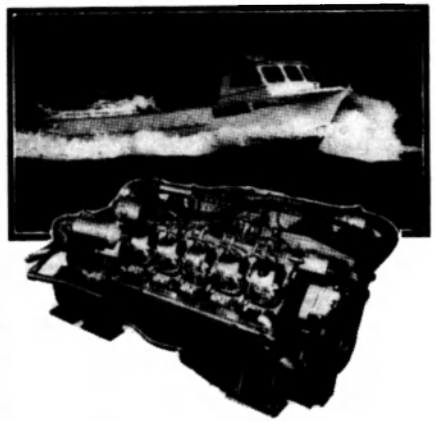
All three versions are in full production, a task currently being shared between Marconi and Plessey, with the involvement of other specialist firms.

AMAZON CLASS FRIGATES

Our photograph shows HMS **Amazon** on sea trials. She is the first of the Royal Navy's Type 21 frigates, which are built to a design carried out under Ministry of Defence contract by Vosper Thornycroft Limited in collaboration with Yarrow Shipbuilders. This makes the class the first major warships for many years designed as well as built by commercial shipbuilders. Eight ships are on order, three, including HMS **Amazon**, from Vosper Thornycroft Limited, and five from Yarrow Shipbuilders. HMS **Amazon** (see photograph), as the prototype of a new and sophisticated class of warship, has a long programme of trials to complete. She is expected to be in service with the Royal Navy this year.

HMS **Arrow**, fifth of the Royal Navy's new Type 21 Amazon class frigates, was launched by Lady Raper, wife of Vice-Admiral Sir George Raper, Director-General Ships, on 11 December, 1973, at the Glasgow shipyard of Yarrow (Shipbuilders) Ltd.

HMS **Arrow's** armament will be Seacat surface-to-air missiles and a 4.5in Mk 8 gun. She will also carry a Wasp helicopter, which will be replaced later by a twin-engined Lynx.



HMS INVINCIBLE

Plessey Radar has received a Ministry of Defence contract, valued at almost 1 million pounds, to supply action information equipment for the Royal Navy's new cruiser HMS **Invincible.**

The equipment is the latest version of the successful series of digital display systems currently in production at the Plessey Radar Addlestone factory. The first system of this type is in service in the guided weapon destroyer HMS **Bristol.**

Other systems are being fitted aboard the Royal Navy's new type 42 destroyers and in a number of Leander class frigates as part of a modernisation and conversion programme.

HMS **Invincible,** the largest ship to be built for the Royal Navy since World War Two, is to have a more comprehensive automated action information organisation than any previous vessel. The Plessey display system will enable the command team to make full use of the extensive volume of data available in the Action Data Automation (ADA) system for deployment of the ship's weapons and aircraft, also for command and control of co-operating forces.

Orders received by Plessey Radar for ADA digital systems for both ships and short training purposes now exceed a total value of 9 million pounds.

• • •

DOPPLER RADOMES FOR SEA KING HELICOPTERS

The Microwave Materials unit of Plessey Interconnect has received further orders valued at 48,000 pounds from Westland Helicopters Limited for the supply of Radomes for the Marconi AD580 Doppler System used on the Sea-King helicopter.

The radomes are required to protect the receiver and transmitter arrays of the Sea King's doppler radar system. Due to the aircraft's versatile operational role — which includes a capability of emergency landing on water — together with its fuselage configuration, a pair of highly accurate radomes which are an integral part of the aircraft structure, are required to employ the extreme sensitivity of the doppler. Shielding is also required to prevent stray reflections from the bulkhead which could produce error signals.

Plessey was able to design and develop a composite radome and absorber assembly that allows 98 per cent transmission of power through the radomes and suppresses stray reflection. Additional sealing produces 75dB isolation between the transmitter and receiver array.

• • •

USA

LITTON CONTRACTS DESTROYER ELECTRONIC SYSTEMS

The Amecom division of Litton Industries, College Park, Md. has received a contract in excess of $7 million from the Naval Electronic Systems Command for production of electronic support measures systems aboard the first 10 US Navy Spruance-class DD-963 series destroyers.

The new systems are an adaptation of the AN/ALR-59 passive electronic surveillance systems the division has been producing for both Navy's E2C airborne early warning planes and the Patrol Hydrofoil Missile (PHM) ships. The DD-963 systems will be an integrated automatic receiving system composed of antennas, receivers, data processors and displays. The contract is firm fixed price with options for additional systems.

These new systems are functionally modular and will be installed in the destroyers after delivery to the Navy. A fleet of up to 30 Spruance-class multi-mission destroyers are in production at the Ingalls Shipbuilding division of Litton Industries in Pascagoula, Miss. The first destroyer was launched on November 10.

The destroyer surveillance system, like the other two Navy programmes now in production in College Park, will employ receiver/processing techniques that enable high probability of signal detection, precision bearing measurements, mission programability, low false alarm rate, and low system cost.

• • •

TOTAL "CAINS" AWARDS ARE INCREASED TO $41 MILLION

Litton Industries' Guidance and Control Systems division has received an additional $16.2 million contract award from the US Navy for production of the Carrier Aircraft Inertial Navigation Systems (CAINS).

The award by the Naval Air Systems Command increases Litton CAINS contracts to a total of $41 million.

CAINS has been designated as standard equipment for the three new Navy carrier aircraft currently undergoing Navy Bureau of Inspection and Survey (BIS) trials: Grumman's F-14A air superiority fighter and E-2C early warning aircraft, and Lockheed's S-3A anti-submarine warfare fighter. The system will also be installed in Grumman's A-6E attack aircraft which is currently in production.

The latest contract covers Litton production of 106 CAINS systems and test equipment, with deliveries scheduled through October 1974. Contracts to date are for approximately 250 CAINS systems produced by Litton's Guidance and Control Systems division at its Woodland Hills, Calif. and Salt Lake City, Utah, facilities.

• • •

LITTON DELIVERS ELEVENTH NUCLEAR SUBMARINE

The USS **Tunny** (SSN-682), the US Navy's newest and most modern nuclear powered submarine, joined the fleet in commissioning ceremonies on 9 February, at the Ingalls Shipbuilding division of Litton Industries.

The 300-foot attack type submarine, designed and built to seek out and destroy enemy submarines, is the eleventh nuclear-powered submarine built by Ingalls.

With the **Tunny**, the Navy will have a nuclear submarine force of 102 vessels, including 41 of the Polaris/Poseidon missile firing type and 61 attack type.

Equipped with the most advanced antisubmarine weapons systems, **Tunny** combines the endurance and environmental independence of nuclear power with deep submergency and speed.

The new submarine will be manned by a crew of 12 officers and 96 enlisted men.

• • •

USSR

RUSSIANS AIM TO BE TOP NAVY POWER

The Soviet Navy is expanding with pretensions of becoming the world's foremost naval power.

Some experts believe the Soviet already has achieved this distinction.

Last year the Russians surpassed the United States in number of nuclear missile-carrying submarines, though not in number or sophistication of missiles.

This year the Soviet Navy acquired air power for the first time with the launching of its first aircraft carrier, and a second is under construction.

US navy officials generally concede the Soviet has a lead in developing ship-to-ship missiles.

It now boasts a fleet built primarily in the 1960s while the older US fleet still includes many vessels of World War II vintage.

"Jane's Fighting Ships," the most authoritative publication on world-wide seapower, said recently the Soviet Navy had made "staggering advances", in just one year.

It said the Russians have the "super navy of a super power".

Detractors of the view of a rapidly ascendant Soviet Fleet say numbers can be deceiving.

They argue that while the Russians outnumber the United States in submarines — 350 to 140 — each country has about 100 nuclear subs, the most significant gauge of submarine strength.

The rest are old-fashioned diesel subs.

Naval experts in Washington point to other factors beyond mere numbers as a cause for concern.

They include the growth in Soviet shipyard capacity and corresponding decline in American shipyards.

Another factor is the Russians' progress in matching the pioneering US techniques in refueling and supplying ships at sea, resulting in diminished Soviet requirements for a heavy backup of non-combat support ships.

ALL IN THE NAME

Have you ever wondered how RAN ships got their names, how many PARRAMATTAs there have been or what is the oldest ship's name in the RAN?

The answer to these questions and other naval puzzles can be found in the archives of the Naval Historical Section at Victoria Barracks, Melbourne. Recently, the Naval Historian cleared up some of the mysteries surrounding the choosing of ships' names.

The problem of naming ships first arose in 1908 when the Fisher Government ordered three torpedo boat destroyers from Britain. The Admiralty suggested the Commonwealth's first naval vessels should be named after Australian rivers. Senator Pearce, then Minister for Defence, suggested they should be called after eminent early Australian navigators, but the Prime Minister decided to follow Admiralty advice and the three new vessels were named **Parramatta** (launched February 1910), **Yarra** (launched April 1910) and **Warrago** (prefabricated in Britain and reassembled at Cockatoo Island dockyard) after rivers with Aboriginal names.

Three more TBDs were built at Cockatoo to form the RAN's World War I flotilla of six vessels, but for some reason the decision to use only Aboriginal river names was not followed and the new ships were called **Huon, Torrens** and **Swan** after rivers in Tasmania, South Australia and West Australia.

There was not much difficulty when the time came to choose a name for Australia's first fleet flagship, the 19,000 ton Indefatigable Class battle cruiser commissioned in June 1913. She was naturally called **Australia.**

Admiralty practice of adopting "Town" names was followed when names were given to the three Chatham Class cruisers built for the RAN 1911-16. They were named **Melbourne, Sydney** and **Brisbane.** A fourth cruiser completed at Cockatoo Dockyard in 1922 was called **Adelaide.**

Today's well known names such as **Stalwart** are inherited from the RN of 1919 when six destroyers and three sloops were transferred to Australian service.

All the ships kept their RN names but a change was made in 1925 when the RN sloop **Silvio** was acquired as a survey ship and she was re-named **Moresby** to honour John Moresby, discoverer of the Papua-New Guinea port.

The name **Australia** was used again for one of the two County Class heavy cruisers ordered under the 1924-29 Five Year Naval Programme. The other cruiser was called **Canberra** although the First Naval Member, Rear-Admiral W. R. Napier, thought at the time that sailors were sure to quickly turn this into "Can't Bear Her". His fears don't seem to have been justified.

The fourth ship of the 1924-29 construction programme, the seaplane tender **Albatross,** was launched at Cockatoo Island Dockyard in February 1928.

Before 1926, proposed names for all RAN ships were submitted to the King for approval. But two submarines on order at the time were named **Otway** and **Oxley** without consulting the Palace on the grounds that submarines were not ships.

The second **Yarra** and **Swan** were both sloops launched at Cockatoo Island Dockyard in 1935 and 1936 and the second **Sydney** was the improved Leander Class cruiser ex-HMS **Phaeton** launched in 1934 and commissioned in 1935.

The flotilla leader **Stuart** and the V and W Class destroyer **Vampire, Vendetta, Voyager** and **Waterhen** were transferred to the RAN on loan in 1933, which later made their mark as the famous "Scrap Iron Flotilla" of World War II.

When two further Yarra Class sloops came up for naming in 1938, the "River" names **Parramatta** and **Warrago** were revived.

Join the
NAVAL RESERVE CADETS

If you are between the ages of 13 and 18 years:

The Naval Reserve Cadets are administered by the Australian Naval Board.

The Naval Reserve Cadets provide for the spiritual, social and educational welfare of boys and to develop in them character, a sense of patriotism, self-reliance, citizenship and discipline.

Uniforms are supplied free of charge.

Cadets are required to produce a certificate from their doctor to confirm they are capable of carrying out the normal duties and activities of the Cadet Corps. If injured while on duty, Cadets are considered for payment of compensation.

Parades are held on Saturday afternoon and certain Units hold an additional parade one night a week.

The interesting syllabus of training covers a wide sphere and includes seamanship, handling of boats under sail and power, navigation, physical training, rifle shooting, signalling, splicing of wire and ropes, general sporting activities and other varied subjects.

Instructional camps are arranged for Cadets and they are also given opportunities, whenever possible to undertake training at sea in ships of the Royal Australian Navy.

Cadets, if considering a sea career, are given every assistance to join the Royal Australian Navy, the Mercantile Marine or the Royal Australian Naval Reserve, but there is no compulsion to join these Services.

For further information, please contact the Senior Officer in your State, using the form provided below.

SENIOR OFFICERS, NAVAL RESERVE CADETS:

NEW SOUTH WALES: Staff Office Cadets, HMAS Watson, Watsons Bay, NSW, 2030.

QUEENSLAND: C/- 39 Pinecroft Street, Camp Hill, Queensland, 4152.

WESTERN AUSTRALIA: C/- 182 Coode Street, Como, 6152.

SOUTH AUSTRALIA: C/- Box 1529M, GPO, Adelaide, 5001.

VICTORIA: C/- Room 6, 2nd Floor, 528 Collins Street, Melbourne, 3000.

TASMANIA: C/- 3 Winmarleigh Street, Taroona, 7006.

AUSTRALIAN CAPITAL TERRITORY: Industry House, National Circuit, Barton, 2600.

TO: The Senior Officer,
Naval Reserve Cadets.

I am interested in joining the Naval Reserve Cadets and would be pleased to receive further information.

NAME .....

STREET ..... SUBURB .....

STATE OR TERRITORY ..... POSTCODE .....

PHONE No ..... AGE .....

(Please Print Clearly)

Please address your envelope to the Senior Officer in your State or Territory — see list of addresses above.

One tree doesn't make an orchard

But it's a good start. The Kingfish oilfield in Bass Strait is a major producer, even by world standards. With its neighbours, Halibut and Barracouta, it produces over 60% of Australia's current oil needs. But what about next year? And the year after? Bass Strait will still be producing — but Australia's thirst for oil energy is growing fast. At about 6% a year, a higher rate than the world average. And no oil well lasts forever.
To maintain our present degree of self-sufficiency in oil, Australia needs to discover the equivalent of a Kingfish field every two years. To do that means an exploration expenditure of $200 million every year. Oil search is very costly and very risky — and very important for Australia.

Esso

EXPANDING AUSTRALIA'S ENERGY

ES1036.80

Printed and published by Percival Publishing Co. Pty. Ltd., 862-870 Elizabeth Street, Waterloo, 2017.. Phone 699-2600 with permission of the Navy League of Australia

THE Navy

MAY-JUNE-JULY, 1974

Registered for posting as a periodical — Category A

30 CENTS

THE NAVY

The magazine of the Navy League of Australia
Registered for posting as a periodical — Category A

Vol 36 MAY-JUNE-JULY, 1974 No 2

CONTENTS

PLUS SUNDRY STORIES AND PHOTOGRAPHS

All correspondence should be directed to the Editor, Box C178, Clarence Street Post Office, Sydney, NSW, 2000, Australia
Telephone Enquiries — 84 7198 (evenings only)

Published by the Navy League of Australia, Box 1719, GPO, Sydney, NSW, 2001; Phone: 241 1008

ADVERTISING AND PUBLICATION: PERCIVAL PUBLISHING CO PTY LTD

SYDNEY	MELBOURNE	ADELAIDE	BRISBANE	PERTH	HOBART
862 Elizabeth St Waterloo NSW, 2017 Phone: 699 2600	Greenan Publications Pty Ltd 374 Little Collins St Phone: 67 1334	17 Currie St Adelaide, 5000 Phone: 51 6225	72 Eagle St Brisbane, 4000 Phone: 31 2531	194 St George's Tce Perth, 6000 Phone: 22 4072	152 Collins St Hobart, 7000 Phone: 34 4098

THE NAVY LEAGUE OF AUSTRALIA

PATRON: His Excellency the Governor-General.
FEDERAL COUNCIL
President: Commander F. G. Evans, MBE, VRD, RANVR.
Vice-President: Captain L. F. Vickridge, OBE, VRD, RANR.
Deputy Vice-President: Lieut Cmdr A. W. Grazebrook, RD, RANVR.
Secretary: Lieut Cmdr O. V. Dimmitt, VRD, RANR.

New South Wales Division
Patron: His Excellency, the Governor of New South Wales.
President: Lieut Cmdr E. Bryden-Brown, VRD, RANR.
Honorary Secretary: Lieut Cmdr A. A. Andrews, MBE, RAN (Ret'd), 28 Royal Street, Chatswood, 2067.

Victorian Division
Patron: His Excellency, the Governor of Victoria.
President: Lieut Cmdr A. H. Burrows, VRD, RANVR.
Hon Secretary: Lieut Cmdr O. V. Dimmitt, VRD, RANR, Box 227, Post Office, Hawthorn, Victoria, 3122.

Queensland Division
Patron: His Excellency, the Governor of Queensland.
President: Surgeon Commander A. H. Robertson, VRD, RANVR.
Hon Secretary: Colonel P. V. O. Fleming, ED, 39 Pmecroft Street, Camp Hill, Queensland, 4152.

Australian Capital Territory Division
President: Commander J. B. Howse, VRD, RANVR.
Hon Secretary: Commander D. M. Blake, RD, RANVR, 12 Darmody Street, Weetangera, ACT, 2614.

South Australian Division
Patron: His Excellency, the Governor of South Australia.
President: Geoffrey Ashton, Esq.
Hon Secretary: Miss Robyn Wallace, Box 1529M, GPO, Adelaide, 5001.

Tasmanian Division
Patron: Vice-Admiral Sir Guy Wyatt, KBE, CB.
President: Commander J. G. B. Campbell, DFC, RANEM.
Hon Secretary: Lieut D. J. Heath, 3 Winmarleigh Street, Taroona, 7006.

West Australian Division
Patron: His Excellency, the Governor of Western Australia.
President: Captain L. S. W. Vickridge, OBE, VRD, RANR.
Hon Secretary: K. M. Johnson, Esq, Box 578 PO, Fremantle, 6160.

This drawing of Point Drake from 1865 shows men excavating the bed for the graving dock. First plans for the dock were made in 1853 by Captain Charles Ferguson, the Harbour Master. The coffer dam was finally constructed and pumped out in July, 1869.

"Cradle of the Clippers Centenary"

The "Cradle of the Clippers" celebrated its 100th birthday on Saturday, 2 March.

Better known to Australian shipbuilders as the Alfred Graving Dock at HMA Naval Dockyard, Williamstown, Victoria, this centenarian was officially brought into service when HM Victorian Ship NELSON, with 126 guns, was docked on 2 March, 1874.

This docking of the battleship **Nelson** (the first three-decked ship of the line to be built in England after the glorious naval victory at Trafalgar) saw the beginning of the first permanent drydock in the Southern Hemisphere.

Captain Charles Ferguson, the Harbour Master in 1853, recommended the construction of a graving dock at Point Gellibrand capable of taking a vessel of 3500 tons. He prepared plans and proposed a site, the exact location of which was finally decided upon in 1863.

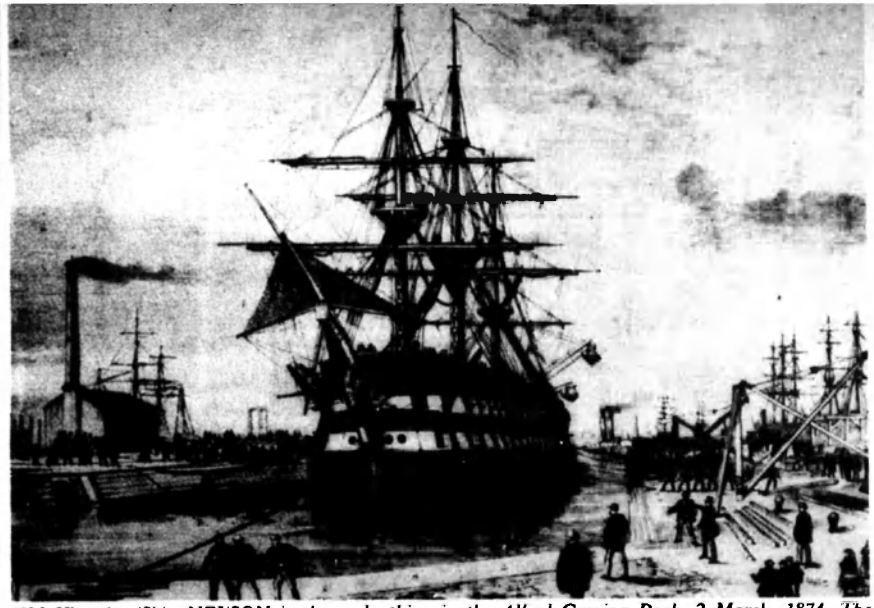
Sketch plans were drawn up by William Wardell, Inspector-General of Public Works, and site preparations commenced in the following year. The first contract was awarded to the firm of Glaister and Company on 14 September, 1864, but news of bigger ships being designed in the United Kingdom caused a review of plans and dock dimensions. The coffer dam was finally constructed and pumped out during July, 1869.

Prince Alfred, Duke of Edinburgh, and Captain of HMS **Galatea**, laid the memorial stone in the embryo dock structure on 4 January, 1868, and assented to the name of Alfred Graving Dock.

This portion of Gellibrand Peninsula occupied by the Dockyard was known as Point Drake, and was the site of a 6 pound gun battery set up in 1841. The Naval Depot, located within the present perimeter of the Naval Dockyard, became HMAS **Cerberus**, and for this reason it is held locally, with some justification, the Williamstown Naval Dockyard was the nursery of the Royal Australian Navy in much the same was as Plymouth is regarded in relation to the Royal Navy. (HMAS **Cerberus** is now the Navy's training establishment at Westernport, Victoria.)

The opening of the Suez Canal in 1869 caused the diversion of a number of sailing ships from the China tea trade to the Australian wool trade. The Alfred Graving Dock played an important part in this most colourful era in maritime history.

So many of the famous clipper ships were docked and refitted for



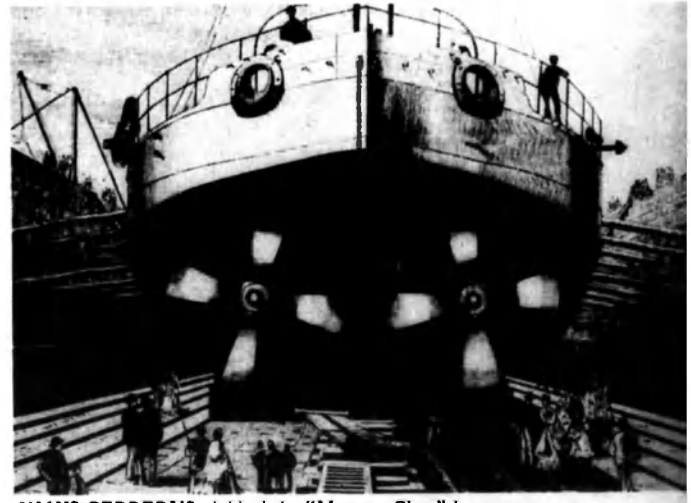
HM Victorian Ship NELSON is shown berthing in the Alfred Graving Dock, 2 March, 1874. The battleship NELSON, with 126 guns, was the first three-decked ship-of-the-line to be built in England after the glorious naval victory at Trafalgar.

the long voyage home that the dock has been referred to as the "cradle of the clippers".

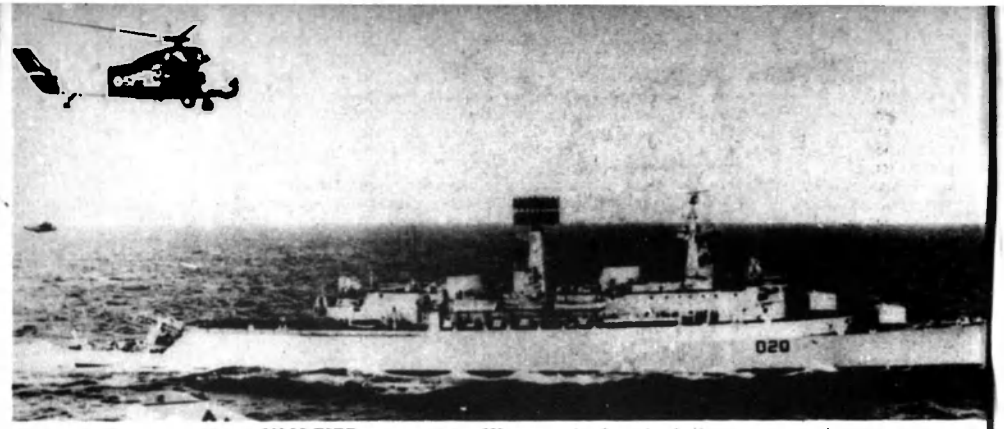
The Department of the Navy officially took over the dockyard on 28 October, 1942, and from that date it became known as HMA Naval Dockyard, Williamstown. Since that date the dockyard has been engaged in building and refitting a wide range of naval craft.

Since the Navy took over operation of the dockyard more than 870 vessels of all sizes ranging from barges, ferries and cranes to the most modern warships, have used the concrete sided dock. The first ship launched at Williamstown was a steam suction dredge, the **W. H. Edgar**, in July, 1913. The latest ship launched was the Hydrographic Survey ship HMAS **Flinders** in July of 1972

From the old wooden battleship **HMVS Nelson** to the newest vessel in the Royal Australian Navy's fleet the 100 year-old Alfred Graving Dock at Williamstown has more than earned her salt.



HMVS CERBERUS, dubbed the "Monster Class" by seamen, was the first iron-clad turret ship to be berthed in the Alfred Graving Dock. CERBERUS carried four ten-inch rifled muzzel-loading Armstrong guns and four one-inch Nordenfeldt quick-firers. Her engines had a nominal horsepower rating of 250 horses. CERBERUS was two-hundred-and-twenty-five feet long and forty-five feet wide. This picture is circa 1871.



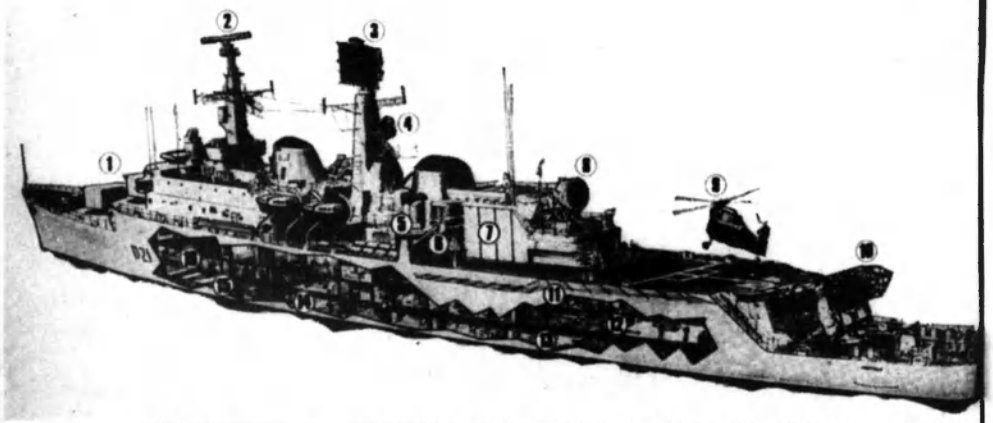
HMS FIFE at sea with her Wessex anti-submarine helicopter on patrol.

NAVY LEAGUE VISITS HMS FIFE

On Sunday, 2 June, 1974, members of the New South Wales Division of the Navy League of Australia boarded HMS FIFE for a tour of inspection.

After morning coffee in the ward-room the party split into two groups to learn more concerning the role and intricate workings of a guided missile destroyer of the COUNTY class.

The main function of the class is the provision of air defence against both missiles and aircraft for a force of ships. They also have the capacity to defend themselves against surface ships and submarines. The importance of this role will be greatly enhanced when the Navy withdraws its aircraft carriers in the seventies.



1 Two 4·5 inch guns 2 Surface and Air Warning Radar 3 Long Range Air Warning Radar 4 Height-finding Radar 5 Seacat Director 6 Seacat Launcher 7 Helicopter Hangar 8 Seaslug Control Radar 9 Anti-Submarine Helicopter 10 Seaslug Launcher 11 Crew's Dining Hall 12 Seaslug Stowage 13 Ratings Messdeck 14 Machinery Control Room 15 Computer Room 16 Operations Room

The Operations Room is the nerve centre of the ship and it is from there that the captain exercises tactical control. Although situated well below decks the "ops room" and the associated sonar control room, provides the captain and his staff with an up-to-the-second tactical picture of what is going on in the air, on the surface and below the waves. **Fife** and her later sisters employ Action Data Automation (ADA) which makes use of the most modern computer techniques to provide this tactical report. A lift connects the operations room to the bridge, enabling the captain to transfer without delay.

The main propulsion machinery, which develops 60,000 shaft horse power, consists of two sets of geared steam turbines for normal steaming. Four gas turbines provide additional boost for high speeds or for leaving harbour in an emergency without having to raise steam. This machinery has a large degree of remote and automatic control. To meet the weapon and domestic requirements the ship has a total electrical generating capacity of 5000 kilowatts, produced by a mixture of steam, gas turbine and diesel generators. Stabilisers are fitted to provide a stable platform for weapon firing. An Inertial Navigation System provides a continuous and accurate indication of the ship's true position and an automatic helmsman may be used to ease the quartermaster's task.

Exocet "Flying Fish" anti-ship missile systems will shortly be installed in four of the ships of the County class in place of the "B" gun turrets.

The League extends its thanks to the Commanding Officer and Officers of **Fife**, also to the Secretary of the New South Wales Division, Lieutenant Commander Arthur Andrews, for organising a rewarding and enlightening inspection.

CONTRIBUTIONS INVITED

The editor invites persons to submit articles, photographs and drawings (black ink) for inclusion in the magazine, but regrets that no payment can be made for contributions submitted. Contributions should be addressed: The Editor, "The Navy", Box C173, Clarence Street Post Office, Sydney, N.S.W., 2000, Australia.

The Editor does not hold himself responsible for manuscripts, though every effort will be made to return those with which a stamped and addressed envelope is enclosed.

"The Civilian Arm of the Navy"

The principal objective of the Navy League of Australia is to stress the vital importance of Sea Power to the Commonwealth of Nations and the important role played by the Royal Australian Navy.

The League supports the Naval Reserve Cadets who are administered by the Royal Australian Navy, which Service provides technical sea training for boys who intend to serve in the Naval or Merchant Services, also to those sea-minded boys, who do not intend to follow a sea career, but who given this knowledge will form a valuable reserve for the Naval Service.

We invite you to swell our ranks and so keep up to date with Maritime Affairs to help to build an ever-increasing weight of informed public opinion. The Navy League will then become widely known and exercise an important influence in the life of the Australian Nation.

The League consists of Fellows and Associates. All British subjects who support the objectives of the League are eligible for membership. Members receive copies of the League's magazine "The Navy".

DIVISIONS

New South Wales — Box 1719, GPO, Sydney, 2001.

Victoria — Box 227, Post Office, Hawthorn, 3122.

Queensland — 39 Pinecroft Street, Camp Hill, Queensland, 4152.

Tasmania — 3 Winmarleigh Street, Taroona, 7006.

South Australia — Box 1529M, GPO, Adelaide, 5001.

Western Australia — Box 578, PO, Fremantle, 6160.

Australian Capital Territory — 12 Darmody Street, Weetangera, ACT 2614.

THE NAVY LEAGUE OF AUSTRALIA

Application for Membership

To: The Secretary,
The Navy League of Australia,
(..... Division).

Sir,

I am desirous of becoming a Member of the Navy League of Australia with whose objects I am in sympathy.

Name (Mr) (Mrs) (Miss) (Rank) .....

Please Prim Clearly.

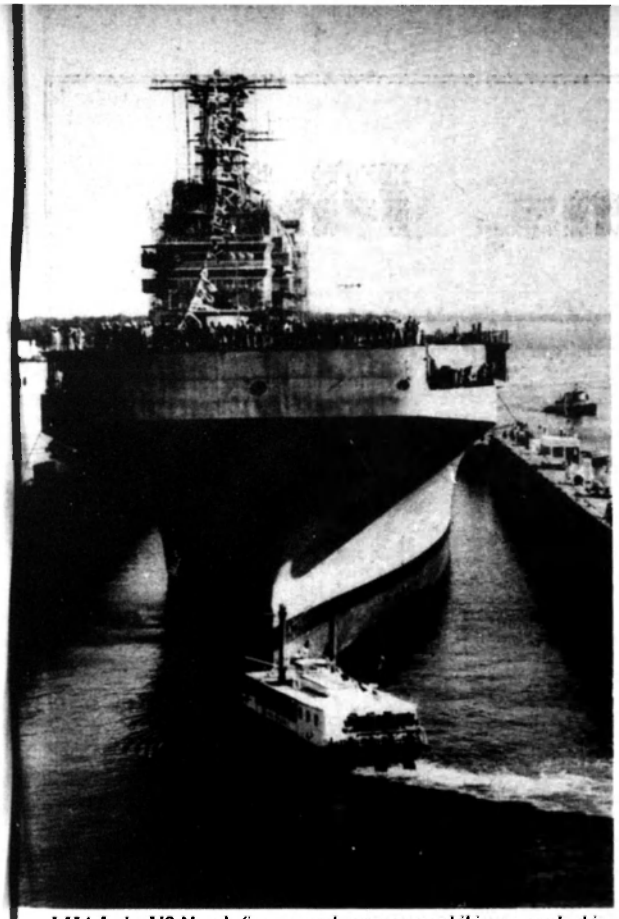
Street ..... Suburb .....

State ..... Postcode .....

Signature ..... Date .....

Enclosed is a remittance for $4.20 being my first annual subscription.

AFTER COMPLETION, THIS FORM SHOULD BE DISPATCHED TO YOUR DIVISIONAL SECRETARY — NOTE LIST OF ADDRESSES ABOVE



LHA-1 The U.S.S. Tarawa

by LtCol Arthur T. McDermott and LtCol Fred H. Kruck

The muscle of amphibious forces for the remainder of this century will be Marines launched from our newest amphibious assault ships.

LHA-1, the US Navy's first general purpose amphibious assault ship, is christened USS TARAWA during launching ceremonies at Litton's Ingalls Shipbulding in Pascagoula.

On 1 December 1973, Mrs. Robert E. Cushman, wife of the Commandant of the Marine Corps, stepped forward and cermonially christened the newest addition to the amphibious fleet. As the ship's sponsor, Mrs. Cushman dedicated the ship "In honor of the Marines who went ashore at Tarawa . . ." Only moments before, Gen Cushman had reminded those present at the Ingalls Shipyard in Pascagoula, Mississippi, that the launching of LHA-1, *Tarawa*, followed almost 30 years to the day the historic South Pacific battle for which the ship was named.

Appropriately designated General Purpose Amphibious Assault Ships, *Turawa* and her four soon-to-follow sister ships give Fleet Marine Forces a significant increase in amphibious capability. This ship was designed for modern concepts in employment of amphibious forces. Built with the inherent capability for extended deployment, combat ready Marines can be strategically located within striking range of crisis areas. The LHA

Four ships in one — TARAWA (LHA-1), the first in a new fleet of general purpose amphibious assault ships (LHAs) for the Navy, rests at the water's edge waiting launching at Ingalls Shipbuilding division of Litton Industries in Pascaguola, Miss. Designed by Litton, the new ships feature the combined capabilities of four previous types of amphibious assault vessels. Ingalls is building five LHAs, all of which are in production with keels already laid for the first four ships. Built to land Marines, the LHAs will transport a combat-equipped Marine battalion landing team. The vessels will have unprecedented flexibility in discharging troops both by landing craft and helicopters.

highlights the Marine Corps' role as the nation's force-in-readiness by facilitating deployment of hard hitting air and ground forces. Combat power can be put ashore faster and more effectively than ever before; or, we can retain that power at sea, poised and ready for commitment at the critical moment. After twenty-five years of Marine Corps pioneering in helicopter employment, the LHA achieves an ideal in vertical and surface assault capability by providing a platform for the CH-53E assault helicopter with its 16-ton lift capability in combination with the V/STOL close air support of the AV-8 Harrier, and the across-the-beach thrust of the LVTP7.

The LHA achieves this enhanced capability while simultaneously remaining competitive in today's energy conscious world. The introduction of the LHA into the active fleet will increase responsiveness and flexibility while concurrently reducing the number of ships required for the deployment with a concomitant saving of fuel. Ecology is also served by the ship's three sewage treatment plants which include a waste-burning system and waste-holding tanks.

The LHA is being built using the newest techniques of modular shipbuilding construction. Built as six separate modules, five of these are later joined to form the hull; the sixth comprises the island. Once the modules are assembled, the LHA is launched in preparation for final outfitting. The launching is illustrative of the uniqueness of the Ingalls' techniques. Once the ship is assembled on land it is moved by rail onto a floating dry dock. When LHA-1 was moved aboard the dry dock, it was (at 19,500 tons) the largest mass ever moved on land by man. The dry dock is then moved into deeper water and ballasted down until the LHA floats free.

LHA-2 (*Saipan*) is scheduled for launch during June, 1974, with the final three ships following at approximately six-month intervals. Launch, however, does not mean availability to the fleet. Right now LHA-1 is being fitted out with the additional 20,000 tons of equipment (five-inch guns, radios, boilers, mess equipment, bunks, and all other types of gear) which will prepare her to go to sea. Following her fitting out, various trials, tests and shakedowns are required before *Tarawa* joins the active Navy/Marine Corps team.

When she is commissioned in March 1975, *Tarawa* will be a triple-threat performer, capable of launching helicopters for vertical envelopment, amphibian vehicles for surface assault, and V/STOL aircraft for close air support forces. With launching spots capable of handling nine CH-53E's simultaneously, initial waves can be much heavier. Concurrent with the heliborne assault, up to four LCU's, eight LVTP7's and one LCM6 can be launched from the well deck. A standard aviation mix aboard an LHA could include CH-46, CH-53, AH-1J, UH-1N and AV-8A's in varying numbers. The primary limitation on the latter capability will be the range and depth of maintenance parts required; however, the hangar deck of the LHA can accommodate a mix of helicopters and/or V/STOL aircraft. One such mix might be eighteen CH-46D's, six CH-53D's, two CH-53E's, two UH-1N's and two AH-1J's. Various mixes will be tested later on in the program to include the AV-8A and possibly the OV-10A.

The LHA's came into being to fill a recognized

US NAVY LHA GENERAL PURPOSE AMPHIBIOUS ASSAULT SHIP

Artist's concept of the US Navy's LHA on completion which is designed to transport a balanced marine assault force, with all required equipment and supplies, and land them ashore by a combination of assault craft and helicopters. The LHA could also be used for the rapid evacuation and protection of American citizens in times of civil strife or to assist in the search, rescue and care of civilian populations stricken by natural disaster. The LHA is 820 feet (250 metres) in length at the flight deck, 106 feet (32.3 metres) at the beam, has a displacement of 39,300 tons fully loaded and a speed in excess of 20 knots.

need. A 1966 study by the Naval Weapons Analysis Group at the Center for Naval Analysis recommended that a number of large general purpose amphibious assault ships be built to lift the assault echelons of a Marine Amphibious Force. Following a definition phase during which the ship specifications were developed in terms of performance requirements, a contract was awarded to the Ingalls Shipbuilding Division of Litton Industries on 1 May 1969. Ingalls was to design and build nine ships capable of meeting the performance specifications set forth in the contract. Subsequently, the number of ships was reduced from nine to five. Slippage in the production and delivery schedule has also occurred but LHA-1 is launched and LHA-2 is nearly on time.

The ship reflects the latest refinements in current technology. A key feature of her amphibious assault capability is the cargo handling system which is capable of off-loading up to 500 pallets per hour. This is accomplished by an ingenious combination of overhead monorails, elevators, horizontal conveyors and pallet transporters. The pallet transporters are capable of marrying up with the conveyors and carrying up to four pallets up ramps to the flight deck to be loaded aboard waiting helicopters. The cargo system is designed and located so that it does not interfere with the orderly debarkation of troops and vehicles.

Other unique features of the LHA are its troop habitability and acclimatization capabilities. Most Marines remember life aboard ship as unpleasant at best with only marginal comforts. Space for personal belongings and 782 gear was inadequate or nonexistent. Helmets, rifles, packs and other gear hung from the sides of narrow multi-tier bunks or lay in the narrow aisles. And who has forgotten water hours and salt water showers? Those complaints are a thing of the past, at least aboard *Tarawa*. Troops will have separate, adequate and comfortable berthing, messing and storage facilities. Living spaces will be heated and air conditioned. New colors, patterns, materials and floor plans have been developed and harmonized to add to the pleasure of eating, sleeping and relaxing after working hours. Up-to-date food handling and catering devices are provided in both cafeteria style and dining room facilities. Recreation rooms have televisions, newspapers, and magazines—the ship's own TV studio has the capability of originating shows or projecting movies or previously taped entertainment features. The ship has a hobby shop, photo lab, library, post office, snack and ice cream bars, barber shop, vending machines and a small PX.

To assure maximum efficiency when the troops reach the objective area, acclimatization takes place en route. To accomplish this, the LHA is equipped with a special 5,000 square foot troop training and acclimatization room where landing force personnel can be "exercised in a controlled environment simulating that on which they will land."

Prior to the arrival of *Tarawa*, the LPH has been the keystone of our vertical envelopment capability. Even with the LHA, the LPH will be a fundamental part of the alligator fleet; however, the LHA will be the new baseline for comparison.

With a flight deck 820 feet in length and over two acres in area, the LHA provides about twice the deck space as the LPH. Deck space is not the only parameter in which the LHA is superior. (See Figure 1.) With her 39,000 ton displacement the LHA will be the second largest ship in the Navy, with only the attack aircraft carrier (CVA) having a larger displacement. Although the LHA has approximately the same dimensions as the Essex class carrier, *Tarawa* is designed for vertical and short take-off and landing aircraft operations. The LHA does not have the catapult and arresting gear required for conventional fixed wing aircraft.

Comparison of the LHA and LPH

	LHA	LPH (Iwo Jima Class)
Design		
Length	820 ft	602 ft
Beam	106 ft	84 ft
Displacement	39,999 tons	18,000 tons
Draft	26 ft	29 ft
Capacities		
Staff	119	69
Troops	1924	1712
Cargo		
Vehicles	24,416 sq ft	5,567 sq ft
Cargo	107,000 cu ft	52,500 cu ft
Ammo	60,000 cu ft	55,257 cu ft
Fuel (bulk)		
Mogas	10,000 gal	6,525 gal
JP-5	400,000 gal	405,000 gal
Landing craft		
	4 LCU	2 LCPL
	2 LCM-6	2 Motor Whale Boats
	4 LCP-L	2 Utility Boats
Flight deck		
Operating spots*	9 CH-53 or	4 CH-53
or	12 CH-46	7 CH-46
Hangar deck		
Stowage*	30 CH-46 or	19 CH-46
or	19 CH-53H	11 CH-53

*Normally both the LHA and LPH will carry a mix of helicopters. These figures are given for comparison purposes only.

Figure 1

The LHA is coming onto the amphibious scene at a time that requires her unique flexibility. The Nixon doctrine and our national security strategy of realistic deterrence are highlighting the concept of forward afloat deployed amphibious forces. The Navy/Marine Corps integrated sea, air and landing force team has always been our most flexible and usable military force. The Sixth Fleet with its integral Mediterranean Landing Force was visible, available, and credible during the recent Middle East crisis. This visibility, availability and credibility were key factors in our country's diplomatic posture during the critical negotiations that constrained that crisis from becoming a major-power confrontation. The force was also available to keep transportation lanes open and assure that the balance of power was not critically tipped due to Russian military aid to the Arab nations.

Forward deployed amphibious ready groups (ARG) built around the LHA will probably be similar to those where the LPH was the primary vessel. A deployed amphibious squadron might consist of an LHA, an LSD, and an LST. A Marine Amphibious Unit as currently constituted could easily lit in such a package. Even more flexibility could be added if an LPH or LPD is one of the ships. Adding five LHA's to the fleet means that 10,000 more Marines can be deployed than can be today. It may be possible, with an adequate shore-based establishment, to deploy reduced size Marine Amphibious Brigades where we now are limited to MAU's. One of the first operational techniques to be investigated is multi-deck operations with LHA, LPH and LPD.

A number of military, diplomatic and humanitarian operations have been carried out by MAU sized forces in the recent past. The LHA adds a new dimension to the independent MAU operation. The increased flexibility in landing mode (air or sea in various combinations) combined with a significant increase in command and control capability must be matched by landing force expertise in combat and non-combat skills. The ability to precisely meter the amount of combat power required into a low intensity conflict situation will be greatly enhanced by the responsiveness provided by the LHA.

In addition to its uses as the flagship and primary launching platform of a self-contained MAU, the LHA also can be employed as the flag-

ship for a MAB operation, or as part of a larger force. In either instance, it would appear that the LHA could remain in the amphibious objective area throughout the amphibious portion of the operation to serve as a command and control ship, a hospital ship, and a floating maintenance and supply facility. Additionally, it can function as a helicopter platform and small boat harbor.

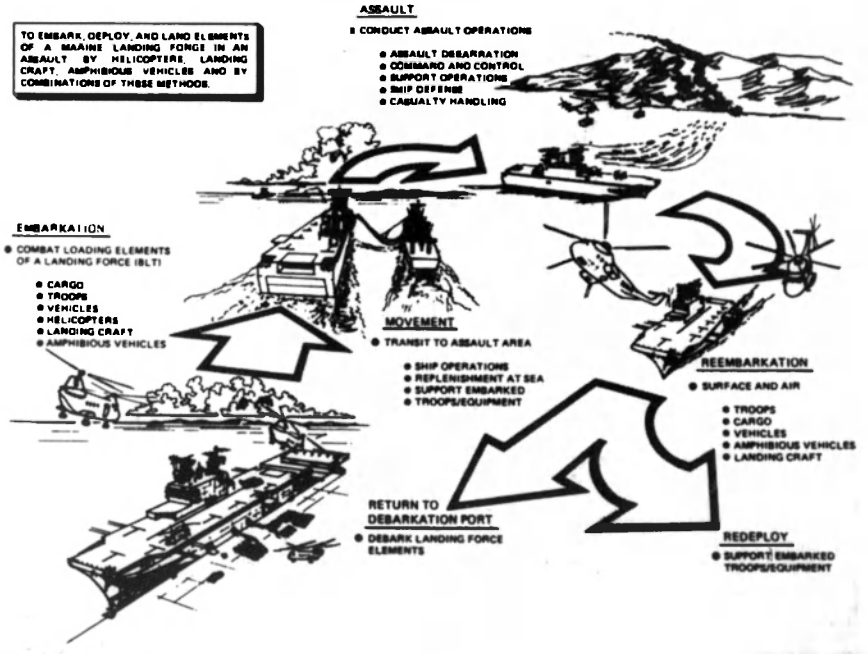
An example of one mission for the LHA during an amphibious assault would be as the staging area for the MAF reserve. Its capability of moving to either flank of the beachhead, to land troops by surface and/or air, and of providing a measure of naval gunfire and (with organic AV-8A's) close air support make it an extremely versatile and potent weapons system.

Another example could be its use in supporting operations as part of a larger force. The LHA with its embarked combat power could be detailed to conduct amphibious demonstrations or raids in support of the main landing. Also on independent missions it could act as the support base for interdiction operations to isolate the objective area.

The payoff of all these capabilities will be selective delivery of Marine Corps combat power in any chosen form. The LHA is not limited to the performance of amphibious assaults. Cap L. R. Zinser's recent GAZETTE article, *The BLT in Evacuation Operations*, highlighted the growing need for that capability. Recent history is also replete with examples of Navy/Marine Corps response to natural disasters. Both evacuation operations and "missions of mercy" are right up the LHA's alley.

With its 20-knot speed, *Tarawa* can steam quickly to the scene, and its organic helicopters and landing craft can shuttle aid and comfort between ship and shore. Should it be necessary to provide shelter for disaster victims or evacuees, the LHA's capability of providing food, water, clothing and medical care are unsurpassed. Medical and dental facilities aboard the LHA are capable

LHA MISSION



of providing intensive medical care to 300 casualties. The medical facilities aboard *Tarawa* include two emergency operating rooms, three dental operating rooms, two x-ray rooms, a blood bank, laboratories, pharmacy and post-operative, recuperation and isolation wards. The LHA's communications and control system make it the ideal location for the rescue or evacuation command post. From here the commander can direct operations and maintain communications with the U.S. Country Team, the local government agencies, and with higher headquarters. And the LHA has the capacity to remain in the area for an extended period, if necessary, until order, communications and vital facilities are restored ashore.

However, in spite of all the written and spoken words concerning her capabilities, one basic question remains to be answered: How well can the LHA do what it is supposed to do?

The Marine Corps Development and Education Command in concert with the Navy's Operational Test and Evaluation Force (OPTEVFOR) is participating in the test and evaluation of the LHA. Two aspects of the ship will be tested. First, it must be decided by appropriate tests if the performance specifications have been met. The second objective will be for the Navy and the Marine Corps to rate the ship on how well she accomplishes the amphibious mission. These two test objectives are so interrelated that the performance and the mission accomplishment of the LHA can often be tested simultaneously. The Development Center has been designated as the agency to manage and coordinate the Marine Corps participation in the operational test and evaluation of the LHA.

The complete test program for the LHA is unique. Each component of every system is being tested by Ingalls Shipbuilding upon receipt at the shipyard. Ingalls then tests each component of the major systems subsequent to installation, and once a system is installed, tests the entire system to make sure it all works once it is aboard ship in its final configuration. All of this testing is planned and conducted by the Ingalls people prior to the Navy acceptance trials to make sure that the best possible product will be delivered in March 1975. The Marine Corps is providing input to these tests by reviewing the test procedures, submitting recommendations for changes in the procedures or in the evaluation plans, and sending observers to the shipyard at Pascagoula to observe selected tests and systems demonstrations. The contractor's pre-delivery tests number almost 600 and, of these, the Development Center will actively monitor about 25 per cent.

The major effort involved in operational testing will not occur until after delivery of the ship to the Navy in March 1975. The Navy will conduct the usual shakedown for the ship and the crew and then begin a series of "operational evaluations" which will culminate in a 17-day amphibious assault exercise. This exercise, currently scheduled for September 1975, will test each of the ship systems and the interactions of the systems with each other in an operational environment. A Marine Amphibious Unit will be embarked for the 17-day exercise and will take part in most of the specific tests designed to evaluate the performance and the mission accomplishment capabilities of the ship. Units of the MAU will also take part in several separate tests prior to the exercise; these tests will be a demonstration of various elements of the command and control system of the ship. Examples of these are a determination of the maximum range over which the LHA can control helicopters and fixed wing aircraft; determination of the range of control of LVT's during movement; and adequacy of display of information by the Integrated Tactical Amphibious Warfare Data System. These system components will of course be exercised during the amphibious assault exercise (and during the rehearsal) but the limits of these systems should be determined first in order to determine the maximum capabilities of the ship and its associated components.

The amphibious exercise will continue with reembarkation of the landing force which will determine how easily the vessel can resume an afloat status with a MAU re-embarked. The ship and landing force aboard will then be ready for follow-on assignments.

Other tests are planned by the Development Center and OPTEVFOR working together. These separate tests will examine aspects of the ship and its compatability with equipment and techniques not envisioned in 1969 when the contract specifications first were determined. One such test could be a test of the compatability and operability of the AV-8A from the LHA while the ship is also conducting helicopter operations or well-deck operations involving launch and/or recovery of LVT's and landing craft. A second test could be an evaluation of different combinations of helicopters stowed aboard and operating simultaneously. Still another could be a comparison of the LHA performance and capability when operating as a part of a larger force instead of operating as a part of an Amphibious Task Force embarking only a MAU.

The separate tests of the LHA will be evaluated and assimilated by the LHA Test and Evaluation Group established at the Development Center, and an independent report will be submitted to the Commandant of the Marine Corps. There will be changes in doctrine as a result of the introduction of the LHA into the amphibious fleet and these will be incorporated into Marine Corps and Navy publications subsequent to the tests.

The embarked Marines will be highly trained. A major task of the LHA Test and Evaluation Group is to determine training and formal schooling requirements. Training courses recommended by the shipbuilder are being evaluated to determine courses to be incorporated into those scheduled and conducted by the Landing Force Training Commands. In addition, if no comparable course is scheduled, recommendations for courses, course content, and attendance will be made to the Training Commands. Simultaneously, studies are underway to program attendance at initial contractor courses in order to properly test and evaluate the LHA Class Ship. Training requirements for embarked troops are being determined prior to the formal test phases. The test and evaluation effort for the LHA is designed to "wring out" the ship and its capabilities using the best trained and prepared Marines.

In remarks made at the launching of *Tarawa*, the Commandant reflected on the conflicting demands for the maintenance of an overseas presence and a reduction in the number of Americans permanently based on foreign soil. "The answer," he said, "lies in our mobility and our use of the seas."

"The LHA will be the backbone of our amphibious forces for the rest of this century," he asserted.

The muscle of those amphibious forces will be the Marine landing forces launched from the LHA. When the Tarawa and her four sister ships have joined the Fleet, the nation's force in readiness will have both muscle and mobility for the projection of seapower ashore at the time and place required.

OUR COVER

HMAS VAMPIRE, a modified Daring-class destroyer. This 3600-ton vessel is 390 feet long and carries a complement of 321 officers and sailors.

NEXT EDITION OF "THE NAVY"

The next edition of "The Navy" magazine will be a special issue for Navy Week in Australia and will incorporate the special events scheduled. An article entitled "Meet the Navy League Executive" will be included in this special edition and will contain biographical particulars and photographs of the principal officers of each Division of the Navy League of Australia.

The Royal Australian and the New Defence Organisation

Text of an address by the
Federal President of the Navy League of Australia
COMMANDER F. G. EVANS, MBE, VRD, RANVR
to the Victorian Chapter of the Naval Historical Society, on 6 May, 1974

From 1939 until December, 1972, the Australian defence organisation consisted of the Department of Defence, and the Departments of Navy, Army and Air. The Department of Supply with a very substantial defence element, was usually included in the defence "group of departments", and like the Defence and Service Departments, had its own Minister responsible to the Government for the activities of his department.

Under this arrangement the Defence Department had a number of co-ordinating functions, and these were developed steadily over a period of years by the formation of a number of committees comprised of members of the Defence Department and of three Service Departments.

The committees were purely advisory bodies and the allegiance — if this is the right word — of the part-time Service members was to their parent Department rather than to the Defence Department.

The committee system proved inadequate and in 1968 was replaced by a Joint Staff Organisation within the Defence Department. The members appointed to the Joint Staff from other departments served full-time and their responsibilities were to Defence rather than to the individual Services.

The principal interests of the Joint Staff related to policy, operations and plans, communications and intelligence.

Also within the Defence Department was the Chiefs of Staff Committee, consisting of:

- The Chairman — a post filled by a serving officer of the Navy, Army or Air Force (invariably retired Chief of Staff, and rotated between the three Services).
- The Chiefs of the Naval, Army and Air Staffs.

Again, this was an advisory committee and the Chairman, although the most senior officer in the Armed Forces, had no statutory authority, or power of direction over the individual Service Chiefs of Staff.

Contrary to a widely held belief, the Department of Defence was by no means an ineffectual or powerless department. It's Minister had authority to direct Policy over his colleagues the Ministers for the Navy, the Army, Air and Supply: he could decide the total and content of the defence group estimates: he could support or reject projects put forward by indvidual departments; for example, the type of ship recommended by the Navy for its destroyer replacement programme.

(As a businessmen, if I had power over policy and the purse, I would consider myself not unimpdrtant in the Managerial hierarchy.)

Although the Defence Department was not without influence the overall management and day-to-day direction of the Armed Forces was very much in the hands of the individual Services, and was exercised through the Service Boards; in the case of RAN, the Naval Board.

The Naval Board, and I will use the present tense, as with the Army and Air Boards, it is still in being and will remain so until the Parliament decides otherwise, is comprised of:

- The Minister for the Navy;
- Five Serving Officers with specific responsibilities;
- and at this moment, a nominee of the Defence Department in place of the Secretary Department of the Navy, a department which was merged with Defence at the end of 1973.

The Army and Air Boards are similarly constituted, but lack certain executive powers vested in the Naval Board.

This, then, is the structure which has evolved, so far as the Navy is concerned, over a period of some seventy years. Essentially a structure of corporate authority and responsibility and an arrangement which has enabled naval administrators — professional and civilian — to hammer out their problems, to arrive at a decision and to present this decision (or recommendation) through their Minister to the Government of the day. Similarly, to be held corporately responsible for the result of their activities.

(I would like at this stage to remark, as one who has worn naval uniform, that the Public Servants in the Navy — the civilians in the stores, the clerks and so on — were often referred to in a somewhat disparaging way when things when wrong (the wrong stores arrived, or failed to arrive at all).

Nevertheless, from the Naval Board down there was a very close affinity between the civilian and uniformed elements, and at nearly all levels the civilian was as dedicated to the Navy as was his opposite number in uniform.)

In short, the organisation known as the Department of Navy "worked", and this fact was reflected in the ships and men of the Royal Australian Navy; they were and are efficient.

Period of Change Begins

In the early nineteen-sixties, a number of the countries with which we are most closely associated — including Canada, the United

Kingdom, New Zealand — looked very closely at their defence organisations and subsequently took action to centralise in varying degrees their defence administrations.

Canada went to the extreme and unified the Navy, Army and Air Force into a single Service based largely on Army practices.

I can think of only one other country which has done this — Israel, where the circumstances are rather different and which is not a significant Naval Power.

I do not propose to comment further on the Canadian experiment, except to say that all my information indicates that Canada is still trying to sort things out. Very few countries can afford to experiment in this way, but then few countries are on the doorstep of and important to, a nuclear power.

Whatever was happening in other countries, and whatever other Australian political parties proposed to do, the Labour Party "shadow" Defence Minister, Mr Lance Barnard, made it quite clear that a Labor Government would integrate the Australian Service Departments into a single Ministry of Defence.

When his Party came into power on 2 December, 1972, Mr Barnard wasted no time. Within three weeks (19.12.72) Mr Barnard issued a statement and directive advising those directly concerned that he had assumed charge of the Departments of Defence, Navy, Army, Air and Supply.

At the same time he listed the Government's requirements for an integrated defence organisation; named the Secretary of the Defence Department (Sir Arthur Tange) as "Principal Adviser on policy, resources and organisation to the Minister for Defence, Navy, Army, Air and Supply"; and directed Sir Arthur to prepare a scheme to achieve the Government's objectives.

(It has been suggested that this document was ready for Mr Barnard to sign when he became Minister; I have no reason to disbelieve this story.)

Sir Arthur Tange's recommendations were sent to the Minister within twelve months, under cover of a letter dated 28 November, 1973.

Two days later (on 30 November), the Departments of Navy, Air and Army were abolished. The Department of Supply was retained for the time being.

A few days after this, on 4 December, 1973, the Government's plans for defence re-organisation, in substance the Tange proposals, were presented to the Parliament.

As the approval of the Parliament is required for a number of the changes proposed — and as the new scheme cannot work unless these changes are approved — and as Parliament was dissolved before approval could be sought, it is proper to note the reaction of the Liberal Party's defence spokesman, Dr A. J. Forbes.

Dr Forbes agreed in principle with integration (or centralisation) in Defence, but expressed some doubt that the views of the professional servicemen had been sufficiently taken into account.

It is Dr Forbes' opinion that the plans for defence reorganisation should be examined by the joint Foreign Affairs and Defence Committee of Parliament, and that involved or interested persons should be enabled to express their views on the proposed changes.

One may assume that this will happen if the coalition parties win the election on 18 May; it may even happen if the Labor Party regains office. I personally believe this is the proper course to take, because the changes proposed are quite drastic.

The New Structure

In the new structure the Service Boards which might be termed the focal point of each Service at the moment, disappear.

I have already stated that the Navy, Army, and Air Departments have been abolished.

In the new structure there will be three very important people — the Minister for Defence representing the Government; the Secretary of the Defence Department (a Public Servant); and the Chief of Defence Force Staff — a professional officer who may be a sailor, a soldier or an airman.

In the normal course of events Ministers will come and go, and the professional officer will be changed every four or five years. Because of continuity of service alone, in the new organisation the civil head will be a very influential person. I will return to this trio later.

The Defence Department itself will be enlarged and a number of existing organisations altered or new one's created, to deal with major subjects such as:

Strategic Policy and Force Development;

Supply and Support Services;

Resources and Financial Programmes;

Defence Manpower;

Organisation and Management Services;

Defence Research, Development, Trial and Evaluation.

It is intended that all these organisations will come under the Secretary's side of the defence organisation, rather than that of the CDFS.

Twelve committees will be formed, and as their interests embrace nearly all the functions of the separate Service Departments, it is desirable to list them.

1. Defence Co-ordination Committee

The task of this committee is to advise the Minister for Defence in the formation of policies which require co-ordinated information about strategic, military, foreign affairs and economic matters.

It is headed by the Secretary of the Defence Department and it's members include three other Departmental Secretaries (PM and Cabinet, Treasury and Foreign Affairs) and what I will refer to hereafter as the "four professionals" — the Chiefs of Defence Staff, and the Chiefs of the Navy, Army and Air Staffs.

2. Defence Programme Committee

This appears to be the existing Defence Force Development Committee with another name.

Its purpose now seems to be to keep an eye on the current five-year defence programme and to "filter" some of the information going to the Defence Co-ordination committee which I have just mentioned.

It is comprised of the Defence Secretary, the four professionals, augmented by specialists on specific matters the committee wishes to consider.

3. Chiefs of Staff Committee

This is comprised of the four professionals (CDFS, CNS, CGS and CAS) and it's task is to advise the Minister for Defence on purely military matters, such as the allocation of military resources to commanders engaged in joint-service operations.

4. Defence Management Committee

Composition: The Defence Secretary; The Four Professionals; The Head of Defence Research, Trials and Evaluation; The Director of Joint Intelligence; Deputy Secretaries.

A general discussion group to enable a slightly larger number of officials to "keep in touch" with what is going on.

5. Plans and Operations Executive

Supplementary to Committee No 3, the Chiefs of Staff Committee, it is comprised of their deputies whose task it is to advise their masters on military, operational and training matters.

6. Defence Force Structure Committee

Again a committee of deputies to advise Committee No 2, the Defence Programme Committee.

The Committee is headed by a Deputy of the Defence Secretary, and its purpose is to advise on the development of the force structure, the five-year rolling programme, and major equipment proposals.

7. Defence Operational Requirements Group

and

8. Programme and Estimates Committee

Committees of Deputies to provide guidelines on the subjects suggested by the title of the committees.

9. Defence (Conditions of Service) Committee

This committee, with a Deputy Secretary as Chairman, is comprised of representatives of the defence manpower organisation and the Treasury, and includes the Chief of Naval Personnel (formerly the 2nd NM) and his Army and Air Force equivalents.

Rather surprisingly, this committee appears to tender its advice on service pay and conditions (I refer to the uniformed personnel, and not to members of the Public Service) to the Minister for Defence and the Federal Treasurer.

10. Defence Science Board

A fairly tentative committee headed by the Secretary of Defence, and including the Chief of Defence Force Staff, the head of the Defence Research Organisation and the Deputy Secretary of the Treasury.

To consider the application to defence of scientific developments, and vice versa. It may well be that discoveries made in the defence field (eg weapon research) will be applicable in the civilian area.

11. Dockyard Policy Committee

This is an interesting committee, and I will return to it shortly.

12. Defence, Research Development, Trials and Evaluation Committee

The Chairman of this Committee is the Head of the Defence ROT & E Organisation, and it is a part of one of the major organisations on the Defence Secretary's side of the new defence structure.

Its members include the Assistant CDFS, DCNS, Chief of Army Operations, DCAS and several technical representatives.

The functions of the ROT & E Committee are to produce guidelines for research and development, trials and evaluation, to draw attention to developments which may effect policy, and "to recommend projects of a continuing nature and are estimated to cost more than one million dollars pa or two point five million over their life span".

These are the 12 committees proposed in the Tange report, and in addition, there are one or two related to industrial and business matters presently under consideration.

Secretarial

All the committees I have mentioned will be served by a small "s" secretary (as opposed to the capital "S" Secretary who is the head of a major Department) drawn from a Central Secretariat or in the case of the Chiefs of Staff Committee and the plans and Operations Executive, from the joint Civil and Military Secretariat.

The committees are consultative bodies and do not have executive authority. To some extent they are the visible "signs of change" in the defence structure.

Organisational Change

There are some less visible but quite fundamental changes within the organisation, and one in particular I would like to mention as it is both an example of change, and is of particular relevance to the Navy.

This is the new situation in what I can best describe as the Branch of the Navy headed by the Director of Technical Services — the old position of Third Naval Member or "the Engineer Admiral".

An extremely important and costly item in naval planning relates to ship refits and maintenance. This is of particular concern to the Chief of Naval Technical Services involving as it does not only vefy large sums of money, but extensive contact with the civilian element of the Navy employed in Navy Office and the Dockyards.

A large section of this part of the Naval organisation (dockyards, ship refit and maintenance) is to be transferred to the Secretary's side of the Defence Department, and included in the Supply and Support Organisation.

The Chief of Naval Technical Services has for some time worn "two hats", having responsibilities to both the Naval Board and the Secretary of the Navy Department, but as both he and the Secretary were members of the Board it was a "tight" but viable arrangement — within the Navy.

The Chief of Naval Technical Services will still have "two hats", but one will be worn outside the Naval framework, and in the Secretary's Supply and Support organisation.

Moreover, the Chief of NTS will be a member — the executive member — of the Dockyard Policy Committee. This committee will be chaired by a representative of the (Defence) Secretary, and will include the DCNS, several senior public servants concerned with manpower, resources, and material policies; and possibly an "outside" representative of the engineering industry. Plus the head of a "Dockyard Secretariat" which is to be formed.

The Committee I have just mentioned is essentially a forward planning committee, so in effect, the Chief of Naval Technical Services will have responsibilities to:

firstly, his immediate superior in the Navy — the CNS — for some aspects of the day-to-day functioning of his Branch;

secondly, to the Defence Secretary for other aspects of routine matters;

and thirdly, he will be involved in forward planning.

Such a division of responsibilities in an extremely important area of naval administration seems to me, basically unsound.

Finally I return to the real seat (or seats) of power in the new defence organisation, the chairs occupied by the Defence Minister; the permanent Head of this Department, the Secretary of Defence; and the Chief of Defence Force Staff, who will no longer be simply the Chairman of a Committee (the Chiefs of Staff Committee), but nominally the senior executive of the Armed Forces.

The Minister

In his report, Sir Arthur Tange referred on more than one occasion to the probability that the Minister for Defence would have ministerial assistance in carrying out his duties which include recommending to the Government the expenditure of upwards of thirteen hundred million dollars each year.

While Mr Barnard did not acknowledge this when presenting the Government's proposals or defence re-organisation to the Parliament, one must assume that one or more assistant Ministers will be actively involved with Defence.

(Personally I believe that any Government would be failing in its duty to the Australian people if it did NOT provide ministerial assistance in this most exacting and vital appointment.)

The Secretary For Defence

With the disappearance of the Service Boards and the transfer of their corporate responsibilities to a triumvirate, the Defence Secretary, by virtue of his relative permanence to that of the Minister and the Chief of Defence Force Staff, plus his statutory and delegated authority and the division of responsibility in the new defence structure, will without any doubt be the most important person in the Australian defence organisation.

Chief of Defence Force Staff

As I remarked previously, the Service Officer holding this appointment will be the senior "professional" in the Armed Forces, and as such he will be the principal military advisor to the Defence Minister.

The Chiefs of Staff, Navy, Army and Air Force will be sub-ordinate to him, and the Military Plans and Operations Staff, the Service Medical Organisations, and the Legal Branch will come under his wing.

The CDFS will have some direct military responsibilities to the Minister; others (including such matters as senior postings and promotions in the armed forces) he will share with the Secretary.

Although it might appear that the Secretary of the Department of Defence and the Chief of the Defence Force Staff "run" the Department (under the Minister) as equal partners, this is not really so. The extent and importance of those parts of the defence organisation which will be the responsibility of the Secretary make it quite clear that he will be the dominant partner.

Although the title of this lecture is "The RAN and the New Defence Organisation", when I came to prepare my notes I realised that I would have to spend 90% of my time trying to describe the overall structure of the defence organisation.

Because scattered throughout this new organisation are pieces of the Navy. Which brings me to the situation of the **Chief of Naval Staff.**

CNS in the Naval Board system of administration was, and is, without doubt a very important figure. Unquestionably the leader of his Service; through the Board, in touch with and influencing every aspect of its activities. And until recently with a Minister to argue his case in the Government and in the Parliament.

In the new scheme all this is changed and CNS becomes more of a "field commander". He commands the Service under the authority of the CDFS and is responsible through that Officer to the Minister for Defence.

His responsibilities include the implementation of approved defence policies, directions and programmes. He has some influence in the formation of these policies etc through his membership of the various committees.

By and large, however, he loses much of his power to influence the affairs of the Navy or the RAN as we know it today. Whole sections of the Navy are moved out of the Naval organisation into other new organisations — supply and support policy, control of establishments and others. Some officers subordinate in rank will be responsible partly to him, partly to others outside the naval organisation.

Change in the defence forces was probably inevitable. The enormous cost and the sophistication of defence equipment, and the large number of people engaged in defence activities, made a very close examination of our defence structure necessary.

Certainly an examination must have been made before Sir Arthur Tange and the Government set out their intentions and proposals. Whether it was deep and broad enough, and took into account sufficiently, the views of the Service Chiefs, must be debatable.

I would like to conclude my remarks by reminding you that I speak, not as a professional sailor, nor as a public servant involved in defence.

I am simply a civilian who has enjoyed a long association with the Navy, and one who takes a keen interest in the maritime affairs of the country.

I have endeavoured to study the new defence structure as dispassionately as possible, and tried to form an opinion as to whether it provides a sound base on which to build our maritime forces. It is not easy to reach a conclusion.

There are to my mind a number of worrying features in the Government's plans:

1. The lack of political involvement at the top is a major weakness.

2. A certain rigidity in the structure and division of responsibilities would seem to make it doubtful whether the talent available amongst Service Officers could be used to the best advantage.

3. The position of the Naval (or Service) Officer in relation to the Public Servant, and his place in the policy-determination area, has been argued for years (refer to Hyslop's "Naval Administration 1900-1939"). The Tange report certainly does not, in my view, contribute to a solution to this problem, and it will continue to be argued.

One can only hope that these and other weaknesses I have touched upon in the course of this address will receive the attention I believe they deserve, before our defence re-organisation is completed.

Exercise Bali Hai. The name must have seemed like a bad joke to the 70 soldiers of the 3rd Battalion, The Royal Green Jackets, sleeping on the upper decks of Australian destroyer HMAS VENDETTA when light rain began to fall before dawn.

THE DAY THE ARMY LEARNED ABOUT CASEX

The closest they had come to the islands off the south-eastern coast of Peninsula Malaysia made famous in the film "South Pacific" was in the dark the night before.

Even then they came only close enough for the ship's 4.5 inch guns to bombard target buoys south of Pulau Aur. They saw no white sand beaches or palm trees, only the flash of the guns and the bright bursts of star shells illuminating the target eight miles away.

Exercise Bali Hai began at the ANZUK Naval Basin in Singapore when two platoons and a company headquarters of the Green Jackets together with 12 Royal Engineers embarked in the **Vendetta**. The aim was to put them ashore in six aluminium assault craft at Kerengga Bay, about 60 miles due north the following morning.

The Green Jackets are a British strategic reserve battalion which came to the Far East for training at the Malaysian Army's jungle warfare school at Pulada in Johor State.

For them, the two month stint in the "ulu" represented a respite from duty in Northern Ireland, and a chance to keep alive the skills of jungle warfare. The amphibious landing at Kerengga Bay was the start of their only battalion level exercise while in Malaysia.

The Australian Navy Daring Class destroyer HMAS VENDETTA rides at anchor as the first wave of assault craft head for the beach.

For **Vendetta**, the landing was merely an interlude in a busy weapons training programme representing the run up to 1974's first major Five Power naval exercise. How busy **Vendetta's** programme had been is easy to demonstrate. Only the night before she had participated in a surprise "smashex" — a search for a simulated sunken submarine. A few hours after she embarked the Green Jackets she was scheduled to rendezvous with a Royal Fleet Auxiliary tanker **Tidespring** to take on much-needed oil fuel.

The first phase of Bali Hai was organised as an amphibious landing because it gave many of the soldiers a chance to do something they had never done before — to work with the navy, and to see the navy at work.

The ANZUK Naval Commander, Commodore D. A. H. Clarke, made two ships available — **Vendetta** and HMS **Scylla**. For the soldiers in **Vendetta**, the RAS (replenishment at sea) with **Tidespring** was a spectacular beginning to their brief cruise. They lined the upper decks in awe as the destroyer inched alongside the big tanker. But when the lines had been fired across, the hoses hauled aboard and fuel was flowing into the ship's tanks it all became a bore and they went below for lunch.

A few minutes later they were agape again as a Royal Navy Canberra bomber target aircraft passed directly overhead, and **Scylla**, a Royal Navy Leander Class escort, opened up at the red light of the target with her 4.5 inch guns. A neat line of white puffs marked the shell bursts in the target's wake and the soldiers echoed the knowledgeable sailors in shouting "good shooting".

Scanning the sky for another glimpse of the target aircraft and perhaps another display, the soldiers were quick to spot a grey and white aircraft drop through the clouds. But it was not the Canberra, but an RAF Nimrod maritime reconnaissance aircraft. A CASEX (anti-submarine exercise) was about to begin.

A CASEX is a good example of how technology has taken much of the drama out of modern warfare. Those soldiers expecting to see submarine hunting in the North Atlantic convoy/Compass Rose style were sorely disappointed. The Nimrod disappeared over the horizon, followed by **Scylla**, and another Royal Navy Leander escort, **Londonderry**. Well out of sight, the Nimrod dropped a pattern of red sonar buoys on the surface and before long the sound of the submarine's motors had been picked up and its position plotted by the aircraft's computer.

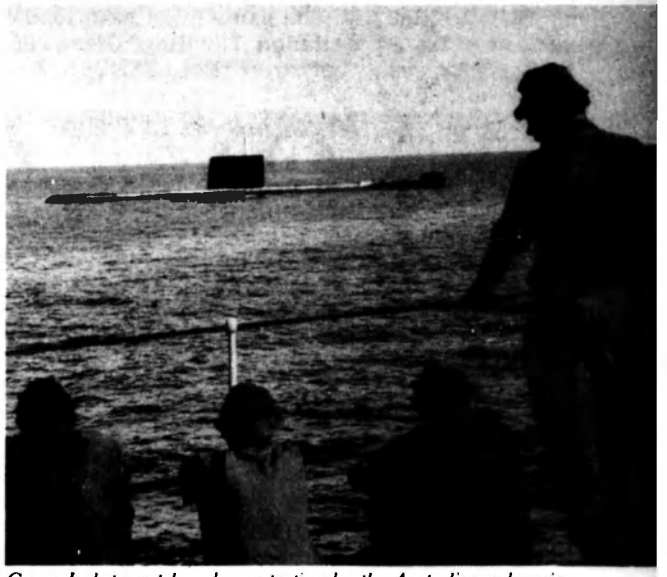
The aircraft made one or two simulated attacks, then **Scylla** and **Londonderry** were given their chance. Unless you had been listening to the radio chatter in **Vendetta's** operations room, you might as well have been on a P&O cruise.

The Navy, however, is not unaware that both soldiers and small boys love a submarine. So a second type of CASEX had been scheduled. "If you look on the starboard side — for the soldier's that's the right hand side — you'll see the submarine's periscope making a very small V in the water," an officer announced. The Australian submarine HMAS **Oxley** surfaced, and dived, then several hundred yards away from **Vendetta** displayed all her masts one by one — the periscope, the radar, masts, the snort and so on.

After "playing" with the destroyer, **Oxley** surfaced again and at long last the army got its chance to be something more than spectators.

Six "old and bold" soldiers from 3RGJ's support company boarded a Gemini rubber dinghy in the fading light and transferred to the submarine. Their mission was to attempt to infiltrate Kerengga Bay the following night as enemy, but in the meantime they could relax and enjoy a barbecue on the beach the next day.

The night naval gunfire support practice on the range at Pulau Aur provided a long-to-be remembered aural, if not visual, experience for the soldiers. First, X-ray turret illuminated the target buoys south of the island with star shells, then



Green Jackets watch a demonstration by the Australian submarine HMAS OXLEY in South Asian waters.

with a forward observation troop of commandos from the Royal Artillery directing the fire from ashore, Alpha and Bravo turrets set to with a will. By 2030 it was over, and the Green Jackets could get some sleep.

Dawn on the morning of the landing was cool and damp, and most of the soldiers, sleeping Dunkirk style on the upper decks, were woken by the rain well before their scheduled "shake" at 0500.

The problem of launching the Royal Engineer's assault craft had been the subject of a hurried conference aboard **Vendetta** several days previously, and the chief shipwright's solution was eventually adopted. His device was elegant in its simplicity, if not in appearance: two 15ft lengths of four-by-two fastened to a 44 gallon drum. The drum floated in the water, and if all went well the assault craft would slide down the four-by-twos like a coal truck on rails.

The only catch was that the stern of the assault craft might well enter the water at too steep an angle, resulting in a swamping rather than a launching. **Vendetta's** first lieutenant, Lieutenant Commander Max Sulman, supervised the operation with tense determination, and finally the last assault craft was in the water right side up.

All that remained was to launch the Green Jackets equally successfully. With clearing skies and a rising sun this seemed simple enough, and it was. One after another the soldiers went down the scrambling nets. One nearly lost a rifle, one forgot his pack, and a young second lieutenant zealously supervising matters elsewhere was almost left behind.

But soon the first wave of soldiers was roaring towards the beach in the capable hands of the Royal Engineers. When the second wave was safely away, Lieutenant Commander Sulman heaved a sigh of relief.

As far as **Vendetta** was concerned Bali Hai was over, and the ship could prepare for the second serial of the day — a spectacular simulated attack by six Hunter jet fighters of the Singapore Air Defence Command.

The Canadian IROQUOIS class of Destroyer Helicopter Escorts carry two Sea King CHSS-2 anti-submarine helicopters and are fitted with Sea Sparrow anti-aircraft missiles. With a full load displacement of 4050 tons, overall length of 426 feet (129.8 metres), beam of 50 feet (15.2 metres) and draught of 14 feet (4.3 metres) these vessels are gas turbine powered and have a designed speed of 27 knots.

ATHABASKAN, IROQUOIS, ALGONQUIN, HURON — The New Class of Helicopter Destroyer

By CAPTAIN ROBIN McNEILL

Building a warship is like packing a suitcase. Everything is jammed in and there's never enough room. And the Canadian Forces are packing more into their four new warships than ever before.

The design and development of the DDH 280 class has taken more than five years. The first hull (Athabaskan) slid down the ways at Davie Shipbuilding Ltd on 27 November, 1970, and the second hull (Iroquois) was launched a day later at Marine Industries Ltd. The two follow ships, Huron and Algonquin, were in the water within the next year.

Bigger, Deadlier, and More Flexible

The new ships are bigger and more lethal than the Annapolis class of helicopter-destroyer. At 425 feet, they're 60 feet longer; their 50-foot beam is eight feet wider; their masts tower 35 feet higher; and with a deep draft displacement of 4485 tons they are 1500 tons heavier. Their shaft horse power has been boosted 67% from 30,000 to 50,000. At the same time, the crew is up less than 10% from 260 to 280 officers and men with 30 additional training billets. Despite the extra size, the new ships will be slightly faster, and cruise considerably longer.

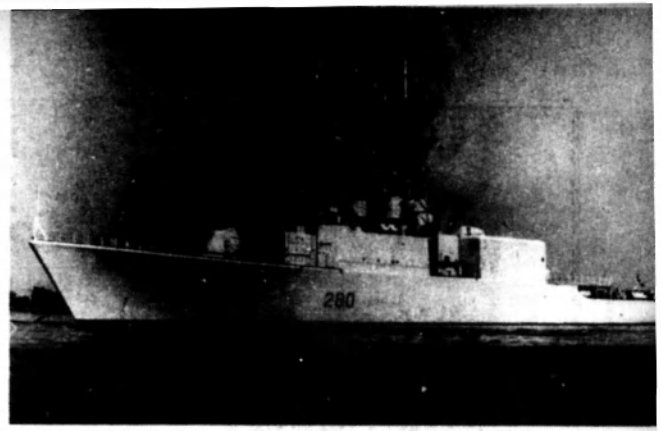
Why larger ships? They carry a second helicopter for one thing, and the double hangar and flight deck take almost a third of the upper deck space. A destroyer captain normally considers the helicopter his prime weapon system, because it can attack a submarine independently without risking the ship. But the trick with a single helicopter is keeping it serviceable in its matchbox-sized hangar. With two helicopters on the DDH 280s, the designers felt, one helicopter will always be flying or ready to fly.

Another new space requirement is the close range anti-missile and anti-aircraft missile system — something entirely new for the Canadian navy. According to one weapons expert, "there won't be anything like it anywhere else for five years at least; these missiles increase our anti-air fire power by a factor of ten." There are other ships with missile systems, of course, but not ships of this size and this diversity.

The Sea Sparrow missiles are originally air-to-air missiles, adapted to the marine environment. They sit out of sight on both sides of the superstructure just behind the forward gun mount. During firing, four 12-foot missiles extend on a narrow beam and hang out over the side like mail hooks. The beam then retracts, loads and reappears with another four missiles.

On their stern, some Canadian destroyers carry a variable depth sonar body which is towed behind the ship to detect submarines beneath thermal layers in the water. These towed bodies usually weight a couple of tons. But the towed body on the DDH 280s is a seven-ton monster, which suprisingly the DDH 280s can tow at higher speeds, significantly greater depths, and launch or recover in high seas.

The other major size factor weighing on the design of the DDH 280



HMCS IROQUOIS name ship of the class of Destroyer Helicopter Escorts (DDH) was completed on 30 August, 1972.

class is the all-gas-turbine propulsion plant. The physical plant isn't bigger than a steam plant despite the big increase in power, but the turbines use much larger air intakes and uptakes.

At the Frontiers of Naval Engineering

While practically all the systems in the ships (some 150 systems are new) reflect improved concepts in Canadian naval engineering, some of the ship's major innovations are at the frontier of world naval engineering.

The DDH 280s are the first ships of their size to go exclusively to gas turbines for main propulsion, although other warships are now being designed with all-gas-turbine plants and many large warships use turbines for boost power. Simplicity is very attractive to the warship designers who lay out ships' compartments, and the all-gas-turbine plant is relatively simple compared to a steam plant with its myriad ancilliary systems. Maintenance crews lead a cleaner and less complicated life. The turbines themselves are more suited to noise reduction engineering, and from a tactical standpoint they can raise full power from a colt start in less than half an hour. Steam plants take a good half day. The problem now will be to extricate sailors from supermarkets, theatres, and their girl-friends' arms fast enough to match the turbines' performance.

The primary generator plant for ship services is also gas-turbine — three 750 KW generators. As far as the electrical designers know, no one else has tried gas turbine generators with a great deal of success but they feel they've beaten the problems (even for tropical conditions where British experiments had the most difficulty). An interesting aside — more than 10 per cent of the ship's power will be closely regulated 400 cycle, compared to one half or one per cent in present destroyers.

No one in the world matches Canada in the basic helicopter-destroyer concept (operating a large helicopter from a small warship), and now Canada has embarked on another unique step — operating two large helicopters from a small warship. The ideas are made possible by the Canadian-developed bear trap haul-down system which yanks the helicopter down onto the flight deck. But it's a tight squeeze! When the 62-foot Sea King sits on the flight deck, there's only 17 feet from the tip of the rotor blades to the hangar doors. As one aviator says, "When you start coming down at that little deck, you wonder how in heaven you're ever going to hit it."

A whole engineering section has grown up around the problem of repairing helicopters in their tiny tossing hangars. In the DDH 280s, maintenance men are able to change engines in the hangars using a monorail that runs along the deckhead. There's more storage for spare parts in the DDH 280s, and one helicopter can always be stripped to keep the other one flying.

The ships are designed slightly more tender with respect to pitch and roll so the helicopters can land more easily. The period or roll (side to side and back again) is nine seconds. Also during the development of the DDH 280s, people have been experimenting with new night landing aids. Helicopters, for the first time, are able to operate from the ships 24 hours a day.

These areas — helicopters, turbine generators, and turbine main propulsion — are all in the vanguard of naval engineering, and other navies will be watching the DDH 280s with keen interest.

Complexity, Endless Detail and an Evolution in Canadian Industry

Ship construction and outfitting alone require 2000 drawings made up of about 5000 sheets, which works out to somewhere between 25,000 and 50,000 pages — or roughly the equivalent of 200 average-length novels. Thousands of equipment drawings are also involved.

The DDH 280 programme was the largest capital acquisition programme going for either DND or the Department of Supply and Services, and both departments are heavily committed. Almost every DSS procurement branch bought something for the programme, while DND supplied design and specification, overseeing, financial and logistic management through the long course of design, development, construction, trials and turnover.

Seven years is a long gestation period in the fluctuating climate of defence and government policy. Ideas on how the ships should perform evolved with time and subtly alter the ship's sub-systems even in the process of development and production. Over the three year construction period, there were perhaps 300 design changes, although only 15 or 20 were changes to design intent.

Either a warship is designed for the future or she is obsolete by the time she commissions. So at the outset of the DDH 280 programme, designers sketched in weapons, communications, detection and propulsion systems which were still in the barest stage of development. Development thus proceeded step by step with production.

This fluid development process alongside a rigid production schedule added a new dimension in organisation complexity —

HMCS IROQUOIS (280) one of four Destroyer Helicopter Escorts recently commissioned into the Royal Canadian Navy (ALGONQUIN — 283; ATHABASKAN — 282; and HURON — 281). Vessels of the class are fitted with one five-inch (127mm) dual purpose gun, one A-S Mortar Mk X and two triple torpedo tubes for anti-submarine homing torpedoes.

particularly at the design-production interface. The engineers worked in a high risk area, never perfectly certain that what they release for production will withstand the demands of later development.

A warship works on a delicate ecology. The DDH 280s use gas turbines, for instance, and gas turbines have a different kind of exhaust than steam plants. First of all, the exhaust is 200 degrees hotter, so the stacks had to be V shaped and made of heavier steel. Not only is the exhaust hotter, there's 11 or 12 times more of it — which means big enough intakes and uptakes to create stress problems in the hull.

So Dr Gordon Biggs, Carleton university professor, made a photo elastic analysis of a plastic hull to find the optimum position for various deck openings in relation to the large intake and uptake holes. Then the intakes and uptakes took so much room in the centre of the ship, that communication channels, wiring, piping and people were wedged into narrow compartments on either side. And that meant ... the process went on and on. Like a finely balanced aquarium, when one element was changed, the whole system had to find a new equilibrium.

This development dynamics had its impact on the 160 (approx) Canadian companies involved in the DDH 280 project — for example, United Aircraft of Canada Limited in Montreal, which developed the gas turbine propulsion system, had only a few minor projects in the marine environment before the DDH 280s. Now with the experience and 50 or so specialists they've built up, they are trying to interest allied navies in the gas turbine concept.

Raytheon Canada in Waterloo is a similar example. Primarily a radar company, they have moved into the missile field with the development of the Sea Sparrow missile system. Programme manager Ed Hale now feels Raytheon offers a unique Canadian weapons system capability. He feels no other Canadian company offers the immediate expertise of a compact design group for small missile systems. Raytheon Canada would also like to move into the larger allied market, either with the Sea Sparrow missile system or with other point-defence missile systems.

Whether these new capabilities will have a commercial or foreign defence spin-off as the companies hope, remains to be seen — at least as a result of the DDH 280 programme, Canadian industry has new opportunities to bid for modern defence contracts.

Time and the Mad Hatter's Watch

War in the 1970s might well be caricatured as technology chasing itself around a watch dial. The weapons, fire control system, and command and control system in the DDH 280s are graphic illustrations of technology's race against time — reaction time. The main surface armament is an Italian 5-inch gun which unlike the present 3-inch guns can be fired without a gun crew. It fires a maximum 45 rounds a minute, and as one weapons expert says, "You can get away 44 rounds before any of the gun crew arrive, and a further 22 rounds with just one man loading. So really you can fire several dozen shells while the gun crew is still piling out of bunks. We've eliminated human response time."

The missile system also eliminates human response time. Fire controllers can launch the first 16 missiles before the sailors reach the missile loading compartment.

On most ships you can see the fire control radar dishes swinging around, but on the DDH 280s there housed in two fibreglass radomes like big golfballs teed up on the superstructure. The radars have a track-while-scan capability which means the ship can make air and surface attacks with one radar at the same time.

In most destroyers the unavoidable human bottleneck has been the operations room plot table, where the tactical situation is re-created for the captain by a number of plotters who get their information verbally from radar and sonar operators. As the number of targets on the table goes up, the plotters become busier and busier. More and more Xs appear with scribbled notations; telephone chatter mushrooms.

The Litten Systems (Canada) Ltd command and control system which supersedes the plot table, replaces the bottleneck with a computer. The captain, weapons officer and staff sit before a number of display consoles which present the complete tactical situation in real time. Small symbols come up on the displays. Different symbol shapes are used to denote unknown, friendly, or hostile radar and sonar targets.

Torpedoes blink. At the most only a few milliseconds separate actual events from the picture on the eight command and control consoles.

The system displays the tactical situation to those concerned, offers solutions to various tactical problems, when questioned (such as the best time to fire), and evaluates or ranks the various threats. A computer is the heart of this system.

Naval tacticians who programmed the computers — a job which has taken 36-man-years — to handle every conceivable situation. The programmers put a trial programme into one computer, and then tested it with the other computer. All the major electronic systems in the ship — the missile, fire control and anti-submarine warfare and detection systems, radars, the log and gyro, and communications — feed into this one all-embracing brain.

And a simulator is built right in, so the captain can throw false targets onto the scopes to see if his operators are napping.

Make it Smaller: Hallmark of the Digital Age

What are the secrets to these advanced capabilities? The answers are found in thousands of pinhead-size metal rings which nowadays constitute computer memory cores, and in the faded hieroglyphics of integrated circuits printed layer upon layer like electronic honeycombs. The leap from analog to digital technology is perhaps the greatest departure of the DDH 280 class from earlier Canadian warships. The main machinery control room is the only remaining use of analog circuits. The new command and control system is 95 per cent integrated circuits, a mere five per cent transistor, and the only tubes are the eight large and eight small cathode tubes in the display consoles. The computer itself has more computing power (though less storage space) then the massive North American Air Defence computers at North Bay which fill two huge rooms. Yet the ship's computer is only 56 inches by 30 inches by 19 inches and weight 500 pounds.

Similarly, the new underwater detection system would fill the ship if it was built with tube electronics. The old sonars are a scaning type, and they scan over the beams that the transducer sends out. One of the receivers is a split beam video receiver and the other an audio receiver. In the DDH 280 sonar system, there are 576 initial detection receivers plus 36 passive receivers and a fine track receiver. There is an audio receiver as well but it's just a classification aid. Like the command and control system, this detection system has its own set of display consoles rather than a plot table, and can track several targets simultaneously.

Through an automatic data link between command control computers, the DDH 280s are able to exchange information instantaneously with sister ships, or with a number of NATO ships that use the same concept.

The 30-odd communication points in the DDH 280s channel through a single communication sorting console developed at RCA in Montreal.

Problems Merchant Ships Don't Have

Aside from things like dragging seven-ton sonar bodies behind the ship and changing helicopter engines, Canadian warships require two specific areas of engineering foreign to most merchant ships. Because they are submarine detection platforms as well as warships, their shape and machinery must cause as little noise as possible. And this attempt at noise reduction introduced a number of unique features. The bow, for instance, is specially rounded to move quietly through the water. The intakes and uptakes for the gas turbines are all acoustically lined. The entire propulsion plant is mounted on "rafts" which insulate the machinery from the hull. All the machinery is mounted to transmit as little vibration to the hull as possible.

If merchant ships aren't designed as sonar platforms, they certainly aren't designed to survive a nuclear blast, and operate in the fall-out cloud. But the DDH 280s are. The machinery is shock-mounted to survive a nuclear concussion, and the hull uses a G40.8 steel which resists cracking from strong underwater shock. Again, as far as the designers know, the DDH 280s will be the first destroyer class which can operate continuously in a nuclear biological or chemical cloud. The Annapolis class destroyers can seal themselves off and escape from a cloud, but the DDH 280s were designed to operate sealed off for at least 30 days, with the crew relatively comfortable. They can even send men on deck in special clothing to refuel. The new hydronic system of air conditioners has 128 small units (to minimise duct work and give more local control). In present destroyers, heat rises fairly dramatically in sealed up conditions, so the ventilation and air conditioning systems in the DDH 280s were completely redesigned.

At 47 to a Mess Deck, Small Changes Mean a Lot

So much has to go into a warship, that it's a fight to leave room for the crew. A hanging garden of cables, wires, pipes, drains and vents grows down from under every deck and tries to choke out sailors in the spaces below. Chief hull draftsman Alex Hylan and his Montreal staff did their best to restrict this metal plant-life to 18 inches, but he said it's impossible to design out every potential head-thumper.

Beneath the threatening deck-heads, sailors live and work in restricted spaces with no windows and mostly artificial lighting. Home is a bunk and a two-foot square 6 foot high locker in the middle of 47 other bunks and lockers where men sleep, dress, talk or play cards.

Bunks in DDH 280 are 6" longer. Also, talking and card playing are being coaxed into special quiet areas near the ladder — to isolate the disruptions. Lockers screen these quiet areas so light won't penetrate to the bunks. Designers then put light formica on aluminium bulk-heads to set off brightly-coloured furniture.

Paint colours are light throughout the ships, with subtle variations between shades of blue, green, and cream — not the traditional and universal grey.

How have the sailors adjusted to the new generation of technology on the ship? "Computer is a household word anyway," said one experienced naval officer. "They've shared in the rise of television, and mass media, and have witnessed man landing on the moon. I'm quite sure we've got the right training to cope with this transition."

Two Ways to Skin a Cat

The shipyards which constructed the DDH 280s — Marine Industries Ltd at Lauzon, and Davie Shipbuilding Ltd, at Sorel, Quebec — proved that there are more ways than one to skin a cat, or build helicopter destroyers.

Both companies worked on the general concept of unit construction (no one builds from the keel up any more). The units, which are massive 15-30 ton lumps of structure, were built in the shops and then welded into the ship on the ways. But each shipyard chose its own unit boundaries and its own order of unit construction. In other words, each company broke the ship into its own jigsaw pattern of construction. Davie Shipbuilding also built their units right side up, while Marine Industries prefered to build theirs upside down.

The Davie ships were built on traditional sloping slipways and dramatically launched on the classic layer of grease. The MIL ships were constructed to a more finished stage on level supports, then launched mechanically on a transfer slip.

Despite these differences in the order and timetable of construction, naval overseers feel the end products of the two yards are virtually identical.

Roles and a Well-balanced Ship

After the Korean war, Canadian naval requirements tended to zero in on anti-submarine warfare and exclude other features, such as, a primarily surface gun, which the DDH 280s have. But more significantly, the DDH 280s — and they are still primarily anti-submarine warships — are far less vulnerable to aircraft or missile attack, and far more valuable as control and co-ordinating platforms. In fact, this latter feature, reflecting the digital age in electronics, has proved to be the DDH 280s greatest asset. Most warfare, and particularly anti-submarine warfare with its chess pieces of long-range patrol aircraft, helicopters and squadrons of ships, is a team effort. And the DDH 280s have to act as floating control centres now that the aircraft carrier **Bonaventure** is out of service.

The DDH 280s aren't "all singing, all dancing". But are Canada's most advanced weapons platform, and between the offensive power and the defensive power, they are well-balanced ships.

A WARM WAR ATTACK ON AUSTRALIA'S SEABORNE TRADE

By A. W. GRAZEBROOK
Federal Vice-President, The Navy League of Australia

Since World War II, it seems to have been assumed by many Western World defence planners that an attack upon the trade of one of the world's major trading nations would be so serious as to provoke strategic nuclear retaliation. Therefore, such an attack upon trade would not occur. This argument may have been valid, in the fifties and early sixties, when the world's major trading nations (Britain, the United States and their allies) controlled nuclear weapons strength far in excess of that of the USSR.

However, the USSR and the United States are now more or less at parity in nuclear strength. The USSR now controls nuclear weapons strength sufficient to respond to a United States nuclear attack with a very severe, if not knockout, blow. This changed balance of nuclear weapons may well force the United States to elect to use conventional weapons in defence of their trade from an attack by the USSR, rather than draw upon themselves a nuclear attack.

It has been repeatedly demonstrated in war that the defence of world-wide seaborne trade must be a co-operative effort between allies, and it would seem most unwise to plan western defence upon the basis that there will be no significant attack upon seaborne trade, on the assumption that such an attack would provoke nuclear retaliation.

The possibility of an attack on seaborne trade involves a fundamental change in strategic thinking because:

(a) The Western Nations (Japan, Australia/New Zealand, the EEC, the USA) are much more dependent upon seaborne trade than are the USSR, China and their allies.

(b) The USSR and China, being less dependant on seaborne trade than the Western Nations, are in the position of being able to attack in an area where Western Defence is inadequate — an area moreover where the West cannot attack them so effectively.

(c) A minor attack upon seaborne trade involves the attacker in the deployment of minimal resources, but forces the defender to devote enormous resources to defend his trade.

(d) An attack upon seaborne trade involves, primarily, an attack upon material things, with minimal risk to civilian life. Compare the risk involved to civilian life in mining a cargo ship with the risk involved to civilians in blowing up a major industrial complex near a big city.

In summary, the USSR and China now have, in their ability to attack and severely inhibit the seaborne trade of any of the world's major trading nations, a weapon they can use which:

(a) Presents them with a pronounced superiority over the West's defences.

(b) Can be used without more than minor adverse effect upon Third World public opinion.

(c) Is cheap to use and involves their opponents in very substantial expense.

(d) Could bring at least some Western trading nations (Japan, the United Kingdom) to their political knees, without the destruction of resources involved in nuclear attack or military invasion.

It seems clear, in the light of what is now known, that the interruption to their seaborne trade had brought Japan to the point of collapse in 1945 and that the atomic bombs on Hiroshima and Nagasaki caused her to surrender a few weeks before she would otherwise have been forced to do so. Most historians are aware of the fact that, apart from relatively recent times, interference with seaborne trade was constant even when war had not been declared — the activities of Drake and the Barbary pirates are examples.

As one of the world's major trading nations, Australia is open to the same kind of pressure. However, in addition to our overseas trade, our coastal trade in iron ore within Australia is vulnerable and essential to our economy and almost all our local production of petrol and oil comes from the sea and, although it is not carried in ships, is clearly vulnerable to attack.

However, it is probably safe to assume that neither the USSR nor China will apply such pressure against Australia. Recent history shows that, if they wish to apply such pressure upon a relatively minor power, the USSR and China do so by supplying another minor power with arms and encouragement. Alternatively, and more probably in Australia's circumstances, such a minor power might, of her own volition, apply "warm war" level of pressure upon Australia, with encouragement and support from a major power. In 1971, India acted in this way against Pakistan, with non-participatory support from the USSR.

Pressure could come in "cold war" terms (harassment, obstruction, guerilla warfare), or "warm war" terms (military action short of all out use of all arms). It is clear that an attack upon our seaborne trade is now a possibility in relatively cool "warm war" circumstances.

Turning specifically to Australia's position in these circumstances, it is clear that a number of Indian Ocean powers already have the military ability to apply "warm war" attacks upon Australia's trade.

Such an attack could take the form of a carrier based air attack, attack by surface warship, by submarine, or by mine. The first two are overt, and could be defeated by the Navy — our carrier aircraft and destroyers could locate and defeat the only such force now operated by an Indian Ocean Power, although it is now known that another power is negotiating for the construction of a through deck cruiser, equipped with VTOL/STOL aircraft. Submarine and mine attack are real threats now, should any of the four Indian Ocean submarine operating powers decide to apply warm war pressure.

In the year ended 30 June, 1969, there were over twenty thousand sailings from Australia's principal ports (ie ports with at least three sailings per week). To defend these, we have eleven escorts, but two of these are not fitted with anti-submarine weapons effective against the modern submarine. We have six mine countermeasures vessels. We have twenty-two long range maritime patrol aircraft (of which twelve are in need of replacement) and Melbourne's complement of sixteen anti-submarine aircraft and helicopters. Much of the force we have is effective qualitatively, but is clearly numerically inadequate to defend our trade.

No Indian Ocean power now has the strength to mount a major submarine attack upon our seaborne trade. However, four Indian Ocean powers now have modern submarine forces, sufficient for each of them to keep two submarines constantly on our trade routes. Two of these powers are now expanding their submarine forces. One power is acquiring midget submarines — the size of craft the Japanese used to attack Sydney Harbour in 1942.

Two submarines, one each (say) off Cape Howe and the South West corner of Australia, could destroy many merchant vessels and would tie up all of Australia's escorts in defending merchantmen in these areas alone. Of course, we would have no way of knowing which key shipping areas the submarines would attack. They could be effective off most of the twenty-four principal ports mentioned.

Mines could be laid by innocent looking merchantmen, converted to the role in a matter of weeks. In World War II, the enemy laid mines in Australian waters, sinking a number of merchant vessels. None of the minelayers were detected, either before or during their minelaying activity. The marine mine is still extremely effective, as the United States demonstrated in 1972, when they used the mine and stopped virtually all of North Vietnam's seaborne trade.

The argument that most of Australia's trade is carried in neutral bottoms, immune from attack, is invalid and in any case is inapplicable so far as coastal trade is concerned. In North Vietnamese waters, the American mines could not discriminate between neutral and North Vietnamese targets. All trade, neutral or otherwise, stopped. Recent history shows that neutral shipping in waters affected by armed conflict are there at their own risk. Neutral shipowners either pay astronomic insurance premiums and multiply their freight rates, or withdraw their ships altogether. Either course would have severely inhibiting effects upon our seaborne trade. During the Spanish Civil War, in "warm war" circumstances, Spanish and Italian submarines did not discriminate between neutral and Spanish flagged merchantmen.

A severe inhibition of Australian trade would have a serious adverse effect upon our major trading partners. Japan must have Australian raw materials as must the EEC and, to a lesser extent, the United States. Even those industrial nations not dependent upon our raw materials would be quickly effected by the rapidly escalating commodity prices that would follow the excess of demand over supply due to the removal of Australian commodities, and the reduction in cargo capacity.

One could speculate as to what action, if any, our trading partners would take to assist us if a minor power attacked our seaborne trade by means of submarines or mines. All that can be said with certainty is that we have been clearly told by the United States to defend ourselves, that no Western nation has spare anti-submarine escorts or aircraft that we could buy or borrow, that such ships take years to build and that, although there may currently be available minesweepers to buy, they will not be available after the next two or three years.

In summary:

(a) There exists now a real "warm war" threat of effective submarine and mine attack upon our trade.

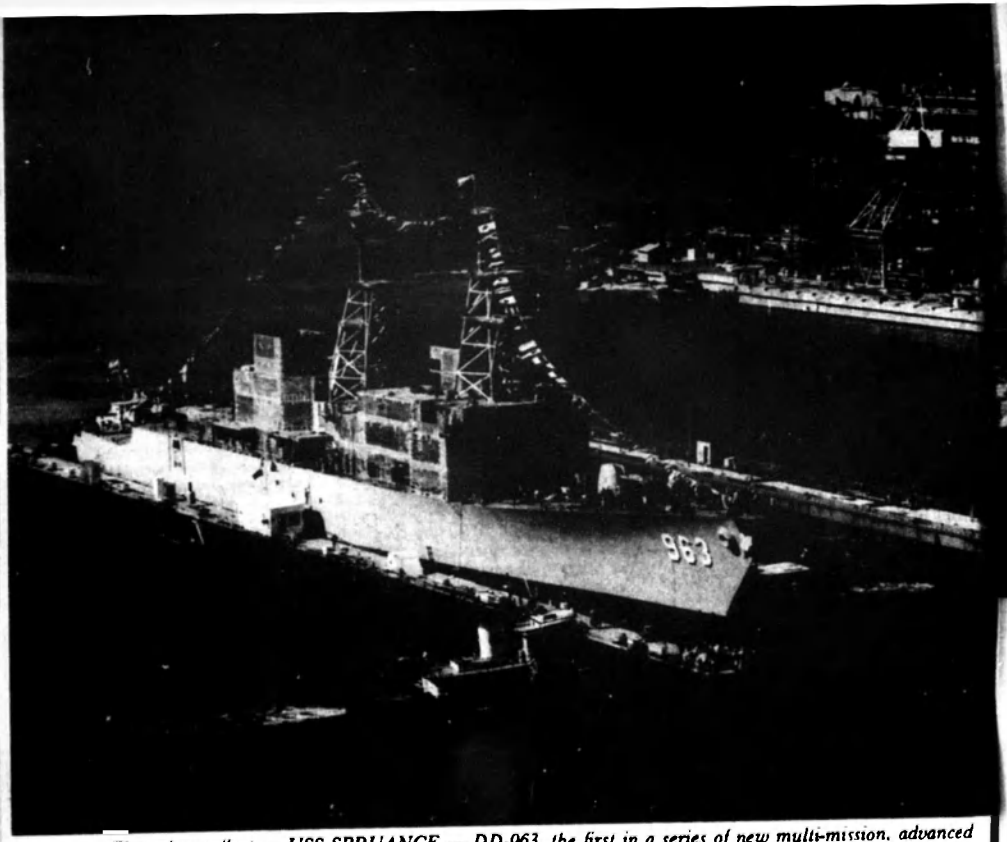
(b) We cannot forecast what assistance we can expect from our trading partners, but the Nixon doctrine gives notice that the defence of Australia's trade in Australia's responsibility.

(c) Our existing escort forces would be unable to contain the threat for numerical reasons.

(d) To fill the gap, our escort forces should be expanded

(e) Provided we maintain our current level of MCM (Mine Countermeasure) material and expertise, we could currently expect sufficient material assistance from allies to defend our ports against mine attack. The period of expansion of MCM forces could involve a severe but temporary interruption to our trade.

(f) We should expand our own MCM forces as the existing pool of surplus MCM vessels disappears from Europe and North America.



First of new fleet — USS SPRUANCE — DD-963, the first in a series of new multi-mission, advanced destroyers being built for the Navy by Ingalls Shipbuilding division of Litton Industries, was launched in Pascagoula on Saturday, 10 November, 1973. Ingalls launches ships by a unique floating platform system, and the christening ceremony was performed from the bow of a sternwheeler patterned after 19th century riverboats.

US Navy's Latest Destroyer Launched

USS SPRUANCE (DD-963), the first of the new fleet of multi-mission US Navy destroyers, was launched on Saturday, 10 November, 1973, at the Ingalls Shipbuilding Division of Litton Industries.

The 563-foot Litton-designed ship is the first in a planned class or thirty advanced Spruance type which the Litton yard will build under "series production" methods

The new destroyer, 150 feet longer than the latest class of destroyer now in the US Fleet, is primarily an anti-submarine weapon system — but it will have other missions as well. With a speed in excess of 30 knots it will be among the fastest Navy ships afloat.

The Spruance-class destroyer has a 55-foot beam and a draft of 29 feet. With a full load displacement of approximately 7800 tons, the **Spruance** has more than twice the displacement of World War II destroyers.

The ships are powered by four Maine gas turbine engines, each developing 20,000 horsepower. They have two controllabe pitch propellers, which allow a high degree of maneouvreability and can be tuned for varying degrees of economy, speed and silent running.

In addition to anti-submarine warfare, the destroyers can be assigned to bombard shore positions, support amphibious assaults, escort military and merchant ship convoys, perform surveillance and trailing of hostile surface ships, establish blockades and undertake search and rescue operations.

Ingalls has the total responsibility for producing these new destroyers. In addition to the design and production of the ships, Ingalls' responsibility includes precurement, integration and installation of the electronics systems aboard the ships, as well as comprehensive logistics support in determining maintenance schedules and spare part requirements, determining the size of the crew and training the officers and enlisted men.

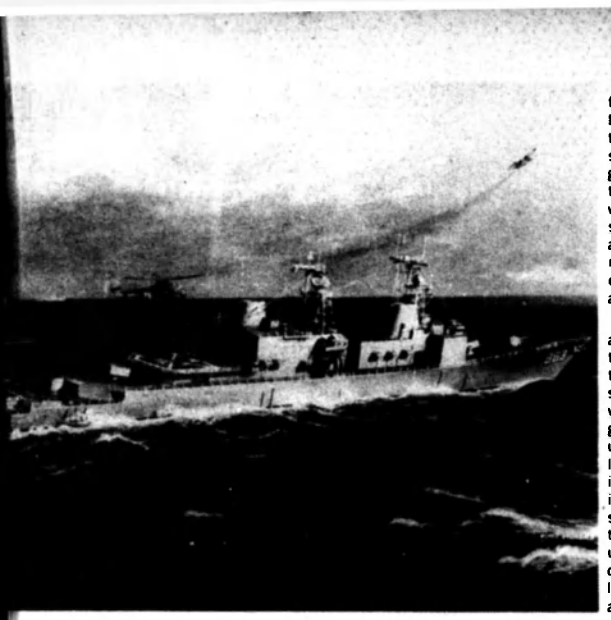
The extensive electronics systems, accounting for nearly 30 per cent of the cost of each ship, are initially tested in a command and control shore station in Southern California, where the computer system programmes also are developed. The unique land based test facility, located at the shipyard, is used to integrate electronic components into systems and to test them under simulated combat conditions prior to installation aboard ship as one unit. This method accounts for considerable savings in initial installation, as well as future modernisation.

Five succeeding ships are already in production. In addition to the **Spruance** (DD-963), keels for four of the ships (DD-964 through DD-967) already have been laid, marking the start of erection and assembly of previously fabricated steel. Fabrication of steel for the sixth ship in the series (DD-968) also has begun, and its keel will be laid in January.

Succeeding ships named by the Navy to date includes USS **Foster** (DD-964), USS **Kinkaid** (DD-965) and USS **Hewitt** (DD-966), all named for distinguished admirals of World War II.

USS **Spruance** is named in honour of Admiral Raymond A. Spruance. In World War II, during the battle of Midway, Spruance's forced turned back a vastly superior Japanese invading armada inflicting the first decisive defeat on the Japanese Navy in 350 years. Two years later, during the invasion of Saipan in the Marianas Islands, forces under Spruance's command shattered the Japanese naval air force in the famous "turkey shoot".

Mrs Raymond A. Spruance, widow of Admiral Spruance, was the ship's sponsor, and christened the ship with the traditional burst of champagne.



US NAVY SPRUANCE-CLASS (DD-963) DESTROYER

An artist's drawing of the Spruance-class of destroyers on completion.

These multi-mission destroyers are capable of anti-submarine warfare, air defence against aircraft and missiles, shore bombardment and surface warfare. They can also provide gunfire support for amphibious assaults and land warfare, escort military and merchant convoys, perform surveillance and trailing, participate in blockades and handle search and rescue missions.

The Spruance-class vessels are nearly 560 feet long with a 55 foot beam, a displacement of approximately 7000 tons and a speed in excess of 30 knots. They are the first major combatant ships in the US Navy to use marine gas turbine engines for main propulsion. Their weapon systems include anti-submarine torpedoes and rockets (ASROCs), Sparrow missiles, five-inch fully automatic guns and helicopters.

Join the NAVAL RESERVE CADETS

If you are between the ages of 13 and 18 years:

The Naval Reserve Cadets are administered by the Australian Naval Board.

The Naval Reserve Cadets provide for the spiritual, social and educational welfare of boys and to develop in them character, a sense of patriotism, self-reliance, citizenship and discipline.

Uniforms are supplied free of charge.

Cadets are required to produce a certificate from their doctor to confirm they are capable of carrying out the normal duties and activities of the Cadet Corps. If injured while on duty, Cadets are considered for payment of compensation.

Parades are held on Saturday afternoon and certain Units hold an additional parade one night a week.

The interesting syllabus of training covers a wide sphere and includes seamanship, handling of boats under sail and power, navigation, physical training, rifle shooting, signalling, splicing of wire and ropes, general sporting activities and other varied subjects.

Instructional camps are arranged for Cadets and they are also given opportunities, whenever possible to undertake training at sea in ships of the Royal Australian Navy.

Cadets, if considering a sea career, are given every assistance to join the Royal Australian Navy, the Mercantile Marine or the Royal Australian Naval Reserve, but there is no compulsion to join these Services.

For further information, please contact the Senior Officer in your State, using the form provided below.

SENIOR OFFICERS, NAVAL RESERVE CADETS:
NEW SOUTH WALES: Staff Office Cadets, HMAS Watson, Watsons Bay, NSW, 2030.

QUEENSLAND: Box 6, Post Office, Stafford, 4053.

WESTERN AUSTRALIA: C/- 182 Cooda Street, Como, 6152.

SOUTH AUSTRALIA: C/- Box 1529M, GPO, Adelaide, 5001.

VICTORIA: C/- Box 227, Post Office, Hawthorn, 3122.

TASMANIA: C/- 3 Winmarleigh Street, Taroona, 7006.

AUSTRALIAN CAPITAL TERRITORY: Industry House, National Circuit, Barton, 2600.

TO: The Senior Officer,
Naval Reserve Cadets,
I am interested in joining the Naval Reserve Cadets and would be pleased to receive further information.

NAME.....

STREET.....SUBURB.....

STATE OR TERRITORY.....POSTCODE.....

PHONE No.....AGE.....

(Please Print Clearly)

Please address your envelope to the Senior Officer in your State or Territory — see list of addresses above.

ANNUAL REPORT 1974

QUEENSLAND DIVISION NAVY LEAGUE OF AUSTRALIA

The year 1974 is one of some significance in Queensland and Naval history.

It is the bicentenary of the birth of Matthew Flinders, the centenary of the visit of HMS **Challenger** to North Queensland and the twenty-first anniversary of the establishment of the Queensland Division of the Navy League.

Flinders and **Challenger** have left their names in maritime history and the Queensland Division also intends to be well remembered in its own state and possibly even in Canberra.

From a small League committee in Brisbane and a Sea Cadet Unit at **Moreton**, commanded by Lieutenant Commander L. D. M. Roberts, MBE, RANR, the Division established Branches and Sea Cadet Units at Southport, Bundaberg, Mackay, Townsville, Cairns and "Magnus" at the Church of England Grammar School, Brisbane.

During the last decade a dynamic youth organisation at Stafford, Brisbane, became associated with the League with TS **Paluma**, and their Commanding Officer, Lieutenant Commander F. Dixon, MBE, is now Senior Officer, of the Naval Reserve Cadets in Queensland.

All this has been done by a League membership which rarely exceeded fifty men and women, and the present impressive series of unit Headquarters are a tribute to their quality and energetic community involvement.

The latest example of League progress is at Cairns, where the Branch has acquired a seagoing vessel of 160 tons powered by a 230hp diesel engine and with ample accommodation and facilities.

This vessel was built at Cairns in 1943 and until her replacement was a supply vessel for the Torres Strait Islands.

The Branch President, Gordon McKauge, with volunteers from the Cairns Cruising Yacht Squadron, and other organisations, has already undertaken her refit, so that when painted white overall, she will be commissioned as MV **Triton**.

This valuable asset will be operated by the Branch as a charter vessel, with access for Naval Reserve Cadets and hopefully, numerous bookings for interstate cadet groups who may want to do sea time in Barrier Reef Waters.

All the Branch properties are now capable of handling visiting groups of cadets, and such visits were a feature of the days of the joint administration.

Whether the all-Navy control of cadets will significantly alter these admirable exercises remains to be seen.

The altered status of the League and Navy has operated smoothly in Queensland with a high degree of co-operation from both sides and rent being received regularly by the Branches.

The current decentralised organisation was set up by the first secretary, Geoffrey O'Neill, and enabled the change over to be implemented without a hitch.

The present secretary, Colonel P. V. O. Fleming, has carried on the considerable administrative and liaison duties with expertise and the Treasurer, Bert Pearce, continues to control the increasingly complex Divisional finances.

In December, 1973, retiring officers and instructors were dined in **Paluma** and in May, 1974, the South Coast Branch arranged a presentation to Lieutenant Commander Trickett, the retired Commanding Officer of **Tyalgum**.

These men were the elite of the Australian Sea Cadet Corps and its founders in Queensland.

The Division and the nation has been well served by these volunteers and I hope the Naval Reserve Cadets will remember their contributions.

The Navy League certainly will, and I am proud to preside over an organisation which has done so much to bring something of the sea and the Navy to many of Queensland's youths.

Navy League Ball

THE VICTORIAN DIVISION OF THE NAVY LEAGUE OF AUSTRALIA

will this year hold the

NAVY LEAGUE BALL

at the **Palais de Danse, St Kilda**

on Oaks Night, Thursday, 7 November, 1974

It is anticipated that His Excellency the Governor of Victoria will attend and that the Navy Band from FLINDERS will play

Additional information may be obtained from the Secretary of the Victorian Division, Lieutenant Commander O. V. Dimmitt, Box 227, Post Office, Hawthorn, Victoria, 3122.

CHANGE OF ADDRESS

Important notice to Subscribers to "The Navy" and Fellows of the Navy League of Australia.

It would be helpful to the Editor and Post Office if you would kindly complete the form provided below prior to moving from the postal address registered with the Navy League, thereby ensuring that "The Navy" reaches you on time. Fellows of the Navy League should also advise their Divisional Secretary of any change in status or postal address. (Refer page one for address.)

Tear off here.

NOTICE OF CHANGE OF ADDRESS

To: The Editor,
"The Navy" magazine,
Box C178, Clarence Street Post Office,
Sydney, N.S.W. 2000, Australia.

(PLEASE PRINT CLEARLY)

Name: Mr. / Mrs. / Miss / Rank .....

Present address: .....

.....

I will be moving from the above postal address on

..... to reside at:
(date)

New address: .....

.....

(please include your postcode)

I am a *Subscriber or *Fellow of the ( ) Division of the Navy League.
(* delete inapplicable words)

Signature: .....

FELLOWS OF THE NAVY LEAGUE! DON'T FORGET TO ALSO ADVISE CHANGE OF ADDRESS TO YOUR DIVISIONAL SECRETARY. (REFER PAGE ONE FOR ADDRESS.)

Naval Reserve Cadet News

TASMANIA

Submitted by JACK MILLAR

TS Macquarie Sea Cadets sell training ketch.

Sea Cadets based at Strahan, on Tasmania's west coast, have sold their 87ft training ketch **Reginald M.**

The **Reginald M** was bought in Adelaide by the Mt Lyell Co for use as an explosives storage craft in Macquarie Harbour. It had originally been used as a wheat trader in South Australian waters.

TS **Macquarie** caters for about 30 boys and the purchase money from the ketch will provide them with several smaller boats such as sabots, navy whalers or 40ft dinghies.

The unit has been functioning for about two years, although it received Navy League recognition only in May this year.

Know Your Commanding Officers

Submitted by A. J. LEE

Lieutenant Allan Cleaver, the CO of TS **Tamar**, served in the RAN during World War II between 1940 to 1946, seeing action in "N" class destroyers in the Mediterranean, Indian Ocean and Pacific plus two years in the New Guinea area.

In the New Guinea area he was a prominent boxer fighting in Milne Bay and Morotai. He was also considered to be a first-class hockey player and after his discharge was an interstate player on many occassions.

In 1953 he joined the Sea Cadet Corps as an Instructor Petty Officer for gunnery and seamanship.

During the past twenty years he has gone through the normal promotion channels being appointed Lieutenant in March, 1969.

He has seen many changes in his Unit, going from rented premises miles from the river to the present Headquarters on the river bank.

Lieutenant Cleaver became Commanding Officer of **Tamar** in 1969

TIGHT BINDING

and in his first year was awarded the State Colours. He has been awarded the Naval Volunteer Reserve Medal and Bar for long service.

* * *

The Commanding Officer of TS Leven, Lieutenant Bruce Bates, joined the RANR in July, 1944, and served in Boom Defence at Darwin, and HMA Ships **Huon** and **Cerberus**. He was discharged in August, 1946.

Bruce rejoined the RAN for a two-year interim period in July, 1947. He completed the Electrical Course at **Cerberus** and was drafted to commission HMAS **Sydney**. He arrived in England in June, 1948, and returned with **Sydney** to Australia in May, 1949.

He joined the ASCC in September, 1963, as a P/O Instructor and became a Chief Petty Officer in May, 1965. He was promoted to Sub-Lieutenant in 1966 and Lieutenant in 1971.

Lieutenant Bates assumed command of TS **Leven** in 1972 relieving Lieutenant Commander G. T. Baxhall who became Divisional Training Officer. Bruce's main task ahead is to rehouse his Unit in new buildings as the present one is no longer satisfactory.

A DAY ON THE BAY

The Federal President of the Navy League (Commander Geoff Evans) had a number of distinguished guests in the yacht **Winston Churchill** recently. They included Mr Frank Crean (Federal Treasurer) and Mrs Crean; three leading Melbourne newsmen, Messrs Graham Perkin, Lyle Turnbull (also a yachtsman of note) and Harry Gordon; and the Naval Officer-in-Charge Victoria, Commodore Brian Murray; Mrs Ann Burrows, wife of the Victorian President (Alan Burrows), who was in Sydney at the time, chaperoned Mrs Crean.

Winston Churchill is on charter to the Victorian Division, and is used for Naval Reserve Cadet training purposes. On this occasion the 52 foot cutter was skippered by Lieutenant Commander (Cadets) Ray Applebee, and manned by nine Instructors and Cadets from TS **Voyager**. The yacht's owner, Graham Warner, and his wife Joyce are both active members of the Victorian executive of the League.

Although the party set out in comparatively quiet conditions, the weather changed (as it so often does on Port Phillip Bay!) after an hour or so, and as one guest put it afterwards **Churchill** became "very lively". However, the party returned to harbour in good order and condition if somewhat damp. (It was subsequently remarked that had misfortune overtaken **Churchill** and her company it would have been a quite newsworthy event!)

Printed and published by Percival Publishing Co. Pty. Ltd., 862-870 Elizabeth Street, Waterloo, 2017., Phone 699-2600 with permission of the Navy League of Australia