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THE Navy



FEBRUARY-MARCH-APRIL, 1976

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CONTENTS

Page

| | |
|---|----|
| Victorious — 1785-1970 | 3 |
| Naval Reserve Cadet News | 5 |
| The US Navy and the Future | 12 |
| Book Reviews | 19 |
| The Navy League of the Future | 20 |
| Periscope on Australia | 22 |
| Vic Division — Annual General Meeting | 24 |

PLUS SUNDY STORIES AND PHOTOGRAPHS

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ANOTHER



PRODUCT



VICTORIOUS — 1785-1970

BY ROSS GILLET

Four ships of the Royal Navy have borne the name of VICTORIOUS. This article will give a brief history from the first two-decker, to the majestic aircraft carrier which ended her distinguished career in the most spectacular, but unfortunate, circumstances.

The first VICTORIOUS, built by Perry at Blackwall, was a third rate two-decker, boasting 74 guns. She was launched on 27 April, 1785, and measured 170½ feet in length, with a 47 foot beam. VICTORIOUS I was present at the capture of Cape Good Hope in 1795, and participated in actions in the Malacca Straits in 1796. In 1803, she paid off for scrapping and was broken up in Lisbon in August of that year.

The second VICTORIOUS, like her predecessor, was a third rate, 74 gun ship. Built by Adams at Bucklers Hard, she was launched on 20 October, 1808. After participating in the disastrous Walcheren Expedition of 1809, fortunes changed when three years later she took part in an extremely successful single ship engagement off Trieste.

With the brig WEAZEL, VICTORIOUS blockaded the new French vessel RIVOLI and three other brigs in Venice. On 21 February, the French vessels made for the open sea, but were brought to battle by the British ships. In the ensuing five hour battle, the RIVOLI lost over 400 men and was forced to surrender. She was finally reduced to a crippled hulk. VICTORIOUS, although the victor, lost 27 men killed, and 99 wounded. In August, 1825, VICTORIOUS became a receiving ship. She was finally sold in 1862 and subsequently scrapped.

VICTORIOUS III was a Majestic class, pre-dreadnought battleship of 14,900 tons. She was laid down at Chatham on 28 May, 1894, launched on 19 October, 1895, and finally completed in November,

1896, at a cost of about 950,000 pounds. VICTORIOUS III's main armament consisted of 4 x 12 inch 35 cal. and 12 x 6 inch 40 cal. guns. Smaller armament included 16 x 12 pdr, 12 x 3 pdr, 2 Maxims and 2 x 12 pdr boat guns. In addition five 18 inch torpedo tubes were fitted, four being submerged and one being placed above water level at the stern. She measured 390 feet in length, with a 75 foot beam and 26½-27½ foot draught. Top speed was 14 knots and her radius at 10 knots was 4700 miles.

VICTORIOUS began service in home waters, with later postings to the China Station and Mediterranean Sea. From 1904 to 1906, she acted as second-in-command of the Channel Fleet. In August, 1914, with her sister ships HANNIBAL, MAGNIFICENT and MARS, VICTORIOUS formed part of the 9th Battle Squadron. Up to January, 1915, VICTORIOUS and her sisters served in the Mediterranean.

With the introduction of the larger battleships of the Iron Duke, Queen Elizabeth and Royal Sovereign classes, the older pre-dreadnoughts were gradually taken out of first line

service. Reduced to guardships by early 1915, VICTORIOUS and her three sisters lost their 12 inch turrets for installation in the Lord Clive class monitors. After being demoted to the Third Division Reserve Fleet, VICTORIOUS began duties as a troop transport. In March, 1916, she was fitted out as a dockyard repair ship and based at Longhope in the Orkney Islands.

VICTORIOUS remained at Scapa Flow, the Grand Fleet's base, until 1919. The following year, she was renamed INDUS II. Sold on 19 December, 1922, to A. J. Purnes, she was again sold in April, 1923, to Stanlee of Dover for scrapping.

The fourth, and most recent VICTORIOUS, was an illustrious class aircraft carrier, built by Messrs Vickers Armstrong Ltd, at Newcastle Upon Tyne. Authorised in 1936, VICTORIOUS IV was laid down on 4 May, 1937, launched on 14 September, 1939, and commissioned on 29 March, 1941.

Eight weeks after commissioning, VICTORIOUS received orders to join the search for the German battleship BISMARCK, which was running to Brest after having sunk the Royal Navy's largest warship, the battlecruiser, HOOD. Although only nine Swordfish and six Fulmars were being carried onboard, VICTORIOUS's aircraft located the BISMARCK and inflicted one torpedo hit and one probable hit. This reduced the German's speed and greatly helped in the final destruction by other Royal Navy units soon after.

After convoy work in the Arctic, VICTORIOUS ferried RAF Hurricane aircraft to relieve the position in Malta. Strikes were carried out against enemy positions on the Norwegian coast in the last months of 1941. In August, 1942, VICTORIOUS became Flagship of Rear Admiral A. L. St G. Lyster. With her

A Silhouette of the pre-dreadnought HMS VICTORIOUS, she was completed in 1896.





One hit was made on the BISMARCK by aircraft from HMS VICTORIOUS, seen above, but the torpedo exploded amidships against her side armour and did no damage. It was about three hours after this attack that the BISMARCK succeeded in shaking off the pursuit by the Home Fleet.

sister INDOMITABLE, and the old carrier EAGLE she escorted an important convoy to Malta in late 1942.

Sailing to the Pacific theatre of war in the new year, VICTORIOUS joined in operations with the United States Navy. With a squadron of USN fighter aircraft embarked, she carried out several sweeps in the Coral Sea and south-west and mid Pacific Oceans. During this period her own torpedo bombers were operating from a USN flat-top.

Returning to the Atlantic in 1944, VICTORIOUS during April aided in the destruction of BISMARCK's sister ship, TIRPITZ. In June, she

sailed from Clyde to join the Eastern Fleet at Colombo. The next month, VICTORIOUS began attacks with the INDOMITABLE against Sabang and later engaged the enemy on Sumatra and other Japanese occupied islands. In January, 1945, she sailed to Sydney to join the battleship KING GEORGE V and the rest of the British Pacific Fleet. After operations at Myako Island, VICTORIOUS received flight-deck damage from Japanese kamikaze suicide aircraft.

With the war's end, VICTORIOUS began repatriation of ex-Japanese Allied POW's to Australia. Leaving Sydney on 25 September, 1945,

she sailed to Plymouth via Fremantle and Colombo arriving on 31 October. From December, 1945, to January, 1947, VICTORIOUS was employed on troop work to and from Australia and the Far East, in all making three trips. Placed in category "B" reserve at Devonport on 16 January, 1947, she remained in this state until 14 July, when recommissioned to relieve the battleship NELSON, then serving as a training ship in the Portland Training Squadron. With alterations to accommodation, and specially built classrooms in the hangar deck, VICTORIOUS began training duties in October, 1947.

In February, 1948, her sister ship FORMIDABLE was chosen to be modernised, but due to the latter's unavailability at the time, VICTORIOUS instead was sent to Portsmouth in March, 1950, for the rebuilding process. VICTORIOUS was relieved in her training role by the battleship VANGUARD. Taken in hand by Portsmouth Dockyard on 10 October, it was planned that completion of rebuilding would be in mid 1954. Included in the rebuilding was an 8½ degrees angled deck, new radar, new boilers, improved aircraft and servicing arrangements, space for guided weapons in the hangar, mirror landing aids and steam catapults.

Emerging in 1958, after eight years in dockyard hands, VICTORIOUS

little resembled her former self. Reconstruction had made her 30 feet longer, as well as increasing her displacement. She now was armed with six twin 3 inch anti-aircraft guns and a single six-barrelled 40mm bofors gun.

Recommissioned on 14 January, 1958, VICTORIOUS sailed for the Mediterranean on 28 September, for her first tour of duty. First port of call was Gibraltar, followed by Malta on 13 October. After visits to Toulon and Messina, she returned to Portsmouth on 14 January, 1959. Sailing again on 20 February, VICTORIOUS visited Oslo, Denmark and then followed on with a visit to Norfolk, Virginia, after participating in exercise "Riptide" with the US 2nd Fleet.

On 22 February, 1960, VICTORIOUS commenced a six month refit at Portsmouth, ending her first commission since the completion of reconstruction.

After service in the Far East, including a one month deployment in the Persian Gulf, VICTORIOUS underwent a long refit from 2 April, 1962, to 12 June, 1963. Posted again to the Far East in 1963, she provided air search and support to the commando carriers ALBION and BULWARK in Malaysian and Indonesian waters. In May the following year, she visited Yokosuka Naval Base in Japan. VICTORIOUS, with squadrons embarked, left for Australia in April, 1966, after completion of a five month refit. Following calls at Singapore, Hong Kong, Sydney and Perth, she made for the Suez Canal. Passing through the Egyptian waterway just prior to the 1967 Middle East War breaking out, she received orders to remain in Malta until the fighting had halted.

Arriving back at Portsmouth on 21 June, 1967, she began another refit to prepare her for further Far East service. However, on 11 November, VICTORIOUS suffered

damage from a fire which blazed below decks from 6 am to 12.30 pm. In anticipation of her recommissioning VICTORIOUS's crew turned to cleaning up the damage. However, the Captain was informed on 23 November, 1967, that the old ship would not be recommissioned as had been originally planned. She had been scheduled to serve until 1971.

At 7.05 pm on 13 March, 1968, VICTORIOUS's white ensign was lowered for the last time. She was sold in July, 1969, and left Portsmouth on the 11th of that month for the Shipbreaking Industries yard at Faslane on the Gara Loch in Scotland.

By July, 1970, all that remained of the once majestic aircraft carrier was a few feet of rusted metal floating on the water. VIC was no longer.



HMS VICTORIOUS after her 1966 refit. The sole survivor of a series of six fleet aircraft carriers. She was the first aircraft carrier in the Royal Navy to be fitted with a fully angled deck.

CORRECTION

In the November-December-January, 1976-78 edition there were certain photographs incorrectly captioned.

Page 19: LST 1150 should have been captioned USS BRISTOL COUNTY.

Page 18: Top photograph — LHA 200 should have been captioned USS WASHBURN.

Lower photograph — should have been captioned — Amphibious Transport Dock LPD, USS RALEIGH.

These errors occurred at time of printing and an apology is extended to Mr Ross Gilroy, author of the article United States Amphibious Forces Thirty Years Later.

BYRON



Above: VICTORIOUS, 1939. Below: VICTORIOUS after reconstruction.

OUR COVER

THE PRINCE IN OILS

Admiral of the Fleet, Earl Mountbatten, unveils the portrait of Prince Charles which is to face his own across the elaborate staircase to the famous Painted Hall in the Royal Naval College, Greenwich, London.

The Prince, portrayed in the uniform of lieutenant in the Royal Navy, recently attended a course at the college and has taken over his first command — that of the Royal Navy minehunter, HMS Bronington.

The portrait by John Gilroy was commissioned by the wardroom mess at Greenwich.

Naval Reserve Cadet News

PLAN FOR NEW-STYLE CADET CORPS

The Minister for Defence, the Honourable D. J. Killen, said on 15 January, 1976, that he had asked the Department of Defence to draw up a plan for a new system of service cadets. His statement follows —

"This honours the undertaking I gave during the election campaign to reverse the previous Government's decision to disband cadet corps.

The new-style cadet corps will retain the essential virtues of cadet training, but will rely more heavily on voluntary support from the community.

Cadet training engenders many valuable qualities in young people. It fosters initiative, leadership, self-discipline, comradeship and loyalty — all qualities which we should try to develop in young people.

I believe the cadet corps of the Navy, Army and Air Force have made a very worthwhile contribution over the years, but this could be enhanced by giving interested organisations and members of the public a chance to accept more responsibility and develop initiatives for cadet training.

To be realistic we must also consider how much money and Service manpower the defence force can afford to devote to cadets. I have asked the Department of Defence to ensure that the new scheme it proposes is less demanding in both these areas.

The department will also study the objectives, organisation and training methods of the cadet corps. I hope it will be possible to devise a scheme which will provide for greater uniformity between the three cadet organisations than has been the case in the past.

I would welcome any suggestions from voluntary organisations

interested in assisting the Services in the future administration of cadet activities."

Mr Killen further stated that he had asked the Department of Defence to submit proposals to him by the end of February. Although action to disband the Army and Air Force cadet corps, initiated by the previous Government, had been dropped, it would not be possible to recommence Army and Air cadet activities until plans for the new scheme had been drawn up.



The Honourable D. J. Killen,
MP, Minister for Defence.

VICTORIAN DIVISION

TRAINING CAMP — LAKE EPPALOCK

A report by the Senior Officer, Naval Reserve Cadets, **Lieutenant Commander Alan Burrows, RANR.**

An Annual Continuous Training Camp was held from 1-7 September, 1975, on a seven acre site on the shores of Lake Eppalock, Victoria. This site is part of TS BENDIGO and is often used for weekend training camps using the small facilities permanently located at Eppalock.

However, for this the first large scale camp held in Victoria other than at RAN establishments like HMAS CERBERUS and HMAS LONSDALE, the permanent buildings had to be significantly augmented. This was achieved by the staff at HMAS LONSDALE organising the loan of excellent and wide ranging equipment from the Army. This included tents for living and mess tents, field kitchens and refrigeration, lighting and generating motors and so on.

Total members in attendance were five Officers, eight Senior Instructors and 123 cadets. All seven Victorian units sent contingents and the camp was visited during the whole period by Divisional Staff Officers, the Commanding Officer of HMAS LONSDALE, the Staff Officer Cadets from HMAS LONSDALE and his Petty Officer assigned to Cadet Affairs.

Apart from a little rain, the weather was very good and all activities planned were carried out over the whole period. These were many and varied and the cadets learned a number of useful skills that can be adequately taught in this adventure-type camp.

There was sailing, canoeing, and boat-pulling along with lectures and practical exercises in bush survival and living off the land. All these activities are enjoyable and useful to the cadets and might well be instrumental in saving life at some later date.

All in all it was a splendid exercise and hopefully, others will follow. Everyone learned something and the camps in future should benefit from the experience gained in this, the first of its kind.

Its success was due to the efforts of many — HMAS LONSDALE'S staff were extremely helpful and did much to ensure the achievements that were so evident at the camp's end.

The Officers and Instructors themselves all made vital contributions for the enjoyment of all.
(Photographs accompanying this article are reproduced by courtesy of The Sun News-Pictorial, Melbourne, Editor.)



General view of the camp — Officers, Instructors and cadets attended from all the Victorian Units. The tents and other camping gear were loaned by the Army.

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Chief Petty Officer R. Skennerton of TS MELBOURNE in 14ft dinghy instructing cadets while Sub-Lieutenant H. Goodall of TS MILDURA maintains radio contact with other craft afloat on Lake Eppalock.



Cadets and the Flying Fox — a popular pastime.



A couple of cadets getting "knotted up".



A well supervised cadet rope climbing. Lieutenant Commander Alan Burrows, Senior Officer, Naval Reserve Cadets, Victorian Division, and Lieutenant Commander Jim Lundberg, Commanding Officer, TS BENDIGO and Officer-in-Charge of Lake Eppalock Camp.



Cadet on survival exercise and some of his equipment.



"Cooks of the Galley" under the watchful eye of Senior Instructor W. Stewart of TS MILDURA.

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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.

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NEW SOUTH WALES: Staff Office Cadets, HMAS Watson,
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Leeuwin, PO Box 58, Fremantle, 6160.

SOUTH AUSTRALIA: Staff Office Cadets, HMAS
Encounter, PO Box 117, Port Adelaide, 5015.

VICTORIA: Staff Office Cadets, HMAS Lonsdale, Rouse
Street, Port Melbourne, 3207.

TASMANIA: Staff Office Cadets, HMAS Huon, Hobart,
7000.

AUSTRALIAN CAPITAL TERRITORY: Staff Office Cadets,
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THE US NAVY

And The Future



BY: A. W. GRAZEBROOK
Federal Vice-President of the Navy League of Australia

DD945 USS HULL a destroyer of the Forrest Sherman class commissioned in 1958. Ships of this class were the first US destroyers of post World War II design. During 1974 she was experimentally fitted with an 8 inch gun forward to determine the feasibility of installing a major calibre gun in destroyer type vessels — for shore bombardment.

The United States Navy is so, a number of major decisions will be taken. These history; in the next year or decisions will be funda-

mental. They will have strategic, tactical and material effect upon Australia.

Changing strategic circumstances, domestic politics, and the demise of a large number of old ships are all contributory factors:

- The neutralisation of the Strategic Nuclear Deterrent
- The emergence of the Russian Navy as a multi-ocean offensive fighting force.
- A change in the balance of US domestic political power.
- The hulls and machinery of the last of a large number of World War II type ships, upon which the US and a number of her allies have depended for the bulk of their escort, MCM and submarine forces, are finally wearing out.

Since the fifties, the Russians have had sufficient superiority in submarines and mines, over escort forces and MCM forces, to cripple the trade of the Democracies.

A Russian Cruiser (CLG) of the Kresta I class. Four of these vessels were built between 1965-1968; each carry Shaddock surface-to-surface and Goa surface-to-air missiles.

A Soviet SAM KOTLIN class (DDG) destroyer. Fitted with conventional armanent and Goa (SA-N-I) surface-to-air missiles.

Although some deeper thinkers have questioned the reliability of the approach, most Western strategists have assumed that this threat has been neutralised by clearly expressing their intention of treating an attack upon trade as "casus belli" for the use of the Western strategic

nuclear strike force. This situation has changed fundamentally. If the US uses nuclear weapons against Soviet cities, the Russians have the ability to hit back at the major cities of the Democracies with a smashingly unacceptable nuclear blow.

Admiral Gorshkov, the "Jacky Fisher" of the Soviet Navy, has added to the very strong defensive Russian Navy a multi-ocean offensive fighting force. Built around a fleet of SAM and SSGW armed submarines, destroyers and cruisers, this force is large when measured in terms of firepower and numbers of ships. When considered in terms of firepower available for the strategic offensive, after defensive commitments have been met, the new Russian Ocean-going Fleet is immense. Put simply, the US Navy is still numerically larger than that of the Russians, however, when each is related to their strategic tasks, the Russians have a substantial surplus strength, whereas the USN has a shortage.

If the Russians attacked Atlantic, Pacific or Mediterranean trade, those Democracies with nuclear deterrents (the US, France and the UK) would not dare respond with a nuclear attack. The West would just have to fight it out, with conventional weapons, on, over and under the oceans. One of the big questions is whether the West has the strength to do that.

On top of all this, the US domestic political situation has changed. The



LHA 1, USS TARAWA on commissioning trials.

reasons for this are many and varied. Suffice it to say that defence appropriations are having a far more difficult passage through Congress, and the USN can no longer rely on the availability of conscripted manpower.

During the fifties and sixties, the US and the United Kingdom both had a large number of World War II ships (escorts, submarines and minesweepers) in reserve — far more than they could man themselves. Although the RAN did not do so, many other allies could and did purchase or borrow ships from what was, for all practical purposes, an inexhaustible pool.

The last of these ships are now disappearing, finally obsolete or worn out. The other allies recognise this, as the new building programmes of Brazil, Greece, Turkey, Argentina and others show. Australia is the odd man out — we are the country that cancelled the three ship DDL programme in favour of two smaller ships arriving later. We are the country that has laid no new keel for a fighting ship since 1965.

OTHER FACTORS

In making their major decisions, the US must take into account other factors common to most maritime powers.

Ship designers must allow space in new hulls not only for today's latest weapons systems but also for the systems that may have to be

installed at the ship's half-life modernisation 12 to 15 years after the ship is completed — that is, 20 to 25 years after initial design work starts.

All over the world manpower costs are rising. In the Democracies, this tends to apply more than in totalitarian countries. In the US, this trend is accentuated by the withdrawal of conscript manpower. The US Navy is having to attract manpower from other forms of Government Service and free enterprise. This is expensive in terms of pay and conditions. Better afloat living conditions can only be provided at the expense of space for weapons, or by building bigger hulls.

Another major question concerns the future of the manned aircraft. There are authorities who maintain that the days of the manned military aircraft are numbered, and that the successful development of the SAM missile, Polaris and Poseidon ICBM systems, are the first stages of this. Other authorities argue that the change will not spread to tactical aircraft and there are a multitude of opinions in favour of various stages in between the two extremes.

STRATEGIC ATTACK CARRIER, TACTICAL SAP, OR BOTH?

In the thirty years since World War II, the prime strategic role of the US Navy has been the projection of offensive striking power overseas in the furtherance of US interests — aid to allies (eg in South East Asia or

USS STONEWALL JACKSON SSBN 634, a nuclear powered fleet ballistic missile submarine (FBM) of the Lafayette class. Originally fitted to carry Polaris A-3 missiles she was subsequently converted to carry the Poseidon C-3 missile (16 tubes).

DE 1074 USS HAROLD E. HOLT, an ocean escort ship fitted with Sea Sparrow basic point defence missile system.

the Eastern Mediterranean) or merely by its presence stabilising the situation in an area of tension.

The spearhead in this projection of force has been the attack carrier striking force. This force has enabled the United States to despatch overwhelming airpower in both the strike and support of troops roles, thousands of miles from their homeland. Initially, the force was built around modernised World War II type ESSEX and MIDWAY class carriers. Slowly, but surely, most of the ESSEX class have been replaced by the FORRESTAL (steam) and ENTERPRISE (nuclear powered) carriers. This process is still going on, with the MIDWAY class past their thirtieth birthdays and a decision regarding their replacement falling due.

With the change in their strategic situation, the US strategic and tactical maritime defence planners must decide how much strategic carrier striking power their country needs and the most economic way to protect that power. They must decide whether the US Navy's trend towards bigger and bigger attack carriers operating bigger and more powerful aircraft is the most effective way to employ their available funds.

Whilst the super attack carrier undeniably achieves the economy of scale, one hull can only be in one place at one time. Smaller navies, and some in the USN contend the USN as well, have a need for smaller Seaborne Air Platforms capable of operating anti-submarine helicopters and tactical aircraft against ground and fast attack craft targets.

The USN went so far as to assign a ship as a temporary Sea Control Ship to test the tactical and operational practicability of the concept. That ship has now returned to her original role and the Sea Control Ship concept has been shelved. However, the US Secretary of Defence, Dr Schlesinger, has stated that the US Navy has a need for a ship operating a smaller number of VSTOL aircraft and helicopters in low threat areas. These can be provided by a number of ships already in existence in the USN.

Nevertheless, no form of Sea Control Ship can provide the strike power of a super carrier either in quality or quantity. Today, the US Navy has a force of fifteen strategic attack carriers and over 2500 fighter and attack aircraft. Even in the United States, there are limits to

funds available for defence. The attack carrier force can only be maintained at its present striking power at the expense of other arms. The problem facing US defence planners is in identifying a compromise which will provide a balance of strength required in all arms — strategic carrier, tactical air support, escort, MCM, submarine or amphibious.

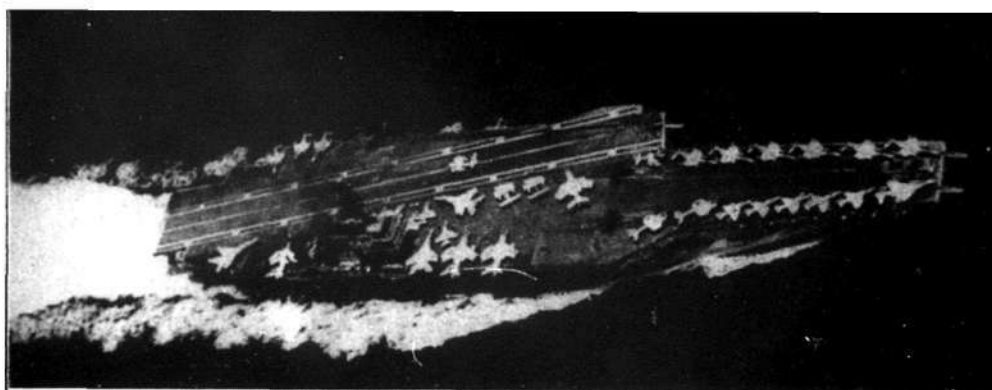
SUBMARINES

Since the mid-fifties, the USN has devoted substantial resources to the development of their nuclear powered attack submarine force (which now totals 62 units). Apart from their potential in the attack role, these 62 units constitute substantial anti-submarine strength. The USN's high opinion of the potential of these craft is demonstrated by the fact that a further 23 are building and yet another twelve projected.

Perhaps because, unlike the Soviets, the US treats anti-submarine warfare as the prime role of the SSN, the American boats do not yet carry cruise missiles. A surface-to-surface guided weapon is now under development and will be named HARPOON. The Russians have had a suitable missile at sea for a decade or more — their submarines are capable of surfacing many miles from a surface warship or merchantman and firing and directing a missile.

Alone amongst maritime powers operating nuclear powered submarines, the US appears to have completely stopped the construction of diesel electric submarines. Only nine conventional attack submarines are in commission and none have been completed since 1959. The other countries operating SSNs are still building conventional submarines — even the British intend to design a new class to replace their OBERONS in the 1980s.

The United States' 41 strategic missile submarines (SSBN) are part of the country's strategic nuclear deterrent. They are not relevant to maritime power in the sense of this article, and the decision regarding their replacement when they wear out in the 1980s is governed by the availability of alternate means of delivery of the strategic nuclear deterrent and the country's position under the SALT Agreement.



The aircraft carrier USS CONSTELLATION an improved Forrestal design, she is an attack carrier of the Kitty Hawk class. Fitted with 2 twin Terrier surface-to-air missile launchers.

Nevertheless, some factors in the choice of replacement hull and machinery are relevant to general submarine technology.

As with the attack carriers, there is a trend in SSBNs towards ever larger more heavily armed boats. These tentatively selected to carry the new TRIDENT missiles are expected to displace 12,000 tons on the surface (some authorities have mentioned a much higher figure). This compares with 7320 tons for the largest POSEIDON armed submarines.

However, the USN has requested funds to initiate the NARWHAL programme of smaller SSBNs to carry TRIDENT missiles in smaller numbers in a smaller hull, and complement the large SSBNs. Consideration is being given to converting some existing POSEIDON carrying SSBNs to carry TRIDENT missiles. The disadvantage of this is their expected vulnerability to the improved detection systems that are expected to be available to the Russians in the 1980s.

SURFACE WARFARE SHIPS

It is in the number of surface warfare ships — cruisers, destroyers and escorts — that the decline in the strength of the US Navy is most apparent.

Although a comparison of absolute numbers of ships can be misleading — it is the total capability of the weapons systems in all ships that is most relevant — such numbers are indicative of the trend in this instance. In 1965, the USN listed nearly 750 completed ships of

cruiser, destroyer and destroyer escort size. Ten years later, the comparable number is only just over two hundred.

In 1975, the US had 27 guided missile cruisers. All armed with surface-to-air (or anti-aircraft) missiles. Not one has surface-to-surface guided weapons in operational service, although a number are scheduled for service shortly, all but seven of the guided missile cruisers are of recent construction.

None of the 39 guided missile destroyers in service are armed with surface-to-surface guided weapons, all being primarily anti-aircraft ships, however, as with the cruisers, there are plans to equip some of these ships with the STANDARD SSGW.

Of the 66 destroyers in service, some 50 are the last of the World War II types and must be expected to expire soon. The first of a further 30 anti-submarine destroyers (the SPRUANCE class) are just entering service, however, the missile armament of these new 6000 ton plus ships is limited to a point defence system designed for close range operation against hostile aircraft.

Sixty-five modern frigates are in service. A further 52 are building or planned. These ships (the FFGs) will be the first surface ships designed to carry SSGW to enter service with the USN.

AMPHIBIOUS WARFARE SHIPS

In this field, the US Navy is still strong. Capitalising on the basic

knowledge and technology developed in World War II, and adding the practical experience gained in amphibious operations in limited wars since that date, the US Navy has constructed a number of much improved types of ship and craft for amphibious warfare.

Most of the sixty plus ships now in commission have entered service in the last 10 years. A further 44 ships are in reserve. The first of the 39,300 ton multi-purpose ships, USS TARAWA, is just entering service. TARAWA and her four sisters will be able to provide the helicopter and VSTOL capability specified as necessary by the Secretary for Defence, apart from landing over 1800 troops and equipment across the beach.

Other ships in service include seven 17,000 ton helicopter assault ships which could, with relatively minor modification, also provide the limited helicopter and VSTOL capability mentioned earlier.

Fourteen LPDs and 23 Dock Landing Ships, and a numerous flotilla of other craft complete the US Navy's not inconsiderable amphibious warfare strength.

Whilst this force represents considerable strength in terms of amphibious warfare, the size of fleets necessary to mount an opposed landing by only a division of troops during World War II should not be forgotten.

MINE WARFARE

The US Navy has been making considerably less effort in the field



USS GRAND RAPIDS (PG 98) a patrol missile boat of the Ashville class she carries two launchers for STANDARD surface-to-surface missiles and one 3-inch gun forward.

of mine counter measures, as has been pointed out in extensive discussion in recent issues of United States Naval Institute Proceedings.

This may seem surprising, as it was the United States Navy that demonstrated the prohibitive effect of the mine as recently as the total stoppage of trade in North Vietnam in 1972-73.

One group of US Navy thought advocates the use of helicopters (Air MCM) whilst another holds the view that there is a place for both AMCM and surface borne MCM. The US MCM operation in Vietnam in 1972-73, similar activities in the Suez Canal area, and European technical developments in the MCM field would all seem to demonstrate that there may be a place for both AMCM and SMCM.

Meanwhile, the number of MCM vessels in the US Navy has declined steadily — there are now only 37 such vessels. One new vessel is planned provisionally for financial year 1978 funding, and a further three for the financial year 1980.

FAST ATTACK CRAFT AND PATROL BOATS

The geography of the United States, coupled with the consider-

able strength of some of their allies in this field, has enabled the US virtually to confine their activity in the fast attack craft field to the building of a few ships for mainly development work.

Some successful and original work has been carried out on missile (HARPOON) armed hydrofoils, whilst four ASHEVILLE class fast attack craft have been fitted with two launchers each for a modified STANDARD SSGW.

Provisional plans announced show that the US Navy intends to continue concentrating on developing hydrofoil technology for the fast attack and patrol craft fields.

SSGW — RECENT PROGRESS

Perhaps the most striking feature of the USN today is its lack of surface and submarine launched tactical surface-to-surface guided weapons.

The first of these are only just going to sea with the USN. Based on its assumption of omnipresent tactical air superiority, the USN assumed that its air defence could

deal with any threat by SSGW armed fast attack craft. It may be that the USN assumed that its SSNs could deal with SSGW armed submarines before they launched their cruise missiles.

In either case, the USN's current modernisation and construction plans indicate that the Service now sees a role for the surface-to-surface guided weapon.

THE EFFECTS ON AUSTRALIA

Within the United States, the defence debate is growing. It is for the US to decide how much they spend on their own defence, and how these funds should be divided between various weapons systems. Although these decisions are for the US to make, they will have a considerable effect on their allies — not least Australia.

Some of these consequences will be strategic. The ANZUS Treaty is a cornerstone of Australian Defence Policy. Assuming that all political queries are resolved, and that the US Congress would be willing to risk escalation and send forces to aid an Australia under threat. The Navy League has doubts as to whether Australia can count on the US Navy having sufficient forces to spare to send the help we would need.

The Navy League's concern was reinforced recently, when the immediate past Vice-Chief of US Naval Operations, Admiral Worth H. Bagley, USN (Navy International, October, 1975), commented "Under current force-level plans — the task in the NATO Centre, added to those on the NATO Southern Flank and in the Norwegian Sea, and the Pacific Fleet commitments in the Western Pacific and Indian Ocean, will prove to be infeasible if a credible deterrent is sought."

Let there be no doubt that the Australian Navy League places great value on the alliance with the United States — we cannot afford to be without it from the viewpoint of training and equipment, much less strategic support. Nevertheless, we must recognise that the US has other commitments as well — in the case of NATO, an over riding commitment. The stronger we are ourselves, the more of an asset (and not a liability) we are to our allies the more willingly would they send us aid.



"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 seafaring 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 — 9 Albert Place, Camden Park, 5038.

Western Australia — Box 735, 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 \$5.00 being my first annual subscription.

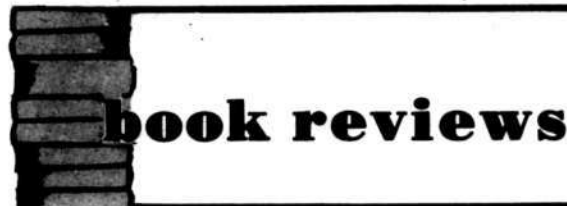
AFTER COMPLETION, THIS FORM SHOULD BE DISPATCHED TO YOUR DIVISIONAL SECRETARY NOTE LIST OF ADDRESSES ABOVE

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 C17B, Clarence Street, Post Office, Sydney, NSW 2000, Australia.

Authors are requested to include a photograph of themselves together with brief biographical particulars.

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.



book reviews

THE GREAT NAVAL RACE

Anglo-German Naval Rivalry 1900-1914

BY PETER PADFIELD

382 pages, including index, bibliography, reference notes and twelve pages of black and white photographs.

Published by Hart-Davis, MacGibbon, London

Our copy supplied by Hicks Smith & Sons Pty Ltd, Sydney

Price \$17.30

Reviewed by: SHTANDARDT

Much has been written about the results of the naval rivalry which existed between England and Germany in years prior to the First World War, however, detailed publications concerning the nature and reasons for that same rivalry have, prior to now, been relatively scarce. Peter Padfield's book examines the events and personnel concerned with this troubled era, and in so doing has not only built up a competent and interesting picture of the naval race itself, but has shown in great detail why the Germany of the Kaisers and Great Britain attempted to outbuild each other with regard to capital ships and other heavy units for their respective fleets.

Bearing in mind the title of this book, the text begins by discussing in depth the political and social-economic fabric of Imperial Germany at the end of the last century together with the ideas and influences of the period. Those who were prominent in Germany at this period come under close scrutiny. These include the dedicated Admiral von Tirpitz; Kaiser Wilhelm II himself who, on many public occasions, delivered bellicose, nationalistic speeches which were a source of acute diplomatic embarrassment in many quarters within Germany; and Heinrich Treitschke, Professor of History at the University of Berlin and arch-priest of the concept of State power.

It was people such as these who had such a major effect on the creation and growth of an ocean-going German Fleet worthy of the name. Obviously, England had her equivalent ideas and people who were concerned with the maintenance of her overall maritime supremacy in the face of this new European challenge, and textual balance of this book is preserved by an equally full coverage of England's policies and naval growth.

The author maintains that the personalities behind the naval armaments race and not the warships themselves brought on the First World War. Balkan politics and the reader's opinion on this issue notwithstanding, he will find much food for thought in this excellently researched work. Herein lie the seeds of the book's few faults. The sinuous complexity of this history leads the reader, of necessity, along many tortuous paths which are occasionally made difficult to navigate because of needlessly long and poorly punctuated sentences. This sometimes results in having to re-read passages in order to absorb their full context. Fortunately, the books' many merits overshadow its faults, and it therefore deserves space on the bookshelves of the serious naval student or historian.

GHOST OF THE ATLANTIC

The Kronprinz Wilhelm 1914-1919

BY EDWIN P. HOYT

160 pages. Price \$8.90

Published by Arthur Barker Limited, London

Our copy supplied by Hicks Smith & Sons Pty Ltd, Sydney

Reviewed by: SHTANDARDT

This book is concerned with the First World War career of the ex-North German Lloyd passenger liner KRONPRINZ WILHELM from the time she sailed out of New York harbour under sealed orders on the

evening of 3 August, 1914, to the date of her scrapping in 1923, by which time she had become, because of internment, the American troop-transport VON STEUBEN.

The good qualities of this work are quite apparent. The author, a trained journalist, has written an easy-to-read, competently researched and lively sea-yarn which fulfills its intended purpose. Even though the KRONPRINZ WILHELM was far from being a top-scoring armed merchant cruiser, the tactics of her commanding officer leave the reader in no doubt as to why she became known to the allies as the "Ghost of the Atlantic".

However, those few criticisms that are necessary concern, in the main, sins of omission; and this reviewer feels they should be made.

Firstly, there is not one photograph or drawing of the ship anywhere in the book. The story deserved at least a frontispiece and perhaps some detail photographs in the middle of the book. Such parsimony is glaringly obvious.

Secondly, no details at all are given of the ships' career following her completion and prior to her war service. She was a well-known liner, and information such as this is much sought-after today.

Thirdly, no explanation is forthcoming as to why such a large and speedy vessel should be fitted with the puny main armament of only two, 3.4-inch guns, and a single light machine-gun on the bridge. In any case, why was such a vessel chosen for her given task? Her fuel problems were immense. She was designed for the Europe-New York run only and, as such, carried only enough coal for seven days steaming at top speed, ie, 3500 tons. She consumed a monumental 500 tons per day. A seven day chase by a hostile warship would therefore see her fuel exhausted. The Germans made this error of choice several times; but, there again, so did the English. The difference was that the British Admiralty realised their mistake earlier than did the Germans. In any case, British AMC's were usually more heavily armed, albeit with sometimes obsolete guns. Criticisms aside, this was an enjoyable book to read, and this reviewer has no hesitation in recommending it to all those who enjoy a good story which has, in large measure, been well written.

The Navy League of The Future

By SURGEON COMMANDER
ER A H ROBERTSON,
PRESIDENT, QUEENSLAND
LAND DIVISION, THE
NAVY LEAGUE OF
AUSTRALIA

Any advance planning by the League must take note of current pressures for reduction of Government spending, the unilateral declaration of independence by the Government of 1972, when the Naval Defence Act was amended, and the foreshadowed abolition of the Naval Reserve Cadets.

The past five years were certainly a period of change but the traumas have provided some useful experience, and above all, the League has survived.

The actual articles of association of the company do not require any urgent amendment but the objectives and future commitments certainly do.

Support for the Navy is implicit in our existence, and although the RAN may not need us, Australia needs the Navy, and as motivated citizens we will continue to emphasise this point privately and in public.

Some States have well informed members who provide relevant pro Navy comment to the media whilst others limit themselves to letters to the Editor.

Increased use of "The Navy" magazine as a vehicle for civilian as well as Service opinion would not only inform League members of their affairs, but get through to the Service with long term benefits to both sectors.

Finally, there is the involvement with the Cadet movement and this aspect needs the closest scrutiny.

Here was an association of professionals with civilian volunteers, and even in its hey day the cadet movement had a low priority in the time and money of the Defence Department.

Support should be a bilateral operation but with constantly changing service personnel and their commitments, the benefits of such liaison are not only obvious to the civilian field workers of the League.

The Scout movement and Boys' Brigade operates successfully without Defence control and the League Sea Cadets of the future could do likewise.

Navy participation could be limited to providing facilities for Annual Camps and access to ships and establishments for instructor courses.

The status and capacity of the Navy League of Australia varies so much in each State it is difficult to provide a universal formula for subsidising the League of the future, but writing from Queensland in

January, 1976, it is suggested that if Defence wishes to continue its involvement then the current rents for Navy League of Australia facilities are a good basis for discussion.

Whatever the future it is hoped the Government will negotiate locally rather than maintain the past remote-controlled and occasional direction to the man and women who provide the basic work force for any youth movement.

The form, size and functions of the Sea Cadet Corps of the future must be the subject of another article.

SUBSCRIPTION FORM

To "The Navy",
26 Wesson Road, West Pennant Hills,
NSW, 2120, Australia.

I enclose \$4.40 being *subscription to "The Navy" magazine within Australia for 1½ years (refer notes below).

Name

Street

Suburb

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Date

(Please Print Clearly)

Please make cheques, postal orders or money orders payable to "The Navy League".

Subscriptions commence in January of each year and a subscription reminder notice is forwarded to current subscribers — Annual Subscription (Australian Dollars) within Australia \$2.50 — Beyond Australia \$4.00 (sea mail) — \$7.00 (air mail).

*Persons within Australia commencing subscriptions to "The Navy" magazine during the quarter commencing APRIL (ie, sub for 1½ years) should remit \$4.40, JULY (sub for 1½ years) \$3.75; and OCTOBER (sub for 1½ years) \$3.13.

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

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"The Navy" magazine,
26 Wesson Road, West Pennant Hills,
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Name: Mrs. _____
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Present address:

I will be moving from the above postal address on

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

NOTICE TO ADVERTISERS

The Trade Practices Act, 1974 came into force on October 1, 1974. There are important new provisions in that Act which contain strict regulations on advertising and all advertisers and advertising agents are advised to study those provisions very carefully. It can be an offence for anyone to engage, in trade or commerce, in conduct "misleading or deceptive". In particular Section 53 contains prohibitions from doing any of the following in connection with the supply of goods or services or in connection with the promotion, by any means, of the supply or use of goods or services:

- Falsely represent that goods or services are of a particular standard, quality or grade, or that goods are of a particular style or model;
- Falsely represent that goods are new;
- Represent that goods or services have sponsorship, approval, performance characteristics, accessories, uses or benefits they do not have;
- Represent that he or it has a sponsorship, approval or affiliation he or it does not have;
- Make false or misleading statements concerning the existence of, or amounts of, price reductions;
- Make false or misleading statements concerning the need for any goods, services, replacements or repairs;
- Make false or misleading statements concerning the existence or effect of any warranty or guarantee.

PENALTY:
For an individual — \$10,000 or 6 months imprisonment.
For a corporation — \$50,000.

It is not possible for this company to ensure that advertisements which are published in this magazine comply with the Act and the responsibility must therefore be on the person, company or advertising agency submitting the advertisements for publication.

IN CASE OF DOUBT CONSULT YOUR LAWYER

Periscope on Australia

by Grommel

FAREWELL PARADE FOR CCS

Sailors, soldiers and airmen farewelled the retiring Chairman Chiefs of Staff Committee, Admiral Sir Victor Smith, at a special parade in Canberra on 21 November, 1975.

A 100-man Guard of Honour drawn from the three Services, with the Band of the Royal Military College, Duntroon, was mounted outside the Department of Defence Building at Russell at 2.15 pm.

The parade was attended by the Secretary of the Defence Department, Sir Arthur Tange; Chief of Naval Staff, Vice Admiral H. D. Stevenson; Chief of the General Staff, Lieutenant General F. G. Hassett; and Chief of the Air Staff, Air Marshal J. A. Rowland.

Admiral Smith was born in Sydney in 1913 and entered the Royal Australian Naval College 14 years later. He left the college in 1930 and received further training in the United Kingdom and Australia. Promoted Lieutenant in 1936, Admiral Smith specialised in aviation and joined the Fleet Air Arm in 1937.

During World War II, Admiral Smith was awarded a Mention in Despatches for air torpedo attacks on the Scharnhorst; he later received the Distinguished Service Cross during fighter operations from HMS Ark Royal.

Admiral Smith was appointed Chairman Chiefs of Staff Committee on 23 November, 1970. He was the first graduate of the RAN College to attain the rank of Admiral.

His successor is Lieutenant General Hassett, who is to be promoted to General when he takes up the three-year appointment on 24 November. Major General A. L. MacDonald, the present Vice Chief of the General Staff, becomes Chief of

the General Staff with promotion to Lieutenant General.

NEW SONAR PROJECT FOR RAN SUBMARINES

A contract for the first phase of a project to provide a new attack sonar for the Royal Australian Navy's Oberon-class submarines has been awarded to Plessey Australia.

The firm is the leader of a consortium with Krupp-Atlas Elektronik of West Germany and Plessey Marine of the United Kingdom.

These projects include a new passive range-finding sonar system manufactured by Sperry Gyroscope USA. This system has already entered service in HMAS Ovens and is being installed in the two new submarines under construction in the UK. The remaining three submarines in service will be fitted during scheduled refits.

Another important project is a computerised data-handling and fire-control system, due to enter service in 1979. It is being manufactured to an RAN specification by Singer Librascope USA.

The RAN is also considering acquiring new-generation guided torpedoes and underwater-launched anti-ship missiles for its Oberon-class submarines. A number of contending weapons are under examination.

The sonar contract, placed with Plessey Australia last October, was for a contract definition study worth \$75,800.

The system selected is an advanced sonar designed by Krupp-Atlas Elektronik for the Federal German Navy. It has the advantage over the present system of being able to scan a 360 degree arc continuously. The present system, housed in the familiar "bubble" on the submarine bow, only scans a narrow arc rather like a searchlight.

If this first phase proves successful, it is intended to proceed to a production contract towards the end of 1976.

SHIPPING EXERCISE IN PACIFIC

More than 200 merchant vessels participated in an allied naval control of shipping communications exercise nicknamed Exercise Redcoat 76 conducted in the Pacific between 19-30 January, 1976.

Redcoat 76 was primarily a communications exercise designed to test plans and procedures for the control and protection of civilian merchant shipping in the event of war or other national emergency. Participating countries included Australia, Canada, New Zealand, the United Kingdom, and the United States.

The exercise was under the over-all direction of Vice Admiral Robert P. Coogan, USN, Commander Third Fleet, with headquarters at Pearl Harbour, Hawaii.

CANADIAN NATIONAL DEFENCE COLLEGE VISIT

Members of the staff and students of the Canadian National Defence College visited Australia from 12-16 January.

The group, which was led by Major General Gerard John James Edwards, comprised senior Service officers as well as Federal and Provincial public servants, businessmen and academics.

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

The group arrived in Canberra on Monday, 12 January, and were



HMAS BRISBANE, a guided missile destroyer, winner of the Wardle Cup.

given briefings on Australia's foreign affairs, defence, economy and trade. During the visit to Sydney on 15 January they were further briefed on the subjects of city administration, Commonwealth-State relations, and Australia in the post-election period.

SALE OF FORMER RAN VESSELS

Newspapers on 31 December, 1975, carried advertisements inviting tenders for the purchase and removal of the Offshore Minesweepers, formerly HMA Ships HAWK and GULL and the Inshore Minesweeper, formerly HMAS POPHAM.

Tenders closed at 2 pm, 20 January, 1976.

WARDLE CUP

The RAN's annual award for communications and electronic warfare, the Commodore Wardle Cup, has been won by the guided missile destroyer, HMAS Brisbane.

The award recognises HMAS Brisbane's consistently high standard of performance in all

aspects of communications and electronic warfare.

HMAS Hobart came a close second in the competition and HMAS Vendetta received a special mention.

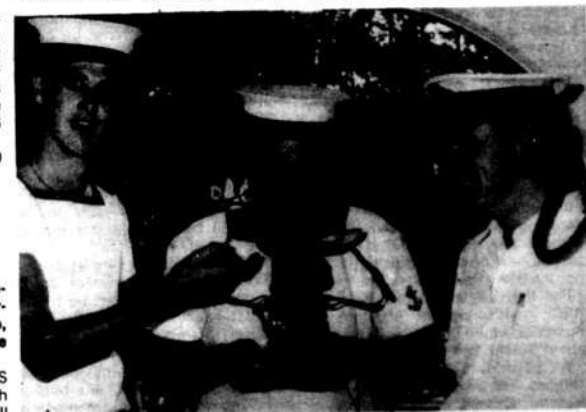
VAMPIRE IN PENANG

Smile now, watch the snake! A new approach to the age old photographic expression.

Three crew members from HMAS VAMPIRE look surprised when a

snake from Penang's famous Snake Temple decided to substitute for the traditional "birdie". They are left to right: Able Seaman Paul Deacon of Queenstown, Tasmania and Leading Seaman Photographer Bob Ferrall of Launceston, Tasmania, watched by Royal Navy exchange officer Lieutenant Paddy Morgan who is providing a pathway for another of the Temple's "friendly" reptiles.

HMAS VAMPIRE visited Penang during the destroyer's current goodwill tour of South East Asia.



THE NAVY LEAGUE OF AUSTRALIA — VICTORIAN DIVISION

Report of the President of the Executive Committee for **THE ANNUAL GENERAL MEETING**

HELD MONDAY, 27 OCTOBER, 1975

It is only six months since my last annual report, for as you know, we have brought this annual general meeting forward, so that it more sensibly relates to the 12 months ended 30 June, 1975. I will, therefore, comment mainly on the future rather than retrace old steps.

The only things I want to emphasise about the past is that our finance situation as you will see is very poor with virtually our only income being derived from subscriptions from a small membership.

This leads to the second weak area, that we must bolster, and that is membership itself.

Our meetings (formal) are few, although much work is accomplished in the intervening time. We have purposely done this, so as not to place too much demand on the committee members whom I realise are busy with business and other pursuits.

However, a larger attendance at our meetings would be helpful — more ideas might be generated and the greater personal involvement should be to the betterment of the League's welfare.

So much for the past. Now the future.

The demands upon the Navy League and consequently the committee will be far greater than they have been for some considerable time, when, as seems inevitable, the League resumes responsibility for the cadet organisation.

It is important to note here that no cadet unit will be permitted to continue operating unless it comes under the sponsorship of the Navy League.

The League's view and valid assessment has been conveyed to the RAN, which wants to retain the NRC and is, as a consequence, sympathetic to our cause. No citizen organisation could operate a Service Cadet Corps without the support of the parent service — indeed no British country nor the USA attempts to do so.

For the League to take over the NRC in its present strength in Australia, would involve us in finding about \$¼ million a year and this is way beyond our resources and abilities. The League must, however, and so intends, to make a very

positive contribution, largely in the property field to provide suitable quarters for the cadet units, but there are naturally a number of other areas where we can help. For example, there will be need to cover costs of administration, travel, stores, victuals, etc, for the cadets to remain a viable organisation, which it currently is.

At this point we are not sure what the actual date is for the cut-off of government support, and when this does come, how much the Navy, albeit most willing to assist, will be permitted to do so in tangible ways.

Negotiations have been underway for some many weeks now. It is going to become complicated, particularly on the property side, for this is still not resolved in Victoria at least. No rents have been received, although due, from 1st January, 1973, so we have firstly to get these monies in, and then be probably involved in dismantling what has not been fully assembled, in the properties area. From the cut-off point of government support, most of the seven units in Victoria should be able to operate for some months on what they will have in hand. Things like uniforms, stores, boats, should be retained. We have to work hard, however, for the time which won't be too far distant when the units will need replacements of many worn items and additional equipment for new recruits as the cadet force, hopefully continues to grow. Where these requirements will be sourced has also to be negotiated, but wherever it is, money will be needed.

Another expense to be met will be that of travelling costs. For some time now contributing factors to the successful operation of the NRC have been combined unit camps at HMAS CERBERUS, at Lake Eppalock and what have recently become beneficial and popular, unit-to-unit visits. The return fares from any unit

to another, particularly those as far afield as Portland and Mildura in this unit interchange for, say, 10-15 cadets is expensive.

While the units themselves have, in varying degrees, local committees working for them, you can readily see that we have many future fields where the NL can support and help maintain the cadets. It is, of course, too soon to make concrete plans and recommendations as there are many unknown factors to be resolved. Much will depend on our continuing negotiations with the Government, the Navy and elsewhere.

In any event, perhaps this will be the incentive for us to become a very active organisation. I can only commend to you all that you get right behind the League and rely upon help to keep our fine cadet corps in being.

It has, after all, been one of our main responsibilities starting in the 1920's.

While the emphasis of my remarks in this report has been on the place of Naval Reserve cadets in our scheme of things, and which I believe is our most important charge, one should not overlook the other role of the Navy League. As you know it expresses views from time to time on national issues, mainly of a defence and maritime nature, and on specific naval matters contained within the ambit of its abilities and knowledge. Such are generally received as objective comments perhaps offering another point of view for consideration in the public interest.

In conclusion, I wish to thank all those who have worked hard and contributed to the League's welfare and advancement and to express my appreciation of the support of my colleagues in committee.

ALAN H. BURROWS,
President.

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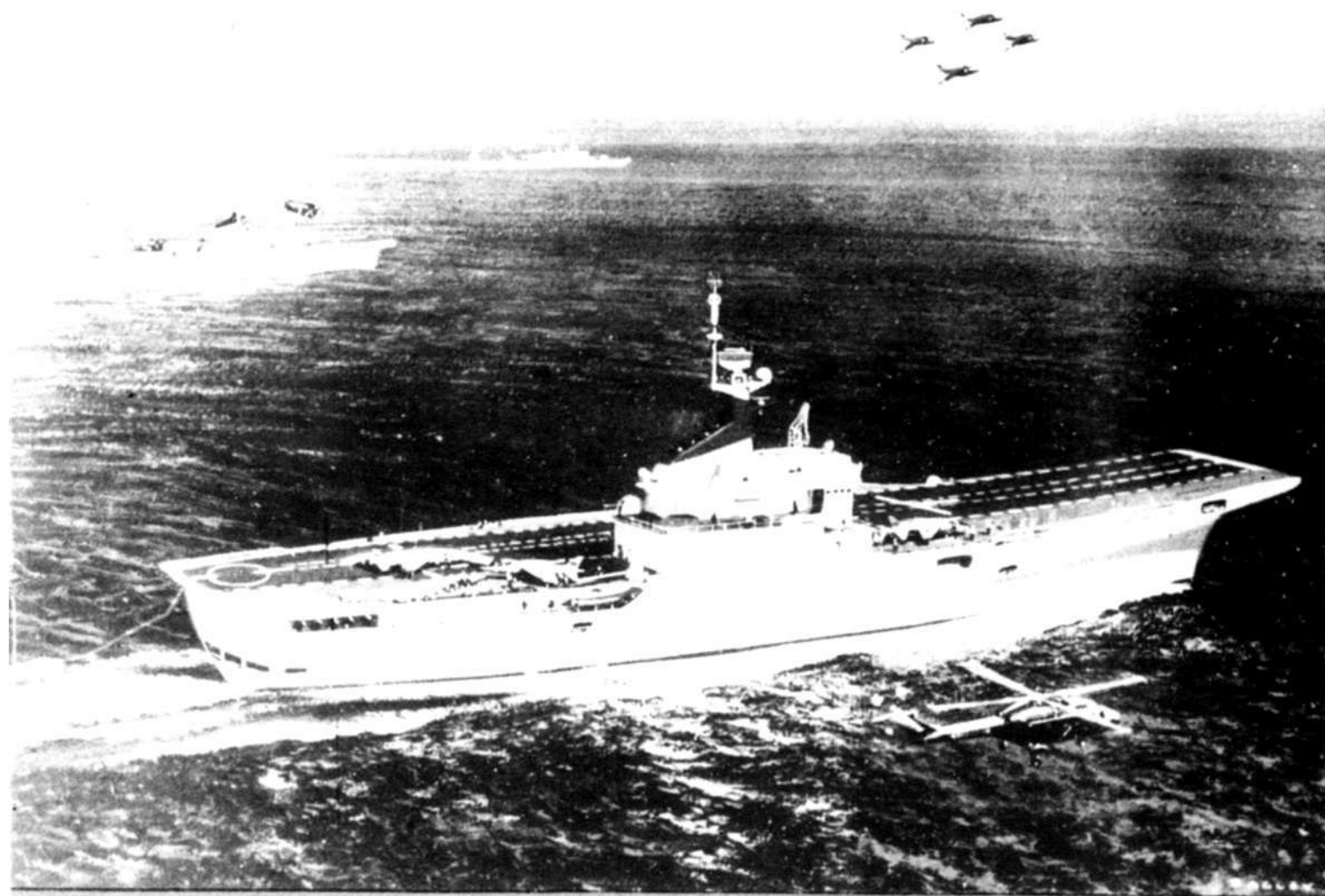
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No 2

CONTENTS

| | Page |
|---|------|
| Naval Reserve Cadet News | 2 |
| The Indian Ocean and Australian Strategy | 7 |
| Overseas Designs to Compete for Australian Patrol Boat Order | 13 |
| Photos From Far and Wide | 17 |
| Destroyers for The Royal Australian Navy | 19 |
| The RAN's Blackest Day | 27 |
| Harrier Carrier Proposal | 29 |
| New Diver Speech Processor | 31 |
| New Anti-Fouling Underwater Paints | 32 |
| Annual General Meeting — New South Wales Division of The Navy League of Australia | 32 |

PLUS SHORT STORIES AND PHOTOGRAPHS

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Naval Reserve Cadet News

AUSTRALIA'S NEW CADET SCHEME

Extracts from a Statement made by the Minister for Defence,
the Honourable D. J. Killen, MP

I am now able to announce to the House details of a new scheme which each Service should have in operation by September this year.

Three factors were important in shaping this new scheme. The first is my belief, and I am sure this is a belief shared by all Honourable Members, that we have an obligation to do all we can to encourage young people to develop the qualities of leadership, discipline, self-reliance and loyalty which the previous cadet training schemes fostered.

Secondly, the Government wishes to see greater involvement of schools and the community generally in cadet training.

The third consideration was one of cost. In a period when the Government must rigorously examine every facet of its expenditure the cost effectiveness of expenditure at this level on cadet training obviously demanded close scrutiny. This is particularly so at the present time when priority in defence expenditure must be given to equipment and the infrastructure essential to an adequate basis for expansion of our defence capability.

The scheme which the Government has approved retains the essential virtues of cadet training while at the same time seeking to ensure the maximum efficiency within the resources available. It will encompass both school and community sponsored units.

Features of future Commonwealth financial assistance are:

- provisions of appropriate military uniform;
- full Defence Force support for annual camps of up to 7 days for all cadets. At these camps rations, accommodation and equipment will be provided;
- reimbursement of up to an average of \$10 per cadet to schools and



Naval Reserve Cadets on Parade

sponsoring authorities for travel costs associated with annual camps;

- provision by the Navy, Army and Air Force of 141 Regular Servicemen and some 20 Department of Defence civilian staff to supervise and provide assistance in the running of cadets;
- Commonwealth Compensation cover;
- payment of annual allowance to cadet instructors.

Under the new scheme, the Navy, Army and Air cadets will retain their individual identity: a desire which was strongly expressed in the submissions of individuals and community groups and is shared by the Government.

This is stressed in our decision to adopt a common aim for all three organisations, which has been formulated bearing in mind the fact that the organisations will be funded from the Defence Vote, and that the public submissions received strongly favoured the maintenance of a military flavour in cadet activity.

The aim is to be as follows: "The common aim of the Australian Services' Cadet Schemes is, by

predominantly voluntary effort, better to equip young people for community life by fostering initiative, leadership, discipline and loyalty through training programmes also designed to stimulate an interest in a particular Arm of the Defence Force".

Besides introducing a common aim the Government has also decided that there should be a greater degree of commonality among the three Services' cadet schemes particularly in the nature of the Commonwealth assistance.

The Naval Reserve Cadets system will continue. A ceiling of 4000 cadets, which is an increase of about 1500, which will enable the Navy to maintain a similar proportion of cadets, compared to Service strength, as the Air Force. The total number of Permanent Naval Force personnel supporting naval cadet units will remain at 11 as under the previous scheme.

Naval cadets will also receive the same training as before which includes small boat safety, trips to sea on Naval ships and navigation.

Both Navy and Air Force Cadets will receive weapons training under the same conditions as Army Cadets.

As with Army units the Air Training Corps and Naval Reserve Cadets will rely heavily on volunteer instructors, trained by the parent Service.

This will provide a very rewarding part-time activity for men who wish to become involved in an active and stimulating form of youth work which the Government believes is essential to the character building of Australian youth.

Cadet officer/cadet instructors will be paid an annual allowance. The level of that allowance and the conditions under which it will be paid is a matter that will be examined by the established Defence machinery for pay and conditions of service.

Cadet service for girls will be given consideration after the new scheme is properly established and then the Government would welcome submissions on this.

At current prices the scheme will cost approximately \$5.77m for Army Cadets, \$1.19m for the Air Training Corps and \$640,000 for the Naval Reserve Cadets. This is a substantial amount but represents a reduction of some \$5.5m on the previous scheme at current prices.

I believe the community support necessary to make this scheme a success will be forthcoming, and once again cadet training will make a worthwhile contribution to the physical and mental development of Australia's young people.

CANADA

Cadet life points way to sound future

They have been called the "tomorrow" builders, and if tough, challenging and rewarding training is any criterion, the acclaim is deserved.

They're the thousands of sea, army and air cadets across the land who function under the auspices of the Canadian Forces cadet leagues.



His Excellency the Governor of New South Wales inspecting a Guard of Naval Reserve Cadets.

Aim of the movement is to develop in youth the attributes of good citizenship, promote physical fitness, and stimulate interest in the armed forces of Canada.

There now are 62,000 cadets enrolled in 966 cadet corps, from the east coast of Newfoundland to Vancouver Island, and as far north as Cambridge Bay.

Highlights of the year for cadets are the summer camps, athletic and training activities, exchange visits to the USA and European countries, and ships' cruises.

Training covers leadership, diving, sailing, communications, flying, gliding, mountaineering, survival, first aid, marksmanship and parachuting.

And last year, for the first time, girls officially were recognised as part of the cadet movement, when Bill C-6 was given royal assent in July.

About 2600 of 13,000 girl cadets attended summer camps for the first time. The first groups took leadership and challenge courses at Banff, Alta, national army cadet camp, while others attended courses at sea, army and air cadet camps across the country.

For youth who dreamt of a sea-faring life, the opportunity was provided by cruises in ships of the navy, the Canadian Coast Guard and environment department.

Exchange visits took 105 sea cadets to the US, England, the Netherlands, Germany, Sweden and Belgium.

National camps held at HMCS QUADRA, BC, CFB CORNWALLIS, NS, CFB HALIFAX, and HMCS HAIDA — moored in Toronto harbour — attracted 3000 cadets.

The youthful HAIDA sailors performed such duties as tour guides for visitors to the famous Second World War destroyer and fired a noon-day gun time check for Torontonians within earshot.

Another unique performance for Toronto cadets was the firing of field guns to support a performance of the 1812 Overture at Ontario Place.

Although cadet training ideally paves the way for a future in the Armed Forces, there is no compulsion on youth to follow through. Helping Canada shape the builders of tomorrow is return enough for the organisation charged with protecting the Canadian way of life.

OUR COVER

This latest artist's impression of the Vosper Thornycroft HARRIER CARRIER design shows two of the ships in company with a frigate escort. The nearest ship has one Sea Harrier on the VTO grid forward of the superstructure, another is nearing flight-deck level on the after lift, and a third is being prepared for take-off from the runway in the area aft the superstructure. A formation of four Sea Harriers is airborne, and a Lynx search-and-rescue helicopter keeps station on the ship's starboard beam. The HARRIER CARRIER in the background is operating SEA KING anti-submarine helicopters. (Refer Story).



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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.

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WESTERN AUSTRALIA: Staff Office Cadets, HMAS Leeuwin, PO Box 58, Fremantle, 6160.

SOUTH AUSTRALIA: Staff Office Cadets, HMAS Encounter, PO Box 117, Port Adelaide, 5015.

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TASMANIA: Staff Office Cadets, HMAS Huon, Hobart, 7000.

AUSTRALIAN CAPITAL TERRITORY: Staff Office Cadets, HMAS Watson, Watsons Bay, NSW, 2030.

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

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THE INDIAN OCEAN AND AUSTRALIAN STRATEGY

By A. W. Grazebrook

During the past two or three years, much has been said in Australia on the subject of the presence of super-power maritime forces in the Indian Ocean. In spite of all the attention given this subject, many commentators have ignored some very basic points.

A number of factors are relevant to Australian Strategy in the Indian Ocean:

- Strategic Mobility.
- The development of the Cockburn Sound Naval Operating Facility.
- Super-Power strength and potential strength in the Ocean.
- The Increasing Maritime Strength of Indian Ocean Regional Powers.
- The Distances between key Indian Ocean Strategic Points.
- The Balance of power in, and control of, Southern Africa.

To be effective in the Indian Ocean, armed force must be maritime force. It must be capable of fighting over long distances on, over, or under the sea. Probably the most significant aspect of maritime power is its mobility — not only tactical mobility but, perhaps in this case more significant, strategic mobility.

STRATEGIC MOBILITY AND AFLOAT SUPPORT

One particular aspect of the strategic mobility of maritime power that seems to have been largely ignored in much of the recent public comment. Much attention has been paid to bases — particularly naval bases. We have been told that the Russians have naval bases in Singapore, Somalia, Aden, Bangla Desh, and elsewhere. Concern has been expressed, in both the USA and a number of Indian Ocean nations, at the United States plans to build a naval base at Diego Garcia.

A largely ignored, but very important, aspect of the comment on bases is that both super-powers involved can deploy substantial maritime power for extended periods in the Indian Ocean without bases. The controversial bases, which would probably be little more than stores depots with some relatively minor maintenance facilities without access

to an industrial base, would certainly make the employment of maritime power in the Indian Ocean cheaper, and represent a degree of political commitment to allies on the part of the super-power involved.

However, if the bases are not there, both the United States and the USSR have sufficient afloat support to keep very substantial forces operating in the Indian Ocean — on a rotation basis, virtually permanently.

Clearly, both the USSR and the USA are well aware of this fundamental aspect of maritime power in the 1970s and 1980s. The comments of their senior Admirals are ample evidence of this. Both have been practicing the afloat support concept in the Mediterranean for some years. If further evidence were needed, it can be provided by a glance at their recent and forthcoming new construction programmes:

USA 1976-80 Financial Years

- 3 Ammunition Ships (AE).
- 3 Combat Stores Ships (AFS).
- 11 oilers (AO).
- 46 other auxiliary ships (including destroyer tenders, submarine tenders and ocean-going fleet tugs).

USSR

The current ship-building programme includes: 4 UGRA Class Submarine Depot Ships, AMUR class Repair Ships, CHILIKIN Class Fleet Replenishment Ships.

Existing Soviet Afloat Support Craft include: 19 Submarine Depot and Support Craft, 6 Missile Support Ships, 13 Repair Ships, 8 Replenishment Tankers.

In addition, State-owned Soviet merchant craft have been used extensively for replenishment of Soviet warships.

Bases have clear advantages over afloat support — economy, virtually

limitless storage, availability of civilian technicians, and so forth. However, the lack of bases will not deny the Indian Ocean to substantial maritime forces of the USA and USSR.

THE OPERATIONAL MOBILITY OF MARITIME POWER

Much of the public comment and dispute over the number of warships either the USA or the USSR has in the Indian Ocean also ignores another fundamental aspect of maritime power — its operational mobility.

It is largely irrelevant whether or not either super-power has a task force in the Indian Ocean at a given time. If either power lacks a task force there, and they conceive a need for such a task force, a major force can be deployed by either power into the Indian Ocean within three weeks.

The USSR can move such forces from their Mediterranean Fleet through the Suez Canal; from their Atlantic Fleet around the Cape of Good Hope or, as they have done frequently, from their Far East Fleet through the Malacca Straits.

Similarly, the USA can move substantial maritime forces into the Indian Ocean at short notice.

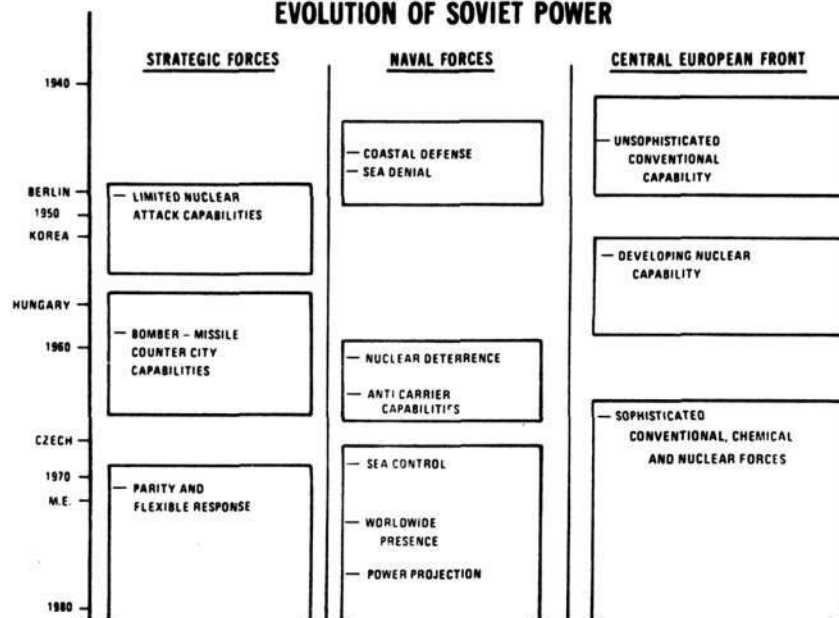
One effect of this is to make any agreement between super-powers to withdraw their maritime forces from the Indian Ocean virtually meaningless. Quite apart from the difficulty of policing such an agreement, either power could have major naval forces back in the Indian Ocean in a very short period.

During World War II, there were many examples of rapid strategic redeployment of maritime power. The movement of US carrier forces from the Coral Sea to the Midway Area in May/June, 1942, is one example. Another is the deployment of the British Force H from Gibraltar for the assault on Madagascar in 1942.

The rapidity of redeployment, and the extent to which maritime forces can operate with afloat support, has been greatly improved as a result of

The graphics summarise concisely some of the trends in the Soviet Defence posture that are so disquieting to US Officials.

EVOLUTION OF SOVIET POWER



When one considers the strategic nuclear, naval, and Central European Front Balances together, it is apparent that significant changes in Soviet capabilities have occurred in the past 15 years. The Soviets have come from the unsophisticated, continentally confined armed forces of the post World War II days to clear military super-power status in the 1970's.

There is powerful momentum in Soviet military programmes and in the emerging pattern of external projection of Soviet power.

extensive practical experience in the Pacific during World War II and since. That experience and expertise has now been built into the second generation of US afloat support craft.

INDIAN OCEAN DISTANCES

A recent Australian Defence Minister once remarked that "Some commentators seem to forget the effect of the enormous distances of the Indian Ocean". The distances are substantial indeed (a fact often obscured by Mercator's projection, as Admiral Somerville once complained).

However, the distances are not insuperable. Taiwanese fishing vessels have little difficulty in operating off our coasts 2500 miles from their home ports.

World War II submarines operated from Fremantle right up into the China Sea. A modern 1000-ton diesel-electric submarine has a range four times the distance from Ceylon to Fremantle.

A light carrier task force with a replenishment at sea capability, based

on the other side of the Indian Ocean, would have sufficient range to operate in our maritime area for extended periods. During World War II, converted German merchantmen laid mines off the Victorian Coast.

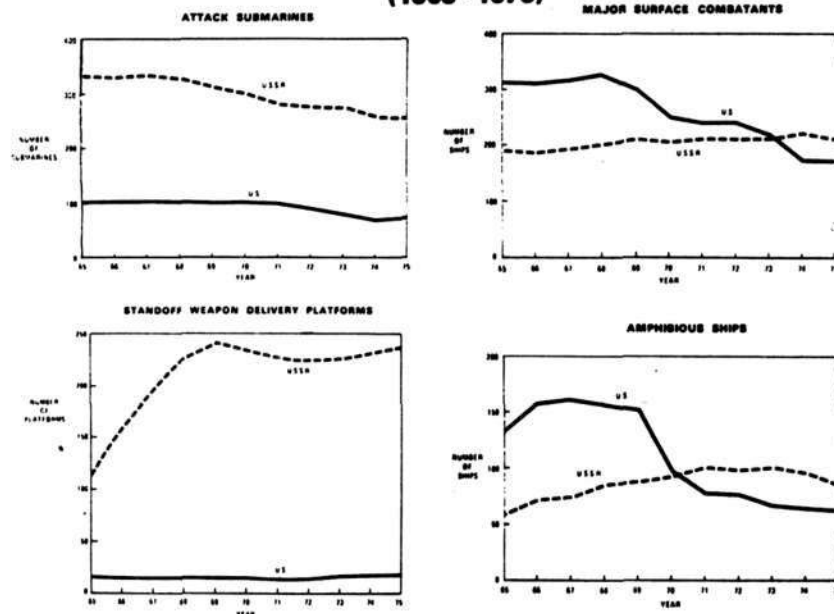
There is no doubt that the Indian Ocean is a moat — one of the largest in the world. However, moats can be crossed and, perhaps more pertinent, many critical battles have been fought to prevent or permit the crossing of such moats.

SOUTHERN AFRICA AND THE INDIAN OCEAN

Since well before the turn of the century, Western naval bases in Southern Africa have been secure — secure as a basis for the safety of western trade around the Cape of Good Hope.

These bases — primarily Simonstown in South Africa, but also other ports — were used extensively

CHANGES IN NAVAL FORCE LEVELS -- U.S./U.S.S.R. (1965 - 1975)



The Soviet Force has become smaller with the retirement of large numbers of diesel submarines. However, the Soviets retain a 2.5-to-1 advantage in attack submarines.

The Soviets have 20% greater numbers of major surface combatants — aircraft carriers, cruisers,

destroyers, and frigates — although the US has an unquestioned lead in sea-based aviation.

There is a marked asymmetry in the way the two Navies have dispersed offensive, standoff weapons capability — the US standoff, offensive strength lies almost entirely in 13

aircraft carriers, where the Soviets have some 240 ships with standoff, weapons capability.

The Soviets have built a force of amphibious lift ships which numerically exceeds those of the US, however, US assault capability and flexibility vastly exceeds theirs.

during World War II for defence against submarines and surface warships.

Since 1967, the closure of the Suez Canal has increased greatly the amount of trade passing around the Cape of Good Hope. During this period, the economy of scale of ships has reached a point where many craft are too large to pass through the reopened Suez Canal.

Whilst there are plans to widen the Suez Canal, these will not bear fruit for some years — even assuming that the political instability of the Middle

East neither retards the plans nor re-closes the Canal.

The size of the newer merchant ships, coupled with the probability that no wise power or business will rely upon the Suez Canal being both open and their ships permitted to pass, make it probable that the Cape of Good Hope shipping routes will remain at least as vital to Australian trade during the next decade as they have been since 1967.

In these circumstances, Australian strategists could be wise to examine the future of Southern Africa, with particular reference to the probable

political hue of the power or powers in control of that part of the African Continent. This is not a matter of one or another approach to apartheid. It is a case of taking an objective and pragmatic approach to Australian strategy.

At the present time, those in control of Southern Africa are very far from hostile towards Australia. Should that situation change, and a power antipathetic or hostile to Australia gain control of Southern Africa and, perhaps, the Southern African Armed Forces, it would be a matter of vital concern to Australia.

The figure consists of three line graphs showing force levels for ICBMs, SLBMs, and Bombers from 1965 to 1975 for the US and USSR.

- ICBMs:** The USSR force level starts at approximately 250 in 1965, rises sharply to about 1500 by 1973, and then levels off. The US force level starts at approximately 850, rises to 1000 by 1968, and remains constant thereafter.
- SLBMs:** The USSR force level starts at approximately 450 in 1965, rises to about 600 by 1968, and remains constant thereafter. The US force level starts at approximately 100, rises to about 600 by 1973, and then levels off.
- BOMBERS:** The FB-111A force level starts at approximately 900 in 1965, declines to about 500 by 1970, and then levels off. The US force level starts at approximately 900 in 1965, declines to about 500 by 1970, and then levels off. The BACKFIRE USSR force level starts at approximately 150 in 1965, declines slightly to about 140 by 1970, and then levels off.

| Year | ICBM USSR | ICBM US | SLBM USSR | SLBM US | Bomber FB-111A | Bomber US | Bomber BACKFIRE USSR |
|------|-----------|---------|-----------|---------|----------------|-----------|----------------------|
| 1965 | 250 | 850 | 450 | 100 | 900 | 900 | 150 |
| 1970 | 1400 | 1000 | 600 | 300 | 500 | 500 | 140 |
| 1975 | 1500 | 1000 | 600 | 600 | 500 | 500 | 140 |

Page Eleven

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OVERSEAS DESIGNS TO COMPETE FOR AUSTRALIAN PATROL BOAT ORDER

Of the eleven shipbuilders (two British, one German, one French, one Swedish and six Australian) invited to tender for project definition study contracts relating to the supply of the new class of patrol craft, designs from Britain and West Germany have been selected to compete for a reported \$70 million order for new patrol craft for the Royal Australian Navy.

Although overseas designs have been selected, the new patrol boats, with the exception of lead craft (expected to enter service 1979), will be built in Australia giving an important boost to the Australian shipbuilding industry.

The designs selected are from Brooke Marine of the United Kingdom (PCF420) and Lürssen Werft of the Federal Republic of Germany (variant

of the FPB45). Readers should refer to the May-June-July, 1975 edition of this magazine for complete details of the classes selected.

The PCF420 is 42 metres long and displaces about 220 tonnes. It is a development of the proven PCF375 patrol craft in service in the Persian Gulf and Africa.

Patrol craft of the FPB45 type are in service with a number of navies

throughout the world. It is 45 metres long and displaces about 250 tonnes.

The main armament of both designs has yet to be selected, but it will include a modern general purpose close range gun.

The designs were chosen to compete for the Australian order after evaluation of proposals from numerous Australian and overseas shipbuilders. Both designs are variations of modern, well-proven designs, and are well suited to Australia's special requirements.

Australia's present force of 12 Attack Class Patrol Boats are hard pressed to patrol Australia's 20,000 kilometre coastline, and the prospect of a 320 kilometre economic resources zone makes it imperative that more patrol boats are built with a better range and sea-keeping qualities than the present Attack Class.

The two designs will be evaluated following project definition in Australia which would provide detailed information on the costs and capabilities of the craft.

Following evaluation late this year a decision will be made on the craft to be acquired, numbers to be built and the Australian shipbuilder.

Australian shipbuilders under consideration are:

- Vickers Cockatoo Dockyard Pty Ltd;
 - North Queensland Engineers and Agents Pty Ltd;
 - Carrington Shipway Pty Ltd in association with de Havilland Marine Ltd;
 - Dillingham Shipyard (WA) Pty Ltd.
- Project definition will provide costs for construction of 10 craft and options for up to a further five.



Brooke Marine PCF 420

An artist's impression of the patrol boats selected for project definition as possible replacements for the RAN's existing Attack class patrol boats.



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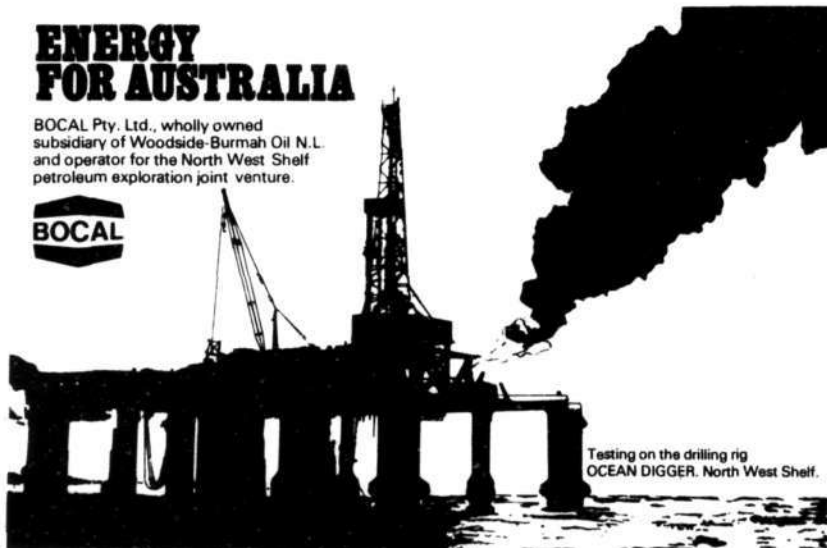
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The editor invites persons to submit articles, photographs, and drawings (black ink) for inclusion in the magazine. All contributions should be made for contributions submitted. Contributions should be addressed: The Editor, The Navy, 26 Wesson Road, West Pennant Hills, NSW 2112.

Authors are requested to include a photograph of their own or other with their biographical particulars.

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

PHOTOS FROM FAR AND WIDE

JETS IN FORMATION



A close-flying formation of four Navy Skyhawk jets come in to land at HMAS ALBATROSS, the naval air station at Nowra, NSW. The jets operate from the carrier, HMAS MELBOURNE, and use the Nowra base for training and land-based operations.

PRINCE CHARLES PIPED ABOARD HIS FIRST COMMAND

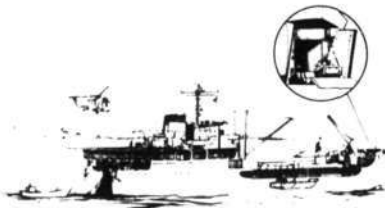


Prince Charles is piped aboard HMS BRONINGTON as the vessel's new captain — his first command — at the Rosyth Naval Base in Scotland. Bronington a 360-ton Ton class mine-hunter, is part of the Royal Navy's 1st Mine Countermeasures Squadron based at Rosyth and will be mainly operating in northern British waters. She has a ship's company of four officers and 33 ratings.

The Prince, a lieutenant in the Royal Navy, is the first member of the Royal Family to command a Royal Naval vessel since 1950, when his father, the Duke of Edinburgh, was captain of the frigate MAGPIE in the Mediterranean Fleet.

He entered the Royal Navy in September, 1971, after having served at the Royal Air Force College, Cranwell, where he obtained his wings, making a solo flight in a jet Provost training aircraft and co-piloting a super-sonic Phantom. His naval career has included an extensive period as a pilot in an operational helicopter squadron.

JOINT OPERATIONS SHIP — HMAS TOBRUK



Amphibious Heavy Lift Ship

The memory of the "Rats of Tobruk" and the men of the RAN who supported them will be perpetuated in the name of a new naval ship.

HMAS TOBRUK, which is expected to join the Fleet in 1980, will be a joint operations ship capable of carrying several hundred soldiers, battle tanks, artillery, and other equipment.

The 6000-tonne ship is designed to operate in undeveloped areas with minimal or non-existent port facilities. It will unload by beaching itself and driving vehicles ashore through its bow doors, or by using its landing craft, helicopters, pontoons, or amphibious vehicles.



LAUNCH OF BOFORS ROCKETS AND IKARA MISSILE FROM BRAZILIAN FRIGATE NITEROI



The Brazilian frigate NITEROI, first of four 3500-ton Vosper Thornycroft Mark 10S under construction at the company's Woolston, Southampton, shipyard, is now undergoing contractor's sea trials. Recently the armament of this ship, which is to the anti-submarine version of the Mark 10 design, was given trials on ranges in the English Channel, to prove that structure adjacent to the weapon launchers was not damaged by blast. The photographs show the launching of one of the Bofors 375-mm medium-range A/S rockets (left picture) and of an Ikara long-range A/S guided weapon (right picture).

NEW CLASS OF FISHERY PROTECTION VESSEL FOR ROYAL NAVY

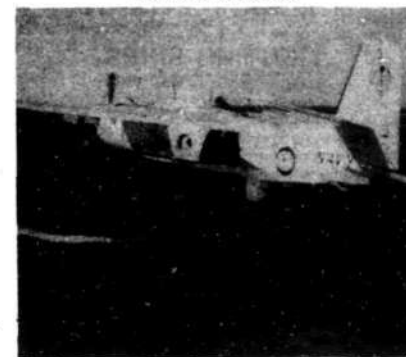


HMS KINGFISHER, the first of a new class of patrol vessel specially built for the Royal Navy, sets sail on her first fishery protection patrol from Rosyth, Scotland. Her patrol will cover the North Sea and the English Channel areas.

The 120 feet long, 190-ton vessel will primarily operate in coastal regions, although eventually, Britain's North Sea oil rigs could also form part of her patrol. Three more vessels of the type — the Bird class — are being built for evaluation in fishery protection, the first ships specifically built for this role by the Royal Navy. Until now, fishery protection in coastal regions has been carried out by coastal mine sweepers.

The KINGFISHER is armed with a Bofors gun mounted aft and two machine guns on the bridge, and her speed is in the region of 20 to 24 knots.

SURVEILLANCE OF TAIWANESE FISHING VESSELS



A Royal Australian Navy Tracker aircraft on a fisheries surveillance patrol flies low over a Taiwanese fishing boat off the west Australian coast. The Trackers, which have been primarily concerned with monitoring the activities of Indonesian traditional fishermen off the north-west coast, have completed their task and left Broome to return to their base at Nowra, on June 10, 1976. Increased patrols by RAAF long range maritime patrol aircraft, and RAN patrol boats will continue to provide surveillance of the large Taiwanese fishing fleet gathering off Western Australia.

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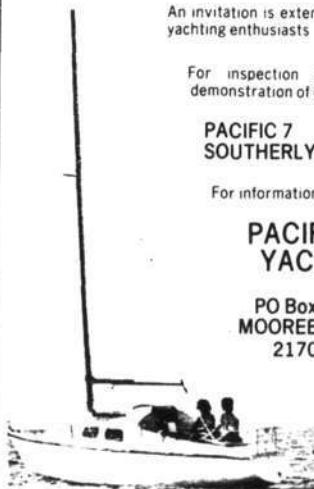
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Destroyers for The Royal Australian Navy

Statement by the Honourable D. J. Killen, MP, Minister for Defence

I wish to announce the Government's decision to acquire two Guided Missile Frigates for the Royal Australian Navy. The ships will be procured from the United States Navy construction programme for Guided Missile Frigates. These ships were previously known as Patrol Frigates and are now called the "FFG-7, Oliver Hazard Perry Class". The two ships will be in service by 1982.

The "sail-away" cost for the two ships as procured from the United States is \$A195m in January 1976 prices. The total project investment cost, including helicopters, spares, test equipment, ammunition and so on, for the two ships has been estimated at \$A330m in January 1976 prices.

Members will be aware that in our pre-election "Defence Policy" we said that we would give priority to a review of the previous Government's cancellation of the light destroyer (DDL) programme. We also said that it might be necessary now to accept a modified destroyer design. The review has been completed and the results have been presented to the Government.

The review which was most comprehensive covered the characteristics required of the

destroyers, the pros and cons of re-instituting the DDL programme, the acquisition of FFGs and of alternative ships to meet the current destroyer requirements of the Navy. The Navy itself has been deeply involved in the United States FFG programme and has also conducted its own independent and very searching investigations. The unanimous advice I have received from my advisers is that the DDL programme can no longer be considered because of costs and prospective delays.

It might be remembered that at the time of the Coalition Government's approval in 1972 the DDL was to include essentially the same weapons and sensor capability as the then Patrol Frigate (area air-defence weapons, helicopter operation, anti-ship missile), except that the DDL was planned to have a larger gun. The DDL

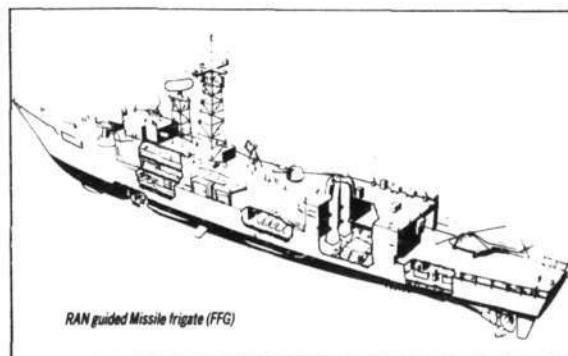
hull and machinery outfit would have been less austere than the Patrol Frigate. There were some other unsatisfactory features in the design of the then Patrol Frigate.

Over the last three to four years the United States Navy has developed the Guided Missile Frigate to have a capability much closer to the DDL than that of the original Patrol Frigate design. I might add that some of the improvements have been influenced by the input of Australian professional judgement through RAN participation in the United States Navy Programme. There will be some relatively minor modifications in the RAN version of the FFG, specifically to meet Australian operational requirements.

The FFG will provide the RAN with the essential characteristics required in this destroyer acquisition. It will provide them at lower cost. There is no doubt that the DDL would have been a less austere ship and would, if successfully developed, have provided a marginally better fighting capability; but it would now be too late in time. It had reached the preliminary design stage only.

The DDL Programme has lost its momentum and the development of a detailed design together with the substantial workload and facilities modernisation programme of the Williamstown Dockyard would not permit destroyer construction to commence in Australia until 1980. It is currently estimated that the DDL Programme for two ships would cost about \$130m more than the FFG Programme — \$460m against \$330m. The DDL would enter service some five years later than the FFG.

The Government believes that the FFG is now the best choice if replacement of destroyers due to retire in the early 1980s is to be effected in a timely and economic fashion. The Government has no doubts that the ships will be a most appropriate adjunct to the RAN. The



RAN guided missile frigate (FFG)

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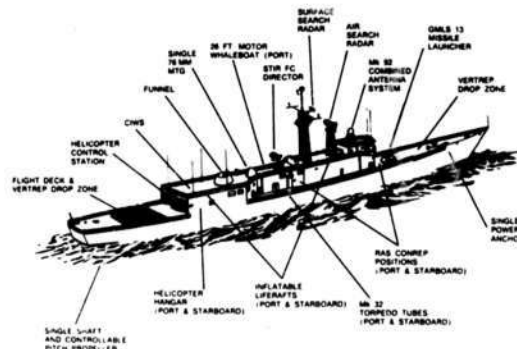
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Weapons fit of FFG-7

Navy has demonstrated that the ship will have the performance that it needs in service.

Substantial effort has been exerted by US and Australian authorities in developing an adequate level of Australian industry participation against an FFG purchase. Provided Australian industry is sufficiently competitive, there is a good prospect of Australian industry participation against the ship acquisition. In this

regard we will be supported by the US Department of Defence and I have directed that my Department make every effort to increase the scope of participation.

The United States Navy FFG Programme consists of a lead ship (prototype) and a series of follow-ships. The lead ship was funded in the United States Budget for fiscal year 1973 and is now under construction. The first three follow-ships were

funded in fiscal year 1975. The United States 1976 Defence Appropriation Bill which includes funds for a further six ships was signed by the President on February 9, 1976. In the proposed budget for fiscal year 1977 presented to Congress on January 21, 1976, the United States Department of Defence has sought funds for a further eight follow-ships. The total projected US programme is 70 ships including the lead ship.

The FFG Programme is in a very highly developed state with all weapon and ship systems thoroughly researched and tested at a very considerable expense. The fact that systems have been proved at sea prior even to the building of the lead ship is a strong assurance of the success of the programme. We are joining this programme on very advantageous conditions. Because it is a major United States Programme we will reap the benefit of concurrent procurement with the United States and the economics of scale.

In all, the Government is satisfied that the Navy's present needs for destroyer acquisition will be met by the procurement of the two Guided Missile Frigates and that they will prove most adequate to enhance the Navy's destroyer force when they enter service. Whilst these ships



Artist's impression of FFG-7



Model of FFG-7

represent a significant contribution to the strength of the Royal Australian Navy, the Government believes that further acquisitions will be necessary in due course. Studies are now underway to determine what future additions to the RAN are required. Whether or not future selections are of this type of ship is yet to be determined.

THE ROLE OF THE FFG-7 CLASS IN THE RAN

Although the FFG-7 class is scheduled to come into service about the time the RAN's present Daring-class destroyers are due to reach the end of their useful lives the new ships are not intended simply to replace the capability represented by the Darings. HMA Ships VAMPIRE and VENDETTA are specialised gunnery ships, having six 4.5 inch guns each. The FFG-7 class ships are intended to enhance existing capabilities, such as area air defence, and to provide the RAN with capabilities it does not possess in its present destroyer fleet — armed helicopters for surveillance and strike against suitable targets, and surface-to-surface missile capability. Both these capabilities together with good seakeeping and endurance have been given high priority by other modern navies, and are essential for the RAN in the 1980s and 1990s.

THE DESIGN CONCEPT OF THE FFG-7

Considerable emphasis has been placed on economy in the design of the FFG-7 class, both in terms of construction and running costs. The hull and superstructure are prefabricated, and the US programme aims at achieving economies through construction of a large number of

ships. The internal arrangements aim at economical use of manpower and space; and significant savings should result from the use of gas turbine propulsion (see above), and maintenance arrangements which allow parts to be removed and be replaced by new parts while the original part is serviced ashore. This scheme will enable the ship to spend more time at sea and less time alongside for maintenance.

WEAPONS

- Mk 13 missile launcher which can launch either the STANDARD area defence anti-aircraft missile or the HARPOON anti-ship missile. Both missiles are stored in a common magazine below the launcher, and the launcher can fire a missile, reload and be ready to fire again in seconds. Both missiles are about 5 metres long. STANDARD is radar-guided and can intercept aircraft more than 15 nautical miles from the ship; HARPOON is a homing weapon which can attack ships over 60 nautical miles away.

- OTO Melara 76mm rapid fire gun is mounted amidships to give it maximum field of fire against aircraft and incoming missiles. The gun is normally fired remotely by a man sitting at a console; no personnel are required inside the mounting. The rate of fire of this Italian-designed weapon ranges from 10 to 85 rounds per minute.

- Weight and space have been provided in the FFG-7 design for a close-in weapon system which would be intended to intercept any incoming missiles which evade the ship's longer range defences. One system under development uses a radar-controlled gun which, with a rate of fire of several thousand rounds per minute, throws out a hail of metal which is extremely difficult for a missile to penetrate.

- The RAN FFG class will carry two armed helicopters of a type yet to be determined. Two helicopters are considered necessary to provide maximum availability of aircraft. The helicopters will enable the ships to carry out effective surveillance over greater areas of ocean than any previous RAN ships with the exception of aircraft carriers. Depending on the type of helicopter selected weapon systems could include, torpedoes and possibly a stand-off missile system to enable them to engage missile-carrying patrol craft.

- The RAN FFG will also carry two triple-torpedo tubes. Homing torpedoes will give the ship an effective anti-submarine capability.

ELECTRONIC SYSTEMS

The RAN FFG will be equipped with various radars, probably an Australian-developed sonar system, electronic warfare equipment, fire control systems, comprehensive communications, and an automated naval combat data system.

Radars will include:

- AN SPS-49 long range air search and early warning radar;
- AN SPS-55 search and navigation radar;

- Mk 92/STIR gun/missile fire control system.

If trials of the Australian developed MULLOKA active sonar system continue to prove satisfactory it is planned to fit this system to the RAN FFG class and other Australian warships. The system has been designed to suit Australian conditions, and its performance to date suggests that in these conditions it will be equal or superior to other comparable systems. FFG-7 class ships built for the US Navy will be fitted with an American sonar at present also undergoing trials. (Active sonar detects submarines by emitting a sound pulse underwater and listening for echoes bounced off any hard submerged object. The quality of sound propagation underwater varies greatly from one part of the world to another.)

The Australian FFG electronic warfare fit has yet to be determined. Electronic warfare equipment is vital in modern naval warfare as it can give warning of the presence of an otherwise undetected enemy, and provide some capability to counteract.

A naval combat data system will

process and present information from the ship's sensors in a form such as to enable officers in the ship's operations room to make rapid decisions on offensive or defensive action. Modifications of the original US design suggested by the RAN will be incorporated in both USN and RAN Ships.

An external communications fit to suit Australian operational needs will be provided. It will include some Australian designed and manufactured equipment.

PERSONNEL

The complement of the RAN FFG class — about 185 including air crew and maintainers for the helicopter flight — will be considerably smaller than for a destroyer of similar displacement. (Daring class destroyers have a complement of 321). As manpower costs represent a high proportion of the Defence budget this will represent a considerable saving over the life of the ship. All living and working spaces will be air-conditioned and certain modifications have been made to the US design to bring the ship into conformity with Australian accommodation standards.

PROPULSION

The FFG-7 class will be the first ships in the RAN to be powered by gas turbine. These engines are derived from aircraft jet engines, and the LM-2500 engine to be used in the FFG-7 is a derivative of the CF6 engine in service in the DC-10 airliner. Gas turbines can be started instantly whereas steam turbines must be "warmed-up" for several hours before a ship is ready to put to sea. Gas turbines also require fewer personnel aboard ship, and simplify on-board maintenance. The FFG-7 engines can be controlled directly from the bridge.

The two LM-2500 engines, producing a total of 40,000 shaft horsepower, will be connected to a single variable pitch/reversible pitch propeller. Single propellers have been unusual in destroyers, but are used extensively in nuclear submarines. The RAN and the US Navy believe there will be only marginal operating disadvantages in this system but major savings in the weight, space, and cost of the ship. The system and the engines are being extensively tested at sea and ashore by the US Navy before being incorporated in the FFG-7.

While cruising the FFG-7 will

operate on one turbine, and when bursts of speed are required the second engine will be coupled to the propeller. This system gives the ship good range, and eliminates the need for two additional gas turbines (two smaller turbines for cruise and two larger ones for high speed) as fitted to twin propeller gas turbine warships.

In addition two auxiliary propulsors will be fitted which will be used in manoeuvres in confined spaces, such as berthing, and provide the ship with a means of emergency propulsion should the main propeller become inoperable.

RAN MODIFICATIONS

An allowance of about \$12 million is being made in the project for modifications to the ships to suit RAN conditions. These modifications include:

- Substitution of the Australian-designed MULLOKA sonar for the US set being developed for the FFG-7 (Subject to satisfactory performance);
- Addition of stabilisers;
- Redesign of external communication fit;

- Improvements to the air conditioning and fresh water distilling capacity to suit the warmer climate in which RAN ships often operate;
- Changes to accommodation arrangements to suit RAN requirements; and
- Various smaller changes such as additional lifesaving equipment.

The RAN team working with the US Navy on the design of the FFG-7 has made various suggestions for improvements to the US design and some of these, such as changes in the naval combat data system, and installation of an additional generator, have been adopted by the US Navy.

STATISTICS

Displacement: 3500 tonnes (full load).
Length: 136m (445ft).
Beam: 13.7m (45ft).
Draft: 7.5m (24.5ft).
Complement: About 185 (subject to review when helicopter type is selected).
Cruising Speed: 20 knots.
Max Speed: In excess of 28 knots.
Range: In excess of current RAN destroyers.

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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

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"The Navy" magazine,
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NOTICE TO ADVERTISERS

The Trade Practices Act, 1974 came into force on October 1, 1974. There are important new provisions in that Act which contain strict regulations on advertising and all advertisers and advertising agents are advised to study those provisions very carefully. It can be an offence for anyone to engage, in trade or commerce, in conduct "misleading or deceptive". In particular Section 53 contains prohibitions from doing any of the following in connection with the supply of goods or services or in connection with the promotion, by any means, of the supply or use of goods or services:

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It is not possible for this company to ensure that advertisements which are published in this magazine comply with the Act and the responsibility must therefore be on the person, company or advertising agency submitting the advertisements for publication.

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THE RAN'S BLACKEST DAY

April 12, 1924, has often been described as the RAN's blackest day. On that day, the nation's first capital ship, the indefatigable class battle cruiser AUSTRALIA, was towed out of Sydney Harbour and ceremonially sunk in accordance with the principles of the Washington Naval Treaty of that year. Although only eleven years old, AUSTRALIA had not been included in the total of fifteen capital ships allowed to be retained by the Royal Navy under the Treaty, and as a result of this was listed for disposal.

Escorted by the cruisers MELBOURNE, BRISBANE and ADELAIDE and the destroyers ANZAC and STALWART, AUSTRALIA headed out of Sydney on her last voyage a little after noon. At 2.30 pm the skeleton crew on board opened the sea-cocks and hurriedly joined the waiting ship's boat of BRISBANE. Watched by five ferries loaded with mourners, the AUSTRALIA, complete with her White Ensign and Australian Flag, slowly sank to the bottom.

Originally laid down in June, 1910, by J. Brown & Co Ltd, Clydebank, AUSTRALIA was launched on October 25, 1911, and completed in June, 1913. After undergoing builders' trials, AUSTRALIA left British waters and made for Sydney via the Suez Canal, arriving in Australia in September.

On October 4, 1913, she led the new Australian Fleet into Sydney Harbour for the first time. This fleet included the cruisers ENCOUNTER, SYDNEY and MELBOURNE, and the destroyers PARRAMATTA, YARRA and WARREGO. Admiralty pressure



HMAS AUSTRALIA, a battlecruiser of the indefatigable class, she was towed out and sunk off Sydney in 1924.



By ROSS GILLET

was brought to bear on the Federal Government that the AUSTRALIA be transferred to the British Fleet, since the vessel served no worthwhile part in Pacific defence. Arguments for and against the transfer were still being

debated when war broke out on August 4, 1914.

Mr Winston Churchill, First Lord of the Admiralty, put forward plans that the RAN flagship be transferred to the Atlantic station, but continued local fears of the German armoured cruisers SCHARNHORST and GNEISENAU, under Von Spee, led to the AUSTRALIA being deployed to New Guinea waters. With Vice-Admiral Patey in command, AUSTRALIA began the futile search for Von Spee's Squadron. Joining up with the MELBOURNE, both ships sailed for New Caledonia, arriving on August 21, 1914. With the MONTCALM, an old French armoured cruiser, completed in 1904, the two Australian warships escorted a New

Zealand Expeditionary Force to Samoa.

After returning to the search for Von Spee around Fiji, AUSTRALIA received orders to proceed to the North Sea. On her way to England in January, 1915, she intercepted and sank the German ship ELENORE WOERMANN off the Falkland Islands. Upon her arrival in English waters, she became Flagship of the 2nd Battlecruiser Squadron.

A collision with her sister ship, NEW ZEALAND, in 1916, robbed the AUSTRALIA of her chance of participating in the Battle of Jutland. Experiments in handling aircraft were begun in 1917, and in December of that year, she successfully launched aircraft from her decks.

AUSTRALIA continued patrol duties in the North Sea, searching for enemy vessels until armistice was declared. With the SYDNEY and MELBOURNE, she attended the surrender of the German High Seas Fleet in the Firth of Forth on November 21, 1918, her task being the acceptance of surrender from the German Battlecruiser HINDENBURG.

On June 15, 1919, she returned to Sydney and again became RAN Flagship until being paid off to reserve at the end of 1921. Of her sister ships, NEW ZEALAND, scrapped in 1922, served mainly with the Royal Navy, and INDEFATIGABLE was lost at Jutland due to a lack of armour protection.

STATISTICS

Displacement: 21,300 tons (full load).
Dimensions: 590' x 80' x 30'.
Armament: 8 x 12", 14 x 4", 1 x 4" aa, 1 x 3" aa, 4 x 3 pdr, 5 x MG, 2 x 18" TT.
Machinery: Parsons Turbines.
Speed: 25 knots.
Radius: 6300 miles at 10 knots.
Complement: 820.



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HARRIER CARRIER PROPOSAL

A feasibility study carried out by Vosper Thornycroft in consultation with Hawker Siddeley Aviation has resulted in the preparation of an outline design for a completely new type of warship — a vessel of frigate size capable of acting as a base for eight Sea Harrier V/STOL (vertical/short take-off and landing) aircraft. The ship is also suitable for carrying eight Sea King A/S helicopters, or a mix of helicopters and Harriers totalling eight aircraft.

The basic concept of the HARRIER CARRIER is that it should be the smallest and cheapest autonomous warship capable of making full use of the unique operational capabilities of the Sea Harrier aircraft. The unique capabilities of the Harrier stem from its specially developed Pegasus engine, which provides vectored thrust by rotating the four exhaust nozzles, and from aircraft's control system which enables it to hover.

The thrust can be directed vertically for vertical take-off and landing horizontally for forward flight at up to high subsonic speeds, and in intermediate directions for short take-off runs. The Sea Harrier is being designed for use in the fighter reconnaissance and air-to-surface Strike roles.

The Royal Navy version is designated FRS Mk 1. The US Marine Corps have already used their Harriers from flight decks to carry and dispense sonobuoys and the aircraft is capable of carrying air-dropped torpedoes.

The Sea Harrier gives many of the launch and recovery advantages of the helicopter combined with the offence/defence capability of a conventional high-performance jet aircraft and thus provides a weapons system of immense tactical versatility.

To exploit the full potential of the Sea Harrier it is necessary to make provision for a short take-off run, since this allows a larger payload than can be lifted in the pure vertical take-off mode.

Vosper Thornycroft have designed a ship with a flight deck long enough to allow the Sea Harrier to take off with its maximum load when underway and heading into a light (10-

knot) breeze in still-air conditions there may be a small reduction in payload, depending on the mission requirements.

The HARRIER CARRIER has an overall length of 450ft and a displacement of about 6000 tons — comparable in size with a modern frigate. Propulsion machinery for top speeds in the range of 25-30 knots, according to requirements, is envisaged. A complement of some 250 officers and men is provided for.

The flight deck runs the full length of the ship. An island superstructure occupies part of the starboard side, leaving the full runway width required by the Harrier — about 40ft — to port. The area on deck abaft the superstructure provides for three Harriers to hold clear of the runway, while a fourth is taking off. This makes it possible to launch a flight of four Sea Harriers with a minimum of delay.

A specially designed VTO gridded area, with ducting to carry away the Harrier's exhaust gases, is provided forward of the superstructure, also clear of the runway for a Harrier to wait at immediate readiness for a scramble VTO. Quick release hold-down gear, releasable by the pilot from the cockpit, may be used to tie this aircraft firmly on deck until the engine reaches full power. The combination of tie-down and grid ensures that the Harrier achieves a maximum VTO payload safely in a wide range of sea states. Alternatively, this area could be used by a helicopter, whether for search and rescue or other duties.

An advanced but simple handling system is provided on both flight and hangar decks to ensure swift and secure handling of aircraft in a wide

range of weather conditions and sea states. A turntable at the after end of the flight deck runway helps reduce the intervals between take-offs. A pilot-released hold-back tie attached to the undercarriage allows the engine to be run up to full power before the aircraft is committed to rolling. Since there is no intention to operate conventional fixed wing aircraft and the HARRIER CARRIER is not intended to be comparable with a normal aircraft carrier (which would in any case be much larger and many times more costly) there is no requirement for catapults or arrestor gear. Two lifts are provided for moving aircraft between the hangar deck and the flight deck. This ensures that any particular aircraft can be moved without the need to move other aircraft.

While it is envisaged that Harriers will normally launch using the STO runway, with the ship heading into the wind, landings will always be vertical. Vertical landings can be accomplished without the need to impose limitations on ship speed or heading or to steam so as to provide a specific relative wind over deck. This recovery freedom confers greatly increased tactical ease of manoeuvre on the ship compared with conventional aircraft carriers.

All design aspects of the HARRIER CARRIER's flight deck, aircraft handling, and safety arrangements have been worked out in consultation with Hawker Siddeley Aviation and are based on actual operating experience at sea with the Harrier.

Full radar air traffic control and navigational systems are provided for in the HARRIER CARRIER design. For surveillance separate height finding and two-dimensional radars are specified. The height finder is the Marconi S613N, which can accurately determine the altitudes of up to 20 aircraft targets at a minute at ranges of up to 120 miles. To match this range, and to provide sophisticated anti-clutter and ECCM processing facilities, the Plessey AWS-3 two-dimensional radar is proposed. However, there would be a substantial cost saving if the smaller



An artist's impression of the HARRIER CARRIER, a vessel of frigate size able to accommodate 8 Sea Harrier V/STOL aircraft.

AWS-5 radar were substituted, with a detection range of 80-90 miles, and in many cases this would be an acceptable compromise. The HARRIER CARRIER would often be operating in company with small radar picket ships, which would give advance warnings of approaching air targets.

The Air Group operational functions of the ship are divided into three sections, each with its own compartment. There are the operations room, the flight control office ('flyco') and the lighter direction office.

The operations room has all displays and controls needed to compile air and surface tactical pictures and present them to the command. The action information and flying control organisation is computer-assisted using a modification of the Ferranti CAAIS (computer-assisted action information system) which is already well-proven in the role of aircraft control. Two main command displays with similar facilities are provided for tactical command of own ship and aircraft and for force command respectively. The two displays are interchangeable and capable of carrying out a number of subsidiary tasks if required. Detection and picture compilation take place at separate consoles. Anti-aircraft point

defence is also controlled from the operations room.

The 'flyco' is situated above the bridge and houses two display consoles, for local air traffic control and homing of returning aircraft. The 'flyco' officer has a good view of the flight deck, and directs two console operators, who also have full computer assistance available. Adjacent to the 'flyco' is the lighter direction office, and the officer in charge here takes over from the local air traffic control officer when departing aircraft leave the 'circuit'. He has two lighter controllers, each with his own PPI display. Using computer assistance each controller can handle two simultaneous interceptions, IFF together with TACAN and UHF/DF navigational facilities are provided as a minimum, and there would be at least nine UHF radar links. Additional equipment can be fitted as required.

While the basic configuration and layout of the ship is optimised to meet the requirements of the Sea Harrier, it also lends itself to the operation of anti-submarine helicopters such as the Westland Sea King, equipped with dunking sonar and A/S weapons. For many situations a mixture of Harriers and helicopters would be most useful — perhaps four helicopters and four Harriers.

For self-defence apart from its

aircraft, the HARRIER CARRIER is armed with three twin 40-mm Breda 1970 gun mountings. Fire control is provided by dual Marconi-Sperry Sapphire equipment with ST 802 tracker radars and an S810 X-band surveillance radar, mainly for target acquisition. This gives autonomy from the AIO system, but targets can of course also be designated from the ship's other radars through this system.

Aircraft fuel and spares and other stores are carried for cruises of about a fortnight, during which each aircraft would probably operate for about 40 hours. Ship endurance when cruising can of course be extended by replenishment at sea. Despite the small size of the ship, maintenance, including engine changes, wing changes and other major operations can be carried out aboard if necessary, or aircraft can be flown to a shore base for this purpose.

The great versatility of the Sea Harrier imparts to this new and unique fighting ship the potential for a wide variety of roles, further broadened by the option of carrying helicopters.

Being a ship of frigate size it can perform many of a frigate's duties, and several which are beyond a frigate's capabilities, while being of the same order of cost. Examples are civil disaster relief (where large power generation capacity and space for hospital facilities would be available), fleet support (including the maintenance of helicopters operating from smaller ships), area surveillance, convoy escort and the transport of assault troops.

The Sea Harrier itself is particularly effective in the strike role, and can carry powerful air surface missiles such as Martel and Harpoon. It can also drop sonobuoys at a greater range from the ship than a helicopter with greatly reduced reaction and transit time and carry bomb or torpedo armaments. Use of the STI facility enables aircraft to be flown off with a full payload under nearly all operational conditions.

The HARRIER CARRIER is an entirely new class of light warship which combines a great variety of fighting and peace-time roles in a ship whose cost brings it within the reach of many countries which could not contemplate the acquisition and operation of a conventional aircraft carrier.

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NEW DIVER SPEECH PROCESSOR

Marconi Space and Defence Systems Limited, a GEC-Marconi Electronics company, has announced the introduction of a new Diver Speech Processor known as the DSO34.

The new equipment, designed to overcome the "Donald Duck" effect that an oxy-helium mixture has on a diver's speech, made its first public appearance at the Oceanology International '75 exhibition at Brighton during March, 1975.

DSO34 supplements the successful Type 023 speech processor which has been tested in actual and simulated dives to 1500ft and incorporates a number of new features making it especially attractive to the offshore oil and gas market as well as for naval applications throughout the world.

Up to four divers can be connected to one of the new processors which can be used for inter-diver, diver-to-surface and surface-to-diver communications. The processor can be operated in either the simplex or duplex modes dependent on the type of diver "umbilical" link. An in-built loudspeaker or headset can be used for monitoring communications and facilities for tape-recording are also available.

To ensure maximum clarity of speech at all times the equipment is fitted with adjustable voice expansion control. This control is used to match the voice expansion ratio to the oxygen-helium mixture. A switch is provided to override the ratio control which, when operated, will revert the processor to the ratio of 1:1 to give normal intercom facilities.

A new "fail-safe" power supply system is incorporated in the DSO34 processor; if the mains supply fails the DSO34 automatically switches to its internal batteries which give up to ten hours of standby operation.

The DSO34 System

When diving to great depths it is necessary to breathe a mixture of, for example, oxygen and helium, in which the partial pressure of oxygen is maintained at the same magnitude as in air at sea-level. Speech produced in this environment is

badly distorted and at depths greater than about 600 feet becomes virtually unintelligible. The principal cause of speech distortion in oxy-helium is the increased velocity of sound. Speech is produced by exciting the resonances of the vocal tract by puffs of air from the larynx during voiced sounds and by turbulence at constrictions during unvoiced sounds. When a diver is speaking at 1500 feet depth in oxy-helium these resonant frequencies are almost trebled and speech is completely unintelligible.

The basis of the method employed in the DSO34 is to write sections of the speech into temporary stores and then to read them at a lower rate. During voiced sounds these sections are taken from the most dominant part of each larynx period and the remainder is rejected. During unvoiced sounds the sections are taken less regularly and are more closely spaced. The frequency compression resulting from the lower replay rate is inversely proportional to the time expansion.

A section length of 2.5 milliseconds was chosen to allow operation at larynx frequencies up to 400Hz.

Four temporary stores are used and at any time one is being written whilst the remainder are being read. This enables the expansion ratio to be varied over the range 1:1 to 3.5:1 whilst retaining all of the sampled sections.

The unit comprises a straight audio amplifier from controller to divers, a delta/sigma helium speech processor and simplex or duplex links. Duplex links enable divers to talk to each other or the operator at

sea level on clear, undistorted voice channels.

The equipment can be used in its own free-standing, sealed-lid housing or mounted in a standard 483mm (19in) rack. All controls, inputs and outputs are arranged on the top panel. A junction box connected to the output socket on this panel carries outlets for up to four divers. The mains supply is backed up by a float-charged nickel cadmium battery ensuring ten hours operation in the event of mains failure. Safety locks in the control switches safeguard divers and operators from high voltage. The diver link can be switched to two wire simplex or four wire duplex. In the simplex mode the two wire link is changed from "up only" to "down only" by the operator's pressel. In the duplex mode the four wire link routes the processed speech back down to the diver's earpiece to enable the unit to be used as a diver to diver intercom when the operator's pressel is not in use.

An expansion control ranging from 1:1 to 3.5:1 is provided and an expansion switch which, in the "off" position, sets expansion to 1:1 without disturbing the dial setting.

An internal/external speaker switch routes the processed speech to an internal or external speaker without disturbing the path to the operator's earpiece or, in the duplex receive mode, to the diver's earpiece.

Auxiliary input socket wiring can be used to parallel two divers at the processor terminals or can be used to connect a tape recorder into the system.

The on-off switch consists of two separate switches mechanically linked to switch off the ac supply and isolated dc supply separately to prevent ac high voltage from hazarding the diver. The equipment operates from a 240v or 115v 48-65Hz supply.

New Anti-Fouling Underwater Paints Saving Time and Money

A successful long-term programme to develop and evaluate anti-fouling underwater paints to meet the particular problems of Australian conditions has resulted in the saving of thousands of dollars in recent years.

The programme has meant the time at sea between expensive dry docking periods can be lengthened.

The Navy, the Australian paint industry, the CSIRO and particularly the Defence Standards Laboratories have developed jointly an oleo-

resinous paint system which — when used in conjunction with an anti-corrosive primer — extends the fouling-free life of ships' hulls by preventing the early attachment and growth of marine organisms such as barnacles.

Further research is expected to produce improved coating systems which will extend the fouling-free life of ships to meet a proposed three year interval between dry dockings.

The Department of Defence has established and operates a paint immersion and testing facility at Garden Island Dockyard in Sydney. Another facility is at Innisfail, Queensland, at the Joint Tropical

Research Unit which is administered by the Department of Supply and the UK Ministry of Defence. A reciprocal testing programme is also current at these two sites with US Naval paint systems while other navies have been invited to participate in this work.

The Commonwealth Paint Committee through the verification testing of the Naval Paint Laboratory at Garden Island Dockyard controls the establishment of underwater paint standards and has a useful role in maintaining the quality of all paints used for anti-fouling application in the RAN.

THE NAVY LEAGUE OF AUSTRALIA (NEW SOUTH WALES DIVISION)

Annual General Meeting

Notice is hereby given that the Annual General Meeting of the Navy League of Australia (New South Wales Division) will be held at 5.30 pm, Monday, 30th August, 1976, in the Conference Room, 2nd Floor, P & O Australia Limited, P & O Building, 55 Hunter Street, Sydney (access by way of Castlereagh Street entrance).

BUSINESS

1. Apologies.
2. Confirmation of Minutes of Annual General Meeting held 29th August, 1975.
3. To receive the Committee's Annual Report — presented by the President, Lieutenant Commander E. Bryden-Brown, VRD, RANR.
4. To receive the Balance Sheet and Accounts — presented by Mr R. I. Rae, FCA, Honorary Treasurer.
5. Election of Executive Committee —

The following gentlemen offer themselves for re-election:

Lieutenant Commander E. Bryden-Brown
Commander R. O. Albert
Rear Admiral G. J. B. Crabb
Mr D. P. Trickett
Commander Keith Adams

Mr Malcolm Longstaff
Mr A. R. Webber
Mr M. McCullagh
Commander R. A. Denovan

(FURTHER NOMINATIONS WILL BE RECEIVED)

6. Future of the Naval Reserve Cadets and the role of the Navy League — remarks by the President, Lieutenant Commander E. Bryden-Brown.
7. Question time.
8. General Business.
9. Adjournment.

**AT THE CONCLUSION OF FORMAL BUSINESS, LIGHT
REFRESHMENTS WILL BE SERVED**

Box 1719,
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Dennis P. Trickett,
Honorary Secretary.
30th July, 1976

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